MacDon

R216
Rotary Disc Header

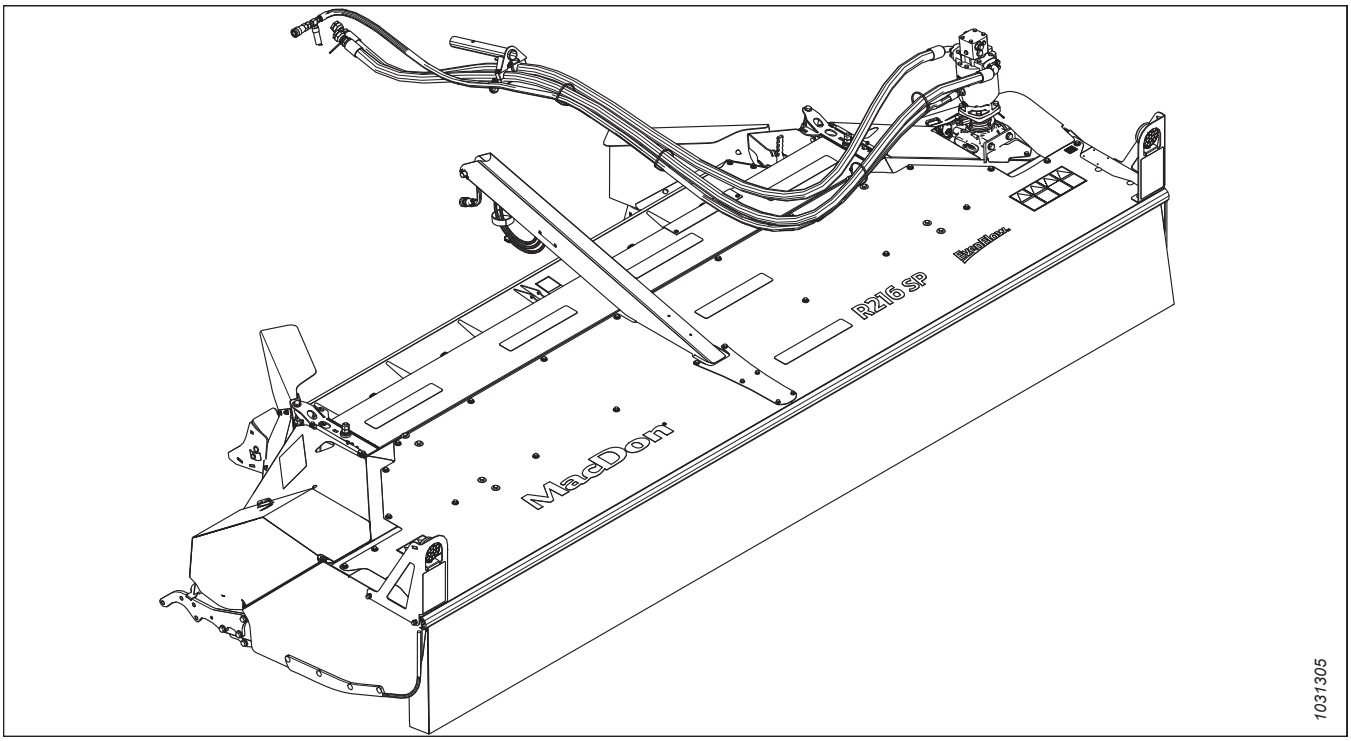
Operator's Manual

215972 Revision A

Original Instruction

The Harvesting Specialists.

R216 Rotary Disc Header



Published August 2022

Introduction

This instructional manual contains safety, operating, and maintenance procedures for the MacDon R216 Rotary Disc Header, including a Grass Seed (GSS) version. The rotary disc header when attached to a MacDon M1 Series Windrower, M155*E4* SP Windrower, or M205 SP Windrower, is designed to cut, condition, and lay a wide variety of grasses and hay crops in windrows.

NOTE:

The Grass Seed version of the R216 Rotary Disc Header is incompatible with M155*E4* and M205 SP Windrowers.

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, the rotary disc header will work well for many years. If you require more detailed service information, contact your Dealer.

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 and to pass on to new Operators or Owners. Call your Dealer if you need 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 machine function and machine life and may result in a hazardous situation.

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:

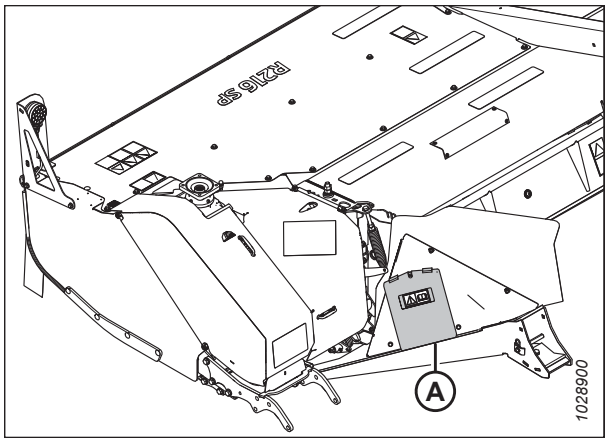
- Accident
- Misuse
- Abuse
- Improper maintenance or neglect
- Abnormal or extraordinary use of the machine
- Failure to use the machine, equipment, component, or part in accordance with the manufacturer’s instructions

Conventions

The following conventions are used in this document:

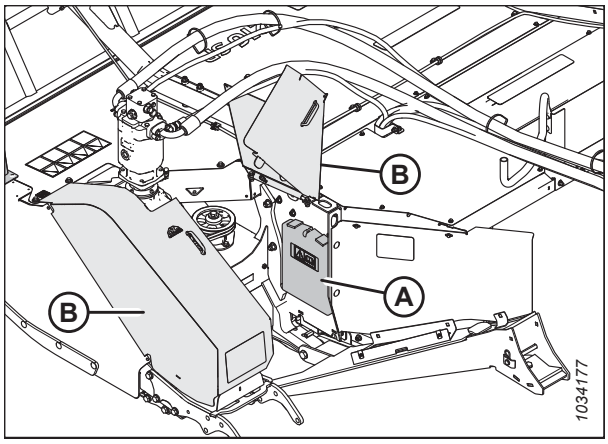
- Right and left are determined from the operator’s position. The front of the rotary disc header faces the crop.
- Unless otherwise noted, use the standard torque values provided in this manual.

Standard headers: Store the operator's manual and the parts catalog in plastic manual case (A) on the left fixed deflector.



Manual Storage Case – Standard Headers

Grass seed option: Store the operator's manual and the parts catalog in plastic manual case (A) located inside driveshields (B).



Manual Storage Case – Grass Seed (GSS) Option

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

Summary of Changes

At MacDon, we're continuously making improvements, and occasionally these improvements affect 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
Serial Number, page vii	Removed "Header Model" field.	Technical Publications
1.3 General Safety, page 3	Added "hoodies" to the list of dangling items that you should never wear when you are near equipment.	Product Support
2.1 Specifications, page 17	Revised grass seed drum speed specification: "Off, or 235–660 rpm" was 235–705 rpm.	Product Management
3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26	Added DANGER: Ensure that all bystanders have cleared the area.	Technical Publications
3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27	Added DANGER: Ensure that all bystanders have cleared the area.	Technical Publications
Auger/Rotary Disc/Draper-Ready Configuration – Quick Coupler Connections, page 40	Corrected reference in Step *6, page 42* to the outboard bulkhead fitting, which was referenced as the inboard fitting.	Audit #2022–38
Auger/Rotary Disc/Draper-Ready Configuration – Quick Coupler Connections, page 40	Removed any mention of header position sensors from Step *13, page 44* because there are no header position sensors on the header.	Product Support
Rotary Disc-Only Configuration – Hard-Plumbed Connections, page 44	Removed any mention of header position sensors from Step *11, page 47* because there are no header position sensors on the header.	Product Support
Rotary Disc-Only Configuration – Quick Coupler Connections, page 47	Removed any mention of header position sensors from Step *8, page 50* because there are no header position sensors on the header.	Product Support
3.3.4 Connecting R2 Series Rotary Disc Header Hydraulics and Electrical Systems – M1170 Windrower, page 50	Removed any mention of header position sensors from Step *16, page 55* because there are no header position sensors on the header.	Product Support
3.3.4 Connecting R2 Series Rotary Disc Header Hydraulics and Electrical Systems – M1170 Windrower, page 50	Added Step *5, page 51* and Step *6, page 52* to include hard-plumbed connections.	Product Support
3.4.1 Detaching R2 Series Rotary Disc Header from an M1 Series Windrower, page 56	Revised Figure *3.67, page 57* caption to include hard-plumbed connections for M1170. Added missing Figure *3.69, page 58* for M1240.	Product Support
3.10.1 Opening Cutterbar Curtain, page 119	Added Step *1, page 119* for safety.	Technical Publications
Adjusting Skid Shoe Height, page 123	Added table.	ECN 62067
Adjusting Gauge Roller Height, page 124	Clarified procedure. Updated all illustrations in procedure to account for updates to gauge wheel parts. Added cutting height reference table.	ECN 62067
3.12.3 Adjusting Feed Roll Drive Belt Tension, page 133	Added topic.	ECN 62369

Section	Summary of Change	Internal Use Only
3.12.5 Forming Shields – Roll Conditioner, page 137	Removed WARNING: Keep everyone at a safe distance from your operation. Ensure bystanders are never in line with the front or rear of the machine. Stones or other foreign objects can be ejected from either end with force.	Technical Publications
Positioning Rear Baffle, page 138	Added information about M155*E4* Self-Propelled Windowers to the NOTE about the optional Remote Baffle Control kit (MD #B6664).	Technical Publications
3.13 Cutterbar Deflectors – Standard Headers Only, page 141	Specified the topic applies to standard headers.	Technical Publications
3.14 Cutterbar Disc Feed Plates – Standard and Grass Seed Headers, Installing, Removing, and Storing Plates, page 144	Added topic.	Technical Publications
3.15 Grass Seed Version Operation, page 151	Clarified the information about the one-crop stream.	Technical Publications
3.15.1 Activating Grass Seed Option, page 152	Changed the term “sensor” to “system” in Step *8, page 153* for clarity.	Product Support
3.15.2 Operating with Grass Seed Option, page 154	Revised grass seed drum speed specification in the NOTE under Step *6, page 156*.	Product Management
3.15.4 Performance Improvement Tips for Grass Seed Headers, page 158	Added topic based off of the quickcard.	Technical Publications
4.2 Preparing Machine for Servicing, page 164	Removed CAUTION: To avoid personal injury, perform the following procedures before servicing disc header or opening drive covers.	Technical Publications
4.4.1 Maintenance Schedule/Record – Standard Headers, page 167	Made schedule specific to standard headers. Moved grass seed information to *4.4.2 Maintenance Schedule/Record – Grass Seed Headers, page 169*.	Product Support
4.4.2 Maintenance Schedule/Record – Grass Seed Headers, page 169	Added topic.	Product Support
4.4.3 Break-In Inspections, page 170	Revised inspection schedule to show standard and grass seed headers.	Product Support
4.5.2 Lubrication Locations – Standard Headers, page 173	Revised Figure *4.6, page 173* to show new spring tension bracket. Added Figure *4.8, page 175* to show vertical drivelines.	ECN 62369 Product Support
4.5.3 Lubrication Locations – Grass Seed Headers, page 176	Added Figure *4.10, page 177* to show vertical drivelines.	Product Support
Draining the Cutterbar, page 182	Added Step *1, page 182* for safety.	Technical Publications
Filling Cutterbar with Lubricant, page 183	Added Step *1, page 183* for safety.	Technical Publications
Installing Cutterbar Spindles, page 194	Added Figure *4.39, page 195* to show the storage location of the disc timing tool.	Product Support
Inspecting Accelerators, page 207	Revised Step *5, page 208* (recommendation for replacing accelerators).	Engineering
Inspecting Rock Guards, page 213	Added NOTE to Step *4, page 213*.	Technical Publications
4.6.9 Cutterbar Crop Stream, page 259	Added the three-crop stream configuration. Shortened the information and replaced the illustration for clarity.	Product Management Technical Publications

Section	Summary of Change	Internal Use Only
Configuring Cutterbar Crop Streams – Standard Header, page 260	Revised the NOTE to clarify the procedure does not apply to grass seed headers. Added the three-crop stream configuration.	Product Management Technical Publications
—	Deleted topic titled “Configuring Cutterbar Crop Streams – Grass Seed Header” because there is no need to change the crop stream.	Technical Publications
4.10.1 Inspecting Conditioner Components, page 273	Added Step *4, page 273* to remove the feed roll belt before inspecting the left feed roll bearing. Clarified the types of damage bearings can suffer.	Engineering
Feed Roll Drive Belt, page 275	Added topic.	Product Support
Removing Feed Roll Belt, page 275	Added topic.	Product Support
Installing Feed Roll Belt, page 276	Added topic.	Product Support
5.1 Tall Crop Kit (Cutterbar Deflectors and Tall Crop Feed Plates) – MD #B6967, Standard Headers Only, page 291	Specified the kit applies to standard headers.	Technical Publications
5.2 Double Windrow Attachment, page 292	Specified the kit applies to standard headers and that three crop streams are recommended.	Technical Publications

Noise Levels

The A-weighted sound pressure level inside the operator's station of a typical self-propelled vehicle (e.g., M1240), when operated in conjunction with this R216 Rotary Disc Header, **is 70 dBA**. This measurement was taken in accordance with ISO 5131. The sound pressure level depends upon the rotary disc speed, crop conditions, as well as the exact type of self-propelled vehicle used to power the R216 Rotary Disc Header.

Serial Number

The serial number identifies the header and is required if you request technical assistance. Record the serial number and model year of the header in the spaces provided below.

Serial number: _____

Model year: _____

Serial number plate (A) is located on the left side of the header, on the top of the end panel.

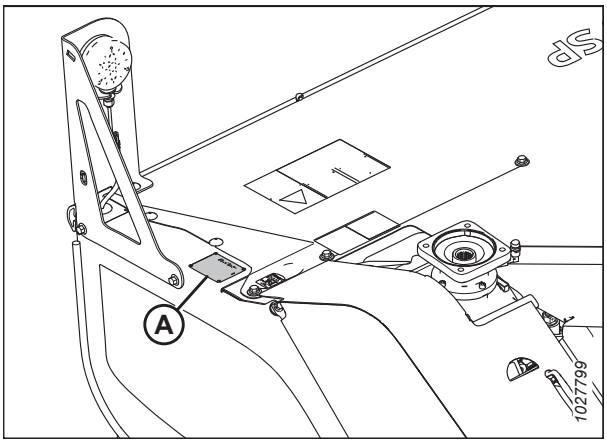


Figure 1: Serial Number Location

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 not avoided, will result in death or serious injury.

WARNING

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

CAUTION

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

IMPORTANT:

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

NOTE:

Provides additional information or advice.

1.3 General Safety

Protect yourself when assembling, operating, and servicing machinery.

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

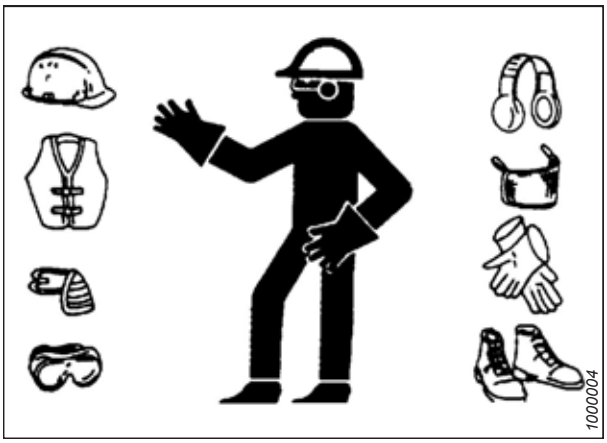


Figure 1.2: Safety Equipment

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 1.3: 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.

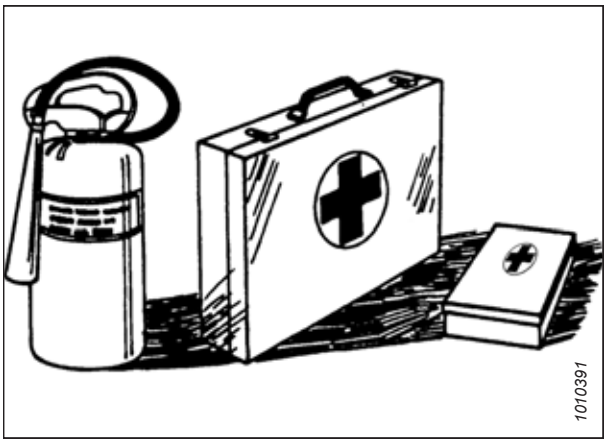


Figure 1.4: Safety Equipment

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

Figure 1.5: Safety around Equipment

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

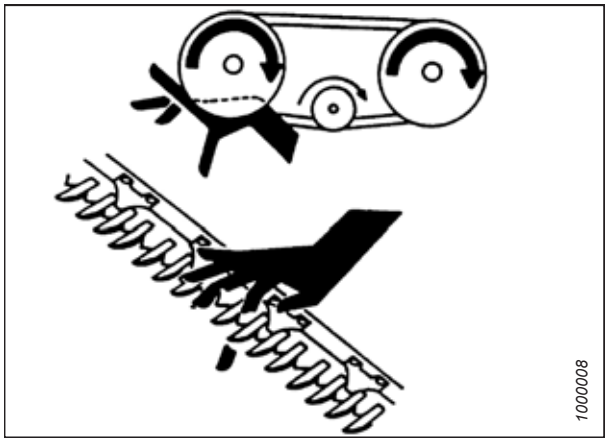


Figure 1.6: Safety around Equipment

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

Figure 1.7: Safety around Equipment

1.4 Maintenance Safety

Protect yourself when maintaining machinery.

To ensure your safety while maintaining the machine:

- Review the operator's manual and all safety items before operating or performing maintenance on the machine.
- Place all controls in Neutral, stop the engine, set the parking brake, remove the ignition key, and wait for all moving parts to stop before servicing, adjusting, or repairing the machine.
- Follow good shop practices:
  - Keep service areas clean and dry
  - Ensure that electrical outlets and tools are properly grounded
  - Keep the work area well lit

Figure 1.8: Safety around Equipment

- Relieve pressure from hydraulic circuits before servicing and/or disconnecting the machine.
- Ensure that all components are tight and that steel lines, hoses, and couplings are in good condition before applying pressure to hydraulic systems.
- Keep hands, feet, clothing, and hair away from all moving and/or rotating parts.
- Clear the area of bystanders, especially children, when carrying out any maintenance, repairs, or adjustments.
- Install the transport lock or place safety stands under the frame before working under the machine.
- If more than one person is servicing the machine at the same time, be aware that rotating a driveline or another mechanically driven component by hand (for example, accessing a lubricant fitting) will cause drive components in other areas (belts, pulleys, and knives) to move. Stay clear of driven components at all times.
- Wear protective gear when working on the machine.
- Wear heavy gloves when working on knife components.

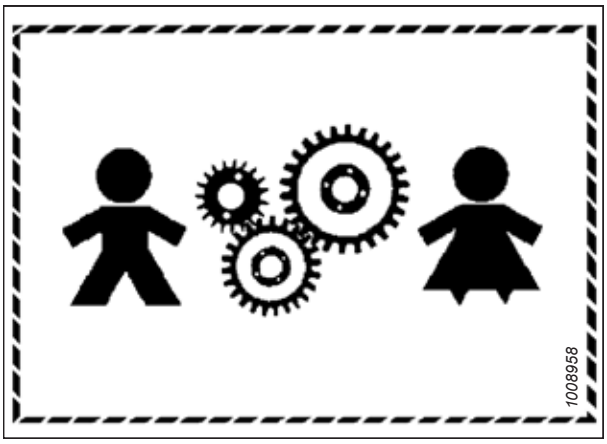


Figure 1.9: Equipment is NOT Safe for Children

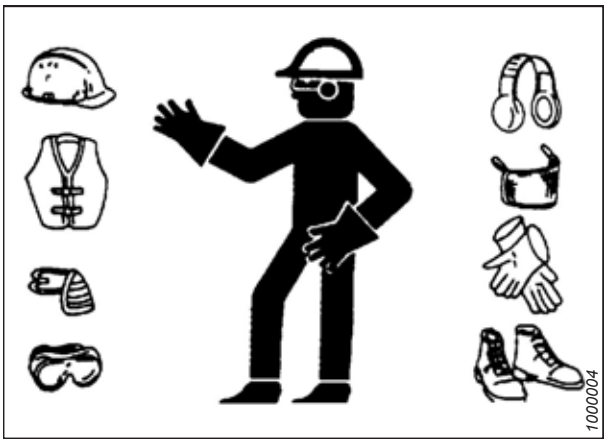


Figure 1.10: Safety Equipment

1.5 Hydraulic Safety

Protect yourself when assembling, operating, and servicing hydraulic components.

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

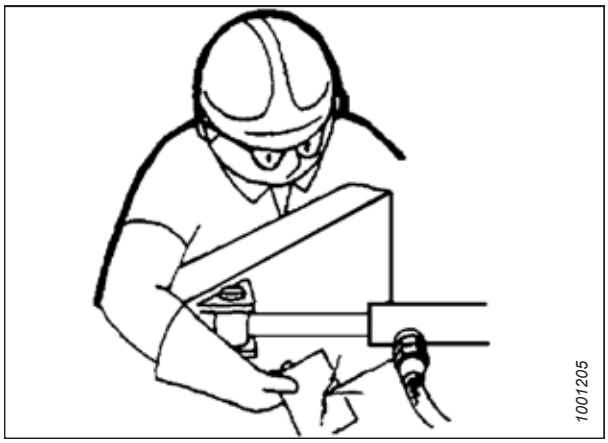


Figure 1.11: Testing for Hydraulic Leaks

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

Figure 1.12: Hydraulic Pressure Hazard

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

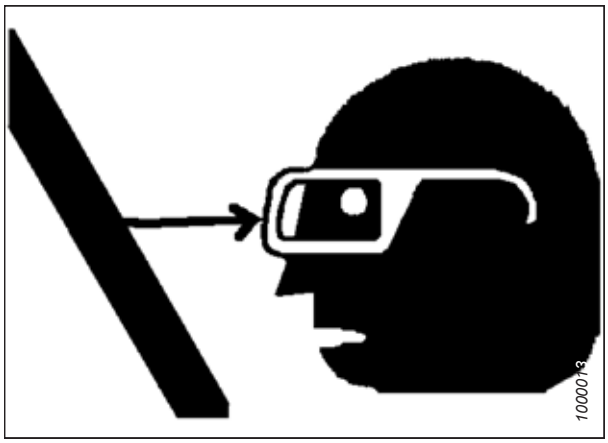


Figure 1.13: Safety around Equipment

1.6 Welding Precaution

To prevent damage to sensitive electronics, welding should never be attempted on the header while it is connected to a windrower.

WARNING

Severe damage to sensitive, expensive electronics can result from welding on the header while it is connected to the windrower. It can be impossible to know what effect high current could have with regard to future malfunctions or shorter lifespan. It is very important that welding on the header is not attempted while the header is connected to the windrower.

If it is unfeasible to disconnect the header from the windrower before welding, contact your MacDon Dealer for welding precautions detailing all electrical components that must be disconnected first for safe welding.

1.7 Safety Signs

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

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

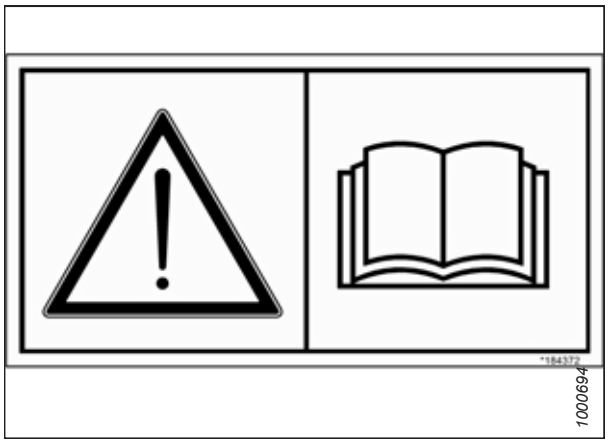


Figure 1.14: Operator's Manual Decal

1.7.1 Installing Safety Decals

Replace any safety decals that are worn or damaged.

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.

1.8 Safety Decal Locations – Standard Header

Refer to the diagram below to locate the safety decals on the standard version of the R2 Series Rotary Disc Header.

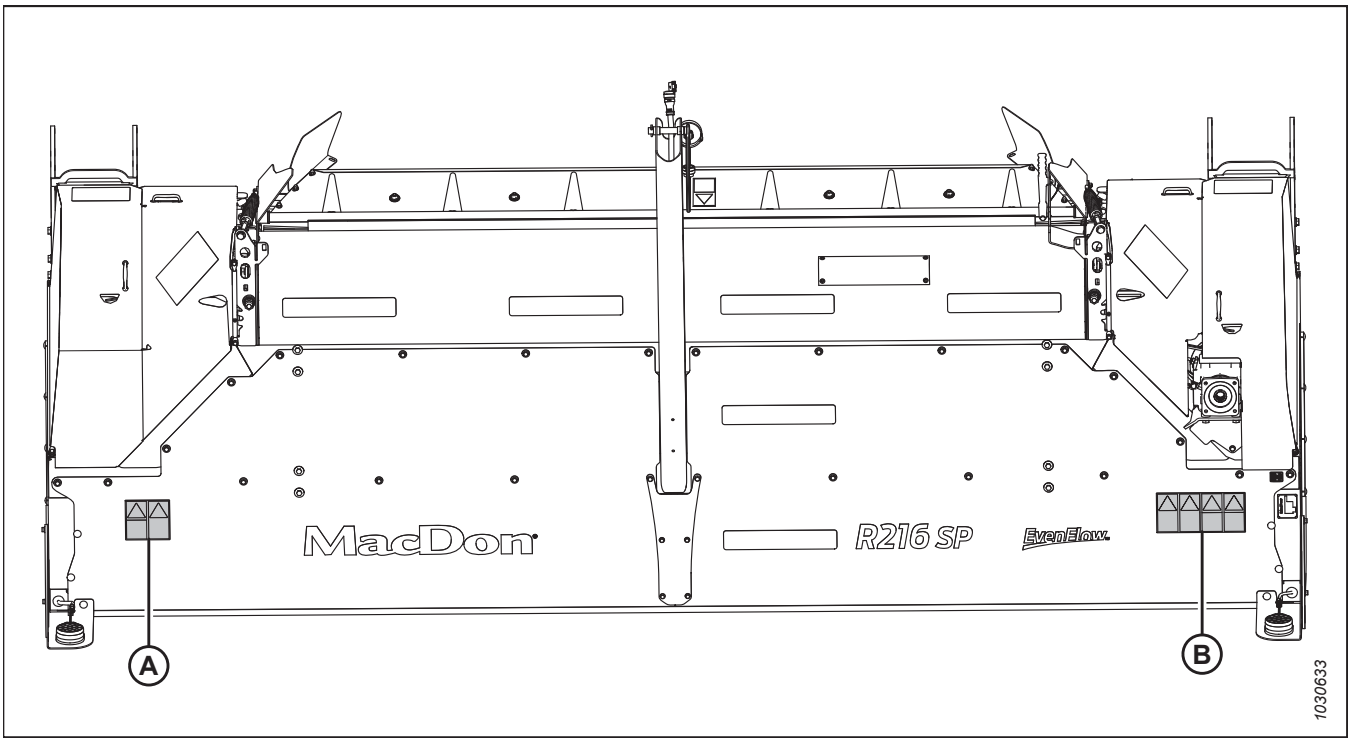


Figure 1.15: Safety Sign Decal Locations – Top View

A - MD #307746 **B - MD #325706**

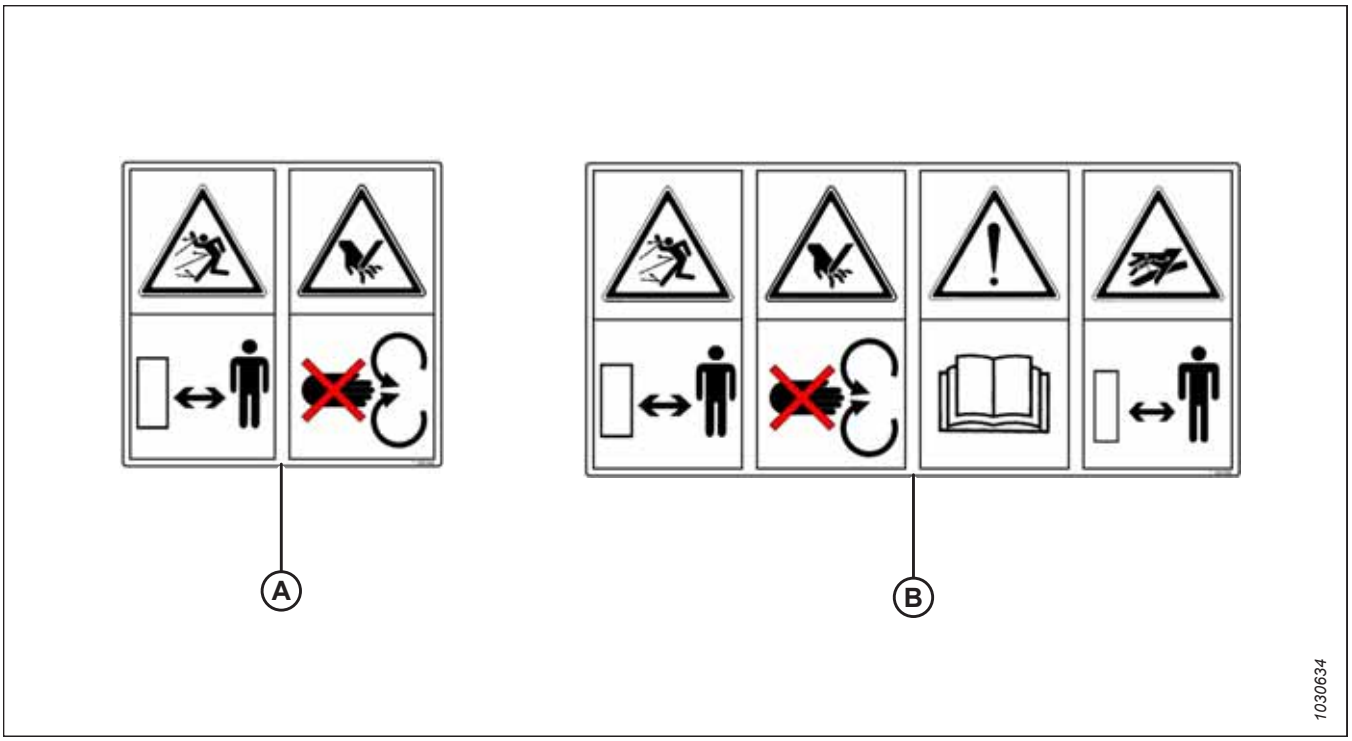


Figure 1.16: Safety Sign Decals

A - MD #307746 **B - MD #325706**

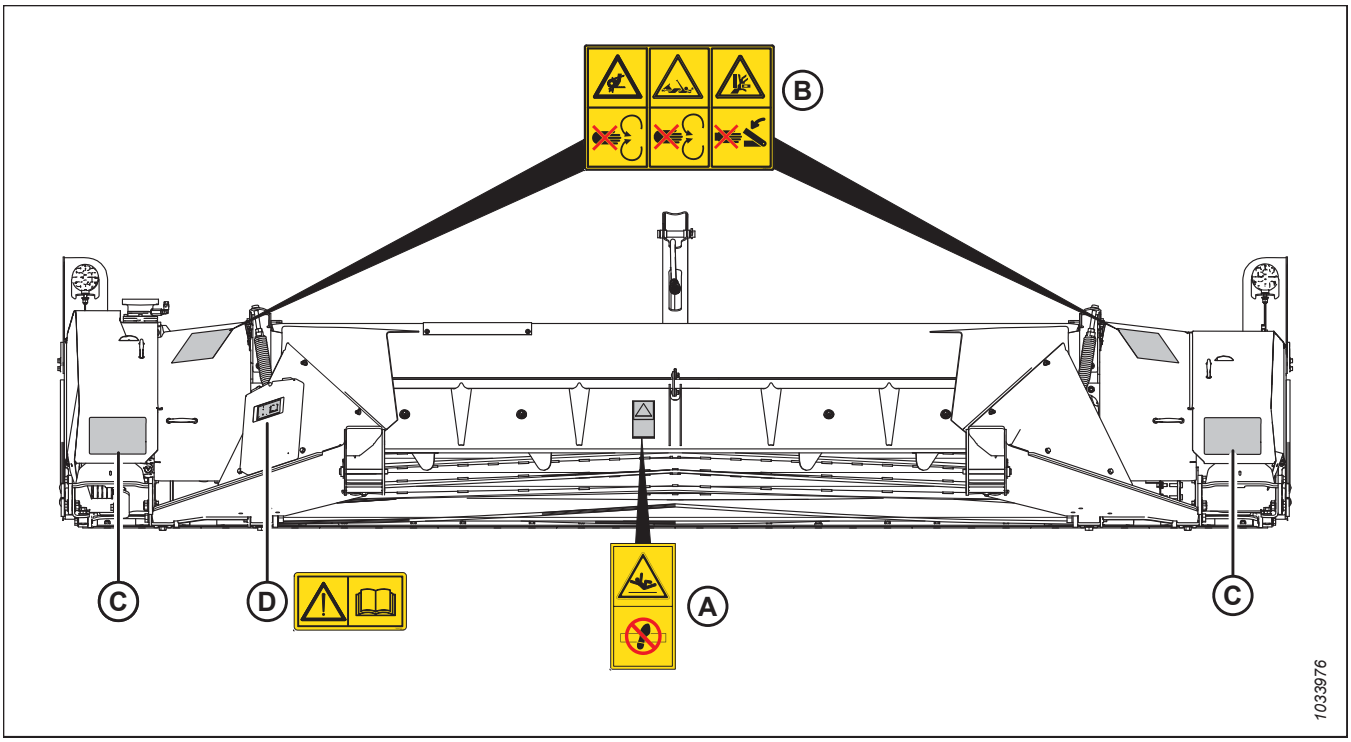


Figure 1.17: Safety Sign Decal Locations – Rear View

A - MD #190546
B - MD #325070
C - Reflector
D - MD #184372

1.9 Safety Decal Locations – Grass Seed Header

Refer to the diagram below to locate the safety decals on the grass seed version of the R2 Series Rotary Disc Header.

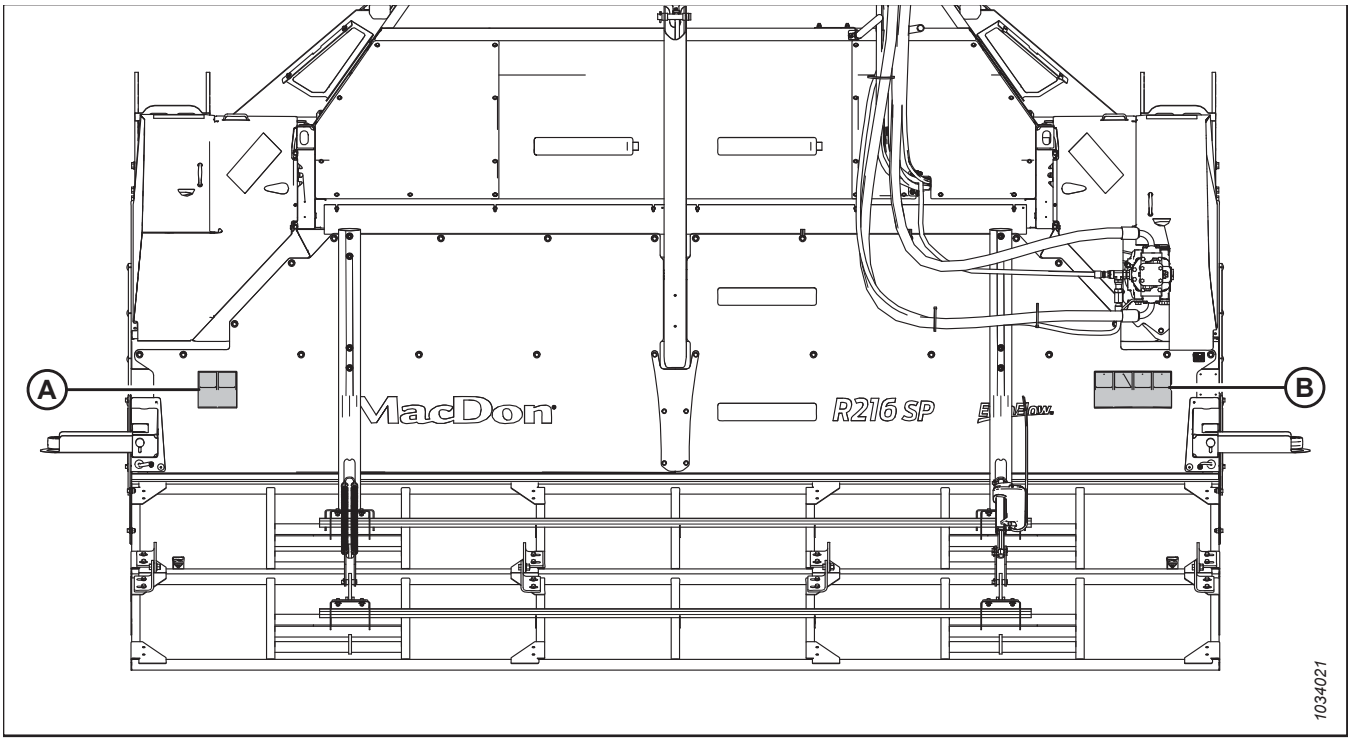


Figure 1.18: Safety Sign Decal Locations – Top View

A - MD #307746 **B - MD #325706**

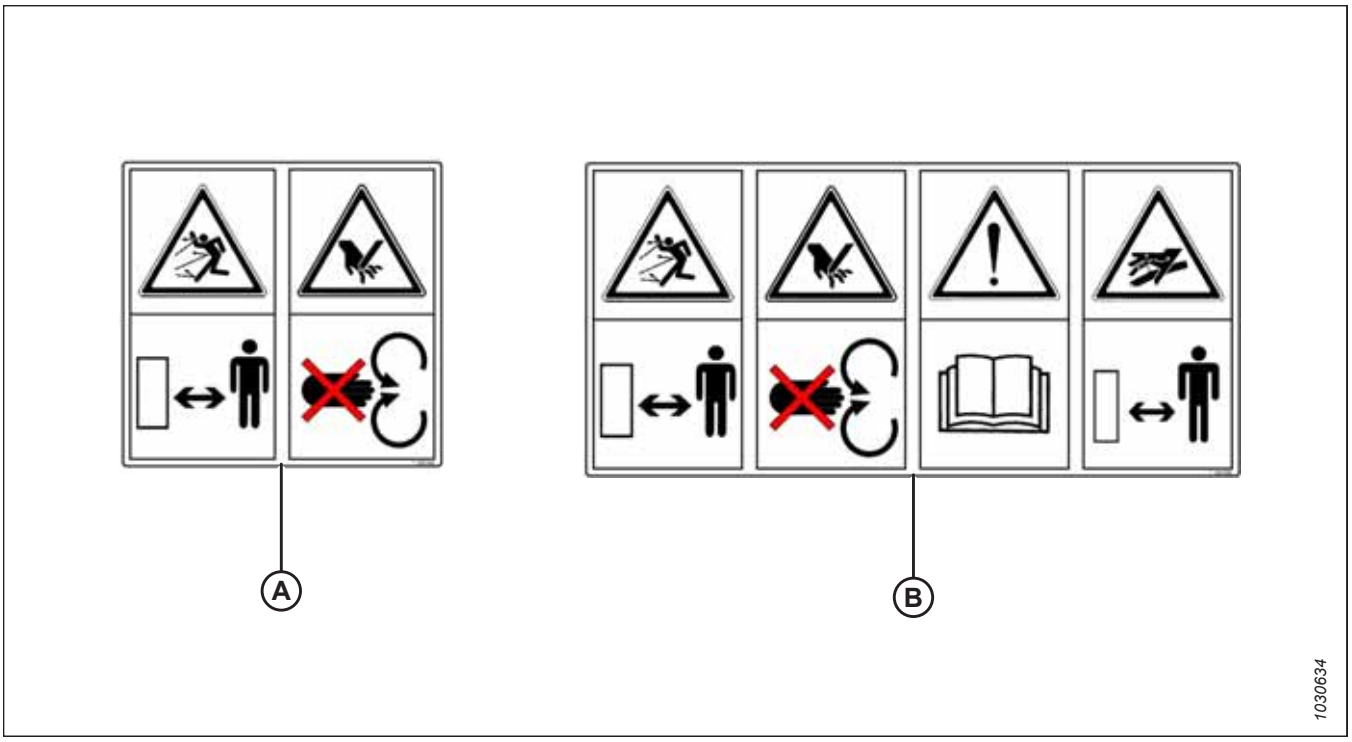


Figure 1.19: Safety Sign Decals

A - MD #307746 **B - MD #325706**

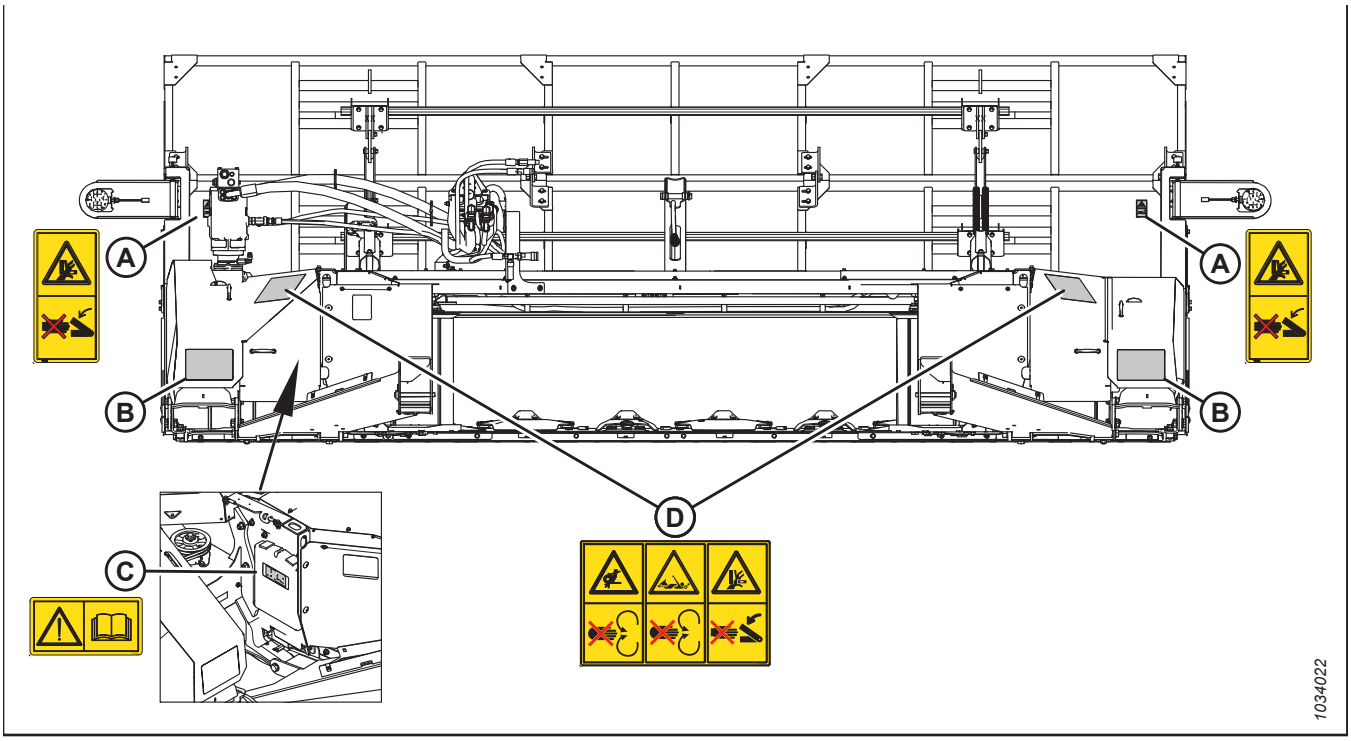


Figure 1.20: Safety Sign Decal Locations – Rear View

A - MD #246959
B - Reflector
C - MD #184372
D - MD #325070

1.10 Understanding Safety Signs

Refer to this topic to learn the hazards that each type of safety decal denotes.

MD #190546

Slipping hazard

WARNING

To prevent injury or death:

- Do **NOT** use this area as a step or platform.

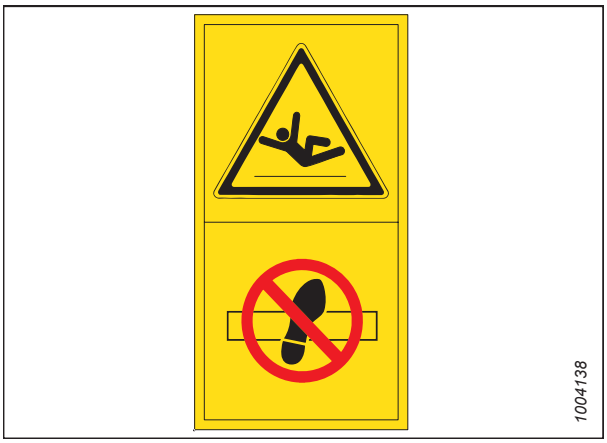


Figure 1.21: MD #190546

MD #246959

Pinch point hazard

CAUTION

To prevent injury:

- Do **NOT** reach into the pinch area.

Figure 1.22: MD #246959

MD #307746

Thrown objects hazard

WARNING

To prevent injury or death from thrown objects:

- Stand clear of the header while it is operating.
- Stop the machine, and wait for all movement to cease before approaching the indicated area.

Blade cutting hazard

WARNING

To prevent injury from sharp blades:

- Do **NOT** operate the machine without the shields in place.
- Disengage the PTO, stop the engine, and remove the key from the ignition before opening the shield.
- Stop the machine, and wait for all movement to cease before approaching the indicated area.

Figure 1.23: MD #307746

MD #325070

Driveline entanglement hazard

DANGER

To prevent injury:

- Stop the engine and remove the key from the ignition before opening the shield.
- Do **NOT** operate the machine without the shields in place.

Hand and arm entanglement hazard

WARNING

To prevent injury:

- Stop the engine and remove the key from the ignition before opening the shield.
- Do **NOT** operate without shields in place.

Pinch point hazard

CAUTION

To prevent injury:

- Do **NOT** reach into the pinch area.

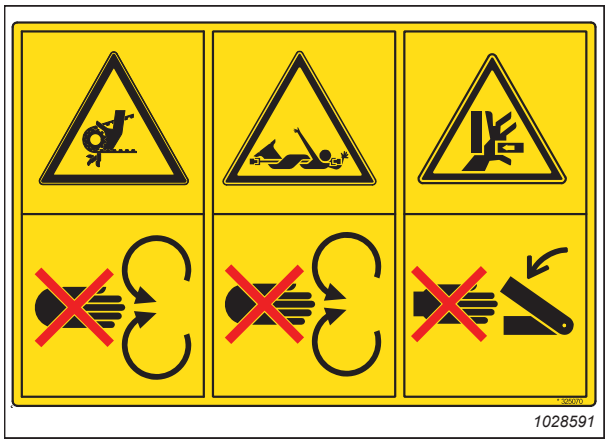


Figure 1.24: MD #325070

MD #325706

Thrown and sharp object/hydraulic oil pressure hazard

WARNING

- Crop materials exiting at high speed.
- Stop the machine and wait for all movement to cease before approaching the indicated area.
- Where applicable, disengage the power take-off, shut off the engine, and remove the key before opening any shields.
- Listen and look for evidence of rotation before lifting the cover.
- Ensure that the cutters are not rotating before reaching into the cutterbar.

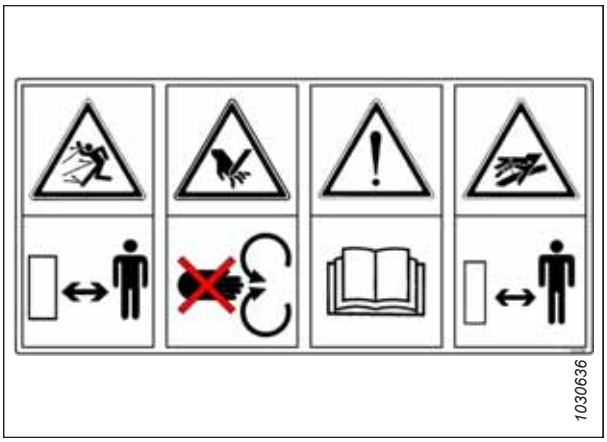


Figure 1.25: MD #325706

- Read the operator's manual, and follow all safety instructions therein. If you do not have a manual, obtain one from your Dealer.
- Do **NOT** allow untrained persons to operate the machine.
- Review all safety instructions with all Operators of this machine annually.
- Ensure that all safety signs are installed and legible.
- Ensure that bystanders are clear of the machine before starting the engine, and while the machine is operating.
- Do not allow anyone to ride on the machine.
- Keep all shields in place and stay clear of moving parts.
- Shut off the engine and remove the key from the ignition before servicing, adjusting, lubricating, cleaning, or unplugging the machine.
- Engage the lift locks to prevent the header from falling when raised for service.
- Use a slow moving vehicle emblem and flashing warning lights when transporting the machine on roadways, unless these are prohibited by law.
- High pressure oil can easily puncture the skin, causing serious injury, gangrene, or death.
- If injured, seek emergency medical help.
- Do **NOT** use any part of your body to check for leaks.
- Lower the load or relieve the pressure in the hydraulic system before loosening any fittings.

Chapter 2: Product Overview

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

2.1 Specifications

Refer to this section to learn about the physical characteristics of and equipment specifications for your header.

NOTE:

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

Frame and Structure	
Width	5027 mm (198 in.)
Weight: base machine with hydraulic motor and steel conditioner	2154 kg (4740 lb.)
Weight: base machine with hydraulic motor, grass seed module, and shield	2298 kg (5055 lb.)
Compatible windrower	Standard Header: MacDon M1 Series Windrowers, and M205 and M155*E4* SP Windrowers Grass Seed Header: MacDon M1 Series Windrowers
Lighting	Left and right turn signals
Manual storage	Plastic case on header – left header support deflector
Cutterbar	
Number of cutting discs	Ten
Blades per disc	Two 18° bevel down
Disc speed (full engine speed)	If used with M1 Windrowers: 2700 rpm (NOTE: M1170 Windrower may not be able to achieve the full 2700 rpm.) If used with M155*E4* or M205 SP Windrower: 2600 rpm
Blade max tip speed	83.6 m/s (187 mph)
Effective cutting width	4942 mm (16 ft. 2 in.)
Minimum cutting height	20 mm (25/32 in.) at 8° header tilt
Cutting angle range	0–8° below horizontal
Adjustable shoes or gauge rollers	Standard
Gear train protection	Shearpin (safecut)
Feeding Elements	
Converging drums	Four-drum type
Feed roller (standard headers only)	Standard
Diameter (peripheral)	152 mm (6 in.)
Length	3275 mm (6 in.)
Drive (with spring loader idler)	2 HA belt
Speed range	720–1040 rpm
Tall crop kit (cutterbar deflectors and tall crop feed plates)	Optional

Grass seed module and anti-shatter shield	Optional
Converging drums	Grass seed module adds four drums, for a total of eight drums on the header
Drum speed range	Off, or 235–660 rpm
Drives	
Hydraulic motor	Piston type into 90° gearbox
Cutterbar	Direct drive through 90° gearbox and universal shaft
Conditioner drive	Belt drive (4HB) from 90° gearbox to conditioner
Conditioner roll timing	Timing gearbox
Hay Conditioner Options	
Steel rolls	Optional
Roll type	Steel on steel chevron conditioner rolls
Roll length	3275 mm (129 in.)
Roll diameter	229 mm (9 in.) roll diameter (outer) on 179 mm (7 in.) OD tube
Roll speed	1040 rpm (at disc speed of 2600 rpm)
Polyurethane rolls	Optional
Roll type	Polyurethane intermeshing conditioner rolls
Roll length	3275 mm (129 in.)
Roll diameter	254 mm (10 in.) roll diameter (outer) on 203 mm (8 in.) OD tube
Roll speed	1009 rpm
No conditioner (grass seed module with anti-shatter shield)	Optional
Swath width[1]	915–2438 mm (36–96 in.)
Forming shields	Full width angle-adjustable rear baffle on conditioner with adjustable windrower mounted forming shield

1. The actual width of the swath might vary, depending on the type of conditioner used and on the type of crop being harvested and its volume.

2.2 Component Identification – Standard Header

Being able to identify the parts and systems of the standard version of the R2 Series Rotary Disc will make looking up content in its reference manuals much easier.

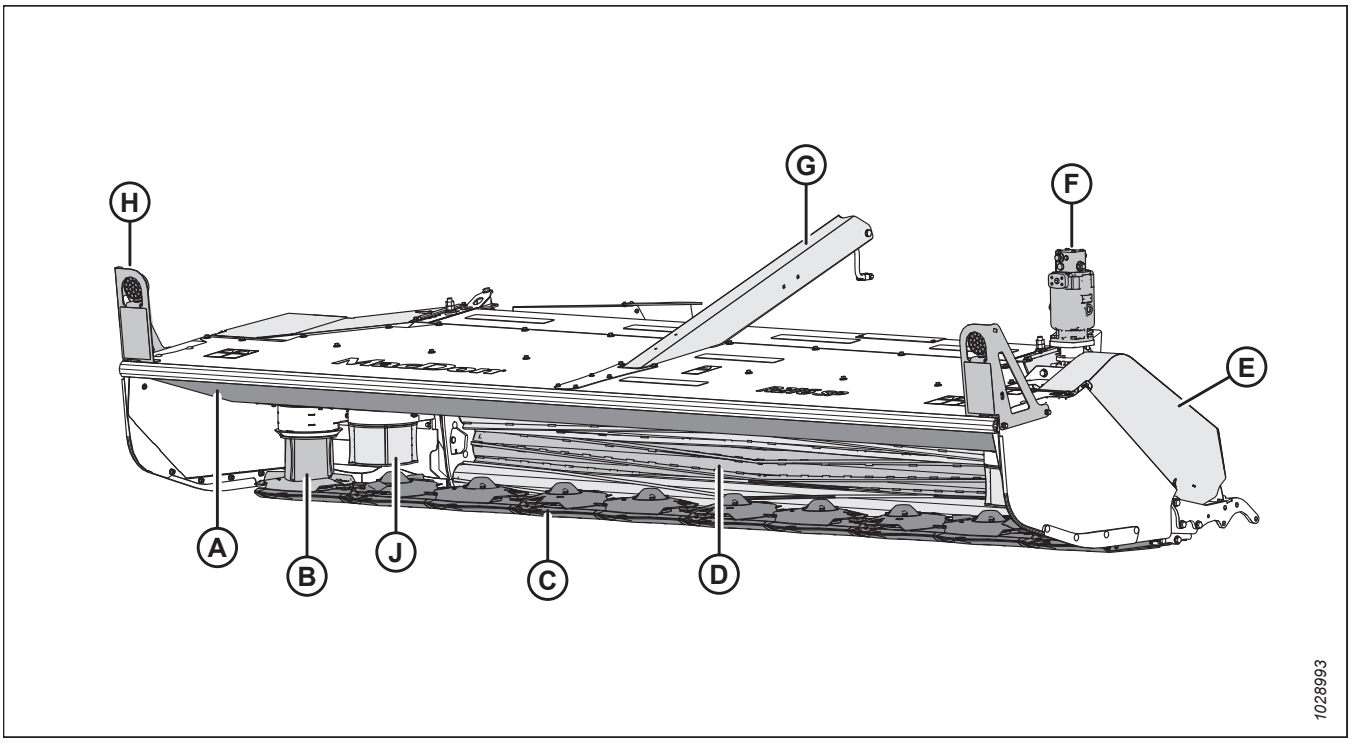


Figure 2.1: R216 Rotary Disc Header – Standard Header

A - Front Curtain
B - Disc Drum (Right Shown)
C - 10-Disc Cutterbar
D - Conditioner Rolls
E - Drive Shield (Left Shown)
F - Hydraulic Motor
G - Center-Link Tube (Welded to Frame)
H - Hazard/Brake Lights
J - Suspended Drum (Right Shown)

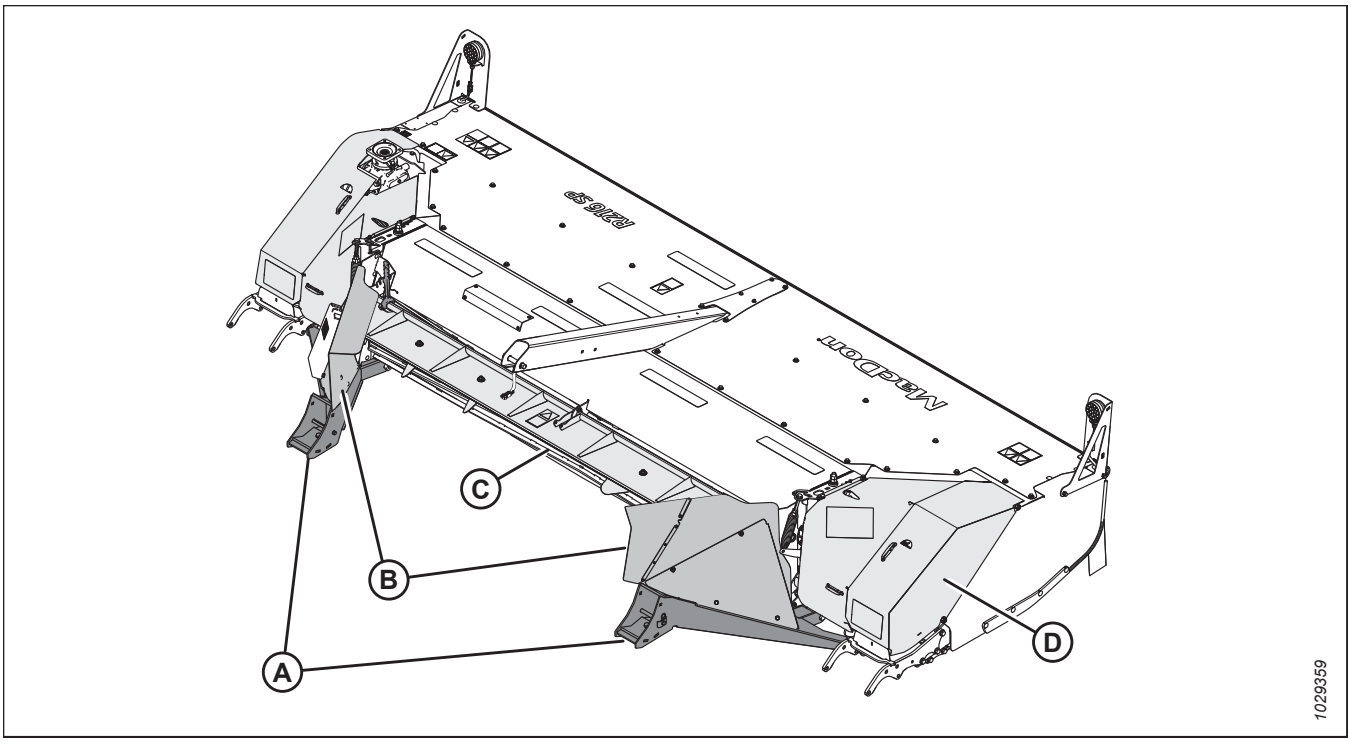


Figure 2.2: R216 Rotary Disc Header – Standard Header

A - Header Supports
B - Deflectors
C - Rear Crop Baffle
D - Drive Shield

2.3 Component Identification – Grass Seed Header

Being able to identify the parts and systems of the grass seed version of the R2 Series Rotary Disc will make looking up content in its reference manuals much easier.

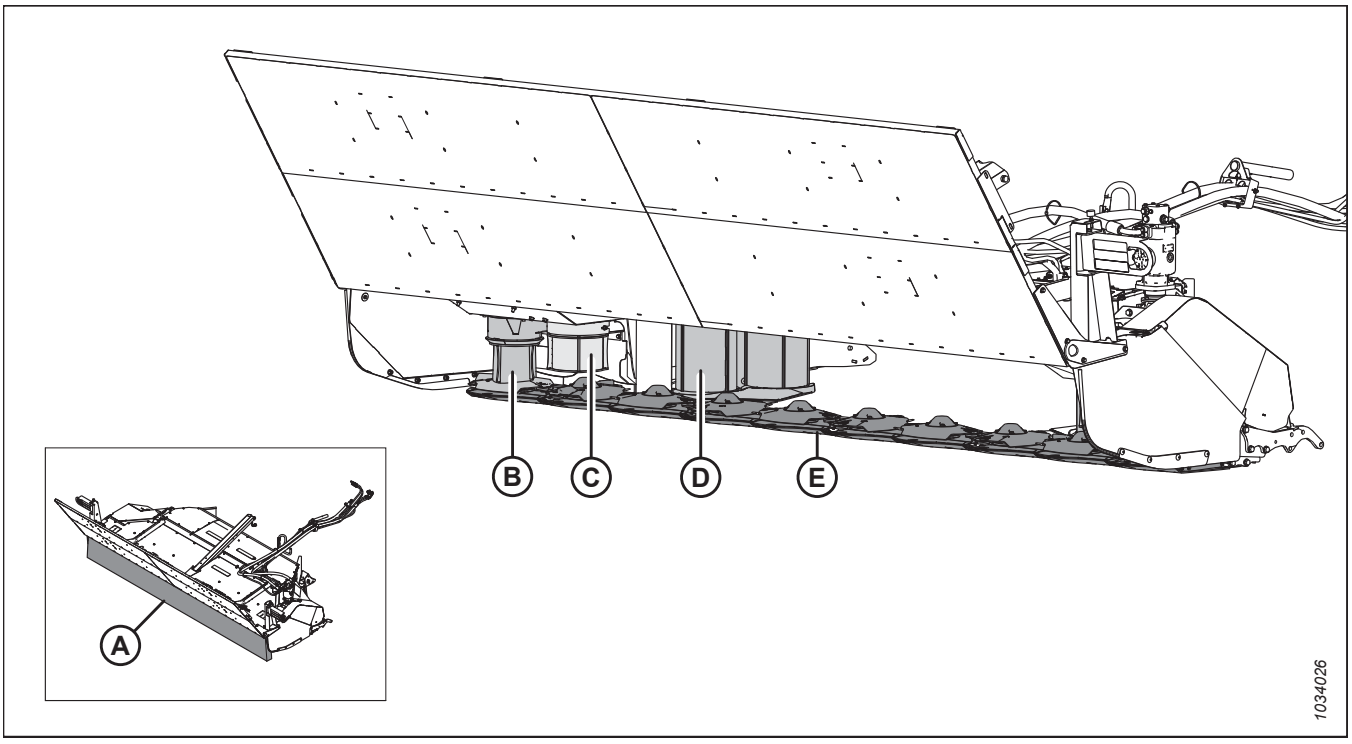


Figure 2.3: R216 Rotary Disc Header – Grass Seed Header

A - Front Curtain
B - Disc Drum (Right)
C - Suspended Drum (Right)
D - Grass Seed Module Drums x 2 (Right)
E - 10-Disc Cutterbar

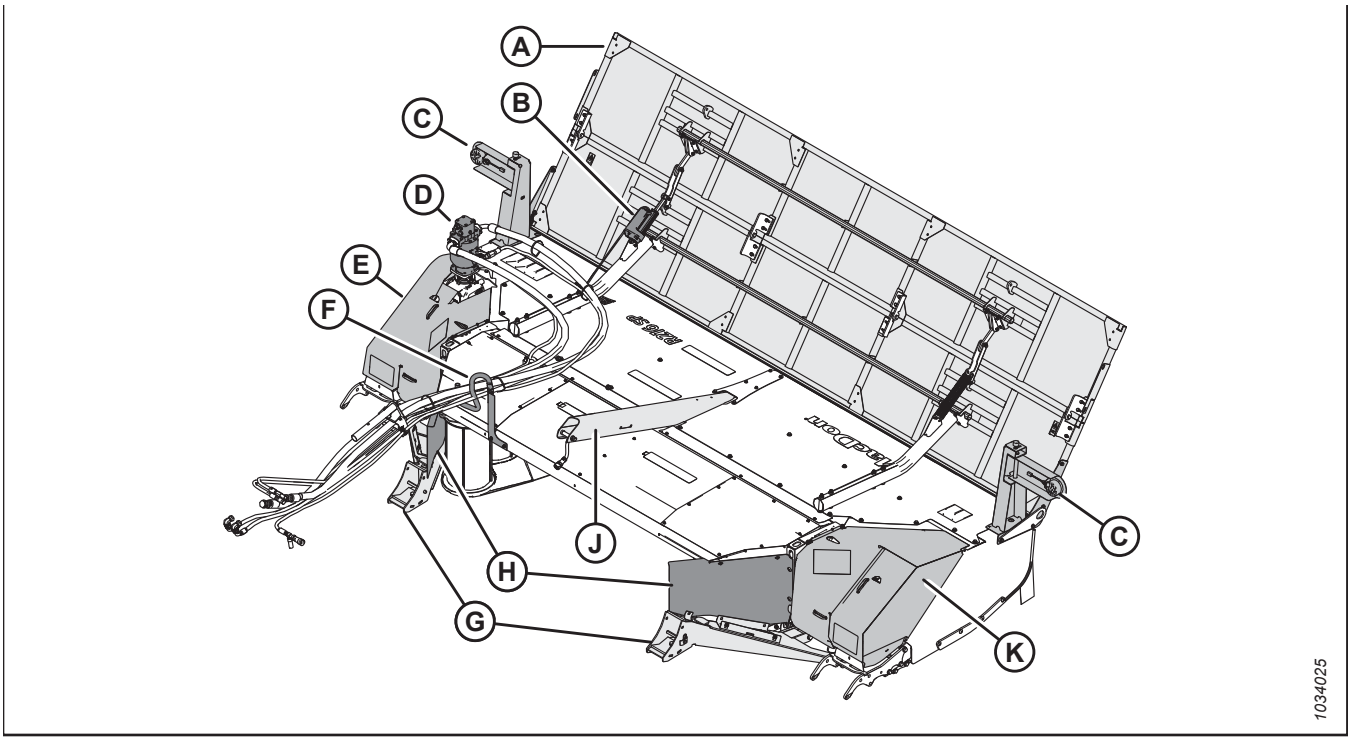


Figure 2.4: R216 Rotary Disc Header – Grass Seed Header

A - Anti-Shatter Shield
B - Actuator for Anti-Shatter Shield
C - Hazard/Brake Lights
D - Hydraulic Motor
E - Left Drive Shield
F - Hose Guide
G - Header Supports
H - Deflectors
J - Center-Link Tube (Welded to Frame)
K - Right Drive Shield

2.4 Definitions

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

Term	Definition
API	American Petroleum Institute
ASTM	American Society of Testing and Materials
Bolt	A headed and externally threaded fastener designed to be paired with a nut
Cab-forward	Windrower operation mode, in which the Operator's seat faces the header
CDM	Cab display module on an M Series Windrower
Center-link	A hydraulic cylinder or manually adjustable turnbuckle type connection between the header and the vehicle, which is used to change the angle of the header relative to the vehicle
CGVW	Combined gross vehicle weight
Export header	The header configuration typical outside North America
FFFT	Flats from finger tight
Finger tight	Finger tight is a reference position in which the given sealing surfaces or components are making contact with each other and the fitting has been tightened by hand to a point where the fitting is no longer loose and cannot be tightened further by hand
GSS	Grass Seed
GVW	Gross vehicle weight
Hard joint	A joint made with use of a fastener where joining materials are highly incompressible
Header	A machine that cuts and lays crop into a windrow when attached to a windrower
Hex key	A tool of hexagonal cross-section used to drive bolts and screws that have a hexagonal socket in the head (internal-wrenching hexagon drive); also known as an Allen key
HPT display	Harvest Performance Tracker display module on an M1 Series Windrower
JIC	Joint Industrial Council: A standards body that developed standard sizing and shape for original 37° flared fitting
M Series Windrowers	MacDon M100, M105, M150, M155, M155*E4*, M200, and M205 Windrowers
M1 Series Windrowers	MacDon M1170, M1170*NT5*, and M1240 Windrowers
n/a	Not applicable
North American header	The header configuration typical in North America
NPT	National Pipe Thread: A style of fitting used for low-pressure port openings. Threads on NPT fittings are uniquely tapered for an interference fit
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
PARK	The slot opposite the NEUTRAL position on operator's console of M1 Series windrowers
R2 SP Series	MacDon R216 Rotary Disc Headers for windrowers
rpm	Revolutions per minute
SAE	Society of Automotive Engineers
Screw	A headed and externally threaded fastener that threads into preformed threads or forms its own thread when inserted into a mating part
Soft joint	A flexible joint made by use of a fastener in which the joining materials compress or relax over a period of time

Term	Definition
Tension	An axial load placed on a bolt or screw, usually measured in Newtons (N) or pounds (lb.). This term can also be used to describe the force a belt exerts on a pulley or sprocket
TFFT	Turns from finger tight
Torque	The product of a force * the length of a lever arm, usually measured in Newton-meters (Nm) or foot-pounds (lbf·ft)
Torque angle	A tightening procedure in which a fitting is assembled to a specified tightness (usually finger tight) and then the nut is turned farther by a specified number of degrees until it achieves its final position
Torque-tension	The relationship between the assembly torque applied to a piece of hardware and the axial load it induces in a bolt or screw
Washer	A thin cylinder with a hole or a slot located in the center, used as a spacer, a load distribution element, or a locking mechanism
Windrower	The power unit for a header

Chapter 3: Operation

Safely operating your machine requires familiarizing yourself with its capabilities.

3.1 Break-In Period

After attaching the header to the windrower for the first time, operate the machine slowly for 5 minutes, watching and listening from the operator's seat for binding or interfering parts.

NOTE:

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

M1240 or M1170 Windrowers:

DANGER

Before investigating an unusual sound or attempting to correct a problem, stop the engine, put the ground speed lever (GSL) in PARK, and remove the key.

M205 or M155*E4* SP Windrowers:

DANGER

Before investigating an unusual sound or attempting to correct a problem, place ground speed lever (GSL) in N-DETENT, shut off engine, and remove key.

NOTE:

Perform the items specified in *4.4.3 Break-In Inspections, page 170*.

3.2 Engaging and Disengaging Header Safety Props

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

Proceed according to the model of windrower:

- If using an M1170 or M1240 Windrower, refer to *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*.
- If using an M155*E4* or M205 SP Windrower, refer to *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*.

3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower

Safety props are located on both header lift cylinders on the windrower. Engage the props any time you are going to work on or around a raised header. When engaged, safety props prevent a header from dropping suddenly if the lift system hydraulics lose pressure.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

1. Start the engine.
2. Press HEADER UP switch (A) on the ground speed lever (GSL) to raise the header to its maximum height.

   NOTE:

   If one end of the header does **NOT** fully rise, rephase the lift cylinders as follows:

   a. Press and hold HEADER UP switch (A) until both cylinders stop moving.

   b. Continue to hold the switch for 3–4 seconds. The cylinders are now phased.
3. Shut down the engine, and remove the key from the ignition.

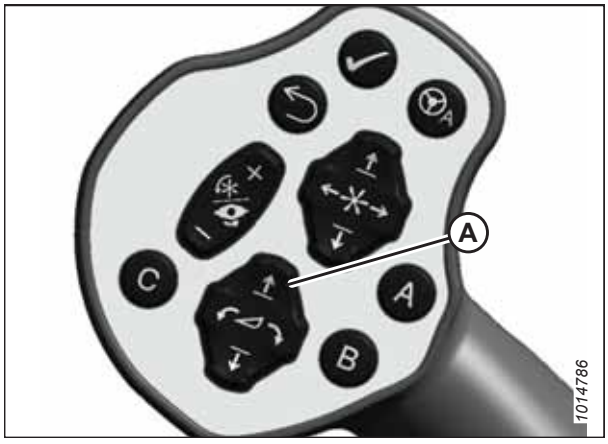


Figure 3.1: Ground Speed Lever

4. Engage the safety props on both lift cylinders as follows:

   a. Pull lever (A) toward you to release it, and then rotate it toward the header to lower the safety prop onto the cylinder.

   b. Repeat the previous step for the opposite lift cylinder.

   IMPORTANT:

   Ensure that the safety props engage over the cylinder piston rods. If the safety prop does **NOT** engage properly, raise the header until the safety prop fits over the rod.

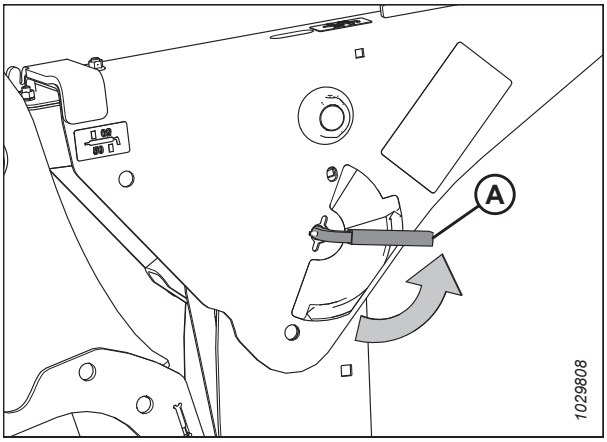


Figure 3.2: Safety Prop Lever

5. Disengage the safety props on both lift cylinders as follows:

   a. Turn lever (A) away from the header to raise the safety prop until the lever locks into the vertical position.

   b. Repeat the previous step for the opposite cylinder.

   NOTE:

   If the safety prop will **NOT** disengage, raise the header to release the prop.

6. Start the engine.

7. Lower the header fully.

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

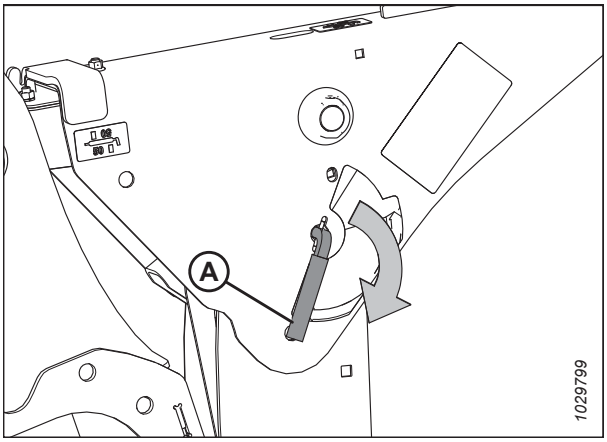


Figure 3.3: Safety Prop Lever

3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower

Safety props are located on both header lift cylinders on the windrower. Engage the props anytime you are going to work on or around a raised header. When engaged, the safety props prevent the header from dropping suddenly if the lift system hydraulics lose pressure.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

1. Start the engine and press HEADER UP switch (A) to raise the header to its maximum height.
2. Rephase the cylinders if one end of the header does not rise fully:
   a. Press and hold HEADER UP switch (A) until both cylinders stop moving.
   b. Continue to hold the switch for 3–4 seconds. The cylinders are now phased.

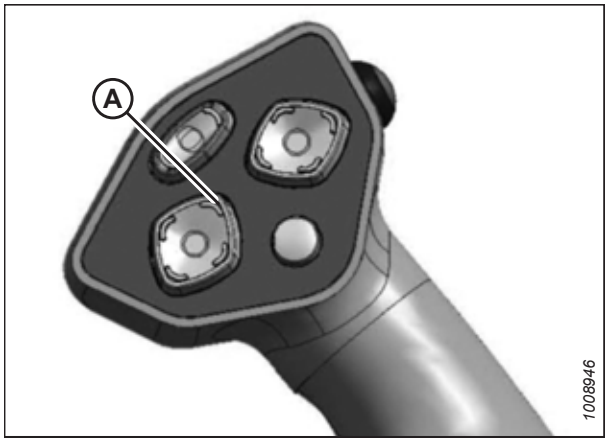


Figure 3.4: Ground Speed Lever (GSL)

3. To engage the safety prop, pull lever (A) and rotate it toward the header to lower safety prop (B) onto the cylinder. Repeat this step to engage the safety prop on the opposite side of the windrower.

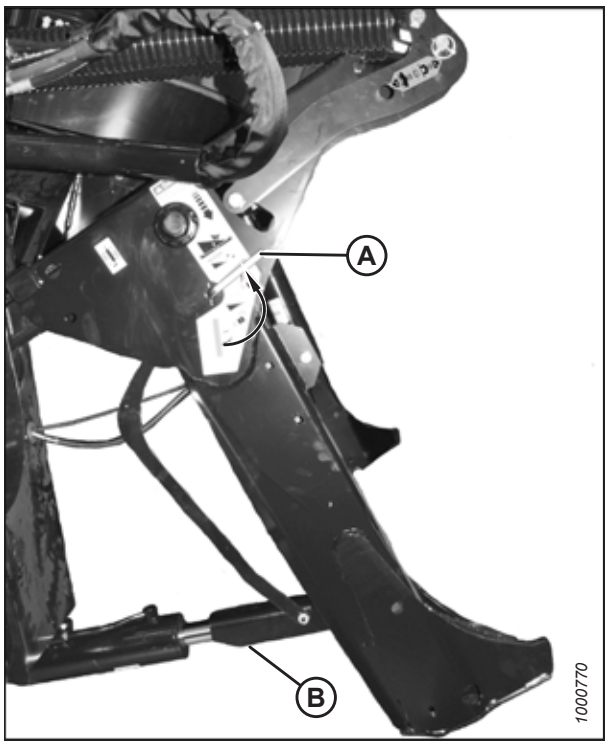


Figure 3.5: Safety Prop

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.

4. To disengage the safety prop, turn lever (A) away from the header to raise the safety prop until the lever locks into the vertical position. Repeat this step to disengage the safety prop on the opposite side of the windrower.

5. Start the engine. Move the windrower to a level area, and lower the header to the ground.

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

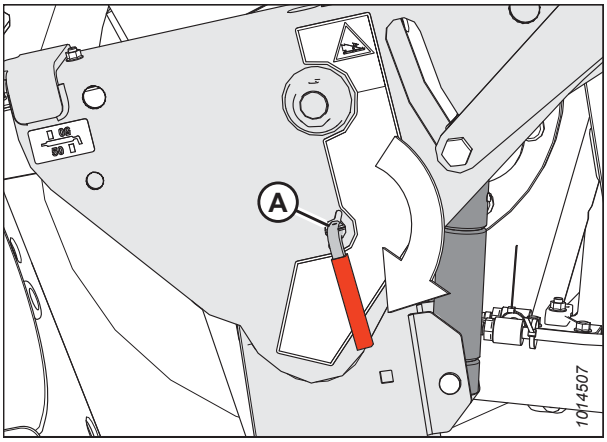


Figure 3.6: Safety Prop

3.3 Attaching R2 Series Rotary Disc Header to M1 Series Windrower

Attaching the header to the windrower will allow you to cut, condition, and lay a wide variety of grasses and hay crops in windrows.

3.3.1 Attaching Forming Shield

The forming shield determines the width and the placement of the windrow. Follow the instructions in this section to properly attach the forming shield to the windrower.

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 for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Position forming shield (A) in between windrower legs as shown.
3. Remove lynch pin (B) and clevis pin (C).
4. Mount forming shield (A) to bolt and spacer (D).

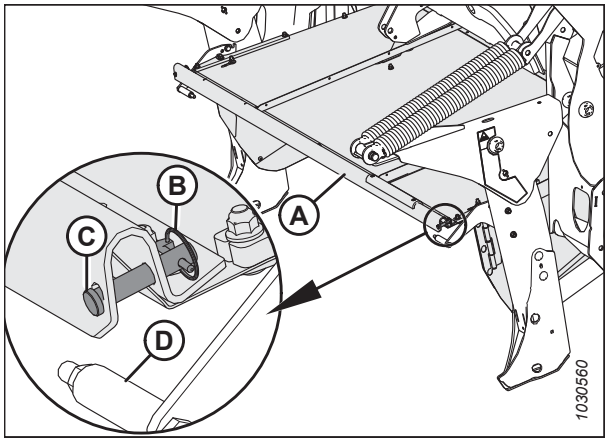


Figure 3.7: Forming Shield and Windrower

5. Secure forming shield (C) to bolt and spacer (D) using clevis pin (B) and lynch pin (A).

6. Repeat Steps *3, page 30* to *5, page 31* on the opposite side of the forming shield.

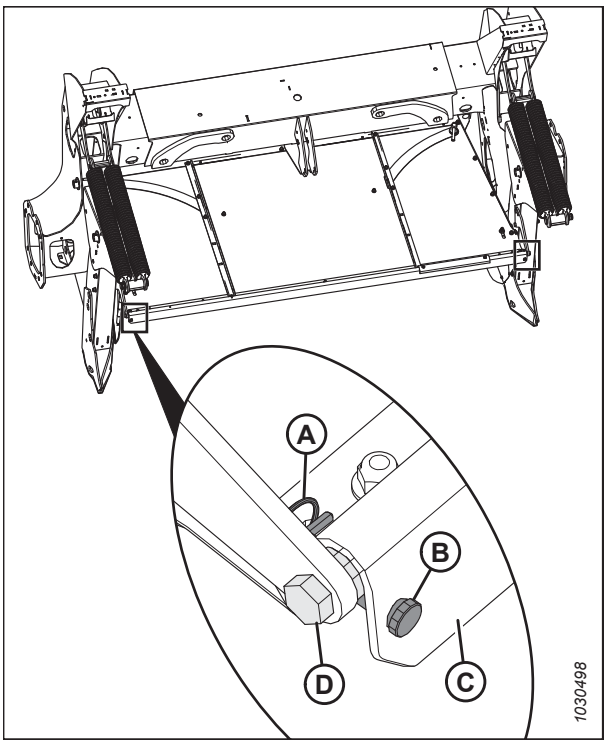


Figure 3.8: Forming Shield Secured to Front of Windrower Legs

7. Remove lynch pin (A) and washer (B) from straight pin (C).

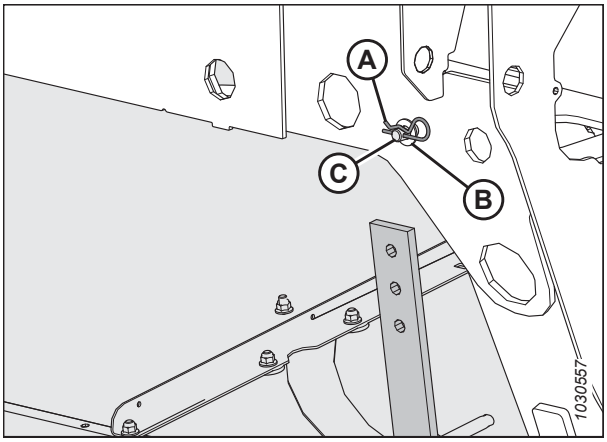


Figure 3.9: Lynch Pin and Washer at Rear of Windrower Leg

8. Attach rubber strap (D) to straight pin (C) at the rear of the windrower leg. Secure it with washer (B) and lynch pin (A).

9. Repeat Step *7, page 31* to Step *8, page 32* at the opposite side of the forming shield.

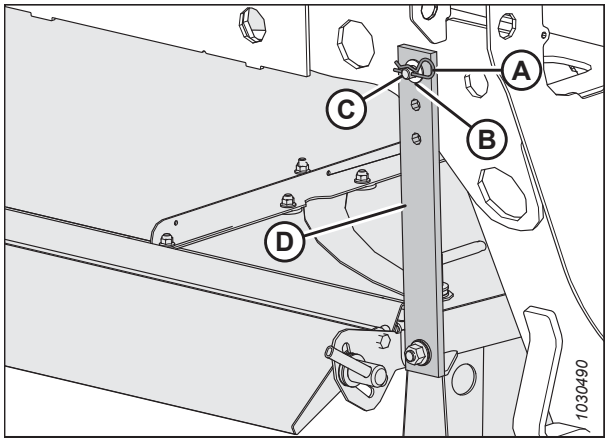


Figure 3.10: Rubber Strap Securing Forming Shield onto Windrower Leg

3.3.2 Attaching R2 Series Rotary Disc Header to M1 Series Windrower

The windrower's support feet and center-link will need to be connected to the rotary disc header. The windrower may be equipped with an optional self-aligning hydraulic center-link, which allows control over the vertical position of the center-link from the cab.

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 for any reason.

IMPORTANT:

To attach an R216 SP Rotary Disc Header to an M1 Series Windrower previously configured for a D1X Series Draper Header, ensure that two shield mount plates (A) (MD #307045) are attached to the windrower and the forming shield.

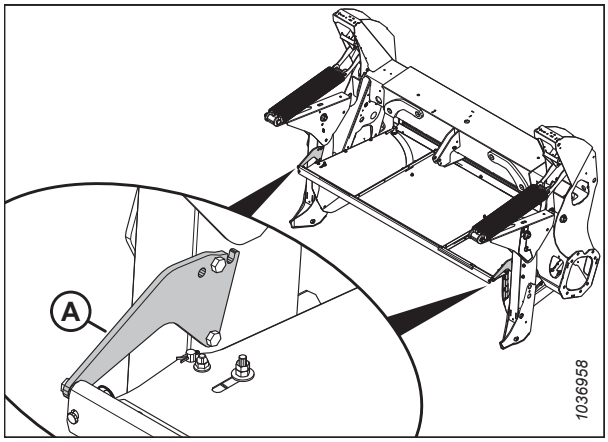


Figure 3.11: Shield Mount Plates on Forming Shield

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

2. **Windrowers equipped with a hydraulic center-link without self-alignment:** Remove pin (A) and raise center-link (B) until the hook is above the attachment pin on the header. Replace pin (A) to hold the center-link in place.

   IMPORTANT:

   Ensure that the center-link is positioned high enough that it does not contact the header as the windrower approaches the header.

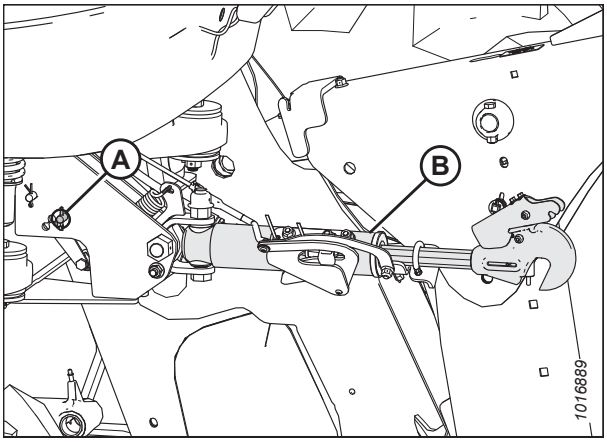


Figure 3.12: Hydraulic Center-Link

3. Remove hairpin (A) from clevis pin (B), and remove the pin from header support (C) on both sides of the header.

4. Start the engine.

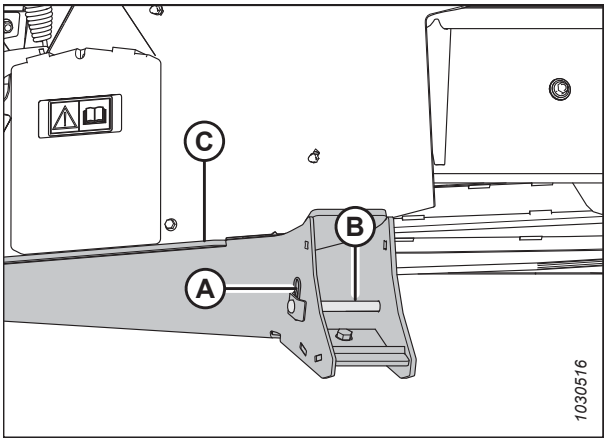


Figure 3.13: Header Support

5. Lift header support (A) and place 2 x 4 in. blocks (B) under the header support. A total of four 2 x 4 in. blocks (B) will be necessary to raise the boot up into the field position. Ensure that the boot's bottom edge (C) is parallel with the ground.

   NOTE:

   Do **NOT** stack blocks (B) crosswise; doing so can make the header unstable when you are attempting to connect the header and the windrower. Stack blocks (B) so that they are aligned with each other.

6. Repeat Step *5, page 33* on the opposite side of the header.

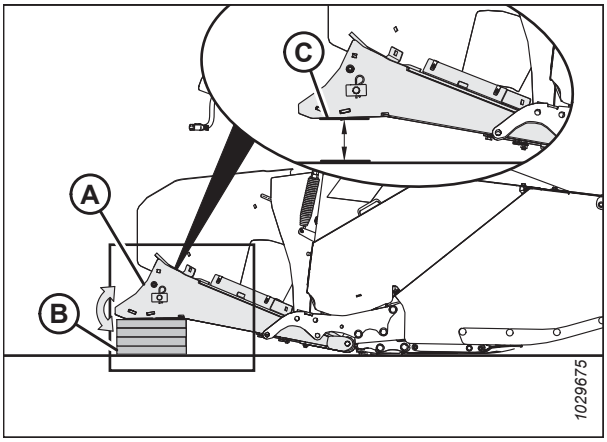


Figure 3.14: Header Support

7. **If the header lift legs will be lowered WITH a header or weight box attached**, proceed to Step *11, page 35*.

   If the header lift legs will be lowered WITHOUT a header or weight box attached to the windrower, fully release the tension in header float springs (A):

   - If the Harvest Performance Tracker (HPT) displays a message saying that the float should be removed, then remove the float and proceed to Step *11, page 35*.
   - If the HPT does **NOT** display a message saying that the float should be removed, then proceed to Step *8, page 34* to remove the float manually.

   IMPORTANT:

   To lower the header lift legs without a header or weight box attached to the windrower, ensure that the tension on the float springs is fully released. This will prevent damage to the header lift linkages.

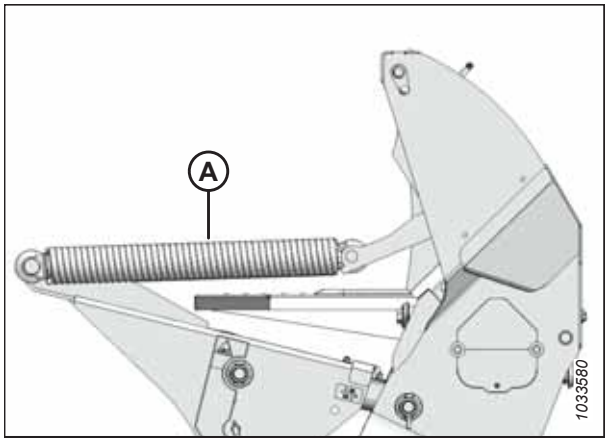


Figure 3.15: Header Float Springs

8. Press rotary scroll knob (A) on the HPT to highlight the QuickMenu options.

9. Rotate scroll knob (A) to highlight HEADER FLOAT symbol (B). Press the scroll knob to select it. The Float Adjust page will appear.

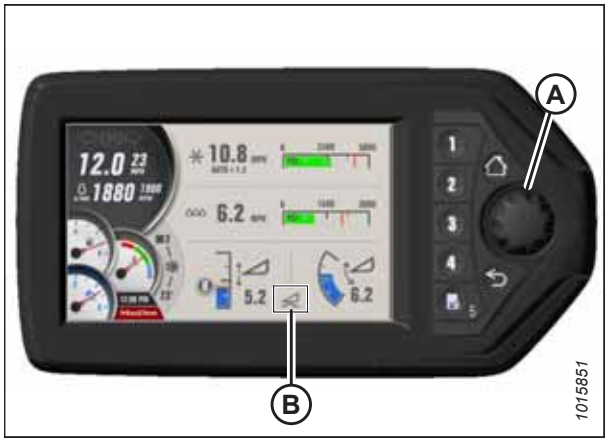


Figure 3.16: HPT Display

10. Press soft key 3 (A) to remove the header float.

    NOTE:

    If the header float is active, the icon at soft key 3 displays Remove Float; if the header float has been removed, then the icon displays Resume Float.

Figure 3.17: HPT Display

11. Press HEADER DOWN switch (E) on the ground speed lever (GSL) to fully retract the header lift cylinders.

12. **Windrowers equipped with a self-aligning hydraulic center-link:** Press REEL UP switch (B) on the GSL to raise the center-link until the hook is above the attachment pin on the header.

    IMPORTANT:

    Ensure that the center-link is positioned high enough that it does not contact the header as the windrower approaches the header.

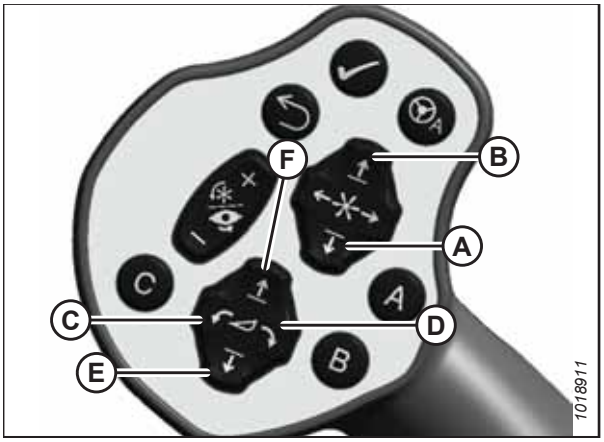


Figure 3.18: GSL

A - Reel Down
B - Reel Up
C - Header Tilt Down
D - Header Tilt Up
E - Header Down
F - Header Up

13. Drive the windrower slowly forward until feet (A) enter supports (B). Continue to drive slowly forward until the feet engage the supports and the header is nudged forward.

14. Ensure that feet (A) are properly engaged in supports (B).

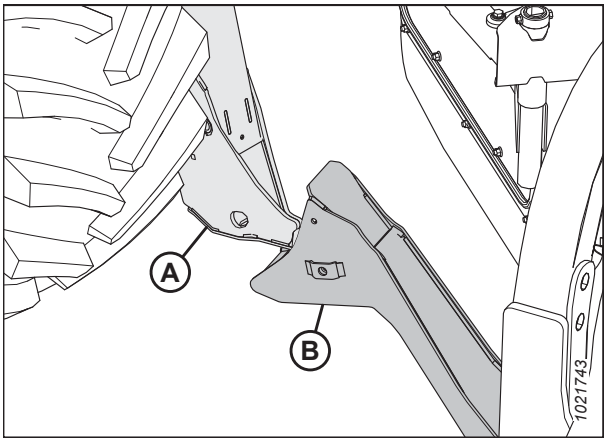


Figure 3.19: Header Support

15. **Windrowers equipped with the self-aligning center-link kit:**

    a. Adjust the position of center-link cylinder (A) with the switches on the GSL until hook (B) is above the header attachment pin.

       IMPORTANT:

       Hook release (C) must be down to enable the self-locking mechanism to function.

    b. If hook release (C) is open (in the up position), shut down the engine, and remove the key from the ignition. Manually push hook release (C) down after the hook engages the header pin.

    c. Lower center-link (A) onto the header with the REEL DOWN switch on the GSL until the center-link locks into position and hook release (C) is down.

    d. Check that the center-link is locked onto the header by pressing the REEL UP switch on the GSL.

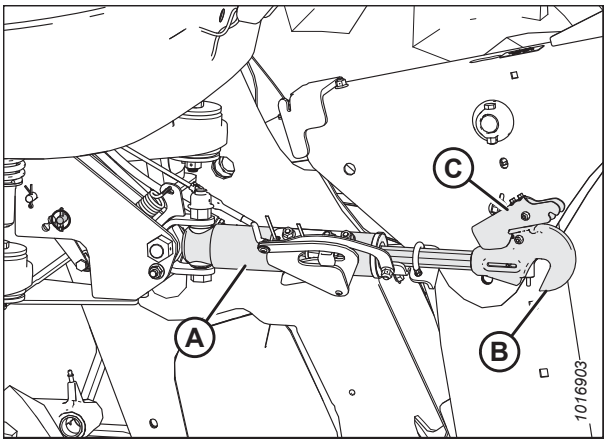


Figure 3.20: Hydraulic Center-Link

16. **Windrowers without the self-aligning center-link kit:**

    a. Press the HEADER TILT UP or HEADER TILT DOWN cylinder switches on the GSL to extend or retract the center-link cylinder until the hook is aligned with the header attachment pin.

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

    c. Push down on the rod end of link cylinder (B) until the hook engages and locks onto the header pin.

    IMPORTANT:

    The hook release must be down to enable the self-locking mechanism to function. If the hook release is open (in the up position), manually push it down after the hook engages the pin.

    d. Check that center-link (A) is locked onto the header by pulling upward on rod end (B) of the cylinder.

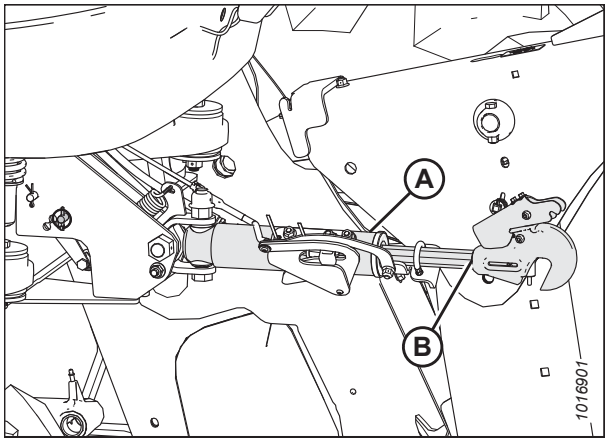


Figure 3.21: Hydraulic Center-Link

DANGER

Ensure that all bystanders have cleared the area.

e. Start the engine.

17. Press HEADER UP switch (A) to raise the header to its maximum height.

    NOTE:

    If one end of the header does **NOT** fully rise, rephase the lift cylinders as follows:

    a. Press and hold HEADER UP switch (A) until both cylinders stop moving.

    b. Continue to hold the switch for 3–4 seconds. The cylinders are now phased.

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

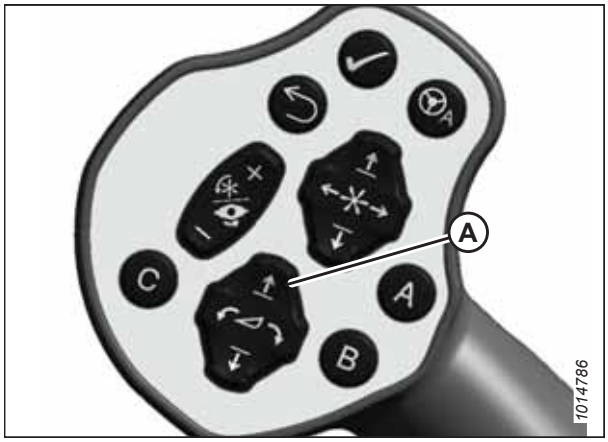


Figure 3.22: GSL

19. Engage the safety props on both lift cylinders as follows:

    a. Pull lever (A) toward you to release it, and then rotate it toward the header to lower the safety prop onto the cylinder.

    b. Repeat the previous step for the opposite lift cylinder.

    IMPORTANT:

    Ensure that the safety props engage over the cylinder piston rods. If the safety prop does **NOT** engage properly, raise the header until the safety prop fits over the rod.

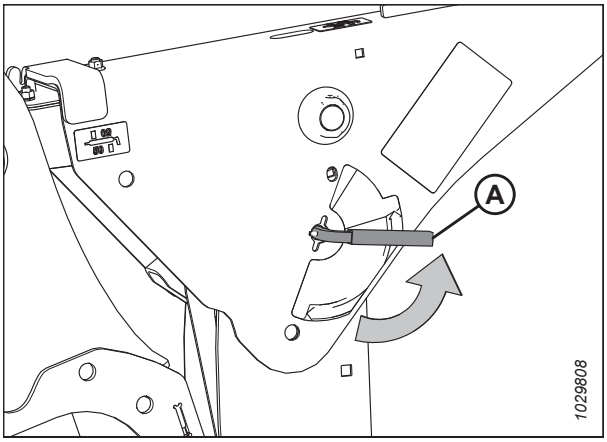


Figure 3.23: Safety Prop Lever

20. Install clevis pin (A) through the support and the windrower lift arm. Secure the clevis pin with hairpin (B). Repeat this step on the opposite side of the header.

    IMPORTANT:

    Ensure that clevis pin (A) is fully inserted, and that the hairpin is installed behind the bracket.

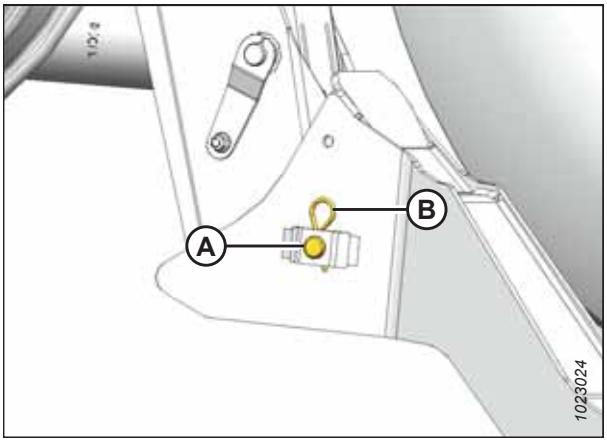


Figure 3.24: Header Support

21. Disengage the safety props on both lift cylinders as follows:

    a. Turn lever (A) away from the header to raise the safety prop until the lever locks into the vertical position.

    b. Repeat the previous step for the opposite cylinder.

    NOTE:

    If the safety prop will **NOT** disengage, raise the header to release the prop.

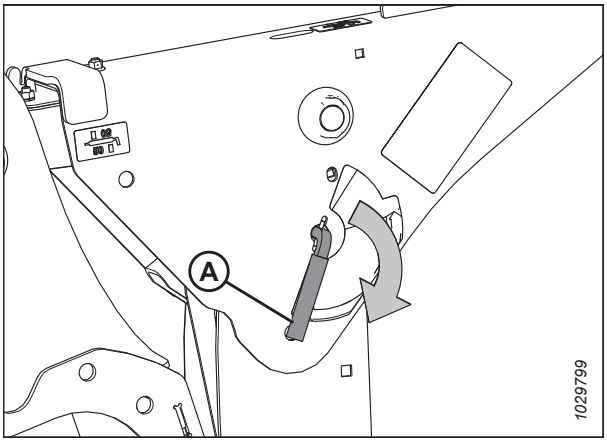


Figure 3.25: Safety Prop Lever

22. Start the engine and press HEADER DOWN switch (A) on the GSL to fully lower the header.

    NOTE:

    If HPT display does not display a message saying that the float must be restored, then restore the float manually.

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

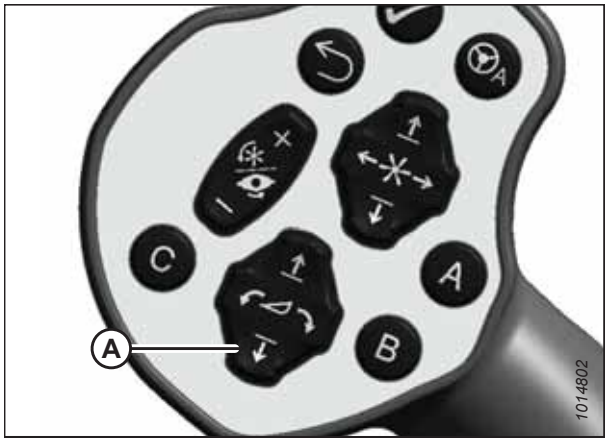


Figure 3.26: GSL

3.3.3 Connecting R2 Series Rotary Disc Header Electrical and Hydraulics – M1240 Windrower

The header's hydraulic and electrical multicoupler will need to be connected to the windrower.

1. Approach platform (A) on the left cab-forward side of the windrower. Ensure that the cab door is closed.
2. Push latch (B) and pull platform (A) toward the walking beam until it stops and the latch engages.

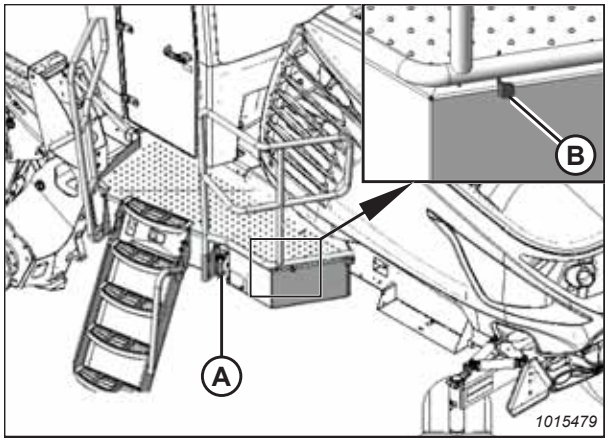


Figure 3.27: Left Cab-Forward Platform

Proceed to the relevant procedure:

Auger/rotary disc/draper-ready configuration (A): For instructions, refer to *Auger/Rotary Disc/Draper-Ready Configuration – Quick Coupler Connections, page 40*.

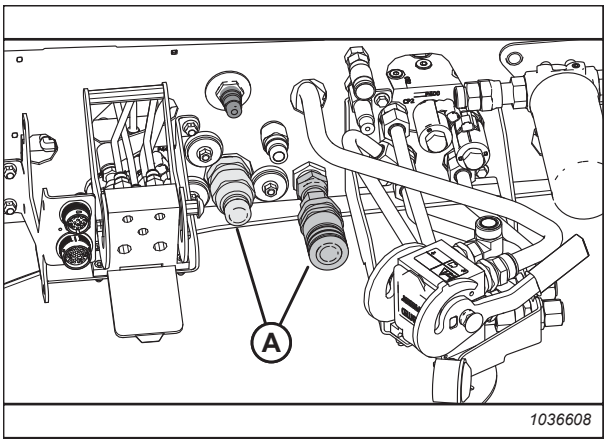


Figure 3.28: Header Hydraulics Configurations – Auger/Rotary Disc/Draper-Ready

Rotary disc-only hard-plumbed configuration (A): For instructions, refer to *Rotary Disc-Only Configuration – Hard-Plumbed Connections, page 44*.

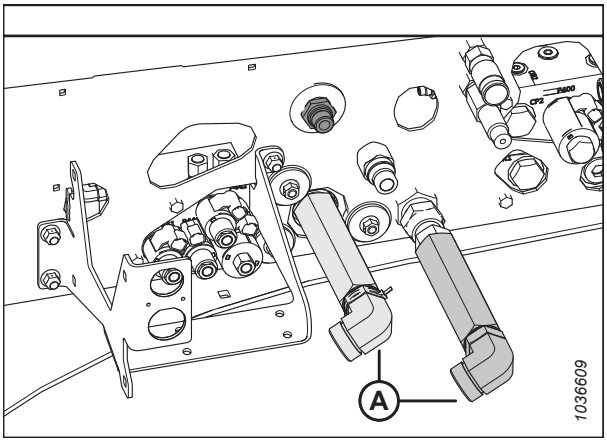


Figure 3.29: Header Hydraulics Configuration – Rotary Disc-Ready with Hard-Plumbed Connections

Rotary disc-ready configuration with quick couplers (A): For instructions, refer to *Rotary Disc-Only Configuration – Quick Coupler Connections, page 47*.

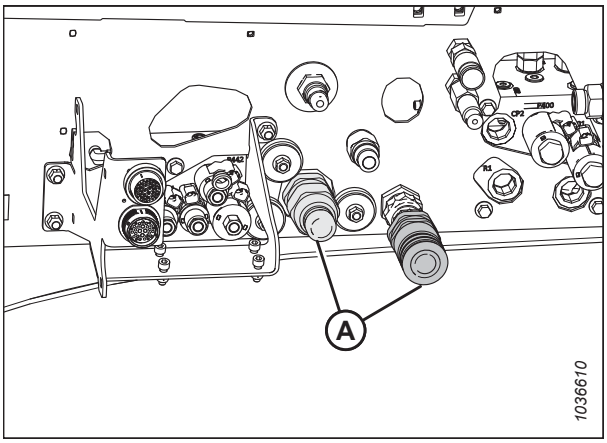


Figure 3.30: Header Hydraulics Configuration – Rotary Disc-Ready with Quick Couplers

Auger/Rotary Disc/Draper-Ready Configuration – Quick Coupler Connections

Windrowers with the auger/rotary disc/draper-ready configuration are equipped with the hydraulic connections needed to pair with an auger, rotary disc, or draper header.

IMPORTANT:

To prevent contamination of the hydraulic system, use a clean rag to remove dirt and moisture from all (fixed and movable) hydraulic couplers.

1. Retrieve hydraulic hoses (A) from the header and route the hose bundle under the windrower frame.

   NOTE:

   Adding anti-seize compound to the hose holder pin will make future removal easier.

2. Insert pin (B) into hole (C) in the windrower frame.

   IMPORTANT:

   Route the hydraulic hoses as straight as possible, avoiding wear points that could damage the hoses. To prevent abrasion damage, the hoses should have enough slack to pass by the multicoupler bracket without contacting it. To adjust the slack in the hoses, loosen the clamps below pin (B), adjust the hoses, then retighten the hose holder.

3. Ensure that hose (A) is disconnected from windrower receptacle (B) and placed in storage cup (C) on the multicoupler.

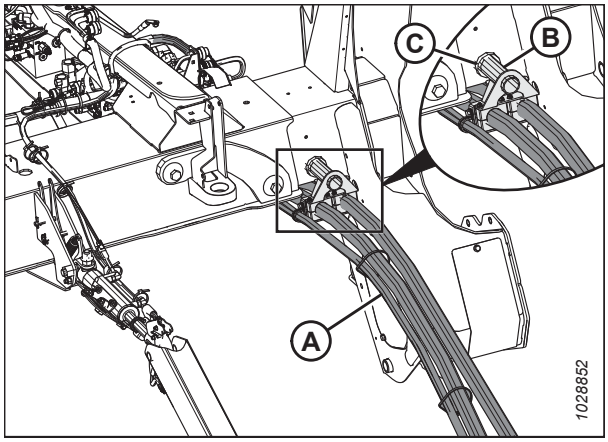


Figure 3.31: Hose Support Attachment

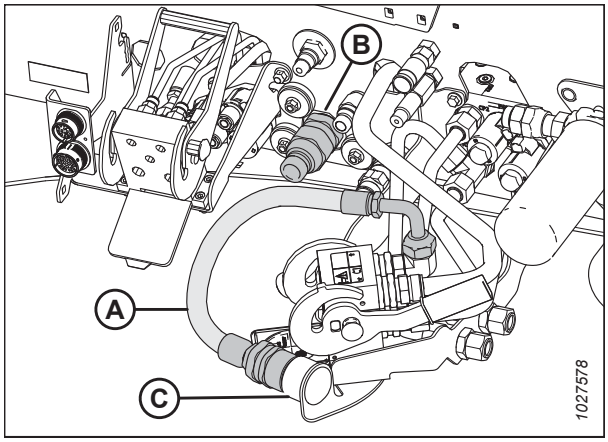


Figure 3.32: Couplers – Auger/Rotary Disc/Draper-Ready Configuration

4. Connect the hydraulic fittings to the hydraulic hoses as follows:

   NOTE:

   The two quick couplers and two elbow fittings are supplied in the Quick Coupler kit (MD #B6277).

   a. Attach 90° elbow fitting (A) and 1 in. female coupler fitting (B) to disc pressure hose (C).

   b. Attach 90° elbow fitting (A) and 1 in. male coupler fitting (D) to disc return hose (E).

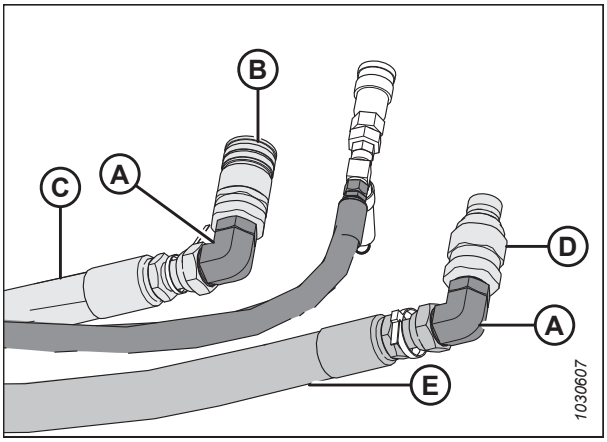


Figure 3.33: Header Hydraulic Fittings

5. Connect the hydraulic hoses to the windrower as follows:

   a. Connect disc pressure hose (A) to coupler (B).

   b. Connect disc return hose (C) to coupler (D).

   c. Connect case drain hose (E) to fitting (F) so that the relief valve points toward the ground.

   NOTE:

   Loosen and tighten fitting (F) as needed to ensure that the relief valve is pointing down.

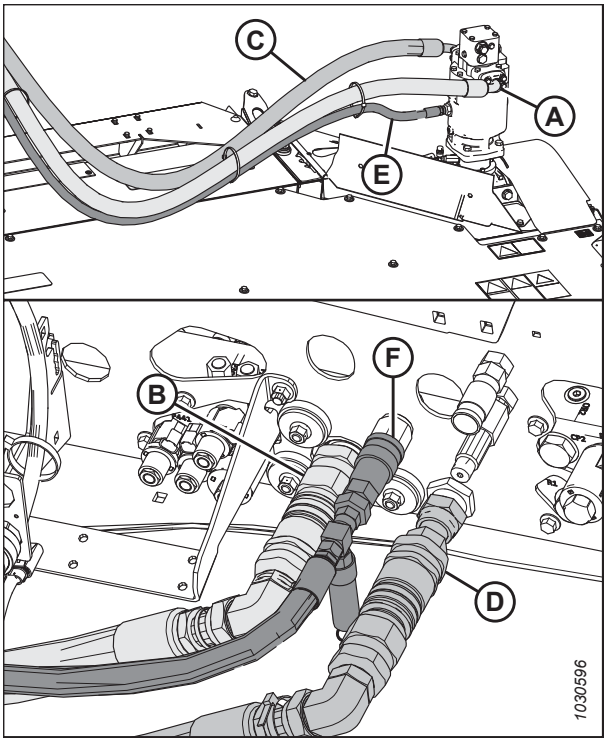


Figure 3.34: Hydraulics and Electrical – Auger/Rotary Disc/Draper-Ready Configuration

6. **Grass seed header (GSS):** Connect the additional four hoses supplied with the grass seed version of the header as follows:

   a. Connect the hose with the green cable tie with female quick coupler (A) to coupler (B) on the windrower frame.

   b. Connect the hose with the yellow cable tie with male quick coupler (C) to coupler (D) on the windrower frame.

   c. Remove the cap (not shown) from inboard bulkhead fitting (E). Connect hose (F) (red cable tie) to inboard bulkhead fitting (E).

      NOTE:

      The other end of hose (F) connects to the grass seed module's drum on the left side of the header.

   d. Remove the cap (not shown) from outboard bulkhead fitting (G). Connect hose (H) (blue cable tie) to outboard bulkhead fitting (G).

      NOTE:

      The other end of hose (H) connects to the grass seed module's drum on the right side of the header.

7. Free electrical harness (A) from adjustable strap (B).

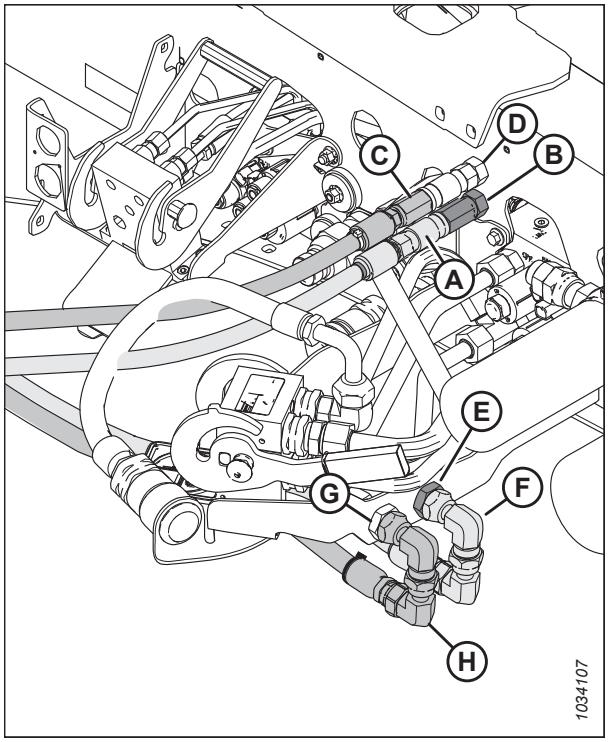


Figure 3.35: Grass Seed Hydraulic Connections – Auger/Rotary Disc/Draper—Ready Configuration

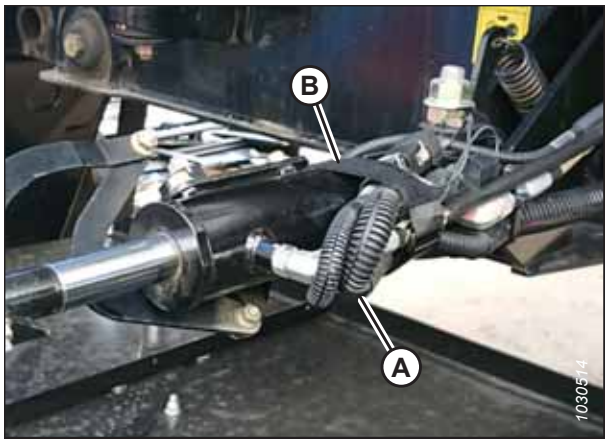


Figure 3.36: Electrical Harness Secured to Center-Link

8. Connect main header harness (A) to adapter harness (B).
9. **Headers equipped with the electric baffle control kit:** Connect electric baffle control harness (C) to adapter harness (D).
10. **Grass seed headers (GSS):** Connect actuator harness (C) to adapter harness (D).

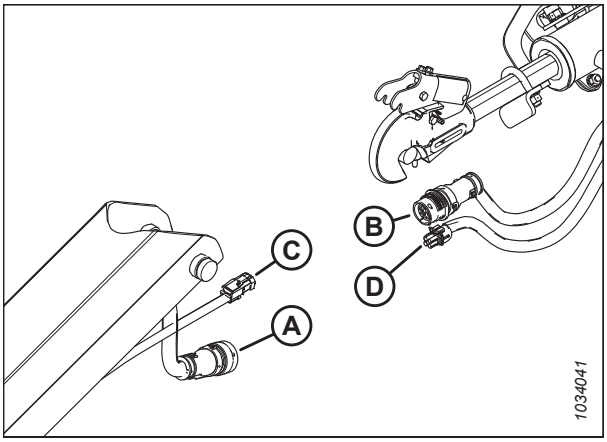


Figure 3.37: Electrical Harness Connection at Center-Link

11. Push latch (A) to unlock platform (B).

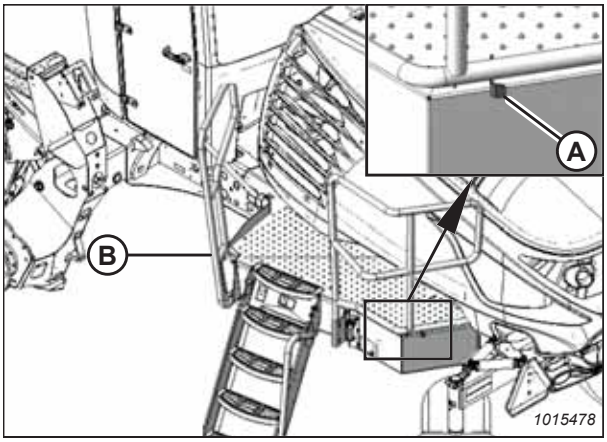


Figure 3.38: Left Cab-Forward Platform

12. Pull platform (A) towards the cab until it stops and the latch is engaged.

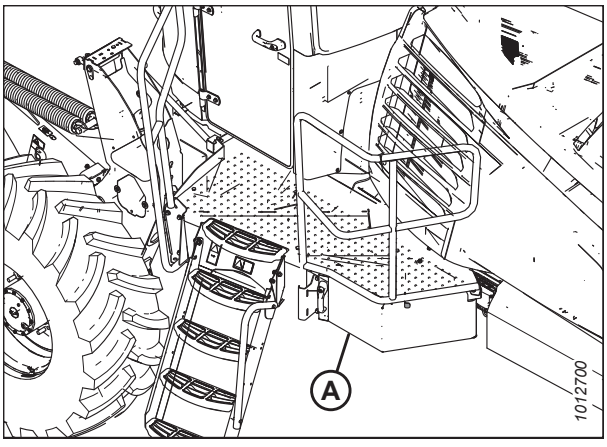


Figure 3.39: Left Cab-Forward Platform

13. If necessary, calibrate the knife drive. Calibrate the knife drive whenever you are:
    - Attaching the header to the windrower for the first time
    - Changing the speed sensor or hydraulic drive motor on the header
    - Changing the header drive pump associated with the knife drive, Harvest Performance Tracker (HPT), or the master controller on the windrower

    For instructions on calibrating the knife drive, refer to the windrower operator's manual.

Rotary Disc-Only Configuration – Hard-Plumbed Connections

The rotary disc-only configuration allows the windrower to operate with compatible rotary disc headers. The hydraulic connections must be torqued correctly when using hard-plumbed fittings.

IMPORTANT:

To prevent contamination of the hydraulic system, use a clean rag to remove dirt and moisture from all (fixed and movable) hydraulic couplers.

1. Retrieve hydraulic hoses (A) from the header and route the hose bundle under the windrower frame.

   NOTE:

   Adding anti-seize compound to the hose holder pin will make future removal easier.

2. Insert pin (B) into hole (C) in the windrower frame.

   IMPORTANT:

   Route the hydraulic hoses as straight as possible, avoiding wear points that could damage the hoses. To prevent abrasion damage, the hoses should have enough slack to pass by the multicoupler bracket without contacting it. To adjust the slack in the hoses, loosen the clamps below pin (B), adjust the hoses, then retighten the hose holder.

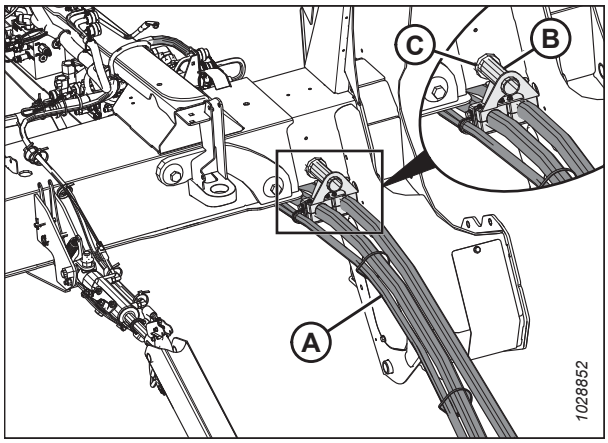


Figure 3.40: Hose Support Attachment

3. Connect the hydraulic hoses to the windrower as follows:

   a. Connect disc pressure hose (A) (fitted with red cable tie [B]) to hard plumb fitting (C) (fitted with a red cable tie) and torque the connection to 215 Nm (159 lbf·ft).

   b. Connect disc return hose (D) to hard plumb fitting (E) and torque the connection to 215 Nm (159 lbf·ft).

   c. Connect case drain hose (F) to fitting (G).

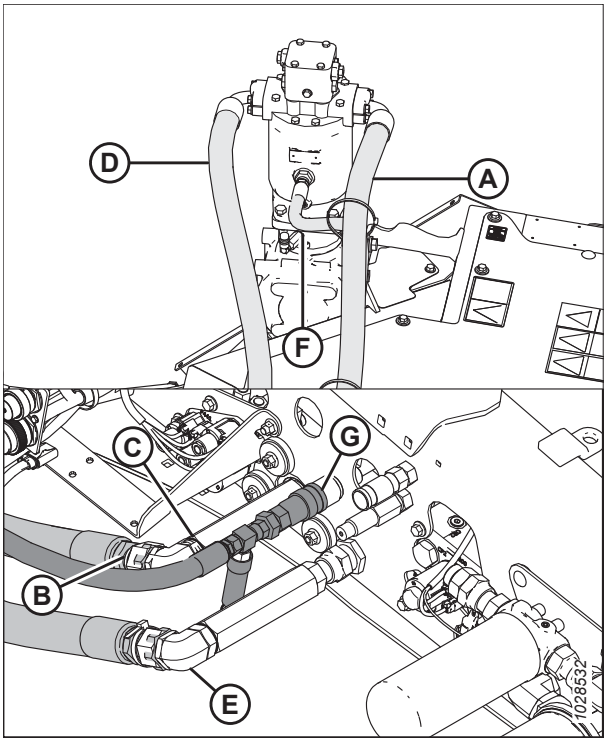


Figure 3.41: Hard-Plumbed Connections on R216 Rotary Disc Header Ready Windrower

4. **Grass seed header (GSS):** Connect the additional four hoses supplied with the grass seed version of the header as follows:

   a. Remove the plug (not shown) from drive manifold port R1. Install 45° fitting (A) in port R1. Connect hose (C) (blue cable tie) to fitting (A).

      NOTE:

      The other end of hose (C) connects to the grass seed module's drum on the right side of the header.

   b. Remove the plug (not shown) from drive manifold port CP2. Install 45° fitting (B) in port CP2. Connect hose (D) (red cable tie) to fitting (B).

      NOTE:

      The other end of hose (D) connects to the grass seed module's drum on the left side of the header.

   c. Connect hose (green cable tie) with female quick coupler (E) to coupler (F) as shown.

   d. Connect hose (yellow cable tie) with male quick coupler (G) to coupler (H) as shown.

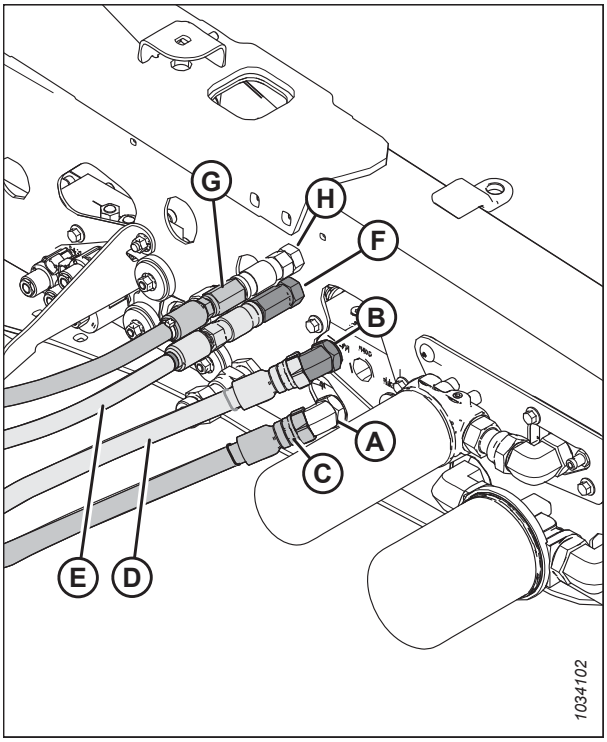


Figure 3.42: Grass Seed Hydraulic Connections – Rotary Disc Configuration

5. Free electrical harness (A) from adjustable strap (B).

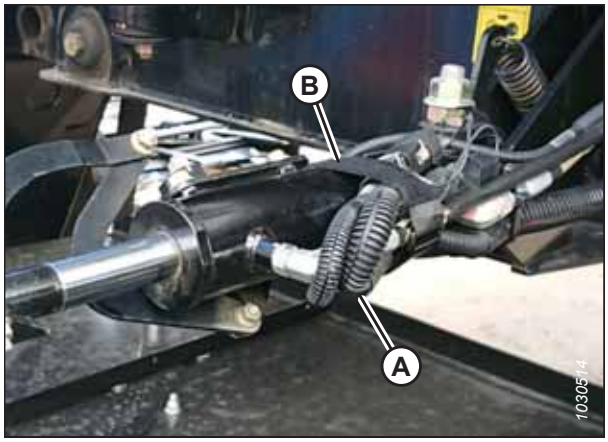


Figure 3.43: Electrical Harness Secured to Center-Link

6. Connect main header harness (A) to adapter harness (B).
7. **Headers equipped with the electric baffle control kit:** Connect electric baffle control harness (C) to adapter harness (D).
8. **Grass seed headers (GSS):** Connect actuator harness (C) to adapter harness (D).

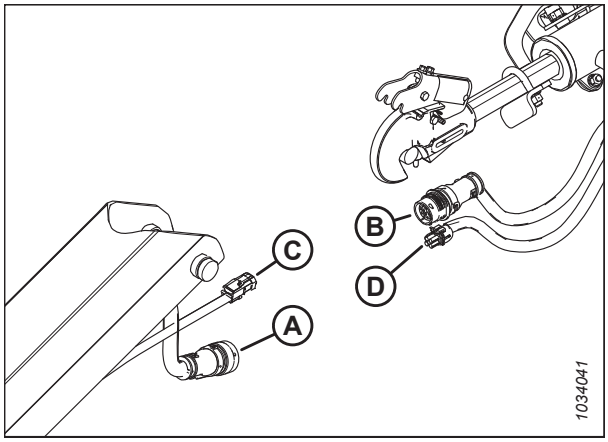


Figure 3.44: Electrical Harness Connection at Center-Link

9. Push latch (A) to unlock platform (B).

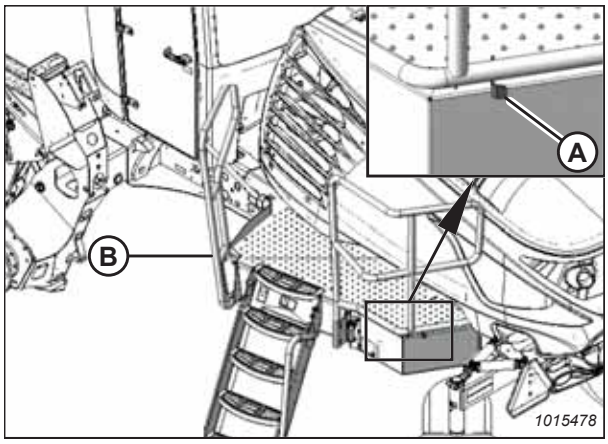


Figure 3.45: Left Cab-Forward Platform

10. Pull platform (A) towards the cab until it stops and the latch is engaged.

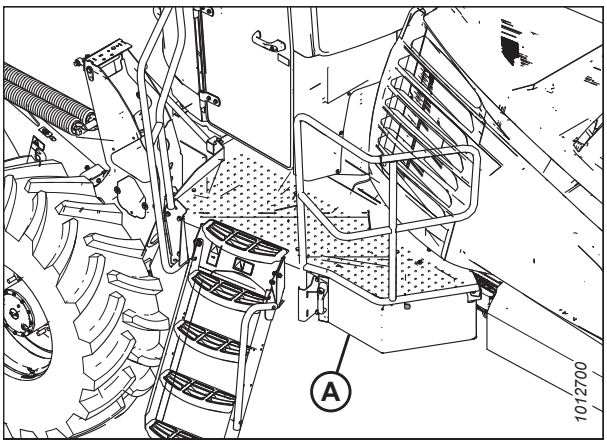


Figure 3.46: Left Cab-Forward Platform

11. If necessary, calibrate the knife drive. Calibrate the knife drive whenever you are:
    - Attaching the header to the windrower for the first time
    - Changing the speed sensor or hydraulic drive motor on the header
    - Changing the header drive pump associated with the knife drive, Harvest Performance Tracker (HPT), or the master controller on the windrower

    For instructions on calibrating the knife drive, refer to the windrower operator's manual.

Rotary Disc-Only Configuration – Quick Coupler Connections

The rotary disc-only configuration allows the windrower to operate with compatible rotary disc headers. Attaching the header's hydraulic connections to the windrower's ports using quick couplers does not require any additional tools or hardware.

IMPORTANT:

To prevent contamination of the hydraulic system, use a clean rag to remove dirt and moisture from all hydraulic couplers.

1. Retrieve hydraulic hoses (A) from the header and route the hose bundle under the windrower frame.

   NOTE:

   Adding anti-seize compound to the hose holder pin will make future removal easier.

2. Insert pin (B) into hole (C) in the windrower frame.

   IMPORTANT:

   Route the hydraulic hoses as straight as possible, avoiding wear points that could damage the hoses. To prevent abrasion damage, the hoses should have enough slack to pass by the multicoupler bracket without contacting it. To adjust the slack in the hoses, loosen the clamps below pin (B), adjust the hoses, then retighten the hose holder.

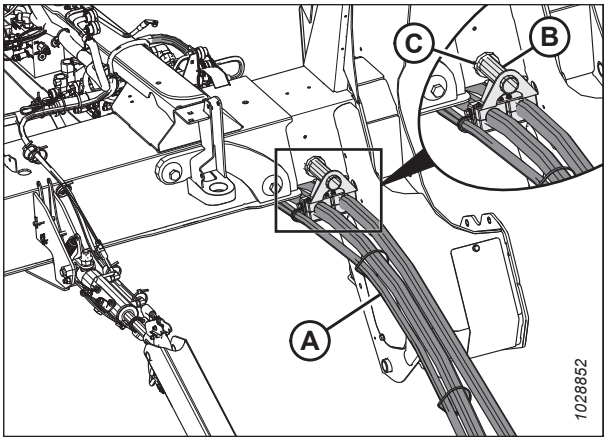


Figure 3.47: Hose Support Attachment

3. Connect the hydraulic fittings to the hydraulic hoses as follows:

   NOTE:

   Two quick couplers and two elbow fittings are supplied in the Quick Coupler kit (MD #B6277).

   a. Attach 90° elbow fitting (A) and 1 in. female coupler fitting (B) to disc pressure hose (C).

   b. Attach 90° elbow fitting (A) and 1 in. male coupler fitting (D) to disc return hose (E).

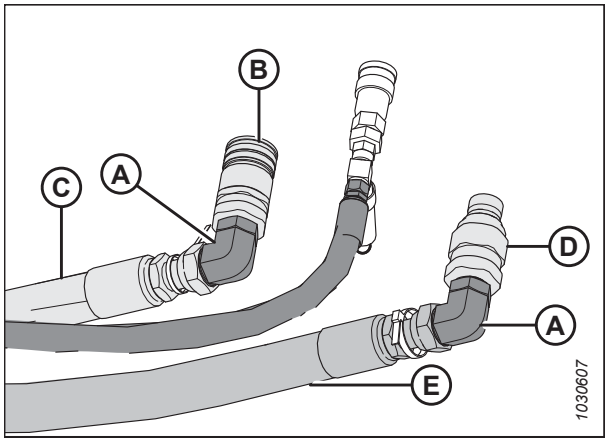


Figure 3.48: Header Hydraulic Fittings

4. Connect the header's hydraulic hoses to the windrower as follows:

   a. Connect disc pressure hose (A) to coupler (B) as shown.

   b. Connect disc return hose (C) to coupler (D) as shown.

   c. Connect case drain hose (E) to fitting (F), ensuring that the connection is oriented so that the relief valve points toward the ground.

   NOTE:

   Loosen and retighten fitting (F) as needed to ensure that the relief valve is pointing straight down as shown.

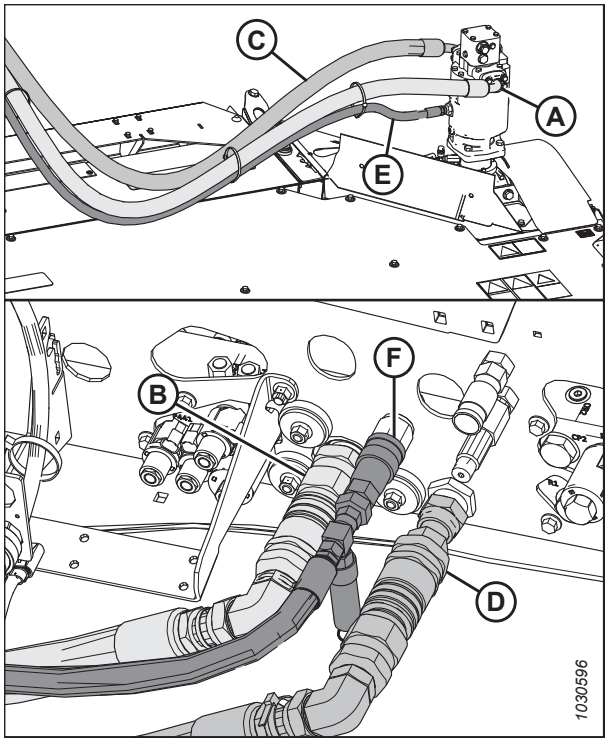


Figure 3.49: Hydraulics and Electrical – Rotary Disc Configuration with Quick Couplers Installed

5. **Grass seed header (GSS):** Connect the additional four hoses supplied with the grass seed version of the header as follows:

   a. Remove the plug (not shown) from drive manifold port R1. Install 45° fitting (A) in port R1. Connect hose (C) (blue cable tie) to fitting (A).

      NOTE:

      The other end of hose (C) connects to the grass seed module's drum on the right side of the header.

   b. Remove the plug (not shown) from drive manifold port CP2. Install 45° fitting (B) in port CP2. Connect hose (D) (red cable tie) to fitting (B).

      NOTE:

      The other end of hose (D) connects to the grass seed module's drum on the left side of the header.

   c. Connect the hose (green cable tie) with female quick coupler (E) to coupler (F) on the windrower.

   d. Connect the hose (yellow cable tie) with male quick coupler (G) to coupler (H) on the windrower.

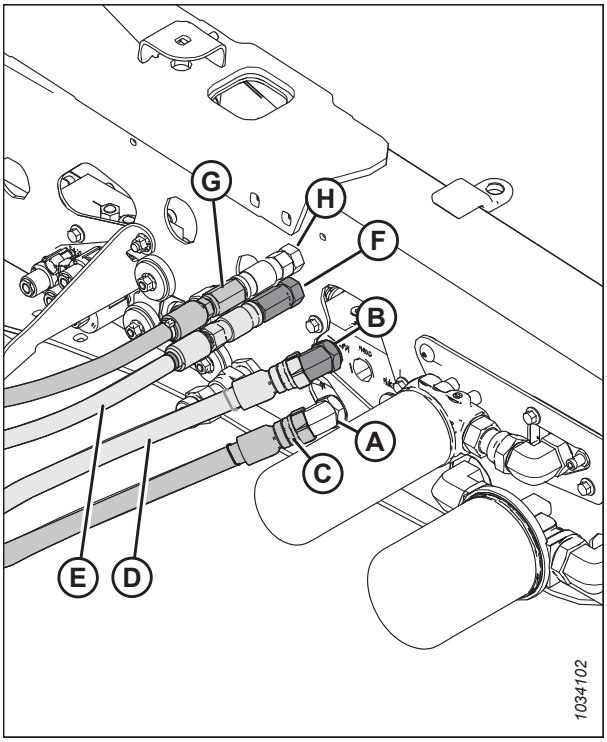


Figure 3.50: Grass Seed Hydraulic Connections – Rotary Disc Configuration

6. Push latch (A) to unlock platform (B).

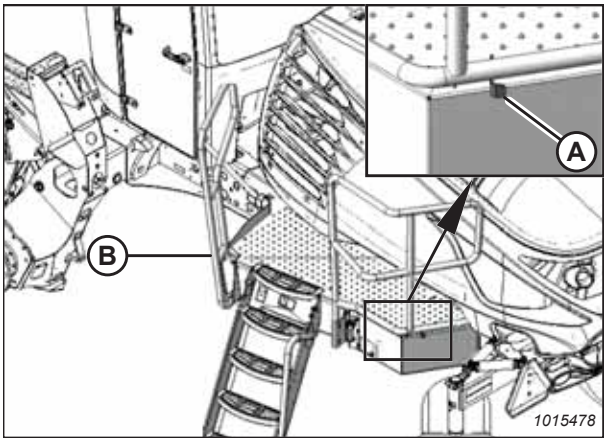


Figure 3.51: Left Cab-Forward Platform

7. Pull platform (A) towards the cab until it stops and the latch is engaged.

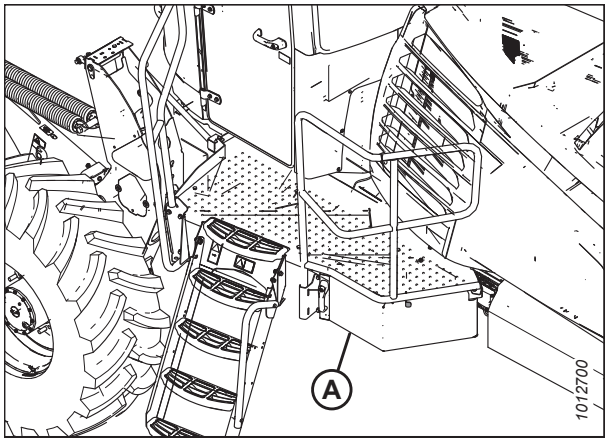


Figure 3.52: Left Cab-Forward Platform

8. If necessary, calibrate the knife drive. Calibrate the knife drive whenever you are:
   - Attaching the header to the windrower for the first time
   - Changing the speed sensor or hydraulic drive motor on the header
   - Changing the header drive pump associated with the knife drive, Harvest Performance Tracker (HPT), or the master controller on the windrower

   For instructions on calibrating the knife drive, refer to the windrower operator's manual.

3.3.4 Connecting R2 Series Rotary Disc Header Hydraulics and Electrical Systems – M1170 Windrower

Connecting the R2 Series Rotary Disc Header's hydraulic and electrical systems to the windrower involves attaching the header's knife drive, pressure, return, case drain, and electrical connectors to the windrower's receptacles.

IMPORTANT:

To prevent contamination of the hydraulic system, use a clean rag to remove dirt and moisture from all hydraulic couplers.

1. Approach platform (A) on the left cab-forward side of the windrower. Ensure that the cab door is closed.
2. Push latch (B) and pull platform (A) toward the walking beam until it stops and the latch engages.

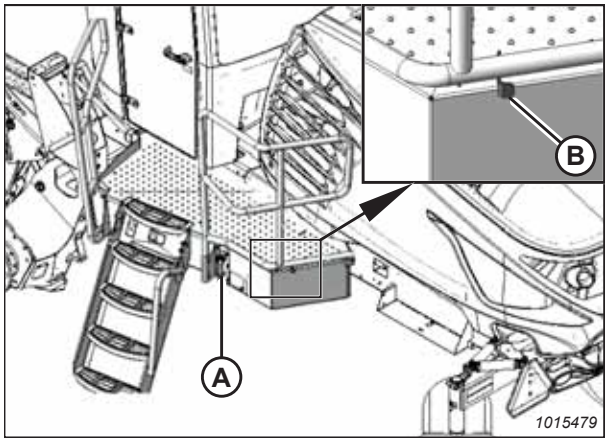


Figure 3.53: Left Cab-Forward Platform

3. Retrieve hydraulic hoses (A) from the header and route the hose bundle under the windrower frame.

   NOTE:

   Adding anti-seize compound to the hose holder pin will make future removal easier.

4. Insert pin (B) into hole (C) in the windrower frame.

   IMPORTANT:

   Route the hydraulic hoses as straight as possible, avoiding wear points that could damage the hoses. To prevent abrasion damage, the hoses should have enough slack to pass by the multicoupler bracket without contacting it. To adjust the slack in the hoses, loosen the clamps below pin (B), adjust the hoses, then retighten the hose holder.

5. If using hard-plumbed fittings (A), proceed to Step *6, page 52*. If using quick couplers (B), proceed to Step *7, page 52*.

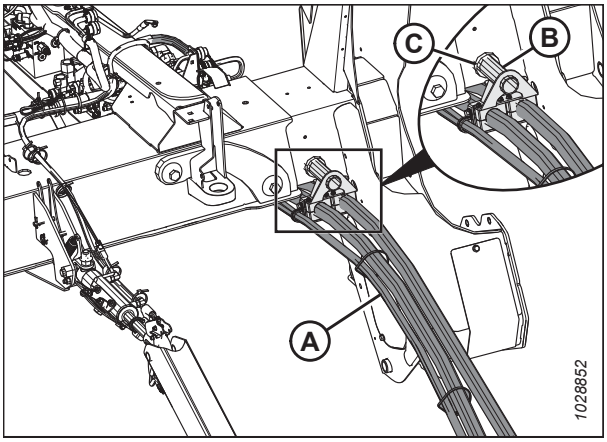


Figure 3.54: Hose Support Attachment

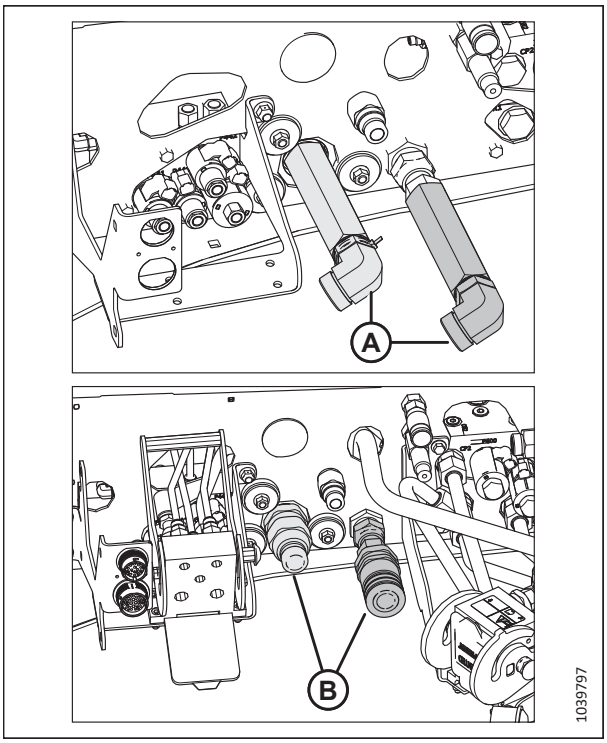


Figure 3.55: Hard-Plumbed Fittings Compared to Quick Couplers

6. **Hard-plumbed fittings:** Connect the hydraulic hoses to the windrower as follows:

   a. Connect disc pressure hose (A) (fitted with red cable tie [B]) to hard plumb fitting (C) (fitted with a red cable tie) and torque the connection to 215 Nm (159 lbf·ft).

   b. Connect disc return hose (D) to hard plumb fitting (E) and torque the connection to 215 Nm (159 lbf·ft).

   c. Connect case drain hose (F) to fitting (G).

   d. If connecting to a grass seed header, proceed to Step *9, page 53*. Otherwise proceed to Step *10, page 54*.

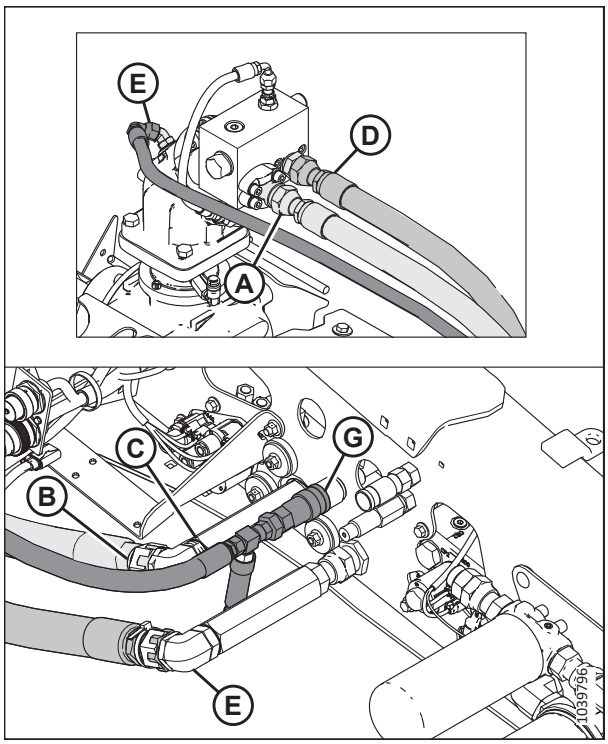


Figure 3.56: Hard-Plumbed Fittings

7. **Quick couplers:** If switching from an auger/draper header to a rotary header, disconnect hose (A) from knife pressure receptacle (C) on the frame, and move it to storage location (B).

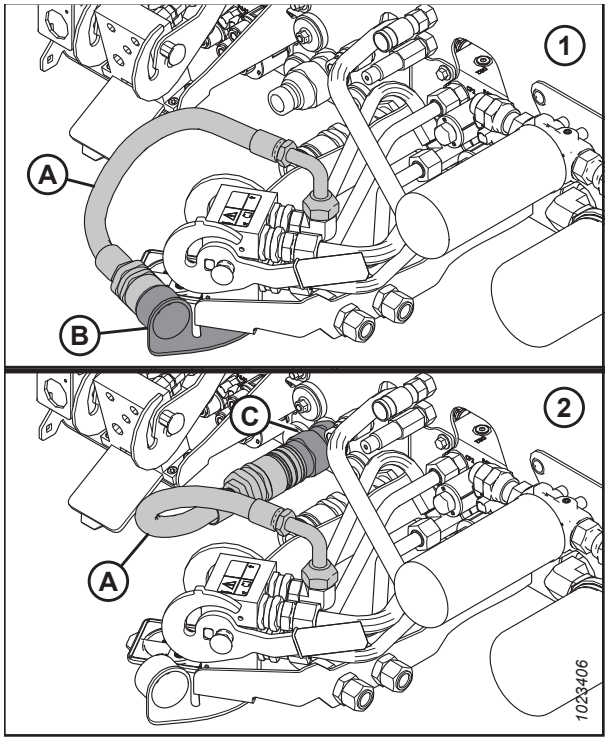


Figure 3.57: Knife Pressure Hose Positions

1 - Knife Pressure Hose in Storage Position – Rotary Configuration
2 - Hose to Knife Pressure Receptacle – Auger/Draper Configuration

8. **Quick couplers:** Connect the hydraulic hoses to a windrower with quick coupler fittings as follows:

   a. Connect disc pressure hose (A) with coupler (B). Torque the connection to 216 Nm (159 lbf·ft).

   b. Connect disc return hose (C) with coupler (D). Torque the connection to 216 Nm (159 lbf·ft).

   c. Connect case drain hose (E) to fitting (F), with the relief valve pointing towards the ground.

   NOTE:

   If required, loosen fitting (F) and retighten it as needed to ensure that the relief valve is pointing straight down.

   d. If connecting to a grass seed header, proceed to Step *9, page 53*. Otherwise proceed to Step *10, page 54*.

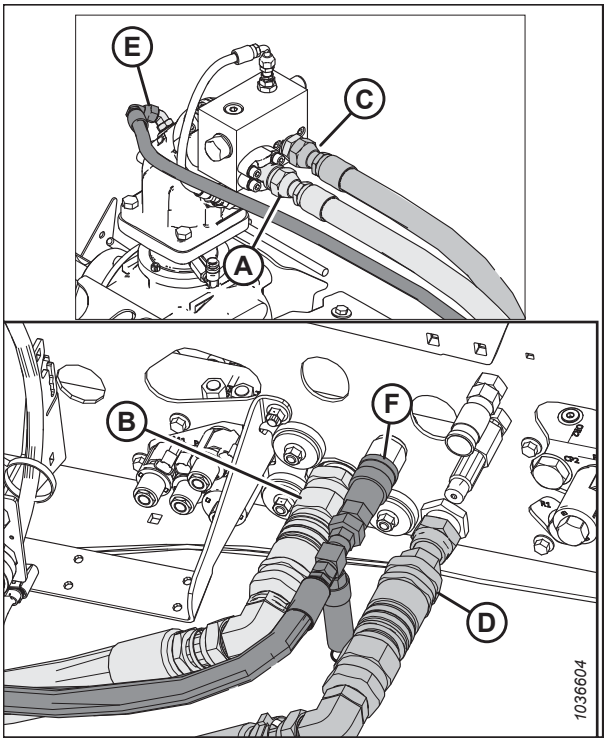


Figure 3.58: Quick Couplers

9. **To connect a grass seed header:** Connect the four additional hydraulic hoses supplied with the grass seed version of the header as follows:

   a. Connect hose (green cable tie) with female quick coupler (A) to coupler (B) on the windrower frame.

   b. Connect hose (yellow cable tie) with male quick coupler (C) to coupler (D) on the windrower frame.

   c. Remove the cap (not shown) from inboard bulkhead fitting (E). Connect hose (F) (red cable tie) to inboard bulkhead fitting (E).

   NOTE:

   The other end of hose (F) connects to the grass seed module drum on the left side of the header.

   d. Remove cap (not shown) from outboard bulkhead fitting (G). Connect hose (H) (blue cable tie) to inboard bulkhead fitting (G).

   NOTE:

   The other end of hose (H) connects to the grass seed module drum on the right side of the header.

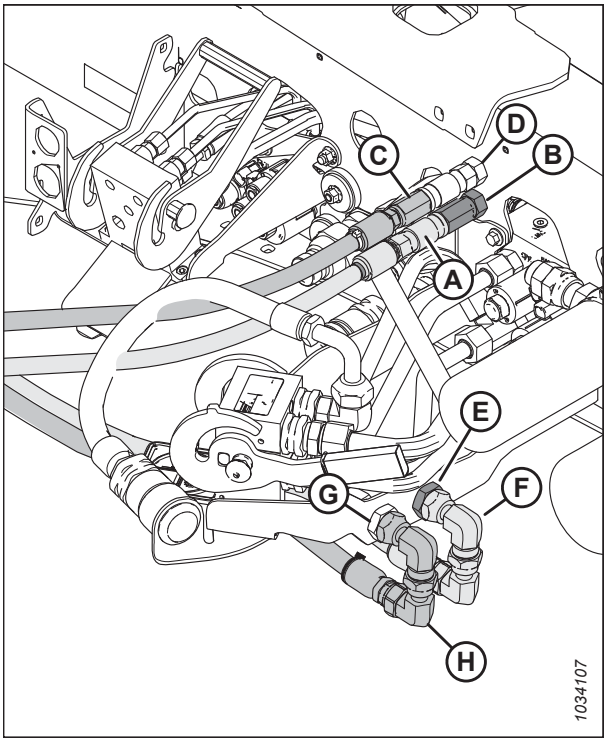


Figure 3.59: Grass Seed Header Hydraulic Connections

10. Free electrical harness (A) from adjustable strap (B).

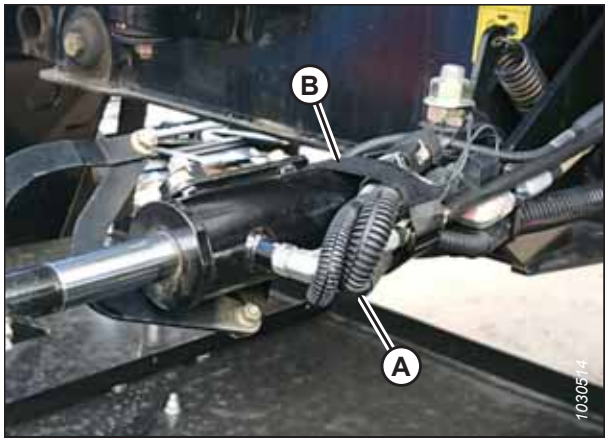


Figure 3.60: Electrical Harness Secured to Center-Link

11. Connect main header harness (A) to adapter harness (B).
12. **Headers equipped with the electric baffle control kit:** Connect electric baffle control harness (C) to adapter harness (D).
13. **Grass seed headers (GSS):** Connect actuator harness (C) to adapter harness (D).

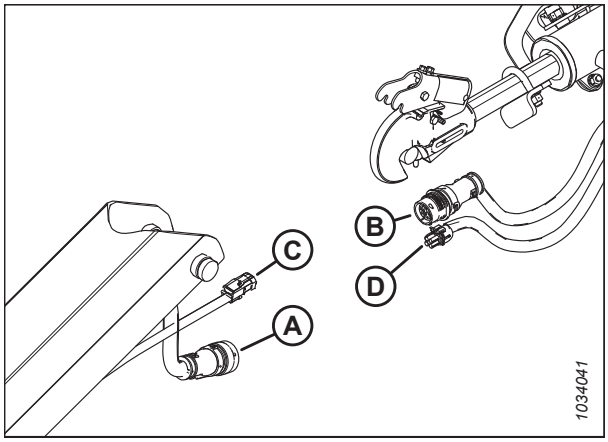


Figure 3.61: Electrical Harness Connection at Center-Link

14. Push latch (A) to unlock platform (B).

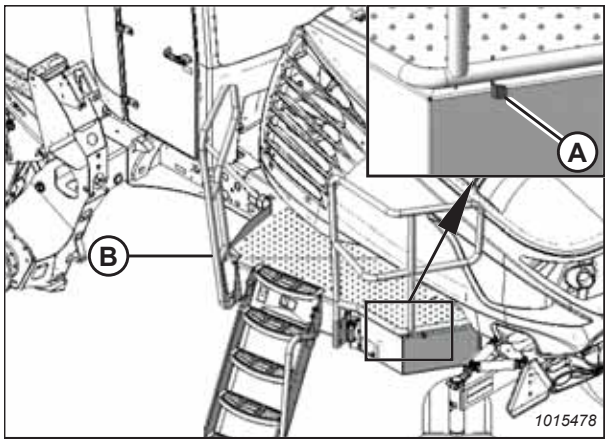


Figure 3.62: Left Cab-Forward Platform

15. Pull platform (A) towards the cab until it stops and the latch is engaged.

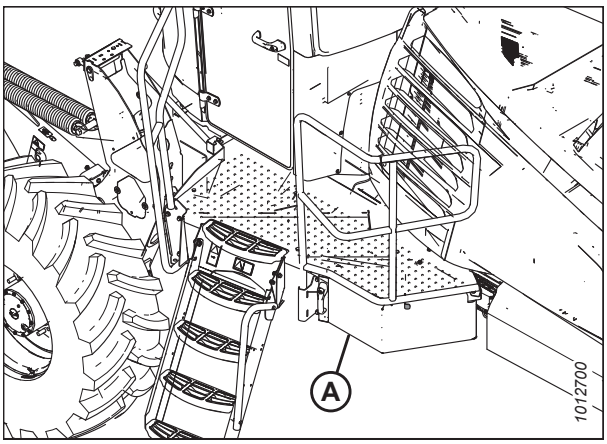


Figure 3.63: Left Cab-Forward Platform

16. If necessary, calibrate the knife drive. Calibrate the knife drive whenever you are:
    - Attaching the header to the windrower for the first time
    - Changing the speed sensor or hydraulic drive motor on the header
    - Changing the header drive pump associated with the knife drive, Harvest Performance Tracker (HPT), or the master controller on the windrower

    For instructions on calibrating the knife drive, refer to the windrower operator's manual.

3.4 Detaching R2 Series Rotary Disc Header from M1 Series Windrower

Detach the header when replacing the header with a different one or when storing the header.

3.4.1 Detaching R2 Series Rotary Disc Header from an M1 Series Windrower

Detach the header when replacing the header with a different one or when storing the header.

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 for any reason.

DANGER

Ensure that all bystanders have cleared the area.

IMPORTANT:

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

1. Start the engine, and press switch (A) to lower the header to the ground.
2. Shut down the engine, and remove the key from the ignition.

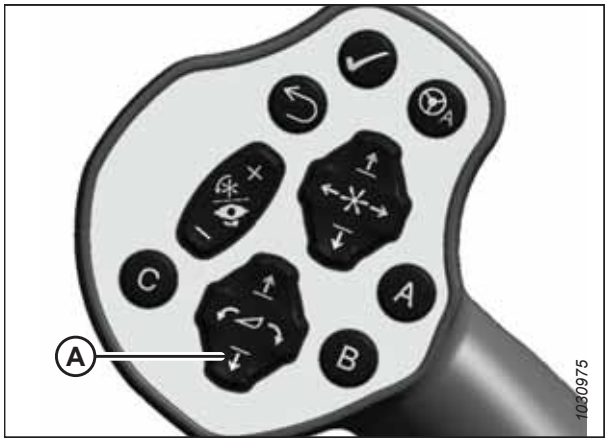


Figure 3.64: GSL

3. Approach platform (A) on the left cab-forward side of the windrower. Ensure that the cab door is closed.
4. Push latch (B) and pull platform (A) toward the walking beam until it stops and the latch engages.

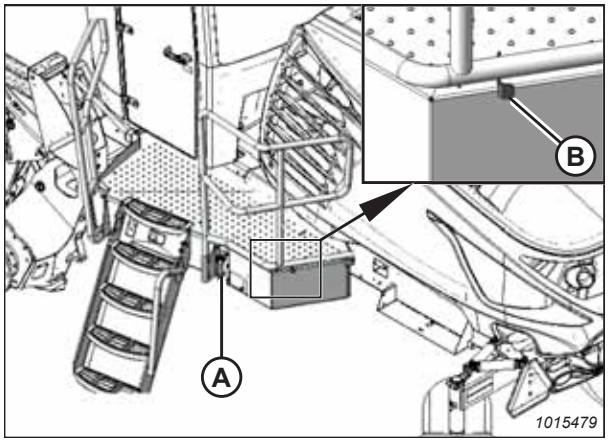


Figure 3.65: Left Cab-Forward Platform

5. Disconnect hydraulic hoses (A), (B), and (C) from the windrower.

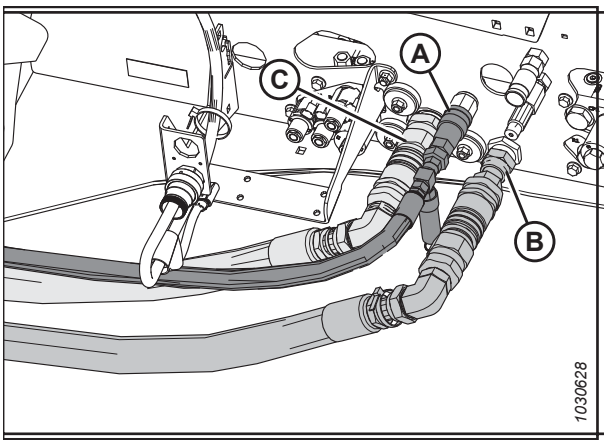


Figure 3.66: Header Drive Hydraulics – Quick Couplers

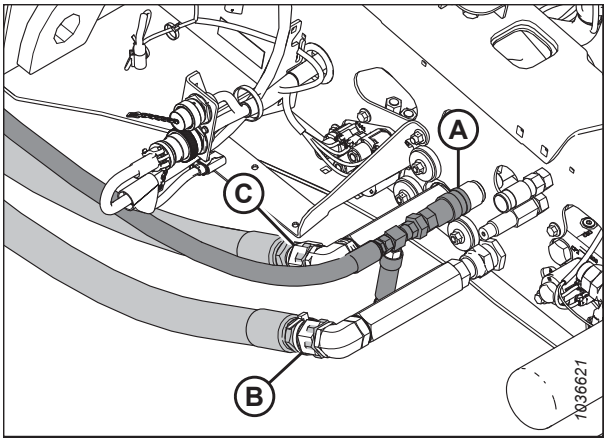


Figure 3.67: Header Drive Hydraulics – Hard-Plumbed Fittings

6. **Grass seed header:** Disconnect additional four hoses (A), (B), (C), and (D).

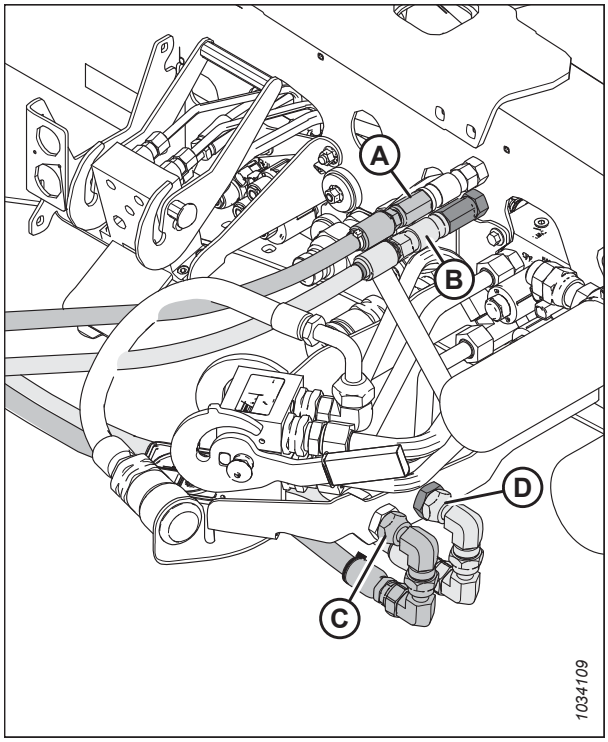


Figure 3.68: Grass Seed Hydraulic Connections – M1240 Draper/Disc Ready Configuration, M1170 Configuration

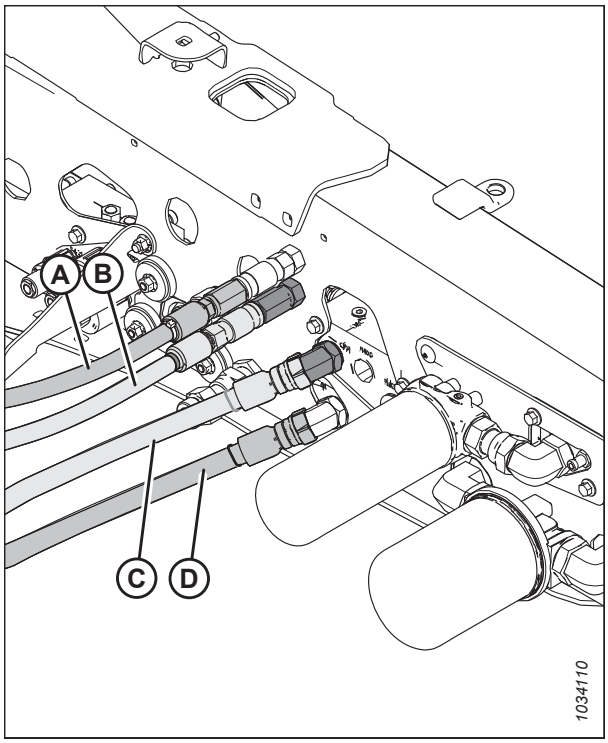


Figure 3.69: Grass Seed Hydraulic Connections – M1240 Rotary Disc Configuration

7. Push latch (A) to unlock platform (B).

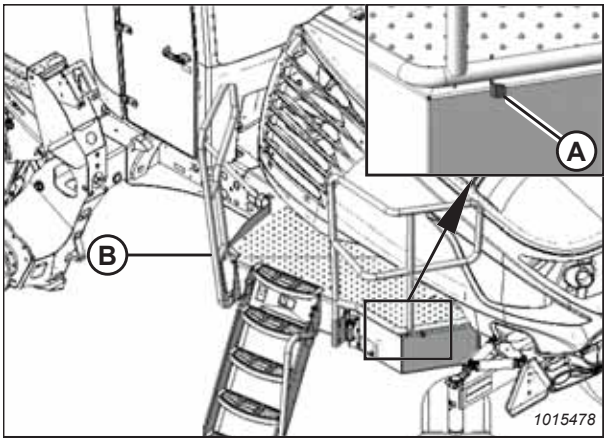


Figure 3.70: Left Cab-Forward Platform

8. Pull platform (A) towards the cab until it stops and the latch is engaged.

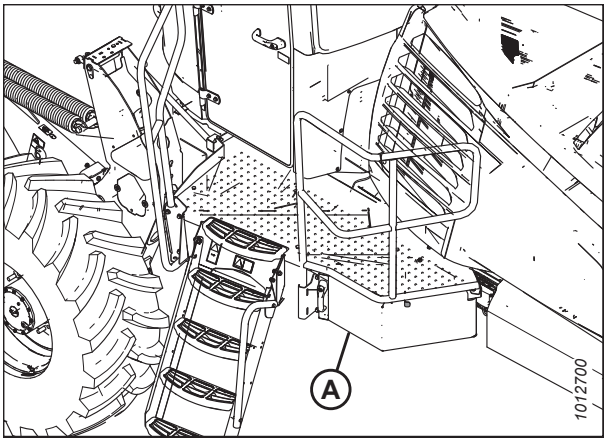


Figure 3.71: Left Cab-Forward Platform

9. Remove hose support (A) and the hose bundle from the windrower frame.

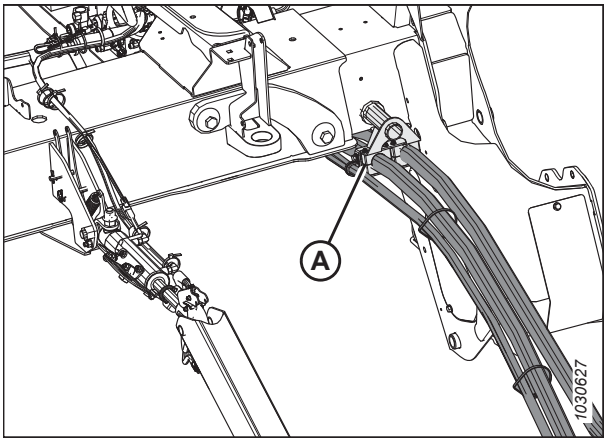


Figure 3.72: Header Hoses on Windrower

10. Rest hydraulic hose bundle (A) on the header for storage as shown.

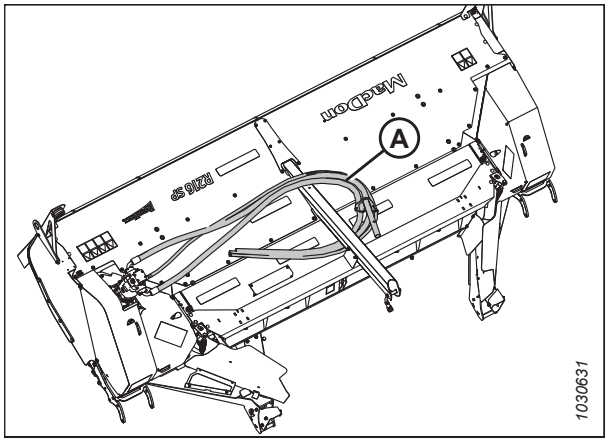


Figure 3.73: Hose Bundle Storage Position

11. Disconnect main header harness (A) from adapter harness (B).
12. **Standard headers equipped with optional electric baffle control kit:** Disconnect electric baffle control harness (C) from adapter harness (D).
13. **Grass seed:** Disconnect actuator harness (C) from adapter harness (D).

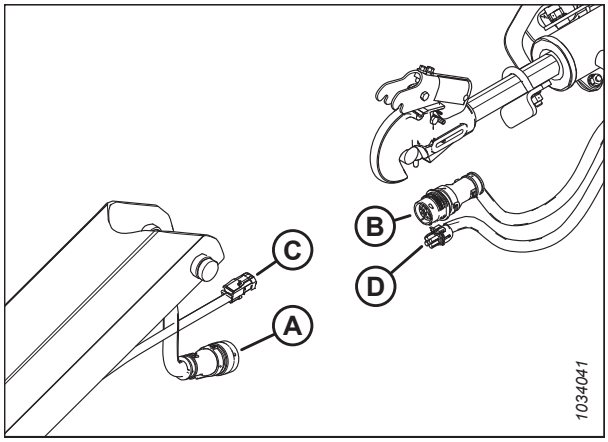


Figure 3.74: Electrical Harness Connection at Center-Link

14. Secure adapter harness (A) on the center link with an adjustable strap (B).

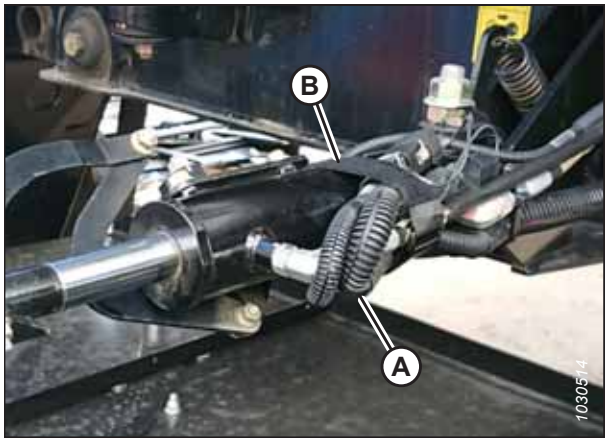


Figure 3.75: Adapter Harness

15. Remove hairpin (B) from clevis pin (A). Remove the clevis pin from header support (C) on both sides of the header.

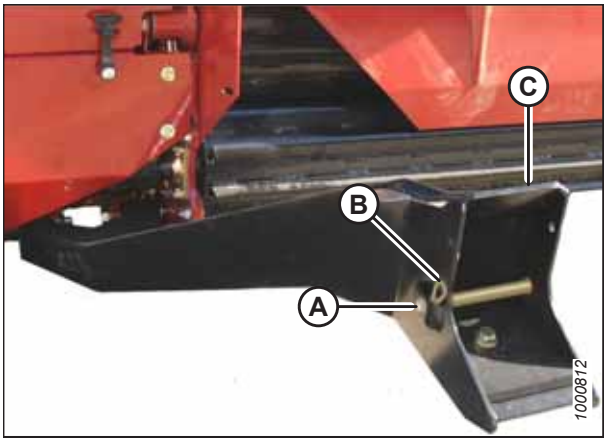


Figure 3.76: Header Supports

16. **Windrowers WITH center-link self-alignment kit:** Release center-link latch (A) before returning to the cab.

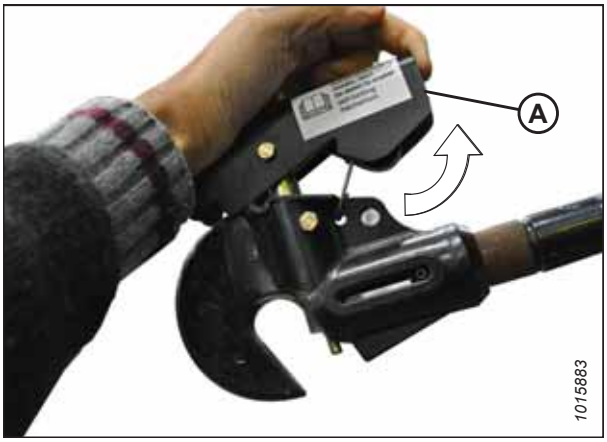


Figure 3.77: Center-Link

DANGER

Ensure that all bystanders have cleared the area.

17. Start the engine.

18. Remove the header float when prompted by the Harvest Performance Tracker (HPT).

NOTE:

If not prompted by the HPT to remove the float, remove the float manually.

19. Use HEADER TILT cylinder switches (A) on the GSL to release the load on center-link cylinder.

20. **Windrowers WITH center-link self-alignment kit:** Operate the link lift cylinder with REEL UP switch (B) to disengage the center-link from the header. Proceed to Step *24, page 62*.

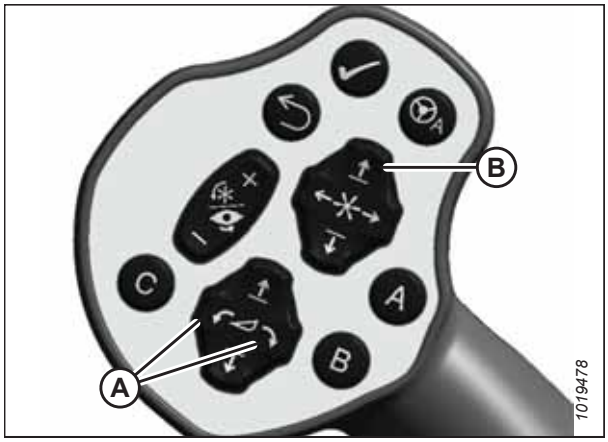


Figure 3.78: GSL

21. **Windrowers WITHOUT center-link self-alignment kit:** Shut down the engine, and remove the key from the ignition.

22. **Windrowers WITHOUT center-link self-alignment kit:** Lift hook release (A) and lift hook (B) off the header pin.

DANGER

Ensure that all bystanders have cleared the area.

23. **Windrowers WITHOUT center-link self-alignment kit:** Start the engine.

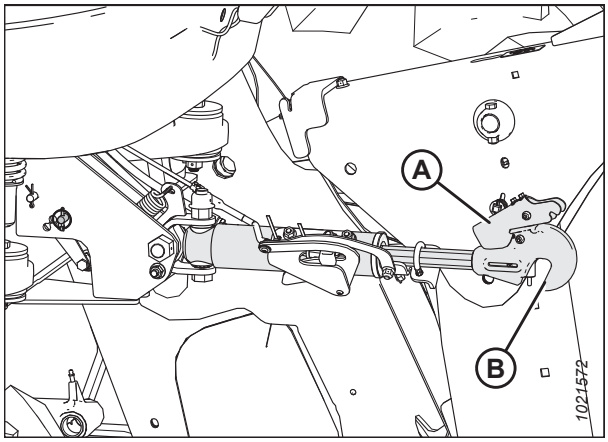


Figure 3.79: Hydraulic Center-Link

24. Back the windrower slowly away from the header.

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

26. Reinstall clevis pin (A) through support (C) and secure it with hairpin (B). Repeat for the opposite side of the header.

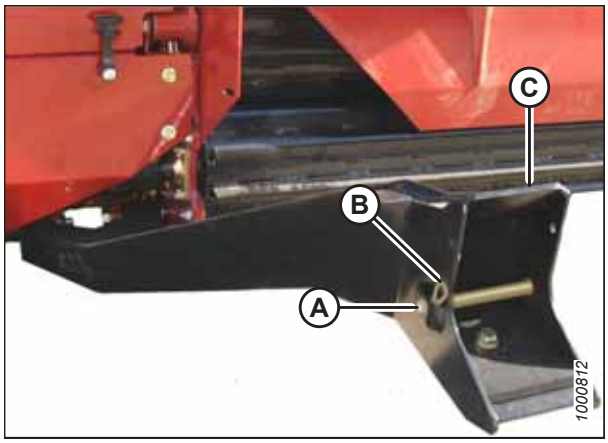


Figure 3.80: Header Support

IMPORTANT:

When detaching an R216 SP Rotary Disc Header from an M1 Series Windrower that will be configured for a D1X Series Draper Header, ensure two shield mount plates (A) (MD #307045) are removed from the windrower and forming shield.

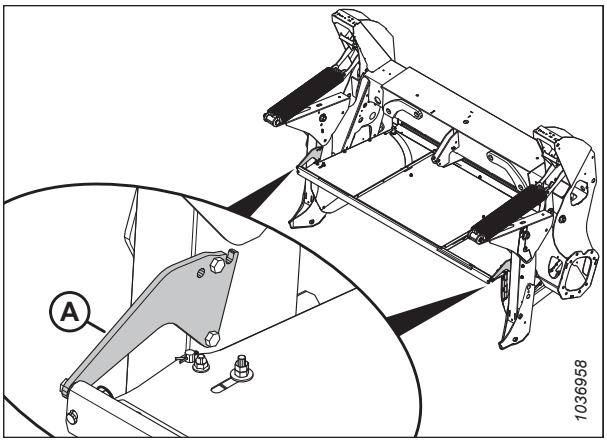


Figure 3.81: Shield Mount Plates on Forming Shield

3.4.2 Removing Forming Shield

The forming shield controls the width and placement of the windrow. Follow the instructions in this section to properly remove the forming shield from the windrower.

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 for any reason.

NOTE:

It is **NOT** always necessary to remove the forming shield after detaching the header from the windrower.

1. Shut down the engine, and remove the key from the ignition.
2. Mark the strap location, then remove and retain hairpin (A) and washer (B) from straight pin (C).
3. Pull rubber strap (D) away from straight pin (C).
4. Lower the rear end of the forming shield.
5. Reinstall washer (B) and hairpin (A) on straight pin (C) for storage.
6. Repeat Step *2, page 63* to Step *5, page 63* at the opposite side.

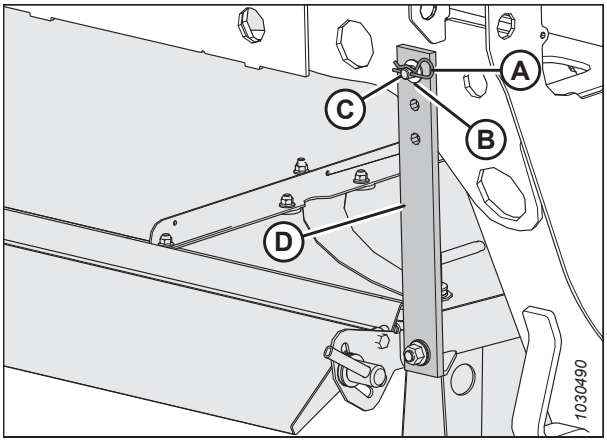


Figure 3.82: Rubber Strap Securing Forming Shield onto Windrower Leg

7. Remove lynch pin (A) and clevis pin (B) securing forming shield (C) to bolt and spacer (D). Repeat at the opposite side.

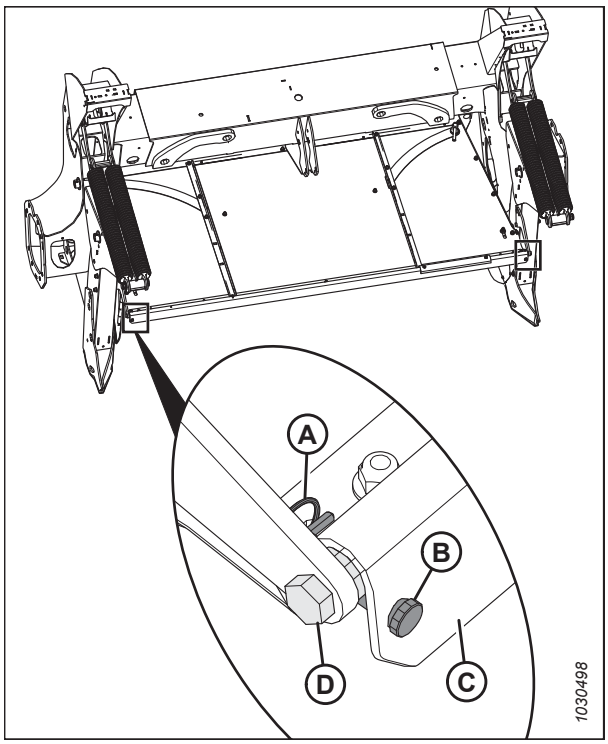


Figure 3.83: Forming Shield Secured to Front of Windrower Legs

8. Dismount forming shield (A) from bolts and spacers (B).
9. Reattach the clevis pin and lynch pin to the forming shield for storage.
10. Remove the forming shield.

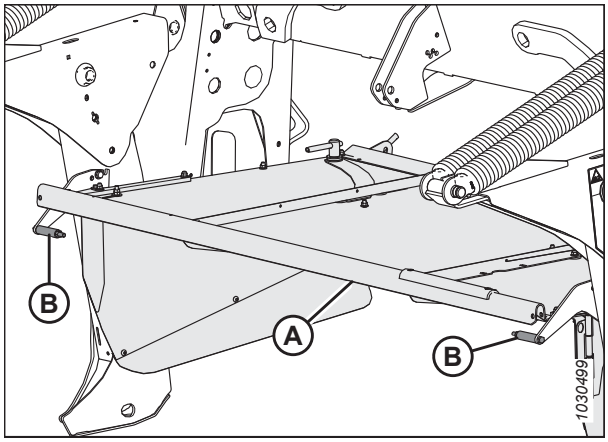


Figure 3.84: Forming Shield under Windrower Frame

3.5 Attaching R2 Series Rotary Disc Header to M205 SP Windrower

Attaching the header to the windrower will allow you to cut, condition, and lay a wide variety of grasses and hay crops in windrows.

3.5.1 Attaching Forming Shield to M205 SP Windrower

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

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 for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Position forming shield (A) in between windrower legs as shown.
3. Remove lynch pin (B) and clevis pin (C).
4. Mount forming shield (A) to bolt and spacer (D).

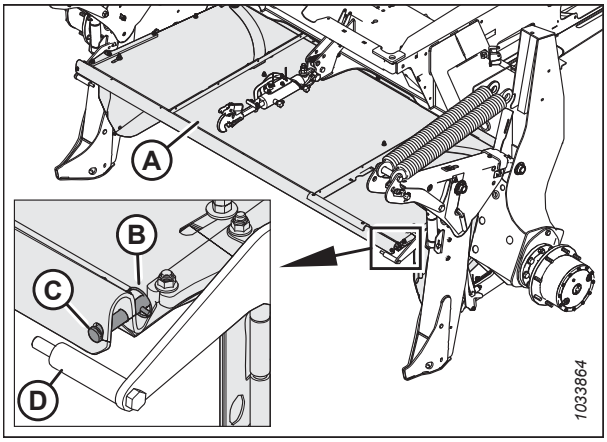


Figure 3.85: Forming Shield and Windrower

5. Secure forming shield (C) to bolt and spacer (D) using clevis pin (B) and lynch pin (A).
6. Repeat Step *3, page 65* to Step *5, page 66* at the opposite side.

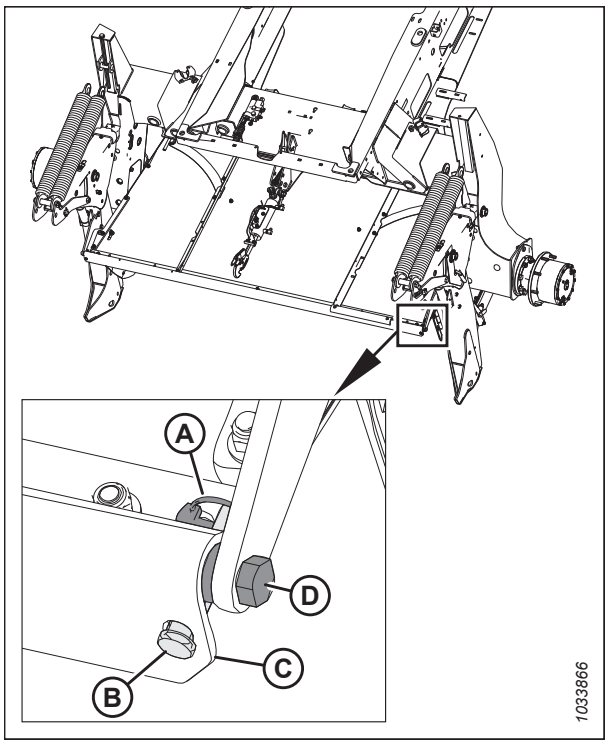


Figure 3.86: Forming Shield Secured to Front of Windrower Legs

7. Remove lynch pin (A) and washer (B) from straight pin (C).

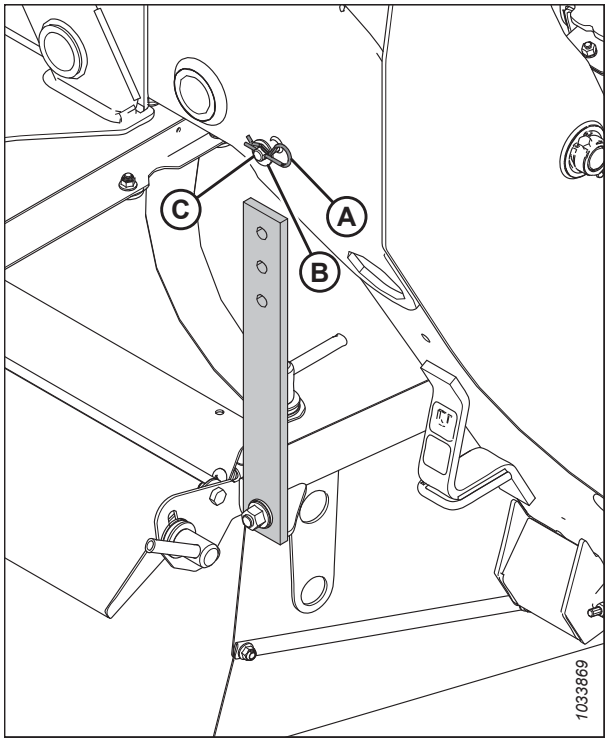


Figure 3.87: Lynch Pin and Washer at Rear of Windrower Leg

8. Attach rubber strap (A) to straight pin (B) at the rear of the windrower leg. Secure it with washer (C) and lynch pin (D).

9. Repeat Step *7, page 66* to Step *8, page 67* at the opposite side.

10. Proceed according to the type of center-link used on the M205 SP Windrower:

    - If equipped with a hydraulic center-link with optional self-alignment, proceed to *3.5.2 Attaching R2 Series Rotary Disc Header to M205 SP Windrower – Hydraulic Center-Link with Optional Self-Alignment, page 67*.
    - If equipped with a hydraulic center-link without optional self-alignment, proceed to *3.5.3 Attaching R2 Series Rotary Disc Header to M205 SP Windrower – Hydraulic Center-Link without Optional Self-Alignment, page 74*.

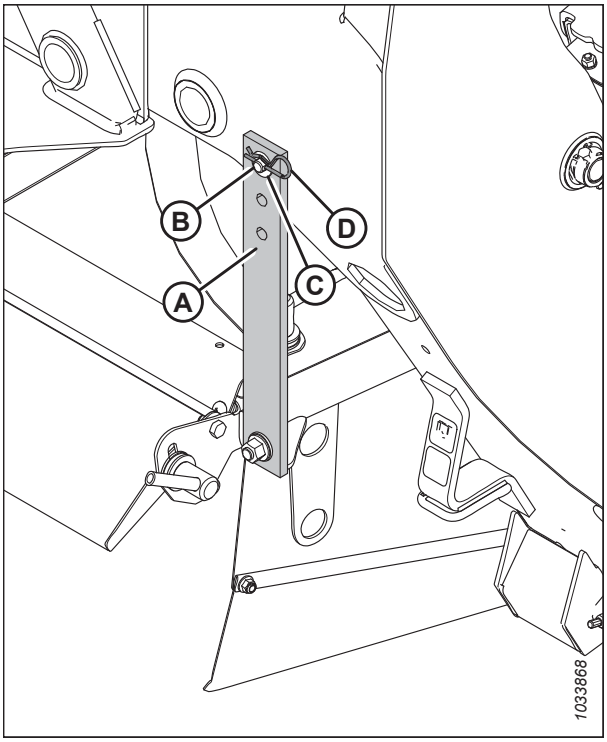


Figure 3.88: Rubber Strap Securing Forming Shield onto Windrower Leg

3.5.2 Attaching R2 Series Rotary Disc Header to M205 SP Windrower – Hydraulic Center-Link with Optional Self-Alignment

The optional self-aligning hydraulic center-link on an M205 SP Windrower allows vertical position control of the center-link from the cab.

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 for any reason.

NOTE:

The R216 Rotary Disc Header requires conversion kit (MD #B7220) if being used with an M205 SP Windrower. Once configured for an M205 SP Windrower, the R216 Rotary Disc Header is incompatible with the optional Remote Baffle Control kit (MD #B6664).

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

2. Remove hairpin (A) from clevis pin (B), and remove the pin from header support (C) on both sides of the header.

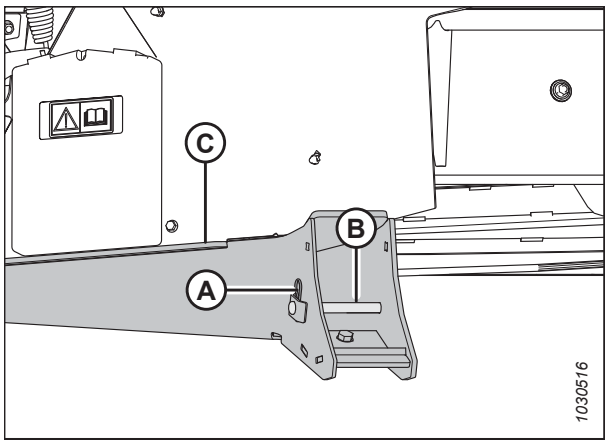


Figure 3.89: Header Support

3. Lift header support (A) and place 2 x 4 in. blocks (B) under the header support. A total of four 2 x 4 in. blocks (B) will be necessary to raise the boot up into field position. Ensure the boot's bottom edge (C) is parallel with the ground. Repeat this step for the opposite side.

   NOTE:

   Do **NOT** stack blocks (B) crosswise as doing so can make the header unstable when attempting to connect the header and windrower. Stack blocks (B) parallel with each other.

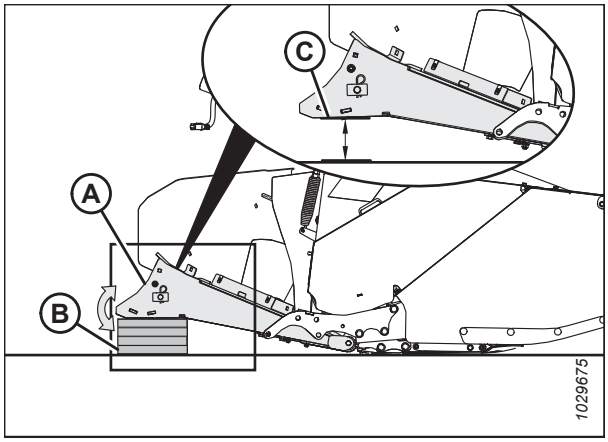


Figure 3.90: Header Support

4. Remove the float engagement pin from hole (A) to disengage the float springs, and insert the float engagement pin into storage hole (B). Secure the float engagement pin with a lynch pin. Repeat this step for the opposite linkage.

   IMPORTANT:

   To prevent damage to the lift system when lowering the header lift linkages without a header or weight box attached to the windrower, ensure the float engagement pin is installed in storage hole (B) and **NOT** in engaged position (A).

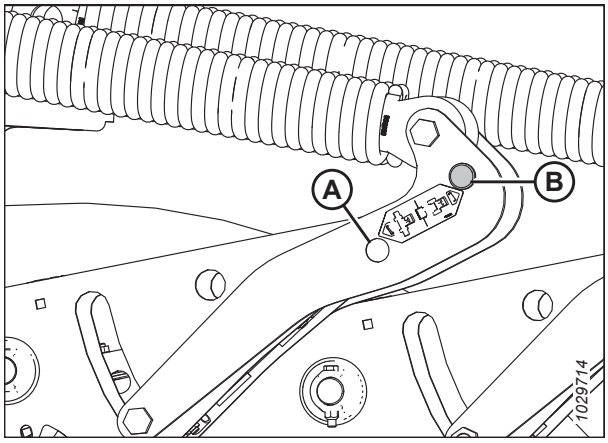


Figure 3.91: Float Linkage

DANGER

Ensure that all bystanders have cleared the area.

5. Start the engine and activate HEADER DOWN button (A) on the ground speed lever (GSL) to fully retract the header lift cylinders.

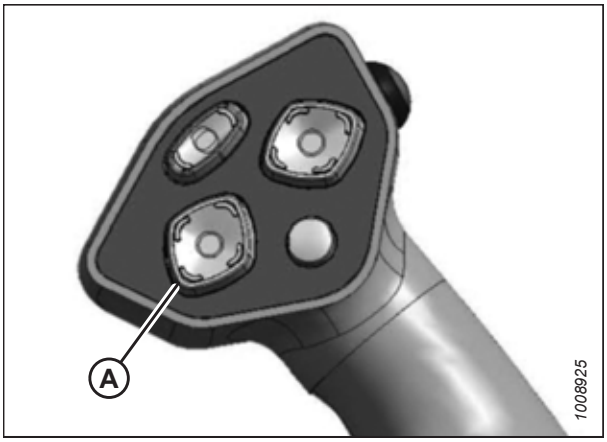


Figure 3.92: Ground Speed Lever

6. Press REEL UP switch (A) on the GSL to raise the center-link until the hook is above the attachment pin on the header.

   IMPORTANT:

   If the center-link is too low, it may contact the header as the windrower approaches the header for hookup.

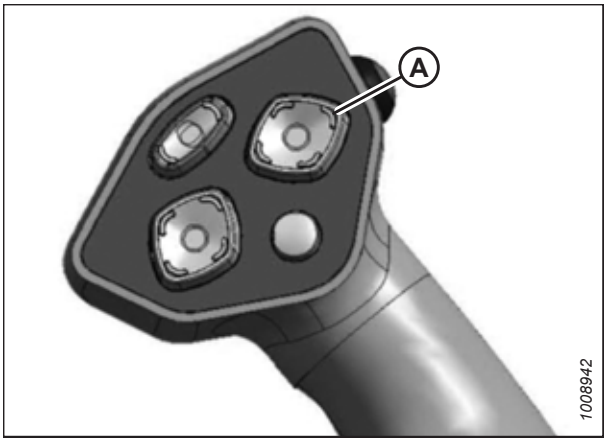


Figure 3.93: Ground Speed Lever

7. Slowly drive the windrower forward until windrower feet (A) enter header supports (B). Continue driving slowly forward until the feet engage the supports and the header nudges forward.

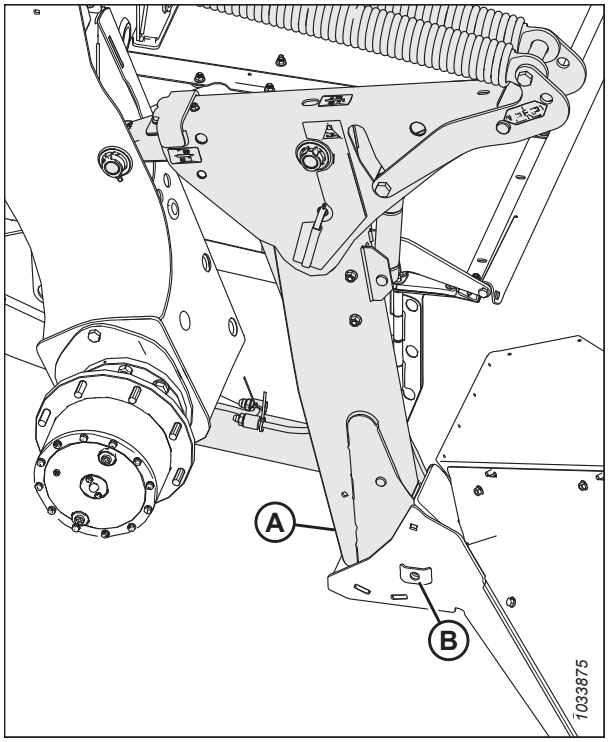


Figure 3.94: Header Support

8. Use the following GSL functions to position the center-link hook above the header attachment pin:
   - REEL UP (A) to raise the center-link
   - REEL DOWN (B) to lower the center-link
   - HEADER TILT UP (C) to retract the center-link
   - HEADER TILT DOWN (D) to extend the center-link

   IMPORTANT:

   The hook release must be down to enable the self-locking mechanism. If the release is open (up), manually push it down after the hook engages the header pin.

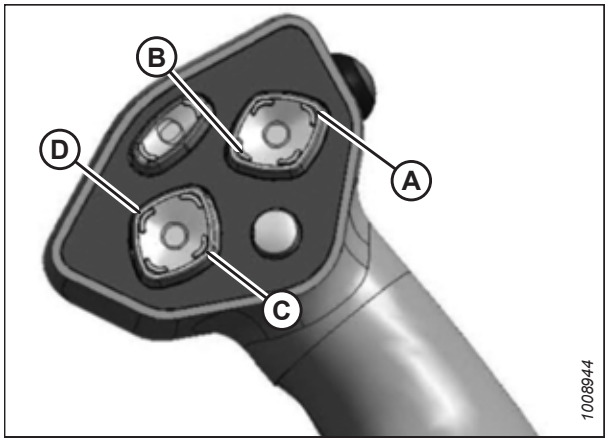


Figure 3.95: Ground Speed Lever

9. Adjust the position of center-link cylinder (A) with the REEL UP and REEL DOWN switches on the GSL until the hook is positioned above the header attachment pin.

   IMPORTANT:

   Hook release (B) must be down to enable the self-locking mechanism. If the release is open (up), manually push it down after the hook engages the header pin.

10. Lower center-link (A) onto the header using the REEL DOWN switch on the GSL until the center-link locks into position and hook release (B) is down.

11. Check that the center-link is locked onto the header by pressing the REEL UP switch on the GSL.

12. Press HEADER UP switch (A) to raise the header to its maximum height.

13. If one end of the header does **NOT** fully rise, rephase the lift cylinders as follows:

    a. Press and hold the HEADER UP switch until both cylinders stop moving.

    b. Continue to hold the switch for 3–4 seconds. The cylinders are now phased.

    NOTE:

    It may be necessary to repeat this procedure if there is air in the hydraulic system.

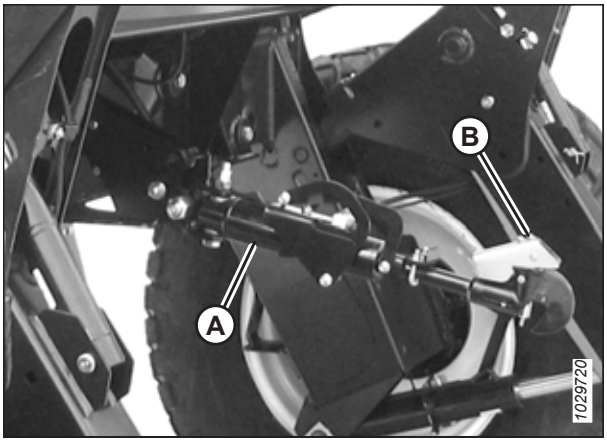


Figure 3.96: Hydraulic Center-Link

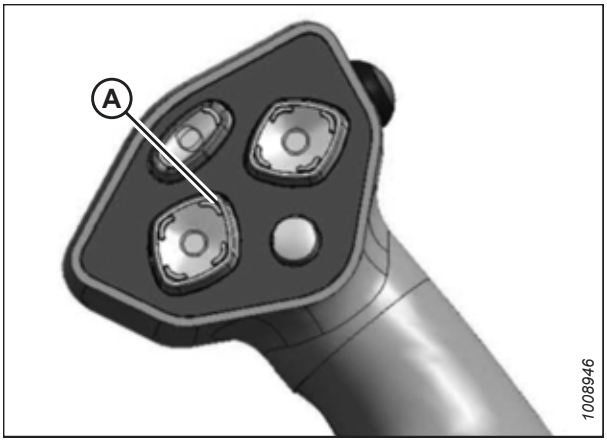


Figure 3.97: Ground Speed Lever

14. Pull lever (A) outward and rotate it toward the header to lower safety prop (B) onto the cylinder. Repeat this step for the opposite cylinder.

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

    b. Pull lever (A) outward and rotate it towards the header to release and lower safety prop (B) onto the lift cylinder.

    c. Repeat for the opposite lift cylinder.

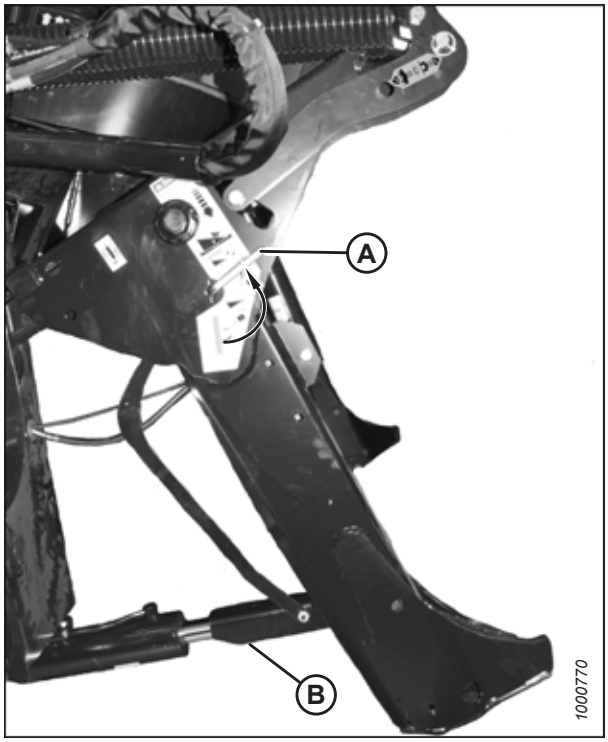


Figure 3.98: Safety Prop

15. Install clevis pin (A) through the support and the windrower lift member, and secure it with hairpin (B). Repeat this step for the opposite side of the machine.

    IMPORTANT:

    Ensure clevis pin (A) is fully inserted and the hairpin is installed behind the bracket.

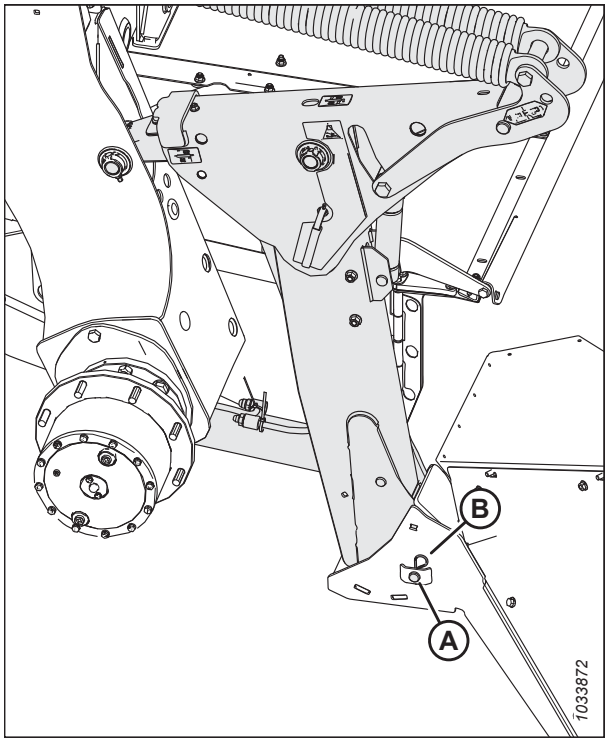


Figure 3.99: Header Support

16. Remove the clevis pin from storage position (B) in the linkage and insert it into hole (A) to engage the float springs. Secure it with the hairpin. Repeat this step on the opposite float linkage.

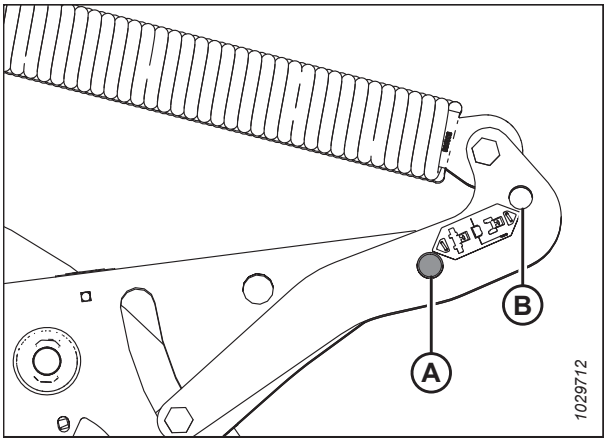


Figure 3.100: Header Float Linkage

17. Disengage the safety prop by turning lever (A) downwards until the lever locks into vertical position.

18. Repeat the previous step for the opposite safety prop.

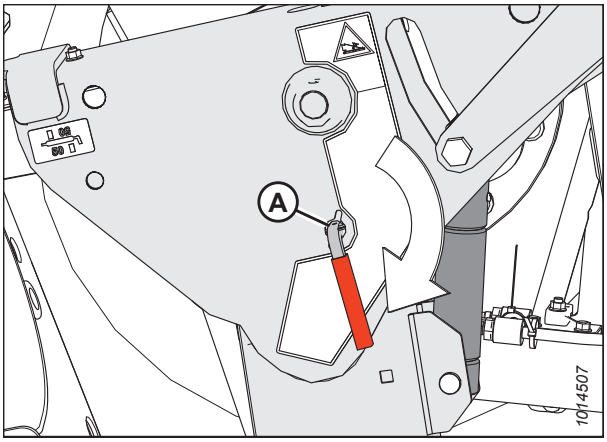


Figure 3.101: Safety Prop

DANGER

Ensure that all bystanders have cleared the area.

19. Start the engine, and press HEADER DOWN switch (A) on the GSL to fully lower the header.

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

21. Proceed to *3.5.4 Connecting R2 Series Rotary Disc Header Hydraulics and Electrical to an M205 SP Windrower, page 80*.

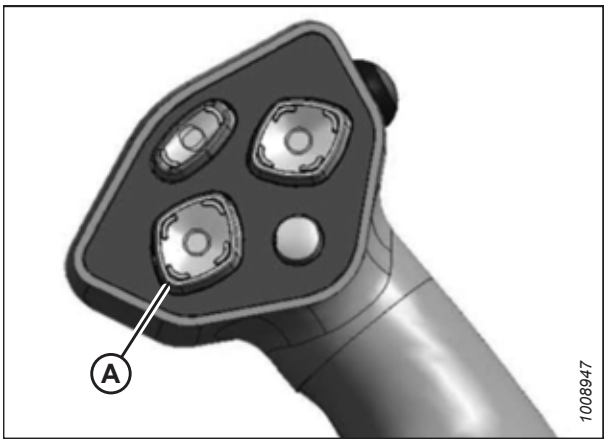


Figure 3.102: Ground Speed Lever

3.5.3 Attaching R2 Series Rotary Disc Header to M205 SP Windrower – Hydraulic Center-Link without Optional Self-Alignment

Attach the header to an M205 SP Windrower that is equipped without an optional self-aligning hydraulic center-link (which allows the operator to control the vertical position of the center-link from the cab).

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 for any reason.

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

2. Remove hairpin (A) from clevis pin (B), and remove the pin from header support (C) on both sides of the header.

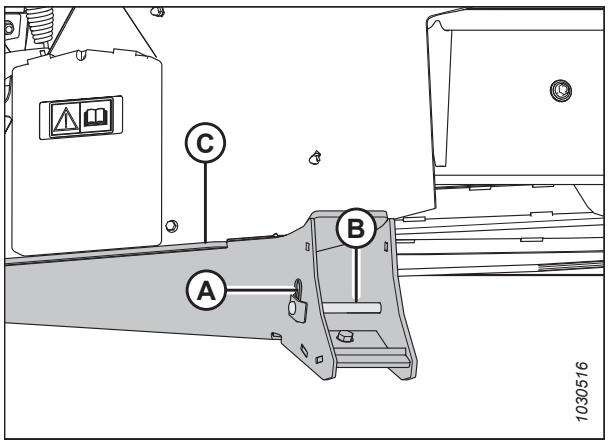


Figure 3.103: Header Support

3. Lift header support (A) and place 2 x 4 in. blocks (B) under the header support. A total of four 2 x 4 in. blocks (B) will be necessary to raise the boot up into field position. Ensure the boot's bottom edge (C) is parallel with the ground. Repeat this step for the opposite side.

   NOTE:

   Do **NOT** stack blocks (B) crosswise as doing so can make the header unstable when attempting to connect the header and windrower. Stack blocks (B) parallel with each other.

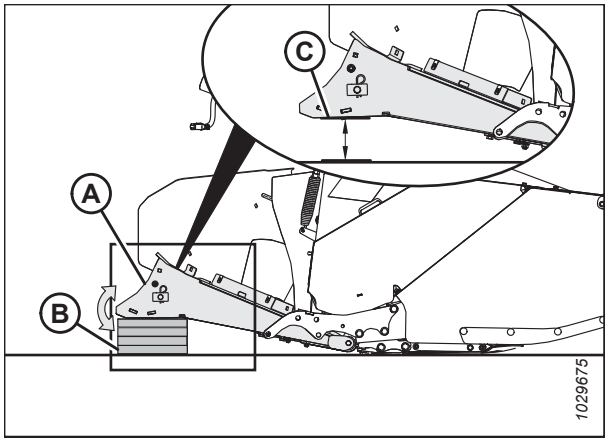


Figure 3.104: Header Support

4. To disengage the float springs, move the float engagement pin from engaged position (A) and insert the pin into storage hole (B). Secure the float engagement pin with a lynch pin. Repeat this step for the opposite linkage.

   IMPORTANT:

   To avoid damaging the lift system when lowering the header lift linkages without a header or weight box attached, ensure the float engagement pin is installed in storage position (B) and **NOT** in engaged position (A).

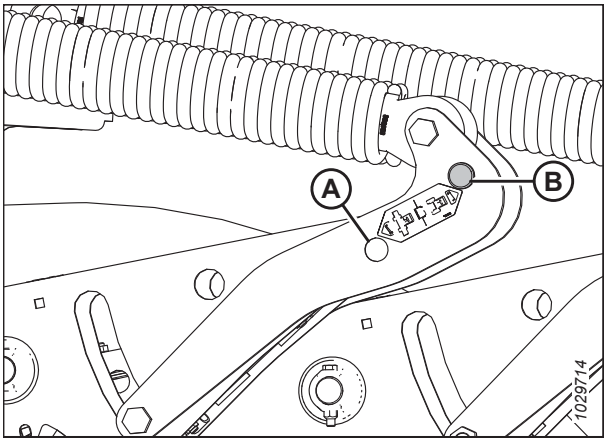


Figure 3.105: Header Float Linkage

DANGER

Ensure that all bystanders have cleared the area.

5. Start the engine and activate HEADER DOWN button (A) on the ground speed lever (GSL) to fully retract the header lift cylinders.

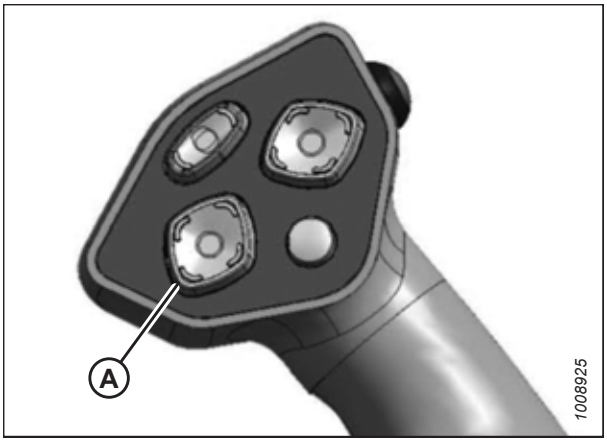


Figure 3.106: Ground Speed Lever

6. Remove pin (A) from the frame linkage and raise center-link (B) until the hook is above the attachment pin on the header. Replace pin (A) to hold the center-link in place.

   IMPORTANT:

   If the center-link is too low, it may contact the header as the windrower approaches the header for hookup.

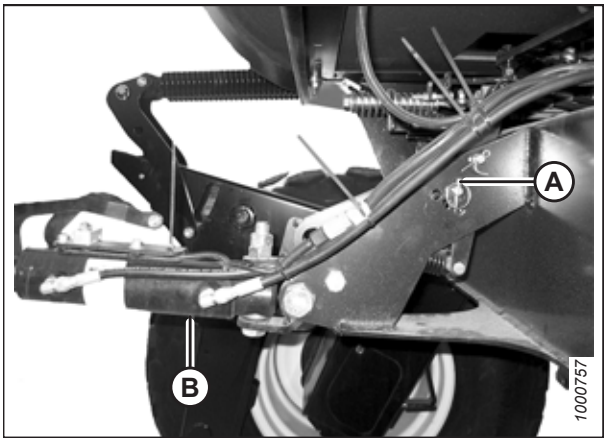


Figure 3.107: Hydraulic Center-Link

7. Slowly drive the windrower forward until windrower feet (A) enter header supports (B). Continue driving slowly forward until the feet engage the supports and the header nudges forward.

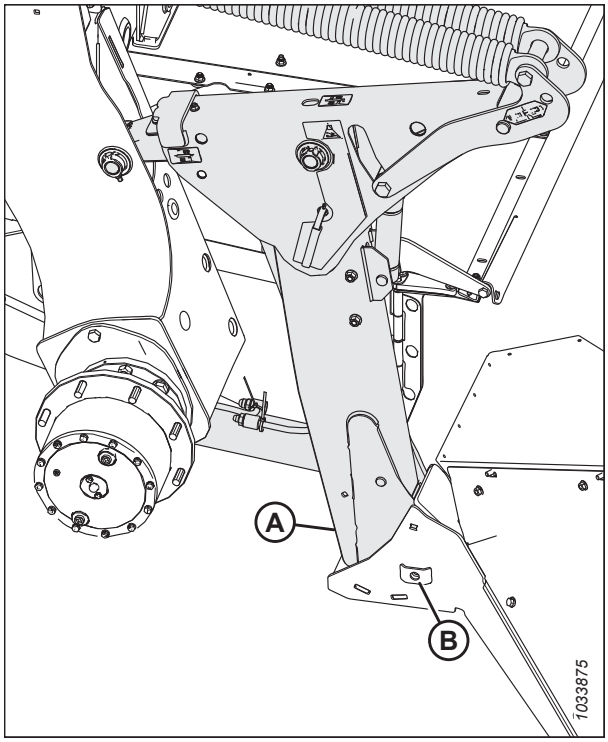


Figure 3.108: Header Support

8. Use the following GSL functions to position the center-link hook above the header attachment pin:
   - HEADER TILT UP (A) to retract the center-link
   - HEADER TILT DOWN (B) to extend the center-link
9. Stop the engine, and remove the key from the ignition.

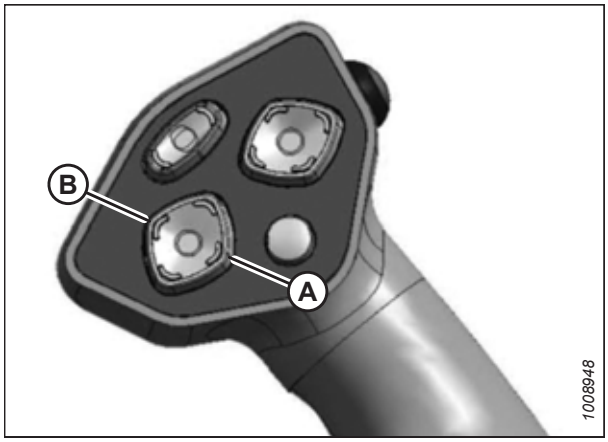


Figure 3.109: Ground Speed Lever

10. Push down on the rod end of link cylinder (A) until hook (B) engages and locks onto the header pin.

    IMPORTANT:

    The hook release must be down to enable the self-locking mechanism. If the release is open (up), manually push it down after the hook engages the header pin.

11. Check that center-link (A) is locked onto the header by pulling upward on the rod end of the cylinder.

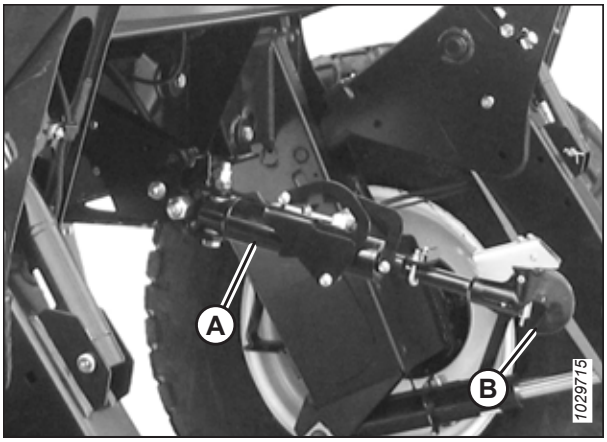


Figure 3.110: Hydraulic Center-Link

DANGER

Ensure that all bystanders have cleared the area.

12. Start the engine.

13. Press HEADER UP switch (A) to raise the header to maximum height.

14. If one end of the header does **NOT** fully raise, rephase the lift cylinders as follows:

    a. Press and hold the HEADER UP switch until both cylinders stop moving.

    b. Continue to hold the switch for 3–4 seconds. The cylinders are now phased.

    NOTE:

    It may be necessary to repeat this procedure if there is air in the system.

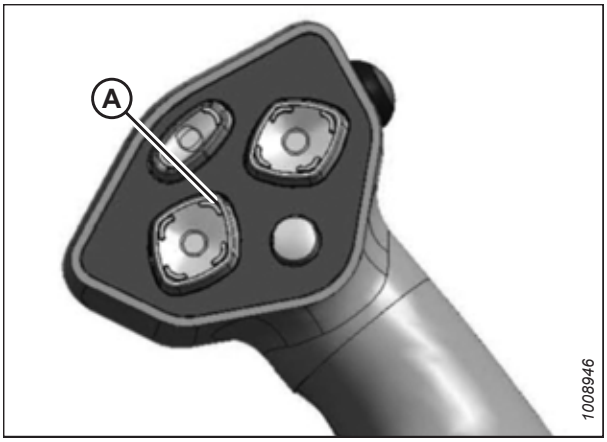


Figure 3.111: Ground Speed Lever

15. Pull lever (A) outward and rotate it toward the header to lower safety prop (B) onto the cylinder. Repeat this step for the opposite cylinder.

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

    b. Pull lever (A) outward and rotate it towards the header to release and lower safety prop (B) onto the lift cylinder.

    c. Repeat for the opposite lift cylinder.

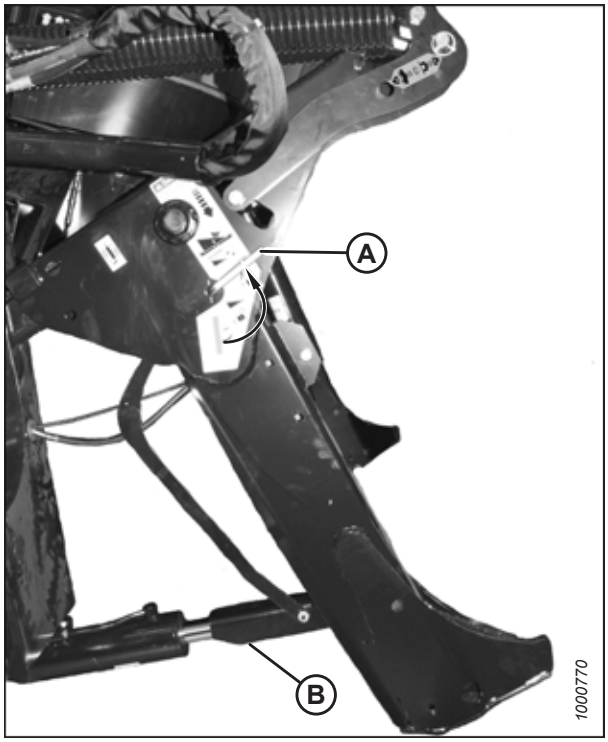


Figure 3.112: Safety Prop

16. Install clevis pin (A) through the support and the windrower lift member, and secure it with hairpin (B). Repeat this step for the opposite side of the machine.

    IMPORTANT:

    Ensure clevis pin (A) is fully inserted and the hairpin is installed behind the bracket.

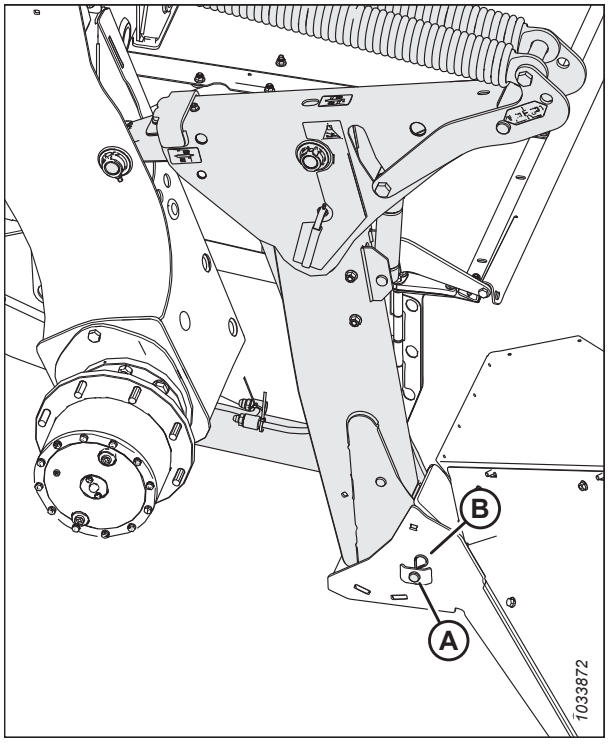


Figure 3.113: Header Support

17. Remove the clevis pin from storage position (B) in the linkage and insert it into hole (A) to engage the float springs. Secure it with the hairpin. Repeat this step on the opposite float linkage.

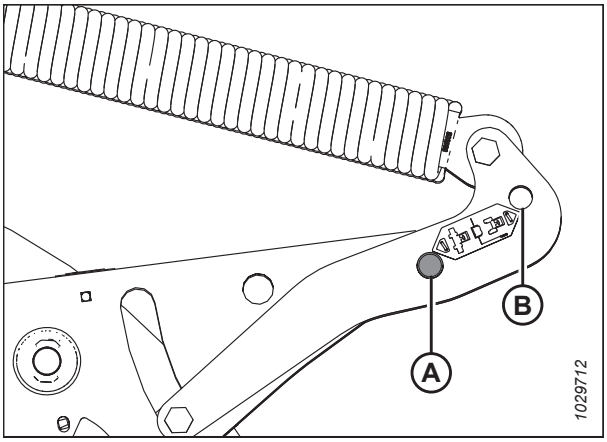


Figure 3.114: Header Float Linkage

18. Disengage the safety prop by turning lever (A) downwards until the lever locks into vertical position.
19. Repeat the previous step for the opposite safety prop.

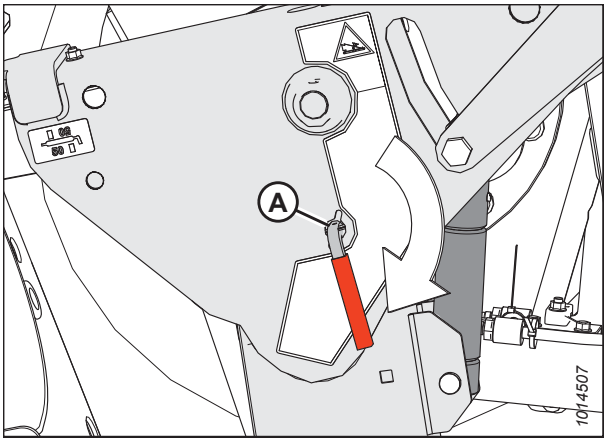


Figure 3.115: Safety Prop

DANGER

Ensure that all bystanders have cleared the area.

20. Start the engine, and press HEADER DOWN switch (A) on the GSL to fully lower the header.
21. Shut down the engine, and remove the key from the ignition.
22. Proceed to *3.5.4 Connecting R2 Series Rotary Disc Header Hydraulics and Electrical to an M205 SP Windrower, page 80*.

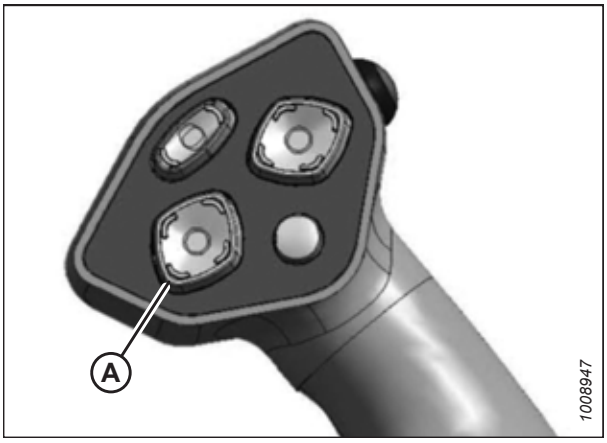


Figure 3.116: Ground Speed Lever

3.5.4 Connecting R2 Series Rotary Disc Header Hydraulics and Electrical to an M205 SP Windrower

Connect the header hydraulic and electrical components to the windrower in order to operate the header.

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 for any reason.

NOTE:

M205 compatibility kit MD #B7220 is required to connect an R216 Rotary Disc Header to an M205 SP Windrower. This kit supplies the hydraulic fittings used for hard-plumbed connections. If the M205 SP Windrower uses quick coupler connections, install quick coupler kit (MD #B5497) onto the R216 Rotary Disc Header pressure and return hoses.

1. Shut down the engine, and remove the key from the ignition.
2. Open the left platform. For instructions, refer to the windrower operator's manual.
3. Insert the pin on header hose support (A) into hole (B) in the windrower frame near the left cab-forward leg.

   IMPORTANT:

   Route the hoses as straight as possible and avoid rub/wear points that could damage the hydraulic hoses.

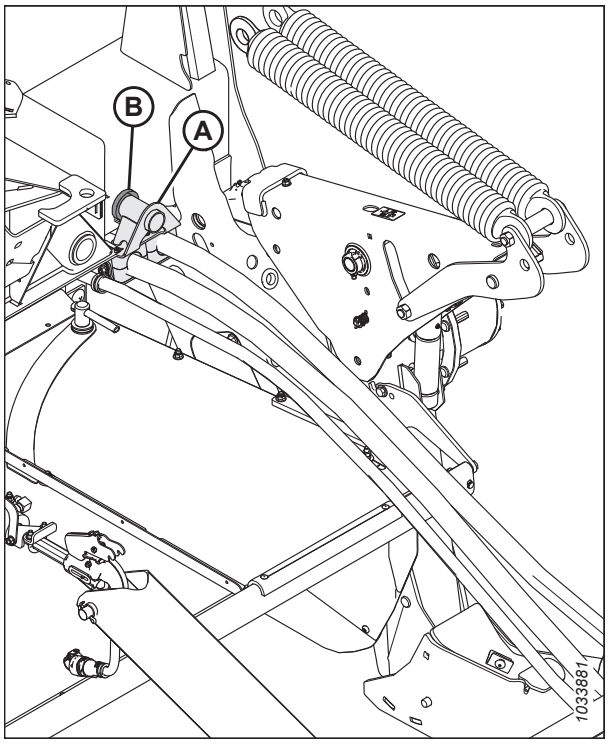


Figure 3.117: Hose Support Installed

NOTE:

When connecting the header hoses to the windrower in the following steps, you can adjust the length of the hoses as follows:

- Loosen nut (A) and clamp (B) to adjust the length of the case drain hose.
- Loosen nuts (C) and clamps (D) to adjust the length of the pressure and return hoses.
- Tighten all hardware after making adjustments.

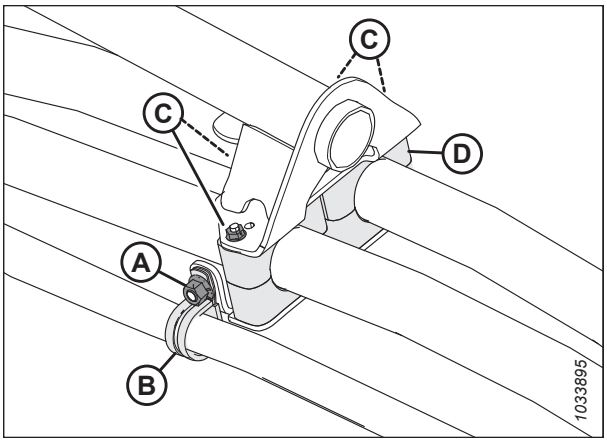


Figure 3.118: Hose Support Clamps

4. Proceed according to the type of hydraulic couplers or fittings used on the M205 SP Windrower:
   - If the M205 SP Windrower is equipped with quick couplers (A) to connect to the header, proceed to Step *5, page 82*.

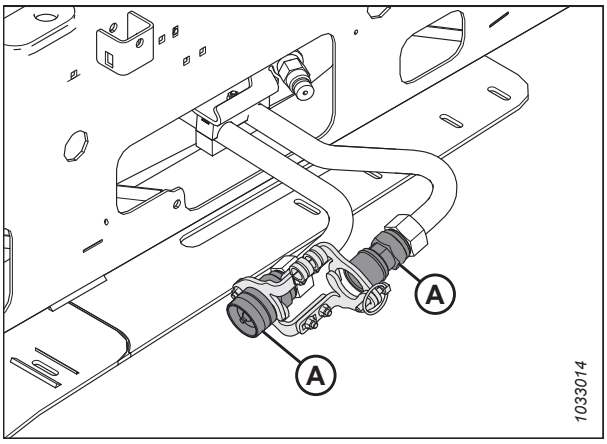


Figure 3.119: Pressure and Return Steel Lines with Quick Couplers

   - If the M205 SP Windrower uses union fittings (A) instead of quick couplers to connect to the header, remove union fittings (A) from the steel lines and install the hard-plumbed connections provided in the M205 compatibility kit. For instructions, proceed to Step *13, page 84*.

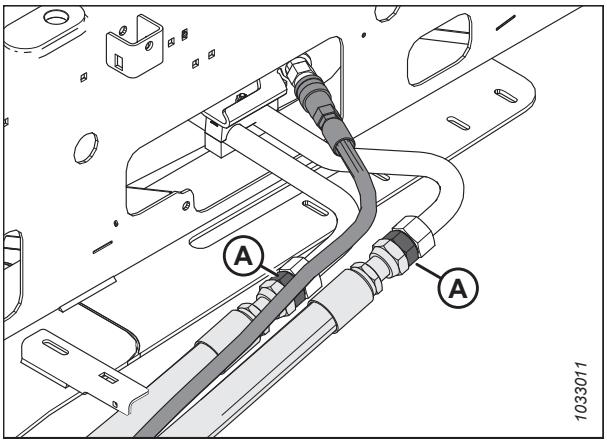


Figure 3.120: Pressure and Return Steel Lines with Union Fittings

- If the M205 SP Windrower has plugs (A) installed in the steel lines, remove the plugs from the steel lines and install the hard-plumbed connections provided in the M205 compatibility kit. For instructions, proceed to Step *13, page 84*.

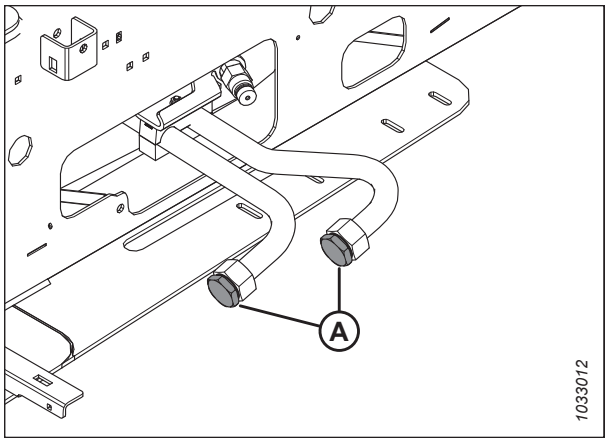


Figure 3.121: Pressure and Return Steel Lines with Plugs

5. **Quick coupler connections:** Connect male quick coupler (A) to pressure coupler (B). Connect female quick coupler (C) to return coupler (D).

   NOTE:

   For reference, the other end (E) of the pressure hose is connected to the front of the hydraulic motor. The other end (F) of the return hose is connected to the rear of the hydraulic motor.

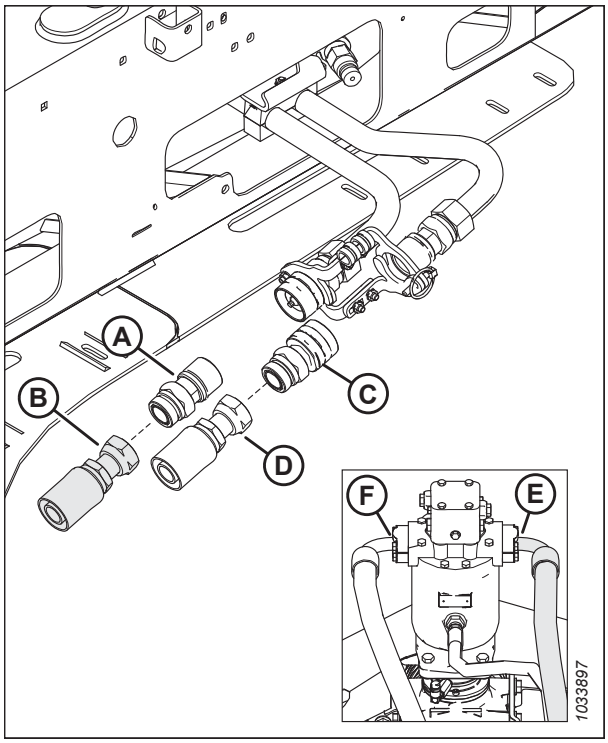


Figure 3.122: Header Pressure and Return Connections

6. **Quick coupler connections:** Connect pressure coupler (A) to inboard steel line coupler (B).

   NOTE:

   For reference, the other end (C) of the pressure hose is connected to the front of the hydraulic motor.

7. **Quick coupler connections:** Connect return coupler (D) to outboard steel line coupler (E).

   NOTE:

   For reference, the other end (F) of the return hose is connected to the rear of the hydraulic motor.

8. **Quick coupler connections:** Close coupler lock assembly (G) over the couplers and secure it with pin (H).

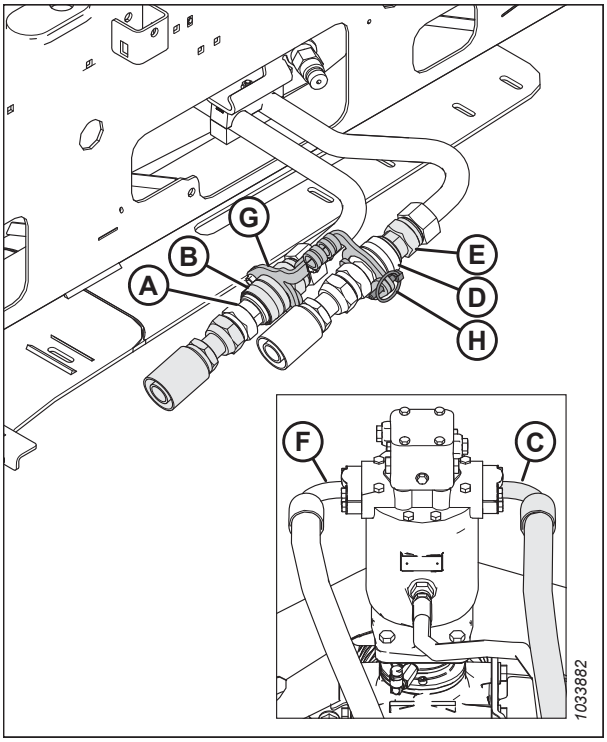


Figure 3.123: Header Pressure and Return Connections

9. **Quick coupler connections:** Confirm quick couplers are connected properly. Couplers will restrict oil flow if they are not fully mated (O-ring [A] will be visible). This will generate excessive heat, damaging the drive components and the couplers themselves. Couplers (B) at right are fully mated, and couplers (C) at right are not fully mated.

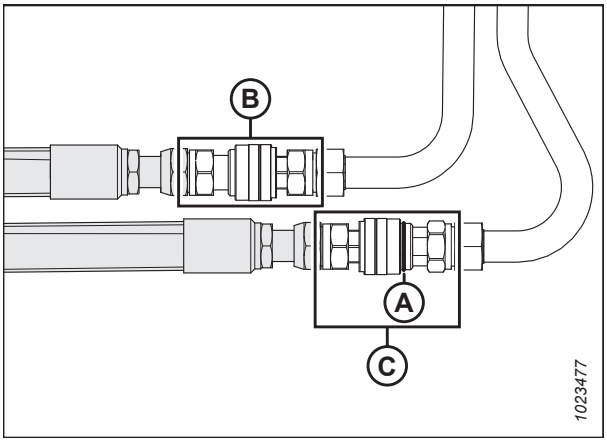


Figure 3.124: Quick Couplers – View from Above

10. **Quick coupler connections:** Connect case drain hose (A) to 1/2 in. male flat face fitting (B).

    NOTE:

    For reference, the other end of the case drain hose is connected to hydraulic motor port (D).

11. **Quick coupler connections:** Secure case drain hose to coupler lock assembly with two clamps (C).

12. **Quick coupler connections:** Proceed to Step *16, page 85*.

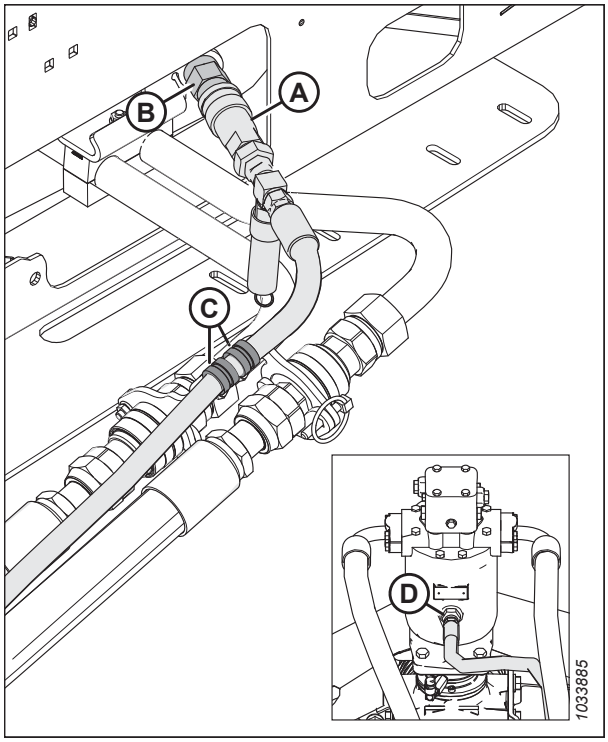


Figure 3.125: Case Drain Connection

13. **Hard-plumbed connections:** Connect pressure coupler (A) to inboard steel line (B) using adapter fittings (C) and (D).

    NOTE:

    For reference, other end (E) of the pressure hose is connected to the front of the hydraulic motor.

14. **Hard-plumbed connections:** Connect return coupler (G) to outboard steel line (H) using adapter fittings (J) and (K).

    NOTE:

    For reference, the other end (L) of the return hose is connected to the rear of the hydraulic motor.

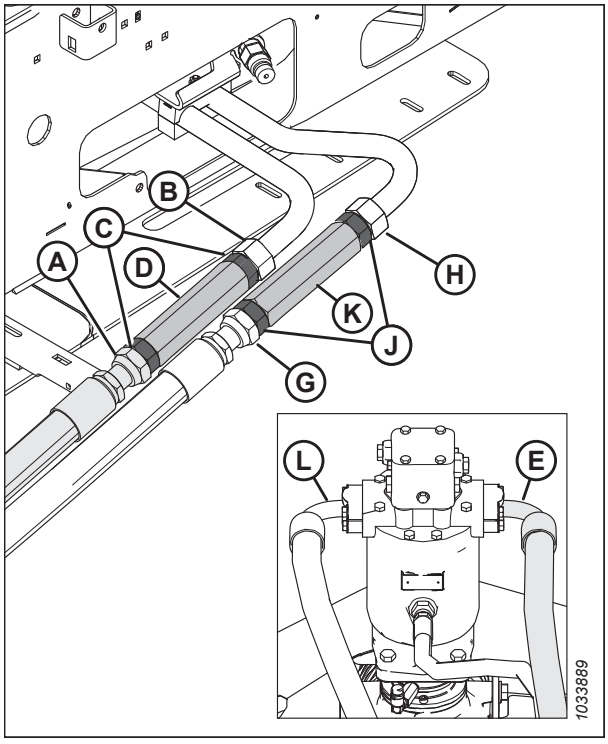


Figure 3.126: Header Pressure and Return Connections

15. **Hard-plumbed connections:** Connect case drain hose (A) to 1/2 in. male flat face fitting (B).

    NOTE:

    For reference, the other end of the case drain hose is connected to hydraulic motor port (C).

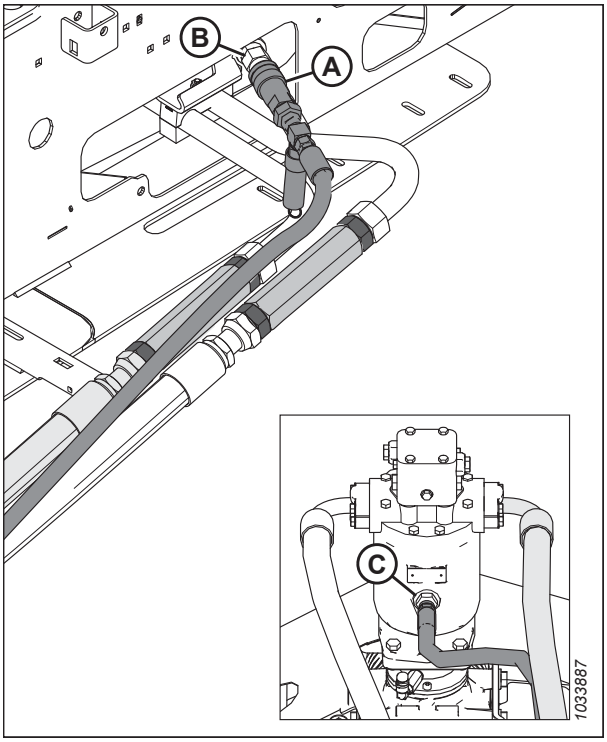


Figure 3.127: Case Drain Connection

16. Remove M205 adapter harness (A) from the storage location on center-link (B).

17. Connect harness (A) to header harness (C).

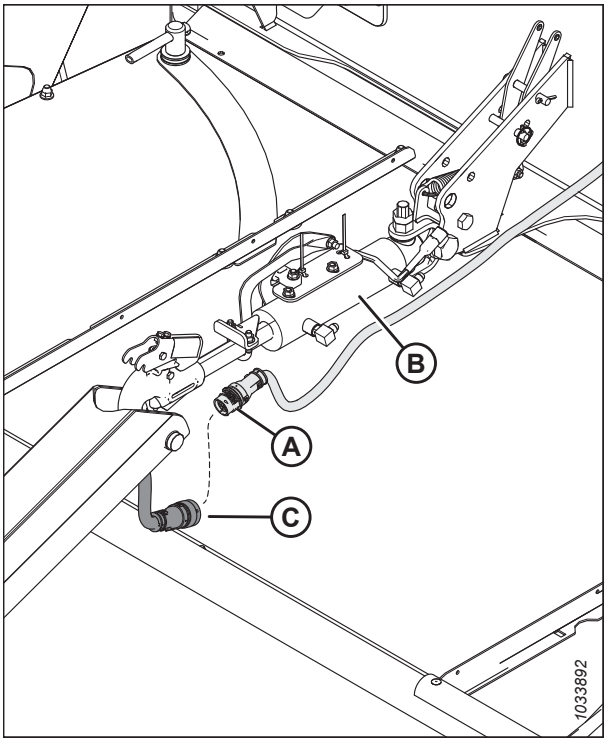


Figure 3.128: M205 Adapter Harness

3.6 Detaching R2 Series Rotary Disc Header from M205 SP Windrower

Detach the header when replacing the header with a different one or when storing the header.

3.6.1 Detaching R2 Series Rotary Disc Header from M205 SP Windrower

Detach the header when replacing the header with a different one or when storing the header.

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 for any reason.

1. Start the engine and press HEADER UP switch (A) to raise the header to its maximum height.
2. Rephase the cylinders if one end of the header does not rise fully:
   a. Press and hold HEADER UP switch (A) until both cylinders stop moving.
   b. Continue to hold the switch for 3–4 seconds. The cylinders are now phased.

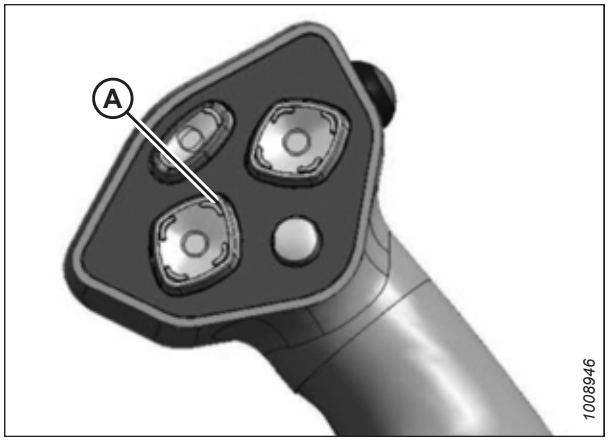


Figure 3.129: Ground Speed Lever (GSL)

3. Shut down the engine, and remove the key from the ignition.
4. Open the left platform. For instructions, refer to the windrower operator's manual.

5. Pull lever (A) outward and rotate it toward the header to lower safety prop (B) onto the cylinder. Repeat for the opposite cylinder.

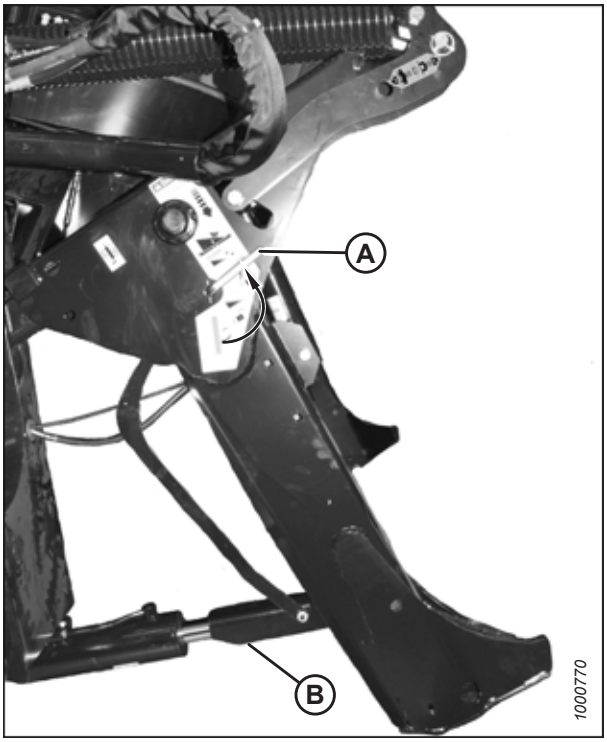


Figure 3.130: Safety Props

6. Remove hairpin (B) from clevis pin (A) and remove the clevis pin from header boot (C) on both sides of the header.

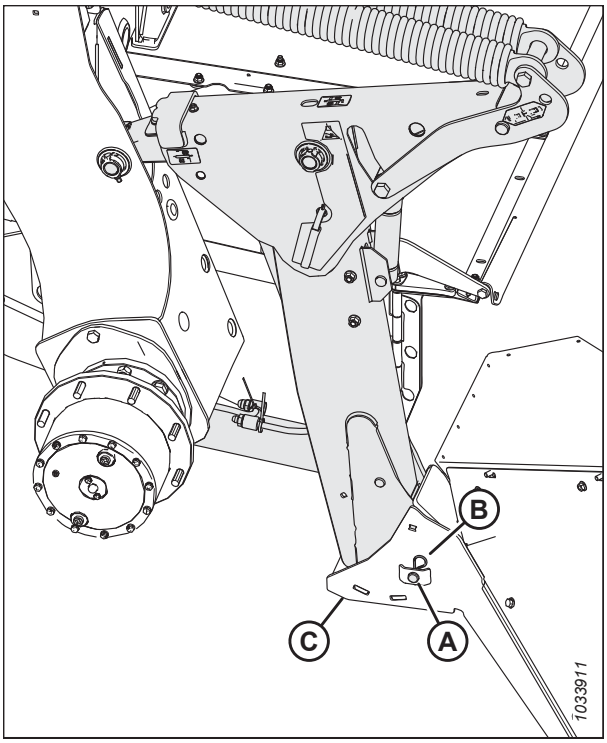


Figure 3.131: Header Boots

7. Remove the hairpin and clevis pin from location (A) to disengage the float springs, and insert the hairpin and clevis pin into storage hole (B). Secure with the hairpin.

   IMPORTANT:

   To prevent damage to the lift system when lowering header lift linkages without a header or weight box attached to the windrower, ensure the float engagement pin is installed in storage position (B) and **NOT** in engaged position (A).

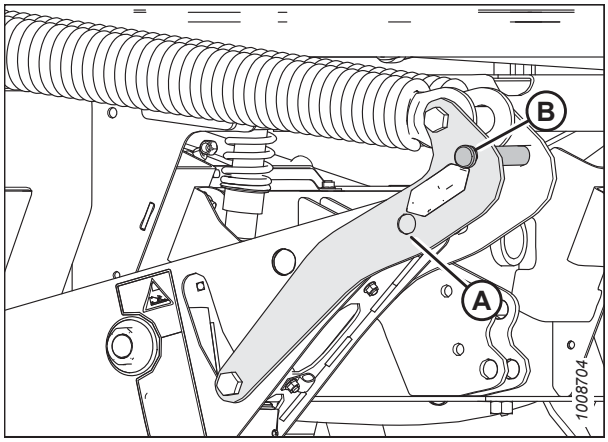


Figure 3.132: Header Float Linkage

DANGER

Ensure that all bystanders have cleared the area.

8. Disengage the safety props by turning lever (A) away from the header to raise the safety prop until the lever locks into the vertical position. Repeat for the opposite cylinder.

9. Start the engine, choose a level area, and lower the header to the ground.

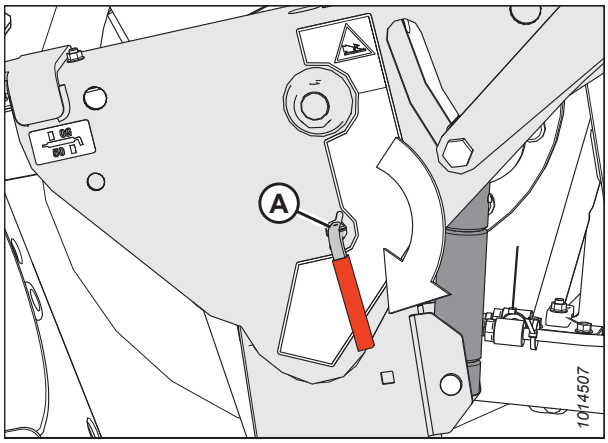


Figure 3.133: Safety Props

10. Press HEADER TILT UP (A) and HEADER TILT DOWN (B) cylinder switches on the GSL to release the load on the center-link cylinder.

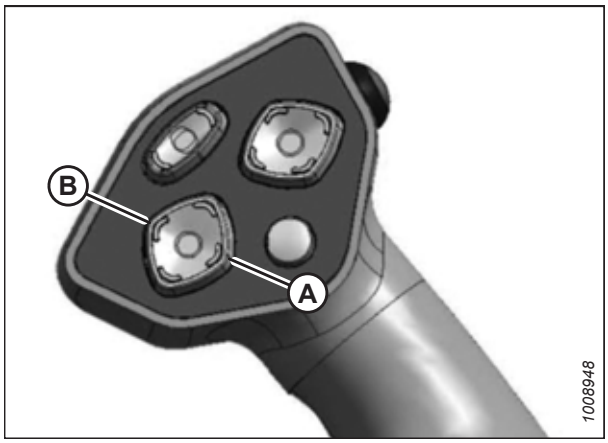


Figure 3.134: Ground Speed Lever

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

12. Lift hook release (C) and lift hook (B) off the header pin.

    NOTE:

    If the optional center-link lift cylinder is installed, lift release (C) and then operate the link lift cylinder from the cab to disengage center-link (A) from the header.

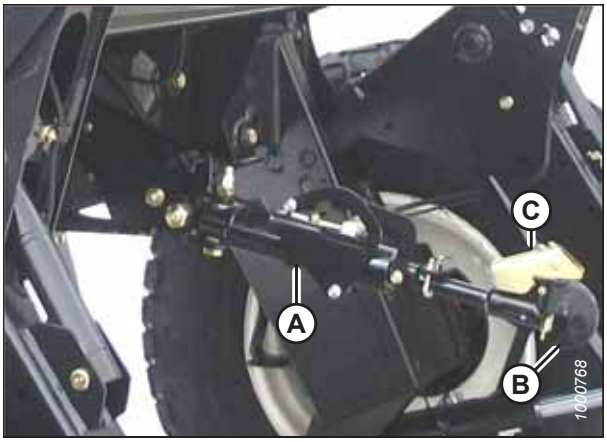


Figure 3.135: Hydraulic Center-Link

13. Proceed as follows:

    - If equipped with quick couplers (A), proceed to Step *14, page 90*.
    - If equipped with hard-plumbed couplers (B), proceed to Step *19, page 91*.

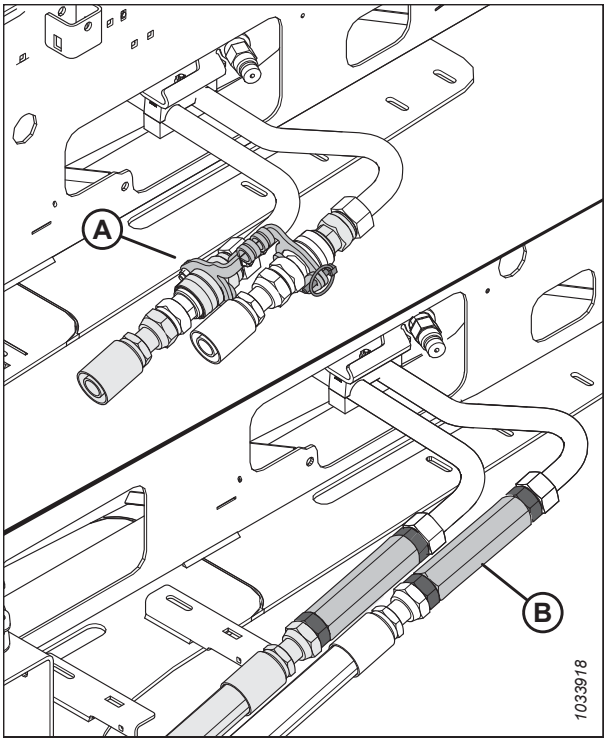


Figure 3.136: Quick Couplers and Hard-Plumbed Couplers

14. **Quick coupler connections:** Disconnect case drain hose (A) from fitting (B).

15. **Quick coupler connections:** Remove two clamps (C) and hose (A). Reinstall clamps (C).

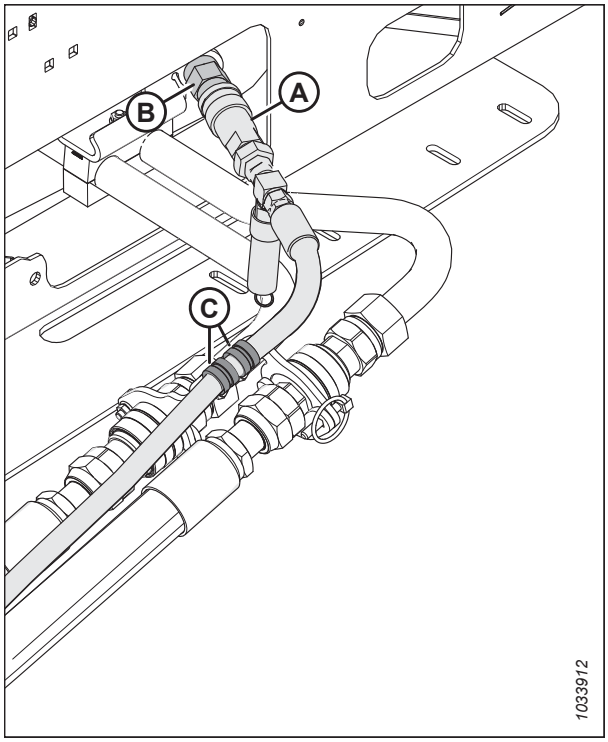


Figure 3.137: Case Drain Connection

16. **Quick coupler connections:** Remove pin (A). Open coupler lock assembly (B).

17. **Quick coupler connections:** Disconnect coupler (C) from steel line coupler (D). Disconnect coupler (E) from steel line coupler (F).

18. **Quick coupler connections:** Proceed to Step *21, page 91*.

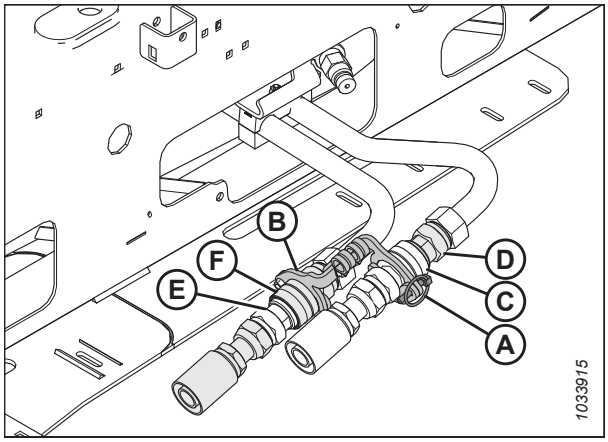


Figure 3.138: Header Pressure and Return Connections

19. **Hard-plumbed connections:** Disconnect case drain hose (A) from fitting (B).

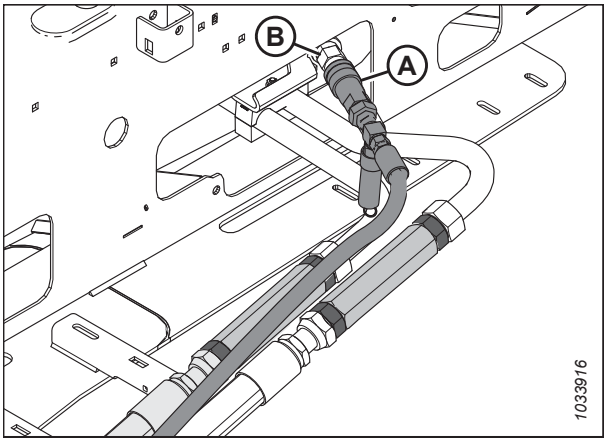


Figure 3.139: Case Drain Connection

20. **Hard-plumbed connections:** Disconnect the hose with fitting (A) from steel line (B). Disconnect the hose with fitting (C) from steel line (D).

21. Install caps and plugs on the open lines to prevent the buildup of dirt and debris during storage.

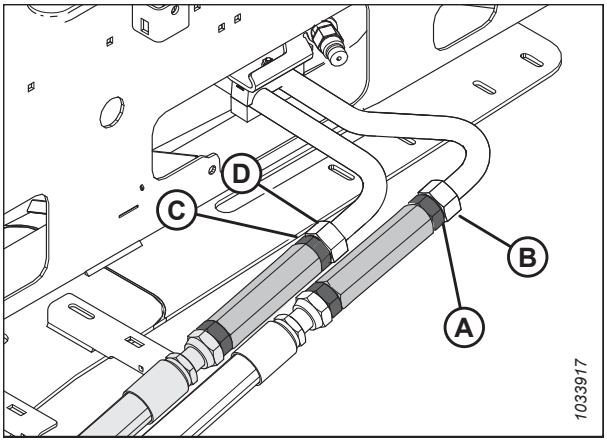


Figure 3.140: Header Pressure and Return Connections

22. Remove header hose support (A) from hole (B) in the windrower frame near the left cab-forward leg.

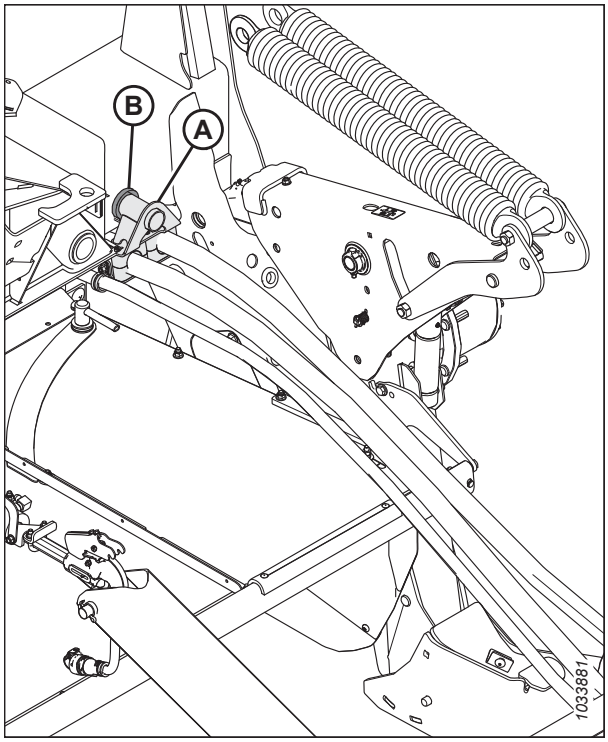


Figure 3.141: Hose Support Installed

23. Rest hydraulic hose bundle (A) on the header for storage as shown.

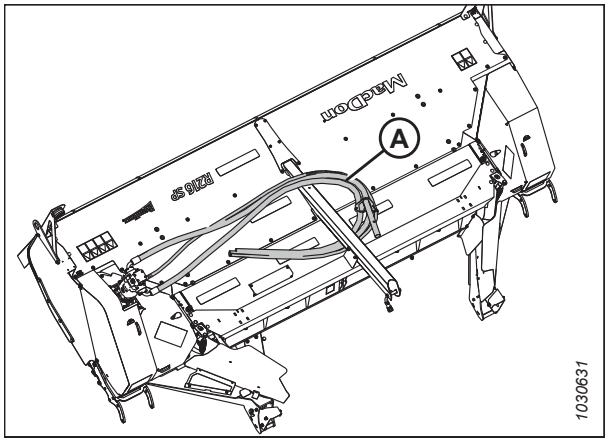


Figure 3.142: Hose Bundle Storage Position

24. Disconnect M205 SP Windrower adapter harness (A) from header connector (C). Install electrical caps on the connectors.
25. Store harness (A) on center-link (B) using straps (not shown).
26. Back the windrower slowly away from the header.

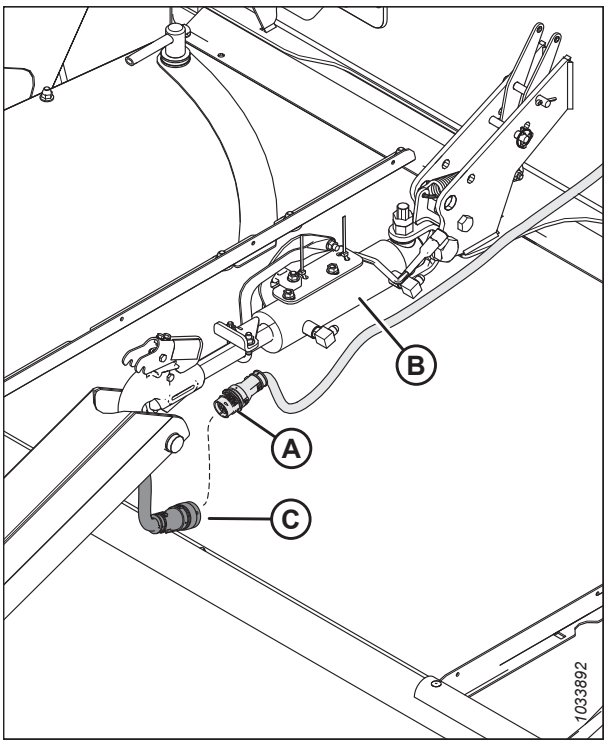


Figure 3.143: M205 SP Windrower Adapter Harness

27. Reinstall clevis pin (B) through boot (C), and secure it with hairpin (A). Repate for opposite side.

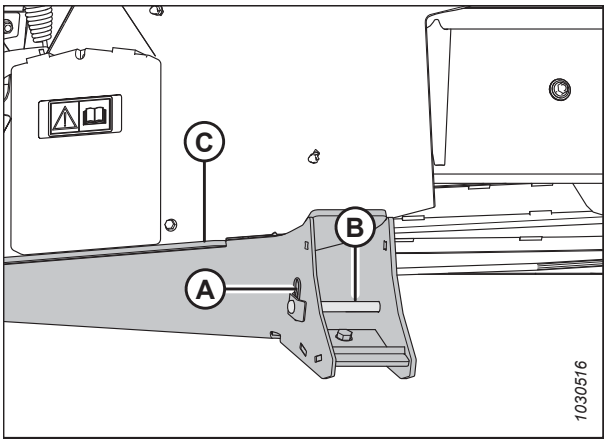


Figure 3.144: Header Boot

3.6.2 Removing the Forming Shield

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

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 for any reason.

NOTE:

It is **NOT** always necessary to remove the forming shield after detaching the header from the windrower.

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

2. Remove and retain hairpin (A) and washer (B) from straight pin (C).
3. Pull rubber strap (D) away from straight pin (C).
4. Lower the rear end of the forming shield.

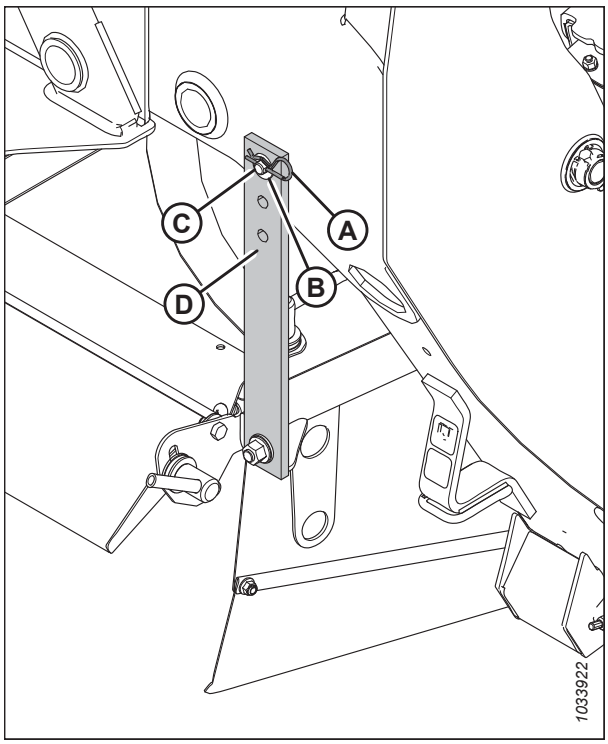


Figure 3.145: Rubber Strap Securing Forming Shield onto Windrower Leg

5. Reinstall washer (B) and hairpin (A) on straight pin (C) for storage.
6. Repeat Step *2, page 94* to Step *5, page 94* at the opposite side.

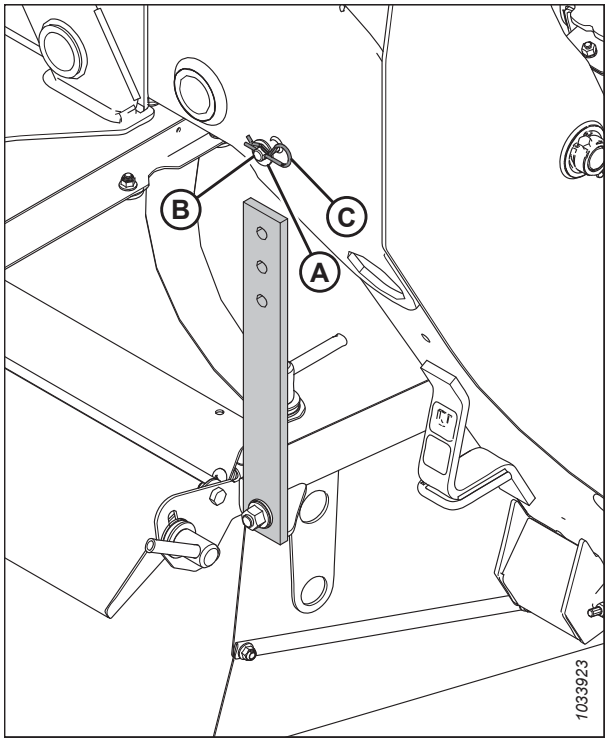


Figure 3.146: Lynch Pin and Washer at Rear of Windrower Leg

7. Remove lynch pin (A) and clevis pin (B) securing forming shield (C) to bolt and spacer (D). Repeat at the opposite side.

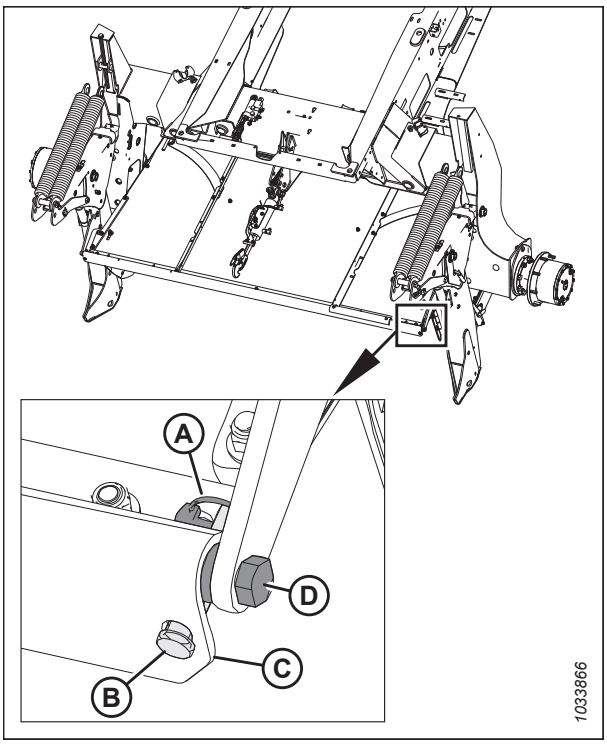


Figure 3.147: Forming Shield Secured to Front of Windrower Legs

8. Dismount forming shield (A) from bolts and spacers (B). Repeat at the opposite side.
9. Reattach clevis pin (C) and lynch pin (D) to the forming shield for storage. Repeat at the opposite side.
10. Remove the forming shield.

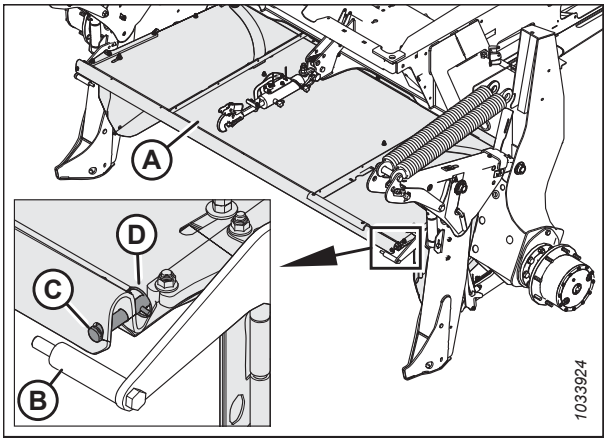


Figure 3.148: Forming Shield and Windrower

3.7 Attaching R2 Series Rotary Disc Header to M155*E4* SP Windrower

Follow the procedures below to safely attach the R216 Rotary Disc Header to an M155*E4* Self-Propelled Windrower. The procedures differ somewhat depending on whether or not the windrower is equipped with a self-aligning hydraulic center-link.

NOTE:

To use an R216 Rotary Disc Header with an M155*E4* Self-Propelled Windrower, the following kits must be installed first:

- Disc drive kit (MD #B4657)
- M155*E4* hydraulic drive kit (MD #B7310)

Proceed to the relevant topic:

- To connect the header to an M155*E4* Self-Propelled Windrower equipped with a self-aligning hydraulic center-link, proceed to *3.7.1 Attaching R2 Series Rotary Disc Header to M155E4 SP Windrower – Hydraulic Center-Link with Self-Alignment, page 96*.
- To connect the header to an M155*E4* Self-Propelled Windrower equipped with a non-self-aligning hydraulic center-link, proceed to *3.7.2 Attaching R2 Series Rotary Disc Header to M155E4 SP Windrower – Hydraulic Center-Link without Self-Alignment, page 102*.

3.7.1 Attaching R2 Series Rotary Disc Header to M155*E4* SP Windrower – Hydraulic Center-Link with Self-Alignment

The M155*E4* Self-Propelled Windrower may be equipped with an optional self-aligning hydraulic center-link, which allows the Operator to control the vertical position of the center-link from the cab. This simplifies the process of attaching the R216 Rotary Disc Header to the windrower.

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 for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Remove hairpin (A) from clevis pin (B), and remove the pin from header support (C).
3. Repeat the previous step on the other side of the header.

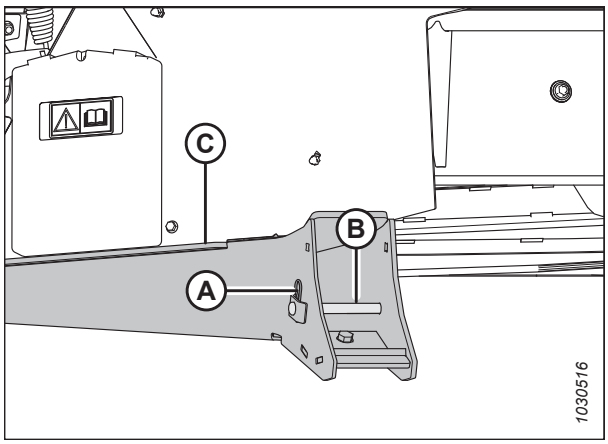


Figure 3.149: Header Support

4. Lift header support (A) and place 2 x 4 in. blocks (B) under the header support. A total of four 2 x 4 in. blocks (B) will be necessary to raise the boot up into field position. Ensure the boot's bottom edge (C) is parallel with the ground. Repeat for the opposite side.

   NOTE:

   Do **NOT** stack blocks (B) crosswise; doing so can make the header unstable. Stack blocks (B) so that the edges of the blocks are flush with each other.

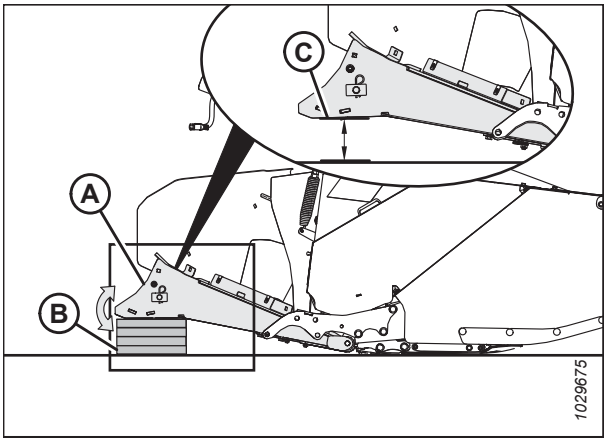


Figure 3.150: Header Support

5. Remove the float engagement pin from hole (A) to disengage the float springs. Insert the float engagement pin into storage hole (B). Secure the engagement pin with the lynch pin.

   IMPORTANT:

   To prevent damage to the lift system when lowering the header lift linkages without a header or a weight box attached to the windrower, ensure that the float engagement pin is installed in storage hole (B) and **NOT** in engaged position (A).

6. Repeat the previous step for the other float engagement pin.

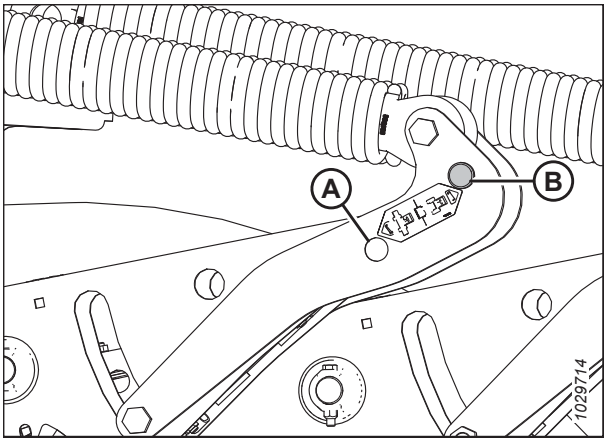


Figure 3.151: Float Linkage

DANGER

Ensure that all bystanders have cleared the area.

7. Start the engine and activate HEADER DOWN button (A) on the ground speed lever (GSL) to fully retract the header lift cylinders.

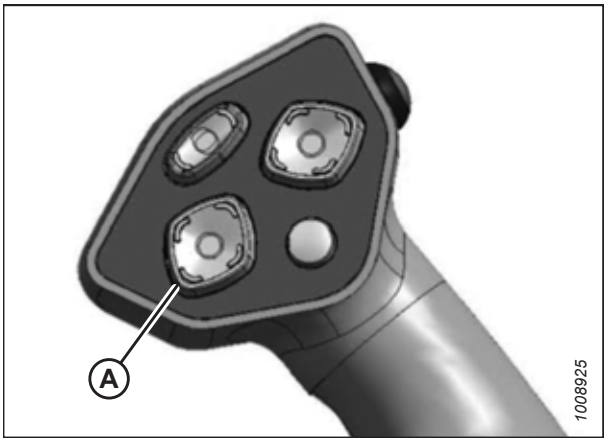


Figure 3.152: Ground Speed Lever

8. Press REEL UP switch (A) on the GSL to raise the center-link until the hook is above the attachment pin on the header.

   IMPORTANT:

   If the center-link is too low, it may contact the header as the windrower approaches the header for hookup.

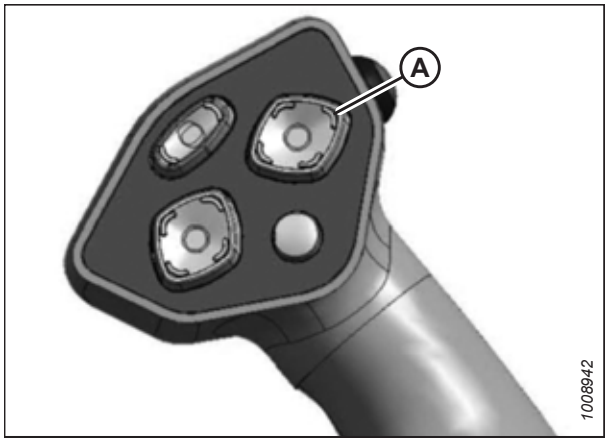


Figure 3.153: Ground Speed Lever

9. Slowly drive the windrower forward until windrower feet (A) enter header supports (B). Continue driving slowly forward until the feet engage the supports and the header is nudged forward.

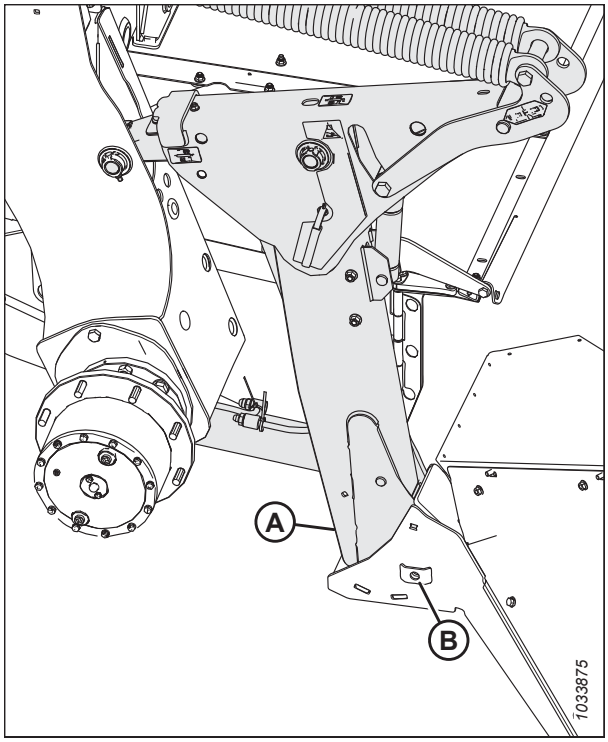


Figure 3.154: Header Support

10. Use the following GSL functions to position the center-link hook above the header attachment pin:
    - REEL UP (A) to raise the center-link
    - REEL DOWN (B) to lower the center-link
    - HEADER TILT UP (C) to retract the center-link
    - HEADER TILT DOWN (D) to extend the center-link

    IMPORTANT:

    The hook release must be down to enable the self-locking mechanism. If the release is open (up), manually push it down after the hook engages the header pin.

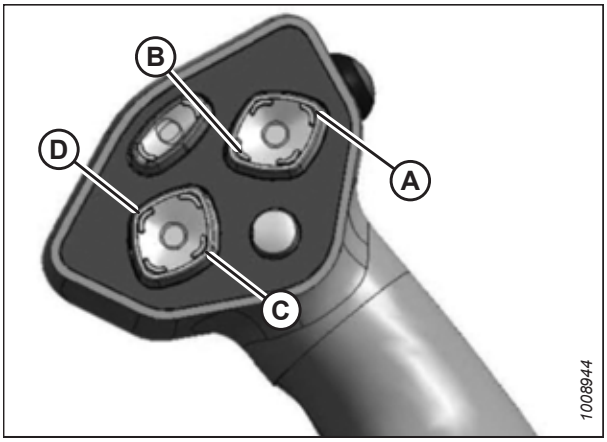


Figure 3.155: Ground Speed Lever

11. Adjust the position of center-link cylinder (A) with the REEL UP and REEL DOWN switches on the GSL until the hook is positioned above the header attachment pin.

    IMPORTANT:

    Hook release (B) must be down to enable the self-locking mechanism. If the release is open (up), manually push it down after the hook engages the header pin.

12. Lower center-link (A) onto the header using the REEL DOWN switch on the GSL until the center-link locks into position and hook release (B) is down.

13. Check that the center-link is locked onto the header by pressing the REEL UP switch on the GSL.

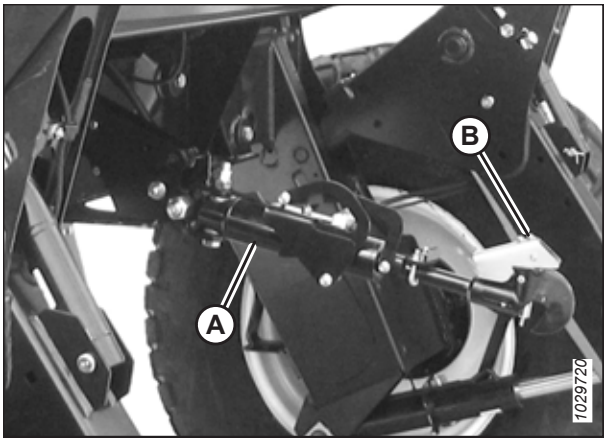


Figure 3.156: Hydraulic Center-Link

14. Press HEADER UP switch (A) to raise the header to its maximum height.

15. If one end of the header does **NOT** fully rise, rephase the lift cylinders as follows:

    a. Press and hold the HEADER UP switch until both cylinders stop moving.

    b. Continue to hold the switch for 3–4 seconds. The cylinders are now phased.

    NOTE:

    It may be necessary to repeat this procedure if there is air in the hydraulic system.

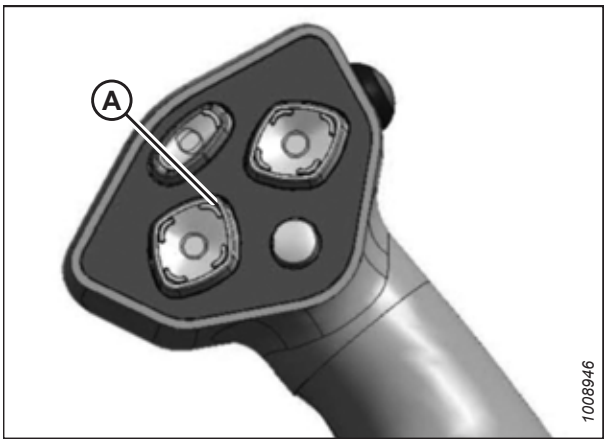


Figure 3.157: Ground Speed Lever

16. To lower the safety props:

    a. Pull lever (A) outward and rotate it toward the header to lower safety prop (B) onto the cylinder.

    b. Repeat the previous step for the other safety prop.

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

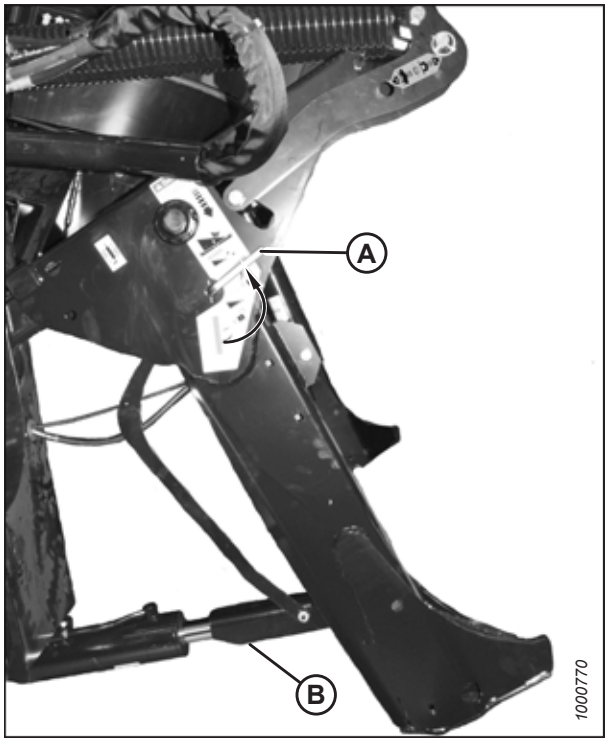


Figure 3.158: Safety Prop

17. Install clevis pin (A) through the support and the windrower foot. Secure the clevis pin with hairpin (B).

    IMPORTANT:

    Ensure that clevis pin (A) is fully inserted and that the hairpin is installed behind the bracket.

18. Repeat the previous step on the other side of the header.

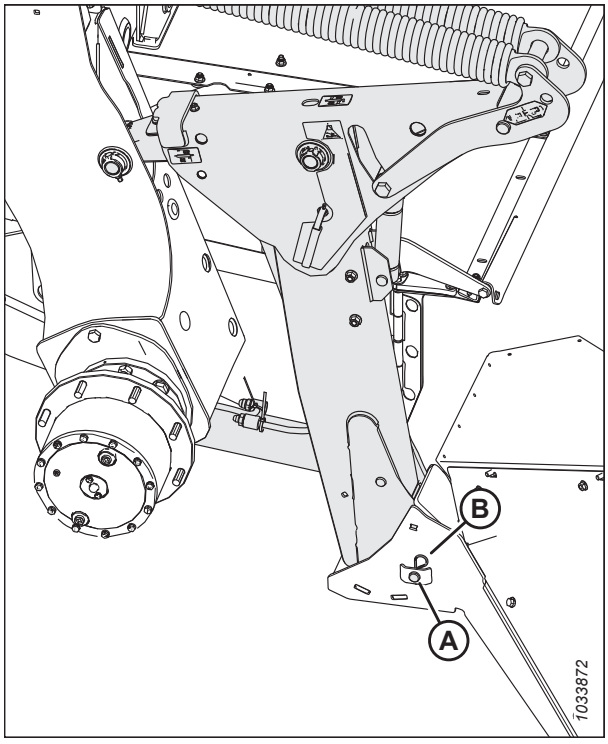


Figure 3.159: Header Support

19. Remove the clevis pin from storage position (B) in the linkage and insert it into hole (A) to engage the float springs. Secure it with the hairpin. Repeat this step on the opposite float linkage.

20. Repeat the previous step for the other float engagement pin.

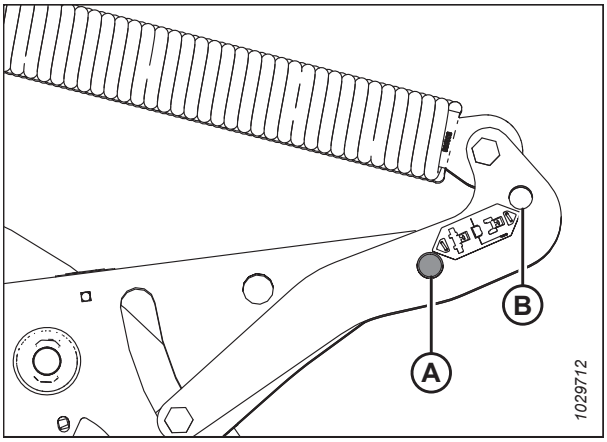


Figure 3.160: Header Float Linkage

21. Disengage the safety prop by turning lever (A) downwards until the lever locks into vertical position.

22. Repeat the previous step for the opposite safety prop.

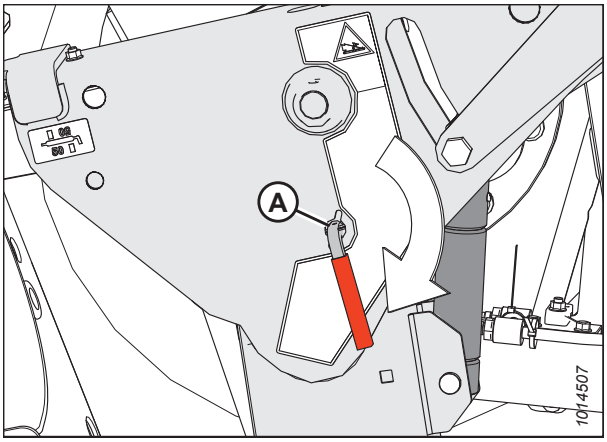


Figure 3.161: Safety Prop

DANGER

Ensure that all bystanders have cleared the area.

23. Start the engine, and press HEADER DOWN switch (A) on the GSL to fully lower the header.

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

25. Proceed to *3.7.3 Connecting R2 Series Rotary Disc Header Hydraulics and Electrical to M155E4 SP Windrower, page 108*.

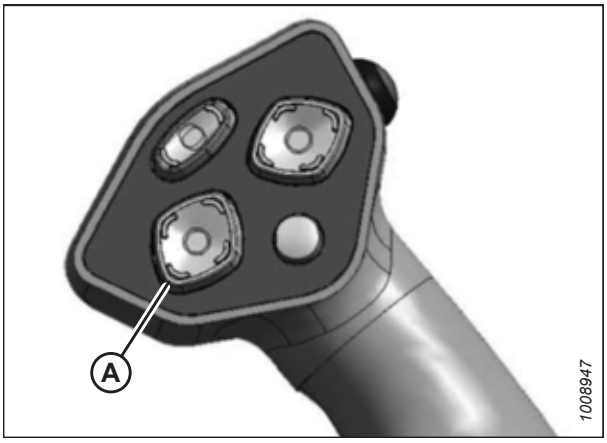


Figure 3.162: Ground Speed Lever

3.7.2 Attaching R2 Series Rotary Disc Header to M155*E4* SP Windrower – Hydraulic Center-Link without Self-Alignment

If the M155*E4* Self-Propelled Windrower is equipped with a hydraulic center-link that lacks self-alignment capability, the Operator will have to manually attach the hydraulic center-link's hook to the R216 Rotary Disc Header's center pin.

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 for any reason.

1. Shut down the engine, and remove the key from the ignition.
2. Remove hairpin (A) from clevis pin (B), and remove the pin from header support (C).
3. Repeat the previous step on the other side of the header.

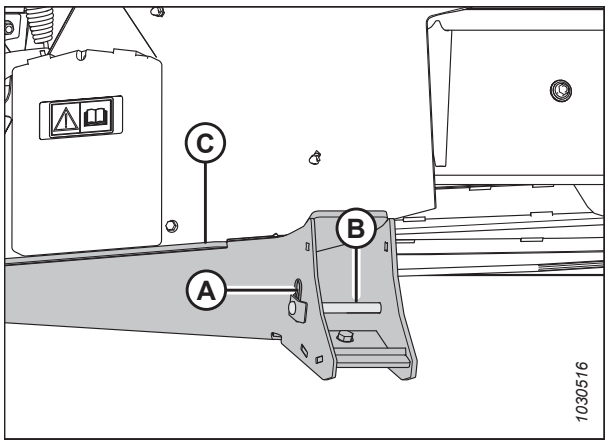


Figure 3.163: Header Support

4. Lift header support (A) and place 2 x 4 in. blocks (B) under the header support. A total of four 2 x 4 in. blocks (B) will be necessary to raise the boot up into field position. Ensure the boot's bottom edge (C) is parallel with the ground. Repeat for the opposite side.

   NOTE:

   Do **NOT** stack blocks (B) crosswise; doing so can make the header unstable. Stack blocks (B) so that the edges of the blocks are flush with each other.

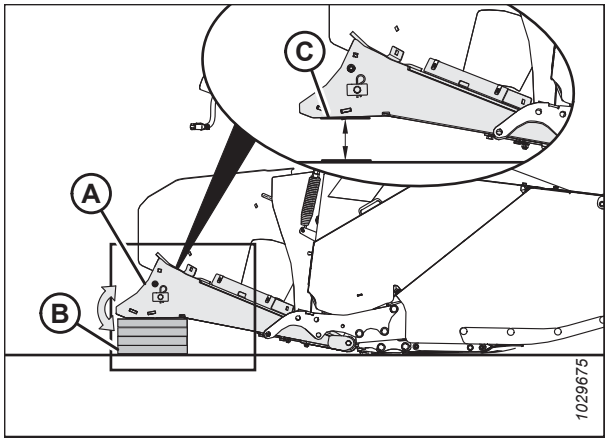


Figure 3.164: Header Support

5. Remove the float engagement pin from hole (A) to disengage the float springs. Insert the float engagement pin into storage hole (B). Secure the engagement pin with the lynch pin.

   IMPORTANT:

   To prevent damage to the lift system when lowering the header lift linkages without a header or a weight box attached to the windrower, ensure that the float engagement pin is installed in storage hole (B) and **NOT** in engaged position (A).

6. Repeat the previous step for the other float engagement pin.

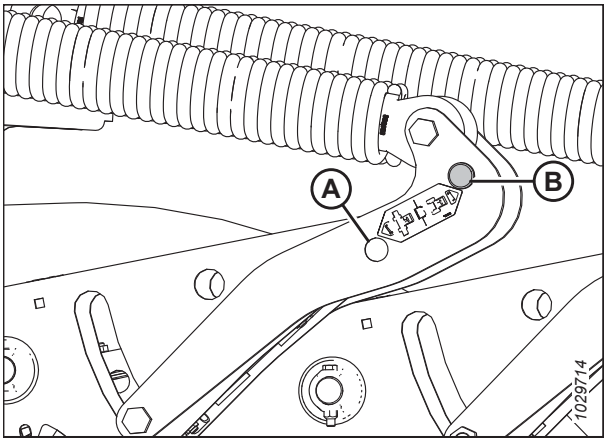


Figure 3.165: Float Linkage

DANGER

Ensure that all bystanders have cleared the area.

7. Start the engine and activate HEADER DOWN button (A) on the ground speed lever (GSL) to fully retract the header lift cylinders.

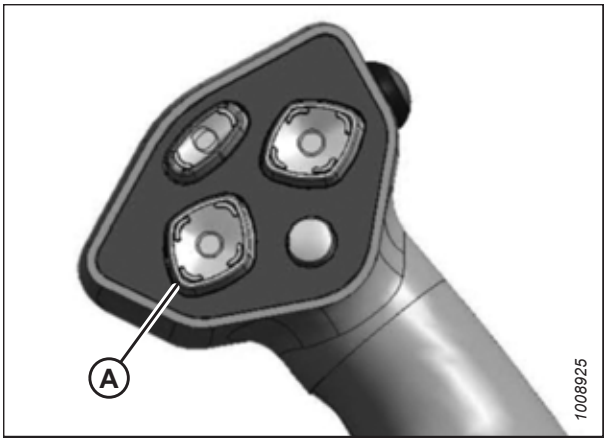


Figure 3.166: Ground Speed Lever

8. Remove pin (A) from the frame linkage and raise center-link (B) until the hook is above the attachment pin on the header. Replace pin (A) to hold the center-link in place.

   IMPORTANT:

   If the center-link is too low, it may contact the header as the windrower approaches the header for hookup.

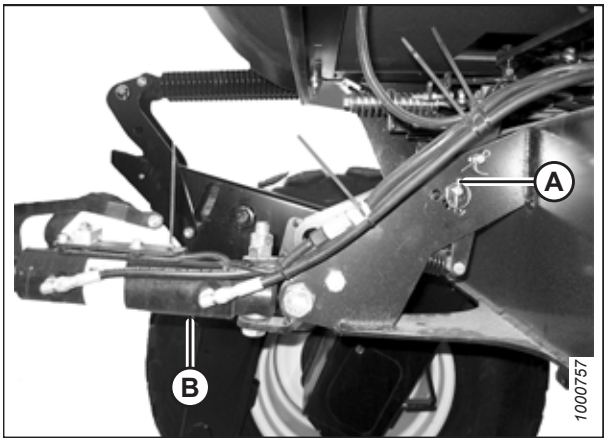


Figure 3.167: Hydraulic Center-Link

9. Slowly drive the windrower forward until windrower feet (A) enter header supports (B). Continue driving slowly forward until the feet engage the supports and the header is nudged forward.

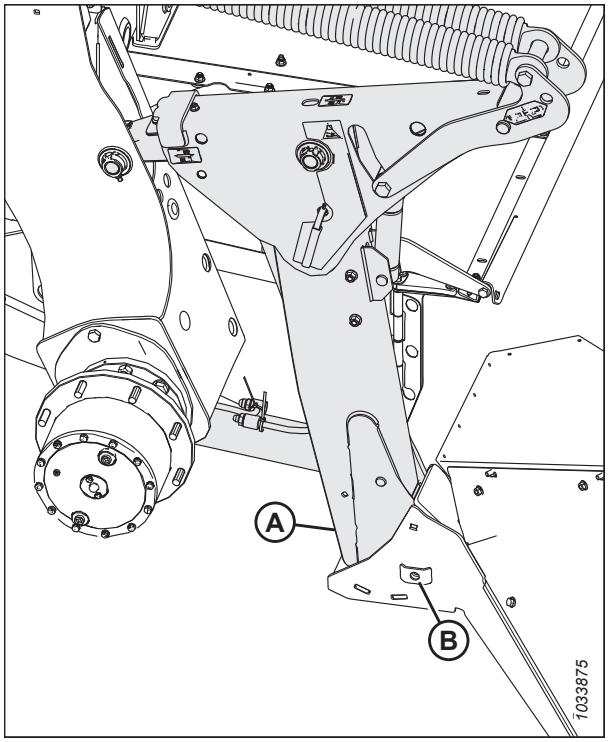


Figure 3.168: Header Support

10. Use the following GSL functions to position the center-link hook above the header attachment pin:
    - HEADER TILT UP (A) to retract the center-link
    - HEADER TILT DOWN (B) to extend the center-link
11. Stop the engine, and remove the key from the ignition.

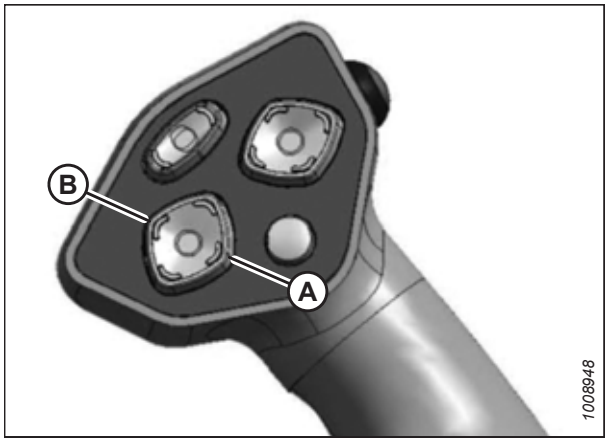


Figure 3.169: Ground Speed Lever

12. Push down on the rod end of link cylinder (A) until hook (B) engages and locks onto the header pin.

    IMPORTANT:

    The hook release must be down to enable the self-locking mechanism. If the release is open (up), manually push it down after the hook engages the header pin.

13. Check that center-link (A) is locked onto the header by pulling upward on the rod end of the cylinder.

14. Start the engine.

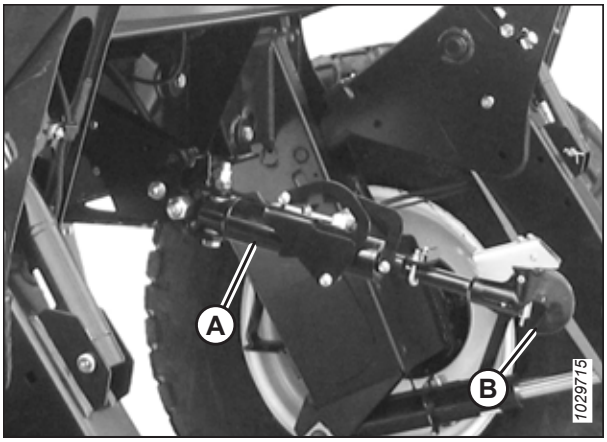


Figure 3.170: Hydraulic Center-Link

15. Press HEADER UP switch (A) to raise the header to its maximum height.

16. If one end of the header does **NOT** fully rise, rephase the lift cylinders as follows:

    a. Press and hold the HEADER UP switch until both cylinders stop moving.

    b. Continue to hold the switch for 3–4 seconds. The cylinders are now phased.

    NOTE:

    It may be necessary to repeat this procedure if there is air in the hydraulic system.

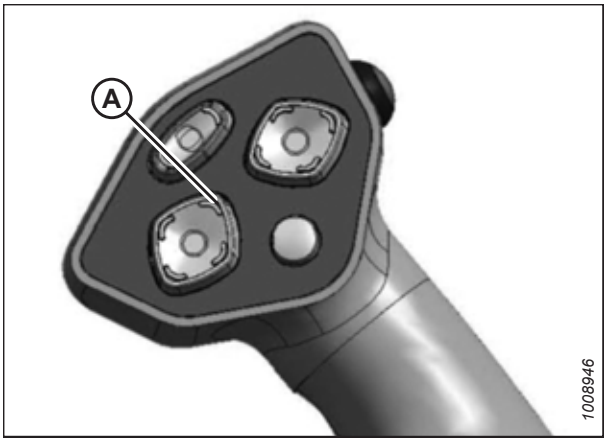


Figure 3.171: Ground Speed Lever

17. To lower the safety props:

    a. Pull lever (A) outward and rotate it toward the header to lower safety prop (B) onto the cylinder.

    b. Repeat the previous step for the other safety prop.

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

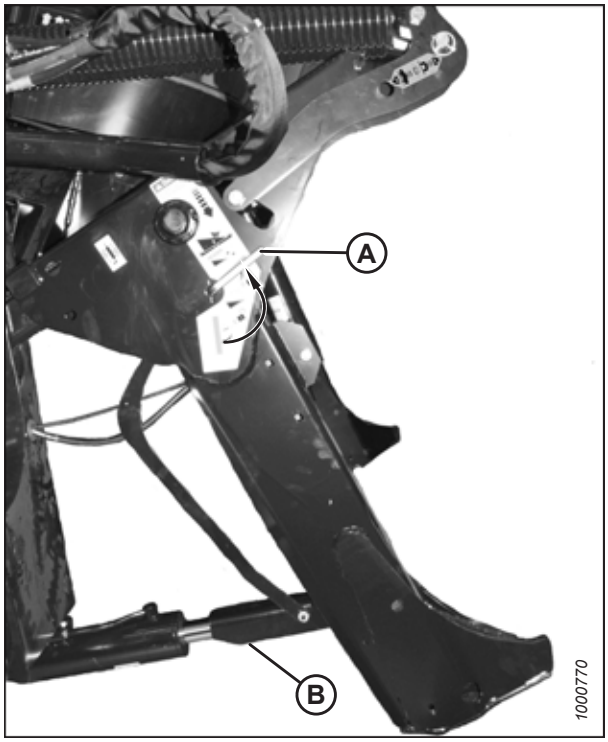


Figure 3.172: Safety Prop

18. Install clevis pin (A) through the support and the windrower foot. Secure the clevis pin with hairpin (B).

    IMPORTANT:

    Ensure that clevis pin (A) is fully inserted and that the hairpin is installed behind the bracket.

19. Repeat the previous step on the other side of the header.

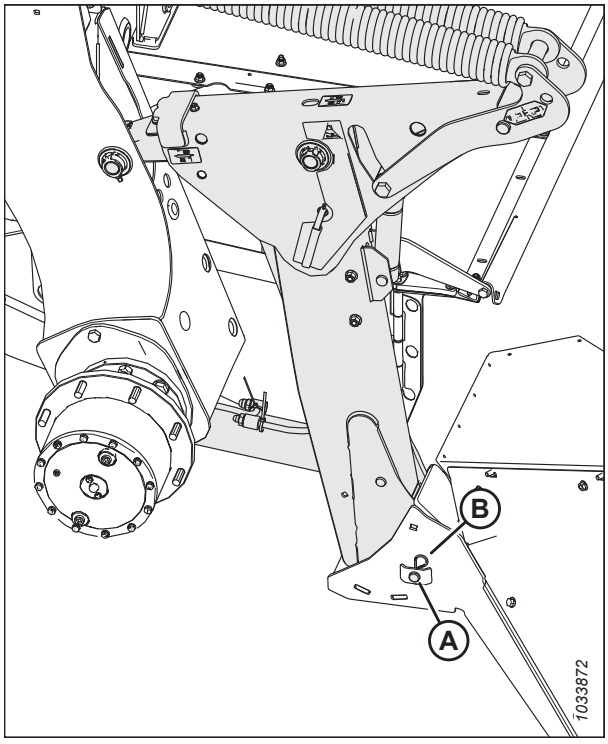


Figure 3.173: Header Support

20. Remove the clevis pin from storage position (B) in the linkage and insert it into hole (A) to engage the float springs. Secure it with the hairpin. Repeat this step on the opposite float linkage.

21. Repeat the previous step for the other float engagement pin.

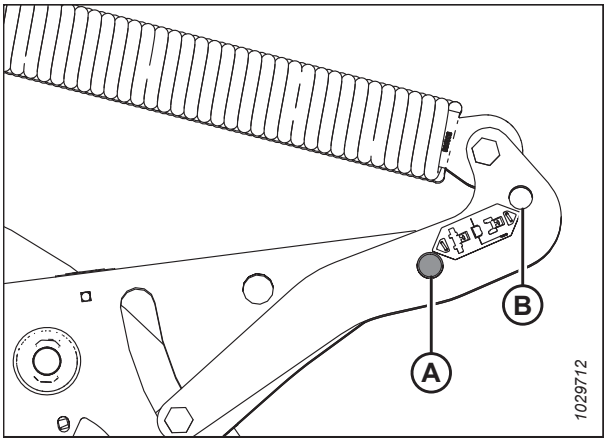


Figure 3.174: Header Float Linkage

22. Disengage the safety prop by turning lever (A) downwards until the lever locks into vertical position.

23. Repeat the previous step for the opposite safety prop.

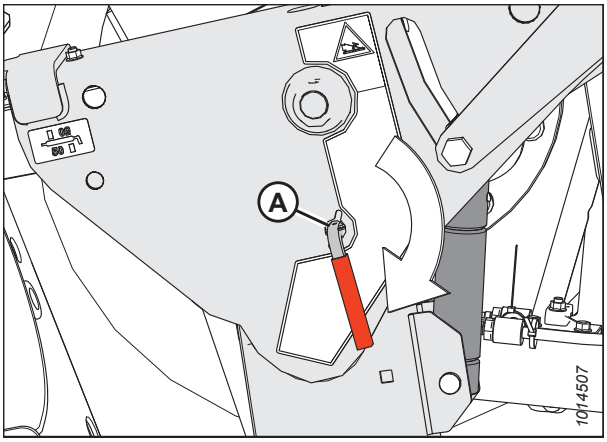


Figure 3.175: Safety Prop

DANGER

Ensure that all bystanders have cleared the area.

24. Start the engine, and press HEADER DOWN switch (A) on the GSL to fully lower the header.

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

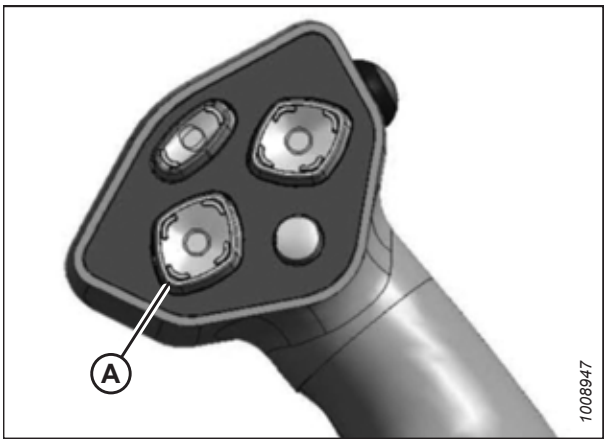


Figure 3.176: Ground Speed Lever

3.7.3 Connecting R2 Series Rotary Disc Header Hydraulics and Electrical to M155*E4* SP Windrower

Once the R216 Rotary Disc Header is attached to the M155*E4* Self-Propelled Windrower, the hydraulic and electrical connections must be completed.

1. Connect the windrower's hydraulic hoses to the header's. Refer to the illustrations provided for guidance. The callout letters in the first illustration correspond to those in the second; for example, upper pressure hose (A) in the first illustration corresponds to upper pressure hose (A) in the second illustration:
   - (A) Upper pressure hose
   - (B) Lower pressure hose
   - (C) Return hose
   - (D) Case drain hose

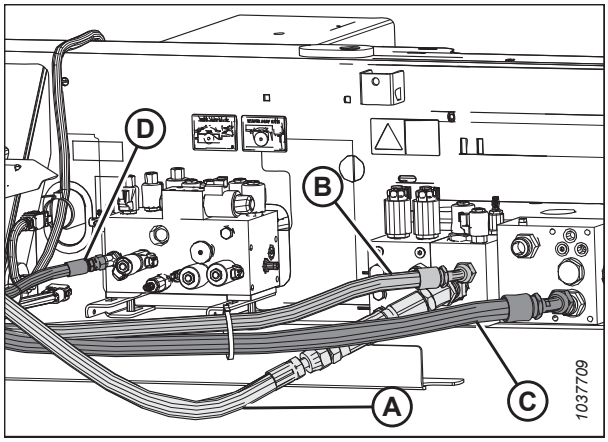


Figure 3.177: Windrower Hydraulic Hoses Connected to Hydraulic Block

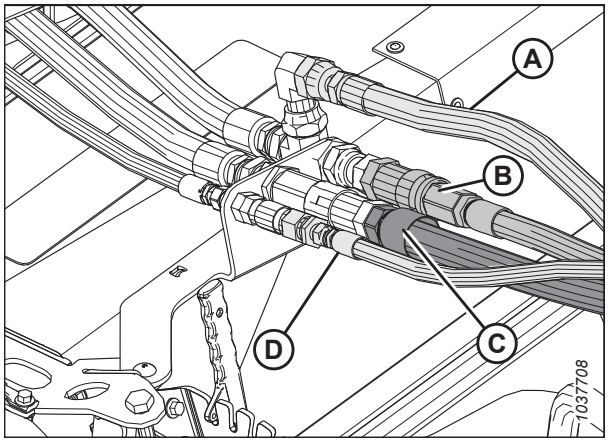


Figure 3.178: Windrower Hydraulic Hoses Connected to Header – View from Rear of Header

2. Locate windrower adapter harness (A) on the windrower's center-link. Remove windrower adapter harness (A) from its storage location on center-link (B).

3. Connect harness (A) to header harness (C).

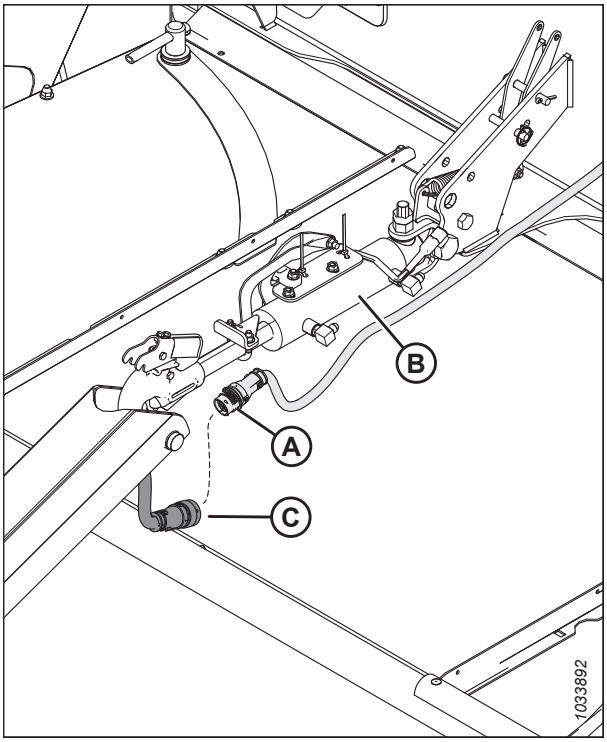


Figure 3.179: Windrower Adapter Harness

NOTE:

When the harness is not in use, secure harness (A) to the center-link tilt cylinder using strap (B).

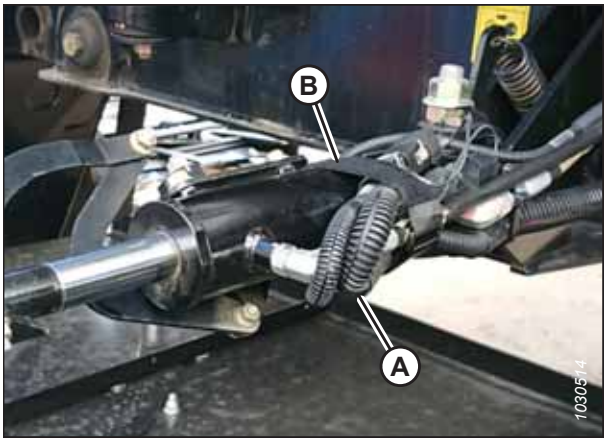


Figure 3.180: Adapter Harness Secured to Center-Link

3.8 Detaching R2 Series Rotary Disc Header from M155*E4* SP Windrower

Detaching a header from the windrower involves removing the header's mechanical connection to the windrower and disconnecting the hydraulic and electrical connections. The procedure differs slightly depending on whether or not the windrower is equipped with a self-adjusting hydraulic center-link.

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 for any reason.

1. Start the engine and press HEADER UP switch (A) to raise the header to its maximum height.
2. Rephase the cylinders if one end of the header does not rise fully:
   a. Press and hold HEADER UP switch (A) until both cylinders stop moving.
   b. Continue to hold the switch for 3–4 seconds. The cylinders are now phased.

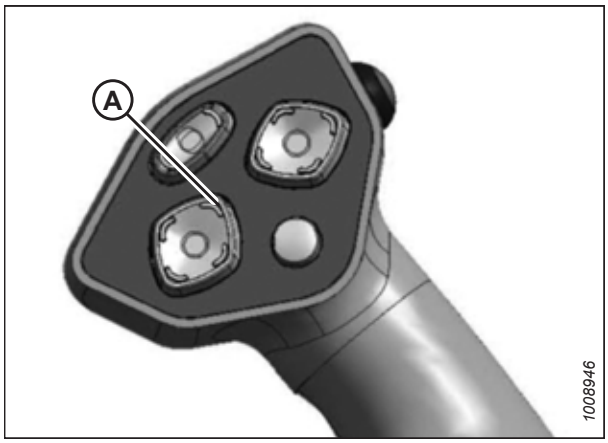


Figure 3.181: Ground Speed Lever (GSL)

3. Shut down the engine, and remove the key from the ignition.
4. To engage the safety props on the lift cylinders:
   a. Pull lever (A) and rotate it toward the header to lower safety prop (B) onto the cylinder.
   b. Repeat the previous step for the opposite lift cylinder.

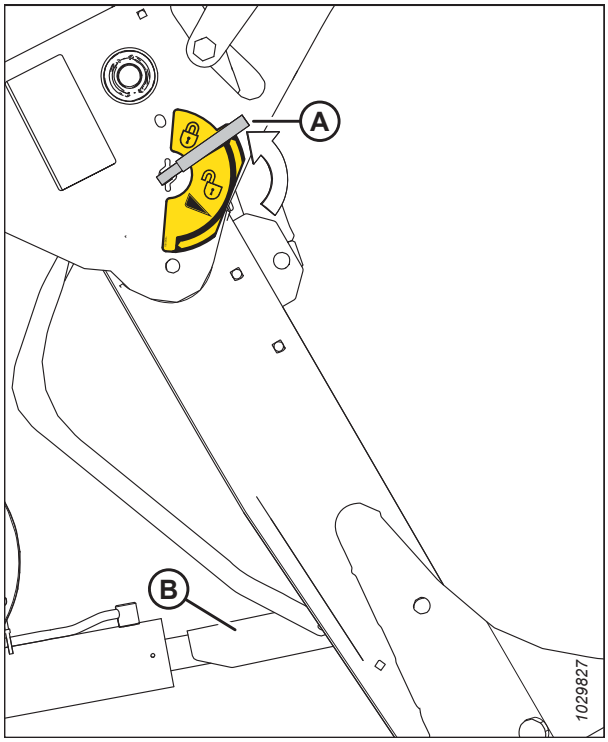


Figure 3.182: Safety Prop

5. Remove the hairpin from the float spring clevis pin. Remove the clevis pin from hole (B) and insert it into storage hole (A) to disengage the float springs. Secure the clevis pin with the hairpin.

6. Repeat the previous step for the other float engagement pin.

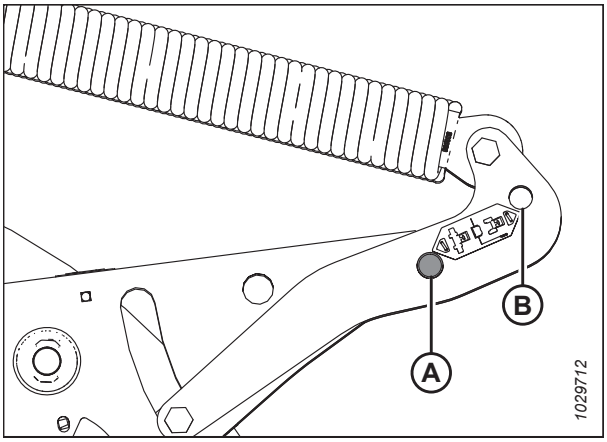


Figure 3.183: Header Float Linkage

7. Remove hairpin (B) from clevis pin (A). Remove clevis pin (B). Retain the pins.

8. Repeat the previous step on the other side of the header.

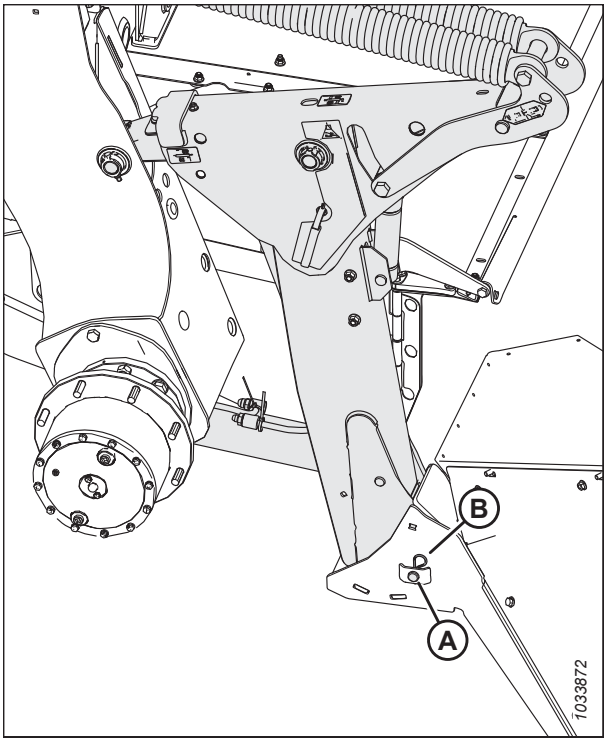


Figure 3.184: Header Support

9. Disengage the safety props by turning lever (A) away from the header to raise the safety prop until the lever locks into vertical position. Repeat for the opposite cylinder.

10. Start the engine, choose a level area, and lower the header to the ground.

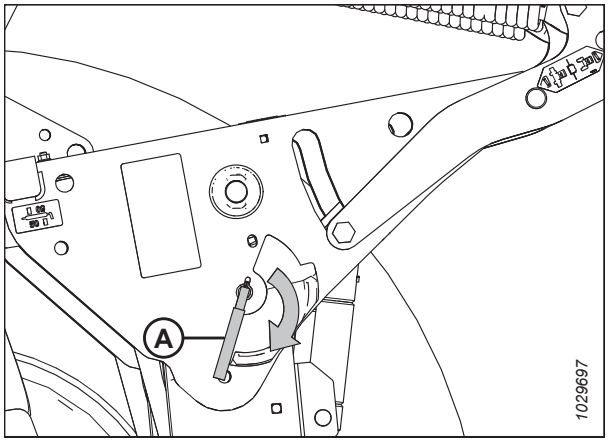


Figure 3.185: Safety Props

11. Press HEADER TILT UP (A) and HEADER TILT DOWN (B) cylinder switches on the GSL to release the load on the center-link cylinder.

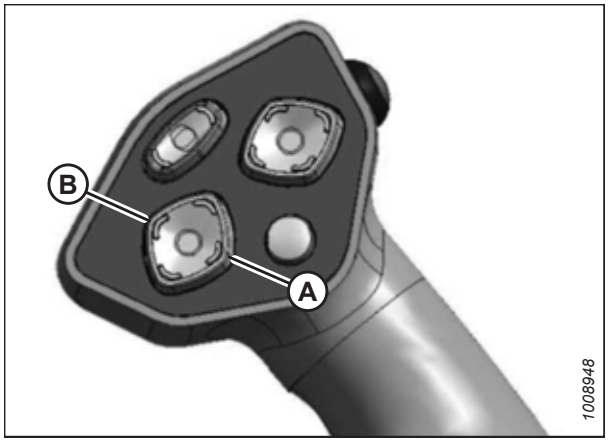


Figure 3.186: Ground Speed Lever

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

13. Lift hook release (C) and lift hook (B) off of the header pin.

    NOTE:

    If the optional center-link lift cylinder is installed, lift release (C) and then operate the link lift cylinder from the cab to disengage center-link (A) from the header.

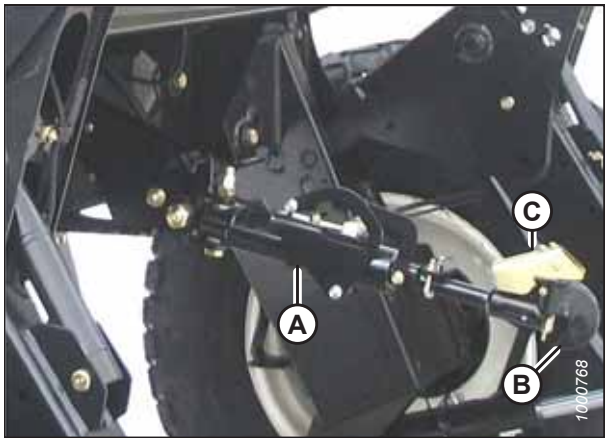


Figure 3.187: Hydraulic Center-Link

14. Disconnect upper pressure hose (A), lower pressure hose (B), return hose (C), and case drain hose (D) from the header.

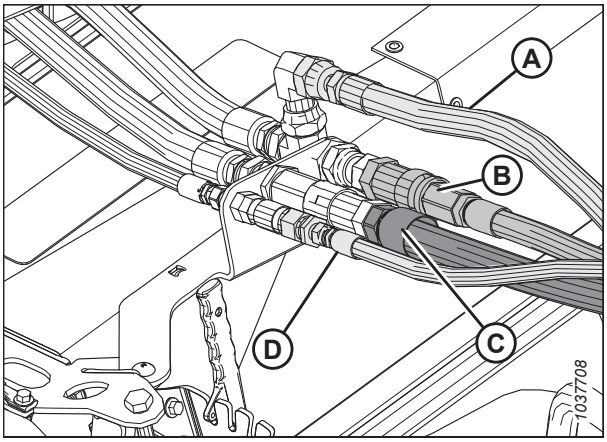


Figure 3.188: Windrower Hydraulic Hoses Connected to Header — View from Rear of Header

15. Pull hydraulic hose bundle (A) and the upper hydraulic pressure hose through the hose guide.
16. Open latch (B).
17. Fold hose bundle (A) and the upper hydraulic pressure hose (not shown) back as shown and secure them with latch (B).

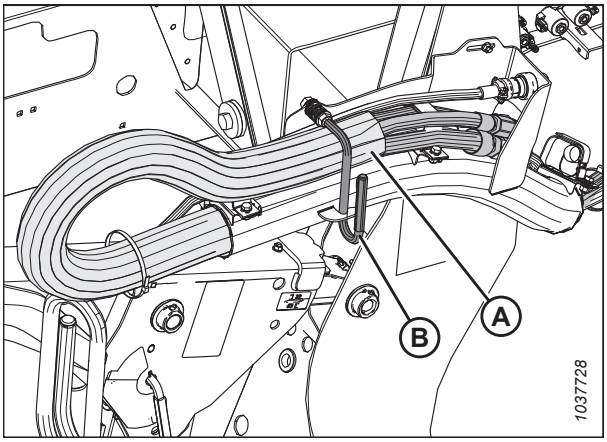


Figure 3.189: Hydraulic Hoses in Storage Position

18. Disconnect windrower harness (A) from header harness (C). Install the protective caps on each connector.
19. Store harness (A) on center-link (B) with the attached straps (not shown).
20. Slowly back the windrower away from the header.

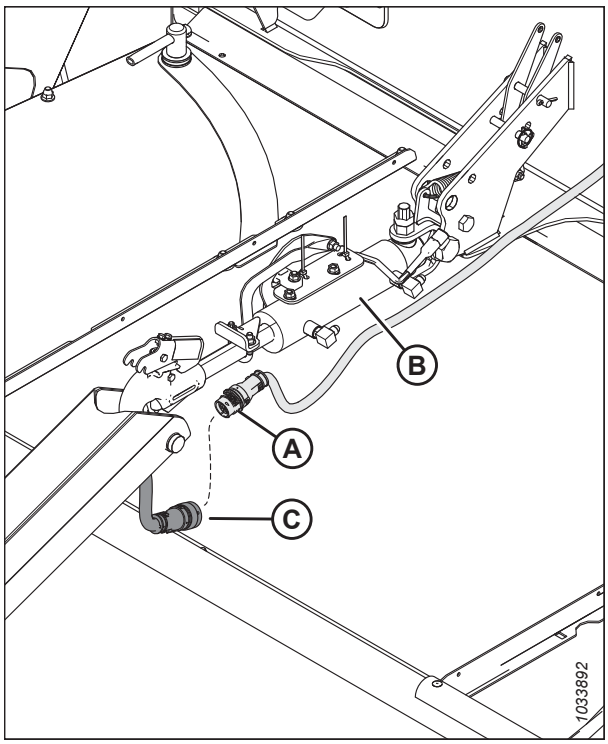


Figure 3.190: Windrower Harness

21. Insert clevis pin (B) into boot (C) as shown. Secure the clevis pin with hairpin (A).
22. Repeat the previous step on the other side of the header.

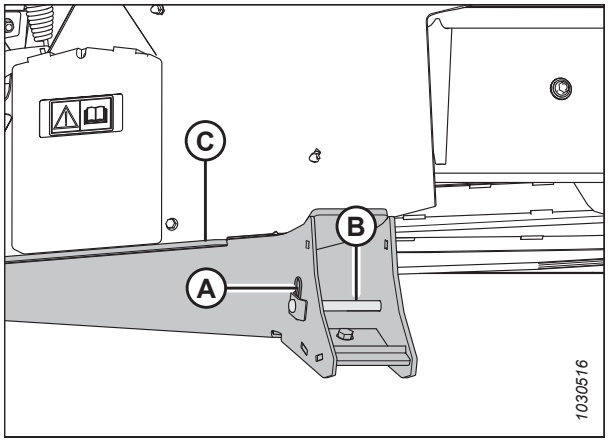


Figure 3.191: Header Boot

3.9 Driveshields

Driveshields protect drive components from damage and provide access to drive components for maintenance and servicing. Driveshields are located on the left and right ends of the header.

3.9.1 Opening Driveshields

Open the driveshields to gain access to the drive components.

WARNING

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

NOTE:

The illustrations provided in this procedure show the left driveshield; the right driveshield is similar.

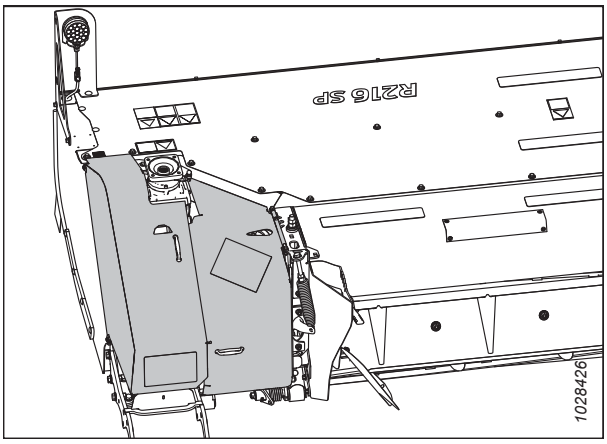


Figure 3.192: Left Driveshield

1. Push down on release lever (A) to disengage the release latch and pull handle (B).

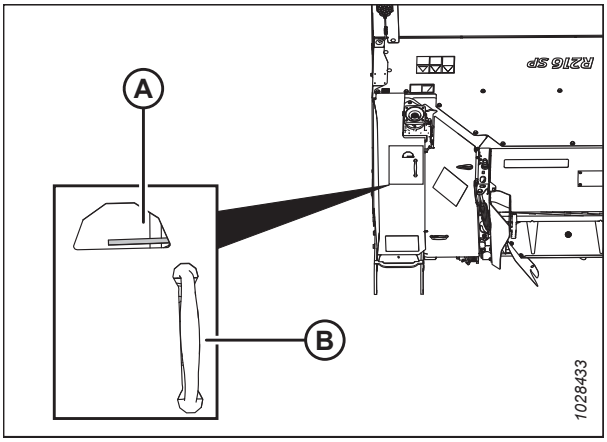


Figure 3.193: Driveshield Latch and Handle

2. Lift outboard driveshield panel (A) as shown.

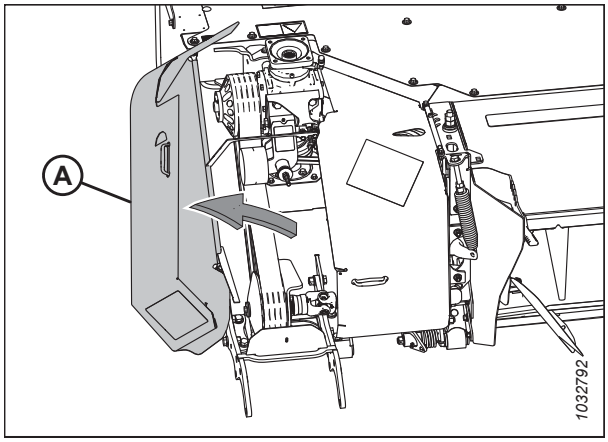


Figure 3.194: Opening Driveshield – Outboard Panel

3. Pull handle (A) and lift inboard driveshield panel (B) toward the middle of the header.
4. Repeat this procedure to open the right driveshield.

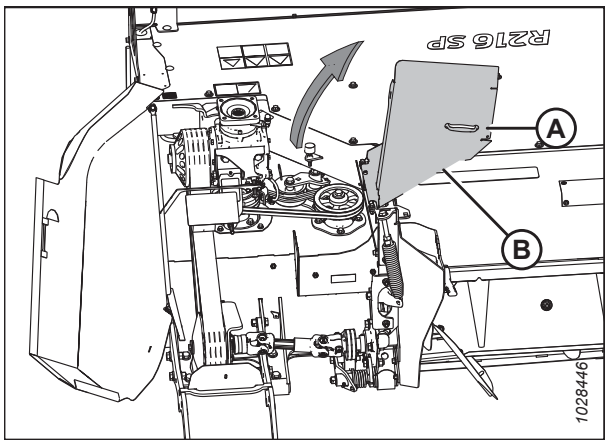


Figure 3.195: Driveshield – Inboard Panel

3.9.2 Closing Driveshields

Closing the driveshields before operating the machine will protect drive components from damage.

WARNING

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

NOTE:

The illustrations provided in this procedure show the left driveshield; the right driveshield is similar.

1. While lifting the driveshield, lift lock latch (A) to disengage the driveshield lock.

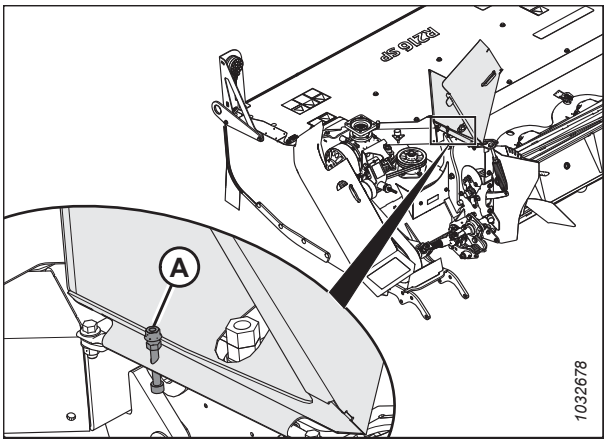


Figure 3.196: Driveshield Lock Latch

2. Move the inboard half of driveshield (A) back to the closed position.

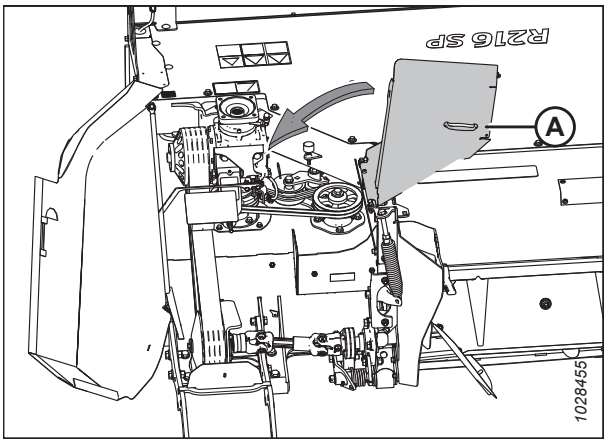


Figure 3.197: Left Driveshield

3. Move the outboard half of driveshield (A) back to the closed position.

4. Repeat this procedure to close the right driveshield.

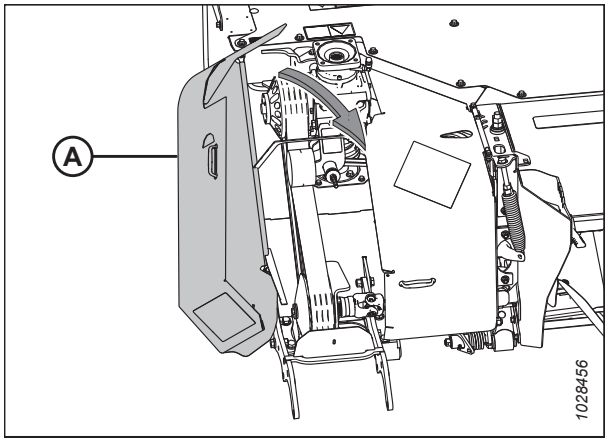


Figure 3.198: Left Driveshield

3.10 Cutterbar Curtain

The curtain is installed at the front of the header. It reduces the risk of thrown objects being ejected at high speed from the cutterbar area.

WARNING

To reduce the risk of personal injury and machine damage, do NOT operate the machine without curtain installed and in good condition. Objects in the path of the blades can be ejected with considerable force when the machine is started.

NOTE:

The cutterbar curtain is attached at the front and the sides of the header. **ALWAYS** keep the curtain lowered when operating the disc header.

IMPORTANT:

Replace curtain (A) if it becomes worn or damaged. For instructions, refer to *4.9.1 Inspecting Cutterbar Curtain, page 269*.

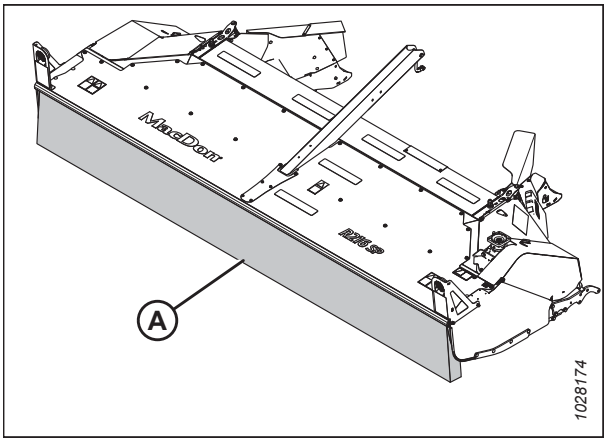


Figure 3.199: Cutterbar Curtains

3.10.1 Opening Cutterbar Curtain

The cutterbar curtain will need to be opened in order for the cutterbar to be inspected or serviced.

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. Push curtain (A) inward and up.

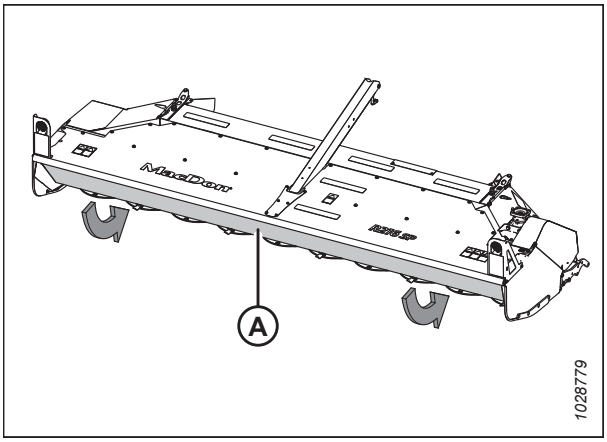


Figure 3.200: Cutterbar Curtain – Standard Header Shown

3. Secure the curtain in place at locations (A) using the three clips provided.

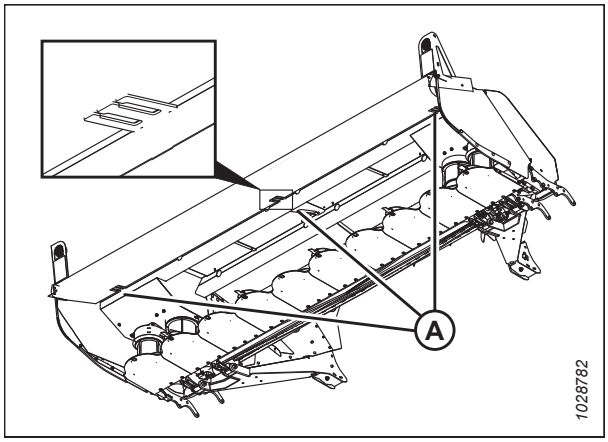


Figure 3.201: Cutterbar Curtain — Standard Header Shown, View from Below

NOTE:

Cutterbar curtain (A) is held in place between the tines of retaining clips (B).

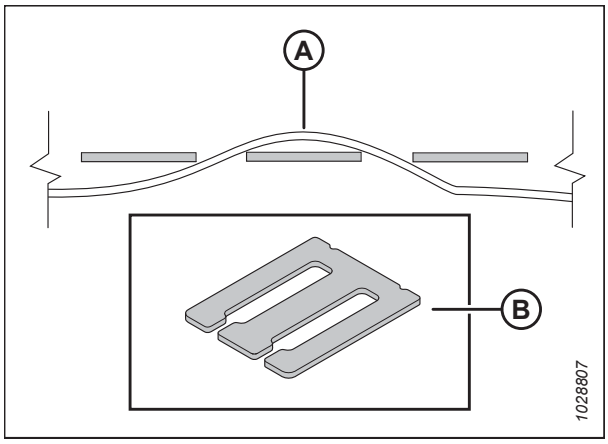


Figure 3.202: Cutterbar Curtain and Retaining Clips

3.10.2 Closing Cutterbar Curtain

Once your maintenance tasks are complete, the cutterbar curtain must be closed before the header is operated.

CAUTION

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

1. Pull the curtain outward from the retaining clips and lower the curtain.

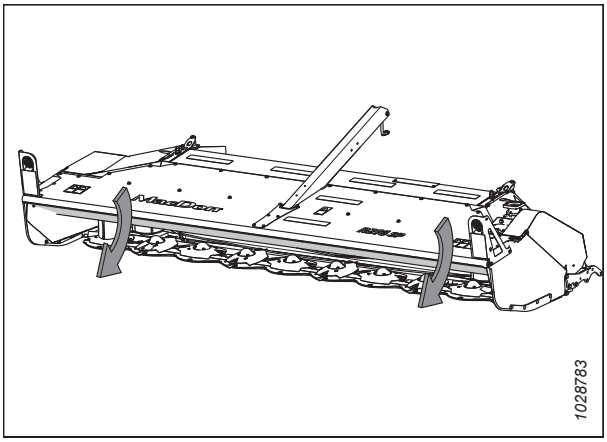


Figure 3.203: Cutterbar Curtain – Standard Header Shown

3.11 Header Settings

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

Correct operation reduces crop loss and increases productivity. Proper adjustments and timely maintenance increases the length of service of the machine.

The variables listed in the following table and detailed in this manual affect the performance of the disc header. Most of the adjustments have been set at the factory, but settings can be changed to suit your crop conditions.

Table 3.1 Header Operating Variables

Variable	Refer to
Cutting height	*3.11.1 Cutting Height, page 122*
Float	*3.11.3 Header Float, page 128*
Header angle	*3.11.2 Cutterbar Angle, page 128*
Ground speed	*3.11.4 Ground Speed, page 129*
Crop stream configuration	*4.6.9 Cutterbar Crop Stream, page 259*
Standard headers: Conditioner settings	*3.12 Conditioner – Standard Header, page 130*
Grass seed version of header: Operation	*3.15 Grass Seed Version Operation, page 151*

3.11.1 Cutting Height

Cutting height is determined by a combination of the cutterbar angle and the settings of the optional skid shoes and/or gauge rollers. Adjust the cutting height for optimum cutting performance and to prevent the build-up of mud and debris inside the header.

Optional adjustable gauge rollers and skid shoes are available to provide different cutting heights. For instructions, refer to:

- *Adjusting Skid Shoe Height, page 123*
- *Adjusting Gauge Roller Height, page 124*

Lowering the skid shoes or the gauge rollers and decreasing the cutterbar angle increases the cutting height. Increased cutting height leaves higher stubble for the swath to rest on, which speeds drying. Increased cutting height may also be desirable in stony fields to help reduce damage to cutting components.

Raising the skid shoes or the gauge rollers and increasing the cutterbar angle decreases the cutting height, resulting in shorter stubble.

To select a header angle that maximizes performance for your crop and field conditions, refer to *3.11.2 Cutterbar Angle, page 128*.

To minimize damage to the cutterbar, soil scooping, and 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 *3.11.3 Header Float, page 128*.

Adjusting Skid Shoe Height

Adjustable skid shoes can be installed on the header. These allow the skid shoes to be adjusted so that an increased range of cutting height options are available.

The adjustable skid shoes have multiple position settings: lowest working position (A), intermediate working positions (B), and storage position (C).

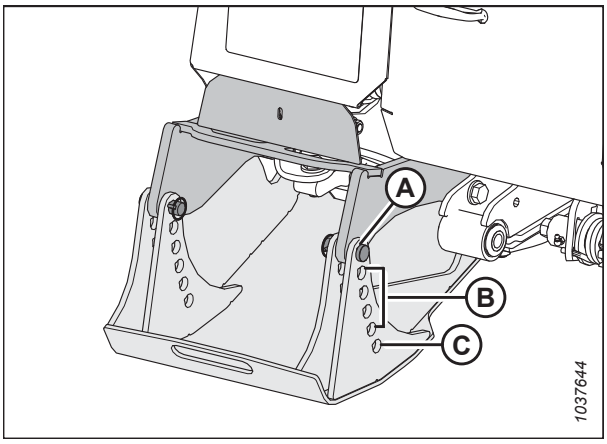


Figure 3.204: Skid Shoe Position Settings

To adjust the height of the skid shoes, follow these steps:

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 windrower's lift cylinder safety props before going under the machine.

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the lift cylinder safety props. For instructions, refer to the relevant procedure:
   - **M1 Series Windrower:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*

CAUTION

The skid shoes are heavy. Support the rear end of the skid shoe while the pins are removed.

4. Remove the lynch pins and the clevis pins from the skid shoe.

5. Position the skid shoe in the preferred working position by aligning skid shoe holes (A) with the mounting holes in bracket (B). Refer to the table below for information on the effect that each skid shoe setting has on the height of the disc blades.

   NOTE:

   This example shows the lowest working position.

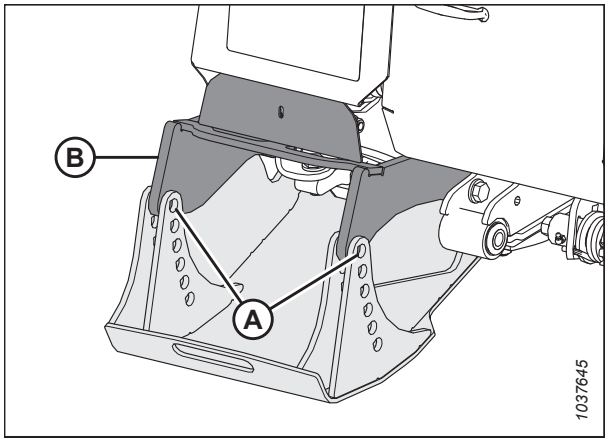


Figure 3.205: Positioning Skid Shoe

Table 3.2 R2 Series Rotary Disc Header Height at Various Skid Shoe Positions

Skid Shoe Position	Header Tilt Angle		
	Flat	Half	Full
	Approximate Height of Blades Off of the Ground		
1	197 mm (7.75 in.)	133 mm (5.25 in.)	76 mm (3 in.)
2	171 mm (6.75 in.)	108 mm (4.25 in.)	44 mm (1.75 in.)
3	140 mm (5.5 in.)	76 mm (3 in.)	32 mm (1.25 in.)
4	114 mm (4.5 in.)	44 mm (1.75 in.)	32 mm (1.25 in.)
5	76 mm (3 in.)	32 mm (1.25 in.)	32 mm (1.25 in.)

6. Replace clevis pins and lynch pins (A) to secure the skid shoe.

   IMPORTANT:

   Install lynch pins (A) at the inboard side of the skid shoe.

7. Repeat this procedure to set the height of the second skid shoe. Ensure that both skid shoes are set to the same position.

8. Adjust the cutterbar angle to the desired working position using the disc header angle controls. If the angle is not critical, set it to mid-position. For instructions, refer to *3.11.2 Cutterbar Angle, page 128*.

9. Check the header float. For instructions, refer to the windrower operator's manual.

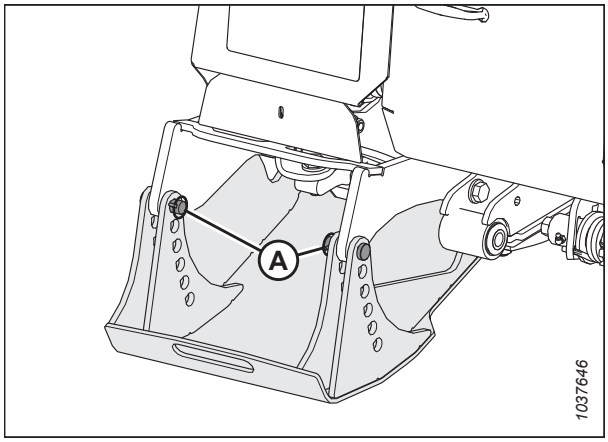


Figure 3.206: Skid Shoe in Lowest Working Position

Adjusting Gauge Roller Height

Gauge rollers, an option on R2 Series Rotary Disc Headers, allow the Operator to adjust the header's cutting height. Both gauge wheels will need to be set to the same height.

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 windrower's lift cylinder safety props before going under the machine.

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the lift cylinder safety props. For instructions, refer to the relevant procedure:
   - **M1 Series Windrower:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrower:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*
4. Locate the left gauge roller. Remove two lynch pins (A) from clevis pins (B). Remove clevis pins (B).

   NOTE:

   Depending on the position of the gauge roller, you may need to support the gauge roller's weight while removing the pins.

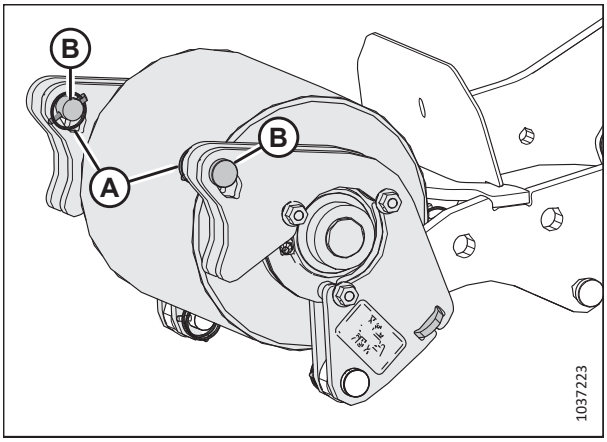


Figure 3.207: Left Gauge Roller in Storage Position

5. Remove hair pin (A). Remove scraper plate (B) as shown.

   NOTE:

   If the gauge roller is in a working position, hair pin (A) can be found in hole (C).

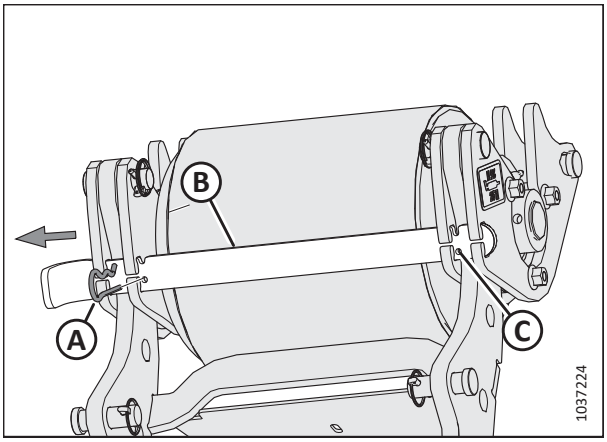


Figure 3.208: Left Gauge Roller in Storage Position – View from Below

The gauge roller has three position settings: lowest working position, intermediate working position, and storage position. Refer to the table below for information on the cutting height each setting provides:

Table 3.3 R2 Series Rotary Disc Header Height at Various Gauge Wheel Settings

	Header Tilt Angle		
	Flat	Half	Full
Working Position	**Approximate Distance of Cutterbar from the Ground**		
Lowest	152 mm (6 in.)	89 mm (3 1/2 in.)	32 mm (1 1/4 in.)
Intermediate	114 mm (4 1/2 in.)	51 mm (2 in.)	32 mm (1 1/4 in.)

To adjust to different height positions, refer to the relevant procedure:

- To set the gauge wheels to the lowest working position, proceed to Step *6, page 126*
- To set the gauge wheels to the intermediate working position, proceed to Step *9, page 126*
- To set the gauge wheels to the storage position, proceed to Step *13, page 127*

Lowest working position

To adjust the gauge rollers to the lowest working position, follow these steps:

6. Swing the gauge roller forward and align the holes in the gauge roller plate with the holes at the bottom of the mounting plates.
7. Secure the gauge roller with clevis pins (A) and lynch pins (B).

   IMPORTANT:

   Lynch pins (B) should be installed at the inboard side of the gauge roller.
8. Proceed to Step *11, page 127*.

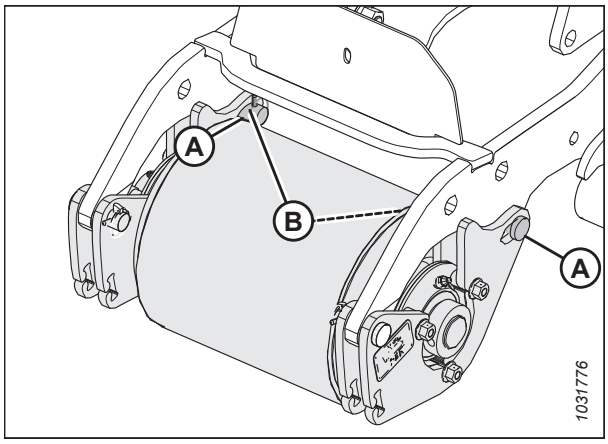


Figure 3.209: Gauge Roller in Lowest Working Position

Intermediate working position

To adjust the gauge rollers to the intermediate position, follow these steps:

9. Swing the gauge roller forward and align the holes in the gauge roller plate with the holes at the top of the mounting plates.
10. Secure the gauge roller with clevis pins (A) and lynch pins (B).

    IMPORTANT:

    Lynch pins (B) should be installed at the inboard side of the gauge roller.

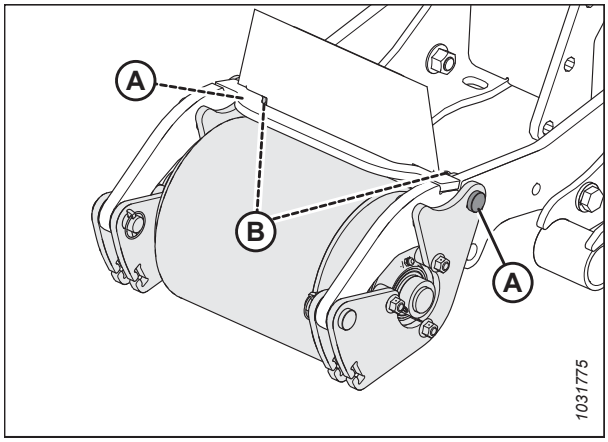


Figure 3.210: Gauge Roller in Intermediate Working Position

11. Reinstall scraper plate (A) in the slot as shown. Secure the scraper plate by inserting hairpin (B) as shown.

    IMPORTANT:

    Ensure that the tab on the scraper plate is positioned as shown.

12. Repeat this procedure to adjust the height of the other gauge wheel. Both gauge wheels must be at the same height.

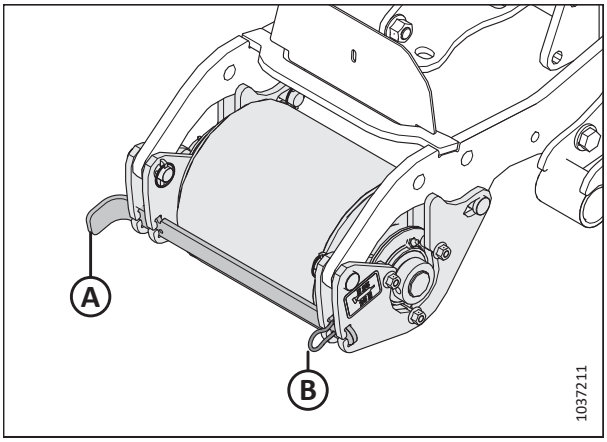


Figure 3.211: Gauge Roller Secured with Scraper Plate

Storage position

To adjust the gauge roller to the storage position, follow these steps:

13. Swing the gauge roller in the direction shown. Secure the roller using clevis pins (A) and lynch pins (B).

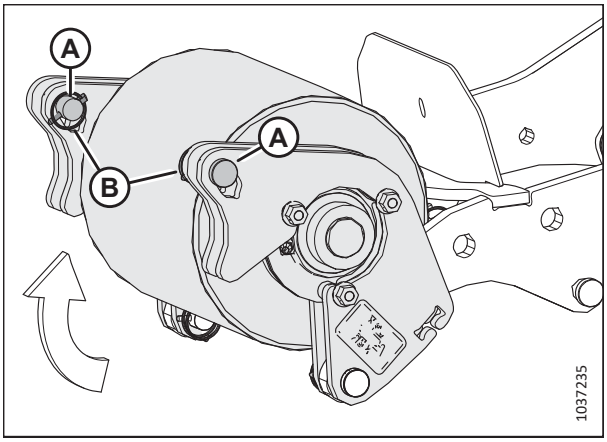


Figure 3.212: Gauge Roller in Storage Position

14. Insert scraper plate (C) into the assembly from the outboard side of the header as shown.
15. Insert hairpin (A) into hole (B) near the bend in scraper plate (C) as shown.
16. Repeat this procedure to adjust the height of the other gauge wheel. Both gauge wheels must be at the same height.

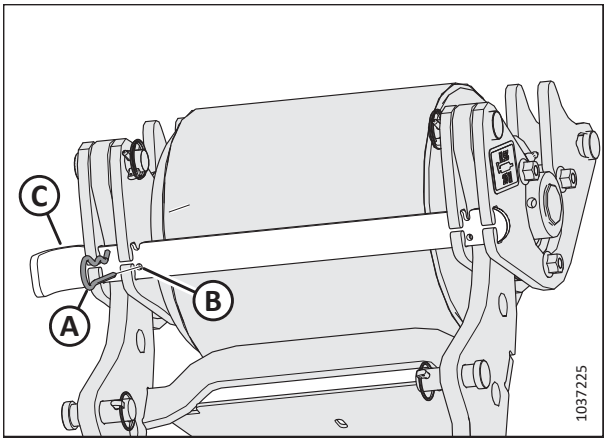


Figure 3.213: Left Gauge Roller in Storage Position – View from Below

3.11.2 Cutterbar Angle

Cutterbar angle (sometimes called header angle) is the angle at which the cutterbar approaches the crop and the ground. It is one of the settings that affects cutting height and quality.

Cutterbar angle (A) adjustment ranges from 0 to 8° below horizontal. Choose an angle that maximizes performance for your crop and field conditions. A flatter angle provides better clearance in stony conditions, while a steeper angle is required in downed crops for better lifting action.

Check the float after significantly adjusting the cutterbar angle because the adjustments affect the header float due to shifting the header center of gravity. Refer to your windrower operator's manual for instructions.

NOTE:

An angle of 3 to 5°, on the Harvest Performance Tracker (HPT) display, is suitable for most conditions. At steep cutterbar angles (7 to 10°) the cut pattern of the discs will become apparent, leaving a variation in stubble height between discs.

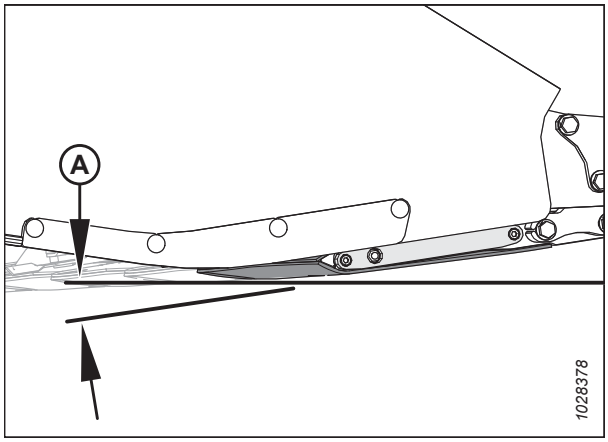


Figure 3.214: Cutterbar Angle

3.11.3 Header Float

The header float feature allows the header to closely follow ground contours and respond quickly to sudden changes or obstacles. The float setting is ideal when the cutterbar is on the ground with minimal bouncing, scooping, or pushing soil.

For instructions on setting and adjusting the header float, refer to your windrower operator's manual.

IMPORTANT:

- Set the header float as light as possible—without excessive bouncing—to avoid frequent breakage of knife components, scooping soil, or soil build-up at the cutterbar in wet conditions.
- Avoid excessive bouncing (resulting in a ragged cut) by operating at a slower ground speed when the float setting is light.
- Install applicable header options (crop dividers, etc.) before setting the header float.
- Adjust the float when adding or removing optional attachments that affect the weight of the header.
- Changing header angle affects the float. Check the float after making appropriate changes to the header angle for crop type and conditions, field conditions, and speed settings.

3.11.4 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.

CAUTION

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

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

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

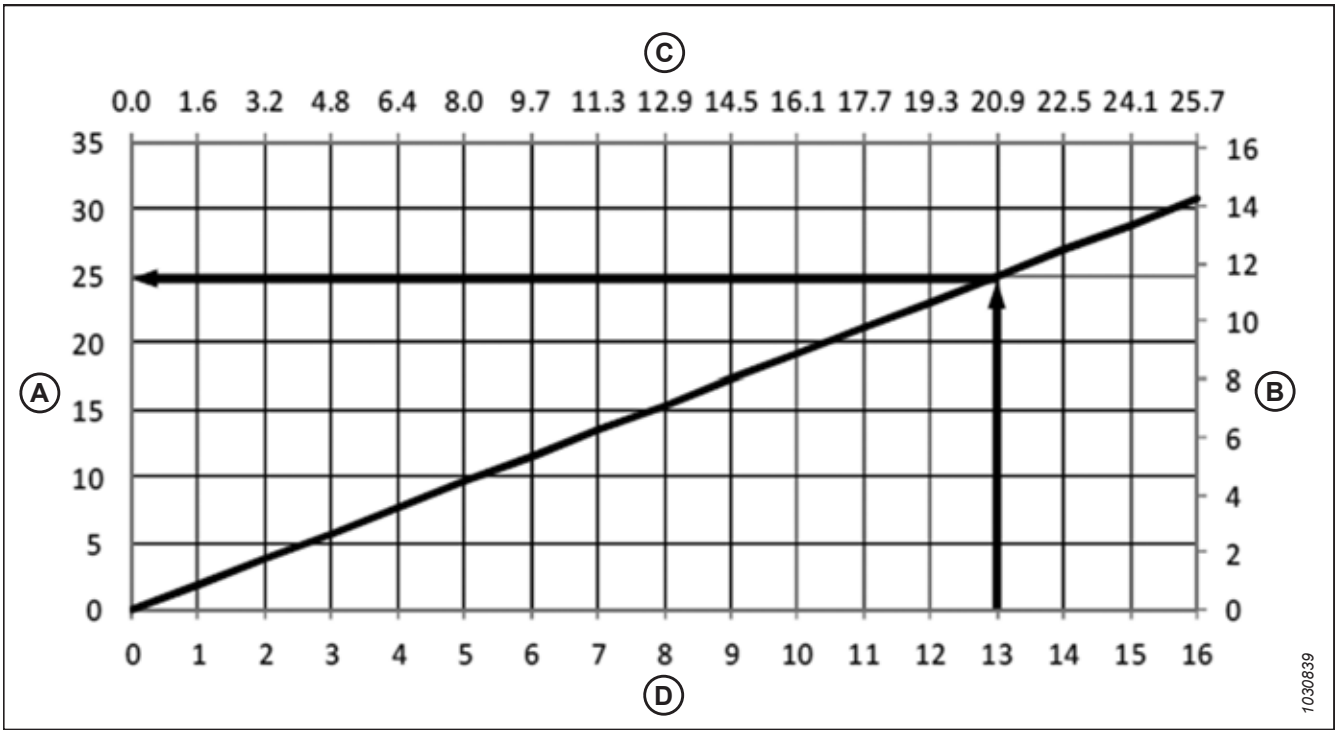
In light crops, reduce the disc header's disc speed while maintaining ground speed.

NOTE:

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

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

Figure 3.215: Ground Speed for R216 Rotary Disc Headers



A - Acres/Hour B - Hectares/Hour C - Kilometers/Hour D - Miles/Hour

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

3.12 Conditioner – Standard Header

Rolls condition the crop by crimping and crushing the stem in several places, which allows the release of moisture resulting in faster drying times. There are two roll conditioner options—steel conditioner rolls and polyurethane rolls.

3.12.1 Roll Gap

Roll gap refers to the spacing between the conditioner rolls. The conditioner's roll gap is set at the factory, but can be changed as needed.

The roll gap controls the degree to which crop is conditioned as it passes through the rolls. The roll gap is factory-set at approximately 6 mm (1/4 in.) for steel rolls, and 3 mm (1/8 in.) for polyurethane rolls.

Steel rolls can be operated over a large range of roll gap settings, up to 25 mm (1 in.). Steel rolls are suited to a wide range of crops, including alfalfa and thicker-stemmed cane-type crops. However, making the roll gap too wide may result in difficulties feeding crop into the conditioner.

Grass-type crops may require a small gap to ensure proper feeding and conditioning.

IMPORTANT:

If you intend to use a roll gap narrower than that set at the factory, visually inspect the roll gap to ensure that there is no metal-to-metal contact between the upper and lower rolls.

Adjusting Roll Gap – Steel Rolls

The roll gap controls the degree to which crop is conditioned as it passes through the rolls. The roll gap can be adjusted using the set of nuts on both sides 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.

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 that the rolls intermesh.
5. Turn lower nut (B) clockwise to increase the gap or counterclockwise to decrease the gap. Make adjustments to the roll gap based on header performance and crop conditions.
6. Once the gap is sized correctly, hold nut (B) and tighten jam nut (A) on both sides of the header.

   IMPORTANT:

   Ensure that the roll gap adjustment nuts are adjusted equally on both sides of the disc header to achieve a consistent gap across the rolls.

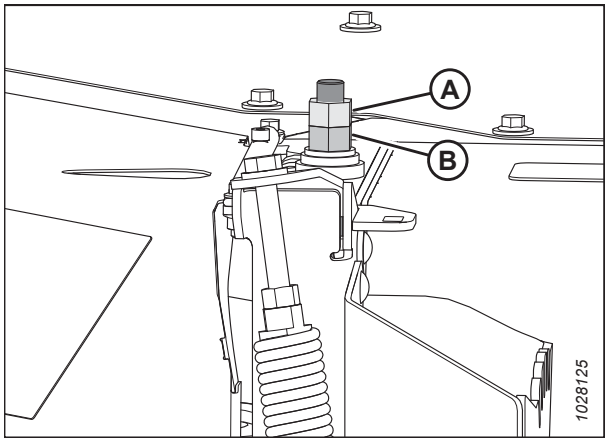


Figure 3.216: Roll Gap Adjustment

Adjusting Roll Gap – Polyurethane Rolls

The roll gap controls the degree to which crop is conditioned as it passes through the rolls. The roll gap can be adjusted using the set of nuts on both sides 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.

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.
5. Turn lower nut (B) clockwise to increase the gap or counterclockwise to decrease the gap. Make adjustments to the roll gap based on the performance of the header and harvest conditions.
6. Once the gap is sized correctly, hold nut (B) and tighten jam nut (A) on both sides of the header.

   IMPORTANT:

   Ensure that the roll gap adjustment nuts are adjusted equally on both sides of the header to achieve a consistent gap across the rolls.

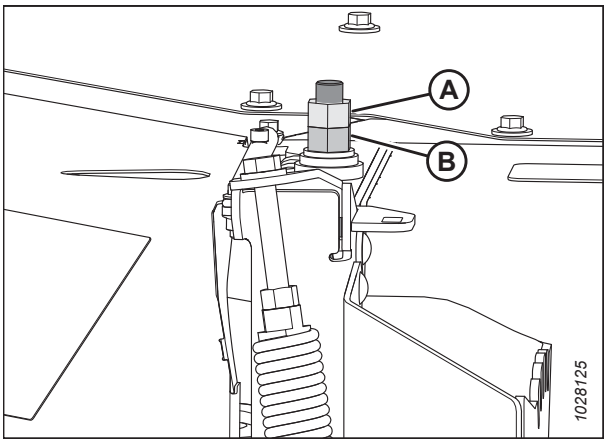


Figure 3.217: Roll Gap Adjustment – Left Side Shown

3.12.2 Roll Tension

Roll tension describes the degree of pressure holding the conditioner rolls together.

Roll tension is factory-set to maximum and should rarely require adjustment.

Heavy crops or tough forage can cause the rolls to separate; therefore, maximum roll tension is required to ensure that the crop materials are conditioned sufficiently.

Adjusting Roll Tension

The roll tension can be adjusted by increasing or decreasing the amount of exposed thread on the roll tension adjuster bolt.

DANGER

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

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Loosen jam nut (A) on both sides of the conditioner.
4. Adjust the spring drawbolt as follows:
   - Turn spring drawbolt (B) clockwise to tighten the spring and **INCREASE** the roll tension.
   - Turn spring drawbolt (B) counterclockwise to loosen the spring and **DECREASE** the roll tension.

   IMPORTANT:

   Turn each bolt equally. Roll tension changes by approximately 32 N (7.2 lbf) with each turn of the drawbolt.

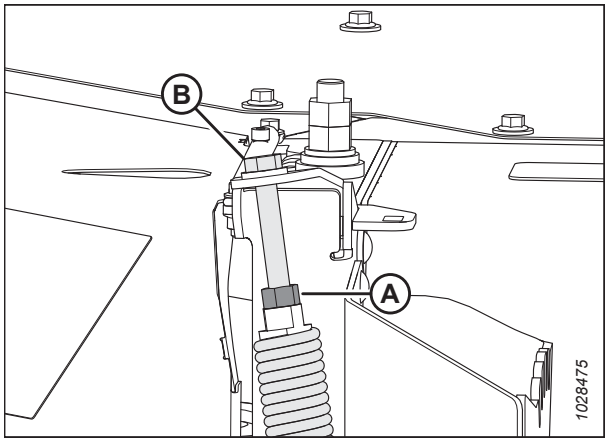


Figure 3.218: Roll Tension Adjuster

5. Measure the amount of exposed thread on spring drawbolt (A) at each end of the conditioner. Measurement (B) should be 12–15 mm (1/2–9/16 in.).
6. Tighten jam nut (C) on both sides of the conditioner.

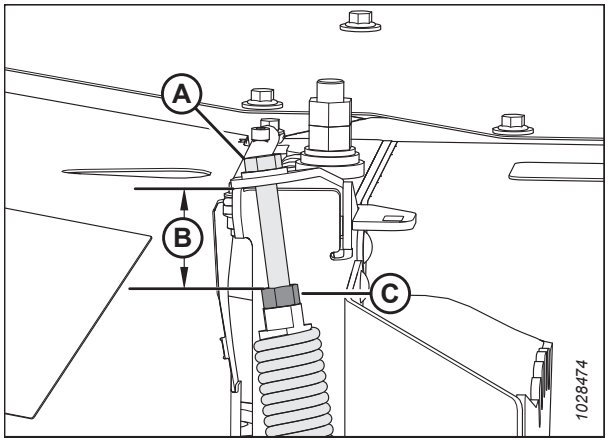


Figure 3.219: Roll Tension Adjuster

3.12.3 Adjusting Feed Roll Drive Belt Tension

There are two tension settings for the feed roll drive belt. One setting suits most crop conditions. The other setting improves belt performance in heavy crop conditions.

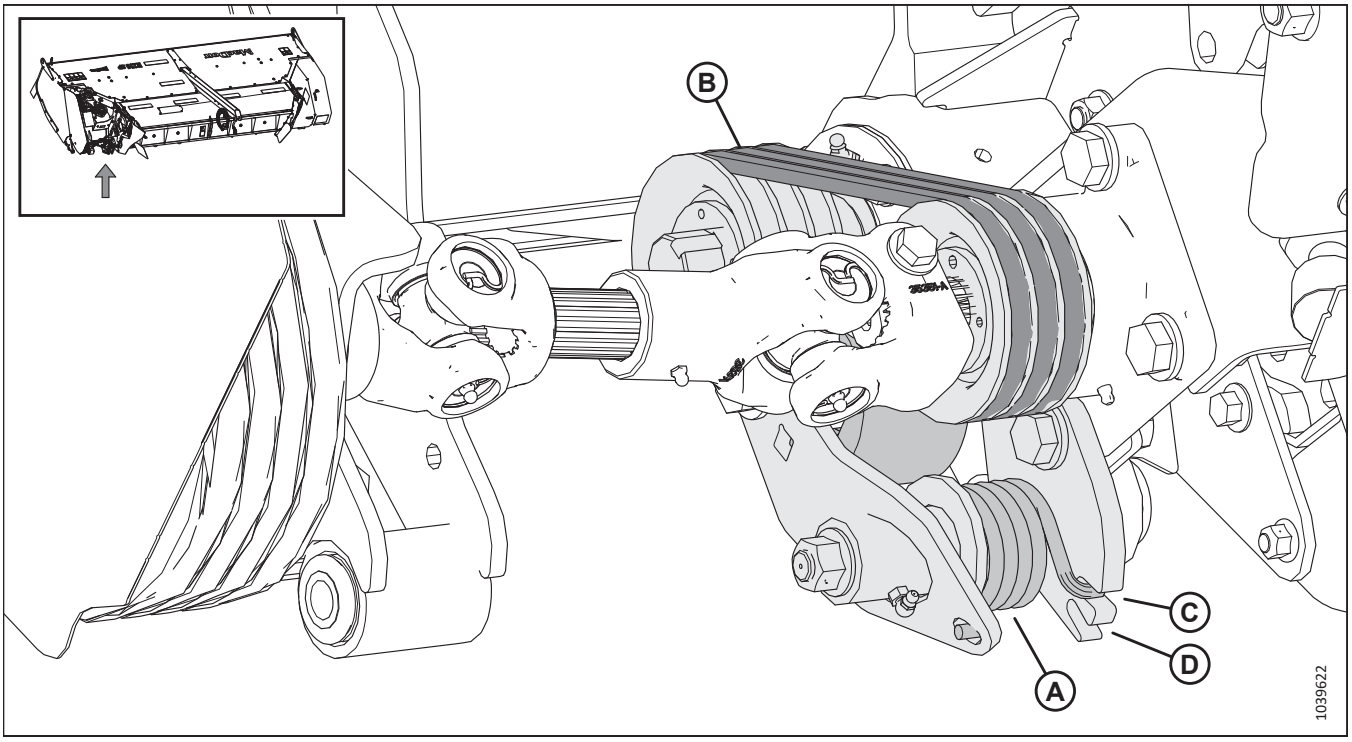


Figure 3.220: Tensioner Spring

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Wait for all moving parts on the header to stop, especially drivelines and belts.
3. Open the driveshields on the left side of the header. For instructions, refer to *3.9.1 Opening Driveshields, page 115*.
4. Spring (A) controls the tension in feed roll belt (B). To adjust the tension, manually move the spring into one of the following notches:
   - Use upper notch (C) for most conditions.
   - If the feed roll belt performs poorly in heavy crop conditions, use lower notch (D).
5. Close the driveshields. For instructions, refer to *3.9.2 Closing Driveshields, page 117*.

3.12.4 Roll Timing

For proper conditioning, the rolls must be properly timed with the bar on one roll 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.

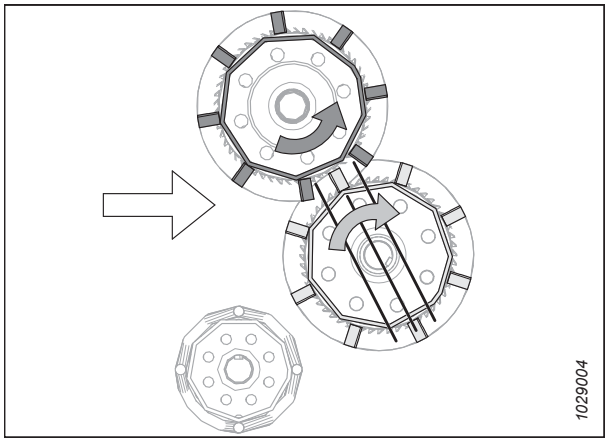


Figure 3.221: Properly Timed Rolls

Checking Roll Timing

The roll timing should be checked if excessive noise is coming from the conditioner rolls.

DANGER

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

The roll timing is factory-set and should not require adjustment; however, if there is excessive noise coming from the conditioner rolls, the timing may need to be adjusted. For instructions, refer to *Adjusting Roll Timing, page 134*.

Adjusting Roll Timing

The timing of the conditioner rolls can be changed by disconnecting the rolls from the roll timing gearbox and reconnecting them to achieve the desired timing.

DANGER

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

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

2. On the right side of the header, engage lift release latch (A) and pull handle (B) to open outboard driveshield (C).
3. Lift at handle (D) to open inboard driveshield (E).

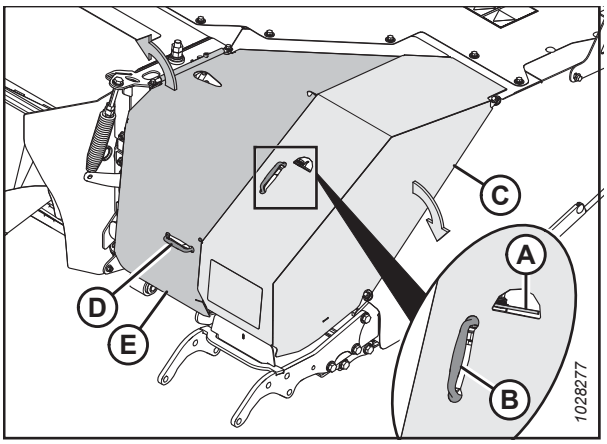


Figure 3.222: Right Driveshields

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

   NOTE:

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

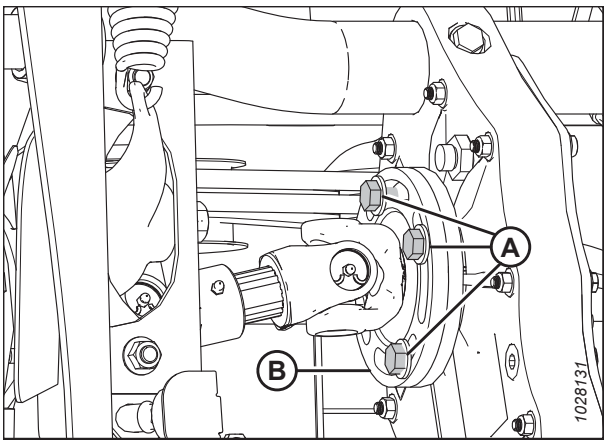


Figure 3.223: Conditioner Drive

5. Secure bottom roll (A).
6. Manually rotate upper roll (B) counterclockwise as shown until it stops rotating.
7. Make a mark (C) across yoke plate (D) and gearbox flange (E).

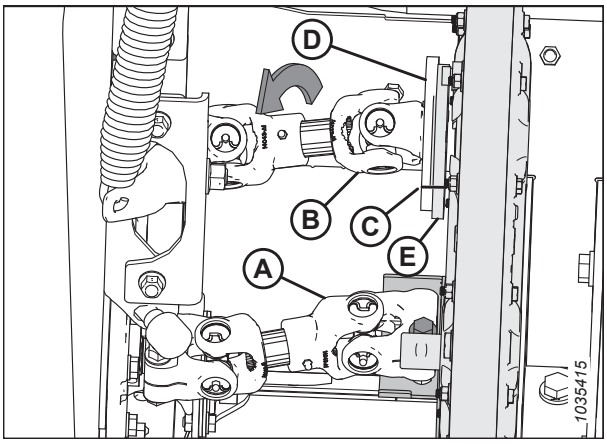


Figure 3.224: Conditioner Drive

8. Manually rotate upper roll (A) clockwise as shown until it stops rotating.
9. Make a second mark (B) on yoke flange (C), and align it with the mark previously made on gearbox flange (D).

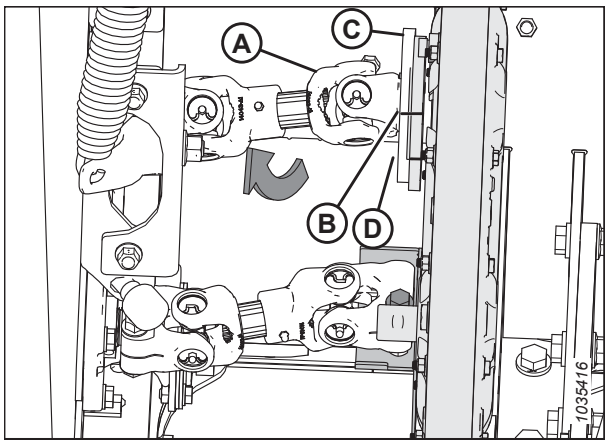


Figure 3.225: Conditioner Drive

10. Determine and mark center point (A) between marks (B) on yoke plate (C).
11. Rotate upper roll (D) counterclockwise as shown, until the bolt lines up with marked center point (A).

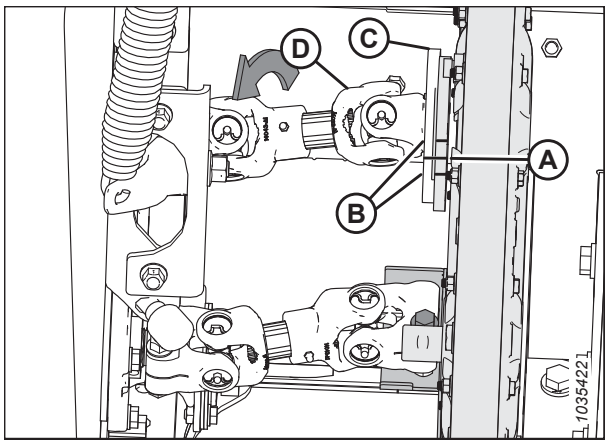


Figure 3.226: Conditioner Drive

12. Remove one of four bolts (A) from yoke plate (B). Ensure the bolt's threads are clean and free of lubricant.

    NOTE:

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

13. Apply medium-strength threadlocker (Loctite® 242 or equivalent) to the removed bolt.
14. Reinstall the bolt in yoke plate (B). Torque the bolt to 95 Nm (70 lbf·ft).
15. Repeat Step *12, page 136* to Step *14, page 136* for the other three bolts.
16. Close the right driveshields. For instructions, refer to *3.9.2 Closing Driveshields, page 117*.

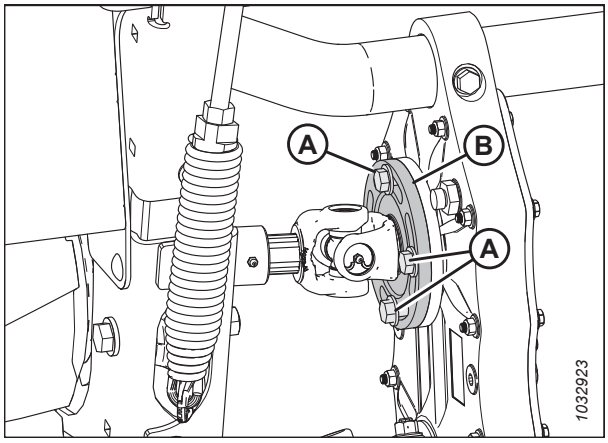


Figure 3.227: Conditioner Drive

3.12.5 Forming Shields – Roll Conditioner

The forming shield 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

The position of the side deflectors controls the width and placement of the windrow. To ensure that the windrow deposited between the windrower's wheels, the left and right deflectors must be set 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.
2. Set forming shield side deflectors (A) to the desired position by moving adjuster handle (B).
3. To ensure that the windrow will be centered between the windrower's wheels, adjust both side deflectors to the same position.

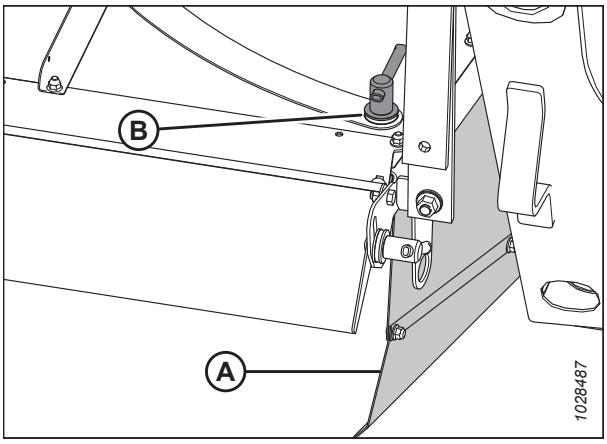


Figure 3.228: Forming Shield Side Deflector and Adjuster Handle

Positioning Rear Baffle

The rear baffle is used in conjunction with the forming shields to control the width of the windrow.

NOTE:

An optional Remote Baffle Control kit (MD #B6664) is available for R216 Rotary Disc Headers configured for M1 Series Windrowers **ONLY**. The Remote Baffle Control kit is **NOT** compatible with M205 or M155*E4* Self-Propelled Windowers. For more information, refer to *5.4 Remote Baffle Control Kit – MD #B6664, page 294*.

NOTE:

This procedure is used to manually position the rear baffle on headers that are **NOT** equipped with the Remote Baffle Control kit (MD #B6664).

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

- Direct crop flow into the forming shield for narrow and moderate width windrows.
- Direct crop downward to form a wide swath.
- Provide even material distribution across the windrow with adjustable fins under the rear baffle. For instructions, refer to *Positioning Rear Baffle Deflector Fins, page 139*.

To position the rear baffle, 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 the lever 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 hole in bracket (C).
6. Secure baffle adjustment lever (B) with lynch pin (A).

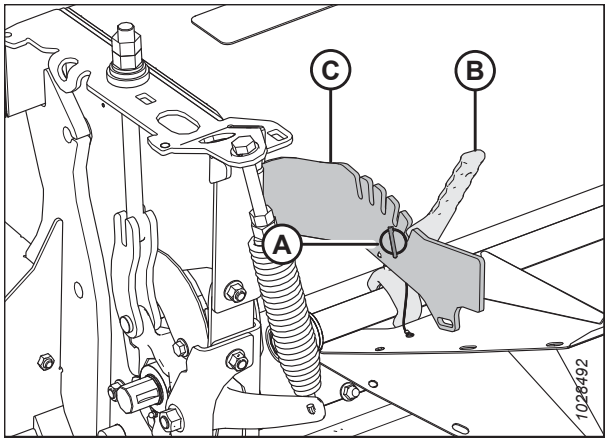


Figure 3.229: Left Side of Conditioner

Positioning Rear Baffle Deflector Fins

Four rear baffle deflector fins are located under the baffle. The rear baffle deflector fins help spread the crop in the windrow. The fins are set at the factory to an angle of approximately 60°.

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. Deflector fins (A) are located on the underside of the rear baffle.

   NOTE:

   There are two fins on the left side and two fins on the right side of the header.

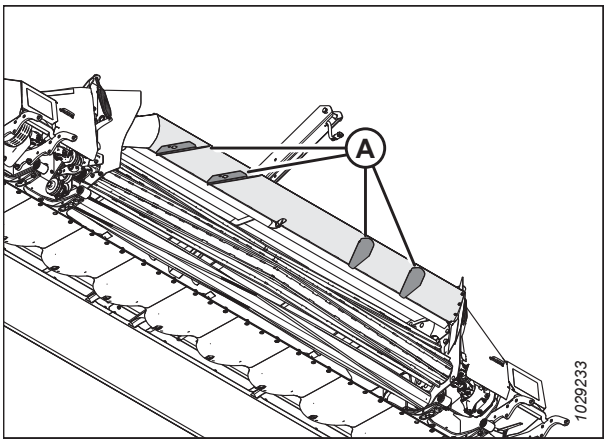


Figure 3.230: Deflector Fins Under Rear Baffle – View from Below

3. To adjust deflector fins (A), loosen already installed bolt and nut (B). Once the deflector fins have been adjusted to the desired angle, torque the nut to 58 Nm (42 lbf·ft).
4. Repeat the previous step to adjust the remaining deflector fins.

   NOTE:

   The fins may interfere with crop flow in large-stemmed crops, or when using the Double Windrow Attachment (DWA). It may be necessary to remove the fins in these conditions.

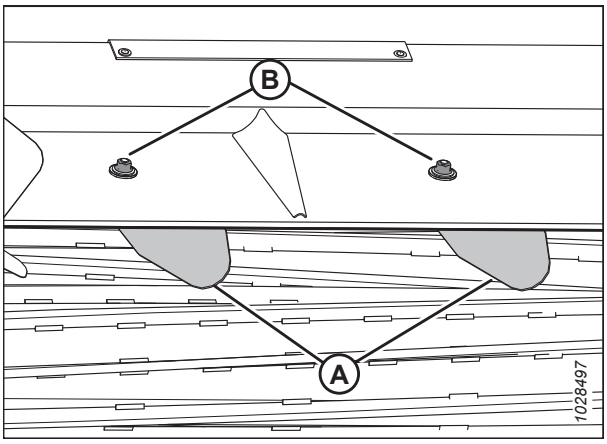


Figure 3.231: Left Deflector Fins in Field Position Under Baffle

NOTE:

Deflector fins (A) can be put in the storage position by removing the already installed nut and bolt and then reattaching the fins on top of the baffle.

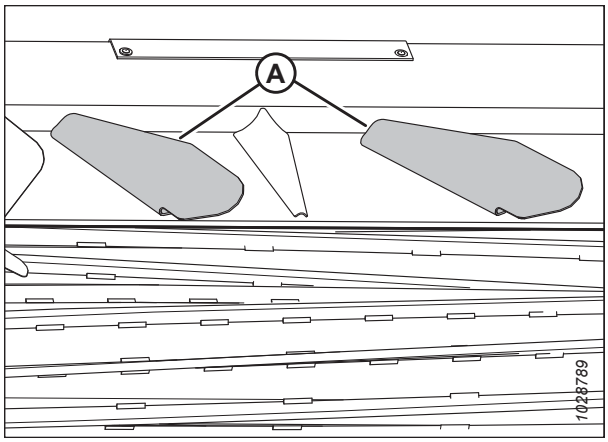


Figure 3.232: Left Deflector Fins in Storage Position

3.13 Cutterbar Deflectors – Standard Headers Only

A Tall Crop kit (MD #B6967) is available for attaching to the cutterbar just below the header's conditioner rolls. Deflectors provide improved feeding into the conditioner rolls and prevent heavy crop with long stems from feeding under the rolls.

Cutterbar deflectors may not be well-suited for some crop and field conditions. Refer to the following table:

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 (refer to the note below table)	No

NOTE:

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

3.13.1 Removing Cutterbar Deflectors

The cutterbar deflectors are used with roll conditioners only.

DANGER

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

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the lift cylinder safety props. For instructions, refer to the procedure according to the type of windrower:
   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M155*E4* or M205 SP Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*
4. Locate deflectors (A) and (D) on the back of the cutterbar.
5. Clean debris from deflectors and deflector area.
6. Remove bolt (B) from the cutterbar on the outboard end of the deflector. Retain the hardware.
7. Remove three bolts (C) and nuts securing deflector (A) to the cutterbar. Remove deflector (A).
8. Reinstall removed bolts (B) and (C), and nuts on the deflector for storage.
9. Repeat Step *4, page 141* to Step *8, page 141* for left deflector (D).
10. Store the deflectors in a safe place.

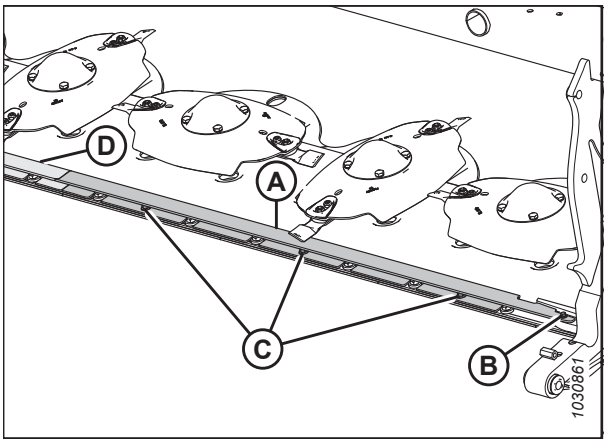


Figure 3.233: Right Deflector Plate – View from Rear

11. If the cutterbar is being replaced, install the deflectors on the new cutterbar. For instructions, refer to *3.13.2 Installing Cutterbar Deflectors, page 142*.

3.13.2 Installing Cutterbar Deflectors

The cutterbar deflectors are used with roll conditioners only.

DANGER

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

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the lift cylinder safety props. For instructions, refer to the procedure according to the type of windrower:
   - **M1 Series:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M155*E4* or M205:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*
4. Clean debris from the ledge and the six mounting holes along aft edge of the cutterbar.
5. Position left deflector (A) on the aft edge of the cutterbar, and align the slots in deflector plate (A) with the existing fasteners and cutterbar plug.

   NOTE:

   Some parts removed from illustration for clarity.
6. Apply medium-strength threadlocker (Loctite® 243 or equivalent) to M8 hex flange head bolt (B), and then loosely install at the outboard end of deflector plate (A).
7. Loosely secure deflector plate (A) to the cutterbar with three M10 carriage bolts and lock nuts (C). Insert the bolts into the cutterbar from the bottom.

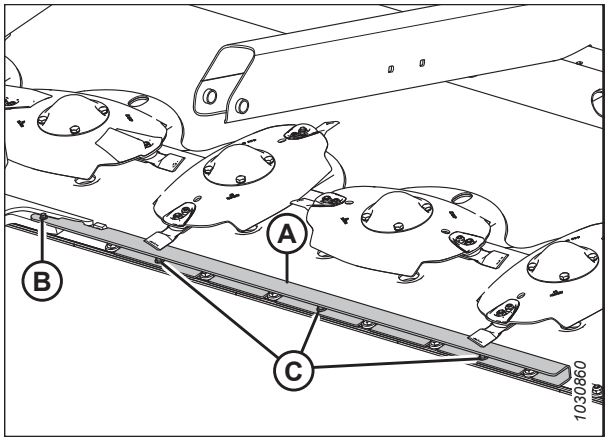


Figure 3.234: Left Deflector Plate Installed on Aft Edge of Cutterbar – View from Rear

8. Position right deflector (A) on the right aft edge of the cutterbar, and loosely secure in place with three M10 carriage bolts and lock nuts (C) . Insert the bolts into the cutterbar from the bottom.

   NOTE:

   Some parts removed from illustration for clarity.

9. Apply medium-strength threadlocker (Loctite® 243 or equivalent) to M8 hex flange head bolt (B), and then loosely install at the outboard end of deflector plate (A).

10. Align right deflector plate (A) with left deflector plate (D).

11. Tighten all six nuts (three securing each deflector plate) to 39 Nm (29 lbf·ft).

12. Tighten the two M8 bolts (at the outboard ends of the deflector plates) to 29 Nm (21 lbf·ft).

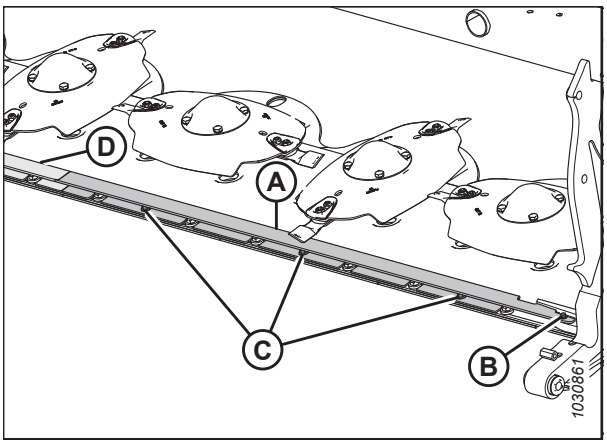


Figure 3.235: Right Deflector Plate Installed on Aft Edge of Cutterbar – View from Rear

3.14 Cutterbar Disc Feed Plates – Standard and Grass Seed Headers, Installing, Removing, and Storing Plates

The disc feed plates assist with the feeding of tall crops into the conditioner by encouraging material flow from behind the drums.

Overview

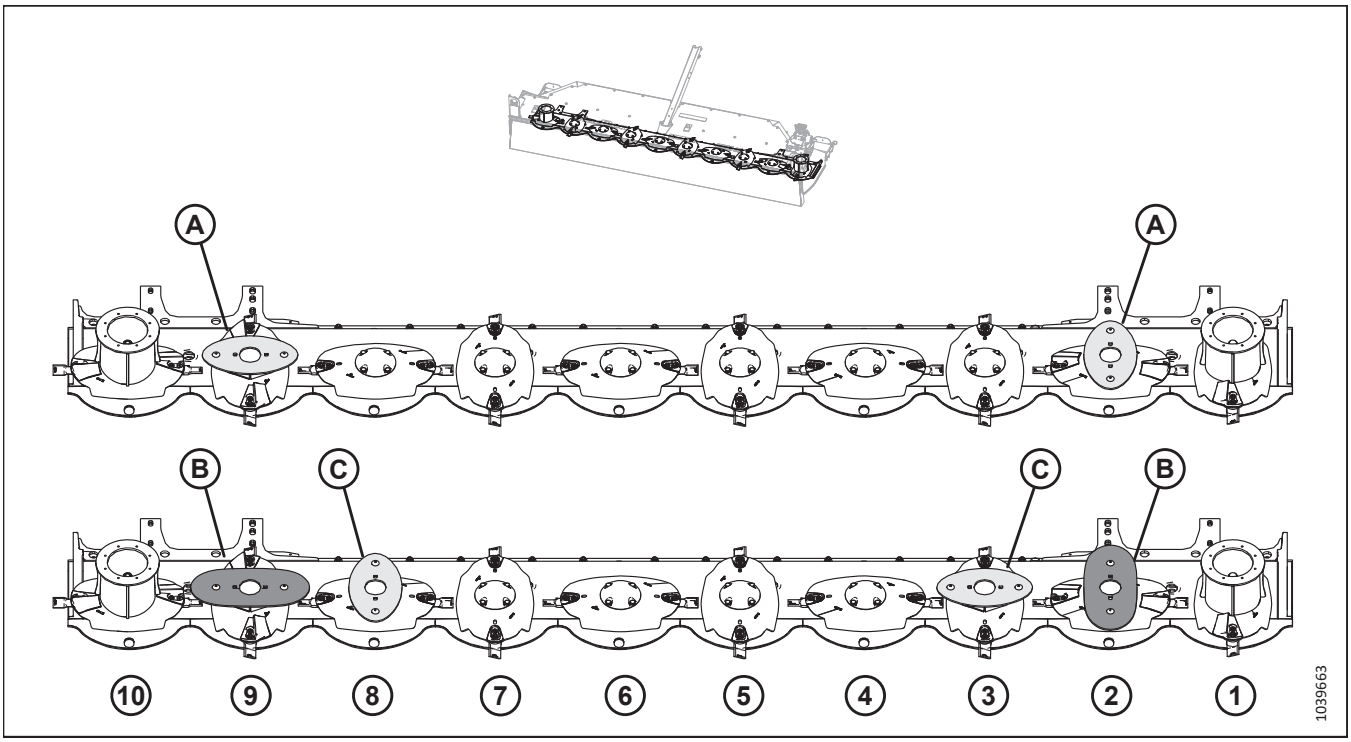


Figure 3.236: Standard Header and Grass Seed Header Feed Plate Configurations

Feed plate configurations include the following:

- **Standard headers:** Obtain kit MD #B6967. Install standard-sized plates (A) on discs 9 and 2.
- **Grass seed headers:** Leave extended feed plates (B) installed on cutterbar discs 9 and 2. Do **NOT** remove the extended feed plates or install them onto other discs. If cutting extremely lodged crops, add standard plates (C) onto discs 8 and 3. The standard plates are stored on top of the disc timing tool.

NOTE:

The installation instructions are the same for all feed plates. For instructions, proceed to *1, page 145*

Safety Steps

DANGER

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

CAUTION

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

1. Start the engine.
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the safety props on both lift cylinders as follows:
   a. Pull lever (A) toward you to release it, and then rotate it toward the header to lower the safety prop onto the cylinder.
   b. Repeat the previous step for the opposite lift cylinder.

   IMPORTANT:

   Ensure that the safety props engage over the cylinder piston rods. If the safety prop does **NOT** engage properly, raise the header until the safety prop fits over the rod.

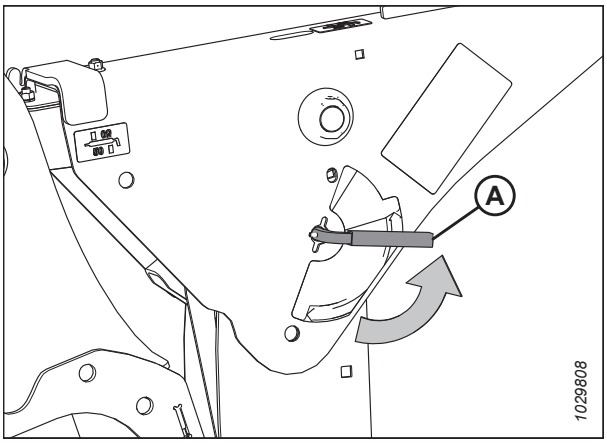


Figure 3.237: Safety Prop Lever

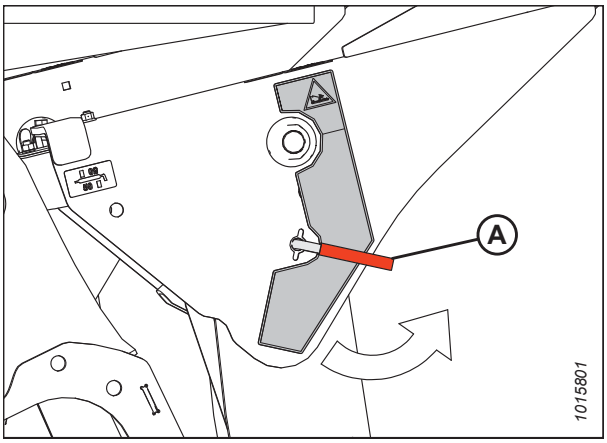


Figure 3.238: Safety Prop — Model Year 2019 and Prior

Retrieving Feed Plates from Storage

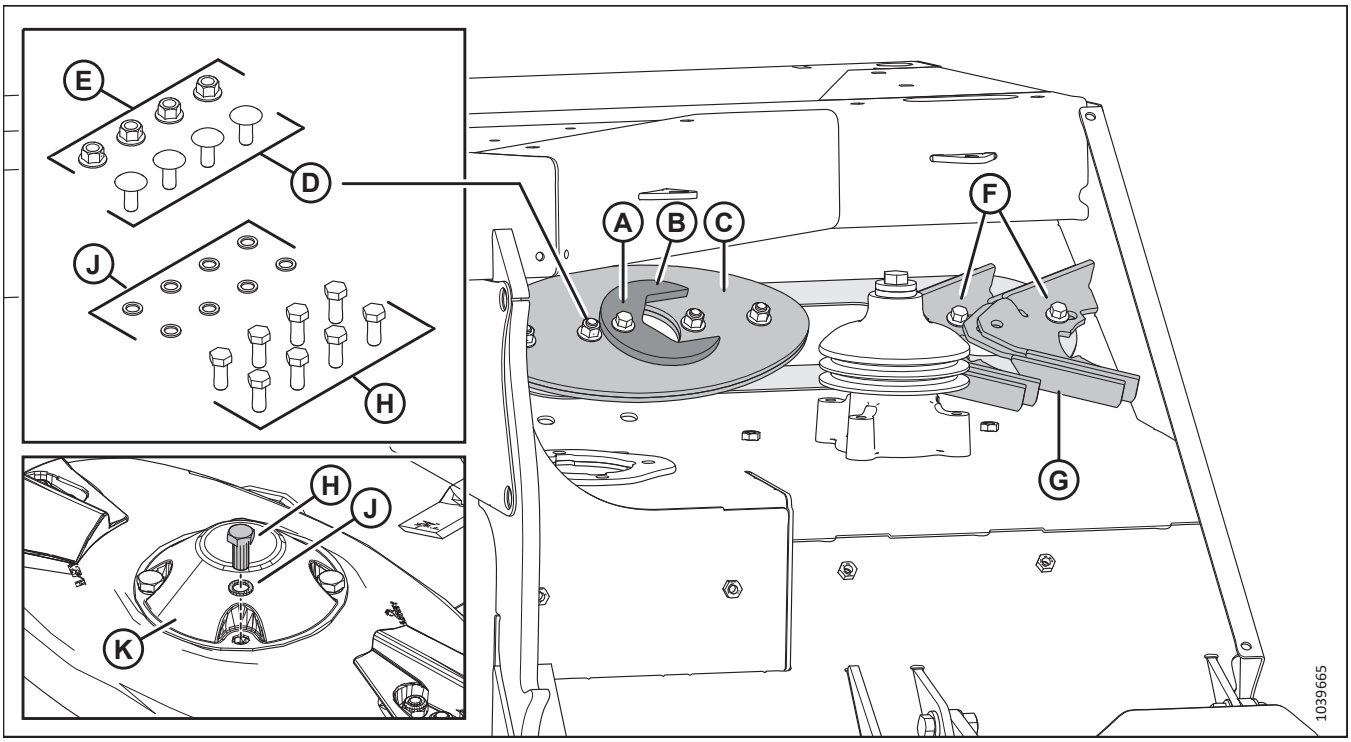


Figure 3.239: Standard-Sized Feed Plates and Support Angles in Storage Position

5. Open the right driveshield. For instructions, refer to *3.9.1 Opening Driveshields, page 115*.
6. Remove bolt (A), Safecut Spindle-Nut Wrench (B), and standard-sized plates (C). Reinstall bolt (A) and wrench (B).
7. Remove two bolts (F) and four support angles (G). Reinstall bolts (F). Set the support angles aside.
8. Separate plates (C) by removing M12 x 30 mm carriage head bolts (D) and nuts (E). Set the plates and hardware aside.
9. If the feed plates were previously installed onto the cutterbar, the eight M12 x 30 mm hex bolts (H) and washers (J) required to mount support angles (G) may have been left installed in the cutterbar disc cap (K) for convenience. If the hardware is stored elsewhere, retrieve the eight bolts and washers now.

Installing Feed Plates

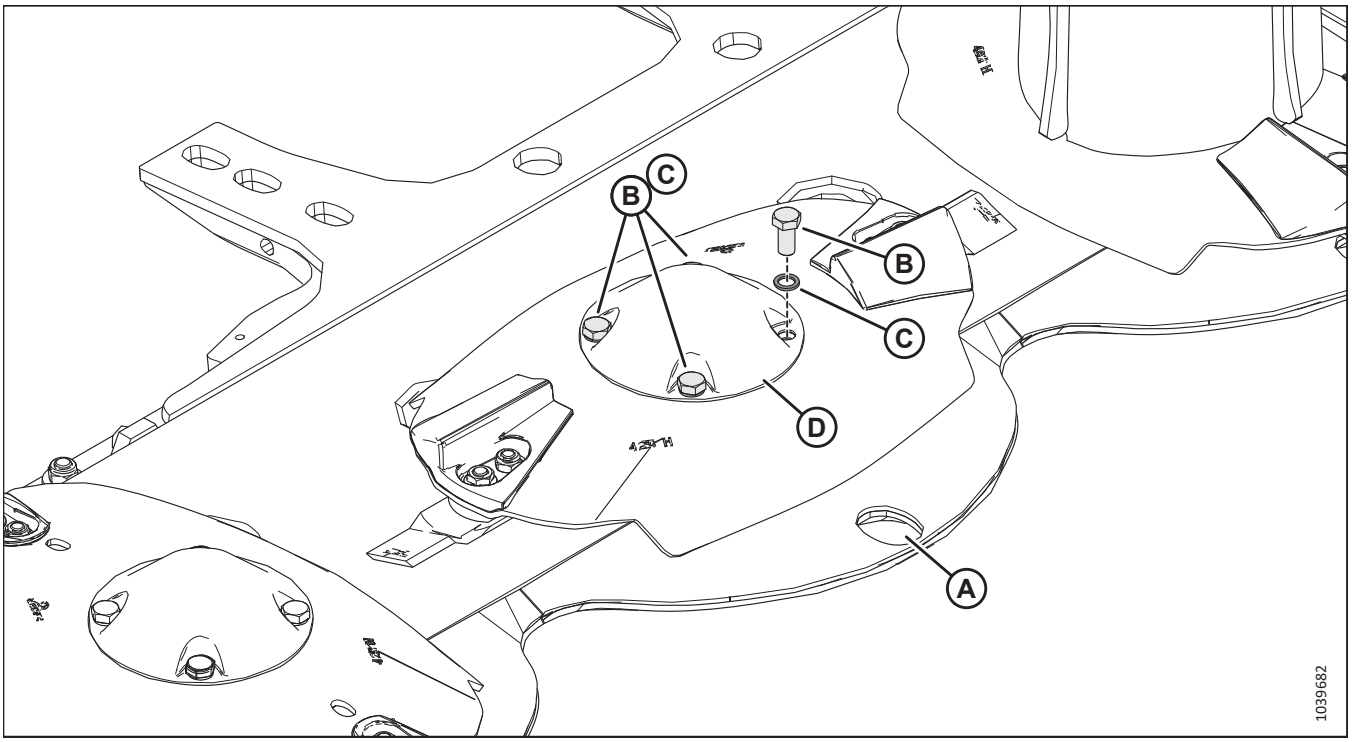


Figure 3.240: Cutterbar Disc Cap Hardware Removal – Disc 9 Shown

NOTE:

All illustrations show disc 2. The drum hanging above disc 2 has been removed for clarity.

10. Open the cutterbar curtain. For instructions, refer to *3.10.1 Opening Cutterbar Curtain, page 119*.
11. Place a pin (or equivalent) in front hole (A) of the rock guard to prevent the disc from rotating while you are working on it.

    NOTE:

    This procedure can be performed with the discs oriented so that the blades face sideways or face the front and rear of the header.
12. Remove four M12 bolts (B) and washers (C).
13. Remove cap (D).

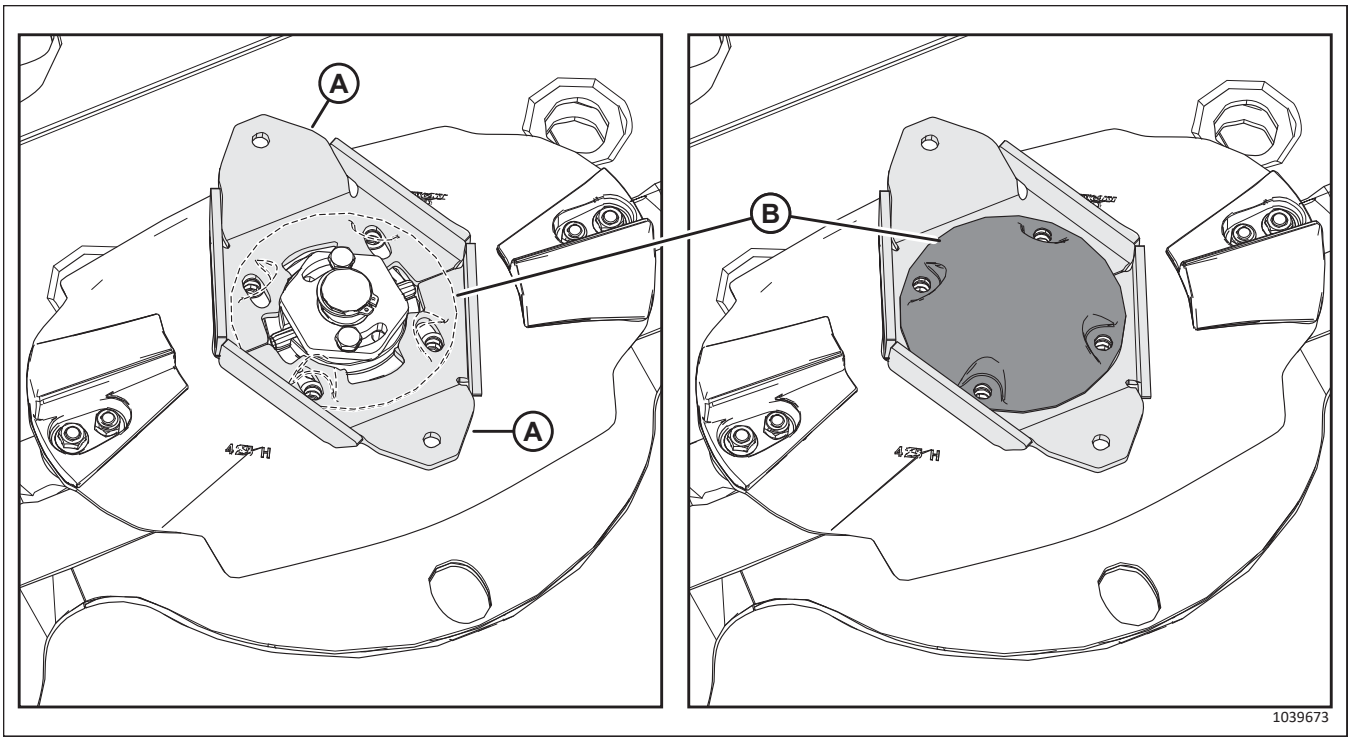


Figure 3.241: Support Angles and Cap

14. Position two support angles (A) across the narrow length of the disc, with cap (B) on top of them. Align the holes in the cap and angles with the disc.

    NOTE:

    If installing feed plates on disc 2 or 9: You must position the cap and the support angles on the disc at the same time. There is not enough room to pass the cap between the hanging drums and the support angles once the support angles are installed.

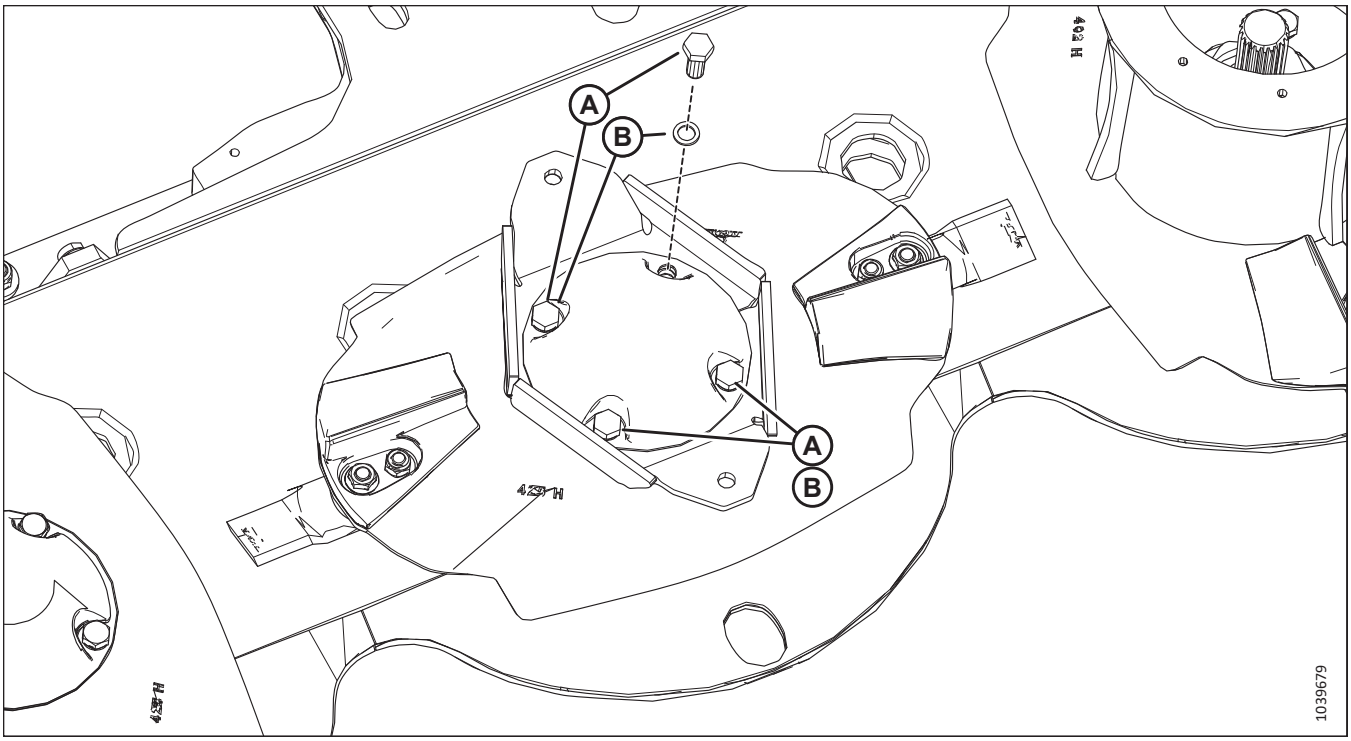


Figure 3.242: Hardware Installation

15. Secure the cap and angles using four M12 x 30 mm hex bolts (A) and washers (B).

16. Torque bolts (A) to 85 Nm (63 lbf·ft).

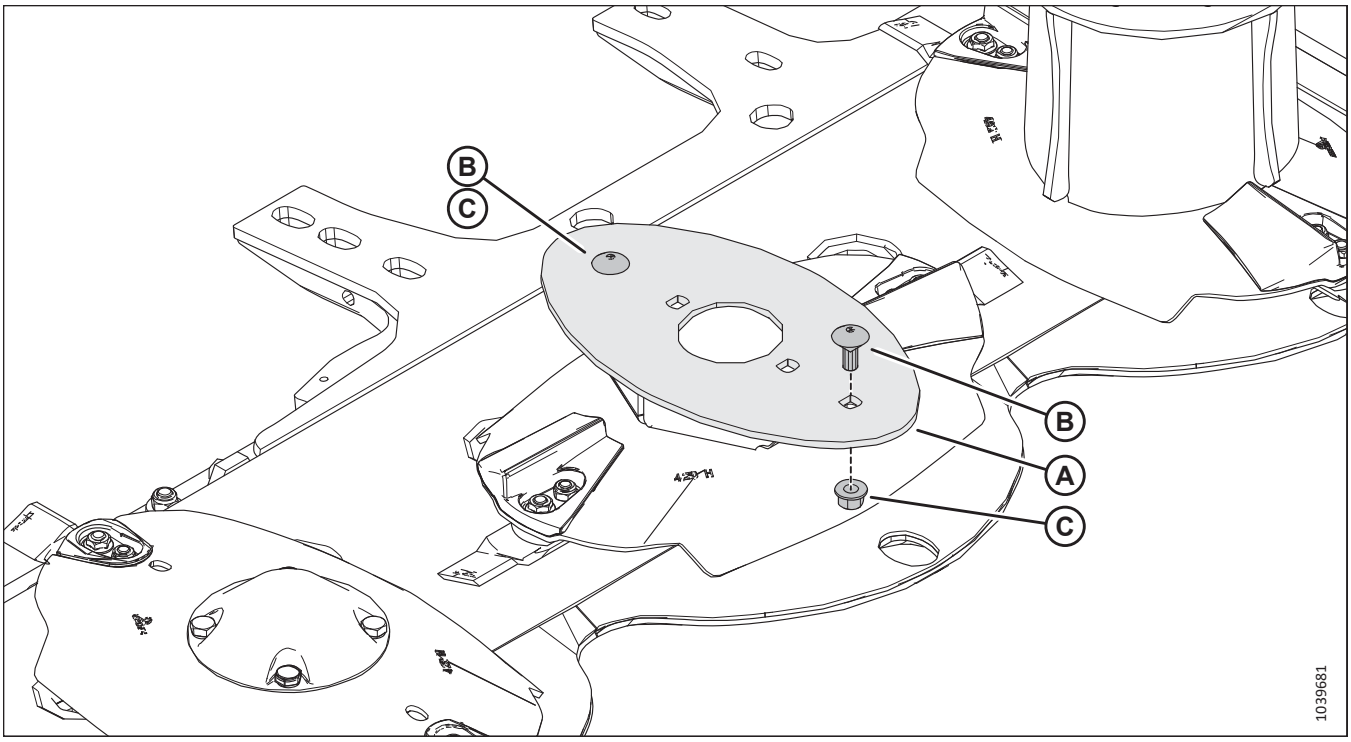


Figure 3.243: Standard Feed Plate Installed on Disc

17. Position feed plate (A) on top of the support angles and secure with two M12 carriage bolts (B) and M12 lock nuts (C).
18. Remove the pin (or equivalent) from the front hole of the rock guard.
19. Repeat Step *12, page 147* to Step *19, page 150* install the feed plate on the other disc.

WARNING

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

20. Close the cutterbar curtain. For instructions, refer to *3.10.2 Closing Cutterbar Curtain, page 120*.
21. Close the driveshield. For instructions, refer to *3.9.2 Closing Driveshields, page 117*.

Removing Feed Plates

1. Follow the safety steps (Step *1, page 145* to Step *4, page 145*).
2. Follow the installation and storage steps in reverse.

3.15 Grass Seed Version Operation

The optional grass seed (GSS) version of the header is intended for cutting delicate grass seed crops, and laying them in a windrow prior to a combine picking them up.

Anti-shatter shield (A) prevents the shattering of the grass seed heads as the header cuts. Grass seed drums (C) gently guide the crop into a windrow so the delicate grass seed heads aren't damaged. During field operation, fully extend the shield (shown) or fully retract the shield depending on the type of crop, and rotate hazard/brake lights (B) to the front (shown). To transport the header, fully retract the shield and rotate the hazard/brake lights outward.

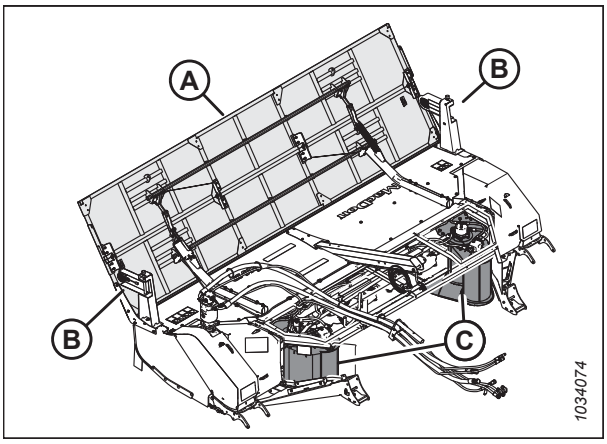


Figure 3.244: Grass Seed Version – Field Position

The cutterbar is configured to produce one crop stream (A). Do **NOT** change the crop steam configuration. For more information, refer to *4.6.9 Cutterbar Crop Stream, page 259*.

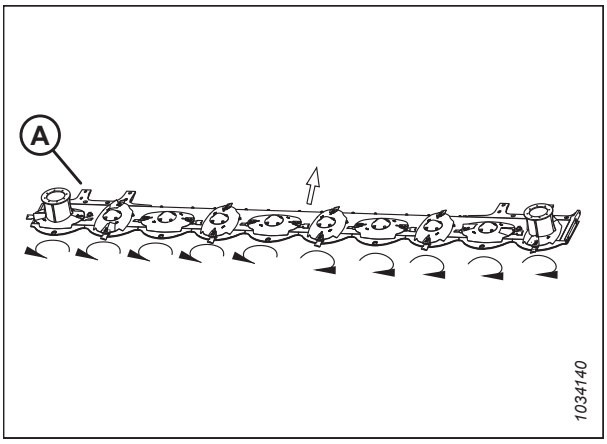


Figure 3.245: Cutterbar – One-Crop Stream

The grass seed option must be activated as an attachment through the Harvest Performance Tracker (HPT) the first time the header is connected to the windrower before any of the grass seed controls on the ground speed level (GSL) or operator's console will work. For instructions, refer to *3.15.1 Activating Grass Seed Option, page 152*.

Once the grass seed is activated through the HPT, operate the attachment. For instructions, refer to the following:

- To operate the header in the field, refer to *3.15.2 Operating with Grass Seed Option, page 154*.
- To prepare the header for transport, refer to *3.15.3 Preparing Header with Grass Seed Option for Transport, page 157*.

3.15.1 Activating Grass Seed Option

The grass seed (GSS) option must be activated in the windrower's control system the first time it is attached to the windrower.

NOTE:

The windrower requires the software versions (or newer) listed in Table *3.5, page 152* to operate the grass seed header.

Table 3.5 Windrower Software Requirement

Windrower (North America, Export)	Software Version
M1170 (North America, Export) M1240 (North America, Export)	**Master Controller:** MCAL203587Q or newer
	Harvest Performance Tracker: HPAL203586T or newer

NOTE:

A header must be attached to the windrower to be able to activate the grass seed option.

1. Turn the ignition key to ON to activate the Harvest Performance Tracker (HPT).
2. Press soft key 5 (A) to open the main menu or press SHIFT and SELECT on the ground speed lever.
3. Use scroll knob (B) or the ground speed lever (GSL) scroll wheel (not shown) to place red cursor (C) over the icon you want to select.

   NOTE:

   Using the scroll knob will activate titles which explain each selection.
4. Press scroll knob (B) or the GSL SELECT button (not shown) to select the highlighted icon.

   NOTE:

   Pressing the corresponding soft key will also work.
5. Scroll down and select HEADER SETUP menu (A).

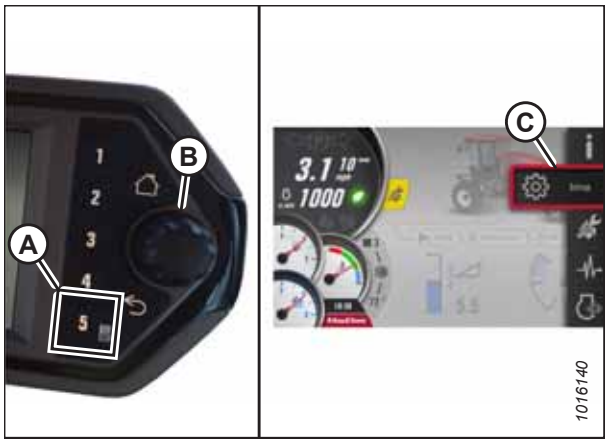


Figure 3.246: Opening the Main Menu

Figure 3.247: Header Setup Screen

6. Select R2 DISC (A).

Figure 3.248: Header Setup

7. Select ATTACHMENTS (A).

Figure 3.249: Header Setup

8. Select GRASS SEED (A). The system is now active, and the HPT, the GSL, and the operator console can be used to control the grass seed attachment.

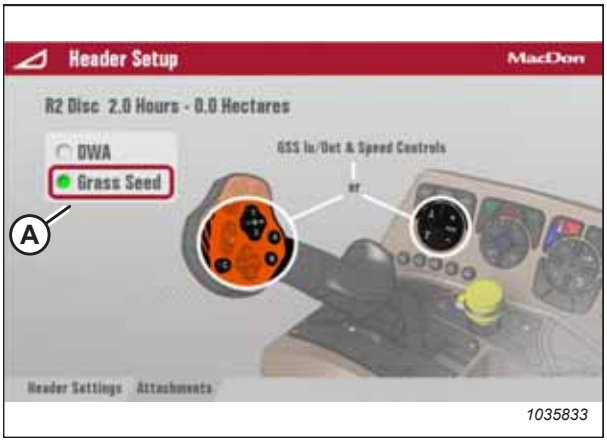


Figure 3.250: Header Setup

9. Once the grass seed option is activated, Run Screen 2 on the HPT will display speed (A) and pressure (B) of the grass seed drums.

Figure 3.251: Run Screen 2 – Grass Seed Active

3.15.2 Operating with Grass Seed Option

The anti-shatter shield on the R2 Series Rotary Disc Header's grass seed option can be extended or retracted using the controls on the windrower's operator console. The speed of the drums and the width of the windrow can be set using the ground speed lever (GSL).

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. Manually rotate light brackets (A) forward as shown.
3. Start the engine.

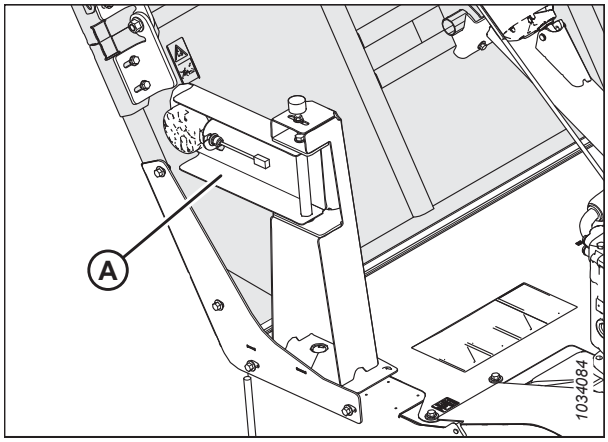


Figure 3.252: Grass Seed Version – Field Position

4. **FULLY** extend (A) or retract (C) the anti-shatter shield as follows:

   - Fully extend (A) the shield by pressing and holding F6 (D) on the operator console.
   - Fully retract (C) the shield by pressing and holding F5 (B) on the operator console.

   IMPORTANT:

   Do **NOT** operate the header in the field with the shield partially extended.

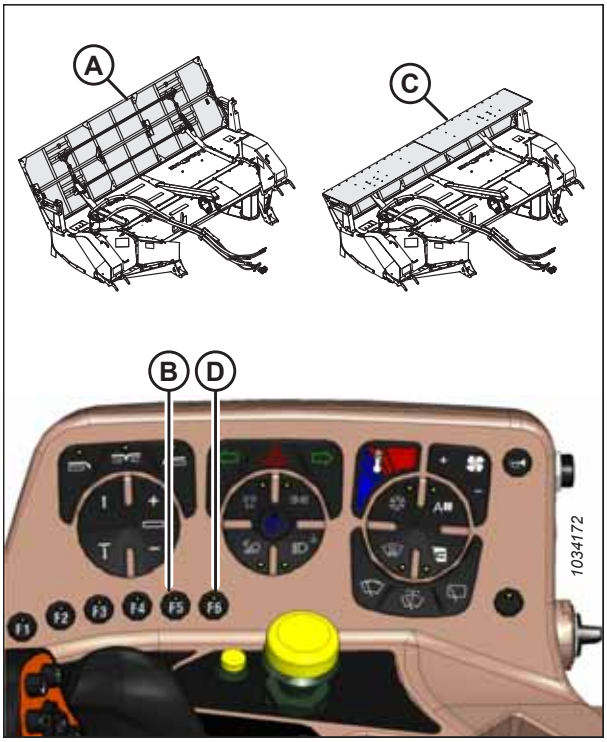


Figure 3.253: Grass Seed Version – Field Position

5. Adjust the drum speed and windrow width (drum spacing) as desired using the GSL or the operator's console:

   - To widen the windrow, press REEL UP (A) switch the on the GSL, or button (A) on the operator's console.
   - To narrow the windrow, press REEL DOWN (B) switch on the GSL, or button (B) on the operator's console.
   - To increase the drum speed, press switch (C) on the GSL, or button (C) on the operator's console.
   - To decrease the drum speed, press switch (D) on the GSL, or button (D) on the operator's console.

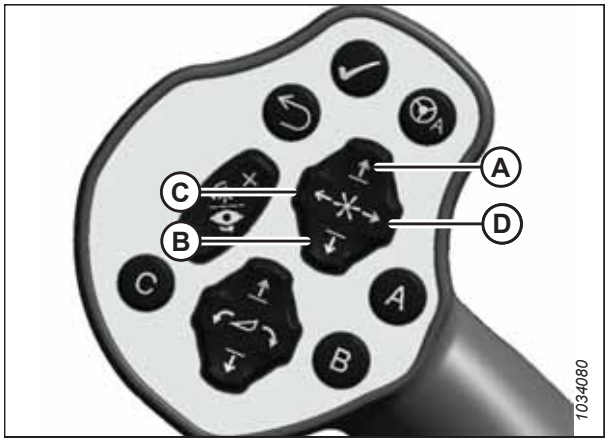


Figure 3.254: GSL – Grass Seed Drum Controls

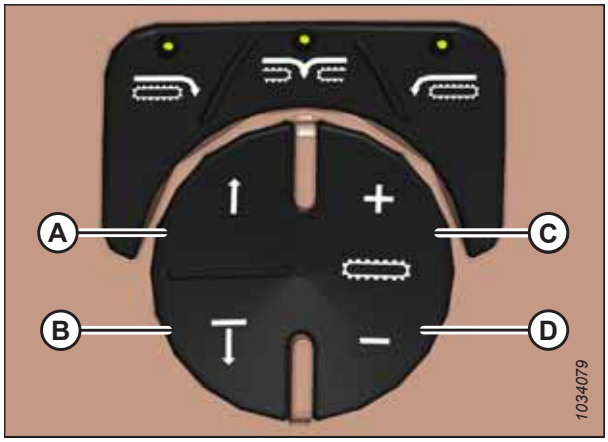


Figure 3.255: Operator's Console – Grass Seed Drum Controls

6. Check Run Screen 2 on the HPT as needed to monitor grass seed drum speed (A) and pressure (B).

   NOTE:

   You can operate the drum between speeds of 235–660 rpm, or you can stop the drums (0 rpm). You cannot operate the drums between 1–234 rpm.

Figure 3.256: Run Screen 2 – Grass Seed Active

3.15.3 Preparing Header with Grass Seed Option for Transport

Before an R2 Series Rotary Disc Header equipped with the grass seed option (GSS) can be transported, several preliminary steps must be completed.

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. Start the engine.
2. **FULLY** retract anti-shatter shield (A) by pressing and holding F6 (B) on the operator console.

   IMPORTANT:

   NEVER transport the header with the anti-shatter shield even partially extended.
3. Shut down the engine, and remove the key from the ignition.

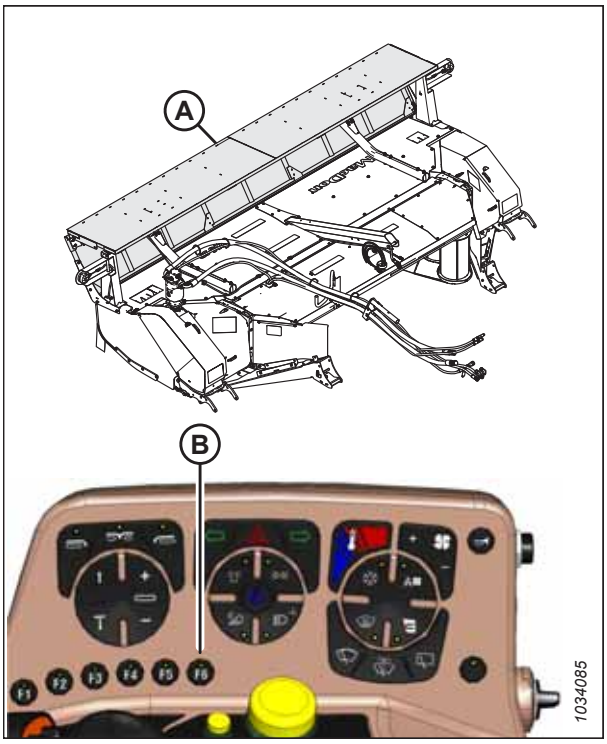


Figure 3.257: Grass Seed Version – Transport Position

4. Manually rotate light brackets (A) outward as shown.
5. Refer to the windrower's operator manual for transport instructions.

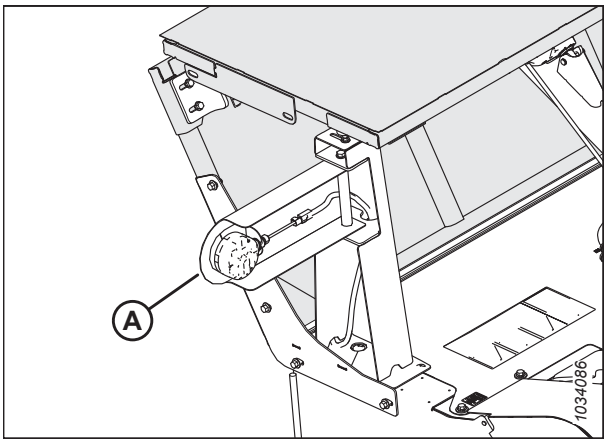


Figure 3.258: Anti-Shatter Shield and Lights – Transport Position

3.15.4 Performance Improvement Tips for Grass Seed Headers

You can improve the performance of the grass seed header by changing windrower settings or configurations.

Disable Eco Engine Control (EEC) (A) to maximize engine horsepower.

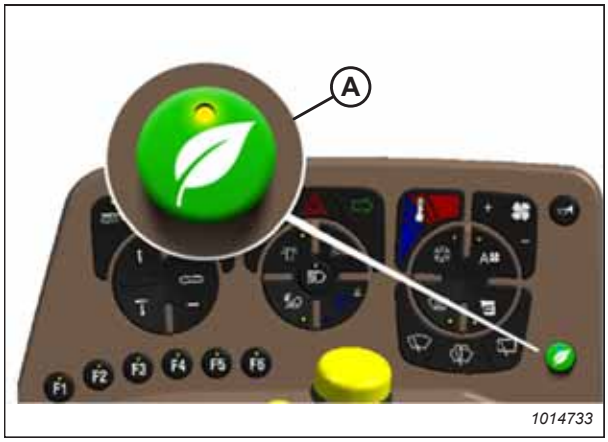


Figure 3.259: Eco Engine Control Button

Use hard-plumbed fittings (A) instead of quick couplers (B) to connect to the header. Hard-plumbing will allow more efficient power transfer, increasing available power to the header.

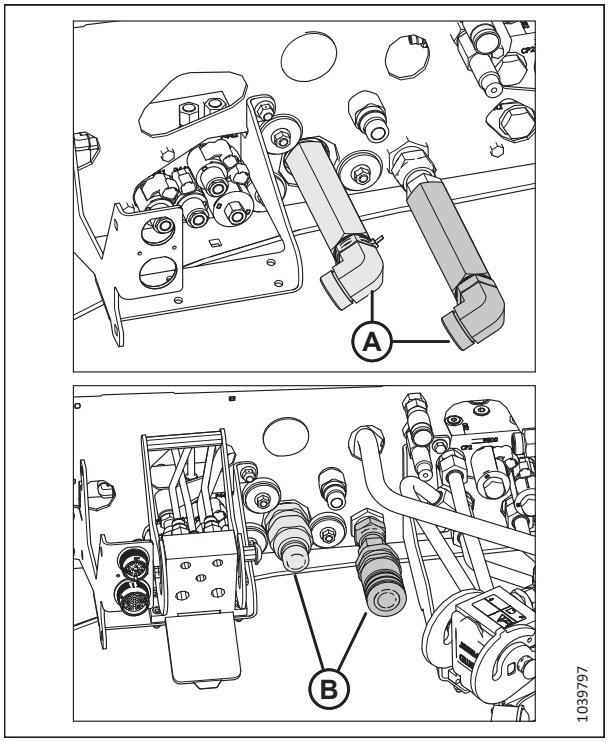


Figure 3.260: M1 Hard-Plumbed Fittings for Rotary Disc Headers

3.16 Haying Tips

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

3.16.1 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.

3.16.2 Topsoil Moisture

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

Table 3.6 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, moisture from the soil is absorbed by the hay above it. Determine the moisture level of the toposil before beginning 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 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.

3.16.3 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.

3.16.4 Windrow Characteristics

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

For instructions, refer to *3 Operation, page 25* for instructions on adjusting the header.

Table 3.7 Recommended Windrow Characteristics

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

3.16.5 Driving on Windrow

Driving on previously cut windrows that will not be raked can lengthen drying time by a full day. If practical, set the machine's forming shields to produce a narrower windrow which the machine can straddle. However, driving on the windrow in high-yield crops may be unavoidable if a full width windrow is necessary.

3.16.6 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.

3.17 Transporting the Header

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

Chapter 4: Maintenance and Servicing

Proper maintenance and servicing of your machine will ensure great performance and excellent crop yield.

The following instructions provide information about routine servicing for the header. A parts catalog is located in a plastic case on the fixed deflector on the left side of the header.

Log hours of operation and use the maintenance record provided (refer to *4.4.1 Maintenance Schedule/Record – Standard Headers, page 167*) to keep track of your scheduled maintenance.

4.1 Daily Start-Up Check

Perform this procedure before operating the machine.

CAUTION

- **Ensure that the windrower and the header are properly attached, all controls are in neutral, and the windrower brakes are engaged.**
- **Clear the area of bystanders, pets, etc. Keep children away from the machinery. Walk around confirm that no one is under, on, or close to it.**
- **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. Don't take chances when it comes to safety.**
- **Remove any foreign objects from the machine. 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 *4.13.1 Checking Hydraulic Hoses and Lines, page 289*.

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 *4.4.1 Maintenance Schedule/Record – Standard Headers, page 167*.

4.2 Preparing Machine for Servicing

A few preliminary tasks will need to be performed before the header can be serviced safely.

DANGER

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

To prevent personal injury and damage to the header, perform the following procedures before servicing the rotary disc header or opening its drive covers:

1. Lower the header fully. If service must be performed with the header in the raised position, always engage the windrower's safety props. For instructions, refer to the procedure according to the type of windrower:
   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M155*E4* or M205 SP Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*
2. Stop the windrower on level ground, and then do the following:
   - **M1 Series Windrowers:** Place the ground speed lever (GSL) into the PARK position.
   - **M155*E4* or M205 SP Windrowers:** Place the ground speed lever (GSL) into the N-DETENT position.
3. Shut down the engine, and remove the key from the ignition.
4. Wait for all moving parts to come to a stop.

4.3 Recommended Safety Procedures

- Park on level surface when possible. Follow all recommendations in your windrower operator's manual.
- Wear close-fitting clothing and cover 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.

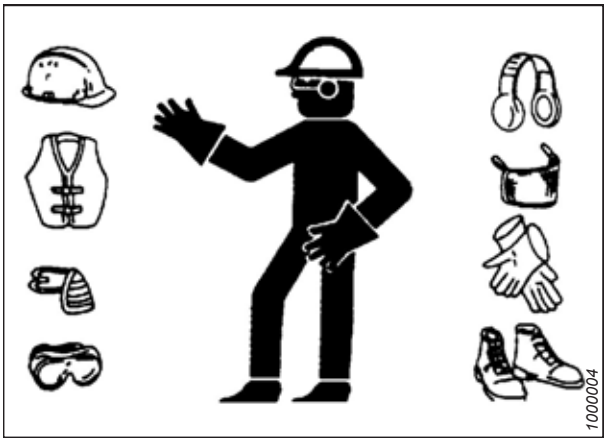


Figure 4.2: Safety Equipment

- 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 lube fitting) will cause drive components in other areas (belts, pulleys, and discs) to move. Stay clear of driven components at all times.

Figure 4.3: Safety Around Equipment

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

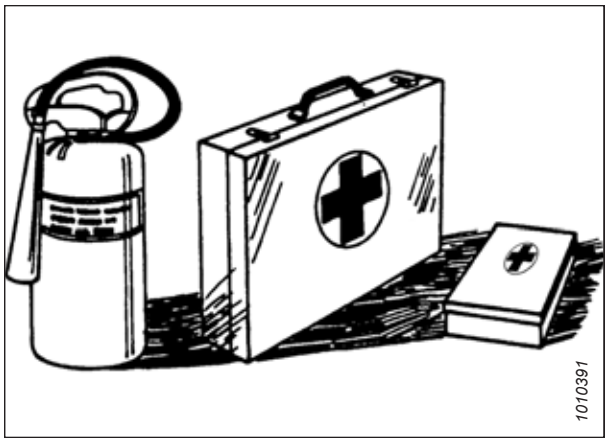


Figure 4.4: Safety Equipment

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

Figure 4.5: Safety Around Equipment

- Use adequate light for the job at hand.
- Reinstall 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.

4.4 Maintenance Requirements

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

IMPORTANT:

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

If more than one interval is specified for a service item (e.g., 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. Refer to this manual's inside back cover and use only the specified fluids and lubricants.

Log hours of operation, use the maintenance record, and keep copies of your maintenance records.

- Standard headers: Refer to *4.4.1 Maintenance Schedule/Record – Standard Headers, page 167*.
- Grass seed headers: Refer to *4.4.2 Maintenance Schedule/Record – Grass Seed Headers, page 169*.

CAUTION

Carefully follow all safety messages. Refer to *4.3 Recommended Safety Procedures, page 165*.

4.4.1 Maintenance Schedule/Record – Standard Headers

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 *4.4.3 Break-In Inspections, page 170*.												
End of season	Refer to *4.4.5 End-of-Season Servicing, page 171*.												
Action	✓ Check			♦ Lubricate					▲ Change				
First 10 hours then Daily													
✓	Inspect cutterbar discs. Refer to *Inspecting Cutterbar Discs, page 185*.												
✓	Inspect disc blades. Refer to *Inspecting Disc Blades, page 200*.												
✓	Inspect accelerators. Refer to *Inspecting Accelerators, page 207*.												
✓	Inspect rock guards. Refer to *Inspecting Rock Guards, page 213*.												
✓	Inspect drums. Refer to *Inspecting Drums, page 218*.												
✓	Check hydraulic hoses and lines. Refer to *4.13.1 Checking Hydraulic Hoses and Lines, page 289*.												

Every 25 Hours													
♦	Lubricate idler pivot. Refer to *4.5 Lubrication, page 172*.												
♦	Lubricate upper and lower driveline universal joints. Refer to *4.5 Lubrication, page 172*.												
♦	Lubricate roller conditioner and feed roller bearings. Refer to *4.5 Lubrication, page 172*.												
♦	Lubricate conditioner driveline. Refer to *4.5 Lubrication, page 172*.												
♦	Lubricate gauge rollers (if equipped). Refer to *4.5 Lubrication, page 172*.												
Every 100 Hours or Annually													
✓	Check conditioner drive belt tension. Refer to *Inspecting Conditioner Drive Belt, page 277*.												
✓	Check roll timing gearbox lubricant. Refer to *4.7.1 Checking and Changing Conditioner Roll Timing Gearbox Oil, page 263*.												
✓	Check header drive gearbox lubricant. Refer to *4.8.1 Checking Oil in Header Drive Gearbox, page 266*												
Every 250 Hours[2]													
▲	Change roll timing gearbox lubricant. Refer to *4.7.1 Checking and Changing Conditioner Roll Timing Gearbox Oil, page 263*.												
▲	Change header drive gearbox lubricant. Refer to *4.8.2 Changing Oil in Header Drive Gearbox, page 268*												
▲	Change cutterbar lubricant. Refer to *4.6.1 Lubricating Cutterbar, page 179*.												
♦	Lubricate the vertical drivelines at the left and right driven drums. Refer to *Lubricating Vertical Drivelines, page 242*.												

2. Begins after the first 150 hour service.

4.4.2 Maintenance Schedule/Record – Grass Seed Headers

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 *4.4.3 Break-In Inspections, page 170*.
End of season	Refer to *4.4.5 End-of-Season Servicing, page 171*.

Action	✓ Check	♦ Lubricate	▲ Change

First 10 hours then Daily														
✓	Inspect cutterbar discs. Refer to *Inspecting Cutterbar Discs, page 185*.													
✓	Inspect disc blades[3]. Refer to *Inspecting Disc Blades, page 200*.													
✓	Inspect accelerators. Refer to *Inspecting Accelerators, page 207*.													
✓	Inspect rock guards. Refer to *Inspecting Rock Guards, page 213*.													
✓	Inspect drums. Refer to *Inspecting Drums, page 218*.													
✓	Check hydraulic hoses and lines. Refer to *4.13.1 Checking Hydraulic Hoses and Lines, page 289*.													
Every 25 Hours														
♦	Lubricate idler pivot. Refer to *4.5 Lubrication, page 172*.													
♦	Lubricate gauge rollers (if equipped). Refer to *4.5 Lubrication, page 172*.													
Every 50 Hours														
♦	Lubricate the grass seed drum bearings. Refer to *4.5 Lubrication, page 172*.													
Every 100 Hours or Annually														
✓	Check header drive gearbox lubricant. Refer to *4.8.1 Checking Oil in Header Drive Gearbox, page 266*													
Every 250 Hours[4]														
▲	Change header drive gearbox lubricant. Refer to *4.8.2 Changing Oil in Header Drive Gearbox, page 268*													
▲	Change cutterbar lubricant. Refer to *4.6.1 Lubricating Cutterbar, page 179*.													
♦	Lubricate the vertical drivelines at the left and right driven drums. Refer to *Lubricating Vertical Drivelines, page 242*.													

3. You might need to replace blades more often if cutting grass seed.
4. Begins after the first 150 hour service.

4.4.3 Break-In Inspections

From the factory the header is ready for normal operation. However, there are several things to check and change or adjust during the first 100 hours of use.

Table 4.1 Break-In Inspection Schedule

Inspection Interval	Item	Standard Header	Grass Seed	Refer to
1 Hour	Check for loose hardware and tighten to required torque.	•	•	*7.1 Torque Specifications, page 307*
5 Hours	Check for loose hardware and tighten to required torque.	•	•	*7.1 Torque Specifications, page 307*
5 Hours	Check conditioner drive belt tension.	•	—	*Inspecting Conditioner Drive Belt, page 277*
50 Hours	Change conditioner roll timing gearbox lubricant.	•	—	*4.7.1 Checking and Changing Conditioner Roll Timing Gearbox Oil, page 263*
50 Hours	Change header drive gearbox lubricant.	•	•	*4.8.2 Changing Oil in Header Drive Gearbox, page 268*
100 Hours	Check conditioner drive belt tension, and adjust tension if necessary.	•	—	*Inspecting Conditioner Drive Belt, page 277*

4.4.4 Preseason Servicing

CAUTION

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

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

1. Lubricate machine completely. For instructions, refer to *4.5 Lubrication, page 172* and *4.6.1 Lubricating Cutterbar, page 179*.
2. Perform all annual maintenance. For instructions, refer to *4.4.1 Maintenance Schedule/Record – Standard Headers, page 167*.

4.4.5 End-of-Season Servicing

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

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

CAUTION

Cover cutterbar to prevent injury from accidental contact.

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

1. Raise the header and engage lift cylinder safety props.
2. Clean the header thoroughly.
3. Check for worn components and repair as necessary.
4. Check for broken components and order replacements from your Dealer. Immediate repair of these items will save time and effort at the beginning of the next season.
5. Replace or tighten any missing or loose hardware. For more information, refer to *7.1 Torque Specifications, page 307*.
6. Lubricate the header thoroughly leaving excess grease on fittings to keep moisture out of bearings.
7. Apply grease to exposed threads, cylinder rods, and sliding surfaces of components.
8. Oil cutterbar components to prevent rust.
9. Loosen the drive belt.
10. Remove divider rods (if equipped) to reduce space required for inside storage.
11. Repaint all worn or chipped painted surfaces to prevent rust.
12. Store the header in a dry, protected place if possible. If stored outside, always cover the header with a waterproof canvas or other protective material.

4.5 Lubrication

Greasing points are marked on the machine by decals on the left and right outboard shielding.

WARNING

To avoid personal injury, before servicing header or opening drive covers, refer to *4.2 Preparing Machine for Servicing, page 164*.

Log hours of operation and use the maintenance schedule provided to keep a record of scheduled maintenance. Refer to *4.4.1 Maintenance Schedule/Record – Standard Headers, page 167*.

4.5.1 Greasing Procedure

Only use clean, high temperature, extreme pressure grease. Refer to this manual's inside back cover for a list of recommended fluids and lubricants.

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. Open the driveshields at the ends of the header to access greasing points. For instructions, refer to *3.9.1 Opening Driveshields, page 115*.
3. Wipe grease fittings with a clean cloth before greasing to avoid injecting dirt and grit.
4. Replace any loose or broken fittings immediately.
5. Inject grease through fittings with a grease gun until grease overflows fitting (except where noted).
6. Leave excess grease on fittings to keep out dirt.
7. Remove and thoroughly clean any fitting that will not take grease and clean lubricant passageway. Replace the fitting if necessary.

4.5.2 Lubrication Locations – Standard Headers

This topic identifies lubrication locations according to the maintenance schedule for standard headers.

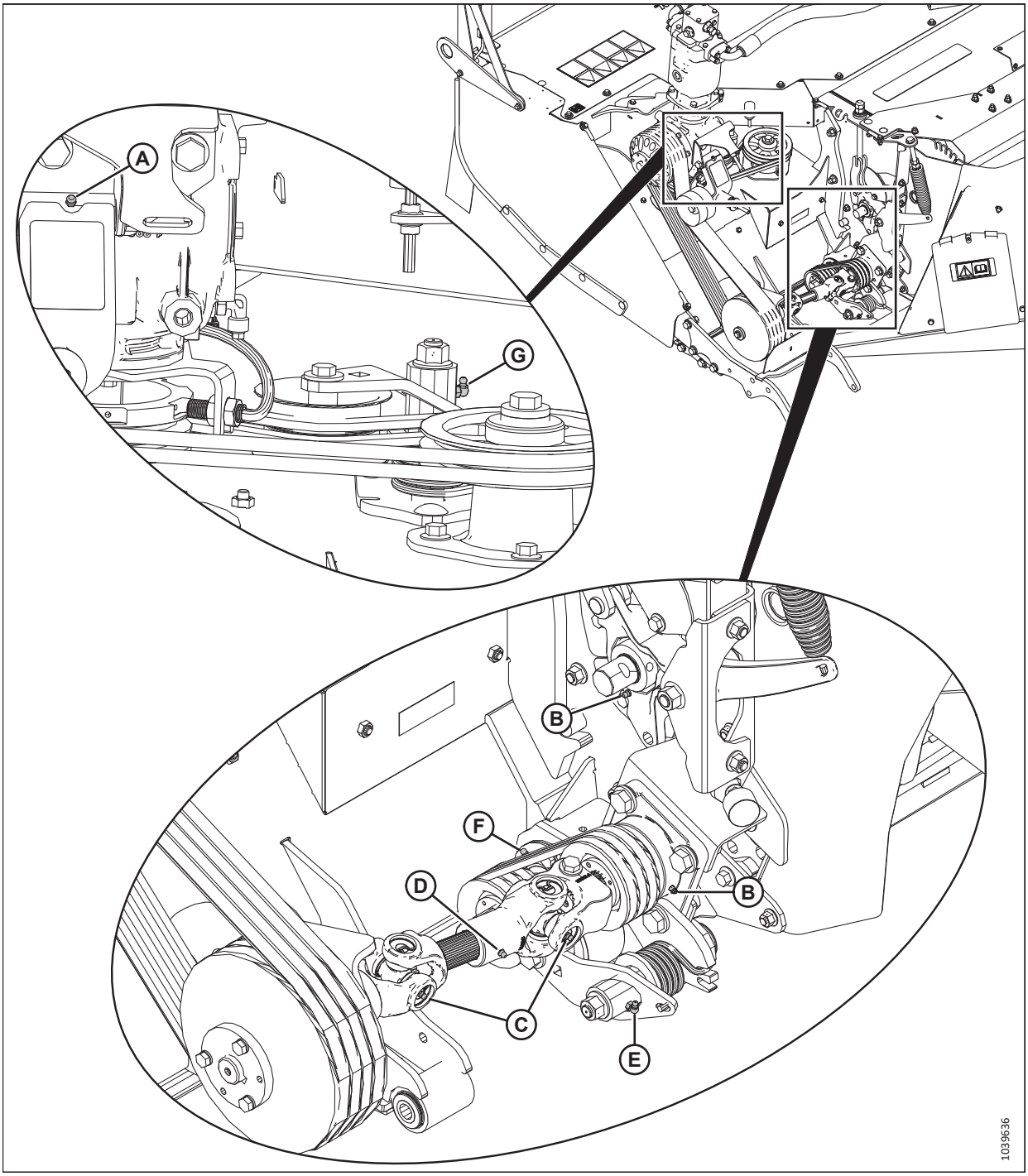


Figure 4.6: Left Lubrication Locations

A - Idler/Tensioner Pivot
B - Bearing, Roller Conditioner (Two Places)
C - U-Joint, Conditioner Driveline (Two Places)
D - Slip Joint, Conditioner Driveline[5]
E - Idler/Tensioner Pivot
F - Bearing, Feed Roll
G - Tensioner Arm

5. Use high-temperature, extreme-pressure (EP2) performance grease with 10% max molybdenum disulphide (NLGI grade 2) lithium base.

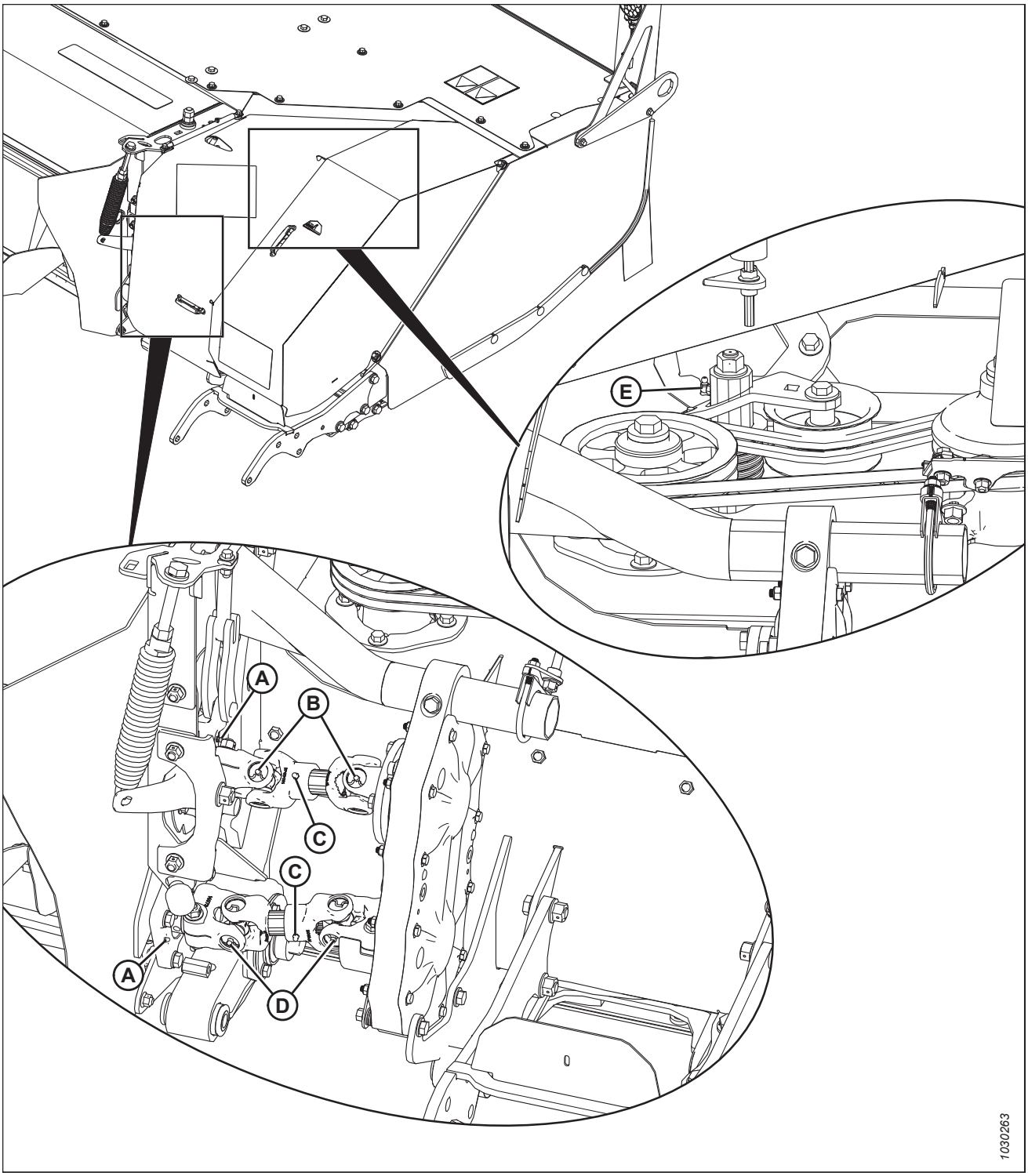


Figure 4.7: Right Lubrication Locations

A - Bearing, Roller Conditioner (Two Places)
B - U-Joint, Upper Driveline (Two Places)
C - Slip Joints, Conditioner Drivelines[6]
D - U-Joint, Lower Driveline (Two Places)
E - Idler Pivot

6. Use high-temperature, extreme-pressure (EP2) performance grease with 10% max molybdenum disulphide (NLGI grade 2) lithium base.

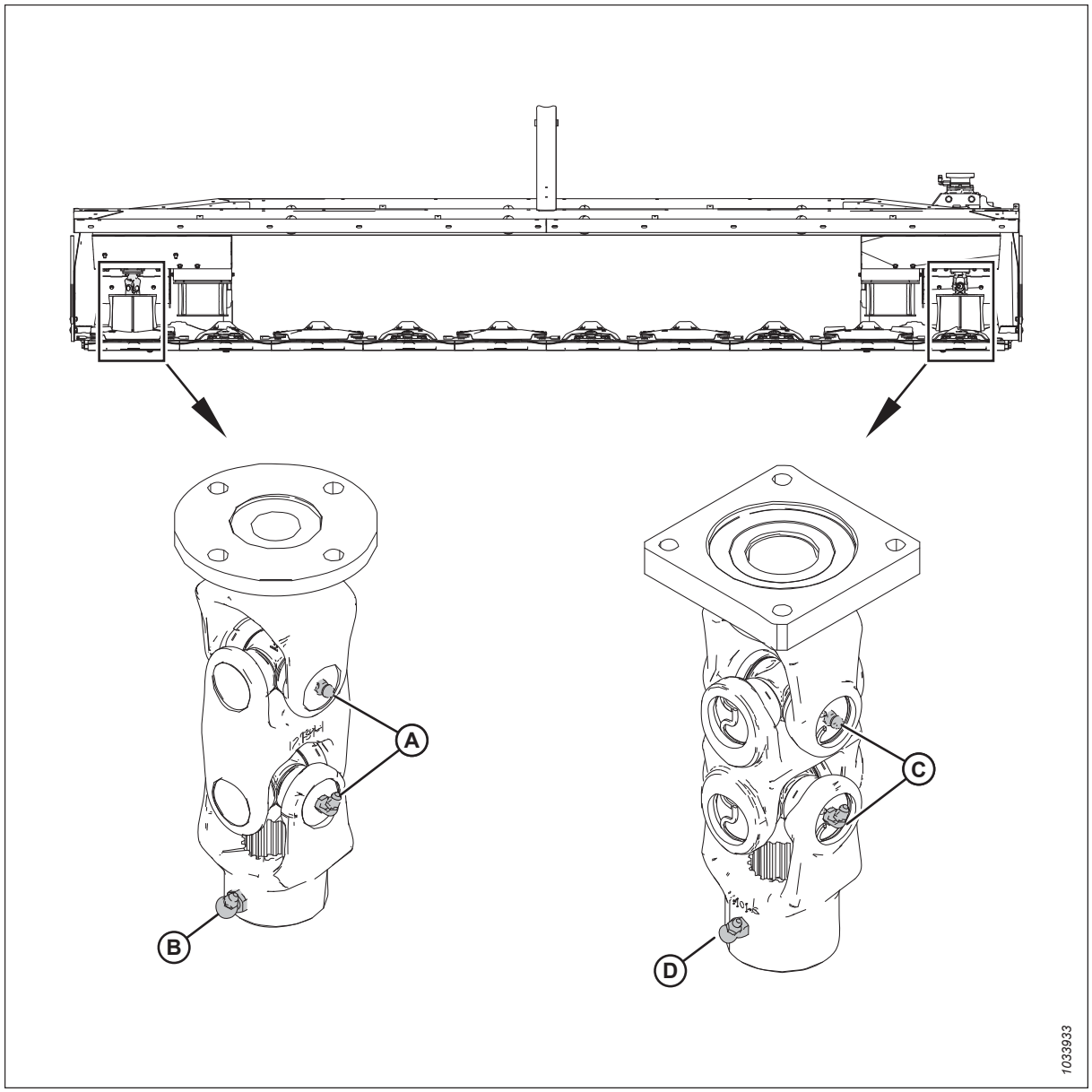


Figure 4.8: Vertical Drivelines Lubrication Locations

A - Right Driveline U-Joints (Two Places)[7] **B - Right Driveline Shaft (One Place)**[8] **C - Left Driveline U-Joints (Two Places)**[9]
D - Left Driveline Shaft (One Places)[8]

7. For fittings (A) and (C), use high-temperature, extreme-pressure (EP2) performance grease with 10% max molybdenum disulphide (NLGI grade 2) lithium base. To access these lubrication points, refer to *Lubricating Vertical Drivelines*.
8. Fittings (B) and (D), use high-temperature, extreme-pressure (EP2) performance grease with 1% max molybdenum disulphide (NLGI grade 2) lithium base. To access these lubrication points, refer to *Lubricating Vertical Drivelines*
9. For fitting (A) and (C), use high-temperature, extreme-pressure (EP2) performance grease with 10% max molybdenum disulphide (NLGI grade 2) lithium base. To access these lubrication points, refer to *Lubricating Vertical Drivelines*

4.5.3 Lubrication Locations – Grass Seed Headers

This topic identifies lubrication locations according to the maintenance schedule for grass seed headers.

Lubricate idler/tensioner locations (A) and (D) every 25 hours. Lubricate grass seed drum locations (B), (C), (E), and (F) every 50 hours. Use high-temperature, extreme-pressure performance grease with 1% max molybdenum disulphide (NLGI grade 2) lithium base for all locations.

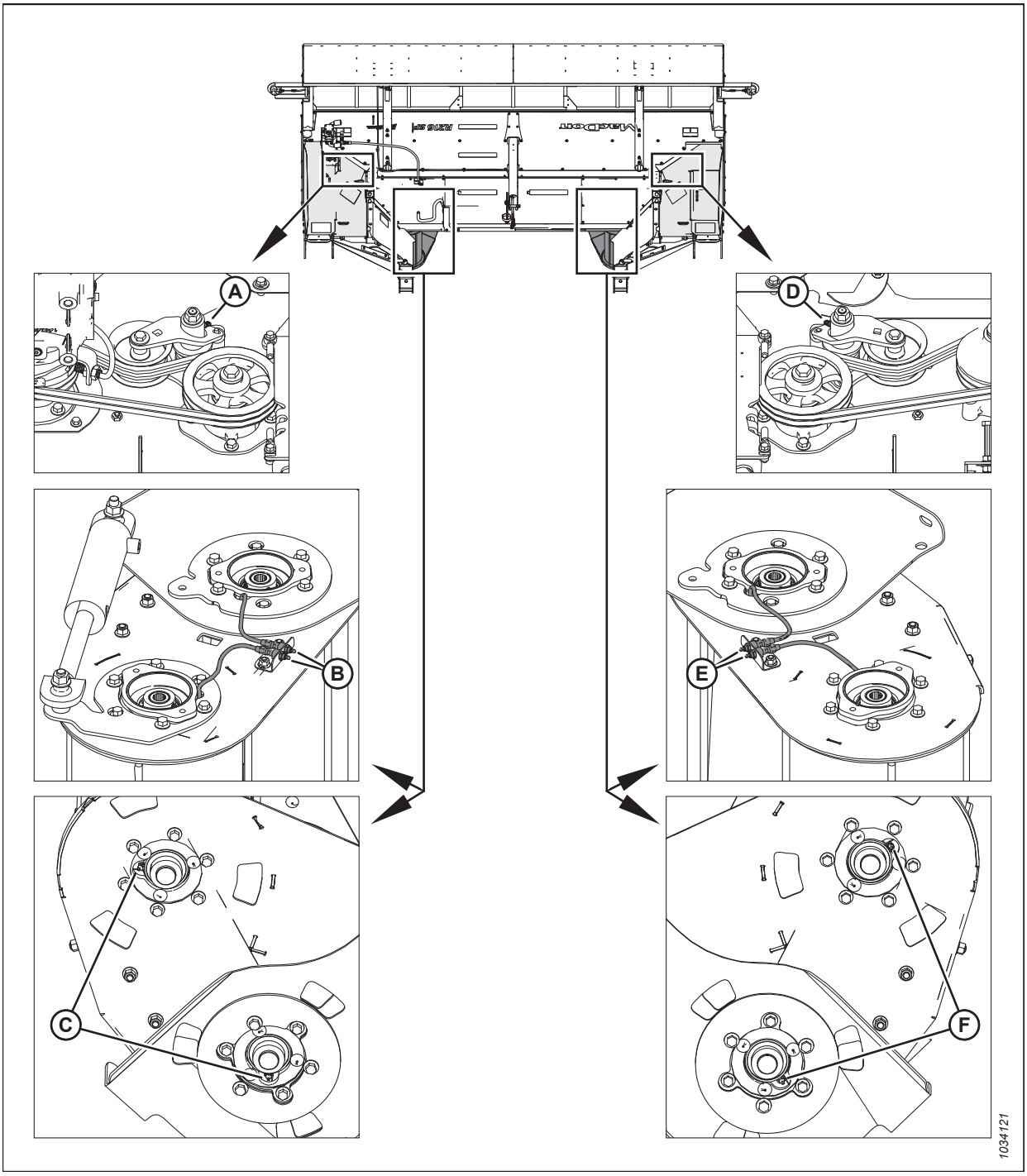


Figure 4.9: Lubrication Locations – Grass Seed

A - Left Idler/Tensioner Pivot
B - Top of Left Grass Seed Drum (Two Places)
C - Bottom of Left Grass Seed Drum (Two Places)
D - Right Idler/Tensioner Pivot
E - Top of Right Grass Seed Drum (Two Places)
F - Bottom of Right Grass Seed Drum (Two Places)

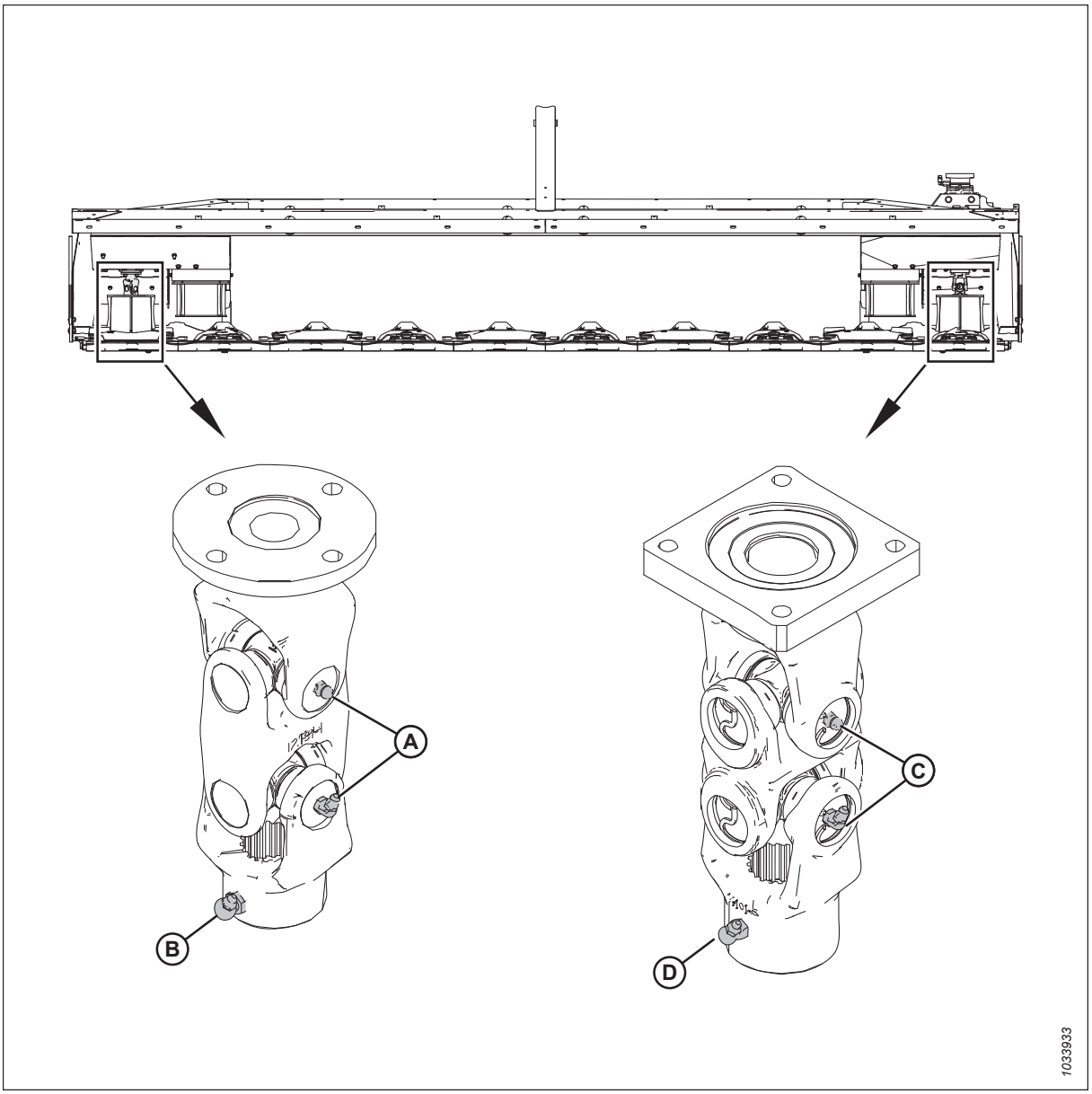


Figure 4.10: Vertical Drivelines Lubrication Locations

A - Right Driveline U-Joints (Two Places)[10] **B - Right Driveline Shaft (One Place)**[11] **C - Left Driveline U-Joints (Two Places)**[12]
D - Left Driveline Shaft (One Places)[11]

10. For fittings (A) and (C), use high-temperature, extreme-pressure (EP2) performance grease with 10% max molybdenum disulphide (NLGI grade 2) lithium base. To access these lubrication points, refer to *Lubricating Vertical Drivelines*.
11. Fittings (B) and (D), use high-temperature, extreme-pressure (EP2) performance grease with 1% max molybdenum disulphide (NLGI grade 2) lithium base. To access these lubrication points, refer to *Lubricating Vertical Drivelines*
12. For fitting (A) and (C), use high-temperature, extreme-pressure (EP2) performance grease with 10% max molybdenum disulphide (NLGI grade 2) lithium base. To access these lubrication points, refer to *Lubricating Vertical Drivelines*

4.5.4 Lubrication Locations – Gauge Rollers (Option)

Gauge rollers (MD #B6855) are optional.

Grease two grease fittings (A) on both gauge rollers every 25 hours using high-temperature, extreme-pressure performance grease with 1% max molybdenum disulphide (NLGI grade 2) lithium base.

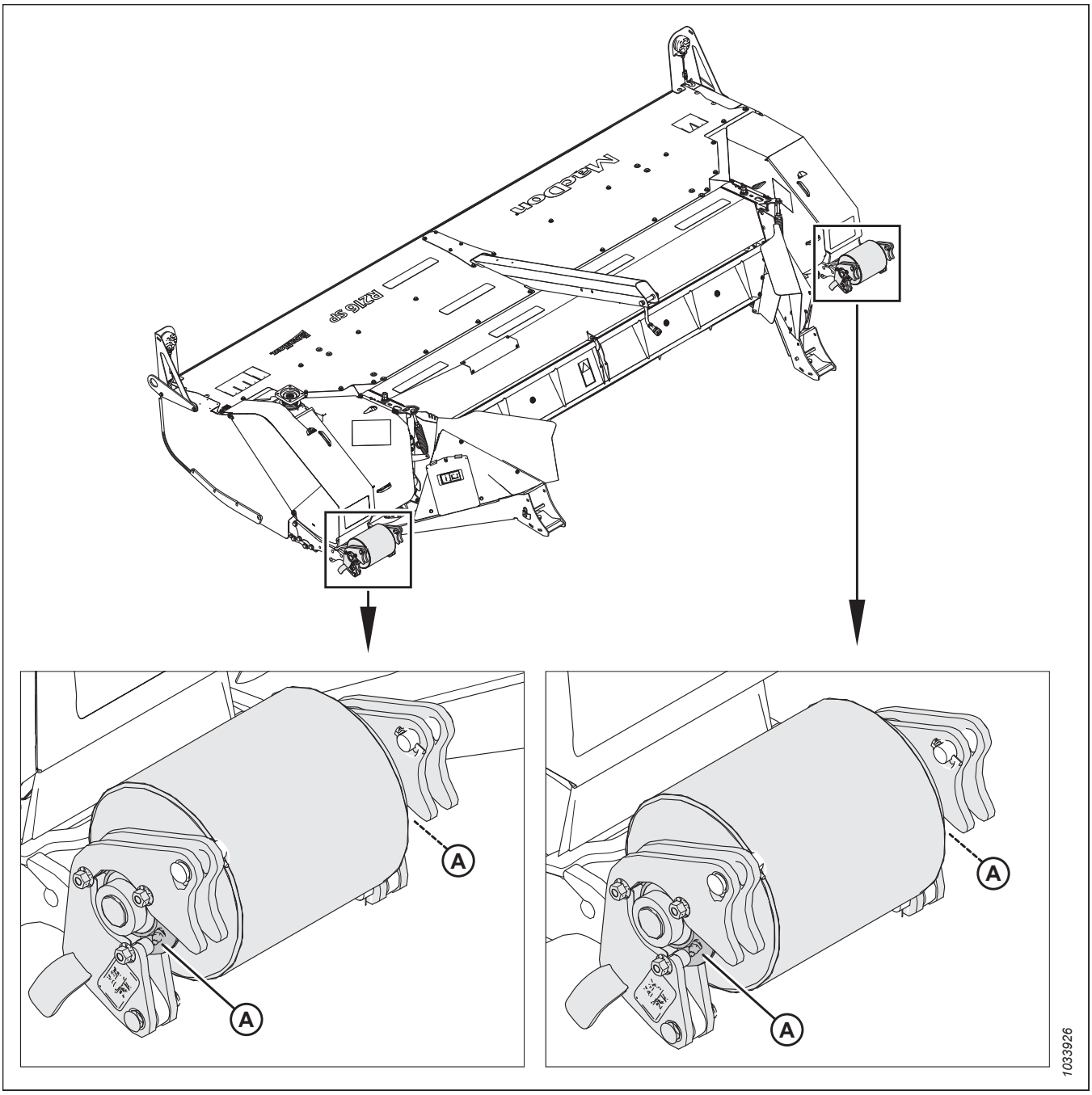


Figure 4.11: Gauge Rollers Lubrication Locations

4.6 Cutterbar System

The R216 cutterbar contains 10 rotating discs. Each disc has two blades on it. Each cutting disc is equipped with a rock guard to protect the cutterbar and discs from stones and debris, and to prevent the cutterbar from digging into the ground.

Check and change the lubricant at regular intervals. For instructions, refer to *4.4 Maintenance Requirements, page 167*.

IMPORTANT:

Warm-up cold lubricant by idling the machine for 10 minutes prior to checking lubricant level.

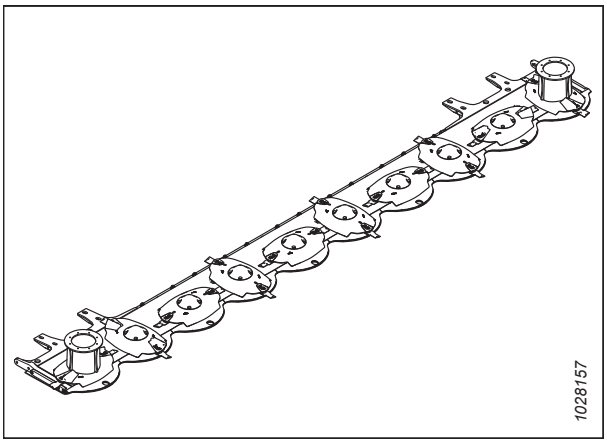


Figure 4.12: R216 SP Cutterbar

4.6.1 Lubricating Cutterbar

Checking and Adding Lubricant in Cutterbar

Make sure the oil level is correct to maximize the service life of the cutterbar. Too much or too little oil can cause excessive heat buildup in 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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

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 level ground.
2. Lower the header onto 25 cm (10 in.) blocks under both ends of the cutterbar.
3. Shut down the engine, and remove the key from the ignition.

4. Open cutterbar curtain (A). For instructions, refer to *3.10.1 Opening Cutterbar Curtain, page 119*.

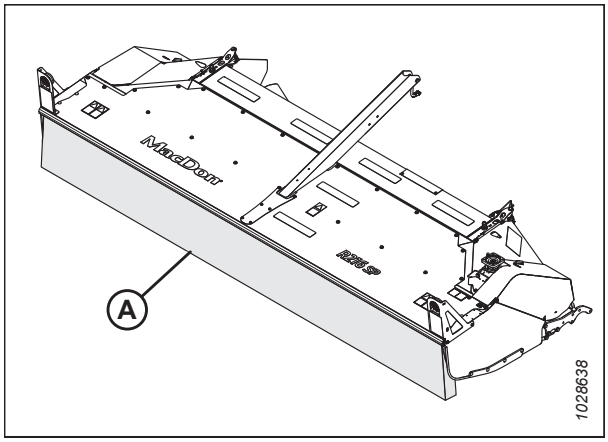


Figure 4.13: Cutterbar Curtain – Header with Conditioner Shown

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

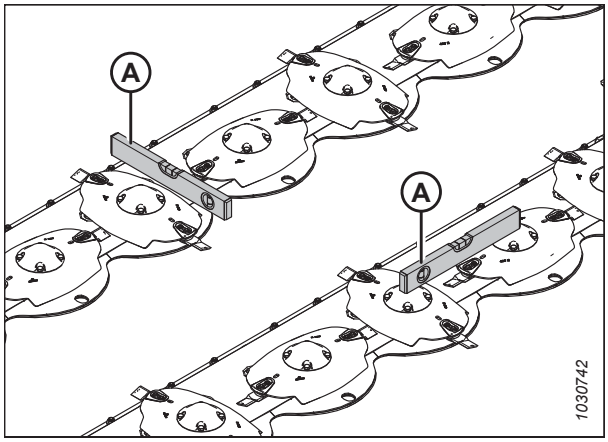


Figure 4.14: Spirit Level on Cutterbar

6. Clean the area around plug (A). Place a 5 liter (5.2 US qts) container under plug (A).
7. Use a 17 mm socket to remove plug (A) and gasket (B) from the cutterbar. The should be at the level of the inspection plug hole. If additional oil is needed, proceed to the next step. If additional lubricant is **NOT** required, proceed to Step *22, page 181*.
8. Reinstall the inspection plug.

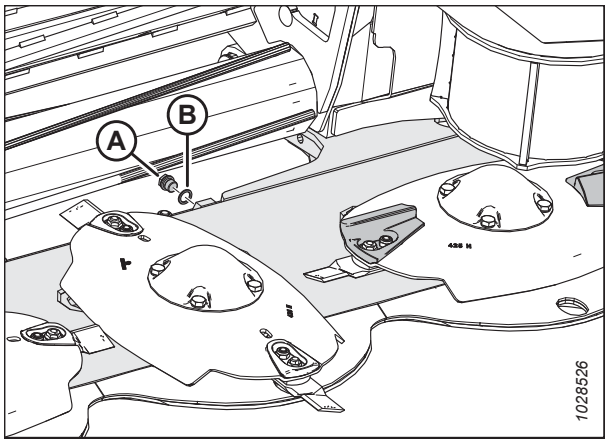


Figure 4.15: Cutterbar Oil Inspection Plug

DANGER

Ensure that all bystanders have cleared the area.

9. Start the engine, and raise the header slightly.
10. Lower the header onto blocks, so the right end is slightly higher than left end.

11. Shut down the engine, and remove the key from the ignition.
12. Remove plug (A) at the right end of the header.

    IMPORTANT:

    Do **NOT** remove bolts (B).
13. Add lubricant as needed.

    IMPORTANT:

    Do **NOT** overfill the cutterbar. Overfilling can cause the cutterbar to overheat, resulting in equipment damage..

    NOTE:

    Refer to the inside back cover of this manual for lubrication specifications.
14. Replace plug (A) and torque it to 30 Nm (22 lbf·ft).

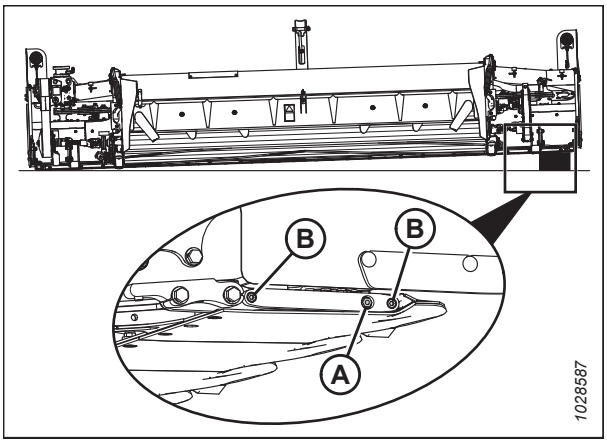


Figure 4.16: Cutterbar Oil Plug

DANGER

Ensure that all bystanders have cleared the area.

15. Start the engine and raise the header fully.
16. Shut down the engine, and remove the key from the ignition. Engage the windrower lift cylinder safety props.
17. Remove the block from under the header.
18. Disengage the windrower lift cylinder safety props.

DANGER

Ensure that all bystanders have cleared the area.

19. Start the engine, and lower the header to a level position on the ground.
20. Shut down the engine, and remove the key from the ignition.
21. Recheck the oil level.
22. Check gasket (B) for breaks or cracks, and replace it if necessary.
23. Install plug (A) and gasket (B). Tighten the plug securely.

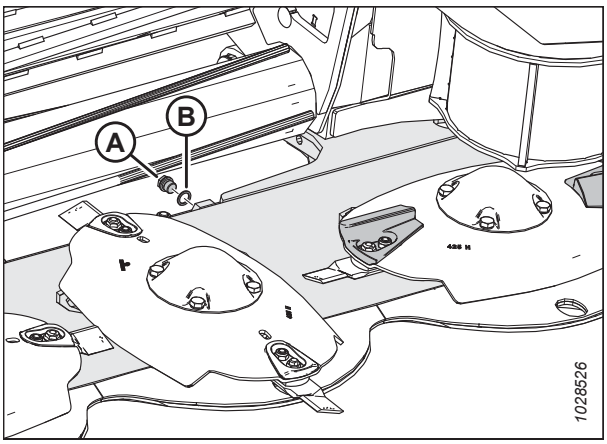


Figure 4.17: Cutterbar Oil Inspection Plug

24. Close cutterbar curtain (A). For instructions, refer to *3.10.2 Closing Cutterbar Curtain, page 120*.

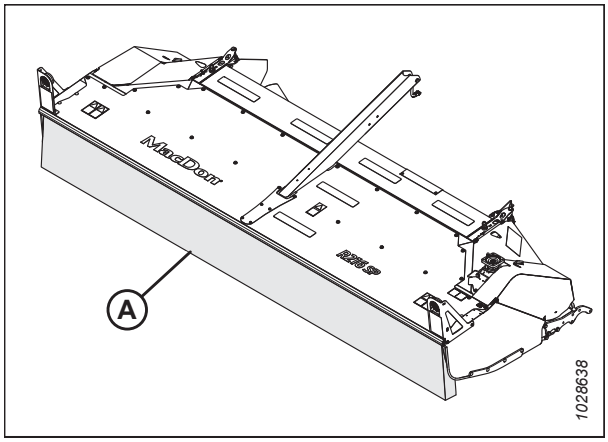


Figure 4.18: Cutterbar Curtain – Header with Conditioner Shown

Draining the Cutterbar

Drain the cutterbar if the oil level is too high, or drain the cutterbar completely if the oil will be changed.

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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

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

WARNING

Ensure that all bystanders have cleared the area.

1. Start the engine, and raise the disc header.
2. Shut down the engine, and remove the key from the ignition.
3. Place a block under each end of the disc header as shown, so that the right end of the header 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 lead to breather contamination or failure.
4. Start the engine.
5. Tilt the header fully forward, and lower the header onto the blocks.
6. Shut down the engine, and remove the key from the ignition.

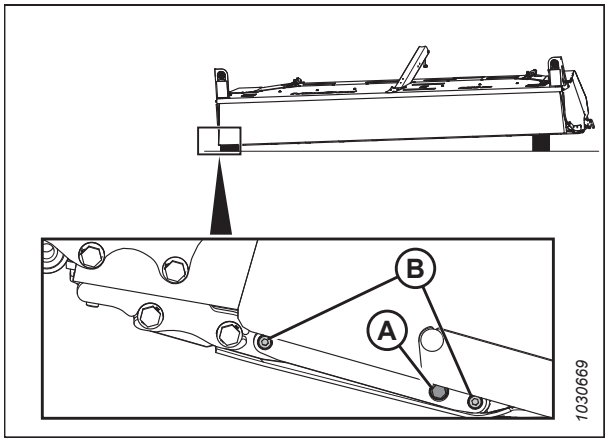


Figure 4.19: Disc Header Tilted Forward

7. Place a 10 liter (10.5 US qts) container under the right end of the cutterbar. Clean the area around plug (A), and remove the plug.

   IMPORTANT:

   Do **NOT** remove hex head bolts (B) securing the cutterbar end plate to the cutterbar; lubricant leaks may result.

8. Allow sufficient time for the lubricant to drain, then reinstall cutterbar plug (A).

   NOTE:

   Do **NOT** flush the cutterbar.

9. Fill the cutterbar with lubricant before operating the disc header. For instructions, refer to *Filling Cutterbar with Lubricant, page 183*.

   IMPORTANT:

   Dispose of used lubricant responsibly.

Filling Cutterbar with Lubricant

Fill the cutterbar with lubricant after completely draining the cutterbar of oil.

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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

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

WARNING

Ensure that all bystanders have cleared the area.

IMPORTANT:

The cutterbar should be completely empty of oil before filling it. For instructions, refer to *Draining the Cutterbar, page 182*.

If you are checking oil level or topping it up, refer to *Checking and Adding Lubricant in Cutterbar, page 179*.

1. Start the engine, and raise the header fully.
2. Place a block under each end of the header, so that the right end of the header is higher than the left end.
3. Start the engine. Lower the header onto the blocks.
4. Shut down the engine, and remove the key from the ignition.

5. Remove access plug (A) from the raised end of the cutterbar and add the **EXACT** amount of lubricant specified. Refer to the inside back cover of this manual for a list of recommended fluids, lubricants, and quantities for the machine.

   IMPORTANT:

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

   NOTE:

   Do **NOT** remove hex bolts (B) securing the cutterbar end plate to the rest of the cutterbar, or lubricant leaks may result.

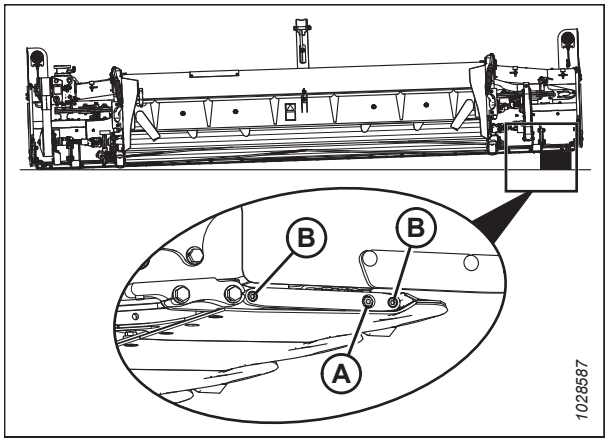


Figure 4.20: Cutterbar Access Plug

6. Install access plug (A). Torque the plug to 30 Nm (22 lbf·ft).
7. Start the engine, and raise the header fully.
8. Shut down the engine, and remove the key from the ignition. Engage the windrower lift cylinder safety props. For instructions, refer to the procedure according to the type of windrower:
   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*
9. Remove the blocks from under the cutterbar.
10. Lower the header.
11. Shut down the engine, and remove the key from the ignition. Disengage the windrower lift cylinder safety props. For instructions, refer to the procedure according to the type of windrower:
    - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
    - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*
12. Check the lubricant level. For instructions, refer to *Checking and Adding Lubricant in Cutterbar, page 179*.

4.6.2 Cutterbar Discs

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

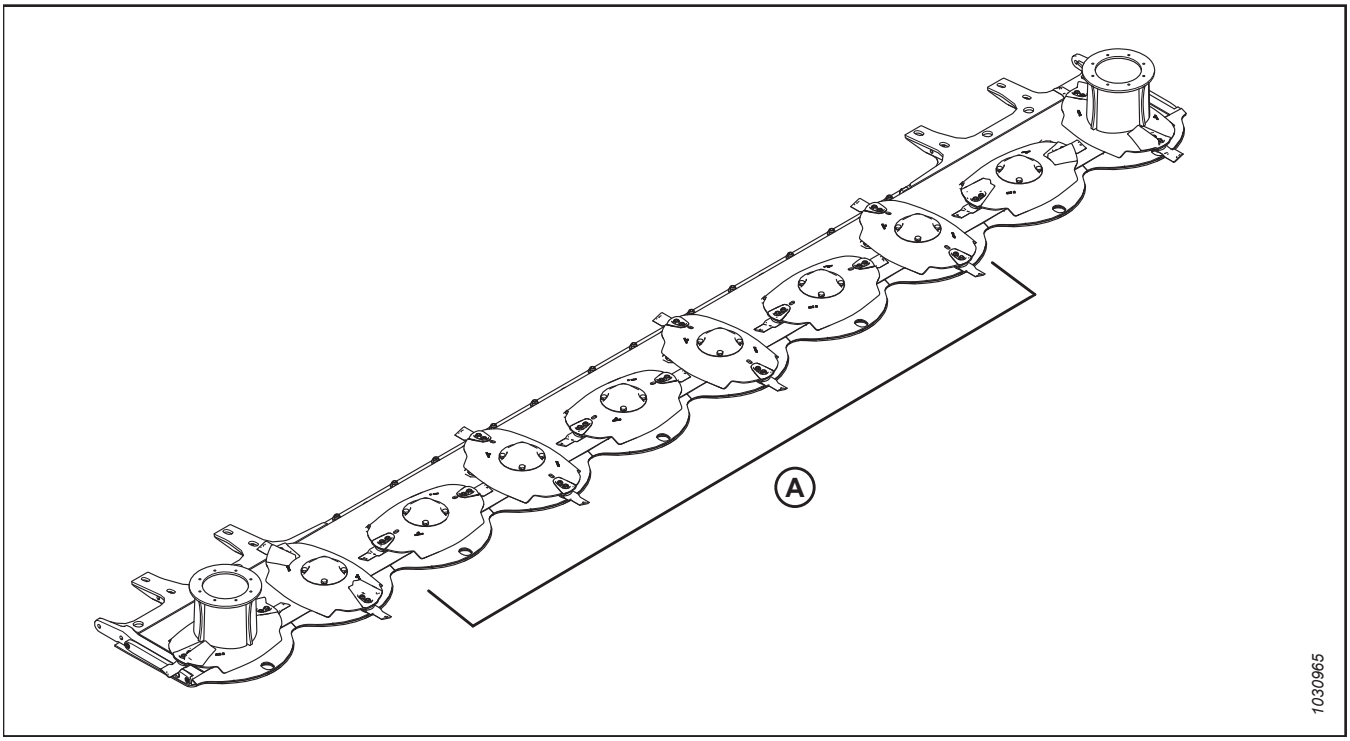


Figure 4.21: Interchangeable Cutterbar Discs

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

The cutterbar discs will need to be inspected periodically for damage or wear. Deformed or damaged discs can damage other parts of the header during operation, which can result in poor cutting performance.

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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

Disc blades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with 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 may damage the cutterbar, which could result in poor cutting performance. Replace damaged blades immediately.

IMPORTANT:

Ensure that the cutterbar remains balanced. An unbalanced cutterbar can lead to premature failure of the cutterbar components.

1. Place the header in a position where you can access the component that will be serviced.
2. Shut down the engine, and remove the key from the ignition.
3. If the header is fully raised, engage the safety props. If the header is off the ground and not fully raised, place blocks under the header. Never work on or beneath an unsupported header. For instructions on engaging the safety props, refer to the relevant procedure:
   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*

IMPORTANT:

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

4. Inspect cutterbar disc surface (D) for cracks, excessive wear, and disc distortion.
5. Inspect cutterbar disc edges (E) for cracks, excessive wear, and edge distortion.
6. Ensure that disc blade fasteners (A) are securely attached to the cutterbar disc and that nut shields (B) are present and undamaged. Replace these components as needed.
7. Check that cutterbar disc bolts (C) are securely attached to the spindles. Tighten these bolts as needed.

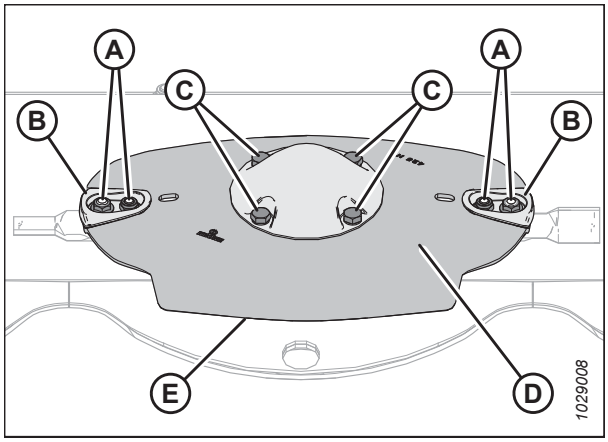


Figure 4.22: Cutterbar Disc

8. Inspect the cutterbar disc for severe deformation. If the disc is deformed, dimension (A) must **NOT** exceed 48 mm (1 7/8 in.). Replace the discs as needed.

   NOTE:

   Dimension (A) refers to the space between the cutterbar and the edge of the cutterbar disc.

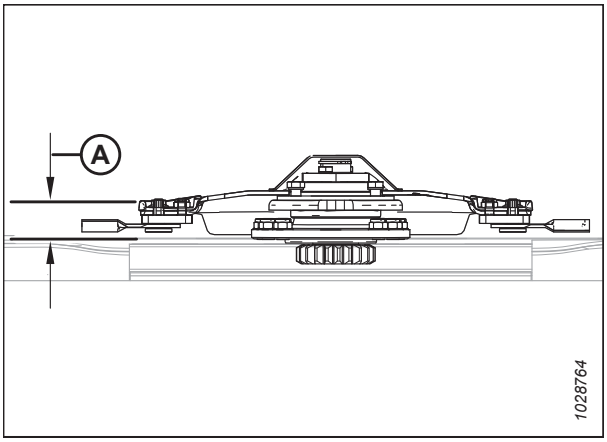


Figure 4.23: Cutterbar Disc – Cutaway View

9. Inspect the cutterbar disc for abrasion (for example, abraded area [A]). The wear limit for abrasion is reached when the material thickness of the cutterbar discs is less than 3 mm (1/8 in.). Replace the discs as needed.

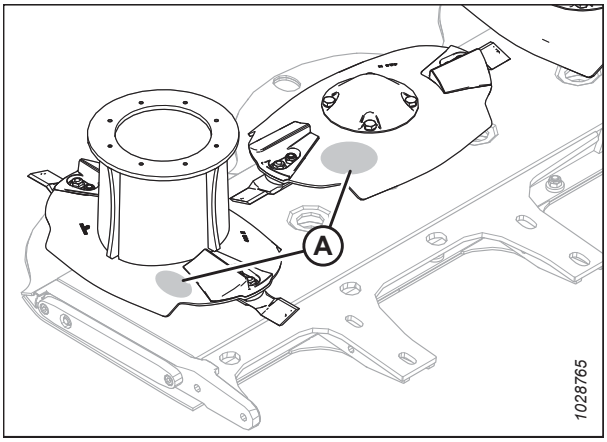


Figure 4.24: Cutterbar Disc – View from Above

Removing Cutterbar Discs

This procedure applies to the cutterbar discs that are not attached to a driveline. Remove the disc to replace it and/or to inspect spindle components.

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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

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

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

3. Engage the windrower lift cylinder safety props. For instructions, refer to the procedure according to the type of windrower:
   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*
4. Open cutterbar curtain (A). For instructions, refer to *3.10.1 Opening Cutterbar Curtain, page 119*.

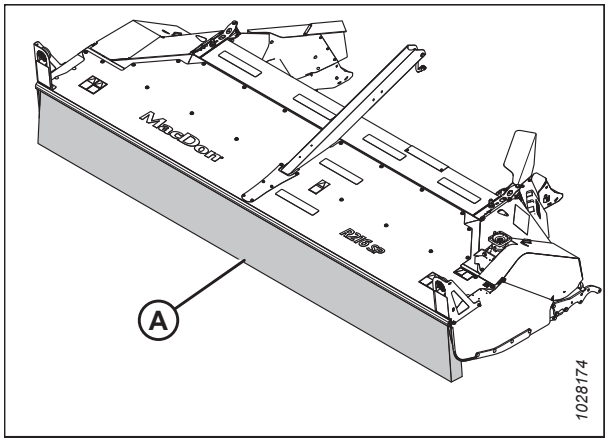


Figure 4.25: Cutterbar Curtain

5. Place a pin (or equivalent) in the front hole of rock guard (B) to prevent disc rotation while loosening bolts.
6. Remove four M12 bolts (A) and washers.

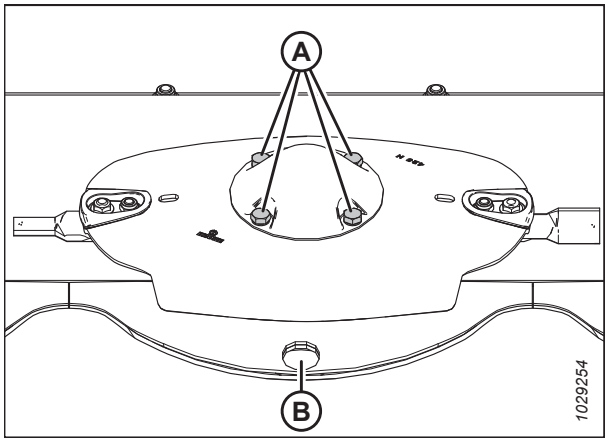


Figure 4.26: Cutterbar Disc Bolts

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

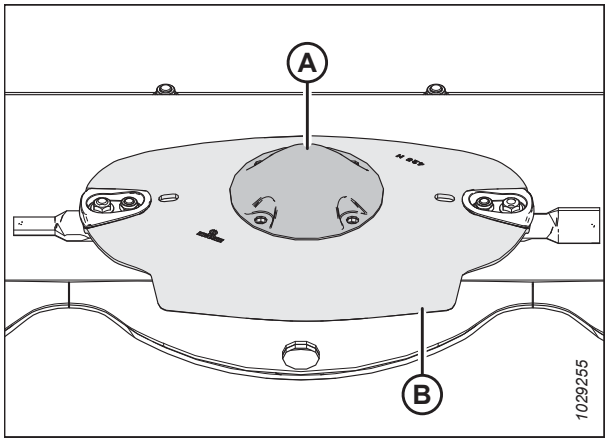


Figure 4.27: Cutterbar Disc and Cap

9. To remove the outboard cutterbar discs, refer to *Removing Left Driven Drum and Driveline, page 230* and *Removing Right Driven Drum and Driveline, page 236*.

Installing Cutterbar Discs

This procedure applies to the cutterbar discs that are not attached to a driveline. Install the disc so that it is rotated 90° in relation to 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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

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

1. Place the header in a position where you can access the component that will be serviced.
2. Shut down the engine, and remove the key from the ignition.
3. If the header is fully raised, engage the safety props. If the header is off the ground and not fully raised, place blocks under the header. Never work on or beneath an unsupported header. For instructions on engaging the safety props, refer to the relevant procedure:
   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*
4. Place a pin (or equivalent) in front hole (D) of the rock guard to prevent disc rotation while tightening bolts.
5. Position new disc (A) on the spindle, ensuring that it is positioned at a 90° angle in relation to the adjacent discs.
6. Install cutterbar disc cap (B), and secure assembly with four M12 bolts and washers (C). Torque bolts to 85 Nm (63 lbf·ft).

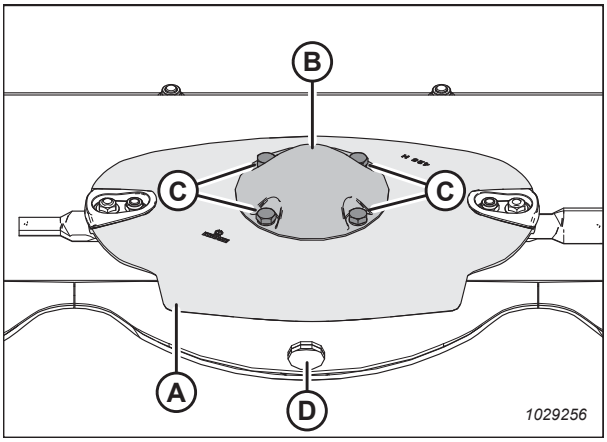


Figure 4.28: Cutterbar Disc and Cap

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.

7. Remove pin (or equivalent) from the front hole of the rock guard.

8. Close the cutterbar curtain. For instructions, refer to *3.10.2 Closing Cutterbar Curtain, page 120*.

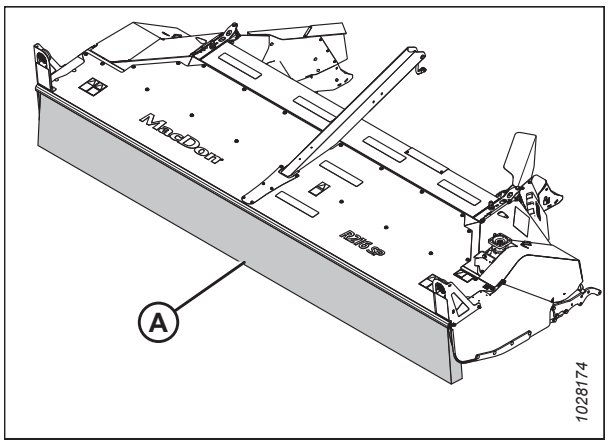


Figure 4.29: Cutterbar Curtain

9. To install the outboard cutterbar discs, refer to *Installing Left Driven Drum and Driveline, page 233* and *Installing Right Driven Drum and Driveline, page 239*.

4.6.3 Cutterbar Spindles

Spindles allow the cutterbar discs to rotate.

To prevent damage to the cutterbar and drive systems, each disc is attached to a spindle containing a shear pin (A).

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 while remaining attached to the spindle by snap ring (B).

NOTE:

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

Refer to *4.6.8 Cutterbar Spindle Shear Pin, page 249* for instructions on replacing the shear pin.

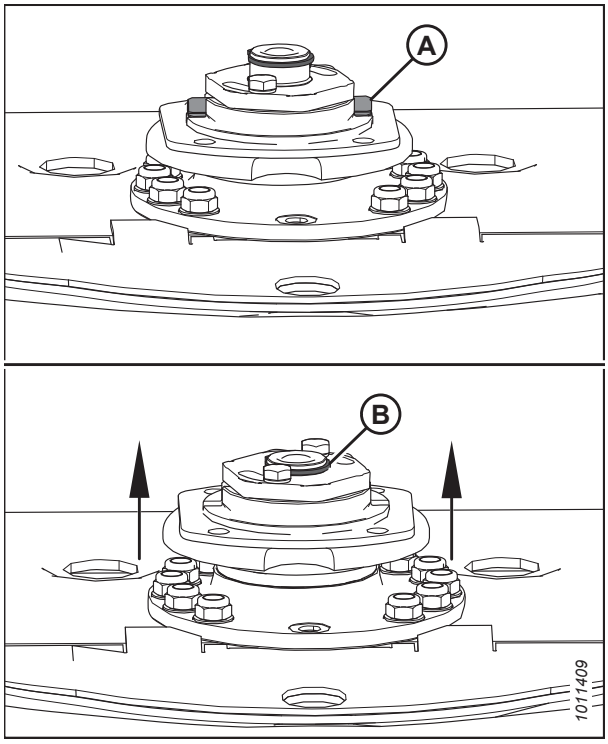


Figure 4.30: Cutterbar Spindles

IMPORTANT:

- Spindles that rotate clockwise have right-leading threading and can be identified by the smooth top on spindle gear shaft (A).
- Spindles that rotate counterclockwise have left-leading threading and can be identified by the machined grooves on spindle gear shaft (B) and nut (C).
- If the spindle's 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 the cutterbar components.
- Safecut components (that is, shear pins) will not be effective if the spindles are installed in the wrong orientation.

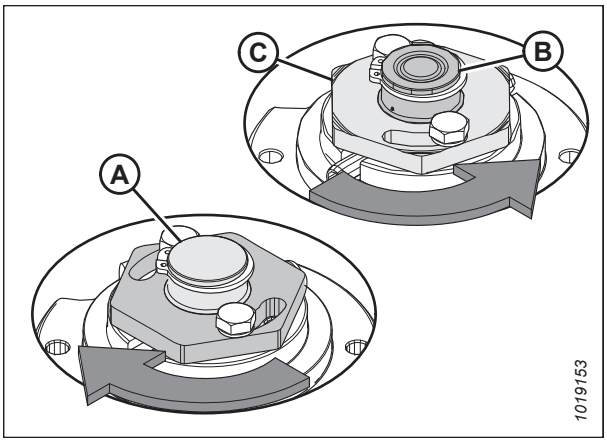


Figure 4.31: Cutterbar Spindles

Removing Cutterbar Spindles

The disc and spacer plate covering the rotary disc header's spindle will need to be removed so that the spindle 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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

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

1. Park the windrower on a level surface.
2. Place the header in a position where you can access the component that will be serviced.
3. Shut down the engine, and remove the key from the ignition.
4. If the header is fully raised, engage the safety props. If the header is off the ground and not fully raised, place blocks under the header. Never work on or beneath an unsupported header. For instructions on engaging the safety props, refer to the relevant procedure:
   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*

5. Open cutterbar curtain (A). For instructions, refer to *3.10.1 Opening Cutterbar Curtain, page 119*.

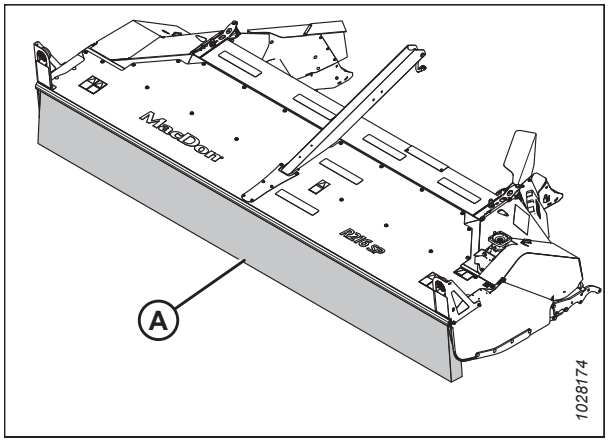


Figure 4.32: Cutterbar Curtain

6. Place a pin (or equivalent) in front hole (B) of the rock guard to prevent the disc from rotating while the hardware is removed.
7. Remove four M12 bolts and washers (A).

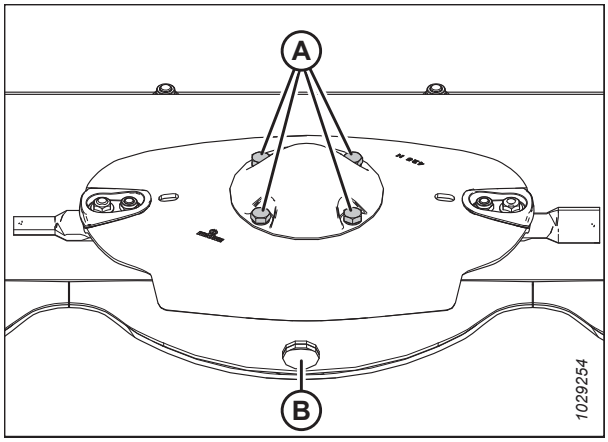


Figure 4.33: Cutterbar Disc Bolts

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

IMPORTANT:

Each blade is designed for either clockwise or counterclockwise rotation. Ensure that the entire disc is swapped when a spindle changes position.

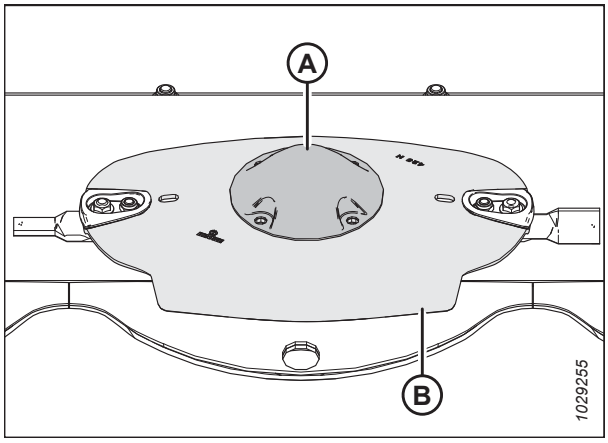


Figure 4.34: Cutterbar Disc and Cap

10. Remove spacer plate (A).

    NOTE:

    The area around the spindle must be cleaned thoroughly to prevent debris from entering into the cutterbar gearbox.

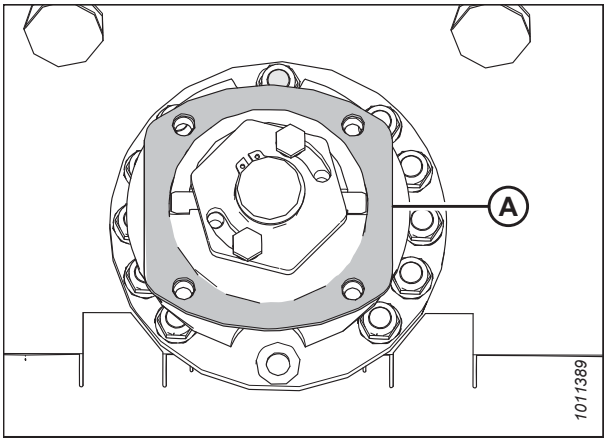


Figure 4.35: Spacer Plate

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

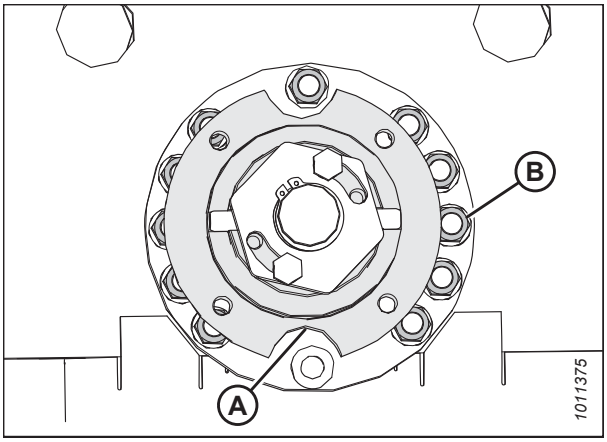


Figure 4.36: Left Spindle Hub and Hardware

12. Remove spindle (A) from the cutterbar.

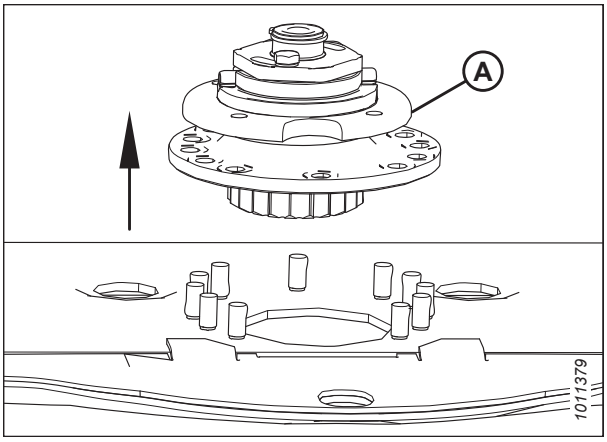


Figure 4.37: Left Spindle

Installing Cutterbar Spindles

Spindles must be installed correctly with respect to their direction of rotation (clockwise or counterclockwise) and their position relative to neighboring discs.

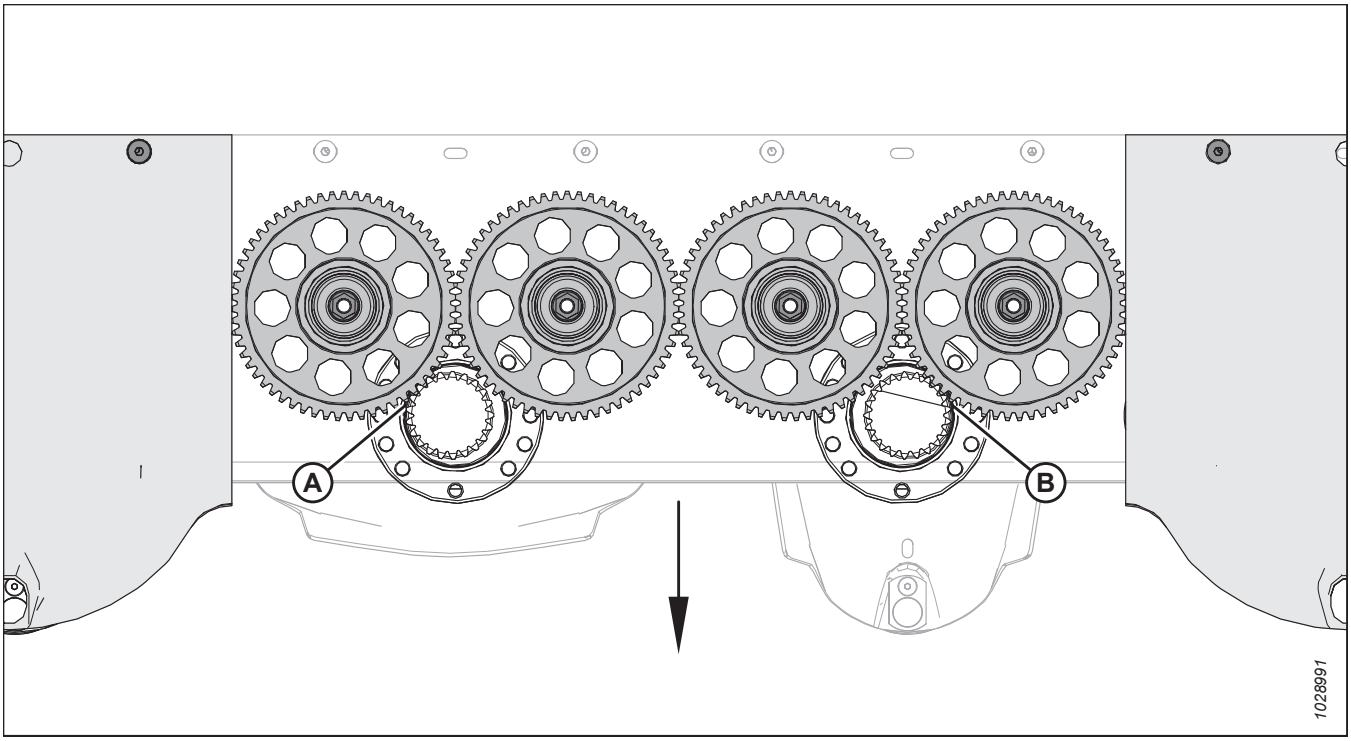


Figure 4.38: Underside of Cutterbar Spindles

NOTE:

Right discs (A) and left discs (B) are slightly offset, 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

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:

- The disc blades of co-rotating discs striking each other
- The disc blades of diverging discs striking adjacent discs

NOTE:

The disc timing tool (A) (MD #307954) is stored under the right driveshield.

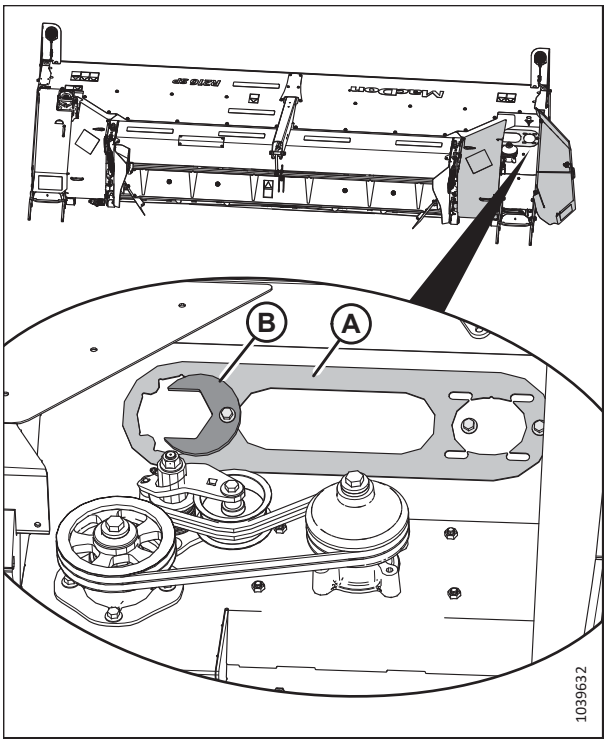


Figure 4.39: Disc Timing Tool

A - Disc Timing Tool (MD #307954)
B -Safecut Spindle-Nut Wrench

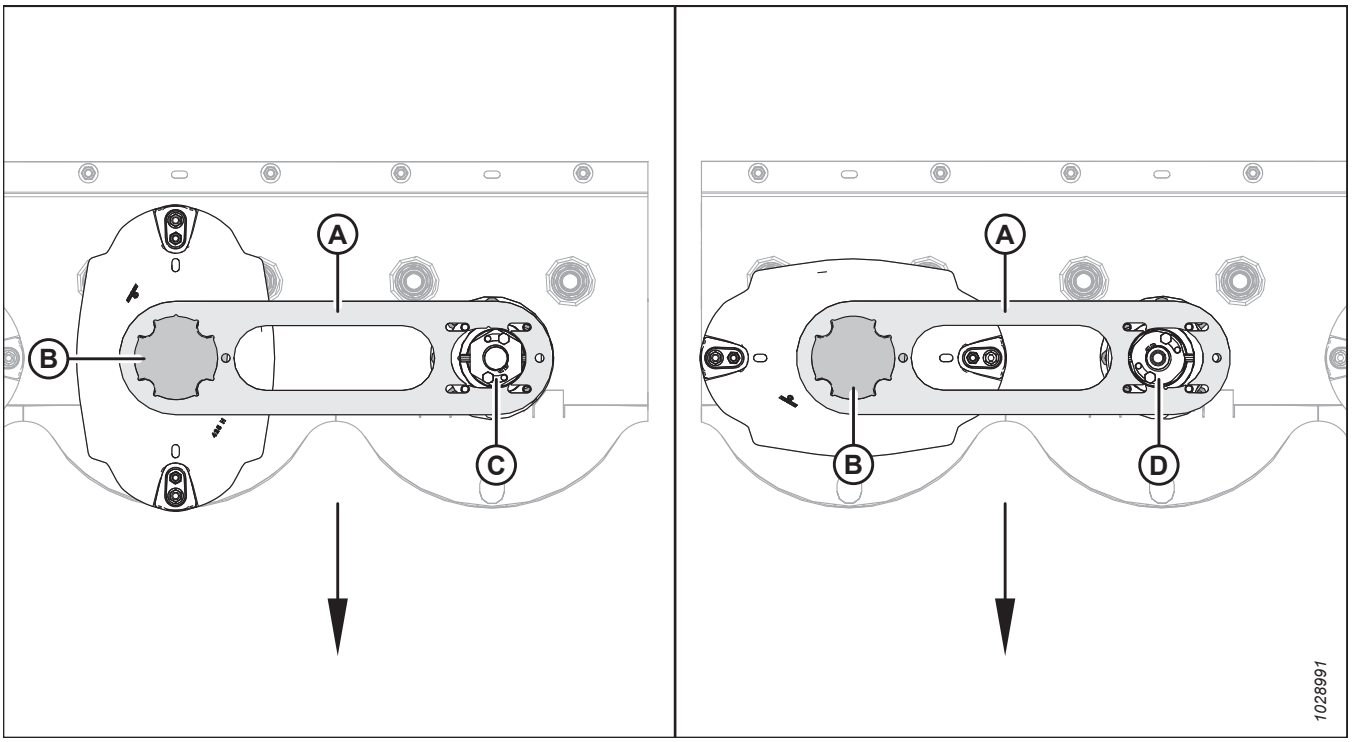


Figure 4.40: Checking Timing with Disc Timing Tool – View from Above

A - Disc Timing Tool (MD #307954)
B - Cutter Disc Cap
C - Right Disc, Correct Timing
D - Left Disc, Correct Timing

IMPORTANT:

Inspect the disc timing using the disc timing tool (MD #307954) before securing the spindle to the cutterbar. The disc is correctly timed if the spindle hub is aligned with the disc timing tool as shown. 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 180° while ensuring that the base does not turn, and reinstall the spindle. Recheck the timing before securing the hub. Spindles do **NOT** need to be bolted to the disc timing tool; visual confirmation of the alignment is sufficient.

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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

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

To install a cutterbar spindle, follow these steps:

1. Park the windrower on a level surface.
2. Place the header in a position where you can access the component that will be serviced.
3. Shut down the engine, and remove the key from the ignition.
4. If the header is fully raised, engage the safety props. If the header is off the ground and not fully raised, place blocks under the header. Never work on or beneath an unsupported header. For instructions on engaging the safety props, refer to the relevant procedure:
   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*

NOTE:

To prevent oil from spilling from the cutterbar while the disc spindle is installed, ensure that the windrower is on level surface and that the header is tilted fully backward.

5. Determine the appropriate spindle rotation pattern for the crop conditions. For instructions, refer to *4.6.3 Cutterbar Spindles, page 190*.

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

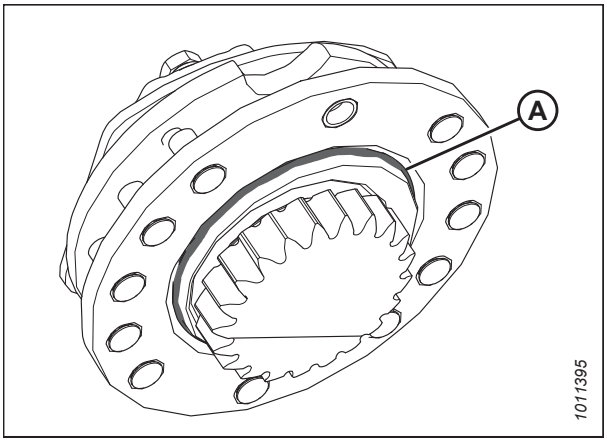


Figure 4.41: Left Spindle O-ring

7. Insert spindle (A) into the cutterbar.

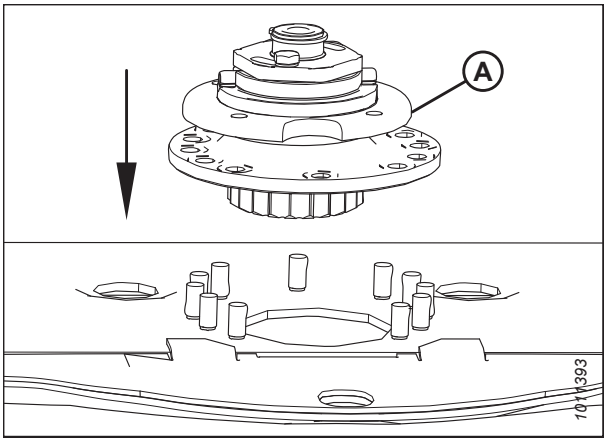


Figure 4.42: Left Spindle

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 locations.

   IMPORTANT:

   Ensure that the clockwise spindles rotate clockwise and that the counterclockwise spindles (identifiable by their machined grooves) rotate counterclockwise.

   IMPORTANT:

   The design of the spindle means that it is possible to install the spindles incorrectly. If the spindles rotate in the wrong direction, the discs will not spin up after striking an object, potentially resulting in damage to the cutterbar.

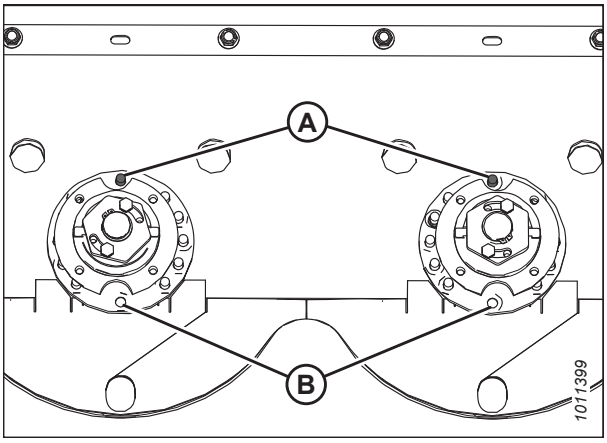


Figure 4.43: Spindle Orientation

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 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 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 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.

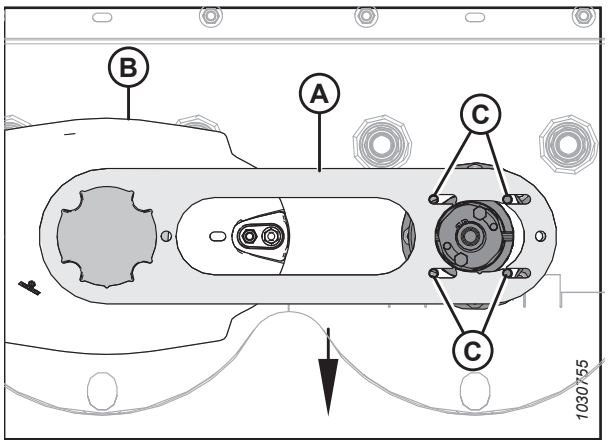


Figure 4.44: Alignment Tool

10. Ensure that hub (A) is fully seated into the cutterbar before tightening nuts (B).

11. Rotate spindle hub (A) to access the studs. Install eleven M12 lock nuts and washers (B).

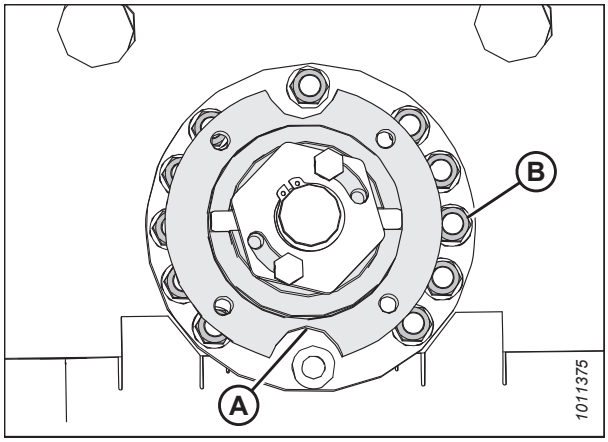


Figure 4.45: Left Spindle Hub

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

    NOTE:

    The hub has been removed from the illustration for the sake of clarity.

    IMPORTANT:

    Do **NOT** use an impact wrench to tighten the hardware; damage to the stud welds may result.

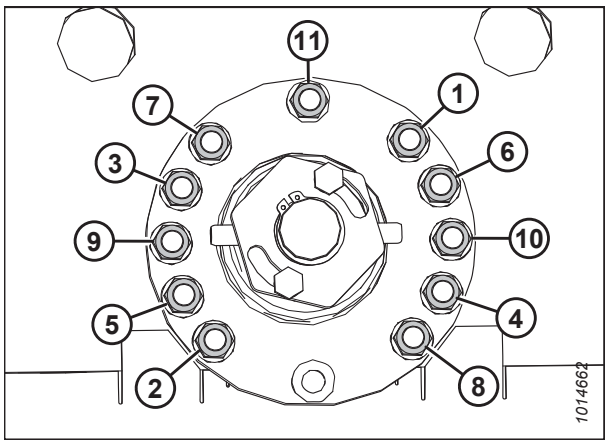


Figure 4.46: Tightening Pattern

13. Install spacer plate (A).

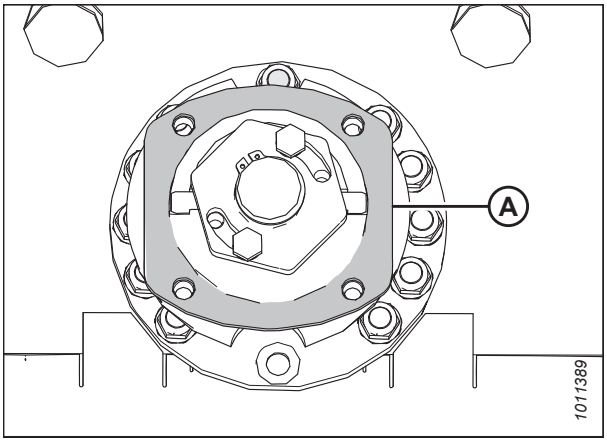


Figure 4.47: Spacer Plate

14. Place a pin (or equivalent) in front hole (D) of the rock guard to prevent the disc from rotating while the hardware is tightened.

    IMPORTANT:

    Each blade is designed for either clockwise or counterclockwise rotation. Ensure that the entire disc is swapped when a spindle changes position.

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

    NOTE:

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

16. Install cutterbar disc cap (B). Secure the assembly using four M12 bolts and washers (C). Torque the bolts to 85 Nm (63 lbf·ft).

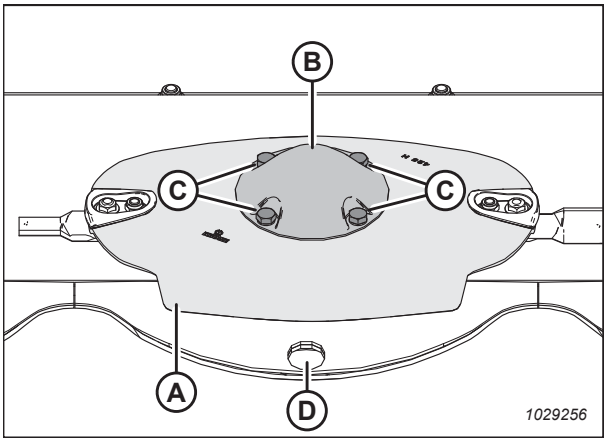


Figure 4.48: Cutterbar Disc and Cap

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.

17. Remove the pin (or equivalent) from the front hole of the rock guard.

18. Close cutterbar curtain (A). For instructions, refer to *3.10.2 Closing Cutterbar Curtain, page 120*.

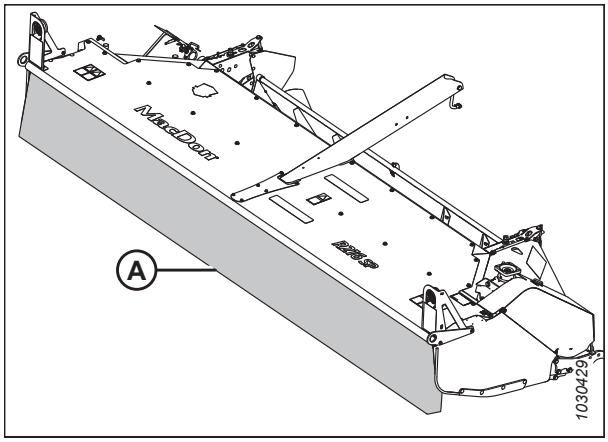


Figure 4.49: Cutterbar Curtain

4.6.4 Disc Blades

Disc blades are attached to the rotating cutting discs on the rotary disc header, and are responsible for cutting the crop.

Each disc has two blades (A) attached at opposite ends of the disc. The blades 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 they are severely worn or damaged.

IMPORTANT:

Always use factory replacement parts.

NOTE:

The discs on the rotary disc header are equipped with 18° bevel-down blades. For service parts, refer to the header parts catalog.

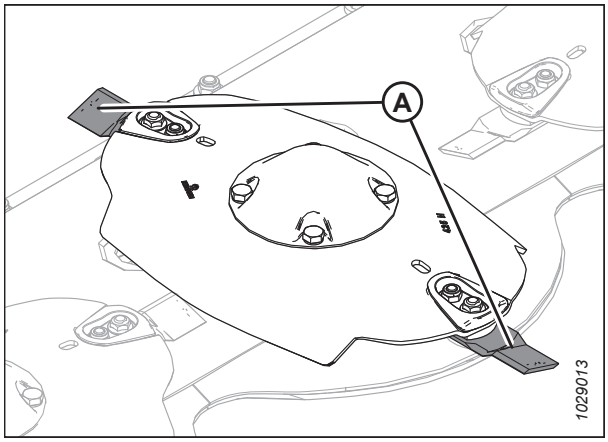


Figure 4.50: Disc Blades

Inspecting Disc Blades

The blades on the rotary disc header's discs should be inspected daily and flipped or replaced 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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

Disc blades have two sharp cutting edges that can cause serious injury. Exercise caution and wear gloves when working with 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. Place the header in a position where you can access the component that will be serviced.
2. Shut down the engine, and remove the key from the ignition.
3. If the header is fully raised, engage the safety props. If the header is off the ground and not fully raised, place blocks under the header. Never work on or beneath an unsupported header. For instructions on engaging the safety props, refer to the relevant procedure:
   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*
4. On a daily basis, check that the disc blades are securely attached to the disc.
5. Inspect the blades for cracks, blade wear (A), and holes (B), which may have widened beyond safe operating limits (C).
6. Replace any suspect blades immediately.

   IMPORTANT:

   Blades should be replaced in pairs so that the disc remains balanced.

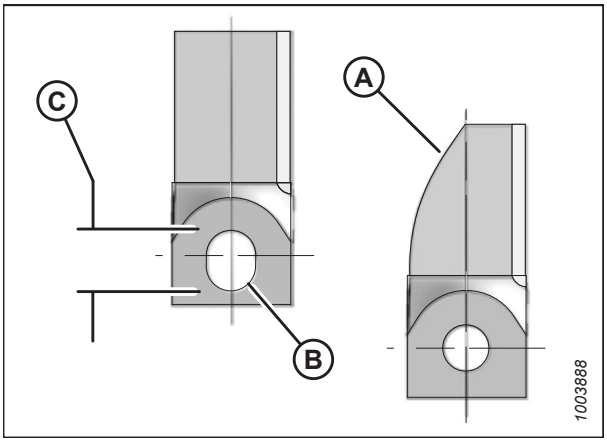


Figure 4.51: Disc Blades

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 *.4.6.9 Cutterbar Crop Stream, page 259* for instructions.

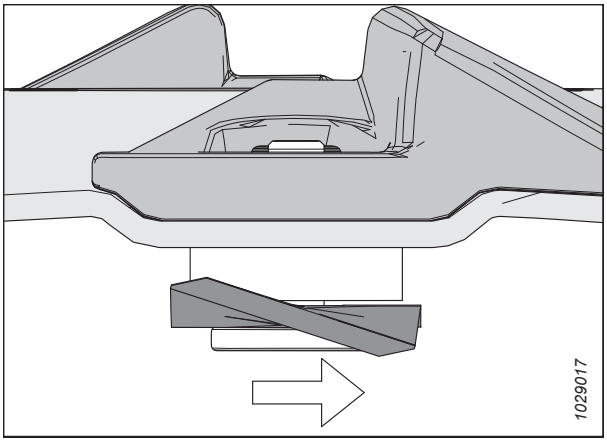


Figure 4.52: Counterclockwise Disc Rotation

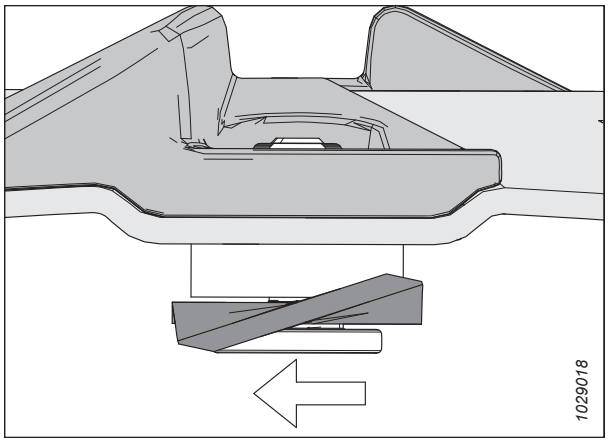


Figure 4.53: Clockwise Disc Rotation

Inspecting Disc Blade Hardware

Whenever the blades on the rotary disc header's discs are inspected, the hardware securing the blades should also be inspected and replaced as needed.

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 instructions on replacing the hardware on the discs, refer to *Removing Disc Blades, page 204* and *Installing Disc Blades, page 206*.

To inspect the hardware on the discs, follow these steps:

1. Inspect the bolt securing the disc blade. Replace the bolt if:
   - The bolt has been removed and installed five times
   - Head (A) is worn flush with the bearing surface of the blade
   - The diameter of the bolt's neck has worn to (B) 3 mm (1/8 in.)

     NOTE:

     Excessive wear can occur when the header's disc speed is set too low when harvesting cane-type crops.
   - The bolt is cracked (C)
   - The bolt is visibly distorted (D)
   - The bolt shows evidence of interference (E) with adjacent parts

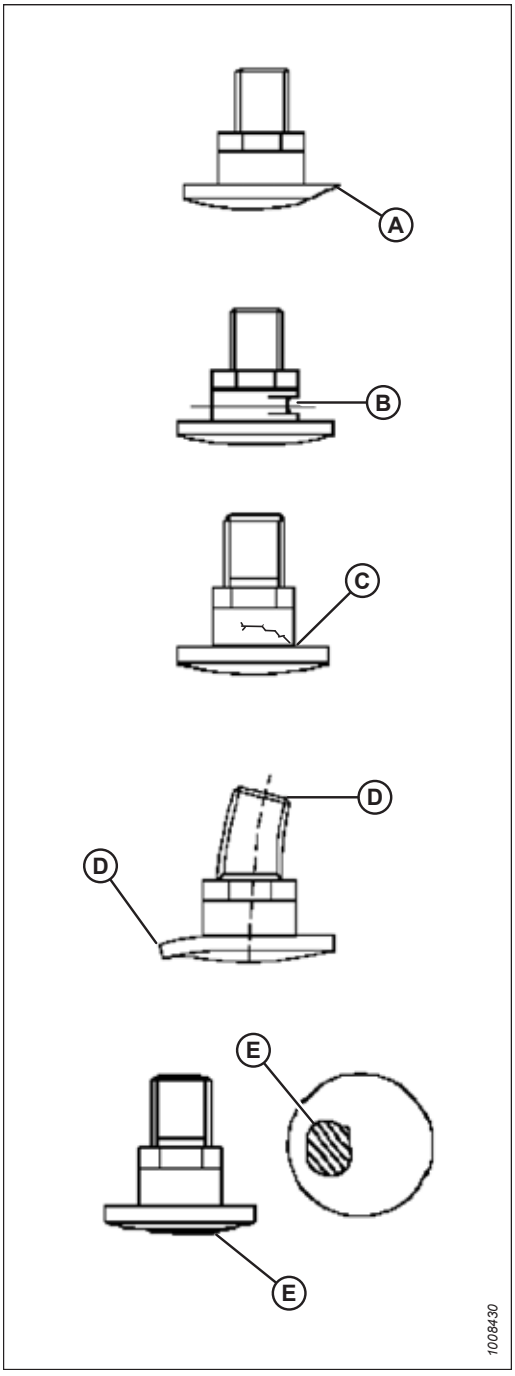


Figure 4.54: Disc Blade Bolts

2. Inspect the nut securing the disc blade. Replace the nut if:
   - The nut has been previously removed; nuts are intended for one-time use only
   - The nut shows signs of wear (A) that is more than half of original height (B)
   - The nut is cracked

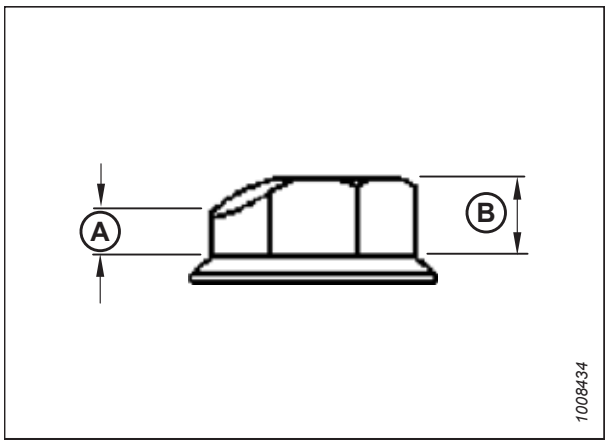


Figure 4.55: Disc Blade Nut

Removing Disc Blades

If a blade on the rotary disc header's discs needs to be flipped or replaced, it will first 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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

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

1. Place the header in a position where you can access the component that will be serviced.
2. Shut down the engine, and remove the key from the ignition.
3. If the header is fully raised, engage the safety props. If the header is off the ground and not fully raised, place blocks under the header. Never work on or beneath an unsupported header. For instructions on engaging the safety props, refer to the relevant procedure:
   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*

4. Open cutterbar curtain (A). For instructions, refer to *3.10.1 Opening Cutterbar Curtain, page 119*.

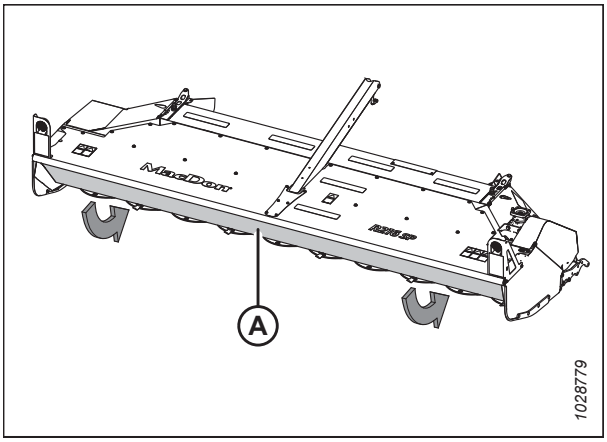


Figure 4.56: Cutterbar Curtain

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

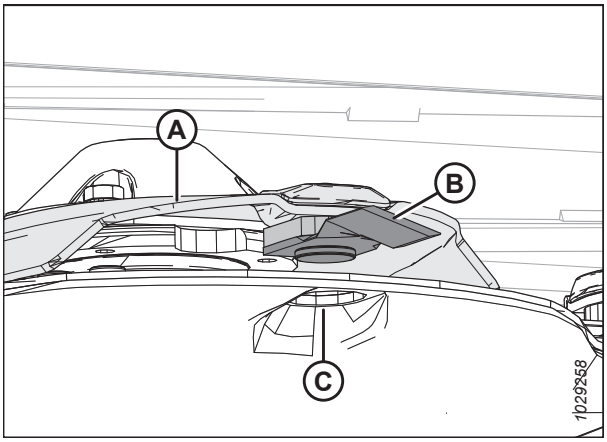


Figure 4.57: Disc Blade Aligned with Hole in Rock Guard

6. Place a pin (or equivalent) in the front hole of the neighboring rock guard to prevent the disc from rotating while the blade bolts are loosened.
7. Clean the debris from the blade attachment area.
8. Remove and discard nut (A).

   IMPORTANT:

   The nuts installed on the disc blades are intended for one-time-use only. Whenever a blade is flipped or replaced, **ALWAYS** reinstall it using a new nut.
9. Remove shoulder bolt (B) and blade (C).

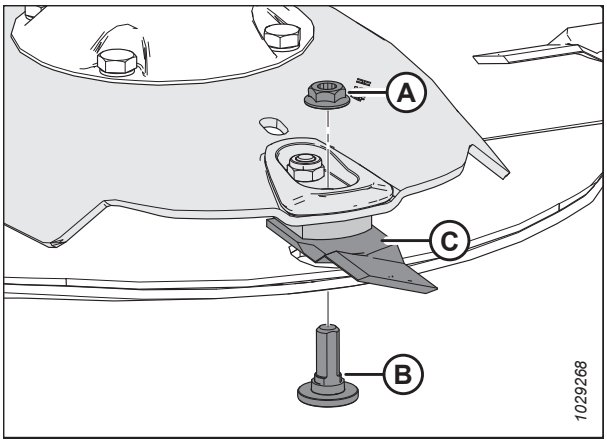


Figure 4.58: Disc Blade

Installing Disc Blades

Each disc has two blades. Blades in good condition can be flipped over and reinstalled so that they wear evenly. The disc blades are **NOT** repairable and must be replaced if they are severely worn or damaged. The blade mounting nuts must always be replaced whenever the blades are replaced.

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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

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

IMPORTANT:

If you are unsure which direction the spindles rotate, refer to *4.6.9 Cutterbar Crop Stream, page 259*.

1. Place the header in a position where you can access the component that will be serviced.
2. Shut down the engine, and remove the key from the ignition.
3. If the header is fully raised, engage the safety props. If the header is off the ground and not fully raised, place blocks under the header. Never work on or beneath an unsupported header. For instructions on engaging the safety props, refer to the relevant procedure:
   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*
4. Place a pin (or equivalent) in the front hole of the rock guard to prevent the disc from rotating while the hardware is tightened.
5. Install new or reversed blade (A) using shoulder bolt (B) onto disc (C).

   IMPORTANT:

   The nuts installed on the disc blades are intended for one-time-use only. Whenever a blade is flipped or replaced, **ALWAYS** reinstall it using a new nut.
6. Install new nut (D). Torque the nut to 125 Nm (92 lbf·ft).
7. Remove the pin (or equivalent) from the front hole of the rock guard.

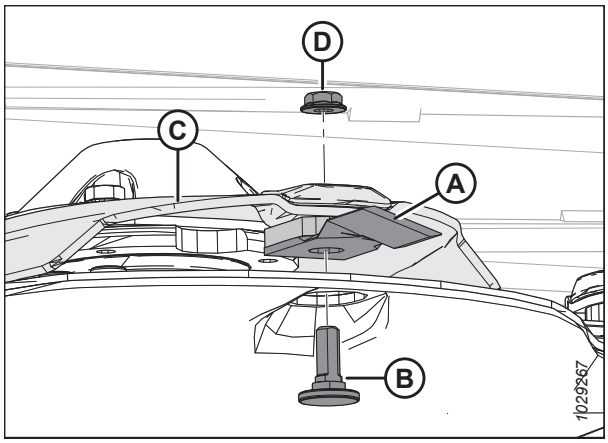


Figure 4.59: Disc Blade

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.

8. Close cutterbar curtain (A). For instructions, refer to *3.10.2 Closing Cutterbar Curtain, page 120*.

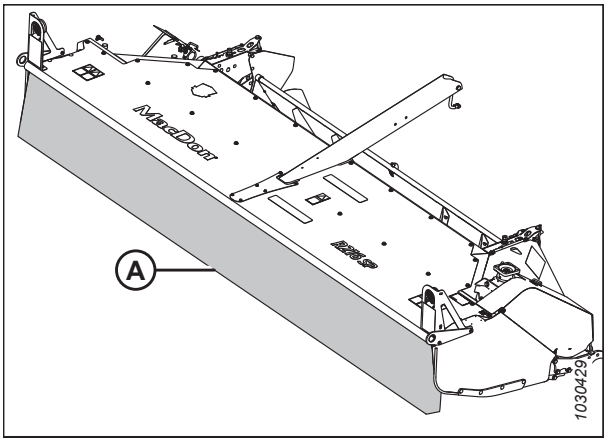


Figure 4.60: Cutterbar Curtain

4.6.5 Accelerators

Accelerators are designed to quickly move cut material off of the disc and into the conditioner.

R216 Rotary Disc Headers have one pairs of accelerators (A) on each pair of outboard discs.

Inspect the accelerators periodically for damage and for loose or missing fasteners. Replace or repair the accelerators and their hardware as needed.

IMPORTANT:

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

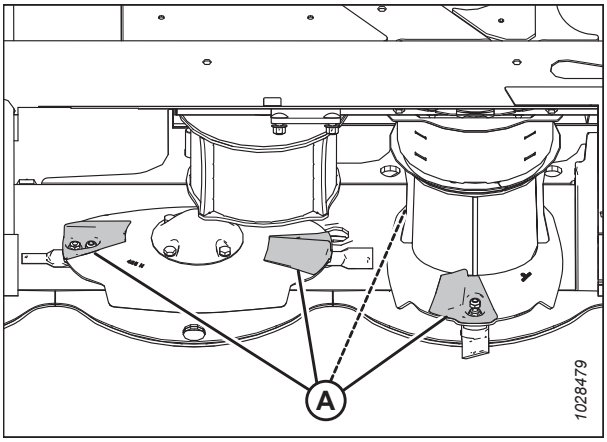


Figure 4.61: Accelerators – Left Side of Header

Inspecting Accelerators

Accelerators should be inspected regularly to ensure that they are in good condition and can effectively move crop off of 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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

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

To inspect the accelerators, follow these steps:

1. Place the header in a position where you can access the component that will be serviced.
2. Shut down the engine, and remove the key from the ignition.
3. If the header is fully raised, engage the safety props. If the header is off the ground and not fully raised, place blocks under the header. Never work on or beneath an unsupported header. For instructions on engaging the safety props, refer to the relevant procedure:
   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*
4. Open cutterbar curtain (A). For instructions, refer to *3.10.1 Opening Cutterbar Curtain, page 119*.

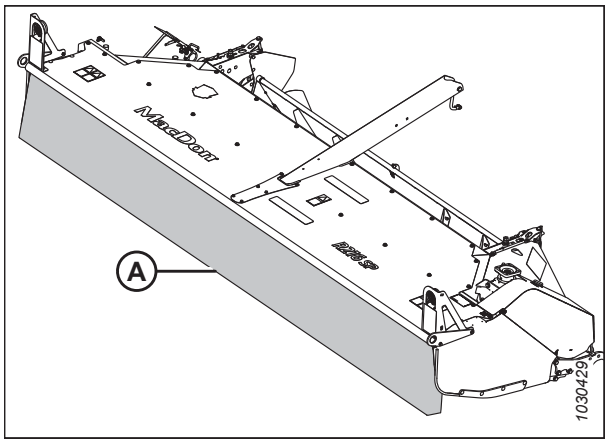


Figure 4.62: Cutterbar Curtain

5. Inspect accelerators (A) for damage and wear. Replace the accelerators if they are worn so completely that they are flush with the disc.
6. Tighten or replace any loose or missing fasteners.

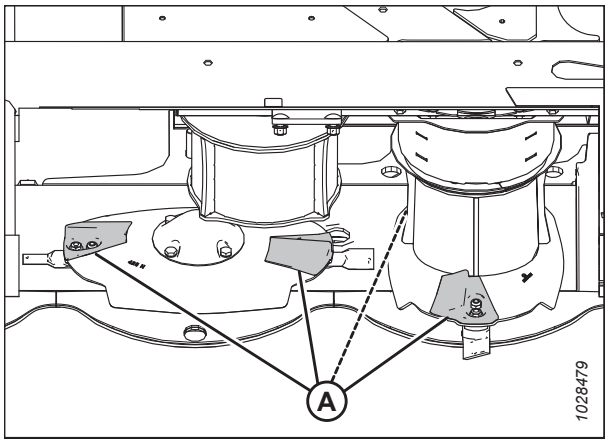


Figure 4.63: Accelerators – Left Side of Header Shown, Right Side Opposite

Removing Accelerators

Accelerators should be removed from the cutterbar discs when they are damaged or so worn that 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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

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

IMPORTANT:

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

To remove the accelerators, follow these steps:

1. Place the header in a position where you can access the component that will be serviced.
2. Shut down the engine, and remove the key from the ignition.
3. If the header is fully raised, engage the safety props. If the header is off the ground and not fully raised, place blocks under the header. Never work on or beneath an unsupported header. For instructions on engaging the safety props, refer to the relevant procedure:
   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*
4. Open cutterbar curtain (A). For instructions, refer to *3.10.1 Opening Cutterbar Curtain, page 119*.

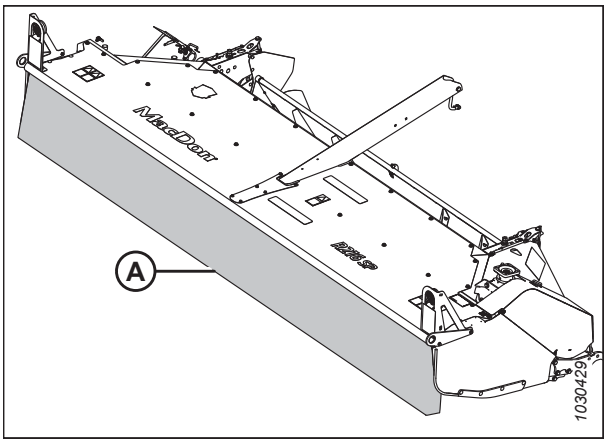


Figure 4.64: Cutterbar Curtain

5. Place a pin (or equivalent) in the front hole of the rock guard to prevent the disc from rotating while the hardware is removed.
6. Line up the hole in the rock guard with the bolt to be removed.
7. Remove nut (A), flange bolt (B), and disc blade (C) from the disc. Discard the nut.

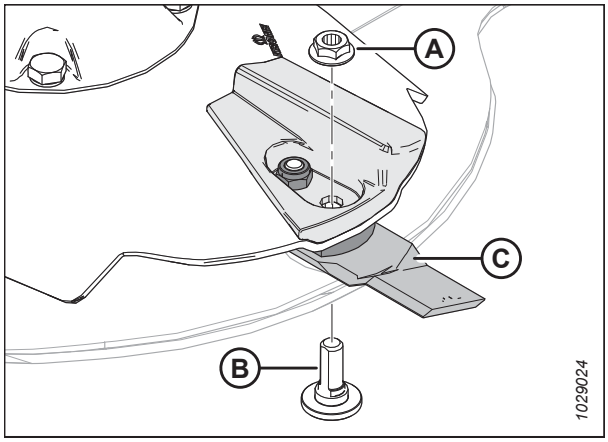


Figure 4.65: Accelerator Removal

8. Remove lock nut (A), accelerator (B), blade holder (C), and hex-socket bolt (D).
9. Repeat Step *5, page 210* to Step *8, page 210* for the second accelerator.
10. Remove the pin from the rock guard.

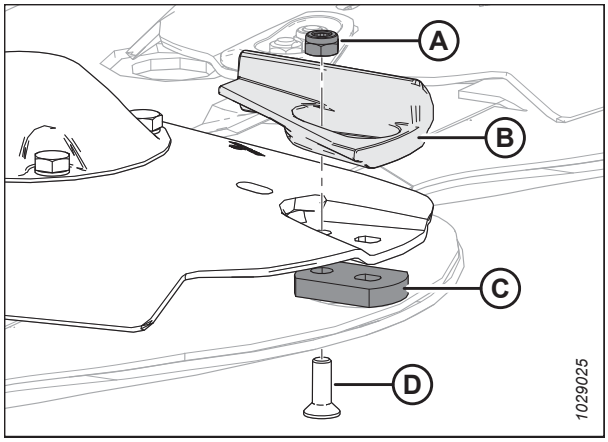


Figure 4.66: Accelerator Removal

Installing Accelerators

Once the old accelerators have been removed from the outboard discs on the rotary disc header's cutterbar, the new ones will need to be installed.

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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

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

IMPORTANT:

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

1. Place the header in a position where you can access the component that will be serviced.
2. Shut down the engine, and remove the key from the ignition.
3. If the header is fully raised, engage the safety props. If the header is off the ground and not fully raised, place blocks under the header. Never work on or beneath an unsupported header. For instructions on engaging the safety props, refer to the relevant procedure:
   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*
4. Open the cutterbar curtain. For instructions, refer to *3.10.1 Opening Cutterbar Curtain, page 119*.
5. Place a pin (or equivalent) in the front hole of the neighboring rock guard to prevent the disc from rotating while the blade bolts are tightened.

   IMPORTANT:

   Accelerators are unidirectional; both clockwise and counterclockwise accelerators are used on the cutterbar. Verify the direction of the disc before installing accelerators. If you are unsure which direction the spindle rotates, refer to *4.6.3 Cutterbar Spindles, page 190*.
6. Install lock nut (A), accelerator (B), blade holder (C), and hex-socket bolt (D). Do **NOT** tighten the hardware yet.

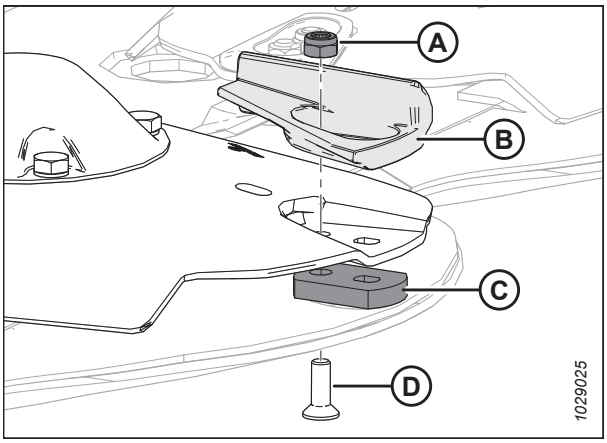


Figure 4.67: Accelerator Installation

7. Install new nut (A), flange bolt (B), and disc blade (C) onto the disc.

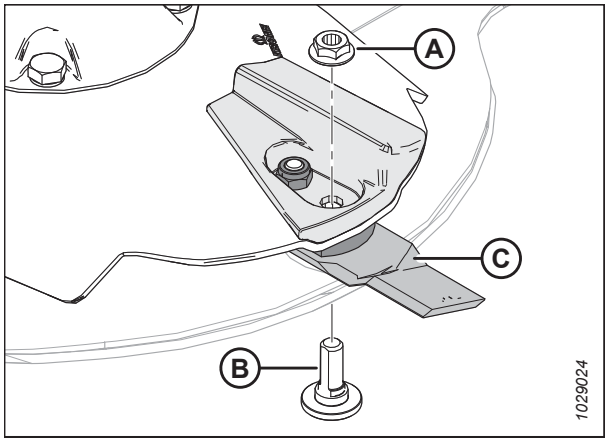


Figure 4.68: Accelerator Installation

8. Torque interior nut (A) to 58 Nm (43 lbf·ft).
9. Torque exterior nut (B) (the one closest to the blade) to 125 Nm (92 lbf·ft).
10. Repeat the installation procedure for the second accelerator.

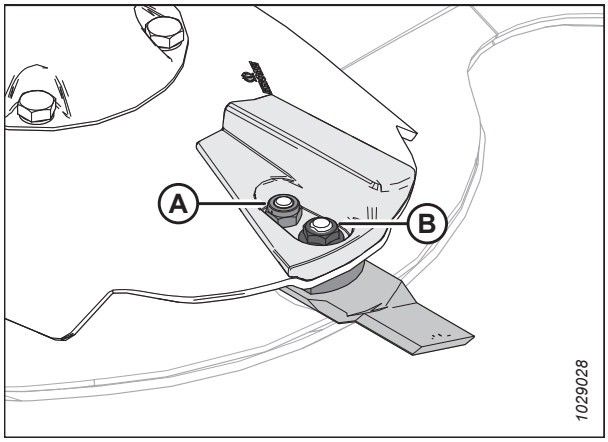


Figure 4.69: Accelerator Installation

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.

11. Remove the pin (or equivalent) installed in Step *5, page 211*.
12. Close cutterbar curtain (A). For instructions, refer to *3.10.2 Closing Cutterbar Curtain, page 120*.

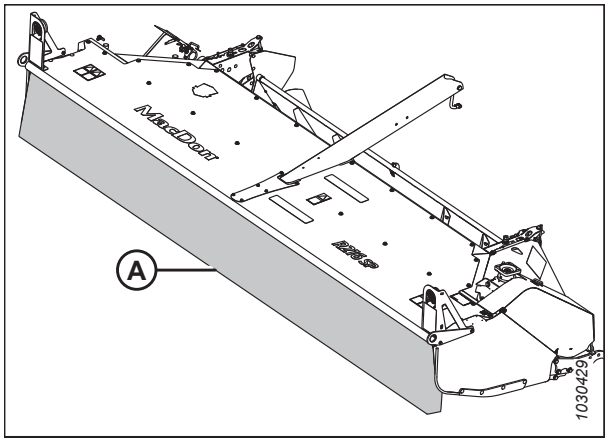


Figure 4.70: Cutterbar Curtain

4.6.6 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. Replace them as necessary.

Inspecting Rock Guards

Rock guards protect the cutting blades from damage. Inspect them periodically to ensure 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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

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

1. Place the header in a position where you can access the component that will be serviced.
2. Shut down the engine, and remove the key from the ignition.
3. If the header is fully raised, engage the safety props. If the header is off the ground and not fully raised, place blocks under the header. Never work on or beneath an unsupported header. For instructions on engaging the safety props, refer to the relevant procedure:
   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*
4. Inspect the rock guards for wear, cracks, damage, or distortion. Replace any rock guard if it is worn to 75% or less of its original thickness.

   NOTE:

   The factory thickness of the rock guards is 5 mm (0.2 in.).
5. Check for loose or missing fasteners. Tighten or replace the fasteners as needed.

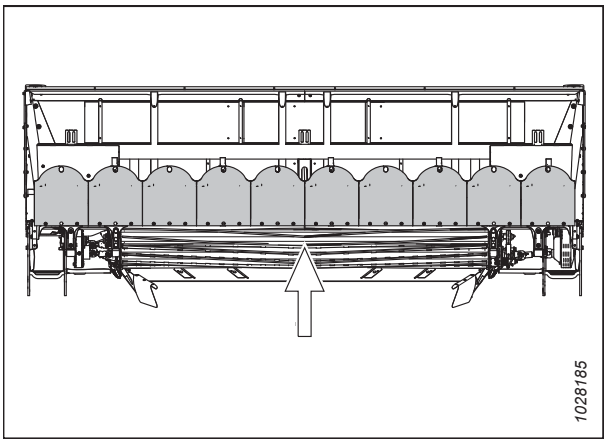


Figure 4.71: Rock Guards

Rotating Rock Guards

The rock guards can wear unevenly across the width of the header. More abrasive soil conditions increase the rate of wear of the rock guards at the ends of the rotary disc header. Rotating the rock guards as part of the header's regular maintenance will increase their service life.

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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

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

1. Mark the order of the rock guards as shown.

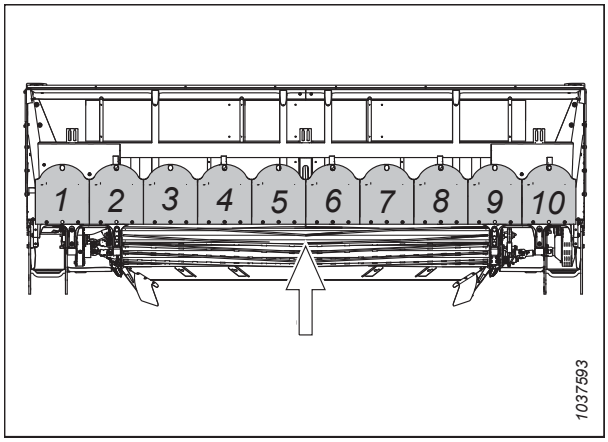


Figure 4.72: R216 Rotary Disc Header Rock Guard Order

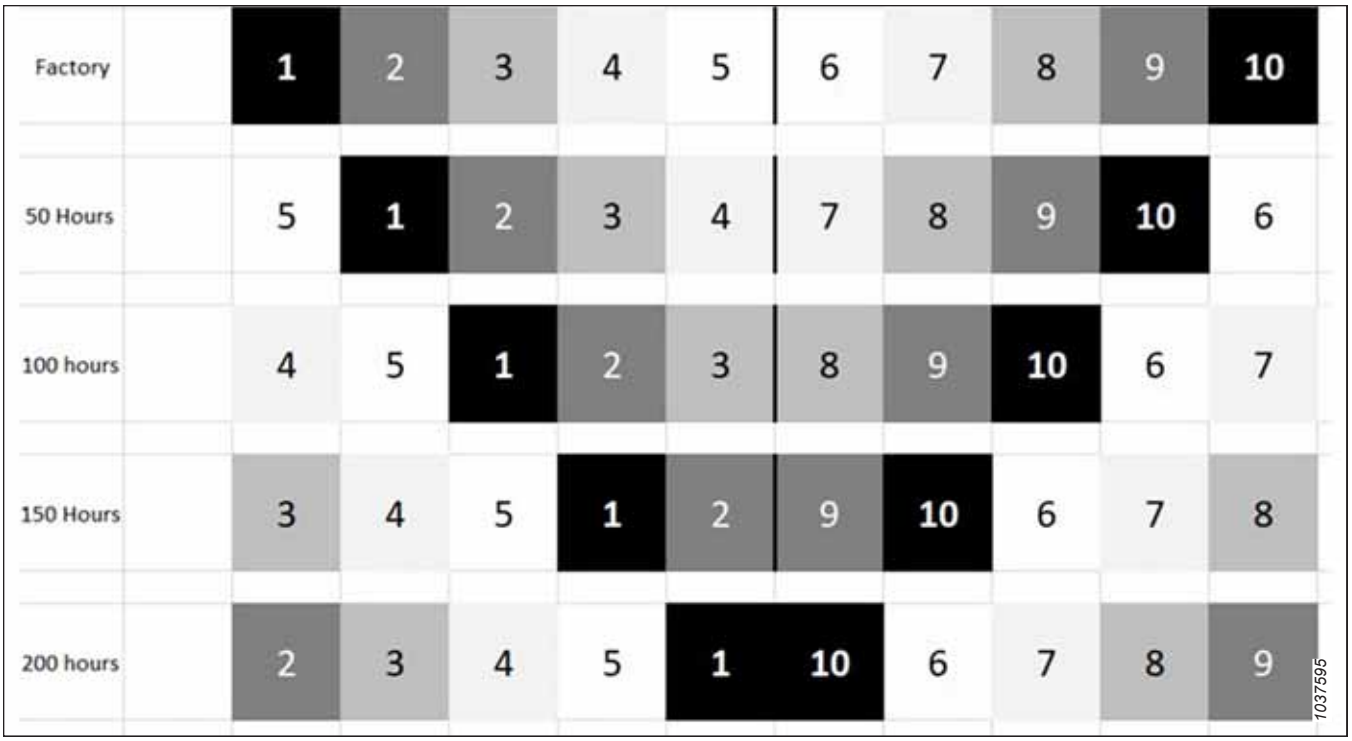


Figure 4.73: R216 Rotary Disc Header Rock Guard Swap Order by Operating Hours

2. Using the illustrations provided above as a guide, note how the rock guards will need to be removed and installed.
3. Remove the rock guards. For instructions, refer to *Removing Rock Guards, page 215*.
4. Install the rock guards according to the sequence in the illustration above. For instructions, refer to *Installing Rock Guards, page 216*.

Removing Rock Guards

Rock guards are secured to the underside of the rotary disc header with two screws and nuts.

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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

1. Place the header in a position where you can access the component that will be serviced.
2. Shut down the engine, and remove the key from the ignition.
3. If the header is fully raised, engage the safety props. If the header is off the ground and not fully raised, place blocks under the header. Never work on or beneath an unsupported header. For instructions on engaging the safety props, refer to the relevant procedure:
   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*

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

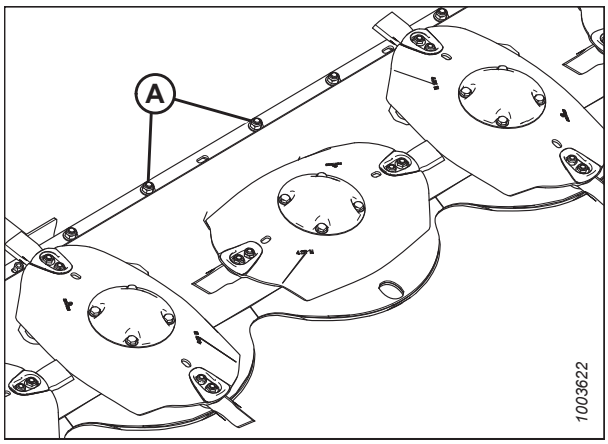


Figure 4.74: Rock Guards

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

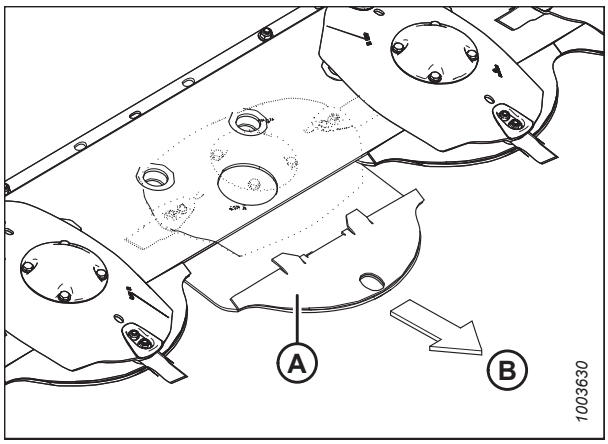


Figure 4.75: Rock Guards

Installing Rock Guards

The rock guards will need to be secured to the underside of the rotary disc header using two screws and nuts.

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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

1. Place the header in a position where you can access the component that will be serviced.
2. Shut down the engine, and remove the key from the ignition.
3. If the header is fully raised, engage the safety props. If the header is off the ground and not fully raised, place blocks under the header. Never work on or beneath an unsupported header. For instructions on engaging the safety props, refer to the relevant procedure:
   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*

4. Guide the rock guard onto the cutterbar until tabs (A) sit on top of the cutterbar and the bolt holes in the rock guard line up with the holes in the frame.

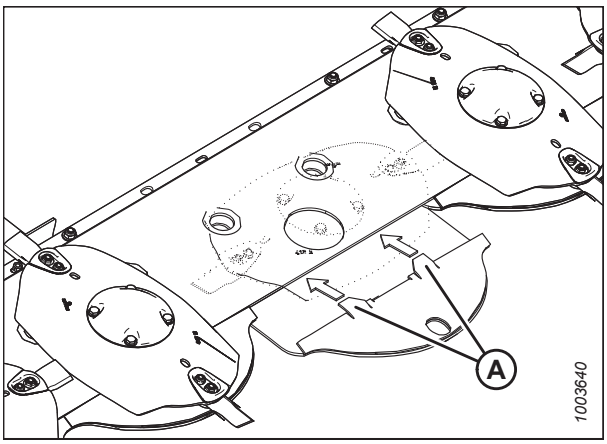


Figure 4.76: Rock Guards

5. Center the rock guard if there are gaps on either side. Install two hex head screws, washers, and lock nuts (A).

   NOTE:

   Lock nuts (A) and washers are installed on top.

6. Torque the hardware to 68 Nm (50 lbf·ft).

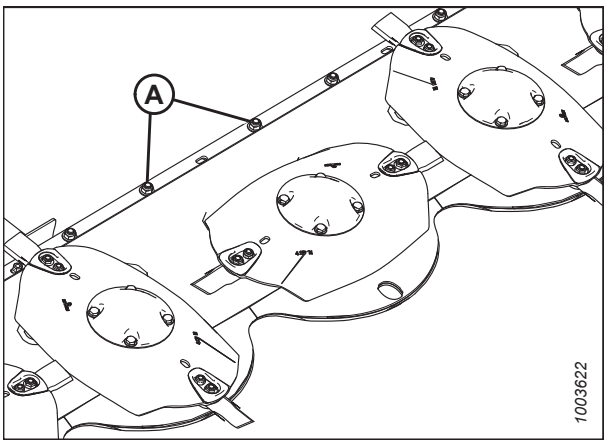


Figure 4.77: Rock Guards

4.6.7 Drums

Suspended and driven drums deliver cut material from the ends of the cutterbar and help maintain an even crop flow into the conditioner.

Drums include:

- Suspended drums (A)
- Left driven drum (B)
- Right driven drum (C)

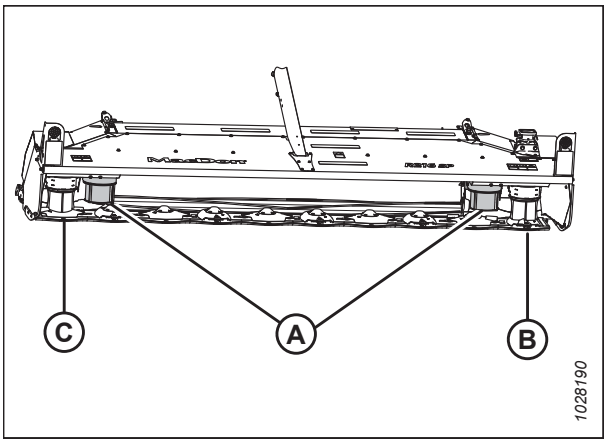


Figure 4.78: Driven and Suspended Drums

Inspecting Drums

The drums on the rotary disc header should be inspected daily for signs of damage or wear, and replaced 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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

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

1. Place the header in a position where you can access the component that will be serviced.
2. Shut down the engine, and remove the key from the ignition.
3. If the header is fully raised, engage the safety props. If the header is off the ground and not fully raised, place blocks under the header. Never work on or beneath an unsupported header. For instructions on engaging the safety props, refer to the relevant procedure:
   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*
4. Open cutterbar curtain (A). For instructions, refer to *3.10.1 Opening Cutterbar Curtain, page 119*.

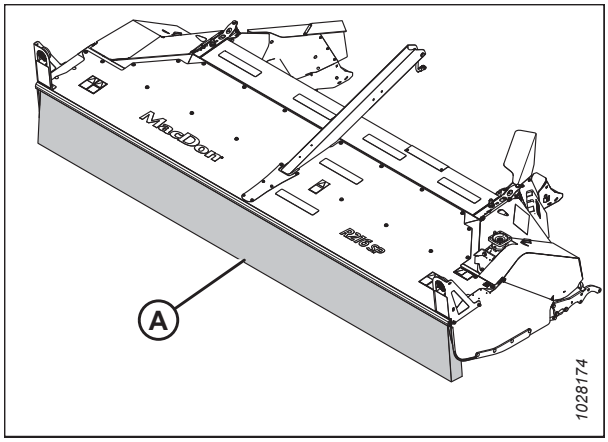


Figure 4.79: Cutterbar Curtain

5. Inspect drums (A), (B), and (C) for damage and wear. Replace a drum if it is worn at the center to 50% or more of its original thickness. Do **NOT** attempt to repair worn drums.

6. Examine the drums for large dents. Replace dented drums.

   IMPORTANT:

   Dented drums can cause the cutterbar to become unbalanced.

   .

7. Tighten any loose fasteners. Replace any missing fasteners.

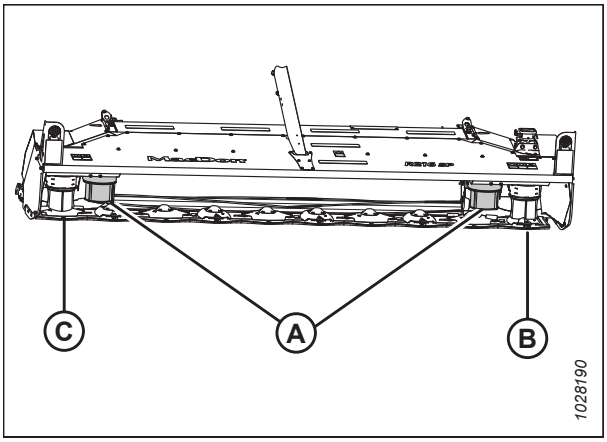


Figure 4.80: Driven and Suspended Drums

A - Suspended Drums

B - Left Driven Drum

C - Right Driven Drum

8. Inspect the left and right driven drums for severe deformation. If the drum is deformed, dimension (A) must **NOT** exceed 48 mm (1 7/8 in.). Replace the drums as needed.

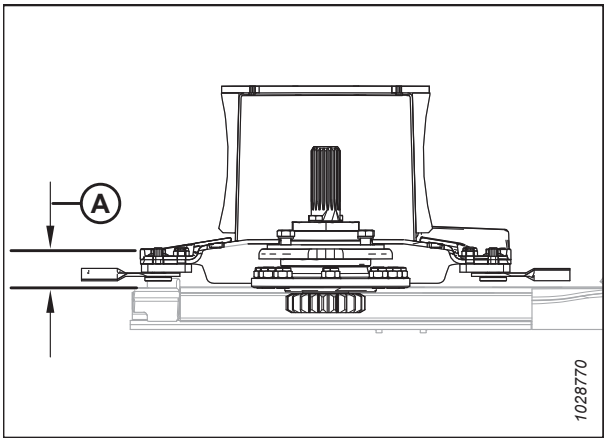


Figure 4.81: Driven Drum – Cutaway View

9. Inspect the left and right driven drums for abrasion (A). The wear limit for abrasion is attained when the material thickness of the drums is less than 3 mm (1/8 in.). Replace the drums as needed.

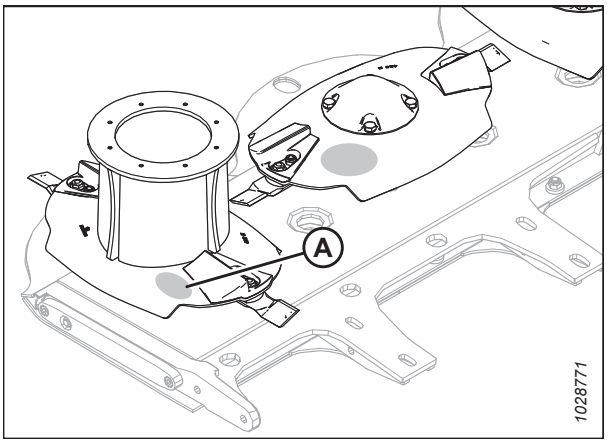


Figure 4.82: Driven Drum – View from Above

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 cutterbar curtain (A). For instructions, refer to *3.10.2 Closing Cutterbar Curtain, page 120*.

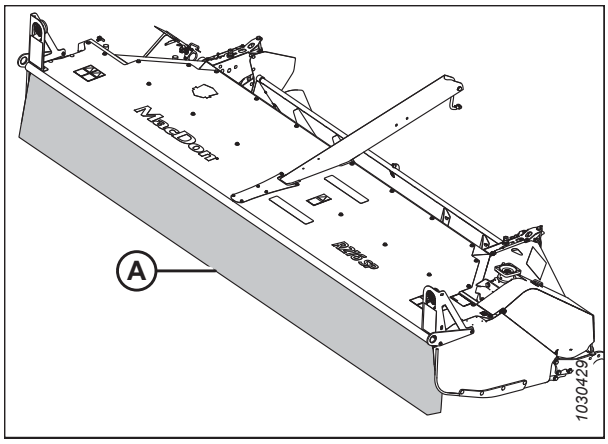


Figure 4.83: Cutterbar Curtain

Removing Suspended Drums

If one of the rotary disc header's suspended drums is damaged or worn, it will need to be removed before it can be replaced.

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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

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

NOTE:

The illustration shows the right suspended drum; the left drum is similar.

1. Place the header in a position where you can access the component that will be serviced.
2. Shut down the engine, and remove the key from the ignition.
3. If the header is fully raised, engage the safety props. If the header is off the ground and not fully raised, place blocks under the header. Never work on or beneath an unsupported header. For instructions on engaging the safety props, refer to the relevant procedure:
   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*

4. Open cutterbar curtain (A). For instructions, refer to *3.10.1 Opening Cutterbar Curtain, page 119*.

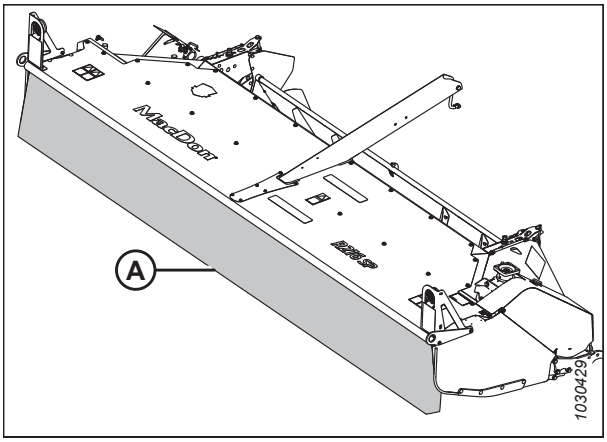


Figure 4.84: Cutterbar Curtain

5. Loosen two M10 hex flange head bolts (A). Remove driveline shield (B).

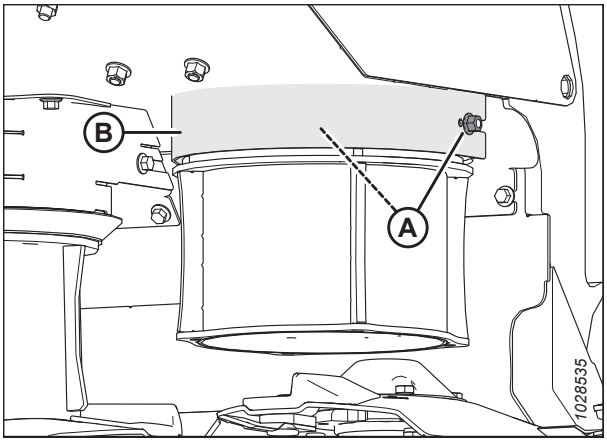


Figure 4.85: Driveline Shield

6. Remove four M12 hex flange head bolts (A) securing suspended drum (B) to shaft (C), and remove suspended drum (B).

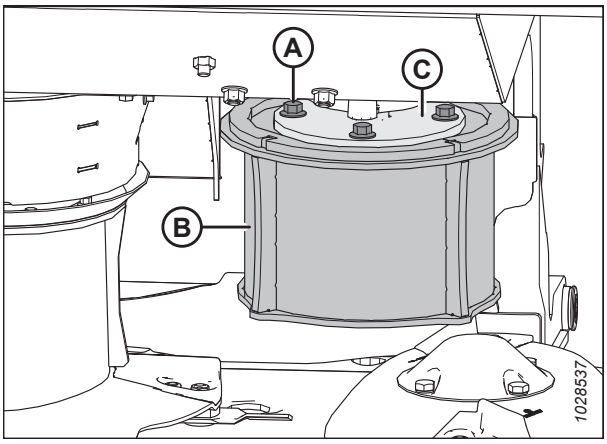


Figure 4.86: Suspended Drum

7. Remove two M10 hex flange head bolts (A). Remove driveline shield (B).

8. Repeat Step *5, page 221* to Step *7, page 222* to remove the opposite suspended drum.

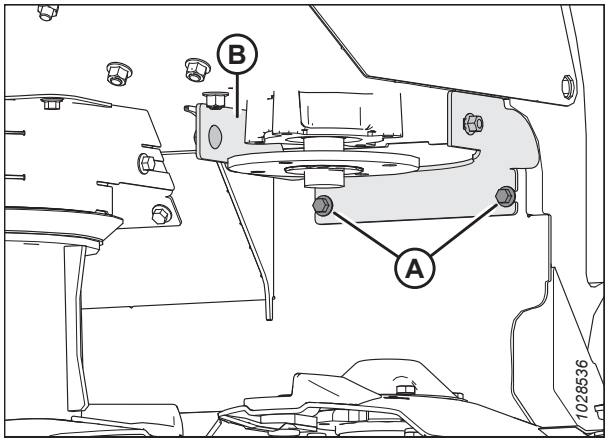


Figure 4.87: Driveline Shield

Installing Suspended Drums

The rotary disc header's suspended drum will need to be reinstalled onto its shaft and the driveline shield reinstalled.

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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

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

NOTE:

Illustrations show the right suspended drum, the left suspended drum is opposite.

1. Place the header in a position where you can access the component that will be serviced.

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

3. If the header is fully raised, engage the safety props. If the header is off the ground and not fully raised, place blocks under the header. Never work on or beneath an unsupported header. For instructions on engaging the safety props, refer to the relevant procedure:

   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*

4. Open the cutterbar curtain. For instructions, refer to *3.10.1 Opening Cutterbar Curtain, page 119*.

5. Position suspended drum (B) to shaft (C) as shown.

6. Apply a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of four M12 hex flange head bolts (A). Use the bolts to secure suspended drum to the shaft. Torque the bolts to 100 Nm (74 lbf·ft).

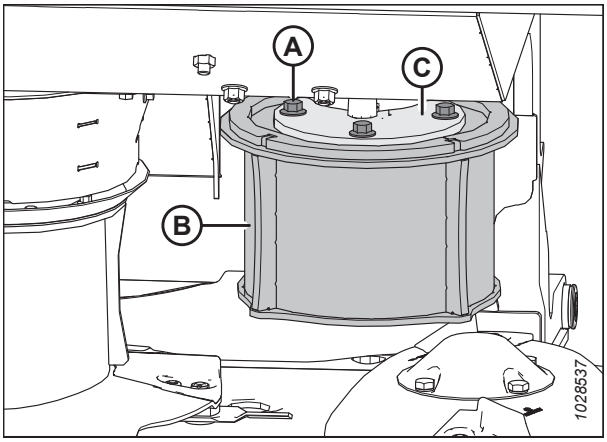


Figure 4.88: Suspended Drum

7. Position driveline shield (B) as shown. Use two M10 hex flange head bolts (A) to secure driveline shield (B).

8. Repeat Step *5, page 223* to Step *7, page 223* to install the opposite suspended drum.

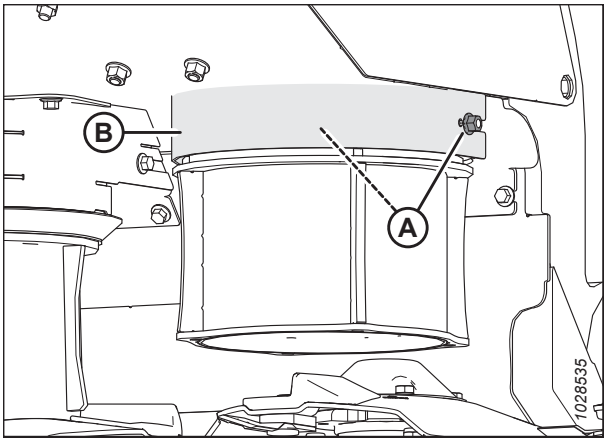


Figure 4.89: Driveline Shield

9. Close cutterbar curtain (A). For instructions, refer to *3.10.2 Closing Cutterbar Curtain, page 120*.

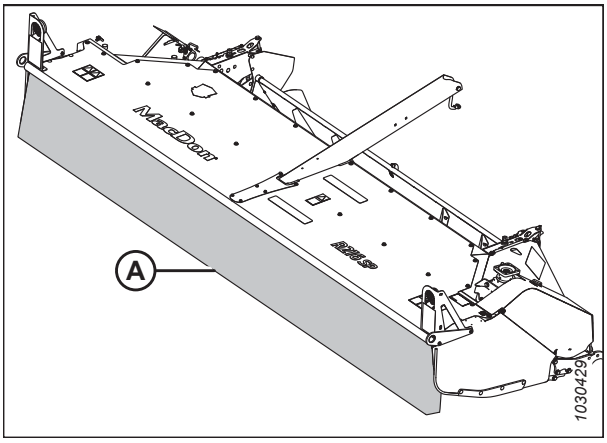


Figure 4.90: Cutterbar Curtain

Replacing Left Suspended Drum Drive Belt

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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

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

1. Place the header in a position where you can access the component that will be serviced.
2. Shut down the engine, and remove the key from the ignition.
3. If the header is fully raised, engage the safety props. If the header is off the ground and not fully raised, place blocks under the header. Never work on or beneath an unsupported header. For instructions on engaging the safety props, refer to the relevant procedure:
   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*
4. Open cutterbar curtain (A). For instructions, refer to *3.10.1 Opening Cutterbar Curtain, page 119*.

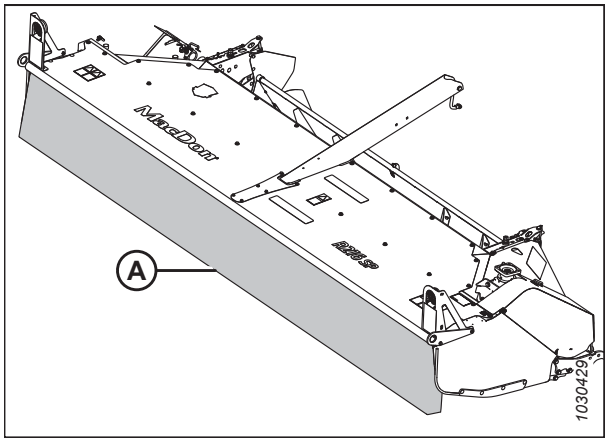


Figure 4.91: Cutterbar Curtain

Removing left suspended drive belt

5. On the left side of the header, remove two M10 hex flange bolts (A). Remove driveline shield (B).

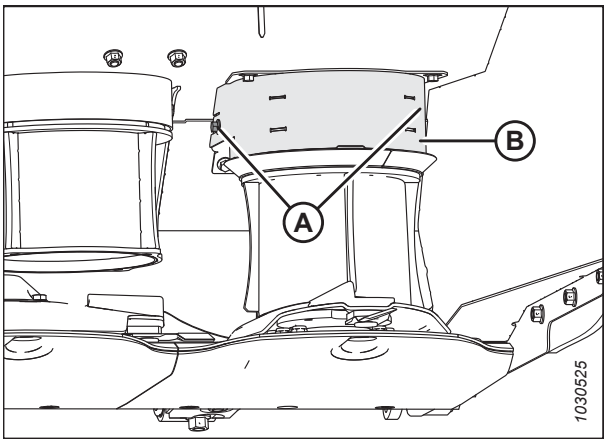


Figure 4.92: Left Driveline

6. Open left driveshield (A). For instructions, refer to *3.9.1 Opening Driveshields, page 115*.

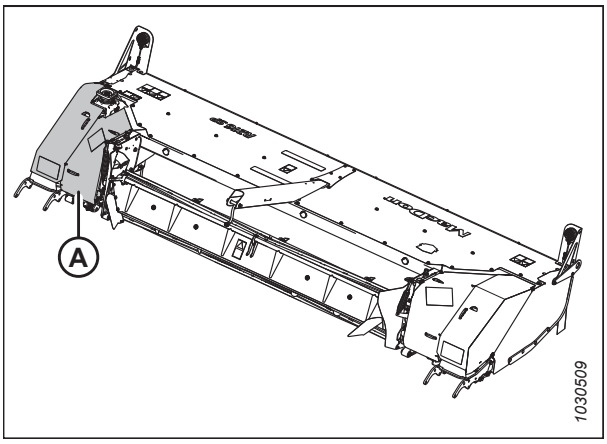


Figure 4.93: Left Driveshield

7. Loosen two bolts (A) at front.
8. Remove two bolts (B) and shield plate (C).
9. Remove four bolts (D) securing spindle spline to the gearbox hub.

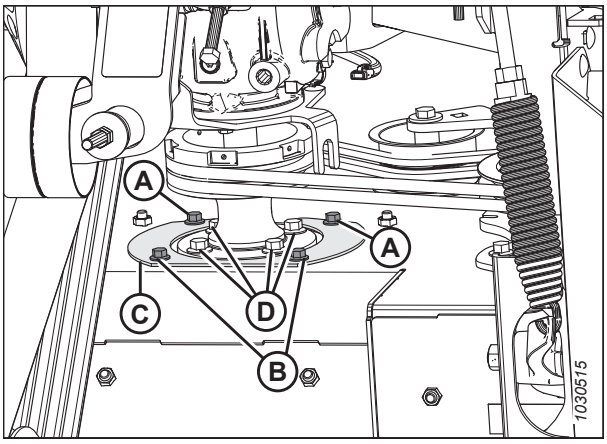


Figure 4.94: Gear Hub and Shield Plate

NOTE:

Removing the four bolts dismounts spindle spline (A) from the gearbox hub.

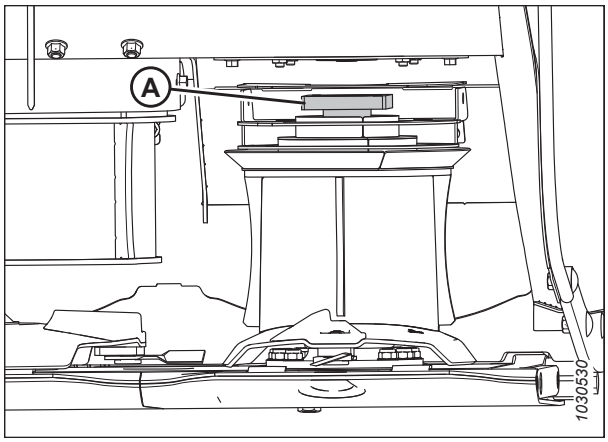


Figure 4.95: Left Driven Drum – Spindle Spline Dismounted

10. Using a ratchet, remove belt tension by rotating tensioner (A) clockwise.
11. Remove belt (B) from the pulley, and slide the belt through opening (C).
12. Remove the ratchet to release the tensioner.

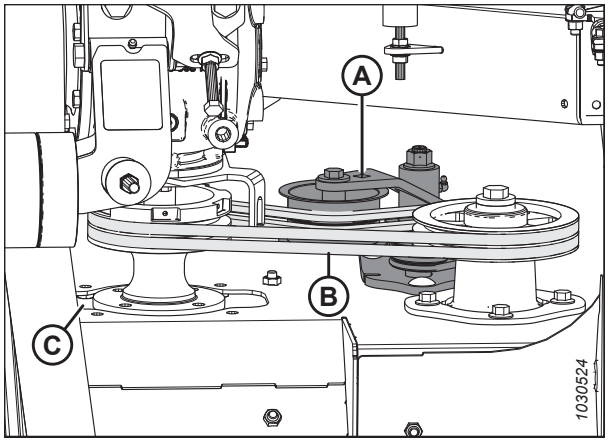


Figure 4.96: Left Drum Belts

Installing left suspended drive belt

13. Slide belt (A) through opening (B).
14. Using a ratchet, rotate tensioner (E) clockwise.
15. Position belt (A) on gearbox hub (D) and pulley (C) as shown.
16. Remove the ratchet to release tensioner (E).

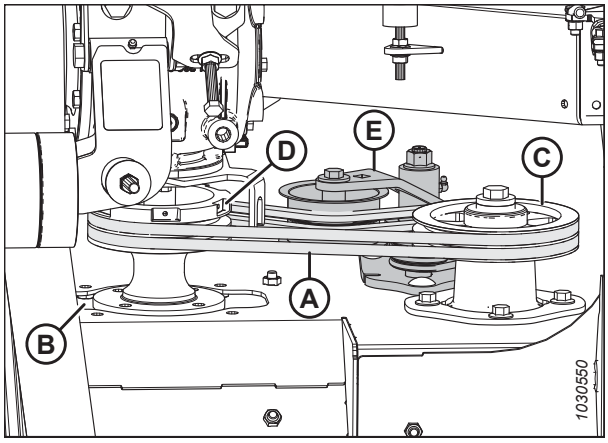


Figure 4.97: Left Drum Belts

17. Hold spindle spline (A) up and secure on gear hub (B) with four bolts (C).

    NOTE:

    Frame panel made transparent to show connection between spindle spline (A) and gear hub (B).

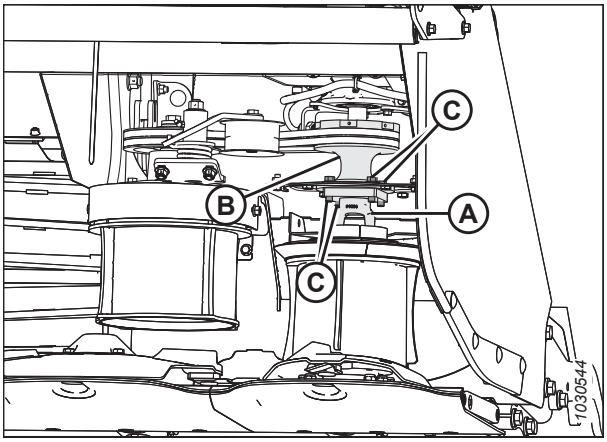


Figure 4.98: Left Driven Drum – Spindle Spline Dismounted

18. Slide shield plate (A) forward, and tighten two bolts (B).
19. Install and tighten two more bolts (C).

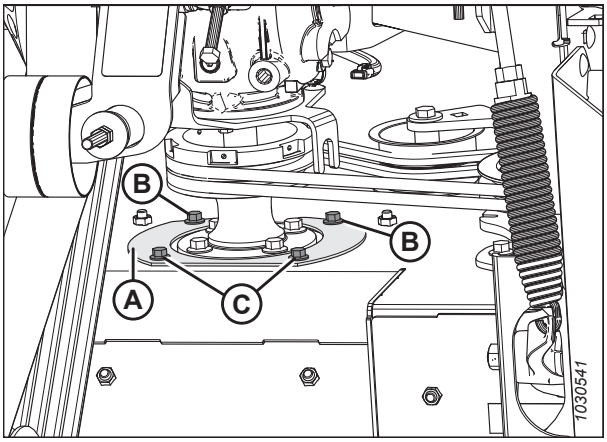


Figure 4.99: Gear Hub and Shield Plate

20. Close left driveshield (A). For instructions, refer to *3.9.2 Closing Driveshields, page 117*.

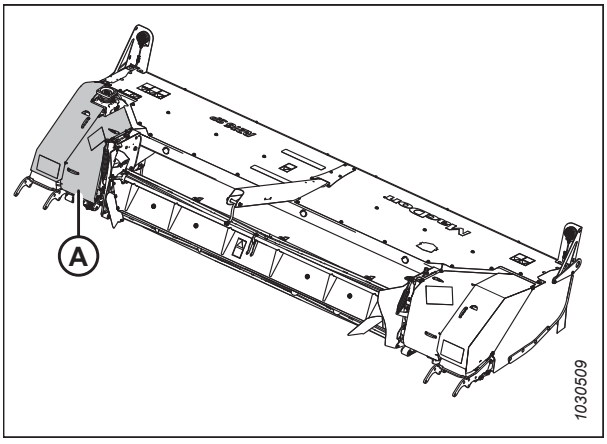


Figure 4.100: Left Driveshield

21. Install driveline shield (B) using two bolts (A).

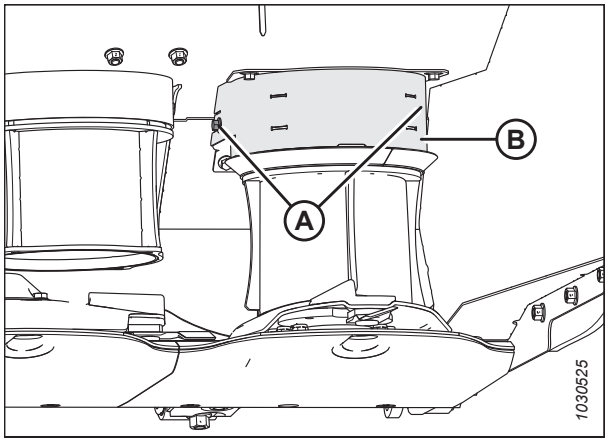


Figure 4.101: Left Driveline

22. Close cutterbar curtain (A). For instructions, refer to *3.10.2 Closing Cutterbar Curtain, page 120*.

23. Disengage the windrower safety props. For instructions, refer to the procedure according to the type of windrower:

    - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
    - **M155*E4* or M205 SP Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*

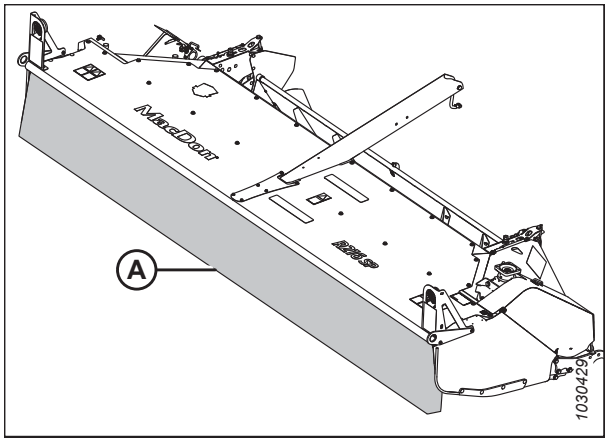


Figure 4.102: Cutterbar Curtain

Replacing Right Suspended Drum Drive Belt

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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

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

1. Place the header in a position where you can access the component that will be serviced.

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

3. If the header is fully raised, engage the safety props. If the header is off the ground and not fully raised, place blocks under the header. Never work on or beneath an unsupported header. For instructions on engaging the safety props, refer to the relevant procedure:
   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*

Removing right suspended drive belt

4. Open right driveshield (A). For instructions, refer to *3.9.1 Opening Driveshields, page 115*.

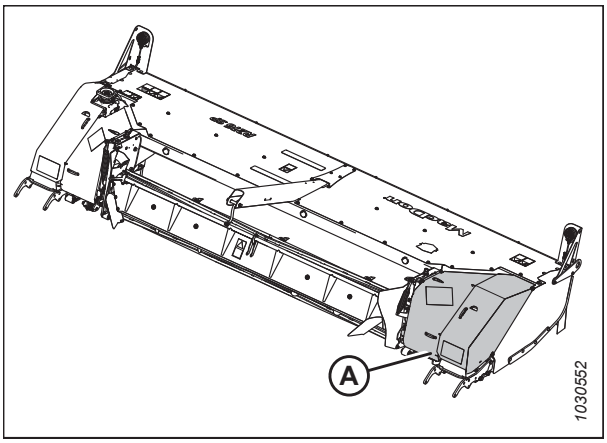


Figure 4.103: Right Driveshield

5. Using a ratchet, release belt tension by rotating counterclockwise on tensioner (A).
6. Remove belt (B) from the pulleys.

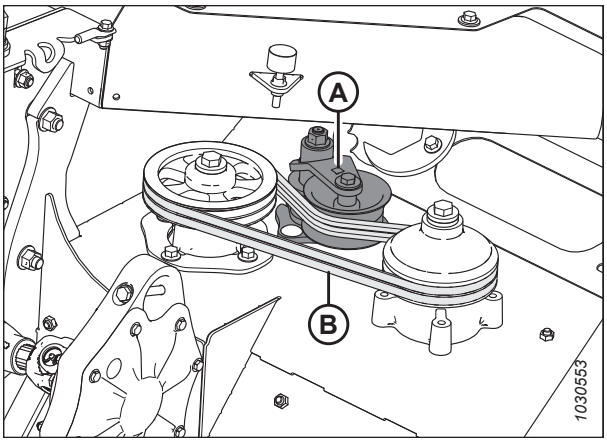


Figure 4.104: Right Drum Belts

Installing right suspended drive belt

7. Using a ratchet, rotate tensioner (A) counterclockwise to move it away from the pulleys.
8. Slide belt (B) on pulleys as shown.
9. Remove ratchet from tensioner to release tensioner.

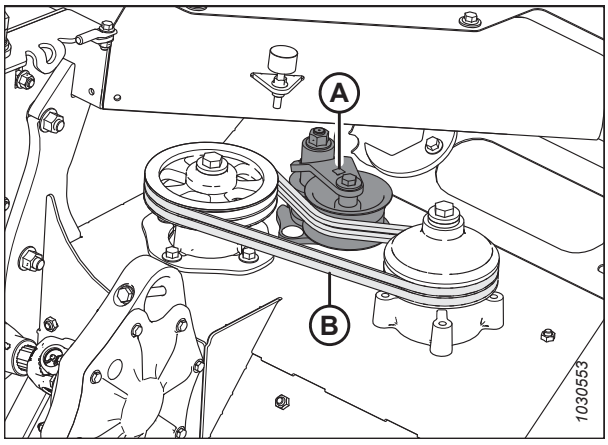


Figure 4.105: Right Drum Belts

10. Close right driveshield (A). For instructions, refer to *3.9.2 Closing Driveshields, page 117*.
11. Disengage the windrower safety props. For instructions, refer to the procedure according to the type of windrower:
    - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
    - **M155*E4* or M205 SP Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*

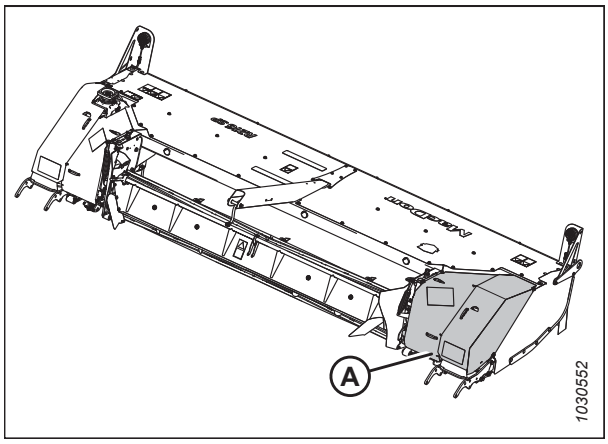


Figure 4.106: Right Driveshield

Removing Left Driven Drum and Driveline

If the rotary disc header's left driven drum is damaged or worn, it will need to be removed before it can be replaced.

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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

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

1. Place the header in a position where you can access the component that will be serviced.
2. Shut down the engine, and remove the key from the ignition.

3. If the header is fully raised, engage the safety props. If the header is off the ground and not fully raised, place blocks under the header. Never work on or beneath an unsupported header. For instructions on engaging the safety props, refer to the relevant procedure:

   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*

4. Open cutterbar curtain (A). For instructions, refer to *3.10.1 Opening Cutterbar Curtain, page 119*.

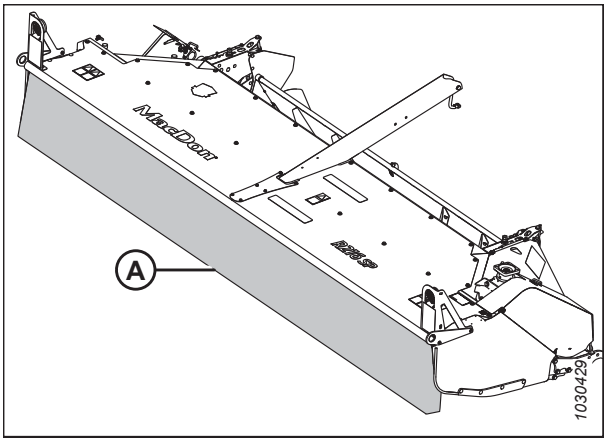


Figure 4.107: Cutterbar Curtain

5. Remove four M10 hex flange head bolts (A). Loosen two M10 hex flange head bolts (B). Remove driveline shield (C).

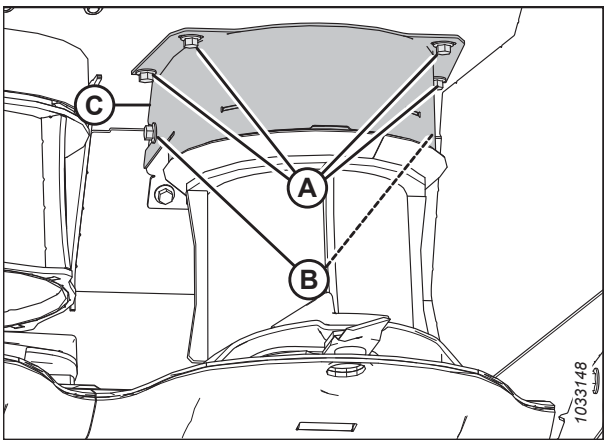


Figure 4.108: Driveline Shield

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

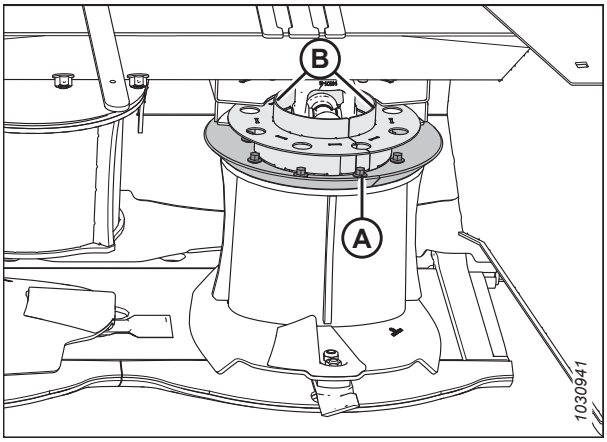


Figure 4.109: Driveline Shields

7. Remove two M10 hex flange head bolts (A). Remove driveline shield (B).

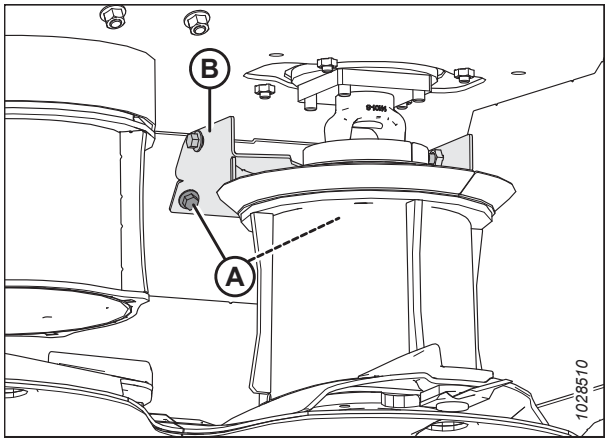


Figure 4.110: Driveline Shield

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

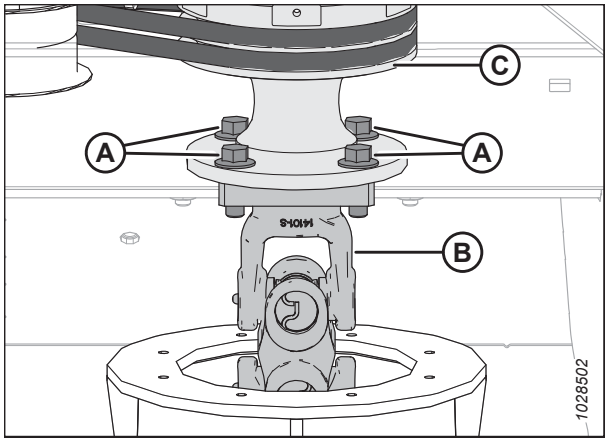


Figure 4.111: Driveline

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

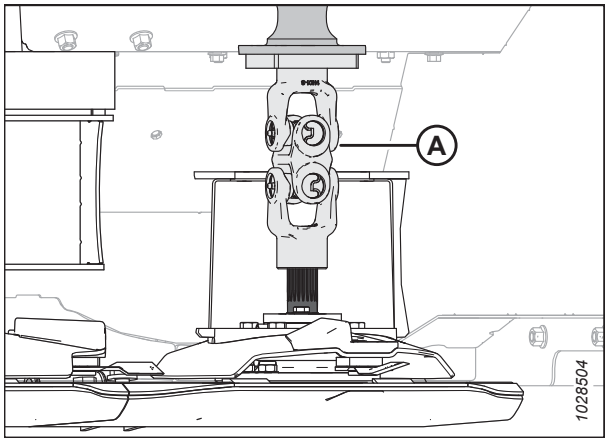


Figure 4.112: Drum and Tube Shield – Cutaway View

10. Use an 18 mm deep socket and an extension to remove four M12 bolts (A) and washers securing drum disc assembly (B) in place.

11. Remove drum disc assembly (B).

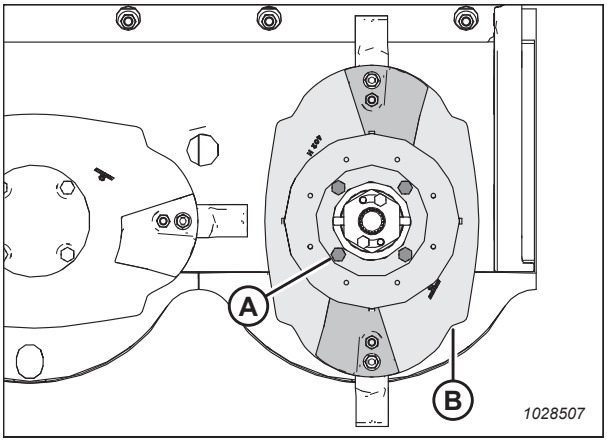


Figure 4.113: Driven Drum – View from Above

Installing Left Driven Drum and Driveline

The rotary disc header's left driven drum will need to be reinstalled onto the drive spindle and the driveline shield reinstalled.

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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

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

1. Place the header in a position where you can access the component that will be serviced.

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

3. If the header is fully raised, engage the safety props. If the header is off the ground and not fully raised, place blocks under the header. Never work on or beneath an unsupported header. For instructions on engaging the safety props, refer to the relevant procedure:

   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*

4. Ensure that spacer (A) is present on the spindle.
5. Apply anti-seize compound to spindle splines (B).

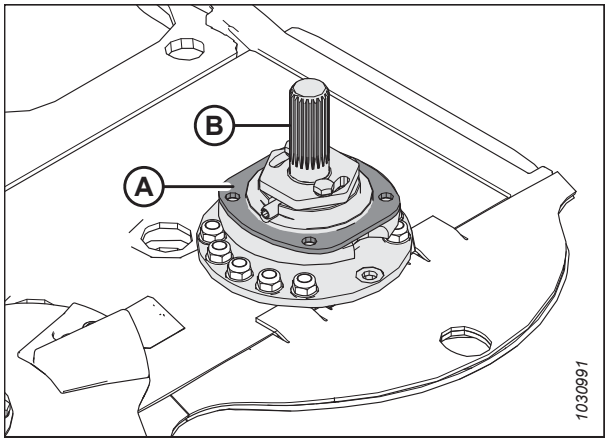


Figure 4.114: Driven Spindle

6. Position drum disc assembly (B) over the spindle, ensuring that the disc is rotated 90° from the neighboring disc.
7. Using an 18 mm deep socket and an extension, secure the drum disc using four M12 bolts and washers (A). Torque the hardware to 85 Nm (63 lbf·ft).

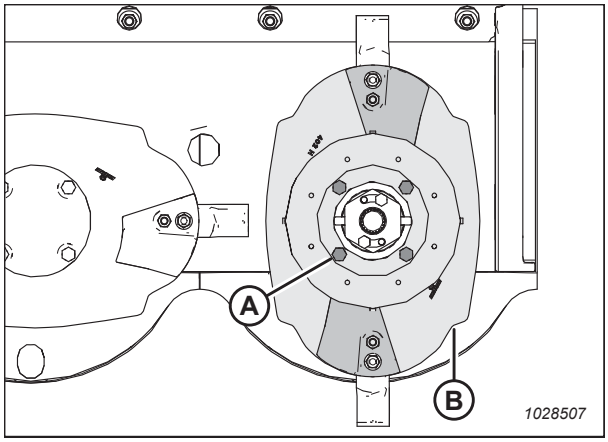


Figure 4.115: Driven Drum – View from Above

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 of driveline (B).

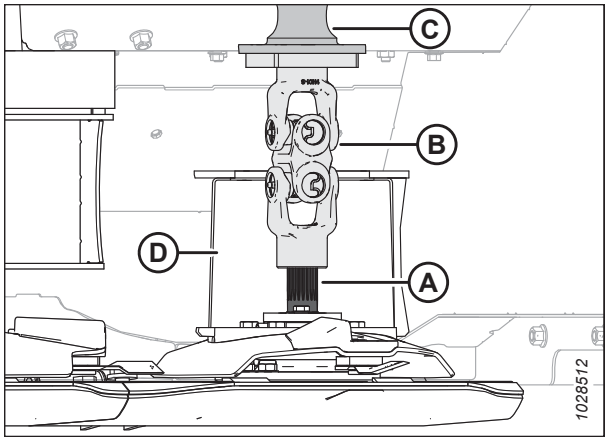


Figure 4.116: Drum and Tube Shield – Cutaway View

10. Place a bead of high-strength threadlocker (Loctite® 262 or equivalent) around the threads of four M12 hex flange head bolts (A). Use the bolts to secure driveline assembly (B) to hub drive (C). Torque the bolts to 100 Nm (74 lbf·ft).

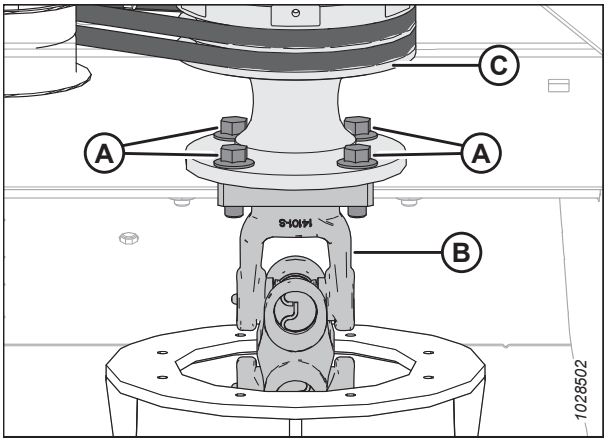


Figure 4.117: Driveline

11. Position driveline shield (B) as shown. Apply a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of two M10 hex flange head bolts (A). Use bolts (A) to secure driveline shield (B).

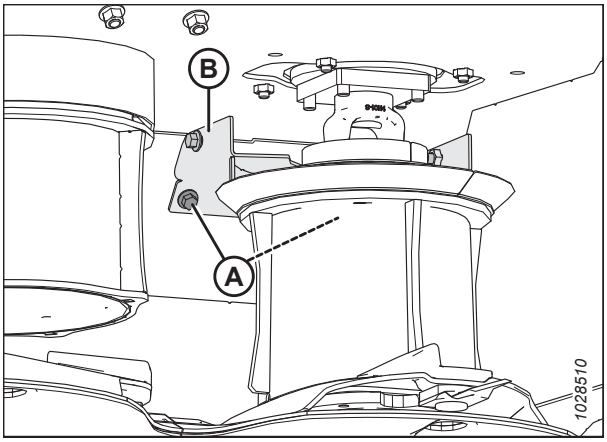


Figure 4.118: Driveline Shield

12. 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).

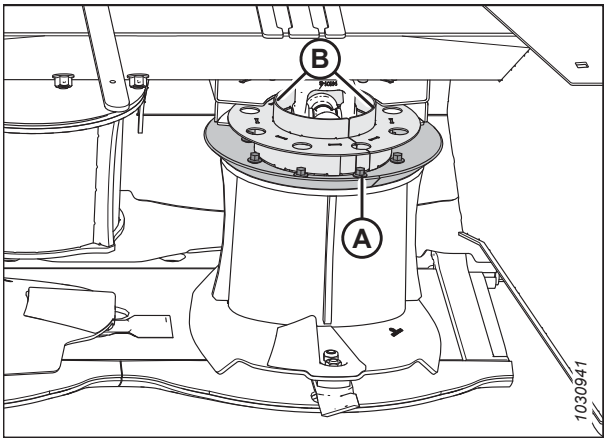


Figure 4.119: Driveline Shields

13. Position driveline shield (C) as shown. Apply a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of four M10 hex flange head bolts (A) and two M10 hex flange head bolts (B). Use bolts (A) and (B) to secure driveline shield (C).

14. Tighten any loose hardware on the driveline shields.

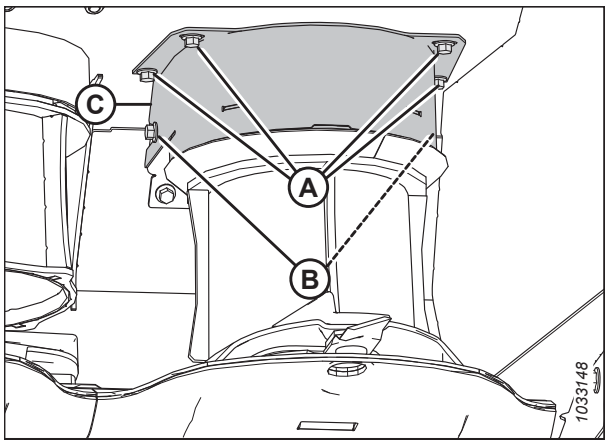


Figure 4.120: Driveline Shield

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.

15. Close cutterbar curtain (A). For instructions, refer to *3.10.2 Closing Cutterbar Curtain, page 120*.

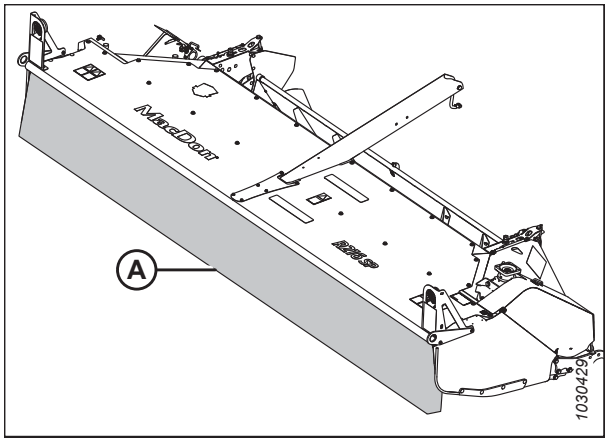


Figure 4.121: Cutterbar Curtain

Removing Right Driven Drum and Driveline

If the rotary disc header's right driven drum is damaged or worn, it will need to be removed before it can be replaced.

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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

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

1. Place the header in a position where you can access the component that will be serviced.

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

3. If the header is fully raised, engage the safety props. If the header is off the ground and not fully raised, place blocks under the header. Never work on or beneath an unsupported header. For instructions on engaging the safety props, refer to the relevant procedure:

   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*

4. Open cutterbar curtain (A). For instructions, refer to *3.10.1 Opening Cutterbar Curtain, page 119*.

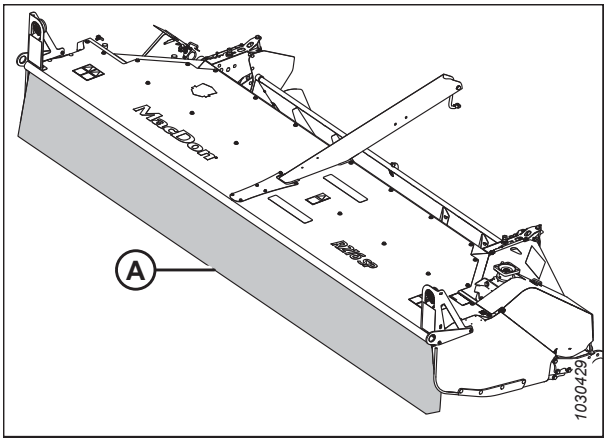


Figure 4.122: Cutterbar Curtain

5. Remove four M10 hex flange head bolts (A) and loosen two M10 hex flange head bolts (B). Remove driveline shield (C).

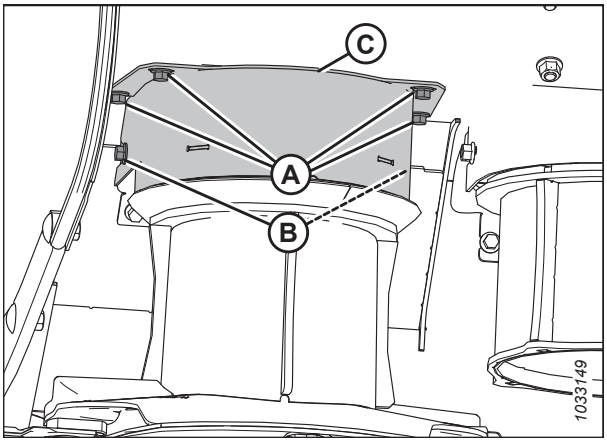


Figure 4.123: Driveline Shield

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

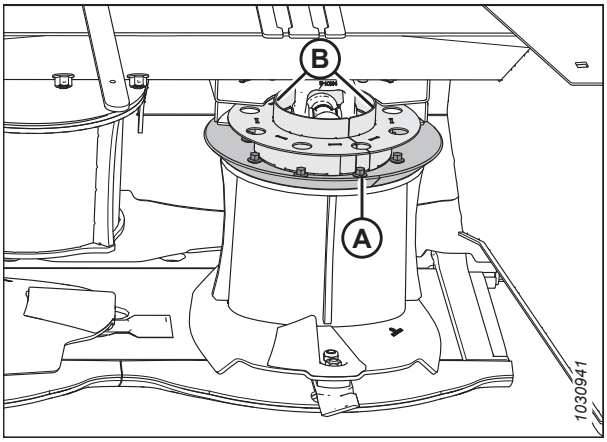


Figure 4.124: Driveline Shields

7. Remove two M10 hex flange head bolts (A). Remove driveline shield (B).

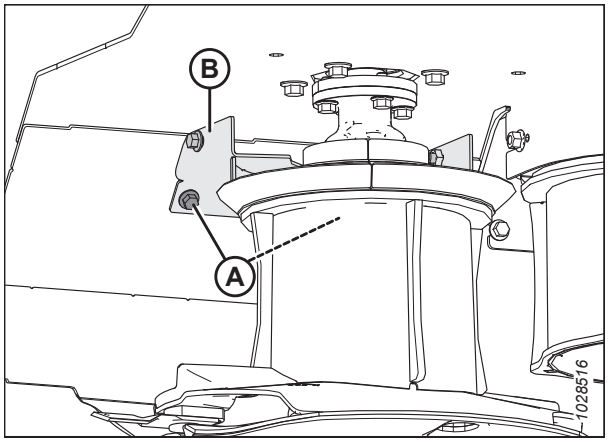


Figure 4.125: Driveline Shield

8. Remove four M10 hex flange head bolts (A) securing driveline assembly (B) to hub drive (C).

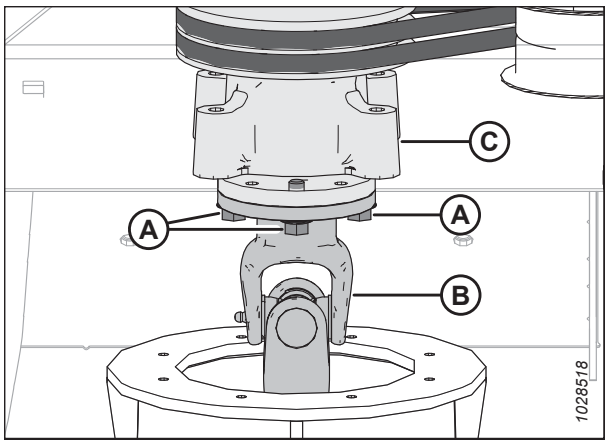


Figure 4.126: Driveline

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

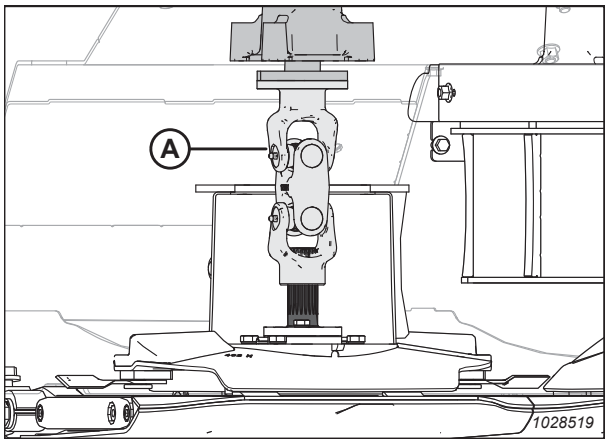


Figure 4.127: Drum and Tube Shield – Cutaway View

10. Use an 18 mm deep socket and an extension to remove four M12 bolts and washers (A) securing drum disc assembly (B).

11. Remove drum disc assembly (B).

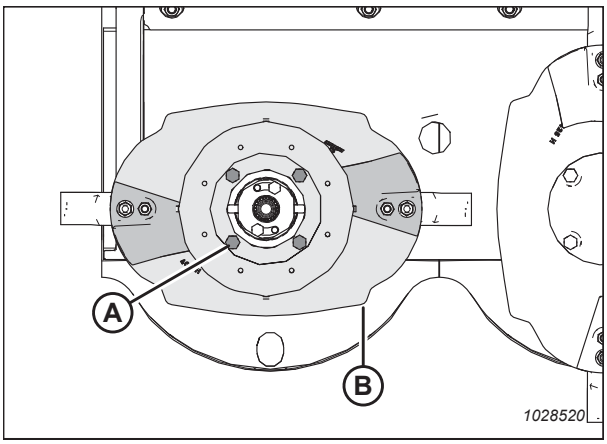


Figure 4.128: Right Driven Drum – View from Above

Installing Right Driven Drum and Driveline

The rotary disc header's right driven drum will need to be reinstalled onto the drive spindle and the driveline shield reinstalled.

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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

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

1. Place the header in a position where you can access the component that will be serviced.

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

3. If the header is fully raised, engage the safety props. If the header is off the ground and not fully raised, place blocks under the header. Never work on or beneath an unsupported header. For instructions on engaging the safety props, refer to the relevant procedure:

   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*

4. Ensure that spacer (A) is present on the spindle.
5. Apply anti-seize compound to spindle splines (B).

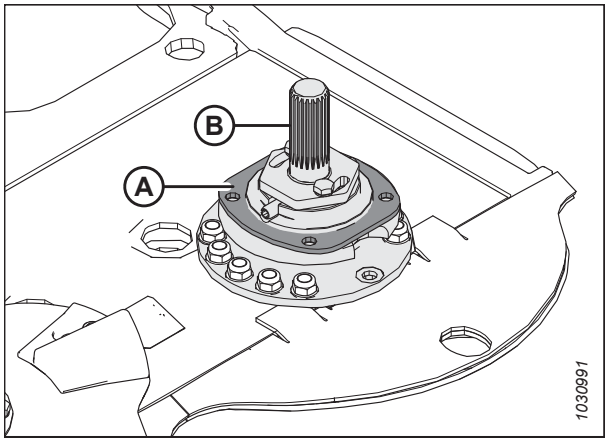


Figure 4.129: Right Driven Spindle

6. Position drum disc assembly (B) so that it is oriented 90° relative to the neighboring disc.
7. Use an 18 mm deep socket and an extension to install four M12 bolts and washers (A) to secure the drum disc. Torque the hardware to 85 Nm (63 lbf·ft).

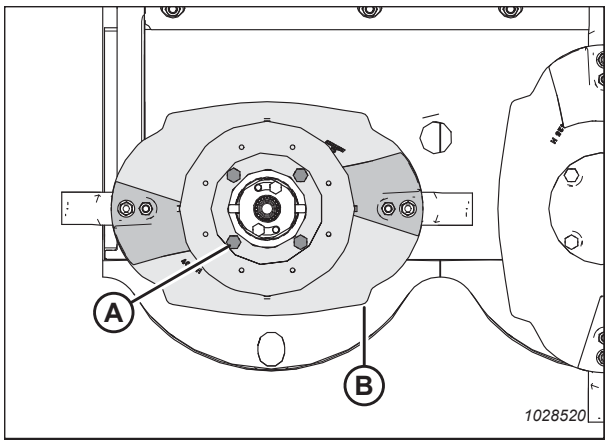


Figure 4.130: Right Driven Drum – View from Above

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 of driveline (B).

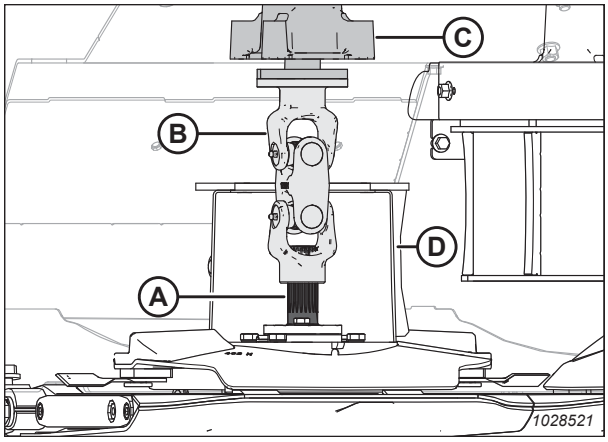


Figure 4.131: Drum and Tube Shield – Cutaway View

10. Place a bead of high-strength threadlocker (Loctite® 262 or equivalent) around the threads of four M10 hex flange head bolts (A). Use the bolts to secure driveline assembly (B) to hub drive (C). Torque the bolts to 57.5 Nm (42 lbf·ft).

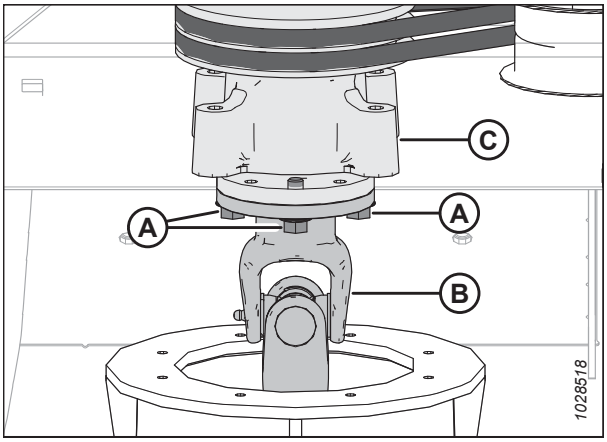


Figure 4.132: Driveline

11. Position driveline shield (B) as shown. Apply a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of two M10 hex flange head bolts (A). Use M10 hex flange head bolts (A) to secure driveline shield (B).

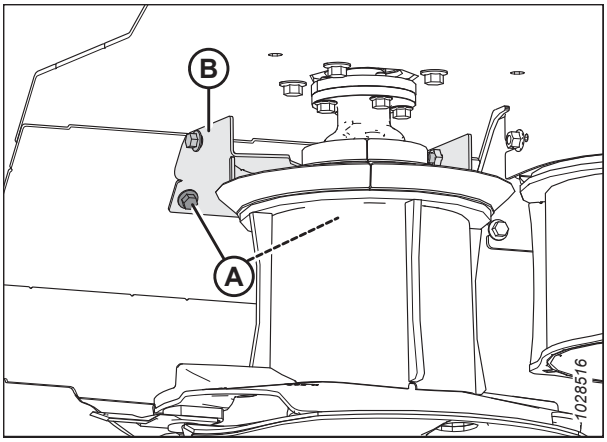


Figure 4.133: Driveline Shield

12. 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).

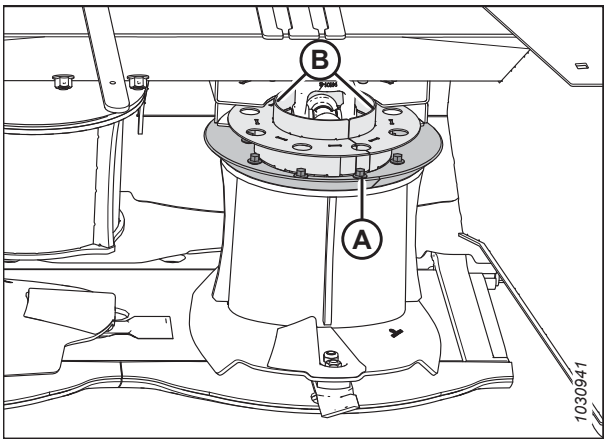


Figure 4.134: Driveline Shields

13. Position driveline shield (C) as shown. Apply a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of four M10 hex flange head bolts (A) and two M10 hex flange head bolts (B). Use bolts (A) and (B) to secure driveline shield (C).

14. Tighten all loose hardware on the driveline shields.

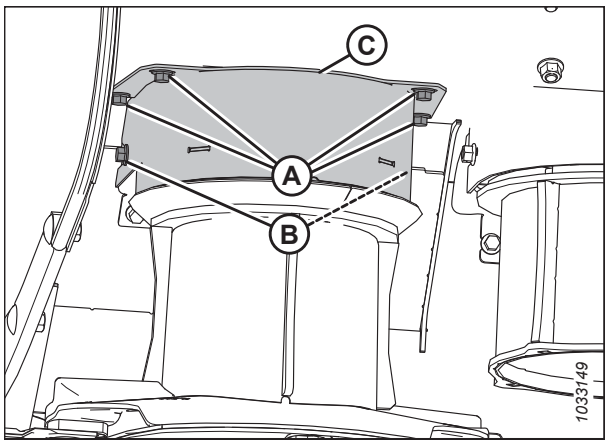


Figure 4.135: Driveline Shield

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.

15. Close cutterbar curtain (A). For instructions, refer to *3.10.2 Closing Cutterbar Curtain, page 120*.

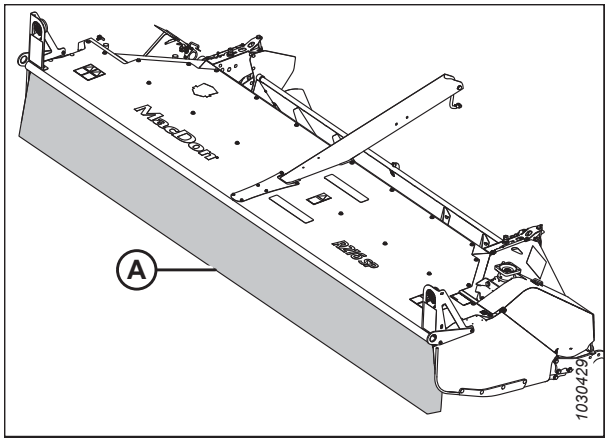


Figure 4.136: Cutterbar Curtain

Lubricating Vertical Drivelines

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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

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

1. Place the header in a position where you can access the component that will be serviced.

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

3. If the header is fully raised, engage the safety props. If the header is off the ground and not fully raised, place blocks under the header. Never work on or beneath an unsupported header. For instructions on engaging the safety props, refer to the relevant procedure:

   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*

4. Open cutterbar curtain (A). For instructions, refer to *3.10.1 Opening Cutterbar Curtain, page 119*.

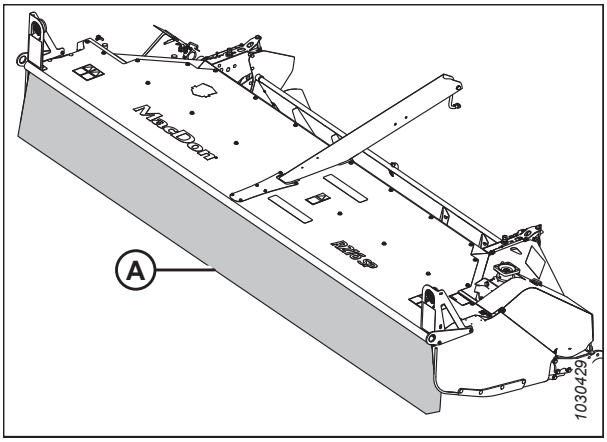


Figure 4.137: Cutterbar Curtain

5. On the left of the header, remove four M10 hex flange head bolts (A) and loosen two M10 hex flange head bolts (B). Remove driveline shield (C).

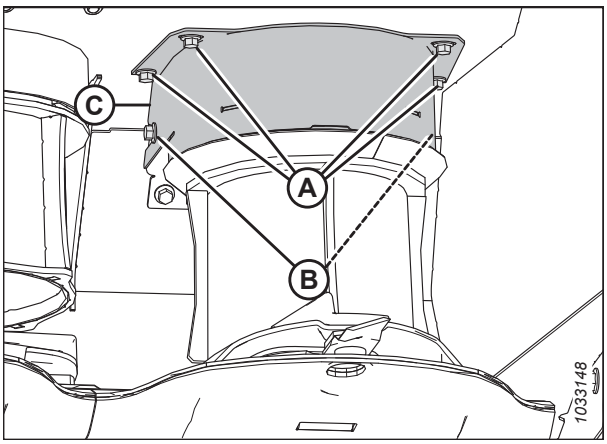


Figure 4.138: Driveline Shield – Left Drum

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

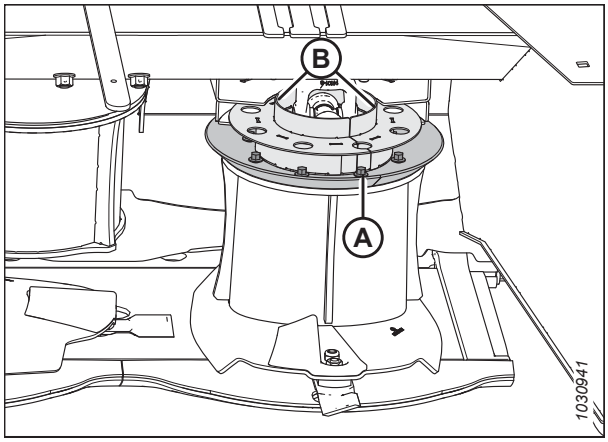


Figure 4.139: Driveline Shields – Left Drum

7. Remove two M10 hex flange head bolts (A) and remove driveline shield (B).

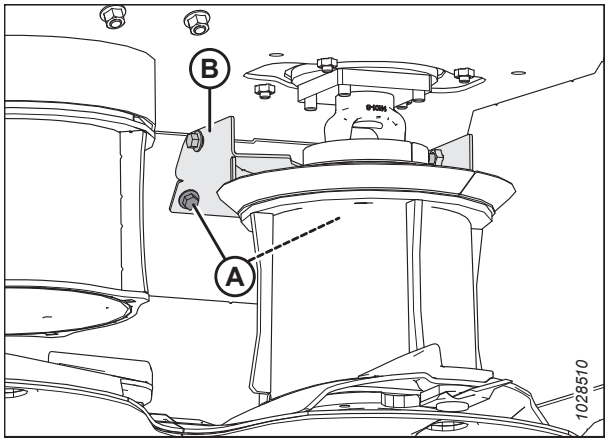


Figure 4.140: Driveline Shield – Left Drum

8. On the right of the header, remove four M10 hex flange head bolts (A) and loosen two M10 hex flange head bolts (B). Remove driveline shield (C).

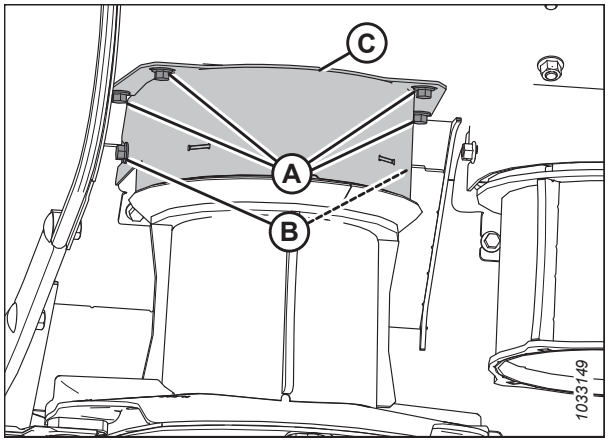


Figure 4.141: Driveline Shield – Right Drum

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

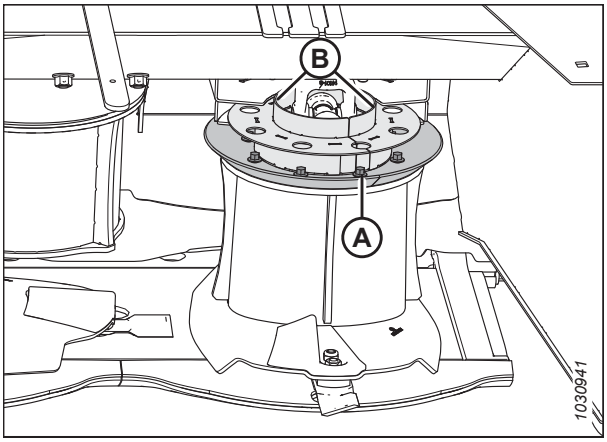


Figure 4.142: Driveline Shields – Right Drum

10. Remove two M10 hex flange head bolts (A) and remove driveline shield (B).

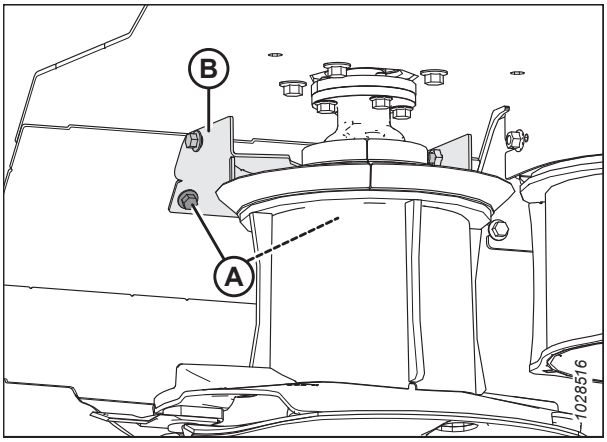


Figure 4.143: Driveline Shield – Right Drum

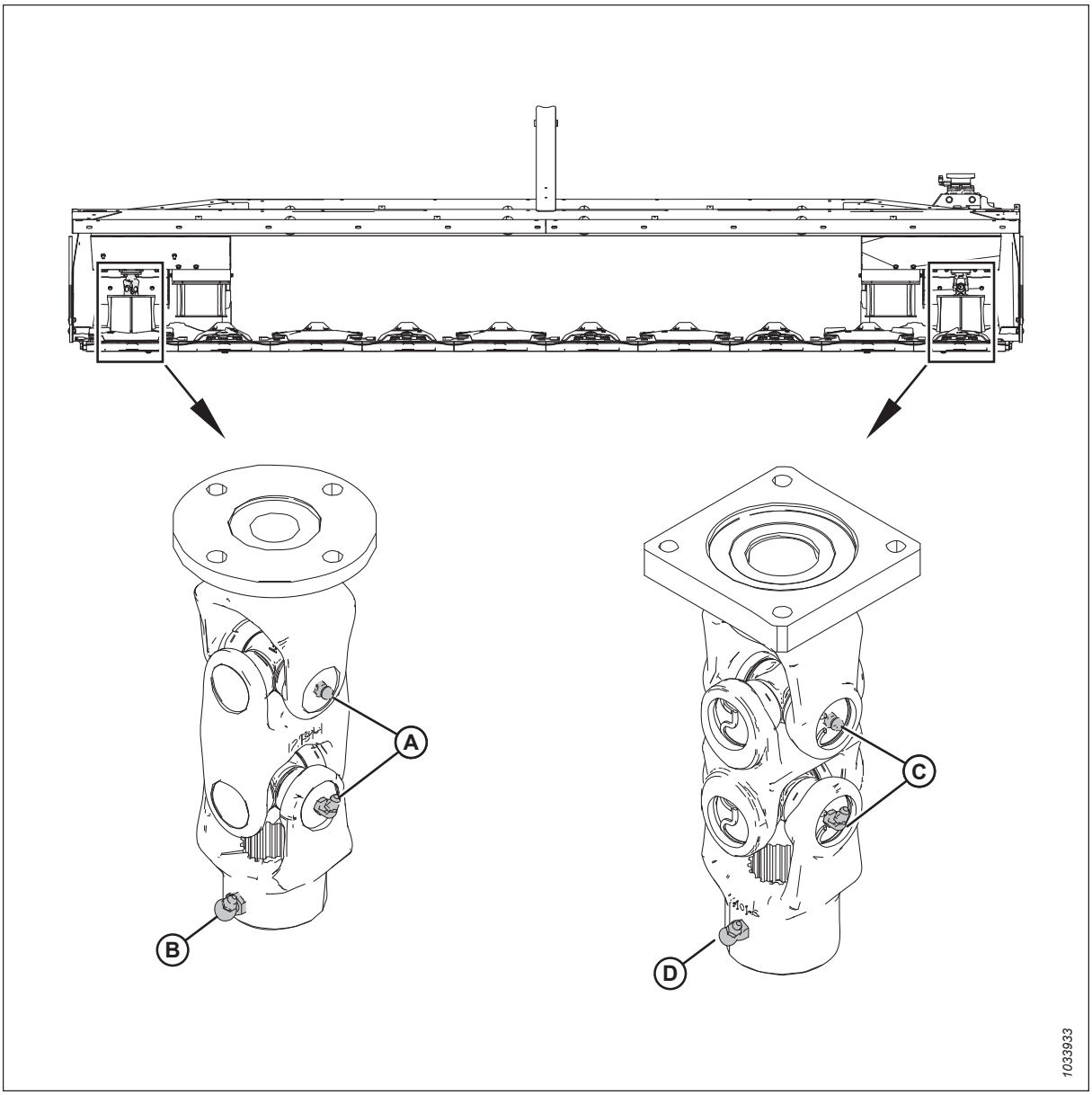


Figure 4.144: Vertical Drivelines Lubrication Locations

11. Lubricate the left and right vertical drivelines every 250 hours at the following locations:

    - Two grease fittings (A) on right driveline U-joints
    - One grease fitting (B) on right driveline shaft
    - Two grease fittings (C) on left driveline U-joints
    - One grease fitting (D) on left driveline shaft

    IMPORTANT:

    Fittings (A) and (C) – use high-temperature, extreme-pressure performance grease with **1%** max molybdenum disulphide (NLGI grade 2) lithium base.

    Fittings (B) and (D) – use high-temperature, extreme-pressure performance grease with **10%** max molybdenum disulphide (NLGI grade 2) lithium base.

12. On the right of the header, position driveline shield (B) as shown. Apply a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of two M10 hex flange head bolts (A). Use M10 hex flange head bolts (A) to secure driveline shield (B) in place.

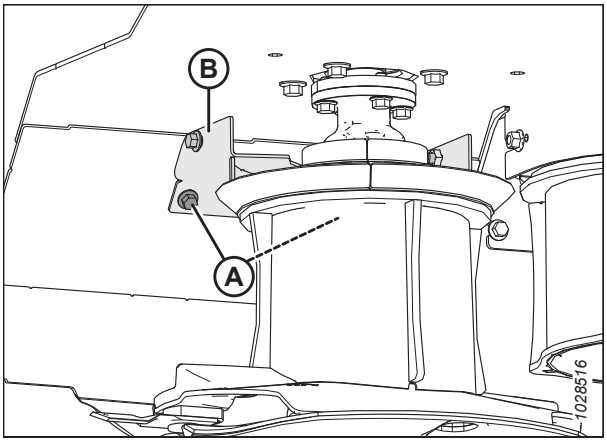


Figure 4.145: Driveline Shield – Right Drum

13. 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 in place. Torque hardware to 27 Nm (20 lbf·ft).

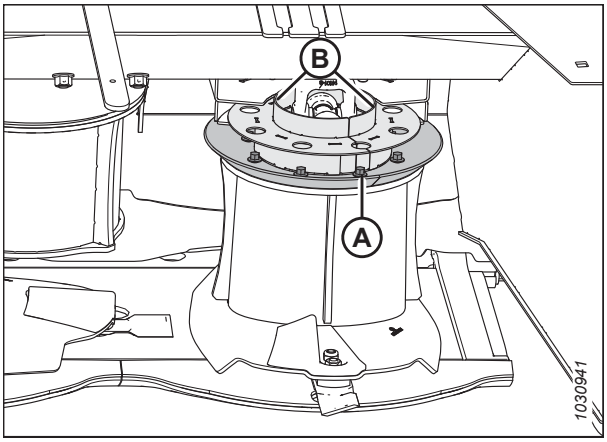


Figure 4.146: Driveline Shields – Right Drum

14. Position driveline shield (C) as shown. Apply a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of four M10 hex flange head bolts (A) and two M10 hex flange head bolts (B). Use bolts (A) and (B) to secure driveline shield (C) in place.

15. Tighten all hardware on driveline shields.

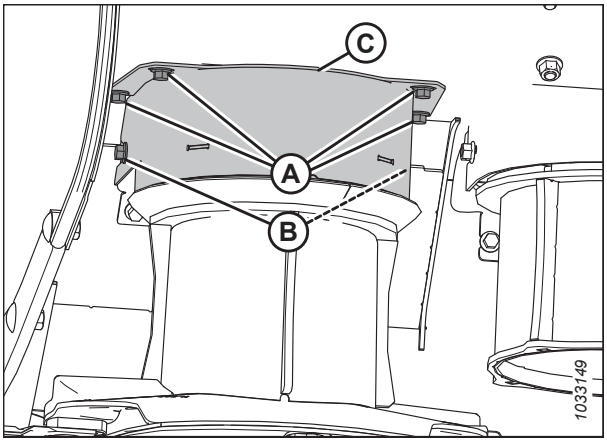


Figure 4.147: Driveline Shield – Right Drum

16. On the left of the header, position driveline shield (B) as shown. Apply a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of two M10 hex flange head bolts (A). Use bolts (A) to secure driveline shield (B) in place.

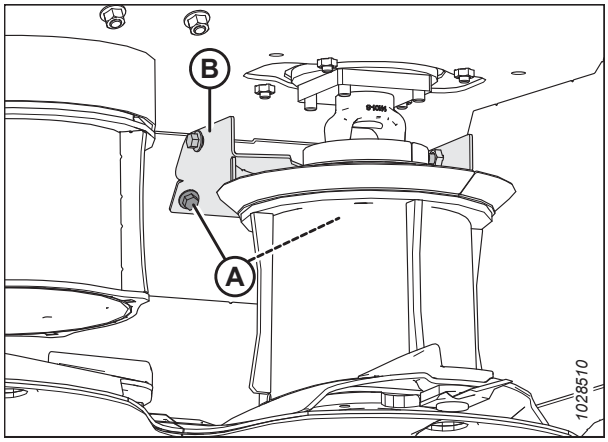


Figure 4.148: Driveline Shield – Left Drum

17. 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 in place. Torque hardware to 27 Nm (20 lbf·ft).

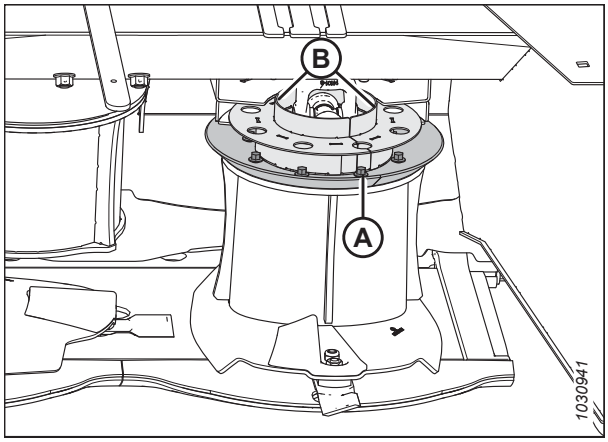


Figure 4.149: Driveline Shields – Left Drums

18. Position driveline shield (C) as shown. Apply a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of four M10 hex flange head bolts (A) and two M10 hex flange head bolts (B). Use bolts (A) and (B) to secure driveline shield (C) in place.

19. Tighten all hardware on driveline shields.

⚠ 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.

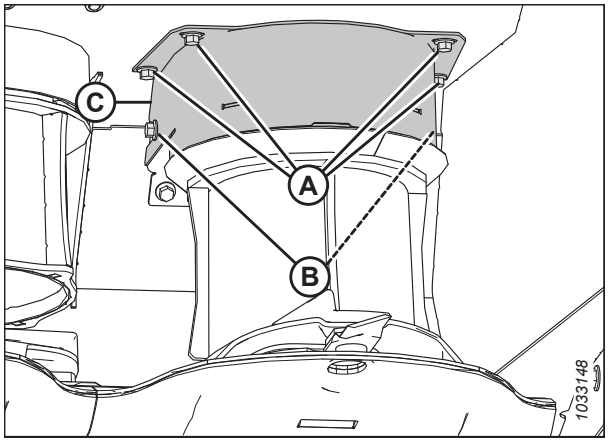


Figure 4.150: Driveline Shield – Left Drums

4.6.8 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 while remaining attached to the spindle with snap ring (B).

IMPORTANT:

Ensure correct orientation of the shear pins during replacement:

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

NOTE:

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

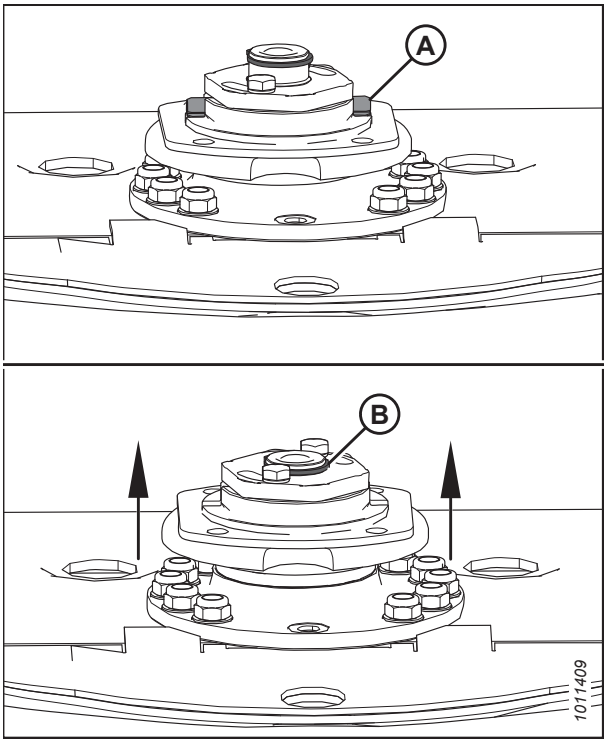


Figure 4.151: Cutterbar Spindles

NOTE:

A special spindle-nut wrench (A) is located under the panel on the right side of the header. This tool is used to loosen and tighten the spindle nuts.

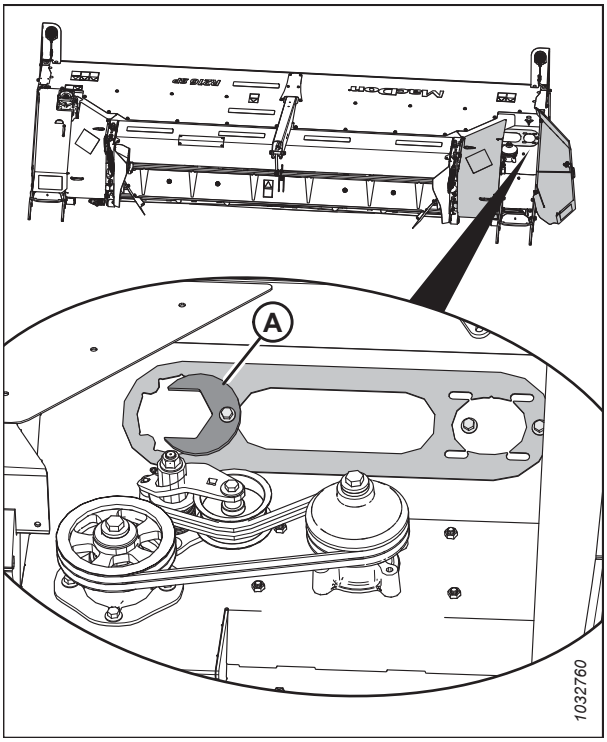


Figure 4.152: Safecut Spindle-Nut Wrench

Removing Cutterbar Spindle Shear Pin

Once a shear pin in the rotary disc header's spindle has broken, it will need to be removed before it can be replaced.

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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

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

1. Place the header in a position where you can access the component that will be serviced.
2. Shut down the engine, and remove the key from the ignition.
3. If the header is fully raised, engage the safety props. If the header is off the ground and not fully raised, place blocks under the header. Never work on or beneath an unsupported header. For instructions on engaging the safety props, refer to the relevant procedure:
   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*
4. Open cutterbar curtain (A). For instructions, refer to *3.10.1 Opening Cutterbar Curtain, page 119*.
5. Clean any debris from the work area.

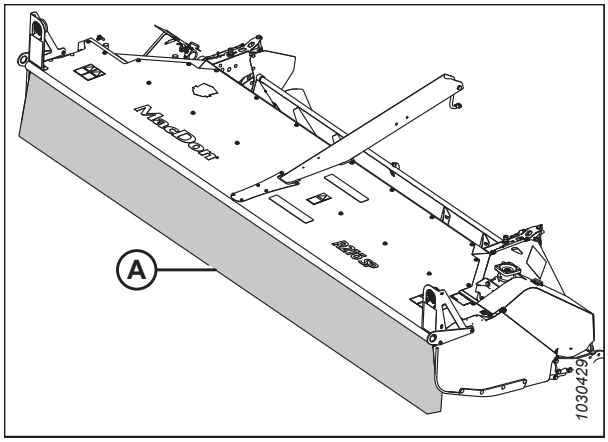


Figure 4.153: Cutterbar Curtain

6. Refer to the relevant disc removal procedure:
   - To remove cutterbar disc (A), refer to *Removing Cutterbar Discs, page 187*.
   - To remove left driven drum (B), refer to *Removing Left Driven Drum and Driveline, page 230*.
   - To remove right driven drum (C), refer to *Removing Right Driven Drum and Driveline, page 236*.

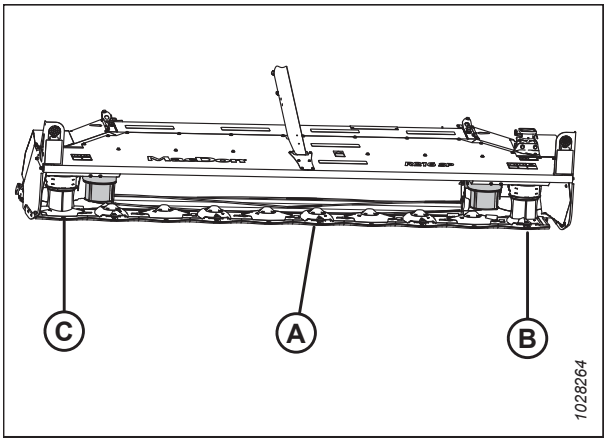


Figure 4.154: Cutterbar Disc and Driven Drums

7. Remove spacer plate (A) and retaining ring (B).

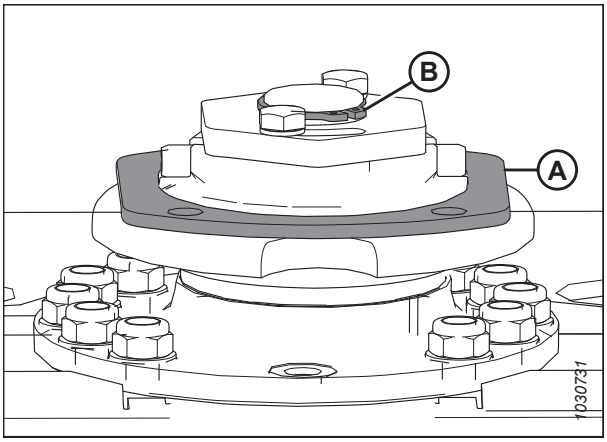


Figure 4.155: Cutterbar Spindle

8. Locate the storage location for the safecut spindle-nut wrench. Remove the M12 bolt and remove safecut spindle-nut wrench (A) from its storage location.

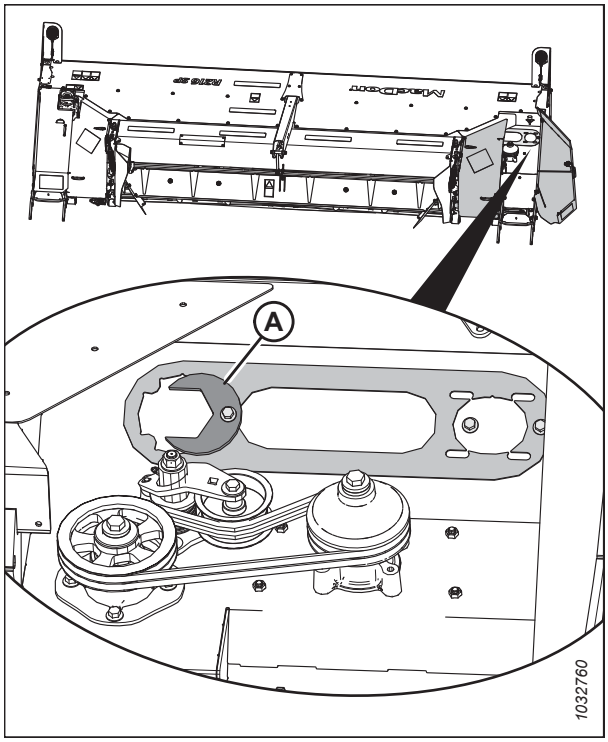


Figure 4.156: Safecut Spindle-Nut Wrench

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 a spindle's 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 a proper rotation pattern can result in damage to the spindle or the cutterbar components.

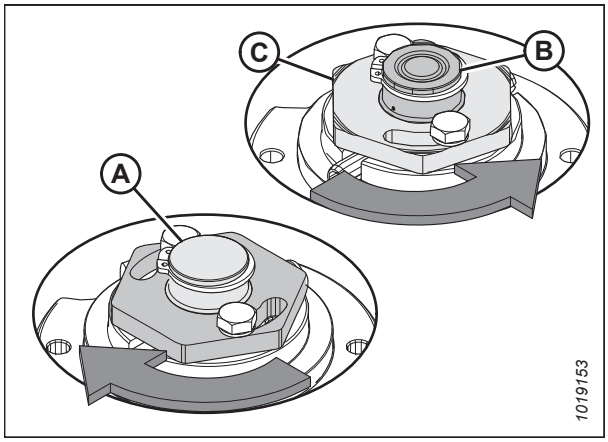


Figure 4.157: Cutterbar Spindles

9. Remove two M10 bolts and washers (A).

10. Inspect the threads of two M10 bolts (A). Replace any damaged bolts.

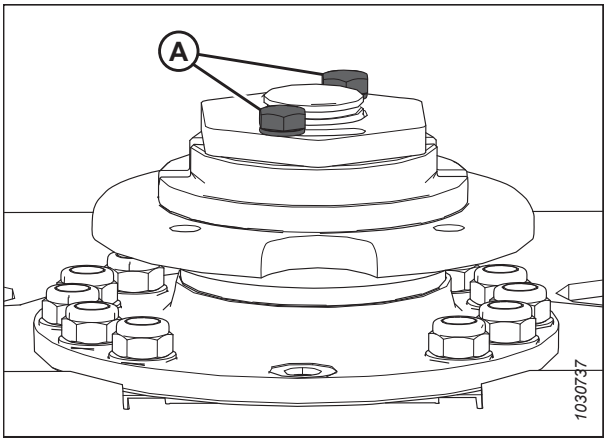


Figure 4.158: Cutterbar Spindle

11. Use the safecut spindle-nut wrench to remove nut (A).

12. Remove hub (B). Inspect the hub for damage. Replace the hub if necessary.

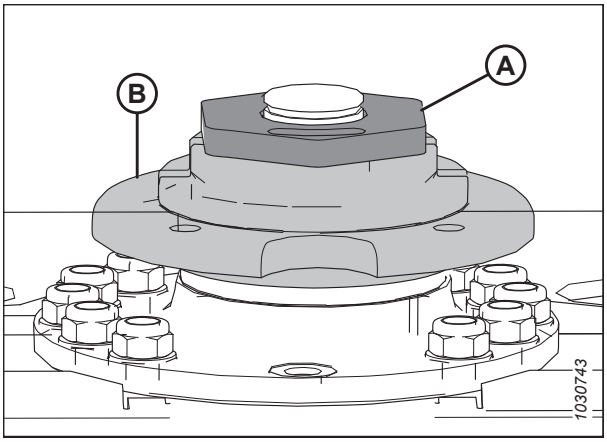


Figure 4.159: Cutterbar Spindle

13. Remove damaged shear pins (A) using pin punch (B).

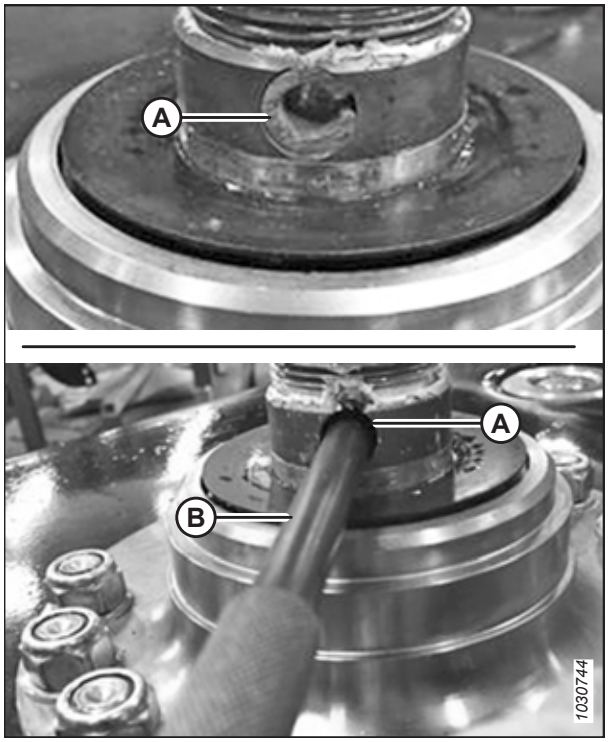


Figure 4.160: Removing Shear Pin

14. Remove and clean Belleville washer (A).

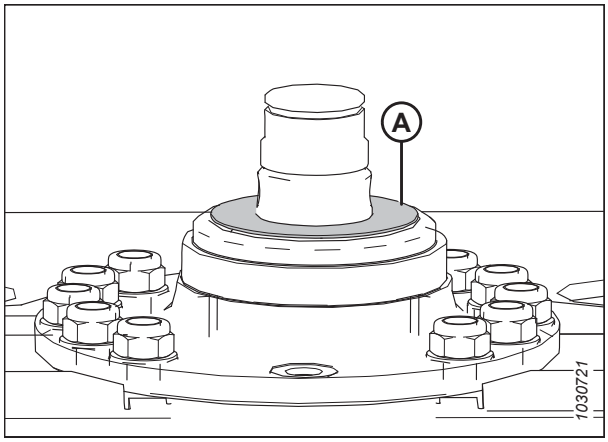


Figure 4.161: Belleville Washer

Installing Cutterbar Spindle Shear Pin

The rotary disc header's spindle will need to have two shear pins connecting the hub to 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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

WARNING

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

1. Place the header in a position where you can access the component that will be serviced.
2. Shut down the engine, and remove the key from the ignition.
3. If the header is fully raised, engage the safety props. If the header is off the ground and not fully raised, place blocks under the header. Never work on or beneath an unsupported header. For instructions on engaging the safety props, refer to the relevant procedure:
   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*
4. Fill the space above the bearing with grease. Refer to the inside back cover of this manual for information on the type of grease to use.
5. Reinstall Belleville washer (A) so that its dome face downward and the outside edges face upward.

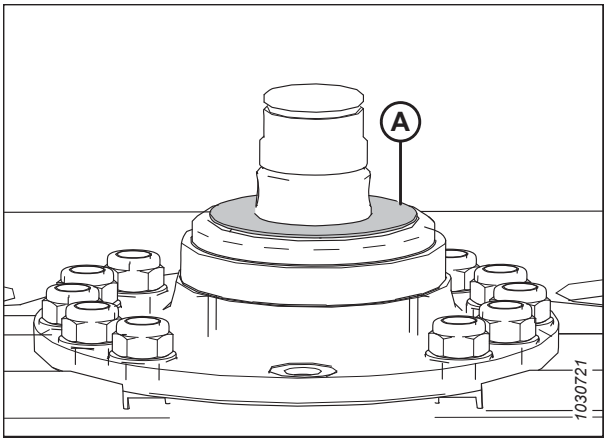


Figure 4.162: Cutterbar Spindle

6. Place hub (A) on spindle (B), and line up the slots in the hub with the holes in the spindle shaft.
7. Position the new shear pins with grooves (C) as shown.

   IMPORTANT:

   Ensure that grooves (C) in the shear pins are parallel with the cutterbar.

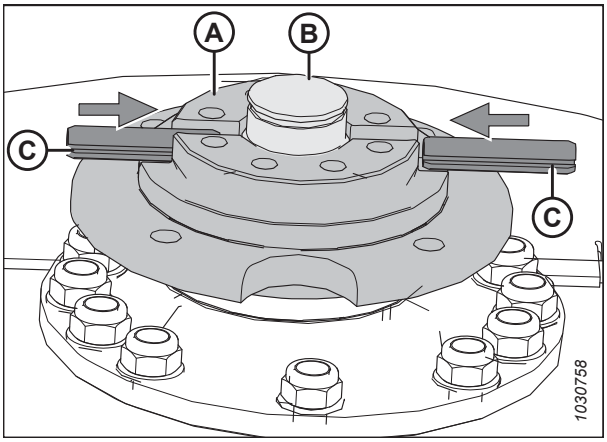


Figure 4.163: Shear Pin Orientation

8. Install new shear pin (A) using a pin punch and hammer. Repeat this step on the other side of spindle.

   NOTE:

   Ensure that the ends of the shear pins do **NOT** protrude past the step in the hub.

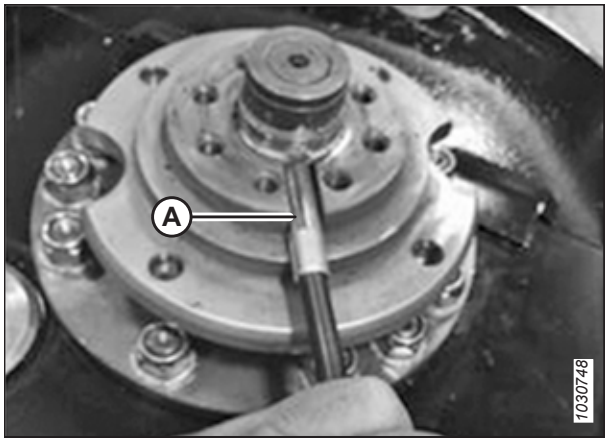


Figure 4.164: Cutterbar Spindle

9. Install nut (A) and spacer plate (B).

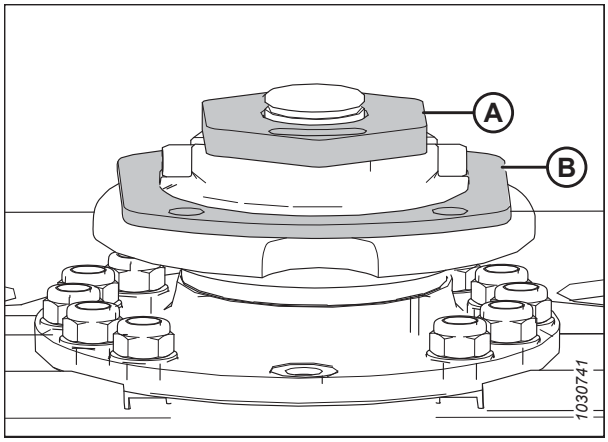


Figure 4.165: Cutterbar Spindle

10. Attach safecut spindle-nut wrench (B) 90° (D) to torque wrench (A).

    IMPORTANT:

    If the wrench is not attached correctly, the proper degree of torque will **NOT** be applied to the nut.

11. Position safecut spindle-nut wrench (B) on spindle nut (C). Torque the nut to 300 Nm (221 lbf·ft).

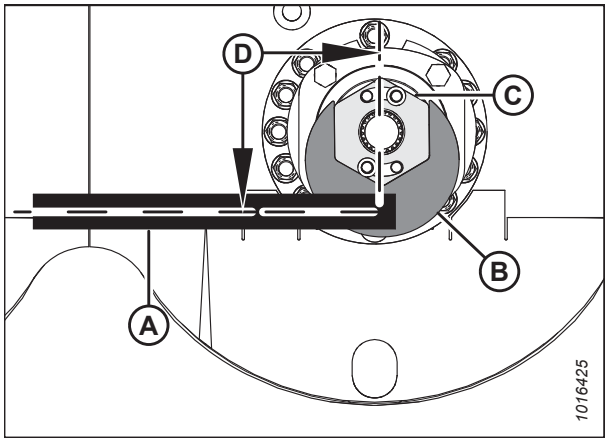


Figure 4.166: Spindle Nut

12. Install two M10 bolts and washers (A). Torque the hardware to 55 Nm (40 lbf·ft).

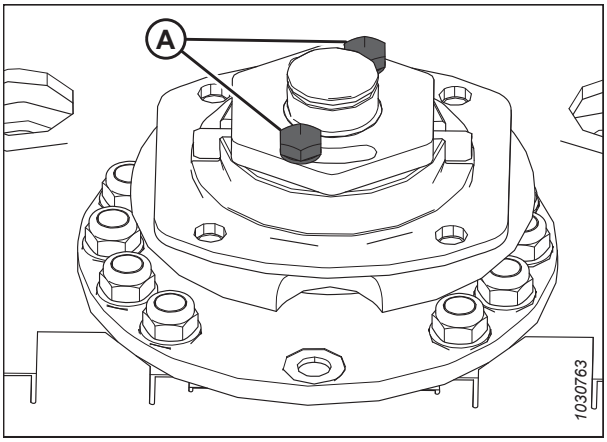


Figure 4.167: Cutterbar Spindle

13. Install retaining ring (A).

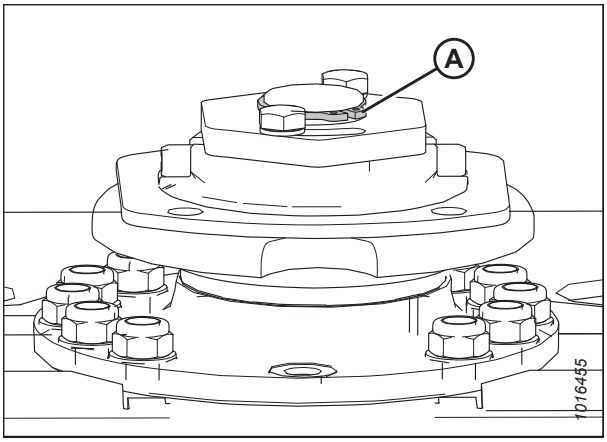


Figure 4.168: Cutterbar Spindle

14. Proceed to the relevant procedure:

    - Install cutterbar disc (A). For instructions, refer to *Installing Cutterbar Discs, page 189*.
    - Install left driven drum (B). For instructions, refer to *Installing Left Driven Drum and Driveline, page 233*.
    - Install right driven drum (C). For instructions, refer to *Installing Right Driven Drum and Driveline, page 239*.

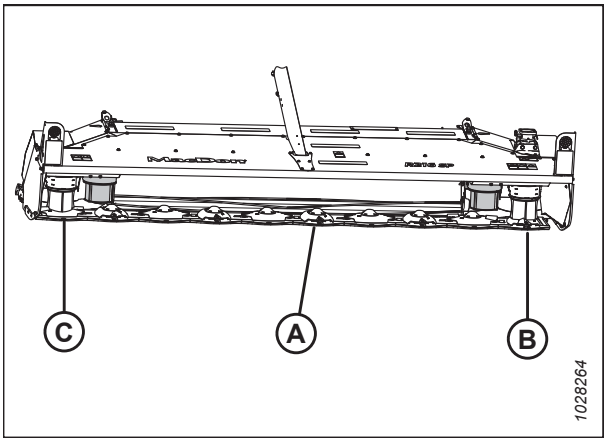


Figure 4.169: Cutterbar Disc and Driven Drums

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.

15. Close cutterbar curtain (A). For instructions, refer to *3.10.2 Closing Cutterbar Curtain, page 120*.

16. Return the safecut spindle-nut wrench to its storage location. For the storage location of wrench (B), refer to Figure .

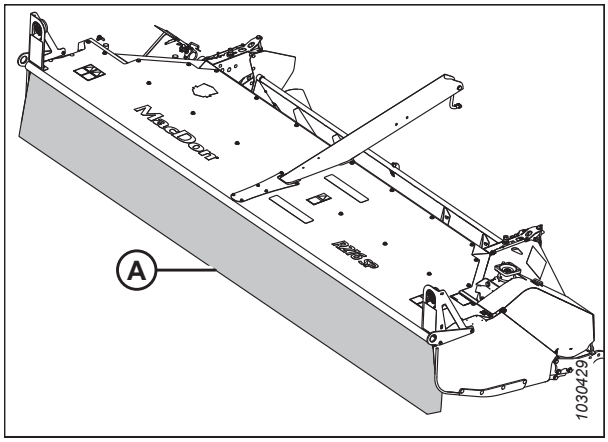


Figure 4.170: Cutterbar Curtain

4.6.9 Cutterbar Crop Stream

The number of crop streams fed into the header affects the shape of the windrow and, in some cases, the quality of the cut.

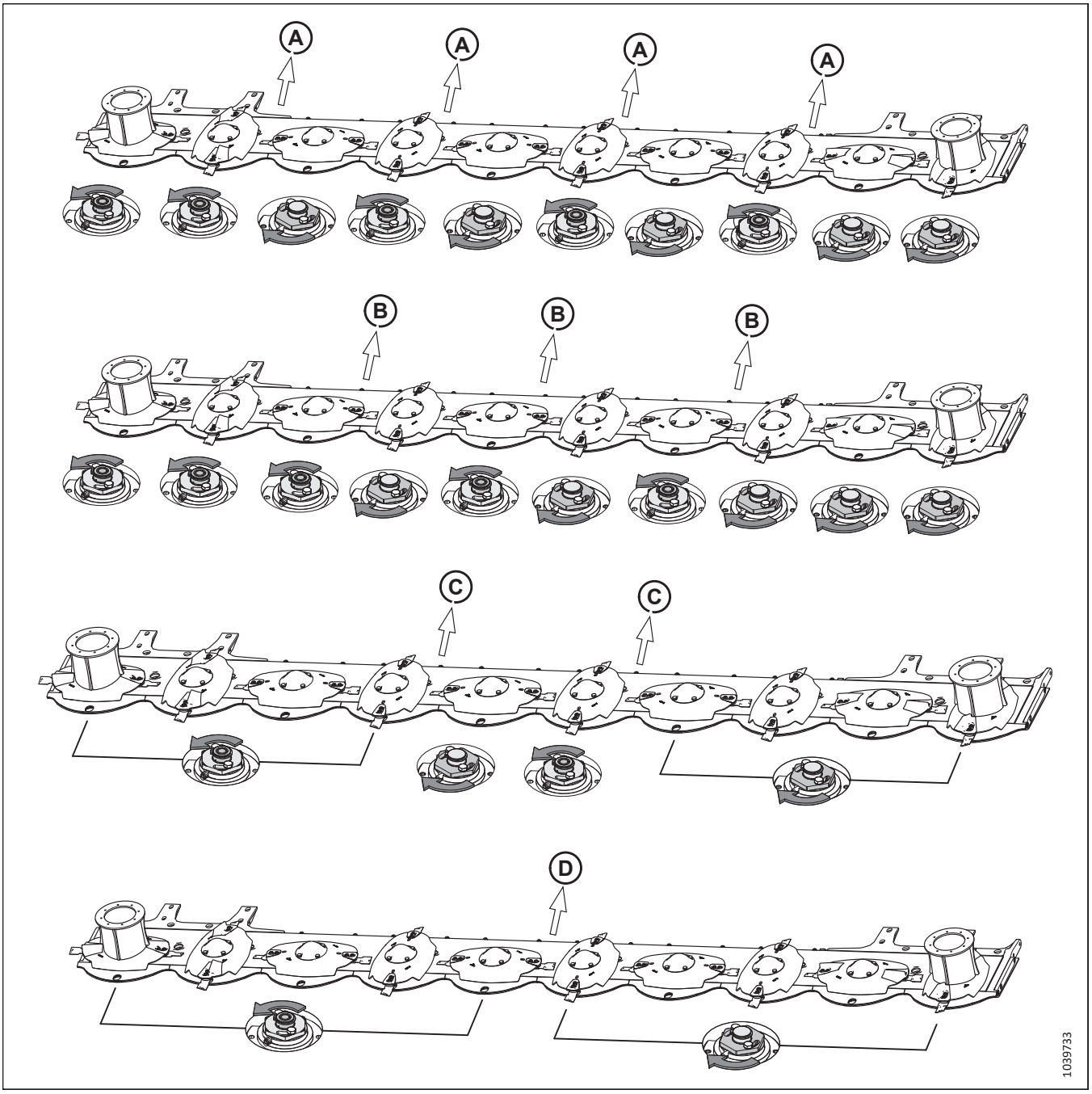


Figure 4.171: Cutterbar Crop Stream Configurations

Standard header: You can configure the cutterbar to produce four (A) (factory configuration), three (B), or two (C) crop streams. For more information, refer to *Configuring Cutterbar Crop Streams – Standard Header, page 260*

Grass seed header: One crop steam (D) is the only recommended configuration. Do **NOT** change the crop steam configuration.

Configuring Cutterbar Crop Streams – Standard Header

The cutterbar on the standard header can be configured to produce two, three, or four crop streams.

NOTE:

This procedure does **NOT** apply to grass seed headers. Do **NOT** change the crop stream configuration on a grass seed header.

1. To change the crop stream configuration, swap spindles and discs as needed. Refer to the IMPORTANT below before proceeding.

   IMPORTANT:

   - Spindles that rotate clockwise have right-leading threading and are identified by a smooth top on the spindle gear shaft (A).
   - Spindles that rotate counterclockwise have left-leading threading and are identified by machined grooves on the spindle gear shaft (B) and nut (C).
   - If the spindle's position in 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 cutterbar components.
   - Safecut components (shear pin) will not work if spindles are used in the wrong orientation.

2. Determine the ideal crop stream configuration according to Figure *4.173, page 261*.

3. Change the crop stream configuration according to Figure *4.174, page 262*.

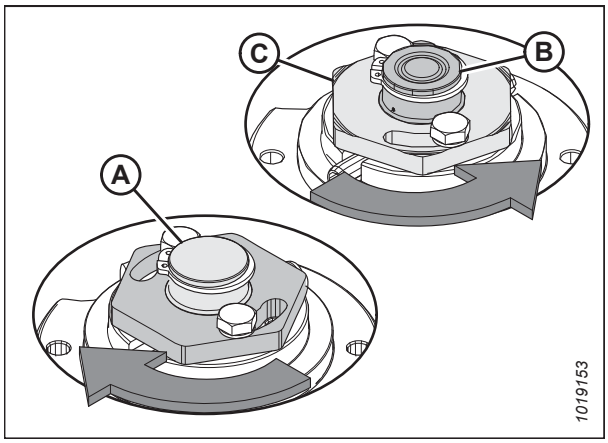


Figure 4.172: Cutterbar Spindles

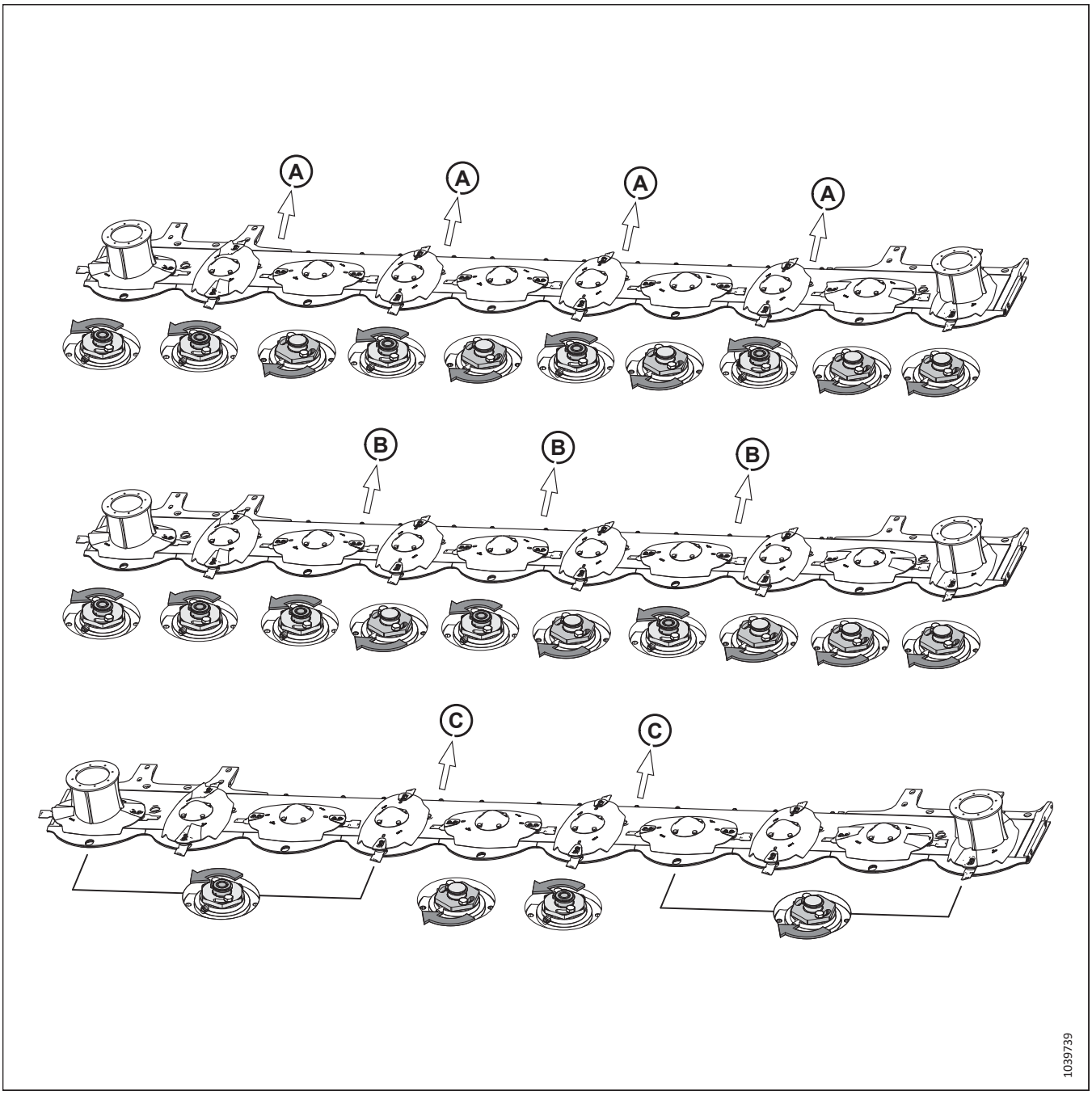


Figure 4.173: Cutterbar Crop Stream Configurations

- Four crop streams (A) (factory configuration) are recommended for most crops and conditions.
- Three crop streams (B) are recommended if using the double windrower attachment (DWA) in heavy conditions.
- Two crops streams (C) are recommended if cutting light alfalfa, or if using the DWA in light conditions.
- Reducing the number of crop streams narrows windrows.
- Increasing the number of crop streams widens and smooths windrows. Increasing the number of crop streams will also increase the number of diverging disc pairs which might reduce cut quality in certain conditions.

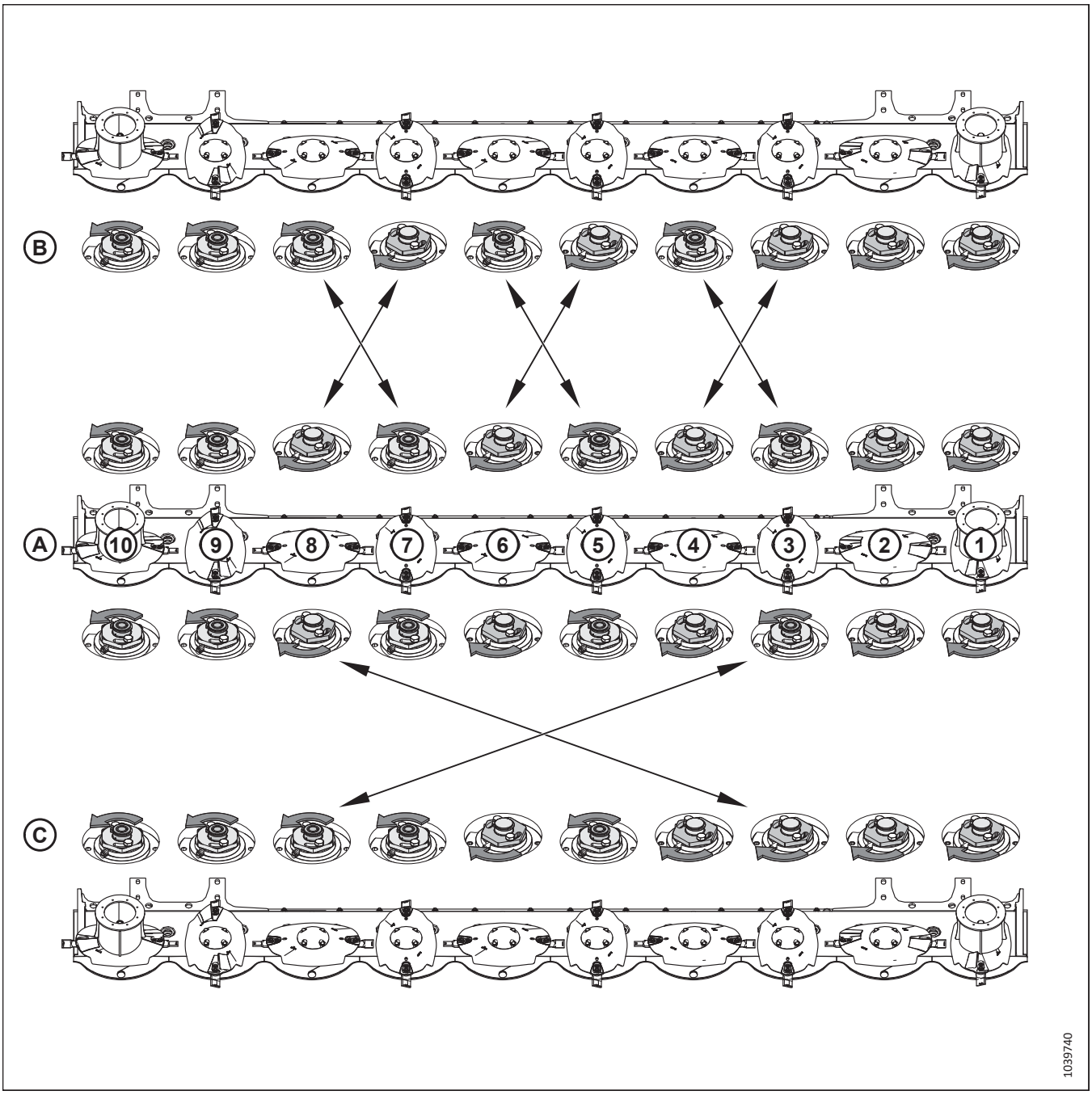


Figure 4.174: Cutterbar Crop Stream Conversion

- To change from four streams (A) to three streams (B), swap disc/spindles (8) with (7), (6) with (5), and (4) with (3), and vice versa.
- To change from four streams (A) to two streams (C), swap disc/spindle (8) with (3), and vice versa.
- For instructions on swapping spindles and discs, refer to *Removing Cutterbar Spindles, page 191* and *Installing Cutterbar Spindles, page 194*.

4.7 Conditioner Roll Timing Gearbox

The conditioner roll timing gearbox is located inside the drive compartment at the right of the header. It transfers power from the gearbox-driven lower conditioner roll to the upper roll.

Gearbox (A) does not require routine maintenance or service other than checking and changing oil.

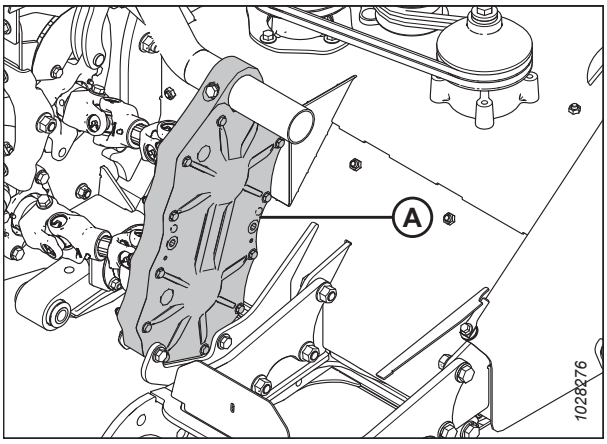


Figure 4.175: Conditioner Roll Timing Gearbox

4.7.1 Checking and Changing Conditioner Roll Timing Gearbox Oil

Change the oil after the first 50 hours of operation. Perform subsequent oil changes every 250 hours or annually (preferably before the start of the cutting season). Refer to this manual's inside back cover for a list of recommended fluids, lubricants, and capacities.

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.

IMPORTANT:

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

1. Lower the rotary disc header to the ground and adjust the header angle so that the cutterbar is parallel to the ground.
2. Shut down the engine, and remove the key from the ignition.
3. On the right side of the header, engage lift release latch (A) and pull handle (B) to open outboard driveshield (C).
4. Lift handle (D) to open inboard driveshield (E).

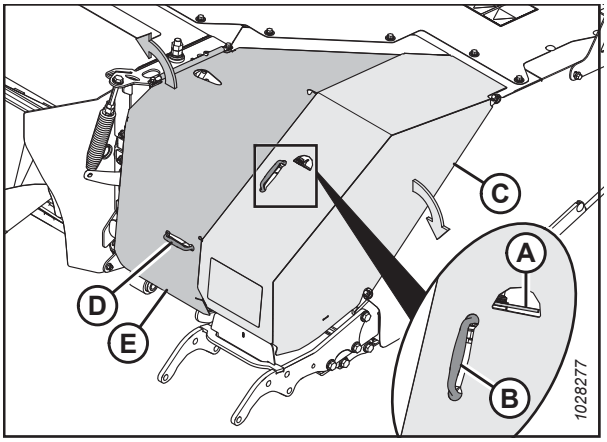


Figure 4.176: Right Driveshields

5. Remove right driveshield (A). For instructions, refer to *4.11.1 Removing Driveshields, page 282*.

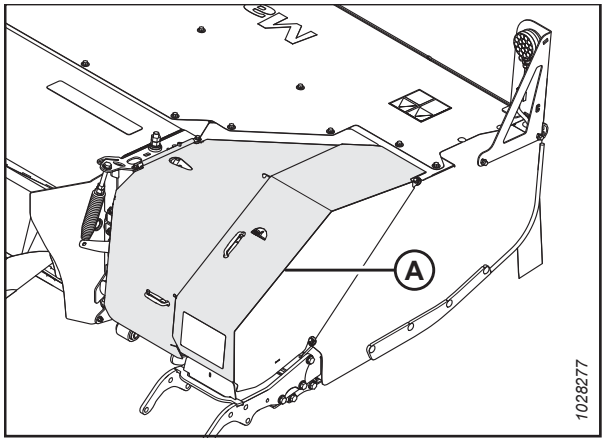


Figure 4.177: Right Driveshield

Checking the oil level:

6. Clean around oil level sight glass (A) and breather (B) on the inboard side of the gearbox.
7. Ensure that the lubricant is level with the top of the sight glass. If necessary, add lubricant through breather (B). Refer to this manual's inside back cover for a list of recommended fluids, lubricants, and capacities.

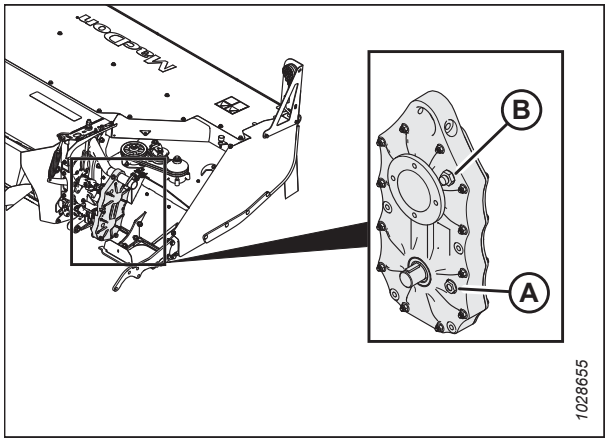


Figure 4.178: Roll Timing Gearbox

Changing the oil:

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 windrower's lift cylinder safety props before going under the machine.

8. Raise the header to provide sufficient access to oil drain plug (A).
9. Shut down the engine, and remove the key from the ignition.
10. Engage the windrower lift cylinder safety props.

    For instructions, refer to the relevant procedure:

    - **M1 Series Windrower:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
    - **M155*E4* or M205 SP Windrower :** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*
11. Clean around oil drain plug (A) on the bottom of the gearbox and around oil level plug (B) on the inboard side of the gearbox.
12. Place a 1 liter (1.05 qts [US]) container underneath the conditioner gearbox.
13. Remove oil drain plug (A) using a hex key.
14. Allow sufficient time for the oil to drain, then reinstall oil drain plug (A), and tighten it.
15. Fill the gearbox with the volume of oil specified on the inside back cover of this manual, or until level is visible in sight glass (B).

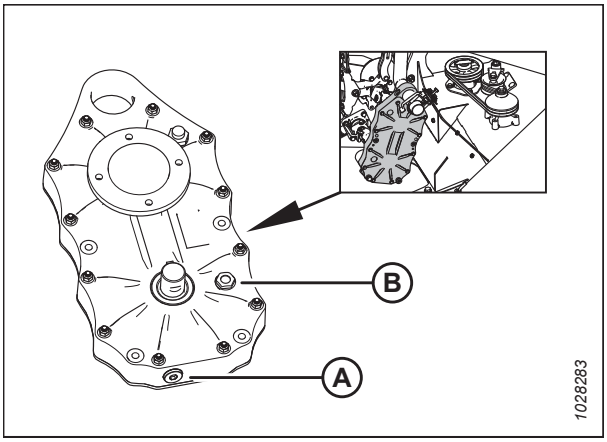


Figure 4.179: Roll Timing Gearbox

16. Reinstall the driveshields. For instructions, refer to *4.11.2 Installing Driveshields, page 283*.
17. Lower the header fully.
18. Properly dispose of the oil.

4.8 Header Drive Gearbox

Header drive gearbox (A) transfers power from the hydraulic motor to the cutterbar and conditioner. It is located inside the drive compartment at the left end of the header.

The only regular servicing required is maintaining the lubricant level and changing the lubricant according to the intervals specified in this manual. For more information, refer to *4.4 Maintenance Requirements, page 167*.

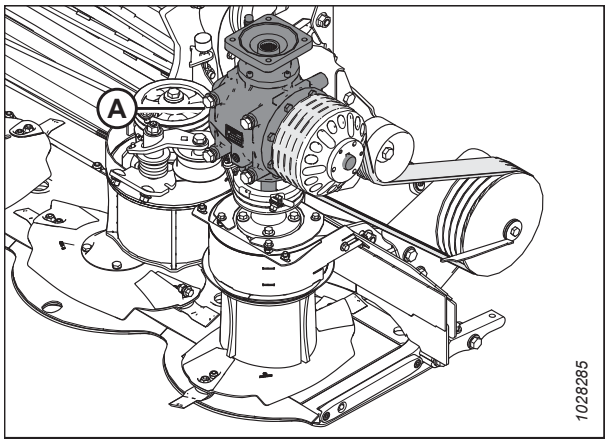


Figure 4.180: Header Drive Gearbox

4.8.1 Checking Oil in Header Drive Gearbox

Check the oil every 100 hours or annually.

IMPORTANT:

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

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. Park the windrower on a level surface.
2. Start the engine.
3. Adjust the header height until the cutterbar is parallel with the ground.
4. Shut down the engine, and remove the key from the ignition.
5. Open the left driveshield. For instructions, refer to *3.9.1 Opening Driveshields, page 115*.

6. Locate gearbox (A) on the left side of the header.

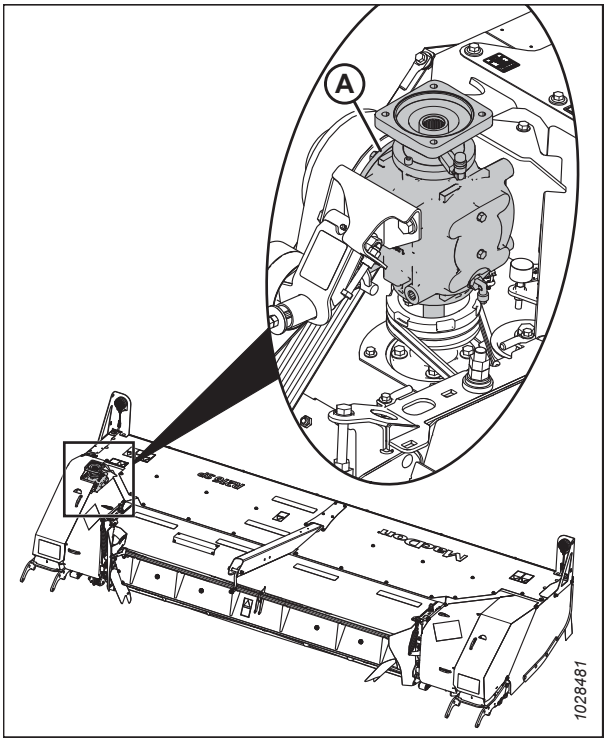


Figure 4.181: Header Drive Gearbox Location – Header with Conditioner Shown

7. Clean the area around check plug (A).
8. Remove check plug (A) with a 13 mm (1/2 in.) socket.
9. Ensure the lubricant is even with the bottom of the check hole (with check plug [A] removed) or slightly runs out of the check hole.
10. If necessary, remove fill plug (B) and add lubricant to the gearbox through the fill hole until lubricant runs out of the check hole (with check plug [A] removed). Refer to the inside back cover of this manual for a list of recommended fluids, lubricants, and capacities for the machine.
11. Reinstall the plug(s) and torque them to 23 Nm (17 lbf·ft).
12. Close the left driveshield.
13. Lower the header fully.
14. Shut down the engine, and remove the key from the ignition.

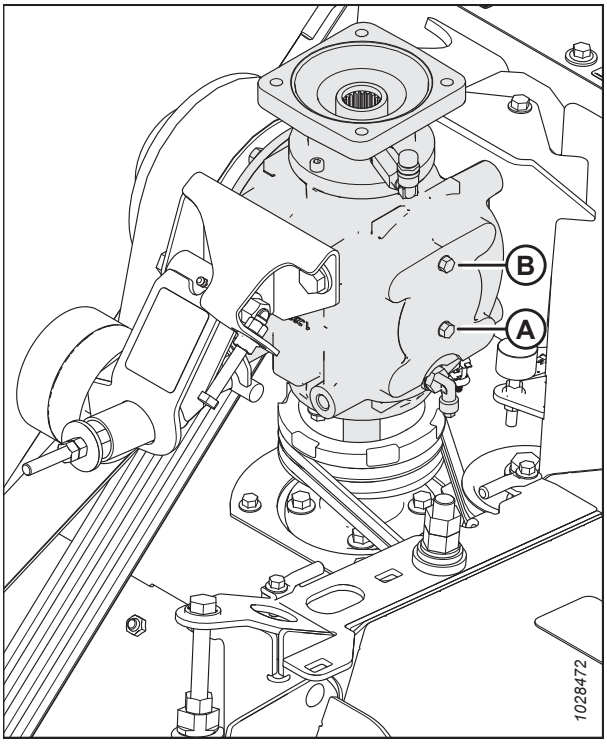


Figure 4.182: Header Drive Gearbox

4.8.2 Changing Oil in Header Drive Gearbox

Change oil after the first 50 hours of operation. Perform subsequent oil changes every 250 hours or annually (preferably before the start of the cutting season).

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. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Open the cutterbar curtain. For instructions, refer to *3.10.1 Opening Cutterbar Curtain, page 119*.
4. Open the left driveshield. For instructions, refer to *3.9.1 Opening Driveshields, page 115*.
5. Clean around oil drain plug (A) on the bottom of the gearbox and around check plug (B) on the inboard side of the gearbox.
6. Place a 4 liter (1 gal. [US]) container under drain (A).
7. Remove oil drain plug (A).
8. Allow sufficient time for oil to drain, reinstall oil drain plug (A), and tighten.
9. Remove check plug (B) and fill plug (C).
10. Add lubricant through the fill hole (with fill plug [C] removed) until the oil level is even with the check hole (with check plug [B] removed). Refer to the inside back cover of this book for a list of recommended fluids, lubricants, and capacities for the machine.
11. Replace check plug (B) and fill plug (C). Tighten plugs.
12. Clean up any spilled oil and properly dispose of used oil and wipes.
13. Close the cutterbar curtain. For instructions, refer to *3.10.2 Closing Cutterbar Curtain, page 120*.

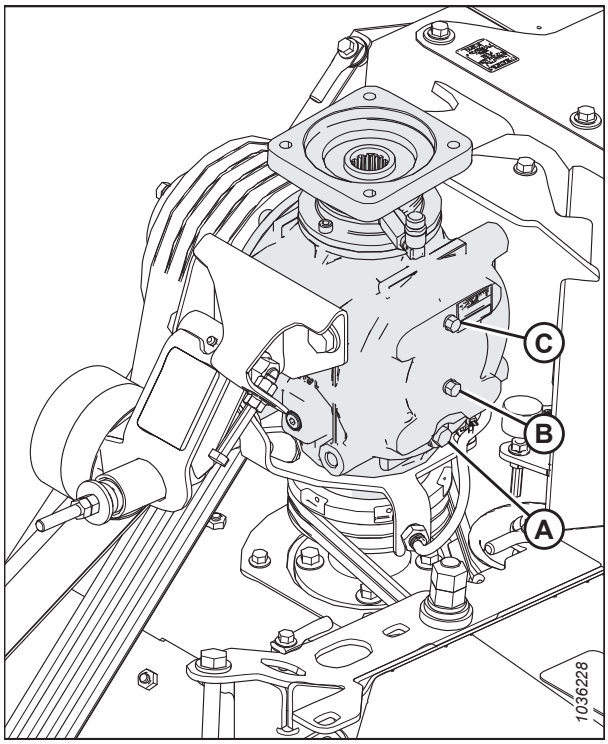


Figure 4.183: Header Drive Gearbox

4.9 Cutterbar Curtain

Rubber curtain (A) is installed at the front of the header. The curtain forms a barrier that minimizes the risk of thrown objects being ejected from the cutterbar area. Always keep curtains down during operation.

Replace the curtains if they become worn or damaged.

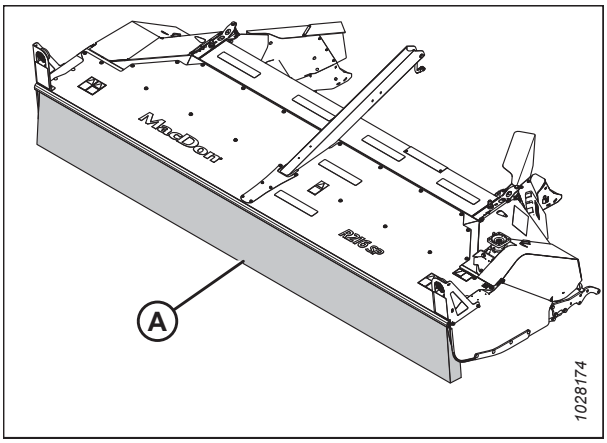


Figure 4.184: Cutterbar Curtain

4.9.1 Inspecting Cutterbar Curtain

The cutterbar curtain is an important safety feature that reduces the potential for thrown objects. Always keep the curtain down when operating the header.

WARNING

To reduce the risk of personal injury and machine damage, do NOT operate the machine without curtain installed and in good condition. Objects in the path of the blades can be ejected with considerable force when the machine is started.

CAUTION

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

Check cutterbar curtain (A) for the following conditions:

- Rips and tears: Replace curtain.
- Cracking: While the curtain may look whole, this is an indicator that failure is imminent—replace curtain.
- Missing bolts: Replace missing hardware before operating.

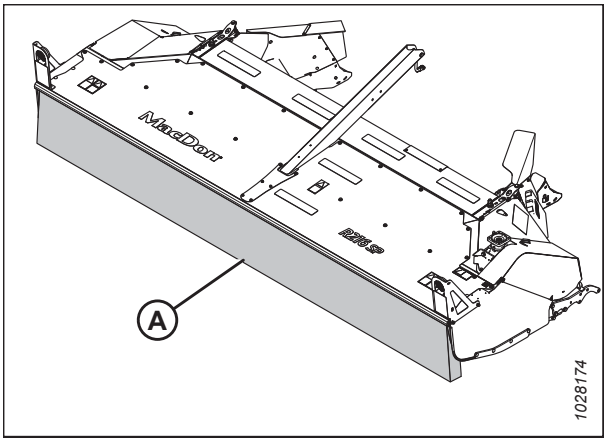


Figure 4.185: Cutterbar Curtain

4.9.2 Removing Cutterbar Curtain

In order to replace the cutterbar curtain, it must first be removed from the header.

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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

1. Place the header in a position where you can access the component that will be serviced.
2. Shut down the engine, and remove the key from the ignition.
3. If the header is fully raised, engage the safety props. If the header is off the ground and not fully raised, place blocks under the header. Never work on or beneath an unsupported header. For instructions on engaging the safety props, refer to the relevant procedure:
   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*
4. Remove hex flange head bolt and washer (A) securing curtain (B) to the inboard side of the end panel.

   NOTE:

   The cutterbar has been removed from the illustration for the sake of clarity.
5. Loosen six lock nuts (C) securing curtain (B) to the front of the header frame. Do **NOT** remove the nuts at this time.

   NOTE:

   The curtain seam faces the inside of the header frame.

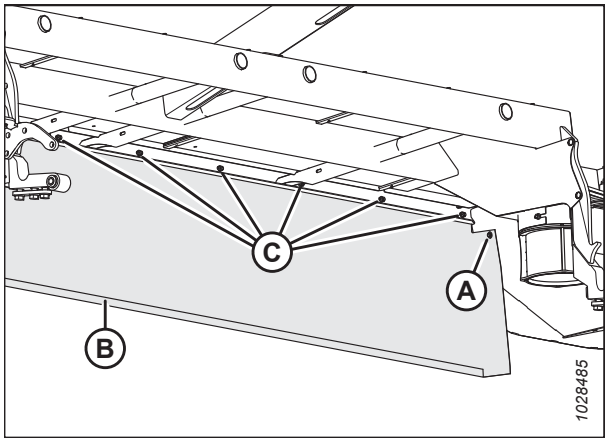


Figure 4.186: Cutterbar Curtain – View from Below

6. Remove bumper (A) by sliding it off of bumper mount (D).

   NOTE:

   The top shield has been removed from the illustration for the sake of clarity.
7. Remove six M10 bolts (B), six lock nuts (C), and bumper mount (D).
8. Repeat Steps *4, page 270* to *7, page 270* at the opposite end of the header.
9. Remove curtain (E).

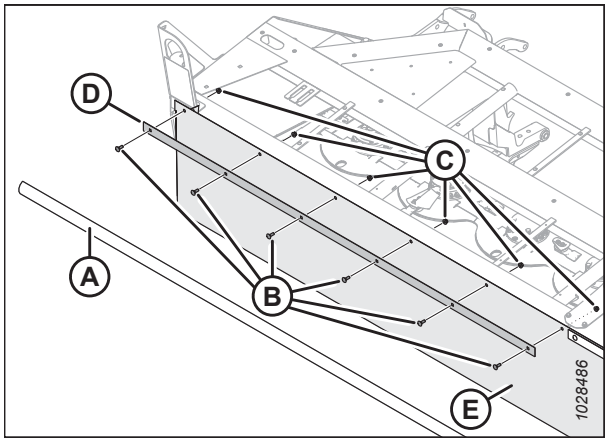


Figure 4.187: Cutterbar Curtain – View from Front

4.9.3 Installing Cutterbar Curtain

The cutterbar curtain protects bystanders from objects thrown by the cutterbar. It must be installed before the header can be operated.

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. Never work on or beneath an unsupported header. If the header is fully raised, always engage the safety props. If the header is off of the ground but not raised to its full height, place blocks under the header.

1. Place the header in a position where you can access the component that will be serviced.
2. Shut down the engine, and remove the key from the ignition.
3. If the header is fully raised, engage the safety props. If the header is off the ground and not fully raised, place blocks under the header. Never work on or beneath an unsupported header. For instructions on engaging the safety props, refer to the relevant procedure:
   - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
   - **M Series Self-Propelled Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*
4. Position curtain (E) on the front of the header frame.

   NOTE:

   The top shield has been removed from the illustration for the sake of clarity.
5. Secure the curtain using bumper mount (D), six M10 bolts (B), and six lock nuts (C). Do **NOT** tighten the nuts yet.
6. Slide bumper (A) onto bumper mount (D) from the outboard end of the header.

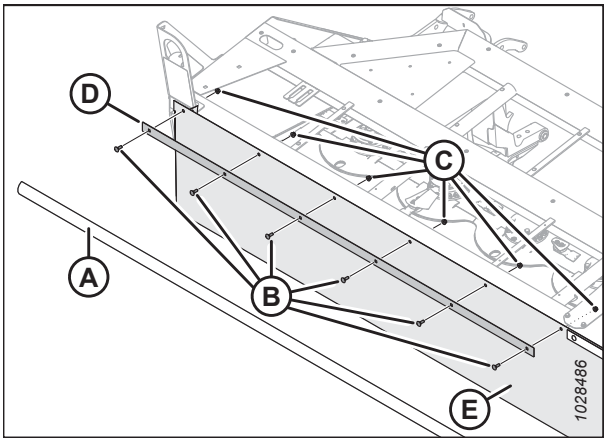


Figure 4.188: Cutterbar Curtain – View from Front

7. Tighten six lock nuts (C) securing curtain (B) to the front of the header frame.

   NOTE:

   The cutterbar has been removed from the illustration for the sake of clarity.
8. Secure the curtain to the inboard side of the end panel using hex flange head bolt and washer (A). Torque the bolt to 29 Nm (21 lbf·ft).
9. Repeat Steps *4, page 271* to *8, page 271* at the opposite end of the header.

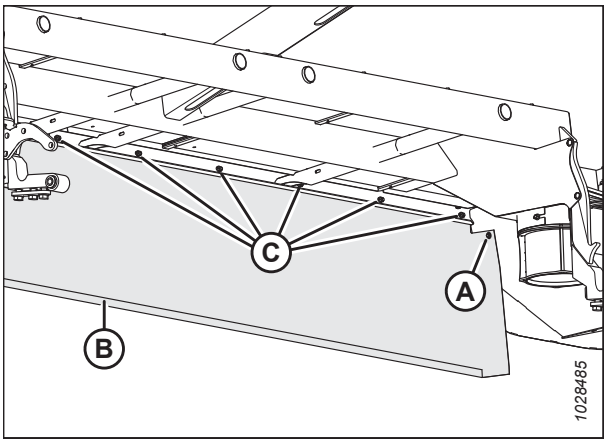


Figure 4.189: Cutterbar Curtain – View from Below

10. Disengage the windrower's safety props. For instructions, refer to the relevant procedure:

    - **M1 Series Windrowers:** *3.2.1 Engaging and Disengaging Header Safety Props – M1 Series Windrower, page 26*
    - **M155*E4* or M205 SP Windrowers:** *3.2.2 Engaging and Disengaging Header Safety Props – M Series Self-Propelled Windrower, page 27*

11. Lower the header.

4.10 Conditioner – Standard Header

Rolls condition the crop by crimping and crushing the stem in several places, which allows the release of moisture resulting in faster drying times. There are two roll conditioner options—steel conditioner rolls and polyurethane rolls.

4.10.1 Inspecting Conditioner Components

If there is a problem with the performance of the conditioner, the conditioner roll bearings, feed roll bearings, and driveline U-joints may need to be inspected 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 windrower's lift cylinder safety props 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. Open driveshields (A). For instructions, refer to *3.9.1 Opening Driveshields, page 115*.

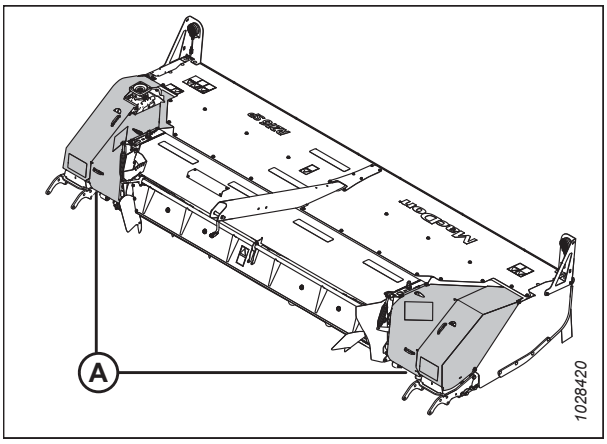


Figure 4.190: Driveshields

4. Remove the left feed roll belt to release the tension on the conditioner roll. For instructions, refer to *Removing Feed Roll Belt, page 275*.
5. Inspect feed roll left bearing (A) for signs of wear, damage, grease, axial play, or radial play. The presence of grease indicates that the bearing seal has failed. Radial or axial play indicates that the bearing is worn out. If the bearing is suffering any form of diminished performance, replace the bearing. If the bearing needs replacing, contact your Dealer.

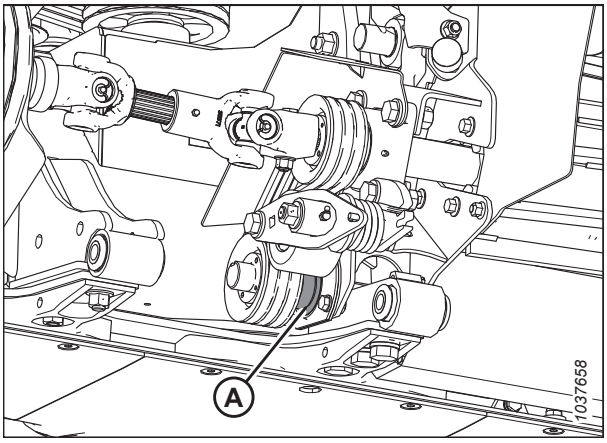


Figure 4.191: Feed Roll Left Bearing – View from Below

6. Inspect feed roll right bearing (A) for signs of wear, damage, grease, axial play, or radial play. The presence of grease indicates that the bearing seal has failed. Radial or axial play indicates that the bearing is worn out. If the bearing is suffering any form of diminished performance, replace the bearing. If the bearing needs replacing, contact your Dealer.

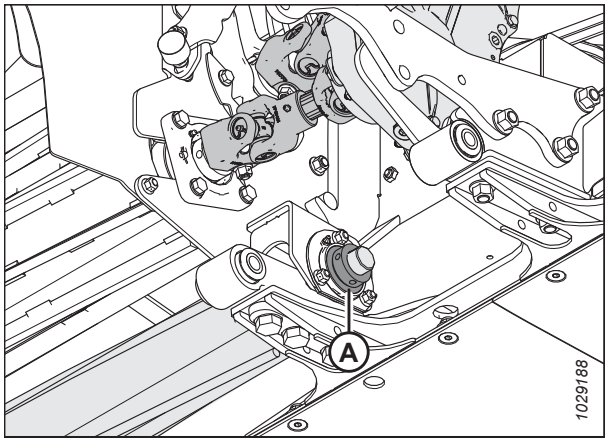


Figure 4.192: Feed Roll Right Bearing – View from Below

7. Inspect conditioner roll left bearings (A) for signs of wear, damage, grease, axial play, or radial play. The presence of grease indicates that the bearing seal has failed. Radial or axial play indicates that the bearing is worn out. If the bearing is suffering any form of diminished performance, replace the bearing. If the bearings need replacing, contact your Dealer.

   NOTE:

   The bearings are located on the inboard side of the feed roll tensioner assembly driver pulley and left roll arm.

8. Inspect conditioner driveline U-joints (B) for signs of wear or damage. If the U-joints need replacing, contact your Dealer.

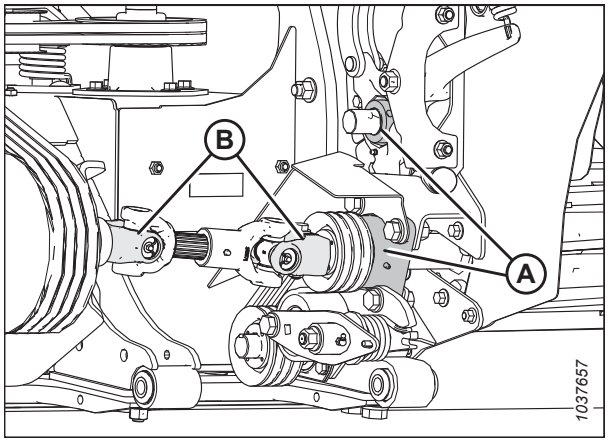


Figure 4.193: Conditioner Roll Left Bearings

9. Inspect conditioner drive U-joints (A) for signs of wear or damage. If the U-joints need replacing, contact your Dealer.

10. Inspect conditioner roll right bearings (B) for signs of wear, damage, grease, axial play, or radial play. The presence of grease indicates that the bearing seal has failed. Radial or axial play indicates that the bearing is worn out. If the bearing is suffering any form of diminished performance, replace the bearing.If the bearings need replacing, contact your Dealer.

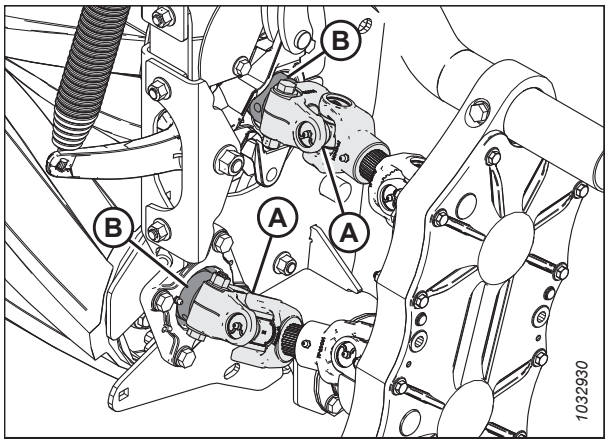


Figure 4.194: Conditioner Drive U-Joints and Conditioner Roll Right Bearings

11. Inspect roll timing gearbox bearings (A) for signs of wear, damage, grease, axial play, or radial play. The presence of grease indicates that the bearing seal has failed. Radial or axial play indicates that the bearing is worn out. If the bearing is suffering any form of diminished performance, replace the bearing. If the bearings need replacing, contact your Dealer.

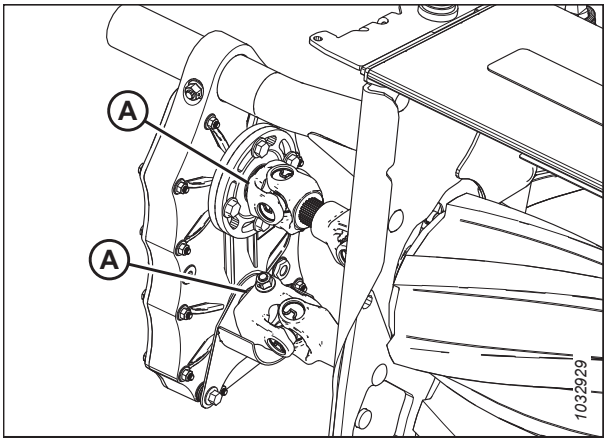


Figure 4.195: Roll Timing Gearbox Bearings

Feed Roll Drive Belt

The feed roll drive belt is located inside the left driveshield and is tensioned with a spring tensioner.

Removing Feed Roll Belt

The feed roll belt will need to be removed from the drive and driven pulleys In order to relieve the tension on the feed rolls.

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Open the left driveshield. For instructions, refer to *3.9.1 Opening Driveshields, page 115*.
3. Release tension using a 1/2 in. ratchet or breaker bar at location (B).
4. Slide belt (A) off of the pulleys.

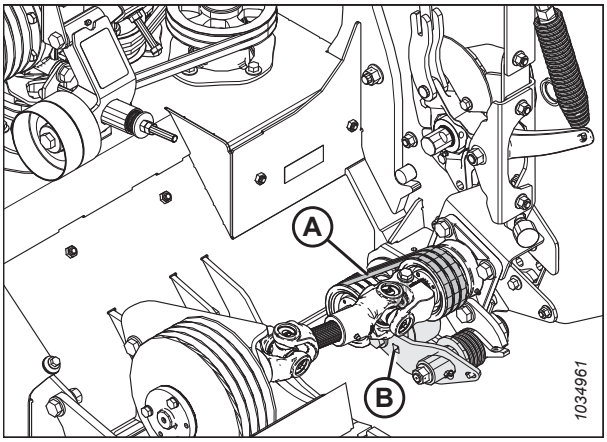


Figure 4.196: Pulley and Belt

5. Release spring-lock quick-coupling yoke (B) on conditioner driveline (A).
6. Compress driveline (A) enough to remove the belt.

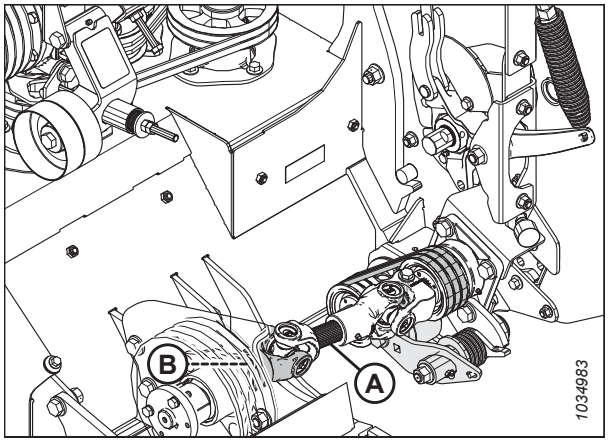


Figure 4.197: Conditioner Driveline

Installing Feed Roll Belt

The feed roll belt will need to be installed on the drive and driven pulleys on the feed roll drive system.

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Open the left driveshield. For instructions, refer to *3.9.1 Opening Driveshields, page 115*.
3. Compress the driveline enough to install the belt.
4. If necessary, apply anti-seize compound to the splined shaft attached to the pulley.

   NOTE:

   Anti-seize compound is applied to the splined shaft of the driveline before leaving the factory.
5. Release spring-lock quick-coupling yoke (B) on conditioner driveline (A). Slide it on to the shaft as shown.

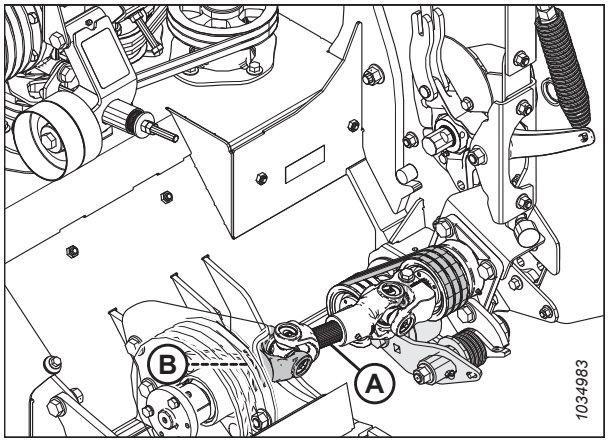


Figure 4.198: Conditioner Driveline

6. Release the spring tension using a 1/2 in. ratchet or breaker bar at location (B).
7. Seat belt (A) in the grooves in the pulleys.
8. Slowly increase the spring tension on the belts.
9. Remove the ratchet or breaker bar.
10. Close the driveshields.

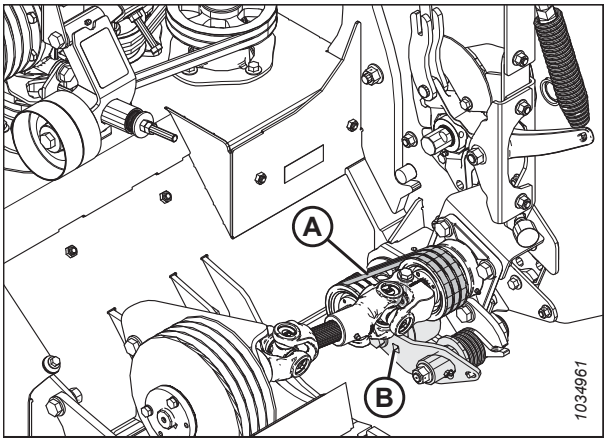


Figure 4.199: Pulley and Belt

Conditioner Drive Belt

The conditioner drive belt is located inside the left driveshield and is tensioned with a spring tensioner.

Inspecting Conditioner Drive Belt

The tension on the conditioner drive belt is set at the factory and should not require adjustment. The belt, however, should be inspected periodically.

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. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Open left driveshield (A). For instructions, refer to *3.9.1 Opening Driveshields, page 115*.

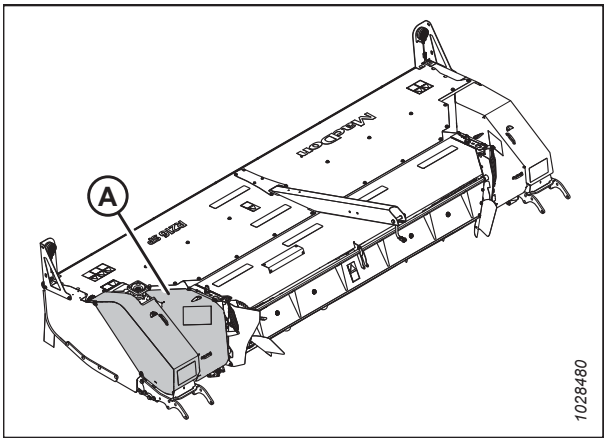


Figure 4.200: Left Driveshield

4. Inspect drive belt (A). If the belt is cracked or otherwise damaged, replace it.

5. Ensure that jam nut (B) and adjuster nut (C) are tight.

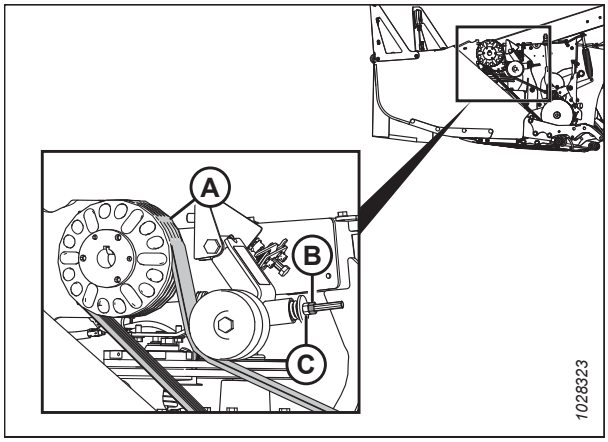


Figure 4.201: Conditioner Drive

6. Measure the length of belt tensioner spring (A). Ensure that spring length (B) is 17.5 mm (11/16 in.) in accordance with spring tension decal (C). If the spring length requires adjustment, refer to *Installing Conditioner Drive Belt, page 280*.

7. Close the driveshield. For instructions, refer to *3.9.2 Closing Driveshields, page 117*.

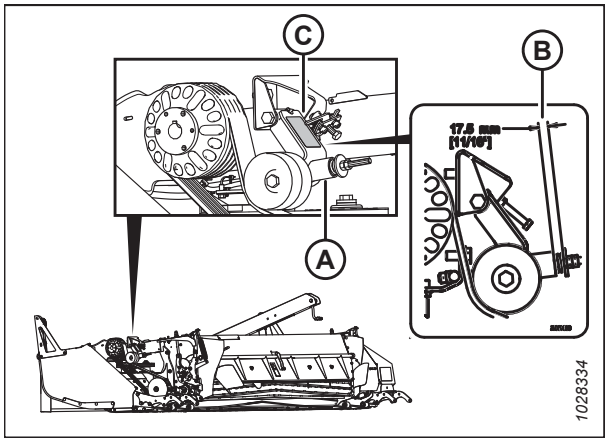


Figure 4.202: Belt Tension Spring

Removing Conditioner Drive Belt

The conditioner drive belt is located inside the left driveshield and is tensioned with a spring tensioner. The tension on the belt will need to be relieved in order for the belt to be 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.

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 *3.9.1 Opening Driveshields, page 115*.
4. Turn jam nut (A) counterclockwise to unlock the tension adjustment.
5. Turn jam nut (A) and adjuster nut (B) counterclockwise to fully extend tensioner spring (C. The tension on conditioner drive belt (D) will be relieved.
6. Fully loosen the hardware, then slide threaded rod (E) forward and down to disengage the rod pivot point from the disc speed sensor bracket.

   NOTE:

   The threaded rod pivot point must be disengaged from the disc speed sensor bracket to allow the tensioner assembly to rotate enough to remove the drive belt.
7. Remove drive belt (D).

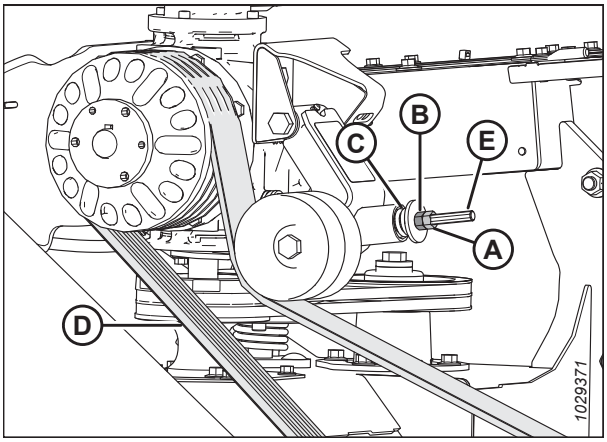


Figure 4.203: Conditioner Drive

Installing Conditioner Drive Belt

In order for the conditioner drive rolls to turn when the header is operating, the conditioner drive belt will need to be installed and its tension set.

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. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Open left driveshield (A). For instructions, refer to *3.9.1 Opening Driveshields, page 115*.

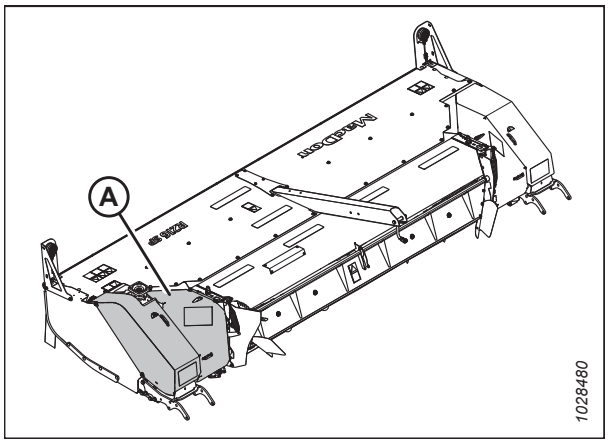


Figure 4.204: Left Driveshield

4. Install drive belt (A) onto driven pulley (C) first, and then onto drive pulley (B), ensuring that the belt is in the pulley grooves.

   NOTE:

   If necessary, loosen the jam nut and adjuster nut to relieve the spring tension.

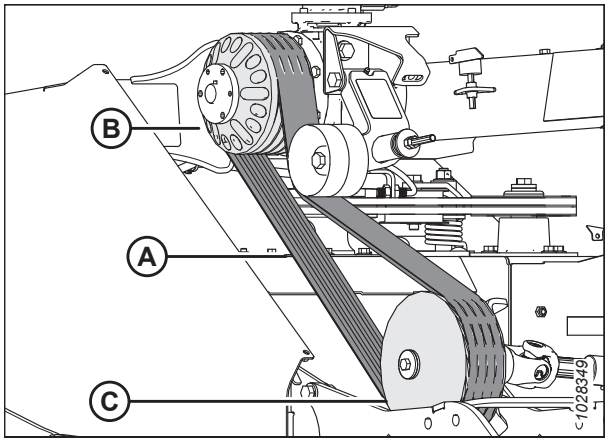


Figure 4.205: Conditioner Drive

5. Check the position of bracket (B). Center-to-center distance (C) between drive pulley (D) and driven pulley (E) should be 723 mm (28 7/16 in.). If bracket (B) is not set correctly, loosen M16 hex head bolt and lock nuts (A) on pulley mount bracket (B), and adjust the position of bracket (B).
6. Torque the hardware to 170 Nm (126 lbf·ft).

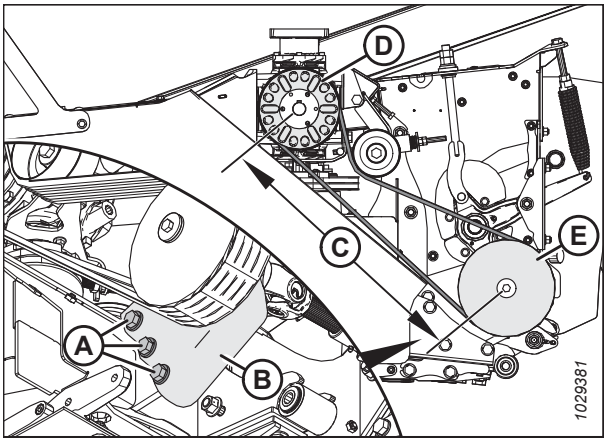


Figure 4.206: Conditioner Drive

7. Slide threaded rod (E) up and backward into the disc speed sensor bracket, then snug the hardware to engage the rod pivot point with the bracket.
8. Measure the length of tensioner spring (C). To ensure that the belt is tensioned correctly, dimension (D) should be set to 17.5 mm (11/16 in.).
9. If the tensioner spring requires adjustment, loosen jam nut (A) by turning it counterclockwise.
10. Turn adjuster nut (B) clockwise to increase the tension on the tensioner spring or turn adjuster nut (B) counterclockwise to decrease the tension on the tensioner spring, as needed.
11. Hold adjuster nut (B) in place and tighten jam nut (A) against it by turning the jam nut clockwise.
12. Reconnect speed sensor (B) to wiring harness (A).
13. Close the left driveshield. For instructions, refer to *3.9.2 Closing Driveshields, page 117*.

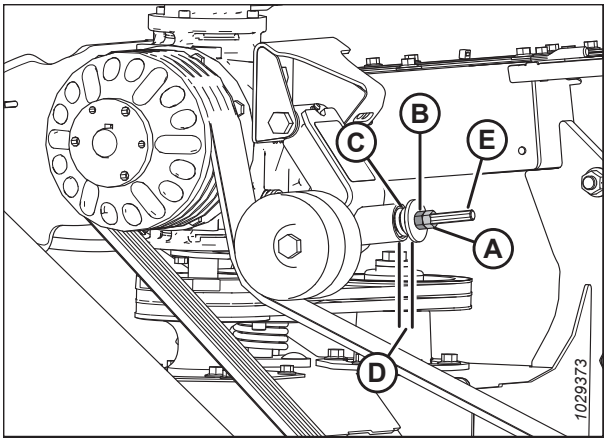


Figure 4.207: Conditioner Drive

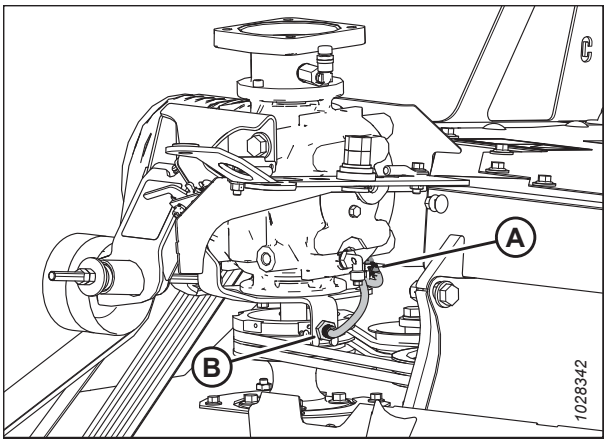


Figure 4.208: Speed Sensor

4.11 Replacing Driveshields

If driveshields are missing, severely damaged, or are not securely installed due to damage, they must be replaced.

4.11.1 Removing Driveshields

Remove the left or right driveshields as needed to service the header.

WARNING

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

NOTE:

The illustrations provided in this procedure show the left driveshield; the right driveshield is similar.

1. Open the driveshields. For instructions, refer to *3.9.1 Opening Driveshields, page 115*.

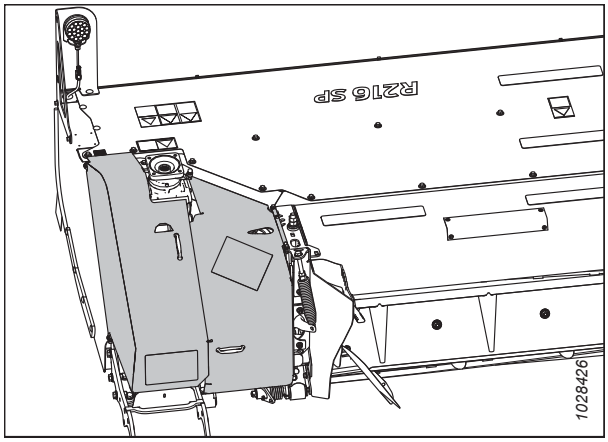


Figure 4.209: Left Driveshield

2. Remove bolt (C), retainer pin (B), two washers (A), and the hex flange center lock nut from the top and bottom of the outboard half of the driveshield.
3. Remove bolt (C), retainer pin (B), and the hex flange center lock nut from the front and rear of the inboard half of the driveshield.

   NOTE:

   The inboard half of the driveshield does **NOT** use washers (A).

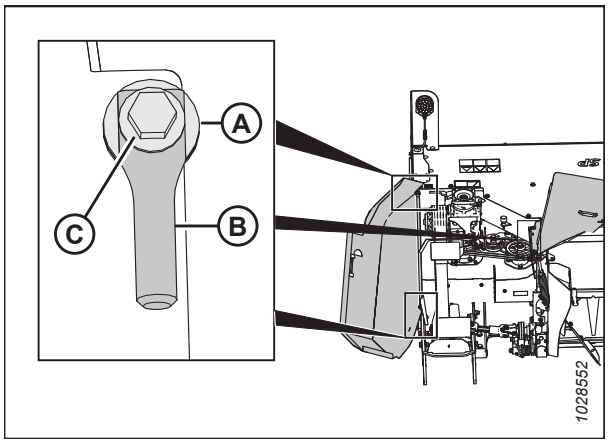


Figure 4.210: Retaining Pins on Driveshields

4. Pull outboard side (A) and inboard side (B) of the driveshield away from the rotary disc header.

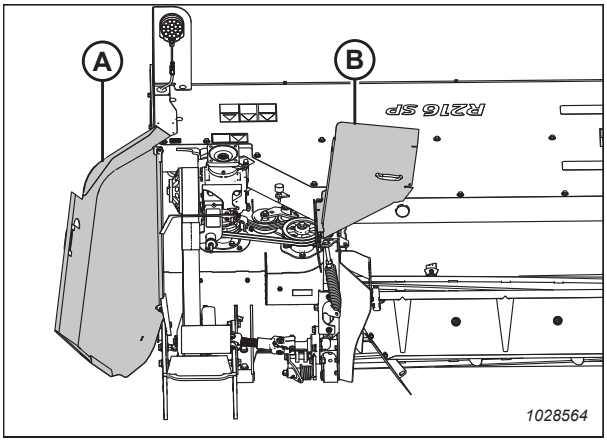


Figure 4.211: Inboard and Outboard Half of Driveshield

4.11.2 Installing Driveshields

Install and close the left and right driveshields before operating the header.

CAUTION

Do NOT operate the machine without the driveshields in place and secured.

NOTE:

The illustrations provided in this procedure show the left driveshield on headers equipped with a conditioner; the right driveshield is similar. The procedure is the same for grass seed (GSS) headers.

1. Position outboard half (A) and inboard half (B) of the driveshield as shown.

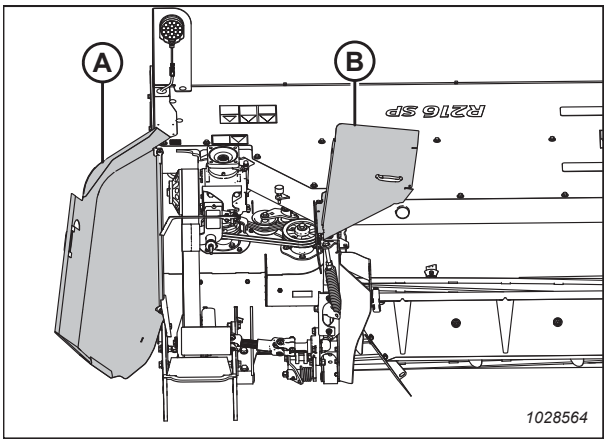


Figure 4.212: Inboard and Outboard Half of Driveshield

2. Secure the top of the outboard half of the driveshield using two washers (A), retaining pin (B), bolt (C), and the hex flange center lock nut.

3. Secure the front and rear of the inboard half of the driveshield using retaining pin (B), bolt (C), and the hex flange center lock nut.

   NOTE:

   The inboard half of the driveshield does **NOT** use washers (A).

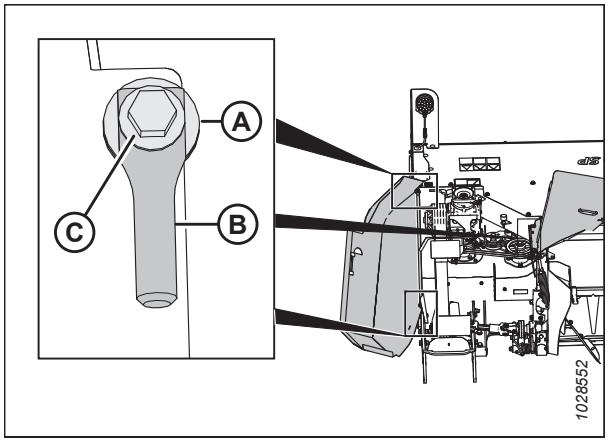


Figure 4.213: Retaining Pins and Hardware on Driveshield

4. Close the driveshields. For instructions, refer to *3.9.2 Closing Driveshields, page 117*.

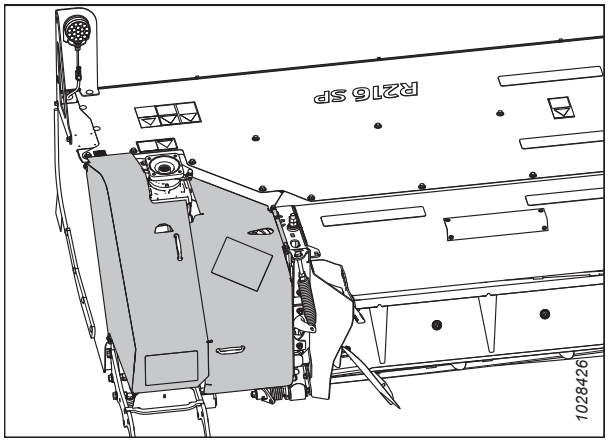


Figure 4.214: Left Driveshield

4.12 Electrical System

The header's electrical system is powered by the windrower. The electrical harness from the header connects to the windrower, supplying power to the hazard and signal lights. It also receives signals from the header speed sensor.

4.12.1 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.
- Replace any damaged lights.

4.12.2 Replacing Amber Hazard/Signal Light

The hazard/signal lights are installed in the brackets mounted on the front left and right corners of the rotary disc header. If the lights are damaged, they will need to be replaced.

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. Detach harness (A) on light (B) from main header harness (C).
3. Loosen nut (D), and then remove light (B) from light bracket (E). Discard the light.
4. Loosen nut (D) on new light fixture (B), then insert the light into light bracket (E).
5. Tighten nut (D) to secure the light. Torque the nut to 16 Nm (12 lbf·ft).
6. Connect light harness (A) to main header harness (C).
7. Ensure that the new light operates correctly.

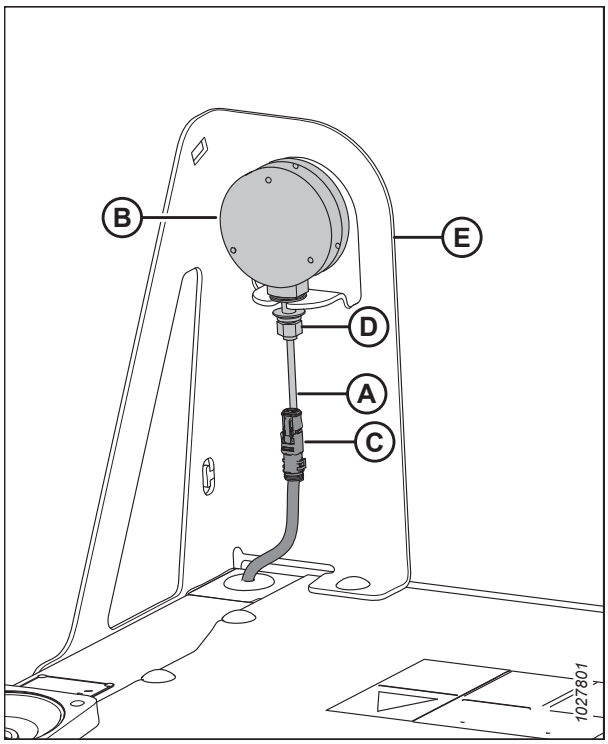


Figure 4.215: Left Amber Hazard/Signal Light – Standard Headers

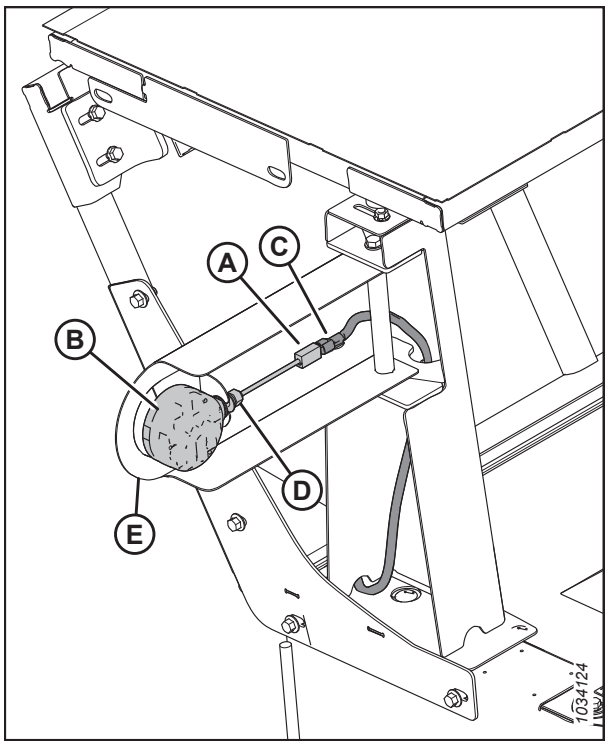


Figure 4.216: Left Amber Hazard/Signal Light – Grass Seed

4.12.3 Replacing Header Disc Speed Sensor

If the rotary disc header's disc speed sensor malfunctions or is damaged, it will need to be removed from the header drive system and replaced.

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. Lower the header to the ground.
2. Stop the engine, and remove the key from the ignition.
3. Open the left driveshield. For instructions, refer to *3.9.1 Opening Driveshields, page 115*.
4. Disconnect wire harness (A) from speed sensor connector (B).
5. Remove fir tree clip and cable tie (E). Retain the clip for reinstallation.
6. Loosen nut (C) from the end of the sensor. Remove the sensor from bracket (D).
7. Remove the nut from the end of the new sensor. Install the new sensor into bracket (D) and secure it using nut (C).
8. Connect sensor wire (B) to harness (A).

   NOTE:

   Ensure that the wires are clear of the belt and the pulley.
9. Secure the sensor wire using fir tree clip (E) and the new cable tie.

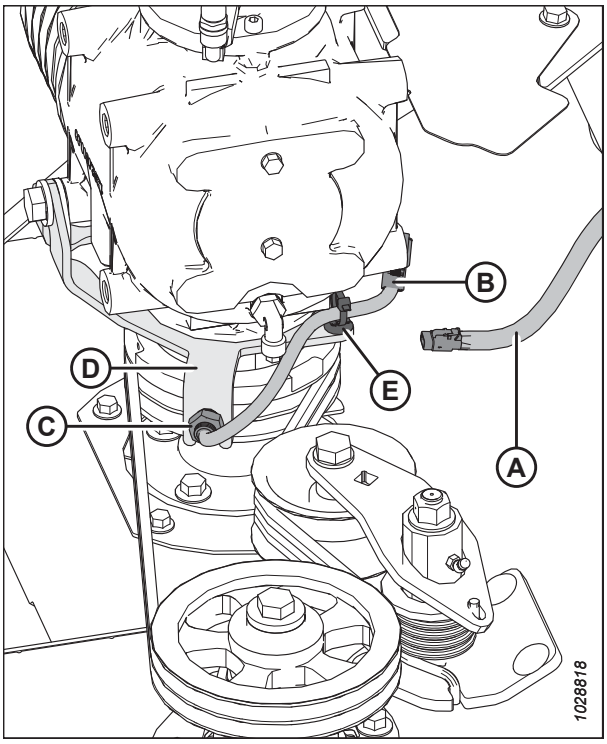


Figure 4.217: Header Disc Speed Sensor

10. Adjust nuts (A) as needed to achieve 2–3 mm (1/16–1/8 in.) gap (B) between sensor (C) and the high end of pulley (D) (M1 Series Windrowers) or encoder (D) (M155*E4* or M205 SP Windrowers). Ensure that the faces of the sensor and of the pulley are parallel. Bend bracket (E) as needed. Rotate hub (F) by hand to check that there is sufficient gap all the way around the pulley or encoder.

11. Tighten nuts (A) to 15 Nm (11 lbf·ft).

12. Close the left driveshield. For instructions, refer to *3.9.2 Closing Driveshields, page 117*.

13. Start the windrower, engage the header, and ensure that the speed sensor is reporting the disc speed. The sensor may require re-calibrating. For instructions, refer to the windrower operator's manual.

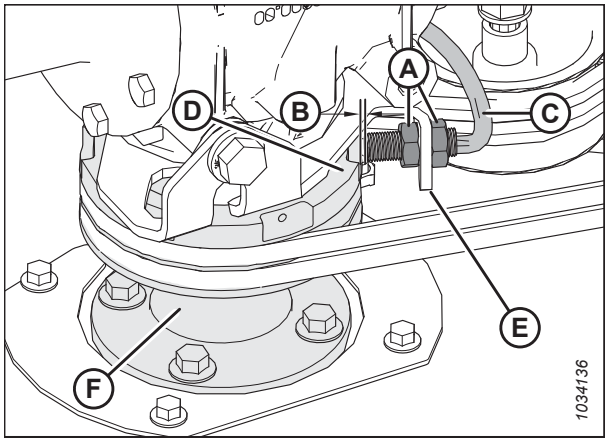


Figure 4.218: Header Disc Speed Sensor – M1 Series Windrower Sensor Bracket Shown

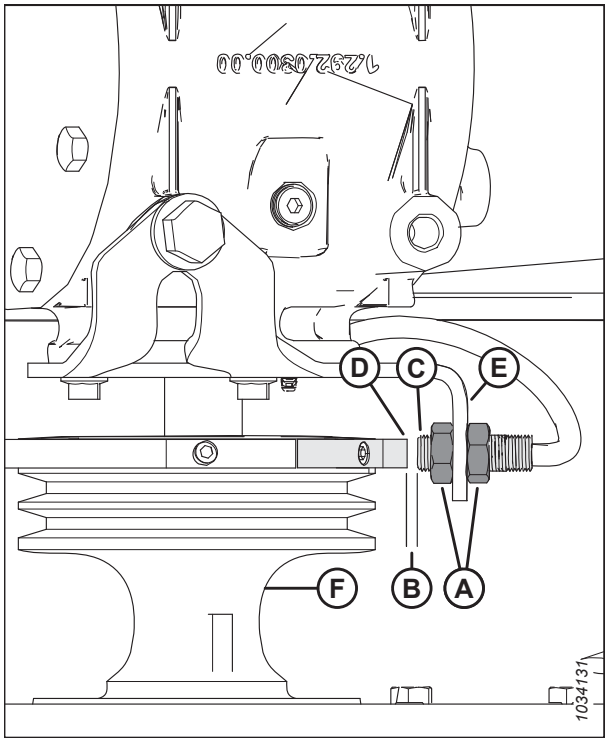


Figure 4.219: Header Disc Speed Sensor – M Series Self-Propelled Windrower Sensor Encoder Shown

4.13 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.

4.13.1 Checking Hydraulic Hoses and Lines

Check 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 4.220: 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.

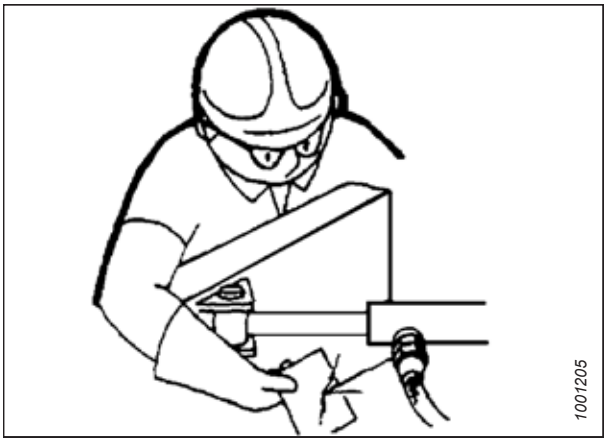


Figure 4.221: Testing for Hydraulic Leaks

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 Tall Crop Kit (Cutterbar Deflectors and Tall Crop Feed Plates) – MD #B6967, Standard Headers Only

The tall crop kit supplies cutterbar deflectors and tall crop feed plates to improve crop feeding from the cutterbar into the conditioner in thick stemmed crops such as sorghum.

Cutterbar Deflectors

A two-piece cutterbar deflector is attached to the cutterbar just below the header's conditioner rolls. Deflectors provide improved feeding into the conditioner rolls and prevent heavy crop with long stems from feeding under the rolls.

Cutterbar deflectors may not be well-suited for some crop and field conditions. Refer to the following table:

Table 5.1 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[13]	No

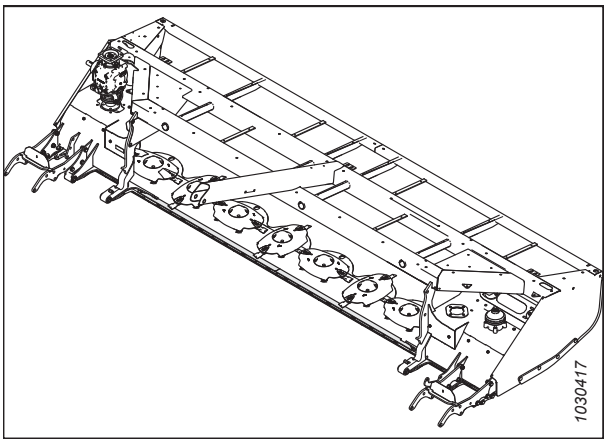


Figure 5.1: Cutterbar Deflectors

Tall Crop Feed Plates

The tall crop feed plates assist the feeding of tall crops into the conditioner by encouraging material flow from behind the drums. Do **NOT** use this kit in medium to light alfalfa as it will degrade the cutterbar's cutting performance.

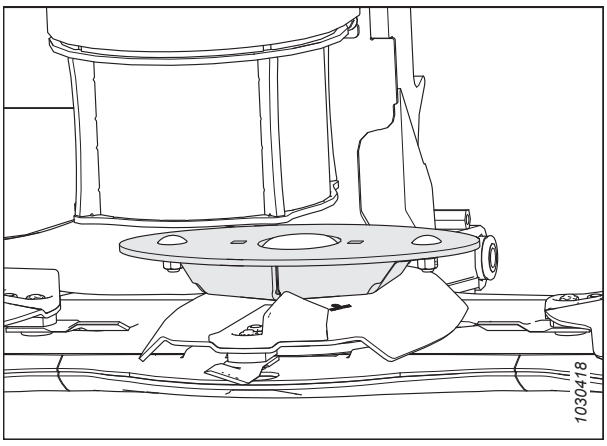


Figure 5.2: Tall Crop Feed Plate

13. Removing the deflector helps feed dirt/rocks through the header and prevents debris build up, wear and damage from rocks.

5.2 Double Windrow Attachment

This kit allows disc headers to lay a double windrow when installed on a windrower. The kit includes a draper deck, linkage assembly, hydraulics, and installation instructions.

NOTE:

When paired with a R216 Rotary Disc Header, the double windrow attachment (DWA) is compatible with standard headers, but incompatible with grass seed headers. If using the DWA in heavy conditions, it is recommended that the R216 Rotary Disc Header cutterbar be configured to produce three crop streams. If using the DWA in light conditions, it is recommended that the R216 Rotary Disc Header cutterbar be configured to produce two crop streams. For more information about crop streams, refer to *Configuring Cutterbar Crop Streams – Standard Header, page 260*.

M1 Series Windrowers

MD #C2070 consists of:

- MD #B6693 – Deck
- MD #B6694 – Mounting frame and hydraulic/electrical connections
- Double Windrow Attachment (DWA) manual

M155*E4* and M205 SP Windrowers

MD #C1987 consists of:

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

5.3 Grass Seed Configuration – MD #C2081

The optional grass seed (GSS) version of the R216 Rotary Disc Header is intended for cutting delicate grass seed crops, and laying them in a windrow prior to a combine picking it up. At the time of printing, it is only available for (and required for) North American headers that are not equipped with conditioners. The current kit is **NOT** intended for converting standard headers (headers with conditioners) to grass seed. The kit is only compatible with M1 Series Windrowers. It is **NOT** compatible with M155*E4* or M205 SP Windrowers.

M1 Series Windrowers

MD #C2081 consists of:

- MD #B7221 – Grass seed module (A), hydraulics, and instructions
- MD #B7222 – Grass seed anti-shatter shield (B) and electrical components

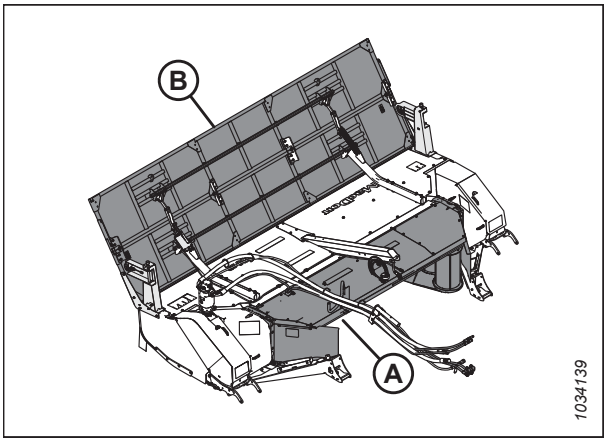


Figure 5.3: R2 Series Grass Seed Version – Field Position

5.4 Remote Baffle Control Kit – MD #B6664

The Remote Baffle Control kit (MD #B6664), allows the operator to electronically adjust the disc header baffle from inside the windrower.

The Remote Baffle Control kit is **NOT** compatible with M155*E4* or M205 SP Windrowers.

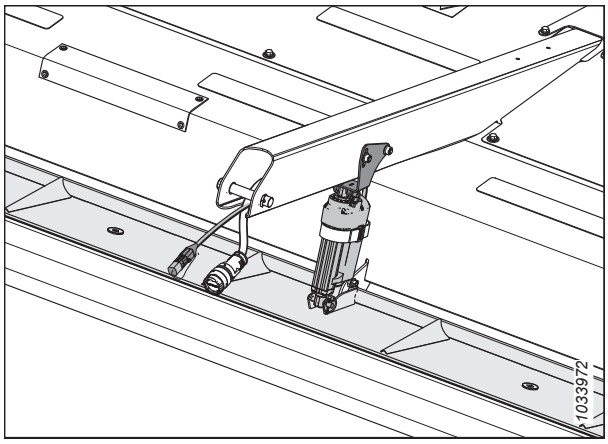


Figure 5.4: Electric Remote Baffle Kit

Adjust the position of the rear baffle from inside the cab as follows:

- To adjust the baffle up and down, press F5 (A) and F6 (B) keys respectively.
- A pop-up will appear on the HPT display for 3 seconds indicating the baffle position from 0–10.

If the windrower HPT has a display version HPAM203586U (or later) and master controller version MCAM203587R (or later) the following additional features are available:

- Baffle position can be saved using the one-touch-return buttons. For instructions on using the one-touch-return buttons, refer to the windrower operator's manual.
- A baffle position pop-up will appear on the HPT when buttons F5/F6 are pressed.

  NOTE:

  Windrower HPT software version HPAL203567T does not support the baffle position pop-up.

Figure 5.5: Operator's Console

5.5 Adjustable Gauge Roller Kit – MD #B7334

The adjustable gauge roller kit allows the header to achieve the desired cutting height for optimum cutting performance. Adjustable gauge rollers are recommended only for dry and hard packed terrain.

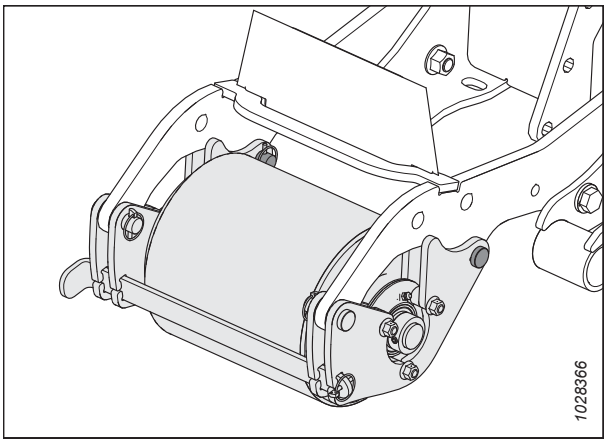


Figure 5.6: Adjustable Gauge Roller

5.6 Polyurethane Intermeshing Roller – MD #B6661

Rolls condition the crop by crimping and crushing the stem in several places, which allows the release of moisture resulting in faster drying times. A polyurethane roll conditioner is better suited for crushing stems while providing reduced crimping and is recommended for alfalfa, clover, legumes, and similar crops. The kit includes the conditioner and installation hardware.

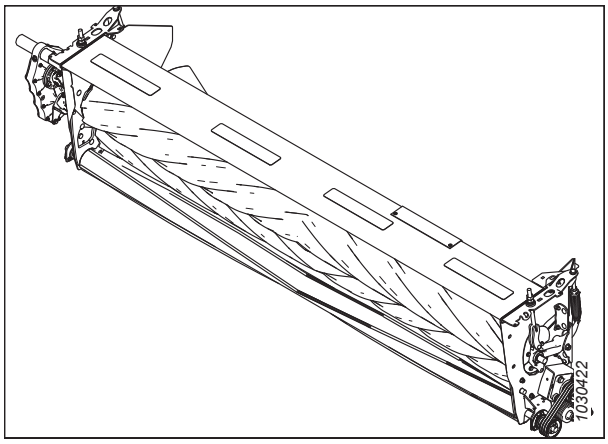


Figure 5.7: Polyurethane Intermeshing Roller – MD #B6661

5.7 Steel Intermeshing Roller – MD #B6662

Rolls condition the crop by crimping and crushing the stem in several places, which allows the release of moisture resulting in faster drying times. Steel rolls with a larger gap (up to 25 mm [1 in.]) may be desirable for thick-stemmed cane-type crops; however, too large of a gap may cause feeding problems. Steel rolls are recommended for these types of situations. The kit includes the conditioner and installation hardware.

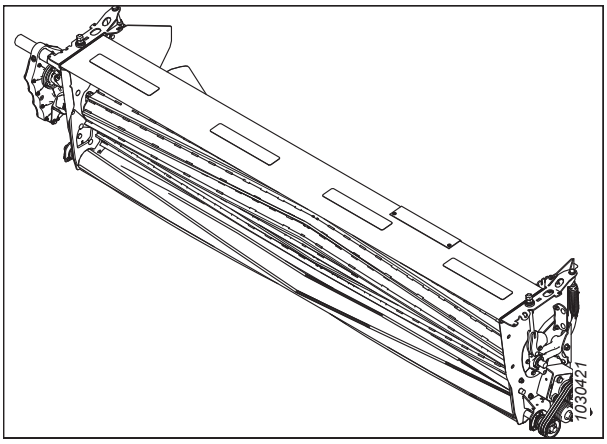


Figure 5.8: Steel Intermeshing Roller – MD #B6662

5.8 Adjustable Skid Shoes Kit – MD #B7333

The adjustable skid shoes kit allows the header to achieve the desired cutting height for optimum cutting performance. Skid shoes are recommended for most conditions including wet or muddy terrain.

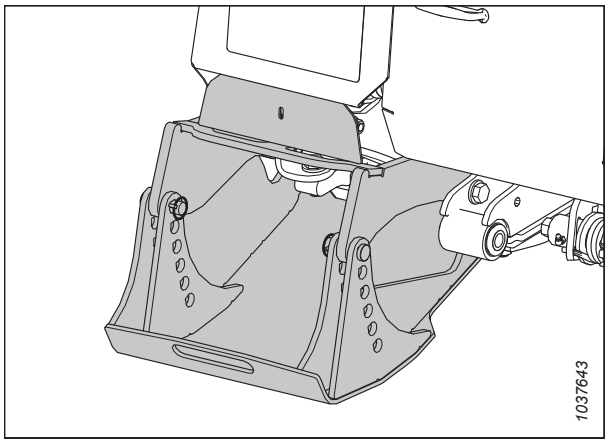


Figure 5.9: Adjustable Skid Shoe – MD #B7333

5.9 Tall Crop Divider Kit – MD #B6808

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

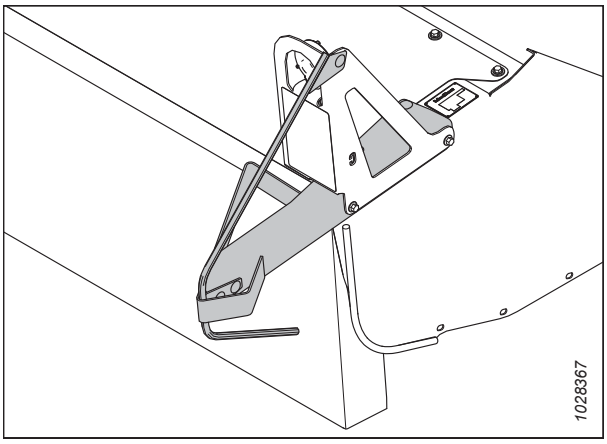


Figure 5.10: Tall Crop Divider – MD #B6808

Chapter 6: Troubleshooting

Refer to this table if you encounter problems while operating your machine.

6.1 Performance Problems

Problem	Solution	Refer to
Symptom: Ragged or uneven cutting of crop		
Header angle too flat for blades to pick up downed crop	Increase header angle.	*3.11.1 Cutting Height, page 122*
Header float too light, causing bouncing	Adjust to heavier float setting.	Refer to windrower operator's manual
Excessive ground speed	Reduce ground speed.	—
Symptom: Strips of uncut crop left on field		
Dull, bent, or badly worn disc blades	Replace disc blades.	• *Removing Disc Blades, page 204* • *Installing Disc Blades, page 206*
Buildup of dirt between rock guards	Decrease header angle and increase float. In some conditions, it may be necessary to carry header slightly with header lift cylinders.	• *3.11.1 Cutting Height, page 122* • Refer to windrower operator's manual
Excessive header speed	Reduce header disc speed.	—
Foreign object on cutterbar	Disengage header and stop engine. When all moving parts are completely stopped, remove foreign object.	*4.6 Cutterbar System, page 179*
Disc not turning	Replace spindle shear pin.	—
Ground speed too slow	Increase ground speed.	—
Symptom: Uneven formation and bunching of windrow		
Swath baffle (deflector) bypassing or dragging crop	Adjust rear deflector for proper crop control.	*Positioning Rear Baffle Deflector Fins, page 139*
Crop is tall/tangled.	Install tall crop kit.	*5.1 Tall Crop Kit (Cutterbar Deflectors and Tall Crop Feed Plates) – MD #B6967, Standard Headers Only, page 291*
Forming shields improperly adjusted	Adjust roll conditioner forming shields.	• *Positioning Forming Shield Side Deflectors, page 137* • *Positioning Rear Baffle, page 138*
Roll gap too large	Adjust roll gap.	• *Adjusting Roll Gap – Steel Rolls, page 130*
Conditioner rolls running too slow	Maintain rated header speed.	Refer to windrower operator's manual
Conditioner drive belt slipping	Adjust conditioner drive belt tension.	*Conditioner Drive Belt, page 277*

Problem	Solution	Refer to
Symptom: Conditioner rolls plugging		
Ground speed too fast	Reduce ground speed.	—
Roll gap too large for proper feeding	Decrease roll gap.	• *Adjusting Roll Gap – Steel Rolls, page 130*
Roll gap too small in thick-stemmed cane-type crops	Increase roll gap.	• *Adjusting Roll Gap – Steel Rolls, page 130*
Swath baffle set too low	Raise swath baffle.	*3.12.5 Forming Shields – Roll Conditioner, page 137*
Roll speed too low	Increase disc speed.	—
Foreign object between rolls	Disengage header and stop engine. When all moving parts are completely stopped, remove foreign object.	*4.6.2 Cutterbar Discs, page 185*
Cutting height too low	Decrease header angle to raise cutting height.	*3.11.1 Cutting Height, page 122*
Backing into windrow	Raise header before backing up.	—
Rolls improperly timed	Adjust roll timing.	*Adjusting Roll Timing, page 134*
Conditioner drive belt slipping	Adjust conditioner drive belt tension.	*Conditioner Drive Belt, page 277*
Symptom: Uneven windrow formation in light crop		
Uneven feeding	Reduce header speed.	Refer to windrower operator's manual
Symptom: Plugging behind end hourglass deflectors		
Ground speed too slow	Increase ground speed.	—
Symptom: Not cutting short enough in down crop		
Ground speed too fast	Reduce ground speed.	—
Broken, bent, or dull blades	Turn blades over or replace blades.	• *Removing Disc Blades, page 204* • *Installing Disc Blades, page 206*
Cutting height too high	Adjust header angle steeper to lower cutting height if field conditions allow.	*3.11.1 Cutting Height, page 122*
Symptom: Material being pulled out by roots when cutting, and tall crop leaning into machine		
Crop in conditioner rolls before crop is cut	Increase roll gap.	• *Adjusting Roll Gap – Steel Rolls, page 130*
Symptom: Damaged leaves and broken stems		
Insufficient roll gap	Increase roll gap.	• *Adjusting Roll Gap – Steel Rolls, page 130*
Roll timing off	Check roll timing and adjust if necessary.	• *Checking Roll Timing, page 134* • *Adjusting Roll Timing, page 134*
Symptom: Cutting height varies from one side to the other		
Float not properly balanced	Adjust header float.	Refer to windrower operator's manual
Symptom: Slow crop drying		

Problem	Solution	Refer to
Crop is bunched in windrow	Adjust forming shields/baffle.	• *Positioning Forming Shield Side Deflectors, page 137* • *Positioning Rear Baffle Deflector Fins, page 139*
Rolls not crimping crop sufficiently	Decrease roll gap.	• *Adjusting Roll Gap – Steel Rolls, page 130*
Symptom: Excessive drying or bleaching of crop		
Excessive crimping	Increase roll gap.	• *Adjusting Roll Gap – Steel Rolls, page 130*
Crop is spread too wide in windrow	Adjust forming shields.	• *Positioning Forming Shield Side Deflectors, page 137* • *Positioning Rear Baffle Deflector Fins, page 139*
Symptom: Poorly formed or bunchy windrows		
Forming shields not properly positioned	Adjust forming shields.	• *Positioning Forming Shield Side Deflectors, page 137* • *Positioning Rear Baffle Deflector Fins, page 139*

6.2 Mechanical Problems

Problem	Solution	Refer to
Symptom: Excessive noise		
Bent disc blade	Replace blade.	• *Removing Disc Blades, page 204* • *Installing Disc Blades, page 206*
Conditioner roll timing off	Check roll timing and adjust if necessary.	• *Checking Roll Timing, page 134* • *Adjusting Roll Timing, page 134*
Bent drum deflector	Replace drum.	*4.6.7 Drums, page 217*
Conditioner roll gap too small	Check gap and adjust if necessary.	• *Adjusting Roll Gap – Steel Rolls, page 130*
Symptom: Excessive vibration or noise in header		
Mud deposits on conditioner rolls	Clean rolls.	—
Conditioner rolls contacting each other	Increase roll gap.	• *Adjusting Roll Gap – Steel Rolls, page 130*
Conditioner rolls contacting each other	Check roll timing.	*Checking Roll Timing, page 134*
Symptom: Excessive heat in cutterbar		
Incorrect level of lubricant in cutterbar—either too little or too much	Drain lubricant and refill with specified amount.	*Draining the Cutterbar, page 182*
Symptom: Spindle bearing failure		
Material wrapped around spindle	Remove disc and remove material.	• *Removing Disc Blades, page 204* • *Installing Disc Blades, page 206*
Unbalanced drums/discs	Replace unbalanced components	• *4.6.2 Cutterbar Discs, page 185* • *4.6.7 Drums, page 217*
Symptom: Frequent blade damage		
Mud on cutterbar	Remove mud from cutterbar. Do **NOT** allow mud to dry on cutterbar.	—
Header float set too heavy	Increase float.	Refer to windrower operator's manual
Cutting too low in rocky field conditions	Decrease header angle, increase float.	• *3.11.1 Cutting Height, page 122* • Refer to windrower operator's manual
Ground speed too high in rocky field conditions. At high ground speed, header tends to dig rocks from ground instead of floating over them	Reduce ground speed.	—
Disc blades incorrectly mounted	Check all blade mounting hardware and ensure blades are free to move.	*Inspecting Disc Blade Hardware, page 202*
Symptom: Excessive wear of cutting components		
Header angle too steep	Reduce header angle.	*3.11.1 Cutting Height, page 122*
Crop residue and dirt deposits on cutterbar	Clean cutterbar.	—

Problem	Solution	Refer to
Mud on cutterbar	Remove mud from cutterbar. Do **NOT** allow mud to dry on cutterbar.	—
Symptom: Machine pulling to one side		
Header dragging on one end and pulling to that side	Adjust header float on both ends.	Refer to windrower operator's manual
Symptom: Breakage of conditioner roll timing belt		
Belt not in proper groove in pulley	Move belt to proper groove.	*Inspecting Conditioner Drive Belt, page 277*
Foreign object between rolls	Disengage header and stop the engine. When all moving parts are completely stopped, remove foreign object.	*4.10.1 Inspecting Conditioner Components, page 273*
Belt pulleys and idlers misaligned	Align pulleys and idler.	See MacDon Dealer
Symptom: Conditioner roll does not rotate		
Faulty drive belt	Check drive belt pulleys.	*Inspecting Conditioner Drive Belt, page 277*
Symptom: Disc does not turn when engaging header		
Hoses not connected	Connect hoses.	
Poor electrical connection at pump solenoid	Check connection at windrower.	Refer to windrower operator's manual
Symptom: Header runs while unloaded, but slows or stops when starting to cut		
Defective hydraulic motor	Repair/replace hydraulic motor.	See MacDon Dealer
Defective hydraulic pump in windrower	Repair/replace pump.	See MacDon Dealer
Defective relief valve in windrower	Repair/replace relief valve.	See MacDon Dealer
Cold oil in hydraulic drive system	Reduce ground speed until oil reaches operating temperature.	—

6.3 Grass Seed Problems

Grass seed problems are specific to headers configured with the grass seed (GSS) option (MD #C2081).

Problem	Solution	Refer to
Symptom: Rear drum not turning		
Debris buildup	• Check for debris buildup around drums and remove as necessary. This will most likely occur on the front set of drums. If the left drums cannot turn, the right drums will probably not turn since the motors are plumbed in series. • Check for crop wrapped around drums (should be visible from the cab).	—
Drum attachment/speed setting	Check that the grass seed is set as an attachment in the Harvest Performance Tracker (HPT) and the drum speed is set.	*3.15.1 Activating Grass Seed Option, page 152*
Drive motor issue	Check the drive motor. Motors are plumbed in series, so motors/drums down the line likely will not spin if there is a motor issue.	—
Symptom: Rear drums not moving in/out		
Debris buildup	Check for debris buildup around drums and remove as necessary.	—
Part failure	• Check the adjustment linkage and structure around it for failed parts. • Check the hydraulic cylinder that pivots the drums on the left side.	—
Symptom: Anti-shatter shield not folding/unfolding		
Actuator disconnected	Confirm linear actuator is working and plugged in correctly.	—
Linkage component failure	• Confirm linkage is in the correct position when folded or unfolded. • Check the pins along the linkage or the pins that attach the actuator for failures in those areas.	—
Header plugging in corners		
Debris buildup.	Check for debris buildup and remove as necessary.	—

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

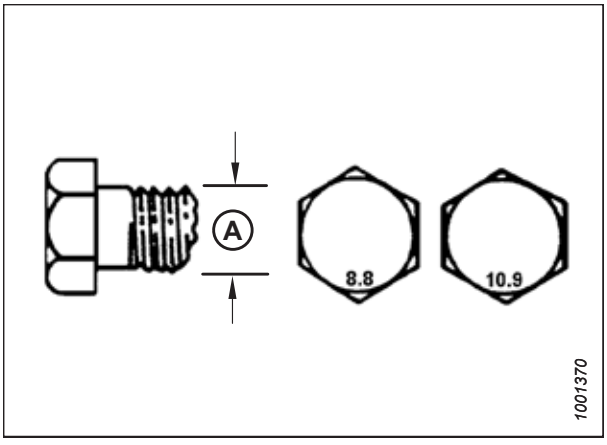


Figure 7.1: Bolt Grades

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

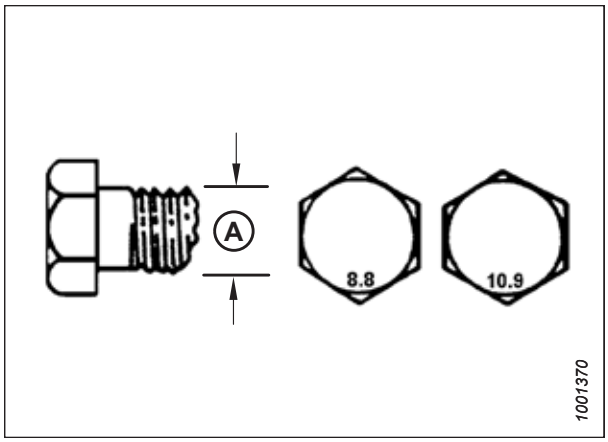


Figure 7.2: Bolt Grades

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

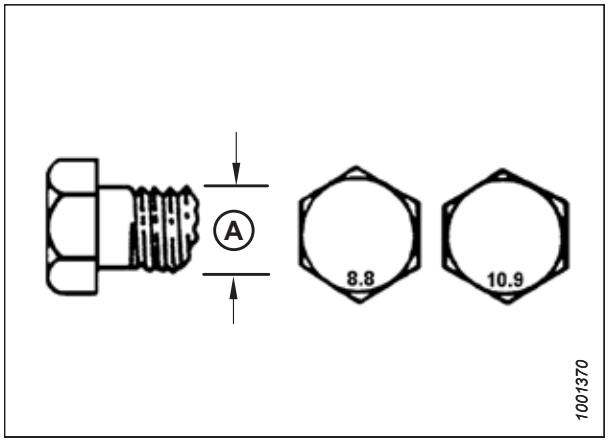


Figure 7.3: Bolt Grades

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

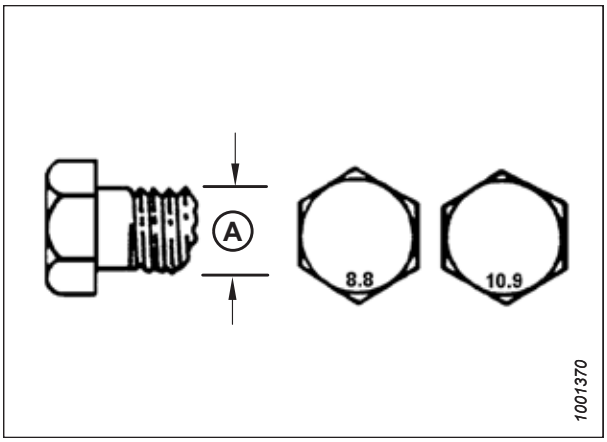


Figure 7.4: Bolt Grades

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	–	–	–	–

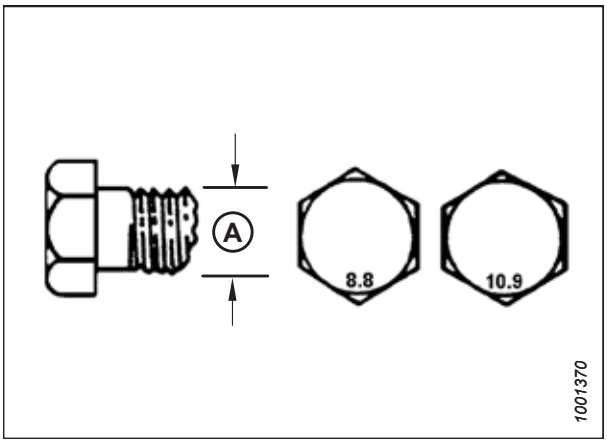


Figure 7.5: Bolt Grades

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 is pushed toward lock nut (C) as far as possible.
3. Ensure that O-ring (A) is **NOT** on the threads. Adjust O-ring (A) if necessary.
4. Apply hydraulic system oil to O-ring (A).

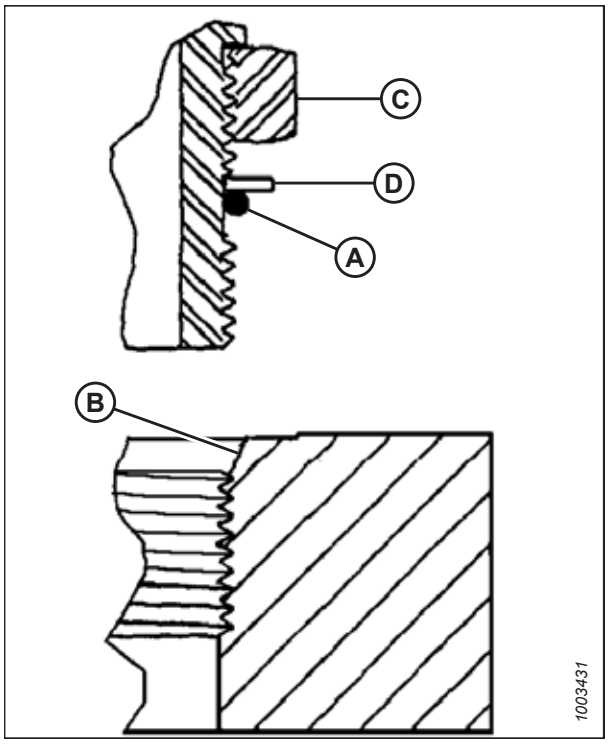


Figure 7.6: Hydraulic Fitting

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

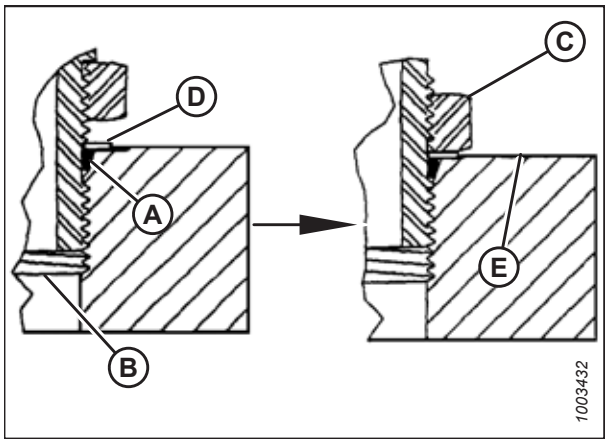


Figure 7.7: Hydraulic Fitting

Table 7.6 O-Ring Boss (ORB) Hydraulic Fittings – Adjustable

SAE Dash Size	Thread Size (in.)	Torque Value[14]	
		Nm	lbf·ft (*lbf·in)
-2	5/16–24	6–7	*53–62
-3	3/8–24	12–13	*106–115

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

Table 7.6 O-Ring Boss (ORB) Hydraulic Fittings – Adjustable (continued)

SAE Dash Size	Thread Size (in.)	Torque Value[15]	
		Nm	lbf·ft (*lbf·in)
-4	7/16–20	19–21	14–15
-5	1/2–20	21–33	15–24
-6	9/16–18	26–29	19–21
-8	3/4–16	46–50	34–37
-10	7/8–14	75–82	55–60
-12	1 1/16–12	120–132	88–97
-14	1 3/8–12	153–168	113–124
-16	1 5/16–12	176–193	130–142
-20	1 5/8–12	221–243	163–179
-24	1 7/8–12	270–298	199–220
-32	2 1/2–12	332–365	245–269

7.1.4 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 311*.
6. Verify the final condition of the fitting.

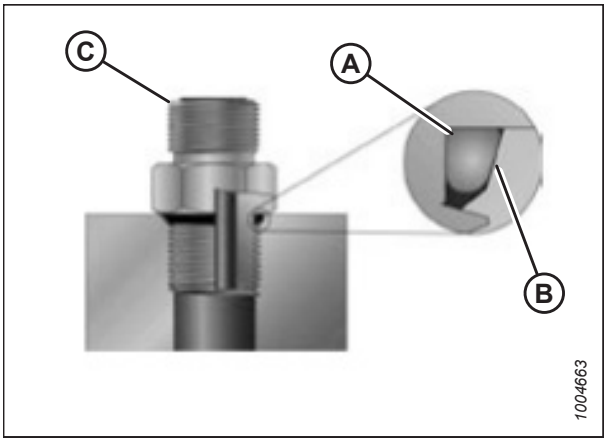


Figure 7.8: Hydraulic Fitting

Table 7.7 O-Ring Boss (ORB) Hydraulic Fittings – Non-Adjustable

SAE Dash Size	Thread Size (in.)	Torque Value[15]	
		Nm	lbf·ft (*lbf·in)
-2	5/16–24	6–7	*53–62
-3	3/8–24	12–13	*106–115
-4	7/16–20	19–21	14–15
-5	1/2–20	21–33	15–24
-6	9/16–18	26–29	19–21
-8	3/4–16	46–50	34–37

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

Table 7.7 O-Ring Boss (ORB) Hydraulic Fittings – Non-Adjustable (continued)

SAE Dash Size	Thread Size (in.)	Torque Value[16]	
		Nm	lbf·ft (*lbf·in)
-10	7/8–14	75–82	55–60
-12	1 1/16–12	120–132	88–97
-14	1 3/8–12	153–168	113–124
-16	1 5/16–12	176–193	130–142
-20	1 5/8–12	221–243	163–179
-24	1 7/8–12	270–298	199–220
-32	2 1/2–12	332–365	245–269

7.1.5 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 313*

1. Ensure that the sealing surfaces and the fitting threads are free of burrs, nicks, scratches, and any foreign material.

Figure 7.9: Hydraulic Fitting

2. Apply hydraulic system oil to O-ring (B).
3. Align the tube or hose assembly so that the flat face of sleeve (A) or (C) comes into full contact with O-ring (B).
4. Thread tube or hose nut (D) until it is hand-tight. The nut should turn freely until it bottoms out.
5. Torque the fittings according to values in Table *7.8, page 313*.

   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).

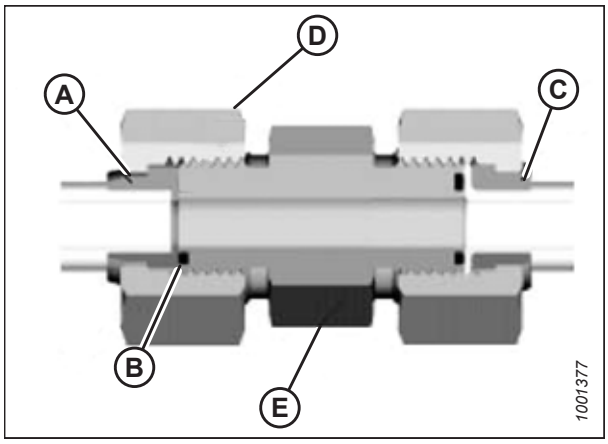


Figure 7.10: Hydraulic Fitting

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

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[17]	
			Nm	lbf·ft
-3	Note[18]	3/16	–	–
-4	9/16	1/4	25–28	18–21
-5	Note[18]	5/16	–	–
-6	11/16	3/8	40–44	29–32
-8	13/16	1/2	55–61	41–45
-10	1	5/8	80–88	59–65
-12	1 3/16	3/4	115–127	85–94
-14	Note[18]	7/8	–	–
-16	1 7/16	1	150–165	111–122
-20	1 11/16	1 1/4	205–226	151–167
-24	1–2	1 1/2	315–347	232–256
-32	2 1/2	2	510–561	376–414

7.1.6 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.

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 314*. 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.

17. Torque values and angles shown are based on lubricated connection as in reassembly.
18. O-ring face seal type end not defined for this tube size.

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

Both SI units (including metric) and US customary units (sometimes referred to as standard units) of measurement are used in this manual. A list of those units along with their abbreviations and conversion factors is provided here for your reference.

Table 7.10 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
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^3 or cc	x 0.061 =	cubic inch	$in.^3$
Weight	kilogram	kg	x 2.2046 =	pound	lb.

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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.

Table .11 Recommended Lubricants

Specification	Description	Use	Capacities
Lubricant: Grease			
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	—
Lubricant: Gear Lubricant			
SAE 80W-90	High thermal and oxidation stability API service class GL-5	4.9 m (16 ft.) cutterbar	10 liters (10.5 qts [US])
SAE 80W-140	Gear lubricant API service class GL-5	Conditioner roll timing gearbox	0.7 liters (0.75 qts [US])
SAE 80W-140	Fully Synthetic Oil API GL-5 Minimum, SAE J2360 Preferred	Header drive 90° gearbox	1.8 liters (1.9 qts [US])

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