

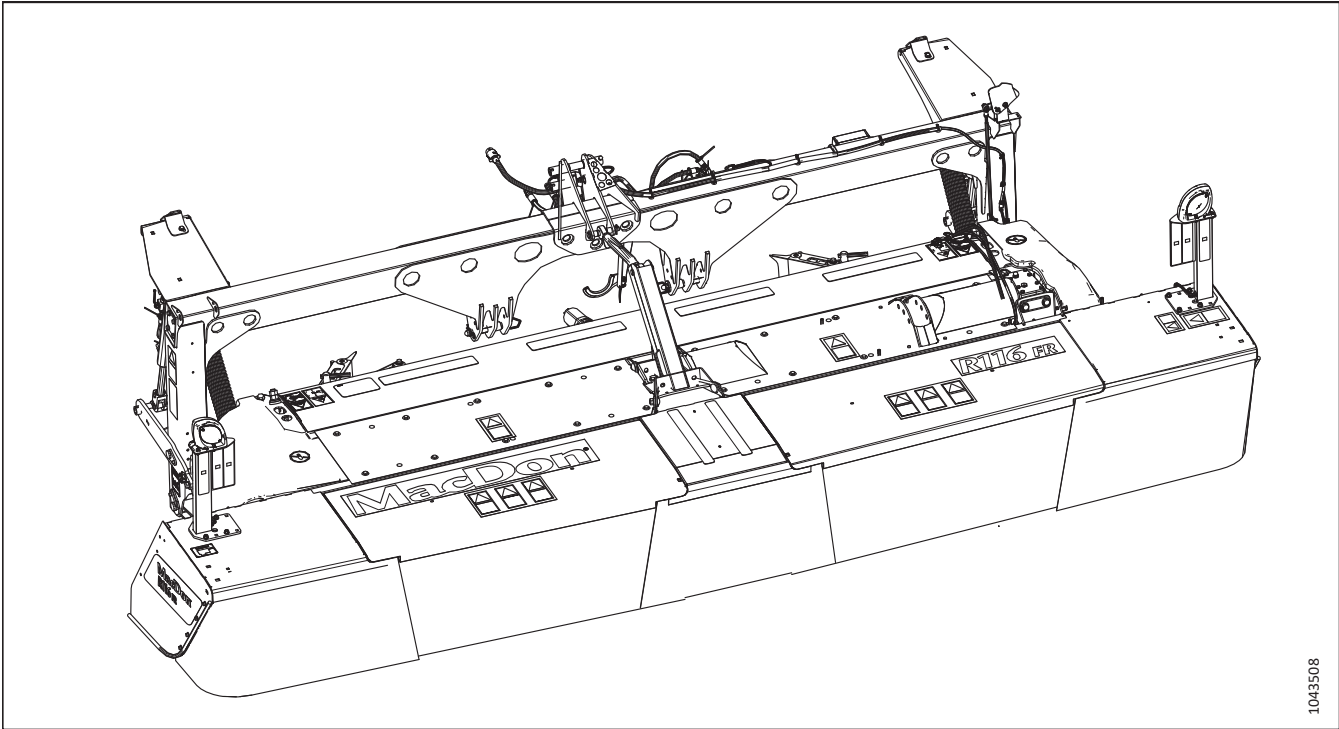
# **R1 FR Series Front Mount Rotary Disc**

Operator's Manual

262818 Revision A

Original Instruction

R1 FR



1043508

Published: November 2024

© 2024 MacDon Industries, Ltd.

The information in this publication is based on the information available and in effect at the time of printing. MacDon Industries, Ltd. makes no representation or warranty of any kind, whether expressed or implied, with respect to the information in this publication. MacDon Industries, Ltd. reserves the right to make changes at any time without notice.

## Introduction

This instructional manual contains safety, operating, and maintenance procedures for the MacDon R1 FR Series Rotary Disc.

### ***Your machine***

The MacDon R113 and R116 Front-Mount Rotary Disc machine, when mounted to the front of a suitable agricultural tractor, are designed to cut, condition, and lay a wide variety of grasses and hay crops in windrows.

### ***Your warranty***

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

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

### ***Your manual***

**Carefully read all the material provided before attempting to unload, assemble, or use the machine.**

Use this manual as your first source of information about the machine. If you follow the instructions provided in this manual, and use MacDon parts when repair is necessary, the R1 FR Series will work well for many years.

Use the Table of Contents and the Index to guide you to specific topics. Study the Table of Contents to familiarize yourself with how the material is organized. Keep this manual handy for frequent reference. If the machine is sold or transferred, pass this manual on to the new Owners. Call your Dealer if you need any additional assistance, information, or additional copies of this manual.

When setting up the machine or making adjustments, review and follow the recommended machine settings in all relevant MacDon publications. Failure to do so may compromise the functionality of the machine, reduce its service life, and may result in a hazardous situation for the Operator or bystanders.

### **Conventions**

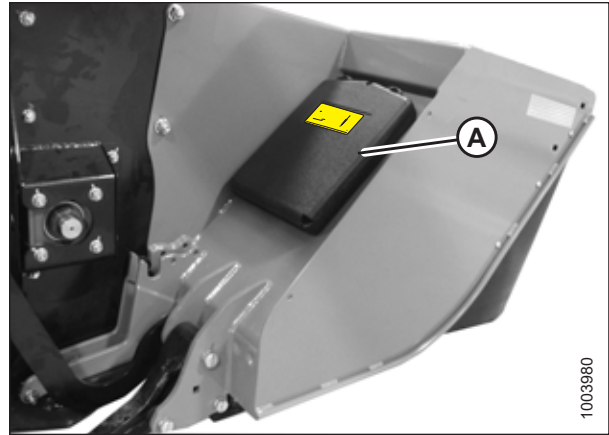
The following conventions are used in this document:

- Right and left are determined from the operator's position. The front of the machine faces the crop.
- Unless otherwise noted, use the standard torque values provided in this manual.

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

**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).

This document is currently available in English.



**Manual Storage Case**



## Summary of Changes

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.

Section	Summary of Change	Internal Use Only
<i>Serial Numbers, page iv</i>	Updated topic.	Product Support
<i>1.7 Safety Sign Locations, page 7</i>	Updated illustration and table.	UECN 31620
<i>2.3 Product Specifications, page 13</i>	<ul style="list-style-type: none"> <li>Updated product specification information for power take- off RPM.</li> <li>Added polyurethane conditioner roll specifications.</li> </ul>	Product Support ECN 65654 ECN 65903
<i>3.6.1 Tractor Requirements, page 23</i>	Changed hydraulic flow setting to 20–30%. (was 10–20%).	Engineering
<i>3.7.1 Connecting Tractor to Front Mount Rotary Disc, page 23</i>	Reordered steps so that the PTO gets connected before the 3 point-hitch. Added step to rotate the storage bracket into storage position.	Engineering, Product Support
	Reordered steps so that the lift lock pins get removed before the lower link arms on the 3 point-hitch get adjusted.	Engineering
	Clarified that the lower linkage dimension is measured from the center of the lift arm pins to the ground. Changed the measurement to 5 1/2 in. (was 7.25 in.).	Engineering, Product Support
	Changed hydraulic channel setting from "ON" to "CONTINUOUS".	Engineering
	Changed hydraulic flow setting to 20–30% (was 15–20%).	Engineering
<i>Adjusting Conditioner Baffle Curtain Position, page 53</i>	Added topic.	ECN 66218
<i>Adjusting Roll Gap – Polyurethane Rolls, page 46</i>	Added topic.	ECN 65903
<i>3.12 Transporting Rotary Disc Header, page 32</i>	Added bullet point.	Product Safety
<i>Checking and Changing Lubricant in Conditioner Roll Timing Gearbox, page 174</i>	Updated illustrations of lubricant sight glass.	ECN 65369
<i>Inspecting Disc Blades, page 103</i>	Updated topic.	ECN 65234
<i>5.2.2 Polyurethane Intermeshing Roller, page 191</i>	Added topic.	ECN 65903
<i>4.3.2 Break-in Inspections, page 62</i>	Updated items.	Engineering
Inside Back Cover	Updated lubricant capacity.	Engineering

## Serial Numbers

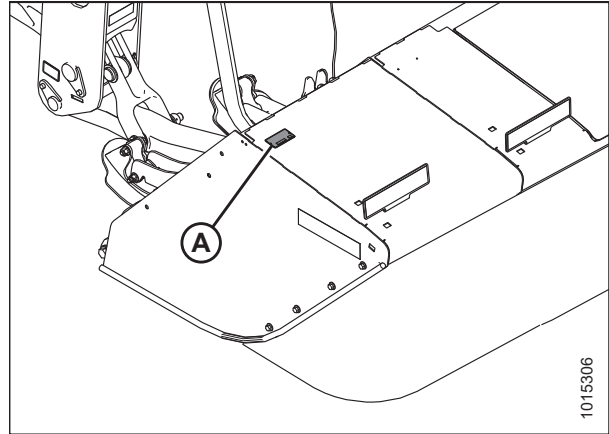
Record the serial number of the machine in the spaces provided below, and the transport option (if equipped) provided below.

R1 Front Mount Rotary disc  
serial number (A):

\_\_\_\_\_

Model year:

\_\_\_\_\_



**R1 Front Mount Rotary Disc Serial Number Location**

## TABLE OF CONTENTS

---

Introduction .....	i
Summary of Changes.....	iii
Serial Numbers.....	iv
<b>Chapter 1: Safety .....</b>	<b>1</b>
1.1 Safety Alert Symbols .....	1
1.2 Signal Words .....	1
1.3 General Safety .....	2
1.4 Hydraulic Safety .....	4
1.5 Decommissioning and Disposing of Agricultural Equipment.....	5
1.6 Safety Signs .....	6
1.6.1 Installing Safety Decals.....	6
1.7 Safety Sign Locations.....	7
<b>Chapter 2: Product Overview .....</b>	<b>11</b>
2.1 Definitions .....	11
2.2 Component Identification .....	12
2.3 Product Specifications .....	13
<b>Chapter 3: Operation .....</b>	<b>15</b>
3.1 Auxiliary Lift Lock Pins .....	15
3.1.1 Installing Auxiliary Lift Lock Pins.....	15
3.1.2 Removing Auxiliary Lift Locking Pins .....	16
3.2 Auxiliary Lift Cylinder Lock-Out Valves.....	17
3.2.1 Locking and Unlocking Auxiliary Lift Cylinders .....	17
3.3 Driveshields.....	18
3.3.1 Opening Driveshields .....	18
3.3.2 Closing Driveshields.....	20
3.4 Cutterbar Doors .....	20
3.4.1 Opening Cutterbar Doors.....	21
3.4.2 Closing Cutterbar Doors .....	21
3.5 Daily Start-Up Check .....	22
3.6 Preparing Tractor for Front Mount Rotary Disc .....	23
3.6.1 Tractor Requirements .....	23
3.7 Attaching Front Mount Rotary Disc to Tractor .....	23
3.7.1 Connecting Tractor to Front Mount Rotary Disc.....	23
3.8 Detaching Front Mount Rotary Disc from Tractor .....	28
3.8.1 Disconnecting the Tractor from Front Mount Rotary Disc.....	28
3.9 Breaking in Rotary Disc Header .....	31
3.10 Engaging Power Take-Off .....	31
3.11 Shutdown Procedure .....	31
3.12 Transporting Rotary Disc Header .....	32

## TABLE OF CONTENTS

3.12.1 Transport Lighting .....	32
<b>3.13 Operating Rotary Disc Header .....</b>	<b>32</b>
3.13.1 Raising and Lowering Rotary Disc Header .....	33
Header Raise / Lower – Auxiliary Lift System .....	33
3.13.2 Float .....	34
Adjusting Float .....	35
3.13.3 Cutting Height .....	37
Adjusting Cutting Height .....	38
3.13.4 Cutterbar Angle .....	39
Adjusting Cutterbar Angle – Mechanical Center-Link .....	39
Adjusting Cutterbar Angle – Optional Hydraulic Center-Link .....	40
3.13.5 Ground Speed.....	40
3.13.6 Cutterbar Deflectors .....	41
Removing Cutterbar Deflectors .....	42
Installing Cutterbar Deflectors.....	42
3.13.7 Tall Crop Divider Option .....	43
Installing Tall Crop Divider.....	43
Removing Tall Crop Divider.....	44
<b>3.14 Roll Conditioner.....</b>	<b>44</b>
3.14.1 Conditioner Roll Gap.....	45
Checking Roll Gap.....	45
Adjusting Roll Gap – Steel Rolls .....	45
Adjusting Roll Gap – Polyurethane Rolls.....	46
3.14.2 Roll Tension .....	47
Adjusting Roll Tension .....	47
3.14.3 Roll Timing.....	48
Adjusting Roll Timing.....	48
3.14.4 Forming Shields – Roll Conditioner .....	51
Positioning Forming Shield Side Deflectors – Roll Conditioner.....	51
Adjusting Conditioner Baffle Position .....	52
Adjusting Conditioner Baffle Curtain Position.....	53
<b>3.15 Haying Tips .....</b>	<b>53</b>
3.15.1 Curing .....	53
3.15.2 Topsoil Moisture .....	54
3.15.3 Weather and Topography .....	54
3.15.4 Windrow Characteristics.....	54
3.15.5 Driving on Windrows .....	55
3.15.6 Raking and Tedding .....	55
3.15.7 Using Chemical Drying Agents .....	55
<b>3.16 Unplugging Rotary Disc Header .....</b>	<b>55</b>
<b>Chapter 4: Maintenance and Servicing.....</b>	<b>57</b>
<b>4.1 Recommended Safety Procedures .....</b>	<b>57</b>
<b>4.2 Preparing Machine for Servicing.....</b>	<b>59</b>
<b>4.3 Maintenance Requirements .....</b>	<b>59</b>
4.3.1 Maintenance Schedule/Record.....	60
4.3.2 Break-in Inspections .....	62

## TABLE OF CONTENTS

---

4.3.3 Preseason Servicing .....	63
4.3.4 End-of-Season Servicing .....	63
4.3.5 Lubrication .....	64
Greasing Procedure.....	65
Service Intervals .....	65
<b>4.4 Cutterbar System.....</b>	<b>71</b>
4.4.1 Cutterbar Doors .....	71
Inspecting Cutterbar Doors.....	71
4.4.2 Maintaining Curtains .....	72
Inspecting Curtains .....	72
Removing Cutterbar Door Curtains .....	73
Installing Cutterbar Door Curtains.....	74
Removing Cutterbar Inboard Curtain.....	75
Installing Cutterbar Inboard Curtain .....	76
Removing Outboard Curtains.....	77
Installing Outboard Curtains .....	79
4.4.3 Lubricating Cutterbar.....	80
Checking and Adding Lubricant – Cutterbar .....	80
Draining Cutterbar .....	82
Filling Cutterbar with Lubricant .....	83
4.4.4 Cutterbar Discs .....	85
Inspecting Cutterbar Discs.....	85
Removing Cutterbar Discs .....	87
Installing Cutterbar Discs.....	88
4.4.5 Replacing Cutterbar Spindles.....	90
Removing Cutterbar Spindles .....	91
Installing Cutterbar Spindles .....	93
4.4.6 Reconfiguring Cutterbar Crop Stream .....	100
Changing Cutterbar Crop Stream Configuration.....	101
Changing Ten Disc Cutterbar Crop Stream Configuration.....	102
4.4.7 Maintaining Disc Blades .....	103
Inspecting Disc Blades .....	103
Inspecting Disc Blade Hardware .....	105
Removing Disc Blades.....	107
Installing Disc Blades .....	108
4.4.8 Maintaining Quick Change Blade System – Option .....	109
Inspecting Retaining Bolts .....	109
Inspecting Quick Change Plates .....	112
Replacing Quick Change Blades .....	114
4.4.9 Accelerators.....	116
Inspecting Accelerators.....	116
Removing Accelerators .....	117
Installing Accelerators .....	119
4.4.10 Rock Guards .....	121
Inspecting Rock Guards.....	121
Removing Inboard Rock Guards.....	122
Installing Inboard Rock Guards.....	123
Removing Outboard Rock Guards .....	124
Installing Outboard Rock Guards .....	126
4.4.11 Maintaining Small Drums – Ten Disc Cutterbar .....	128
Inspecting Small Drums – Ten Disc Cutterbar.....	128

## TABLE OF CONTENTS

Removing Small Driven Drum and Driveline – Ten Disc Cutterbar .....	129
Installing Small Driven Drum and Driveline – Ten Disc Cutterbar .....	133
Removing Small Non-Driven Drum – Ten Disc Cutterbar .....	136
Installing Small Non-Driven Drum – Ten Disc Cutterbar.....	137
4.4.12 Maintaining Large Drums.....	139
Inspecting Large Drums .....	139
Removing Large Driven Drums and Driveline .....	140
Installing Large Driven Drums and Driveline.....	144
Removing Large Non-Driven Drums .....	148
Installing Large Non-Driven Drums.....	149
4.4.13 Replacing Cutterbar Spindle Shear Pin.....	151
Removing Cutterbar Spindle Shear Pin.....	151
Installing Cutterbar Spindle Shear Pin.....	154
<b>4.5 Drive Systems .....</b>	<b>157</b>
4.5.1 Driveshields .....	157
Removing Driveshields.....	157
Installing Driveshields .....	159
Replacing Driveshield Latch .....	160
4.5.2 Driveline Guards .....	161
Removing Driveline Guards .....	161
Installing Driveline Guards.....	162
4.5.3 Primary Driveline .....	163
Removing Primary Driveline.....	163
Installing Primary Driveline.....	164
4.5.4 Cross Driveline .....	166
Removing Cross Driveline.....	166
Installing Cross Driveline .....	167
4.5.5 Conditioner Drive Belt .....	169
Inspecting Conditioner Drive Belt .....	169
Removing Conditioner Drive Belt.....	170
Installing Conditioner Drive Belt .....	170
4.5.6 Conditioner System .....	172
Inspecting Roll Conditioner.....	172
4.5.7 Conditioner Roll Timing Gearbox .....	174
Checking and Changing Lubricant in Conditioner Roll Timing Gearbox.....	174
4.5.8 Header Drive Gearbox .....	177
Checking and Adding Lubricant – Header Drive Gearbox .....	177
Draining Lubricant – Header Drive Gearbox .....	178
4.5.9 Cutterbar / Conditioner Drive Gearbox .....	179
Checking and Adding Lubricant – Cutterbar / Conditioner Drive Gearbox .....	180
Draining Lubricant from Cutterbar – Conditioner Drive Gearbox (T-Gearbox) .....	180
<b>4.6 Hydraulics .....</b>	<b>185</b>
4.6.1 Checking Hydraulic Hoses and Lines .....	185
4.6.2 Hydraulic Cylinders.....	185
<b>4.7 Electrical System .....</b>	<b>186</b>
4.7.1 Maintaining Electrical System.....	186
4.7.2 Replacing Amber Hazard/Signal Bulb .....	186
4.7.3 Inspecting Auxiliary Lift System Sensors .....	186
4.7.4 Setting Relay Logic Switch.....	188

TABLE OF CONTENTS

**Chapter 5: Options and Attachments ..... 189**

- 5.1 Performance Kits ..... 189
  - 5.1.1 Tall Crop Divider Kit ..... 189
  - 5.1.2 Hydraulic Center-Link Kit ..... 189
  - 5.1.3 Quick Change Blade Kit ..... 190
- 5.2 Replacement Conditioners ..... 190
  - 5.2.1 Steel Intermeshing Roller ..... 190
  - 5.2.2 Polyurethane Intermeshing Roller ..... 191

**Chapter 6: Troubleshooting..... 193**

- 6.1 Troubleshooting Rotary Disc Header Performance..... 193
- 6.2 Troubleshooting Mechanical Issues..... 195

**Chapter 7: Reference ..... 197**

- 7.1 Torque Specifications ..... 197
  - 7.1.1 Metric Bolt Specifications ..... 197
  - 7.1.2 Metric Bolt Specifications – Cast Aluminum ..... 199
  - 7.1.3 O-Ring Boss Hydraulic Fittings – Adjustable ..... 200
  - 7.1.4 O-Ring Boss Hydraulic Fittings – Non-Adjustable ..... 201
  - 7.1.5 O-Ring Face Seal Hydraulic Fittings ..... 202
  - 7.1.6 Tapered Pipe Thread Fittings ..... 203
- 7.2 Conversion Chart ..... 204

**Index ..... 207**

**Recommended Lubricants ..... 211**





# Chapter 1: Safety

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

## 1.1 Safety Alert Symbols

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

This symbol means:

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

Carefully read and follow the safety message accompanying this symbol.

**Why is safety important to you?**

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



Figure 1.1: Safety Symbol

## 1.2 Signal Words

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

Signal words are selected using the following guidelines:

### **DANGER**

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

### **WARNING**

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

### **CAUTION**

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

### **IMPORTANT:**

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

### **NOTE:**

Provides additional information or advice.

## 1.3 General Safety

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

### CAUTION

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

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

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

In addition, take the following precautions:

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



Figure 1.2: Safety Equipment



Figure 1.3: Safety Equipment

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

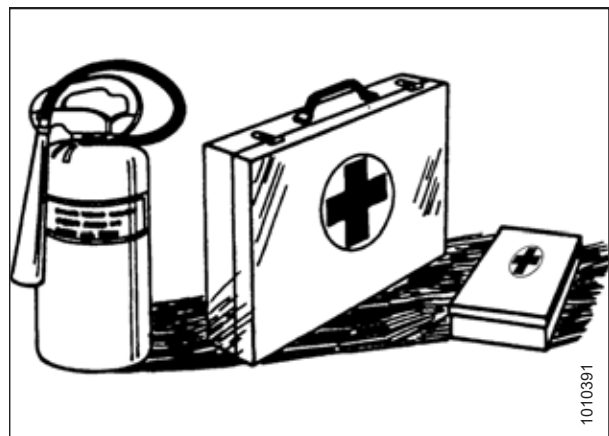


Figure 1.4: Safety Equipment

## SAFETY

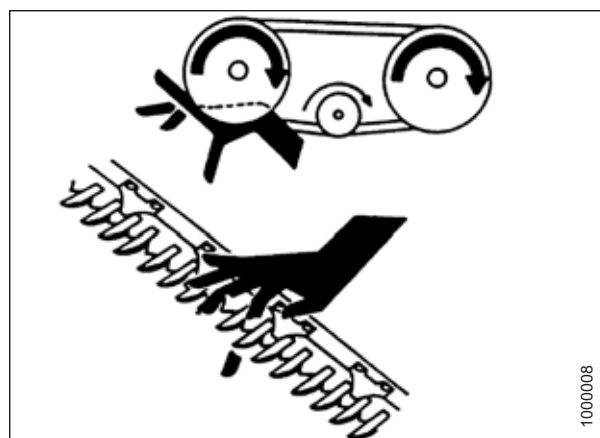
- Wear close-fitting clothing and cover long hair. **NEVER** wear dangling items such as hoodies, scarves, or bracelets.
- Keep all shields in place. **NEVER** alter or remove safety equipment. Ensure that the driveline guards can rotate independently of their shaft, and that they can telescope freely.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



1000007

Figure 1.5: Safety around Equipment

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



1000008

Figure 1.6: Safety around Equipment

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



1000009

Figure 1.7: Safety around Equipment

## 1.4 Hydraulic Safety

Because hydraulic fluid is under extreme pressure, hydraulic fluid leaks can be very dangerous. Follow the proper safety procedures when inspecting hydraulic fluid leaks and servicing hydraulic equipment.

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



Figure 1.8: Testing for Hydraulic Leaks

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



Figure 1.9: Hydraulic Pressure Hazard

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

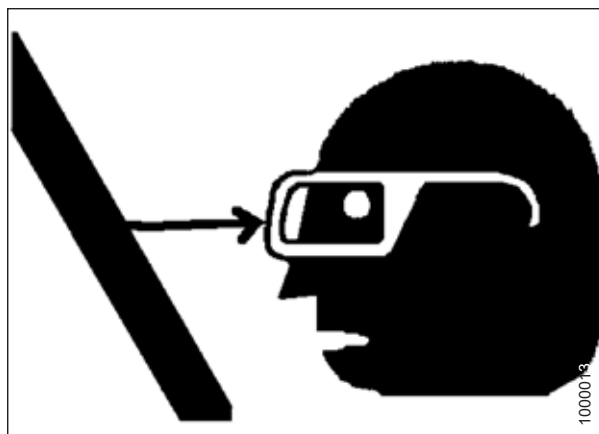


Figure 1.10: Safety around Equipment

## 1.5 Decommissioning and Disposing of Agricultural Equipment

When agricultural equipment is no longer serviceable and needs to be decommissioned and disposed of, recyclable materials including ferrous and non-ferrous metals, rubber, and plastics; fluids such as lubricants, refrigerants, and fuels; and hazardous materials found in batteries, some light bulbs, and electronic equipment must be handled safely and not introduced into the environment.

Comply with local regulations and authorities.

Products with symbol (A) should **NOT** be disposed of with domestic waste.



Figure 1.11: Symbol for Do NOT Dispose with Domestic Waste

Materials with symbol (B) should be recycled as labelled.

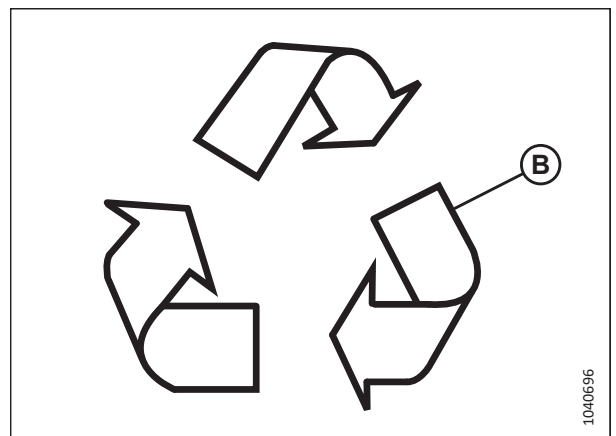


Figure 1.12: Symbol for Recycle as Labelled

## SAFETY

- Use appropriate personal protective equipment when removing and handling objects and materials.
- Use appropriate personal protective equipment when handling objects with residue from pesticides, fertilizers, or other agricultural chemicals. Follow local regulations when handling and disposing of these objects.
- Safely release stored energy from suspension components, springs, hydraulic, and electrical systems.
- Recycle or reuse packaging material.
- Recycle or reuse plastics that are labelled with specifications for a material such as PP TV 20. Do **NOT** dispose of them with domestic waste.
- Return batteries to the vendor or take them to a collection point. Batteries contain hazardous substances. Do **NOT** dispose of batteries with domestic waste.
- Follow local regulations to correctly dispose of hazardous materials such as oils, hydraulic fluids, brake fluids, and fuels.
- Take refrigerants to qualified people at specialized facilities for disposal. Refrigerants must **NEVER** be released into the atmosphere.

### 1.6 Safety Signs

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

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

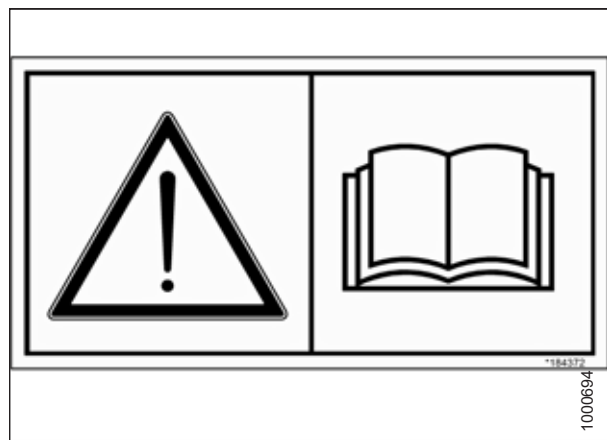


Figure 1.13: Operator's Manual Decal

#### 1.6.1 Installing Safety Decals

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

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

## 1.7 Safety Sign Locations

Safety signs are installed in several locations on the header. Replace any missing or damaged decals on the machine with identical parts.

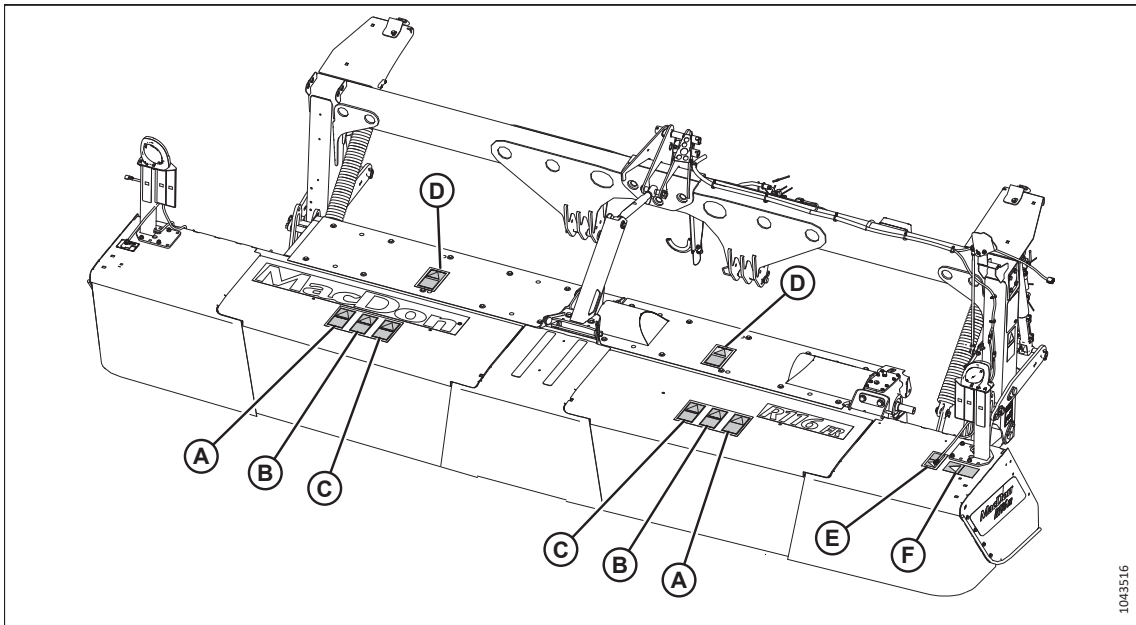


Figure 1.14: Safety Sign Decal Locations – Top

A - MD #194465  
D - MD #190546

B - MD #247167  
E - MD #166466

C - MD #194466  
F - MD #113482

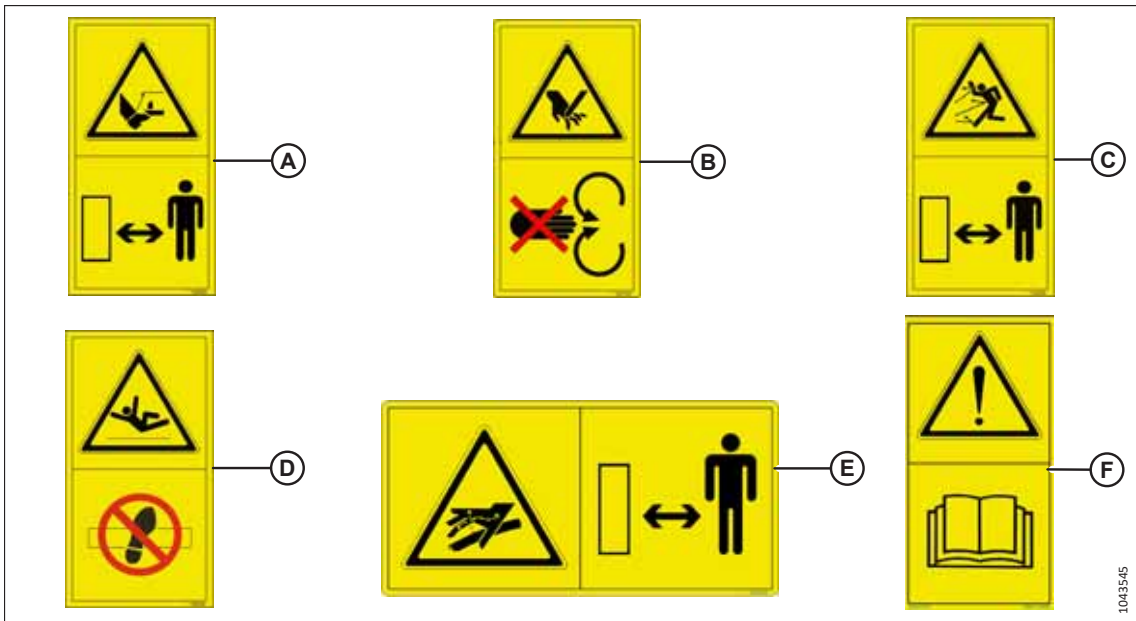
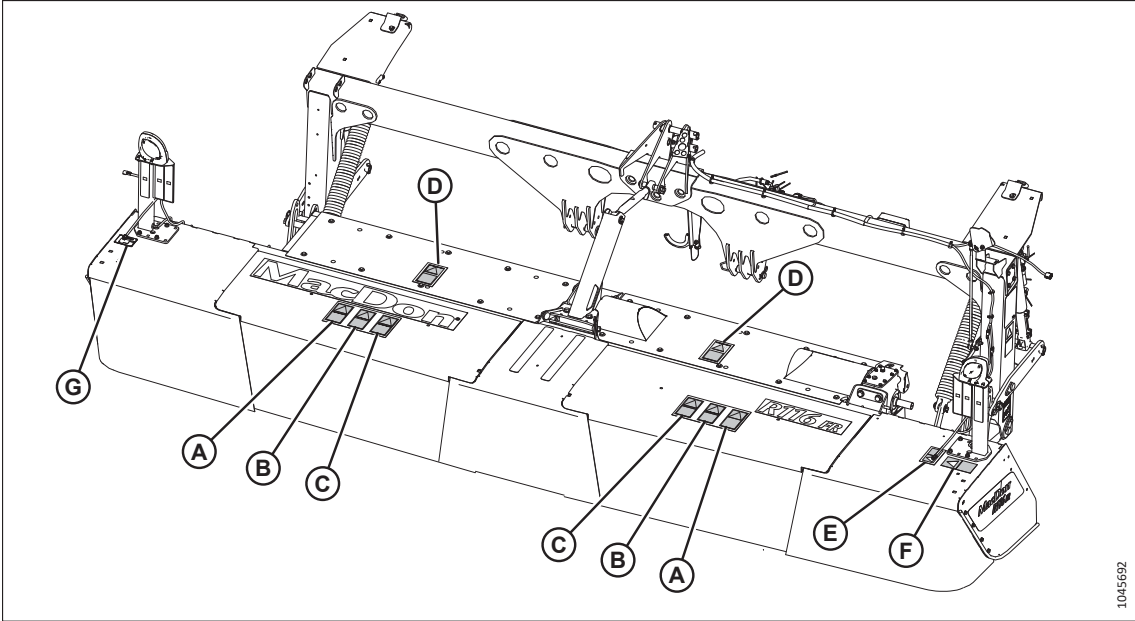


Figure 1.15: Safety Sign Decals – Top

**SAFETY**

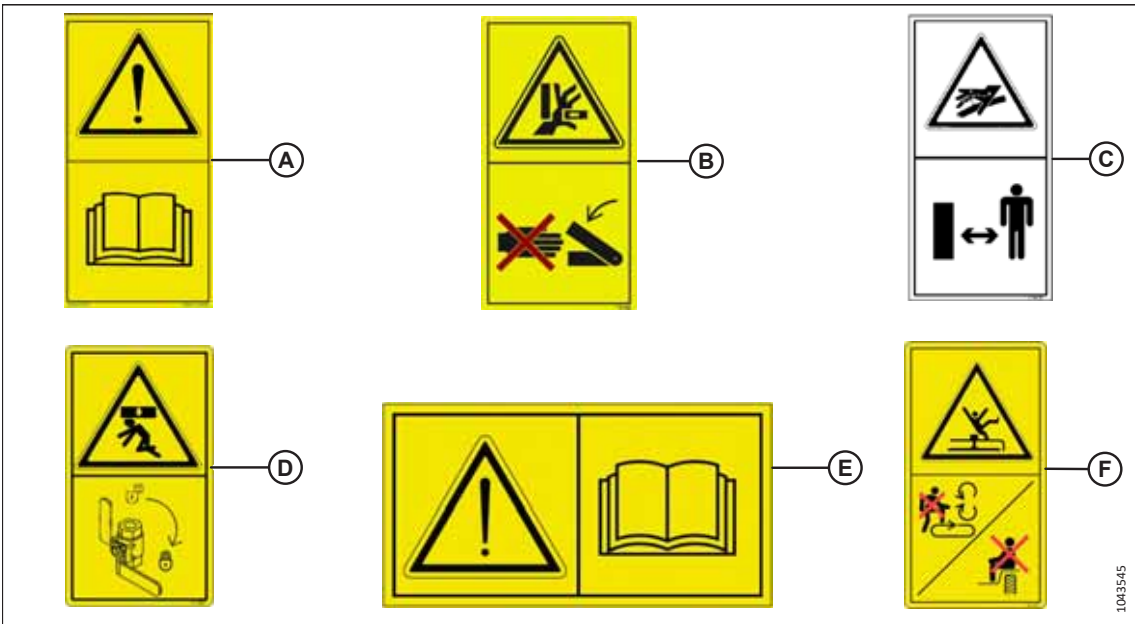


**Figure 1.16: Safety Sign Decal Locations – Back and Sides**

A - MD #113482  
 D - MD #171287  
 G - MD #259417

B - MD #167502  
 E - MD #247166

C - MD #174436  
 F - MD #184372



**Figure 1.17: Safety Sign Decals – Back and Sides**



SAFETY

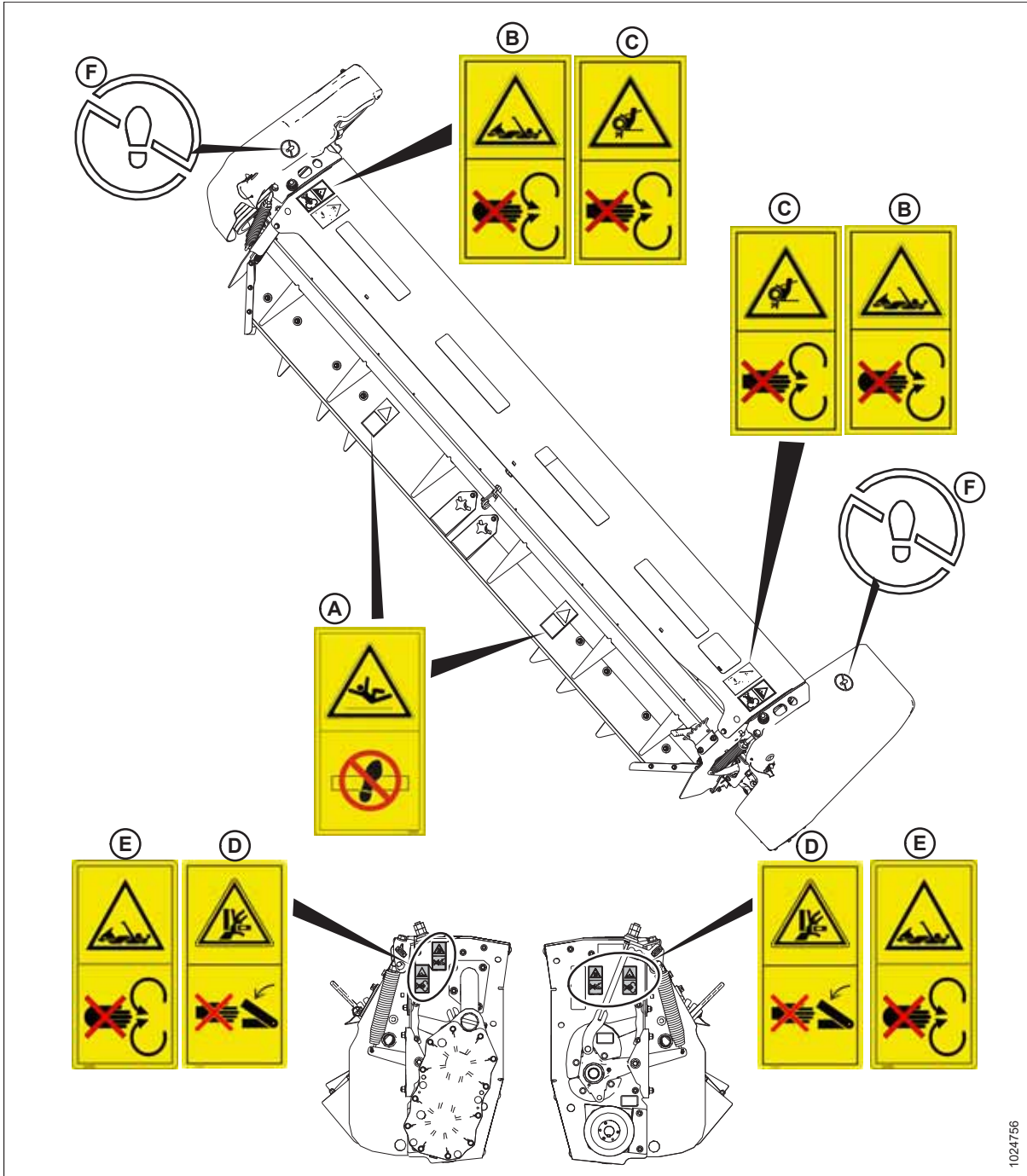


Figure 1.18: Safety Sign Decal Locations – Roll Conditioner

A - MD #190546  
D - MD #246959

B - MD #184385  
E - MD #246956

C - MD #184371  
F - NO STEP Symbol (Imprinted on Shield)

**NOTE:**

The roller conditioner for R1 FR Front Mount Rotary Disc has a split baffle for the driveline. The safety decal locations are correct.



## Chapter 2: Product Overview

Refer to this section to learn about the machine’s dimensions, weights, and specifications.

### 2.1 Definitions

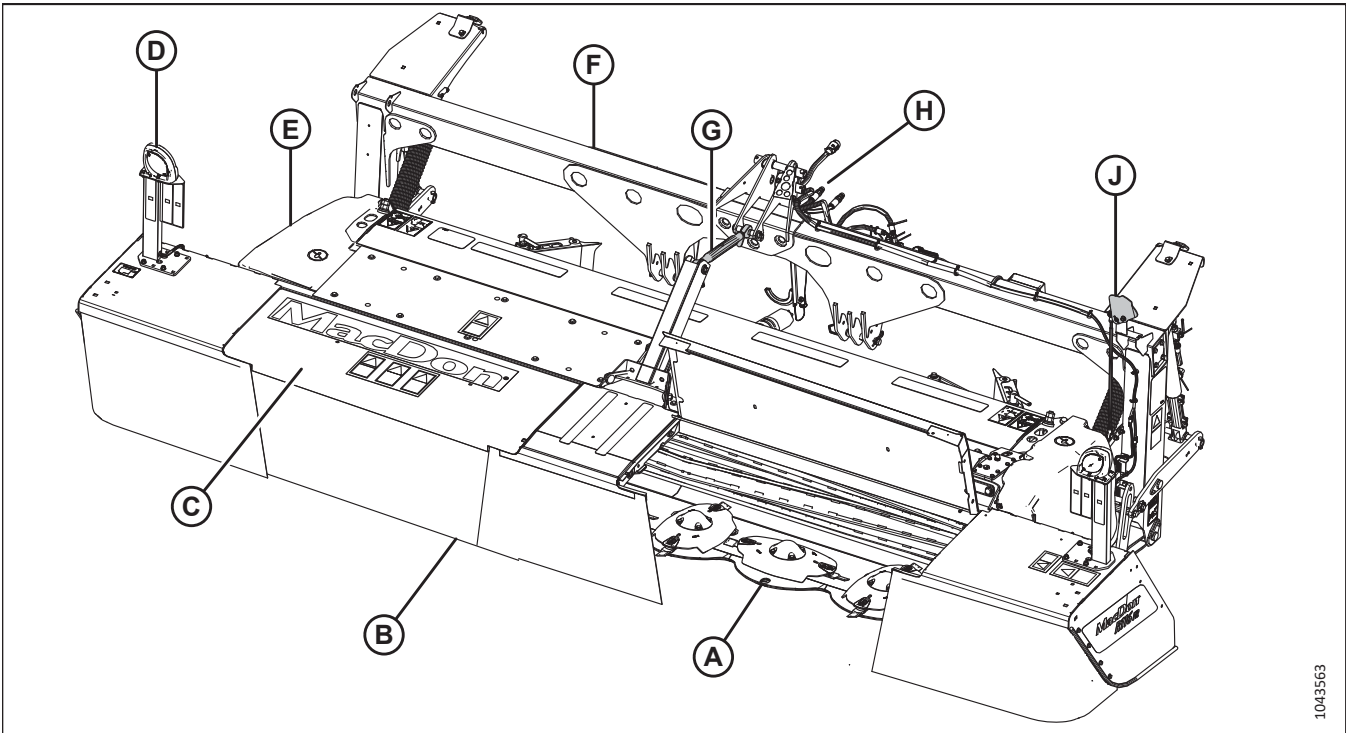
The following terms, abbreviations, and acronyms are used in this manual.

**Table 2.1 Definitions**

Term	Definition
API	American Petroleum Institute
Bolt	A headed and externally threaded fastener designed to be paired with a nut
FFFT	Flats from finger tight
Finger tight	A reference position in which the given sealing surfaces or components are making contact with each other. The fitting has been tightened by hand to a point where the fitting is no longer loose and cannot be tightened further by hand
n/a	Not applicable
Nut	An internally threaded fastener designed to be paired with a bolt
ORB	O-ring boss: A style of fitting commonly used in port openings on manifolds, pumps, and motors
ORFS	O-ring face seal: A style of fitting commonly used for connecting hoses and tubes. This style of fitting is also commonly called ORS, which stands for O-Ring Seal
PTO	Power take-off
R1 FR Series	R113 and R116 Front Mount Rotary Disc for Agricultural Tractors
SAE	Society of Automotive Engineers
Screw	A headed and externally threaded fastener that threads into preformed threads or forms its own thread when it is inserted into a mating part
Tension	An axial load placed on a bolt or screw, usually measured in Newtons (N) or pounds (lb.). This term can also be used to describe the force a belt exerts on a pulley or sprocket
TFFT	Turns from finger tight
Torque	The product of a force * the length of a lever arm, usually measured in Newton-meters (Nm), foot-pounds (lbf-ft), or inch-pounds (lbf-in)
Torque angle	A tightening procedure in which a fitting is assembled to a specified tightness (usually finger tight) and then the nut is turned farther by a specified number of degrees until it achieves its final position
Torque-tension	The relationship between the assembly torque applied to a piece of hardware and the axial load it induces in a bolt or screw
Tractor	Agricultural-type power unit which provides motive force to a front mounted header
Washer	A thin cylinder with a hole or a slot located in the center, used as a spacer, a load distribution element, or a locking mechanism

## 2.2 Component Identification

Being able to identify the parts and systems of your Front Mount Rotary Disc will help to find content in reference manuals.



1043563

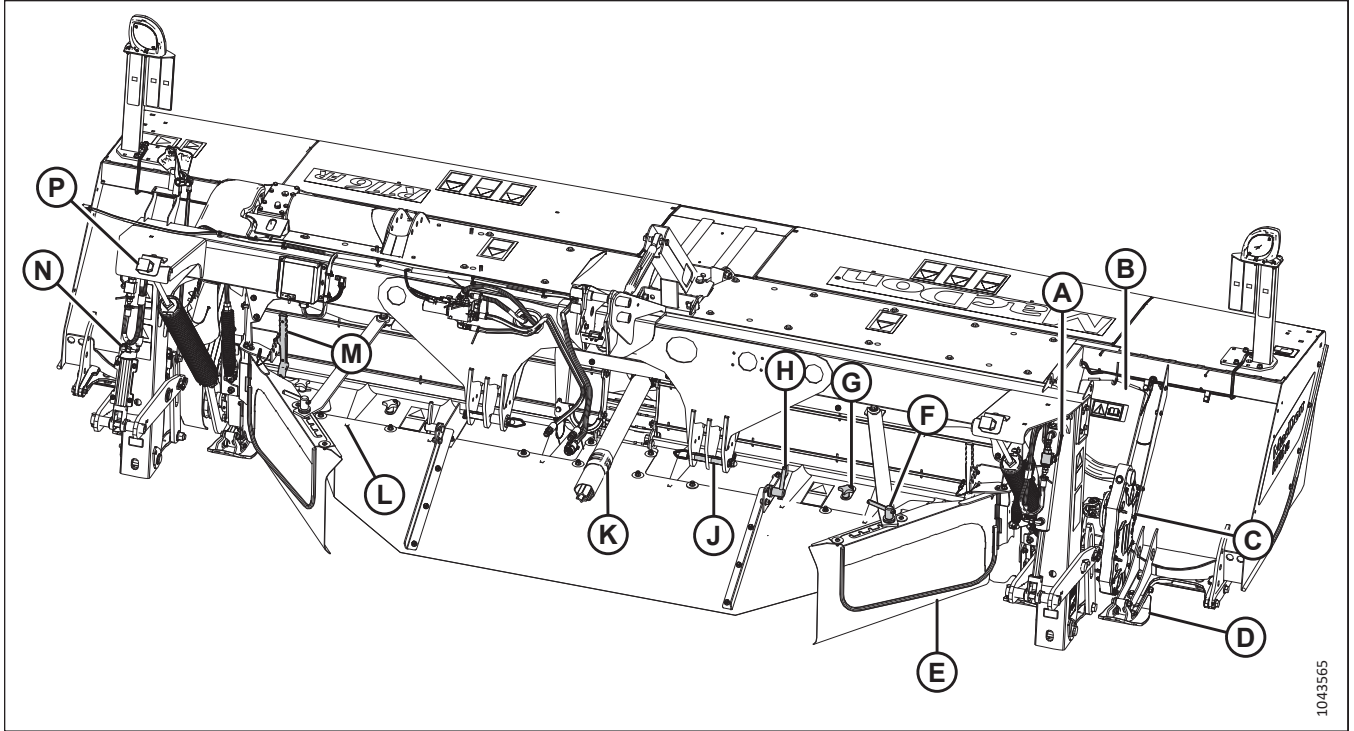
Figure 2.1: R116 FR with Conditioner

A - Cutterbar  
D - Clearance Lights  
G - Center-Link

B - Curtains  
E - Roll Conditioner  
H - Hydraulic and Electrical Connections

C - Cutterbar Door  
F - Carrier Frame  
J - Float Indicator

## PRODUCT OVERVIEW



**Figure 2.2: R116 FR with Conditioner**

A - Auxiliary Lift Cylinder Lock-Out Valve  
 D - Skid Shoe  
 G - Baffle Fin Adjuster  
 K - PTO Shaft (Half Shown)  
 N - Auxiliary Lift Cylinder

B - Manual Case  
 E - Side Deflector  
 H - Crop Shield Adjuster  
 L - Rear Baffle and Crop Shield  
 P - Float Spring

C - Conditioner Gearbox (Guard Removed)  
 F - Side Deflector Adjuster  
 J - Hitch Point  
 M - Rear Baffle Adjuster

## 2.3 Product Specifications

Consult this section to learn about dimensions, weight, and equipment specifications.

**NOTE:**

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

**Table 2.2 R1 FR Series Specifications**

Components	R113 FR	R116 FR
<b>Frame and Structure</b>		
Transport width <sup>1</sup>	4063 mm (160 in.)	5027 mm (198 in.)
Transport length	7117 mm (23 ft. 4 in.)	8580 mm (28 ft. 2 in.)
Estimated weight (with steel roll conditioner)	3084 kg (6800 lb.)	3420 kg (7540 lb.)
Carrier	Front Mount	
Lighting	Two amber clearance lights	
Manual storage	Plastic case on right backsheet	
<b>Cutterbar</b>		
Effective cutting width	3978 mm (156 5/8 in.)	4942 mm (194 5/8 in.)
Quantity of cutting discs	8	10
Blades per disc	Two 18 degrees bevel down reversible	

1. Without crop dividers.

**PRODUCT OVERVIEW**

**Table 2.2 R1 FR Series Specifications (continued)**

Components		R113 FR	R116 FR
Disc speed		2652 rpm @ 1000 power take-off rpm	
Blade tip speed range		303 km/h (188 mph)	
Minimum cutting height		27 mm (1 1/16 in.)	
Cutting angle range	with hydraulic tilt	0–7 degrees below horizontal	
Cutting angle range	with mechanical center-link	0–5 degrees below horizontal	
Skid shoes		Two adjustable	Four adjustable
Geartrain protection		Shearable disc spindles	
Deflectors		Two drum-type converging	Four drum-type converging
<b>Drives</b>			
1000 rpm tractor power take-off (PTO)		35 mm (1 3/8 in.) diameter, 21T spline 44 mm (1 3/4 in.) diameter, 20 spline 35 mm (1 3/8 in.) diameter, 6 spline	
Mechanical		Gearbox and driveline	
<b>Conditioner – Roll Type</b>			
Drive		4HB belt driven enclosed timing gearbox and driveline	
Conditioner system		Intermeshing rolls (steel)	
Conditioner speed		900 rpm @ 1000 power take-off rpm	
Length of rolls		3275 mm (10 ft. 9 in.)	
Roll diameter	Steel on steel chevron	229 mm (9 in.) / 179 mm (7 in.) O.D. tube	
Intermeshing steel bars		229 mm (9 in.) / 179 mm (7 in.) O.D. tube	
Conditioner system		Intermeshing rolls (polyurethane)	
Conditioner speed		900 rpm @ 1000 power take-off rpm	
Length of rolls		3275 mm (10 ft. 9 in.)	
Roll diameter	chevron	254 mm (10 in.) / 203 mm (8 in.) OD tube	
Intermeshing polyurethane bars		254 mm (10 in.) / 203 mm (8 in.) OD tube	
Swath width		915–2896 mm (36–114 in.)	
Forming shields		Conditioner mounted assembly with adjustable side deflectors	
<b>Ground Speed</b>			
Recommended cutting		8–15 km/h (5–10 mph)	
<b>Tractor Requirements</b>			
Power take-off (PTO) power – minimum		74 kW (100 hp)	93 kW (125 hp)
Hydraulic	Pressure	13.7 MPa (2000 psi)	
Hydraulics (front)	Couplers (pair)	Base model header: 1; Base plus hydraulic header angle option: 2	
Three-point hitch		Category 2, 3, or 3N	

**NOTE:**

Tractor must be equipped with a cab.

## Chapter 3: Operation

Safely operating your machine requires familiarizing yourself with its capabilities.

### 3.1 Auxiliary Lift Lock Pins

Auxiliary lift linkage lock pins ensure the carrier frame does not move when the header is disconnected from the tractor.

#### 3.1.1 Installing Auxiliary Lift Lock Pins

Auxiliary lift linkage lock pins are used to lock the auxiliary lift linkage to prevent the carrier frame from moving when the machine is not attached to a tractor.



#### **DANGER**

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



#### **DANGER**

Before starting the machine, check to be sure all bystanders have cleared the area.

#### **IMPORTANT:**

Do **NOT** disconnect the header from the tractor before installing the auxiliary lift lock pins. The pins prevent the carrier frame from moving when the header is disconnected from a tractor.

1. Park the machine on a flat, level surface.
2. Lower the header fully.
3. Shut down the engine, and remove the key from the ignition.

## OPERATION

- Retrieve the auxiliary lift lock straight pins, washers, and lynch pins from storage location (B) on the left side of the carrier frame, and install the straight pins into holes (A) in the auxiliary lift linkages on both sides of the machine.

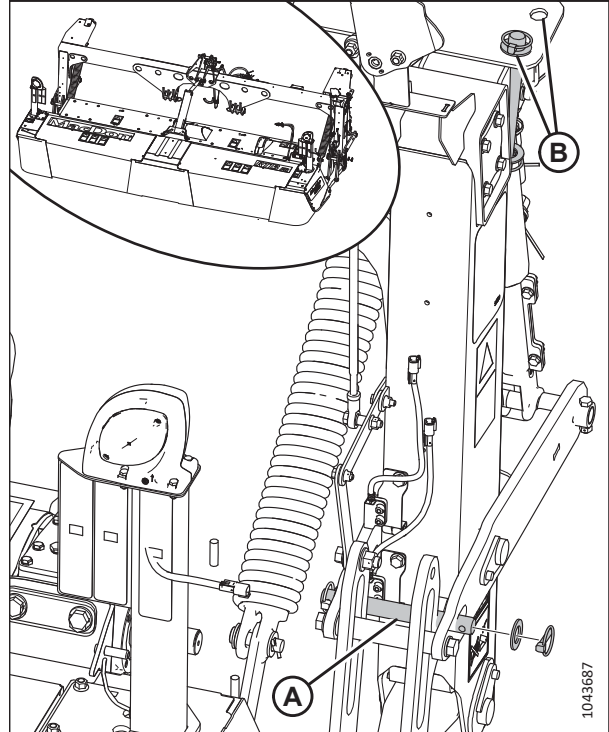


Figure 3.1: Auxiliary Lift Lock Pins – Left Side

### 3.1.2 Removing Auxiliary Lift Locking Pins

The auxiliary lift lock pins prevent the carrier frame from moving when the machine is not attached to a tractor.

#### DANGER

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

#### DANGER

Ensure that all bystanders have cleared the area.

- Connect the tractor's three-point hitch to the header. For instructions, refer to [3.7.1 Connecting Tractor to Front Mount Rotary Disc, page 23](#).

#### NOTE:

The auxiliary lift lock pins should be removed before operating in the field. The header float feature will **NOT** function correctly when the auxiliary lift system is locked.



## OPERATION

2. Remove auxiliary lift lock straight pins (A) from the holes in the auxiliary lift linkages on both sides of the machine. Store the auxiliary lift lock straight pins, washers, and lynch pins in storage location (B) on the left side of the carrier frame.

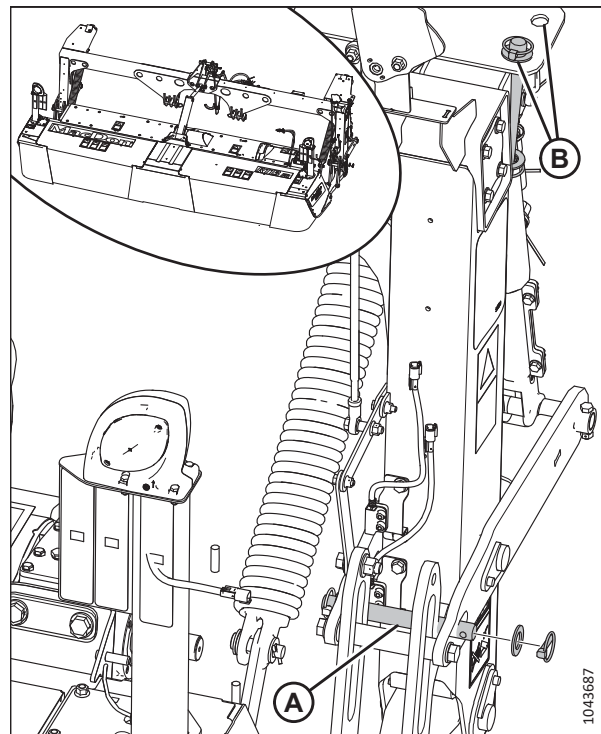


Figure 3.2: Auxiliary Lift Lock Pins – Left Side

## 3.2 Auxiliary Lift Cylinder Lock-Out Valves

To prevent unintended header movement, engage the auxiliary lift cylinder lock-out valves before disconnecting, servicing, or transporting your machine. The lock-out valves are located on the auxiliary lift cylinders at the back of the header.

### 3.2.1 Locking and Unlocking Auxiliary Lift Cylinders

The auxiliary lift cylinders provide additional lift range when raising the three-point hitch.

Auxiliary lift cylinders at both ends of the machine use a shut-off valve to prevent movement during transport, service, and when disconnecting from the tractor. When operating in the field, the shut-off valves must be open for machine raise and lower functions to work correctly.

1. To unlock auxiliary lift cylinder (A), rotate lock-out valve (B) parallel with the cylinder. Repeat for the lock-out valve on the opposite side.

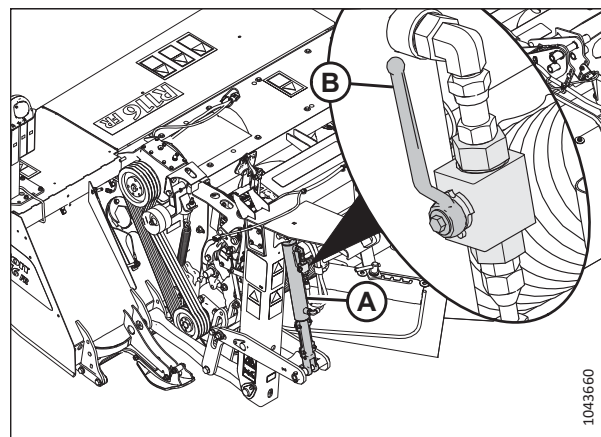


Figure 3.3: Auxiliary Lift Cylinders – Unlocked (Open)

## OPERATION

2. To lock auxiliary lift cylinder (A), rotate lock-out valve (B) perpendicular with the cylinder. Repeat for the lock-out valve on the opposite side.

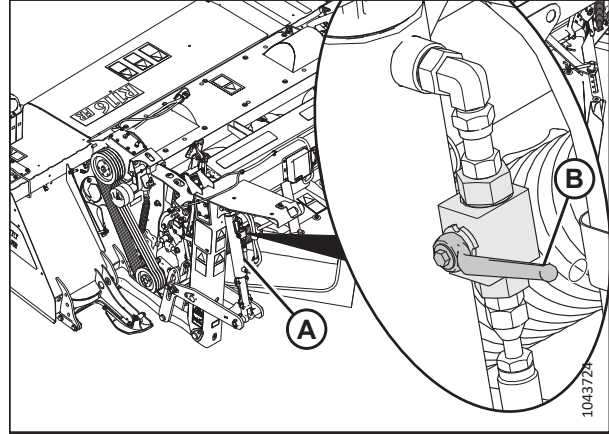


Figure 3.4: Auxiliary Lift Cylinders – Locked (Closed)

## 3.3 Driveshields

Driveshields offer protection from the rotating belts and drives. The machine has two driveshields: one on the left side, and one on the right side.

### 3.3.1 Opening Driveshields

The driveshields offer protection from moving components. Open them only when you intend to service the machine.

#### DANGER

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

#### WARNING

To reduce the risk of personal injury, do NOT operate the machine without the driveshields in place and secured.

#### NOTE:

The illustrations in this procedure show left driveshield (A); the right driveshield is similar.

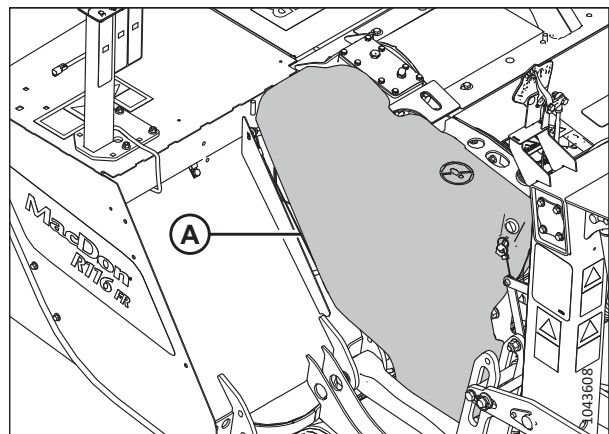


Figure 3.5: Left Driveshield

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

## OPERATION

2. Remove lynch pin (A) and tool (B) from pin (C).

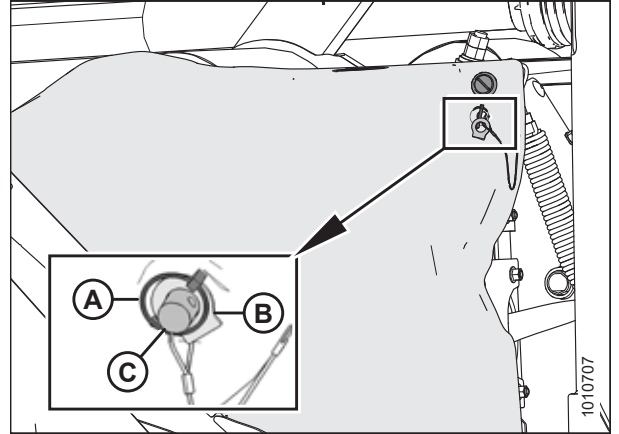


Figure 3.6: Left Driveshield

3. Insert the flat end of tool (A) into latch (B) and turn it counterclockwise to unlock the driveshield.

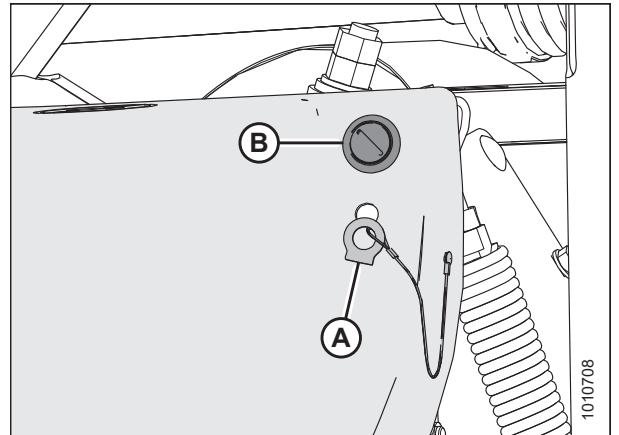


Figure 3.7: Driveshield Latch

4. Pull the top of driveshield (A) away from the machine to open it.

**NOTE:**

For improved access, lift the driveshield off the pins at the base of the shield, and lay the shield on the machine. For instructions, refer to [Removing Driveshields, page 157](#).

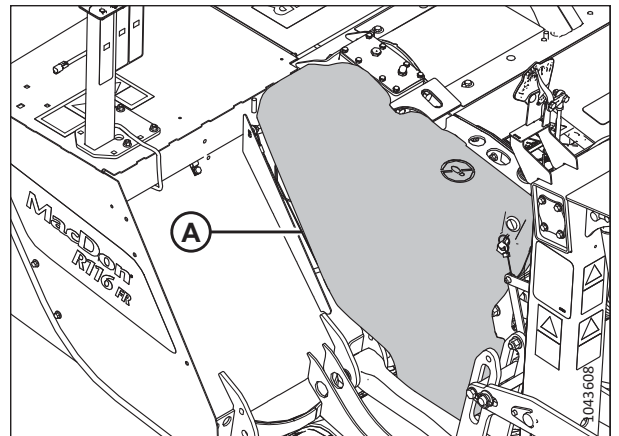


Figure 3.8: Left Driveshield

### 3.3.2 Closing Driveshields

Close the driveshields when your maintenance or repair tasks are complete.

#### **WARNING**

To reduce the risk of personal injury, do NOT operate the machine without the driveshields in place and secured.

#### **NOTE:**

The illustrations shown in this procedure apply to the left driveshield; the right driveshield is similar.

1. Position the driveshield onto the pins, if necessary.
2. Push driveshield (A) to engage latch (B).
3. Ensure that the driveshield is properly secured.

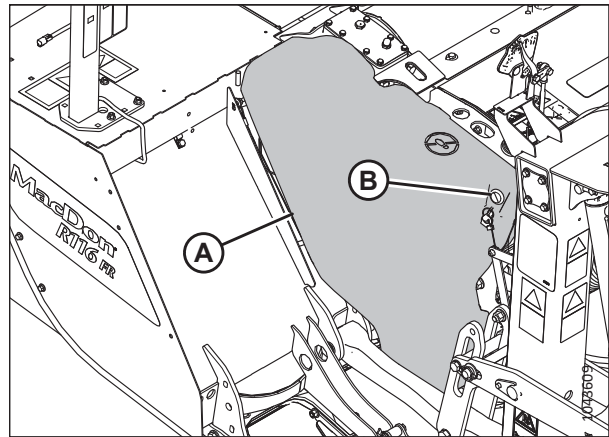


Figure 3.9: Left Driveshield

4. Replace tool (B) and lynch pin (A) onto pin (C).

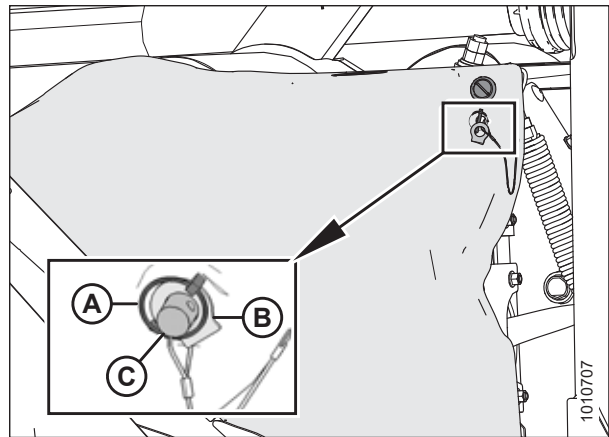


Figure 3.10: Left Driveshield

### 3.4 Cutterbar Doors

Two doors with rubber curtains provide access to the cutterbar area.

#### **WARNING**

To reduce the risk of personal injury and machine damage, do NOT operate the machine installed and in good condition. Objects in the path of the blades can eject with considerable force when the machine is started.

## OPERATION

Curtains are attached to cutterbar doors (A), each front corner (B), and at center (C). Keep the curtains lowered when operating the R1 Front Mount Rotary Disc.

### IMPORTANT:

Replace the curtains if they become worn or damaged. For instructions, refer to [4.4.2 Maintaining Curtains, page 72](#).

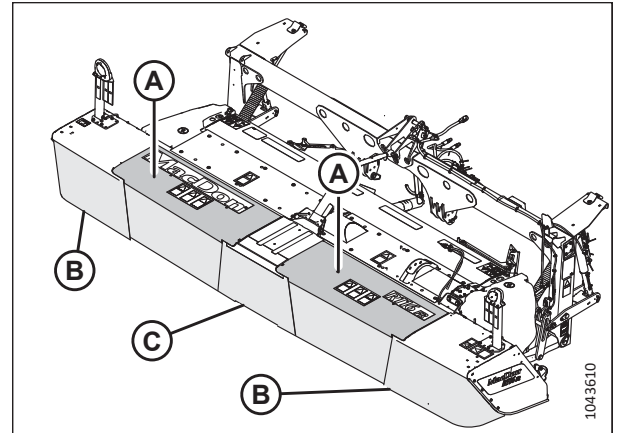


Figure 3.11: Cutterbar Doors and Curtains

### 3.4.1 Opening Cutterbar Doors

You will need to open the cutterbar doors to access the cutterbar.

#### DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Lift up doors (A) at the front of the machine.

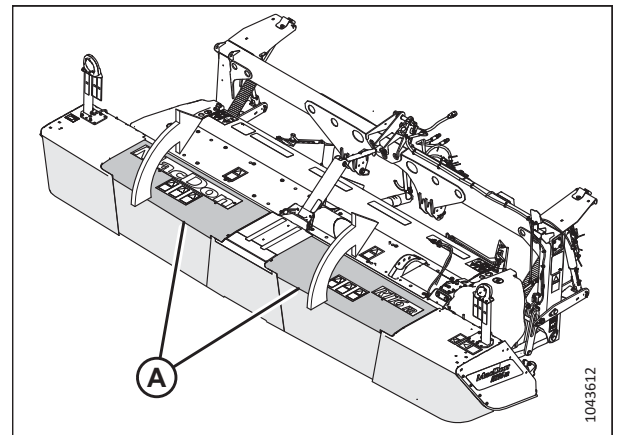


Figure 3.12: Cutterbar Doors and Curtains

### 3.4.2 Closing Cutterbar Doors

Do **NOT** operate the machine without closing the cutterbar doors.

#### CAUTION

Keep your hands and fingers away from the corners of the doors when you are closing them.

## OPERATION

1. Pull down on door (A) from the top to close it.
2. Ensure that the curtains hang properly and completely enclose the cutterbar area.

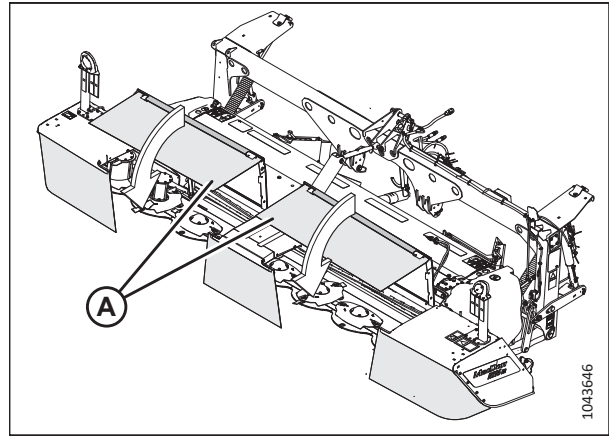


Figure 3.13: Cutterbar Doors and Curtains

### 3.5 Daily Start-Up Check

Perform this procedure before operating the machine.

#### CAUTION

- Ensure that the tractor and the header are properly attached, that all controls are in neutral, and that the tractor brakes are engaged.
- Ensure that the area is clear of bystanders.
- Wear close-fitting clothing and protective shoes with slip-resistant soles. Have at hand any protective clothing and personal safety devices that **MIGHT** be necessary throughout the day.
- Clear any obstacles that might interfere with the operation of the machine.

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

#### NOTE:

Use the proper procedure when searching for pressurized fluid leaks. For instructions, refer to [4.6.1 Checking Hydraulic Hoses and Lines, page 185](#).

2. Clean all lights and reflective surfaces on the machine, and check the lights to ensure that they are operating correctly.
3. Perform all daily maintenance procedures. For instructions, refer to [4.3.1 Maintenance Schedule/Record, page 60](#).

## 3.6 Preparing Tractor for Front Mount Rotary Disc

To operate the front mount rotary disc with a tractor, the tractor must meet power and hydraulic requirements.

### 3.6.1 Tractor Requirements

The tractor used to run the rotary disc header must meet the requirements outlined in the table.

**Table 3.1 Tractor Requirements**

Model Number	Minimum Power	Minimum Hydraulics	Electrical Supply	Hitch
R113 FR	75 kW (100 hp)	Front remote <sup>2</sup> 13.7 MPa (2000 psi)	12 V, 7-pin	Three-point type 2, 3, or 3N; 1815 Kg (4000 lbs) capacity
R116 FR	93 kW (125 hp)	Front remote <sup>2</sup> 13.7 MPa (2000 psi)	12 V, 7-pin	Three-point type 2, 3, or 3N; 1815 Kg (4000 lbs) capacity

**NOTE:**

The tractor must be equipped with a cab.

**NOTE:**

The hydraulic flow control for the tractor's front hydraulic circuit should be set to 20–30%. For instructions, refer to the tractor operator's manual.

## 3.7 Attaching Front Mount Rotary Disc to Tractor

The Front Mount Rotary Disc can be attached to the tractor with a three-point hitch.

### 3.7.1 Connecting Tractor to Front Mount Rotary Disc

Connecting the machine to the tractor involves connecting the hydraulic and electrical systems. The R1 FR Series can attach to three-point hitch categories 2, 3, and 3N.



**DANGER**

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



**DANGER**

Ensure that all bystanders have cleared the area.

---

2. Two channels required for optional hydraulic center link.

## OPERATION

1. Ensure the machine is set on a flat level surface.
2. Connect your tractor's 3-point hitch to the following locations on the header frame according to the hitch type.
  - Category 3: connect to upper linkage (A) and lower linkages (D).
  - Category 3N: connect to upper linkage (A) and lower linkages (C).
  - Category 2: connect upper linkage (B) and lower linkages (C).

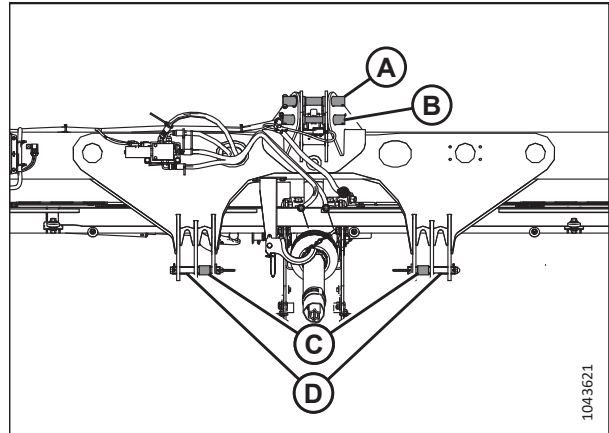


Figure 3.14: Front Linkage Connections

3. Attach three-point hitch (A) to carrier frame linkage (B). Refer to your tractor hitch instructions to properly secure the connections.
4. Lower the header fully.
5. Shut down the engine, and remove the key from the ignition.

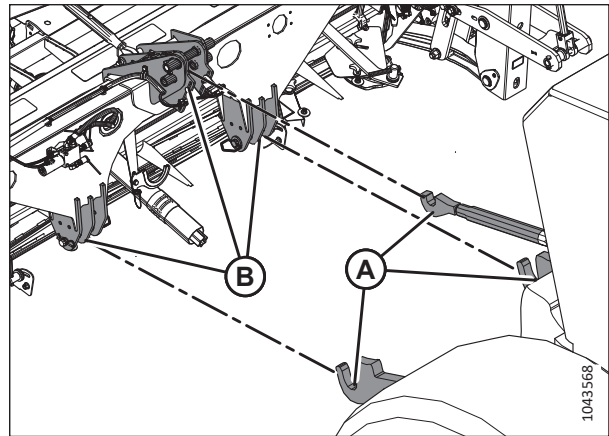


Figure 3.15: Alignment with Header Carrier Frame



## OPERATION

6. Remove auxiliary lift lock straight pins (A) from holes in lift linkages on both sides of the header. Store the auxiliary lift lock straight pins, washers, and lynch pins in storage location (B) on the left side of the carrier frame.

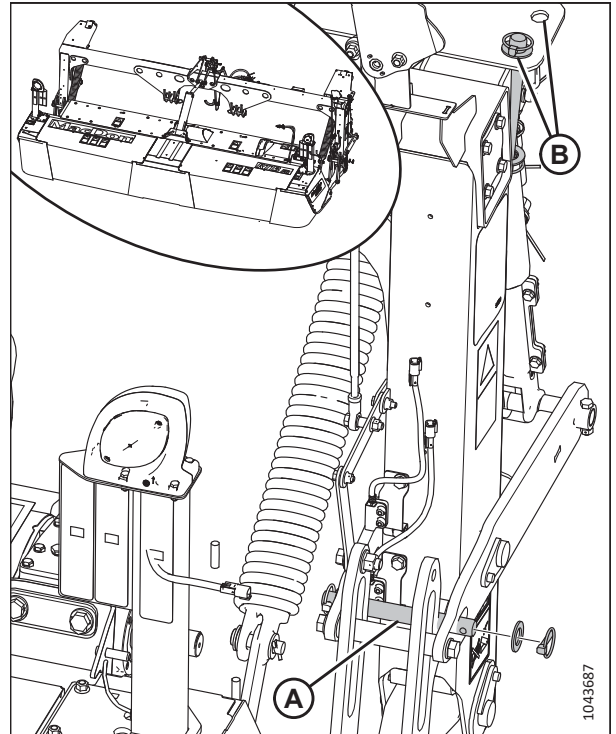


Figure 3.16: Auxiliary Lift Lock Pins – Left Side

7. Adjust lower link arms (A) on the three-point hitch until dimension (B) (from the center of the pin to the ground) is 140 mm (5 1/2 in.).

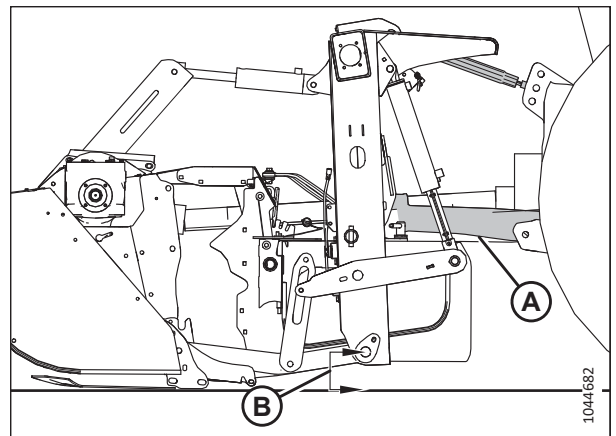
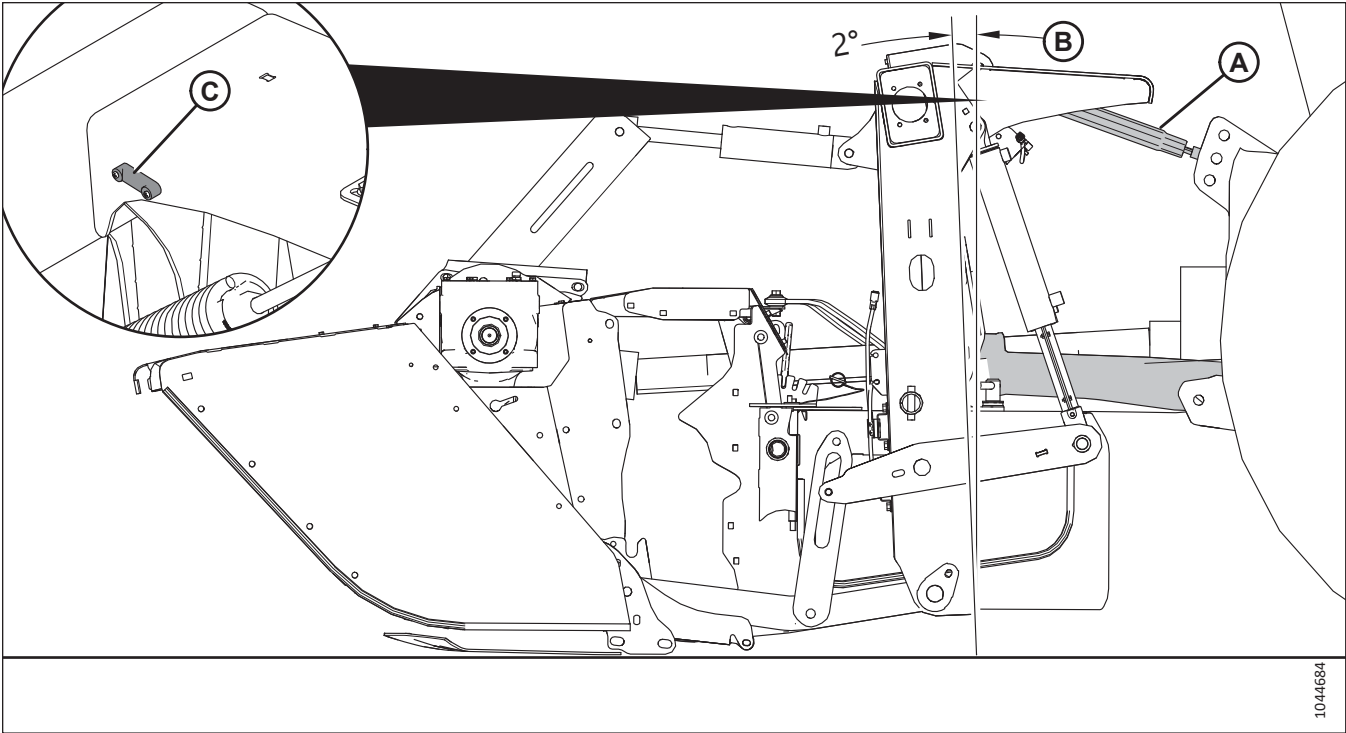


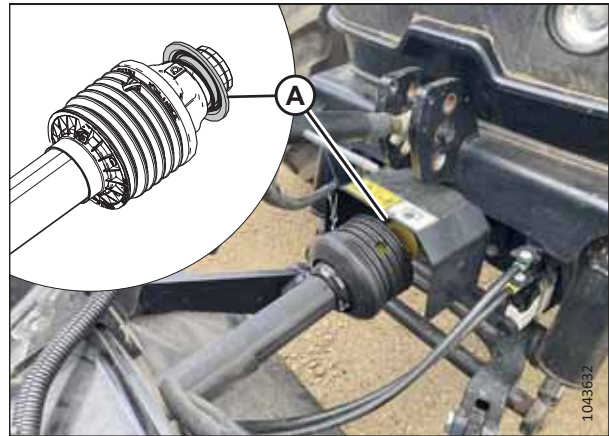
Figure 3.17: Alignment with Header Carrier Frame

## OPERATION



**Figure 3.18: Alignment with Header Carrier Frame**

8. Adjust the length of top link (A) on the three-point hitch until carrier frame angle (B) is approximately 2° forward. Use bubble level (C), located on the right side of the carrier frame to set the angle.
9. Position the driveline onto the tractor's PTO shaft.
10. Pull back collar (A) on the driveline and push the driveline onto the PTO shaft until it locks. Release the collar.



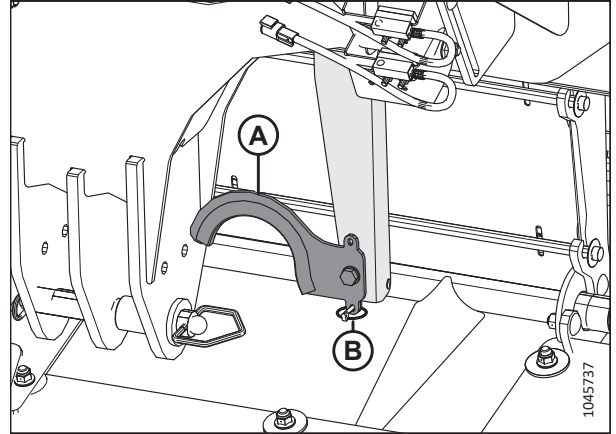
**Figure 3.19: Tractor Front PTO Connection**

## OPERATION

11. Rotate storage bracket (A) into storage position and secure it with pin (B).

**IMPORTANT:**

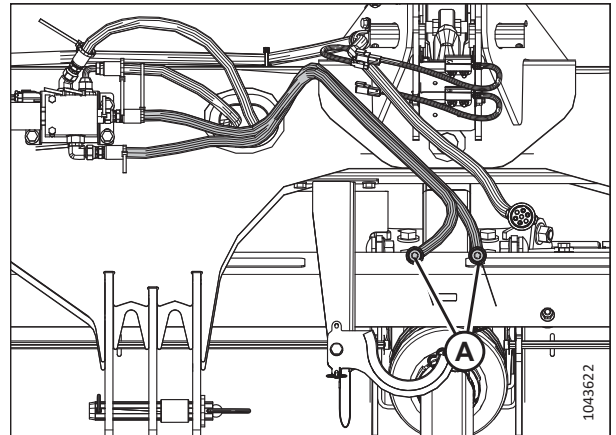
If the bracket is not put into storage position, it can be damaged when lifting the header.



**Figure 3.20: Driveline Storage Bracket in Storage Position**

12. Locate pressure and return hoses (A):

- Pressure (yellow tie)
- Return (green tie)

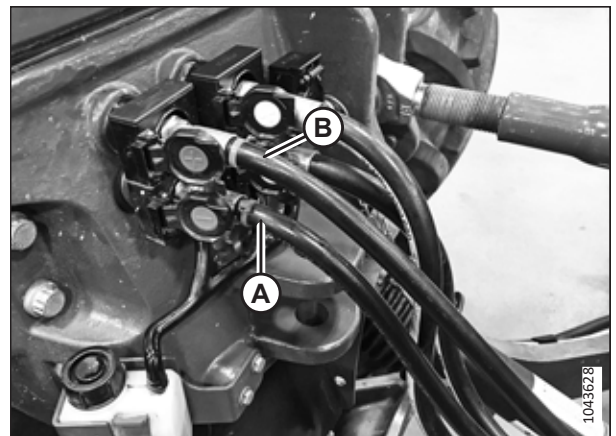


**Figure 3.21: Hydraulic Control Hoses**

13. Connect pressure hose (A) (yellow tie) and return hose (B) (green tie) to the tractor's front selective control valve.

**NOTE:**

Ensure that the hoses are connected to the same remote set.



**Figure 3.22: Hydraulic Connections**

## OPERATION

14. Connect the seven-pin electrical connector (A) on the header to the tractor's front electrical plug.

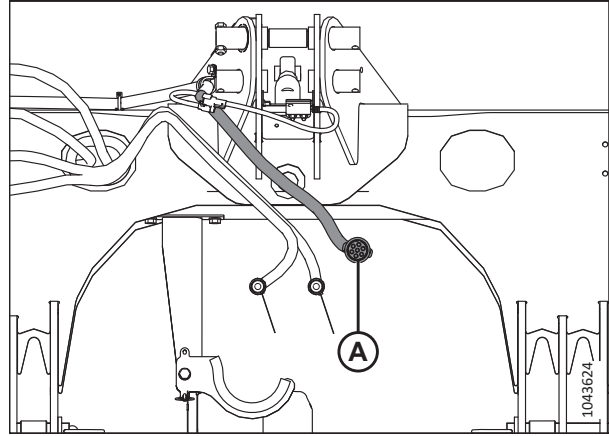


Figure 3.23: Header Electrical Harness

15. Locate the relay logic switch on the left side of the carrier frame at the back of the machine and set switch (A) to the manual "M" position.
16. Using the tractor's front hydraulic circuit controls, fully extend the auxiliary lift cylinders to fill them.

### IMPORTANT:

Make sure you extend the cylinders first. Retracting the lift cylinders without the system primed can cause damage to the components.

17. Set switch (A) to the automatic "A" position for normal operation. In this mode, the auxiliary lift cylinders will extend or retract according to feedback from the position sensors.
18. Set the tractor's front hydraulic channel to CONTINUOUS, and adjust flow to 20–30 %. For instructions, refer to the tractor operator's manual.

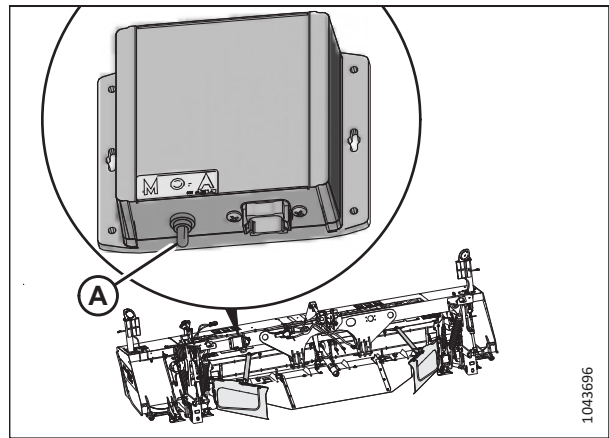


Figure 3.24: Relay Logic Assembly

## 3.8 Detaching Front Mount Rotary Disc from Tractor

Detach the front mount rotary disc from the tractor for servicing or storing.

### 3.8.1 Disconnecting the Tractor from Front Mount Rotary Disc

The following procedure explains how to disconnect the tractor from the front mount rotary disc.

#### DANGER

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

#### DANGER

Ensure that all bystanders have cleared the area.

1. Park the machine on a flat, level surface.
2. Shut down the engine, and remove the key from the ignition.

## OPERATION

- Place blocks under each end, or just inside each end, of the cutterbar.
- Lower the header onto blocks.
- Ensure that the auxiliary lift cylinders are fully retracted.
- Shut down the engine, and remove the key from the ignition.
- Turn the auxiliary lift cylinder lock-out valves to the closed position. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
- Retrieve the lift lock straight pins, washers, and lynch pins from storage location (B) on the left side of the carrier frame, and install the straight pins into the holes (A) in lift linkages on both sides of the header.
- Secure the straight pins with washers and lynch pins (two per pin) on both sides of the front mount rotary disc carrier frame.

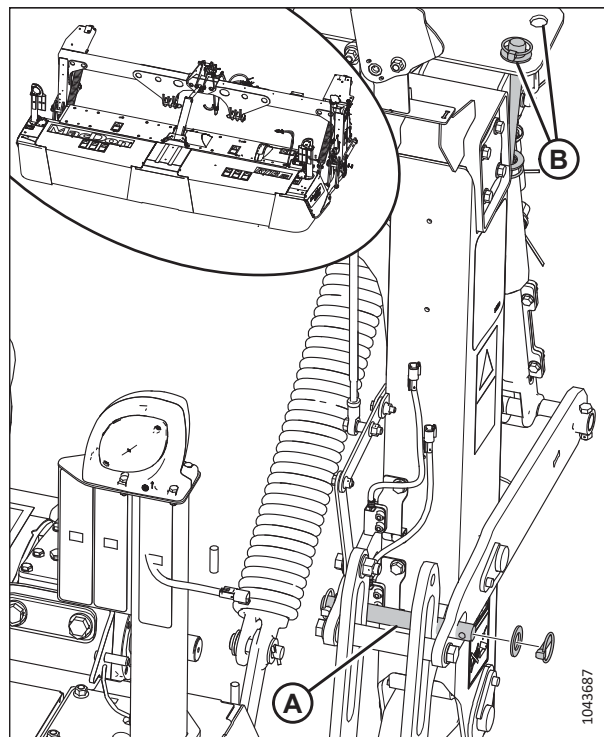


Figure 3.25: Auxiliary Lift Lock Pins – Left Side

- Disconnect pressure hose (A) (yellow tie) and return hose (B) (green tie) from the tractor's front selective control valve and store the hoses on the front mount rotary disc.

**IMPORTANT:**

Install caps and plugs on open hydraulic hoses and lines to prevent buildup of dirt and debris while in storage.

**NOTE:**

Disconnect the hoses for the hydraulic center-link if equipped.

- Disconnect the header power plug from the tractor's seven-pin outlet, and store the power cable on the header.

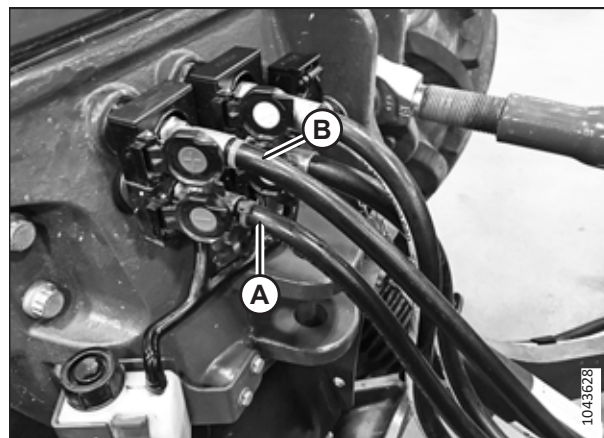


Figure 3.26: Hydraulic Connections

## OPERATION

12. Disconnect the power take-off (PTO) driveline chain from the tractor.
13. Pull back on collar (A) and pull the driveline off the tractor's PTO shaft.

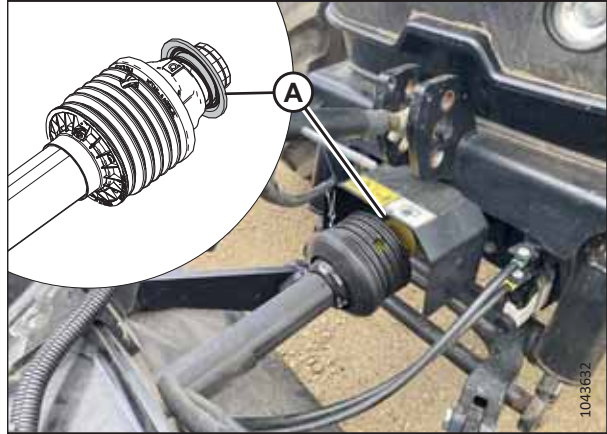


Figure 3.27: Tractor Front PTO Connection

14. Rotate storage bracket (C) back to the holding position.
15. Set the PTO driveline (A) on storage bracket and secure the driveline with chain and lynch pin (B).

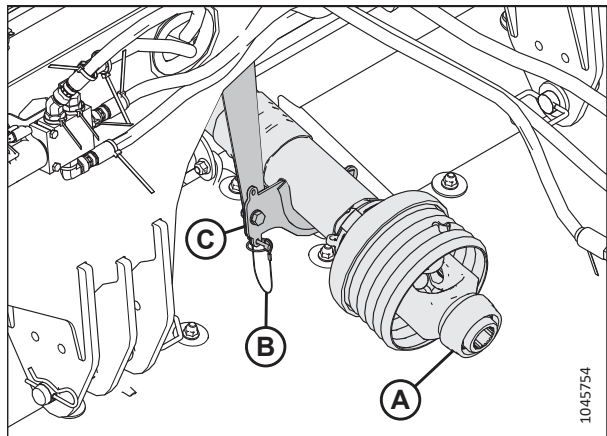


Figure 3.28: PTO Storage

16. Disconnect three-point hitch (A) from carrier frame linkage (B). Ensure all clevis and hair pins are stored securely on the front mount rotary disc frame.

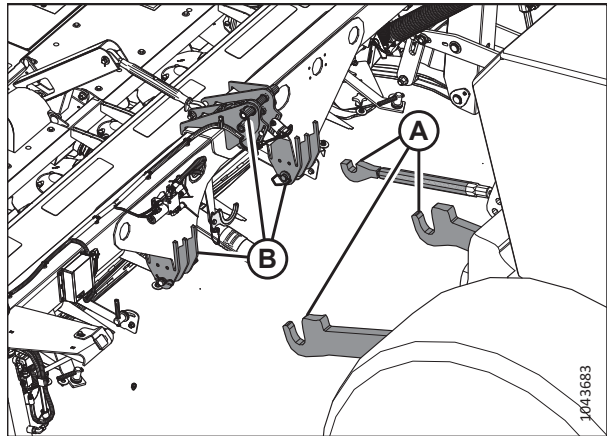


Figure 3.29: Tractor Alignment with Header Carrier Frame



### 3.9 Breaking in Rotary Disc Header

After attaching the rotary disc header to the tractor for the first time, operate the machine at low speed for 5 minutes while watching and listening **FROM THE OPERATOR'S SEAT** for binding or interfering parts.

#### DANGER

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

#### IMPORTANT:

Be especially alert until you become familiar with the sound and feel of your new rotary disc header.

Refer to [4.3.2 Break-in Inspections, page 62](#) to determine the service interval for your header, and complete the scheduled break-in inspection procedures.

### 3.10 Engaging Power Take-Off

The power take-off transfers power from the tractor to the rotary disc header.

#### DANGER

**Ensure that all bystanders are clear of the machine before engaging the power take-off (PTO). Never leave tractor seat with the PTO engaged.**

1. Move the header up to the standing crop, and slowly engage the PTO.
2. Ensure that the tractor PTO is running at 1000 rpm before starting to cut.
3. Disengage the PTO when not operating the rotary disc header.

### 3.11 Shutdown Procedure

Follow all the safety procedure and operational instructions given in this manual and in your tractor operator's manual.

#### DANGER

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

- Disengage the power take-off.
- Park on level ground if possible.
- Lower the header fully.
- Place all controls in NEUTRAL or PARK.
- Engage the park brake.
- Shut down the engine, and remove the key from the ignition.
- Wait for all movement to stop.
- Lock the tractor's shielding and closures when leaving the machine unattended.

## 3.12 Transporting Rotary Disc Header

You can transport the rotary disc header using a tractor.

### CAUTION

- Obey all highway traffic regulations in your area when transporting on public roads. Use flashing amber lights unless prohibited by law.
- Be aware of roadside obstructions, oncoming traffic, and bridges.
- Travel at safe speeds to ensure complete machine control and stability at all times. Do NOT exceed 32 km/h (20 mph). Reduce speed for corners and slippery conditions.
- Use tractor lights and rotary disc header flashing amber lights when transporting on roads in order to provide adequate warning to operators of other vehicles.
- Do NOT transport the rotary disc header on a road or highway at night or in reduced visibility conditions such as rain or fog.
- Do NOT transport with any highway-capable vehicle. Use only an agricultural tractor with a sufficient weight such that the fully loaded implement weighs no more than 1.5 times the weight of the tractor.
- To prevent unintended header movement, engage the lift cylinder lock-out valve and turn off the tractor's hydraulic flow (refer to the tractor operator's manual).

### 3.12.1 Transport Lighting

Light assemblies provide position, hazard, and turning direction information.

## 3.13 Operating Rotary Disc Header

Operating the rotary disc header properly results in less crop lost and increased productivity during harvest. This includes making proper adjustments while operating the machine to suit various crops and harvest conditions. Regular maintenance and operating the machine safely and properly increases the machine's length of service.

The variables listed in Table 3.2, page 32 and detailed on the following pages will affect the performance of your rotary disc header. You will quickly become adept at adjusting your machine to produce the desired results. Although most of the adjustments have been set at the factory, settings can be changed to suit your crop conditions.

**Table 3.2 Rotary Disc Header Performance Variables**

Variable	Refer to
Float	<a href="#">3.13.2 Float, page 34</a>
Cutterbar angle	<a href="#">3.13.4 Cutterbar Angle, page 39</a>
Cutting height	<a href="#">3.13.3 Cutting Height, page 37</a>
Ground speed	<a href="#">3.13.5 Ground Speed, page 40</a>
Conditioning: roll type	<a href="#">3.14 Roll Conditioner, page 44</a>



### 3.13.1 Raising and Lowering Rotary Disc Header

The rotary disc header can be raised or lowered to clear obstacles, for maintenance, or for storage and transport.

#### *Header Raise / Lower – Auxiliary Lift System*

The auxiliary lift system uses position sensors, an electronically controlled valve, and hydraulic cylinders to automatically adjust the header position when the Operator adjusts header raise/lower position with the 3-point hitch.

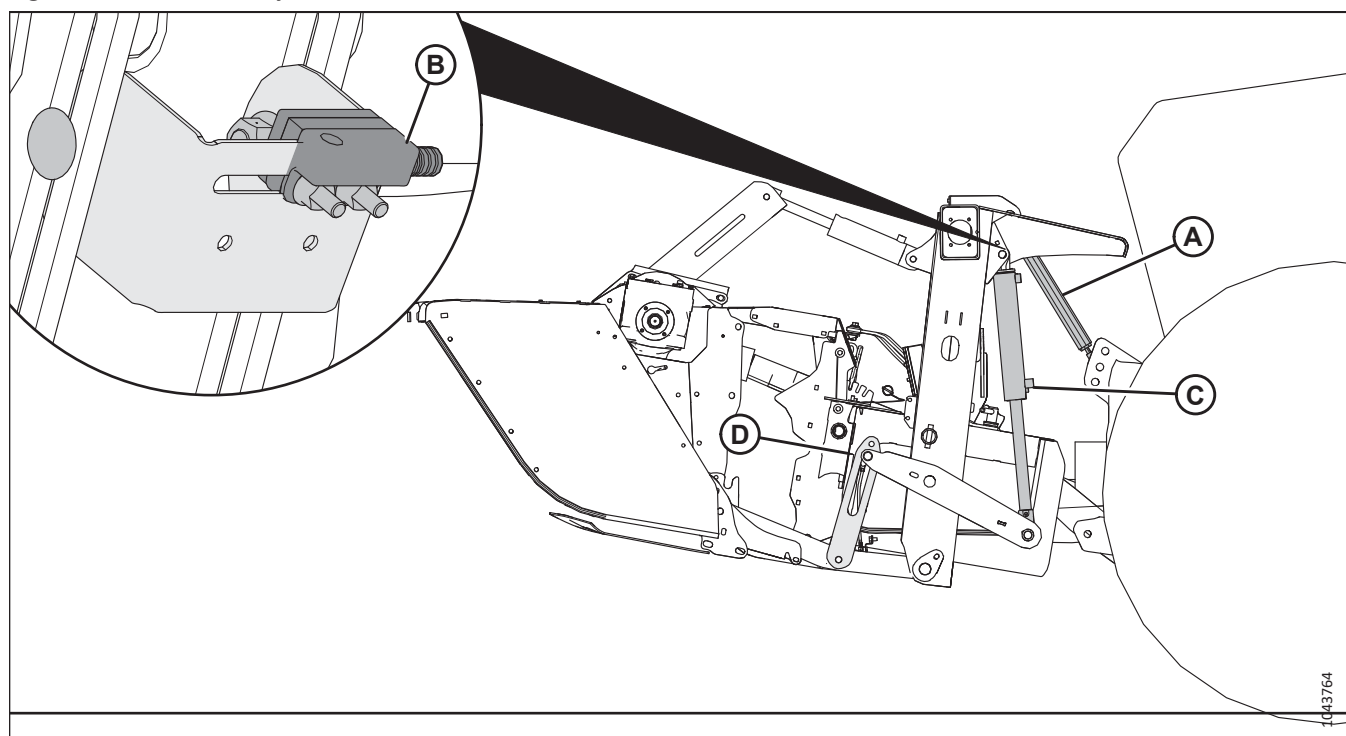
#### **!** DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, stop the engine, remove the key from the ignition, and engage the lift cylinder lock-out valves before going under the machine.

#### **!** DANGER

Ensure that all bystanders have cleared the area.

Figure 3.30: R1 FR – Fully Raised Position



When the 3-point hitch is fully raised, top link (A) moves to within 1–3 mm (1/32–1/8 in.) of upper proximity sensor (B) (inset); the hydraulic system extends auxiliary lift cylinders (C) to lift linkage (D). The header will raise to clear obstacles and windrows during field operation, and provide positioning options for maintenance, storage, or transport. The extended cylinders also reduce pressure on the float springs.

#### **NOTE:**

For the auxiliary lift system to function, the tractor's front hydraulic circuit must be CONTINUOUS, and the hydraulic flow rate adjusted to 15–20 %. For instructions, refer to the tractor operator's manual.

## OPERATION

To raise or lower the 3-point hitch, activate cylinder control lever (A) as follows:

- Move the lever **FORWARD** to position (B) to lower the header.
- Move the lever **BACKWARD** to position (C) to raise the header.

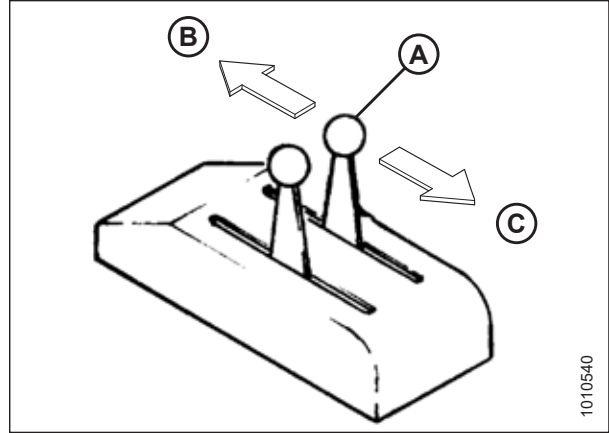


Figure 3.31: Tractor Control Lever

### 3.13.2 Float

Float springs are normally set so a weight of approximately 43–47 kg (95–105 lb.) is required to lift either end of the rotary disc header.

From the tractor's operator position, pointer (A) provides a visible indicator of the ground pressure communicated through rod (B).

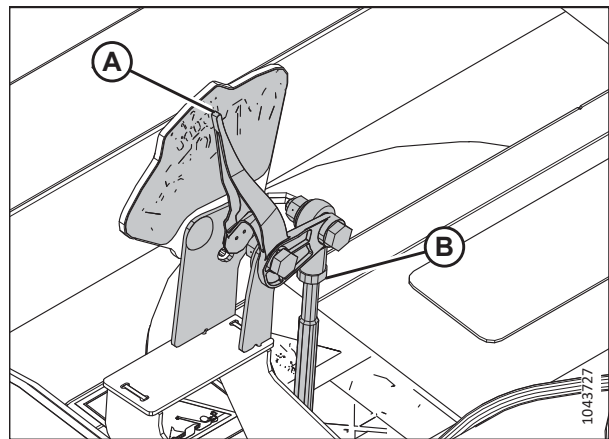


Figure 3.32: Float Indicator – Left Side

When calibrated properly, the float indicator pointer will react to ground pressure as follows:

- **Pointer centered on number 2 (A):** header on level ground in cutting position, normal ground pressure
- **Pointer above number 2:** header on ground, increased ground pressure
- **Pointer below number 2:** header off the ground, decreased ground pressure

#### NOTE:

When the float indicator is calibrated properly, it is normal for the indicator needle to not read as low as zero when the header is off the ground.

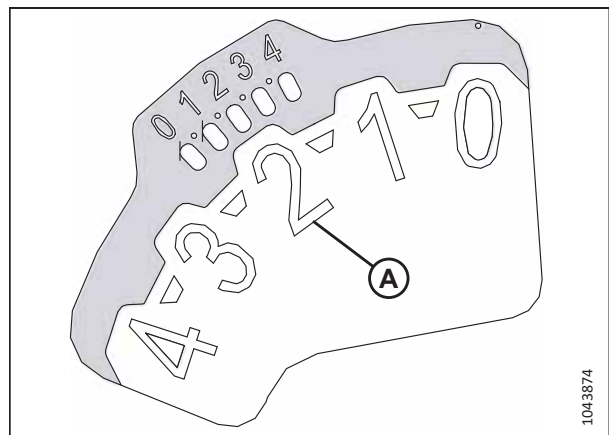


Figure 3.33: Float Indicator

### Adjusting Float

The float setting (or lifting force) changes depending on options. The setting must be the same at both ends of the rotary disc header.

#### DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, stop the engine, remove the key from the ignition, and engage the lift cylinder lock-out valves before going under the machine.

#### DANGER

Ensure that all bystanders have cleared the area.

#### NOTE:

Changing the rotary disc header's operating position can affect the float settings. After adjusting the cutting height or the cutterbar angle, check the float and adjust as necessary.

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Close the rotary disc header's auxiliary lift cylinder lock-out valve (A) on each lift cylinder by turning the handle to the horizontal position (90° to the hose). Repeat this step on the opposite side.

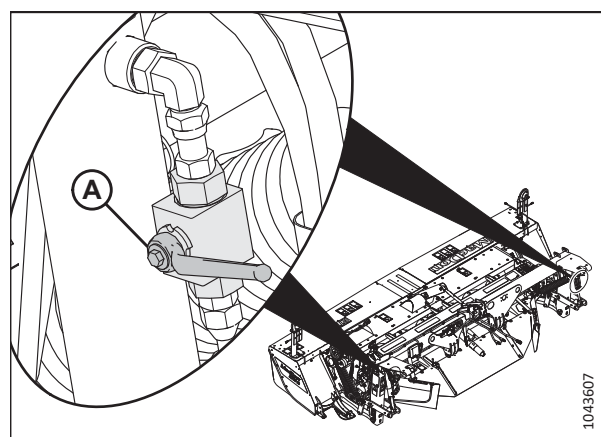


Figure 3.34: Cylinder Lock-Out Valve – Closed Position

4. Loosen retaining bolt (A) and rotate cover plate (B) away from float spring bolt (C). Repeat this step on the opposite side.
5. Fully loosen float spring bolt (C). Repeat this step on the opposite side.

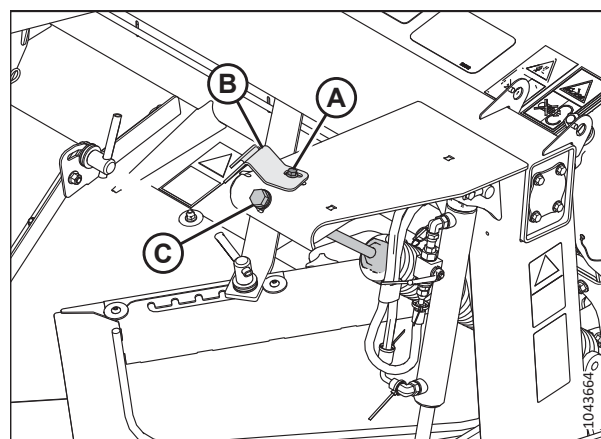


Figure 3.35: Float Spring – Right Side

## OPERATION

- Turn adjuster bolt (A) to achieve the recommended measurement (B) for the conditioner type. Refer to Table 3.3, page 36 for measurements.

**NOTE:**

Float settings indicated in the table are starting points. Float force should be checked with header float and cutting angle set as planned for use in the field.

- Turn bolt (A) clockwise (towards the spring) to increase float.
- Turn bolt (A) counterclockwise (away from the spring) to decrease float.

Repeat this step on the opposite side.

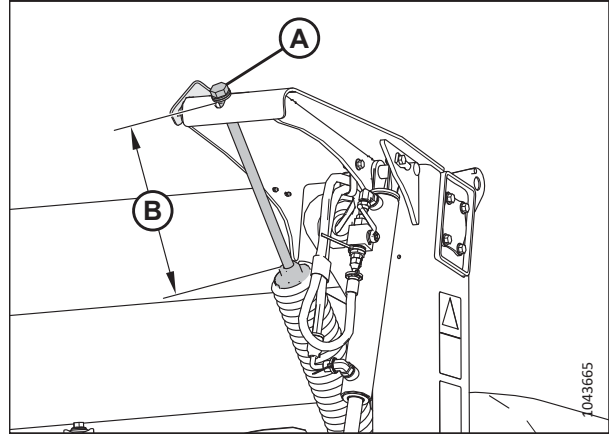


Figure 3.36: Adjuster Bolt

Table 3.3 Float Setting Starting Point

Model	Conditioner Type	Length of Exposed Thread
R113 FR	Roll	120–130 mm (4 3/4–5 1/8 in.)
R116 FR	Roll	70–80 mm (2 3/4–3 1/8 in.)

- Reposition cover plate (A) over the float spring adjuster bolt as shown. Secure cover plate (A) by tightening bolt (B). Repeat this step on the opposite side.

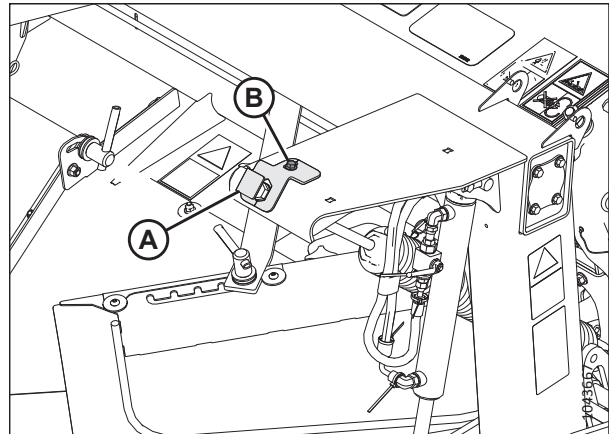


Figure 3.37: Adjuster Bolt Cover Plate

## OPERATION

- Open auxiliary lift cylinder lock-out valve (A) on each cylinder by turning the handle to the open position (in line with the hose).
- Lower the rotary disc header to cutting position, grasp the front corner of the header, and lift; the weight should feel like approximately 45 kg (100 lb.) at both ends.

**NOTE:**

In rough or stony conditions, it may be preferable to apply less force in order to protect the cutting components.

**NOTE:**

When the float setting is light, it may be necessary to reduce the ground speed to prevent excessive bouncing and leaving a ragged cut.

- Repeat the adjustment procedures until the desired weight is achieved at both ends of the header.
- With the header on level ground in cutting position, calibrate float indicator (A) by loosening jam nut (B), and turning the adjustable rod until the needle is centered on the number "2".

**NOTE:**

The auxiliary lift cylinders should be fully retracted when calibrating the float indicator.

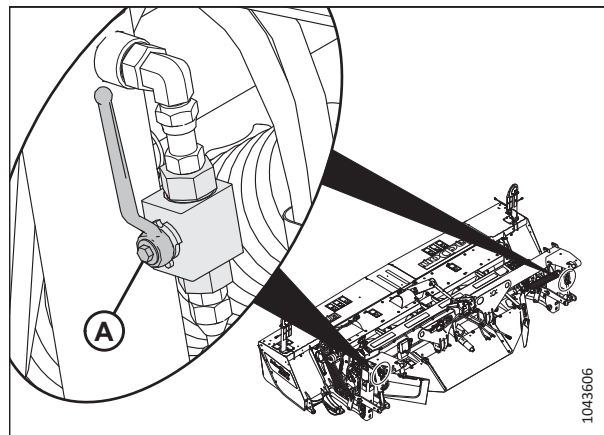


Figure 3.38: Lock-Out Valve – Open Position

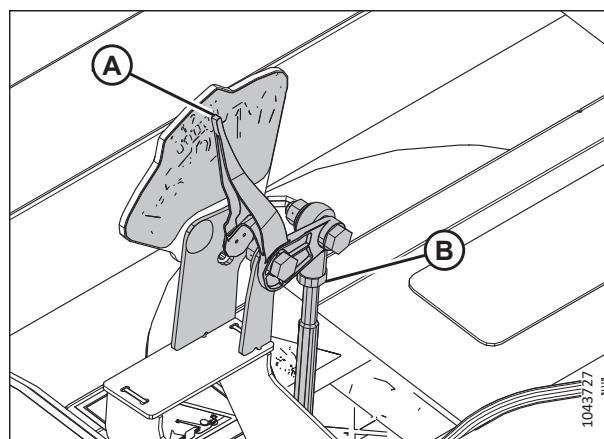


Figure 3.39: Float Indicator – Left Side

### 3.13.3 Cutting Height

The cutting height is determined by a combination of the cutterbar angle and the skid shoe settings. Adjust the cutting height for optimum cutting performance while preventing the excessive build-up of mud and soil inside the rotary disc header, which can lead to poor crop flow and increased wear on cutting components.

Lowering the skid shoes and decreasing the cutterbar angle increases the cutting height, resulting in higher stubble that helps material dry faster. This may be desirable in stony conditions to help reduce damage to cutting components.

Raising the skid shoes and increasing the cutterbar angle decreases the cutting height, resulting in a shorter stubble. For instructions, refer to [Adjusting Cutting Height, page 38](#).

To choose a cutterbar angle that maximizes performance for your crop and field conditions, refer to [3.13.4 Cutterbar Angle, page 39](#).

To minimize cutterbar damage, scooping soil, and soil build-up at the cutterbar in damp conditions, the float should be set as light as possible without causing excessive bouncing. For instructions, refer to [Adjusting Float, page 35](#).

## OPERATION

### Adjusting Cutting Height

Lowering the skid shoes and decreasing the cutterbar angle increases the cutting height, resulting in taller stubble that helps material dry faster. Raising the skid shoes and increasing the cutterbar angle decreases the cutting height, resulting in shorter stubble.

#### DANGER

Ensure that all bystanders have cleared the area.

#### NOTE:

There are two skid shoes on the R113 FR and four on the R116 FR.

1. Position the rotary disc header at an appropriate height for the task.
2. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).

3. Loosen bolts (C).
4. Remove bolts, nuts, and washers (D).
5. Raise or lower the skid shoe.

#### NOTE:

Skid shoes have two adjustment settings: fully raised (A) and fully lowered (B).

6. Install bolts, nuts, and washers (D).
7. Tighten bolts (C).
8. Adjust the cutterbar angle to the desired working position. If the angle is not critical, set it to the mid-position. For instructions, refer to [3.13.4 Cutterbar Angle, page 39](#).
9. Check the header float. For instructions, refer to [Adjusting Float, page 35](#).

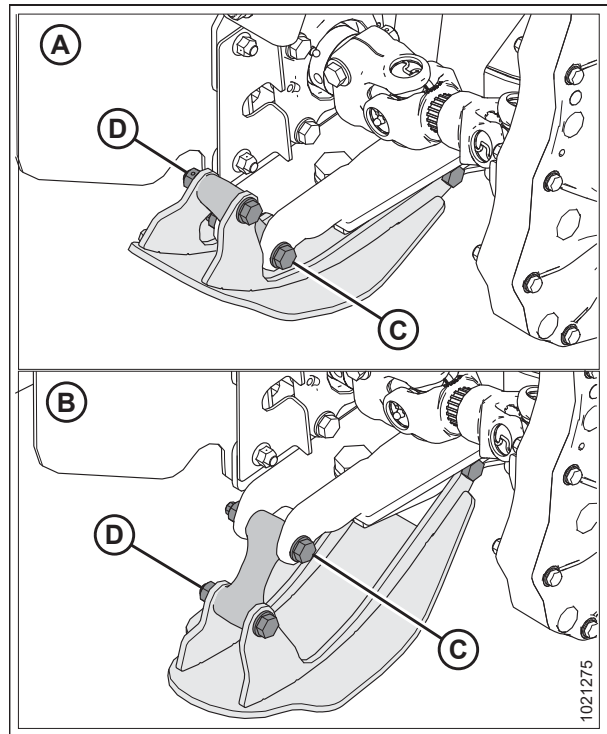


Figure 3.40: Skid Shoes – R113 FR

### 3.13.4 Cutterbar Angle

The cutterbar angle (sometimes called the header angle) is the angle at which the cutterbar approaches the crop relative to the ground. It is one of the variables that impact the cutting height and quality.

Cutterbar angle (A) adjustment ranges from 0° to 5° below the horizontal plane when the mechanical center-link is used, and from 0° to 7° below the horizontal plane when the hydraulic center-link is used. Choose an angle that maximizes the performance for your crop and field conditions. A flatter angle provides better clearance in stony conditions, whereas a steeper angle is required in lodged crops for better lifting action.

Check the float after significantly adjusting the cutterbar angle. Adjusting the cutterbar angle affects the header float, because the header's center of gravity shifts when the cutterbar angle is changed.

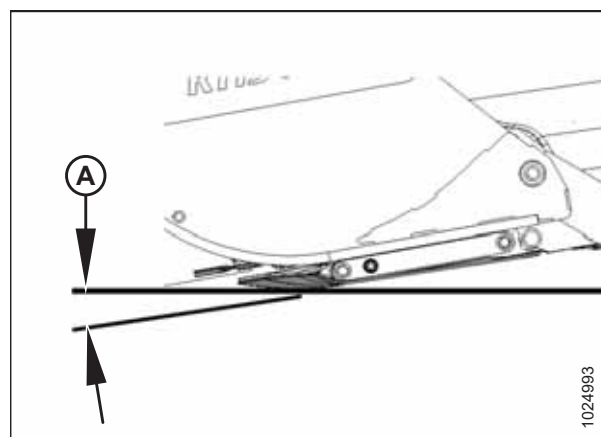


Figure 3.41: Cutterbar Angle

#### Adjusting Cutterbar Angle – Mechanical Center-Link

Cutterbar angle is one of the settings that affects cutting height. On machines equipped with mechanical center-links, you can adjust the cutterbar angle manually.

To adjust the cutterbar angle on a machine with a mechanical center-link, follow these steps:

#### DANGER

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

#### DANGER

Ensure that all bystanders have cleared the area.

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Loosen nut (A).
4. Decrease (flatten) cutterbar angle by rotating turnbuckle sleeve (B) to decrease the turnbuckle length.
5. Increase (steepen) cutterbar angle by rotating turnbuckle sleeve (B) to increase the turnbuckle length.
6. Tighten nut (A) but do **NOT** overtighten. A slight tap with a small hammer is sufficient.
7. Check cutting height and adjust it if required.
8. Check the float and adjust it if required. For adjustment instructions, refer to [Adjusting Float, page 35](#).

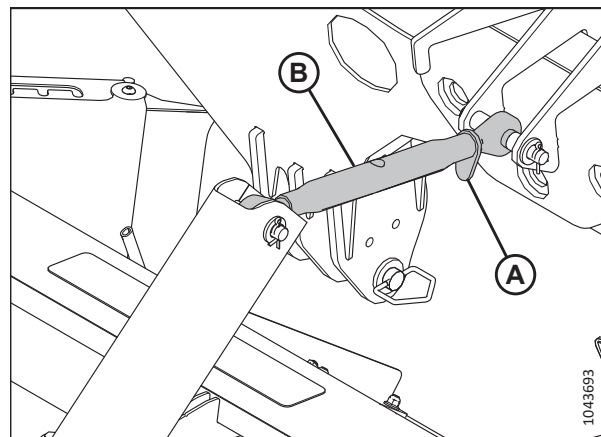


Figure 3.42: Mechanical Center-Link



## OPERATION

### *Adjusting Cutterbar Angle – Optional Hydraulic Center-Link*

Cutterbar angle is one of the settings that affects cutting height. On machines equipped with the optional hydraulic center-link, you can adjust the cutterbar angle from the tractor cab.

To adjust the cutterbar angle on a machine equipped with a hydraulic center-link, follow these steps:

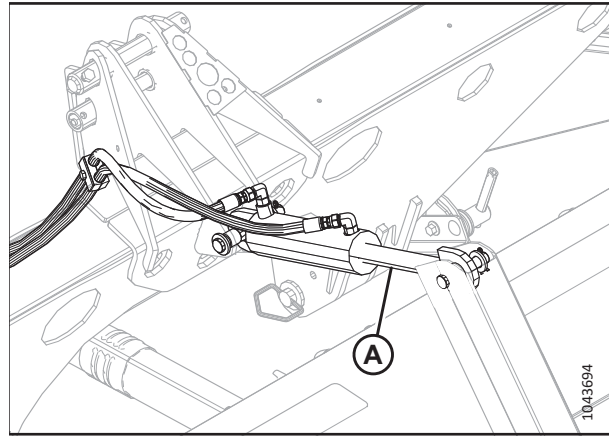
#### **NOTE:**

The cutterbar angle can be adjusted from the tractor without shutting down the header.

#### **⚠ DANGER**

**Ensure that all bystanders have cleared the area.**

1. Lower the header fully.
2. Decrease (flatten) the cutterbar angle by operating the tractor hydraulic control so that cylinder (A) retracts.
3. Increase (steepen) the cutterbar angle by operating the tractor hydraulic control so that cylinder (A) extends.



**Figure 3.43: Hydraulic Center-Link**

### **3.13.5 Ground Speed**

Choose a ground speed that allows the cutterbar to cut the crop smoothly and evenly.

Try different combinations of disc speed and ground speed to suit your specific crop. Operating the header at the minimum disc speed will extend the service life of the cutting components.

#### **⚠ CAUTION**

**Reduce the ground speed when turning, crossing slopes, or traveling over rough ground.**

In tough cutting conditions (such as when cutting native grasses) set the disc speed to MAXIMUM.

In light crops, reduce the disc speed while maintaining the same ground speed.

#### **NOTE:**

Refer to your tractor operator's manual for instructions on changing the ground speed.

The example shown in Figure 3.44, page 41 illustrates the relationship between the ground speed and the cut area for R113 and R116 Front Mount Rotary Disc. The chart demonstrates that a ground speed of 21 km/h (13 mph) would produce a cut area of approximately 8 hectares (20 acres) per hour.



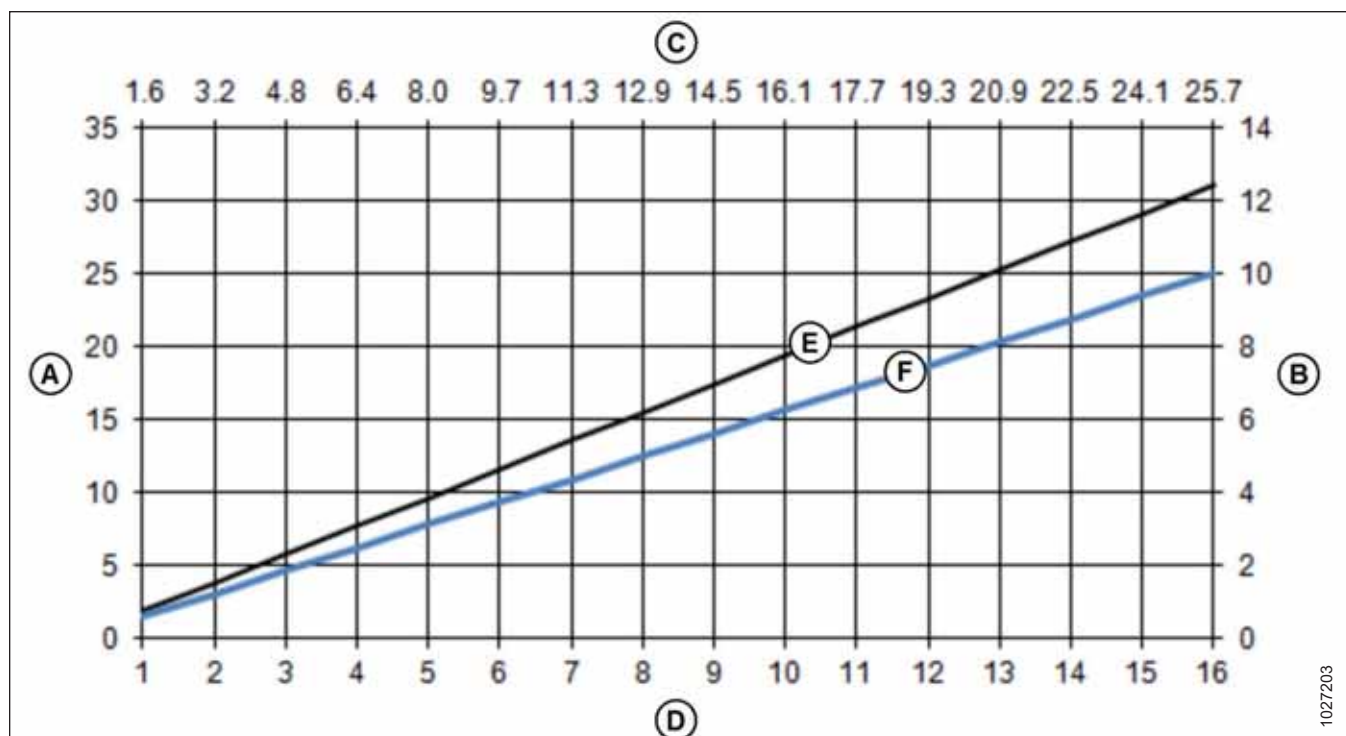


Figure 3.44: Ground Speed for R113 and R116 Front Mount Rotary Disc

A - Acres/Hour  
E - R116 FR

B - Hectares/Hour  
F - R113 FR

C - Kilometers/Hour

D - Miles/Hour

### 3.13.6 Cutterbar Deflectors

A two-piece cutterbar deflector is attached to the cutterbar just below the conditioner rolls. Cutterbar deflectors improve feeding into the conditioner rolls and prevent long-stemmed crop from feeding under the rolls.

Refer to the following table for the suitability of cutterbar deflectors in different crops and field conditions:

Table 3.4 Conditions for Using Cutterbar Deflectors

Crop/Field Condition	Use Deflector?
Average crop/normal field conditions	No
Long-stemmed and heavy/normal field conditions	Yes
Long-stemmed and heavy/sandy soil	No
Long-stemmed and heavy/gopher mounds or rocks <sup>3</sup>	No

3. Removing the deflector helps feed dirt/rocks through the header and prevents debris buildup, wear, and damage from rocks.

## OPERATION

### Removing Cutterbar Deflectors

When cutting a short-stemmed crop in normal field conditions, the cutterbar deflectors may not be necessary and can be removed.

#### DANGER

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

#### WARNING

Disc blades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with, or near, blades.

1. Position the rotary disc header at an appropriate height for the task.
2. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
3. Locate deflector (A) behind the cutterbar.
4. Clean debris from the deflector area.
5. Remove and retain bolt (B) securing the outboard end of the deflector to the cutterbar.
6. On the left side of the cutterbar, remove and retain three bolts (C).
7. Repeat Step [6, page 42](#) on the right side.
8. Remove cutterbar deflector (A).
9. If the cutterbar is being replaced, install the deflectors on the new cutterbar. For instructions, refer to [Installing Cutterbar Deflectors, page 42](#).

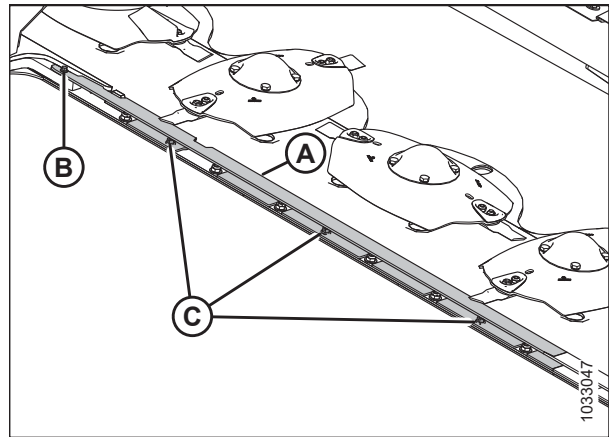


Figure 3.45: Cutterbar Deflector – Left Side

### Installing Cutterbar Deflectors

When cutting long-stemmed crops in certain field conditions, installing cutterbar deflectors is recommended.

#### DANGER

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

**WARNING**

Disc blades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with, or near, blades.

1. Position the rotary disc header at an appropriate height for the task.
2. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).

3. Clean any debris from the ledge and the six mounting holes along the aft edge of the cutterbar.

4. Position left deflector (A) on the back edge of the cutterbar, and align the slots in the deflector with the existing fasteners and cutterbar plug.

5. Secure the outboard end of the deflector to the cutterbar using M8 x 20 mm hex flange bolt (B). Apply medium-strength threadlocker (Loctite® 243 or equivalent) to the bolt threads.

6. Install three button socket head M10 bolts and lock nuts (C) that secure the left cutterbar deflector.

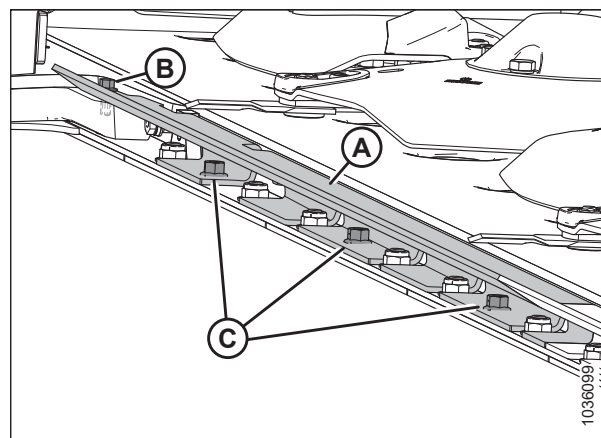


Figure 3.46: Cutterbar Deflector – Left Side

**NOTE:**

The bolts are inserted into the cutterbar from the bottom.

7. Tighten bolts (C) to 54 Nm (40 lbf·ft).
8. Tighten bolt (B) to 29 Nm (21 lbf·ft [257 lbf·in]).
9. Repeat Steps [3, page 43](#) to [8, page 43](#) to secure the right cutterbar deflector.

### 3.13.7 Tall Crop Divider Option

Tall crop dividers (one on each end of the header) help divide tall crops cleanly, and improve crop flow to the cutterbar. Tall crop dividers are not adjustable, but they are removable.

#### Installing Tall Crop Divider

Tall crop dividers can provide a cleaner cut in some crop conditions.

**DANGER**

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

**DANGER**

Ensure that all bystanders have cleared the area.

## OPERATION

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Remove three bolts (A) and nuts where divider (B) will be mounted.
4. Position divider (B) on the header, and reinstall three bolts (A) and nuts. Tighten the nuts.
5. Repeat the previous two steps for the opposite side of the header.
6. Close the cutterbar doors. For instructions, refer to [3.4.2 Closing Cutterbar Doors, page 21](#).

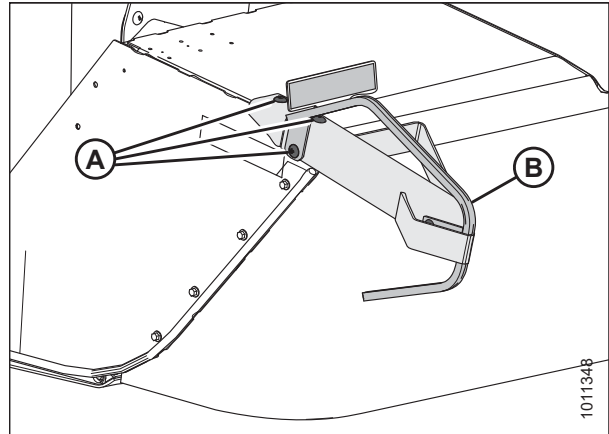


Figure 3.47: Divider and Hardware

### Removing Tall Crop Divider

Tall crop dividers can be removed for transport, or when not suitable for terrain or crop conditions.

#### 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.

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Remove three bolts (A), and remove deflector (B).
4. Reinstall three bolts (A).
5. Repeat for opposite side.
6. Close cutterbar doors. For instructions, refer to [3.4.2 Closing Cutterbar Doors, page 21](#).

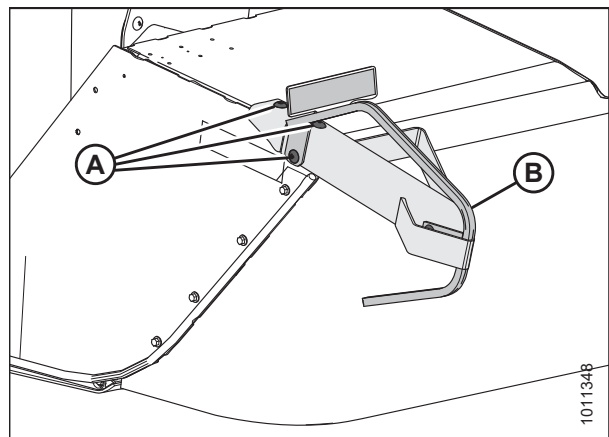


Figure 3.48: Deflector and Hardware

## 3.14 Roll Conditioner

Rolls condition the crop by crimping and crushing the stem in several places, allowing the release of moisture resulting in faster drying times.

Only Steel conditioner rolls are available. Refer to Chapter [5 Options and Attachments, page 189](#) for ordering information.

### 3.14.1 Conditioner Roll Gap

The roll gap is the distance between the two conditioner rolls. The roll gap controls the degree to which the crop is conditioned as it passes through the rolls. The roll gap is factory-set at approximately 6 mm (1/4 in.).

Steel rolls can be operated over a larger range of roll gap settings, since they are able to intermesh, and are therefore suited to a wider range of crops, from alfalfa to thicker-stemmed cane-type crops. They are capable of a roll gap of up to 25 mm (1 in.); however, too large a gap may cause crop feeding problems.

Grass-type crops may require a smaller gap for proper feeding and conditioning.

#### Checking Roll Gap

To prevent equipment damage, check the size of the roll gap when you are using a roll gap setting smaller than that set at the factory.

#### IMPORTANT:

Choose the roll gap setting that is suitable for your crop conditions. Refer to [3.14.1 Conditioner Roll Gap, page 45](#) for factory and custom roll gap settings.



#### DANGER

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



#### DANGER

Ensure that all bystanders have cleared the area.

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. **Steel rolls:** The length of thread (A) extending above the jam nut on the adjustment rods can be used as an approximation of the roll gap; however, this method does **NOT** provide consistent roll gap measurements. The roll gap factory setting for steel rolls is 6 mm (1/4 in.). If adjustments are required, refer to [Adjusting Roll Gap – Steel Rolls, page 45](#) for adjustment instructions.

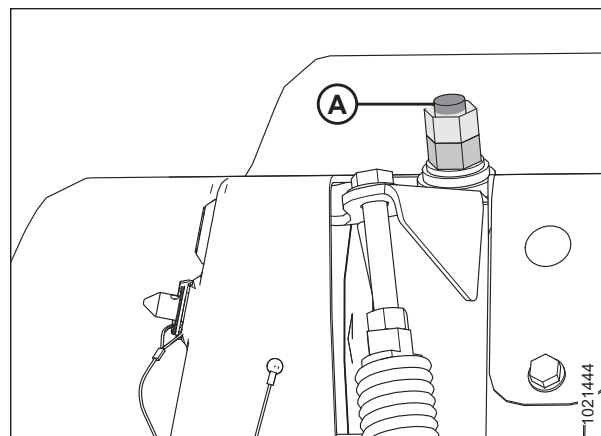


Figure 3.49: Roll Gap Adjustment

#### Adjusting Roll Gap – Steel Rolls

The length of thread extending above the jam nut on the adjustment rods can be used as an approximation of roll gap but does **NOT** provide consistent roll gap measurements.



#### DANGER

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

## OPERATION

### DANGER

Ensure that all bystanders have cleared the area.

To ensure the roll gap is at the factory setting, follow the procedure below:

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Loosen jam nut (A) on both sides of the conditioner.
4. Turn lower nut (B) counterclockwise until the upper roll rests on the lower roll. Ensure the rolls intermesh.
5. Turn lower nut (B) two and a half full turns clockwise to raise the upper roll and achieve a 6 mm (1/4 in.) roll gap.
6. Hold nut (B) and tighten jam nut (A) on both sides of the conditioner.

#### IMPORTANT:

Make sure the roll gap adjustment nuts are adjusted equally on both sides to achieve a consistent gap across the rolls.

7. If further adjustment to roll gap is required:
  - Turn lower nut (B) clockwise to increase the roll gap.
  - Turn lower nut (B) counterclockwise to decrease the roll gap.

#### NOTE:

Make further adjustments to the roll gap based on cutting performance and crop conditions.

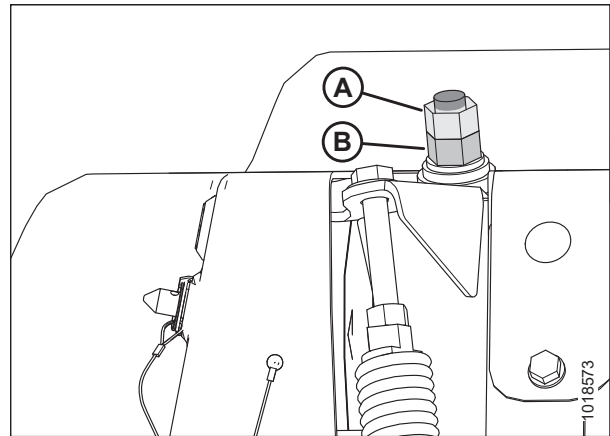


Figure 3.50: Roll Gap Adjustment

### *Adjusting Roll Gap – Polyurethane Rolls*

Because polyurethane rolls operate at smaller gaps and the conditioning is less aggressive, the roll gap setting is more sensitive than on steel rolls.

### DANGER

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

### DANGER

Ensure that all bystanders have cleared the area.

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

## OPERATION

3. Loosen upper jam nut (A) on both sides of the conditioner attachment.
4. Turn lower nut (B) counterclockwise until the upper roll rests on the lower roll.
5. Turn lower nut (B) one full turn clockwise to raise the upper roll and achieve a 3 mm (1/8 in.) roll gap.
6. Hold nut (B) and tighten jam nut (A) on both sides of the conditioner attachment.

### IMPORTANT:

Make sure the roll gap adjustment nuts are adjusted equally on both sides to achieve a consistent gap across the rolls.

7. Rotate the rolls manually and use a feeler gauge at the ends of the rolls to check that the actual gap is no less than 2 mm (1/16 in.) and no more than 4 mm (5/32 in.).

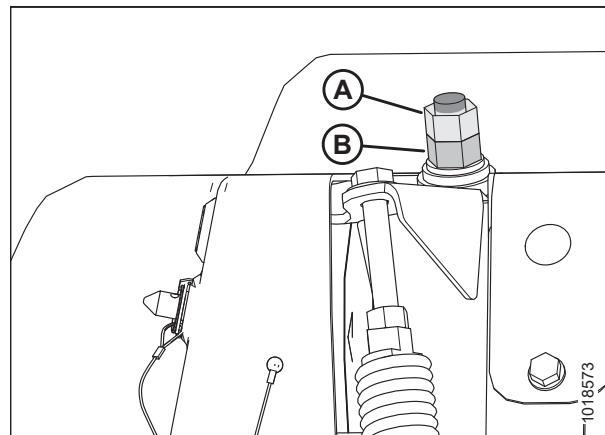


Figure 3.51: Roll Gap Adjustment

### 3.14.2 Roll Tension

Roll tension refers to the tension holding the rolls together. It is factory-set to maximum and should rarely require adjustment. Heavy crops or tough forage can, however, cause the rolls to separate. In such conditions, maximum roll tension is required to ensure that the cut crop is crimped sufficiently.

#### *Adjusting Roll Tension*

The amount of pressure that is applied to the crop as it passes through the roll conditioner is adjusted by changing the roll tension setting. Generally, maximum roll tension is desirable.



### 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

Ensure that all bystanders have cleared the area.

To adjust the roll tension back to the factory setting, follow these steps:

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

## OPERATION

- Loosen jam nut (A) on both sides of the conditioner.
- Turn spring drawbolt (B) clockwise to tighten spring (C) and increase the roll tension.
- Turn spring drawbolt (B) counterclockwise to loosen spring (C) and decrease the roll tension.
- Measure the amount of exposed thread on spring drawbolt (B) at each end of the conditioner. Measurement (D) should be 12–15 mm (1/2–9/16 in.).

### IMPORTANT:

Turn each bolt equally. Each turn of the bolt changes the roll tension by approximately 32 N (7.2 lbf).

- Tighten jam nuts (A) on each end of the conditioner.

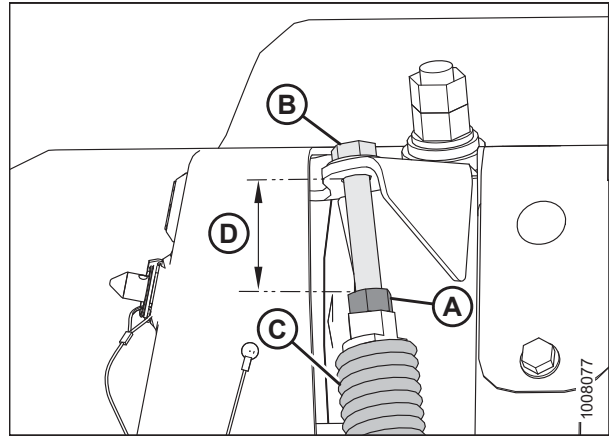


Figure 3.52: Adjusting Roll Tension

### 3.14.3 Roll Timing

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

### IMPORTANT:

Roll timing is critical when the roll gap is decreased because conditioning is affected and the bars may contact each other.

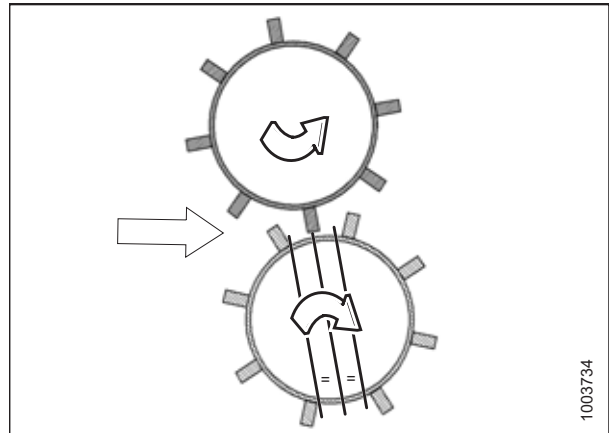


Figure 3.53: Properly Timed Rolls

### Adjusting Roll Timing

The roll timing is factory-set and should not require adjustment; however, if there is excessive noise coming from the conditioner rolls, the timing will need to be adjusted.



### DANGER

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

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



## OPERATION

2. On the upper roll, loosen four bolts (A) securing yoke plate (B).

**NOTE:**

Only three of the four bolts are shown in the illustration.

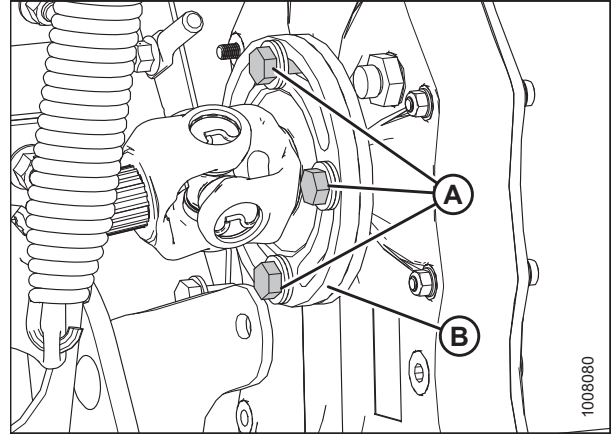


Figure 3.54: Conditioner Drive

3. Secure bottom roll (A).
4. Rotate upper roll (B) counterclockwise until it stops.
5. Make a mark (C) across yoke (D) and gearbox flange (E).

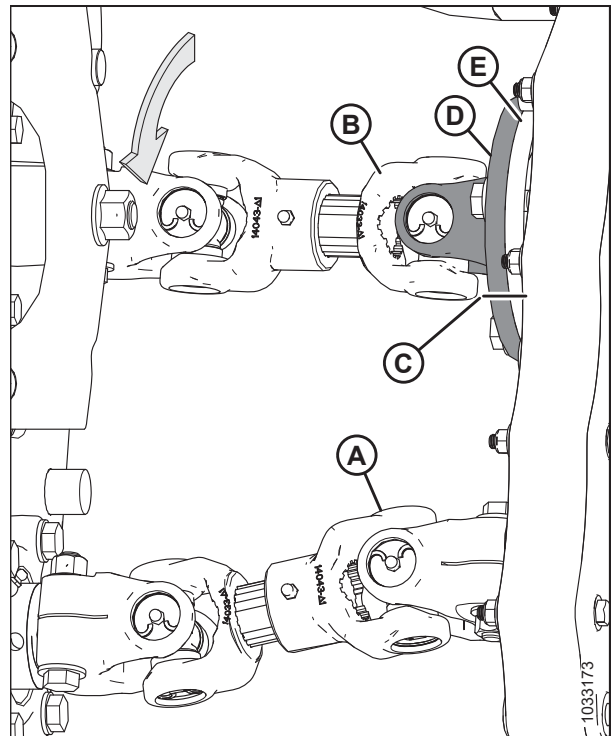


Figure 3.55: Conditioner Drive

## OPERATION

6. Secure bottom roll (A).
7. Rotate upper roll (B) clockwise until it stops.
8. Make a mark (C) across yoke (D) and gearbox flange (E).

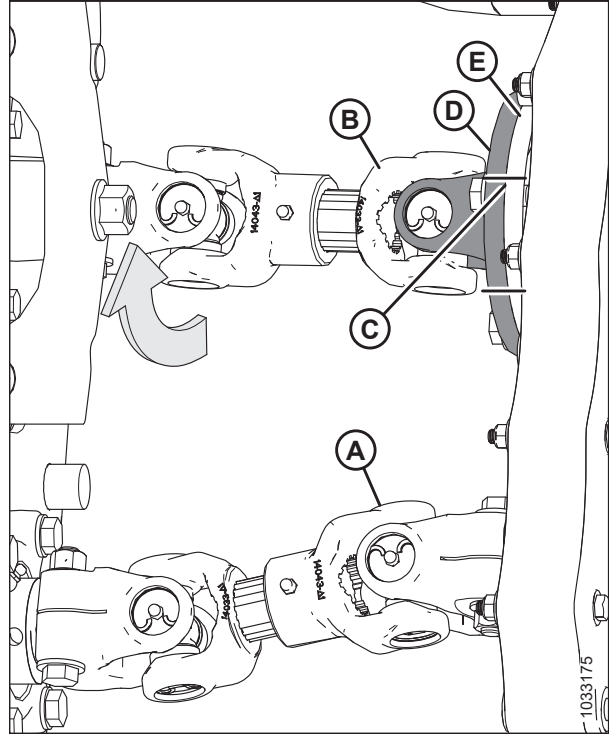


Figure 3.56: Conditioner Drive

9. Determine center point (A) between the two marks on the yoke plate, and place a third mark.
10. Rotate upper roll (B) counterclockwise until the mark on the gearbox flange lines up with the third (center) mark.

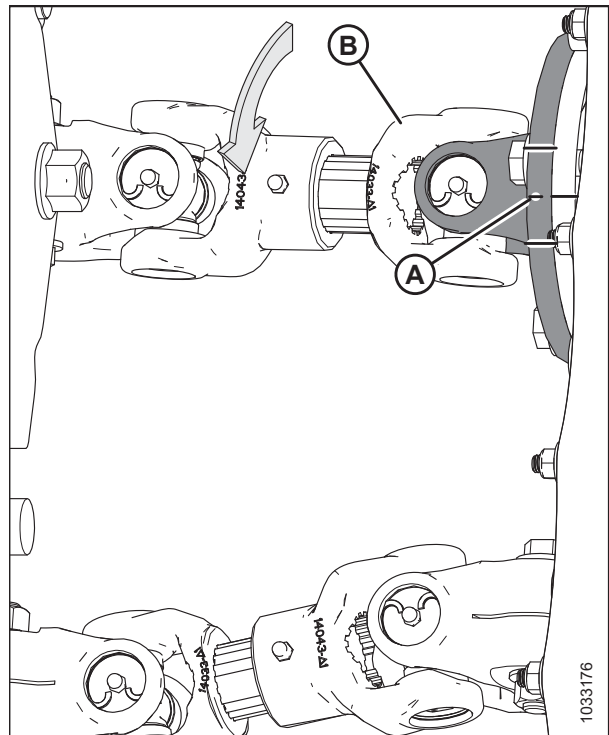


Figure 3.57: Conditioner Drive

## OPERATION

11. Ensure that the threads on four bolts (A) are clean and free of lubricant.

**NOTE:**

Only three of the four bolts are shown in the illustration.

12. Apply medium-strength threadlocker (Loctite® 242 or equivalent) to bolts (A).
13. Torque the bolts to 95 Nm (70 lbf·ft).

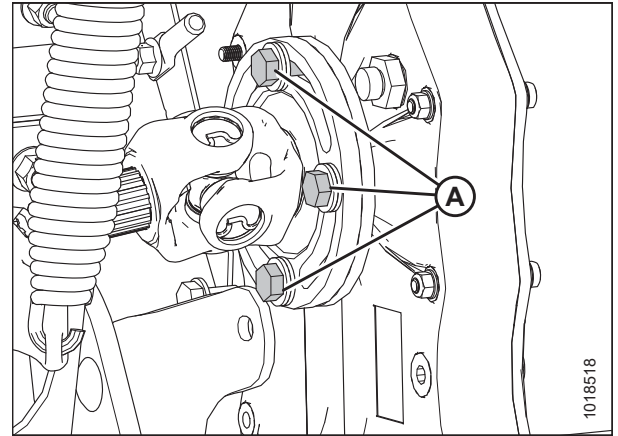


Figure 3.58: Conditioner Drive

### 3.14.4 Forming Shields – Roll Conditioner

The forming shield position controls the width and placement of the windrow.

Consider the following factors when setting the forming shield position:

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

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

#### *Positioning Forming Shield Side Deflectors – Roll Conditioner*

The position of the side deflectors controls the width and placement of the windrow. To ensure that windrow placement is centered between the tractor wheels, adjust the left and right deflectors to the same position.

### **DANGER**

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

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

## OPERATION

2. Loosen locking handle (A).
3. Slide adjuster bar (B) along adjuster plate (C) to the desired deflector position and engage bar (B) into a notch in the adjuster plate.
4. Tighten locking handle (A).
5. Repeat Step 2, page 52 to Step 4, page 52 on the opposite side of the conditioner.

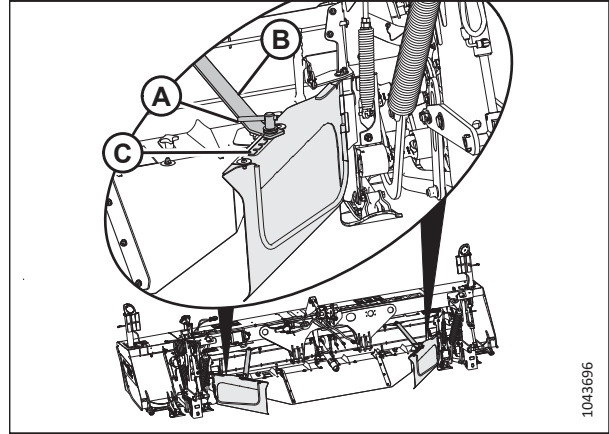


Figure 3.59: Side Deflector and Adjuster Bar

### Adjusting Conditioner Baffle Position

The conditioner baffle is used in conjunction with the side deflectors to determine the height and width of the windrow.

The conditioner baffle is located immediately behind and above the conditioner rolls and can be positioned to do the following:

- Raise the baffle and direct crop flow into the forming shields for a fluffier, narrower windrow.
- Lower the baffle and direct crop downward to form a flatter, wider windrow.

To adjust the conditioner baffle position, follow these steps:

### DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Remove lynch pin (A) securing rear baffle adjustment lever (B) to bracket (C).
3. Pull rear baffle adjustment lever (B) inboard to disengage it from bracket (C).
4. Position rear baffle adjustment lever (B) as follows:
  - Move the lever forward to raise the baffle.
  - Move the lever backward to lower the baffle.
5. Release rear baffle adjustment lever (B) so that the tab engages the middle notch in bracket (C).
6. Secure baffle adjustment lever (B) with lynch pin (A).
7. Repeat this process on the opposite rear baffle adjustment lever.

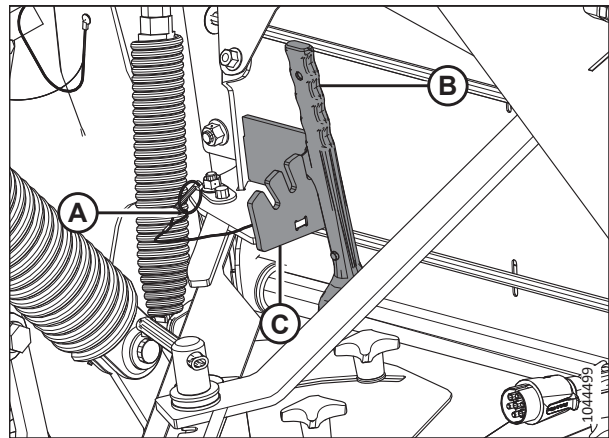


Figure 3.60: Left End of Conditioner

## OPERATION

### *Adjusting Conditioner Baffle Curtain Position*

The conditioner baffle curtain is used in conjunction with the rear baffle and the side deflectors to determine the height and width of the windrow.

The conditioner baffle curtain is located behind the conditioner rolls and can be positioned to do the following:

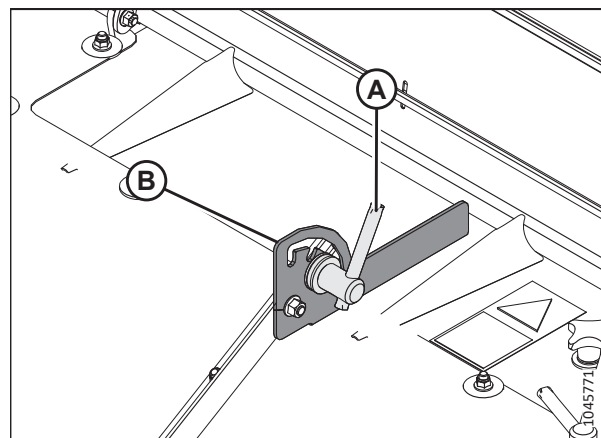
- Raise the baffle curtain and direct crop flow into the forming shields for a fluffier, narrower windrow.
- Lower the baffle curtain and direct crop downward to form a flatter, wider windrow.

To adjust the conditioner baffle curtain position, follow these steps:

### **DANGER**

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

1. Shut down the engine, and remove the key from the ignition.
2. Slide adjustment levers (A) out of slotted bracket setting (B).
3. Position baffle curtain (C) as follows:
  - Raise baffle curtain (C).
  - Lower baffle curtain (C).
4. Slide baffle curtain adjustment levers (A), into preferred baffle curtain slots (B).
5. Secure both baffle curtain adjustment levers (A).



**Figure 3.61: Baffle Conditioner Curtain Bracket**

## **3.15 Haying Tips**

Follow the recommendations in this section to ensure the highest quality hay production.

### **3.15.1 Curing**

Curing crops quickly helps maintain the highest quality of crop material. Approximately 5% of protein is lost from hay for each day that it lays on the ground after cutting.

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

### 3.15.2 Topsoil Moisture

Topsoil moisture is an important consideration when determining the timing of hay cutting and the type of windrow needed.

**Table 3.5 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, do **NOT** create a wide and thin windrow. A narrower, thicker windrow will dry faster than hay left flat on wet ground.
- When the ground is wetter than the hay, the moisture from the soil is absorbed by the hay above it. Determine the moisture level of the topsoil before you begin cutting. Use a soil moisture tester or estimate the level.
- If the ground is wet due to irrigation, wait until the soil moisture level drops below 45%.
- If the ground is wet due to frequent rains, cut the hay when the weather allows. Let the hay 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.

### 3.15.3 Weather and Topography

Time your hay cutting so that the cut hay is able to cure as rapidly as possible.

- Cut as much hay as possible by midday. Drying conditions are best in the afternoon.
- Sun-facing slopes receive up to 100% more exposure to the sun's heat than slopes that do not face the sun. If the hay is to be baled and chopped, consider baling sun-facing slopes and chopping slopes that do not face the sun.
- When the relative humidity is high, the evaporation rate is low and so hay dries slowly.
- Humid air is trapped around the windrow in calm conditions. Raking or tedding will expose the hay to fresher and drier air.
- Cut hay perpendicular to the direction of the prevailing winds, if possible.

### 3.15.4 Windrow Characteristics

The shape and density of the windrow is an important factor with respect to how rapidly the hay cures.

Refer to Chapter *3.13 Operating Rotary Disc Header, page 323 Operation, page 15* for instructions on adjusting the header.

**Table 3.6 Recommended Windrow Characteristics**

Characteristic	Advantage
High and fluffy	Enables airflow through the 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

### 3.15.5 Driving on Windrows

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

However, driving on windrows in high-yield crops may be unavoidable if a full width windrow is necessary.

### 3.15.6 Raking and Tedding

Raking or tedding speeds up the drying process; 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 the moisture levels reach 40–50%. Hay should not be raked or teded at moisture levels below 25% or excessive yield loss will result.

### 3.15.7 Using Chemical Drying Agents

Hay drying agents work by removing wax from legume surfaces, allowing moisture to escape from cut crop and evaporate faster; however, treated hay lying on wet ground will absorb ground moisture faster, even if a hay drying agent is used.

Before deciding to use a drying agent, carefully compare the costs and benefits of doing so.

## 3.16 Unplugging Rotary Disc Header

The cutterbar and conditioner can get plugged with crop and may require unplugging.



### DANGER

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



### DANGER

Ensure that all bystanders have cleared the area.



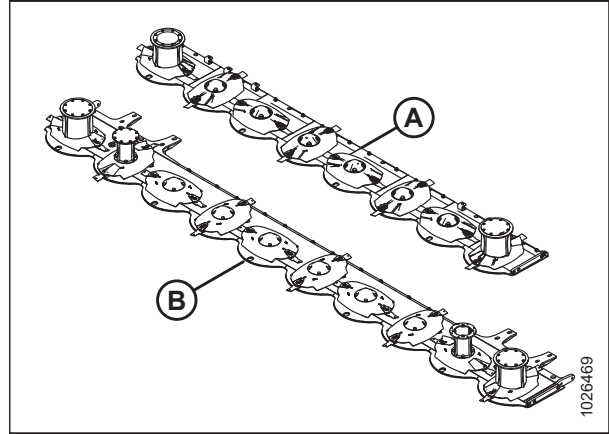
### WARNING

Wear heavy gloves when working around cutterbar.

1. Stop forward movement of the tractor and stop the power take-off (PTO).
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
5. Open the cutterbar doors. For instructions, refer to [3.4.1 Opening Cutterbar Doors, page 21](#).

## OPERATION

6. Clean off the cutterbar and conditioner rolls by hand.



**Figure 3.62: Cutterbars**

- A - Eight Disc Cutterbar
- B - Ten Disc Cutterbar

7. Close the cutterbar doors. For instructions, refer to [3.4.2 Closing Cutterbar Doors, page 21](#).



## Chapter 4: Maintenance and Servicing

This section provides information about routine servicing for the header. A parts catalog is located in a plastic case at the right end of the header.

Log the machine's hours of operation and use the maintenance record provided (refer to [4.3.1 Maintenance Schedule/Record, page 60](#)) to keep track of maintenance procedures as they are performed.

### 4.1 Recommended Safety Procedures

These procedures will minimize the chances of injury when maintaining or repairing the machine.

- Park on a level surface when possible. Follow all recommendations in your windrower operator's manual.
- Wear close-fitting clothing and cover any long hair. Never wear dangling items such as scarves or bracelets.



Figure 4.1: Safety Around Equipment

- Wear protective shoes with slip-resistant soles, a hard hat, protective glasses or goggles, and heavy gloves, as needed.



Figure 4.2: Safety Equipment

## MAINTENANCE AND SERVICING

- Be aware that if more than one person is servicing the machine at the same time, rotating a driveline or other mechanically driven component by hand (for example, to access a lubrication fitting) will cause drive components in other areas (belts, pulleys, and discs) to move. Stay clear of driven components at all times. Communicate regularly with your co-workers.



Figure 4.3: Safety Around Equipment

- Be prepared to deal with an accident should it occur. Know where the first aid kits and fire extinguishers are located, and know how to use them.

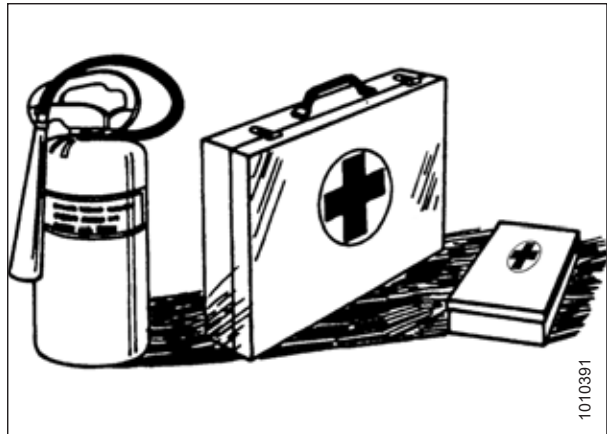


Figure 4.4: Safety Equipment

- Keep the service area clean and dry. Wet or oily floors are slippery. Wet spots can be dangerous when working with electrical equipment. Ensure that all electrical outlets and tools are properly grounded.



Figure 4.5: Safety Around Equipment

## MAINTENANCE AND SERVICING

- Use adequate light for the job at hand.
- Replace all shields removed or opened for service.
- Use only service and repair parts made or approved by the equipment manufacturer. Substituted parts may not meet strength, design, or safety requirements.
- Keep machinery clean. Never use gasoline, naphtha, or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.

### 4.2 Preparing Machine for Servicing

Follow these steps to safely prepare your equipment for maintenance or repair.

#### **DANGER**

To avoid personal injury, perform the following procedures before servicing the front mount rotary disc or opening the drive covers:

1. Disengage power take-off (PTO).
2. Position the rotary disc header at an appropriate height for the task.
3. Engage the parking brake.
4. Wait for all moving parts to stop moving.
5. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).

### 4.3 Maintenance Requirements

Regular maintenance is the best insurance against early wear and untimely breakdowns. Following the maintenance schedule will increase your machine's service life. Periodic maintenance requirements are organized according to service intervals.

#### **IMPORTANT:**

The recommended intervals are based on typical operating conditions. Service the machine more often if the machine operates regularly under adverse conditions (for example, severe dust, extra heavy loads, etc.).

If more than one interval is specified for a service item (for example, 100 hours or annually), service the machine at whichever interval is reached first.

When servicing the machine, refer to the specific headings in this section. Use only the fluids and lubricants specified in the inside back cover of this book.

Log the hours of machine operation. Use the maintenance record provided in this manual, and keep extra copies of these maintenance records. Refer to [4.3.1 Maintenance Schedule/Record, page 60](#).




#### **CAUTION**

Follow all safety messages. For more information, refer to [4.1 Recommended Safety Procedures, page 57](#).

**MAINTENANCE AND SERVICING**

**4.3.1 Maintenance Schedule/Record**

Keep a record of maintenance as evidence of a properly maintained machine. Daily maintenance records are not required to meet normal warranty conditions.

	Hour meter reading																		
	Service date																		
	Serviced by																		
First use		Refer to <i>4.3.2 Break-in Inspections, page 62.</i>																	
End of season		Refer to <i>4.3.4 End-of-Season Servicing, page 63.</i>																	
Action		✓ Check					◆ Lubricate					▲ Change							
<b>First Hour<sup>4</sup></b>																			
✓	Check for loose hardware. Refer to <i>7.1 Torque Specifications, page 197.</i>																		
<b>First 5 Hours</b>																			
✓	Check for loose hardware. Refer to <i>7.1 Torque Specifications, page 197.</i>																		
✓	Check conditioner drive belt tension. Refer to <i>Inspecting Conditioner Drive Belt, page 169.</i>																		
<b>First 10 Hours, Then Daily</b>																			
✓	Check hydraulic hoses and lines. Refer to <i>4.6.1 Checking Hydraulic Hoses and Lines, page 185.</i>																		
✓	Check cutterbar discs. Refer to <i>Inspecting Cutterbar Discs, page 85.</i>																		
✓	Check cutterbar disclades. Refer to <i>Inspecting Disc Blades, page 103.</i>																		
✓	Check cutterbar drums. Refer to <i>Inspecting Large Drums, page 139.</i>																		
✓	Check auxiliary lift system sensors. Refer to <i>4.7.3 Inspecting Auxiliary Lift System Sensors, page 186</i>																		
<b>First 25 Hours</b>																			
✓	Check conditioner drive belt tension. Refer to <i>Inspecting Conditioner Drive Belt, page 169.</i>																		
✓	Check cutterbar lubricant. Refer to <i>Checking and Adding Lubricant – Cutterbar, page 80.</i>																		
✓	Check cutterbar-conditioner drive gearbox lubricant. Refer to <i>Checking and Adding Lubricant – Cutterbar / Conditioner Drive Gearbox, page 180.</i>																		
✓	Check conditioner roll timing gearbox oil. Refer to <i>Checking and Changing Lubricant in Conditioner Roll Timing Gearbox, page 174.</i>																		

4. Begins from first use of machine.

**MAINTENANCE AND SERVICING**

Every 25 Hours												
✓	Check conditioner drive belt tension. Refer to <i>Inspecting Conditioner Drive Belt, page 169.</i>											
⬇	Lubricate idler pivot. Refer to <i>4.3.5 Lubrication, page 64.</i>											
⬇	Lubricate upper and lower driveline universal joints. Refer to <i>4.3.5 Lubrication, page 64.</i>											
⬇	Lubricate roller conditioner bearings. Refer to <i>4.3.5 Lubrication, page 64.</i>											
⬇	Lubricate conditioner roll driveline slip joints. Refer to <i>4.3.5 Lubrication, page 64.</i>											
First 50 Hours												
✓	Check conditioner drive belt tension. Refer to <i>Inspecting Conditioner Drive Belt, page 169.</i>											
▲	Change cutterbar lubricant. Refer to <i>Draining Cutterbar, page 82</i> and <i>Filling Cutterbar with Lubricant, page 83.</i>											
▲	Change roll timing gearbox lubricant. Refer to <i>Checking and Changing Lubricant in Conditioner Roll Timing Gearbox, page 174.</i>											
▲	Change cutterbar-conditioner drive gearbox lubricant. Refer to <i>Draining Lubricant from Cutterbar – Conditioner Drive Gearbox (T-Gearbox), page 180</i> and <i>Checking and Adding Lubricant – Cutterbar / Conditioner Drive Gearbox, page 180.</i>											
▲	Change header drive gearbox lubricant. Refer to <i>Draining Lubricant – Header Drive Gearbox, page 178</i> and <i>Checking and Adding Lubricant – Header Drive Gearbox, page 177.</i>											
Every 100 Hours or Annually <sup>5</sup>												
✓	Check conditioner drive belt tension. Refer to <i>Inspecting Conditioner Drive Belt, page 169.</i>											
✓	Check cutterbar lubricant. Refer to <i>Checking and Adding Lubricant – Cutterbar, page 80.</i>											
✓	Check cutterbar-conditioner drive gearbox lubricant. Refer to <i>Checking and Adding Lubricant – Cutterbar / Conditioner Drive Gearbox, page 180.</i>											

5. Change all gearbox and cutterbar lubricants annually.

**MAINTENANCE AND SERVICING**

✓	Check roll timing gearbox lubricant. Refer to <i>Checking and Changing Lubricant in Conditioner Roll Timing Gearbox, page 174.</i>													
✓	Check header drive gearbox lubricant. Refer to <i>Checking and Adding Lubricant – Header Drive Gearbox, page 177.</i>													
<b>Every 250 Hours or Annually<sup>6</sup></b>														
▲	Change cutterbar lubricant. Refer to <i>Draining Cutterbar, page 82</i> and <i>Filling Cutterbar with Lubricant, page 83.</i> <sup>7</sup>													
▲	Change roll timing gearbox lubricant. Refer to <i>Checking and Changing Lubricant in Conditioner Roll Timing Gearbox, page 174.</i>													
▲	Change cutterbar-conditioner drive gearbox lubricant. Refer to <i>Draining Lubricant from Cutterbar – Conditioner Drive Gearbox (T-Gearbox), page 180</i> and <i>Checking and Adding Lubricant – Cutterbar / Conditioner Drive Gearbox, page 180.</i>													
▲	Change header drive gearbox lubricant. Refer to <i>Draining Lubricant – Header Drive Gearbox, page 178</i> and <i>Checking and Adding Lubricant – Header Drive Gearbox, page 177.</i>													

**4.3.2 Break-in Inspections**

The header is factory-ready for normal operation; however, there are several maintenance tasks to complete during the early operating hours of the machine’s service life.

**Table 4.1 Break-In Inspection Schedule**

<b>Inspection Interval</b>	<b>Item</b>	<b>Refer to</b>
<b>1 Hour</b>	Check for loose hardware and tighten to required torque	<i>7.1 Torque Specifications, page 197</i>
<b>5 Hours</b>	Check for loose hardware and tighten to required torque	<i>7.1 Torque Specifications, page 197</i>
<b>5 Hours</b>	Check conditioner drive belt tension	<i>Inspecting Conditioner Drive Belt, page 169</i>
<b>25 Hours</b>	Check conditioner drive belt tension	<i>Inspecting Conditioner Drive Belt, page 169</i>
<b>50 Hours</b>	Check conditioner drive belt tension	<i>Inspecting Conditioner Drive Belt, page 169</i>
<b>50 Hours</b>	Change conditioner roll timing gearbox lubricant	<i>Checking and Changing Lubricant in Conditioner Roll Timing Gearbox, page 174</i>

- 6. Change all gearbox and cutterbar lubricants annually.
- 7. Use only the specified amount. Do **NOT** overfill.

Table 4.1 Break-In Inspection Schedule (continued)

Inspection Interval	Item	Refer to
50 Hours	Change header drive gearbox lubricant	<i>Draining Lubricant – Header Drive Gearbox , page 178 and</i>
50 Hours	Change cutterbar lubricant	<i>4.4.3 Lubricating Cutterbar, page 80</i>
50 Hours	Check and change the conditioner drive gearbox lubricant	<i>4.5.9 Cutterbar / Conditioner Drive Gearbox, page 179</i>
150 Hours	Check conditioner drive belt tension	<i>Inspecting Conditioner Drive Belt, page 169</i>
250 Hours	Check and change the conditioner drive gearbox lubricant	<i>4.5.9 Cutterbar / Conditioner Drive Gearbox, page 179</i>
250 Hours	Change header drive gearbox lubricant	<i>Draining Lubricant – Header Drive Gearbox , page 178 and</i>

### 4.3.3 Preseason Servicing

Perform these procedures when taking the machine out of storage.



#### CAUTION

- Review the operator's manual to refresh your memory on safety and operating recommendations.
- Review all safety signs and other decals on the rotary disc header and note any potential hazard areas.
- Ensure that all shields and guards are properly installed and secured. Never alter or remove safety equipment.
- Ensure that you understand and have practised safe use of all controls. Know the capacity and the operating characteristics of the machine.
- Check the first aid kit and the fire extinguisher. Know where they are and how to use them.

At the beginning of each operating season:

1. Lubricate the machine completely. For instructions, refer to *4.3.5 Lubrication, page 64* and *4.4.3 Lubricating Cutterbar, page 80*.
2. Perform all annual maintenance tasks as listed in *4.3.1 Maintenance Schedule/Record, page 60*.

### 4.3.4 End-of-Season Servicing

Perform these procedures when storing the machine at the end of the season.



#### DANGER

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.



#### WARNING

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

### CAUTION

Cover the cutterbar to prevent injury from accidental contact with the blades.

1. Position the rotary disc header at an appropriate height for the task.
2. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
3. Clean the header thoroughly.
4. Check for worn components and repair them as necessary.
5. Check for any broken components and order replacements from your Dealer. Immediately repairing these items will save time and effort at beginning of the next season.
6. Replace or tighten any missing or loose hardware. For information, refer to [7.1 Torque Specifications, page 197](#).
7. Lubricate the header thoroughly, leaving excess grease on the fittings to keep moisture out of the lubricated component.
8. Apply grease to any exposed threads, cylinder rods, and sliding surfaces of components.
9. Oil the cutterbar components to prevent rust from forming.
10. Loosen the drive belt.
11. If the divider rods are equipped, remove them to reduce the space required for inside storage.
12. Repaint all worn or chipped painted surfaces to prevent rust from forming.
13. If possible, store the machine in a dry, protected place. If you are storing the machine outside, always cover the header with a waterproof canvas or other protective material.

### 4.3.5 Lubrication

Proper lubrication is essential to ensuring the service life of the machine.

### WARNING

To avoid personal injury, before servicing the header or opening the drive covers, refer to [4.2 Preparing Machine for Servicing, page 59](#).



## MAINTENANCE AND SERVICING

Greasing points are marked on the machine by decals showing a grease gun and the grease interval, which is specified in hours of operation.

Log the hours of machine operation. Use the maintenance schedule provided in this manual to keep a record of scheduled maintenance. For details, refer to [4.3.1 Maintenance Schedule/Record](#), page 60.

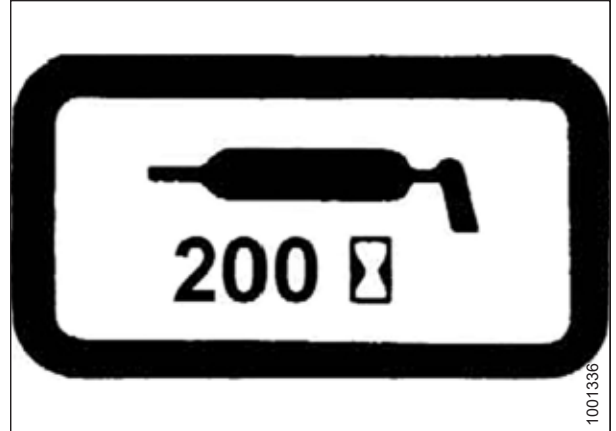


Figure 4.6: Grease Interval Decal

### *Greasing Procedure*

Refer to this procedure whenever a component requires grease.

### **DANGER**

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

1. Open the driveshields at the ends of the header to access the greasing points. For instructions, refer to [3.3.1 Opening Driveshields](#), page 18.
2. Before greasing a fitting, wipe it with a clean cloth to avoid injecting dirt and grit into the component.
3. Replace any loose or broken fittings immediately.
4. Inject grease through the fitting with a grease gun until grease overflows the fitting (unless the instructions specify otherwise).
5. Leave excess grease on the fitting to keep out dirt.
6. Remove and thoroughly clean any fitting that will not take grease and clean the lubricant passageway. Replace the fitting if necessary.

### *Service Intervals*

Regular maintenance is required to keep your machine operating at peak performance.

#### **NOTE:**

Use high-temperature, extreme-pressure (EP2) performance grease with 1% max. molybdenum disulphide (NLGI Grade 2) lithium base unless otherwise specified.

## MAINTENANCE AND SERVICING

### Every 25 Hours

Regular maintenance is required to keep your machine operating at peak performance.

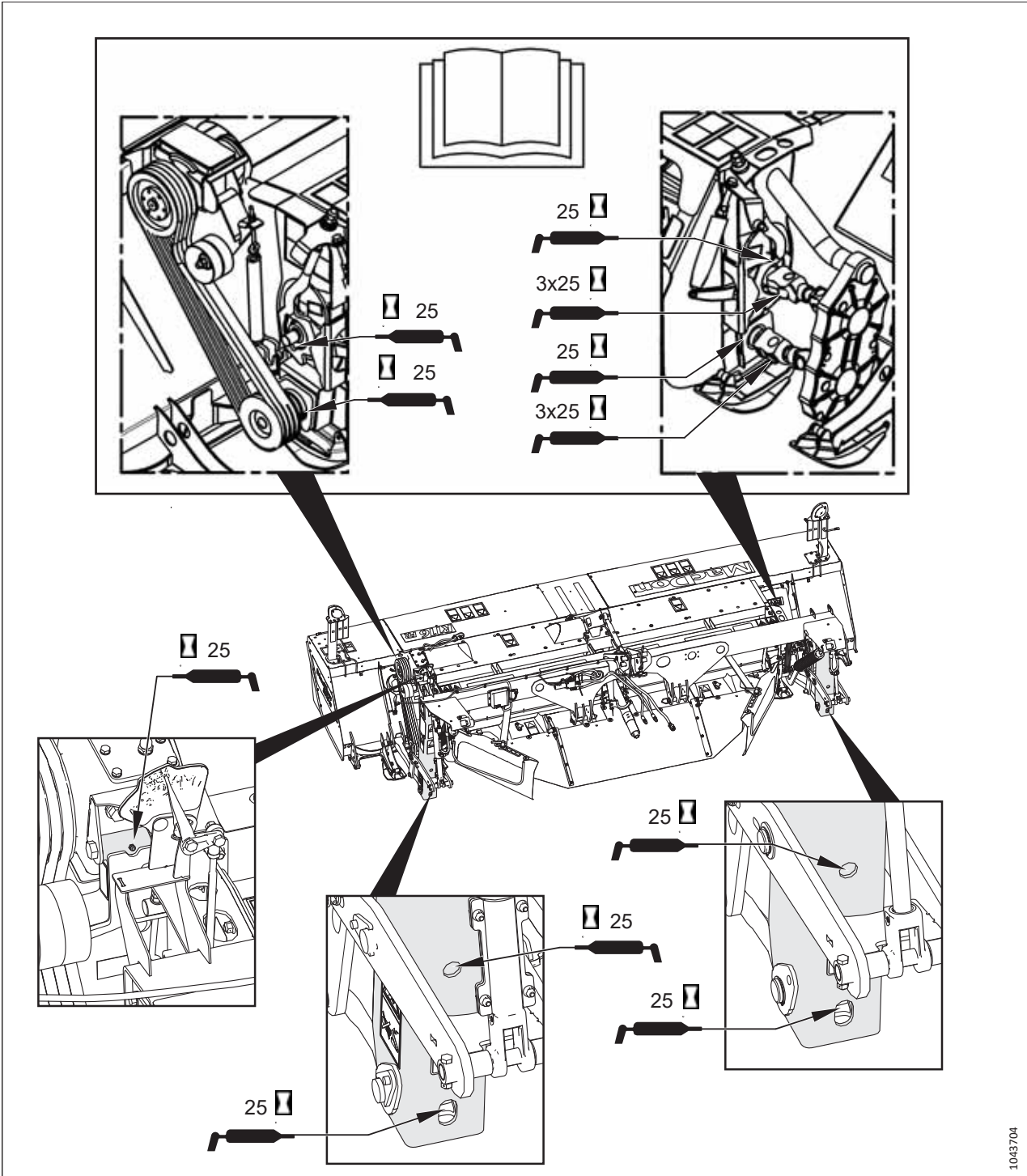


Figure 4.7: Grease Locations (Every 25 Hours)

#### NOTE:

Use high temperature extreme pressure (EP2) performance with 1% max. molybdenum disulphide (NLGI Grade 2) lithium base unless otherwise specified.

## MAINTENANCE AND SERVICING

### Every 50 Hours

Regular maintenance is required to keep your machine operating at peak performance.

#### NOTE:

Use high temperature extreme pressure (EP2) performance with 1% max. molybdenum disulphide (NLGI grade 2) lithium base unless otherwise specified.

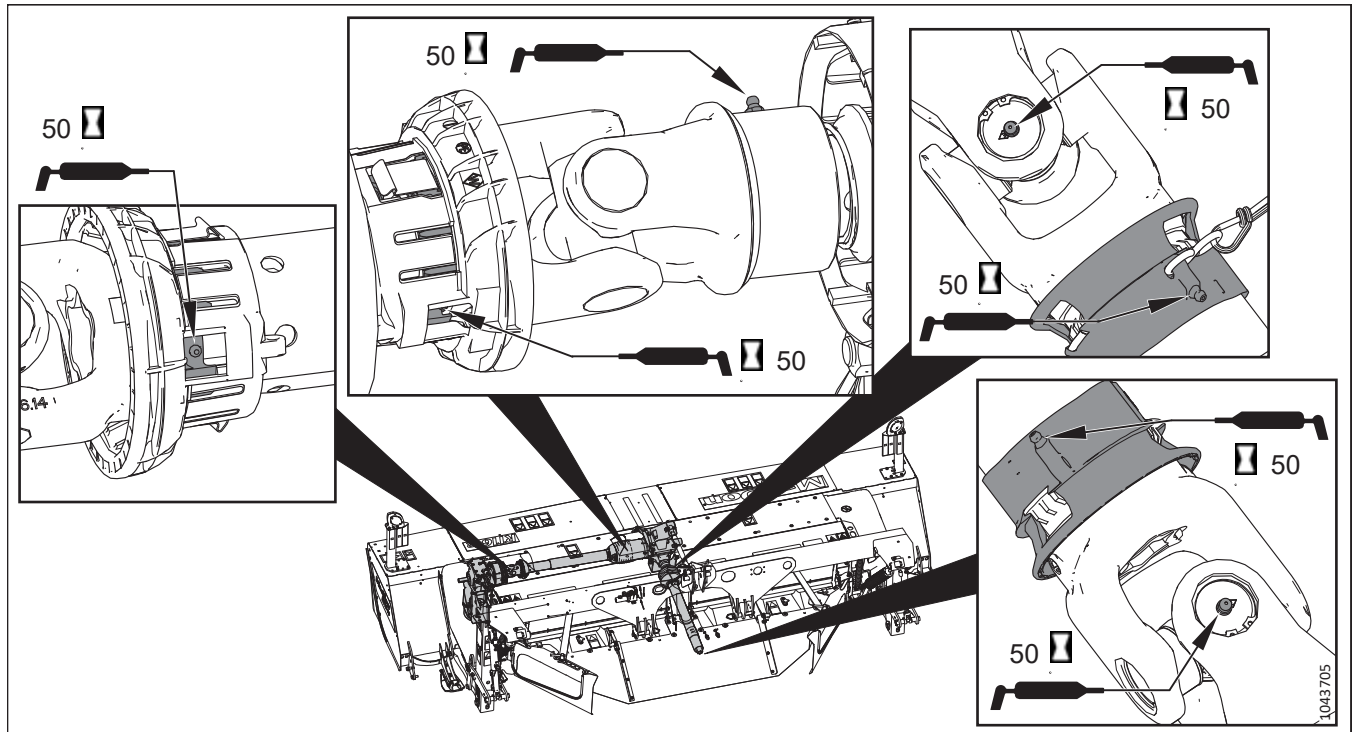


Figure 4.8: Grease Locations (Every 50 Hours)

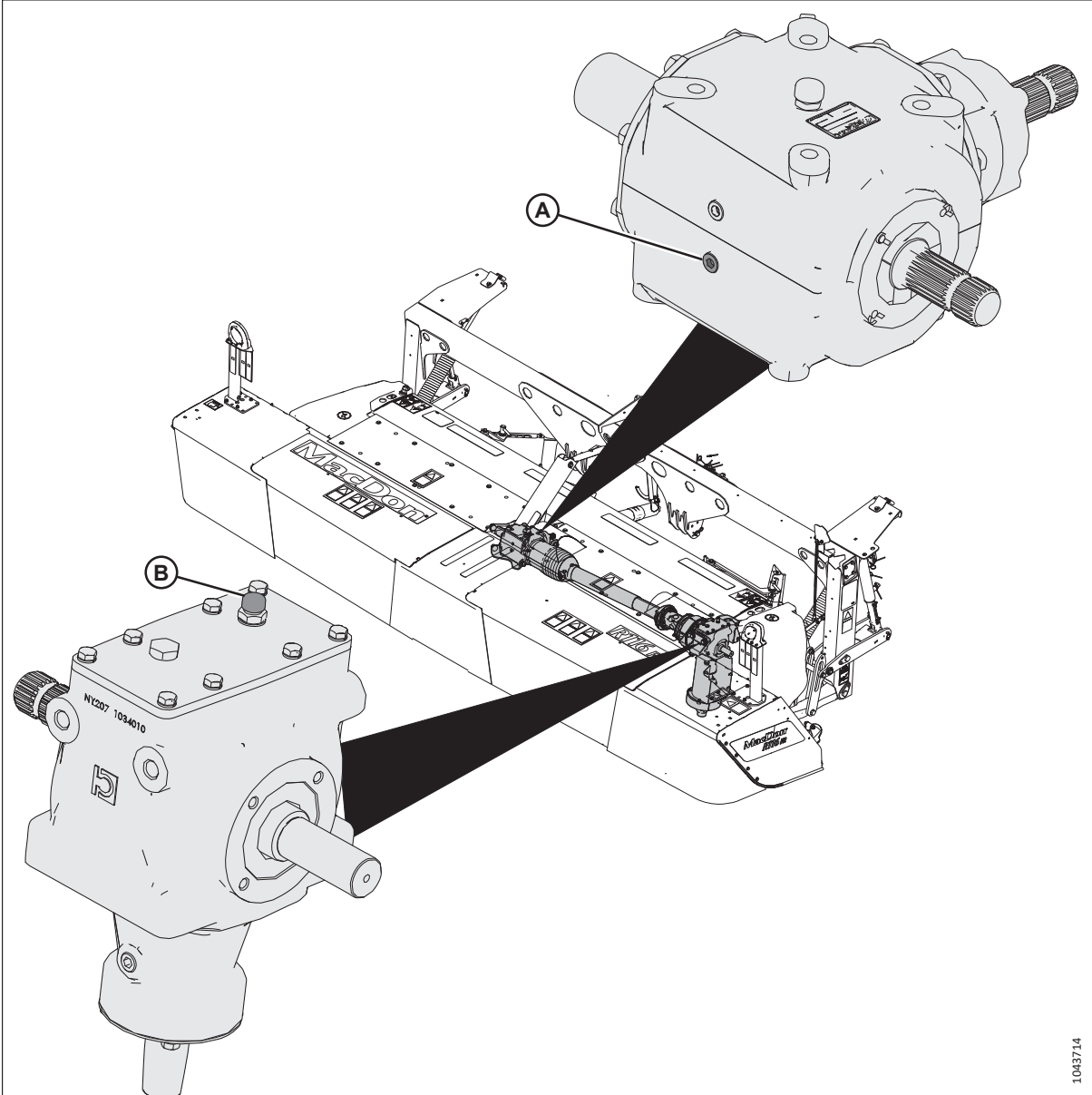
## MAINTENANCE AND SERVICING

### Every 100 Hours

Regular maintenance is required to keep your machine operating at peak performance.

#### NOTE:

Ensure the top of the header is horizontal, and verify oil levels.



**Figure 4.9: Lubrication Check (Every 100 Hours)**

A - Check Plug - Header Drive Gearbox

B - Breather/Dipstick - Cutterbar/Conditioner Drive Gearbox

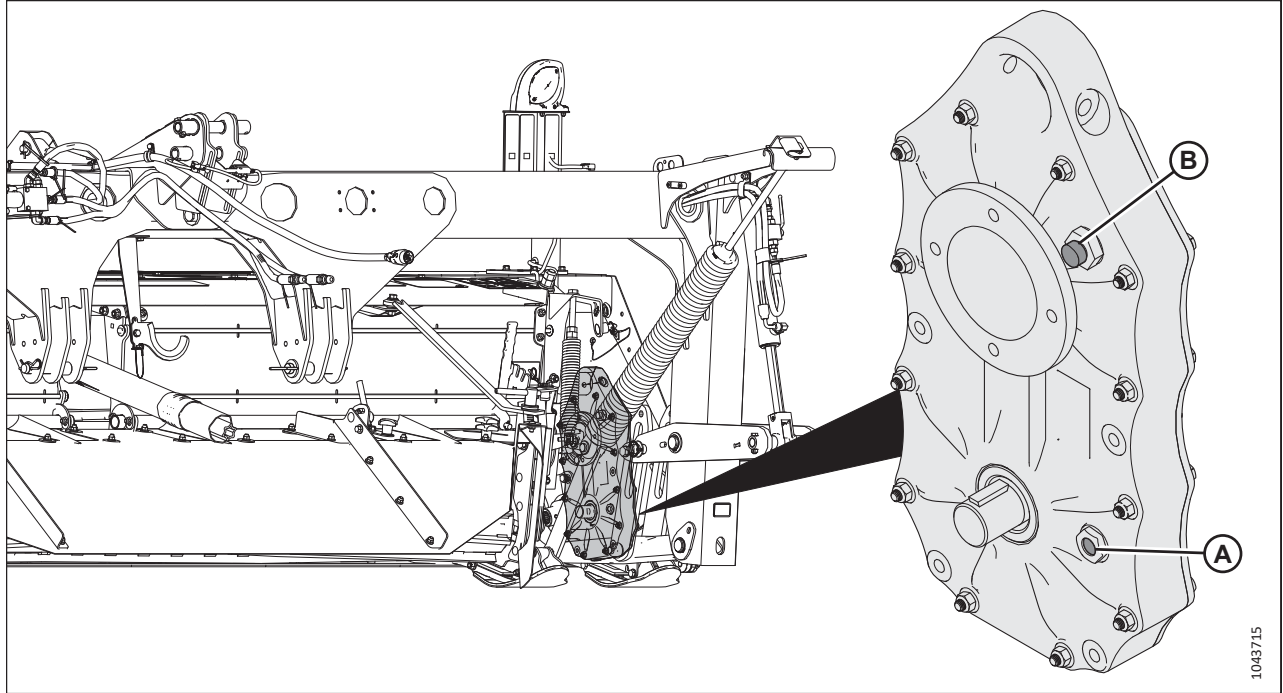


Figure 4.10: Lubrication Check (Every 100 Hours)

A - Sight Glass - Conditioner Roll Timing Gearbox

B - Breather - Conditioner Roll Timing Gearbox<sup>8</sup>

8. Refer to the inside back cover for lubricant specifications.

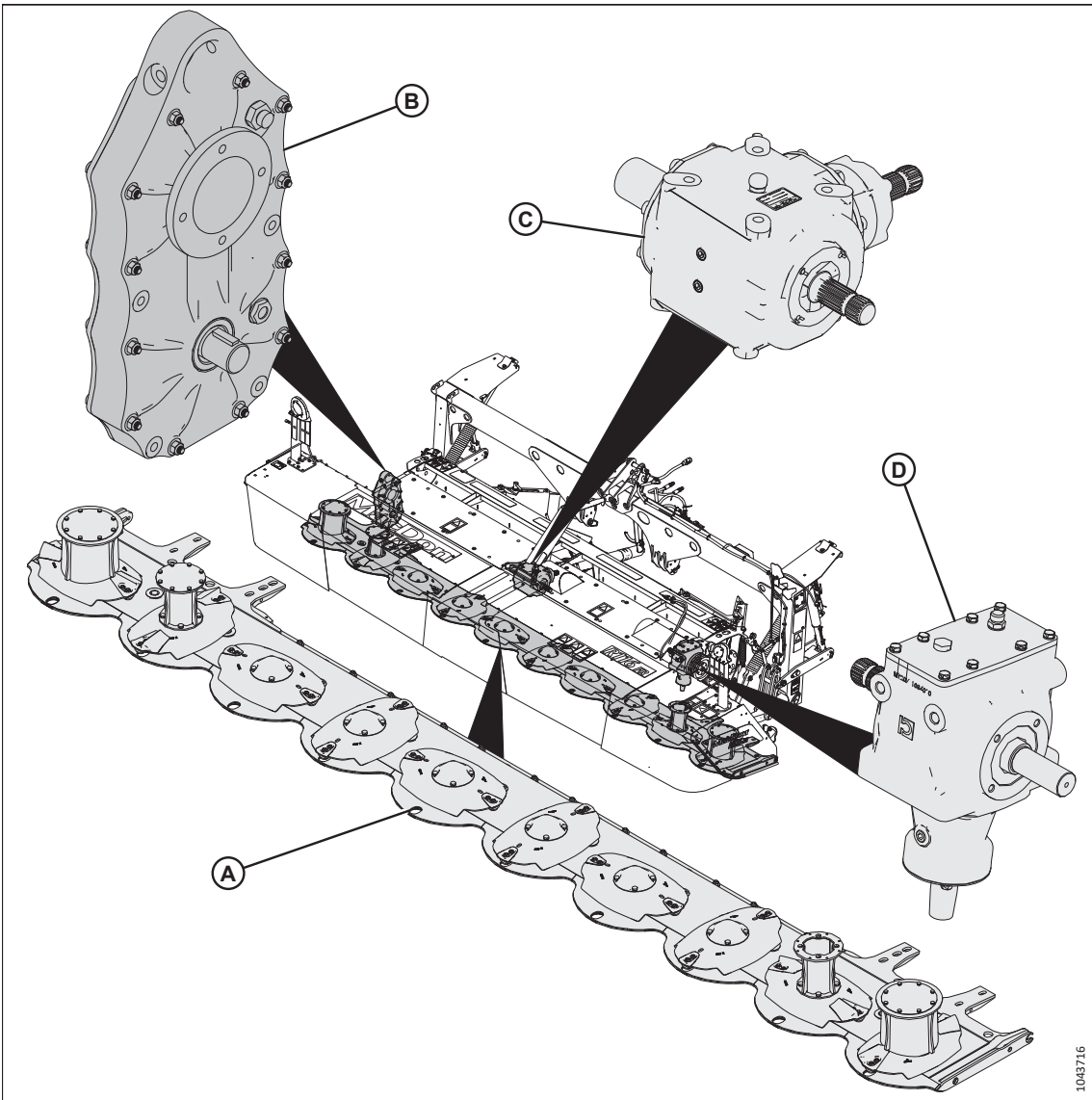
## MAINTENANCE AND SERVICING

### Every 250 Hours

Regular maintenance is required to keep your machine operating at peak performance.

1. Change lubricant in locations (A), (B), (C), and (D). Refer to the following sections for more information:

- [4.4.3 Lubricating Cutterbar, page 80.](#)
- [Checking and Adding Lubricant – Header Drive Gearbox, page 177.](#)
- [Checking and Changing Lubricant in Conditioner Roll Timing Gearbox, page 174](#)



**Figure 4.11: Lubrication Location (Every 250 Hours)**

A - Cutterbar  
C - Header Drive Gearbox

B - Conditioner Roll Timing Gearbox  
D - Cutterbar/Conditioner Drive Gearbox

## 4.4 Cutterbar System

The cutterbar (A) comes in two cutting widths: 3.9 m (13 ft.) and 4.9 m (16 ft.). The 3.9 m (13 ft.) holds eight discs and the 4.9 m (16 ft.) holds ten discs that rotate to a maximum of 2500 rpm at full speed. Each disc carries two cutting blades.

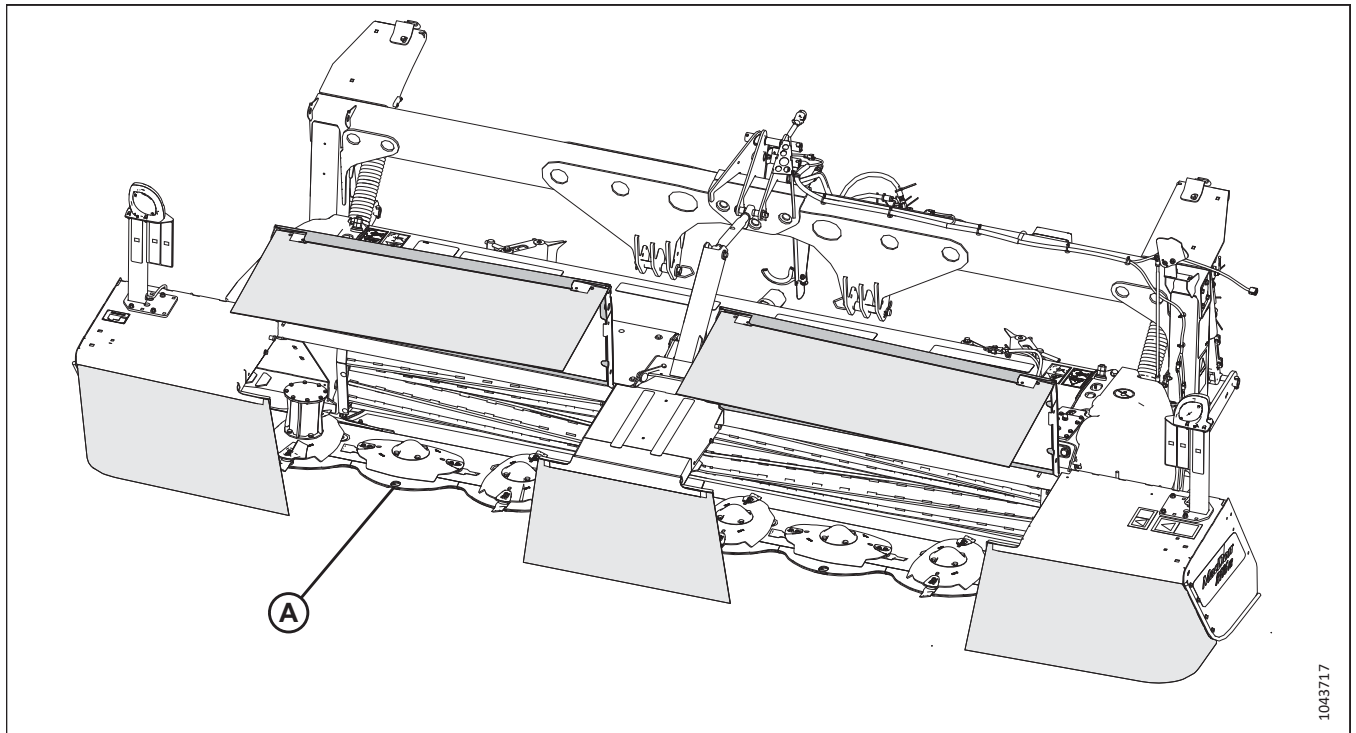


Figure 4.12: Cutterbar – R116 FR Shown

A - 4.9 m (16 ft.) Cutterbar

### NOTE:

Discs are factory-installed to produce three crop streams; however, the disc rotation pattern can be changed by changing the spindle and its disc to suit crop conditions. For more information, refer to [4.4.6 Reconfiguring Cutterbar Crop Stream](#), page 100.

### 4.4.1 Cutterbar Doors

Two doors with rubber curtains provide access to the cutterbar area, and reduce the risk of objects being ejected. Always keep doors closed during operation.

#### *Inspecting Cutterbar Doors*

The cutterbar doors protect bystanders from flung objects and protect the blades from obstacles. They should be inspected periodically.

### DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Ensure that the door operates smoothly and lies flat when it is closed. Adjust the doors if necessary.



## MAINTENANCE AND SERVICING

3. Inspect hinge pin bolts (A). If the bolts are loose, tighten them to 69 Nm (51 lbf·ft).
4. Check the door for cracks. Repair the door if any cracks are found.
5. Check the door for exposed metal and surface rust. Repair and repaint the door if necessary.
6. Check shield/curtain bolts (B) and replace them if they are missing. If they are loose, tighten them.
7. Repeat Step 3, page 72 to Step 6, page 72 for the other cutterbar door.

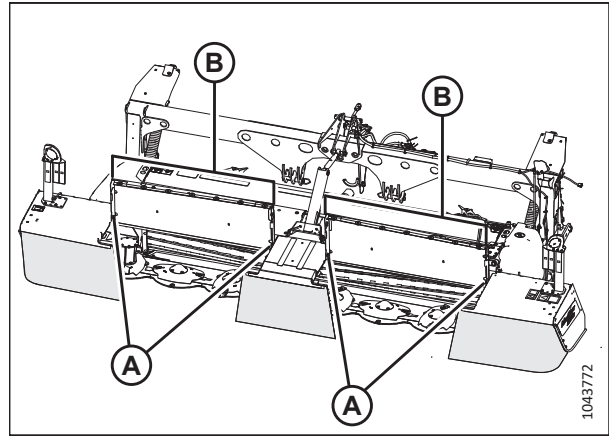


Figure 4.13: Cutterbar Doors

### 4.4.2 Maintaining Curtains

The curtains prevent objects from being ejected from the cutterbar area. Always lower the curtains down when operating the header.

Rubber curtains are installed at the following locations:

- Inboard curtain (A) is attached to the center fixed cover
- Door curtains (B) is attached to each cutterbar door
- Outboard curtains (C) is attached to each front corner

Replace the curtains if they become worn or damaged.

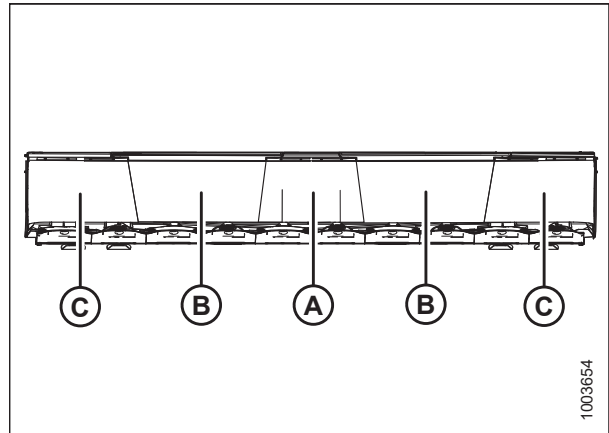


Figure 4.14: Cutterbar Curtains

#### *Inspecting Curtains*

The cutterbar curtains should be inspected periodically for damage and loose or missing hardware.

#### **DANGER**

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

#### **WARNING**

To reduce the risk of personal injury and machine damage, do NOT operate the machine installed and in good condition. Objects in the path of the blades can eject with considerable force when the machine is started.

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



## MAINTENANCE AND SERVICING

2. Check cutterbar curtains (A) for the following conditions:
  - Rips and tears. If any are found, replace the curtain.
  - Cracking. While the curtain may look whole, this is an indicator that failure is imminent, and so the curtain should be replaced.
  - Missing bolts. Replace any missing hardware before operating the machine.

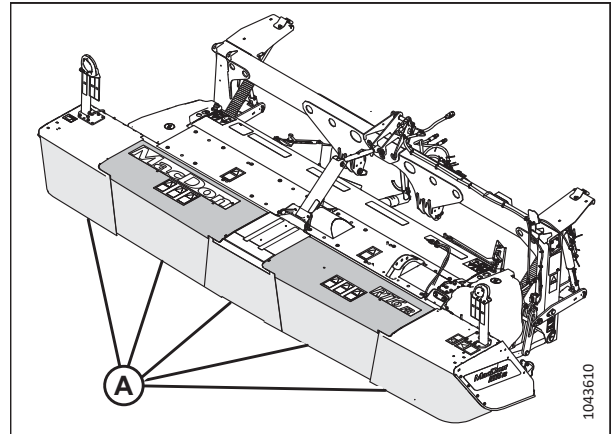


Figure 4.15: Cutterbar Curtains

### Removing Cutterbar Door Curtains

The procedure for removing the cutterbar door curtains is the same for both doors.

#### DANGER

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

#### DANGER

Ensure that all bystanders have cleared the area.

#### WARNING

Disc blades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with, or near, blades.

1. Position the rotary disc header at an appropriate height for the task.
2. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
3. Open the cutterbar doors. For instructions, refer to [3.4.1 Opening Cutterbar Doors, page 21](#).

## MAINTENANCE AND SERVICING

4. Remove seven nuts (A) from the bolt studs.
5. Remove aluminum liner (B).
6. Remove curtain (C).
7. Repeat Step 4, [page 74](#) to Step 6, [page 74](#) for the other cutterbar door.

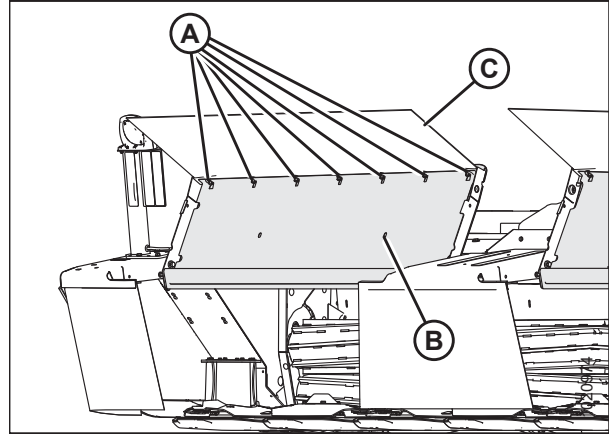


Figure 4.16: Cutterbar Door

### *Installing Cutterbar Door Curtains*

Do **NOT** overtighten the nuts when installing the cutterbar door curtains.

#### **DANGER**

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

#### **WARNING**

Disc blades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with, or near, blades.

1. Position the rotary disc header at an appropriate height for the task.
2. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).

## MAINTENANCE AND SERVICING

3. Insert seven cutterbar door stud bolts (B) into the precut holes on curtain (A).

**NOTE:**

R1 SP for windrowers shown in the illustration; R1 FR similar.

4. Install seven large washers (C).
5. Install liner panel (D) against the washers.
6. Install seven nuts (E) onto the bolt studs. Torque the nuts to 28 Nm (21 lbf-ft [248 lbf-in]).

**IMPORTANT:**

To avoid damaging the bolt studs, do **NOT** overtighten the nuts.

7. Close the cutterbar doors. For instructions, refer to [3.4.2 Closing Cutterbar Doors, page 21](#).

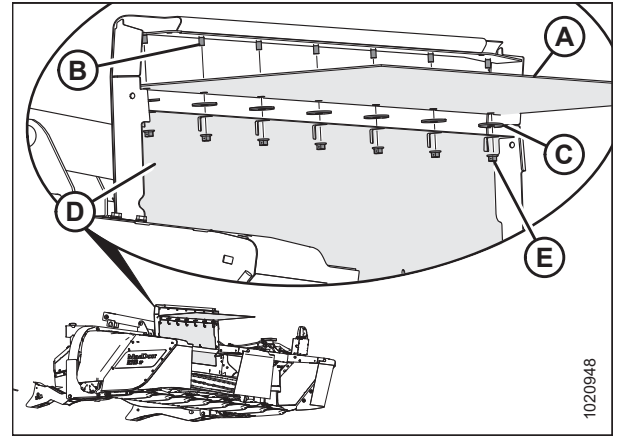


Figure 4.17: Cutterbar Curtain

### Removing Cutterbar Inboard Curtain

Remove the cutterbar inboard curtain if it is torn or cracked.



#### DANGER

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.



#### WARNING

Disc blades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with, or near, blades.

1. Position the rotary disc header at an appropriate height for the task.
2. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
3. Open the cutterbar doors. For instructions, refer to [3.4.1 Opening Cutterbar Doors, page 21](#).

## MAINTENANCE AND SERVICING

- Remove two M10 carriage head bolts (A) and nuts securing curtain assembly (B) to the rotary disc header, and remove the curtain assembly.

**NOTE:**

R1 SP for windrowers shown in the illustration; R1 FR similar.

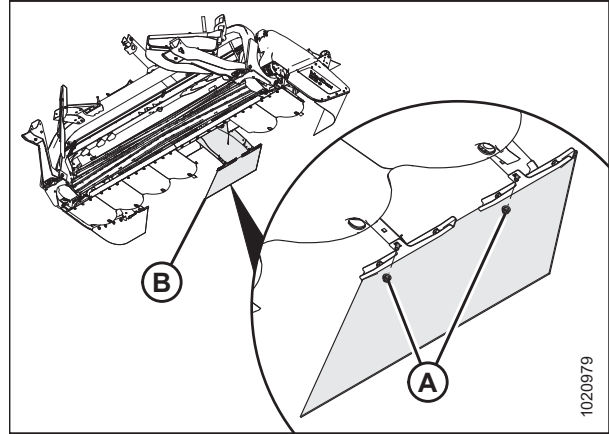


Figure 4.18: Inboard Curtain

- Remove four nuts (A) from the studs on the center shield.
- Remove two curtain brackets (B).
- Remove the curtain.

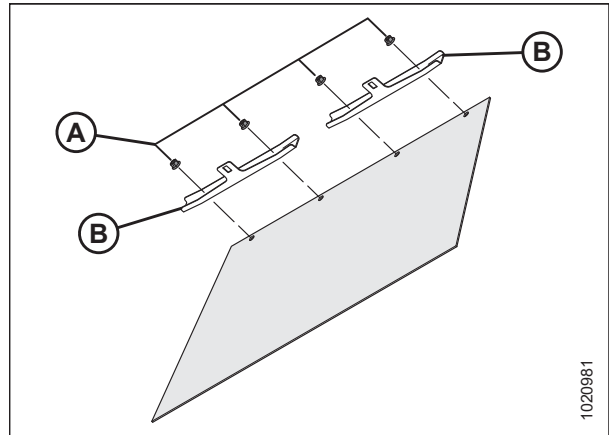


Figure 4.19: Inboard Curtain

### *Installing Cutterbar Inboard Curtain*

Do **NOT** overtighten the nuts when installing the inboard curtain.

**!** **DANGER**

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

**!** **WARNING**

Disc blades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with, or near, blades.

## MAINTENANCE AND SERVICING

1. Position the rotary disc header at an appropriate height for the task.
2. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
3. Open the cutterbar doors. For instructions, refer to [3.4.1 Opening Cutterbar Doors, page 21](#).
4. Install the curtain onto the studs on the center shield. Install two curtain brackets (B) and secure the brackets to the curtain with four nuts (A).

**NOTE:**

R1 SP for windrowers shown in the illustration; R1 FR similar.

5. Torque the hardware to 28 Nm (20.7 lbf-ft [248 lbf-in]).

**IMPORTANT:**

To avoid damaging the bolts, do **NOT** overtighten the nuts.

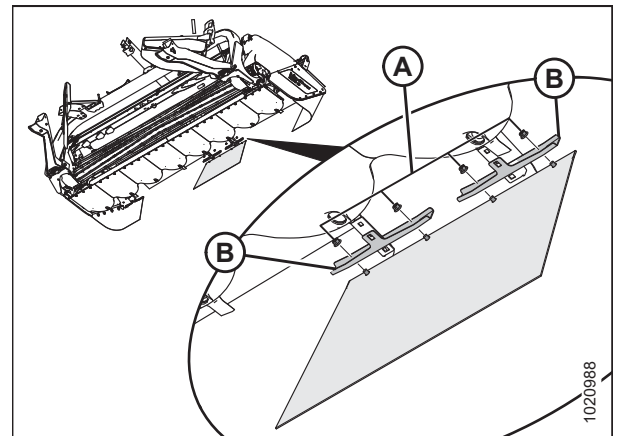


Figure 4.20: Inboard Curtain

6. Secure two curtain brackets (A) to the center shield using two M10 carriage head bolts and nuts (B).

**NOTE:**

R1 SP for windrowers shown in the illustration; R1 FR similar.

7. Torque bolts (B) to 39 Nm (29 lbf-ft).

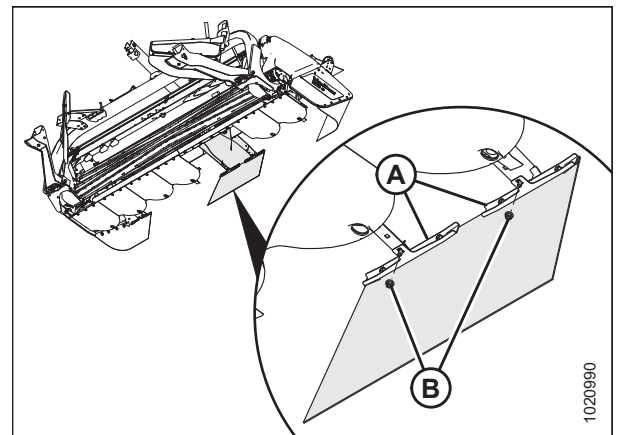


Figure 4.21: Inboard Curtain

### Removing Outboard Curtains

Remove the outboard curtains if they are damaged or cracked.

### DANGER

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

**WARNING**

Disc blades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with, or near, blades.

1. Position the rotary disc header at an appropriate height for the task.
2. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
3. Open the cutterbar doors. For instructions, refer to [3.4.1 Opening Cutterbar Doors, page 21](#).
4. Remove four bolts, large washers, and nuts (A) securing outboard curtain (B) to the endsheet.

**NOTE:**

R1 SP for windrowers shown in the illustration; R1 FR similar.

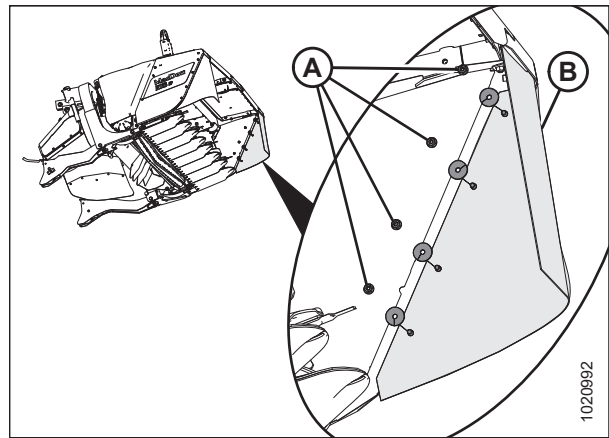


Figure 4.22: Left Endsheet

5. Remove two nuts (A) from the bolt studs.

**NOTE:**

R1 SP for windrowers shown in the illustration; R1 FR similar.

6. Remove nut (B) from the carriage head bolt, remove bracket (C), and remove curtain (D).

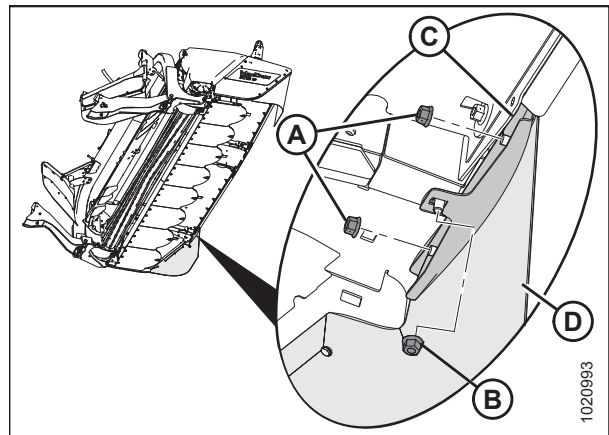


Figure 4.23: Outboard Curtain

### Installing Outboard Curtains

The procedure for installing outboard curtains is the same for both sides of the machine.

#### DANGER

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

#### WARNING

Disc blades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with, or near, blades.

1. Position the rotary disc header at an appropriate height for the task.
2. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
3. Open the cutterbar doors. For instructions, refer to [3.4.1 Opening Cutterbar Doors, page 21](#).
4. Install curtain (A) into bracket (B).

**NOTE:**

R1 SP for windrowers shown in the illustration; R1 FR similar.

5. Install two nuts (D) and tighten them.
6. Slide bracket (B) into position and install square neck carriage head bolt and flange nut (C).
7. Torque flange nut (C) to 39 Nm (29 lbf-ft).

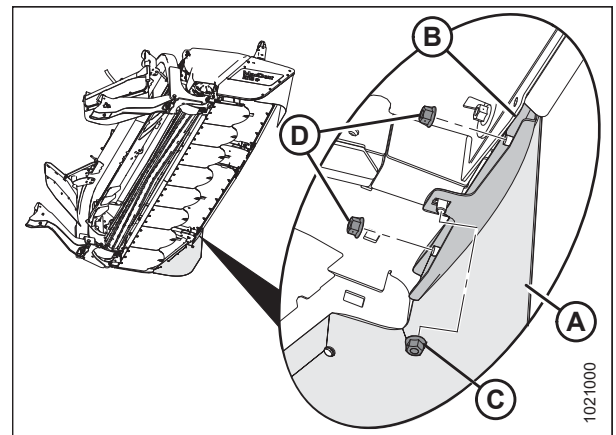


Figure 4.24: Outboard Curtain

8. Install four bolts, large washers, and nuts (A) to secure outboard curtain (B) to the endsheet. Torque the bolts to 39 Nm (29 lbf-ft).

**NOTE:**

R1 SP for windrowers shown in the illustration; R1 FR similar.

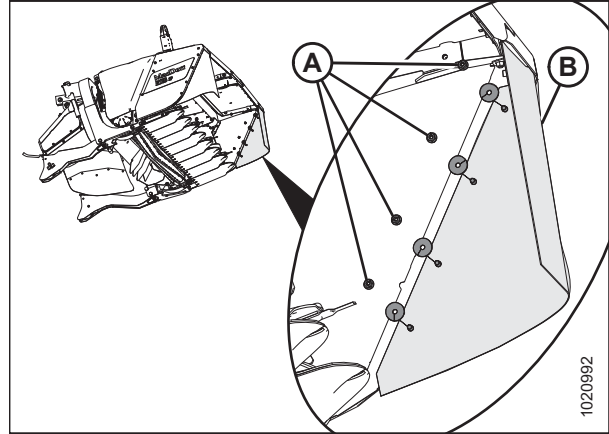


Figure 4.25: Left Endsheet

### 4.4.3 Lubricating Cutterbar

The machine should be on flat, level ground when checking and changing the lubricant in the cutterbar.

#### *Checking and Adding Lubricant – Cutterbar*

The correct lubricant levels are essential to the performance and longevity of the cutterbar.

**⚠ DANGER**

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

**⚠ DANGER**

Ensure that all bystanders have cleared the area.

**⚠ WARNING**

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

**IMPORTANT:**

Check the cutterbar lubricant level when the lubricant is warm. If the lubricant is cold, idle the machine for approximately 10 minutes prior to checking.

1. Park the machine on a flat, level surface.
2. Shut down the engine, and remove the key from the ignition.
3. Place blocks under each end, or just inside each end, of the cutterbar.
4. Lower the header onto the blocks.
5. Shut down the engine, and remove the key from the ignition.
6. Open the cutterbar doors. For instructions, refer to [3.4.1 Opening Cutterbar Doors, page 21](#).



## MAINTENANCE AND SERVICING

7. Use spirit level (A) to ensure that the cutterbar is level in both directions. Adjust the cutterbar position accordingly.

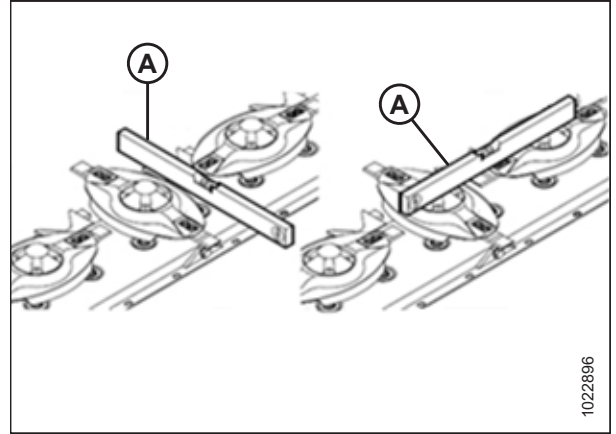


Figure 4.26: Spirit Level on Cutterbar

8. Clean the area around plug (A). Place a 5 liter (5.2 US qts) capacity container under the plug.
9. Remove plug (A) and O-ring (B) from the cutterbar. The oil level must be up to the inspection plug hole.
10. If the oil is up to the inspection plug hole, reinstall the plug and proceed to Step 16, page 82. If the oil is **NOT** up to the inspection plug hole, proceed to the next step.

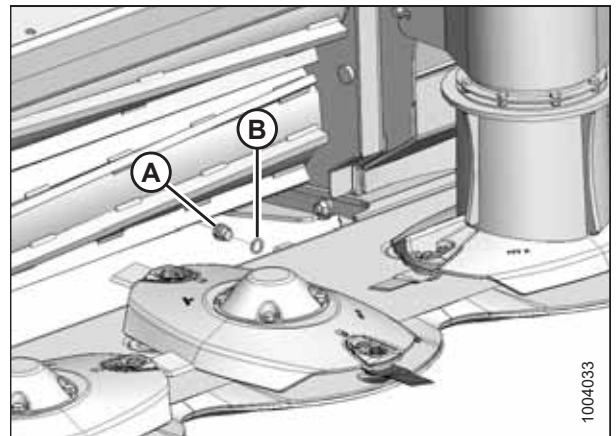


Figure 4.27: Cutterbar Oil Inspection Plug

11. Raise the header slightly.
12. Lower the header onto blocks so that the left end is slightly higher than the right end.
13. Shut down the engine, and remove the key from the ignition.
14. Add lubricant through the inspection hole that is used to check the oil level.

### **IMPORTANT:**

Do **NOT** overfill the cutterbar. Overfilling can cause overheating, damage, and failure of cutterbar components.

### **NOTE:**

Refer to the inside back cover of this manual for lubricant specifications.

15. Recheck the oil level.
16. Check O-ring (B) for breaks or cracks, and replace it if necessary.
17. Install plug (A) and O-ring (B).
18. Close the cutterbar doors. For instructions, refer to [3.4.2 Closing Cutterbar Doors](#), page 21.

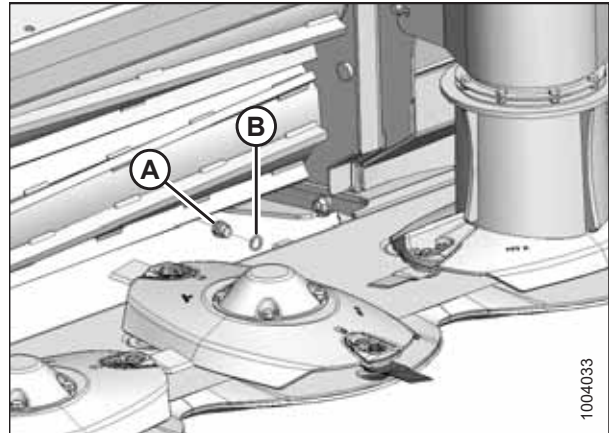


Figure 4.28: Cutterbar Oil Inspection Plug

### *Draining Cutterbar*

In order to change the cutterbar lubricant, the cutterbar will first need to be drained.

#### **⚠ DANGER**

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

#### **⚠ DANGER**

Ensure that all bystanders have cleared the area.

#### **⚠ WARNING**

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

1. Remove the right outboard rock guard. This will improve access to the drain plug located in the end cap of the cutterbar. To remove the outboard rock guard, refer to [Removing Outboard Rock Guards](#), page 124.
2. Raise the header.
3. Shut down the engine, and remove the key from the ignition.
4. Place a block under each end of the header so that the right end is lower than the left end.

#### **IMPORTANT:**

Always drain lubricant from the right end of the header. Draining lubricant from the left end of the header may contaminate the breather or cause it to fail.

5. Lower the header onto the blocks.
6. Shut down the engine, and remove the key from the ignition.
7. Place a 10 liter (10.5 US qts) container under the right end of the cutterbar.

## MAINTENANCE AND SERVICING

- Clean the area around plug (A) and remove it.

**IMPORTANT:**

Do **NOT** remove hex head bolts (B) securing the cutterbar end plate to the cutterbar or lubricant may leak.

- Let the lubricant drain. Reinstall cutterbar plug (A) when the lubricant has fully drained.

**NOTE:**

Do **NOT** flush the cutterbar.

- Fill the cutterbar with lubricant before operating the header. For instructions, refer to *Filling Cutterbar with Lubricant, page 83*.

**IMPORTANT:**

Dispose of used lubricant responsibly.

- Reinstall the right outboard rock guard. For instructions, refer to *Installing Outboard Rock Guards, page 126*.

### *Filling Cutterbar with Lubricant*

Refer to this procedure after completely draining the cutterbar of oil.

If you are checking the oil level or topping it up, proceed to *Checking and Adding Lubricant – Cutterbar, page 80*.



### **DANGER**

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.



### **DANGER**

Ensure that all bystanders have cleared the area.



### **WARNING**

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

**IMPORTANT:**

The cutterbar should be completely empty of oil before filling it. For instructions, refer to *Draining Cutterbar, page 82*.

- Remove the right outboard rock guard. This will improve access to the drain plug located in the end cap of the cutterbar. To remove the outboard rock guard, refer to *Removing Outboard Rock Guards, page 124*.
- Raise the header fully.
- Shut down the engine, and remove the key from the ignition.

## MAINTENANCE AND SERVICING

- Place blocks under the right end of the header so that the right end is higher than the left end.

### NOTE:

R1 Pull-Type shown in the illustration; R1 FR similar.

- Lower the header onto the blocks.
- Shut down the engine, and remove the key from the ignition.
- Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
- Remove access plug (A) from the left end of the cutterbar and add the **EXACT** amount of lubricant specified. Refer to the inside back cover of this manual for lubricant types and quantities.

### IMPORTANT:

Do **NOT** overfill the cutterbar. Overfilling can damage the cutterbar and cause it to fail.

- Reinstall access plug (A).
- Torque the plug to 30 Nm (22 lbf-ft [266 lbf-in]).
- Open the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
- Raise the header fully.
- Shut down the engine, and remove the key from the ignition.
- Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
- Remove the blocks from under the cutterbar.
- Check the lubricant level. For instructions, refer to [Checking and Adding Lubricant – Cutterbar, page 80](#).
- Reinstall the right outboard rock guard. For instructions, refer to [Installing Outboard Rock Guards, page 126](#).

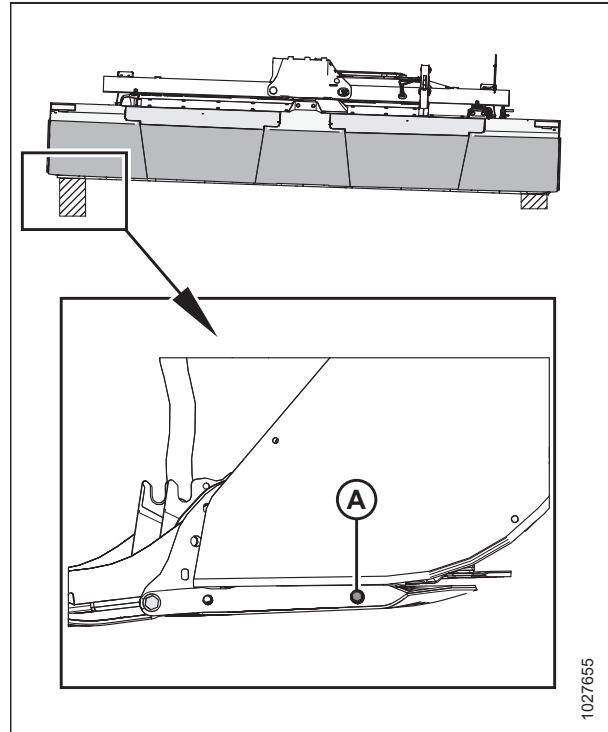
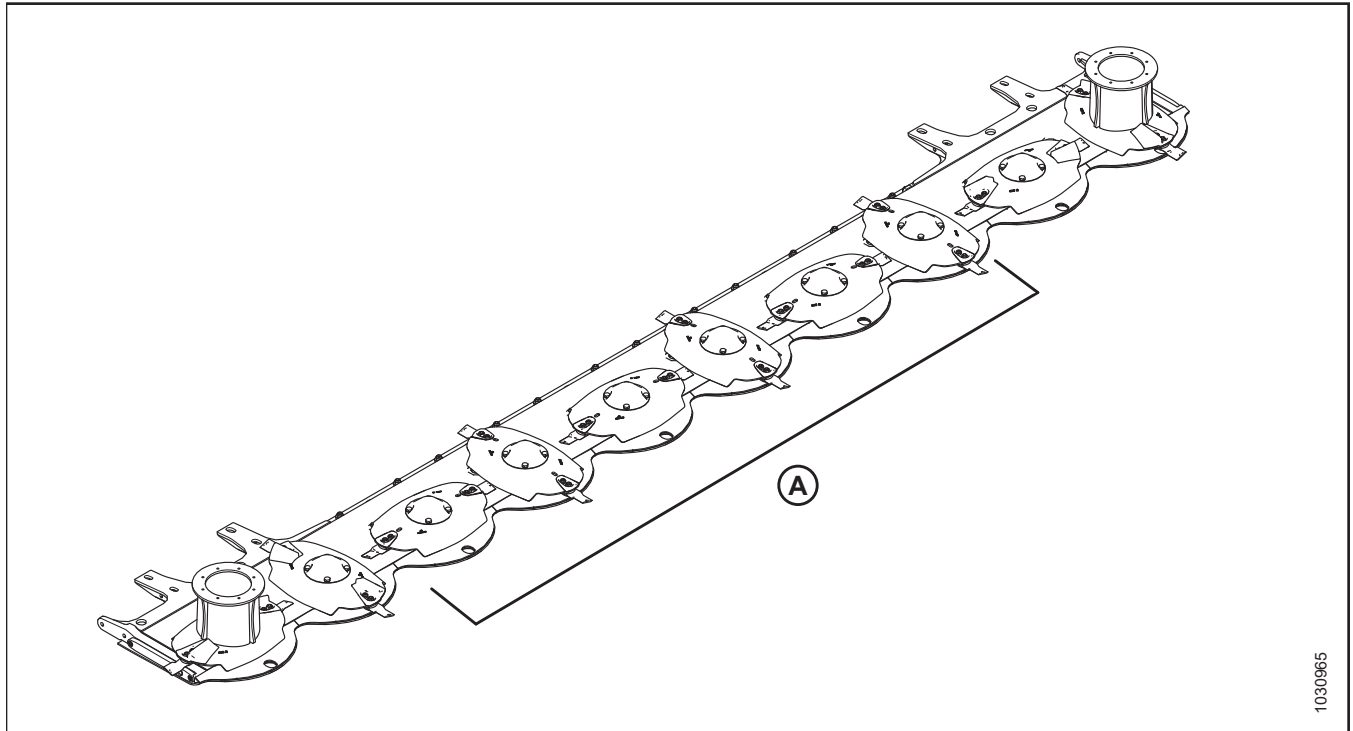


Figure 4.29: Filling Cutterbar

#### 4.4.4 Cutterbar Discs

The cutterbar discs provide rotary cutting action. They may need to be replaced from time to time.



**Figure 4.30: Interchangeable Cutterbar Discs**

Cutterbar discs (A) are interchangeable and can be moved to a spindle that rotates in the opposite direction, so long as the disc is in usable condition and the blades are oriented to cut in the correct direction.

Perform daily inspections to ensure that the cutterbar discs are not damaged or deformed.

The cutterbar discs are **NOT** repairable and must be replaced if they are 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.

*Inspecting Cutterbar Discs*

Damaged cutterbar discs cut poorly and may damage the cutterbar. Replace damaged discs immediately.



**WARNING**

**Disc blades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with, or near, blades.**

1. Position the rotary disc header at an appropriate height for the task.
2. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).

## MAINTENANCE AND SERVICING

3. Inspect the cutterbar disc for any deformity on the side of the disc blades. Dimension (A) must not exceed 48 mm (1 7/8 in.). Replace any damaged discs immediately.

### IMPORTANT:

Cutterbar discs are **NOT** repairable and must be replaced if damaged.

### NOTE:

Dimension (A) is between the cutterbar and the edge of the disc as shown.

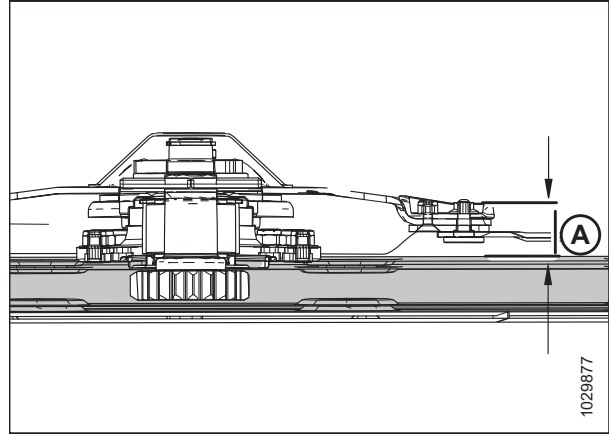


Figure 4.31: Cutterbar Disc

4. Inspect the discs for abrasion (A) at the cutting blade sides. Replace the disc if the material thickness is less than 3 mm (1/8 in.).

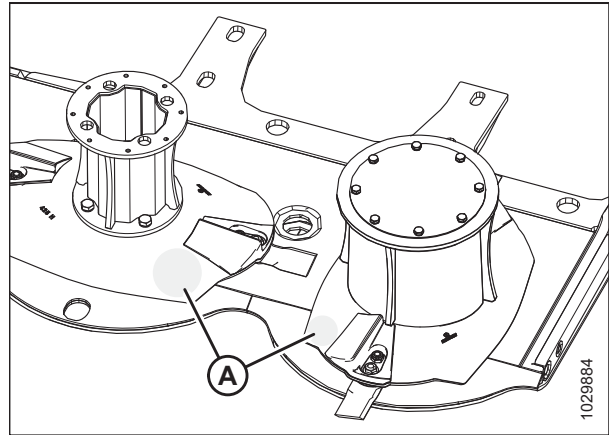


Figure 4.32: Cutterbar Disc

5. Inspect cutterbar disc surface (D) for cracks, excessive wear, and check if the disc is distorted. Replace any damaged discs immediately.
6. Inspect cutterbar disc edges (E) for cracks, excessive wear, and check if the edge is distorted. Replace any damaged components immediately.
7. Ensure that disc blade fasteners (A) are securely attached to the cutterbar disc and that nut shields (B) are present and undamaged. Replace any damaged components immediately.
8. Check that cutterbar disc bolts (C) are securely attached to the spindles. Tighten the bolts as needed.

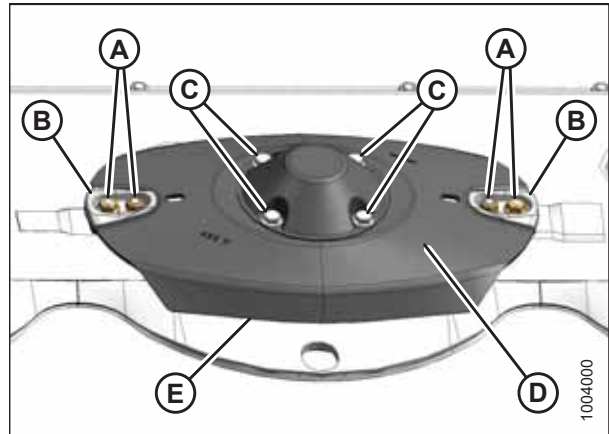


Figure 4.33: Cutterbar Disc

### Removing Cutterbar Discs

Cutterbar discs may need to be removed for replacement or so they can be swapped to change the type of crop stream.

#### DANGER

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

#### WARNING

Disc blades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with, or near, blades.

1. Position the rotary disc header at an appropriate height for the task.
2. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
3. Open the cutterbar doors. For instructions, refer to [3.4.1 Opening Cutterbar Doors, page 21](#).
4. Place a pin (or equivalent) in front hole (B) of the rock guard to prevent the discs from rotating while you are loosening the bolts.
5. Remove four M12 bolts and washers (A).

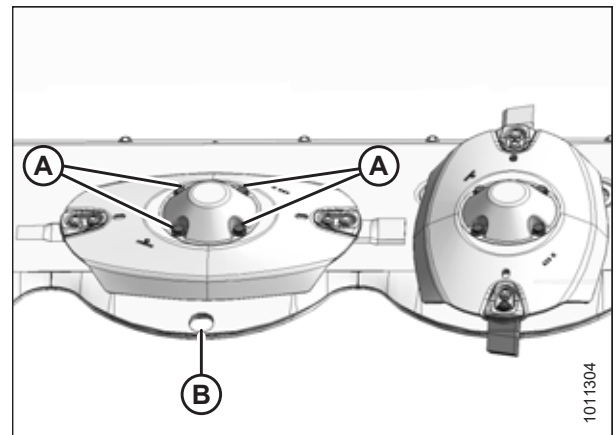


Figure 4.34: Cutterbar Disc Bolts

6. Remove cutterbar disc cap (A).
7. Remove cutterbar disc (B).

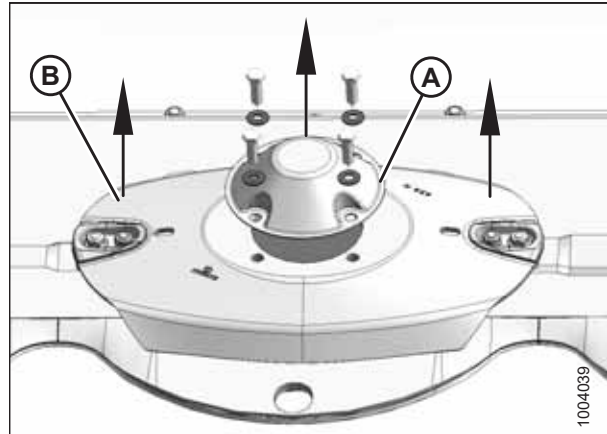


Figure 4.35: Cutterbar Disc and Cap

### *Installing Cutterbar Discs*

Ensure that the blades of the installed disc are perpendicular to those on the adjacent discs.

#### **DANGER**

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

#### **WARNING**

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

1. Position the rotary disc header at an appropriate height for the task.
2. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).



## MAINTENANCE AND SERVICING

3. Install spacer plate (A) on the spindle.

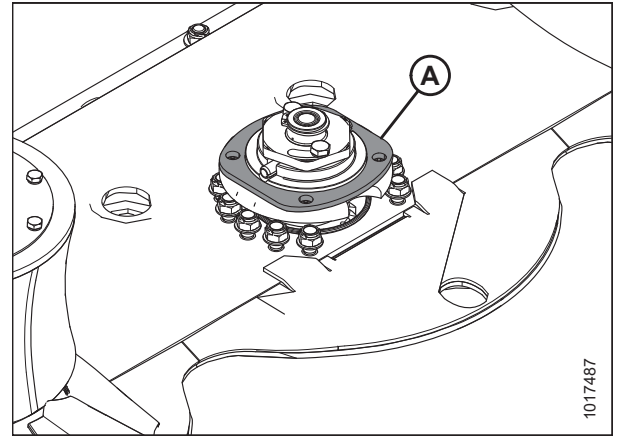


Figure 4.36: Disc Spindle

4. To prevent the disc from rotating while you are tightening the bolts, place a pin (or equivalent) in front hole (D) of the rock guard.
5. Position new disc (A) on the spindle so that the blades are perpendicular to those on the adjacent discs.
6. Install cutter disc cap (B), and secure the assembly with four M12 bolts and washers (C).
7. Torque the bolts to 85 Nm (63 lbf-ft).

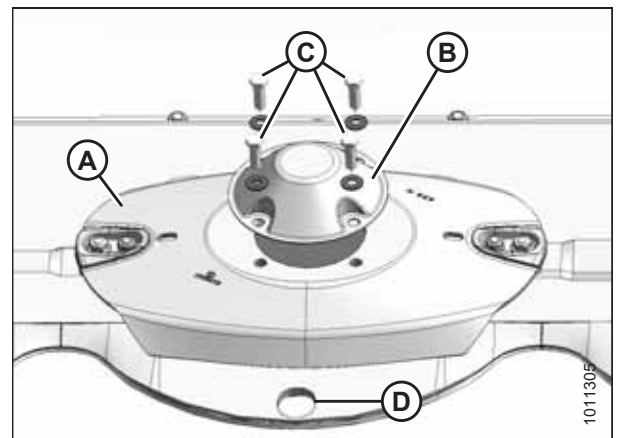


Figure 4.37: Cutterbar Disc and Cap

### **WARNING**

Ensure that the cutterbar is completely clear of foreign objects. Foreign objects can be ejected with considerable force when the machine is started, which can result in serious injury or cause damage to the machine.

8. Remove the pin (or equivalent) from the front hole of the rock guard.
9. Close the cutterbar doors. For instructions, refer to [3.4.2 Closing Cutterbar Doors, page 21](#).

### 4.4.5 Replacing Cutterbar Spindles

Cutterbar spindles allow for the rotation of the cutterbar discs. They have either right or left-handed threads, and are equipped with a shear pin.

A shear pin (A) is installed on each disc in order to prevent damage to the cutterbar if the disc collides with an obstacle.

If the disc contacts a large object such as a stone or stump, the pin will shear and the disc will stop rotating and move upwards. The disc will remain attached to the spindle because of snap ring (B).

**NOTE:**

Once the spindle has risen due to shear pin failure, the spindle's bearing will become unloaded. Do **NOT** replace the spindle simply because the spindle exhibits excessive play. Check the play of the spindle after torquing the spindle nut and replacing any damaged shear pins.

Refer to [4.4.13 Replacing Cutterbar Spindle Shear Pin, page 151](#) for instructions on replacing the shear pin.

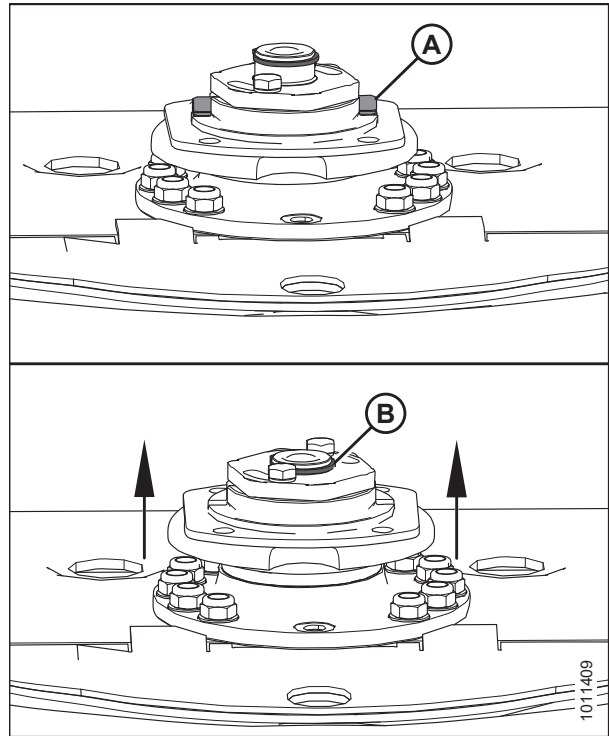


Figure 4.38: Cutterbar Spindles

**IMPORTANT:**

- Spindles that rotate clockwise have right-leading threading and are identified by a smooth top on spindle gear shaft (A).
- Spindles that rotate counterclockwise have left-leading threading and are identified by machined grooves on spindle gear shaft (B) and nut (C).
- If the spindle position in the cutterbar has changed, the rotational direction of that spindle **MUST** remain the same (that is, a clockwise spindle must maintain its clockwise rotation).
- Failure to maintain the rotation pattern can result in damage to the spindle and/or to the cutterbar components.
- The shear pin will not perform properly if the spindles used are in the wrong orientation.

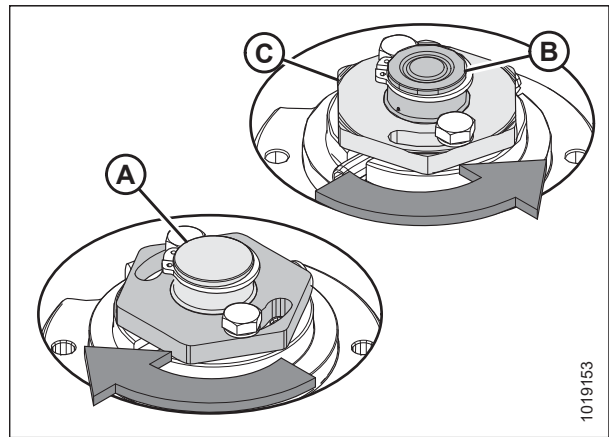


Figure 4.39: Cutterbar Spindles

### Removing Cutterbar Spindles

The cutterbar spindles are secured to the cutterbar frame with 11 nuts and washers.

#### DANGER

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

#### DANGER

Ensure that all bystanders have cleared the area.

#### WARNING

Disc blades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with, or near, blades.

1. Park the machine on a flat, level surface.
2. Position the rotary disc header at an appropriate height for the task.

#### NOTE:

To prevent oil from spilling from the cutterbar while you are removing the disc spindles, ensure that the header is on a flat, level surface and that it is tilted all the way back.

3. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
4. Open the cutterbar doors. For instructions, refer to [3.4.1 Opening Cutterbar Doors, page 21](#).
5. Open the cutterbar doors. For instructions, refer to [3.4.1 Opening Cutterbar Doors, page 21](#) or .
6. To prevent the disc from rotating while you are loosening the bolts, place a pin (or equivalent) in front hole (B) of the rock guard.
7. Remove four M12 bolts and washers (A).

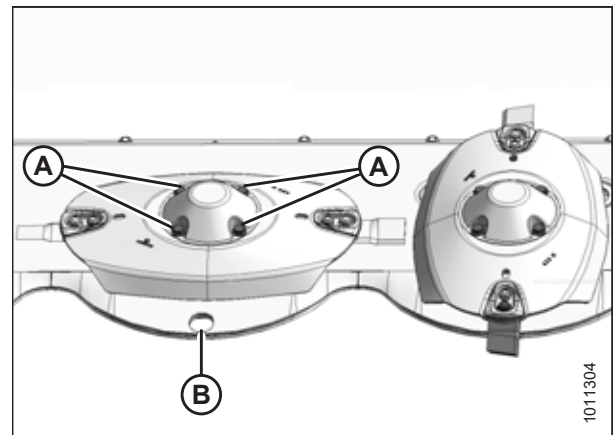


Figure 4.40: Cutterbar Disc Bolts

## MAINTENANCE AND SERVICING

8. Remove cutterbar disc cap (A).
9. Remove cutterbar disc (B).

**IMPORTANT:**

The blades are oriented to cut in one direction or the other. Therefore, swap the entire disc when swapping spindles.

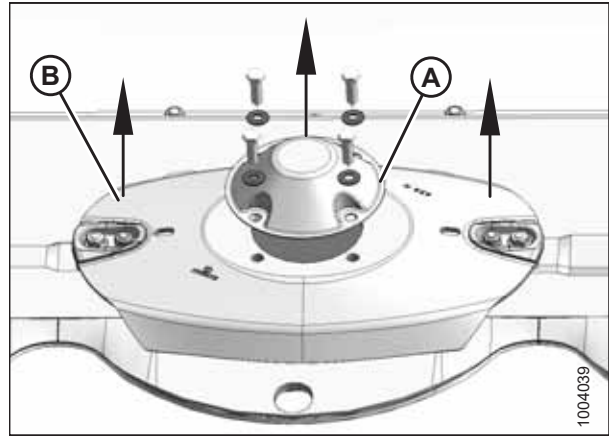


Figure 4.41: Cutterbar Disc and Cap

10. Remove spacer plate (A).

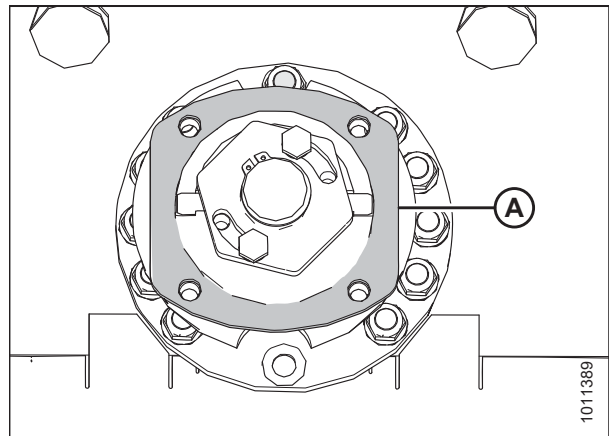


Figure 4.42: Spacer Plate

11. Rotate spindle hub (A) to access the nuts, and remove 11 M12 lock nuts and washers (B).

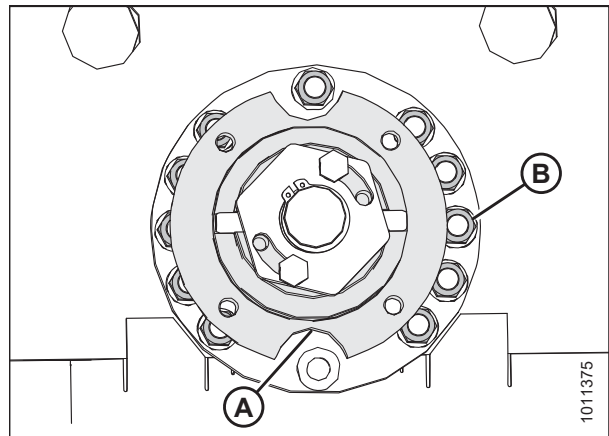


Figure 4.43: Left Spindle Hub and Hardware

12. Remove spindle (A) from the cutterbar.

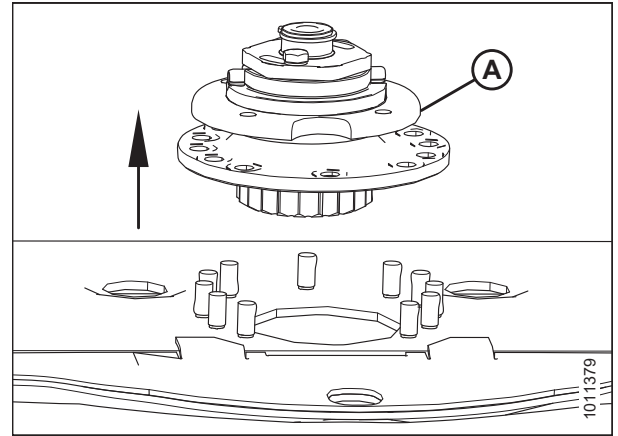


Figure 4.44: Left Spindle

### Installing Cutterbar Spindles

Ensure that the discs are timed correctly when installing the cutterbar spindles or the cutterbar may become damaged.

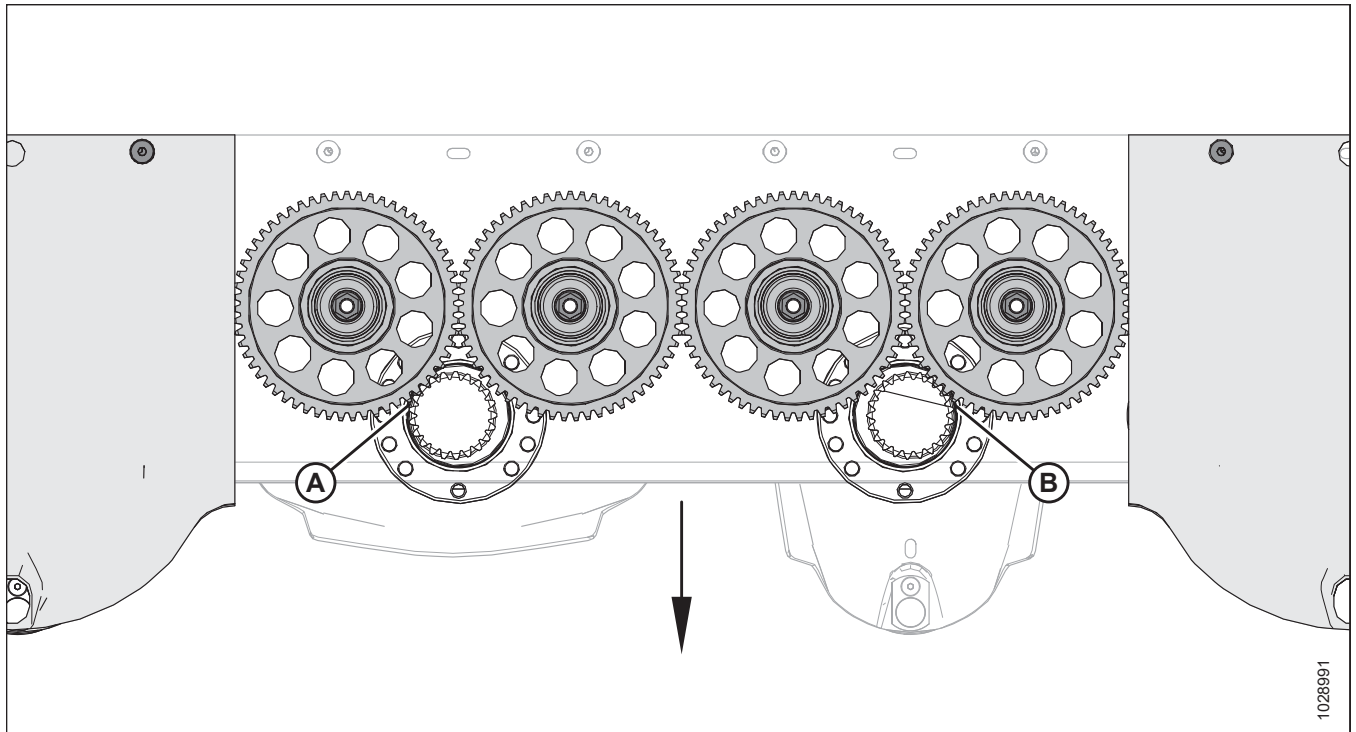


Figure 4.45: Underside of Cutterbar Spindles

**NOTE:**

Right discs (A) and left discs (B) are slightly offset as shown, depending on which idler gear the spindle is turning:

- Spindles that rotate clockwise have left-leading threading.
- Spindles that rotate counterclockwise have right-leading threading.

## MAINTENANCE AND SERVICING

### IMPORTANT:

Right discs (A) and left discs (B) are timed and must be installed at a 90° angle relative to the neighboring discs. Misaligned discs could result in the following:

- Disc blades of co-rotating discs hitting each other
- Disc blades of diverging discs hitting adjacent discs

Before securing the spindle to the cutterbar, inspect the disc timing using the disc timing tool. The disc is correctly timed if the spindle hub is aligned with the disc timing tool as shown in Figure 4.48, page 95.

Turn the disc by hand to ensure that the disc blades do **NOT** contact each other or those of adjacent discs.

If the alignment is incorrect, lift the spindle clear of the mounting bolts, rotate the spindle by 180° (ensuring that the base does not turn), and reinstall the spindle.

Before securing the hub, recheck the timing. The spindles do **NOT** need to be bolted to the disc timing tool; visual confirmation of the alignment is sufficient.

### NOTE:

Remove the driveshield and retrieve disc timing tools (A) from the left rear side of the header.

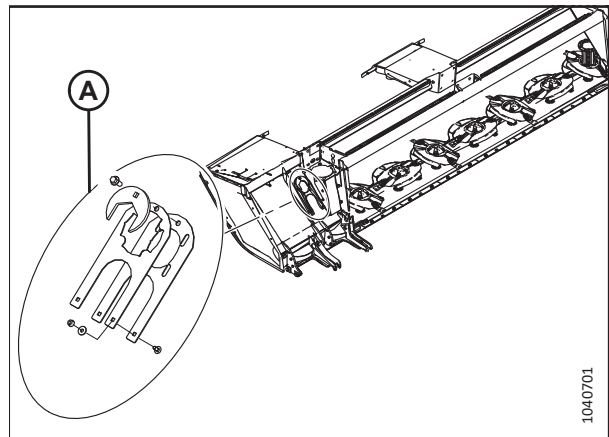


Figure 4.46: Disc Timing Tool Location – Left Rear Side

MAINTENANCE AND SERVICING

**NOTE:**

Assemble disc timing tools (A) and (B) and secure them with M8 carriage head bolt (C), washer (D), and M8 flange hex nut (E).

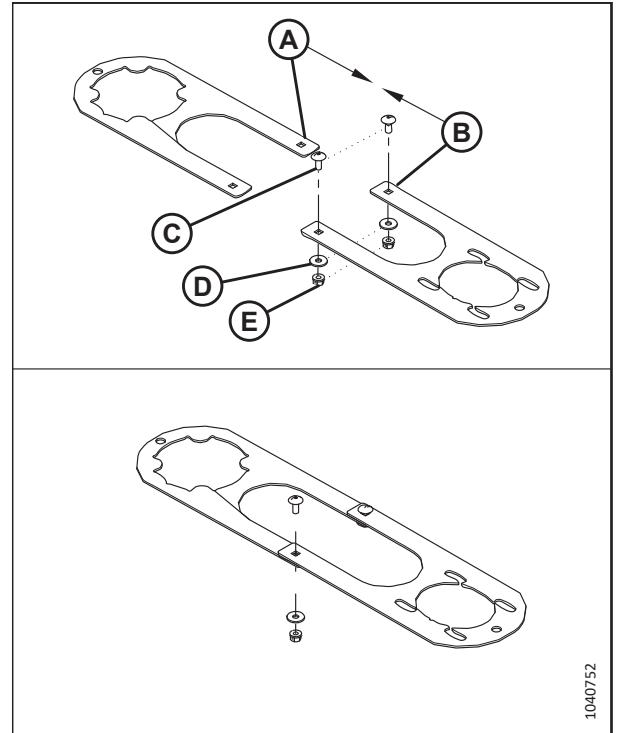


Figure 4.47: Disc Timing Tool

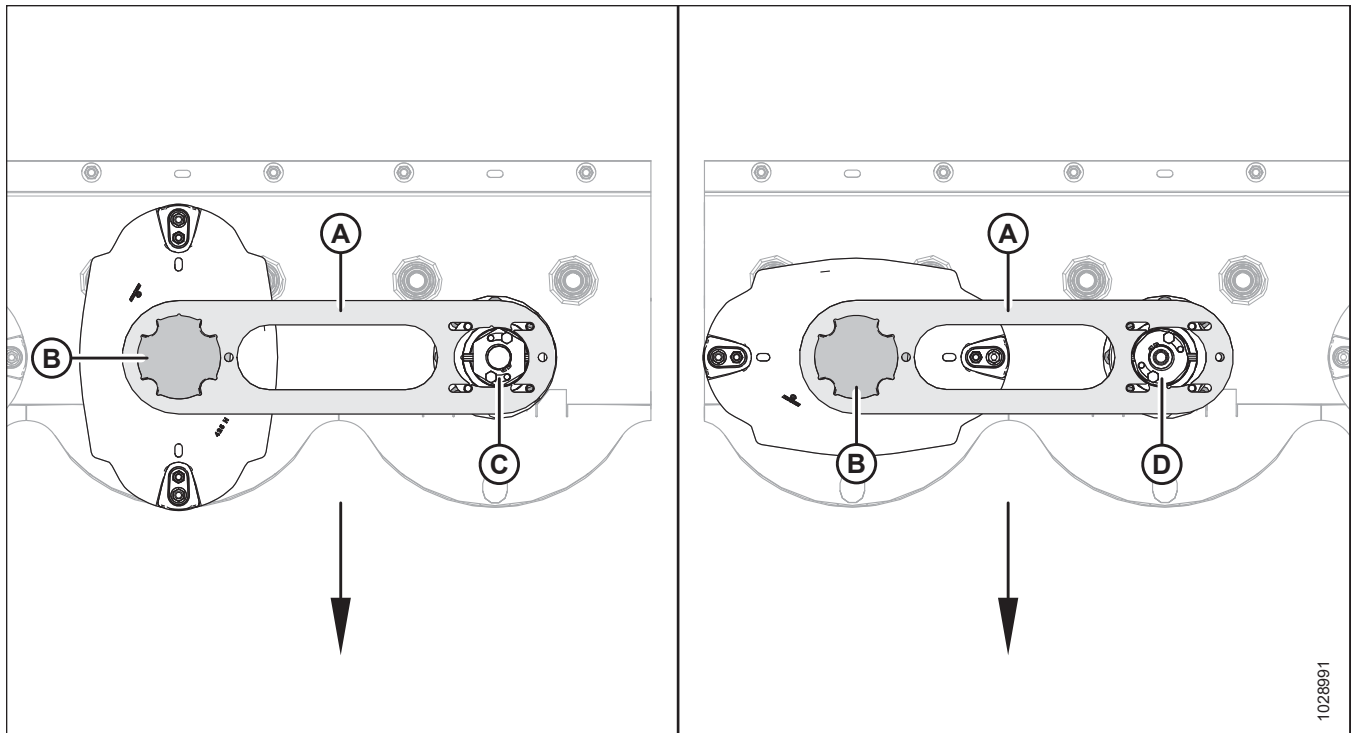


Figure 4.48: Checking Timing with Disc Timing Tool – View from Above

A - Disc Timing Tool  
C - Right Disc, Correct Timing

B - Cutter Disc Cap  
D - Left Disc, Correct Timing

**⚠ DANGER**

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

**⚠ DANGER**

Ensure that all bystanders have cleared the area.

**⚠ WARNING**

Disc blades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with, or near, blades.

1. Park the machine on a flat, level surface.

**NOTE:**

To prevent oil from spilling from the cutterbar while you are removing the disc spindles, ensure that the header is on a flat, level surface and that it is tilted all the way back.

2. Position the rotary disc header at an appropriate height for the task.
3. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
4. Open the cutterbar doors. For instructions, refer to [3.4.1 Opening Cutterbar Doors, page 21](#).
5. Choose a suitable spindle rotation pattern. For more information, refer to [4.4.5 Replacing Cutterbar Spindles, page 90](#).

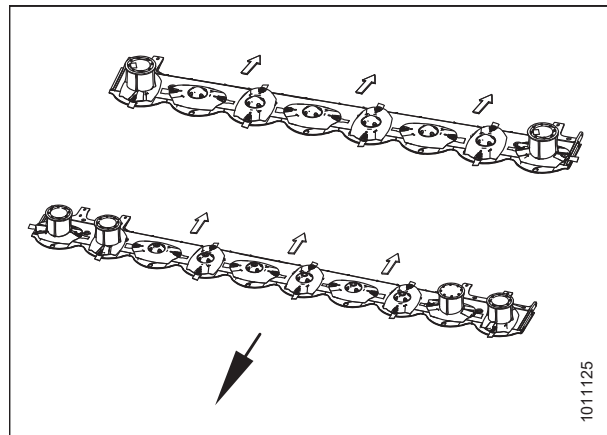


Figure 4.49: Cutterbars

1011125



## MAINTENANCE AND SERVICING

6. Ensure that spindle O-ring (A) is properly seated, cleaned, and undamaged.

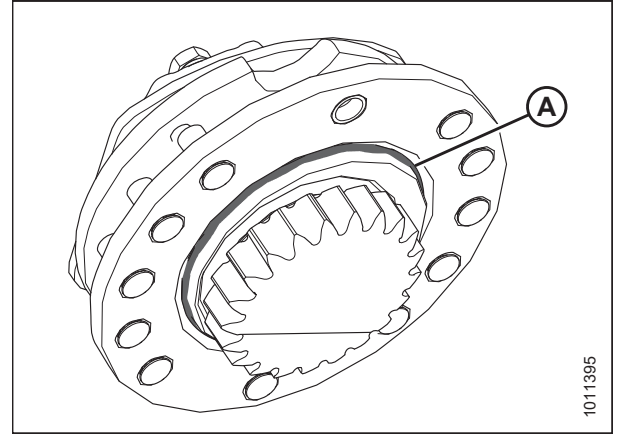


Figure 4.50: Left Spindle O-Ring

7. Insert spindle (A) into the cutterbar.

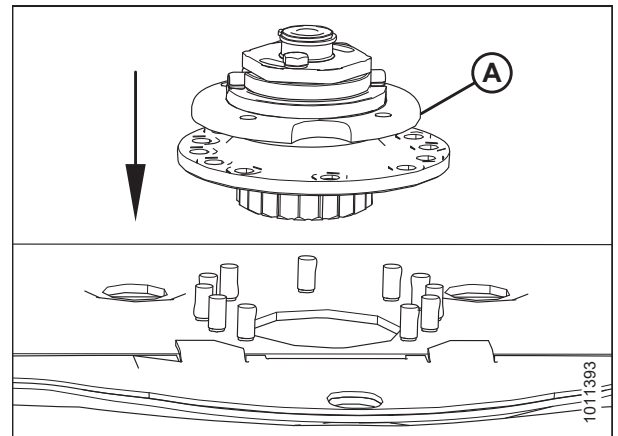


Figure 4.51: Left Spindle

8. Insert studs (A) into the spindle as shown.

**NOTE:**

The plugs are factory-installed as shown in position (B), but may loosen over time. Ensure that the studs are inserted into the proper location.

**IMPORTANT:**

The design of the cutterbar makes it possible to install spindles that rotate in the wrong direction. This will prevent the discs from spinning up and can result in damage to the cutterbar. Ensure that the clockwise spindles rotate clockwise and that the counterclockwise spindles (with machined grooves) rotate counterclockwise.

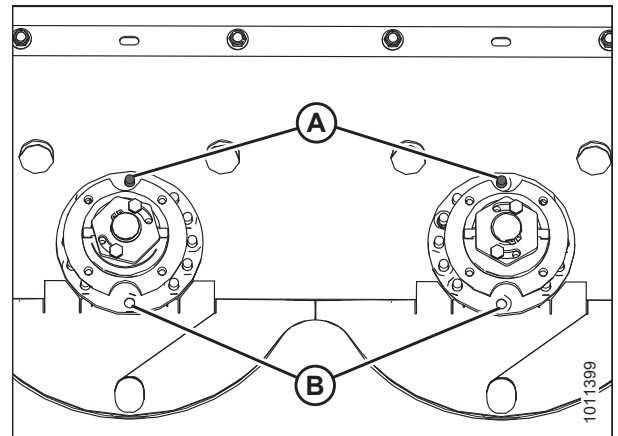


Figure 4.52: Spindle Orientation

## MAINTENANCE AND SERVICING

9. Check and adjust the disc timing as follows:

**NOTE:**

There are an odd number of teeth on the cutterbar gears; this can make aligning the spindle hub challenging.

- a. Place one end of disc timing tool (A) on adjacent disc (B) and the other end of the disc timing tool on the left spindle as shown.
- b. Check bolt hole alignment (C) as shown.
- c. If the alignment is slightly off, lift the spindle and rotate it by one tooth in either direction to try and line up the bolt holes.
- d. Recheck the timing using the disc timing tool. If the discs are still not lining up, lift the spindle and rotate the hub by 1/4 turn at a time. Recheck the timing using the disc timing tool.
- e. Repeat the disc alignment procedure until the bolt holes are aligned.

**NOTE:**

The arrow in the illustration points to the front of the header.

10. Ensure that hub (A) is fully seated into the cutterbar before tightening nuts (B).
11. Rotate spindle hub (A) to access the studs, and install 11 M12 lock nuts (B) and washers.

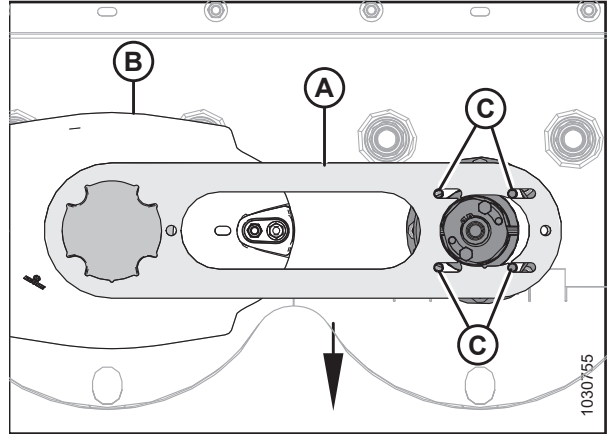


Figure 4.53: Alignment Tool

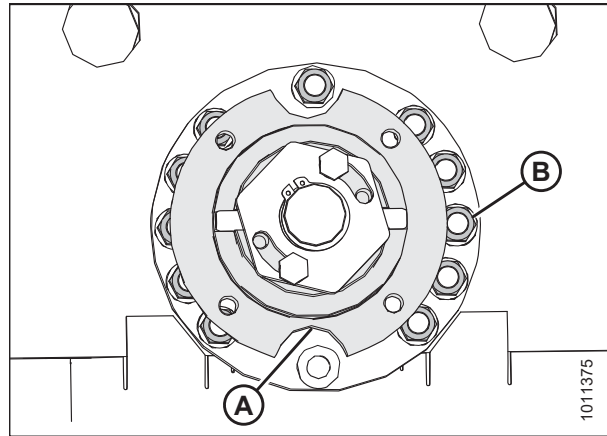


Figure 4.54: Left Spindle Hub

## MAINTENANCE AND SERVICING

- Torque the bolts to 50 Nm (37 lbf-ft) following the tightening pattern shown.

**NOTE:**

The hub has been removed from the illustration for clarity.

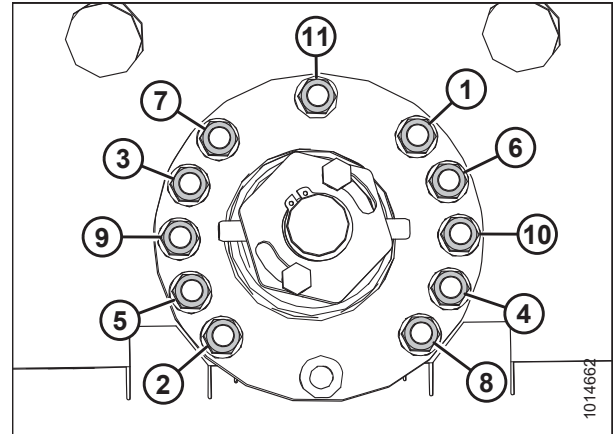


Figure 4.55: Tightening Pattern

- Install spacer plate (A).

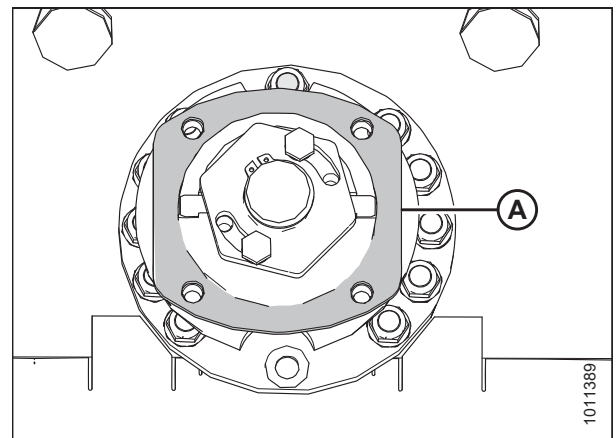


Figure 4.56: Spacer Plate

- To prevent the disc from rotating while you are tightening the bolts, place a pin (or equivalent) in front hole (D) of the rock guard.

**IMPORTANT:**

The blades are oriented to cut in one direction or the other. Swap the entire disc when you are swapping spindles.

- Position disc (A) on the spindle, ensuring that it is positioned at a 90° angle relative to the adjacent discs.

**NOTE:**

Turn disc (A) by hand to ensure that the disc blades do not contact each other or adjacent discs.

- Install cutter disc cap (B) and secure the assembly with four M12 bolts and washers (C).

- Torque the bolts to 85 Nm (63 lbf-ft).

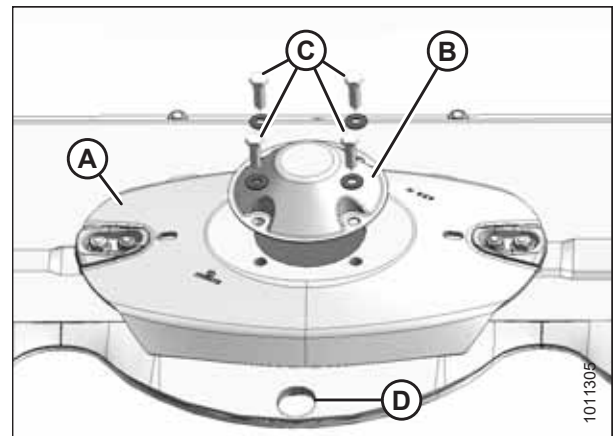


Figure 4.57: Cutterbar Disc and Cap

**WARNING**

Ensure that the cutterbar is completely clear of foreign objects. Foreign objects can be ejected with considerable force when the machine is started, which can result in serious injury or cause damage to the machine.

18. Remove the pin (or equivalent) from the front hole of the rock guard.
19. Close the cutterbar doors. For instructions, refer to [3.4.2 Closing Cutterbar Doors, page 21](#).

### 4.4.6 Reconfiguring Cutterbar Crop Stream

Discs are factory-installed to produce three crop streams; however, the disc rotation pattern can be changed by changing the spindle and its disc to suit crop conditions. Each spindle and disc pair is designed to rotate in one direction, and must be changed as a set when the crop flow is altered.

Reducing or increasing the number of crop streams will produce the following results:

- Reducing the number of crop streams will result in narrower windrows.
- Increasing the number of crop streams will result in smoother, wider windrows.

**NOTE:**

Increasing the number of crop streams will also increase the number of diverging disc pairs. This may negatively affect the quality of the cutting.

**IMPORTANT:**

- Spindles that rotate clockwise have right-leading threading and are identified by a smooth top on spindle gear shaft (A).
- Spindles that rotate counterclockwise have left-leading threading and are identified by machined grooves on spindle gear shaft (B) and nut (C).
- If the spindle position in the cutterbar has changed, the rotational direction of that spindle **MUST** remain the same (that is, a clockwise spindle must maintain its clockwise rotation).
- Failure to maintain the rotation pattern can result in damage to the spindle and/or to the cutterbar components.
- The shear pin will not perform properly if the spindles used are in the wrong orientation.

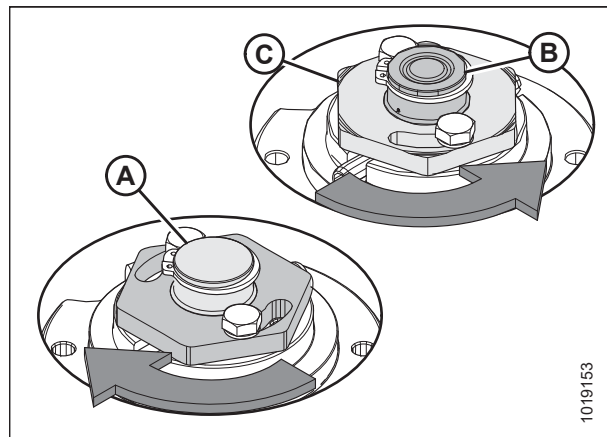
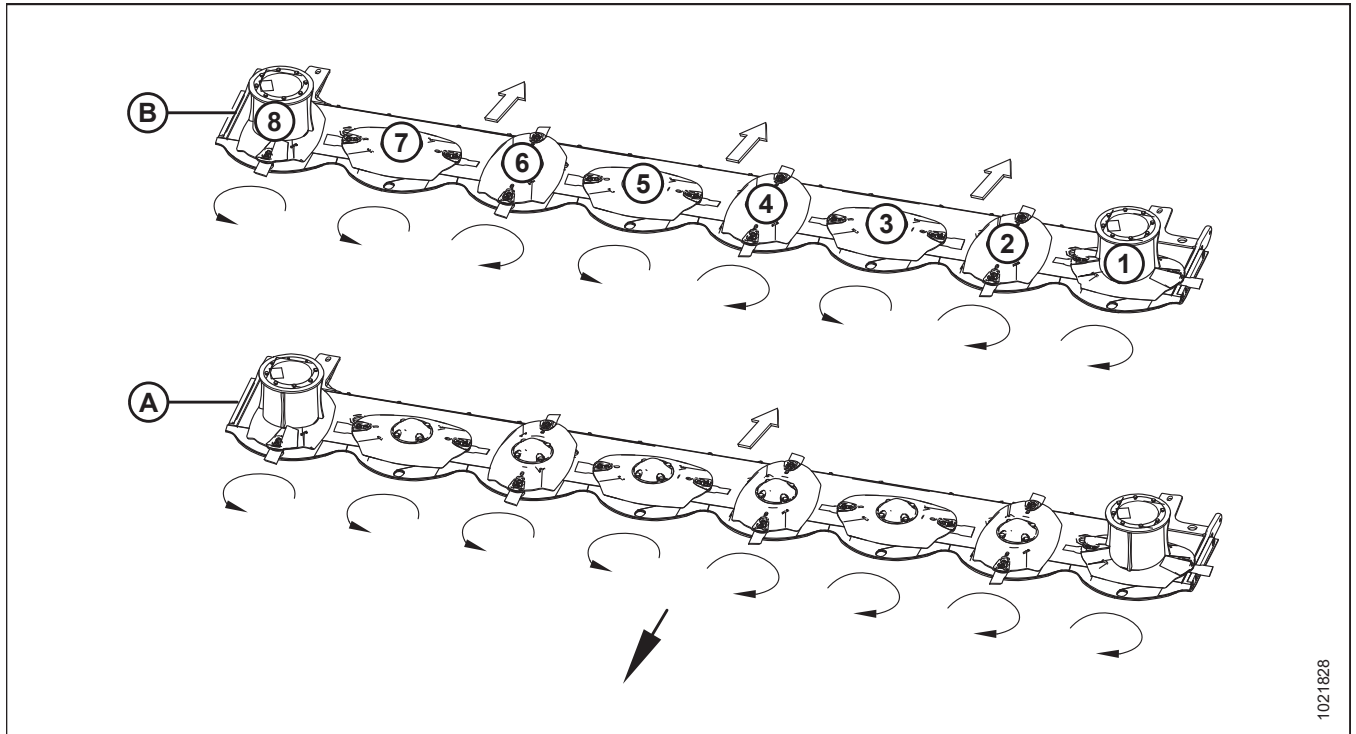


Figure 4.58: Cutterbar Spindles

*Changing Cutterbar Crop Stream Configuration*

Two crop stream settings are possible: one stream and three streams.

**Figure 4.59: Spindle Rotation Pattern and Crop Streams**



A - One Crop Stream

B - Three Crop Streams

**To change the spindle rotation from three crop streams (B) to one crop stream (A):**

- Swap disc/spindle (3) with disc/spindle (6).

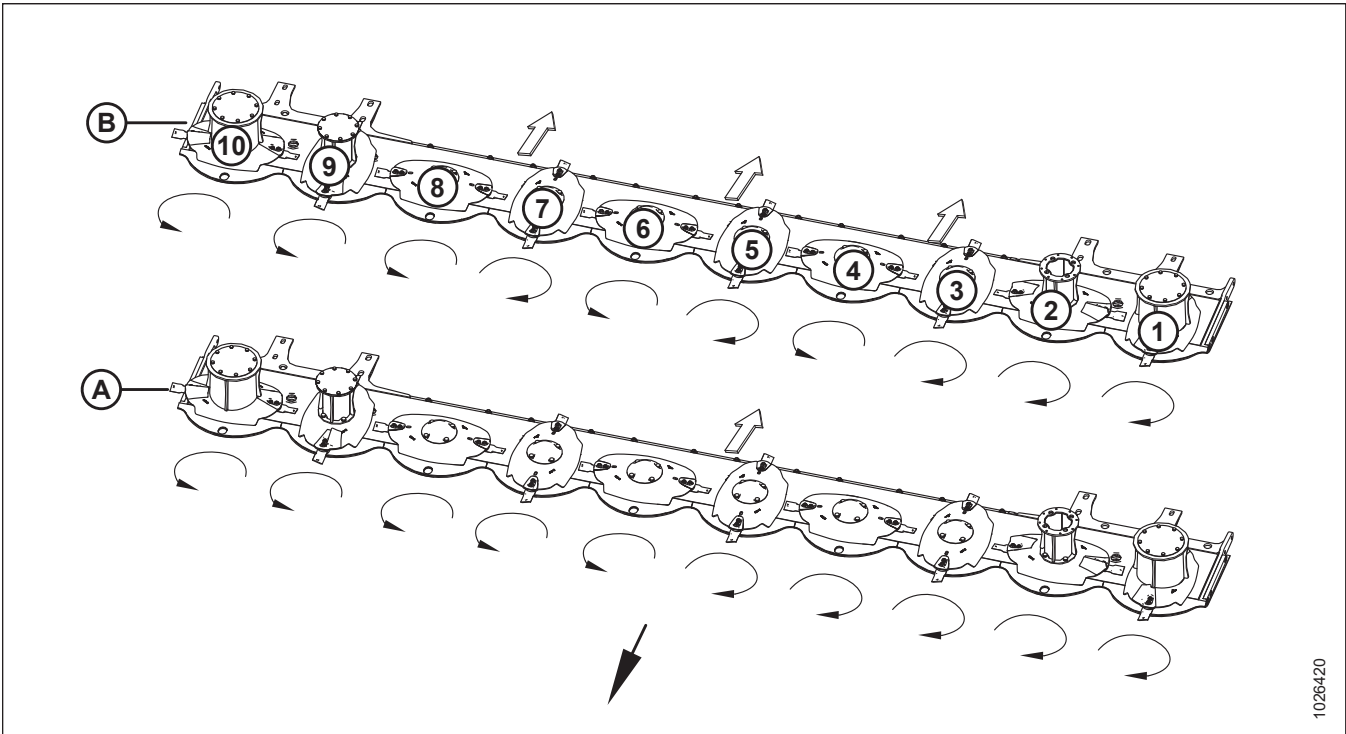
**To change the spindle rotation from one crop stream (A) to three crop streams (B):**

- Swap disc/spindle (6) with disc/spindle (3).

For instructions, refer to [Removing Cutterbar Spindles, page 91](#) and [Installing Cutterbar Spindles, page 93](#).

*Changing Ten Disc Cutterbar Crop Stream Configuration*

Multiple crop stream settings are possible.



**Figure 4.60: Spindle Rotation Pattern and Crop Streams (10 Disc)**

A - One Crop Stream

B - Three Crop Streams

To change (10 disc) spindle rotation from one crop stream (A) to three crop streams (B),

- Swap disc/spindle (7) with disc/spindle (4)

To change (10 disc) spindle rotation from three crop streams (B) to one crop stream (A),

- Swap disc/spindle (4) with disc/spindle (7)

For instructions, refer to *Removing Cutterbar Spindles, page 91* and *Installing Cutterbar Spindles, page 93*.

### 4.4.7 Maintaining Disc Blades

Each disc has two blades attached at opposite ends that are free to rotate horizontally on a specially designed shoulder bolt.

Each blade (A) has two cutting edges and can be flipped over so that the blade does not need replacing as often.

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

**IMPORTANT:**

Always use factory replacement parts.

**NOTE:**

Discs are equipped with 18° bevel-down blades; 11° bevel-down blades are offered as a non-standard option. For more information, refer to the header parts catalog.

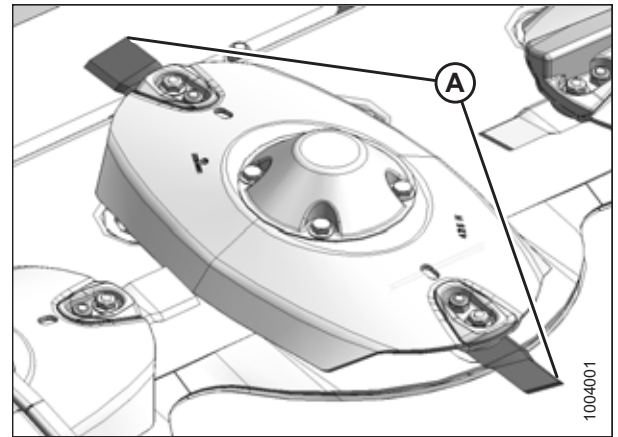


Figure 4.61: Disc Blades

#### *Inspecting Disc Blades*

Inspect the disc blades daily and flip or replace them as needed.

**⚠ DANGER**

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

**⚠ WARNING**

Disc blades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with, or near, blades.

**⚠ WARNING**

Damaged or loose disc blades or blade attachment hardware can be ejected during machine operation and may cause personal injury or machine damage.

**IMPORTANT:**

Damaged blades cut poorly and may damage the cutterbar. Replace damaged blades immediately.

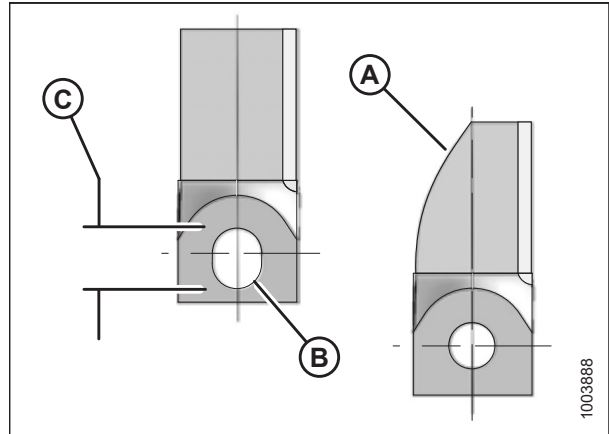
1. Position the rotary disc header at an appropriate height for the task.
2. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).

## MAINTENANCE AND SERVICING

3. On a daily basis, check that the disc blades are securely attached to the disc.
4. Inspect the blades for cracks, blade wear (A), and holes (B), which may have widened beyond safe operating limits (C).
5. Replace any potentially damaged blades immediately.

### IMPORTANT:

Replace blades in pairs so that the disc remains balanced.



**Figure 4.62: Disc Blades**

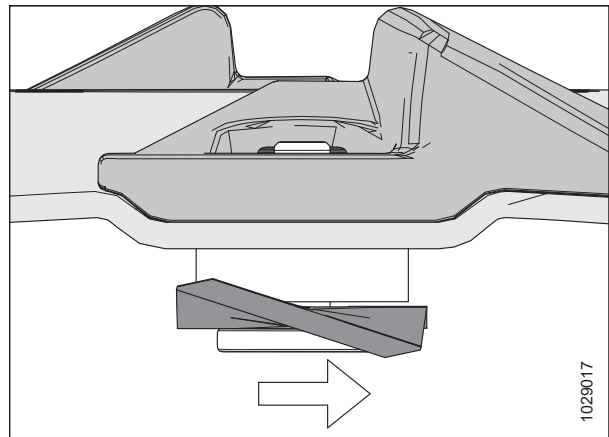
A - Blade Wear to Center Line

B - Elongated Hole

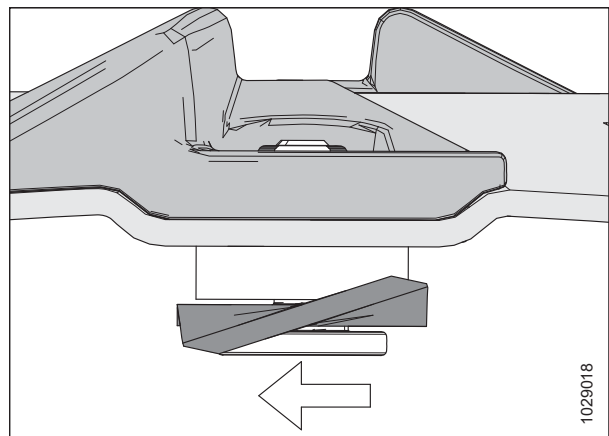
C - Maximum Elongation 21 mm (13/16 in.)

### IMPORTANT:

The disc blades have cutting edges on both sides so that 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 for instructions.



**Figure 4.63: Counterclockwise Disc Rotation**



**Figure 4.64: Clockwise Disc Rotation**



### *Inspecting Disc Blade Hardware*

Inspect the blade attachment hardware each time the blades are changed.

 **DANGER**

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

 **WARNING**

Disc blades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with, or near, blades.

 **WARNING**

Damaged or loose disc blades or blade attachment hardware can be ejected during machine operation and may cause personal injury or machine damage.

For hardware replacement instructions, refer to *Removing Disc Blades, page 107* and *Installing Disc Blades, page 108*.

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

## MAINTENANCE AND SERVICING

2. When inspecting the blades, check each blade-attachment bolt and replace it if:

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

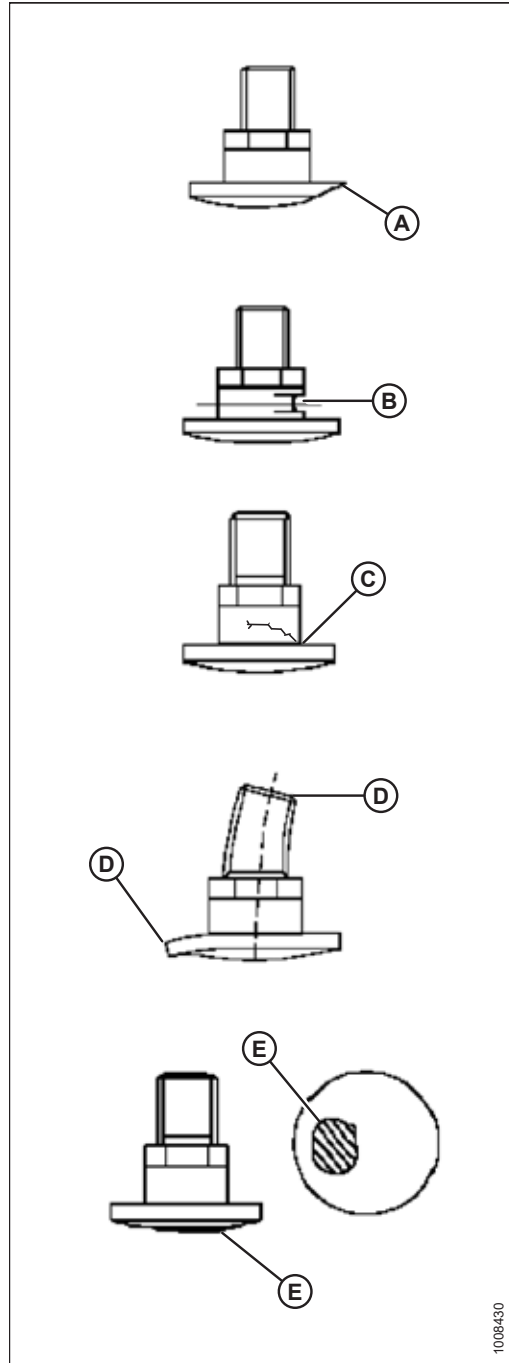


Figure 4.65: Disc Blade Bolts

## MAINTENANCE AND SERVICING

3. Check the nuts holding the disc blades. Replace the nuts if:
  - The nut has been previously installed; nuts are one-time-use items only.
  - The nut shows signs of wear (A) such that the nut has lost more than half the original height (B) in one or more areas.
  - The nut is cracked.

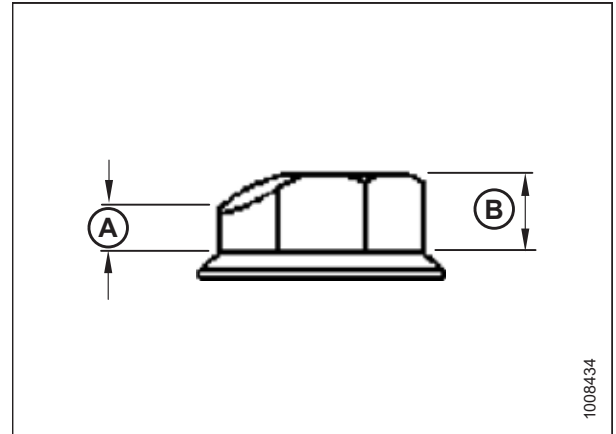


Figure 4.66: Disc Blade Nut

### Removing Disc Blades

Use new nuts whenever you are replacing or flipping disc blades.

#### DANGER

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

#### DANGER

Ensure that all bystanders have cleared the area.

#### WARNING

Disc blades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with, or near, blades.

1. Position the rotary disc header at an appropriate height for the task.
2. Shut down the engine, and remove the key from the ignition.
3. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).

## MAINTENANCE AND SERVICING

4. Rotate disc (A) so blade (B) faces forward and lines up with hole (C) in the rock guard.

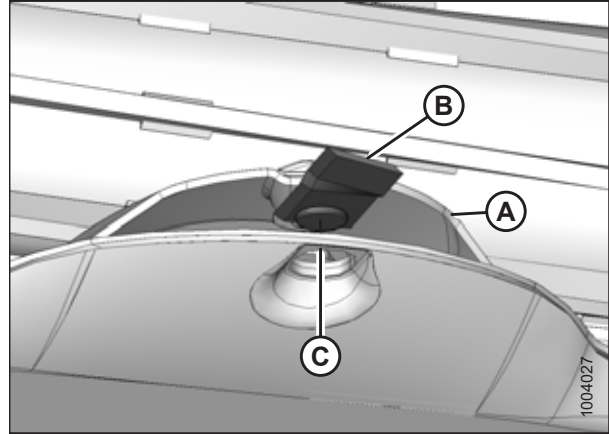


Figure 4.67: Disc Blade Aligned with Hole in Rock Guard

5. To prevent the disc from rotating while loosening the blade bolts, place a pin (or equivalent) in the front hole of the rock guard.
6. Clean debris from the blade attachment area.
7. Remove and discard nut (A).

### IMPORTANT:

Nuts are one-time use items. When flipping or replacing a blade, use a **NEW** nut.

8. Remove shoulder bolt (B) and blade (C).

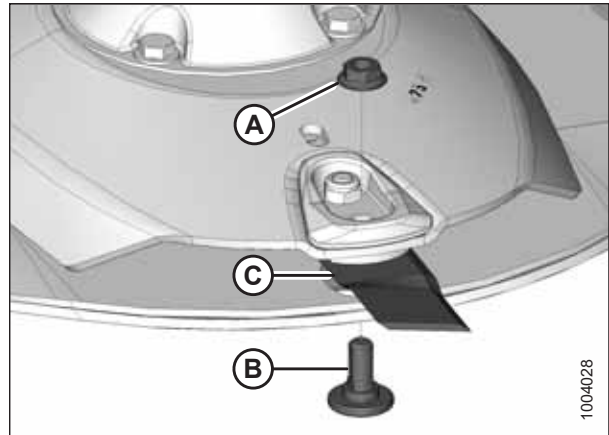


Figure 4.68: Disc Blade

### Installing Disc Blades

Check the disc blade hardware for damage while you are installing the disc blades.

### DANGER

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

### DANGER

Ensure that all bystanders have cleared the area.

### WARNING

Disc blades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with, or near, blades.

### IMPORTANT:

If you are unsure in which direction the spindles rotate, refer to [4.4.6 Reconfiguring Cutterbar Crop Stream, page 100](#).

## MAINTENANCE AND SERVICING

1. Position the rotary disc header at an appropriate height for the task.
2. Shut down the engine, and remove the key from the ignition.
3. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
4. To prevent the disc from rotating while you are tightening the blade bolts, place a pin (or equivalent) in the front hole of the rock guard.
5. Install new or reversed blade (A) with shoulder bolt (B) onto disc (C).
6. Install new nut (D) and torque it to 125 Nm (92 lbf·ft).

### IMPORTANT:

Nuts are one-time use items. When flipping or replacing a blade, use a **NEW** nut.

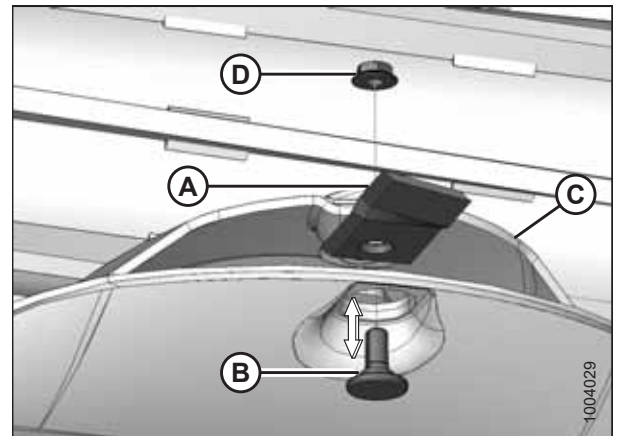


Figure 4.69: Disc Blade

### WARNING

Ensure that the cutterbar is completely clear of foreign objects. Foreign objects can be ejected with considerable force when the machine is started, which can result in serious injury or cause damage to the machine.

7. Close the cutterbar doors. For instructions, refer to [3.4.2 Closing Cutterbar Doors, page 21](#).

## 4.4.8 Maintaining Quick Change Blade System – Option

The following topics outline maintenance procedures for the optional Quick Change Blade (QCB) system.

### *Inspecting Retaining Bolts*

Check the thickness of the retaining bolts and the quick change plate using the supplied gauge.

### DANGER

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

### DANGER

Ensure that all bystanders have cleared the area.

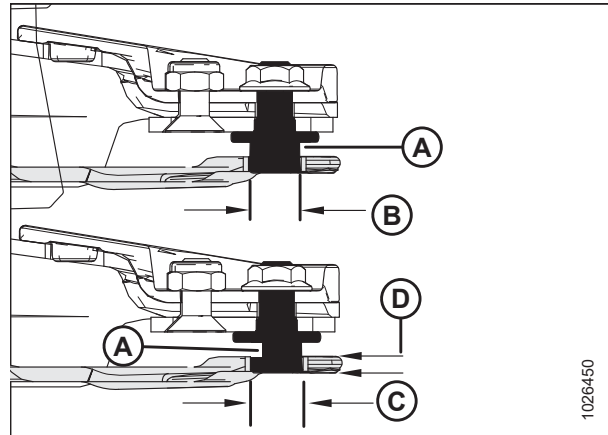
**WARNING**

Disc blades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with, or near, blades.

**DANGER**

To avoid serious injuries or death due to insufficient thickness of material on the retaining bolts, check the thickness (A) of the retaining bolts every time a blade is changed. Damaged or worn retaining bolts must always be replaced in pairs at each cutting disc.

- Material thickness of retaining bolts (A) must **NOT** be less than 14 mm (9/16 in.) (C) at the narrowest point.
- Material thickness at the quick change plate must **NOT** be less than 3 mm (1/8 in.) (D) at the narrowest point.



**Figure 4.70: Retaining Bolt and Quick Change Plate**

- |                      |                       |
|----------------------|-----------------------|
| A - Retaining Bolt   | B - 17 mm (11/16 in.) |
| C - 14 mm (9/16 in.) | D - 3 mm (1/8 in.)    |

1. Position the rotary disc header at an appropriate height for the task.
2. Shut down the engine, and remove the key from the ignition.
3. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).

4. Remove hairpin clip (A).
5. Remove pin (B).
6. Remove change tool (C).

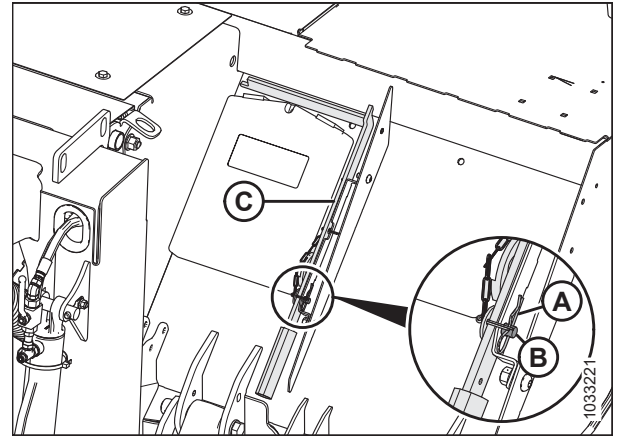


Figure 4.71: Installing Quick Change Blade

7. Remove gauge (A) on change tool (B).

**NOTE:**

Section (C) of the gauge is used to check the material thickness of the retaining bolts; section (D) of the gauge is used to check the outer radius of the quick change plate.

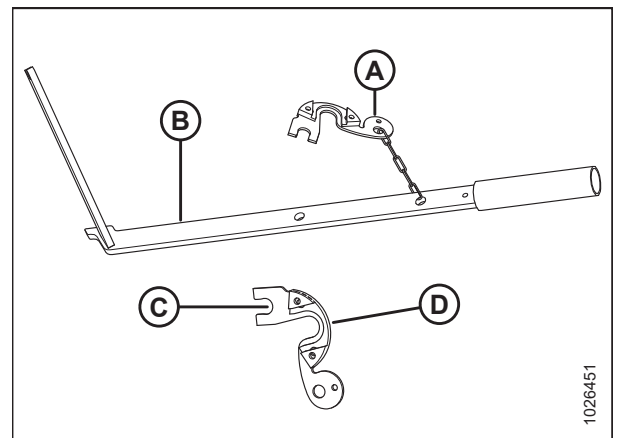


Figure 4.72: Change Tool and Gauge

8. Thoroughly clean the area around and between the retaining bolts and the quick change plate.
9. Remove the blade. For instructions, refer [Replacing Quick Change Blades, page 114](#).
10. Place gauge (A) over the retaining bolt and rotate 90°.
  - If it is **NOT** possible to slide the gauge over the retaining bolt during the rotation, then the retaining bolt is still in working order.
  - If it **IS** possible to slide the gauge over the retaining bolt during rotation, then the retaining bolt must be replaced immediately.

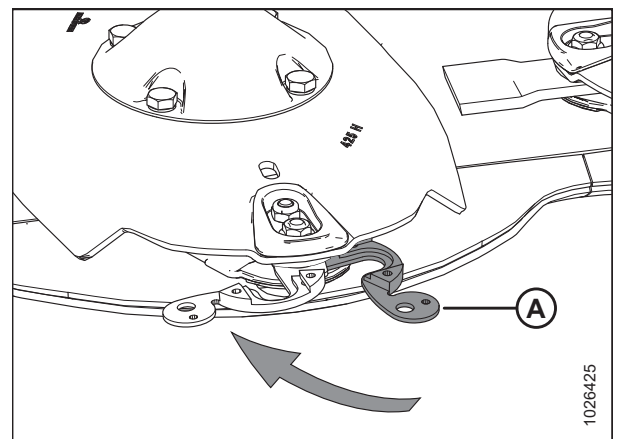


Figure 4.73: Checking Retaining Bolts

### Inspecting Quick Change Plates

Check the thickness of the retaining bolts and the quick change plate using the supplied gauge.

#### DANGER

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

#### DANGER

Ensure that all bystanders have cleared the area.

#### WARNING

Disc blades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with, or near, blades.

#### DANGER

To avoid serious injury or death due to worn quick change plate, check the plates for damage before and after each use. The wear limit of the quick change plate is reached when the application seam is worn away at one point. The wear limit must be checked with a gauge.

1. Position the rotary disc header at an appropriate height for the task.
2. Shut down the engine, and remove the key from the ignition.
3. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders](#), page 17.
4. Remove hairpin clip (A).
5. Remove pin (B).
6. Remove change tool (C).

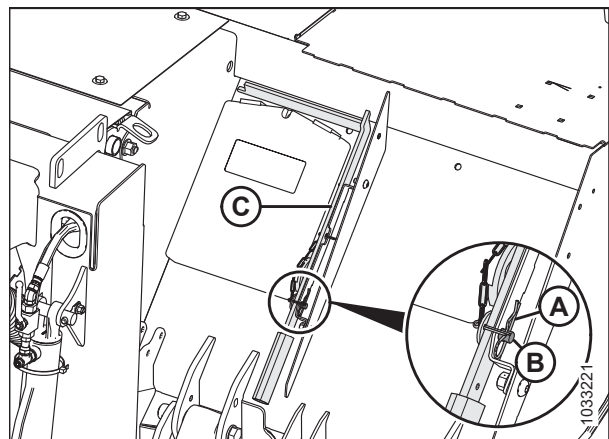


Figure 4.74: Installing Quick Change Blade



## MAINTENANCE AND SERVICING

7. Remove gauge (A) from change tool (B).

**NOTE:**

Section (C) of the gauge is used to check the material thickness of the retaining bolts; section (D) of the gauge is used to check the outer radius of the quick change plate.

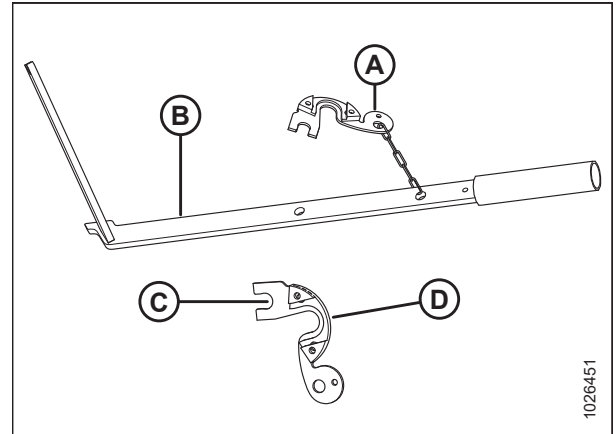


Figure 4.75: Change Tool and Gauge

8. Thoroughly clean the area around and between the retaining bolt and the quick change plate.
9. Place gauge (A) against the retaining bolt of the quick change plate (B) as far as it will go.

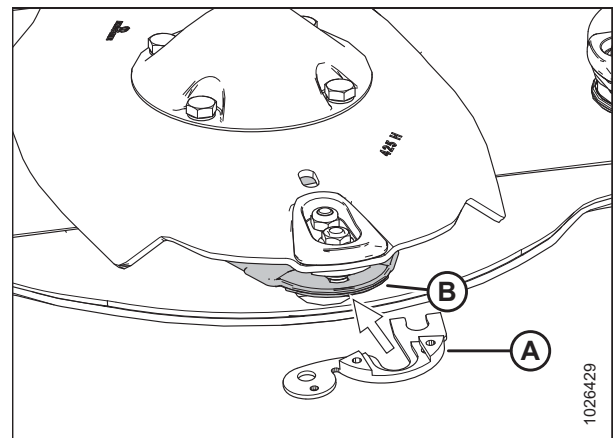


Figure 4.76: Gauge and Quick Change Plate

- If the outer radius of quick change plate (B) aligns with or is outside the outer radius of gauge (A), the quick change plate has not yet reached its wear limit.
- If the outer radius of the quick change plate (B) does **NOT** align with the outer radius of gauge (A), the quick change plate must be replaced.

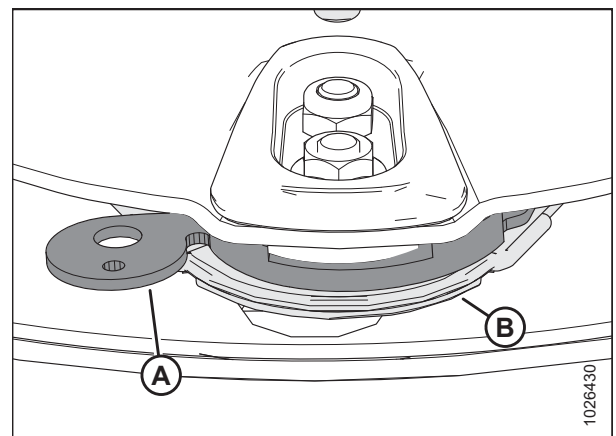


Figure 4.77: Gauge and Change Plate Aligned

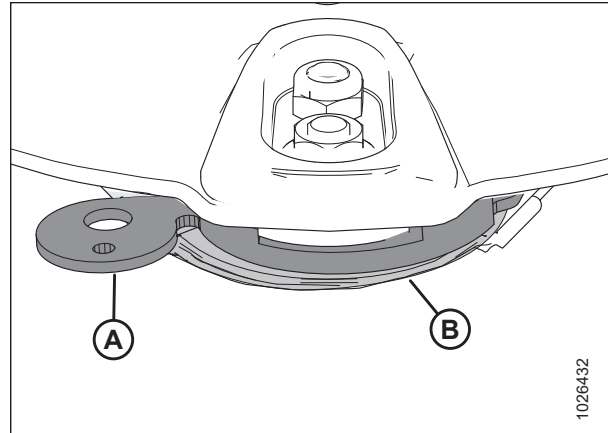


Figure 4.78: Gauge and Change Plate Unaligned

### Replacing Quick Change Blades

If the optional quick change blade kit is installed, replace blades as required.

#### **⚠ DANGER**

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

#### **⚠ DANGER**

Ensure that all bystanders have cleared the area.

#### **⚠ WARNING**

Disc blades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with, or near, blades.

#### **⚠ WARNING**

Firmly hold the blade change tool when changing disc blades. Failing to do so can result in the blade change tool releasing its spring tension, which can result in injury.

1. Position the rotary disc header at an appropriate height for the task.
2. Shut down the engine, and remove the key from the ignition.
3. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).

## MAINTENANCE AND SERVICING

4. Remove hairpin clip (A).
5. Remove pin (B).
6. Remove blade change tool (C) from the storage location.
7. Open the cutterbar doors. For instructions, refer to [3.4.1 Opening Cutterbar Doors, page 21](#).

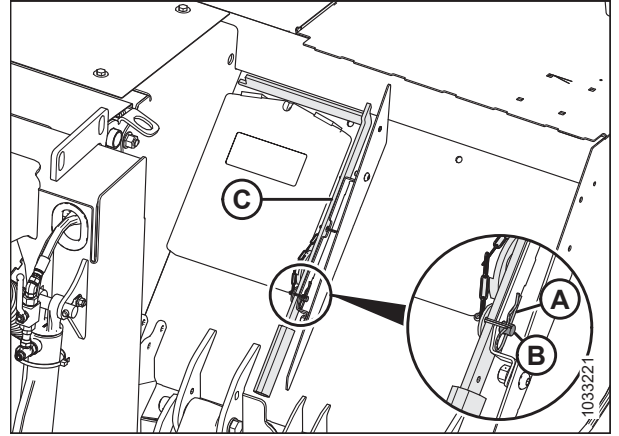


Figure 4.79: Blade Change Tool Storage Location

8. Slide the flat bar on quick blade change tool (A) between disc (B) and quick change plate (C) from the side.

**NOTE:**

If required, remove any material that has collected between quick change plate (C) and the rock guard.

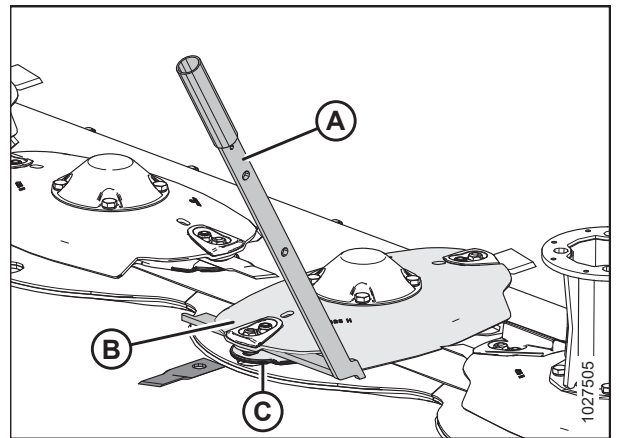


Figure 4.80: Blade Change Tool

**IMPORTANT:**

Check that the flat bar on blade change tool (A) is touching on both sides of the disc at location (B).

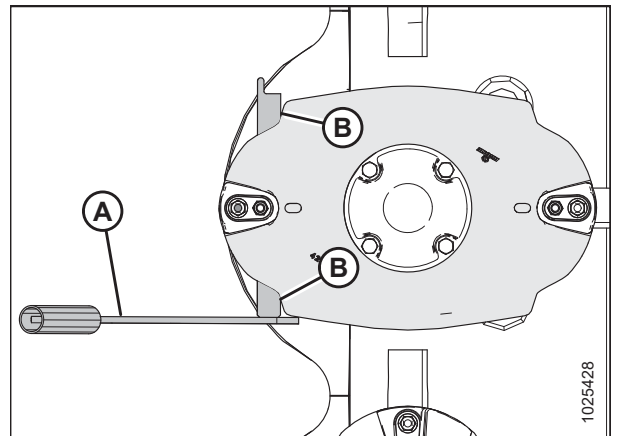


Figure 4.81: Correct Positioning of Blade Change Tool

## MAINTENANCE AND SERVICING

9. Pull down on blade change tool (A), separate disc (B) from quick change plate (C), and remove old blade (D) from blade bolt (E). Push blade change tool (A) upward to return quick change plate (C) to the closed position.
10. Pull down on blade change tool (A) and separate disc (B) from quick change plate (C). Insert new blade (D) on blade bolt (E).
11. Push blade change tool (A) upward, enclosing new blade (D) in the disc assembly.
12. Return the blade change tool to the storage location.

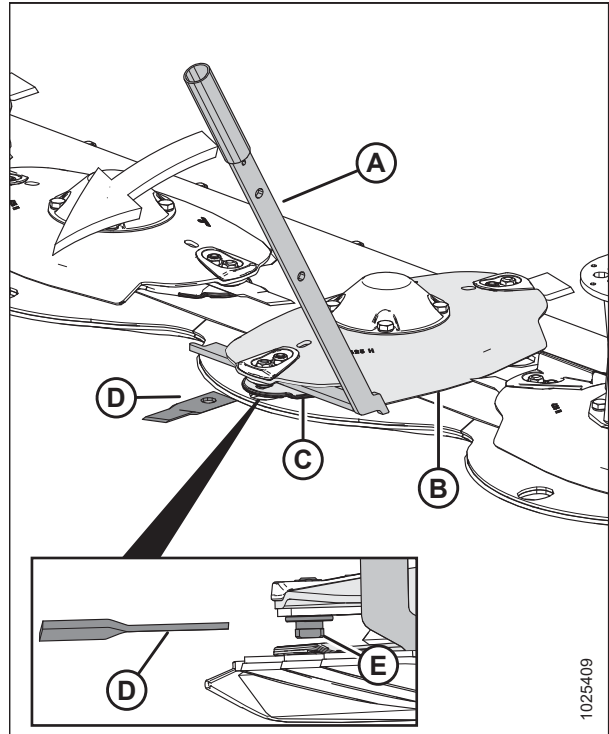


Figure 4.82: Installing Quick Change Blade

### 4.4.9 Accelerators

Accelerators are mounted on each outboard disc and are designed to quickly move cut material off the disc and into the conditioner.

Two pairs of accelerators are installed on an 8-disc cutterbar. There is one pair of accelerators (A) on the outboard disc at each end of the cutterbar.

Periodically inspect the accelerators for damage and loose or missing fasteners. Replace damaged components as necessary.

#### **IMPORTANT:**

Always replace accelerators in pairs to ensure that the discs remain balanced.

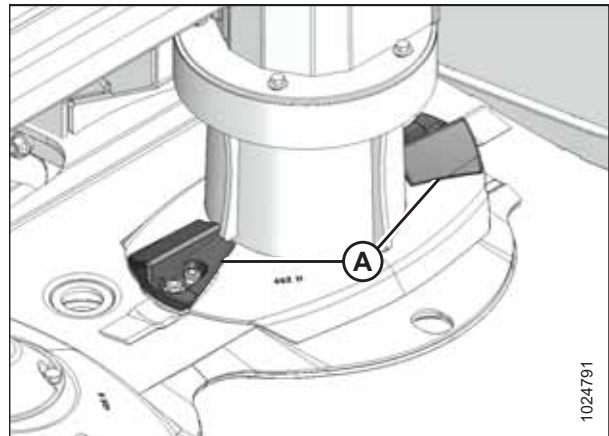


Figure 4.83: Eight Disc Cutterbar Accelerators

#### *Inspecting Accelerators*

Inspect the accelerators regularly to ensure that they are in good condition and can effectively move crop off the disc and into the conditioner.

#### **⚠ DANGER**

Ensure that all bystanders have cleared the area.

**⚠ DANGER**

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

**⚠ WARNING**

Disc blades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with, or near, blades.

1. Position the rotary disc header at an appropriate height for the task.
2. Shut down the engine, and remove the key from the ignition.
3. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
4. Open the cutterbar doors. For instructions, refer to [3.4.1 Opening Cutterbar Doors, page 21](#).
5. Inspect accelerators (A) for damage and wear. Replace the accelerators if they are worn to 50% or more of their original height or if they no longer effectively move crop.
 

**IMPORTANT:**  
Always replace accelerators in pairs to ensure that the discs remain balanced.

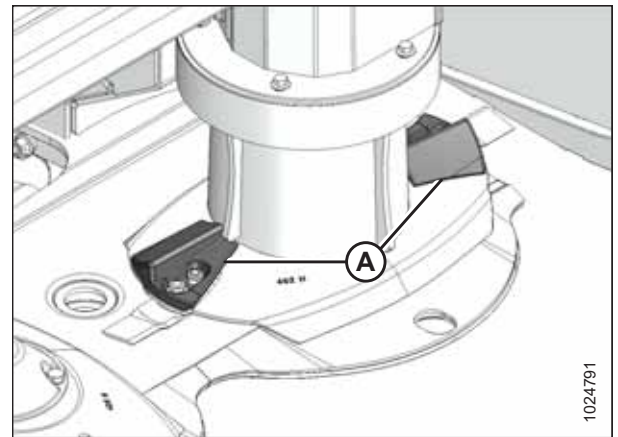


Figure 4.84: Eight Disc Cutterbar Accelerators

*Removing Accelerators*

Remove the accelerators when they are damaged or when they can no longer effectively move crop from the discs to the conditioner.

**⚠ DANGER**

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

**⚠ DANGER**

Ensure that all bystanders have cleared the area.

**⚠ WARNING**

Disc blades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with, or near, blades.

**IMPORTANT:**

Always replace accelerators in pairs to ensure that the discs remain balanced.

1. Position the rotary disc header at an appropriate height for the task.
2. Shut down the engine, and remove the key from the ignition.
3. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
4. Open the cutterbar doors. For instructions, refer to [3.4.1 Opening Cutterbar Doors, page 21](#).
5. Remove nut (A), flange bolt (B), and disc blade (C) from the disc. Discard the nut.

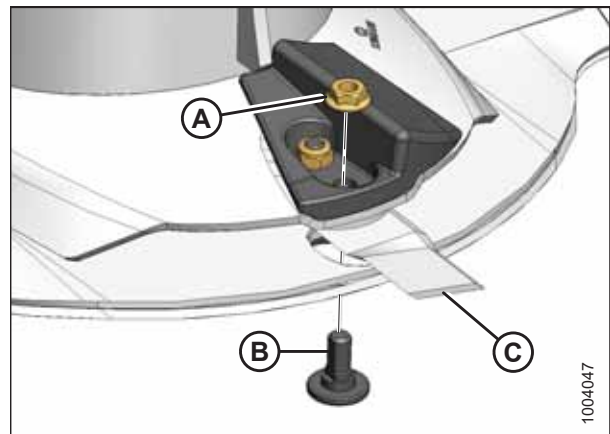


Figure 4.85: Accelerator Removal

## MAINTENANCE AND SERVICING

6. Remove lock nut (A), accelerator (B), blade holder (C), and hex-socket bolt (D).
7. Repeat Steps 5, [page 118](#) and 6, [page 119](#) to remove the second accelerator.

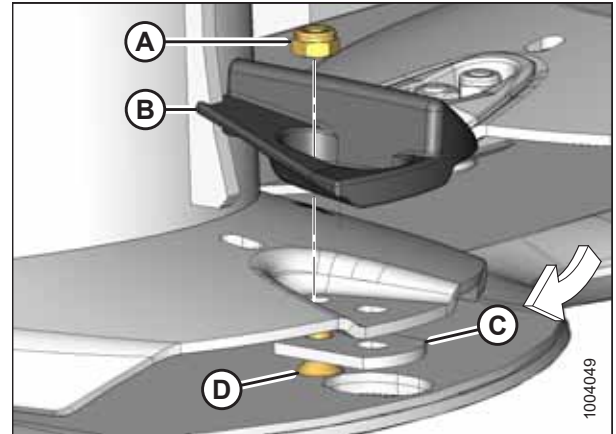


Figure 4.86: Accelerator Removal

### *Installing Accelerators*

A new pair of accelerators should be installed when the old ones can no longer effectively move crop off the disc and into the conditioner.

#### **DANGER**

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

#### **WARNING**

Disc blades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with, or near, blades.

#### **IMPORTANT:**

Always replace accelerators in pairs to ensure that the discs remain balanced.

1. Position the rotary disc header at an appropriate height for the task.
2. Shut down the engine, and remove the key from the ignition.
3. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).

## MAINTENANCE AND SERVICING

- To prevent the cutterbar discs from rotating while you are tightening the blade bolts, place a wooden block between the two discs.

### IMPORTANT:

Accelerators are unidirectional: both clockwise and counterclockwise accelerators are used on the cutterbar. Verify the direction of the disc before installing any accelerators. If you are unsure in which direction the spindle rotates, refer to [4.4.5 Replacing Cutterbar Spindles](#), [page 90](#).

- Install lock nut (A), accelerator (B), blade holder (C), and hex-socket bolt (D). Do **NOT** tighten the hardware yet.
- Install new nut (A), flange bolt (B), and disc blade (C) onto the disc.
- Torque inside nut (A) to 58 Nm (43 lbf-ft).
- Torque outside nut (B) (closest to the blade) to 125 Nm (92 lbf-ft).
- Repeat Steps [4, page 120](#) to [8, page 120](#) to replace the second accelerator.

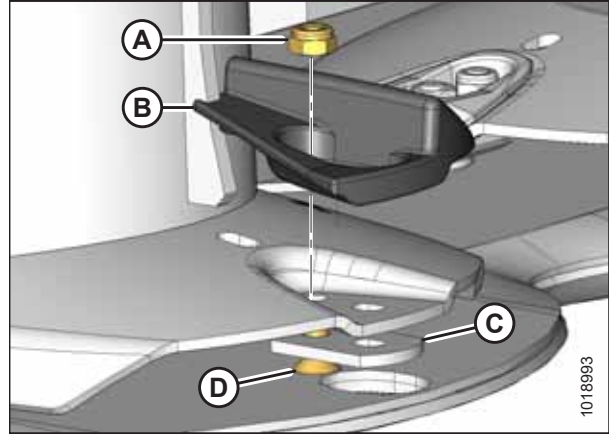


Figure 4.87: Accelerator Installation

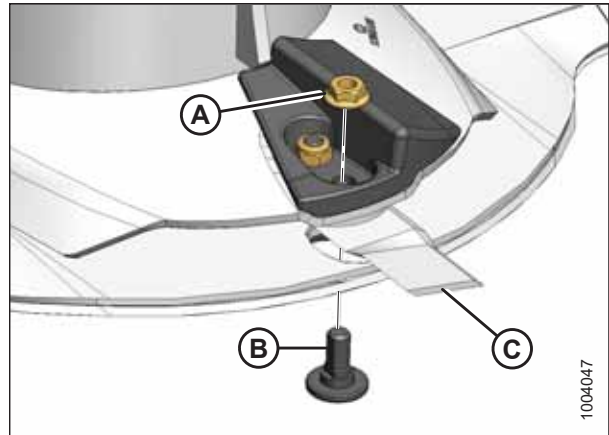


Figure 4.88: Accelerator Installation

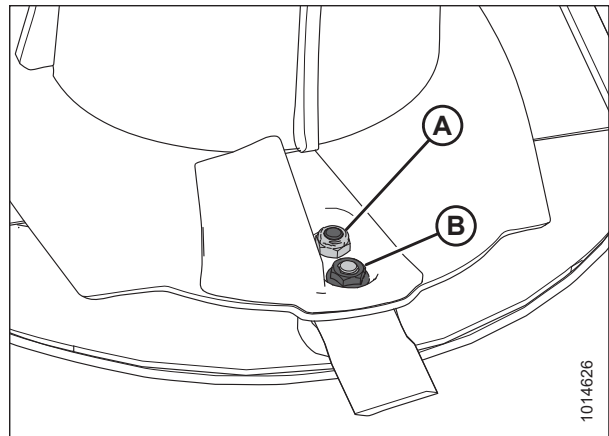


Figure 4.89: Accelerator Installation



 **WARNING**

Ensure that the cutterbar is completely clear of foreign objects. Foreign objects can be ejected with considerable force when the machine is started, which can result in serious injury or cause damage to the machine.

10. Remove the wooden block from between the cutterbar discs.
11. Close the cutterbar doors. For instructions, refer to [3.4.2 Closing Cutterbar Doors, page 21](#).

#### 4.4.10 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 into contact with stones and other debris. Periodically inspect the rock guards for damage and replace them as necessary.

##### *Inspecting Rock Guards*

Rock guards protect the cutting blades from damage. Inspect them periodically to ensure that they are not damaged or worn out.

 **DANGER**

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

 **WARNING**

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

1. Position the rotary disc header at an appropriate height for the task.
2. Shut down the engine, and remove the key from the ignition.
3. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).

## MAINTENANCE AND SERVICING

4. Inspect the rock guards for damage. Replace any rock guard if it has been worn down to 75% or less of its original thickness.

### NOTE:

The factory thickness of the rock guards is 5 mm (0.2 in.).

5. Check the guards for loose or missing fasteners. Tighten or replace the fasteners as needed.

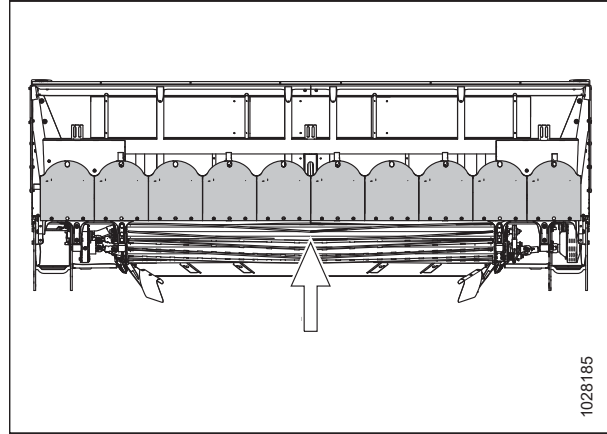


Figure 4.90: Rock Guards

### Removing Inboard Rock Guards

Remove any damaged or worn rock guards to maximize the life of the cutting blades.

#### DANGER

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

#### WARNING

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

1. Position the rotary disc header at an appropriate height for the task.
2. Shut down the engine, and remove the key from the ignition.
3. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).

- Remove two hex head screws, washers, and lock nuts (A).

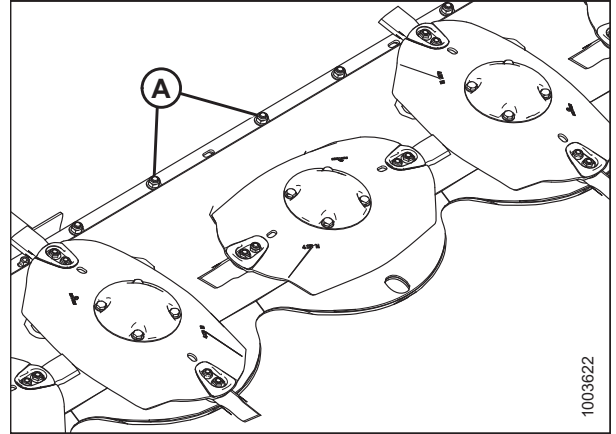


Figure 4.91: Inboard Rock Guards

- Slide inboard rock guard (A) forward (in the direction of arrow [B]) and remove it.

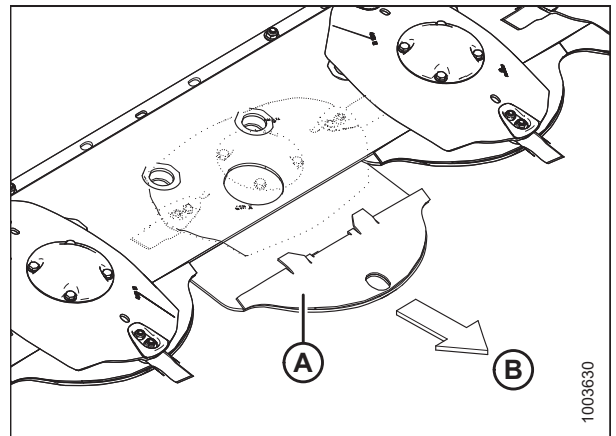


Figure 4.92: Inboard Rock Guards

### *Installing Inboard Rock Guards*

When installing an inboard rock guard, ensure that the nuts securing the rock guards are installed on top of the cutterbar.

#### **⚠ DANGER**

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

#### **⚠ WARNING**

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

- Position the rotary disc header at an appropriate height for the task.
- Shut down the engine, and remove the key from the ignition.

## MAINTENANCE AND SERVICING

3. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
4. Guide the inboard rock guard onto the cutterbar until tabs (A) sit on top of the cutterbar, and the bottom back bolt holes in the rock guard line up with the holes in the cutterbar.

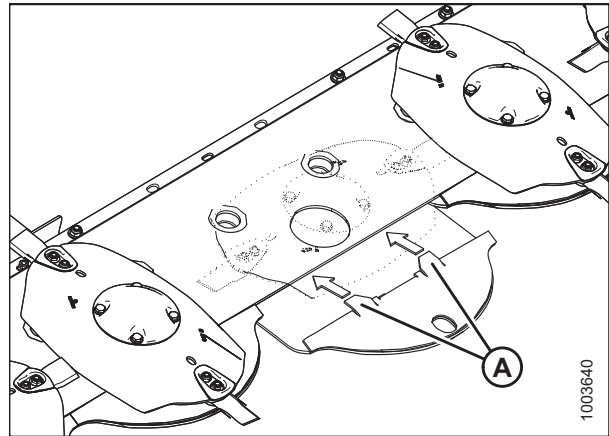


Figure 4.93: Inboard Rock Guards

5. Install two hex head screws, washers, and lock nuts (A). Torque the hardware to 68 Nm (50 lbf-ft).

**NOTE:**

Lock nuts (A) must be installed on top of the cutterbar.

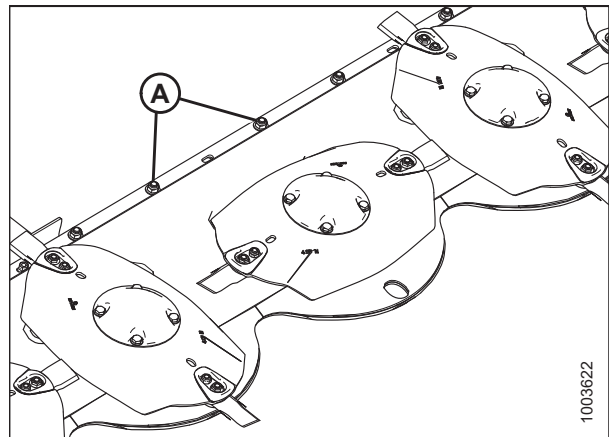


Figure 4.94: Inboard Rock Guards

### Removing Outboard Rock Guards

The outboard rock guards are secured to the cutterbar with more hardware than the inboard rock guards.

### DANGER

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

**WARNING**

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

1. Position the rotary disc header at an appropriate height for the task.
2. Shut down the engine, and remove the key from the ignition.
3. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
4. Locate rock guard (B) under the outboard end of the cutterbar. There is one guard on each end of the cutterbar.
5. Remove two hex head screws (A).
6. Remove washers and lock nuts (C) securing rock guard (B) to the cutterbar assembly.

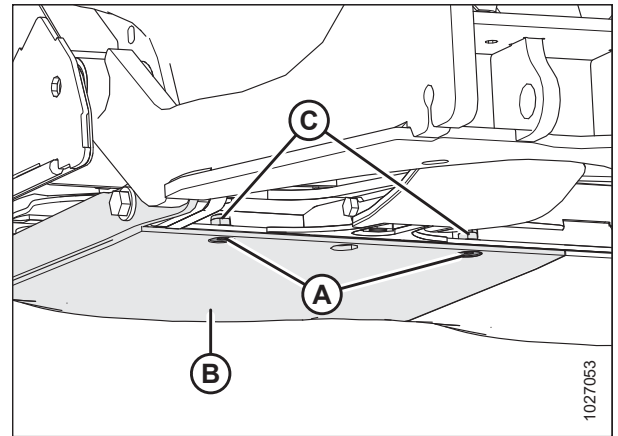


Figure 4.95: Left Outboard Rock Guard – Rear View

7. Remove bolt and washers (A).
8. Loosen bolt (B).
9. Remove rock guard (C) by sliding it forward.
10. Repeat Step [4, page 125](#) to Step [9, page 125](#) on the opposite side of the cutterbar.

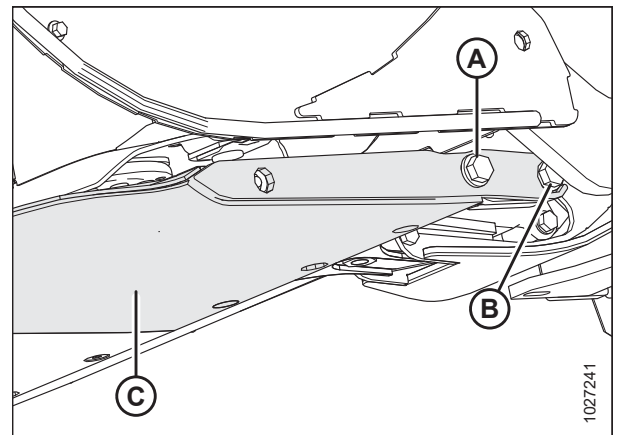


Figure 4.96: Left Outboard Rock Guard – Side View

### Installing Outboard Rock Guards

Use a rubber mallet to properly install the outboard rock guard.

#### DANGER

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

#### WARNING

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

1. Position the rotary disc header at an appropriate height for the task.
2. Shut down the engine, and remove the key from the ignition.
3. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
4. Remove any debris on the cutterbar which could obstruct the installation of the outboard rock guard.
5. Apply medium-strength threadlocker (Loctite® 242 or equivalent) to bolt (B).

**NOTE:**

Some parts have been removed from the illustration for clarity.

6. With a single washer, install bolt (B) onto the cutterbar.
7. Angle rock guard (A) outward as shown. Align the slot in the side plate between the washer and the cutterbar on rear M16 bolt (B).
8. Rotate the rock guard toward the center of the header until the tabs on the front of the rock guard are supported by the cutterbar.

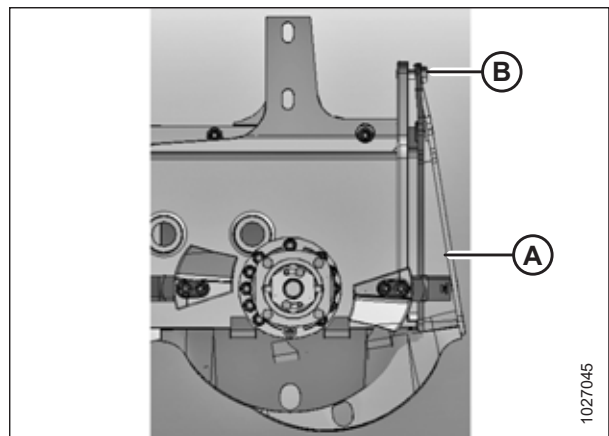


Figure 4.97: Left Outboard Rock Guard – Angled

## MAINTENANCE AND SERVICING

- Using a rubber mallet, tap rock guard (A) so that it is parallel and flush against cutterbar (B).

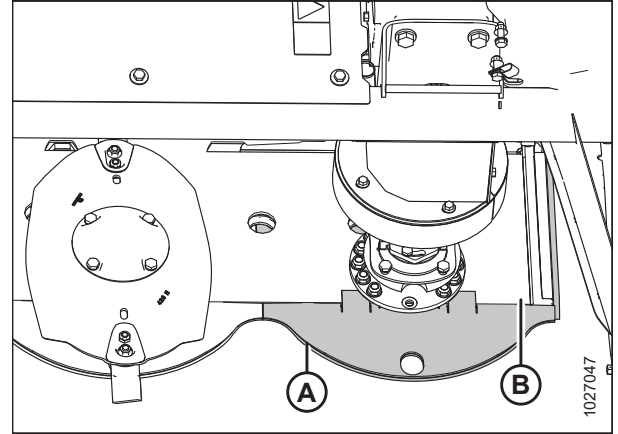


Figure 4.98: Outboard Rock Guard

- Ensure that rock guards (B) and (C) are parallel. Gap (A) should be 5–7 mm (3/16–1/4 in.).

**NOTE:**

You may need to loosen the next one or two rock guards to adjust gap (A).

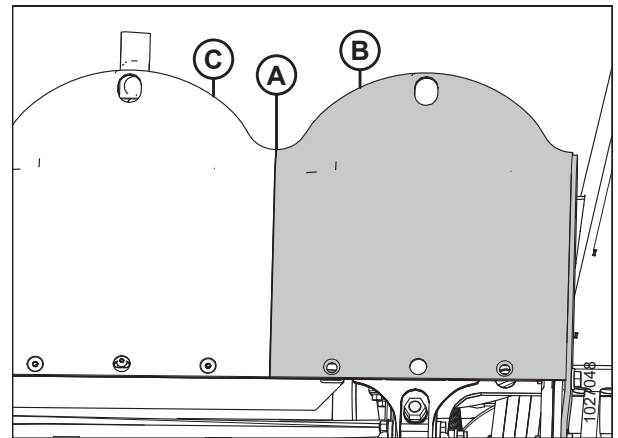


Figure 4.99: Outboard Rock Guard Installed

- Apply medium-strength threadlocker (Loctite® 242 or equivalent) on two hex head screws (C). Loosely install the screws with lock nuts.
- Install M16 x 60 bolt (A) and one washer (B) as shown. Torque bolts (A) and (D) to 251 Nm (185 lbf-ft).
- Torque screws (C) to 54 Nm (40 lbf-ft).

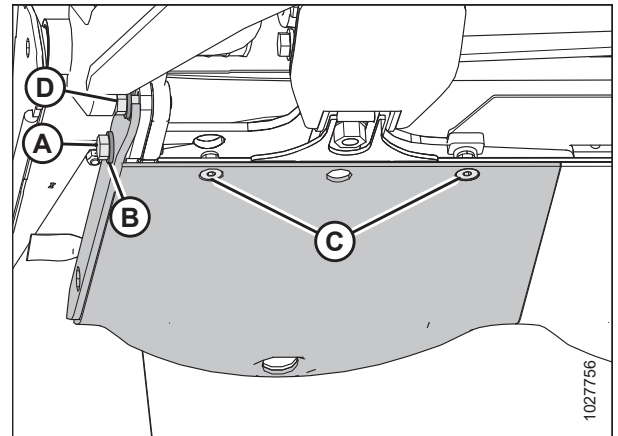


Figure 4.100: Left Outboard Rock Guard – Rear View

#### 4.4.11 Maintaining Small Drums – Ten Disc Cutterbar

Drums deliver cut material from the ends of the cutterbar and help maintain an even crop flow into the conditioner. The small drums are found on the 10 disc cutterbar are attached to the two discs inboard of the large drums.

Inboard drums (B) and (C) are approximately 73 mm (2 3/8 in.) smaller in diameter than outboard drums (A).

**IMPORTANT:**

Measure the size of the drums to determine if small or large drums are installed on your rotary disc header. The diameter of the large drum is 250 mm (9 7/8 in.). The diameter of the small drum is 187 mm (7 3/8 in.). If your rotary disc header has large drums, refer to *4.4.12 Maintaining Large Drums, page 139*.

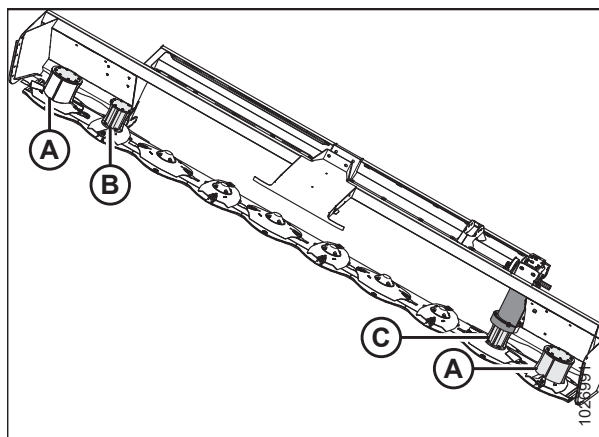


Figure 4.101: Ten Disc Cutterbar

A - Large Drums

B - Small Non-Driven Drum

C - Small Driven Drum

#### *Inspecting Small Drums – Ten Disc Cutterbar*

Inspect the drums daily for signs of damage or wear.

**! DANGER**

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator’s seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

**! DANGER**

Ensure that all bystanders have cleared the area.

**! WARNING**

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

1. Position the rotary disc header at an appropriate height for the task.
2. Shut down the engine, and remove the key from the ignition.
3. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to *3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17*.

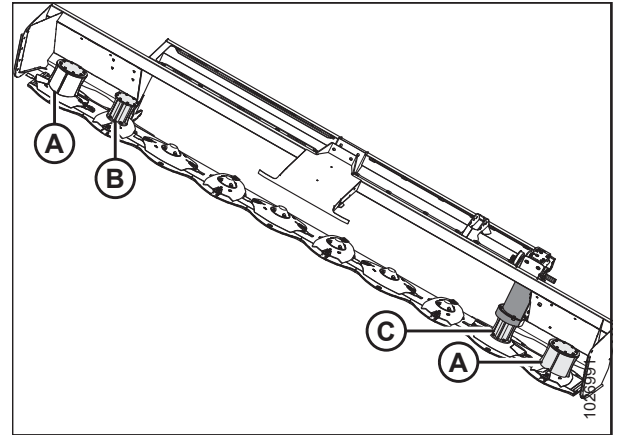


## MAINTENANCE AND SERVICING

4. Open the cutterbar doors. For instructions, refer to [3.4.1 Opening Cutterbar Doors, page 21](#).
5. Inspect small drums (B) and (C) for damage and wear. Replace the drums if they are worn at the center to 50% or less of their original thickness. Do **NOT** repair damaged drums; they must be replaced.
6. Examine drums (B) and (C) for large dents. Replace any dented drums to ensure that the cutterbar remains balanced.
7. Tighten or replace any loose or missing fasteners.

### **WARNING**

Ensure that the cutterbar is completely clear of foreign objects. Foreign objects can be ejected with considerable force when the machine is started, which can result in serious injury or cause damage to the machine.

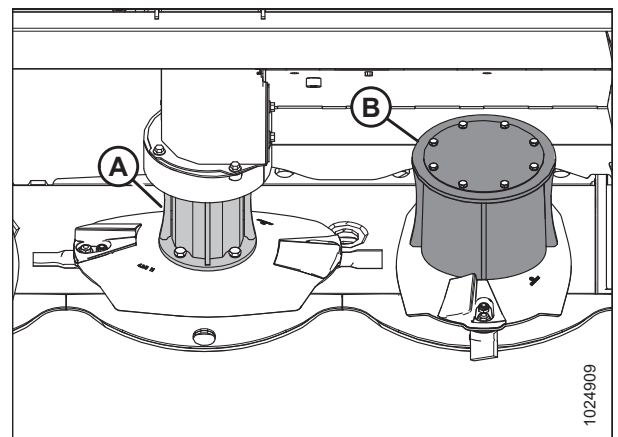


**Figure 4.102: Cutterbar**

A - Large Non-Driven Drums

B - Small Non-Driven Drum

C - Small Driven Drum



**Figure 4.103: Ten Disc Cutterbar Drums**

A - Small Driven Drum

B - Large Non-Driven Drum

8. Close the cutterbar doors. For instructions, refer to [3.4.2 Closing Cutterbar Doors, page 21](#).

### *Removing Small Driven Drum and Driveline – Ten Disc Cutterbar*

The small driven drum is the second drum from the end on the left side of the cutterbar.

### **DANGER**

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

### **DANGER**

Ensure that all bystanders have cleared the area.

**WARNING**

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

1. Position the rotary disc header at an appropriate height for the task.
2. Shut down the engine, and remove the key from the ignition.
3. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
4. Open the cutterbar doors. For instructions, refer to [3.4.1 Opening Cutterbar Doors, page 21](#).
5. Remove four M10 hex flange head bolts (A) and remove vertical driveshield (B).

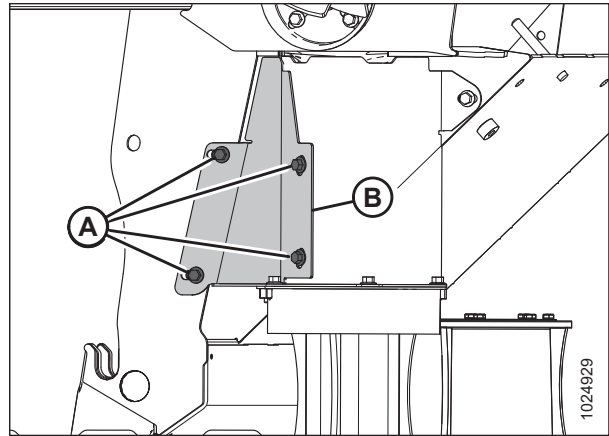


Figure 4.104: Driveline Shield

6. Remove two M10 hex flange head bolts (B) and cover plate (A).

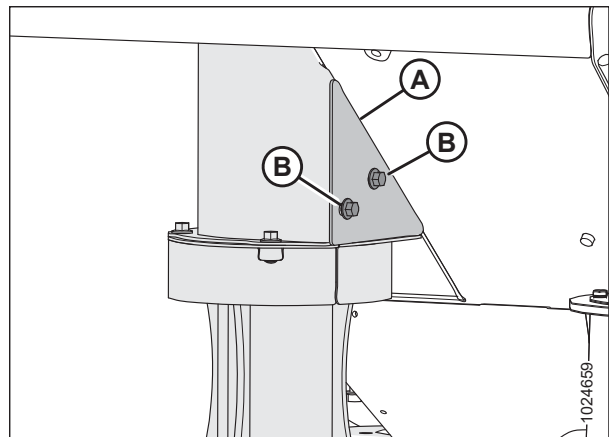


Figure 4.105: Driveline Shield

## MAINTENANCE AND SERVICING

7. Remove four M10 hex flange head bolts (A), top plate (B), and drum top (C).

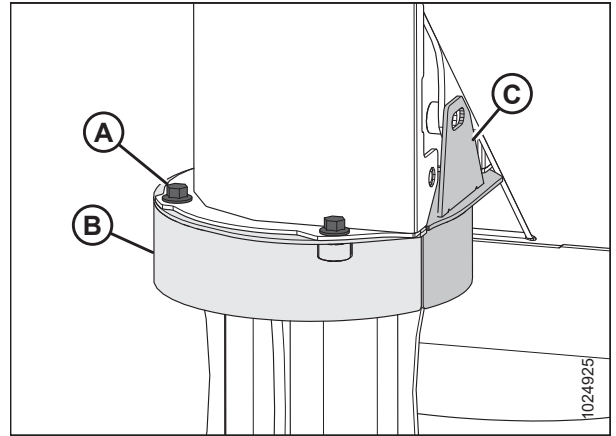


Figure 4.106: Driveline Shield

8. Remove one 20 mm M10 hex flange head bolt (B), two 16 mm M10 hex flange head bolts (C), and vertical shield (A).

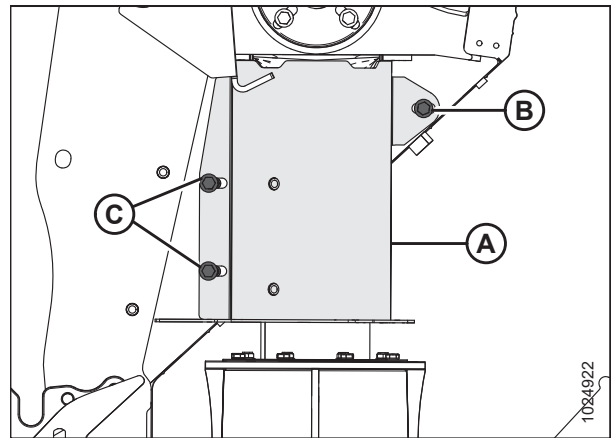


Figure 4.107: Driveline Shield

9. Remove eight M8 hex flange head bolts (A) and two drum shields (B).

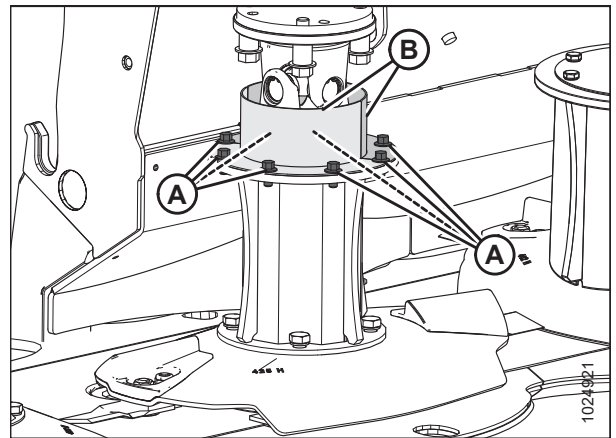


Figure 4.108: Driveline Shield

## MAINTENANCE AND SERVICING

10. Remove four M12 hex flange head bolts and spacers (A) securing driveline assembly (B) to hub drive (C).

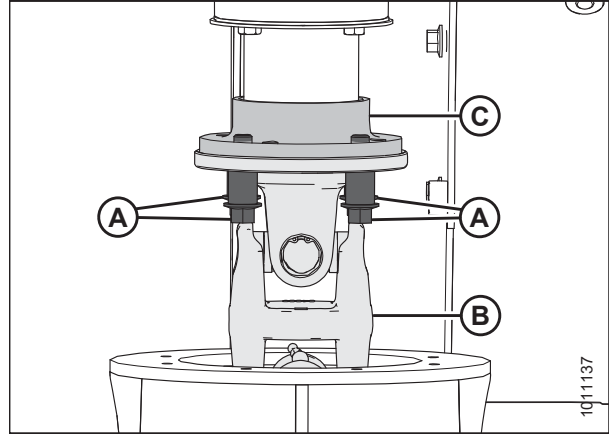


Figure 4.109: Hub Drive to Driveline Connection

11. Slide driveline (A) downwards, tilt it to the side, and pull the driveline up and out of drum.

**NOTE:**

For clarity, the illustration shows a cutaway view of the drum and the tube shield.

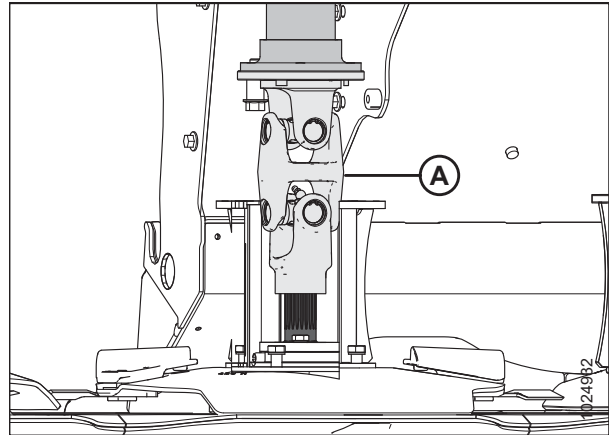


Figure 4.110: Hub Drive to Driveline Connection

12. Remove four M12 bolts and washers (A) holding the drum disc in place.
13. Remove drum disc assembly (B).

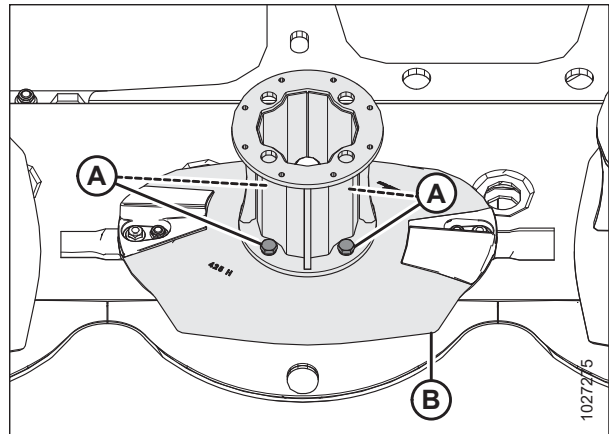


Figure 4.111: Driven Drum

*Installing Small Driven Drum and Driveline – Ten Disc Cutterbar*

The small driven drum is the second drum from the end on the left side of the cutterbar.

**⚠ DANGER**

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator’s seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

**⚠ DANGER**

Ensure that all bystanders have cleared the area.

**⚠ WARNING**

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

1. Position the rotary disc header at an appropriate height for the task.
2. Shut down the engine, and remove the key from the ignition.
3. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
4. Position drum disc assembly (B) as shown.
5. Install four M12 bolts (A) along with the washers that hold the drum disc in place. Torque the hardware to 85 Nm (63 lbf-ft).

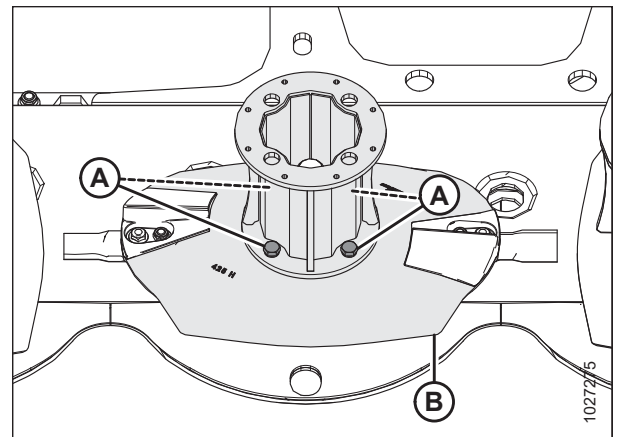


Figure 4.112: Drum Disc

## MAINTENANCE AND SERVICING

- Lubricate spindle splines (A). For specifications, refer to the inside back cover of this manual.

### NOTE:

For clarity, the illustration shows a cutaway view of the drum and tube shield.

- Insert driveline (B) at an angle and guide it past hub drive (C) and drum (D).
- Insert splined spindle end (A) into the splined bore of driveline (B).

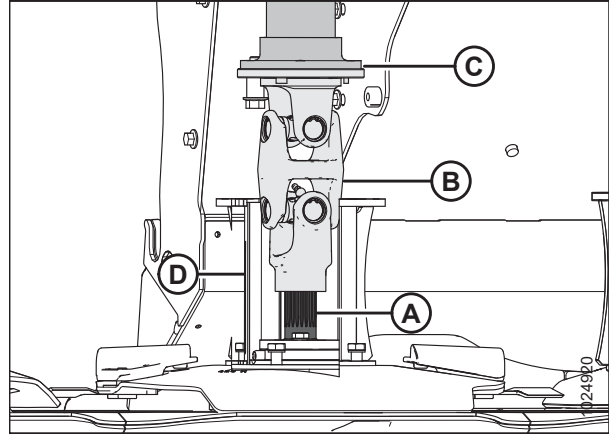


Figure 4.113: Hub Drive to Driveline Connection

- Place a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of four M12 hex flange head bolts (A). Use the bolts and spacers to secure driveline assembly (B) to hub drive (C). Torque the bolts to 102 Nm (75 lbf-ft).

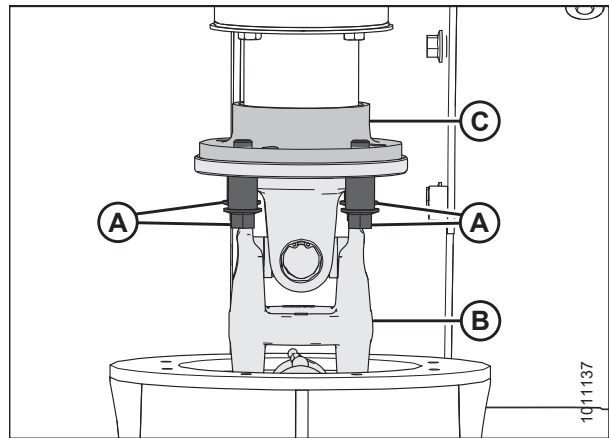


Figure 4.114: Hub Drive to Driveline Connection

- Position two drum shields (B) as shown. Apply a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of eight M8 hex flange head bolts (A). Use the bolts to secure the drum shields. Torque the hardware to 27 Nm (20 lbf-ft [239 lbf-in]).

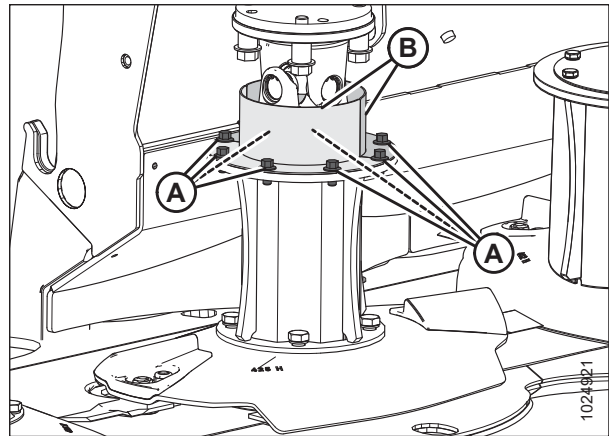


Figure 4.115: Driven Drum

## MAINTENANCE AND SERVICING

11. Position vertical shield (A) as shown. Apply a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of one M10 hex flange head bolt (B) and two M10 hex flange head bolts (C). Use bolts (B) and (C) to secure the vertical shield. Torque the hardware to 61 Nm (45 lbf·ft).

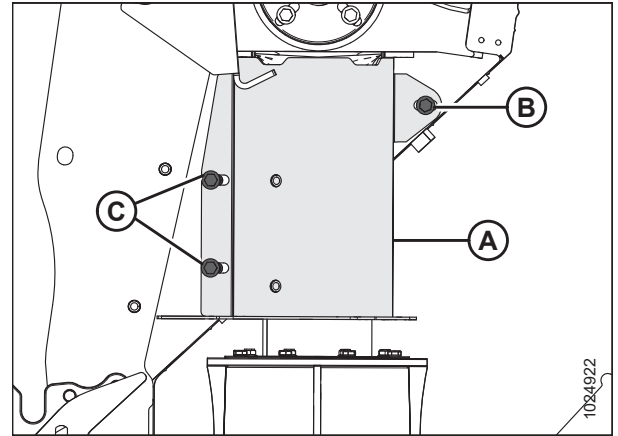


Figure 4.116: Driveline Shield

12. Position top plate (B) and drum top (C) onto the drum as shown. Apply a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of four M10 hex flange head bolts (A). Use the bolts to secure the top plate and the drum top. Torque the hardware to 61 Nm (45 lbf·ft).

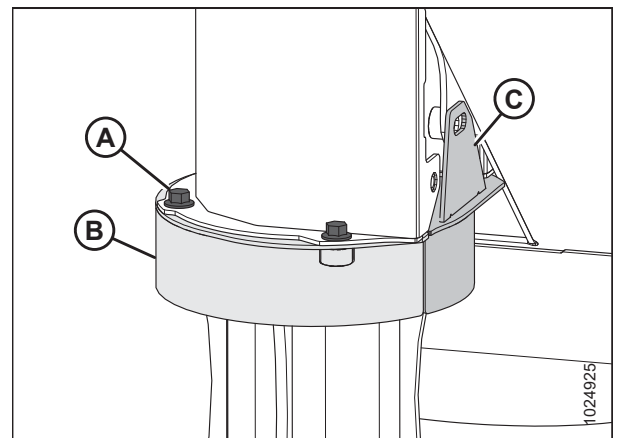


Figure 4.117: Driveline Shield

## MAINTENANCE AND SERVICING

13. Apply a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of M10 hex flange head bolt (B). Install bolt (B) through cover plate (A) and top plate (C). Torque the hardware to 61 Nm (45 lbf-ft).
14. Apply a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of M10 hex flange head bolt (D). Install bolt (D) through cover plate (A) and vertical shield (E). Torque the hardware to 61 Nm (45 lbf-ft).
15. Tighten bolts (B) and (D).

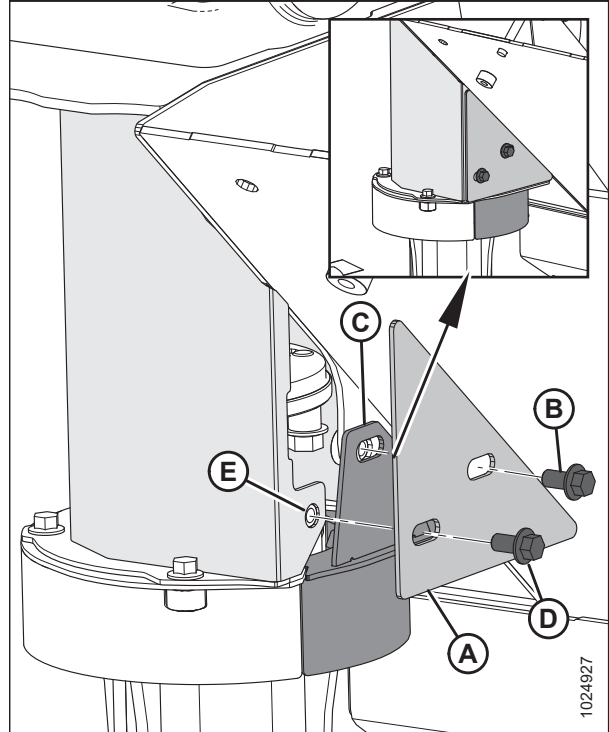


Figure 4.118: Driveline Shield

16. Position vertical driveshield (B) as shown at right. Apply a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of four M10 hex flange head bolts (A). Use bolts (A) to secure the vertical driveshield. Torque the hardware to 61 Nm (45 lbf-ft).

### **WARNING**

Ensure that the cutterbar is completely clear of foreign objects. Foreign objects can be ejected with considerable force when the machine is started, which can result in serious injury or cause damage to the machine.

17. Close the cutterbar doors. For instructions, refer to [3.4.2 Closing Cutterbar Doors, page 21](#).

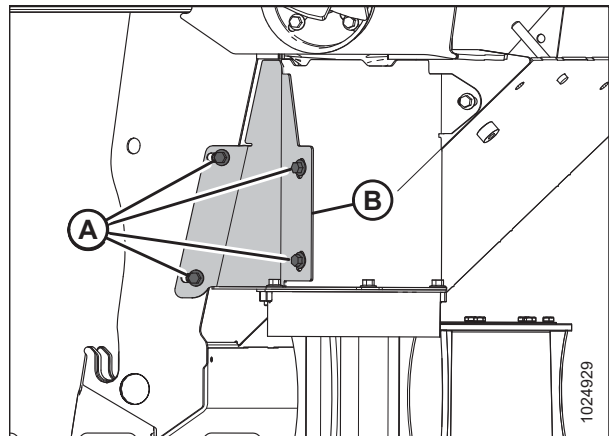


Figure 4.119: Driveline Shield

### *Removing Small Non-Driven Drum – Ten Disc Cutterbar*

The small non-driven drum is the second from the end on the right side of the cutterbar.

### **DANGER**

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.



**⚠ DANGER**

Ensure that all bystanders have cleared the area.

**⚠ WARNING**

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

1. Position the rotary disc header at an appropriate height for the task.
2. Shut down the engine, and remove the key from the ignition.
3. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
4. Open the cutterbar doors. For instructions, refer to [3.4.1 Opening Cutterbar Doors, page 21](#).
5. Remove four M12 bolts (A) outside the drum.
6. Remove disc assembly (B).

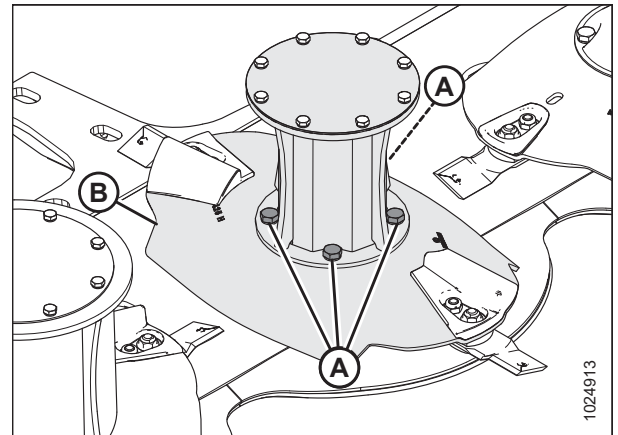


Figure 4.120: Non-Driven Drum

*Installing Small Non-Driven Drum – Ten Disc Cutterbar*

Remember to replace the spacer when installing the small non-driven drum.

**⚠ DANGER**

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

**⚠ DANGER**

Ensure that all bystanders have cleared the area.

**WARNING**

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

1. Position the rotary disc header at an appropriate height for the task.
2. Shut down the engine, and remove the key from the ignition.
3. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
4. Ensure spacer (A) is on the spindle.

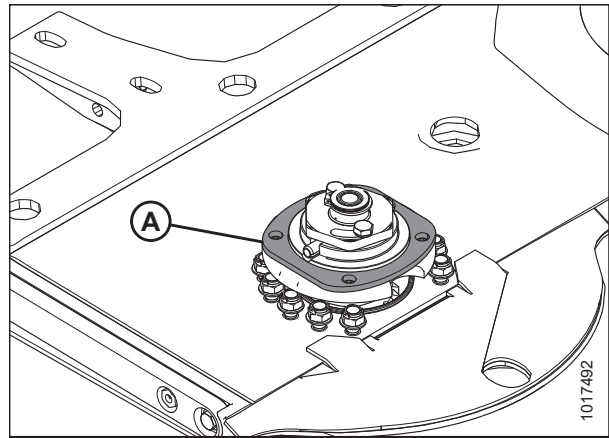


Figure 4.121: Non-Driven Spindle

5. Position non-driven disc assembly (B) onto the spindle as shown.
6. Install four M12 bolts (A) and the washers securing the disc assembly to the spindle. Torque the hardware to 55 Nm (40 lbf-ft).

**WARNING**

Ensure that the cutterbar is completely clear of foreign objects. Foreign objects can be ejected with considerable force when the machine is started, which can result in serious injury or cause damage to the machine.

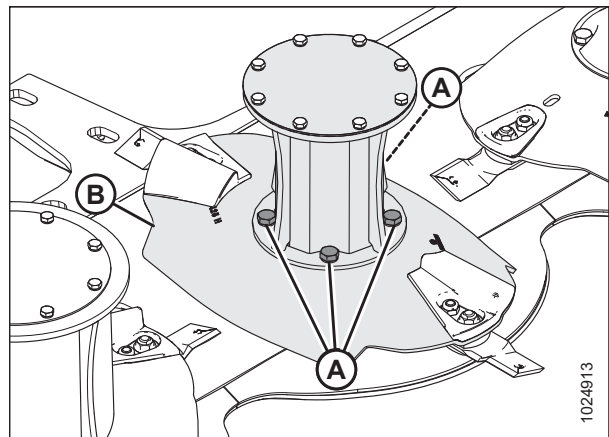


Figure 4.122: Non-Driven Drum

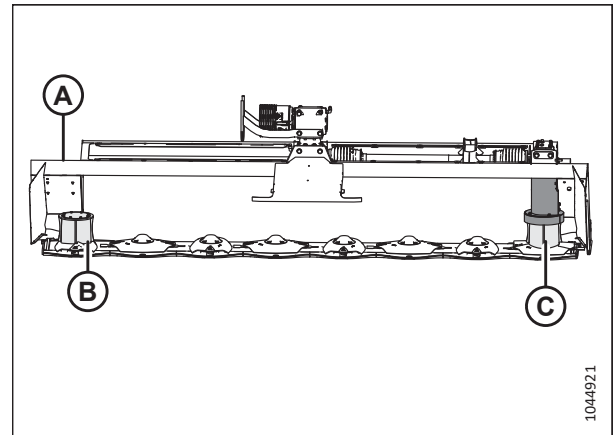
7. Close the cutterbar doors. For instructions, refer to [3.4.2 Closing Cutterbar Doors, page 21](#).

#### 4.4.12 Maintaining Large Drums

Drums deliver cut material from the ends of the cutterbar and help maintain an even crop flow into the conditioner. Large drums are attached to the two outboard discs on 8-disc cutterbars.

**NOTE:**

Large drums measure 250 mm (9 7/8 in.) in diameter.



**Figure 4.123: Cutterbars**

A - Eight Disc Cutterbar  
C - Large Driven Drum

B - Large Drums

#### *Inspecting Large Drums*

Inspect the large drums daily for signs of damage or wear.

**⚠ DANGER**

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

**⚠ DANGER**

Ensure that all bystanders have cleared the area.

**⚠ WARNING**

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

1. Position the rotary disc header at an appropriate height for the task.
2. Shut down the engine, and remove the key from the ignition.
3. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).

## MAINTENANCE AND SERVICING

4. Open the cutterbar doors. For instructions, refer to [3.4.1 Opening Cutterbar Doors, page 21](#).
5. Inspect large drums (B) and (C) for signs of damage or wear. Replace the large drums if the drum feed bars are 50% or less of their original thickness. Do **NOT** repair the drums.
6. Examine the drums for large dents. Replace dented drums to prevent an imbalance in the cutterbar.
7. Tighten or replace loose or missing fasteners.

### WARNING

Ensure that the cutterbar is completely clear of foreign objects. Foreign objects can be ejected with considerable force when the machine is started, which can result in serious injury or cause damage to the machine.

8. Close the cutterbar doors. For instructions, refer to [3.4.2 Closing Cutterbar Doors, page 21](#).
9. Inspect drums (A) and (B) for damage and wear, and replace if drums are worn at the center to 50% or more of their original thickness. Do **NOT** repair drums.
10. Examine drums for large dents. Replace dented drums to prevent an imbalance in the cutterbar.
11. Tighten any loose fasteners. Replace any missing fasteners.

### WARNING

Ensure that the cutterbar is completely clear of foreign objects. Foreign objects can be ejected with considerable force when the machine is started, which can result in serious injury or cause damage to the machine.

12. Close the cutterbar doors. For instructions, refer to [3.4.2 Closing Cutterbar Doors, page 21](#).

### Removing Large Driven Drums and Driveline

The large driven drum is on the left end of the cutterbar.

### DANGER

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

### DANGER

Ensure that all bystanders have cleared the area.

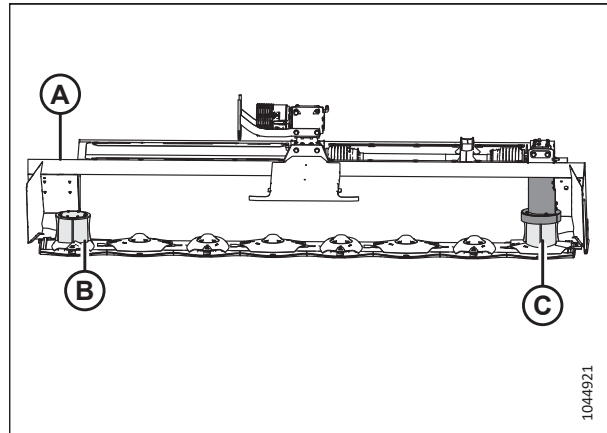


Figure 4.124: Cutterbars

A - Eight Disc Cutterbar  
C - Large Driven Drum

B - Large Drums

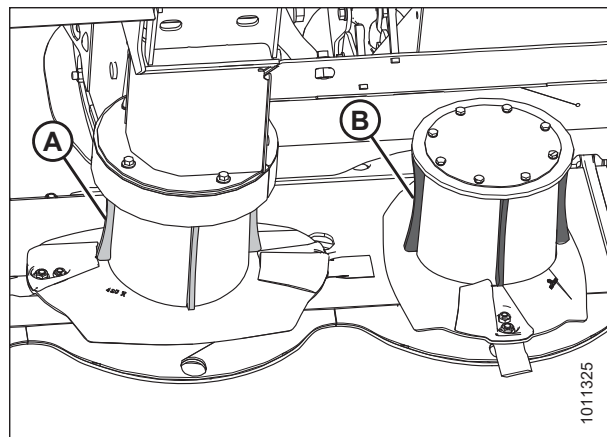


Figure 4.125: Cutterbar Drums – Ten Disc

**WARNING**

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

1. Position the rotary disc header at an appropriate height for the task.
2. Shut down the engine, and remove the key from the ignition.
3. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
4. Shut down the engine, and remove the key from the ignition.
5. Open the cutterbar doors. For instructions, refer to [3.4.1 Opening Cutterbar Doors, page 21](#).
6. Remove four M10 hex flange head bolts (A) and remove vertical driveshield (B).

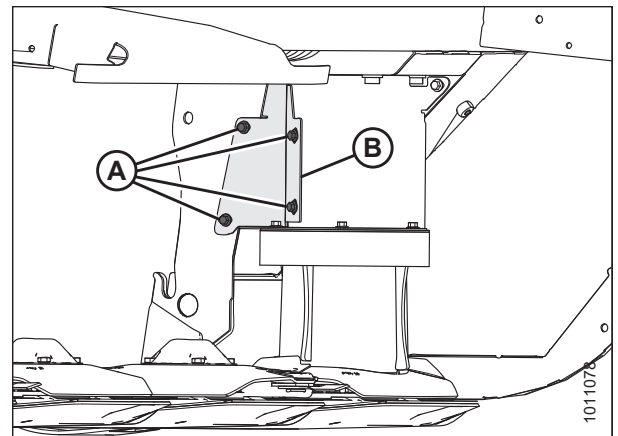


Figure 4.126: Vertical Drive Shield

7. Remove two M10 hex flange head bolts (A) and remove cover plate (B).

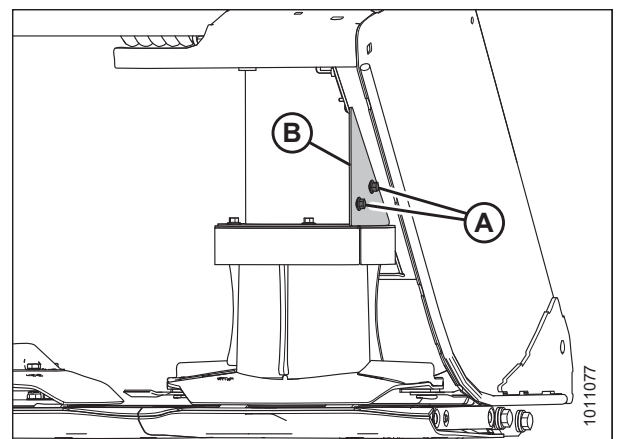


Figure 4.127: Cover Plate

## MAINTENANCE AND SERVICING

- Remove four M10 hex flange head bolts (A), and remove top plate (B) and drum top (C).

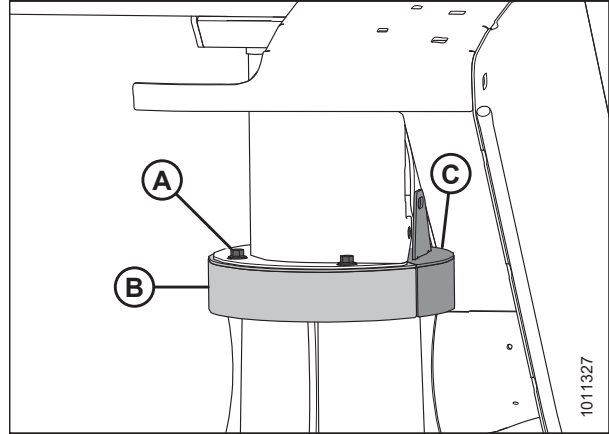


Figure 4.128: Top Plate and Drum Top

- Remove one M10 x 20 hex flange head bolt (A), two M10 x 16 hex flange head bolts (B), and vertical shield (C).

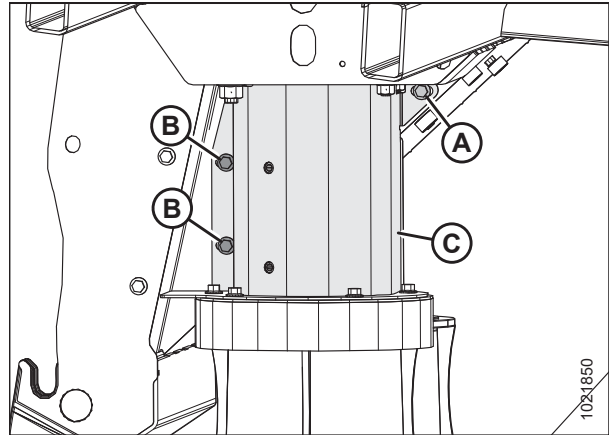


Figure 4.129: Vertical Shield

- Remove eight M8 hex flange head bolts (A), and remove two drum shields (B).

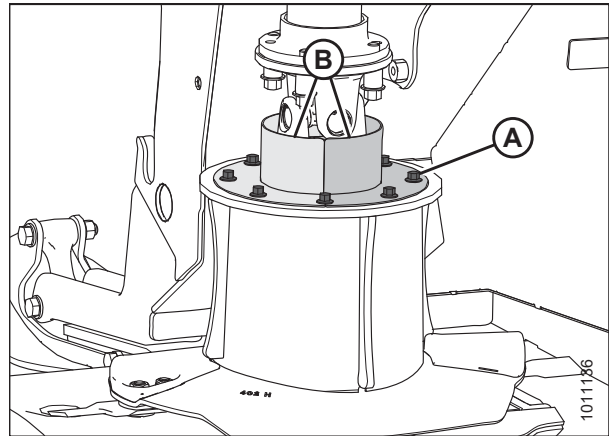


Figure 4.130: Drum Shields

## MAINTENANCE AND SERVICING

11. Remove four M12 hex flange head bolts and spacers (A) securing driveline assembly (B) to hub drive (C).

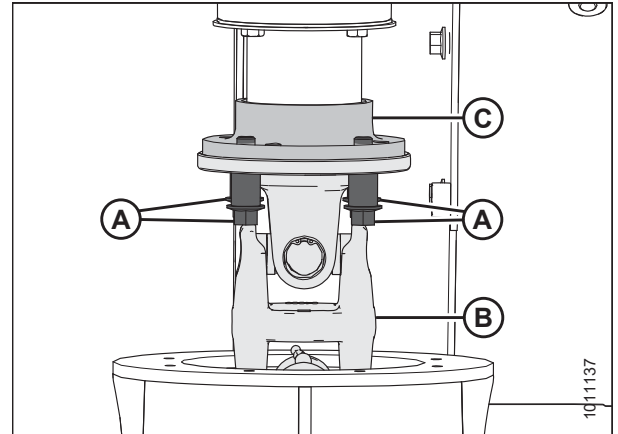


Figure 4.131: Hub Drive to Driveline Connection

12. Slide driveline (A) downwards, and tilt it to the side. Pull the driveline up and out of the drum.

**NOTE:**

The illustration shows a cutaway view of the drum and the tube shield.

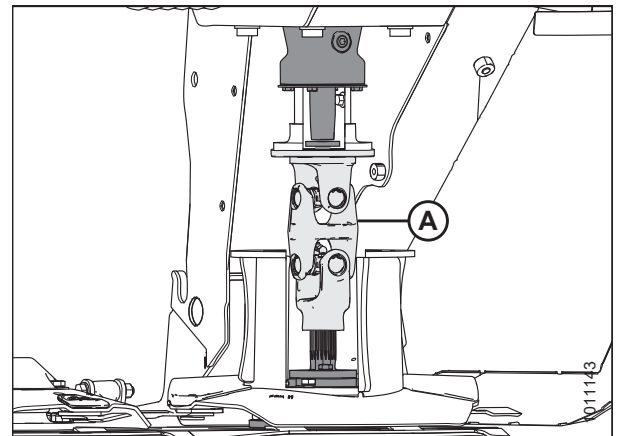


Figure 4.132: Hub Drive to Driveline Connection

13. Inside the drum, remove four M12 bolts and washers (A) holding the drum disc in place.

14. Remove the drum disc assembly.

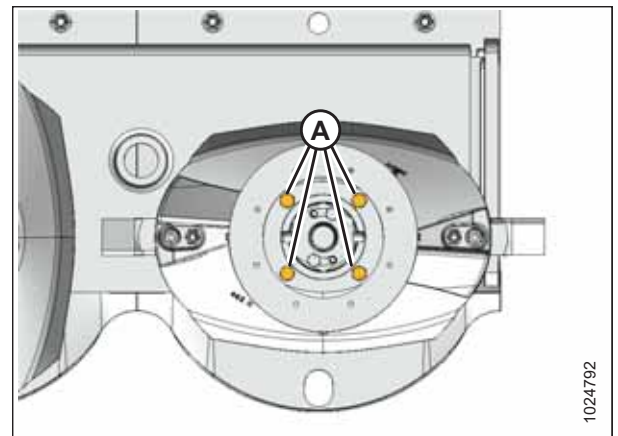


Figure 4.133: Driven Drum

### *Installing Large Driven Drums and Driveline*

The large driven drum is on the left end of the cutterbar.

#### **DANGER**

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

#### **DANGER**

Ensure that all bystanders have cleared the area.

#### **WARNING**

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

1. Position the rotary disc header at an appropriate height for the task.
2. Shut down the engine, and remove the key from the ignition.
3. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
4. Ensure that spacer plate (A) is on the spindle.

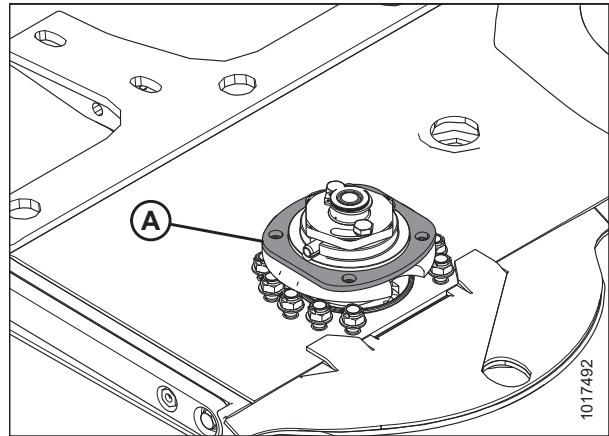


Figure 4.134: Spacer Plate



## MAINTENANCE AND SERVICING

5. Position the drum disc assembly as shown.

**NOTE:**

Orient the disc so that the blades are perpendicular to those on the adjacent disc.

6. Install four M12 bolts and washers (A) that hold the drum disc in place. Torque the hardware to 85 Nm (63 lbf·ft).

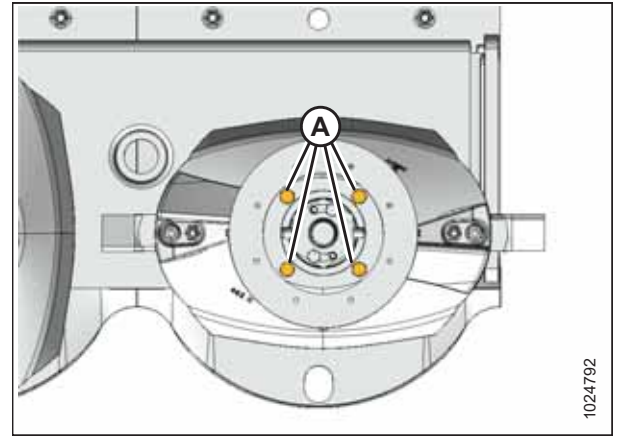


Figure 4.135: Drum

7. Lubricate spindle splines (A). For specifications, refer to the inside back cover of this manual.

**NOTE:**

The driveline U-joints were greased at the factory and are considered to be lubricated for life. No further lubrication is required.

**NOTE:**

The illustration shows a cutaway view of the drum and the tube shield.

8. Insert driveline (B) at an angle and guide it past hub drive (C) and drum (D).
9. Insert splined spindle end (A) into the splined bore on driveline (B).
10. Place a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of four M12 hex flange head bolts (A).
11. Use the bolts and spacers to secure driveline assembly (B) to hub drive (C). Torque the bolts to 102 Nm (75 lbf·ft).

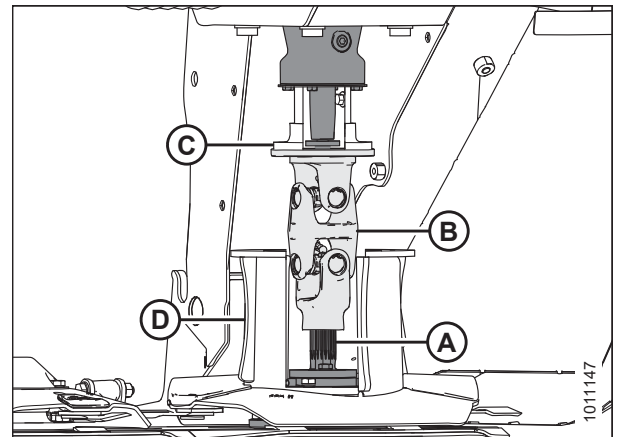


Figure 4.136: Hub Drive to Driveline Connection

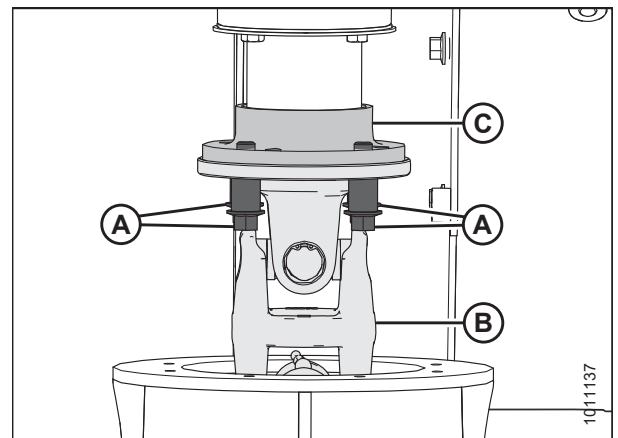


Figure 4.137: Hub Drive to Driveline Connection

## MAINTENANCE AND SERVICING

12. Position two drum shields (B) as shown.
13. Apply a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of eight M8 hex flange head bolts (A).
14. Use the bolts to secure the drum shields. Torque the bolts to 27 Nm (20 lbf·ft [239 lbf·in]).

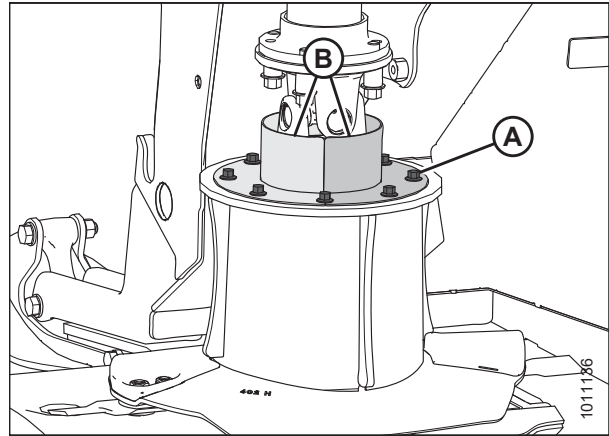


Figure 4.138: Drum Shield

15. Position vertical shield (A) as shown.
16. Apply a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of one M10 hex flange head bolt (B) and two M10 hex flange head bolts (C).
17. Use bolts (B) and (C) to secure the vertical shield. Torque the bolts to 61 Nm (45 lbf·ft).

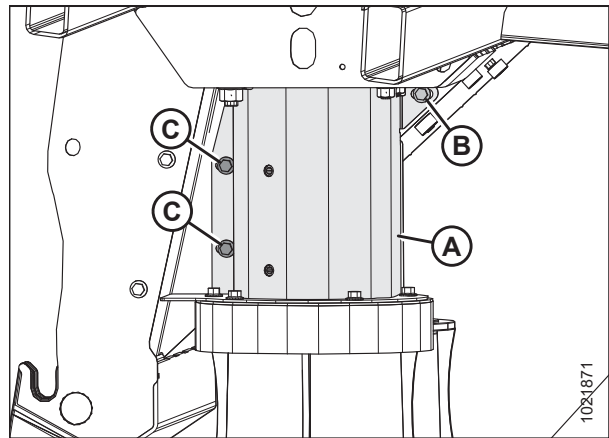


Figure 4.139: Vertical Shield

18. Position top plate (B) and drum top (C) onto the drum as shown.
19. Apply a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of four M10 hex flange head bolts (A).
20. Use the bolts to secure the top plate and drum top. Torque the hardware to 61 Nm (45 lbf·ft).

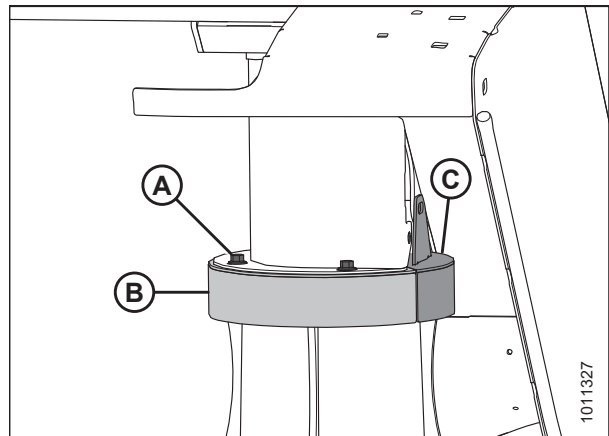


Figure 4.140: Top Plate and Drum Top

## MAINTENANCE AND SERVICING

21. Apply a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of M10 hex flange head bolt (B).
22. Install bolt (B) through cover plate (A) and top plate (C). Torque the bolt to 61 Nm (45 lbf·ft).
23. Apply a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of M10 hex flange head bolt (D).
24. Install bolt (D) through cover plate (A) and vertical shield (E). Torque the bolt to 61 Nm (45 lbf·ft).

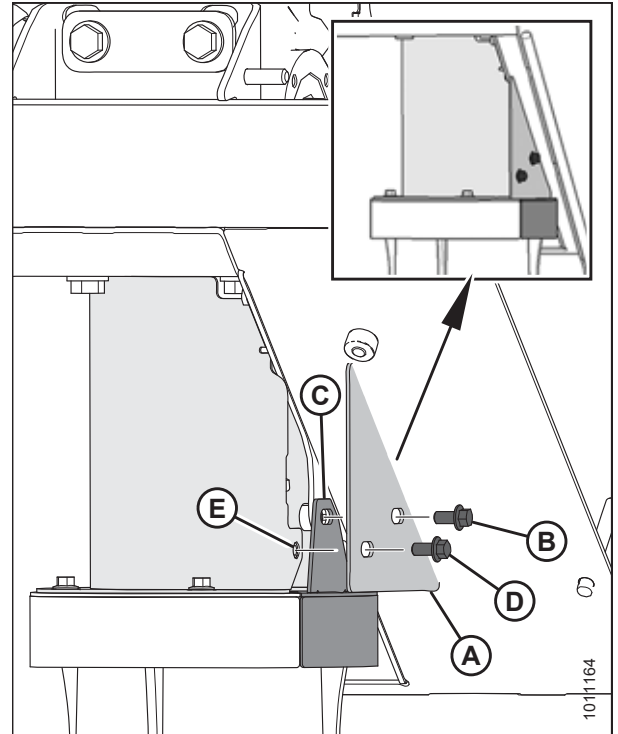


Figure 4.141: Cover Plate and Top Plate

25. Position vertical driveshield (B) as shown.
26. Apply a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of four M10 hex flange head bolts (A).
27. Use bolts (A) to secure the vertical driveshield.
28. Torque the bolts to 61 Nm (45 lbf·ft).

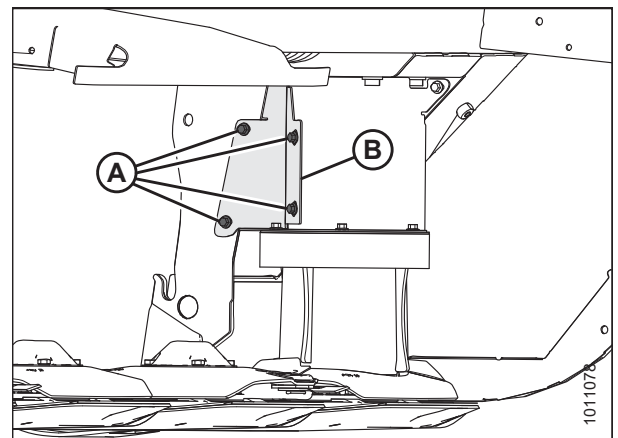


Figure 4.142: Vertical Shield



### WARNING

Ensure that the cutterbar is completely clear of foreign objects. Foreign objects can be ejected with considerable force when the machine is started, which can result in serious injury or cause damage to the machine.

29. Close the cutterbar doors. For instructions, refer to [3.4.2 Closing Cutterbar Doors, page 21](#).

### Removing Large Non-Driven Drums

The non-driven large drums are held in place with four bolts.

#### DANGER

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

#### DANGER

Ensure that all bystanders have cleared the area.

#### WARNING

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

1. Position the rotary disc header at an appropriate height for the task.
2. Shut down the engine, and remove the key from the ignition.
3. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
4. Open the cutterbar doors. For instructions, refer to [3.4.1 Opening Cutterbar Doors, page 21](#).
5. To prevent the disc from rotating while you are loosening the blade bolts, place a wooden block between the two cutterbar discs.
6. Remove eight M8 bolts and washers (A) securing cover (B) to the non-driven drum.
7. Remove the cover.

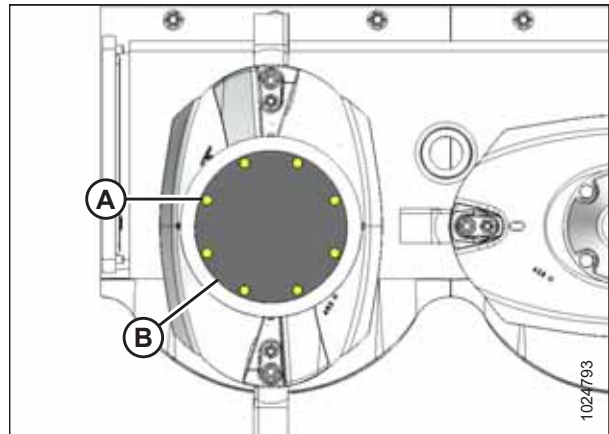


Figure 4.143: Non-Driven Drum

## MAINTENANCE AND SERVICING

8. Remove four M10 bolts (A) from inside the drum.
9. Remove the wooden block.
10. Remove drum/disc (B).

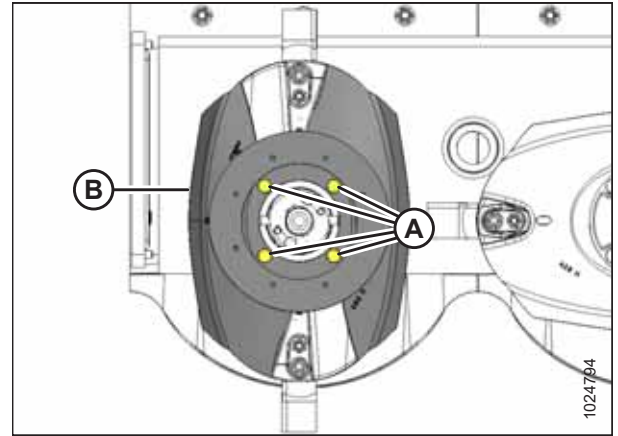


Figure 4.144: Non-Driven Drum

### *Installing Large Non-Driven Drums*

Before installing the large non-driven drum, ensure that the spacer is in place.

#### **DANGER**

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

#### **DANGER**

Ensure that all bystanders have cleared the area.

#### **WARNING**

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

1. Position the rotary disc header at an appropriate height for the task.
2. Shut down the engine, and remove the key from the ignition.
3. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).

4. Ensure that spacer (A) is on the spindle.

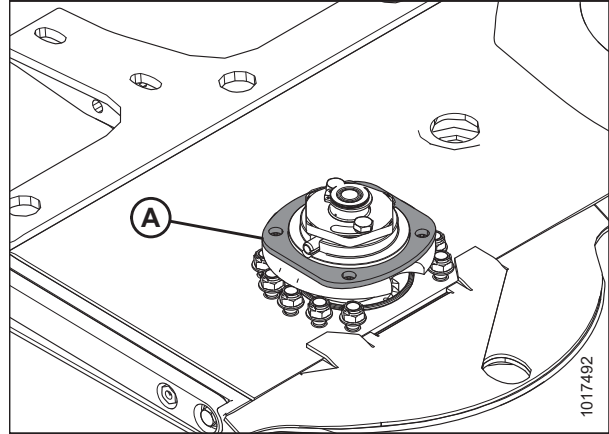


Figure 4.145: Non-Driven Spindle

5. Position non-driven drum/disc (B) onto the spindle as shown.
6. Install four M12 bolts and washers (A) to secure the drum and disc assembly to the spindle.
7. Torque the hardware to 85 Nm (63 lbf·ft).

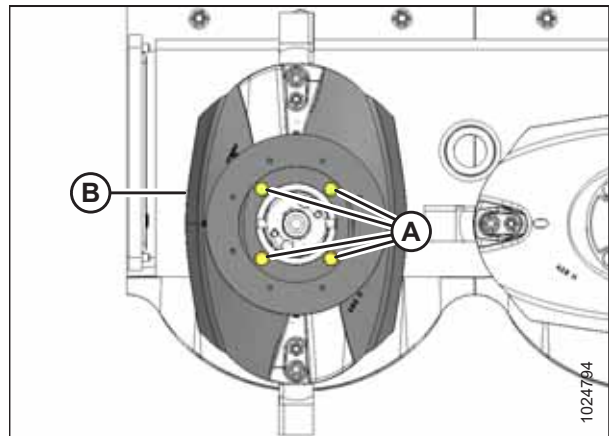


Figure 4.146: Non-Driven Drum

8. Install eight M8 bolts and washers (A) to secure cover (B) to the non-driven drum.
9. Torque the bolts to 28 Nm (21 lbf·ft [248 lbf·in]).

**⚠ WARNING**

Ensure that the cutterbar is completely clear of foreign objects. Foreign objects can be ejected with considerable force when the machine is started, which can result in serious injury or cause damage to the machine.

10. Close the cutterbar doors. For instructions, refer to [3.4.2 Closing Cutterbar Doors, page 21](#).

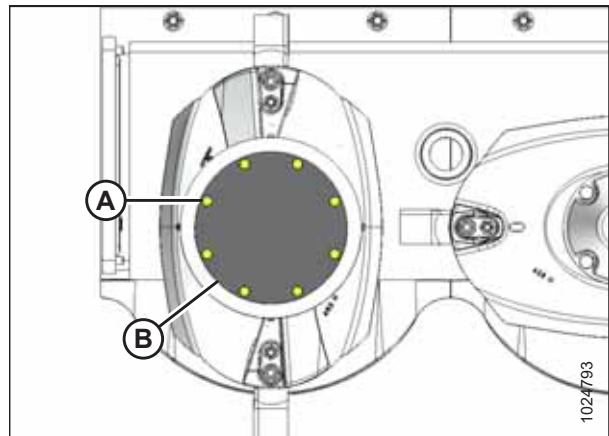


Figure 4.147: Non-Driven Drum

### 4.4.13 Replacing Cutterbar Spindle Shear Pin

To prevent damage to the cutterbar and drive systems, each disc is attached to a spindle containing a shear pin.

If the disc contacts a large object such as a stone or stump, pin (A) will shear and the disc will stop rotating and move upwards. Snap ring (B) ensures that the disc will remain attached to the spindle.

**IMPORTANT:**

- Ensure that the slots on both shear pins (A) are aligned horizontally.
- Spindles that rotate clockwise have right-leading threading.
- Spindles that rotate counterclockwise have left-leading threading.

**NOTE:**

Once the spindle has risen due to the shear pin, the spindle's bearing will become unloaded. The spindle will appear to be damaged. Do **NOT** replace the spindle simply because it has excessive play. Check the play of the spindle **AFTER** torquing the spindle nut and replacing the damaged shear pin.

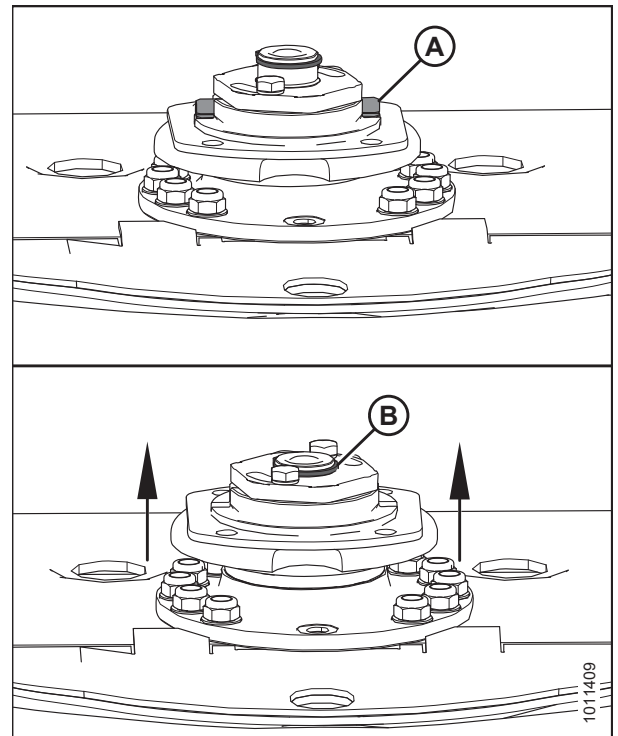


Figure 4.148: Cutterbar Spindles

#### Removing Cutterbar Spindle Shear Pin

Once the shear pin on a cutterbar spindle has broken, it will need to be removed.

**⚠ DANGER**

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

**⚠ DANGER**

Ensure that all bystanders have cleared the area.

**⚠ WARNING**

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

1. Position the rotary disc header at an appropriate height for the task.
2. Shut down the engine, and remove the key from the ignition.

## MAINTENANCE AND SERVICING

3. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
4. Open the cutterbar doors. For instructions, refer to [3.4.1 Opening Cutterbar Doors, page 21](#).
5. Clean any debris from the work area.
6. Remove cutterbar disc (A). For instructions, refer to [Removing Cutterbar Discs, page 87](#).
7. Remove the drum.
  - To remove a driven drum (B), refer to [Removing Large Driven Drums and Driveline, page 140](#).
  - To remove a non-driven drum (C), refer to [Removing Large Non-Driven Drums, page 148](#).

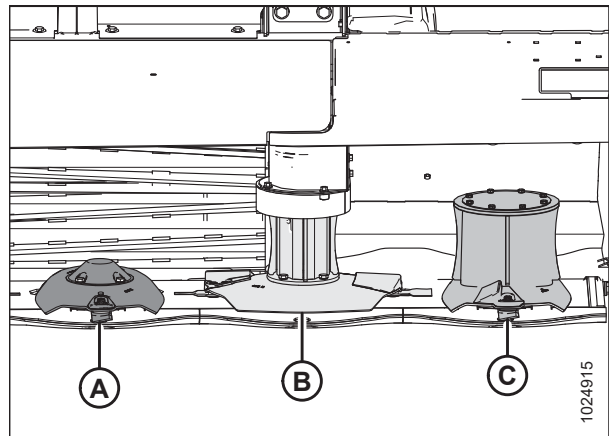


Figure 4.149: Disc Assemblies – 10 Disc Shown, 8 Disc Similar

8. Remove retaining ring (A).

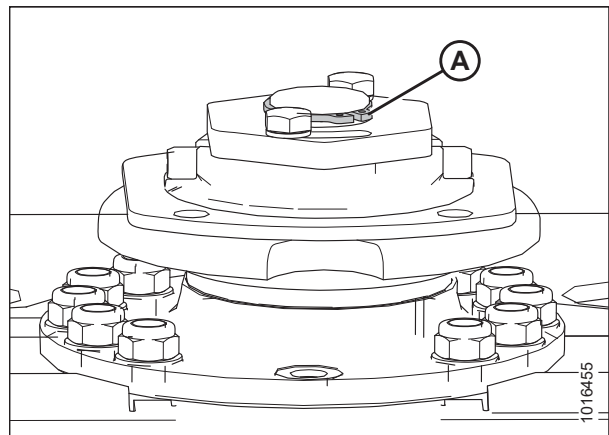


Figure 4.150: Cutterbar Spindle



## MAINTENANCE AND SERVICING

9. Remove the M12 bolt securing Safecut spindle-nut wrench (A) to its storage location.
10. Remove the Safecut spindle-nut wrench and reinstall the M12 bolt for safekeeping.

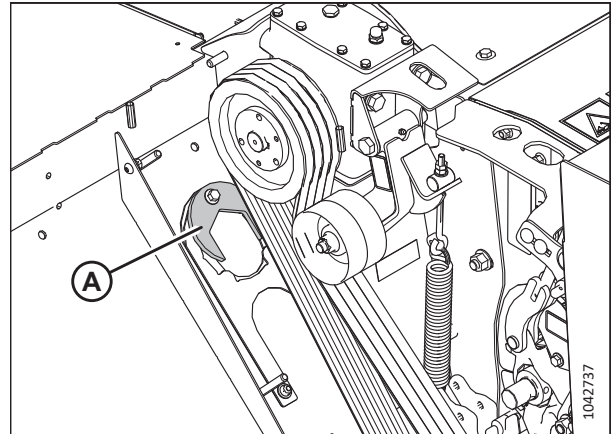


Figure 4.151: Safecut Spindle-Nut Wrench Location

### IMPORTANT:

- Spindles that rotate clockwise have right-leading threading and a smooth top on spindle gear shaft (A).
- Spindles that rotate counterclockwise have left-leading threading and machined grooves on spindle gear shaft (B) and nut (C).
- If the spindle position in the cutterbar has changed, the rotational direction of that spindle **MUST** remain the same (that is, a clockwise spindle must maintain its clockwise rotation). Failure to maintain the rotation pattern can damage to the spindle and/or the cutterbar components.

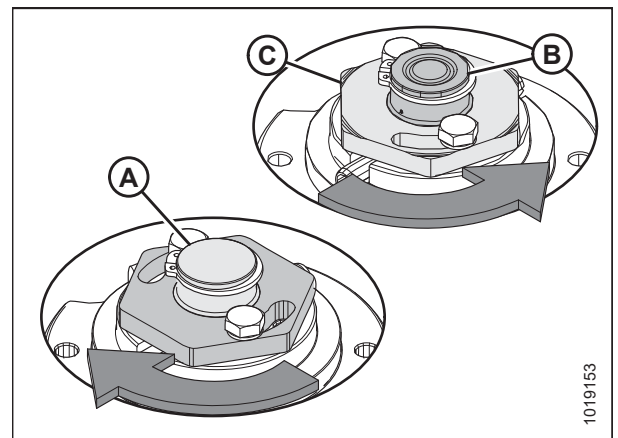


Figure 4.152: Cutterbar Spindles

11. Remove two M10 bolts and washers (A).

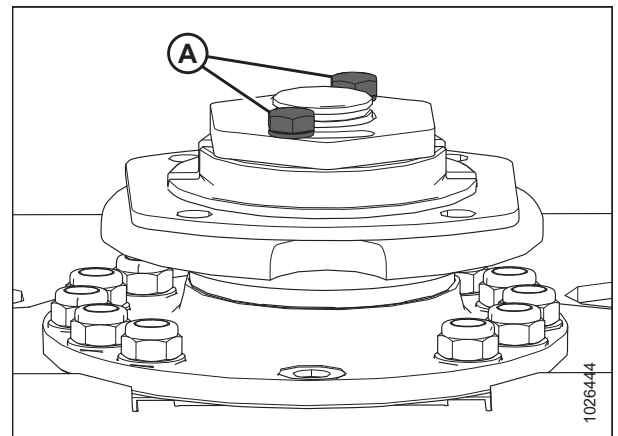


Figure 4.153: Cutterbar Spindle

## MAINTENANCE AND SERVICING

12. Use the Safecut spindle-nut wrench to remove nut (A).

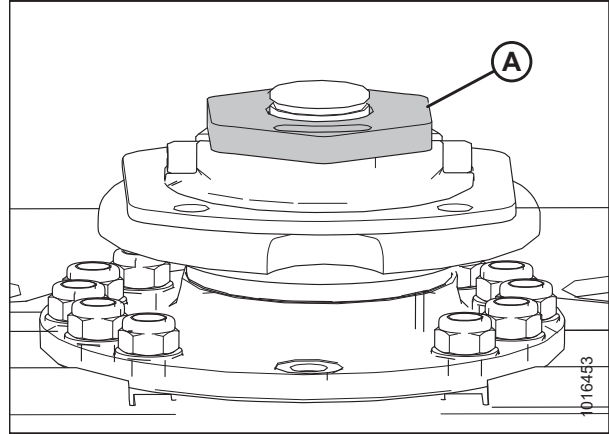


Figure 4.154: Cutterbar Spindle

13. Remove shear pins (B).

**IMPORTANT:**

Do **NOT** damage the pin bore on the pinion.

14. Remove hub (A).
15. Check the nut and the hub for damage. Replace them if necessary.

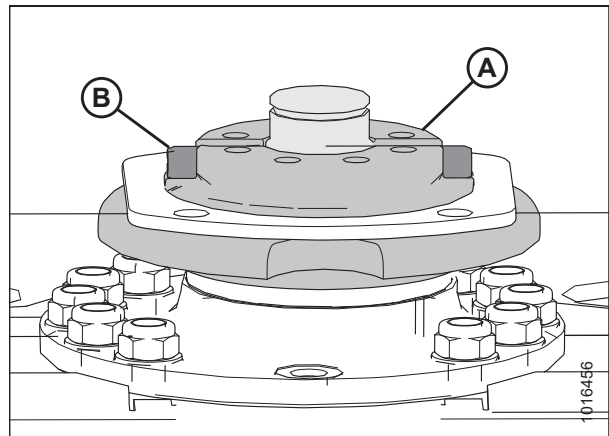


Figure 4.155: Cutterbar Spindle

### *Installing Cutterbar Spindle Shear Pin*

Ensure that the grooves in the shear pin are parallel to the cutterbar when it is installed into the spindle.

#### **DANGER**

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

#### **WARNING**

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

1. Position the rotary disc header at an appropriate height for the task.
2. Shut down the engine, and remove the key from the ignition.

## MAINTENANCE AND SERVICING

3. If the rotary disc header is raised:
  - a. Place blocks under each end, or just inside each end, of the cutterbar.
  - b. Lower the rotary disc header onto the blocks.
  - c. Shut down the engine, and remove the key from the ignition.
  - d. Close the auxiliary lift cylinder lock-out valves. For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
4. Fill the space above the bearing with grease.
5. Place hub (A) on spindle (C).
6. Install shear pins (B) so that both shear pin grooves are parallel to the cutterbar.

**NOTE:**

Ensure that the ends of shear pins (B) do not protrude past the step in hub (A).

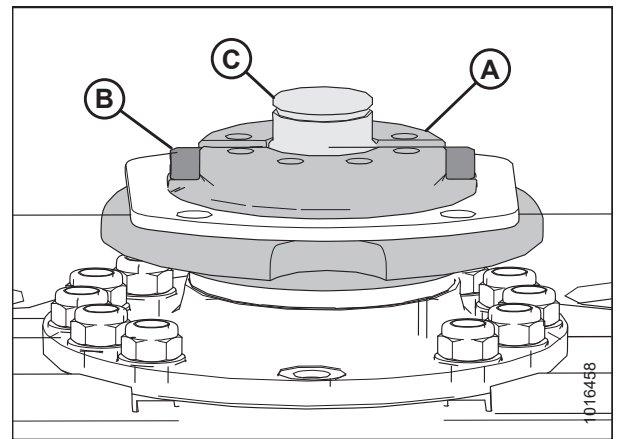


Figure 4.156: Cutterbar Spindle

7. Observe the orientation of the grooves in shear pins (A).

**IMPORTANT:**

The correct shear pin orientation is critical. Both shear pin grooves (A) must be parallel to the cutterbar. They do not need to be facing in the same direction.

**NOTE:**

The shaft has been removed from the illustration for clarity.

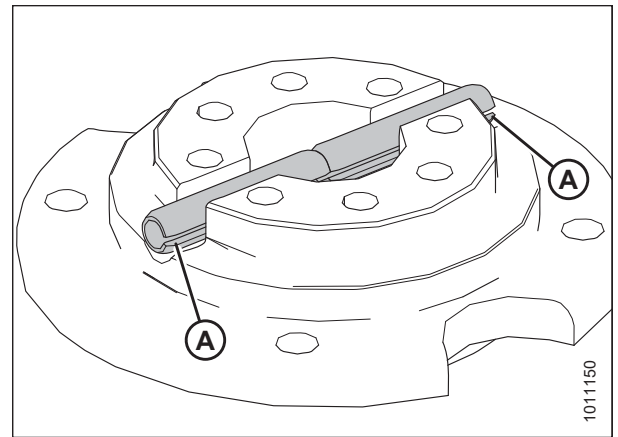


Figure 4.157: Shear Pin Orientation

## MAINTENANCE AND SERVICING

8. Install nut (A).
9. Retrieve the Safecut spindle-nut wrench from the left shield plate.

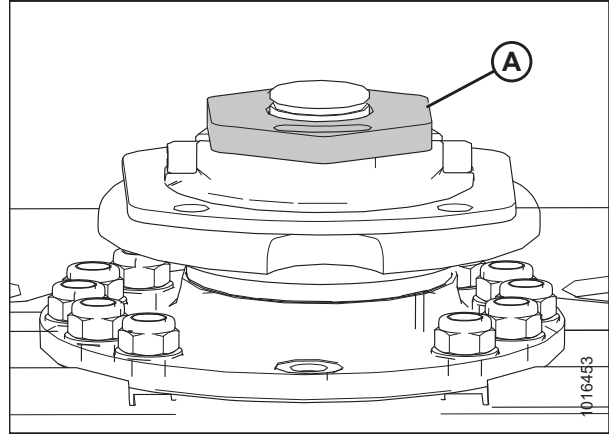


Figure 4.158: Cutterbar Spindle

10. Attach Safecut spindle-nut wrench (B) by 90° (D) to torque wrench (A).

### IMPORTANT:

The Safecut spindle-nut wrench **MUST** be used with a torque wrench.

11. Position Safecut spindle-nut wrench (B) on spindle nut (C). Torque the nut to 300 Nm (221 lbf-ft).
12. Return Safecut spindle-nut wrench (B) to the left shield plate.

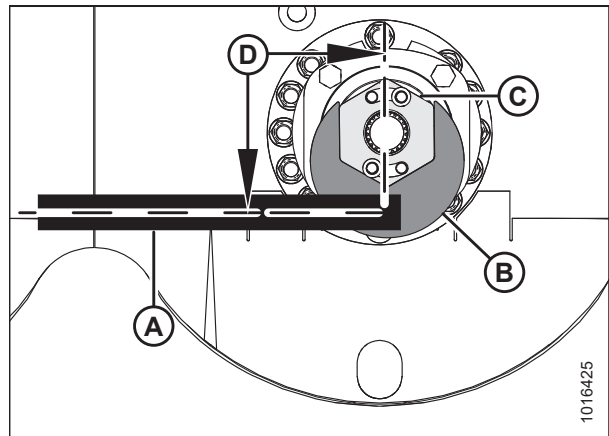


Figure 4.159: Spindle Nut

13. Inspect the threads of two M10 bolts (A) and replace them if they are damaged.
14. Install two M10 bolts and washers (A).
15. Torque the hardware to 55 Nm (40 lbf-ft).

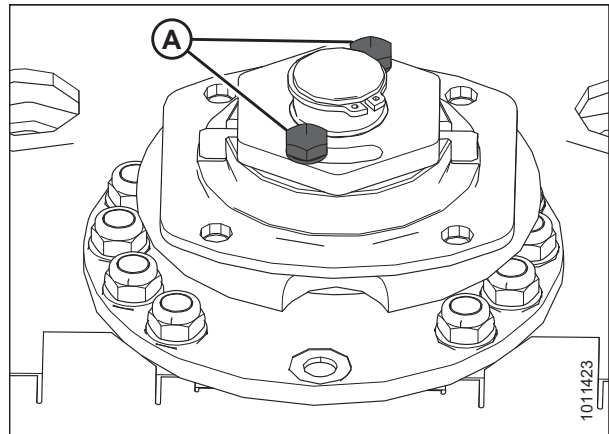


Figure 4.160: Cutterbar Spindle

16. Install retaining ring (A).

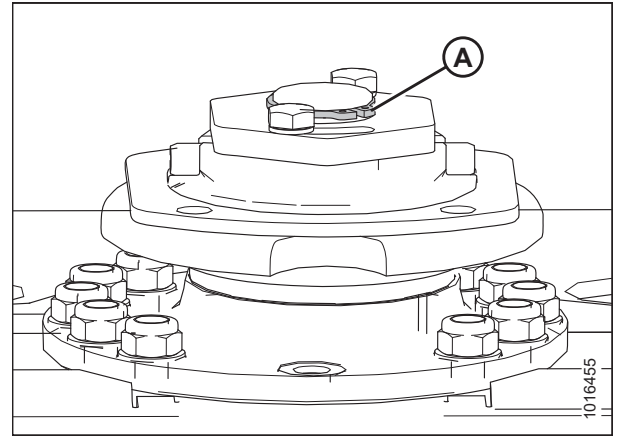


Figure 4.161: Cutterbar Spindle

17. Install the disc or drum. Refer to the relevant procedure:

- Install cutterbar disc (A). For instructions, refer to *Installing Cutterbar Discs, page 88*.
- Install driven drum (B). For instructions, refer to *Installing Large Driven Drums and Driveline, page 144*.
- Install non-driven drum (C). For instructions, refer to *Installing Large Non-Driven Drums, page 149*.

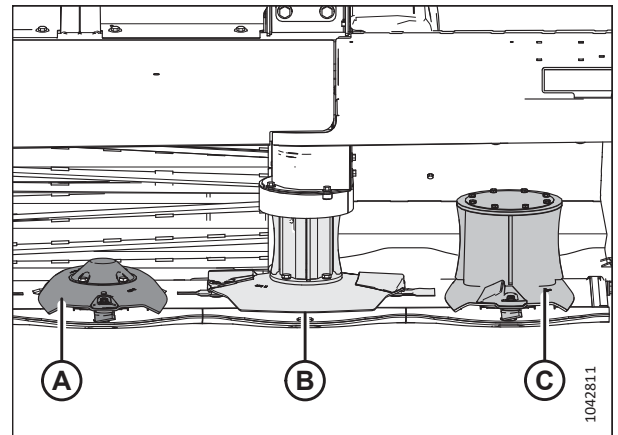


Figure 4.162: Cutterbar – 10 Disc Shown, 8 Disc Similar

## WARNING

Ensure that the cutterbar is completely clear of foreign objects. Foreign objects can be ejected with considerable force when the machine is started, which can result in serious injury or cause damage to the machine.

18. Close the cutterbar doors. For instructions, refer to *3.4.2 Closing Cutterbar Doors, page 21*.

## 4.5 Drive Systems

Drive systems transfer power from the PTO to the .

### 4.5.1 Driveshields

Driveshields protect people from rotating belts and drives.

#### *Removing Driveshields*

No additional tools are needed to remove the driveshields.

## WARNING

To reduce the risk of personal injury, do NOT operate the machine without the driveshields in place and secured.

## MAINTENANCE AND SERVICING

### NOTE:

The illustrations shown in this procedure depict the left driveshield (A); the right driveshield is similar.

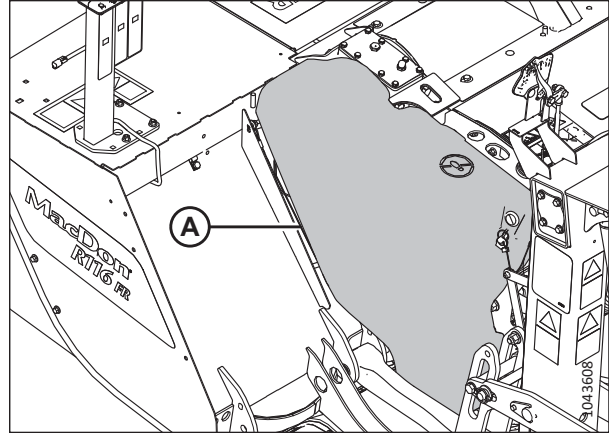


Figure 4.163: Left Driveshield

1. Remove lynch pin (A) and tool (B) from pin (C).

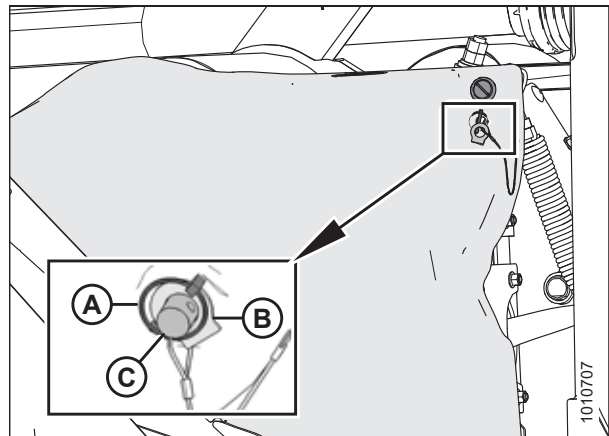


Figure 4.164: Tool to Unlock Driveshield

2. Insert the flat end of tool (A) into latch (B) and turn it counterclockwise to unlock the latch.

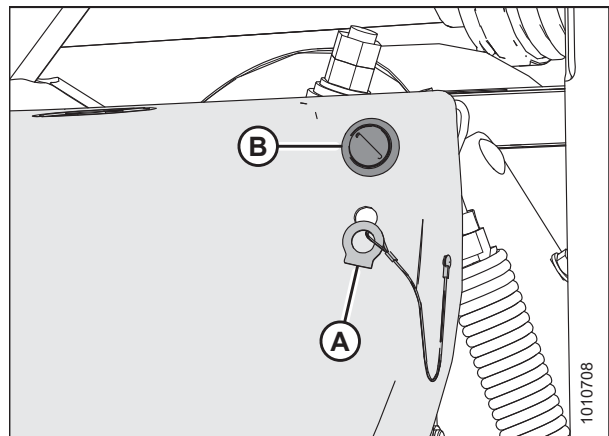


Figure 4.165: Tool to Unlock Driveshield and Latch

## MAINTENANCE AND SERVICING

3. Pull the top of driveshield (A) away from the header and lift the driveshield off of the pins at the base of the shield.

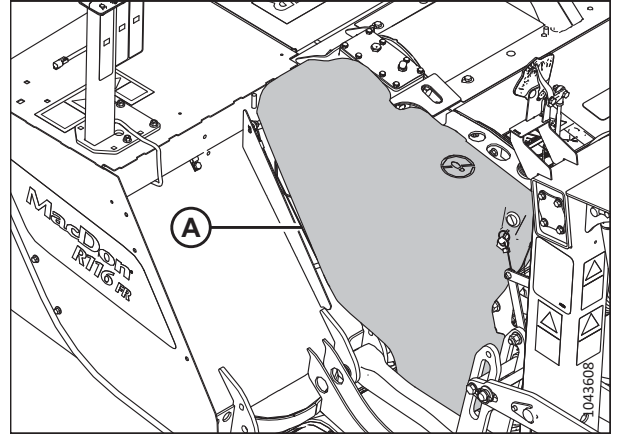


Figure 4.166: Left Driveshield

### Installing Driveshields

No additional tools are needed to install the driveshields.

#### **WARNING**

To reduce the risk of personal injury, do NOT operate the machine without the driveshields in place and secured.

#### **NOTE:**

The illustrations shown in this procedure depict the left driveshield; the right driveshield is similar.

1. Position driveshield (A) onto pins (B) at the base of the driveshield.

#### **NOTE:**

R1 SP for windrowers is shown in the illustration; R1 FR is similar.

2. Push the driveshield so that latch (C) is engaged.
3. Check that driveshield (A) is properly secured.

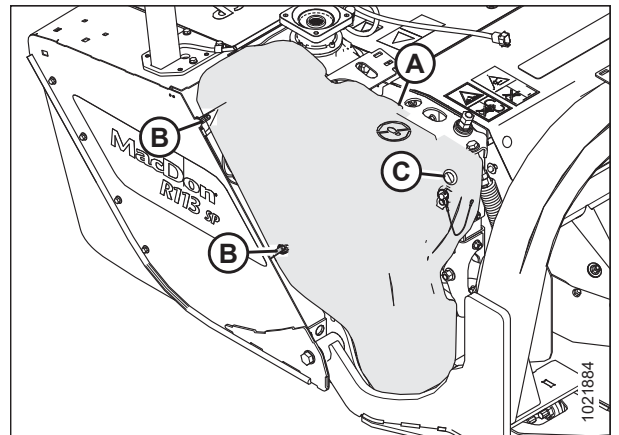


Figure 4.167: Driveshield and Latch

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

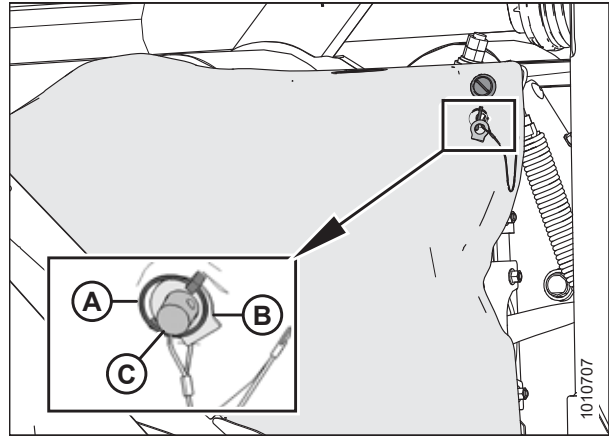


Figure 4.168: Tool to Unlock Driveshield

### Replacing Driveshield Latch

The driveshield is an important safety component. If the latch is not holding the driveshield securely, it will need to be replaced.



### WARNING

To reduce the risk of personal injury, do NOT operate the machine without the driveshields in place and secured.

### NOTE:

The illustrations shown depict the left driveshield; the right driveshield is similar.

1. Remove the driveshield. For instructions, refer to [Removing Driveshields, page 157](#).
2. Remove and retain hex nut and flat washer (A) securing the latch to the backside of the driveshield.
3. Remove the latch and replace it with the new part.
4. Reinstall retained hex nut and flat washer (A).

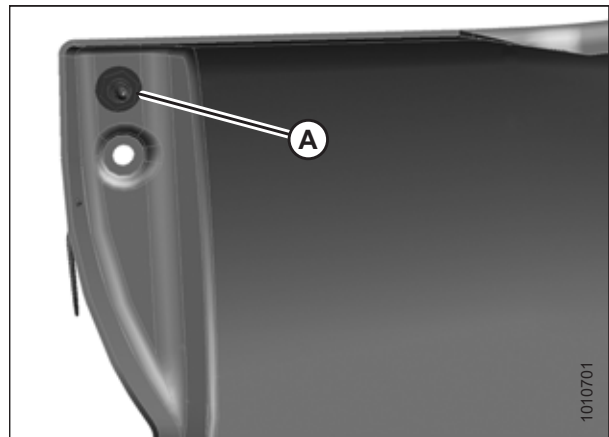


Figure 4.169: Backside of Driveshield



5. Remove two carriage bolts (A), replace stud and clip assembly (B) if it is worn or damaged, and reinstall the carriage bolts.

**NOTE:**

R1 Pull-Type is shown in the illustration; R1 FR is similar.

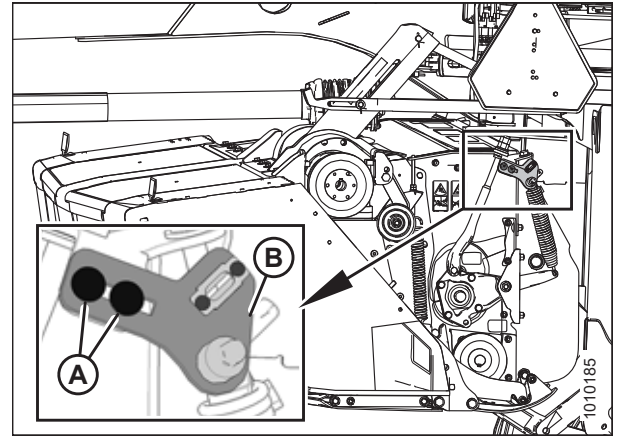


Figure 4.170: Stud and Clip Assembly

6. Reinstall the driveshield. For instructions, refer to *Installing Driveshields*, page 159.

## 4.5.2 Driveline Guards

Guards protect the U-joints from dirt, dust, and debris.

### *Removing Driveline Guards*

Driveline guards protect components from dirt and debris, and protect operators from moving components. Driveline guards need to be removed before drivelines can be serviced or removed.

#### **DANGER**

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

#### **WARNING**

Do NOT operate the machine without the driveline guards in place and securely fastened.

Driveline guards protect both ends of the cross driveline and the primary driveline. To remove the driveline guards, follow these steps:

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

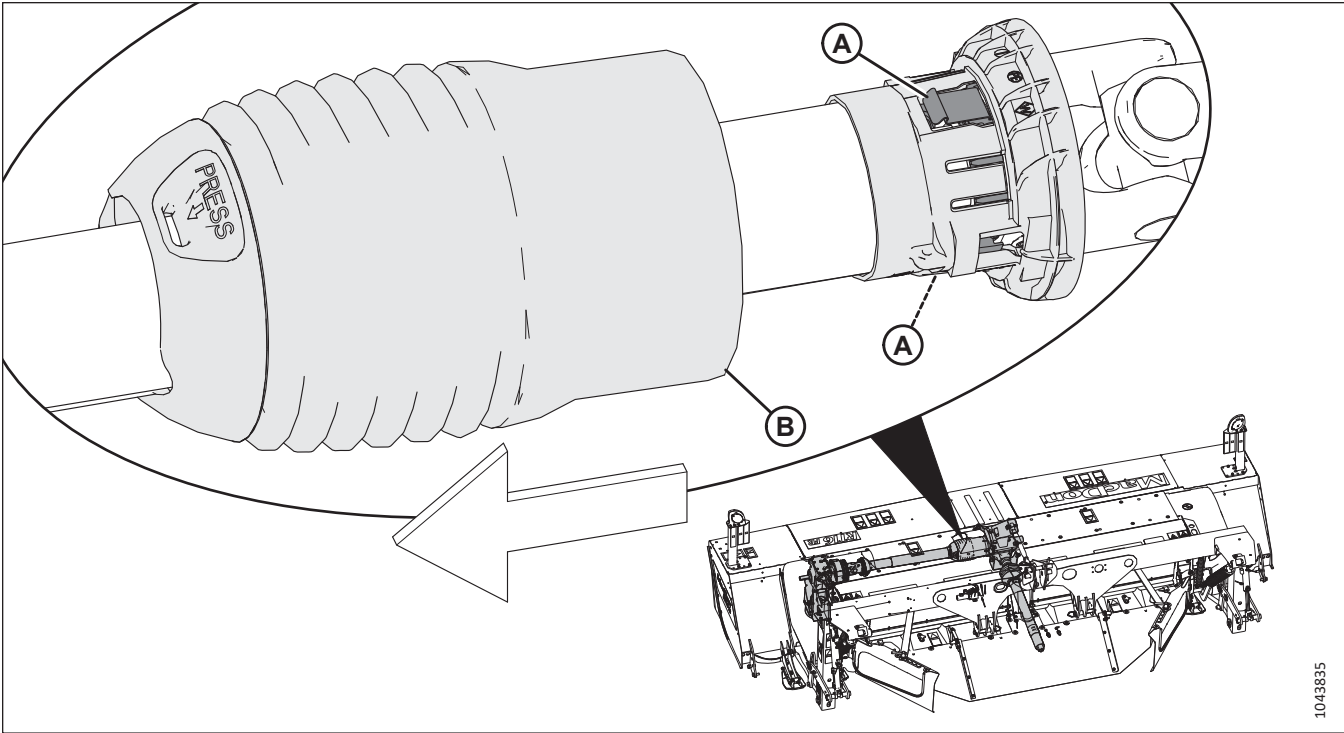


Figure 4.171: Driveline Guards

3. To remove driveline guards, press clips (A) on either side of the guard while pulling guard (B) backward on the driveline shaft.

### *Installing Driveline Guards*

Driveline guards protect components from dirt and debris, and protect operators from moving components. Driveline guards must be installed before operating the machine.

### **⚠ DANGER**

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

### **⚠ WARNING**

Do NOT operate the machine without the driveline guards in place and securely fastened.

Driveline guards protect both ends of the cross driveline and the primary driveline. To install the driveline guards, follow these steps:

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

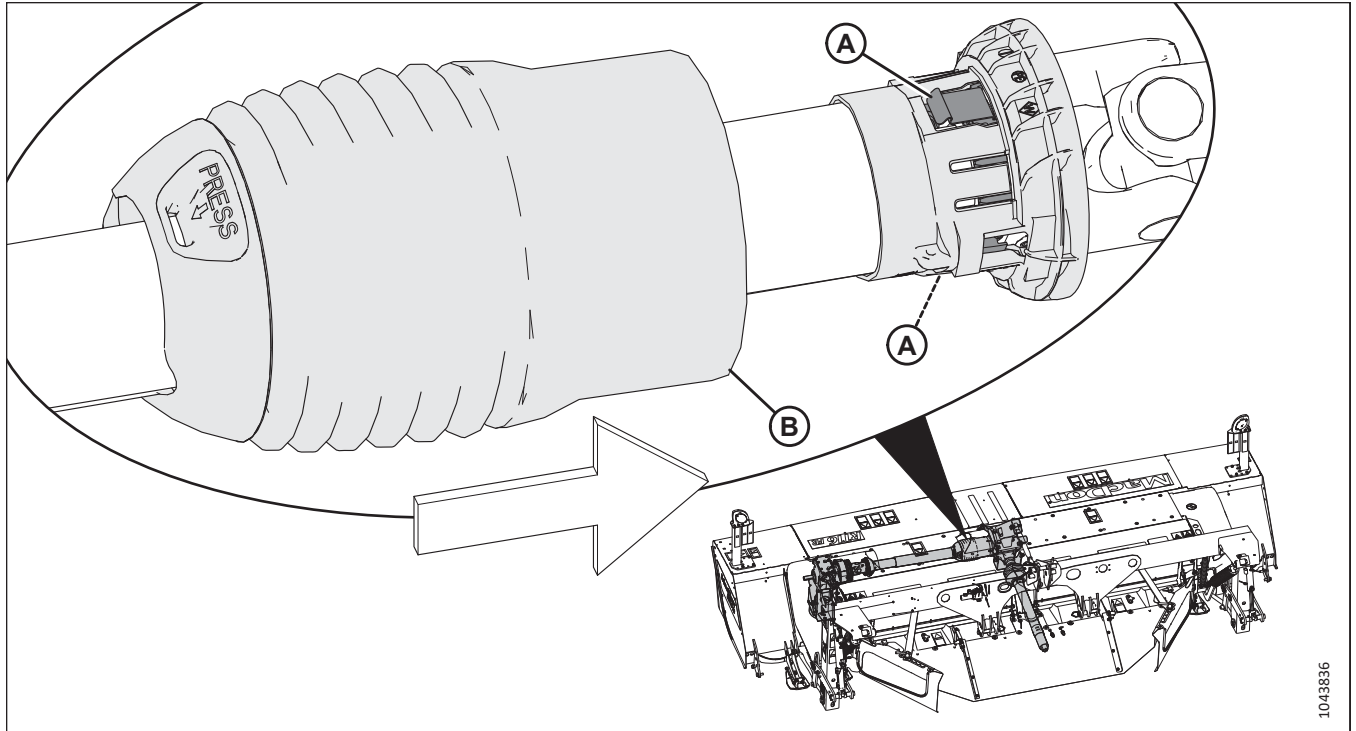


Figure 4.172: Driveline Guard

3. Slide guard (B) toward the driveline ring until both spring clips (A) lock both sides of the guard in place on the driveline shaft.

**IMPORTANT:**

If installing a replacement guard, ensure chain is short enough and does **NOT** wrap around the driveline guard.

### 4.5.3 Primary Driveline

The primary driveline transfers power from the tractor's power take-off (PTO) to the header drive gearbox.

Follow regular lubrication procedures and ensure all drivelines are installed as instructed. For instructions, refer to [4.3.1 Maintenance Schedule/Record, page 60](#).

#### *Removing Primary Driveline*

The primary driveline transfers power from the tractor's power take-off (PTO) to the header drive gearbox. These instructions describe the procedure for removing the driveline.

**⚠ DANGER**

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

**⚠ WARNING**

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

1. Shut down the engine, and remove the key from the ignition.
2. Unhook the header from the tractor. For instructions, refer to [3.8.1 Disconnecting the Tractor from Front Mount Rotary Disc, page 28](#).

## MAINTENANCE AND SERVICING

3. Open the cutterbar doors. For instructions, refer to [3.4.1 Opening Cutterbar Doors, page 21](#).
4. Disconnect driveline chain (A) from the header frame.
5. Remove the driveline guard. For instructions, refer to [Removing Driveline Guards, page 161](#).

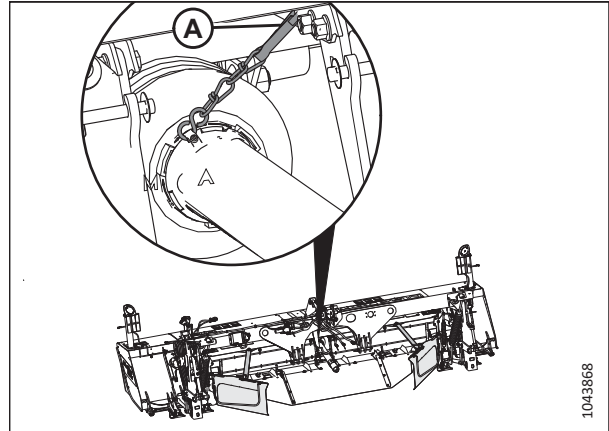


Figure 4.173: Primary Driveline

6. At the inboard end of primary driveline (A), pull back collar (B) while pulling driveline away from the splined shaft of the header drive gearbox.

**NOTE:**

The cutterbar and the drive gearbox support bracket are shown transparent in the illustration.

7. Lower primary driveline down and remove it from below the header.

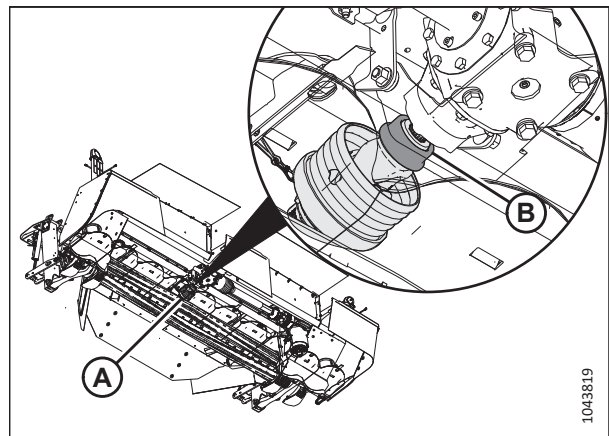


Figure 4.174: Primary Driveline – Viewed Below Header

### Installing Primary Driveline

The primary driveline transfers power from the tractor's power take-off (PTO) to the header drive gearbox. These instructions describe the procedure for installing the driveline.

**⚠ DANGER**

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

**⚠ WARNING**

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

This procedure is continued from [Removing Primary Driveline, page 163](#) and assumes the header is lowered to the ground and disconnected from the tractor.

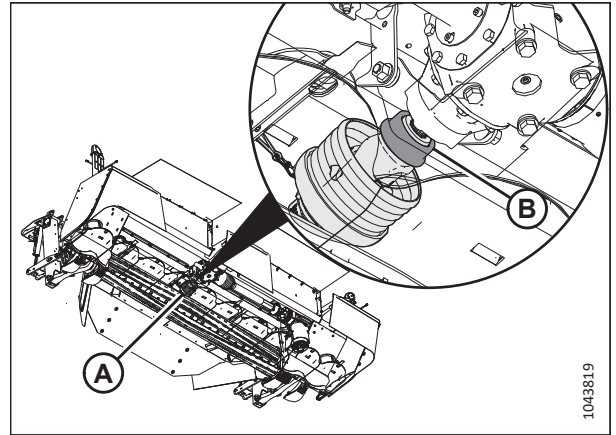
## MAINTENANCE AND SERVICING

1. Open the cutterbar doors. For instructions, refer to [3.4.1 Opening Cutterbar Doors, page 21](#).
2. From below the header, install primary driveline (A) onto the splined shaft of the header drive gearbox until collar (B) locks onto the shaft.

**NOTE:**

The cutterbar and the drive gearbox support bracket are shown transparent in the illustration.

3. Install the driveline guard. For instructions, refer to [Installing Driveline Guards, page 162](#).

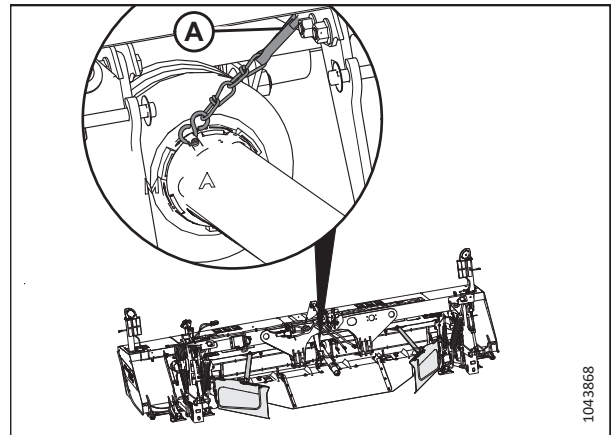


**Figure 4.175: Primary Driveline – View from Below Header**

4. Reconnect driveline chain (A) to the header frame.

**IMPORTANT:**

Ensure chain is short enough and does **NOT** wrap around the driveline guard.



**Figure 4.176: Primary Driveline Chain**

### 4.5.4 Cross Driveline

The cross driveline transfers power from the tractor's power take-off (PTO) to the cutterbar-conditioner drive gearbox (T-gearbox).

Follow the regular lubrication schedule for cross driveline (A).  
For instructions, refer to [4.3.5 Lubrication, page 64](#).

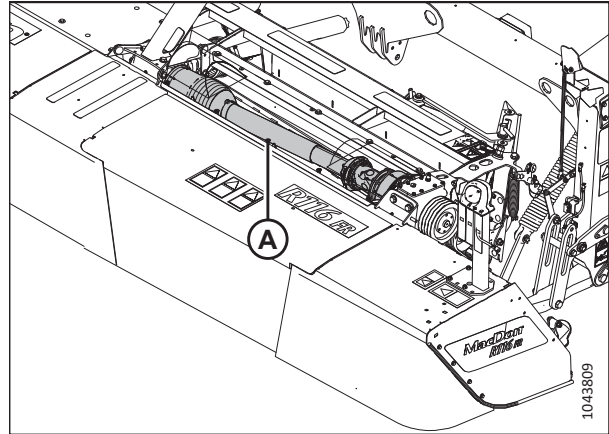


Figure 4.177: Cross Driveline

#### Removing Cross Driveline

The cross driveline transfers power from the tractor's power take-off (PTO) to the cutterbar-conditioner drive gearbox (T-gearbox).

#### DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Remove 10 bolts (B) securing top shield (A) and remove top shield to access the cross driveline. Retain bolts for installation.
3. Remove the driveline guards. For instructions, refer to [Removing Driveline Guards, page 161](#).

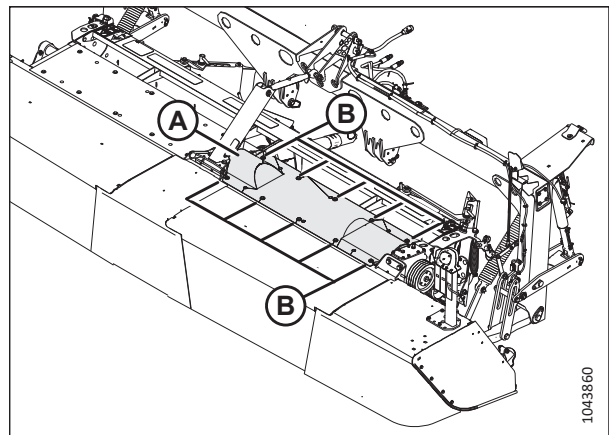
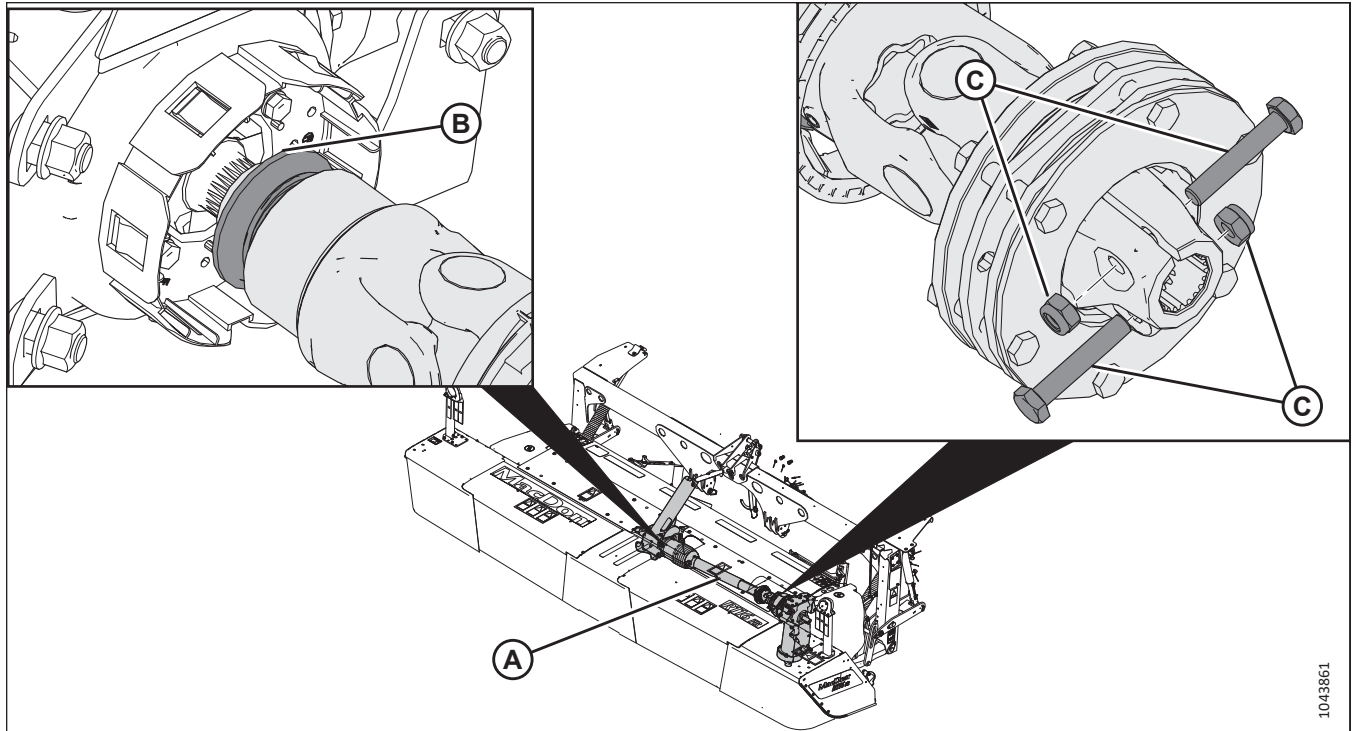


Figure 4.178: Top Shield – Left Side



**Figure 4.179: Cross Driveline**

4. At the inboard end of cross driveline (A), pull back collar (B) while pulling driveline away from the splined shaft of the header drive gearbox.
5. At the outboard end of cross driveline (A), remove nuts (C) and bolts securing the driveline to the splined shaft of the cutterbar/conditioner drive gearbox. Retain nuts and bolts for installation.
6. Remove the cross driveline.

### *Installing Cross Driveline*

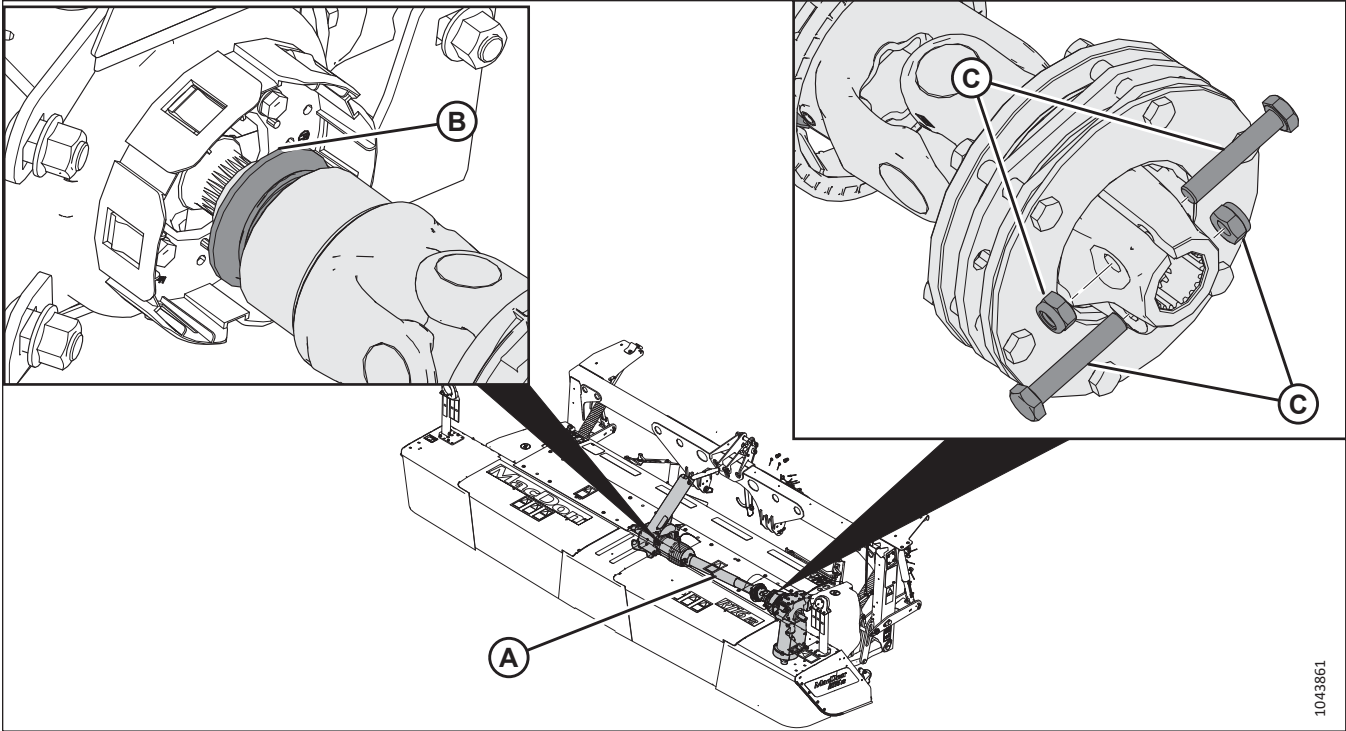
The cross driveline transfers power from the tractor's power take-off (PTO) to the cutterbar-conditioner drive gearbox (T-gearbox).

### **! DANGER**

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

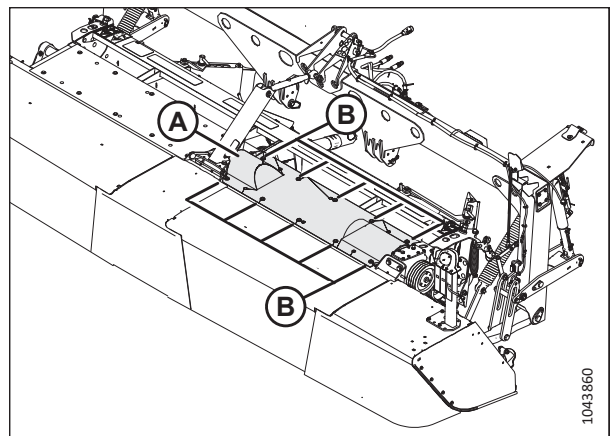
1. Shut down the engine, and remove the key from the ignition.





**Figure 4.180: Cross Driveline**

2. At the outboard end of cross driveline (A), install the driveline onto the splined shaft of the cutterbar/conditioner drive gearbox.
3. Secure the driveline to the splined shaft with existing nuts and bolts (C) configured as shown in [4.180, page 168](#). Torque the nuts to 88 Nm (65 lbf-ft).
4. At the inboard end of cross driveline (A), install the driveline onto the splined shaft of the gearbox until collar (B) engages the shaft.
5. Install the driveline guards. For instructions, refer to [Installing Driveline Guards, page 162](#).
6. Install top shield (A) and secure with 10 bolts (B).



**Figure 4.181: Top Shield – Left Side**



### 4.5.5 Conditioner Drive Belt

The conditioner drive belt is located inside the left driveshield and is tensioned with a spring tensioner. The tension is factory-set and should not require adjustment.

#### *Inspecting Conditioner Drive Belt*

The belt tension must be checked and inspected for damage or wear according to the intervals specified.

#### **DANGER**

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

#### **DANGER**

Ensure that all bystanders have cleared the area.

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Open the left driveshield. For instructions, refer to [3.3.1 Opening Driveshields, page 18](#).
4. Inspect drive belt (A). Replace it if it is torn or cracked.
5. Check that jam nut (B) and adjuster nut (C) are tight.

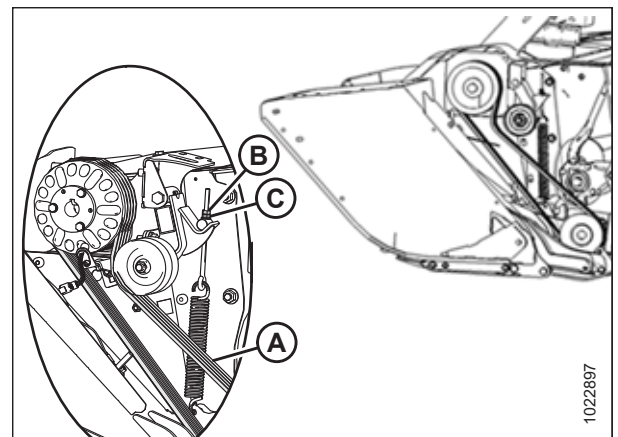


Figure 4.182: Conditioner Drive

6. Measure the length of spring (A). Spring length (B) should be 366 mm (14 3/8 in.) in accordance with spring tension decal (C). If the spring length requires adjustment, refer to the instructions in [Installing Conditioner Drive Belt, page 170](#).
7. Close the driveshield. For instructions, refer to [3.3.2 Closing Driveshields, page 20](#).

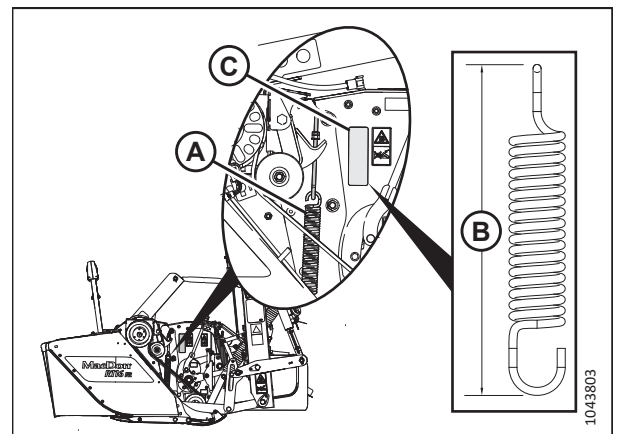


Figure 4.183: Belt Tensioner Spring

### Removing Conditioner Drive Belt

Removing the conditioner belt drive that transfers power to the conditioner.

#### DANGER

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

#### DANGER

Ensure that all bystanders have cleared the area.

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Remove the left driveshield. For instructions, refer to [Removing Driveshields, page 157](#).
4. Turn jam nut (A) counterclockwise to unlock the tension adjuster.
5. Turn jam nut (A) and adjuster nut (B) counterclockwise to fully collapse tensioner spring (C) and release the tension from conditioner drive belt (D).
6. Remove drive belt (D).

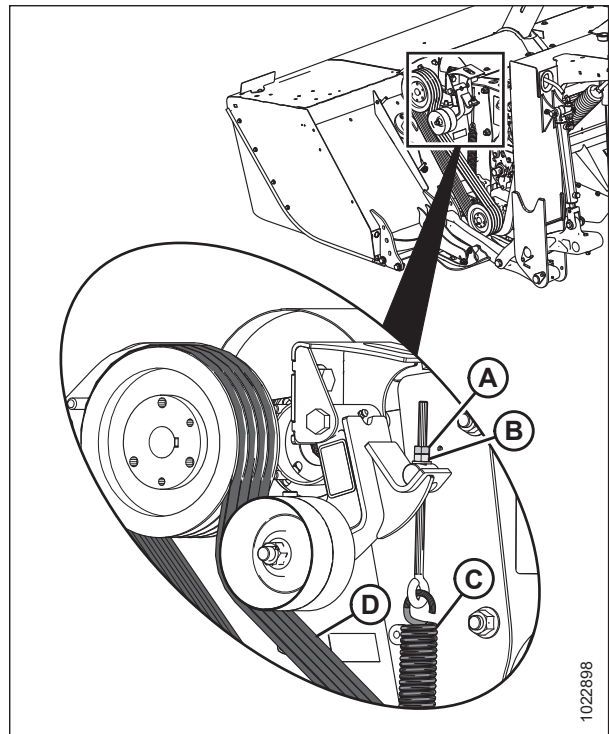


Figure 4.184: Conditioner Drive

### Installing Conditioner Drive Belt

Installing the conditioner belt drive that transfers power to the conditioner.

#### 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

Ensure that all bystanders have cleared the area.

## MAINTENANCE AND SERVICING

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Remove the left driveshield. For instructions, refer to [Removing Driveshields, page 157](#).
4. Install drive belt (A) onto driven pulley (C), and then onto drive pulley (B). Ensure the belt is in the pulley grooves.

**NOTE:**

If it is necessary, loosen the jam nut and adjuster nut (D) to relieve spring tension.

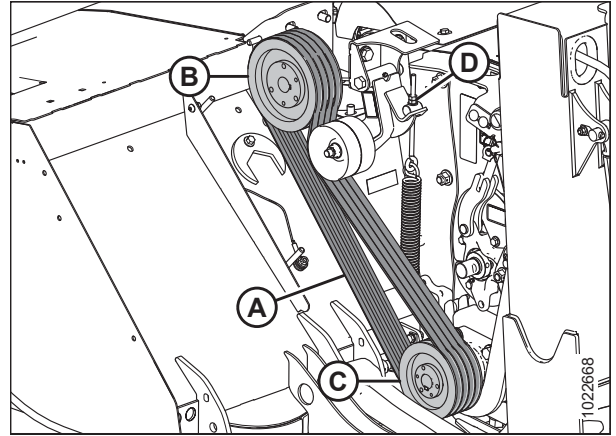


Figure 4.185: Conditioner Drive

5. Measure the length of tensioner spring (A), and adjust spring length to 366 mm (14 3/8 in.) to match spring tension decal (B).
- NOTE:**  
R1 Pull-Type shown in the illustration; R1 FR similar.
6. Increase the spring length (tension) by turning adjuster nut (D) clockwise.
  7. Once the correct spring measurement has been achieved, hold adjuster nut (D) and tighten jam nut (C) against it.

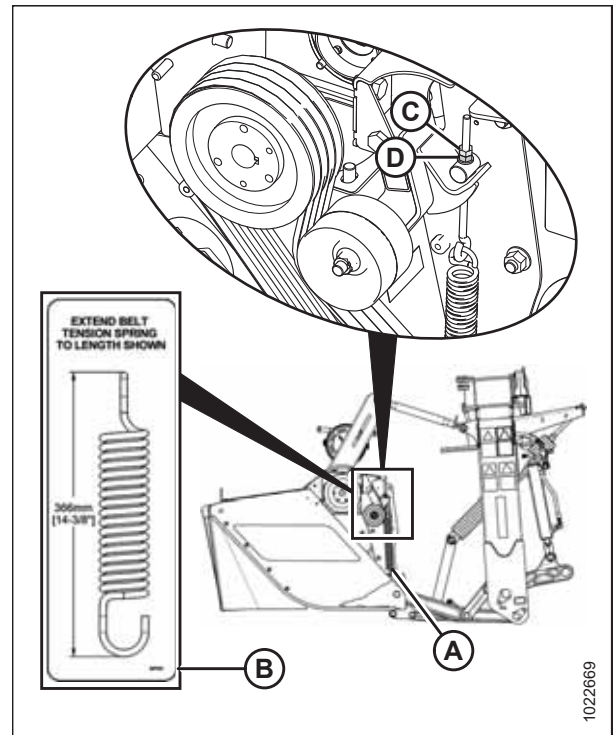


Figure 4.186: Spring Tension Decal

8. Install the left driveshield. For instructions, refer to [Installing Driveshields, page 159](#).

## 4.5.6 Conditioner System

The conditioner system crimps and crushes crop stems, helping crop dry faster.

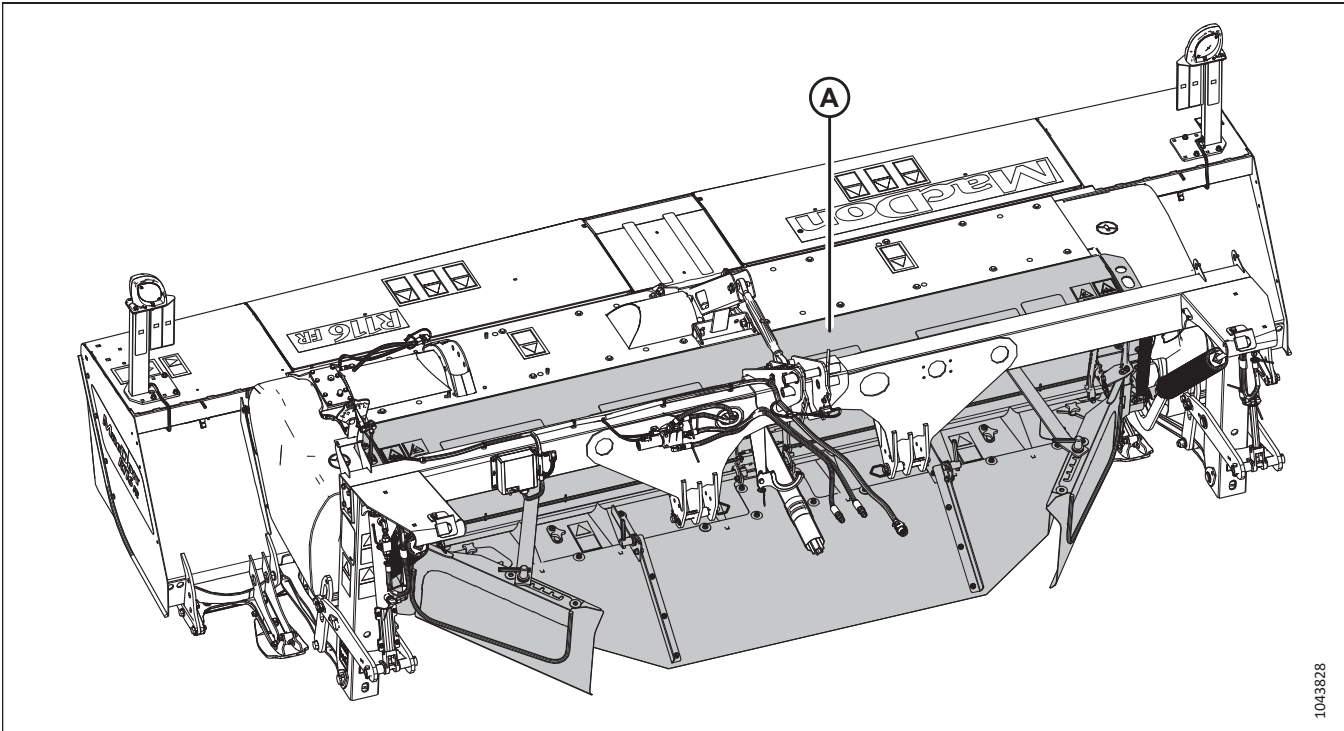


Figure 4.187: R1 FR Series Rotary Disc

A — Roll Conditioner System

### *Inspecting Roll Conditioner*

The conditioner bearings, U-joints, and roll timing gearbox should be inspected periodically for signs of wear or damage.

#### **⚠ DANGER**

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, stop the engine, remove the key from the ignition, and engage the lift cylinder lock-out valves before going under the machine.

#### **⚠ WARNING**

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

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Remove the left and right driveshields. For instructions, refer to [Removing Driveshields, page 157](#).

## MAINTENANCE AND SERVICING

4. Inspect conditioner roll left bearing (A) for signs of wear or damage. If the bearing needs replacing, contact your MacDon Dealer.

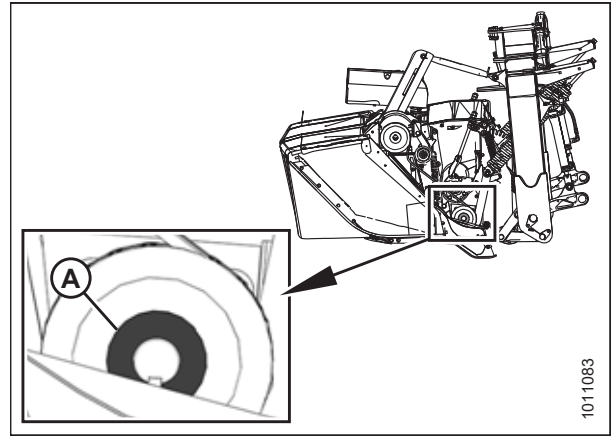


Figure 4.188: Conditioner Roll Left Bearing

5. Inspect conditioner drive U-joints (A) for signs of wear or damage. If the U-joints need replacing, contact your MacDon Dealer.

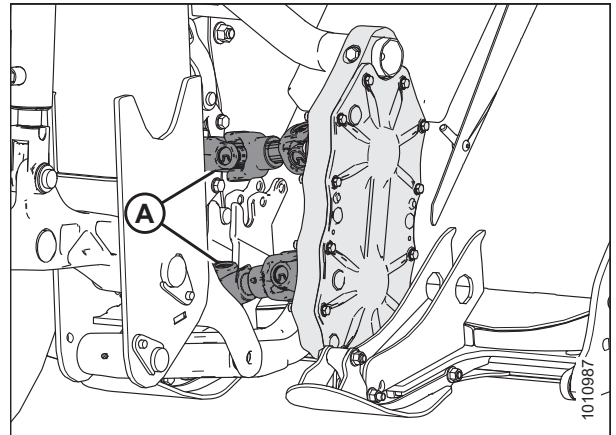


Figure 4.189: Conditioner Drive U-Joints

6. Inspect roll timing gearbox bearings (A) for signs of wear or damage. If the bearings need replacing, contact your MacDon Dealer.

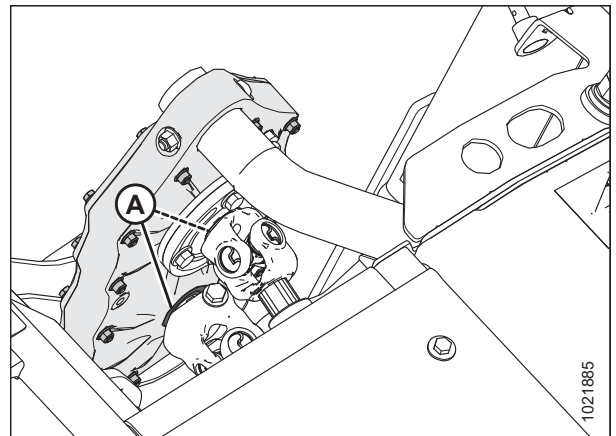


Figure 4.190: Roll Timing Gearbox Bearings

### 4.5.7 Conditioner Roll Timing Gearbox

The conditioner roll timing gearbox transfers power from the gearbox-driven lower roll to the upper roll.

Conditioner roll timing gearbox (A) is located inside the drive compartment at the right of the header.

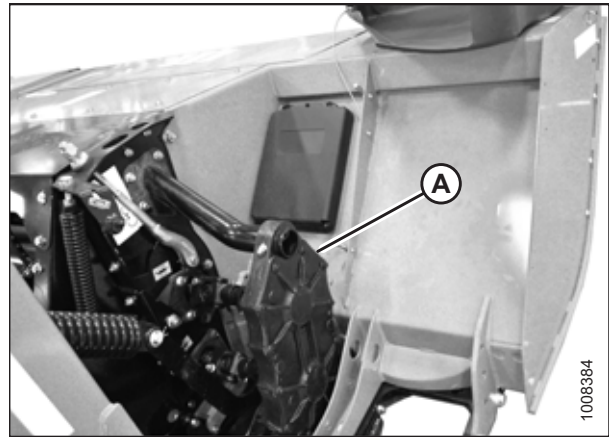


Figure 4.191: Conditioner Roll Timing Gearbox

#### *Checking and Changing Lubricant in Conditioner Roll Timing Gearbox*

The lubricant in the conditioner roll timing gearbox must be serviced regularly to ensure performance.

#### **!** DANGER

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

#### **!** DANGER

Ensure that all bystanders have cleared the area.

For information on oil change intervals, refer to [4.3.1 Maintenance Schedule/Record, page 60](#).

#### **IMPORTANT:**

Check the gearbox lubricant level when the lubricant is warm. If the lubricant is cold, idle the machine for approximately 10 minutes prior to checking the lubricant level.

1. Adjust the header angle (tilt) so that the top of the conditioner is parallel with the ground.

#### **NOTE:**

To help ensure an accurate lubricant level reading for the conditioner roll timing gearbox, set the header's skid shoes in the fully raised position. For instructions, refer to [Adjusting Cutting Height, page 38](#).

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

## MAINTENANCE AND SERVICING

4. Open right driveshield (A). For instructions, refer to [3.3.1 Opening Driveshields](#), page 18.

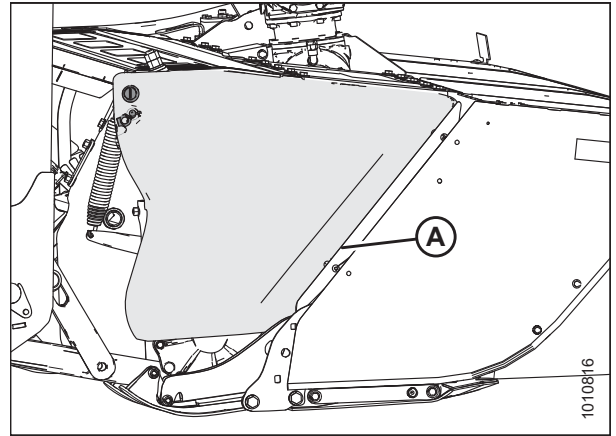


Figure 4.192: Right Driveshield

### **Checking the conditioner roll timing gearbox lubricant level:**

5. Clean any dirt from around lubricant level sight glass (A) on the outboard side of the gearbox.

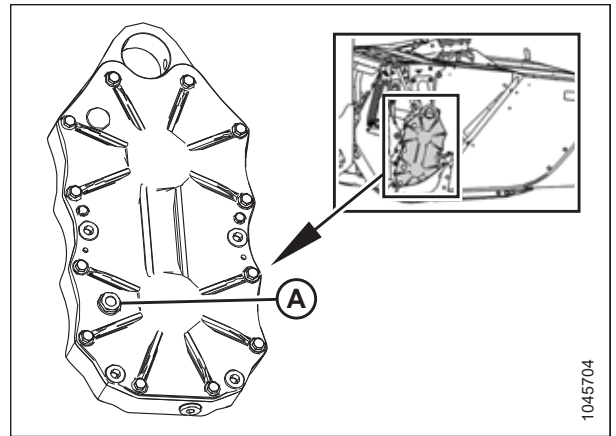


Figure 4.193: Roll Timing Gearbox

6. Clean any dirt from around lubricant breather (A) on the inboard side of the gearbox.
7. Ensure that the lubricant is level at the top of the sight glass. If necessary, add lubricant through breather (B).
8. Add lubricant to the gearbox if necessary. Refer to this manual's inside back cover for a list of recommended fluids, lubricants, and capacities.

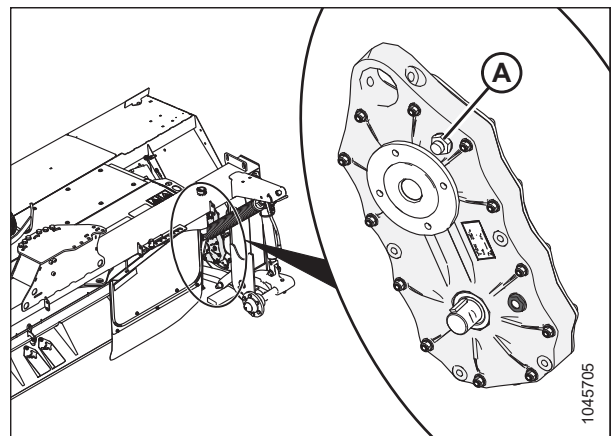


Figure 4.194: Roll Timing Gearbox



*Changing the conditioner roll timing gearbox lubricant:*

**⚠ DANGER**

To prevent injury or death from the unexpected start-up or fall of a raised machine, always stop the engine and remove the key from the ignition before leaving the operator's seat or making adjustments to the machine. If the rotary disc header is raised, always close the lock-out valves, and place blocks under the header. Never work on or beneath an unsupported header.

9. Raise the header to provide sufficient access to lubricant drain plug (A).
10. Shut down the engine, and remove the key from the ignition.
11. Shut down the engine, and remove the key from the ignition.
12. Close the cylinder lock-out valve on each auxiliary lift cylinder by turning the handle to the closed position (the valve handle should be perpendicular to the hose). For instructions, refer to [3.2.1 Locking and Unlocking Auxiliary Lift Cylinders, page 17](#).
13. Clean around lubricant drain plug (A) on the bottom of the gearbox and around lubricant level plug on the inboard side of the gearbox.
14. Place a 1 liter (1.05 qts [US]) container underneath the conditioner gearbox.
15. Remove lubricant drain plug (A) using a hex key.
16. Let the lubricant drain.
17. Replace lubricant drain plug (A) and tighten it.
18. Fill the gearbox with the volume of lubricant specified on the inside back cover of this manual or until the lubricant is visible in sight glass (B).
19. Properly dispose of the old lubricant.

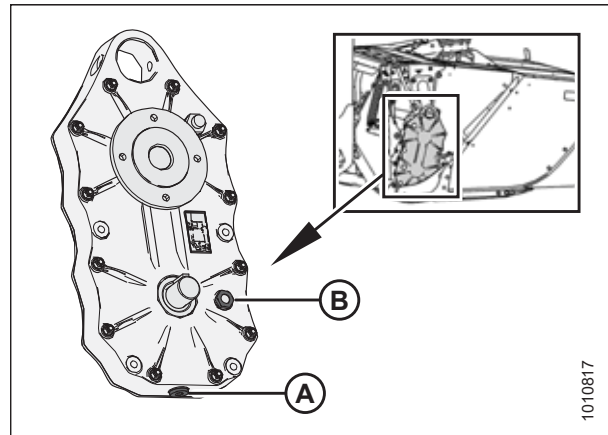


Figure 4.195: Roll Timing Gearbox

1010817



### 4.5.8 Header Drive Gearbox

The header drive gearbox transfers power from the tractors PTO to the cutterbar/conditioner drive gearbox.

The header drive gearbox (A) is located in the center of the machine and receives power from the tractor's PTO via the primary driveline.

**NOTE:**

If the gearbox requires repair, contact your MacDon dealer. For service intervals, refer to [4.3.1 Maintenance Schedule/Record, page 60](#).

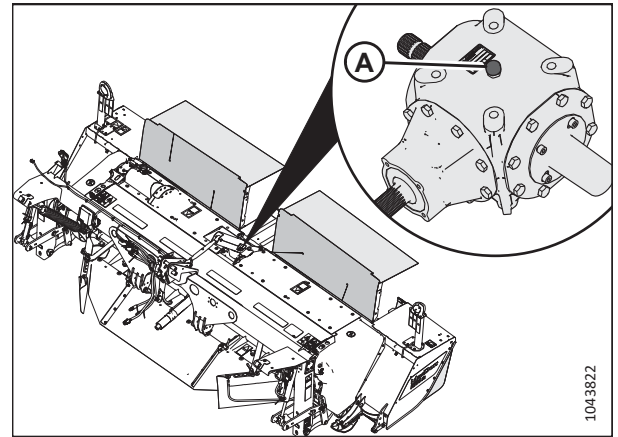


Figure 4.196: Header Drive Gearbox

#### *Checking and Adding Lubricant – Header Drive Gearbox*

The header drive gearbox will need lubricant checks according to the Maintenance Schedule. Follow this procedure for checking and added lubricant.

**⚠ DANGER**

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

**⚠ DANGER**

Ensure that all bystanders have cleared the area.

**⚠ WARNING**

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

1. Park the machine on a flat, level surface.
2. Lower the header fully.
3. Adjust the header so gearbox is level to ensure accurate oil level readings.
4. Shut down the engine, and remove the key from the ignition.
5. Open the cutterbar doors. For instructions, refer to [3.4.1 Opening Cutterbar Doors, page 21](#).

## MAINTENANCE AND SERVICING

6. Clean around check plug (A) on the forward facing side of the gearbox.
7. Remove (lower) check plug (A). Lubricant should be level with or slightly dripping from the check port.
8. Install check plug and tighten. If lubricant level is low, proceed to the next step.

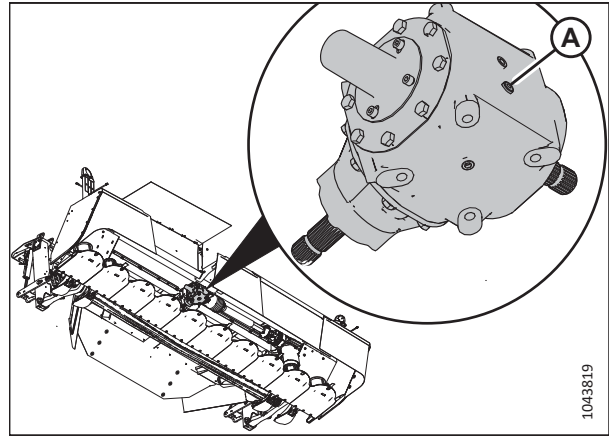


Figure 4.197: Drive Gearbox – Viewed from Below

9. Clean around breather port (A) on the top facing side of the gearbox.
10. Use a 22 mm socket to remove the breather (A) and add lubricant into the breather port.

### NOTE:

Refer to the inside back cover for lubrication specifications.

11. Repeat Step 7, page 178 to Step 8, page 178 until lubricant drips slightly from the check port.
12. Reinstall breather into the top of the gearbox.
13. Clean up spilled lubricant.

### IMPORTANT:

Ensure no objects or tools are left on the cutterbar.

14. Close the cutterbar doors. For instructions, refer to [3.4.2 Closing Cutterbar Doors, page 21](#).

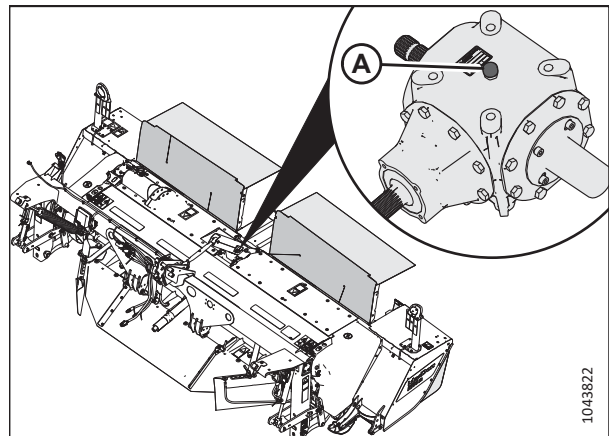


Figure 4.198: Drive Gearbox – Viewed from Above

### Draining Lubricant – Header Drive Gearbox

The header drive gearbox lubricant will need to be changed according to the Maintenance Schedule. Follow this procedure to drain the lubricant from the header drive gearbox.

### DANGER

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

### DANGER

Ensure that all bystanders have cleared the area.

### WARNING

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

### IMPORTANT:

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

1. Park the machine on a flat, level surface.
2. Lower the header fully.
3. Adjust the header so gearbox is level.
4. Shut down the engine, and remove the key from the ignition.
5. Open the cutterbar doors. For instructions, refer to [3.4.1 Opening Cutterbar Doors, page 21](#).
6. Clean around drain plug (A) on the bottom facing side of the gearbox.
7. Place a 2 liter (2.11 qts [US]) container under drain plug (A).
8. Remove drain plug (A).
9. When lubricant has drained completely, reinstall the drain plug and add lubricant to the gearbox.

### NOTE:

For lubricant specifications, refer to the inside back cover of this manual.

10. Clean up spilled lubricant.

### IMPORTANT:

Ensure no objects or tools are left on the cutterbar.

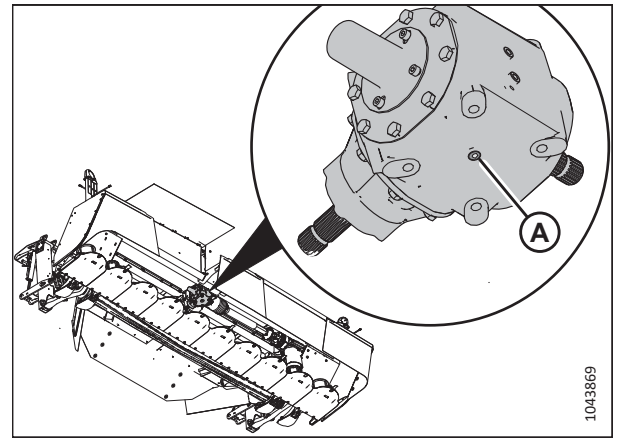


Figure 4.199: Drive Gearbox – Viewed from Below

### 4.5.9 Cutterbar / Conditioner Drive Gearbox

The cutterbar/conditioner drive gearbox transfers power from the header drive gearbox to the conditioner and cutterbar.

The cutterbar-conditioner drive gearbox (A), located inside the drive compartment on the left side of the header, transfers power from the header drive gearbox to the conditioner and cutterbar.

### NOTE:

If the gearbox requires repair, contact your MacDon Dealer. For service intervals, refer to [4.3.1 Maintenance Schedule/Record, page 60](#).

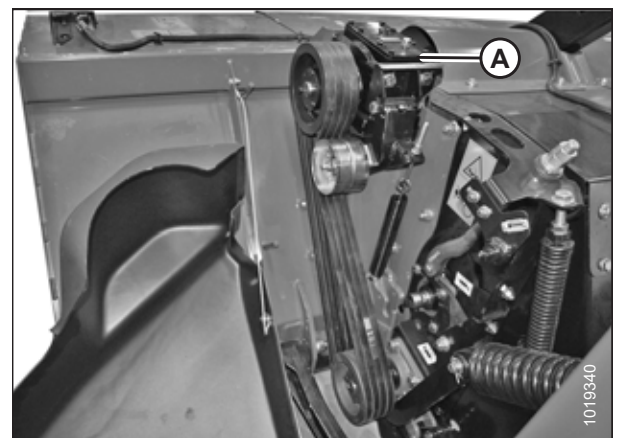


Figure 4.200: Left Drive Compartment

*Checking and Adding Lubricant – Cutterbar / Conditioner Drive Gearbox*

The cutterbar/conditioner drive gearbox is located inside the drive compartment at the left side of the header.

**⚠ 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**

Ensure that all bystanders have cleared the area.

1. Lower the header onto level ground.
2. Shut down the engine, and remove the key from the ignition.
3. **New gearboxes or gearboxes after an oil change:** To ensure that the gearbox oil level is accurate, rotate cutterbar drum (A) a few turns. This will allow the oil to run into all gearbox cavities, such as the bottom bearings.

**NOTE:**

A new gearbox is a gearbox that has been filled with oil for the first time, but has not been operated yet.

4. Clean the area around dipstick (B).
5. Remove dipstick using a 22 mm socket.
6. Ensure the lubricant level is to the full line on the dipstick.
7. If necessary, add gear lubricant through dipstick hole (B). Refer to the manual’s inside back cover for lubricant information.
8. Reinstall the dipstick and tighten it.

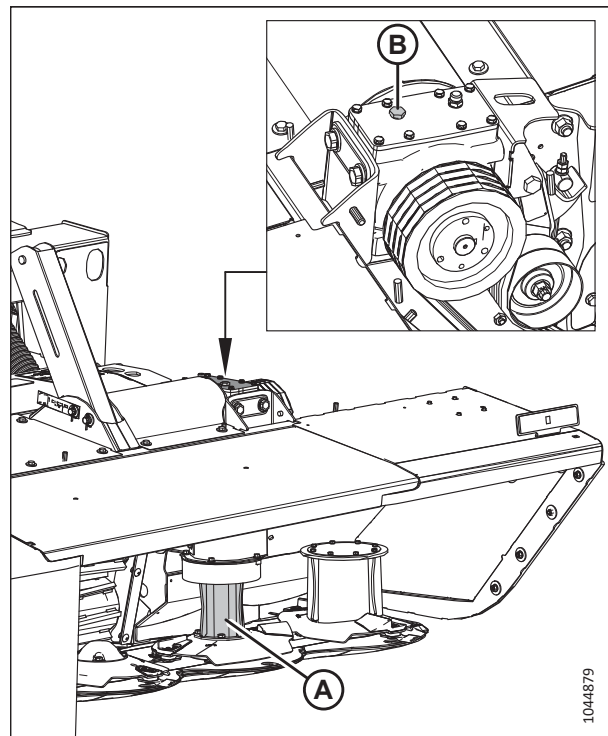


Figure 4.201: Left Side of Rotary Header

*Draining Lubricant from Cutterbar – Conditioner Drive Gearbox (T-Gearbox)*

The cutterbar/conditioner drive gearbox is located inside the drive compartment at the left side of the rotary disc pull-type.

**⚠ DANGER**

To prevent bodily injury or death from the unexpected startup of the machine, always stop the engine and remove the key from the ignition before leaving the operator’s seat.

**⚠ DANGER**

Ensure that all bystanders have cleared the area.

## MAINTENANCE AND SERVICING

### IMPORTANT:

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

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Open the cutterbar doors. For instructions, refer to [3.4.1 Opening Cutterbar Doors, page 21](#).
4. Remove four M10 hex flange head bolts (A) and vertical driveshield (B).

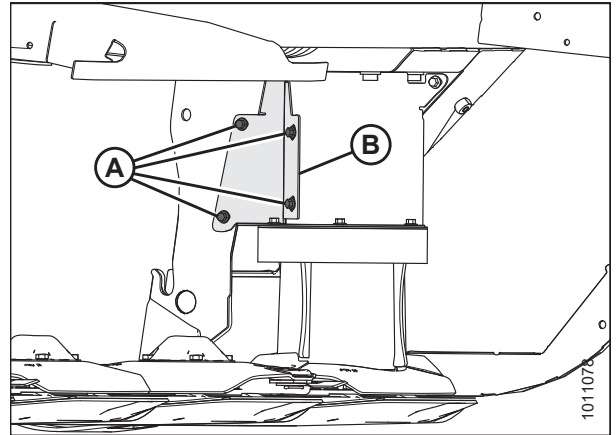


Figure 4.202: Vertical Driveshield

5. Remove two M10 hex flange head bolts (A) and cover plate (B).

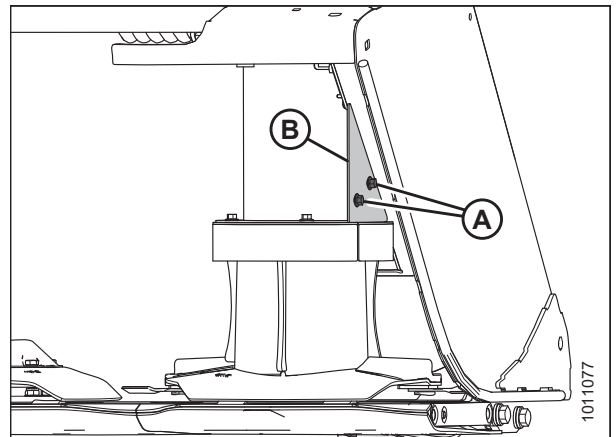


Figure 4.203: Cover Plate

## MAINTENANCE AND SERVICING

- Remove four M10 hex flange head bolts (A), top plate (B), and drum top (C).

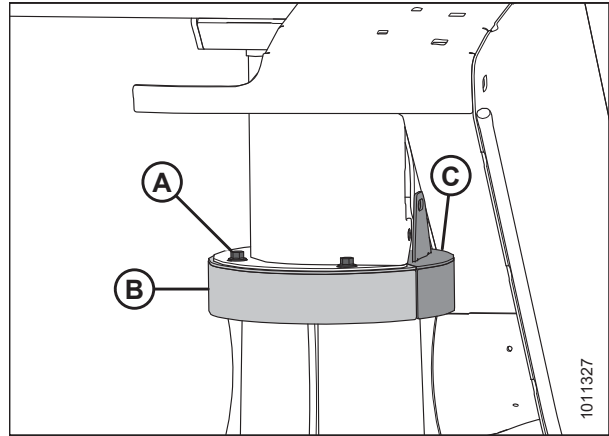


Figure 4.204: Top Plate and Drum Top

- Remove M10 hex flange head bolt (A) and vertical shield (B).

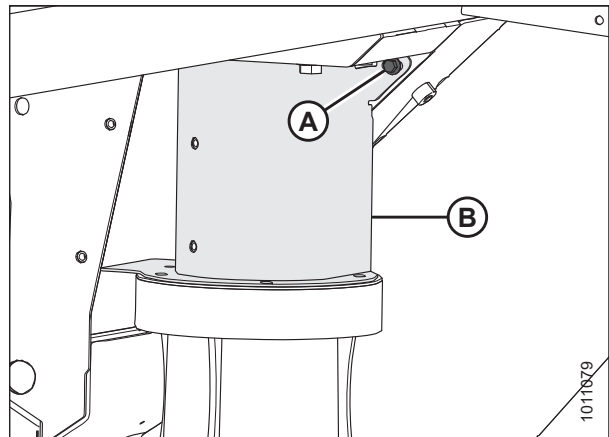


Figure 4.205: Vertical Shield

- Place a 2 liter (2.11 qts [US]) container under drain plug (A). Remove the plug using a 17 mm socket.
- Let the lubricant drain, replace drain plug (A), then tighten it.
- Properly dispose of the used lubricant.

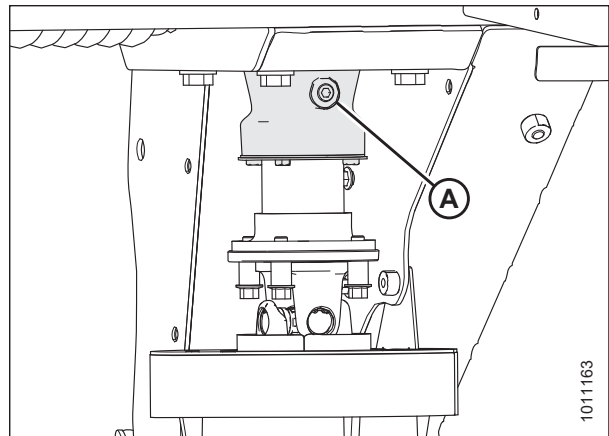


Figure 4.206: Drain Plug

## MAINTENANCE AND SERVICING

11. Position vertical shield (B) as shown, and install an M10 hex flange head bolt (A).

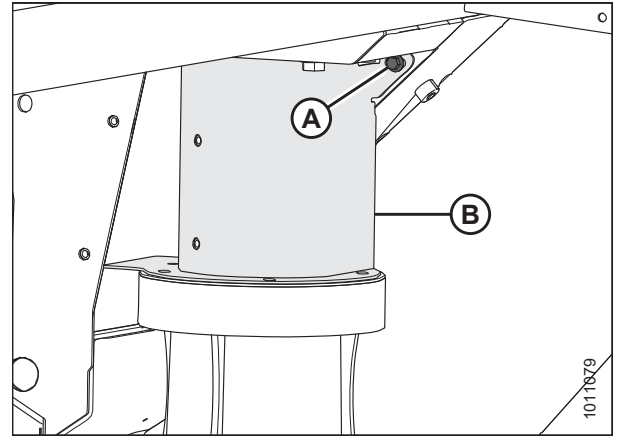


Figure 4.207: Vertical Shield

12. Position top plate (B) and drum top (C) onto the drum as shown, and secure it with four M10 hex flange head bolts (A).

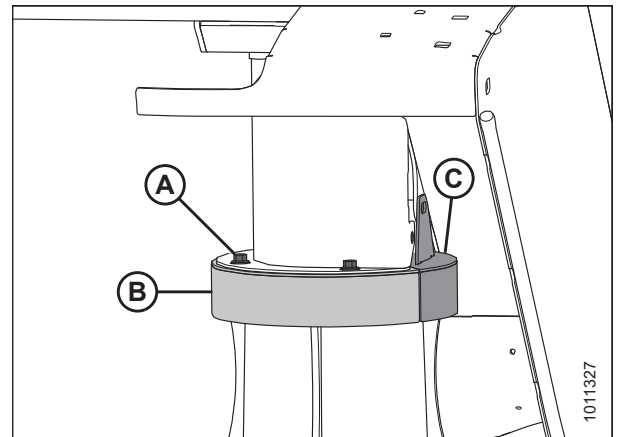


Figure 4.208: Top Plate and Drum Top

## MAINTENANCE AND SERVICING

13. Install top M10 hex flange head bolt (B) through cover plate (A) and top plate (C).
14. Install lower M10 hex flange head bolt (D) through cover plate (A) and vertical shield (E).
15. Tighten bolts (B) and (D).

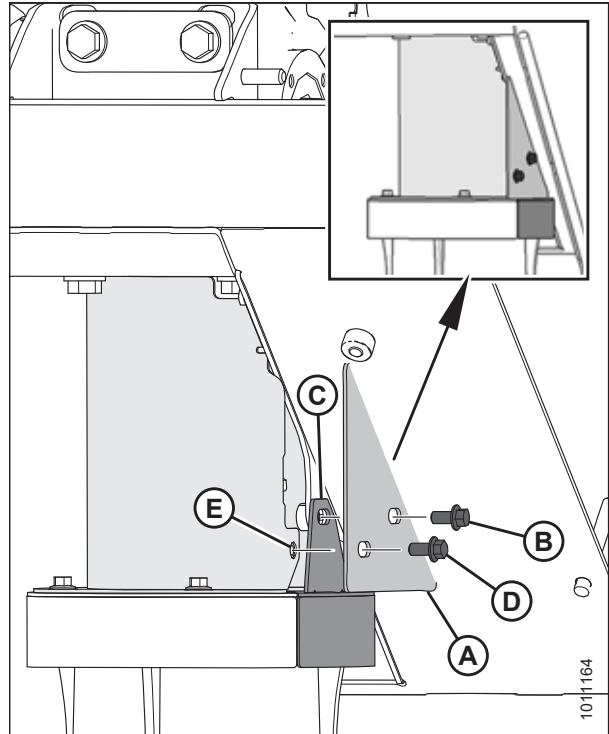


Figure 4.209: Cover Plate and Vertical Drive Shield

16. Install vertical driveshield (B) using four M10 hex flange head bolts (A).



### WARNING

Ensure that the cutterbar is completely clear of foreign objects. Foreign objects can be ejected with considerable force when the machine is started, which can result in serious injury or cause damage to the machine.

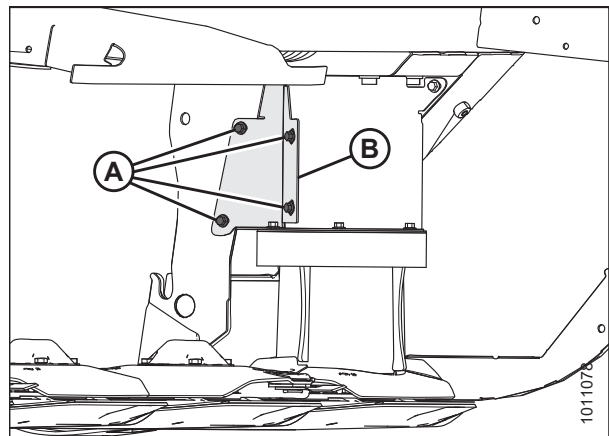


Figure 4.210: Vertical Driveshield

17. Close the cutterbar doors. For instructions, refer to [3.4.2 Closing Cutterbar Doors, page 21](#).



## 4.6 Hydraulics

Consult this section for general information on the hydraulic system. Detailed procedures for maintaining and repairing the hydraulic system are beyond the scope of the operator's manual.

### 4.6.1 Checking Hydraulic Hoses and Lines

Check the hydraulic hoses and lines daily for signs of damage or leaks. Replace any damaged or leaking hoses immediately. Follow all applicable safety procedures while inspecting and maintaining the hydraulic system.

#### WARNING

- **Avoid high-pressure fluids.** Escaping fluid can penetrate the skin, causing serious injury. Relieve the pressure from the hydraulic system before disconnecting any hydraulic lines. Tighten all hydraulic connections before applying pressure. Keep your limbs away from pin holes and nozzles, which can eject fluids with enormous force.
- **If any fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type of injury or gangrene may result.**



Figure 4.211: Hydraulic Pressure Hazard

- 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. Overhauls must be performed in an environment free of dust and debris.

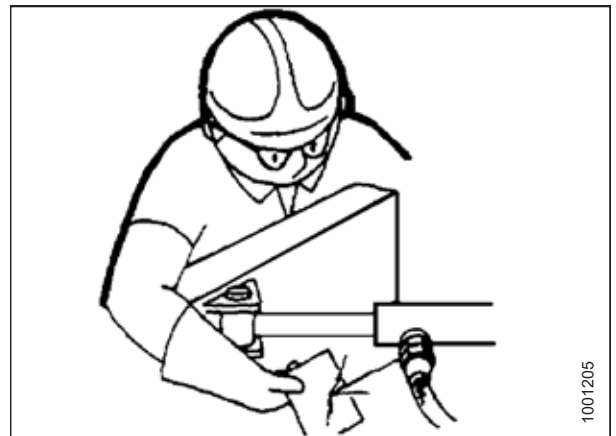


Figure 4.212: Testing for Hydraulic Leaks

### 4.6.2 Hydraulic Cylinders

The hydraulic cylinders do not require routine maintenance or service. Occasionally visually inspect cylinders for signs of leaks or damage. If repairs are required, remove them and have them serviced by your MacDon Dealer.

## 4.7 Electrical System

The R1 FR's electrical system is powered by the tractor. The electrical harness from the header connects to the tractor and supplies power to the position lights and the header lift assist system.

### 4.7.1 Maintaining Electrical System

Proper maintenance of the electrical system helps prevent future problems.

- Use electrical tape and cable ties as required to prevent the wiring harness from dragging or rubbing.
- Keep the lights clean and replace any defective bulbs or LED lights.

### 4.7.2 Replacing Amber Hazard/Signal Bulb

Replace the amber hazard or signal bulbs if they are damaged or inoperable.

#### DANGER

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

#### DANGER

Ensure that all bystanders have cleared the area.

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Remove two Phillips screws (A) from the fixture.
4. Remove the plastic lens.
5. Replace the bulb.
6. Reinstall the plastic lens and screws.

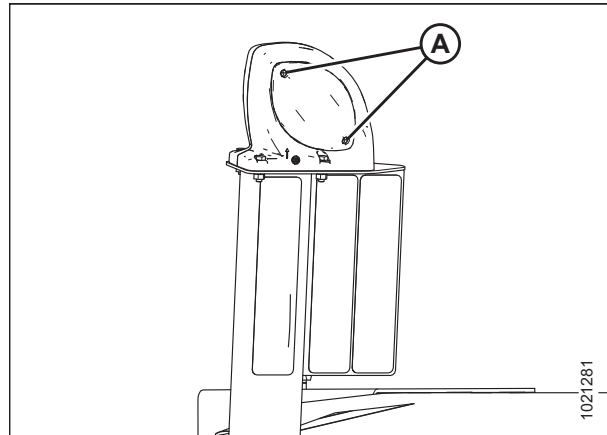


Figure 4.213: Plastic Lens and Screws

### 4.7.3 Inspecting Auxiliary Lift System Sensors

Sensors are used to determine when the auxiliary lift cylinders are activated to adjust the header position.

#### DANGER

To prevent bodily injury or death from the unexpected start-up or fall of a raised machine, stop the engine, remove the key from the ignition, and engage the lift cylinder lock-out valves before going under the machine.

**⚠ DANGER**

Ensure that all bystanders have cleared the area.

1. Remove auxiliary lift lock straight pins (A) from holes in lift linkages on both sides of the header. Store the auxiliary lift lock straight pins, washers, and lynch pins in storage location (B) on the left side of the carrier frame.
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.

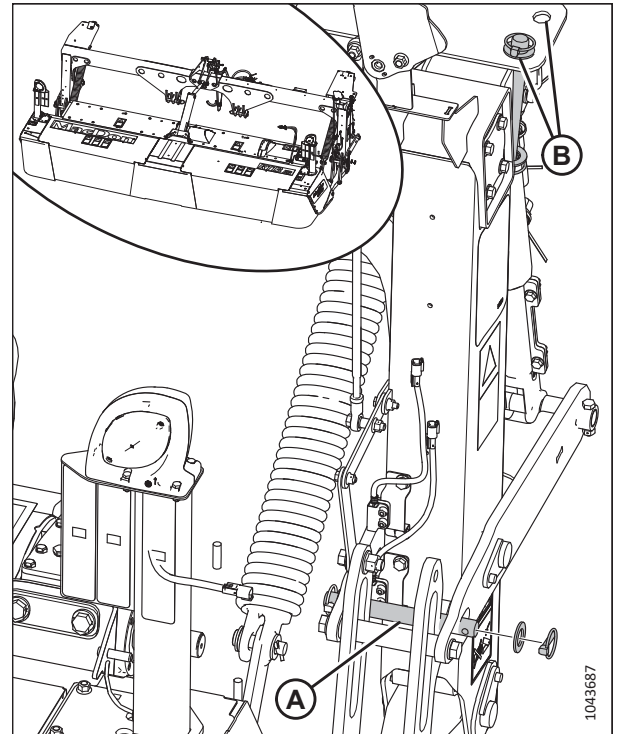


Figure 4.214: Auxiliary Lift Lock Pins – Left Side

4. Close the rotary disc header's auxiliary lift cylinder lock-out valve (A) on each lift cylinder by turning the handle to the horizontal position (90° to the hose). Repeat this step on the opposite side.

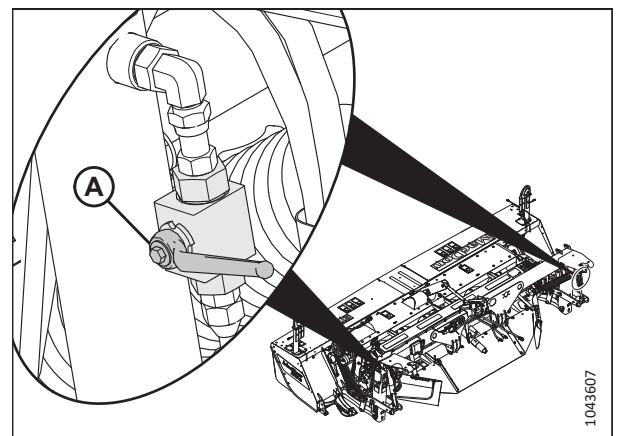


Figure 4.215: Cylinder Lock-Out Valve – Closed Position

## MAINTENANCE AND SERVICING

5. Ensure that upper proximity sensor (B) (inset) is within 1–3 mm (1/32–1/8 in.) of top link (A) when the 3-point hitch is fully raised.

**NOTE:**

Auxiliary lift cylinders (C) should be fully extended and to assist the 3-point hitch by lifting the header with lift linkage (D).

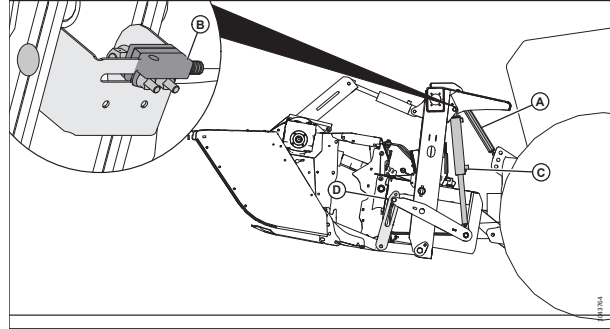


Figure 4.216: R1 FR – Fully Raised Position

6. On the left side of the carrier frame, ensure upper and lower sensors (A) are within 1–3 mm (1/32–1/8 in.) of inboard lift linkage (B).

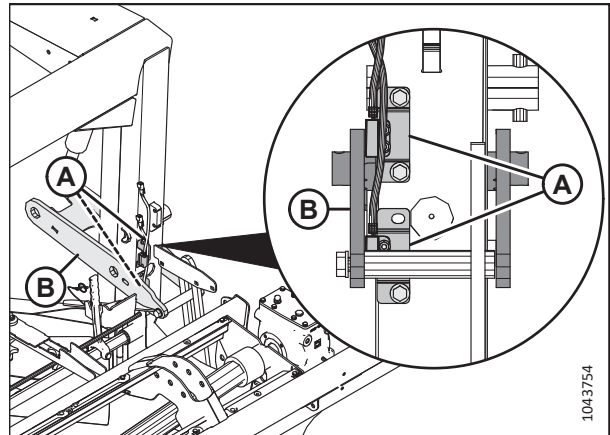


Figure 4.217: Carrier Frame – Left Auxiliary Lift Linkage

### 4.7.4 Setting Relay Logic Switch

The R1 FR's hydraulic lift assist system uses sensors and electronics for automatic control. The electronic relay logic assembly has three setting options.

The relay logic assembly is located on the left side of the carrier frame at the back of the header. Switch (A) on the bottom of the cover has three positions. Select the position that suits your application:

- Automatic (right): select the automatic setting when operating in normal conditions. The auxiliary lift cylinders will extend or retract according to feedback from the position sensors.
- Off (center): select this mode to turn the lift assist system off when servicing, transporting, or storing the header.
- Manual (left): select this mode to use the tractor's front hydraulic circuit controls to manually extend or retract the auxiliary lift cylinders.

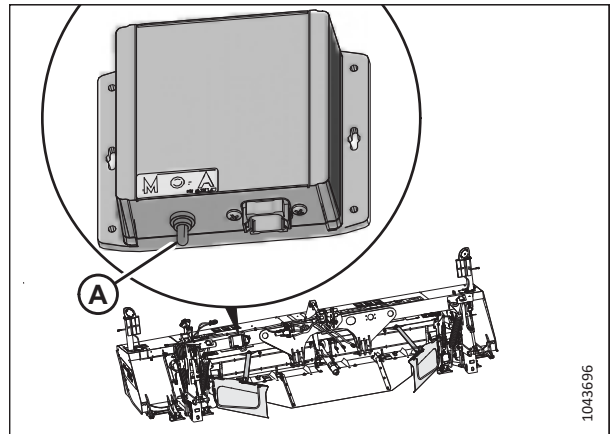


Figure 4.218: Relay Logic Assembly

## Chapter 5: Options and Attachments

Consult this section to learn about additional hardware and configuration options for your machine. Contact your Dealer for more information.

### 5.1 Performance Kits

Performance kits allow your machine to cut different types of crop in different conditions. The following kits are available through your MacDon Dealer. The Dealer will require the bundle number for pricing and availability.

#### 5.1.1 Tall Crop Divider Kit

Tall crop dividers attach to the ends of the machine for clean crop dividing and cutterbar entry in tall crops.

The kit includes left and right crop dividers and the hardware needed to attach them.

B5800

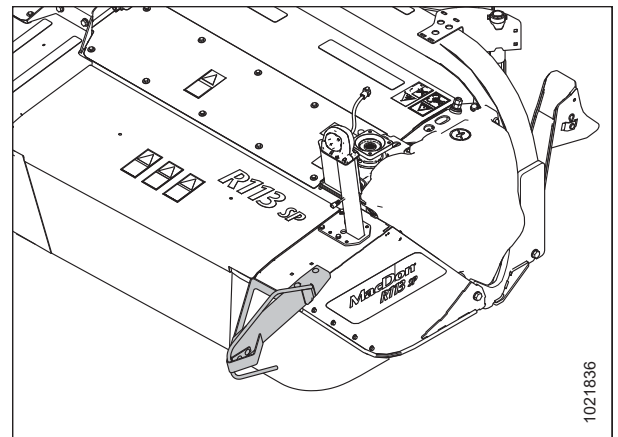


Figure 5.1: Tall Crop Divider — Left Side Shown

#### 5.1.2 Hydraulic Center-Link Kit

The Hydraulic Center-Link kit replaces the standard mechanical link and uses a hydraulic cylinder and separate tractor front hydraulic circuit to adjust the rotary disc header angle.

The kit includes installation instructions.

B7516

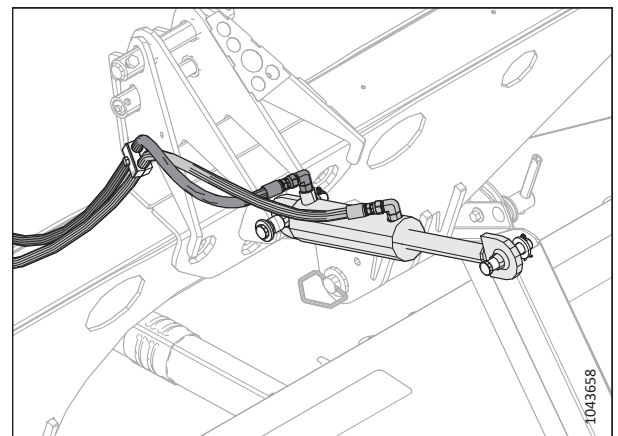


Figure 5.2: Hydraulic Center-Link

### 5.1.3 Quick Change Blade Kit

The Quick Change Blade kit allows you to change blades quickly using a blade change tool that separates the disc assembly.

Kits include all hardware and installation instructions. Available for factory-configured machines with quick-change-ready discs.

- 10 Disc Kit – B6699
- 8 Disc Kit – B6700

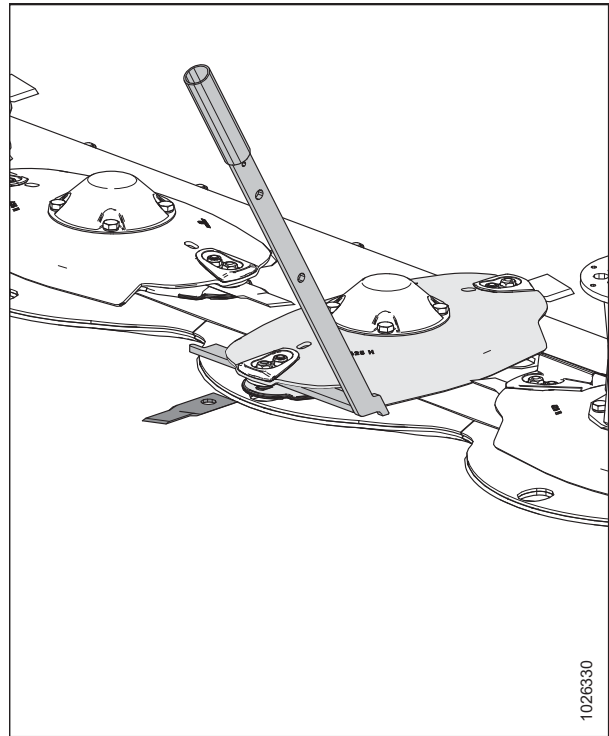


Figure 5.3: Quick Change Blade Kit

## 5.2 Replacement Conditioners

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

### 5.2.1 Steel Intermeshing Roller

Steel conditioner rolls are suited to a wide range of crops (including alfalfa and thicker-stemmed cane-type crops).

A replacement steel intermeshing roller conditioner can be ordered for R1 FR Series machines.

B7517

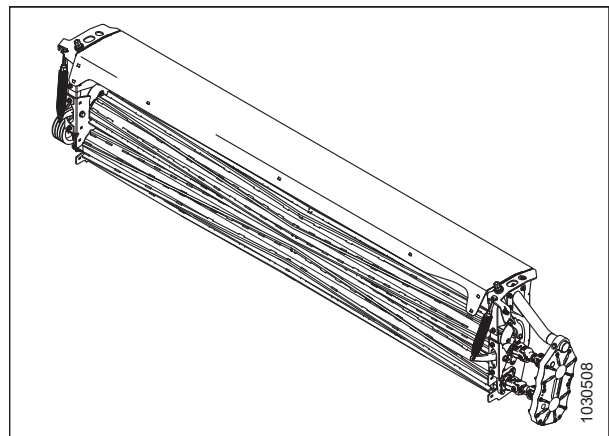


Figure 5.4: Steel Intermeshing Roller

## 5.2.2 Polyurethane Intermeshing Roller

Polyurethane conditioner rolls are suited to a wide range of crops (including alfalfa and finer-stemmed plant type crops like native hay, timothy, and bermuda grass).

A replacement poly intermeshing roller conditioner can be ordered for R1 FR Series machines.

B7640

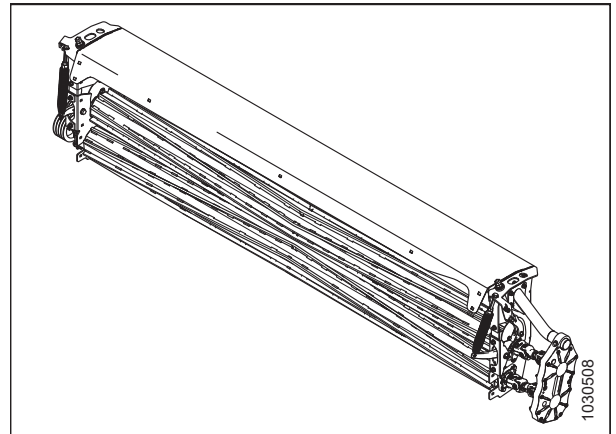


Figure 5.5: Poly Intermeshing Roller





## Chapter 6: Troubleshooting

Refer to this table if problems are encountered while operating the machine.

### 6.1 Troubleshooting Rotary Disc Header Performance

A list of solutions are presented here on how to troubleshoot your rotary header performance.

Problem	Solution	Refer to
<b>Symptom: Cutterbar plugging</b>		
Dull, bent, or badly worn blades	Replace blades.	<a href="#">4.4.7 Maintaining Disc Blades, page 103</a>
Build-up of dirt between rock guards	Decrease rotary disc header angle and increase float. In some conditions, it may be necessary to carry rotary disc header slightly with lower skid shoes.	<a href="#">3.13.3 Cutting Height, page 37</a>
Conditioner drive belt slipping	Adjust conditioner drive belt tension.	<a href="#">4.5.5 Conditioner Drive Belt, page 169</a>
<b>Symptom: Ragged or uneven cutting of crop</b>		
Float too light, causing bouncing	Adjust to heavier float setting.	<a href="#">3.13.2 Float, page 34</a>
Ground speed too slow	Increase ground speed.	<a href="#">3.13.5 Ground Speed, page 40</a>
Downed crop	Adjust rotary disc header angle or install blade-lowering kit on rotary disc header to cut closer to ground.	<a href="#">3.13.4 Cutterbar Angle, page 39</a>
<b>Symptom: Strips of uncut crop left on field</b>		
Bent or dull disc blades	Replace blades.	<a href="#">4.4.7 Maintaining Disc Blades, page 103</a>
Build-up of dirt between rock guards	Decrease rotary disc header angle and increase float.	<a href="#">3.13.4 Cutterbar Angle, page 39</a>
Build-up of dirt between rock guards	Decrease rotary disc header cutterbar angle and increase float.	<a href="#">3.13.2 Float, page 34</a>
Ground speed too slow	Increase ground speed.	<a href="#">3.13.5 Ground Speed, page 40</a>
Foreign object on cutterbar	Disengage rotary disc header and stop engine. When all moving parts have completely stopped, remove foreign object.	<a href="#">3.16 Unplugging Rotary Disc Header, page 55</a>
<b>Symptom: Conditioner rolls plugging</b>		
Ground speed too fast	Reduce ground speed.	<a href="#">3.13.5 Ground Speed, page 40</a>
Roll gap too large for proper feeding	Decrease roll gap.	<a href="#">3.14.1 Conditioner Roll Gap, page 45</a>
Roll gap too small in thick-stemmed cane-type crops	Increase roll gap.	<a href="#">3.14.1 Conditioner Roll Gap, page 45</a>
Baffle set too low	Raise baffle.	<a href="#">Adjusting Conditioner Baffle Position, page 52</a>
Foreign object between rolls	Disengage rotary disc header and stop engine. When all moving parts have completely stopped, remove foreign object.	<a href="#">3.16 Unplugging Rotary Disc Header, page 55</a>

## TROUBLESHOOTING

Problem	Solution	Refer to
Cutting height too low	Decrease rotary disc header angle to raise cutting height.	<a href="#">3.13.4 Cutterbar Angle, page 39</a>
Backing into windrow	Raise rotary disc header before backing up.	<a href="#">3.13.1 Raising and Lowering Rotary Disc Header, page 33</a>
Rolls improperly timed	Adjust roll timing.	<a href="#">3.14.3 Roll Timing, page 48</a>
<b>Symptom: Uneven formation and bunching of windrow</b>		
Rear deflector bypassing or dragging crop	Adjust rear deflector for proper crop control. Raise baffle 1 notch.	<a href="#">Adjusting Conditioner Baffle Position, page 52</a>
Forming shields improperly adjusted	Adjust forming shields.	<a href="#">Positioning Forming Shield Side Deflectors – Roll Conditioner, page 51</a>
Roll gap too large	Adjust roll gap.	<a href="#">3.14.1 Conditioner Roll Gap, page 45</a>
<b>Symptom: Cutting height varies from one side to the other</b>		
Float not properly balanced	Adjust rotary disc header float.	<a href="#">3.13.2 Float, page 34</a>
<b>Symptom: Not cutting short enough in down crop</b>		
Broken, bent, or dull blades	Replace blades, or turn blades over.	<a href="#">4.4.7 Maintaining Disc Blades, page 103</a>
Ground speed too fast	Reduce ground speed.	<a href="#">3.13.5 Ground Speed, page 40</a>
Cutting height too high	Adjust to steeper rotary disc header cutterbar angle in order to lower cutting height if field conditions allow.	<a href="#">3.13.4 Cutterbar Angle, page 39</a>
<b>Symptom: Material being pulled out by roots when cutting, tall crop leaning into machine</b>		
Crop in conditioner rolls before crop is cut	Increase roll gap.	<a href="#">3.14.1 Conditioner Roll Gap, page 45</a>
<b>Symptom: Damaged leaves and broken stems</b>		
Insufficient roll gap	Adjust roll spacing.	<a href="#">3.14.1 Conditioner Roll Gap, page 45</a>
Roll timing off	Check roll timing and adjust if necessary.	<a href="#">3.14.3 Roll Timing, page 48</a>
<b>Symptom: Slow crop drying</b>		
Rolls not crimping crop sufficiently	Decrease roll gap.	<a href="#">3.14.1 Conditioner Roll Gap, page 45</a>
Crop is bunched in windrow	Adjust forming shields/baffle.	<ul style="list-style-type: none"> <li>• <a href="#">Positioning Forming Shield Side Deflectors – Roll Conditioner, page 51</a></li> <li>• <a href="#">Adjusting Conditioner Baffle Position, page 52</a></li> </ul>
<b>Symptom: Excessive drying or bleaching of crop</b>		
Excessive crimping	Increase roll gap.	<a href="#">3.14.1 Conditioner Roll Gap, page 45</a>
Crop is spread too wide in windrow	Adjust forming shields.	<a href="#">Positioning Forming Shield Side Deflectors – Roll Conditioner, page 51</a>
<b>Symptom: Plugging behind end drums</b>		
Ground speed too slow	Increase ground speed.	<a href="#">3.13.5 Ground Speed, page 40</a>
<b>Symptom: Bunching or poorly formed windrows</b>		
Forming shields not properly adjusted	Adjust forming shields.	<a href="#">Positioning Forming Shield Side Deflectors – Roll Conditioner, page 51</a>

## 6.2 Troubleshooting Mechanical Issues

A list of solutions are presented here on how to troubleshoot your rotary disc header mechanical issues.

Problem	Solution	Refer to
<b>Symptom: Excessive noise</b>		
Bent disc blade	Replace blade.	<i>4.4.7 Maintaining Disc Blades, page 103</i>
Conditioner roll timing off	Check roll timing, and adjust if necessary.	<i>3.14.3 Roll Timing, page 48</i>
Conditioner roll gap too small	Check roll gap, and adjust if necessary.	<i>3.14.1 Conditioner Roll Gap, page 45</i>
<b>Symptom: Excessive vibration or noise in rotary disc header</b>		
Mud deposits on conditioner rolls	Clean rolls.	<i>3.16 Unplugging Rotary Disc Header, page 55</i>
Conditioner rolls contacting each other	Increase roll gap.	<i>3.14.1 Conditioner Roll Gap, page 45</i>
Conditioner rolls contacting each other	Check roll timing.	<i>3.14.3 Roll Timing, page 48</i>
<b>Symptom: Excessive heat in cutterbar</b>		
Too much oil in cutterbar	Drain oil, and refill with specified amount.	<i>4.4.3 Lubricating Cutterbar, page 80</i>
<b>Symptom: Frequent blade damage</b>		
Mud on cutterbar	Remove mud from cutterbar. Do not allow mud to dry on cutterbar.	<i>3.16 Unplugging Rotary Disc Header, page 55</i>
Material wrapped around spindle	Remove disc and remove material.	<i>3.16 Unplugging Rotary Disc Header, page 55</i>
Cutting too low in rocky field conditions	Decrease rotary disc header cutterbar angle.	<i>3.13.4 Cutterbar Angle, page 39</i>
Cutting too low in rocky field conditions	Increase float.	<i>3.13.2 Float, page 34</i>
Float set too heavy	Increase float.	<i>3.13.2 Float, page 34</i>
Ground speed too high in rocky field conditions. At high ground speed, rotary disc header tends to dig rocks from ground instead of floating over them.	Reduce ground speed.	<i>3.13.5 Ground Speed, page 40</i>
Blade incorrectly mounted	Check all blade mounting hardware, and ensure blades move freely.	<i>4.4.7 Maintaining Disc Blades, page 103</i>
<b>Symptom: Excessive wear of cutting components</b>		
Angle too steep	Reduce rotary disc header cutterbar angle.	<i>3.13.4 Cutterbar Angle, page 39</i>
Crop residue and dirt deposits on cutterbar	Clean cutterbar.	<i>3.16 Unplugging Rotary Disc Header, page 55</i>
Mud on cutterbar	Remove mud from cutterbar. Do not allow mud to dry on cutterbar.	<i>3.16 Unplugging Rotary Disc Header, page 55</i>

## TROUBLESHOOTING

Problem	Solution	Refer to
<b>Symptom: Breakage of conditioner drive belt</b>		
Improper belt tension	Adjust conditioner drive belt tension.	<i>4.5.5 Conditioner Drive Belt, page 169</i>
Belt not in proper groove in pulley	Move belt to proper groove.	<i>4.5.5 Conditioner Drive Belt, page 169</i>
Foreign object between rolls	Disengage rotary disc header and stop engine. When all moving parts have completely stopped, remove foreign object.	<i>3.16 Unplugging Rotary Disc Header, page 55</i>
Belt pulleys and idlers misaligned	Align pulleys and idler.	<i>4.5.5 Conditioner Drive Belt, page 169</i>
<b>Symptom: Machine pulling to one side</b>		
Rotary disc header dragging on one end and pulling to that side	Adjust rotary disc header float on both ends.	<i>3.13.2 Float, page 34</i>
<b>Symptom: Disc does not start when engaging power take-off (PTO)</b>		
Mud on cutterbar	Remove mud from cutterbar. Do not allow mud to dry on cutterbar.	<i>3.16 Unplugging Rotary Disc Header, page 55</i>
Primary driveline not connected	Connect driveline.	<i>Installing Primary Driveline, page 164</i>
Cross driveline not connected	Connect driveline.	<i>Installing Cross Driveline, page 167</i>
<b>Symptom: Header does not raise properly</b>		
Auxiliary lift locking pins installed.	Remove auxiliary lift locking pins before attempting to raise header.	<i>3.1.2 Removing Auxiliary Lift Locking Pins, page 16</i>
Hydraulic flow setting from tractor to auxiliary lift cylinder valve too high	Set the hydraulic flow rate from the tractor front selective control valve to 15–20 %.	For instructions, refer to the tractor operator's manual.
Header position sensor(s) misaligned	Adjust the header position sensors.	<i>4.7.3 Inspecting Auxiliary Lift System Sensors, page 186</i>
Header position sensor(s) damaged	Replace damaged sensors.	Contact your MacDon dealer.
Relay logic switch is set to OFF or MANUAL.	Set relay logic switch to AUTO.	<i>4.7.4 Setting Relay Logic Switch, page 188</i>

# Chapter 7: Reference

The reference chapter provides additional information such as torque specifications and a unit conversion chart.

## 7.1 Torque Specifications

The following tables provide torque values for various bolts, cap screws, and hydraulic fittings. Refer to these values only when no other torque value has been specified in a given procedure.

- Tighten all bolts to the torque values specified in the charts below, unless you are directed otherwise in this manual.
- Replace removed hardware with hardware of the same strength and grade.
- Refer to the torque value tables as a guide when periodically checking the tightness of bolts.
- Understand the torque categories for bolts and cap screws by reading the markings on their heads.

### Jam nuts

Jam nuts require less torque than nuts used for other purposes. When applying torque to finished jam nuts, multiply the torque applied to regular nuts by 0.65 to obtain the modified torque value.

### Self-tapping screws

Refer to the standard torque values when installing the self-tapping screws. Do **NOT** install the self-tapping screws on structural or otherwise critical joints.

### 7.1.1 Metric Bolt Specifications

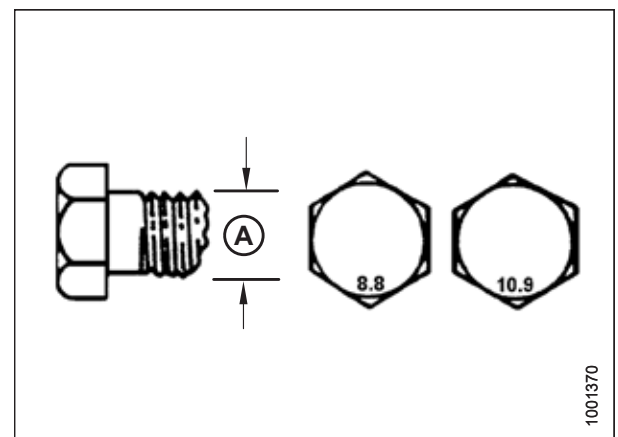
Specifications are provided for the appropriate final torque values to secure various sizes of metric bolts.

#### NOTE:

The torque values provided in the following metric bolt torque tables apply to hardware installed dry; that is, hardware with no grease, oil, or threadlocker on the threads or heads. Do **NOT** add grease, oil, or threadlocker to bolts or cap screws unless you are directed to do so in this manual.

**Table 7.1 Metric Class 8.8 Bolts and Class 9 Free Spinning Nut**

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



**Figure 7.1: Bolt Grades**

REFERENCE

Table 7.2 Metric Class 8.8 Bolts and Class 9 Distorted Thread Nut

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

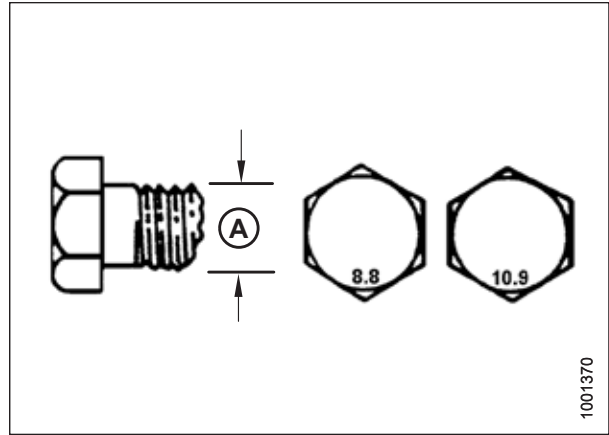


Figure 7.2: Bolt Grades

Table 7.3 Metric Class 10.9 Bolts and Class 10 Free Spinning Nut

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

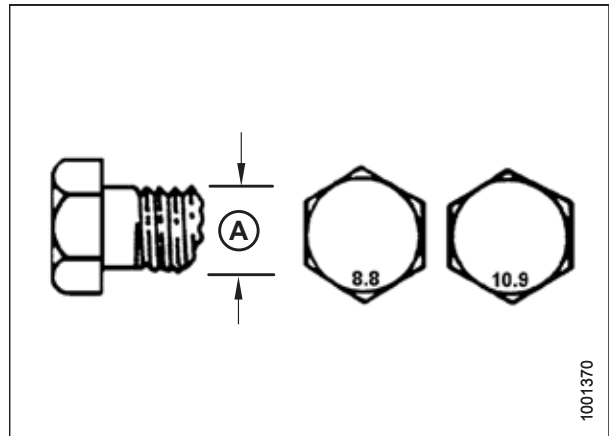


Figure 7.3: Bolt Grades

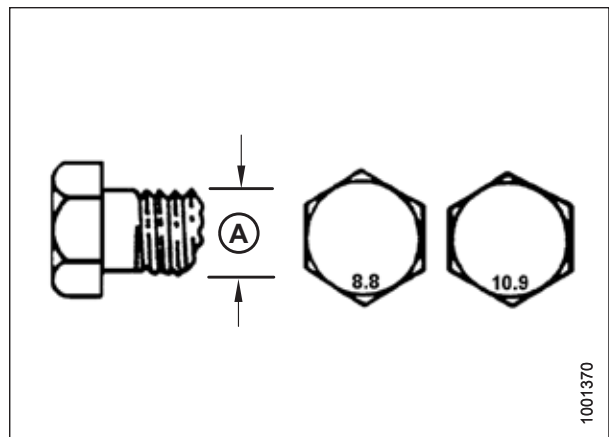


Figure 7.4: Bolt Grades

REFERENCE

**Table 7.4 Metric Class 10.9 Bolts and Class 10 Distorted Thread Nut**

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

### 7.1.2 Metric Bolt Specifications – Cast Aluminum

Specifications are provided for the appropriate final torque values for various sizes of metric bolts in cast aluminum.

**NOTE:**

The torque values provided in the following metric bolt torque tables apply to hardware installed dry; that is, hardware with no grease, oil, or threadlocker on the threads or heads. Do **NOT** add grease, oil, or threadlocker to bolts or cap screws unless you are directed to do so in this manual.

**Table 7.5 Metric Bolt Bolting into Cast Aluminum**

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

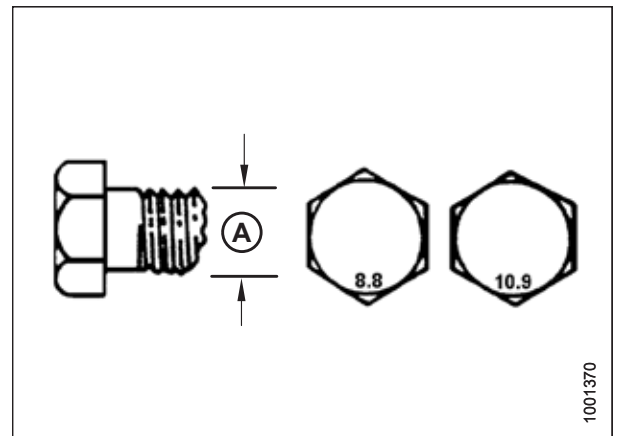


Figure 7.5: Bolt Grades

### 7.1.3 O-Ring Boss Hydraulic Fittings – Adjustable

The standard torque values are provided for adjustable hydraulic fittings. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, refer to the value specified in the procedure instead.

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

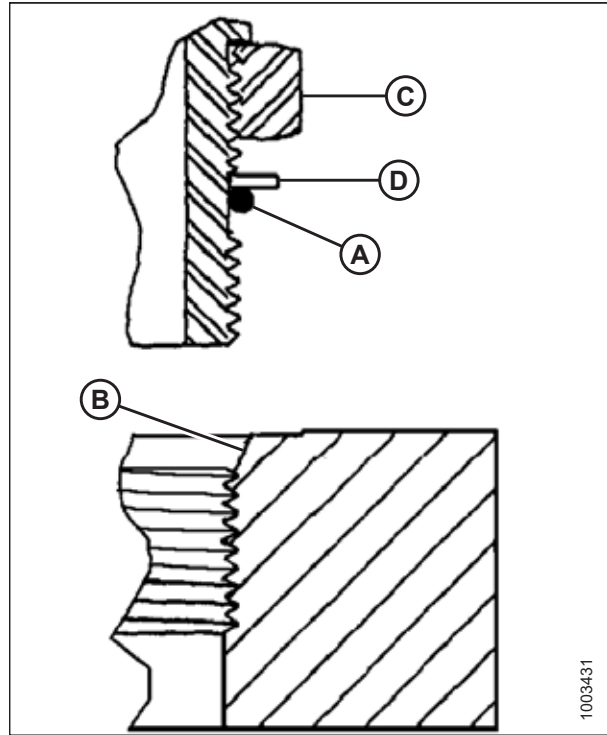


Figure 7.6: Hydraulic Fitting

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

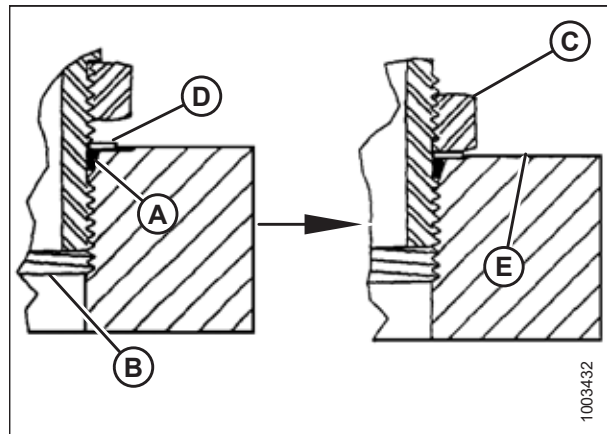


Figure 7.7: Hydraulic Fitting



REFERENCE

Table 7.6 O-Ring Boss (ORB) Hydraulic Fittings – Adjustable and Non-Adjustable

SAE Dash Size	Thread Size (in.)	Torque Value <sup>9</sup>	
		Nm	lbf-ft (*lbf-in)
-2	5/16–24	10–11	*89–97
-3	3/8–24	18–20	*159–177
-4	7/16–20	29–32	21–24
-5	1/2–20	32–35	24–26
-6	9/16–18	40–44	30–32
-8	3/4–16	70–77	52–57
-10	7/8–14	115–127	85–94
-12	1 1/16–12	183–201	135–148
-14	1 3/16–12	237–261	175–193
-16	1 5/16–12	271–298	200–220
-20	1 5/8–12	339–373	250–275
-24	1 7/8–12	414–455	305–336
-32	2 1/2–12	509–560	375–413

### 7.1.4 O-Ring Boss Hydraulic Fittings – Non-Adjustable

The standard torque values for non-adjustable hydraulic fittings are provided. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, use the value specified in the procedure instead.

1. Inspect O-ring (A) and seat (B) for dirt or defects.
2. Ensure that O-ring (A) is **NOT** on the threads. Adjust O-ring (A) if necessary.
3. Apply hydraulic system oil to the O-ring.
4. Install fitting (C) into the port until the fitting is hand-tight.
5. Torque fitting (C) according to values in Table 7.7, page 201.
6. Verify the final condition of the fitting.

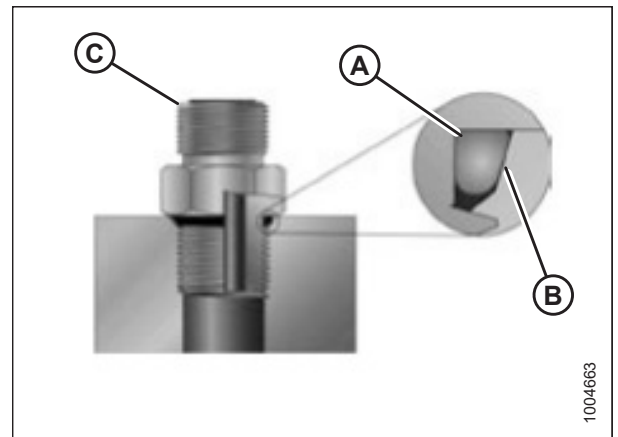


Figure 7.8: Hydraulic Fitting

Table 7.7 O-Ring Boss (ORB) Hydraulic Fittings – Adjustable and Non-Adjustable

SAE Dash Size	Thread Size (in.)	Torque Value <sup>9</sup>	
		Nm	lbf-ft (*lbf-in)
-2	5/16–24	10–11	*89–97
-3	3/8–24	18–20	*159–177
-4	7/16–20	29–32	21–24
-5	1/2–20	32–35	24–26

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

REFERENCE

Table 7.7 O-Ring Boss (ORB) Hydraulic Fittings – Adjustable and Non-Adjustable (continued)

SAE Dash Size	Thread Size (in.)	Torque Value <sup>10</sup>	
		Nm	lbf-ft (*lbf-in)
-6	9/16-18	40-44	30-32
-8	3/4-16	70-77	52-57
-10	7/8-14	115-127	85-94
-12	1 1/16-12	183-201	135-148
-14	1 3/16-12	237-261	175-193
-16	1 5/16-12	271-298	200-220
-20	1 5/8-12	339-373	250-275
-24	1 7/8-12	414-455	305-336
-32	2 1/2-12	509-560	375-413

### 7.1.5 O-Ring Face Seal Hydraulic Fittings

The standard torque values are provided for O-ring face seal hydraulic fittings. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, refer to the value specified in the procedure instead.

Torque values are shown in the Table 7.8, page 203.

1. Ensure that the sealing surfaces and the fitting threads are free of burrs, nicks, scratches, and any foreign material.



Figure 7.9: Hydraulic Fitting

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

## REFERENCE

2. Apply hydraulic system oil to O-ring (B).
3. Align the tube or hose assembly so that the flat face of sleeve (A) or (C) comes into full contact with O-ring (B).
4. Thread tube or hose nut (D) until it is hand-tight. The nut should turn freely until it bottoms out.
5. Torque the fittings according to values in Table 7.8, page 203.

### NOTE:

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

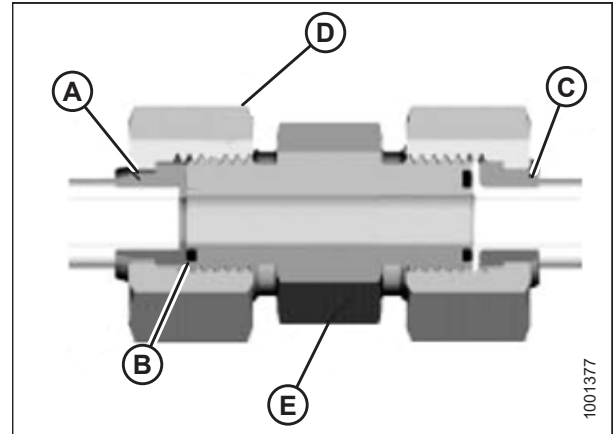


Figure 7.10: Hydraulic Fitting

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

Table 7.8 O-Ring Face Seal (ORFS) Hydraulic Fittings

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value <sup>11</sup>	
			Nm	lbf-ft
-3	Note <sup>12</sup>	3/16	–	–
-4	9/16	1/4	25–28	18–21
-5	Note <sup>12</sup>	5/16	–	–
-6	11/16	3/8	40–44	30–32
-8	13/16	1/2	55–61	41–45
-10	1	5/8	80–88	59–65
-12	1 3/16	3/4	115–127	85–94
-14	Note <sup>12</sup>	7/8	–	–
-16	1 7/16	1	150–165	111–122
-20	1 11/16	1 1/4	205–226	151–167
-24	2	1 1/2	315–347	232–256
-32	2 1/2	2	510–561	376–414

### 7.1.6 Tapered Pipe Thread Fittings

The standard torque values are provided for tapered pipe thread fittings. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, refer to the value specified in the procedure instead.

Assemble pipe fittings as follows:

1. Ensure that the fitting and the port threads are free of burrs, nicks, scratches, and any other form of contamination.
2. Apply paste-type pipe thread sealant to the external pipe threads.
3. Thread the fitting into the port until it is hand-tight.

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

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

## REFERENCE

4. Torque the connector to the appropriate torque angle. The turns from finger tight (TFFT) and flats from finger tight (FFFT) values are shown in Table 7.9, page 204. Ensure that the tube end of a shaped connector (typically a 45° or 90° elbow) is aligned to receive the incoming tube or hose assembly. Always finish the alignment of the fitting in the direction of tightening. Never loosen the threaded connectors to achieve alignment.
5. Clean all residue and any excess thread conditioner with an appropriate cleaner.
6. Inspect the final condition of the fitting. Pay special attention to the possibility of cracks in the port opening.
7. Mark the final position of the fitting. If a fitting leaks, disassemble the fitting and check it for damage.

**NOTE:**

The failure of fittings due to over-torquing may not be evident until the fittings are disassembled and inspected.

**Table 7.9 Hydraulic Fitting Pipe Thread**

Tapered Pipe Thread Size	Recommended TFFT	Recommended FFFT
1/8–27	2–3	12–18
1/4–18	2–3	12–18
3/8–18	2–3	12–18
1/2–14	2–3	12–18
3/4–14	1.5–2.5	12–18
1–11 1/2	1.5–2.5	9–15
1 1/4–11 1/2	1.5–2.5	9–15
1 1/2–11 1/2	1.5–2.5	9–15
2–11 1/2	1.5–2.5	9–15

## 7.2 Conversion Chart

This manual uses both SI units (including metric) and US customary units (sometimes referred to as standard units) of measurement. A list of those units along with their abbreviations and conversion factors is provided here for your reference.

**Table 7.10 Conversion Chart**

Quantity	SI Units (Metric)		Factor	US Customary Units (Standard)	
	Unit Name	Abbreviation		Unit Name	Abbreviation
Area	hectare	ha	x 2.4710 =	acre	acres
Flow	liters per minute	L/min	x 0.2642 =	US gallons per minute	gpm
Force	Newton	N	x 0.2248 =	pound force	lbf
Length	millimeter	mm	x 0.0394 =	inch	in.
Length	meter	m	x 3.2808 =	foot	ft.
Power	kilowatt	kW	x 1.341 =	horsepower	hp
Pressure	kilopascal	kPa	x 0.145 =	pounds per square inch	psi
Pressure	megapascal	MPa	x 145.038 =	pounds per square inch	psi
Pressure	bar (Non-SI)	bar	x 14.5038 =	pounds per square inch	psi
Torque	Newton meter	Nm	x 0.7376 =	pound feet or foot pounds	lbf-ft
Torque	Newton meter	Nm	x 8.8507 =	pound inches or inch pounds	lbf-in
Temperature	degrees Celsius	°C	(°C x 1.8) + 32 =	degrees Fahrenheit	°F

REFERENCE

Table 7.10 Conversion Chart (continued)

Quantity	SI Units (Metric)		Factor	US Customary Units (Standard)	
	Unit Name	Abbreviation		Unit Name	Abbreviation
Velocity	meters per minute	m/min	x 3.2808 =	feet per minute	ft/min
Velocity	meters per second	m/s	x 3.2808 =	feet per second	ft/s
Velocity	kilometers per hour	km/h	x 0.6214 =	miles per hour	mph
Volume	liter	L	x 0.2642 =	US gallon	US gal
Volume	milliliter	mL	x 0.0338 =	ounce	oz.
Volume	cubic centimeter	cm <sup>3</sup> or cc	x 0.061 =	cubic inch	in. <sup>3</sup>
Weight	kilogram	kg	x 2.2046 =	pound	lb.



# Index

## A

accelerators	
inspecting .....	116
installing .....	119
maintaining .....	116
removing .....	117
attachments, <i>See</i> options and attachments	
auxiliary lift cylinders	
lock-out valves .....	17
auxiliary lift lock pins	
installing .....	15
removing .....	16

## B

break-in	
break-in inspections .....	62
breaking in header .....	31

## C

component identification .....	12
conditioner drive belt	
inspecting .....	169
conditioner roll timing gearbox, <i>See</i> gearboxes	
conditioner systems .....	172
conditioners	
conditioner roll drive belts	
installing .....	170
removing .....	170
forming shields .....	51
positioning rear baffle .....	52
positioning rear baffle curtain .....	53
positioning side deflectors .....	51
inspecting .....	172
roll conditioners .....	44
roll drive belts .....	169
roll gaps .....	45
adjusting roll gap	
polyurethane rolls .....	46
steel rolls .....	45
checking roll gap	
steel rolls .....	45
roll tension .....	47
adjusting .....	47
roll timing .....	48
adjusting .....	48
conversion chart .....	204
curtains	
inspecting curtains .....	72
installing door curtains .....	74

installing inboard curtains .....	76
installing outboard curtains .....	79
maintaining .....	72
removing door curtains .....	73
removing inboard curtains .....	75
removing outboard curtains .....	77
cutterbar	
unplugging .....	55
cutterbar discs .....	85
cutterbars .....	71, 85, 116, 121, 151
<i>See also</i> accelerators	
<i>See also</i> cutterbar discs	
<i>See also</i> rock guards	
<i>See also</i> spindles	
crop streams .....	100
changing configuration .....	101
crop streams (10 Disc)	
changing configuration .....	102
cutting height	
adjusting cutterbar angle – hydraulic center-link (option) .....	40
adjusting cutterbar angle – mechanical center- link .....	39
deflectors .....	41
installing .....	42
removing .....	42
disc blades .....	103
doors .....	20
closing doors .....	21
inspecting doors .....	71
opening doors	
North America .....	21
lubricating .....	80
adding lubricant .....	80
checking lubricant level .....	80
draining cutterbar .....	82
filling cutterbar with lubricant .....	83
maintaining cutterbar discs	
inspecting discs .....	85
installing discs .....	88
removing discs .....	87
spindles	
installing .....	93
removing .....	91
replacing .....	90
cutting height .....	37
adjusting .....	38
cylinders	
lift	
lock-out valves .....	17

## INDEX

### D

daily start-up check.....	22
decals.....	7
definitions.....	11
deflectors	
cutterbar deflectors.....	41
installing.....	42
removing.....	42
side deflectors	
positioning on roll conditioner.....	51
disc blades.....	103
<i>See also</i> cutterbars	
inspecting.....	103
inspecting hardware.....	105
installing.....	108
removing.....	107
disc maintenance	
accelerators	
inspecting.....	116
installing.....	119
maintaining.....	116
removing.....	117
cutterbar discs	
inspecting.....	85
installing.....	88
removing.....	87
drive systems.....	157
drivelines	
cross driveline.....	166
drivelines	
cross driveline.....	166
installing.....	167
removing.....	166
driveline guards.....	161
installing.....	162
removing.....	161
primary driveline.....	163
installing.....	164
removing.....	163
driveshield latches	
replacing.....	160
driveshields.....	18, 157
closing.....	20
installing.....	159
opening.....	18
removing.....	157
drums	
large drums	
inspecting.....	139
installing driven drum and driveline.....	144
installing non-driven drums.....	149
maintaining.....	139
removing driven drum and driveline.....	140
removing non-driven drums.....	148
small drums	

inspecting.....	128
installing driven drum and driveline.....	133
installing non-driven drums.....	137
maintaining.....	128
removing driven drum and driveline.....	129
removing non-driven drum.....	136
drying agents.....	55

### E

electrical systems.....	186
maintaining.....	186

### F

float	
adjusting float.....	35
fluids, <i>See</i> lubricants	
forming shields	
on roll conditioner.....	51–53
positioning side deflectors.....	51
positioning rear baffle.....	52
positioning rear baffle curtain.....	53

### G

gearboxes	
cutterbar drive	
conditioner drive.....	180
cutterbar/conditioner drive	
checking and adding lubricant.....	180
header drive.....	177, 179
draining lubricant.....	178
lubricant.....	177
greasing	
decals.....	64
every 100 hours.....	68
every 25 hours.....	66
every 250 hours.....	70
every 50 hours.....	67
greasing procedures.....	65
ground speed.....	40

### H

hayng tips.....	53
chemical drying agents.....	55
curing.....	53
driving on windrows.....	55
raking and tedding.....	55
topsoil moisture.....	54
weather and topography.....	54
windrow characteristics.....	54



## INDEX

header angle .....	39
hydraulic cylinders.....	185
hydraulics	
checking hoses and lines .....	185
fittings	
O-ring boss – adjustable.....	200
O-ring boss – non-adjustable .....	201
O-ring face seal .....	202
tapered pipe thread fittings.....	203
hydraulic center-link kits.....	189
hydraulic maintenance.....	185
hydraulic safety .....	4
raise control.....	33

## I

inspections	
accelerators .....	116
break-in inspections .....	62
cutterbar curtains .....	72
cutterbar discs.....	85
disc blade hardware .....	105
disc blades.....	103
rock guards .....	121
introduction .....	i
serial numbers.....	iv

## L

lift controls.....	33
lights	
amber hazard/signal lights	
replacing bulbs.....	186
transport lights.....	32
lock-out valves, <i>See</i> auxiliary lift cylinders	
lubricant levels	
every 100 hours.....	68
every 25 hours.....	66
every 250 hours.....	70
every 50 hours.....	67
lubricating.....	64
<i>See also</i> greasing	
conditioner roll timing gearbox	
changing .....	174
checking.....	174
lubrication	
every 100 hours.....	68
every 25 hours.....	66
every 250 hours.....	70
every 50 hours.....	67

## M

maintenance and servicing.....	57
--------------------------------	----

break-in inspections .....	62
end-of-season servicing.....	63
maintenance records .....	60
maintenance requirements .....	59
preparing for servicing .....	59
preseason/annual servicing.....	63
recommended lubricants.....	211
safety procedures .....	57
maintenance schedule/records .....	60
metric bolts	
torque specifications .....	197

## O

operating rotary headers .....	32
operations.....	15
header angle .....	39
options and attachments .....	189
hydraulic center-link kits.....	189
quick change blade kit .....	190
replacement conditioners	
poly roller.....	191
steel roller.....	190
tall crop dividers .....	189

## P

power take-off	
engaging.....	31
preseason servicing .....	63

## R

raising and lowering rotary disc header .....	33
raking.....	55
rear baffle curtain	
positioning on roll conditioner.....	53
rear baffles	
positioning on roll conditioner.....	52
reference	
maintenance requirements .....	59
rock guards	
inspecting .....	121
installing inboard rock guards.....	123
installing outboard rock guards.....	126
maintaining.....	121
removing inboard rock guards .....	122
removing outboard rock guards.....	124
roll conditioners	
deflectors .....	51
forming shields.....	51
roll tension.....	47
roll timing .....	48
roll gaps.....	45

## INDEX

adjusting roll gap	
polyurethane rolls.....	46
steel rolls.....	45
roll tension.....	47
adjusting.....	47
roll timing.....	48
adjusting.....	48
roll-type conditioning, <i>See</i> conditioners	
rotary disc header	
operating.....	32

## S

safety.....	1
alert symbols.....	1
daily start-up checks.....	22
general safety.....	2
hydraulic safety.....	4
procedures.....	57
safety sign decals.....	6
installing decals.....	6
locations.....	7
signal words.....	1
serial numbers.....	iv
servicing	
maintenance and servicing.....	57
preparing for servicing.....	59
shutdown procedures.....	31
specifications.....	13
torque specifications.....	197
tractor requirements.....	23
spindles	
installing.....	93
removing.....	91
shear pins	
installing.....	154
removing.....	151
start-up procedures	
daily start-up check.....	22

## T

tall crop dividers.....	43
installing.....	43
removing.....	44
tedding.....	55
topsoil moisture.....	54
torque specifications.....	197
metric bolt specifications.....	197
cast aluminum.....	199
O-ring boss hydraulic fittings – adjustable.....	200
O-ring boss hydraulic fittings – non-adjustable.....	201
O-ring face seal fittings.....	202
tapered pipe thread fittings.....	203

tractors	
attaching front mount rotary disc.....	23
connecting.....	23, 28
detaching front mount rotary disc.....	28
setting up tractor	
tractor requirements.....	23
setup.....	23
transporting.....	32
lighting.....	32
troubleshooting.....	193
header performance.....	193
mechanical issues.....	195

## W

weather and topography.....	54
windrows	
driving on windrows.....	55
windrow characteristics.....	54

## Recommended Lubricants

Keep your machine operating at top efficiency by using only clean lubricants and by ensuring the following:

- Use clean containers to handle all lubricants.
- Store lubricants in an area protected from dust, moisture, and other contaminants.

### IMPORTANT:

Do **NOT** overfill the cutterbar when adding lubricant. Overfilling could result in overheating and failure of cutterbar components.

Specification	Description	Use	Capacities
<b>Lubricant: Grease</b>			
SAE Multipurpose	High temperature, extreme pressure (EP) performance with 1% max. molybdenum disulphide (NLGI Grade 2) lithium base	As required unless otherwise specified	—
SAE Multipurpose	High temperature, extreme pressure (EP) performance with 10% max. molybdenum disulphide (NLGI Grade 2) lithium base	Driveline slip-joints	—
<b>Lubricant: Gear Lubricant</b>			
SAE 80W-90	High thermal and oxidation stability API service class GL-5	R113 FR cutterbar	8 L (8.5 qts [US])
SAE 80W-90	High thermal and oxidation stability API service class GL-5	R116 FR cutterbar	10 L (10.5 qts [US])
SAE 85W-140	Gear lubricant API service class GL-5	Header drive gearbox	1.9 L (2.0 qts [US])
SAE 85W-140	Gear lubricant API service class GL-5	Conditioner roll timing gearbox	0.7 L (0.75 qts [US])
SAE 85W-140	Gear lubricant API service class GL-5	Cutterbar and conditioner drive gearbox	1.8 L (1.9 qts [US])

# MacDon®

**CUSTOMERS**  
**MacDon.com**

**DEALERS**  
**Portal.MacDon.com**

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

Printed in Canada