

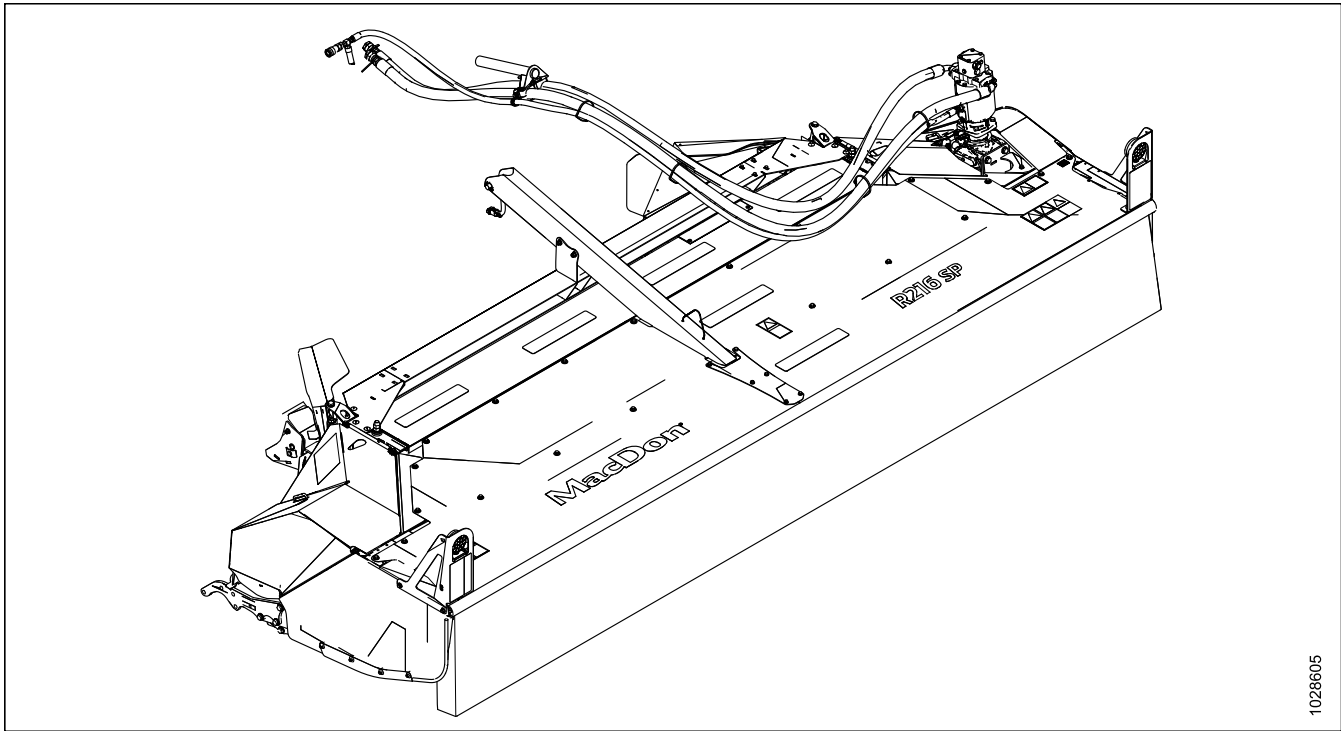
R216 SP Rotary Disc Header

Operator's Manual

214880 Revision A

Original Instruction

R216 SP Series Rotary Disc Header



Published April 2019.

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 SP 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 the exact type of self-propelled vehicle used to power the R216 SP Rotary Disc Header.

Introduction

This instructional manual contains safety, operating, and maintenance procedures for the MacDon R216 SP Rotary Disc Header. The rotary disc header when attached to a MacDon M1240 Windrower, is designed to cut, condition, and lay a wide variety of grasses and hay crops in windrows.

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

Use this manual as your first source of information about the machine. If you follow the instructions 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

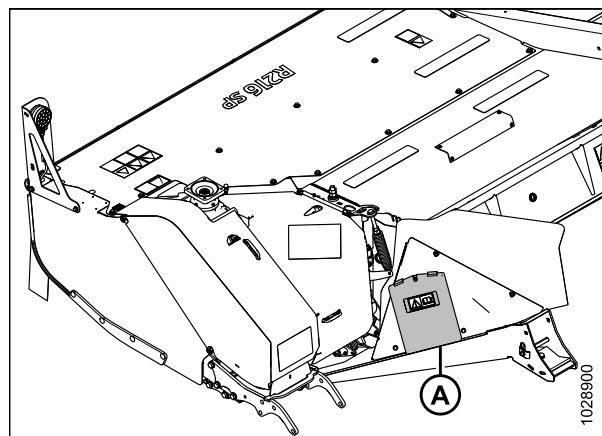
Conventions

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.

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

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).



Manual Storage Case

Serial Number

Record the serial number and model year of the header in the spaces provided below.

Header model: R216 SP Disc Mower
Serial number: _____
Model year: _____

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

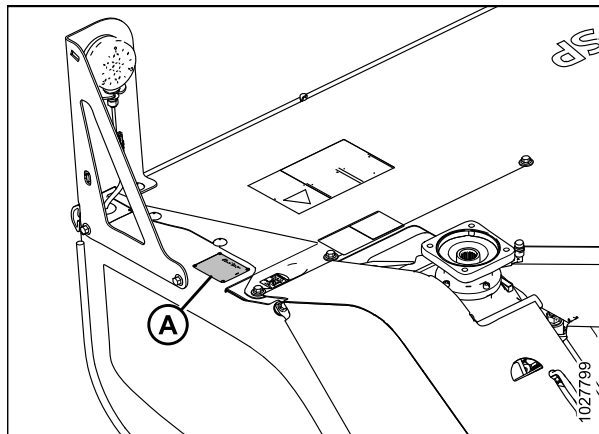


Figure 1: Serial Number Location

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Chapter 1: Safety

1.1 Safety Alert Symbols

This 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

CAUTION

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

Protect yourself.

- When assembling, operating, and servicing machinery, wear all protective clothing and personal safety devices that could be necessary for 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
- Be aware that exposure to loud noises can cause hearing impairment or loss. Wear suitable hearing protection devices such as earmuffs or earplugs to help protect against loud noises.

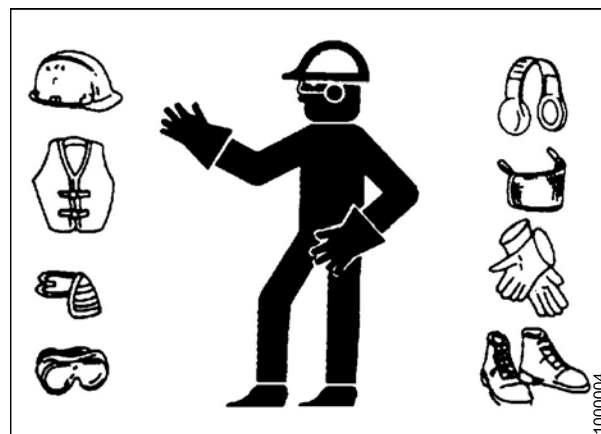


Figure 1.2: Safety Equipment



Figure 1.3: Safety Equipment

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

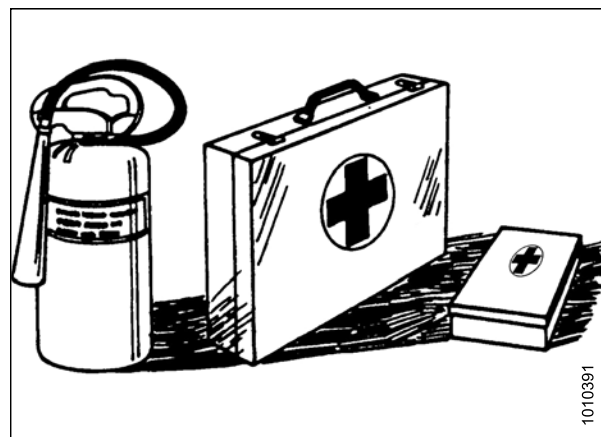


Figure 1.4: Safety Equipment

SAFETY

- Wear close-fitting clothing and cover long hair. **NEVER** wear dangling items such as scarves or bracelets.
- Keep all shields in place. **NEVER** alter or remove safety equipment. Make sure driveline guards can rotate independently of shaft and can telescope freely.
- Use only service and repair parts made or approved by equipment manufacturer. Substituted parts may not meet strength, design, or safety requirements.



Figure 1.5: Safety around Equipment

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

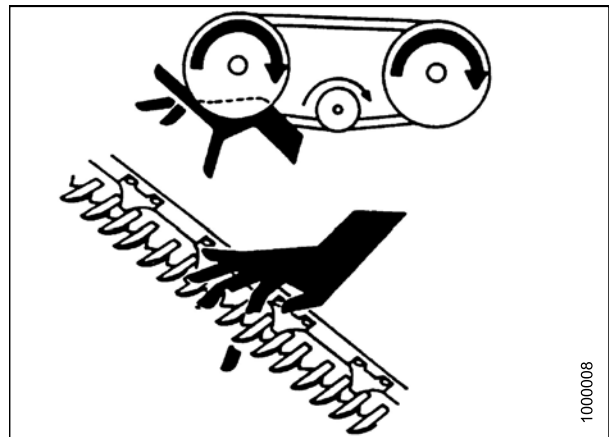


Figure 1.6: Safety around Equipment

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



Figure 1.7: Safety around Equipment

1.4 Maintenance Safety

To ensure your safety while maintaining machine:

- Review operator's manual and all safety items before operation and/or maintenance of machine.
- Place all controls in Neutral, stop the engine, set the park brake, remove the ignition key, and wait for all moving parts to stop before servicing, adjusting, and/or repairing.
- Follow good shop practices:
 - Keep service areas clean and dry
 - Be sure electrical outlets and tools are properly grounded
 - Keep work area well lit
- Relieve pressure from hydraulic circuits before servicing and/or disconnecting machine.
- Make sure all components are tight and that steel lines, hoses, and couplings are in good condition before applying pressure to hydraulic systems.
- Keep hands, feet, clothing, and hair away from all moving and/or rotating parts.
- Clear area of bystanders, especially children, when carrying out any maintenance, repairs, or adjustments.
- Install transport lock or place safety stands under frame before working under machine.
- If more than one person is servicing machine at same time, be aware that rotating a driveline or other 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 machine.
- Wear heavy gloves when working on knife components.



Figure 1.8: Safety around Equipment

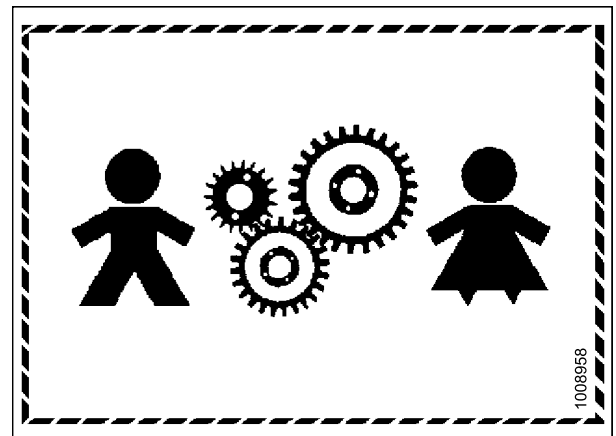


Figure 1.9: Equipment NOT Safe for Children

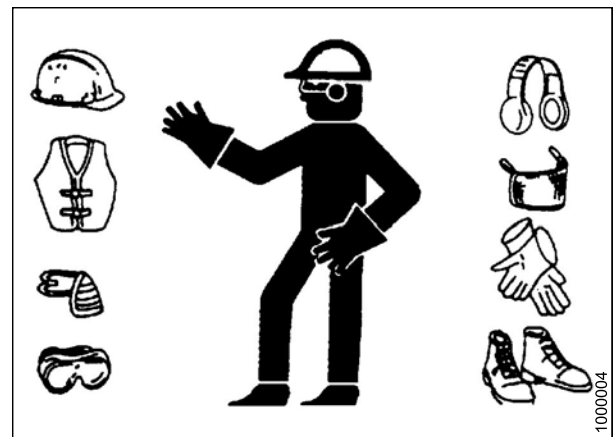


Figure 1.10: Safety Equipment

1.5 Hydraulic Safety

- Always place all hydraulic controls in Neutral before dismounting.
- Make sure that all components in 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 will fail suddenly and create hazardous and unsafe conditions.

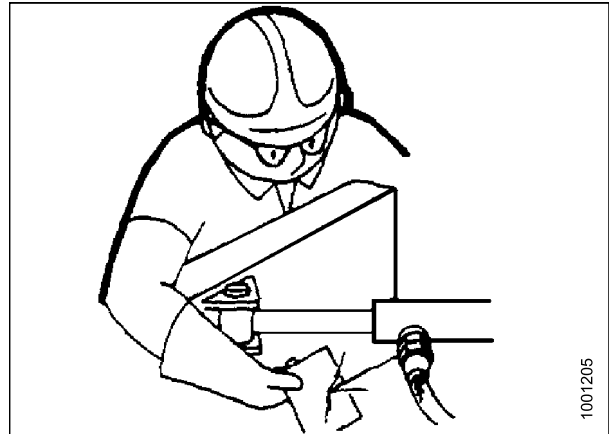


Figure 1.11: Testing for Hydraulic Leaks

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



Figure 1.12: Hydraulic Pressure Hazard

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

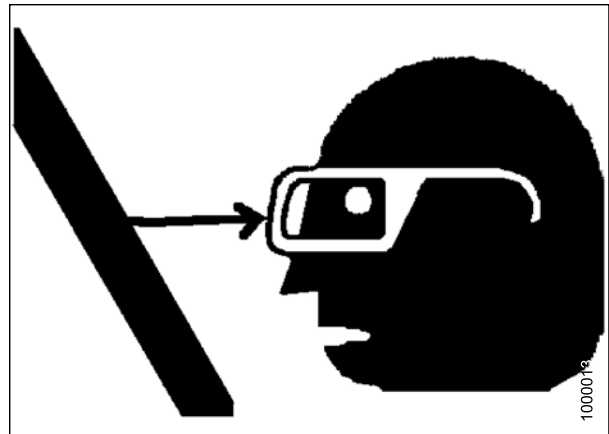


Figure 1.13: Safety around Equipment

1.6 Welding Precaution

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 an Operator needs to do any welding on the header, it should first be disconnected and removed from the windrower.

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

1.7 Safety Signs

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

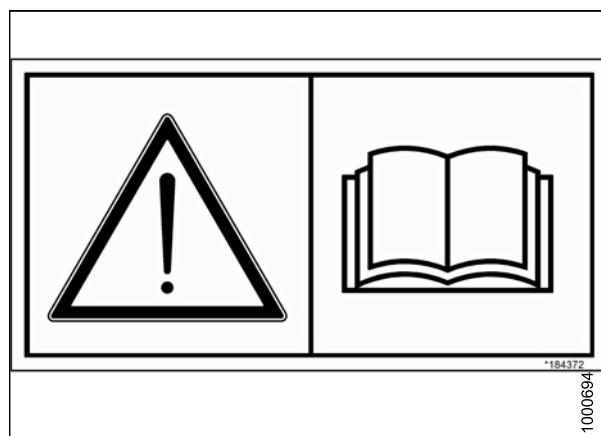


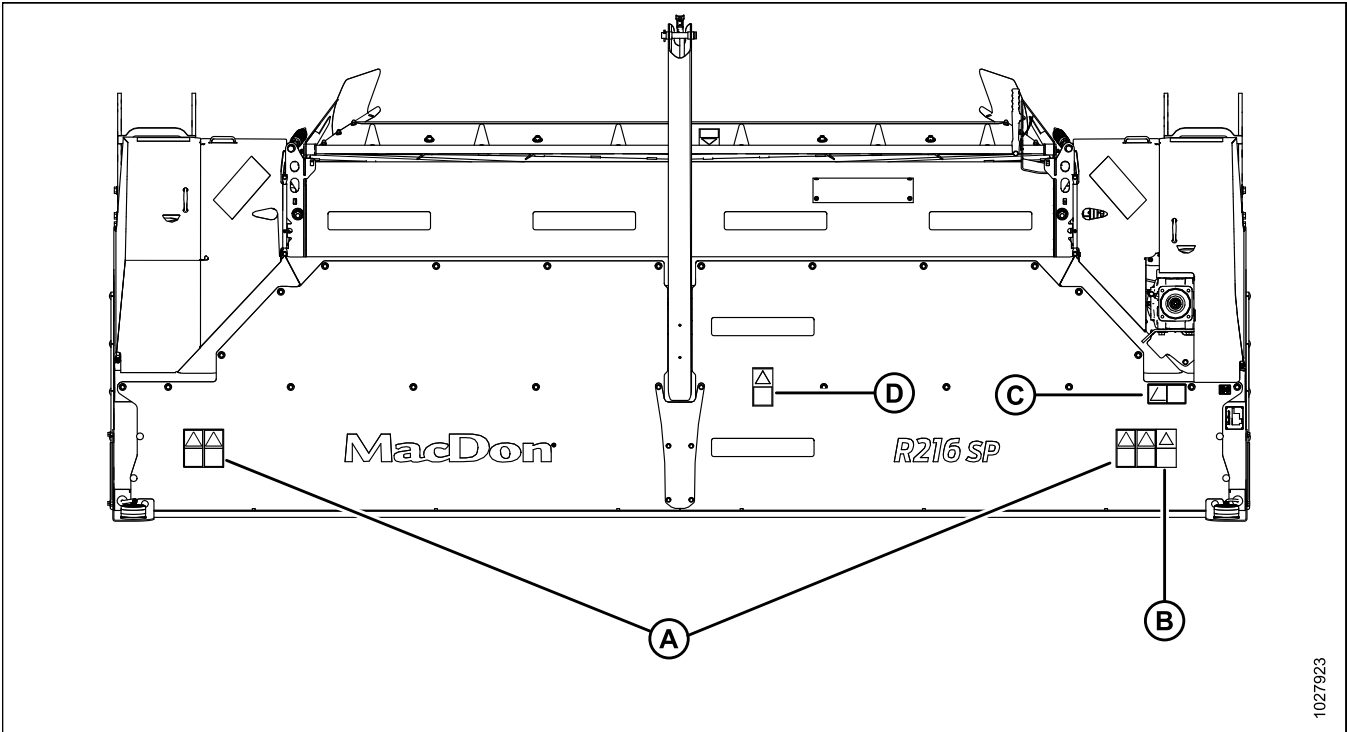
Figure 1.14: Operator's Manual Decal

1.7.1 Installing Safety Decals

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

1.8 Locating Safety Decals

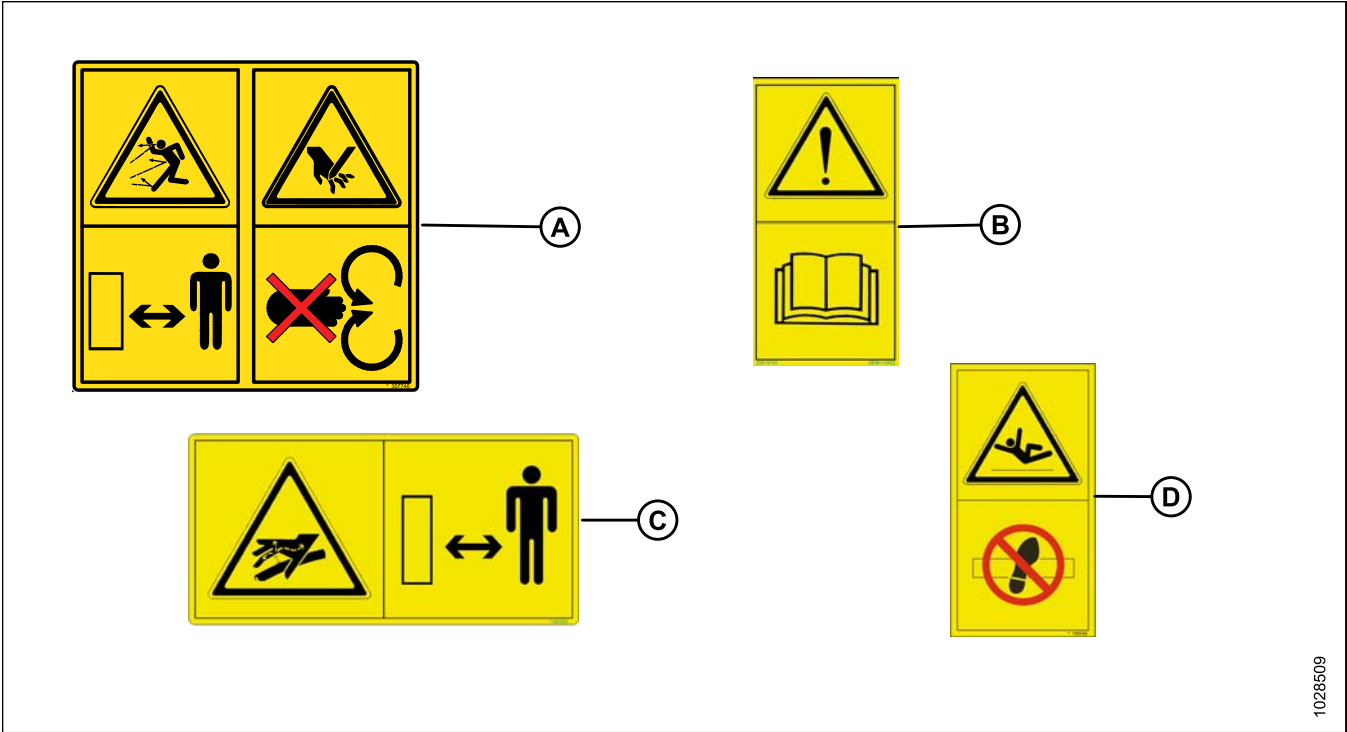
Figure 1.15: Safety Sign Decal Locations – Top View



A - MD #307746
C - MD #166832

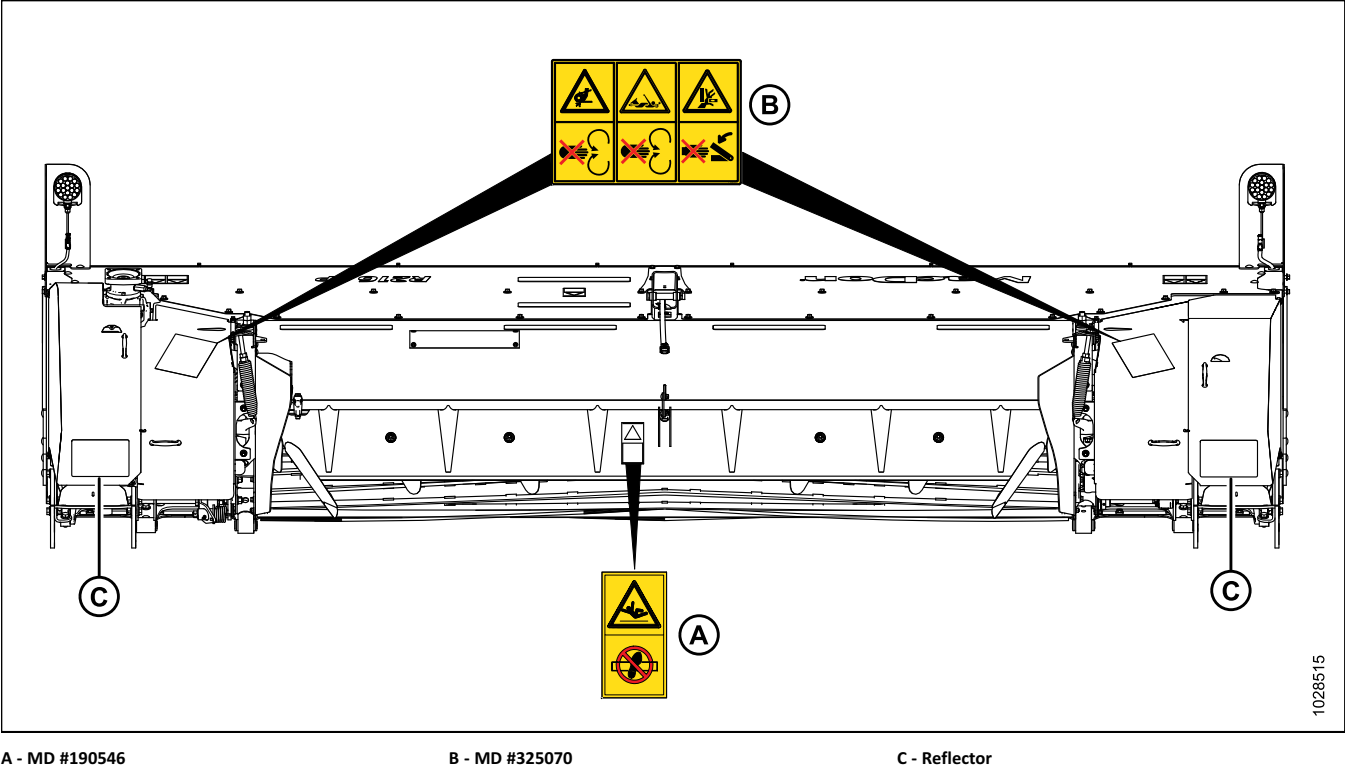
B - MD #113482
D - MD #190546

Figure 1.16: Safety Sign Decals



SAFETY

Figure 1.17: Safety Sign Decal Locations – Rear View



1.9 Understanding Safety Signs

NOTE:

This is a general list of safety sign definitions and the decals listed may not necessarily be applicable to your machine.

MD #113482

General hazard pertaining to machine operation and servicing.

CAUTION

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



Figure 1.18: MD #113482

MD #166832

Hydraulic pressure oil hazard

WARNING

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



Figure 1.19: MD #166832

SAFETY

MD #190546

Slippery surface

WARNING—DO NOT STEP ON SURFACE

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

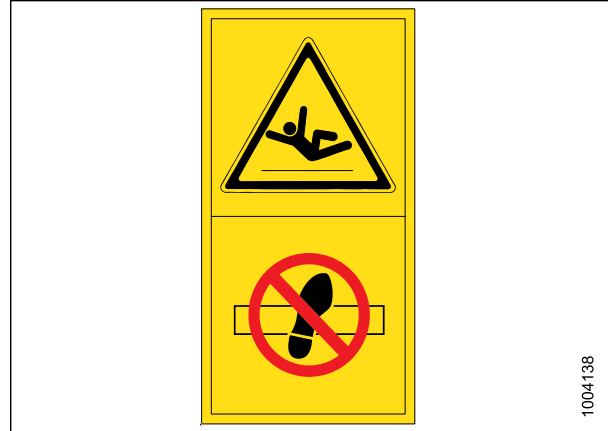


Figure 1.20: MD #190546

MD #307746

Thrown/sharp object hazard

WARNING

- Crop materials exiting at high speed.
- Stop machine, look, listen, and wait for all movement to stop before approaching.
- Failure to comply could result in death or serious injury.
- Disengage power take-off, shut off tractor, and remove key before opening covers.
- Listen and look for evidence of rotation before lifting cover.
- Cutters may continue to rotate after power is shut off due to inertia.



Figure 1.21: MD #307746

MD #325070

Pinch/tangle hazard

WARNING

- Guard missing. Do **NOT** operate.
- Keep all shields in place.
- To avoid entanglement with rotating auger, stand clear of header while machine is running.
- Failure to comply could result in serious injury or death.

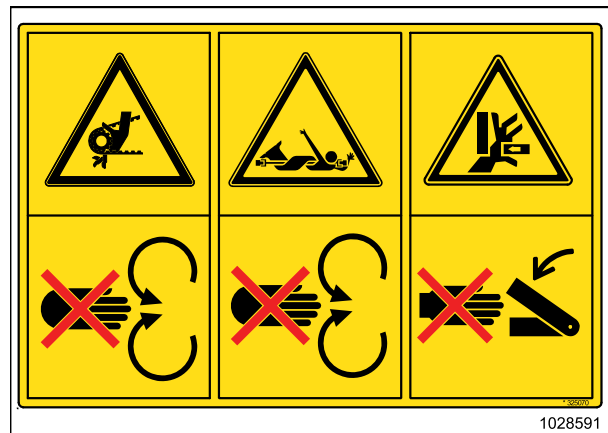


Figure 1.22: MD #325070

Chapter 2: Product Overview

2.1 Specifications

NOTE:

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

Frame and Structure	
Width (transport)	5027 mm (198 in.)
Weight: base machine with steel conditioner	2156 kg (4750 lb.)
Compatible windrower	MacDon M1240
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 degrees bevel down
Disc speed (full engine speed)	2500 rpm
Blade max tip speed	80.5 m/s (180 mph)
Effective cutting width	4942 mm (16 ft. 2 in.)
Minimum Cutting height	27 mm (1 1/16 in.)
Cutting angle range	0–8 degrees below horizontal
Adjustable shoes	Standard
Gear train protection	Shearpin (safecut)
Converging Drums	Four-drum type
Drives	
Hydraulic motor	Piston type into 90-degree gearbox
Cutterbar	Direct drive through 90-degree gearbox and universal shaft
Conditioner drive	Belt drive (4HB) from 90-degree gearbox to conditioner
Conditioner roll timing	Timing gearbox

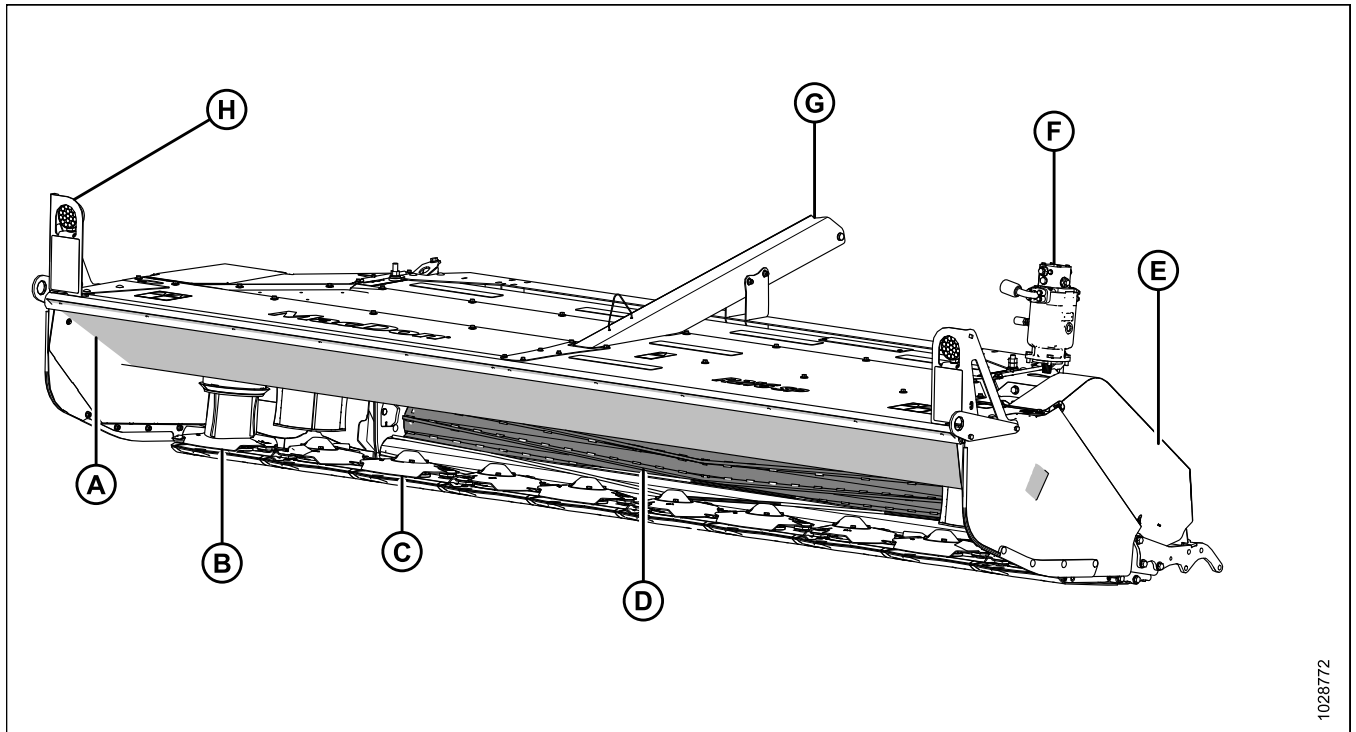
PRODUCT OVERVIEW

Hay Conditioner Options	
Steel rolls	Standard
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	1009 rpm
Swath width ¹	915–2438 mm (36–96 in.)
Forming shields	Full width adjustable baffle on conditioner with adjustable windrower mounted forming shield

1. Actual swath width may vary based upon conditioner type, crop type, and crop volume.

2.2 Component Identification

Figure 2.1: R216 SP Series rotary Rotary Disc Header



A - Front Curtain
D - Conditioner Rolls
G - Center-Link Tube

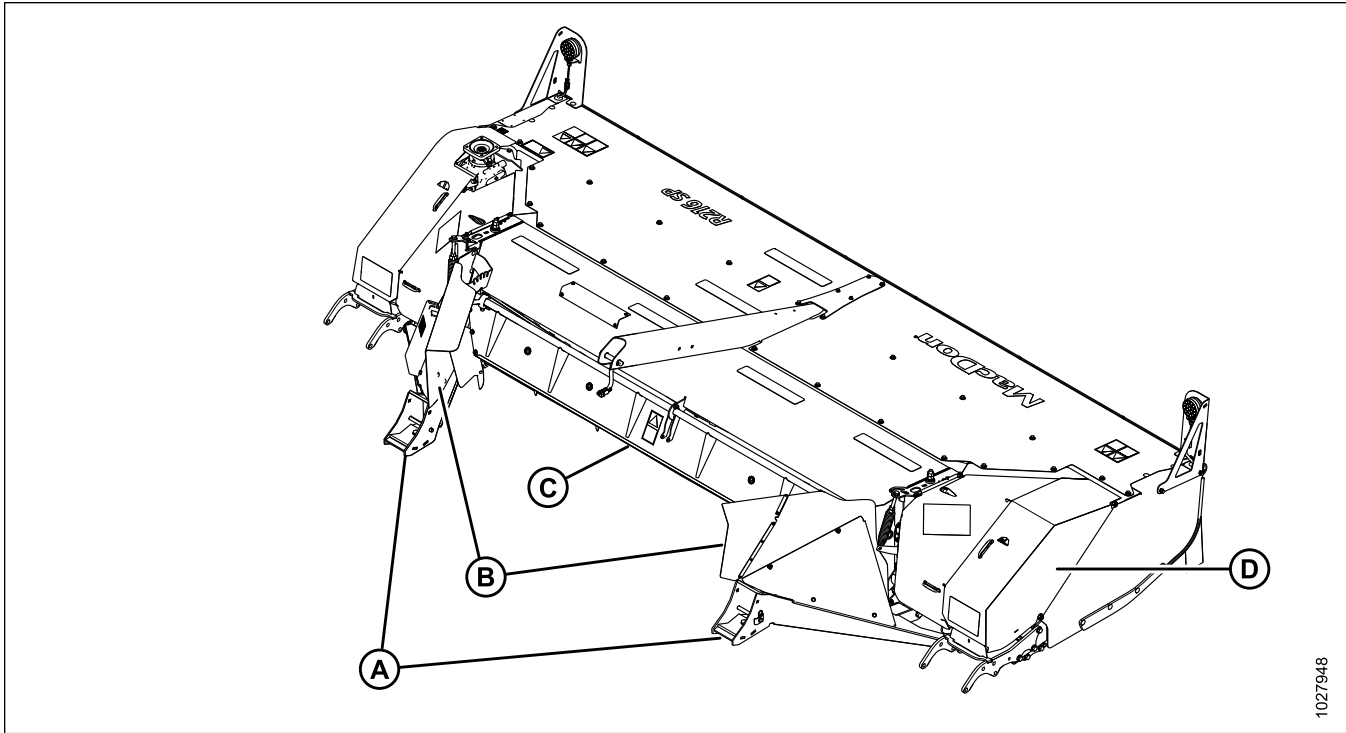
B - Disc Drum (Right)
E - Drive Shield (Left)
H - Hazard/Brake Lights

C - 10-Disc Cutterbar
F - Hydraulic Motor

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PRODUCT OVERVIEW

Figure 2.2: R216 SP Series Rotary Disc Header



A - Header Supports
C - Rear Crop Baffle

B - Deflectors
D - Drive Shield

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2.3 Definitions

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

Term	Definition
API	American Petroleum Institute
ASTM	American Society of Testing and Materials
Bolt	A headed and externally threaded fastener that is designed to be paired with a nut
Cab-forward	Windrower operation with Operator and cab facing in direction of travel
Center-link	A hydraulic cylinder link between header and machine used to change header angle
CGVW	Combined gross vehicle weight
Export header	Header configuration typical outside North America
FFFT	Flats from finger tight
Finger tight	Finger tight is a reference position where sealing surfaces or components are making contact with each other, and fitting has been tightened to a point where fitting is no longer loose
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 and is attached to a windrower
Hex key	A tool of hexagonal cross-section used to drive bolts and screws that have a hexagonal socket in head (internal-wrenching hexagon drive); also known as an Allen key and various other synonyms
hp	Horsepower
HPT display	Harvest Performance Tracker display module on a windrower
JIC	Joint Industrial Council: A standards body that developed standard sizing and shape for original 37° flared fitting
M1 Series	MacDon M1170 and M1240 Windrowers
n/a	Not applicable
North American header	Header configuration typical in North America
NPT	National Pipe Thread: A style of fitting used for low-pressure port openings. Threads on NPT fittings are uniquely tapered for an interference fit
Nut	An internally threaded fastener that is 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 into a mating part

PRODUCT OVERVIEW

Term	Definition
Soft joint	A joint made with use of a fastener where joining materials are compressible or experience relaxation over a period of time
SP rotary disc header	Rotary disc header that connects to a self-propelled machine (windrower, etc.)
Tension	Axial load placed on a bolt or screw, usually measured in Newtons (N) or pounds (lb.)
TFFT	Turns from finger tight
Torque	The product of a force X lever arm length, usually measured in Newton-meters (Nm) or foot-pounds (lbf·ft)
Torque angle	A tightening procedure where fitting is assembled to a precondition (finger tight) and then nut is turned farther a number of degrees to achieve its final position
Torque-tension	The relationship between assembly torque applied to a piece of hardware and axial load it induces in bolt or screw
Washer	A thin cylinder with a hole or slot located in the center that is to be used as a spacer, load distribution element, or locking mechanism
Windrower	Power unit of a self-propelled header

Chapter 3: Operation

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.



CAUTION

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.

NOTE:

Perform the items specified in [4.3.2 Break-In Inspections, page 66](#).

3.2 Daily Start-Up Check

Perform the following checks each day before startup:

CAUTION

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

Protect yourself. You may need the following:

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

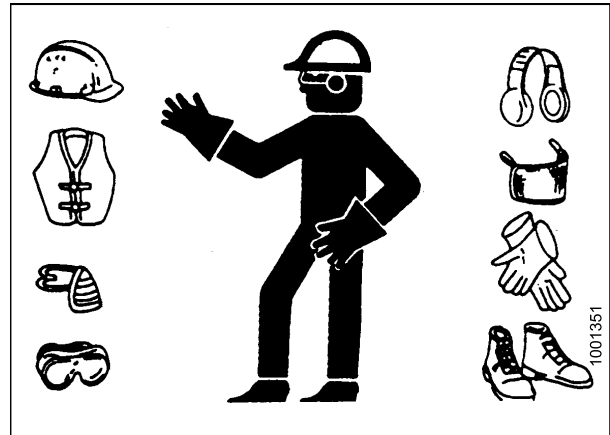


Figure 3.1: Safety Equipment

Use proper hearing protection:

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



Figure 3.2: Safety Equipment

OPERATION

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

NOTE:

Use proper procedure when searching for pressurized fluid leaks. Refer to [4.12.1 Checking Hydraulic Hoses and Lines, page 151](#).

2. Clean all lights and reflective surfaces on the machine, and check lights for proper operation.
3. Perform all daily maintenance. Refer to [4.3.1 Maintenance Schedule/Record, page 64](#).

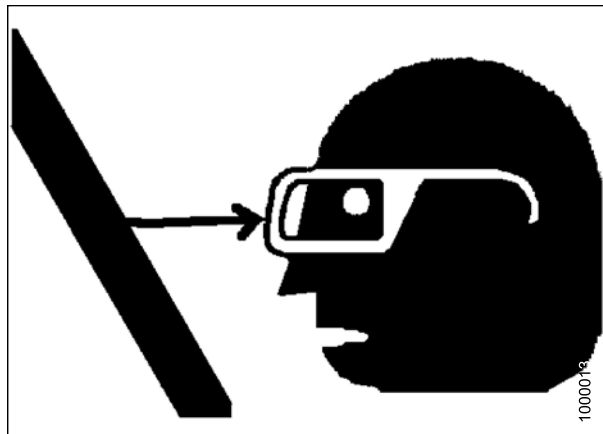


Figure 3.3: Safety around Equipment

3.3 Engaging and Disengaging Header Safety Props

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

3.3.1 Engaging and Disengaging Header Safety Props – M1240 Windrower

Safety props are located on both header lift cylinders on the windrower. Follow these steps to engage or disengage the header safety props:

DANGER

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

1. Start the engine. Press the HEADER UP (A) switch to raise header to maximum height.

NOTE:

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

- a. Press and hold the HEADER UP switch (A) until both cylinders stop moving.
 - b. Continue to hold the switch for 3–4 seconds. Cylinders are now phased.
2. Shut down the engine, and remove the key from the ignition.



Figure 3.4: Ground Speed Lever

3. Engage safety props on both lift cylinders as follows:
 - a. Pull lever (A), rotate toward header to release, and lower the safety prop onto the cylinder.
 - b. Repeat for opposite lift cylinder.

IMPORTANT:

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

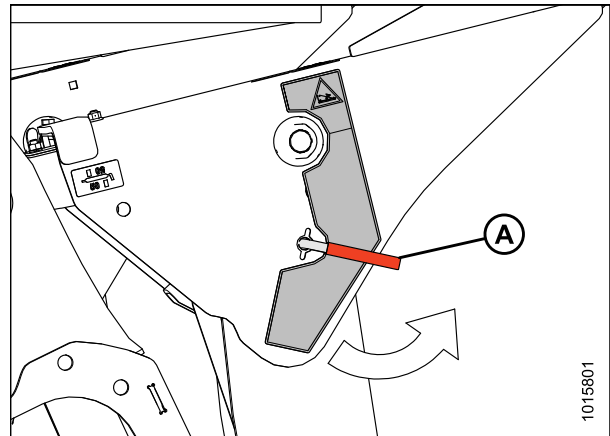


Figure 3.5: Safety Prop

OPERATION

4. Disengage safety props on both lift cylinders as follows:

NOTE:

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

- a. Turn lever (A) away from header to raise safety prop until lever locks into vertical position.
- b. Repeat for opposite cylinder.



CAUTION

Check to be sure all bystanders have cleared the area.

5. Start the engine, choose a level area, and lower header to the ground. Shut down the engine and remove the key from the ignition.

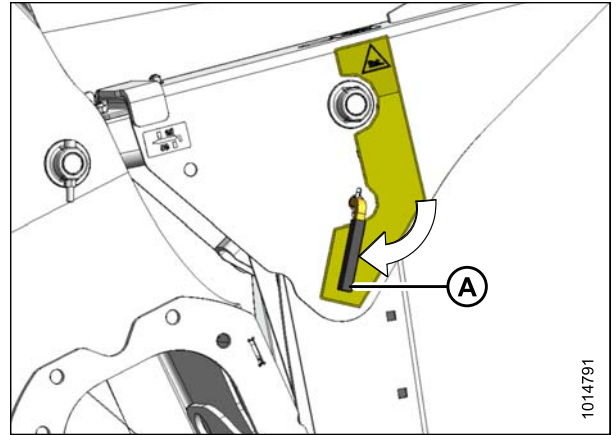


Figure 3.6: Safety Prop

3.4 Attaching Header to M1240 Windrower

3.4.1 Attaching Rotary Disc Header

The M1240 windrower may have an optional self-aligning hydraulic center-link that allows vertical position control of the center-link from the cab.

WARNING

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. **Hydraulic Center-Link without Self-Alignment:** Remove pin (A) and raise center-link (B) until hook is above the attachment pin on disc header. Replace pin (A) to hold center-link in place.

IMPORTANT:

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

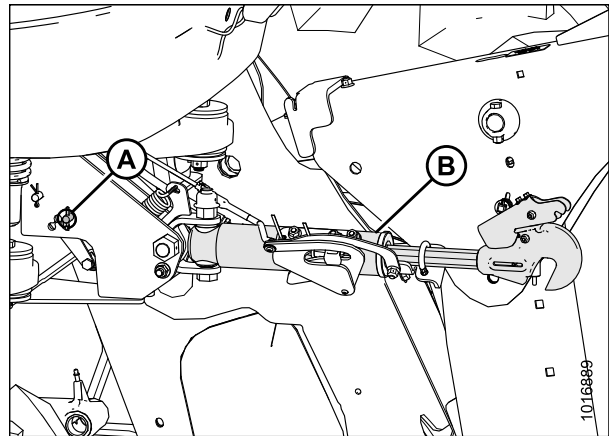


Figure 3.7: Hydraulic Center-Link

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

CAUTION

Check to be sure all bystanders have cleared the area.

3. Start the windrower engine.

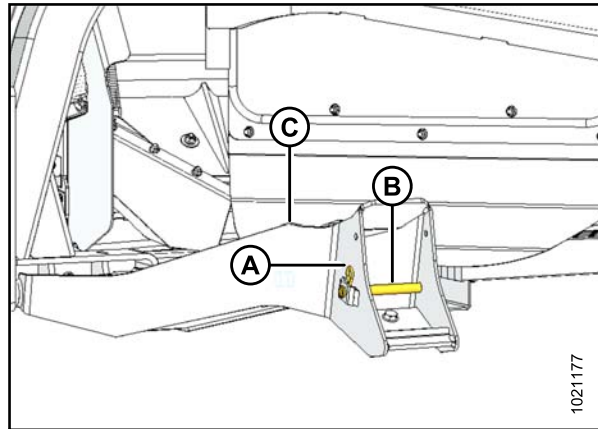


Figure 3.8: Rotary Disc Header Support

CAUTION

When lowering header lift legs without a header or weight box attached to the windrower, ensure the float springs tension is fully released to prevent damage to the header lift linkages.

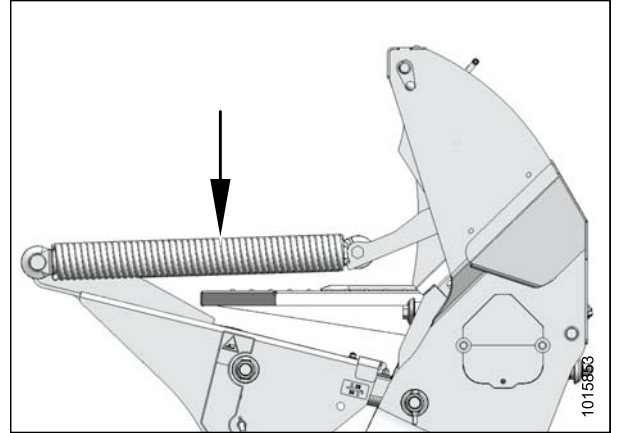


Figure 3.9: Header Float Spring

4. Press rotary scroll knob (A) on the display to highlight QuickMenu options.
5. Rotate scroll knob (A) to highlight the HEADER FLOAT symbol (B), and press scroll knob to select. The header float adjust screen displays.



Figure 3.10: HPT Display

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

NOTE:

If the header float is active, the icon at soft key 3 will display REMOVE FLOAT; if header float has been removed, the icon will display RESUME FLOAT.



Figure 3.11: HPT Display

OPERATION

7. Press HEADER DOWN switch (E) on the ground speed lever (GSL) to fully retract header lift cylinders.
8. **Self-Aligning Hydraulic Center-Link:** Press the REEL UP switch (B) 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.

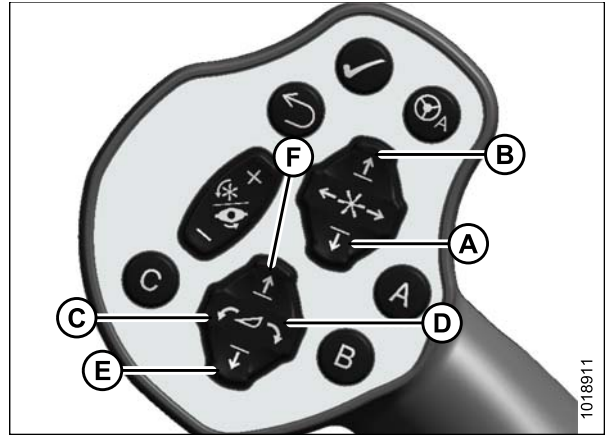


Figure 3.12: GSL

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

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

NOTE:

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

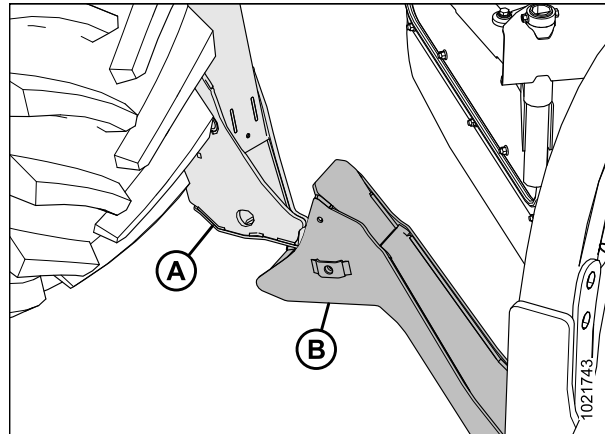


Figure 3.13: Header Support

10. Self-Aligning Hydraulic Center-Link:

- a. Adjust position of the 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 self-locking mechanism.

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

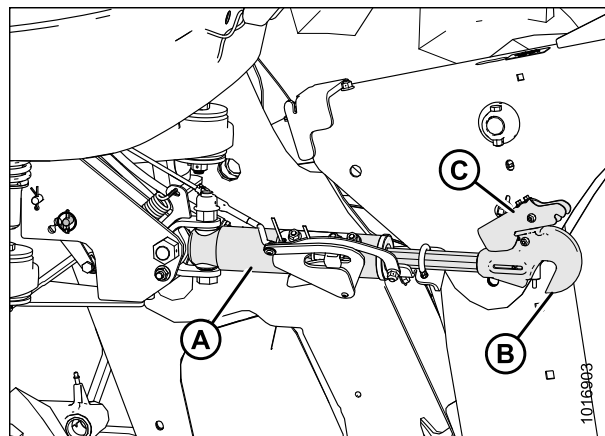


Figure 3.14: Hydraulic Center-Link

OPERATION

11. **Self-Aligning Hydraulic Center-Link:** Connect header electrical harness (A) to windrower.

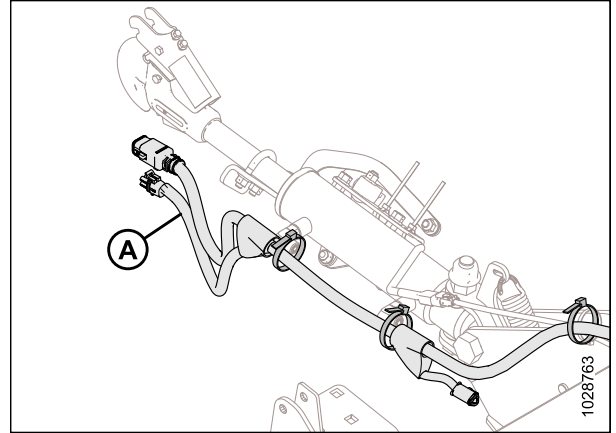


Figure 3.15: Header Electrical Harness

12. **Self-Aligning Hydraulic Center-Link:**
 - a. Lower center-link (A) onto the header with REEL DOWN switch on the GSL until the center-link locks into position and the hook release (B) is down.
 - b. Check that center-link is locked onto header by pressing the REEL UP switch on the GSL.

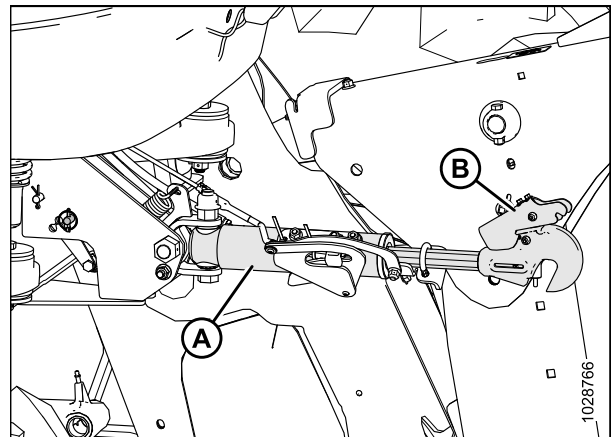


Figure 3.16: Hydraulic Center-Link

13. **Hydraulic Center-Link without Self-Alignment:**
 - a. Press HEADER TILT UP or HEADER TILT DOWN cylinder switches on the GSL to extend or retract center-link cylinder until the hook is aligned with the header attachment pin.
 - b. Stop the engine and remove the key.
 - c. Push down on rod end of link cylinder (B) until hook engages and locks onto header pin.

IMPORTANT:

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

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

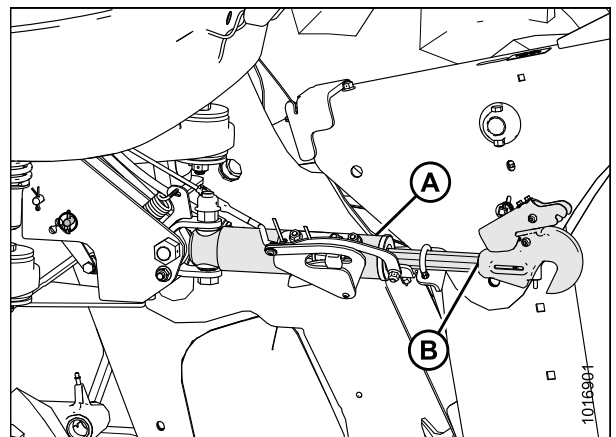


Figure 3.17: Hydraulic Center-Link

OPERATION

14. **Hydraulic Center-Link without Self-Alignment:** Connect header electrical harness (A) to windrower.

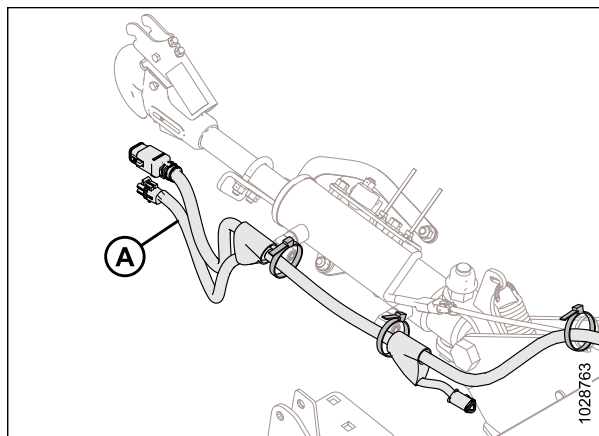


Figure 3.18: Header Electrical Harness

15. Install clevis pin (A) through support and windrower lift arm and secure with hairpin (B). Repeat for opposite side.

IMPORTANT:

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

CAUTION

Check to be sure all bystanders have cleared the area.

16. Start the windrower engine.
17. Lower the header fully to the ground.
18. Turn off the windrower engine and remove the key from the ignition.

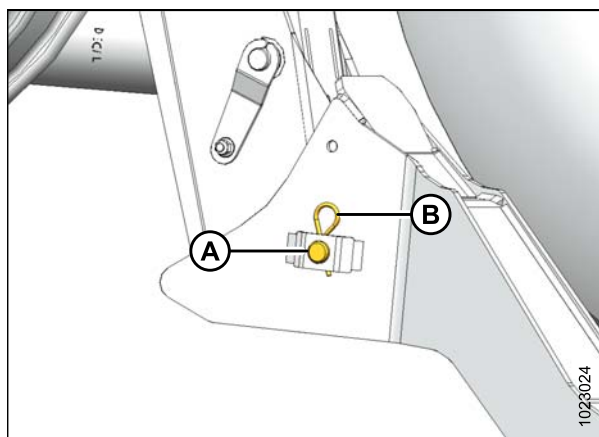


Figure 3.19: Header Support

OPERATION

Connecting Rotary Disc Header Hydraulics and Electrical – M1240 Windrowers

1. Move windrower left (cab forward) platform (A) to the OPEN position. For instructions, refer to the windrower operator's manual.

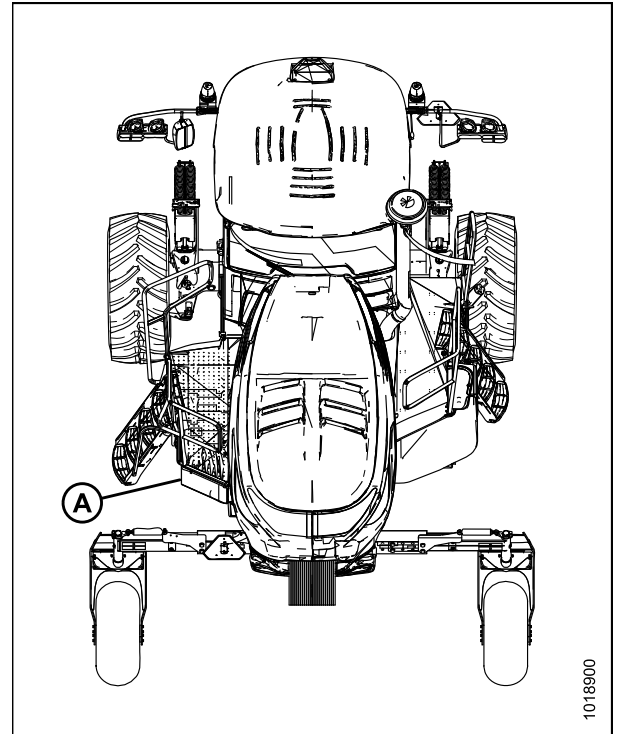


Figure 3.20: Windrower with Left Platform in Open Position

2. Route hose bundle (A) from the header, under the windrower frame, then insert pin (B) into the hole (C) in the windrower frame.

NOTE:

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

3. Rest hoses on header.

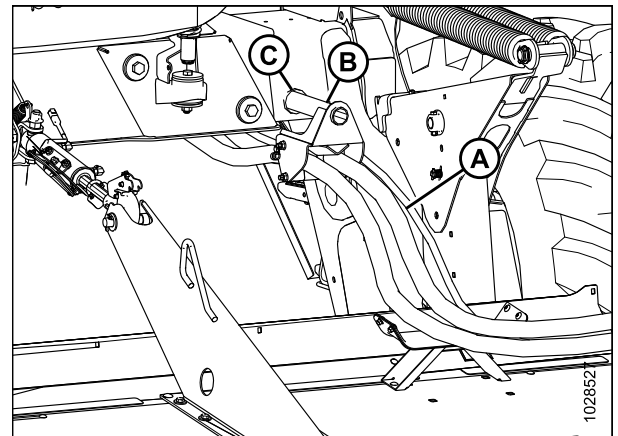


Figure 3.21: Hydraulic Hoses

OPERATION

4. Remove protective plugs (A) from ends of hydraulic hoses.

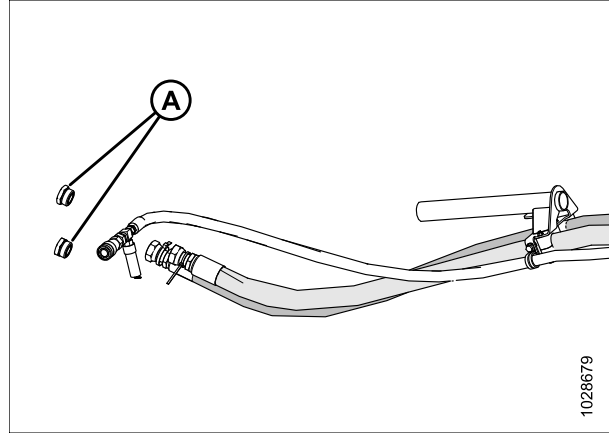


Figure 3.22: Protective Shipping Plugs on R216 Hydraulic Hoses

5. Use a clean rag to remove dirt and moisture from the couplers on the windrower and remove protective plugs (A) from hoses (B).

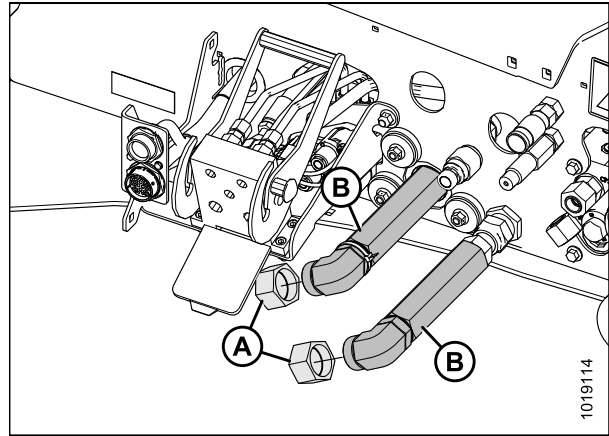


Figure 3.23: Hose Support

OPERATION

6. Make the following hydraulic connections to the windrower:
 - a. Connect disc pressure hose (A) marked with a red cable tie (B) to hard plumb fitting marked with a red cable tie (C) and torque to 205–226 Nm (151–167 lbf·ft)
 - b. Connect disc return hose (D) to hard plumb fitting (E) and torque to 205–226 Nm (151–167 lbf·ft)
 - c. Connect case drain hose (F) to fitting (G)

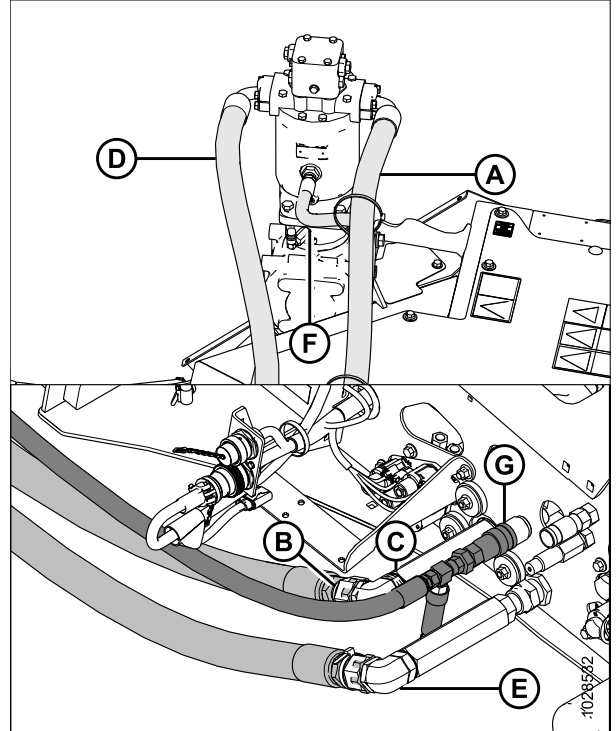


Figure 3.24: Hydraulic Connections on Header and M1240 Windrower

7. Connect header adapter harness (A) and main header harness (B).

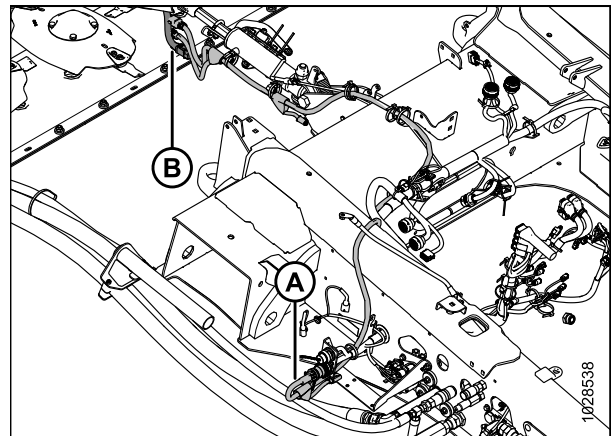


Figure 3.25: Electrical Connections

OPERATION

8. Close the windrower's left side platform (A). Refer to windrower operator's manual for procedure.

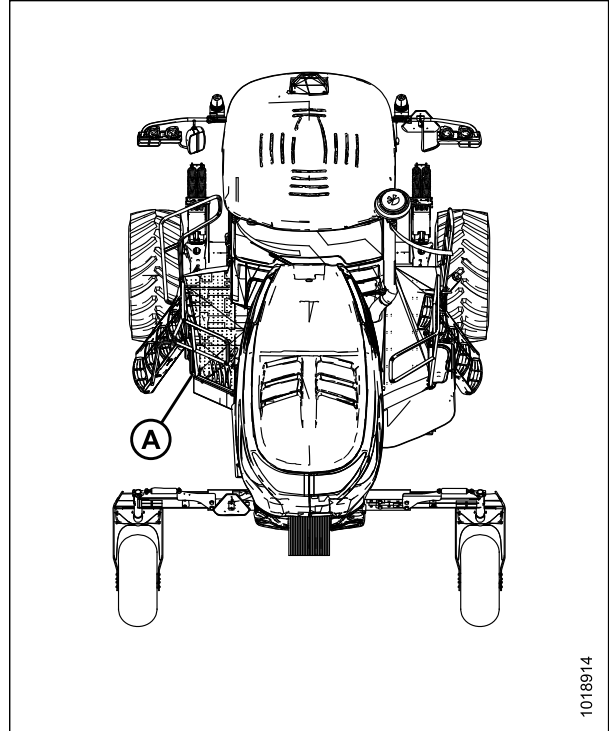


Figure 3.26: M1240 Windrower with Left Platform in Closed Position

Connecting Rotary Disc Header Hydraulics Using Quick Couplers

To connect the R216 Rotary Rotary Disc Header hydraulic hoses to the M1240 Windrower using quick couplers, follow these steps:

If your windrower is equipped with hard plumb connections, refer to for connection instructions.

1. Route hose bundle (A) from the disc header, under the windrower frame, then insert pin (B) into hole (C) in the windrower frame.

NOTE:

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

NOTE:

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

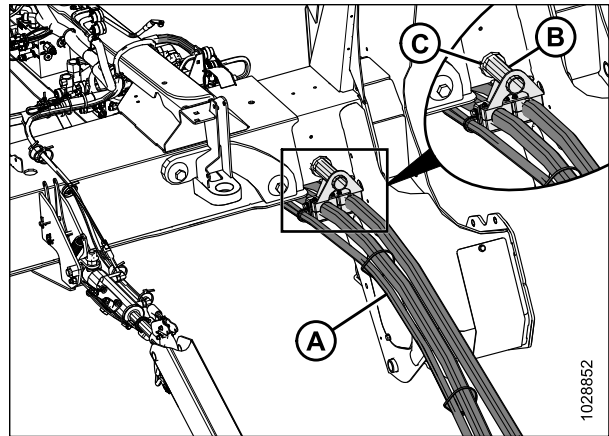


Figure 3.27: Hydraulic Hoses

OPERATION

2. Remove protective plugs (A) from the ends of the hydraulic hoses.

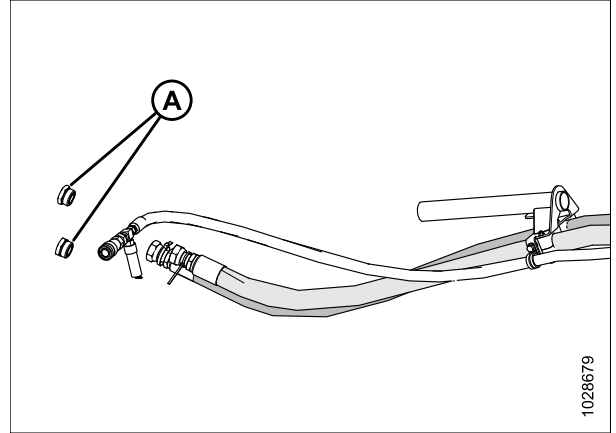


Figure 3.28: Protective Shipping Plugs on R216 Hydraulic Hoses

3. Use a clean rag to remove dirt and moisture from the couplers on the left side of the windrower frame.
4. Make the following hydraulic and electrical connections to the windrower:
 - a. Connect disc pressure hose (A) with coupler (B) and torque to 205–226 Nm (151–167 lbf·ft)
 - b. Connect disc return hose (C) with coupler (D) and torque to 205–226 Nm (151–167 lbf·ft)
 - c. Connect case drain hose (E) to fitting (F), with relief valve pointing towards the ground

NOTE:

Parts removed from illustration for clarity.

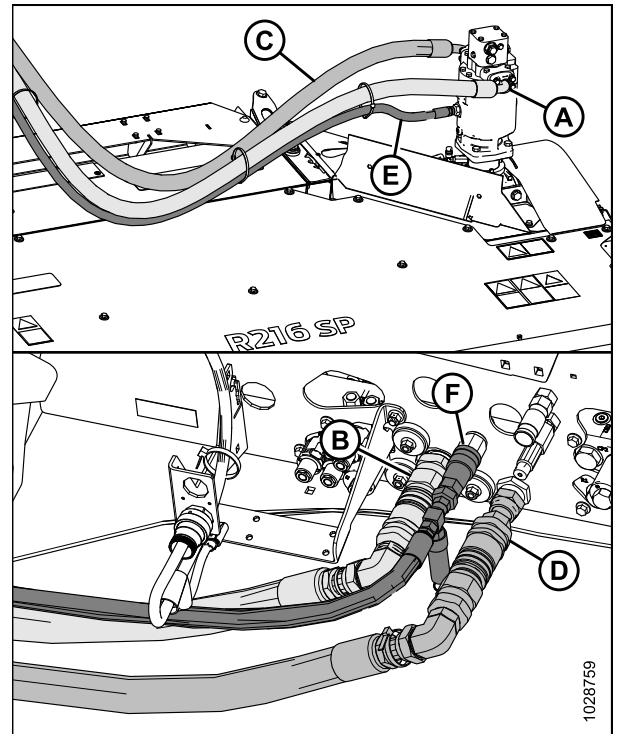


Figure 3.29: Hydraulic Connections on Rotary Disc Header and M1240 Windrower

OPERATION

5. Move left windrower platform (A) to the CLOSED position.
For instructions, refer to the windrower operator's manual.

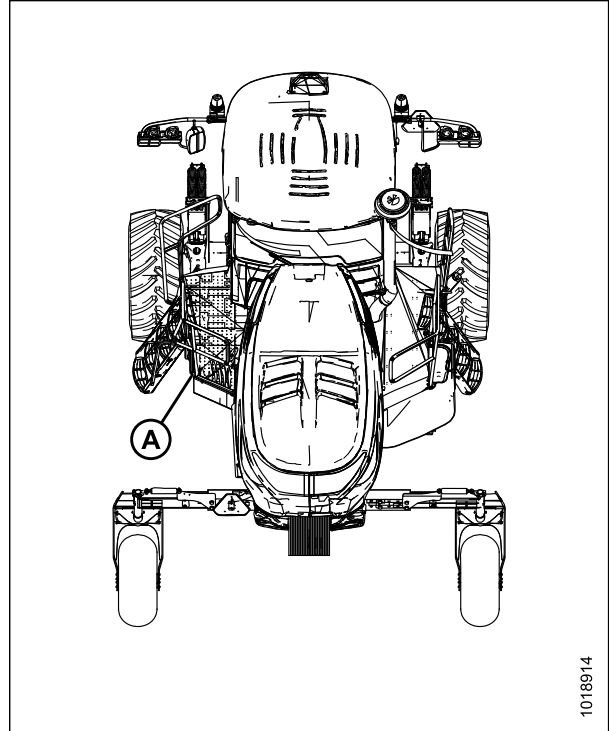


Figure 3.30: Windrower with Left Platform in Closed Position

3.5 Detaching Header from M1240 Windrower

3.5.1 Detaching Rotary Disc Header from M1240 Windrower



WARNING

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



CAUTION

Check to be sure all bystanders have cleared the area.

1. Start the engine, and press switch (A) to raise the header to the maximum height.
2. Stop the engine, and remove the key.



Figure 3.31: GSL

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

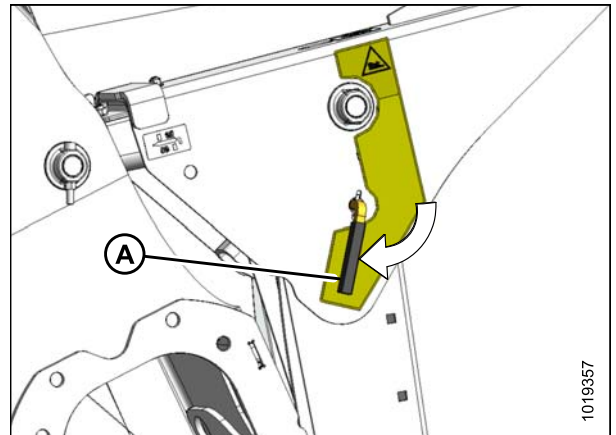


Figure 3.32: Safety Props

4. Open left side platform. For instructions, refer to the windrower operator's manual.

OPERATION

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

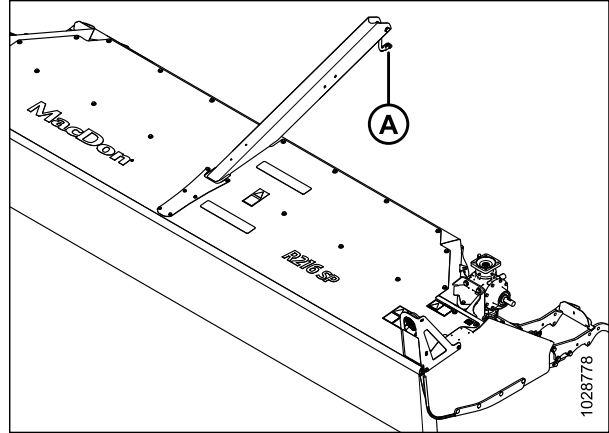


Figure 3.33: Header Electrical Connection

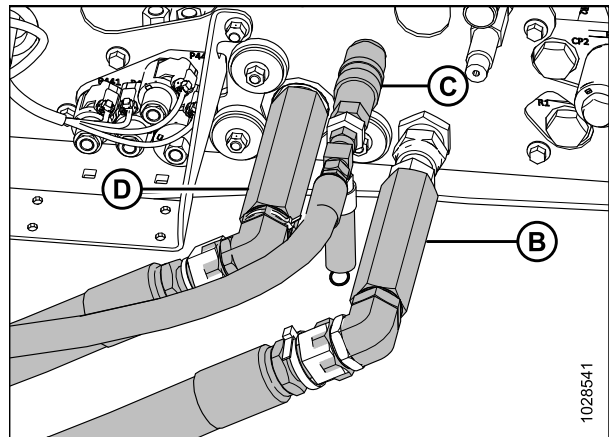


Figure 3.34: Header Drive Hydraulics

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

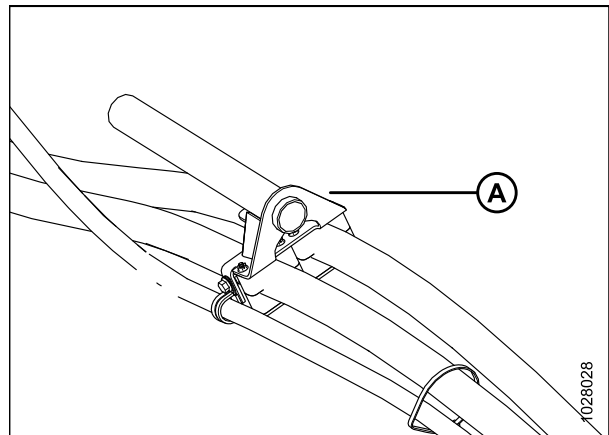


Figure 3.35: Hoses on Windrower

OPERATION

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

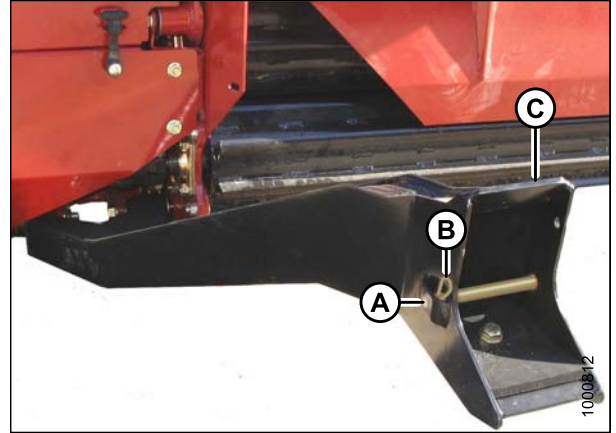


Figure 3.36: Header Supports

Windrowers with self-aligning center-link kit only:

8. Release the center-link latch (A) before returning to the cab.

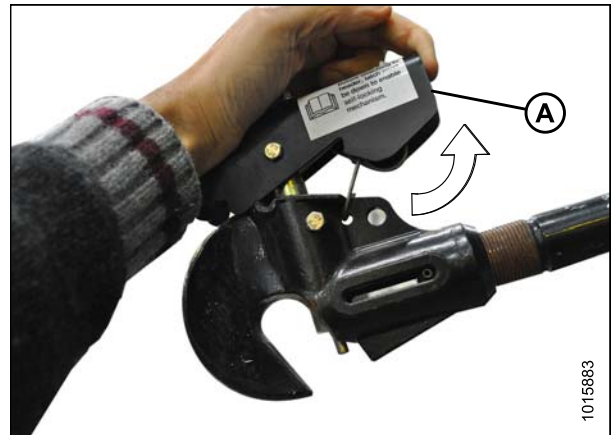


Figure 3.37: Center-Link

9. Disengage safety prop by turning lever (A) downwards until lever locks into the vertical position.
10. Repeat for the opposite side.



CAUTION

Check to be sure all bystanders have cleared the area.

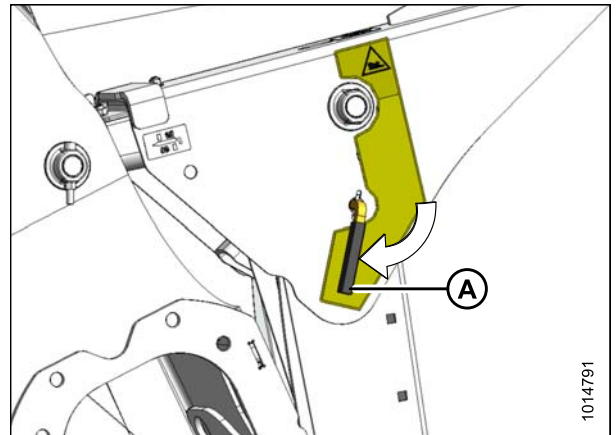


Figure 3.38: Safety Props

11. Start engine and remove header float when prompted by the Harvest Performance Tracker (HPT).

NOTE:

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

12. Lower header to the ground.

OPERATION

Self-aligning hydraulic center-link (if installed):

13. Use HEADER TILT cylinder switches (A) on GSL to release load on center-link cylinder.
14. Operate the link lift cylinder with the REEL UP switch (B) to disengage the center-link from the header.

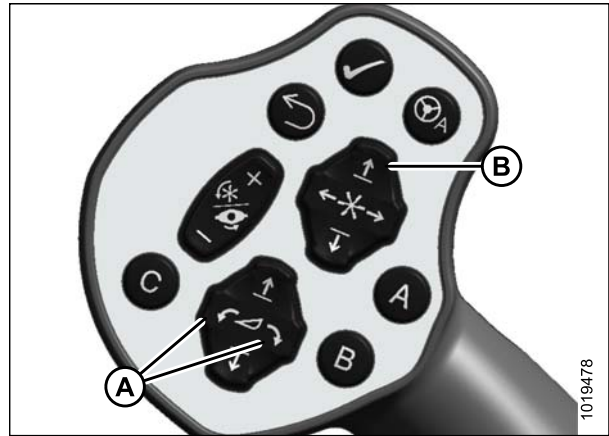


Figure 3.39: GSL

Hydraulic center-link without self-alignment:

15. Shut off the engine and remove the key.
16. Lift hook release (A) and lift hook (B) off header pin.
17. Disconnect header harness and remote baffle connector (if equipped).

CAUTION

Check to be sure all bystanders have cleared the area.

18. Start the engine.

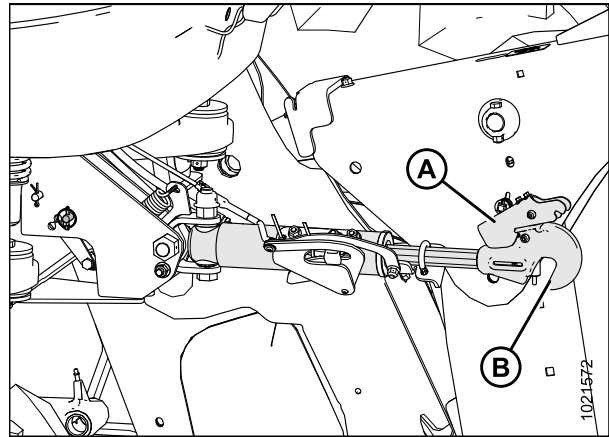


Figure 3.40: Hydraulic Center-Link

19. Back the windrower slowly away from header.
20. Turn off engine and remove key from ignition.
21. Reinstall clevis pin (A) through support (C) and secure with hairpin (B). Repeat for opposite side.

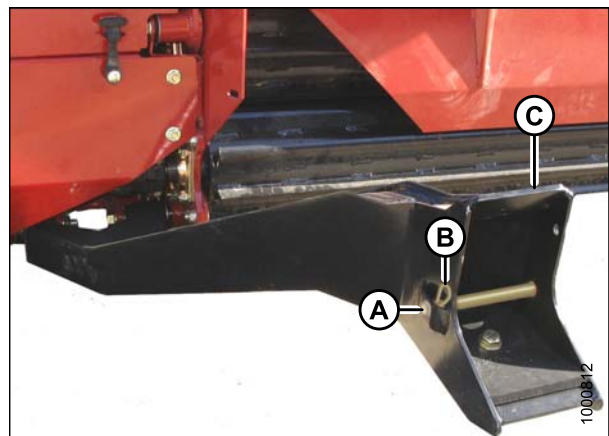


Figure 3.41: Header Support

3.6 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.

3.6.1 Opening Driveshields

CAUTION

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

NOTE:

Images shown in this procedure are for the left driveshield—the right driveshield is similar.

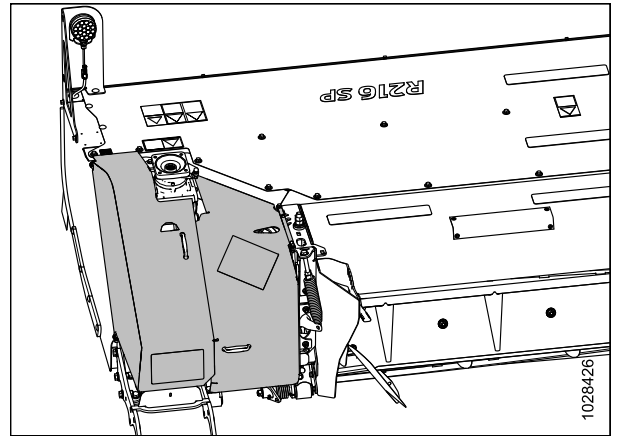


Figure 3.42: Left Driveshield

1. Engage the release latch and lift release lever (A) and pull handle (B).

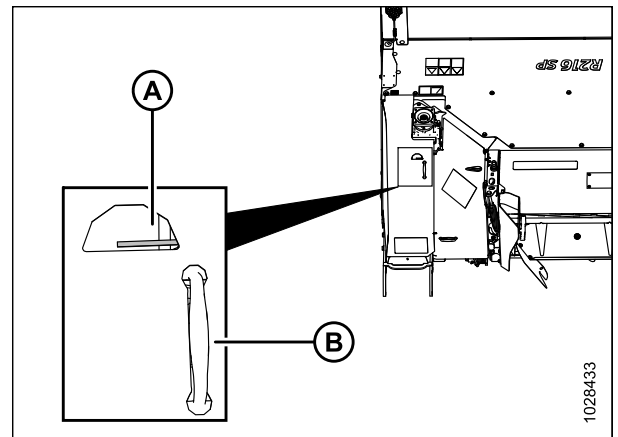


Figure 3.43: Driveshield Latch and Handle

OPERATION

2. Lift outboard driveshield panel toward outboard end of header.

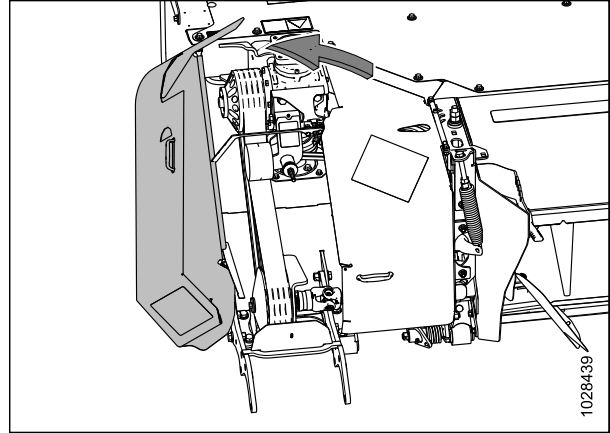


Figure 3.44: Opening Driveshield – Outboard Side

3. Grab handle (A) and lift the other half of the endshield (B) to the inboard side of the header.

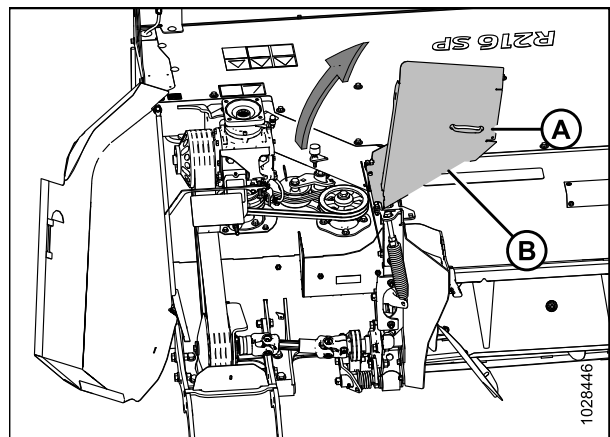


Figure 3.45: Driveshield – Inboard Side

3.6.2 Closing Driveshields

CAUTION

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

NOTE:

Images shown in this procedure are for the left driveshield—the right driveshield is similar.

1. Lift lock latch (A) to disengage driveshield lock.

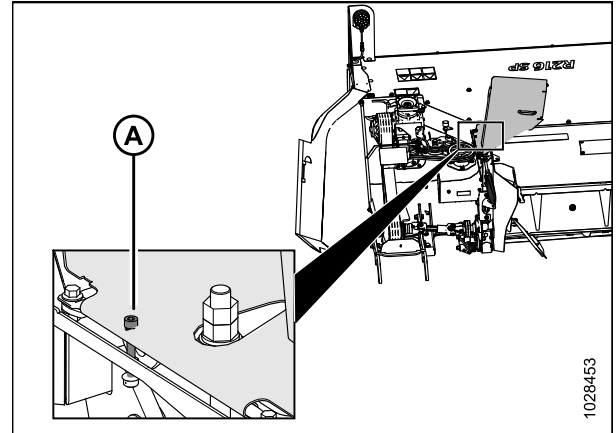


Figure 3.46: Driveshield Lock Latch

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

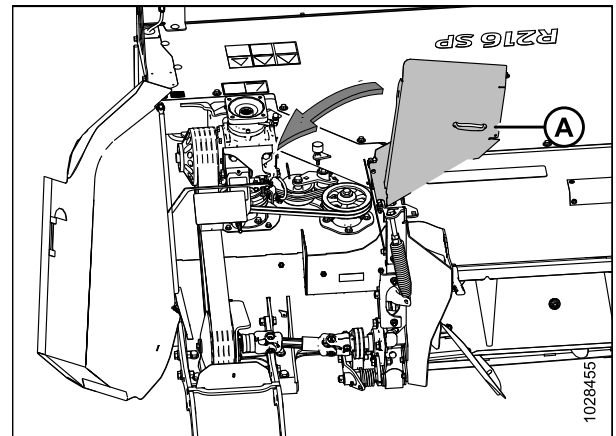


Figure 3.47: Left Driveshield

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

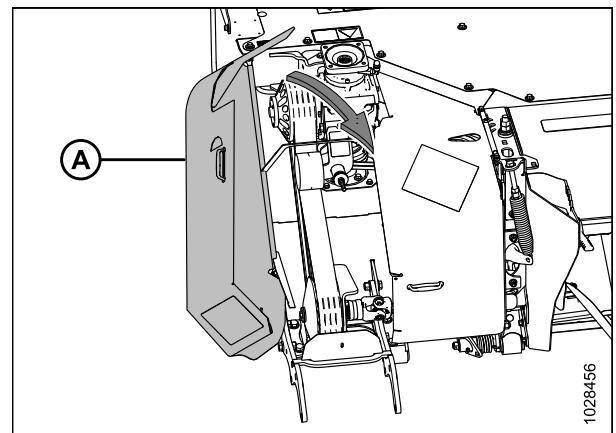


Figure 3.48: Left Driveshield

3.7 Cutterbar Curtain

WARNING

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

NOTE:

Cutterbar curtain is attached at the front and the sides of the header. **Always** keep curtain lowered when operating the disc header.

IMPORTANT:

Replace curtain (A) if it becomes worn or damaged. Refer to [4.8.1 Inspecting Cutterbar Curtain, page 130](#).

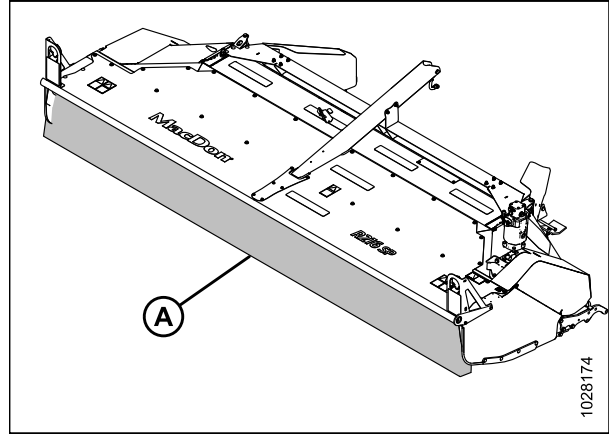


Figure 3.49: Cutterbar Curtains

3.7.1 Opening Cutterbar Curtain

WARNING

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

1. Push curtain (A) inward and up.

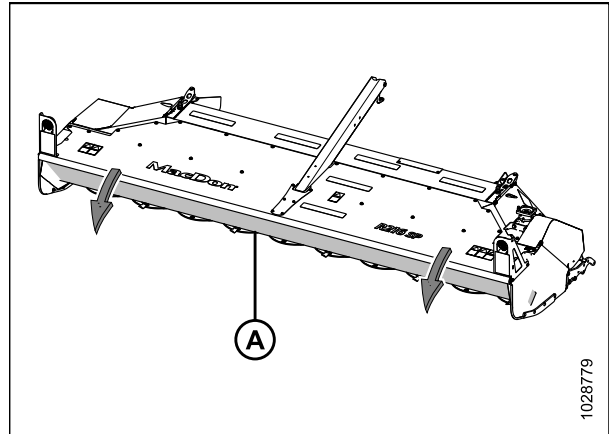


Figure 3.50: Cutterbar Curtain

OPERATION

2. Securing curtain in place at locations (A) using 3 clips provided.

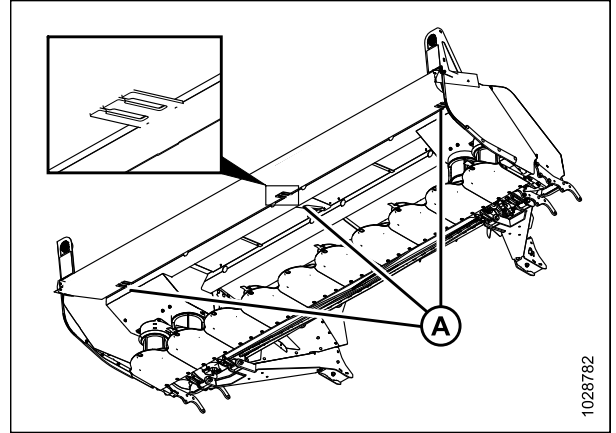


Figure 3.51: Cutterbar Curtains — View from Below

NOTE:

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

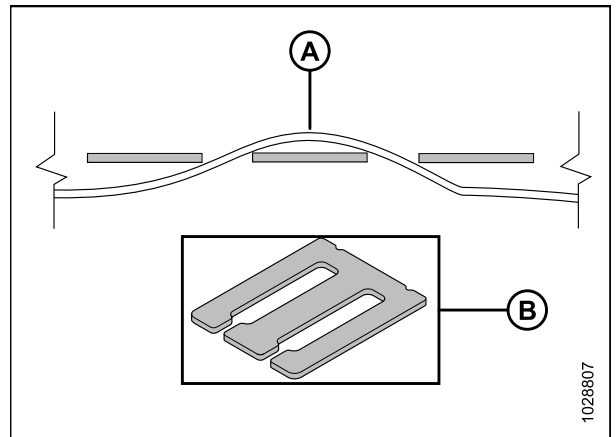


Figure 3.52: Cutterbar Curtain and Retaining Clips

3.7.2 Closing Cutterbar Curtain

CAUTION

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

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

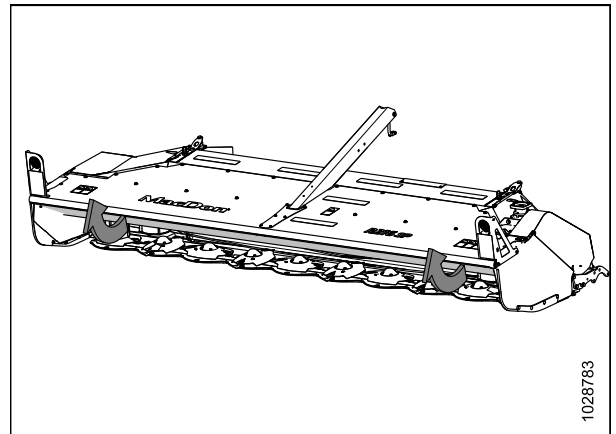


Figure 3.53: Cutterbar Curtain

3.8 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
Float	3.8.3 Header Float, page 45
Header angle	3.8.2 Adjusting Cutterbar Angle, page 45
Cutting height	3.8.1 Cutting Height, page 44
Ground speed	3.8.4 Ground Speed, page 46
Conditioner Settings	3.10 Conditioner, page 49
Crop Stream Configuration	3.9 Reconfiguring Cutterbar Crop Stream, page 47

3.8.1 Cutting Height

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

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

- [5.1.2 Adjustable Gauge Roller Kit, page 153](#)
- [5.1.3 Adjustable Skid Shoes Kit, page 154](#)

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

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

To choose a header angle that maximizes performance for your crop and field conditions, refer to [3.8.2 Adjusting Cutterbar Angle, page 45](#).

To minimize cutterbar damage, scooping soil, and soil build-up at the cutterbar in damp conditions, the float should be set as light as possible without causing excessive bouncing. Refer to [3.8.3 Header Float, page 45](#).

3.8.2 Adjusting Cutterbar Angle

The header angle (A) adjustment ranges from 0 to 8 degrees 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 header 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:

In most cases, cut quality is improved by keeping the cutterbar angle as close to 0 degrees as possible.

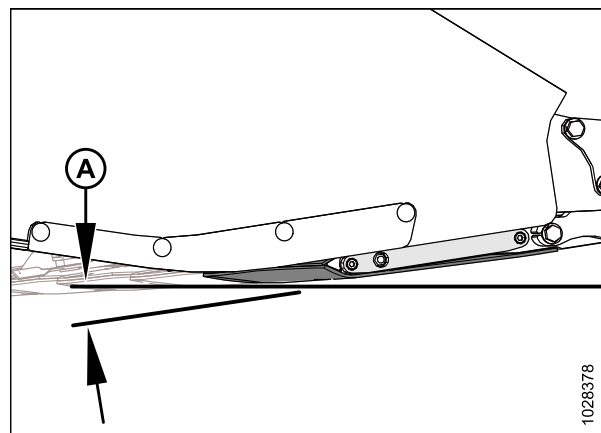


Figure 3.54: Cutterbar Angle

3.8.3 Header Float

The M1240 float is completely adjustable from the cab through the Harvest Performance Tracker (HPT).

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.

IMPORTANT:

- Set 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 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 header angle for crop type and conditions, field conditions, and speed settings.

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

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



CAUTION

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

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

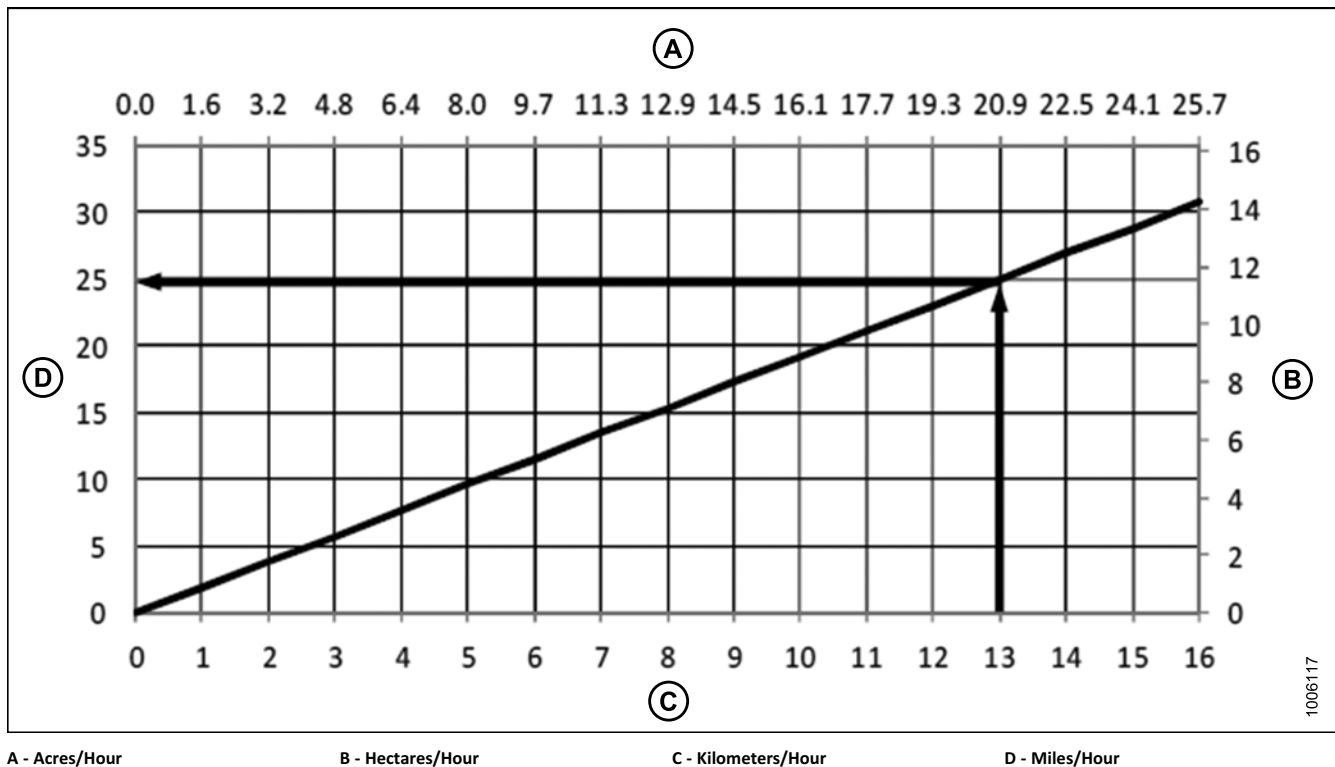
In light crops, reduce the disc header's disc speed while maintaining ground speed.

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 3.55: Ground Speed for R216 SP Rotary Disc Headers



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

3.9 Reconfiguring Cutterbar Crop Stream

Discs are factory-installed to produce four crop streams, but disc rotation pattern can be changed by substitution of spindle and corresponding disc to suit crop conditions. Each spindle and disc pair is designed to rotate in one direction and must be changed as sets when altering crop flows.

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

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

NOTE:

Increasing the number of crop streams will also increase the number of diverging disc pairs which may negatively affect cut quality in certain conditions.

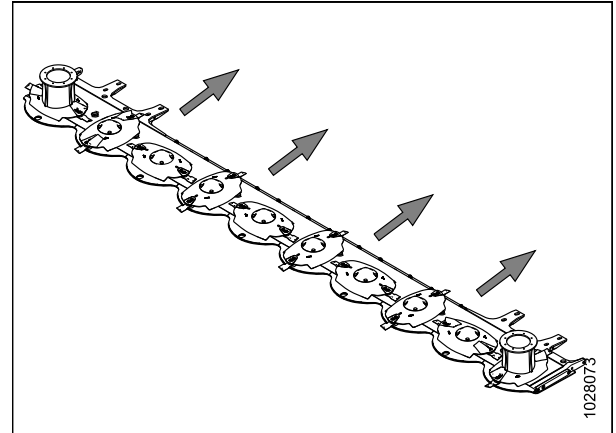


Figure 3.56: R216 Cutterbar

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 spindle 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 rotation pattern can result in damage to spindle and/or cutterbar components.
- Safecut (shear pin) will not work if spindles used in the wrong orientation.

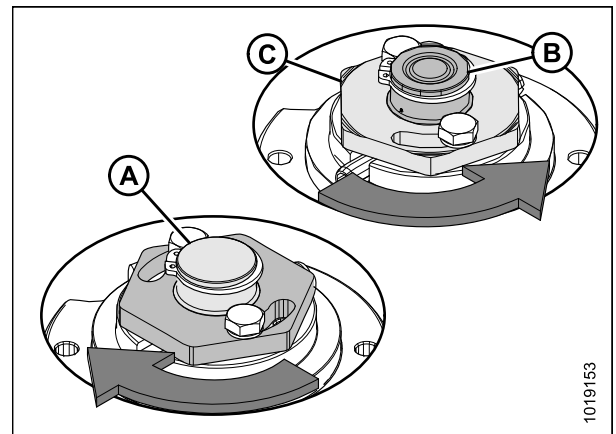
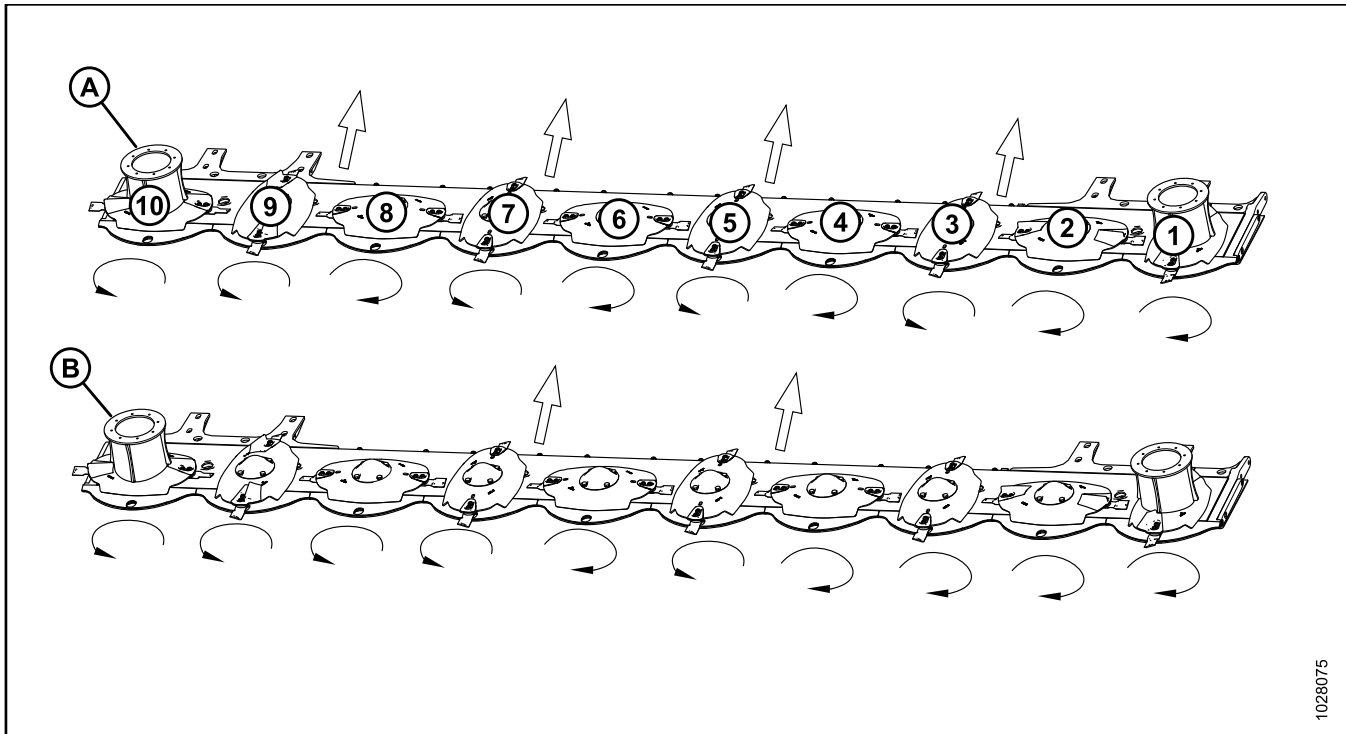


Figure 3.57: Cutterbar Spindles

3.9.1 Changing R216 SP Cutterbar Crop Stream Configuration

Figure 3.58: R216 SP (10 Disc) Spindle Rotation Pattern and Crop Streams



A - Four Crop Stream

B - Two Crop Streams

NOTE:

Refer to [Removing Cutterbar Spindles, page 81](#) and [Installing Cutterbar Spindles, page 83](#).

To change R216 SP (10 disc) spindle rotation from four crop streams (A) to two crop stream (B):

- Swap disc/spindle (3) with disc/spindle (8).

NOTE:

A disc timing tool (MD #307954) is available through MacDon parts to change disc/spindle configuration.

NOTE:

Switching from 4 streams to 2 streams is a recommended setting when cutting light alfalfa and using the double windrower attachment (DWA).

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3.10 Conditioner

Rolls condition the crop by crimping and crushing the stem in several places, which allows the release of moisture resulting in faster drying times. R216 SP headers are equipped with steel conditioner rolls.

3.10.1 Roll Gap

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

Steel rolls can be operated over a large range of roll gap settings (intermesh). Using a roll gap of (up to) 25 mm (1 in.), they are suited to a wide range of crops (including alfalfa and thicker-stemmed cane-type crops). However operating with too large of a gap may cause feeding problems.

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

IMPORTANT:

If using settings below the factory setting, visually inspect the roll gap.

Adjusting Roll Gap

To adjust the roll gap to factory setting, follow the procedure below:



WARNING

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

IMPORTANT:

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

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

NOTE:

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

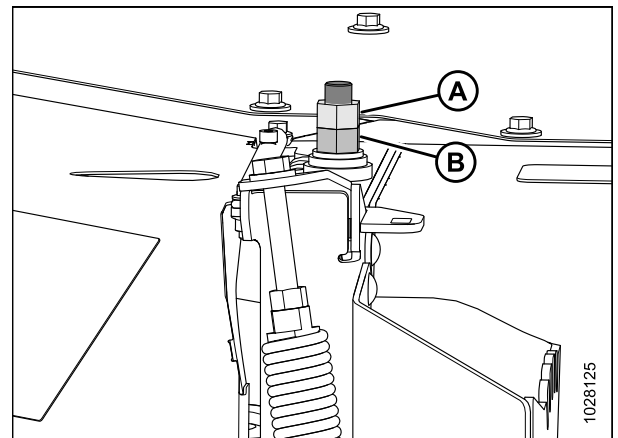


Figure 3.59: Roll Gap Adjustment

3.10.2 Roll Tension

Roll tension (the pressure holding the conditioner rolls together) 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 materials are sufficiently crimped.

Adjusting Roll Tension

To adjust roll tension, follow these steps:



WARNING

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

1. Lower the header to the ground.
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 spring drawbolt as follows:
 - Turn spring drawbolt (B) clockwise to tighten spring and **INCREASE** the roll tension.
 - Turn spring drawbolt (B) counterclockwise to loosen 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.

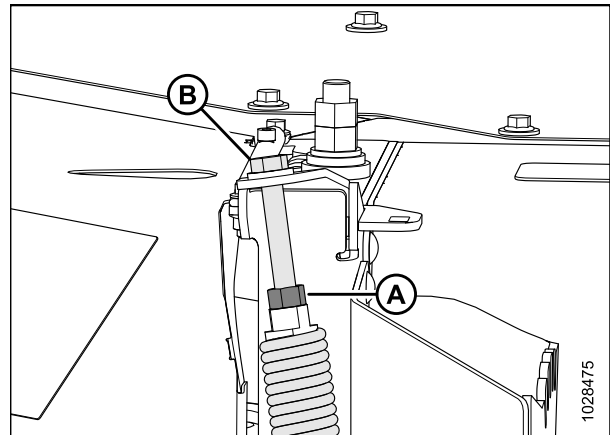


Figure 3.60: Roll Tension Adjuster

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

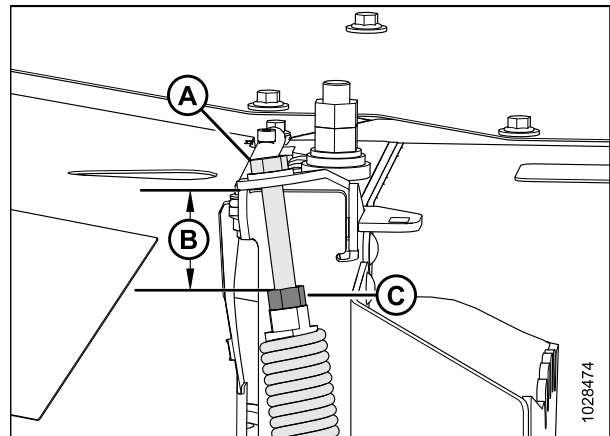


Figure 3.61: Roll Tension Adjuster

3.10.3 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.

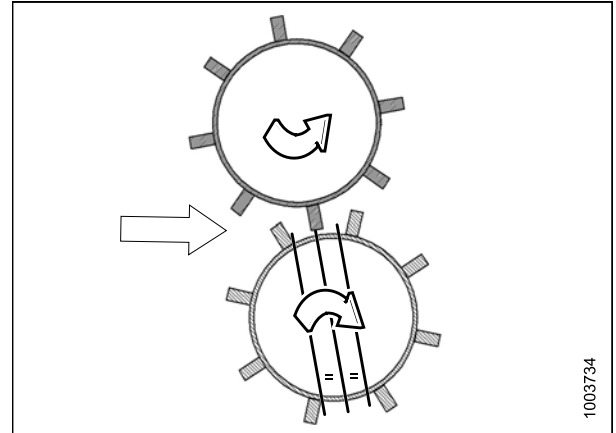


Figure 3.62: Properly Timed Rolls

Checking Roll Timing

Check roll timing 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.

Roll timing is factory-set and should not require adjustment; however, if there is excessive noise coming from the conditioner rolls, the timing will need to be adjusted. Refer to [Adjusting Roll Timing, page 51](#).

Adjusting Roll Timing



WARNING

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

NOTE:

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

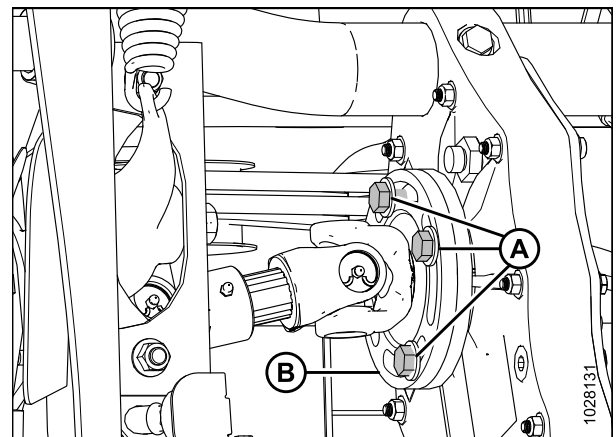


Figure 3.63: Conditioner Drive

OPERATION

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

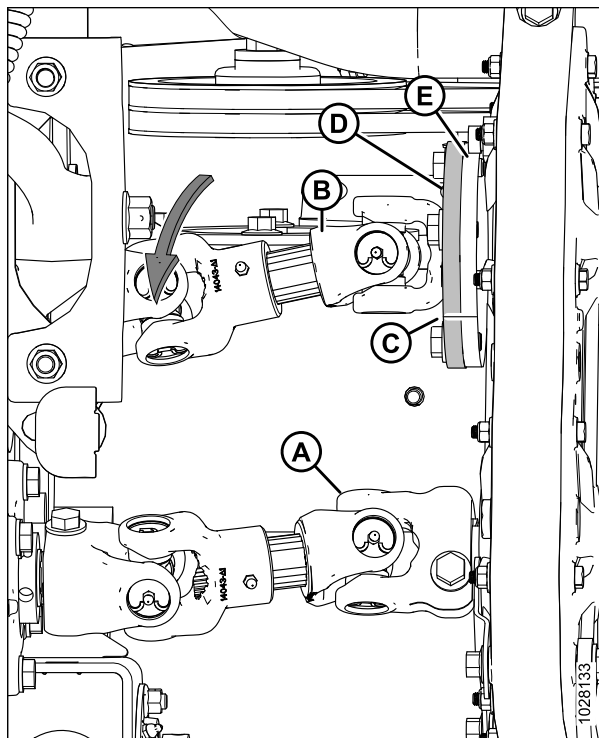


Figure 3.64: Conditioner Drive

6. Manually rotate upper roll (A) clockwise it stops rotating. Make a second mark (B) on the yoke flange, and align it with the mark on the gearbox flange.

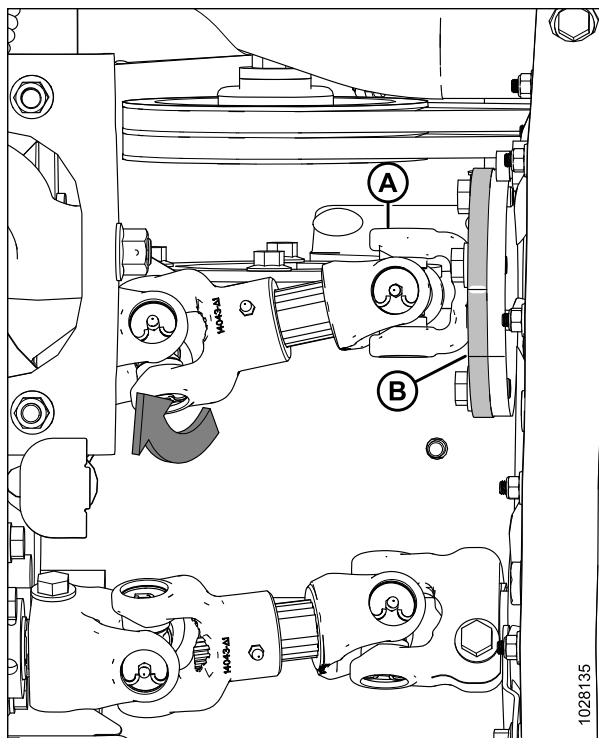


Figure 3.65: Conditioner Drive

OPERATION

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

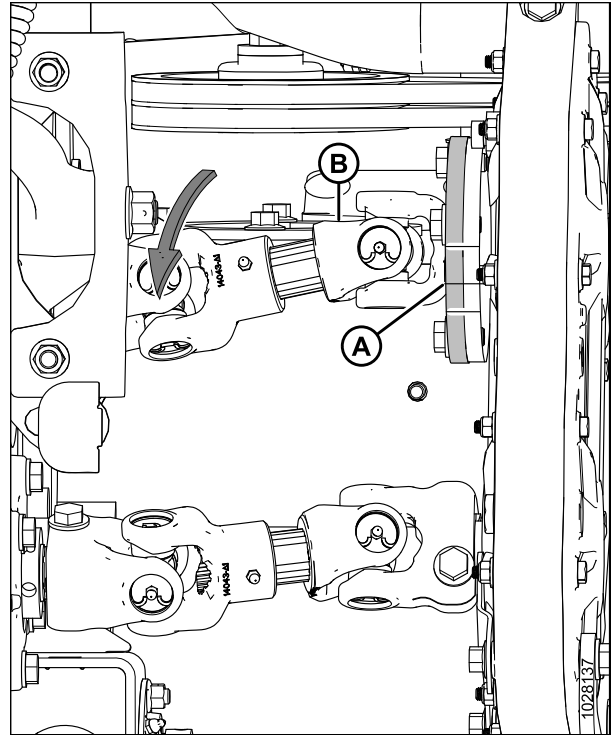


Figure 3.66: Conditioner Drive

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

NOTE:

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

10. Apply medium-strength threadlocker (Loctite® 242 or equivalent) and tighten bolts (A). Torque to 95 Nm (70 lbf-ft).

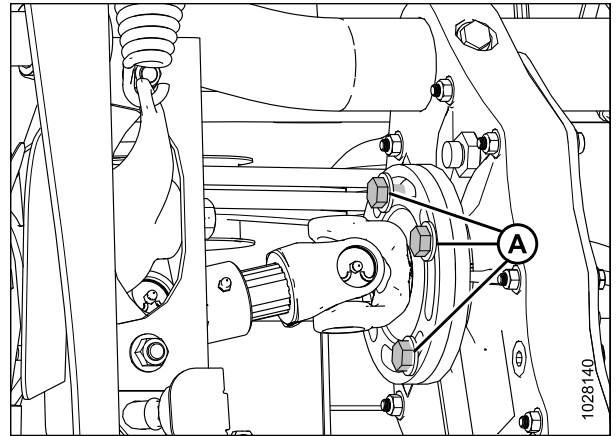


Figure 3.67: Conditioner Drive

3.10.4 Adjusting Forming Shields – Roll Conditioner

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.

The forming shield position controls the width and placement of the windrow. Consider the following factors when setting the forming shield position:

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

A wider windrow will generally dry faster and more evenly, resulting in less protein loss. Fast drying is especially important in areas where the weather allows only a few days to cut and bale. A narrower windrow may be preferable for ease of pick-up and when drying is not critical (for example, when cutting for silage or green feed).

Positioning Forming Shield Side Deflectors – Roll Conditioner

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

WARNING

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

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

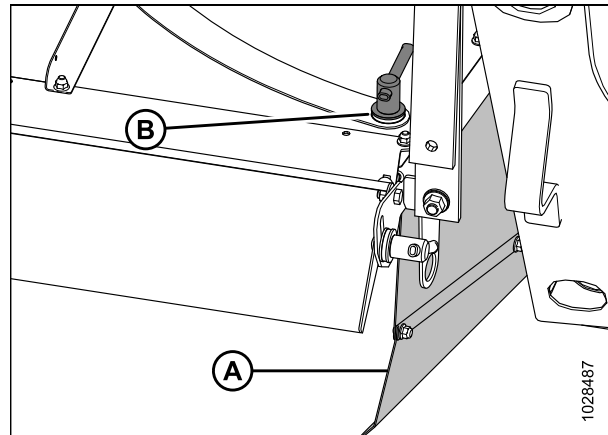


Figure 3.68: Forming Shield Side Deflector and Adjuster Handle

OPERATION

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

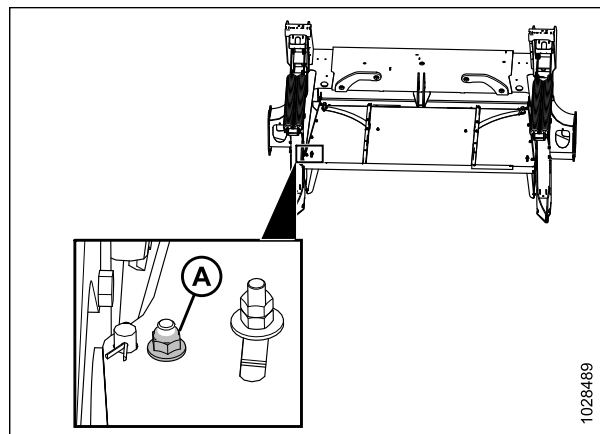


Figure 3.69: Side Deflector Adjustment

Positioning Rear Baffle – Roll Conditioner

The rear baffle is used in conjunction with the forming shields to affect the windrow width. It is located immediately behind and above the conditioning rolls and can be positioned to do the following:

- Direct crop flow into forming shield for narrow and moderate width windrows.
- Direct crop downward to form a wide swath.
- Provide even material distribution across windrow with adjustable fins under rear baffle. Refer to [Positioning Rear Baffle Deflector Fins, page 56](#).

To position the rear baffle, follow these steps:

DANGER

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

1. Remove lynch pin (A) securing rear baffle adjustment lever (B) to bracket (C).
2. Pull rear baffle adjustment lever (B) inboard to disengage from bracket (C).
3. Position rear baffle adjustment lever (B) as follows:
 - Move the lever forward to raise the baffle
 - Move the lever backward to lower the baffle
4. Release rear baffle adjustment lever (B) so that the tab engages the hole in bracket (C).
5. Secure baffle adjustment lever (B) with lynch pin (A).

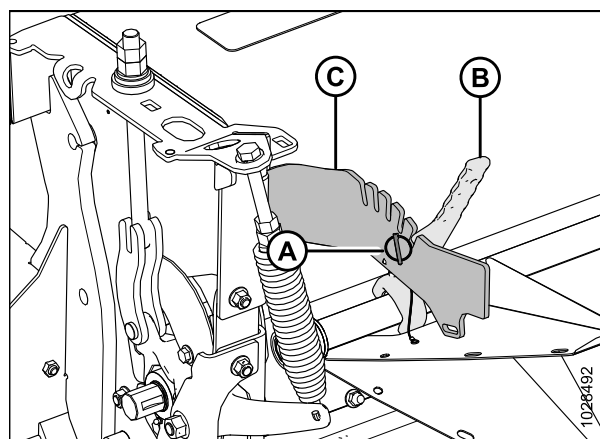


Figure 3.70: Left Side of Conditioner

NOTE:

An optional remote baffle adjustment kit (B6664) is available for R216 headers. For more information, refer to [5.1.4 Electric Remote Baffle Kit, page 154](#).

OPERATION

Positioning Rear Baffle Deflector Fins

Four rear baffle deflector fins are located under the baffle. Fins are factory-configured to approximately 60°. They can be adjusted when a narrower windrow is desired.

To adjust fins, follow these steps:

DANGER

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

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

NOTE:

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

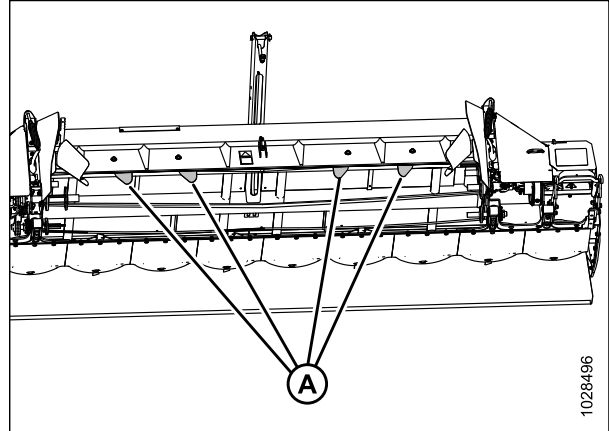


Figure 3.71: Deflector Fins Under Baffle

2. To adjust deflector fins (A), use existing bolt and nut (B). Once adjusted to the desired angle for windrow width, torque nut to 69 Nm (51 lbf·ft).
3. Repeat for the opposite deflector fins.

NOTE:

Fins may interfere with crop flow in large-stemmed crops, or when using the double windrow attachment. It may be necessary to remove fins in these conditions.

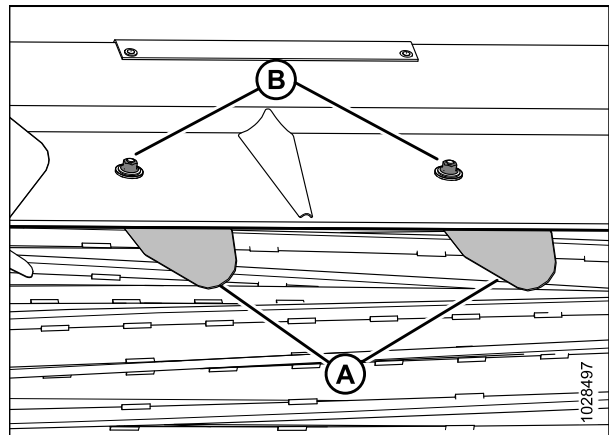


Figure 3.72: Left Deflector Fins in Field Position under Baffle

OPERATION

NOTE:

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

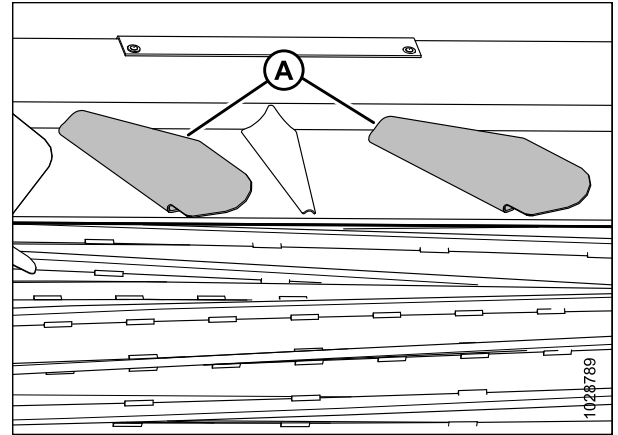


Figure 3.73: Left Deflector Fins in Storage Position

3.11 Haying Tips

3.11.1 Curing

Curing crops quickly helps maintain the highest quality of crop material as 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.

3.11.2 Topsoil Moisture

Table 3.2 Topsoil Moisture Levels

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

- On wet soil, the general rule of wide and thin does not apply. A narrower windrow will dry faster than hay left flat on wet ground.
- When the ground is wetter than the hay, moisture from the soil is absorbed by the hay above it. Determine topsoil moisture level before cutting. Use a moisture tester or estimate level.
- If ground is wet due to irrigation, wait until soil moisture drops below 45%.
- If ground is wet due to frequent rains, cut hay when weather allows and let the forage lie on wet ground until it dries to the moisture level of the ground.
- Cut hay will dry only to the moisture level of the ground beneath it, so consider moving the windrow to drier ground.

3.11.3 Weather and Topography

- Cut as much hay as possible by midday when drying conditions are best.
- Slopes that face the sun receive up to 100% more exposure to the sun's heat than slopes that do not face the sun. If hay is baled and chopped, consider baling sun-facing slopes and chopping slopes that do not.
- When relative humidity is high, the evaporation rate is low and 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.

3.11.4 Windrow Characteristics

Producing windrows with the recommended characteristics will achieve the best results. Refer to [3 Operation, page 19](#) for instructions on adjusting the header.

Table 3.3 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

3.11.5 Driving on Windrow

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

NOTE:

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

3.11.6 Using Chemical Drying Agents

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

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

3.12 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

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 [4.3.1 Maintenance Schedule/Record, page 64](#)) to keep track of your scheduled maintenance.

4.1 Preparing Machine for Servicing



CAUTION

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

1. Lower the header fully. If you need to perform service in the raised position, always engage safety props. For instructions, refer to [3.3.1 Engaging and Disengaging Header Safety Props – M1240 Windrower, page 22](#).
2. Put the ground speed lever (GSL) in PARK.
3. Stop the engine and remove the key from the ignition.
4. Wait for all moving parts to stop.

4.2 Recommended Safety Procedures

- Park on level surface when possible. Follow all recommendations in your tractor 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.

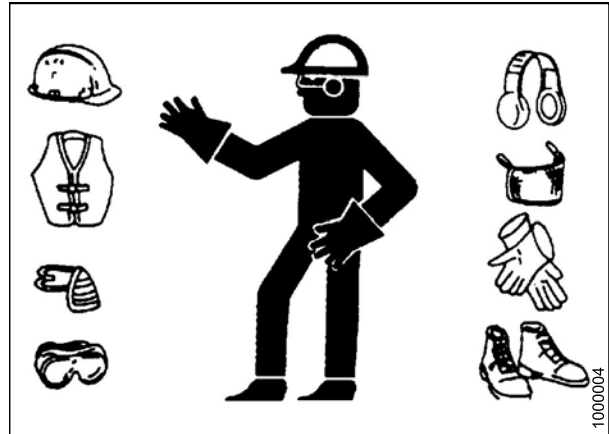


Figure 4.2: Safety Equipment

- 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.

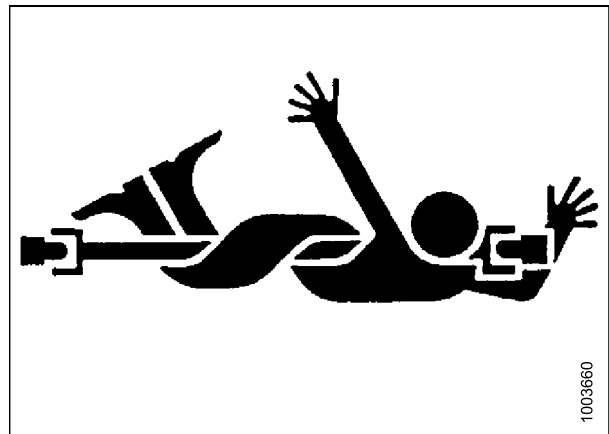


Figure 4.3: Safety Around Equipment

MAINTENANCE AND SERVICING

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

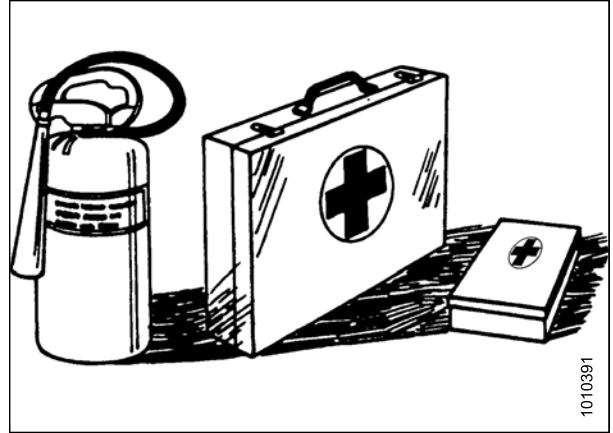


Figure 4.4: Safety Equipment

- 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.

4.3 Maintenance Requirements

IMPORTANT:

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

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.

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. Refer to [4.3.1 Maintenance Schedule/Record, page 64](#).



CAUTION

Carefully follow all safety messages. Refer to [4.2 Recommended Safety Procedures, page 62](#).

4.3.1 Maintenance Schedule/Record

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

	Hour meter reading													
	Service date													
	Serviced by													
First use		Refer to 4.3.2 Break-In Inspections, page 66 .												
End of season		Refer to 4.3.4 End-of-Season Servicing, page 67 .												
Action		✓ Check				⬇ Lubricate				▲ Change				
First 10 hours then Daily														
✓	Inspect cutterbar discs. Refer to Inspecting Cutterbar Discs, page 76 .													
✓	Inspect discblades. Refer to Inspecting Discblades, page 87 .													
✓	Inspect accelerators. Refer to Inspecting Accelerators, page 93 .													
✓	Inspect rock guards. Refer to Inspecting Rock Guards, page 97 .													
✓	Inspect drums. Refer to Inspecting Drums, page 100 .													
✓	Check hydraulic hoses and lines. Refer to 4.12.1 Checking Hydraulic Hoses and Lines, page 151 .													

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Every 25 Hours ²													
✓	Check conditioner drive belt tension. Refer to <i>Inspecting Conditioner Drive Belt, page 134.</i>												
●	Lubricate idler pivot. Refer to <i>4.4 Lubrication, page 68.</i>												
●	Lubricate upper and lower driveline universal joints. Refer to <i>4.4 Lubrication, page 68.</i>												
●	Lubricate roller conditioner and feed roller bearings. Refer to <i>4.4 Lubrication, page 68.</i>												
●	Lubricate conditioner driveline. Refer to <i>4.4 Lubrication, page 68.</i>												
Every 100 Hours or Annually													
✓	Check conditioner drive belt tension. Refer to <i>Inspecting Conditioner Drive Belt, page 134.</i>												
✓	Check roll timing gearbox lubricant. Refer to <i>4.6.1 Checking and Changing Conditioner Roll Timing Gearbox Oil, page 124.</i>												
✓	Check header drive gearbox lubricant. Refer to <i>4.7.1 Checking Header Drive Gearbox Oil, page 127</i>												
Every 250 Hours ³													
▲	Change roll timing gearbox lubricant. Refer to <i>4.6.1 Checking and Changing Conditioner Roll Timing Gearbox Oil, page 124.</i>												
▲	Change header drive gearbox lubricant. Refer to <i>4.7.2 Changing Header Drive Gearbox Oil, page 129</i>												
▲	Change cutterbar lubricant. Refer to <i>4.5.1 Lubricating Cutterbar, page 71.</i>												
▲	Lubricate left and right driven drums. Refer to <i>Removing Left Driven Drum and Driveline, page 105</i> and <i>Removing Right Driven Drum and Driveline, page 110</i>												

2. The driveline inside the driven drum is lubricated for life and does not require any routine lubrication.

3. Begins after the first 150 hour service.

4.3.2 Break-In Inspections

Table 4.1 Break-In Inspection Schedule

Inspection Interval	Item	Refer to
1 Hour	Check for loose hardware and tighten to required torque	<i>7.1 Torque Specifications, page 161</i>
5 Hours	Check for loose hardware and tighten to required torque	<i>7.1 Torque Specifications, page 161</i>
5 Hours	Check conditioner drive belt drive tension	<i>Inspecting Conditioner Drive Belt, page 134</i>
25 Hours	Check converging drum and feed roller belt drive tension	<i>Inspecting Conditioner Drive Belt, page 134</i>
50 Hours	Check conditioner drive belt tension	<i>Inspecting Conditioner Drive Belt, page 134</i>
50 Hours	Change conditioner roll timing gearbox lubricant	<i>4.6.1 Checking and Changing Conditioner Roll Timing Gearbox Oil, page 124</i>
50 Hours	Change header drive gearbox lubricant	<i>4.7.2 Changing Header Drive Gearbox Oil, page 129</i>

4.3.3 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. Refer to *4.4 Lubrication, page 68* and *4.5.1 Lubricating Cutterbar, page 71*.
2. Perform all annual maintenance. Refer to *4.3.1 Maintenance Schedule/Record, page 64*.

4.3.4 End-of-Season Servicing



CAUTION

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 beginning of next season.
5. Replace or tighten any missing or loose hardware. Refer to [7.1 Torque Specifications, page 161](#).
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 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 in a dry, protected place if possible. If stored outside, always cover header with a waterproof canvas or other protective material.

4.4 Lubrication



WARNING

To avoid personal injury, before servicing header or opening drive covers, refer to [4.1 Preparing Machine for Servicing, page 61](#).

Greasing points are marked on the machine by decals on the left and right outboard shielding.

Log hours of operation and use the maintenance schedule provided to keep a record of scheduled maintenance. Refer to [4.3.1 Maintenance Schedule/Record, page 64](#).

4.4.1 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.



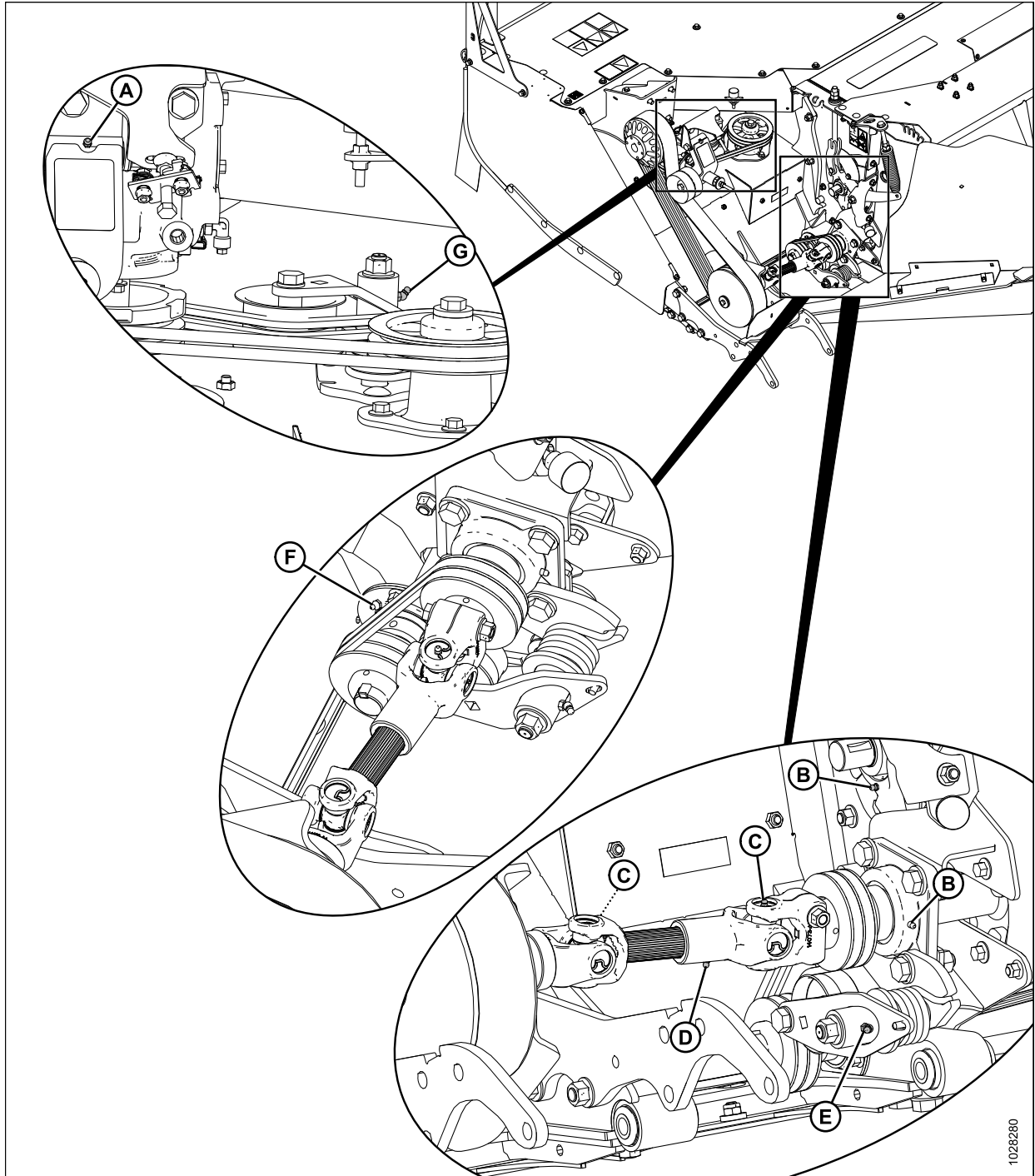
WARNING

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

1. Open driveshields at the ends of the header to access greasing points. Refer to [3.6.1 Opening Driveshields, page 39](#).
2. Wipe grease fitting with a clean cloth before greasing to avoid injecting dirt and grit.
3. Replace any loose or broken fittings immediately.
4. Inject grease through fitting with grease gun until grease overflows fitting (except where noted).
5. Leave excess grease on fitting to keep out dirt.
6. Remove and thoroughly clean any fitting that will not take grease and clean lubricant passageway. Replace fitting if necessary.

4.4.2 Lubrication Locations

Figure 4.6: Left Side Lubrication Locations



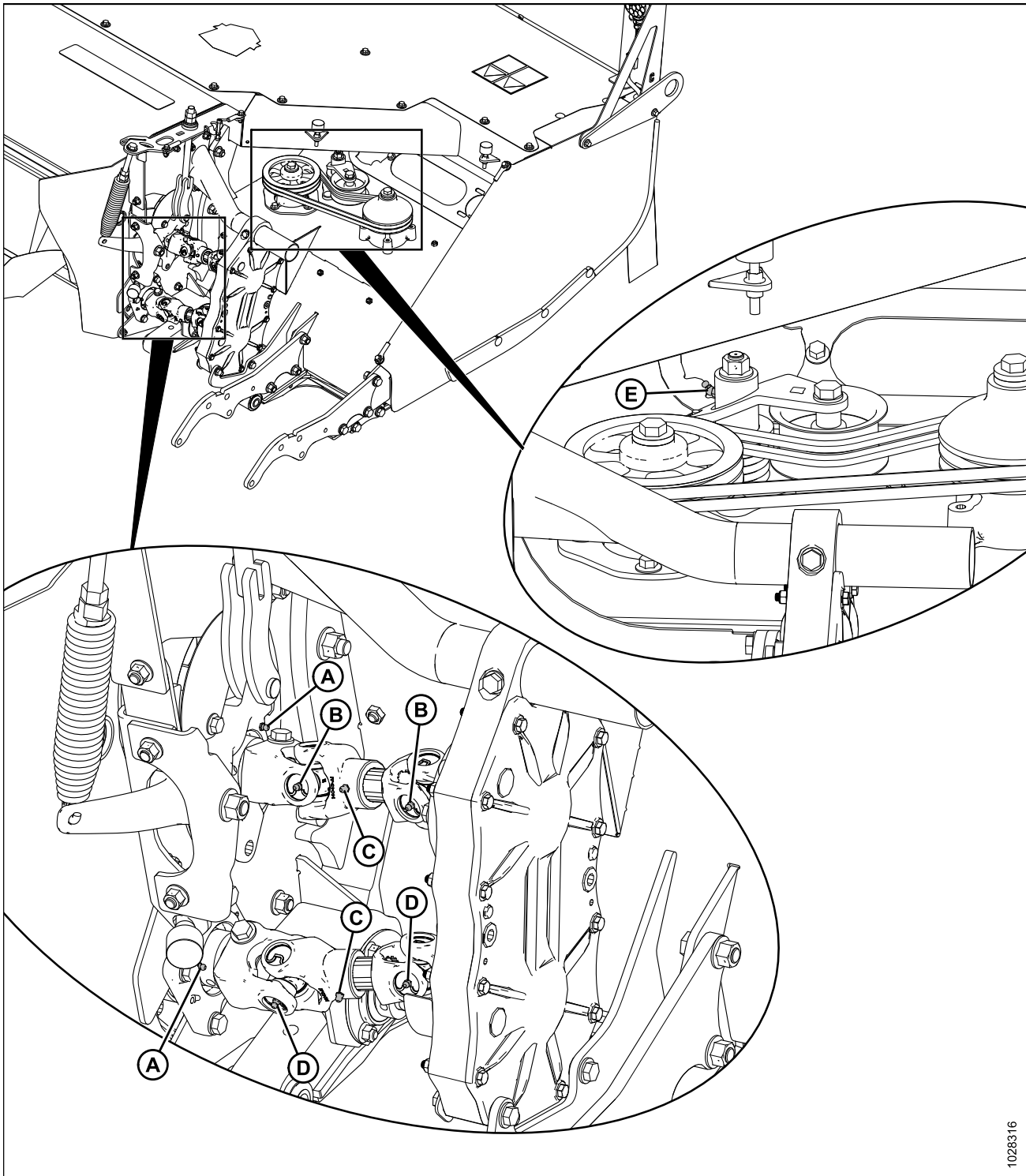
A - Idler/Tensioner Pivot
D - Slip Joint, Conditioner Driveline⁴
G - Tensioner Arm

B - Bearing, Roller Conditioner (2 Places)
E - Idler/Tensioner Pivot

C - U-Joint, Conditioner Driveline (2 Places)
F - Bearing, Feed Roll

4. Use high-temperature, extreme-pressure (EP2) performance grease with 10% max molybdenum disulphide (NLGI grade 2) lithium base.

Figure 4.7: Right Side Lubrication Locations



1028316

A - Bearing, Roller Conditioner (2 Places)
D - U-Joint, Lower Driveline (2 Places)

B - U-Joint, Upper Driveline (2 Places)
E - Idler Pivot

C - Slip Joints, Conditioner Drivelines⁵

5. Use high-temperature, extreme-pressure (EP2) performance grease with 10% max molybdenum disulphide (NLGI grade 2) lithium base.

4.5 Cutterbar System

Check and change the lubricant at regular intervals. Refer to [4.3 Maintenance Requirements](#), page 64.

IMPORTANT:

Warm cold lubricant by idling the machine for 10 minutes prior to checking level.

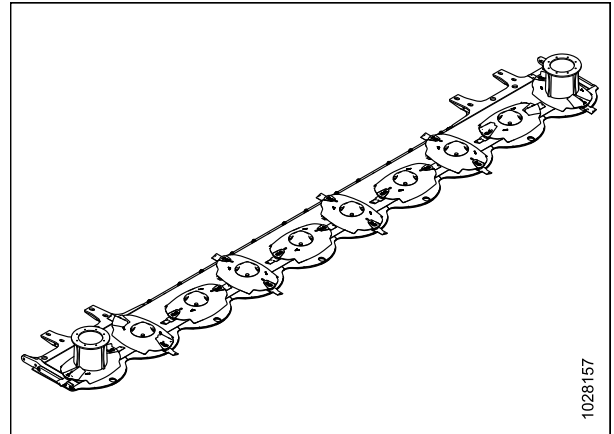


Figure 4.8: R216 SP Cutterbar

4.5.1 Lubricating Cutterbar

Checking and Adding Cutterbar Lubricant



WARNING

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



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). Refer to [3.7.1 Opening Cutterbar Curtain](#), page 42.

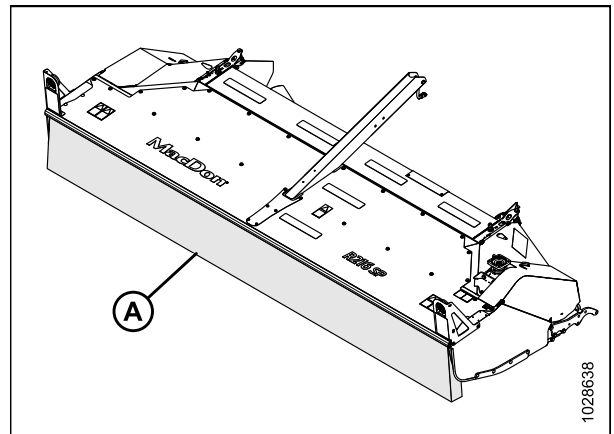


Figure 4.9: Cutterbar Curtain

MAINTENANCE AND SERVICING

5. Use a spirit (bubble) level (A) to ensure the cutterbar is level in both directions. Adjust the header accordingly.

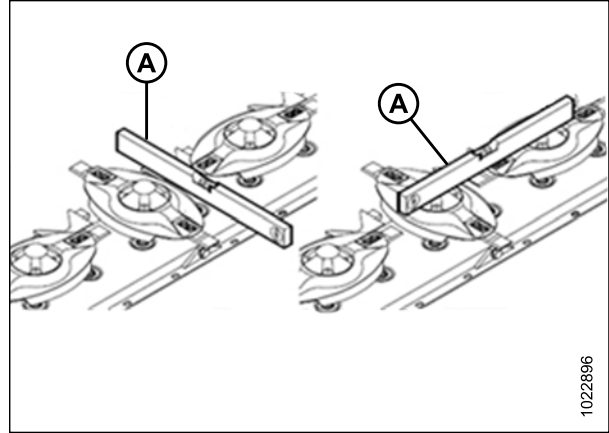


Figure 4.10: Spirit Level on Cutterbar

6. Clean the area around plug (A). Place a 5 liter (5.2 US qts) capacity container under plug (A).
7. Use a 17 mm socket to remove plug (A) and O-ring (B) from cutterbar. Oil level must be up to the inspection plug hole. If additional lubricant is required, continue following this procedure and refer to the next step. If additional lubricant is **NOT** required, proceed to Step 22, page 73.
8. Reinstall the inspection plug.

CAUTION

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

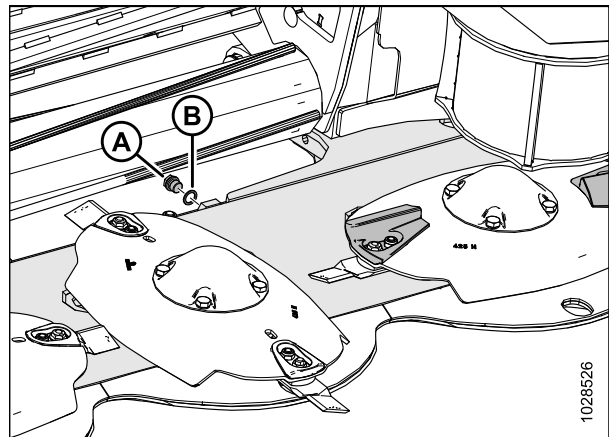


Figure 4.11: Cutterbar Oil Inspection Plug

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 to the required level.

IMPORTANT:

Do **NOT** overfill the cutterbar. Overfilling can cause overheating, damage, or cutterbar component failure.

NOTE:

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

14. Replace plug (A) and torque to 30 Nm (22 lbf-ft).

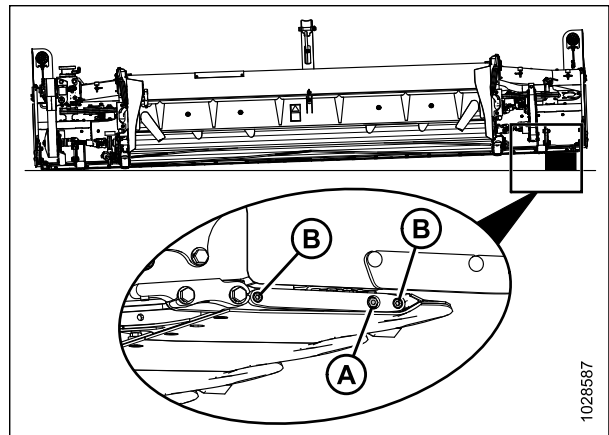


Figure 4.12: Cutterbar Oil Plug

CAUTION

Before starting the machine, check to be sure 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.

CAUTION

Before starting the machine, check to be sure 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 O-ring (B) for breaks or cracks, and replace if necessary.
23. Install plug (A) and O-ring (B). Tighten securely.

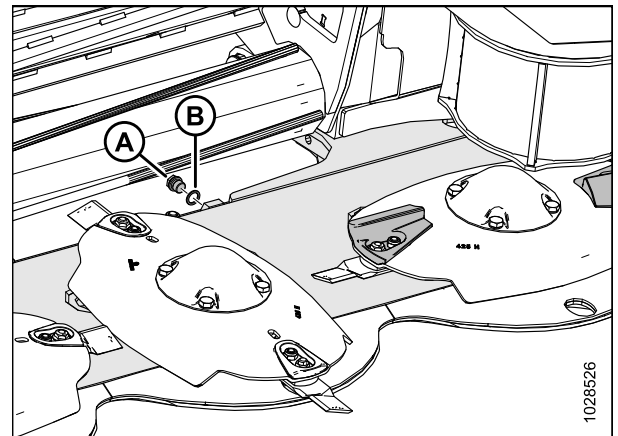


Figure 4.13: Cutterbar Oil Inspection Plug

24. Close cutterbar curtain (A). Refer to [3.7.2 Closing Cutterbar Curtain, page 43](#).

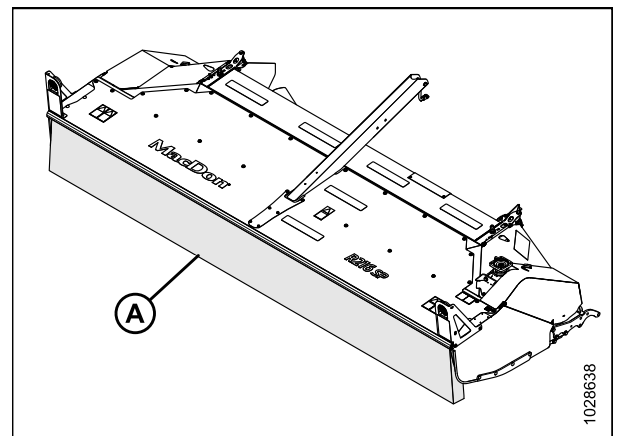


Figure 4.14: Cutterbar Curtain

Draining the Cutterbar

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.

WARNING

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

1. Start the engine and raise the disc header.
2. Place a block under each end of the disc header so the right end is lower than the left end.

IMPORTANT:

Always drain lubricant from the right end of the disc header. Draining lubricant from the left end of the disc header may lead to breather contamination or failure.

3. Lower the disc header onto the blocks.
4. Shut down the engine, and remove the key from the ignition.
5. Place a 10 liter (10.5 US qts) capacity container under lower end of cutterbar, clean area around plug (A), and remove plug.

IMPORTANT:

Do **NOT** remove hex head bolts securing cutterbar end plate to cutterbar or lubricant leaks could result.

6. Allow sufficient time for lubricant to drain, then reinstall cutterbar plug (A).

NOTE:

Do **NOT** flush the cutterbar.

7. Fill the cutterbar with lubricant before operating the disc header. Refer to [Filling Lubricant into a Repaired Cutterbar](#), page 74.

IMPORTANT:

Dispose of used lubricant responsibly.

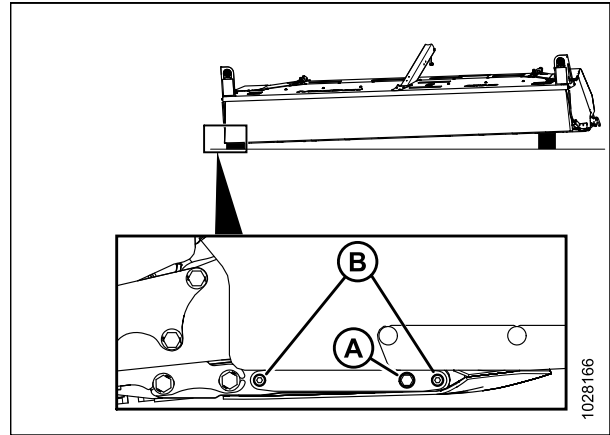


Figure 4.15: Draining Cutterbar

Filling Lubricant into a Repaired Cutterbar

This procedure should be used when the cutterbar has been completely drained of oil. If you are checking oil level or topping it up, refer to [Checking and Adding Cutterbar Lubricant](#), page 71.

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.

WARNING

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

IMPORTANT:

The cutterbar should be completely empty of oil before filling it. Refer to *Draining the Cutterbar*, page 74.

1. Start the engine, and raise the header fully.
2. Place a block under each end of the disc header, so the right end is higher than the left end.
3. 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 list of recommended fluids and lubricants.

IMPORTANT:

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

NOTE:

Do **NOT** remove the hex bolts (B) securing the cutterbar end plate to the cutterbar or lubricant leaks could result.

6. Install access plug (A). Torque to 30 Nm (22 lbf-ft).

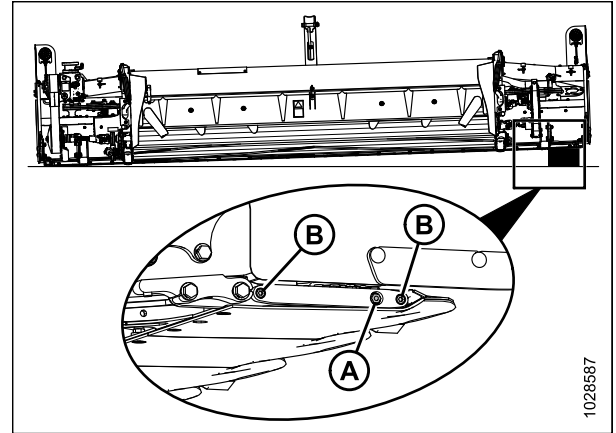


Figure 4.16: Filling Cutterbar

CAUTION

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

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. Refer to *3.3.1 Engaging and Disengaging Header Safety Props – M1240 Windrower*, page 22.
9. Remove the block from under the cutterbar.
10. Lower the header.
11. Check the lubricant level. Refer to *Checking and Adding Cutterbar Lubricant*, page 71.

4.5.2 Maintaining Cutterbar Discs

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

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

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

IMPORTANT:

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

Inspecting Cutterbar Discs



WARNING

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



CAUTION

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



CAUTION

Damaged blades may damage the cutterbar and result in poor cutting performance. Replace damaged blades immediately.

1. Inspect the cutterbar disc surface (D) for cracks, excessive wear, and disc distortion. Replace as required.
2. Inspect the cutterbar disc edges (E) for cracks, excessive wear, and edge distortion. Replace as required.

NOTE:

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

3. Ensure that the discblade fasteners (A) are securely attached to the cutterbar disc and that nut shields (B) are present and undamaged. Replace as required.
4. Check that the cutterbar disc bolts (C) are securely attached to the spindles. Tighten as required.
5. Inspect the cutterbar disc for deformation. If the disc is deformed, dimension (A) must **NOT** exceed 48 mm (1 7/8 in.). Replace as required.

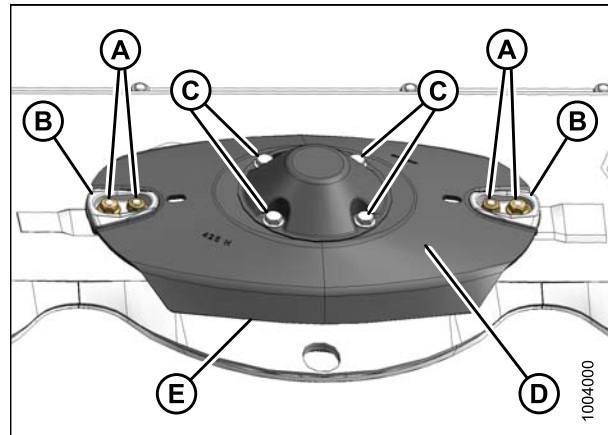


Figure 4.17: Cutterbar Disc

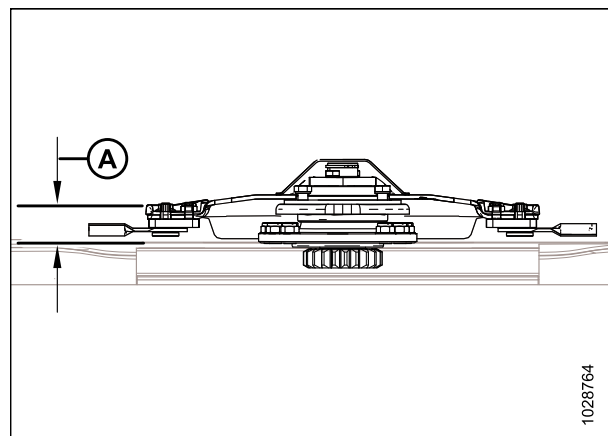


Figure 4.18: Cutterbar Disc – Cutaway View

6. Inspect the cutterbar disc for abrasion (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 as required.

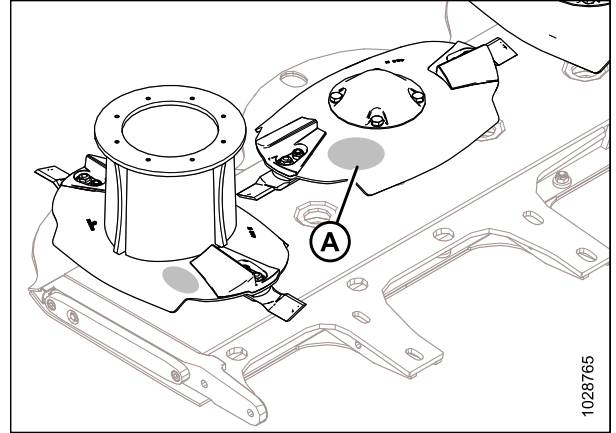


Figure 4.19: Cutterbar Disc – View from Above

Removing Cutterbar Discs

DANGER

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

CAUTION

Disclades 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 off the engine, and remove key from the ignition.
3. Engage windrower lift cylinder safety props. Refer to [3.3.1 Engaging and Disengaging Header Safety Props – M1240 Windrower, page 22](#).
4. Open cutterbar curtain (A). Refer to [3.7.1 Opening Cutterbar Curtain, page 42](#).

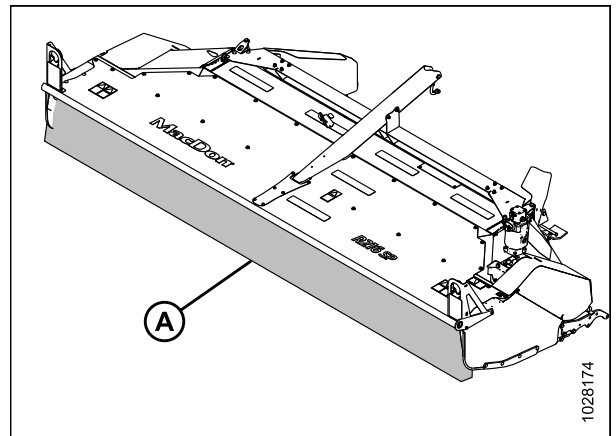


Figure 4.20: Cutterbar Curtain

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5. Place a pin (or equivalent) in the front hole of the rock guard (B) to prevent disc rotation while loosening bolts.
6. Remove four M12 bolts (A) and washers.

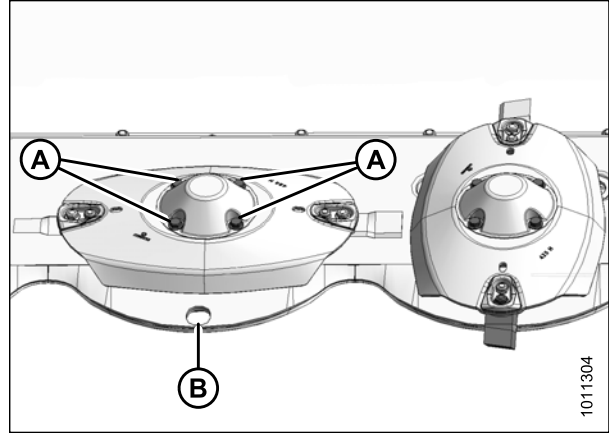


Figure 4.21: Cutterbar Disc Bolts

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

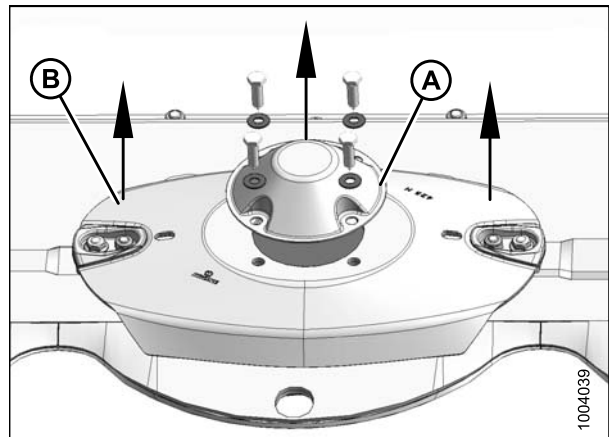


Figure 4.22: Cutterbar Disc and Cap

Installing Cutterbar Discs



WARNING

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

1. Install spacer plate (A) on spindle.

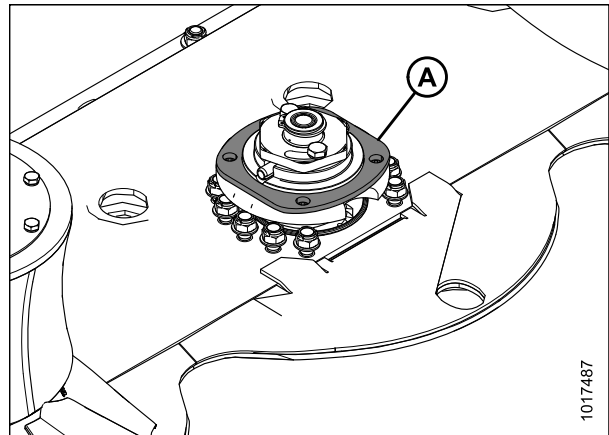


Figure 4.23: Disc Spindle

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2. Place a pin (or equivalent) in the front hole of the rock guard (D) to prevent disc rotation while tightening bolts.
3. Position new disc (A) on spindle ensuring that it is positioned at a 90 degree angle in relation to the adjacent discs.
4. Install cutter disc cap (B), and secure assembly with four M12 bolts and washers (C). Torque bolts to 85 Nm (63 lbf·ft).



WARNING

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

5. Remove pin (or equivalent) from front hole of rock guard.
6. Close the cutterbar curtain. Refer to [3.7.2 Closing Cutterbar Curtain, page 43](#).

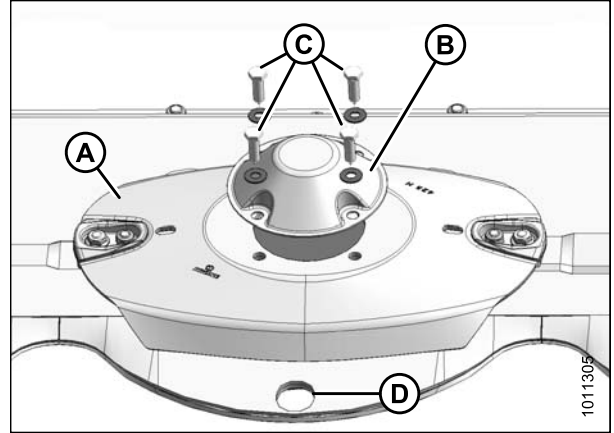


Figure 4.24: Cutterbar Disc and Cap

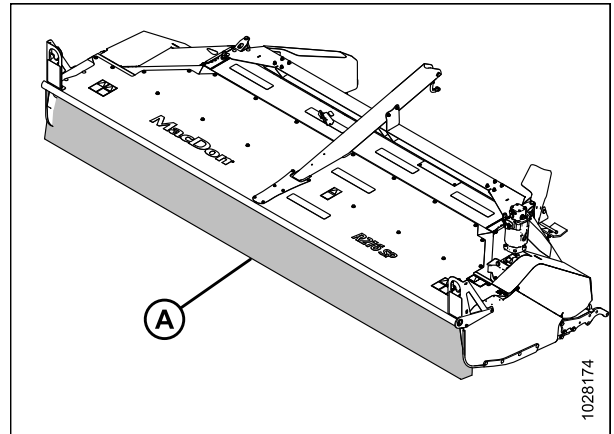


Figure 4.25: Cutterbar Curtain

4.5.3 Replacing Cutterbar Spindles

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 with a snap ring (B).

NOTE:

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

Refer to [4.5.8 Replacing Cutterbar Spindle Shear Pin](#), page 116 to replace shear pin.

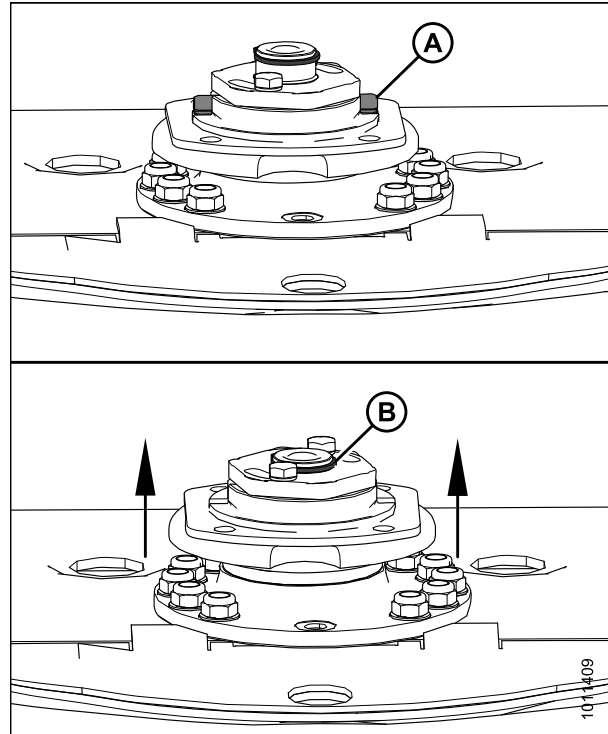


Figure 4.26: Cutterbar Spindles

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 spindle 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 rotation pattern can result in damage to spindle and/or cutterbar components.
- Safecut (shear pin) will not work if spindles are used in the wrong orientation.

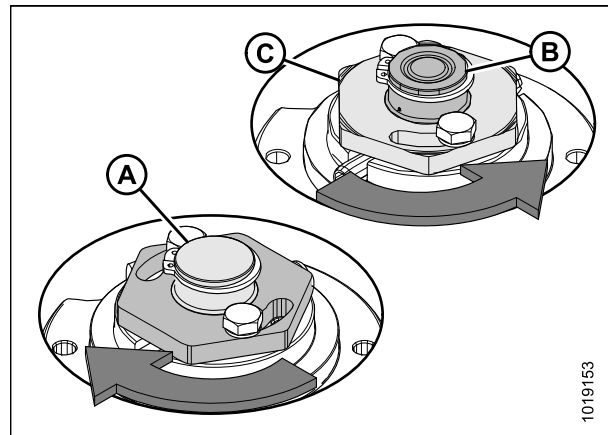


Figure 4.27: Cutterbar Spindles

Removing Cutterbar Spindles

DANGER

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

CAUTION

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

1. Park on a flat, level surface.
2. Raise the header.
3. Shut off the engine, and remove the key from the ignition.
4. Engage windrower lift cylinder safety props. Refer to [3.3.1 Engaging and Disengaging Header Safety Props – M1240 Windrower, page 22](#).
5. Open cutterbar curtain (A). Refer to [3.7.1 Opening Cutterbar Curtain, page 42](#).

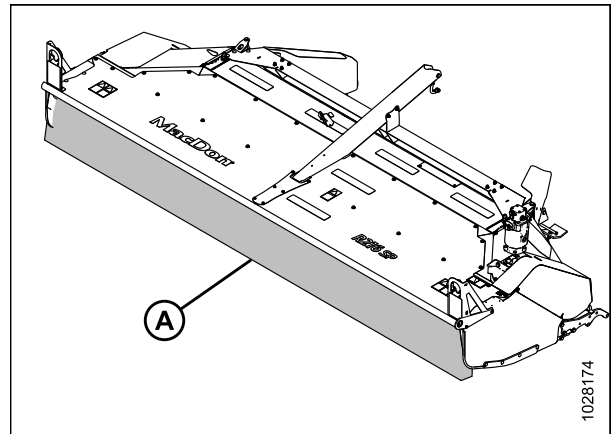


Figure 4.28: Cutterbar Curtain

6. Place a pin (or equivalent) in the front hole of the rock guard (B) to prevent disc rotation while loosening bolts.
7. Remove four M12 bolts (A) and washers.

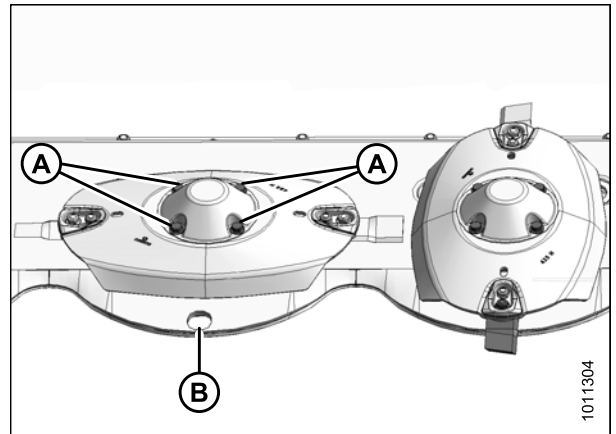


Figure 4.29: Cutterbar Disc Bolts

MAINTENANCE AND SERVICING

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

IMPORTANT:

Blades are rotation specific. Switch entire disc when swapping spindles.

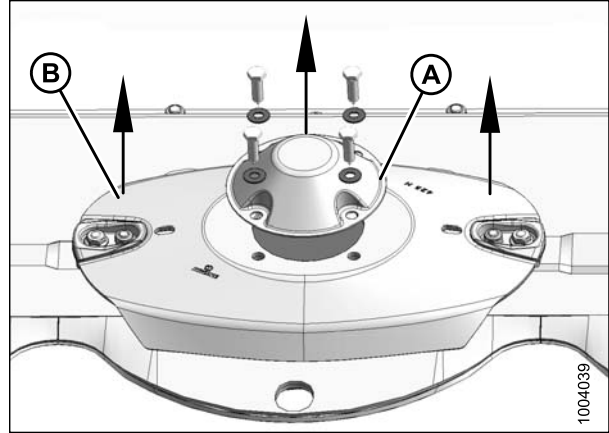


Figure 4.30: Cutterbar Disc and Cap

10. Remove spacer plate (A).

NOTE:

The area around the spacer plate must be cleaned thoroughly to prevent debris from entering into the cutterbar gearbox.

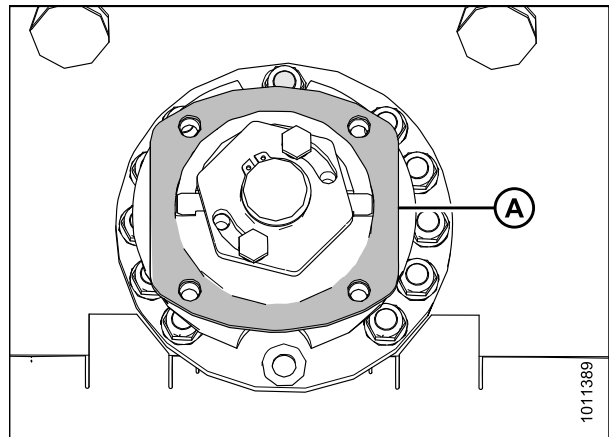


Figure 4.31: Spacer Plate

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

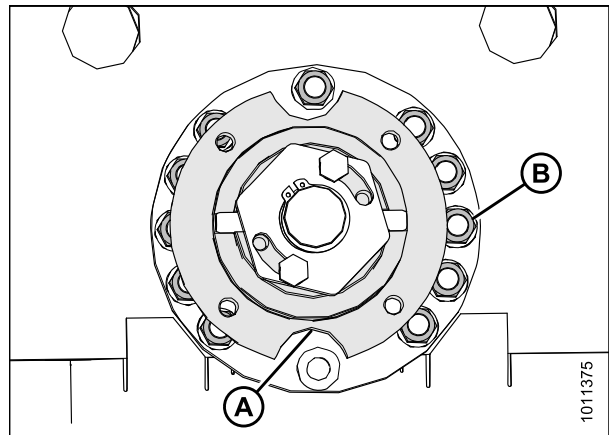


Figure 4.32: Left Spindle Hub and Hardware

12. Remove spindle (A) from cutterbar.

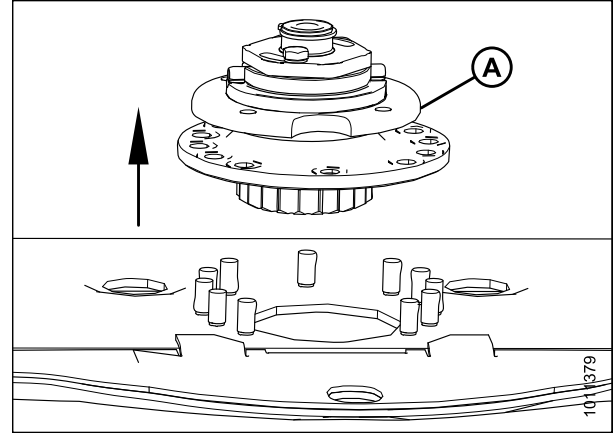
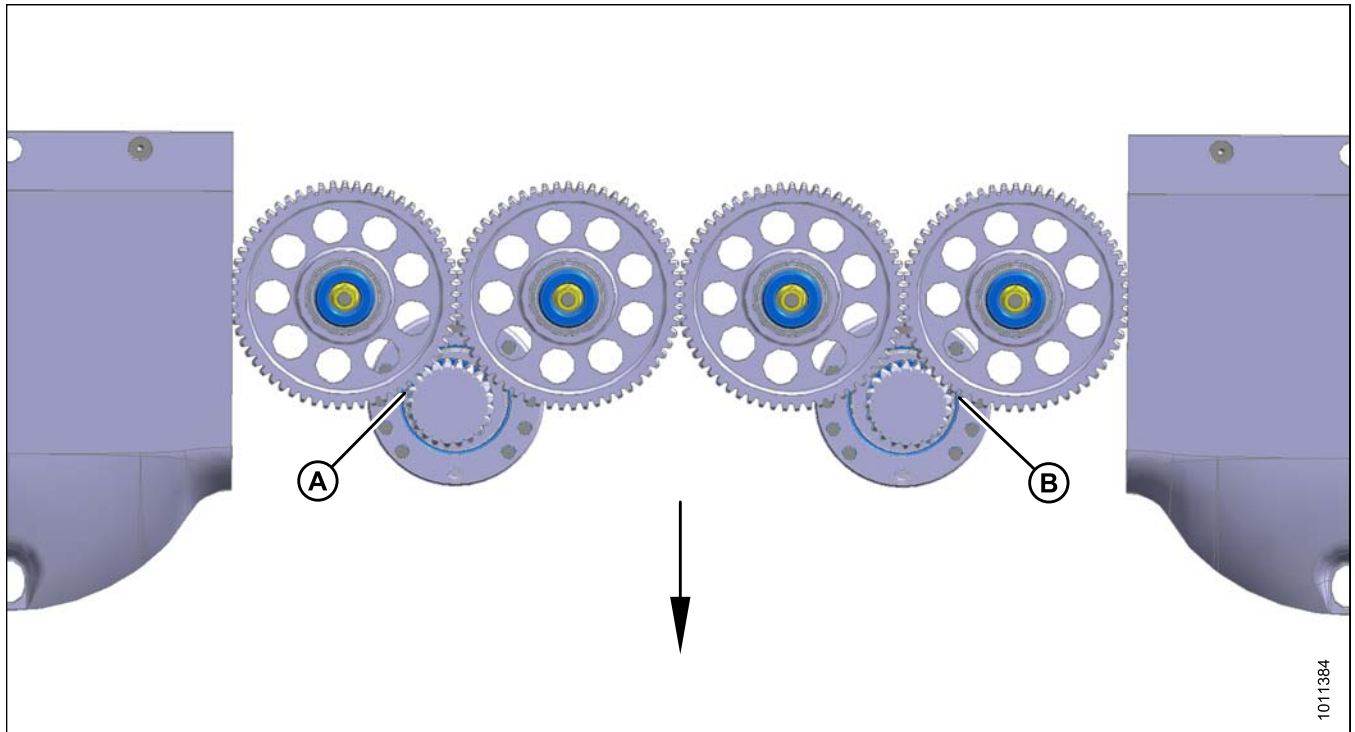


Figure 4.33: Left Spindle

Installing Cutterbar Spindles

Figure 4.34: Underside of Cutterbar Spindles



IMPORTANT:

Right discs (A) and left discs (B) are timed and must be at a 90 degree angle from adjacent discs when reinstalled. Misaligned discs could result in the following:

- Discblades of co-rotating discs hitting each other
- Discblades of diverging discs hitting adjacent discs

Check clearance (timing) before tightening spindle to the cutterbar. Turn disc by hand to ensure discblades do not contact each other or adjacent discs. If contact occurs or alignment is incorrect, lift spindle to clear mounting bolts, rotate spindle 180 degrees (ensuring that base does not turn), and reinstall. Recheck timing before bolting hub down and tightening all of the nuts.

NOTE:

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

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

! DANGER

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

! CAUTION

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

1. Park on a flat, level surface.
2. Lower the disc header fully, shut off engine, and remove key.

NOTE:

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

3. Determine suitable spindle rotation pattern for crop conditions. Refer to [4.5.3 Replacing Cutterbar Spindles, page 80](#).
4. Ensure that spindle O-ring (A) is properly seated, cleaned, and undamaged.

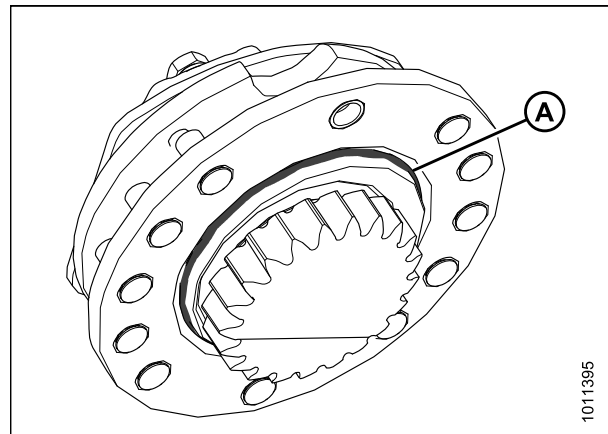


Figure 4.35: Left Spindle O-Ring

5. Insert spindle (A) into cutterbar.

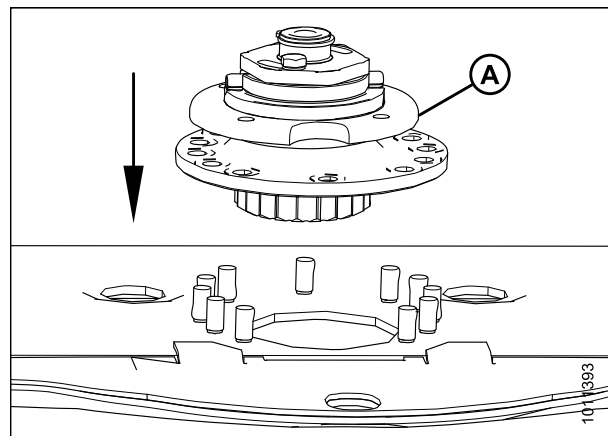


Figure 4.36: Left Spindle

6. Insert studs (A) into spindle as shown.

NOTE:

Plugs are factory-installed as shown in position (B), but may come loose over time. Ensure studs are inserted into proper location.

IMPORTANT:

Ensure clockwise spindles rotate clockwise and counterclockwise spindles (with machined grooves) rotate counterclockwise.

IMPORTANT:

The offset gear design makes it possible to install spindles that rotate in the wrong direction. This will prevent discs from spinning up after impact, resulting in cutterbar component damage.

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

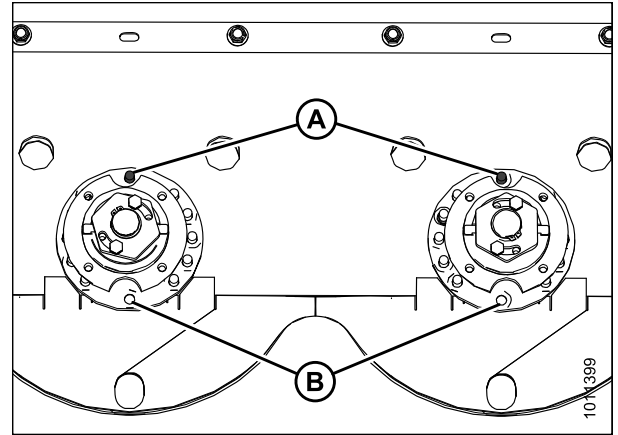


Figure 4.37: Spindle Orientation

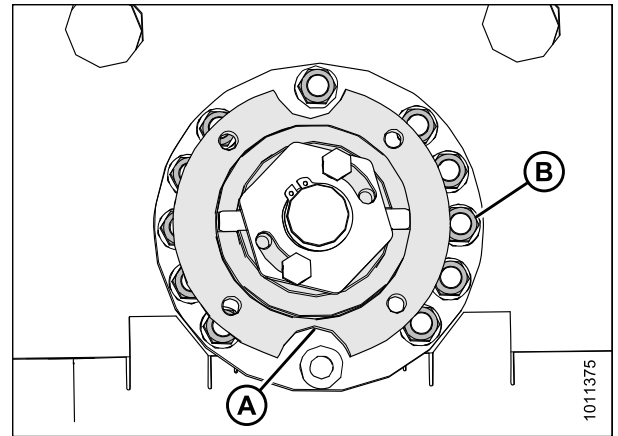


Figure 4.38: Left Spindle Hub

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

NOTE:

Hub removed from illustration for clarity.

IMPORTANT:

Do **NOT** use an impact wrench when tightening as it will damage the weld studs.

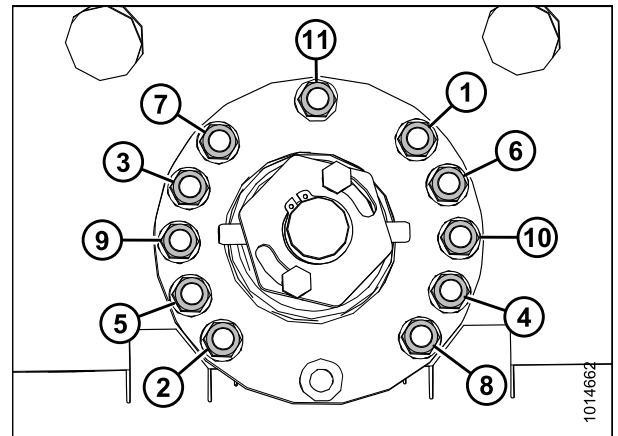


Figure 4.39: Tightening Pattern

10. Install spacer plate (A).

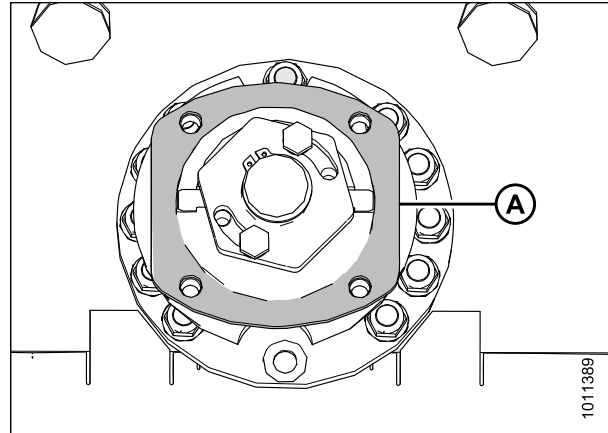


Figure 4.40: Spacer Plate

11. Place a pin (or equivalent) in the front hole of the rock guard (D) to prevent disc rotation while tightening bolts.

IMPORTANT:

Blades are rotation specific. It is necessary to switch entire disc when swapping spindles.

12. Position disc (A) on spindle ensuring that it is positioned at a 90 degree angle in relation to the adjacent discs.

NOTE:

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

NOTE:

Each header comes with a disc timing tool (MD #307954) and instructions.

13. Install cutter disc cap (B) and secure assembly with four M12 bolts and washers (C). Torque bolts to 85 Nm (63 lbf-ft).

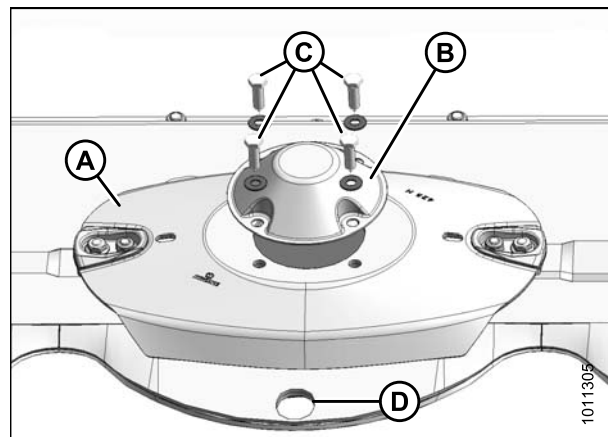


Figure 4.41: Cutterbar Disc and Cap



WARNING

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

14. Remove pin (or equivalent) from front hole of rock guard.

15. Close cutterbar curtain (A). Refer to [3.7.2 Closing Cutterbar Curtain](#), page 43.

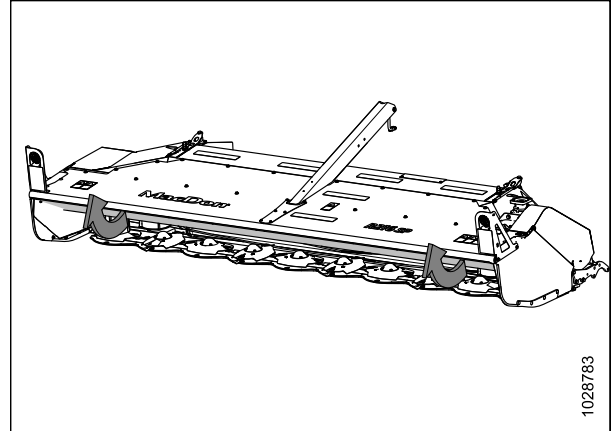


Figure 4.42: R216 SP

4.5.4 Maintaining Discblades

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

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

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

IMPORTANT:

Always use factory replacement parts.

NOTE:

Discs are equipped with 18-degree bevel-down blades; 11-degree bevel-down blades are offered as a non-standard option. Refer to R216 SP Series Rotary Disc Header Parts Catalog.

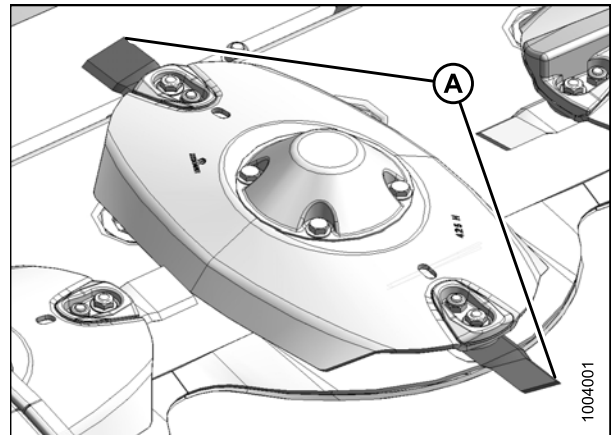


Figure 4.43: Discblades

Inspecting Discblades



WARNING

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



CAUTION

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



CAUTION

Damaged blades may damage the cutterbar and result in poor cutting performance. Replace damaged blades immediately.



CAUTION

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

MAINTENANCE AND SERVICING

1. Check daily that the discblades are securely attached to the disc.
2. Inspect blades for cracks, blade wear (A), and/or elongated hole (B) beyond safe operating limits (C).
3. Replace blades immediately when problems are noticed.

IMPORTANT:

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

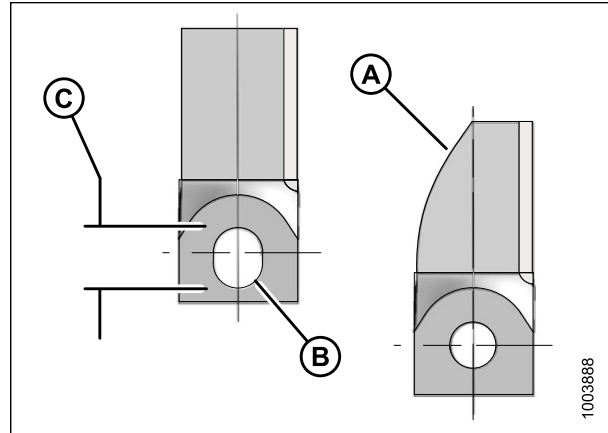


Figure 4.44: Discblades

A - Blade Wear to Center Line

B - Elongated Hole

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

IMPORTANT:

The discblades have cutting edges on both sides so the blades can be turned over and reused. The twist in each blade determines the cutting direction. If you are unsure which direction the spindles rotate, refer to [3.9 Reconfiguring Cutterbar Crop Stream, page 47](#).

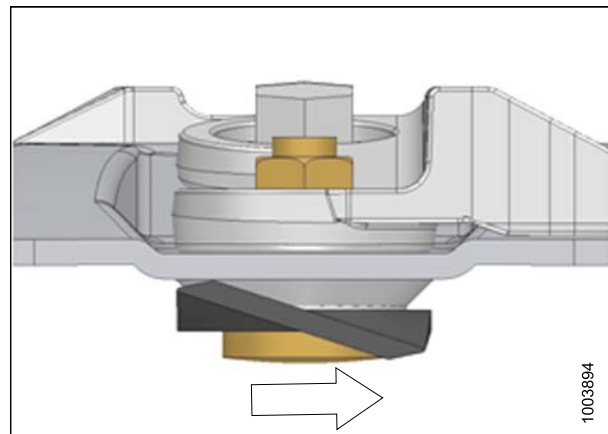


Figure 4.45: Counterclockwise Disc Rotation Direction

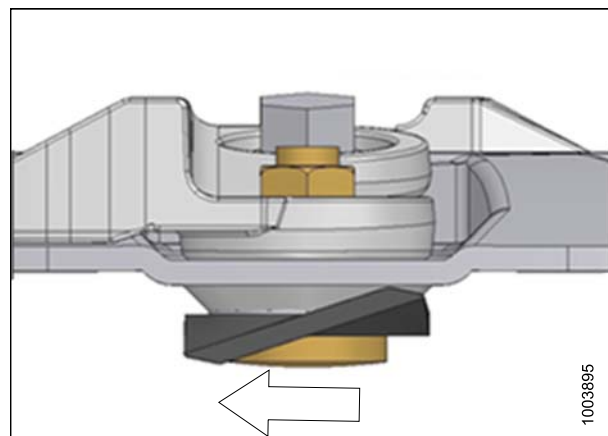


Figure 4.46: Clockwise Disc Rotation Direction

Inspecting Discblade Hardware

CAUTION

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

Inspect blade attachment hardware each time blades are changed. Refer to [Removing Discblades, page 90](#) and [Installing Discblades, page 92](#) for hardware replacement procedure.

1. Check and replace bolt if:

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

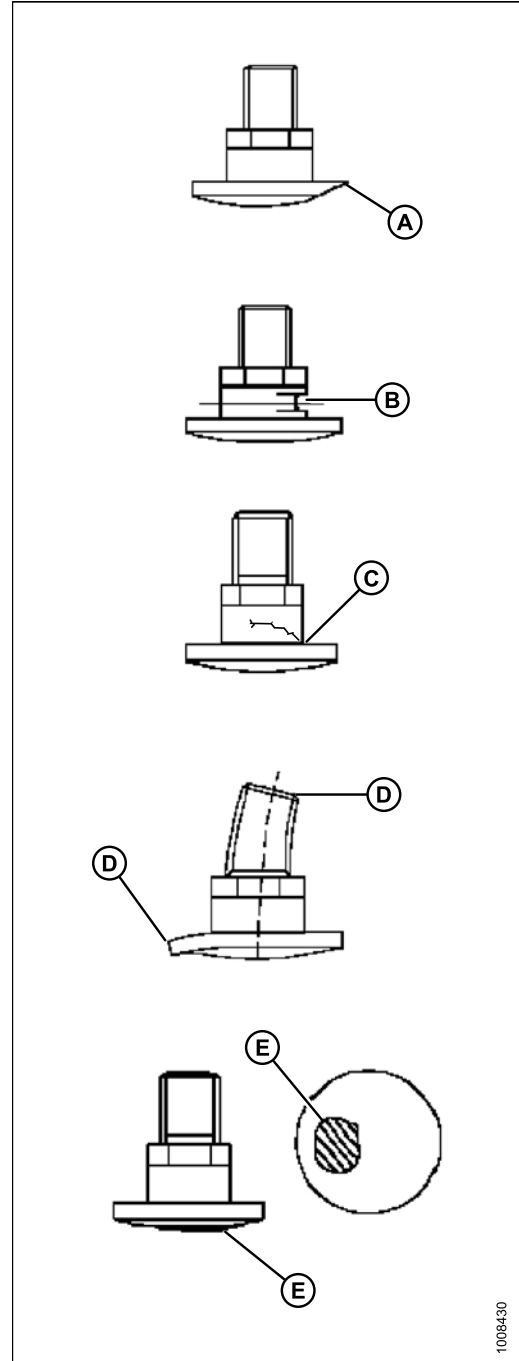


Figure 4.47: Discblade Bolts

MAINTENANCE AND SERVICING

2. Check and replace nuts under the following conditions:
 - Nut has been previously installed—nuts are one-time use only
 - Nut shows signs of wear (A) that is more than half the original height (B)
 - Nut is cracked

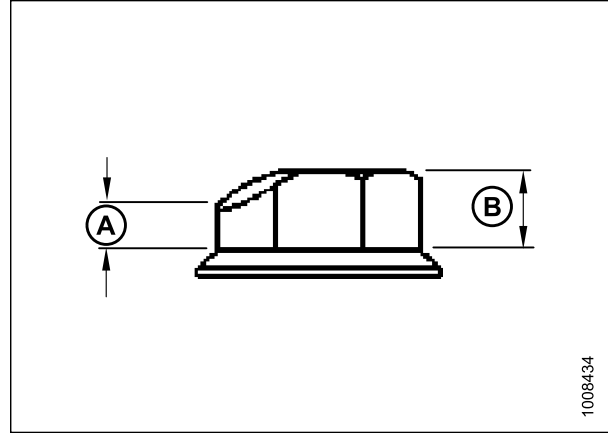


Figure 4.48: Discblade Nut

Removing Discblades



DANGER

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



CAUTION

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

1. Raise disc header fully, shut off engine, and remove key.
2. Engage windrower lift cylinder safety props. Refer to [3.3.1 Engaging and Disengaging Header Safety Props – M1240 Windrower, page 22](#).
3. Open cutterbar curtain (A). Refer to [3.7.1 Opening Cutterbar Curtain, page 42](#).

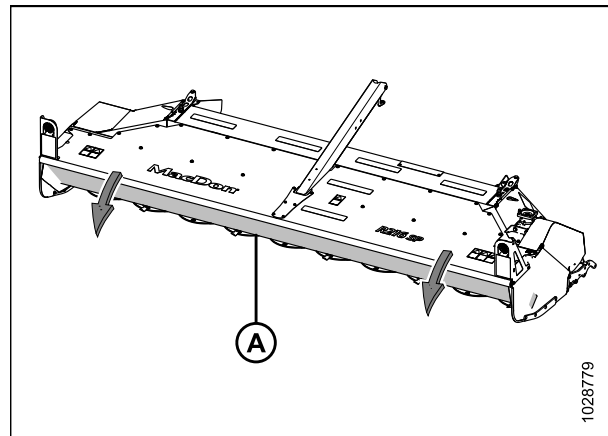


Figure 4.49: R216 SP

MAINTENANCE AND SERVICING

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

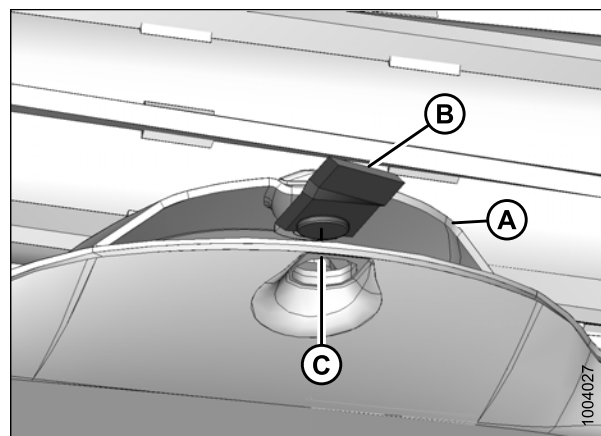


Figure 4.50: Discblade Aligned with Hole in Rock Guard

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

IMPORTANT:

Nuts are one-time-use only. When flipping or changing a blade, replace using a **NEW** nut only.

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

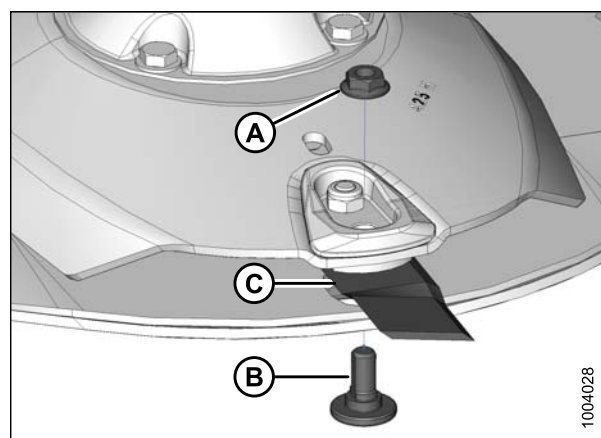


Figure 4.51: Discblade

Installing Discblades

CAUTION

Discblades 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 [3.9 Reconfiguring Cutterbar Crop Stream, page 47](#).

1. Place a pin (or equivalent) in the front hole of the rock guard to prevent disc rotation while tightening blade bolts.
2. Install new or reversed blade (A) with shoulder bolt (B) onto disc (C).

IMPORTANT:

Nuts are one-time-use only. When flipping or changing a blade, replace using a **NEW** nut only.

3. Install new nut (D) and torque to 125 Nm (92 lbf·ft).

WARNING

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

4. Close the cutterbar curtain (A). Refer to [3.7.2 Closing Cutterbar Curtain, page 43](#).

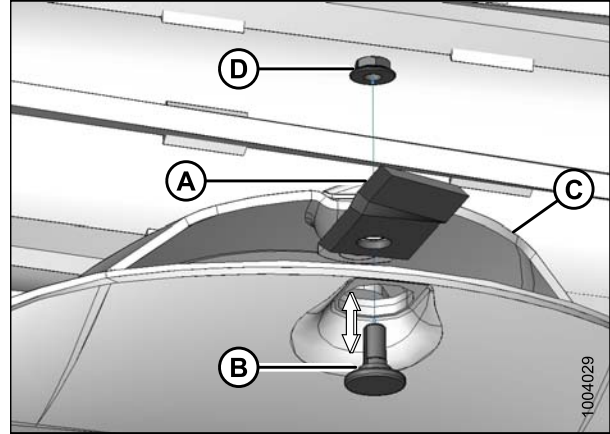


Figure 4.52: Discblade

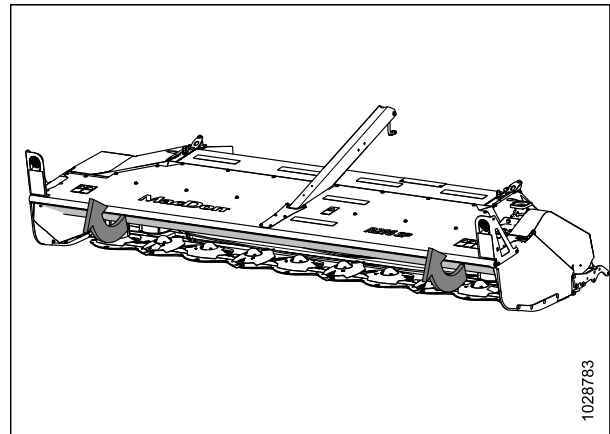


Figure 4.53: R216 SP

4.5.5 Maintaining Accelerators

Accelerators (A) are mounted on each outboard disc and are designed to quickly move cut material off the disc and into the conditioner. R216 headers have two pairs of accelerators at each end of the header.

Periodically inspect accelerators for damage and loose or missing fasteners, and replace as necessary.

IMPORTANT:

Always replace accelerators in pairs to ensure proper disc balance.

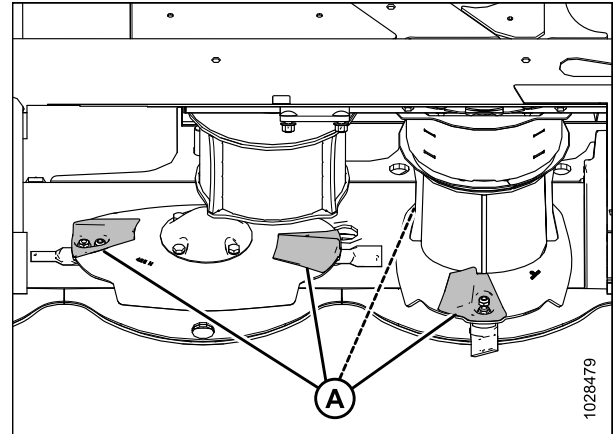


Figure 4.54: R216 SP Cutterbar Accelerators

Inspecting Accelerators



CAUTION

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



WARNING

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

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the windrower lift cylinder safety props. Refer to [3.3.1 Engaging and Disengaging Header Safety Props – M1240 Windrower, page 22](#).
4. Open the cutterbar curtain (A). Refer to [3.7.1 Opening Cutterbar Curtain, page 42](#).

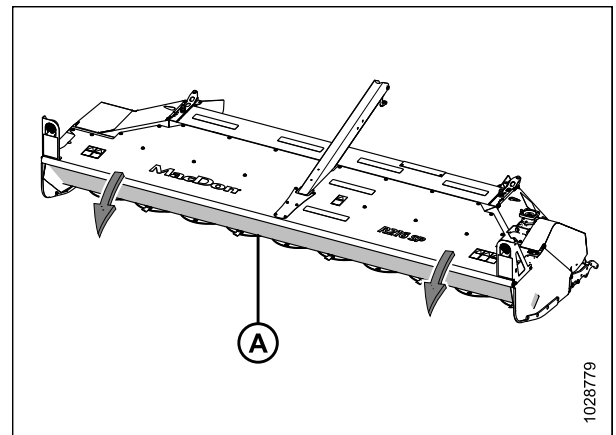


Figure 4.55: R216 SP

MAINTENANCE AND SERVICING

5. Inspect accelerators (A) for damage and wear, and replace if worn to 50% or more of their original height or if they are no longer effectively moving crop.
6. Tighten or replace loose and missing fasteners.

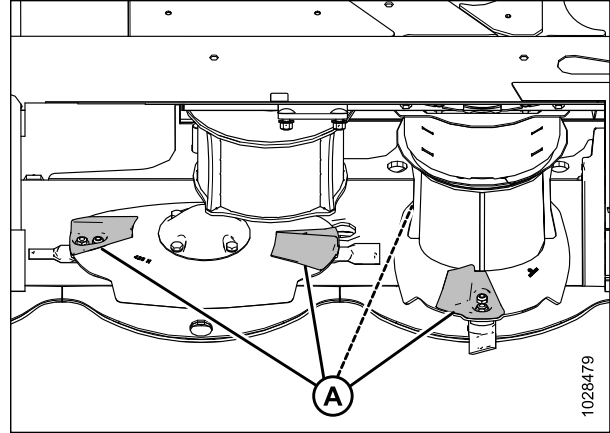


Figure 4.56: Accelerators

Removing Accelerators



CAUTION

Disclades 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 proper disc balance.

1. Raise the header fully.
2. Shut off the engine, and remove the key from the ignition.
3. Engage windrower lift cylinder safety props. Refer to [3.3.1 Engaging and Disengaging Header Safety Props – M1240 Windrower, page 22](#).
4. Open cutterbar curtain (A). Refer to [3.7.1 Opening Cutterbar Curtain, page 42](#).

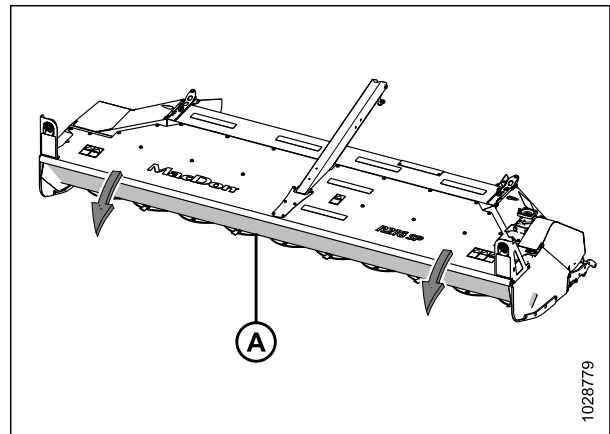
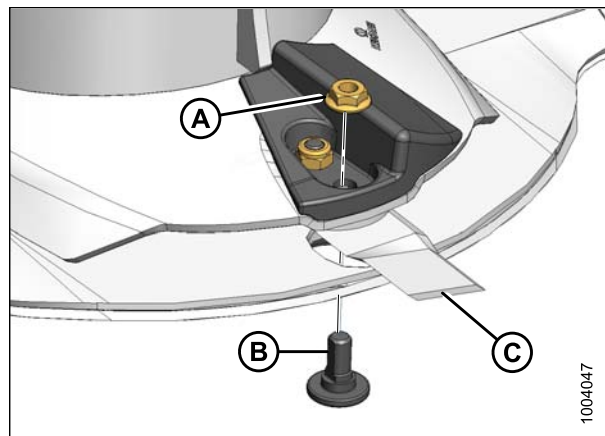


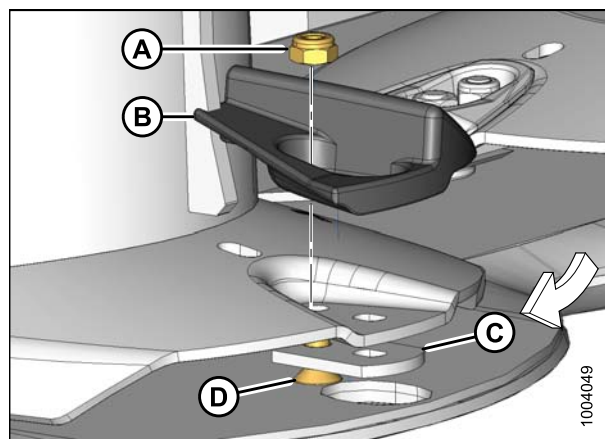
Figure 4.57: R216 SP

MAINTENANCE AND SERVICING

5. Place a pin (or equivalent) in the front hole of the rock guard to prevent disc rotation while loosening bolts.
6. Line up rock guard hole and bolt to be removed.
7. Remove nut (A), flange bolt (B), and discblade (C) from disc. Discard nut.



8. Remove lock nut (A), accelerator (B), blade holder (C), and hex-socket bolt (D).
9. Repeat the removal procedure for the second accelerator.
10. Remove pin.



Installing Accelerators

CAUTION

Disclades 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 proper disc balance.

1. Place a pin (or equivalent) in the front hole of the neighboring rock guard to prevent disc rotation while tightening blade bolts.

IMPORTANT:

Accelerators are unidirectional; both clockwise and counterclockwise accelerators are used on the cutterbar. Verify the direction of the disc before installing accelerators.

2. Install lock nut (A), accelerator (B), blade holder (C), and hex-socket bolt (D). Do **NOT** tighten at this time.
3. Install new nut (A), flange bolt (B), and discblade (C) onto disc.

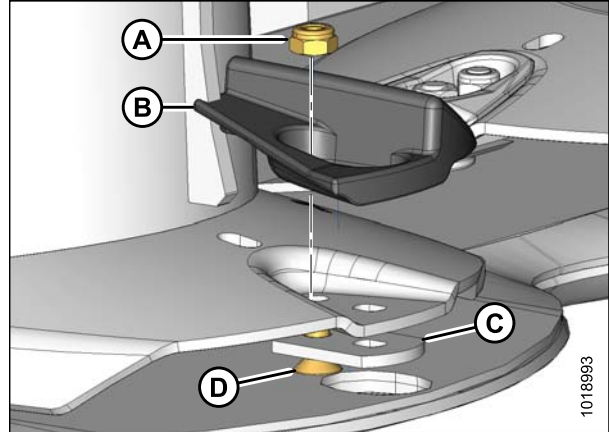


Figure 4.60: Accelerator Install

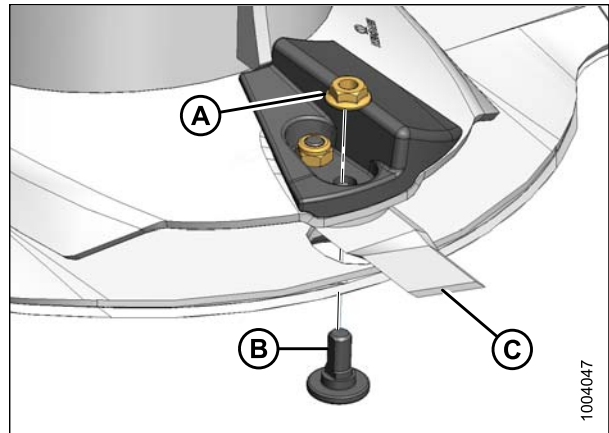


Figure 4.61: Accelerator Install

4. Torque the inside nut (A) to 58 Nm (43 lbf·ft).
5. Torque the outside nut (B) (closest to the blade) to 125 Nm (92 lbf·ft).
6. Repeat the installation procedure for the second accelerator.



WARNING

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

7. Remove the pin (or equivalent) installed in Step 1.
8. Close cutterbar curtain (A). Refer to [3.7.2 Closing Cutterbar Curtain](#), page 43.

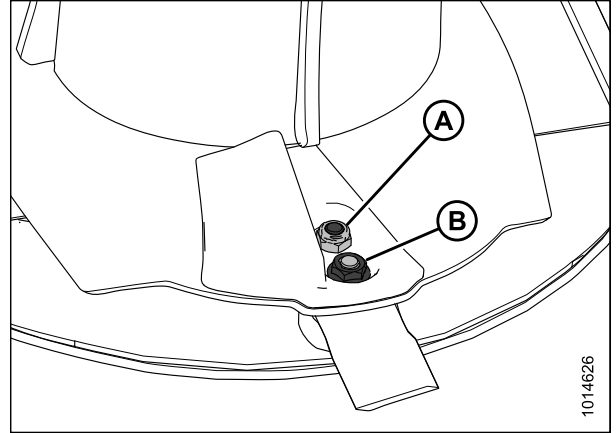


Figure 4.62: Accelerator Install

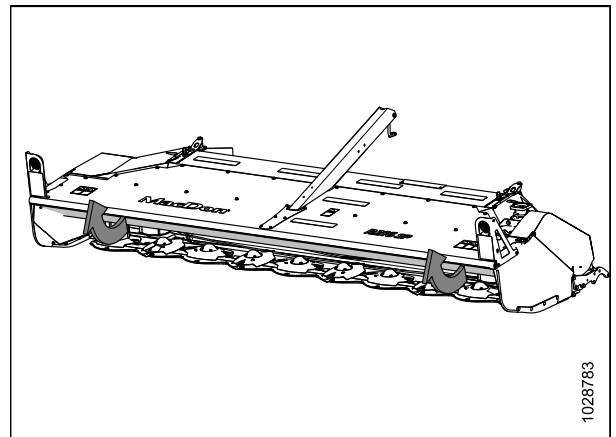


Figure 4.63: R216 SP

4.5.6 Maintaining Rock Guards

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

Inspecting Rock Guards



DANGER

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



WARNING

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

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage windrower lift cylinder safety props. Refer to [3.3.1 Engaging and Disengaging Header Safety Props – M1240 Windrower](#), page 22.

MAINTENANCE AND SERVICING

4. Inspect rock guards for wear, cracks, damage, or distortion. Replace if worn to 75% or more of their original thickness.
5. Check for loose or missing fasteners; tighten or replace fasteners as needed.

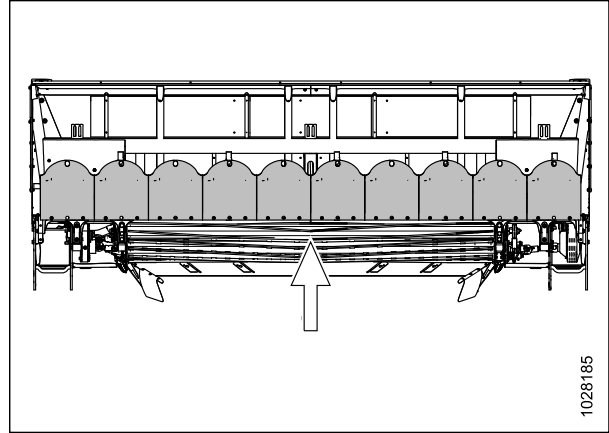


Figure 4.64: Rock Guards

Removing Rock Guards

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

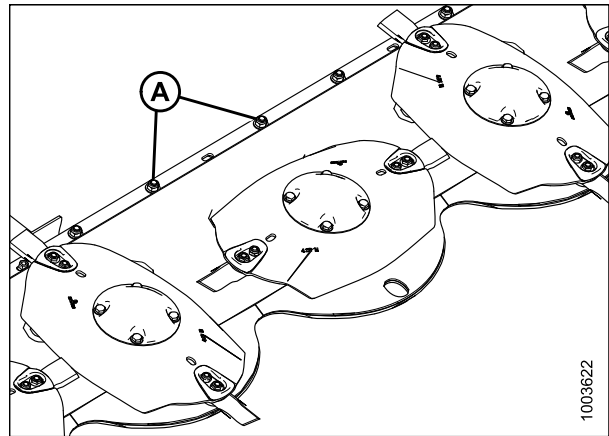


Figure 4.65: Rock Guards

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

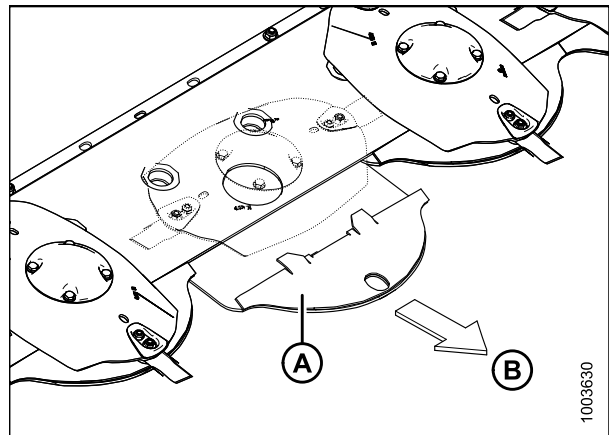


Figure 4.66: Rock Guards

Installing Rock Guards

1. Guide rock guard onto cutterbar until tabs (A) sit on top of the cutterbar and bottom back bolt holes line up.

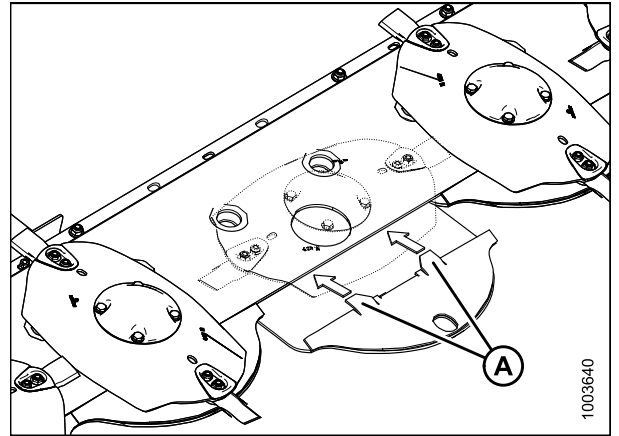


Figure 4.67: Rock Guards

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

NOTE:

Lock nuts and washers (A) are installed on top.

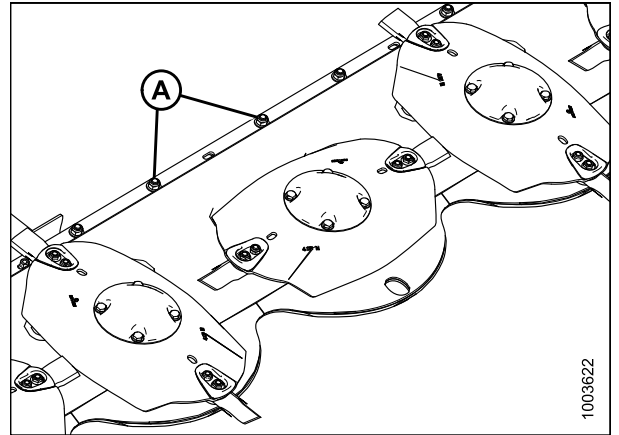


Figure 4.68: Rock Guards

4.5.7 Maintaining Drums

Suspended and driven drums deliver cut material from the ends of the cutterbar and help maintain an even crop flow into the conditioner.

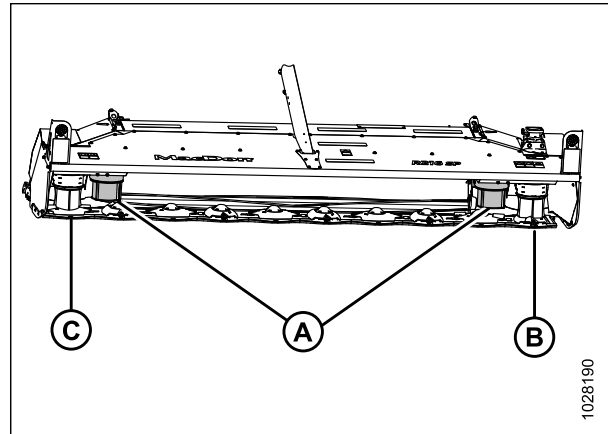


Figure 4.69: Cutterbar – R216

A - Suspended Drums

B - Left Driven Drum

C - Right Driven Drum

Inspecting Drums

Inspect drums daily for signs of damage or wear.

! DANGER

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

! CAUTION

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

1. Lower the header fully.
2. Shut off the engine, and remove the key from the ignition.
3. Open cutterbar curtain (A). Refer to [3.7.1 Opening Cutterbar Curtain, page 42](#).

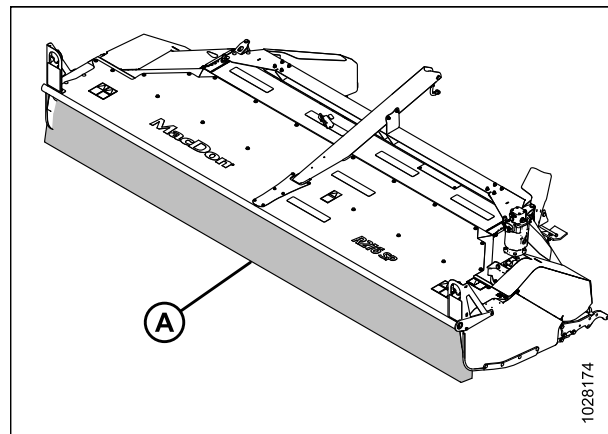


Figure 4.70: R216 SP

MAINTENANCE AND SERVICING

4. Inspect drums (A), (B), and (C) for damage and wear, and replace if drums are worn at the center to 50% or more of their original thickness. Do **NOT** repair drums.
5. Examine drums for large dents. Replace dented drums to prevent an imbalance in the cutterbar.
6. Tighten or replace loose or missing fasteners.

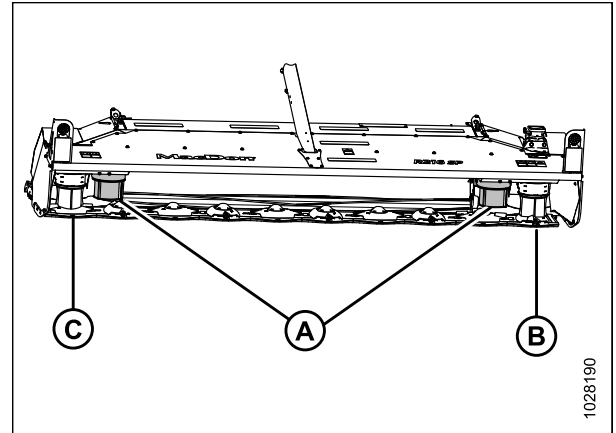


Figure 4.71: R216 SP Cutterbar

A - Suspended Drums

B - Left Driven Drum

C - Right Driven Drum

7. Inspect the driven and non-driven drums for deformation. If the drum is deformed, dimension (A) must **NOT** exceed 48 mm (1 7/8 in.). Replace as required.

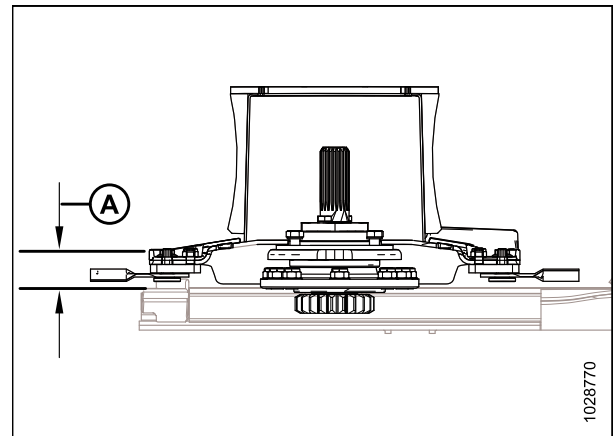


Figure 4.72: Driven Drum – Cutaway View

8. Inspect the driven and non-driven drums for abrasion (A). The wear limit for abrasion is reached when the material thickness of the drums is less than 3 mm (1/8 in.). Replace as required.

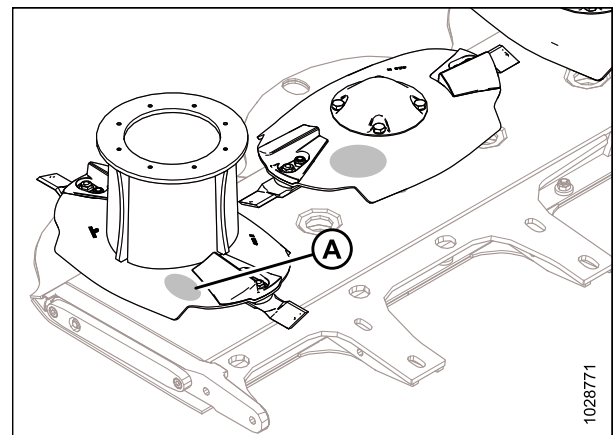


Figure 4.73: Driven Drum – View from Front



WARNING

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

9. Close cutterbar curtain (A). Refer to [3.7.2 Closing Cutterbar Curtain, page 43](#).

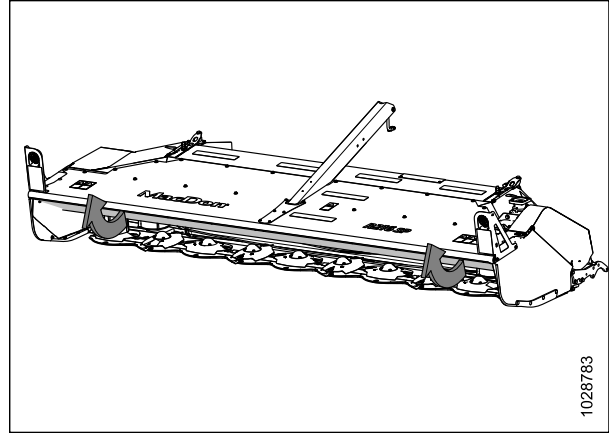


Figure 4.74: R216 SP

Removing Suspended Drums

DANGER

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

WARNING

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

NOTE:

Illustrations show right suspended drum, left suspended drum is opposite.

1. Raise the header.
2. Shut down the engine, and remove the key from the ignition.
3. Engage windrower lift cylinder safety props. Refer to [3.3.1 Engaging and Disengaging Header Safety Props – M1240 Windrower, page 22](#)
4. Open cutterbar curtain (A). Refer to [3.7.1 Opening Cutterbar Curtain, page 42](#).

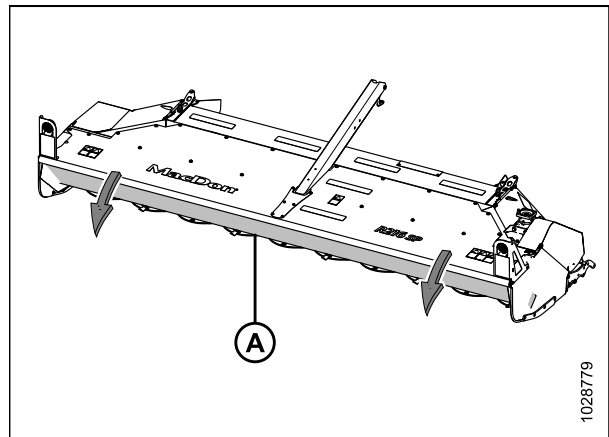


Figure 4.75: Cutterbar Curtain

MAINTENANCE AND SERVICING

5. Loosen two M10 hex flange head bolts (A). Pull back driveshield (B).

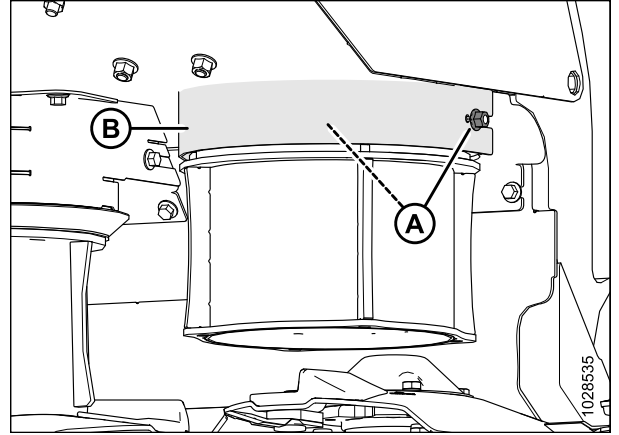


Figure 4.76: Driveshield

6. Remove four M12 hex flange head bolts (A) securing suspended drum (B) to shaft (C), and remove suspended drum (B).

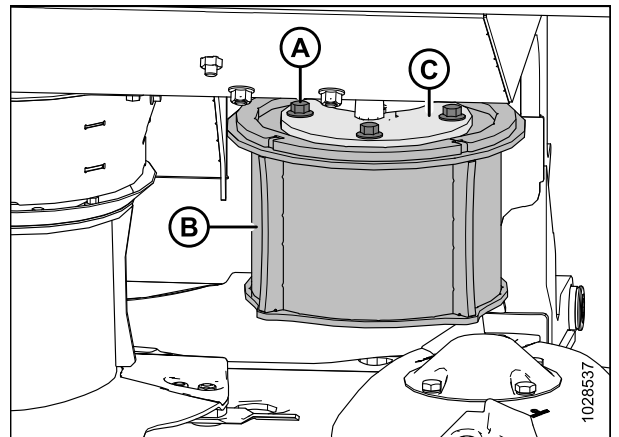


Figure 4.77: Suspended Drum

7. Remove two M10 hex flange head bolts (A) and remove driveshield (B).
8. Repeat Step 5, page 103 to Step 7, page 103 to remove the opposite suspended drum.

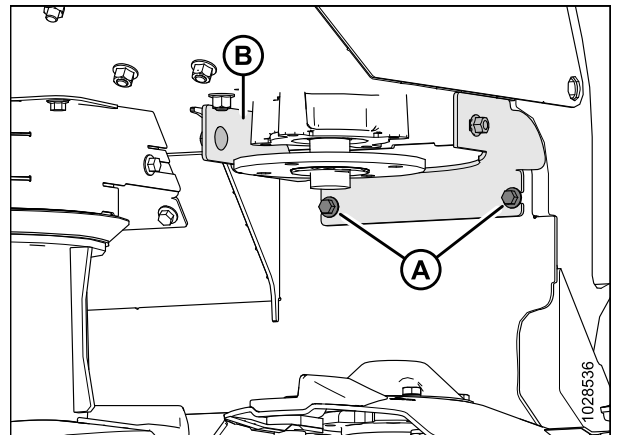


Figure 4.78: Driveshield

Installing Suspended Drums

DANGER

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

WARNING

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

NOTE:

Illustrations show right suspended drum, left suspended drum is opposite.

NOTE:

Ensure driveshield (B) is installed before suspended drum.

1. Position driveshield (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 driveshield (B) in place.
2. Position suspended drum (B) to shaft (C) as shown. 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 shaft. Torque bolts to 100 Nm (74 lbf·ft).

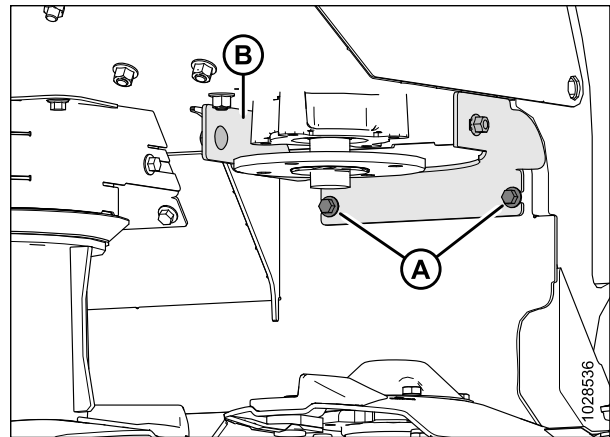


Figure 4.79: Driveshield

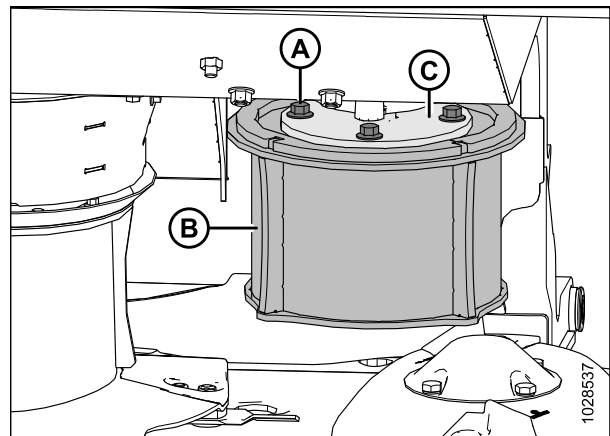


Figure 4.80: Suspended Drum

MAINTENANCE AND SERVICING

3. Position driveshield (B) as shown. Use two M10 hex flange head bolts (A) to secure driveshield (B) in place.
4. Repeat Step 1, [page 104](#) to Step 3, [page 105](#) to install the opposite suspended drum.
5. Close cutterbar curtain (A). Refer to [3.7.2 Closing Cutterbar Curtain, page 43](#).

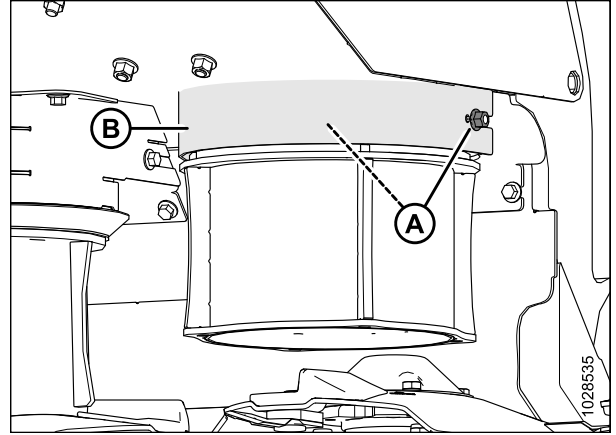


Figure 4.81: Driveshield

Removing Left Driven Drum and Driveline

DANGER

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

WARNING

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

NOTE:

To grease the vertical drivelines: Follow steps 1-5, grease driveline, and reinstall driveshield.

1. Raise the header.
2. Shut down the engine, and remove the key from the ignition.
3. Engage windrower lift cylinder safety props. Refer to [3.3.1 Engaging and Disengaging Header Safety Props – M1240 Windrower, page 22](#).
4. Open cutterbar curtain (A). Refer to [3.7.1 Opening Cutterbar Curtain, page 42](#).

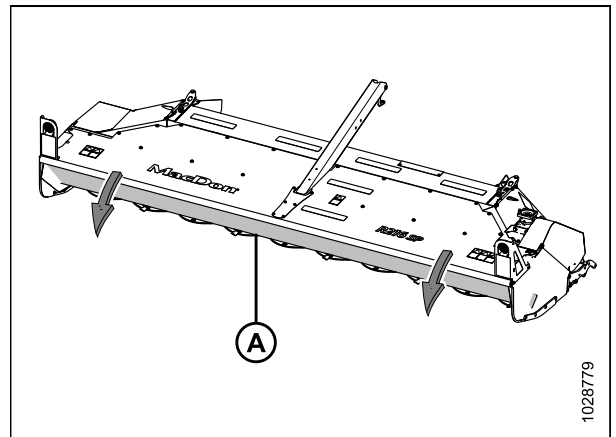


Figure 4.82: Cutterbar Curtain

MAINTENANCE AND SERVICING

5. Remove two M10 hex flange head bolts (A) and loosen two M10 hex flange head bolts (B). Pull back driveshield (C).

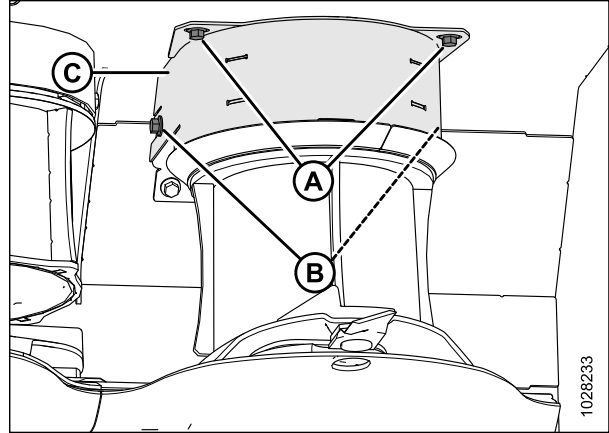


Figure 4.83: Driveshield

6. Remove two M10 hex flange head bolts (A) and remove driveshield (B).

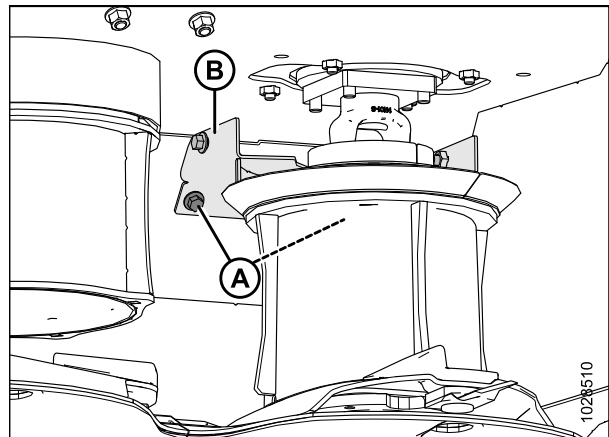


Figure 4.84: Driveshield

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

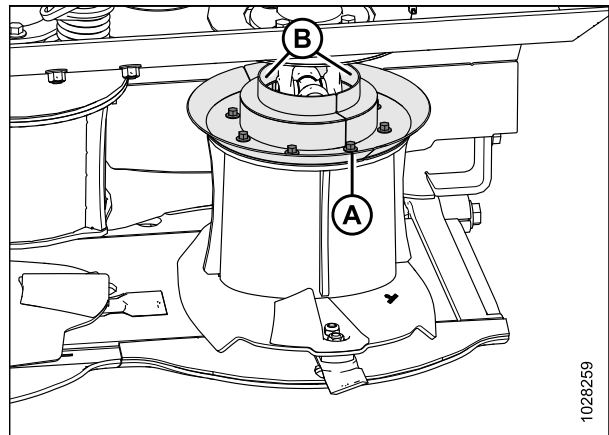


Figure 4.85: Driveline Shields

MAINTENANCE AND SERVICING

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

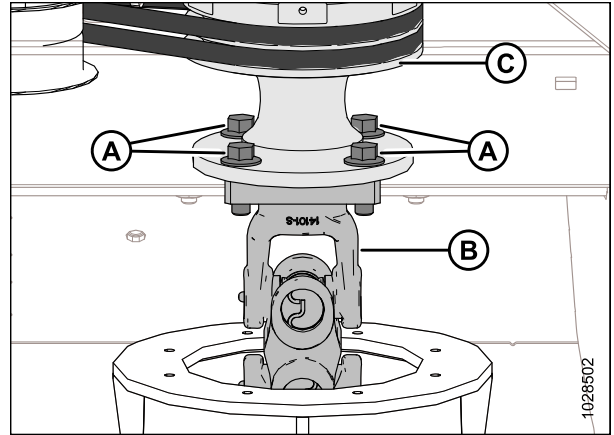


Figure 4.86: Driveline

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

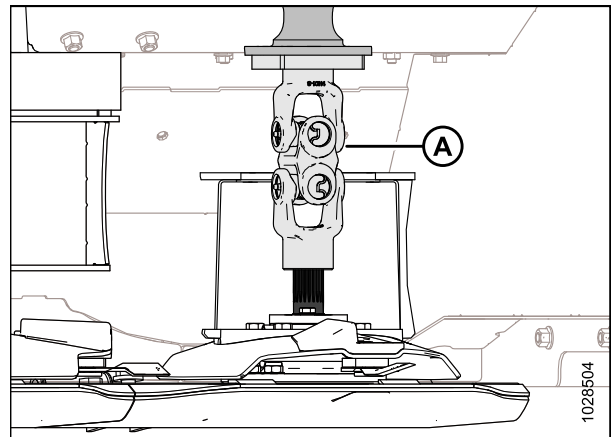


Figure 4.87: Drum and Tube Shield – Cutaway View

10. Use a 18 mm deep socket to remove four M12 bolts (A) and washers holding the drum disc assembly (B) in place.
11. Remove drum disc assembly (B).

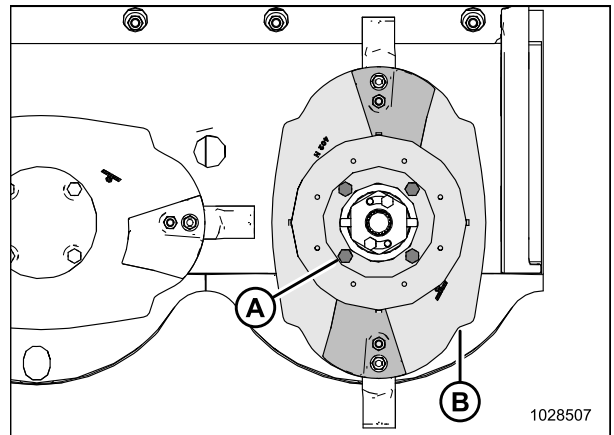


Figure 4.88: Driven Drum – View from Above

Installing Left Driven Drum and Driveline

⚠ DANGER

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

⚠ WARNING

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

1. Ensure spacer (A) is on spindle.

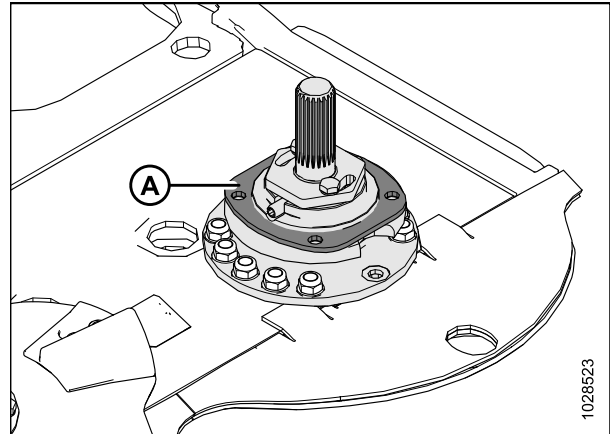


Figure 4.89: Driven Spindle

2. Position the drum disc assembly (B) as shown.
3. Use a 18 mm deep socket to install four M12 bolts (A) and washers that hold the drum disc in place. Torque hardware to 85 Nm (63 lbf·ft).

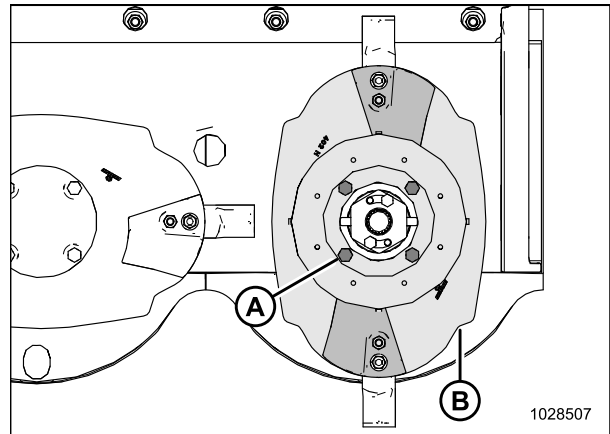


Figure 4.90: Driven Drum – View from Above

4. Lightly lubricate spindle splines (A). For specifications, refer to the inside back cover of this manual.
5. Insert driveline (B) at an angle and guide it past hub drive (C) and drum (D).
6. Insert splined spindle end (A) into splined bore of driveline (B).

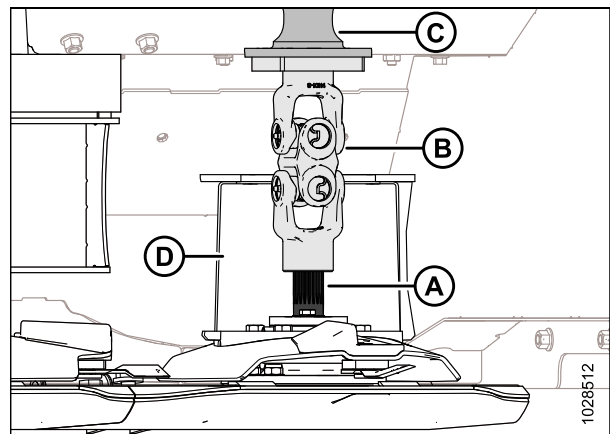


Figure 4.91: Drum and Tube Shield – Cutaway View

MAINTENANCE AND SERVICING

7. 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 bolts to 100 Nm (74 lbf·ft).

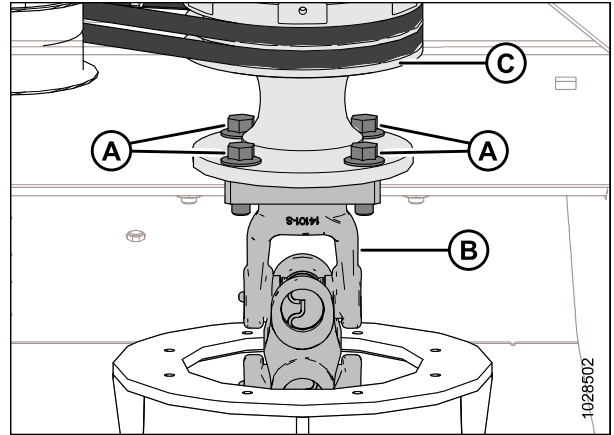


Figure 4.92: Driveline

8. 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.).

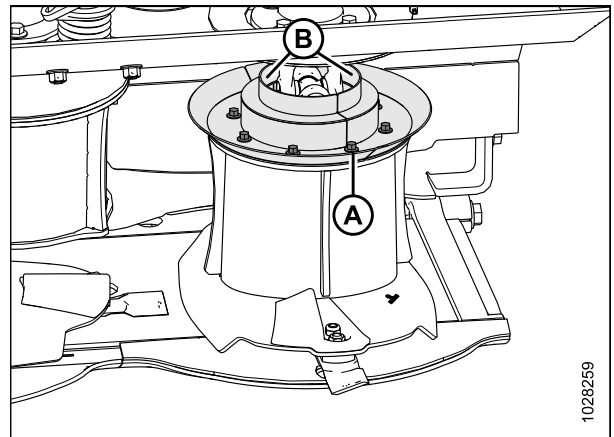


Figure 4.93: Driveline Shields

9. Position driveshield (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 driveshield (B) in place.

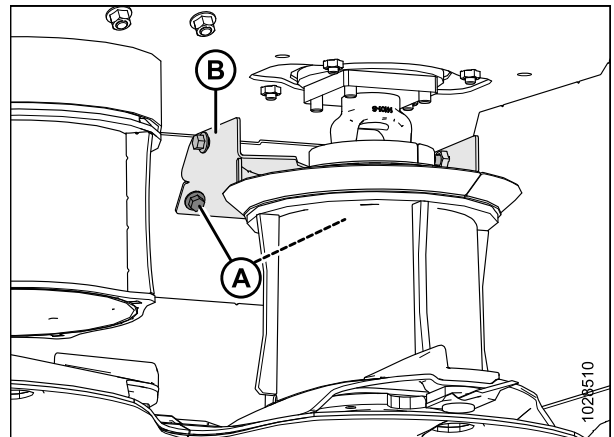


Figure 4.94: Driveshield

10. Position driveshield (C) as shown. Apply a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of two M10 hex flange head bolts (A) and two M10 hex flange head bolts (B). Use bolts (A) and (B) to secure driveshield (C) in place.

11. Tighten all hardware on driveshields.

WARNING

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

12. Close cutterbar curtain (A). Refer to [3.7.2 Closing Cutterbar Curtain](#), page 43.

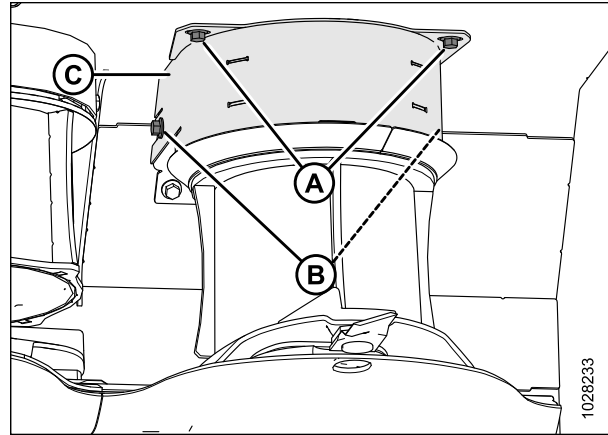


Figure 4.95: Driveline Shield

Removing Right Driven Drum and Driveline

DANGER

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

WARNING

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

NOTE:

To grease the vertical drivelines: Follow steps 1-5, grease driveline, and reinstall driveshield.

1. Raise the header.
2. Shut down the engine, and remove the key from the ignition.
3. Engage windrower safety props. Refer to [3.3.1 Engaging and Disengaging Header Safety Props – M1240 Windrower](#), page 22.
4. Open cutterbar curtain (A). Refer to [3.7.1 Opening Cutterbar Curtain](#), page 42.

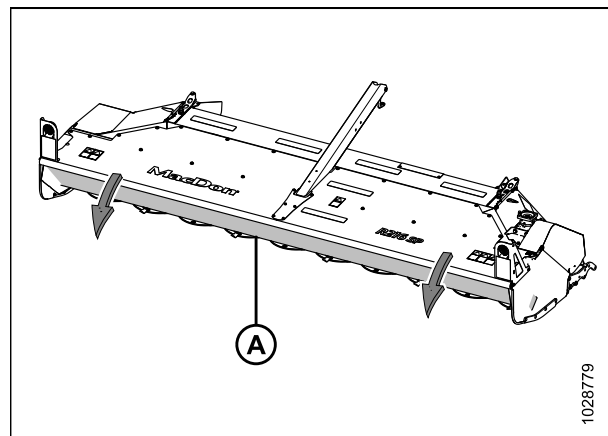


Figure 4.96: Cutterbar Curtain

MAINTENANCE AND SERVICING

5. Remove two M10 hex flange head bolts (A) and loosen two M10 hex flange head bolts (B). Pull back driveshield (C).

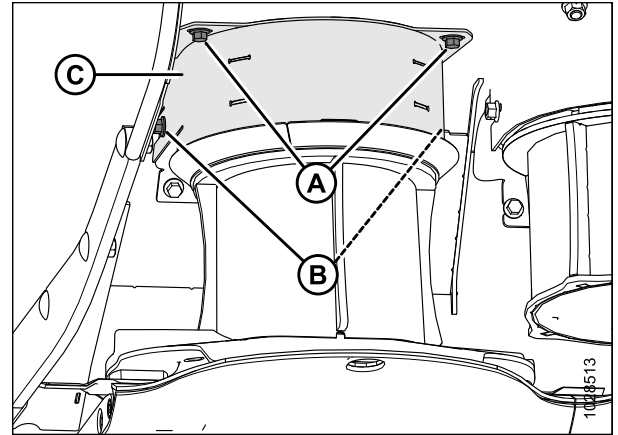


Figure 4.97: Driveshield

6. Remove two M10 hex flange head bolts (A) and remove driveshield (B).

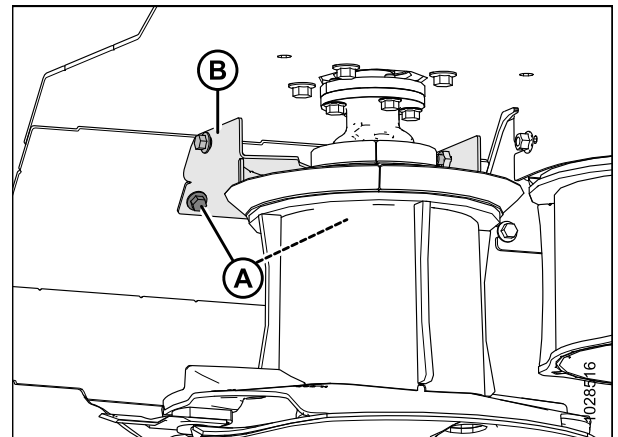


Figure 4.98: Driveshield

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

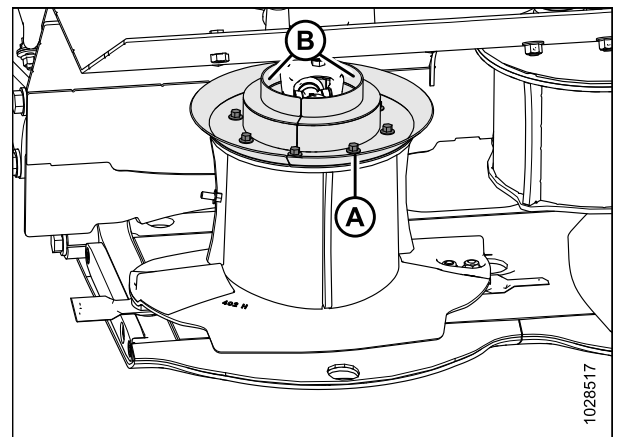


Figure 4.99: Driveline Shields

MAINTENANCE AND SERVICING

8. Remove four M10 hex flange head bolts (A) securing driveline assembly (B) to hub drive (C).

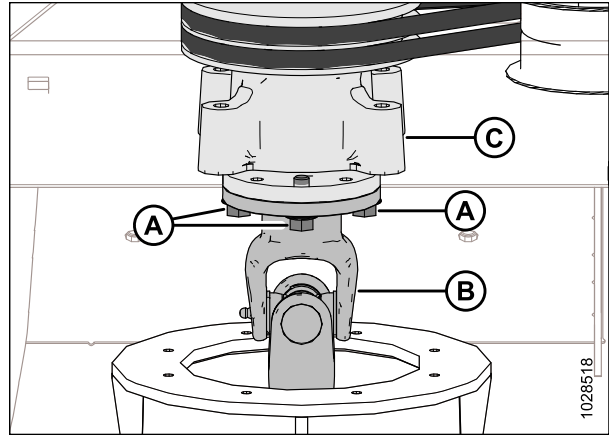


Figure 4.100: Driveline

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

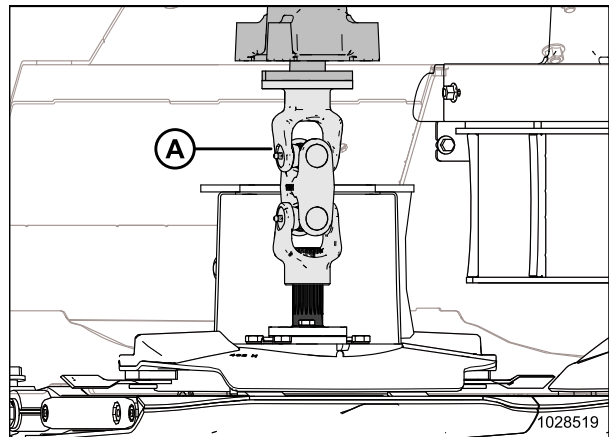


Figure 4.101: Drum and Tube Shield – Cutaway View

10. Use a 18 mm deep socket to remove four M12 bolts (A) and washers holding the drum disc assembly (B) in place.
11. Remove drum disc assembly (B).

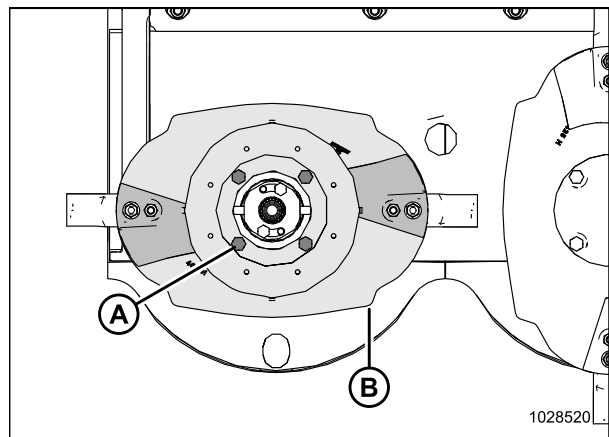


Figure 4.102: Right Driven Drum – View from Above

Installing Right Driven Drum and Driveline

⚠ DANGER

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

⚠ WARNING

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

1. Ensure spacer (A) is on spindle.

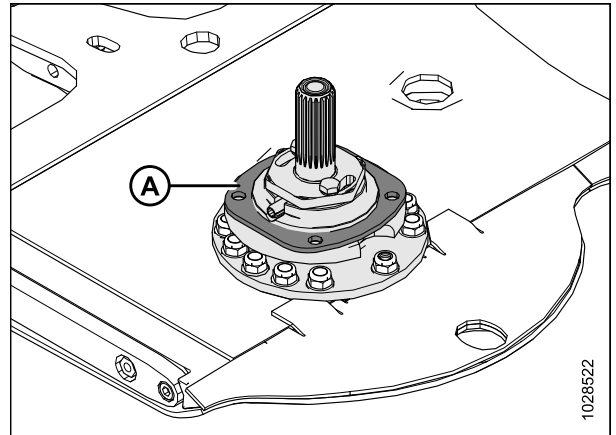


Figure 4.103: Right Driven Spindle

2. Position the drum disc assembly (B) as shown.
3. Use a 18 mm deep socket to install four M12 bolts (A) and washers that hold the drum disc in place. Torque hardware to 85 Nm (63 lbf·ft).

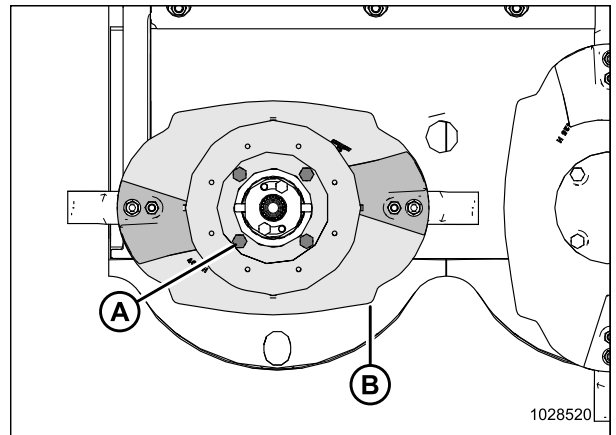


Figure 4.104: Right Driven Drum – View from Above

MAINTENANCE AND SERVICING

4. Lightly lubricate spindle splines (A). For specifications, refer to the inside back cover of this manual.
5. Insert driveline (B) at an angle and guide it past hub drive (C) and drum (D).
6. Insert splined spindle end (A) into splined bore of driveline (B).

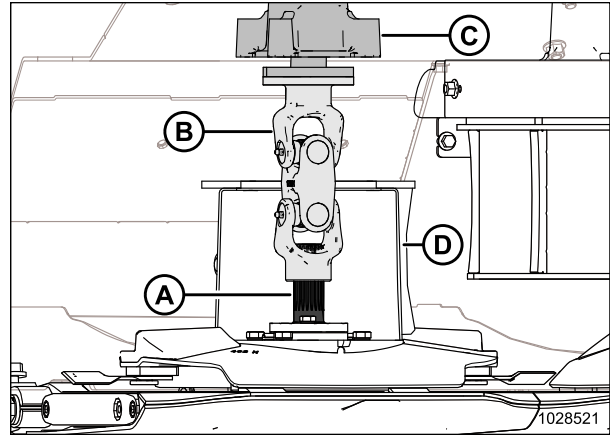


Figure 4.105: Drum and Tube Shield – Cutaway View

7. 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 bolts to 100 Nm (74 lbf·ft).

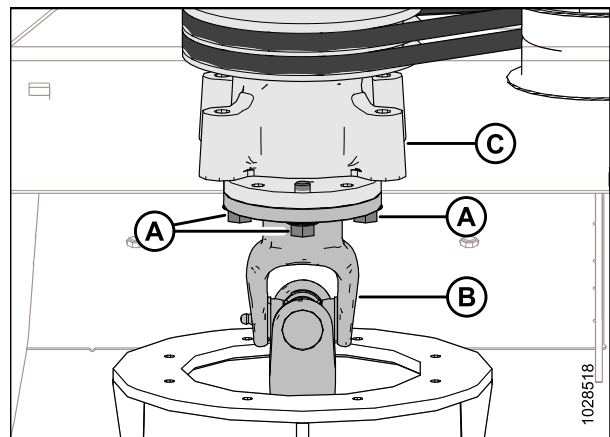


Figure 4.106: Driveline

8. 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).

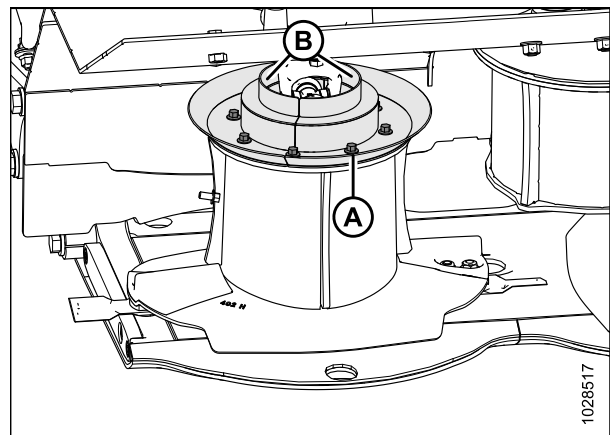


Figure 4.107: Driveline Shields

MAINTENANCE AND SERVICING

9. Position driveshield (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 driveshield (B) in place.

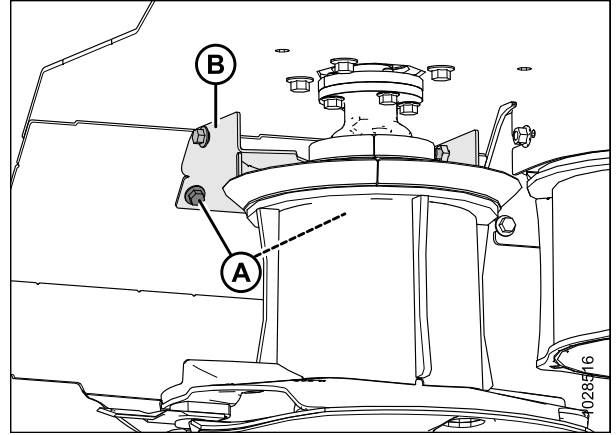


Figure 4.108: Driveshield

10. Position driveshield (C) as shown. Apply a bead of medium-strength threadlocker (Loctite® 243 or equivalent) around the threads of two M10 hex flange head bolts (A) and two M10 hex flange head bolts (B). Use bolts (A) and (B) to secure driveshield (C) in place.

11. Tighten all hardware on driveshields.



WARNING

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

12. Close cutterbar curtain (A). Refer to [3.7.2 Closing Cutterbar Curtain](#), page 43.

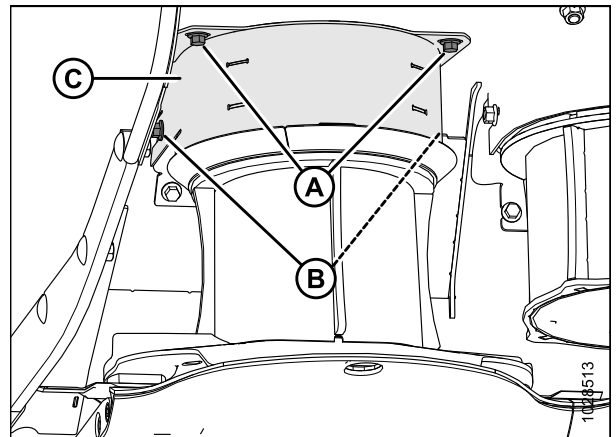


Figure 4.109: Driveline Shield

4.5.8 Replacing Cutterbar Spindle Shear Pin

To prevent damage to the cutterbar and drive systems, each disc is attached to a spindle containing a shear pin (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 with a 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 spindle has risen due to shear pin failure, the spindle's bearing will become unloaded. Do **NOT** replace the spindle due to excessive play. Check play after torquing spindle nut and replacing damaged shear pins.

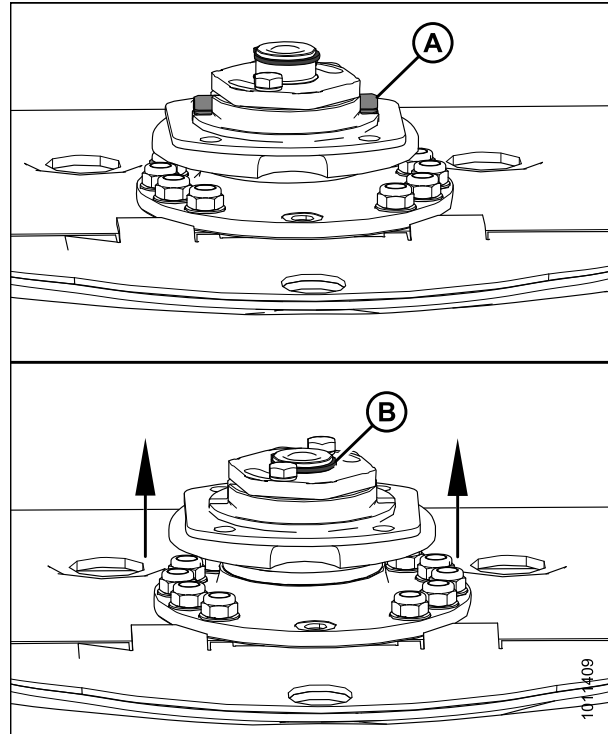


Figure 4.110: Cutterbar Spindles

NOTE:

A special spindle nut wrench is located under the panel on the right side of the header. This tool is used to loosen and tighten the spindle nuts.

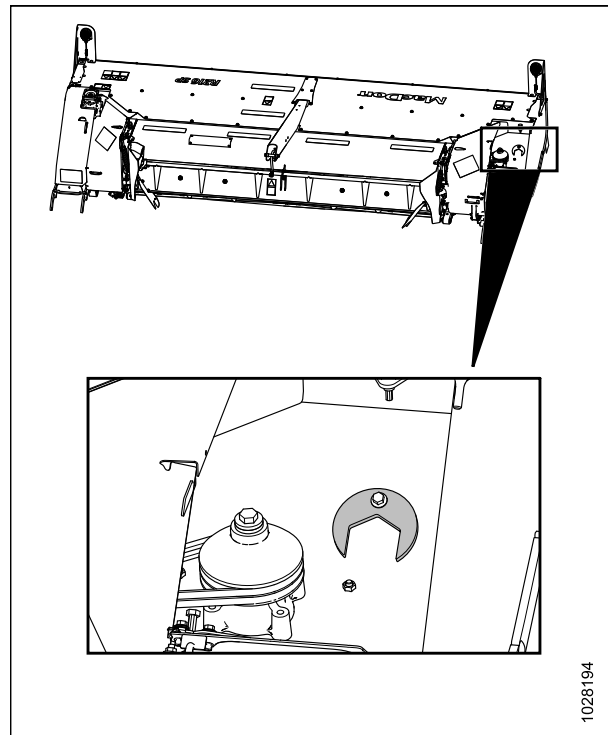


Figure 4.111: Spindle Nut Tool

Removing Cutterbar Spindle Shear Pin

WARNING

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

CAUTION

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

1. Raise the header fully.
2. Shut off the engine, and remove the key from the ignition.
3. Engage windrower lift safety props. Refer to [3.3.1 Engaging and Disengaging Header Safety Props – M1240 Windrower, page 22](#).
4. Open cutterbar curtain (A). Refer to [3.7.1 Opening Cutterbar Curtain, page 42](#).
5. Clean debris from work area.

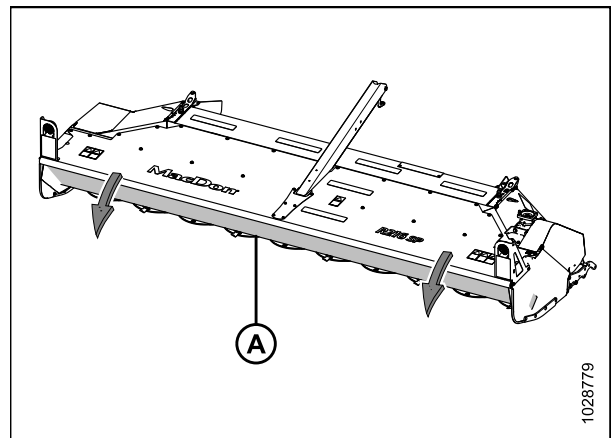


Figure 4.112: R216 SP

6. Depending on the type of disc with a broken shear pin, refer to the applicable disc removal procedure:
 - To remove cutterbar disc (A), refer to [Removing Cutterbar Discs, page 77](#).
 - To remove left driven drum (B), refer to [Removing Left Driven Drum and Driveline, page 105](#).
 - To remove right driven drum (C), refer to [Removing Right Driven Drum and Driveline, page 110](#).

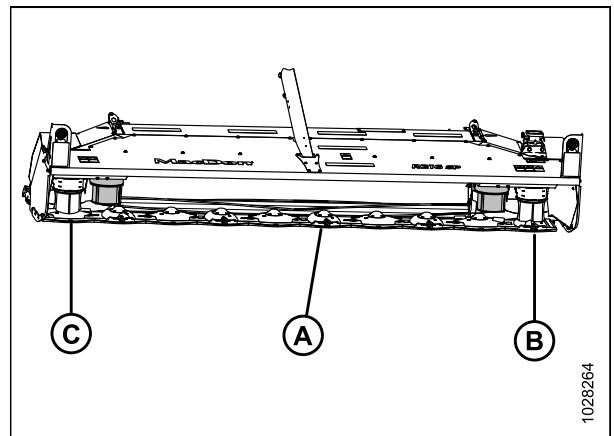


Figure 4.113: R216 SP Cutterbar

MAINTENANCE AND SERVICING

7. Remove retaining ring (A).

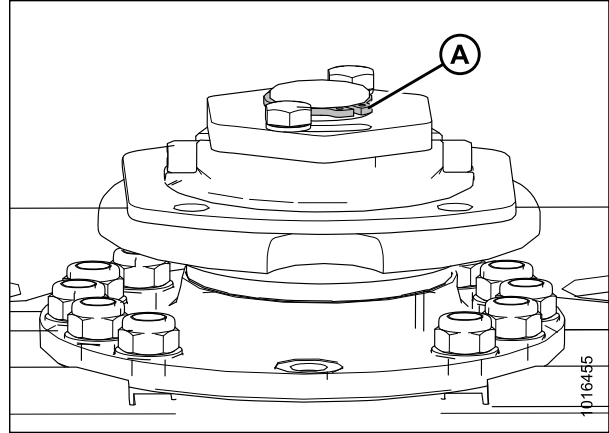


Figure 4.114: Cutterbar Spindle

8. Remove M12 bolt and remove safecut spindle-nut wrench (A) from storage location.

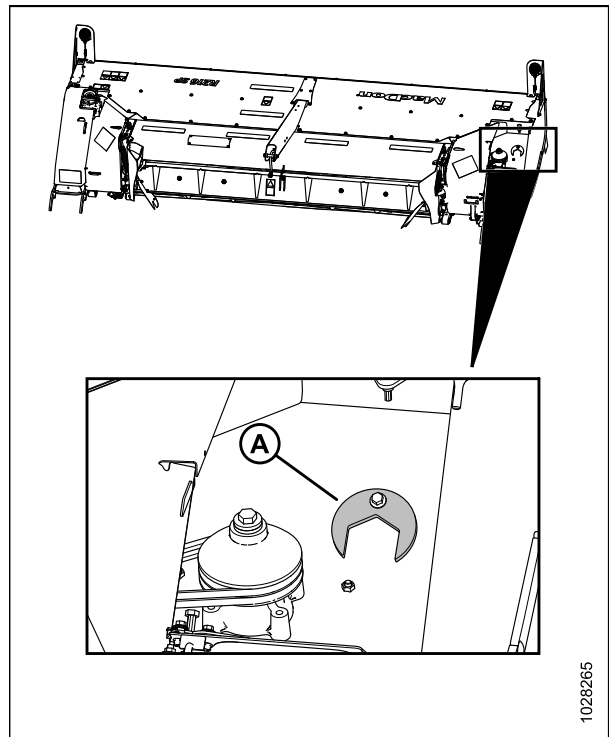


Figure 4.115: Safecut Spindle-Nut Wrench Location

IMPORTANT:

- Spindles that rotate clockwise have right-leading threading and a smooth top on the spindle gear shaft (A).
- Spindles that rotate counterclockwise have left-leading threading and machined grooves on the spindle gear shaft (B) and nut (C).
- If spindle 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 rotation pattern can result in damage to spindle and/or cutterbar components.

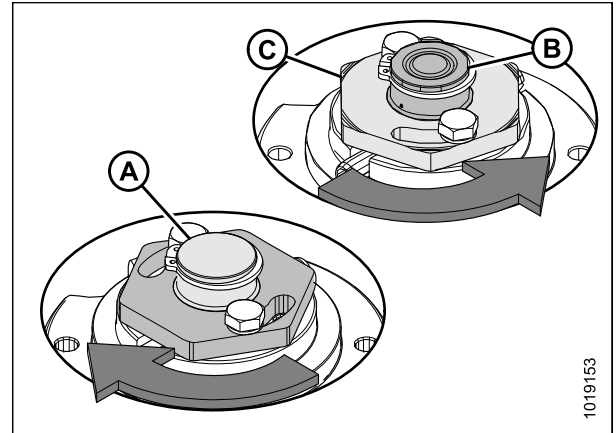


Figure 4.116: Cutterbar Spindles

9. Remove two M10 bolts and washers (A).

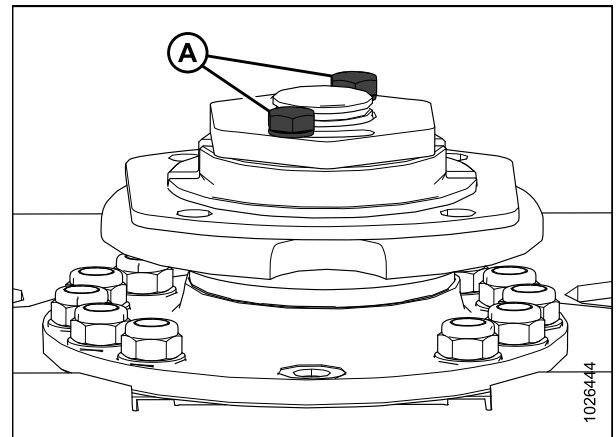


Figure 4.117: Cutterbar Spindle

10. Use the safecut spindle-nut wrench and remove nut (A).

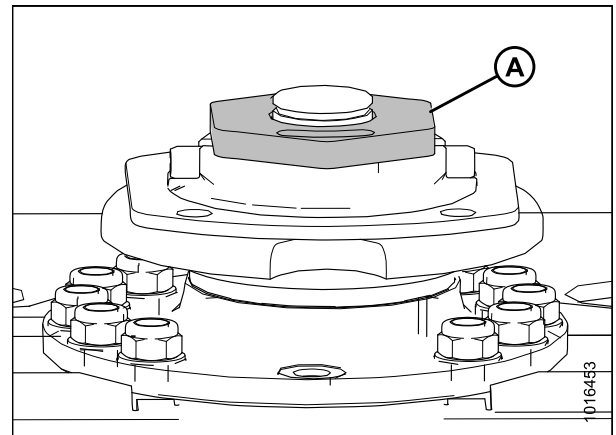


Figure 4.118: Cutterbar Spindle

MAINTENANCE AND SERVICING

11. Remove shear pins (B). Do **NOT** damage the pin bore on the pinion.
12. Remove the hub (A).
13. Check the nut and hub for damage. Replace if necessary.

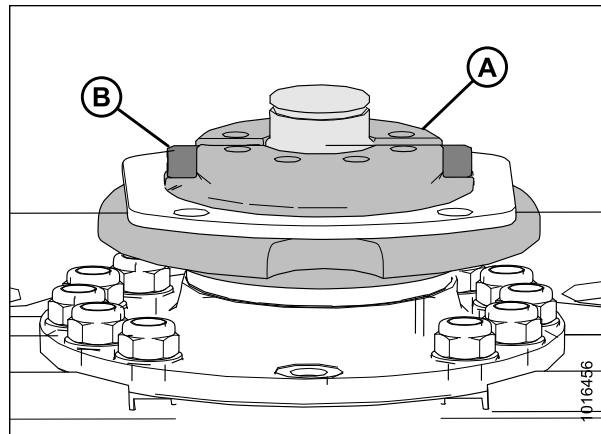


Figure 4.119: Cutterbar Spindle

Installing Cutterbar Spindle Shear Pin

WARNING

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

CAUTION

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

1. Fill the space above the bearing with grease. Refer to the inside back cover of this manual.
2. Place the hub (A) on the spindle (C).
3. Install shear pins (B).

NOTE:

Ensure that the ends of the shear pins do not protrude past the step in the hub.

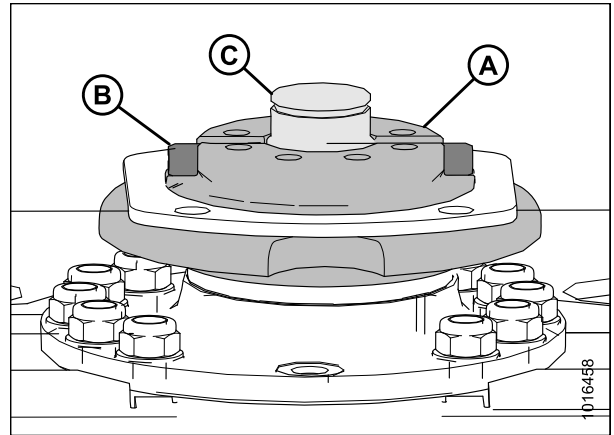


Figure 4.120: Cutterbar Spindle

4. Observe orientation of groove in shear pin (A).

IMPORTANT:

The correct shear pin orientation is critical. Both shear pin grooves (A) must be facing the same direction and parallel to the cutterbar.

NOTE:

Shaft removed from illustration for clarity.

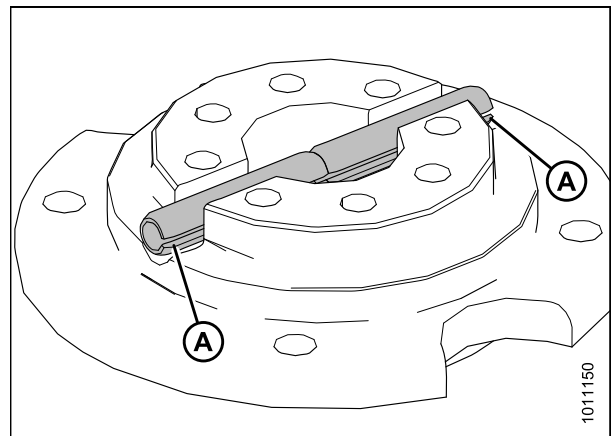


Figure 4.121: Shear Pin Orientation

MAINTENANCE AND SERVICING

5. Install nut (A).

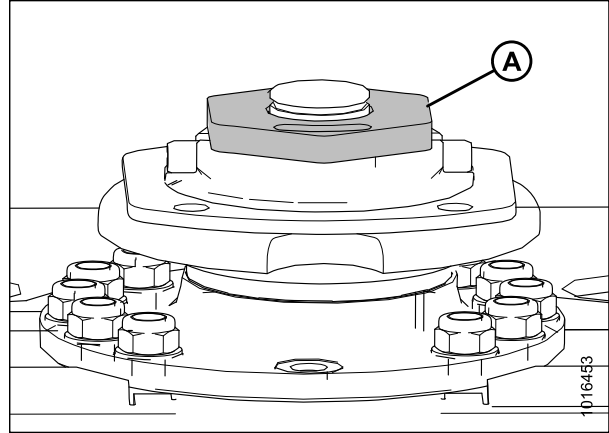


Figure 4.122: Cutterbar Spindle

6. Attach the safecut spindle-nut wrench (B) 90 degrees (D) to the torque wrench (A).

IMPORTANT:

If this is not done, the proper torque will **NOT** be applied to the nut.

7. Locate the safecut spindle-nut wrench (B) on spindle nut (C). Torque nut to 300 Nm (221 lbf-ft).
8. Return safecut spindle-nut wrench to left shield plate.

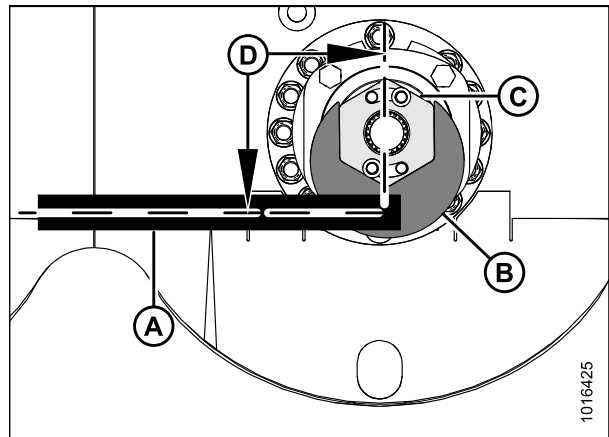


Figure 4.123: Spindle Nut

9. Inspect the threads of the two M10 bolts (A) and replace if damaged.
10. Install two M10 bolts (A) and washers. Torque hardware to 55 Nm (40 lbf-ft).

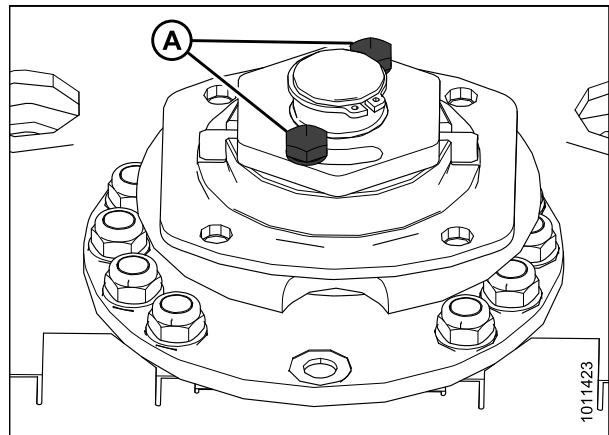


Figure 4.124: Cutterbar Spindle

11. Install retaining ring (A).

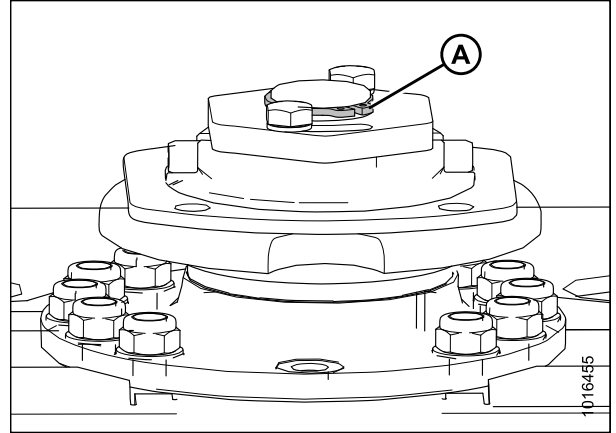


Figure 4.125: Cutterbar Spindle

12. Depending on the type of disc with the new shear pin, refer to the applicable disc installation procedure:

- Install cutterbar disc (A). Refer to *Installing Cutterbar Discs*, page 78.
- Install left driven drum (B). Refer to *Installing Left Driven Drum and Driveline*, page 107.
- Install right driven drum (C). Refer to *Installing Right Driven Drum and Driveline*, page 113.



WARNING

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

13. Close cutterbar curtain (A). Refer to *3.7.2 Closing Cutterbar Curtain*, page 43.

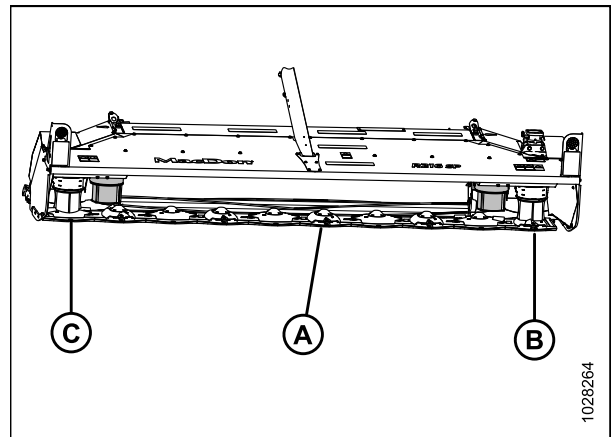


Figure 4.126: R216 SP Cutterbar

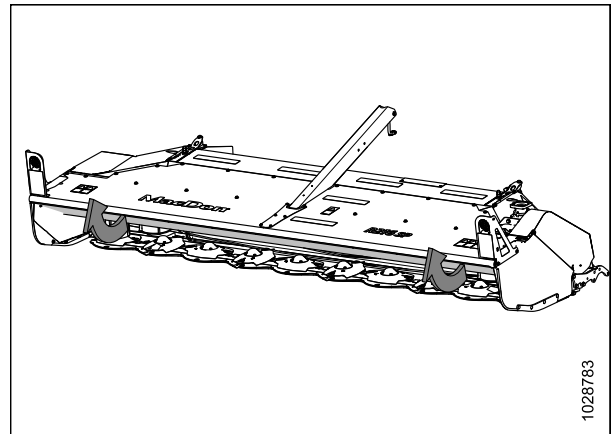


Figure 4.127: R216 SP

4.6 Servicing Conditioner Roll Timing Gearbox

The conditioner roll timing gearbox (A), located inside the drive compartment at the right of the header, transfers power from the gearbox-driven lower roll to the upper roll.

The gearbox (A) does not require routine maintenance or service other than checking and changing oil.

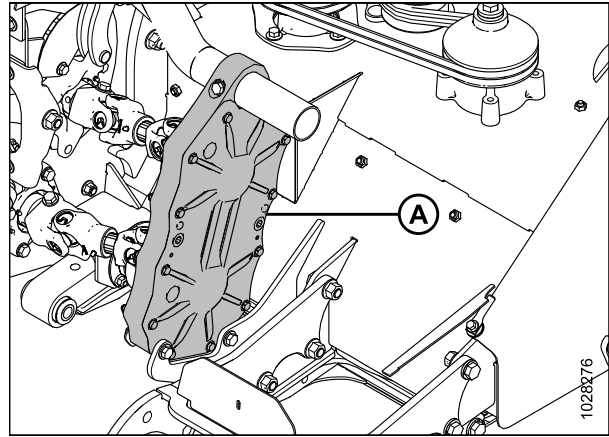


Figure 4.128: Conditioner Roll Timing Gearbox

4.6.1 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 capacity.



WARNING

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 disc header to the ground and adjust the header angle (tilt) so that the top of the conditioner is level (parallel) with 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 at handle (D) and open inboard driveshield (E).

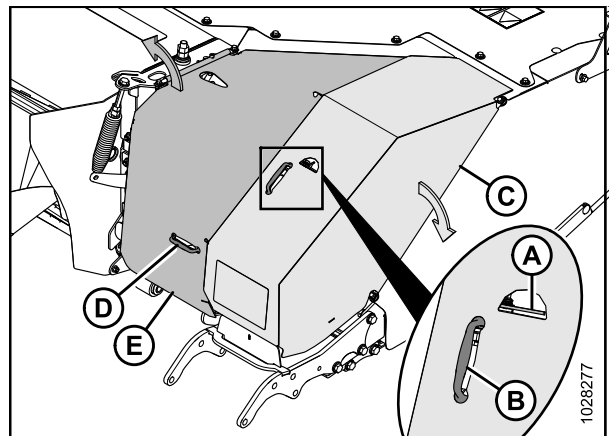


Figure 4.129: Right Driveshields

MAINTENANCE AND SERVICING

5. Remove the right driveshield (A). Refer to [4.10.1 Removing Driveshields, page 146](#).

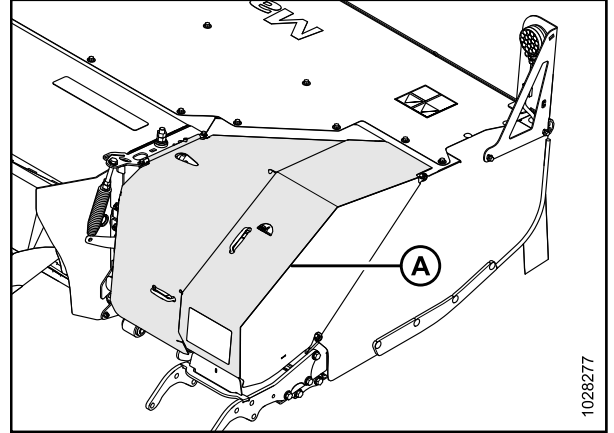


Figure 4.130: Right Driveshield

Checking conditioner roll timing gearbox 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.

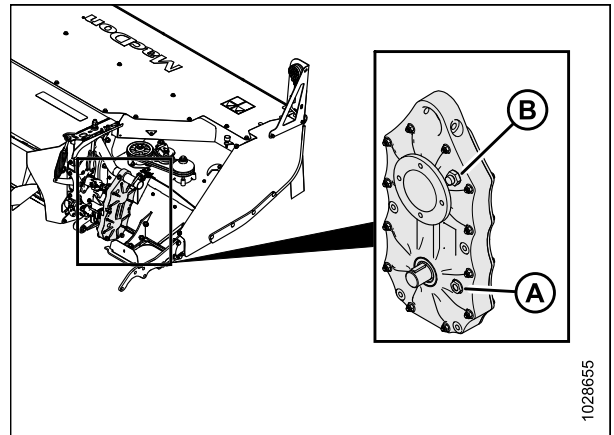


Figure 4.131: Roll Timing Gearbox

Changing conditioner roll timing gearbox oil:



WARNING

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

MAINTENANCE AND SERVICING

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. Refer to [3.3.1 Engaging and Disengaging Header Safety Props – M1240 Windrower, page 22](#).
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, reinstall oil drain plug (A), and tighten.
15. Fill with the specified volume of oil as listed on the inside back cover of this manual or until level is visible in the sight glass (B).
16. Reinstall driveshields. Refer to [4.10.2 Installing Driveshields, page 147](#).
17. Lower the header.
18. Properly dispose of oil.

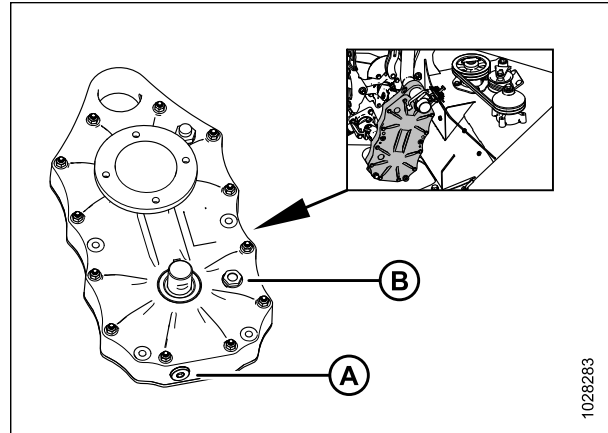


Figure 4.132: Roll Timing Gearbox

4.7 Servicing Header Drive Gearbox

The 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. Refer to [4.3 Maintenance Requirements, page 64](#).

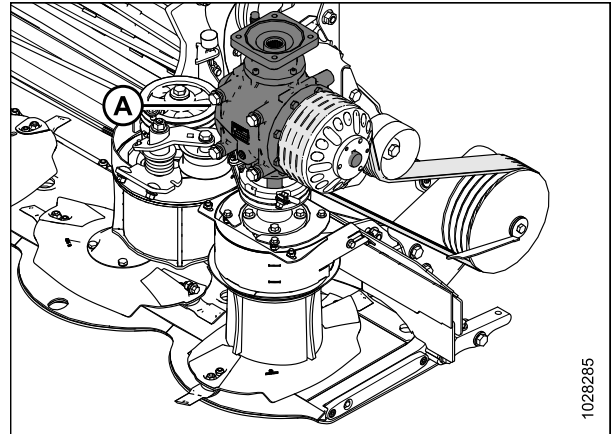


Figure 4.133: Header Drive Gearbox

4.7.1 Checking Header Drive Gearbox Oil

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).

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.



WARNING

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

1. Adjust the header height until the cutterbar is parallel with the ground.
2. Stop the engine and remove the key.
3. Open left driveshield. For instructions, refer to [3.6.1 Opening Driveshields, page 39](#).

MAINTENANCE AND SERVICING

4. Locate gearbox (A) on the left side of the header.

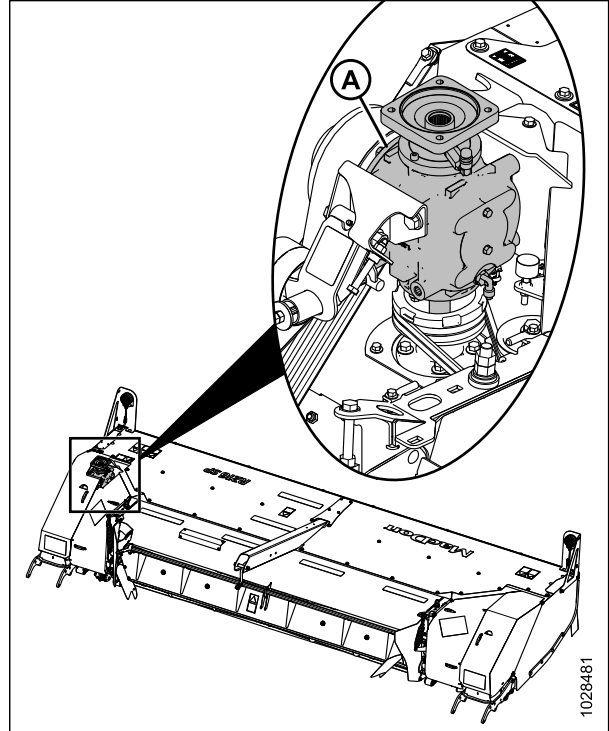


Figure 4.134: Header Drive Gearbox Location

5. Clean area around check plug (A).
6. Remove check plug (A) with a 13 mm (1/2 in.) socket.
7. Ensure lubricant is even with bottom of check hole (A) or slightly runs out of hole (A).
8. If necessary, remove fill plug (B) and add lubricant to gearbox through hole (B) until lubricant runs out of hole (A). Refer to the inside back cover of this manual for lubricant information.
9. Reinstall plug(s) and tighten.
10. Close left driveshield and lower header.

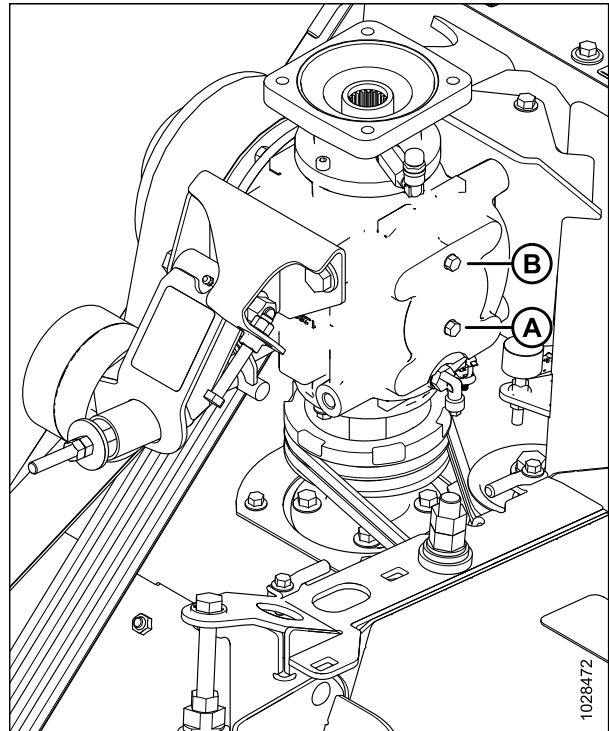


Figure 4.135: Header Drive Gearbox

4.7.2 Changing Header Drive Gearbox Oil

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).

WARNING

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

1. 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.
2. Place a 4 liter (1 gal. [US]) container under drain (A).
3. Remove hex plug (A).
4. Allow sufficient time for oil to drain, reinstall oil drain plug (A), and tighten.
5. Remove the check plug (B) and fill plug (C).
6. Add lubricant through hole (C) until the oil level is even with check hole (B). Refer to for a list of recommended fluid and lubricant types and amounts.
7. Replace the check plug (B) and fill plug (C). Tighten plugs.
8. Clean up any spilled oil and properly dispose of used oil and wipes.
9. Lower the cutterbar curtain. Refer to [3.7.2 Closing Cutterbar Curtain, page 43](#).

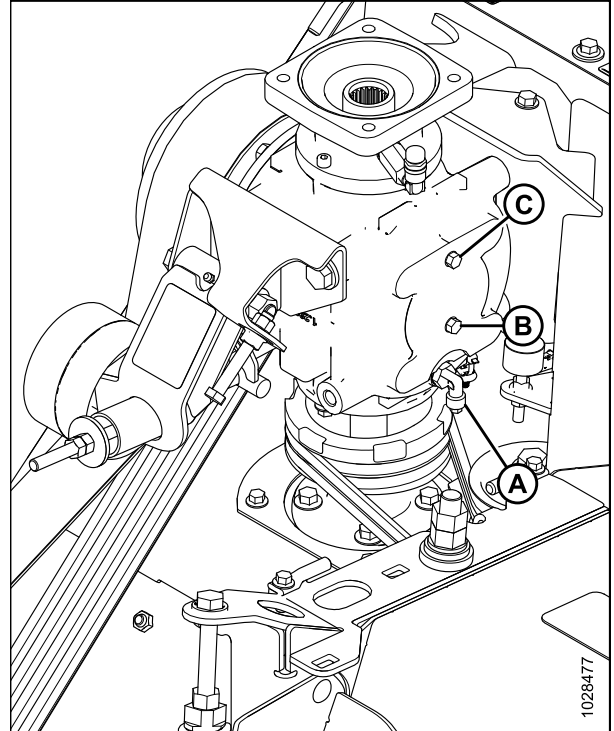


Figure 4.136: Header Drive Gearbox

4.8 Cutterbar Curtain

A 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.

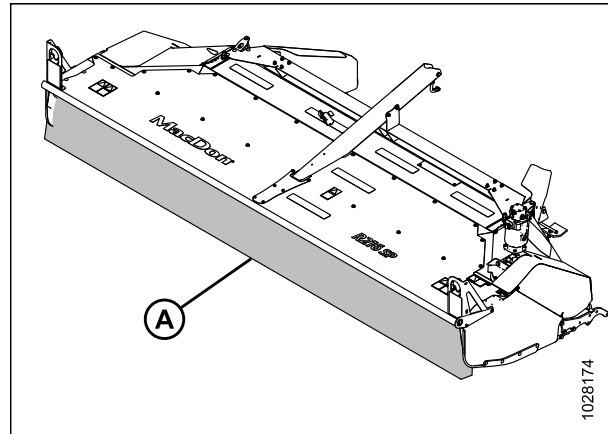


Figure 4.137: Cutterbar Curtain

4.8.1 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 or machine damage, do NOT operate the machine without curtain installed and in good condition. Foreign objects 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.

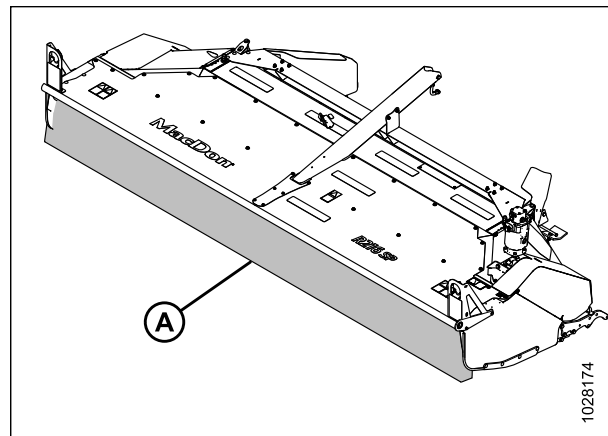


Figure 4.138: Cutterbar Curtain

4.8.2 Removing Cutterbar Curtain

1. Open cutterbar curtain (A). Refer to [3.7.1 Opening Cutterbar Curtain](#), page 42.

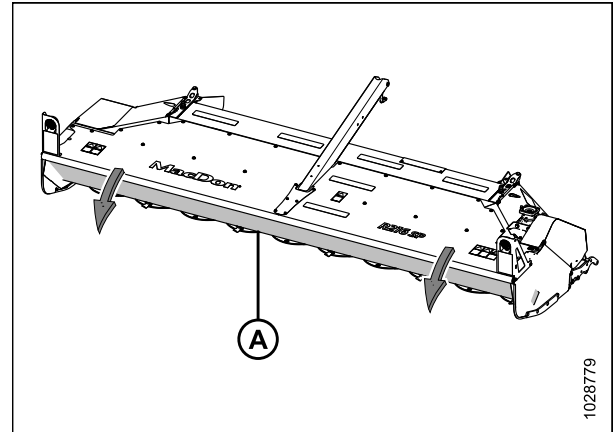


Figure 4.139: Cutterbar Curtain

NOTE:

Cutterbar removed from illustration for clarity.

2. Remove hex flange head bolt and washer (A) securing curtain (B) to the inboard side of the end panel.
3. Loosen six lock nuts (C) securing curtain (B) to the front of the header frame. Do **NOT** remove nuts at this time.

NOTE:

Curtain seam is on the inside.

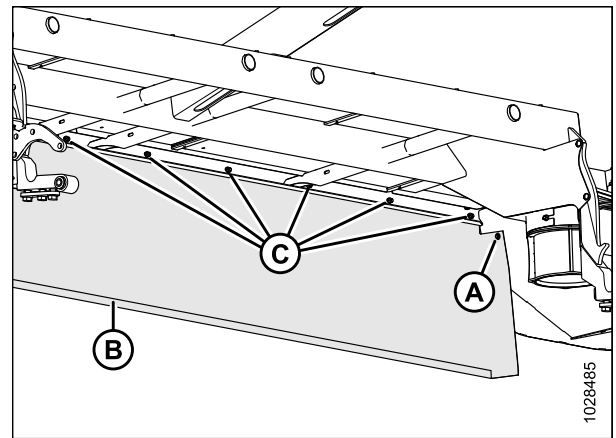


Figure 4.140: Cutterbar Curtain – View from Below

NOTE:

Top shield removed from illustration for clarity.

4. Remove bumper (A).
5. Remove six M10 bolts (B), six lock nuts (C), and bumper mount (D).
6. Repeat Steps [2, page 131](#) to [5, page 131](#) at the opposite end of the header.
7. Remove curtain (E).

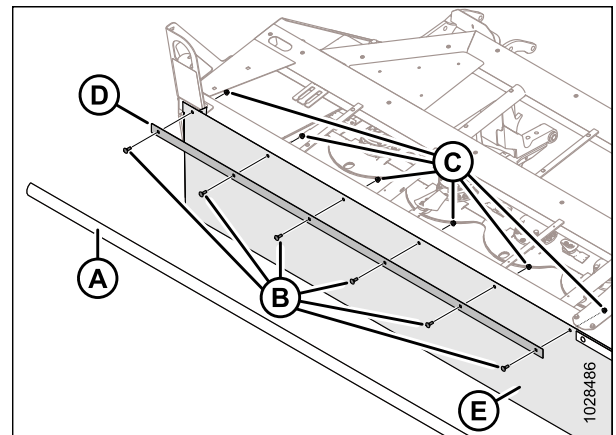


Figure 4.141: Cutterbar Curtain – View from Front

4.8.3 Installing Cutterbar Curtain

NOTE:

Top shield removed from illustration for clarity.

1. Position curtain (E) on the front of the header frame.
2. Secure curtain with bumper mount (D), six M10 bolts (B), and six lock nuts (C). Do **NOT** tighten nuts at this time.
3. Slide bumper (A) onto bumper mount (D) from outboard end.

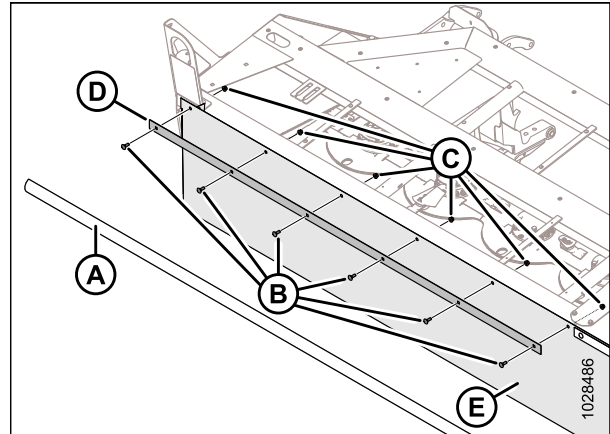


Figure 4.142: Cutterbar Curtain – View from Front

NOTE:

Cutterbar removed from illustration for clarity.

4. Tighten six lock nuts (C) securing curtain (B) to the front of the header frame.
5. Secure curtain to the inboard side of the end panel with a hex flange head bolt and washer (A). Tighten bolt and washer.
6. Repeat Steps 1, page 132 to 5, page 132 at the opposite end of the header.

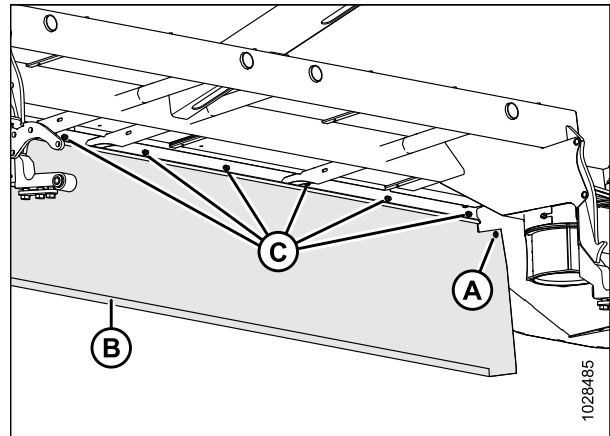


Figure 4.143: Cutterbar Curtain – View from Below

4.9 Conditioner

Rolls condition the crop by crimping and crushing the stem in several places, which allows the release of moisture resulting in faster drying times. R216 SP headers are equipped with steel conditioner rolls.

4.9.1 Inspecting Conditioner

DANGER

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

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). Refer to [3.6.1 Opening Driveshields](#), page 39.

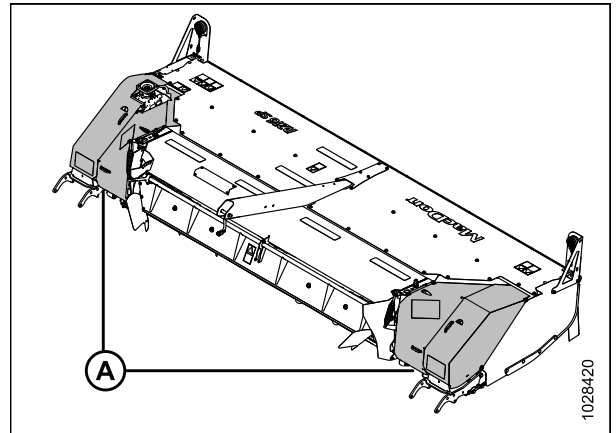


Figure 4.144: Driveshields

4. Inspect conditioner roll left bearing (A) for signs of wear or damage. If the bearing needs replacing, contact your Dealer.

NOTE:

Bearing is located on the inboard side of the pulley.

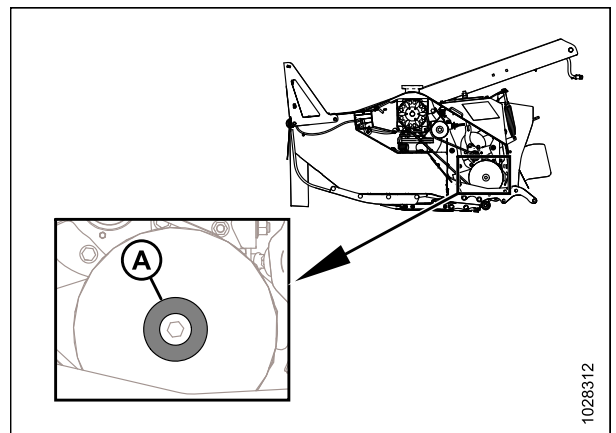


Figure 4.145: Conditioner Roll Left Bearing

MAINTENANCE AND SERVICING

5. Inspect conditioner drive U-joints (A) for signs of wear or damage. If the U-joints need replacing, contact your Dealer.

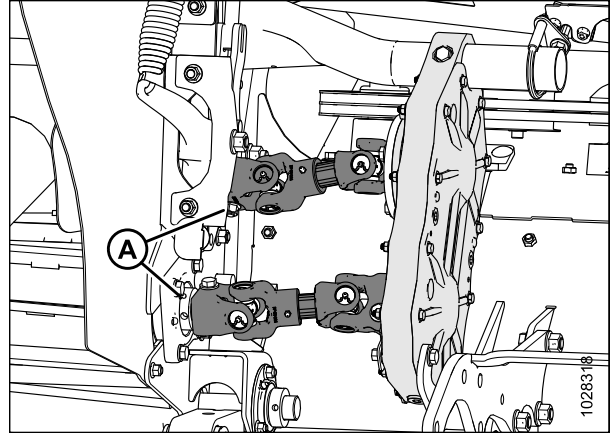


Figure 4.146: Conditioner Drive U-Joints

6. Inspect roll timing gearbox bearings (A) for signs of wear or damage. If the bearing needs replacing, contact your Dealer.

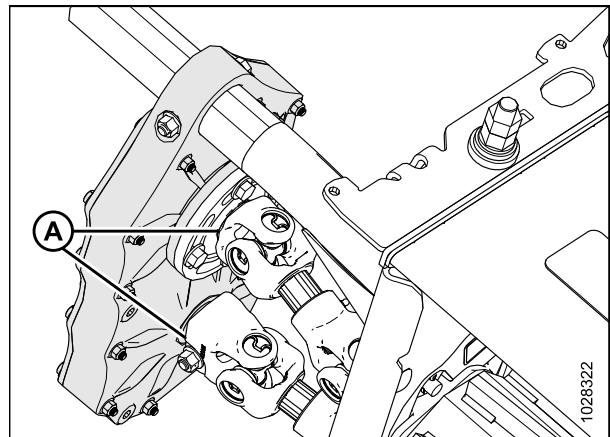


Figure 4.147: Roll Timing Gearbox Bearings

Conditioner Drive Belt

The conditioner drive belt is located inside the left driveshield and is tensioned with a spring tensioner.

Inspecting Conditioner Drive Belt

Check the belt tension and inspect for damage or wear every 50 hours or annually (preferably before the start of the cutting season).



WARNING

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

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

MAINTENANCE AND SERVICING

3. Open left driveshield (A). Refer to [3.6.1 Opening Driveshields, page 39](#).

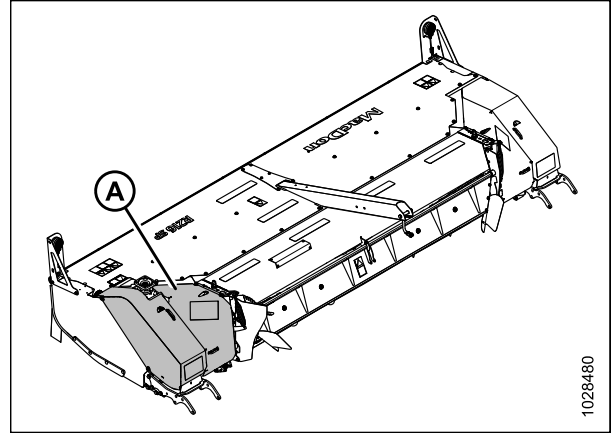


Figure 4.148: Left Driveshield

4. Inspect drive belt (A) and replace if damaged or cracked.
5. Check that jam nut (B) and adjuster nut (C) are tight.

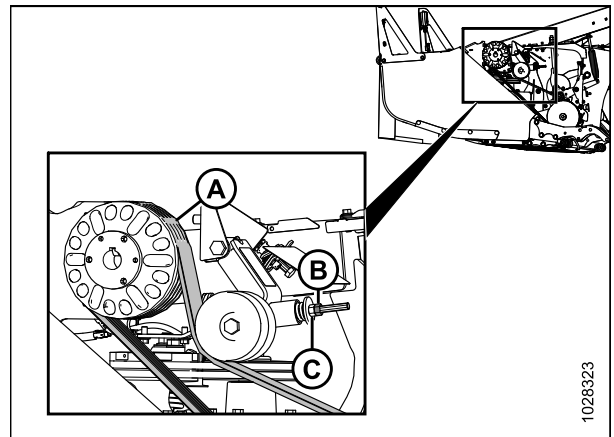


Figure 4.149: Conditioner Drive

6. Measure the length of belt tensioner spring (A) and ensure spring length (B) is 17 mm (11/16 in.) in accordance with spring tension decal (C). If the spring length requires adjustment, refer to [Installing Conditioner Drive Belt, page 137](#).
7. Close the driveshield. Refer to [3.6.2 Closing Driveshields, page 41](#).

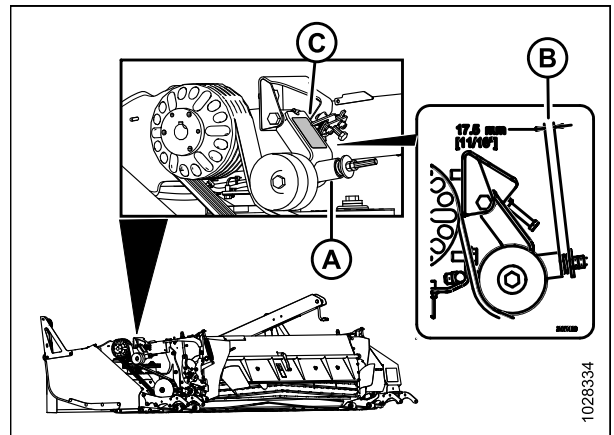


Figure 4.150: Belt Tension Spring

Removing Conditioner Drive Belt

WARNING

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

1. Lower the header fully.
2. Shut down the engine, and remove key from the ignition.
3. Remove the left driveshield. Refer to [3.6.1 Opening Driveshields, page 39](#).
4. Disconnect wire harness (A) from speed sensor (B).

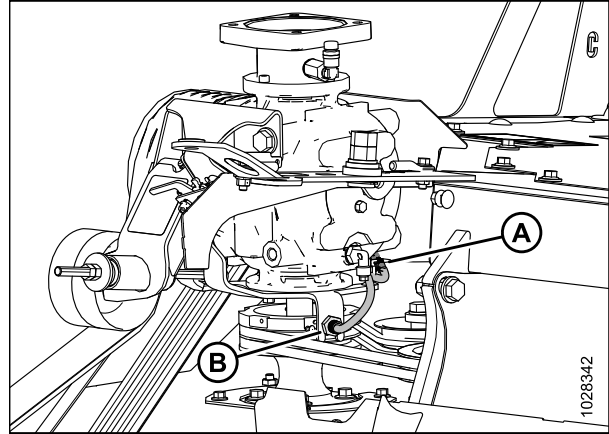


Figure 4.151: Speed Sensor Assembly

5. Turn jam nut (A) counterclockwise to unlock the tension adjustment.
6. Turn jam nut (A) and adjuster nut (B) counterclockwise to fully collapse tensioner spring (C), and release the tension from conditioner drive belt (D).
7. Remove drive belt (D).

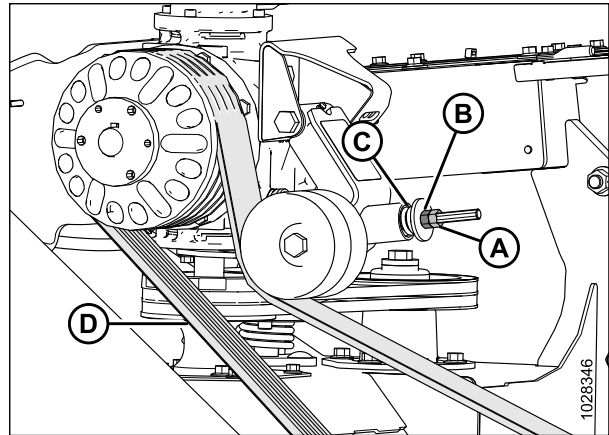


Figure 4.152: Conditioner Drive

Installing Conditioner Drive Belt

WARNING

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

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Open left driveshield (A). Refer to [3.6.1 Opening Driveshields, page 39](#).

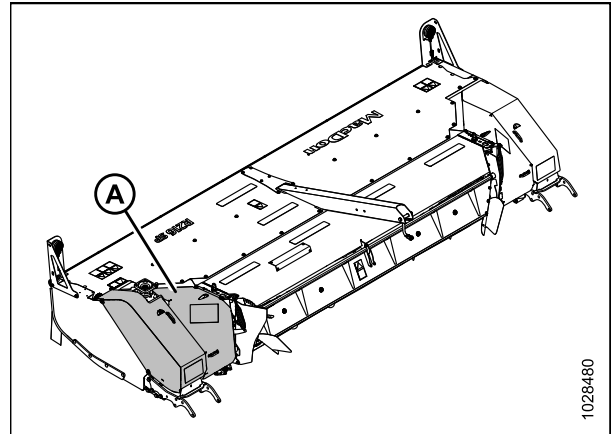


Figure 4.153: Left Driveshield

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.

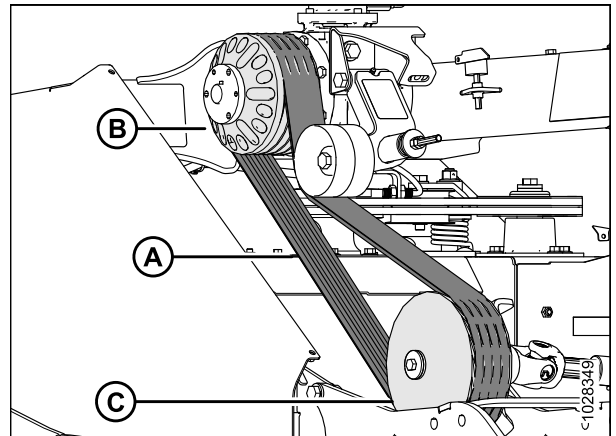


Figure 4.154: Conditioner Drive

MAINTENANCE AND SERVICING

5. Measure the length of tensioner spring (C). For proper belt tension, dimension (D) should be set to 17 mm (11/16 in.).
6. To adjust spring tension, loosen jam nut (A) by turning it counterclockwise.
7. Turn adjuster nut (B) clockwise to increase tensioner spring/belt tension or turn adjuster nut (B) counterclockwise to decrease tensioner spring/belt tension.
8. Once the correct spring measurement has been achieved, hold adjuster nut (B) in place and tighten jam nut (A) against it by turning the jam nut clockwise.

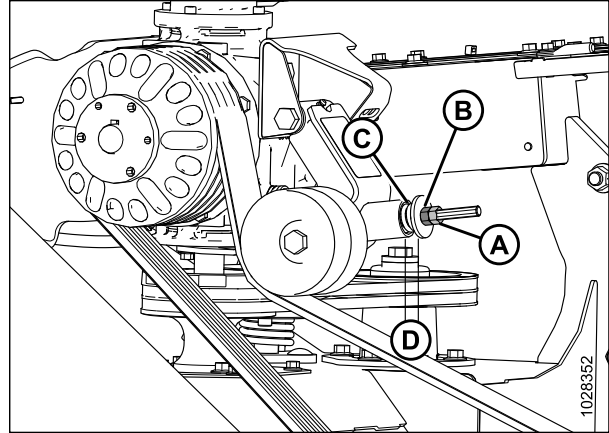


Figure 4.155: Conditioner Drive

9. Reconnect speed sensor (B) to wiring harness (A).
10. Close the left driveshield. Refer to [3.6.2 Closing Driveshields, page 41](#).

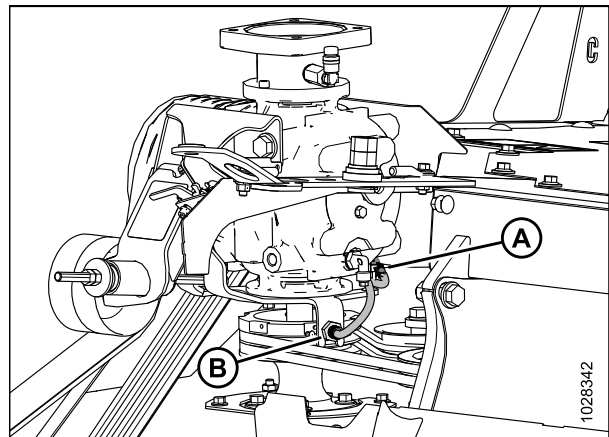


Figure 4.156: Speed Sensor

Changing the Conditioner

R216 SP Series Rotary Disc Headers are equipped with a steel roll conditioner. Rolls condition the crop by crimping and crushing the stem in several places, which allows the release of moisture resulting in faster drying times.

Follow these instructions to remove or install conditioners.

Removing the Conditioner

This procedure is applicable when the header is not attached to the windrower. If necessary, detach the header from the windrower before proceeding.

1. Remove the driveshields. Refer to [4.10.1 Removing Driveshields, page 146](#).

2. Move hose bundle (A) clear of the frame and lay it on the header.

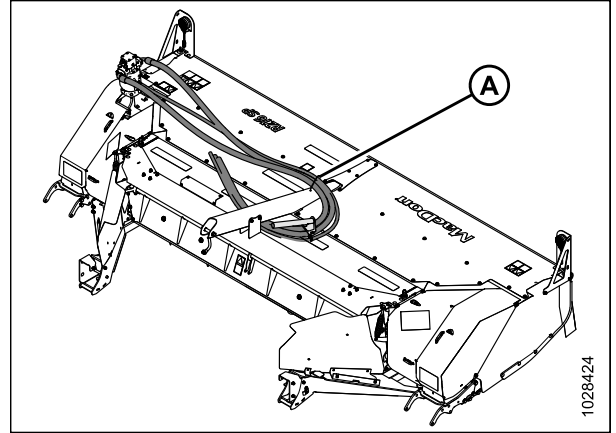


Figure 4.157: M1 Series Hose Bundle

3. If remote baffle kit is installed, disconnect linear actuator harness (A) from main harness and remove clevis pin (B) and lynch pin from clevis support (C), otherwise proceed to Step 4, [page 139](#).

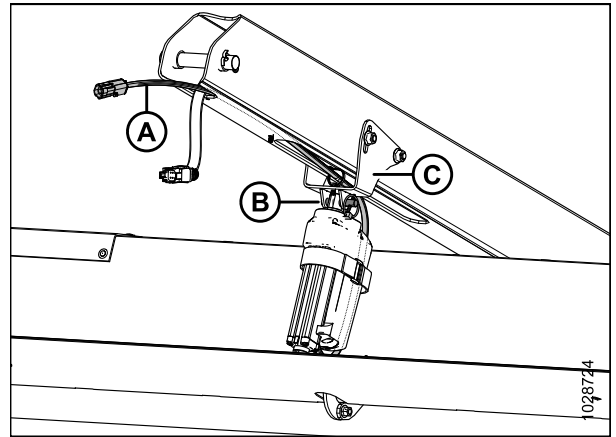


Figure 4.158: Linear Actuator

4. Remove two M10 hex flange bolts (A) and two M10 short square neck carriage head bolts (B) securing the fixed deflector support (C) to the header support deflector, and remove the support.

NOTE:

Left fixed deflector support is shown, right is similar.

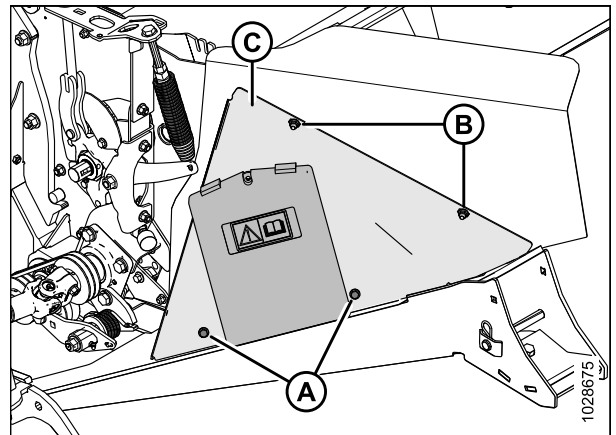


Figure 4.159: Fixed Deflector Support – Left Side of Header

MAINTENANCE AND SERVICING

5. Remove three M10 short square neck carriage head bolts (A) securing the header support deflector (B) to the header support, and remove the deflector.
6. Repeat Steps 4, page 139 and 5, page 140 at the opposite side of the header.

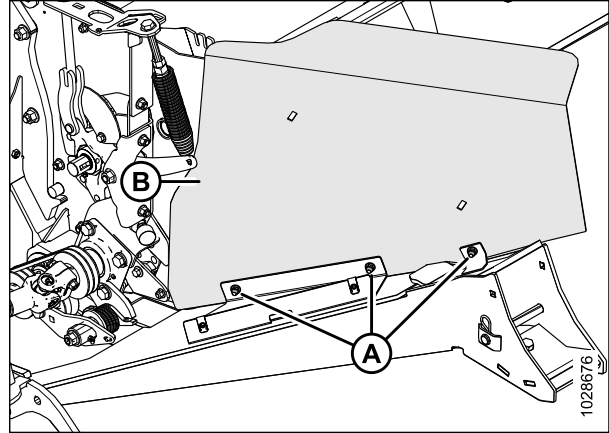


Figure 4.160: Header Support Deflector – Left Side of Header

WARNING

To prevent straps from slipping off forks, ensure straps are securely attached to forks. Failure to do so could result in death or serious injury.

7. Attach spreader bar (A) to a forklift (or equivalent lifting device) and attach chains to lugs (B) on conditioner (C). Use a chain rated for overhead lifting with a minimum working load of 1135 kg (2500 lb.).

NOTE:

Header supports removed from illustration for clarity.

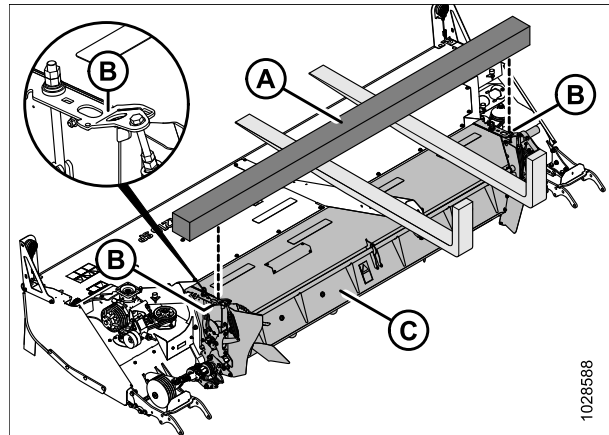


Figure 4.161: Spreader Bar

8. Release spring lock quick coupling yoke (C) of conditioner driveline (B), and secure driveline to the conditioner housing to keep it out of the way.
9. If removing the conditioner driveline (B) from conditioner, loosen M12 hex head bolt (A) securing driveline to the conditioner. Remove M12 bolt (A), washer, and hex flange center lock nut, and remove conditioner driveline.

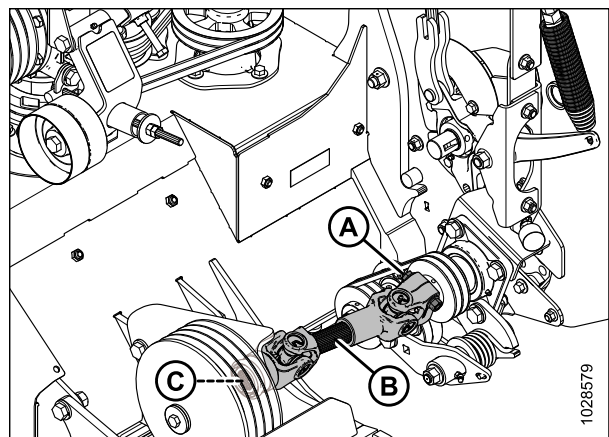


Figure 4.162: Conditioner Driveline – Left Side of Header

10. Loosen two M16 hex head bolts (A) at each side of the conditioner that secure it to the header.

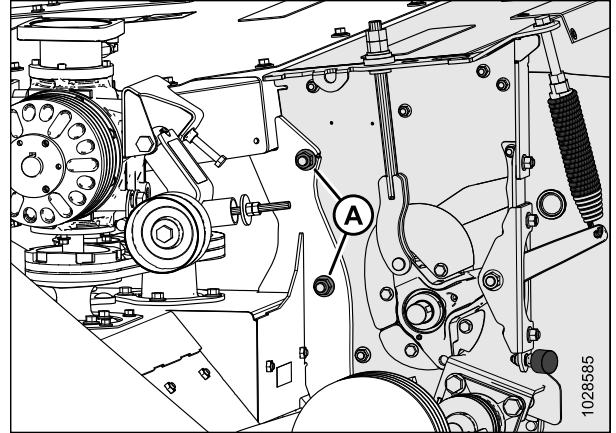


Figure 4.163: Left Side of Conditioner – Right Side Similar

11. Loosen two M12 hex head bolts (A) securing conditioner gearbox (B) to the header.



WARNING

To prevent the conditioner from falling backward, ensure lifting chains are secure and tight. Failure to do so may result in death or serious injury.



CAUTION

Stand clear when detaching conditioner as conditioner may shift when bolts are removed.

12. Adjust the height of the forks to raise the conditioner slightly. Remove the loosened bolts and retain hardware for reinstallation.

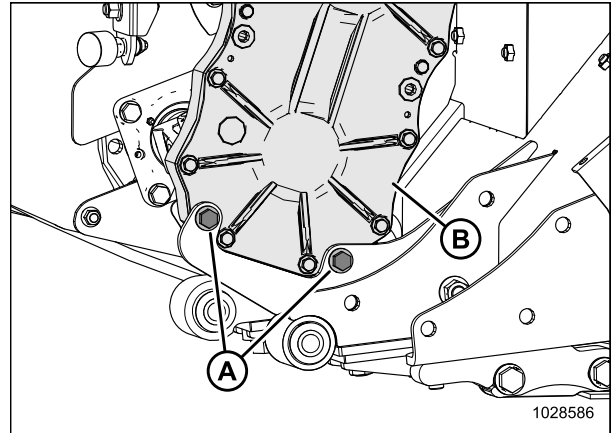


Figure 4.164: Conditioner Gearbox



WARNING

Ensure spreader bar is secured to the forks so that it cannot slide off the forks or towards the header. Failure to do so could result in death or serious injury.

13. Using the forklift, lift conditioner (A) off header (B). Avoid contact between the top of the conditioner and center-link anchor (C).

NOTE:

Header supports removed from illustration for clarity.

14. Move the conditioner away from the work area, set it on the ground, and remove the chains securing the conditioner to the spreader bar.

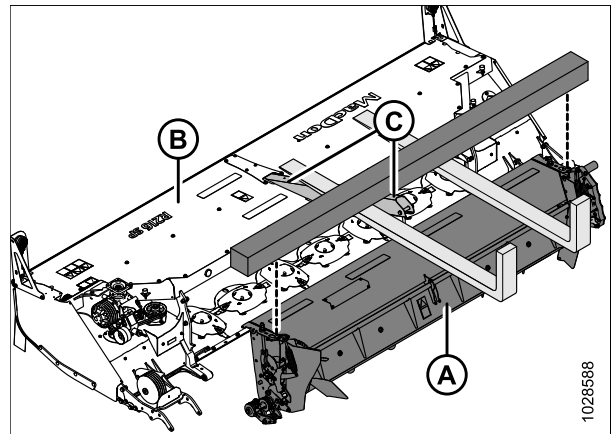


Figure 4.165: Conditioner Lift

Installing the Conditioner

This procedure is applicable when the header is not attached to the windrower. If necessary, detach the header from the windrower before proceeding.

WARNING

Ensure spreader bar is secured to the forks so that it cannot slide off the forks or towards the header while attaching the conditioner to the header. Failure to do so could result in death or serious injury.

1. Attach spreader bar (A) to the forklift (or equivalent lifting device) and attach chains to lugs (B) on the conditioner. Use a chain rated for overhead lifting with a minimum working load of 1135 kg (2500 lb.).
2. Lift conditioner (C) and align it with the header opening. Avoid contact between the top of the conditioner and the center-link anchor.
3. Carefully align pin (B) at each end of conditioner (A) with lug (C) on the header. Lower conditioner (A) until pins (B) engage lugs (C) on the header.

NOTE:

Avoid contact between the top of the conditioner and the center-link anchor.

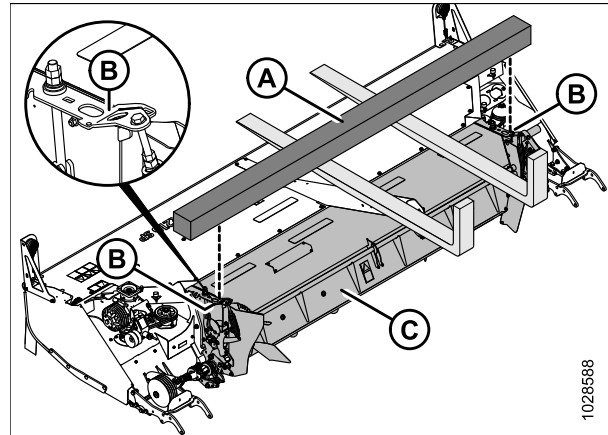


Figure 4.166: Conditioner Lift

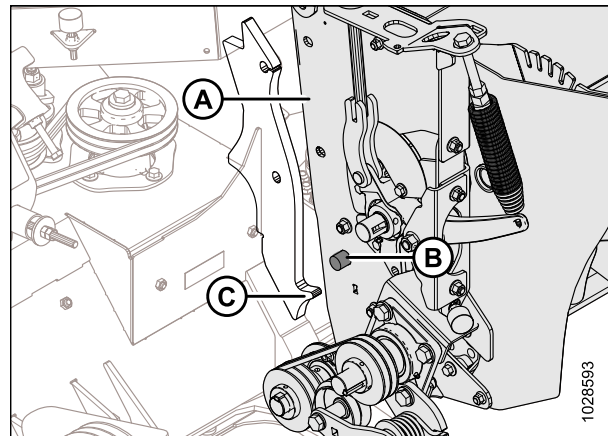


Figure 4.167: Installing Conditioner

4. Align the mounting holes and install two M16 x 60 hex head bolts (A) (one per side) and two M16 x 75 hex head bolts (B) (one per side) with the heads facing inboard. Secure with M16 center lock flanged nuts. Do **NOT** tighten.

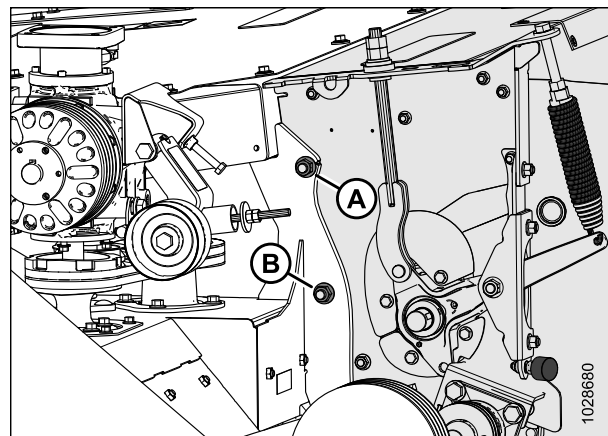


Figure 4.168: Left Side of Conditioner –
Right Side Similar

MAINTENANCE AND SERVICING

5. Loosen bolts (A) and (B) on gearbox support (C). Do **NOT** remove hardware.

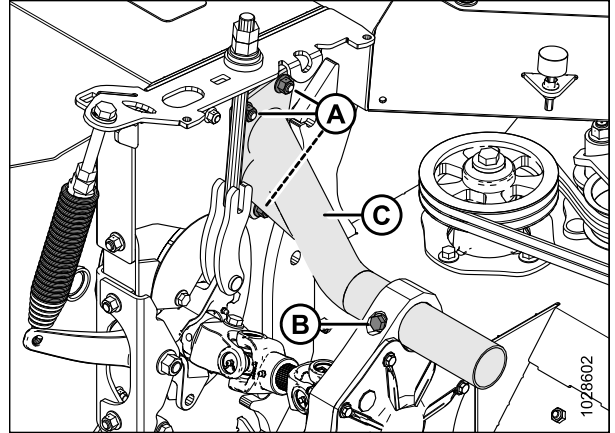


Figure 4.169: Conditioner Gearbox Support

6. Align the holes in the conditioner gearbox (A) with the mounting holes in the header frame (B). Apply high-strength threadlocker (Loctite® 262 or equivalent) on two M12 hex head bolts (C), and install bolts and washers to secure conditioner gearbox (A) to the header.
7. Torque bolts to 139 Nm (103 lbf·ft).

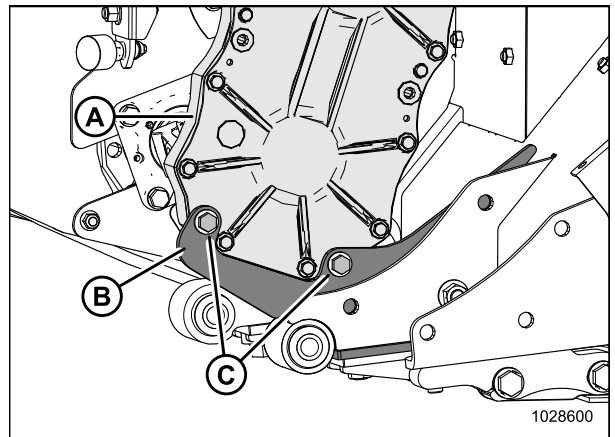


Figure 4.170: Conditioner Gearbox

8. Tighten bolts (A) and (B) on gearbox support (C).

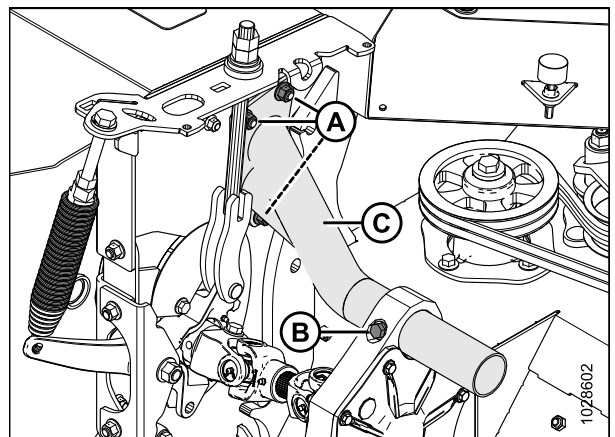


Figure 4.171: Conditioner Gearbox Support

9. Torque nuts (A) to 170 Nm (126 lbf·ft) on both sides of the conditioner.

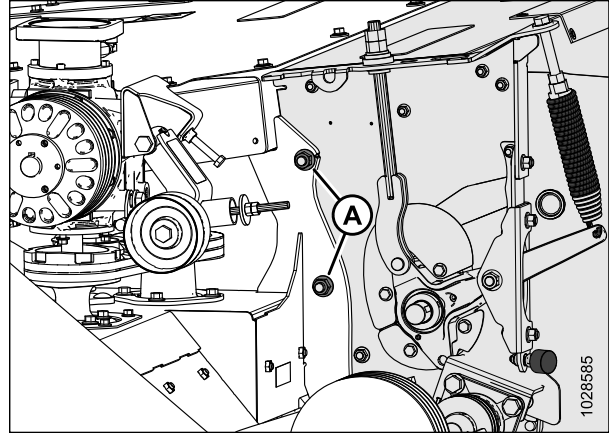


Figure 4.172: Left Side of Conditioner –
Right Side Similar

NOTE:

Ensure feed roll rotates freely and that there is sufficient clearance between the feed roll pulley (C) and frame for belt removal before installing driveline.

10. Apply an anti-seize compound to splined shaft (D) if necessary, and install spring lock quick coupling yoke of driveline (B) as shown.

NOTE:

Anti-seize compound is applied to splined shaft of driveline before leaving the factory.

11. If conditioner driveline (B) was removed from conditioner, secure driveline to the conditioner with a M12 hex head bolt (A), washer, and hex flange center lock nut. Torque bolt (A) to 69 Nm (51 lbf·ft).
12. Remove the lifting chains from the conditioner and move the lifting device clear of the work area.
13. Position the header support deflector (B) onto the header support as shown, and install three M10 short square neck carriage head bolts (A) and hex flange nuts. Bolt heads face inboard.
14. Torque bolts (A) to 53 Nm (39 lbf·ft).

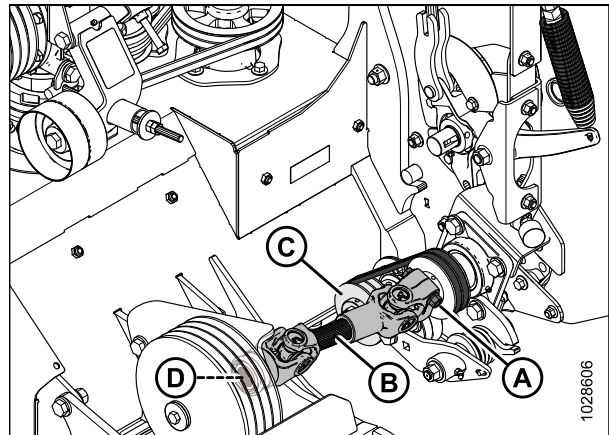


Figure 4.173: Conditioner Driveline – Left Side
of Header

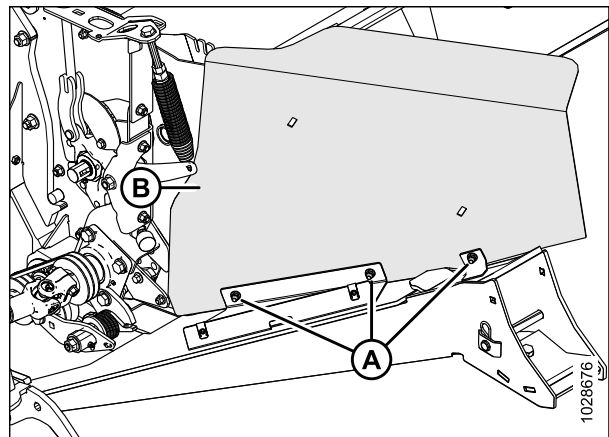


Figure 4.174: Header Support Deflector – Left Side
of Header

15. Position the fixed deflector support (C) onto the header support deflector as shown, and install two M10 short square neck carriage head bolts (B). Bolt heads face inboard.
16. Apply medium-strength threadlocker (Loctite® 243 or equivalent) to the threads of two M10 hex flange bolts (A), and install M10 bolts (A) as shown to secure the fixed deflector support to the header support.

NOTE:

Ensure header support deflector in Figure 4.174, page 144 is flush with inboard side of header support once fixed deflector support is installed.

17. Torque bolts (A) and (B) to 53 Nm (39 lbf·ft).
18. Repeat Steps 13, page 144 to 17, page 145 at the opposite side of the header.
19. If remote baffle kit is installed, connect linear actuator harness (A) to main harness and secure linear actuator to clevis support (C) with clevis pin (B) and lynch pin, otherwise proceed to Step 20, page 145.

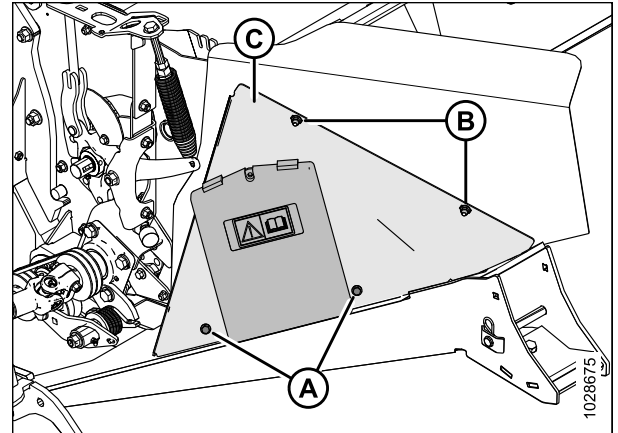


Figure 4.175: Fixed Deflector Support – Left Side of Header

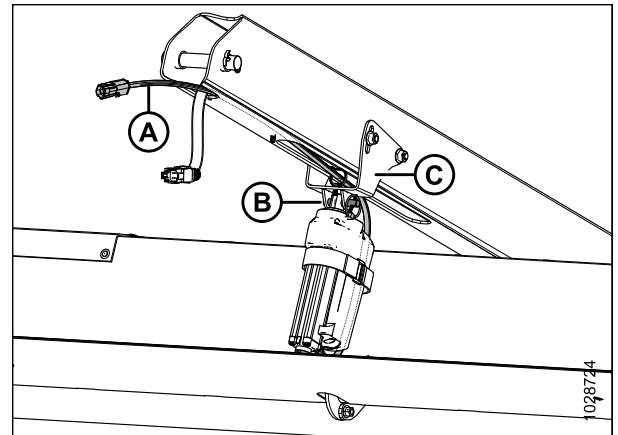


Figure 4.176: Linear Actuator

20. Reposition hose bundle (A) on the frame.
21. Install the driveshields. Refer to 4.10.2 Installing Driveshields, page 147.

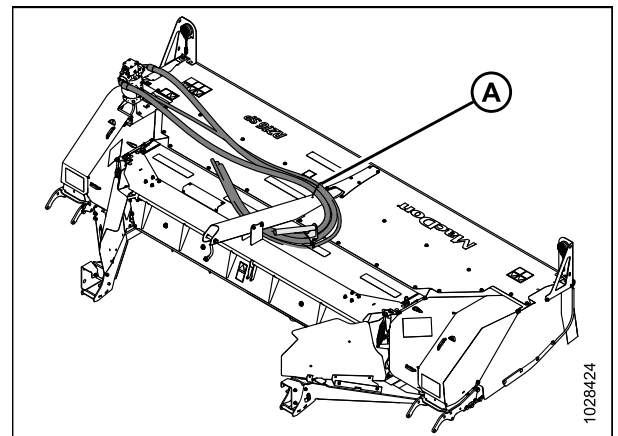


Figure 4.177: M1 Series Hose Bundle

4.10 Replacing Driveshields

If driveshields are missing, severely damaged, or are not securely installed due to damage, they must be replaced.

4.10.1 Removing Driveshields

CAUTION

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

NOTE:

Images shown in this procedure are for the left driveshield—the right driveshield is similar.

1. Open driveshields. Refer to [3.6.1 Opening Driveshields](#), [page 39](#).

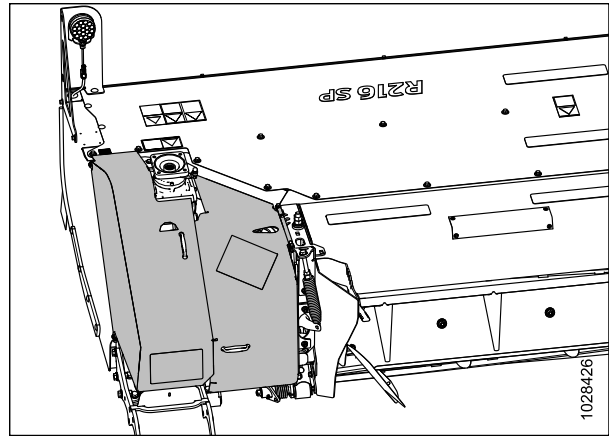


Figure 4.178: Left Driveshield

2. Remove bolt (C), retainer pin (B), and washer (A) from the top and bottom of the outboard and inboard half of the driveshield.

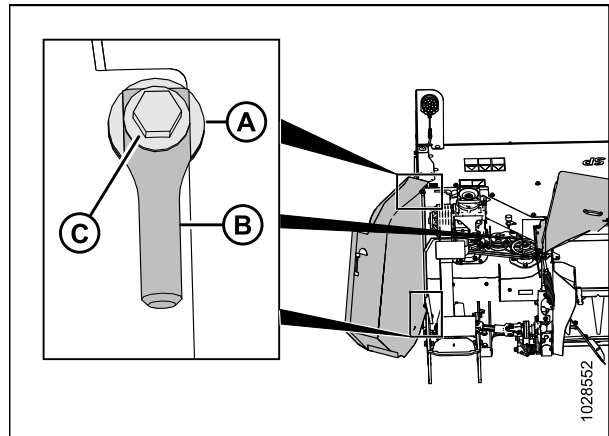


Figure 4.179: Retaining Pins on Driveshields

3. Pull the outboard side (A) and inboard side (B) of driveshield away from the header to remove.

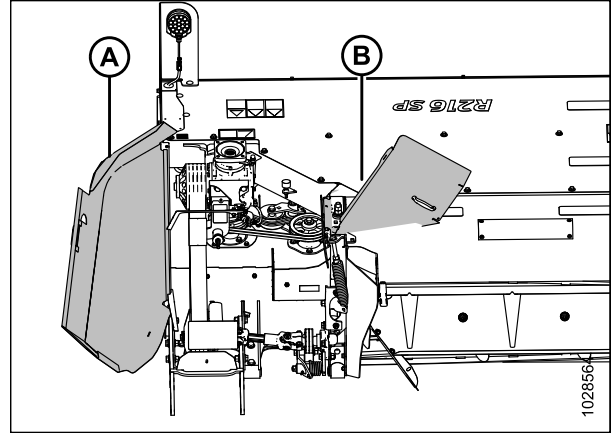


Figure 4.180: Inboard and Outboard Half of Driveshield

4.10.2 Installing Driveshields



CAUTION

Do NOT operate the machine without the driveshields in place and secured.

NOTE:

Images shown in this procedure are for the left driveshield—the right driveshield is similar.

1. Position outboard half (A) and outboard half (B) of driveshield as shown.

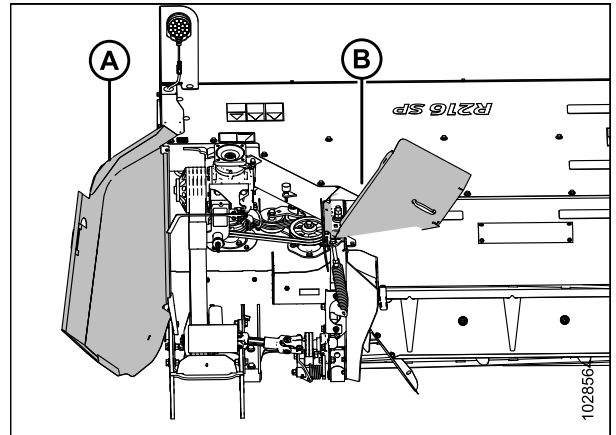


Figure 4.181: Inboard and Outboard Half of Driveshield

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2. Secure top and bottom of inboard and outboard driveshields with washer (A), retaining pin (B), and bolt (C).

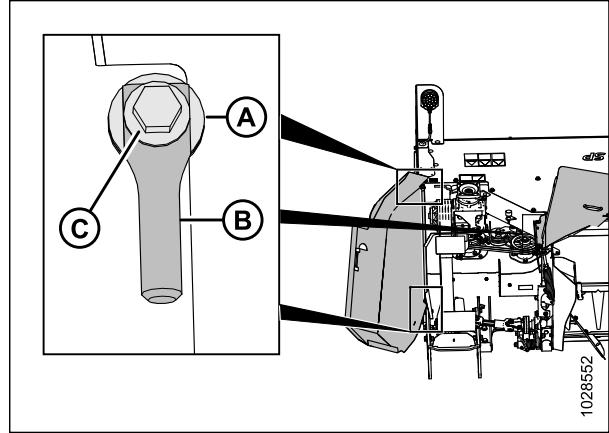


Figure 4.182: Retaining Pins and Hardware on Driveshield

3. Close driveshields. Refer to [3.6.2 Closing Driveshields, page 41](#).

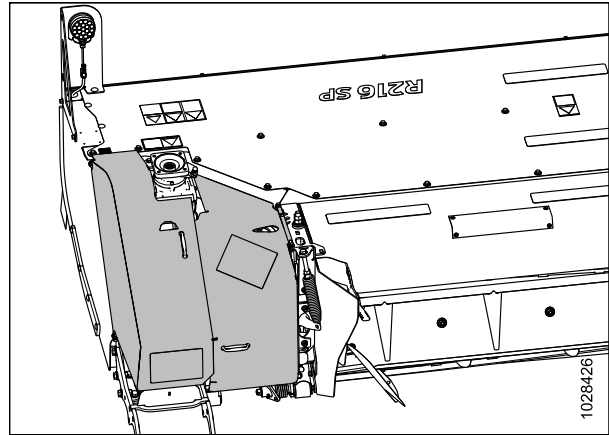


Figure 4.183: Left Driveshield

4.11 Electrical System

4.11.1 Maintaining Electrical System

- Use electrical tape and cable ties as required to prevent the wiring harness from dragging or rubbing.
- Keep lights clean.
- Replace damaged lights.

4.11.2 Replacing Amber Hazard/Signal Light

1. Detach harness (A) on light (B) from header harness (C).
2. Loosen nut (D), and then remove light (B) from light bracket (E). Discard light.
3. Loosen nut (D) on new light fixture (B), then insert light into light bracket (E).
4. Tighten nut (D) to secure light in place. Torque to 16 Nm (12 lbf-ft).
5. Connect light harness (A) to header harness (C).
6. Check operation of new light.

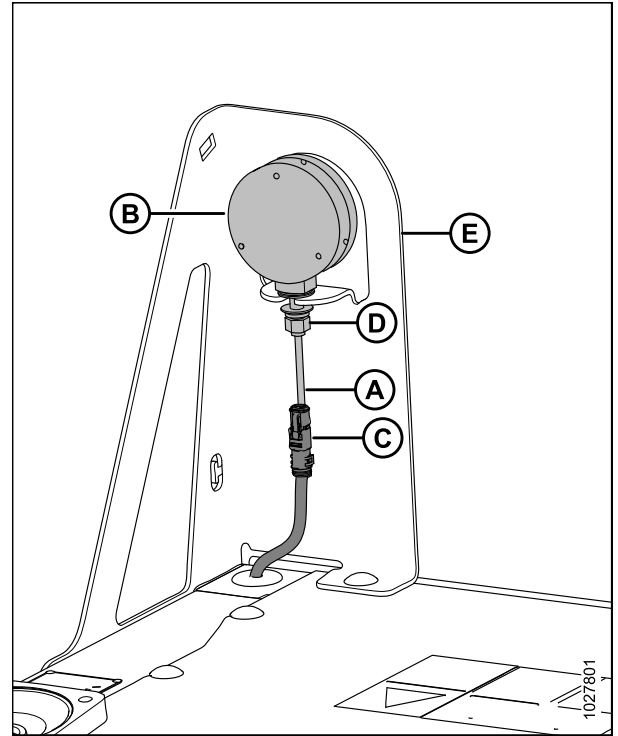


Figure 4.184: Left Amber Hazard/Signal Light

4.11.3 Replacing Header Disc Speed Sensor

If the header disc sensor malfunctions or is damaged, use this procedure to replace it.

1. Lower header fully.
2. Stop the engine, and remove the key.
3. Open the left driveshield. For instructions, refer to [3.6.1 Opening Driveshields, page 39](#).

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4. Disconnect wire harness (A) from speed sensor connector (B).
5. Remove fir tree clip and cable tie (E). Retain clip for reinstallation.
6. Remove nut (C) from end of sensor and remove sensor from bracket (D).
7. Remove nut from the end of new sensor, install the new sensor into bracket (D) and secure with nut (C).
8. Connect the sensor wire (B) to harness (A).

NOTE:

Ensure wires are clear of belt and pulley.

9. Secure with fir tree clip (E) and new cable tie.

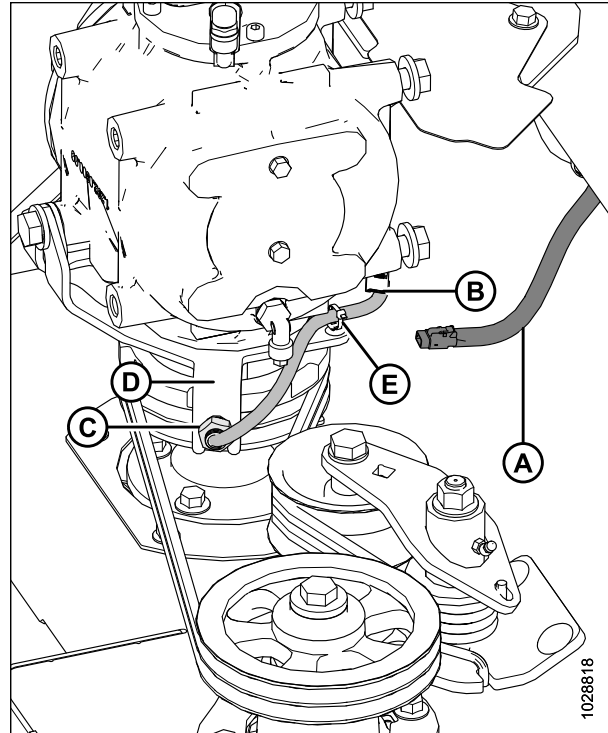


Figure 4.185: Header Disc Speed Sensor

10. Adjust nuts (A) as required to achieve a 2–3 mm (1/16–1/8 in.) gap (B) between the sensor (C) and the pulley (D). Ensure sensor face and pulley face are parallel. Bend bracket (E) as required.
11. Tighten nuts (A) to 12 Nm (9 lbf·ft).
12. Reinstall the driveshield. For instructions, refer to [4.10.2 Installing Driveshields, page 147](#).
13. Start windrower, engage header, and check operation of speed sensor on monitor. The sensor may require re-calibrating. Refer to the windrower operator's manual.

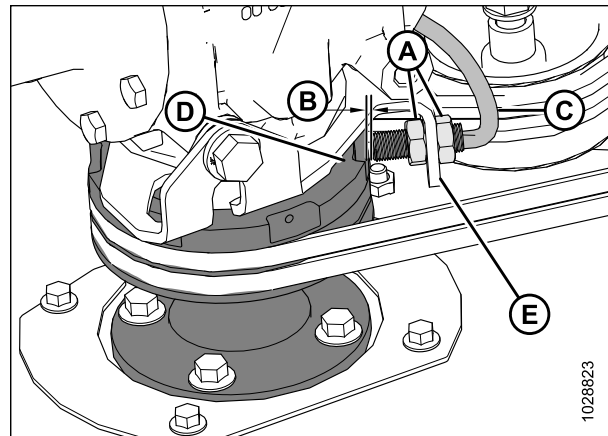


Figure 4.186: Header rpm Sensor

4.12 Hydraulics

4.12.1 Checking Hydraulic Hoses and Lines

Check hydraulic hoses and lines daily for signs of leaks.



WARNING

- Avoid high-pressure fluids. Escaping fluid can penetrate the skin causing serious injury. Relieve pressure before disconnecting hydraulic lines. Tighten all connections before applying pressure. Keep hands and body away from pin holes and nozzles which eject fluids under high pressure.
- If any fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type of injury or gangrene may result.



Figure 4.187: 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. Precision fits require a perfectly clean connection during overhaul.

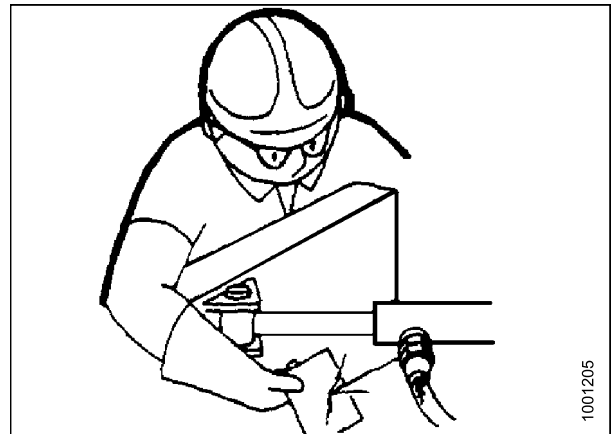


Figure 4.188: Testing for Hydraulic Leaks

Chapter 5: Options and Attachments

5.1 Performance Kits

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

5.1.1 Tall Crop Divider Kit

Tall crop dividers attach to the ends of the self-propelled disc header for clean crop dividing and cutterbar entry in tall crops. The kit (MD #B6665) includes left and right dividers and attachment hardware.

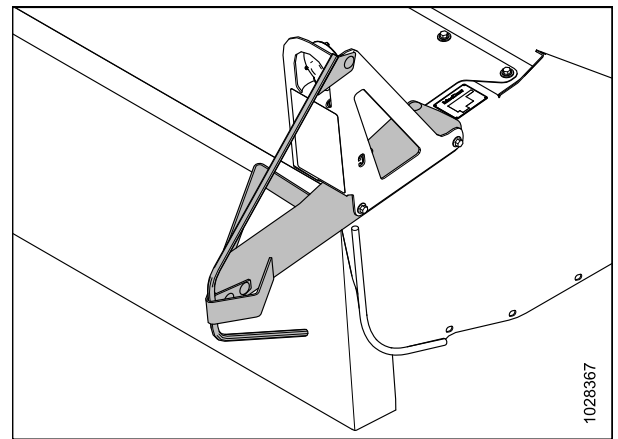


Figure 5.1: Left Side Tall Crop Divider

5.1.2 Adjustable Gauge Roller Kit

The Adjustable Gauge Roller kit (MD #B6666) allows the R216 Rotary Rotary Disc Header to achieve the desired cutting height for optimum cutting performance.

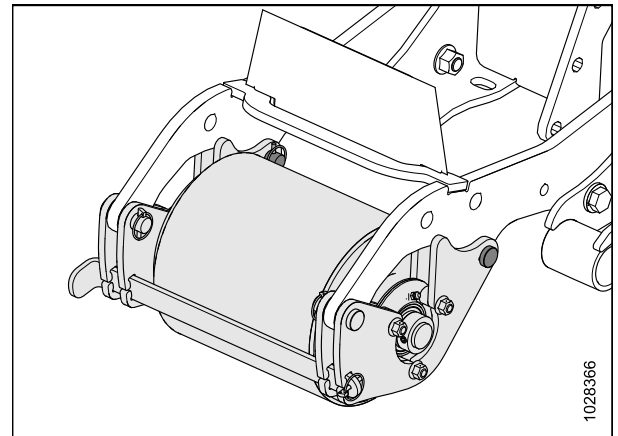


Figure 5.2: Adjustable Gauge Roller

5.1.3 Adjustable Skid Shoes Kit

The Adjustable Skid Shoes kit (MD #B6667) allows the R216 Rotary Rotary Disc Header to achieve the desired cutting height for optimum cutting performance.

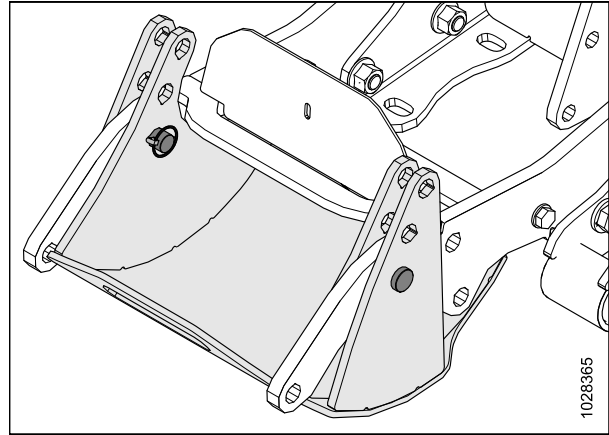


Figure 5.3: Adjustable Skid Shoe

5.1.4 Electric Remote Baffle Kit

The Electric Remote Baffle kit (MD #B6664), allows the operator to adjust the disc header baffle electronically from inside the windrower.

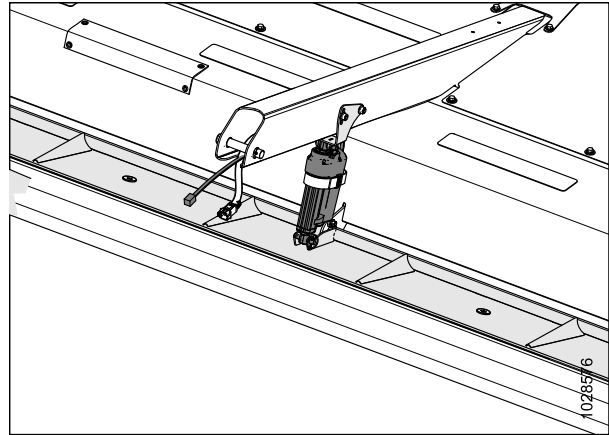


Figure 5.4: Electric Remote Baffle Kit

Chapter 6: Troubleshooting

6.1 Performance Problems

Problem	Solution	Refer to
Symptom: Cutterbar plugging		
Dull, bent, or badly worn discblades	Replace discblades.	<ul style="list-style-type: none"> Removing Discblades, page 90 Installing Discblades, page 92
Build-up of dirt between rock guards	Decrease header angle and increase float. In some conditions, it may be necessary to carry header slightly with header lift cylinders.	<ul style="list-style-type: none"> 3.8.1 Cutting Height, page 44 Refer to windrower operator's manual
Conditioner drive belt slipping	Adjust conditioner drive belt tension.	Conditioner Drive Belt, page 134
Symptom: Ragged or uneven cutting of crop		
Header angle too flat for guards to pick up downed crop	Increase header angle.	3.8.1 Cutting Height, page 44
Downed crop	Adjust header angle to cut closer to ground.	3.8.1 Cutting Height, page 44
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 discblades	Replace discblades.	<ul style="list-style-type: none"> Removing Discblades, page 90 Installing Discblades, page 92
Build-up of dirt between rock guards	Decrease header angle and increase float. In some conditions, it may be necessary to carry header slightly with header lift cylinders.	<ul style="list-style-type: none"> 3.8.1 Cutting Height, page 44 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.	4.5 Cutterbar System, page 71
Disc not turning	Replace spindle shear pin.	—
Ground speed too slow	Increase ground speed.	—
Symptom: Conditioner rolls plugging		
Ground speed too fast	Reduce ground speed.	—
Roll gap too large for proper feeding	Decrease roll gap.	<ul style="list-style-type: none"> Adjusting Roll Gap, page 49
Roll gap too small in thick-stemmed cane-type crops	Increase roll gap.	<ul style="list-style-type: none"> Adjusting Roll Gap, page 49
Swath baffle set too low	Raise swath baffle.	3.10.4 Adjusting Forming Shields – Roll Conditioner, page 54

TROUBLESHOOTING

Problem	Solution	Refer to
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.	4.5.2 Maintaining Cutterbar Discs, page 75
Cutting height too low	Decrease header angle to raise cutting height.	3.8.1 Cutting Height, page 44
Backing into windrow	Raise header before backing up.	—
Rolls improperly timed	Adjust roll timing.	Adjusting Roll Timing, page 51
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 56
Forming shields improperly adjusted	Adjust roll conditioner forming shields.	<ul style="list-style-type: none"> • Positioning Forming Shield Side Deflectors – Roll Conditioner, page 54 • Positioning Rear Baffle – Roll Conditioner, page 55
Roll gap too large	Adjust roll gap.	<ul style="list-style-type: none"> • Adjusting Roll Gap, page 49
Conditioner rolls running too slow	Maintain rated header speed.	Refer to windrower operator's manual
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	Replace blades or turn blades over.	<ul style="list-style-type: none"> • Removing Discblades, page 90 • Installing Discblades, page 92
Cutting height too high	Adjust header angle steeper to lower cutting height if field conditions allow.	3.8.1 Cutting Height, page 44
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.	<ul style="list-style-type: none"> • Adjusting Roll Gap, page 49
Symptom: Damaged leaves and broken stems		
Insufficient roll gap	Increase roll gap.	<ul style="list-style-type: none"> • Adjusting Roll Gap, page 49
Roll timing off	Check roll timing and adjust if necessary.	<ul style="list-style-type: none"> • Checking Roll Timing, page 51 • Adjusting Roll Timing, page 51
Symptom: Cutting height varies from one side to the other		
Float not properly balanced	Adjust header float.	Refer to windrower operator's manual

TROUBLESHOOTING

Problem	Solution	Refer to
Symptom: Slow crop drying		
Crop is bunched in windrow	Adjust forming shields/baffle.	<ul style="list-style-type: none"> Positioning Forming Shield Side Deflectors – Roll Conditioner, page 54 Positioning Rear Baffle Deflector Fins, page 56
Rolls not crimping crop sufficiently	Decrease roll gap.	<ul style="list-style-type: none"> Adjusting Roll Gap, page 49
Symptom: Excessive drying or bleaching of crop		
Excessive crimping	Increase roll gap.	<ul style="list-style-type: none"> Adjusting Roll Gap, page 49
Crop is spread too wide in windrow	Adjust forming shields.	<ul style="list-style-type: none"> Positioning Forming Shield Side Deflectors – Roll Conditioner, page 54 Positioning Rear Baffle Deflector Fins, page 56
Symptom: Poorly formed or bunchy windrows		
Forming shields not properly positioned	Adjust forming shields.	<ul style="list-style-type: none"> Positioning Forming Shield Side Deflectors – Roll Conditioner, page 54 Positioning Rear Baffle Deflector Fins, page 56

6.2 Mechanical Problems

Problem	Solution	Refer to
Symptom: Excessive noise		
Bent discblade	Replace blade.	<ul style="list-style-type: none"> • Removing Discblades, page 90 • Installing Discblades, page 92
Conditioner roll timing off	Check roll timing and adjust if necessary.	<ul style="list-style-type: none"> • Checking Roll Timing, page 51 • Adjusting Roll Timing, page 51
Bent drum deflector	Replace drum.	4.5.7 Maintaining Drums, page 100
Conditioner roll gap too small	Check gap and adjust if necessary.	<ul style="list-style-type: none"> • Adjusting Roll Gap, page 49
Symptom: Excessive vibration or noise in header		
Mud deposits on conditioner rolls	Clean rolls.	—
Conditioner rolls contacting each other	Increase roll gap.	<ul style="list-style-type: none"> • Adjusting Roll Gap, page 49
Conditioner rolls contacting each other	Check roll timing.	Checking Roll Timing, page 51
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 74
Symptom: Frequent blade damage		
Mud on cutterbar	Remove mud from cutterbar. Do NOT allow mud to dry on cutterbar.	—
Spindle bearing failure	Replace spindle bearing.	<ul style="list-style-type: none"> • Removing Cutterbar Spindles, page 81 • Installing Cutterbar Spindles, page 83
Header float set too heavy	Increase float.	Refer to windrower operator's manual
Material wrapped around spindle	Remove disc and remove material.	<ul style="list-style-type: none"> • Removing Discblades, page 90 • Installing Discblades, page 92
Cutting too low in rocky field conditions	Decrease header angle, increase float.	<ul style="list-style-type: none"> • 3.8.1 Cutting Height, page 44 • 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.	—
Discblades incorrectly mounted	Check all blade mounting hardware and ensure blades are free to move.	Inspecting Discblade Hardware, page 89
Symptom: Excessive wear of cutting components		

TROUBLESHOOTING

Problem	Solution	Refer to
Header angle too steep	Reduce header angle.	3.8.1 Cutting Height, page 44
Crop residue and dirt deposits on cutterbar	Clean cutterbar.	—
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 134
Foreign object between rolls	Disengage header and stop the engine. When all moving parts are completely stopped, remove foreign object.	4.9.1 Inspecting Conditioner, page 133
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 134
Symptom: Disc does not turn when engaging header		
Hoses not connected	Connect hoses.	3.4 Attaching Header to M1240 Windrower, page 24
Poor electrical connection at pump solenoid	Check connection at windrower.	Refer to windrower operator's manual
Symptom: Header slows when going uphill		
Hydraulic oil level in windrower is low	Add oil to windrower reservoir.	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.	—

Chapter 7: Reference

7.1 Torque Specifications

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

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

Jam nuts

When applying torque to finished jam nuts, multiply the torque applied to regular nuts by $f=0.65$.

Self-tapping screws

Standard torque is to be used (**NOT** to be used on critical or structurally important joints).

7.1.1 Metric Bolt Specifications

Table 7.1 Metric Class 8.8 Bolts and Class 9 Free Spinning Nut

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

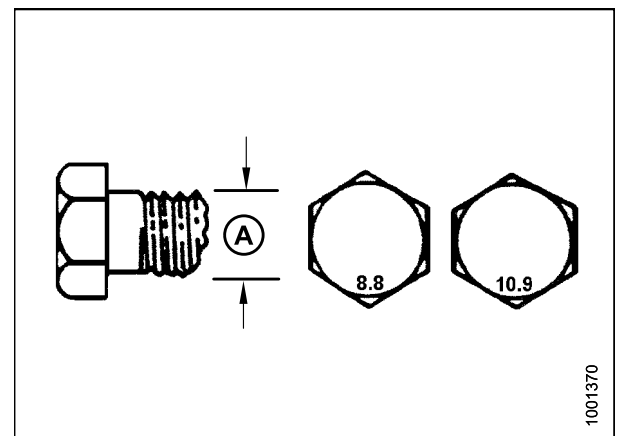


Figure 7.1: Bolt Grades

REFERENCE

Table 7.2 Metric Class 8.8 Bolts and Class 9 Distorted Thread Nut

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

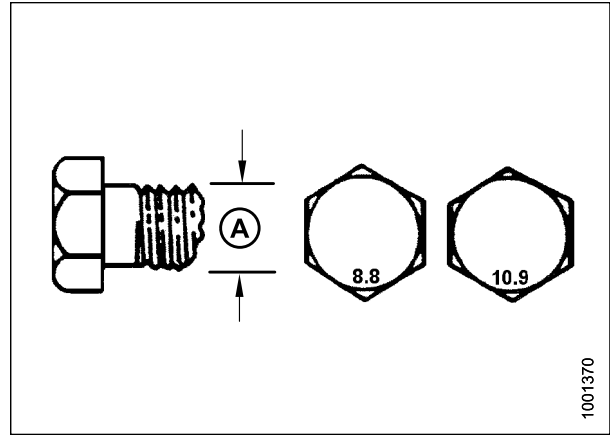


Figure 7.2: Bolt Grades

Table 7.3 Metric Class 10.9 Bolts and Class 10 Free Spinning Nut

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

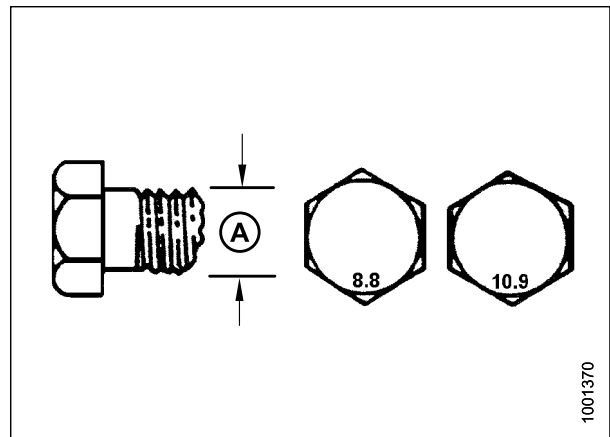


Figure 7.3: Bolt Grades

REFERENCE

Table 7.4 Metric Class 10.9 Bolts and Class 10 Distorted Thread Nut

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

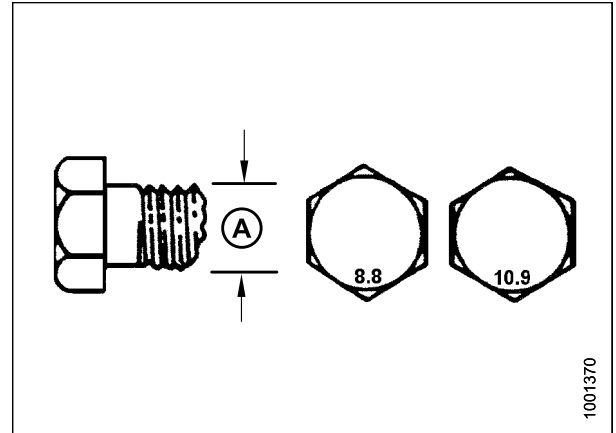


Figure 7.4: Bolt Grades

7.1.2 Metric Bolt Specifications Bolting into Cast Aluminum

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	—	—	—	—

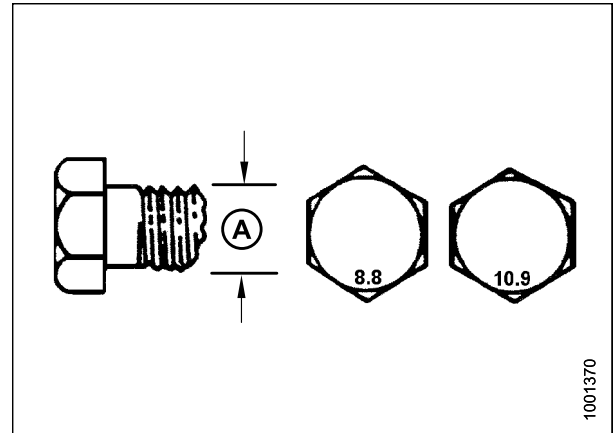


Figure 7.5: Bolt Grades

7.1.3 O-Ring Boss Hydraulic Fittings – Adjustable

1. Inspect O-ring (A) and seat (B) for dirt or obvious 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. Check that O-ring (A) is **NOT** on threads and adjust if necessary.
4. Apply hydraulic system oil to O-ring (A).

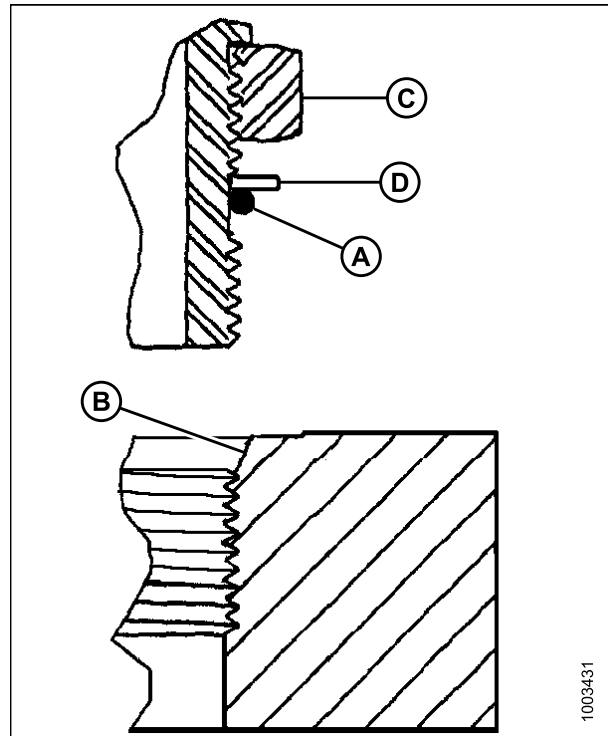


Figure 7.6: Hydraulic Fitting

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

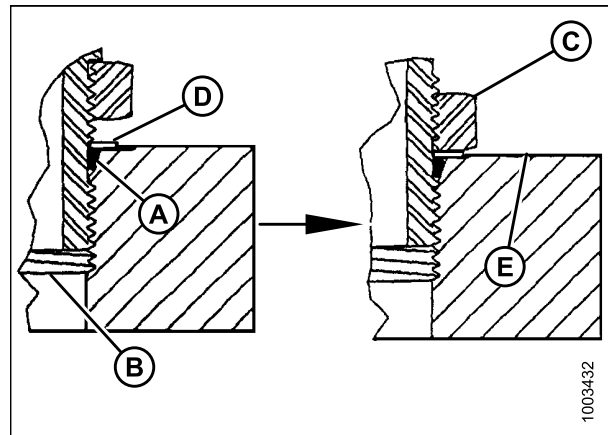


Figure 7.7: Hydraulic Fitting

REFERENCE

Table 7.6 O-Ring Boss (ORB) Hydraulic Fittings – Adjustable

SAE Dash Size	Thread Size (in.)	Torque Value ⁶	
		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
-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

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

7.1.4 O-Ring Boss Hydraulic Fittings – Non-Adjustable

1. Inspect O-ring (A) and seat (B) for dirt or obvious defects.
2. Check that O-ring (A) is **NOT** on threads and adjust if necessary.
3. Apply hydraulic system oil to O-ring.
4. Install fitting (C) into port until fitting is hand-tight.
5. Torque fitting (C) according to values in Table 7.7, page 166.
6. Check final condition of fitting.

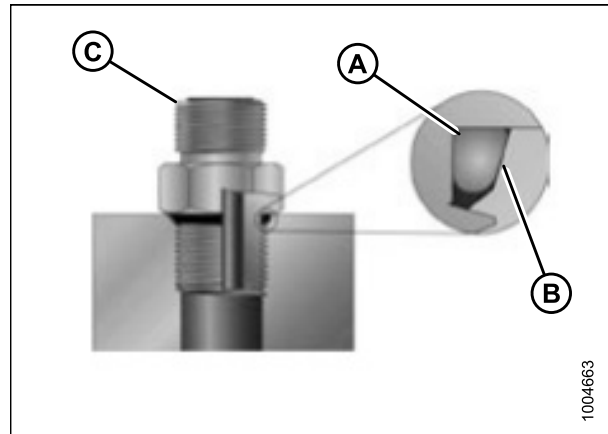


Figure 7.8: Hydraulic Fitting

Table 7.7 O-Ring Boss (ORB) Hydraulic Fittings – Non-Adjustable

SAE Dash Size	Thread Size (in.)	Torque Value ⁷	
		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
-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. Torque values shown are based on lubricated connections as in reassembly.

7.1.5 O-Ring Face Seal Hydraulic Fittings

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



Figure 7.9: Hydraulic Fitting

2. Apply hydraulic system oil to O-ring (B).
3. Align tube or hose assembly so that flat face of sleeve (A) or (C) comes in full contact with O-ring (B).
4. Thread tube or hose nut (D) until hand-tight. The nut should turn freely until it is bottomed out.
5. Torque fittings according to values in Table 7.8, page 167.

NOTE:

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

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

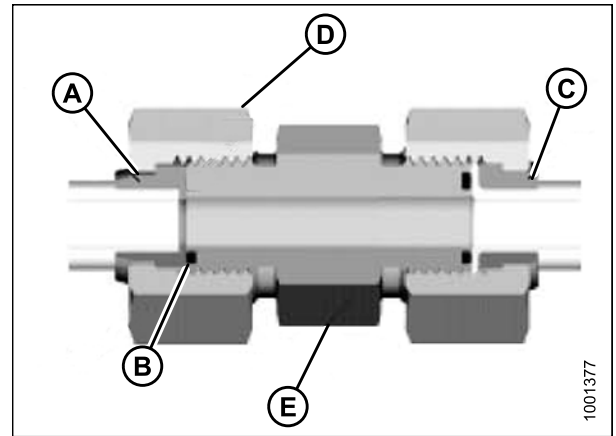


Figure 7.10: Hydraulic Fitting

Table 7.8 O-Ring Face Seal (ORFS) Hydraulic Fittings

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value ⁸	
			Nm	lbf-ft
-3	Note ⁹	3/16	–	–
-4	9/16	1/4	25–28	18–21
-5	Note ⁹	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 ⁹	7/8	–	–

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

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

REFERENCE

Table 7.8 O-Ring Face Seal (ORFS) Hydraulic Fittings (continued)

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value ¹⁰	
			Nm	lbf-ft
-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

Assemble pipe fittings as follows:

1. Check components to ensure that fitting and port threads are free of burrs, nicks, scratches, or any form of contamination.
2. Apply pipe thread sealant (paste type) to external pipe threads.
3. Thread fitting into port until hand-tight.
4. Torque connector to appropriate torque angle. The turns from finger tight (TFFT) and flats from finger tight (FFFT) values are shown in Table 7.9, [page 168](#). Make sure that tube end of a shaped connector (typically 45 degree or 90 degree) is aligned to receive incoming tube or hose assembly. Always finish alignment of fitting in tightening direction. Never back off (loosen) pipe threaded connectors to achieve alignment.
5. Clean all residue and any excess thread conditioner with appropriate cleaner.
6. Assess final condition of fitting. Pay special attention to possibility of cracks to port opening.
7. Mark final position of fitting. If a fitting leaks, disassemble fitting and check for damage.

NOTE:

Overtorque failure of fittings may not be evident until fittings are disassembled.

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

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

7.2 Conversion Chart

Table 7.10 Conversion Chart

Quantity	SI Units (Metric)		Factor	US Customary Units (Standard)	
	Unit Name	Abbreviation		Unit Name	Abbreviation
Area	hectare	ha	$\times 2.4710 =$	acre	acres
Flow	liters per minute	L/min	$\times 0.2642 =$	US gallons per minute	gpm
Force	Newton	N	$\times 0.2248 =$	pound force	lbf
Length	millimeter	mm	$\times 0.0394 =$	inch	in.
Length	meter	m	$\times 3.2808 =$	foot	ft.
Power	kilowatt	kW	$\times 1.341 =$	horsepower	hp
Pressure	kilopascal	kPa	$\times 0.145 =$	pounds per square inch	psi
Pressure	megapascal	MPa	$\times 145.038 =$	pounds per square inch	psi
Pressure	bar (Non-SI)	bar	$\times 14.5038 =$	pounds per square inch	psi
Torque	Newton meter	Nm	$\times 0.7376 =$	pound feet or foot pounds	lbf-ft
Torque	Newton meter	Nm	$\times 8.8507 =$	pound inches or inch pounds	lbf-in
Temperature	degrees Celsius	°C	$(^{\circ}\text{C} \times 1.8) + 32 =$	degrees Fahrenheit	°F
Velocity	meters per minute	m/min	$\times 3.2808 =$	feet per minute	ft/min
Velocity	meters per second	m/s	$\times 3.2808 =$	feet per second	ft/s
Velocity	kilometers per hour	km/h	$\times 0.6214 =$	miles per hour	mph
Volume	liter	L	$\times 0.2642 =$	US gallon	US gal
Volume	milliliter	mL	$\times 0.0338 =$	ounce	oz.
Volume	cubic centimeter	cm ³ or cc	$\times 0.061 =$	cubic inch	in. ³
Weight	kilogram	kg	$\times 2.2046 =$	pound	lb.

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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 85W-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 degree gearbox	1.65 liters (1.74 qts [US])

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