

**R85**  
**Rotary Disc 16-Foot Header for**  
**Self-Propelled Windrower**

Operator's Manual

147754 Revision A

Model Year 2016

Original Instruction

R85 Rotary Disc 16-Foot Header for Self-Propelled Windrower



1005291

Published: July 2015

# Introduction

This manual describes operating and maintenance procedures for the MacDon R85 Rotary Disc 16-Foot Self-Propelled Windrower Header.

Your new 16-foot rotary header can be attached to MacDon M200 and M205 Self-Propelled Windrowers and is designed to cut, condition, and lay in windrows a wide variety of grasses and hay crops.

**Carefully read all the material provided before attempting to use or service the machine.**

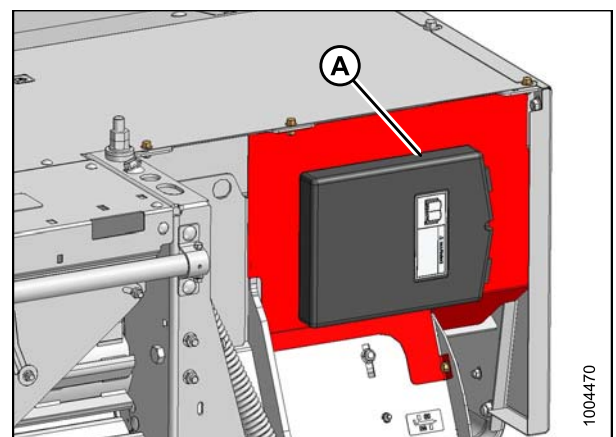
Use this manual as your first source of information for the machine.

A parts catalog is also supplied with your new header. If you require more detailed service information, contact your MacDon Dealer.

Use the Table of Contents and the Index to guide you to specific areas. Study the Table of Contents to familiarize yourself with how the material is organized. Keep this manual handy for frequent reference and to pass on to new Operators or Owners. Call your 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](http://www.macdon.com) or from our Dealer-only site (<https://portal.macdon.com>) (login required).

Store the operator's manual and the parts catalog in the plastic manual case (A) located at the right-hand side of the header.



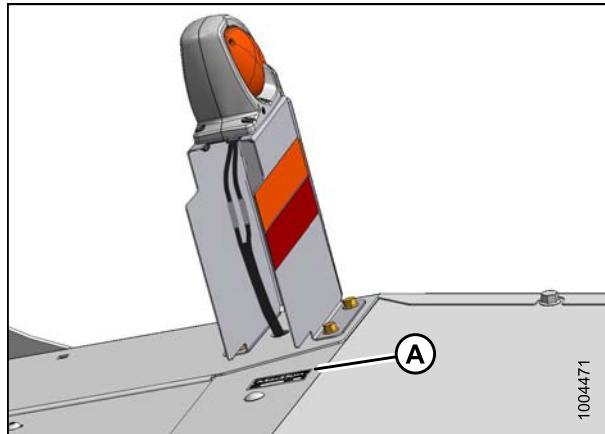
**Figure 1: Manual Storage Case**

## Serial Number(s)

Record the serial number of the header in the space provided.

**Header Serial No:** \_\_\_\_\_

Serial Number Plate (A) is located on the top cover at the right side of the header.



**Figure 2: Serial Number Location – Self Propelled**



## List of Revisions

At MacDon, we're continuously making improvements: occasionally these improvements impact product documentation. The following list provides an account of major changes from the previous version of this document.

<b>Summary of Change</b>	<b>Location</b>
Updated safety decal locations	<a href="#">1.7 Safety Decal Locations, page 8</a>
Added nut shield information	<a href="#">5.4.7 Nut Shield, page 128</a>
Updated recommended fluids and lubricants	<a href="#">5.2 Recommended Fluids and Lubricants, page 102</a>
Updated the maintenance schedule	<a href="#">5.3.1 Maintenance Schedule/Record, page 103</a>
Updated specifications	<a href="#">2.3 Specifications, page 22</a>
Updated the definitions	<a href="#">2.1 Definitions, page 19</a>
Updated hydraulic motor procedures	<a href="#">5.6.1 Hydraulic Motor, page 147</a>
Updated header speed sensor procedures	<a href="#">5.5.4 Header Drive Speed Sensor, page 141</a>



## TABLE OF CONTENTS

Introduction .....	i
Serial Number(s) .....	ii
List of Revisions .....	iii
<b>1 Safety .....</b>	<b>1</b>
1.1 Safety Alert Symbols .....	1
1.2 Signal Words .....	2
1.3 General Safety .....	3
1.4 Maintenance Safety .....	5
1.5 Hydraulic Safety .....	6
1.6 Safety Signs .....	7
1.6.1 Installing Safety Decals .....	7
1.7 Safety Decal Locations .....	8
1.8 Understanding Safety Signs .....	11
<b>2 Product Overview .....</b>	<b>19</b>
2.1 Definitions .....	19
2.2 Component Identification .....	21
2.3 Specifications .....	22
<b>3 Operation .....</b>	<b>25</b>
3.1 Owner/Operator Responsibilities .....	25
3.2 Operational Safety .....	26
3.3 Header Safety Props .....	28
3.4 Driveshields .....	30
3.4.1 Opening the Driveshield: North American Headers .....	30
3.4.2 Closing the Driveshield: North American Headers .....	30
3.4.3 Opening the Driveshield: Export Headers .....	31
3.4.4 Closing the Driveshield: Export Headers .....	31
3.4.5 Removing Right Endshield .....	32
3.4.6 Installing Right Endshield .....	32
3.5 Cutterbar Doors .....	33
3.5.1 Opening the Cutterbar Doors: North America .....	34
3.5.2 Closing the Cutterbar Doors: North American Header .....	35
3.5.3 Opening the Cutterbar Doors: Export Header .....	36
3.5.4 Closing the Cutterbar Doors: Export Header .....	37
3.6 Daily Start-Up Check .....	39
3.7 Attaching the Header .....	41
3.7.1 Attaching the Forming Shield .....	41
3.7.2 Attaching the Header (M205 Windrowers) .....	43
3.7.3 Attaching the Header (M200 Windrowers) .....	48
3.8 Detaching the Header .....	55
3.8.1 Detaching the Header (M205 Windrowers) .....	55
3.8.2 Detaching the Header (M200 Windrowers) .....	59
3.9 Break-In Period .....	62
3.10 Shutting Down the Windrower .....	63
3.11 Transporting the Header .....	64
3.12 Adjusting the Transport Lights .....	65
<b>4 Operating the Header .....</b>	<b>67</b>
4.1 Header Float .....	67
4.1.1 Checking Float .....	67
4.1.2 Adjusting Float .....	68
4.2 Roll Gap .....	69
4.2.1 Checking Roll Gap .....	69
4.2.2 Adjusting Roll Gap .....	70
4.3 Roll Tension .....	72

## TABLE OF CONTENTS

---

4.3.1	Adjusting Roll Tension .....	72
4.4	Roll Timing .....	73
4.4.1	Checking Roll Timing .....	73
4.4.2	Adjusting Roll Timing .....	74
4.5	Forming Shields .....	75
4.5.1	Adjusting the Side Deflectors .....	75
4.5.2	Adjusting the Rear Deflector (Fluffer Shield).....	77
4.5.3	Adjusting the Swath Baffle .....	77
4.6	Header Angle .....	79
4.7	Cutting Height .....	80
4.7.1	Adjusting Gauge Roller Height .....	80
4.7.2	Adjusting the Skid Shoe Height .....	80
4.8	Disc Speed.....	82
4.9	Ground Speed.....	83
4.10	Double Windrowing.....	84
4.11	Tall Crop Feed Plates.....	85
4.11.1	Removing the Tall Crop Feed Plates from Storage.....	85
	Installing Tall Crop Feed Plates under Driven Deflector .....	86
	Installing Tall Crop Feed Plates under Driveline Deflector .....	86
4.11.2	Removing Tall Crop Feed Plates .....	87
	Removing Tall Crop Feed Plates from under Driven Deflector .....	88
	Removing Tall Crop Feed Plates from under Driveline Deflector.....	88
4.11.3	Returning Tall Crop Feed Plates to Storage.....	89
4.12	Tall Crop Divider Option .....	90
4.12.1	Removing Tall Crop Divider.....	90
4.13	Overshot Auger .....	92
4.13.1	Adjusting the Overshot Auger.....	92
4.14	Stripper Bars .....	95
4.14.1	Adjusting the Stripper Bar .....	95
4.15	Haying .....	98
4.15.1	Curing .....	98
4.15.2	Topsoil Moisture .....	98
4.15.3	Weather and Topography.....	98
4.15.4	Windrow Characteristics .....	98
4.15.5	Driving on Windrow .....	99
4.15.6	Raking and Tedding.....	99
4.15.7	Using Chemical Drying Agents.....	99
4.16	Unplugging the Header .....	100
<b>5</b>	<b>Maintenance and Servicing .....</b>	<b>101</b>
5.1	Preparation for Servicing.....	101
5.2	Recommended Fluids and Lubricants .....	102
5.3	Maintenance Requirements.....	103
5.3.1	Maintenance Schedule/Record.....	103
5.3.2	Preseason/Annual Service.....	105
5.3.3	End-of-Season Service.....	106
5.3.4	Lubrication and Servicing.....	106
5.3.5	Greasing Procedure .....	107
5.3.6	Lubrication and Servicing Intervals .....	108
5.3.7	Lubricating the Cutterbar .....	113
	Draining the Cutterbar Lubricant .....	113
	Filling the Cutterbar Lubricant .....	115
5.3.8	Rock Guards.....	117
	Inspecting the Rock Guards .....	117
5.4	Cutterbar Disc Maintenance .....	118

## TABLE OF CONTENTS

5.4.1	Direction of Spindle Rotation .....	118
5.4.2	Inspecting the Cutterbar Discs .....	119
5.4.3	Removing a Cutterbar Disc .....	119
5.4.4	Installing a Cutterbar Disc .....	120
5.4.5	Cutter Blades .....	121
	Inspecting Cutter Blades .....	121
	Inspecting Cutter blade Hardware .....	123
	Replacing the Cutter Blades .....	124
5.4.6	Accelerators .....	125
	Inspecting Accelerators .....	126
	Replacing Accelerators .....	126
5.4.7	Nut Shield .....	128
	Inspecting Nut Shield .....	128
	Replacing Nut Shield .....	129
5.4.8	Rotary Deflectors .....	130
	Inspecting Rotary Deflectors .....	130
	Removing the Driven Deflector .....	130
	Installing the Driven Deflector .....	131
	Removing the Driveline Deflector .....	131
	Installing the Driveline Deflector .....	132
5.5	Drive Systems .....	134
5.5.1	Bevel Gearbox .....	134
	Changing the Bevel Gearbox Lubricant .....	134
5.5.2	Conditioner Drive Belt .....	135
	Inspecting the Conditioner Drive Belt .....	135
	Replacing the Conditioner Drive Belt .....	136
5.5.3	Conditioner Gearbox .....	138
	Changing the Conditioner Gearbox Lubricant .....	138
5.5.4	Header Drive Speed Sensor .....	141
	Adjusting the Header Drive Speed Sensor .....	141
	Replacing the Header Drive Speed Sensor .....	142
5.5.5	Auger Drive Belt .....	143
	Inspecting and Adjusting the Auger Drive Belts .....	143
	Replacing the Auger Drive Belts .....	144
5.5.6	Installing Sealed Bearings .....	146
5.6	Hydraulics .....	147
5.6.1	Hydraulic Motor .....	147
	Removing the Hydraulic Motor .....	147
	Installing the Hydraulic Motor .....	148
5.6.2	Hydraulic Hoses and Lines .....	149
5.7	Electrical .....	150
5.7.1	Hazard Lights .....	150
	Hazard Lights: Replacing Bulbs and Lenses .....	150
	Hazard Lights: Replacing the Lamp Assembly .....	150
	Hazard Lights: Replacing the Lamp Bracket .....	151
<b>6</b>	<b>Troubleshooting .....</b>	<b>153</b>
6.1	Mower Performance .....	153
6.2	Mechanical Problems .....	156
<b>7</b>	<b>Options and Attachments .....</b>	<b>159</b>
7.1	Options and Attachments: Kits .....	159
7.1.1	Adjustable Skid Shoe Kit .....	159
7.1.2	Cutterbar Repair Tool Kit .....	159
7.1.3	Double Windrow Attachment (DWA) .....	160

## TABLE OF CONTENTS

---

7.1.4	Gauge Roller .....	160
7.1.5	Hydraulic Drive: 16-Foot for M200 Self-Propelled .....	160
7.1.6	Tall Crop Divider Kit .....	161
7.1.7	Tall Crop Feed Plate Kit .....	161
<b>8</b>	<b>Reference .....</b>	<b>163</b>
8.1	Torque Specifications .....	163
8.1.1	SAE Bolt Torque Specifications .....	163
8.1.2	Metric Bolt Specifications .....	165
8.1.3	Metric Bolt Specifications Bolting into Cast Aluminum .....	168
8.1.4	Flare-Type Hydraulic Fittings .....	168
8.1.5	O-Ring Boss (ORB) Hydraulic Fittings (Adjustable) .....	170
8.1.6	O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable) .....	172
8.1.7	O-Ring Face Seal (ORFS) Hydraulic Fittings .....	173
8.2	Conversion Chart .....	175
	<b>Index .....</b>	<b>177</b>

# 1 Safety

## 1.1 Safety Alert Symbols

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

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 the following:
  - Hard hat
  - Protective footwear with slip resistant soles
  - Protective glasses or goggles
  - Heavy gloves
  - Wet weather gear
  - Respirator or filter mask
- Be aware that exposure to loud noises can cause hearing impairment or loss. Wear suitable hearing protection devices such as ear muffs or ear plugs to help protect against objectionable or loud noises.

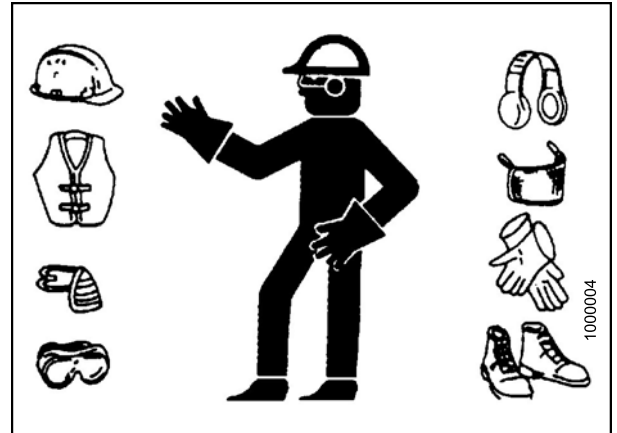


Figure 1.2: Safety Equipment

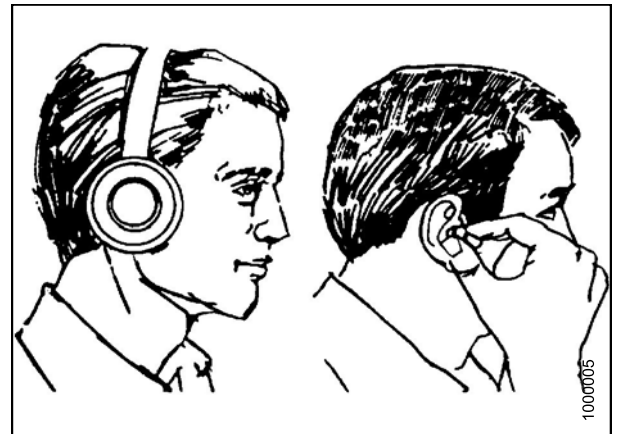


Figure 1.3: Safety Equipment

- 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. Take the time to consider the safest way. Never ignore the warning signs of fatigue.

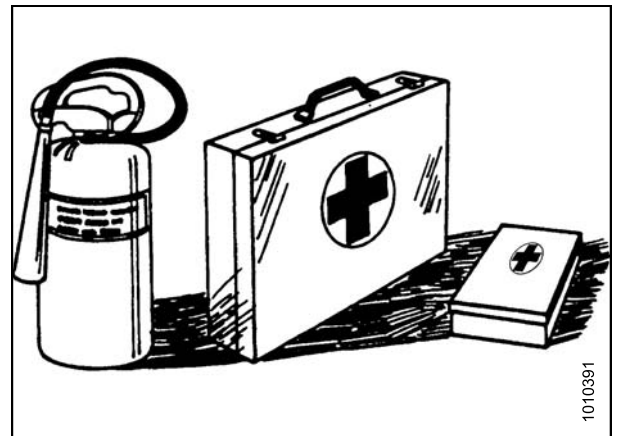


Figure 1.4: Safety Equipment

## SAFETY

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

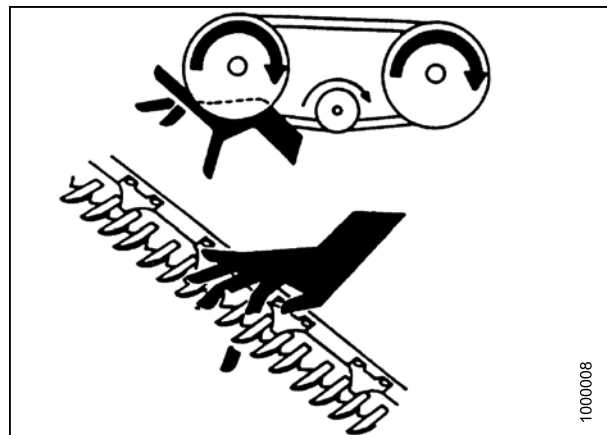


Figure 1.6: Safety Around Equipment

- Keep the service area 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 is 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 hydraulic systems.
- Keep hands, feet, clothing, and hair away from all moving and/or rotating parts.
- Clear the area of bystanders, especially children, when carrying out any maintenance, repairs or, adjustments.
- Install transport lock or place safety stands under the frame before working under the .
- 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 knives) 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

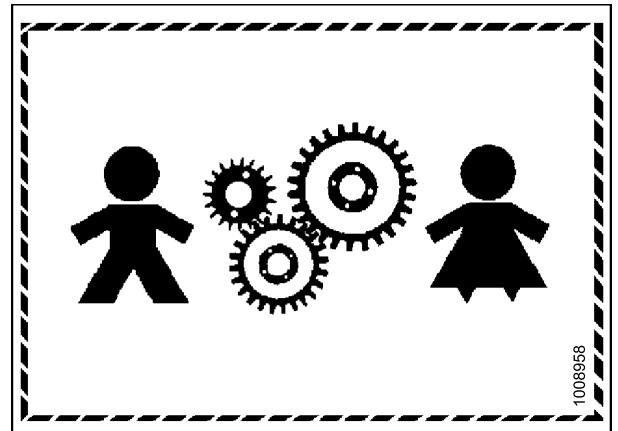


Figure 1.9: Equipment NOT Safe for Children

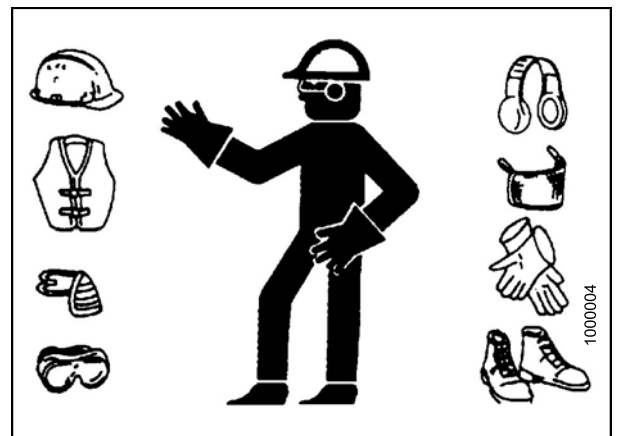


Figure 1.10: Safety Equipment

## 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 hazardous and unsafe conditions.

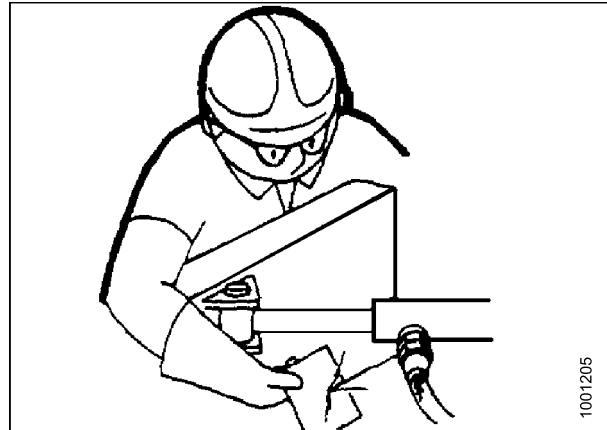


Figure 1.11: Testing for Hydraulic Leaks

- Wear proper hand and eye protection when searching for high-pressure hydraulic leaks. 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 steel lines, hoses, and couplings are in good condition before applying pressure to a hydraulic system.

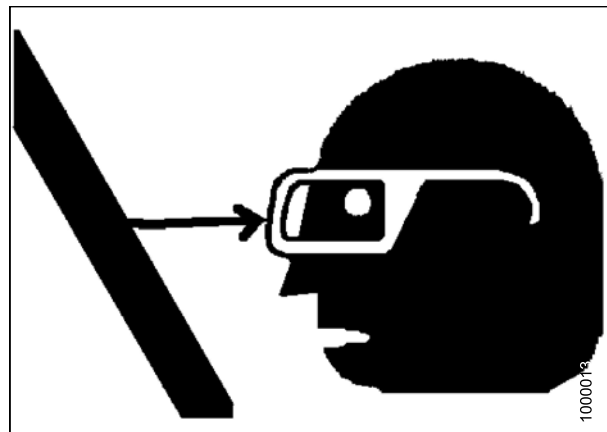
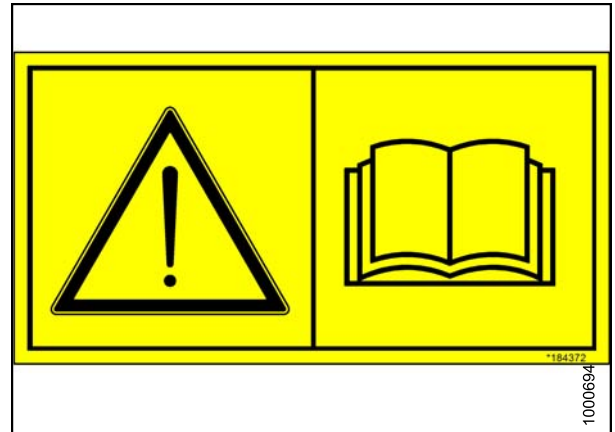


Figure 1.13: Safety Around Equipment

## **1.6 Safety Signs**

- 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 1.14: Operator's Manual Decal**

### **1.6.1 Installing Safety Decals**

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.

# SAFETY

## 1.7 Safety Decal Locations

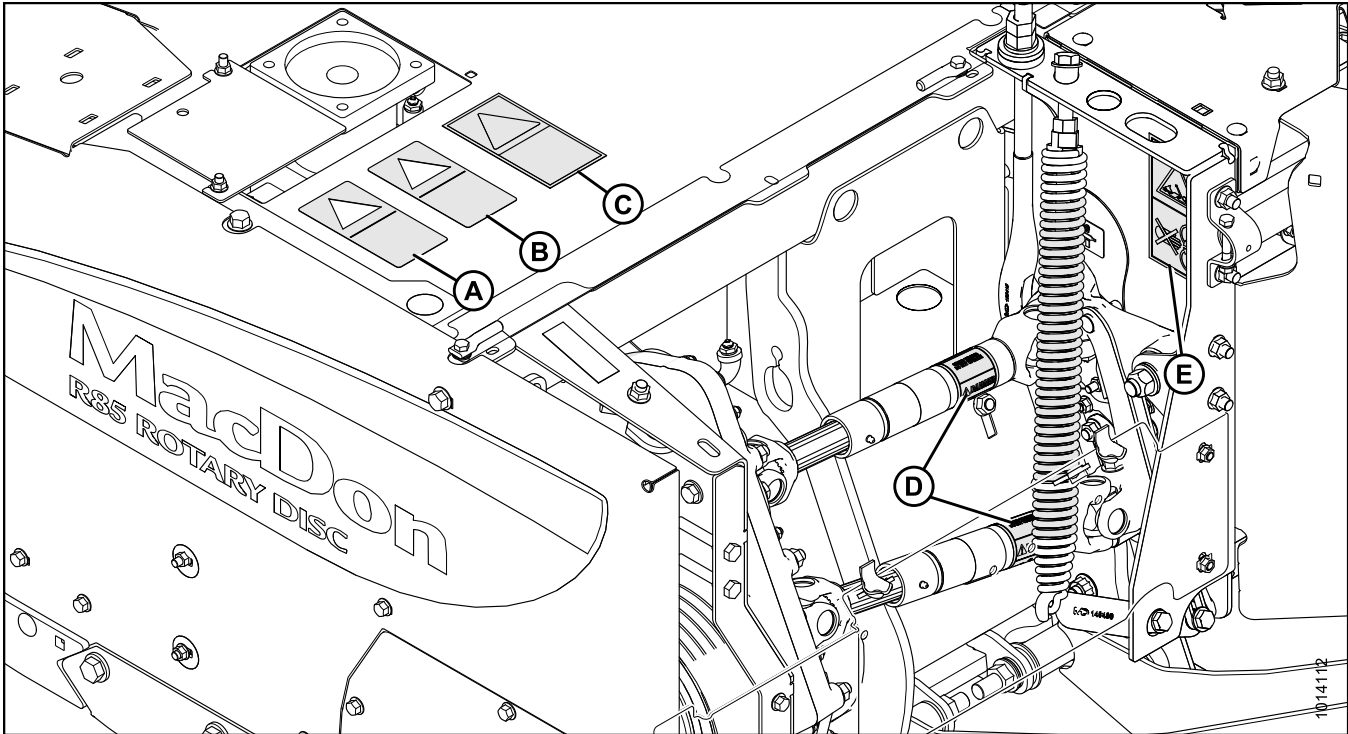


Figure 1.15: Safety Decal Locations

A - MD #174436  
D - MD #194521

B - MD #113482  
E - MD #184385

C - MD #194464

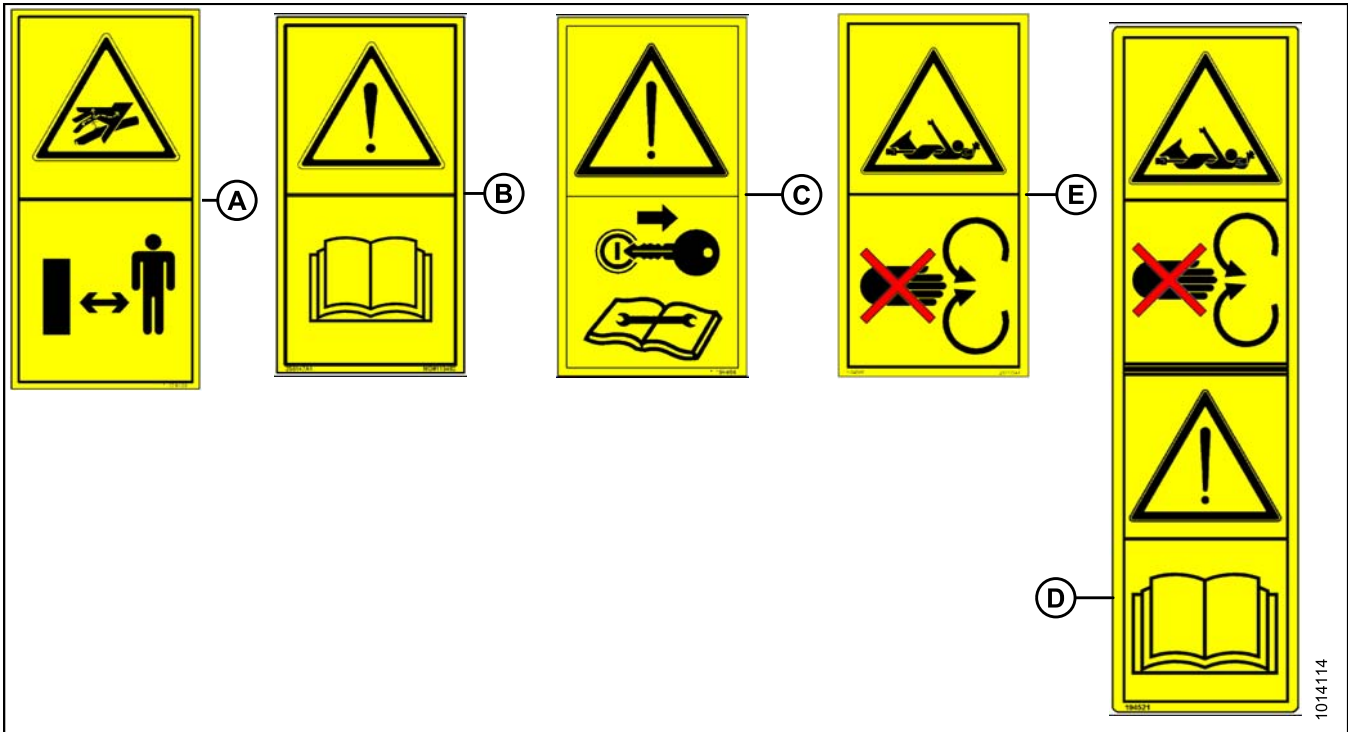
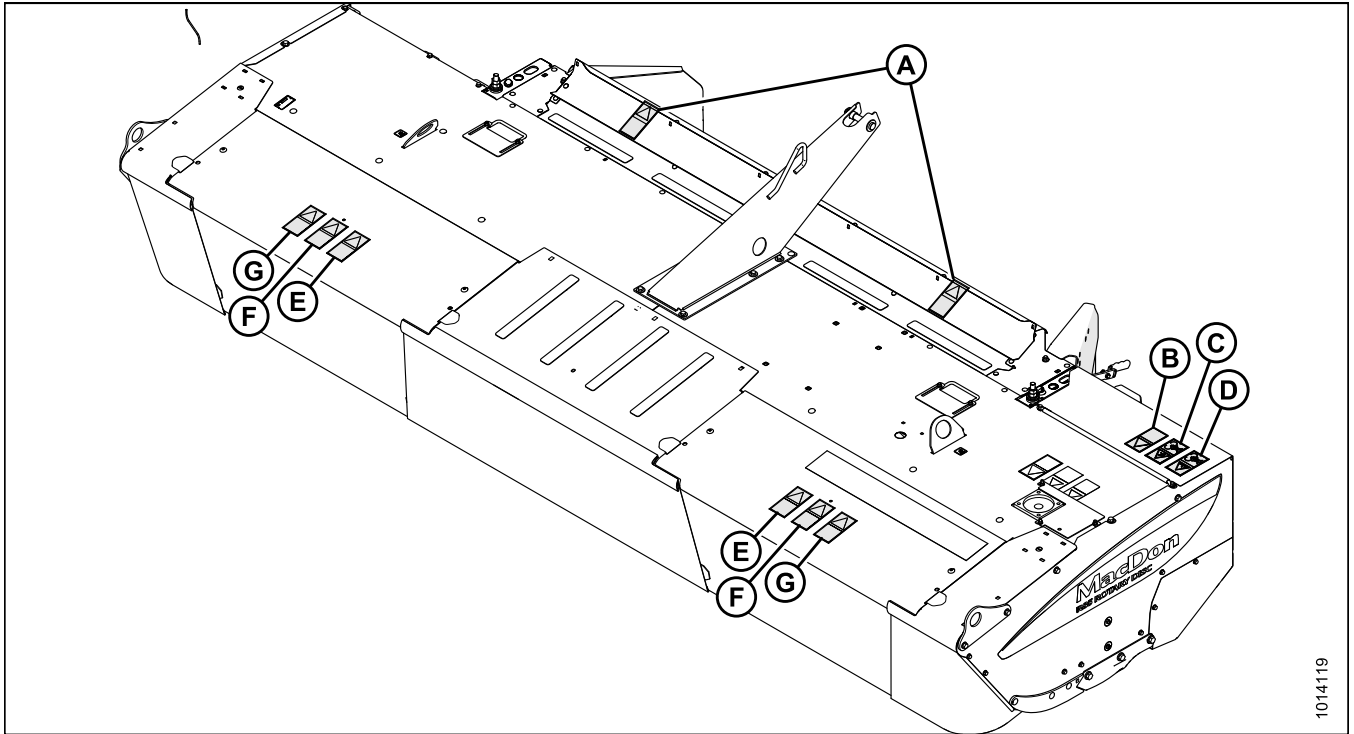


Figure 1.16: Safety Decals

# SAFETY



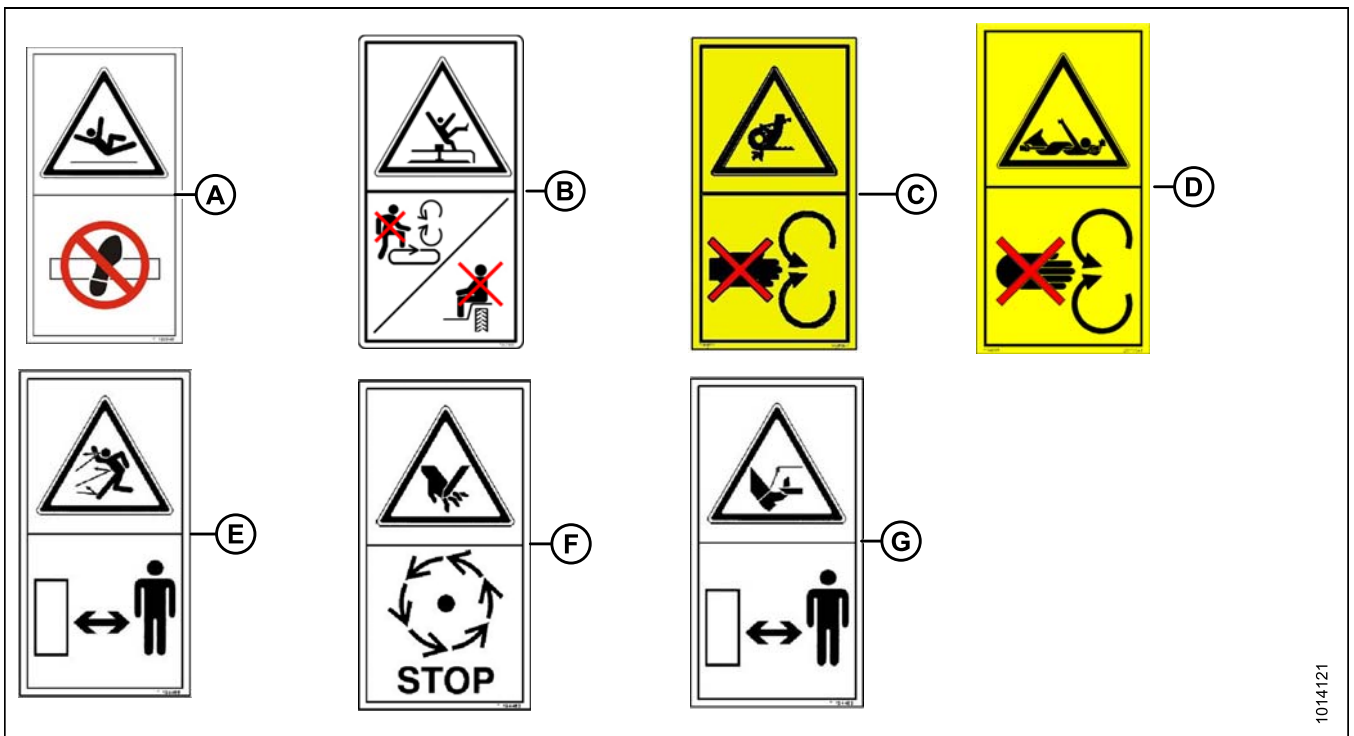
1014119

**Figure 1.17: Safety Decal Locations**

A - MD #190546  
 D - MD #184385  
 G - MD #194465

B - MD #247166  
 E - MD #194466

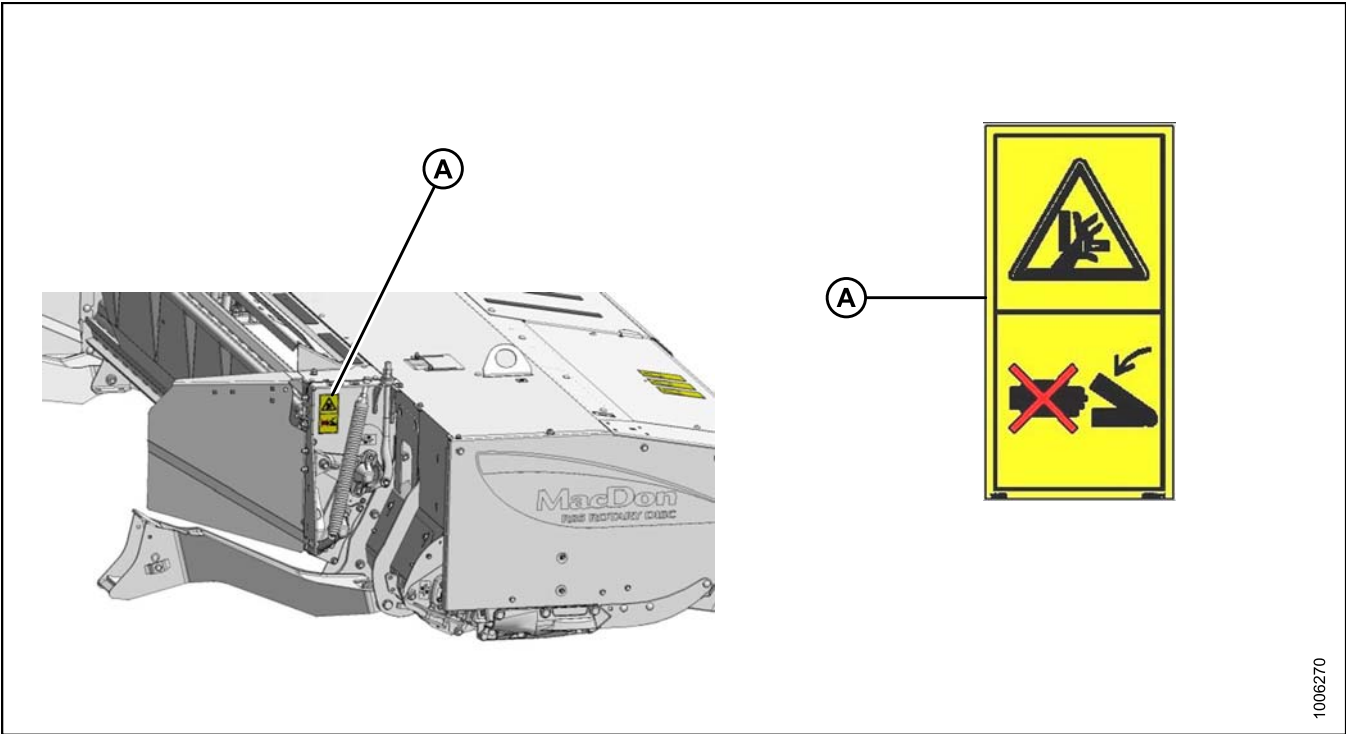
C - MD #184371  
 F - MD #194463



1014121

**Figure 1.18: Safety Decals**

# SAFETY



1006270

**Figure 1.19: Safety Decal Locations**

A - MD #184386



## 1.8 Understanding Safety Signs

### MD #113482

General hazard pertaining to machine operation and servicing

#### 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.
- Stop the engine and remove the key before servicing, adjusting, lubricating, cleaning, or unplugging machine.
- Engage safety props to prevent lowering of header or reel before servicing in the raised position (refer to the header operator's manual).
- Use slow moving vehicle emblem and flashing warning lights when operating on roadways unless prohibited by law.

### MD #166466

High pressure oil hazard

#### 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.

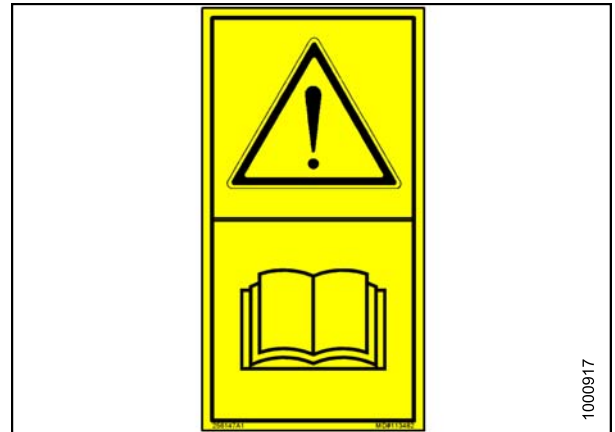


Figure 1.20: MD #113482



Figure 1.21: MD #166466

## SAFETY

### MD #166833

Run-over hazard

#### WARNING

- Remove key from ignition.
- Read tractor and mower manufacturer's manuals for inspection and maintenance instructions.
- Read the windrower and header manuals for inspection and maintenance instructions.

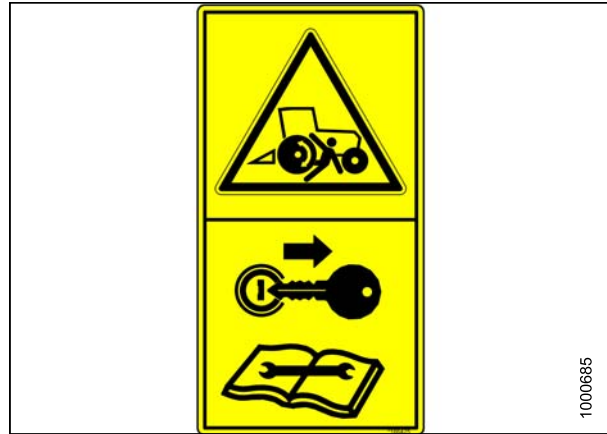


Figure 1.22: MD #166425

### MD #174432

Reel hazard

#### WARNING

- To avoid injury from fall of raised reel; fully raise reel, stop the engine, remove the key, and engage mechanical lock on each reel support arm before working on or under reel.
- Refer to operator's manual.



Figure 1.23: MD #174432

### MD #174434

Header hazard

#### DANGER

- Rest header on ground or engage mechanical locks before going under unit.

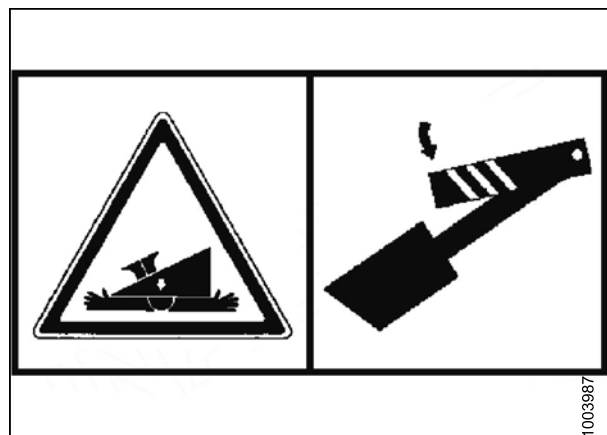


Figure 1.24: MD #174434

## SAFETY

### MD #184371

Open drive hazard

#### WARNING

- Guard missing. Do not operate.
- Keep all shields in place.



Figure 1.25: MD #184371

### MD #184385

Pinch hazard

#### WARNING

- Keep away.
- Failure to comply could result in death or serious injury.



Figure 1.26: MD #184385

### MD #184386

Pinch hazard

#### WARNING

- Failure to comply could result in death or serious injury.



Figure 1.27: MD #184386

## SAFETY

### MD #184422

Keep shields in place hazard

#### WARNING

- Do not place hand.
- To avoid injury, stop the engine and remove the key before opening power drive system shield.
- Keep all shields in place.



Figure 1.28: MD #184422

### MD #190546

Slippery surface

#### WARNING

- Do not use this area as a step or platform.
- Failure to comply could result in serious injury or death.

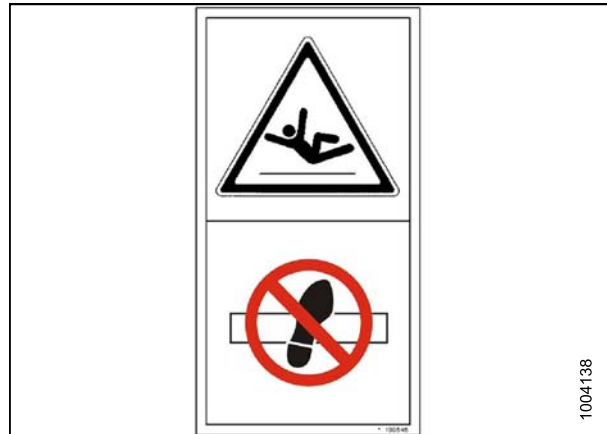


Figure 1.29: MD #190546

### MD #194462

Header crushing hazard

#### WARNING

- Install lock before going under unit.

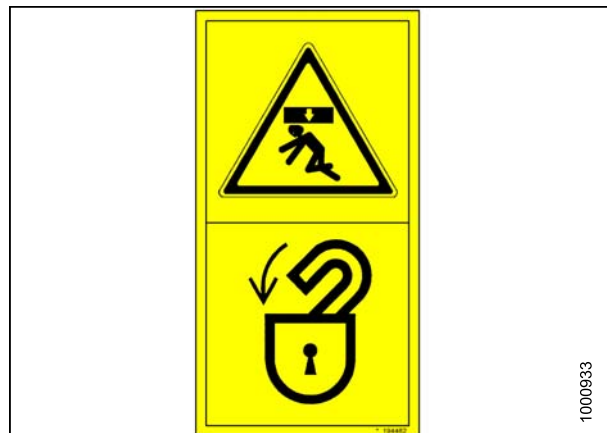


Figure 1.30: MD #194462

## SAFETY

### MD #194463

Rotating blades

#### WARNING

- Stop engine and remove the key before opening the header covers.
- Listen and look for evidence of rotation before lifting cover.
- Rotating cutters may continue to rotate after power is shut off.

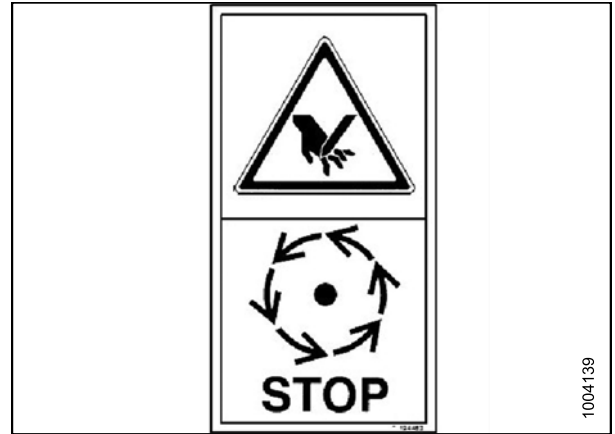


Figure 1.31: MD #194463

### MD #194464

Shut down for service

#### WARNING

- Stop the engine and remove the key.
- Read tractor and mower manufacturer's manuals for inspection and maintenance instructions.
- Read the windrower and header manuals for inspection and maintenance instructions.



Figure 1.32: MD #194464

### MD #194465

Rotating cutters

#### WARNING

- Stand clear.
- Stop the engine and remove the key.
- Disengage PTO and shut off tractor.
- Listen and look for evidence of rotation before lifting cover.
- Rotating cutters may continue to rotate after power is shut off.
- Failure to comply could result in serious injury or death.



Figure 1.33: MD #194465

## SAFETY

### MD #194466

Rotating parts under hood

#### WARNING

- Stand clear.
- Crop materials exiting at high speed.
- Stop machine, look, listen, and wait for all movement to stop before approaching.
- Failure to comply could result in death or serious injury.



Figure 1.34: MD #194466

### MD #194521

Auger entanglement hazard

#### CAUTION

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

General hazard pertaining to machine operation and servicing.

#### CAUTION

- Read the operator's manual and follow 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.
- Stop the engine and remove the key from ignition before servicing, adjusting, lubricating, cleaning, or unplugging machine.
- Engage locks 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.

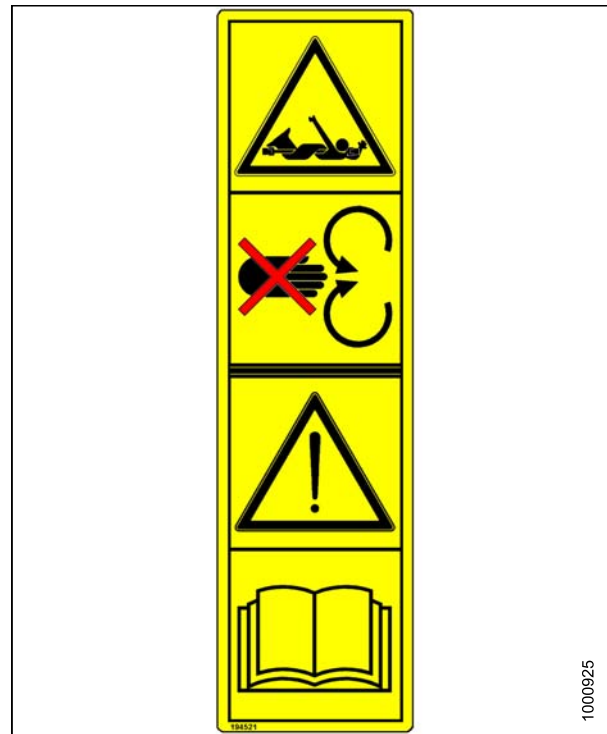


Figure 1.35: MD #194521

## SAFETY

### MD #247166

Moving implement hazard

#### WARNING

- To avoid injury, do not mount or ride machine while the machine is in motion.



Figure 1.36: MD #247166

### MD #247167

Rotating blades

#### WARNING

- Disengage power take-off, stop engine, and remove key before opening covers.
- Listen and look for evidence of rotation before lifting cover.
- Rotating cutters may continue to rotate after power is shut off due to inertia.



Figure 1.37: MD #247167





## 2 Product Overview

### 2.1 Definitions

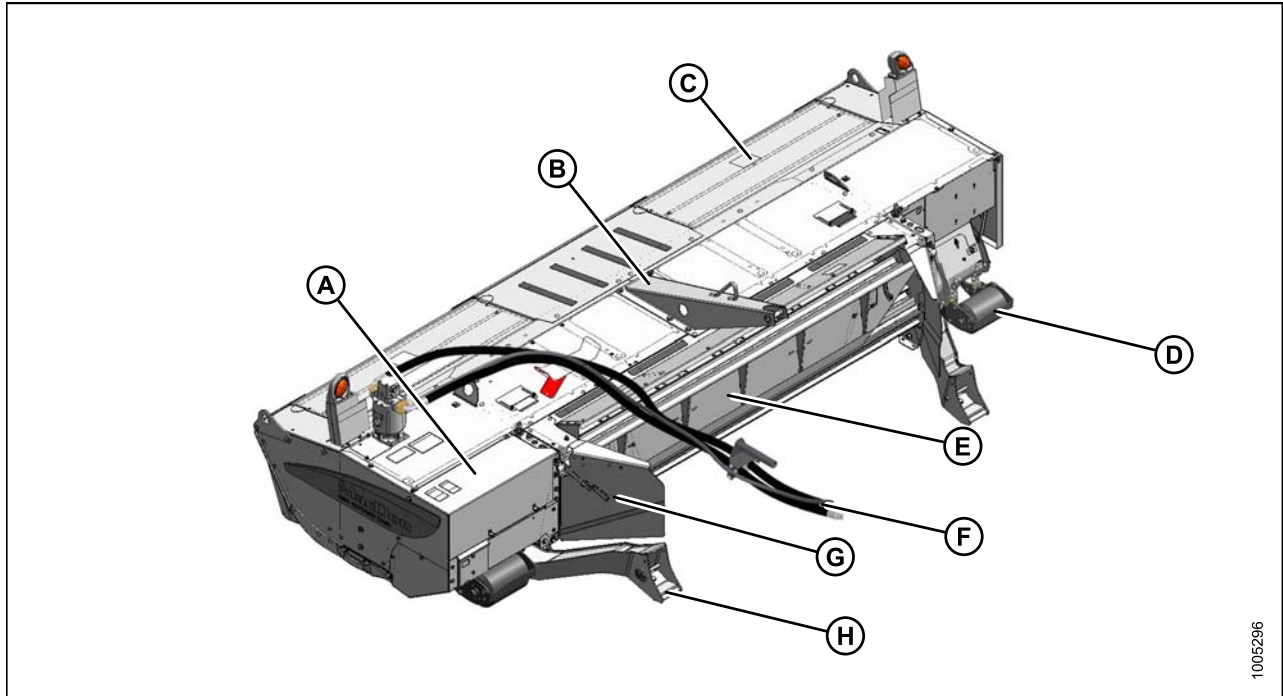
The following terms and acronyms may be used in this manual.

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
DWA	Double Windrow Attachment
ECM	Engine control module
ECU	Electronic control unit
Engine-forward	Windrower operation with the Operator and engine facing in the direction of travel
Export header	Header configuration typical outside North America
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
GSS	Grass Seed Special
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)
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
n/a	Not applicable
Nut	An internally threaded fastener that is designed to be paired with a bolt
N-DETENT	The slot opposite the NEUTRAL position on operator's console

## PRODUCT OVERVIEW

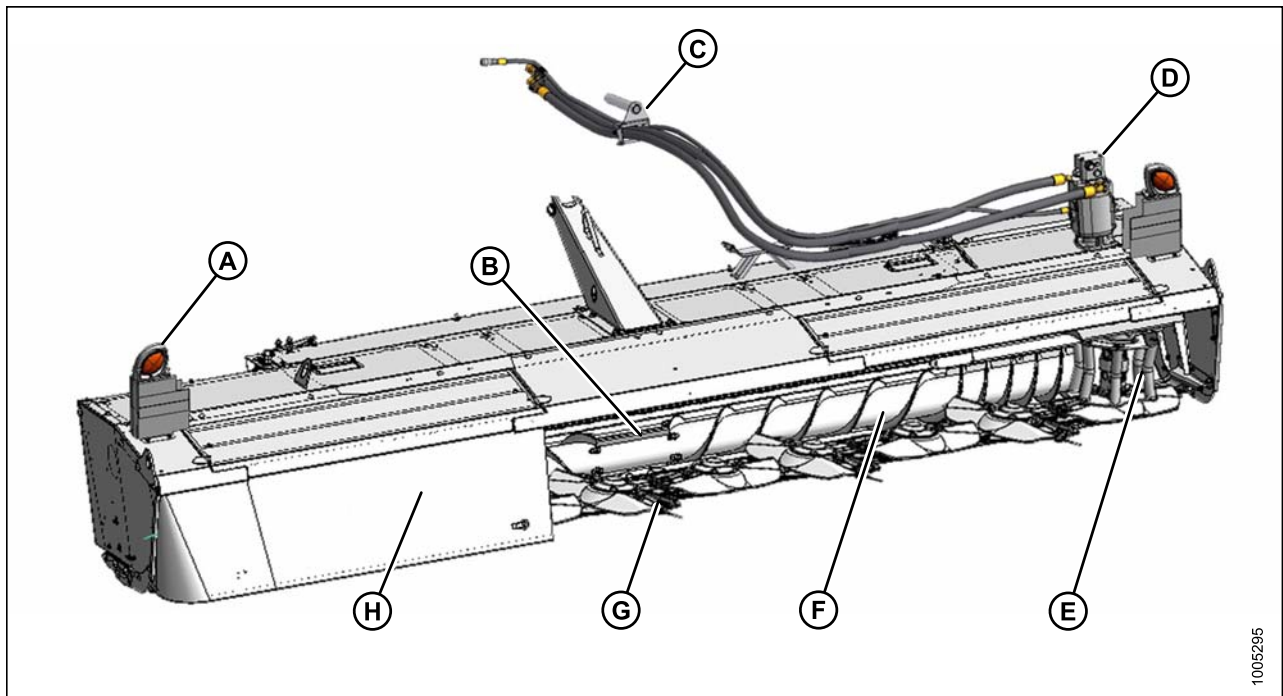
<b>Term</b>	<b>Definition</b>
North American header	Header configuration typical in North America
NPT	National Pipe Thread: A style of fitting used for low pressure port openings Threads on NPT fittings are uniquely tapered for an interference fit
ORB	O-ring boss: A style of fitting commonly used in 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
rpm	Revolutions per minute
R-Series header	MacDon rotary disc header
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
Self-Propelled (SP) Windrower	Self-propelled machine consisting of a power unit with a header
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
Truck	A four-wheel highway/road vehicle weighing no less than 7500 lbs (3400 kg)
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
Washer	A thin cylinder with a hole or slot located in the center that is to be used as a spacer, load distribution element, or a locking mechanism
Windrower	Power unit of a self-propelled header
WCM	Windrower control module

## 2.2 Component Identification



**Figure 2.1: Component Identification**

- |                 |                                     |                    |                              |
|-----------------|-------------------------------------|--------------------|------------------------------|
| A - Driveshield | B - Tower                           | C - Door           | D - Gauge Rollers (Optional) |
| E - Baffle      | F - Hydraulic Hoses to SP Windrower | G - Baffle Control | H - Header Boot              |



**Figure 2.2: Component Identification**

- |                      |                       |                       |                 |
|----------------------|-----------------------|-----------------------|-----------------|
| A - Transport Light  | B - Conditioner Rolls | C - Hose Support      | D - Drive Motor |
| E - Rotary Deflector | F - Overshot Auger    | G - 10 Disc Cutterbar | H - Curtains    |

## PRODUCT OVERVIEW

### 2.3 Specifications

**NOTE:**

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

S: standard / O<sub>F</sub>: optional (factory installed) / O<sub>D</sub>: optional (dealer installed) / -: not available

	<b>R85-16 FT</b>
<b>CUTTERBAR</b>	
Effective cutting width	15.83 ft. (4827 mm)
Number of cutting discs	10
Number of blades per disc	2
11 degree bevel up knives	S
Inline spur gear cutterbar design	S
Geartrain protection - shearable key in spindle (all discs)	S
Tall crop feed plates (stored on header)	2
Austempered cutting discs	S
Knife tip speed	82.9 mps (184 mph)
Range of cutting disc rpm	1800-2600 rpm
Knife tip speed range	59.2-85.5 mps (131-189 mph)
Cutterbar spindle anti-wrap ring	S
Austempered rock guards	S
Hourglass converging impellers	S
Heat treated crop lifters	S
Cutting angle range	0-8° below horizontal
Cutting angle range - minimum cut height	3/4 in. (19 mm)
Adjustable gauge rollers	O
Adjustable shoes	O

## PRODUCT OVERVIEW

	<b>R85-16 FT</b>
<b>Overshot Auger</b>	
Peripheral diameter	9.0 in. (229 mm)
Center tube diameter	6.0 in. (152 mm)
Rpm range:	720-1040
Three HB belt drive (with spring loaded idler)	S
Universal Joint in Auger Center	S
<b>Hay Conditioner</b>	S
Drive: Bevel gearbox to 5 HA banded belt drive to enclosed timing gearbox and driveline	S
Roll Type: Intermeshing steel bars	S
Roll Length: 118 in. (3000 mm)	S
Roll Diameter 9.0 in. (229 mm) outside diameter on 7.0 in. (179 mm) O.D. tube	S
Roll Diameter 9.17 in. (233 mm) outside diameter on 6.63 in. (168.4 mm) O.D. tube (SP)	S
Roll Speed	730-1040
<b>Forming Shield</b> for 36 in. (915 mm) windrow to 102 in. (2540 mm) wide swath	S
Header mounted adjustable baffle	S
Tractor mounted side deflector and rear baffle	S
<b>Frame and Structure</b>	
Two amber transport lights	S
Mounts to self-propelled windrower tractor	S
Easy access doors to access cutterbar components	2
Transport width	4879 mm (192 in)
Total Weight complete with lift arms (estimated)	1955 kg (4300 lbs)
<b>Drives</b>	
M205 Windrower tractor to 106 cc (6.4 cu in.) Eaton heavy duty hydraulic motor	S
M205 maximum hydraulic power developed	174 kW (231 Hp)
<b>Hydraulic Header Connection</b>	
Hydraulic Couplers for Quick Attachment	O <sub>D</sub>

## PRODUCT OVERVIEW

	<b>R85-16 FT</b>
<b>Attachments and Accessories</b>	
Double Windrow Attachment	O <sub>D</sub>
Tall Crop Divider Kit	O
Cutterbar Repair Tool Kit	O

## 3 Operation

### 3.1 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.
- Ensure that the windrower is properly equipped to safely operate the header. This may include adding ballast according to windrower operator's manual requirements for attachments of this size and mass.

## 3.2 Operational Safety

### CAUTION

Follow these safety precautions:

- Follow all safety and operational instructions given in your windrower operator's manuals. If you do not have an operator's manual, get one from your Dealer and read it thoroughly
- Never attempt to start the windrower's 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 or header

### 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
- If cutting ditch banks, use extreme caution. If the header hits an obstruction, the front of the windrower will usually swerve toward the ditch
- When working on inclines, travel uphill or downhill when possible. Be sure to keep the windrower transmission in gear when travelling downhill
- Never attempt to get on or off a moving machine
- Do NOT get off the windrower while the header is in operation
- To avoid bodily injury or death from unexpected startup of machine, always stop the windrower engine and remove the key before adjusting or removing plugged material from the machine.
- Check for excessive vibration and unusual noises. If there is any indication of trouble, shut down and inspect the machine

### CAUTION

Follow proper shut down procedure:

- Engage the windrower brake
- Stop the engine and remove the key
- Wait for all movement to stop
- Engage the header safety props before inspecting a raised machine



**⚠ CAUTION**

- Operate only in daylight or good artificial light
- Keep everyone several hundred feet away from your operation
- Ensure bystanders are never in line with the front or rear of the machine. Stones or other foreign objects can be ejected with force from either end
- Extreme care must be exercised to avoid injury from thrown objects. Do NOT, under any circumstances, operate the header when other people are in the vicinity. Stones and other objects can be thrown great distances by the rotating cutting blades
- The cutterbar curtains are very important to reduce the potential for thrown objects. Always keep the cutterbar curtains down when operating the header. Replace the curtains if they become worn or damaged

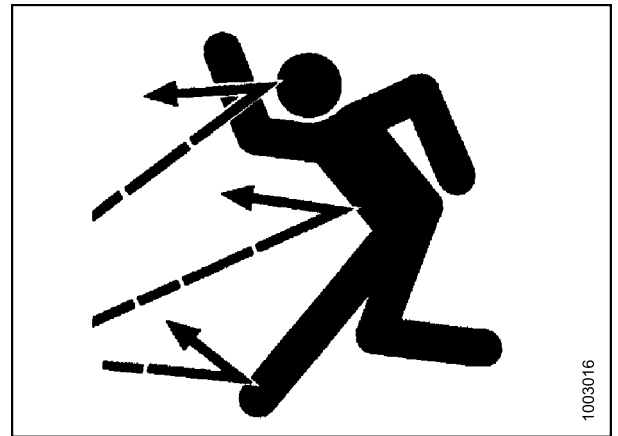


Figure 3.1: Ejected Objects Warning

1003016

### 3.3 Header Safety Props

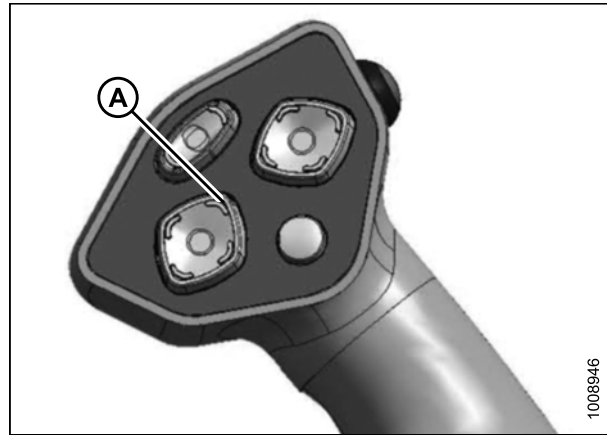
Safety props are located on both header lift cylinders on the windrower.

#### **⚠ DANGER**

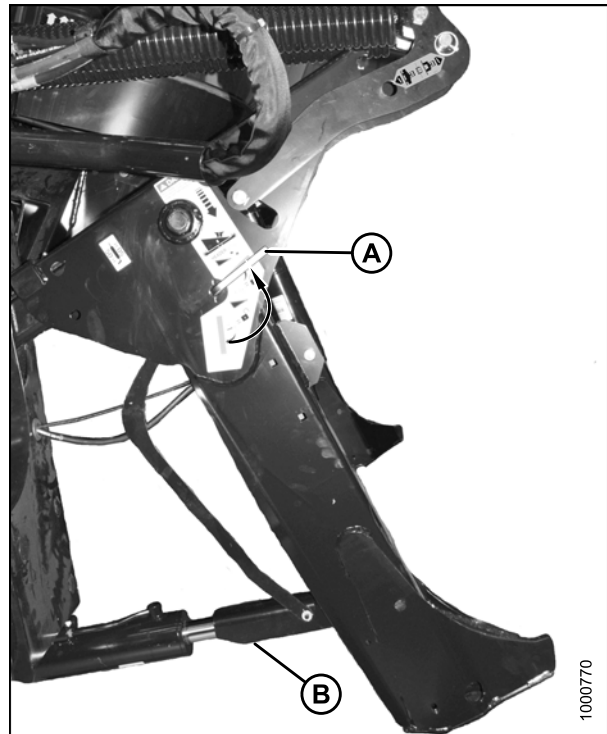
**To avoid bodily injury from fall of raised header, always engage safety props when working on or around raised header, and before going under header for any reason.**

Engage safety props as follows:

1. Start engine and press header up (A) switch to raise header to maximum height.
2. Rephase cylinders if one end of the header does not raise fully. If rephasing is required, proceed as follows:
  - a. Press and hold the header up (A) switch until both cylinders stop moving.
  - b. Continue to hold the switch for 3–4 seconds. Cylinders are now phased.
3. Pull lever (A) and rotate toward header to lower safety prop (B) onto cylinder. Repeat for opposite cylinder.



**Figure 3.2: Ground Speed Lever (GSL)**



**Figure 3.3: Safety Prop**

## OPERATION

4. Disengage safety props by turning lever (A) away from header to raise safety prop until lever locks into vertical position. Repeat for opposite cylinder.
5. Start engine, choose a level area, and lower header to the ground. Stop the engine and remove the key.

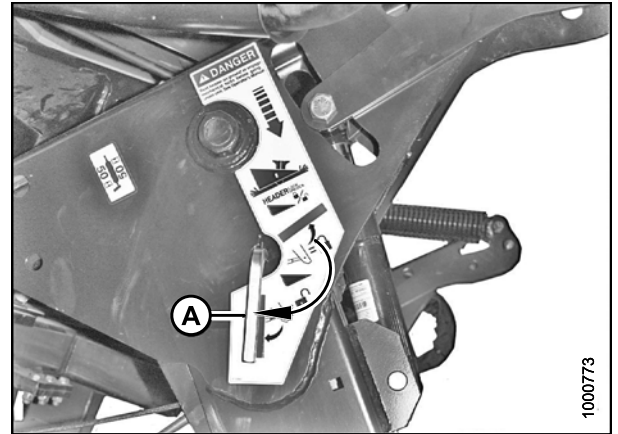


Figure 3.4: Safety Prop

## 3.4 Driveshields

### **⚠** WARNING

Do NOT operate the machine with the driveshields open. High-speed rotating components may throw debris and could result in death or serious injury.

The R85 16-Foot Header for Self-Propelled Windrower comes in two configurations—one configured for use in North America and one configured for use outside of North America. The configuration is specified in the title when necessary.

### 3.4.1 Opening the Driveshield: North American Headers

Follow these steps to open the driveshield on North American headers:

1. Release rubber latches (A).
2. Lift shield (B).

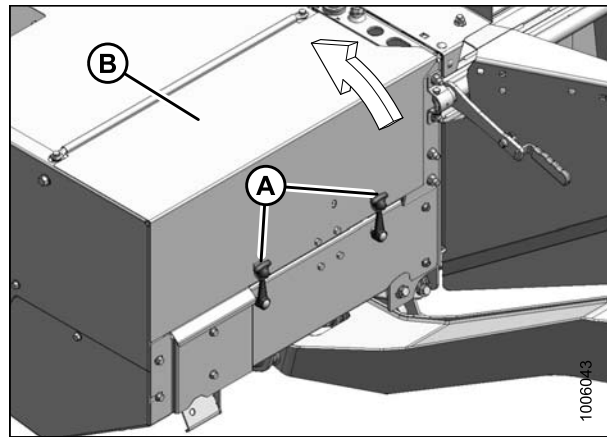


Figure 3.5: Driveshield

### 3.4.2 Closing the Driveshield: North American Headers

Follow these steps to close the driveshield on North American headers:

1. Lower shield (B) so that pins at lower end of shield engage holes in lower panel.
2. Engage rubber latches (A).

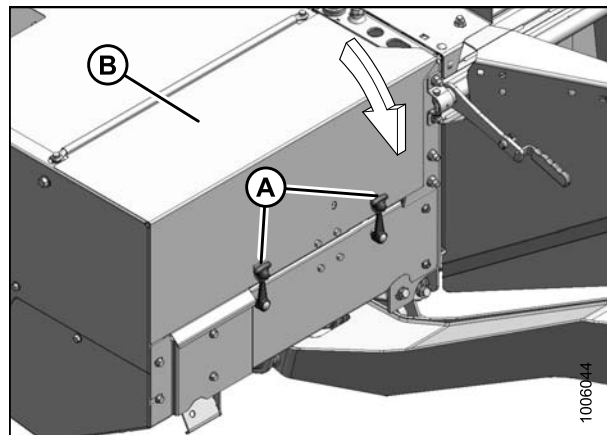


Figure 3.6: Driveshield

### 3.4.3 Opening the Driveshield: Export Headers

Follow these steps to open the driveshield on export headers:

1. Release rubber latches (A).
2. Insert a screwdriver (or equivalent) through hole in shield (B) and into the notch in latch (C) and disengage latch.
3. Open shield (D).

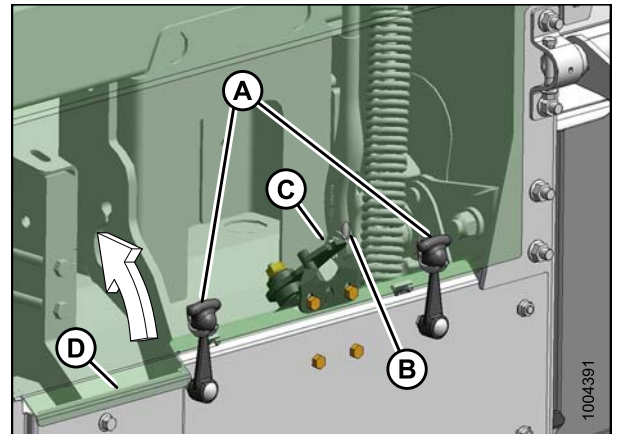


Figure 3.7: Driveshield

### 3.4.4 Closing the Driveshield: Export Headers

Follow these steps to close the driveshield on export headers:

1. Lower the shield (C) so that pins at lower end of shield engage holes in the lower panel and latch (B) reengages the shield.
2. Engage rubber latches (A).

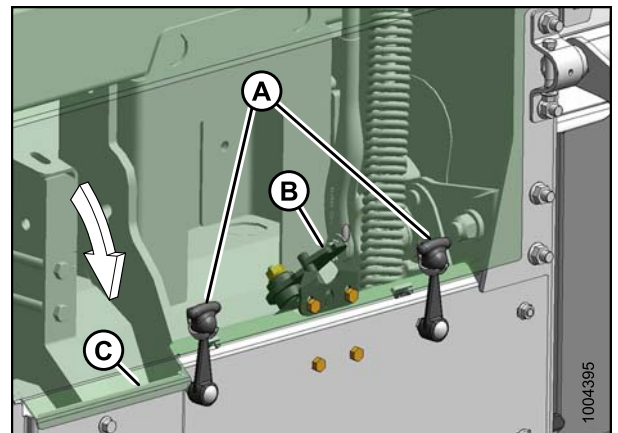


Figure 3.8: Driveshield

## OPERATION

### 3.4.5 Removing Right Endshield

1. Remove three bolts (A) and remove right endshield (B).

**NOTE:**

Tall crop feed plates are supplied from the factory and stored behind the right endshield.

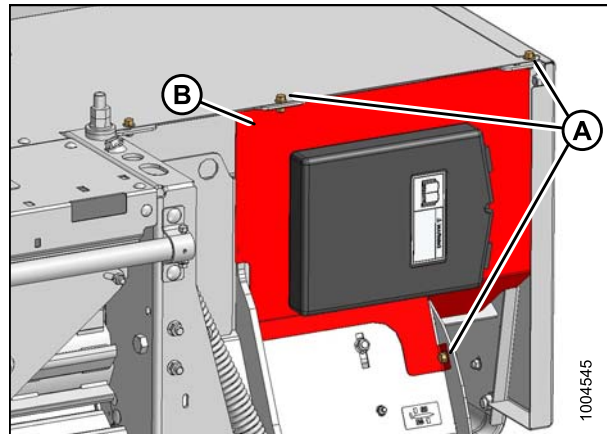


Figure 3.9: Right Endshield

### 3.4.6 Installing Right Endshield

1. Install right endshield (B) using three bolts (A).

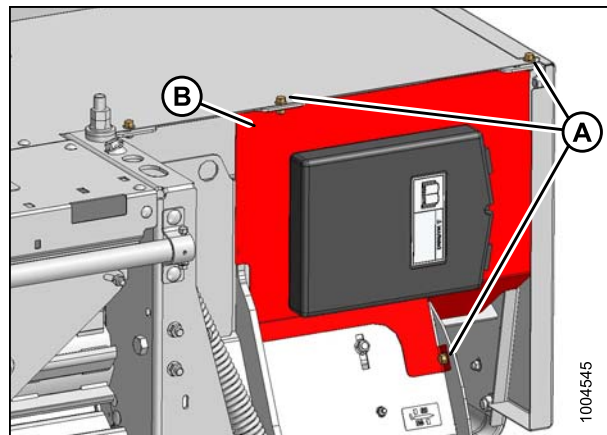


Figure 3.10: Right Endshield

## 3.5 Cutterbar Doors

The R85 comes in two configurations—one configured for use in North America and one configured for use outside of North America. The configuration is specified in the title when necessary.

### CAUTION

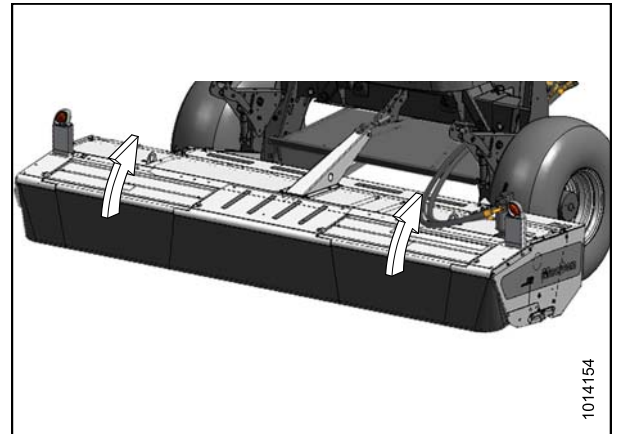
**Do NOT operate the machine without all the cutterbar doors down. The curtains should be installed and in good condition.**

Two doors provide access to the cutterbar area.

Rubber curtains are attached to each door at the front corners and center fixed cover. Latches at the lower corners of each curtain keep the curtains together to minimize the risk of thrown objects.

The cutterbar curtains reduce the potential for thrown objects. Always keep curtains down when operating the header.

Replace the worn or damaged curtains. Refer to your Dealer for replacement instructions.



**Figure 3.11: Cutterbar Doors**

## OPERATION

### 3.5.1 Opening the Cutterbar Doors: North America

Follow these steps to open the cutterbar doors on a North American header:

1. Unhook the curtain latches (A).

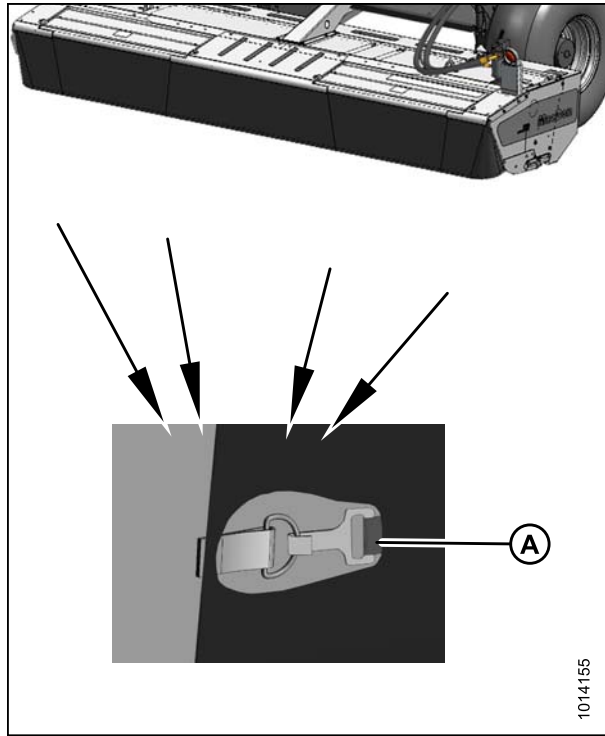


Figure 3.12: Curtain Latches

2. Lift front of door to the open position.



Figure 3.13: Cutterbar Doors



### 3.5.2 Closing the Cutterbar Doors: North American Header

Follow these steps to close the cutterbar doors on a North American header:

**⚠ CAUTION**

To avoid injury, keep hands and fingers away from corners of doors when closing.

1. Pull at top of the cutterbar door and move to the closed position.



Figure 3.14: Cutterbar Doors

2. Hook curtain latches (A).

**NOTE:**

Ensure that curtains hang properly and completely enclose cutterbar area.

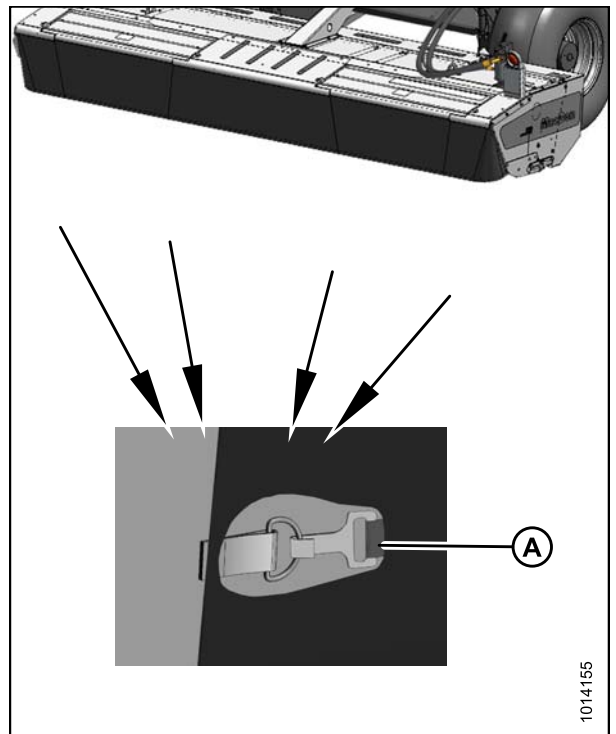


Figure 3.15: Curtain Latches

## OPERATION

### 3.5.3 Opening the Cutterbar Doors: Export Header

Follow these steps to open the cutterbar doors on an export header:

1. Unhook curtain latches (A).

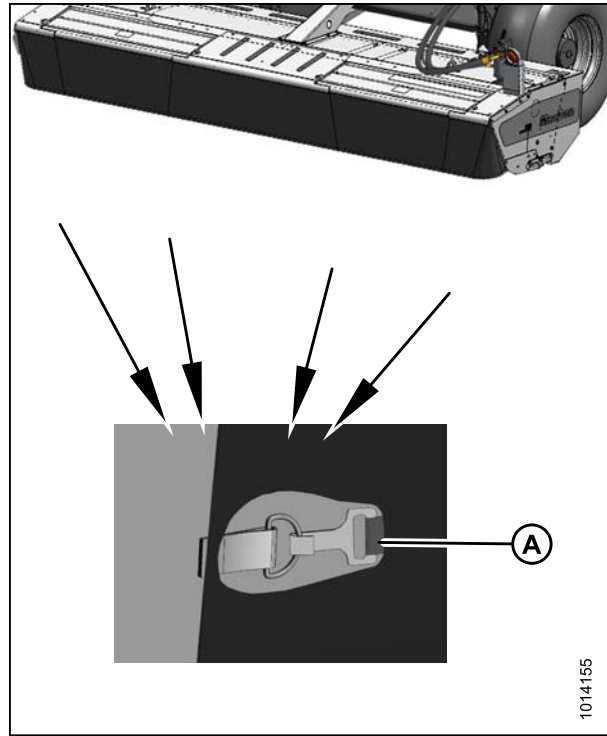


Figure 3.16: Curtain Latches

## OPERATION

2. Insert a screwdriver (or equivalent) through hole (A) in door into notch in latch (B) and push latch to disengage.
3. Lift at front of door to open.

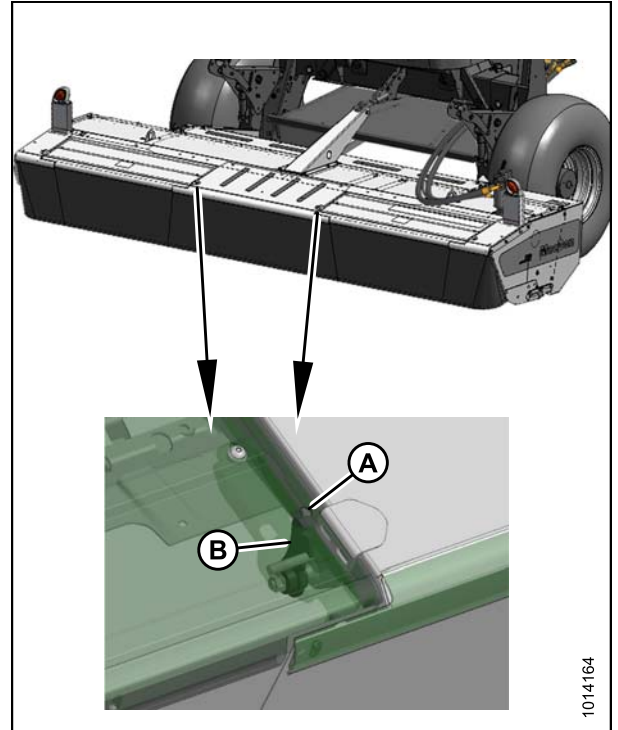


Figure 3.17: Cutterbar Door Latch

### 3.5.4 Closing the Cutterbar Doors: Export Header

To close the cutterbar doors on an export header follow these steps:

 **CAUTION**

To avoid injury, keep hands and fingers away from corners of doors when closing.

## OPERATION

1. Pull at top and move to closed position. Ensure latch (A) has engaged the door.

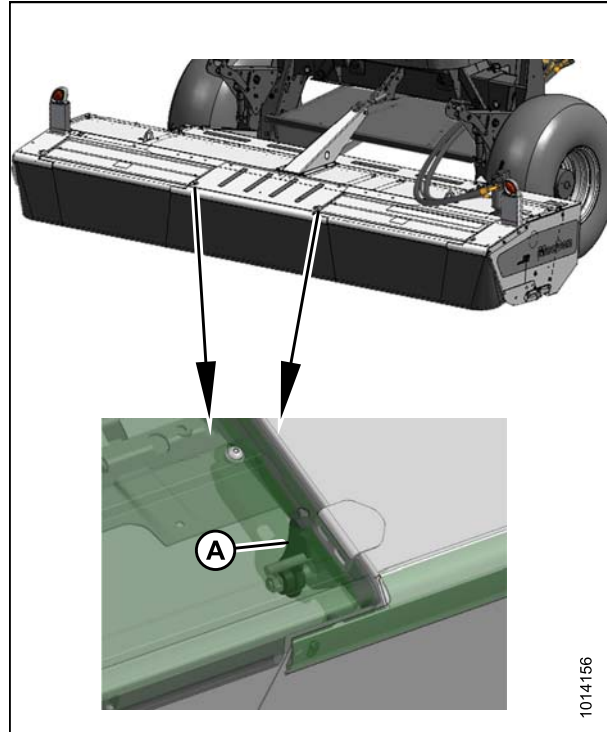


Figure 3.18: Cutterbar Door Latch

2. Hook curtain latches (A).

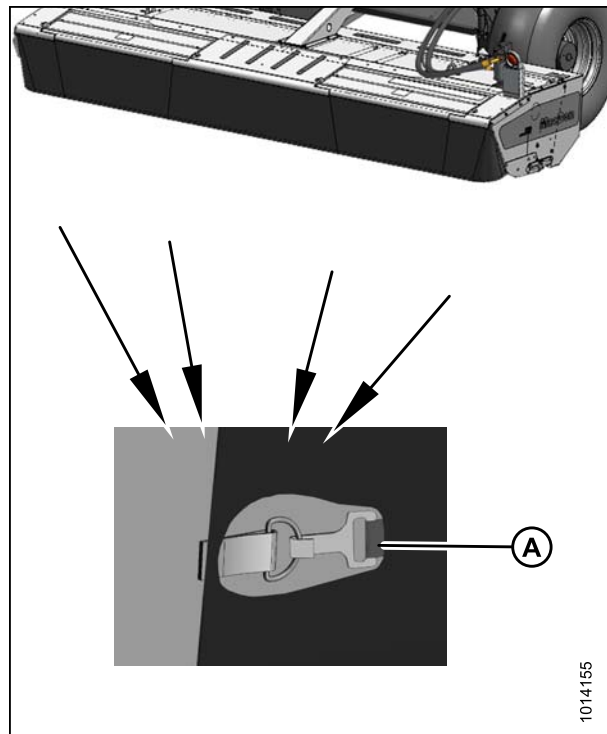


Figure 3.19: Curtain Latches

### 3.6 Daily Start-Up Check

#### CAUTION

- Be sure windrower and header are properly attached, all controls are in NEUTRAL, and windrower brake is engaged.
- Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the header to be sure no one is under, on or close to it.
- Wear close fitting clothing and protective shoes with slip resistant soles. As well, carry with you any protective clothing and personal safety devices that COULD be necessary through the day. Don't take chances.
- Remove foreign objects from the machine and surrounding area.

You may need the following:

- A hard hat
- Protective footwear with slip resistant soles
- Protective glasses or goggles
- Heavy gloves
- A respirator or filter mask
- Wet weather gear

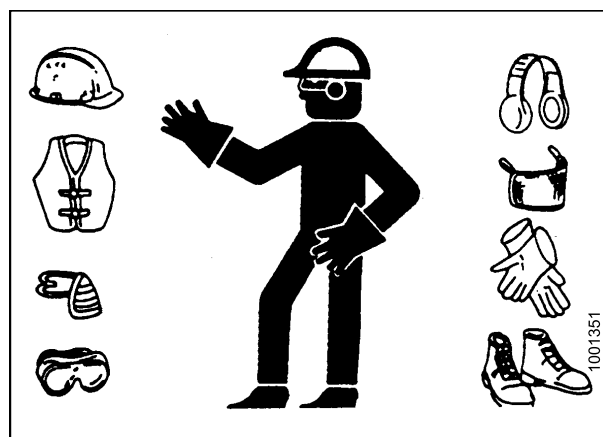


Figure 3.20: Safety Equipment

- 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 3.21: Safety Equipment

## OPERATION

Do the following 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 [5.6.2 Hydraulic Hoses and Lines, page 149](#).

2. Clean all lights and reflective surfaces on the machine. Check lights for proper operation.
3. Perform all daily maintenance. Refer to [5.3.1 Maintenance Schedule/Record, page 103](#).

## 3.7 Attaching the Header

### 3.7.1 Attaching the Forming Shield

#### DANGER

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

1. Stop the engine and remove the key.
2. Remove the two clevis pins (A) from forming shield forward end.

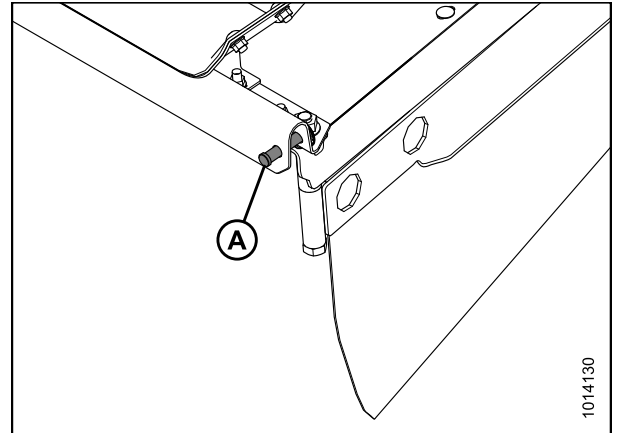


Figure 3.22: Forming Shield

3. Position the forming shield (A) under the windrower frame.

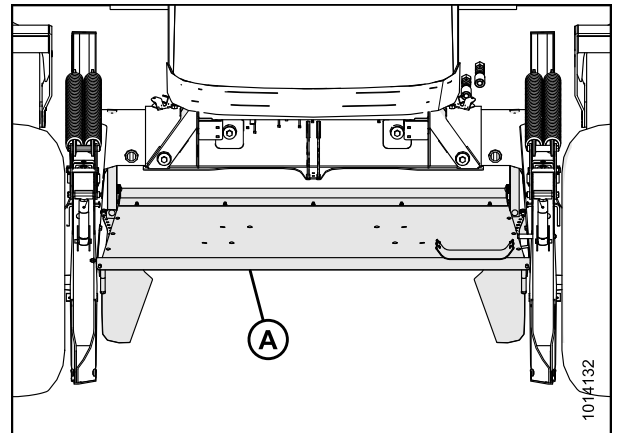


Figure 3.23: Forming Shield under Windrower

## OPERATION

4. Position the forming shield onto spacers (B) on windrower legs. Secure with clevis pins (A) and lynch pin.

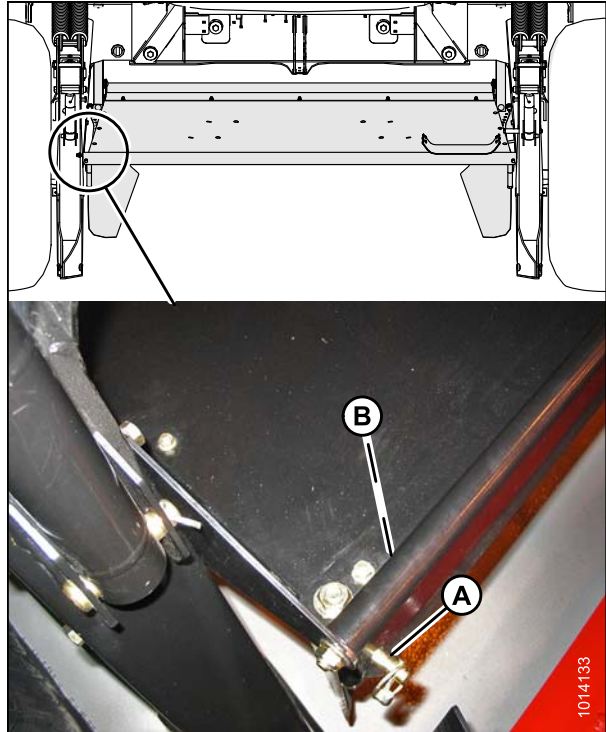


Figure 3.24: Forming Shield under Windrower

5. Lift the aft end of the forming shield and attach straps (B) to pins (A) on windrower frame.
6. Install washer and hairpin to secure strap. Use the middle hole and adjust height to suit the crop.

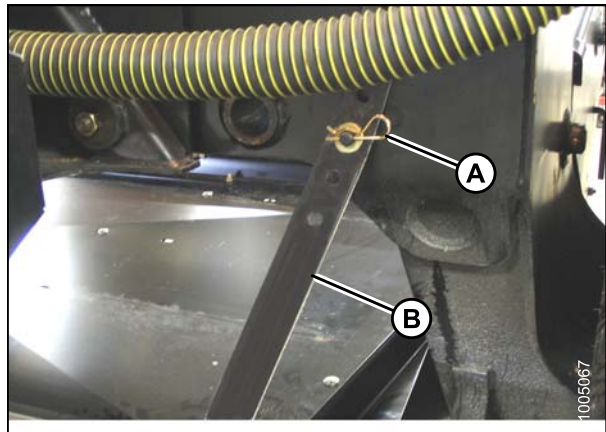


Figure 3.25: Forming Shield Strap



## OPERATION

7. Set the forming shield side deflectors to the desired width by repositioning adjuster bars (A). Use the same hole location on both sides.
8. Adjust rear fluffer deflector (C) to middle position. Loosen handles (B) if required.
9. Attach the R85 header to the windrower. Refer to the windrower operator's manual, and then return to this manual to complete the attachment.
10. Connect the hydraulics and electrical harness,
  - For M205, refer to [3.7.2 Attaching the Header \(M205 Windrowers\)](#), page 43.
  - For M200, refer to [3.7.3 Attaching the Header \(M200 Windrowers\)](#), page 48.

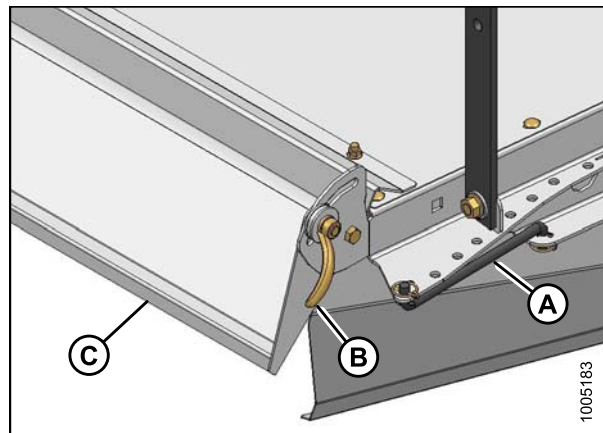


Figure 3.26: Forming Shield Adjuster Bar

### 3.7.2 Attaching the Header (M205 Windrowers)

#### DANGER

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

Refer to your windrower operator's manual for procedures to mechanically attach the header to the windrower. Refer to the following procedures for electrical and hydraulic connections:

1. Move windrower left-hand (cab-forward) platform (A) to OPEN position.

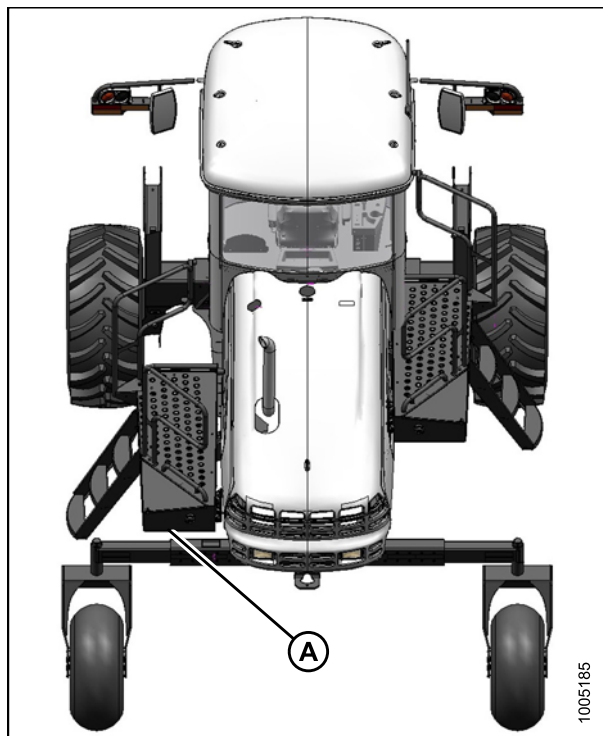


Figure 3.27: Windrower with LH Platform in Open Position

## OPERATION

2. Route the hose bundle (A) from the header, under the windrower frame, and insert pin (B) into hole in windrower frame.
3. Place hoses on support (C) and on the hose support on the forming shield (not shown).
4. If optional couplers and lock are installed on hoses and lines, proceed as follows. Otherwise, proceed to Step 14., page 47.

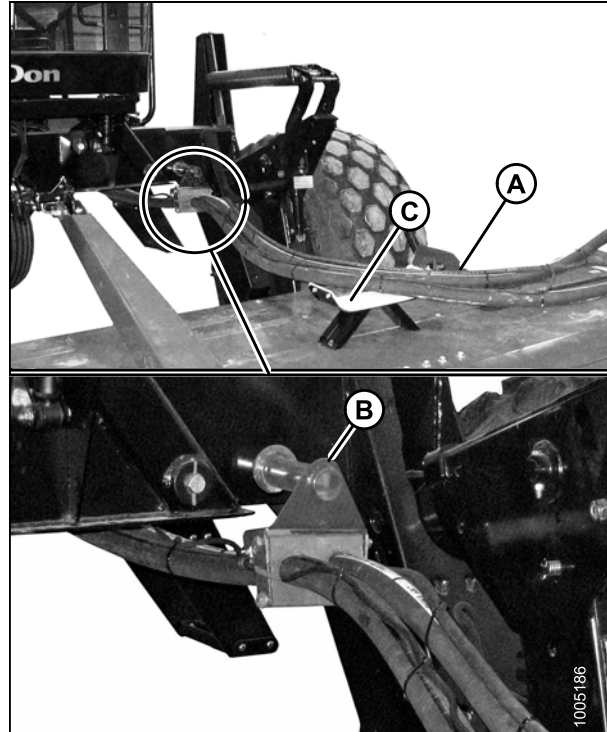


Figure 3.28: Hydraulic Hoses

5. Remove coupler lock as follows:
  - a. Remove lynch pin (A) and open up coupler lock (B).
  - b. Remove lock from coupler.

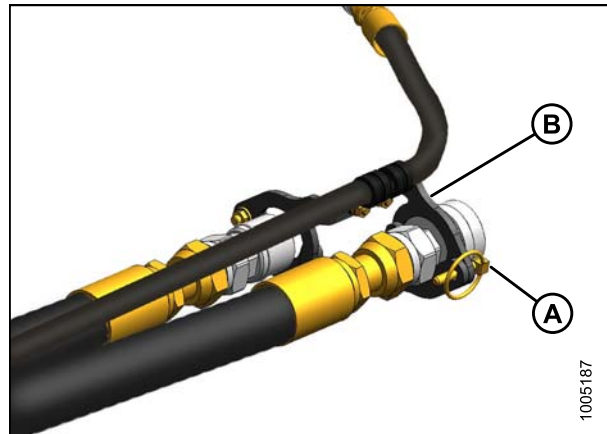


Figure 3.29: Hydraulic Couplers with Coupler Lock

## OPERATION

6. Connect the rear pump hose (A) to outboard line (D) on windrower using fitting (C).
7. Connect the front pump hose (B) to the inboard line (E) on windrower using fitting (C).
8. Torque fittings to 135 ft·lbf (183 N·m).

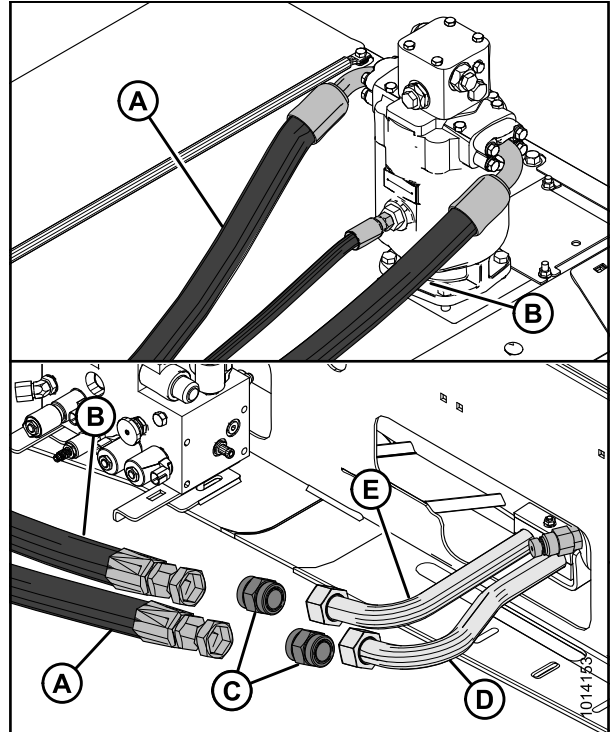


Figure 3.30: Hose Routing and Connections

9. Position the lock onto the couplers so that retainer (A) rests under the fitting next to the sleeve on each coupler.

**NOTE:**

The retainer can be adjusted by loosening bolts (B). Tighten bolts after adjusting.

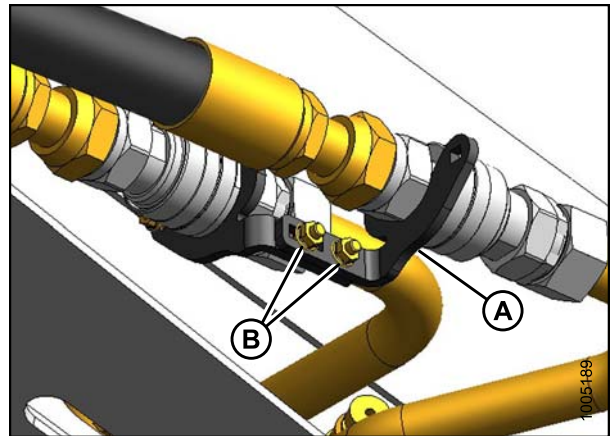


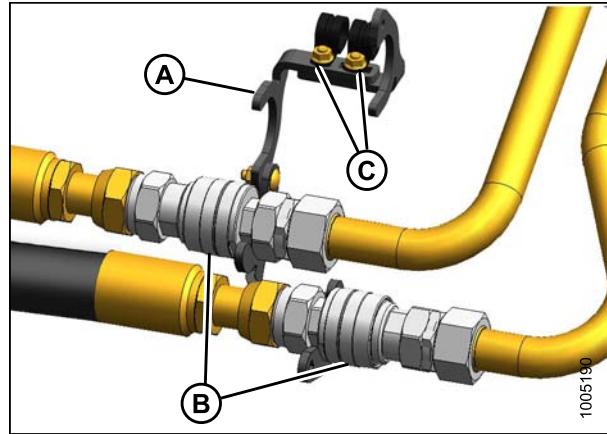
Figure 3.31: Hydraulic Couplers with Coupler Lock

## OPERATION

- Lower holder (A) onto sleeves (B) so that the flats are positioned on the holder.

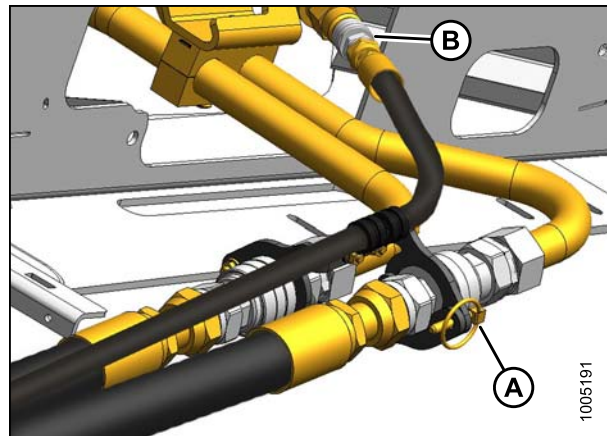
**NOTE:**

Holder can be adjusted by loosening bolts (C).  
Tighten bolts after adjusting.



**Figure 3.32: Hydraulic Couplers with Coupler Lock**

- Insert lynch pin (A) to secure the lock.
- Attach case drain hose coupler at (B).
- Proceed to Step [18.](#), [page 47.](#)



**Figure 3.33: Hydraulic Couplers with Case Drain Hose**

## OPERATION

14. Connect the rear pump hose (A) to outboard line (F) on windrower using fitting (D).
15. Connect the front pump hose (B) to the inboard line (G) on windrower using fitting (D).
16. Torque fittings to 135 ft·lbf (183 N·m).
17. Attach case drain hose and coupler (C) to (E).

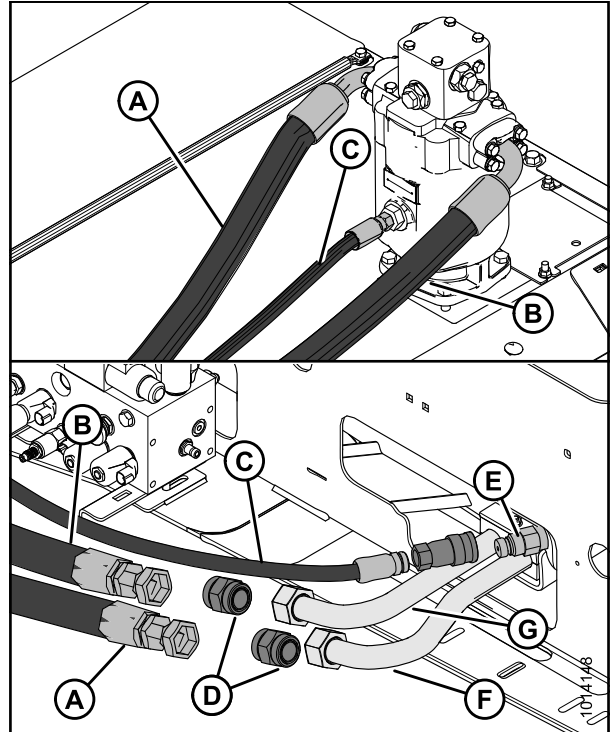


Figure 3.34: Hose Routing and Connections

18. Connect the electrical harness to connector HC-2A (A) (located beside the forward valve block on the windrower).

**NOTE:**

Valve block hidden to show the electrical connector.

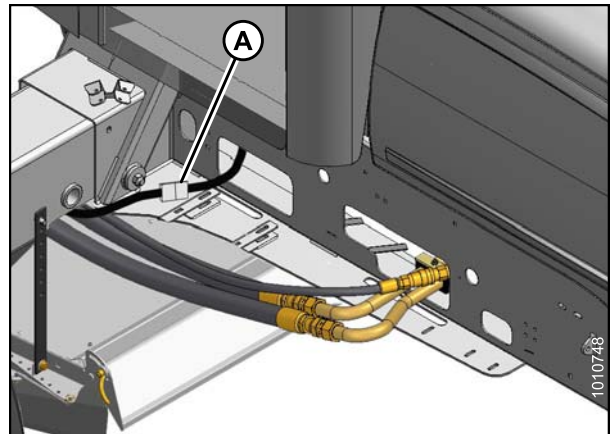


Figure 3.35: Electrical Connection

## OPERATION

19. Move the windrower platform (A) to the CLOSED position.

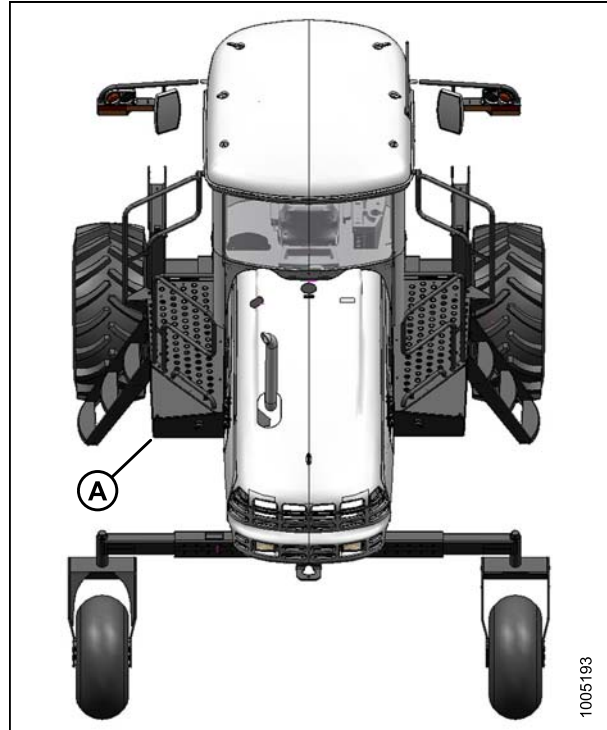


Figure 3.36: Windrower with LH Platform in Closed Position

### 3.7.3 Attaching the Header (M200 Windrowers)

#### DANGER

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

Refer to [3.7 Attaching the Header, page 41](#) for procedure to mechanically attach the header to the windrower. Refer to the following procedures for electrical and hydraulic connections:

To operate the 16-foot header on an M200 windrower, installation of a motor/hose kit (MD #B5455) is required.

If required, obtain the kit through your MacDon Dealer. Install kit in accordance with the supplied instructions.

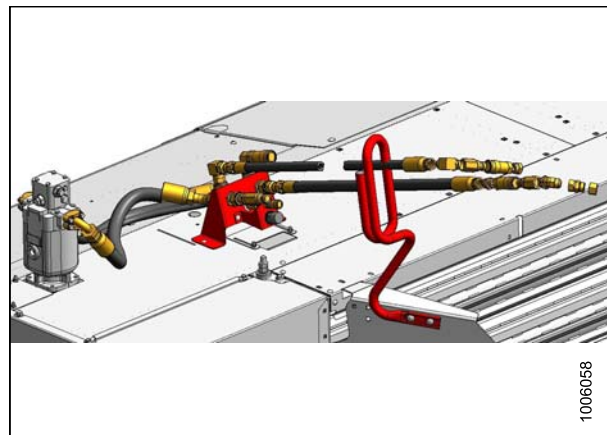
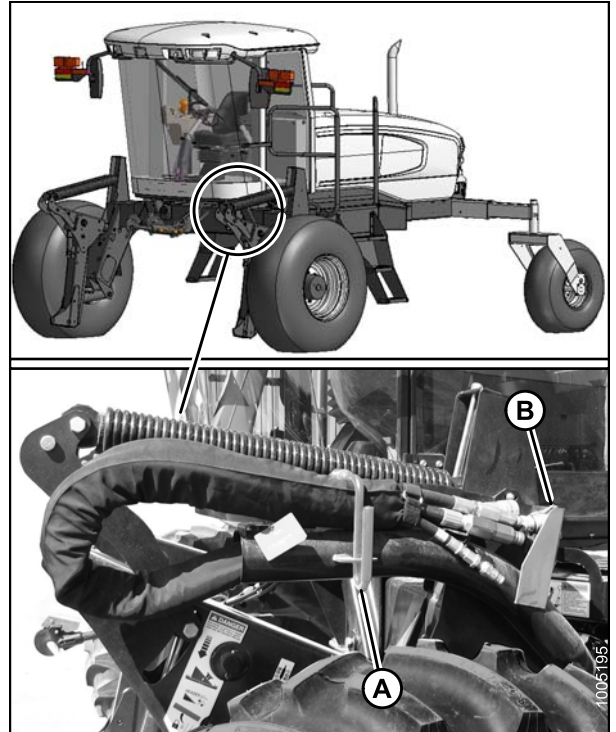


Figure 3.37: MD #B5455



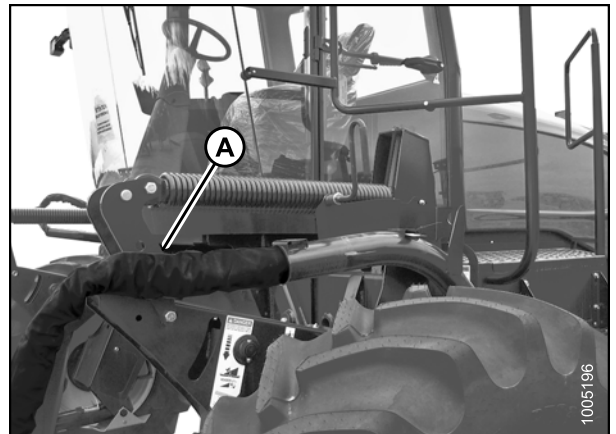
## OPERATION

1. Disengage and rotate lever (A) counterclockwise to the UP position.
2. Remove the cap (B) securing the electrical connector to the frame.



**Figure 3.38: Hose Bundle**

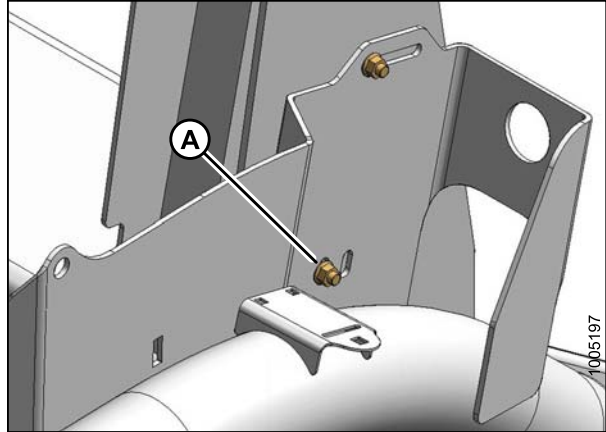
3. Move hose bundle (A) from the windrower and rest the bundle on the header.



**Figure 3.39: Hose Bundle**

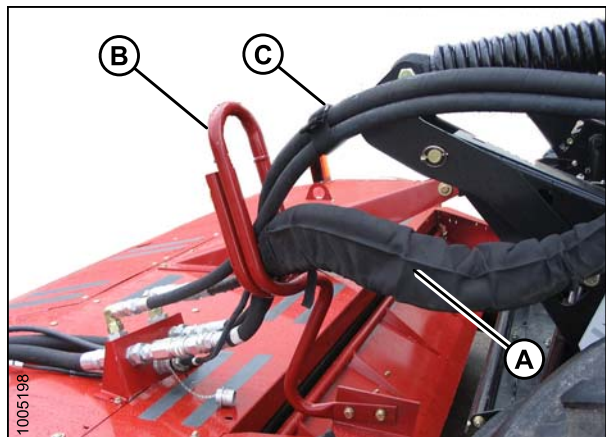
## OPERATION

4. Position the hose support with the lower bolt (A) in the forward hole and the support positioned as shown. Loosen both bolts and adjust as required.



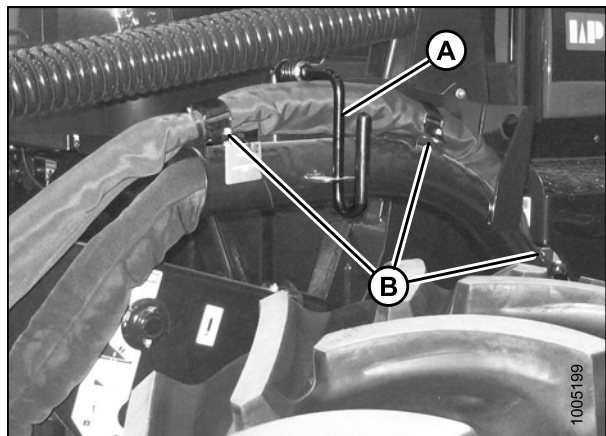
**Figure 3.40: Hose Support**

5. Route hose bundle (A) from the windrower through the support (B) on header.
6. Route header return and pressure hose bundle (C) through support (B) on header to the windrower.



**Figure 3.41: Hose Bundle**

7. Secure hose bundles with three cinch straps (B).
8. Lower and lock lever (A).



**Figure 3.42: Hose Bundle**



## OPERATION

9. Move the windrower's left-hand side (cab-forward) platform (A) to the OPEN position to access the valve blocks.

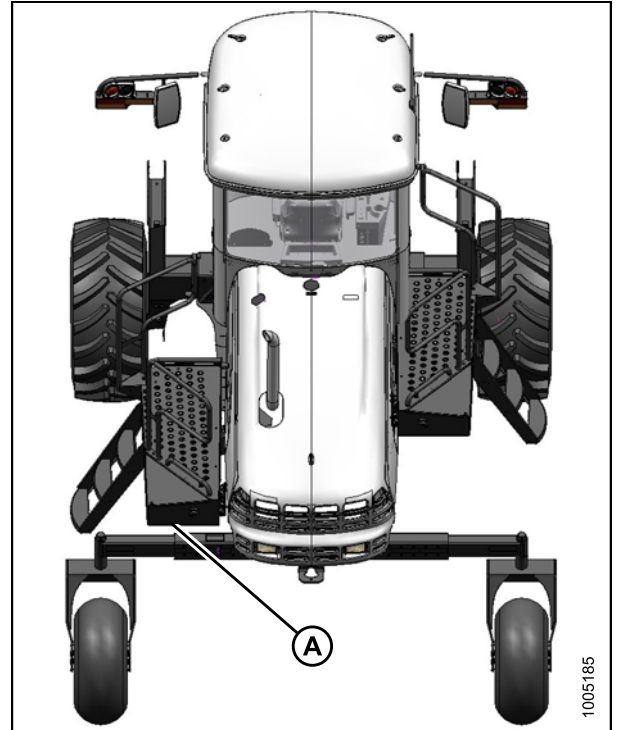


Figure 3.43: Windrower with LH Platform in Open Position

10. Remove caps from pressure (A) and return (B) ports on valve (C) and discard.

**IMPORTANT:**

Keep open lines and ports clean.

11. Remove fitting at pressure port (A) and discard.

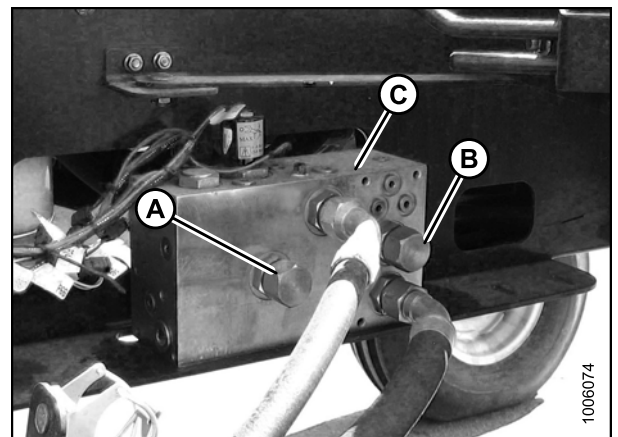


Figure 3.44: Hydraulic Connections

## OPERATION

12. Disconnect fittings at end of hose bundle (A).  
Discard caps.

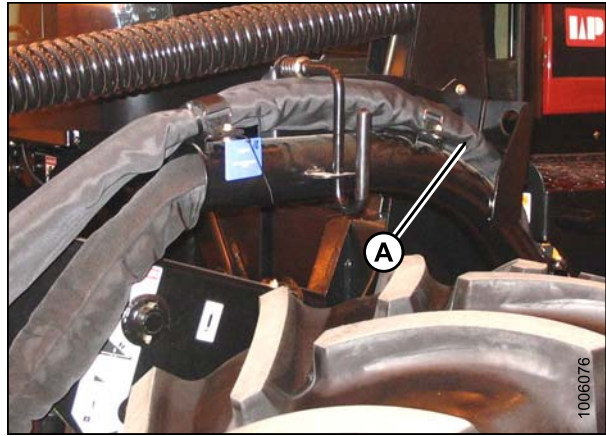


Figure 3.45: Hose Bundle

13. Remove O-ring (A) from cap and install over JIC threads on fitting at return port (B).
14. Install female coupler (C) from hose in return port (B).
15. Install male 45° fitting (D) and male coupler (E) from hose in pressure port (F).

**NOTE:**

Male fitting and coupler may need to be disassembled prior to installing on valve block.

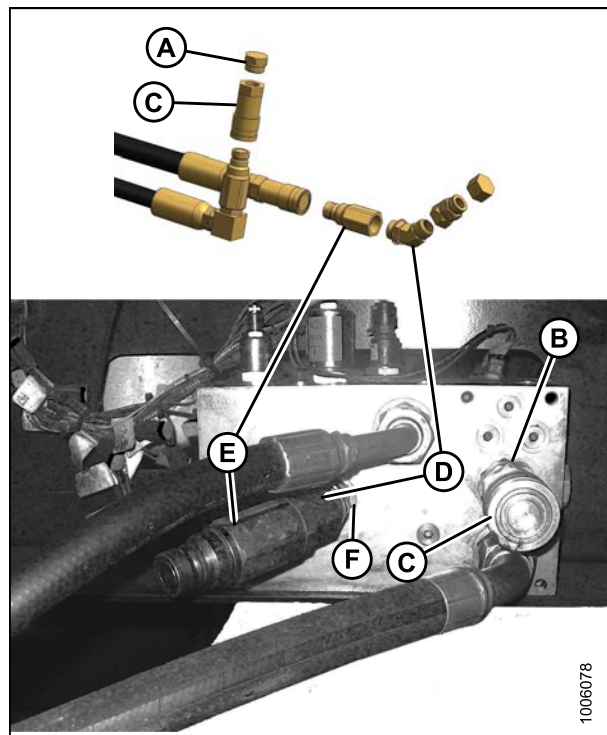


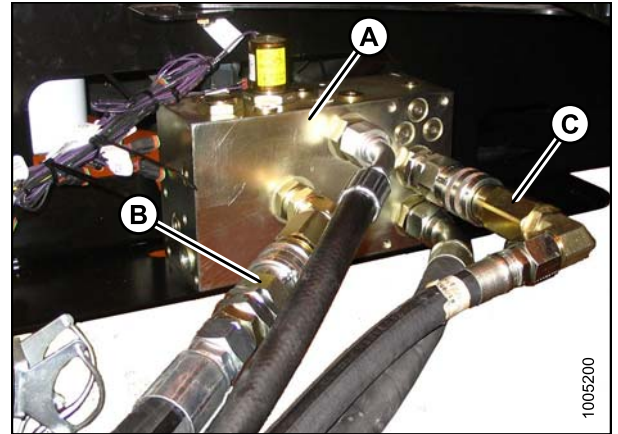
Figure 3.46: Hydraulic Connections

## OPERATION

16. Connect hoses from header to fittings as shown.

**NOTE:**

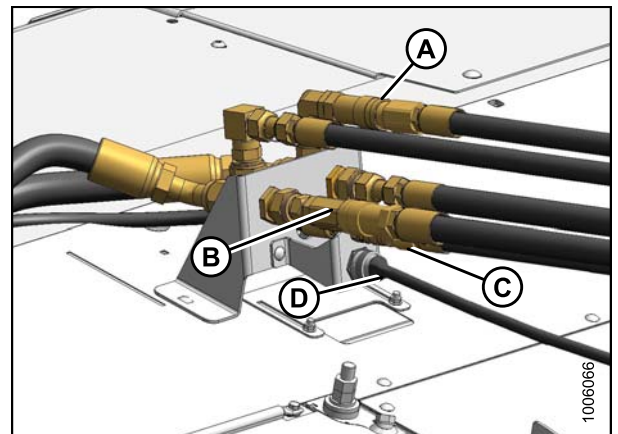
Some windrowers maybe equipped with a reverser. The return line (C) would require a 45° fitting instead of a 90° fitting to avoid contact with the platform.



**Figure 3.47: Hydraulic Connections**

A - Middle Valve Block      B - Pressure  
C - Return

17. Remove caps and plugs from hoses and lines.
18. Connect the pressure (A), return (B), and case drain (C) hoses from windrower to fittings on header as shown.
19. Connect electrical harness (D) from windrower to connector on header.



**Figure 3.48: Header Connections**

## OPERATION

20. Move platform (A) to the CLOSED position.

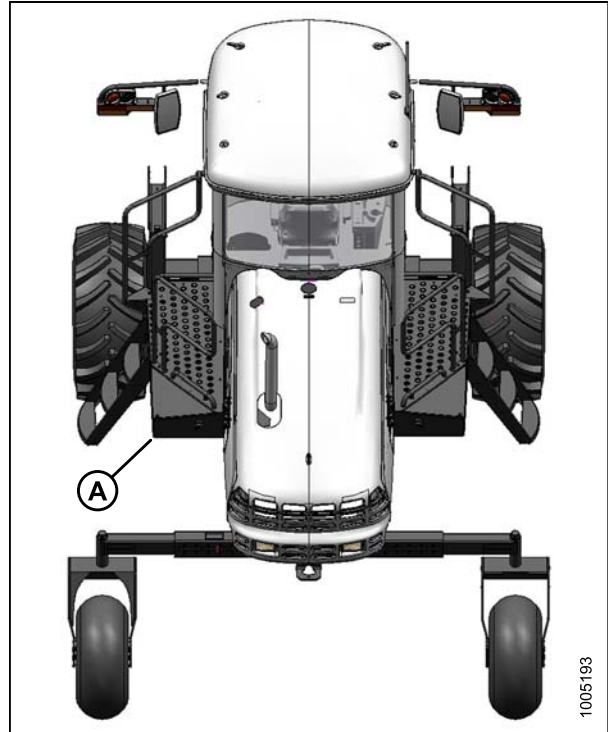


Figure 3.49: Top View of Windrower

## 3.8 Detaching the Header

### 3.8.1 Detaching the Header (M205 Windrowers)

Refer to your windrower operator's manual for procedure to mechanically detach the header from a windrower. Refer to the following procedure to disconnect electrical and hydraulic systems:

#### DANGER

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

1. Lower header to ground. If ground is soft, place blocks under header.
2. Stop the engine and remove the key.
3. Move the left side (cab-forward) platform (A) to the open position.

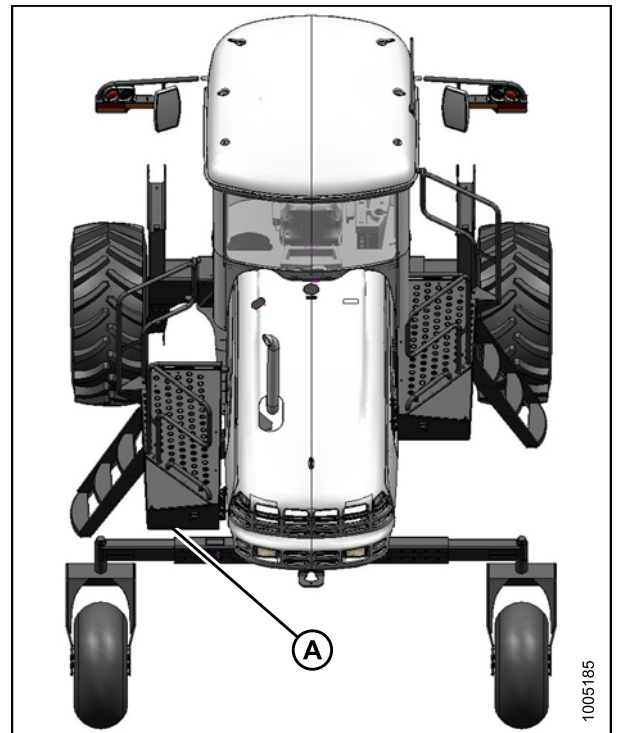


Figure 3.50: Windrower LH Platform

## OPERATION

4. Disconnect the electrical harness at connector (A).

**NOTE:**

Valve block hidden to show the electrical connector.

5. If couplers and coupler lock are installed on lines, proceed as follows. Otherwise, proceed to Step 13., [page 57](#).

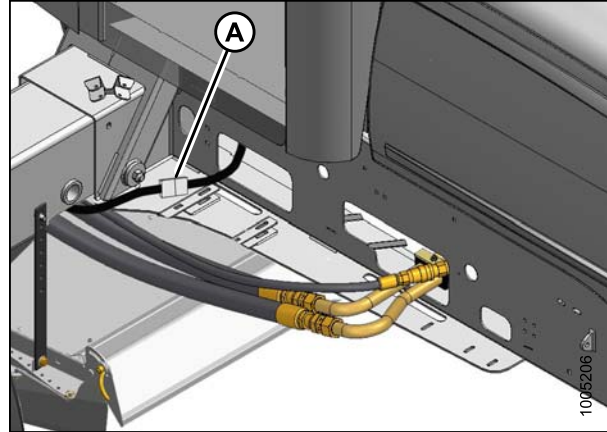


Figure 3.51: Hydraulic Connections

6. Disconnect 1/2 in. (12.7 mm) hose (B) from windrower coupler and remove lynch pin (A).

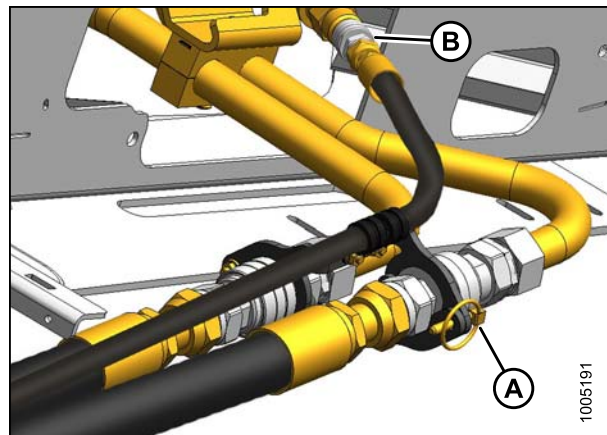


Figure 3.52: Hydraulic Connections

7. Open up coupler lock (A).
8. Remove lock from couplers (B).

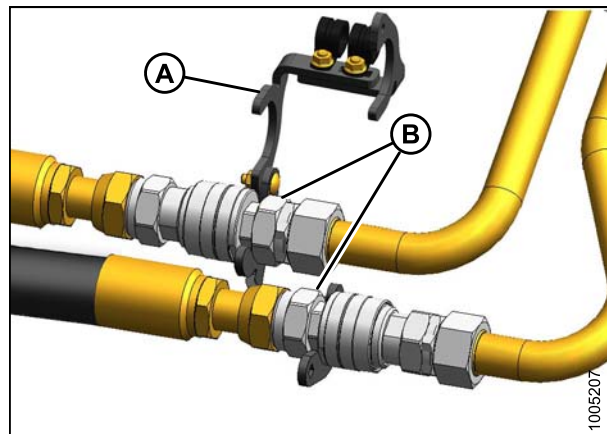
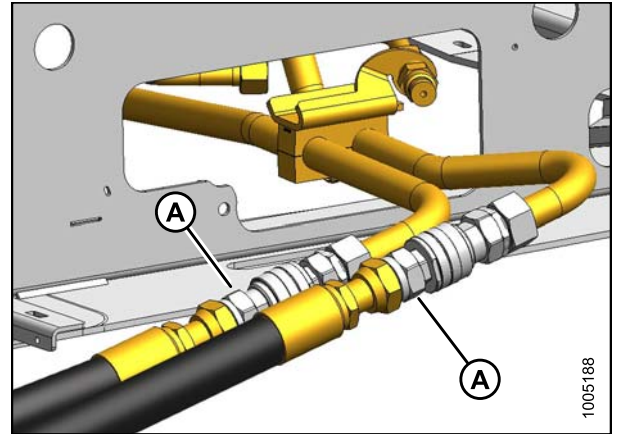


Figure 3.53: Hydraulic Connections



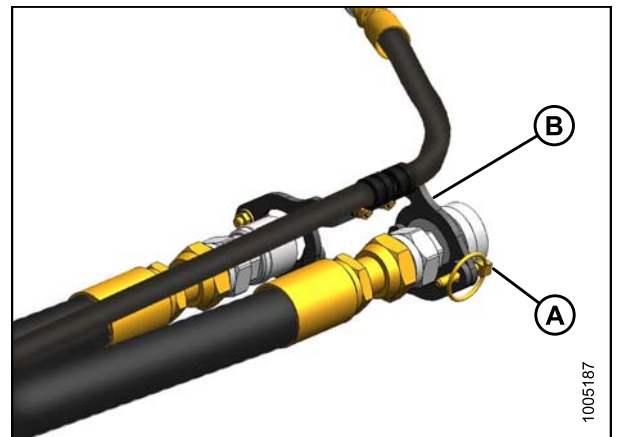
## OPERATION

9. Unscrew sleeves (A) on couplers and separate couplers.
10. Install caps and plugs on open lines.



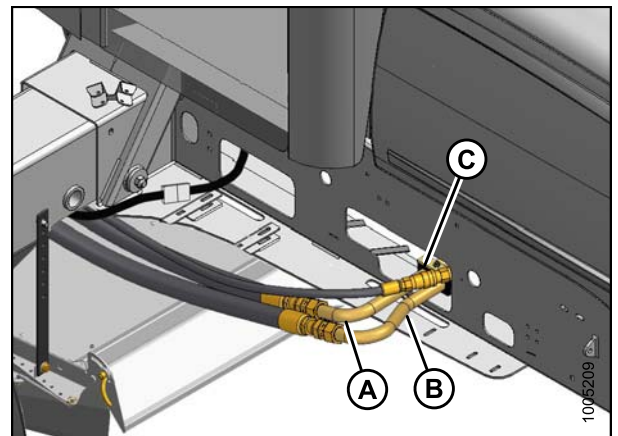
**Figure 3.54: Hydraulic Connections**

11. Attach coupler lock (B) to hoses and secure with lynch pin (A).
12. Proceed to Step [14.](#), [page 58](#).



**Figure 3.55: Hydraulic Connections**

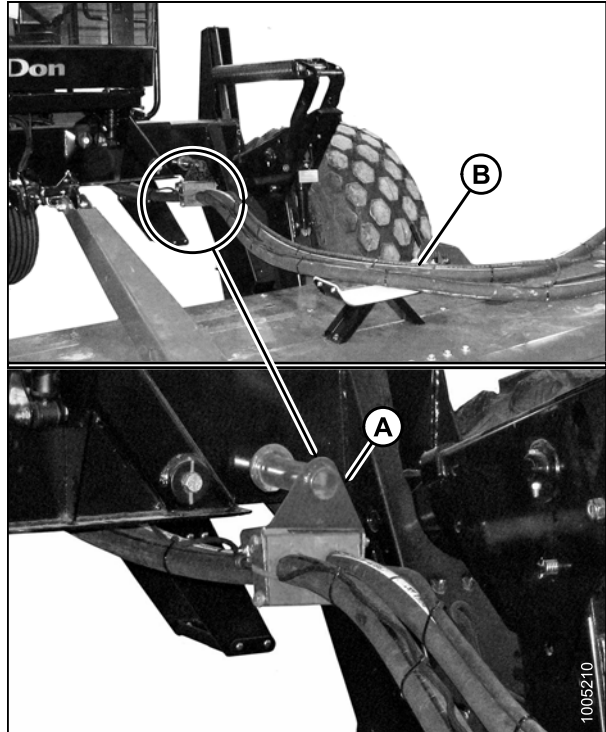
13. Disconnect hoses from lines (A), (B), and (C) on windrower. Install caps and plugs on open lines.



**Figure 3.56: Hydraulic Connections**

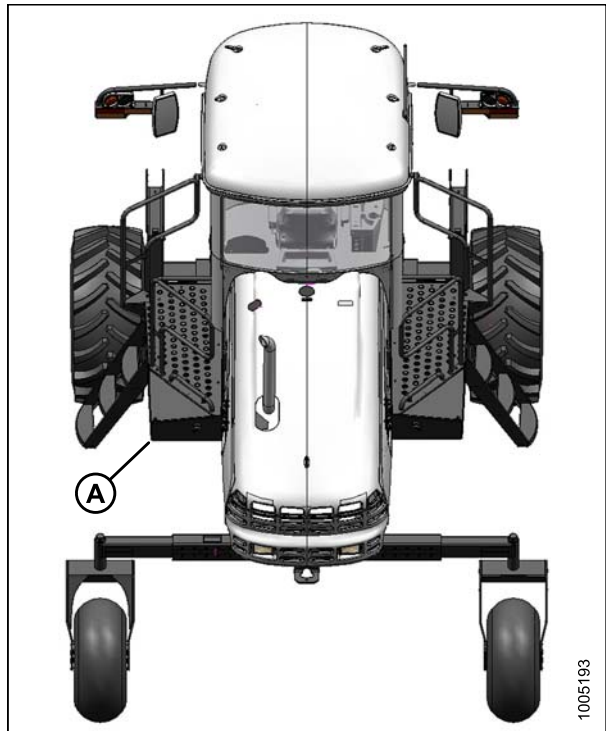
## OPERATION

14. Remove hose support (A) from the windrower frame.
15. Route hoses (B) and electrical harness onto the header.



**Figure 3.57: Hose Bundle**

16. Move maintenance platform (A) to the CLOSED position.
17. Refer to the windrower operator's manual to mechanically detach the header from the windrower.



**Figure 3.58: Windrower LH Platform**



### 3.8.2 Detaching the Header (M200 Windrowers)

Refer to your windrower operator's manual for procedure to mechanically detach the header from a windrower. Refer to the following procedure to disconnect electrical and hydraulic systems:

#### DANGER

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

1. Lower the header to ground. If ground is soft, place blocks under header.
2. Stop the engine and remove the key.
3. Move the left side (cab-forward) platform (A) to the open position.

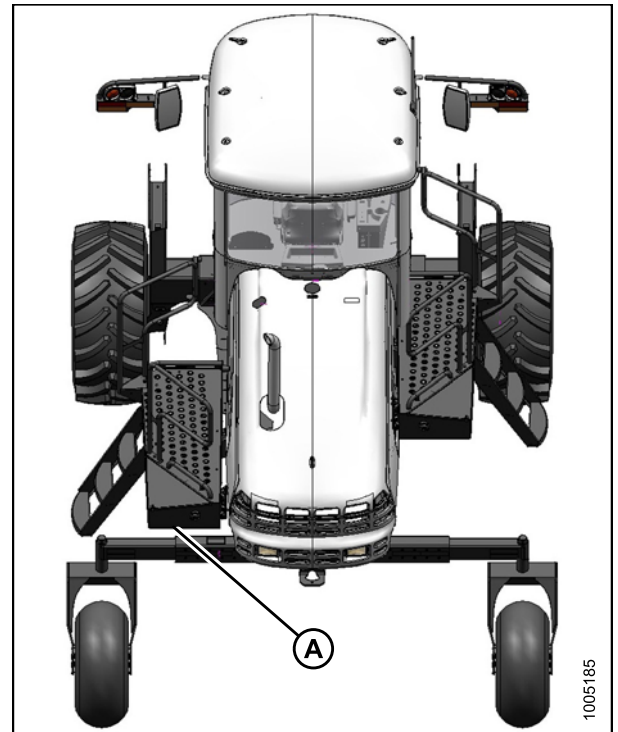


Figure 3.59: Windrower LH Platform

4. Disconnect the pressure hose (A) from port (M2) on the header drive valve block.
5. Disconnect the return hose (B) from port (R2) on the header drive valve block.
6. Install plugs and caps on open windrower lines and header hoses.

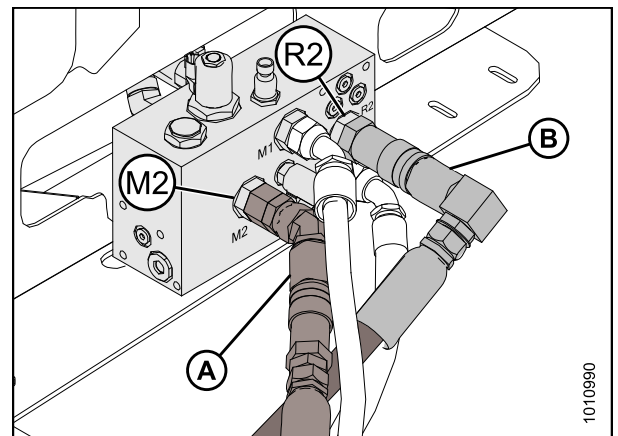


Figure 3.60: Hydraulic Connections

## OPERATION

7. Raise and unlock lever (A) and undo the three cinch straps (B).
8. Move hose bundle to store on header.

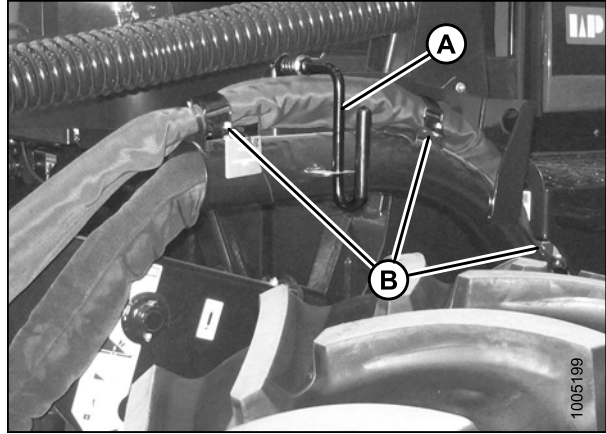


Figure 3.61: Hose Bundle

9. Disconnect the electrical connector (A) at the header by turning the collar counterclockwise and pulling the connector to disengage.

**NOTE:**

Hydraulic lines and hoses hidden on illustration to show the electrical connection.

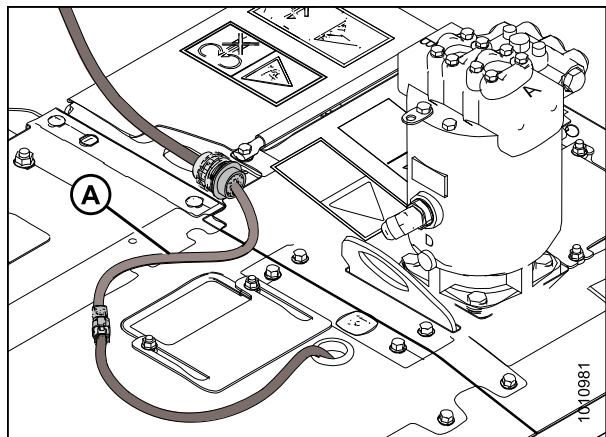


Figure 3.62: Electrical Connection

10. At the header, disconnect electrical connector (D) by turning collar counterclockwise and pull connector to disengage.
11. Disconnect the pressure (A), return (B), and case drain (C) hoses.

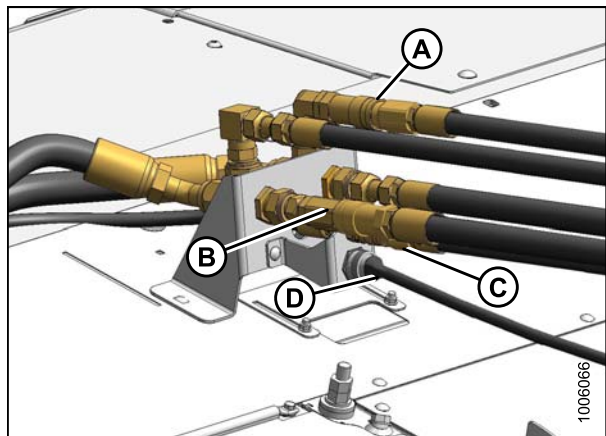
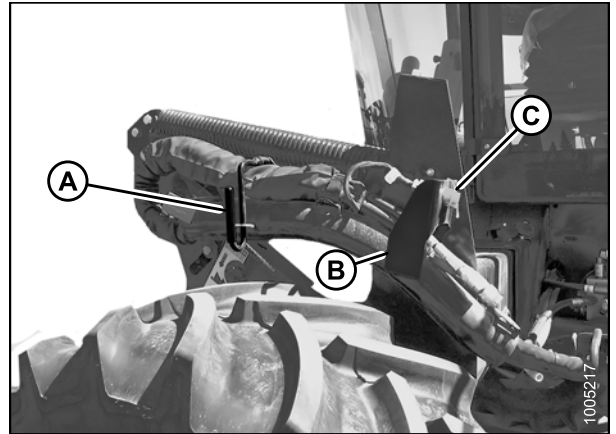


Figure 3.63: Hydraulic Connections

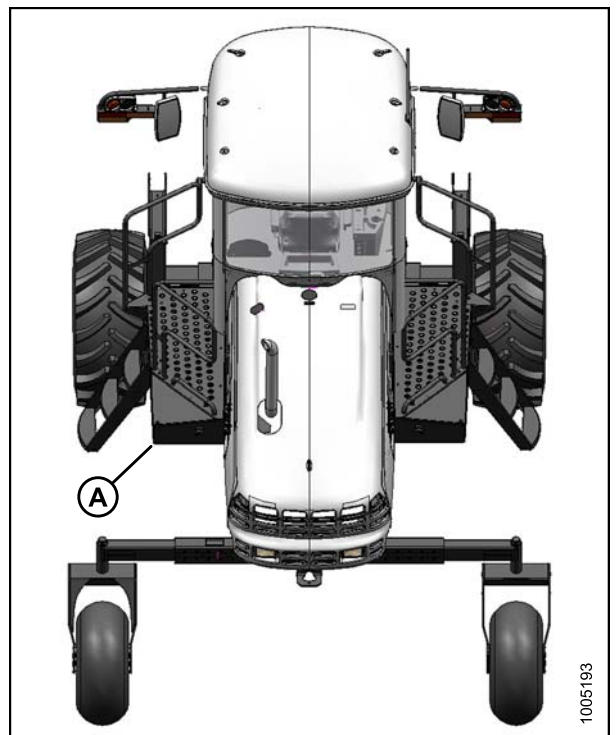
## OPERATION

12. Move the hose bundle from header to the left-side (cab forward) hose support (B).
13. Rotate lever (A) clockwise and push to engage bracket.
14. Route the electrical harness through the hose support (B) and attach cap to electrical connector (C).



**Figure 3.64: Hose Bundle**

15. Move the windrower platform (A) back to the CLOSED position.
16. Refer to the windrower operator's manual to mechanically detach header from the windrower.



**Figure 3.65: Windrower LH Platform**

## 3.9 Break-In Period

After attaching the header to the windrower for the first time, operate the machine slowly for five minutes, watching and listening from the windrower seat for binding or interfering parts.

**NOTE:**

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

 **CAUTION**

**Before investigating an unusual sound or attempting to correct a problem, stop the engine, engage parking brake, and remove the key.**

**NOTE:**

Perform the items specified in [Break-In Inspections](#).

### 3.10 Shutting Down the Windrower

#### CAUTION

**Before leaving the windrower seat for any reason:**

1. Park on level ground (if possible).
2. Lower the header fully.
3. Place ground speed control in N-DETENT.
4. Stop the engine and remove the key.
5. Wait for all movement to stop.

## OPERATION

### 3.11 Transporting the Header

For information on transporting the header when attached to the windrower, refer to your windrower operator's manual.

**IMPORTANT:**

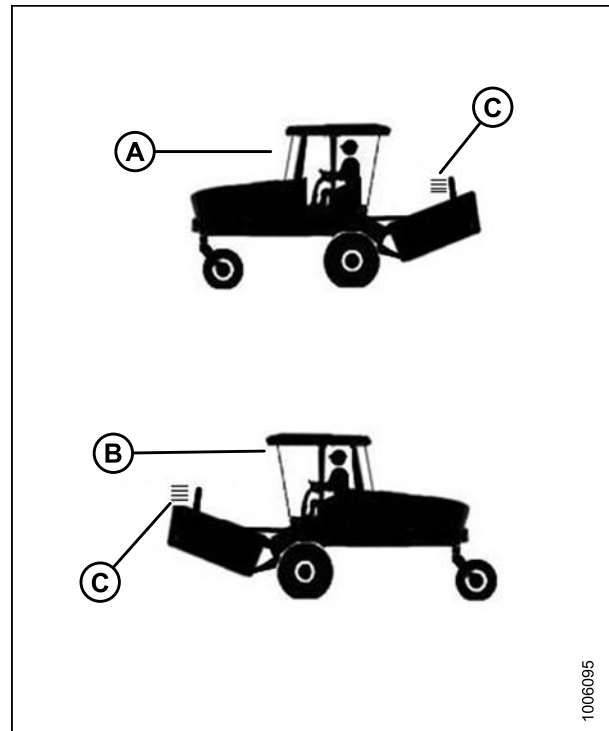
For road travel the windrower must have the lighting and marking bundle installed (B #5412).

**IMPORTANT:**

Lights are factory assembled to meet road travel lighting requirements with windrower in ENGINE-FORWARD transport mode. If transporting header with header forward, light assemblies **MUST** be reversed.

Ensure the reflector assemblies are properly orientated to suit the mode of transporting the header. The amber deflector **MUST** face the direction of travel.

For procedure on changing the reflector orientation, refer to [3.12 Adjusting the Transport Lights, page 65](#).



**Figure 3.66: Windrower Direction**

A - Engine-Forward

B - Cab-Forward

C - Amber Light

### 3.12 Adjusting the Transport Lights

The transport lights, which are mounted on both ends of the header, are activated by switches in the M-Series windrower cab. Refer to your windrower operator's manual on when to use them. The reflectors can be reversed, depending on the direction of travel. The amber deflector must face the direction of travel.

**⚠ DANGER**

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

Change the amber reflector (A) orientation as follows:

**NOTE:**

Arrow indicates direction of travel (B).

1. Disconnect wiring harness (C) at light.
2. Remove four bolts (D) and then remove light assembly (E).

**NOTE:**

Only two bolts shown in illustration.

3. Repeat for opposite light assembly.
4. Swap locations of light assemblies (E).
5. Reinstall light assemblies (E) so that amber reflector faces in opposite direction from original installation.
6. Reinstall bolts (D) and connect light to wiring harness (C).

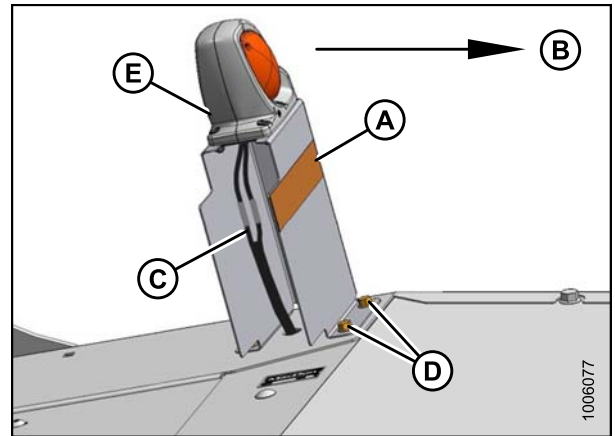


Figure 3.67: Transport Light Assembly

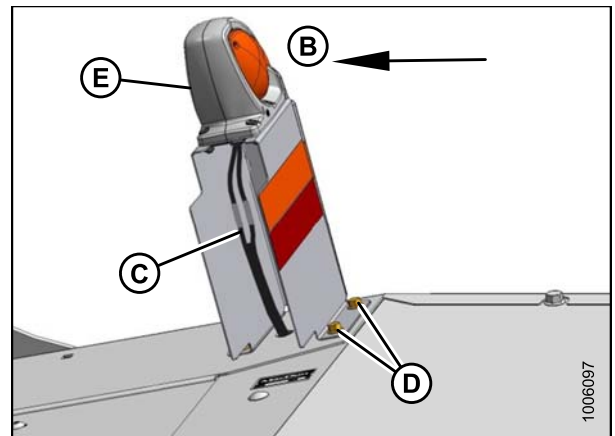


Figure 3.68: Transport Light Assembly





## 4 Operating the Header

Your header will provide the best performance when it is properly adjusted to suit the crop and conditions.

Correct operation reduces crop loss and increases productivity. 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 header. You will quickly become familiar with adjusting the machine to give you the desired results. Most of the adjustments have been set at the factory, but if desired, the settings can be changed to suit crop conditions.

**Table 4.1 Header Adjustment Procedures**

Variable	Refer to
Header float	<a href="#">4.1 Header Float, page 67</a>
Roll gap	<a href="#">4.2 Roll Gap, page 69</a>
Roll tension	<a href="#">4.3 Roll Tension, page 72</a>
Roll timing	<a href="#">4.4 Roll Timing, page 73</a>
Forming shields	<a href="#">4.5 Forming Shields, page 75</a>
Header angle	<a href="#">4.6 Header Angle, page 79</a>
Cutting height	<a href="#">4.7 Cutting Height, page 80</a>
Disc speed	<a href="#">4.8 Disc Speed, page 82</a>
Ground speed	<a href="#">4.9 Ground Speed, page 83</a>

### 4.1 Header Float

Header float springs are normally set so 95–105 lbf (422–467 N) is required to lift either end of the header float off the ground.

In rough or stony conditions, it may be desirable to maintain a lighter setting to protect cutting components.

When float setting is light, it may be necessary to use a slower ground speed to avoid excessive bouncing resulting in a ragged cut. Faster ground speeds may require additional ground pressure.

You can define up to three unique float positions that the system will remember from in the windrower cab. Refer to float options in the windrower operators manual for information on how to set

#### 4.1.1 Checking Float

##### **DANGER**

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

Set the float fine adjustment to **MID-RANGE** with the windrower float adjustment system in the cab (refer to your windrower operator's manual).

1. Lower the header until lift cylinders are fully retracted.
2. Stop the engine and remove the key.
3. Grasp the front corner of the header and lift. The force to lift should be 95–105 lbf (426–471 N) and should be approximately the same at both ends. If adjustment is required, refer to [4.1.2 Adjusting Float, page 68](#)

### 4.1.2 Adjusting Float

#### **DANGER**

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

Set the float fine adjustment to **MID-RANGE** with the windrower float adjustment system in the cab (refer to your windrower operator's manual).

Check the float by grasping the front corner of the header and lifting. The force to lift should be 95–105 lbf (426–471 N) and should be approximately the same at both ends.

If adjustment is required, follow these steps:

1. Raise the header fully, stop the engine, and remove the key.
2. Turn drawbolt (A):
  - a. Clockwise to **INCREASE** float (makes header lighter).
  - b. Counterclockwise to **DECREASE** float (makes header heavier).
3. Recheck the float.



**Figure 4.1: Windrower Lift Linkage**

## 4.2 Roll Gap

Steel rolls condition the crop by crimping and crushing the stem in several places. This allows moisture to release for quicker drying. The degree to which the crop is conditioned as it passes through the rolls is controlled by roll gap that is factory-set at 1.0 in. (25.4 mm).

Correct conditioning of alfalfa, clover, and other legumes is usually indicated when 90% of the stems show cracking, but no more than 5% of the leaves are damaged. Set enough roll gap to achieve this result.

A larger gap may be desirable in thick stemmed cane-type crops. However, too large a gap may cause feeding problems. Grass type crops may require less gap for proper feeding and conditioning.

Grass type crops may require less gap for proper feeding and conditioning.

### IMPORTANT:

If settings below the factory setting are used, it is recommended that the actual gap be visually checked.

### 4.2.1 Checking Roll Gap

#### DANGER

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

1. Lower header fully.
2. Open the driveshield. Refer to [3.4 Driveshields, page 30](#).
3. Remove bolts (A) that secure conditioner shield (B).
4. Remove the shield (B).

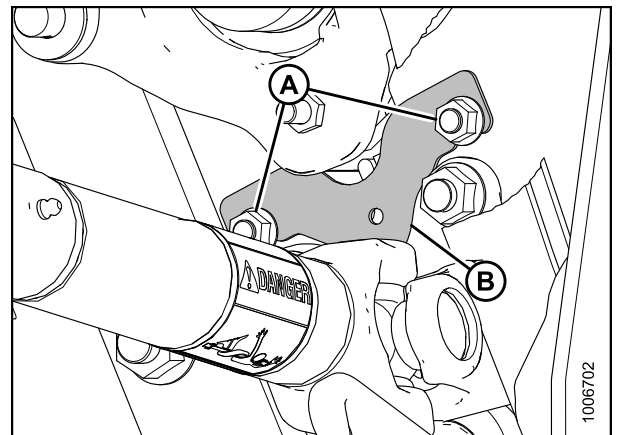


Figure 4.2: Conditioner Shield

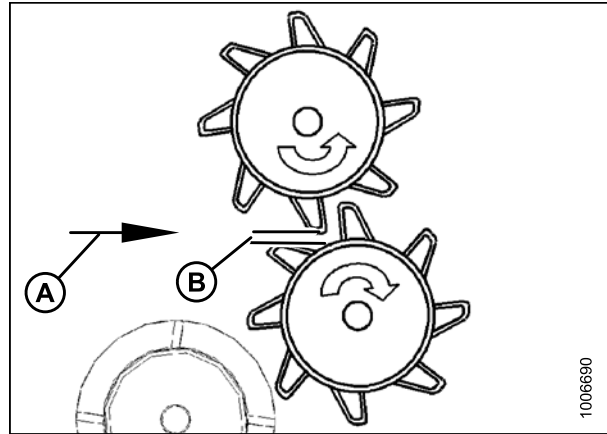
## OPERATING THE HEADER

5. Inspect roll gap at both ends of the rolls. Gap (B) should be 1 in. (25.4 mm). This is the factory setting.

### IMPORTANT:

Roll timing is critical when the roll gap is decreased because the bars may contact each other if the timing is wrong.

6. Check roll timing. Refer to [4.4 Roll Timing, page 73](#).

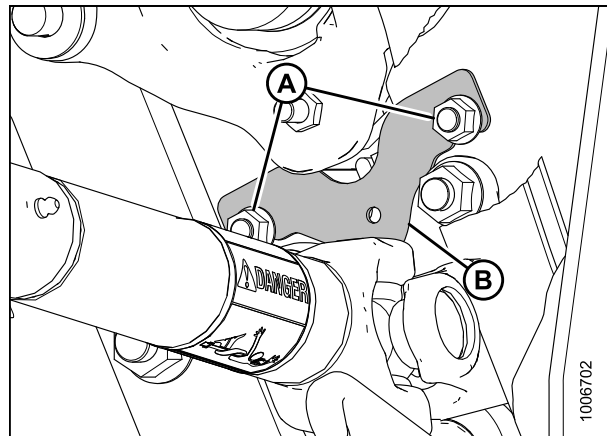


**Figure 4.3: Conditioner Roll Gap**

A - Crop Direction

B - Roll Gap

7. Reinstall the conditioner shield (B) and secure it with nuts (A).
8. Close the driveshield. Refer to [3.4 Driveshields, page 30](#).



**Figure 4.4: Conditioner Shield**

### 4.2.2 Adjusting Roll Gap

#### DANGER

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

1. Lower header fully.
2. Stop the engine and remove the key.
3. Open the left-hand driveshield. Refer to [3.4 Driveshields, page 30](#).

## OPERATING THE HEADER

4. Loosen upper jam nut (B) on both sides of conditioner adjustment bolts.
5. To increase roll gap, turn lower nut (A) clockwise.
6. To decrease roll gap, turn lower nut (A) counterclockwise.
7. Measurement at (C) should be 1.4 in. (35 mm). This equates to 1 in. (25.4 mm) of roll gap.
8. Once adjustment is complete, hold nut (A) and torque jam nut (B) to 75 ft lbf(102 N·m).

**NOTE:**

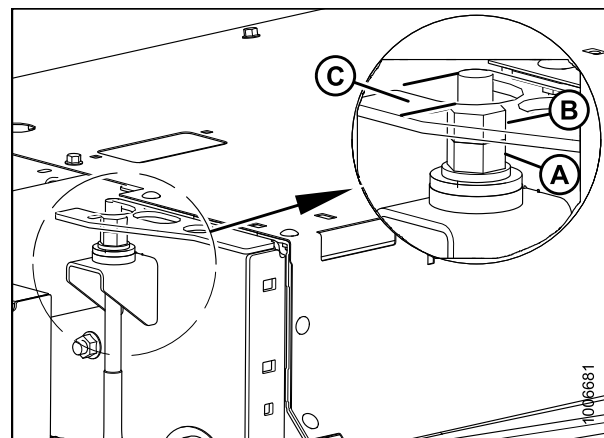
When adjusting roll gap, be sure that the thread protruding at the adjustment is the same on both ends of the conditioner rolls. This will achieve consistent intermesh across the rolls.

9. Check roll gap. Refer to [4.2.1 Checking Roll Gap, page 69](#).

**IMPORTANT:**

Roll timing is critical when the roll gap is decreased because the bars may contact each other if the timing is wrong.

10. Refer to [4.4 Roll Timing, page 73](#) for instructions on checking the timing.
11. Close the driveshield. Refer to [3.4 Driveshields, page 30](#).



**Figure 4.5: Roll Gap Adjustment Bolt**

## 4.3 Roll Tension

Roll tension (the force holding the rolls together) is factory set with a spring type adjustable linkage.

Heavy crops or tough forage tend to separate the rolls and require more tension to ensure material is sufficiently crimped. Light alfalfa and short grasses require less tension to minimize over-conditioning.

### 4.3.1 Adjusting Roll Tension

#### DANGER

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

Before changing the factory adjusted roll tension, refer to [4.2.2 Adjusting Roll Gap, page 70](#) to ensure the roll gap setting is ideal for your crop type.

1. Lower header fully.
2. Stop the engine and the remove the key.
3. Open the driveshield. Refer to [3.4 Driveshields, page 30](#).
4. To decrease the roll tension, turn the spring drawbolts counterclockwise to loosen the springs. Set dimension (C) within 1.77–2.16 in. (45–55 mm).
5. To increase the roll tension, loosen jam nut (A) and turn the spring drawbolt (B) clockwise to tighten the spring at each end of the roll. Set dimension (C) within 1.77–2.16 in. (45–55 mm).

#### IMPORTANT:

Turn each bolt equal amounts. Each turn of the bolt changes the roll tension by approximately 10 lbf (44.5 N).

6. Tighten jam nut (A) against casting after adjusting tension.
7. Close driveshields. Refer to [3.4 Driveshields, page 30](#).

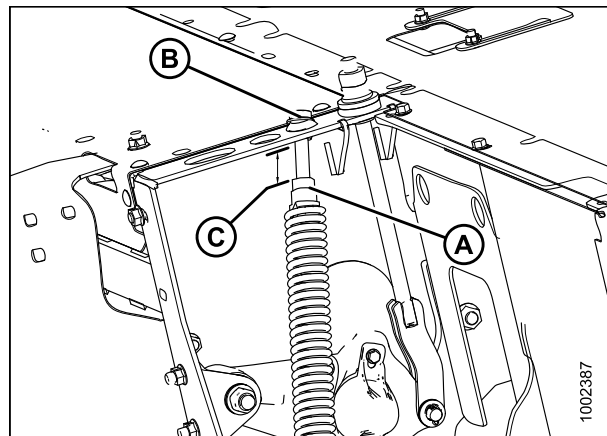


Figure 4.6: Roll Tension Spring (RH Side)

## 4.4 Roll Timing

For proper conditioning the rolls must be properly timed. Each steel bar on one of the rolls should be centered between two bars of the other roll. The factory setting should be suitable for most crop conditions.

### IMPORTANT:

Roll timing is especially critical when roll gap is decreased because the bars can contact each other if the timing is wrong.

### 4.4.1 Checking Roll Timing

#### DANGER

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

To adjust the conditioner roll timing, follow these steps:

1. Lower header fully.
2. Open the driveshield. Refer to [3.4 Driveshields, page 30](#).
3. Loosen nuts (A) and slide conditioner shield (B) up to remove it.

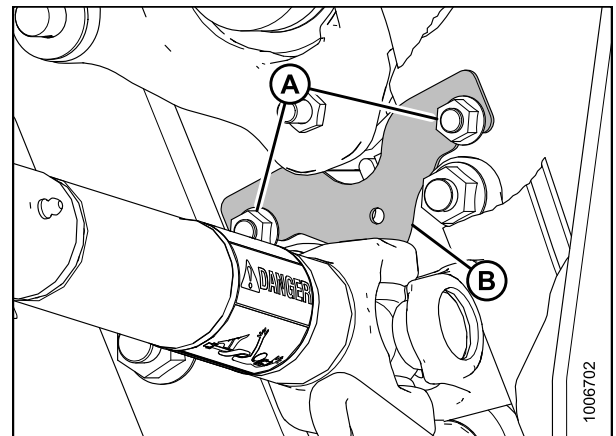


Figure 4.7: Conditioner Shield (LH Side)

4. Measure the clearance (B) between the flats of the conditioner roll bars at both end of the conditioner rolls. Dimension (B) should be set to 0.35–0.51 in. (9–13 mm). If adjustment is required, refer to [4.4.2 Adjusting Roll Timing, page 74](#).

#### NOTE:

There should be less than 0.08 in. (2 mm) difference between the two ends of the conditioner roll.

#### NOTE:

Roll spacing not to scale in illustration.

5. Close the driveshield. Refer to [3.4 Driveshields, page 30](#).

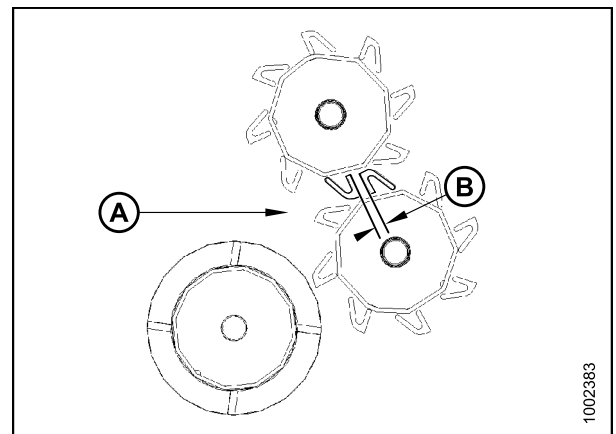


Figure 4.8: Roll Timing

A - Crop Flow

B - Roll Timing Distance 0.35–0.51 in. (9–13 mm)

### 4.4.2 Adjusting Roll Timing

Follow these steps to adjust the roll timing (if necessary):

1. Loosen four bolts (A) in slots of yoke plate (B) on upper roll universal shaft.

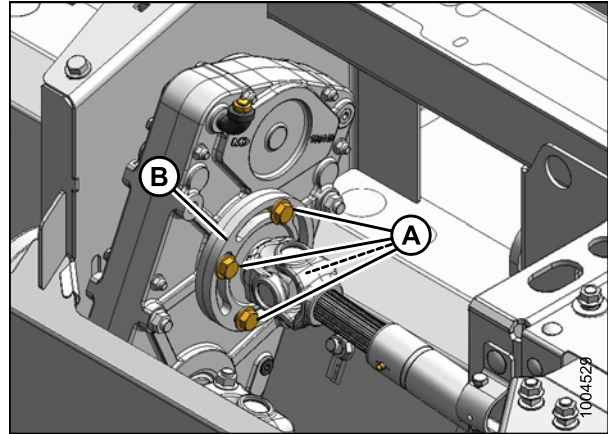


Figure 4.9: Conditioner Gearbox

2. Locate roll timing gauge (MD #150572) (B) on frame member under the flange. Remove nut (A) to remove gauge.

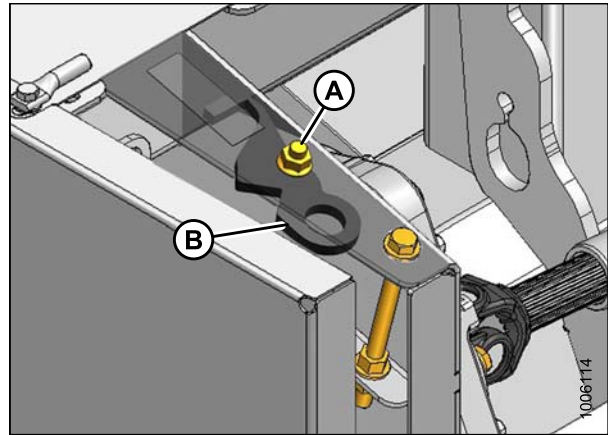


Figure 4.10: Roll Timing Gauge

3. Position gauge (MD #150572) (A) at left end of rolls and manually turn the rolls to engage the gauge. The rolls will automatically adjust to the correct timing. This will provide for a roll gap of 0.43 in. (11 mm) and a roll timing setting of 0.16 in. (4 mm).
4. Using the roll gap adjustment bolt, reduce the roll gap until the roll sits lightly on the gauge.
5. Repeat procedure for right end of the conditioner.
6. Tighten bolts in slots of yoke plate to secure the upper conditioner roll position.
7. Turn the rolls manually to release gauge.

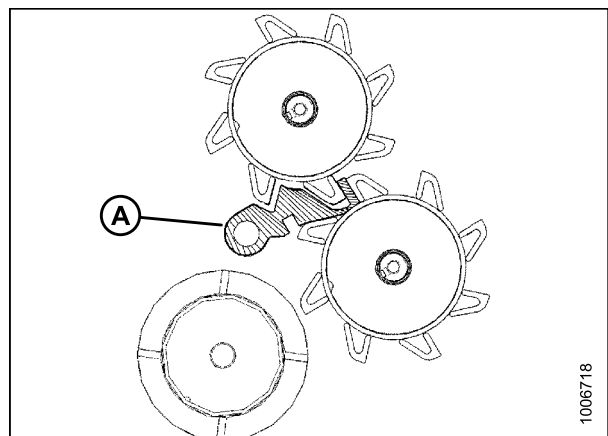


Figure 4.11: Roll Timing Gauge

**⚠ CAUTION**

To ensure gauge is not forcibly ejected from rolls when machine is started, ensure gauge is securely reattached to frame.



## 4.5 Forming Shields

### WARNING

Keep hands and feet away from discharge opening. Keep everyone several hundred feet away from your operation. Never direct the discharge toward anyone. Stones or other foreign objects can be ejected with force.

The position of the forming shields controls the width and placement of the windrow. The decision on forming shield position should be based on the following factors:

- Weather conditions (rain, sun, humidity, wind)
- Type and yield of crop
- Drying time available
- Method of processing (green-feed, bales, silage)

A wider windrow will generally dry faster and more evenly resulting in less protein loss. Fast drying is especially important in areas where the weather allows only a few days to cut and bale. For more information, refer to [4.15 Haying, page 98](#).

A narrower windrow may be preferred for ease of pickup and when drying is not critical (for example, when cutting for silage or green-feed).

### 4.5.1 Adjusting the Side Deflectors

The position of the side deflectors controls the width and placement of the windrow.

### DANGER

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

1. Set forming shield side deflectors (A) to desired width by repositioning adjuster bars (B) in holes in forming shield cover. To ensure windrow placement is centered, adjust both side deflectors to the same position.

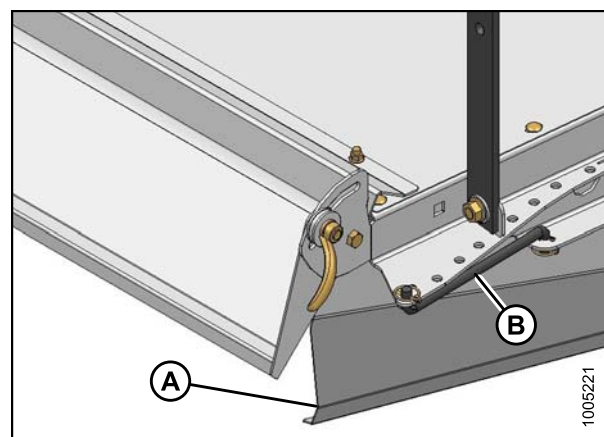


Figure 4.12: Forming Shield

## OPERATING THE HEADER

2. If side deflector attachment is too tight or too loose, tighten or loosen nut (A) as required.

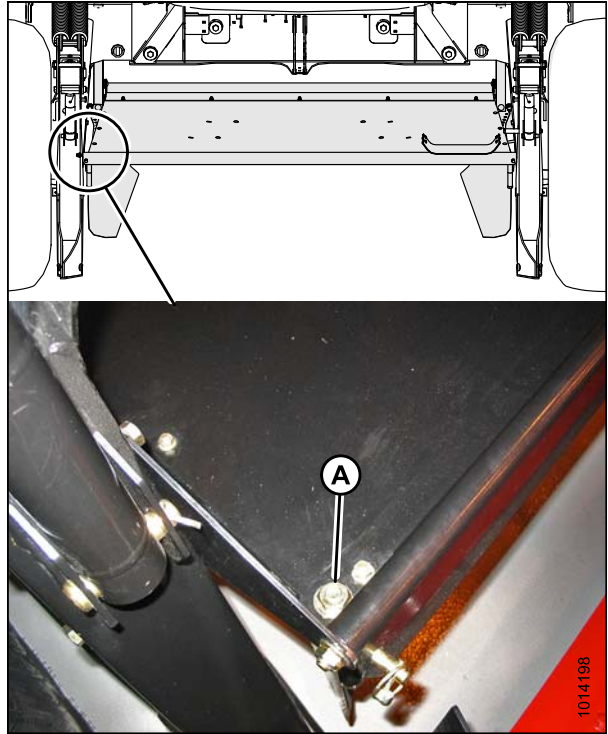


Figure 4.13: Forming Shield

## 4.5.2 Adjusting the Rear Deflector (Fluffer Shield)

### DANGER

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

The rear deflector (fluffer shield) slows the crop exiting the conditioner rolls, directs the flow downward, and fluffs the material.

1. For more crop control in light material, lower the deflector (A) by pushing down on one side of the deflector and then on the other side.

**NOTE:**

Locking handles (B) are located at both ends of the deflector and may be loosened slightly.

2. For heavier crops, raise the deflector by pulling up on one side and then on the other side.

**NOTE:**

For even windrow formation, be sure the deflector (A) is not twisted.

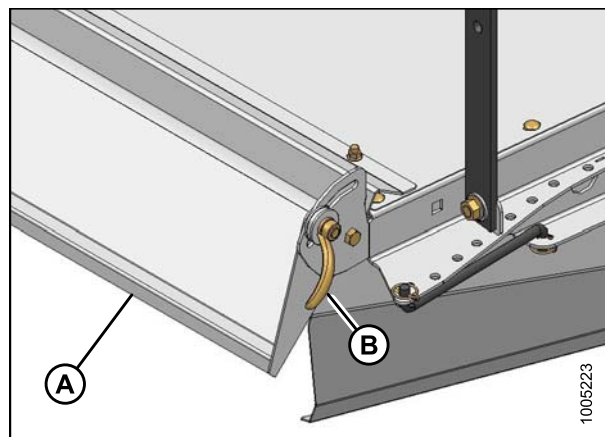


Figure 4.14: Forming Shield

3. Tighten handles (B) to secure deflector position.

## 4.5.3 Adjusting the Swath Baffle

The swath baffle determines the width and height of the windrow.

### DANGER

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

## OPERATING THE HEADER

The swath baffle (A) is located immediately behind and above the conditioning rolls and can be positioned to;

- direct the crop flow into the forming shield for narrow and moderate width windrows
  - direct crop downward to form a wide swath
1. Remove lynch pin from pin (B) and remove pin from lever (C).
  2. Move lever to middle hole in bracket and reinstall pin (B) through lever and bracket.
  3. Secure with lynch pin.

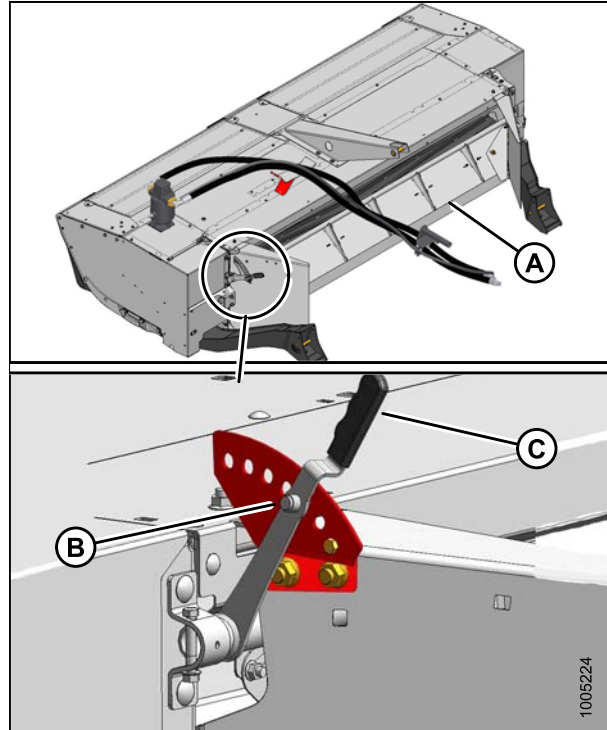


Figure 4.15: Swath Baffle Lever

### NOTE:

Swath baffle position may need to be adjusted for proper pin engagement. Loosen bolts (A) and adjust bracket (B) and baffle as required. Tighten bolts (A).

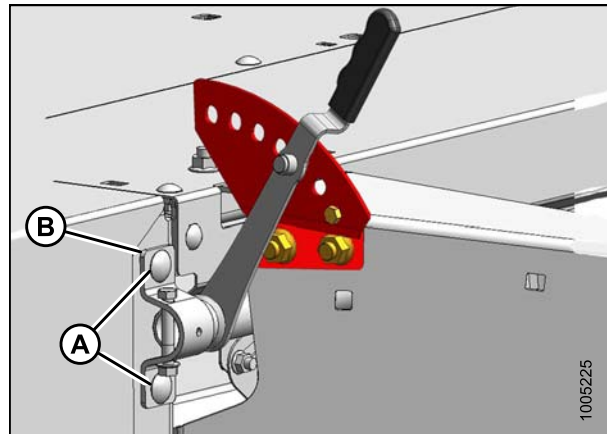


Figure 4.16: Swath Baffle Lever

## 4.6 Header Angle

Header (or cutterbar) angle can be varied from 0–8° below horizontal. Choose an angle that maximizes performance for your crop and field conditions. A flatter angle provides better clearance in stony conditions while a steeper angle provides better lifting action in down crops.

The header angle may be hydraulically adjusted from the windrower cab using the hydraulic cylinder (A) without shutting down the windrower.

Refer to your windrower operator's manual.

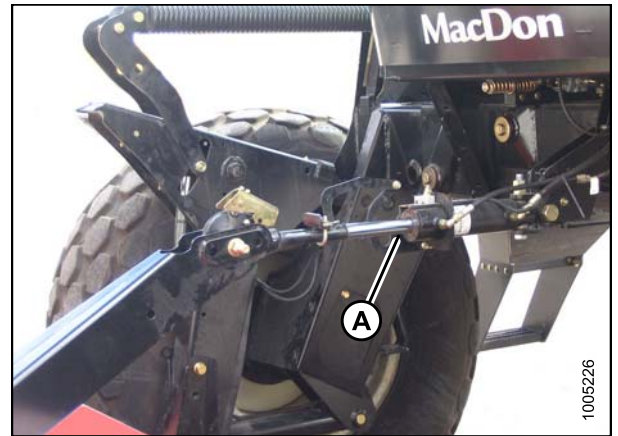


Figure 4.17: Hydraulic Center-Link

## 4.7 Cutting Height

Cutting height is determined by a combination of the angle of the cutterbar/header and the gauge roller or skid shoe settings. Cutting height should be adjusted for optimum cutting performance without excessive mud build-up inside the header that can lead to poor crop flow and increased wear on cutting components. Choose an angle that maximizes performance for your crop and field conditions. Refer to [4.6 Header Angle, page 79](#).

Optional adjustable gauge rollers or skid shoes are also available to provide different cutting heights. Refer to:

- [7.1 Options and Attachments: Kits, page 159](#)
- [4.7.1 Adjusting Gauge Roller Height, page 80](#)
- [4.7.2 Adjusting the Skid Shoe Height, page 80](#)

Lowering the skid shoes/gauge rollers or decreasing header angle increases the cutting height. This may reduce damage to cutting components in stony conditions. Also, a longer stubble length helps material dry faster.

Raising the skid shoes/gauge rollers and increasing header angle allows the crop to be cut lower.

To minimize damage to cutterbar components, scooping soil, or soil build-up at the cutterbar in damp conditions, set header float as light as possible without excessive bouncing.

A light float setting may require reduced ground speeds to avoid excess bouncing and a ragged cut.

### 4.7.1 Adjusting Gauge Roller Height

#### DANGER

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

1. Raise header fully, stop the engine, and remove the key.
2. Engage header safety props.
3. Remove lynch pin and remove adjuster pin (A) from one side of the roller.
4. Hold roller and remove lynch pin and adjuster pin (A) from other side. Position roller at desired position and reinstall adjuster pins (A). Secure with lynch pins.
5. Repeat for roller at opposite end of header.
6. Adjust mud bar (B) by loosening nuts (C).
7. Retighten nuts (C) while maintaining a minimum clearance between mud bar and roller.

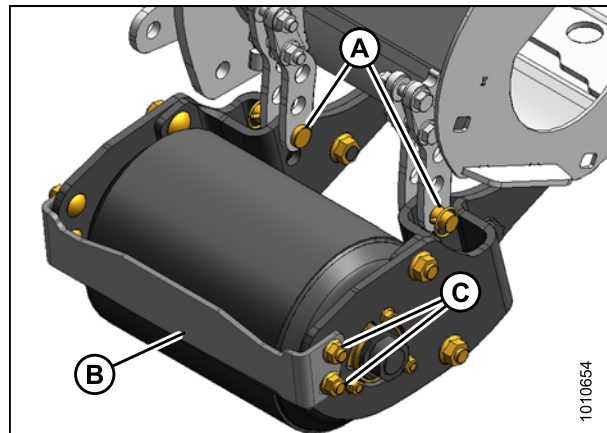


Figure 4.18: Gauge Roller

### 4.7.2 Adjusting the Skid Shoe Height

#### DANGER

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

1. Raise header fully, stop the engine, and remove the key.
2. Engage header safety props.

## OPERATING THE HEADER

3. Remove lynch pin and remove adjuster pin (A) from one side of skid shoe (B).
4. Hold skid shoe and remove lynch pin and adjuster pin (A) from other side. Position shoe at desired position, and reinstall adjuster pins (A). Secure with lynch pins.
5. Repeat for skid shoe at opposite end of header.
6. Check header float as described in [4.1 Header Float, page 67](#).
7. Adjust header angle to desired working position using the machine's header angle controls. If angle is not critical, set it to mid-position. Refer to [4.6 Header Angle, page 79](#).

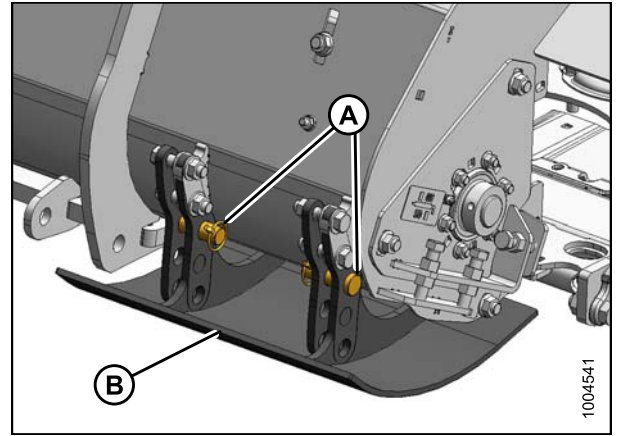


Figure 4.19: Skid Shoe

## 4.8 Disc Speed

The disc header can be used to cut a variety of crops.

For the best cutting results, a range of disc speeds is recommended for each type of crop and condition. Refer to table below.

**Table 4.2 Disc Speed Recommendations**

<b>Crop</b>	<b>Condition</b>	<b>Disc rpm</b>
Alfalfa	Heavy	2300–2500
	Light	1600–2000
Sudan, Sorghum, Haygrazer, Timothy	Tall and stemmy	2300–2500
Short grass	Dense	2500
	Thin	1800–2000

Disc speeds are set and adjusted from the cab using system controls, without shutting down the windrower.

Refer to your windrower operator's manual.



## 4.9 Ground Speed

### CAUTION

Reduce speed when turning, crossing slopes, or when travelling over rough ground.

Choose a ground speed that allows the cutterbar and conditioner to cut the crop smoothly and evenly. Try different combinations of header speed and ground speed to suit your specific crop.

Refer to your windrower operator's manual for changing ground speed.

In tough cutting conditions, such as native grasses, the disc speed will need to be increased.

In light crops, the header speed can be reduced while maintaining ground speed.

### NOTE:

Operating the header at the minimum disc speed will extend the wear life of cutting components.

The chart below indicates the relationship between ground speed and area cut.

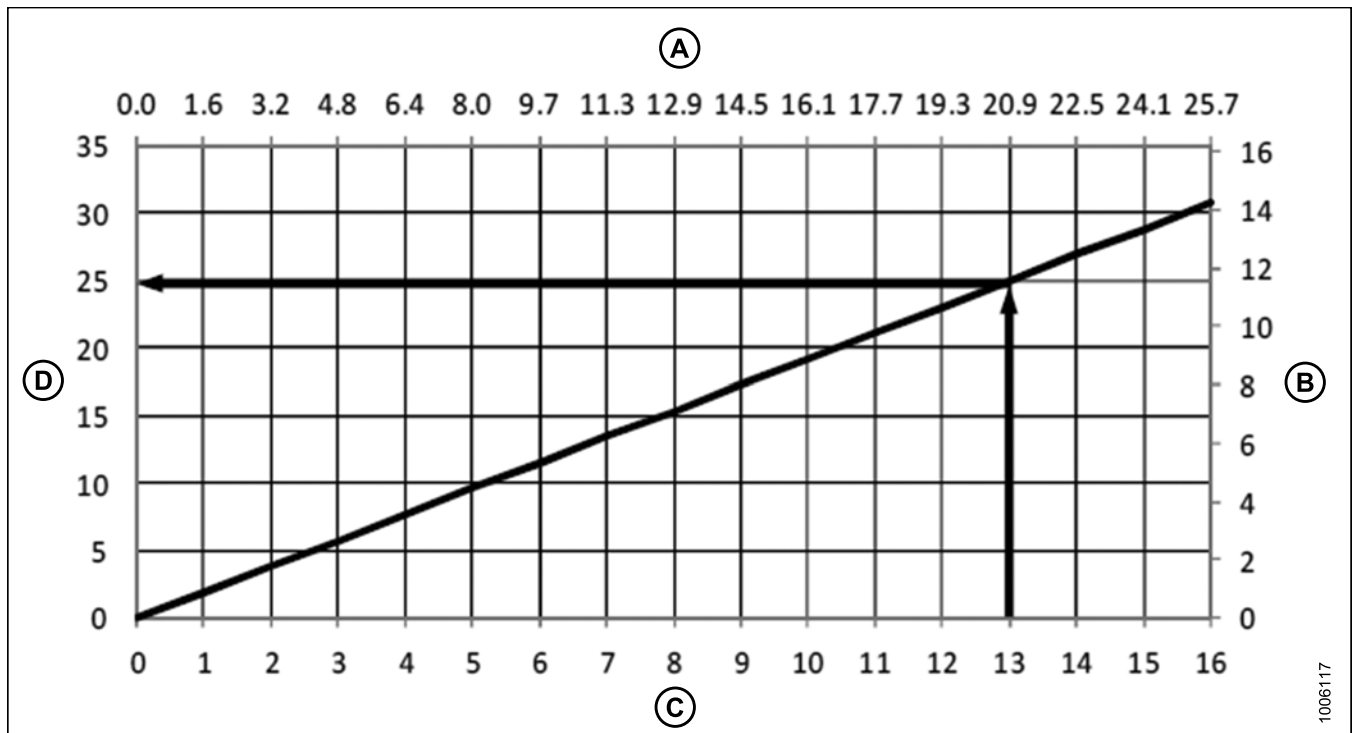


Figure 4.20: Ground Speed Chart

A - Kilometers/Hour

B - Hectares/Hour

C - Miles/Hour

D - Acres/Hour

**Example:** At ground speed of 13 mph (21 km/h) the area cut would be approximately 25 acres (12 hectares) per hour.

## 4.10 Double Windrowing

If your windrower is equipped with the Double Windrow Attachment (DWA [A]), refer to the MacDon DWA Manual for operating and maintenance instructions.

The manual is shipped with the DWA Kit.

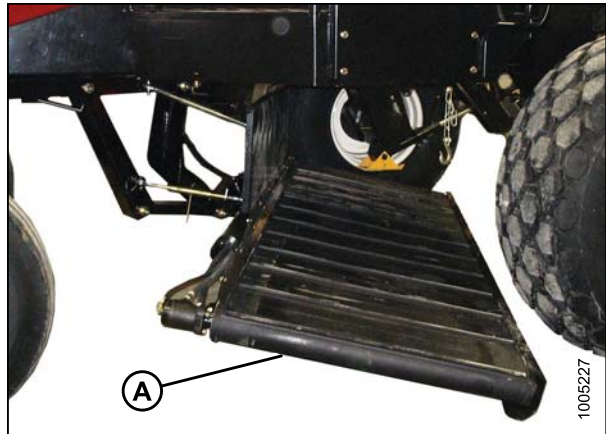


Figure 4.21: DWA

## 4.11 Tall Crop Feed Plates

The tall crop feed plates (A) assist in feeding tall crops into the conditioner by encouraging material flow from behind the cage deflectors (B).

The feed plates are designed for installation under the two cage deflectors. They are stored inside the compartment at the right end of the header.

Tall crop feed plates should only be installed when cutting tall, heavier crops; they can degrade cutterbar performance if used in medium to light alfalfa.

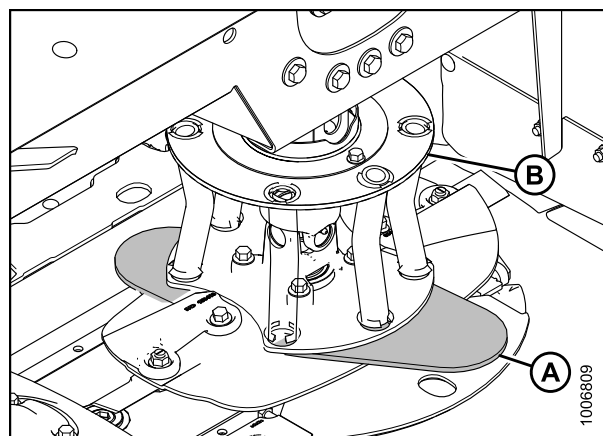


Figure 4.22: Cage Deflector

### 4.11.1 Removing the Tall Crop Feed Plates from Storage

#### DANGER

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

1. Lower the header fully.
2. Stop the engine and remove the key.
3. Open the right-hand end drive cover. Refer to [3.4.5 Removing Right Endshield, page 32](#).
4. Remove the four nuts (A), securing nut shields (B) and feed plates (C) to side of compartment, and remove deflectors and plates. Reinstall nuts (A).
5. Install right-hand endshield. Refer to [3.4.6 Installing Right Endshield, page 32](#).

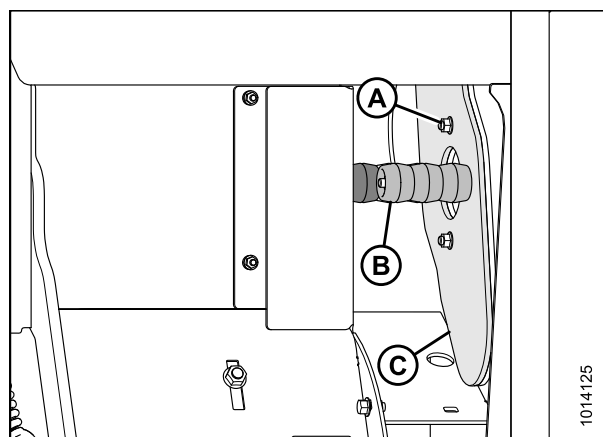
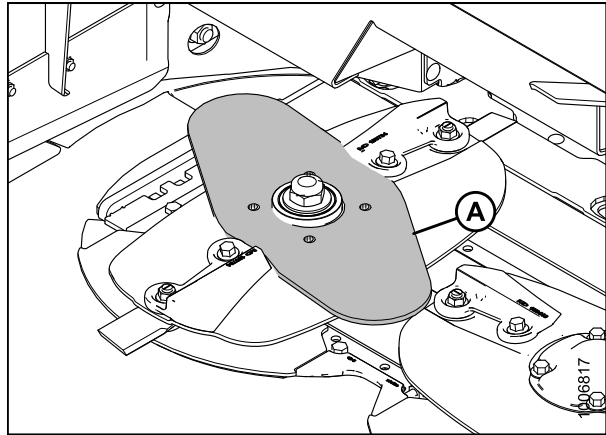


Figure 4.23: Nut Shield and Feed Plate Storage

## OPERATING THE HEADER

### *Installing Tall Crop Feed Plates under Driven Deflector*

1. Remove driven deflector. Refer to [Removing the Driven Deflector, page 130](#).
2. Remove the tall crop feed plates from storage. Refer to [4.11.1 Removing the Tall Crop Feed Plates from Storage, page 85](#).
3. Position feed plate (A) on the disc, ensuring that hole in feed plate registers on disc. Position plate approximately as shown and align holes.

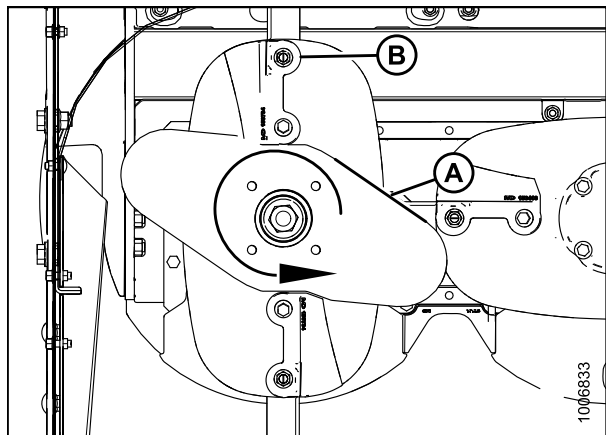


**Figure 4.24: Right End Shown**

#### **IMPORTANT:**

Depending on disc (B) rotation, the feed plate (A) should be positioned so that when holes are aligned, the leading edge of the feed plate is further from the accelerator (B) than the trailing edge.

4. Install the deflector. Refer to [Installing the Driven Deflector, page 131](#).



**Figure 4.25: Right End Top View**

### *Installing Tall Crop Feed Plates under Driveline Deflector*

#### **⚠ DANGER**

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

## OPERATING THE HEADER

1. Locate the feed plates. Refer to [4.11.1 Removing the Tall Crop Feed Plates from Storage, page 85](#).
2. Lower the header fully.
3. Stop the engine and remove the key.
4. Open cutterbar door(s). Refer to [3.5 Cutterbar Doors, page 33](#).
5. Install feed plate (A) on the disc.

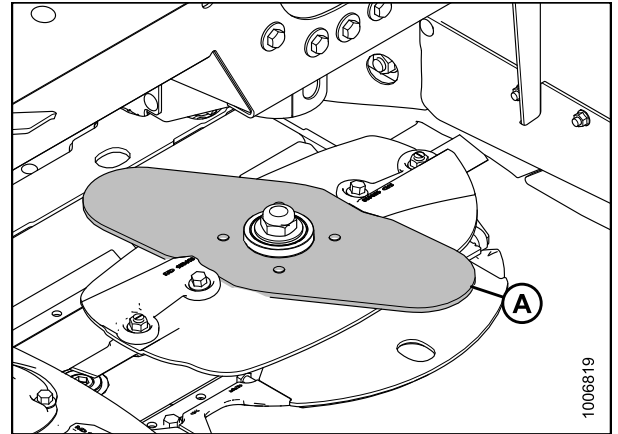


Figure 4.26: Left End Shown

### IMPORTANT:

Depending on disc (B) rotation, the feed plate (A) should be located so that when holes are aligned, the leading edge of the feed plate is further from the accelerator (B) than the trailing edge.

6. Install the deflector. Refer to [Installing the Driveline Deflector, page 132](#).

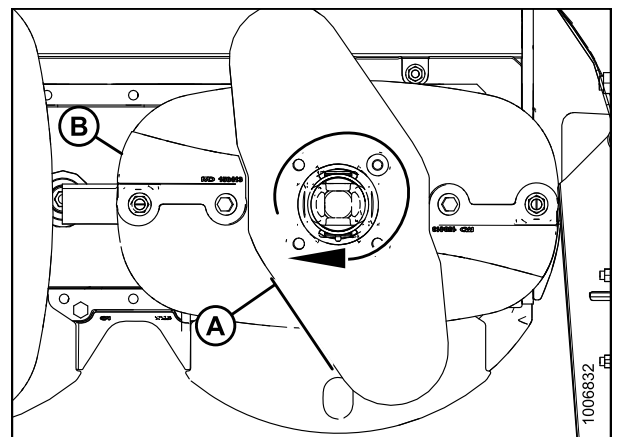


Figure 4.27: Left End Top View Shown

### 4.11.2 Removing Tall Crop Feed Plates

Follow these steps to remove the tall crop feed plates:

#### DANGER

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

## OPERATING THE HEADER

1. Lower header to the ground, stop the engine, and remove the key.
2. Open cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).

### CAUTION

Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

3. Place a block of wood between discs to prevent deflector from turning.

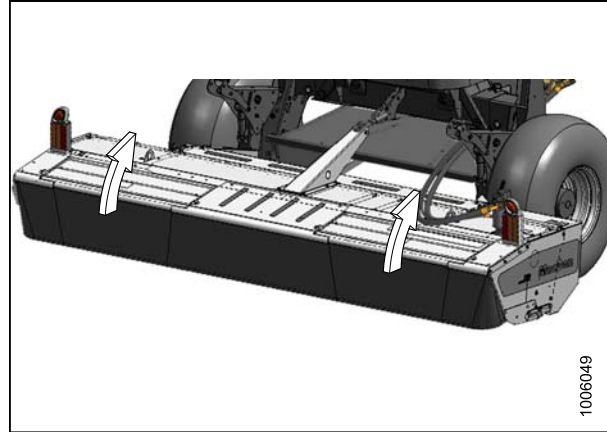


Figure 4.28: Cutterbar Doors

### *Removing Tall Crop Feed Plates from under Driven Deflector*

1. Remove the deflector. Refer to [Removing the Driven Deflector, page 130](#).
2. Remove feed plate (A).
3. Return the tall crop feed plates to the storage location. Refer to [4.11.3 Returning Tall Crop Feed Plates to Storage, page 89](#).
4. Install the deflector. Refer to [Installing the Driven Deflector, page 131](#).
5. Close cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).

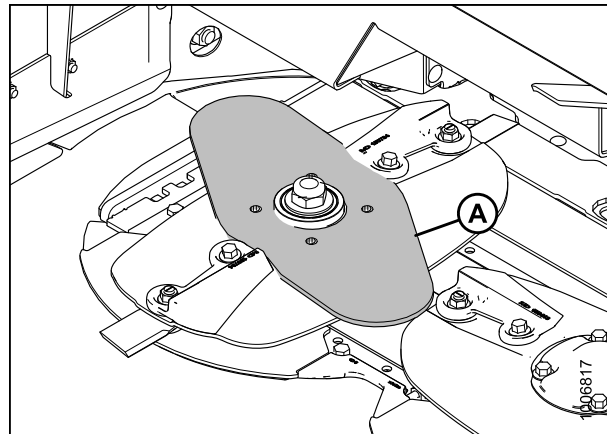


Figure 4.29: Right End Shown

### *Removing Tall Crop Feed Plates from under Driveline Deflector*

1. Open cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).
2. Remove the deflector. Refer to [Removing the Driveline Deflector, page 131](#).

## OPERATING THE HEADER

3. Remove feed plate (A).
4. Return feed plates to storage. Refer to [4.11.3 Returning Tall Crop Feed Plates to Storage](#), page 89.
5. Install the deflector. Refer to [Installing the Driveline Deflector](#), page 132.
6. Close cutterbar doors. Refer to [3.5 Cutterbar Doors](#), page 33.

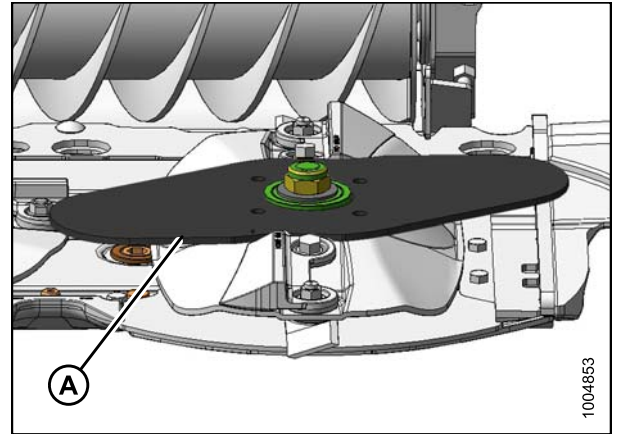


Figure 4.30: Tall Crop Feed Plate

### 4.11.3 Returning Tall Crop Feed Plates to Storage

#### DANGER

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

1. Lower the header fully.
2. Stop the engine and remove the key.
3. Open the right-hand end driveshield. Refer to [3.4.5 Removing Right Endshield](#), page 32.
4. Remove the four nuts (A) and secure the nut shields (B) and feed plates (C) to side of compartment. Reinstall nuts (A).

#### NOTE:

Nut shields will not be in storage location if they are installed on the cutterbar.

5. Install right-hand shield. Refer to [3.4.6 Installing Right Endshield](#), page 32.

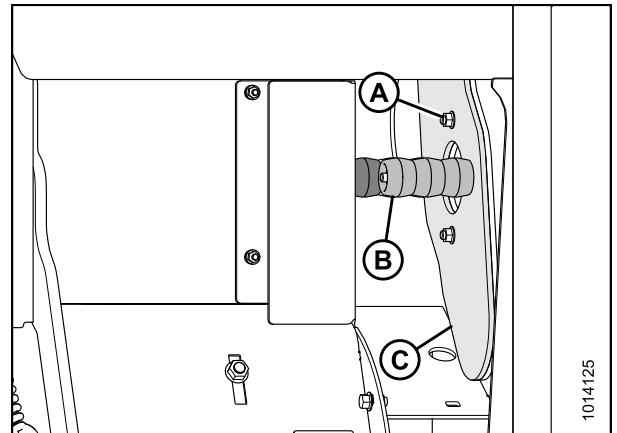


Figure 4.31: Nut Deflector and Feed Plate Storage

## 4.12 Tall Crop Divider Option

Tall crop dividers (one on each end of the header) assist in clean crop dividing and cutterbar entry in tall crops. Tall crop dividers are not adjustable, but they are removable.

### 4.12.1 Removing Tall Crop Divider

#### DANGER

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

1. Lower header to the ground, stop the engine and remove the key.
2. Open cutterbar doors. Refer to [3.5 Cutterbar Doors](#), page 33.

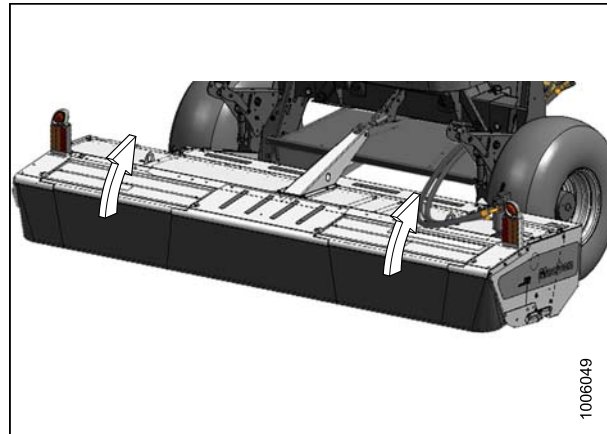


Figure 4.32: Cutterbar Doors

3. Remove the four bolts (A) and nuts. Remove the deflector (B).

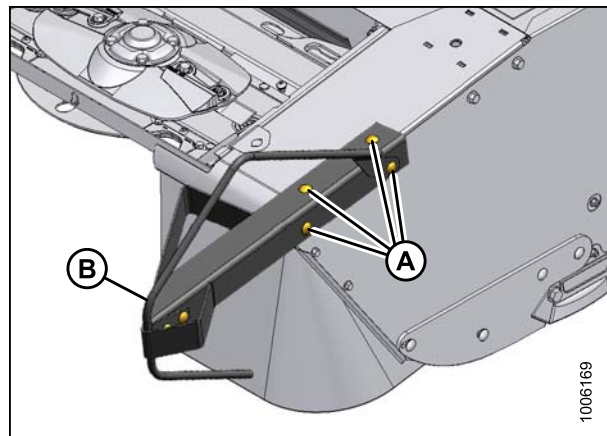
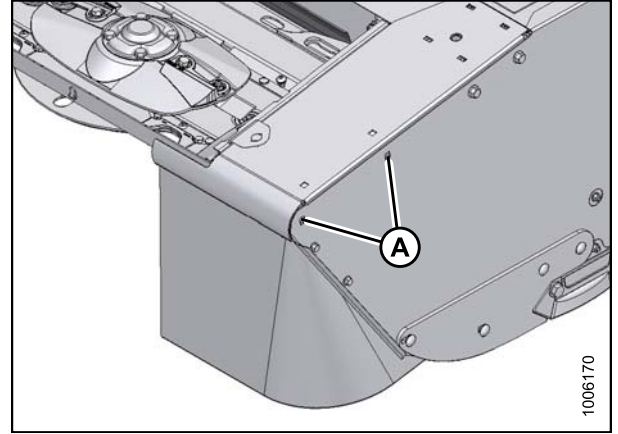


Figure 4.33: LH Crop Divider



## OPERATING THE HEADER

4. Reinstall two bolts and nuts at location shown (A).
5. Repeat Steps [3., page 90](#) and [4., page 91](#) at the other end of the header.
6. Close cutterbar doors.



**Figure 4.34: Crop Divider Mounting Holes**

## 4.13 Overshot Auger

The overshot auger is designed to feed the cut crop from the cutterbar into the conditioner rolls.

The auger position has been factory set and should not normally require adjustment. However, if adjustment is required the vertical and fore-aft positions of the auger can be adjusted for crop conditions. The ideal setting allows optimal movement of crop, minimizes wrapping, and keeps the cutterbar clear.

For fine stemmed crop, the auger performs best when set as close as possible to the pan and stripper bars without rubbing. This is especially important in grass and other crops which have a tendency to wrap.

### IMPORTANT:

The auger flighting should **NEVER** contact the pan or stripper bars.

Component wear may cause excessive clearances resulting in feeding problems and uneven windrows.

### 4.13.1 Adjusting the Overshot Auger

If necessary, adjust the auger position as follows:

#### DANGER

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

1. Raise header to full height, stop the engine, and remove the key.
2. Engage header safety props. Refer to [3.3 Header Safety Props, page 28](#).
3. Remove/loosen four bolts (A) and remove cover (B).

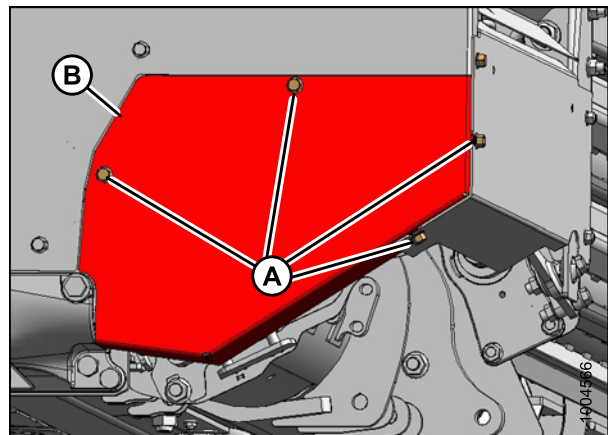


Figure 4.35: Drive Belt Cover

## OPERATING THE HEADER

4. Loosen jam nuts (A) to relieve tension on auger drive belts (B).
5. Loosen three jam nuts (C).
6. To adjust vertical position, loosen upper nuts on adjuster bolts (D). Hold lower nut and turn adjuster bolts (D) to set auger vertical position from bottom of pan.
7. To adjust fore-aft position, loosen aft nut on adjuster bolt (E). Hold forward nut and turn adjuster bolt (E) to set auger so that it clears the back of the pan.
8. Tighten the three nuts (C) and then the jam nuts on adjuster bolts (D) and (E).

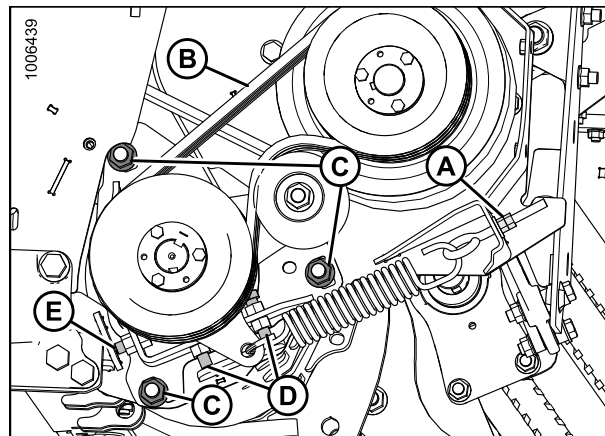


Figure 4.36: Drive Belts

9. Replace cover (B) and tighten bolts (A).
10. Repeat Steps 5., page 93 to 8., page 93 at opposite end of auger.

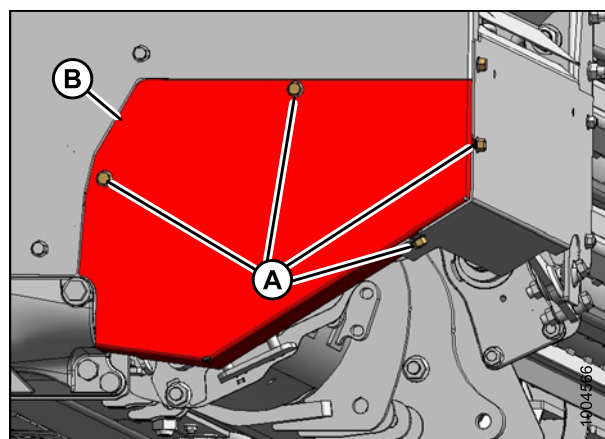


Figure 4.37: Drive Belt Cover

11. To adjust the center support, loosen bolts (A). Adjust auger support (B) fore or aft and vertical position as required. Tighten bolts (A).
12. Check clearance to stripper bars. Refer to 4.14 Stripper Bars, page 95.

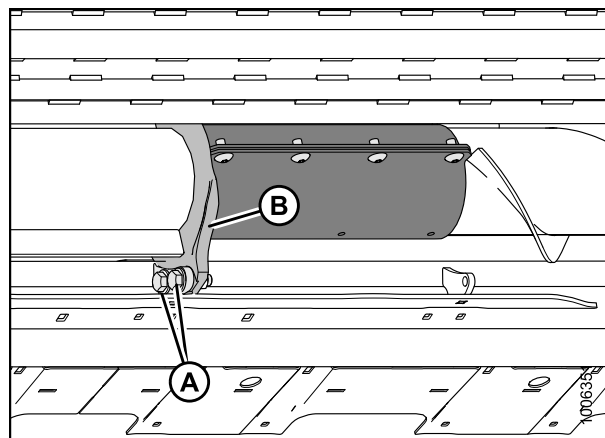
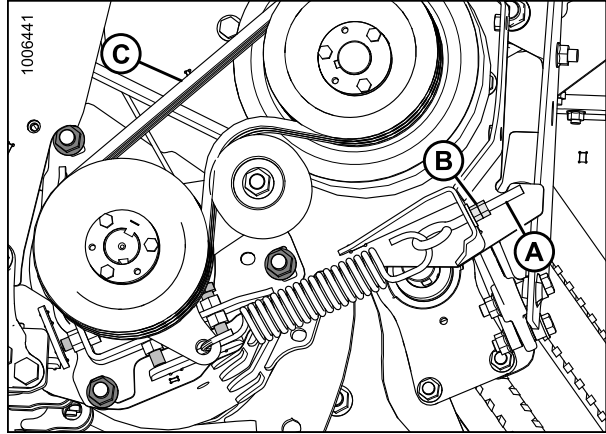


Figure 4.38: Auger Support

## OPERATING THE HEADER

13. To tighten auger drive belts (C), adjust eye bolt (A) and secure with jam nut (B). Refer to [Inspecting and Adjusting the Auger Drive Belts](#), page 143.



**Figure 4.39: Drive Belts**

## 4.14 Stripper Bars

There are two adjustable stripper bars installed on the pan at both ends of the auger that minimize wrapping of material around the auger. The factory position should be satisfactory for most crops but bars can be adjusted for specific conditions.

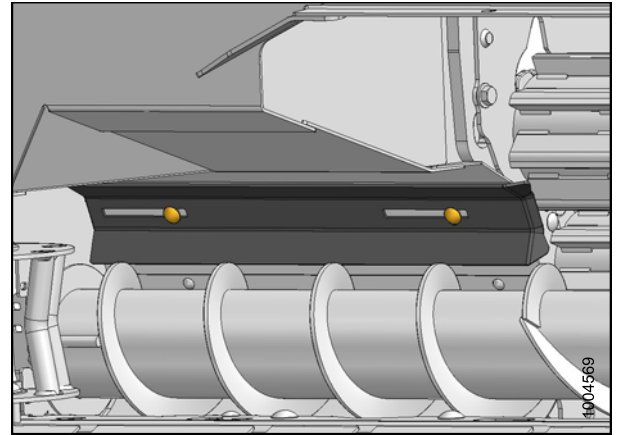
For fine stemmed crop, the auger performs best when the stripper bars are positioned as close as possible to the auger without rubbing.

Component wear and cutting in bumpy terrain where the auger can contact the stripper bar may cause clearances to become excessive resulting in feeding problems and uneven windrows.

If material starts to accumulate between the auger flighting and the strippers, the gap will need to be adjusted.

**NOTE:**

The stripper bars will likely require adjustment if the auger position is changed.



**Figure 4.40: RH Stripper Bar**

### 4.14.1 Adjusting the Stripper Bar

If necessary, adjust the stripper bar as follows:

** DANGER**

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

1. Lower header fully.
2. Stop the engine and remove the key.
3. Open the cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).
4. Open the driveshield. Refer to [3.4 Driveshields, page 30](#).

## OPERATING THE HEADER

5. Loosen nuts (A) on the two bolts securing stripper bar to the pan sufficiently so that stripper bar can be moved.

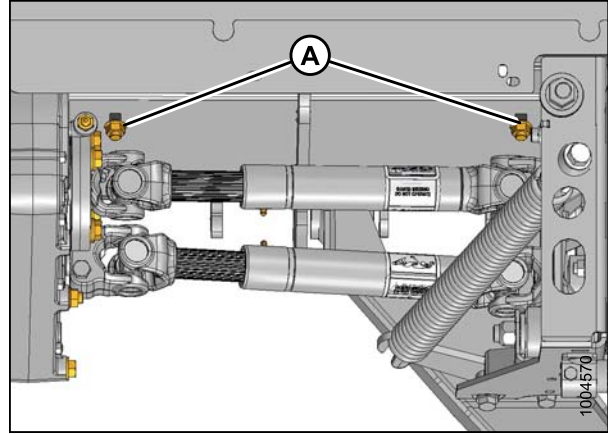


Figure 4.41: Left End Drives

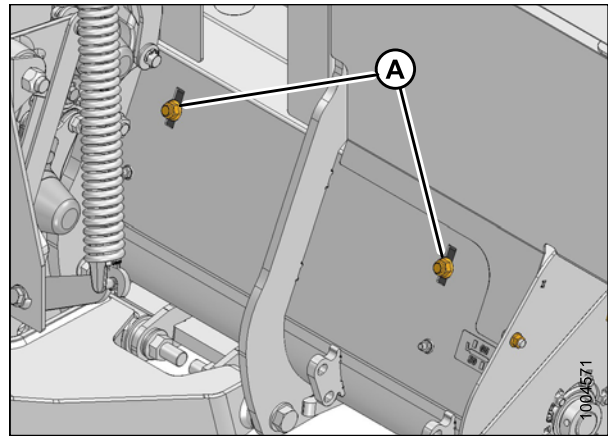


Figure 4.42: Right End

6. Position stripper bar (A) as close as possible to auger flighting without contacting it.
7. Repeat above Steps 5., page 96 and 6., page 96 for opposite side.
8. Manually rotate auger to check that auger does **NOT** contact stripper bars. Readjust as required.

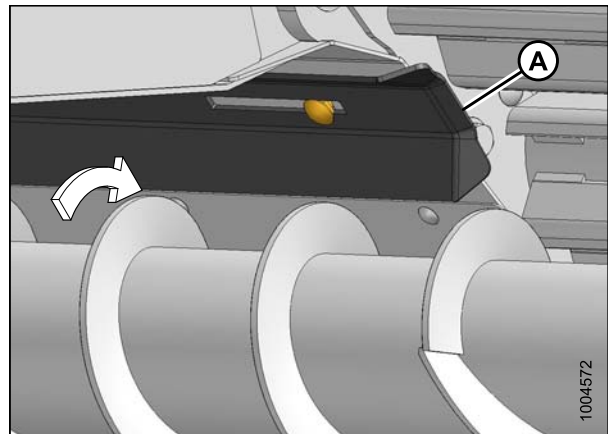


Figure 4.43: Stripper Bar

## OPERATING THE HEADER

9. Tighten nuts (A).

**NOTE:**

Right side and left side stripper bars are interchangeable. Each stripper bar can be flipped when one bar wears out or becomes damaged.

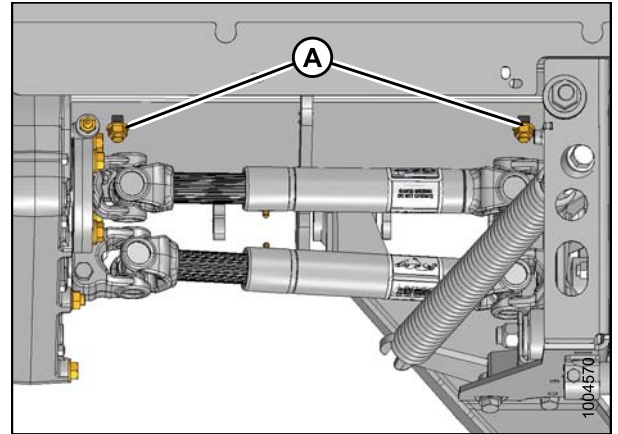


Figure 4.44: Left End

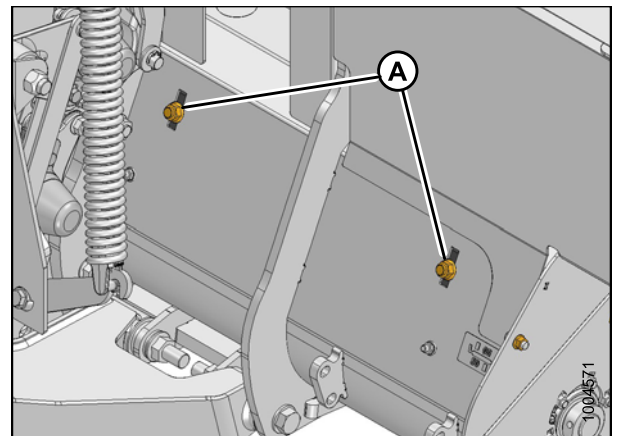


Figure 4.45: Right End

## 4.15 Haying

### 4.15.1 Curing

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

Leaving the windrow as wide and fluffy as possible results in the quickest curing. Cured hay should be baled as soon as possible.

### 4.15.2 Topsoil Moisture

Table 4.3 Topsoil Moisture Levels

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

- 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.
- 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.
- Cut hay will dry only to the moisture level of the ground beneath it, so consider moving the windrow to drier ground.

### 4.15.3 Weather and Topography

- Cut as much hay as possible by midday when drying conditions are best.
- Fields sloping south get up to 100% more exposure to the sun’s heat than do north sloping fields. If hay is baled and chopped, consider baling the south facing fields and chopping those facing north.
- When relative humidity is high, the evaporation rate is low and hay dries slowly.
- If there is no wind, saturated air becomes trapped around the windrow. Raking or tedding will expose the hay to fresh, less saturated air.
- Cut hay perpendicular to the direction of the prevailing winds if possible.

### 4.15.4 Windrow Characteristics

Producing windrows with the recommended characteristics will achieve the greatest results. Refer to [4 Operating the Header, page 67](#) for instructions on adjusting the header.



## OPERATING THE HEADER

**Table 4.4 Recommended Windrow Characteristics**

<b>Characteristic</b>	<b>Advantage</b>
High and fluffy	Enables airflow through windrow which is more important to the curing process than direct sunlight
Consistent formation (not bunching)	Permits an even flow of material into the baler, chopper, etc.
Even distribution of material across windrow	Results in even and consistent bales to minimize handling and stacking problems
Properly conditioned	Prevents excessive leaf damage

### 4.15.5 Driving on Windrow

Driving on previously cut windrows that will not be raked can lengthen drying time by a full day. If practical, set forming shields to produce a narrower windrow that the machine can straddle.

**NOTE:**

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

### 4.15.6 Raking and Tedding

Raking or tedding speeds up drying; however, the resulting leaf loss may outweigh the benefits. 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 moisture levels reach 40–50%. Hay should not be raked or tilled at moisture levels below 25%, however, or excessive yield loss will result.

### 4.15.7 Using Chemical Drying Agents

Hay drying agents work by removing wax from legume surfaces and enabling water to escape and evaporate faster. However, treated hay lying on wet ground will absorb ground moisture faster.

Before deciding to use a drying agent, carefully compare the relative costs and benefits for your area.

## 4.16 Unplugging the Header

Follow these steps to remove plugged material from the header:

### DANGER

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before removing plugged material from header.

1. Stop forward movement of the windrower and disengage the header.
2. Run the header backwards with the header reverse controls in the windrower cab to clear the plug. If plug does not clear, proceed to the next steps.
3. Raise the header fully, stop the engine, and remove the key.
4. Engage header safety props.

### WARNING

Wear heavy gloves when working around cutterbar.

5. Open cutterbar doors. Refer to [3.5 Cutterbar Doors](#), page 33.
6. Clean off the cutterbar or rolls by hand.

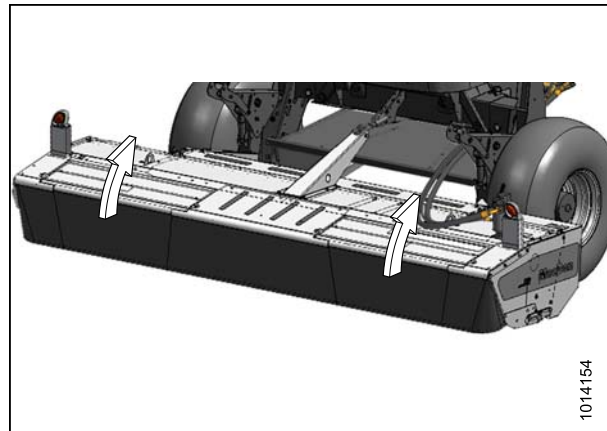


Figure 4.46: Cutterbar Doors

## 5 Maintenance and Servicing

Use the following instructions as your first source of information for servicing the header. A parts catalog is located in a plastic case at the right end of the header. If more detailed maintenance and service information is required, contact your Dealer.

Log the hours of operation and use the Maintenance Schedule/Record provided to keep a record of scheduled maintenance. Refer to [5.3.1 Maintenance Schedule/Record, page 103](#).

### 5.1 Preparation for Servicing

#### CAUTION

**To avoid personal injury, before servicing the header or opening drive covers, perform the following:**

1. Fully lower the header.
2. Stop the engine and remove the key.
3. Engage park brake.
4. Wait for all moving parts to stop.

## 5.2 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.

**Table 5.1 Fluids and Capacities**

Lubricant	Location	Description	Capacities
Grease	As required unless otherwise specified	SAE Multi-Purpose, High temperature extreme pressure (EP) performance with 0–1% max. Molybdenum Disulphide (NLGI Grade 2) Lithium complex base	—
	Driveline slip-joints	High temperature extreme pressure (EP) performance with 10% max. Molybdenum Disulphide (NLGI Grade 2) Lithium base	—
Gear Lubricant	Cutterbar	80W-90 gear lubricant with high thermal and oxidation stability conforming to API gear lubricant service GL-5 minimum (SAE J2360 preferred) specifications such as Traxon 80W-90 gear oil	4.4 US quarts (4.25 l)
	Conditioner gearbox	75W-90 synthetic gear lubricant with high thermal and oxidation stability conforming to API GL-5 minimum (SAE J2360 preferred) specifications such as Traxon E Synthetic 75W-90 gear oil	0.79 US quarts (750 ml)
	Bevel gearbox		13.6 oz. (400 ml)

## 5.3 Maintenance Requirements

In this manual, periodic maintenance requirements are organized by service intervals. For detailed instructions, refer to the specific headings in this section.

Regular maintenance is the best insurance against early wear and breakdowns. Use the following schedule and recommendations to increase machine life.

- Use fluids and lubricants specified in [5.2 Recommended Fluids and Lubricants, page 102](#).
- Make copies of the [5.3.1 Maintenance Schedule/Record, page 103](#) and log the hours of operation.

Where a service interval is given with more than one timeframe, e.g., 100 hours or Annually, service the machine at whichever interval is reached first.




### IMPORTANT:

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 given in [1 Safety, page 1](#).

### 5.3.1 Maintenance Schedule/Record

Action		✓ Check				⬇ Lubricate				▲ Change			
	Hour meter reading												
	Service date												
	Serviced by												
Preseason or Annual. Refer to <a href="#">5.3.2 Preseason/Annual Service, page 105</a> .													
End of season. Refer to <a href="#">5.3.3 End-of-Season Service, page 106</a> .													
<b>First 5 hours</b>													
✓	Check for loose hardware Refer to <a href="#">8.1 Torque Specifications, page 163</a>												
✓	Check drive belt tension Refer to <a href="#">Inspecting the Conditioner Drive Belt, page 135</a> and <a href="#">Inspecting and Adjusting the Auger Drive Belts, page 143</a>												
<b>First 10 hours then daily</b>													
✓	Check hydraulic hoses and lines Refer to <a href="#">5.6.2 Hydraulic Hoses and Lines, page 149</a> .												
✓	Check cutter blades, deflectors and discs Refer to <a href="#">5.4.2 Inspecting the Cutterbar Discs, page 119</a> .												
<b>First 25 hours</b>													

## MAINTENANCE AND SERVICING

	Action	✓ Check	✱ Lubricate	▲ Change									
✓	Check drive belt tension Refer to <i>Inspecting the Conditioner Drive Belt, page 135</i> and <i>Inspecting and Adjusting the Auger Drive Belts, page 143</i>												
<b>Every 25 hours</b>													
◆	Lube roll universal joints Refer to <i>5.3.4 Lubrication and Servicing, page 106</i> .												
◆	Lube cutterbar driveline bearings Refer to <i>5.3.4 Lubrication and Servicing, page 106</i> .												
<b>First 50 hours</b>													
✓	Check drive belt tension Refer to <i>Inspecting the Conditioner Drive Belt, page 135</i> and <i>Inspecting and Adjusting the Auger Drive Belts, page 143</i>												
▲	Change cutterbar lubricant Refer to <i>5.3.7 Lubricating the Cutterbar, page 113</i> <sup>1</sup> .												
▲	Change bevel gearbox lubricant Refer to <i>5.5.1 Bevel Gearbox, page 134</i> .												
▲	Change conditioner gearbox lubricant Refer to <i>5.5.1 Bevel Gearbox, page 134</i> .												
<b>Every 50 hours</b>													
◆	Lube drive belt tensioner Refer to <i>5.3.4 Lubrication and Servicing, page 106</i>												
◆	Lube roll shaft bearings Refer to <i>5.3.4 Lubrication and Servicing, page 106</i>												
◆	Lube gauge roller bearings <sup>2</sup>												
<b>Every 100 hours or annually</b>													
✓	Check conditioner drive belt Refer to <i>Inspecting the Conditioner Drive Belt, page 135</i> .												
✓	Check auger drive belt Refer to <i>Inspecting and Adjusting the Auger Drive Belts, page 143</i> .												

1. Use only the specified amount DO NOT overfill
2. Optional

## MAINTENANCE AND SERVICING

Action		✓ Check		⬇ Lubricate				▲ Change					
✓	Check conditioner gearbox lubricant Refer to <a href="#">5.5.3 Conditioner Gearbox, page 138</a> .												
✓	Check bevel gearbox lubricant Refer to <a href="#">5.5.1 Bevel Gearbox, page 134</a> .												
<b>First 150 hours</b>													
▲	Change cutterbar lubricant Refer to <a href="#">5.3.7 Lubricating the Cutterbar, page 113</a> <sup>1</sup>												
▲	Change bevel gearbox lubricant Refer to <a href="#">5.5.1 Bevel Gearbox, page 134</a>												
▲	Change conditioner gearbox lubricant Refer to <a href="#">5.5.3 Conditioner Gearbox, page 138</a> .												
<b>Every 250 hours<sup>3</sup></b>													
▲	Change cutterbar lubricant Refer to <a href="#">5.3.7 Lubricating the Cutterbar, page 113</a> <sup>1</sup>												
▲	Change bevel gearbox lubricant Refer to <a href="#">5.5.1 Bevel Gearbox, page 134</a>												
▲	Change conditioner gearbox lubricant Refer to <a href="#">5.5.3 Conditioner Gearbox, page 138</a> .												

### 5.3.2 Preseason/Annual Service

#### CAUTION

- Review the operator's manual to refresh your memory on safety and operating recommendations.
- Review all safety signs 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 the operating characteristics of the machine.
- Check the first aid kit and fire extinguisher. Know where they are and how to use them.

Perform the following at the beginning of each operating season:

- Lubricate machine completely. Refer to [5.3.4 Lubrication and Servicing, page 106](#).
- Perform all annual maintenance. Refer to [5.3.1 Maintenance Schedule/Record, page 103](#).

---

3. Begins after the first 150 hour service

### 5.3.3 End-of-Season Service

#### CAUTION

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

Do the following at the end of each operating season:

- Clean the header thoroughly
- Store in a dry, protected place if possible. If stored outside, always cover the header with a waterproof canvas or other protective material.
- Raise header and engage header safety props
- If possible, block up the header to take weight off tires
- Repaint all worn or chipped painted surfaces to prevent rust
- Loosen drive belt
- 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 cutterbar components to prevent rust
- Check for worn components and repair as necessary
- Check for broken components and order replacements from your Dealer. Attention to these items right away will save time and effort at beginning of next season
- Replace or tighten any missing or loose hardware. Refer to [8.1 Torque Specifications, page 163](#)
- Remove divider rods (if equipped) to reduce space required for inside storage

### 5.3.4 Lubrication and Servicing

#### WARNING

To avoid personal injury, before servicing the header or opening drive covers, follow procedures in [5.1 Preparation for Servicing, page 101](#).

Log hours of operation and use the Maintenance Checklist provided to keep a record of scheduled maintenance. Refer to [5.3.1 Maintenance Schedule/Record, page 103](#).



## MAINTENANCE AND SERVICING

To access the drive systems, open the driveshield and cutterbar doors. Refer to:

- [3.4 Driveshields, page 30](#)
- [3.5 Cutterbar Doors, page 33](#)

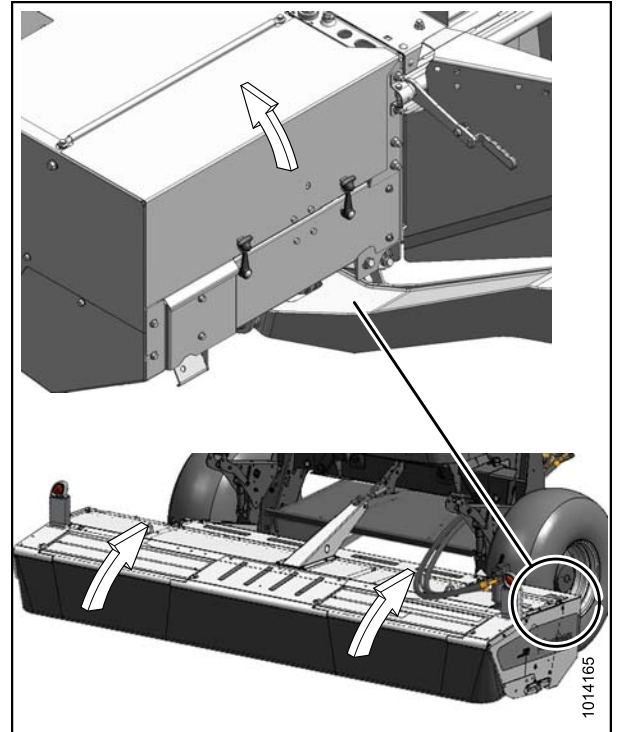


Figure 5.1: Driveshield

### 5.3.5 Greasing Procedure

#### DANGER

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

The greasing points are marked on the machine by decals showing a grease gun and grease interval in hours of operation.

Use the recommended lubricants specified in this manual. Refer to [5.2 Recommended Fluids and Lubricants, page 102](#).

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. If fitting will not take grease, remove and clean thoroughly. Also clean lubricant passageway. Replace fitting if necessary.

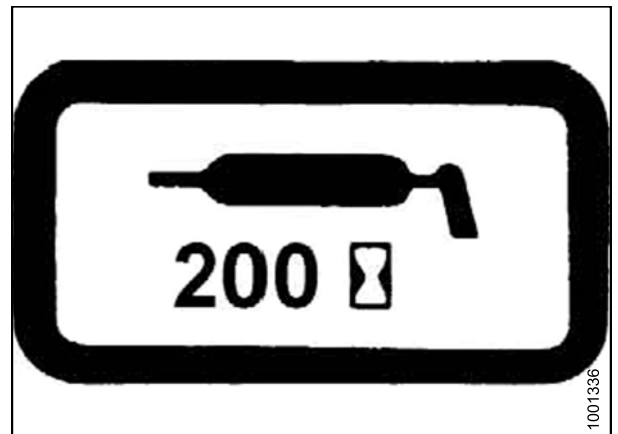


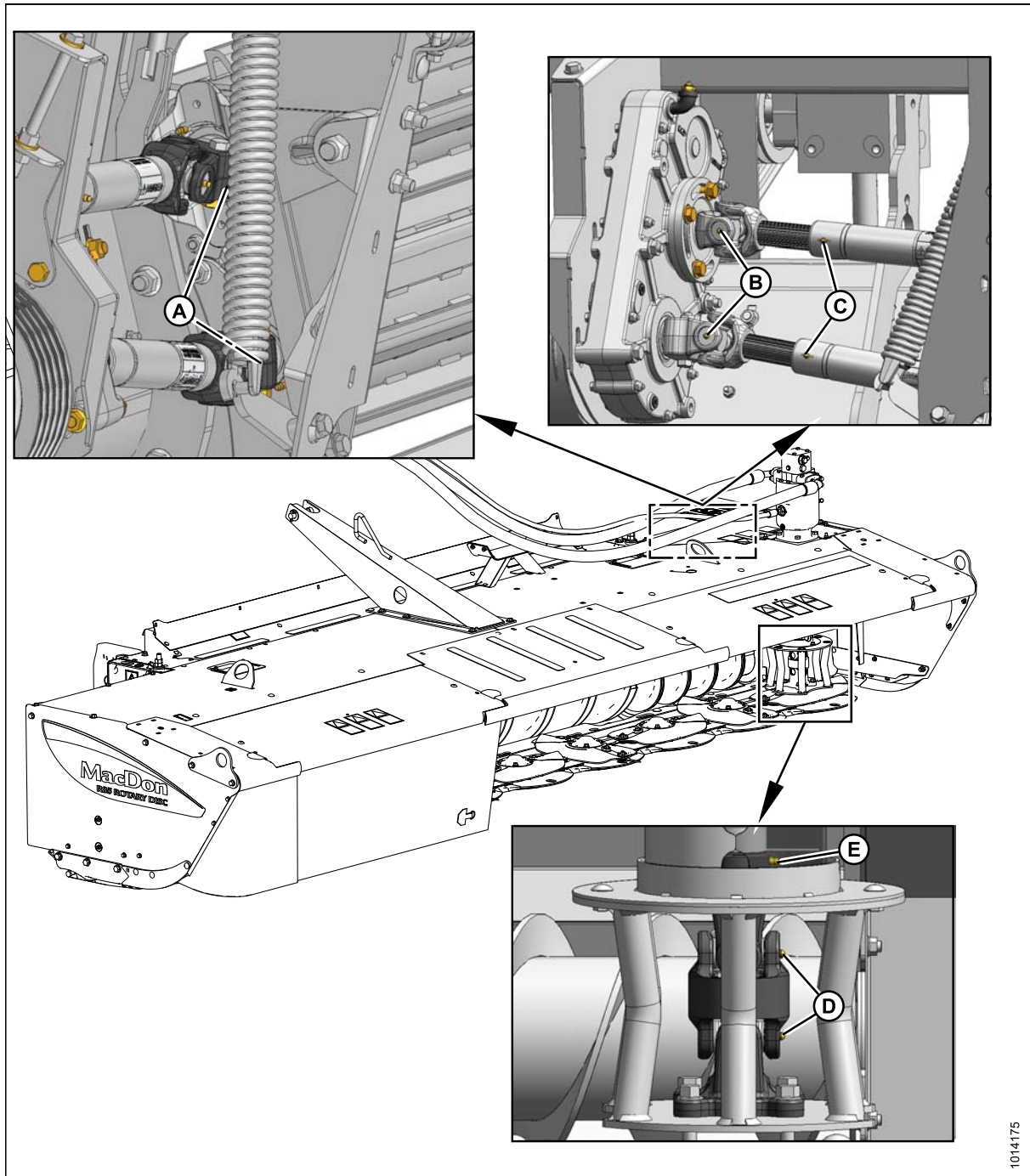
Figure 5.2: Grease Interval Decal

### **5.3.6 Lubrication and Servicing Intervals**

To identify the various locations that require lubrication and servicing, refer to the following illustrations (organized by the frequency of service that is required).

## MAINTENANCE AND SERVICING

Every 25 Hours



A - Driveline Universals (2 Places)  
C - Driveline Shaft<sup>4</sup> (2 Places)  
E - Driveline Shaft<sup>4</sup>

B - Driveline Universals (2 Places)  
D - Driveline Universals (2 Places)

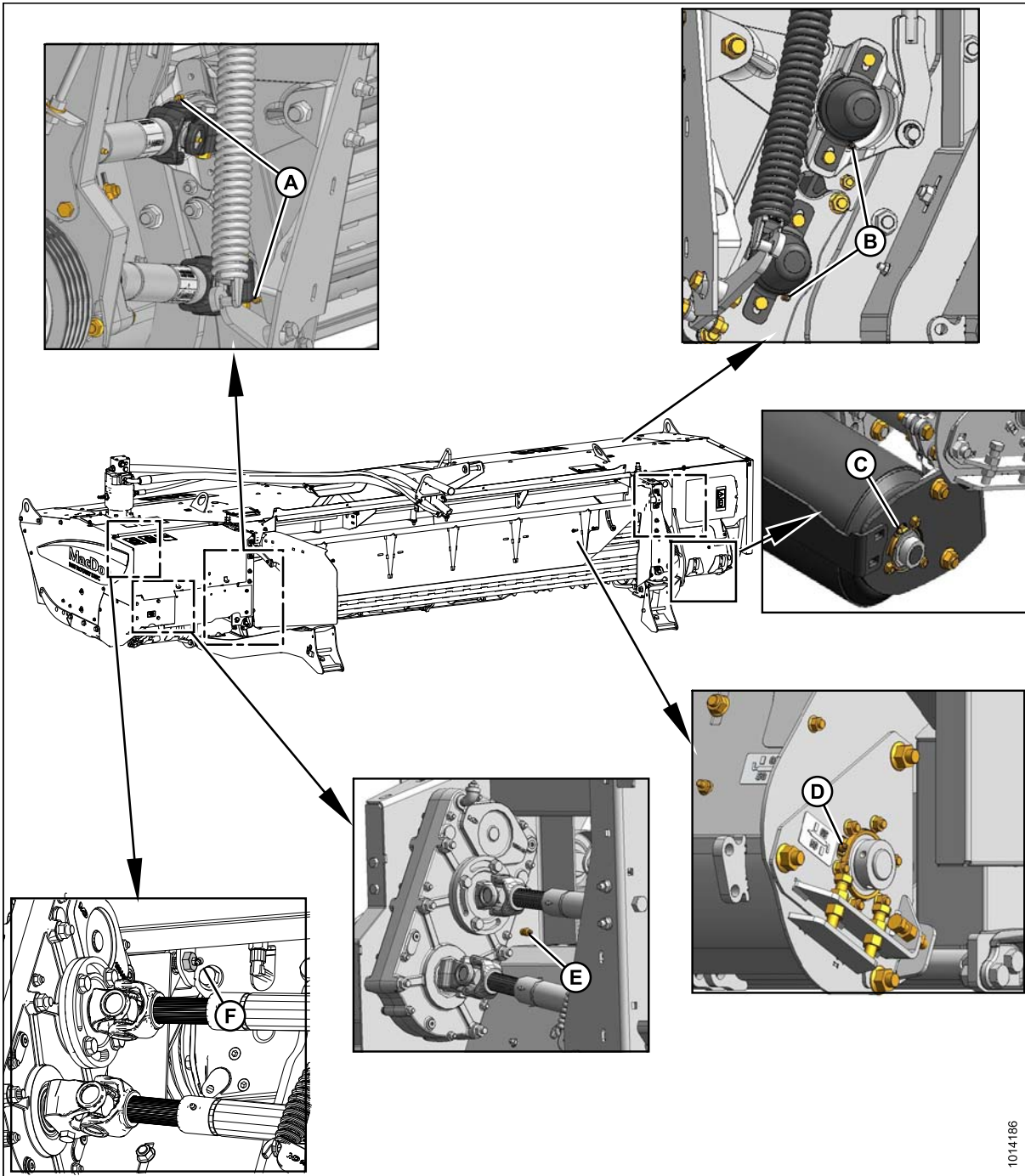
### NOTE:

Use high temperature extreme pressure (EP2) performance with 1% max molybdenum disulphide (NLGI grade 2) lithium base except where noted.

4. 10% moly grease is recommended for driveline shaft slip joint only

## MAINTENANCE AND SERVICING

### Every 50 Hours



A - Roll Shaft Bearings (2 Places)

B - Roll Shaft Bearings (2 Places)

C - Optional Gauge Roll Bearings  
(2 Places Each)

D - Auger Bearing (1 Place)

E - Auger Bearing (1 Place)

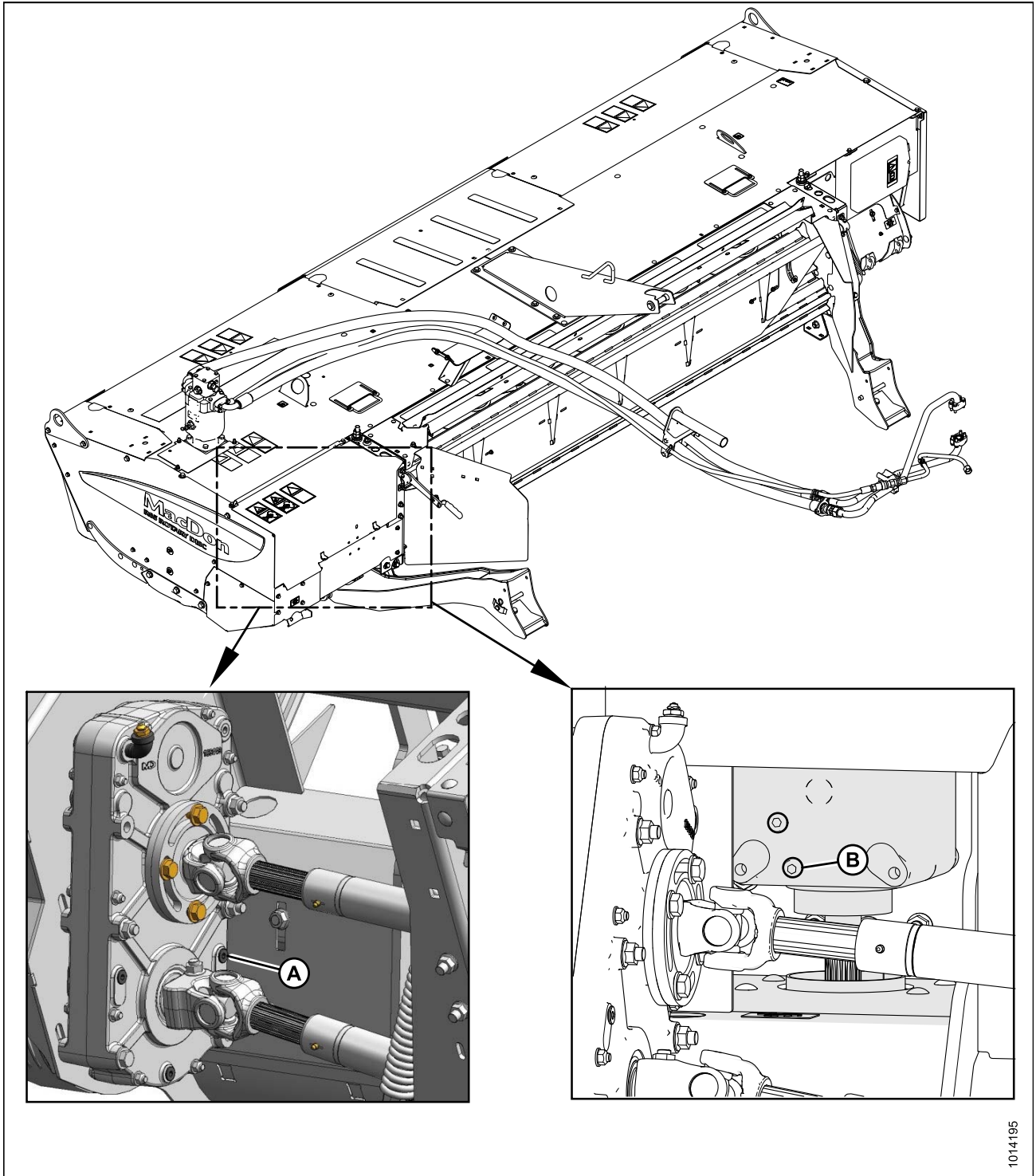
F - Belt Tensioner Pivot (1 Place)

#### NOTE:

Use high temperature extreme pressure (EP2) performance with 1% max molybdenum disulphide (NLGI grade 2) lithium base except where noted.

# MAINTENANCE AND SERVICING

Every 100 Hours or Annually



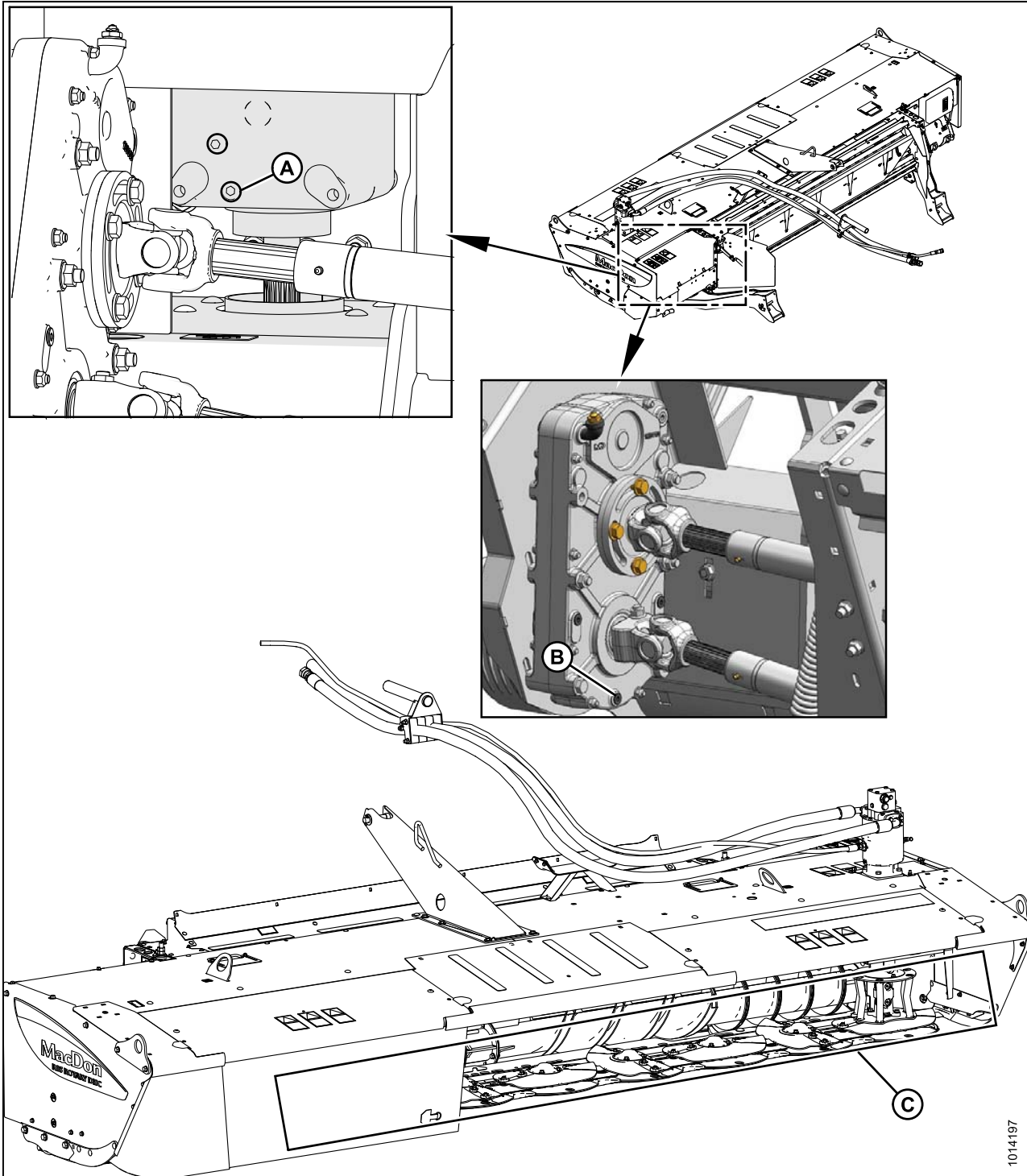
A - Conditioner Gearbox Oil Level (Check with Top of Header Horizontal)

B - Bevel Gearbox Oil Level (Check with Top of Header Horizontal)



## MAINTENANCE AND SERVICING

### Every 250 Hours



A - Drain and Refill Bevel Gearbox Lube<sup>5</sup>

B - Drain and Refill Conditioner Gearbox Lube<sup>5</sup>

C - Drain and Refill Cutterbar Lube. <sup>6</sup>

5. Refer to [Changing the Bevel Gearbox Lubricant, page 134](#)

6. Refer to [5.3.7 Lubricating the Cutterbar, page 113](#)

### 5.3.7 Lubricating the Cutterbar

The lubricant level in the cutterbar **CANNOT** be checked. If the cutterbar lubricant quantity is in doubt, do **NOT** add lubricant. Drain the cutterbar and refill with new clean lubricant.

#### *Draining the Cutterbar Lubricant*

**IMPORTANT:**

Drain the cutterbar when the lubricant is warm. If the lubricant is cold, idle the machine for about 10 minutes prior to draining.

**⚠ DANGER**

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

**⚠ CAUTION**

Be careful when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

**⚠ DANGER**

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

1. Place a block under each end of the header (A).

**NOTE:**

The block under the left end of the header should be higher than the right end.

2. Disengage header safety props. Refer to [3.3 Header Safety Props, page 28](#).
3. Start windrower and lower header onto blocks.
4. Stop the engine and remove the key.
5. Open cutterbar doors (B). Refer to [3.5 Cutterbar Doors, page 33](#).

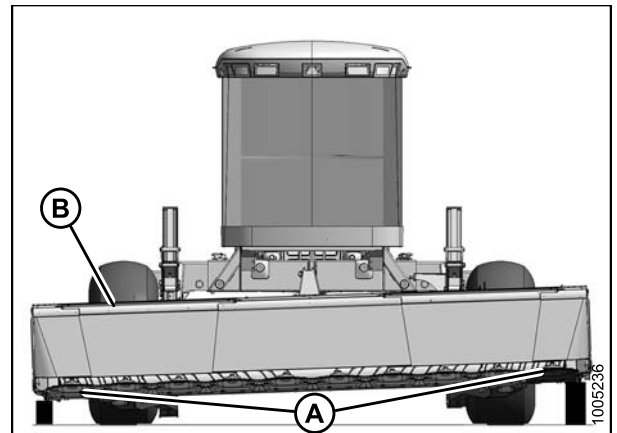
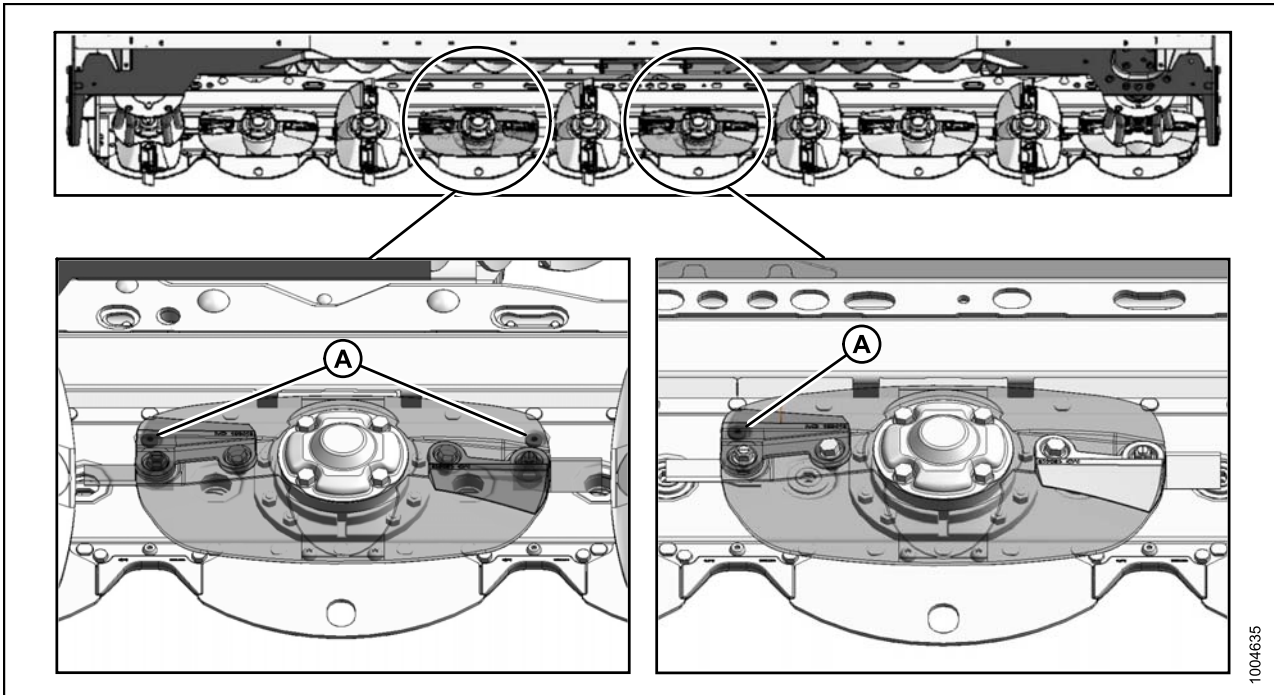


Figure 5.3: Header Raised Left Side

## MAINTENANCE AND SERVICING

6. Locate one of the three filler plugs along the top of the cutterbar. Refer to [5.4: 16 ft.: Cutterbar Filler Plug Locations, page 114](#).



**Figure 5.4: Cutterbar Filler Plug Locations**

7. Clean around either filler plug (A) and remove one plug with an 8 mm hex key.

**NOTE:**

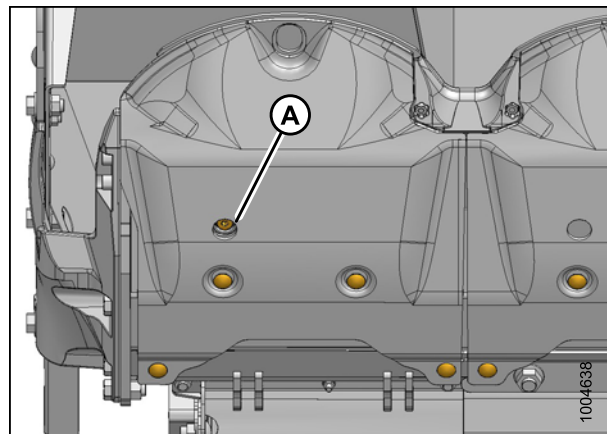
Rotate disc to expose filler plug if necessary.

8. Place a suitably sized container under the cutterbar drain hole (A).
9. Remove plug (A) with an 8 mm hex key and allow sufficient time for lubricant to drain.

**IMPORTANT:**

Do NOT flush the cutterbar.

10. Replace drain plug (A) and tighten.
11. Safely dispose of lubricant.
12. Add lubricant. Refer to [Filling the Cutterbar Lubricant, page 115](#).



**Figure 5.5: Cutterbar Lubricant Drain**



*Filling the Cutterbar Lubricant*

**⚠ DANGER**

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

1. Park the machine on level ground.
2. Raise header fully.
3. Stop the engine and remove the key.
4. Engage header safety props. Refer to [3.3 Header Safety Props, page 28](#).
5. Move higher block to right end of header.

**NOTE:**

Having the fill end higher allows for quicker filling of cutterbar.

6. Disengage header safety props. Refer to [3.3 Header Safety Props, page 28](#).

**⚠ CAUTION**

Never start or move the machine until you are sure all bystanders have cleared the area.

7. Start windrower and lower header onto blocks (A).
8. Start tractor and lower header onto blocks (A).
9. Stop the engine and remove the key.
10. Verify that drain plug (A) has been installed before adding new lubricant.

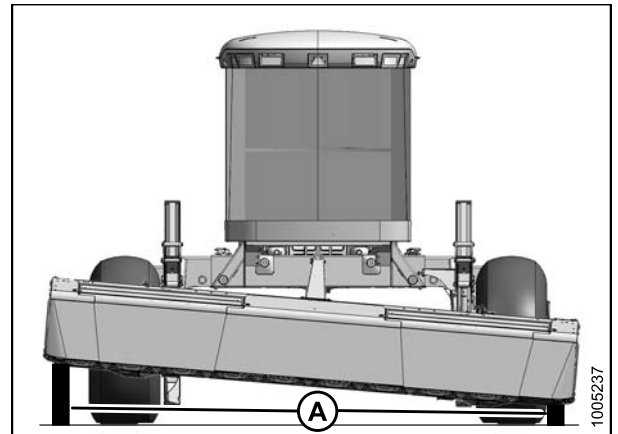


Figure 5.6: Header Raised Right Side

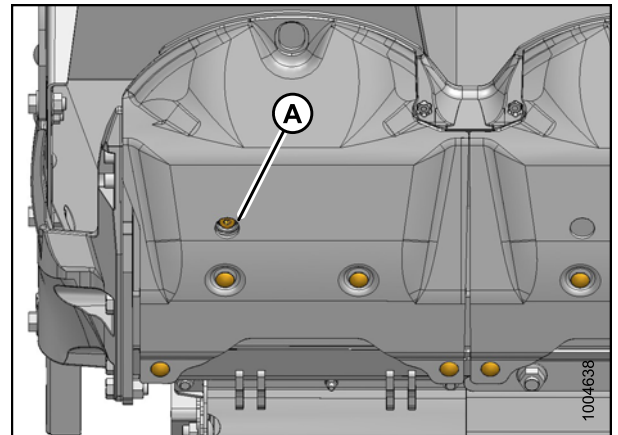
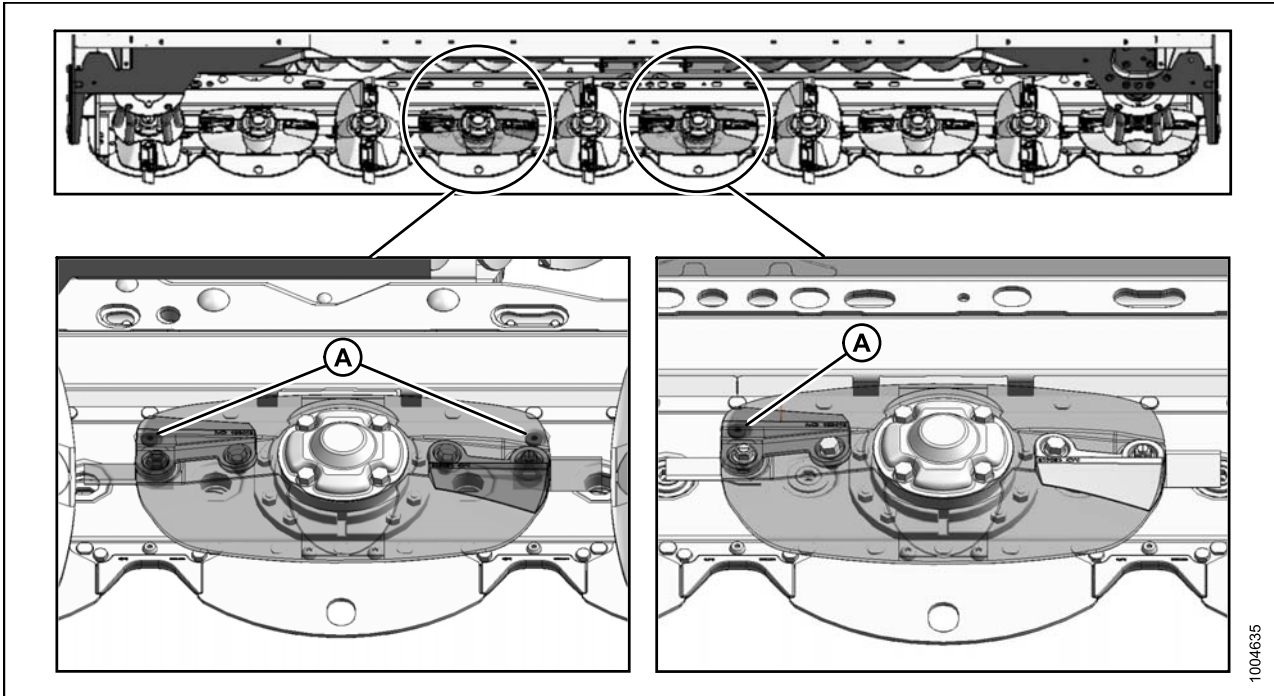


Figure 5.7: Cutterbar Drain Plug

## MAINTENANCE AND SERVICING

11. Locate one of the three filler plugs along the top of the cutterbar. Refer to Figure 5.8: *Cutterbar Filler Plug Locations*, page 116.



**Figure 5.8: Cutterbar Filler Plug Locations**

12. Clean around either filler plug (A) and remove one plug with an 8 mm hex key.

**NOTE:**

Rotate disc to expose filler plug if necessary.

13. Add lubricant to cutterbar through filler hole (A). Refer to *5.2 Recommended Fluids and Lubricants*, page 102.

**IMPORTANT:**

DO NOT overfill the cutterbar. Overfilling can cause overheating and damage to or failure of the cutterbar.

14. Install the filler plug that was removed.
15. Close cutterbar door(s). Refer to *3.5 Cutterbar Doors*, page 33.
16. Start engine and raise header off blocks.
17. Engage header safety props.
18. Remove blocks and lower header.
19. Stop the engine and remove the key.
20. Disengage header safety props.
21. Start engine and lower the header fully.

### 5.3.8 Rock Guards

The machine is equipped with rock guards at each cutting disc location. Rock guards prevent the cutterbar from digging into the ground and protect the disc from coming in contact with stones and other debris.

#### *Inspecting the Rock Guards*

Check rock guards periodically for severe damage or wear as follows:

**⚠ DANGER**

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

**⚠ DANGER**

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

**⚠ CAUTION**

Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

1. Raise header fully, stop the engine, and remove the key.
2. Engage header safety props.
3. Inspect rock guards (A) for severe damage, wear, and distortion. The guards should be replaced if severely damaged or worn.
4. Check for loose or missing fasteners and tighten or replace fastener if missing.
5. Contact your MacDon Dealer for replacement procedures.

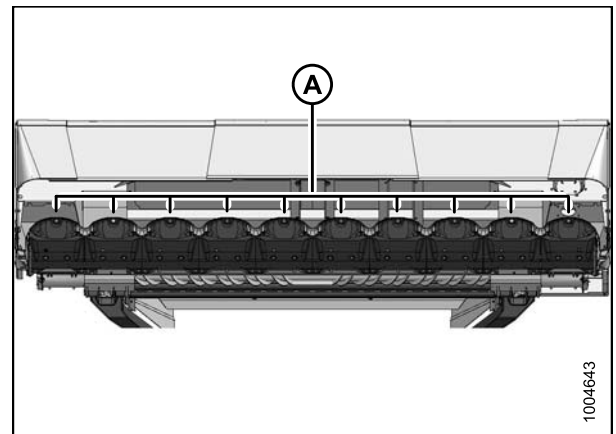


Figure 5.9: Rock Guards

## 5.4 Cutterbar Disc Maintenance

Perform daily inspections to ensure that cutterbar discs have not suffered damage from rocks, or experienced excessive wear from abrasive working conditions.

Cutterbar discs are interchangeable and can be moved to a spindle that rotates in the opposite direction as long as it is in usable condition and the blades are oriented to cut in the correct direction.

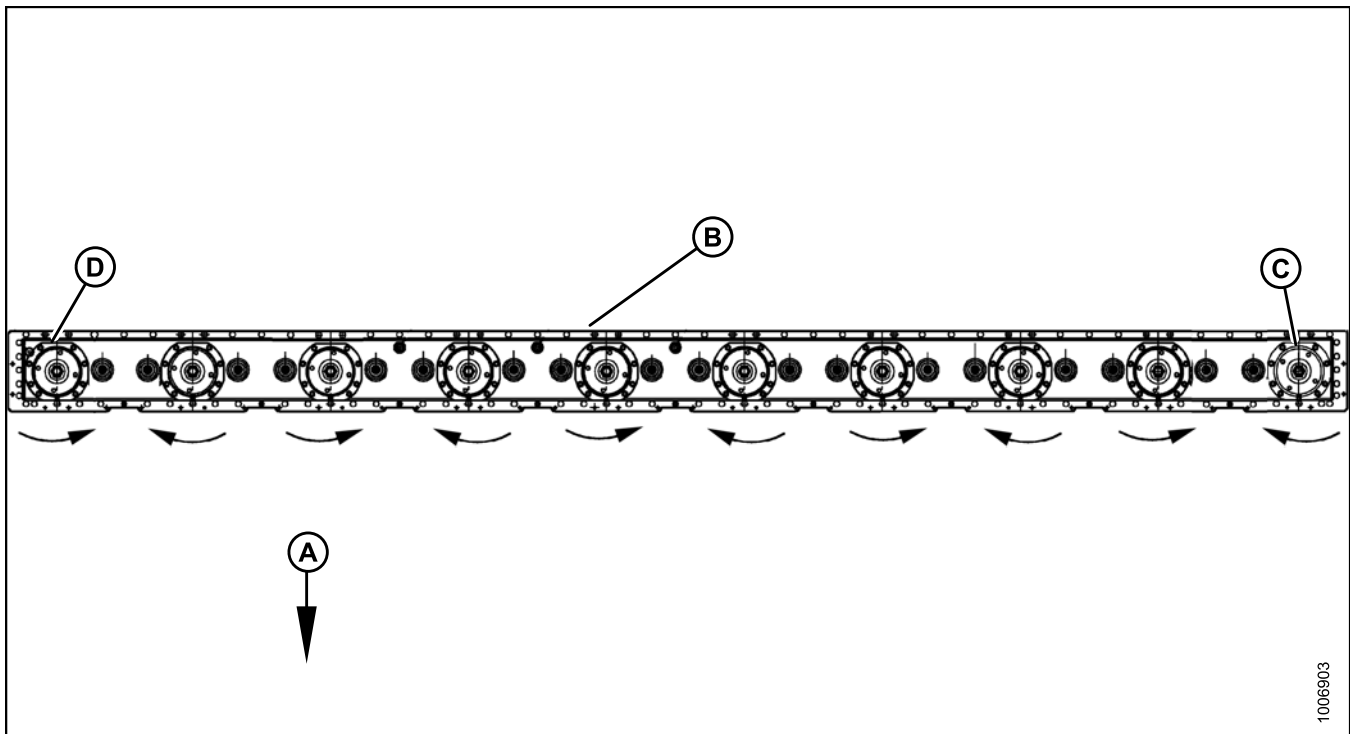
The cutterbar discs are **NOT** repairable and must be replaced if severely damaged or worn.

### IMPORTANT:

If holes appear in a cutterbar disc, replace the disc immediately. Do **NOT** attempt to repair the cutterbar discs. Always use factory replacement parts.

### 5.4.1 Direction of Spindle Rotation

When installing cutter blades or disc accelerators, the direction of rotation determines proper crop positioning. Refer to Figure 5.10: *Spindle Rotation*, page 118 to determine the direction of spindle rotation.



**Figure 5.10: Spindle Rotation**

A - Front of Header  
D - Disc 8<sup>8</sup>

B - 16-foot Cutterbar

C - Disc 1<sup>7</sup>

7. Driveline deflector installed here.
8. Driven deflector installed here.

## 5.4.2 Inspecting the Cutterbar Discs

Perform the following cutterbar disc inspection daily:

### DANGER

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

1. Lower header to ground, stop the engine, and remove key.
2. Open the cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).

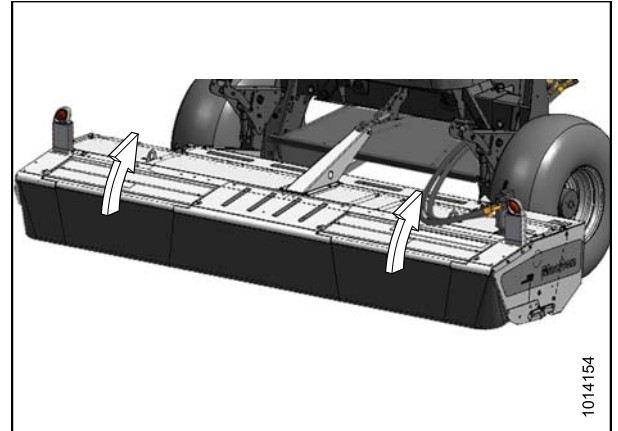


Figure 5.11: Cutterbar Doors

3. Check discs (A) for damage or loose fasteners.
4. Replace damaged discs. Refer to:
  - [5.4.3 Removing a Cutterbar Disc, page 119](#)
  - [5.4.4 Installing a Cutterbar Disc, page 120](#)
5. Replace damaged fasteners. Tighten loose fasteners.
6. Close cutterbar doors.

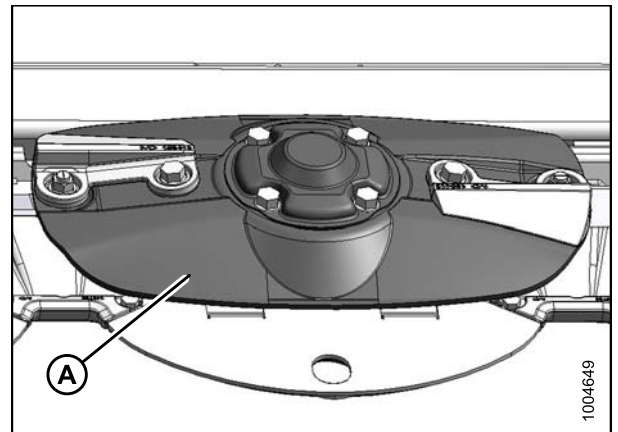


Figure 5.12: Cutterbar Disc

## 5.4.3 Removing a Cutterbar Disc

### CAUTION

Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

1. Open cutterbar door(s). Refer to [3.5 Cutterbar Doors, page 33](#).
2. Identify which disc needs to be replaced.
3. Place a block of wood between two discs to prevent disc rotation while loosening bolts.
4. If the disc has a deflector installed on it. Remove the rotary deflector. Refer to:

## MAINTENANCE AND SERVICING

- [Removing the Driveline Deflector, page 131](#)
  - [Removing the Driven Deflector, page 130](#)
5. Remove four bolts (A) on disc cover (B) and remove cover and disc (C).

**NOTE:**

If removing multiple discs, mark the position of each disc to assist in reinstallation. The blades on each disc are direction-specific. Refer to [5.4.1 Direction of Spindle Rotation, page 118](#).

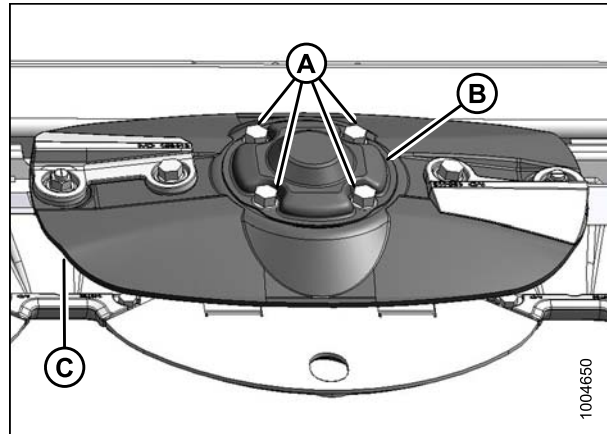


Figure 5.13: Cutterbar Disc

### 5.4.4 Installing a Cutterbar Disc

**⚠ CAUTION**

Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

1. Install the new disc on spindle positioned at a 90° angle to the adjacent discs.

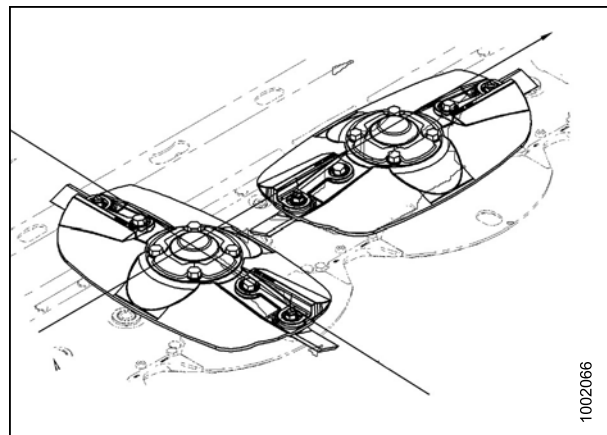


Figure 5.14: Cutterbar Discs

## MAINTENANCE AND SERVICING

2. Install cover (B) and secure with four bolts (A). Tighten bolts.
3. Reinstall previously removed rotary deflector (if applicable). Refer to:
  - [Installing the Driveline Deflector, page 132](#)
  - [Installing the Driven Deflector, page 131](#)
4. Close cutterbar door(s). Refer to [3.5 Cutterbar Doors, page 33](#).

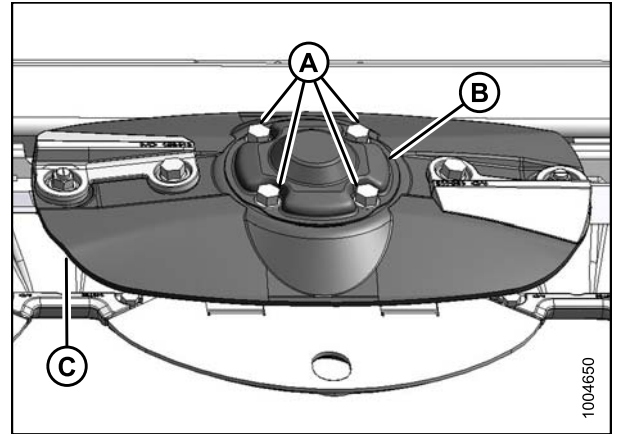


Figure 5.15: Cutterbar Disc

### 5.4.5 Cutter Blades

Each disc has two cutter blades (A) attached at each end with a specially designed shoulder bolt that allows the blades to swivel horizontally.

Since each blade has two cutting edges, they can be flipped over to extend the life of the blades.

The blades are NOT repairable and must be replaced if damaged or worn.

#### **IMPORTANT:**

Always use MacDon factory replacement parts.

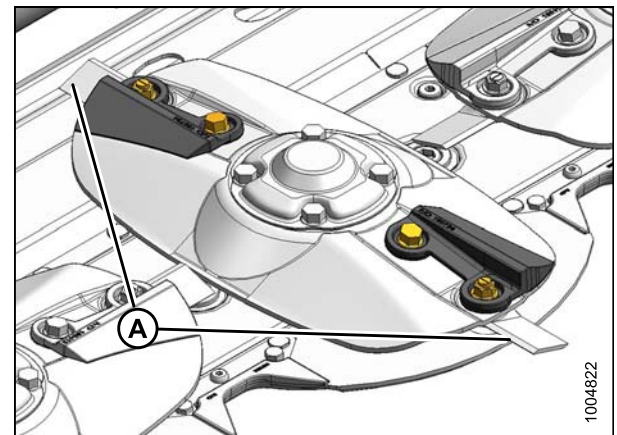


Figure 5.16: Cutter Blades

#### *Inspecting Cutter Blades*

#### **⚠ DANGER**

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key from ignition before leaving operator's seat for any reason

#### **⚠ CAUTION**

Cutter blades have two cutting edges. Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

#### **⚠ CAUTION**

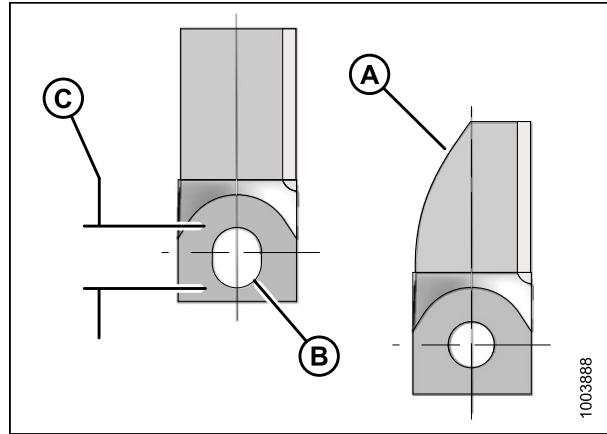
Damaged blades may damage the cutterbar and result in poor cutting performance. Replace damaged blades at earliest possible opportunity.

## MAINTENANCE AND SERVICING

1. Check daily that the cutter blades are securely attached to the disc.
2. Inspect blades for cracks, wear beyond safe operating limits (C), and distortion.
3. Replace blades immediately if any problems occur.

### IMPORTANT:

Blades should be replaced in pairs, or the disc may become unbalanced and cause damage to the cutterbar.



**Figure 5.17: Cutter Blades**

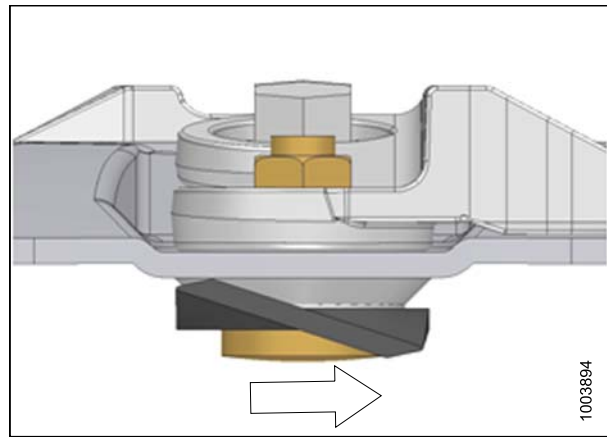
A - Blade Wear to Center Line

B - Elongated Hole

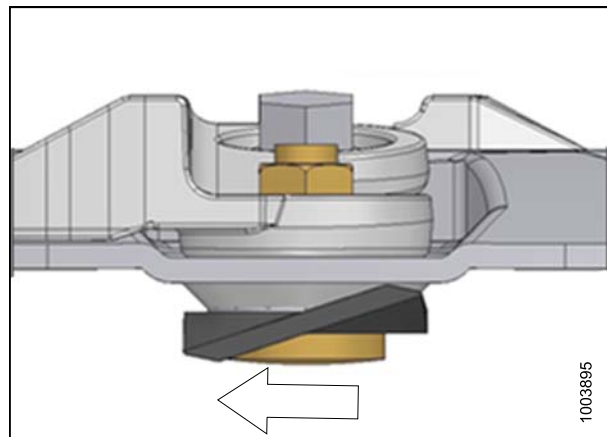
C - Maximum Elongation 13/16 in. (21 mm)

### IMPORTANT:

The cutter blades have cutting edges on both sides so the blades can be turned over and reused. The twist in each blade determines the cutting direction. If you are unsure which direction the spindles rotate, refer to [5.4.1 Direction of Spindle Rotation, page 118](#).



**Figure 5.18: Counterclockwise Disc Rotation Direction**



**Figure 5.19: Clockwise Disc Rotation Direction**



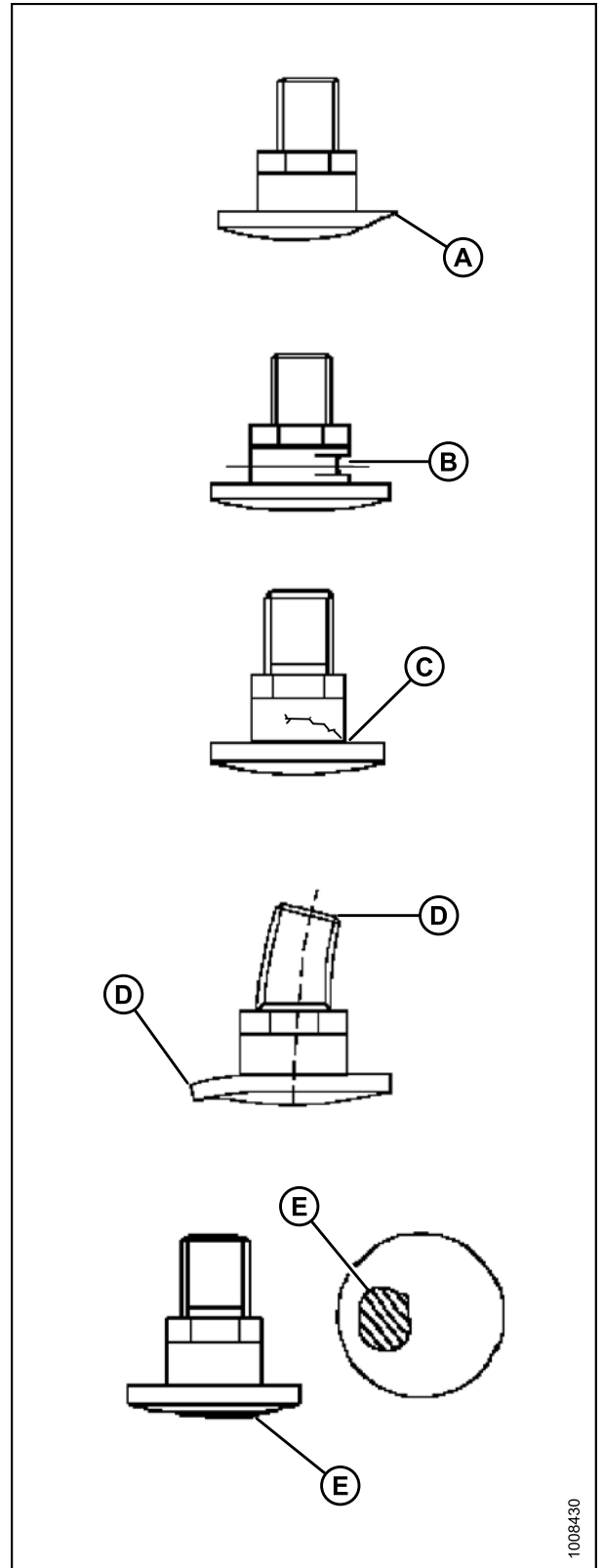
## MAINTENANCE AND SERVICING

### *Inspecting Cutter blade Hardware*

Check blade attachment hardware each time blades are changed. Refer to [Replacing the Cutter Blades, page 124](#) for hardware replacement procedure.

Check bolts and replace bolt if:

- Bolt has been removed and installed five times
- Head (A) is worn flush with bearing surface of blade
- Diameter of bolt neck is worn (B) 1/8 in. (3 mm)
- Bolt is cracked (C)
- Bolt is visibly distorted (D)
- There is evidence of interference (E) with adjacent parts



**Figure 5.20: Cutter blade Bolt**

## MAINTENANCE AND SERVICING

Check nuts and replace nut if:

- Nut has been removed and installed five times
- Worn height (A) is less than half original height (B)
- Nut is cracked

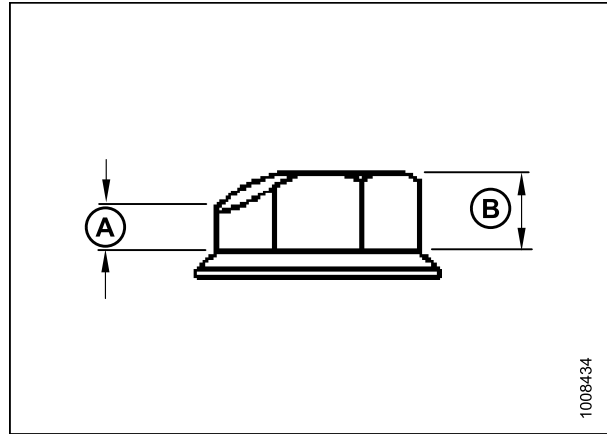


Figure 5.21: Cutter blade Nut

### Replacing the Cutter Blades

Follow these steps to replace the cutter blades:

#### **⚠ DANGER**

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

#### **⚠ CAUTION**

Cutter blades have two cutting edges. Be careful when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

1. Raise header fully.
2. Stop the engine and remove the key.
3. Engage header safety props.
4. Open the cutterbar door(s). Refer to [3.5 Cutterbar Doors, page 33](#).
5. Rotate disc (A) so that blade (B) faces forward and lines up with hole (C) in rock guard.
6. Place a block of wood between two discs to prevent disc rotation while loosening blade bolts.
7. Clean debris from blade attachment area.

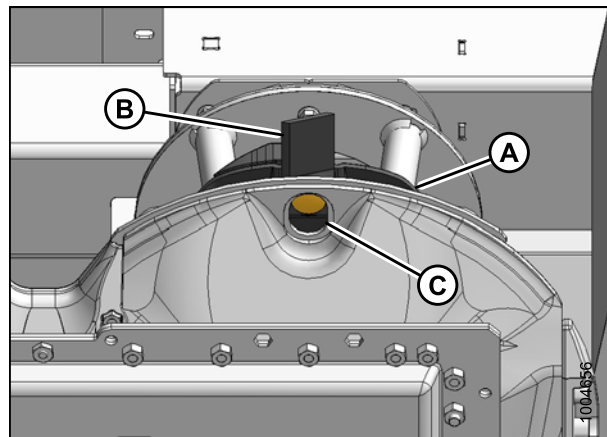


Figure 5.22: Cutter Blades

## MAINTENANCE AND SERVICING

- Remove nut (A).
- Remove shoulder bolt (B) and blade (C).
- Install new or reversed blade (C) with shoulder bolt (B) onto disc.

**NOTE:**

Ensure shoulder bolt is fully engaged into blade before tightening nut.

**NOTE:**

Ensure blade is installed correctly to suit rotation of disc. Refer to:

- [5.18: Counterclockwise Disc Rotation Direction, page 122](#)
- [5.19: Clockwise Disc Rotation Direction, page 122](#)

If you are unsure which direction the spindle rotates, Refer to [5.4.1 Direction of Spindle Rotation, page 118](#).

- Install nut (A). Tighten nut to 100 ft·lbf (135 N·m).
- Remove block of wood (if used).

### **WARNING**

Ensure cutterbar is completely clear of foreign objects. These objects can be ejected with considerable force when the machine is started and may result in serious injury or machine damage.

- Close the cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).

## 5.4.6 Accelerators

Two accelerators (A) are mounted on each outboard disc. They are designed to quickly move the cut material off the disc and into the auger and conditioner.

Accelerators are replaceable and should be inspected periodically for damage and loose or missing fasteners.

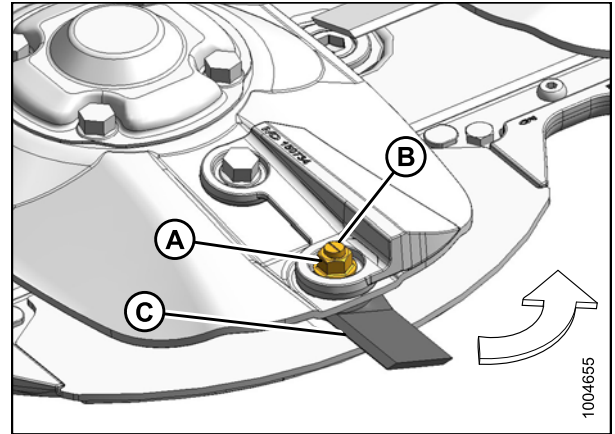


Figure 5.23: Cutter Blades

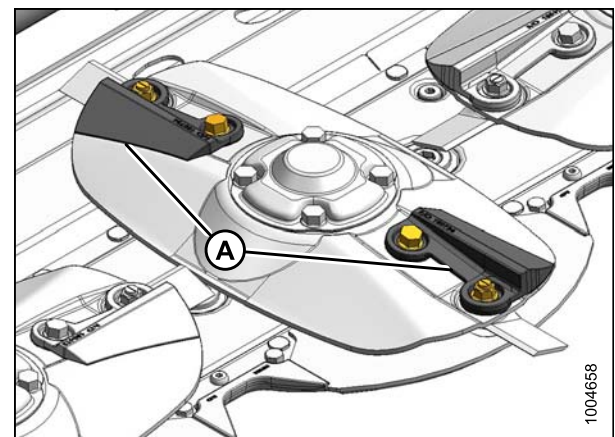


Figure 5.24: Outboard Disc

### Inspecting Accelerators

Follow these steps to inspect accelerators:

#### DANGER

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

1. Raise header fully, stop the engine, and remove the key.
2. Engage header safety props.
3. Open the cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).

#### CAUTION

Cutter blades have two cutting edges. Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

4. Inspect accelerators (A) and replace if severely damaged or worn.
5. Check for loose or missing fasteners and tighten or replace fastener if missing.

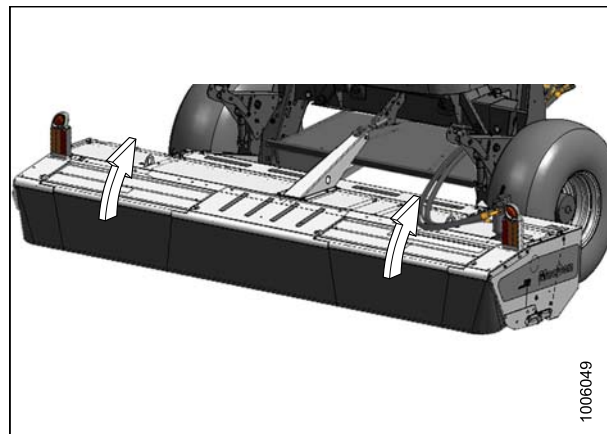


Figure 5.25: Cutterbar Doors

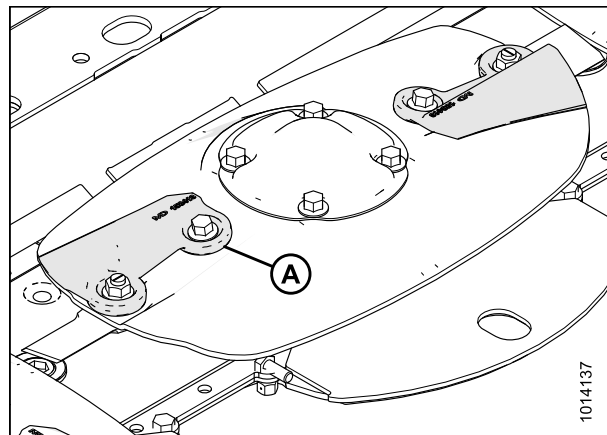


Figure 5.26: Inspecting Accelerators

### Replacing Accelerators

Follow these steps to replace the accelerators:

1. Raise header fully, stop the engine, and remove the key.
2. Engage header safety props.

## MAINTENANCE AND SERVICING

3. Remove disc (D). Refer to [5.4.3 Removing a Cutterbar Disc](#), page 119.
4. Remove bolt and nut (A) and nut (B) and remove accelerator (C) from disc (D).

### IMPORTANT:

Do NOT remove cutter blade bolt unless it or the blade are being replaced. Repeat for other accelerator.

5. Locate new accelerator on disc onto existing cutter blade bolt. Install nut (B).

### NOTE:

Accelerators are handed for clockwise or counterclockwise operation. Verify the direction of disc before installing accelerators.

6. Install hex bolt (A) and nut at inboard hole. Bolt head faces up.
7. Tighten both nuts to 100 ft-lbf (135 N·m).
8. Repeat for other accelerator.
9. Reinstall disc (D) on spindle. Refer to [5.4.4 Installing a Cutterbar Disc](#), page 120.
10. Remove block of wood (if used).



## WARNING

Ensure cutterbar is completely clear of foreign objects. These objects can be ejected with considerable force when the machine is started and may result in serious injury or machine damage.

11. Close the cutterbar doors. Refer to [3.5 Cutterbar Doors](#), page 33.

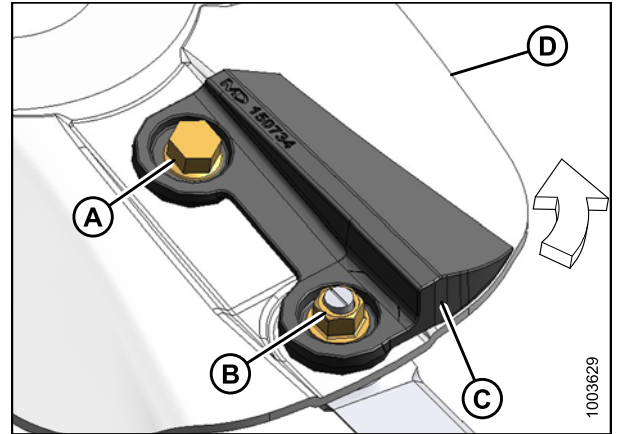


Figure 5.27: Disc Accelerator

## 5.4.7 Nut Shield

If accelerators are not used, nut shields will be required to protect the cutter blade nuts.

Nut shields are mounted on each outboard disc.

Nut shields are replaceable and should be inspected periodically for damage and loose or missing fasteners.

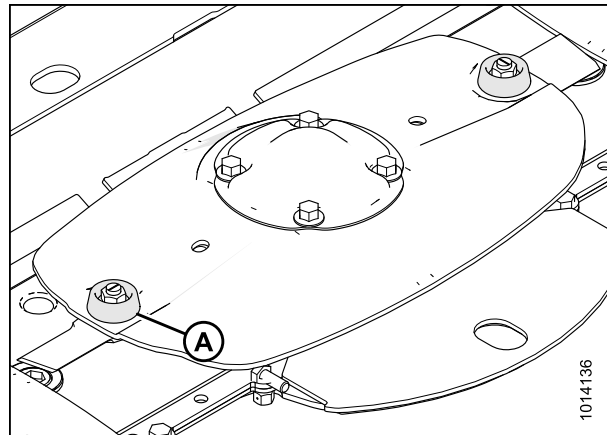


Figure 5.28: Inspecting Nut Shield

### *Inspecting Nut Shield*

1. Raise header fully, stop the engine, and remove the key.
2. Engage header safety props.
3. Open the cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).

### CAUTION

Cutter blades have two cutting edges. Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

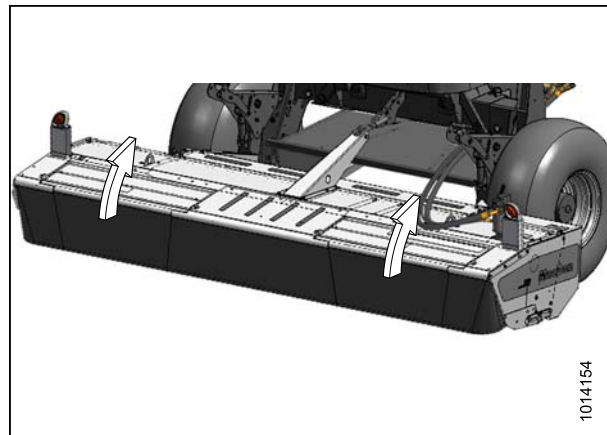


Figure 5.29: Cutterbar Doors

## MAINTENANCE AND SERVICING

4. Inspect nut shields (A) and replace if severely damaged or worn.
5. Check for loose or missing fasteners and tighten or replace fastener if missing.

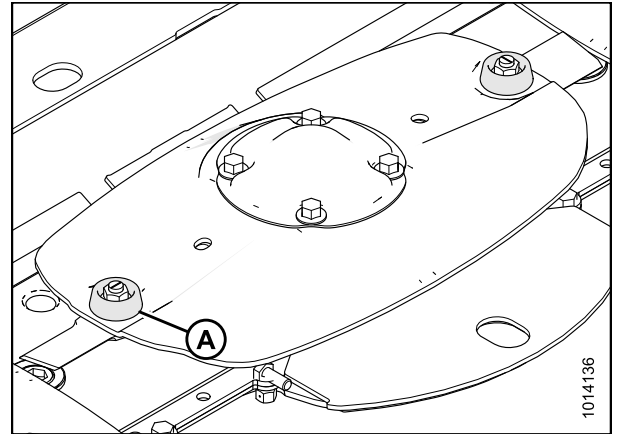


Figure 5.30: Inspecting Nut Shield

### Replacing Nut Shield

1. Raise header fully, stop the engine, and remove the key.
2. Engage header safety props.
3. Remove disc (C). Refer to [5.4.3 Removing a Cutterbar Disc, page 119](#).
4. Remove nut shield by loosening nut (A) and removing nut shield (B) from disc (C).

#### **IMPORTANT:**

Do NOT remove cutter blade bolt unless it or the blade are being replaced. Repeat for other accelerator.

5. Locate new nut shield (B) on disc (C) and align with existing cutter blade bolt. Install nut (A).
6. Tighten nut. Torque to 100 ft-lbf (135 N·m).
7. Reinstall disc (D) on spindle. Refer to [5.4.4 Installing a Cutterbar Disc, page 120](#).
8. Remove block of wood (if used).

#### **⚠ WARNING**

Ensure cutterbar is completely clear of foreign objects. These objects can be ejected with considerable force when the machine is started and may result in serious injury or machine damage.

9. Close cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).

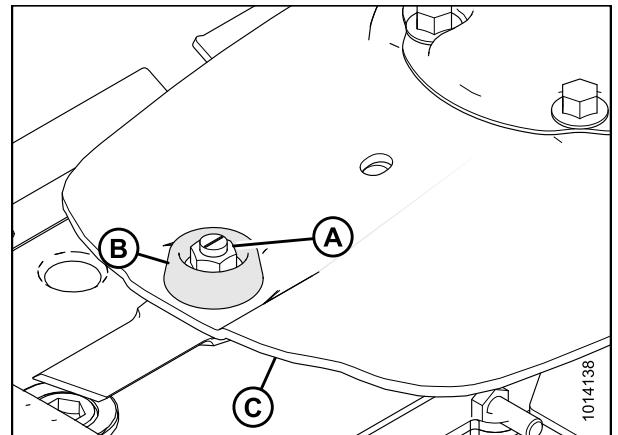


Figure 5.31: Disc Accelerator

## 5.4.8 Rotary Deflectors

The rotary cage deflectors are designed to deliver the cut material from the ends of the cutterbar into the auger and to assist in maintaining an even flow of crop into the conditioner.

Rotary deflectors should be checked daily for damage or wear.

### *Inspecting Rotary Deflectors*

#### **DANGER**

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

1. Lower the header fully.
2. Stop the engine and remove the key.
3. Open the cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).
4. Check that deflectors (A) are not damaged or bent by rocks and for loose fasteners.
5. Replace deflectors (A) if they are severely damaged or worn. Do **NOT** repair. Refer to:
  - [Removing the Driven Deflector, page 130](#)
  - [Installing the Driven Deflector, page 131](#)
  - [Removing the Driveline Deflector, page 131](#)
  - [Installing the Driveline Deflector, page 132](#)
6. Tighten loose fasteners.

#### **WARNING**

**Ensure cutterbar is completely clear of foreign objects. These objects can be ejected with considerable force when the machine is started and may result in serious injury or machine damage.**

7. Close the cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).

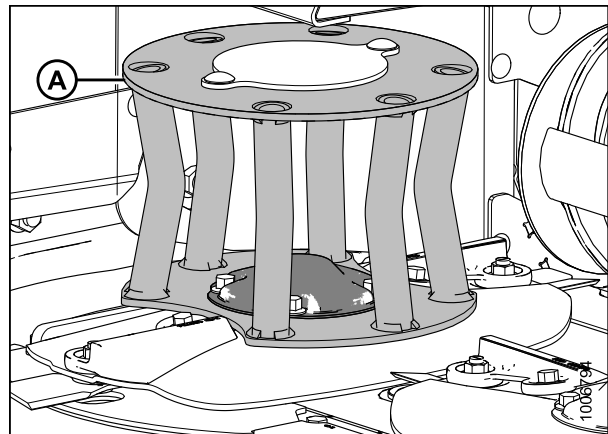
### *Removing the Driven Deflector*

Follow these steps to replace the driven rotary deflector:

#### **DANGER**

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

1. Lower the header fully.
2. Stop the engine and remove the key.
3. Open the cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).



**Figure 5.32: Rotary Deflector**



## MAINTENANCE AND SERVICING

4. Remove four bolts (A).
5. Remove cover (B) and deflector (C).

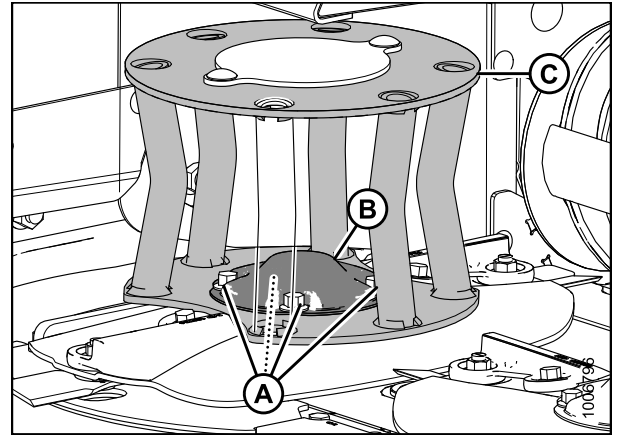


Figure 5.33: Driven Deflector

### *Installing the Driven Deflector*

Follow these steps to replace the driven rotary deflector:

1. Position new deflector (C) on spindle so that it clears accelerators (D).
2. Install cover (B) and secure with four bolts (A).
3. Tighten bolts.
4. Remove block of wood (if used).

#### **WARNING**

Ensure cutterbar is completely clear of foreign objects. These objects can be ejected with considerable force when the machine is started and may result in serious injury or machine damage.

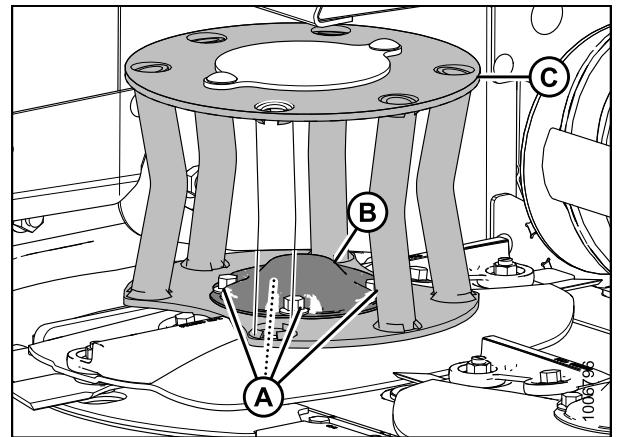


Figure 5.34: Driven Deflector

### *Removing the Driveline Deflector*

Follow these steps to replace the driveline deflector:

#### **DANGER**

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

1. Lower the header fully.
2. Stop the engine and remove the key.
3. Open the cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).

## MAINTENANCE AND SERVICING

4. Locate the deflector (C) with the driveline in the center of it.
5. Remove the four bolts (A) that secure the driveline (B) and disc to the spindle.
6. Rotate the deflector (C) as required so the large opening in deflector faces you.
7. Remove the driveline (B) through the larger opening in the deflector.

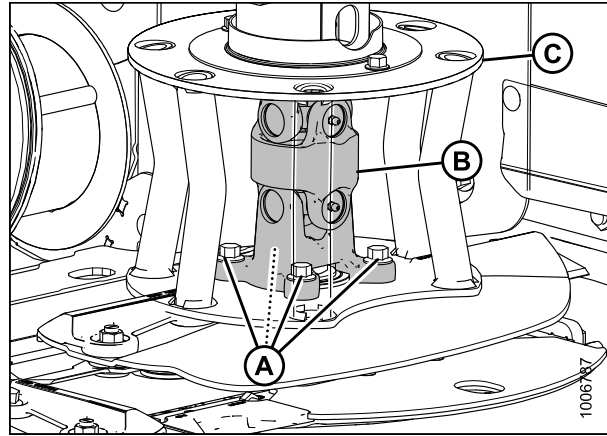


Figure 5.35: Driveline Deflector

8. Loosen the four bolts (A) in the two plates (B) that hold the upper driveline shield (C) in place.
9. Move the plates (B) so that shield (C) can be lowered into deflector (D).
10. Remove the deflector (D).

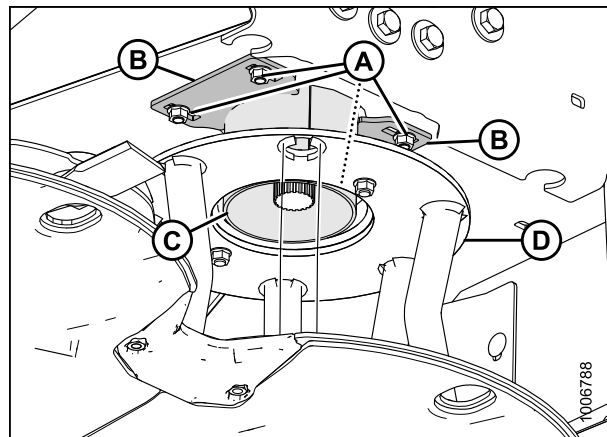


Figure 5.36: Driveline Deflector

### *Installing the Driveline Deflector*

Follow these steps to replace the driveline deflector:

1. Position the deflector (D) and upper driveline shield onto spindle.
2. Raise upper driveline shield (C) into position and slide plates (B) into slots in shield. Do not tighten bolts.

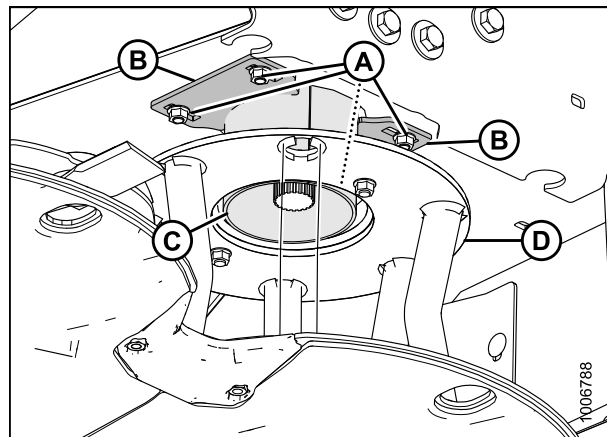


Figure 5.37: Driveline Deflector

## MAINTENANCE AND SERVICING

3. Insert driveline (B) into deflector (C) and install onto shaft. Ensure that driveline (B) grease zerks will be accessible through large opening in deflector.
4. Align mounting holes in deflector (C), spindle, and driveline (B) and reinstall four bolts (A). Tighten bolts.
5. Adjust the upper driveline shield to achieve consistent gap around deflector shield (C).

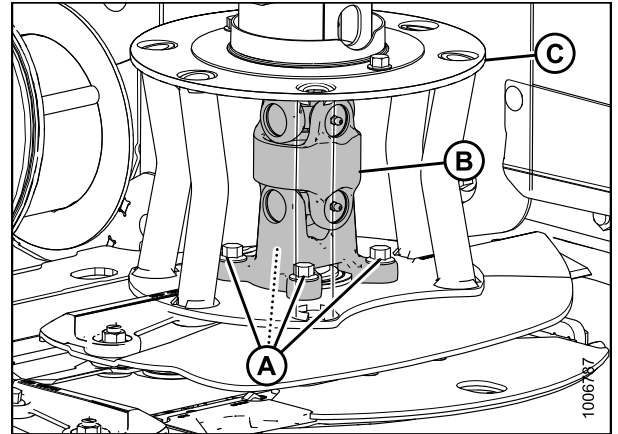


Figure 5.38: Driveline Deflector

6. Tighten bolts (A) on shield plates (B).
7. Remove block of wood (if used).
8. Manually rotate discs to check for interference of adjacent parts.
9. Close cutterbar doors. Refer to [3.5 Cutterbar Doors, page 33](#).

### **WARNING**

Ensure cutterbar is completely clear of foreign objects. These objects can be ejected with considerable force when the machine is started and may result in serious injury or machine damage.

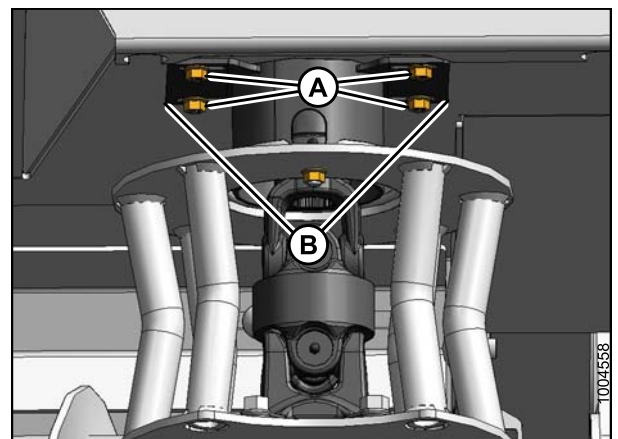


Figure 5.39: Driveline Deflector

## 5.5 Drive Systems

### 5.5.1 Bevel Gearbox

The bevel gearbox (A), which transfers power from the hydraulic motor to the header drives, is located inside the drive compartment at the left end of the header.

If repairs are required, it should be removed and serviced at your Dealer.

The only regular servicing required is maintaining the lubricant level and changing the lubricant according to the intervals specified in this manual. Refer to [5.3.1 Maintenance Schedule/Record, page 103](#).

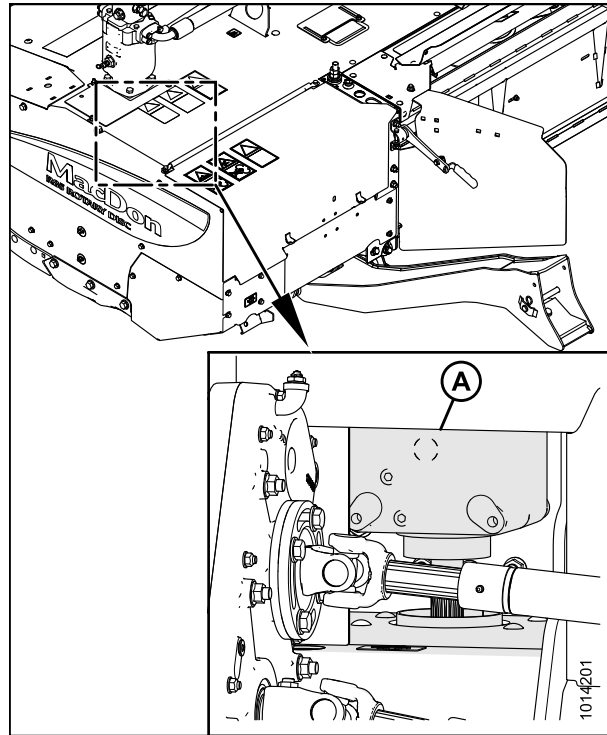


Figure 5.40: Bevel Gearbox

#### *Changing the Bevel Gearbox Lubricant*

Follow these steps to change the bevel gearbox lubricant:

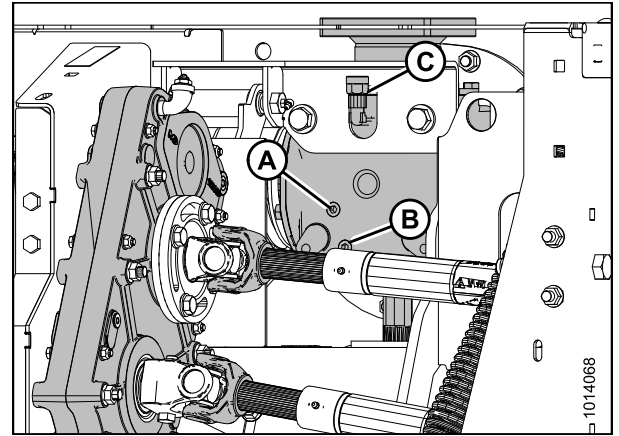
#### **⚠ DANGER**

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

1. Drain the gearbox when the lubricant is warm. If the lubricant is cold, idle the machine for about 10 minutes prior to draining.
2. Raise header to full height, stop the engine, and remove the key.
3. Engage header safety props. Refer to [3.3 Header Safety Props, page 28](#).
4. Open the driveshield. Refer to [3.4 Driveshields, page 30](#).

## MAINTENANCE AND SERVICING

5. Place a suitable container under drain plug (B).
6. Remove plugs (A) and (B).
7. Allow sufficient time for lubricant to drain.
8. Disengage header safety props, start engine, and lower header until the gearbox is level with the ground. Stop the engine and remove the key.
9. Install plug (B).
10. Remove breather from filler elbow (C).
11. Add gear lubricant to gearbox through port (A). Lubricant should slightly run out of port (A) when at the proper level. Refer to [5.2 Recommended Fluids and Lubricants, page 102](#) for quantity and specification.
12. Install plug (A) and breather (C), and tighten.
13. Properly dispose of used lubricant and clean up any spilled lubricant.
14. Close the driveshield.



**Figure 5.41: Bevel Gearbox**

### 5.5.2 Conditioner Drive Belt

The conditioner drive belt is located inside the left driveshield.

The tension is factory-set and should not require adjustment.

#### *Inspecting the Conditioner Drive Belt*

Check the belt tension and inspect for damage or wear every 100 hours or annually (preferably before the start of the cutting season).

#### **DANGER**

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

1. Lower header to ground, turn off engine, and remove key.

## MAINTENANCE AND SERVICING

2. Open the driveshield. Refer to [3.4 Driveshields, page 30](#).

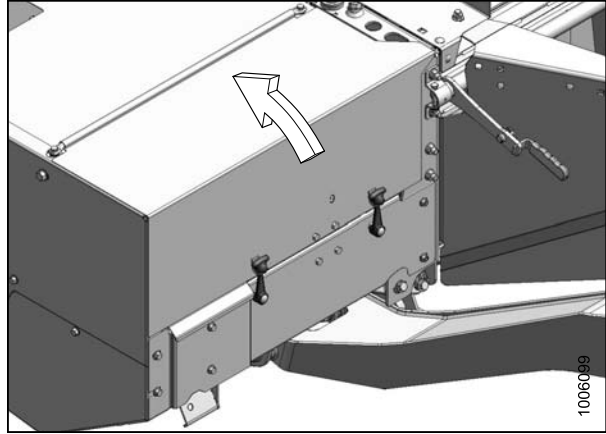


Figure 5.42: Driveshield

3. Inspect the condition of belt (A). Replace if damaged or showing signs of cracking or separation.
4. Check that adjuster nut (B) is tight.
5. Check that end of slots (C) are aligned with plate (D).
6. If necessary, adjust tension as follows:
  - a. Loosen jam nut (E).
  - b. Turn adjuster nut (B) until end of slots (C) are aligned with plate (D).
  - c. Tighten jam nut (E).
7. Close driveshield.

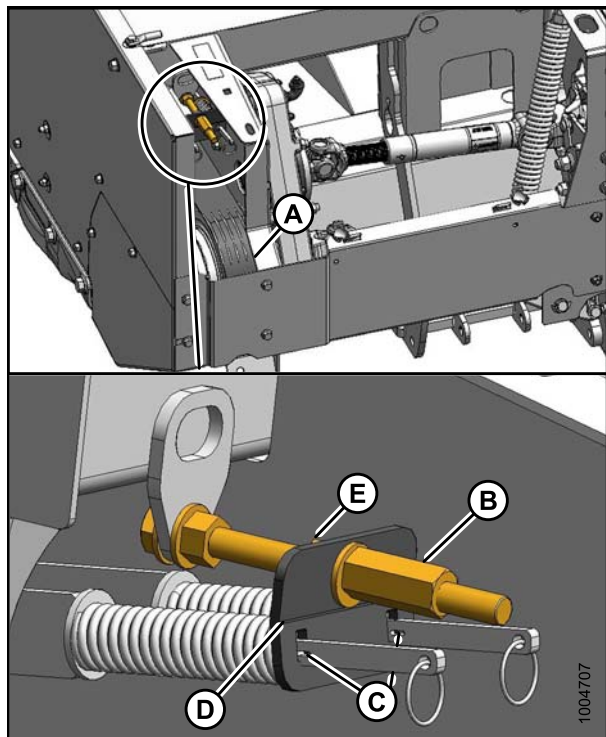


Figure 5.43: Conditioner Drive Belt Adjuster

### *Replacing the Conditioner Drive Belt*

#### **DANGER**

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

## MAINTENANCE AND SERVICING

1. Lower header to ground, turn the engine off, and remove the key.
2. Open the driveshield. Refer to [3.4 Driveshields, page 30](#).
3. Remove the auger drive belts (A). Refer to [Replacing the Auger Drive Belts, page 144](#).

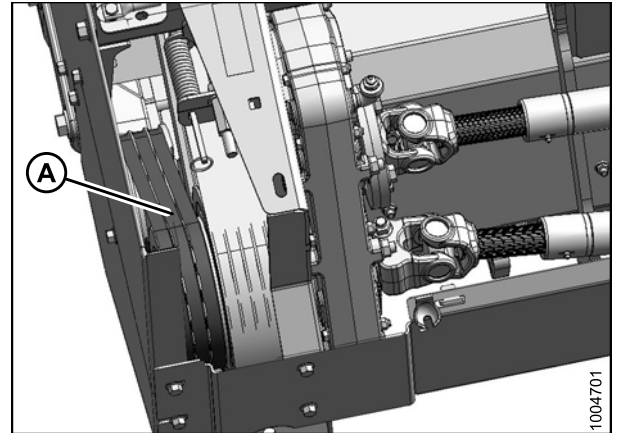


Figure 5.44: Drive Belts (Left Side)

4. Turn adjuster nut (A) counterclockwise until springs are loose and there is no tension on belt (B).

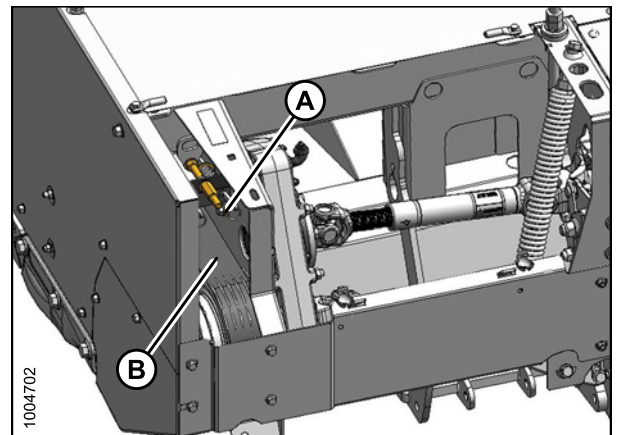


Figure 5.45: Drive Belts (Left Side)

5. Remove conditioner drive belt (A).
6. Install new conditioner drive belt (A) onto pulleys ensuring it is in the pulley grooves.
7. Tension conditioner drive belt (A). Refer to [Inspecting the Conditioner Drive Belt, page 135](#).
8. Install and tension auger drive belts. Refer to [Replacing the Auger Drive Belts, page 144](#).
9. Close driveshield.

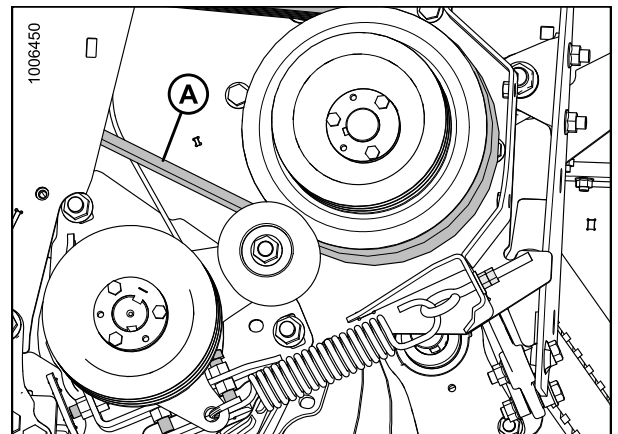


Figure 5.46: Drive Belts (Left Side)



### 5.5.3 Conditioner Gearbox

The conditioner gearbox (A), which transfers power from the bevel gearbox to the conditioner rolls and to the overshot auger, is located inside the drive compartment at the left end of the header.

The only regular servicing required is maintaining the lubricant level and changing the lubricant according to the intervals specified in this manual. Refer to [5.3.1 Maintenance Schedule/Record, page 103](#).

If repairs are required, the conditioner gearbox should be removed and serviced at your MacDon Dealer.

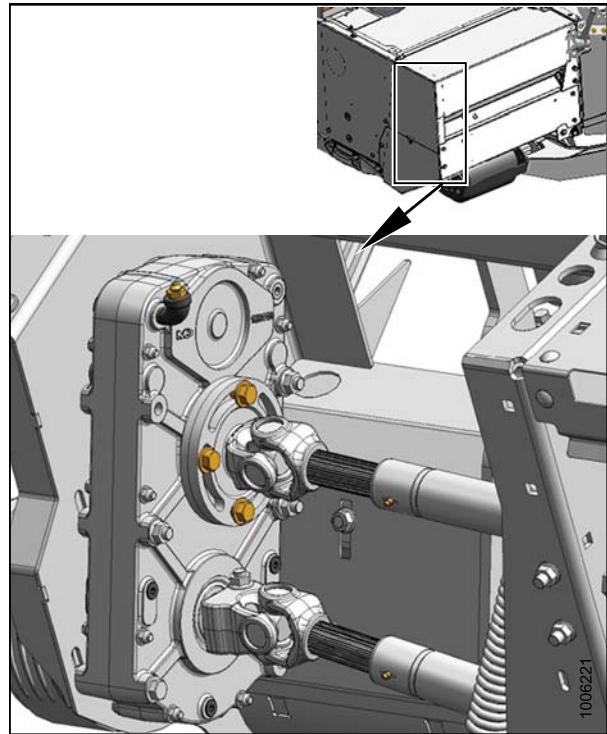


Figure 5.47: Conditioner Gearbox

#### *Changing the Conditioner Gearbox Lubricant*

Follow these steps to change the conditioner gearbox lubricant:

#### **⚠ DANGER**

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

#### **NOTE:**

Drain the gearbox when the lubricant is warm. If the lubricant is cold, idle the machine for about 10 minutes prior to draining.



## MAINTENANCE AND SERVICING

1. Angle the header until the gearbox (A) is level to the ground (B). Refer to [4.6 Header Angle, page 79](#) for the adjustment procedure.
2. Stop the engine, and remove the key.
3. Engage header safety props. Refer to [3.3 Header Safety Props, page 28](#).

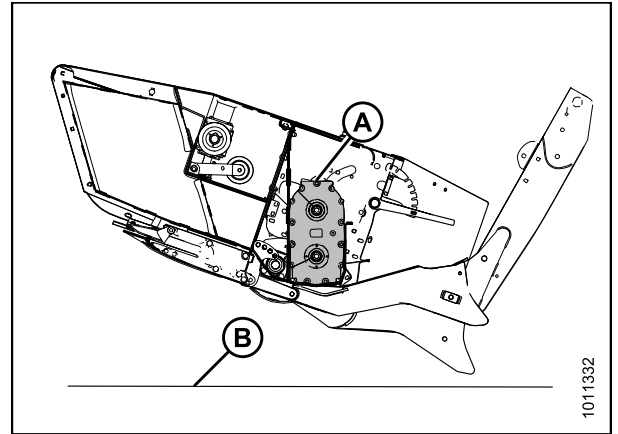


Figure 5.48: Conditioner Gearbox Orientation

4. Open the driveshield. Refer to [3.4 Driveshields, page 30](#).

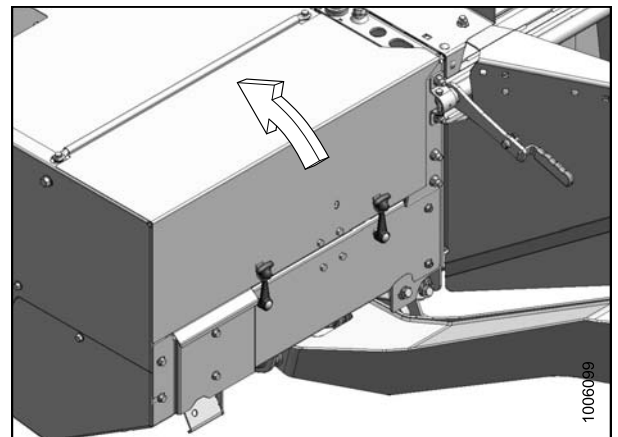


Figure 5.49: Driveshield

5. Place a suitable container under drain plug (A).
6. Remove plugs (A) and (B).
7. Allow sufficient time for lubricant to drain.
8. Replace plug (A) and tighten.

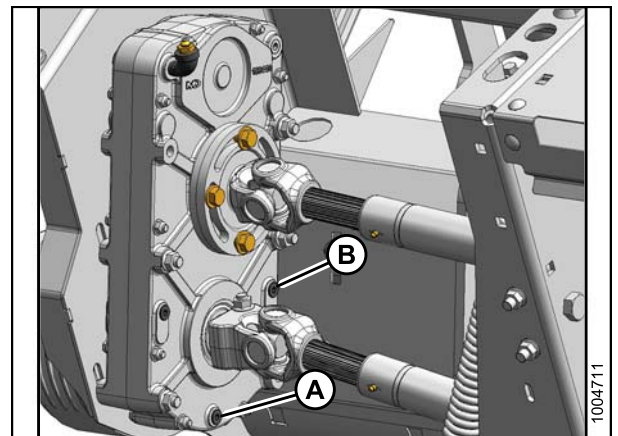


Figure 5.50: Conditioner Gearbox

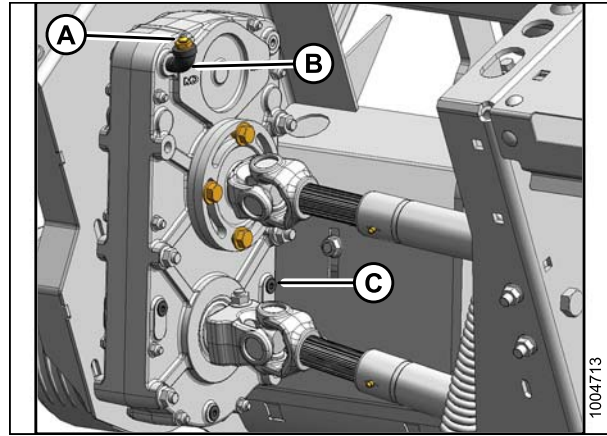
## MAINTENANCE AND SERVICING

9. Remove breather and bushing (A) at filler pipe (B).
10. Add gear lubricant to gearbox through filler pipe (B). Refer to [5.2 Recommended Fluids and Lubricants, page 102](#) for specification.

**NOTE:**

To check the lubricant level, tilt the header so the top of the gearbox is level with the ground. Lubricant should run out of port (C) slightly when at the proper level.

11. Reinstall plug (C) and tighten.
12. Reinstall bushing and breather (A) in filler pipe (B) and tighten.
13. Properly dispose of used lubricant and clean up any spilled lubricant.
14. Close the driveshield. Refer to [3.4 Driveshields, page 30](#).



**Figure 5.51: Conditioner Gearbox**

## 5.5.4 Header Drive Speed Sensor

The header drive speed sensor monitors the rotational speed of the bevel gearbox pulley and sends a signal to the system monitor in the operator's station to display disc speed.

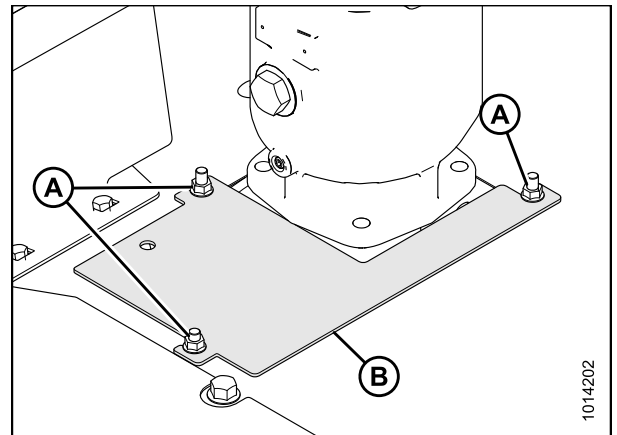
The sensor does not require regular maintenance; if it malfunctions or is damaged, it can be easily adjusted or replaced.

### *Adjusting the Header Drive Speed Sensor*

#### **DANGER**

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

1. Lower header to ground, turn off engine, and remove key.
2. Loosen bolts (A) and slide cover (B) off opening.

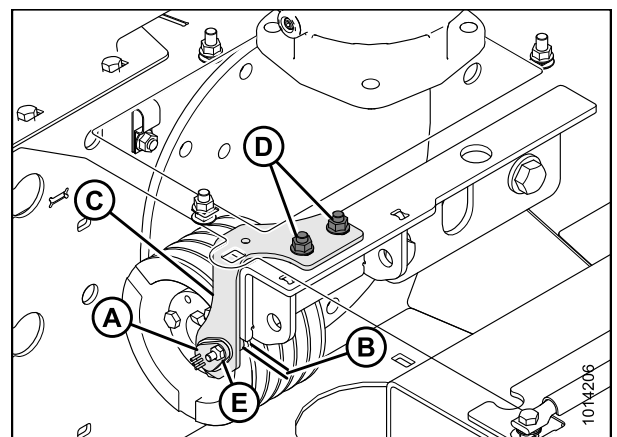


**Figure 5.52: Header Drive**

3. Check gap (B) between sensor (A) and pulley. If required, adjust gap by loosening bolts (D) and moving bracket (C) to achieve 0.08–0.12 in. (2–3 mm) gap (B). When correct gap is achieved, tighten bolts (D).
4. Check position of sensor (A). If required, adjust position by loosening bolt (E) and moving sensor to align it with rim of pulley.

**NOTE:**

Top panel removed for clarity.



**Figure 5.53: Header Drive Speed Sensor**

## MAINTENANCE AND SERVICING

### Replacing the Header Drive Speed Sensor

1. Loosen bolts (A) and remove the cover (B).

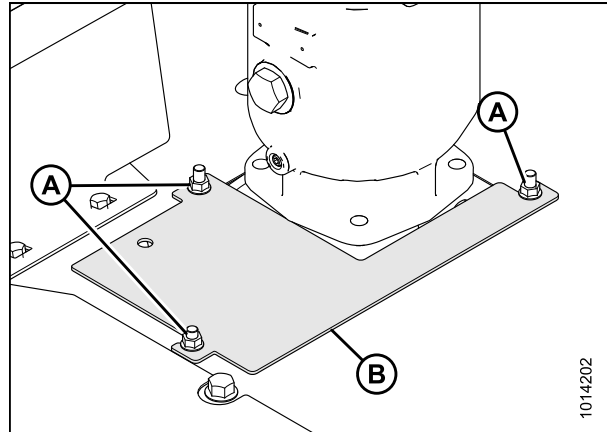


Figure 5.54: Header Drive Cover

2. Cut and remove plastic tie securing harness to bracket (C).
3. Unplug sensor wire from connector (A).
4. Remove nut and bolt (E) securing sensor (A) to bracket (C) and remove the sensor (A).
5. Install the new sensor (A) onto the bracket (C) with bolt and nut (E). Ensure sensor is aligned with the pulley rim.
6. Check that gap (B) between sensor and pulley is 0.08 in. (2 mm). Adjust as required.
7. Connect sensor wire to connector (A).
8. Secure harness to bracket with plastic tie.

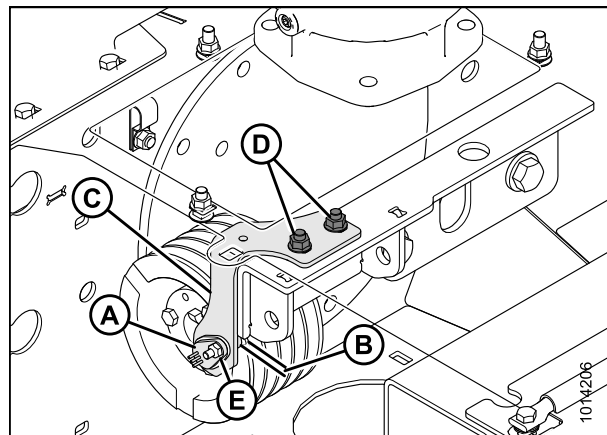


Figure 5.55: Header Drive Speed Sensor

#### NOTE:

Top panel removed for clarity.

9. Reinstall cover (B) and secure with bolts (A).

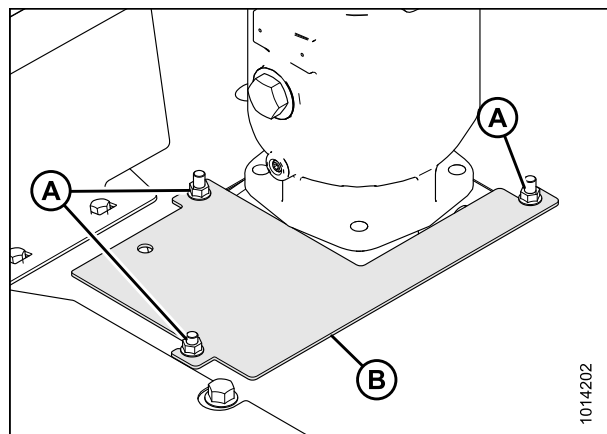


Figure 5.56: Header Drive Cover

## 5.5.5 Auger Drive Belt

The auger drive belts are located inside the drive compartment at the lower left end of the mower/header.

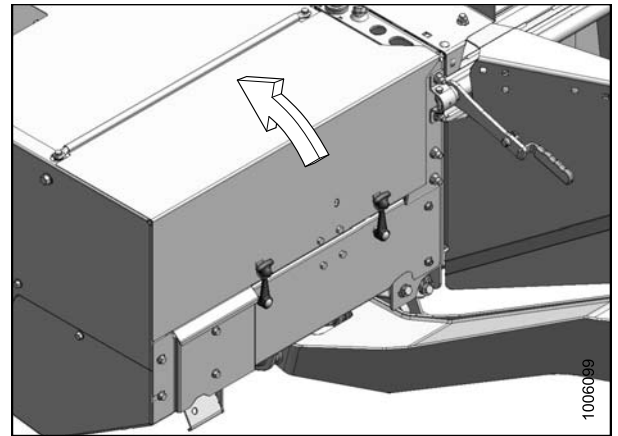
Check the belt tension and inspect for damage or wear every 100 hours or annually, preferably before the start of the cutting season.

### *Inspecting and Adjusting the Auger Drive Belts*

#### **DANGER**

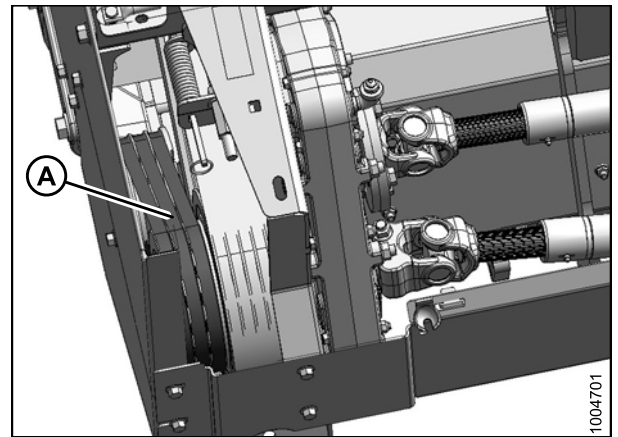
**To avoid bodily injury or death from unexpected startup of the machine, always stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.**

1. Lower header to ground, stop the engine and remove the key.
2. Open the driveshield. Refer to [3.4 Driveshields, page 30](#).



**Figure 5.57: Driveshield**

3. Check condition of auger drive belts (A). If severely worn or damaged, replace them. Refer to [Replacing the Auger Drive Belts, page 144](#).
4. Raise header fully, stop the engine, and remove the key.
5. Engage header safety props. Refer to [3.3 Header Safety Props, page 28](#).



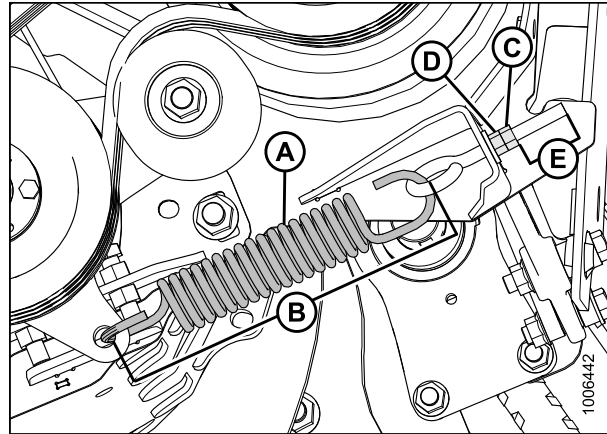
**Figure 5.58: Auger Drive Belts**

**Belt Tension Spring (Eye Bolt Style)**

6. To check the belt tension, spring (A) length should measure 10.3 in. (262 mm) (B). If necessary, adjust belt tension as follows:
  - a. Loosen jam nut (C).
  - b. Adjust eye bolt with adjuster bolt (D) until spring length (B) is achieved.
  - c. Tighten jam nut (C).

**NOTE:**

Edge of eye bolt to jam nut (E) should measure 1.6 in. (41 mm).



**Figure 5.59: Belt Tension Spring**

7. Close driveshield. Refer to [3.4 Driveshields, page 30](#).

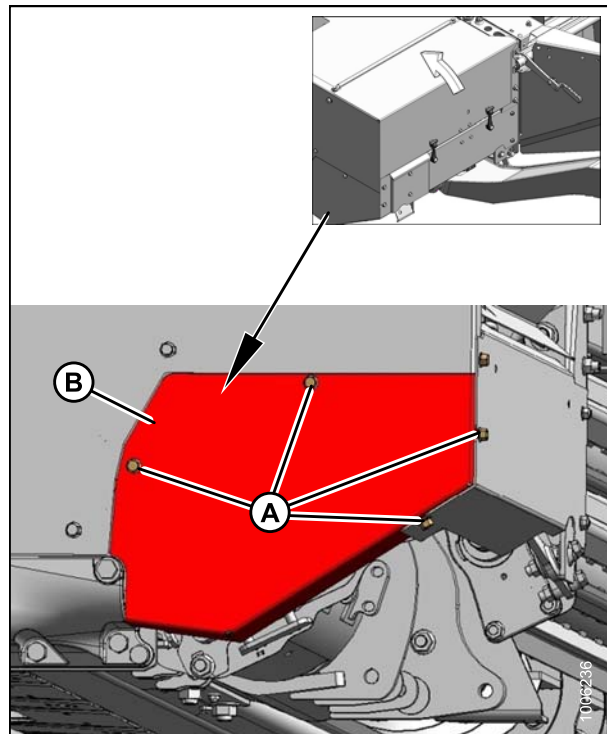
*Replacing the Auger Drive Belts*

Follow these steps to replace the auger drive belts:

**⚠ DANGER**

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

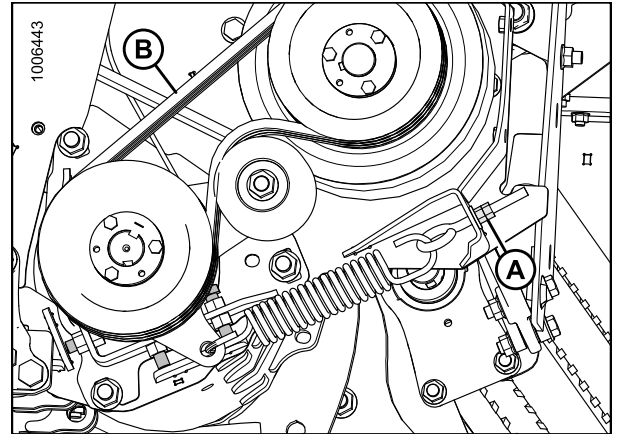
1. Raise header fully, stop the engine, and remove the key.
2. Engage header safety props. Refer to [3.3 Header Safety Props, page 28](#).
3. Open driveshield. Refer to [3.4 Driveshields, page 30](#).
4. Remove/loosen four bolts (A) and remove cover (B).



**Figure 5.60: Drive Cover – SP**

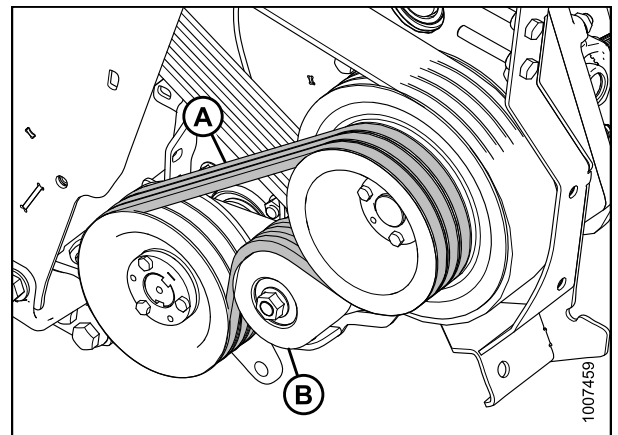
## MAINTENANCE AND SERVICING

5. Loosen jam nut (A) to release tension on auger drive belts (B).
6. Remove all three belts.



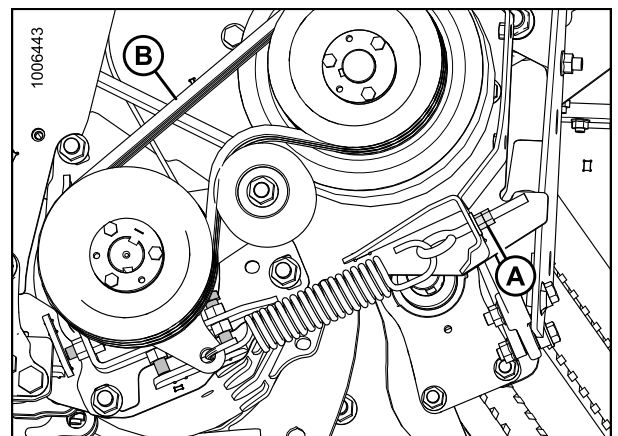
**Figure 5.61: Auger Drive Belts**

7. Install belts (A) on the pulleys. Ensure they are seated in the pulley grooves.
8. Check alignment of belts on pulleys. Belts must not overhang the edge of idler pulley (B). Contact your MacDon Dealer if pulleys need realigning.



**Figure 5.62: Auger Drive Belts**

9. Tension the belts with adjuster nuts (A). Refer to [Inspecting and Adjusting the Auger Drive Belts, page 143](#).



**Figure 5.63: Auger Drive Belts**

## MAINTENANCE AND SERVICING

10. Reinstall cover (B) with bolts (A).
11. Close driveshield.
12. Adjust the tension of new belts after a short run-in period (about 5 hours).

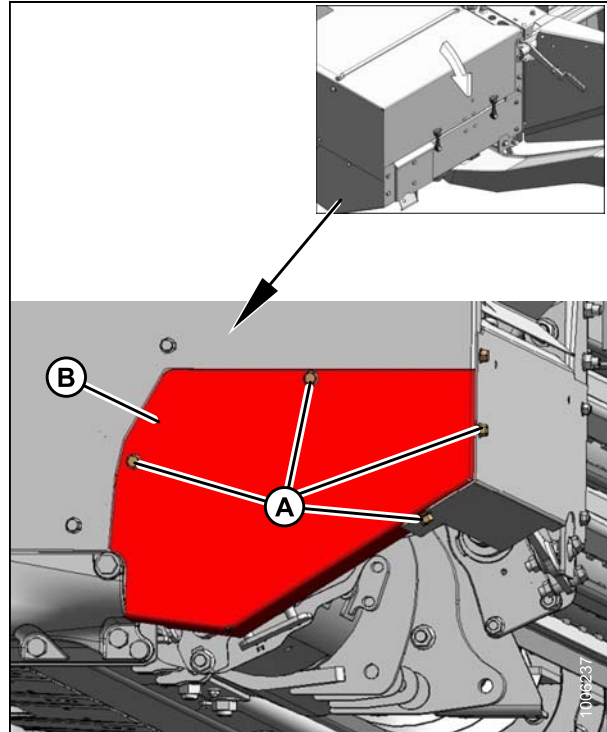


Figure 5.64: Drive Cover – SP

### 5.5.6 Installing Sealed Bearings

Follow these steps to install sealed bearings:

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) the flangette bolts (E).
4. When the shaft is correctly located, lock the lock collar with a punch.

**NOTE:**

The collar should be locked in the same direction the shaft rotates. Tighten the setscrew in the collar.

5. Tighten the flangette bolts.
6. Loosen the flangette bolts on the mating bearing one turn and retighten. This will allow the bearing to line up.

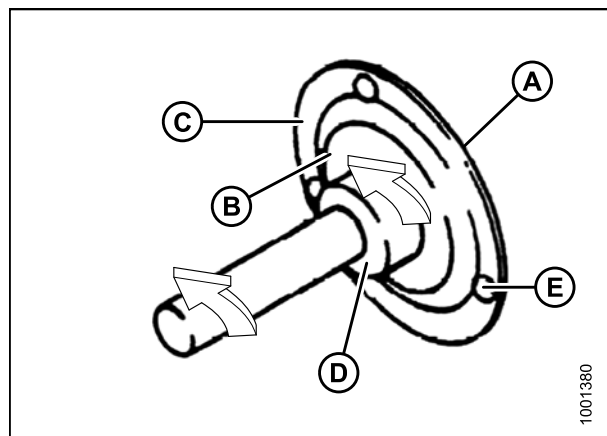


Figure 5.65: Sealed Bearing



## 5.6 Hydraulics

Refer to your windrower operator's manual for hydraulic system maintenance procedures.

### 5.6.1 Hydraulic Motor

The hydraulic motor does not require regular maintenance or servicing. If repairs are required, it should be serviced at your Dealer.

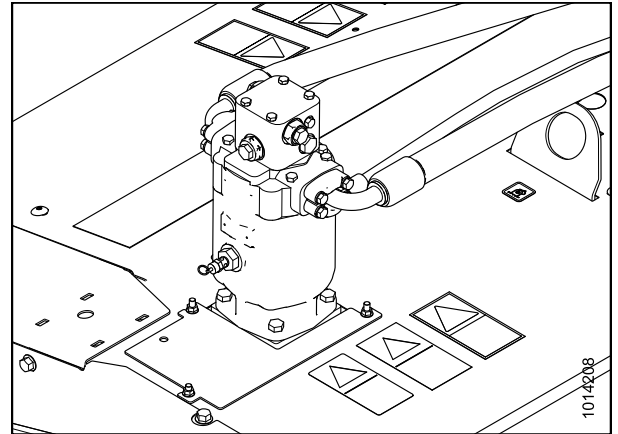


Figure 5.66: Hydraulic Motor

#### *Removing the Hydraulic Motor*

Follow these steps to remove the hydraulic motor:

#### **⚠ DANGER**

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

1. If the machine is connected to the windrower, lower header to ground, stop the engine, and remove the key.
2. Disconnect case drain hose (A) from motor (B).
3. Disconnect pressure and return hoses at fittings (C).

#### **IMPORTANT:**

To protect the motor from contamination and prevent spillage of excess fluid, install caps and plugs on open fittings and hoses.

4. Remove four bolts (D).
5. Use a sling and a lifting device to remove the motor.

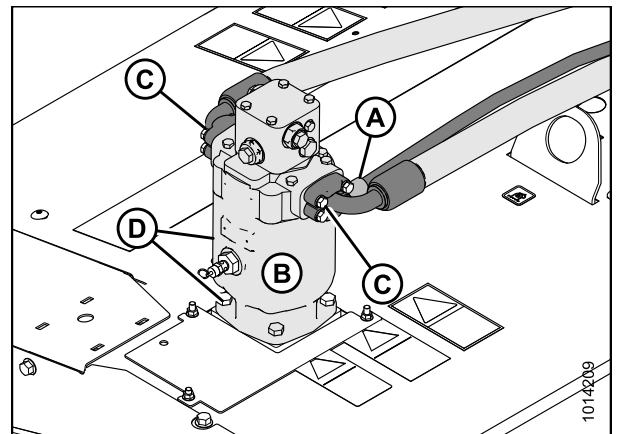


Figure 5.67: Hydraulic Motor

## MAINTENANCE AND SERVICING

6. Cover gearbox opening (A) with a rag or plastic.

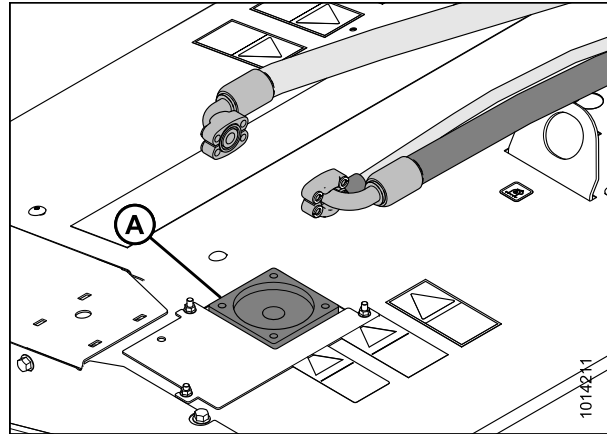


Figure 5.68: Hydraulic Motor Removed

### *Installing the Hydraulic Motor*

Follow these steps to install the hydraulic motor:

1. Remove covering from gearbox opening (A).
2. Attach a sling to the motor with the opposite end to a lifting device.

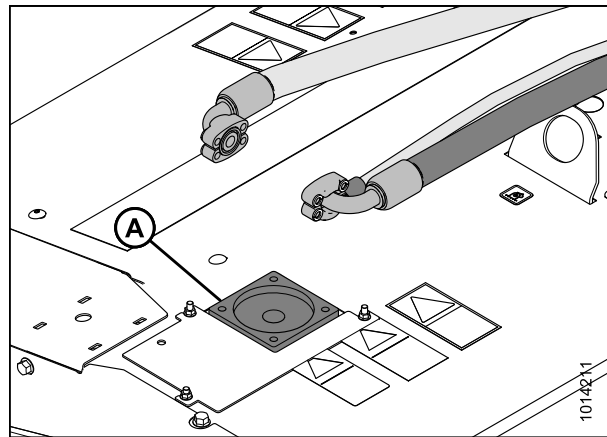


Figure 5.69: Hydraulic Motor Removed

3. Lower the motor (B) on gearbox opening.
4. Install four bolts (D) and torque to 103 ft·lbf (140 N·m).
5. Remove caps from motor ports and hoses.
6. Connect case drain hose (A) to motor.
7. Connect hoses (C) to motor (B) with split flanges (E) and torque to 47–57 ft·lbs (64–77 N·m).

**NOTE:**

Hydraulic connections vary depending on the windrower. Refer to the specific instruction supplied with your hydraulic drive kit.

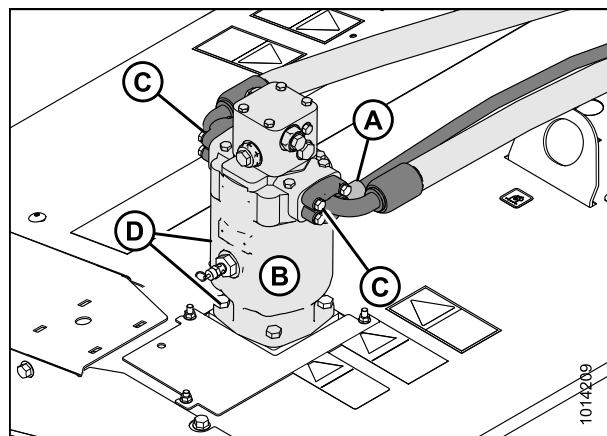


Figure 5.70: Hydraulic Motor: 16-foot

## 5.6.2 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.**

### IMPORTANT:

Keep hydraulic coupler tips and connectors clean. Allowing dust, dirt, water, or foreign material to enter the system is the major cause of hydraulic system damage. Do NOT attempt to service hydraulic systems in the field. Precision fits require a perfectly clean connection during overhaul.



Figure 5.71: Hydraulic Pressure Hazard

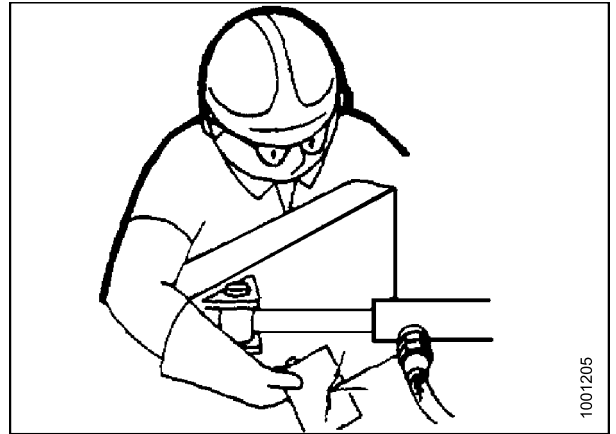


Figure 5.72: Testing for Hydraulic Leaks

## 5.7 Electrical

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

Keep lights clean and replace defective bulbs.

### DANGER

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

### 5.7.1 Hazard Lights

#### *Hazard Lights: Replacing Bulbs and Lenses*

Follow these steps to replace a hazard light bulb or lens:

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

**NOTE:**

Refer to header parts catalog for bulb part number.

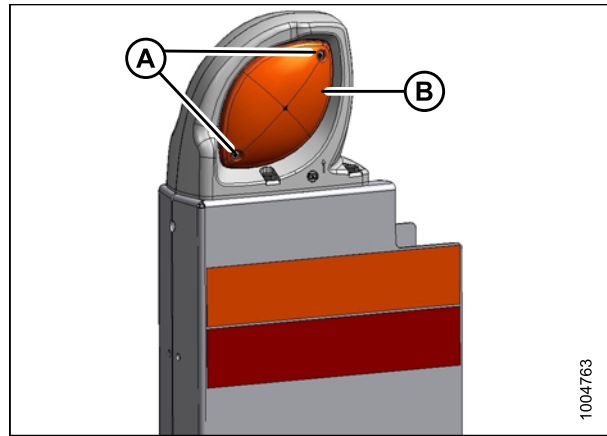


Figure 5.73: Hazard Lights

#### *Hazard Lights: Replacing the Lamp Assembly*

Follow these steps to replace the lamp assembly:

1. Remove four bolts (A) and nuts, and remove lamp assembly (B) from lamp bracket (C).
2. Disconnect lamp wires from wiring harness at connectors (D).
3. Connect new lamp wires to wiring harness (D).
4. Place lamp assembly (B) on lamp bracket (C) and secure with four bolts (A) and nuts.

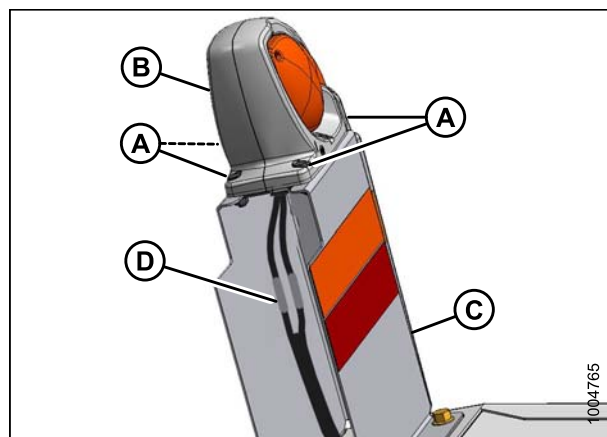


Figure 5.74: Hazard Lights

## MAINTENANCE AND SERVICING

### *Hazard Lights: Replacing the Lamp Bracket*

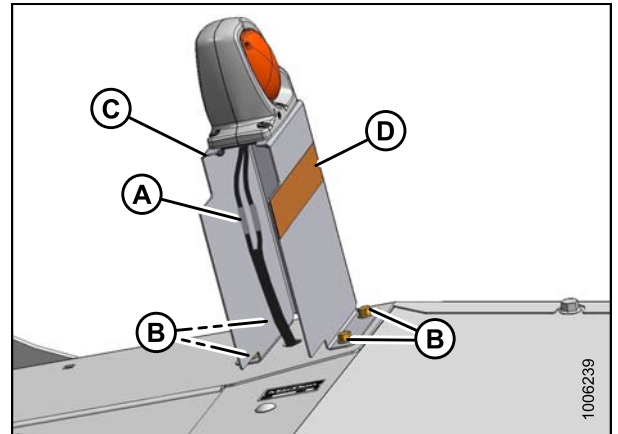
Follow these steps to replace the lamp bracket:

1. Disconnect lamp wires from wiring harness at connectors (A).
2. Remove four bolts (B) and remove lamp assembly (C) from header.
3. Place new lamp assembly (C) on header and secure with four bolts (B).

**NOTE:**

Ensure amber reflector (D) faces the front of the machine.

4. Connect lamp wires to wiring harness (A).



**Figure 5.75: Hazard Lights**



## 6 Troubleshooting

### 6.1 Mower Performance

Symptom	Problem	Solution	Refer to
Cutterbar plugging	Dull, bent, or badly worn blades	Replace blades.	<a href="#">Replacing the Cutter Blades, page 124</a>
	Auger drive belt slipping	Adjust Tension or Change belts.	<a href="#">5.5.5 Auger Drive Belt, page 143</a> and <a href="#">5.5.2 Conditioner Drive Belt, page 135</a>
	Conditioner drive belt slipping		
	Built-up of dirt between rock guards	Decrease header angle and increase float. In some conditions, it may be necessary to carry header slightly with header lift cylinders.	<a href="#">4.6 Header Angle, page 79</a> and <a href="#">4.1 Header Float, page 67</a>
Decrease header angle and increase float.			
Strips of uncut crop left on field	Bent cutter blades	Replace blades.	<a href="#">Replacing the Cutter Blades, page 124</a>
	Excessive header speed	Reduce header disc speed.	<a href="#">4.8 Disc Speed, page 82</a>
	Foreign object on cutterbar	Disengage header and stop the engine. When all moving parts are completely stopped, remove foreign object.	<a href="#">4.16 Unplugging the Header, page 100</a>
	Ground speed too slow	Increase ground speed.	<a href="#">4.9 Ground Speed, page 83</a>
	Header float too light causing bouncing	Adjust to heavier float setting.	<a href="#">4.1 Header Float, page 67</a>
Cutting height varies from one side to the other	Float not properly balanced	Adjust header float.	<a href="#">4.1 Header Float, page 67</a>
	Header float too light causing bouncing	Adjust to heavier float setting.	<a href="#">4.1 Header Float, page 67</a>
	Excessive ground speed	Reduce ground speed.	<a href="#">4.9 Ground Speed, page 83</a>
	Header angle too flat for guards to pick up down crop	Increase header angle.	<a href="#">4.6 Header Angle, page 79</a>
Downed crop	Adjust header angle to cut closer to ground.		
Ragged or uneven cutting of crop	Header float too light causing bouncing	Adjust to heavier float setting.	<a href="#">4.1 Header Float, page 67</a>
	Excessive ground speed	Reduce ground speed.	<a href="#">4.9 Ground Speed, page 83</a>
	Header angle too flat for guards to pick up down crop	Increase header angle.	<a href="#">4.6 Header Angle, page 79</a>
	Downed crop	Adjust header angle to cut closer to ground.	

## TROUBLESHOOTING

Symptom	Problem	Solution	Refer to
Conditioner rolls plugging	Ground speed too fast	Reduce ground speed.	<a href="#">4.9 Ground Speed, page 83</a>
	Roll gap too large for proper feeding	Decrease roll gap.	<a href="#">4.2.2 Adjusting Roll Gap, page 70</a>
	Roll gap too small in thick stemmed cane-type crops	Increase roll gap.	
	Baffle set too low	Raise baffle.	<a href="#">4.5.3 Adjusting the Swath Baffle, page 77</a>
	Roll speed too low	Increase disc speed.	<a href="#">4.8 Disc Speed, page 82</a>
	Foreign object between rolls	Disengage header and stop the engine. When all moving parts are completely stopped, remove foreign object.	–
	Conditioner belt slipping	Adjust belt tension.	<a href="#">5.5.2 Conditioner Drive Belt, page 135</a>
	Auger belt slipping		<a href="#">5.5.5 Auger Drive Belt, page 143</a>
	Cutting height too low	Decrease header angle to raise cutting height.	<a href="#">4.6 Header Angle, page 79</a>
	Rolls improperly timed	Adjust roll timing.	<a href="#">4.4 Roll Timing, page 73</a>
Uneven formation and bunching of windrow	Rear deflector bypassing or dragging crop	Adjust rear deflector for proper crop control.	<a href="#">4.5.2 Adjusting the Rear Deflector (Fluffer Shield), page 77</a>
	Forming shields improperly adjusted	Adjust forming shield.	<a href="#">4.5 Forming Shields, page 75</a>
	Roll gap too large	Adjust roll gap.	<a href="#">4.2.2 Adjusting Roll Gap, page 70</a>
	Auger belts slipping	Replace belts.	<a href="#">5.5.5 Auger Drive Belt, page 143</a>
	Conditioner rolls running too slow	Maintain rated header speed.	Refer to windrower operator's manual
Uneven windrow formation in light crop	Uneven feeding	Reduce header speed.	
Plugging behind end cage deflectors	No cutting full header width	Cut full header width.	–
	Ground speed too slow	Increase ground speed.	<a href="#">4.9 Ground Speed, page 83</a>
Not cutting short enough in down crop	Ground speed too fast	Reduce ground speed.	<a href="#">Replacing the Cutter Blades, page 124</a>
	Broken, bent, or dull blades	Replace blades or turn blades over.	
	Cutting height too high	Adjust header angle to lower cutting height if field conditions allow.	<a href="#">4.6 Header Angle, page 79</a>



## TROUBLESHOOTING

Symptom	Problem	Solution	Refer to
Material being pulled out by roots when cutting tall crop leaning into machine	Crop in conditioner rolls before crop is cut	Increase roll gap.	<a href="#">4.2.2 Adjusting Roll Gap, page 70</a>
	Insufficient roll gap		
Damaged leaves and broken stems	Roll timing off	Check roll timing and adjust if necessary.	<a href="#">4.4 Roll Timing, page 73</a>
	Crop is bunched in windrow	Adjust forming shields/baffle.	<a href="#">4.5 Forming Shields, page 75</a>
Slow crop drying	Rolls not crimping crop sufficiently	Decrease roll gap.	<a href="#">4.2.2 Adjusting Roll Gap, page 70</a>
	Excessive crimping	Increase roll gap.	
Excessive drying or bleaching of crop	Crop is spread too wide in windrow	Adjust forming shields.	<a href="#">4.5 Forming Shields, page 75</a>
	Poorly formed or bunchy windrows		
	Forming shields not properly adjusted		

## TROUBLESHOOTING

### 6.2 Mechanical Problems

Symptom	Problem	Solution	Refer to
Excessive noise	Bent cutter blade	Replace blade.	<a href="#">Replacing the Cutter Blades, page 124</a>
	Conditioner roll timing off	Check roll timing and adjust if necessary.	<a href="#">4.4 Roll Timing, page 73</a>
	Conditioner roll gap too small	Check gap and adjust if necessary.	<a href="#">4.2.2 Adjusting Roll Gap, page 70</a>
Excessive vibration or noise in header	Conditioner rolls contacting each other	Increase roll gap.	<a href="#">4.4 Roll Timing, page 73</a>
		Check roll timing.	
	Auger center support loose	Tighten bolts on support.	<a href="#">4.13.1 Adjusting the Overshot Auger, page 92</a>
Mud deposits on conditioner rolls	Clean rolls.	–	
Excessive heat in cutterbar	Too much lubricant in cutterbar	Drain lubricant and refill with specified amount.	<a href="#">5.3.7 Lubricating the Cutterbar, page 113</a>
Frequent blade damage	Mud on cutterbar	Remove mud from cutterbar: do not allow mud to dry on cutterbar.	–
	Spindle bearing failure	Replace spindle bearing.	See MacDon Dealer
	Material wrapped around spindle	Remove disc and remove material.	<a href="#">5.4 Cutterbar Disc Maintenance, page 118</a>
	Cutting too low in rocky field conditions	Decrease header angle: increase float.	<a href="#">4.6 Header Angle, page 79</a> and <a href="#">4.1 Header Float, page 67</a>
	Ground speed too high in rocky field conditions. At High ground speed, header tends to dig rocks from ground instead of floating over them	Reduce ground speed.	<a href="#">4.9 Ground Speed, page 83</a>
	Blade incorrectly mounted	Check all blade mounting hardware ensuring blades are free to move.	<a href="#">Inspecting Cutter Blades, page 121</a>
	Header float set too heavy	Increase float.	
Machine pulling to one side	Header dragging to one end and pulling to that side	Adjust header float on both ends.	<a href="#">4.1 Header Float, page 67</a>

## TROUBLESHOOTING

Symptom	Problem	Solution	Refer to
Excessive wear of cutting components	Header angle too steep	Reduce header angle.	<a href="#">4.6 Header Angle, page 79</a>
	Crop residue and dirt deposits on cutterbar	Clean cutterbar.	—
	Mud on cutterbar	Remove mud from cutterbar: do not allow mud to dry on cutterbar.	
Breakage of conditioner drive belt	Improper belt tension	Adjust conditioner drive belt tension.	<a href="#">5.5.2 Conditioner Drive Belt, page 135</a>
	Belt not in proper groove in pulley	Move belt to proper groove.	
	Foreign object between rolls	Disengage header and stop the engine. When all moving parts are completely stopped, remove foreign object.	—
	Belt pulleys and idlers misaligned	Align pulleys and idler.	See MacDon Dealer
Discs don't turn when engaging header	Mud on cutterbar	Remove mud from cutterbar: do not allow mud to dry on cutterbar.	—
	Faulty drive belt	Check belt on pulleys.	<a href="#">5.5.2 Conditioner Drive Belt, page 135</a>
	Hoses not connected	Connect hoses.	<a href="#">3.7 Attaching the Header, page 41</a>
Header slows when going uphill	Hydraulic oil level in windrower is low	Add oil to windrower reservoir.	Refer to windrower operator's manual
Header runs while unloaded but slows or stops when starting to cut	Defective hydraulic motor	Repair/replace hydraulic motor.	See MacDon Dealer
	Defective hydraulic pump in windrower	Repair/replace pump.	
	Defective relief valve in windrower	Repair/replace relief valve.	
	Cold oil in hydraulic drive system	Reduce ground speed until oil reaches operating temperature.	<a href="#">4.9 Ground Speed, page 83</a>



## 7 Options and Attachments

### 7.1 Options and Attachments: Kits

The following kits are available through your MacDon Dealer. The Dealer will require the “B” number for pricing and availability.

#### 7.1.1 Adjustable Skid Shoe Kit

The skid shoe kit installs at either end of the cutterbar. The shoes can be adjusted for varying cutting height. The kit includes two skid shoe assemblies, attachment hardware, and installation instructions.

MD #B5660

Instruction Part Number: MD #169466

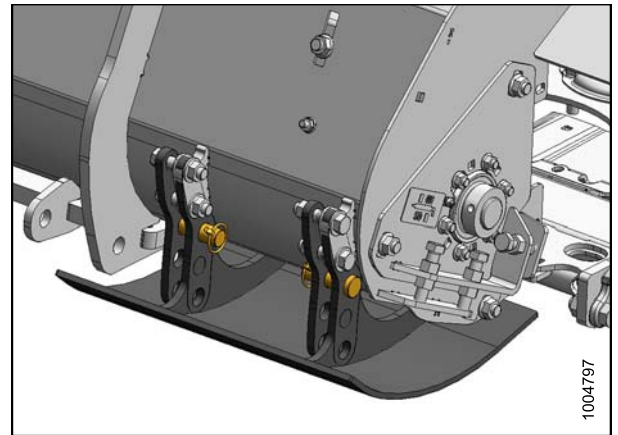


Figure 7.1: MD #B5660

#### 7.1.2 Cutterbar Repair Tool Kit

The cutterbar repair tool kit contains the tools required to replace the cutterbar idler gears.

MD #B4905

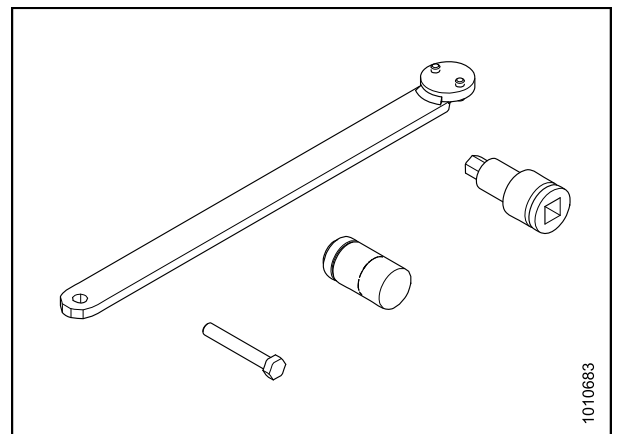


Figure 7.2: MD #B4905

## OPTIONS AND ATTACHMENTS

### 7.1.3 Double Windrow Attachment (DWA)

Allows auger and rotary headers to lay a double windrow when installed on a self-propelled windrower. The kit includes a draper deck, linkage assembly, hydraulics, and installation instructions.

MD #C1987 consists of:

- MD #B4655 Deck
- MD #B5270 Linkage assembly
- MD #B5301 Hydraulic kit
- MD #169216 Double Windrow Attachment (DWA) manual

### 7.1.4 Gauge Roller

MD #B5650

Instruction Part Number: MD #169467

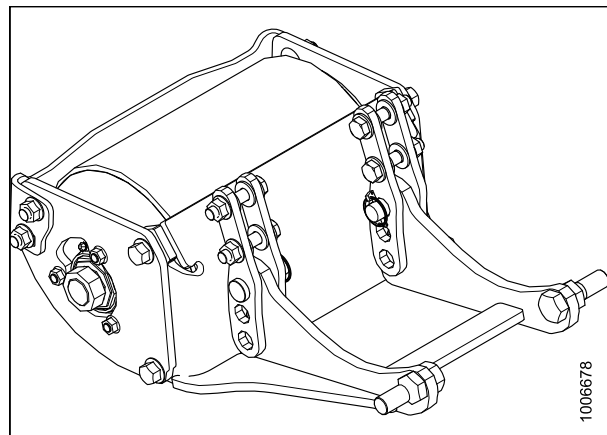


Figure 7.3: MD #B5650

### 7.1.5 Hydraulic Drive: 16-Foot for M200 Self-Propelled

MD #B5455

Instruction Part Number: MD #169483

### 7.1.6 Tall Crop Divider Kit

The tall crop dividers attach to the ends of the header for clean crop dividing and cutterbar entry in tall crops. The kit includes left and right dividers and attachment hardware.

MD #B5509

Instruction Part Number: MD #169485

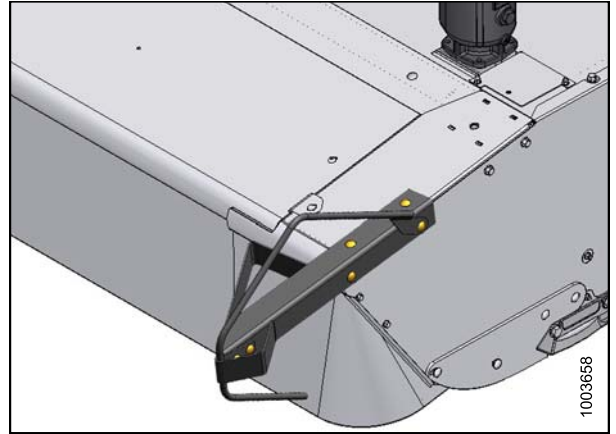


Figure 7.4: MD #B5509

### 7.1.7 Tall Crop Feed Plate Kit

The tall crop feed plates (A) assist the feeding of tall crops into the conditioner by encouraging material flow from behind the cage deflectors (B).

MD #B4903

**NOTE:**

One set is supplied standard.

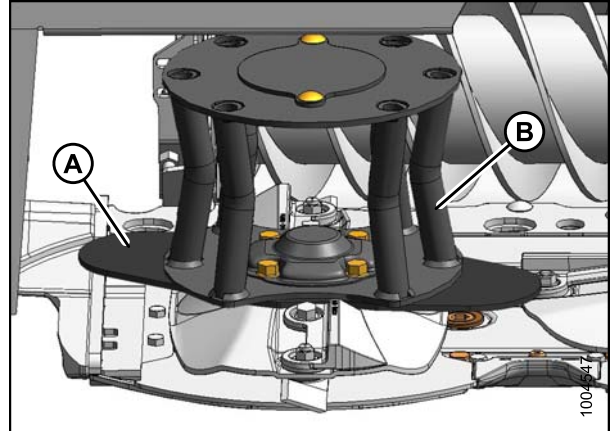


Figure 7.5: MD #B4903





## 8 Reference

### 8.1 Torque Specifications

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

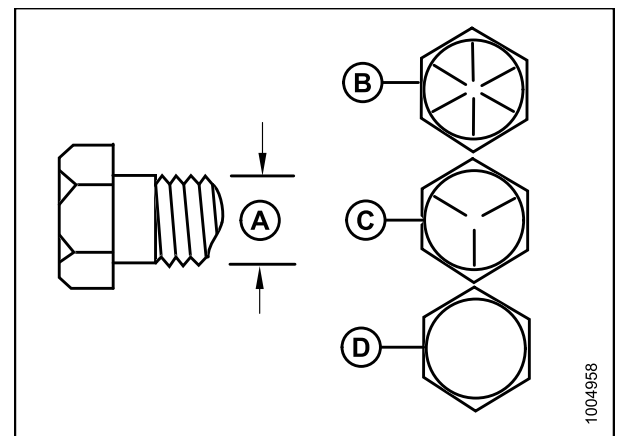
- Tighten all bolts to the torque values specified in the charts (unless otherwise noted throughout this manual).
- Replace hardware with the same strength and grade of bolt.
- Use the torque value tables as a guide and periodically check tightness of bolts.
- Understand torque categories for bolts and cap screws by using their identifying head markings.

#### 8.1.1 SAE Bolt Torque Specifications

Torque values shown in the following tables 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 8.1 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 8.1: Bolt Grades**

A - Nominal Size  
C - SAE-5

B - SAE-8  
D - SAE-2

REFERENCE

Table 8.2 SAE Grade 5 Bolt and Grade F 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

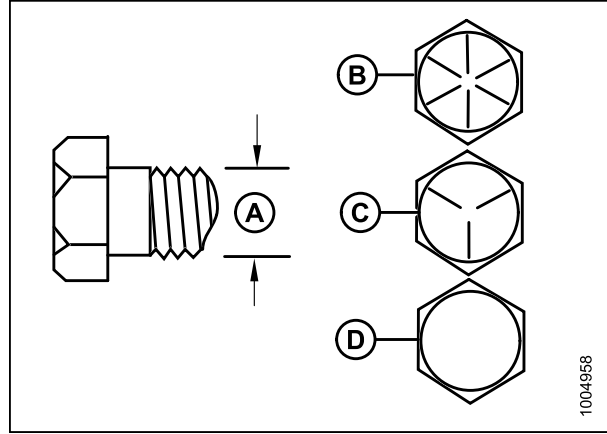


Figure 8.2: Bolt Grades

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

Table 8.3 SAE Grade 8 Bolt and Grade G 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

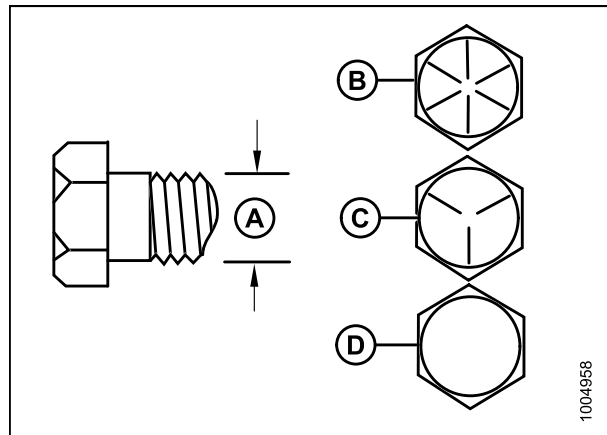


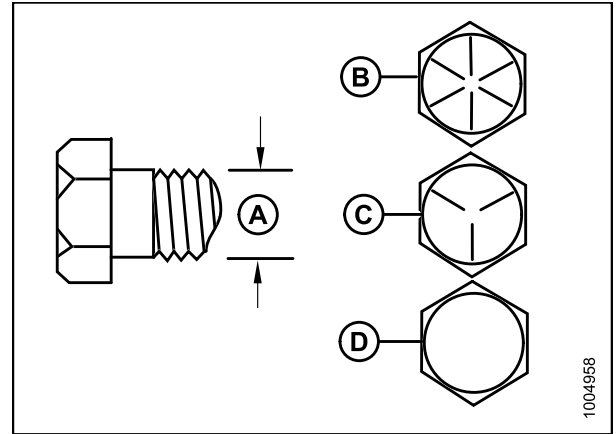
Figure 8.3: Bolt Grades

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

## REFERENCE

**Table 8.4 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 8.4: Bolt Grades**

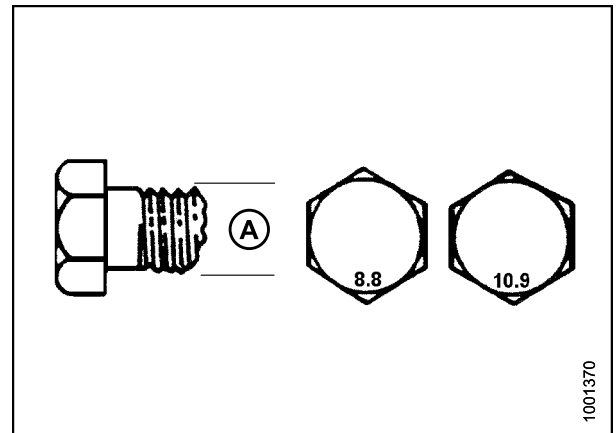
A - Nominal Size  
C - SAE-5

B - SAE-8  
D - SAE-2

### 8.1.2 Metric Bolt Specifications

**Table 8.5 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 8.5: Bolt Grades**

REFERENCE

Table 8.6 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

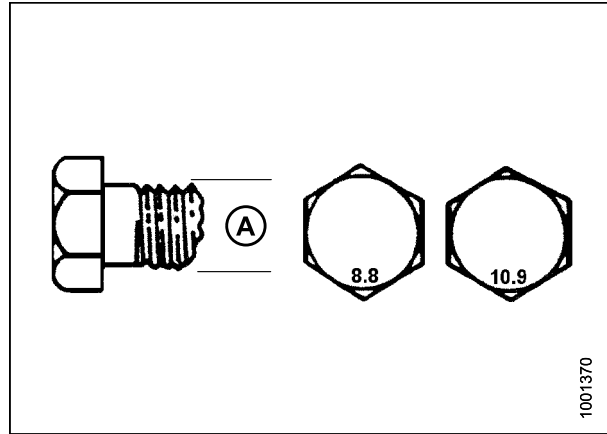


Figure 8.6: Bolt Grades

Table 8.7 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

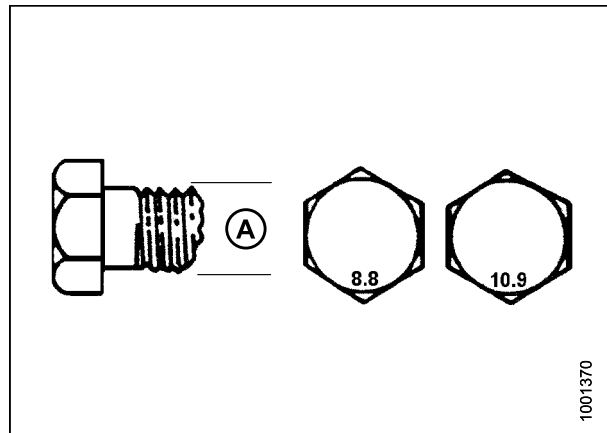
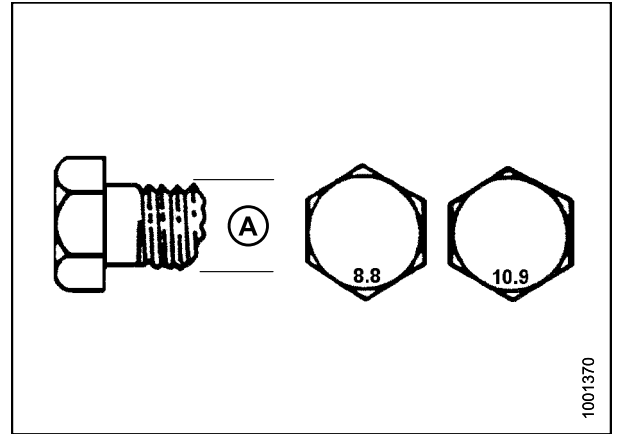


Figure 8.7: Bolt Grades

## REFERENCE

**Table 8.8 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 8.8: Bolt Grades**

### 8.1.3 Metric Bolt Specifications Bolting into Cast Aluminum

Table 8.9 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	–	–	–	–

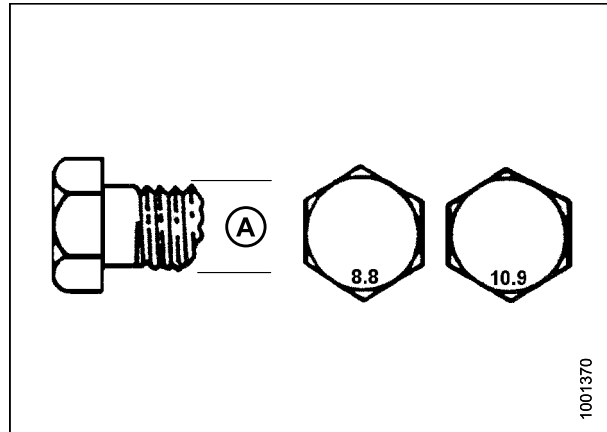


Figure 8.9: Bolt Grades

### 8.1.4 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 in [Table 8.10 Flare-Type Hydraulic Tube Fittings, page 169](#).
4. Use two wrenches to prevent fitting (D) from rotating. Place one wrench on the fitting body (D) and tighten nut (E) with the other wrench to the torque shown.
5. Assess the final condition of the connection.

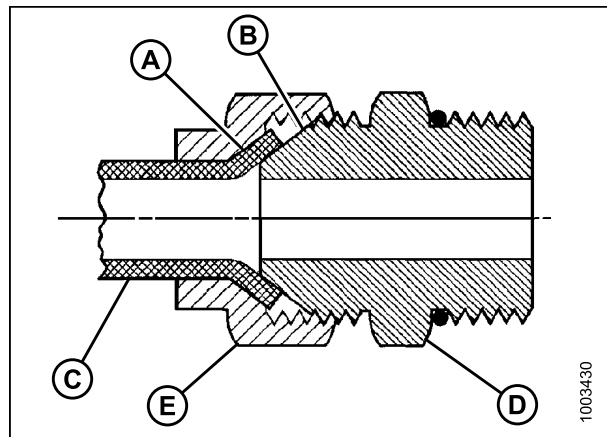


Figure 8.10: Hydraulic Fitting

**REFERENCE**

**Table 8.10 Flare-Type Hydraulic Tube Fittings**

SAE Dash Size	Thread Size (in.)	Torque Value <sup>9</sup>		Flats from Finger Tight (FFFT)	
		ft·lbf	N·m	Tube	Swivel Nut or Hose
-2	5/16-24	3-4	4-5	—	—
-3	3/8-24	5-6	7-8	—	—
-4	7/16-20	13-14	18-19	2-1/2	2
-5	1/2-20	14-15	19-21	2	2
-6	9/16-18	22-24	30-33	2	1-1/2
-8	3/4-16	42-46	57-63	2	1-1/2
-10	7/8-14	60-66	81-89	1-1/2	1-1/2
-12	1-1/16-12	83-91	113-124	1-1/2	1-1/4
-14	1-3/16-12	100-110	136-149	1-1/2	1-1/4
-16	1-5/16-12	118-130	160-176	1-1/2	1
-20	1-5/8-12	168-184	228-250	1	1
-24	1-7/8-12	195-215	264-291	1	1
-32	2-1/2-12	265-291	359-395	1	1
-40	3-12	—	—	1	1

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

## REFERENCE

### 8.1.5 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 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).

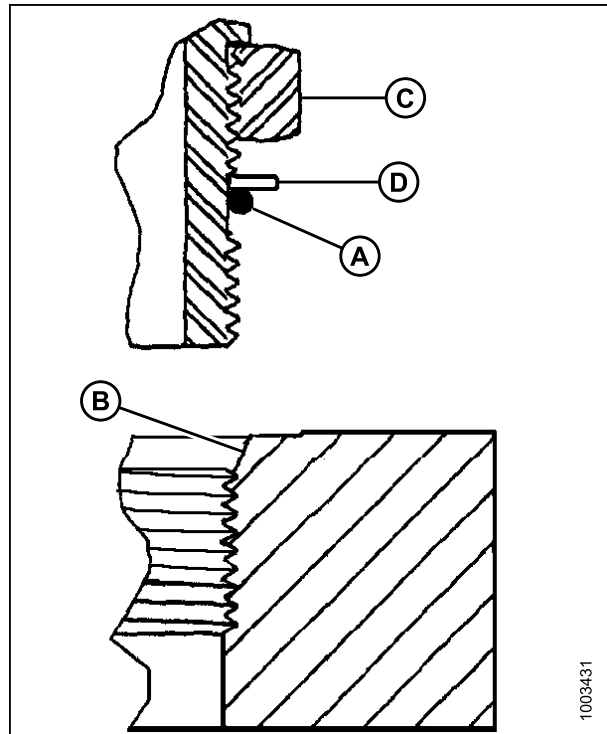


Figure 8.11: Hydraulic Fitting

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 fitting (B) and the other on lock nut (C).
8. Check the final condition of the fitting.

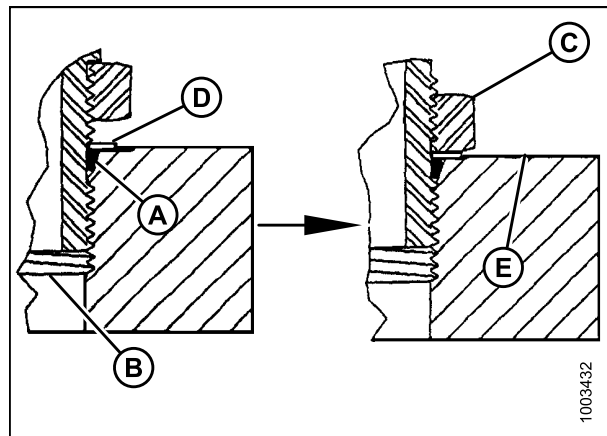


Figure 8.12: Hydraulic Fitting



**REFERENCE**

**Table 8.11 O-Ring Boss (ORB) Hydraulic Fittings (Adjustable)**

SAE Dash Size	Thread Size (in.)	Torque Value <sup>10</sup>	
		ft·lbf (*in·lbf)	N·m
-2	5/16–24	*53–62	6–7
-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
-32	2-1/2–12	245–269	332–365

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

## REFERENCE

### 8.1.6 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 8.12 *O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable)*, page 172.
6. Check the final condition of the fitting.

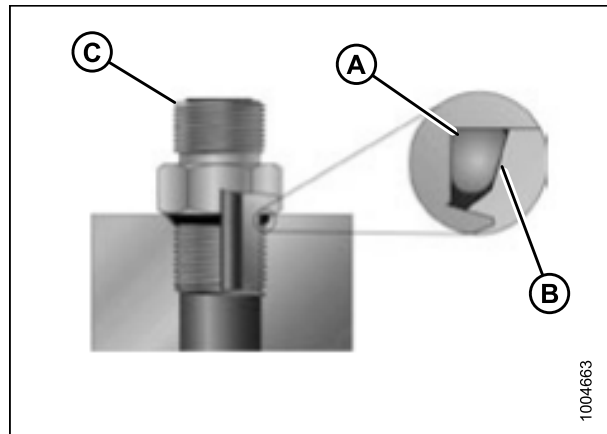


Figure 8.13: Hydraulic Fitting

**Table 8.12 O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable)**

SAE Dash Size	Thread Size (in.)	Torque Value <sup>11</sup>	
		ft·lbf (*in·lbf)	N·m
-2	5/16-24	*53-62	6-7
-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
-32	2-1/2-12	245-269	332-365

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

### 8.1.7 O-Ring Face Seal (ORFS) Hydraulic Fittings

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



Figure 8.14: 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 [8.13 O-Ring Face Seal \(ORFS\) Hydraulic Fittings, page 174](#).

**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).

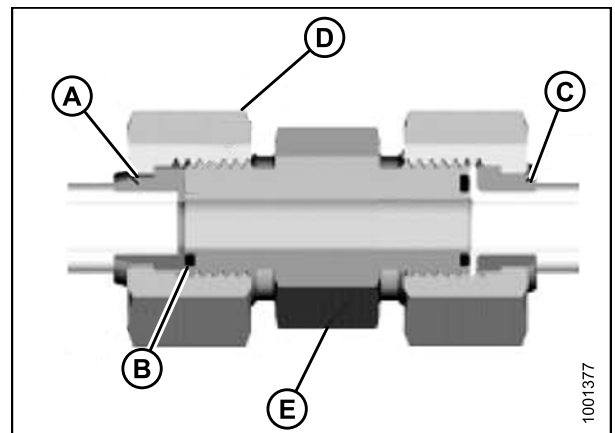


Figure 8.15: Hydraulic Fitting

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

**REFERENCE**

**Table 8.13 O-Ring Face Seal (ORFS) Hydraulic Fittings**

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

12. Torque values and angles shown are based on lubricated connection as in reassembly.

13. O-ring face seal type end not defined for this tube size.

REFERENCE

## 8.2 Conversion Chart

Table 8.14 Conversion Chart

Quantity	Inch-Pound Units		Factor	SI Units (Metric)	
	Unit Name	Abbreviation		Unit Name	Abbreviation
Area	Acres	acres	$\times 0.4047 =$	Hectares	ha
Flow	US gallons per minute	gpm	$\times 3.7854 =$	Liters per minute	L/min
Force	Pounds force	lbf	$\times 4.4482 =$	Newtons	N
Length	Inch	in.	$\times 25.4 =$	Millimeters	mm
	Foot	ft.	$\times 0.305 =$	Meters	m
Power	Horsepower	hp	$\times 0.7457 =$	Kilowatts	kW
Pressure	Pounds per square inch	psi	$\times 6.8948 =$	Kilopascals	kPa
			$\times .00689 =$	Megapascals	MPa
			$\div 14.5038 =$	Bar (Non-SI)	bar
Torque	Pound feet or foot pounds	ft·lbf	$\times 1.3558 =$	Newton meters	N·m
	Pound inches or inch pounds	in·lbf	$\times 0.1129 =$	Newton meters	N·m
Temperature	Degrees Fahrenheit	°F	$(^{\circ}\text{F}-32) \times 0.56 =$	Celsius	°C
Velocity	Feet per minute	ft/min	$\times 0.3048 =$	Meters per minute	m/min
	Feet per second	ft/s	$\times 0.3048 =$	Meters per second	m/s
	Miles per hour	mph	$\times 1.6063 =$	Kilometres per hour	km/h
Volume	US gallons	US gal	$\times 3.7854 =$	Liters	L
	Ounces	oz.	$\times 29.5735 =$	Milliliters	ml
	Cubic inches	in. <sup>3</sup>	$\times 16.3871 =$	Cubic centimeters	cm <sup>3</sup> or cc
Weight	Pounds	lbs	$\times 0.4536 =$	Kilograms	kg



# Index

## A

- accelerators ..... 125
  - See also cutterbar
  - replacing ..... 126
- API
  - definitions ..... 19
- ASTM
  - definitions ..... 19
- attaching
  - windrowers ..... 41
- auger ..... 143
  - drive belts ..... 143–144
  - inspect/adjust ..... 143
  - replacing ..... 144
  - stripper bars
    - adjusting ..... 95
- augers, See overshoot auger

## B

- bearings ..... 146
- bevel gearbox ..... 134
  - changing lubricant ..... 134
- break-in
  - period ..... 62

## C

- center-links ..... 19
  - See also hydraulic links
  - definitions ..... 19
- component identification ..... 21
- conditioner drive belts, See belts
  - inspecting ..... 135
  - replacing ..... 136
- conditioner gearbox, See drive systems
- conditioner roll ..... 69
- conditioner roll tension, See roll tension
- conditioner roll timing, See roll timing
- conversion charts ..... 175
- cutterbar
  - accelerators
    - inspecting ..... 126
    - replacing ..... 126
  - cutter blades ..... 121
    - hardware, See inspecting
    - inspecting ..... 121
    - replacing ..... 124
  - discs
    - accelerators ..... 125

- inspecting ..... 119
- installing ..... 120
- nut shield ..... 128
- removing ..... 119
- lubricating
  - draining lubricant ..... 113
  - filling cutterbar with lubricant ..... 115
- maintaining cutterbar discs ..... 118
- nut shield
  - inspecting ..... 128
  - replacing ..... 129
- repair tool kit ..... 159
- spindles
  - direction of rotation ..... 118
- cutterbar doors ..... 33
  - closing
    - export headers ..... 37
    - North American headers ..... 35
  - opening
    - export headers ..... 36
    - North American headers ..... 34
- cutting height ..... 80
  - gauge roller height
    - adjusting ..... 80
  - skid shoes ..... 80

## D

- definition of terms ..... 19
- disc maintenance
  - cutterbar discs ..... 118
  - inspecting ..... 119
- discs, See cutterbar
  - disc speed ..... 82
- doors, See cutterbar doors
- double windrowing ..... 84
- drive systems ..... 134
  - auger drive belts ..... 143
    - inspect/adjust ..... 143
    - replacing ..... 144
  - bevel gearbox ..... 134
    - changing lubricant ..... 134
  - conditioner drive belt, See belts
  - conditioner drive belts
    - replacing ..... 136
  - conditioner gearbox ..... 138
    - changing lubricant ..... 138
  - hydraulic motor
    - installing ..... 148
    - removing ..... 147
- drivelines

## INDEX

- conditioner drive belt, *See* belts
  - driveshields ..... 30
    - closing
      - export headers..... 31
      - North American headers..... 30
    - opening
      - export headers..... 31
      - North American headers..... 30
    - right endshield
      - installing ..... 32
      - removing ..... 32
  - drying agents ..... 99
- E**
- electrical
    - lights ..... 150
  - export headers
    - definitions ..... 19
- F**
- float
    - adjusting ..... 68
    - checking ..... 67
  - fluids and lubricants, *See* lubrication
  - forming shields ..... 75
    - adjusting side deflectors ..... 75
    - attaching..... 41
    - rear deflector/fluffer shield
      - adjusting ..... 77
    - swath baffle
      - adjusting ..... 77
- G**
- gauge rollers ..... 160
  - gearbox speed sensor..... 141
    - adjusting ..... 141
    - replacing..... 142
  - glossary ..... 19
  - greasing
    - maintenance schedule/record ..... 103
  - ground speed ..... 83
- H**
- haying tips..... 98
    - chemical drying agents ..... 99
    - curing ..... 98
    - driving on windrows ..... 99
    - raking and tedding..... 99
    - topsoil moisture..... 98
    - weather and topography ..... 98
  - windrow characteristics..... 98
- headers**
- angle ..... 79
  - attaching..... 41
    - M200 windrowers..... 48
    - M205 windrowers..... 43
  - definitions ..... 19
  - detaching..... 55
    - M200 windrowers..... 59
    - M205 windrowers..... 55
  - float adjusting..... 68
  - float checking..... 67
  - operating ..... 67
  - transporting..... 64
  - unplugging..... 100
- hydraulic motors, *See* motors**
- hydraulics**
- fittings
    - flare-type ..... 168
    - O-ring boss (ORB) adjustable ..... 170
    - O-ring boss (ORB) non-adjustable ..... 172
    - O-ring face seal (ORFS)..... 173
  - hoses and lines ..... 149
  - hydraulic safety ..... 6
  - installing motor..... 148
  - maintenance ..... 147
  - removing motor ..... 147
- I**
- identification ..... 21
  - inspections
    - auger drive belts..... 143
    - conditioner drive belts..... 135
    - cutter blades ..... 121
    - cutterbar discs ..... 119
    - maintenance schedule/record ..... 103
    - nut shield..... 128
    - rock guards..... 117
    - rotary deflectors ..... 130
- K**
- kits
    - adjustable skid shoe ..... 159
    - cutterbar repair tool ..... 159
    - gauge roller..... 160
    - hydraulic drive - 16-foot for M200 ..... 160
    - tall crop divider..... 161
    - tall crop feed plate ..... 161
- L**
- lights..... 150



## INDEX

- adjusting the transport lights ..... 65
  - hazard lights
    - replacing bulbs and lenses ..... 150
    - replacing lamp assembly ..... 150
    - replacing lamp bracket ..... 151
  - lubrication
    - draining cutterbar lubricant..... 113
    - filling the cutterbar with lubricant..... 115
    - fluids and lubricants..... 102
  - lubrication and servicing..... 106
- M**
- maintenance
    - maintaining cutterbar discs..... 118
  - maintenance and servicing..... 101
    - cutterbar lubrication ..... 113
    - end of season service..... 106
    - greasing procedure ..... 107
    - lubrication and servicing ..... 106
    - maintenance records ..... 103
    - maintenance requirements..... 103
    - maintenance safety ..... 5
    - schedule..... 103
    - service..... 106–107
      - preseason/annual service..... 105
      - service intervals ..... 108
  - metric bolts
    - torque specifications..... 165
  - moisture..... 98
  - motors
    - hydraulic..... 147
- N**
- North American headers
    - definitions ..... 19
  - nut shield ..... 128
    - inspecting ..... 128
    - replacing..... 129
- O**
- operation..... 25, 67
  - operator responsibilities ..... 25
  - options and attachments ..... 159
    - adjustable skid shoe ..... 159
    - cutterbar repair tool ..... 159
    - double windrow attachment (DWA)..... 160
    - gauge roller..... 160
    - hydraulic drive - 16-foot for M200 ..... 160
    - tall crop divider..... 161
    - tall crop feed plate ..... 161
  - overshot augers
    - adjusting ..... 92
    - owner responsibilities..... 25
- P**
- preseason service ..... 105
- R**
- raking ..... 99
  - recommended fluids and lubricants, *See* lubrication
  - references..... 163
    - definition of terms ..... 19
  - revisions list ..... iii
  - rock guards ..... 117
    - inspecting ..... 117
  - roll gap
    - adjusting ..... 70
    - checking ..... 69
  - roll tension ..... 72
    - adjusting ..... 72
  - roll timing ..... 73
    - adjusting ..... 74
    - checking ..... 73
  - rotary deflectors..... 130
    - driveline deflectors
      - installing ..... 132
      - removing ..... 131
    - driven deflectors
      - installing ..... 131
      - removing ..... 130
    - inspecting deflectors..... 130
  - rpm
    - definitions ..... 19
- S**
- SAE
    - bolt torques..... 163
    - definitions ..... 19
  - safety..... 1
    - alert symbols..... 1
    - daily start-up checks ..... 39
    - decal location ..... 8
    - general safety ..... 3
    - header safety props..... 28
    - hydraulic safety ..... 6
    - maintenance and servicing..... 5
    - operational safety ..... 26
    - preparing for service..... 101
    - safety sign decals..... 7
      - installing decals ..... 7
      - interpreting decals..... 11

## INDEX

shutdown procedure .....	63	removing .....	87
signal words .....	2	removing from storage .....	85
sealed bearings		removing plates	
installing .....	146	under driveline deflector .....	88
serial numbers .....	ii	under driven deflector .....	88
shields, See forming shields		storage position .....	89
shut-down procedures .....	63	tedding .....	99
skid shoes .....	80	topography .....	98
adjustable skid shoe .....	159	torque specifications .....	163
adjusting .....	80	flare-type hydraulic fittings .....	168
specifications .....	22	metric bolt specifications .....	165
fluids and lubricants .....	102	bolting into cast aluminum .....	168
torque specifications .....	163	O-ring boss (ORB) fittings	
speed sensor .....	141	(non-adjustable) .....	172
adjusting .....	141	O-ring boss (ORB) hydraulic fittings	
replacing .....	142	(adjustable) .....	170
spindles		O-ring face seal (ORFS) fittings .....	173
direction of spindle rotation .....	118	SAE bolt torque specifications .....	163
spm		tractors	
definitions .....	19	definitions .....	19
start-up procedures .....	39	troubleshooting	
stripper bars .....	95	mechanical .....	156
adjusting .....	95	mower performance .....	153
		trucks	
		definitions .....	19
<b>T</b>			
tall crop dividers .....	90	<b>W</b>	
removing .....	90	weather .....	98
tall crop feed plates .....	85	windrows	
installing plates		driving on windrows .....	99
under driveline deflector .....	86	windrow characteristics .....	98
under driven deflector .....	86		



**MacDon Industries Ltd.**

680 Moray Street  
Winnipeg, Manitoba  
Canada R3J 3S3  
t. (204) 885-5590  
f. (204) 832-7749

**MacDon, Inc.**

10708 N. Pomona Avenue  
Kansas City, Missouri  
United States 64153-1924  
t. (816) 891-7313  
f. (816) 891-7323

**MacDon Australia Pty. Ltd.**

A.C.N. 079 393 721  
P.O. Box 243, Suite 3, 143 Main Street  
Greensborough, Victoria, Australia 3088  
t. 03 9432 9982  
f. 03 9432 9972

**LLC MacDon Russia Ltd.**

123317 Moscow, Russia  
10 Presnenskaya nab, Block C  
Floor 5, Office No. 534, Regus Business Centre  
t. +7 495 775 6971  
f. +7 495 967 7600

## CUSTOMERS

**MacDon.com**

## DEALERS

**Portal.MacDon.com**

Trademarks of products are the marks of their respective manufacturers and/or distributors.

Printed in Canada