

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

Operator's Manual

169457 Rev. F

Original Instruction

Rotary Disc 16-Foot Self-Propelled Windrower Header



1005291

Published: December, 2013

Introduction

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

Your new MacDon rotary header 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 given in this manual, your header will work well for many years.

A parts catalog is also supplied with your new header. If you require more detailed service information, a technical manual is available from your Dealer.

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

Store this operator's manual and the parts catalog in the manual storage case in the windrower cab.

Serial Number(s)

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

Header Serial No: _____

Serial Number Plate (A) is located on the top surface at the right hand end of the header.

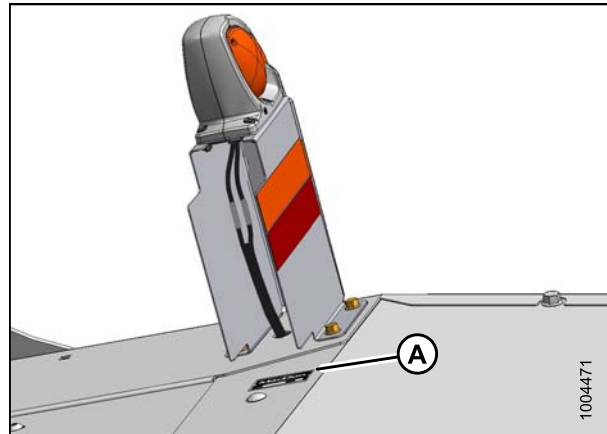


Figure 1

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1 Safety

1.1 Safety Alert Symbols

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

This symbol means:

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

Carefully read and follow the safety message accompanying this symbol.

Why is safety important to you?

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



Figure 1.1: Read Operator's Manual Before Operating

SAFETY

1.2 Signal Words

Three signal words, DANGER, WARNING, and CAUTION, are used to alert you to hazardous situations. The appropriate signal word for each situation has been selected using the following guidelines:



DANGER

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



WARNING

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



CAUTION

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

1.3 General Safety

CAUTION

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

Protect yourself

- When assembling, operating, and servicing machinery, wear all the protective clothing and personal safety devices that **COULD** be necessary for the job at hand. Don't take chances.

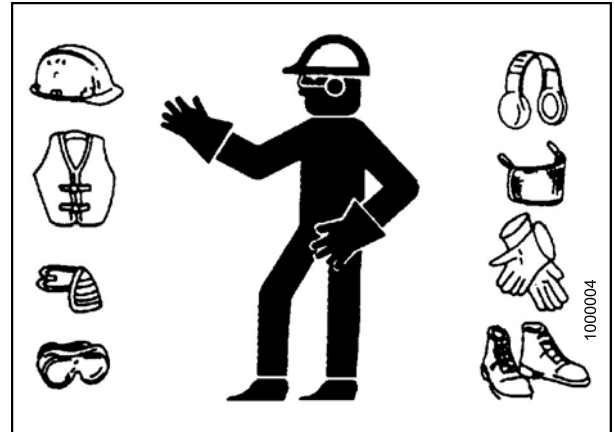


Figure 1.2

- You may need:
 - A hard hat
 - Protective footwear with slip resistant soles
 - Protective glasses or goggles
 - Heavy gloves
 - Wet weather gear
 - A respirator or filter mask
 - Hearing protection

Be aware that exposure to loud noise can cause impairment or loss of hearing. Wearing suitable hearing protection devices such as ear muffs or ear plugs. These will help protect against objectionable or loud noises.
- Provide a first aid kit for use in case of emergencies.
- Keep a fire extinguisher on the machine. Be sure the fire extinguisher is properly maintained. Be familiar with its proper use.
- Keep young children away from the machinery at all times.
- Be aware that accidents often happen when the Operator is tired or in a hurry to get finished. Take the time to consider the safest way. Never ignore warning signs of fatigue.



Figure 1.3

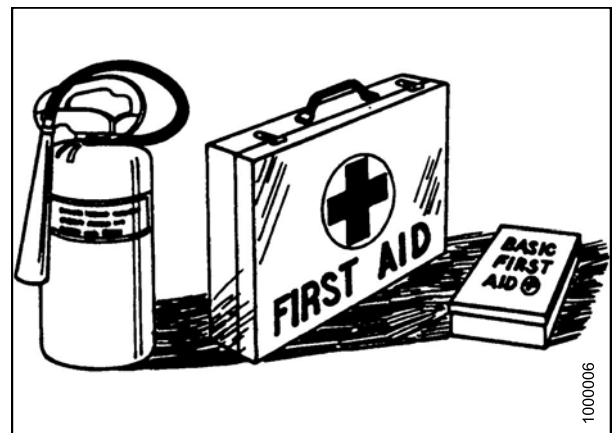


Figure 1.4

SAFETY

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



Figure 1.5

- Keep hands, feet, clothing, and hair away from moving parts. Never attempt to clear obstructions or objects, from a machine while the engine is running.
- Do **NOT** modify the machine. Non-authorized modifications may impair machine function and/or safety. It may also shorten the machine's life.
- Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

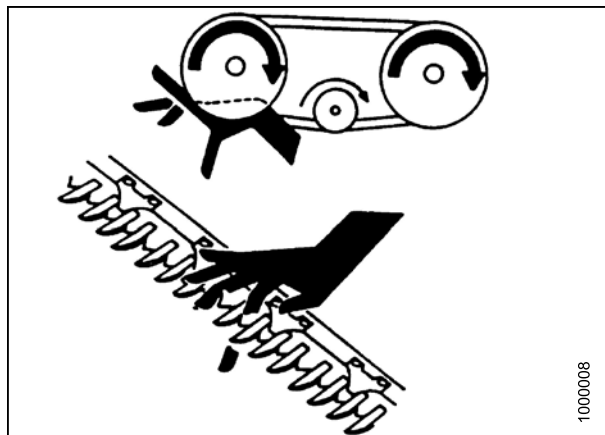


Figure 1.6

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



Figure 1.7

SAFETY

1.4 Maintenance Safety

To ensure your safety while maintaining the machine:

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



Figure 1.8: Slip On Puddle



Figure 1.9: Keep Away

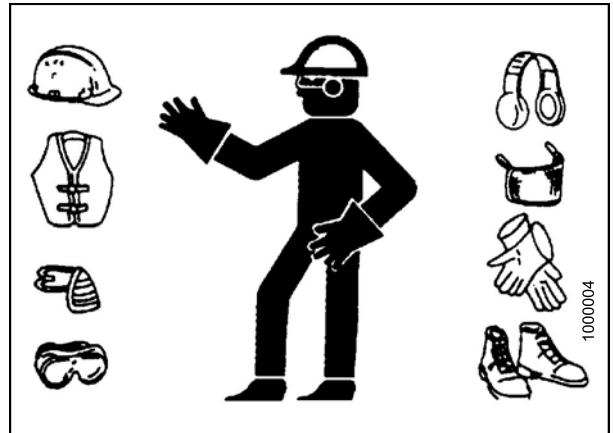


Figure 1.10: Safety Gear

SAFETY

1.5 Hydraulic Safety

- Always place all hydraulic controls in Neutral before dismounting.
- Make sure that all components in the hydraulic system are kept in good condition and clean.
- Replace any worn, cut, abraded, flattened, or crimped hoses and steel lines.
- Do not attempt any makeshift repairs to the hydraulic lines, fittings, or hoses by using tapes, clamps, cements, or welding. The hydraulic system operates under extremely high pressure. Such makeshift repairs will fail suddenly and create a hazardous and unsafe condition.

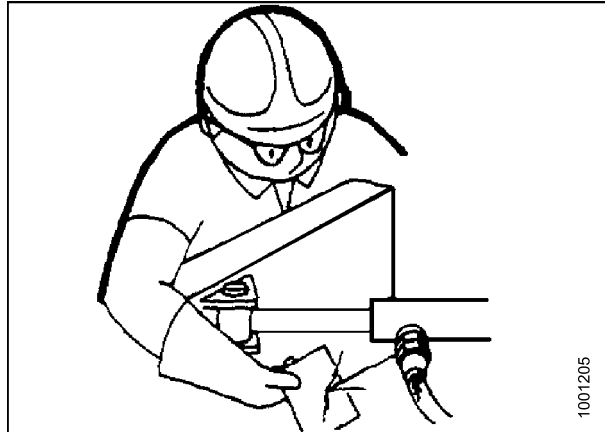


Figure 1.11: Checking Hydraulic Leaks

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



Figure 1.12: Hydraulic Pressure Hazard

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

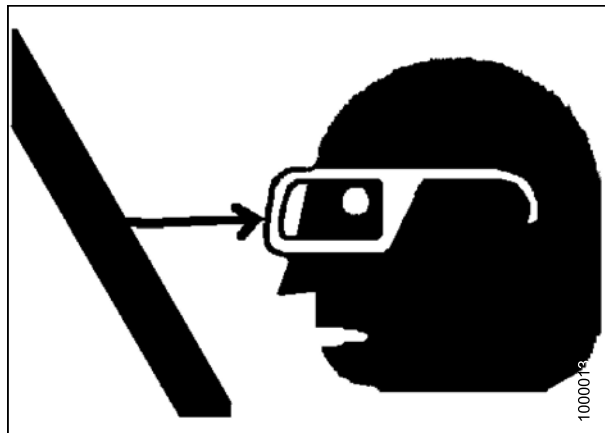


Figure 1.13: Wear Safety Glasses

SAFETY

1.6 Tire Safety

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



Figure 1.14: Lower All Safety Stops

- Do **NOT** attempt to mount a tire unless you have the proper training and equipment.

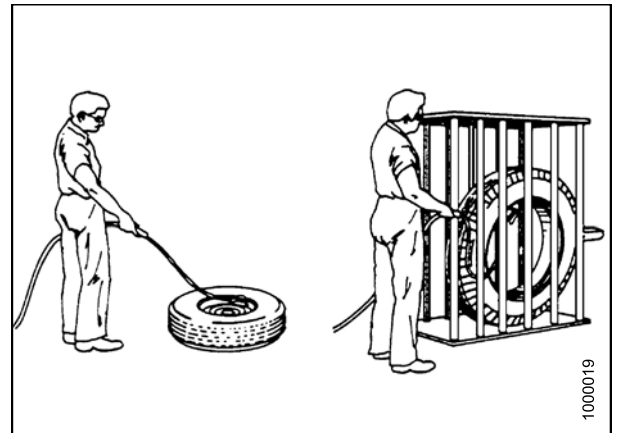


Figure 1.15: Safely Filling a Tire With Air

- Have a qualified tire dealer or repair service perform required tire maintenance.

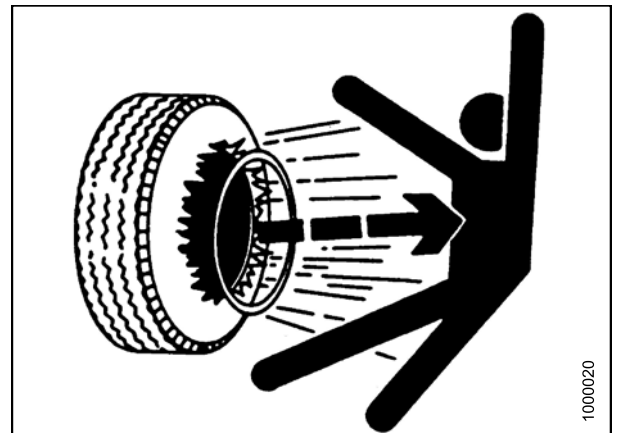


Figure 1.16: Over-Inflation Of Tire

SAFETY

1.7 Safety Signs

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

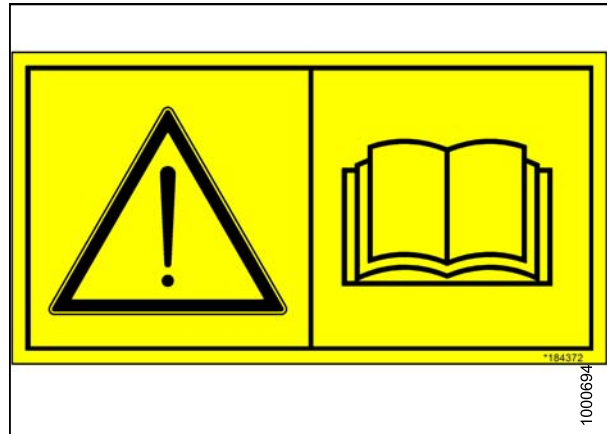


Figure 1.17: Read Operator's Manual Before Operating

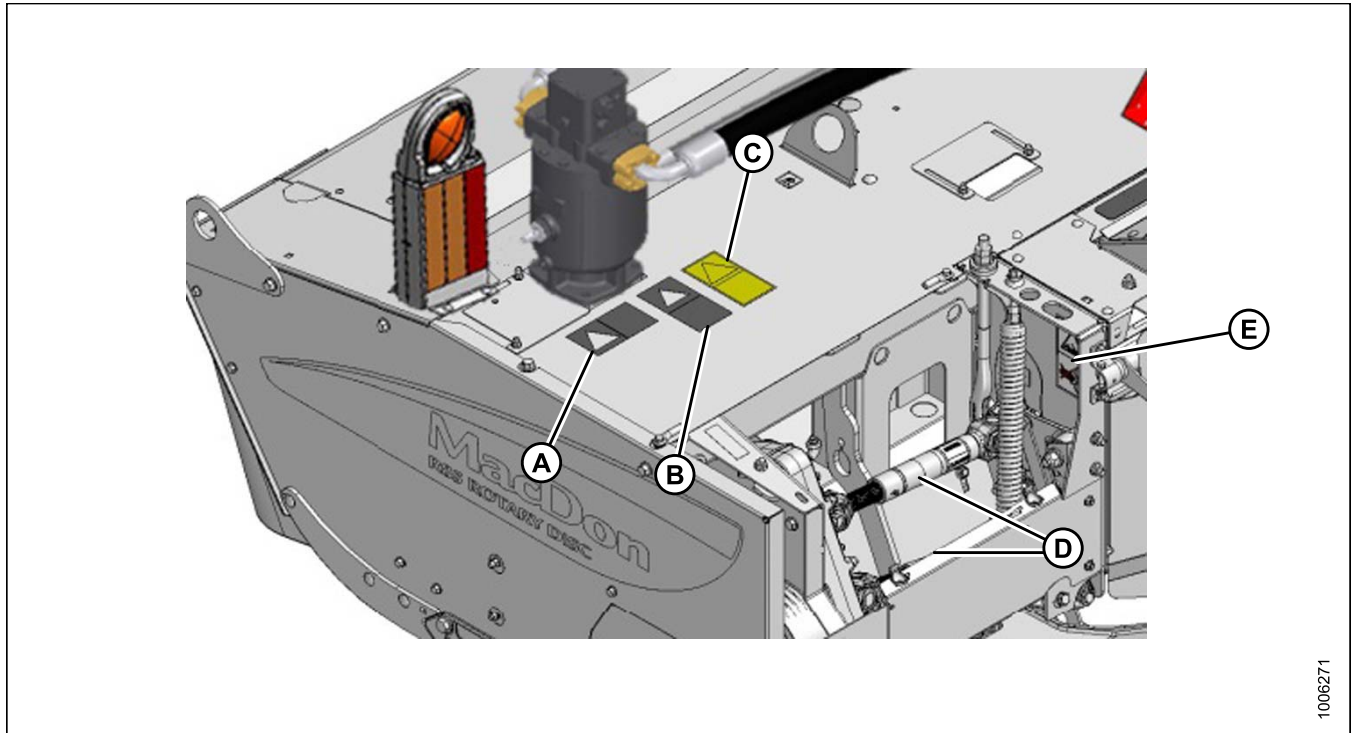
1.7.1 Installing Safety Decals

To install a safety decal, follow these steps:

1. Be sure the installation area is clean and dry.
2. Decide on the exact location before you remove the decal backing paper.
3. Remove the smaller portion of the split backing paper.
4. Place the sign in position and slowly peel back the remaining paper, smoothing the sign as it is applied.
5. Small air pockets can be smoothed out or pricked with a pin.

SAFETY

1.8 Safety Decal Location



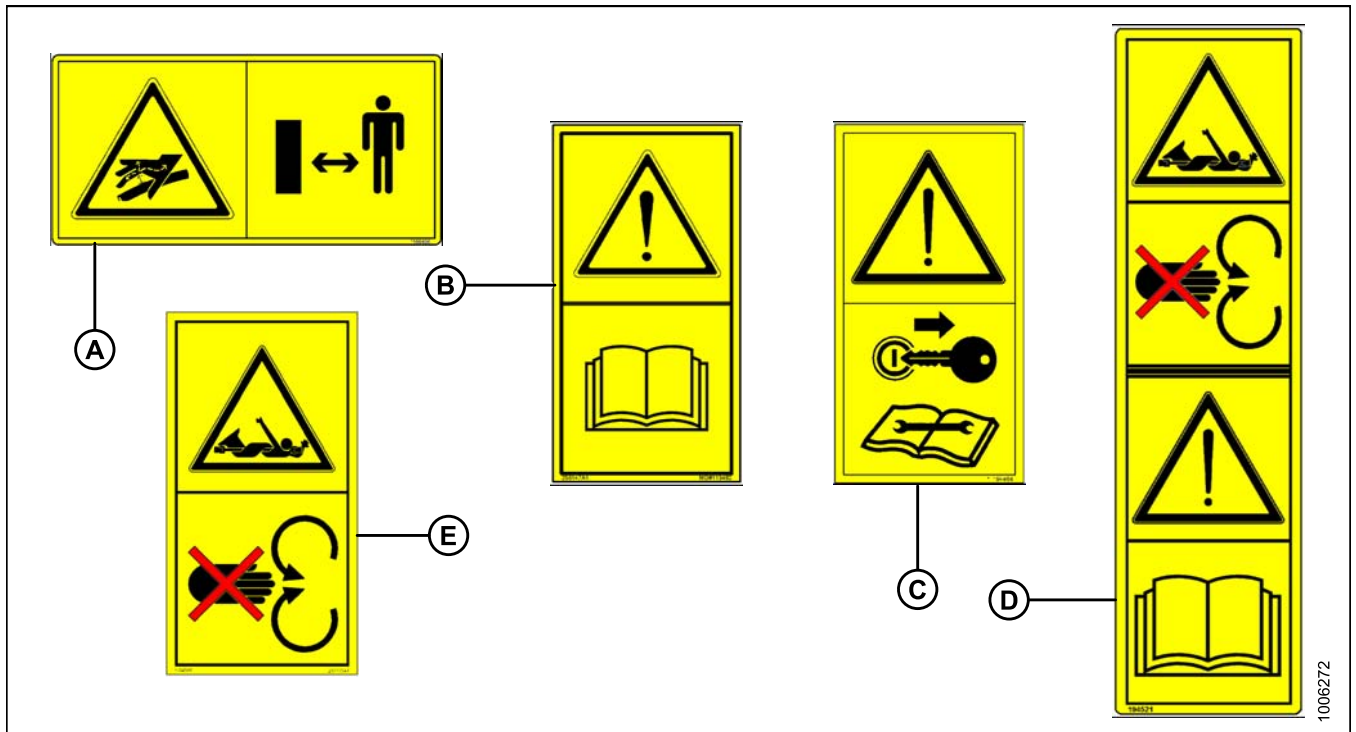
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Figure 1.18

A - MD #166466
D - MD #194521

B - MD #113482
E - MD #184385

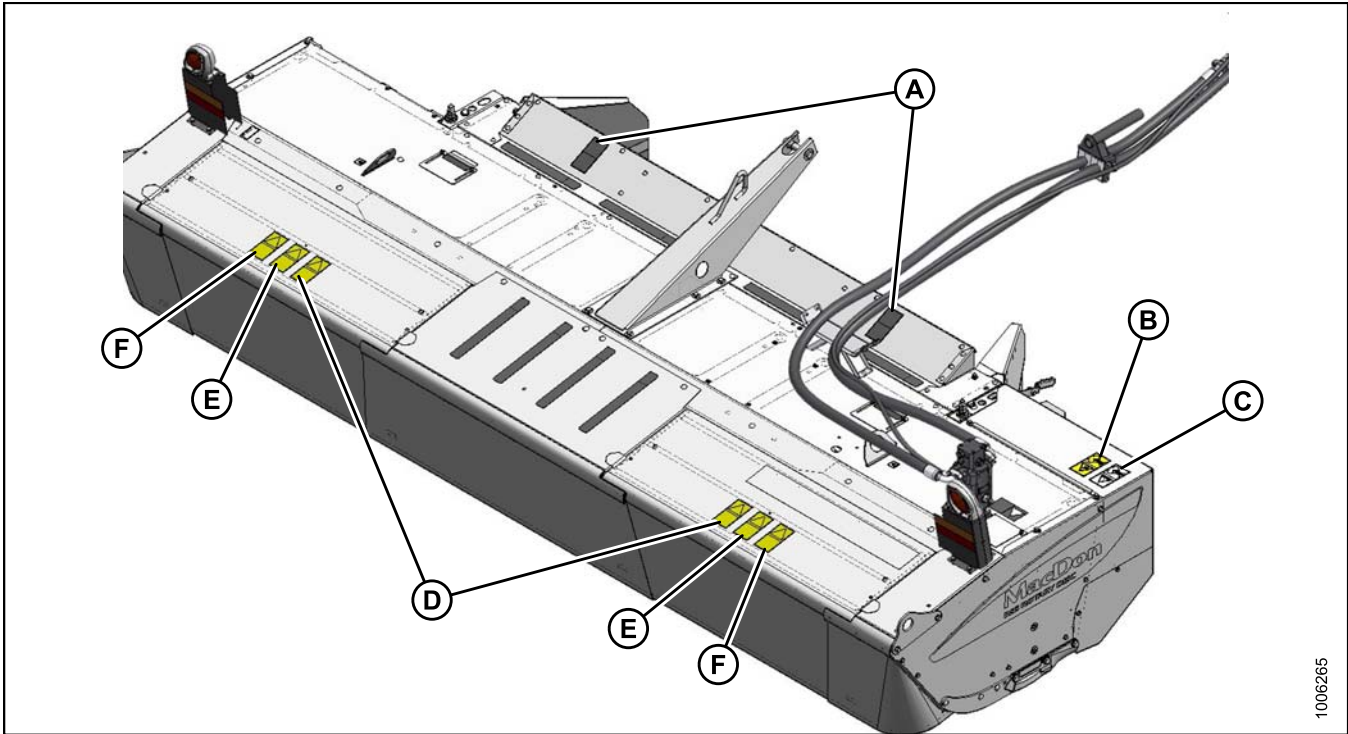
C - MD #194464



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Figure 1.19

SAFETY



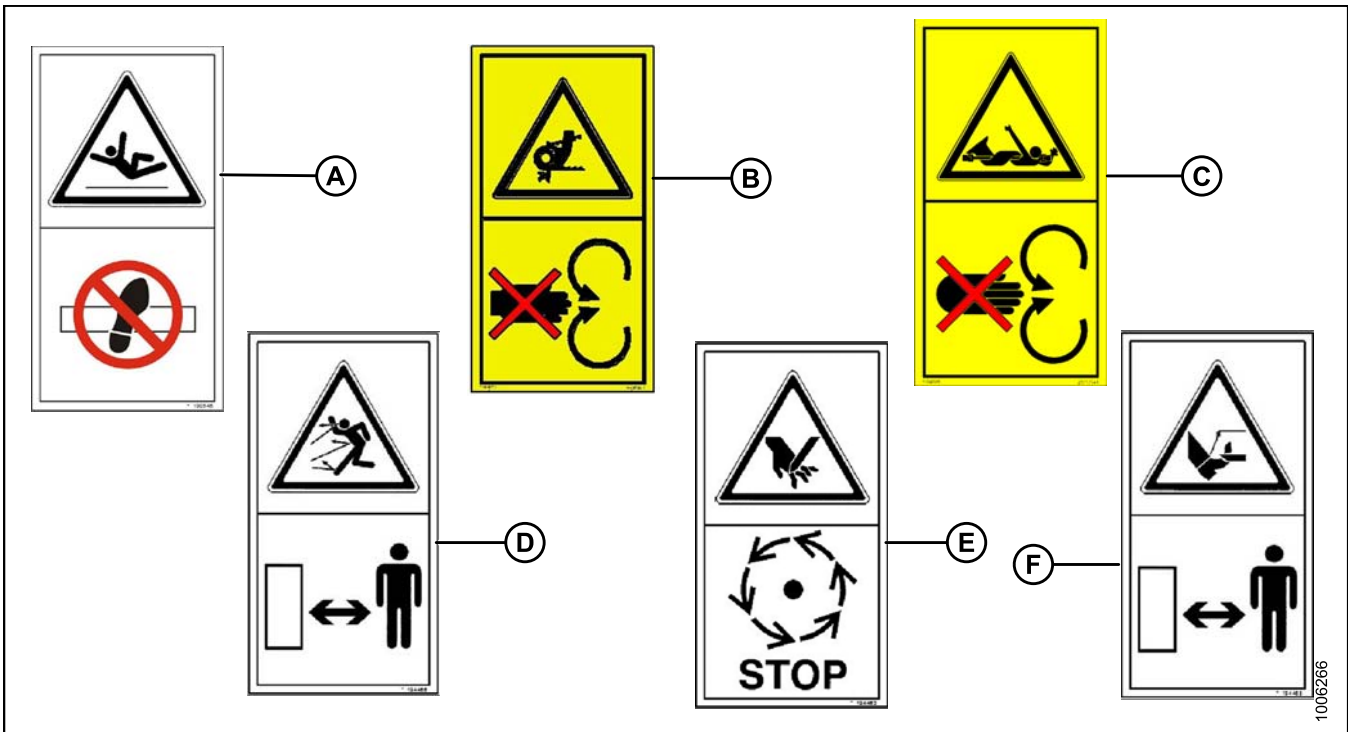
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Figure 1.20

A - MD #190546
D - MD #194466

B - MD #184371
E - MD #194463

C - MD #184385
F - MD #194465



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Figure 1.21

SAFETY

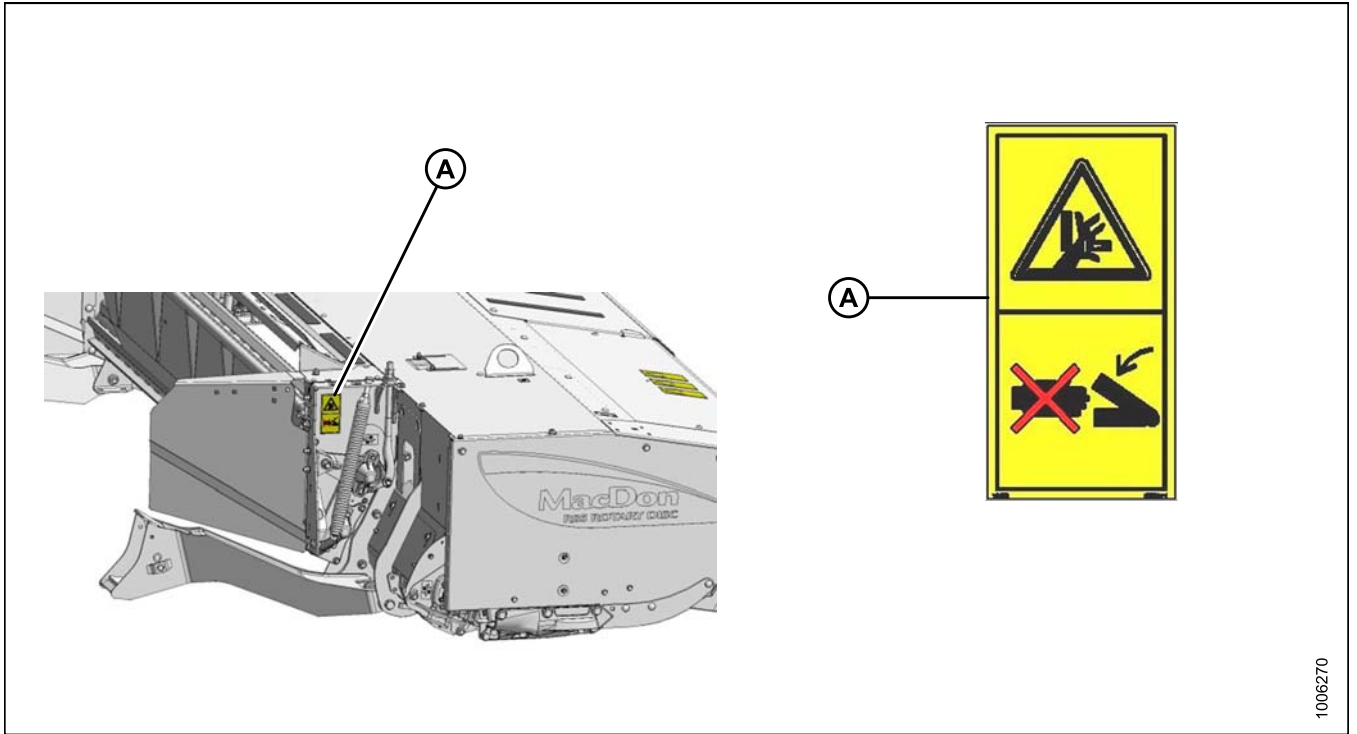


Figure 1.22
A - MD #184386

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SAFETY

1.9 Interpreting Safety Signs

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

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

1. MD #113482

a. General hazard pertaining to machine operation and servicing.

b. **CAUTION**

To avoid injury or death from improper or unsafe machine operation:

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



Figure 1.23: MD #113482

SAFETY

2. MD #166466

a. High pressure oil hazard.

b. **WARNING**

Do not go near leaks.

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



Figure 1.24: MD #166466

3. MD #184371

a. Open drive hazard.

b. **WARNING**

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



Figure 1.25: MD #184371

4. MD #184385

a. Pinch hazard.

b. **WARNING**

Keep away.

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



Figure 1.26: MD #184385

SAFETY

5. MD #184386

- a. Pinch hazard.
- b. **WARNING**
Keep away.
 - Failure to comply could result in death or serious injury.

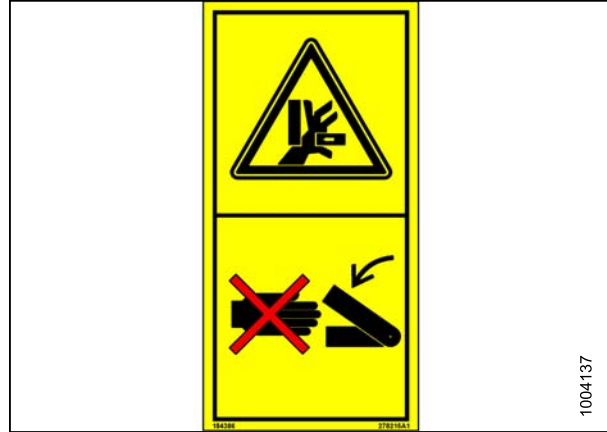


Figure 1.27: MD #184386

6. MD #190546

- a. Slippery surface.
- b. **WARNING**
Do not place foot.
 - Do not use this area as a step or platform.
 - Failure to comply could result in serious injury or death.



Figure 1.28: MD #190546

7. MD #194463

- a. Rotating blades.
- b. **WARNING**
 - Disengage PTO, shut down the engine, and remove the key before opening covers.
 - Listen and look for evidence of rotation before lifting cover.
 - Rotating cutters may continue to rotate after power is shut off.



Figure 1.29: MD #194463

SAFETY

8. MD #194464

a. Shut down for service.

b. **WARNING**

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



Figure 1.30: MD #194464

9. MD #194465

a. Rotating cutters.

b. **WARNING**

Stand clear

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



Figure 1.31: MD #194465

10. MD #194466

a. Rotating flails under hood.

b. **WARNING**

Stand clear

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



Figure 1.32: MD #194466

SAFETY

11. MD #194521

- a. Auger entanglement hazard.
- b. **CAUTION**
 - To avoid injury from entanglement with rotating auger, stand clear of header while machine is running.
- c. General hazard pertaining to machine operation and servicing
- d. **CAUTION**
 - Read the operator's manual and follow safety instructions. If you do not have a manual, obtain one from your Dealer.
 - Do not allow untrained persons to operate the machine.
 - Review safety instructions with all Operators annually.
 - Ensure that all safety signs are installed and legible.
 - Make certain everyone is clear of machine before starting engine and during operation.
 - Keep riders off the machine.
 - Keep all shields in place and stay clear of moving parts.
 - Disengage header drive, put transmission in neutral, and wait for all movement to stop before leaving operator's position.
 - Stop the engine and remove the key from ignition before servicing, adjusting, lubricating, cleaning, or unplugging machine.
 - Engage locks to prevent lowering of header or reel before servicing in the raised position.
 - Use slow moving vehicle emblem and flashing warning lights when operating on roadways unless prohibited by law.

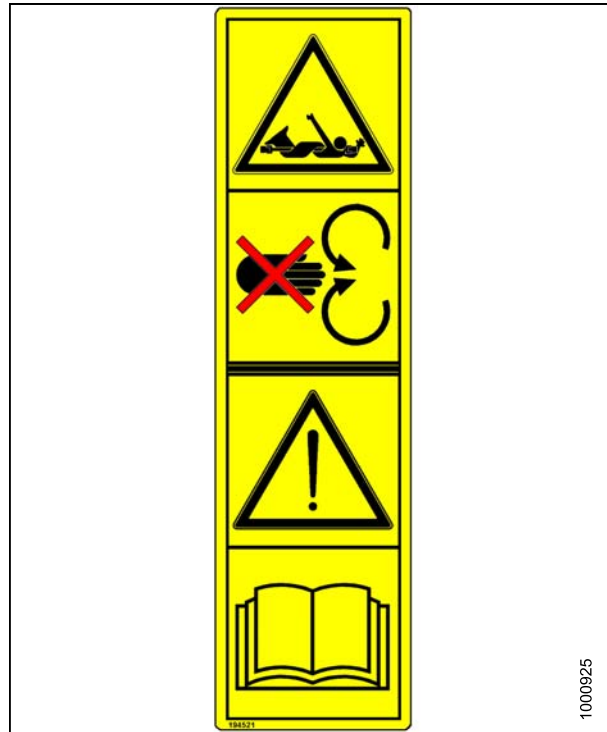


Figure 1.33: MD #194521

2 Definitions

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

Term	Definition
API	American Petroleum Institute.
APT	Articulating Power Turn.
ASTM	American Society of Testing and Materials.
Bolt	A headed and externally threaded fastener that is designed to be paired with a nut.
CDM	Cab Display Module on a self-propelled windrower.
Center-link	A hydraulic cylinder or manually adjustable turnbuckle type link between the header and the machine to which it is attached. It is used to change header angle.
CGVW	Combined Vehicle Gross Weight.
DWA	Double Windrow Attachment.
ECM	Engine Control Module.
Export header	Header configuration typical outside North America.
Finger tight	Finger tight is a reference position where sealing surfaces or components are making contact with each other and the fitting has been tightened to a point where the fitting is no longer loose.
F.F.F.T	Flats from finger tight.
GSL	Ground speed lever.
GSS	Grass Seed Special.
GVW	Gross vehicle weight.
Hard joint	A joint made with the use of a fastener where the joining materials are highly incompressible.
Header	A machine that cuts and lays crop into a windrow, and is attached to a self-propelled windrower.
hp	Horsepower
ISC	Intermediate Speed Control.
JIC	Joint Industrial Council: a standards body that developed the standard sizing and shape for original 37° flared fitting.
n/a	Not applicable
Nut	An internally threaded fastener that is designed to be paired with a bolt.
N-DETENT	The slot opposite the NEUTRAL position on operator's console
North American header	Header configuration typical in North America
NPT	National Pipe Thread: a style of fitting used for low pressure port openings. Threads on NPT fittings are uniquely tapered for an interference fit.
ORB	O-ring Boss: a style of fitting commonly used in port opening on manifolds, pumps and motors.
ORFS	O-ring Face Seal: a style of fitting commonly used for connecting hoses and tubes. This style of fitting is also commonly called ORS, which stands for O-ring Seal.

DEFINITIONS

Term	Definition
PTO	Power Take-Off.
RoHS (Reduction of Hazardous Substances)	A directive by the European Union to restrict the use of certain hazardous substances (such as hexavalent chromium used in some yellow zinc platings).
SAE	Society Of Automotive Engineers.
Screw	A headed and externally threaded fastener that threads into preformed threads or forms its own thread in one of the mating parts.
Self-Propelled Windrower (SP)	Self-propelled machine consisting of a power unit with a header and/or conditioner.
Soft joint	A joint made with the use of a fastener where the joining materials are compressible or experience relaxation over a period of time.
spm	Strokes per minute
Tractor	Agricultural type tractor.
Truck	A four-wheel highway/road vehicle weighing no less than 7500 lbs (3400 kg)
Tension	Axial load placed on a bolt or screw, usually measured in pounds (lb) or Newtons (N).
T.F.F.T.	Turns from finger tight.
Torque	The product of a force X lever arm length, usually measured in foot-pounds (ft·lbf) or Newton-meters (Nm).
Torque angle	A tightening procedure where the fitting is assembled to a precondition (finger tight) and then the nut is turned further a number of degrees or a number of flats to achieve its final position.
Torque-tension	The relationship between the assembly torque applied to a piece of hardware and the axial load it induces in the bolt or screw.
UCA	Upper Cross Auger.
Washer	A thin cylinder with a hole or slot located in the center and is to be used as a spacer, load distribution element or a locking mechanism.
Windrower	Power unit of a self-propelled header.
WCM	Windrower Control Module.

3 Component Identification

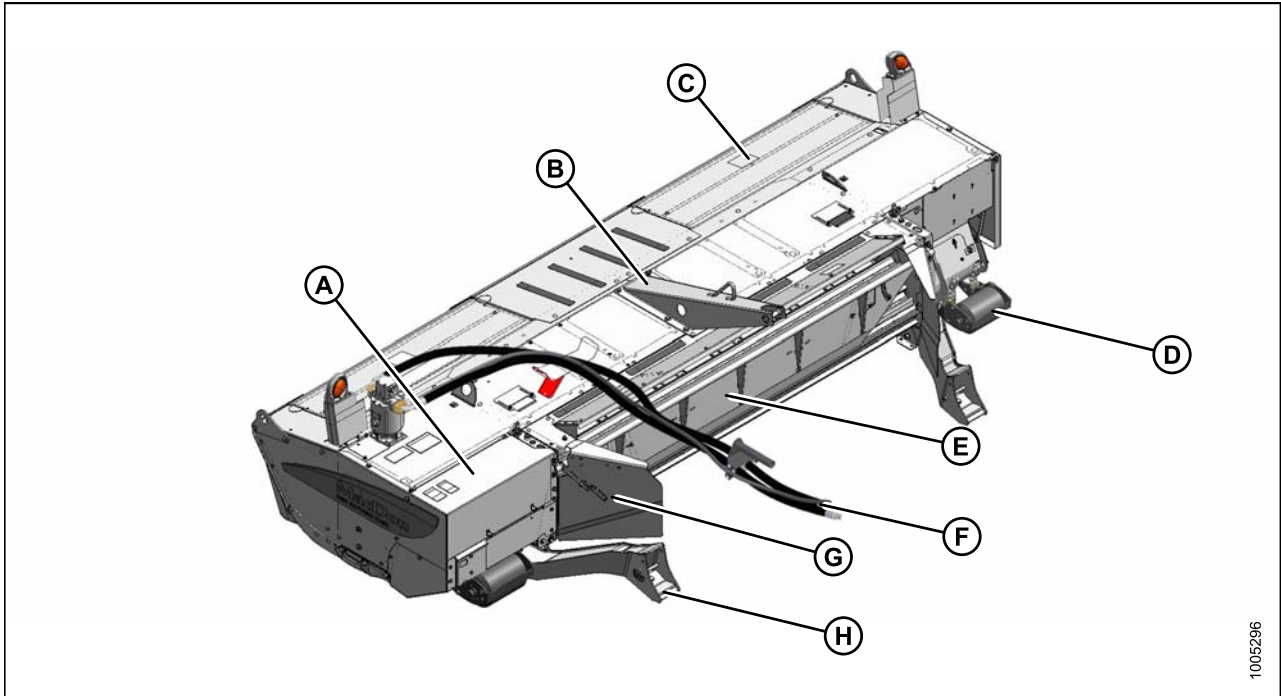


Figure 3.1

A - Driveshield
E - Baffle

B - Tower
F - Hydraulic Hoses to SP Windrower

C - Door
G - Baffle Control

D - Gauge Rollers (Optional)
H - Header Arm

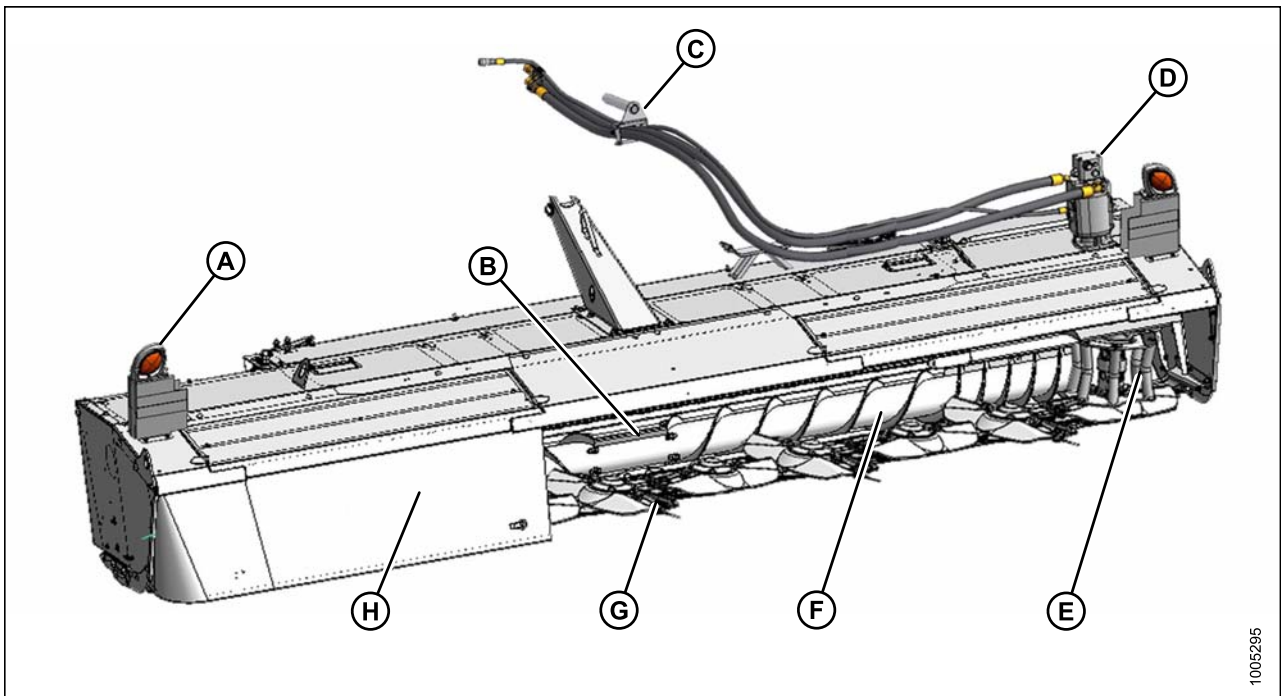


Figure 3.2

A - Transport Light
E - Rotary Deflector

B - Conditioner Rolls
F - Overshot Auger

C - Hose Support
G - 10 Disc Cutterbar

D - Drive Motor
H - Curtains

4 Specifications

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

Frame and Structure	
Transport width	16 ft-0 in. (4879 mm)
Weight (estimated)	4300 lb. (1955 kg)
Carrier	MacDon M200 and M205 Self-Propelled Windrowers
Lighting	Two amber transport
Manual storage	Windrower cab manual storage compartment
Cutterbar	
Quantity of cutting discs	10
Blades per disc	Two 11° bevel up reversible
Disc speed	1800–2600 rpm
Blade tip speed range	131–189 mph (59.2–85.5 m/s)
Effective cutting width	15 ft-10 in. (4827 mm)
Cutting height	3/4 in. (19 mm)
Oil capacity (maximum)	4.4 us quarts (4.25 liters)
Cutting angle range	0–8° below horizontal
Geartrain protection	Shearable disc spindles
Rotary deflectors	2 converging drum
Gauge rollers / skid shoes (optional)	Two adjustable
Overshot Auger	
Peripheral diameter	9.0 in. (229 mm)
Center tube diameter	6.0 in. (152 mm)
Auger speed	720–1040 rpm
Drive	Three HB belts
Drives	
Type	6.4 cu in. (106 cc) heavy duty hydraulic motor
Maximum power developed	231 hp (174 kW)
Connections	Direct coupled (optional quick coupler connection)
Normal operating pressure	4000 psi (27.58 MPa)
Conditioner	
Drive	Bevel gearbox to belt driven enclosed conditioner timing gearbox and driveline
Bevel gearbox lube capacity	13.6 oz. (400 ml)

SPECIFICATIONS

Frame and Structure	
Conditioner gearbox lube capacity	11.8 oz. (350 ml)
Roll type	Intermeshing steel bars
Roll diameter	9-5/32 in. (233 mm) / 6-5/8 in. (168.4 mm) OD tube
Roll length	118 in. (3000 mm)
Roll speed	730–1040 rpm
Swath width	36–102 in. (915–2540 mm)
Forming shields	Windrower mounted adjustable forming shield system
Ground Speed	0–16 mph (25.7 km/h)

5 Operation

5.1 Owner/Operator Responsibilities



CAUTION

- It is your responsibility to read and understand this manual completely before operating the header. Contact your MacDon Dealer if an instruction is not clear to you.
- Follow all safety messages in the manual and on safety decals on the machine.
- Remember that YOU are the key to safety. Good safety practices protect you and the people around you.
- Before allowing anyone to operate the header, for however short a time or distance, make sure they have been instructed in its safe and proper use.
- Review the manual and all safety related items with all Operators annually.
- Be alert for other Operators not using recommended procedures or not following safety precautions. Correct these mistakes immediately before an accident occurs.
- Do NOT modify the machine. Unauthorized modifications may impair the function and/or safety and affect machine life.
- The safety information given in this manual does not replace safety codes, insurance needs, or laws governing your area. Be sure your machine meets the standards set by these regulations.
- Ensure that the windrower is properly equipped to safely operate the header. This may include adding ballast according to windrower operator's manual requirements for attachments of this size and mass.

5.2 Operational Safety



CAUTION

Follow these safety precautions:

- Follow all safety and operational instructions given in your windrower operator's manuals. If you do not have an operator's manual, get one from your Dealer and read it thoroughly
- Never attempt to start the windrower's engine or operate the machine except from the windrower seat
- Check the operation of all controls in a safe clear area before starting work
- Do NOT allow riders on the windrower or header



CAUTION

- Never start or move the machine until you are sure all bystanders have cleared the area
- Avoid travelling over loose fill, rocks, ditches, or holes
- Drive slowly through gates and doorways
- If cutting ditch banks, use extreme caution. If the header hits an obstruction, the front of the windrower will usually swerve toward the ditch
- When working on inclines, travel uphill or downhill when possible. Be sure to keep the windrower transmission in gear when travelling downhill
- Never attempt to get on or off a moving machine
- Do NOT get off the windrower while the header is in operation
- Stop the windrower engine and remove the key before adjusting or removing plugged material from the machine. A child or even a pet could engage the drive
- Check for excessive vibration and unusual noises. If there is any indication of trouble, shut down and inspect the machine



CAUTION

Follow proper shut down procedure:

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

OPERATION



CAUTION

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

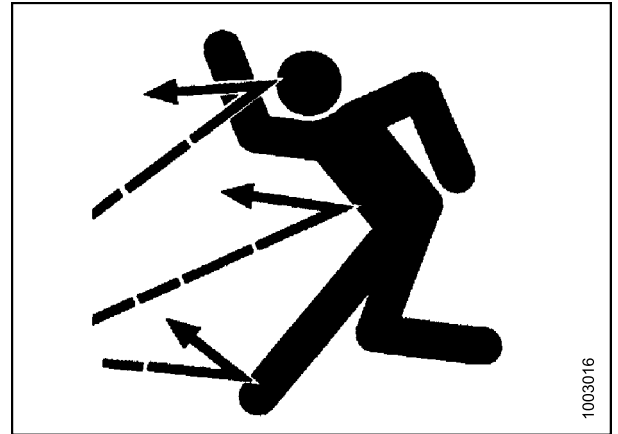


Figure 5.1

OPERATION

5.3 Header Safety Props

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

DANGER

To avoid bodily injury from fall of raised header, always engage safety props when working on or around raised header.

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

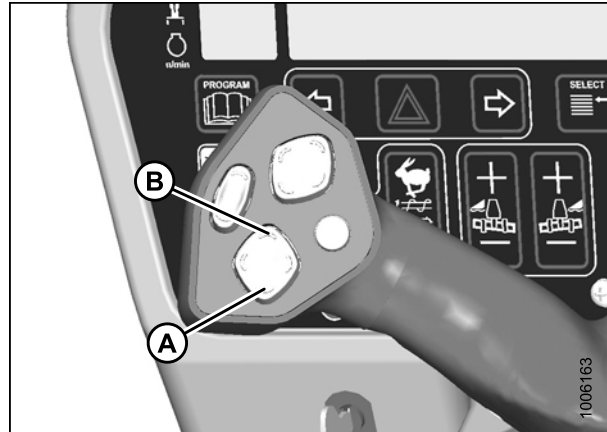


Figure 5.2

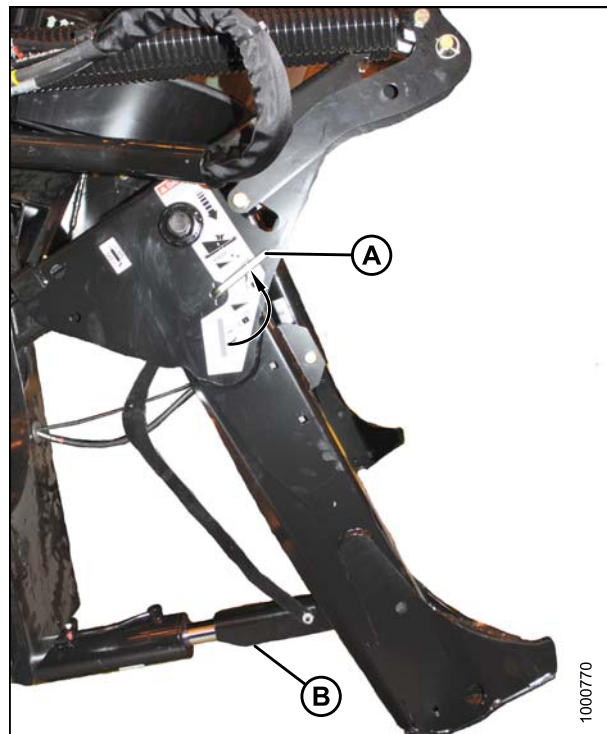


Figure 5.3

OPERATION

4. To disengage safety props, turn lever (A) away from header to raise safety prop until lever locks into vertical position. Repeat for opposite cylinder.



Figure 5.4

5. Start engine, choose a level area, and lower header to the ground. Stop engine and remove key.

OPERATION

5.4 Driveshields

The R85 16-foot self-propelled header comes in two configurations—one configured for use in North America and one configured for use outside of North America. The configuration is specified in the title when necessary.

WARNING

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

5.4.1 Opening the Driveshield: North American Header

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

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

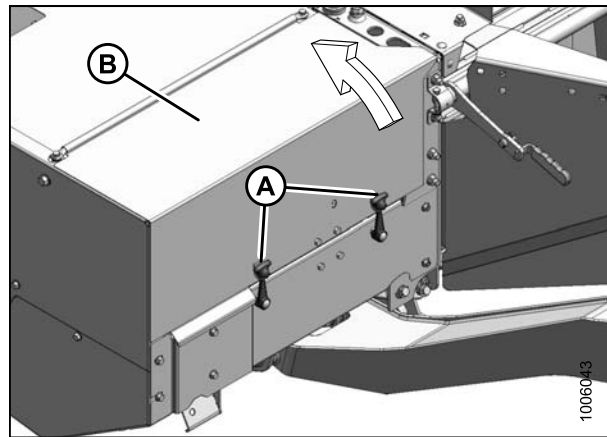


Figure 5.5

5.4.2 Closing the Driveshield: North American Header

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

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

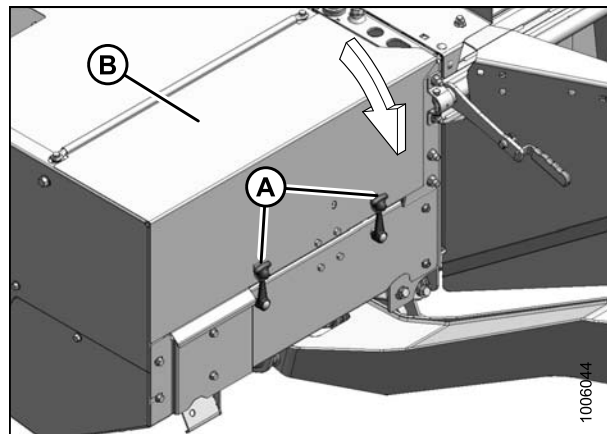


Figure 5.6

OPERATION

5.4.3 Removing Right End Shield: North American Headers

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

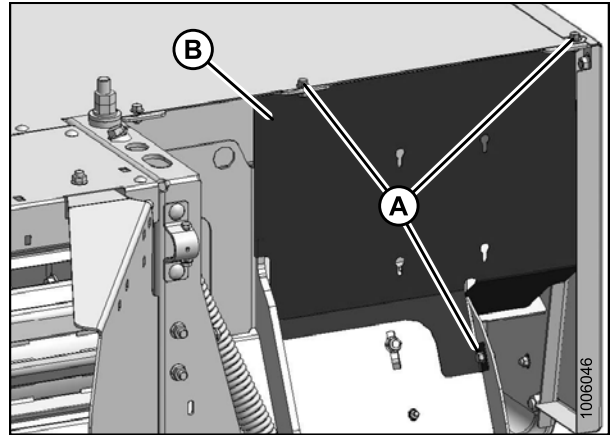


Figure 5.7

5.4.4 Installing Right End Shield: North American Headers

1. Install right end shield (B) using three bolts (A).

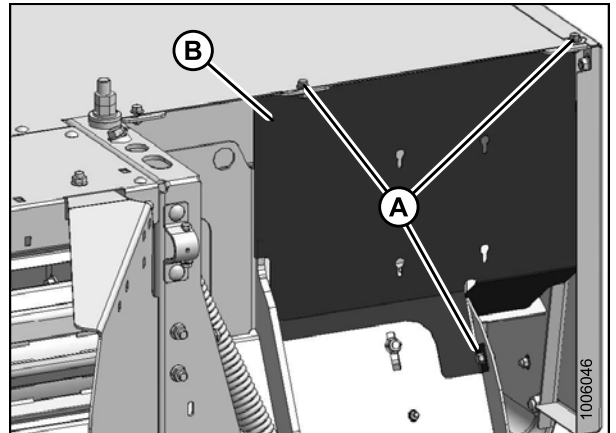


Figure 5.8

OPERATION

5.4.5 Opening the Driveshield: Export Header

Follow these steps to open the driveshield on export header:

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

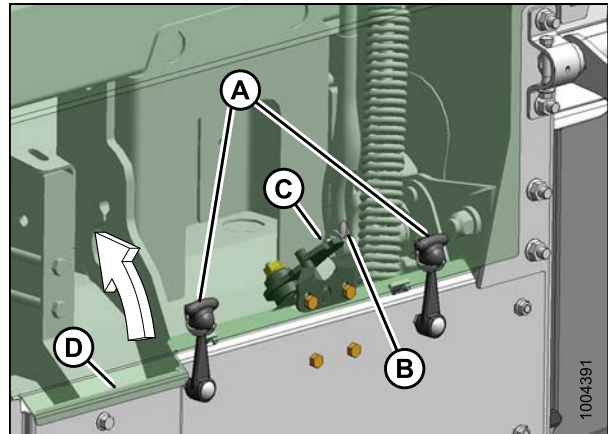


Figure 5.9

5.4.6 Closing the Driveshield: Export Header

Follow these steps to close the driveshield on export header:

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

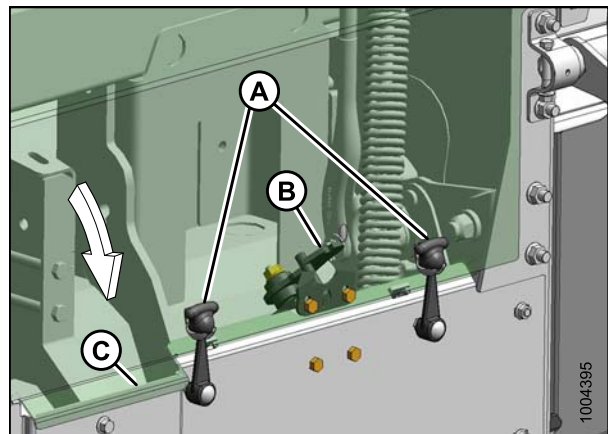


Figure 5.10

OPERATION

5.5 Cutterbar Doors



CAUTION

Do NOT operate the machine without all the cutterbar doors down, curtains installed and in good condition.

There are two doors to provide access to the cutterbar area.

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

The cutterbar curtains are very important to reduce the potential for thrown objects. Always keep these curtains down when operating the header.

Replace the curtains if they should become worn or damaged. Refer to your Dealer for replacement instructions.

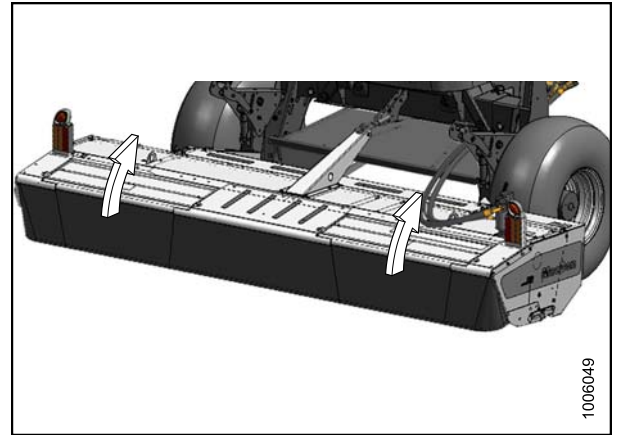


Figure 5.11

5.5.1 Opening the Cutterbar Doors: North American Header

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

1. Unhook the curtain latches (A).

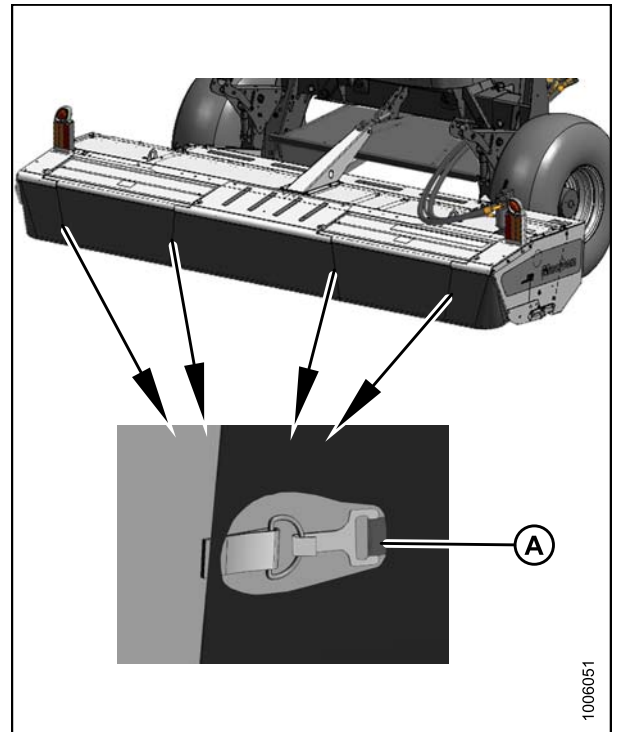


Figure 5.12

OPERATION

2. Lift front of door to the open position.



Figure 5.13

5.5.2 Closing the Cutterbar Doors: North American Header

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



CAUTION

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

1. Pull at top and move to closed position.



Figure 5.14

OPERATION

2. Hook curtain latches (A).

NOTE: Ensure that curtains hang properly and completely enclose cutterbar area.

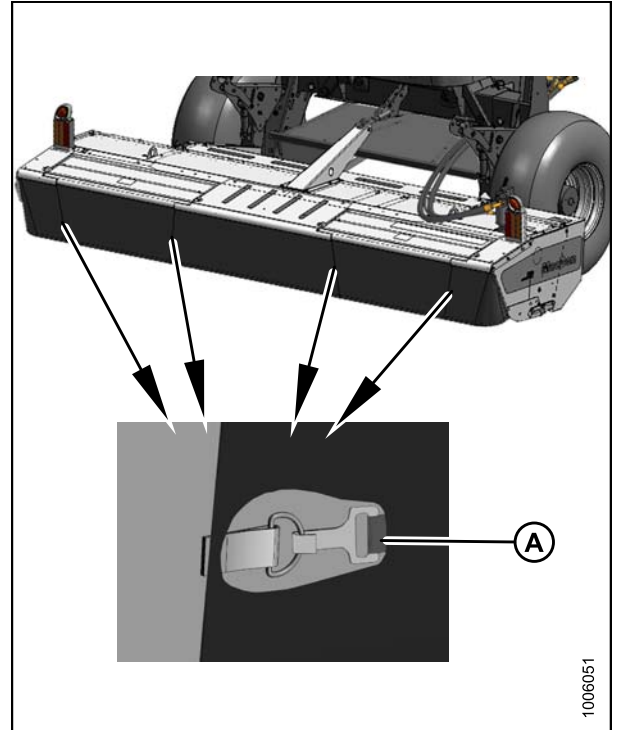


Figure 5.15

OPERATION

5.5.3 Opening the Cutterbar Doors: Export Header

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

1. Unhook curtain latches (A).

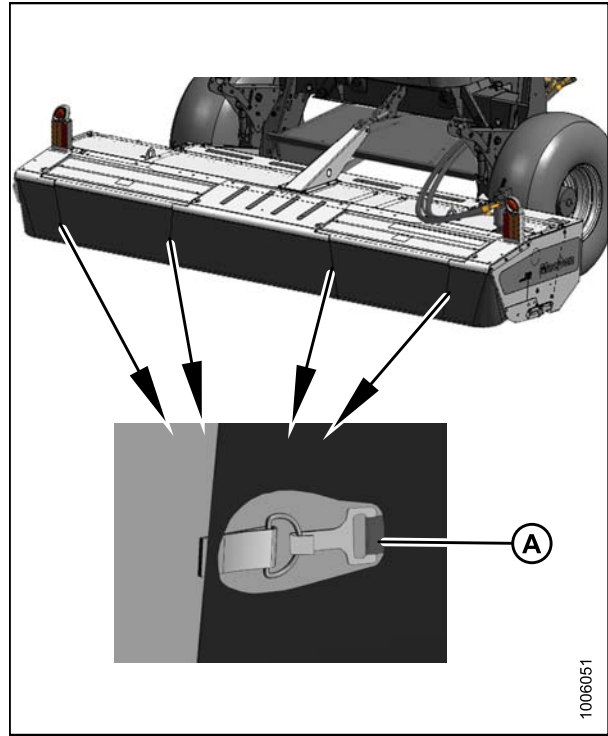


Figure 5.16

OPERATION

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

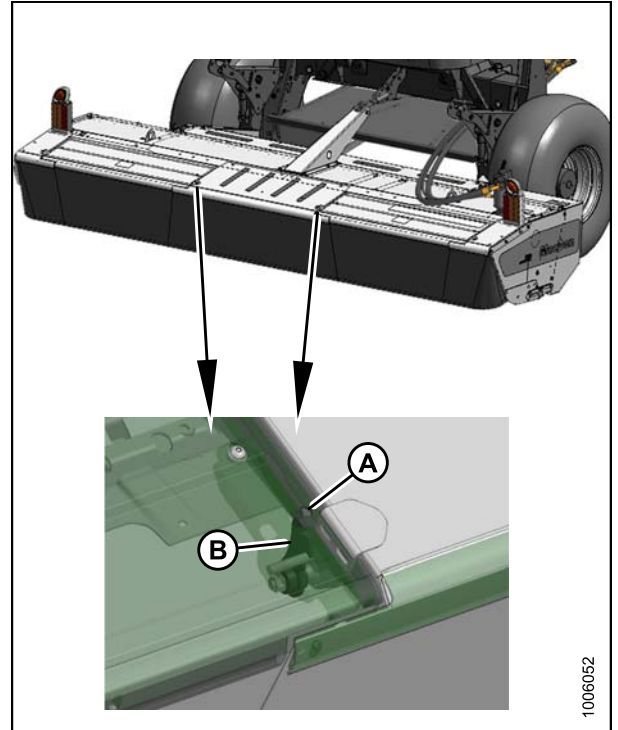


Figure 5.17

OPERATION

5.5.4 Closing the Cutterbar Doors: Export Header

To close the cutterbar doors on export header:

CAUTION

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

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

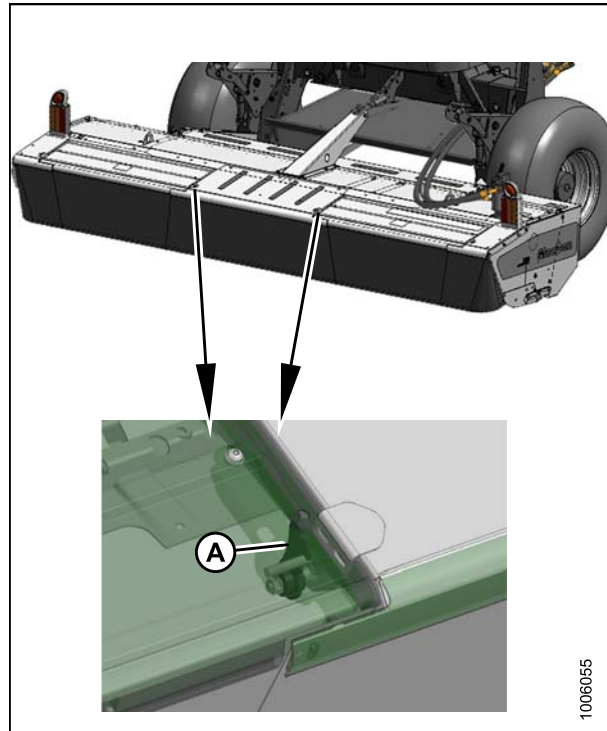


Figure 5.18

OPERATION

2. Hook curtain latches (A).

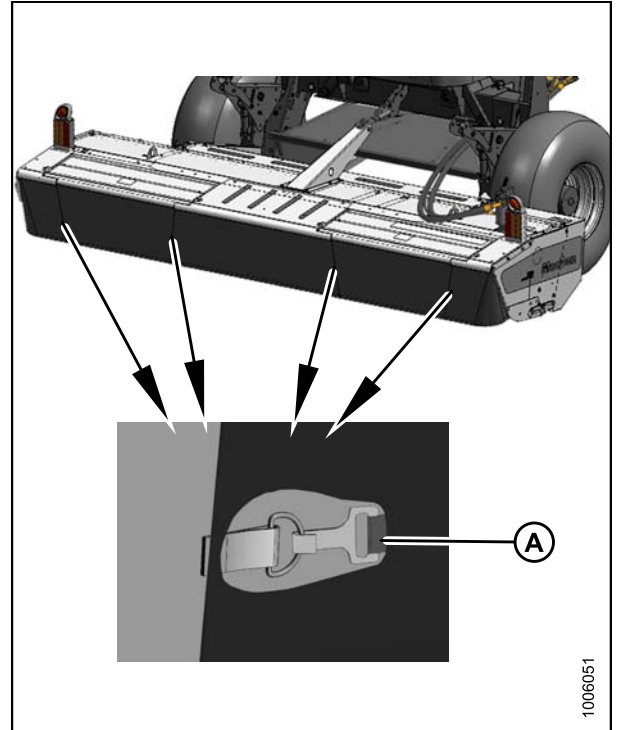


Figure 5.19

OPERATION

5.6 Daily Start-Up Check

CAUTION

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

You may need:

- a hard hat
- protective glasses or goggles
- heavy gloves
- a respirator or filter mask
- wet weather gear

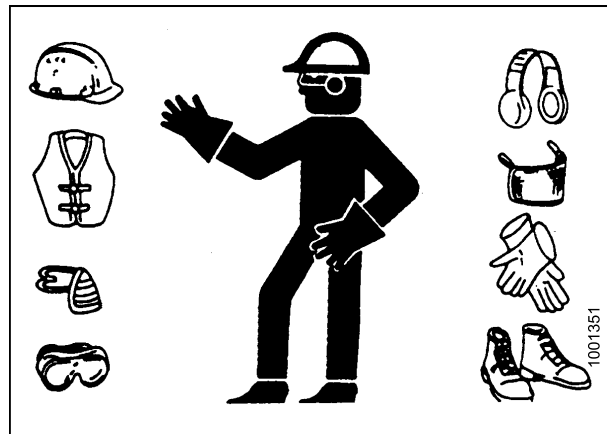


Figure 5.20

- Protect against noise. Wear a suitable hearing protective device such as ear muffs or ear plugs to protect against objectionable or uncomfortable loud noises.



Figure 5.21

OPERATION

Do the following each day before start-up:

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

NOTE: Use proper procedure when searching for pressurized fluid leaks. See Section [7.8.2 Hydraulic Hoses and Lines, page 156](#).

2. Clean all lights and reflective surfaces on the machine. Check lights for proper operation.
3. Perform all daily maintenance refer to Section [7.5.1 Maintenance Schedule/Record, page 112](#).

OPERATION

5.7 Attaching the Header

5.7.1 Attaching the Forming Shield

To attach the forming shield to the windrower, follow these steps.

1. Remove the two clevis pins (A) from forming shield forward end.

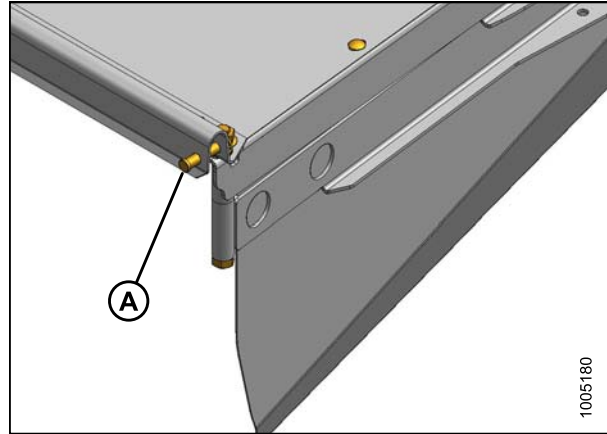


Figure 5.22

DANGER

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

2. Stop engine and remove key.
3. Position the forming shield (A) under the windrower frame.

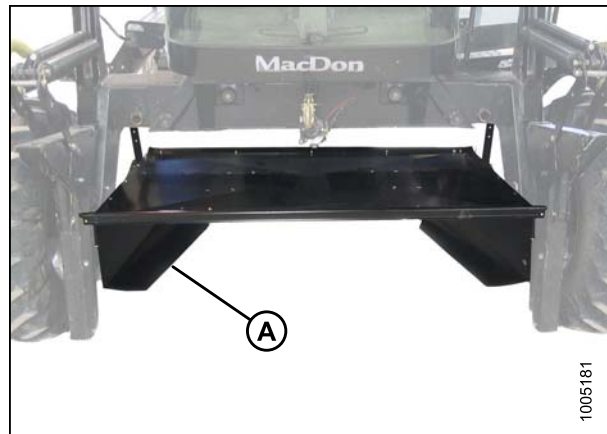


Figure 5.23

OPERATION

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

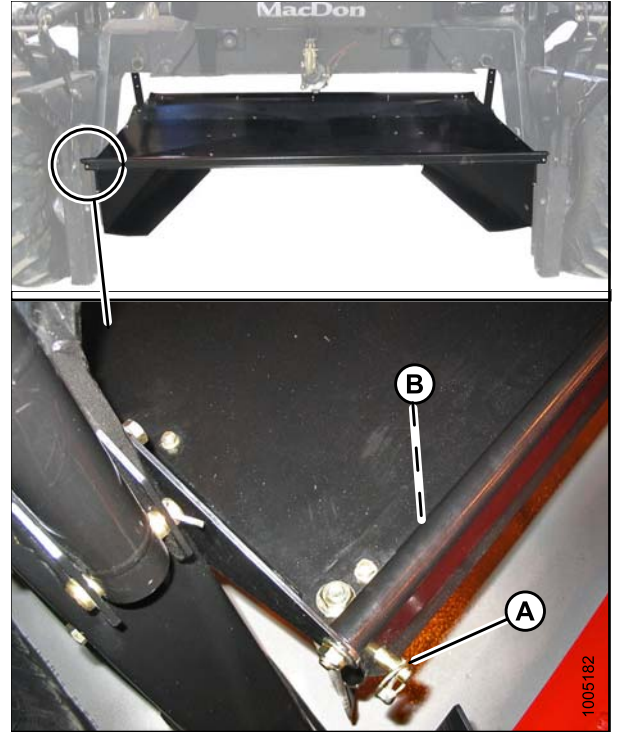


Figure 5.24

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

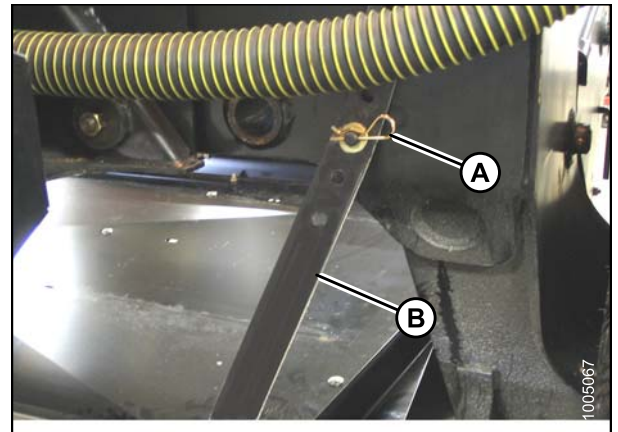


Figure 5.25

OPERATION

6. Set the forming shield side deflectors to the desired width by repositioning adjuster bars (A). Use the same hole location on both sides.
7. Adjust rear fluffer deflector (C) to middle position. Loosen handles (B) if required.

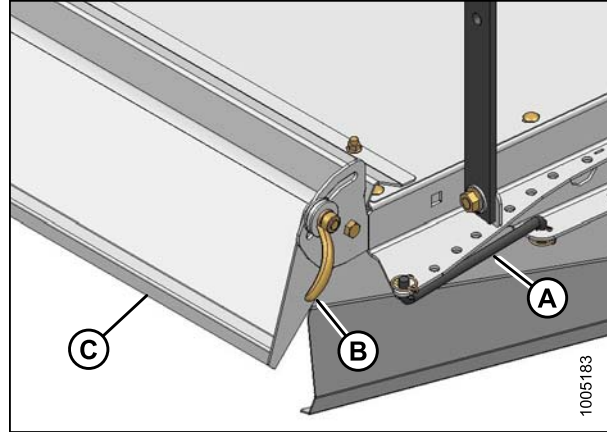


Figure 5.26

8. Attach the R85 header to the windrower. Refer to the MacDon self-propelled windrower operator's manual, and then return to this manual to complete the attachment.
9. Connect the hydraulics and electrical harness. See the following pages for instruction, specific to your windrower model.

5.7.2 Attaching the Header (M205 Windrowers)



DANGER

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

To attach the header to an M205 windrower, follow these steps.

OPERATION

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

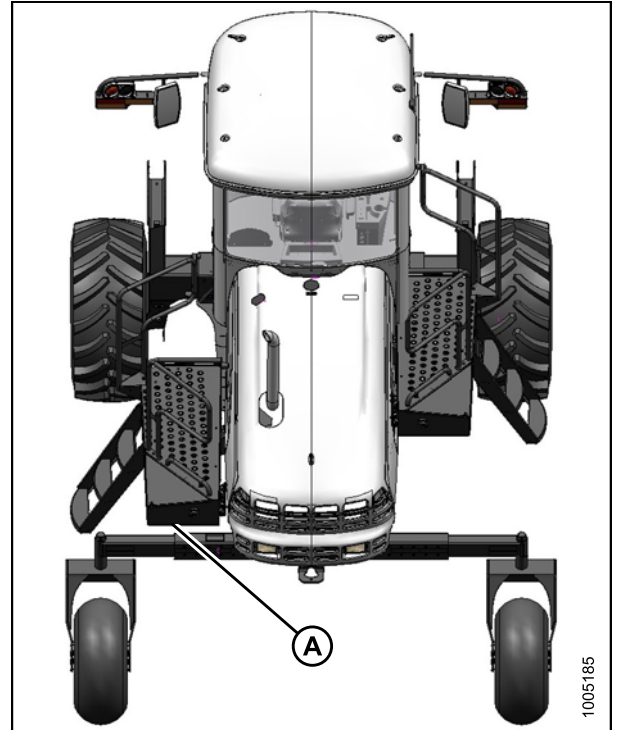


Figure 5.27

2. Route the hose bundle (A) from the header, under the windrower frame and insert pin (B) into hole in windrower frame.
3. Place hoses on support (C).
4. If optional couplers and lock are installed on hoses and lines, proceed as follows. Otherwise, proceed to step 12., [Attaching the Header \(M205 Windrowers\)](#), page 45.

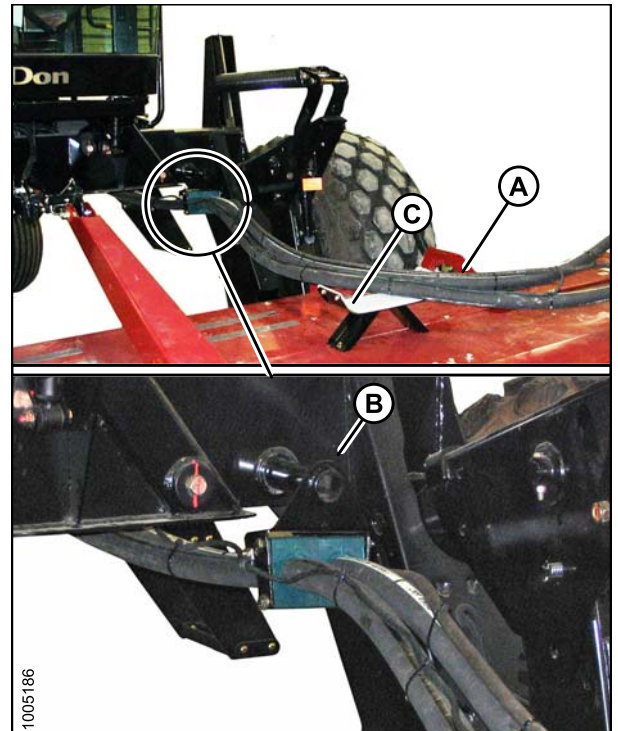


Figure 5.28

OPERATION

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

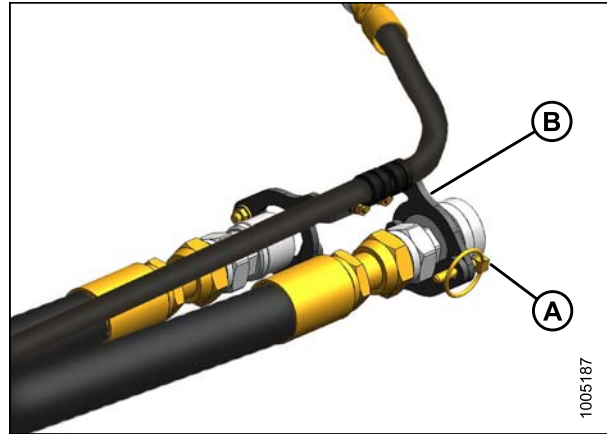


Figure 5.29

6. Position hose couplers against mating couplers on windrower and screw sleeves (A) onto mating receptacles. Use wrench to tighten couplers.

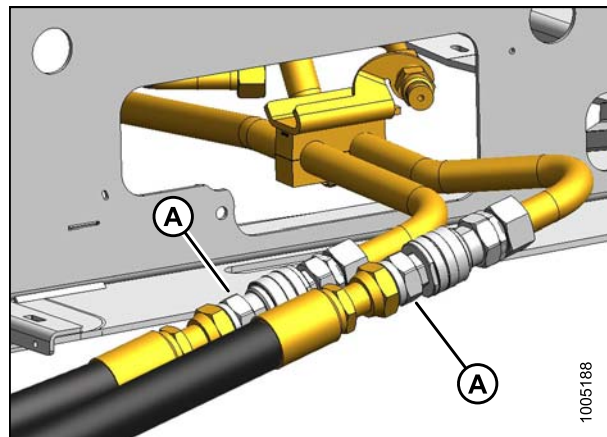


Figure 5.30

7. Locate lock onto couplers so that retainer (A) locates on fitting adjacent to the sleeve on each coupler. Retainer can be adjusted by loosening bolts (B). Tighten bolts after adjusting.

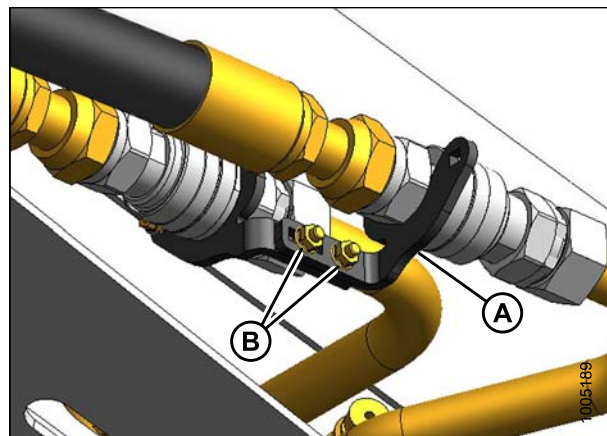


Figure 5.31

OPERATION

- Lower holder (A) onto sleeves (B) so that flats locate on holder. Holder can be adjusted by loosening bolts (C). Tighten bolts after adjusting.

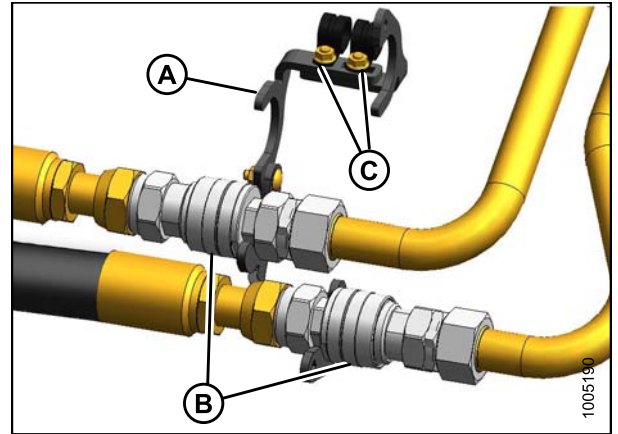


Figure 5.32

- Insert lynch pin (A) to secure lock.
- Attach case drain hose coupler at (B).
- Proceed to step 14., [Attaching the Header \(M205 Windrowers\)](#), page 45.

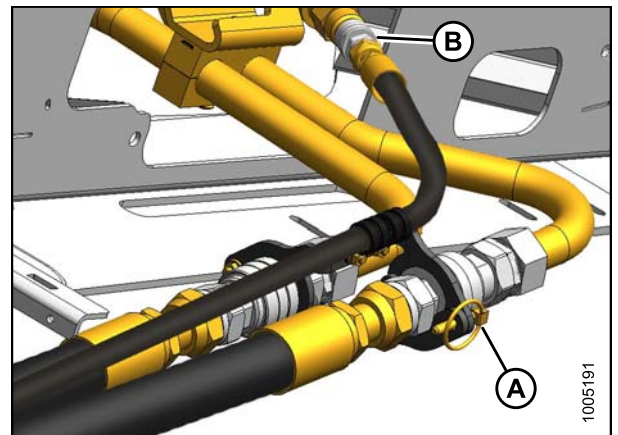


Figure 5.33

- Connect large hoses to the lines at (A) and (B) as shown. Torque fittings to 135 lb-ft (183 N·m).
- Attach case drain hose coupler at (C).
- Connect electrical harness to connector (D) (located beside the forward valve block on the windrower).

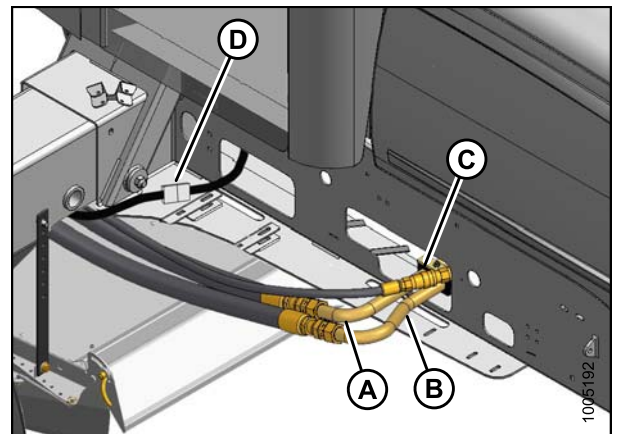


Figure 5.34

OPERATION

15. Move windrower platform (A) to CLOSED position.

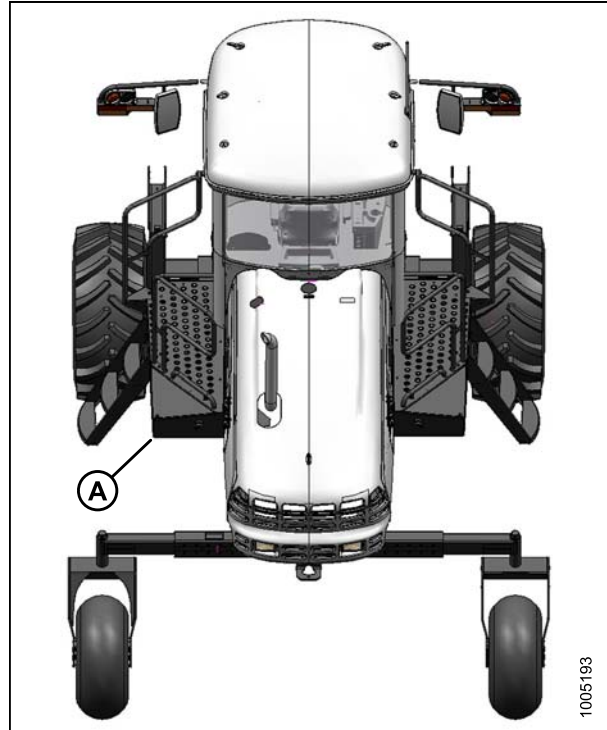


Figure 5.35

5.7.3 Attaching the Header (M200 Windrowers)

The R85 16-foot header requires kit MD #B5455 installed to enable operation on an M200 windrower.

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

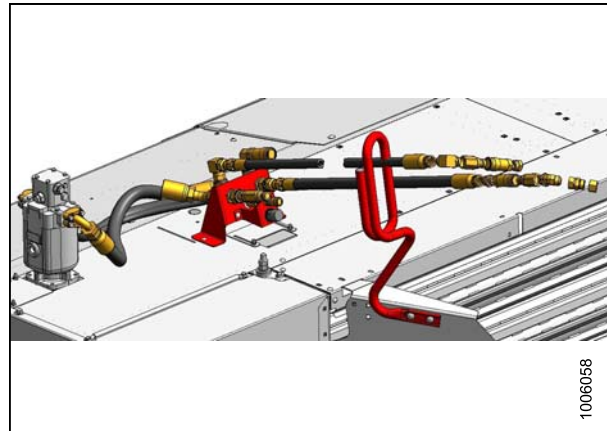


Figure 5.36

DANGER

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

To attach the header to an M200 windrower, follow these steps.

OPERATION

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



Figure 5.37

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



Figure 5.38

OPERATION

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

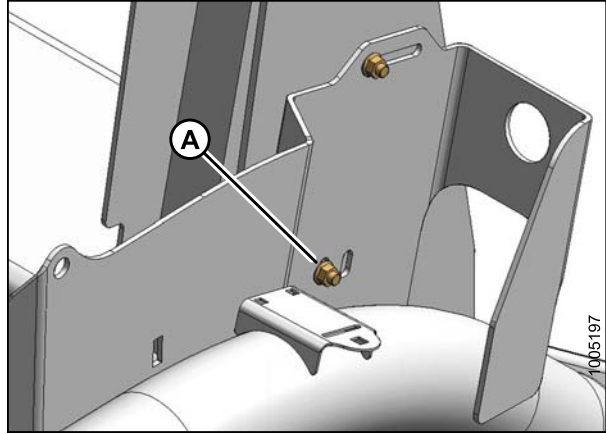


Figure 5.39

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

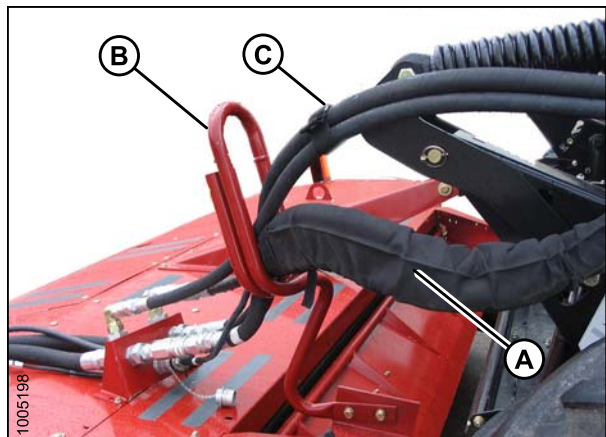


Figure 5.40

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

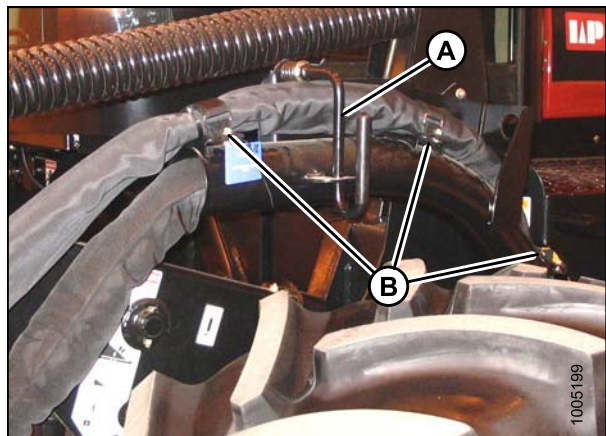


Figure 5.41

OPERATION

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

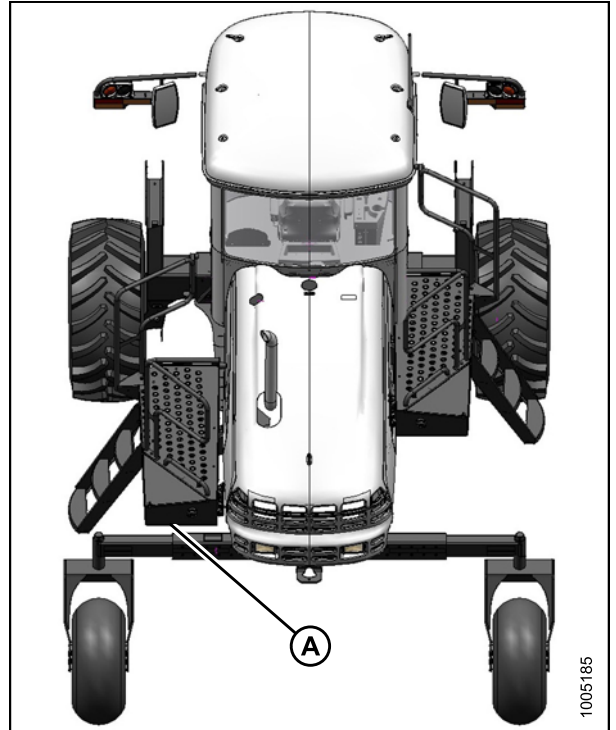


Figure 5.42

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

IMPORTANT

Maintain cleanliness of all open lines and ports.

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

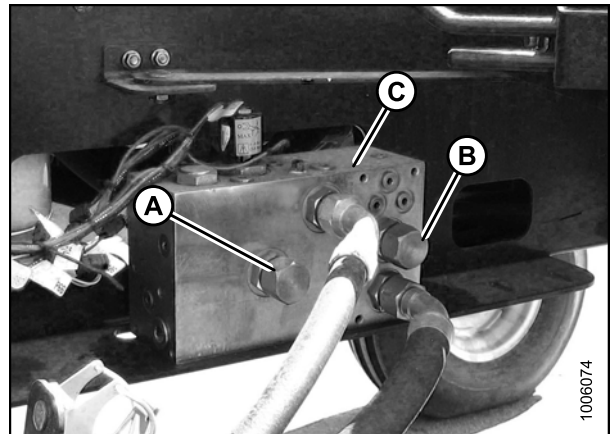


Figure 5.43

OPERATION

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

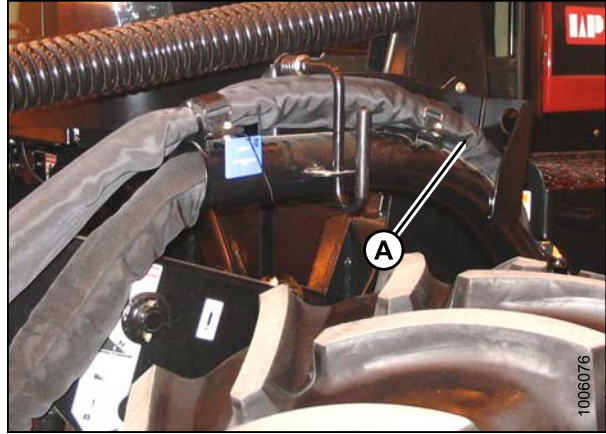


Figure 5.44

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

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

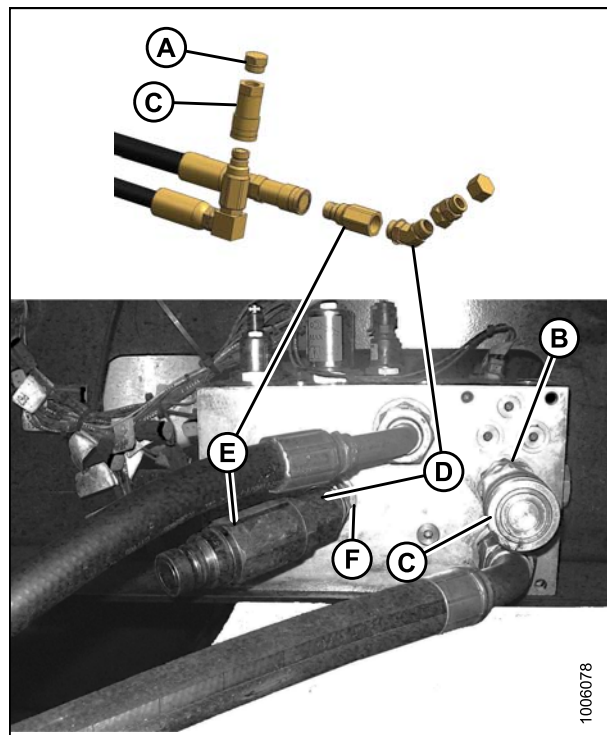


Figure 5.45

OPERATION

16. Connect hoses from header to fittings as shown.

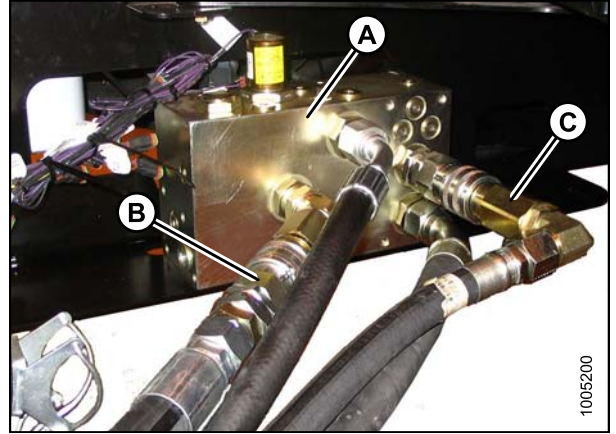


Figure 5.46

A - Middle Valve Block
C - Return

B - Pressure

17. Remove caps and plugs from hoses and lines.

18. Connect the pressure (A), return (B), and case drain (C) hoses from windrower to fittings on header as shown.

19. Connect electrical harness (D) from windrower to connector on header.

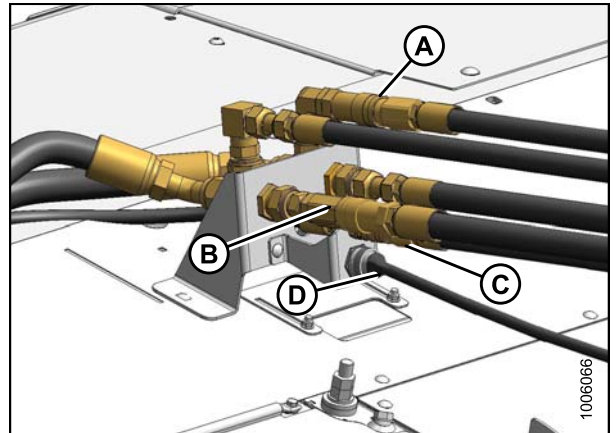


Figure 5.47

OPERATION

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

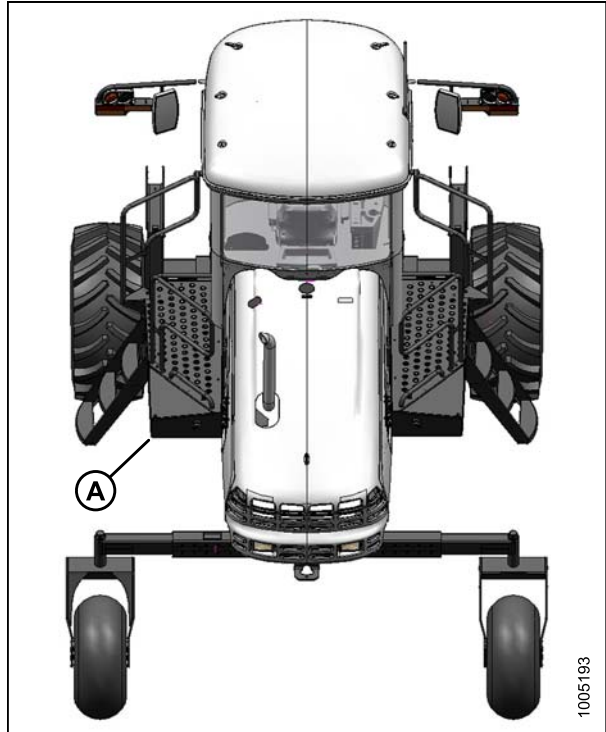


Figure 5.48

1005193

OPERATION

5.8 Detaching the Header

5.8.1 Detaching the Header (M205 Windrowers)



DANGER

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

To detach the header from an M205 windrower, follow these steps:

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

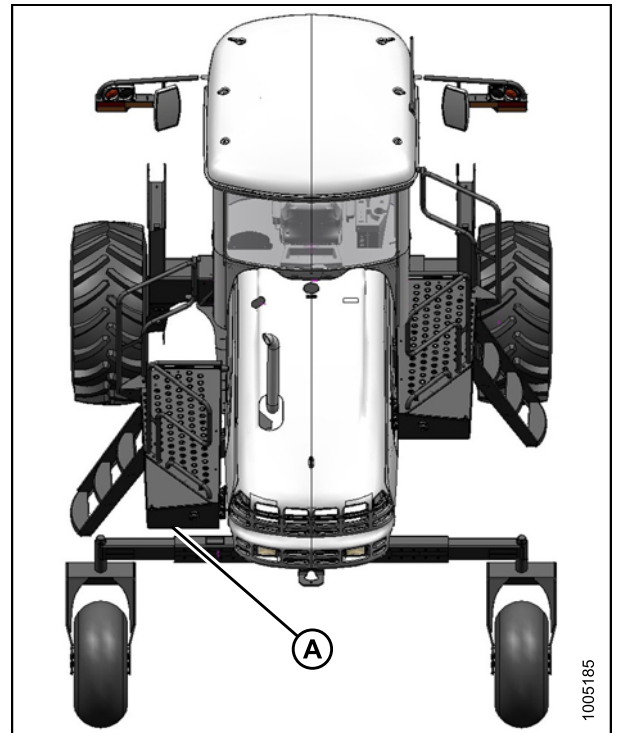


Figure 5.49

OPERATION

4. Disconnect electrical harness at connector (A).
5. If couplers and coupler lock are installed on lines, proceed as follows. Otherwise, proceed to step 13., [Detaching the Header \(M205 Windrowers\)](#), page 55.

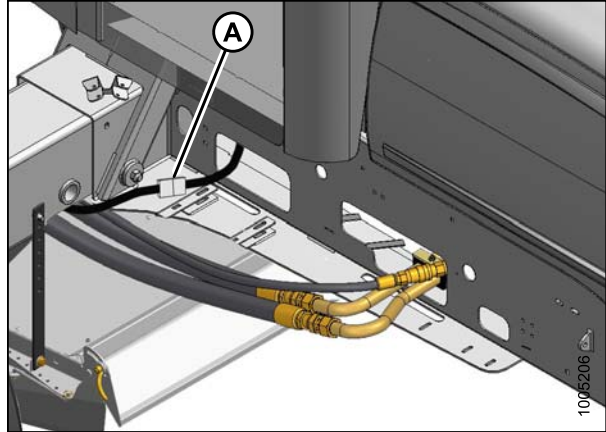


Figure 5.50

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

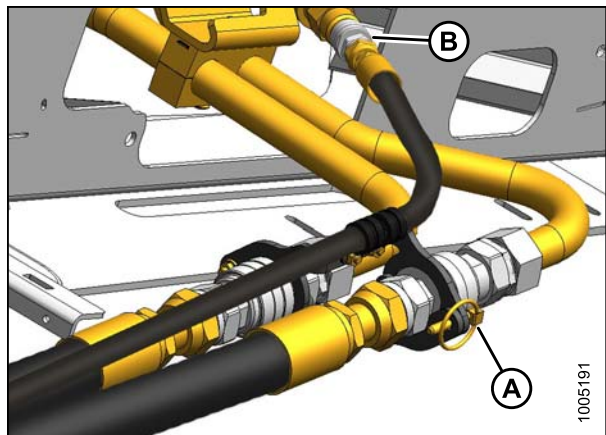


Figure 5.51

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

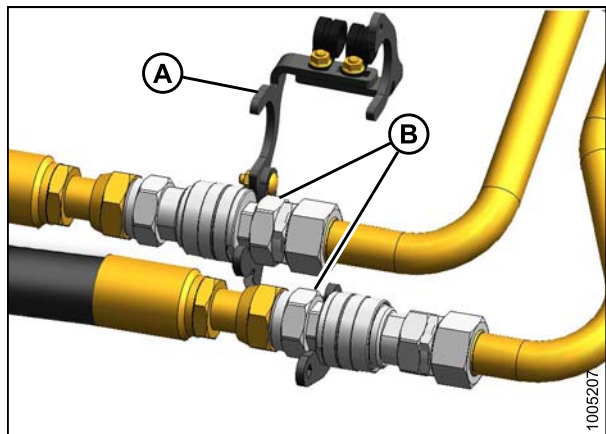


Figure 5.52

OPERATION

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

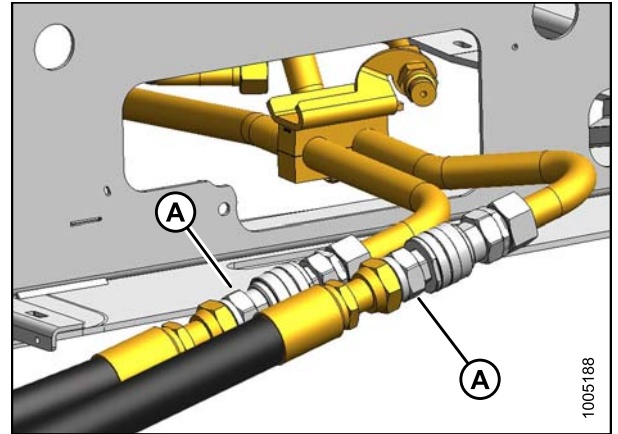


Figure 5.53

11. Attach coupler lock (B) to hoses and secure with lynch pin (A).
12. Proceed to step 14., [Detaching the Header \(M205 Windrowers\)](#), page 56.

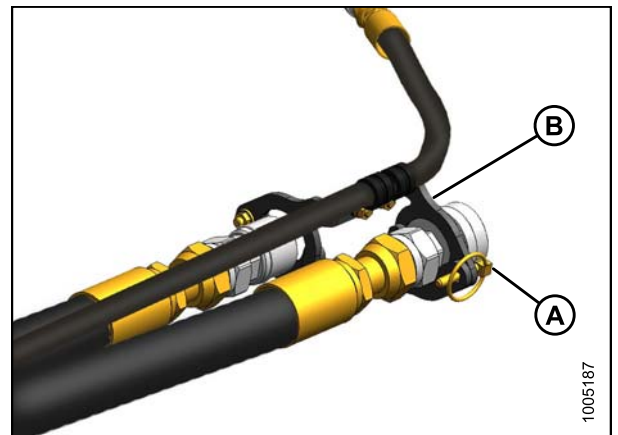


Figure 5.54

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

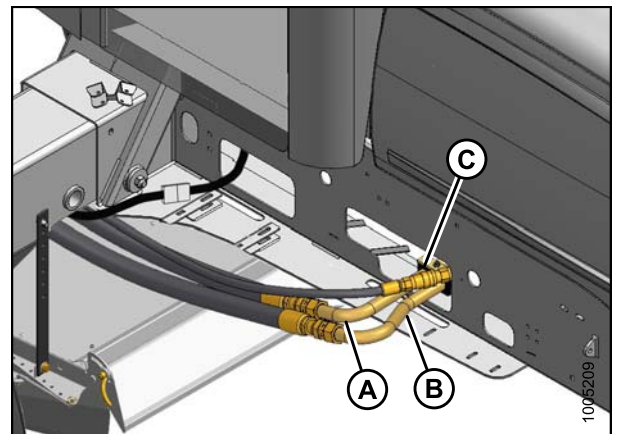


Figure 5.55

OPERATION

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

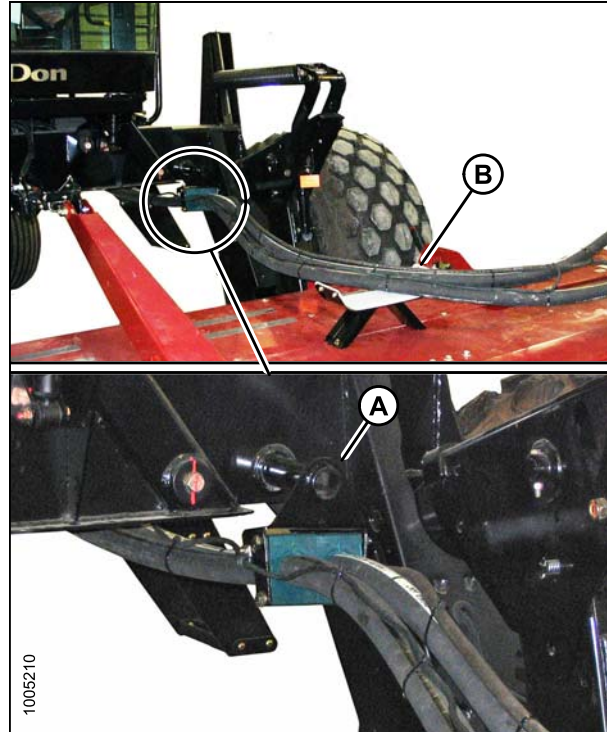


Figure 5.56

16. Move maintenance platform (A) to CLOSED position.
17. Detach the header from the windrower. Refer to the MacDon self-propelled windrower operator's manual.

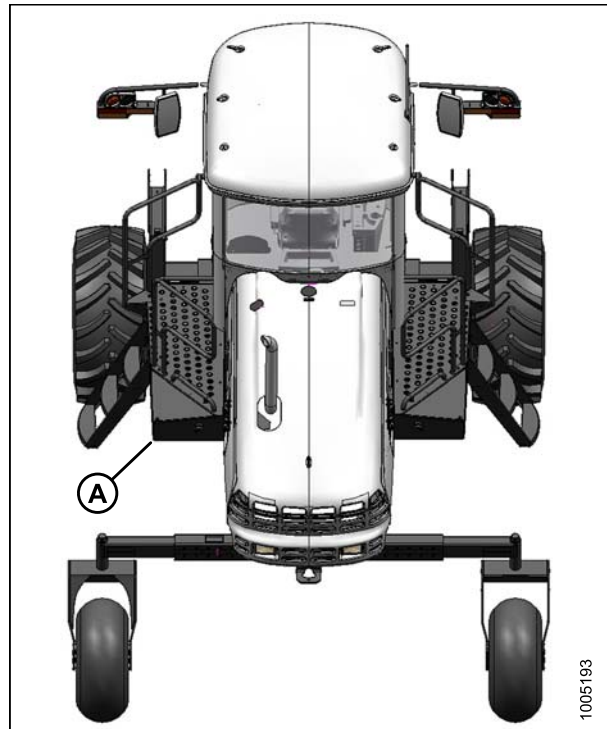


Figure 5.57

OPERATION

5.8.2 Detaching the Header (M200 Windrowers)



DANGER

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

To detach a header from an M200 windrower, follow these steps:

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

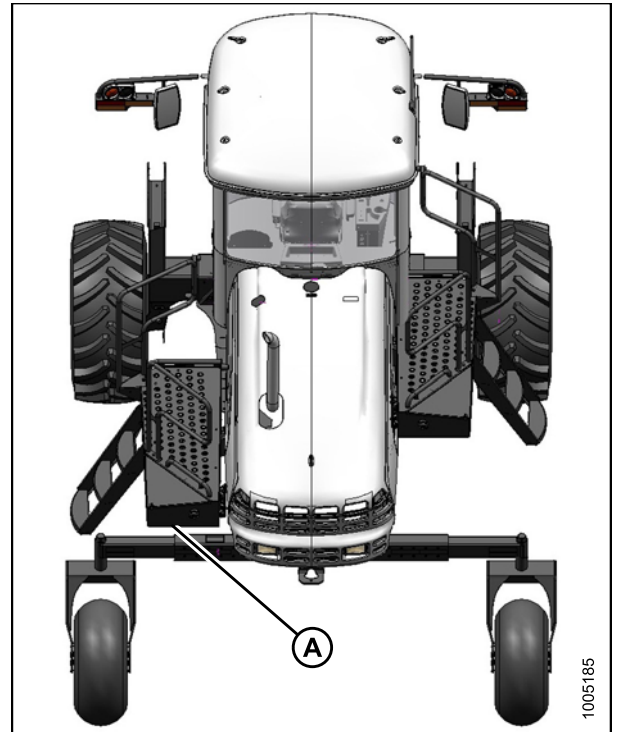


Figure 5.58

4. Disconnect pressure (B) and return (C) hoses from fittings on valve block (A).
5. Install plugs and caps on open windrower lines and header hoses.

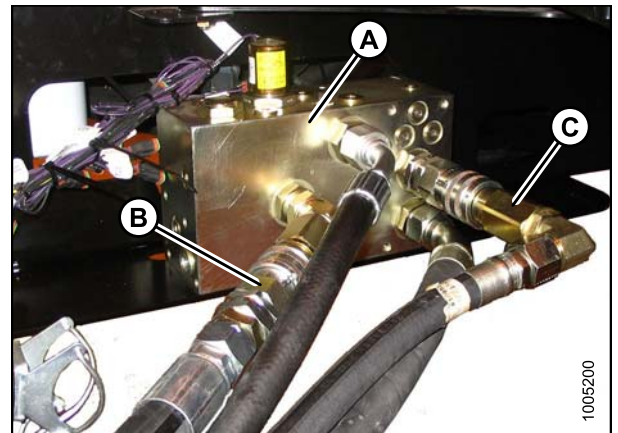


Figure 5.59

OPERATION

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

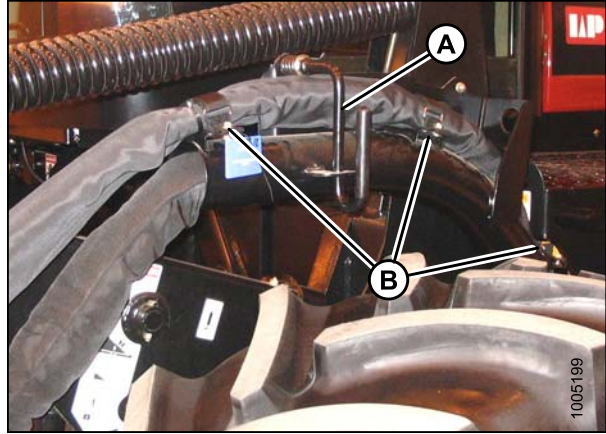


Figure 5.60

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

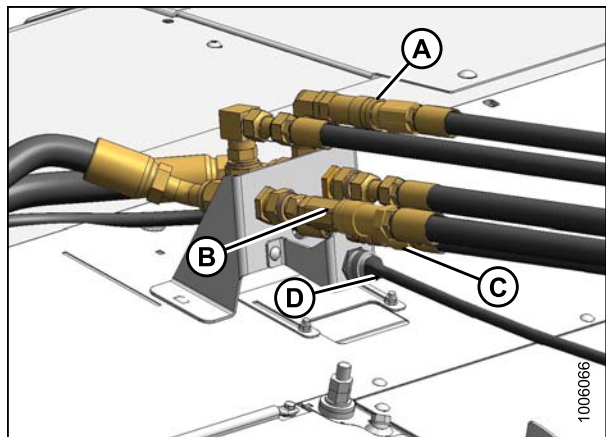


Figure 5.61

10. Move hose bundle from header and locate on windrower left side (cab forward) with hoses in support (B).
11. Rotate lever (A) clockwise and push to engage bracket.
12. Locate electrical harness through support (B) and attach cap to electrical connector (C).

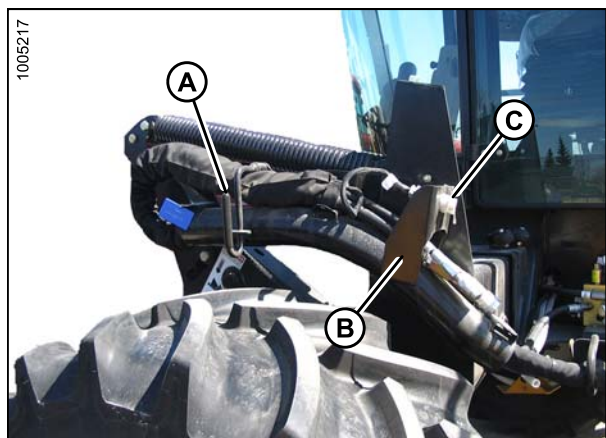


Figure 5.62

OPERATION

13. Move windrower platform (A) back to CLOSED position.
14. Detach header from windrower. Refer to the self-propelled windrower operator's manual.

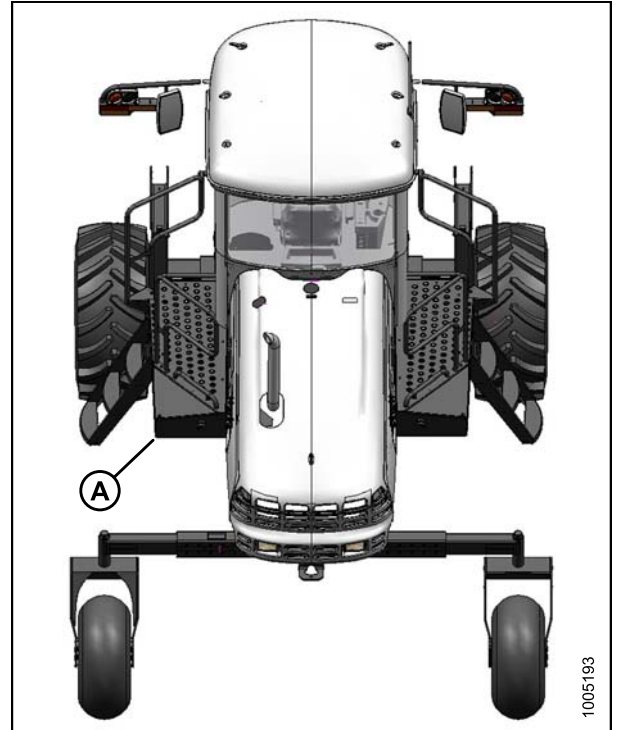


Figure 5.63

1005193

OPERATION

5.9 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 windrower seat for binding or interfering parts.

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



CAUTION

Before investigating an unusual sound or attempting to correct a problem, shut off windrower, engage parking brake, and remove key.

NOTE: Perform the items specified in Section [7.5.2 Break-In Inspections, page 114](#).

5.10 Shutting Down the Windrower



CAUTION

Before leaving the windrower seat for any reason:

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

OPERATION

5.11 Transporting the Header

Refer to your MacDon self-propelled windrower operator's manual for transporting headers when attached to the windrower.

IMPORTANT

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

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

For procedure on changing the reflector orientation, see Section [5.12 Lights, page 63](#)

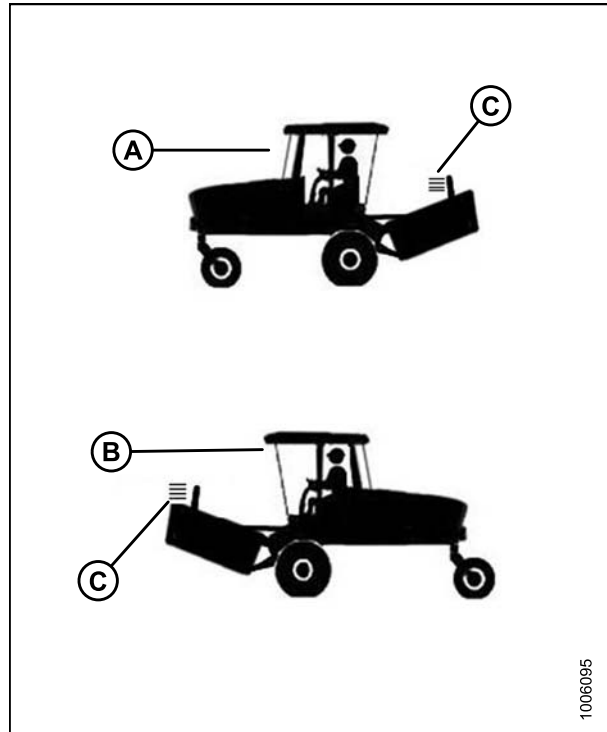


Figure 5.64

A - Engine-Forward B - Cab-Forward C - Amber Light

OPERATION

5.12 Lights

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



DANGER

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

Change amber reflector (A) orientation as follows:

NOTE: Arrow indicates direction of travel (B).

1. Disconnect wiring harness (C) at light.
2. Remove four bolts (D) and remove light assembly (E).
NOTE: Only two bolts shown in illustration.
3. Repeat for opposite light assembly.

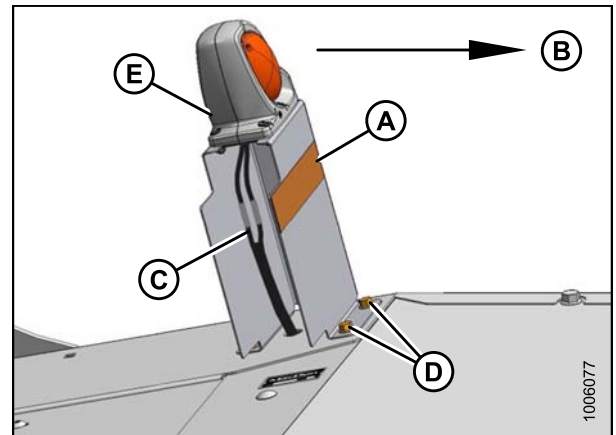


Figure 5.65: Factory Installation

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

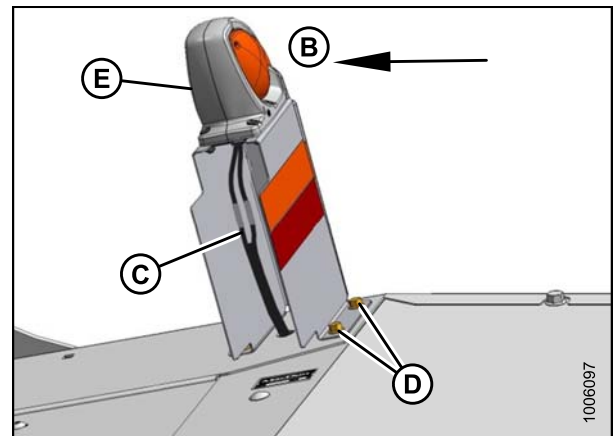


Figure 5.66: Alternate Installation

6 Operating the Header

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

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

The variables listed below and detailed on the following pages will affect the performance of the header. You will quickly become familiar with adjusting the machine to give you the desired results. Most of the adjustments have been set at the factory, but if desired, the settings can be changed to suit crop conditions.

Variable	See Section
Header float	6.1 Header Float, page 65
Roll gap	6.2 Roll Gap, page 67
Roll tension	6.3 Roll Tension, page 70
Roll timing	6.4 Roll Timing, page 71
Forming shields	6.5 Forming Shields, page 74
Header angle	6.6 Header Angle, page 78
Cutting height	6.7 Cutting Height, page 79
Disc speed	6.7.3 Disc Speed, page 80
Ground speed	6.8 Ground Speed, page 81

6.1 Header Float

Header float springs are normally set so 95–105 lbf (426–471 N) is required to lift either end of the header just off the ground.

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

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

OPERATING THE HEADER

6.1.1 Adjusting Header Float

Set the Float Fine Adjustment to **MID-RANGE** with the windrower float adjustment system in the cab. Refer to your windrower operator's manual.



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

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

If it is necessary to adjust the float, perform the following steps:

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



Figure 6.1

OPERATING THE HEADER

6.2 Roll Gap

Steel "n" bar rolls "condition" the crop by crimping and crushing the stem in several places. This allows moisture release for quicker drying. The degree to which the crop is conditioned as it passes through the rolls is controlled by roll gap.

The factory roll gap setting of 1 in. (25.4 mm), measured at the conditioner rolls corresponds to the roll gap setting of 1-3/16 in. (30 mm), measured at the adjustment bolt.

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

NOTE: If the conditioner rolls are set too tight (close together), can result in over conditioning the crop material (excessive leaf damage), reduce machine capacity and use unnecessary horsepower. Monitor your disc speed. When crop loads increase and disc speed falls by more than 50 rpm, you should check conditioning action (on plant). Increased crop volume may result in increased conditioning (leaf loss). Consider increasing roll gap slightly. With optional load sensor on M205, a warning limit may be set to warn the Operator to slow down prior to a header stall or plug.

A larger gap may be desirable in thick stemmed cane-type crops; however, too large gap may cause feeding problems.

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

6.2.1 Checking Roll Gap



DANGER

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

1. Lower header fully.
2. Open the driveshield. See Section [5.4 Driveshields](#), page 28.
3. Remove bolts (A) that secure conditioner shield (B).
4. Remove the shield (B).

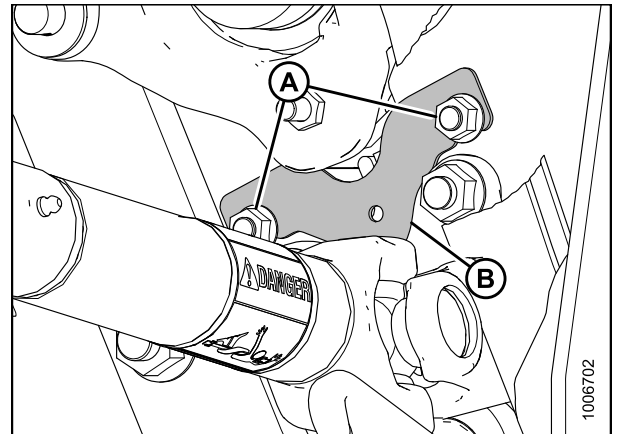


Figure 6.2

OPERATING THE HEADER

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

IMPORTANT

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

6. See Section [6.4 Roll Timing, page 71](#) for instructions on checking the timing.

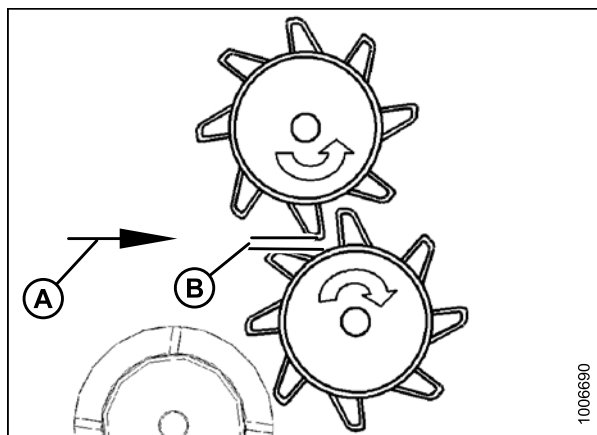


Figure 6.3: Conditioner Roll Gap (Roll Spacing Not to Scale)

7. Reinstall the conditioner shield (B) and secure it with nuts (A).
8. Close the driveshield. See Section [5.4 Driveshields, page 28](#).

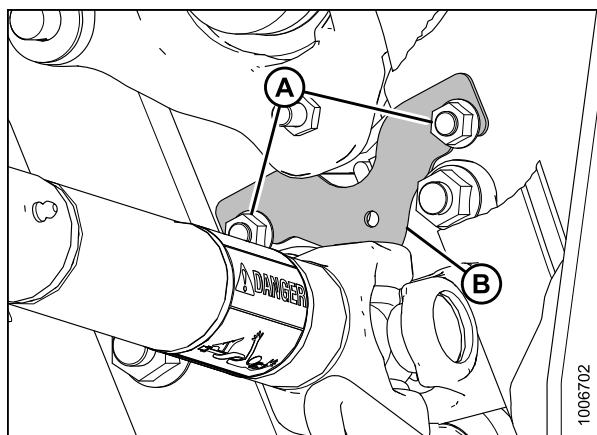


Figure 6.4

6.2.2 Adjusting Roll Gap

DANGER

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

1. Lower header fully.
2. Stop the engine and remove the key.
3. Open the LH driveshield. See Section [5.4 Driveshields, page 28](#).

OPERATING THE HEADER

4. Loosen upper jam nut (B), on both sides of conditioner adjustment bolts.
5. To increase roll gap, turn lower nut (A) clockwise.
6. To decrease roll gap, turn lower nut (A) counterclockwise.
7. Measurement at (C) should be 1-3/16 in. (30 mm).
8. Once adjustment is complete, hold nut (A) and torque jam nut (B) to 75 lb-ft (102 N·m).

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

9. Check roll gap, see Section [6.2.1 Checking Roll Gap](#), page 67.

IMPORTANT

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

10. See Section [6.4 Roll Timing](#), page 71 for instructions on checking the timing.
11. Close the driveshield. See Section [5.4 Driveshields](#), page 28.

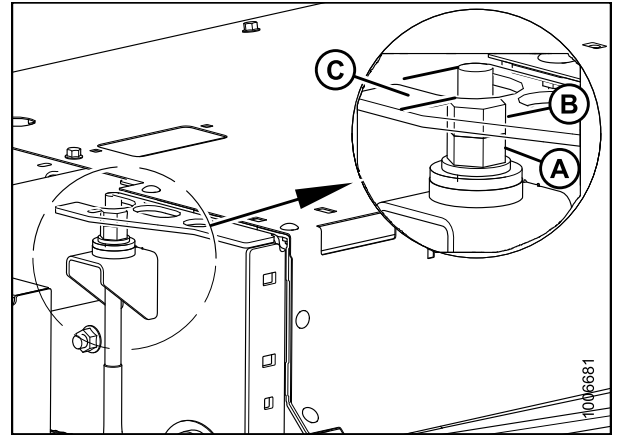


Figure 6.5: Roll Gap Adjustment Bolt

A - Lower Nut

B - Upper Jam Nut

C - 1-3/16 in. (30 mm)

OPERATING THE HEADER

6.3 Roll Tension

The roll tension (the force holding the rolls together) is achieved with a spring type adjustable linkage that is preset to maximum at the factory.

Heavy crops or tough forage that tend to separate the rolls require the maximum roll tension to ensure that material is sufficiently crimped.

Light alfalfa and short grasses would require less roll tension to minimize over-conditioning.

6.3.1 Adjusting Roll Tension

DANGER

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

To adjust the conditioner roll tension on a 16-foot header, follow these steps:

1. Lower header to ground, shut down tractor, and remove key from ignition.
2. Open the driveshield See Section [5.4 Driveshields](#), page 28.
3. To decrease the roll tension, turn the spring drawbolts counterclockwise to loosen the springs.
4. To increase the roll tension, loosen jam nut (A) and turn the spring drawbolt (B) clockwise to tighten the spring at each end of the roll. Set dimension (C) to 1.77–2.16 in. (45–55 mm).

IMPORTANT

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

5. Tighten jam nut (A) against casting after adjusting tension.
6. Close driveshields. See Section [5.4 Driveshields](#), page 28.

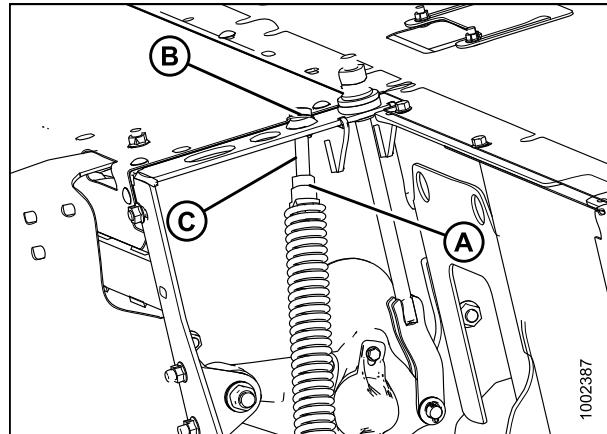


Figure 6.6: Spring Tension Dimension (RH Side)

A - Jam Nut
B - Spring Drawbolt
C - Spring Tension Adjustment
1.77–2.16 in. (45–55 mm)

OPERATING THE HEADER

6.4 Roll Timing

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

IMPORTANT

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

6.4.1 Checking Roll Timing



DANGER

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

To adjust the conditioner roll timing, follow these steps:

1. Lower header fully.
2. Open the driveshield See Section [5.4 Driveshields](#), page 28.
3. Loosen nuts (A) and slide conditioner shield (B) up to remove it.

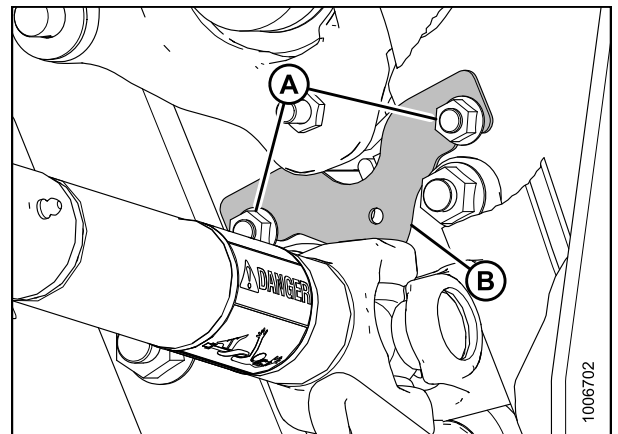


Figure 6.7: End View of Header (LH Side)

A - Nuts

B - Conditioner Shield

OPERATING THE HEADER

4. Measure the clearance (B) between the flats of the conditioner roll bars at both end of the conditioner rolls. Dimension (B) should be set to 0.35–0.51 in. (9–13 mm). If adjustment is required, see Section [6.4.2 Adjusting the Roll Timing, page 72](#)

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

NOTE: Roll spacing not to scale in illustration.

5. Close the driveshield. See Section [5.4 Driveshields, page 28](#).

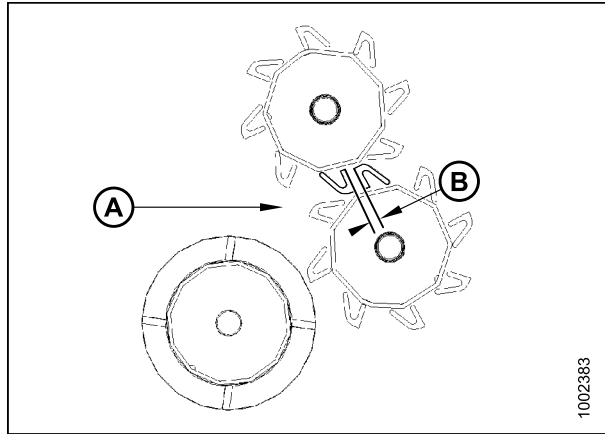


Figure 6.8: Roll Timing

A - Crop Flow

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

6.4.2 Adjusting the Roll Timing

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

1. Loosen four bolts (A) in slots of yoke plate (B) on upper roll universal shaft.
2. Locate roll timing gauge (B) on frame member under the flange. Remove nut (A) to remove gauge.

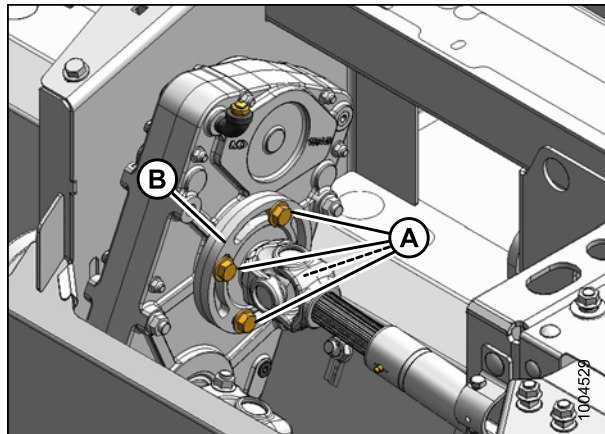


Figure 6.9

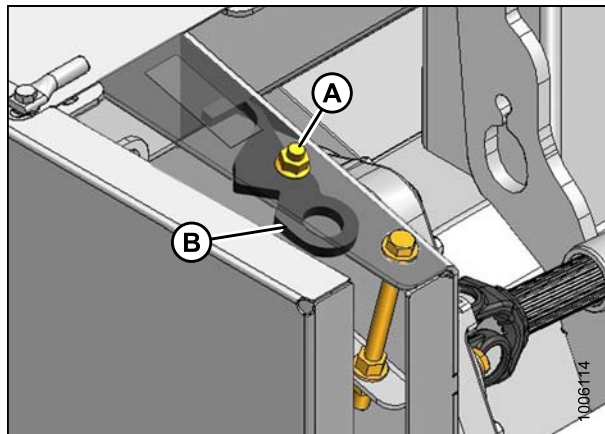


Figure 6.10: Roll Timing Gauge

A - Nut

B - Timing Gauge MD #150572

OPERATING THE HEADER

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



CAUTION

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

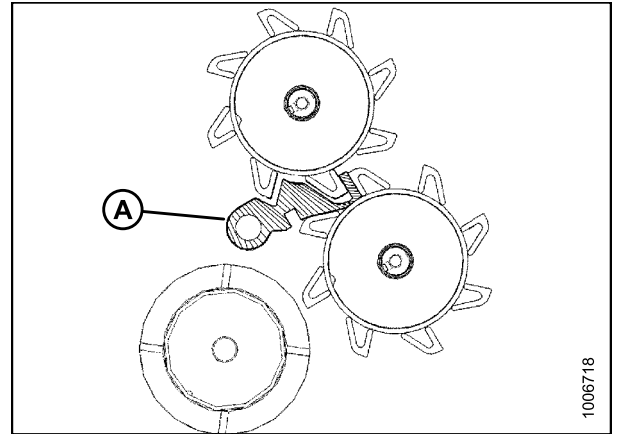


Figure 6.11: Roll Timing Gauge

A - Timing Gauge MD #150572

OPERATING THE HEADER

6.5 Forming Shields

WARNING

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

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

- weather conditions (rain, sun, humidity, wind)
- type and yield of crop
- drying time available
- method of processing (green-feed, bales, silage)

A wider windrow will generally dry faster and more evenly resulting in less protein loss. Fast drying is especially important in areas where the weather allows only a few days to cut and bale. Refer to Section [6.14 Haying Tips](#), page 96 for more information.

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

6.5.1 Adjusting the Side Deflectors

DANGER

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

The position of the side deflectors control the width and placement of the windrow. To adjust the side deflectors, follow these steps:

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

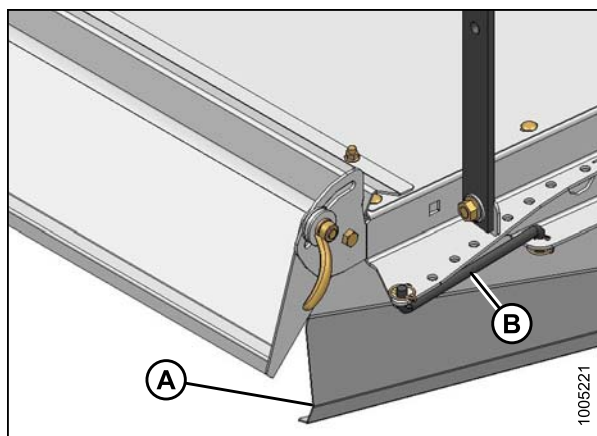


Figure 6.12

OPERATING THE HEADER

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

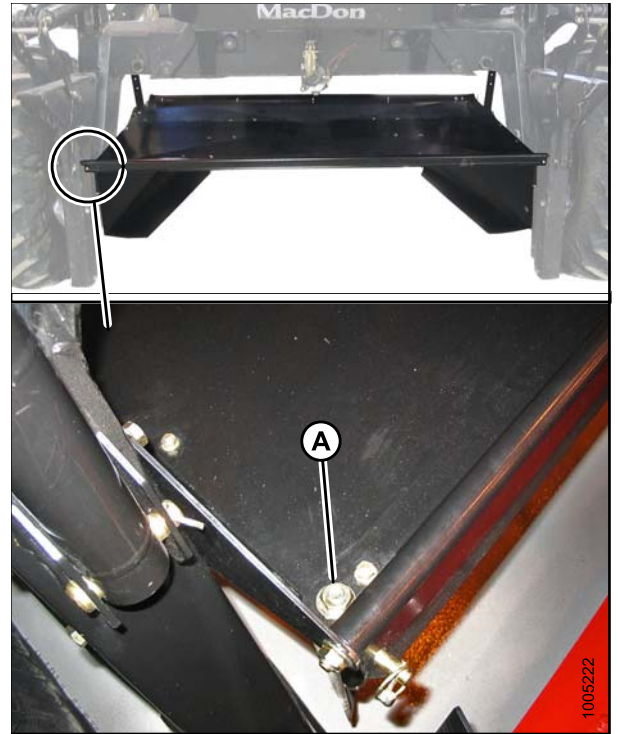


Figure 6.13

OPERATING THE HEADER

6.5.2 Adjusting the Rear Deflector (Fluffer Shield)

DANGER

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

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

Adjust the rear deflector as follows:

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

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

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

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

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

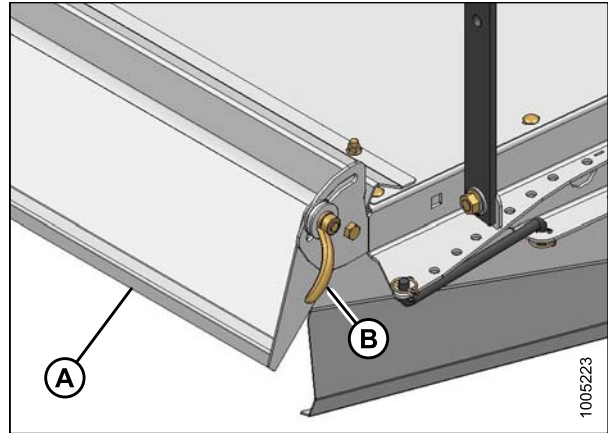


Figure 6.14

6.5.3 Adjusting the Swath Baffle

The swath baffle (A) determines the width and height of the windrow.

It is located immediately behind and above the conditioning rolls and can be positioned to:

- direct the crop flow into the forming shield for narrow and moderate width windrows.
- direct crop downward to form a wide swath.

To adjust the swath baffle, follow these steps:

DANGER

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

1. Remove lynch pin from pin (B) and remove pin from lever (C).
2. Move lever to middle hole in bracket and reinstall pin (B) through lever and bracket.
3. Secure with lynch pin.

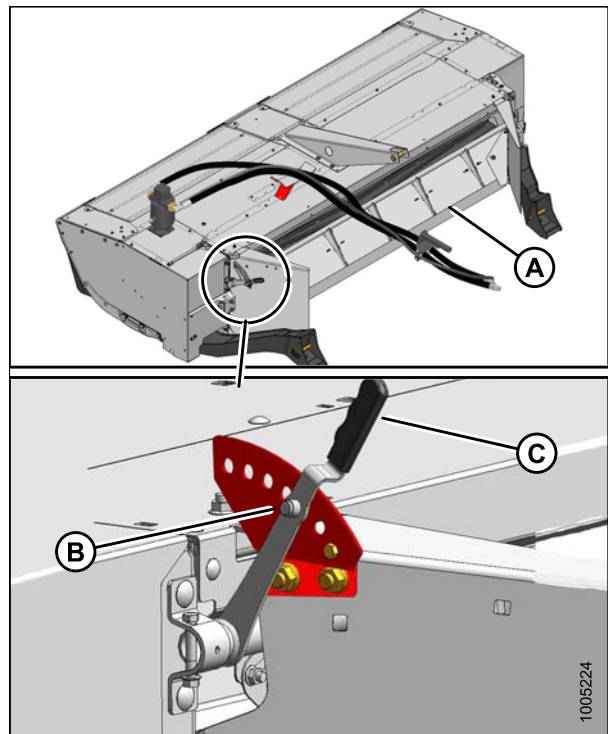


Figure 6.15

OPERATING THE HEADER

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

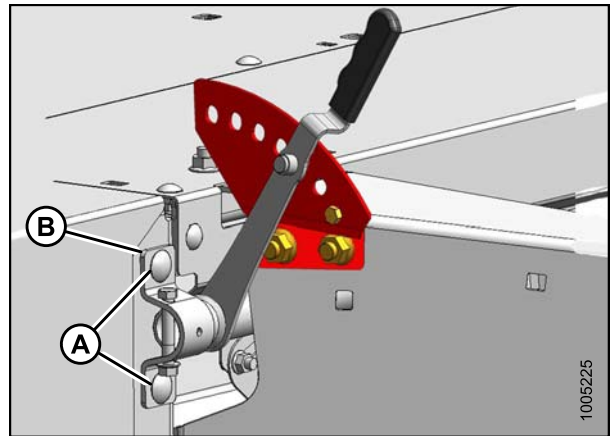


Figure 6.16

OPERATING THE HEADER

6.6 Header Angle

Header (or cutterbar) angle can be varied from 0–8° below horizontal.

Choose an angle that maximizes performance for your crop and field conditions.

A flatter angle provides better clearance in stony conditions while a steeper angle is required in down crops for better lifting action.

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

Refer to your MacDon self-propelled windrower operator's manual.

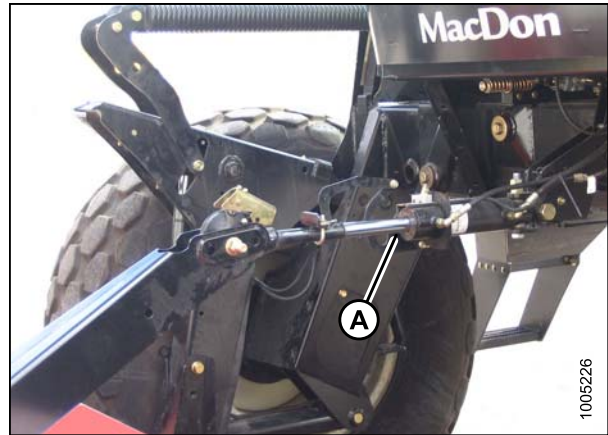


Figure 6.17

OPERATING THE HEADER

6.7 Cutting Height

Cutting height is determined by a combination of the angle of the cutterbar/header and the roller gauge or skid shoe settings.

Cutting height should be adjusted for optimum cutting performance without allowing excessive build-up of mud and soil inside the header that can lead to poor crop flow and increased wear on cutting components.

Choose an angle that maximizes performance for your crop and field conditions. Refer to Section [6.6 Header Angle, page 78](#).

Optional adjustable gauge rollers or skid shoes are available to also provide different cutting heights. Refer to Sections [6.7.1 Adjusting Gauge Roller Height, page 79](#) and [6.7.2 Adjusting the Skid Shoe Height, page 80](#).

- Lowering the skid shoes/gauge rollers or decreasing header angle increases the cutting height. This may be desirable in stony conditions to reduce damage to cutting components. Also, a longer stubble length helps material dry faster.
- Raising the skid shoes/gauge rollers and increasing header angle allows the crop to be cut lower.

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

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

6.7.1 Adjusting Gauge Roller Height



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

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

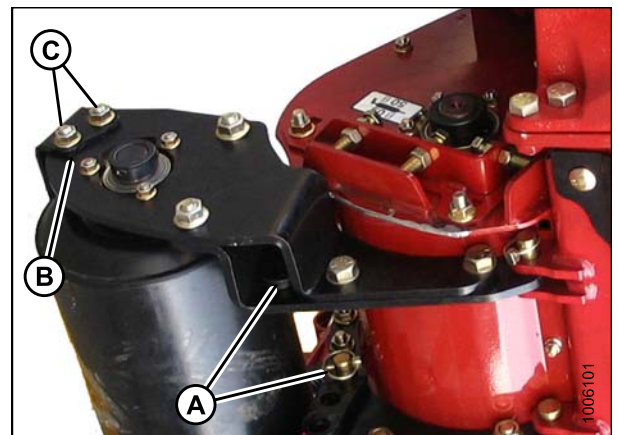


Figure 6.18

OPERATING THE HEADER

6.7.2 Adjusting the Skid Shoe Height

DANGER

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

1. Raise header fully, stop engine, and remove key.
2. Engage header safety props.
3. Remove lynch pin and remove adjuster pin (A) from one side of skid shoe (B).
4. Hold skid shoe and remove lynch pin and adjuster pin (A) from other side. Position shoe at desired position, and reinstall adjuster pins (A). Secure with lynch pins.
5. Repeat for skid shoe at opposite end of header.
6. Check header float as described in Section 6.1 Header Float, page 65.
7. Adjust header angle to desired working position using the machine's header angle controls. If angle is not critical, set it to mid-position. Refer to Section 6.6 Header Angle, page 78.

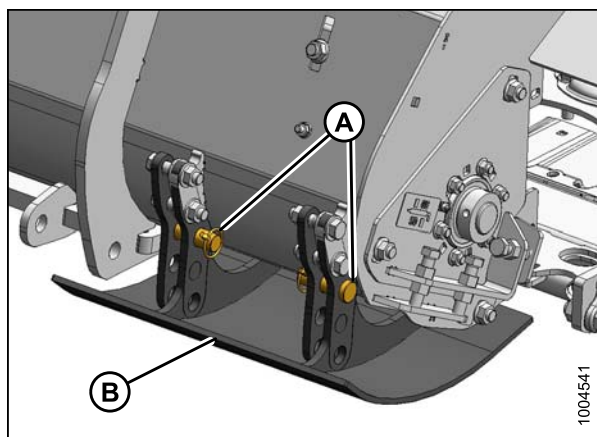


Figure 6.19

6.7.3 Disc Speed

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

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

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

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

Refer to your MacDon self-propelled windrower operator's manual.

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6.8 Ground Speed



CAUTION

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

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

Refer to your MacDon self-propelled windrower operator's manual for changing ground speed.

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

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

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

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

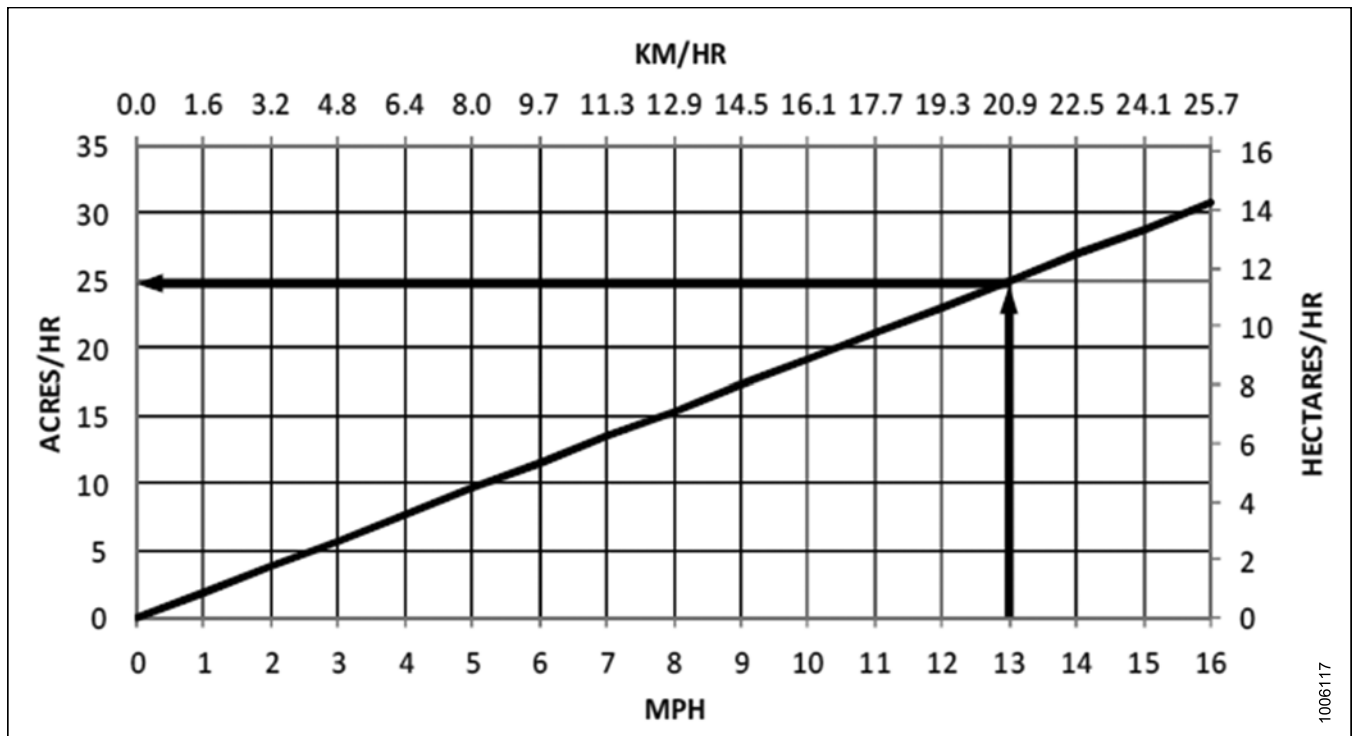


Figure 6.20: Ground Speed

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

OPERATING THE HEADER

6.9 Double Windrowing

If your windrower is equipped with the Double Windrow Attachment (DWA [A]), refer to the MacDon DWA Manual (MD #169216) for operating and maintenance instructions.

The manual is shipped with the DWA Kit.

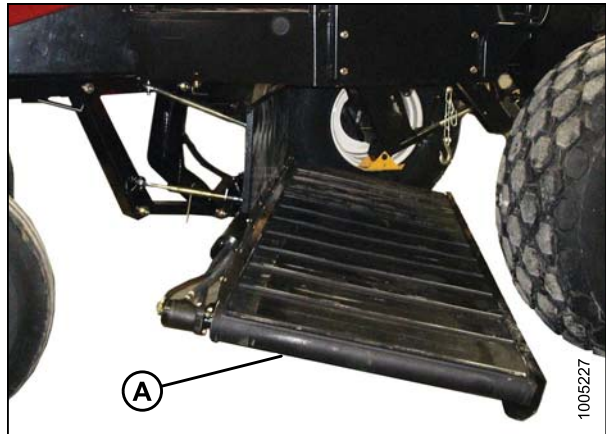


Figure 6.21

OPERATING THE HEADER

6.10 Tall Crop Feed Plates

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

They will degrade the cutting performance of the cutterbar if they are used in medium to light alfalfa and so should not be installed in those types of crops.

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

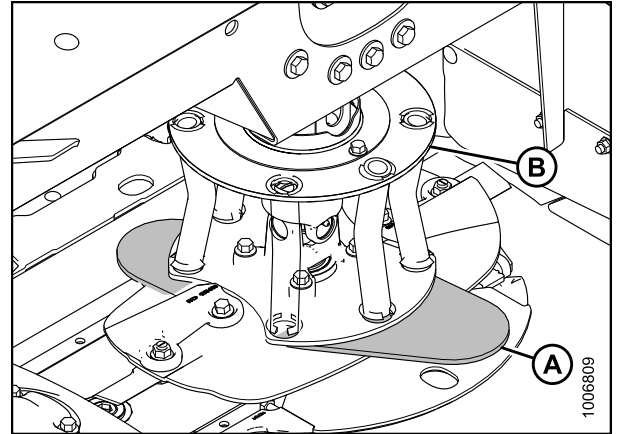


Figure 6.22

6.10.1 Locating Tall Crop Feed Plates for Installation

1. Lower the header fully.



DANGER

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

2. Shut off the engine and remove the key.
3. Open the RH end drive cover. See Section [5.4.3 Removing Right End Shield: North American Headers](#), page 29.
4. Remove nuts (A) securing feed plates (B) to side of compartment and remove plates. Reinstall nuts (A).
5. Install RH shield. See Section [5.4.4 Installing Right End Shield: North American Headers](#), page 29.

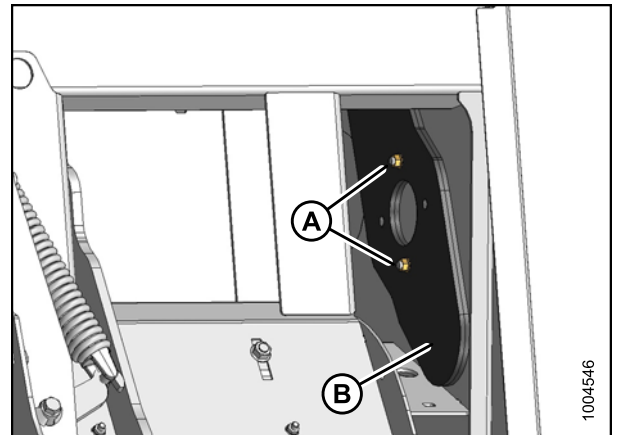


Figure 6.23

OPERATING THE HEADER

Installing Tall Crop Feed Plates: Under Driven Deflector

1. Remove driveline deflector. See [Removing the Driven Deflector, page 137](#).
2. Locate tall crop feed plates from storage. See Section [6.10.1 Locating Tall Crop Feed Plates for Installation, page 83](#).
3. Locate feed plate (A) on the disc, ensuring that hole in feed plate registers on disc. Position plate approximately as shown and align holes.

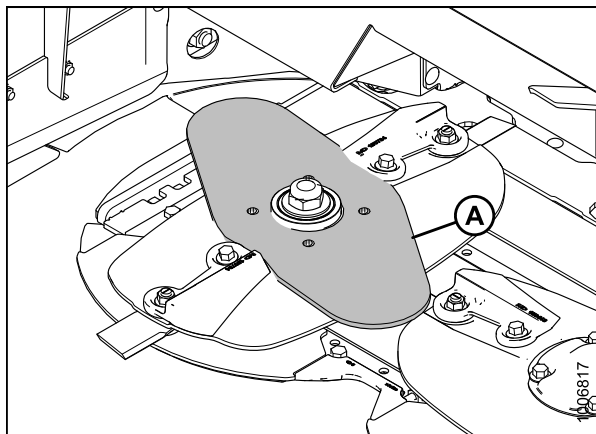


Figure 6.24: RH End

IMPORTANT

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

4. Install the deflector. See [Installing the Driveline Deflector, page 139](#).

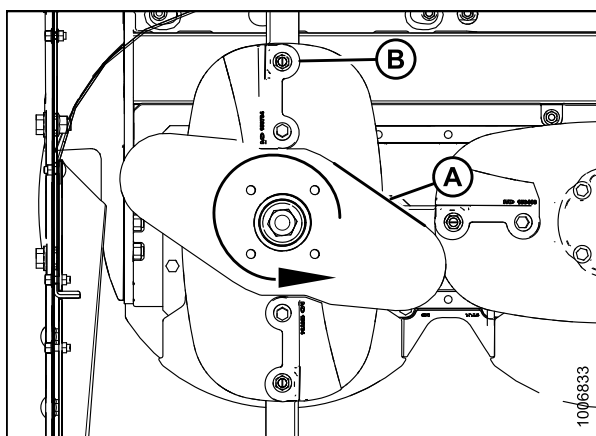


Figure 6.25: RH End Top View

Installing Tall Crop Feed Plates: Under Driveline Deflector

1. Locate feed plates. See [6.10.1 Locating Tall Crop Feed Plates for Installation, page 83](#).
2. Lower the header fully.
3. Shut off the engine and remove the key.
4. Open cutterbar door(s). See Section [5.5 Cutterbar Doors, page 31](#).
5. Install feed plate (A) on the disc.

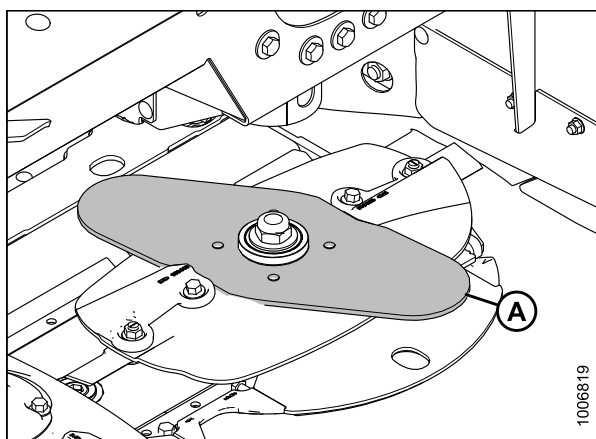


Figure 6.26: LH End Shown

OPERATING THE HEADER

IMPORTANT

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

6. Install the deflectors. See
 - [Installing the Driveline Deflector, page 139](#)
 - [Installing the Driven Deflector, page 138](#)

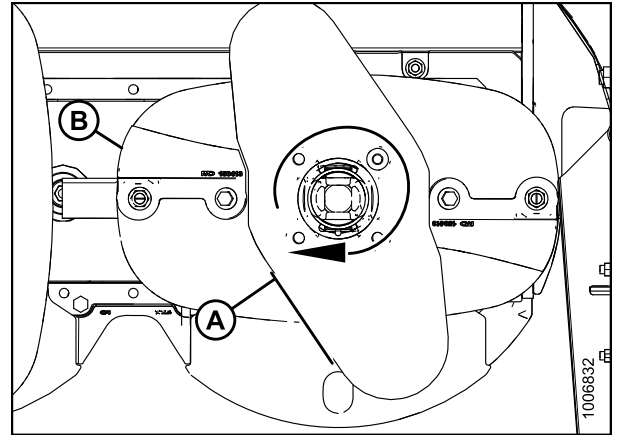


Figure 6.27: LH End Top View Shown

6.10.2 Removing Tall Crop Feed Plates

Follow these steps to remove the tall crop feed plates:



DANGER

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

1. Lower header to the ground, shut off engine, and remove key from ignition.
2. Open cutterbar doors. Refer to Section [5.5 Cutterbar Doors, page 31](#).



CAUTION

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

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

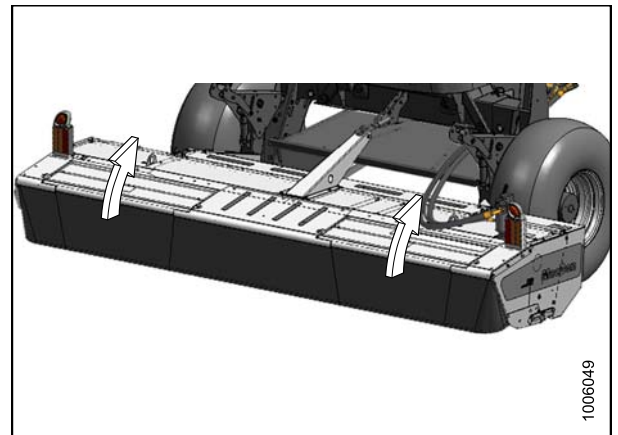


Figure 6.28

Removing Tall Crop Feed Plates: Under Driven Deflector

1. Remove the deflector. See [Removing the Driven Deflector, page 137](#).

OPERATING THE HEADER

2. Remove feed plate (A).
3. Return the tall crop feed plates to the storage location. See Section [6.10.3 Returning Tall Crop Feed Plates to Storage](#), page 87.

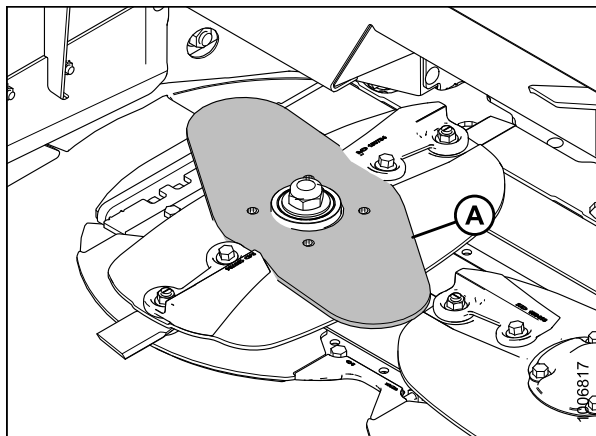


Figure 6.29: RH End

Removing Tall Crop Feed Plates: Under Driveline Deflector

1. Open cutterbar doors. See Section [5.5 Cutterbar Doors](#), page 31.
2. Remove the deflectors. See
 - [Removing the Driveline Deflector](#), page 138
 - [Removing the Driven Deflector](#), page 137
3. Remove feed plate (A).
4. Return feed plates to storage. See Section [6.10.3 Returning Tall Crop Feed Plates to Storage](#), page 87.
5. Install the deflectors. See
 - [Installing the Driveline Deflector](#), page 139
 - [Installing the Driven Deflector](#), page 138
6. Close cutterbar doors. See Section [5.5 Cutterbar Doors](#), page 31.

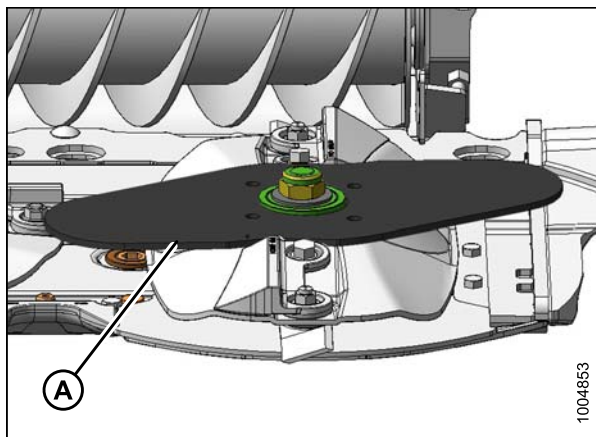


Figure 6.30

OPERATING THE HEADER

6.10.3 Returning Tall Crop Feed Plates to Storage

Follow these steps to install the tall crop feed plates:



DANGER

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

1. Lower the header fully.
2. Shut off the engine and remove the key.
3. Open the RH end drive cover. See Section [5.4.3 Removing Right End Shield: North American Headers, page 29](#).
4. Remove nuts (A) and secure the feed plates (B) to side of compartment and remove plates. Reinstall nuts (A).
5. Install RH shield. See Section [5.4.4 Installing Right End Shield: North American Headers, page 29](#).

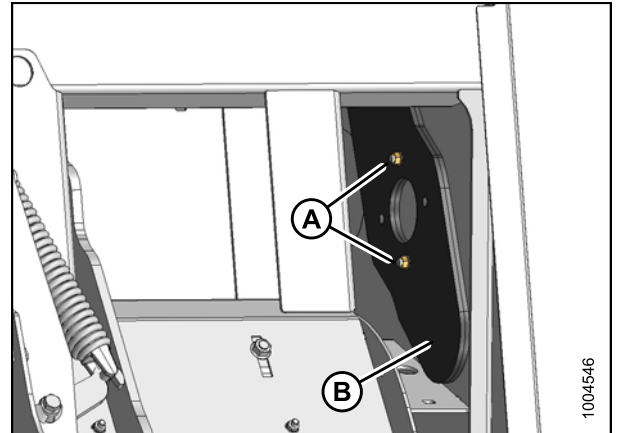


Figure 6.31

OPERATING THE HEADER

6.11 Tall Crop Dividers

The tall crop dividers (one on each end of the header) assist in clean crop dividing and cutterbar entry in tall crops. Tall crop dividers are not adjustable, but can be removed easily.

6.11.1 Removing Tall Crop Divider

DANGER

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

1. Lower header to the ground, shut down windrower, and remove key.
2. Open cutterbar doors. Refer to Section [5.5 Cutterbar Doors](#), page 31.

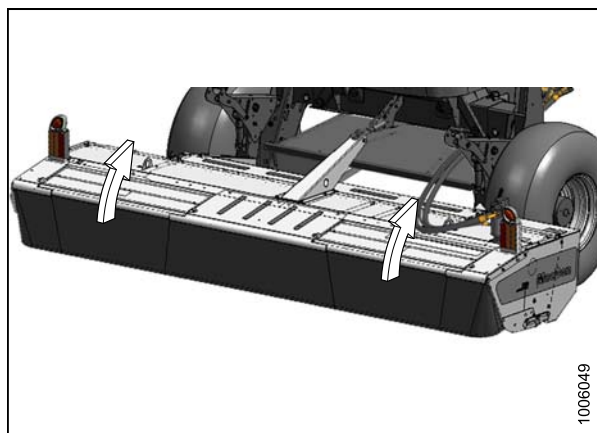


Figure 6.32

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

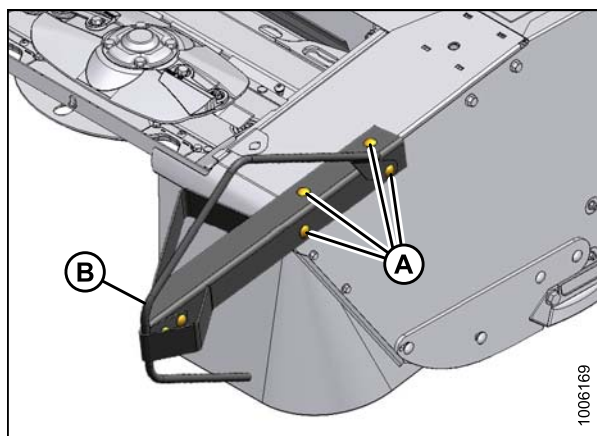


Figure 6.33

OPERATING THE HEADER

4. Reinstall two bolts and nuts at location shown (A).
5. Repeat steps 3., [Removing Tall Crop Divider, page 88](#) and 4., [Removing Tall Crop Divider, page 89](#) at other end.
6. Close cutterbar doors.

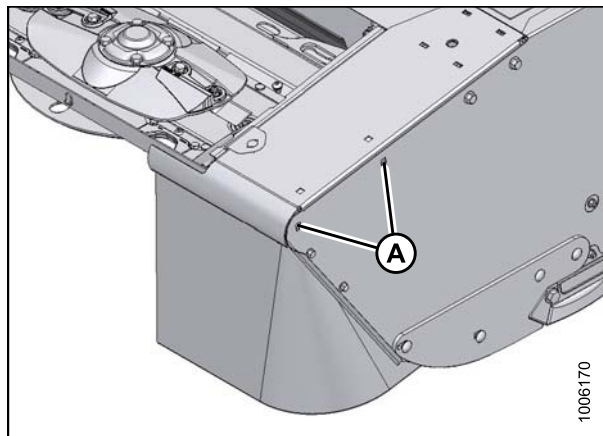


Figure 6.34

OPERATING THE HEADER

6.12 The Overshot Auger

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

The vertical and fore-aft positions of the auger can be adjusted to suit the crop conditions for optimal movement of the crop, minimized wrapping, and to keep the cutterbar clear.

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

The auger position has been factory set and should not normally require adjustment.

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

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

6.12.1 Adjusting the Overshot Auger

If necessary, adjust the auger position as follows:



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

1. Raise header to full height, shut down engine, and remove key from ignition.
2. Engage header safety props. See Section [5.3 Header Safety Props](#), page 26.
3. Remove/loosen four bolts (A) and remove cover (B).

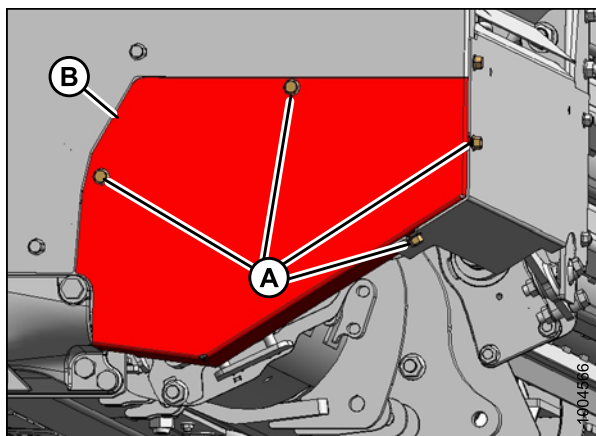


Figure 6.35

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4. Loosen jam nuts (A) to relieve tension on auger drive belts (B).
5. Loosen three jam nuts (C).
6. To adjust **VERTICAL** position, loosen upper nuts on adjuster bolts (D). Hold lower nut and turn adjuster bolts (D) to set auger vertical position from bottom of pan.
7. To adjust **FORE-AFT** position, loosen aft nut on adjuster bolt (E). Hold forward nut and turn adjuster bolt (E) to set auger so that it clears the back of the pan.
8. Tighten the three nuts (C) and then the jam nuts on adjuster bolts (D) and (E).
9. Replace cover (B) and tighten bolts (A).
10. Repeat steps 5 to 8 at opposite end of auger.

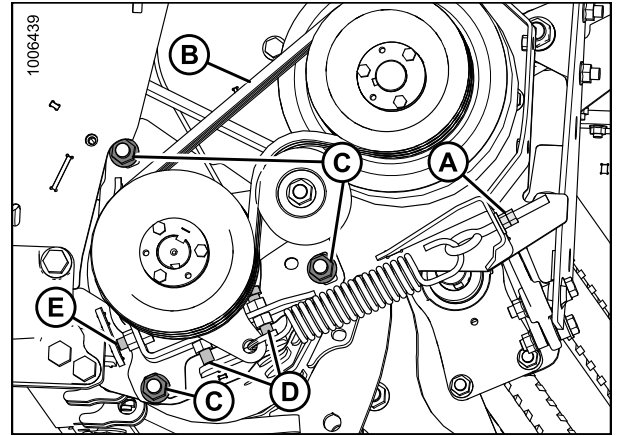


Figure 6.36

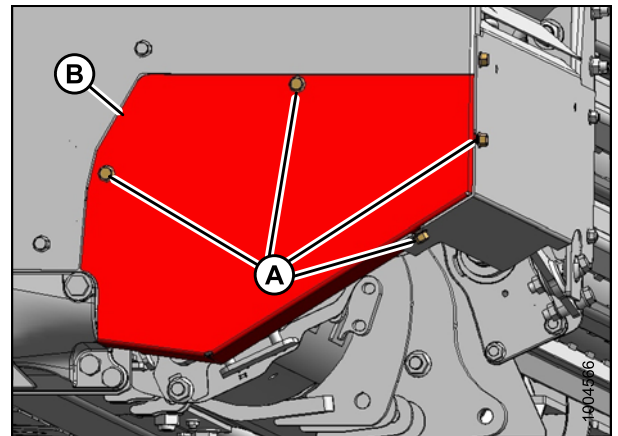


Figure 6.37

11. To adjust the center support, loosen bolts (A). Adjust auger support (B) fore or aft and vertical position as required. Tighten bolts (A).
12. Check clearance to stripper bars. See Section [6.13 Stripper Bars](#), page 93.

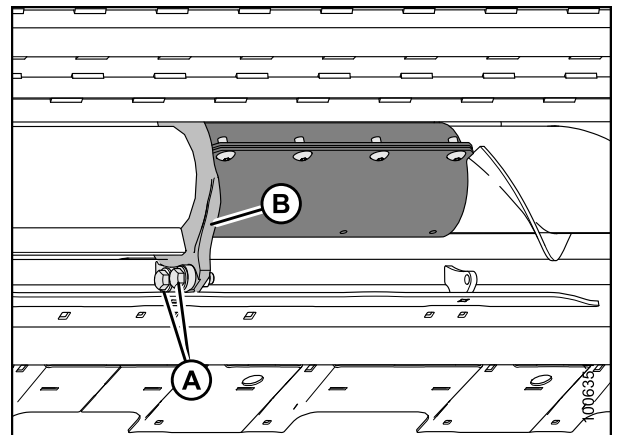


Figure 6.38

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13. Adjust eye bolt (A) and secure with jam nut (B) to tighten auger drive belts (C). See [Inspecting the Auger Drive Belts](#), page 150.

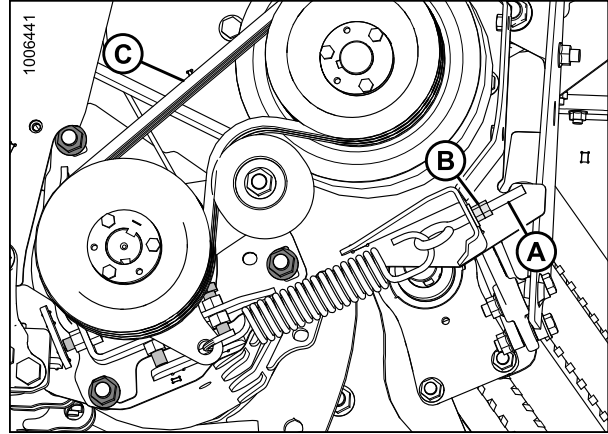


Figure 6.39

OPERATING THE HEADER

6.13 Stripper Bars

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

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

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

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

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

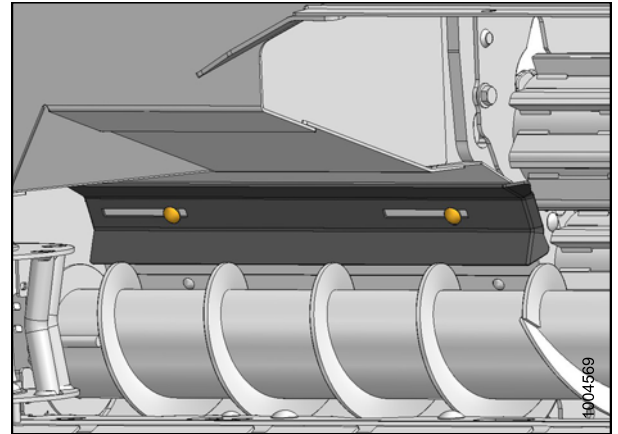


Figure 6.40: RH Side Shown, LH Opposite

6.13.1 Adjusting the Stripper Bar

If necessary, adjust the stripper bar as follows:

DANGER

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

1. Lower header to ground, shut down windrower, and remove key.
2. Open cutterbar doors. Refer to Section [5.5 Cutterbar Doors](#), page 31.
3. Open driveshield. Refer to Section [5.4 Driveshields](#), page 28.
4. Loosen nuts (A) on the two bolts securing stripper bar to the pan sufficiently so that stripper bar can be moved.

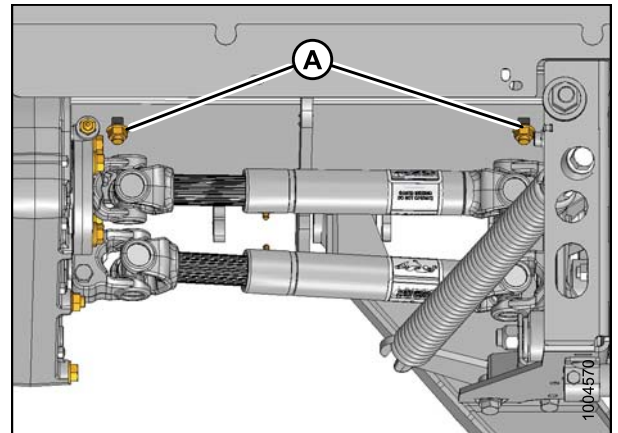


Figure 6.41: Left End

OPERATING THE HEADER

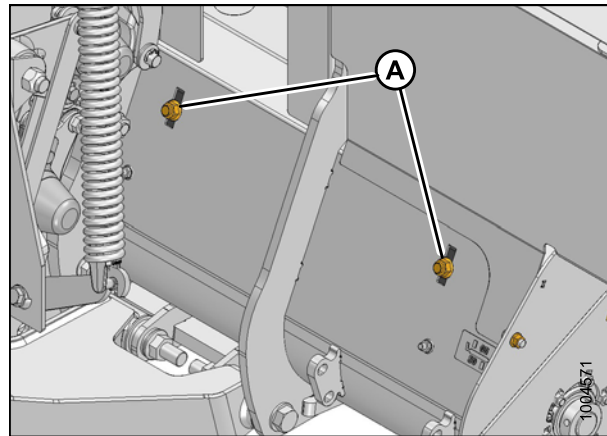


Figure 6.42: Right End

5. Position stripper bar (A) as close as possible to auger flighting, without contacting it.
6. Repeat above steps 4., [Adjusting the Stripper Bar, page 93](#) and 5., [Adjusting the Stripper Bar, page 94](#) for opposite side.
7. Manually rotate auger to check that auger does **NOT** contact stripper bars. Readjust as required.

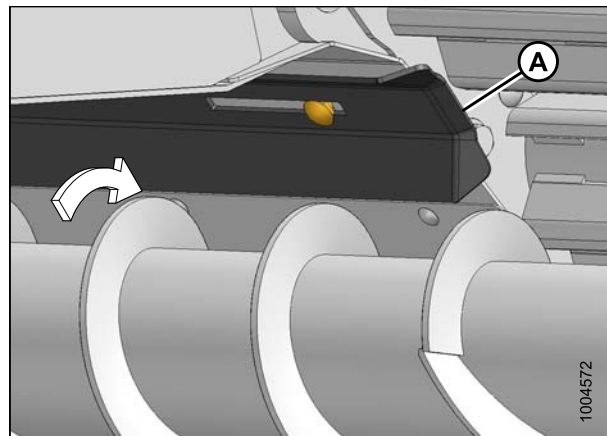


Figure 6.43

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8. Tighten nuts (A).

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

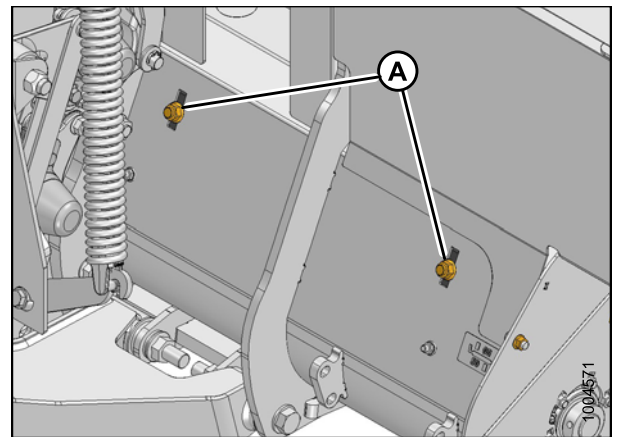
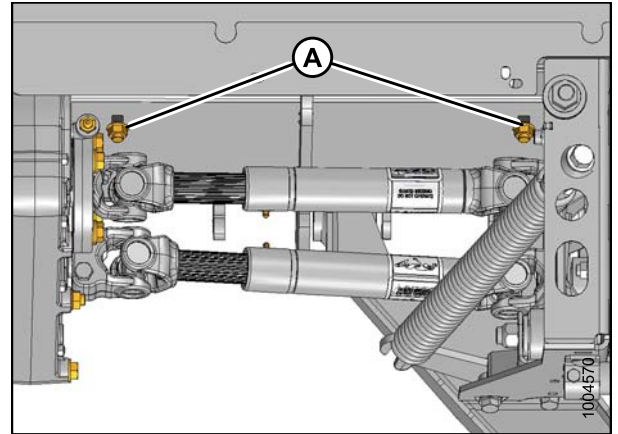


Figure 6.44: Both Ends Shown

OPERATING THE HEADER

6.14 Haying Tips

6.14.1 Curing

A quick cure will maintain top quality because

- 5% of the protein is lost for each day hay lies on the ground.
- The sooner the cut hay is harvested, the earlier the start for next growth.

Leaving the windrow as wide and thin as possible makes for the quickest curing.

Cured hay should be baled as soon as possible.

6.14.2 Topsoil Moisture

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

- On wet soil, the general rule of “wide and thin” does not apply. A narrower windrow will dry faster than hay left flat on wet ground.
- When the ground is wetter than the hay, moisture from the soil is absorbed by the hay above it. Determine topsoil moisture level before cutting. Use a moisture tester or estimate level.
- If ground is wet due to irrigation, wait until soil moisture drops below 45%.
- If ground is wet due to frequent rains, cut when weather allows and let the forage lie on wet ground until it dries to the moisture level of the ground.
- Cut hay will dry no more until the ground under it dries, so consider moving the windrow to drier ground.

6.14.3 Weather and Topography

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

OPERATING THE HEADER

6.14.4 Windrow Characteristics

Refer to Section [6 Operating the Header, page 65](#) for instructions on adjusting the header.

For best results, a windrow should have the following characteristics:

Characteristic	Advantage
High and fluffy	Movement of air through windrow is more important to the curing process than direct sunlight.
Consistent formation, not bunchy	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.

6.14.5 Driving On Windrow

Driving on previously cut windrows can lengthen drying time by a full day in hay that will not be raked.

If practical, set forming shields for a narrower windrow that can be straddled.

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

6.14.6 Raking and Tedding

Raking or tedding speeds up drying, however the benefits must be weighed against the additional leaf losses which will result. There is little or no advantage to raking or tedding if the ground beneath the windrow is dry.

Large windrows on damp or wet ground should be turned over when they reach 40–50% moisture. Hay should not be raked or teded at less than 25% moisture or excessive yield losses will result.

6.14.7 Using Chemical Drying Agents

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

Before deciding to use a drying agent, costs and benefits relative to your area should be carefully compared.

OPERATING THE HEADER

6.15 Unplugging the Header

Follow these steps to remove plugged material from the header:

DANGER

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

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

WARNING

Wear heavy gloves when working around cutterbar.

5. Open cutterbar doors. Refer to Section [5.5 Cutterbar Doors](#), page 31.
6. Clean off cutterbar or rolls by hand.

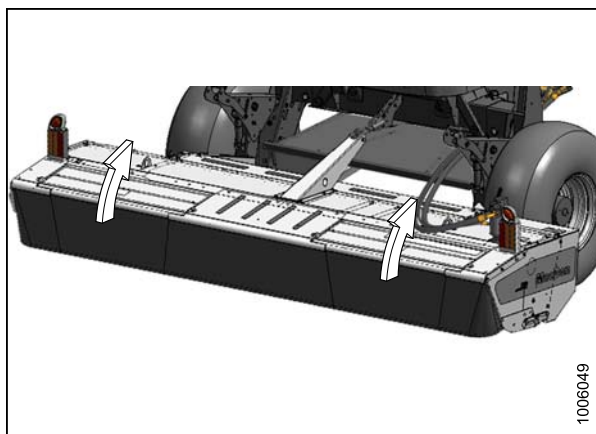


Figure 6.45

7 Maintenance and Servicing

The following instructions are provided to assist the Operator in servicing the header. Detailed maintenance and service information is available from your Dealer. A parts catalog is located in a plastic case at the right end of the header.

Log hours of operation and use the Maintenance Schedule/Record provided to keep a record of scheduled maintenance. Refer to Section [7.5.1 Maintenance Schedule/Record, page 112](#).

7.1 Preparation for Servicing



CAUTION

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

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

MAINTENANCE AND SERVICING

7.2 Torque Specifications

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

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

7.2.1 SAE Bolt Torque Specifications

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

Table 7.1 SAE Grade 5 Bolt and Grade 5 Free Spinning

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

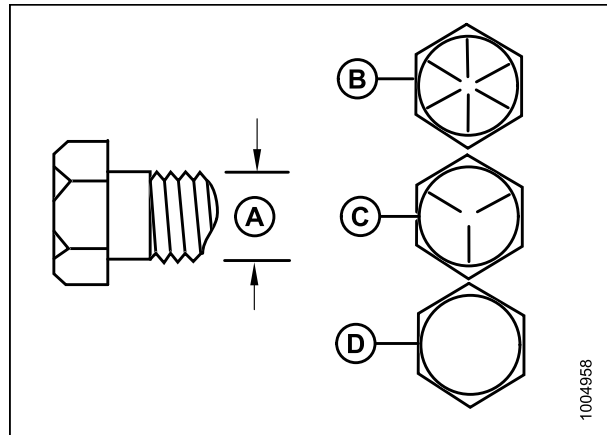


Figure 7.1

A - Nominal Size
C - SAE-5

B - SAE-8
D - SAE-2

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MAINTENANCE AND SERVICING

Table 7.2 SAE Grade 5 Bolt and Grade 5 Distorted Thread Nut

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

Table 7.3 SAE Grade 8 Bolt and Grade 8 Distorted Thread Nut

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

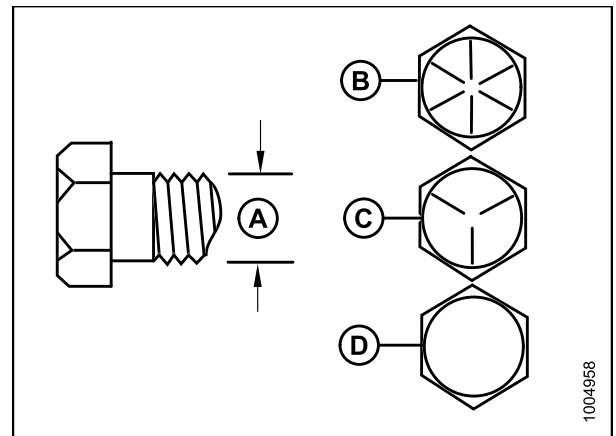


Figure 7.2

A - Nominal Size
C - SAE-5

B - SAE-8
D - SAE-2

MAINTENANCE AND SERVICING

Table 7.4 SAE Grade 8 Bolt and Grade 8 Free Spinning Nut

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

7.2.2 Metric Bolt Specifications

Table 7.5 Metric Class 8.8 Bolts and Class 9 Free Spinning Nut

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

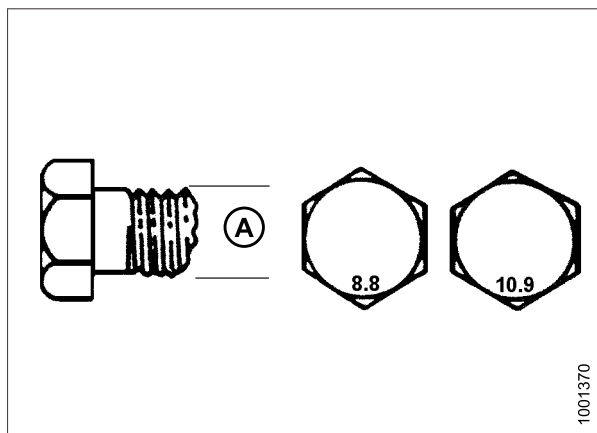


Figure 7.3

A - Nominal Size

MAINTENANCE AND SERVICING

Table 7.6 Metric Class 8.8 Bolts and Class 9 Distorted Thread Nut

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

Table 7.7 Metric Class 10.9 Bolts and Class 10 Free Spinning Nut

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

MAINTENANCE AND SERVICING

Table 7.8 Metric Class 10.9 Bolts and Class 10 Distorted Thread Nut

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

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7.2.3 Metric Bolt Specifications Bolting into Cast Aluminum

Table 7.9 Metric Bolt Bolting into Cast Aluminum

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

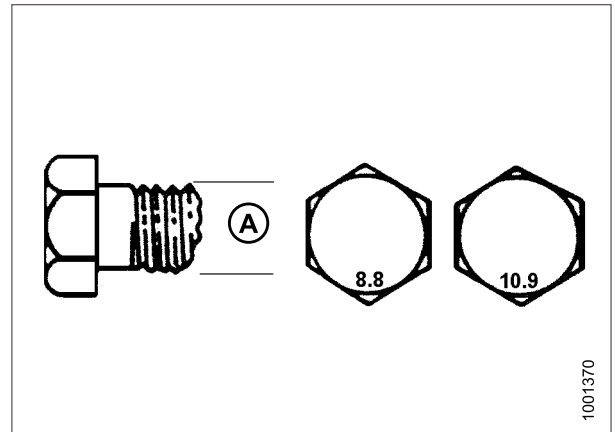


Figure 7.4

A - Nominal Size

7.2.4 Flare-Type Hydraulic Fittings

1. Check flare and flare seat for defects that might cause leakage.
2. Align tube with fitting before tightening.
3. Lubricate connection and hand-tighten swivel nut until snug.
4. To prevent twisting the tube(s), use two wrenches. Place one wrench on the connector body and with the second, tighten the swivel nut to the torque shown.

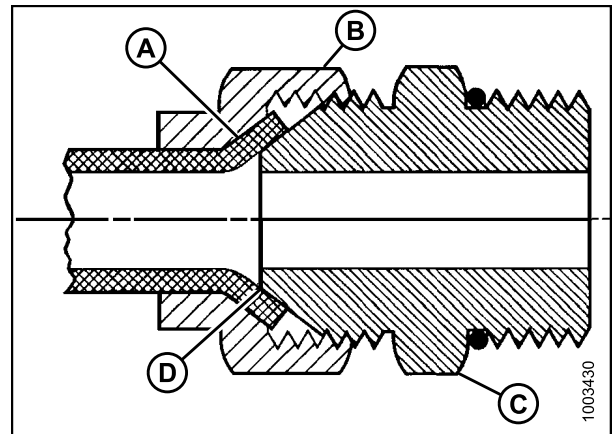


Figure 7.5

A - Flare

B - Nut

C - Flareseat

D - Body

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Table 7.10 Flare-Type Hydraulic Tube Fittings

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

7.2.5 O-Ring Boss (ORB) Hydraulic Fittings

1. Inspect O-ring and seat for dirt or obvious defects.
2. On angle fittings, back off the lock nut until washer (A) bottoms out at top of groove (B) in fitting.
3. Hand-tighten fitting until back up washer (A) or washer face (if straight fitting) bottoms on part face (C) and O-ring is seated.
4. Position angle fittings by unscrewing **NO MORE THAN** one turn.
5. Tighten straight fittings to torque shown.
6. Tighten angle fittings to torque shown in table [7.11 O-Ring Boss \(ORB\) Hydraulic Fittings \(Adjustable\)](#), page 107, while holding body of fitting with a wrench.

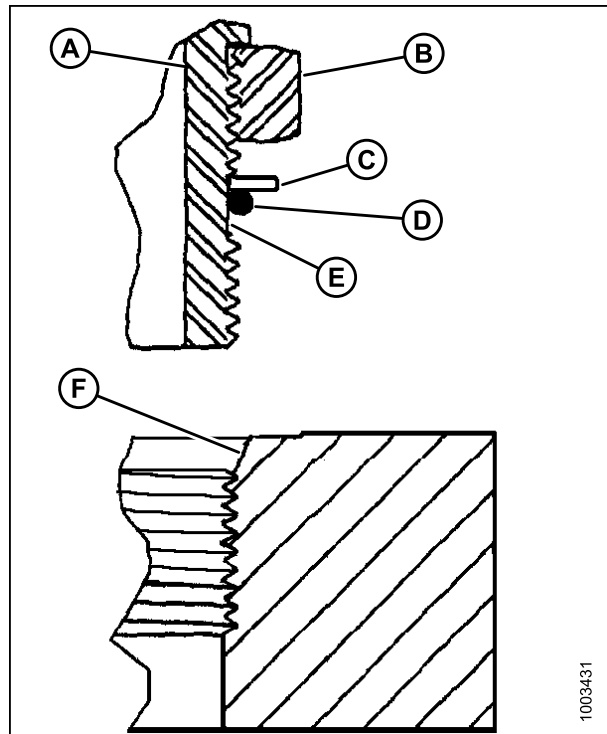


Figure 7.6

- | | | |
|-------------|--------------|------------|
| A - Fitting | B - Lock Nut | C - Washer |
| D - O-Ring | E - Groove | F - Seat |

¹ Torque values shown are based on lubricated connections as in reassembly.

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Table 7.11 O-Ring Boss (ORB) Hydraulic Fittings (Adjustable)

SAE No.	Thread Size (in.)	Nut Size Across Flats (in.)	Torque Value ²		Flats From Finger Tight (FFFT) ³	
			ft·lbf	N·m	Flats	Turns
3	3/8	1/2	6	8	2	1/3
4	7/16	9/16	9	12	2	1/3
5	1/2	5/8	12	16	2	1/3
6	9/16	11/16	18	24	2	1/3
8	3/4	7/8	34	46	2	1/3
10	7/8	1	46	62	1-1/2	1/4
12	1-1/16	1-1/4	75	102	1	1/6
16	1-5/16	1-1/2	105	142	3/4	1/8
20	1-5/8	1-7/8	140	190	3/4	1/8
24	1-7/8	2-1/8	160	217	1/2	1/12

7.2.6 O-Ring Face Seal (ORFS) Hydraulic Fittings

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



Figure 7.7

2. Torque values shown are based on lubricated connections as in reassembly.
3. Always default to the torque value for evaluation of adequate torque.

MAINTENANCE AND SERVICING

2. Apply hydraulic system oil to the O-ring.
3. Align the tube or hose assembly. Ensure that flat face of the mating flange comes in full contact with O-ring.
4. Thread tube or hose nut until hand-tight. The nut should turn freely until it is bottomed out.
5. Torque fitting further to a given torque value in table [7.12 O-Ring Face Seal \(ORFS\) Hydraulic Fittings, page 108](#).

NOTE: If applicable, always hold the hex on the fitting body to prevent unwanted rotation of fitting body and hose when tightening the fitting nut.

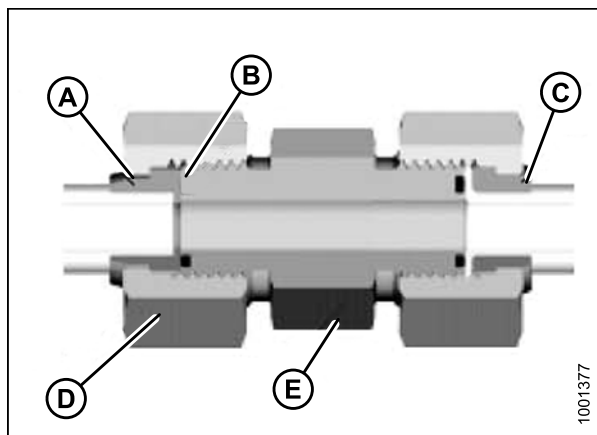


Figure 7.8

A - Brazed Sleeve
 B - O-Ring
 C - Two Piece Sleeve
 D - Nut
 E - Fitting Body

6. When assembling unions or two hoses together, three wrenches will be required.
7. Check the final condition of the fitting.

Table 7.12 O-Ring Face Seal (ORFS) Hydraulic Fittings

SAE No.	Thread Size (in.)	Tube O.D. (in.)	Torque Value ⁴		Flats From Finger Tight (FFFT) ⁵	
			ft·lbf	N·m	Tube Nuts	Swivel & Hose
3	⁶	3/16	–	–	–	–
4	9/16	1/4	11–12	14–16	1/4–1/2	1/2–3/4
5	⁶	5/16	–	–	–	–
6	11/16	3/8	18–20	24–27	1/4–1/2	1/2–3/4
8	13/16	1/2	32–35	43–47		
10	1	5/8	45–51	60–68		
12	1-3/16	3/4	67–71	90–95		1/3–1/2
14	1-3/16	7/8	67–71	90–95		
16	1-7/16	1	93–100	125–135		
20	1-11/16	1-1/4	126–141	170–190		
24	2	1-1/2	148–167	200–225		
32	2-1/2	2	–	–	–	–

4. Torque values and angles shown are based on lubricated connection, as in reassembly.
5. Always default to the torque value for evaluation of adequate torque.
6. O-ring face seal type end not defined for this tube size.

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7.3 Conversion Chart

Quantity	Inch-Pound Units		Factor	SI Units (Metric)	
	Unit Name	Abbreviation		Unit Name	Abbreviation
Area	acres	acres	$\times 0.4047 =$	hectares	ha
Flow	US gallons per minute	gpm	$\times 3.7854 =$	liters per minute	L/min
Force	pounds force	lbf	$\times 4.4482 =$	Newtons	N
Length	inch	in.	$\times 25.4 =$	millimeters	mm
	foot	ft.	$\times 0.305 =$	meters	m
Power	horsepower	hp	$\times 0.7457 =$	kilowatts	kW
Pressure	pounds per square inch	psi	$\times 6.8948 =$	kilopascals	kPa
			$\times .00689 =$	megapascals	MPa
Torque	pound feet or foot pounds	lbf·ft or ft·lbf	$\times 1.3558 =$	newton·meters	N·m
	pound inches or inch pounds	lbf·in. or in·lbf	$\times 0.1129 =$	newton·meters	N·m
Temperature	degrees Fahrenheit	°F	$(^{\circ}\text{F} - 32) \times 0.56 =$	Celsius	°C
Velocity	feet per minute	ft/min	$\times 0.3048 =$	meters per minute	m/min
	feet per second	ft/s	$\times 0.3048 =$	meters per second	m/s
	miles per hour	mph	$\times 1.6063 =$	kilometers per hour	km/h
Volume	US gallons	US gal.	$\times 3.7854 =$	liters	L
	ounces	oz.	$\times 29.5735 =$	milliliters	ml
	cubic inches	in. ³	$\times 16.3871 =$	cubic centimeters	cm ³ or cc
Weight	pounds	lb	$\times 0.4536 =$	kilograms	kg

MAINTENANCE AND SERVICING

7.4 Recommended Fluids and Lubricants

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

- Use clean containers to handle all lubricants.
- Store in an area protected from dust, moisture, and other contaminants.

Lubricant	Specification	Description	Use	Capacities
Grease	SAE Multi-Purpose	High Temperature Extreme Pressure (EP). Performance with 0–1% Max. Molybdenum Disulphide (NLGI Grade 2) Lithium Complex Base	As Required Unless Otherwise Specified.	—
		High Temperature Extreme Pressure (EP) Performance with 10% Max. Molybdenum Disulphide (NLGI Grade 2) Lithium Base	Driveline Slip-Joints	—
Gear Lubricant	Traxon LS 80W90 ⁷	High Thermal & Oxidation Stability. API Service Class GL-5.	Cutterbar	4.4 US quarts (4.25 l)
	Traxon E Synthetic 75W90 ⁷		Conditioner Gearbox	11.8 oz. (350 ml)
			Bevel Gearbox	13.6 oz. (400 ml)

7. Or equivalent.

MAINTENANCE AND SERVICING

7.5 Maintenance Requirements

In this manual, periodic maintenance requirements are organized by service intervals.

Regular maintenance is the best insurance against early wear and untimely breakdowns. Following this schedule will increase machine life.

For detailed instructions, refer to the specific headings in this section.

Use the fluids and lubricants specified in Section [7.4 Recommended Fluids and Lubricants, page 110](#).

Log hours of operation and use Section [7.5.1 Maintenance Schedule/Record, page 112](#) to keep a record of scheduled maintenance.

Make copies of Section [7.5.1 Maintenance Schedule/Record, page 112](#) for this purpose.

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

IMPORTANT

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



CAUTION

Carefully follow safety messages given in Section [1 Safety, page 1](#).

MAINTENANCE AND SERVICING

7.5.1 Maintenance Schedule/Record

Action:	✓ - Check	⬮ - Lubricate	▲ - Change
Hour meter reading			
Service date			
Serviced by			
First use	Refer to Section 7.5.2 Break-In Inspections, page 114.		
100 hours or annually	Refer to Section 7.5.3 Preseason/Annual Service, page 114.		
✓ Conditioner drive belt See section Inspecting the Conditioner Drive Belt, page 142.			
✓ Auger drive belts See section Inspecting the Auger Drive Belts, page 150.			
✓ Conditioner gearbox lube level See Section 7.7.3 Conditioner Gearbox, page 146.			
✓ Bevel gearbox lube level See Section 7.7.1 Bevel Gearbox, page 141.			
End of season	Refer to Section 7.5.4 End-of-Season Service, page 115.		
10 hours or daily	NOTE: A record of daily maintenance is not normally required, but is at the Owner/Operator's discretion.		
✓ Hydraulic hoses and lines See Section 7.8.2 Hydraulic Hoses and Lines, page 156.			
✓ Cutter blades, deflectors, and discs See Section 7.6.1 Inspecting the Cutterbar Discs, page 126.			
25 hours			
⬮ Roll universal shafts See Section 7.5.5 Lubrication and Servicing, page 115.			
⬮ Cutterbar driveline bearings See Section 7.5.5 Lubrication and Servicing, page 115.			
50 HOURS			
▲ Cutterbar lube first 50 and 150 hours See Section 7.5.8 Lubricating the Cutterbar, page 121.			
▲ Bevel gearbox lube level first 50 and 150 hours See Section 7.7.1 Bevel Gearbox, page 141.			

MAINTENANCE AND SERVICING

Action:	✓ - Check	⬇ - Lubricate	▲ - Change																	
⬇ Conditioner gearbox lube first 50 and 150 hours See Section 7.7.3 Conditioner Gearbox , page 146.																				
⬇ Drive belt tensioner See Section 7.5.5 Lubrication and Servicing , page 115.																				
⬇ Roll shaft bearings See Section 7.5.5 Lubrication and Servicing , page 115.																				
⬇ Gauge roller bearings See Section 7.5.5 Lubrication and Servicing , page 115.																				
250 hours																				
▲ Cutterbar lube See Section 7.5.8 Lubricating the Cutterbar , page 121.																				
▲ Conditioner gearbox lube See Section 7.7.3 Conditioner Gearbox , page 146.																				
▲ Bevel gearbox lube See section Changing the Bevel Gearbox Lubricant , page 141.																				

NOTE: It is recommended that annual maintenance be done prior to start of operating season.

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7.5.2 Break-In Inspections

Timing	Item	Refer to
At 5 hours	Check for loose hardware. Tighten to required torque.	Section 7.2 Torque Specifications, page 100 .
	Check drive belt tension.	
At 25 hours	Check drive belt tension.	Inspecting the Conditioner Drive Belt, page 142 and Inspecting the Auger Drive Belts, page 150 .
At 50 hours	Check drive belt tension.	
	Change cutterbar lubricant.	Section 7.5.8 Lubricating the Cutterbar, page 121 . Use Only Specified Amount. Do NOT overfill.
	Change conditioner gearbox lubricant	Changing the Conditioner Gearbox Lubricant, page 146
	Change bevel gearbox lubricant.	Changing the Bevel Gearbox Lubricant, page 141
At 150 hours	Change cutterbar lubricant.	Section 7.5.8 Lubricating the Cutterbar, page 121 .
	Change conditioner gearbox lubricant.	Changing the Conditioner Gearbox Lubricant, page 146
	Change bevel gearbox lubricant.	Changing the Bevel Gearbox Lubricant, page 141

7.5.3 Preseason/Annual Service



CAUTION

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

Perform the following at the beginning of each operating season:

- Lubricate machine completely. Refer to Section [7.5.5 Lubrication and Servicing, page 115](#).
- Perform all annual maintenance. Refer to Section [7.5.1 Maintenance Schedule/Record, page 112](#).

MAINTENANCE AND SERVICING

7.5.4 End-of-Season Service



CAUTION

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

Do the following at the end of each operating season:

- Clean the header thoroughly.
- Store in a dry, protected place if possible. If stored outside, always cover the header with a waterproof canvas or other protective material.
- Raise header and engage header safety props.
- If possible, block up the header to take weight off tires.
- Repaint all worn or chipped painted surfaces to prevent rust.
- Loosen drive belt.
- Lubricate the header thoroughly, leaving excess grease on fittings to keep moisture out of bearings.
- Apply grease to exposed threads, cylinder rods, and sliding surfaces of components.
- Oil cutterbar components to prevent rust.
- Check for worn components and repair as necessary.
- Check for broken components and order replacements from your Dealer. Attention to these items right away will save time and effort at beginning of next season.
- Replace or tighten any missing or loose hardware. Refer to [Section 7.2 Torque Specifications, page 100](#).
- Remove divider rods (if equipped) to reduce space required for inside storage.

7.5.5 Lubrication and Servicing



WARNING

To avoid personal injury, before servicing the header or opening drive covers, follow procedures in [Section 7.1 Preparation for Servicing, page 99](#).

Log hours of operation and use the Maintenance Checklist provided to keep a record of scheduled maintenance. Refer to [Section 7.5.1 Maintenance Schedule/Record, page 112](#).

MAINTENANCE AND SERVICING

Access to the drive systems requires opening the driveshield and cutterbar doors. Refer to Sections

- [5.4 Driveshields, page 28](#)
- [5.5 Cutterbar Doors, page 31](#)

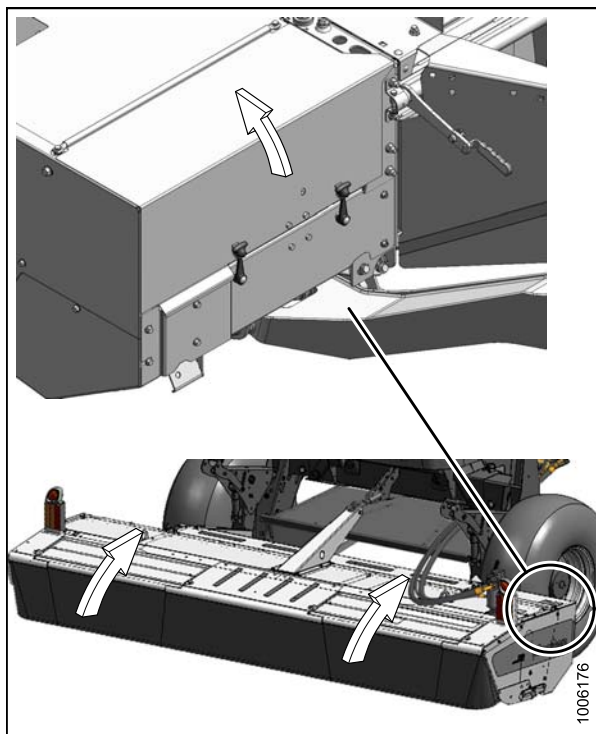


Figure 7.9

7.5.6 Greasing Procedure

DANGER

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

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

Use the recommended lubricants specified in this manual. See [Section 7.4 Recommended Fluids and Lubricants, page 110](#).

1. Wipe grease fitting with a clean cloth before greasing, to avoid injecting dirt and grit.
2. Inject grease through fitting with grease gun until grease overflows fitting, except where noted.
3. Leave excess grease on fitting to keep out dirt.
4. Replace any loose or broken fittings immediately.
5. If fitting will not take grease, remove and clean thoroughly. Also clean lubricant passageway. Replace fitting if necessary.

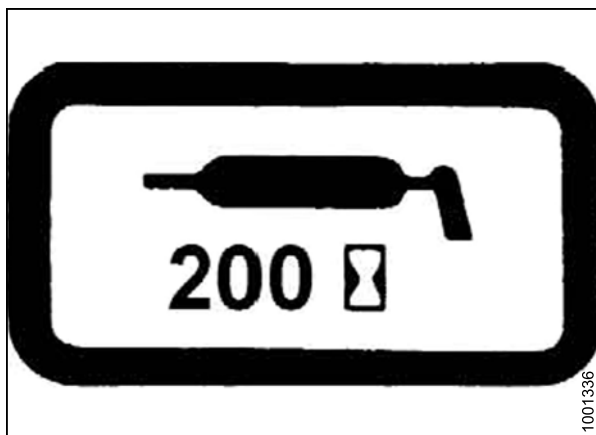


Figure 7.10

MAINTENANCE AND SERVICING

7.5.7 Lubrication and Servicing Intervals

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

Every 25 Hours

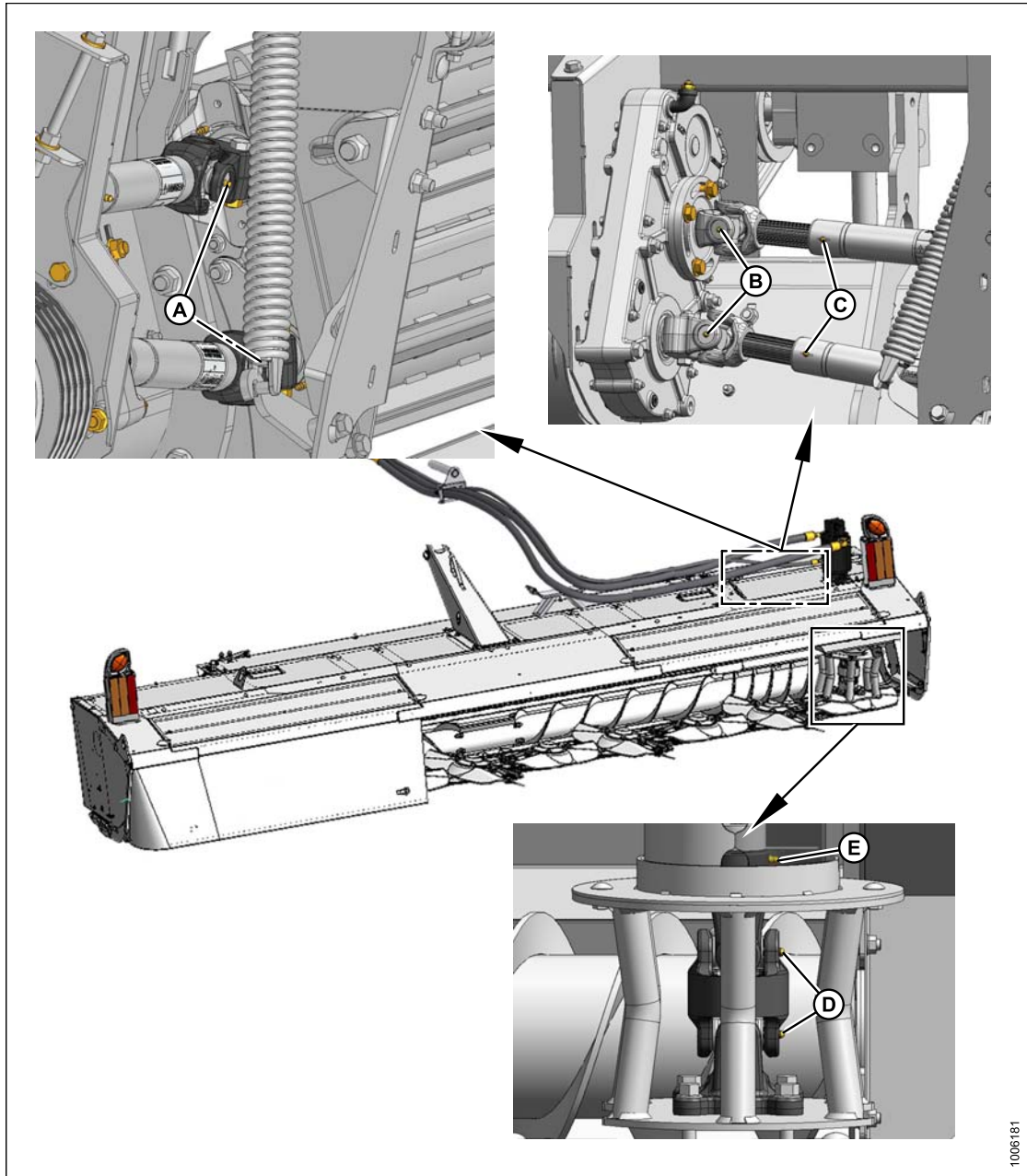


Figure 7.11

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

B - Driveline Universals (2 Places)
E - Driveline Shaft⁸ (1 Place)

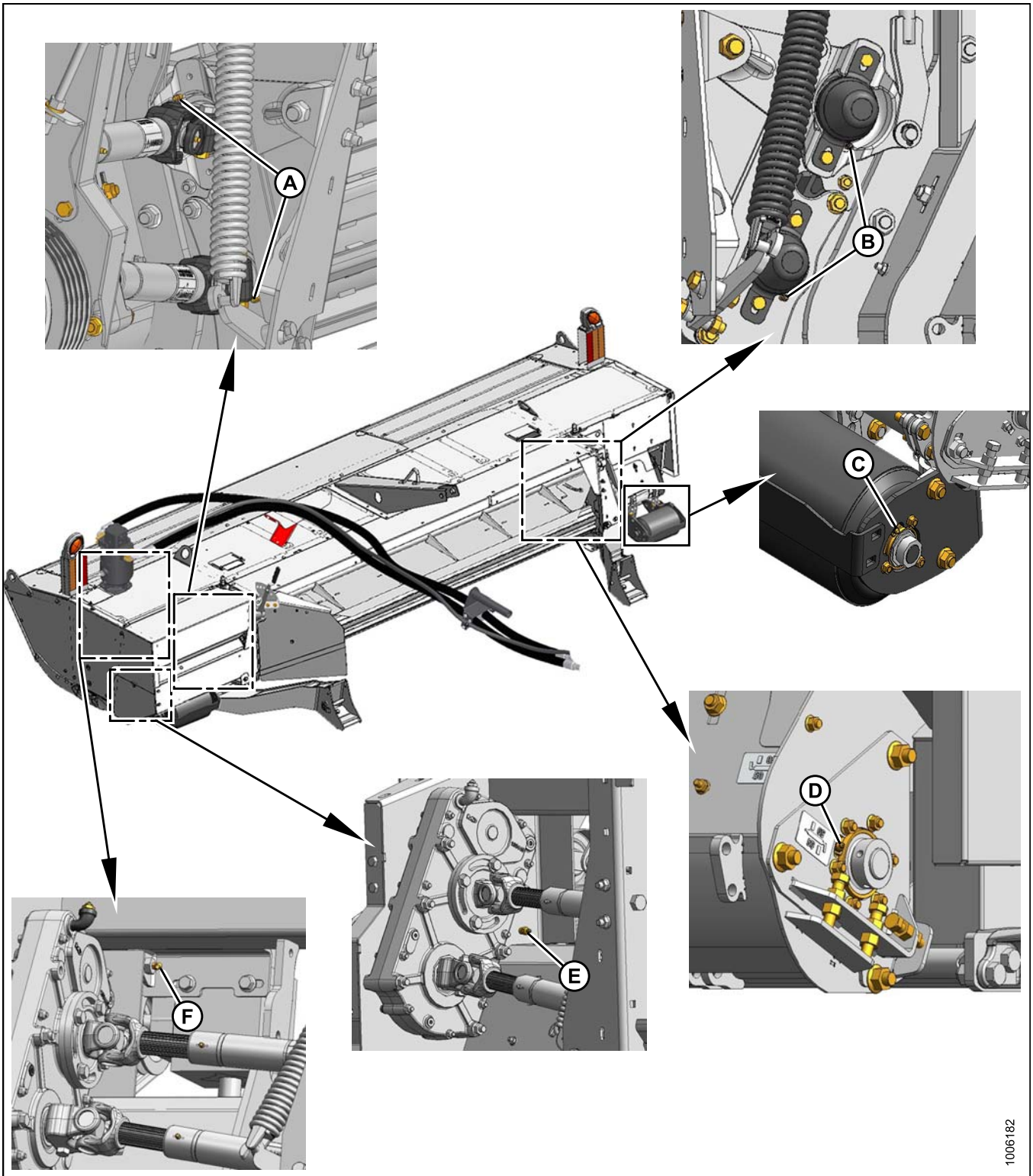
C - Driveline Shaft⁸ (2 Places)

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

8. 10% moly grease is recommended for driveline shaft slip joint only.

MAINTENANCE AND SERVICING

Every 50 Hours



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Figure 7.12

A - Roll Shaft Bearings (2 Places)

B - Roll Shaft Bearings (2 Places)

C - Optional Gauge Roll Bearings (2 Places)
Both Sides

D - Auger Bearing (1 Place)

E - Auger Bearing (1 Place)

F - Belt Tensioner Pivot (1 Place)

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

MAINTENANCE AND SERVICING

Every 100 Hours or Annually

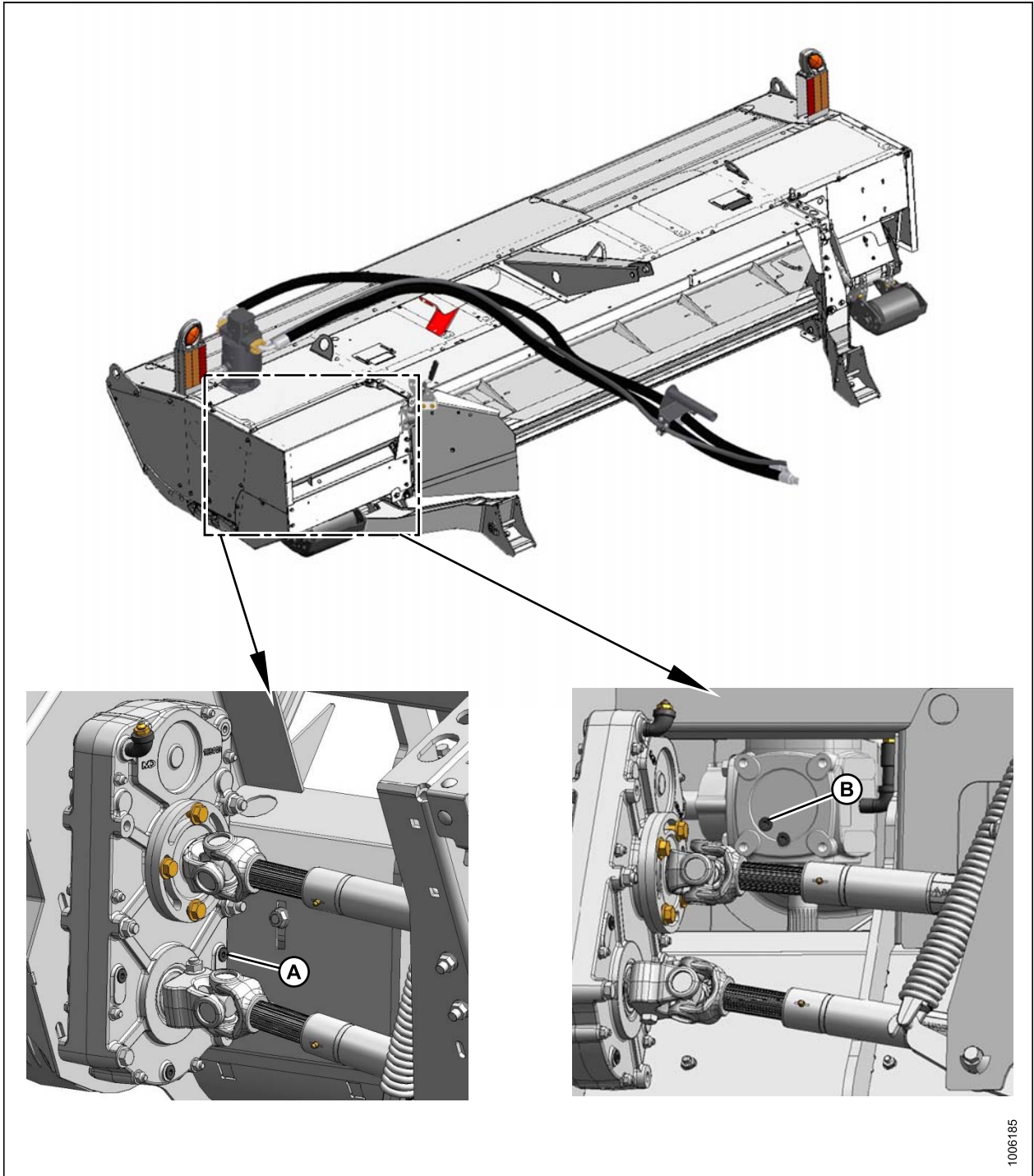


Figure 7.13

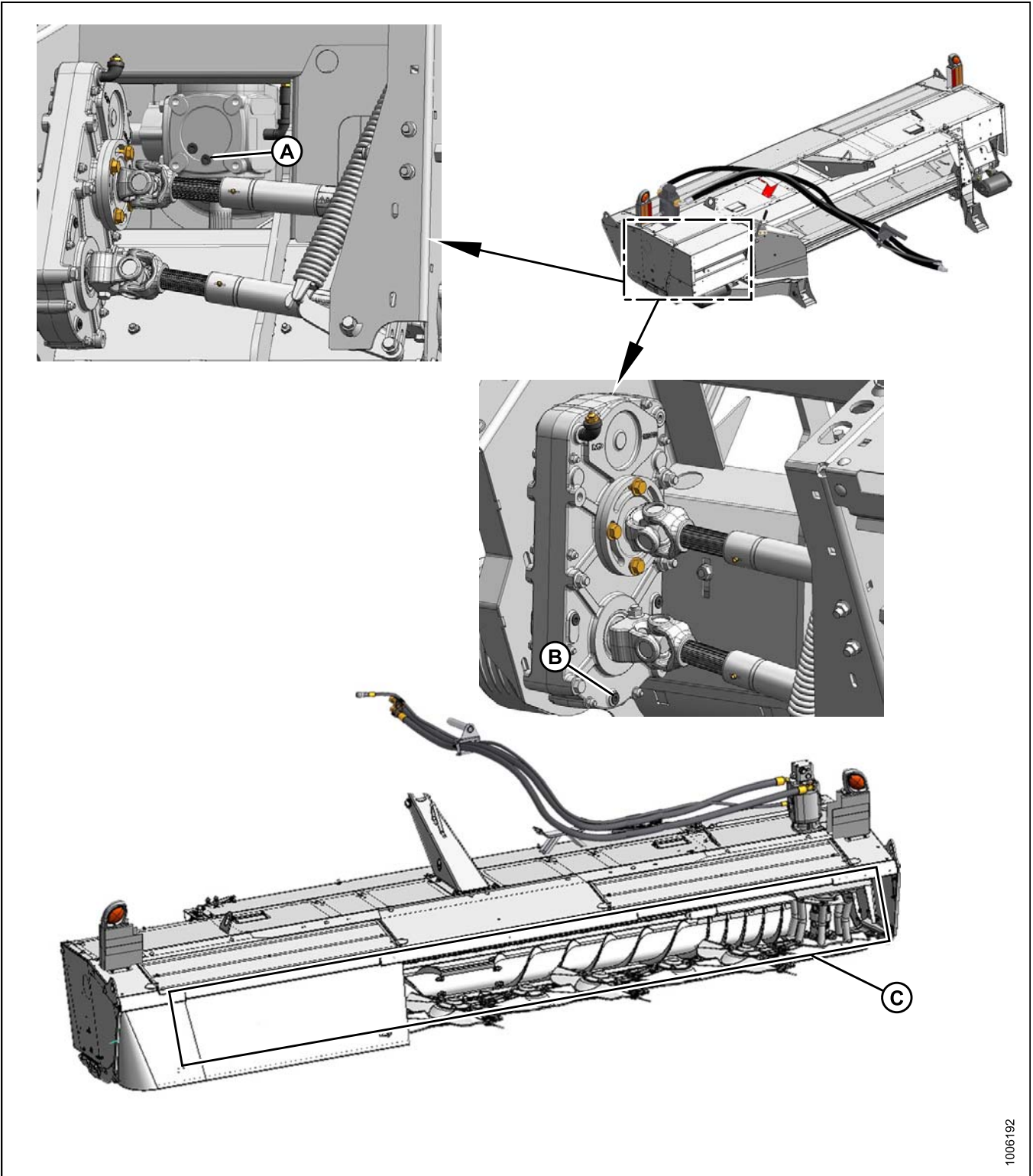
A - Conditioner Gearbox Oil⁹ Level (Check With Top of Header Horizontal). B - Bevel Gearbox Oil⁹ Level (Check With Top of Header Horizontal).

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

9. Oil should run out slightly when check plug removed.

MAINTENANCE AND SERVICING

Every 250 Hours



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Figure 7.14

A - Drain and Refill Bevel Gearbox Lube. See [Changing the Bevel Gearbox Lubricant, page 141](#)

B - Drain and Refill Conditioner Gearbox Lube. See [Changing the Conditioner Gearbox Lubricant, page 146](#)

C - Drain and Refill Cutterbar Lube. See [Section 7.5.8 Lubricating the Cutterbar, page 121](#)

MAINTENANCE AND SERVICING

7.5.8 Lubricating the Cutterbar

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

Draining the Cutterbar Lubricant

IMPORTANT

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



DANGER

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



CAUTION

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



DANGER

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

1. Park the machine on level ground, raise header fully.
2. Stop the engine and remove the key.
3. Engage header safety props.
4. Place a block under each end of the header (A).
NOTE: The block under the left end of the header should be higher than the right end.
5. Disengage header safety props.
6. Start windrower and lower header onto blocks.
7. Stop the engine and remove the key.
8. Open cutterbar doors (B). See Section [5.5 Cutterbar Doors](#), page 31.

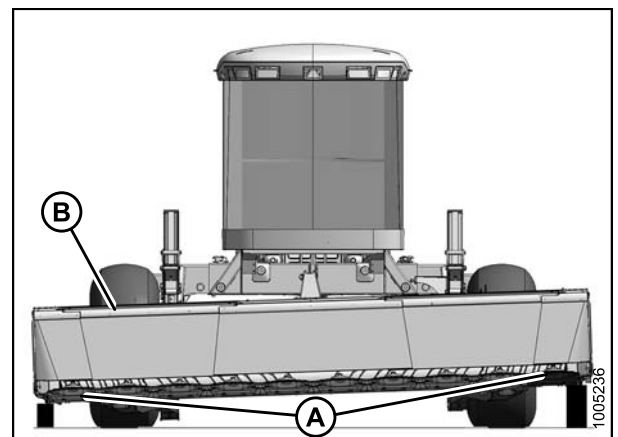


Figure 7.15

MAINTENANCE AND SERVICING

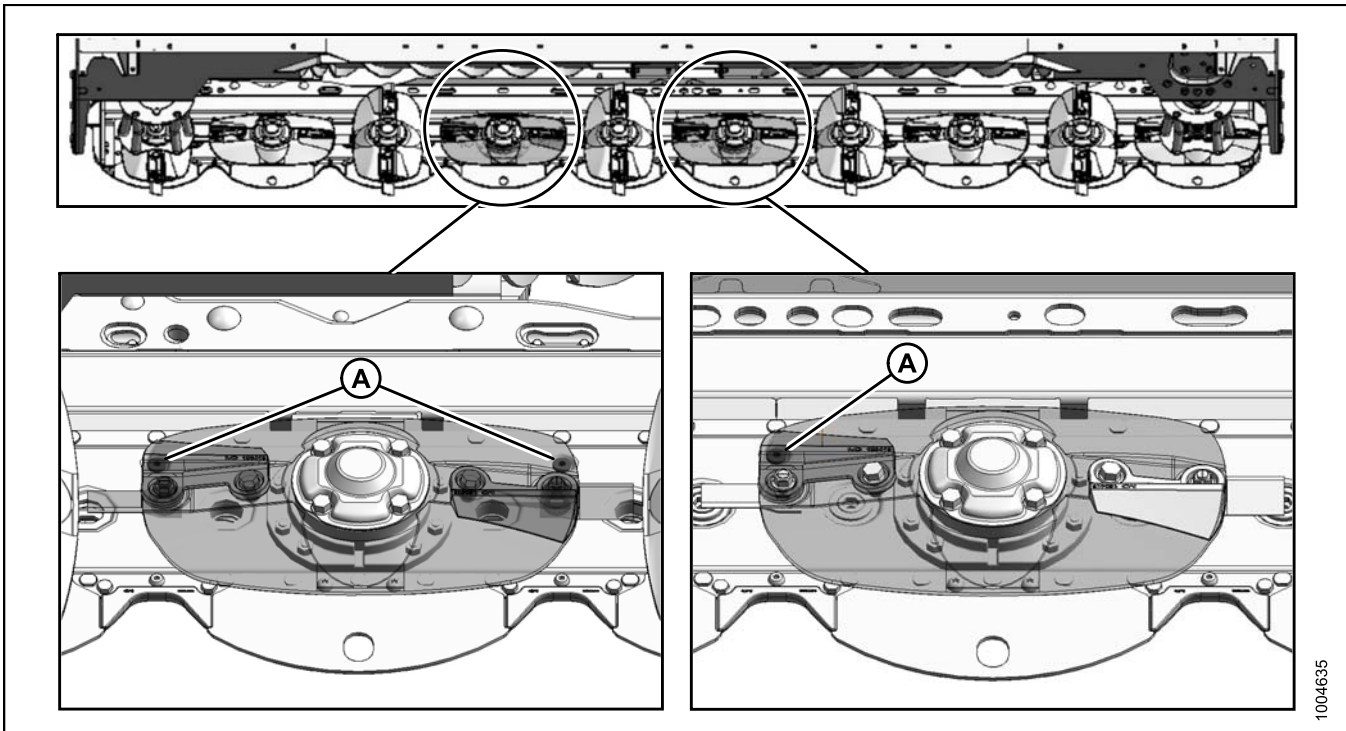


Figure 7.16: Cutterbar Filler Plug Locations

9. Locate one of the three filler plugs along the top of the cutterbar. Refer to [Figure 7.16: Cutterbar Filler Plug Locations, page 122](#).
10. Clean around either filler plug (A) and remove one plug with an 8 mm hex Allen L-key.
NOTE: Rotate disc to expose filler plug if necessary.
11. Place a suitably sized container under the cutterbar drain hole (A).
12. Remove plug (A) with an 8 mm hex Allen L-key and allow sufficient time for lubricant to drain.

IMPORTANT

Do NOT flush the cutterbar.

13. Replace drain plug (A) and tighten.
14. Safely dispose of lubricant.
15. Add lubricant. See [Filling the Cutterbar Lubricant, page 123](#).

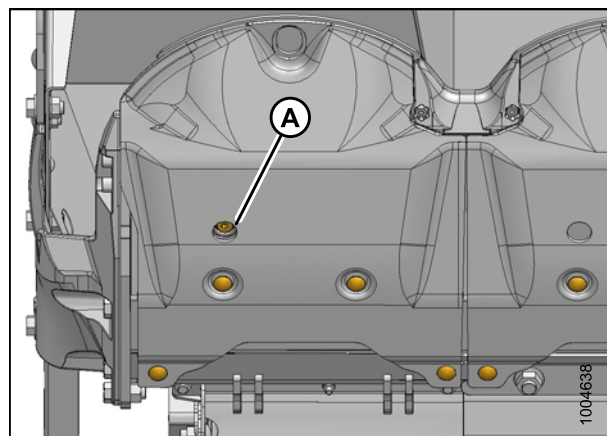


Figure 7.17

MAINTENANCE AND SERVICING

Filling the Cutterbar Lubricant

DANGER

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

DANGER

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 for any reason.

CAUTION

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

1. Park the machine on level ground, raise header fully.
2. Stop the engine and remove the key.
3. Engage header safety props.
4. Move higher block to right end of header.

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

5. Disengage header safety props.
6. Start windrower and lower header onto blocks.
7. Stop the engine and remove the key.

DANGER

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

8. Verify that drain plug (A) has been installed, before adding new lubricant.

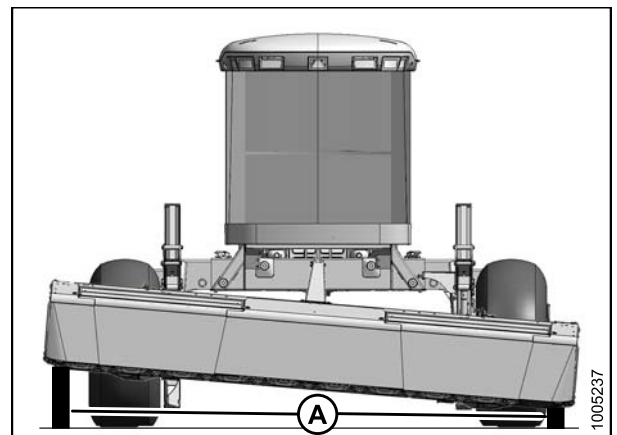


Figure 7.18

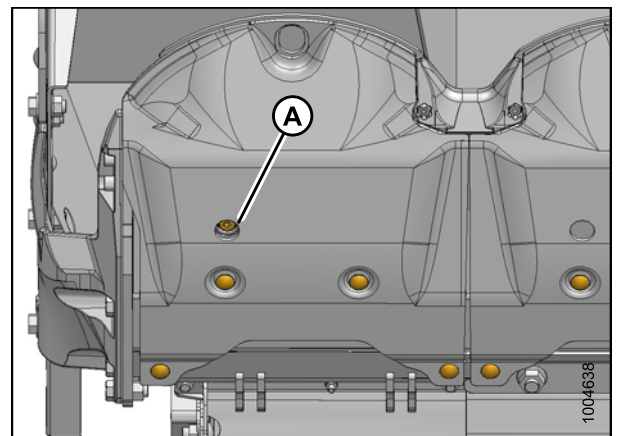


Figure 7.19

MAINTENANCE AND SERVICING

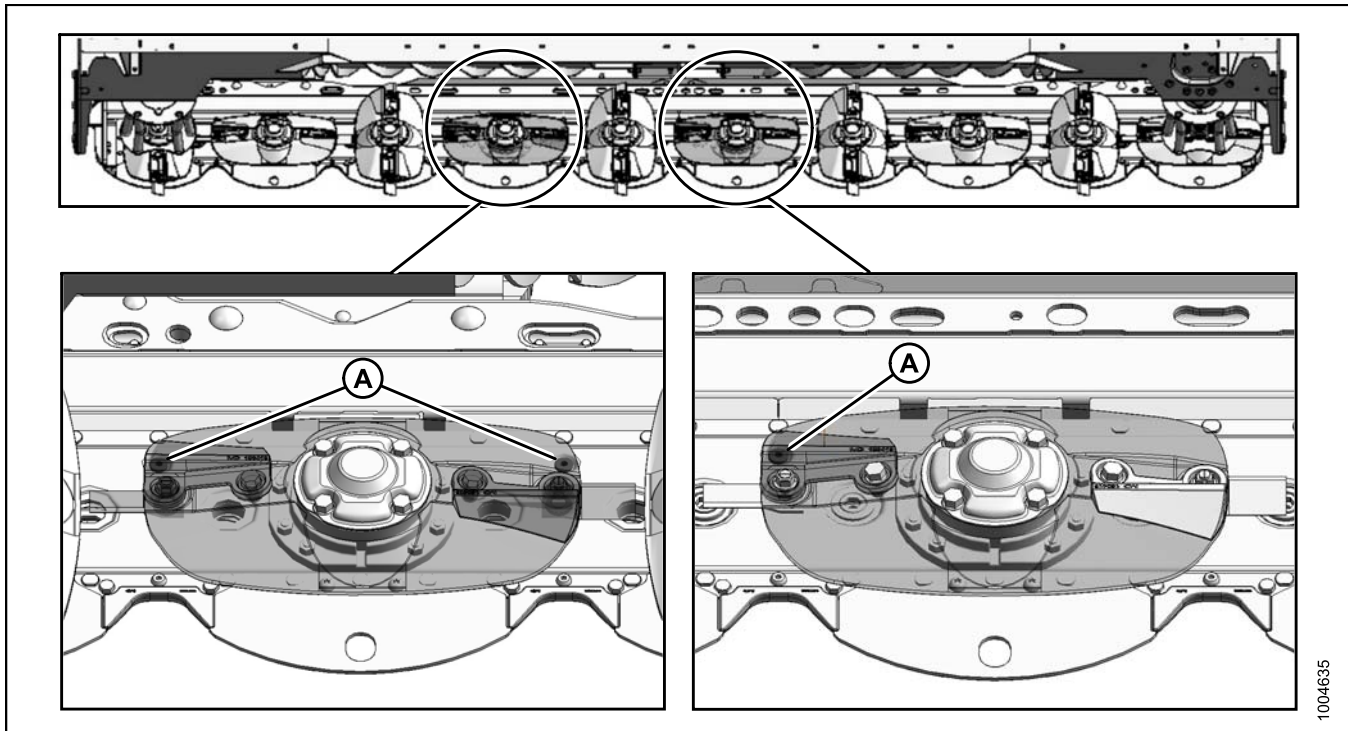


Figure 7.20: Cutterbar Filler Plug Locations

9. Locate one of the three filler plugs along the top of the cutterbar. Refer to [Figure 7.20: Cutterbar Filler Plug Locations, page 124](#).
10. Clean around either filler plug (A) and remove one plug with an 8 mm hex Allen L-key.
NOTE: Rotate disc to expose filler plug if necessary.
11. Add lubricant to cutterbar through filler hole (A). See [Section 7.4 Recommended Fluids and Lubricants, page 110](#).

IMPORTANT

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

12. Install the filler plug that was removed.
13. Close cutterbar door(s). See [Section 5.5 Cutterbar Doors, page 31](#).
14. Start engine and raise header off blocks.
15. Engage header safety props.
16. Remove blocks and lower header.
17. Stop engine and remove key from ignition.
18. Disengage header safety props.
19. Start engine and lower header to the ground.

MAINTENANCE AND SERVICING

7.5.9 Rock Guards

The machine is equipped with a rock guard at each cutting disc location. The rock guard prevents the cutterbar from digging into the ground and protects the disc from coming in contact with stones and other debris.

Inspecting the Rock Guards

DANGER

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

DANGER

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

CAUTION

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

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

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

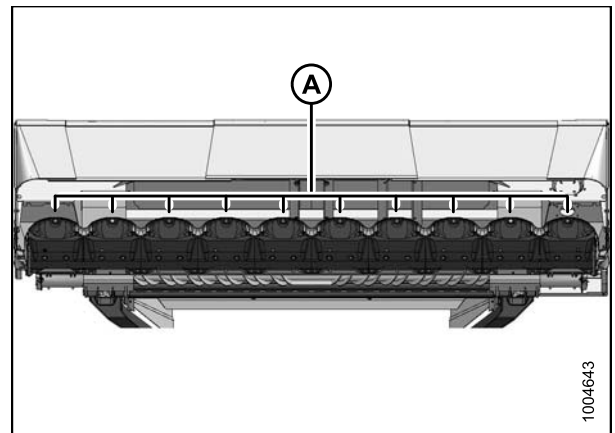


Figure 7.21

MAINTENANCE AND SERVICING

7.6 Cutterbar Disc Maintenance

Check daily that discs are not damaged by rocks or worn excessively from abrasive working conditions.

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

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

IMPORTANT

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

7.6.1 Inspecting the Cutterbar Discs

Perform the following cutterbar disc inspection daily:



DANGER

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

1. Lower header to ground, shut off engine, and remove key.
2. Open cutterbar doors. Refer to Section [5.5 Cutterbar Doors](#), page 31.

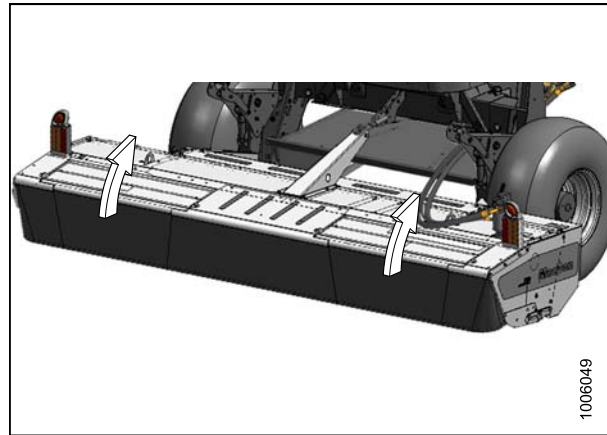


Figure 7.22

MAINTENANCE AND SERVICING

3. Check discs (A) for damage or loose fasteners.
4. Replace damaged discs. Refer to
 - [Removing a Disc, page 127](#)
 - [Installing a Disc, page 128](#)
5. Replace damaged fasteners. Tighten loose fasteners.
6. Close cutterbar doors.

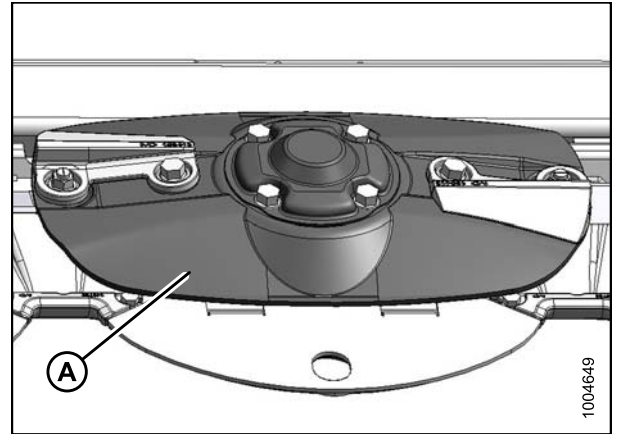


Figure 7.23

7.6.2 Disc

Removing a Disc



CAUTION

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

1. Open cutterbar door(s). See Section [5.5 Cutterbar Doors, page 31](#).
2. Identify which disc needs to be replaced.
3. Place a block of wood between two discs to prevent disc rotation while loosening bolts.
4. Remove rotary deflector. See
 - [Removing the Driveline Deflector, page 138](#)
 - [Removing the Driven Deflector, page 137](#)
5. Remove four bolts (A) on disc cover (B) and remove cover and disc (C).

NOTE: If removing multiple discs, mark each disc to assist in reinstallation as the blades on each disc are direction-specific. See Section [7.6.3 Direction of Spindle Rotation, page 129](#).

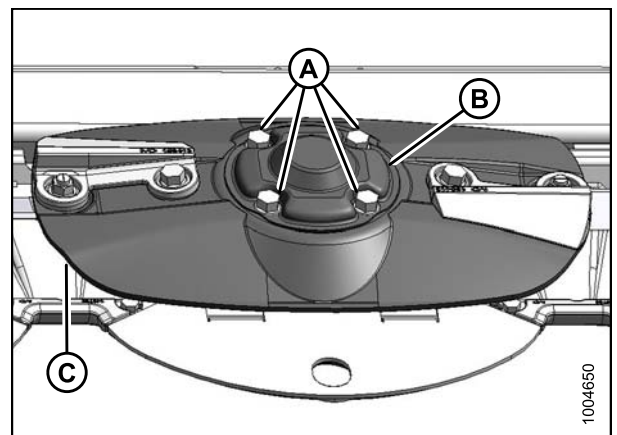


Figure 7.24

MAINTENANCE AND SERVICING

Installing a Disc

CAUTION

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

1. Position new disc (C) on spindle ensuring it is 90° to the adjacent discs.
2. Install cover (B) and secure with four bolts (A). Tighten bolts to 92 ft·lbf (125 N·m).

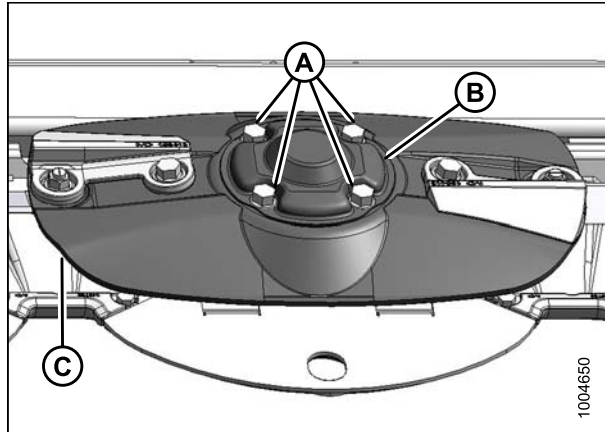


Figure 7.25

3. Install previously removed rotary deflector. See
 - [Installing the Driven Deflector, page 138](#)
 - [Installing the Driveline Deflector, page 139](#)
4. Close cutterbar door(s). See Section [5.5 Cutterbar Doors, page 31](#).

MAINTENANCE AND SERVICING

7.6.3 Direction of Spindle Rotation

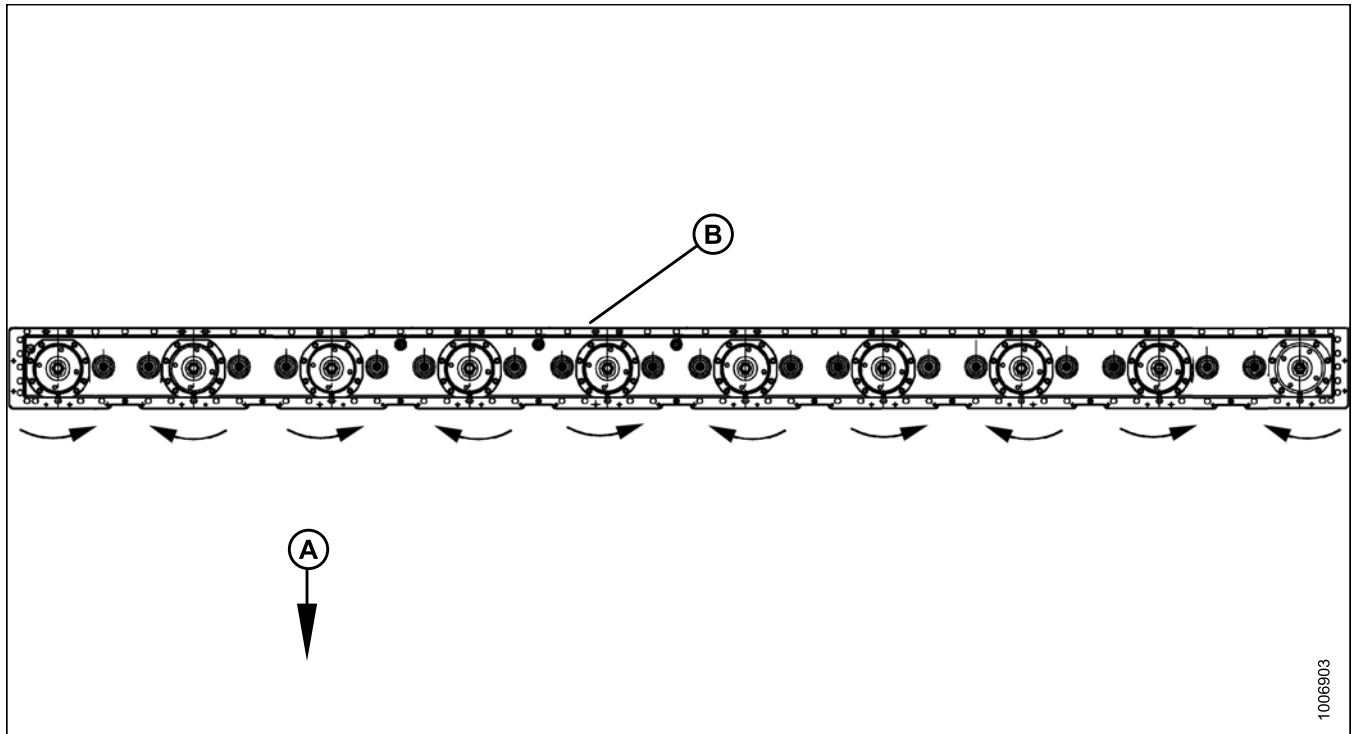


Figure 7.26

A - Front of Header

B - 16-Footer Cutterbar

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7.6.4 Cutter Blades

Each disc has two cutter blades (A) attached to each end and are free to swivel horizontally on a specially designed shoulder bolt.

The blade, with two cutting edges, can be flipped over so that the blade does not need to be replaced as often.

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

IMPORTANT

Always use factory replacement parts.

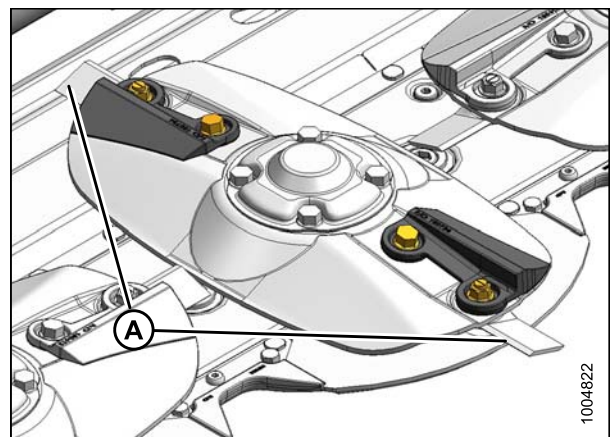


Figure 7.27

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MAINTENANCE AND SERVICING

Inspecting Cutter Blades

CAUTION

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

CAUTION

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

DANGER

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

- Check daily that the cutter blades are securely attached to the disc.
- Check blades for cracks, wear beyond safe operating limits (C), and distortion.
- If any of these problems occur, replace blades immediately.

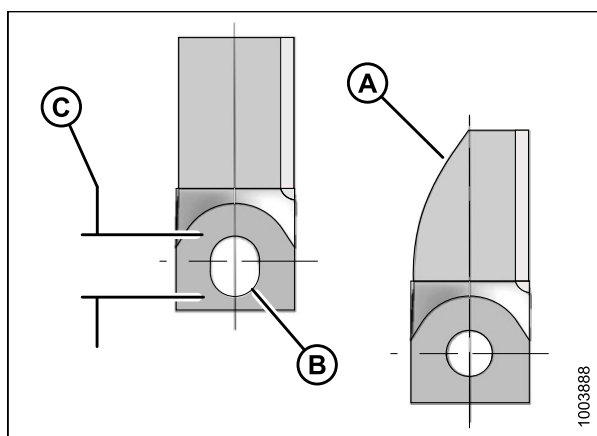


Figure 7.28

A - Blade Wear to Center Line

B - Elongated Hole

C - Maximum Distortion 0.81 in. (20.6 mm)

IMPORTANT

Blades should be replaced in pairs, otherwise the disc may be unbalanced and damage the cutterbar.

IMPORTANT

The cutter blades have cutting edges on both edges so that the blade can be turned over and reused. The twist in each blade determines if its cutting direction is clockwise or counterclockwise. If you are unsure which direction the spindle rotates, see [Section 7.6.3 Direction of Spindle Rotation, page 129](#).

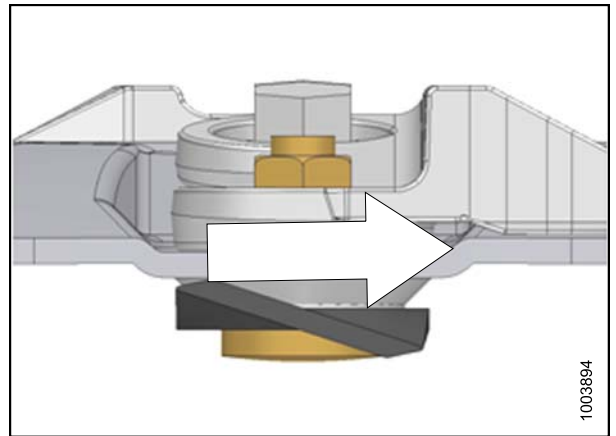


Figure 7.29: Counterclockwise Disc Rotation Direction

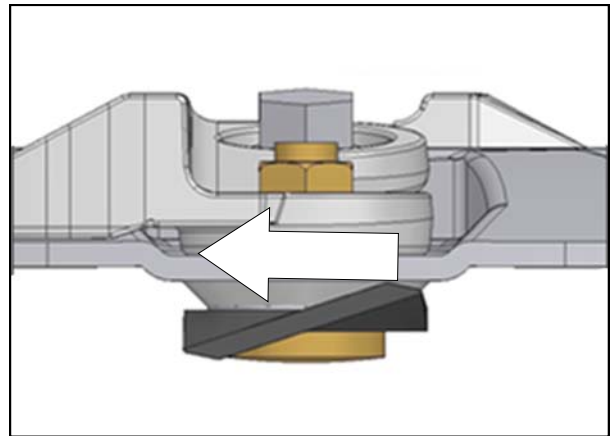


Figure 7.30: Clockwise Disc Rotation Direction

MAINTENANCE AND SERVICING

Replacing the Cutter Blades

Follow these steps to replace the cutter blades:

CAUTION

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

DANGER

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

1. Raise header fully.
2. Shut off the engine and remove the key.
3. Engage header safety props.
4. Open cutterbar door(s). See Section [5.5 Cutterbar Doors](#), page 31.
5. Rotate disc (A) so that blade (B) faces forward and lines up with hole (C) in rock guard.
6. Place a block of wood between two discs to prevent disc rotation while loosening blade bolts.
7. Clean debris from blade attachment area.

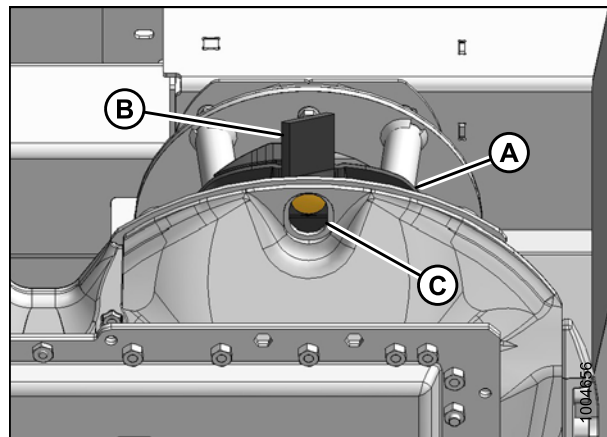


Figure 7.31

MAINTENANCE AND SERVICING

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

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

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

- [7.29: Counterclockwise Disc Rotation Direction, page 131](#)
- [7.30: Clockwise Disc Rotation Direction, page 131](#)

If you are unsure which direction the spindle rotates, see [Section 7.6.3 Direction of Spindle Rotation, page 129](#).

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



WARNING

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

13. Close cutterbar doors. See [Section 5.5 Cutterbar Doors, page 31](#).

Inspecting Cutterbar Hardware

Check blade attachment hardware each time blades are replaced. See [Replacing the Cutter Blades, page 132](#) for replacement procedure.

Check bolts for wear or damage and replace bolt if:

- Bolt has been removed and installed five times.
- Head is worn flush with bearing surface of blade.
- Diameter of bolt neck is worn out of specification.
- Bolt is cracked.
- Bolt is visibly distorted.
- Evidence of interference with adjacent parts.

Check nuts for wear or damage and replace nut if:

- Worn height is less than half total height.
- Nut is cracked.
- Nut has been removed and installed five times.

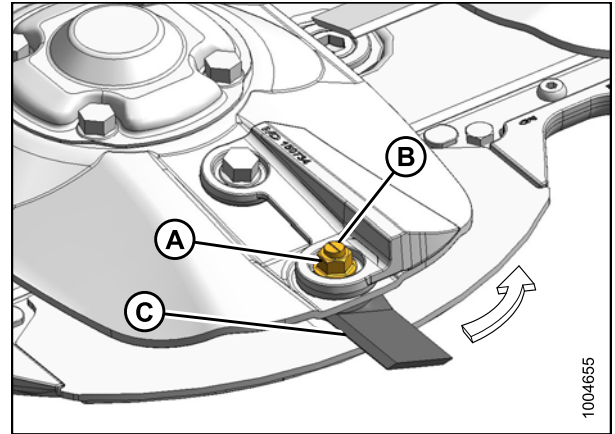


Figure 7.32

MAINTENANCE AND SERVICING

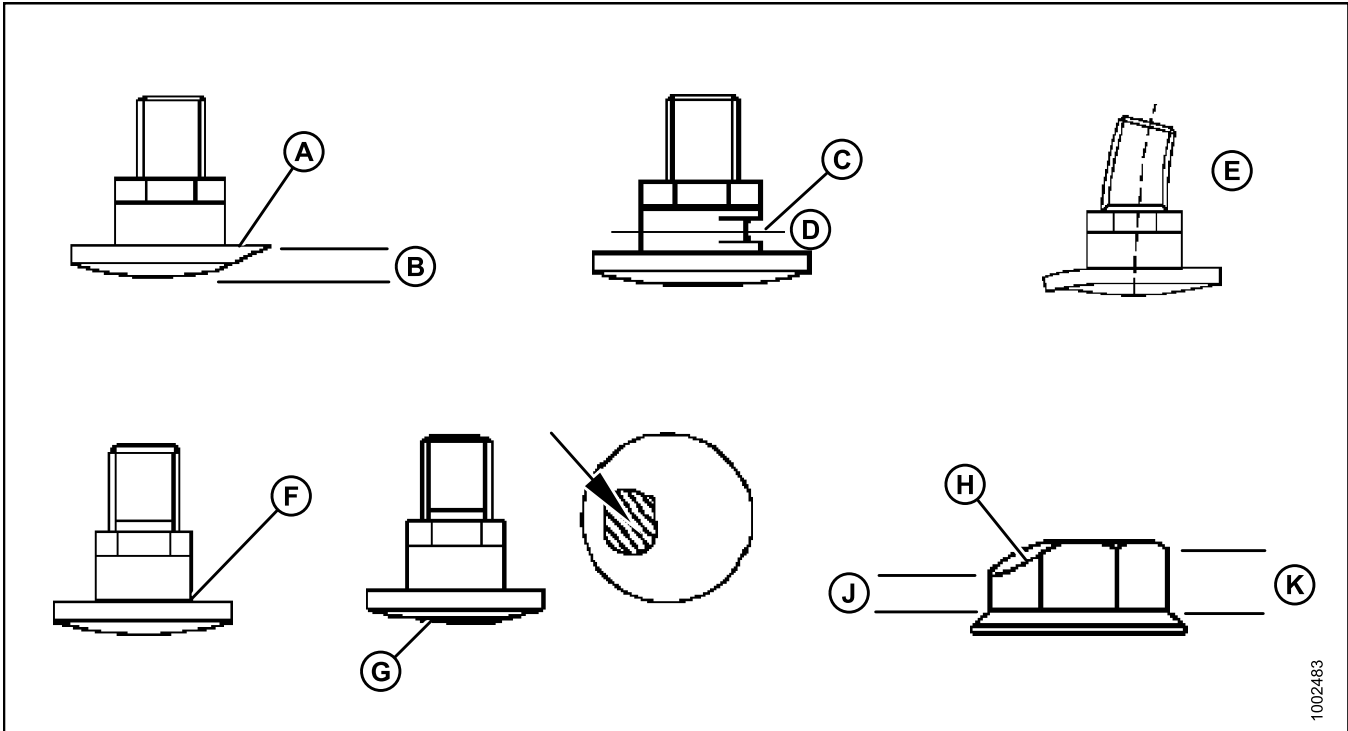


Figure 7.33

A - Bolt Head Worn

D - 0.13 in. (3 mm)

G - Bolt Interference

K - 0.5–0.51 in. (12.8–13mm)

B - 0.0–0.16 in. (0.0–4 mm)

E - Bolt Distorted

H - Nut Wear

C - Bolt Neck Worn

F - Bolt Neck Cracked

J - 0.00–0.24 in. (0.0–6.0 mm)

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7.6.5 Accelerators

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

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

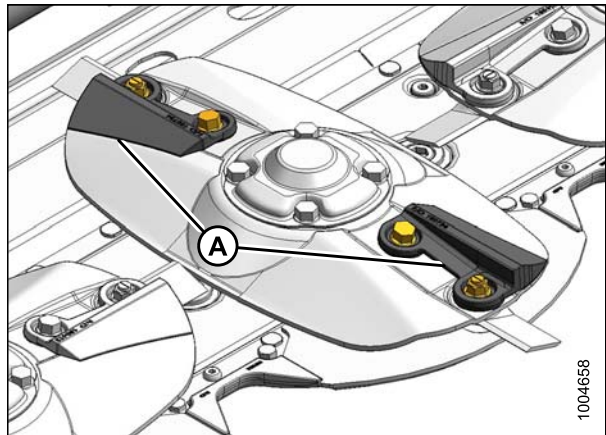


Figure 7.34

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MAINTENANCE AND SERVICING

Inspecting Accelerators

Follow these steps to inspect accelerators:

DANGER

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

1. Raise header fully, stop engine, and remove key.
2. Engage header safety props.
3. Open cutterbar doors. Refer to Section [5.5 Cutterbar Doors](#), page 31.

CAUTION

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

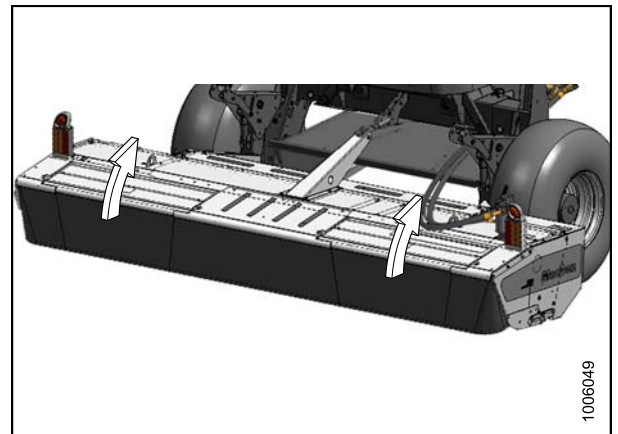


Figure 7.35

4. Inspect accelerators for damage and wear. They should be replaced if severely damaged or worn.
5. Check for loose or missing fasteners and tighten or replace fastener if missing.

Replacing Accelerators

Follow these steps to replace the accelerators:

1. Raise header fully, shut off engine, and remove key.
2. Engage header safety props.
3. Remove disc. See [Removing a Disc](#), page 127.

MAINTENANCE AND SERVICING

- Remove bolt and nut (A) and nut (B) and remove accelerator (C) from disc (D).

IMPORTANT

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

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

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

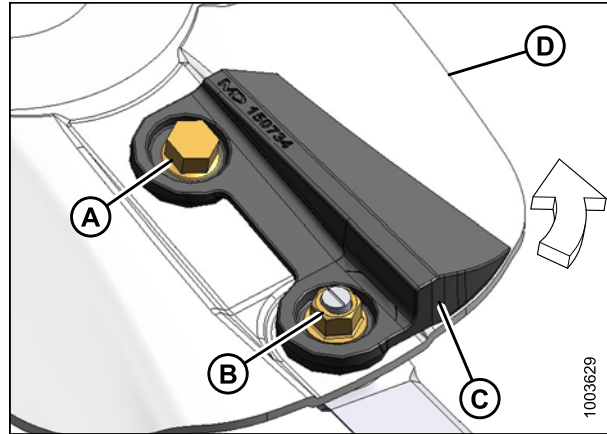


Figure 7.36

- Install hex bolt (A) and nut at inboard hole. Bolt head faces up.
- Tighten both nuts to 100 ft·lbf (135 N·m).
- Repeat for other accelerator.
- Reinstall disc (D) on spindle. Refer to [Installing a Disc, page 128](#).
- Remove block of wood (if used).



WARNING

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

- Close cutterbar doors.

7.6.6 Rotary Deflectors

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

Rotary deflectors should be checked daily for damage or wear.

MAINTENANCE AND SERVICING

Inspecting Rotary Deflectors

DANGER

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

1. Lower header to ground.
2. Shut off the engine and remove the key.
3. Open cutterbar doors. See Section [5.5 Cutterbar Doors](#), page 31.
4. Check that deflectors (A) are not damaged or bent by rocks and for loose fasteners.
5. Replace deflectors (A) if they are severely damaged or worn. See
 - [Removing the Driven Deflector](#), page 137
 - [Installing the Driven Deflector](#), page 138
 - [Removing the Driveline Deflector](#), page 138
 - [Installing the Driveline Deflector](#), page 139

Do **NOT** repair.

6. Tighten loose fasteners.

WARNING

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

7. Close the cutterbar doors. See Section [5.5 Cutterbar Doors](#), page 31.

Removing the Driven Deflector

Follow these steps to replace the driven rotary deflector:

1. Lower header to ground.
2. Shut off the engine and remove the key.
3. Open cutterbar doors. See Section [5.5 Cutterbar Doors](#), page 31.

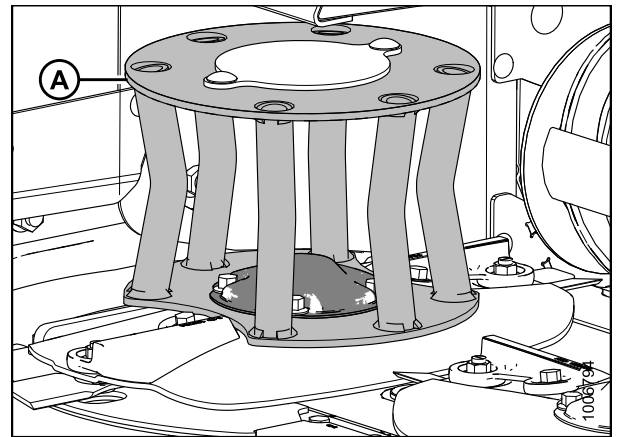


Figure 7.37

MAINTENANCE AND SERVICING

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

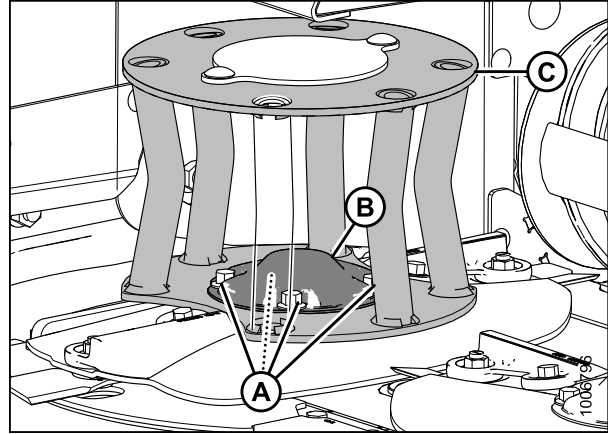


Figure 7.38

Installing the Driven Deflector

Follow these steps to replace the driven rotary deflector:

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

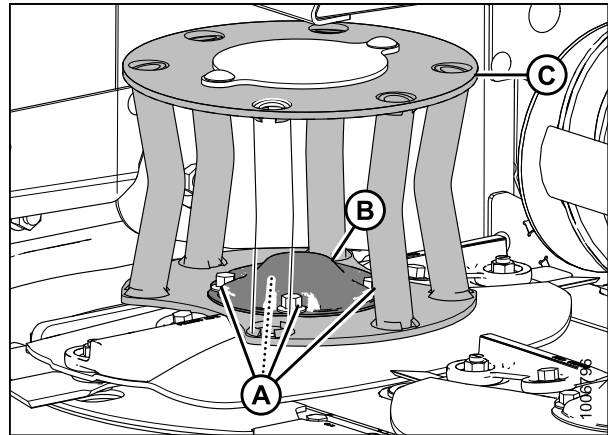


Figure 7.39

Removing the Driveline Deflector

Follow these steps to replace the driveline deflector:

1. Lower header to ground.
2. Shut off the engine and remove the key.
3. Open cutterbar doors. See Section [5.5 Cutterbar Doors](#), page 31.

MAINTENANCE AND SERVICING

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

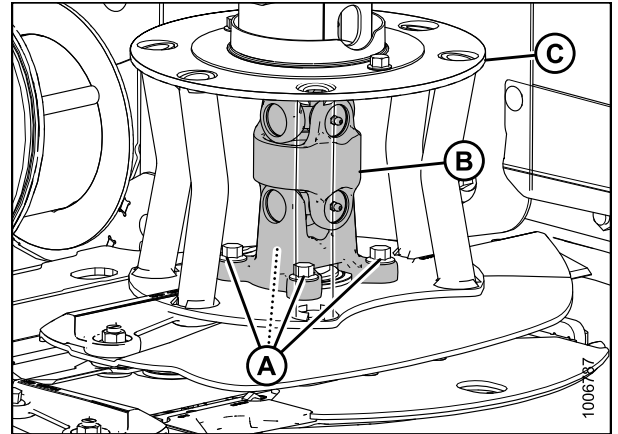


Figure 7.40

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

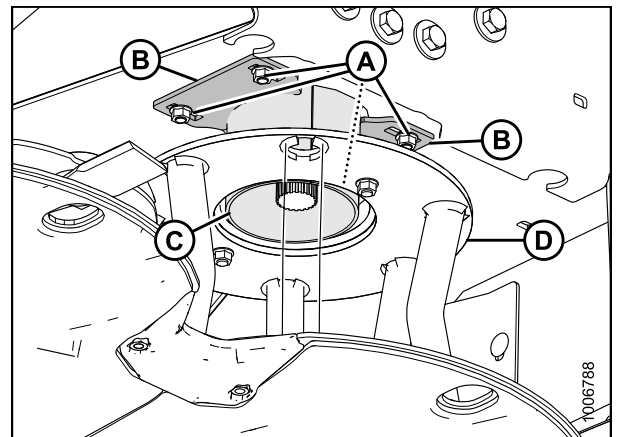


Figure 7.41

Installing the Driveline Deflector

Follow these steps to replace the driveline deflector:

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

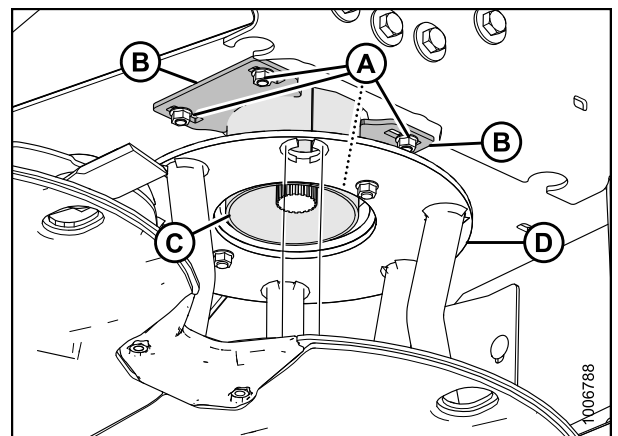


Figure 7.42

MAINTENANCE AND SERVICING

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

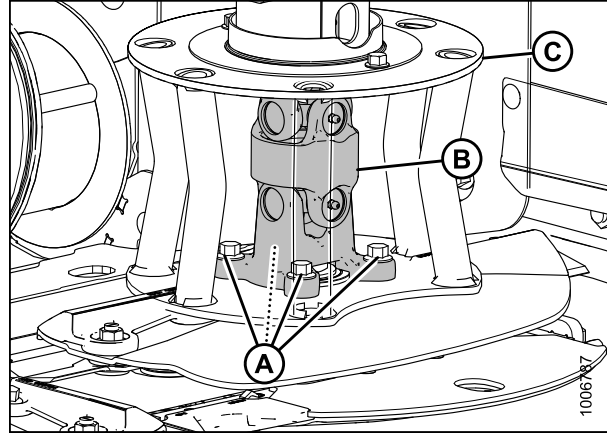


Figure 7.43

6. Tighten bolts (A) on shield plates (B).
7. Remove block of wood (if used).
8. Manually rotate discs to check for interference of adjacent parts.
9. Close cutterbar doors. See Section [5.5 Cutterbar Doors](#), page 31.



WARNING

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

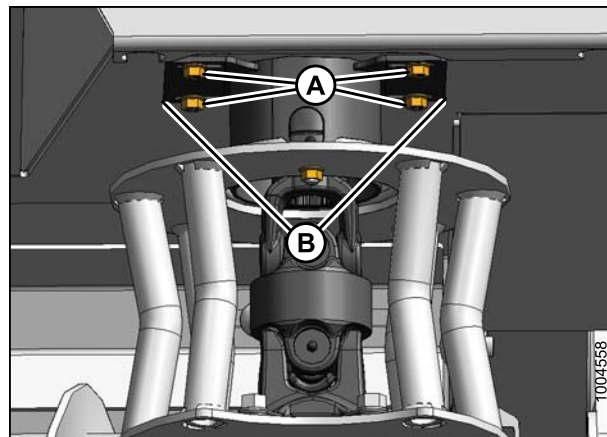


Figure 7.44

7.7 Drive Systems

7.7.1 Bevel Gearbox

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

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

The only regular servicing required is maintaining the lubricant level and changing the lubricant according to the intervals specified in this manual. See [Section 7.5.1 Maintenance Schedule/Record, page 112](#).

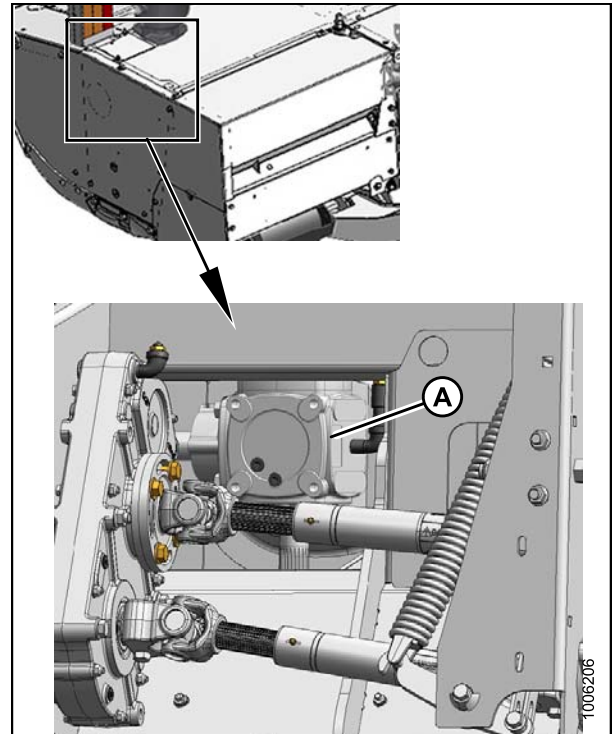


Figure 7.45

Changing the Bevel Gearbox Lubricant

Follow these steps to change the bevel gearbox lubricant:

DANGER

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

1. Drain the gearbox when the lubricant is warm. If the lubricant is cold, idle the machine for about 10 minutes prior to draining.
2. Raise header to full height, stop engine, and remove key from ignition.
3. Engage header safety props. See [Section 5.3 Header Safety Props, page 26](#).

MAINTENANCE AND SERVICING

4. Open the driveshield. See Section 5.4 Driveshields, page 28.

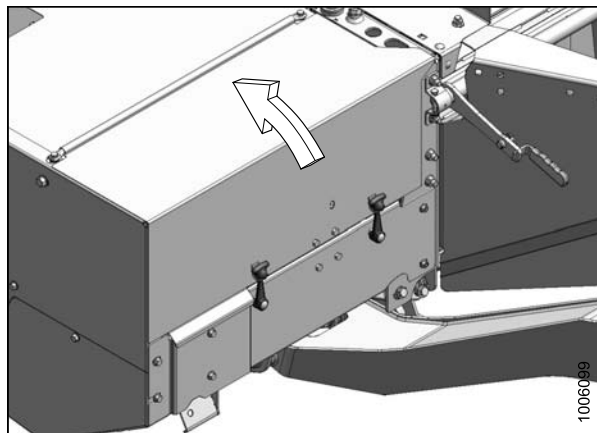


Figure 7.46

5. Place a suitable container under drain plug (A).
6. Remove plugs (A) and (B).
7. Allow sufficient time for lubricant to drain.
8. Disengage header safety props, start engine, and lower header so that it is level. Stop engine and remove key.
9. Replace plug (A).
10. Add 13.6 oz. (400 ml) of Traxon E 75W90 gear lubricant to gearbox through port (B). Lubricant should slightly run out of port (B) when at the proper level.
11. Replace plug (B) and tighten.
12. Properly dispose of used lubricant and clean up any spilled lubricant.
13. Lower driveshield.

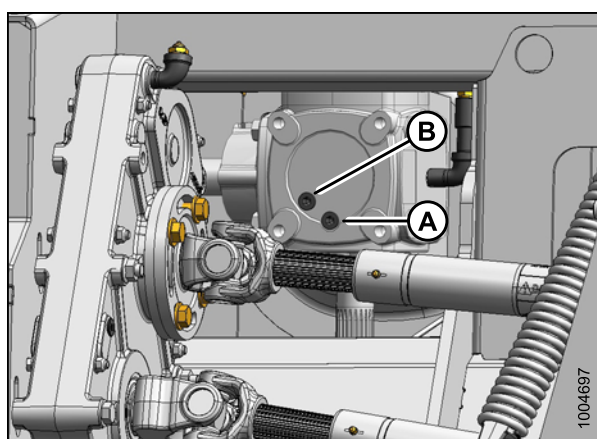


Figure 7.47

7.7.2 Conditioner Drive Belt

The conditioner drive belt is located inside the drive compartment at the left hand side of the header.

The tension is factory set, so should not require adjusting.

Inspecting the Conditioner Drive Belt

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



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

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

MAINTENANCE AND SERVICING

2. Open the driveshield. See Section [5.4 Driveshields](#), page 28.

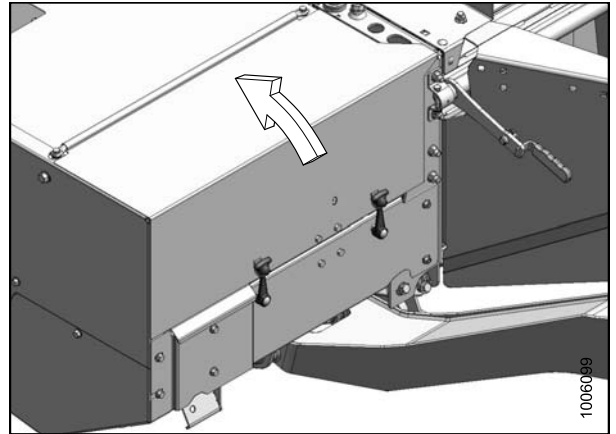


Figure 7.48

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

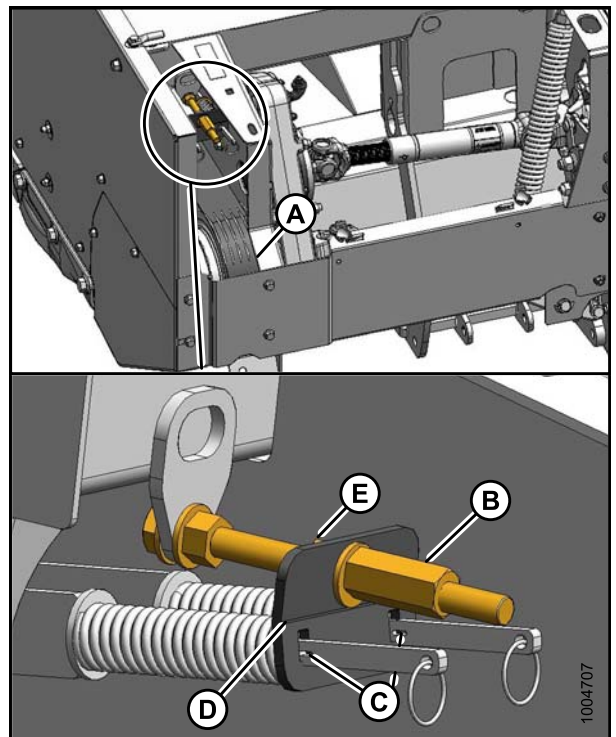


Figure 7.49

MAINTENANCE AND SERVICING

Replacing the Conditioner Drive Belt

Follow these steps to replace the conditioner drive belt:

DANGER

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

1. Lower header to ground, turn off engine, and remove key.
2. Open the driveshield. See Section [5.4 Driveshields](#), page 28.

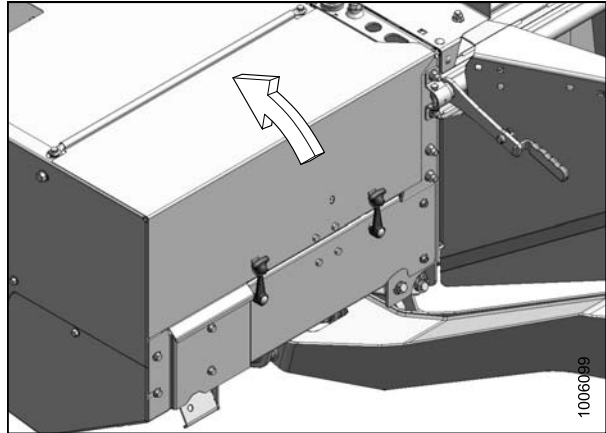


Figure 7.50

3. Remove the auger drive belts (A). See [Replacing the Auger Drive Belts](#), page 151 steps 3., [Replacing the Auger Drive Belts](#), page 151 to 7., [Replacing the Auger Drive Belts](#), page 152.

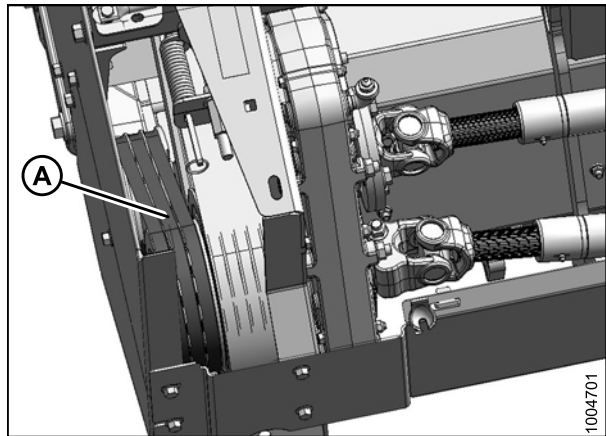


Figure 7.51

MAINTENANCE AND SERVICING

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

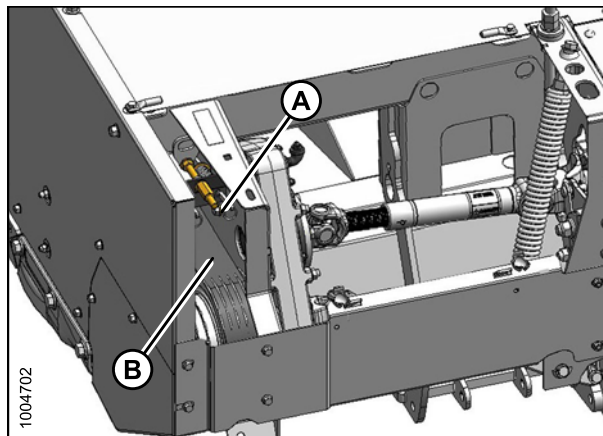


Figure 7.52

5. Remove conditioner drive belt (A).
6. Install new conditioner drive belt (A) onto pulleys, ensuring it is in the pulley grooves.
7. Tension conditioner drive belt (A). See [Inspecting the Conditioner Drive Belt, page 142](#).
8. Install and tension auger drive belts. See [Replacing the Auger Drive Belts, page 151](#).
9. Close driveshield.

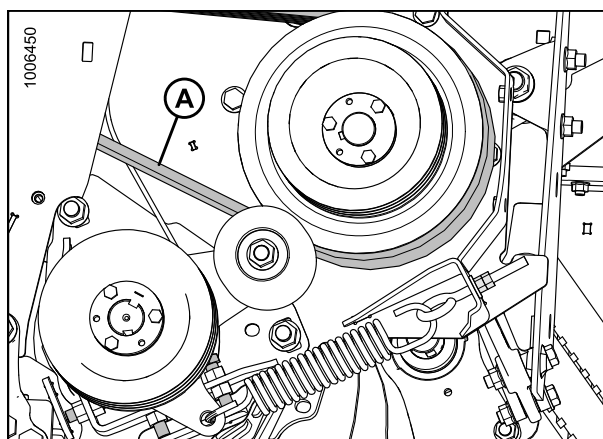


Figure 7.53

MAINTENANCE AND SERVICING

7.7.3 Conditioner Gearbox

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

The only regular servicing required is maintaining the lubricant level and changing the lubricant according to the intervals specified in this manual. See Section [7.5.1 Maintenance Schedule/Record](#), page 112.

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

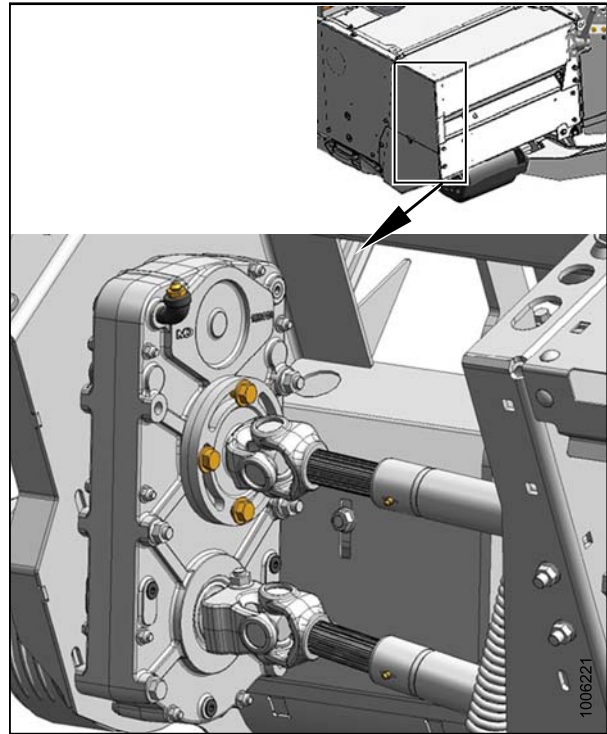


Figure 7.54

Changing the Conditioner Gearbox Lubricant

Follow these steps to change the conditioner gearbox lubricant:

DANGER

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

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

1. Raise header to full height, stop engine, and remove key from ignition.
2. Engage header safety props. See Section [5.3 Header Safety Props](#), page 26.

MAINTENANCE AND SERVICING

3. Open driveshield. See Section [5.4 Driveshields](#), page 28.

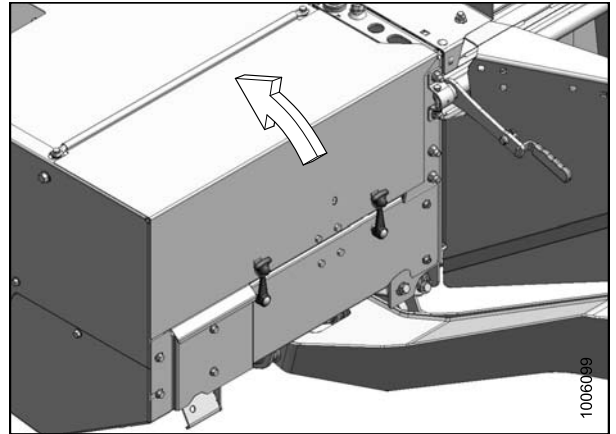


Figure 7.55

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

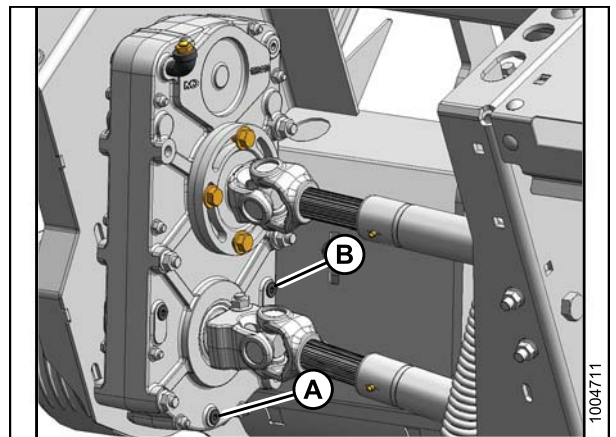


Figure 7.56

8. Remove breather and bushing (A) at filler pipe (B).
9. Add 11.8 oz. (350 ml) of Traxon E Synthetic 80W90 gear lubricant to gearbox through filler pipe (B).

NOTE: Lubricant should run out of port (C) slightly when at the proper level.

10. Reinstall plug (C) and tighten.
11. Reinstall bushing and breather (A) in filler pipe (B) and tighten.
12. Properly dispose of used lubricant and clean up any spilled lubricant.
13. Close driveshield.

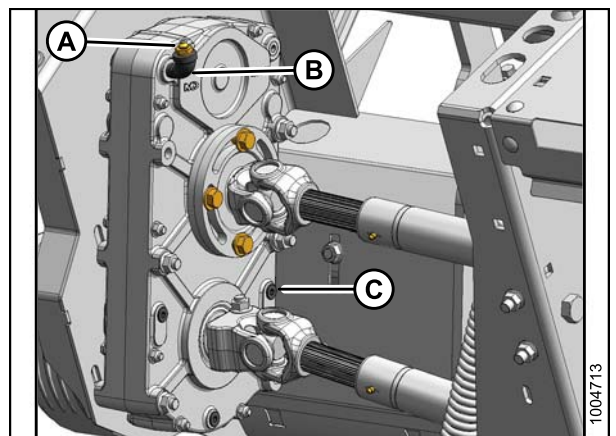


Figure 7.57

MAINTENANCE AND SERVICING

7.7.4 Header Drive Speed Sensor

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

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

Adjusting the Header Drive Speed Sensor

To adjust the gearbox speed sensor, follow these steps:



DANGER

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

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

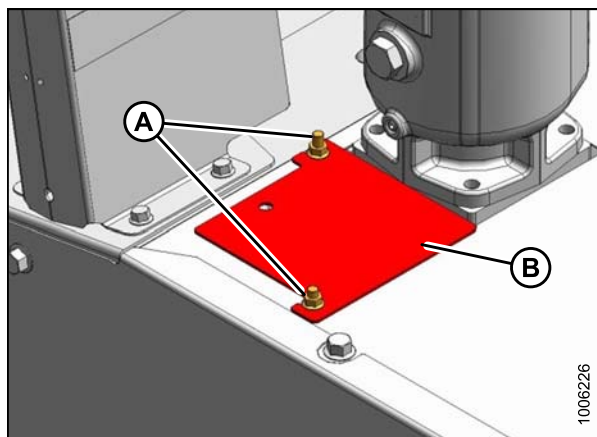


Figure 7.58

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

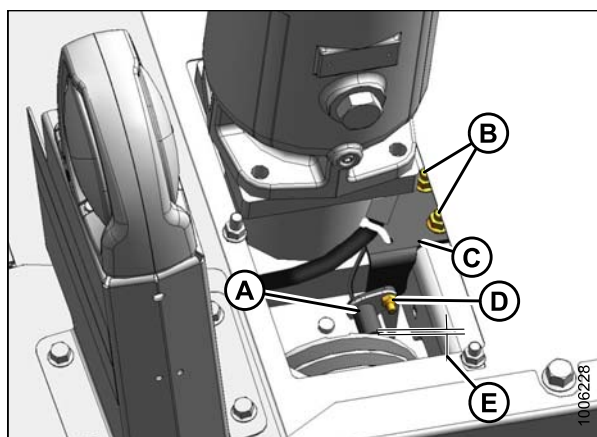


Figure 7.59

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Replacing the Header Drive Speed Sensor

To replace the gearbox speed sensor, follow these steps:

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

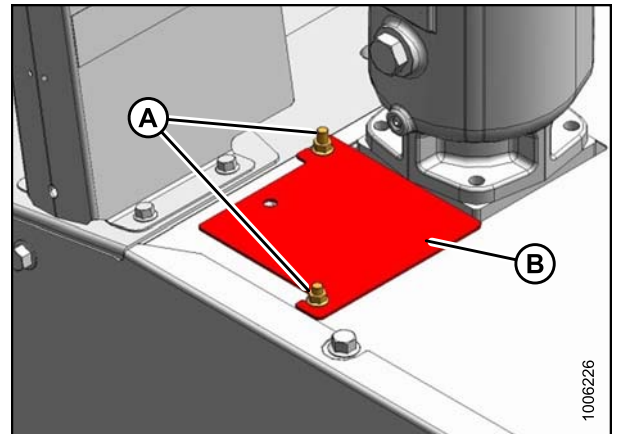


Figure 7.60

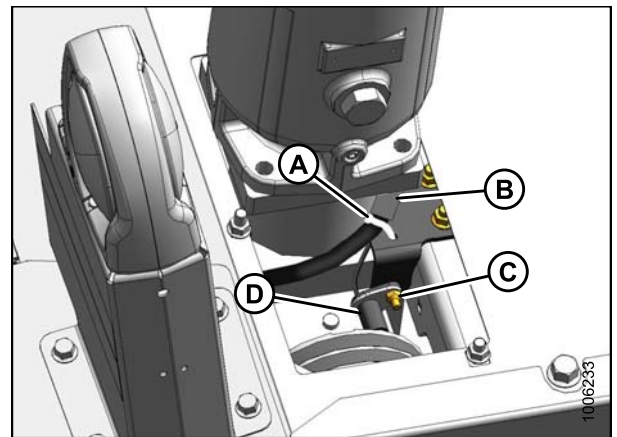


Figure 7.61

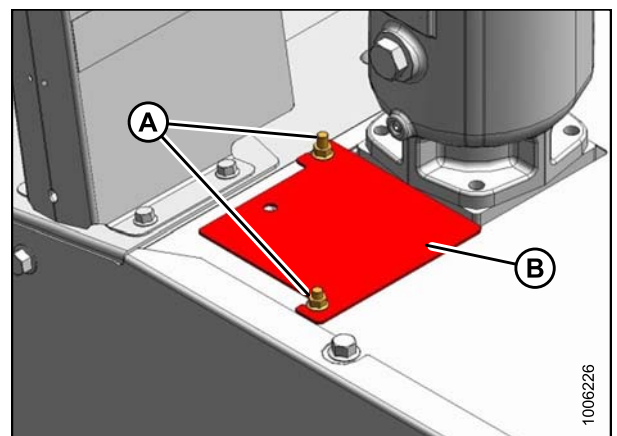


Figure 7.62

MAINTENANCE AND SERVICING

7.7.5 Auger Drive Belt

The auger drive belts are located inside the drive compartment at the lower left end.

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

Inspecting the Auger Drive Belts

DANGER

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

1. Lower header to ground, turn off engine, and remove key.
2. Open driveshield. See Section [5.4 Driveshields](#), page 28.

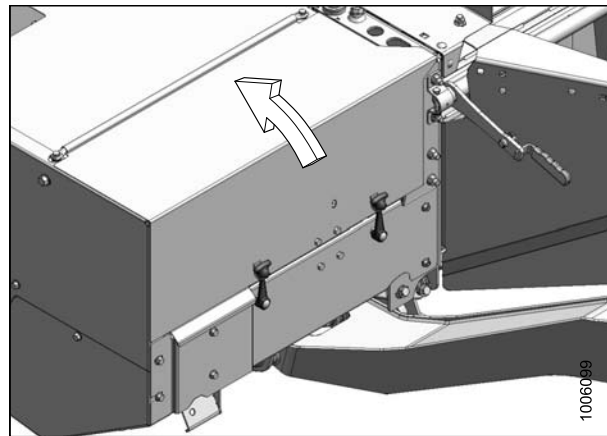


Figure 7.63

3. Check condition of auger drive belts (A). If severely worn or damaged, replace them. Refer to [Replacing the Auger Drive Belts](#), page 151.

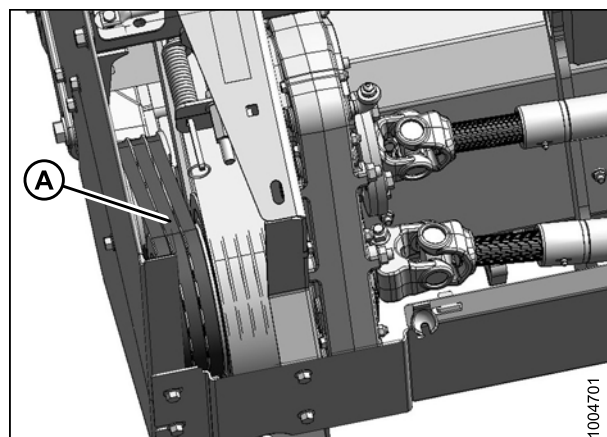


Figure 7.64

4. Raise header fully, turn off engine, and remove key.
5. Engage header safety props. See Section [5.3 Header Safety Props](#), page 26.

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

NOTE: Edge of eye bolt to jam nuts (E) should measure 1.6 in. (41 mm).
7. Close driveshield.

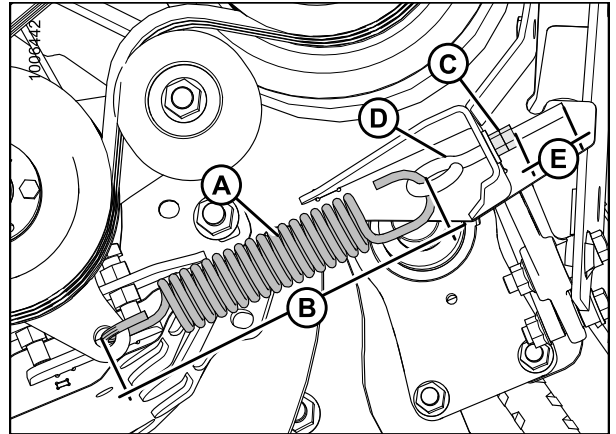


Figure 7.65

Replacing the Auger Drive Belts

Follow these steps to replace the auger drive belts:

1. Raise header fully, turn off engine, and remove key from ignition.
2. Engage header safety props. See Section [5.3 Header Safety Props](#), page 26.
3. Open driveshield. See Section [5.4 Driveshields](#), page 28.
4. Remove/loosen four bolts (A) and remove cover (B).

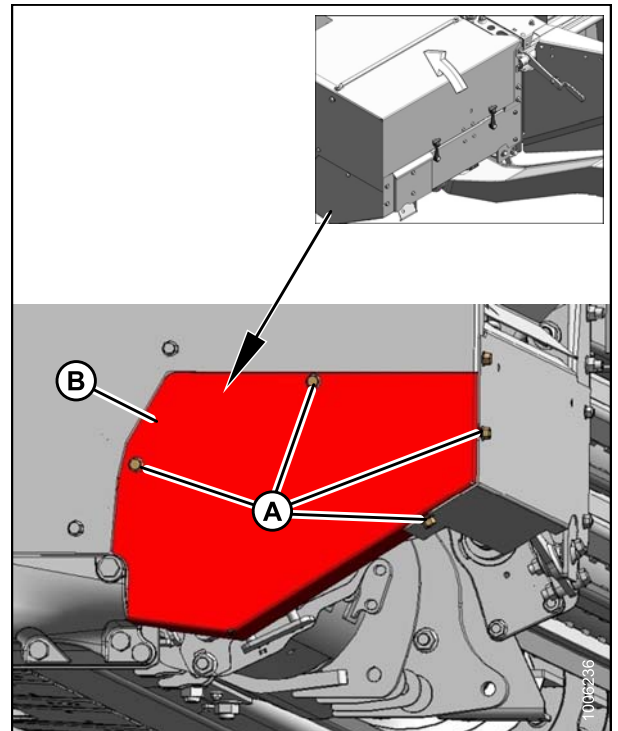


Figure 7.66

MAINTENANCE AND SERVICING

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

6. Remove the belts.

NOTE: All three belts must be replaced.

NOTE: Check alignment of pulleys. Contact your MacDon Dealer if pulleys need realigning.

7. Install belts (B) on pulleys ensuring they are in the pulley grooves.

8. Tension the belts. See [Inspecting the Auger Drive Belts, page 150](#).

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

10. Close driveshield.

11. Readjust tension of new belts after a short run-in period (about 5 hours).

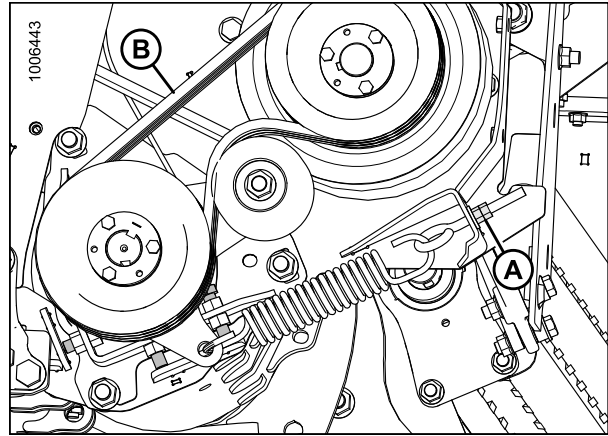


Figure 7.67

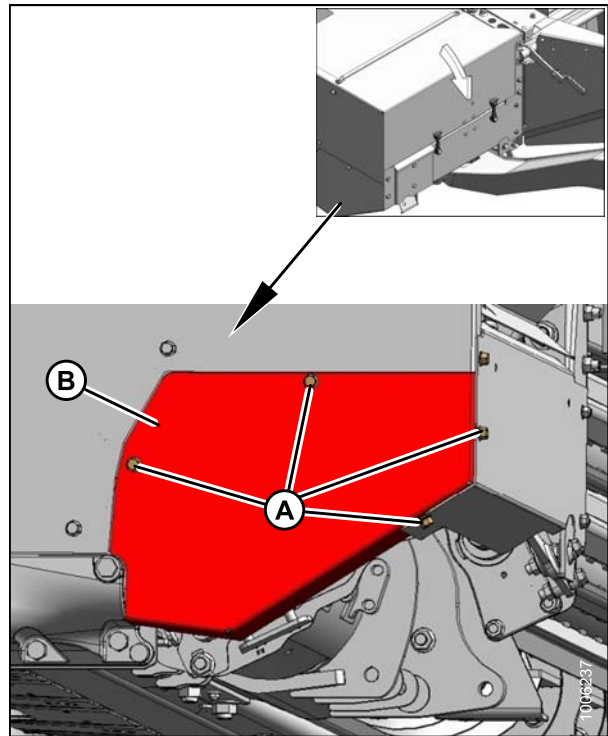


Figure 7.68

7.7.6 Sealed Bearing Installation

Follow these steps to install sealed bearings:

1. Clean shaft and coat with rust preventative.

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2. Install flangette (A), bearing (B), second flangette (C), and lock collar (D).

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

3. Install (but do **NOT** tighten) the flangette bolts (E).
4. When the shaft is correctly located, lock the lock collar with a punch.

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

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

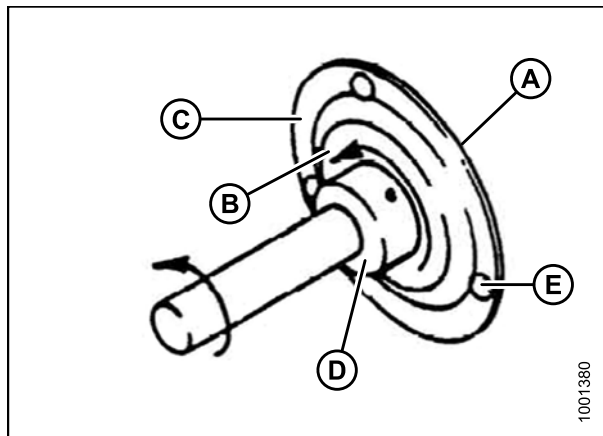


Figure 7.69

MAINTENANCE AND SERVICING

7.8 Hydraulics

Refer to your MacDon self-propelled windrower operator's manual for hydraulic system maintenance procedures for self-propelled windrowers.

7.8.1 Hydraulic Motor

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

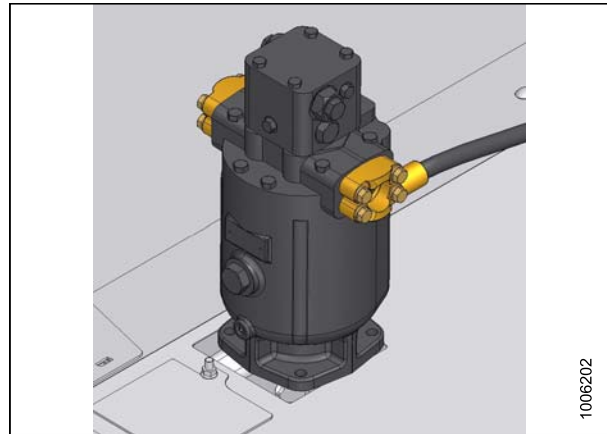


Figure 7.70

Removing the Hydraulic Motor

Follow these steps to remove the hydraulic motor:



DANGER

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

1. If machine is connected to the windrower, lower header to ground, turn off engine, and remove key.
2. Disconnect case drain hose (A) from motor (B) and install caps on hose end and motor port.
3. Disconnect pressure and return hoses at threaded fittings (C). Do NOT remove bolted fittings. Install caps and plugs on open fittings.
4. Remove four bolts (D) and remove motor.

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

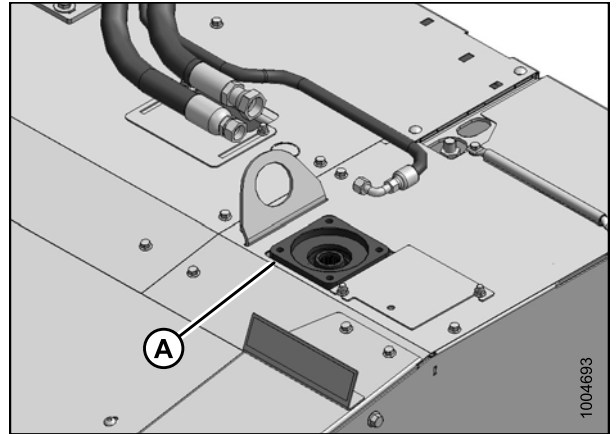


Figure 7.71

Installing the Hydraulic Motor

Follow these steps to install the hydraulic motor:

1. Remove covering from gearbox (A) opening.
2. Place motor (B) on gearbox opening.
3. Install four bolts (D). Torque to 103 ft·lbf (140 N·m).
4. Remove caps from motor ports and hoses and reconnect hoses (A and C) to motor.

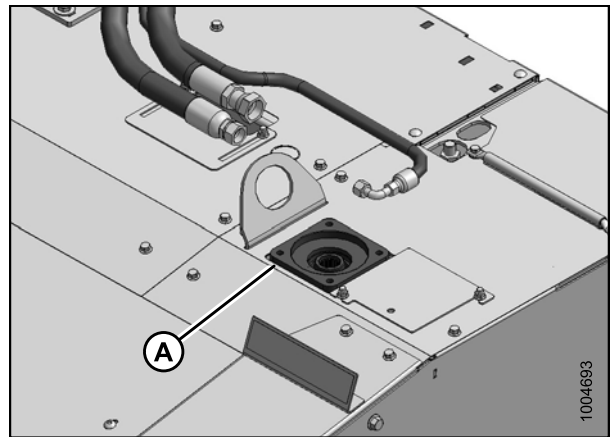


Figure 7.72

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7.8.2 Hydraulic Hoses and Lines

Check hydraulic hoses and lines daily for signs of leaks.

WARNING

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

IMPORTANT

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



Figure 7.73

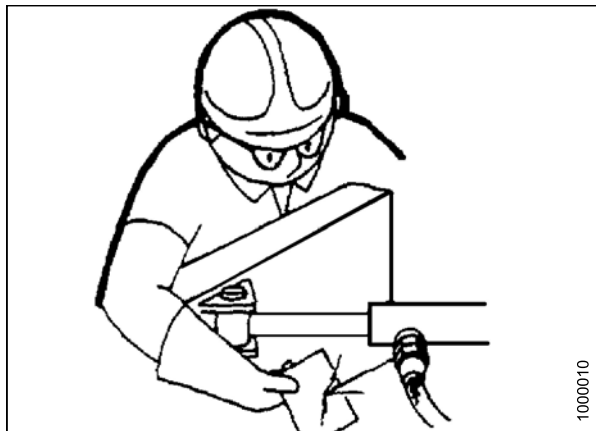


Figure 7.74

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7.9 Electrical

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

Keep lights clean and replace defective bulbs.



DANGER

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

7.9.1 Hazard Lights

Hazard Lights: Replacing Bulbs and Lenses

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

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

NOTE: See parts catalog for bulb part number.

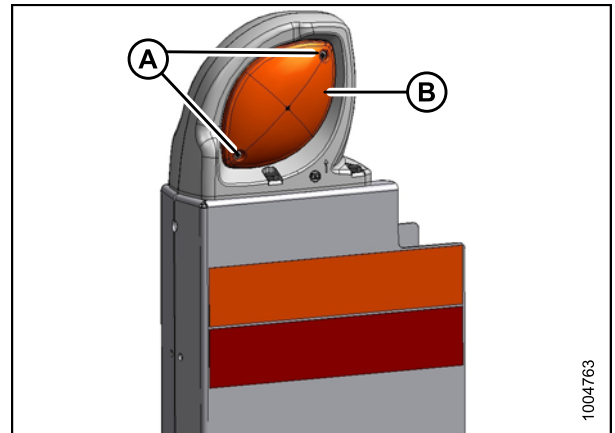


Figure 7.75

Hazard Lights: Replacing the Lamp Assembly

Follow these steps to replace the lamp assembly:

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

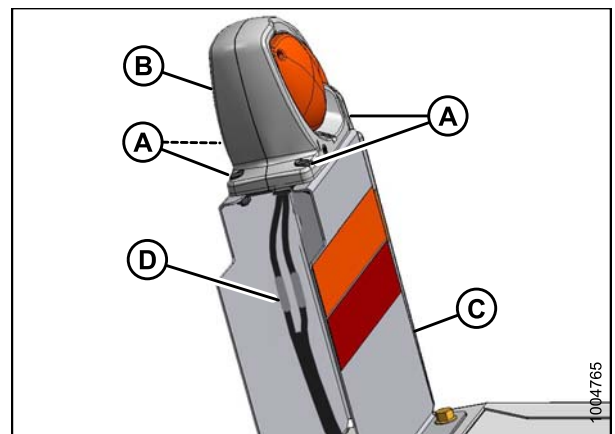


Figure 7.76

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Hazard Lights: Replacing the Lamp Bracket

Follow these steps to replace the lamp bracket:

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

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

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

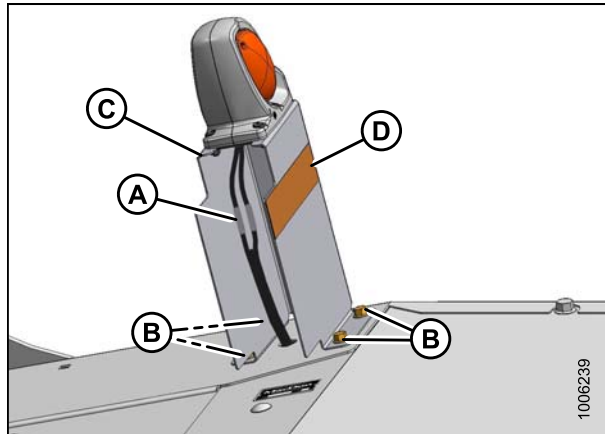


Figure 7.77

8 Troubleshooting

8.1 Mower Performance

Symptom	Problem	Solution	Section
Cutterbar plugging	Dull, bent, or badly worn blades	Replace blades.	Replacing the Cutter Blades, page 132
	Auger drive belt slipping	Adjust Tension. Change belts.	7.7.5 Auger Drive Belt, page 150 and 7.7.2 Conditioner Drive Belt, page 142
	Conditioner drive belt slipping		
	Built-up of dirt between rock guards	Decrease header angle and increase float. In some conditions, it may be necessary to carry header slightly with header lift cylinders.	6.6 Header Angle, page 78 and 6.1 Header Float, page 65
Decrease header angle and increase float.			
Strips of uncut crop left on field	Bent cutter blades	Replace blades.	Replacing the Cutter Blades, page 132
	Excessive header speed	Reduce header disc speed.	6.7.3 Disc Speed, page 80
	Foreign object on cutterbar	Disengage header and stop engine. When all moving parts are completely stopped, remove foreign object.	6.15 Unplugging the Header, page 98
	Ground speed too slow	Increase ground speed.	6.8 Ground Speed, page 81
	Cutting height varies from one side to the other	Float not properly balanced	Adjust header float.
Ragged or uneven cutting of crop	Header float too light causing bouncing	Adjust to heavier float setting.	6.1 Header Float, page 65
	Excessive ground speed	Reduce ground speed.	6.8 Ground Speed, page 81
	Header angle too flat for guards to pick up down crop	Increase header angle.	6.6 Header Angle, page 78
	Downed crop	Adjust header angle to cut closer to ground.	

TROUBLESHOOTING

Symptom	Problem	Solution	Section
Conditioner rolls plugging	Ground speed too fast	Reduce ground speed.	6.8 Ground Speed, page 81
	Roll gap too large for proper feeding	Decrease roll gap.	6.2 Roll Gap, page 67
	Roll gap too small in thick stemmed cane-type crops	Increase roll gap.	
	Baffle set too low	Raise baffle.	6.5.3 Adjusting the Swath Baffle, page 76
	Roll speed too low	Increase disc speed.	6.7.3 Disc Speed, page 80
	Foreign object between rolls	Disengage header and stop engine. When all moving parts are completely stopped, remove foreign object.	–
	Conditioner belt slipping	Adjust belt tension.	7.7.2 Conditioner Drive Belt, page 142
	Auger belt slipping		7.7.5 Auger Drive Belt, page 150
	Cutting height too low	Decrease header angle to raise cutting height.	6.6 Header Angle, page 78
	Rolls improperly timed	Adjust roll timing.	6.4 Roll Timing, page 71
Uneven formation and bunching of windrow	Rear deflector bypassing or dragging crop	Adjust rear deflector for proper crop control.	6.5.2 Adjusting the Rear Deflector (Fluffer Shield), page 76
	Forming shields improperly adjusted	Adjust forming shield.	6.5 Forming Shields, page 74
	Roll gap too large	Adjust roll gap.	6.2 Roll Gap, page 67
	Auger belts slipping	Replace belts.	7.7.5 Auger Drive Belt, page 150
	Conditioner rolls running too slow	Maintain rated header speed.	See windrower operator's manual
Uneven windrow formation in light crop	Uneven feeding	Reduce header speed.	
Plugging behind end cage deflectors	No cutting full header width	Cut full header width.	–
	Ground speed too slow	Increase ground speed.	6.8 Ground Speed, page 81
Not cutting short enough in down crop	Ground speed too fast	Reduce ground speed.	Replacing the Cutter Blades, page 132
	Broken, bent, or dull blades	Replace blades or turn blades over.	
	Cutting height too high	Adjust header angle to lower cutting height if field conditions allow.	6.6 Header Angle, page 78

TROUBLESHOOTING

Symptom	Problem	Solution	Section
Material being pulled out by roots when cutting tall crop leaning into machine	Crop in conditioner rolls before crop is cut	Increase roll gap.	6.2 Roll Gap, page 67
Damaged leaves and broken stems	Insufficient roll gap		
	Roll timing off	Check roll timing and adjust if necessary.	6.4 Roll Timing, page 71
Slow crop drying	Crop is bunched in windrow	Adjust forming shields/baffle.	6.5 Forming Shields, page 74
	Rolls not crimping crop sufficiently	Decrease roll gap.	6.2 Roll Gap, page 67
Excessive drying or bleaching of crop	Excessive crimping	Increase roll gap.	
	Crop is spread too wide in windrow		
Poorly formed or bunchy windrows	Forming shields not properly adjusted	Adjust forming shields.	6.5 Forming Shields, page 74

TROUBLESHOOTING

8.2 Mechanical

Symptom	Problem	Solution	Section
Excessive noise	Bent cutter blade	Replace blade.	Replacing the Cutter Blades, page 132
	Conditioner roll timing off	Check roll timing and adjust if necessary.	6.4 Roll Timing, page 71
	Conditioner roll gap too small	Check gap and adjust if necessary.	6.2 Roll Gap, page 67
Excessive vibration or noise in header	Conditioner rolls contacting each other	Increase roll gap.	6.4 Roll Timing, page 71
		Check roll timing.	
	Auger center support loose	Tighten bolts on support.	6.12.1 Adjusting the Overshot Auger, page 90
Mud deposits on conditioner rolls	Clean rolls.	–	
Excessive heat in cutterbar	Too much lubricant in cutterbar	Drain lubricant and refill with specified amount.	7.5.8 Lubricating the Cutterbar, page 121
Frequent blade damage	Mud on cutterbar	Remove mud from cutterbar. Do not allow mud to dry on cutterbar.	–
	Spindle bearing failure	Replace spindle bearing.	See MacDon Dealer.
	Material wrapped around spindle	Remove disc and remove material.	7.6 Cutterbar Disc Maintenance, page 126
	Cutting too low in rocky field conditions	Decrease header angle. Increase float.	6.6 Header Angle, page 78 and 6.1 Header Float, page 65
	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.	6.8 Ground Speed, page 81
	Blade incorrectly mounted	Check all blade mounting hardware ensuring blades are free to move.	Inspecting Cutter Blades, page 130
	Header float set too heavy	Increase float.	
Machine pulling to one side	Header dragging to one end and pulling to that side	Adjust header float on both ends.	6.1 Header Float, page 65

TROUBLESHOOTING

Symptom	Problem	Solution	Section
Excessive wear of cutting components	Header angle too steep	Reduce header angle.	6.6 Header Angle, page 78
	Crop residue and dirt deposits on cutterbar	Clean cutterbar.	—
	Mud on cutterbar	Remove mud from cutterbar. Do not allow mud to dry on cutterbar.	
Breakage of conditioner drive belt	Improper belt tension	Adjust conditioner drive belt tension.	7.7.2 Conditioner Drive Belt, page 142
	Belt not in proper groove in pulley	Move belt to proper groove.	
	Foreign object between rolls	Disengage header and stop engine. When all moving parts are completely stopped, remove foreign object.	—
	Belt pulleys and idlers misaligned	Align pulleys and idler.	See MacDon Dealer.
Discs don't turn when engaging header	Mud on cutterbar	Remove mud from cutterbar. Do not allow mud to dry on cutterbar.	—
	Faulty drive belt	Check belt on pulleys.	7.7.2 Conditioner Drive Belt, page 142
	Hoses not connected	Connect hoses.	5.7 Attaching the Header, page 40
Header slows when going uphill	Hydraulic oil level in windrower is low	Add oil to windrower reservoir.	See windrower operator's manual.
Header runs while unloaded but slows or stops when starting to cut	Defective hydraulic motor	Repair/replace hydraulic motor.	See MacDon Dealer.
	Defective hydraulic pump in windrower	Repair/replace pump.	
	Defective relief valve in windrower	Repair/replace relief valve.	
	Cold oil in hydraulic drive system	Reduce ground speed until oil reaches operating temperature.	6.8 Ground Speed, page 81

9 Options and Attachments

9.1 Kits

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

9.1.1 Adjustable Skid Shoe Kit

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

MD #B5660

Instruction Part Number: MD #169466

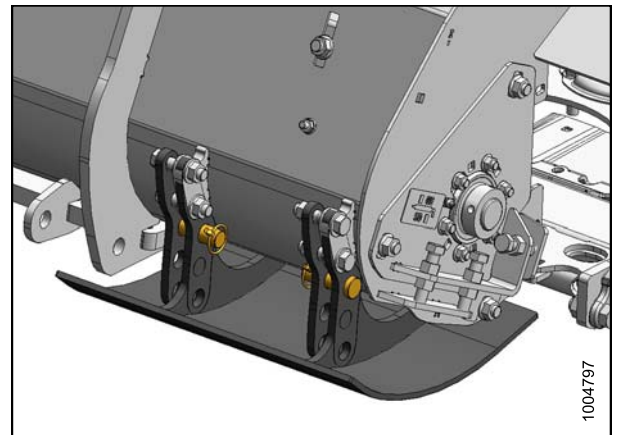


Figure 9.1: MD #B5660

9.1.2 Cutterbar Repair Tool Kit

The cutterbar repair tool kit contains the necessary tools for replacement of the cutterbar idler gears.

MD #B4905

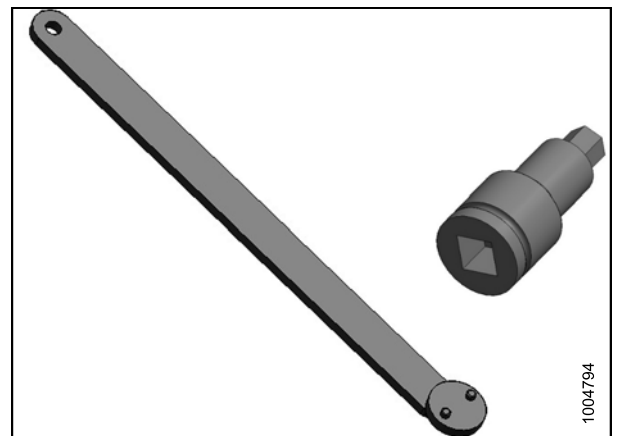


Figure 9.2: MD #B4905

OPTIONS AND ATTACHMENTS

9.1.3 Double Windrow Attachment (DWA)

Allows auger header windrower to lay a double windrow. The kit includes a draper deck, linkage assembly, hydraulics, and installation instructions.

MD #C1987 — This collector consists of:

- MD #46555 Deck
- MD #B5270 Linkage assembly
- MD #B5301 Hydraulic kit

9.1.4 Gauge Roller

MD #B5650

Instruction Part Number: MD #169467

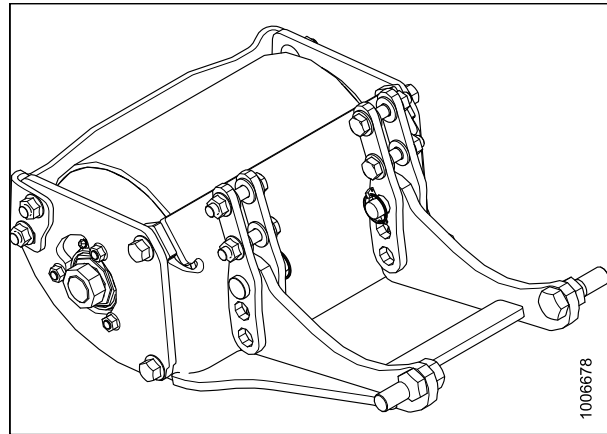


Figure 9.3

9.1.5 Hydraulic Drive - 16-Ft. for M200 Self-Propelled

MD #B5455

Instruction Part Number: MD #169483

OPTIONS AND ATTACHMENTS

9.1.6 Tall Crop Divider Kit

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

MD #B5509

Instruction Part Number: MD #169485

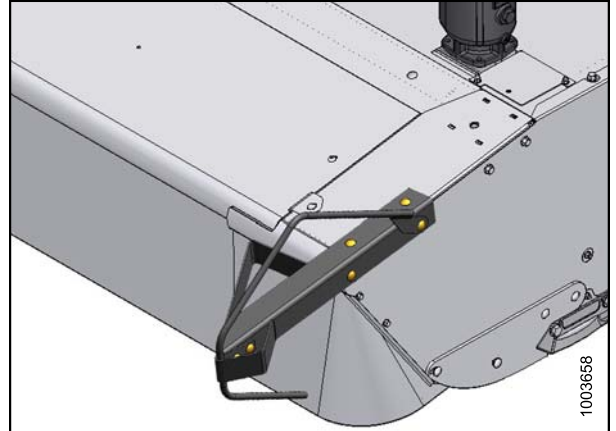


Figure 9.4: MD #B5509

9.1.7 Tall Crop Feed Plate Kit

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

MD #B4903

NOTE: One set is supplied standard.

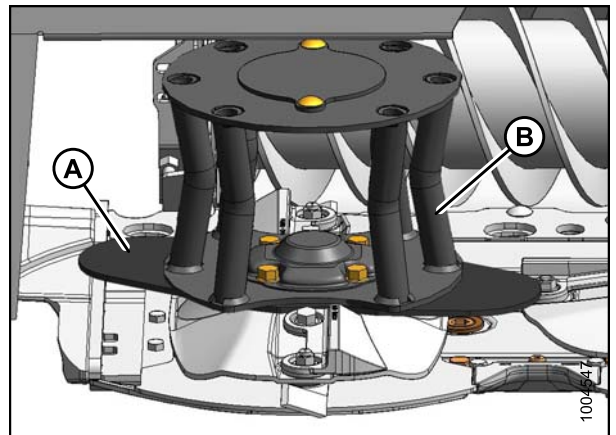


Figure 9.5

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