MacDon

D65
Draper Header for Self-Propelled Windrowers

IMPORTANT: PAGE 35 HAS BEEN UPDATED SINCE THIS MANUAL WAS PUBLISHED.

Operator's Manual

169899 Revision A

Original Instruction

The harvesting specialists.

D65 Draper Header for Self-Propelled Windrowers

Published: August, 2014

Declaration of Conformity

CE

EC Declaration of Conformity

MacDon Industries Ltd
680 Moray Street
Winnipeg, Manitoba, Canada R3J 3S3

Machine type: *SP Draper Header*
Model: *Series D65*
Serial Number(s): *As Per Shipping Document*

fulfills all relevant provisions and essential requirements of the following directives:

Directive	Number	Certification Method
Machinery Directive	2006/42/EC	Self-Certification

Name and address of the person in the European Community authorized to compile the technical construction file:

Johannes Molitor
Schwarzwald Strasse 67
66482 Zweibrucken / Germany
HRB 31002, Amtsgericht Zweibrucken

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Date of Declaration:	13 May 2013	**Title:**	Director, Product Integrity

1005843

Introduction

This instructional manual contains information on the D65 Draper Header. It is designed to serve a dual function in your grain, hay, and specialty crop harvesting operation. Teamed with your self-propelled windrower power unit and optional hay conditioner, D65 Draper Headers will cut and lay crop into uniform, fluffy windrows.

CAREFULLY READ ALL THE MATERIAL PROVIDED BEFORE ATTEMPTING TO UNLOAD, ASSEMBLE, OR USE THE MACHINE.

Use this manual as your first source of information about the machine. If you follow the instructions given here, your header will work well for many years. If you require more detailed service information, a technical manual is available from your MacDon Dealer.

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. A storage case for this manual is located inside the header left endshield.

Call your MacDon Dealer if you need assistance, information, or additional copies of this manual.

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

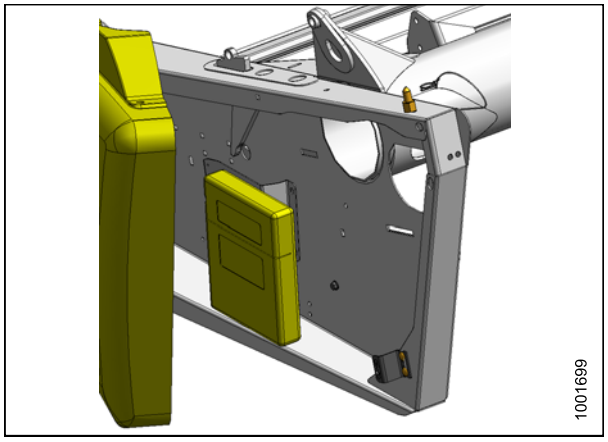


Figure 1: Manual Storage Location

List of Revisions

The following lists the changes from the previous version (169594 Revision C) of this document.

Summary of Change	Refer To
Document Number revised.	
List of Revisions added.	
Timed Knife Drive Tensioning revised.	*Tensioning Timed Knife Drive Belts, page 168*
Knife Drive Belt Tracking added.	*Adjusting Belt Tracking, page 172*
Reel reinforcement bushing replacement added.	*Removing Bushings from 5-, 6- or 9-Bat Reels, page 207* *Installing Bushings on 5-, 6- or 9-Bat Reels, page 212*
Knife Drive section re-organized.	*6.6 Knife Drive, page 153*
Draper Deflector replacement revised.	*6.7.9 Replacing Draper Deflectors, page 195*
Reel Drive section re-formatted.	*6.9 Reel Drive, page 221*
Reel Drive Sprocket replacement revised.	*6.9.1 Replacing Reel Drive Sprocket, page 221*
Cutting on the Ground section revised	*Cutting On the Ground, page 53*
Header Angle, Reel Speed, and Ground Speed sections revised.	*Controlling Header Angle, page 56* *4.7.4 Reel Speed, page 56* *4.7.5 Ground Speed, page 57*
Double Windrowing revised.	*4.9 Double Windrowing, page 76*
Delivery Opening formatting revised.	*4.8 Delivery Opening, page 74*
Header Settings updated.	*4.6.2 Header Settings, page 46*
Safety Decals Locations re-formatted.	*1.8 Safety Decal Locations, page 10*
Reel Tine Tube Re-inforcement Kit, UCA Kits, Draper Deflector Kits added to Options.	*8.1.4 Reel Tine Tube Reinforcing Kit, page 260* *8.4.11 Upper Cross Auger Hydraulic Kit for DDD, page 268* *8.4.12 Upper Cross Auger Case Drain Kit for SDD, page 268* *6.7.9 Replacing Draper Deflectors, page 195*
Figure titles added where missing.	General
UCA Lubrication revised. Lubrication section revised.	*Service Intervals, page 133*
Draper Roller maintenance section revised.	*6.7.8 Draper Roller Maintenance, page 188*

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.

NOTE:
Right Hand (RH) and Left Hand (LH) designations are determined from the operator's position, facing forward.

Draper Header

Header Model: _____

Serial Number: _____

Year: _____

The serial number plate (A) is located beside the knife drive motor on the left hand endsheet.

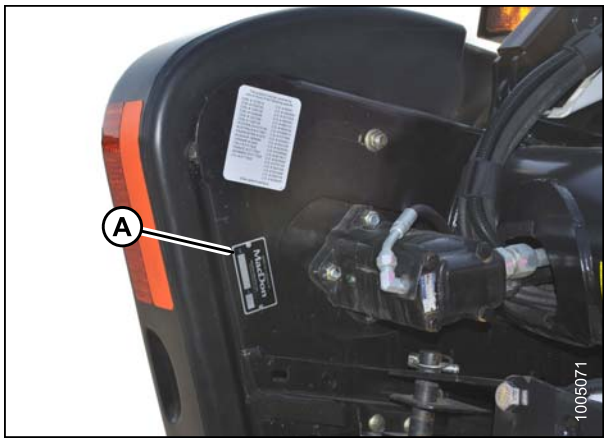


Figure 2: Header

Slow Speed Transport/Stabilizer Wheel Option

Serial Number: _____

Year: _____

The serial number plate (A) is located on the right hand axle assembly.

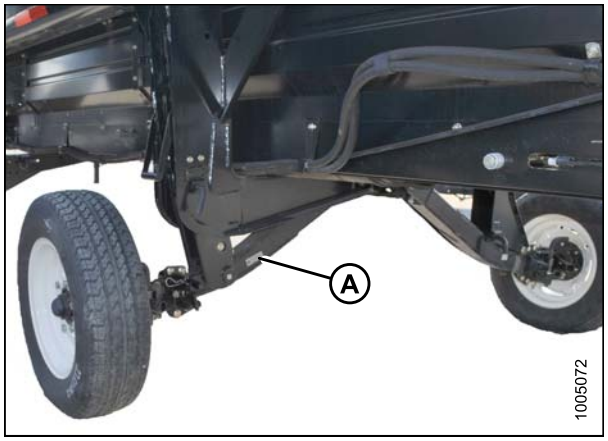


Figure 3: Transport/Stabilizer Option

1 Safety

1.1 Safety Alert Symbols

This safety alert symbol indicates important safety messages in this manual and on safety signs on the header.

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. The appropriate signal word for each situation has been selected using the following guidelines:

DANGER

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

WARNING

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

CAUTION

Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may be used to alert against unsafe practices.

1.3 General Safety

CAUTION

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

Protect yourself

- When assembling, operating, and servicing machinery, wear all the protective clothing and personal safety devices that **COULD** be necessary for the job at hand. Don't take chances.
- You may need:
  - A hard hat
  - Protective footwear with slip resistant soles
  - Protective glasses or goggles
  - Heavy gloves
  - Wet weather gear
  - A respirator or filter mask

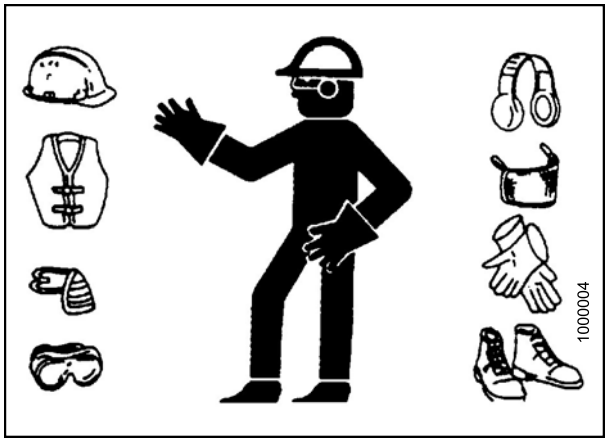


Figure 1.2: Safety Equipment

Hearing protection

- Be aware that exposure to loud noise can cause impairment or loss of hearing. Wear suitable hearing protection devices such as ear muffs or ear plugs to help protect against objectionable or loud noises.

Figure 1.3: Safety Equipment

- Provide a first aid kit for use in case of emergencies.
- Keep a fire extinguisher on the machine. Be sure the fire extinguisher is properly maintained. Be familiar with its proper use.
- Keep young children away from the machinery at all times.
- Be aware that accidents often happen when the Operator is tired or in a hurry to get finished. Take the time to consider the safest way. Never ignore warning signs of fatigue.

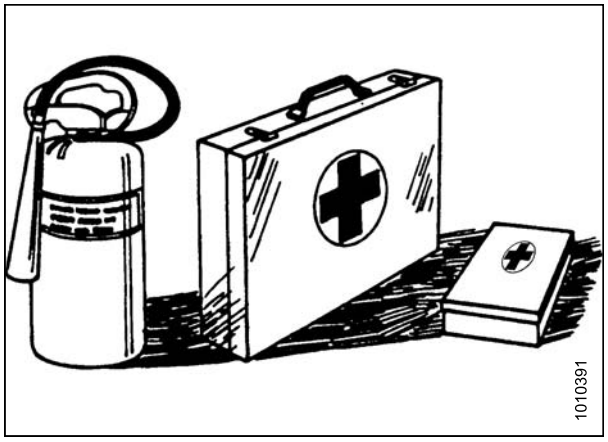


Figure 1.4: Safety Equipment

- Wear close fitting clothing and cover long hair. Never wear dangling items such as scarves or bracelets.
- Keep all shields in place. Never alter or remove safety equipment. Make sure driveline guards can rotate independently of the shaft and can telescope freely.
- Use only service and repair parts made or approved by the equipment manufacturer. Substituted parts may not meet 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. Non-authorized modifications may impair machine function and/or safety. It may also shorten the machine's life.
- Stop the engine and remove the key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

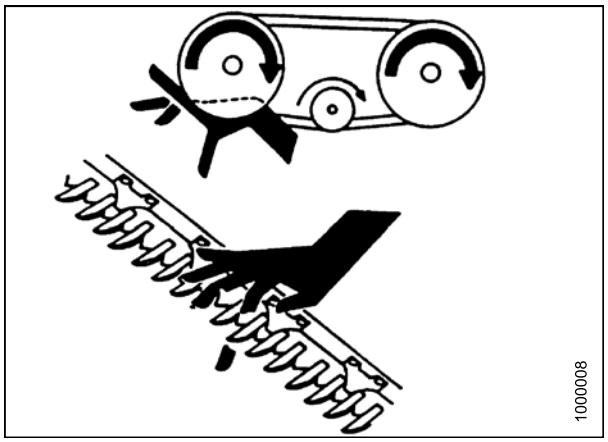


Figure 1.6: Safety Around Equipment

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

Figure 1.7: Safety Around Equipment

1.4 Maintenance Safety

To ensure your safety while maintaining the machine:

- Review the operator's manual and all safety items before operation and/or maintenance of the machine.
- Place all controls in Neutral, stop the engine, set the park brake, remove the ignition key, and wait for all moving parts to stop before servicing, adjusting, and/or repairing.
- Follow good shop practices:
  - Keep service areas clean and dry
  - Be sure electrical outlets and tools are properly grounded
  - Use adequate lighting for the job at hand
- Relieve pressure from hydraulic circuits before servicing and/or disconnecting the machine.
- Make sure all components are tight and that steel lines, hoses, and couplings are in good condition before applying pressure to a hydraulic system..
- 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 and repairs or when making any adjustments.
- Install transport lock or place safety stands under the frame before working under the header.
- If more than one person is servicing the machine at the same time, be aware that rotating a driveline or other mechanically driven component by hand (for example, accessing a lube fitting) will cause drive components in other areas (belts, pulleys, and knife) to move. Stay clear of driven components at all times.
- Wear protective gear when working on the machine.
- Wear heavy gloves when working on knife components.

Figure 1.8: Safety Around Equipment

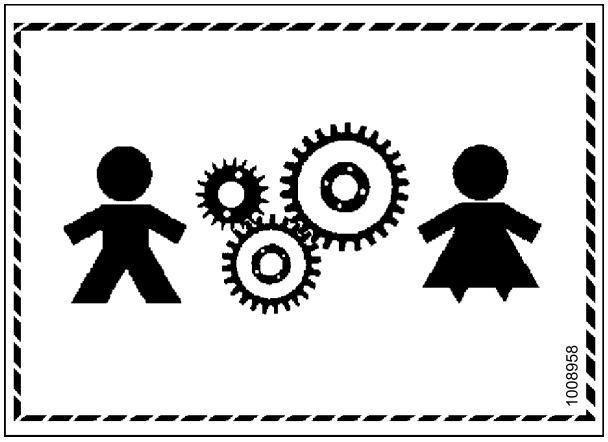


Figure 1.9: Equipment NOT Safe for Children

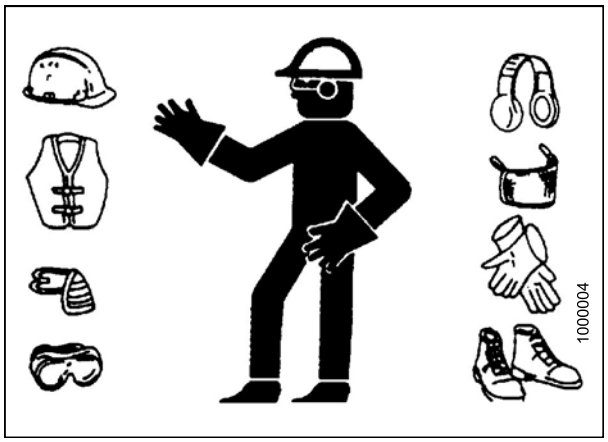


Figure 1.10: Safety Equipment

1.5 Hydraulic Safety

- Always place all hydraulic controls in Neutral before dismounting.
- Make sure that all 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 the hydraulic lines, fittings, or hoses by using tapes, clamps, cements, or welding. The hydraulic system operates under extremely high pressure. Makeshift repairs will fail suddenly and create a hazardous and unsafe condition.

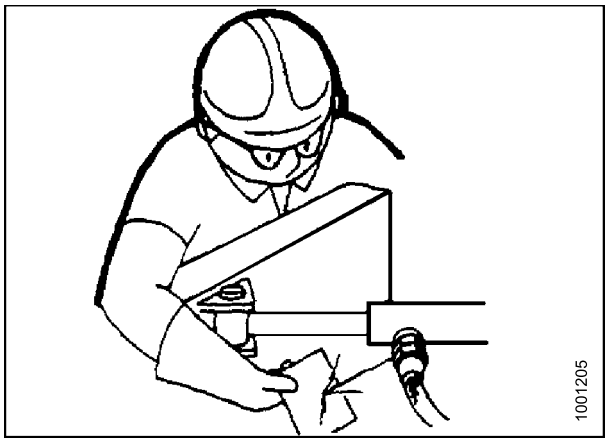


Figure 1.11: Testing for Hydraulic Leaks

- Wear proper hand and eye protection when searching for a high-pressure hydraulic leak. Use a piece of cardboard as a backstop instead of 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

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

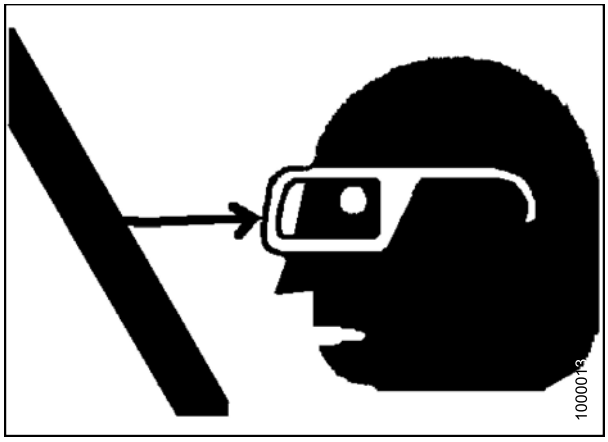


Figure 1.13: Safety Around Equipment

1.6 Tire Safety

- Follow proper procedures when mounting a tire on a wheel or rim. Failure to do so can produce an explosion that may result in serious injury or death.

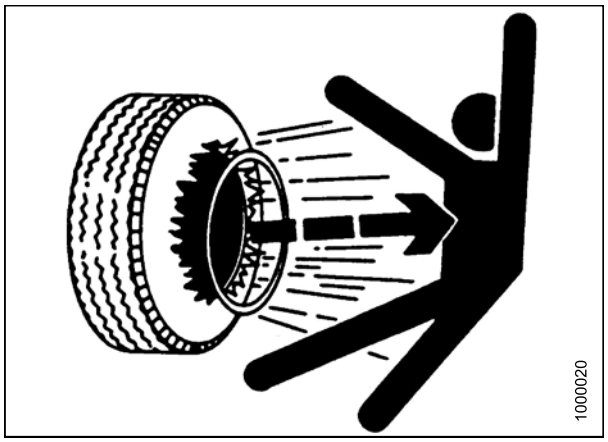


Figure 1.14: Over-Inflated Tire

- Do **NOT** attempt to mount a tire unless you have the proper training and equipment.
- Have a qualified tire dealer or repair service perform required tire maintenance.

Figure 1.15: Safely Filling a Tire with Air

1.7 Safety Signs

- Keep safety signs clean and legible at all times.
- Replace safety signs that are missing or become illegible.
- If original parts on which a safety sign was installed are replaced, be sure the repair part also bears the current safety sign.
- Safety signs are available from your Dealer Parts Department.

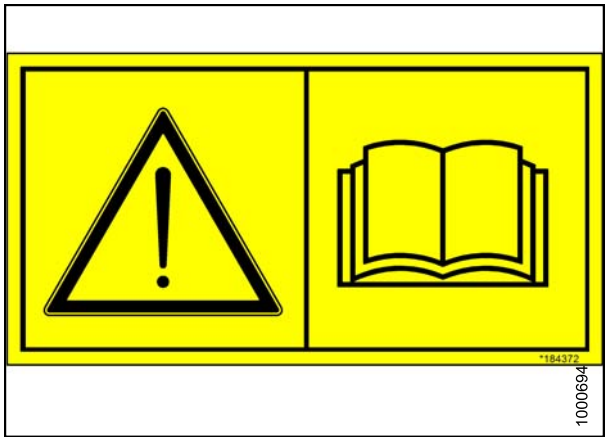


Figure 1.16: Operator's Manual Decal

1.7.1 Installing Safety Decals

To install a safety decal, follow these steps:

1. Clean and dry the installation area.
2. Decide on the exact location before you remove the decal backing paper.
3. Remove the smaller portion of the split backing paper.
4. Place the sign in position and slowly peel back the remaining paper, smoothing the sign as it is applied.
5. Prick small air pockets with a pin and smooth out.

1.8 Safety Decal Locations

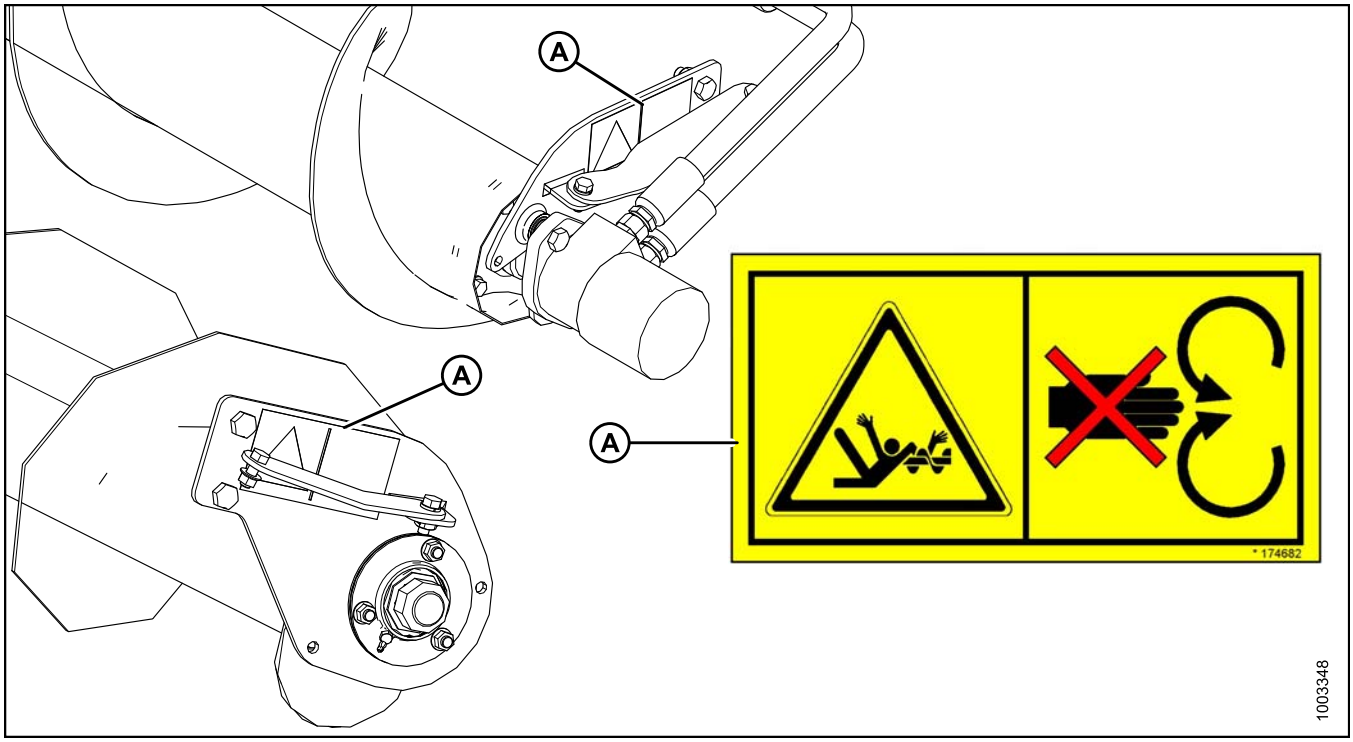


Figure 1.17: Upper Cross Auger

A - MD #174682

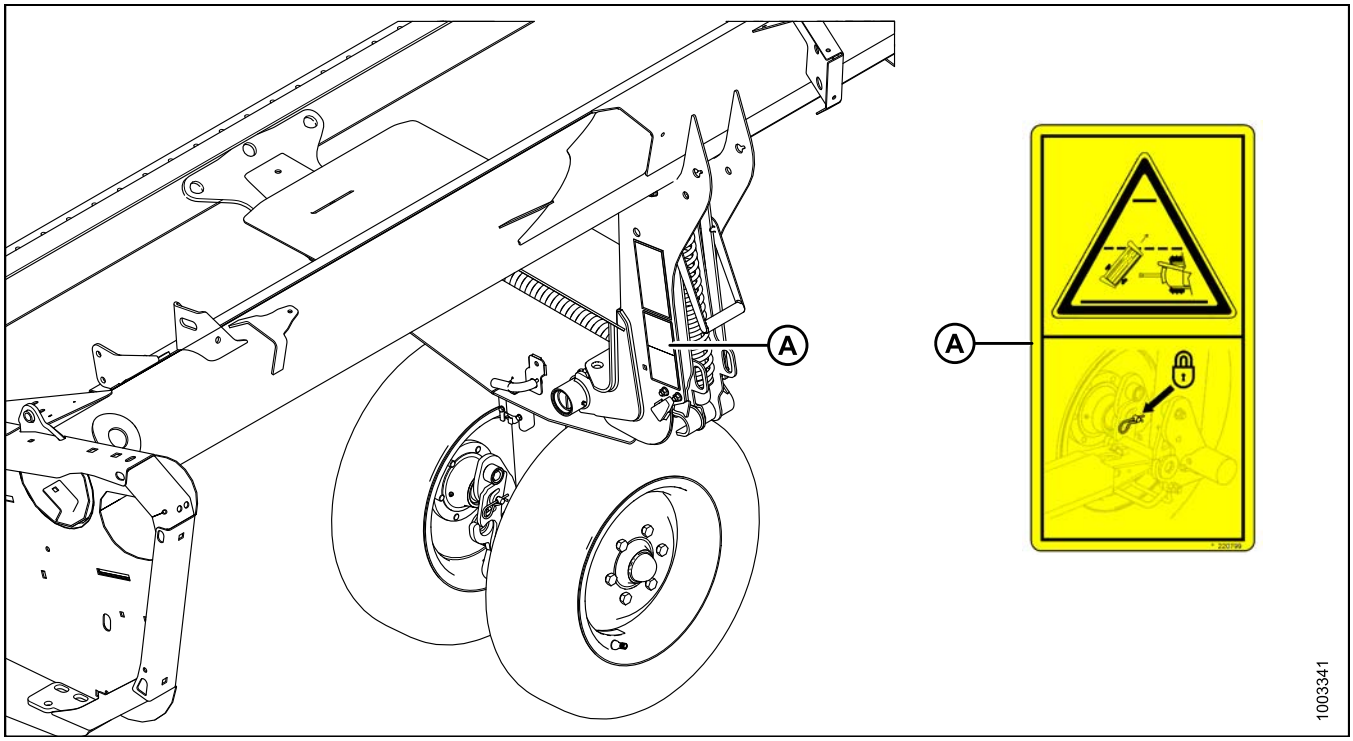


Figure 1.18: Slow Speed Transport

A - MD #220799

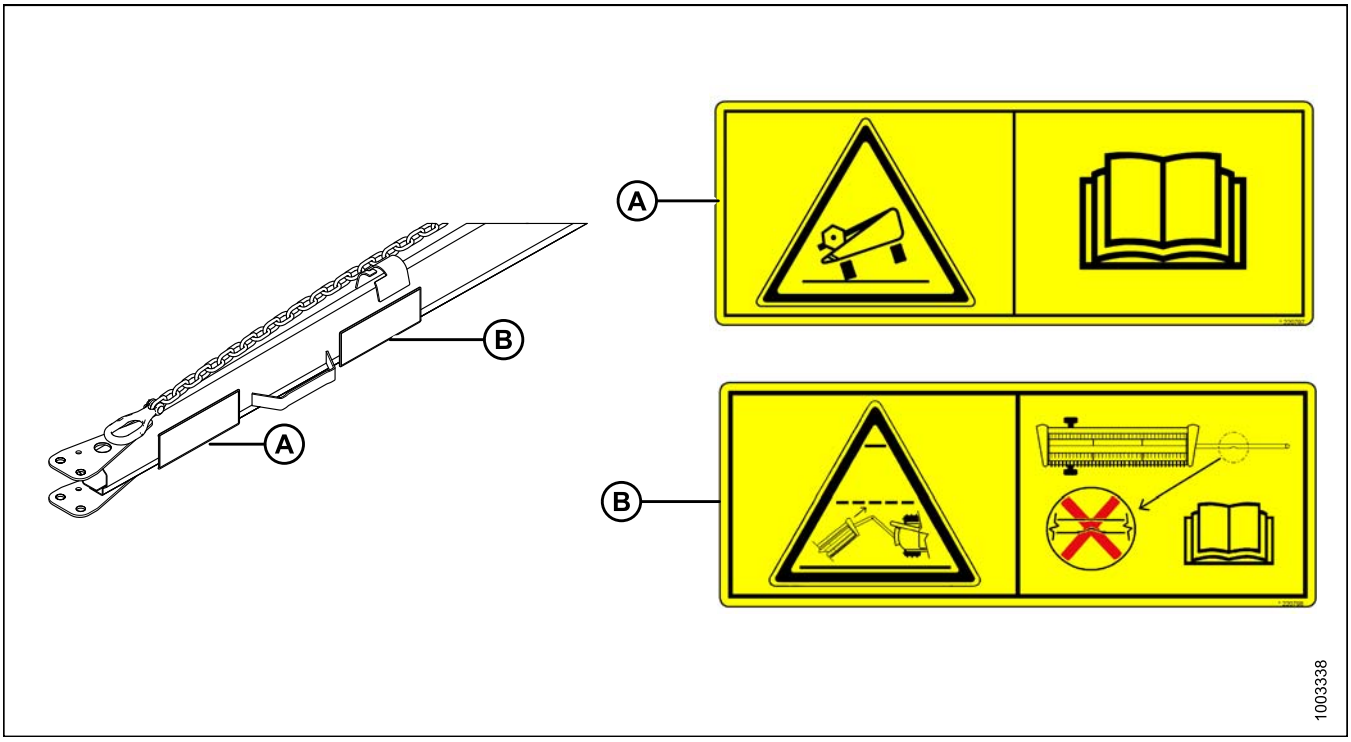


Figure 1.19: Slow Speed Transport Tow-Bar

A - MD #220797 **B - MD #220798**

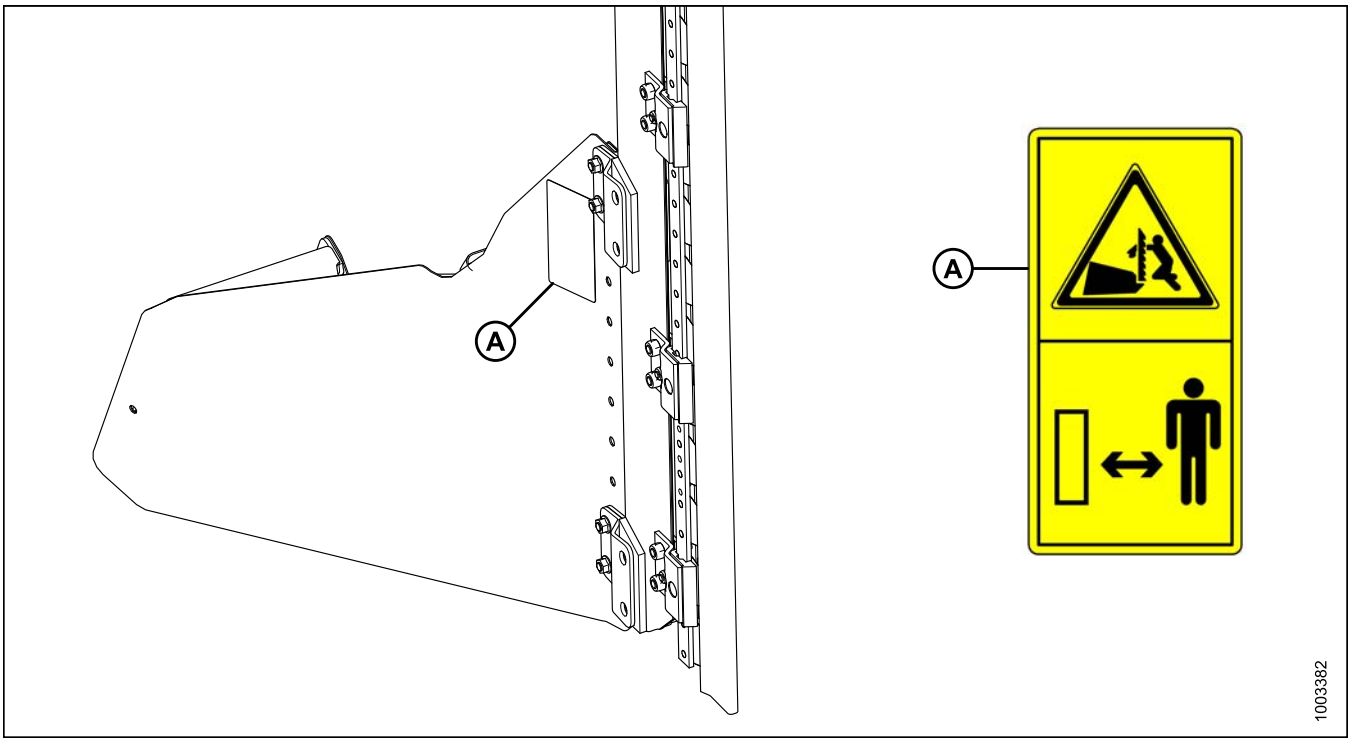


Figure 1.20: Vertical Knife

A - MD #174684

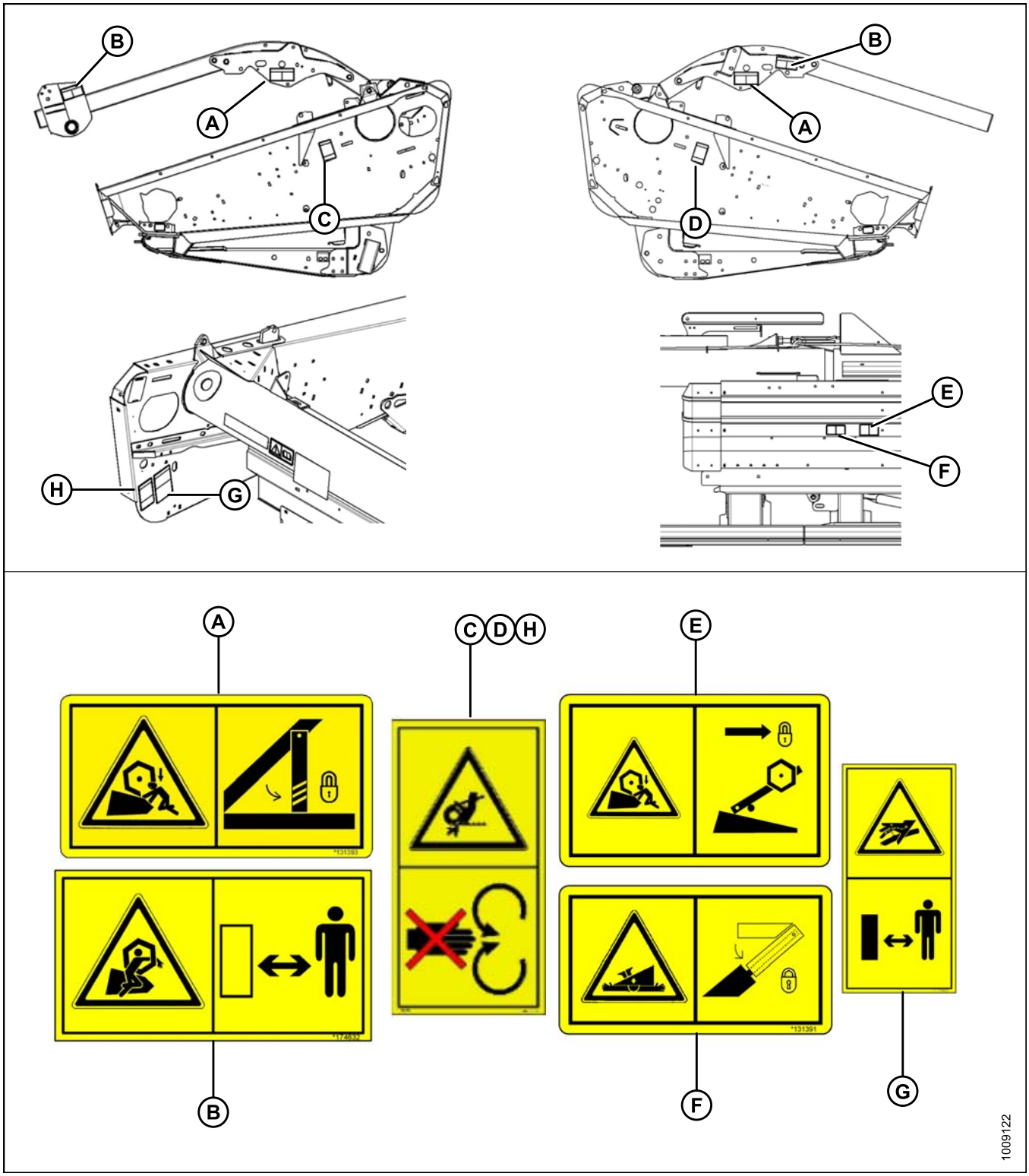


Figure 1.21: Endsheets, Reel Arms, Backsheet

A - MD #131393
B - MD #174632
C - MD #184371
D - MD #184371 (DK Only)
E - MD #131392 (2 Places)
F - MD #131391 (2 Places)
G - MD #174436
H - MD #184371 (DK 2 Places)

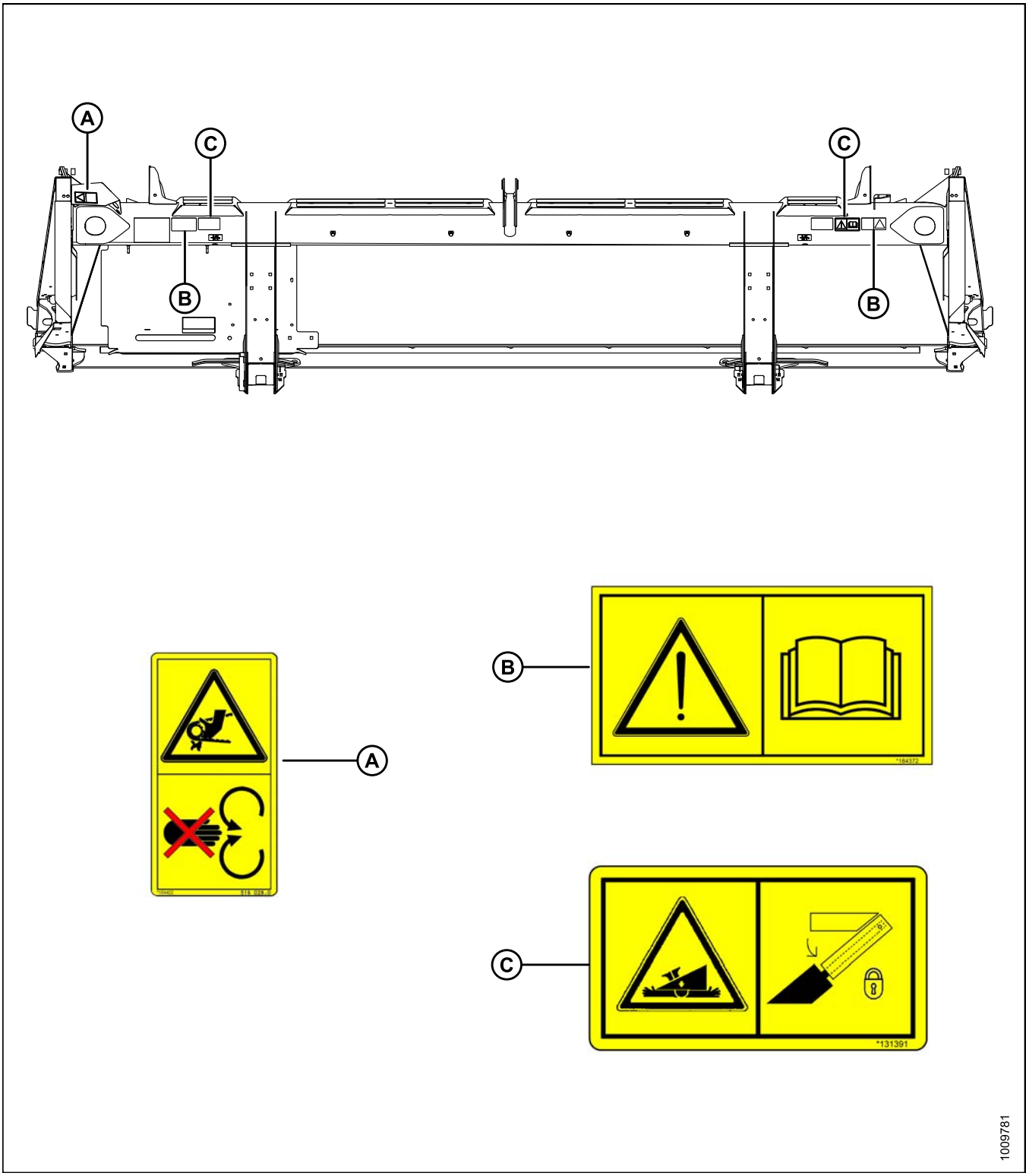


Figure 1.22: Back Tube: 15-Foot Header

A - MD #184422 **B - MD #184372** **C - MD #131391**

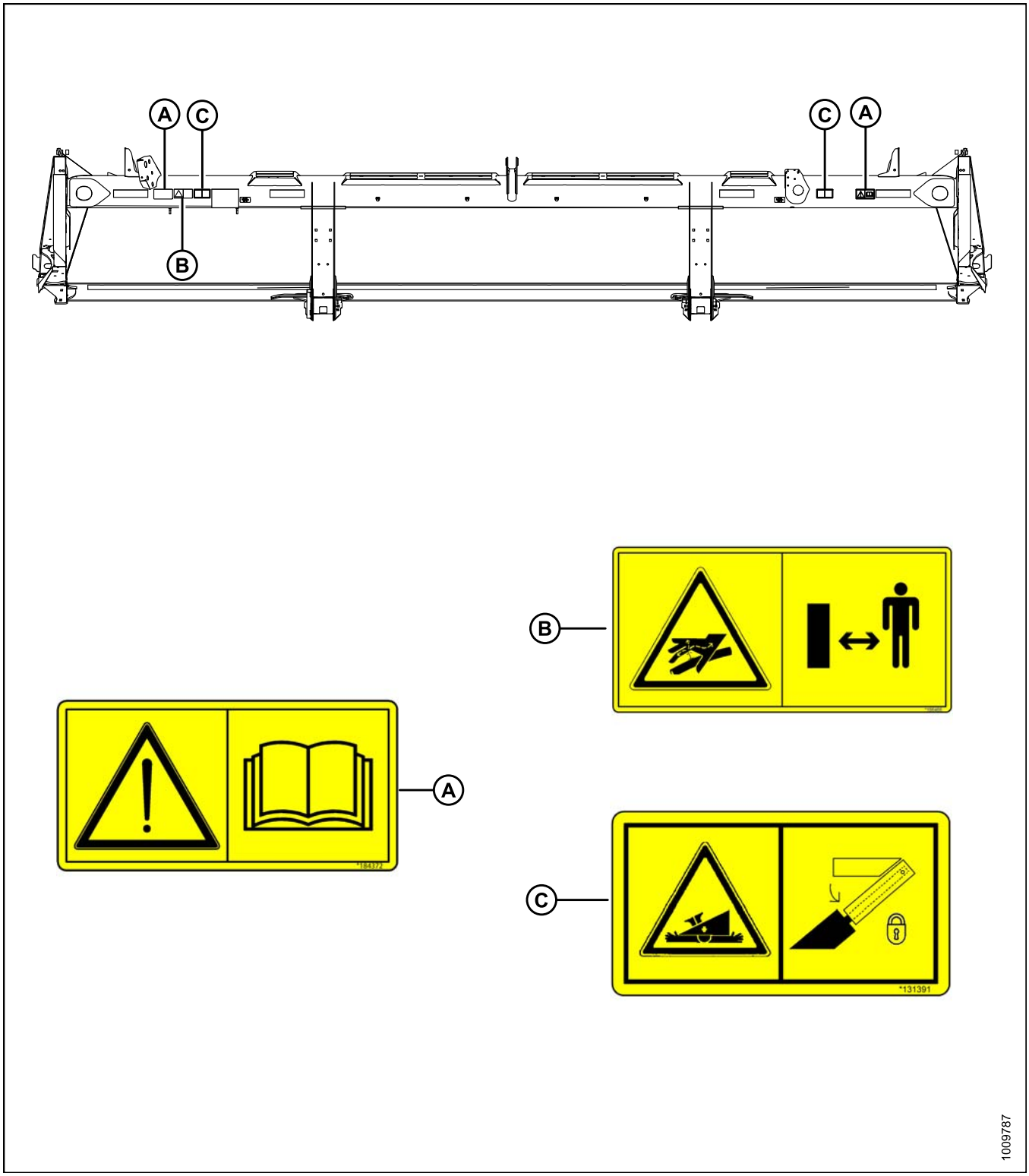


Figure 1.23: Back Tube: 20-Foot Header

A - MD #184372 **B - MD #166466** **C - MD #131391**

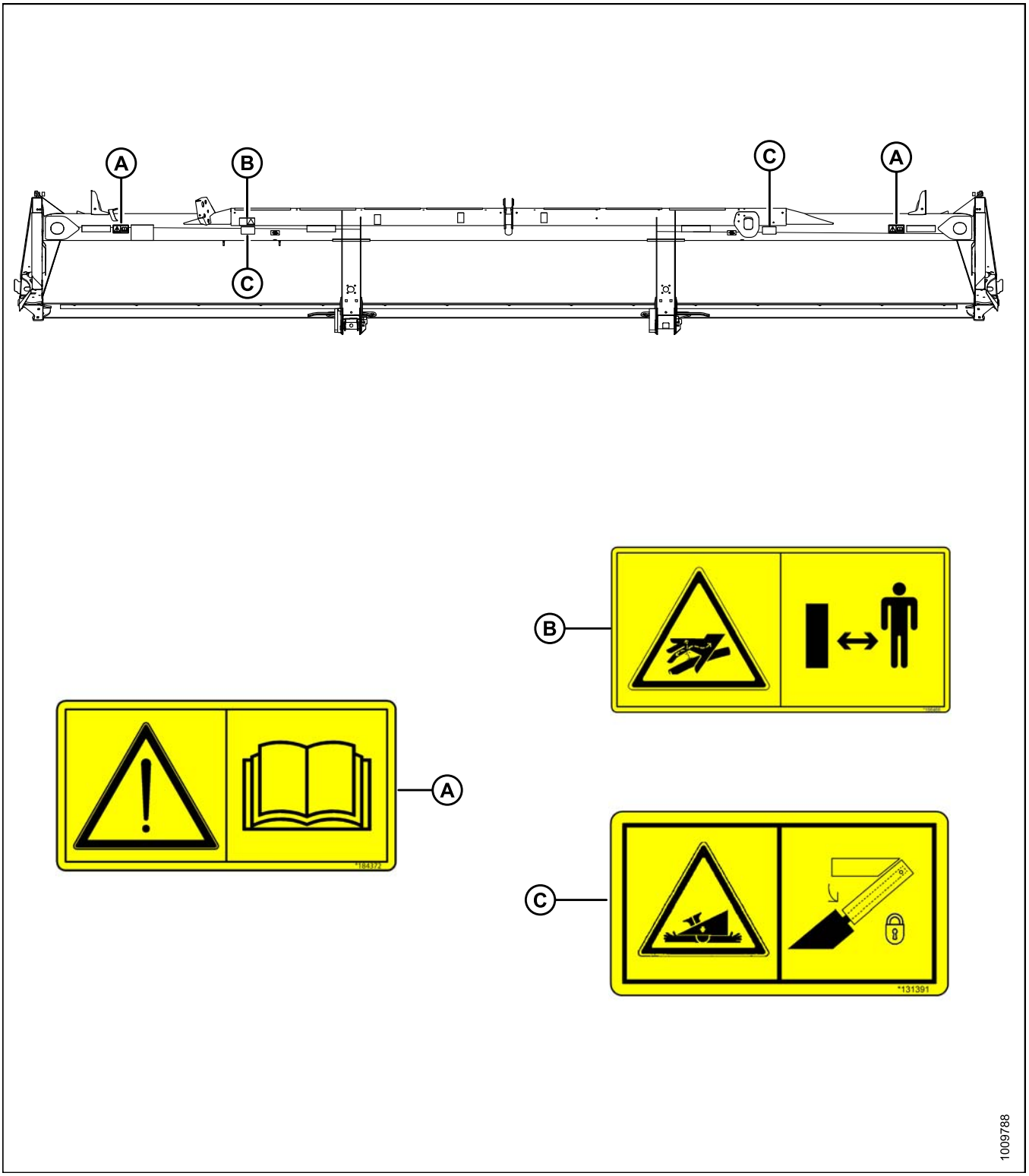


Figure 1.24: Back Tube: 25-Foot Header

A - MD #184372 **B - MD #166466** **C - MD #131391**

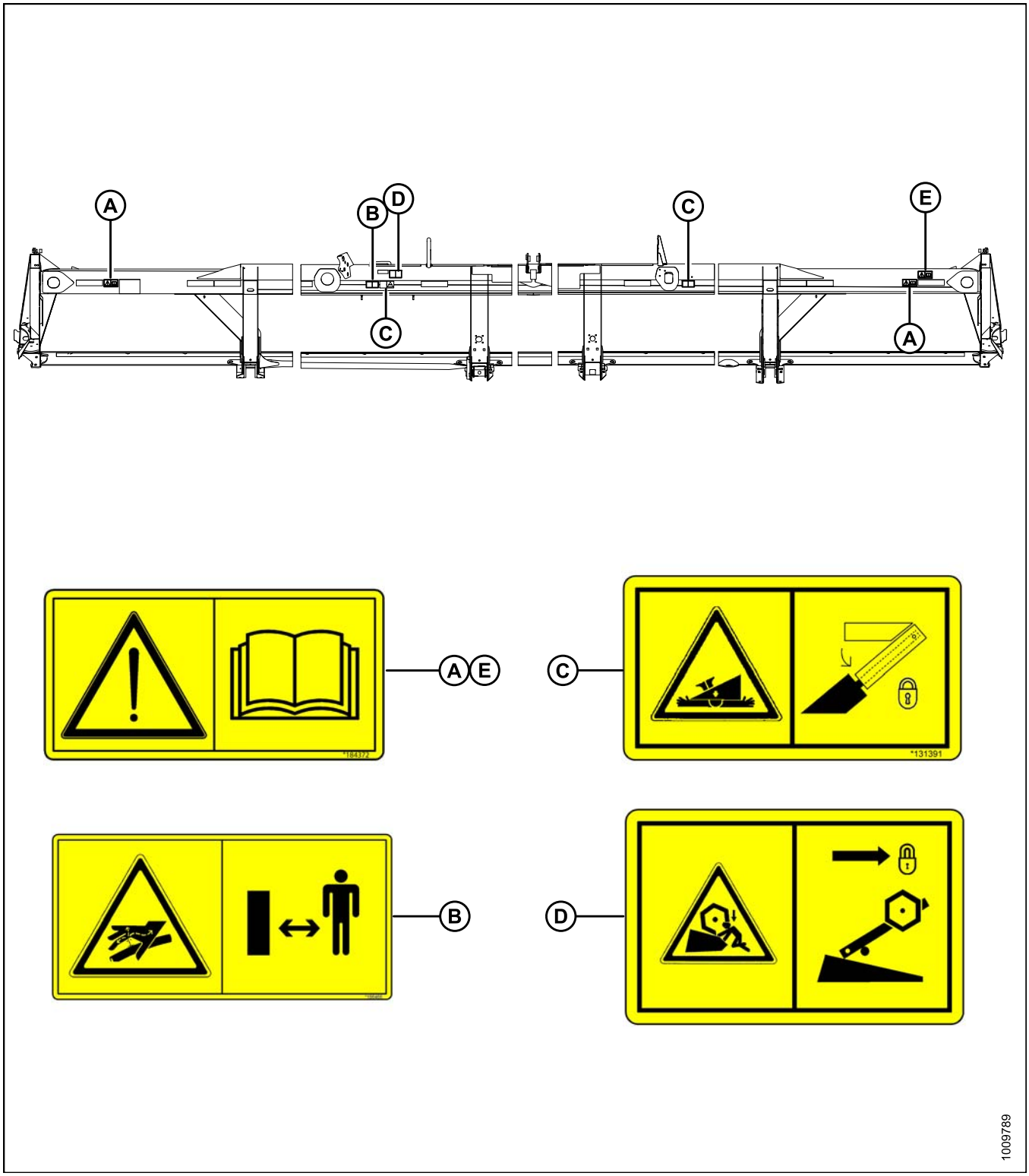


Figure 1.25: Back Tube: 30-, 35-, 40-Foot Header

A - MD #184372
B - MD #166466
C - MD #131391
D - MD #131392 (30 & 35 Ft. DR Only)
E - MD #184372 (Split Frame)

1.9 Interpreting Safety Signs

In the safety sign explanations below, (a) refers to the top or left position panel, (b) refers to the bottom or right position of the safety decal depending on decal orientation.

NOTE:
If there are more than two panels in a decal, the lettering will continue downward or to the right, depending on decal orientation.

1. MD #113482

   a. General hazard pertaining to machine operation and servicing

   b. **CAUTION**
   To avoid injury or death from improper or unsafe machine operation:

   - Read the operator's manual and follow all safety instructions. If you do not have a manual, obtain one from your Dealer.
   - Do not allow untrained persons to operate the machine.
   - Review safety instructions with all Operators every year.
   - Ensure that all safety signs are installed and legible.
   - Make certain everyone is clear of machine before starting engine and during operation.
   - Keep riders off the machine.
   - Keep all shields in place, and stay clear of moving parts.
   - Disengage header drive, put transmission in Neutral, and wait for all movement to stop before leaving operator's position.
   - Shut down the engine and remove the key from ignition before servicing, adjusting, lubricating, cleaning, or unplugging machine.
   - Engage safety props to prevent lowering of header or reel before servicing in the raised position .
   - Use slow moving vehicle emblem and flashing warning lights when operating on roadways unless prohibited by law.

Figure 1.26: MD #113482

2. MD #131391
   a. Crushing hazard
   b. **DANGER**
      - Rest header on ground or engage safety props before going under unit

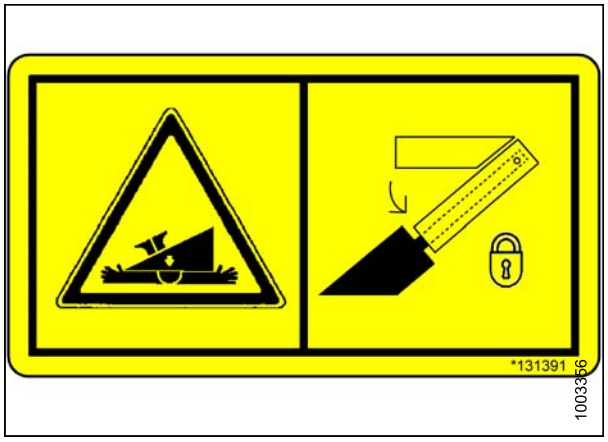


Figure 1.27: MD #131391

3. MD #131392
   a. Crushing hazard
   b. **WARNING**
      - To avoid injury from fall of raised reel; fully raise reel, stop the engine, remove the key, and engage safety prop on each reel support arm before working on or under reel.
      - Refer to header operator's manual.

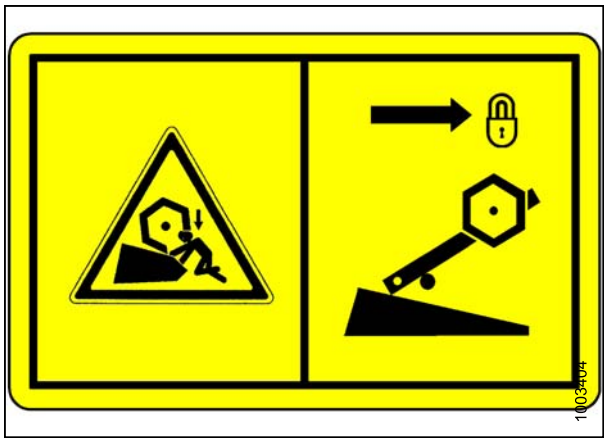


Figure 1.28: MD #131392

4. MD #131393
   a. Reel hazard
   b. **WARNING**
      - To avoid injury from fall of raised reel; fully raise reel, stop the engine, remove the key, and engage safety prop on each reel support arm before working on or under reel.
      - Refer to header operator's manual.

Figure 1.29: MD #131393

5. MD #166466

   a. High pressure oil hazard

   b. **WARNING**
   Do not go near leaks.

   - High pressure oil easily punctures skin causing serious injury, gangrene, or death.
   - If injured, seek emergency medical help. Immediate surgery is required to remove oil.
   - Do not use finger or skin to check for leaks.
   - Lower load or relieve hydraulic pressure before loosening fittings.

Figure 1.30: MD #166466

6. MD #174436

   a. High pressure oil hazard

   b. **WARNING**
   Do not go near leaks

   - High pressure oil easily punctures skin causing serious injury, gangrene, or death.
   - If injured, seek emergency medical help. Immediate surgery is required to remove oil.
   - Do not use finger or skin to check for leaks.
   - Lower load or relieve hydraulic pressure before loosening fittings.

Figure 1.31: MD #174436

7. MD #174632

   a. Reel entanglement hazard

   b. **CAUTION**

   - To avoid injury from entanglement with rotating reel, stand clear of header while machine is running.

Figure 1.32: MD #174632

8. MD #174682
   a. Auger entanglement hazard
   b. **CAUTION**
      - To avoid injury from entanglement with rotating auger, stand clear of header while machine is running.

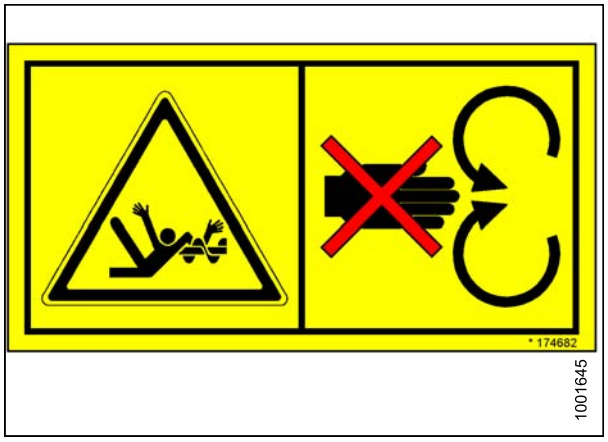


Figure 1.33: MD #174682

9. MD #174684
   a. Sharp component hazard
   b. **CAUTION**
      - Wear heavy canvas or leather gloves when working with knife.
      - Be sure no one is near the vertical knife when removing or rotating knife.

Figure 1.34: MD #174684

10. MD #184372

    a. General hazard pertaining to machine operation and servicing

    b. **CAUTION**
    To avoid injury or death from improper or unsafe machine operation:

    - Read the operator's manual and follow all safety instructions. If you do not have a manual, obtain one from your Dealer.
    - Do not allow untrained persons to operate the machine.
    - Review safety instructions with all Operators annually.
    - Ensure that all safety signs are installed and legible.
    - Make certain everyone is clear of machine before starting engine and during operation.
    - Keep riders off the machine.
    - Keep all shields in place and stay clear of moving parts.
    - Disengage header drive, put transmission in Neutral, and wait for all movement to stop before leaving operator's position.
    - Shut off the engine and remove the key from ignition before servicing, adjusting, lubricating, cleaning, or unplugging machine.
    - Engage safety props to prevent lowering of raised unit before servicing in the raised position.
    - Use slow moving vehicle emblem and flashing warning lights when operating on roadways unless prohibited by law.

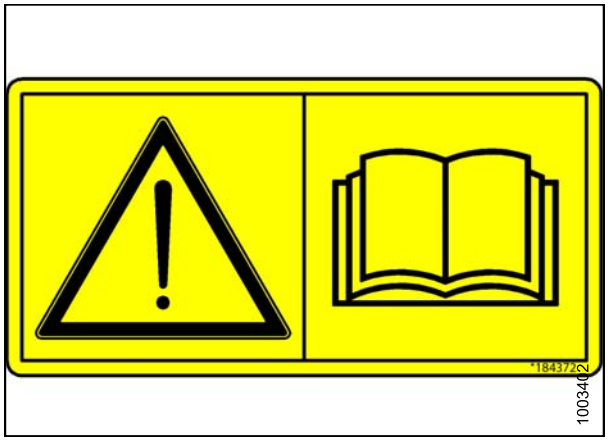


Figure 1.35: MD #184372

11. MD #184422

    a. Keep shields in place hazard

    b. **WARNING**

    - To avoid injury, stop the engine and remove the key before opening power drive system shield
    - Keep all shields in place

Figure 1.36: MD #184422

12. MD #193147
    a. Transport/roading hazard
    b. **WARNING**
        - Ensure tow-bar lock mechanism is locked

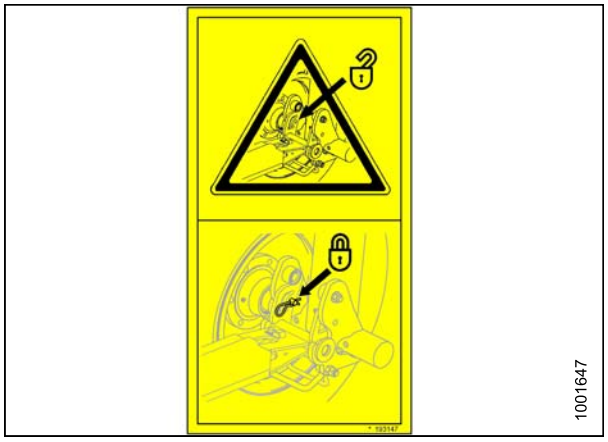


Figure 1.37: MD #193147

13. MD #220797
    a. Tipping hazard in transport mode
    b. **WARNING**
        - Read the operator's manual for more information on potential tipping or roll-over of header while transporting.

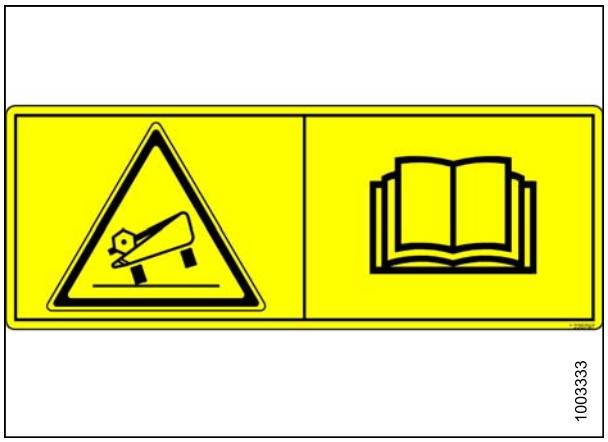


Figure 1.38: MD #220797

14. MD #220798
    a. Loss of control hazard in transport
    b. **CAUTION**
        - Do not tow the header with a dented or otherwise damaged tow pole (the circle with the red X shows a dent in the pole)
        - Consult the operator's manual for more information

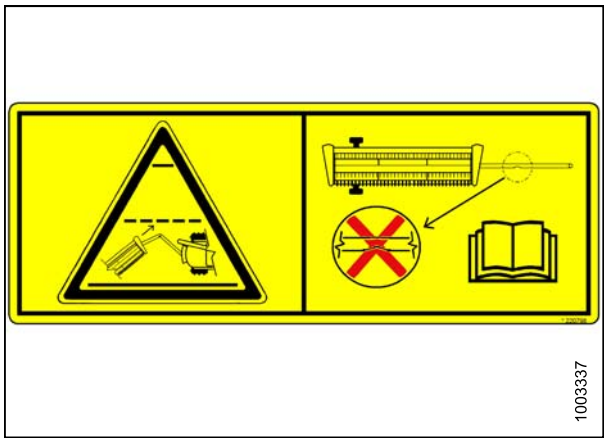


Figure 1.39: MD #220798

15. MD #220799
    a. Transport/roading hazard
    b. **WARNING**
        - Ensure tow-bar lock mechanism is locked

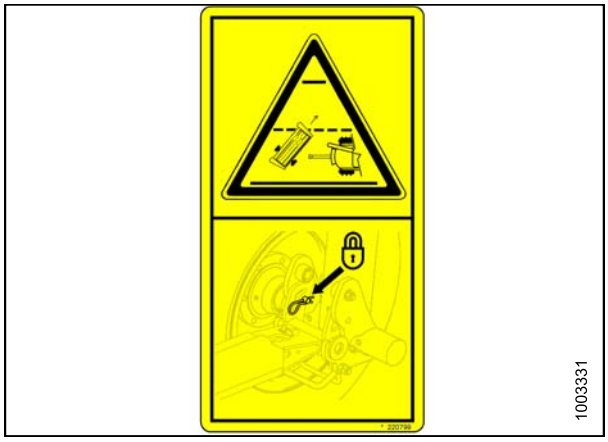


Figure 1.40: MD #220799

2 Reference

2.1 Definitions

The following terms and acronyms may be used in this manual.

Term	Definition
API	American Petroleum Institute
ASTM	American Society of Testing and Materials
Bolt	A headed and externally threaded fastener that is designed to be paired with a nut
Cab-forward	Windrower operation with the Operator and cab facing in the direction of travel
CDM	Cab display module on a self-propelled windrower
Center-link	A hydraulic cylinder link between the header and the machine to which it is attached: It is used to change header angle
CGVW	Combined vehicle gross weight
D-Series header	MacDon rigid draper header
DK	Double knife
DKD	Double-knife drive
DDD	Double-draper drive
DR	Double reel
Finger tight	Finger tight is a reference position where sealing surfaces or components are making contact with each other and the fitting has been tightened to a point where the fitting is no longer loose
FFFT	Flats from finger tight
GSL	Ground speed lever
GVW	Gross vehicle weight
Hard joint	A joint made with the use of a fastener where the joining materials are highly incompressible
Header	A machine that cuts and lays crop into a windrow and is attached to a self-propelled windrower
Hex key	A hex key or Allen key (also known by various other synonyms) is a tool of hexagonal cross-section used to drive bolts and screws that have a hexagonal socket in the head (internal-wrenching hexagon drive)
HDS	Hydraulic deck shift
hp	Horsepower
ISC	Intermediate Speed Control
JIC	Joint Industrial Council: a standards body that developed the standard sizing and shape for original 37° flared fitting
Knife	A cutting device which uses a reciprocating cutter (also called a sickle)
n/a	Not applicable
Nut	An internally threaded fastener that is designed to be paired with a bolt

Term	Definition
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
ORB	O-ring boss: a style of fitting commonly used in port opening 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
PTO	Power Take-Off
RoHS (Reduction of Hazardous Substances)	A directive by the European Union to restrict the use of certain hazardous substances (such as hexavalent chromium used in some yellow zinc platings)
SAE	Society of Automotive Engineers
Screw	A headed and externally threaded fastener that threads into preformed threads or forms its own thread in one of the mating parts
SDD	Single-draper drive
Self-Propelled (SP) Windrower	Self-propelled machine consisting of a power unit with a header
SK	Single knife
SKD	Single-knife drive
Soft joint	A joint made with the use of a fastener where the joining materials are compressible or experience relaxation over a period of time
spm	Strokes per minute
SR	Single reel
Tractor	Agricultural type tractor
Truck	A four-wheel highway/road vehicle weighing no less than 7500 lbs (3400 kg)
Timed knife drive	Synchronized motion applied at the cutterbar to two separately driven knives from a single hydraulic motor
Tension	Axial load placed on a bolt or screw, usually measured in pounds (lb) or Newtons (N)
TFFT	Turns from finger tight
Torque	The product of a force X lever arm length, usually measured in foot-pounds (ft·lbf) or Newton-meters (N·m)
Torque angle	A tightening procedure where the fitting is assembled to a precondition (finger tight) and then the nut is turned further a number of degrees or a number of flats to achieve its final position
Torque-tension	The relationship between the assembly torque applied to a piece of hardware and the axial load it induces in the bolt or screw
UCA	Upper cross auger
Untimed knife drive	Unsynchronized motion applied at the cutterbar to two separately driven knives from a single hydraulic motor or two hydraulic motors
Washer	A thin cylinder with a hole or slot located in the center and is to be used as a spacer, load distribution element, or a locking mechanism
Windrower	Power unit of a self-propelled header

2.2 Component Identification

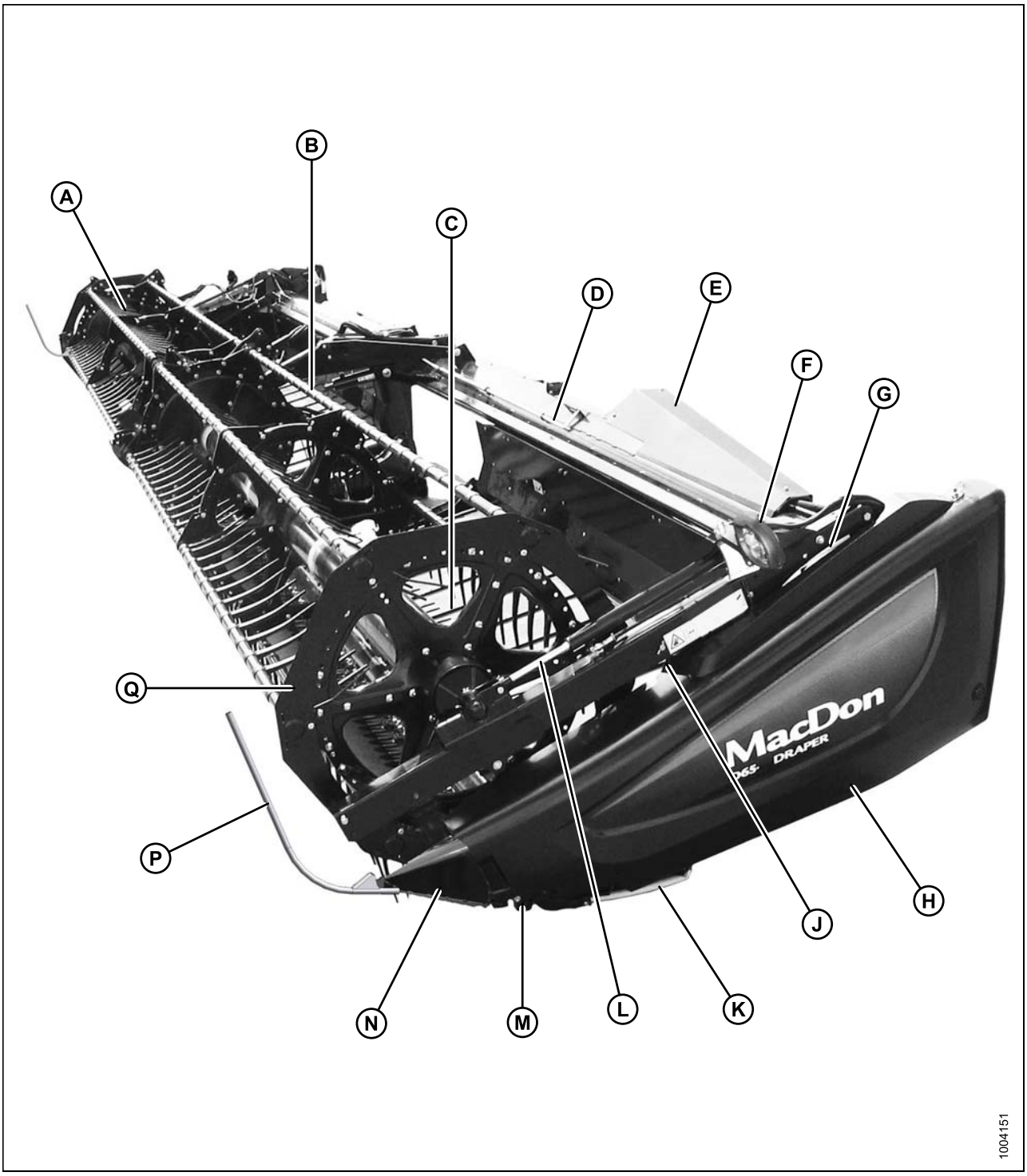


Figure 2.1: D65 Windrower Header Components

A - Reel Cam
B - Pick-Up Reel Tines
C - Drapers
D - Center Reel Arm Prop Handle
E - Hydraulic Connections
F - Transport Light
G - Reel Safety Prop
H - Endshield
J - Reel Lift Cylinder
K - Skid Shoe
L - Reel Fore-Aft Cylinder
M - Knife Drive Box
N - Crop Divider
P - Crop Divider Rod
Q - Reel Endshield

3 Specifications

| D65 | Attachments

S: standard / O_F: optional (factory installed) / O_D: optional (dealer installed) / -: not available

			D65
CUTTERBAR			
Effective cutting width (distance between crop divider points)			
15 ft. header		15.00 ft. (180 in. [4572 mm])	S
20 ft. header		20.00 ft. (240 in. [6096 mm])	S
25 ft. header		25.00 ft. (300 in. [7620 mm])	S
30 ft. header		30.00 ft. (360 in. [9144 mm])	S
35 ft. header		35.00 ft. (420 in. [10,668 mm])	S
40 ft. header		40.00 ft. (480 in. [12192 mm])	S
Cutterbar Lift Range at Guard Tip (Center-Link Fully Retracted)		49-13/16 in. (1265 mm)	
Knife			
Single Knife Drive: One hydraulic motor with V-belt to one heavy duty (MD) knife drive box			O_F
Double Knife Drive 15–35 ft. (timed): One hydraulic motor with two cogged belts to two heavy duty MD knife drive boxes			O_F
Double Knife Drive 40 ft. (untimed): Two hydraulic motors with banded-belts to two heavy duty (MD) knife drive boxes			O_F
Knife Stroke		3 in. (76 mm)	S
Single Knife Speed (strokes per minute)	20, 25 ft.	1200–1400	S
	30 ft.	1200–1400	S
	35 ft.	1100–1300	S
	40 ft.	1050–1200	S
Double Knife Speed (strokes per minute)	15 ft.	1500–1900	S
	20, 25 ft.	1400–1700	S
	30 ft.	1200–1600	S
	35 ft.	1200–1400	S
	40 ft.	1100–1400	S
Knife Sections			
Over-serrated / Solid / Bolted / 9 serrations per inch			O_F
Over-serrated / Solid / Bolted / 14 serrations per inch			O_F
Knife Overlap at Center (Double-Knife Headers)		1/8 in. (3 mm)	S
Guards and Hold-Downs			

			D65
Guard: Pointed / Forged / Double Heat Treated (DHT) Hold-Down: Sheet Metal / Adjustment bolt			O_F
Guard: Pointed / Forged / Case Hardened (CH) Hold-Down: Sheet Metal / Adjustment Bolt			O_F
Guard: Stub / Forged Bottom / Forged Top / Adjustment Plate			O_F
Guard: Stub / Forged Bottom / Sheet Metal Top / Adjustment Bolt			O_F
Guard: 4 Point / No-choke Design (2 Long Points with Tangs / 2 Short Points without Tangs)			O_F
Guard Angle (cutterbar on ground)			
Center-Link Retracted	15–25 ft.	7.5 Degrees	S
Center-Link Retracted	30–40 ft.	2.5 Degrees	S
Center-Link Extended	15–25 ft.	17.0 Degrees	S
Center-Link Extended	30–40 ft.	12.0 Degrees	S
CONVEYOR (Draper) and DECKS			
Draper Width		41-5/8 in. (1057 mm)	S
Draper Drive		Hydraulic	S
Draper Speed		0–742 fpm (225 m/min.)	S
Delivery Opening Width (Center Delivery) / Variable by Shifting Decks	15 ft.	60-5/8 – 69-11/16 in. (1540–1770 mm)	S
	20, 25, 30, 35, 40 ft.	67-1/8 – 76-11/16 in. (1720–1950 mm)	S
Delivery Opening Height (under Frame Tube at 8 in. Cutting Height)	Center-Link Fully Retracted	37-5/8 in. (955 mm)	S
	Center-Link Fully Extended	43-1/2 in. (1105 mm)	S
PR15 PICK-UP REEL			
Quantity of Tine Tubes		5, 6, or 9	
Center Tube Diameter	15 to 30 ft.	8 in. (203 mm)	
	35 ft.	10 in. (254 mm)	
Finger Tip Radius	Factory Set	31-1/2 in. (800 mm)	
	Adjustment Range	30-3/16 – 31-1/2 in. (766–800 mm)	
Effective Reel Diameter (Via Cam Profile)		65 in. (1650 mm)	
Finger Length		11 in. (290 mm)	
Finger Spacing (Staggered on Alternate Bats)		6 in. (150 mm)	
Reel Drive		Hydraulic	S
Reel Speed (Auto-Adjust from Cab Using Ground Speed Index)		0–85 rpm	S
FRAME and STRUCTURE			

				D65
Header Width (Field Mode)			Cut Width + 15-1/8 in. (384 mm)	S
Header Width (Transport Mode—Reel Fore-Aft Fully Retracted)	Header Only	(B)[1] (Long Dividers Installed)	104 in. (2636 mm)	-
		(A)[1] (Long Dividers Removed)	97 in. (2452 mm)	-
	With HC10 Hay Conditioner Installed	(B)[1] (Long Dividers Installed)	112 in. (2834 mm)	-
		(A)[1] (Long Dividers Removed)	104 in. (2650 mm)	-

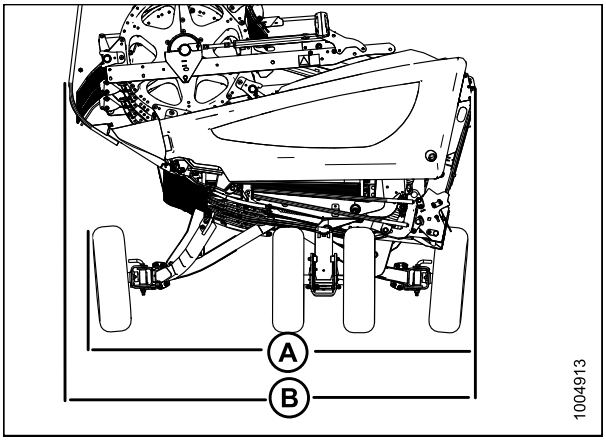


Figure 3.1: Header Width

1. Refer to Figure *3.1: Header Width, page 31*.

			D65
ATTACHMENTS			
HC10 Hay Conditioner			O_D
Roll Length		72 in. (1830 mm)	
Outside Diameter		9-1/8 in. (232 mm)	
Roll Tube Diameter		6-5/8 in. (168 mm)	
Roll Speed		847–915 rpm	
Upper Cross Auger			O_D
Outside Diameter		12 in. (305 mm)	
Tube Diameter	All sizes except 25 ft.	6 in. (152 mm)	
	25 ft.	7 in. (178 mm)	
Stabilizer Wheel / Slow Speed Transport			O_D
Wheels		15 in.	
Tires		P205/75 R-15	

WEIGHT		
Estimated Weight Range – Base Header, No Adapter – Variances are due to different package configurations.		
15 ft. header		2937–3302 lb (1329–1497 kg)
20 ft. header		3146–3600 lb (1430–1633 kg)
25 ft. header		3547–3872 lb (1605–1753 kg)
30 ft header		4370–4812 lb (1981–2178 kg)
35 ft. header		4808–5337 lb (2181–2480 kg)
40 ft. header	North America Frame	5197–5704 lb (235 –2593 kg)
	Export Frame	5437 lb (2461 kg)
45 ft. header (Combine Only)	North America Frame	5990 lb (2711 kg)
	Export Frame	5990 lb (2711 kg)

4 Operation

4.1 Owner/Operator Responsibilities

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 and affect machine life.**
- **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.**

4.2 Operational Safety

CAUTION

Follow these safety precautions:

- **Follow all safety and operational instructions given 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.**

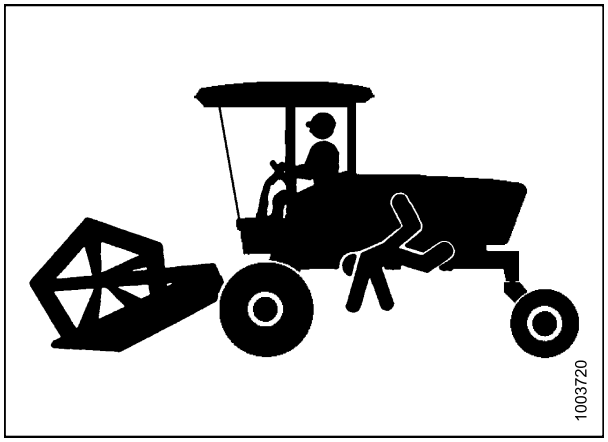


Figure 4.1: No Riders

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 when 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.**
- **Stop engine and remove key before adjusting or removing plugged material from the machine. A child or even a pet could engage the drive.**
- **Check for excessive vibration and unusual noises. If there is any indication of trouble, shut down and inspect the machine. Follow proper shutdown procedure. Refer to Section *4.4 Shutdown Procedure, page 44*.**
- **Operate only in daylight or good artificial light.**

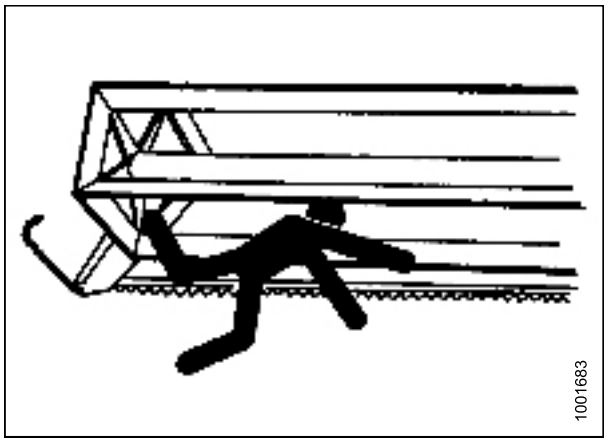


Figure 4.2: Bystander Safety

4.2.1 Header Safety Props

The header safety props are located on the header lift cylinders. The safety props prevent the lift cylinders from inadvertently retracting and lowering the header.

DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine, always stop engine, remove key, and engage safety props before going under header for any reason. Refer to the windrower operator's manual for instructions regarding the proper use and storage of header safety props.

4.2.2 Reel Safety Props

WARNING

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

Reel safety props are located at the reel support arms.

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

Engaging Reel Safety Props

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 the previous step on the opposite side of the header.

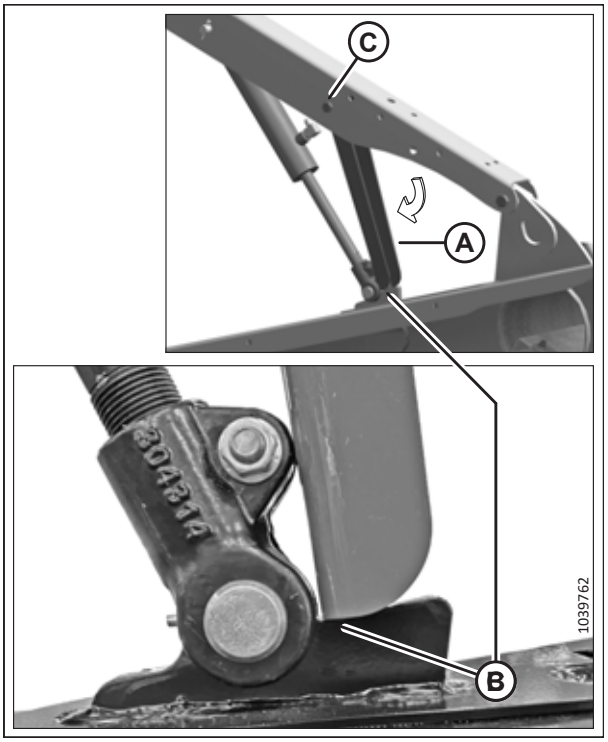


Figure 4.3: Reel Arm Safety Prop

THE CONTENT ON THIS PAGE HAS CHANGED SINCE THIS MANUAL (169899 REVISION A) WAS PUBLISHED.

3. At the center reel arm on double reel headers, use handle (A) to move lock rod to inboard position (B), engaging pin (C) under prop.
4. Lower reel until safety props contact cylinder mounts on outer reel arms and pin at center arm.

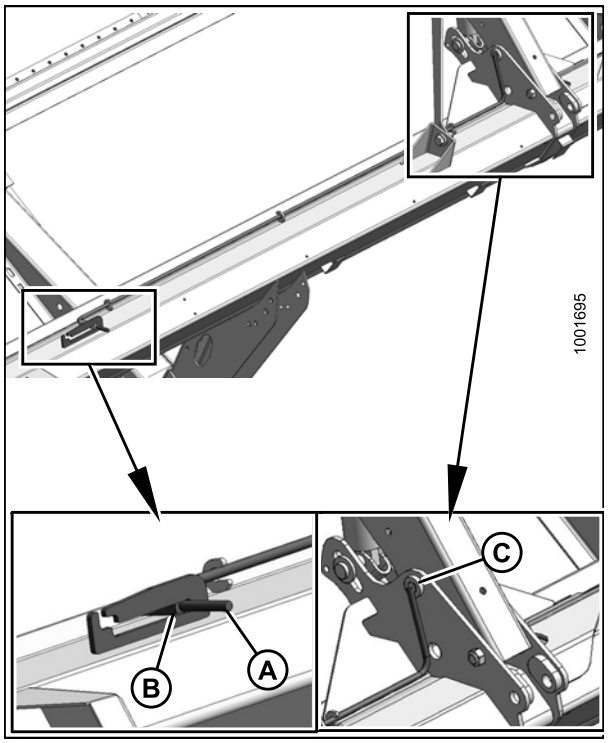


Figure 4.4: Center Arm Reel Prop

Disengaging Reel Safety Props

1. Raise reel to maximum height.
2. At outer reel arms, move props (A) back inside reel arms.

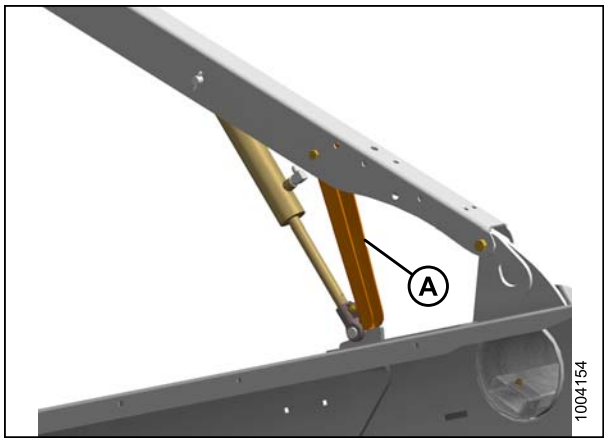


Figure 4.5: Reel Arm Safety Prop

3. Use handle (B) to move lock rod (A) to outboard position.

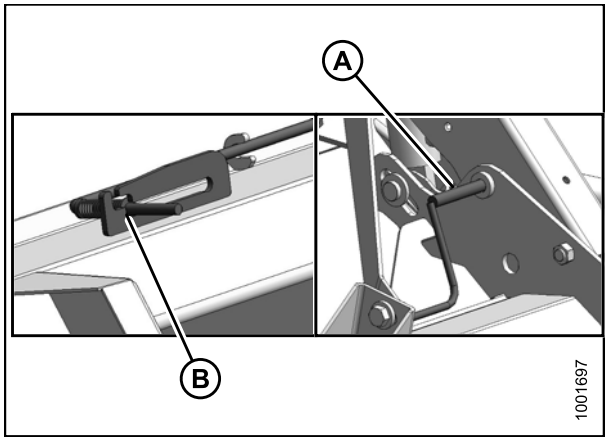


Figure 4.6: Center Arm Safety Prop

4.2.3 Endshields

A hinged, polyethylene endshield is fitted on each end of the header.

Opening Endshields

To open an endshield, follow these steps.

1. Remove lynch pin (A) and tool (B) from pin (C) at top rear of endshield.

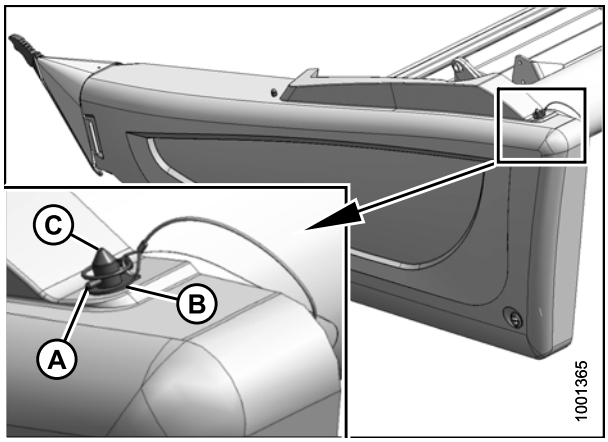


Figure 4.7: Endshield

2. Use tool (B) to unlock latch (A) at lower rear corner of endshield.
3. Lift shield at aft end to clear pin at top rear of endshield.
4. Swing shield out and away from header while maintaining forward pressure to prevent shield from slipping out of tab (C) at front of endsheet.

IMPORTANT:
Do **NOT** force shield once it has reached its end of travel, as damage to the shield structure can occur. Shield is designed to open sufficiently for normal access to the drive system and manual case as shown.

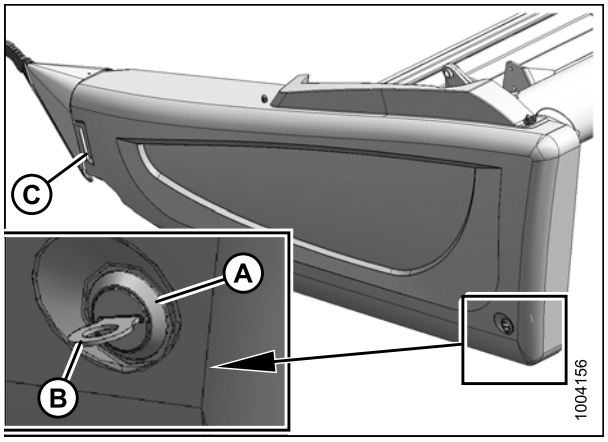


Figure 4.8: Endshield

NOTE:
If more access is required to the front of the drives area, carefully disengage front of shield from tab at the front of the endsheet and then swing front of the shield away from the header.

NOTE:
If complete access to the endsheet area is required, the shield can be removed. Refer to *Removing Endshields, page 39*.

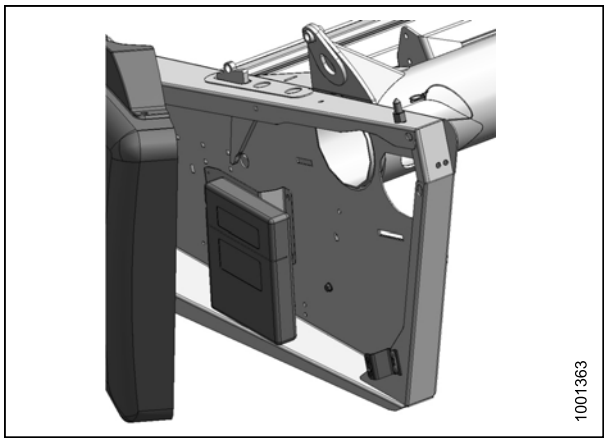


Figure 4.9: Endshield Open

Closing Endshields

To close an endshield, follow these steps.

1. Maintain forward pressure and swing rear of shield towards header.
2. Lift shield and engage pin (C) on top of frame endsheet.

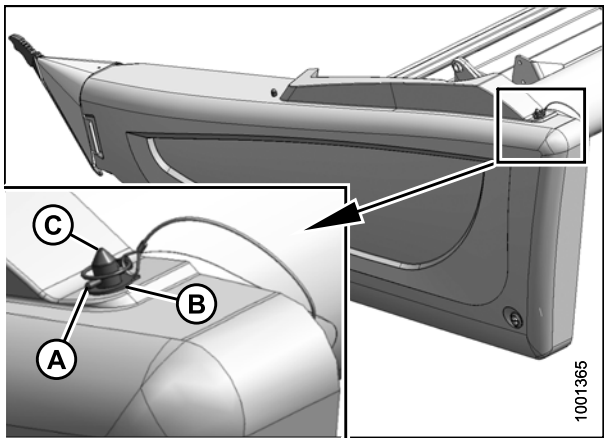


Figure 4.10: Endshield

3. Push in shield to engage lower latch (A).
4. Use tool (B) to lock lower latch (A).

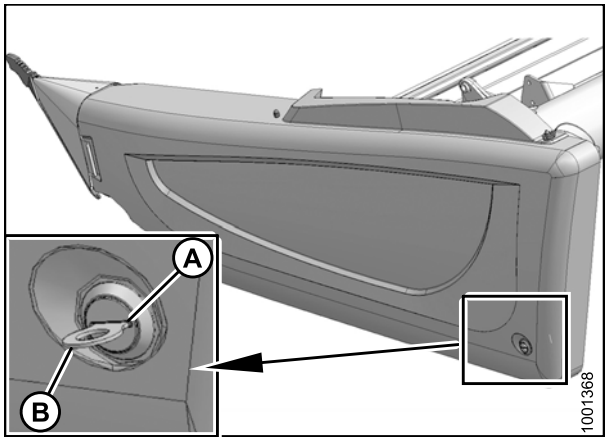


Figure 4.11: Endshield

5. Replace tool (B) and lynch pin (A) on top pin (C).

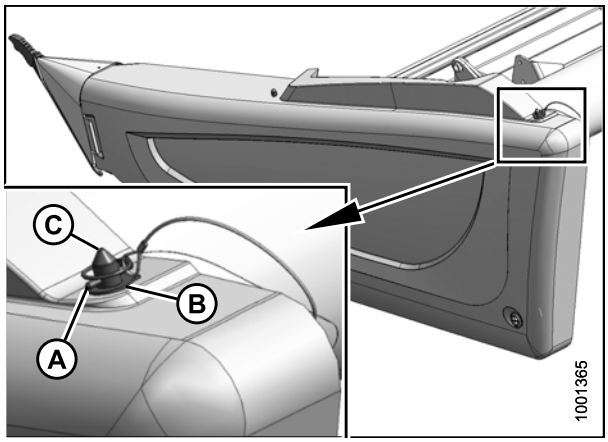


Figure 4.12: Endshield Pin

Removing Endshields

To remove an endshield, follow these steps:

1. Open endshield. Refer to *Opening Endshields, page 37*.
2. Remove acorn nut (A) that secures the endshield to support (B).
3. Lift endshield off support (B).

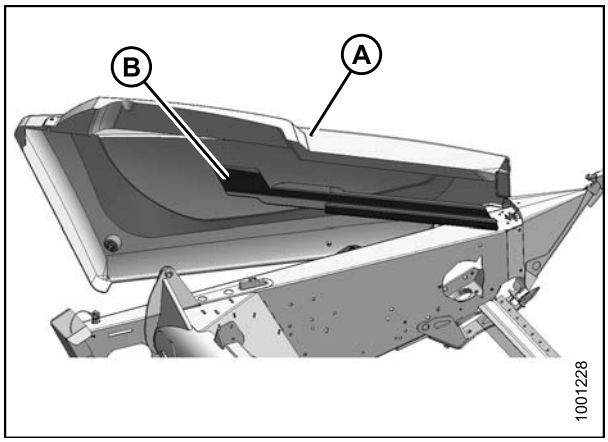


Figure 4.13: Endshield

Installing Endshields

To install an endshield, follow these steps.

1. Position endshield on support (A) and align the hole in the endshield with stud (B) on the support.

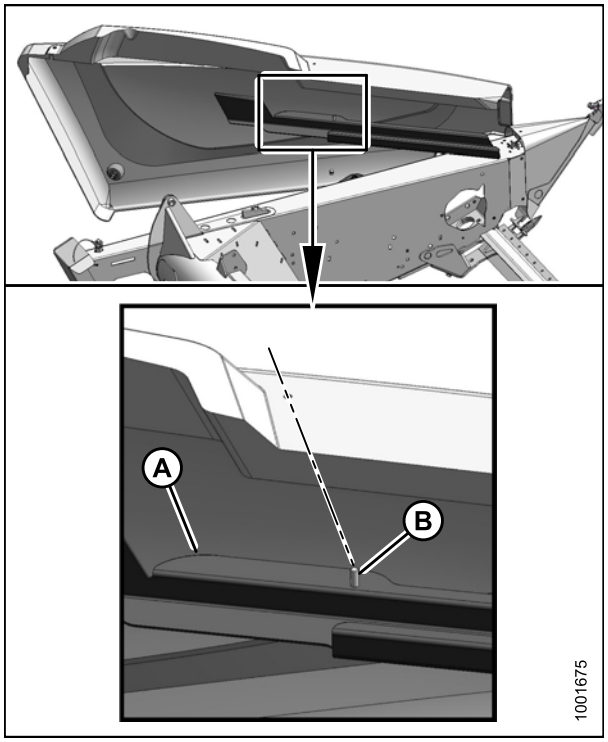


Figure 4.14: Endshield

2. Secure endshield to the support with acorn nut (A).
3. Close endshield. Refer to *Closing Endshields, page 38*.

NOTE:
Plastic endshields are subject to expansion, or contraction depending on large temperature variations. Top pin and lower latch bracket positions can be adjusted to compensate for dimensional changes. Refer to *Adjusting Endshields, page 41*.

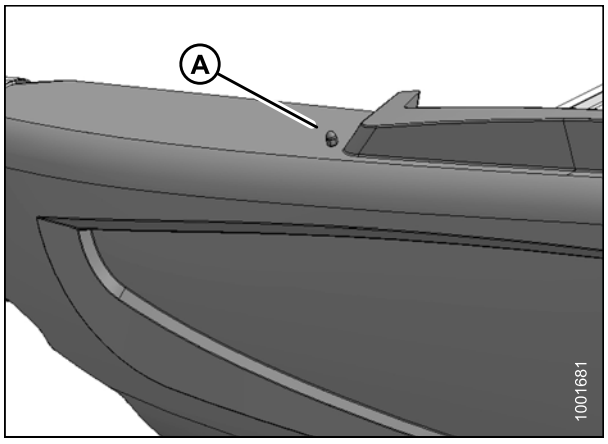


Figure 4.15: Endshield

Adjusting Endshields

Plastic endshields are subject to expansion or contraction from large temperature variations. The position of the top pin and lower catch can be adjusted to compensate for dimensional changes.

To adjust the endshield, perform the following:

1. Check gap **'X'** between the front end of shield and header frame and compare to chart.

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

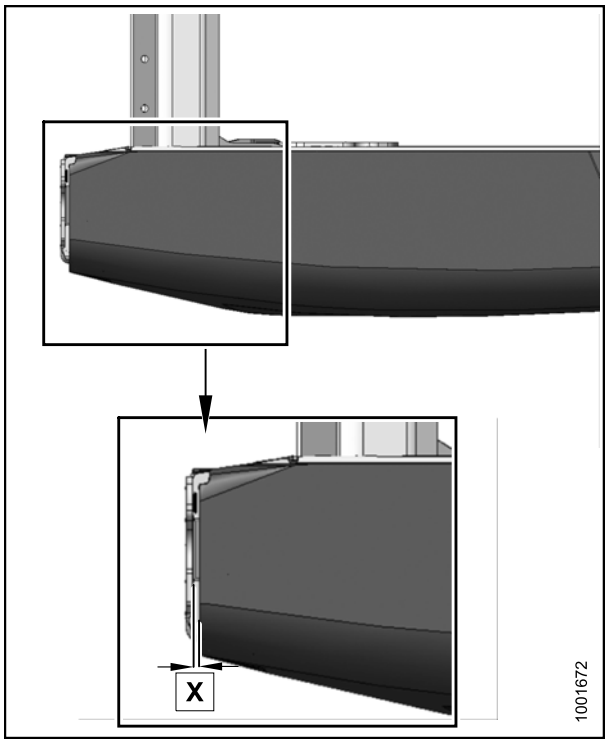


Figure 4.16: Endshield

If adjustments are required, proceed as follows:

2. Open endshield. Refer to *Opening Endshields, page 37*.
3. From inside endsheet, loosen nut (A) on pin (B) with a 3/4 in. socket.
4. Close endshield and adjust position to achieve the gap **'X'** between the front end of shield and header frame.
5. Open endshield and tighten nut (A).
6. To achieve a snug fit between top of shield and header frame and to ensure that endshield is fully engaged on pin (B), loosen bolts on catch (C) and adjust catch as required to reposition shield.
7. Tighten bolts on catch (C).
8. Close endshield. Refer to *Closing Endshields, page 38*.

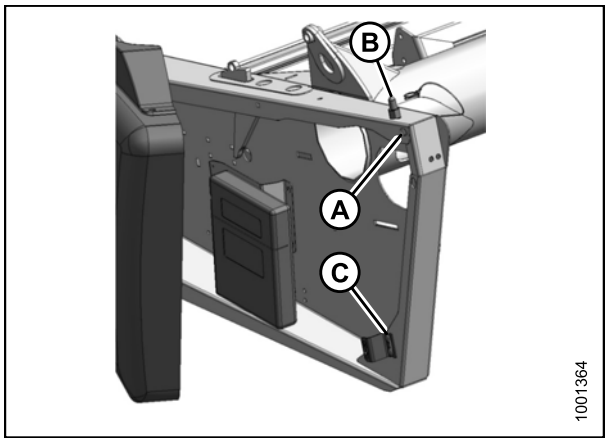


Figure 4.17: Adjustments

4.2.4 Daily Start-Up Check

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.**
- **As well, 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 uncomfortable loud noises.**

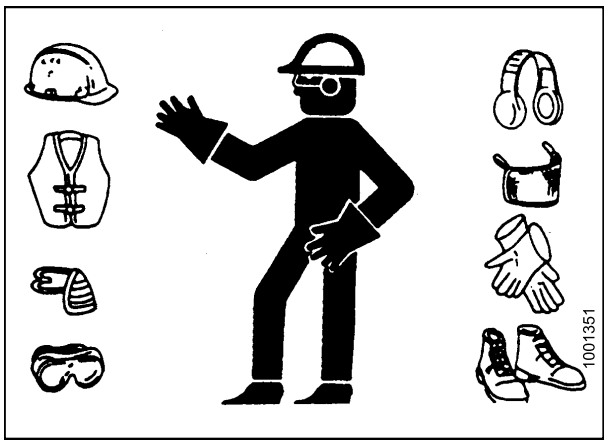


Figure 4.18: Safety Devices

Complete the following tasks each day before start-up:

1. Check the machine for leaks or any parts that are missing, broken, or not working correctly.

NOTE:
Use proper procedure when searching for pressurized fluid leaks. Refer to *6.3.5 Checking Hydraulic Hoses and Lines, page 132*.

2. Clean all lights and reflective surfaces on the machine.
3. Perform all daily maintenance. Refer to *6.3.1 Maintenance Schedule/Record, page 129*.

4.3 Break-in Period

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

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

1. Operate the machine with reel drapers and knife running slowly for five minutes, watching and listening FROM THE OPERATOR'S SEAT for binding or interfering parts.

NOTE:
Reel and side drapers will not operate until oil flow fills the lines.

2. Perform the items specified. Refer to *6.3.2 Break-In Inspection, page 130*.

CAUTION

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

4.4 Shutdown Procedure

CAUTION

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

- Park on level ground if possible.
- Lower the header fully.
- Place all controls in NEUTRAL or PARK.
- Disengage the header drive.
- Lower and retract Reel fully.
- Stop engine and remove key from ignition.
- Wait for all movement to stop.

4.5 Cab Controls

CAUTION

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

Refer to your windrower operator's manual for identification of in-cab controls for:

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

4.6 Header Setup

4.6.1 Header Attachments

Several attachments to improve performance of your D65header are available as options that can be installed at your MacDon dealer. Refer to *8 Options and Attachments, page 259* in this manual for a description of each item.

4.6.2 Header Settings

This table is a guideline for setting up the D65 Draper Header. Settings other than those suggested can be made to suit various crops and conditions not covered here.

Table 4.1 Recommended Header Settings

Crop Type	Stubble Height in. (mm)	Crop Condition	Divider Rods	Header Angle[2]	Knife Speed[3]	Reel Cam[4]	Reel Speed %[5]	Reel Position[6]	Skid Shoe Position[7]	Stabilizer Wheels[8]	Upper Cross Auger	Float lbf (N)[9]
Cereals	<4 (102)	Light	On	0–3	High	2	10–15	6 or 7	Up or Middle	Storage	Not Required	70 (311)
		Normal			Medium		10					
		Heavy		4–7								
		Lodged				3	5–10	4 or 5				
	4–8 (102–203)	Light	On	0–3	High	2	10–15	6 or 7	Middle or Down	As Required	Not Required	70 (311)
		Normal			Medium		10					
		Heavy		4–7								
		Lodged				3	5–10	4 or 5	Down			
	10+. (254+)	Light	On	0–3	High	2	10–15	6 or 7	Not Applicable	As Required	Not Required	150 (667)
		Normal			Medium		10					
		Heavy		4–7								
		Lodged				3	5–10	4 or 5				

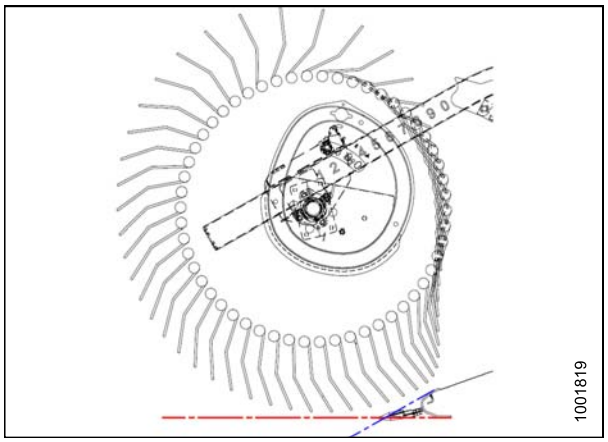
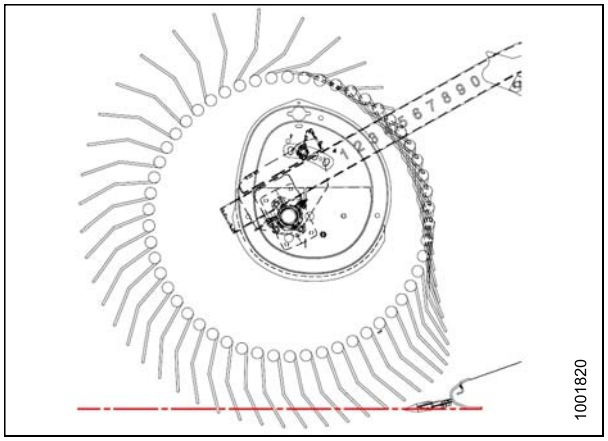
2. Set header angle as shallow as possible (setting A) with center-link and skid shoes while maintaining cutting height. Refer to *Controlling Header Angle, page 56*.
3. Refer to *4.7.7 Knife Speed, page 58*.
4. Refer to *Choosing a Reel Cam Setting, page 65*
5. Percentage above ground speed. Refer to *4.7.4 Reel Speed, page 56*
6. Refer to *4.7.9 Reel Fore-Aft Position, page 58*.
7. Skid shoe position is used in combination with header angle to determine the cutting height when cutting on or very close to the ground. Refer to *4.7.1 Cutting Height, page 50*.
8. Stabilizer wheels are used to limit the side-to-side movement when cutting off the ground in rolling terrain, and to minimize bouncing. Refer to *Adjusting Stabilizer/Slow Speed Transport Wheels, page 50*
9. Force required to lift header at ends. Refer to your windrower operator's manual for adjustment procedures.

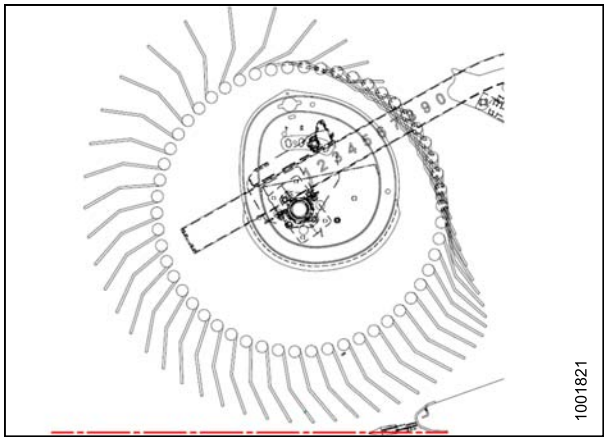
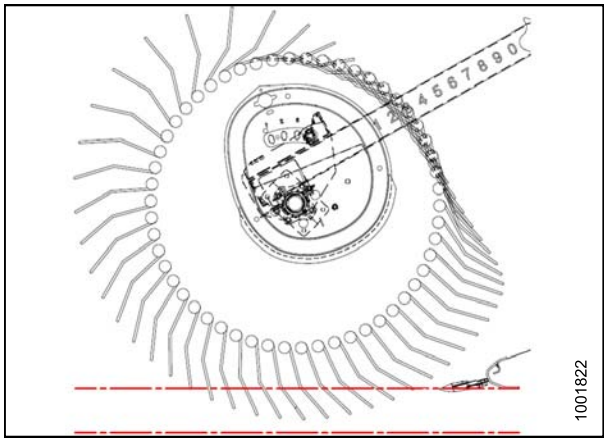
Crop Type	Stubble Height in. (mm)	Crop Condition	Divider Rods	Header Angle[2]	Knife Speed[3]	Reel Cam[4]	Reel Speed %[5]	Reel Position[6]	Skid Shoe Position[7]	Stabilizer Wheels[8]	Upper Cross Auger	Float lbf (N)[9]
Canola	4–8 (102–203)	Light	On	8–10	Medium	2	5–10	6 or 7	Down	As Required	Not Required	70–100 (311–445)
		Normal			Low	1	10		Middle or Down			
		Heavy						3 or 4	Down		Recommended	
		Lodged				2	5–10		Middle or Down			
	10+ (254+)	Light	On	8–10	Medium	3	5–10	6 or 7	Not Applicable	As Required	Not Required	150 (667)
		Normal			Low	2	10					
		Heavy				3		3 or 4			Recommended	
		Lodged					5–10					
Flax	2–6. (51–153)	Light	On	4–7	High	2	5–10	6 or 7	Middle or Down	As Required	Not Required	70–100 (311–445)
		Normal		0–3			10					
		Heavy		4–7								
		Lodged		8–10					Down			
Edible beans		Light	Off	8–10	Medium	2	5–10	3 or 4	Up or Middle	Storage	Not Required	100 (445)
		Normal										
		Heavy										
		Lodged				3						
Grass		Light	On	Variable	High	2	10	6 or 7	Up or Middle	Storage	Not Required	70–100 (311–445)
		Normal										
		Heavy										
		Lodged					10–15					
Alfalfa		Light	On	Variable	High	3	10	6 or 7	Up or Middle	Storage	Not Required	70–100 (311–445)
		Normal				2						
		Heavy										
		Lodged				3	10–15					

4.6.3 Reel Settings

The following chart illustrates the profile of the reel at each cam or finger pitch setting as well as the reel position relative to the ground at different positions on the reel arm. Refer to *4.6.2 Header Settings, page 46* for applicability of each finger pattern and reel position.

Table 4.2 D65 Reel Settings Chart

Cam Setting Number (Finger Speed Gain)	Reel Position Number	Reel Finger Pattern
1 (0)	6 or 7	
2 (20%)	3 or 4	

Cam Setting Number (Finger Speed Gain)	Reel Position Number	Reel Finger Pattern
3 (30%)	6 or 7	
4 (35%)	2 or 3	

NOTE:

- Adjust reel forward to get closer to ground when tilting header back. Fingers/tines will dig into ground at extreme reel forward positions, so adjust skid shoes or header angle to compensate. Adjust reel rearward to get reel further away from ground when tilting header forward.
- Header tilt can be increased to get reel closer to ground, or decreased to get reel further away from ground while keeping material flowing onto drapers.
- To leave maximum amount of stubble behind in lodged crop, raise header but increase header tilt to keep reel close to ground. Position the reel fully forward.
- Reel may have to be moved back to prevent lumps or plugging on cutterbar in thinner crops.
- Minimum crop carrying capacity (minimum area of exposed draper between reel and header backsheet) occurs with the reel in the furthest aft position.
- Maximum crop carrying capacity (maximum area of exposed draper between reel and header backsheet) occurs with the reel in the furthest forward position.
- The tip speed of the fingers/tines at the cutterbar becomes higher than the reel speed at higher cam settings due the nature of the cam action. Refer to Reel Settings chart above.

4.7 Header Operating Variables

Satisfactory function of the header in all situations requires making proper adjustments to suit various crops and conditions.

Correct operation reduces crop loss and allows cutting of more acres. As well, proper adjustments and timely maintenance will increase the length of service you receive from the machine.

The variables listed below and detailed on the following pages will affect the performance of the machine. You will quickly become adept at adjusting the machine to get the desired results.

Variable	Section
Cutting Height	*4.7.1 Cutting Height, page 50*
Header Float	*4.7.2 Header Float, page 55*
Header Angle	*Controlling Header Angle, page 56*
Reel Speed	*4.7.4 Reel Speed, page 56*
Ground Speed	*4.7.5 Ground Speed, page 57*
Draper Speed	*4.7.6 Draper Speed, page 57*
Knife Speed	*4.7.7 Knife Speed, page 58*
Reel Height	*4.7.8 Reel Height, page 58*
Reel Fore-Aft Position	*4.7.9 Reel Fore-Aft Position, page 58*
Reel Tine Pitch	*4.7.10 Reel Tine Pitch, page 65*
Crop Divider Rods	*4.7.12 Crop Divider Rods, page 72*

4.7.1 Cutting Height

The header is designed to allow an Operator to cut the crop above the ground for a desired stubble height or to cut the crop at ground level with the header on the ground. Cutting height will vary, depending on type of crop, crop condition, etc.

Cutting Off The Ground

The stabilizing wheel system is designed to minimize bouncing at the header ends and may be used to float the headers to achieve an even cutting height when cutting above ground level in cereal grains. The system can provide very even stubble height and greatly reduces operator fatigue.

Cutting height is controlled with a combination of the combine header height control and a stabilizer wheel system, or a stabilizer/slow speed transport wheel system.

The stabilizer wheel system or a stabilizer/slow speed transport wheel system are only available on 30, 35, and 40 ft. headers.

Adjusting Stabilizer/Slow Speed Transport Wheels

The proper setting requires balancing the amount of header weight carried by the float and the stabilizer/slow speed transport wheels.

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

3. On the right wheel assembly, remove hairpin (A) from latch.
4. Disengage latch (B) and lift right wheel out of hook and place on ground as shown. This reduces weight of assembly and makes adjusting wheel position easier.
5. Support left wheel weight by lifting slightly with one hand. Pull up on handle (C) to release lock.
6. Lift left wheel to desired height and engage support channel into slot (D) in upper support.
7. Push down on handle (C) to lock.
8. Lift right wheel back into field position and ensure latch (B) is engaged.
9. Secure latch with hairpin (A).
10. Support the left wheel assembly's wheel weight by lifting slightly with one hand. Pull up on handle (A) to release lock.
11. Lift wheels to desired height and engage support channel into slot (B) in upper support.
12. Push down on handle (A) to lock.
13. Lower header to desired cutting height using combine controls and check load indicator. As an example the image shows that the wheels are set to a range between '**2**' and '**3**' on load indicator.

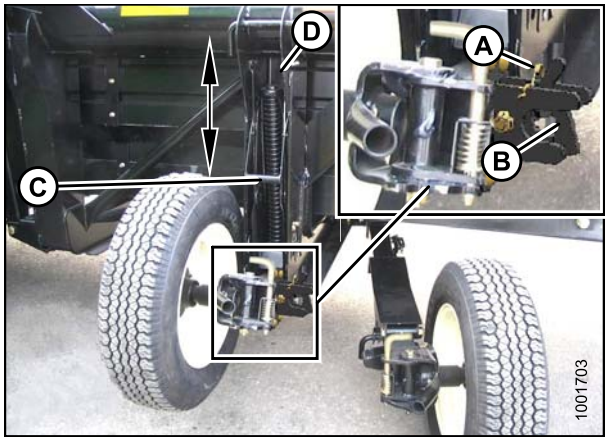


Figure 4.19: Right Wheel

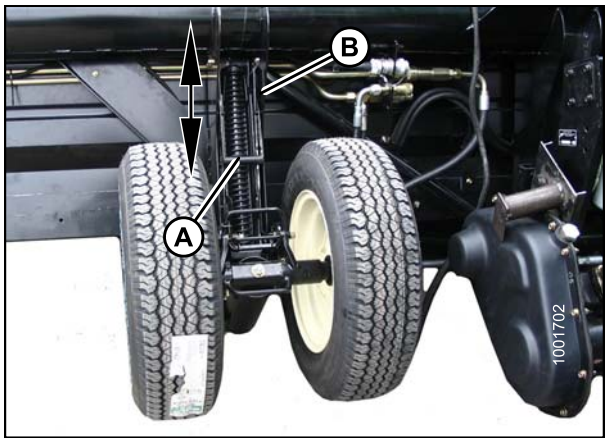


Figure 4.20: Left Wheel

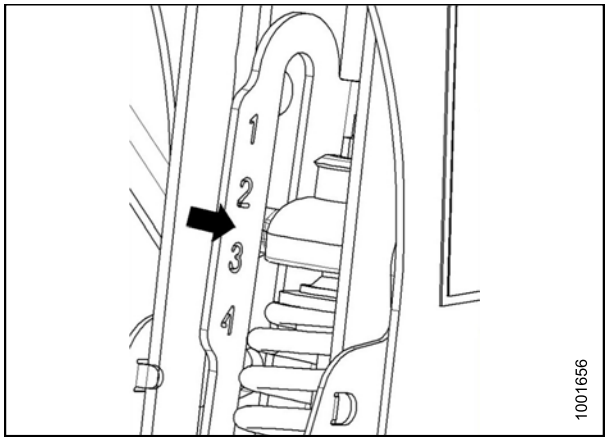


Figure 4.21: Load Indicator

IMPORTANT:
Continuous operation with excessive spring compression (i.e., load Indicator reading greater than '**4**' or a compressed length (A) less than 11–5/8 in. [295 mm]) can result in damage to suspension system.

14. Adjust header angle to desired working angle with the machine's header angle controls. If angle is not critical, set it to mid-position.

NOTE:
The height sensor on the CA25 adapter must be connected to the combine header control module in the cab.

15. Use the windrower cab display module (CDM) controls to automatically maintain cutting height. Refer to your windrower operator's manual for details.

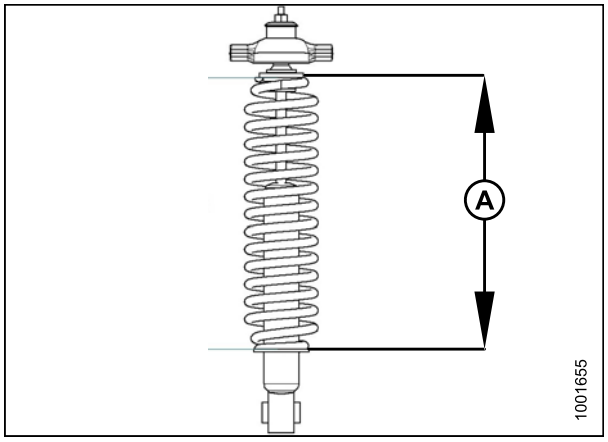


Figure 4.22: Spring Compression

Adjusting Stabilizer Wheels

The proper setting requires balancing the amount of header weight carried by the float and the stabilizer wheels.

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

CAUTION

Handle may be under tension, especially when the wheels are on the ground. Raise header so that wheels are off the ground before making adjustments.

3. Support wheel weight by lifting slightly with one hand on handle (B). Pull up on handle (A) to release lock.
4. Lift wheel with handle (B) and engage support channel into center slot (C) in upper support.
5. Push down on handle (A) to lock.

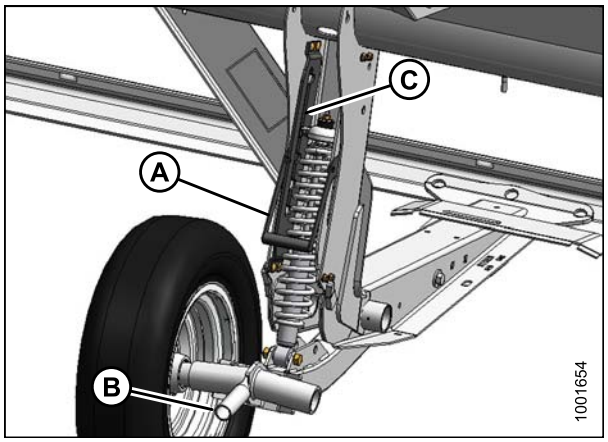


Figure 4.23: Stabilizer Wheel

6. Lower header to desired cutting height using combine controls and check load indicator. As an example the image shows that the wheels are set to a range between '**2**' and '**3**' on load indicator.

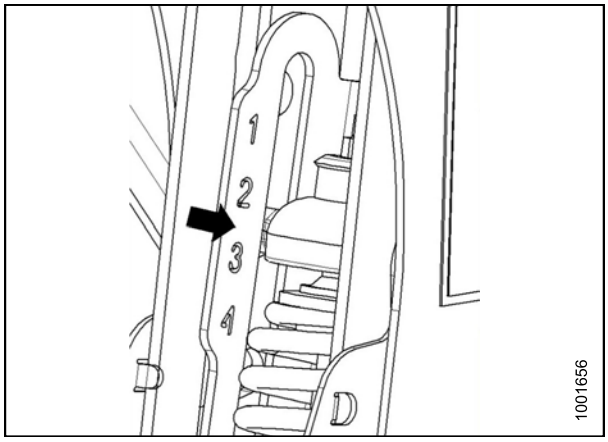


Figure 4.24: Load Indicator

IMPORTANT:
Continuous operation with excessive spring compression (i.e., load Indicator reading greater than '4' or a compressed length less than 11-5/8 in. [295 mm]) (A) can result in damage to suspension system.

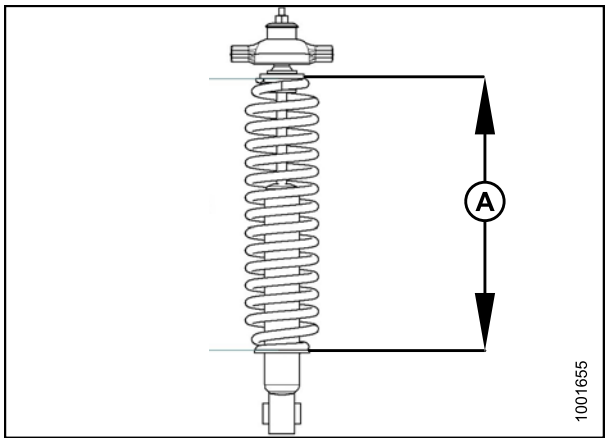


Figure 4.25: Spring Compression

7. Adjust header angle to desired working angle with the machine's header angle controls. If angle is not critical, set it to mid-position.

NOTE:
The height sensor on the CA25 adapter must be connected to the combine height control system in the cab.

8. Use the windrower cab display module (CDM) controls to automatically maintain cutting height. Refer to your windrower operator's manual for details.

Cutting On the Ground

Cutting on the ground is performed with the header fully lowered so that the cutterbar is on the ground. The orientation of the sickle and sickle guards relative to the ground (or header angle) is controlled with the skid shoes and center-link, and **NOT** with the header lift cylinders. These two features allow the operator to adjust to field conditions to maximize the amount of material cut and to reduce damage to the sickle from stones and debris.

The header is equipped with a type of suspension system that floats the header over the surface to compensate for ridges, trenches, or other variations in ground contour instead of pushing the cutterbar into the ground or leaving uncut crop.

Refer to the following sections for further information about each feature:

- *Adjusting Inner Skid Shoe, page 54*.
- *Adjusting Outer Skid Shoe, page 54*.
- *4.7.3 Header Angle, page 55*.
- *4.7.2 Header Float, page 55*.

Adjusting Inner Skid Shoe

1. Fully raise the stabilizer wheels or slow speed transport wheels (if installed). Refer to:
   - *Adjusting Stabilizer Wheels, page 52*, or
   - *Adjusting Stabilizer/Slow Speed Transport Wheels, page 50*

DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine, always stop engine, remove key, and engage safety props before going under header for any reason. Refer to the windrower operator's manual for instructions regarding the proper use and storage of header safety props.

2. Fully raise header, engage safety props, shut off engine, and remove key.
3. Remove lynch pin (A).
4. Hold shoe (B) and remove pin (C) by pulling down to disengage frame and then pulling away from shoe.
5. Raise or lower skid shoe (B) to desired position using holes in support (D) as a guide.

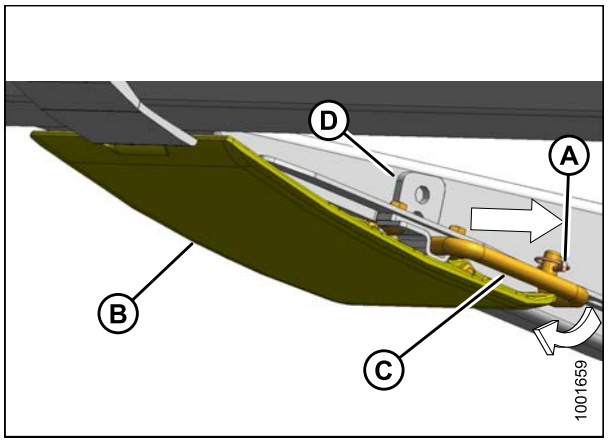


Figure 4.26: Inner Skid Shoe

6. Reinsert pin (B), engage in frame, and secure with lynch pin (A).
7. Check that all of the skid shoes are adjusted to the same position.
8. Adjust header angle to desired working position using the machine's header angle controls. If angle is not critical, set it to mid-position.
9. Check header float as described in your windrower operator's manual.

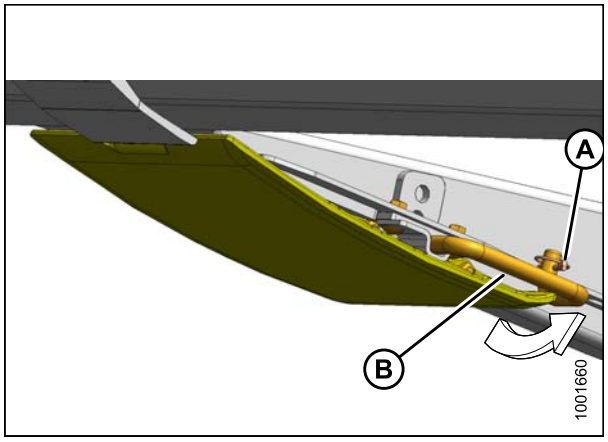


Figure 4.27: Inner Skid Shoe

Adjusting Outer Skid Shoe

1. Fully raise the stabilizer wheels or slow speed transport wheels if installed. Refer to:
   - *Adjusting Stabilizer Wheels, page 52* or
   - *Adjusting Stabilizer/Slow Speed Transport Wheels, page 50*

DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine, always stop engine, remove key, and engage safety props before going under header for any reason. Refer to the windrower operator's manual for instructions regarding the proper use and storage of header safety props.

2. Fully raise header, engage safety props, shut off engine, and remove key.
3. Remove lynch pin (A) at each skid shoe (B).
4. Hold shoe and remove pin (C) by disengaging frame and then pulling away from shoe.
5. Raise or lower skid shoe to desired position using holes in support as a guide.
6. Reinstall pin (C), engage in frame, and secure with lynch pin (A).
7. Check that skid shoes are adjusted to the same position.
8. Check header float as described in your windrower operator's manual.

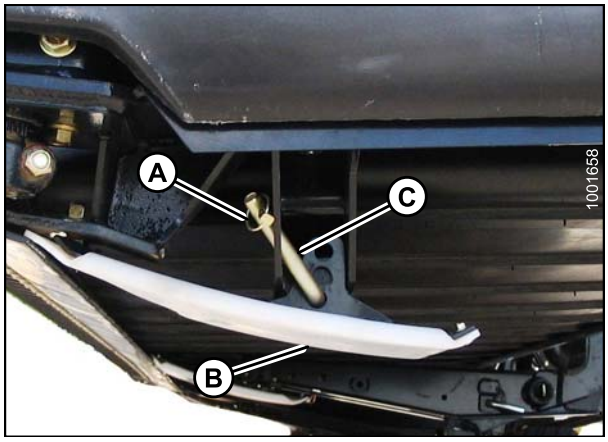


Figure 4.28: Outer Skid Shoe

4.7.2 Header Float

D65 windrower headers are designed to ride on the skid shoes for cutting on the ground operation. 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 M-Series Self-Propelled Windrower Operator's Manual for details about header float adjustments.

4.7.3 Header Angle

Header angle is the angle between the drapers and the ground, and is adjustable to accommodate crop conditions and/or soil type.

The header angle (A) is a critical factor for effective cutting on the ground applications because it determines the actual distance (B) between the sickle and the ground. The header rotates about the point of skid shoe/ground contact (C) by adjusting the length of the center-link thereby adjusting the position of the guards and sickle.

Header angle (A) is synonymous with guard angle (D) which is the angle between the guard upper surface and the ground.

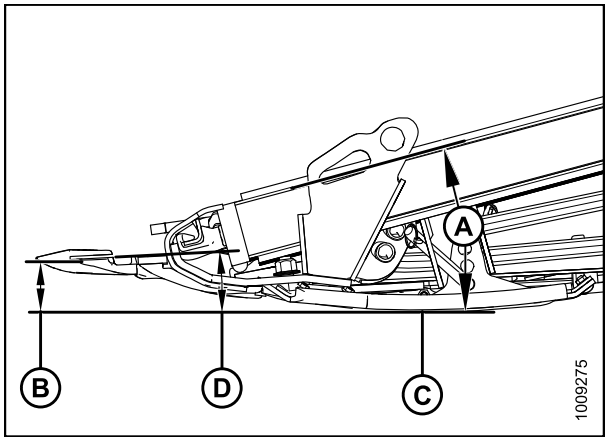


Figure 4.29: Header Angle

Controlling Header Angle

Header angle is varied 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.

4.7.4 Reel Speed

Reel speed is one of the factors that determines the manner in which the crop is moved from the cutterbar onto the drapers.

The reel performs best when it appears to be driven by the ground. It should move the cut crop evenly through the cutterbar and onto the drapers without bunching and with minimal disturbance.

In standing crop, reel speed should be slightly higher than or equal to ground speed.

In flattened crop or a crop that is leaning away from the cutterbar the reel speed needs to be higher than the ground speed, either by increasing the reel speed or decreasing the ground speed.

Excessive shattering of grain heads or crop loss over the header backtube may be indications that the reel speed is too high. Excessive reel speed also increases wear of reel components and overloads the reel drive.

Lower reel speeds can be used with 9-bat reels which is an advantage in shatter prone crops.

NOTE:
9-bat reels are available on 15, 20, and 25 foot headers from the factory. A conversion kit to change a 6-bat reel to a 9-bat reel is also available for these headers.

Refer to *4.6.2 Header Settings, page 46* for recommended reel speeds in specific crops and crop conditions.

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

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

The header is factory equipped with a 19 tooth sprocket to drive the reel which is satisfactory for most crops. Other sprockets are available to provide more torque to the reel is heavy cutting conditions, or to allow higher reel speeds in light crops where increased ground speeds are used. Refer to the following table and contact your MacDon dealer for ordering information.

For installation details, Refer to *6.9.1 Replacing Reel Drive Sprocket, page 221*.

4.7.5 Ground Speed

Using the proper ground speed will result in cleanly cut crop and even delivery of material for a good windrow.

Refer to *4.10 Windrow Types, page 79* 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 (for example, short soybeans), to allow the reel to pull in short plants. Start at 3.0–3.5 mph (4.8–5.8 km/h) and adjust as required.

Higher ground speeds may require heavier float settings to prevent abnormal bouncing that would cause uneven cutting and possible cutting component damage. Generally, if ground speed is increased, draper and reel speeds should be increased to handle the extra material.

The following chart indicates the relationship between ground speed and area cut for the various header sizes.

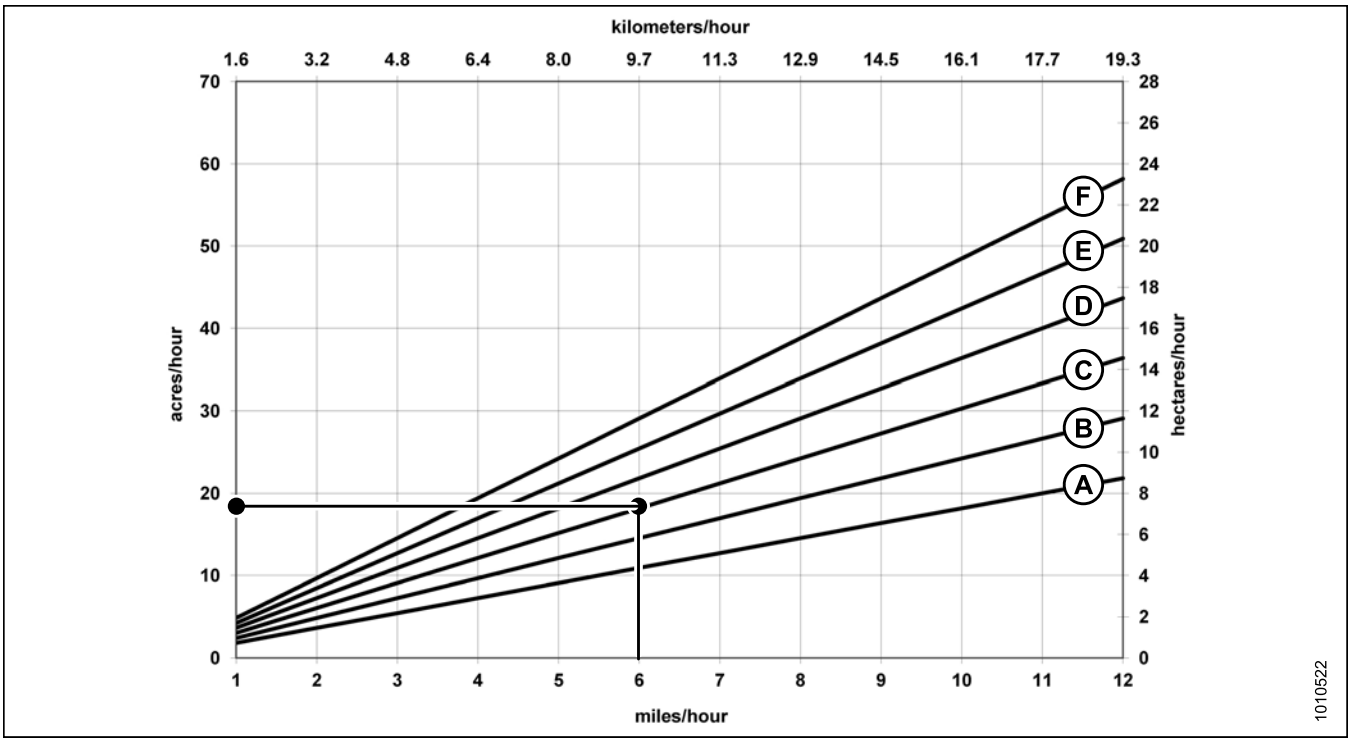


Figure 4.30: Ground Speed vs Acres

A - 15 Foot **B - 20 Foot** **C - 25 Foot**
D - 30 Foot **E - 35 Foot** **F - 40 Foot**

Example shown above: At a ground speed of 6 miles per hour (9.7 km/h) with a 25 ft. header, the area cut in one hour would be approximately 18 acres (7.3 hectares).

4.7.6 Draper Speed

The draper speed is controlled with the windrower Cab Display Module (CDM). Refer to your windrower operator's manual for instructions.

Adjust the draper speed to achieve good feeding of crop for a good windrow. Excessive draper speed will reduce draper life.

4.7.7 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.

Table 4.3 Knife Speed Guidelines

Header Size (ft.)	Recommended Knife Speed Range (spm)	
	Single Knife	Double Knife
15 ft.	—	1500–1900
20, 25 ft.	1200–1400	1400–1700
30 ft.	1200–1400	1200–1600
35 ft.	1100–1300	1200–1400
40 ft.	1050–1200	1100–1400

4.7.8 Reel Height

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

Set reel height to carry material past the knife onto the drapers with minimal disturbance and damage to the cut crop. Also see *4.7.9 Reel Fore-Aft Position, page 58*.

The reel height is controlled with switches in the operators cab.

Indications that reel may be too low are:

- Crop loss over header backtube
- Disturbance of crop on drapers by the reel fingers
- Crop being pushed down by the tine tubes

Indications that the reel may be too high:

- Cutterbar plugging
- Leaving uncut lodged crop
- Grain stalks dropping ahead of cutterbar

Refer to *4.6.2 Header Settings, page 46* for recommended reel height in specific crops and crop conditions.

IMPORTANT:
Maintain adequate clearance to prevent fingers contacting the knife or the ground. Refer to *6.8.1 Reel Clearance to Cutterbar, page 200*.

4.7.9 Reel Fore-Aft Position

Reel fore-aft position is a critical factor for good results in adverse conditions. The reel position is factory-set for normal conditions and can be adjusted forward or backward as required using controls in the cab.

The reel can also be moved approximately 9 in. (227 mm) further aft by repositioning the fore-aft cylinders on the reel arms to accommodate certain crop conditions

For double reel headers, refer to *Repositioning Fore-Aft Cylinders on Double Reel, page 62*.

For single reel headers, refer to *Repositioning Fore-Aft Cylinders on Single Reel, page 59*.

A decal (A) is provided on the reel right support arm for identifying reel position. The cam disc aft edge (B) is the gauge indicator.

For straight standing crop, center the reel over the cutterbar (4–5 on 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:
When difficulty is encountered picking up flattened crop, adjust header angle to a steeper position. Refer to *Controlling Header Angle, page 56* for adjustment details. Adjust reel position only if header angle adjustments are not satisfactory.

Refer to *4.6.2 Header Settings, page 46* for recommended reel positions in specific crops and crop conditions.

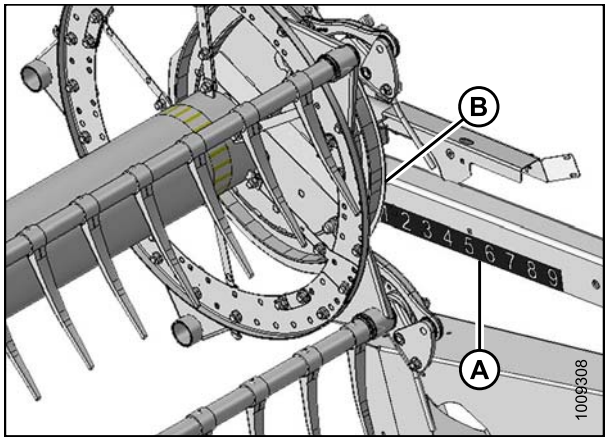


Figure 4.31: Fore-Aft Decal

Adjusting Reel Fore-Aft Position

To adjust the reel fore-aft position, follow these steps:

1. Select FORE-AFT mode on the selector switch in the cab.
2. Operate the hydraulics to move the reel to the desired position, again using the gauge as a reference.
3. Check reel clearance to cutterbar after making changes to cam setting. Refer to the following for measurements and adjustment procedures:
   - *6.8.1 Reel Clearance to Cutterbar, page 200*
   - *6.8.2 Reel Frown, page 203*.

IMPORTANT:
Operating with the reel too far forward can cause the fingers to contact the ground. Lower the skid shoes or adjust header tilt as required when operating with the reel in this position to prevent damage to the fingers.

Repositioning Fore-Aft Cylinders on Single Reel

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

WARNING

Stop windrower engine and remove key before making adjustments to machine. A child or even a pet could engage the drive.

Reposition right arm cylinder as follows:

NOTE:
Reel components are not shown for clarity.

1. Position reel fully aft with support arms horizontal.
2. Stop engine and remove key.
3. Remove four bolts (A) securing cylinder bracket (B) to reel arm.
4. Push reel back until bracket (B) lines up with the aft set of holes (C).
5. Reinstall the four bolts (A) to secure bracket to reel arm at new position.

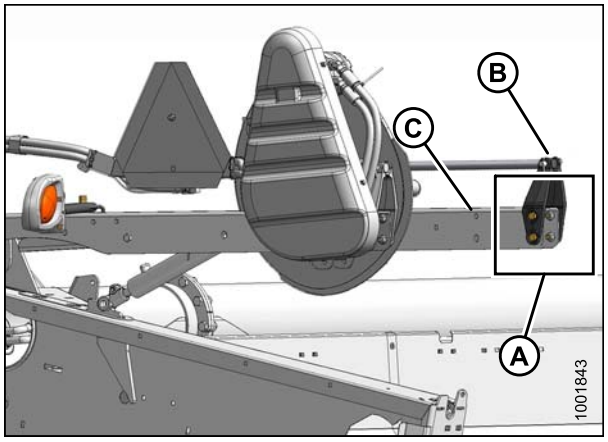


Figure 4.32: Right Arm Cylinder - Forward Position

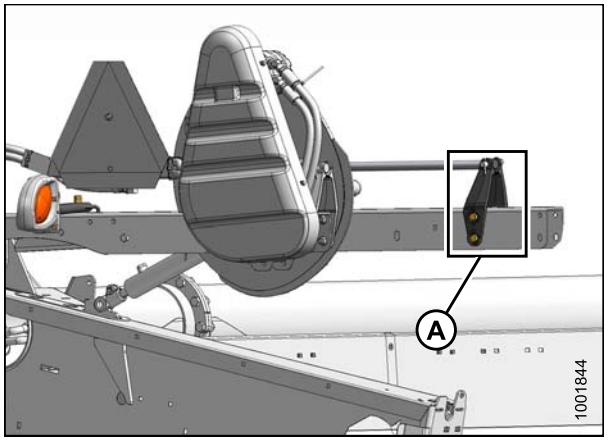


Figure 4.33: Right Arm Cylinder - Rearward Position

Reposition left arm cylinder as follows:

NOTE:
Reel components are not shown for clarity.

6. Remove pin (A) securing cylinder (B) to bracket/light assembly (C).
7. Remove bolts (D) securing bracket (C) to reel arm and remove bracket/light assembly.
8. If necessary, remove cable tie securing harness to bracket or reel arm.
9. Swivel light to working position as shown.

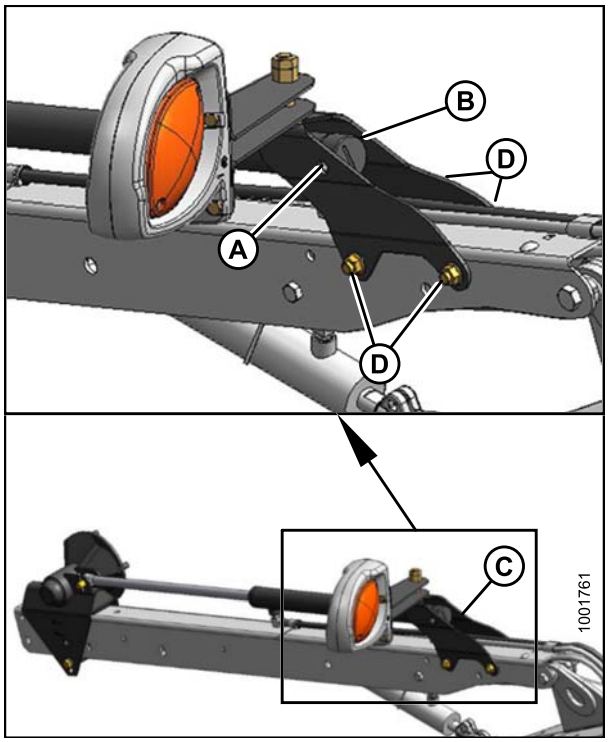


Figure 4.34: Forward Position

10. Reposition bracket/light assembly (C) on reel arm as shown and reinstall the four bolts (D) to secure bracket to reel arm. Tighten bolts.
11. Push reel back and reinstall cylinder (B) to bracket with pin (A). Secure pin with cotter pin.
12. Secure light harness to bracket with plastic tie wrap.
13. Check reel clearance to backsheet, upper cross auger (if installed) and reel braces.
14. Adjust reel tine pitch (if required). For adjustment procedures, refer to *4.7.10 Reel Tine Pitch, page 65*.

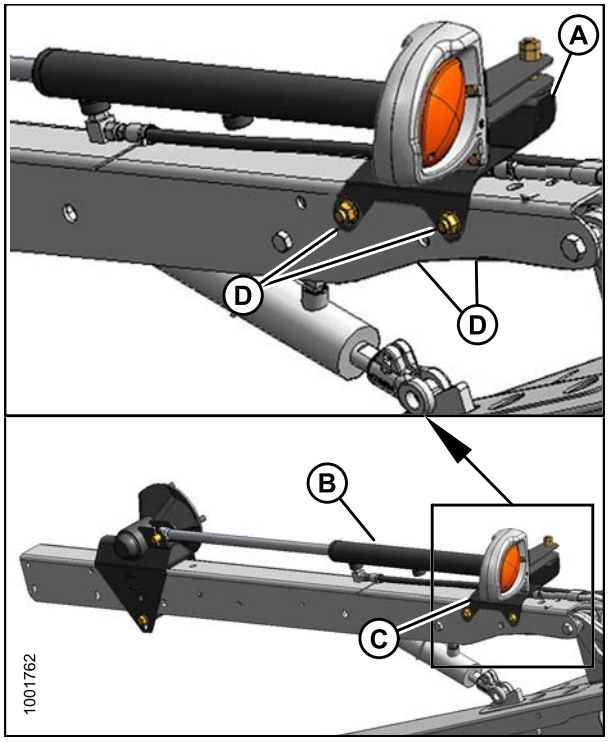


Figure 4.35: Rearward Position

Repositioning Fore-Aft Cylinders on Double Reel

The reel can be moved approximately 9 in (227 mm) further aft by repositioning the fore-aft cylinders on the reel arms. To reposition the cylinders on a double reel, follow these steps:

WARNING

Stop windrower engine and remove key before making adjustments to machine. A child or even a pet could engage the drive.

1. Position reel fully aft with support arms horizontal.
2. Stop engine and remove key.

Reposition center arm cylinder as follows:

NOTE:
Reel components are not shown for clarity.

3. Remove four bolts (A) securing cylinder bracket (B) to reel arm.
4. Push reel back until bracket (B) lines up with the aft set of holes (C).
5. Reinstall the four bolts (A) to secure bracket to reel arm at new position.

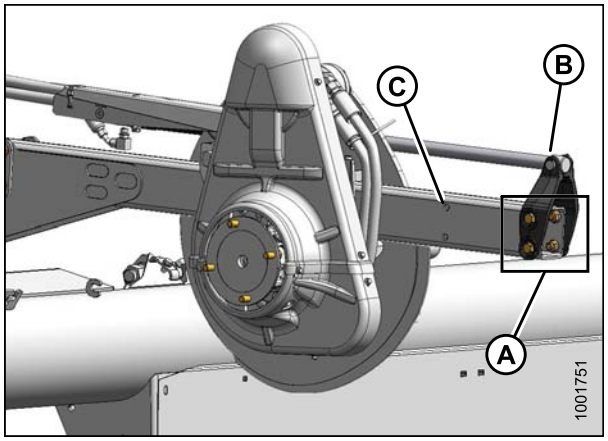


Figure 4.36: Forward Position

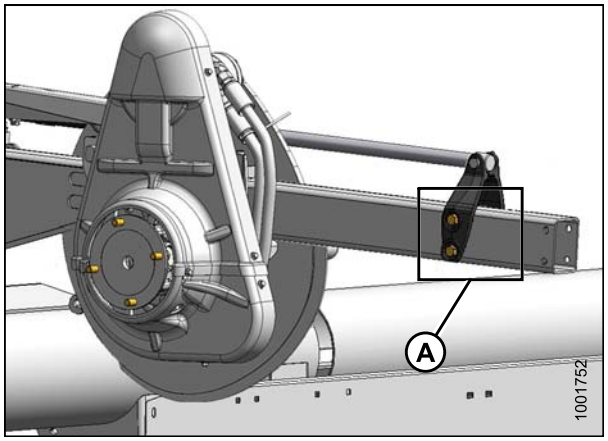


Figure 4.37: Rearward Position

Reposition right arm cylinder as follows:

NOTE:
Reel components are not shown for clarity.

6. Remove four bolts (A) securing cylinder bracket (B) to reel arm.
7. Push reel back until bracket (B) lines up with the aft set of holes (C).
8. Reinstall the four bolts (A) to secure bracket to reel arm at new position.

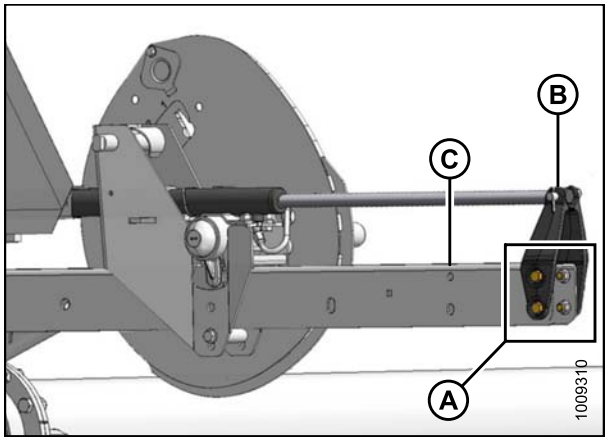


Figure 4.38: Forward Position

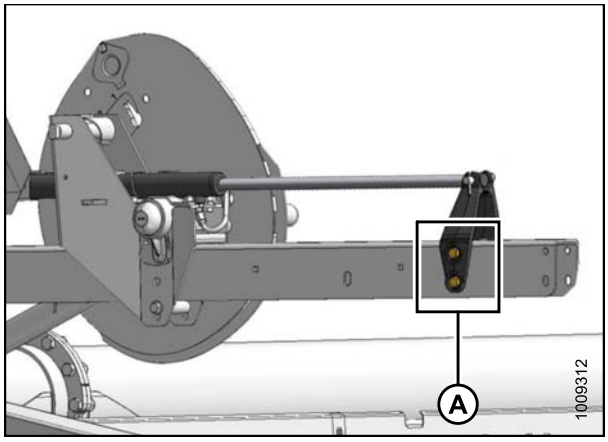


Figure 4.39: Rearward Position

Reposition left arm cylinder as follows:

NOTE:
Reel components are not shown for clarity.

9. Remove pin (A) securing cylinder (B) to bracket/light assembly (C).
10. Remove bolts (D) securing bracket (C) to reel arm and remove bracket/light assembly.
11. If necessary, remove cable tie securing harness to bracket or reel arm.
12. Swivel light to working position as shown.

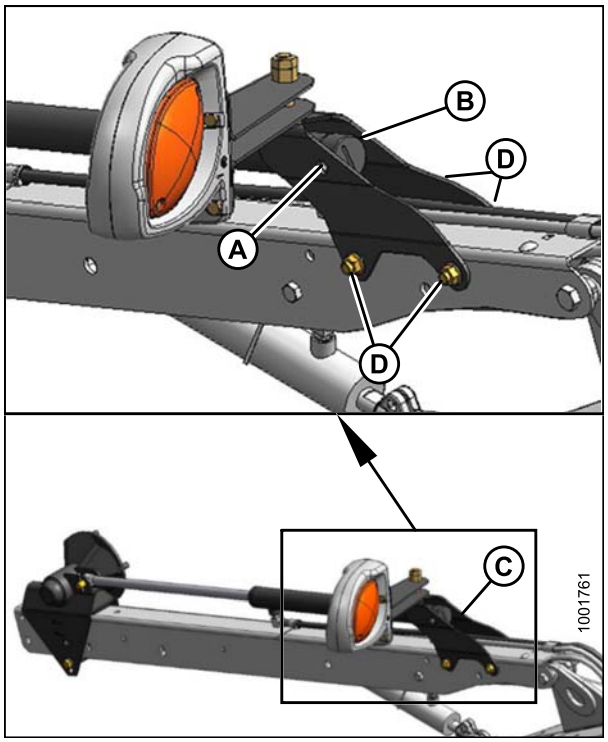


Figure 4.40: Forward Position

13. Reposition bracket/light assembly (C) on reel arm as shown and reinstall the four bolts (D) to secure bracket to reel arm. Tighten bolts.
14. Push reel back and reinstall cylinder (B) to bracket with pin (A). Secure pin with cotter pin.
15. Secure light harness to bracket with plastic tie wrap.
16. Check reel clearance to backsheet, upper cross auger (if installed) and reel braces.
17. Adjust reel tine pitch (if required). For adjustment procedures, refer to *4.7.10 Reel Tine Pitch, page 65*.

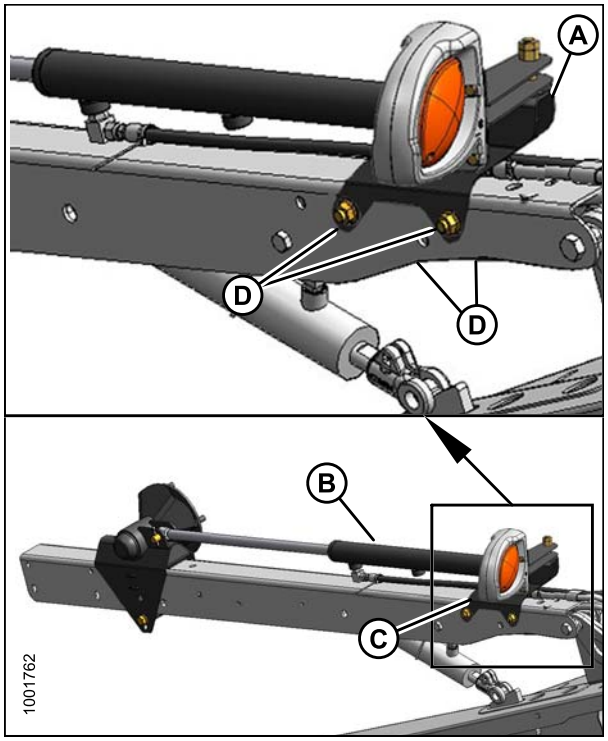


Figure 4.41: Rearward Position

4.7.10 Reel Tine Pitch

IMPORTANT:
The following describes the concept and operational guidelines of the pick-up reel. Please read carefully before operating the machine.

The pick-up reel is designed to pick up flattened and severely lodged crops.

It is not always necessary to increase the tine pitch (higher cam setting) to pick up crops that are lodged, but rather, the cam settings are mainly used to determine how the crop will get delivered to the drapers.

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

For best performance, use the minimum cam setting that will deliver the crop past the rear edge of the cutterbar and onto the drapers. Refer to *4.6.2 Header Settings, page 46Header Settings*

Choosing a Reel Cam Setting

The following outlines the function of each cam setting and includes guidelines for set-up in various crop conditions.

The setting numbers are visible above the slots on the cam disc. Refer to *Adjusting Reel Cam, 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.

- The crop is released quite close to the cutterbar and works best with the cutterbar 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. Initially, have the reel speed set about equal to the ground speed.

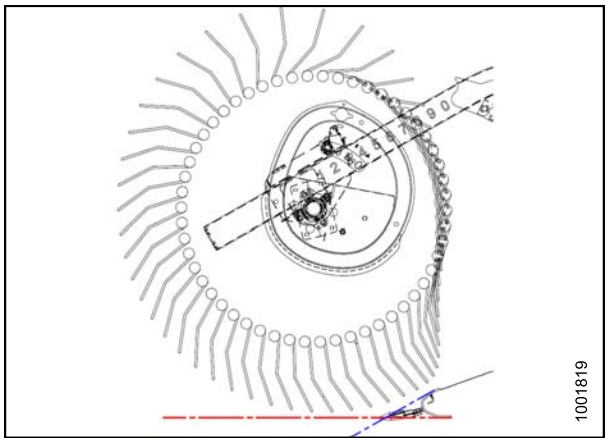


Figure 4.42: Finger Profile - Position 1

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

- This setting gives a fingertip speed approximately 20% faster than the reel speed.
- If crops tend to stall on the cutterbar with the reel in a forward position, the cam setting should be increased to push the crop past the rear edge of the cutterbar.
- If the crop getting fluffed, or the flow across the drapers is disrupted, the cam setting should be decreased.

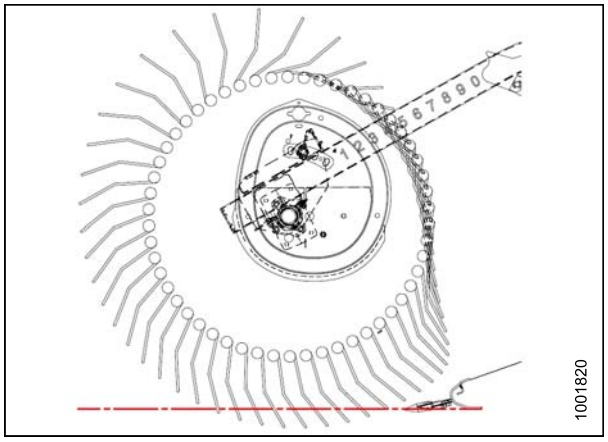


Figure 4.43: Finger Profile - Position 2

Cam Position 3, Reel Position 6 or 7 are 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 gives a finger tip speed approximately 30% faster than the reel speed.

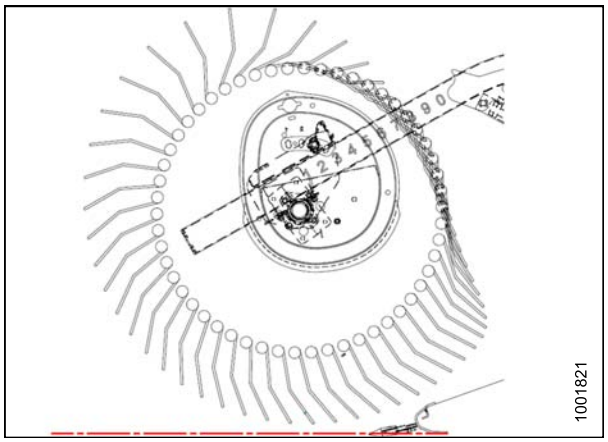


Figure 4.44: Finger Profile - Position 3

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 gives a finger tip speed approximately 35% faster than the reel speed.

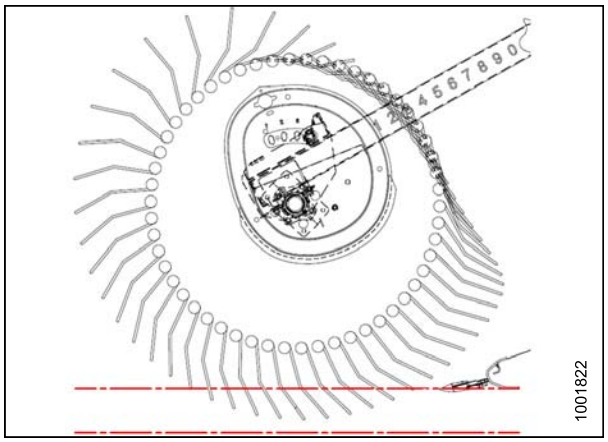


Figure 4.45: Finger Profile - Position 4

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 and gives a finger tip speed approximately 35% faster than the reel speed.

- Cutting height is set to approximately 8 in. (203 mm) to leave a significant amount of stubble. In damp materials such as rice, it is possible to double ground speed because the amount of material that is being cut is less.

NOTE:
High cam settings with the reel fore-aft position at 4–5 severely decreases the draper capacity because the reel disrupts crop flow across the drapers. The fingers are still engaged in the crop that is moving on the drapers. High cam settings are recommended only with the reel at or close to full forward settings.

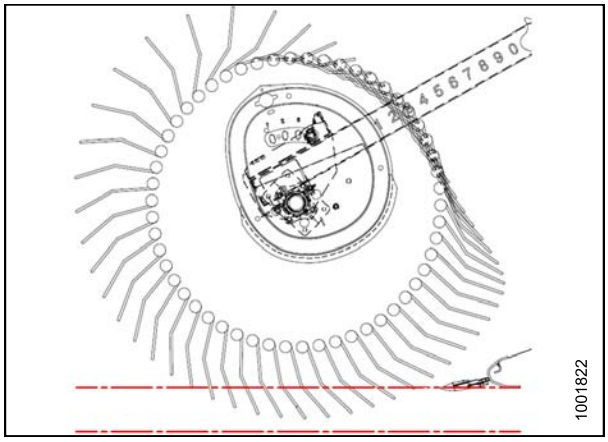


Figure 4.46: Finger Profile - Position 4

IMPORTANT:
The reel to cutterbar clearance should always be checked following adjustments to reel tine pitch and reel fore-aft position.

Refer to *6.8.1 Reel Clearance to Cutterbar, page 200*.

Refer to *4.6.2 Header Settings, page 46* for recommended reel tine pitch in specific crops and crop conditions.

Adjusting Reel Cam

WARNING

Stop windrower engine and remove key before making adjustments to machine. A child or even a pet could engage the drive.

1. Using a 3/4 in. wrench, turn the cam latch pin (A) counterclockwise to release the cam disc.
2. Use the wrench on bolt (B) to rotate cam disc and align latch pin (A) with desired hole (**1** to **4**) at (C) in cam disc.

NOTE:
Bolt (B) is through cam disc. Some parts shown transparent for visibility.

3. Turn latch pin (A) clockwise to engage and lock cam disc.
4. Repeat above procedure for the other reel.

IMPORTANT:
Secure cam position before operating machine.

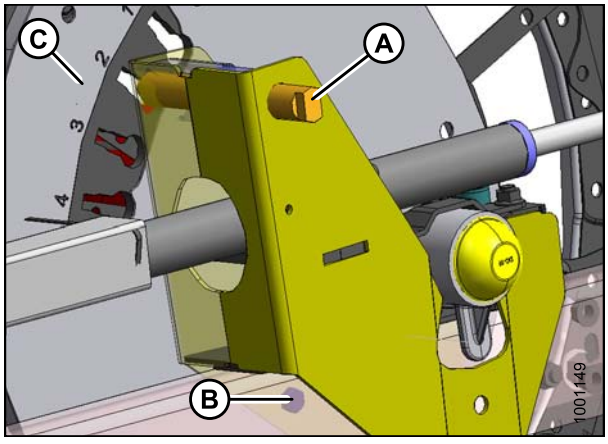


Figure 4.47: Reel Cam Positioner

4.7.11 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 from Header with Latch Option

To remove crop dividers from a header with the latch option, follow these steps.

DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine, always stop engine, remove key, and engage safety props before going under header for any reason. Refer to the windrower operator's manual for instructions regarding the proper use and storage of header safety props.

1. Lower reel, raise header, stop engine, remove key, and engage header safety props. For instructions, refer to your windrower operator's manual.
2. Open/remove header endshields. Refer to *4.2.3 Endshields, page 37*.
3. Lift safety lever (A).
4. Hold onto divider (B), push lever (C) to open latch and lower divider.

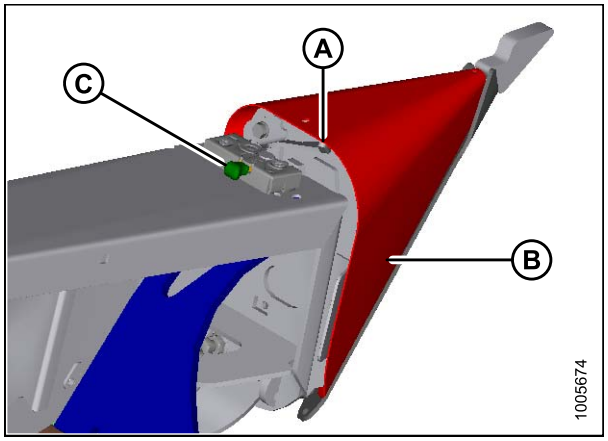


Figure 4.48: Crop Divider

5. Lift divider off endsheet and store as follows:
   a. Locate pin (A) on divider in hole in endsheet at location shown.
   b. Lift divider and locate lugs (B) on divider into bracket on endsheet. Ensure lugs engage bracket.
6. Close/replace header endshields. Refer to *4.2.3 Endshields, page 37*.

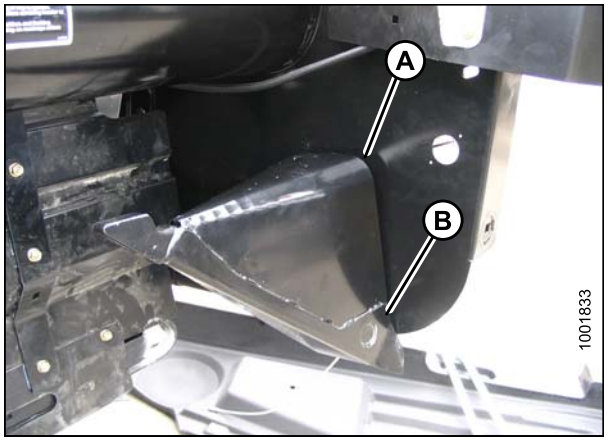


Figure 4.49: Stored Crop Divider

Removing Crop Dividers from Header without Latch Option

To remove crop dividers from a header without the latch option, follow these steps.

DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine, always stop engine, remove key, and engage safety props before going under header for any reason. Refer to the windrower operator's manual for instructions regarding the proper use and storage of header safety props.

1. Lower reel, raise header, stop engine, remove key, and engage safety props. For instructions, refer to your windrower operator's manual.
2. Open/remove header endshields. Refer to *4.2.3 Endshields, page 37*.
3. Remove bolt (A), lock washer and flat washer.
4. Lower divider (B) and lift off endsheet.
5. Close/replace header endshields. Refer to *4.2.3 Endshields, page 37*.

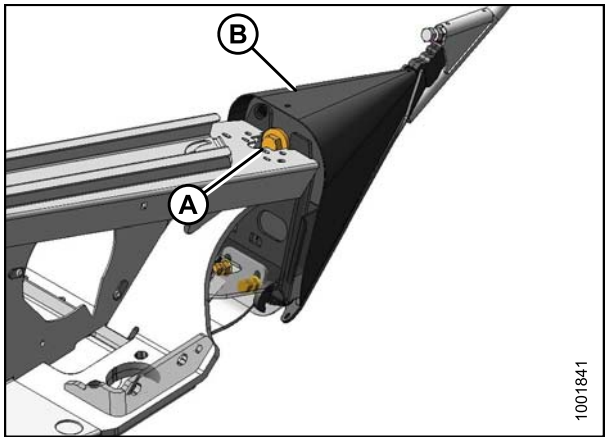


Figure 4.50: Crop Divider

Installing Crop Dividers on Header with Latch Option

To install crop dividers on a header with the latch option, follow these steps.

DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine, always stop engine, remove key, and engage safety props before going under header for any reason. Refer to the windrower operator's manual for instructions regarding the proper use and storage of header safety props.

1. Lower reel, raise header, stop engine, remove key, and engage safety props. For instructions, refer to your windrower operator's manual.
2. Open header and remove endshields.

3. At divider storage location, lift divider to disengage lugs (A) at lower end and then lower it slightly to disengage pin (B) from endsheet.

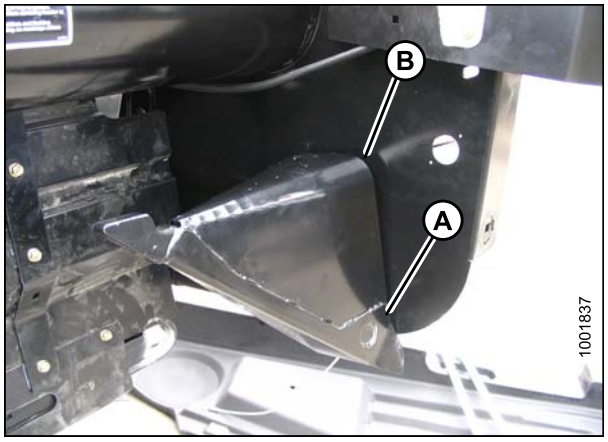


Figure 4.51: Stored Crop Divider

4. Position crop divider as shown by locating lugs (A) in holes in endsheet.
5. Lift forward end of divider until pin (B) at top of divider engages and closes latch (C).
6. Push safety lever (D) down to lock pin in latch.

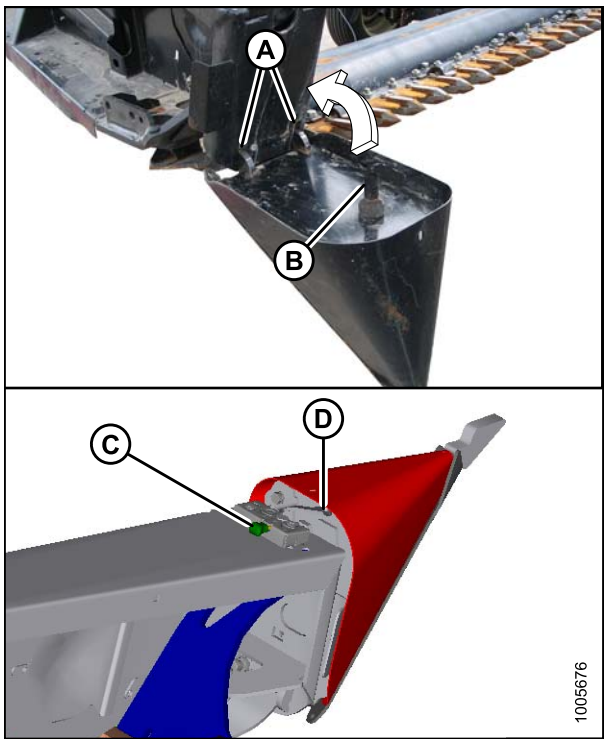


Figure 4.52: Crop Divider

A - Lugs **B - Pin**
C - Latch **D - Safety Lever**

7. Check that divider does **NOT** move laterally. Adjust bolts (A) as required to tighten divider and remove lateral play when pulling at divider tip.
8. Close/install endshields.

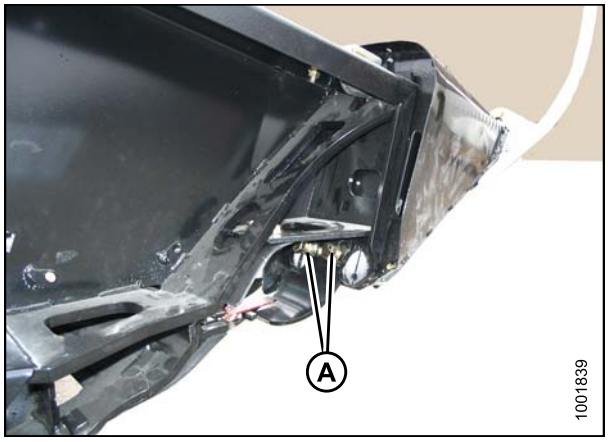


Figure 4.53: Crop Divider

Installing Crop Dividers on Header without Latch Option

To install crop dividers on a header without the latch option, follow these steps.

DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine, always stop engine, remove key, and engage safety props before going under header for any reason. Refer to the windrower operator's manual for instructions regarding the proper use and storage of header safety props.

1. Lower reel, raise header, stop engine, remove key, and engage safety props. For instructions, refer to your windrower operator's manual.
2. Open/remove endshields. Refer to *4.2.3 Endshields, page 37*.
3. Remove crop divider from storage.
4. Position crop divider as shown by locating lugs (A) in holes in endsheet.

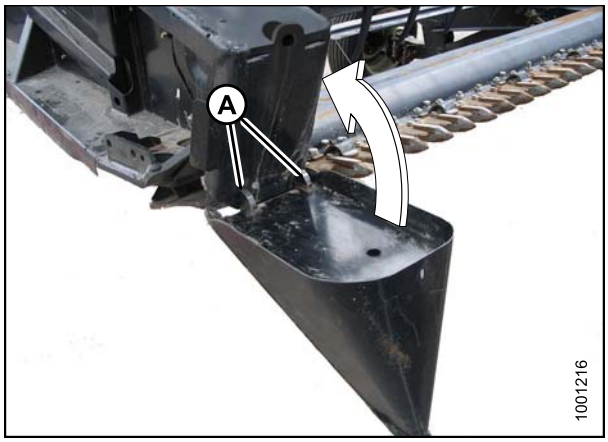


Figure 4.54: Crop Divider

5. Lift forward end of divider and install bolt (A) and special stepped washer (B) (step towards divider). Tighten bolt.
6. Check that divider does not move laterally. Adjust bolts (C) as required to tighten divider and remove lateral play when pulling at divider tip.
7. Close endshield. Refer to *4.2.3 Endshields, page 37*.

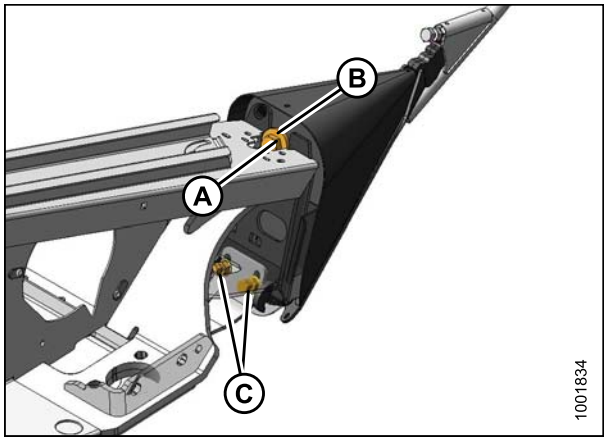


Figure 4.55: Crop Divider

4.7.12 Crop Divider Rods

Crop divider rods are used with the crop dividers. The removable divider rods are suitable when crop is down, but in standing crops, the crop dividers alone are recommended.

Table 4.4 Recommended Use of Crop Divider Rods

With Divider Rods	Without Divider Rods
Alfalfa	Edible Beans
Canola	Milo
Flax	Rice
Grass Seed	Soybeans
Lentils	Standing Cereal
Lodged Cereal	
Peas	
Soybeans	
Sudan Grass	
Winter Forage	

Removing Crop Divider Rods

To remove divider rods, follow these steps:

1. Loosen bolt (B) and remove rod (A).

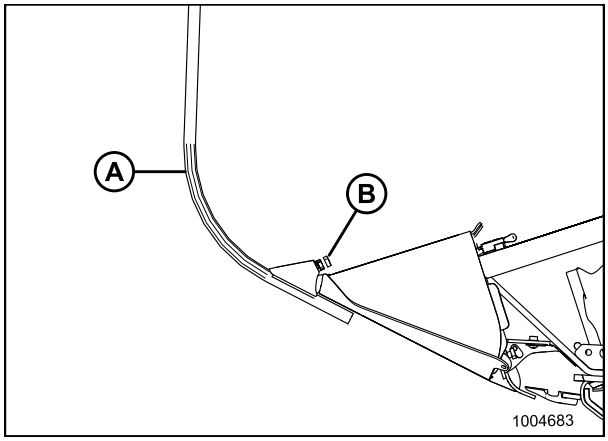


Figure 4.56: Crop Divider Rod

2. Store both rods on the inboard side of the right endsheet.

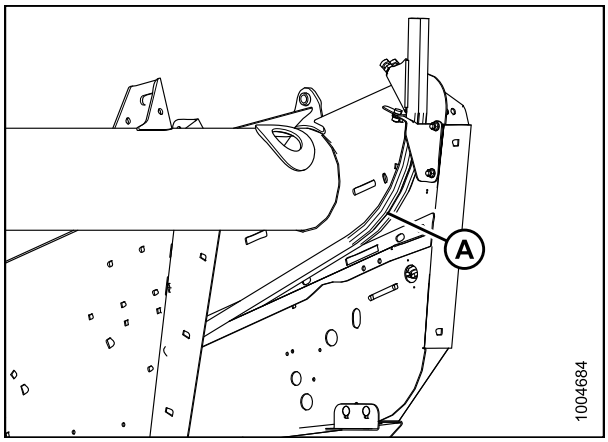


Figure 4.57: Stored Divider Rod

Using Rice Dividers

Optional special rice dividers can be installed and used when required. Refer to *8.4.13 Rice Divider Rods, page 269*.

The installation and removal procedures are the same as for the standard crop dividers.

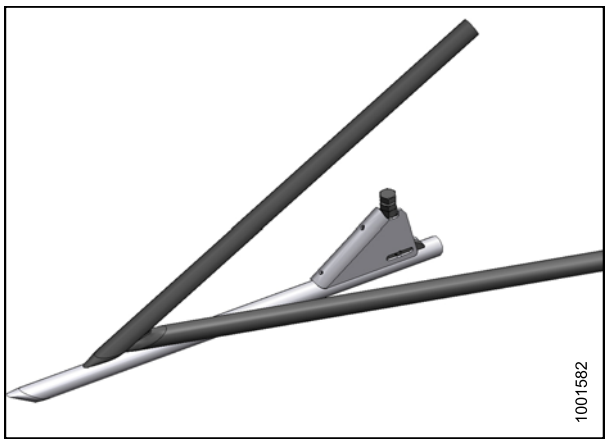


Figure 4.58: Divider Rod for Rice

4.8 Delivery Opening

The width and location of the delivery opening 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:

- Windrower pick-up capability
- Type and yield of crop
- Weather conditions (rain, humidity, wind)
- Drying time available

Refer to *4.10 Windrow Types, page 79* for the strengths and weaknesses of the various windrow configurations with respect to these factors.

Also refer to *4.9 Double Windrowing, page 76*.

4.8.1 Adjusting Delivery Opening on Header with Manual Deck Shift

Both decks can be positioned to vary the delivery opening from 60-5/8—69-11/16 in. (1540–1770 mm) for the 15 ft. header and from 67-1/8—76-11/16 in. (1720–1950 mm) for 20 to 40 ft. models.

1. Loosen bolts (A) on both decks.
2. Slide decks desired amount. Retighten bolts (A).

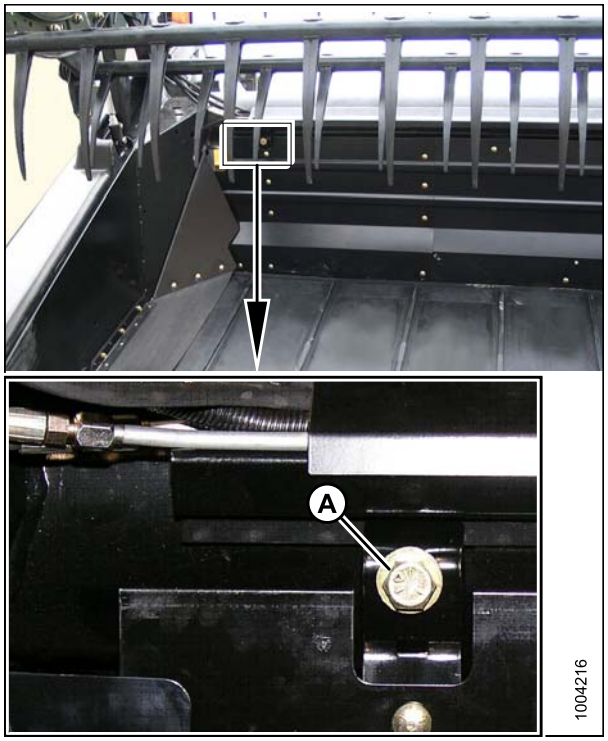


Figure 4.59: Manual Deck Shift

4.8.2 Adjusting Delivery Opening on Header with Hydraulic Deck Shift

The delivery opening can be changed by moving the inboard deck shift stops.

1. Remove bolts (A).
2. Slide stop (B) outboard to decrease the maximum opening size, or inboard to increase the maximum opening.

CAUTION

Adjust the outboard stops to prevent the decks from contacting each other.

3. Reinstall bolts (A) and tighten.

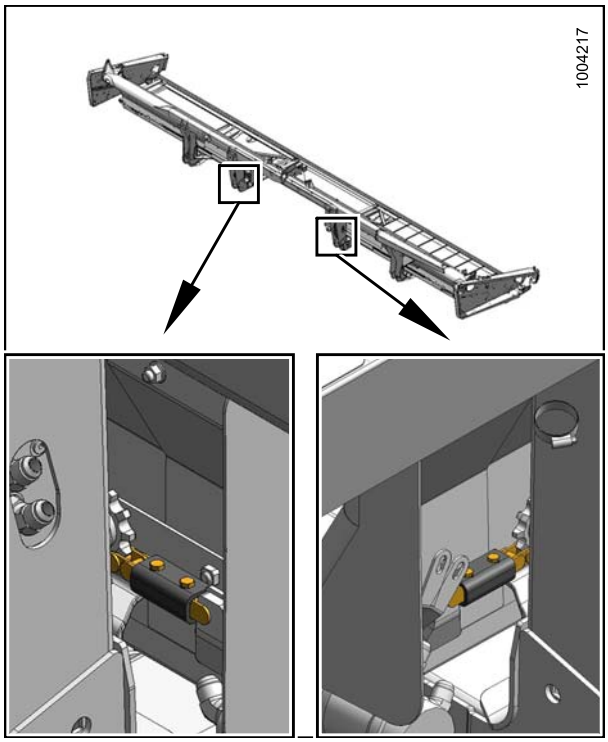


Figure 4.60: Hydraulic Deck Shift

4.9 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 performed with the D65 Draper Headers by two methods; deck shifting, or using the Double Windrow Attachment (DWA).

Deck shifting is used for crops that don't require conditioning, such as grains, canola, and beans for example. Refer to

- *4.9.1 Shifting Decks Hydraulically, page 76*, or
- *4.9.2 Shifting Decks Manually, page 77*

Forage crops such as alfalfa, hay, and some grasses are cut and then fed into the HC10 hay conditioner. The DWA system allows double windrowing with conditioner equipped windrowers up to 30 feet. Refer to *4.9.3 Using Double Windrow Attachment (DWA), page 78*.

4.9.1 Shifting Decks Hydraulically

The hydraulic deck shift feature allows the Operator to select center, left, or right delivery from the windrower cab. It is only available on the 25, 30, and 35 ft. headers.

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

Laying a Double Windrow

NOTE:
30 ft. headers equipped with transport or stabilizer system, require that the wheels be in the raised position to avoid interfering with the windrow.

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

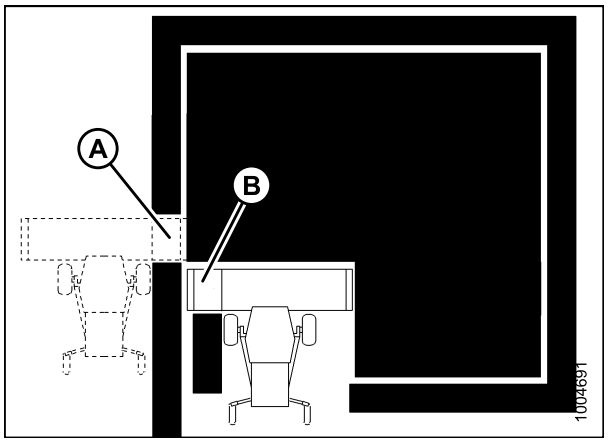


Figure 4.61

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.

4.9.2 Shifting Decks Manually

Both decks can be moved manually to deliver the crop from the center or right/left end on 25 to 40 ft. headers.

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

CAUTION

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

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

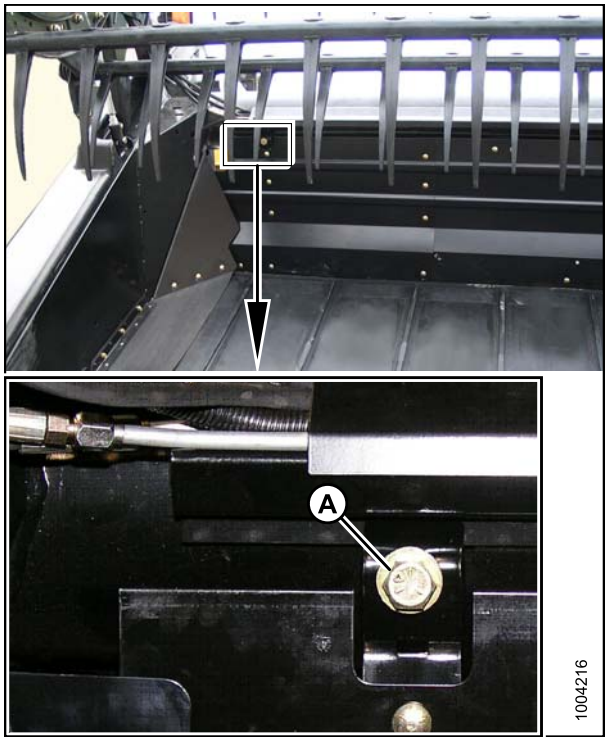


Figure 4.62: Right Deck Shown

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

NOTE:
Loosen clamp on plastic sleeve at drive motor so that hoses (A) can be reversed. Retighten clamp.

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

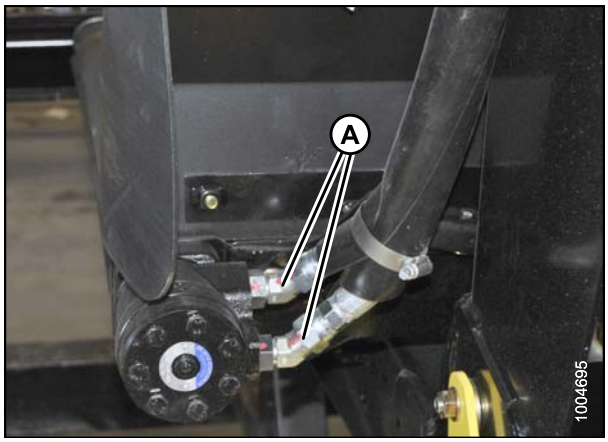


Figure 4.63: Right Deck Motor

Laying a Double Windrow

NOTE:
30 ft. headers equipped with transport or stabilizer system, require that the wheels be in the raised position to avoid interfering with the windrow.

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 above steps to lay the second double windrow.

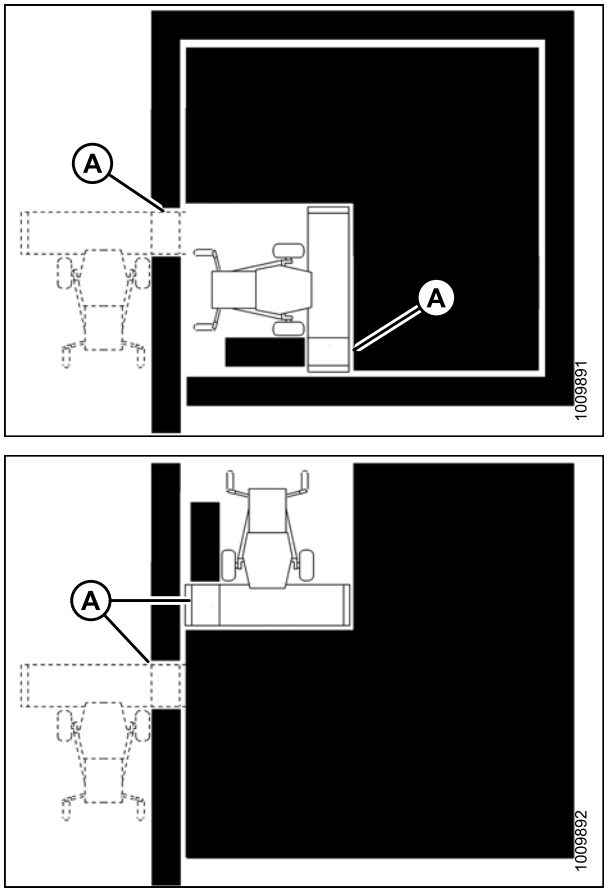


Figure 4.64: Double Windrowing

4.9.3 Using Double Windrow Attachment (DWA)

Allows double windrowing of cut and conditioned forage type crops.

The conditioned crop is deposited onto the side delivery system draper (A) and delivered to the side of the windrower when required. Draper speed and deck position are controlled with switches in the windrower cab.

Laying a Double Windrow

1. Complete one round or one length of the field.
2. Complete the second round or length in the opposite direction to lay a double windrow.
3. Repeat above steps to lay the second double windrow.

NOTE:
The DWA system shuts off the draper automatically when it is raised and allows the crop to be deposited between the tractor wheels as it would be without the side delivery system.

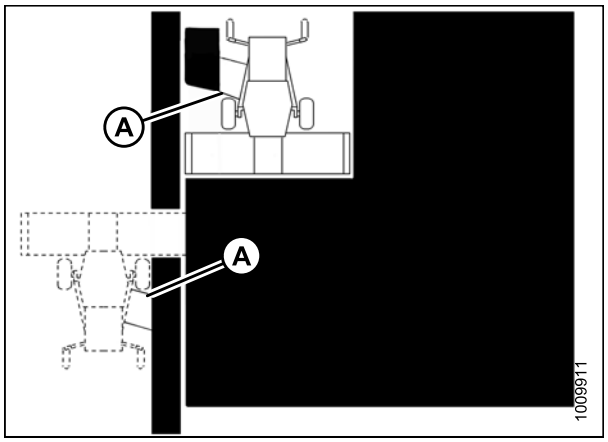
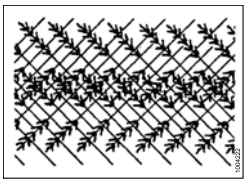
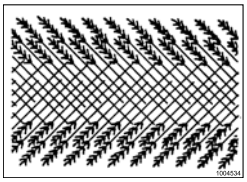
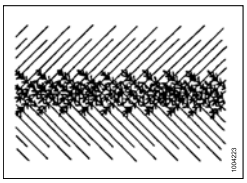
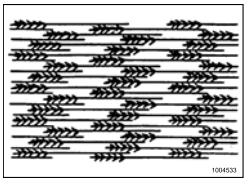


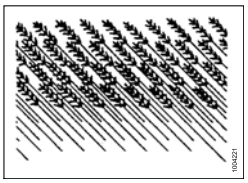
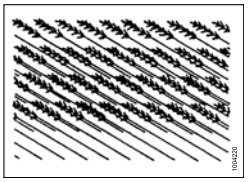
Figure 4.65

4.10 Windrow Types

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

Windrow Type	Description	Weight Distribution	Curing	Weatherability	Machine Setting Guidelines
Herringbone 	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.	Good	Good	Excellent	• Reel and ground speed approximately equal • Medium draper speed • Center delivery
Fantail 	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.	Fair	Fair	Fair	• Low draper speed • Low header angle • Center delivery
Dovetail 	The stalks are lined along outside edges of windrow and heads are crossed in center. This windrow can be formed by center delivery only.	Poor	Fair	Poor	• High draper speed • High header angle • Center delivery
Parallel 	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.	Good	Good	Good	• Medium draper speed • Medium header angle • Center or end delivery

Windrow Type	Description	Weight Distribution	Curing	Weatherability	Machine Setting Guidelines
45° Diagonal 	The stalks are lined along one edge and heads are along opposite edge, 45° to windrow perpendicular. This windrow can be formed by end deliver or by center delivery if the crop is leaning to one side.	Poor	Fair	Poor	• Low reel speed • Less aggressive tine pitch • End delivery or center delivery if crop is leaning
75° Diagonal 	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.	Fair	Good	Fair	• Low reel speed • Less aggressive tine pitch • End delivery or center delivery if crop is leaning

4.11 Haying Tips

The following information may be useful when using the D65 Draper Header in hay crops.

4.11.1 Curing

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 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.

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

If ground is wet due to frequent rains, cut when weather allows and let the forage lie on 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.

4.11.3 Weather and Topography

Cut as much hay as possible by mid day when drying conditions are best.

Fields sloping south get up to 100% more exposure to the sun's heat than do 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 winds is also recommended.

4.11.4 Windrow Configuration

It is recommended that a windrow with the following characteristics be produced. Refer to Section *4.7 Header Operating Variables, page 50* for instructions on adjusting the header.

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 bunchy	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.

4.11.5 Driving on Windrow

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 the windrow in high yielding crops may be unavoidable if a full width windrow is necessary.

4.11.6 Raking and Tedding

Raking or tedding speeds up drying, however, benefits must be evaluated against additional leaf losses which will be the result.

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.

Hay should not be raked or tedded at less than 25% moisture, or excessive yield losses will result.

4.11.7 Chemical Drying Agents

Hay drying agents work by removing wax from legume surfaces, enabling water to escape and evaporate faster. However, treated hay lying on wet ground will also absorb ground moisture faster. Before deciding to use a drying agent, costs and benefits relative to your area should be carefully evaluated.

4.12 Levelling the 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.

If the header is not level, check the pressure of the windrower's tires to ensure they are properly inflated (refer to your windrower's operator's manual).

If the header is still not level, adjust the windrower linkages as required (refer to the appropriate section in the windrower's operator's manual).

4.13 Unplugging Cutterbar

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

1. Stop forward movement of machine and disengage header drives.
2. Raise header to prevent it from filling with dirt, and engage header drive clutch.

   CAUTION

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

3. If plug does **NOT** clear, disengage header drive clutch and raise header fully.

   WARNING

   Stop engine and remove key before removing plugged material from header. A child or even a pet could engage the drive.

4. Shut off engine, remove key, and engage park brake.
5. Engage header safety props.

   CAUTION

   Wear heavy gloves when working around or handling knives.

6. Clean off cutterbar by hand.

NOTE:
If cutterbar plugging persists, refer to *7 Troubleshooting, page 245*.

4.14 Upper Cross Auger (UCA)

The UCA helps deliver very bulky crops across the header onto the windrow.

Removable beater bars assist in delivering material through the header opening, but if wrapping occurs, the beater bars can be removed.

IMPORTANT:
The upper cross auger drive motor must be equipped with a case drain kit when used on single draper drive headers. See your MacDon Dealer for details.

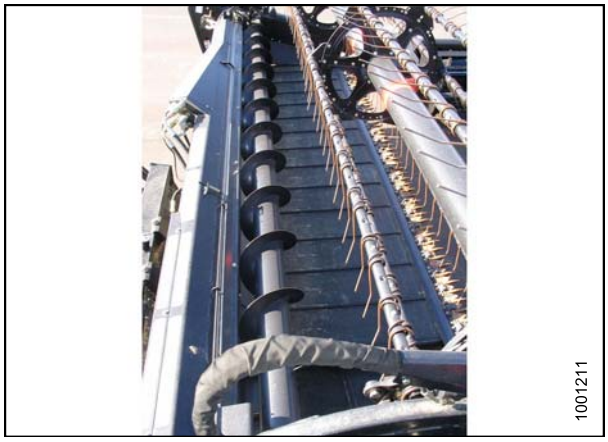


Figure 4.66: Upper Cross Auger

4.14.1 Removing Beater Bars

To remove beater bars, follow these steps.

WARNING

Stop engine and remove key before removing plugged material from header. A child or even a pet could engage the drive.

1. Lower header to ground, shut down engine, and remove key.

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

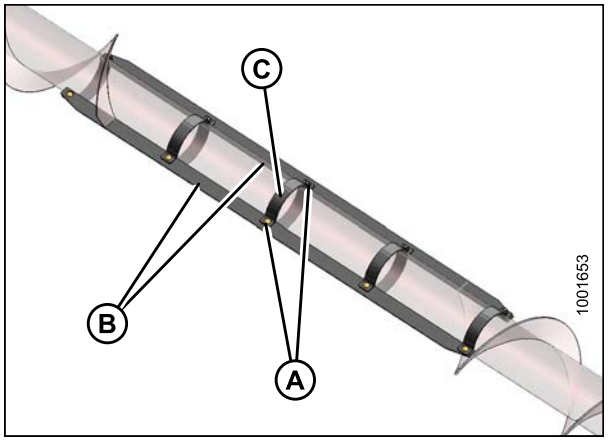


Figure 4.67: Single Reel Headers

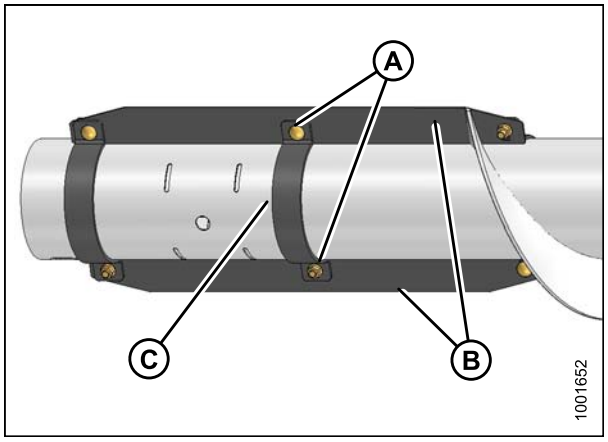


Figure 4.68: Beater Bars

4.14.2 Installing Beater Bars

To install beater bars, follow these steps.

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

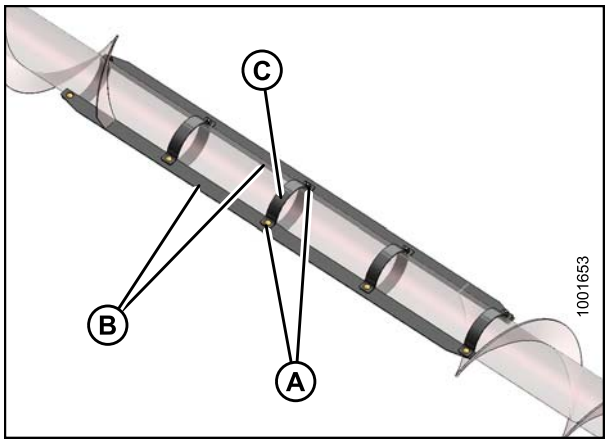


Figure 4.69: Single Reel Headers

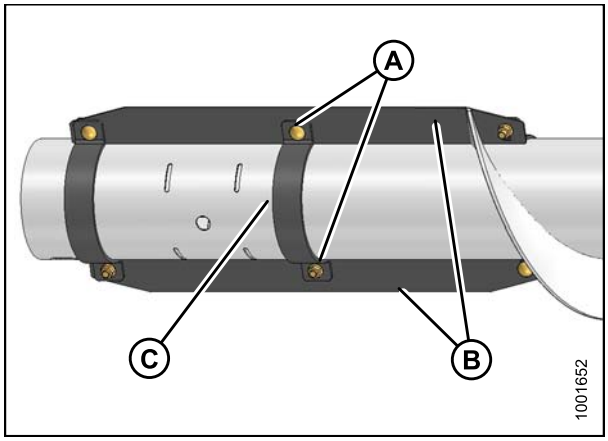


Figure 4.70: Beater Bars

4.15 Transporting Header

WARNING

Do NOT drive 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.

4.15.1 Transporting Header on Windrower

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 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 slow moving vehicle emblem and reflectors. Adjust rear view mirror and clean windows.**
- **Lower the reel fully and raise 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 header at a minimum height. This provides maximum stability if forward motion is stopped for any reason. Raise header completely at bottom of grade to avoid contacting ground.**
- **Travel speed should be such that complete control and machine stability are maintained at all times.**

4.15.2 Towing

Headers with the Slow Speed Transport/Stabilizer Wheel option can be towed behind a properly configured MacDon windrower or an agricultural tractor. Refer to the windrower operator's manual for instructions.

Attaching Header to Towing Vehicle

CAUTION

To avoid bodily injury and/or machine damage caused by loss of control:

- **Weight of towing vehicle must exceed header weight to ensure adequate braking performance and control.**
- **Do NOT tow with any highway-capable vehicle. Use only an agricultural tractor, agricultural combine, or properly configured MacDon windrower.**
- **Ensure that reel is down and fully back on support arms to increase header stability in transport. For headers with hydraulic reel fore-aft, never connect the fore-aft couplers to each other. This would complete the circuit and allow the reel to creep forward in transport, resulting in instability.**
- **Check that all pins are properly secured in Transport position at wheel supports, hitch, and cutterbar support.**
- **Check tire condition and pressure prior to transporting.**
- **Connect hitch to towing vehicle with a proper hitch pin with a spring locking pin or other suitable fastener.**
- **Attach safety hitch chain to towing vehicle. Adjust safety chain length to remove all slack except what is needed for turns.**
- **Connect header wiring harness 7-pole plug to mating receptacle on towing vehicle. (The 7-pole receptacle is available from your MacDon Dealer parts department).**
- **Ensure lights are functioning properly and clean the slow moving vehicle emblem and other reflectors. Use flashing warning lights unless prohibited by law.**

Towing the Header

CAUTION

This is intended as slow speed transport. To avoid bodily injury and/or machine damage caused by loss of control:

- **Do NOT exceed 25 mph (40 km/h). Reduce transport speed to less than 5 mph (8 km/h) for corners and slippery or rough conditions.**
- **Turn corners only at very low speeds (5 mph [8km/h]) or less). While cornering, header stability is reduced as front wheel moves to the left.**
- **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.**

4.15.3 Converting from Transport to Field Position

To convert the header from Transport to Field position, follow these steps.

Removing Tow-Bar

Remove tow-bar as follows:

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

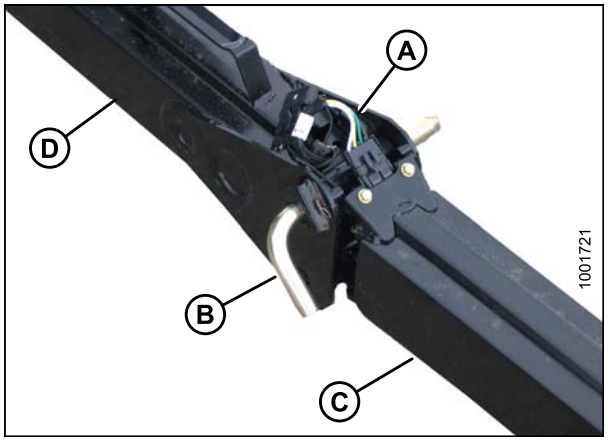


Figure 4.71: Tow-Bar Assembly

A - Wiring Connector **B - Pin**
C - Outer Section **D - Inner Section**

4. Disconnect wiring connector (A) at front wheel.

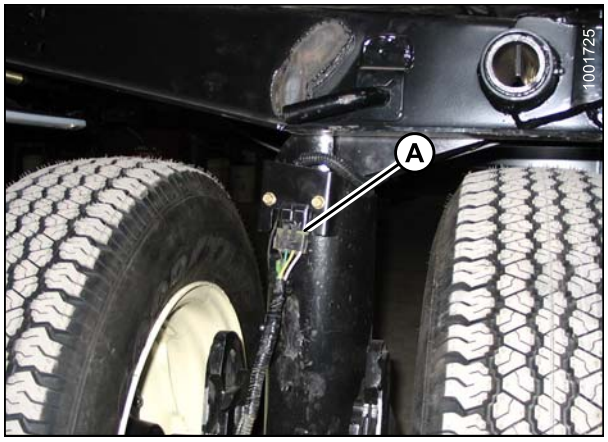


Figure 4.72: Wiring Connector

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

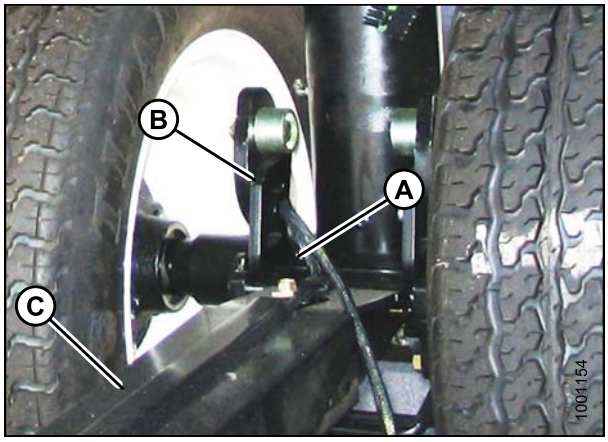


Figure 4.73: Tow-Bar Latch

Storing Tow-Bar

Store tow-bar as follows:

1. At the left end of the header, place the inner end of the outer half of the tow-bar in cradle (A) on header backtube.
2. For clevis or pintle end of tow-bar, secure in support (B) on endsheet with hitch pin (C). Secure with lynch pin.
3. Install rubber strap (D) on cradle (A).

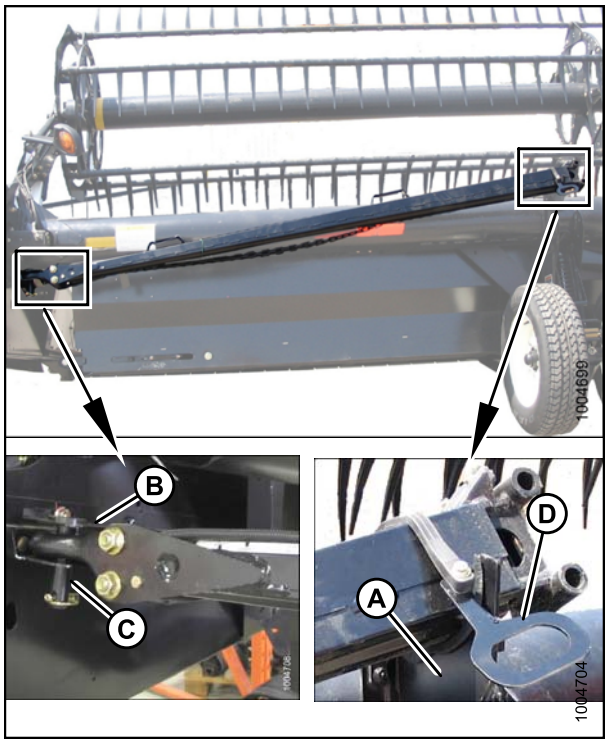


Figure 4.74: Tow-Bar Storage

4. At the **right end of the 25, 35, and 40 ft. header:**
   a. Place the inner end of the inner half of the tow-bar in cradle (A) on header backtube.
   b. Secure tube end in support (B) with clevis pin (C). Secure with hairpin.
   c. Install rubber strap (D) on cradle (A).

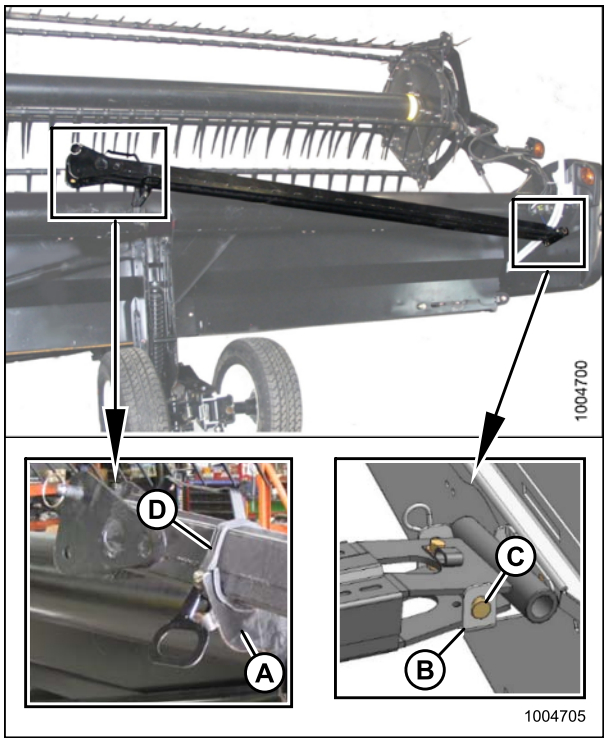


Figure 4.75: 25, 35, and 40 ft. Header

5. At the **right end of the 30 ft. header:**
   a. Place the inner end of the inner half of the tow-bar in cradle (A) on header backtube.
   b. Secure tube end in support (B) with pin (C).
   c. Install rubber strap on cradle (A).

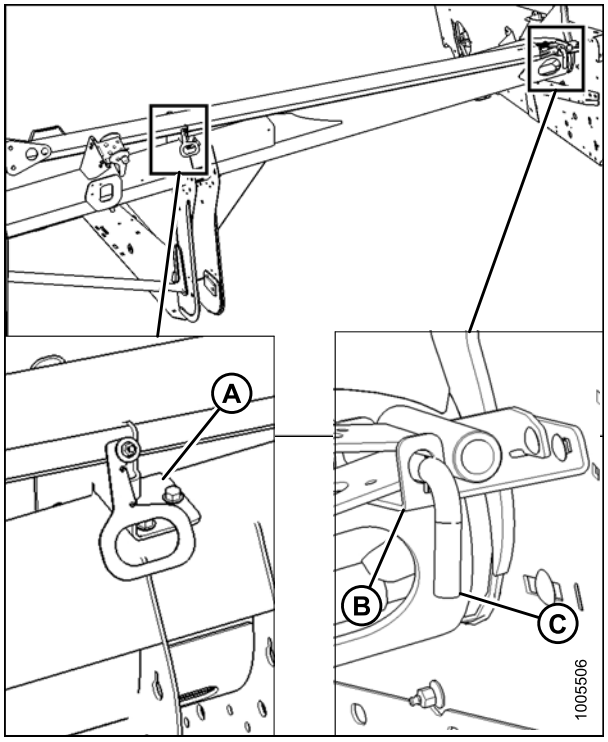


Figure 4.76: 30 ft. Header

6. Attach header to 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.

7. Place transport wheels into field position. Refer to:
   - *Moving Front (Left) Wheels into Field Position, page 93*
   - *Moving Rear (Right) Wheels into Field Position, page 94*

Moving Front (Left) Wheels into Field Position

To move the front (left) transport wheels into field position, follow these steps:

DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine, always stop engine, remove key, and engage safety props before going under header for any reason. Refer to the windrower operator's manual for instructions regarding the proper use and storage of header safety props.

1. Raise header fully. Engage header safety props.
2. Swivel front wheel assembly (A), so wheels are aligned with lower frame.
3. Remove pin (B) and pull wheel assembly towards rear of header. Store pin (B) in hole (C) at top of leg.
4. Pull handle (D) up to release and lower the linkage in the vertical support.

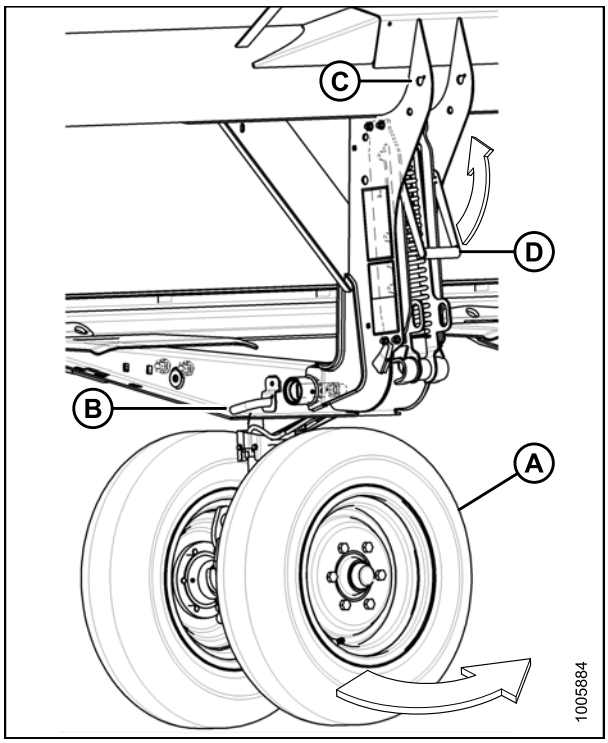


Figure 4.77: Front (Left) Wheels

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

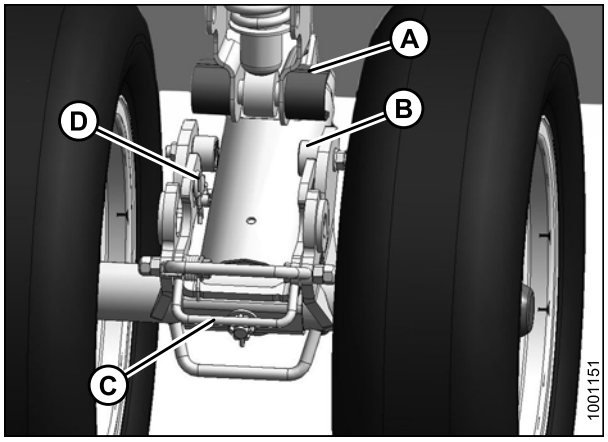


Figure 4.78: Front (Left) Wheels

7. Lift wheel assembly to desired height and slide linkage (A) into appropriate slot in vertical support.
8. Push down on handle (B) to lock.

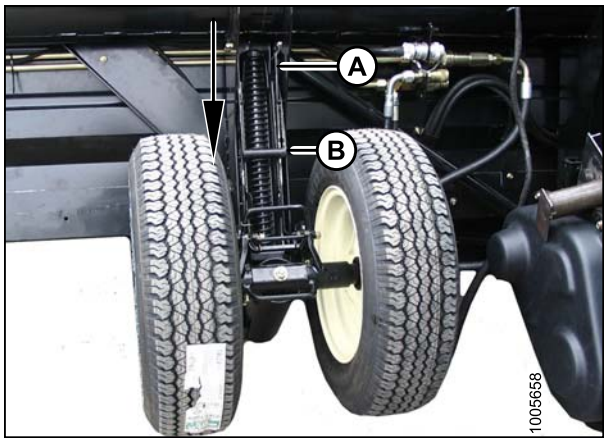


Figure 4.79: Front (Left) Wheels

Moving Rear (Right) Wheels into Field Position

To move the rear (right) transport wheels into field position, follow these steps.

1. Pull pin (A) on the left hand wheel behind the header. Swivel wheel clockwise and lock with pin (A).

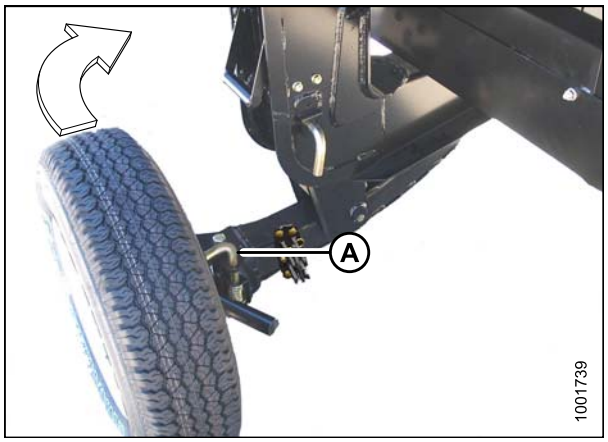


Figure 4.80: Left Rear Wheel

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

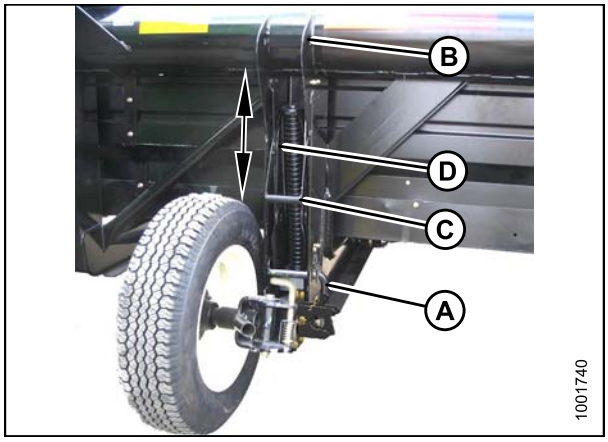


Figure 4.81: Left Rear Wheel

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

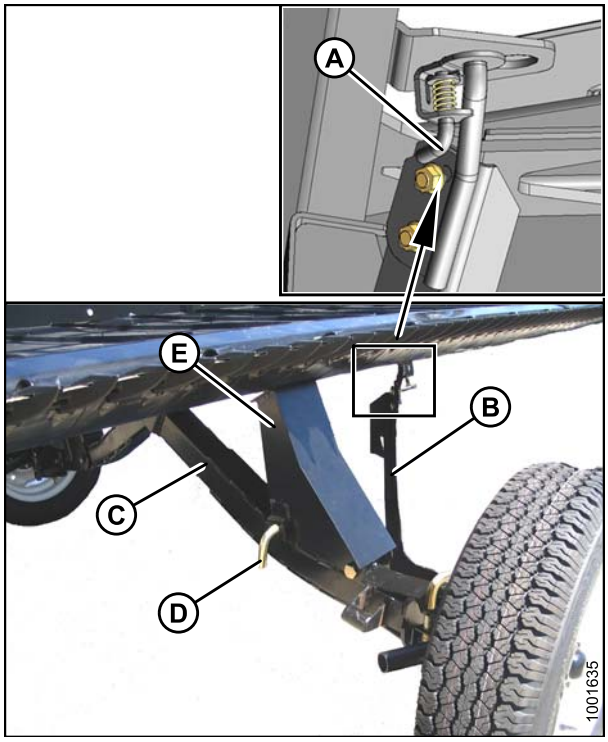


Figure 4.82: Right Rear Axle

9. Pull pin (A) at right wheel, swivel wheel counterclockwise to position shown and lock with pin (A).
10. Remove hairpin (B) from latch (C).
11. Lift wheel, lift latch (C), and engage lug (D) onto left axle. Ensure latch closes.
12. Secure latch with hairpin (B), with open end of pin facing rear of combine.

    NOTE:
    Installing hairpin with the open end facing the cutterbar will cause it to be dislodged by crop during operation.

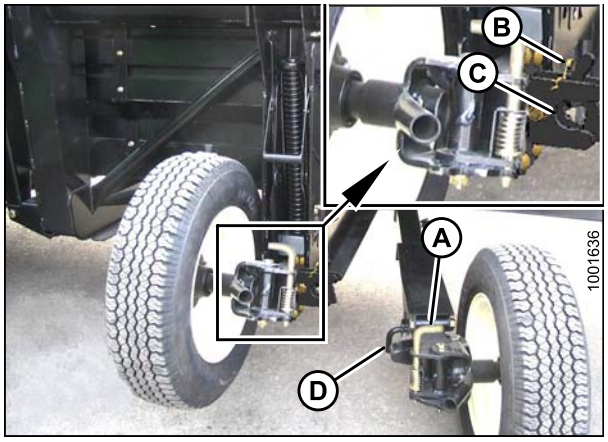


Figure 4.83: Rear Axles

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

13. The conversion is complete when the wheels are as shown.

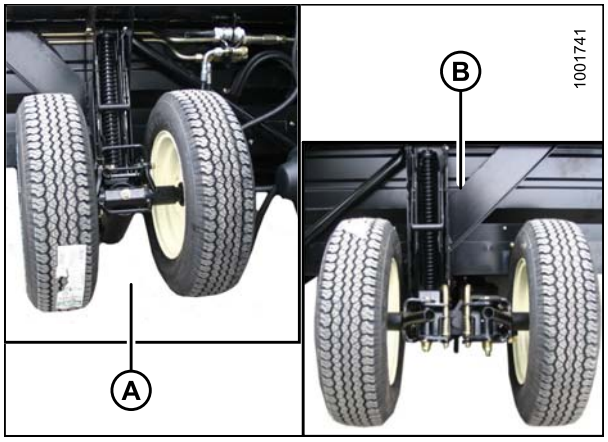


Figure 4.84: Field Position

A - Left Side **B - Right Side**

4.15.4 Converting from Field to Transport Position

To convert the header from field to transport position, follow these steps.

DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine, always stop engine, remove key, and engage safety props before going under header for any reason. Refer to the windrower operator's manual for instructions regarding the proper use and storage of header safety props.

Moving Front (Left) Wheels into Transport Position

To move the left transport wheels into transport position, follow these steps:

CAUTION

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

1. Pull handle (B) up to release and raise the linkage (A) fully upward in the vertical support.
2. Raise header fully, stop engine, and remove key from ignition. Engage header safety props.

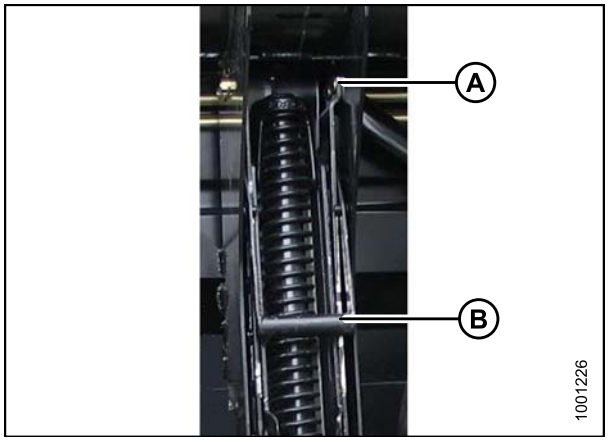


Figure 4.85: Raising Linkage

3. Remove hair pin and clevis pin (A).
4. Pull latch handle (B) to release suspension linkage (C) and pull suspension linkage (C) away from spindle (D).
5. Slowly lower the wheels.

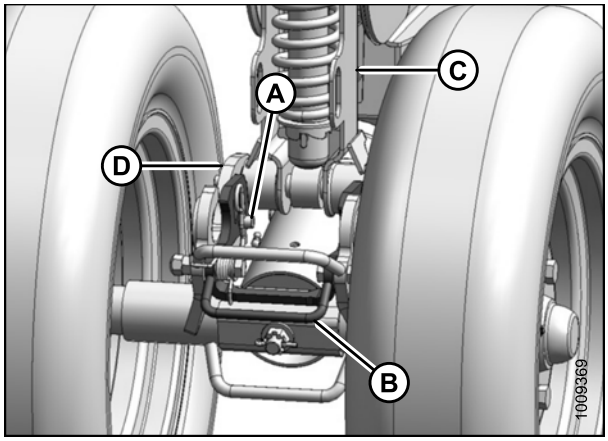


Figure 4.86: Lowering Wheels

6. Lower handle (B) to lock.

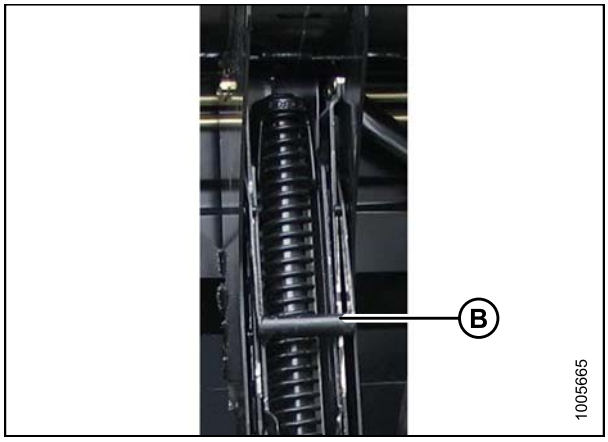


Figure 4.87: Locking Linkage

7. Remove pin (A) from storage at top of leg (B).
8. Move and swivel wheels clockwise so that connector (C) is turned towards the front end of the header.
9. Insert pin (A) and turn to lock.
10. Lower header so that left wheels are just touching the ground.

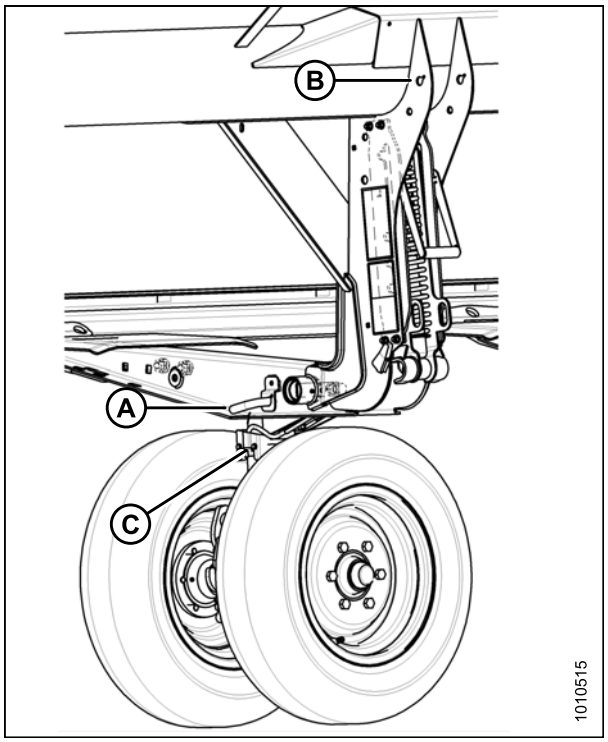


Figure 4.88: Swivelling Wheels

Moving Rear (Right) Wheels into Transport Position

To move the right (rear) transport wheels into transport position, follow these steps:

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

CAUTION

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

3. Carefully pull handle (D) to release the spring and let the wheel drop to the ground.
4. Lift wheel and linkage with handle (E) and position linkage in second slot from bottom.
5. Lower handle (C) to lock.

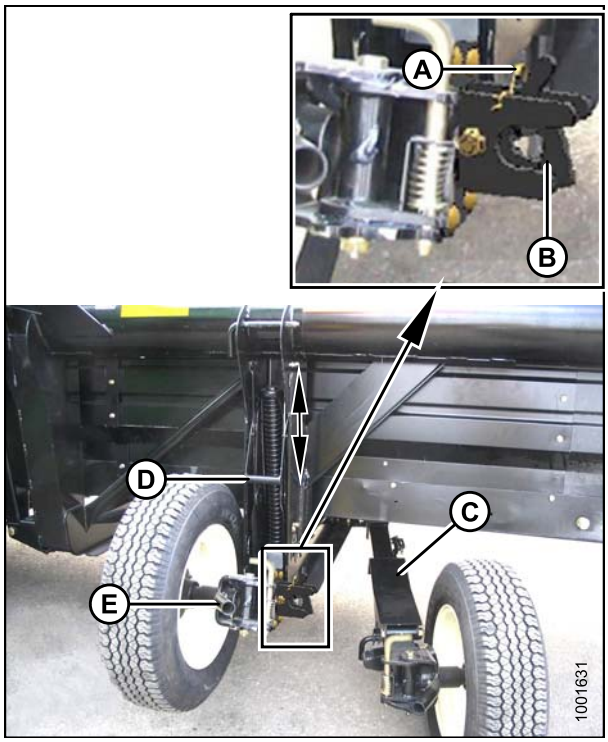


Figure 4.89: Separating Axles

6. Remove pin (A) and install at (B) to secure linkage. Turn pin (A) to lock.
7. Pull pin (D), swivel wheel (C) counterclockwise 90 degrees, and re-lock with pin (D).

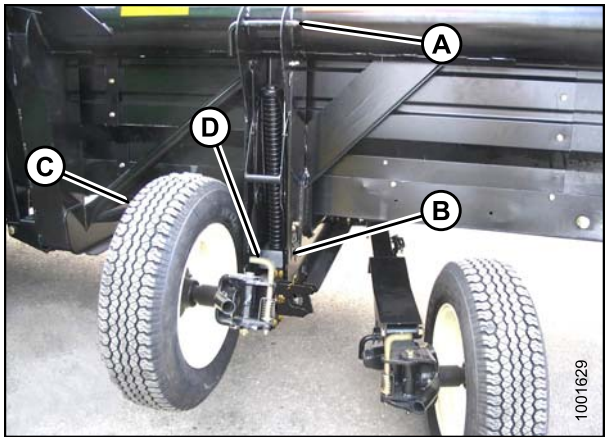


Figure 4.90: Positioning Wheel

8. Left wheel is now in Transport position as shown.

Figure 4.91: Transport Position

9. Pull pin (A), and swivel wheel (B) clockwise 90 degrees.

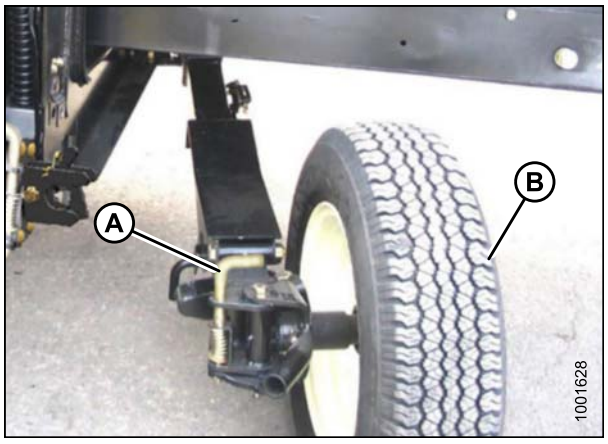


Figure 4.92: Right Rear Wheel

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

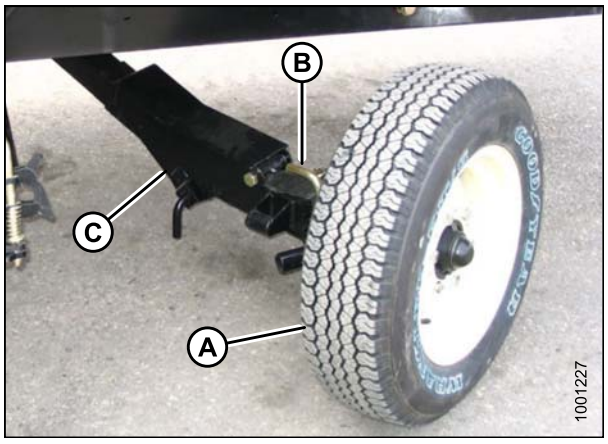


Figure 4.93: Right Rear Wheel

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

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

12. Swing brace (C) into position as shown and insert brace into slot (D) behind cutterbar. Position brace so that pin (E) engages hole in bracket (F). Right hand wheel is now in Transport position.
13. Disengage the header cylinder lift stops.
14. Detach the header from the windrower. Refer to your windrower operator's manual for procedure.
15. Detach the header's hydraulic and electrical connections from the windrower. Refer to *5 Header Attachment/Detachment, page 107*.
16. Start windrower and lower header to the ground.

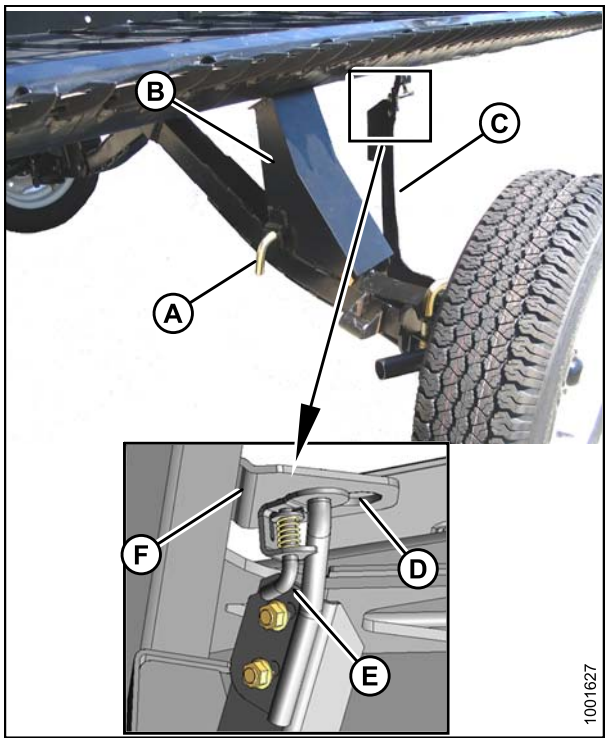


Figure 4.94: Positioning Right Rear Wheel

Attaching Tow-Bar

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

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

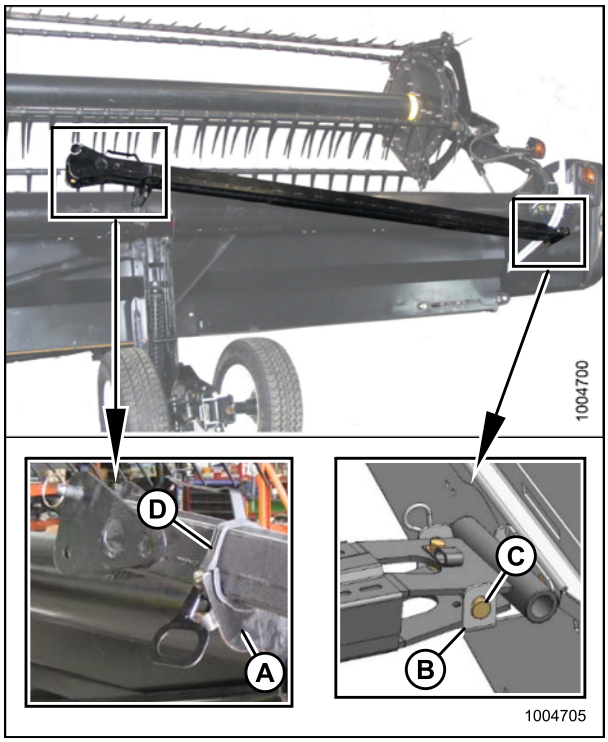


Figure 4.95: Removing Tow-Bar

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

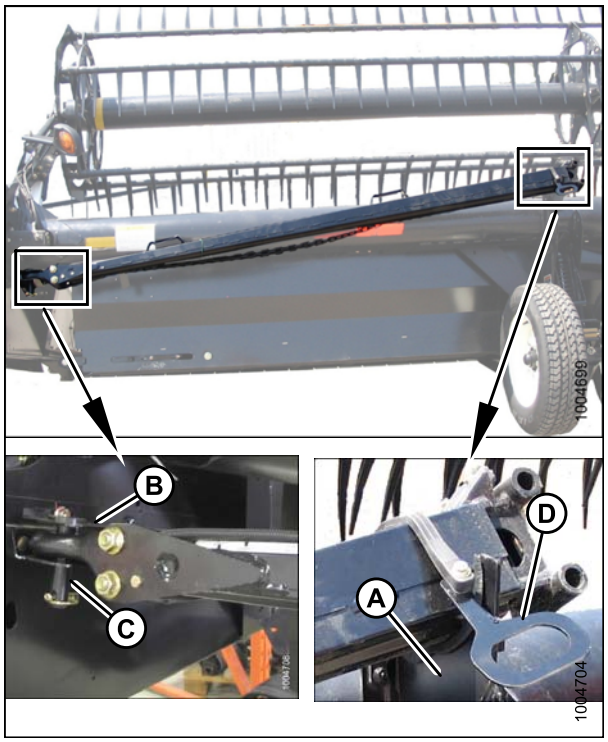


Figure 4.96: Removing Tow-Bar

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

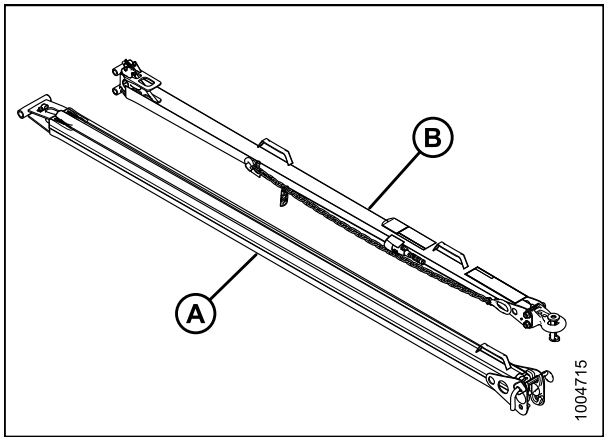


Figure 4.97: Assembling Tow-Bar

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

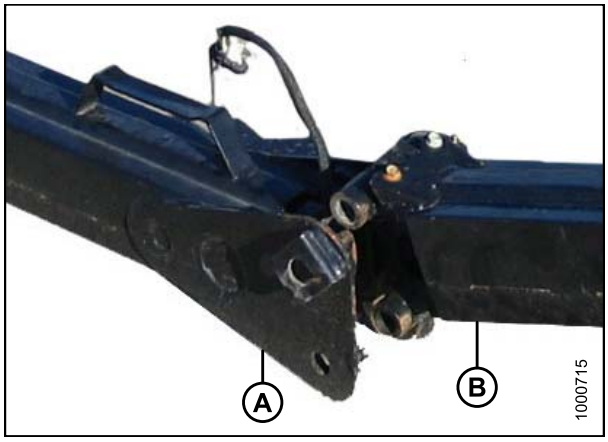


Figure 4.98: Assembling Tow-Bar

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

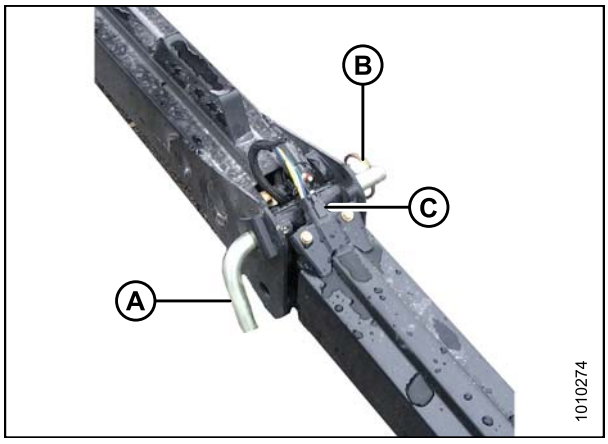


Figure 4.99: Assembling Tow-Bar

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

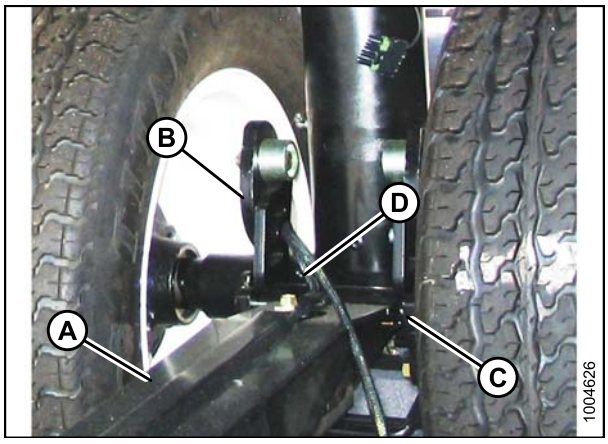


Figure 4.100: Attaching Tow-Bar

15. Make the electrical connection (A) at the front wheel.

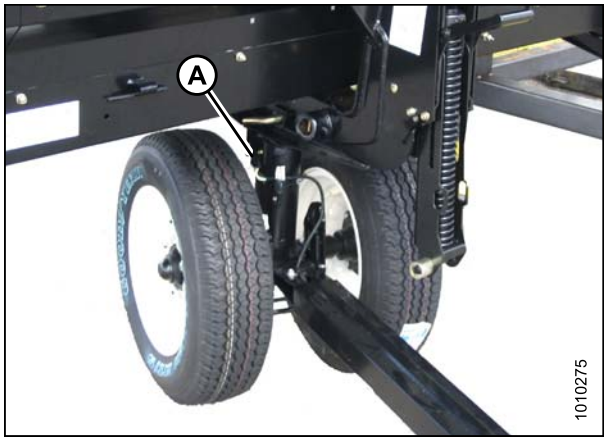


Figure 4.101: Connecting Harness

4.16 Storage

The following should be done at the end of each operating season:

CAUTION

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

CAUTION

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

1. Clean header thoroughly.
2. Store machine in a dry, protected place if possible. If stored outside, always cover with a waterproof canvas or other protective material.

NOTE:
If machine is stored outside, remove drapers and store in a dark, dry place. If drapers are not removed, store header with cutterbar lowered so water/snow will not accumulate on drapers. This accumulation of weight puts excessive stress on drapers and header.

3. Lower header onto blocks to keep cutterbar off the ground.
4. Lower reel completely. If stored outside, tie reel to frame to prevent rotation caused by wind.
5. Re-paint all worn or chipped painted surfaces to prevent rust.
6. Loosen drive belts.
7. Lubricate header thoroughly, leaving excess grease on fittings to keep moisture out of bearings. Apply grease to exposed threads, cylinder rods, and sliding surfaces of components. Oil knife components to prevent rust.
8. Check for worn or broken components, and repair or order replacements from your MacDon Dealer. Attention to these items right away will save time and effort at beginning of next season.
9. Replace or tighten any missing or loose hardware.

5 Header Attachment/Detachment

This chapter includes instructions on setting up, attaching, and detaching the header.

5.1 Attaching Header to Windrower

Refer to your windrower operator's manual for procedures to mechanically attach the header to the self-propelled 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 tractor. The reel drive and control hoses are located on the right cab-forward side.

To attach the header to a windrower, follow these steps:

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

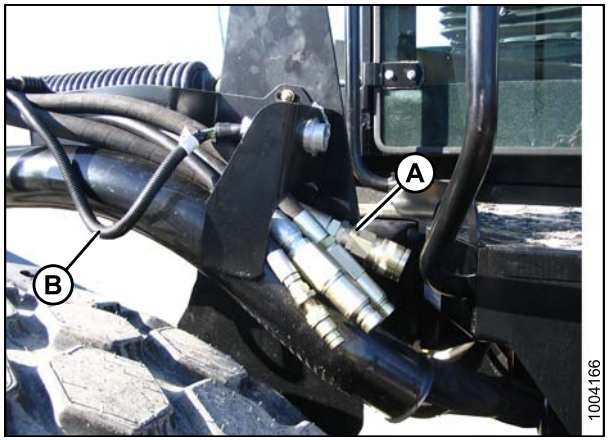


Figure 5.1: Header Drive Hoses

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

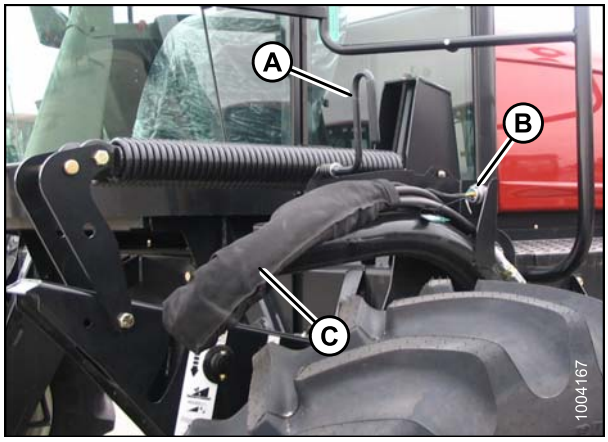


Figure 5.2: Header Drive Hoses

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

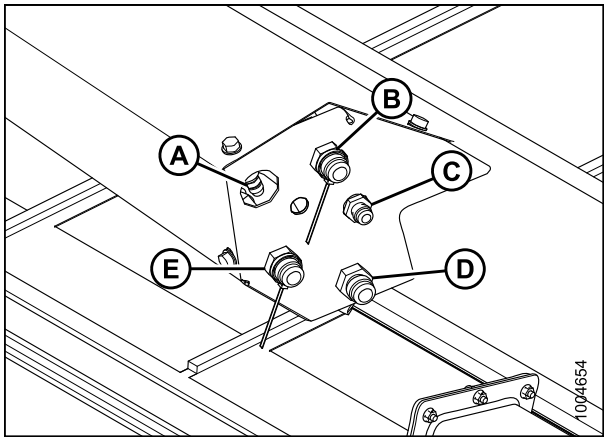


Figure 5.3: Header Receptacles

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

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

Figure 5.4: Hose Storage

10. Before connecting reel hydraulics, check connectors and clean if required.

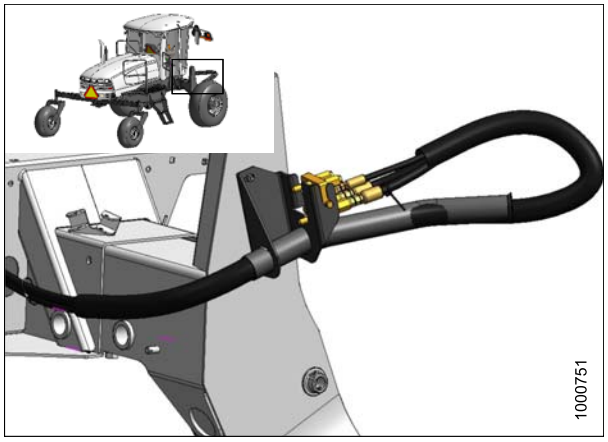


Figure 5.5: Reel Hose Storage

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

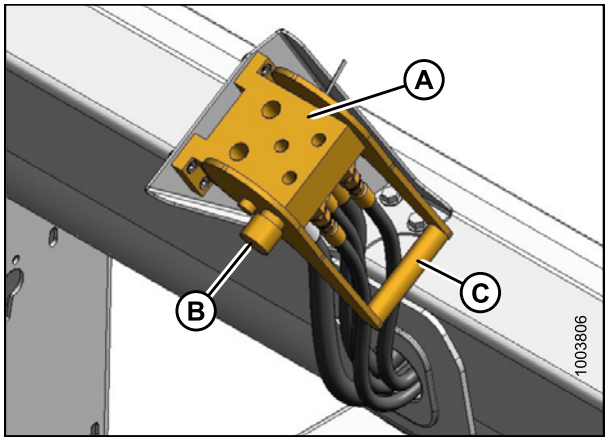


Figure 5.6: Reel Hydraulics Receptacle

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

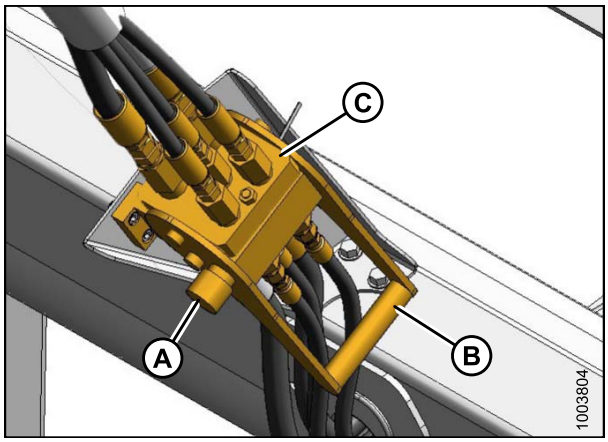


Figure 5.7: Reel Hose Connection

5.2 Detaching Header from Windrower

To detach the header from the windrower, follow these steps:

1. Fully lower the reel.
2. To disconnect the reel hydraulics, push in lock button (A) and pull handle (B) to disengage multi-coupler (C) from header receptacle.
3. Route hose bundle back onto windrower and store multi-coupler (C) on hose support.

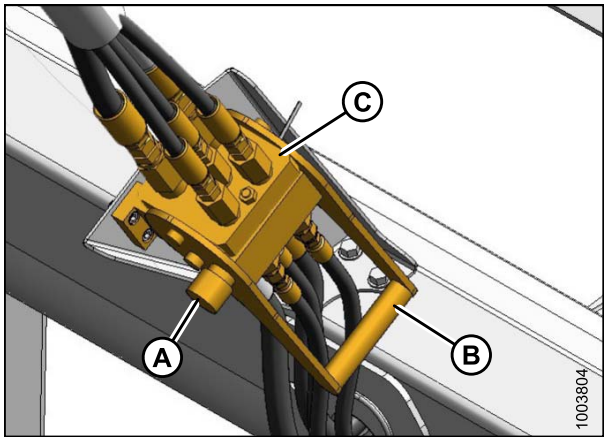


Figure 5.8: Reel Hydraulics

4. Close cover on header receptacle (A).

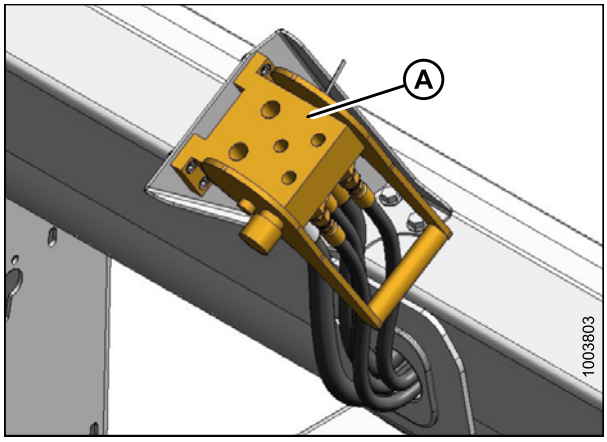


Figure 5.9: Close Cover

5. To disconnect header drive hydraulics, disengage and rotate lever (A) counterclockwise to fully up position.
6. Disconnect electrical connector from header.

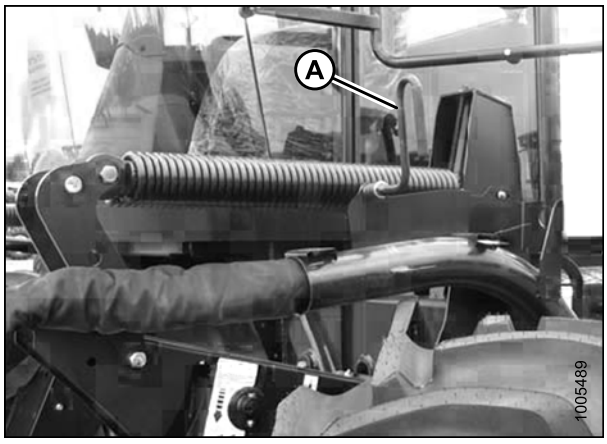


Figure 5.10: Header Drive Hydraulics

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

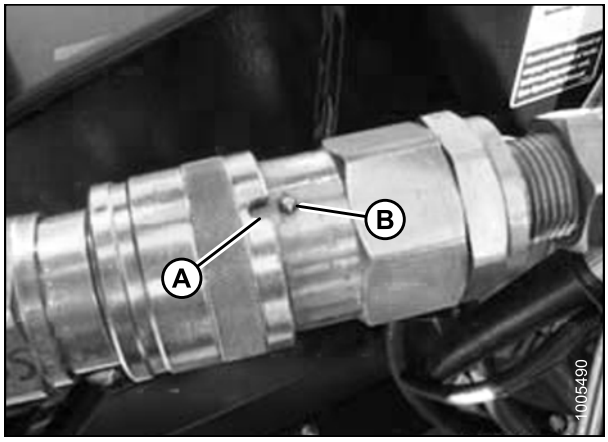


Figure 5.11: Quick Disconnect

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

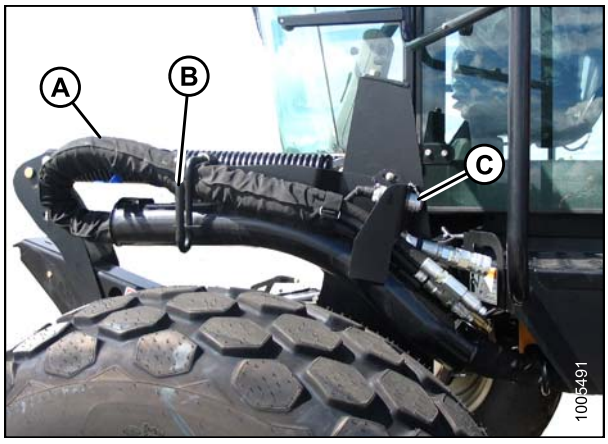


Figure 5.12: Hose Storage

6 Maintenance and Servicing

6.1 Preparation for Servicing

The following instructions are provided to assist Operator in the use of header.

Detailed maintenance, service, and parts information are contained in the technical manual and parts catalog which are available from your MacDon Dealer.

CAUTION

To avoid personal injury, before servicing header or opening drive covers:

1. **Fully lower the header. If necessary to service in the raised position, always engage safety props.**
2. **Stop engine and remove key.**
3. **Engage park brake.**
4. **Wait for all moving parts to stop.**

6.2 Maintenance Specifications

6.2.1 Conversion Chart

Quantity	Inch-Pound Units		Factor	SI Units (Metric)	
	Unit Name	Abbreviation		Unit Name	Abbreviation
Area	Acres	acres	x 0.4047 =	Hectares	ha
Flow	US Gallons per Minute	gpm	x 3.7854 =	Liters per Minute	L/min
Force	Pounds Force	lbf	x 4.4482 =	Newtons	N
Length	Inch	in.	x 25.4 =	Millimeters	mm
	Foot	ft.	x 0.305 =	Meters	m
Power	Horsepower	hp	x 0.7457 =	Kilowatts	kW
Pressure	Pounds per Square Inch	psi	x 6.8948 =	Kilopascals	kPa
			x .00689 =	Megapascals	MPa
			÷ 14.5038 =	Bar (Non-SI)	bar
Torque	Pound Feet or Foot Pounds	ft·lbf	x 1.3558 =	Newton Meters	N·m
	Pound Inches or Inch Pounds	in·lbf	x 0.1129 =	Newton Meters	N·m
Temperature	Degrees Fahrenheit	˚F	(˚F-32) x 0.56 =	Celsius	˚C
Velocity	Feet per Minute	ft/min	x 0.3048 =	Meters per Minute	m/min
	Feet per Second	ft/s	x 0.3048 =	Meters per Second	m/s
	Miles per Hour	mph	x 1.6063 =	Kilometres per Hour	km/h
Volume	US Gallons	US gal	x 3.7854 =	Liters	L
	Ounces	oz.	x 29.5735 =	Milliliters	ml
	Cubic Inches	$in.^3$	x 16.3871 =	Cubic Centimetres	cm^3 or cc
Weight	Pounds	lbs	x 0.4536 =	Kilograms	kg

6.2.2 Recommended Fluids and Lubricants

Your machine can operate at top efficiency only if clean lubricants are used.

- Use clean containers to handle all lubricants.
- Store 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	2.3 quarts (2.2 liters)
			Main Drive Gearbox	5 pints (2.5 liters)

6.2.3 Torque Specifications

The following tables give correct torque values for various bolts, cap screws, and hydraulic fittings.

- Tighten all bolts to the torques specified in chart (unless otherwise noted throughout this manual).
- Replace hardware with the same strength and grade bolt.
- Check tightness of bolts periodically, using the tables below as a guide.
- Torque categories for bolts and cap screws are identified by their head markings.

SAE Bolt Torque Specifications

Torque values shown in this table are valid for non-greased, or non-oiled threads and heads. Therefore, do **NOT** grease or oil bolts or cap screws unless otherwise specified in this manual.

Table 6.1 SAE Grade 5 Bolt and Grade 5 Free Spinning Nut

Nominal Size (A)	Torque (ft·lbf) (*in·lbf)		Torque (N·m)	
	Min.	Max.	Min.	Max.
1/4-20	*106	*117	11.9	13.2
5/16-18	*218	*241	24.6	27.1
3/8-16	32	36	44	48
7/16-14	52	57	70	77
1/2-13	79	87	106	118
9/16-12	114	126	153	170
5/8-11	157	173	212	234
3/4-10	281	311	380	420
7/8-9	449	496	606	669
1-8	611	676	825	912

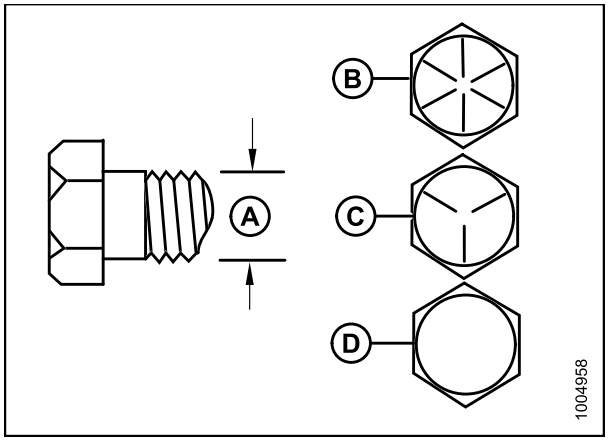


Figure 6.1: Bolt Grades

A - Nominal Size
B - SAE-8
C - SAE-5
D - SAE-2

Table 6.2 SAE Grade 5 Bolt and Grade 5 Distorted Thread Nut

Nominal Size (A)	Torque (ft·lbf) (*in·lbf)		Torque (N·m)	
	Min.	Max.	Min.	Max.
1/4-20	*72	*80	8.1	9
5/16-18	*149	*164	16.7	18.5
3/8-16	22	24	30	33
7/16-14	35	39	48	53
1/2-13	54	59	73	80
9/16-12	77	86	105	116
5/8-11	107	118	144	160
3/4-10	192	212	259	286
7/8-9	306	338	413	456
1-8	459	507	619	684

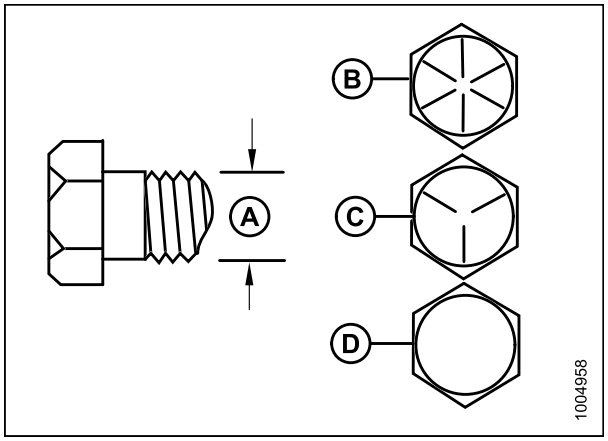


Figure 6.2: Bolt Grades

A - Nominal Size **B - SAE-8**
C - SAE-5 **D - SAE-2**

Table 6.3 SAE Grade 8 Bolt and Grade 8 Distorted Thread Nut

Nominal Size (A)	Torque (ft·lbf) (*in·lbf)		Torque (N·m)	
	Min.	Max.	Min.	Max.
1/4-20	*150	*165	16.8	18.6
5/16-18	18	19	24	26
3/8-16	31	34	42	46
7/16-14	50	55	67	74
1/2-13	76	84	102	113
9/16-12	109	121	148	163
5/8-11	151	167	204	225
3/4-10	268	296	362	400
7/8-9	432	477	583	644
1-8	647	716	874	966

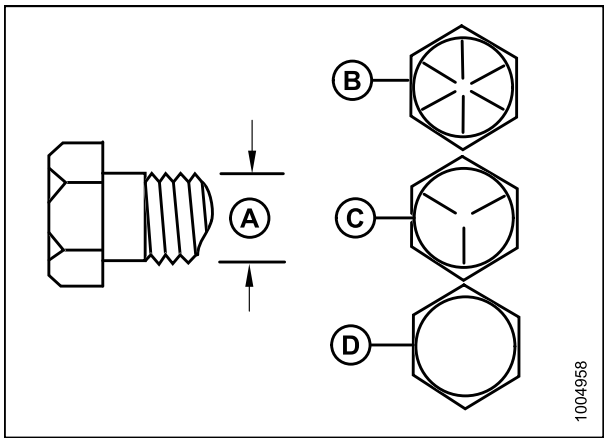


Figure 6.3: Bolt Grades

A - Nominal Size **B - SAE-8**
C - SAE-5 **D - SAE-2**

Table 6.4 SAE Grade 8 Bolt and Grade 8 Free Spinning Nut

Nominal Size (A)	Torque (ft·lbf) (*in·lbf)		Torque (N·m)	
	Min.	Max.	Min.	Max.
1/4-20	*150	*165	16.8	18.6
5/16-18	26	28	35	38
3/8-16	46	50	61	68
7/16-14	73	81	98	109
1/2-13	111	123	150	166
9/16-12	160	177	217	239
5/8-11	221	345	299	330
3/4-10	393	435	531	587
7/8-9	633	700	855	945
1-8	863	954	1165	1288

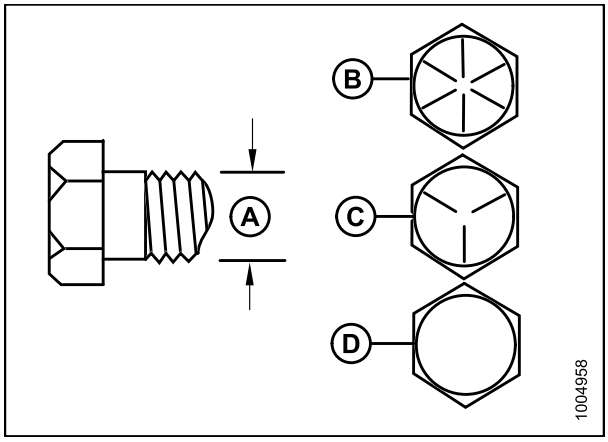


Figure 6.4: Bolt Grades

A - Nominal Size **B - SAE-8**
C - SAE-5 **D - SAE-2**

Metric Bolt Specifications

Table 6.5 Metric Class 8.8 Bolts and Class 9 Free Spinning Nut

Nominal Size (A)	Torque (ft·lbf) (*in·lbf)		Torque (N·m)	
	Min.	Max.	Min.	Max.
3-0.5	*13	*14	1.4	1.6
3.5-0.6	*20	*22	2.2	2.5
4-0.7	*29	*32	3.3	3.7
5-0.8	*59	*66	6.7	7.4
6-1.0	*101	*112	11.4	12.6
8-1.25	20	23	28	30
10-1.5	40	45	55	60
12-1.75	70	78	95	105
14-2.0	113	124	152	168
16-2.0	175	193	236	261
20-2.5	341	377	460	509
24-3.0	589	651	796	879

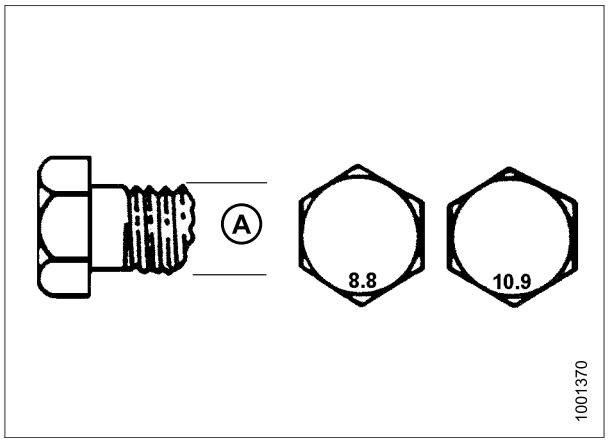


Figure 6.5: Bolt Grades

Table 6.6 Metric Class 8.8 Bolts and Class 9 Distorted Thread Nut

Nominal Size (A)	Torque (ft·lbf) (*in·lbf)		Torque (N·m)	
	Min.	Max.	Min.	Max.
3-0.5	*9	*10	1	1.1
3.5-0.6	*14	*15	1.5	1.7
4-0.7	*20	*22	2.3	2.5
5-0.8	*40	*45	4.5	5
6-1.0	*69	*76	7.7	8.6
8-1.25	*167	*185	18.8	20.8
10-1.5	28	30	37	41
12-1.75	48	53	65	72
14-2.0	77	85	104	115
16-2.0	119	132	161	178
20-2.5	233	257	314	347
24-3.0	402	444	543	600

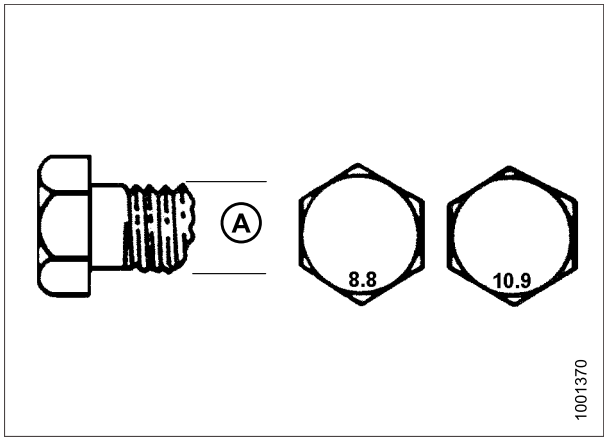


Figure 6.6: Bolt Grades

Table 6.7 Metric Class 10.9 Bolts and Class 10 Free Spinning Nut

Nominal Size (A)	Torque (ft·lbf) (*in·lbf)		Torque (N·m)	
	Min.	Max.	Min.	Max.
3-0.5	*18	*19	1.8	2
3.5-0.6	*27	*30	2.8	3.1
4-0.7	*41	*45	4.2	4.6
5-0.8	*82	*91	8.4	9.3
6-1.0	*140	*154	14.3	15.8
8-1.25	28	31	38	42
10-1.5	56	62	75	83
12-1.75	97	108	132	145
14-2.0	156	172	210	232
16-2.0	242	267	326	360
20-2.5	472	521	637	704
24-3.0	815	901	1101	1217

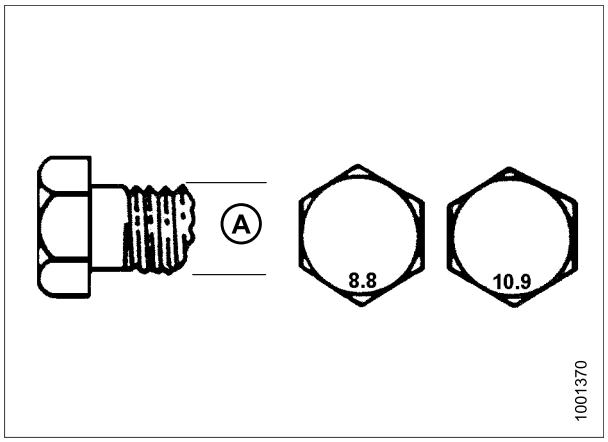


Figure 6.7: Bolt Grades

Table 6.8 Metric Class 10.9 Bolts and Class 10 Distorted Thread Nut

Nominal Size (A)	Torque (ft·lbf) (*in·lbf)		Torque (N·m)	
	Min.	Max.	Min.	Max.
3-0.5	*12	*13	1.3	1.5
3.5-0.6	*19	*21	2.1	2.3
4-0.7	*28	*31	3.1	3.4
5-0.8	*56	*62	6.3	7
6-1.0	*95	*105	10.7	11.8
8-1.25	19	21	26	29
10-1.5	38	42	51	57
12-1.75	66	73	90	99
14-2.0	106	117	143	158
16-2.0	165	182	222	246
20-2.5	322	356	434	480
24-3.0	556	614	750	829

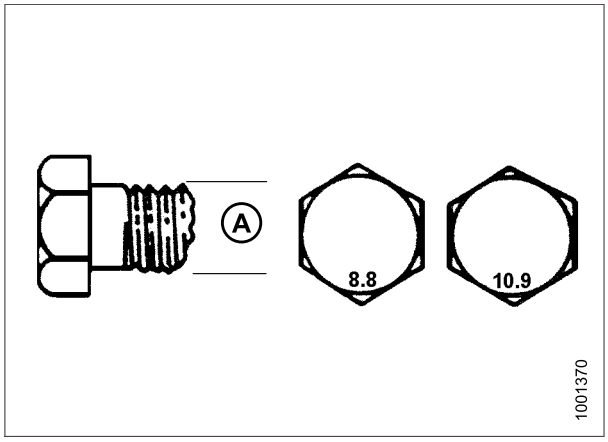


Figure 6.8: Bolt Grades

Metric Bolt Specifications Bolting into Cast Aluminum

Table 6.9 Metric Bolt Bolting into Cast Aluminum

Nominal Size (A)	Bolt Torque			
	8.8 (Cast Aluminum)		10.9 (Cast Aluminum)	
	ft·lbf	N·m	ft·lbf	N·m
M3	–	–	1	–
M4	–	–	2.6	4
M5	–	–	5.5	8
M6	6	9	9	12
M8	14	20	20	28
M10	28	40	40	55
M12	52	70	73	100
M14	–	–	–	–
M16	–	–	–	–

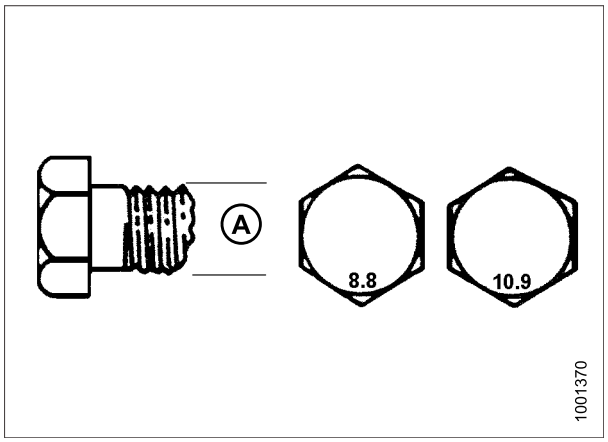


Figure 6.9: Bolt Grades

Flare-Type Hydraulic Fittings

1. Check flare (A) and flare seat (B) for defects that might cause leakage.
2. Align tube (C) with fitting (D), and thread nut (E) onto fitting without lubrication until contact has been made between the flared surfaces.
3. Torque the fitting nut (E) to the specified number of flats from finger tight (FFFT) or to a given torque value shown in Table *6.10 Flare-Type Hydraulic Tube Fittings, page 121*.
4. To prevent the fitting (D) from rotating, use two wrenches. Place one wrench on the fitting body (D), and tighten the nut (E) with the other wrench to the torque shown.
5. Assess the final condition of the connection.

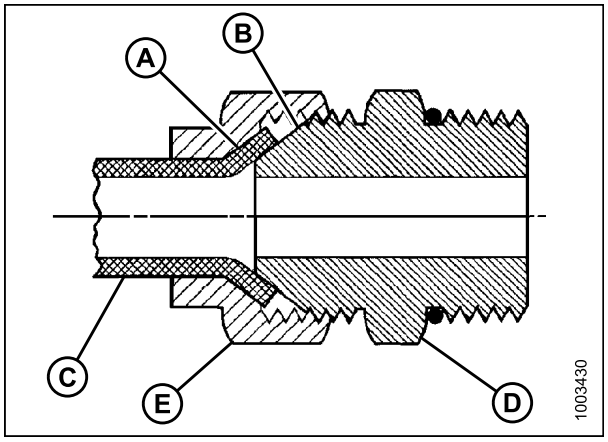


Figure 6.10: Hydraulic Fitting

Table 6.10 Flare-Type Hydraulic Tube Fittings

SAE No.	Tube Size O.D. (in.)	Thread Size (in.)	Nut Size across Flats (in.)	Torque Value[10]		Flats from Finger Tight (FFFT)	
				ft·lbf	N·m	Flats	Turns
3	3/16	3/8	7/16	6	8	1	1/6
4	1/4	7/16	9/16	9	12	1	1/6
5	5/16	1/2	5/8	12	16	1	1/6
6	3/8	9/16	11/16	18	24	1	1/6
8	1/2	3/4	7/8	34	46	1	1/6
10	5/8	7/8	1	46	62	1	1/6
12	3/4	1-1/16	1-1/4	75	102	3/4	1/8
14	7/8	1-3/8	1-3/8	90	122	3/4	1/8
16	1	1-5/16	1-1/2	105	142	3/4	1/8

10. Torque values shown are based on lubricated connections as in reassembly.

O-Ring Boss (ORB) Hydraulic Fittings (Adjustable)

1. Inspect O-ring (A) and seat (B) for dirt or obvious defects.
2. Back off the lock nut (C) as far as possible. Ensure that washer (D) is not loose and is pushed toward the lock nut (C) as far as possible.
3. Check that O-ring (A) is **NOT** on the threads, and adjust if necessary.
4. Apply hydraulic system oil to the O-ring (A).

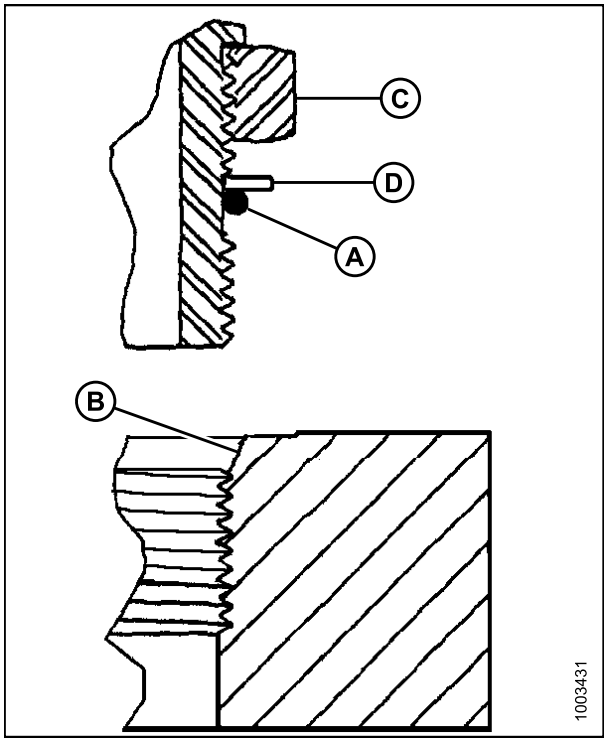


Figure 6.11: Hydraulic Fitting

5. Install fitting (B) into port until back up washer (D) and O-ring (A) contact the part face (E).
6. Position angle fittings by unscrewing no more than one turn.
7. Turn lock nut (C) down to washer (D) and tighten to torque shown. Use two wrenches, one on the fitting (B) and the other on the lock nut (C).
8. Check the final condition of the fitting.

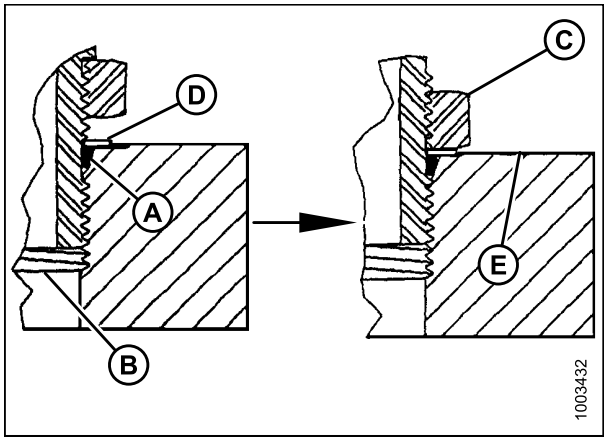


Figure 6.12: Hydraulic Fitting

Table 6.11 O-Ring Boss (ORB) Hydraulic Fittings (Adjustable)

SAE Dash Size	Thread Size (in.)	Torque Value[11]	
		ft·lbf (*in·lbf)	N·m
-3	3/8-24	*106–115	12–13
-4	7/16–20	14–15	19–21
-5	1/2–20	15–24	21–33
-6	9/16–18	19–21	26–29
-8	3/4–16	34–37	46–50
-10	7/8–14	55–60	75–82
-12	1-1/16-12	88–97	120–132
-14	1-3/8-12	113–124	153–168
-16	1-5/16-12	130–142	176–193
-20	1-5/8-12	163–179	221–243
-24	1-7/8-12	199–220	270–298

11. Torque values shown are based on lubricated connections as in reassembly.

O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable)

1. Inspect O-ring (A) and seat (B) for dirt or obvious defects.
2. Check that O-ring (A) is **NOT** on the threads, and adjust if necessary.
3. Apply hydraulic system oil to the O-ring.
4. Install fitting (C) into port until fitting is hand tight.
5. Torque fitting (C) according to the values in Table *6.12 O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable), page 124*.
6. Check the final condition of the fitting.

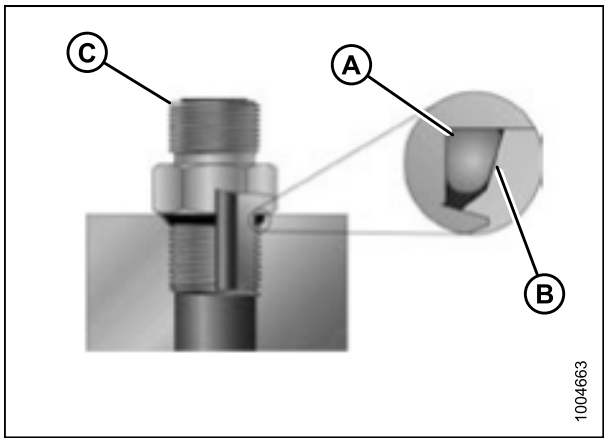


Figure 6.13: Hydraulic Fitting

Table 6.12 O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable)

SAE Dash Size	Thread Size (in.)	Torque Value[12]	
		ft·lbf (*in·lbf)	N·m
-3	3/8-24	*106–115	12–13
-4	7/16–20	14–15	19–21
-5	1/2–20	15–24	21–33
-6	9/16–18	19–21	26–29
-8	3/4–16	34–37	46–50
-10	7/8–14	55–60	75–82
-12	1-1/16-12	88–97	120–132
-14	1-3/8-12	113–124	153–168
-16	1-5/16-12	130–142	176–193
-20	1-5/8-12	163–179	221–243
-24	1-7/8-12	199–220	270–298

12. Torque values shown are based on lubricated connections as in reassembly.

O-Ring Face Seal (ORFS) Hydraulic Fittings

To tighten O-ring face seal (ORFS) hydraulic fittings, follow these steps:

1. Check components to ensure that the sealing surfaces and fitting threads are free of burrs, nicks, and scratches or any foreign material.

Figure 6.14: Hydraulic Fitting

2. Apply hydraulic system oil to the O-ring (B).
3. Align the tube or hose assembly so that the flat face of the sleeve (A) or (C) comes in full contact with O-ring (B).
4. Thread tube or hose nut (D) until hand-tight. The nut should turn freely until it is bottomed out.
5. Torque fittings according to the values in Table *6.13 O-Ring Face Seal (ORFS) Hydraulic Fittings, page 126*.

NOTE:
If applicable, hold the hex on the fitting body (E) to prevent rotation of fitting body and hose when tightening the fitting nut (D).

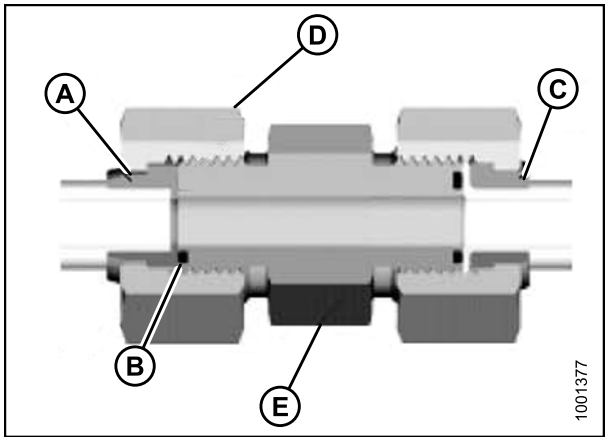


Figure 6.15: Hydraulic Fitting

6. Use three wrenches when assembling unions or two hoses together.
7. Check the final condition of the fitting.

Table 6.13 O-Ring Face Seal (ORFS) Hydraulic Fittings

SAE Dash Size	Thread Size (in.)	Torque Value[13]	
		ft·lbf (*in·lbf)	N·m
-3	Note[14]	–	–
-4	9/16–18	18–21	25–28
-5	Note[14]	–	–
-6	11/16-16	29–32	40–44
-8	13/16-16	41–45	55–61
-10	1–14	59–65	80–88
-12	1-3/16-12	85–94	115–127
-14	Note[14]	–	–
-16	1-7/16-12	111–122	150–165
-20	1-11/16-12	151–167	205–226
-24	2–12	232–256	315–347
-32	2-1/2-12	376–414	510–561

6.2.4 Installing a Roller Chain

To install a roller chain, follow these steps.

CAUTION

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

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.

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

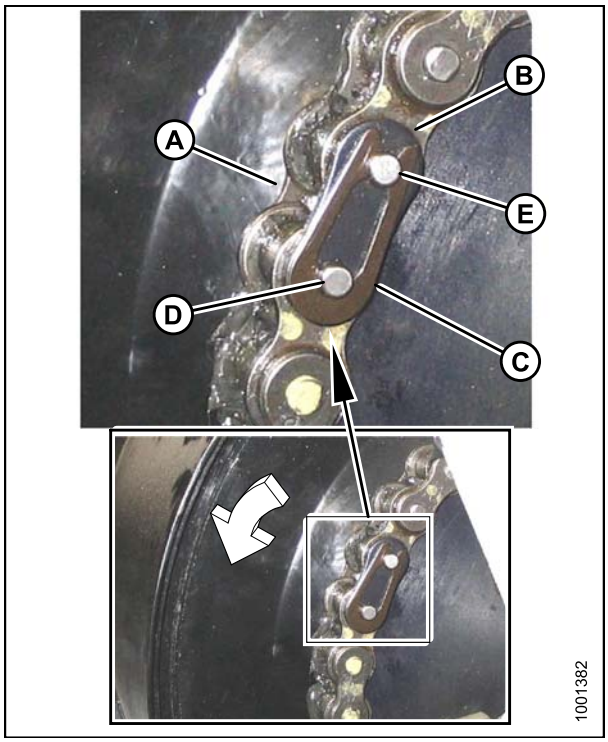


Figure 6.16: Arrow Shows Direction of Rotation

A - Pin Connector **B - Connector**
C - Spring Clip **D - Front Pin**
E - Aft Pin

6.2.5 Installing a Sealed Bearing

To install a sealed bearing, follow these steps.

1. Clean shaft and coat with rust preventative.
2. Install flangette (A), bearing (B), second flangette (C), and lock collar (D).

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

3. Install (but do **NOT** tighten) flangette bolts (E).
4. When the shaft is correctly located, lock the lock collar with a punch. The collar should be locked in the same direction the shaft rotates. Tighten the setscrew in the collar.
5. Tighten flangette bolts.
6. Loosen flangette bolts on mating bearing one turn and retighten. This will allow the bearing to line up.

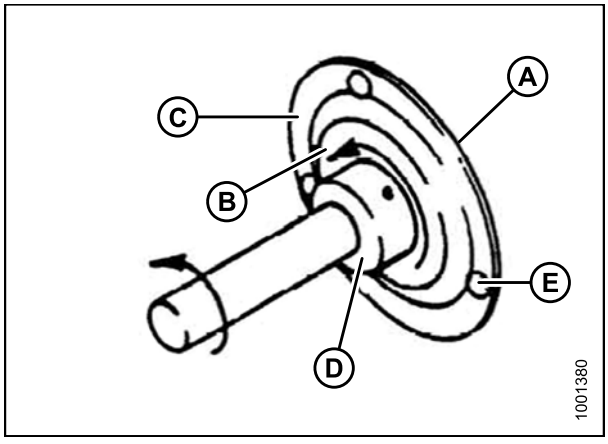


Figure 6.17: Sealed Bearing

A - Flangette **B - Bearing** **C - Flangette**
D - Lock Collar **E - Flangette Bolt**

6.3 Maintenance Requirements

The following maintenance schedule is a listing of periodic maintenance procedures, organized by service intervals. Regular maintenance is the best insurance against early wear and untimely breakdowns. Following this schedule will increase machine life.

For detailed instructions, refer to the specific headings in this section. Use the fluids and lubricants specified, Refer to *6.2.2 Recommended Fluids and Lubricants, page 115*.

Log hours of operation and use the Maintenance Record on the next page to keep a record of scheduled maintenance. Make copies of the Maintenance Record page as required.

Service Intervals: The recommended service intervals are in hours of operation. Where a service interval is given in more than one time frame, e.g., “100 hours or Annually”, service the machine at whichever interval is reached first.

NOTE:
Recommended intervals are for average conditions. Service the machine more often if operated under adverse conditions (severe dust, extra heavy loads, etc.).

CAUTION

Carefully follow safety messages. Refer to *6.1 Preparation for Servicing, page 113* and Maintenance Safety (*1 Safety, page 1*).

6.3.1 Maintenance Schedule/Record

Copy this page to continue record.

Maintenance Record	Action:	✓ - Check							♦ - Lubricate							▲ - Change						
Hour Meter Reading																						
Date																						
Serviced By																						
FIRST USE, Refer to *6.3.2 Break-In Inspection, page 130*																						
END OF SEASON, Refer to *6.3.4 End of Season Service, page 131*																						
10 HOURS OR DAILY[15]																						
✓	Hydraulic Hoses and Lines[16]																					
✓	Knife Sections, Guards, and Hold-Downs[16]																					
✓	Tire Pressure[16]																					
♦	Knife (except in sandy conditions)[16]																					
25 HOURS																						
♦	Knifehead(s)[16]																					
50 HOURS																						
✹	Draper Roller Bearings																					
▲	Knife Drive Box Oil - First 50 Hours Only																					
100 HOURS OR ANNUALLY[15]																						
✓	Draper Seal																					
✓	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																					
♦	Reel Drive Chain																					

15. Whichever occurs first.
16. A record of daily maintenance is not normally required but is at the Owner's/Operator's discretion.

Maintenance Record	Action:	✓ - Check							♦ - Lubricate							▲ - Change						
♦	Upper Cross Auger RH Bearing																					
250 HOURS OR ANNUALLY[15]																						
✓	Draper Seal																					
♦	Upper Cross Auger Center Support and U-Joint																					
♦	Reel Drive U-joint																					
♦	Transport Axle Pivot Bushings																					
500 HOURS OR ANNUALLY[15]																						
✓	Draper Seal																					
♦	Reel Shaft Bearings																					
♦	Stabilizer/Slow Speed Transport Wheel Bearings																					
1000 HOURS OR 3 YEARS[15]																						
▲	Knife Drive Box Lubricant																					

6.3.2 Break-In Inspection

A break-in inspection includes checking belts, fluids, and a general machine inspection for loose hardware or other areas of concern. The break-in inspection ensures that all components can operate for an extended period without requiring service or replacement.

Timing	Item	Refer To
At 5 hours	Check for loose hardware. Tighten to required torque.	*6.2.3 Torque Specifications, page 115*
	Check knife drive belts tension. Periodically check for first 50 hours.	*Tensioning Timed Knife Drive Belts, page 168* *Tensioning Non-Timed Knife Drive Belts, page 163*
At 10 hours	Check knife drive box mounting bolts.	*Mounting Bolts, page 153*
At 50 hours	Change knife drive box lubricant.	*Changing Oil in Knife Drive Box, page 161*

6.3.3 Preseason/Annual Service

Perform the following the beginning of each operating season

CAUTION

- **Review this manual to refresh your memory on safety and operating recommendations.**
- **Review all safety decals and other decals on the header and note hazard areas.**
- **Be sure all 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 tension on drive belts. Depending on your equipment, refer to *Tensioning Non-Timed Knife Drive Belts, page 163* or . *Tensioning Timed Knife Drive Belts, page 168*
2. Perform all annual maintenance. Refer to *6.3.1 Maintenance Schedule/Record, page 129*.

6.3.4 End of Season Service

Do the following at the end of each operating season.

CAUTION

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

CAUTION

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

1. Clean the header thoroughly.
2. Store the machine in a dry, protected place if possible. If stored outside, always cover with a waterproof canvas or other protective material.
3. If machine is stored outside, remove drapers and store in a dark, dry place.

NOTE:
If drapers are not removed, store header with cutterbar lowered so water/snow will not accumulate on drapers. This accumulation of weight puts excessive stress on drapers and header.

4. Lower header onto blocks to keep cutterbar off the ground.
5. Lower reel completely. If stored outside, tie reel to frame to prevent rotation caused by wind.
6. Repaint all worn or chipped painted surfaces to prevent rust.
7. Loosen drive belts.
8. Lubricate the header thoroughly, leaving excess grease on fittings to keep moisture out of bearings. Apply grease to exposed threads, cylinder rods, and sliding surfaces of components. Oil knife components to prevent rust.
9. Check for worn or broken components and repair or order replacement from your MacDon Dealer. Attention to these items right away will save time and effort at beginning of next season.
10. Replace or tighten any missing or loose hardware. Refer to *6.2 Maintenance Specifications, page 114*.

6.3.5 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. Relieve pressure before disconnecting hydraulic lines. Tighten all connections before applying pressure. Keep hands and body away from pin holes and nozzles which eject fluids under high 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.**
- **Use a piece of cardboard or paper to search for leaks.**

Figure 6.18: High Pressure Warning

IMPORTANT:
Keep hydraulic coupler tips and connectors clean. Dust, dirt, water, and foreign material are the major causes of hydraulic system damage. Do NOT attempt to service hydraulic system in the field. Precision fits require WHITE ROOM CARE during overhaul.

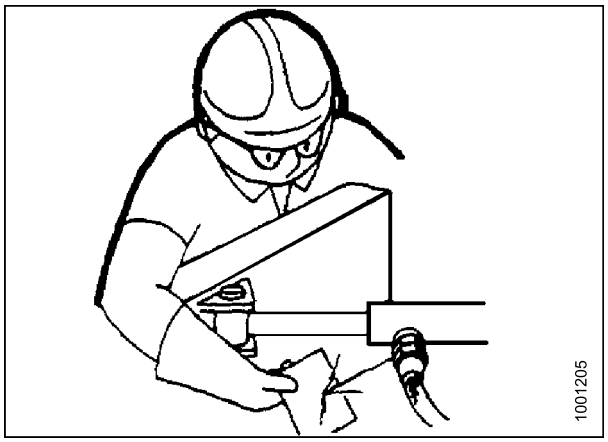


Figure 6.19: Checking Leak

6.3.6 Lubrication and Servicing

CAUTION

To avoid personal injury, before servicing header or opening drive covers, follow procedures in *6.1 Preparation for Servicing, page 113*.

Refer to *6.2.2 Recommended Fluids and Lubricants, page 115* for recommended lubricants.

Log hours of operation and use the Maintenance Record provided to keep a record of scheduled maintenance. Refer to *6.3.1 Maintenance Schedule/Record, page 129*.

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 that is required.

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.

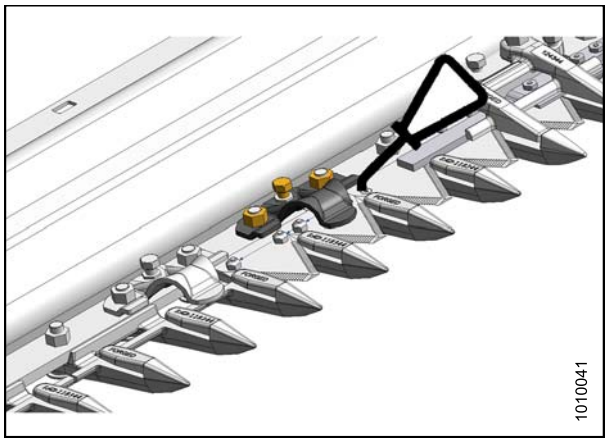


Figure 6.20: Every 10 Hours or Daily

Knifehead:

NOTE:
To prevent binding and/or excessive wear caused by knife pressing on guards, do **NOT** over grease the knifehead (A). Only, one to two pumps with a mechanical grease gun (do **NOT** use an electric grease gun) is required. If more than six to eight pumps of the grease gun are required to fill the cavity, replace the seal in the knifehead. Refer to *Removing Knifehead Bearing*.

NOTE:
Check for signs of excessive heating on first few guards after greasing. If required, relieve pressure by pressing check-ball in grease fitting.

Figure 6.21: Every 25 Hours
A - Knifehead (Single Knife (1 PLC) (Double Knife - 2 PLCS)

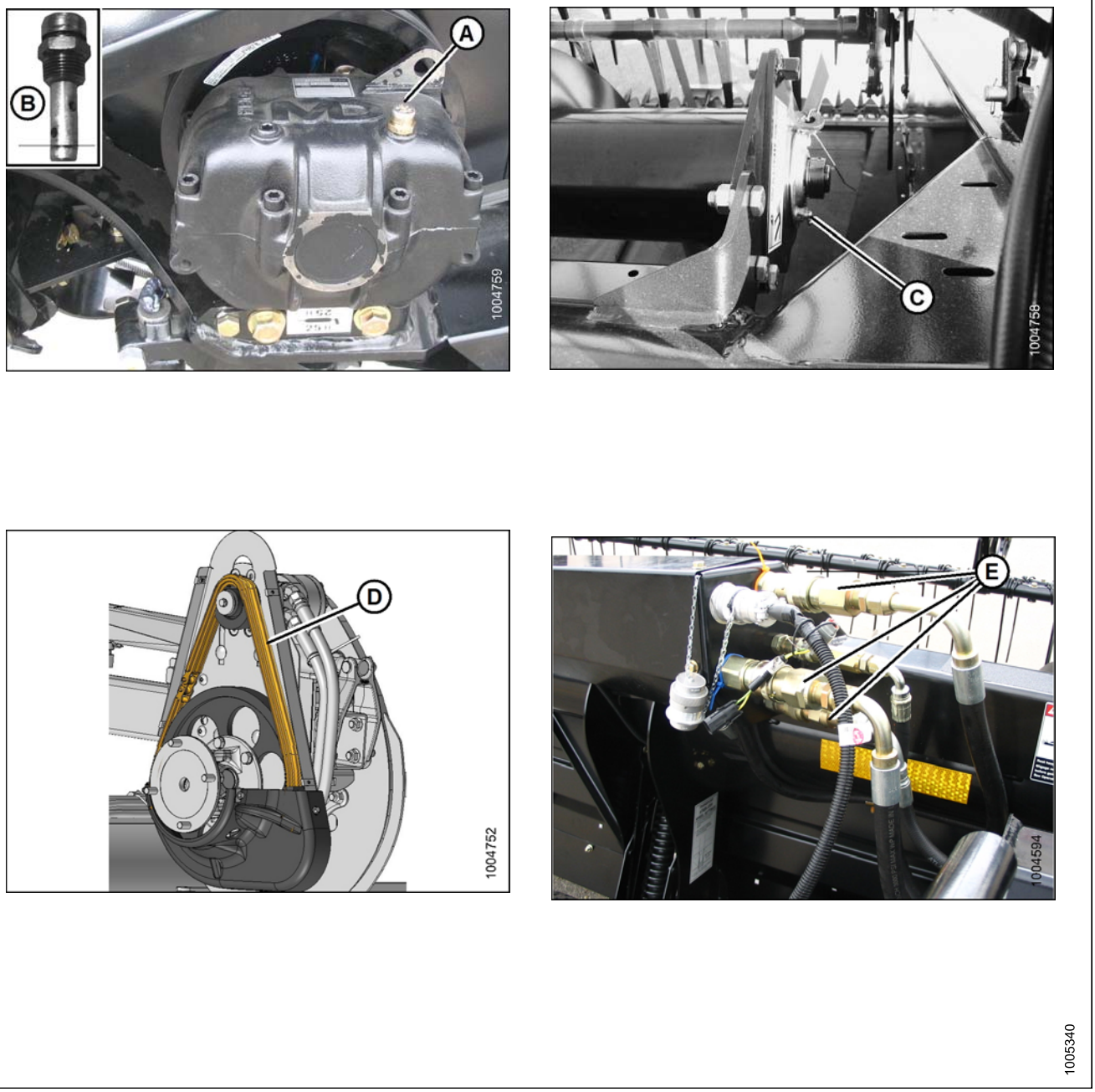


Figure 6.22: Every 100 Hours

A - Knife Drive Box (check oil level with top of knife drive box horizontal)
B - Dipstick (level between lower hole and end)
C - Upper Cross Auger Bearing (1 PLC)
D - Reel Drive Chain (1 PLC) (DR shown – SR similar)
E - Hydraulic Couplers (use WD40® or equivalent)

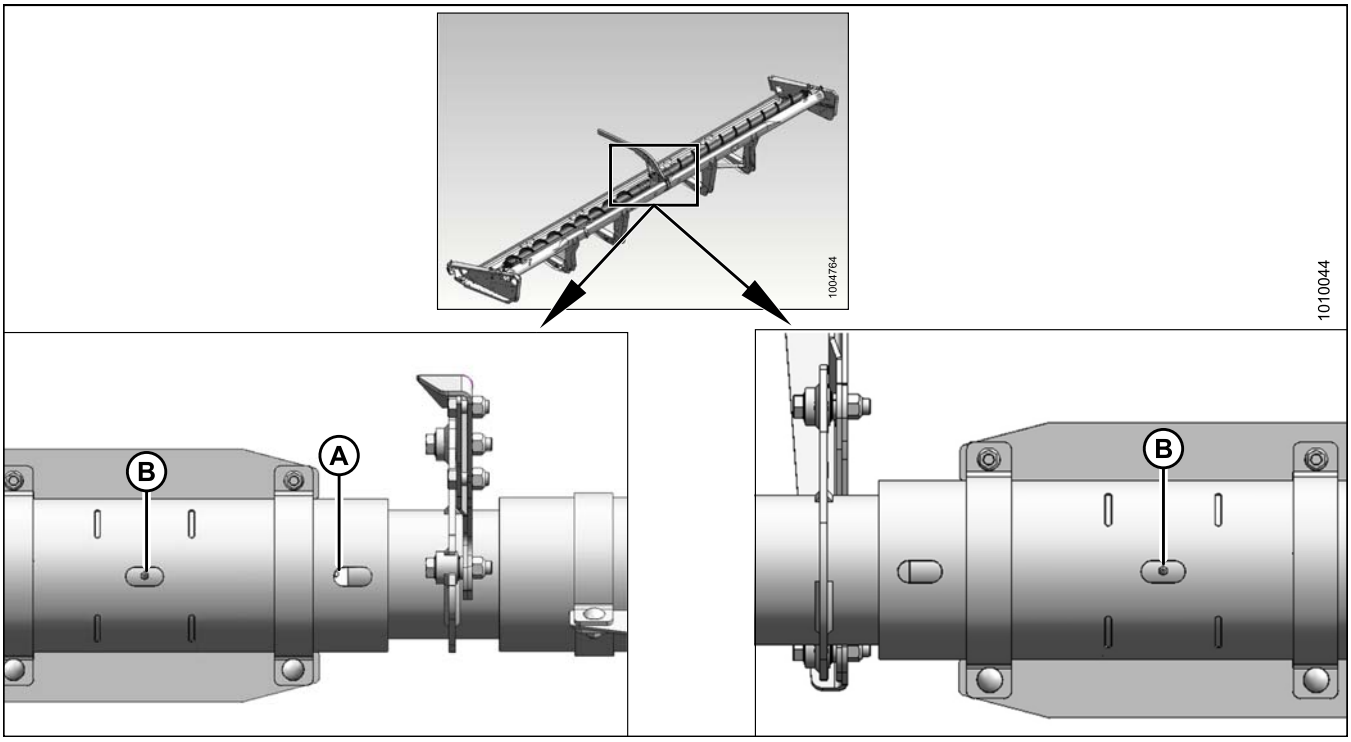


Figure 6.23: Every 250 Hours

A - Upper Cross Auger U-joint[17]

B - Upper Cross Auger Bearing (2 PLCS)[18]

17. U-joint has an extended lubrication cross and bearing kit. Stop greasing when greasing becomes difficult or if U-joint stops taking grease. Overgreasing will damage U-joint. six to eight pumps are sufficient at first grease (factory). Decrease grease interval as U-joint wears and requires more than six pumps.
18. Use High Temperature Extreme Pressure (EP2) Performance With 1.5–5.0% Molybdenum Disulphide (NLGI Grade 2) Lithium Base Grease

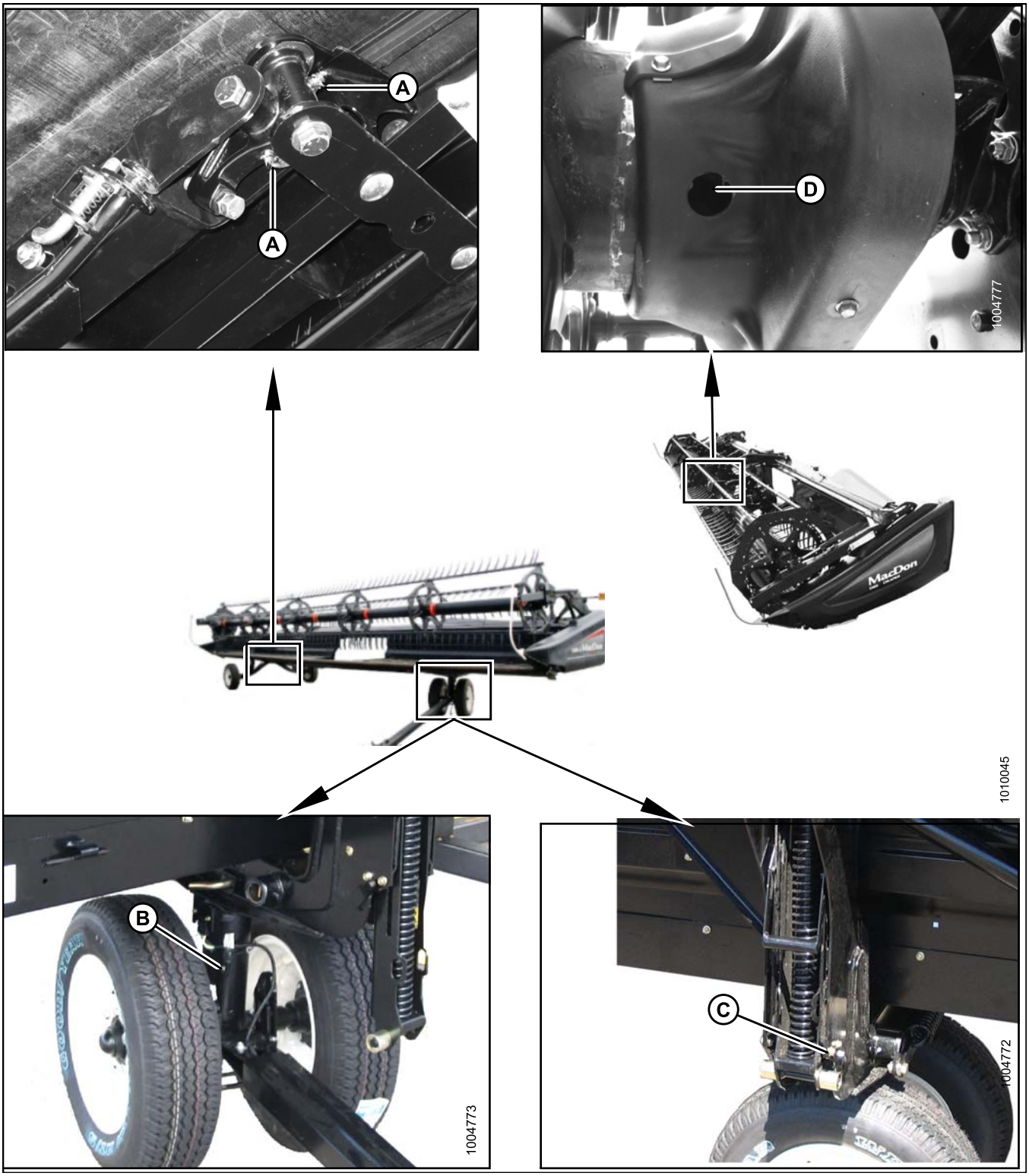


Figure 6.24: Every 250 Hours (Continued)

A - Rear Axle Pivots
B - Front Wheel Pivot (1 PLC)
C -Frame/Wheel Pivot (1 PLC) - Both Sides
D - Double Reel U-Joint (1 PLC)[19]

19. U-joint has an extended lubrication cross and bearing kit. Stop greasing when greasing becomes difficult or if U-joint stops taking grease. Overgreasing will damage U-joint. six to eight pumps are sufficient at first grease (factory). Decrease grease interval as U-joint wears and requires more than six pumps.

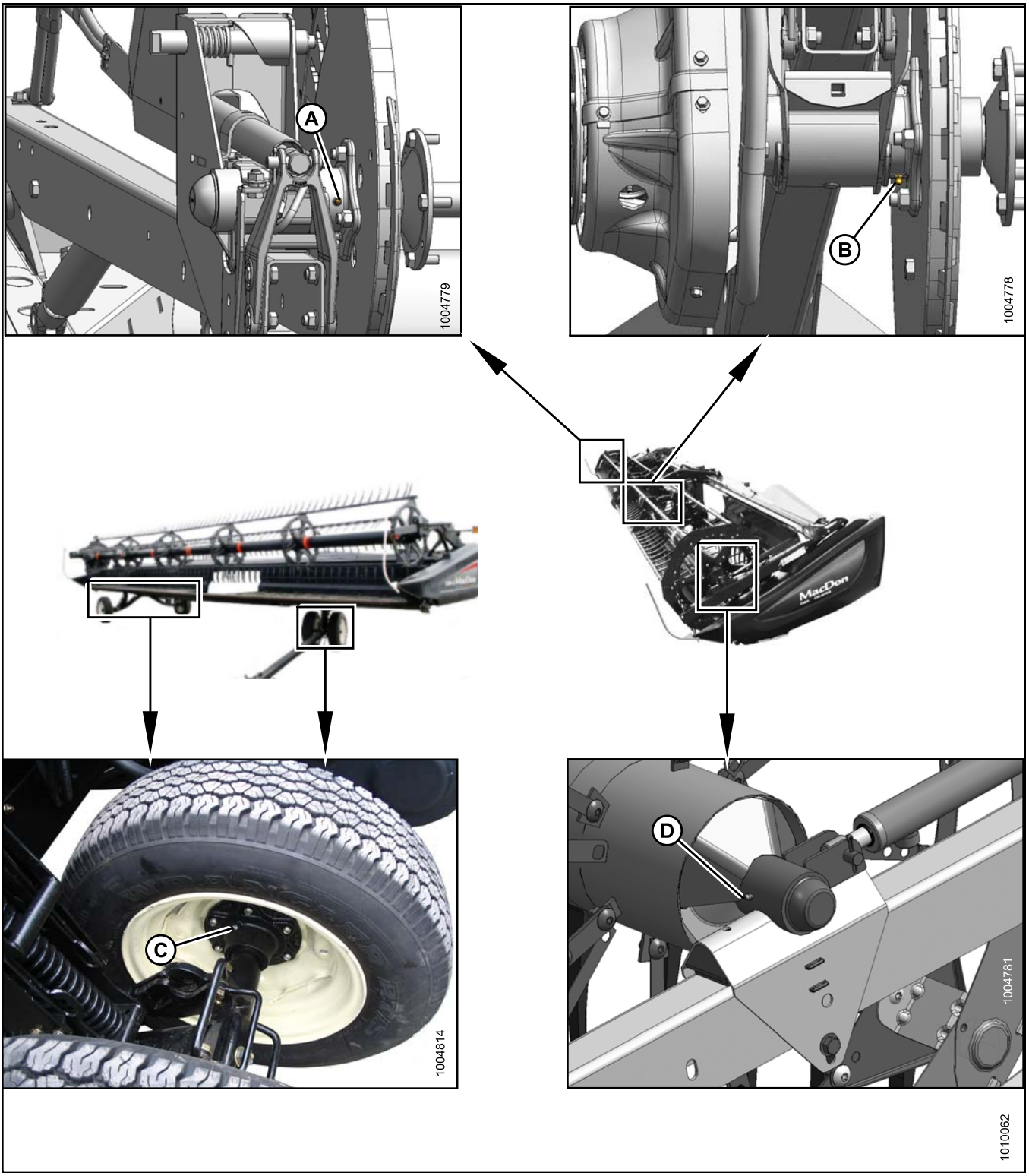


Figure 6.25: Every 500 Hours

A - Reel Right Bearing (1 PLC) **B - Reel Center Bearing (1 PLC)** **C - Wheel Bearings (4 PLCS)** **D - Reel Left Bearing (1 PLC)**

Greasing Procedure

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

Use the recommended lubricants specified in this manual. Refer to *6.2.2 Recommended Fluids and Lubricants, page 115*.

CAUTION

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

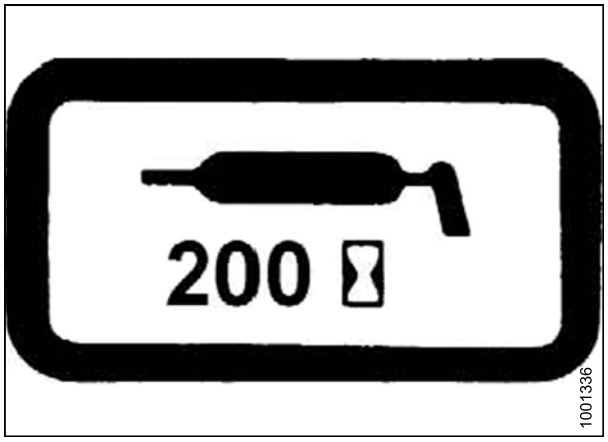


Figure 6.26: Use Only Recommended Lubricants

1. Wipe grease fitting with a clean cloth before greasing to avoid injecting dirt and grit.
2. Inject grease through fitting with grease gun until grease overflows fitting (except where noted).
3. Leave excess grease on 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 lubricant passageway. Replace fitting if necessary.
6. Use clean High Temperature Extreme Pressure grease as shown.

6.4 Electrical

Use electrical tape and wire clips as required to prevent wires from dragging or rubbing.

Keep lights clean and replace defective bulbs.

6.4.1 Replacing Light Bulbs

To replace a light bulb, follow these steps:

1. Using a Phillips screwdriver, remove screws (A) from fixture and remove plastic lens.
2. Replace bulb and reinstall plastic lens and screws.

NOTE:
Use bulb trade #1156 for amber clearance lights and #1157 for red tail light (Slow Speed Transport option).

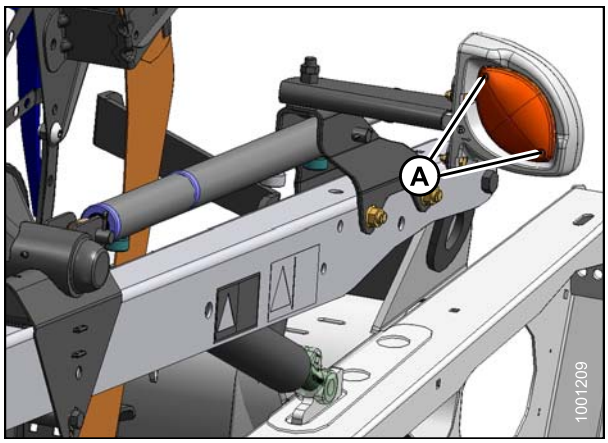


Figure 6.27: Clearance Light

6.5 Knife

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 *6.1 Preparation for Servicing, page 113*.

CAUTION

Wear heavy gloves when working around or handling knives.

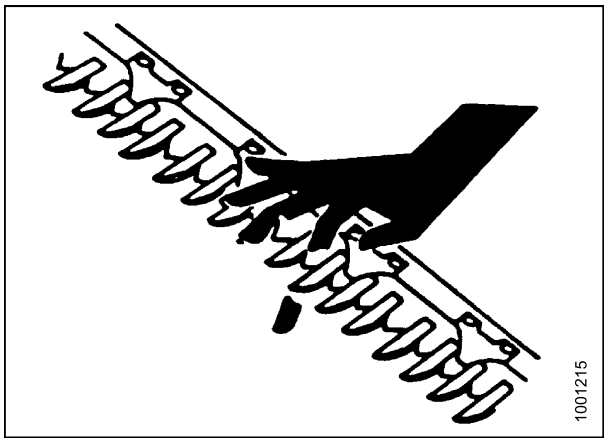


Figure 6.28: Cutterbar Hazard

6.5.1 Replacing Knife Section

Check daily that knife sections are firmly bolted to the knife back and are not worn or broken. Damaged or worn sections leave behind uncut plants. A worn or broken section can be replaced without removing knife from cutterbar.

Coarse serrated sections last longer than fine serrated sections in dirty or sandy conditions.

Fine serrated sections perform better in fine stemmed grasses and plants that contain more fibrous stems.

To replace a section, follow these steps:

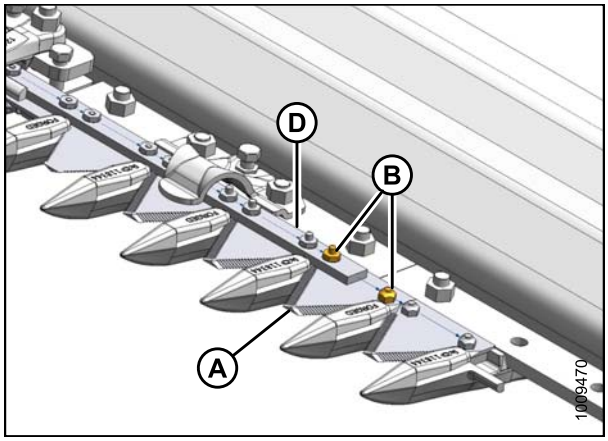
1. Stroke knife as required to center the section (A) between guards.
2. Remove nuts (B).
3. Remove bars (C) and lift section off the knife bar.
4. If section is under a splice bar (D), remove the bar.
5. Clean any dirt off of knife back and position new section on knife.

IMPORTANT:
Do NOT mix fine or coarse sections on same knife.

6. Reposition bars (C) and/or (D) and install lock nuts (A).

NOTE:
If replacing a screw, make sure to fully insert it. Do not use the nut to draw the screw into the knife bar.

7. Torque nuts to 7 ft·lbf (9.5 N·m).



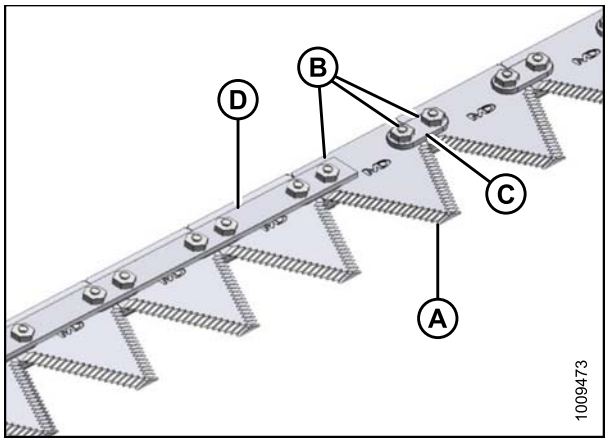


Figure 6.29: Cutterbar

6.5.2 Removing Knife

WARNING

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

1. Manually stroke knife to its outer limit and clean area around the knifehead.
2. Remove bolt (A).
3. Remove the grease zerk (B) from the pin.
4. Use a screwdriver or a chisel in slot (C) to release load on knifehead pin.
5. Pry pin upward with a screwdriver in pin groove until pin is clear of knifehead.
6. Push the knife assembly inboard until it is clear of the output arm.
7. Seal bearing in knifehead with plastic or tape.
8. Wrap a chain around knifehead and pull knife out.

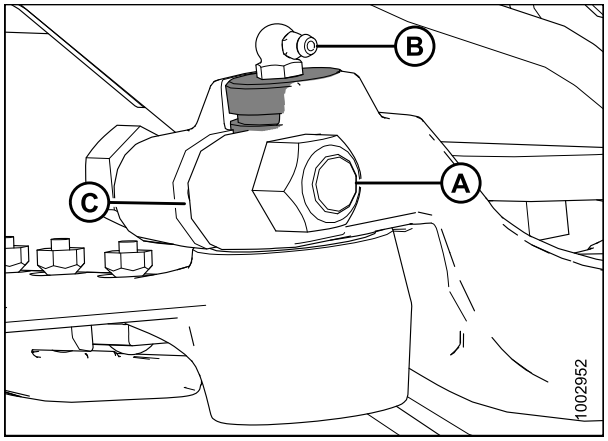


Figure 6.30: Knifehead

NOTE:
For single knife drive with splice plate, remove bolts from splice plate and pull knife out from both ends.

6.5.3 Removing Knifehead Bearing

WARNING

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

IMPORTANT:
The following procedure applies to single knife headers. Repeat this procedure for each knife on double knife headers .

1. Remove the knife. Refer to previous section.

   NOTE:
   It is not necessary to wrap the knifehead to protect the bearing as it is being replaced.

2. Using a flat-ended tool with approximately the same diameter as pin (A). Tap the 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 seal, check pin and needle bearing for wear. Replace if necessary.

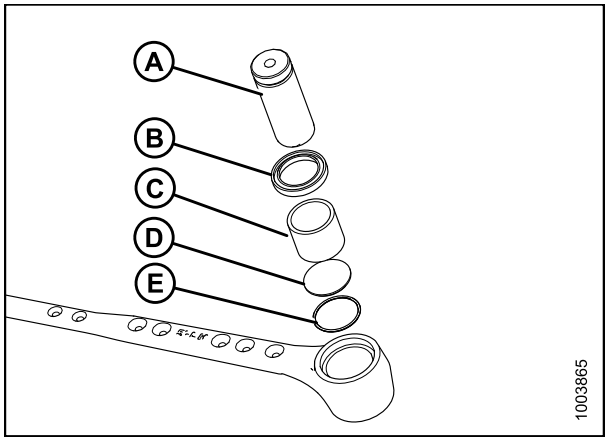


Figure 6.31: Removing Bearing

A - Flat-ended tool **B - Seal** **C - Bearing**
D - Plug **E - O-ring**

6.5.4 Installing Knifehead Bearing

To install the knifehead bearing, follow these steps:

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

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

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

IMPORTANT:
To avoid premature knifehead or knife drive box failure, be sure there is no looseness in the fit of the knifehead pin and the needle bearing, and the fit of the knifehead pin and output arm.

4. Install knife. Refer to *6.5.5 Installing Knife, page 143*.

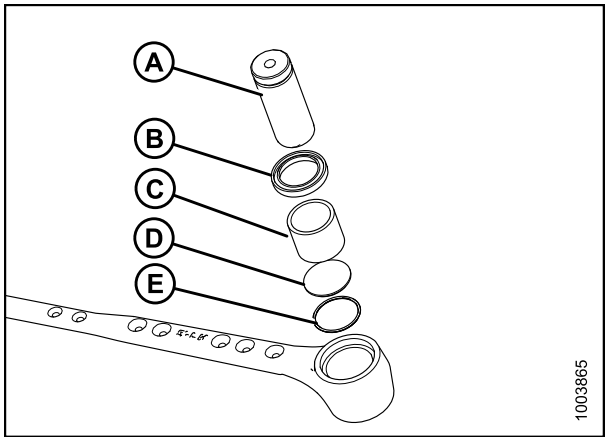


Figure 6.32: Knifehead

A - Flat-ended Tool **B - Seal** **C - Bearing**
D - Plug **E - O-ring**

6.5.5 Installing Knife

WARNING

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

To install a knife, follow these steps:

1. Slide knife into place and align knifehead with the output arm.

NOTE:
For ease of removing or installing knifehead pin, remove grease zerk from pin.

2. Install knifehead pin (A) through the output arm and into the knifehead.
3. Set groove (B) in knifehead pin 0.06 in. (1.5 mm) above (C). Install the 5/8 in. x 3 hex head bolt and nut (D) and torque to 160 ft·lbf (217 N·m).

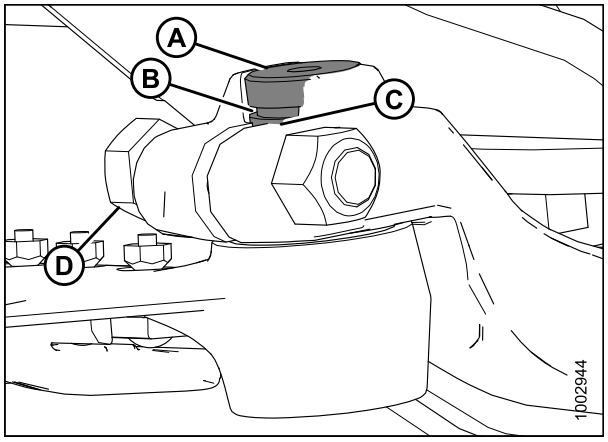


Figure 6.33: Knifehead

4. Install grease zerk (A) into the knifehead pin, turn the grease zerk for easy access.

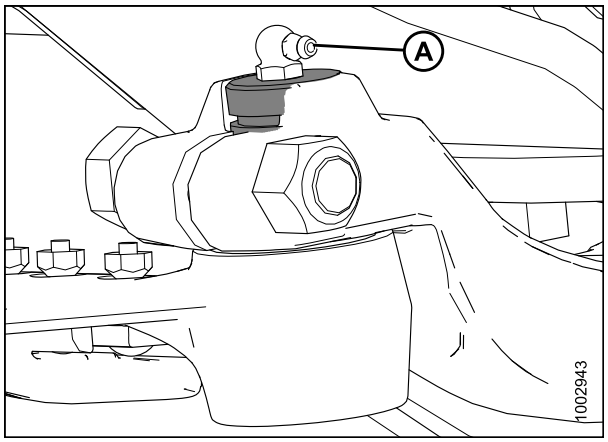


Figure 6.34: Knifehead

6.5.6 Spare Knife

A spare knife may be stored in the header frame tube at the left end. Ensure knife is secured in place.

Figure 6.35: Spare Knife

6.5.7 Knife Guards

Check **DAILY** that guards are aligned and that knife sections are contacting shear surface of each guard.

Adjusting Knife Guards

To adjust knife guards, follow these steps. The guard straightening tool (MD #140135) is available from your MacDon Dealer.

1. To adjust guard tips upward, position tool as shown, and pull up.

Figure 6.36: Upward Adjustment

2. To adjust tips downward, position tool as shown and push down.

   TIP: If trouble is encountered cutting tangled or fine-stemmed material, install a knife hold-down on every guard and then replace lower guards with stub guards.

3. If material is tough to cut, install stub guards with top guard and adjuster plate. A kit is available from your MacDon Dealer. Refer to *8.2.3 Stub Guard Conversion Kit, page 262*.

Figure 6.37: Downward Adjustment

Replacing Pointed Guards on a Single Knife Header

To replace pointed knife guards on a single knife header, follow these steps:

WARNING

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

1. Stroke knife so that knife sections are spaced midway between the guards.
2. Remove two nuts (B) and bolts that attach guard (A) and hold-down (C) (if applicable) to cutterbar.
3. Remove guard, hold-down, and poly wear plate (if installed).
4. Position new guard (A) and poly wear plate (if applicable) on cutterbar, and install bolts.

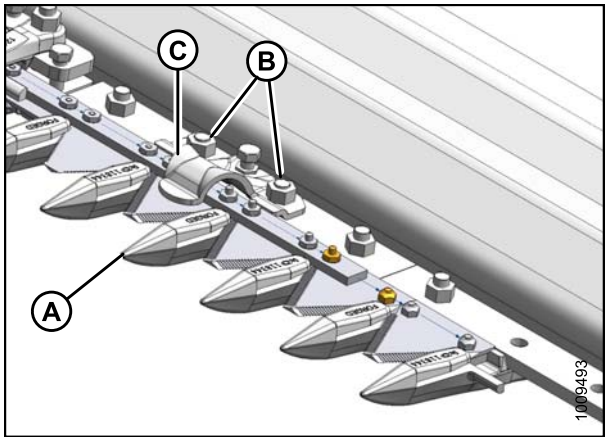


Figure 6.38: Cutterbar

IMPORTANT:
The first four outboard guards (B) on drive side(s) of header do not have a ledger plate. Ensure that proper replacement is installed.

5. Install hold-down, and secure with nuts. Tighten nuts to 50 ft·lbf (68 N·m).
6. Check and adjust clearance between hold-down and knife. Refer to *Checking Knife Hold-Downs, page 149*.

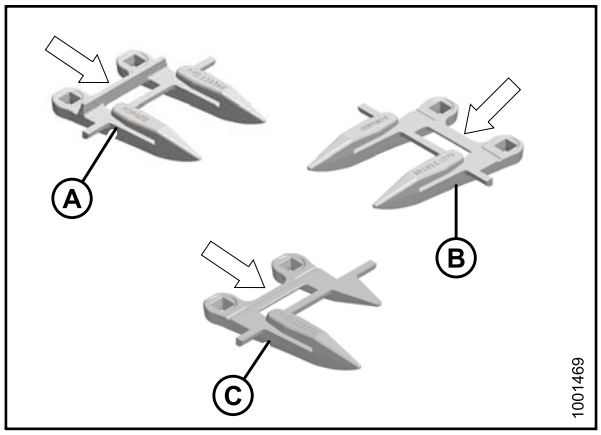


Figure 6.39: Guards

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

Replacing Pointed Guards on a Double Knife Header

WARNING

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

Refer to *Replacing Pointed Guards on a Single Knife Header, page 145* for typical guard replacement.

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

To replace the pointed center guard or center top guide on a double knife header, follow these steps:

1. Remove two nuts (B) and bolts that attach guard (A) and top guide (C) to cutterbar.
2. Remove guard, poly wear plate (if installed), top guide (C), and adjuster bar (D).

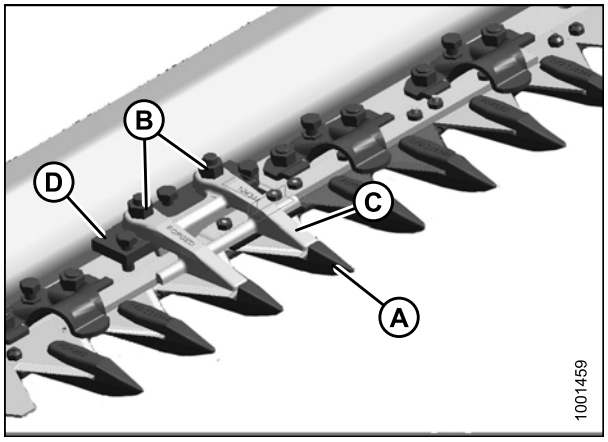


Figure 6.40: Double Knife Guard

A - Knife Guard **B - Nuts**
C - Top Guide **D - Adjuster bar**

3. Position poly wear plate (if applicable), replacement guard (A), adjuster bar, and top guide (B). Install bolts, but do **NOT** tighten.

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

NOTE:
Top guide (B) must accommodate the two overlapping knives at center guard location on double knife header. Ensure replacement is correct part.

4. Check and adjust clearance between hold-down and knife. Refer to *Checking Knife Hold-Downs, page 149*.

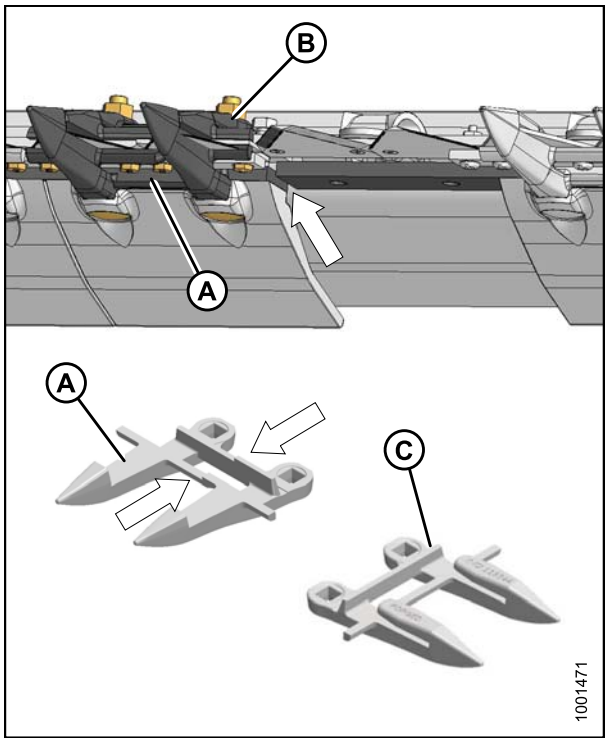


Figure 6.41: Double Knife Guard

A - Knife Guard **B - Top Guide** **C - Normal Guard**

Replacing Stub Guards on a Single Knife Header

WARNING

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

Stub guards, complete with top guides and adjuster plates, are designed to cut tough crops. Only 15, 20, 25, 30, and 35 ft. headers can be equipped with stub guards.

To replace stub guards, follow these steps:

1. Remove the two nuts (A) and bolts that attach guard (B) and top guide (C) to cutterbar.
2. Remove guard, poly wear plate (if installed), top guide, and adjuster bar (D).
3. Position poly wear plate (if applicable), replacement guard (B), adjuster bar (D), top guide (C), and install bolts and nuts (A). Do **NOT** tighten.

IMPORTANT:
Note position of mitre on adjuster bar (D). Bar should be reinstalled in same position. Mitres should not be adjacent to each other.

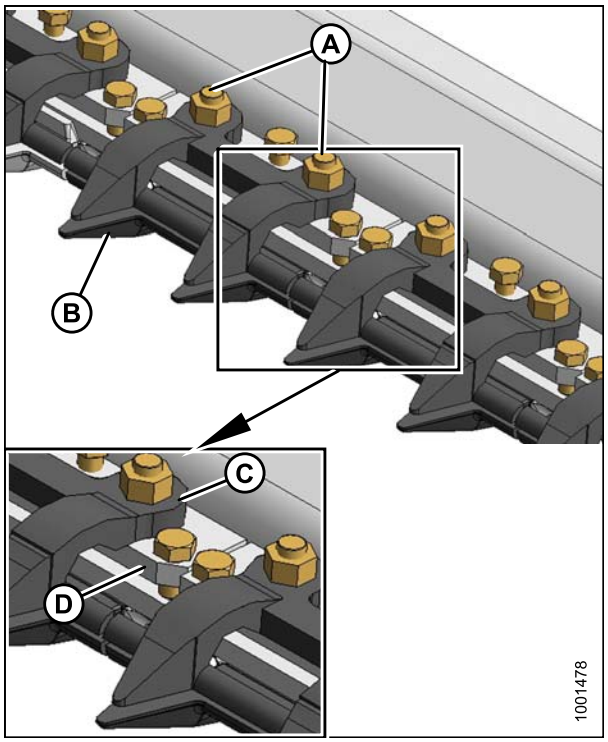


Figure 6.42: Stub Guards

A - Nuts **B - Stub Guard**
C - Top Guide **D - Adjuster Bar**

IMPORTANT:
The first four outboard guards (B) on the drive side(s) of the header do **NOT** have a ledger plate like the normal guards (A). Ensure that the proper replacement is installed.

4. Check and adjust clearance between hold-down and knife. Refer to *Checking Knife Hold-Downs, page 149*.

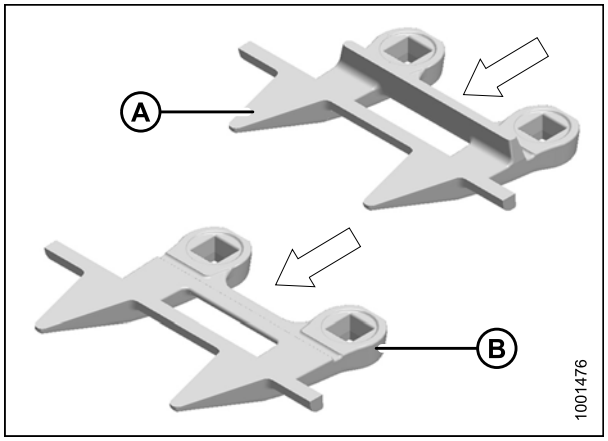


Figure 6.43: Stub Guards

A - Normal Guard **B - Drive Side Guard**

Replacing Stub Guards on a Double Knife Header

Refer to *Replacing Stub Guards on a Single Knife Header, page 147* for typical guard replacement.

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

To replace the center guard or center top guide, follow these steps:

1. Remove the two nuts (A) and bolts that attach guard (B) and top guide (C) and adjuster bar (D) to cutterbar.
2. Remove guard, poly wear plate (if installed), top guide (C), and adjuster bar (D).
3. Locate poly wear plate (if applicable), replacement guard (B), adjuster bar (D), top guide (C), and install bolts, but do **NOT** tighten.

IMPORTANT:
Ensure center guard (B) has offset cutting surfaces. The top guide (C), which is an inverted normal stub guard, must accommodate the two overlapping knives at center guard location on double-knife header. Ensure replacements are correct part.

4. Check and adjust clearance between hold-down and knife. Refer to *Checking Knife Hold-Downs, page 149*.

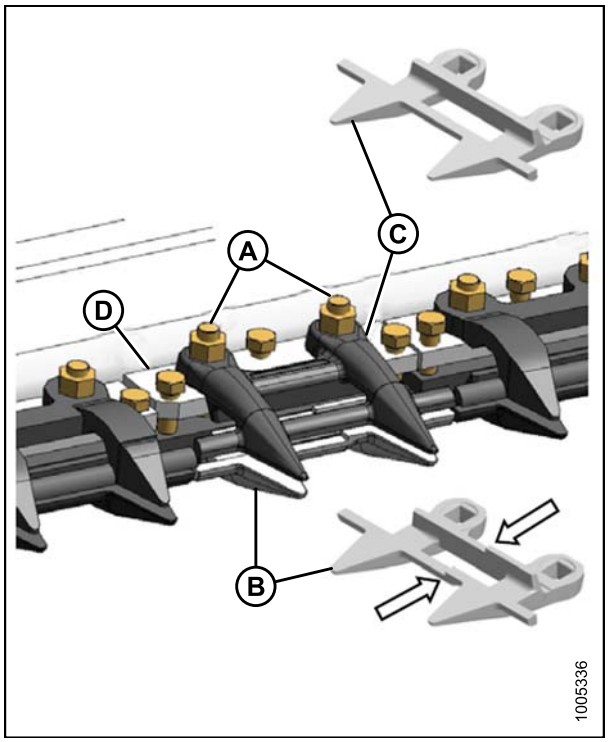


Figure 6.44: Stub Guards

A - Nuts
B - Center Guard
C - Normal Top Guide
D - Adjuster Bar

Checking Knife Hold-Downs

Check daily that knife hold-downs are set to prevent knife sections from lifting off guards, but still permit knife to slide without binding. If there is obvious evidence that the hold-downs are not properly adjusted, check the clearance between the hold down and knife section with a feeler gauge.

Refer to:

- *Adjusting Hold-Downs with Pointed Guards, page 150*
- *Adjusting Hold-Downs with Stub Guards, page 151*

NOTE:
Guards should be aligned prior to adjusting hold-downs. Refer to *Adjusting Knife Guards, page 145*.

Adjusting Hold-Downs with Pointed Guards

To adjust the clearance between hold-downs and knife on header with pointed guards, follow these steps:

1. Check the clearance (A) between the normal hold-down and knife section with a feeler gauge. The clearance should be 0.004–0.024 in. (0.1–0.6 mm).
2. Adjust as required by turning bolt (B).

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

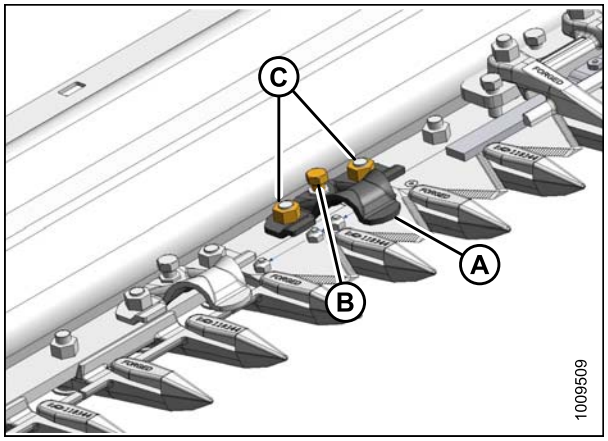


Figure 6.45: Hold-Down Clearance

3. Check the clearances between the center guard hold-down (A) and knife section with a feeler gauge. The clearances should be:
   - 0.004–0.016 in. (0.1–0.4 mm) at guide tip (B)
   - 0.004–0.040 in. (0.1–1.0 mm) at rear of guide (C)
4. If required, adjust clearances as follows:
   a. Torque nuts (D) to 35 ft·lbf (46 N·m).
   b. Turn the three adjuster bolts (E) as required.
   c. Torque nuts (D) to 53 ft·lbf (72 N·m).
5. After adjusting all hold-downs, run header at a low engine speed and listen for noise due to insufficient clearance. Insufficient clearance will also result in overheating of the knife and guards. Readjust as necessary.

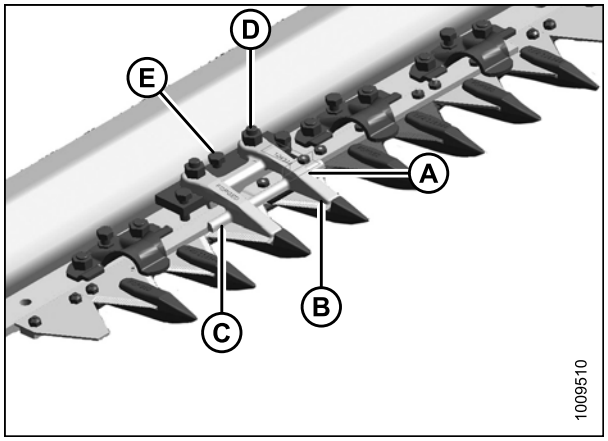


Figure 6.46: Hold-Down Clearance

Adjusting Hold-Downs with Stub Guards

To adjust the clearance between hold-downs and knife for all stub guards, follow these steps:

1. Check the clearances between the center guard hold-down (A) and knife section with a feeler gauge. The clearances should be:
   - 0.004–0.016 in. (0.1–0.4 mm) at guide tip (B)
   - 0.004–0.040 in. (0.1–1.0 mm) at rear of guide (C)
2. If required, adjust clearances as follows:
   a. Torque nuts (D) to 35 ft·lbf (46 N·m).
   b. Turn the three adjuster bolts (E) as required.
   c. Torque nuts (D) to 53 ft·lbf (72 N·m).
3. After adjusting all hold-downs, run header at a low engine speed and listen for noise due to insufficient clearance. Insufficient clearance will also result in overheating of the knife and guards. Readjust as necessary.

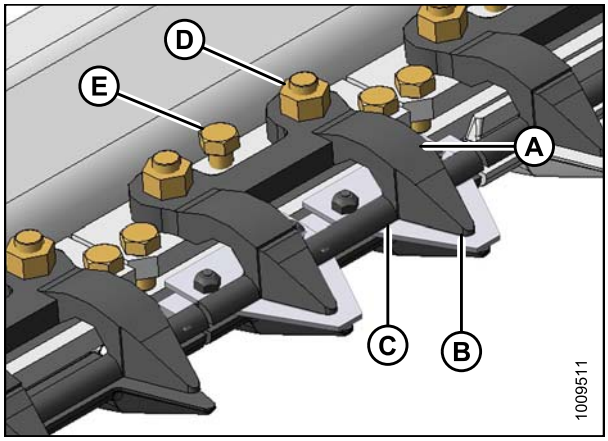


Figure 6.47: Stub Guards

6.5.8 Knifehead Shield

The shield attaches to the endsheet and reduces the knifehead opening to prevent cut crop from accumulating in the knifehead cut-out, especially in severely lodged crops.

The shield(s) and mounting hardware are available from your MacDon Dealer.

IMPORTANT:
Shields should be removed when cutting with the cutterbar on the ground in muddy conditions. Mud may pack into the cavity behind the shield and cause knife drive box failures.

Installing Knifehead Shield

The knifehead shield is supplied in flattened form and can be bent to suit installation on pointed or stub guard cutterbars and on double knife headers. Shields are slightly different depending on header size and guard configuration. Ensure proper shield is used. See header parts catalog for proper replacement parts.

DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine, always stop engine, remove key, and engage safety props before going under header for any reason. Refer to the windrower operator's manual for instructions regarding the proper use and storage of header safety props.

1. Raise reel fully, lower header to ground, shut down windrower, and remove key.

WARNING

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

2. Engage reel arm locks.

CAUTION

Wear heavy gloves when working around or handling knives.

3. Place knifehead shield (A) against endsheet as shown. Orient the shield so that cutout matches profile of knifehead and/or hold-downs.
4. Bend shield along slit to conform to endsheet.
5. Align mounting holes and then install two 3/8 in. x 1/2 Torx® head bolts (B).
6. Snug up bolts just enough so that shield can be adjusted as close as possible to the knifehead.
7. Manually rotate knife drive box pulley to move knife and check for areas of contact between the knifehead and shield.
8. If required, adjust shield to avoid interference with the knife.
9. Tighten bolts.

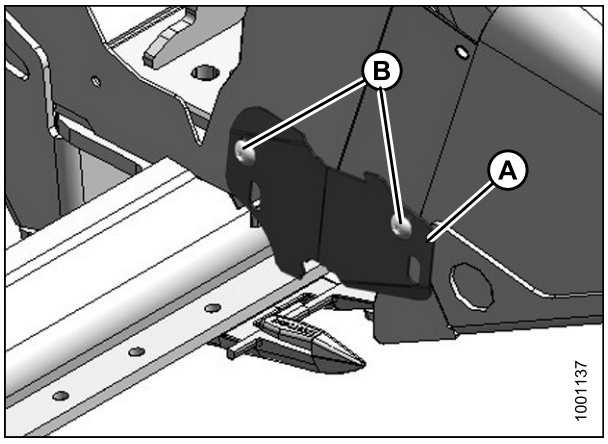


Figure 6.48: Knifehead Shield

6.6 Knife Drive

6.6.1 Knife Drive Box

The knife drive box converts rotational motion into reciprocating motion to the knife. It is belt driven from a hydraulic motor that is powered by the adapter hydraulic pump.

CAUTION

To avoid personal injury, before servicing machine or opening drive covers, refer to *6.1 Preparation for Servicing, page 113*.

Mounting Bolts

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

1. Torque side bolts (A) first, then the bottom bolts (B). Torque to 200 ft·lbf (271 N m).

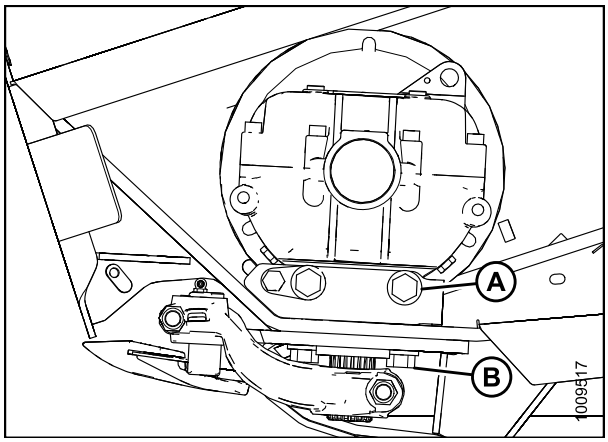


Figure 6.49: Knife Drive Box

Removing Knife Drive Box

Single and Untimed Double Knife

This procedure applies to single and untimed double knife drive box.

1. Open endshield. Refer to *Opening Endshields, page 37*.
2. Loosen the two bolts (A) that secure the motor assembly to header endsheet.
3. Loosen the tension on the belt by turning the tensioning bolt (B) counterclockwise.

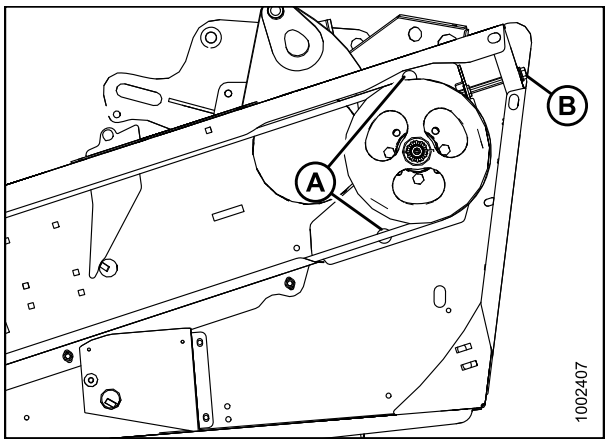


Figure 6.50: Knife Drive

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

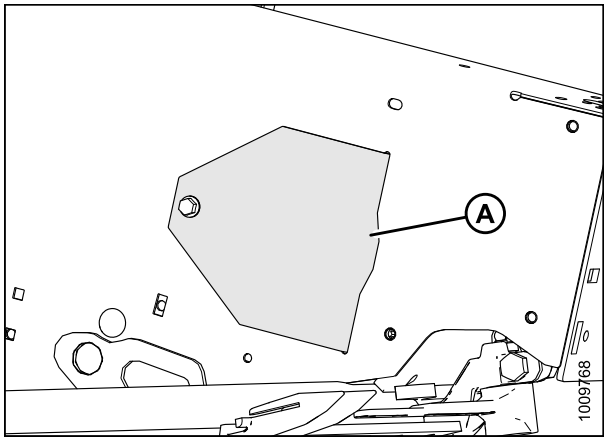


Figure 6.51: Access Cover

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

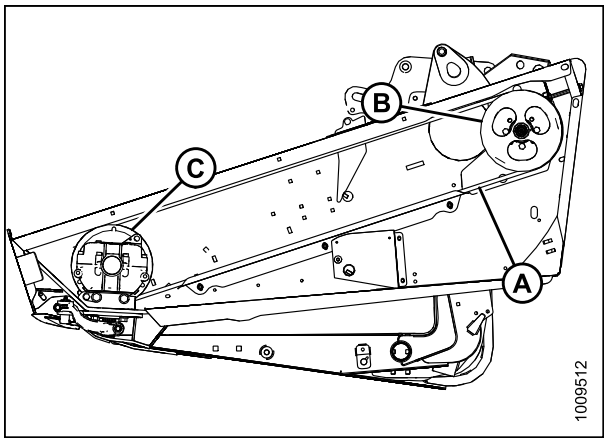


Figure 6.52: Knife Drive

7. Manually stroke knife to its outer limit and clean area around the knifehead.
8. Remove bolt (A).
9. Remove the grease zerk (B) from the pin.
10. Use a screwdriver or a chisel in slot (C) to release load on knifehead pin.
11. Pry pin upward with a screwdriver in pin groove until pin is clear of knifehead.
12. Push the knife assembly inboard until it is clear of the output arm.
13. Seal bearing in knifehead with plastic or tape.

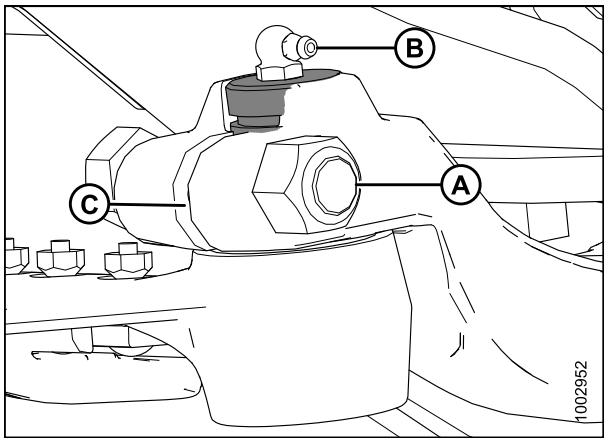


Figure 6.53: Knifehead

14. Remove bolt (A) that clamps the knife drive arm to the knife drive box output shaft.
15. Remove the knife drive arm (B) from the knife drive box output shaft.
16. Remove the four knife drive box mounting bolts (C, D).

NOTE:
Do **NOT** remove bolt (E), this is factory set. It is used to position the knife drive box in the proper fore-aft position.

17. Remove knife drive box and place on a bench for disassembly.

CAUTION

Knife drive box with pulley weighs over 65 lb (35 kg). Use care when removing or installing. Lug (L) can be used for lifting. If speed sensor is installed at this location, you will need to remove it before using it for lifting.

18. For double-knife headers, repeat procedure for opposite end.

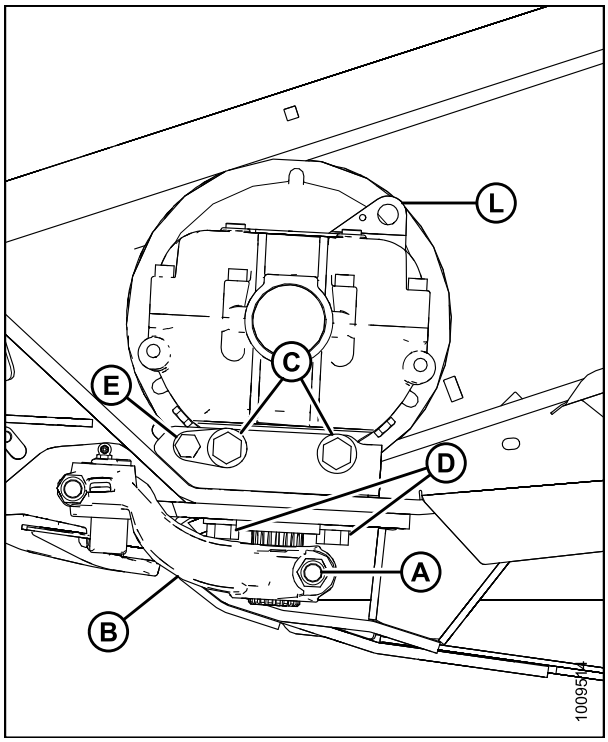


Figure 6.54: Knife Drive Box

Timed Double Knife

NOTE:
Procedure is the same for both ends of the timed double-knife header. Images shown are for the left end, right end is opposite.

1. Open endshield. Refer to *Opening Endshields, page 37*.
2. Loosen two nuts (A) on belt idler bracket to relieve tension on belt.
3. Loosen nut (B) on idler pulley and slide idler down to loosen belt.

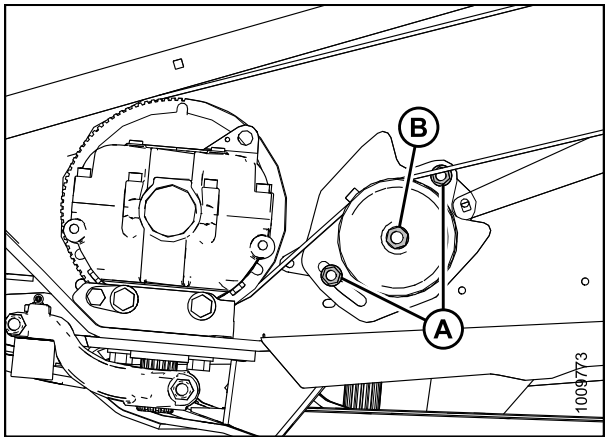


Figure 6.55: Knife Drive

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

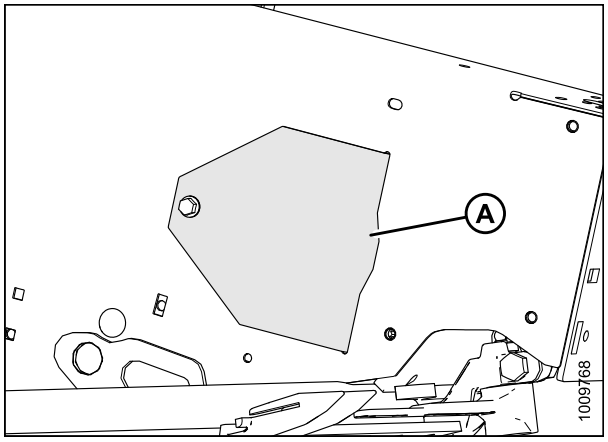


Figure 6.56: Access Cover

5. Manually stroke knife to its outer limit and clean area around the knifehead.
6. Remove bolt (A).
7. Remove the grease zerk (B) from the pin.
8. Use a screwdriver or a chisel in slot (C) to release load on knifehead pin.
9. Pry pin upward with a screwdriver in pin groove until pin is clear of knifehead.
10. Push the knife assembly inboard until it is clear of the output arm.
11. Seal bearing in knifehead with plastic or tape.

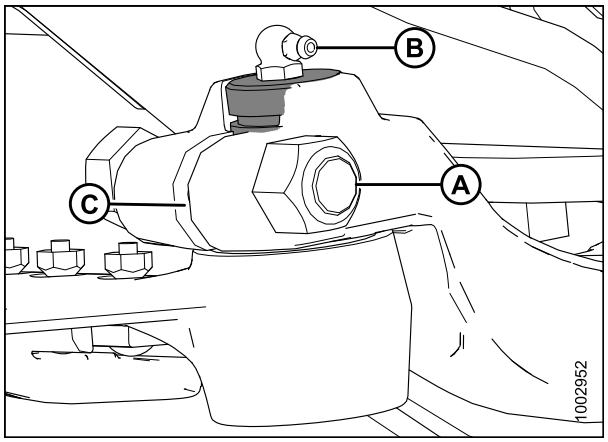


Figure 6.57: Knifehead

12. Remove bolt (A) that clamps the knife drive arm to the knife drive box output shaft.
13. Remove the knife drive arm (B) from the knife drive box output shaft.
14. Remove the four knife drive box mounting bolts (C, D).

NOTE:
Do **NOT** remove bolt (E), this is factory set. It is used to position the knife drive box in the proper fore-aft position.

15. Remove knife drive box and place on a bench for disassembly.

CAUTION

Knife drive box with pulley weighs over 65 lb (35 kg). Use care when removing or installing. Lug (L) can be used for lifting. If speed sensor is installed at this location, you will need to remove it before using it for lifting.

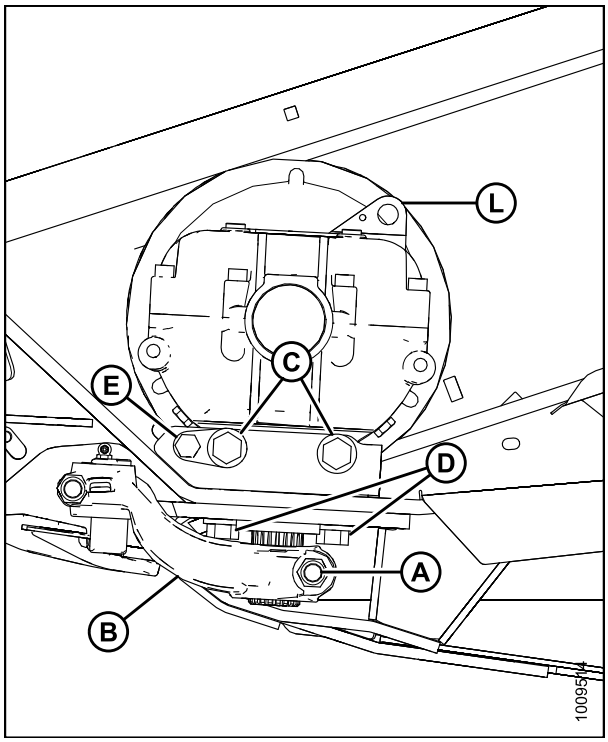


Figure 6.58: Knife Drive Box

Removing Knife Drive Box Pulley

To remove knife drive box pulley, follow these steps:

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

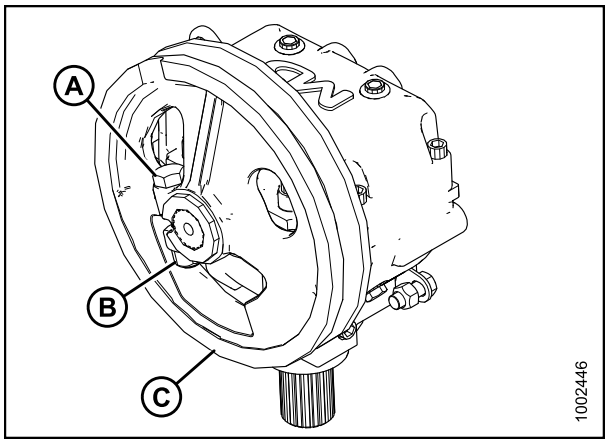


Figure 6.59: Knife Drive Box and Pulley

Installing Knife Drive Box Pulley

To install the knife drive box pulley, follow these steps:

1. Ensure splines and bores in pulley or drive arm are free of paint oil and solvents.
2. Apply Loctite® #243 adhesive (or equivalent) to spline. Apply in two bands (A) around shaft as shown, with one band at end of spline and one band approximately mid-way.
3. Install pulley (B) until flush with end of shaft.
4. Secure pulley with 5/8 in. x 3 hex head bolt with distorted thread NC lock nut and torque to 160 ft·lbf (217 N·m).

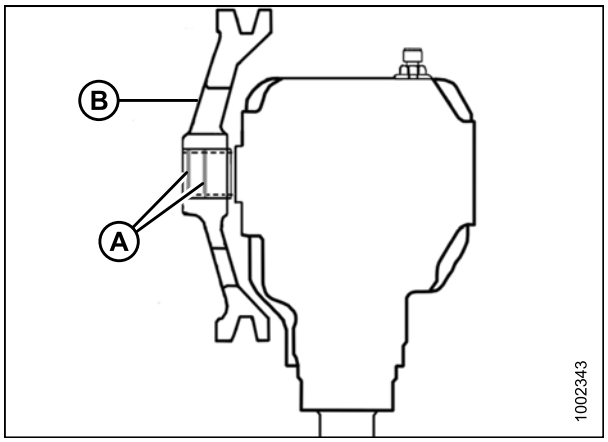


Figure 6.60: Knife Drive Box

Installing Knife Drive Box

This procedure can be used for single- and double-knife headers.

NOTE:
Before installing the knife drive box onto the header, install the pulley onto the knife drive box. Refer to *Installing Knife Drive Box Pulley, page 158*.If the pulley was not removed, then proceed to Step *1., Installing Knife Drive Box, page 158*.

CAUTION

Knife drive box with pulley weighs over 65 lb (35 kg). Use care when removing or installing. Lug (L) can be used for lifting. If speed sensor is installed at this location, you will need to remove it before using it for lifting.

1. Place knife drive box into position on header mount and locate belt on pulley.
2. Install two 5/8 in. x 1.75 grade 8 hex head bolts (A) at the side and two 5/8 in. x 2.25 grade 8 hex head bolts (B) underneath to mount knife drive box to frame.
3. Slightly tighten knife drive box side bolts (A) first, then the bottom bolts (B), to ensure proper contact with vertical and horizontal mounting surfaces. Do **NOT** torque bolts at this time.

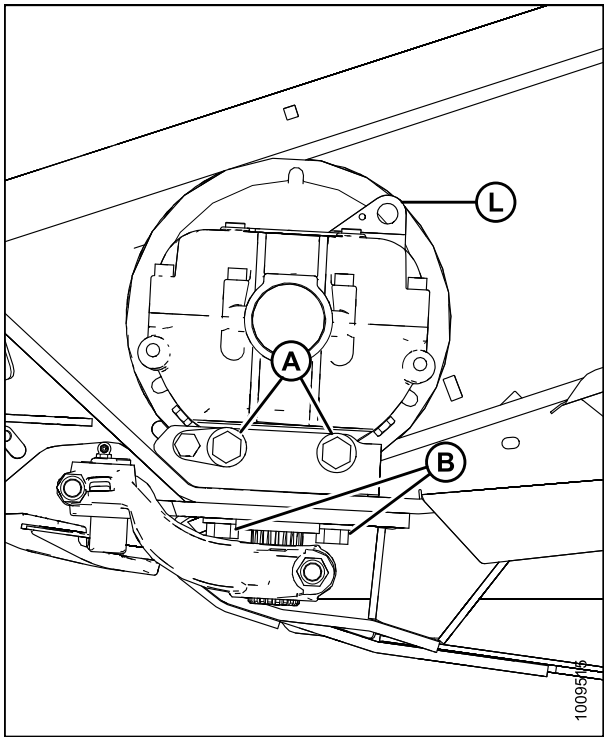


Figure 6.61: Knife Drive Box

4. Apply Loctite® #243 to the output shaft in two bands as shown at (A).
5. Slide output arm (B) onto output shaft. Rotate pulley to ensure drive arm just clears frame on inboard stroke to ensure proper placement on splines.

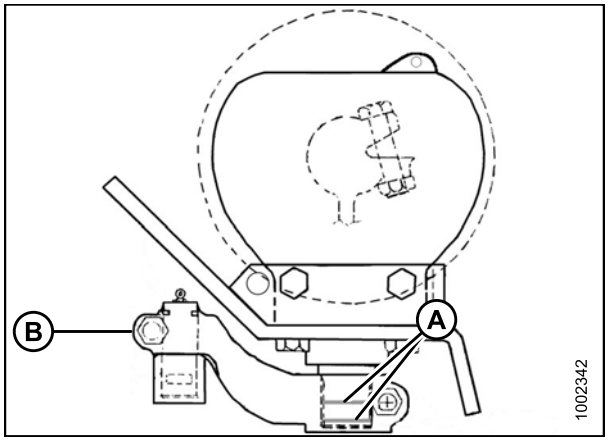


Figure 6.62: Knife Drive Box

6. Position output arm (A) to farthest outboard position. Move output arm (A) up or down on splined shaft until it almost contacts knifehead (B). Exact clearance (C) will be set when installing knifehead pin.

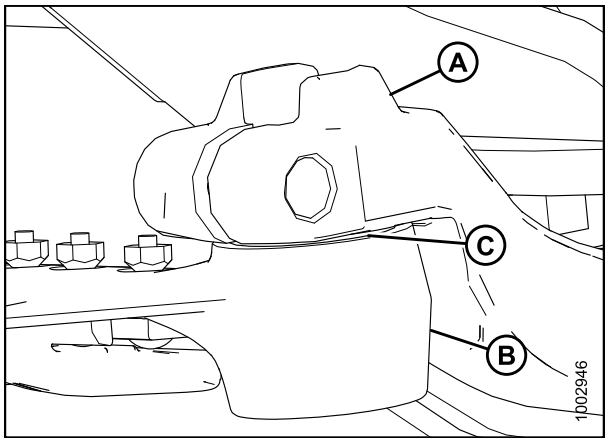


Figure 6.63: Knifehead

7. Torque output arm bolt (B) to 160 ft·lbf (217 N·m) to secure arm to knife drive output shaft.

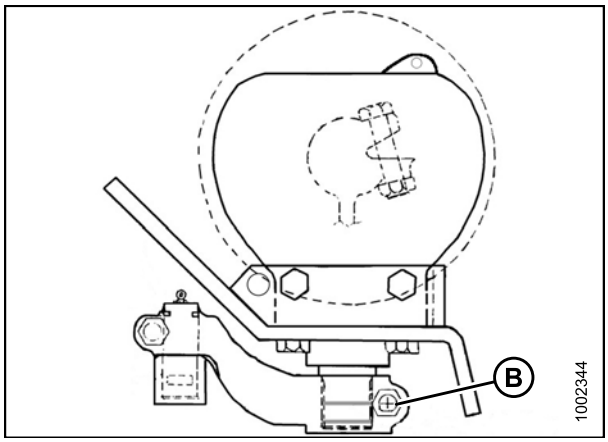


Figure 6.64: Knife Drive Box

NOTE:
For ease of removing or installing knifehead pin, remove grease zerk from pin.

8. Install knifehead pin (A) through the output arm and into the knifehead.
9. Set groove (B) in knifehead pin 0.06 in. (1.5 mm) above (C). Install the 5/8 in. x 3 hex head bolt and nut (D) and torque to 160 ft·lbf (217 N·m).

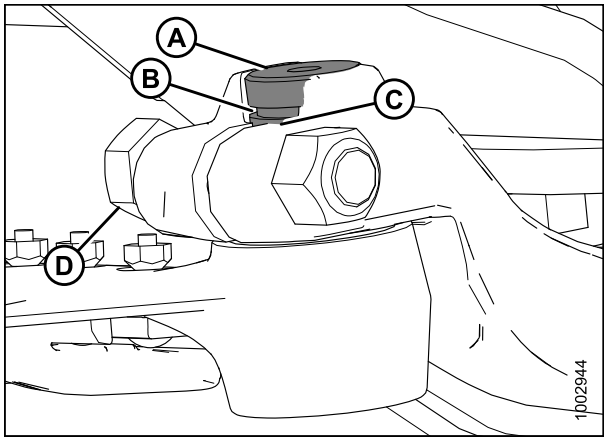


Figure 6.65: Knifehead

10. Install grease zerk (A) into the knifehead pin, turn the grease zerk for easy access.

IMPORTANT:
Grease knifehead just enough to start a slight downward movement of knifehead. Over-greasing will misalign knife, causing guards to overheat and overload the drive system.

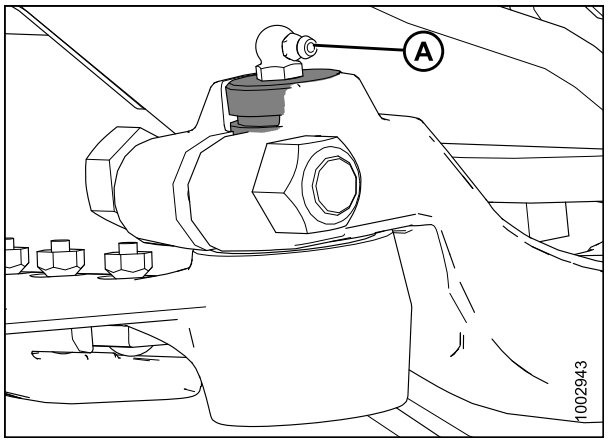


Figure 6.66: Knifehead

11. Check the knife drive box pulley and drive pulley alignment. If adjustment is required, contact your MacDon Dealer.
12. Tighten knife drive box side bolts (A) first, then the bottom bolts (B). Torque to 200 ft·lbf (271 N·m).
13. Stroke the output arm to mid stroke, check and ensure that the knife bar does not contact the front of the first guard. If adjustment is required, contact your MacDon Dealer.
14. Install and tension the knife drive belt(s). Refer to *6.6.2 Knife Drive Belts, page 161*. For timed double-knife headers, also check the knife timing. Refer to *Adjusting Double Knife Timing, page 169* for timing instructions.
15. Close endshield. Refer to *Closing Endshields, page 38*.

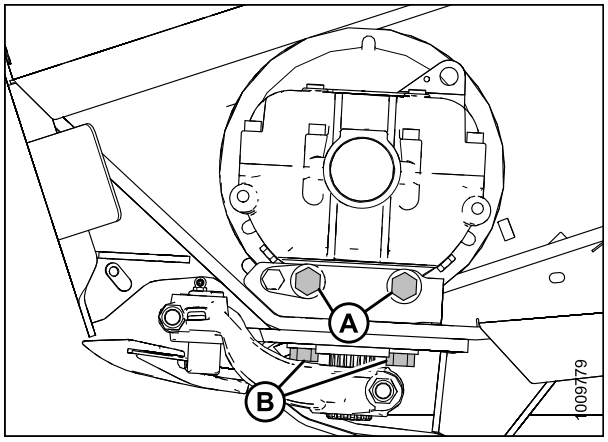


Figure 6.67: Knife Drive Box

Changing Oil in Knife Drive Box

Change knife drive box lubricant after the first 50 hours of operation and every 1,000 hours (or 3 years) thereafter.

To change the oil in the knife drive box, follow these steps:

1. Raise header to allow a suitable container to be placed under the knife box drain to collect oil.
2. Open endshield(s). Refer to *Opening Endshields, page 37*.
3. Remove breather/dipstick (A) and drain plug (B).
4. Allow oil to drain.
5. Reinstall drain plug (B).
6. Add oil to knife drive box. Refer to *6.2.2 Recommended Fluids and Lubricants, page 115* for quantity.
7. Close endshield(s). Refer to *Closing Endshields, page 38*.

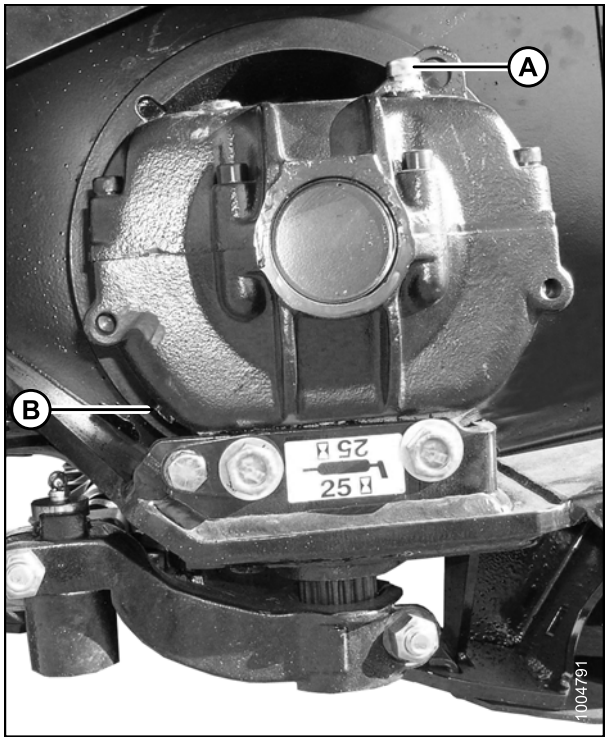


Figure 6.68: Knife Drive Box

6.6.2 Knife Drive Belts

Non-Timed Knife Drive Belts

The knife drive box is driven with a V-belt from a hydraulic motor on the header left endsheet. An identical drive system is used at the opposite end for 40 foot double-knife headers.

Removing Non-Timed Knife Drive Belt

This procedure describes the removal of the knife drive belt on single-knife headers and double-knife headers with non-timed drives.

NOTE:
Procedure is the same for both ends of a double-knife header.

1. Open endshield. Refer to *Opening Endshields, page 37*.
2. Loosen the two bolts (A) that secure the motor assembly to header endsheet.
3. Loosen the belt by turning the tensioning bolt (B) counterclockwise.

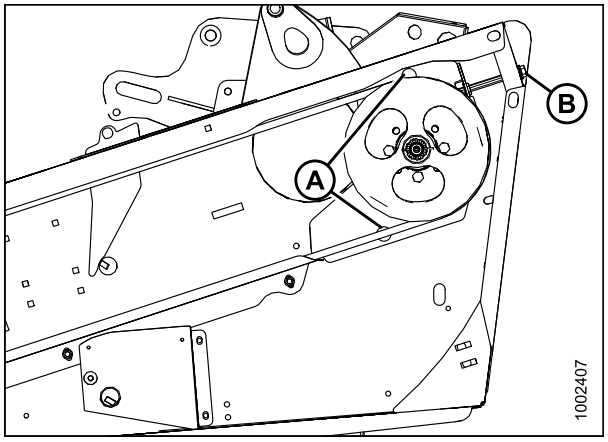


Figure 6.69: Knife Drive

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

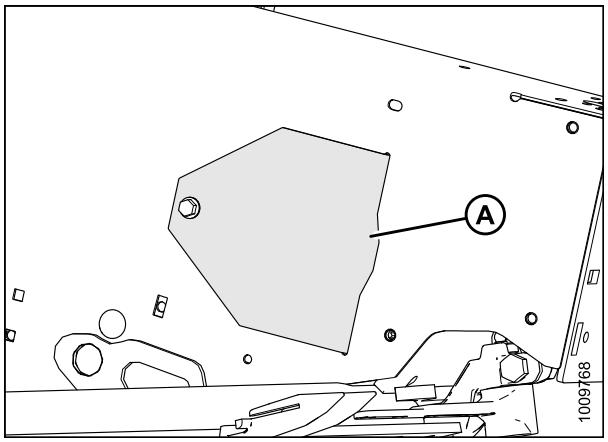


Figure 6.70: Access Cover

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

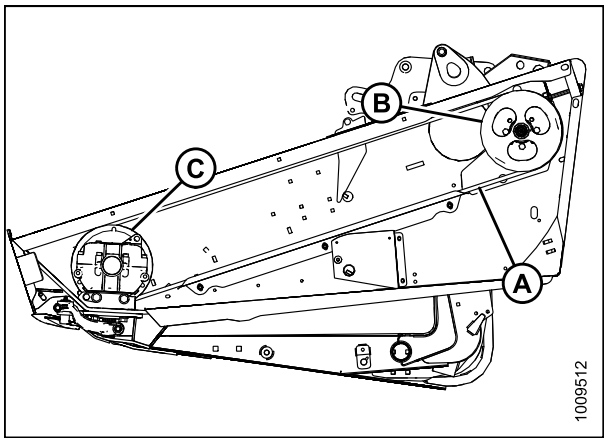


Figure 6.71: Knife Drive

Installing Non-Timed Knife Drive Belts

NOTE:
Procedure is the same for both sides of the double-knife header.

1. Route knife drive belt (A) around knife drive box pulley (C) and knife drive pulley (B). Use notch in pulley (C) to assist in installing belt.

NOTE:
When installing new belt, never pry belt over pulley. Be sure drive motor is fully forward.

2. Tension knife drive belt. Refer to *Tensioning Non-Timed Knife Drive Belts, page 163*.

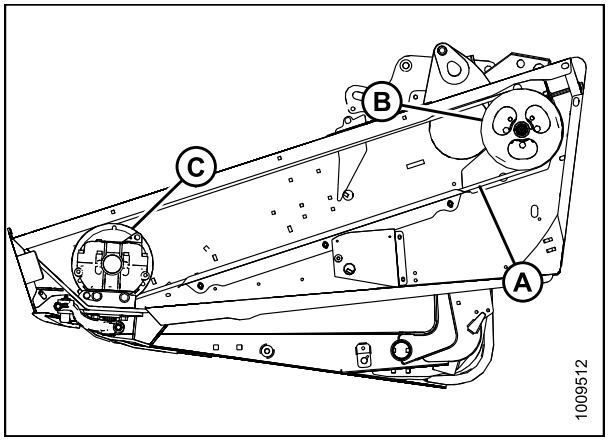


Figure 6.72: Knife Drive

3. Reinstall the access cover (A) and secure it with bolt.
4. Close endshield. Refer to *Closing Endshields, page 38*.

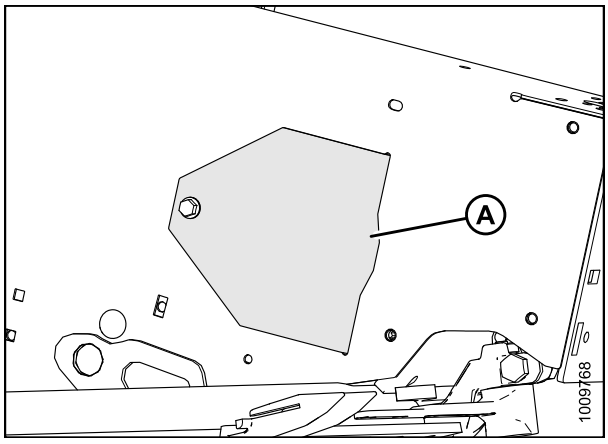


Figure 6.73: Access Cover

Tensioning Non-Timed Knife Drive Belts

This procedure applies to single- and double-knife headers with non-timed drives.

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

1. Open left endshield. Refer to *Opening Endshields, page 37*.
2. Loosen the two bolts (A) that secure the motor assembly to header endsheet.
3. Turn adjuster bolt (B) clockwise to move the drive motor until a force of 20 lbf (80 N) deflects belt (C) 3/4 in. (18 mm) at mid-span.

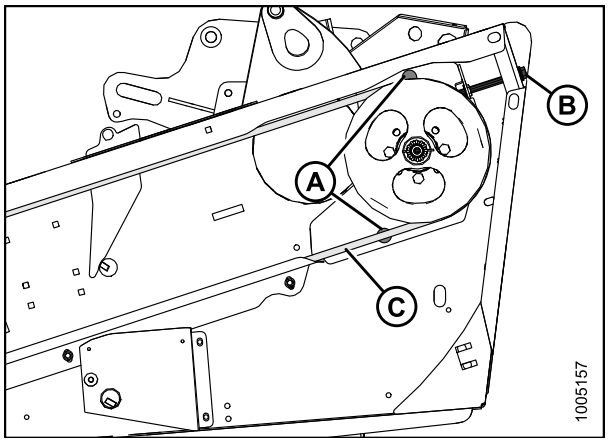


Figure 6.74: Left-Hand Shown – Right-Hand Opposite for Double-Knife Headers

4. Ensure that clearance between belt (A) and belt guide (B) is 1/32 in. (1 mm).
5. Loosen three bolts (C), and adjust position of guide (B) as required.
6. Tighten bolts (C).
7. Close endshield. Refer to *Closing Endshields, page 38*.

NOTE:
Readjust tension of a new belt after a short run-in period (about five hours).

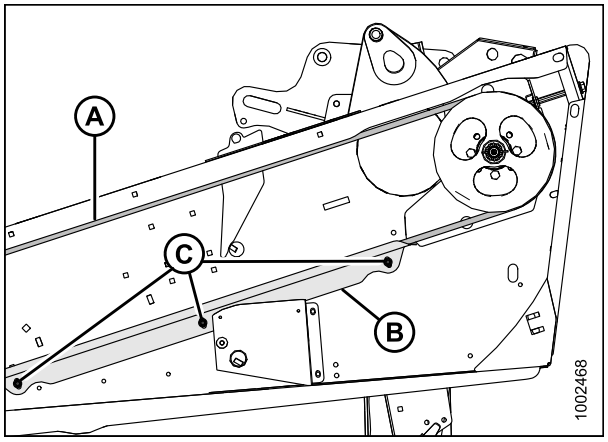


Figure 6.75: Knife Drive

Timed Double Knife Drive Belts

This section applies to 35-foot and smaller double knife model D65 Draper Headers with timed drives.

Removing Timed Drive V-Belts

1. Open left endshield. Refer to *Opening Endshields, page 37*.
2. Loosen two bolts (A) on endsheet.
3. Turn adjuster bolt (B) to loosen the two V-belts (C) and remove them.

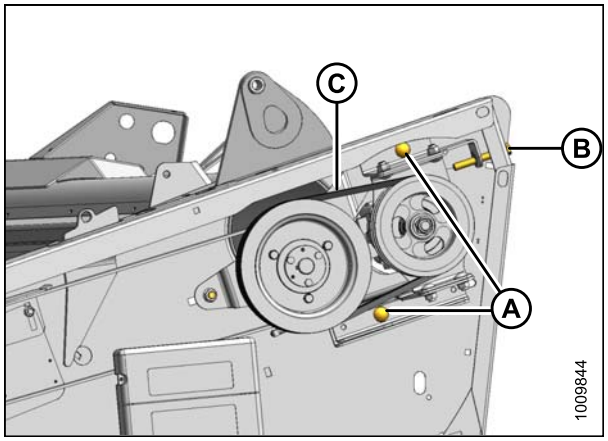


Figure 6.76: Knife Drive V-Belts

Installing Timed Drive V-Belts

NOTE:
New belts must be installed as a matched pair. Never pry belt over pulley. Be sure drive motor is fully forward.

1. Install V-belts (C) onto pulleys.

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

2. Turn adjuster bolt (B) to tighten belts. The belts should deflect 5/32 in. (4 mm) with 12–17 lbf (52–77 N) of force applied to each belt at mid-span when properly tensioned.
3. Tighten the two bolts (A).
4. Close endshield. Refer to *Closing Endshields, page 38*.
5. Check tension of new belts after a short run-in period (about 5 hours).

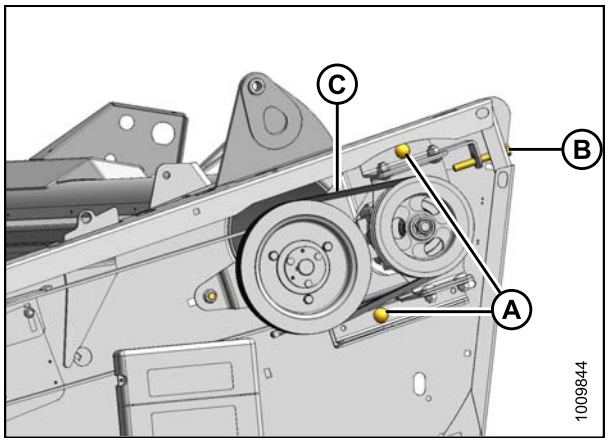


Figure 6.77: Knife Drive V-Belts

Removing Timed Knife Drive Belt

This procedure is applicable to the knife drive on both left and right sides.

1. Open endshield. Refer to *Opening Endshields, page 37*.
2. Loosen two nuts (A) on belt idler bracket to relieve tension on belt.
3. Loosen nut (B) on idler pulley and slide idler down to loosen belt.

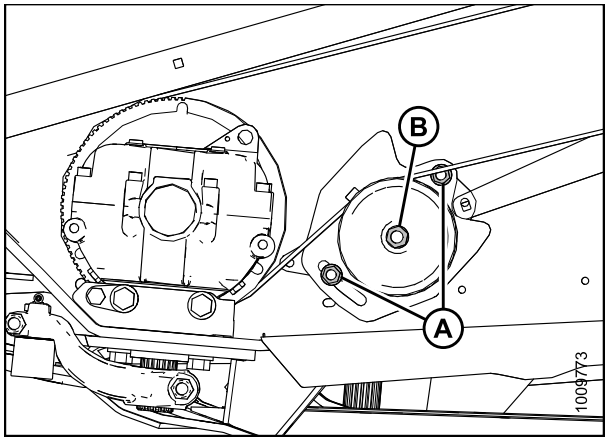


Figure 6.78: Knife Drive

NOTE:
The following two steps are not applicable to the right side drive.

4. Loosen two bolts (A) on endsheet.
5. Turn adjuster bolt (B) to loosen the two V-belts (C) and remove them.

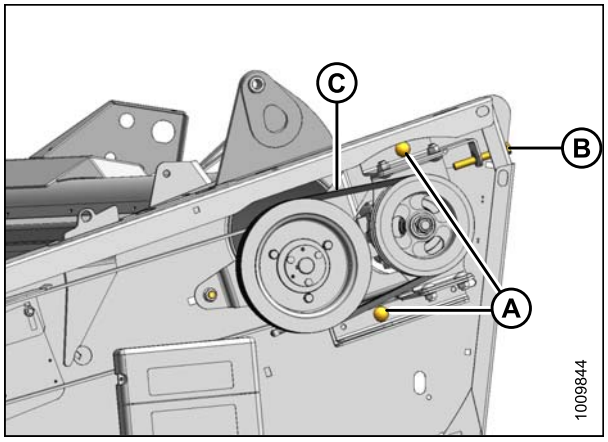


Figure 6.79: Knife Drive V-Belts

6. Open the access panel (A) inside the draper opening, just behind cutterbar. This will give you access to the knife drive pulley.
7. Remove the knife drive belt.

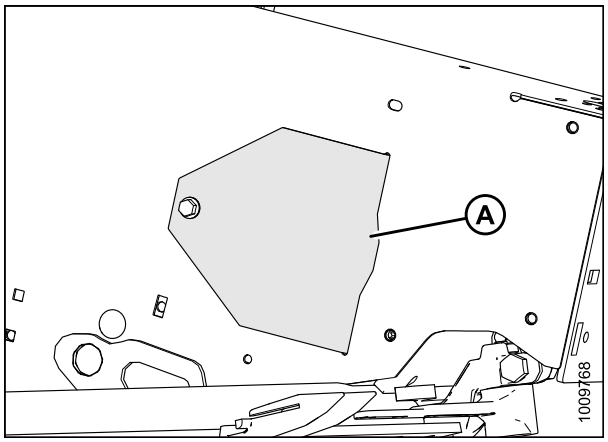


Figure 6.80: Access Cover

Installing Timed Knife Drive Belt

This procedure is applicable to the knife drive on both left and right sides.

If there are problems with belt alignment. Refer to *Adjusting Belt Tracking, page 172*.

1. Route knife drive belt (A) around knife drive pulley (B) and knife drive box pulley (C).

NOTE:
When installing belt, never pry belt over pulley.

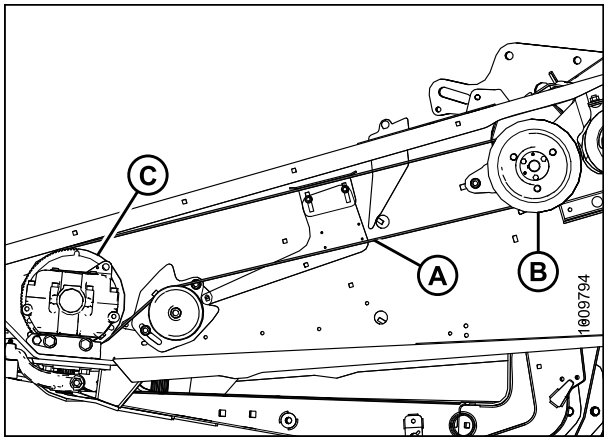


Figure 6.81: Left Side – Right Side Similar

NOTE:
The following two steps do not apply to the right site drive.

2. Install the two V-belts (C) and turn adjuster bolt (B) to tension them. Tension is checked at mid span of the belts. The belts should deflect 5/32 in. (4 mm) with 12–17 lbf (52–77 N) of force applied to each belt.

NOTE:
Ensure drive motor is fully forward to allow V-belt's installation.

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

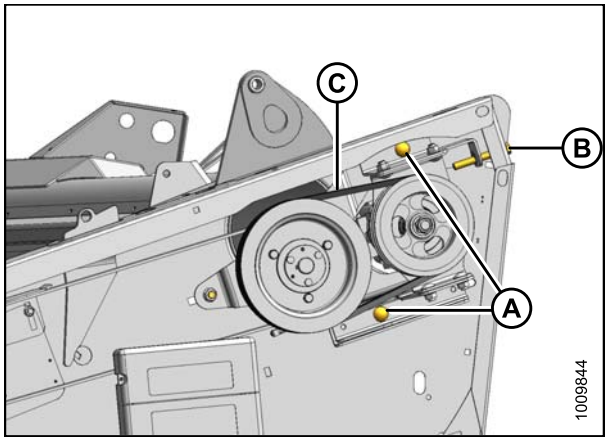


Figure 6.82: Knife Drive V-Belts

4. Ensure that knives are timed before tightening belt. Refer to *Adjusting Double Knife Timing, page 169*.
5. Slide the idler pulley (A) in the slot on the support bracket (B) to take up the slack in the timing belt.

NOTE:
Ensure that the lower nut (C) is as high in the slot as possible.

6. Tighten the nut (D) to 157–173 ft·lbf (212–234 N·m).

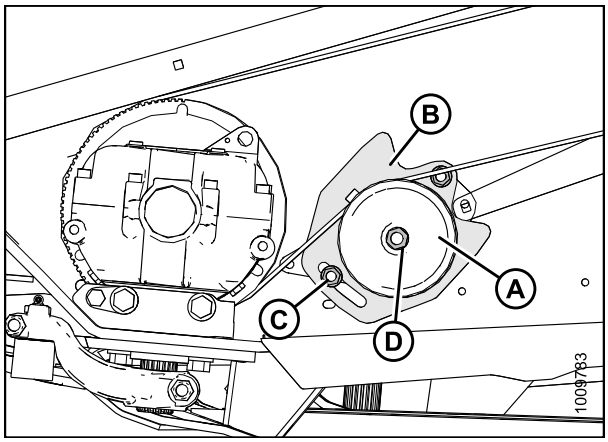


Figure 6.83: Knife Drive

7. Tension knife drive belt. Refer to *Tensioning Timed Knife Drive Belts, page 168*.
8. Close endshield. Refer to *Closing Endshields, page 38*.
9. Reinstall the access panel (A) and secure it with a bolt.

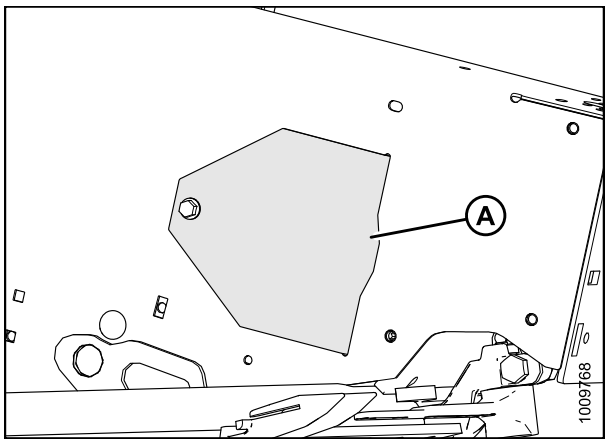


Figure 6.84: Access Cover

Tensioning Timed Knife Drive Belts

This describes the tensioning procedure for the timed left and right knife drive belts. The illustrations for the right side are opposite to what is shown.

IMPORTANT:
To prolong belt and drive life, do **NOT** over-tighten belt.

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

1. Open left endshield. Refer to *Opening Endshields, page 37*.
2. Loosen two nuts (A) on knife drive belt idler bracket.

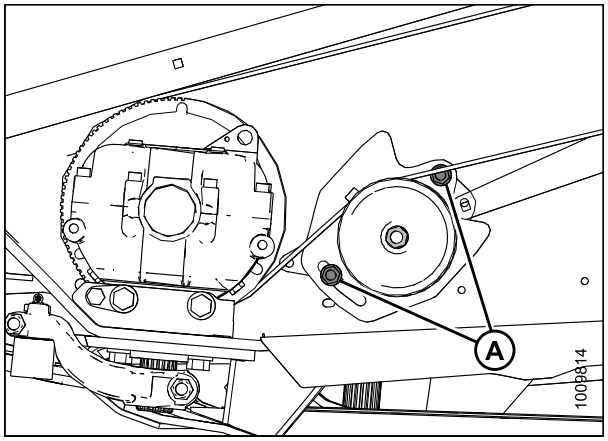


Figure 6.85: Knife Drive

3. Position pry bar (A) under the idler bracket (C), and push the bracket up until a force of 6 lb (27 N) deflects the belt 1/2 in. (13 mm) at mid-point of the upper span.

NOTE:
A piece of wood (B) is placed under pry bar (A) to protect paint.

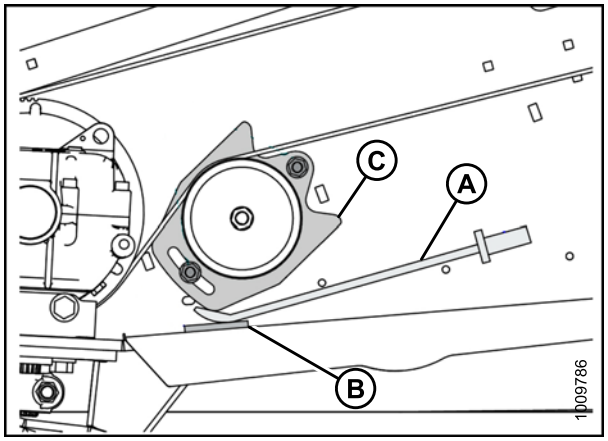


Figure 6.86: Knife Drive

4. Tighten nuts (C) to 54–59 ft·lbf (73–80 N·m) when proper belt tension is achieved.
5. Remove pry bar (A) and wood (B).

NOTE:
Readjust tension of a new belt after a short run-in period (about five hours).

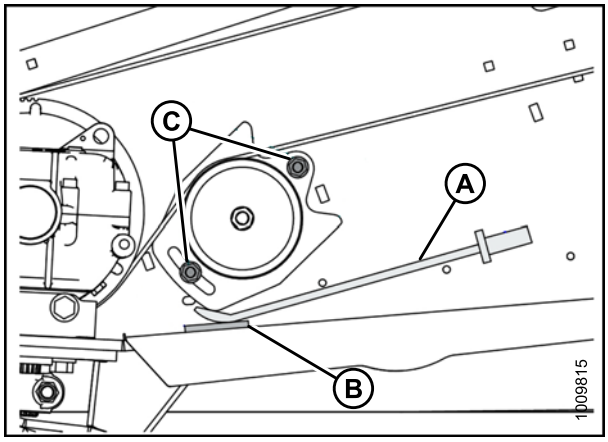


Figure 6.87: Knife Drive

6. Check that clearance (A) between belt (B) and guide (C) is 1/32–1/16 in. (0.5–1.5 mm).
7. If necessary, loosen bolts (D) and adjust guide as required. Tighten bolts.
8. Repeat procedure for opposite side of header.
9. Close endshields.

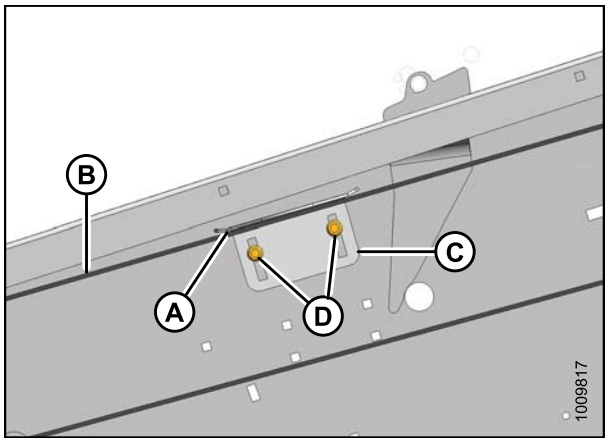


Figure 6.88: Belt Guide

Adjusting Double Knife Timing

Timed double knife D65 draper headers, 35 ft. and smaller, require that knives are properly timed to move in opposite directions.

1. Open both endshields. Refer to *Opening Endshields, page 37*.
2. Remove the belt on the right-hand side. Refer to *Removing Timed Knife Drive Belt, page 165*.

3. 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.

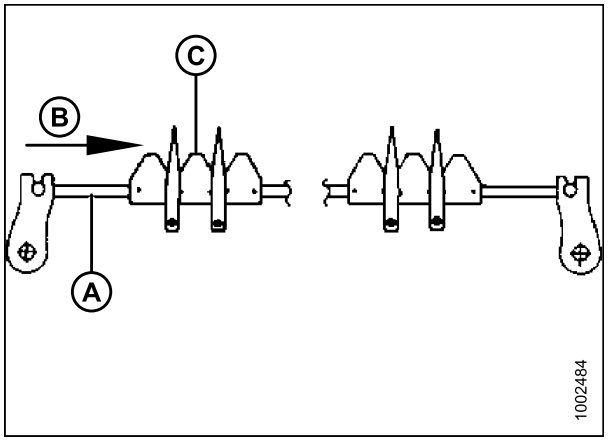


Figure 6.89: Timing: Left Side

4. 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.

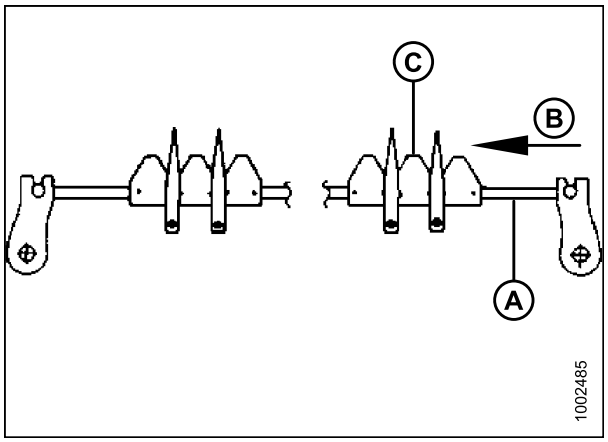


Figure 6.90: Timing: Right Side

5. Install right-hand belt (A).

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

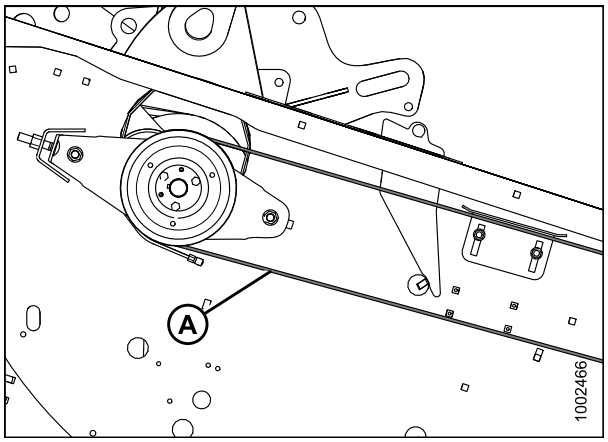


Figure 6.91: Knife Drive: Right Side

6. 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).

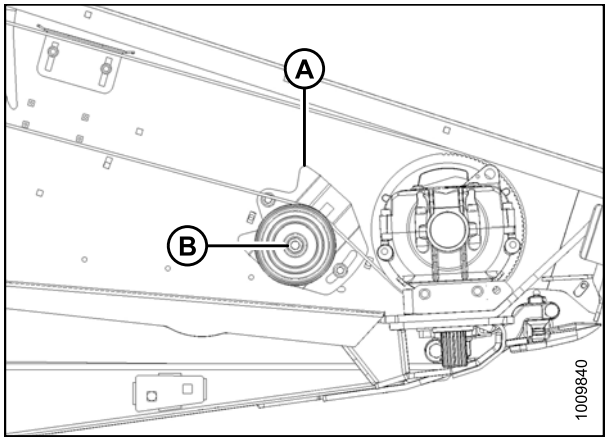


Figure 6.92: Knife Drive: Right Side

7. Position pry bar (A) under the idler bracket (C), and push the bracket up until a force of 6 lb (27 N) deflects the belt 1/2 in. (13 mm) at mid-point of the upper span.

   NOTE:
   Place a piece of wood (B) under pry bar (A) to protect paint.

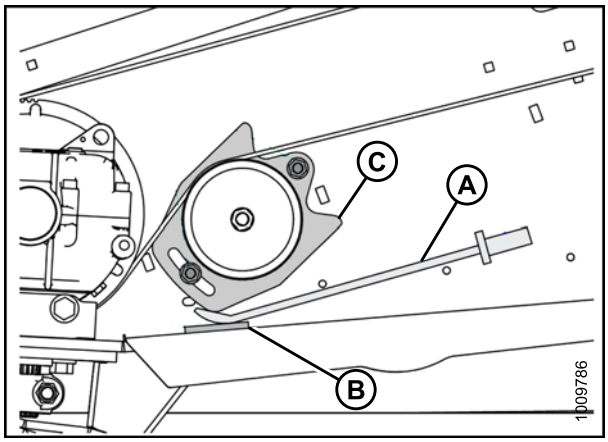


Figure 6.93: Left Side Shown-Right Side Opposite

8. Tighten nuts (C) to 54–59 ft·lbf (73–80 N·m) when proper belt tension is achieved.
9. Check that the timing belts are properly seated in the grooves on both driver and driven pulleys.
10. Check for correct knife timing by rotating the drive slowly by hand and observe 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.

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

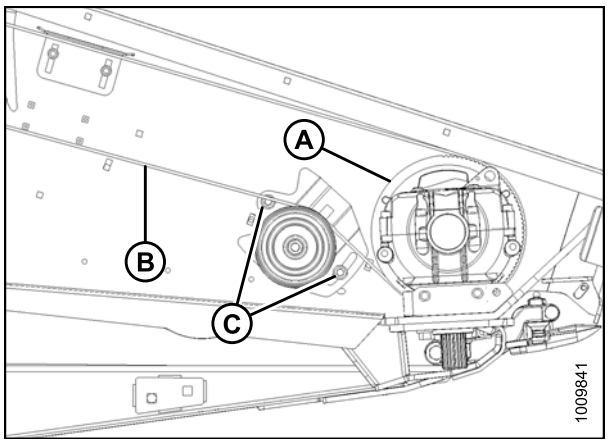


Figure 6.94: Knife Drive: Right Side

12. 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.

13. Recheck the timing.

14. Close both endshields. Refer to *Closing Endshields, page 38*.

Adjusting Belt Tracking

The following procedure is applicable to the left side knife drive and the right side knife drive on timed drive headers.

IMPORTANT:
A belt that is not tracking properly is subject to premature failure. Ensure the pulleys are aligned and parallel. Follow the belt tensioning procedures in this manual to avoid misalignment.

The cogged timing belt should be centered on the knife drive box pulley and at least 0.08 in. (2 mm) from either edge when the header is running. The belt should also avoid constant contact with the flanges on the drive pulley but occasional contact is acceptable. A gap should be visible between the belt and the pulley flanges.

To correct tracking problems, proceed as follows:

1. Open the endshields.

CAUTION

Exercise extreme care when operating the header with the endshields open.

2. Operate the header and observe how the belt is tracking on both the drive pulley and the knife drive box pulley on both sides of the header. Shut down the windrower and remove key from ignition before making any adjustments.

3. If the belt is tracking toward the inboard side of the drive pulley, the likely cause is a toe-out problem (belt tends to move toward the low tension side of the pulley [inboard]). Proceed to Step *6., Adjusting Belt Tracking, page 173* to correct the problem.

4. If the belt is tracking toward the outboard side of the drive pulley, the likely cause is a toe-in problem (belt tends to move toward the low tension side of the pulley [outboard]). Proceed to Step *6., Adjusting Belt Tracking, page 173* to correct the problem.

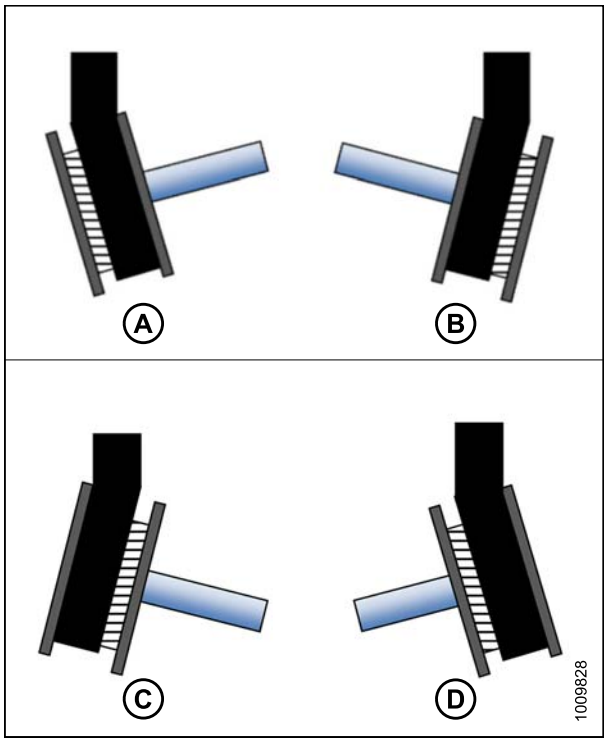


Figure 6.95: Knife Drive Pulley

A - Toe-Out: Left Side
B - Toe-Out: Right Side
C - Toe-In: Left Side
D - Toe-In: Right Side

5. If the belt (A) is tracking to one side of the knife drive box pulley (B), the likely cause is an out of position idler pulley (C). Proceed to Step *7., Adjusting Belt Tracking, page 174* to correct the problem.

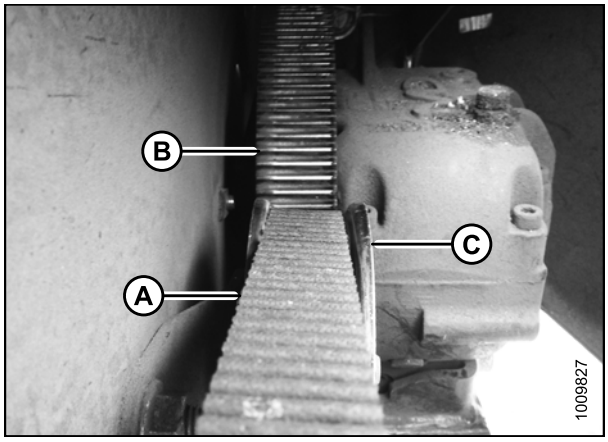


Figure 6.96: Knife Drive Belt

6. To correct the tracking problem on the drive pulley, adjust the position of the cross shaft support tube as follows:
   a. Loosen nut (A) on support assembly (B).
   b. Slide the support (B) rearward in slot (C) to correct toe-out condition, or forward to correct toe-in condition.
   c. Retighten nut (A).
   d. Operate the header and check the tracking. Adjust the support assembly as required.
   e. If the belt tracking problem continues, proceed to Step *8., Adjusting Belt Tracking, page 175*.

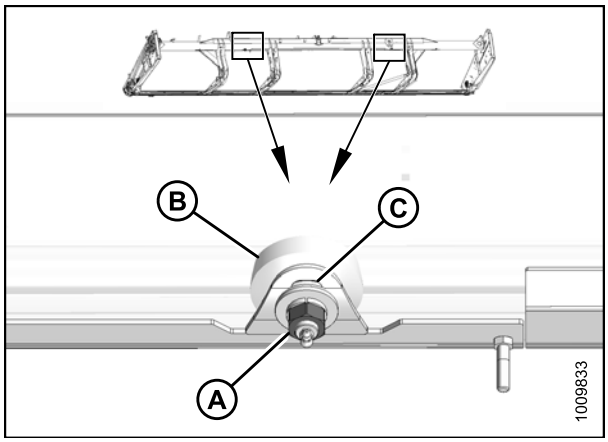


Figure 6.97: Cross-Shaft Support

7. To correct the tracking problem on the knife drive box pulley, adjust the position of the idler as follows:
   a. Loosen nuts (A) and (B) and move bracket and idler until belt is loose.
   b. Remove nut (B) securing idler to bracket, and remove lock washer, idler pulley, and flat washer.
   c. Install the idler pulley (C), ensuring it lines up with the knife drive box pulley, using flat washer(s) (D) as required.
   d. Reinstall lock washer (E) and nut (B).
   e. Tension the belt. Refer to *Tensioning Timed Knife Drive Belts, page 168*.
   f. Operate the header and check the tracking.

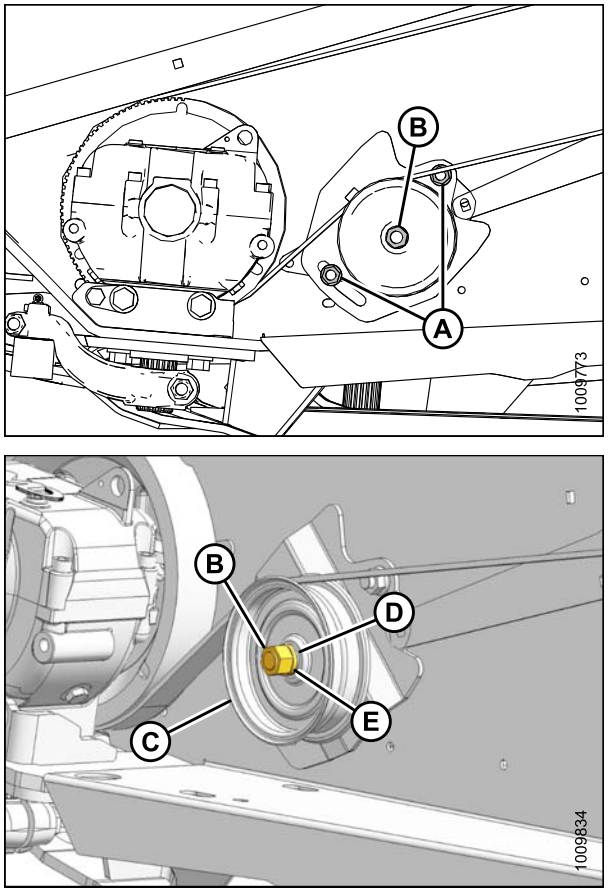


Figure 6.98: Knife Drive

8. If further adjustment to correct the drive pulley tracking, proceed as follows:
   a. Loosen nut (A) on idler and nuts (B) on idler bracket.
   b. Loosen nuts (C) at drive pulley location.
   c. Turn adjuster bolt (D) clockwise to correct a toe-in problem, which will allow the belt to track inboard.
   d. Turn adjuster bolt (D) counterclockwise to correct a toe-out problem, which will allow the belt to track outboard.
   e. Tighten nuts (C) at drive pulley location.
   f. Tension the belt. Refer to *Tensioning Timed Knife Drive Belts, page 168*.
   g. Operate the header and check the tracking. Adjust the drive pulley if required as per the above steps.

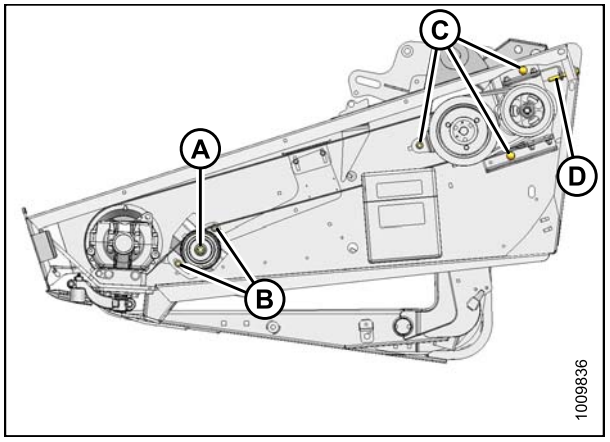


Figure 6.99: Knife Drive: Left Side

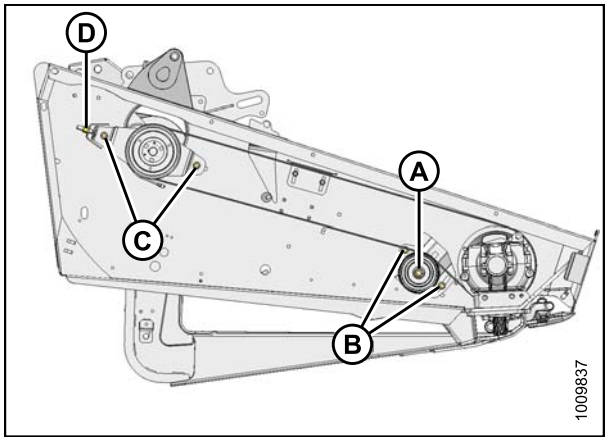


Figure 6.100: Knife Drive: Right Side

6.7 Header Drapers

The draper should be replaced or repaired if it is torn, missing slats, or cracked.

6.7.1 Removing Drapers

To remove a draper, follow these steps:

WARNING

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

1. Raise reel and engage reel safety props.
2. Raise header and engage safety props.
3. Move draper until draper joint is in work area.

NOTE:
Deck can also be shifted towards center to provide opening at endsheet.

4. Release tension on the draper. Refer to *6.7.3 Adjusting Draper Tension, page 178*.
5. Remove fasteners (A) and tube connectors (B) at the draper joint.
6. Pull draper from deck.

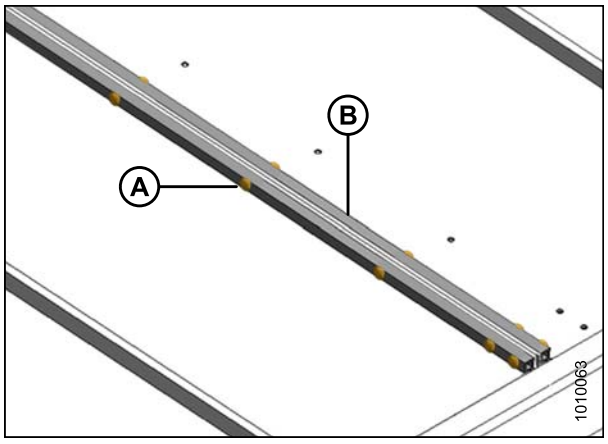


Figure 6.101: Draper Connector

6.7.2 Installing Drapers

To install a draper, follow these steps:

WARNING

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

NOTE:
Check deck height before installing drapers. Refer to *6.7.7 Adjusting Deck Height, page 186*.

1. Apply talc (baby powder) or talc/graphite lubricant mix to the draper surface that forms the seal with the cutter bar and to the underside draper guides.
2. Insert draper into deck at outboard end, under the rollers. Pull draper into deck while feeding it at the end.
3. Feed in the draper until it can be wrapped around the drive roller.
4. Similarly, insert the other end into the deck over the rollers. Pull draper fully into the deck.

Figure 6.102: Installing Draper

5. Loosen the rear deck deflector (A) by loosening mounting bolts (B). This may help with draper installation.

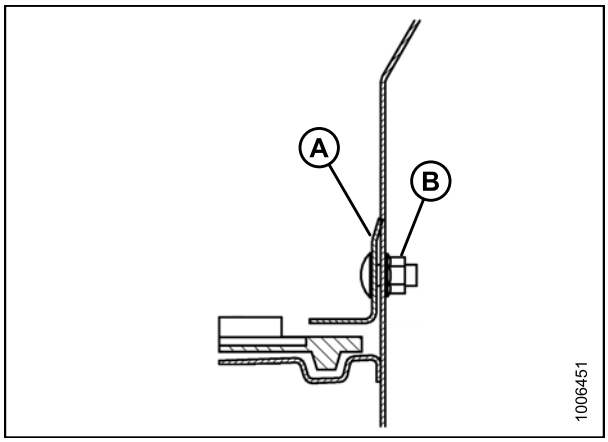


Figure 6.103: Backsheet Deflector

6. Attach ends of draper with tube connectors (B), screws (A) with heads facing the center opening, and nuts.
7. Adjust tension. Refer to *6.7.3 Adjusting Draper Tension, page 178*.

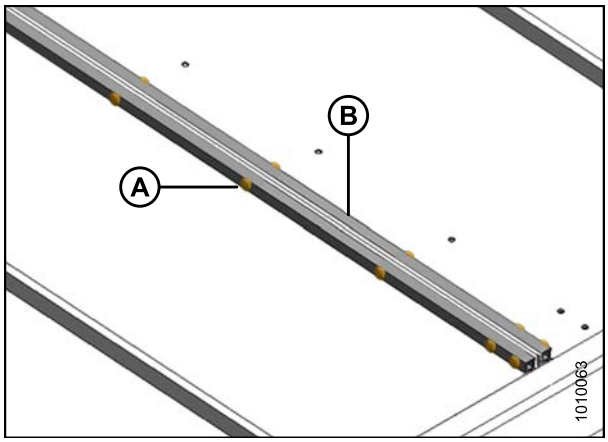


Figure 6.104: Draper Connector

8. Check for seal between the drapers and the cutter bar. There should be a 0.04–0.08 in. (1–2 mm) gap (A) between the cutterbar (C) and the draper (B).
9. To achieve the proper gap, refer to *6.7.7 Adjusting Deck Height, page 186*.

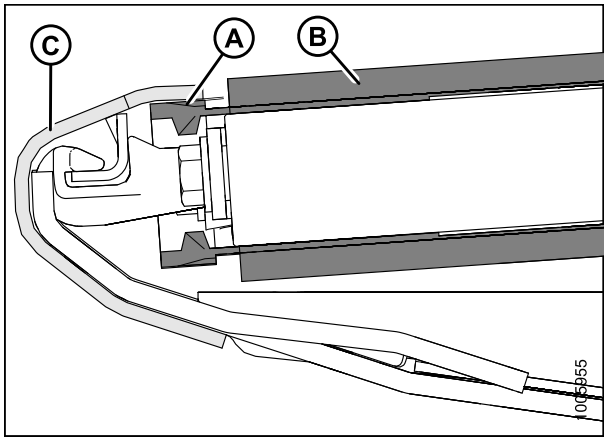


Figure 6.105: Draper Seal

10. If required, adjust backsheet deflector (A) by loosening nut (D) and moving deflector (A) until there is a 1/32–5/16 in. (1–7 mm) gap (C) between the draper (B) and the deflector (A).
11. Operate the drapers with the engine at idle so the talc or talc/graphite lubricant will contact and adhere to the draper seal surfaces.

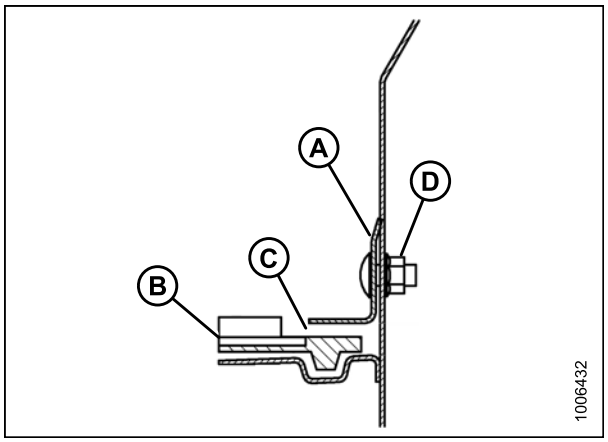


Figure 6.106: Backsheet Deflector

6.7.3 Adjusting Draper Tension

WARNING

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

NOTE:
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.

1. Ensure white bar (A) is about halfway in the window.

CAUTION

Check to be sure all bystanders have cleared the area.

2. Start engine and raise header.
3. Stop engine, remove key, and engage header safety props.

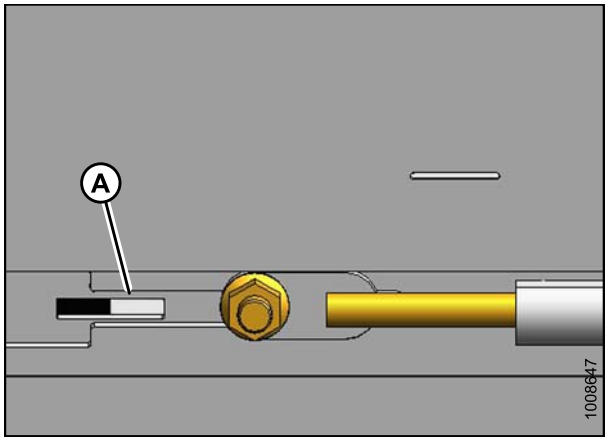


Figure 6.107: Tension Adjuster: Left-Hand Shown – Right-Hand Opposite

4. Check that draper guide (rubber track on underside of draper) is properly engaged in groove of drive roller.

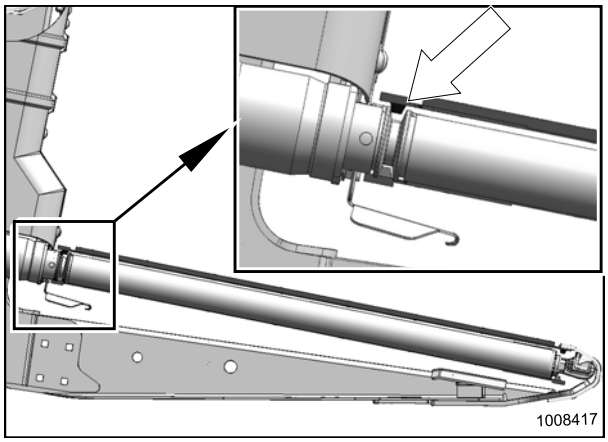


Figure 6.108: Drive Roller

5. Check that idler roller is between the guides.

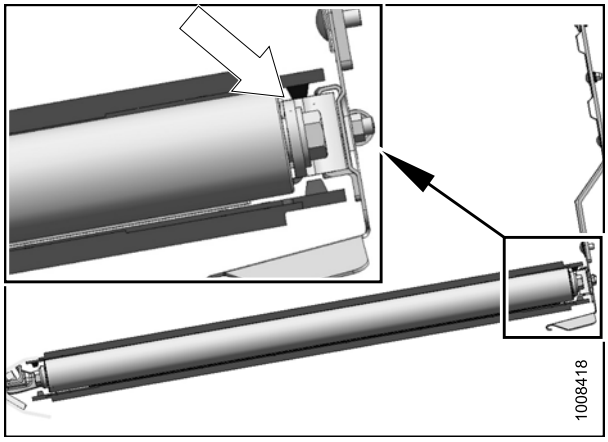


Figure 6.109: Idler Roller

IMPORTANT:
Do **NOT** adjust nut (C). This nut is used for draper alignment only.

6. Turn adjuster bolt (A) counterclockwise to loosen, and white indicator bar (B) will move outboard in direction of arrow (D) to indicate that draper is loosening. Loosen until bar is about halfway in window.
7. Turn adjuster bolt (A) clockwise to tighten, and white indicator bar (B) will move inboard in direction of arrow (E) to indicate that draper is tightening. Tighten until bar is about halfway in window.

IMPORTANT:

- To avoid premature failure of draper, draper rollers, and/or tightener components, do not operate with tension set so that white bar is not visible.
- To prevent the draper from scooping dirt, ensure draper is tight enough that it does not sag below point where cutterbar contacts the ground.

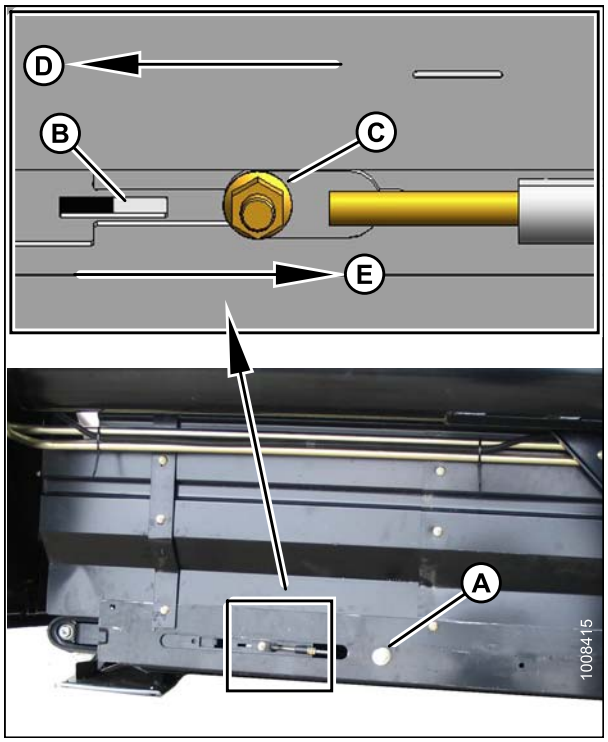


Figure 6.110: Tension Adjuster: Left-Hand Shown – Right-Hand Opposite

6.7.4 Removing Endless Draper

To replace an endless draper, follow these steps:

DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine, always stop engine, remove key, and engage safety props before going under header for any reason. Refer to the windrower operator's manual for instructions regarding the proper use and storage of header safety props.

1. Raise reel and engage reel props.
2. Raise header and install safety props.

3. Turn bolt (A) counterclockwise to fully loosen draper. White indicator bar (B) will move outboard in direction of arrow to indicate that draper is loosening.

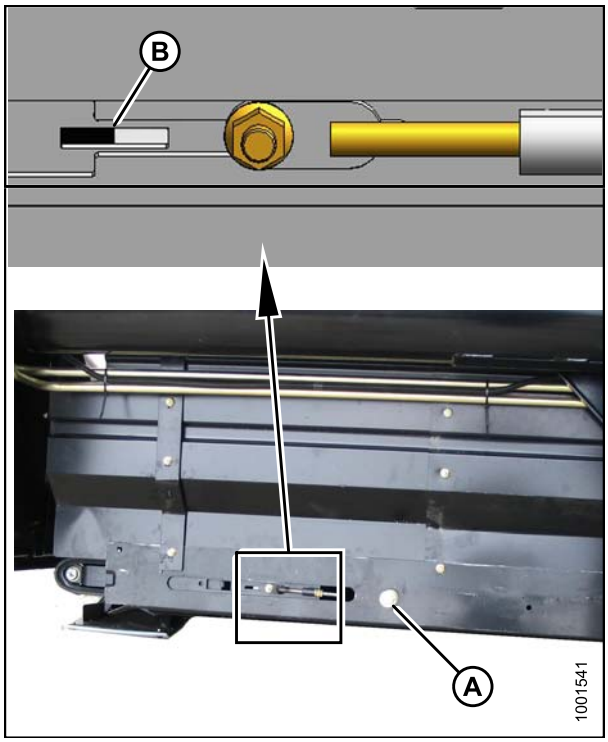


Figure 6.111: Draper Tensioner

4. Push draper away from cutterbar (as shown) to expose deck support (A).

   NOTE:
   There are two or three supports, depending on header size.

5. Remove two center nuts (B) at each support.
6. Move deck away from cutterbar to disengage deck supports.

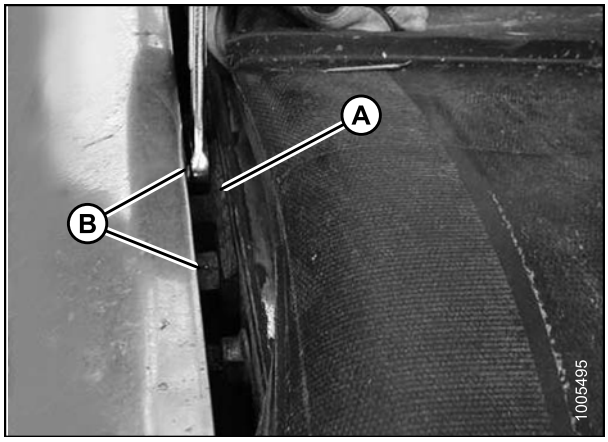


Figure 6.112: Deck Support

7. Insert a pry bar (A) in hole in deck located at approximately the deck mid-point, and lift deck clear of cutterbar.

   NOTE:
   Pry bar should be of sufficient length to accommodate width of draper.

8. Support pry bar (A) on a stand (B) of suitable height.

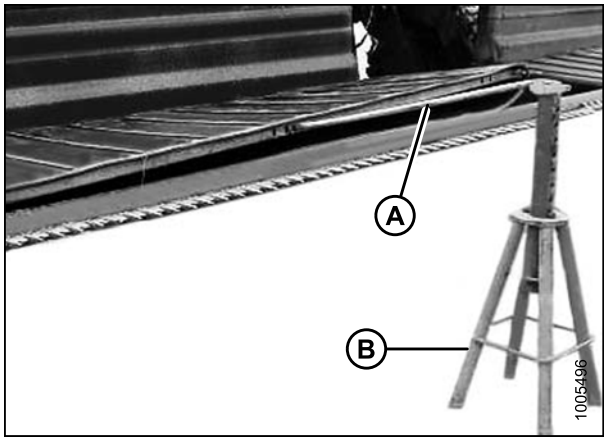


Figure 6.113: Lifting the Deck

9. Pull draper off deck onto pry bar.
10. Remove stand (B), draper, and pry bar (A).

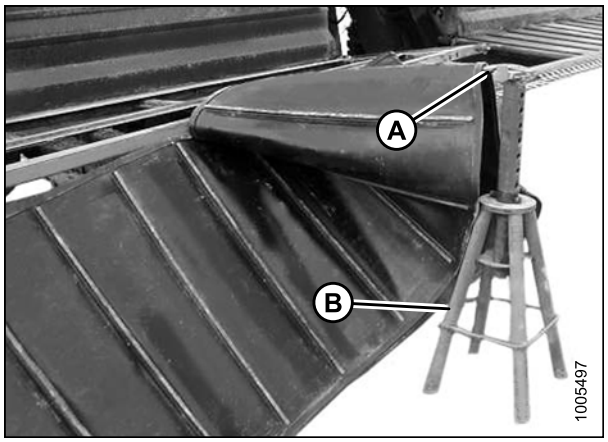


Figure 6.114: Removing Draper

6.7.5 Installing Endless Draper

To install an endless draper, follow these steps:

DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine, always stop engine, remove key, and engage safety props before going under header for any reason. Refer to the windrower operator's manual for instructions regarding the proper use and storage of header safety props.

1. Insert a pry bar (A) through draper and locate bar in hole in deck located at approximately the deck mid-point.

   NOTE:
   Pry bar should be sufficient length to accommodate width of draper.

2. Lift deck clear of cutterbar and support bar on a stand (B) of suitable height.
3. Slide draper onto deck.

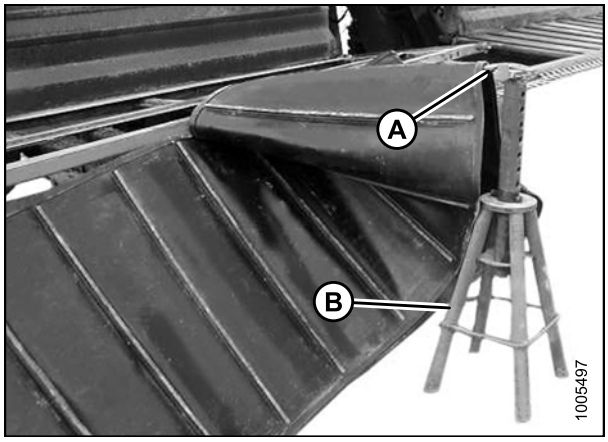


Figure 6.115: Supporting the Draper

4. Lift deck, remove stand (B), and lower deck into position. Remove pry bar (A).

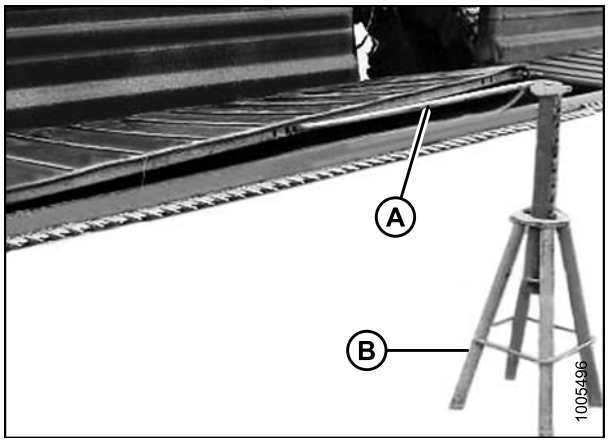


Figure 6.116: Lifting the Deck

5. Line-up deck supports (A) with bolts in deck.
6. Move deck towards cutterbar to engage deck supports.
7. Install nuts (B) and tighten.
8. Adjust draper tension. Refer to Section *6.7.3 Adjusting Draper Tension, page 178*.

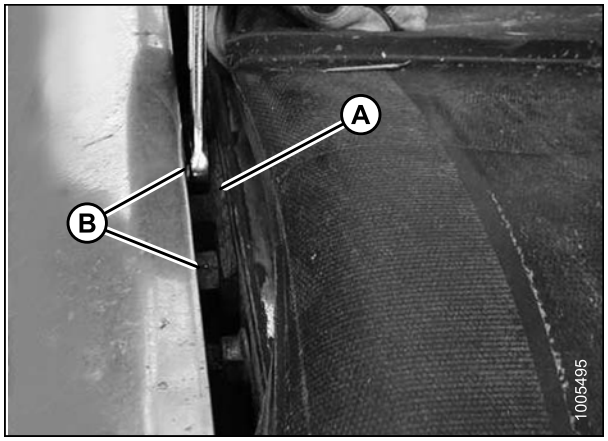


Figure 6.117: Deck Support

6.7.6 Adjusting Header Draper Tracking

Each draper deck has a fixed drive roller (A) and a spring-loaded idler roller (B) that can be aligned by adjuster rods so that the draper tracks properly on the rollers.

If the draper is tracking incorrectly, refer to the following directions to correct the tracking:

CAUTION

To avoid personal injury, before servicing machine or opening drive covers, refer to *6.1 Preparation for Servicing, page 113*.

Table 6.14 Header Draper Tracking

Tracking	At Location	Adjustment	Method
Backward	**Drive** Roller	Increase **'X'**	Tighten nut (C)
Forward		Decrease **'X'**	Loosen nut (C)
Backward	**Idler** Roller	Increase **'Y'**	Tighten nut (C)
Forward		Decrease **'Y'**	Loosen nut (C)

1. Refer to the above table to determine which roller requires adjustment and the required adjustment.
2. To change **'X'**, the back end of the roller is adjusted with the adjuster mechanism at the inboard end of the deck as follows:

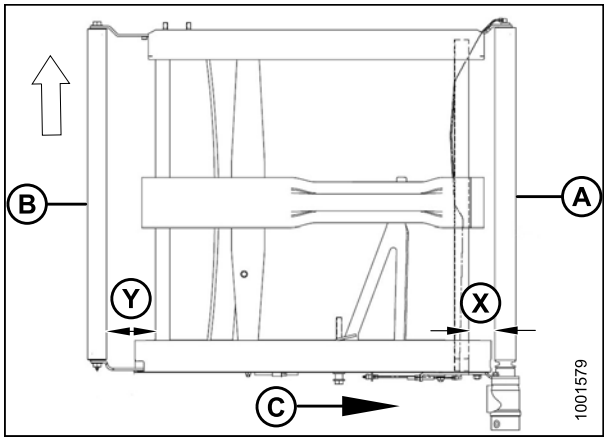


Figure 6.118: Adjustments

A - Drive Roller **B - Idler Roller**
C - Draper Direction
X - Drive Roller Adjust. **Y - Idler Roller Adjust.**

3. Adjust the **drive** roller at **'X'** as follows:
   a. Loosen nuts (A) and jam nut (B).
   b. Turn adjuster nut (C).

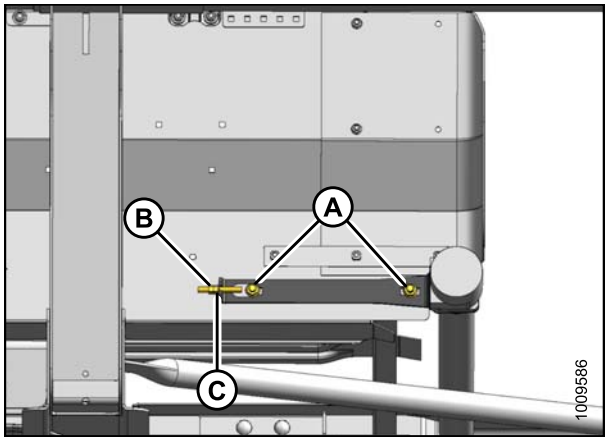


Figure 6.119: Drive Roller

4. Adjust the **idler** roller **'Y'** as follows:
   a. Loosen nut (A) and jam nut (B).
   b. Turn adjuster nut (C).
5. If the draper does not track at the idler roller end after adjusting the idler roller, the drive roller is likely not square to the deck. Adjust the drive roller, and then readjust the idler roller.

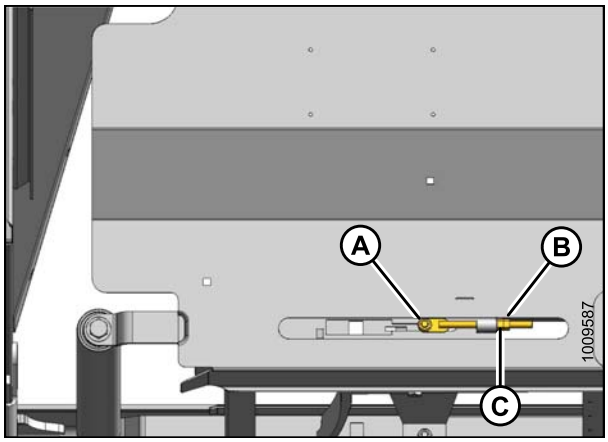


Figure 6.120: Idler Roller

6.7.7 Adjusting Deck Height

To prevent material from entering drapers and cutterbar, maintain deck height so that draper runs just below cutterbar with maximum 1/32 in. (1 mm) gap (A), or with draper deflected down slightly (up to 1/16 in. [1.5 mm]) to create a seal.

NOTE:
Measurement is at supports with header in working position and decks slid fully ahead.

WARNING

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

DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine, always stop engine, remove key, and engage safety props before going under header for any reason. Refer to the windrower operator's manual for instructions regarding the proper use and storage of header safety props.

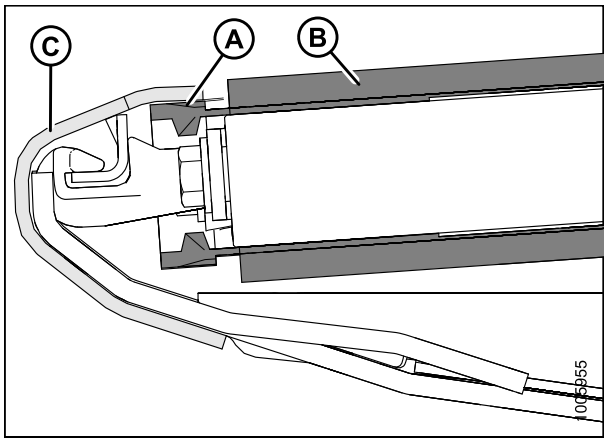


Figure 6.121: Draper Seal

A - Gap (Draper to Cutterbar) B - Draper C - Cutterbar

To adjust deck height, follow these steps:

1. Loosen tension on draper. Refer to *6.7.3 Adjusting Draper Tension, page 178*.
2. Lift draper at front edge past cutterbar to expose the support.
3. Loosen two lock nuts (A) **ONE-HALF TURN ONLY** on deck support (B).

NOTE:
The the number of supports is based on header size; four on single reel 15–30 ft., and eight on double reel 30–40 ft.

4. Tap deck (C) to lower deck relative to supports. Tap support (B) using a punch to raise deck relative to support.

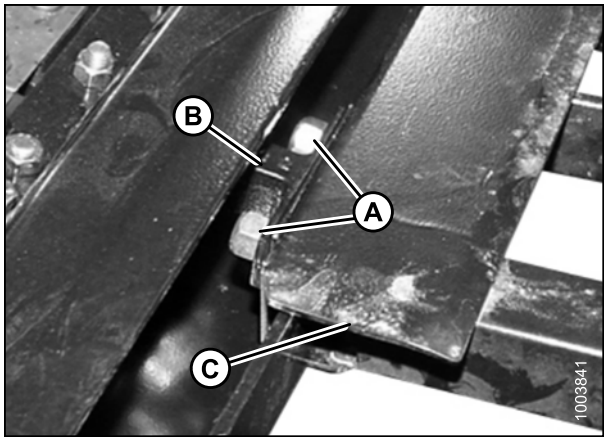


Figure 6.122: Deck Support

5. Set deck (A) to 5/16–3/8 in. (8–9 mm) below the cutterbar (C) to create a seal.
6. Tighten deck support hardware (D).
7. Check dimension (B) again it should be set to 5/16–3/8 in. (8–9 mm).
8. Tension draper. Refer to *6.7.3 Adjusting Draper Tension, page 178*.

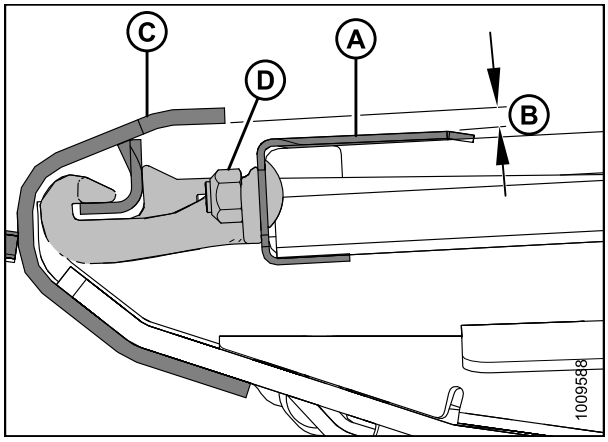


Figure 6.123: Deck Support

9. Adjust the backsheet deflector (A). Loosen nut (D) and adjust deflector (A) until there is a 0.04–0.3 in. (1–7 mm) gap (C) between the draper (B) and the deflector (A).

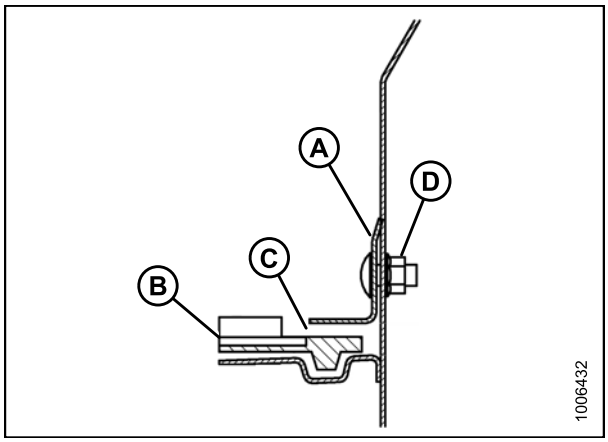


Figure 6.124: Backsheet Deflector

6.7.8 Draper Roller Maintenance

The draper rollers have non-greaseable bearings. The external seal should be checked every 200 hours (and more frequently in sandy conditions) to obtain the maximum bearing life.

Inspecting Draper Roller Bearing

Procedure to inspect draper roller bearings.

1. If a bad bearing is suspected in one of the draper rollers, a quick way to check is using a infrared thermometer.
2. Engage header and run for approximately 3 minutes.
3. Check the temperature each of the roller arms (A), (B), (C) on each deck. They should not exceed 80 F° (44 C°) above ambient temperature.

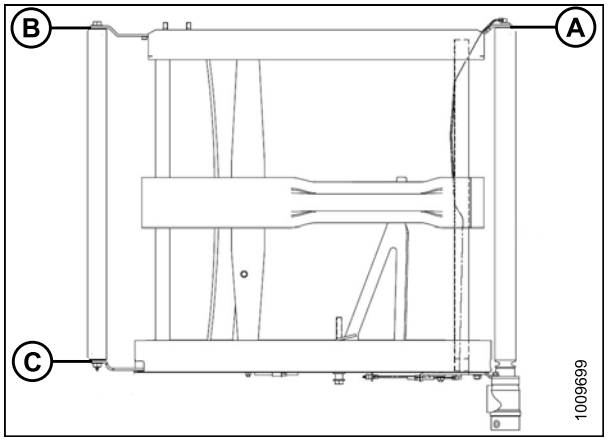


Figure 6.125: Roller Arms

Draper Deck Idler Roller

Removing Draper Idler Roller

1. If draper connector is not visible, engage the header until the connector is accessible, preferably close to the outboard end of the deck.
2. Raise header and reel, shutdown the combine.
3. Engage combine safety props and reel lift cylinder safety props.
4. Loosen draper by turning adjuster bolt (A) counterclockwise.

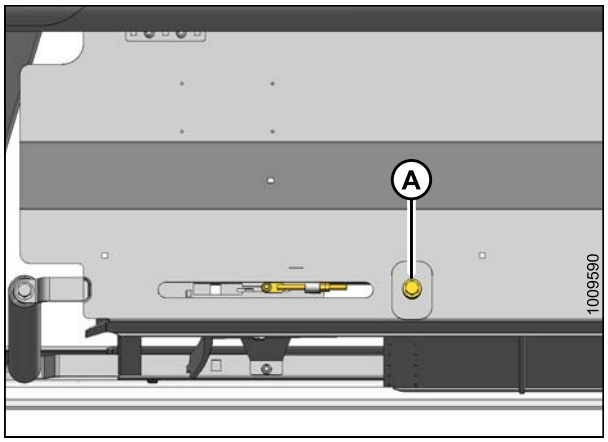


Figure 6.126: Tensioner

5. Remove fasteners (A) and tube connectors (B) at the draper joint to uncouple the draper.
6. Pull the draper off the idler roller.

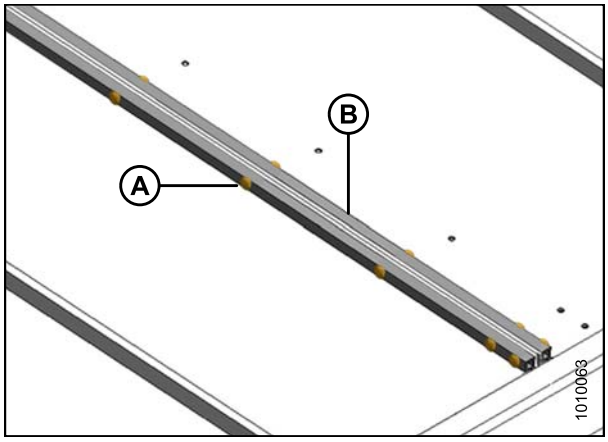


Figure 6.127: Draper Connector

7. Remove bolts (A) and washer at ends of idler roller.
8. Spread roller arms (B) and (C), and remove idler roller.

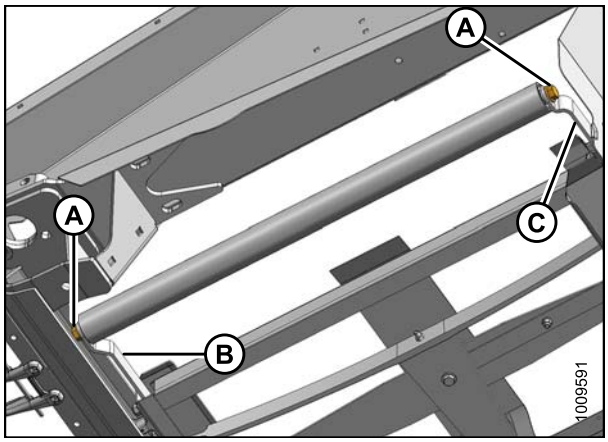


Figure 6.128: Idler Roller

Replacing Draper Idler Roller Bearing

1. Remove draper idler roller assembly. Refer to *Removing Draper Idler Roller, page 188*.

2. Remove bearing assembly (A) and seal (B) from roller tube (C) as follows:
   a. Attach a slide hammer (D) to threaded shaft (E) in bearing assembly.
   b. Tap out the bearing assembly (A) and seal (B).
3. Clean inside of roller tube (C). Check tube for wear or damage and replace if necessary.

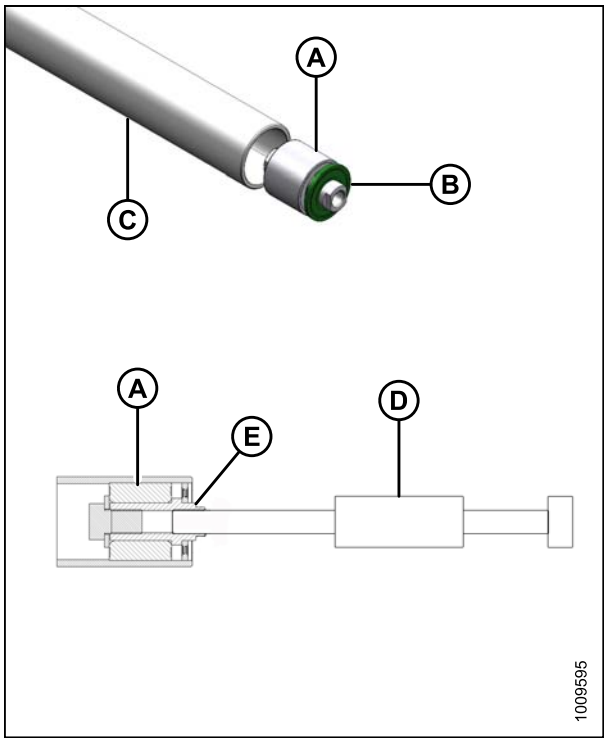


Figure 6.129: Idler Roller Bearing

4. Install new bearing assembly (A) into roller by pushing on outer race of bearing. The bearing is fully positioned when the 9/16 in. (14 mm) dimension (B) is achieved.
5. Apply the recommended grease in front of bearing. Refer to *6.2.2 Recommended Fluids and Lubricants, page 115*.
6. Locate seal (C) at roller opening, and position a flat washer (1.0 in. I.D. x 2.0 in. O.D.) on seal.
7. Tap seal into roller opening with a suitable socket on the washer until it seats on the bearing assembly (A). The seal (C) is fully positioned when the 1/8 in. (3 mm) dimension (D) is achieved.

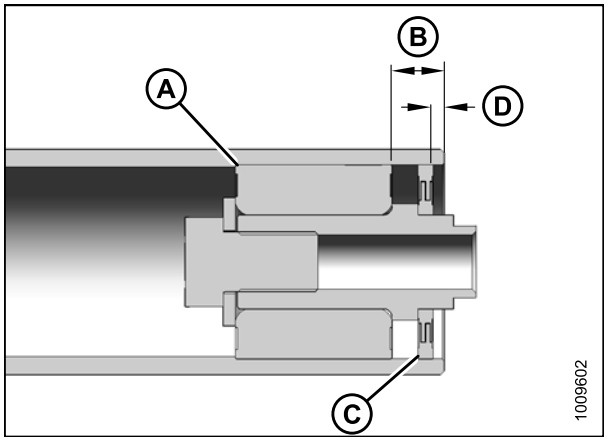


Figure 6.130: Idler Roller Bearing

Installing Draper Idler Roller

1. Position stub shaft in idler roller in forward arm (B) on deck.
2. Push on roller to deflect forward arm slightly so that stub shaft at rear of roller can be slipped into rear arm (C).
3. Install bolts (A) with washers, and torque to 70 lb-ft (93 N·m).
4. Wrap the draper over the idler roller, re-connect it and set the tension. See *6.7.2 Installing Drapers, page 176*.
5. Run machine to verify that draper tracks correctly. Adjust tracking if required. See *6.7.6 Adjusting Header Draper Tracking, page 184*.

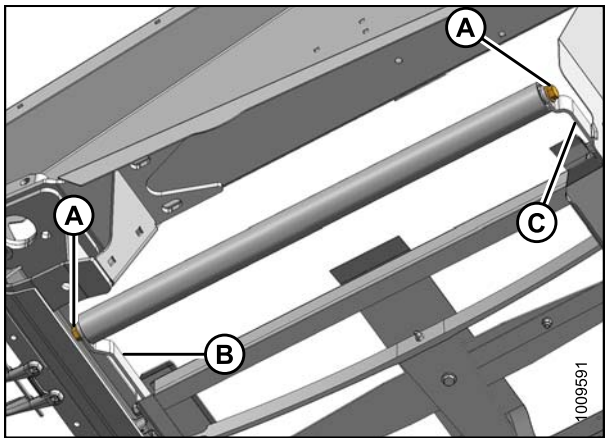


Figure 6.131: Idler Roller

Draper Drive Roller

Removing Draper Drive Roller

1. If draper connector is not visible, engage the header until the connector is accessible, preferably close to the outboard end of the deck.

DANGER

Engage header safety props and reel props before working under header or reel.

2. Raise header and reel, shutdown the engine.
3. Engage header lift cylinder safety props and reel lift cylinder safety props.
4. Loosen draper by turning adjuster bolt (A) counterclockwise.

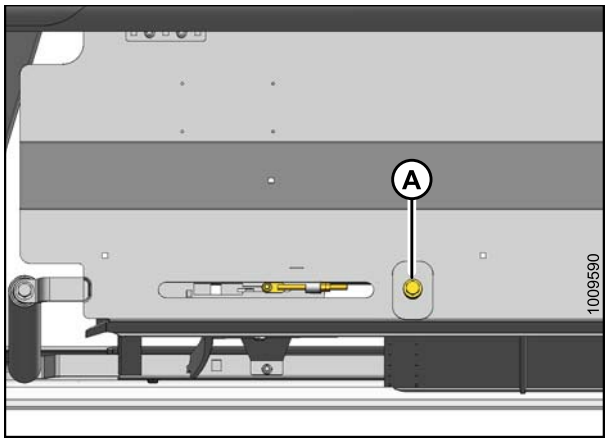


Figure 6.132: Tensioner

5. Remove fasteners (A) and tube connectors (B) at the draper joint to uncouple the draper.
6. Pull the draper off the drive roller.

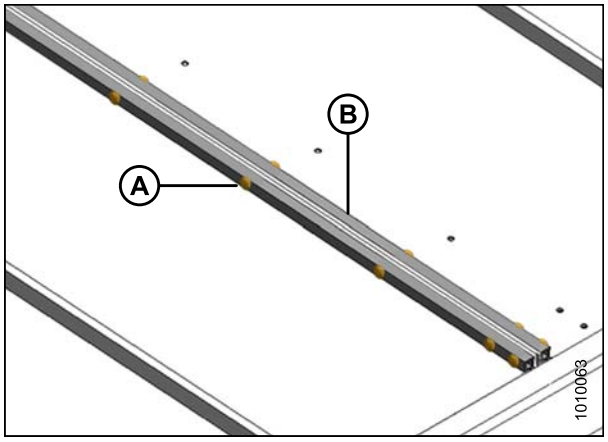


Figure 6.133: Draper Connector

7. Line up the setscrews with the hole (A) in the guard. Remove the two setscrews that hold the motor onto the drive roller.

NOTE:
The setscrews are a 1/4 turn apart.

8. Remove the four bolts (B) that hold motor to the drive roller arm.

NOTE:
Plastic shield (C) may require removal to gain access to the top bolt.

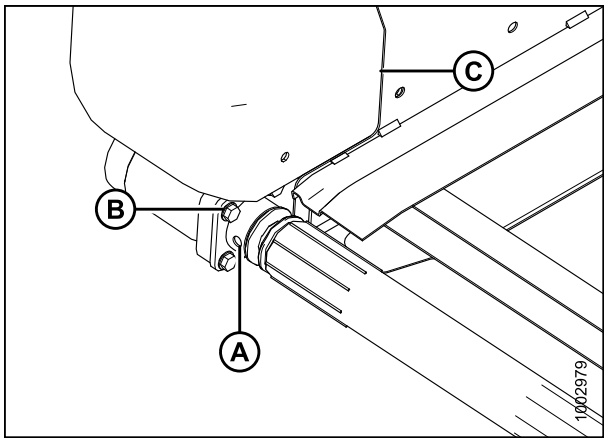


Figure 6.134: Drive Roller

9. Remove bolt (A) that secures the other end of the drive roller (B) to the support arm.
10. Remove the drive roller (B).

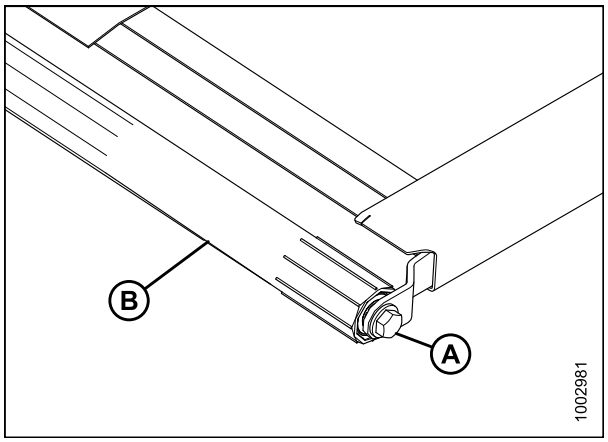


Figure 6.135: Drive Roller

Replacing Draper Drive Roller Bearing

1. Remove draper idler roller assembly. Refer to *Removing Draper Drive Roller, page 191*.

2. Remove bearing assembly (A) and seal (B) from roller tube (C) as follows:
   a. Attach a slide hammer (D) to threaded shaft (E) in bearing assembly.
   b. Tap out the bearing assembly (A) and seal (B).
3. Clean inside of roller tube (C). Check tube for wear or damage and replace if necessary.

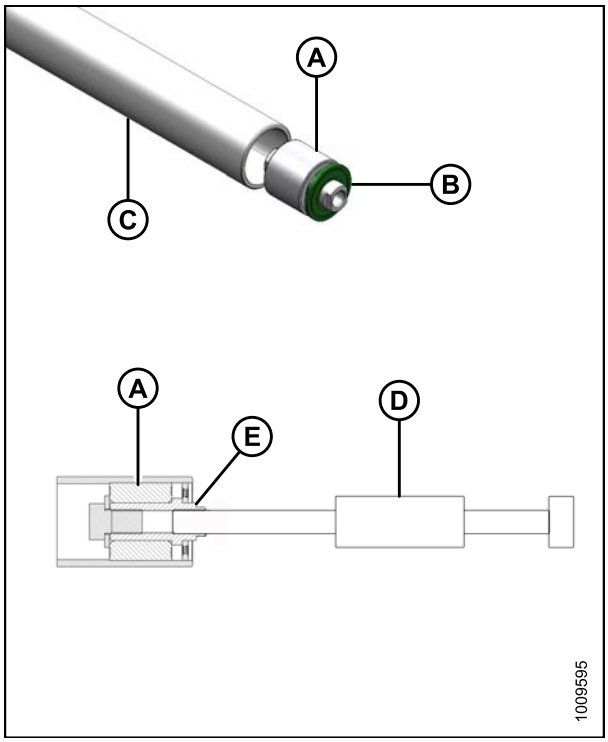


Figure 6.136: Drive Roller Bearing

4. Install new bearing assembly (A) into roller by pushing on outer race of bearing. The bearing is fully positioned when the 9/16 in. (14 mm) dimension (B) is achieved.
5. Apply the recommended grease in front of bearing. Refer to *6.2.2 Recommended Fluids and Lubricants, page 115*.
6. Locate seal (C) at roller opening, and position a flat washer (1.0 in. I.D. x 2.0 in. O.D.) on seal.
7. Tap seal into roller opening with a suitable socket on the washer until it seats on the bearing assembly (A). The seal (C) is fully positioned when the 1/8 in. (3 mm) dimension (D) is achieved.

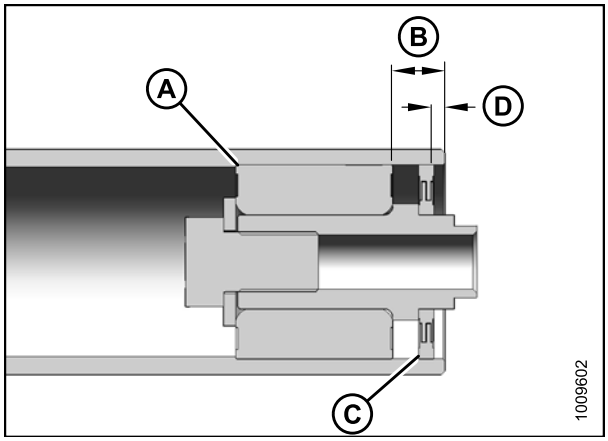


Figure 6.137: Drive Roller Bearing

Installing Draper Drive Roller

1. Locate the drive roller (B) between the roller support arms.
2. Install bolt (A) that holds the drive roller to the arm closest to the cutterbar. Torque bolt to 70 ft·lbf (95 N·m).
3. Grease motor shaft and insert into the end of the drive roller.

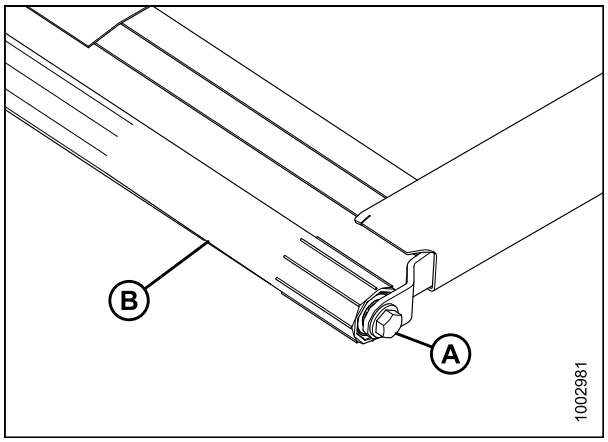


Figure 6.138: Drive Roller

4. Secure motor to the roller support with four bolts (A). Torque to 20 ft·lbf (27 N·m).

NOTE:
Tighten any loosened bolt and reinstall plastic shield (B), if removed.

5. Tighten the two set screws through access hole (C).

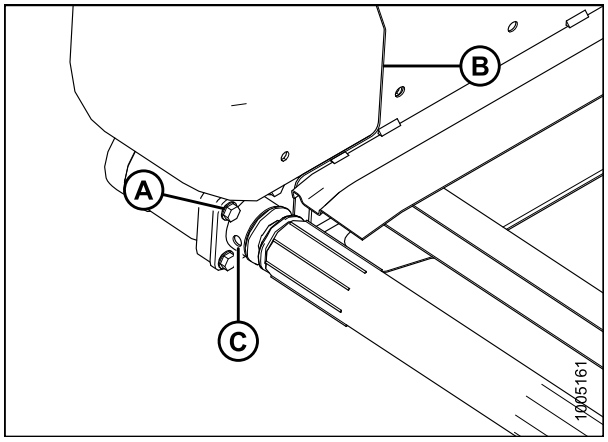


Figure 6.139: Drive Roller

6. Wrap the draper over the drive roller, and attach ends of draper with tube connectors (B), screws (A) with heads facing the center opening, and nuts.

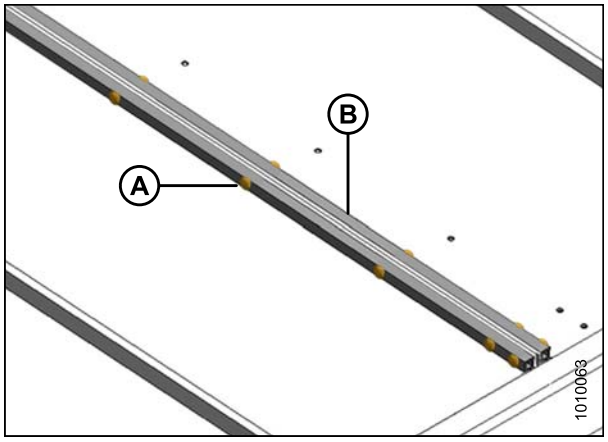


Figure 6.140: Draper Connector

7. Tension the draper, with tensioner bolt (A) and follow the directions on the decal for proper draper tensioning.
8. Disengage the reel and header safety props.
9. Start the engine and lower header and reel.
10. Run machine to verify that draper tracks correctly.
11. If adjustment is required, refer to *6.7.6 Adjusting Header Draper Tracking, page 184*.

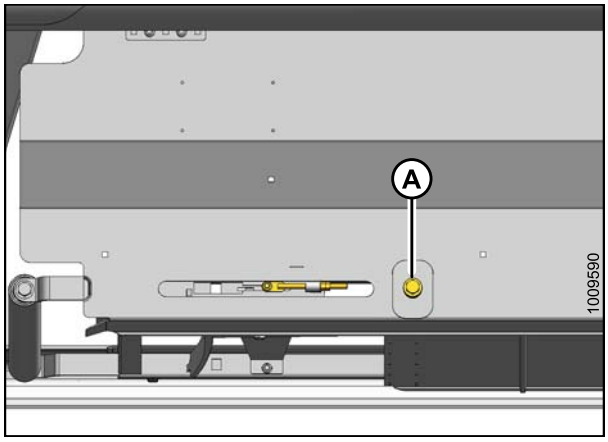


Figure 6.141: Draper Tensioner

6.7.9 Replacing Draper Deflectors

Removing Wide Draper Deflectors

To remove draper deflector, follow these steps: Left end removal is illustrated.

1. Raise reel fully and lower header to ground.
2. Shift decks to allow work space at one end of header if hydraulic deck shift installed, otherwise move decks manually after shutting down windrower.
3. Stop engine, remove key, and engage reel safety props.
4. Open endshield.
5. Loosen nuts (A) on cutterbar until retainer (B) is loose.

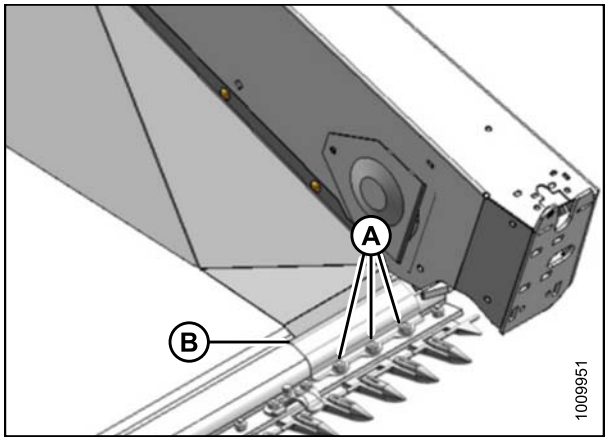


Figure 6.142: Deflector Retainer

6. Remove fasteners securing deflector to endsheet. Nuts (A) are accessible from endshield side. Nuts (B) on uppermost fasteners are accessible from behind the deflector (C).
7. Remove the deflector (C).

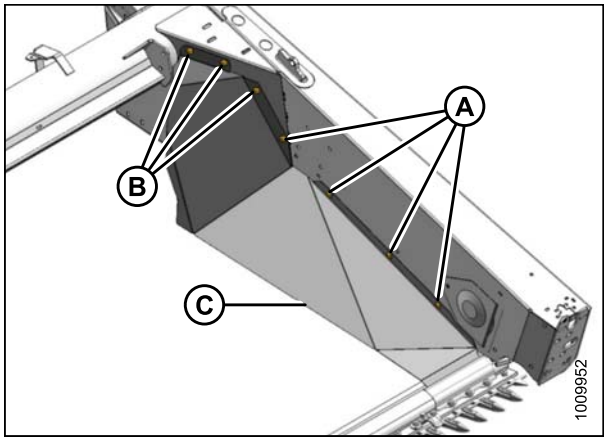


Figure 6.143: Wide Deflector

8. Remove bolts (A) and remove deflector support (B).
9. If support (B) will not be re-installed, replace lower bolt (B) that holds belt guide (C) on opposite side of endsheet.
10. Repeat above steps for opposite end.

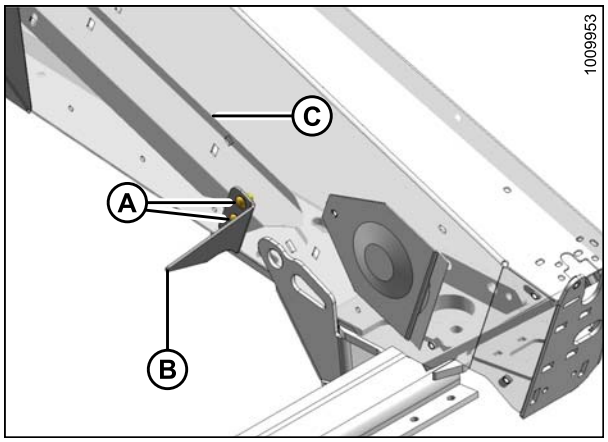


Figure 6.144: Deflector Support

Installing Wide Draper Deflectors

To install draper deflector, follow these steps: Left installation is illustrated.

1. Raise reel fully and lower header to ground.
2. Shift decks to allow work space at one end of header if hydraulic deck shift installed, otherwise move decks manually after shutting down windrower.
3. Stop engine, remove key, and engage reel safety props.

4. Open endshield.
5. Loosen bolts (A) on cutterbar until retainer (B) is loose.
6. Remove existing bolt that secures belt guide (C) on opposite side of endsheet.
7. Locate support (D) as shown and re-install bolt (E), with nut on far side.
8. Install a second 3/8 in. x 3/4 carriage bolt (F) and lock nut. Do not tighten bolts.

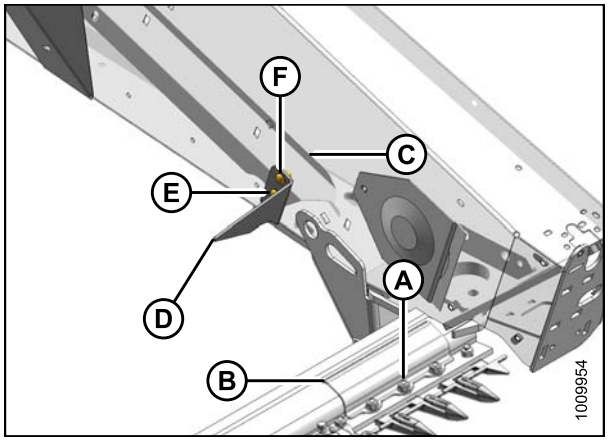


Figure 6.145: Deflector Support

9. Position deflector (A) as shown and adjust forward edge for best fit on cutterbar. Slide deflector under retainer (B).
10. Loosely install seven 3/8 in. x 3/4 carriage bolts (C) with lock nuts to attach deflector to endsheet. Bolt heads face inboard.
11. Adjust position of deflector to obtain best fit at cutterbar and aft edge. Tighten bolts (C) as required to maintain best fit.
12. Tighten bolts (D) on retainer (B). Torque to 65 lbf·ft (88 N·m).

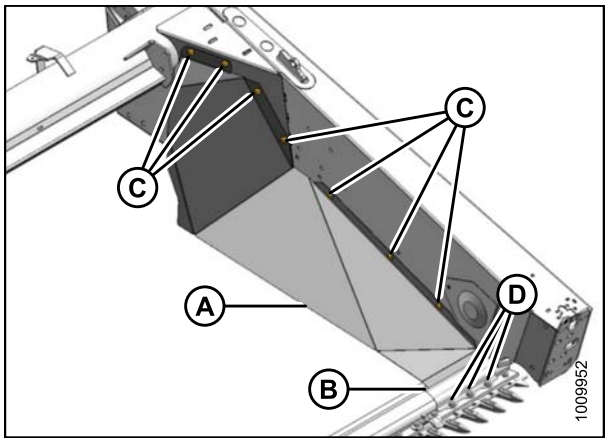


Figure 6.146: Wide Deflector

13. Adjust position of support (A) so that tip contacts the deflector (B). Tighten bolts (C).
14. Repeat above steps for opposite end.

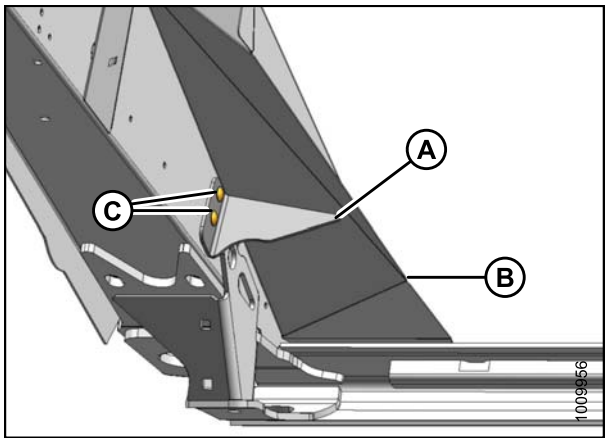


Figure 6.147: Deflector Support

Removing Narrow Draper Deflectors

To remove narrrow draper deflectors, follow these steps: Left end removal is illustrated.

1. Raise reel fully and lower header to ground.
2. Shift decks to allow work space at one end of header if hydraulic deck shift installed, otherwise move decks manually after shutting down windrower.
3. Stop engine, remove key, and engage reel safety props.
4. Open endshield.
5. Remove the two Torx® head screws (A) and lock nuts.
6. Remove the three carriage bolts (B) and lock nuts and remove aft deflector (C).

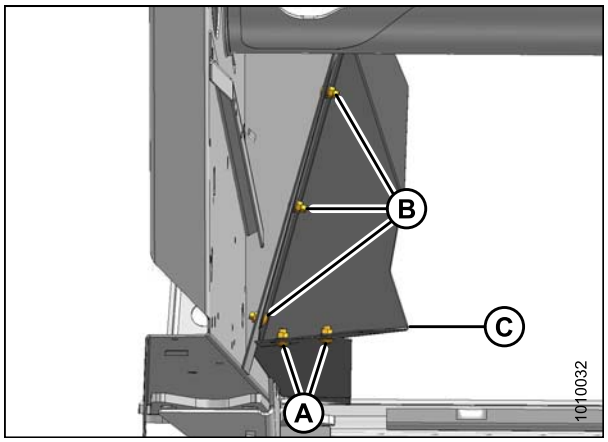


Figure 6.148: Aft Deflector

7. Remove the four screws (A) and remove deflector (B).
8. Repeat above steps for opposite end.

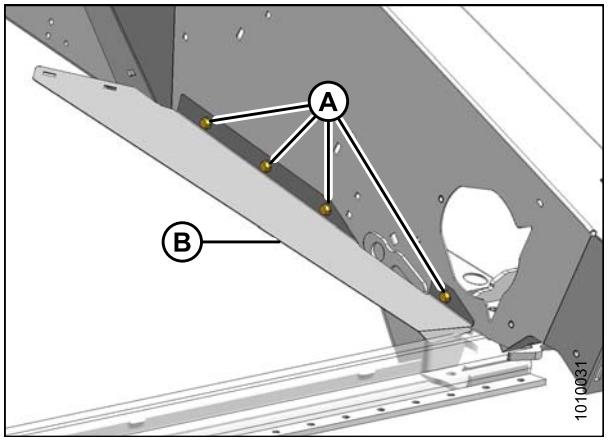


Figure 6.149: Forward Deflector

Installing Narrow Draper Deflectors

Narrow deflectors can replace wide deflectors if bunching occurs at the ends of the header when decks are set for center delivery.

To install narrrow draper deflectors, follow these steps: Left end installation is illustrated.

1. Raise reel fully and lower header to ground.
2. Shift decks to allow work space at one end of header if hydraulic deck shift installed, otherwise move decks manually after shutting down windrower.
3. Stop engine, remove key, and engage reel safety props.

4. Open endshield.
5. Position forward deflector (B) onto endsheet and temporarily install forward and aft 3/8 in. x 5/8 self tapping screws (A).
6. Check fit of forward end of deflector onto cutterbar. There should be no gap between deflector and cutterbar. Remove and bend deflector as required to obtain best fit.
7. Install the four 3/8 in. x 5/8 self-tapping screws (A) and tighten.

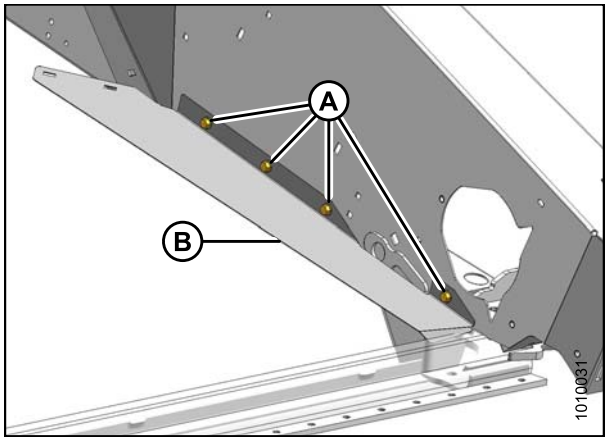


Figure 6.150: Forward Deflector

8. Position aft deflector (C) as shown and install three 3/8 in. x 3/4 carriage bolts (B) and lock nuts. Orientation of bolts not important.
9. Install two Torx® head screws (A) and lock nuts with heads facing down.
10. Tighten all fasteners.
11. Repeat above steps for opposite end.

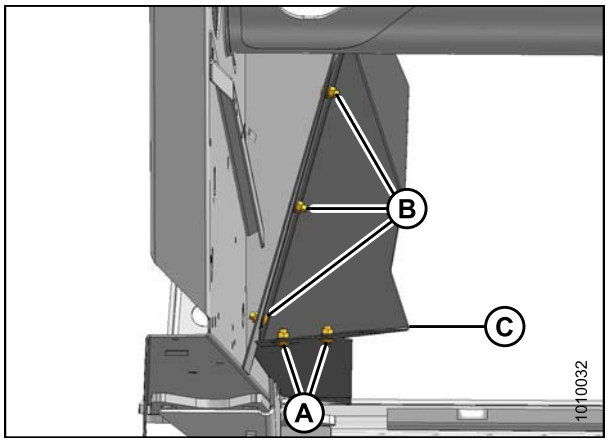


Figure 6.151: Aft Deflector

6.8 Reel

CAUTION

To avoid personal injury, before servicing machine or opening drive covers, refer to *6.1 Preparation for Servicing, page 113*.

6.8.1 Reel Clearance to Cutterbar

The minimum clearance between the reel fingers and the cutterbar ensures that the reel fingers do not contact the cutterbar during operation. The clearance is adjusted at the factory, but adjustments may be necessary before the header is put into operation.

The finger to guard/cutterbar clearances with reels fully lowered are shown in Table *6.15 Finger to Guard/Cutterbar Clearance, page 200*.

Table 6.15 Finger to Guard/Cutterbar Clearance

Header Width	'X' +/- 1/8 in. (3 mm) at Reel Ends	
	Single Reel	Double Reel
15 ft.	3/4 in. (20 mm)	–
20 ft.		
25 ft.	1 in. (25 mm)	
30 ft.	1-3/4 in. (45 mm)	3/4 in. (20 mm)
35 ft.	2-3/8 in. (60 mm)	
40 ft.	–	

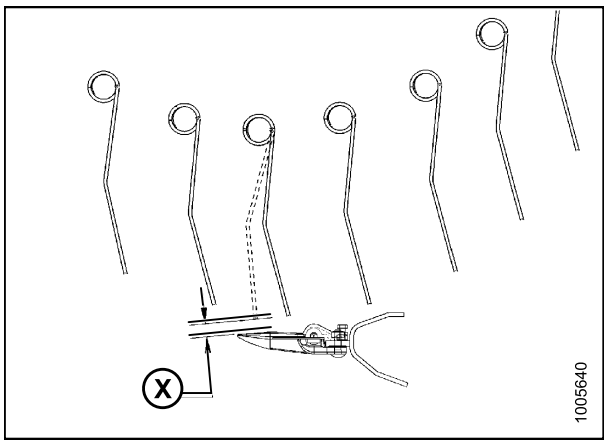


Figure 6.152: Finger Clearance

Measuring Reel Clearance

To measure the finger-to-guard/cutterbar clearance, follow these steps:

DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine, always stop engine, remove key, and engage safety props before going under header for any reason. Refer to the windrower operator's manual for instructions regarding the proper use and storage of header safety props.

1. Park header on level ground.

2. Set the fore-aft position to mid–position (‘5’ on the reel arm indicator decal).
3. Fully lower the reel.
4. Shut down engine. Remove key from ignition.

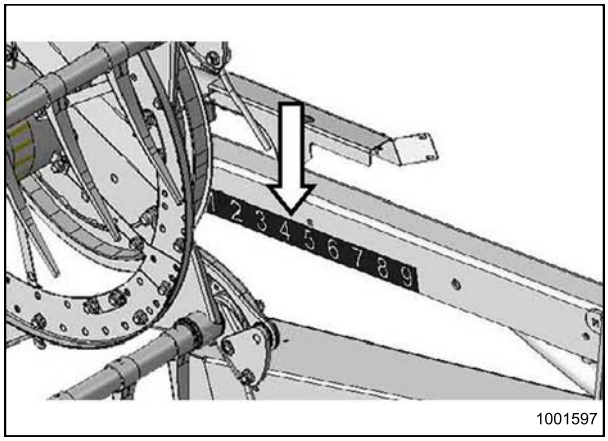


Figure 6.153: Fore-Aft Position

5. Measure clearance ‘X’ between points ‘Y’ and ‘Z’ at ends of each reel (A).

   NOTE:
   The reel has been adjusted at the factory to provide more clearance at the center of the reel than at the ends (‘frown’) to compensate for reel flexing.

6. Check all possible points of contact between points ‘Y’ and ‘Z’. Depending on reel fore-aft position, minimum clearance can occur at guard tine, hold-down, or cutterbar.

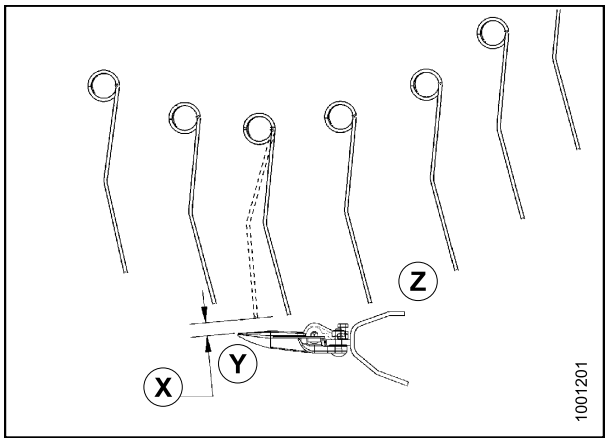


Figure 6.154: Clearance

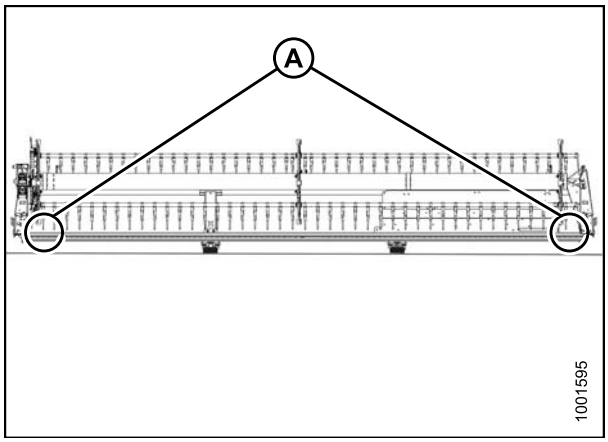


Figure 6.155: Single Reel Measurement Locations (Two Places)

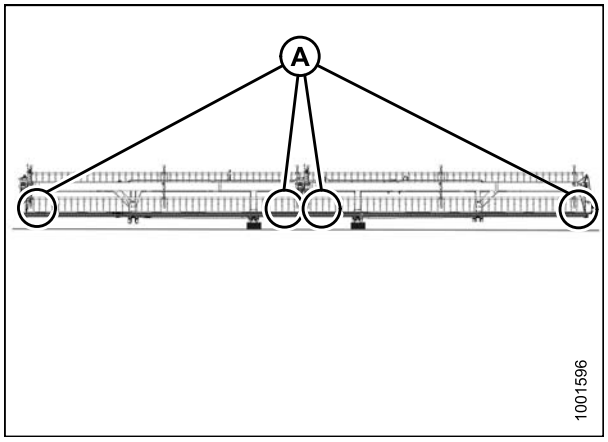


Figure 6.156: Double Reel Measurement Locations (Four Places)

7. If necessary, refer to *Adjusting Reel Clearance, page 202* for adjustment procedure.

Adjusting Reel Clearance

DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine, always stop engine, remove key, and engage safety props before going under header for any reason. Refer to the windrower operator's manual for instructions regarding the proper use and storage of header safety props.

1. Adjust outboard reel arm lift cylinders to set clearance at outboard ends of reel as follows:
   a. Loosen bolt (A).
   b. Turn cylinder rod (B) out of clevis to raise reel and increase clearance to cutterbar, or turn cylinder rod into clevis to lower reel and decrease clearance.
   c. Tighten bolt (A).
   d. Repeat at opposite side.

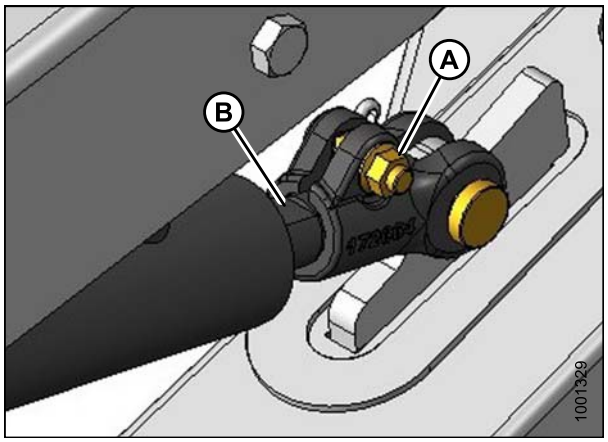


Figure 6.157: Outside Reel Arm

2. **For Double Reel Only:** Adjust center arm lift cylinder stop (A) to change clearance at inboard ends of reels as follows:

   NOTE:
   Instructions apply to double-reel headers only and are performed from the underside of the arm.

   a. Loosen nut (B).

   b. Turn nut (C) counterclockwise to raise reel and increase clearance to cutterbar, or clockwise to lower reel and decrease clearance.

   c. Tighten nut (B).

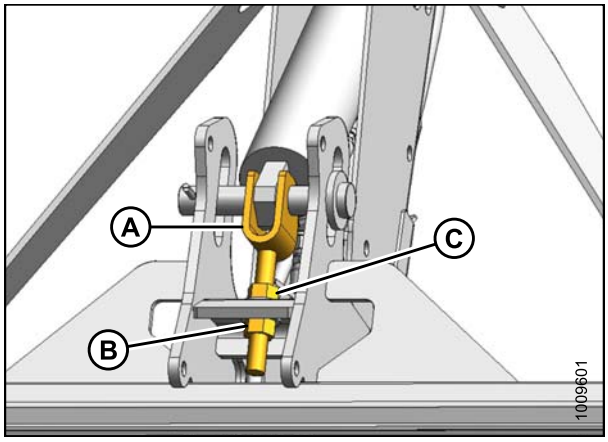


Figure 6.158: Looking Up at Arm Underside

6.8.2 Reel Frown

The reel has been adjusted at the factory to provide more clearance at the center of the reel than at the ends ('frown') to compensate for reel flexing.

Adjusting Reel Frown

The frown is adjusted by repositioning the hardware connecting the reel finger tube arms to the reel discs.

To adjust the reel frown, follow these steps:

NOTE:
The frown profile should be measured prior to reel disassembly for servicing so that the profile can be maintained after reassembly.

1. Position the reel over the cutterbar (between '4' and '5' on the gauge). This position provides adequate clearance at all reel fore-aft positions.
2. Record a measurement at each reel disc location for each reel tube.

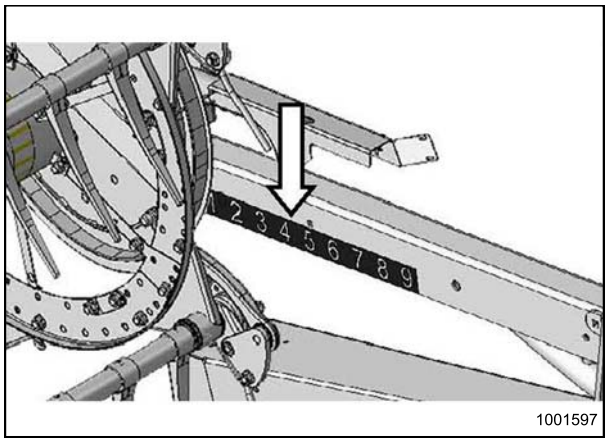


Figure 6.159: Arm Decal

3. Adjust the profile as follows: Start with the reel disc set closest to center of header and proceed to the ends.
   a. Remove bolts (A).
   b. Loosen bolt (B) and adjust arm (C) until desired measurement is obtained between reel tube and cutterbar.

   NOTE:
   Allow the reel tubes to find a natural curve and position the hardware appropriately.

   c. Reinstall bolts (A) in aligned holes and tighten.

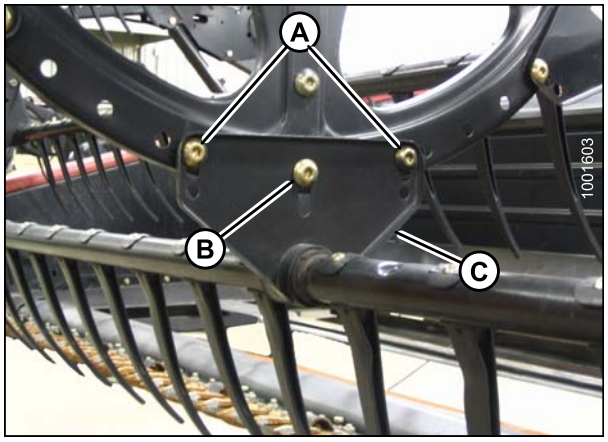


Figure 6.160: Reel Arm

6.8.3 Centering the Reel

The reel(s) should be centered between the endsheets.

Centering Double Reels

To center the reels, follow these steps:

1. Loosen bolt (A) on each brace (B).
2. Move forward end of reel center support arm (C) laterally as required to center both reels.
3. Tighten bolts (A) and torque to 265 ft·lbf (359 N·m).

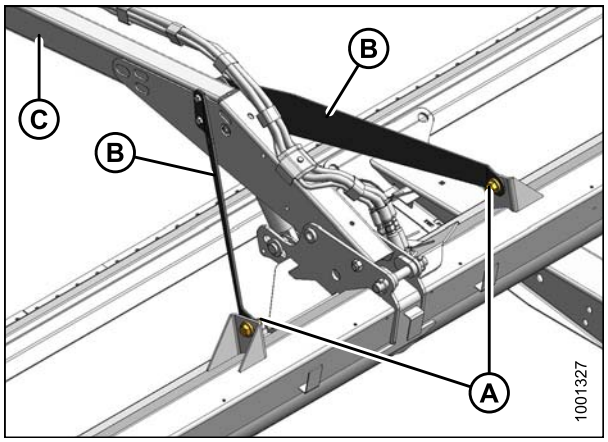


Figure 6.161: Centering Reel

Centering Single Reel

To center the reel, follow these steps:

1. Loosen bolt (A) on brace (B) at both ends of reel.
2. Move forward end of reel support arm (C) laterally as required to center reel.
3. Tighten bolts (A) and torque to 265 ft·lbf (359 N·m).

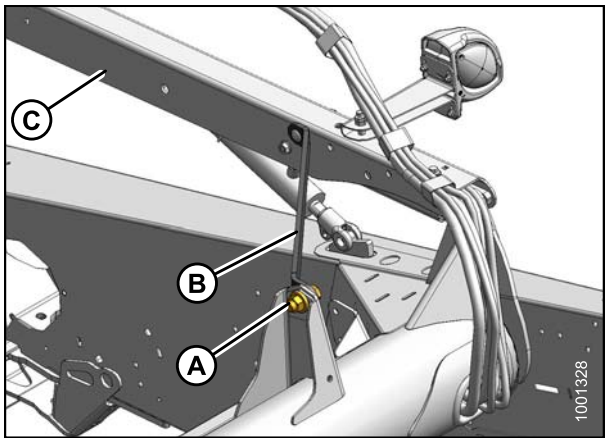


Figure 6.162: Centering Reel

6.8.4 Reel Tines

IMPORTANT:
Keep reel tines in good condition. Straighten or replace as required.

Removing Steel Tines

WARNING

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

1. Lower header and raise reel. Engage reel safety props.
2. Shut down engine and remove key from ignition.
3. Remove tine tube bushings from the applicable tine tube at center and left discs. Refer to *Removing Bushings from 5-, 6- or 9-Bat Reels, page 207*.
4. Temporarily attach reel arms (B) to reel disc, using original attachment locations (A).
5. Cut damaged tine(s) so that it can be removed from tube.
6. Remove bolts on existing tines and slide tines over to replace tine that was cut off in previous step. Remove reel arms (B) from tube as required.

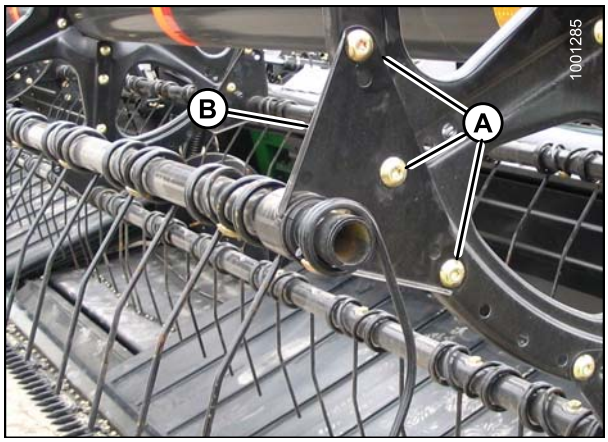


Figure 6.163: Reel Arm

Installing Steel Tines

WARNING

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

IMPORTANT:
Ensure tine tube is supported at all times to prevent damage to the tube or other components.

1. Slide new tines and reel arm (A) onto end of tube.
2. Install tine tube bushings. Refer to *6.8.5 Tine Tube Bushings, page 207*.
3. Attach tines to tine bar with bolts and nuts (B).

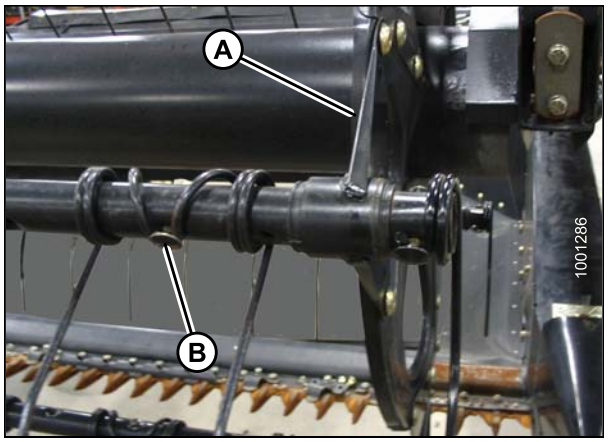


Figure 6.164: Tine Tube

Removing Plastic Fingers

WARNING

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

1. Remove screw (A) with a Torx® Plus 27 IP socket wrench.

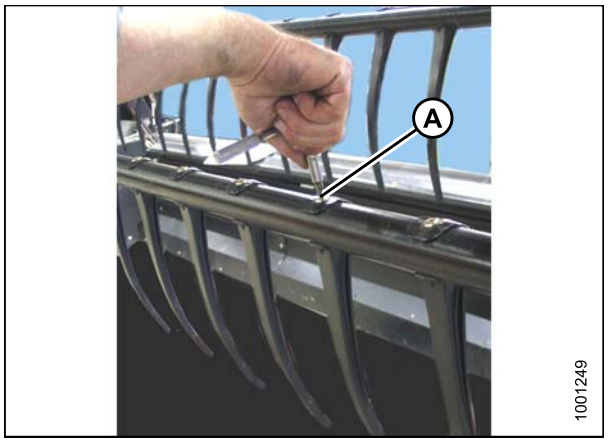


Figure 6.165: Removing Finger

2. Push finger top clip back toward reel tube and remove from finger tube.

Figure 6.166: Removing Finger

Installing Plastic Fingers

WARNING

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

1. Position finger on rear of finger tube and engage lug at bottom of finger in lower hole in finger tube.
2. Gently lift top flange and rotate finger until lug in top flange engages upper hole in finger tube.

Figure 6.167: Installing Finger

IMPORTANT:
Do **NOT** apply force to finger prior to tightening mounting screw. Applying force to finger without screw tightened will break finger or shear off locating pins.

3. Install screw (A) and torque to 75–80 in·lbf (8.5–9.0 N·m) with a Torx®-Plus 27 IP socket wrench.

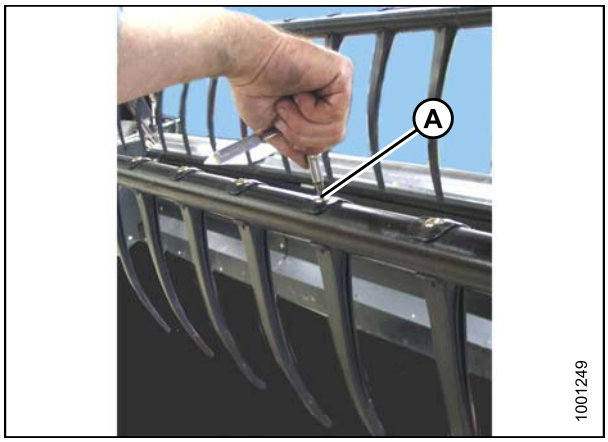


Figure 6.168: Installing Finger

6.8.5 Tine Tube Bushings

Removing Bushings from 5-, 6- or 9-Bat Reels

NOTE:
If only replacing the cam end bushing, Refer to **Cam End Bushings**.

Center Disc and Tail-End Bushings

WARNING

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

1. Lower header, raise reel fully, and engage reel safety props.

IMPORTANT:
Ensure tine tube is supported at all times to prevent damage to the tube or other components.

2. Remove reel endshields and endshield support (C) from the tail end of the reel at applicable tine tube location.

   NOTE:
   There are no endshields on the center disc.

3. Remove bolts (A) securing arm (B) to disc.

IMPORTANT:
Note the hole locations in arm and disc and ensure bolts are reinstalled at original locations.

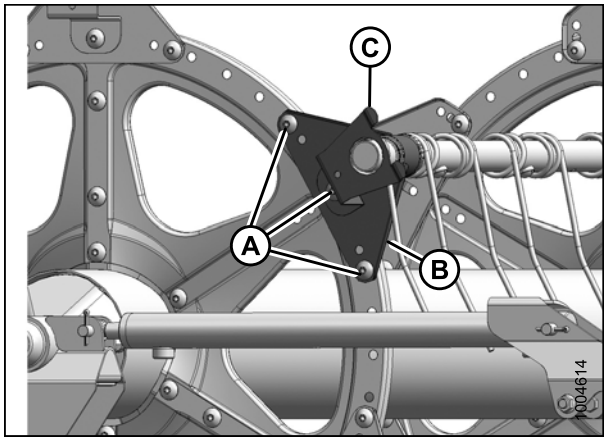


Figure 6.169: Tail End

4. Release bushing clamps (A) using a small screwdriver to separate the serrations. Pull clamp off tine tube.

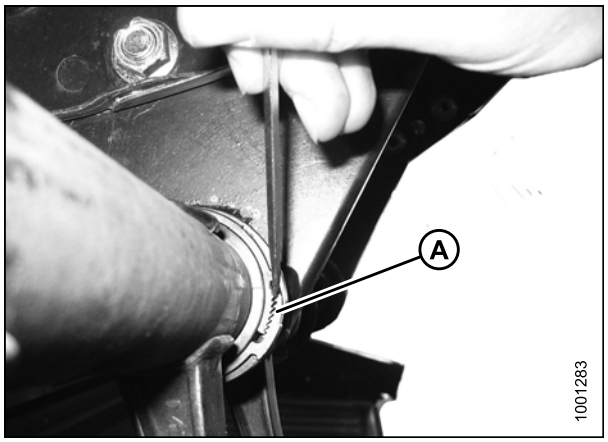


Figure 6.170: Bushing Clamp

5. Rotate arm (A) clear of disc and slide arm inboard off bushing and remove bushing halves (B). If required remove the next tine or plastic finger, so that the arm can slide off the bushing. Refer to:
   - *Removing Plastic Fingers, page 206*
   - *Removing Steel Tines, page 205*

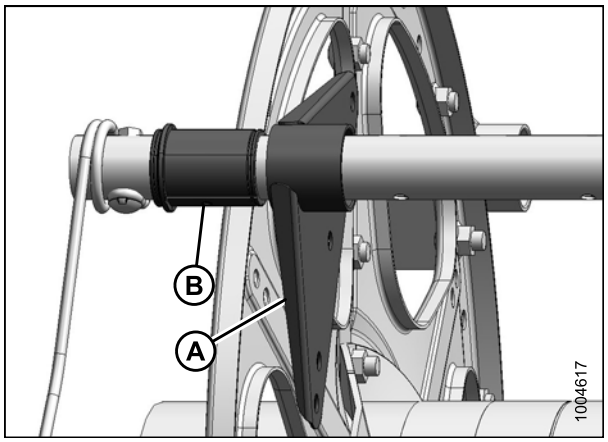


Figure 6.171: Bushing

Cam End Bushings

NOTE:
Removing cam end bushings requires that the tine tube be moved through the disc arms to expose the bushing.

6. At the cam end, remove endshields and endshield support (A) at applicable tine tube location on the cam end.

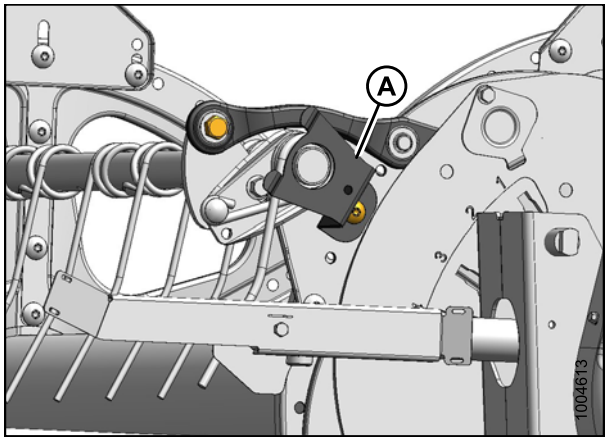


Figure 6.172: Cam End

7. At the tail end, remove reel endshields and endshield support (C) at applicable tine tube location.

   NOTE:
   There are no endshields on the center discs.

8. At the tail and center discs, remove bolts (A) securing arm (B) to disc.

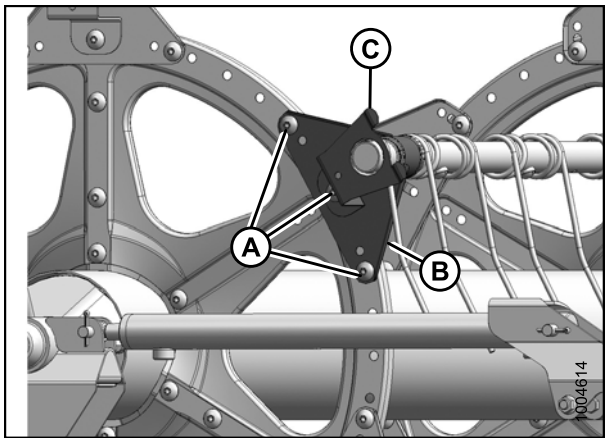


Figure 6.173: Tail End

9. At the tine tube support (if installed) locations ,either release the bushing clamps or disconnect the support channels from the tube support, depending on which tine tube is being moved. Three tine tubes (B) require that the channels be disconnected and two (C) require only to remove the bushing clamp.

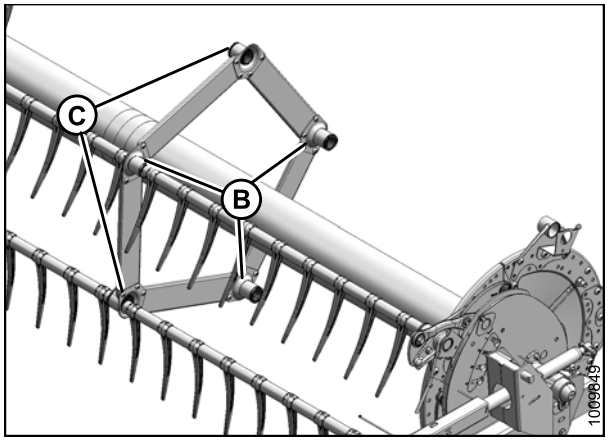


Figure 6.174: Tine Tube Supports

10. Remove bolt (A) at on cam linkage so that tine tube (B) is free to rotate.

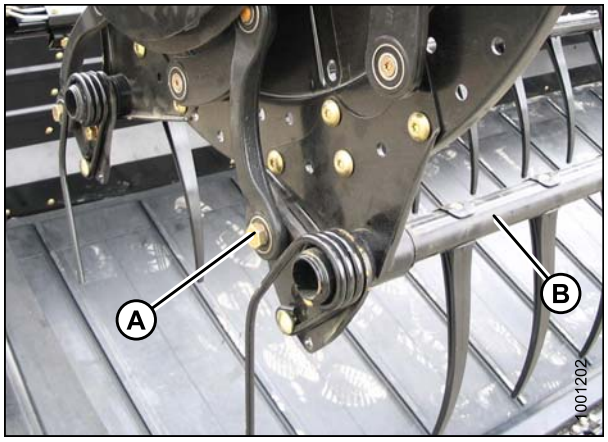


Figure 6.175: Cam End

11. Release bushing clamps (A) at the cam discwith a small screwdriver to separate the serrations. Move clamps off bushings.

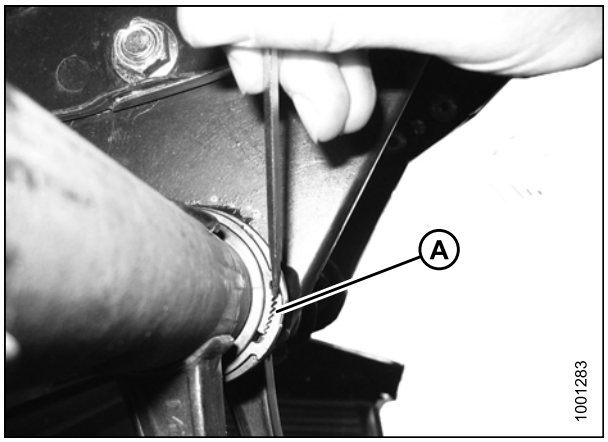


Figure 6.176: Bushing Clamp

12. Slide tine tube (A) outboard to expose the bushing. Remove the bushing halves (B). If required remove the next tine or plastic finger, so that the arm can slide off the bushing. Refer to:
    - *Removing Plastic Fingers, page 206*
    - *Removing Steel Tines, page 205*

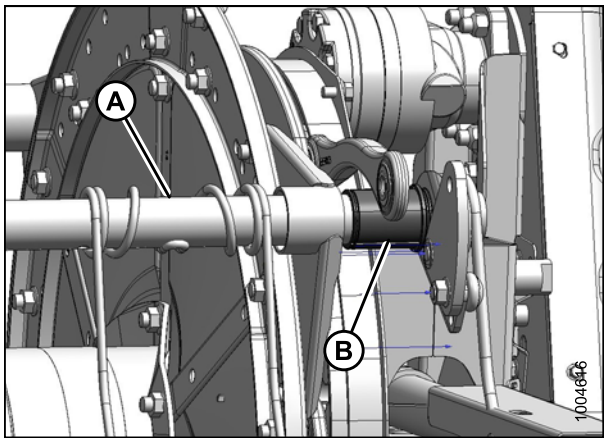


Figure 6.177: Cam End

Tine Tube Support Bushings (If installed)

If the tine tube reinforcing kit is installed:

13. Locate the support (A) that requires a new bushing.
14. Remove four bolts (B) securing channels (C) to support (A).
15. If finger (D) is too close to support to allow access to bushing, remove screw (E) and remove finger (D). Refer to *Removing Plastic Fingers, page 206*.

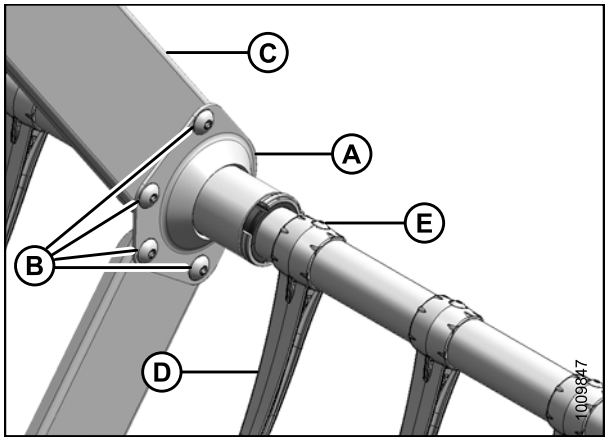


Figure 6.178: Tine Tube Support

16. Release bushing clamp (A) using a small screwdriver to separate the serrations. Move clamp clear of bushing.

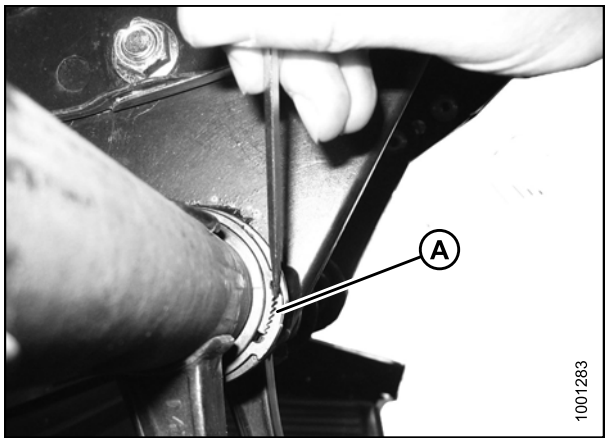


Figure 6.179: Bushing Clamp

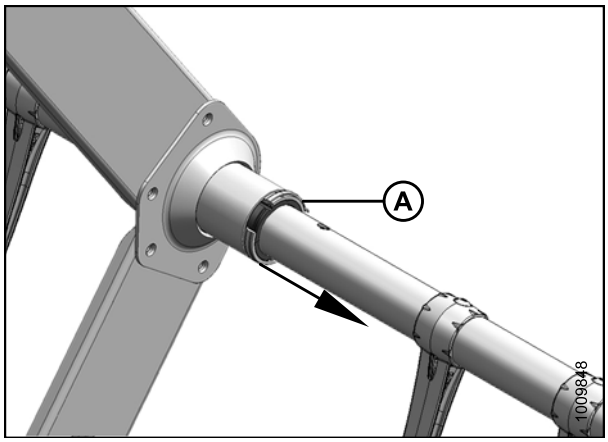


Figure 6.180: Bushing Clamp

17. Slide support (A) off of the bushing halves (B).

NOTE:
Two tine tubes have supports that are assembled opposite to what is shown. Those supports (A) can be rotated for the flange to clear the channels before they can be moved off the bushing. The tine tube can also be moved outward slightly.

18. Remove the bushing halves (B).

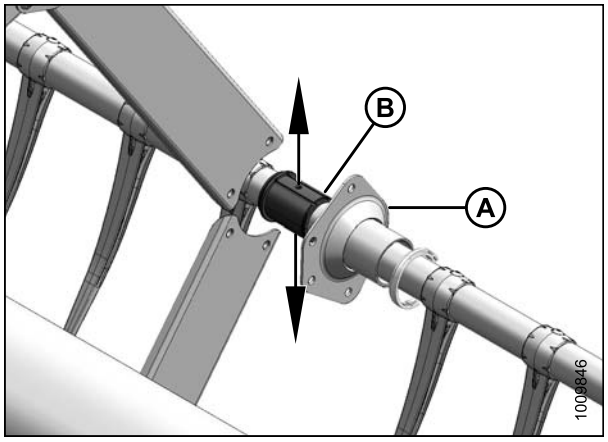


Figure 6.181: Support

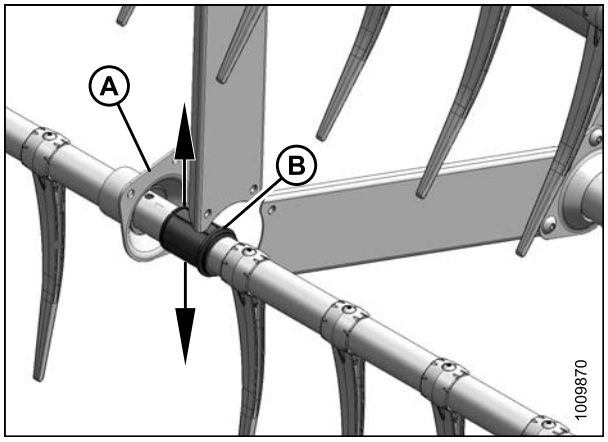


Figure 6.182: Opposite Support

Installing Bushings on 5-, 6- or 9-Bat Reels

WARNING

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

IMPORTANT:
Ensure tine tube is supported at all times to prevent damage to the tube or other components.

NOTE:
A pair of modified channel lock pliers is recommended to install the bushing clamps. Secure pliers (A) in vice and grind in a notch (B) at the end of each arm that fits the clamp (C).

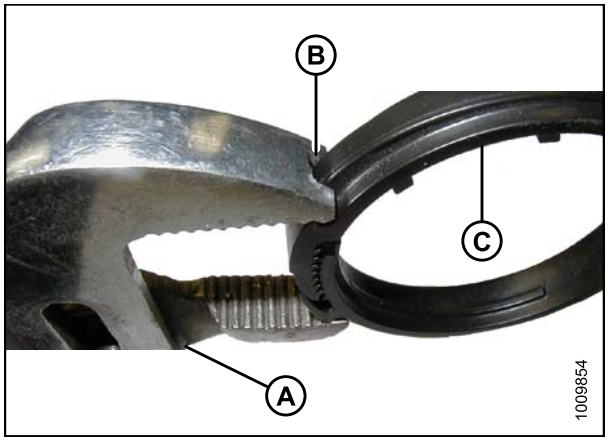


Figure 6.183

Cam End Bushings

1. Position bushing halves (B) on tine tube with flangeless end adjacent to reel arm, and locate lug in each bushing half in hole in tine tube.
2. Slide tine tube (A) toward tail end of reel to insert the bushing (B) into the reel arm. If tine tube supports are installed, ensure that the bushings at those locations slide into the support.
3. Re-install fingers or tines if removed. Refer to:
   - *Installing Steel Tines, page 205*
   - *Installing Plastic Fingers, page 207*
4. Install bushing clamp (A) onto tine tube adjacent to flangeless end of bushing (B).
5. Position clamp (A) on bushings (B) so that edges of clamp and bushing are flush when clamp fits into groove on bushing and lock tabs are engaged.

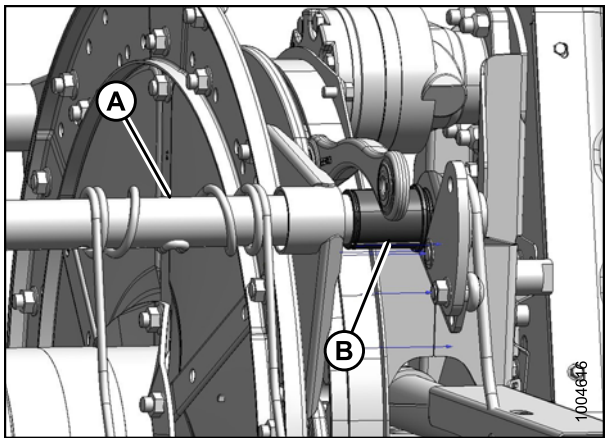


Figure 6.184: Cam End

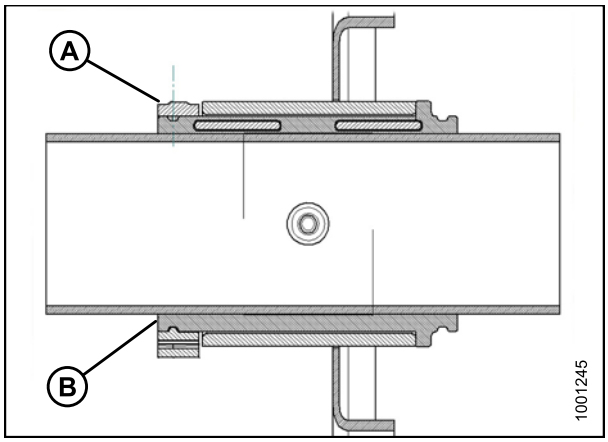


Figure 6.185: Bushing

6. Tighten clamp (A) with modified channel lock pliers (B) so that finger pressure will **NOT** move clamp.

IMPORTANT:
Over-tightening clamp may result in breakage.

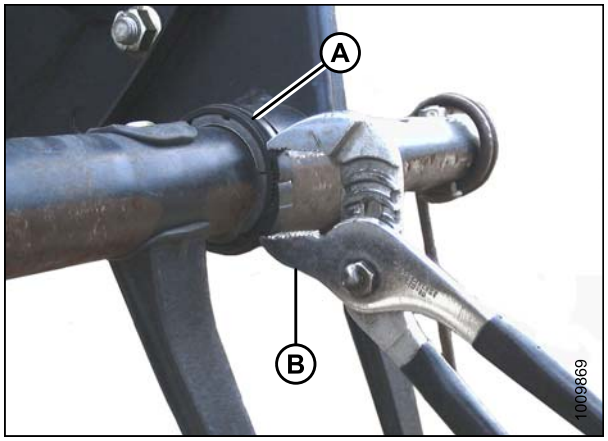


Figure 6.186: Clamp Tool

7. Line up tine bar (B) with cam arm and install bolt (A). Torque bolt to 120 ft·lbf (165 N·m).

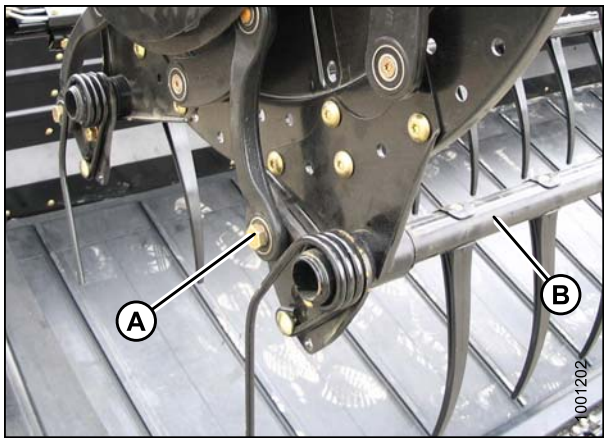


Figure 6.187: Cam End

8. At the center disc, install the bolts (A) securing arm (B) to disc.
9. At the tail end, install reel arm (B) and endshield support (C) from the tail end of the reel at applicable tine tube location with bolts (A).

   NOTE:
   There are no endshields on the center discs.

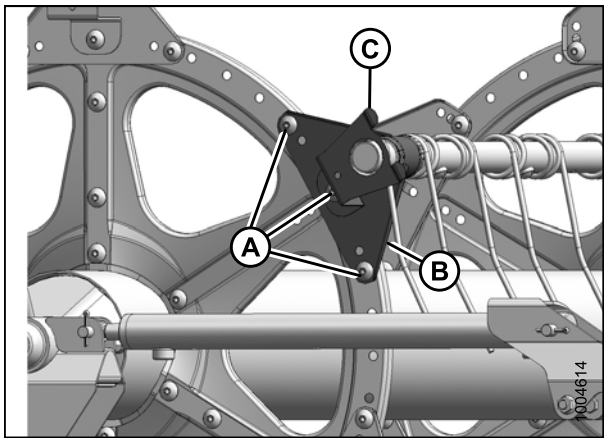


Figure 6.188: Tail End

10. At the cam end, install endshield support (A) at applicable tine tube location on the cam end.
11. Re-install reel endshields. Refer to *6.8.6 Reel Endshields, page 218*.

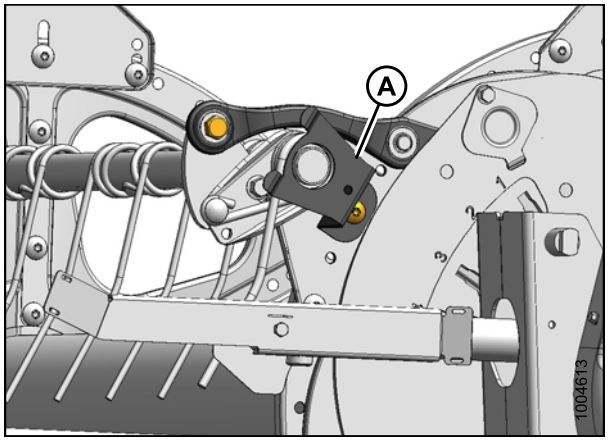


Figure 6.189: Cam End

Center Disc and Tail End Bushings

12. Position bushing halves (B) on tine tube with flangeless end adjacent to reel arm, and locate lug in each bushing half in hole in tine tube.
13. Slide reel arm (A) onto bushing (B) and position against disc at original location.
14. Reinstall any fingers or tines that were removed. Refer to:
    - *Installing Steel Tines, page 205*
    - *Installing Plastic Fingers, page 207*

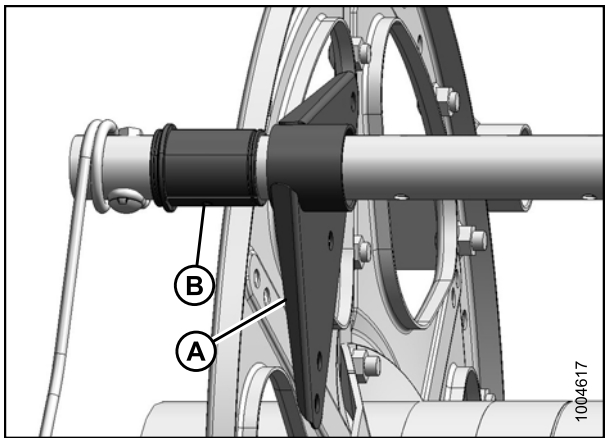


Figure 6.190: Tail End

15. Install bushing clamp (A) onto tine tube adjacent to flangeless end of bushing (B).
16. Position clamp (A) on bushings (B) so that edges of clamp and bushing are flush when clamp fits into groove on bushing and lock tabs are engaged.

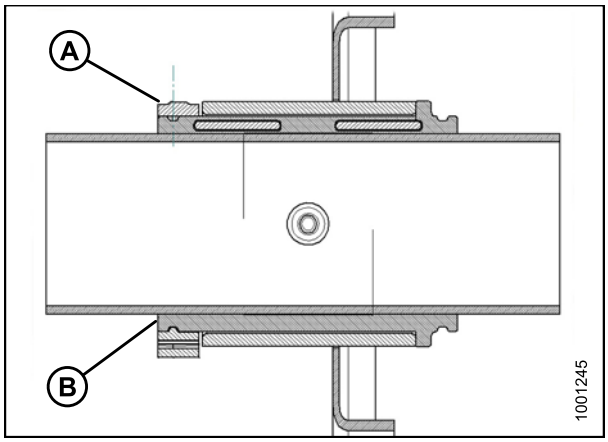


Figure 6.191: Bushing

17. Tighten clamp (A) with modified channel lock pliers (B) so that finger pressure will **NOT** move clamp.

IMPORTANT:
Over-tightening clamp may result in breakage.

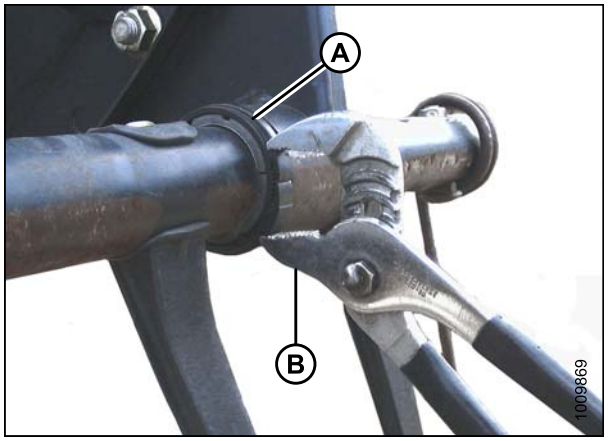


Figure 6.192: Clamp Tool

18. At the center disc, install the bolts (A) securing arm (B) to disc.
19. At the tail end, install reel arm (B) and endshield support (C) at applicable tine tube location with bolts (A). Re-install endshields.

    NOTE:
    There are no endshields on the center discs.

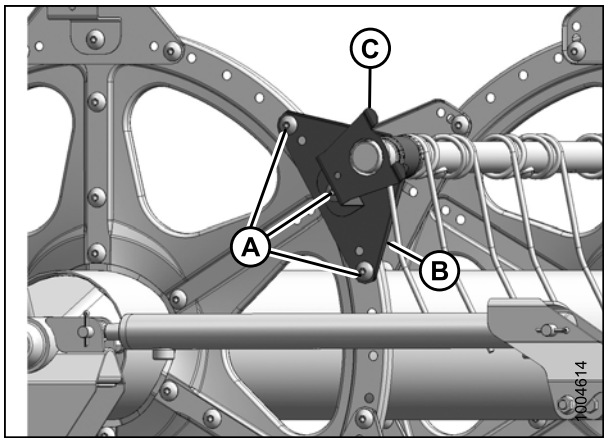


Figure 6.193: Tail End

Tine Tube Support (If installed) Bushings

20. Position bushing halves (B) on tine tube with flangeless end adjacent to reel arm, and locate lug in each bushing half in hole in tine tube.
21. Slide support (C) onto bushing (B). For the opposite tine tube, rotate support (C), or slightly move tine tube, so that it clears channels (D).

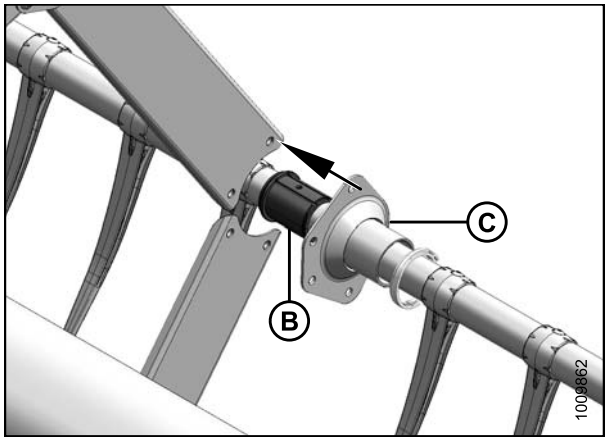


Figure 6.194: Support

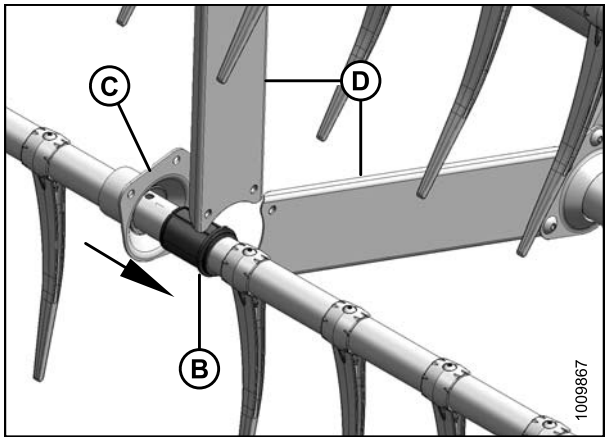


Figure 6.195: Opposite Support

22. Install bushing clamp (A) onto tine tube adjacent to flangeless end of bushing (B).
23. Position clamp (A) on bushings (B) so that edges of clamp and bushing are flush when clamp fits into groove on bushing and lock tabs are engaged.

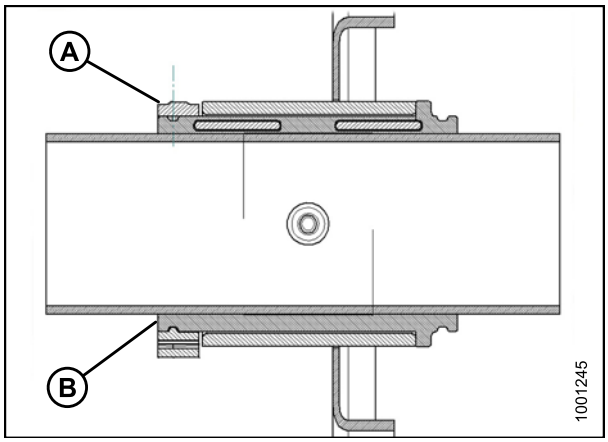


Figure 6.196: Bushing Clamp

24. Tighten clamp (A) with modified channel lock pliers (B) so that finger pressure will **NOT** move clamp.

IMPORTANT:
Over-tightening clamp may result in breakage.

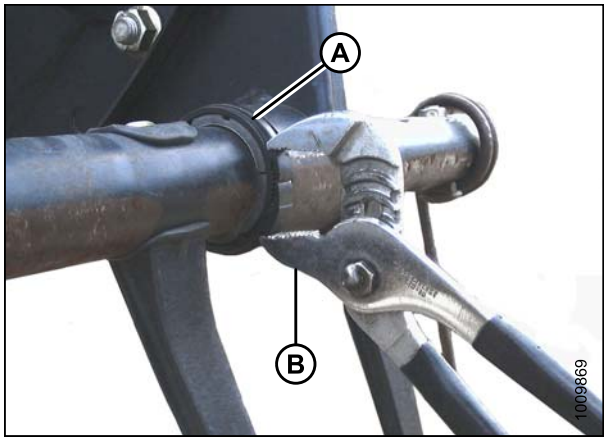


Figure 6.197: Installing Clamp

25. Re-attach channels (C) to support (A) with screws (B) and nuts. Torque screws to 32 lbf·ft (43 N·m).
26. Reinstall any fingers (D) that were removed with screws (E). Refer to *Installing Plastic Fingers, page 207*.

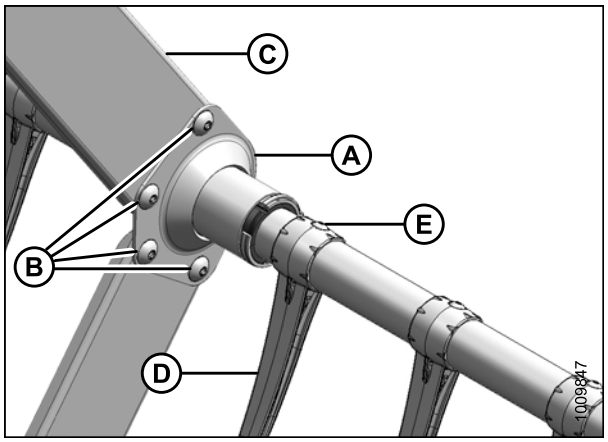


Figure 6.198: Support

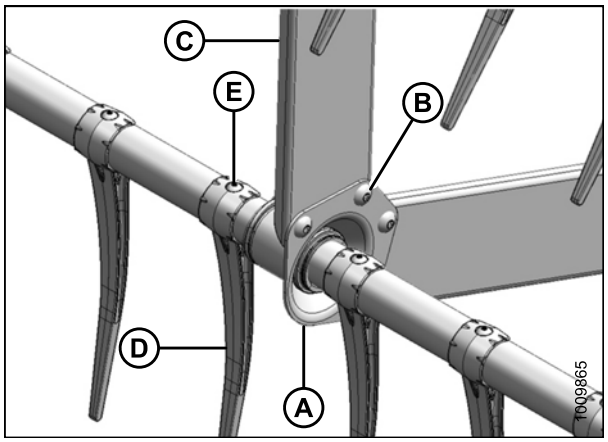


Figure 6.199: Opposite Support

6.8.6 Reel Endshields

The reel endshields and supports do not require regular maintenance but should periodically be checked for damage and loose or missing fasteners. Endshields or supports that are slightly dented or deformed may be repaired. Severely damaged components should be replaced.

Reel endshields can be attached to either end of the reel.

Replacing Endshield

1. Lower header and reel, and shutdown engine. Remove key from ignition.
2. Manually rotate reel for access to endshield (A) to be replaced.
3. Remove three bolts (B).

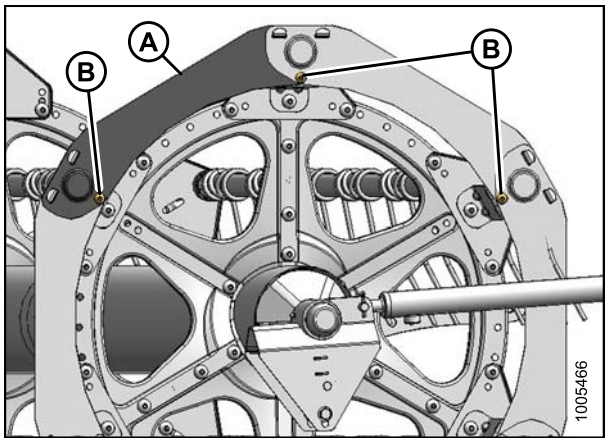


Figure 6.200: Endshields

4. Lift end of endshield (A) off support (B).

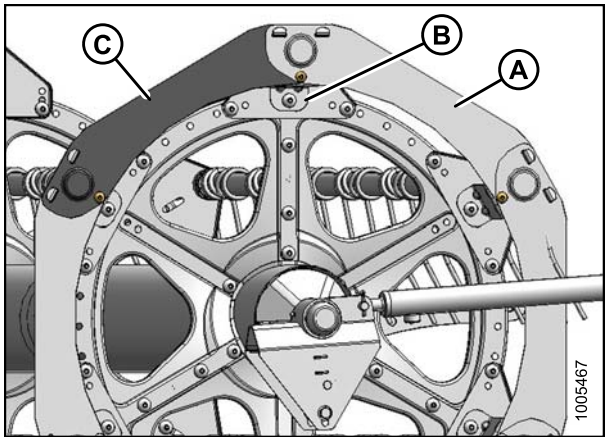


Figure 6.201: Endshields

5. Lift endshield off supports.

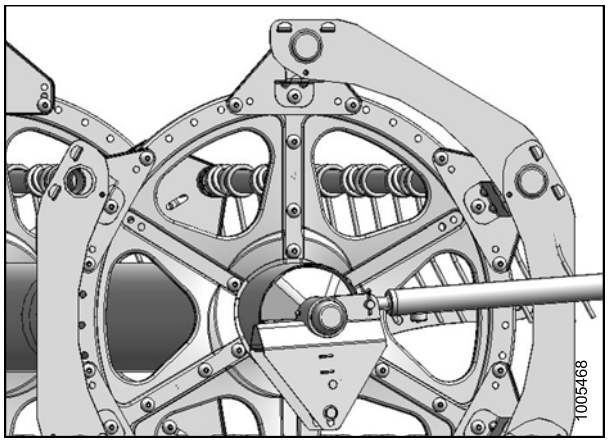


Figure 6.202: Endshields

6. Move endshield (A) away from support (B), and place new endshield (C) onto supports.
7. Reattach end of endshield (A) to support (B).
8. Reinstall bolts (D).
9. Tighten all hardware.

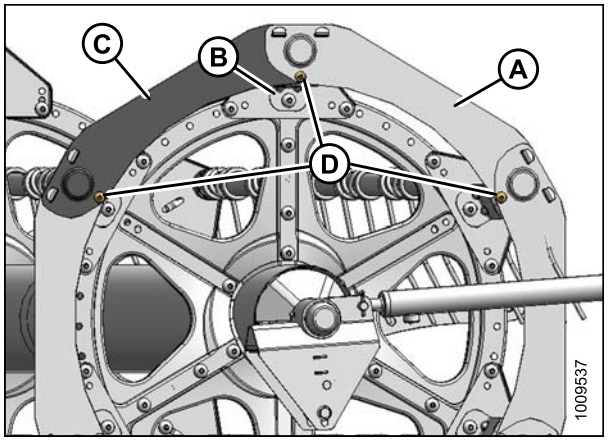


Figure 6.203: Endshields

Replacing Support

1. Lower header and reel, and shut down engine. Remove key from ignition.
2. Manually rotate reel for access to endshield support (A) to be replaced.
3. Remove bolt (B) from support (A).
4. Remove bolts (C) from support (A) and two adjacent supports.

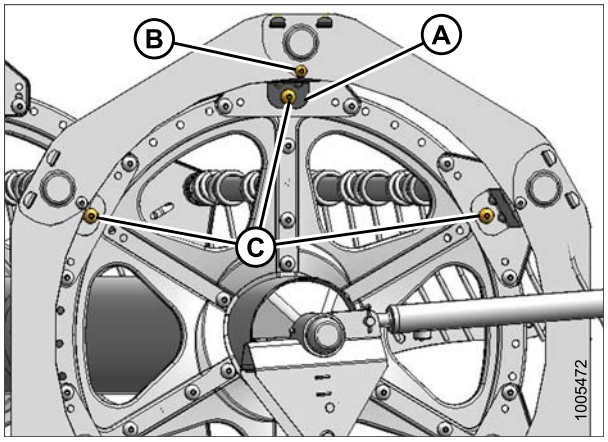


Figure 6.204: Endshield Supports

5. Move endshields (A) away from tine tube and rotate support (B) towards reel to remove it.
6. Insert tabs of new support (B) into slots in endshields and rotate into endshields. Ensure tabs engage both endshields.
7. Secure support (B) to disc with bolt (C) and nut. Do not tighten.
8. Secure endshields (A) to support (B) with bolt (C) and nut. Do not tighten.
9. Reattach supports with bolts (C) and nuts.
10. Check clearance between tine tube and endshield support, and adjust if necessary.
11. Torque nuts to 20 ft·lbf (27 N·m).

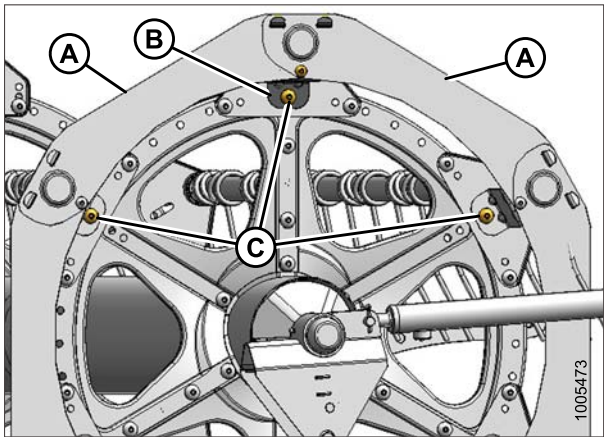


Figure 6.205: Endshield Supports

6.9 Reel Drive

The reel is hydraulically driven through a chain case that is attached to the right end on a single reel header, and between the reels on a double reel header.

6.9.1 Replacing Reel Drive Sprocket

Removing Drive Cover

1. Remove the reel drive cover (A) as follows:

   a. For **SINGLE REEL DRIVE**, remove the four bolts (B) that secure the cover (A) to the reel drive.

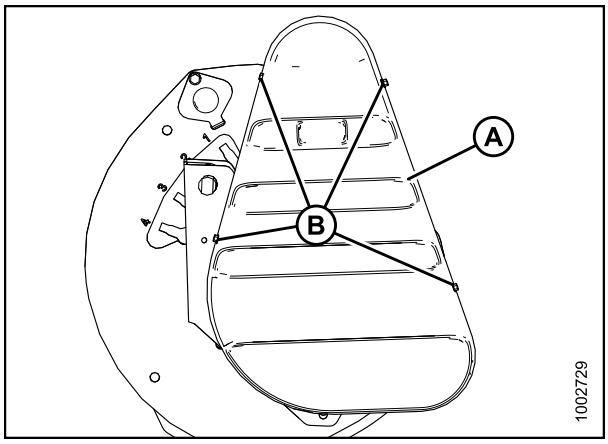


Figure 6.206: Single Reel

   b. For **DOUBLE REEL DRIVE**, remove the six bolts (B) that secure the upper cover (A) to the reel drive and to the lower cover (C).

   NOTE:
   The lower cover (C) may also be removed by taking off the three bolts (D).

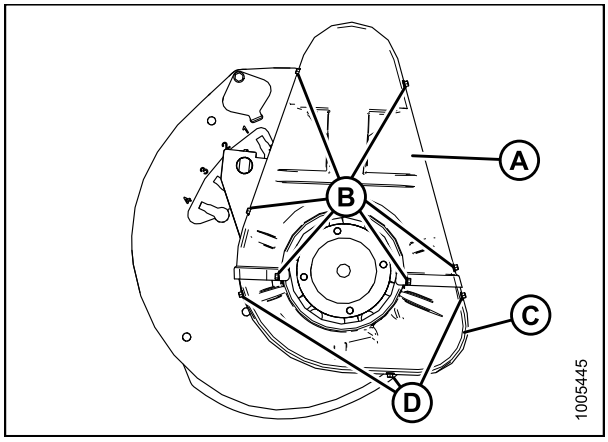


Figure 6.207: Double Reel

Loosening Drive Chain

1. Loosen nuts (A). Slide motor (B) and motor mount (C) down towards reel shaft.

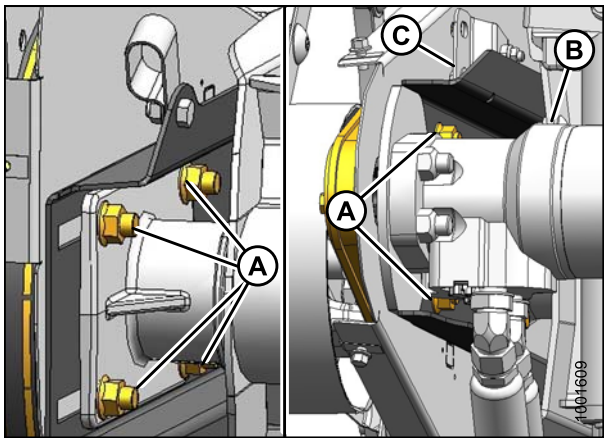


Figure 6.208: Reel Drive

Removing Drive Sprocket

1. Remove the drive chain (A) from the drive sprocket (B).

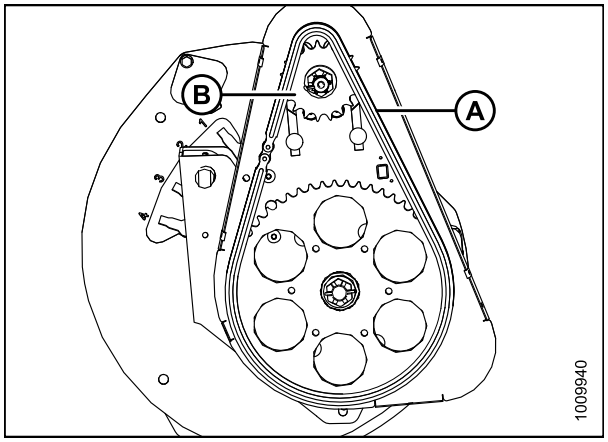


Figure 6.209: Reel Drive

2. Remove the cotter pin (A), slotted nut (B), and flat washer (C) from the motor shaft.
3. Remove the drive sprocket (D). Ensure key remains in the shaft.

IMPORTANT:
Do **NOT** use pry bar and/or hammer to remove drive sprocket (D). This will damage the motor. Use a puller if drive sprocket does not come off by hand.

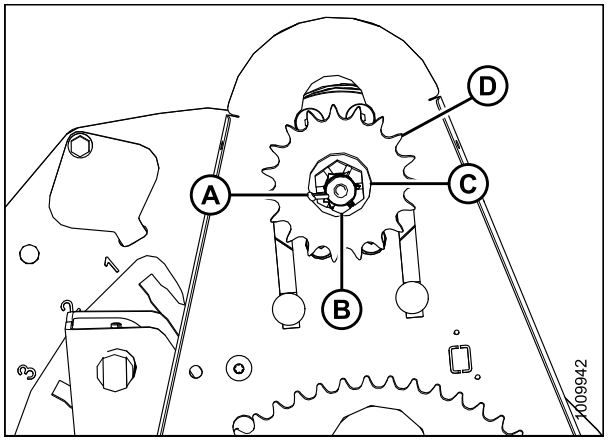


Figure 6.210: Reel Drive

Installing Drive Sprocket

1. Install the new drive sprocket (D), flat washer (C), and slotted nut (B), onto the motor shaft.
2. Torque nut to 40 lbf·ft (54 N·m). Tighten to next slot if necessary to install cotter pin (A).

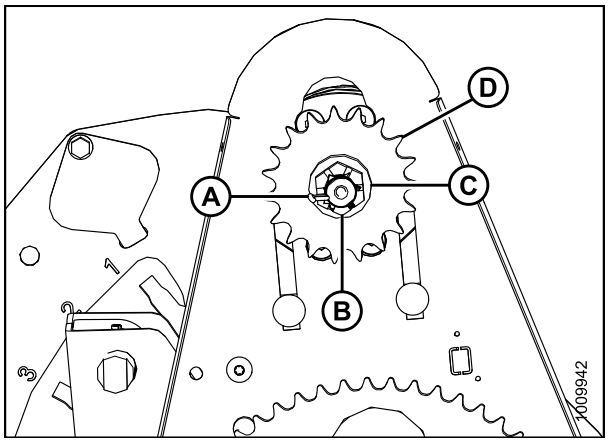


Figure 6.211: Reel Drive Sprocket

3. Install the chain (A) onto drive sprocket (B).

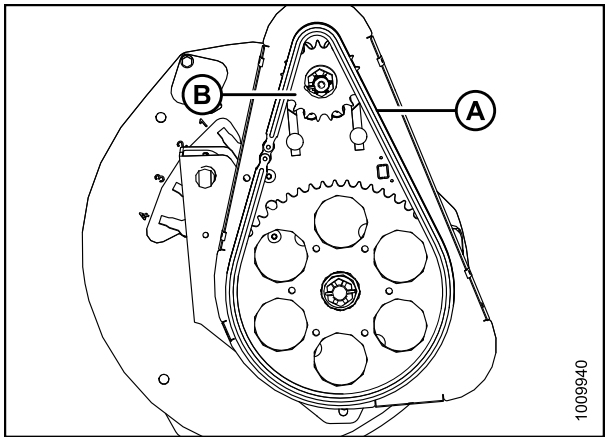


Figure 6.212: Reel Drive

Tightening Drive Chain

1. Ensure the six bolts (B) securing motor mount to chain case are loose.
2. Slide motor and motor mount upwards until chain (A) is tight, and tighten bolts (nuts on backside).
3. There should be 1/8 in. (3 mm) of slack in the chain. Adjust if necessary.
4. Torque bolts (B) to 54 lbf·ft (73 N·m).

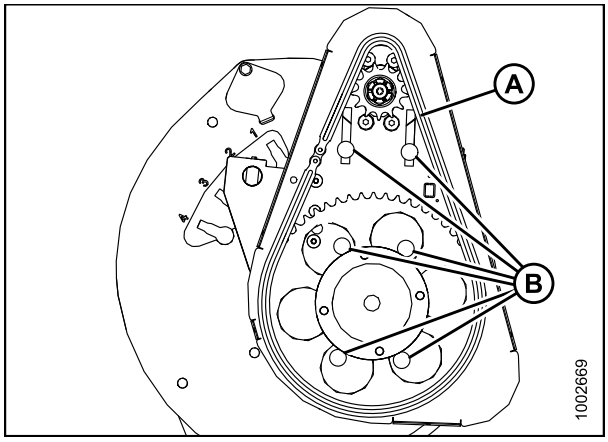


Figure 6.213: Reel Drive

Installing Drive Cover

Install reel drive cover as follows:

1. For **SINGLE REEL DRIVE**, position reel drive cover (A) to the reel drive and secure with four bolts (B).

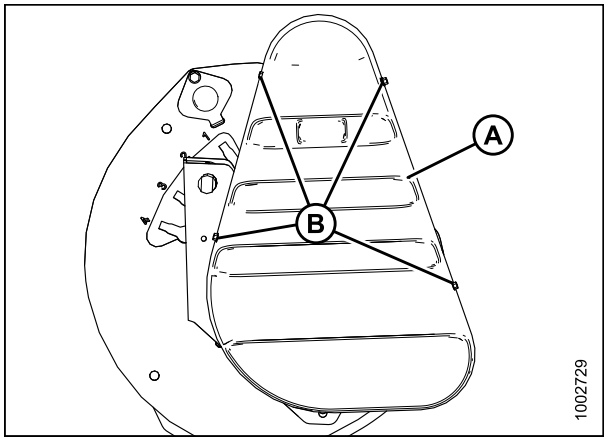


Figure 6.214: Single Reel Drive Cover

2. For **DOUBLE REEL DRIVE**, position the lower cover (C) first (if removed) and secure with three bolts (D). Install upper cover (A) using the six bolts (B).

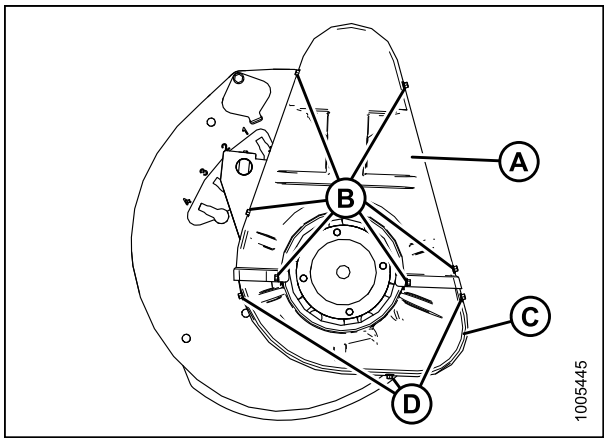


Figure 6.215: Double Reel Drive Cover

6.9.2 Replacing Double Reel U-Joint

The reel drive U-joint allows movement between the two reels. This allows either reel to move independently.

Lubricate the U-joint in accordance with the requirements. Refer to *6.3.6 Lubrication and Servicing, page 132*. U-joint should be replaced if severely worn or damaged. Refer to *Removing Double Reel U-Joint, page 225*.

Removing Drive Cover

1. Remove the six bolts (B) that secure the upper cover (A) to the reel drive and to the lower cover (C).

   NOTE:
   The lower cover (C) may also be removed by taking off the three bolts (D).

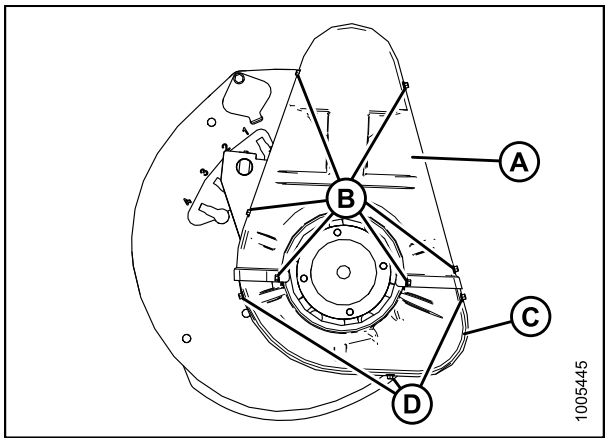


Figure 6.216: Double Reel

Removing Double Reel U-Joint

To remove the U-joint, follow these steps.

1. Support inboard end of right reel with a front end loader and nylon slings (or equivalent setup).

IMPORTANT:
To avoid damaging or denting center tube, support reel as close as possible to the end disc.

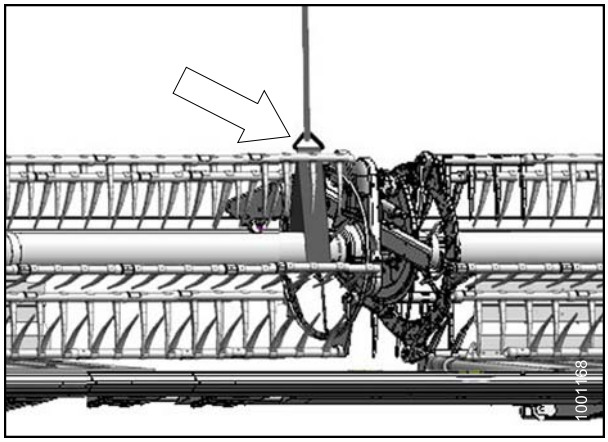


Figure 6.217: Supporting Reel

2. Remove four bolts (A) attaching reel tube to U-joint flange (B) and move reel sideways to disengage stub shaft from U-joint.

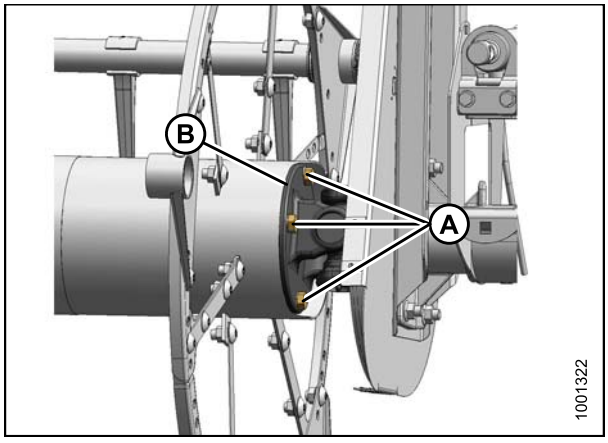


Figure 6.218: U-Joint

3. Remove six bolts (A) attaching U-joint flange (B) to driven sprocket (C).
4. Remove U-joint.

NOTE:
Right hand reel may need to be moved sideways for U-joint to clear reel tube.

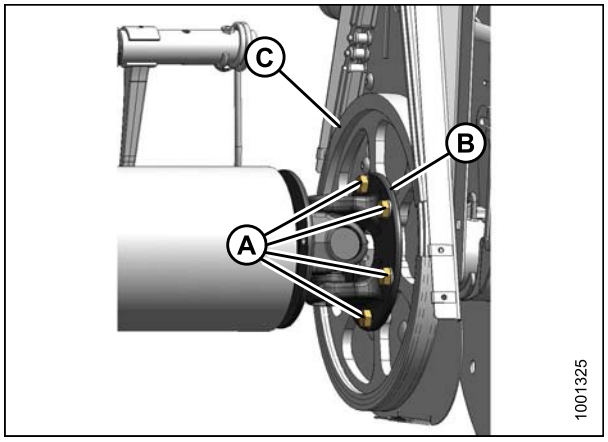


Figure 6.219: U-Joint

Installing Double Reel U-Joint

To install the U-joint, follow these steps.

NOTE:
Right hand reel may need to be moved sideways for U-joint to clear reel tube.

1. Position U-joint flange (B) onto driven sprocket (C) as shown. Install six bolts (A) and hand-tighten. Do **NOT** torque at this time.

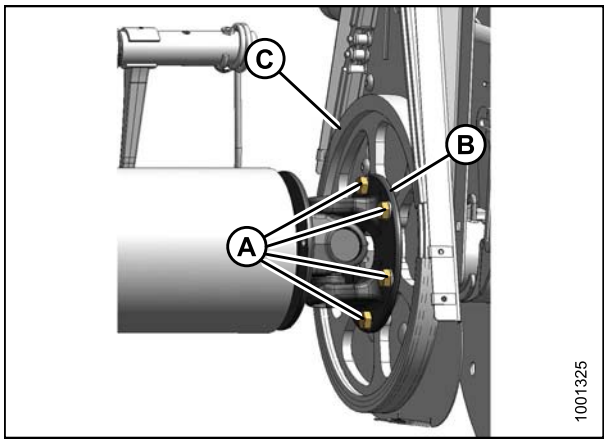


Figure 6.220: U-Joint

2. Position right-hand reel tube against reel drive and engage stub shaft into U-joint pilot hole.
3. Rotate reel until holes in end of reel tube and U-joint flange (B) line up.
4. Install four bolts (A) and torque to 70–80 ft·lbf (95–108 N·m).

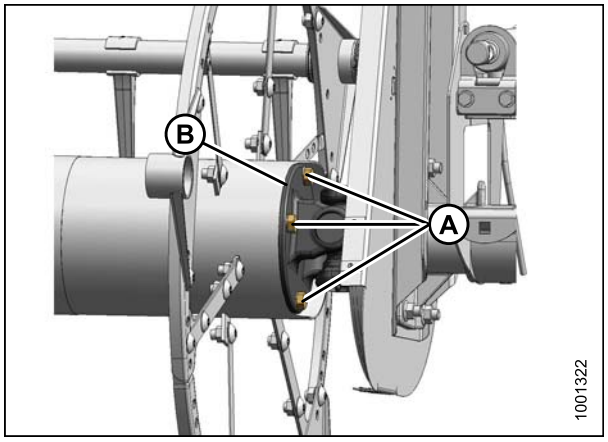


Figure 6.221: U-Joint

5. Remove temporary reel support.

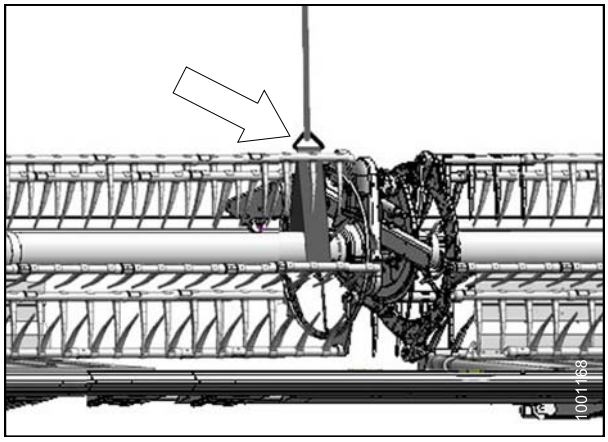


Figure 6.222: Supporting Reel

Installing Drive Cover

1. Position the lower cover (C) first (if removed) and secure with three bolts (D).
2. Install upper cover (A) using the six bolts (B).

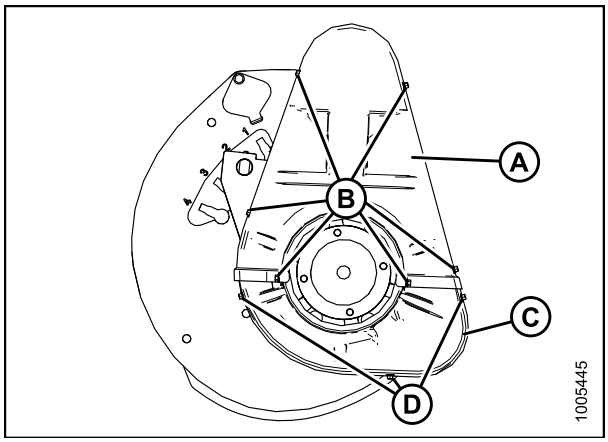


Figure 6.223: Double Reel Drive Cover

6.9.3 Replacing Reel Drive Motor

The reel drive motor does not require regular maintenance or servicing. If problems develop with the motor, it should be removed and serviced at your MacDon Dealer.

Removing Drive Cover

1. Remove the reel drive cover (A) as follows:

   a. For **SINGLE REEL DRIVE**, remove the four bolts (B) that secure the cover (A) to the reel drive.

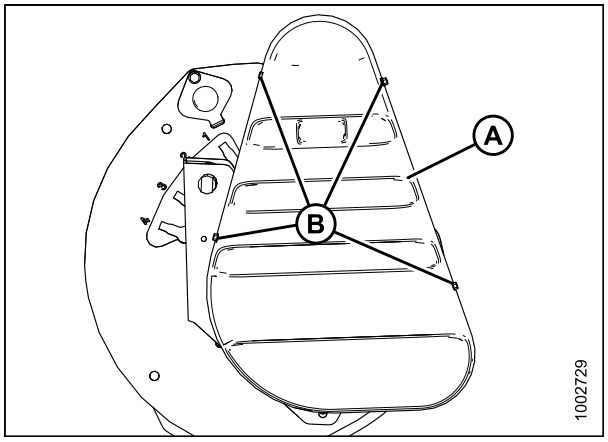


Figure 6.224: Single Reel

   b. For **DOUBLE REEL DRIVE**, remove the six bolts (B) that secure the upper cover (A) to the reel drive and to the lower cover (C).

      NOTE:
      The lower cover (C) may also be removed by taking off the three bolts (D).

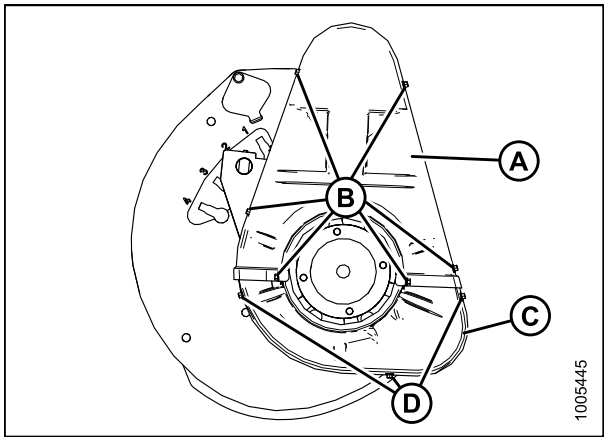


Figure 6.225: Double Reel

Loosening Drive Chain

1. Loosen nuts (A). Slide motor (B) and motor mount (C) down towards reel shaft.

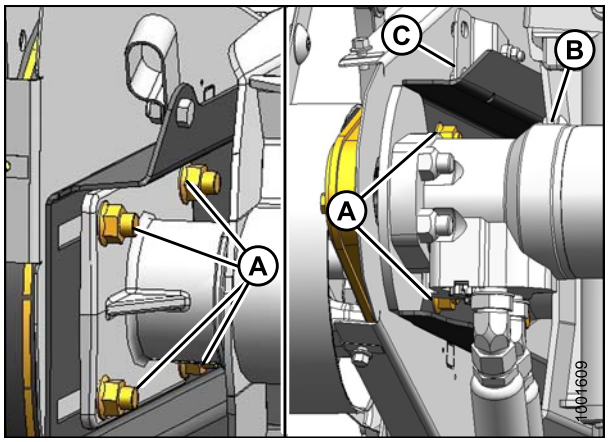


Figure 6.226: Reel Drive

Removing Drive Sprocket

1. Remove the drive chain (A) from the drive sprocket (B).

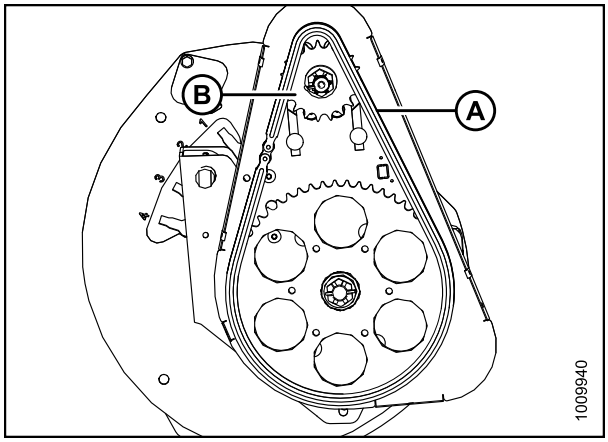


Figure 6.227: Reel Drive

2. Remove the cotter pin (A), slotted nut (B), and flat washer (C) from the motor shaft.
3. Remove the drive sprocket (D). Ensure key remains in the shaft.

IMPORTANT:
Do **NOT** use pry bar and/or hammer to remove drive sprocket (D). This will damage the motor. Use a puller if drive sprocket does not come off by hand.

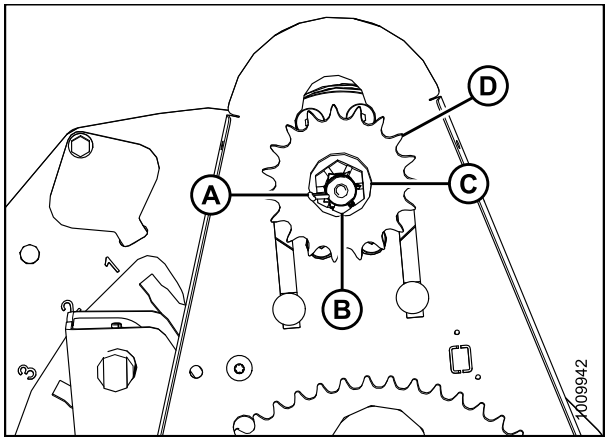


Figure 6.228: Reel Drive

Removing Reel Drive Motor

To remove the reel drive motor from a single or double reel header, follow these steps:

1. Disconnect hydraulic lines (A) at motor (B). Cap or plug open ports and lines.
2. Slide motor (B) and motor mount (C) up or down so that attachment bolts (D) are exposed in holes and slots in back plate.

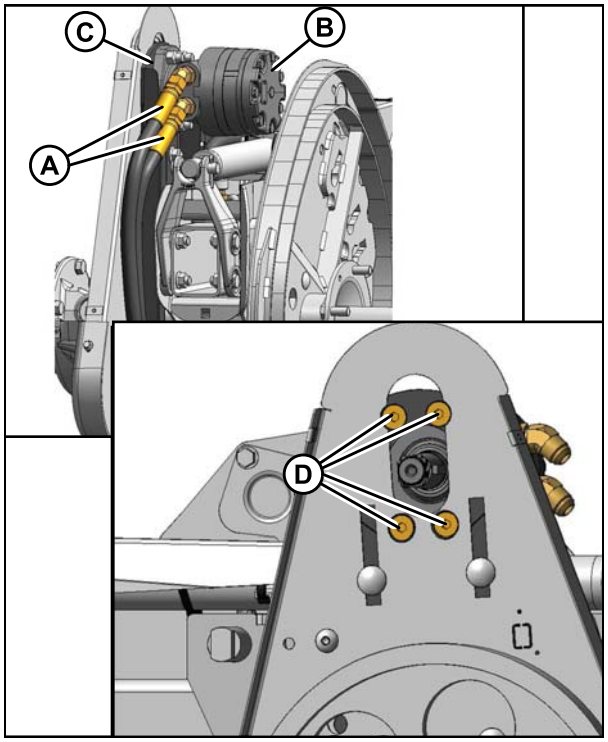


Figure 6.229: Reel Drive Motor

3. Remove four nuts (A) and attachment bolts and remove motor (B) from motor mount (C). Retrieve the spacer (if installed) from between the motor (B) and motor mount (C).

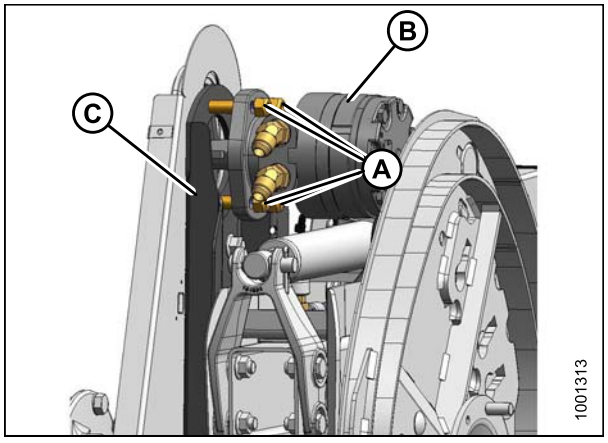


Figure 6.230: Reel Drive Motor

Installing Reel Drive Motor

To install the reel drive hydraulic motor, follow these steps:

1. Slide motor mount (A) up or down so that mounting holes are accessible through openings in chain case.
2. Attach motor (B) and spacer (C) to motor mount with four 1/2 in.x 1.75 countersunk bolts (D).
3. Secure motor with lock nuts (E).
4. Torque nuts to 54 lbf·ft (73 N·m).
5. If installing new motor, install fittings (F) from old motor onto new motor.

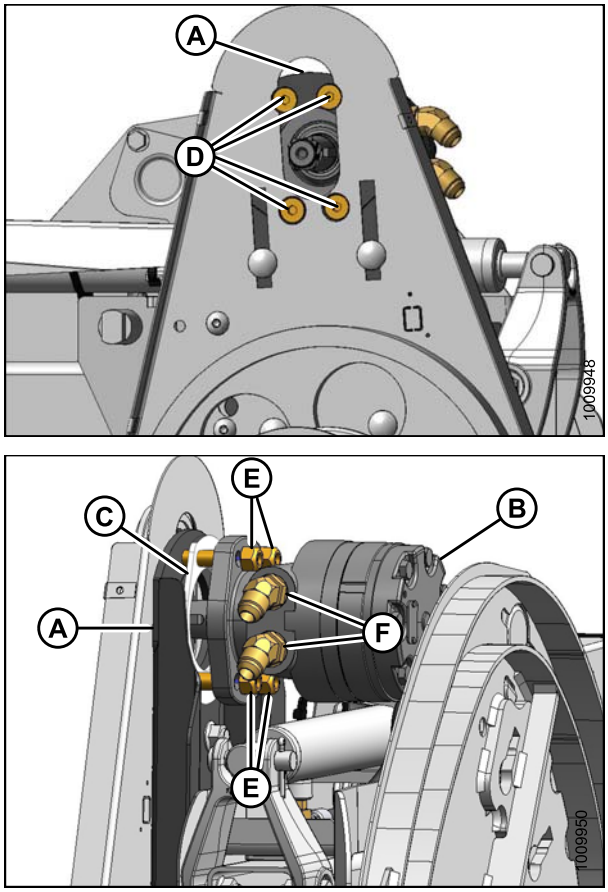


Figure 6.231: Reel Drive Motor

A - Motor Mount **B - Hydraulic Motor** **C - Spacer**
D - Bolts **E - Lock Nuts** **F - Hydraulic Fittings**

6. Reattach hydraulic lines (A) to motor (B).

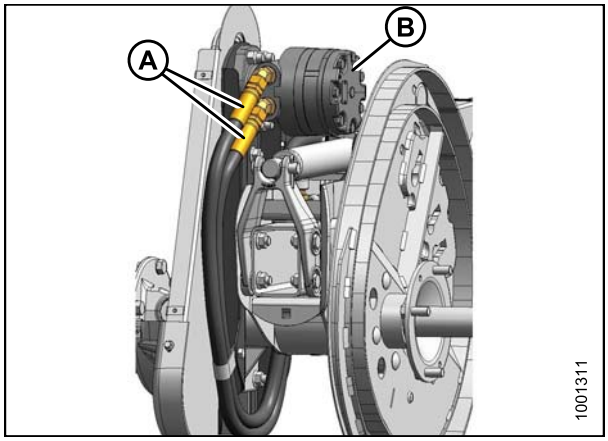


Figure 6.232: Reel Drive

Installing Drive Sprocket

1. Install the new drive sprocket (D), flat washer (C), and slotted nut (B), onto the motor shaft.
2. Torque nut to 40 lbf·ft (54 N·m). Tighten to next slot if necessary to install cotter pin (A).

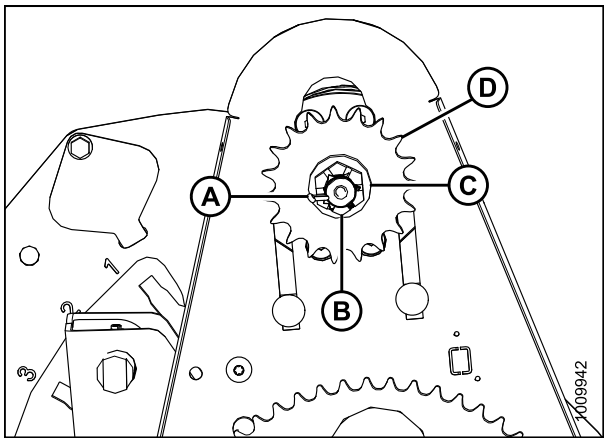


Figure 6.233: Reel Drive Sprocket

3. Install the chain (A) onto drive sprocket (B).

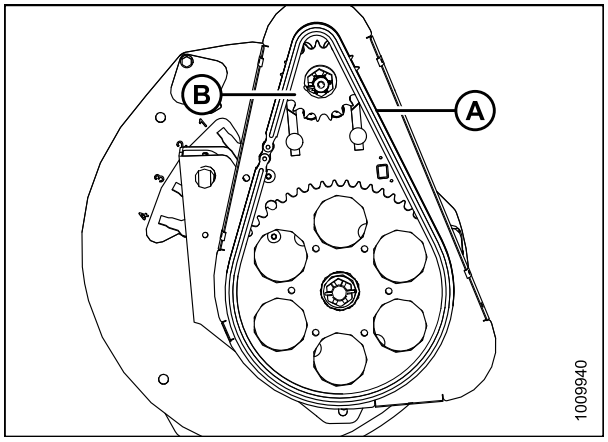


Figure 6.234: Reel Drive

Tightening Drive Chain

1. Ensure the six bolts (B) securing motor mount to chain case are loose.
2. Slide motor and motor mount upwards until chain (A) is tight, and tighten bolts (nuts on backside).
3. There should be 1/8 in. (3 mm) of slack in the chain. Adjust if necessary.
4. Torque bolts (B) to 54 lbf·ft (73 N·m).

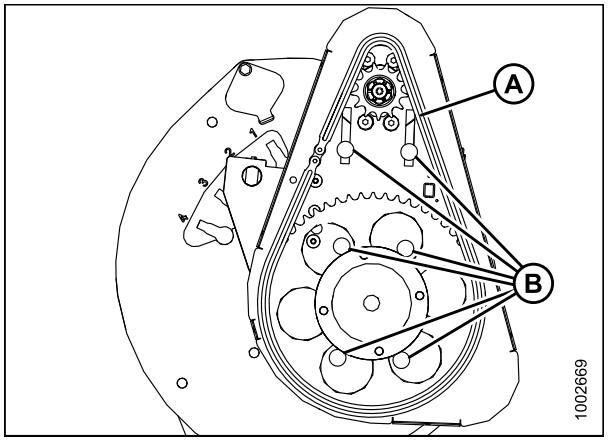


Figure 6.235: Reel Drive

Installing Drive Cover

Install reel drive cover as follows:

1. For **SINGLE REEL DRIVE**, position reel drive cover (A) to the reel drive and secure with four bolts (B).

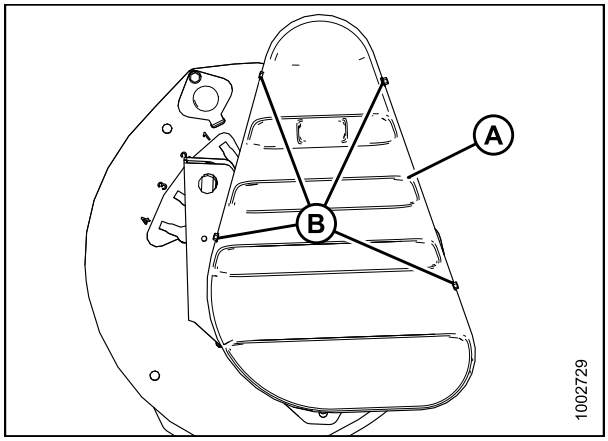


Figure 6.236: Single Reel Drive Cover

2. For **DOUBLE REEL DRIVE**, position the lower cover (C) first (if removed) and secure with three bolts (D). Install upper cover (A) using the six bolts (B).

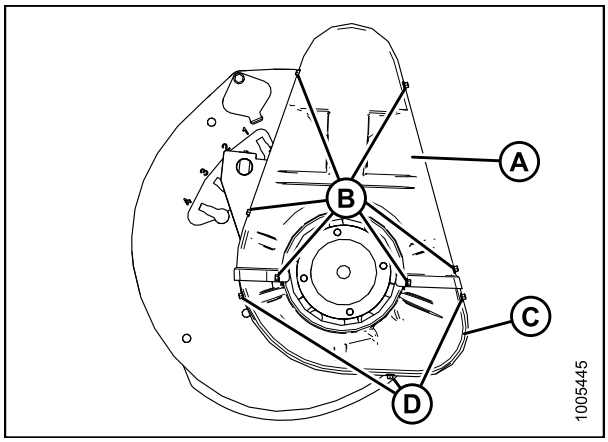


Figure 6.237: Double Reel Drive Cover

6.9.4 Replacing Drive Chain on Double Reel

The drive chain on a high torque double reel drive can be replaced using two methods. Refer to:

- *Disconnecting the Reel Drive Method, page 234*
- *Breaking the Chain Method, page 236*

Both procedures are acceptable, but disconnecting the reel drive method is preferred because the chain integrity is not affected.

Removing Drive Cover

1. Remove the six bolts (B) that secure the upper cover (A) to the reel drive and to the lower cover (C).

   NOTE:
   The lower cover (C) may also be removed by taking off the three bolts (D).

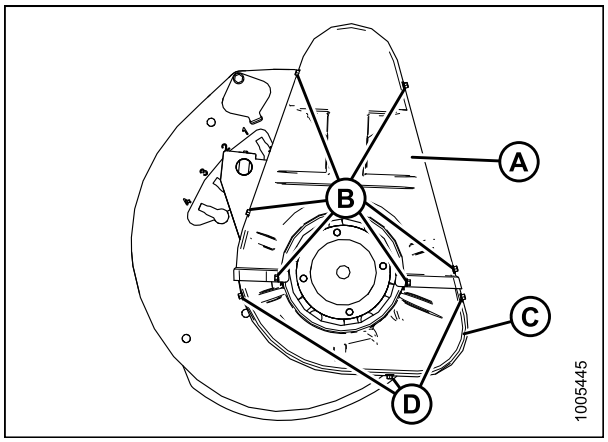


Figure 6.238: Double Reel

Loosening Drive Chain

1. Loosen nuts (A). Slide motor (B) and motor mount (C) down towards reel shaft.

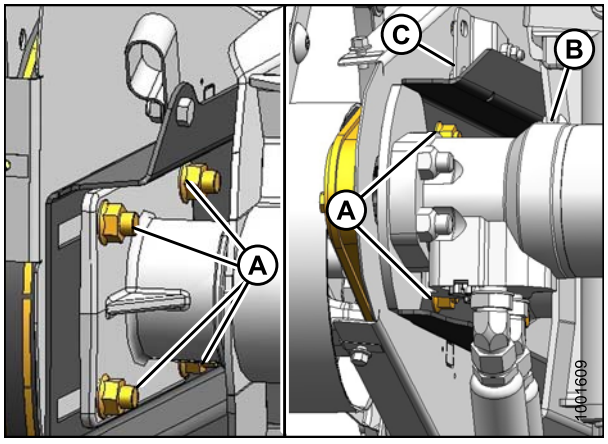


Figure 6.239: Reel Drive

Disconnecting the Reel Drive Method

1. Support inboard end of 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 end disc.

Figure 6.240: Supporting Reel

2. Remove four bolts (A) attaching reel tube to U-joint (B).

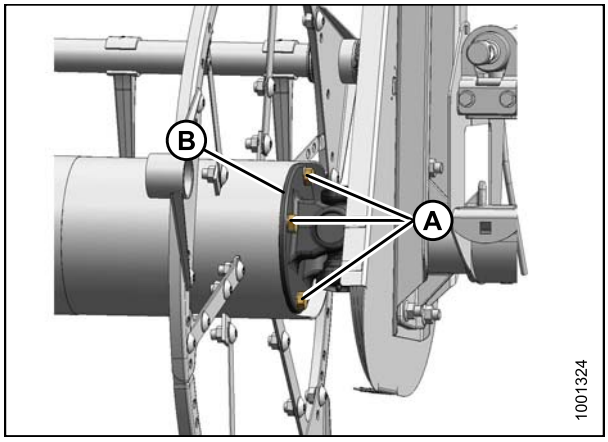


Figure 6.241: U-Joint

3. Move right-hand reel sideways to separate the reel tube (A) and U-joint (B).
4. Remove the chain (C).
5. Route new chain (C) over U-joint (B) and locate on sprockets.

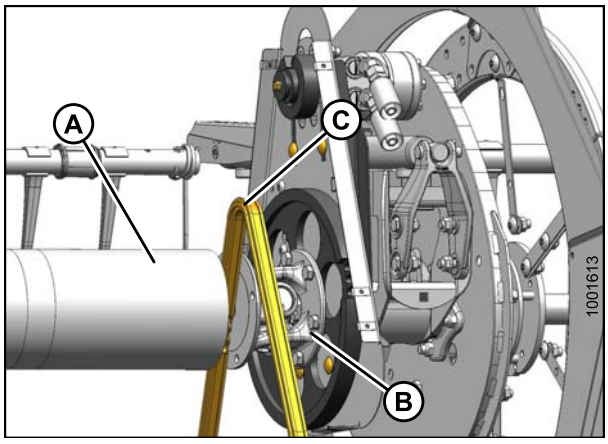


Figure 6.242: Replacing Chain

6. Position right-hand reel tube (A) against reel drive and engage stub shaft into U-joint (B) pilot hole.
7. Rotate reel until holes in end of reel tube and U-joint line up.
8. Apply Loctite® #243 (or equivalent) to four 1/2 in. bolts (A) and install with lock washers.
9. Torque to 75–85 ft·lbf (102–115 N·m).

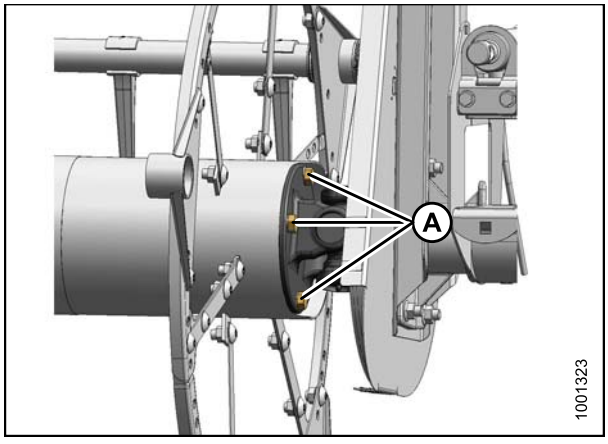


Figure 6.243: U-Joint

10. Remove temporary reel support.
11. Proceed to Tightening Drive Chain.

Figure 6.244: Supporting Reel

Breaking the Chain Method

1. Grind off head of a link rivet on chain (A), punch out the rivet, and remove chain.
2. Grind off the head from one of the link rivets on the new chain and punch out rivet to separate the chain.
3. Locate ends of chain on sprocket (B).

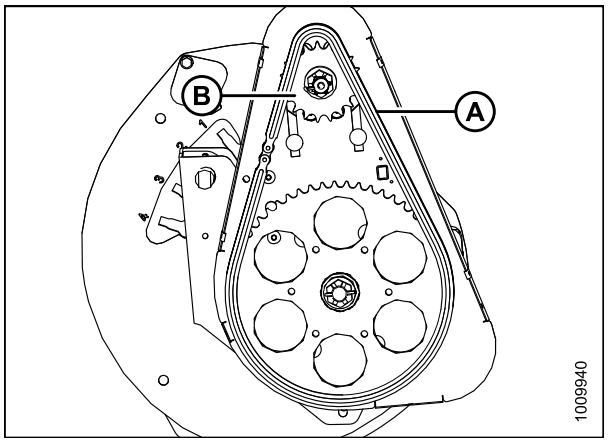


Figure 6.245: Reel Drive

4. Install pin connector (A) (not available as a MacDon part) into chain, preferably from sprocket backside.
5. Install connector (B) onto pins.
6. Install spring clip (C) onto front pin (D) with closed end of clip in direction of sprocket rotation.
7. Locate one leg of clip in groove of apt pin (E).
8. Press other leg of spring clip over face of aft pin (E) until it slips into groove. Do **NOT** press clip lengthwise from closed end.
9. Ensure clip is seated in grooves of pins.

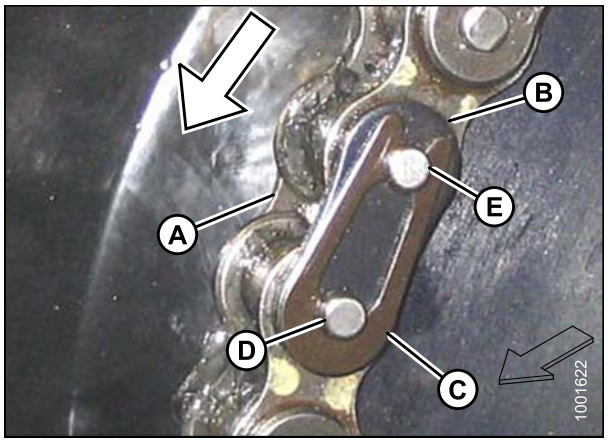


Figure 6.246: Chain

Tightening Drive Chain

1. Ensure the six bolts (B) securing motor mount to chain case are loose.
2. Slide motor and motor mount upwards until chain (A) is tight, and tighten bolts (nuts on backside).
3. There should be 1/8 in. (3 mm) of slack in the chain. Adjust if necessary.
4. Torque bolts (B) to 54 lbf·ft (73 N·m).

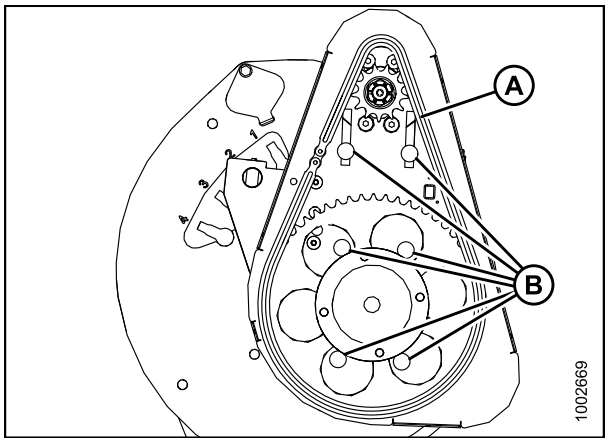


Figure 6.247: Reel Drive

Installing Drive Cover

1. Position the lower cover (C) first (if removed) and secure with three bolts (D).
2. Install upper cover (A) using the six bolts (B).

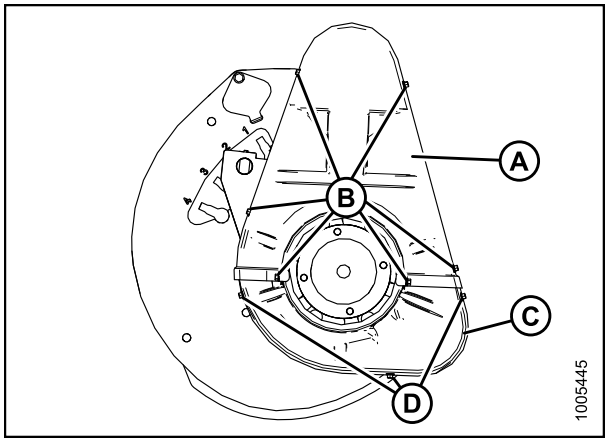


Figure 6.248: Double Reel Drive Cover

6.9.5 Replacing Drive Chain on Single Reel

Removing Drive Cover

1. Remove the reel drive cover (A) as follows:

   a. For **SINGLE REEL DRIVE**, remove the four bolts (B) that secure the cover (A) to the reel drive.

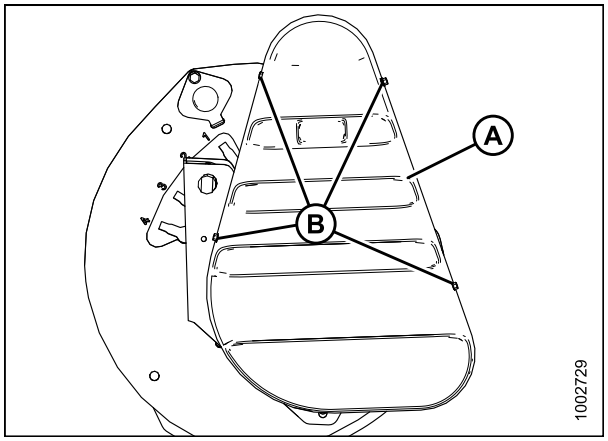


Figure 6.249: Single Reel

   b. For **DOUBLE REEL DRIVE**, remove the six bolts (B) that secure the upper cover (A) to the reel drive and to the lower cover (C).

   NOTE:
   The lower cover (C) may also be removed by taking off the three bolts (D).

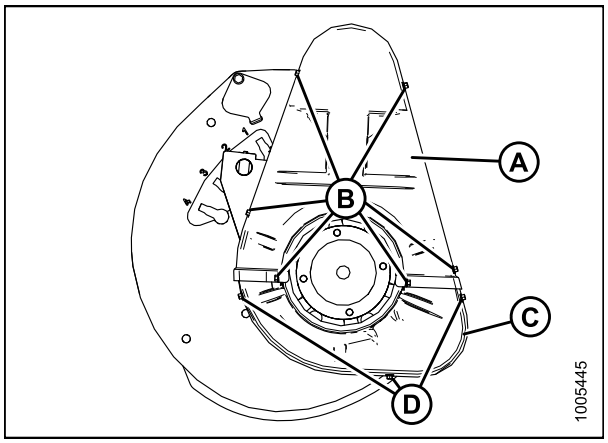


Figure 6.250: Double Reel

Loosening Drive Chain

1. Loosen nuts (A). Slide motor (B) and motor mount (C) down towards reel shaft.

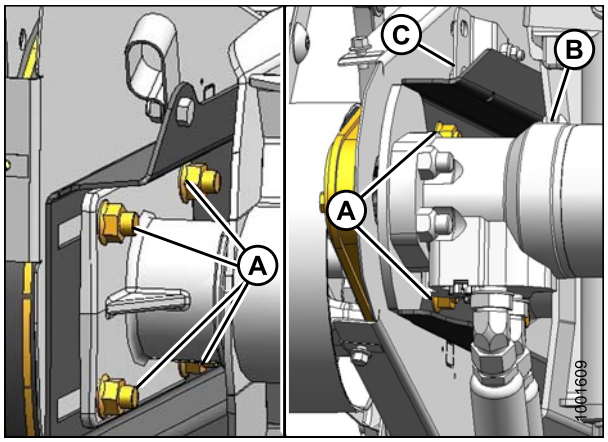


Figure 6.251: Reel Drive

Replacing Chain on Single Reel

1. Lift chain (A) off drive sprocket (B).
2. Lower chain until free of lower sprocket (C) and remove chain from drive.
3. Locate new chain (A) around bottom teeth on lower sprocket (C).
4. Lift chain onto drive sprocket (B) ensuring all links are properly engaged in teeth.

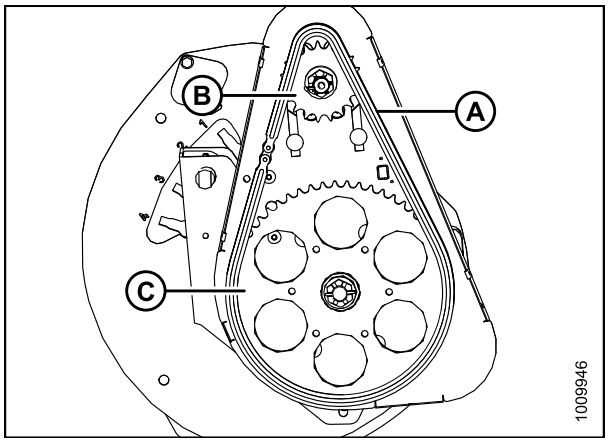


Figure 6.252: Reel Drive

Tightening Drive Chain

1. Ensure the six bolts (B) securing motor mount to chain case are loose.
2. Slide motor and motor mount upwards until chain (A) is tight, and tighten bolts (nuts on backside).
3. There should be 1/8 in. (3 mm) of slack in the chain. Adjust if necessary.
4. Torque bolts (B) to 54 lbf·ft (73 N·m).

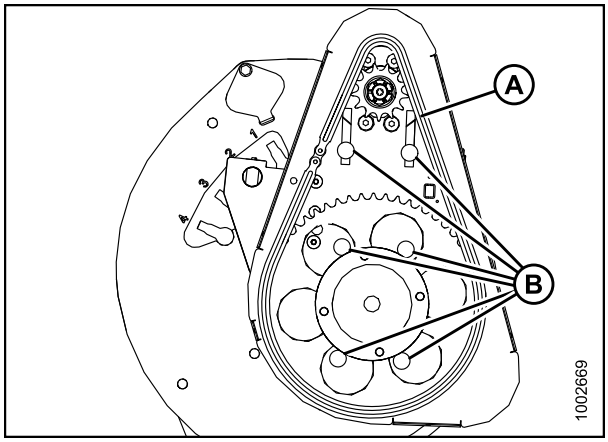


Figure 6.253: Reel Drive

Installing Drive Cover

Install reel drive cover as follows:

1. For **SINGLE REEL DRIVE**, position reel drive cover (A) to the reel drive and secure with four bolts (B).

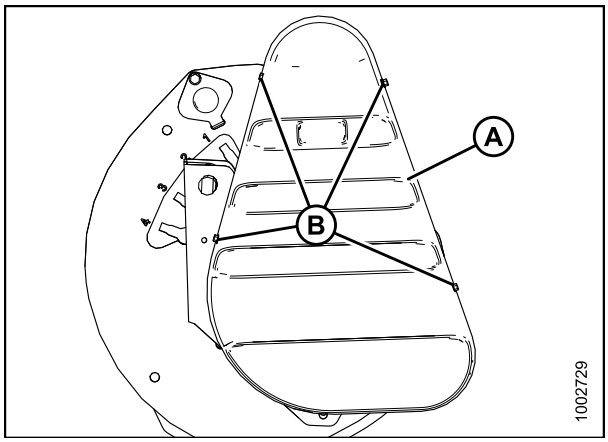


Figure 6.254: Single Reel Drive Cover

2. For **DOUBLE REEL DRIVE**, position the lower cover (C) first (if removed) and secure with three bolts (D). Install upper cover (A) using the six bolts (B).

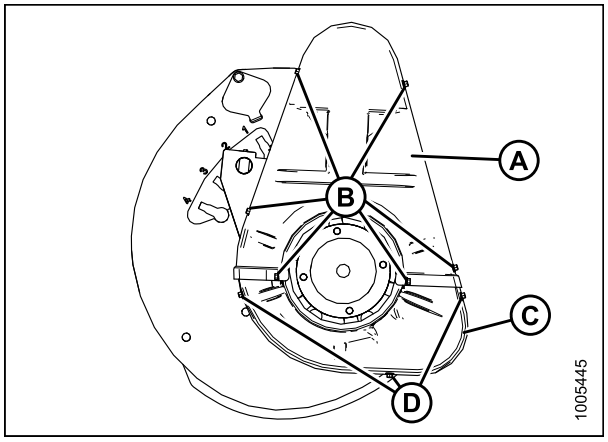


Figure 6.255: Double Reel Drive Cover

6.9.6 Adjusting Reel Drive Chain Tension

Removing Drive Cover

1. Remove the reel drive cover (A) as follows:

   a. For **SINGLE REEL DRIVE**, remove the four bolts (B) that secure the cover (A) to the reel drive.

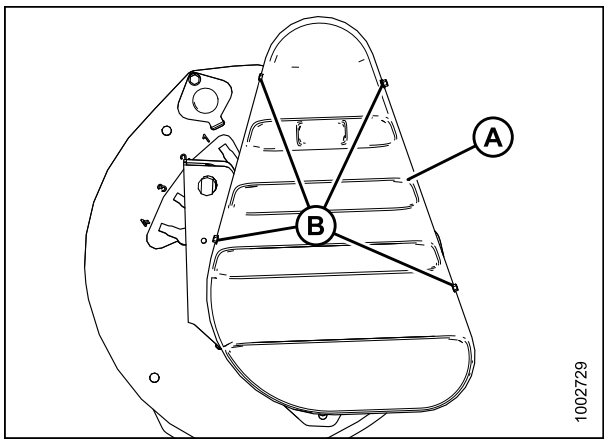


Figure 6.256: Single Reel

   b. For **DOUBLE REEL DRIVE**, remove the six bolts (B) that secure the upper cover (A) to the reel drive and to the lower cover (C).

      NOTE:
      The lower cover (C) may also be removed by taking off the three bolts (D).

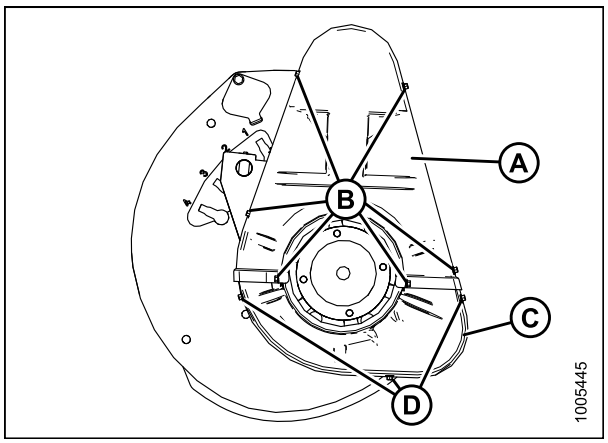


Figure 6.257: Double Reel

Tightening Drive Chain

1. Ensure the six bolts (B) securing motor mount to chain case are loose.
2. Slide motor and motor mount upwards until chain (A) is tight, and tighten bolts (nuts on backside).
3. There should be 1/8 in. (3 mm) of slack in the chain. Adjust if necessary.
4. Torque bolts (B) to 54 lbf·ft (73 N·m).

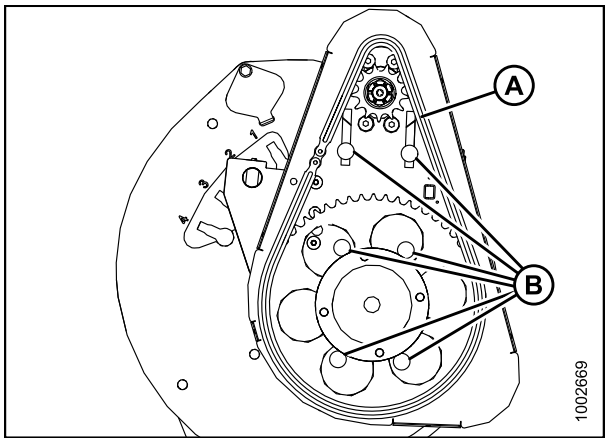


Figure 6.258: Reel Drive

Installing Drive Cover

Install reel drive cover as follows:

1. For **SINGLE REEL DRIVE**, position reel drive cover (A) to the reel drive and secure with four bolts (B).

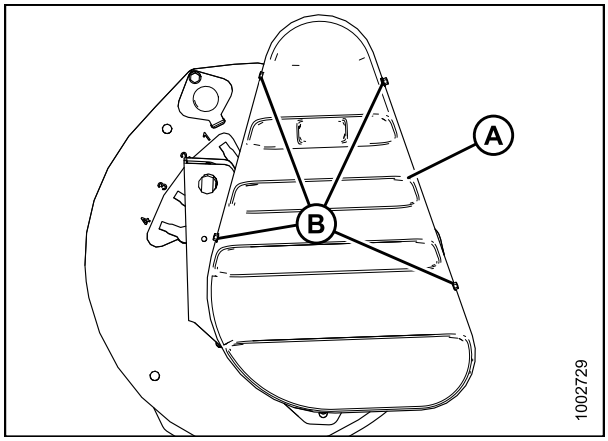


Figure 6.259: Single Reel Drive Cover

2. For **DOUBLE REEL DRIVE**, position the lower cover (C) first (if removed) and secure with three bolts (D). Install upper cover (A) using the six bolts (B).

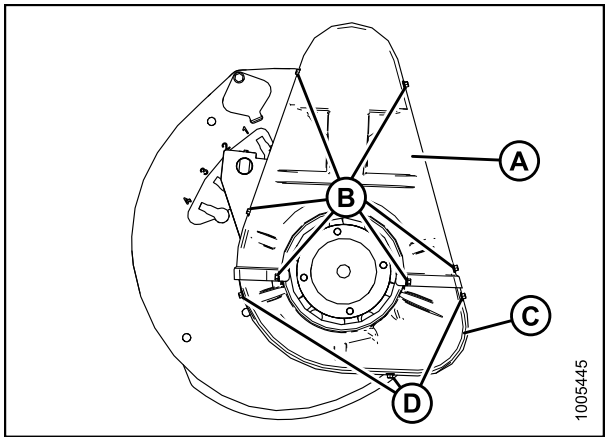


Figure 6.260: Double Reel Drive Cover

6.10 Transport System (Optional)

Refer to *8.3.3 Stabilizer/Slow Speed Transport Wheels, page 264* for more information.

6.10.1 Checking Wheel Bolt Torque

If a Transport System is installed, follow procedure for torquing the wheel bolts.

IMPORTANT:
Whenever a wheel is removed and reinstalled, check torque after one hour of operation and every 100 hours thereafter. Maintain 80–90 ft·lbf (110–120 N·m) torque. Follow bolt tightening sequence shown below.

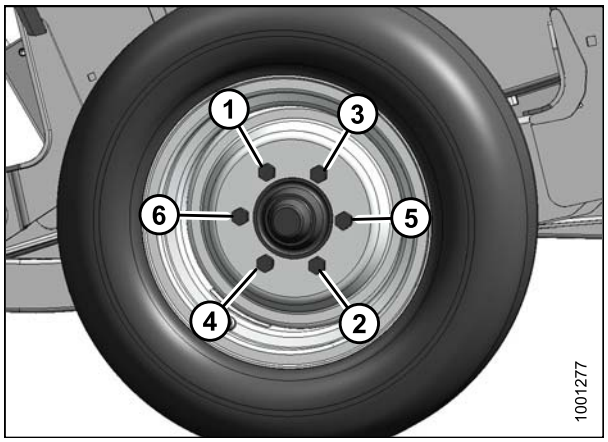


Figure 6.261: Bolt Tightening Sequence

6.10.2 Checking Axle Bolt Torque

If a transport system is installed, follow this procedure for torquing the axle bolts.

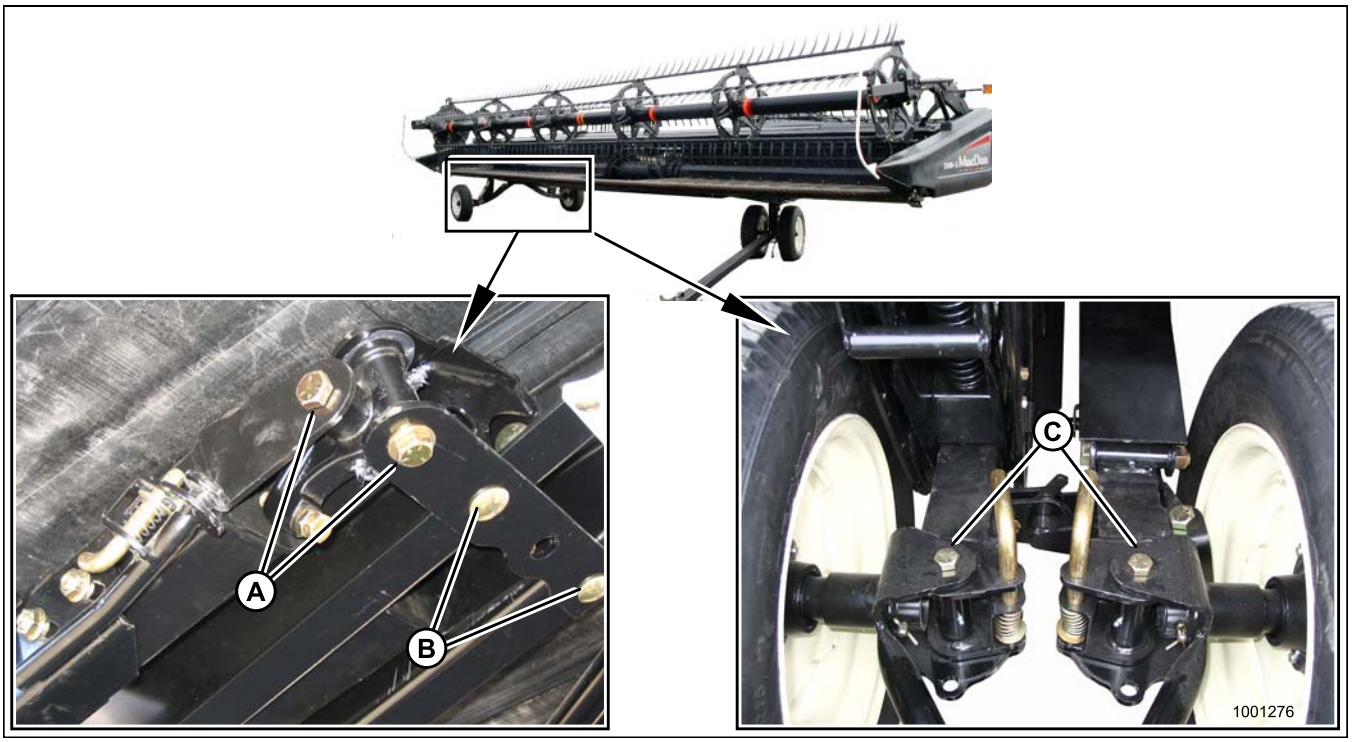


Figure 6.262: Axle Bolts

1. Check and tighten axle bolts **DAILY** until torque is maintained as follows:
   - (A): 180 ft·lbf (244 N·m)
   - (B): 150 ft·lbf (203 N·m)
   - (C): 180 ft·lbf (244 N·m)

6.10.3 Checking Tire Pressure

Check tire pressure daily. Maintain pressure recommended in following table:

Size	Load Range	Pressure
ST205/75 R15	D	65 psi (448 kPa)
	E	80 psi (552 kPa)

WARNING

- **Service tires safely.**
- **A tire can explode during inflation and cause serious injury or death.**
- **Do NOT stand over tire. Use a clip-on chuck and extension hose.**
- **NEVER increase air pressure beyond pressure specified on tire sidewall to seat the bead on the rim.**
- **Replace the tire if it has a defect.**
- **Replace a wheel rim, which has cracks, wear or severe rust.**
- **NEVER weld a wheel rim.**
- **NEVER use force on an inflated or partially inflated tire.**
- **Make sure the tire is correctly seated before inflating to operating pressure.**
- **If the tire is not in correct position on the rim, or is too full of air, the tire bead can loosen on one side, causing air to leak 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 a tire before removing the tire from a rim.**
- **Do NOT remove, install or make repairs to 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.**

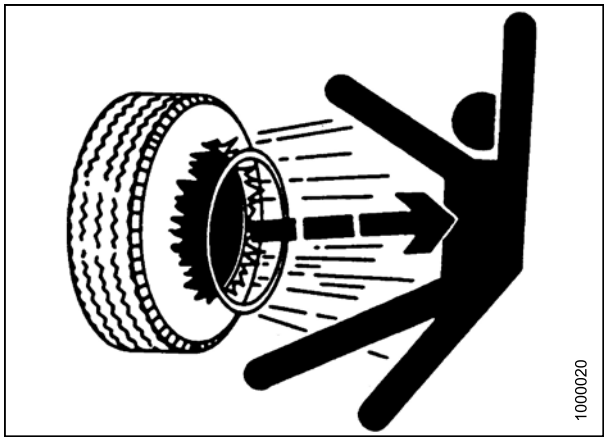


Figure 6.263: Inflation Warning

7 Troubleshooting

7.1 Crop Loss at Cutterbar

Symptom	Problem	Solution	Section
Does not pick up down crop	Cutterbar too high	Lower cutterbar.	*4.7.1 Cutting Height, page 50*
	Header angle too low	Increase header angle.	*Controlling Header Angle, page 56*
	Reel too high	Lower reel.	*4.7.8 Reel Height, page 58*
	Reel too far back	Move reel forward.	*4.7.9 Reel Fore-Aft Position, page 58*
	Ground speed too fast for reel speed	Reduce ground speed or increase reel speed.	*4.7.4 Reel Speed, page 56* *4.7.5 Ground Speed, page 57*
	Reel fingers not lifting crop sufficiently	Increase finger pitch aggressiveness.	*4.7.10 Reel Tine Pitch, page 65*
		Install lifter guards.	See your MacDon Dealer
Heads shattering or breaking off	Reel speed too fast	Reduce reel speed.	*4.7.4 Reel Speed, page 56*
	Reel too low	Raise reel.	*4.7.8 Reel Height, page 58*
	Ground speed too fast	Reduce ground speed.	*4.7.5 Ground Speed, page 57*
	Crop too ripe	Operate at night when humidity is higher.	—
Cut grain falling ahead of cutterbar	Ground speed too slow	Increase ground speed.	*4.7.5 Ground Speed, page 57*
	Reel speed too slow	Increase reel speed.	*4.7.4 Reel Speed, page 56*
	Reel too high	Lower reel.	*4.7.8 Reel Height, page 58*
	Cutterbar too high	Lower cutterbar.	*4.7.1 Cutting Height, page 50*
	Reel too far forward	Move reel back on arms.	*4.7.9 Reel Fore-Aft Position, page 58*
	Cutting at speeds over 6 mph (10 km/h) with high torque (10-tooth) reel drive sprocket	Replace with standard torque (19-tooth) reel drive sprocket.	*6.9.1 Replacing Reel Drive Sprocket, page 221*
	Worn or broken knife components	Replace components.	*6.5 Knife, page 140*
Strips of uncut material	Crowding uncut crop	Allow enough room for crop to be fed to cutterbar.	—
	Broken knife sections	Replace broken sections.	*6.5.1 Replacing Knife Section, page 140*

Symptom	Problem	Solution	Section
Excessive bouncing at normal field speed	Float set too light	Adjust header float.	*4.7.2 Header Float, page 55*
Divider rod running down standing crop	Divider rods too long	Remove divider rod.	*4.7.12 Crop Divider Rods, page 72*
Bushy or tangled crop flows over divider rod, builds up on endsheets	Divider rods providing insufficient separation	Install long divider rods.	*4.7.12 Crop Divider Rods, page 72*
Crop not being cut at ends	Reel not frowning or not centered in header	Adjust reel frown or reel horizontal position.	*4.7.9 Reel Fore-Aft Position, page 58* *6.8.2 Reel Frown, page 203*
	Knife hold-downs not adjusted properly	Adjust hold-downs so knife works freely, but still keep sections from lifting off guards.	*Checking Knife Hold-Downs, page 149*
	Knife sections or guards are worn or broken	Replace all worn and broken cutting parts.	*6.5 Knife, page 140*
	Header is not level	Level header.	*4.12 Levelling the Header, page 83*
	Reel fingers not lifting crop properly ahead of knife	Adjust reel position/finger pitch.	*4.7.9 Reel Fore-Aft Position, page 58* *4.7.10 Reel Tine Pitch, page 65*
	Divider runs down thick crop at ends, preventing proper feeding due to material bridging the cutter guards	Replace 3 or 4 end guards with stub guards.	See your MacDon Dealer, *6.5.7 Knife Guards, page 144* and *8.2.3 Stub Guard Conversion Kit, page 262*
Material accumulating in gap between cut-out in endsheet and knifehead	Crop heads leaning away from knifehead hole in endsheet	Add knifehead shield(s), except in damp/sticky soils.	*8.2.2 Knifehead Shield, page 261*

7.2 Cutting Action and Knife Components

Symptom	Problem	Solution	Section
Ragged or uneven cutting of crop	Knife hold-downs not adjusted properly.	Adjust hold-downs.	*Checking Knife Hold-Downs, page 149*
	Knife sections or guards are worn or broken.	Replace all worn and broken cutting parts.	*6.5 Knife, page 140*
	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.	*4.7.5 Ground Speed, page 57* *4.7.4 Reel Speed, page 56*
	Reel fingers not lifting crop properly ahead of knife.	Adjust reel position / finger pitch.	*4.7.9 Reel Fore-Aft Position, page 58* *4.7.10 Reel Tine Pitch, page 65*
	Cutterbar too high.	Lower cutting height.	*4.7.1 Cutting Height, page 50*
	Header angle too flat.	Steepen header angle.	*Controlling Header Angle, page 56*
	Bent knife, causing binding of cutting parts.	Straighten a bent knife. Align guards.	*6.5.7 Knife Guards, page 144*
	Cutting edge of guards not close enough, or parallel to knife sections.	Align guards.	
	Tangled / tough to cut crop.	Install stub guards.	*6.5.7 Knife Guards, page 144* *8.2.3 Stub Guard Conversion Kit, page 262* See your MacDon Dealer
	Reel too far back.	Move reel forward.	*4.7.9 Reel Fore-Aft Position, page 58*
	Loose knife drive belt.	Adjust drive belt tension.	*Tensioning Non-Timed Knife Drive Belts, page 163* or *Tensioning Timed Knife Drive Belts, page 168*

Symptom	Problem	Solution	Section
Knife plugging	Reel too high or too far forward.	Lower reel or move reel rearward.	*4.7.8 Reel Height, page 58* *4.7.9 Reel Fore-Aft Position, page 58*
	Ground speed too slow.	Increase ground speed.	*4.7.5 Ground Speed, page 57*
	Loose knife drive belt.	Adjust drive belt tension.	*Tensioning Non-Timed Knife Drive Belts, page 163* or *Tensioning Timed Knife Drive Belts, page 168*
	Improper knife hold-down adjustment.	Adjust hold-down.	*Checking Knife Hold-Downs, page 149*
	Dull or broken knife sections.	Replace knife section.	*6.5.1 Replacing Knife Section, page 140*
	Bent or broken guards.	Align or replace guards.	*6.5.7 Knife Guards, page 144*
	Reel fingers not lifting crop properly ahead of knife.	Adjust reel position / finger pitch.	*4.7.9 Reel Fore-Aft Position, page 58* *4.7.10 Reel Tine Pitch, page 65*
	Steel pick-up fingers contacting knife.	Increase reel clearance to cutterbar, or adjust frown.	*6.8.1 Reel Clearance to Cutterbar, page 200* *6.8.2 Reel Frown, page 203*
	Float too heavy.	Adjust springs for lighter float.	*4.7.2 Header Float, page 55*
	Mud or dirt build-up on cutterbar.	Raise cutterbar by lowering skid shoes.	*Cutting On the Ground, page 53*
		Install cut-out sections.	See your MacDon Dealer
		Flatten header angle.	*Controlling Header Angle, page 56*
	Knife is not operating at recommended speed.	Check engine speed of windrower.	Refer to your windrower's operator's manual

Symptom	Problem	Solution	Section
Excessive header vibration	Knife hold-downs not adjusted properly.	Adjust hold-downs.	*Checking Knife Hold-Downs, page 149*
	Knives on double-knife drive not timed.	Adjust knife timing.	*Adjusting Double Knife Timing, page 169*
	Knife not operating at recommended speed.	Check engine speed of windrower.	Refer to your windrower's operator's manual
	Excessive knife wear.	Replace knife.	*6.5.2 Removing Knife, page 142* *6.5.5 Installing Knife, page 143*
	Loose or worn knifehead pin or drive arm.	Tighten or replace parts.	*Removing Knifehead Bearing* *6.6.1 Knife Drive Box, page 153*
	Bent cutterbar.	Straighten cutterbar.	See your MacDon Dealer
Knife back breakage	Bent or broken guard.	Straighten or replace.	*6.5.7 Knife Guards, page 144*
	Worn knifehead pin.	Replace.	*Removing Knifehead Bearing*
	Dull knife.	Replace.	*6.5.2 Removing Knife, page 142* *6.5.5 Installing Knife, page 143*
Excessive breakage of knife sections or guards.	Knife hold-downs not adjusted properly.	Adjust hold-downs.	*Checking Knife Hold-Downs, page 149*
	Cutterbar operating too low in stony conditions.	Raise cutterbar, using skid shoes.	*Cutting On the Ground, page 53*
	Float is set too heavy.	Adjust for lighter float.	*4.7.2 Header Float, page 55*
	Bent or broken guard.	Straighten or replace.	*6.5.7 Knife Guards, page 144*
	Header angle too steep.	Flatten header angle.	*Controlling Header Angle, page 56*

7.3 Reel Delivery

Symptom	Problem	Solution	Section
Reel not releasing material in normal standing crop	Reel speed too fast	Reduce reel speed.	*4.7.4 Reel Speed, page 56*
	Reel too low	Raise reel.	*4.7.8 Reel Height, page 58*
	Reel tines too aggressive	Reduce cam setting.	*4.7.10 Reel Tine Pitch, page 65*
	Reel too far back	Move reel forward.	*4.7.9 Reel Fore-Aft Position, page 58*
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).	*4.7.10 Reel Tine Pitch, page 65*
Wrapping on reel end	Reel tines too aggressive	Reduce cam setting.	*4.7.10 Reel Tine Pitch, page 65*
	Reel too low	Raise reel.	*4.7.8 Reel Height, page 58*
	Reel speed too fast	Reduce reel speed.	*4.7.4 Reel Speed, page 56*
	Crop conditions	Install optional endshields.	See your MacDon Dealer
	Reel not centered in header	Center reel in header.	*6.8.3 Centering the Reel, page 204*
Reel releases crop too quickly	Reel tines not aggressive enough	Increase cam setting.	*4.7.10 Reel Tine Pitch, page 65*
	Reel too far forward	Move reel back.	*4.7.9 Reel Fore-Aft Position, page 58*
Reel will not lift	Reel lift couplers are incompatible or defective	Change quick coupler.	—
Reel will not turn	Control set at 0	Activate reel speed control.	*4.7.4 Reel Speed, page 56*
	Quick couplers not properly connected	Connect couplers.	*5.1 Attaching Header to Windrower, page 107*
	Reel drive chain disconnected	Connect chain.	*6.9.5 Replacing Drive Chain on Single Reel, page 238*
Reel motion uneven under no load	Excessive slack in reel drive chain	Tighten chain.	*6.9.6 Adjusting Reel Drive Chain Tension, page 240*

Symptom	Problem	Solution	Section
Reel motion is uneven or stalls in heavy crops	Reel speed too fast	Reduce reel speed.	*4.7.4 Reel Speed, page 56*
	Reel fingers not aggressive enough	Move to a more aggressive finger pitch notch.	*4.7.10 Reel Tine Pitch, page 65*
	Reel too low	Raise reel.	*4.7.8 Reel Height, page 58*
	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 **NOTE:** Sometimes more than one reservoir.	Fill to proper level.	
	Relief valve malfunction	Replace relief valve.	
	Cutting tough crops with standard torque (19-tooth) reel drive sprocket	Replace with high torque (10-tooth) or 14-tooth reel drive sprocket.	*6.9.1 Replacing Reel Drive Sprocket, page 221*
Plastic fingers cut at tip	Insufficient reel to cutterbar clearance	Increase clearance.	*6.8.1 Reel Clearance to Cutterbar, page 200*
Plastic fingers bent rearward at tip	Reel digging into ground with reel speed slower than ground speed	Raise header.	*4.7.1 Cutting Height, page 50*
		Decrease header tilt.	*Controlling Header Angle, page 56*
		Move reel aft.	*4.7.9 Reel Fore-Aft Position, page 58*
Plastic fingers bent forward at tip (opposite of above)	Reel digging into ground with reel speed faster than ground speed	Raise header.	*4.7.1 Cutting Height, page 50*
		Decrease header tilt.	*Controlling Header Angle, page 56*
		Move reel aft.	*4.7.9 Reel Fore-Aft Position, page 58*
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.	*4.13 Unplugging Cutterbar, page 84*
		Stop reel before plugging becomes excessive.	—

7.4 Header and Drapers

Symptom	Problem	Solution	Section
Header lift insufficient	Low relief pressure	Increase relief pressure.	See your MacDon Dealer
Insufficient draper speed	Speed control set too low	Increase control setting.	*4.7.6 Draper Speed, page 57*
	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 the windrower operator's manual
	Worn out gear pump	Replace pump.	See your MacDon Dealer
	Pressure compensator (V7) set too low	Adjust to increase setting.	Refer to your windrower operator's manual
Draper will not move	Drapers are loose	Tighten drapers.	*6.7.3 Adjusting Draper Tension, page 178*
	Drive or idler roller wrapped with material	Loosen draper and clean rollers.	
	Slat or connector bar jammed by frame or material	Loosen draper and clear obstruction.	
	Roller bearing seized	Replace.	*6.7.8 Draper Roller Maintenance, page 188*
	Low hydraulic oil	Fill windrower reservoir to full level.	Refer to the windrower technical manual
	Incorrect relief setting at flow control valve	Adjust relief setting.	See your MacDon Dealer Refer to the windrower technical manual
Draper stalling	Material not feeding evenly off knife	Lower reel.	*4.7.8 Reel Height, page 58*
		Install stub guards.	See your MacDon Dealer, *6.5.7 Knife Guards, page 144* *8.2.3 Stub Guard Conversion Kit, page 262*
Hesitation in flow of bulky crop	Header angle too low	Increase header angle.	*Controlling Header Angle, page 56*
	Material overload on drapers	Increase side draper speed.	*4.7.6 Draper Speed, page 57*
		Install upper cross auger.	*8.4.10 Upper Cross Auger (UCA), page 268*
		Add flighting extensions.	See your MacDon Dealer

Symptom	Problem	Solution	Section
Drapers back-feed	Drapers running too slow in heavy crop	Increase draper speed.	*4.7.6 Draper Speed, page 57*
Crop is thrown across opening and under opposite side draper	Drapers running too fast in light crop	Reduce draper speed.	
Material accumulates inside or under front edge of draper	Deck height improperly adjusted	Adjust deck height.	*6.7.7 Adjusting Deck Height, page 186*
Material wrapping at upper cross auger beater bars	Crop conditions do not require beater bars	Remove beater bars.	*4.14.1 Removing Beater Bars, page 85*
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).	*4.13 Unplugging Cutterbar, page 84*

7.5 Cutting Edible Beans

Symptom	Problem	Solution	Section
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 the Ground, page 53*
	Float set too light—rides on high spots and does not lower soon enough.	Set float for: - Dry ground: 100–150 lbf - Wet ground: 50–100 lbf	*4.7.2 Header Float, page 55*
	Reel too high.	Fully retract reel cylinders.	*4.7.8 Reel Height, page 58*
	Reel too high with cylinders fully retracted.	Adjust reel height.	*4.7.8 Reel Height, page 58*
	Finger pitch not aggressive enough.	Adjust finger pitch.	*4.7.10 Reel Tine Pitch, page 65*
	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.	*4.7.9 Reel Fore-Aft Position, page 58*
	Header angle too shallow.	Lengthen center-link.	*Controlling Header Angle, page 56*
		If cutting on ground, header angle can be increased by fully retracting lift cylinders.	
	Reel too slow.	Adjust reel speed to be marginally faster than ground speed.	*4.7.4 Reel Speed, page 56*
	Ground speed too fast.	Lower ground speed.	*4.7.5 Ground Speed, page 57*
	Skid shoes too low.	Raise skid shoes to highest setting.	*Cutting On the Ground, page 53*
	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 poly wear strips on cutterbar and raises cutterbar off the ground.	Ground too wet. Allow soil to dry.	—
		Manually clean the bottom of cutterbar when accumulation gets unacceptable.	

Symptom	Problem	Solution	Section
Plants being stripped and complete or partial plants left behind (cont'd)	Plastic wear strip for cutterbar has been installed over top of steel wear plates.	Remove steel cutterbar wear plates when installing the plastic wear strips for cutterbar.	—
	Header not level.	Level header.	*4.12 Levelling the Header, page 83*
	Worn/damaged knife sections.	Replace sections or complete knife.	*6.5 Knife, 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.	*8.2.3 Stub Guard Conversion Kit, page 262*
Excessive losses at dividers	Divider rod running down crop and shattering pods.	Remove divider rod.	*4.7.12 Crop Divider Rods, page 72*
	Vines and plants build up on endsheet.	Install divider rod.	
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.	
Crop accumulating at guards and not moving rearward onto drapers	Reel finger pitch not aggressive enough.	Increase finger aggressiveness (cam position).	*4.7.10 Reel Tine Pitch, page 65*
	Reel too high.	Lower reel	*4.7.8 Reel Height, page 58*
	Minimum reel clearance to cutterbar setting too high.	Re-adjust reel minimum height with cylinders fully retracted.	*Adjusting Reel Clearance, page 202*
	Reel too far forward.	Re-position reel.	*4.7.9 Reel Fore-Aft Position, page 58*
Reel shattering pods	Reel too far forward.		
	Reel speed too high.	Reduce reel speed.	*4.7.4 Reel Speed, page 56*
	Bean pods are too dry.	Cut at night with heavy dew once pods have softened.	—
	Reel finger pitch too retarded.	Increase finger aggressiveness (cam position).	*4.7.10 Reel Tine Pitch, page 65*

Symptom	Problem	Solution	Section
Cutterbar guards breaking	Float insufficient.	Increase float.	*4.7.2 Header Float, page 55*
	Excessive number of rocks in field.	Consider installing optional stub guards.	*6.5.7 Knife Guards, page 144* *8.2.3 Stub Guard Conversion Kit, page 262*
		Tip: Experiment with a few guards on a section of cutterbar to compare the performance of the two different styles of guards.	
Cutterbar pushing too much trash and dirt	Header too heavy.	Re-adjust float to make header lighter.	*4.7.2 Header Float, page 55*
	Header angle too steep.	Decrease header angle with lift cylinders.	*4.7.3 Header Angle, page 55*
		Shorten the center-link.	
	Regular guards push dirt and plug up with trash or plug up with trash and then push dirt.	Install stub guard kit.	*8.2.3 Stub Guard Conversion Kit, page 262*
	Insufficient support for header.	Install center skid shoes on header.	*Cutting On the Ground, page 53*
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.	*6.7.7 Adjusting Deck Height, page 186*
		Raise header fully at each end of field or as required and shift decks back and forth to help clean out cutterbar.	—
Reel carries over odd plants in same location	Reel fingers (steel) bent and hook plants from crop flow on drapers.	Straighten fingers (steel).	
	Dirt accumulation on end of fingers prevent plants dropping off fingers onto drapers.	Raise reel.	*4.7.8 Reel Height, page 58*
		Adjust reel fore and aft location to move fingers out of the ground.	*4.7.9 Reel Fore-Aft Position, page 58*
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° to undulations, provided knife floats across without digging in.	

Symptom	Problem	Solution	Section
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.	*4.7.6 Draper Speed, page 57*
	Finger pitch too retarded.	Increase finger pitch.	*4.7.10 Reel Tine Pitch, page 65*
Reel wraps up with crop	Reel too low.	Raise reel.	*4.7.8 Reel Height, page 58*
Reel ends wrap up with crop	Uncut crop interfering on reel ends.	Add reel endshields.	Refer to the header parts catalog MD #169902.

7.6 Windrow Formation

Symptom	Problem	Solution	Section
Heads on ground and scattered	Draper speed too slow	Increase draper speed.	*4.7.6 Draper Speed, page 57*
	Draper angle too flat	Increase header angle.	*Controlling Header Angle, page 56*
	Ground speed too slow	Increase ground speed.	*4.7.5 Ground Speed, page 57*
	Crop too ripe	Cut material before too mature.	—
Hollow in center	Draper speed too slow	Increase draper speed.	*4.7.6 Draper Speed, page 57*
	Delivery opening too wide	Decrease delivery opening width.	*4.8 Delivery Opening, page 74*
All heads in center	Draper speed too fast or header angle too steep	Reduce draper speed and/or decrease header angle.	*4.7.6 Draper Speed, page 57*
			4.7.3 Header Angle, page 55
	Ground speed too fast	Reduce ground speed.	*4.7.5 Ground Speed, page 57*
	Crop too green	Allow to mature.	—
All heads to one side	Crop leaning to one side and reel too slow	Increase reel speed to re-orient crop parallel to draper slats and/or increase finger pitch aggressiveness.	*4.7.4 Reel Speed, page 56* *4.7.10 Reel Tine Pitch, page 65*
Uneven windrow (any crop condition)	Ground speed too fast for drapers, causing heads to fan out and crop to leave drapers unevenly	Reduce ground speed or increase draper speed.	*4.7.5 Ground Speed, page 57* *4.7.6 Draper Speed, page 57*
	Reel too low	Raise reel.	*4.7.8 Reel Height, page 58*
	Reel speed too fast	Reduce reel speed.	*4.7.4 Reel Speed, page 56*

8 Options and Attachments

The following options and attachments are available for use with your header. Most come with installation instructions. See your MacDon Dealer for availability and ordering information.

8.1 Reel

8.1.1 Lodged Crop Reel Finger Kit

The steel fingers attach to ends of every other tine bar and help in clearing material in heavy, hard-to-cut crops such as lodged rice.

Each kit contains three fingers for the cam end and three fingers for the tail end of the reel. Hardware, installation and adjustment instructions are included with the kit.

MD #B4831

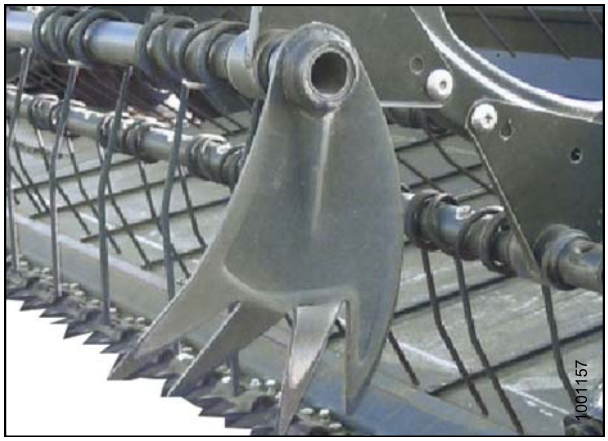


Figure 8.1: Lodged Crop Finger

8.1.2 PR15 Tine Tube Reel Conversion Kit

This kit allows conversion of a 6-bat reel to a 9-bat reel.

Order bundles by header size and type:

- 15 ft. – Steel Fingers MD #B5654
- 20 ft. – Steel Fingers MD #B5655
- 25 ft. – Plastic Fingers MD #B5277
- 30 ft. – Plastic Fingers MD #B5278[20]
- 30 ft. – Steel Fingers MD #B5657
- 35 ft. – Plastic Fingers MD #B5674

NOTE:
Must order additional endshields when converting reel.

20. Double reel units only

8.1.3 Reel Endshield Kit

The steel shields attach to ends of the reel(s) and help in clearing material in heavy, hard-to-cut crops. They are standard equipment on all, except 9-bat, headers. See your MacDon Dealer for more information. Installation and adjustment instructions are included with the kit.

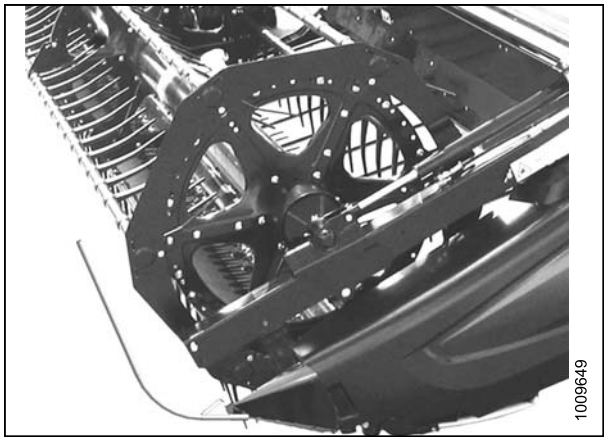


Figure 8.2: Reel Endshields

8.1.4 Reel Tine Tube Reinforcing Kit

The reel tine tube reinforcing kit is available for 5-bat and 6–bat reels when cutting extremely heavy crops where high reel loads are experienced.

- 5-Bat – MD #B5825
- 6-Bat – MD #B5826

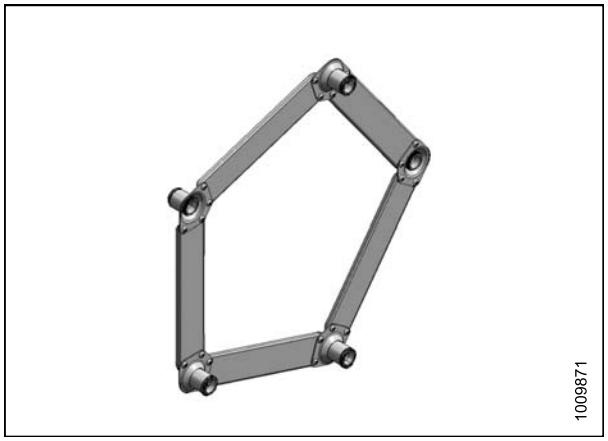


Figure 8.3: 5-Bat Shown– 6-Bat Similar

8.2 Cutterbar

8.2.1 Cutterbar Plastic Wear Strips

Available as an attachment, they are recommended for cutting on the ground where soil adheres to steel.

Bundles by header size:

- 15 ft. – MD #B4864
- 20 ft. – MD #B4865
- 25 ft. – MD #B4838
- 30 ft. – MD #B4839
- 35 ft. – MD #B4840
- 40 ft. – MD #B4841

Figure 8.4: Wear Strips

8.2.2 Knifehead Shield

The shields attach to the endsheets and reduce the knifehead opening to prevent cut crop, particularly severely lodged crop, from accumulating over the knifehead, which could damage the knife drive box and the endsheet.

Order kit according to header size and guard type.

Regular Guards :

- 30 ft. and larger – MD #220101

Stub Guards :

- 30 ft. and larger – MD #220103

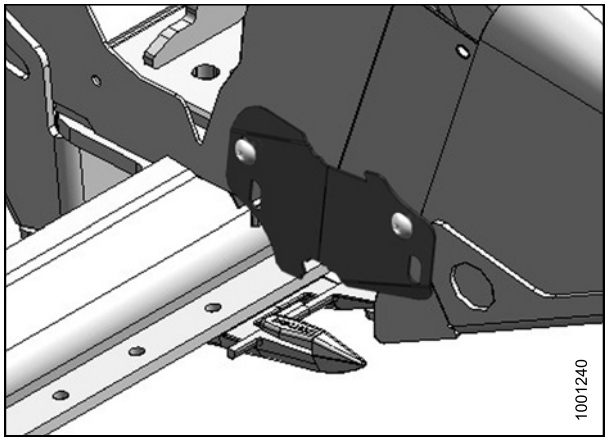


Figure 8.5: Knifehead Shield

8.2.3 Stub Guard Conversion Kit

Stub guards, complete with top guides and adjuster shoes, are designed to cut tough crops.

Installation and adjustment instructions are included in the kit.

Order bundle according to the length of your header:

- 15 ft. – MD #B5009
- 20 ft. – MD #B5010
- 25 ft. – MD #B5011
- 30 ft. – MD #B5012
- 35 ft. – MD #B5013

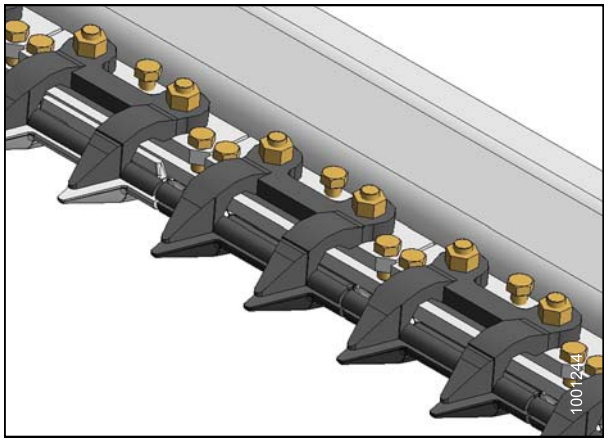


Figure 8.6: Stub Guards

8.2.4 Vertical Knife Mounts

The vertical knife[21] mounts allow installation of vertically oriented knives onto both ends of the header.

Installation and adjustment instructions are included with the bundle.

Order bundles based on left or right side:

- LH – MD #B5757
- RH – MD #B5758

NOTE:
If mounting on multiple headers, you will also require the auxiliary vertical knife plumbing kit MD #B5406.

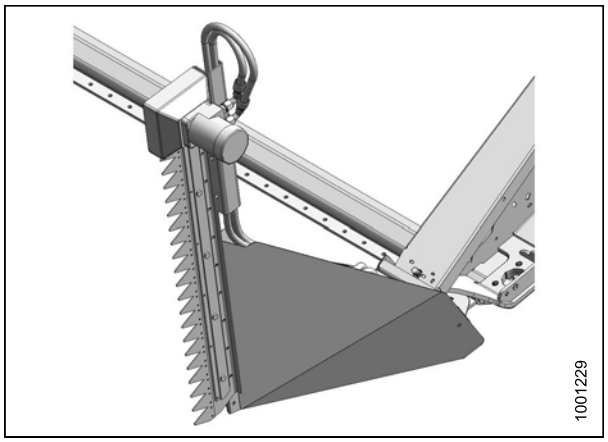


Figure 8.7: Vertical Knife Mount

21. Must be purchased from a separate supplier.

8.3 Header

8.3.1 Divider Latch Kit

The latches attach to the endsheets. They allow for quick removal of endsheet divider cones to accommodate storage and if required, to reduce the transport width of the header. Installation instructions are included with the kit.

MD #B5607

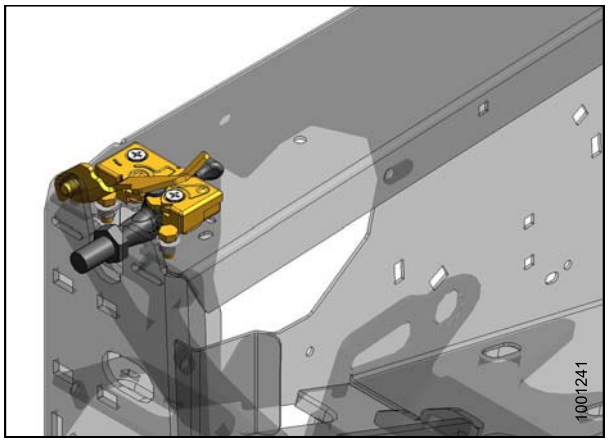


Figure 8.8: Divider Latch

8.3.2 Stabilizer Wheels

The stabilizer wheels help stabilize the header in field conditions that would otherwise cause the header to bounce and result in uneven cutting height. Installation and adjustment instructions are included with the kit.

Available as an attachment for use with 30, 35, and 40 ft. headers.

MD #C1986

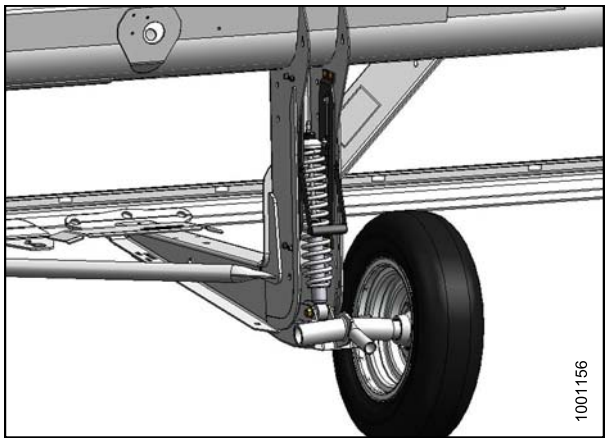


Figure 8.9: Stabilizer Wheel

8.3.3 Stabilizer/Slow Speed Transport Wheels

The Stabilizer/Slow Speed Transport Wheels help stabilize the header in field conditions that would otherwise cause the header to bounce, and result in uneven cutting height. This system is similar to the Stabilizer Wheel option.

The Stabilizer/Slow Speed Transport Wheels convert to transport mode to allow the header to be towed behind a properly configured MacDon windrower (or agricultural tractor) at slow speed. A tow pole is included in the kit.

For use on 30, 35, and 40 ft. headers.

MD #C1997

Figure 8.10: Stabilizer/Transport Wheels

8.4 Crop Delivery

8.4.1 Double Draper Drive (DDD) Kit

This option minimizes draper slipping in heavy forage crops when using the side delivery feature, by having four draper rollers powered instead of the normal two.

Installation instructions are included with the kit.

Available for 30 to 40 ft. headers.

MD #B5653[22]

8.4.2 Double Windrow Attachment (DWA)

The DWA[23] lays up to 48 ft. (14.6 m) of crop in a single windrow which is ideal for today's large forage harvesters. It is only intended for mounting on SP windrowers equipped with an HC10 Conditioner[24].

MD #C1987

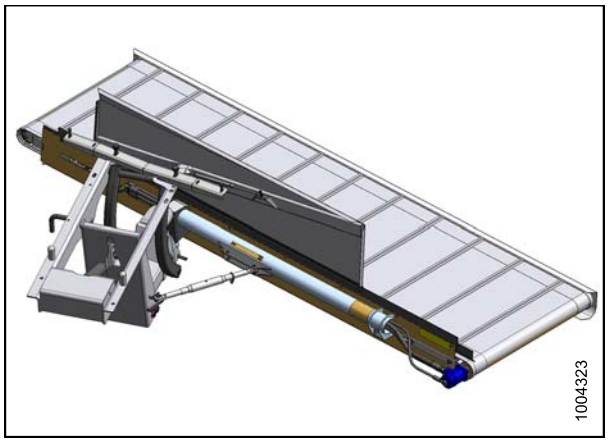


Figure 8.11: Double Windrow Attachment

8.4.3 Draper Deflector (Narrow)

Narrow metal deflectors attach to the inboard side of the endsheets, prevent material from falling through the gap between the endsheet and draper.

Refer to the D65 Draper Header Parts Catalog (MD #169902) for required parts.

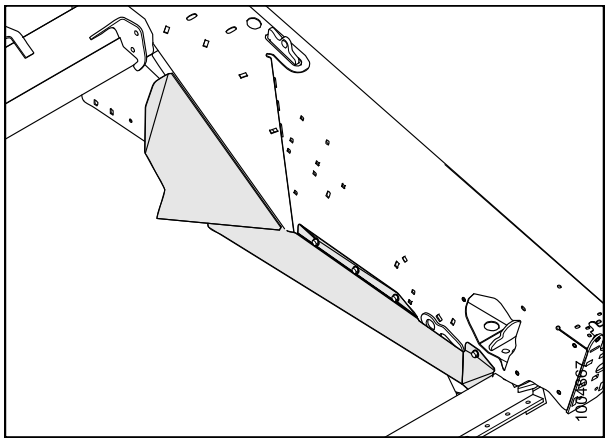


Figure 8.12: Draper Deflector

22. MD #B5606 is required to operate both upper cross auger (UCA) and double draper drive (DDD) on an SP Windrower.
23. This option is not compatible with the M105 SP Windrower.
24. This option is not for use with the M205 or M105 SP Windrower.

8.4.4 Draper Deflector (Wide)

Wide metal deflectors attach to the inboard side of the endsheets, to prevent material from falling through the gap between the endsheet and draper.

Refer to the D65 Draper Header Parts Catalog (MD #169902) for required parts.

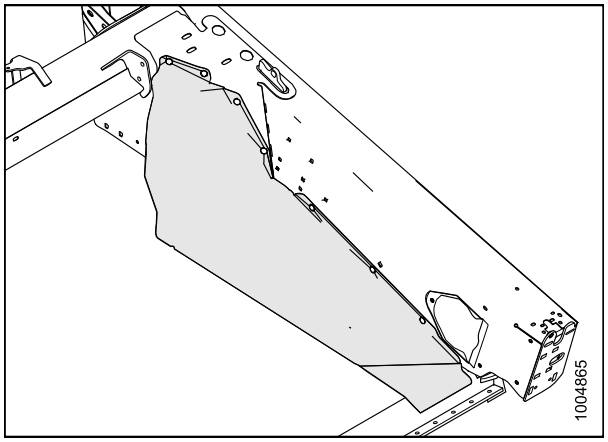


Figure 8.13: Draper Deflector

8.4.5 Draper Extension Kit

This kit increases the length of each deck up to 10 in. (250 mm) into the header opening which decreases the swath width when cutting light/thin crops.

It includes roller support extensions, a draper repair kit and necessary hardware. Installation instructions are also included.

MD #B5407[25]

8.4.6 End Swath Deflector Rods (End Delivery)

End deflector rods are used for double swathing with end delivery only, but can be kept on for center delivery.

The rods help prevent the delivered crop at the opening from interfering with standing crop.

Installation and adjustment instructions are included with the kit.

Order bundles based on left or right end.

- Left - MD #B5088
- Right - MD #B5089

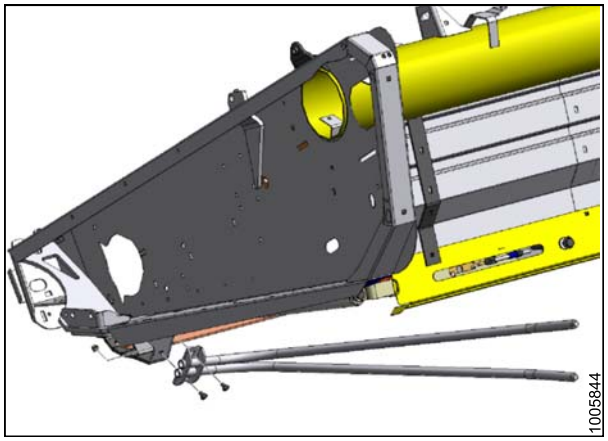


Figure 8.14: Swath Deflector

25. Not for use with Double Draper Drive (DDD).

8.4.7 HC10 Hay Conditioner

The hay conditioner will lay uniform, fluffy windrows. Conditioning or crimping the cut hay allows moisture release for quicker drying and earlier processing.

Installation instructions, operating instructions, and parts list are included.

MD #C1982

NOTE:
Not for use on M205 Windrower.

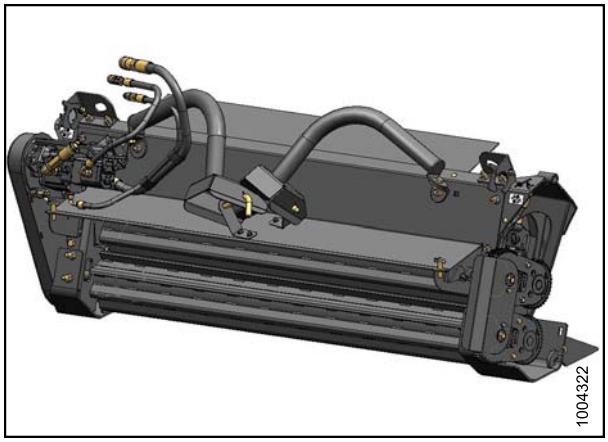


Figure 8.15: Hay Conditioner

8.4.8 Hydraulic Deck Shift Package

This system allows shifting of the decks from the operator's console when double-swathing.

Installation and adjustment instructions are included with the kit.

Available on 25, 30, 35, and 40 ft. headers.

MD #B5664

8.4.9 Swath Forming Rods (Center Delivery)

The rods form the windrow such that the heads are in the center and thus are protected from shatter. The rods are mainly used for grass seed cutting applications.

Installation and adjustment instructions are included with the kit.

MD #4803

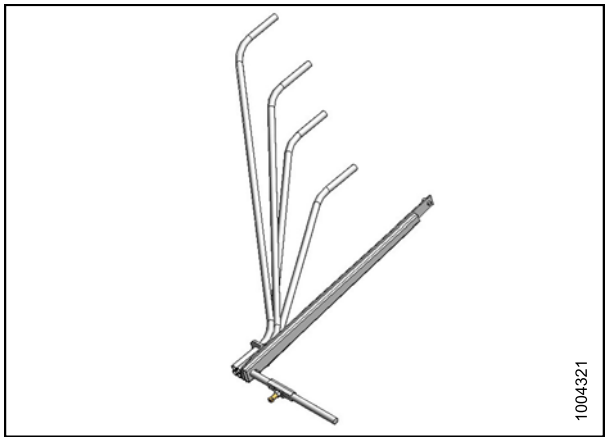


Figure 8.16: Swath Forming Rods

8.4.10 Upper Cross Auger (UCA)

Attaches in front of the backtube, the UCA improves feeding of crop to the center of the header in heavy crop conditions. Ideal for high volume harvesting of forages, oats, canola, mustard and other tall, bushy, hard to feed crops.

Order bundle [26]according to the length of your header:

- 15 ft. – MD #B4844
- 25 ft. – MD #B4846
- 30 ft. – MD #B4847
- 35 ft. – MD #B4848
- 40 ft. – MD #B4849

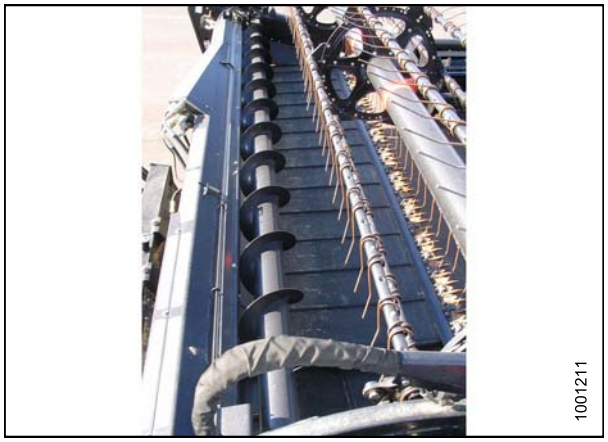


Figure 8.17: Upper Cross Auger

8.4.11 Upper Cross Auger Hydraulic Kit for DDD

This kit is required to provide hydraulic power to the upper cross auger on headers with both upper cross auger and double draper drive kits installed. Operating both options without this kit can result in damage to the upper cross auger motor and inadequate power to the draper drive system. This kit is not applicable to M100 and M105 windrowers.

MD #B5606

8.4.12 Upper Cross Auger Case Drain Kit for SDD

This kit is intended for single draper drive headers equipped with an upper cross auger and is applicable to all M-Series windrowers, except the M205.

MD #5842

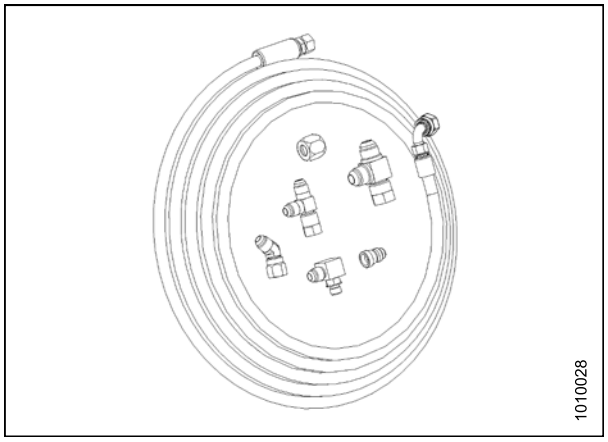


Figure 8.18: Case Drain

26. MD #B5606 is required to operate both upper cross auger (UCA) and double draper drive (DDD) on an SP Windrower.

8.4.13 Rice Divider Rods

The rice divider rods attach to the left hand and right hand endsheet cones and perform the same function in tall and tangled rice crops as standard equipment crop dividers. Installation instructions are included with the kit.

MD #B5609

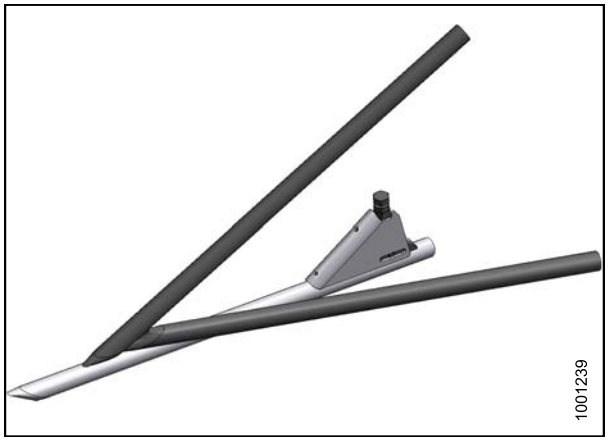


Figure 8.19: Rice Divider Rod

9 Unloading and Assembly

Refer to the header-specific instructions for unloading, assembly, and setup procedures that are included with your shipment. The instruction part numbers are shown in the table below:

Shipping Destination	Header Description	MacDon Instruction Part Number
North America	D65 Draper Header for Self-Propelled Windrowers	MD #169900
Export (that is, anywhere except North America)	D65 Draper Header for Self-Propelled Windrowers	MD #169901

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