MacDon

R85
Rotary Disc 16-Foot Pull-Type Mower Conditioner

Operator's Manual

169456 Rev. D

Original Instruction

The harvesting specialists worldwide.

Rotary Disc 16-Foot Pull-Type Mower Conditioner

Published: November, 2013

Introduction

This instructional manual describes the operating and maintenance procedures for the MacDon Model R85 Rotary Disc 16-foot Pull-Type Mower Conditioner. Your new MacDon rotary disc mower conditioner 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 mower conditioner will work well for many years.

A parts catalog is also supplied with your new mower conditioner. 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 the operator's manual and the parts catalog in the plastic manual case (A) at the mower conditioner right hand side.

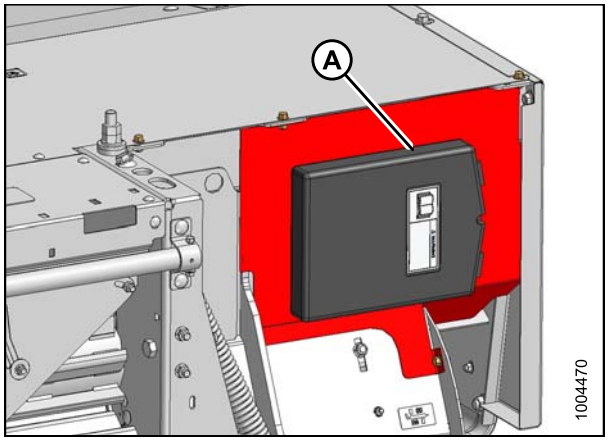


Figure 1

Serial Number(s)

Record the serial numbers of the mower conditioner and articulated power turn (APT) hitch in the spaces provided.

mower conditioner serial no: _____

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

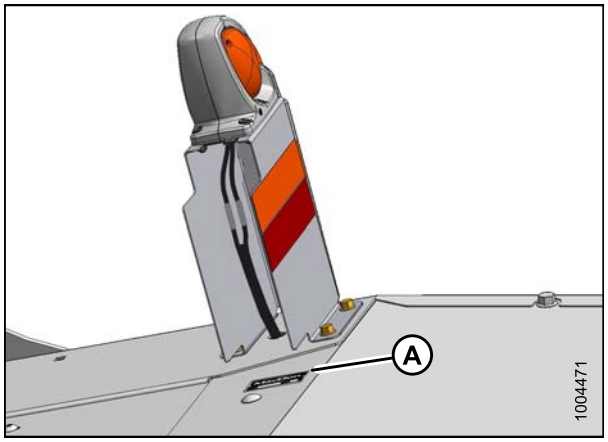


Figure 2

APT hitch serial no: _____

Serial Number Plate (A) is located at the left front side of the (APT) hitch.

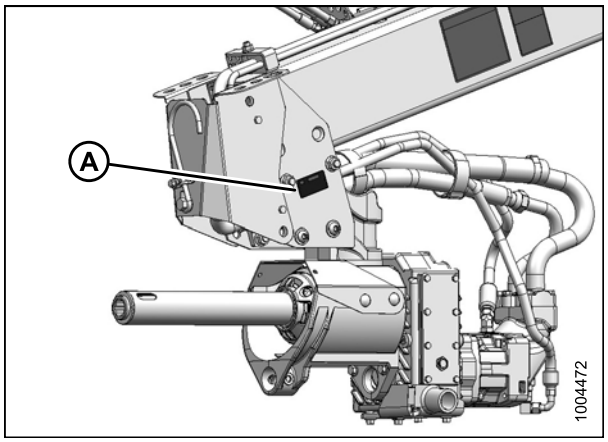


Figure 3

TABLE OF CONTENTS

1 Safety

1.1 Safety Alert Symbols

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

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

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.

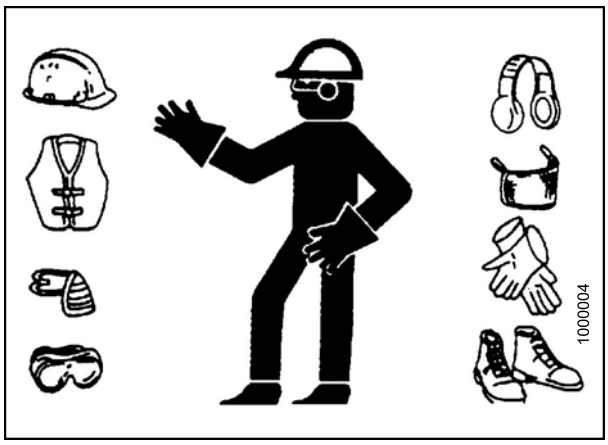


Figure 1.2

- 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.

Figure 1.3

- 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.

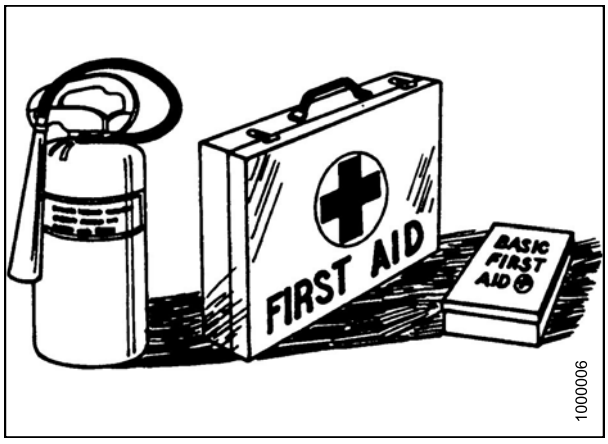


Figure 1.4

- 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.

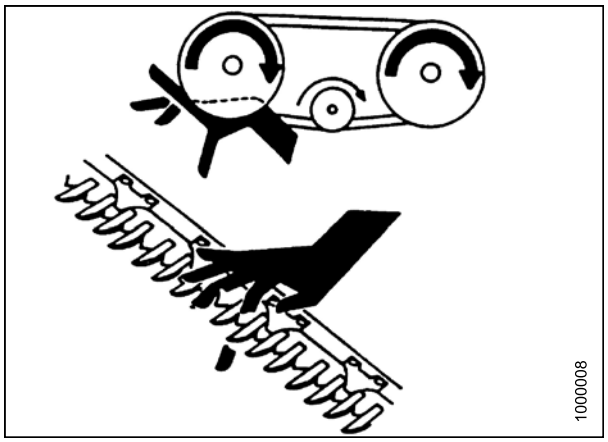


Figure 1.6

- 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

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 mower conditioner.
- 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 sickle) to move. Stay clear of driven components at all times.
- Wear protective gear when working on the machine.
- Wear heavy gloves when working on sickle components.

Figure 1.8: Slip on puddle

Figure 1.9: Keep away

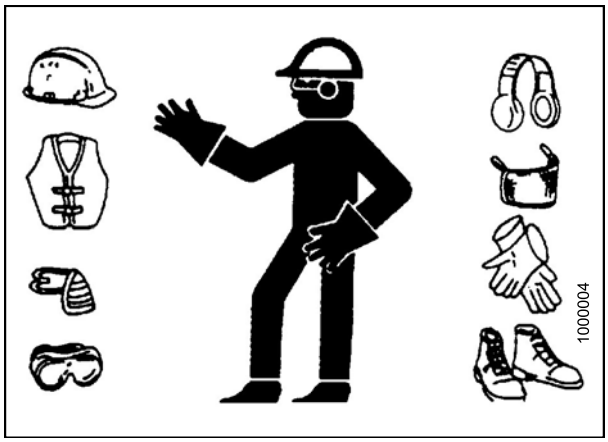


Figure 1.10: Safety gear

1.5 Hydraulic Safety

- Always place all combine/tractor/windrower 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.

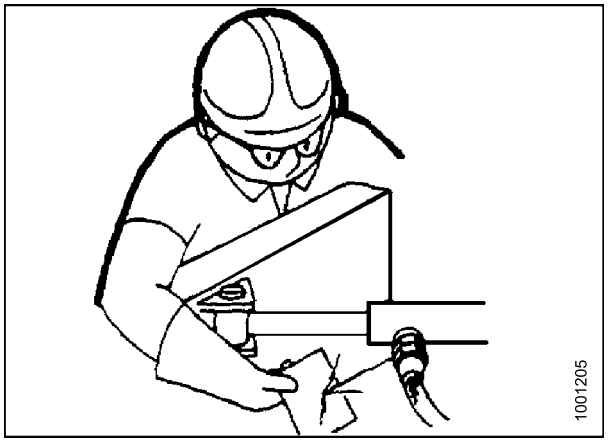


Figure 1.11: Checking hydraulic leaks

- 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.

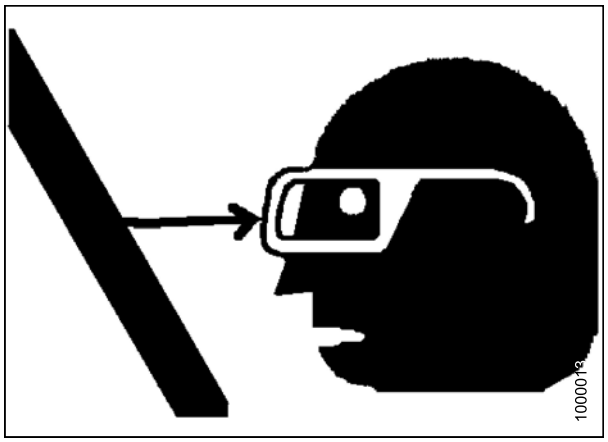


Figure 1.13: Wear safety glasses

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.

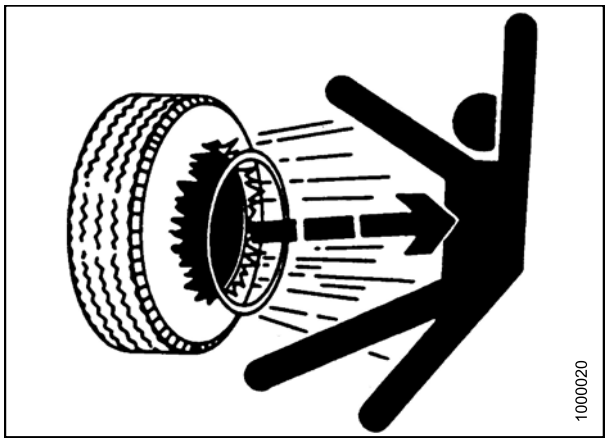


Figure 1.16: Over-inflation of tire

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.

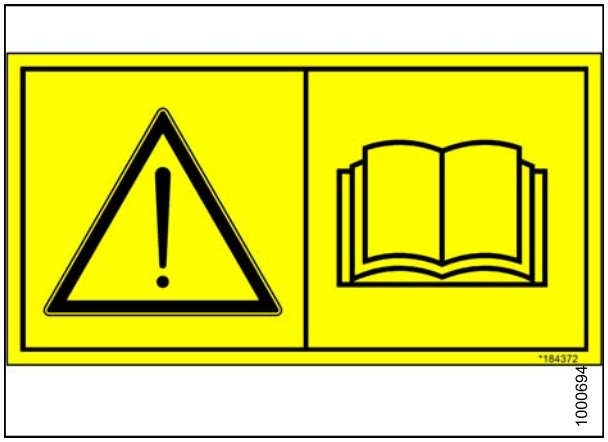


Figure 1.17: Read operator's manual before operating

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.

1.8 Safety Decal Location

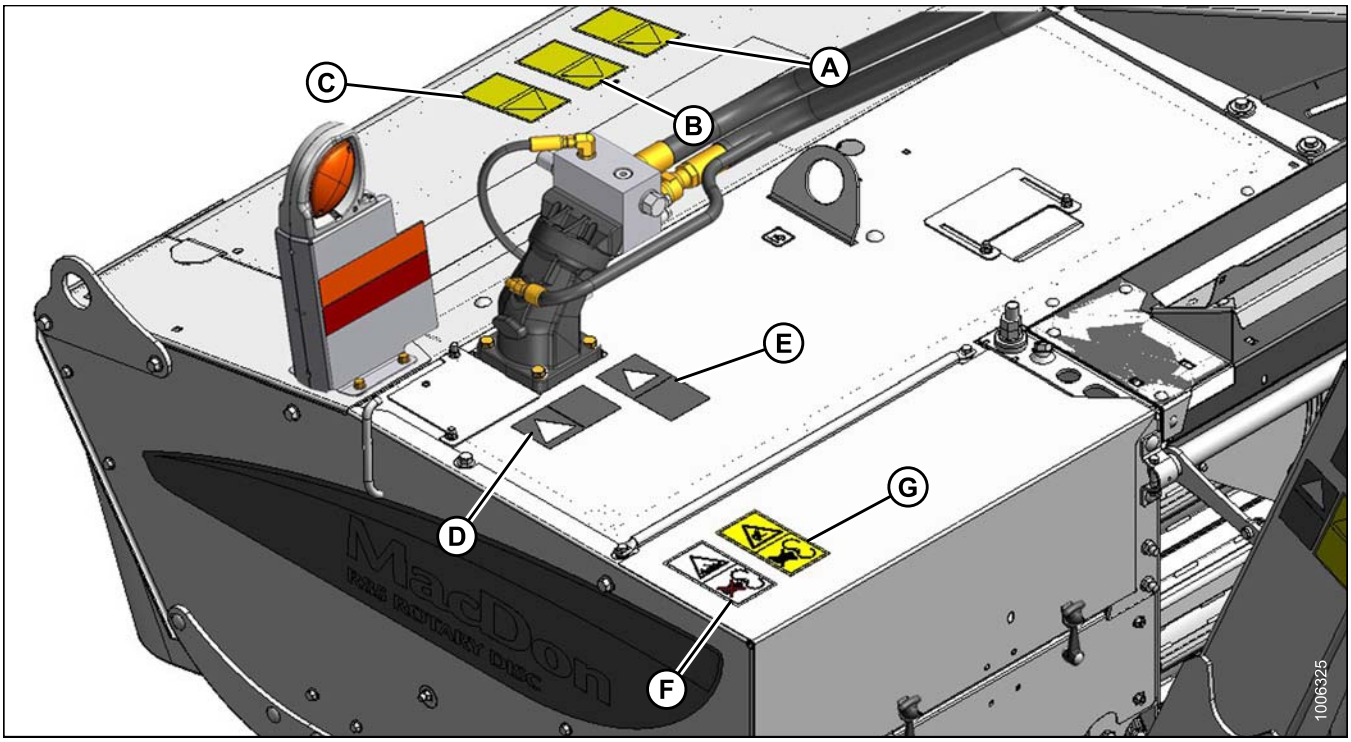


Figure 1.18

A - MD #194466 (2 places) **B - MD #194463 (2 places)** **C - MD #194465 (2 places)** **D - MD #166466**
E - MD #113482 **F - MD #184385** **G - MD #184371**

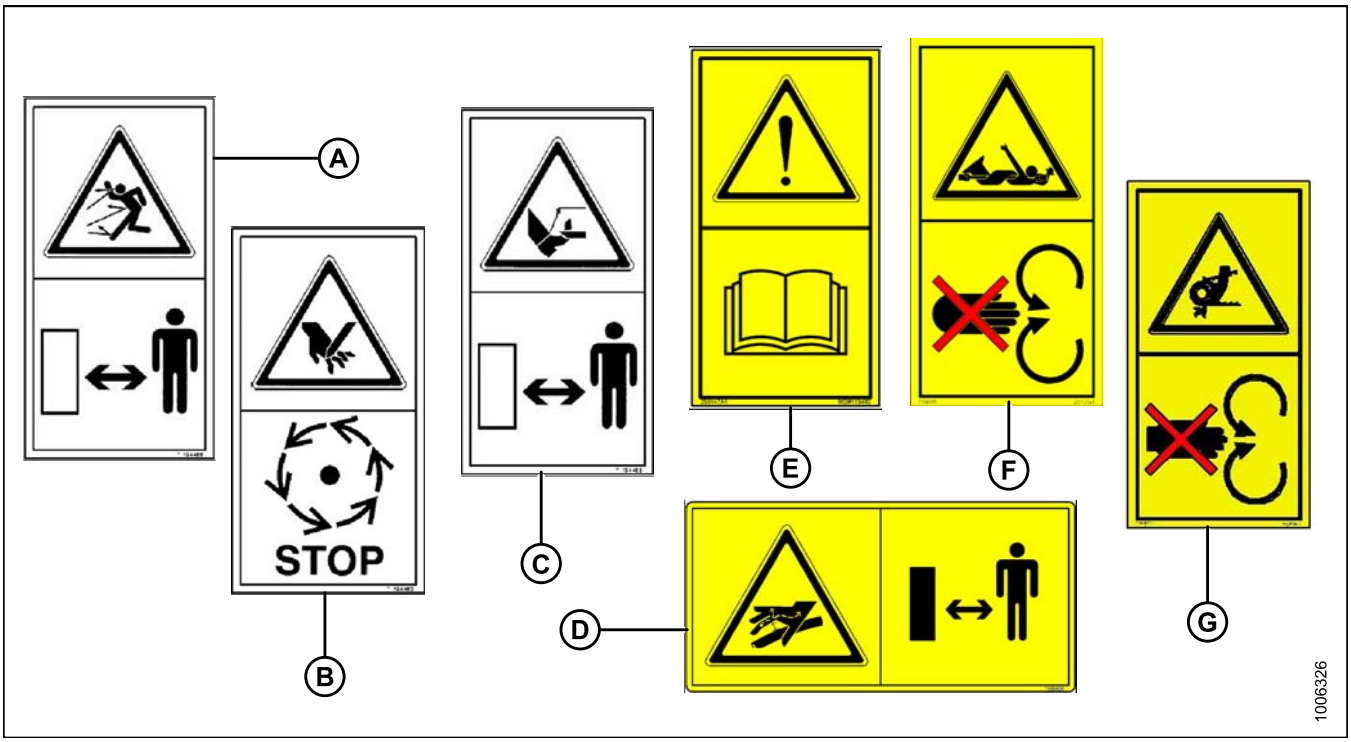


Figure 1.19

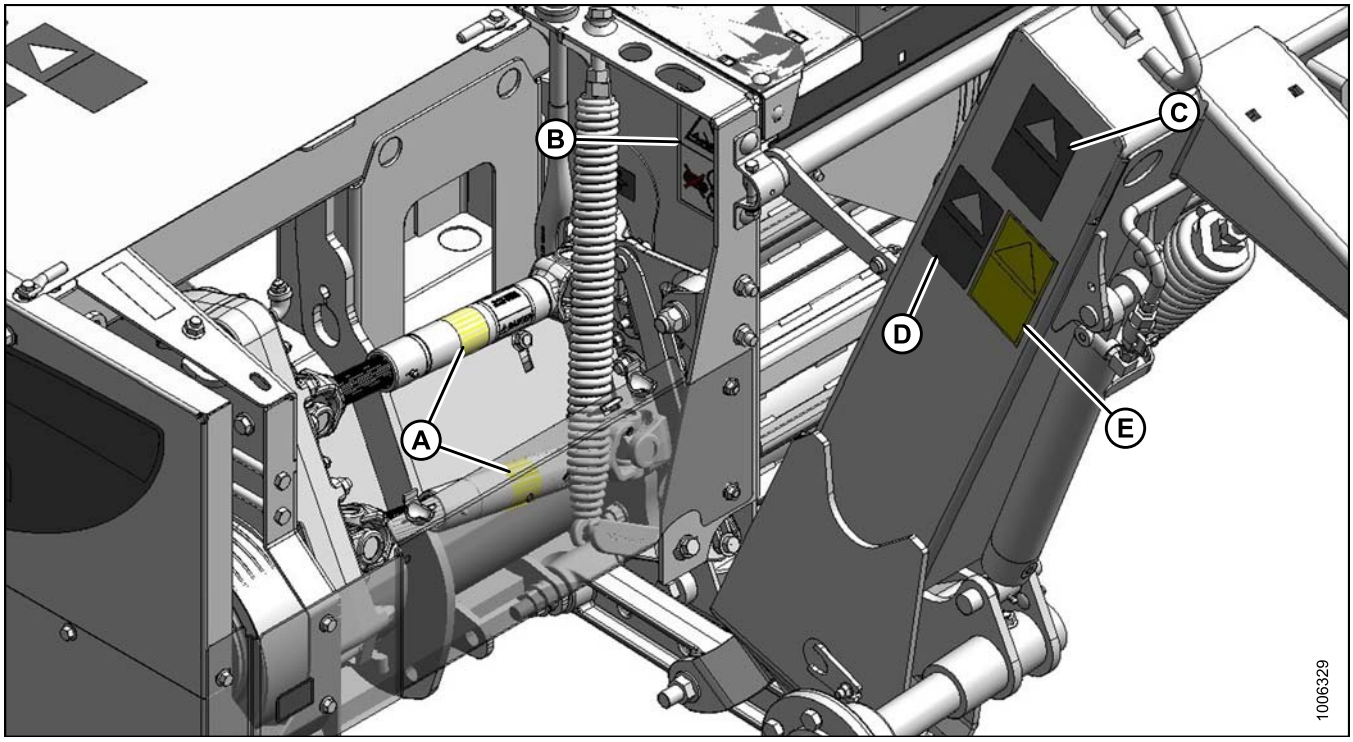


Figure 1.20

A - MD #194521
B - MD #184385
C - MD #113482
D - MD #174436
E - MD #194462 (both sides)

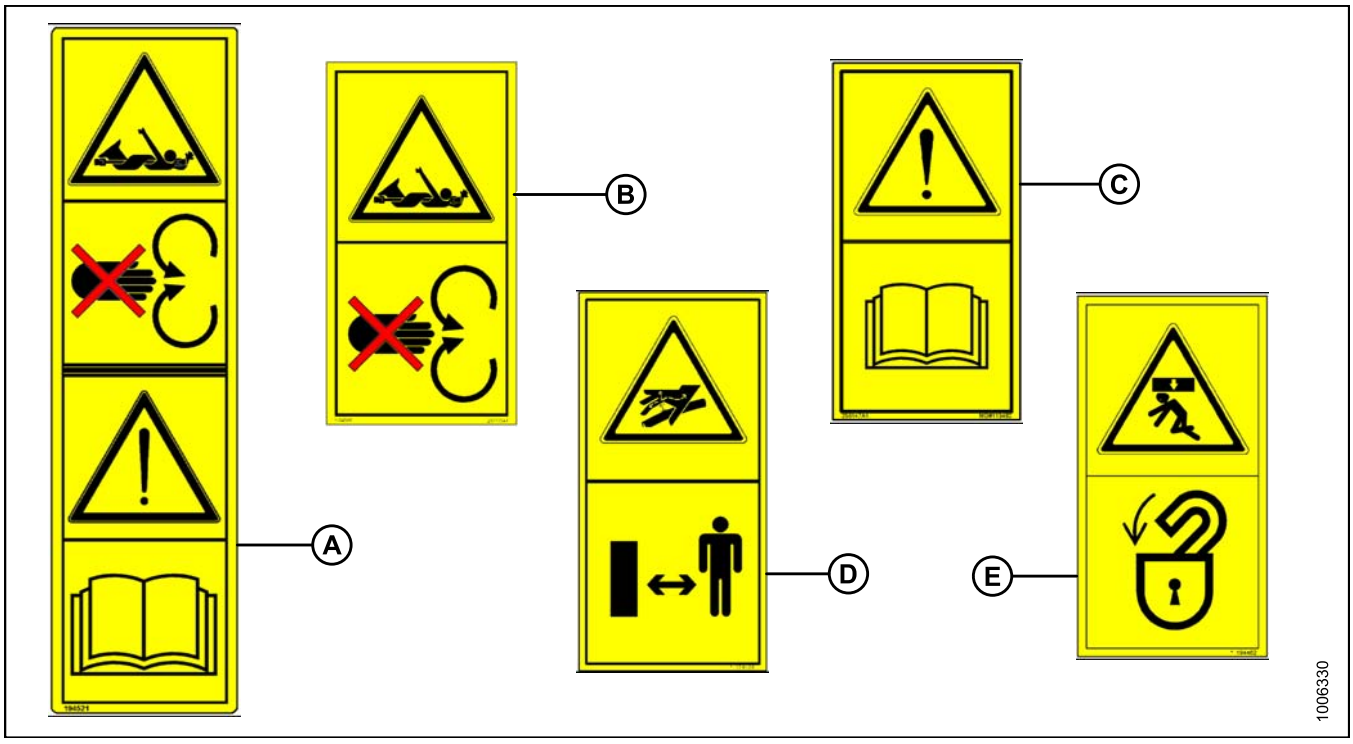


Figure 1.21

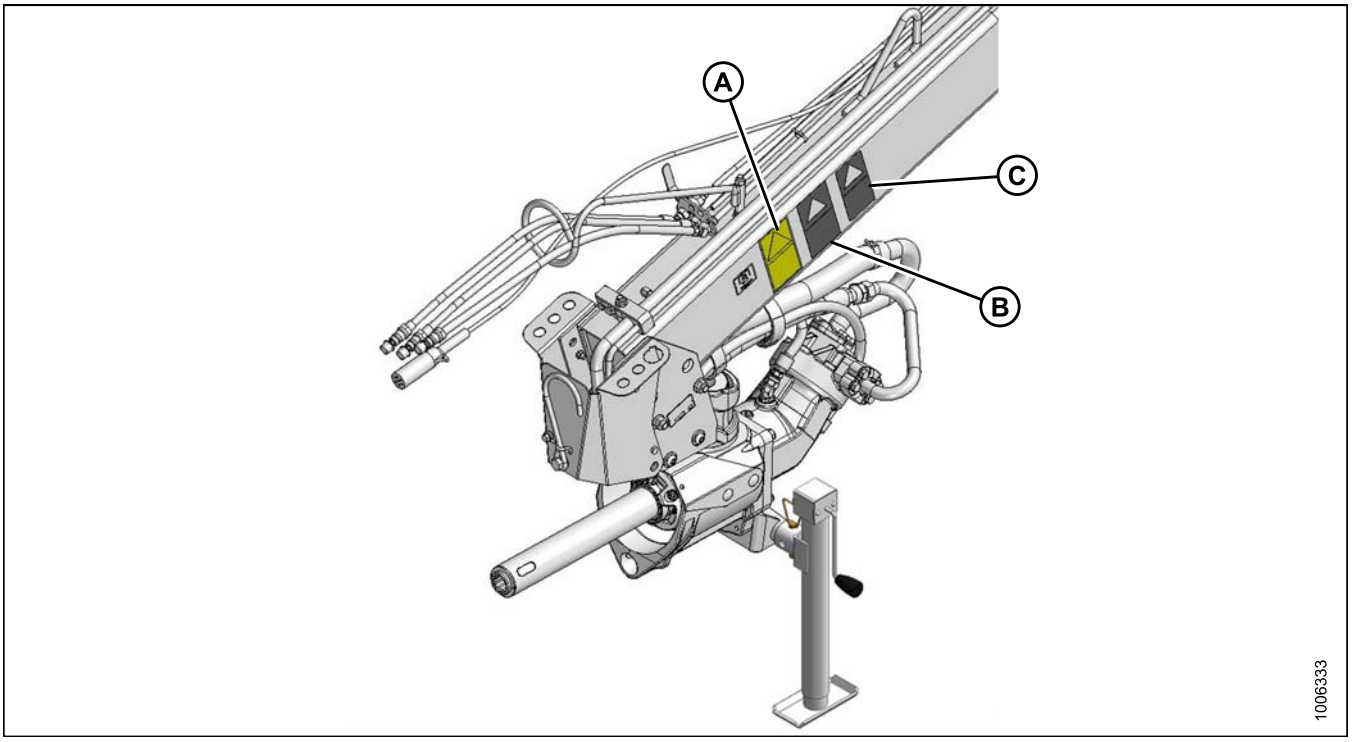


Figure 1.22

A - MD #194464 **B - MD #113482** **C - MD #174436**

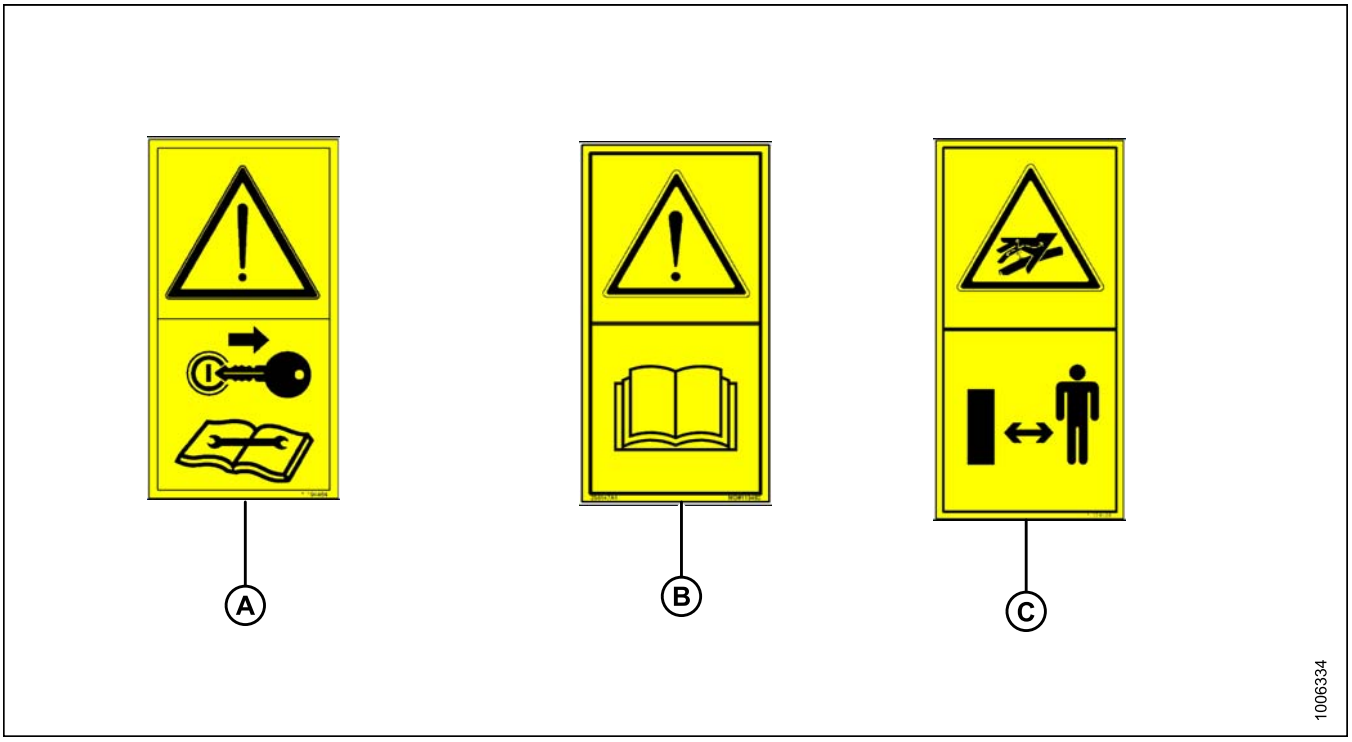


Figure 1.23

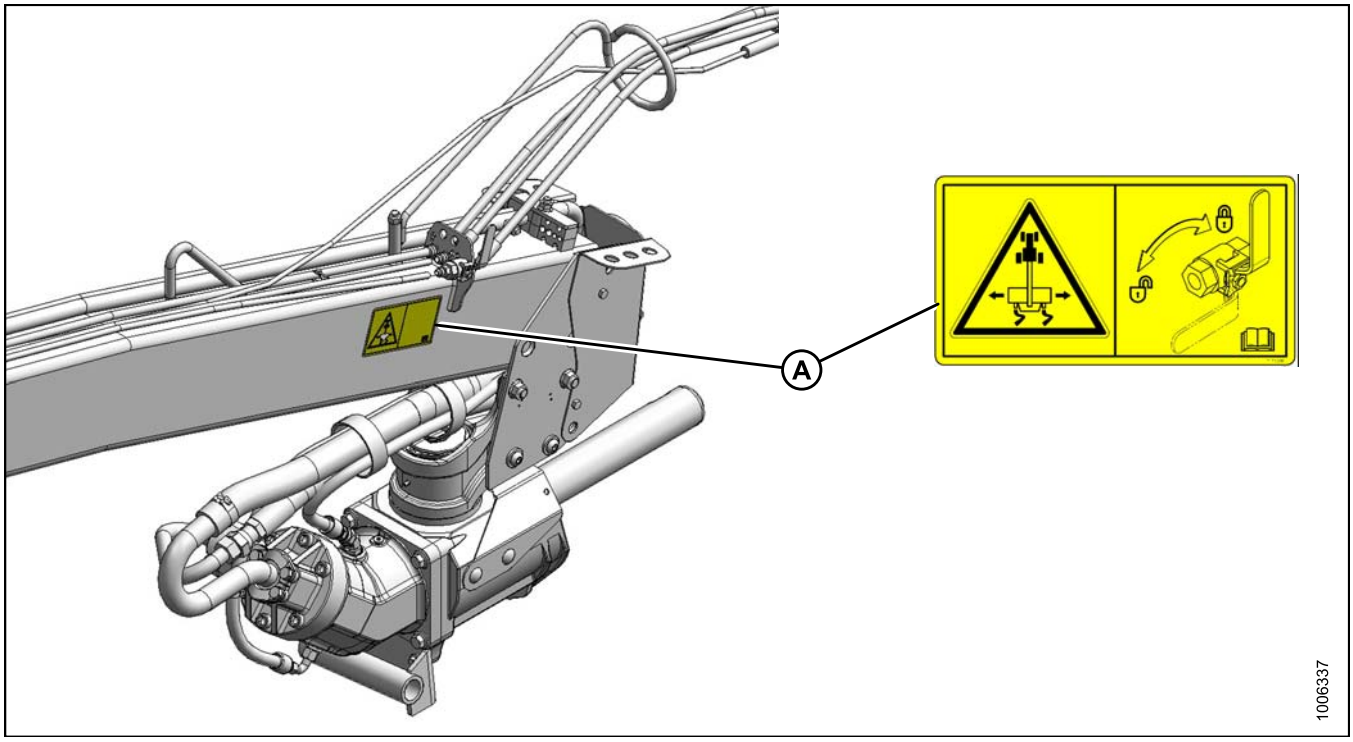


Figure 1.24

A - MD #171280

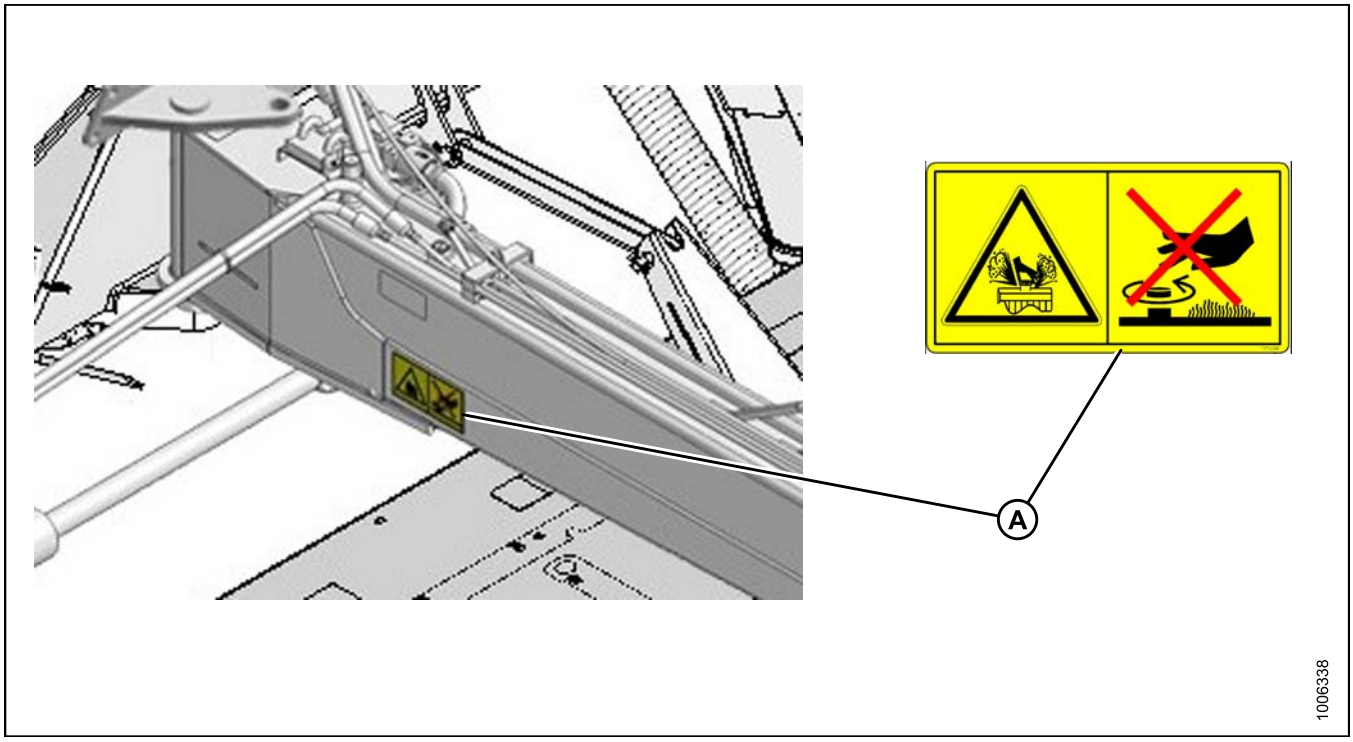


Figure 1.25

A - MD #171281 (both sides)

1.9 Understanding 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**

   - 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 mower conditioner drive, put transmission in Neutral, and wait for all movement to stop before leaving operator's position.
   - Shut off engine and remove key from ignition before servicing, adjusting, lubricating, cleaning, or unplugging machine.
   - Engage locks to prevent lowering of mower conditioner 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.

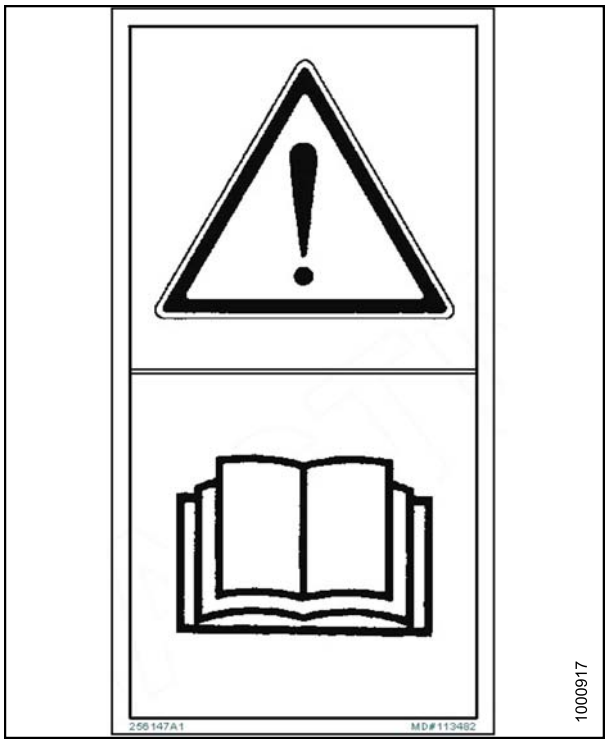


Figure 1.26: MD #113482

2. MD #166466
   a. Hydraulic pressure oil hazard
   b. **CAUTION**
      - High pressure oil easily punctures skin causing serious injury, gangrene, or death.
      - If injured, seek emergency medical help.
      - Do not use finger or skin to check for leaks.
      - Lower load or relieve hydraulic pressure before loosening fittings.

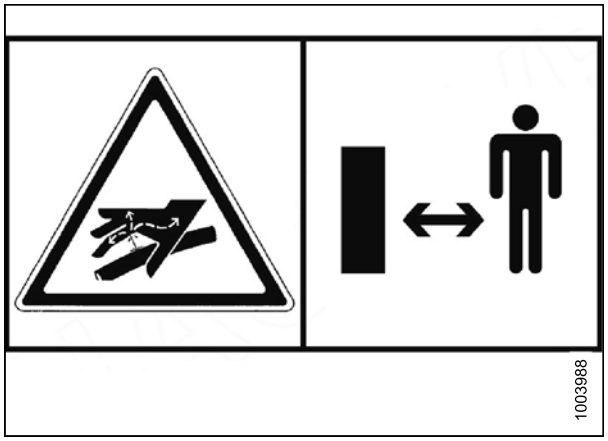


Figure 1.27: MD #166466

3. MD #171280
   a. Lock pull-type (PT) hydraulic for transport
   b. **WARNING**
      - Charge cylinder with oil before towing.
      - Rotate valve handle to lock in transport position.
      - Maximum towing speed 20 mph (32 kph).
      - Failure to comply could result in death or serious injury.

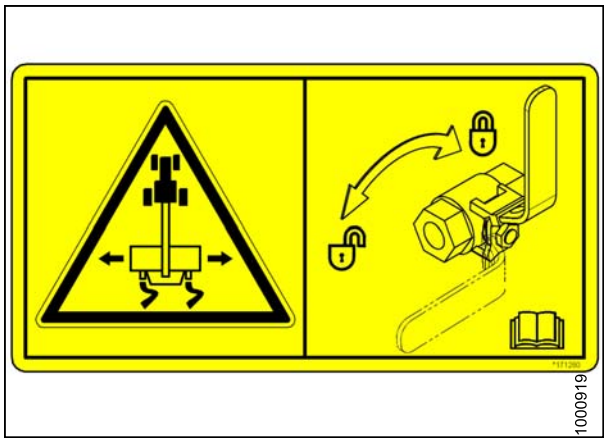


Figure 1.28: MD #171280

4. MD #171281
   a. Hot fluid under pressure
   b. **CAUTION**
      - Coolant is under pressure and may be hot. Never remove radiator cap when engine is hot.

Figure 1.29: MD #171281

5. MD #174436
   a. High pressure oil hazard
   b. **CAUTION**
      - 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 1.30: MD #174436

6. MD #184371
   a. Open drive hazard
   b. **WARNING**
      - Guard missing. Do not operate.
      - Keep all shields in place.

Figure 1.31: MD #184371

7. MD #184385
   a. Entanglement hazard
   b. **CAUTION**
      - To avoid injury from entanglement with rotating auger, stand clear of mower conditioner while machine is running.

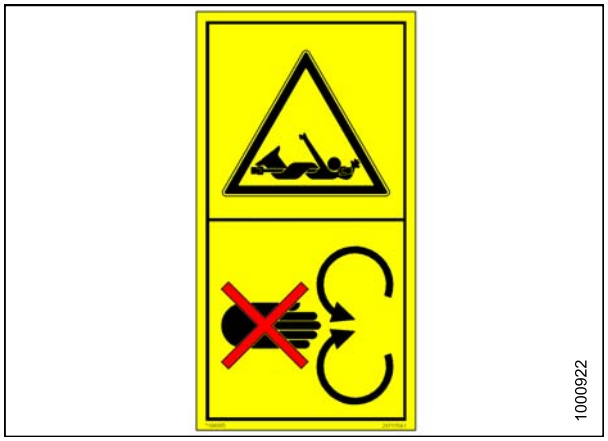


Figure 1.32: MD #184385

8. MD #194462
   a. Install lock
   b. **WARNING**
      - Engage safety lock before going under unit.
      - Failure to comply could result in death or serious injury.

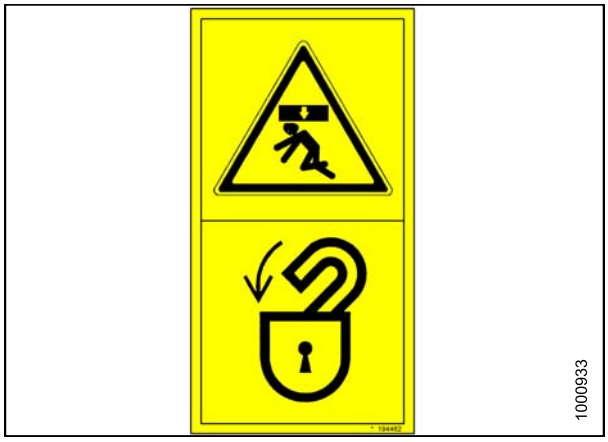


Figure 1.33: MD #194462

9. MD #194463
   a. Rotating blades
   b. **WARNING**
      - Disengage PTO, shut off tractor, and remove key before opening covers.
      - Listen and look for evidence of rotation before lifting cover.
      - Rotating cutters may continue to rotate after power is shut off.

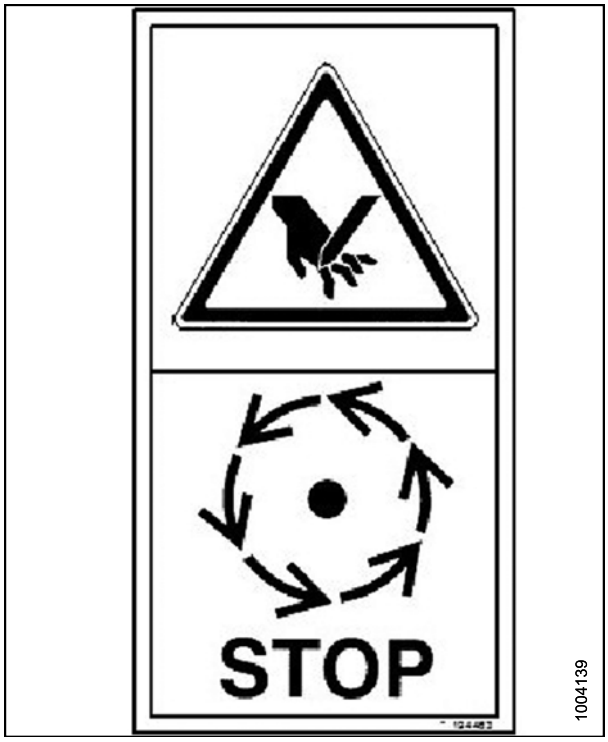


Figure 1.34: MD #194463

10. MD #194464
    a. Shut down for service
    b. **WARNING**
        - Remove key from ignition.
        - Read tractor manufacturer's and mower conditionermanufacturer's manuals for inspection and maintenance instructions.

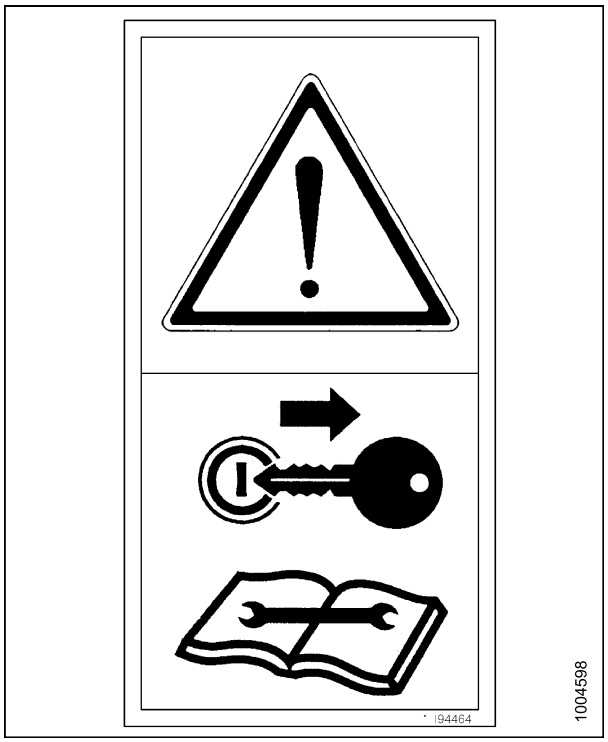


Figure 1.35: MD #194464

11. MD #194465
    a. Rotating cutters
    b. **WARNING–STAND CLEAR**
        - Contact with blades or thrown objects can result in serious injury or death.
        - Do not stand on or near machine when in operation.
        - Do not operate with covers or curtains open or removed.
        - Shut off tractor and remove key before opening covers.

Figure 1.36: MD #194465

12. 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 1.37: MD #194466

13. MD #194521
    a. Shield missing
    b. **WARNING**
        - Guard missing. Do not operate.
        - Read tractor manufacturer's and mower manufacturer's manuals for inspection and maintenance instructions.
        - Failure to comply will result in death or serious injury.

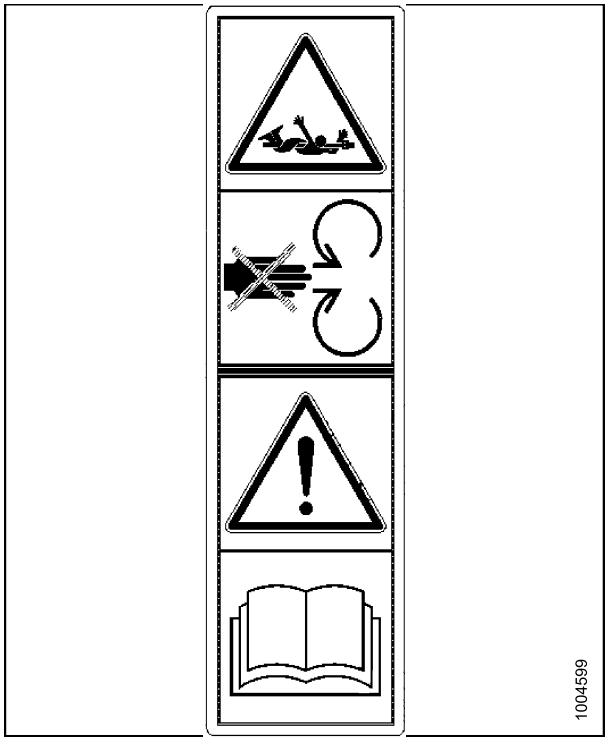


Figure 1.38: MD #194521

2 Definitions

The following terms may be used in this manual:

Term	Definition
API	American Petroleum Institute
APT	Articulated Power Turn
ASTM	American Society of Testing and Materials
Center-link	A hydraulic cylinder or turnbuckle type link between the mower conditioner and the carrier frame that tilts the mower conditioner.
Export mower conditioners	Machine configuration typical outside North America
Mower conditioner	A machine that cuts and conditions hay, and is pulled by an agricultural tractor.
North American mower conditioners	Machine configuration typical in North America.
PTO	Power Take-Off
rpm	Revolutions per minute
SAE	Society of Automotive Engineers
Tractor	Agricultural type tractor
Truck	A four-wheel highway/road vehicle weighing no less than 7500 lb. (3400 kg).

3 Component Identification

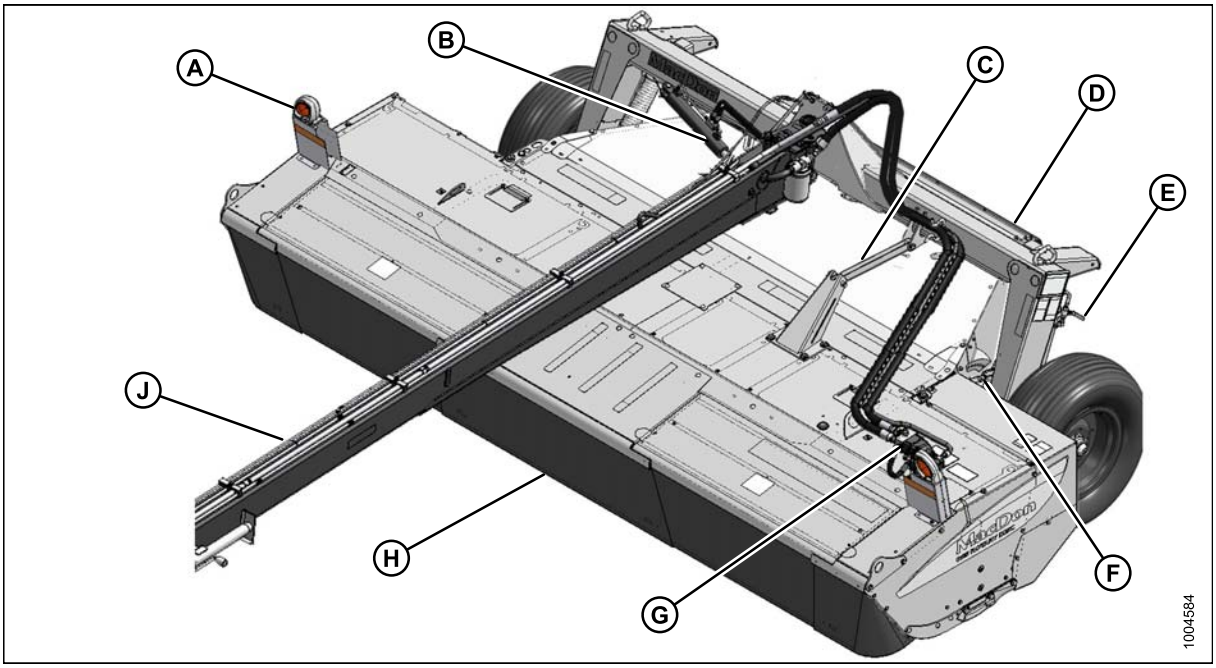


Figure 3.1

A - Hazard light
B - Steering cylinder
C - Center-link
D - Carrier frame
E - Lift cylinder lock-out valve
F - Baffle control
G - Drive motor
H - Front curtains
J - Articulated power turn (APT) hitch

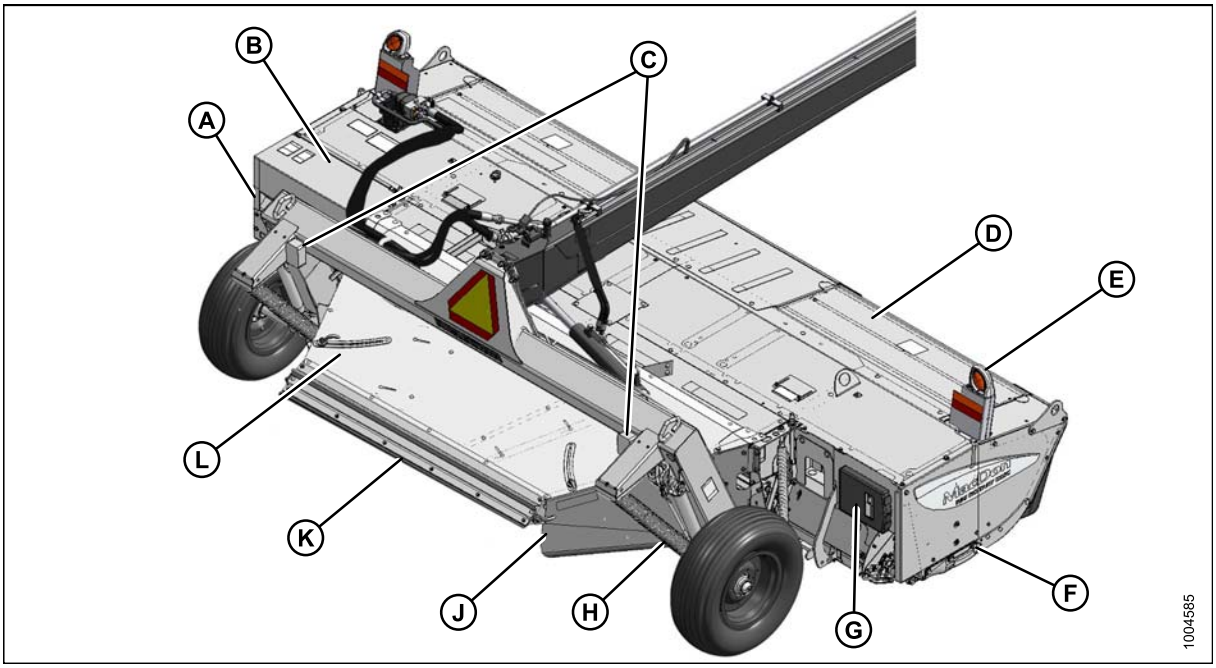


Figure 3.2

A - mower conditioner
B - Driveshield
C - Tail lights
D - Door
E - Hazard light
F - Cutterbar
G - Manual case
H - Float spring
J - Side deflector
K - Rear deflector
L - Forming shield

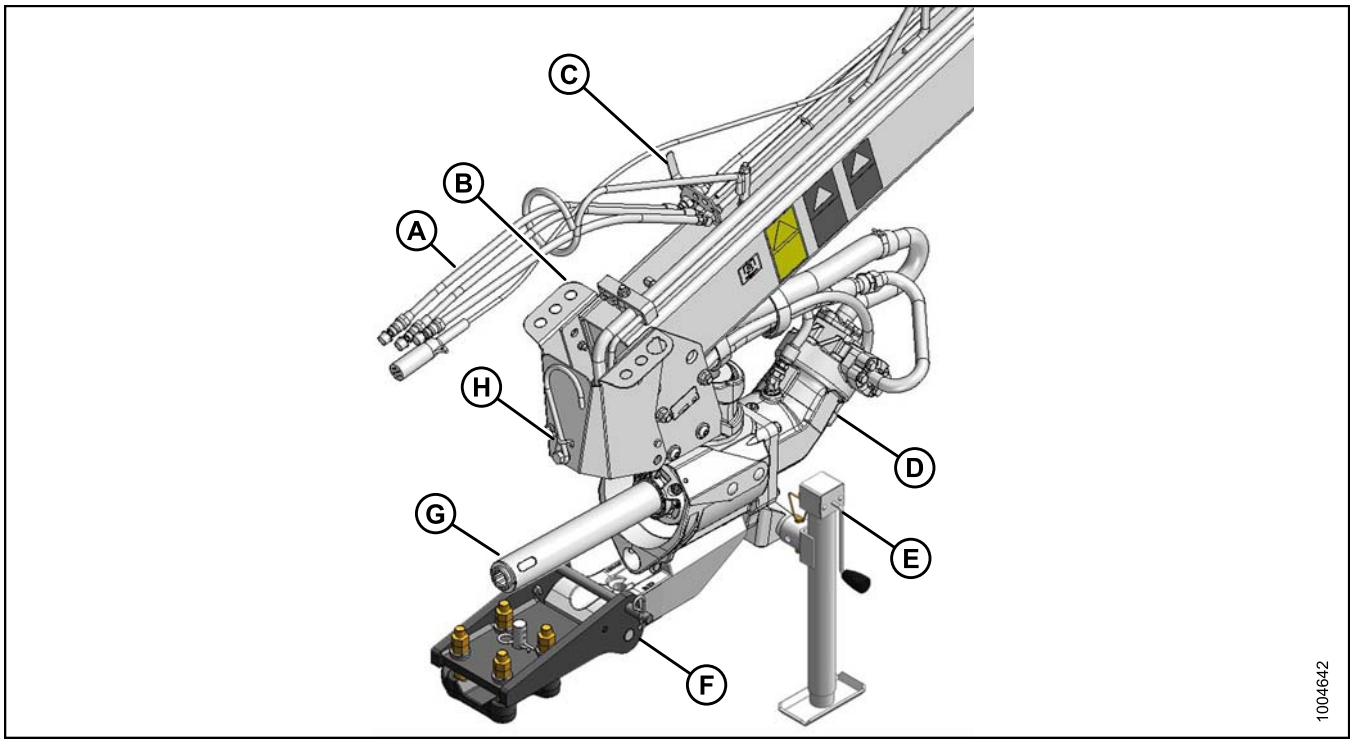


Figure 3.3

A - Control hoses
B - Hose end storage
C - Steering cylinder lock-out valve
D - Pump
E - Jack
F - Drawbar hitch
G - Driveline
H - Driveline storage hook

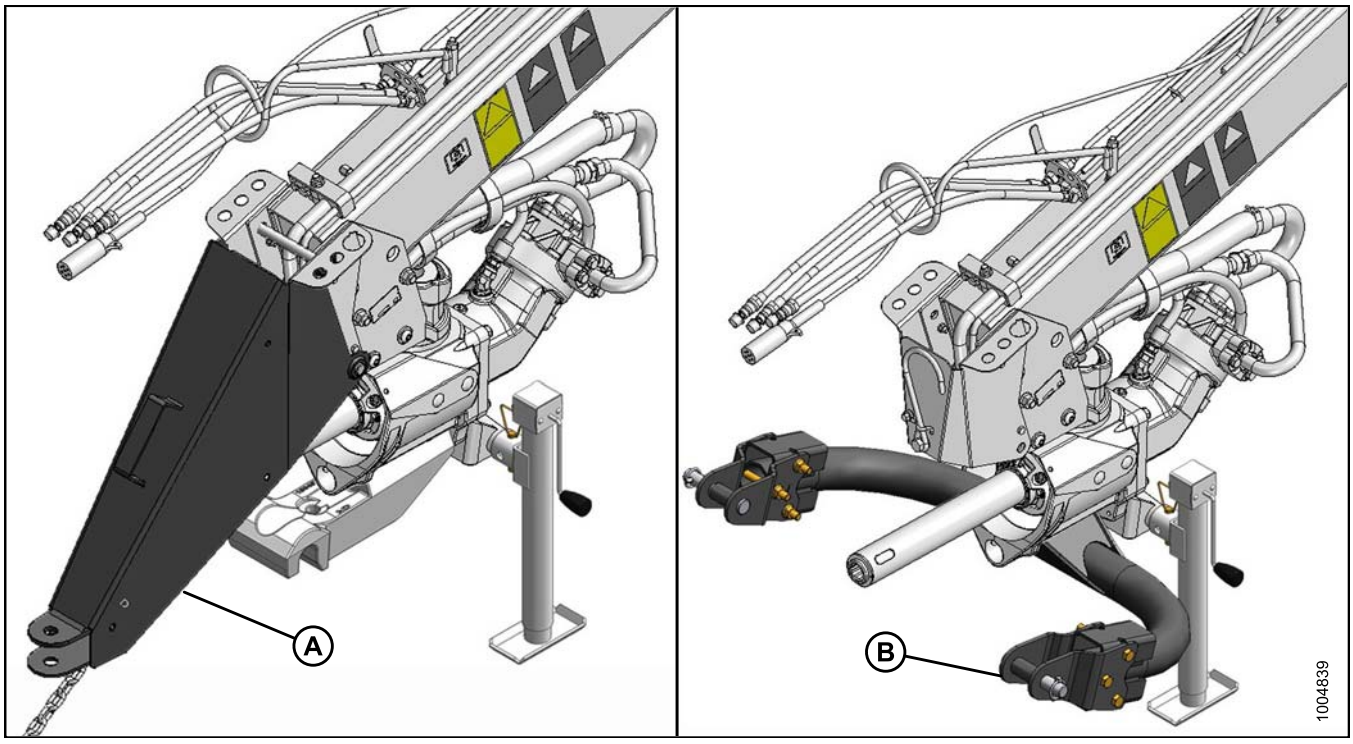


Figure 3.4

A - Towing adapter
B - 3-point hitch adapter

4 Specifications

NOTE:

- Specifications and design are subject to change without notice or obligation to revise previously sold units.
- Tractor must be equipped with a cab.

Frame and structure	
Width (transport)	16 ft-0 in. (4879 mm)
Weight (estimated)	5580 lb. (2533 kg)
Carrier	Pull-type
Lighting	Two amber transport and two red tail-lights
Wheels/Tires	15 - 10 Wheel / 31x13.5-15 NHS 8 Ply High Float
Tread width	150 in. (3800 mm)
Manual storage	Plastic case on mower conditioner right driveshield
Cutterbar	
Quantity of cutting discs	10
Knives per disc	Two 11 degrees bevel up reversible
Disc speed	2530 rpm
Knife tip speed range	184 mph (82.9 m/s)
Effective cutting width	15 ft-10 in. (4827 mm)
Cutting height	7/8 in. (23 mm)
Oil capacity (maximum)	4.4 us quarts (4.25 liters)
Cutting angle range	0–7° below horizontal
Skid shoes	Two adjustable
Geartrain protection	Shearable disc spindles
Deflectors	2 cage type converging
Overshot auger	
Peripheral diameter	9.0 in. (229 mm)
Center tube diameter	6.0 in. (152 mm)
Auger speed	1012 rpm
Drive	Three HB belts
Drives	
Tractor PTO	1.375 in. (35 mm) dia. 21 spline or 1.75 in. (44 mm) dia. 20 spline
Hydraulic connections	Quick attachment couplings to tractor
Hydraulic pump	9.76 cu in. (160 cc) pump
Hydraulic motor	3.9 cu in. (64 cc) to gearbox
Power developed (max)	143 hp (107 kw)
Normal operating pressure	2000 psi (13.71 mpa)

SPECIFICATIONS

Frame and structure		
Conditioner		
Drive		Bevel gearbox to belt driven enclosed timing gearbox and driveline
Roll type		Intermeshing steel bars
Roll diameter		9.17 in. (233 mm) / 6.63 in. (168.4 mm) od tube
Roll length		118 in. (3000 mm)
Roll speed		1012 rpm
Swath width		36–102 in. (915–2540 mm)
Forming shields		mower conditioner mounted adjustable baffle, fixed side deflectors, and mower conditioner mounted adjustable forming shield system
Ground speed		
Recommended cutting		8–11 mph (13–18 km/h)
Recommended transport		20 mph (30 km/h)
Tractor requirements		
PTO power-minimum		125 hp (94 kw)
Hydraulics	Pressure	2000 psi (13.71 mpa)
	Controls	Two double-acting / one single-acting
Hitch		Drawbar / 3-point or quick hitch

5 Operation

5.1 Owner/Operator Responsibilities

CAUTION

- **It is your responsibility to read and understand this manual completely before operating the mower conditioner. 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 mower conditioner, 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 tractor is properly equipped to safely operate the mower conditioner. This may include adding ballast according to tractor 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 tractor 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 tractor's engine or operate the machine except from the tractor seat**
- **Check the operation of all controls in a safe clear area before starting work**
- **Do NOT allow riders on the tractor or mower conditioner**

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 mower conditioner hits an obstruction, the front of the tractor will usually swerve toward the ditch**
- **When working on inclines, travel uphill or downhill when possible. Be sure to keep the tractor transmission in gear when travelling downhill**
- **Never attempt to get on or off a moving machine**
- **Do NOT get off the tractor while the mower conditioner is in operation**
- **Stop the tractor 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 tractor brake**
- **Disengage the power take-off (PTO)**
- **Turn off the engine and remove the key**
- **Wait for all movement to stop**
- **Engage the mower conditioner lift cylinder lock-out valves before inspecting a raised machine**

CAUTION

- **Operate only in daylight or good artificial light**
- **Keep everyone several hundred feet away from your operation**
- **Ensure bystanders are never in line with the front or rear of the machine. Stones or other foreign objects can be ejected with force from either end**
- **Extreme care must be exercised to avoid injury from thrown objects. Do NOT, under any circumstances, operate the mower conditioner 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 mower conditioner. Replace the curtains if they become worn or damaged**

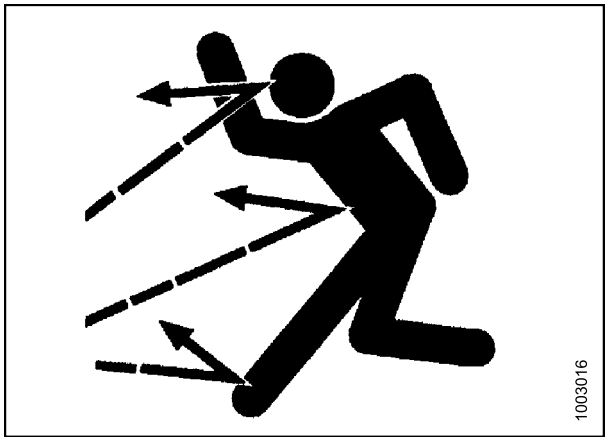


Figure 5.1

5.3 Lift Cylinder Lock-Out Valves

5.3.1 Engaging Locks

WARNING

To avoid bodily injury or death from fall of raised machine, always lock-out lift cylinders before going under mower conditioner for any reason.

IMPORTANT

Hoses should be connected so that moving control lever (A) backward raises the mower conditioner. See Section 5.8.3 Connecting the Hydraulics, page 51 for more information.

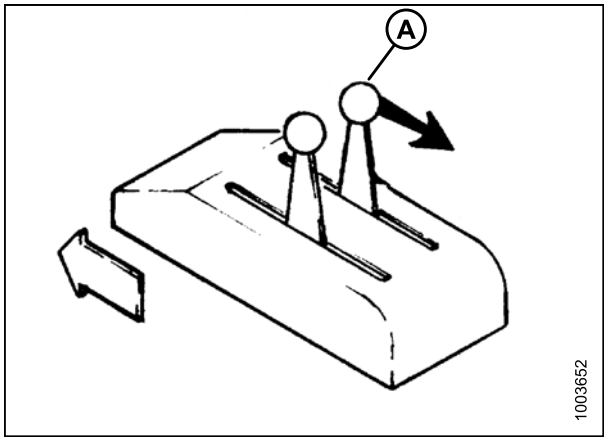


Figure 5.2

To lock-out the lift cylinders, follow these steps:

1. Raise machine to maximum height by activating remote cylinder control valve in tractor.
2. Close the lock-out valve (A) on each lift cylinder by turning the handle to the horizontal position.

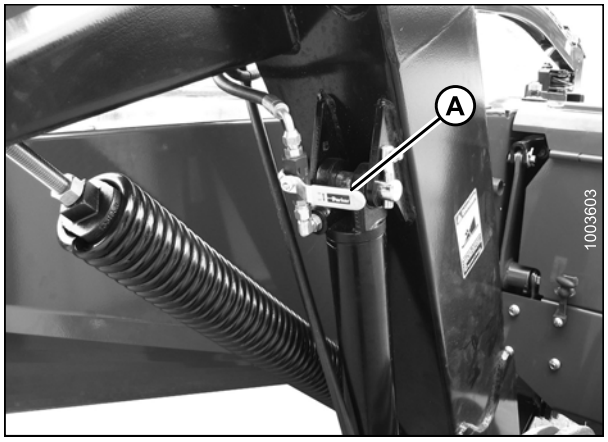


Figure 5.3

5.3.2 Disengaging Locks

Follow these steps to unlock the lift cylinders:

1. Turn the handle on the lock-out valves (A) to the vertical position.

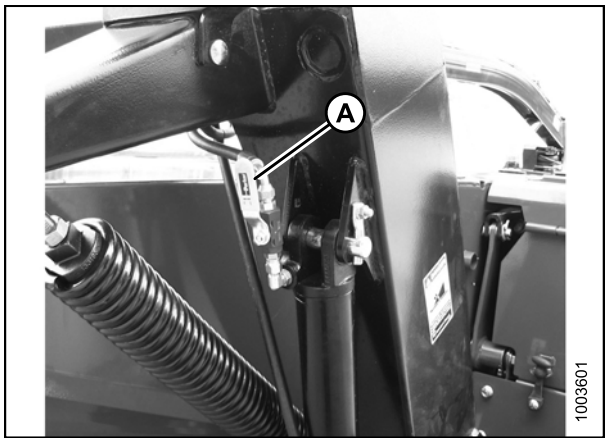


Figure 5.4

2. Lower machine by activating the remote cylinder control (A) in the tractor.

   NOTE: Moving the lever forward lowers the mower conditioner.

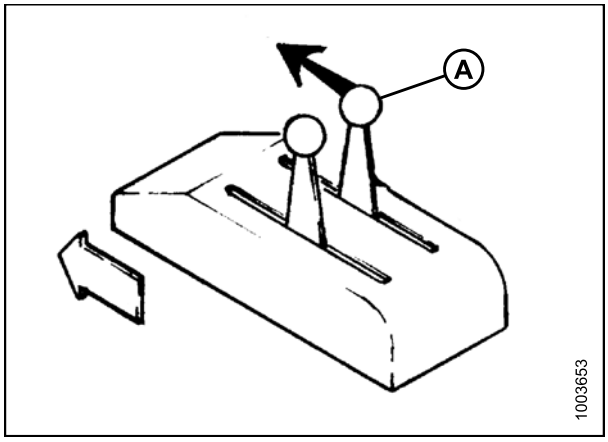


Figure 5.5

5.4 Driveshields

The R85 16-ft. pull-type mower conditioner comes in two configurations—one configured for use in North America and one configured for use outside of North America. The difference in configurations are 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 Mower Conditioner

Follow these steps to open the driveshield on North American mower conditioner:

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

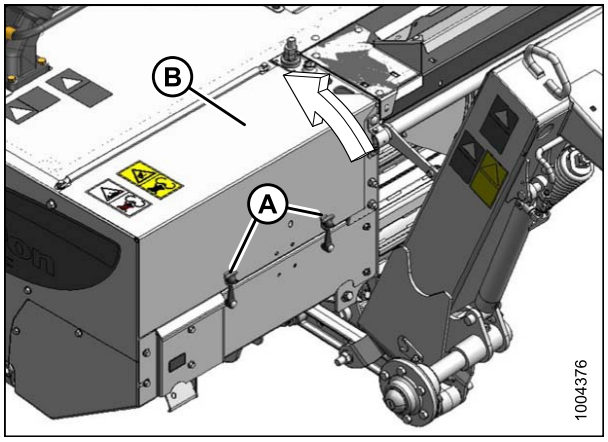


Figure 5.6

5.4.2 Closing the Driveshield: North American Mower Conditioner

Follow these steps to close the driveshield on North American mower conditioner:

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

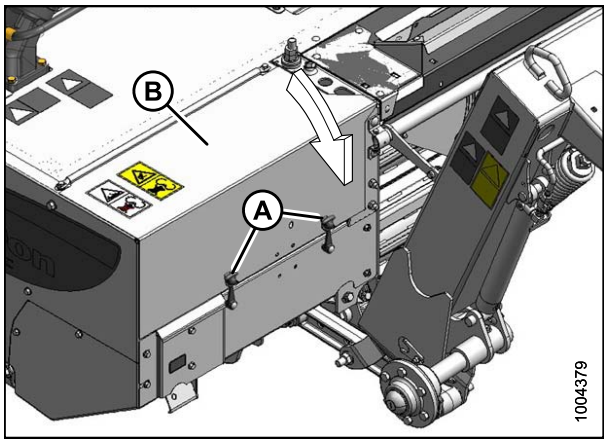


Figure 5.7

5.4.3 Opening the Driveshield: Export Mower Conditioner

Follow these steps to open the driveshield on export mower conditioner:

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).

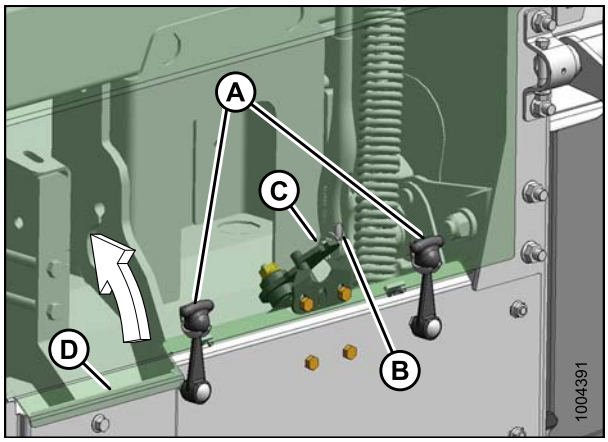


Figure 5.8

5.4.4 Closing the Driveshield: Export Mower Conditioner

Follow these steps to close the driveshield on export mower conditioner:

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).

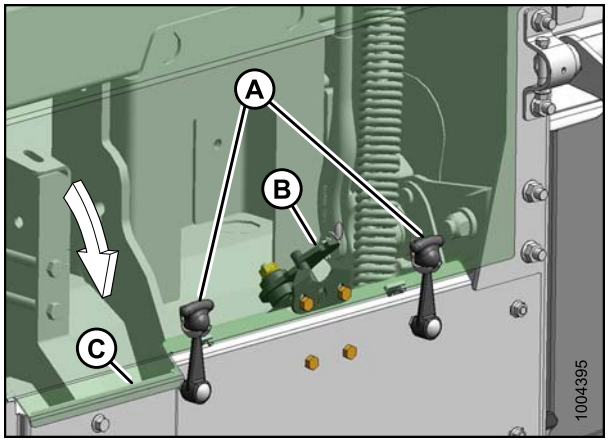


Figure 5.9

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 mower conditioner.

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

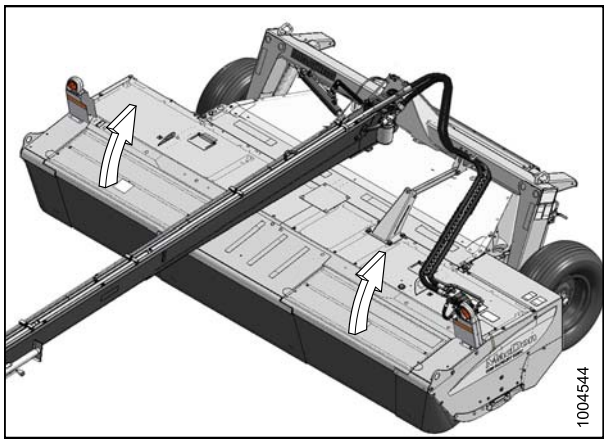


Figure 5.10

5.5.1 Opening the Cutterbar Doors: North American Mower Conditioner

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

1. Unhook the curtain latches (A).

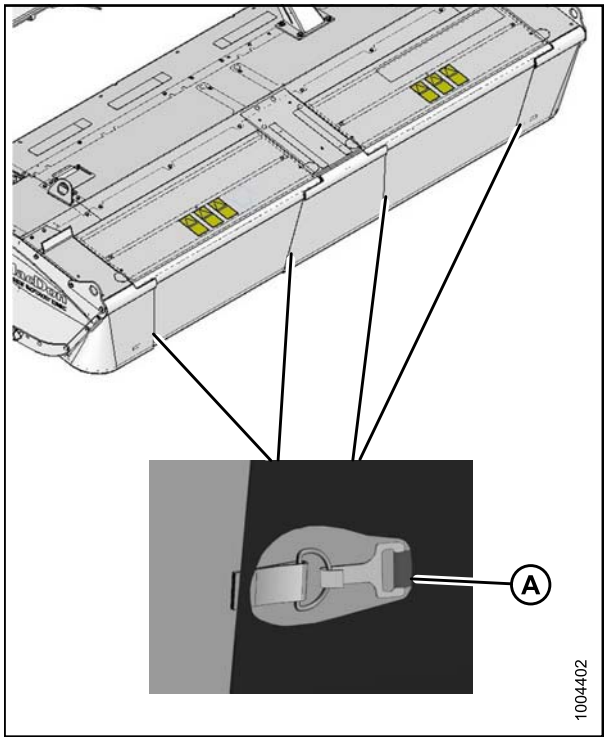


Figure 5.11

2. Lift front of door to the open position.

Figure 5.12

5.5.2 Closing the Cutterbar Doors: North American Mower Conditioner

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

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 5.13

2. Hook curtain latches (A).

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

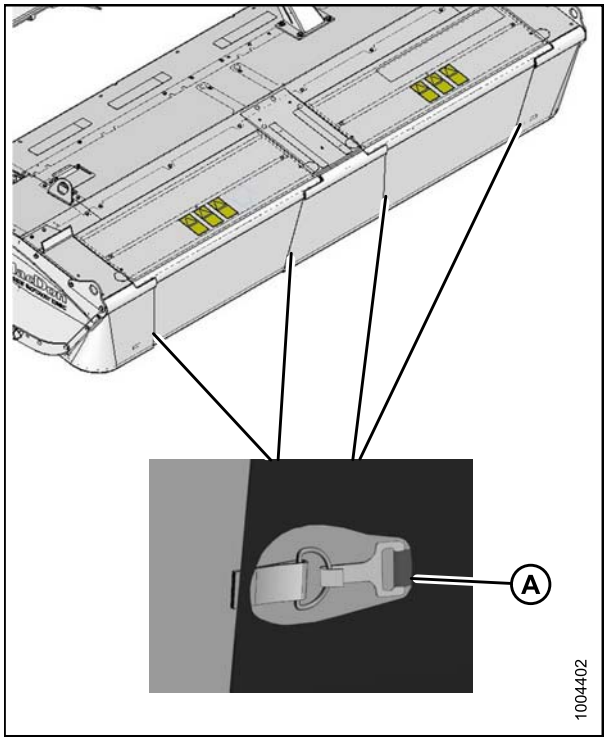


Figure 5.14

5.5.3 Opening the Cutterbar Doors: Export Mower Conditioner

Follow these steps to open the cutterbar doors on export mower conditioner:

1. Unhook curtain latches (A).

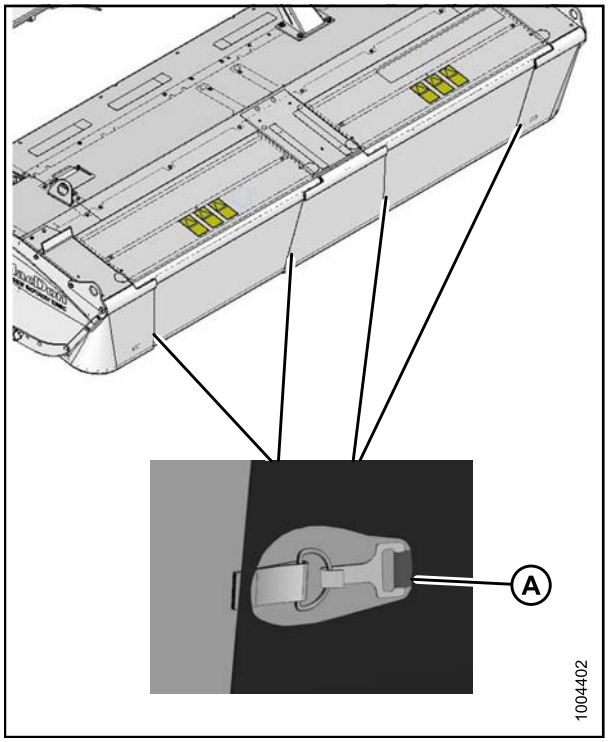


Figure 5.15

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.

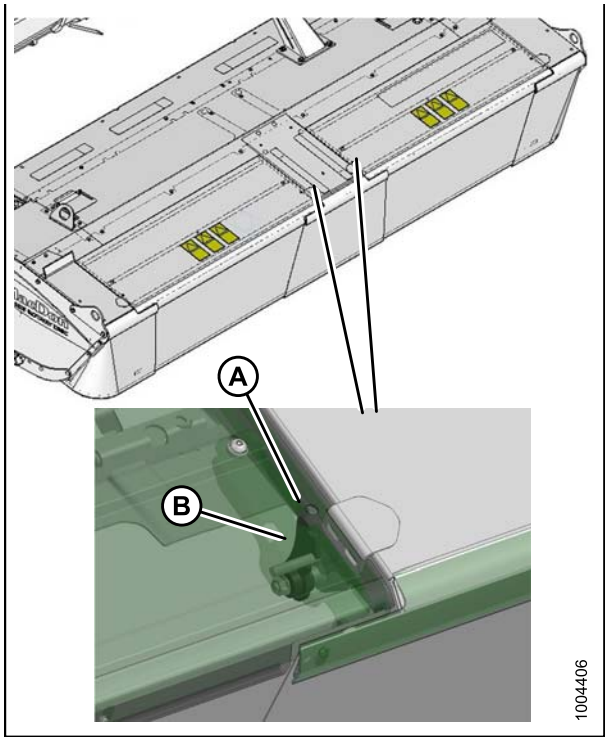


Figure 5.16

5.5.4 Closing the Cutterbar Doors: Export Mower Conditioner

To close the cutterbar doors on export mower conditioner:

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.

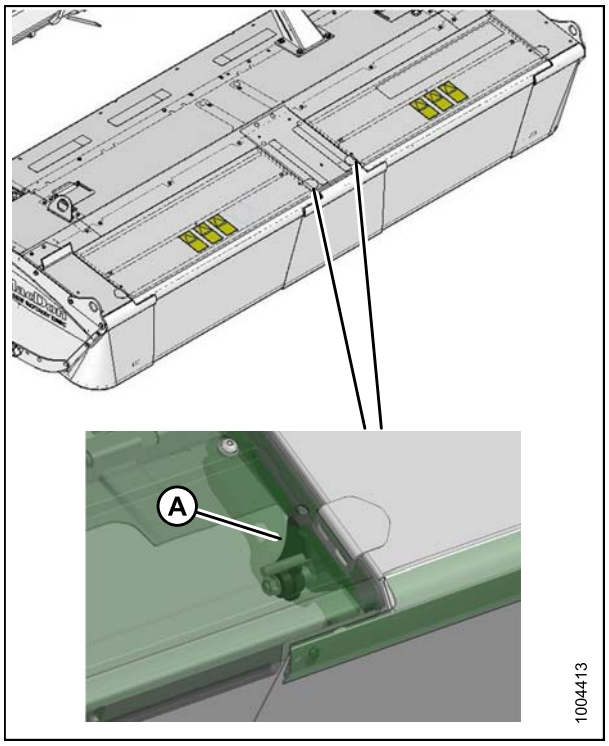


Figure 5.17

2. Hook curtain latches (A).

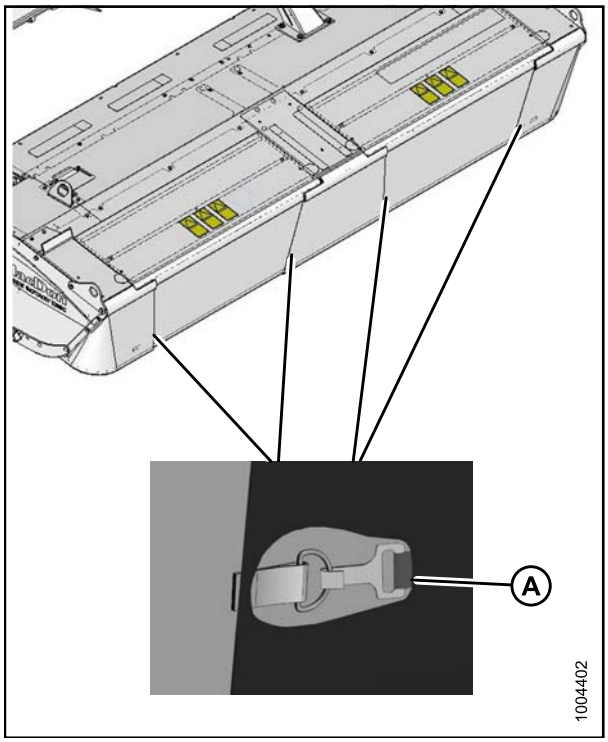


Figure 5.18

5.6 Daily Start-Up Check

CAUTION

- **Be sure tractor and mower conditioner are properly attached, all controls are in NEUTRAL, and tractor brake is engaged.**
- **Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the mower conditioner 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

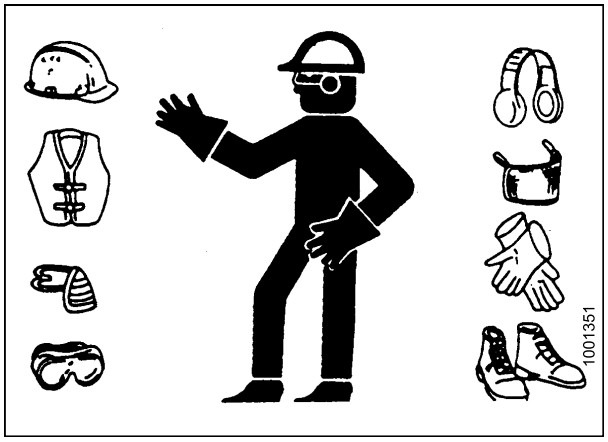


Figure 5.19

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

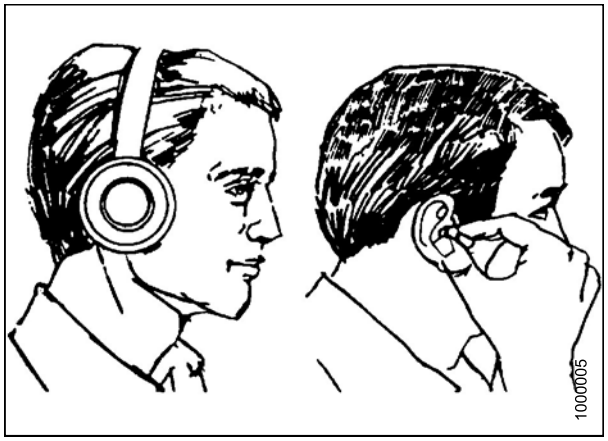


Figure 5.20

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 8.9.7 Hydraulic Hoses and Lines, page 206.

2. Clean all lights and reflective surfaces on the machine. Check lights for proper operation.
3. Perform all daily maintenance refer to Section 8.6.1 Maintenance Schedule/Record, page 138.

5.7 Tractor Setup

5.7.1 Tractor Requirements

Minimum power	Minimum drawbar capacity	Minimum hydraulics
125 hp (93 kW)	As per ASAE	2000 psi (13.7 MPa)

NOTE: Tractor must be equipped with a seven terminal outlet to supply power to the mower conditioner's hazard lights.

5.7.2 Adjusting the Drawbar

To adjust the tractor drawbar:

CAUTION

Shut off tractor, engage parking brake, and remove key before working around hitch.

1. Adjust tractor drawbar to meet ASAE standard specifications as listed in Section 5.1 Drawbar specifications, page 42.

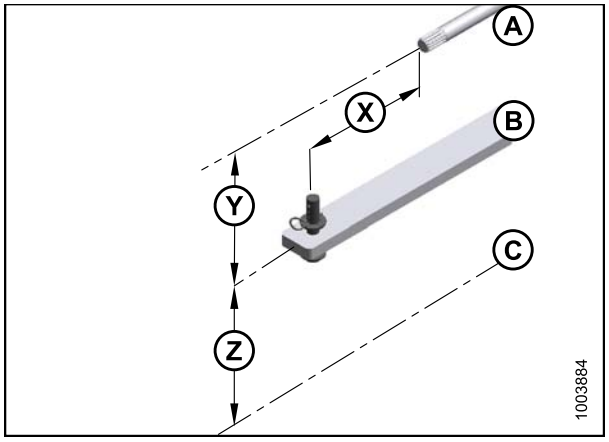


Figure 5.21: Tractor drawbar adjustments

A - PTO
B - Tractor drawbar
C - Ground
X - Dimension X
Y - Dimension Y
Z - Dimension Z

Table 5.1 Drawbar specifications

Dimension	1000 rpm power take-off (PTO)	
	1–3/8 inch diameter	1–3/4 inch diameter
X	16 in. (406 mm)	20 in. (508 mm)
Y	6–12 in. (152–305 mm) 8 in. (203 mm) recommended	
Z	13–17 in. (330–432 mm) 16 in. (406 mm) recommended	

5.7.3 Attaching a Drawbar Hitch

Follow these steps to attach a drawbar hitch:

CAUTION

Shut off tractor, engage parking brake, and remove key before working around hitch.

1. Secure the tractor drawbar so the hitch pin hole is directly below the driveline.
2. Loosen bolts (B) on extension assembly (A) and slide onto drawbar.
3. Install pin (C) through drawbar and extension from underside and secure with hairpin.
4. Gradually tighten the four bolts (B) to 265 ft·lbf (359 N·m).

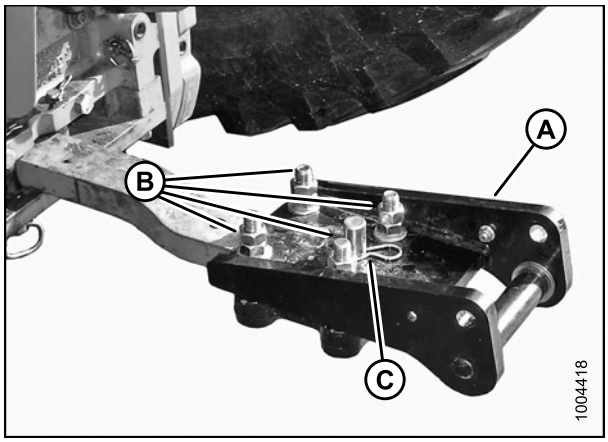


Figure 5.22

5. Attach the swivel hitch member (A) with pin (B) onto the hitch.

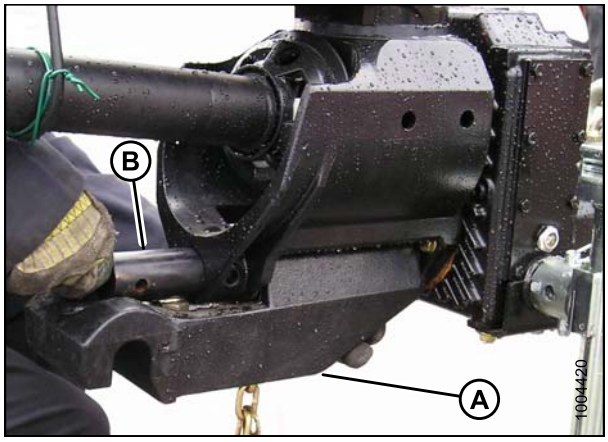


Figure 5.23

6. Secure pin with clevis pin (A), washers, and cotter pin.

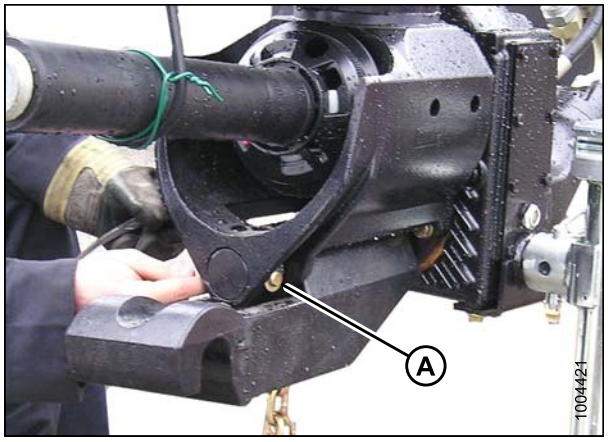


Figure 5.24

7. Assemble driveline male half (A) onto driveline (B) on hitch. Push male half so that driveline is at its fully compressed length.
8. Locate driveline in hook (C).

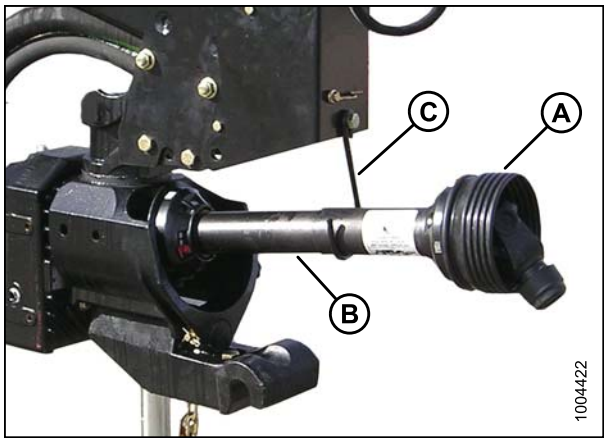


Figure 5.25

5.7.4 Attaching a 3-Point Hitch Adapter (Cat. II, III, IIIN)

Follow these steps to attach a 3-point hitch adapter:

1. Attach the 3-point hitch adapter (A) to the Articulated Power Turn (APT) hitch with pin (B).
2. Secure pin (B) with clevis pin (C), washers, and cotter pin.

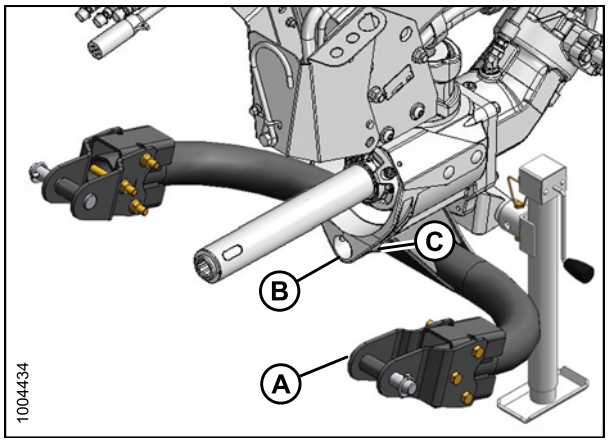


Figure 5.26

3. Set the arms on the adapter (A) to suit Category II and IIIN, or Category III tractor hitch arms.
4. Remove pins (A).
5. Remove bolts (B) (3 per side).
6. Flip outer plate (C) and inner plate (D) on each arm.

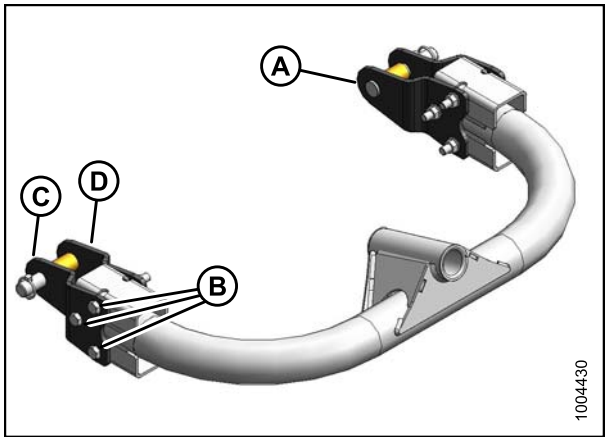


Figure 5.27: Category II or IIIN

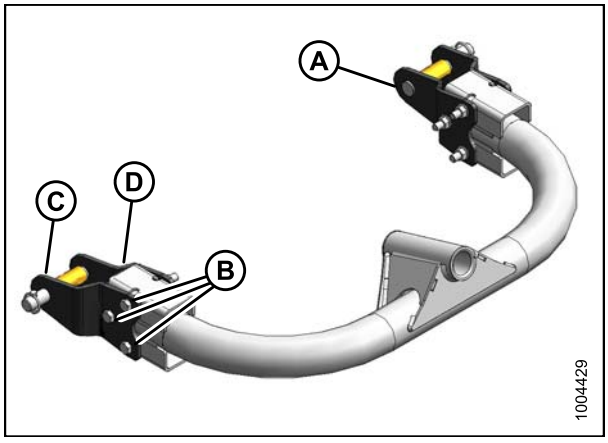


Figure 5.28: Category III

IMPORTANT

The inner plate (A) has a smaller offset than the outer plate (B). Always maintain the proper locations.

7. Reinstall bolts (C).
8. Replace pins (D).

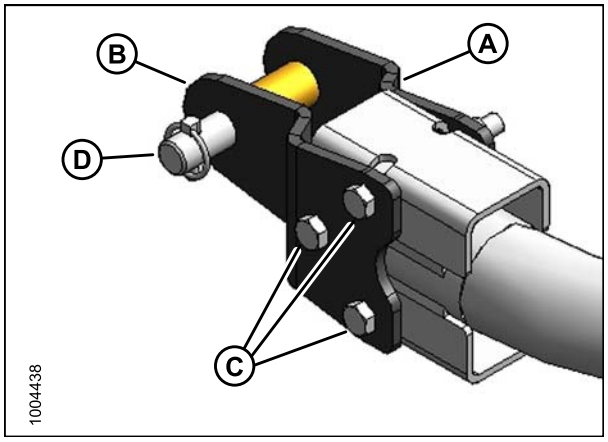


Figure 5.29

NOTE: Bushings (A) on pins can be removed to suit hole size in tractor hitch arms.

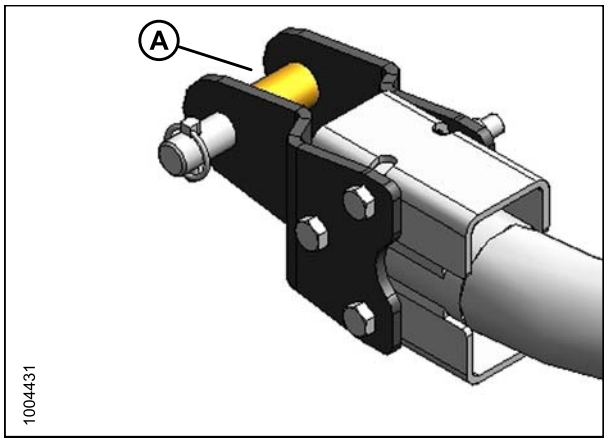


Figure 5.30

9. Assemble driveline male half (A) onto driveline (B) on APT hitch. Push male half so that driveline is at its fully compressed length.
10. Locate driveline in hook (C).

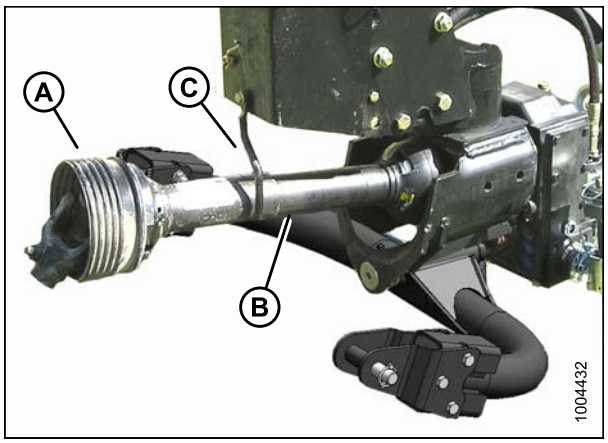


Figure 5.31

5.8 Mower Conditioner/Tractor Hookup

5.8.1 Connecting the Mower Conditioner to a Drawbar Hitch

Follow these steps to hookup to a drawbar hitch:

CAUTION

Shut off tractor, engage parking brake, and remove key before working around hitch.

1. Remove pin (A).

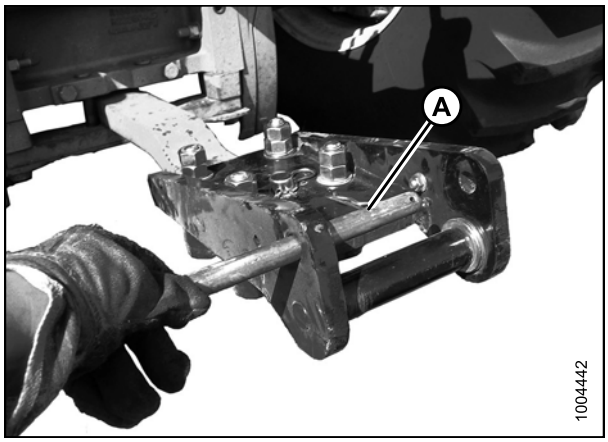


Figure 5.32

2. Position tractor to align drawbar extension (A) with arm (B) on mower conditioner.
3. Lower hitch with jack (C) to engage arm (B) on drawbar extension (A).
4. Install hitch pin (D) and secure with hairpin.

IMPORTANT

If the tractor has a 3-point hitch, lower the lower links as low as possible to prevent damage to articulated power turn (APT) hitch.

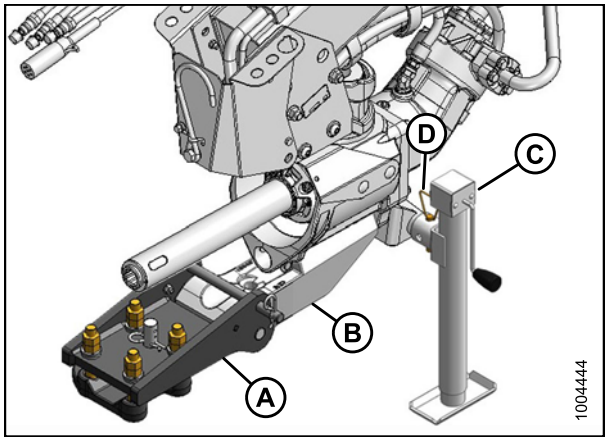


Figure 5.33

5. Attach driveline (A) to tractor power take-off (PTO) as follows:
   a. Position driveline (A) onto tractor PTO.
   b. Pull back collar on driveshaft and push driveshaft until it locks. Release collar.
6. Route safety chain from mower conditioner through chain support (B), around drawbar support, and lock the hook (C) on chain.

IMPORTANT

Adjust chain length to remove all slack except what is needed for turns.

7. Raise jack (A), pull pin (B), and move jack to storage position on side of hitch.
8. Secure jack with pin (B).
9. Proceed to Section 5.8.3 Connecting the Hydraulics, page 51.

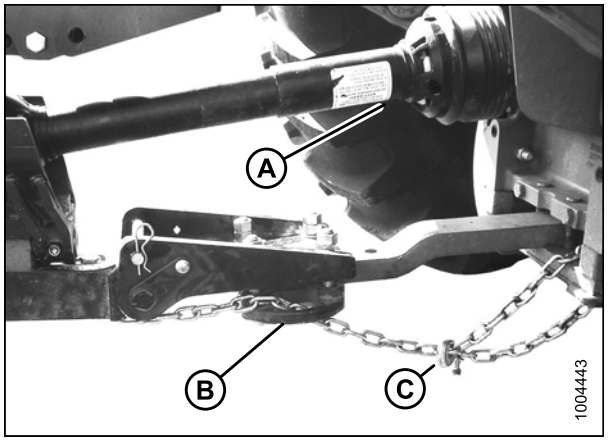


Figure 5.34

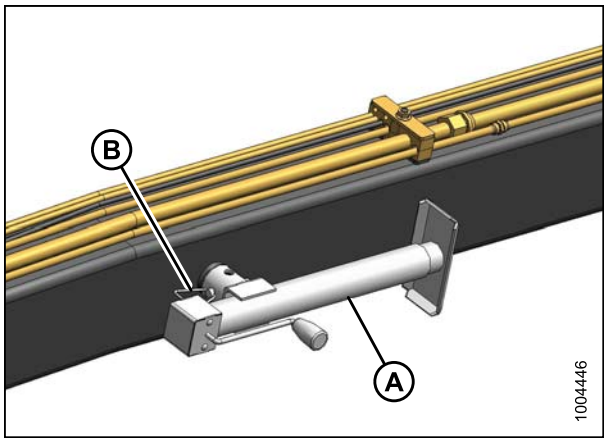


Figure 5.35

5.8.2 Connecting the Mower Conditioner to a 3-Point Hitch (Cat. II, III, IIIN)

Follow these steps to hook-up to a 3-point hitch:

CAUTION

Shut off tractor, engage parking brake, and remove key before working around hitch.

1. Position tractor and align tractor hitch arms (A) with hitch adapter (B). Shut off tractor and remove key.
2. Remove pins (C) from hitch adapter and use the jack to adjust height of hitch so that pins (C) can be reinstalled.

   NOTE: If tractor is equipped with a quick hitch system, pins (C) do not need to be removed.
3. Secure arms onto adapter pins (C) with lynch pins.
4. Install anti-sway bars on tractor hitch to stabilize lateral movement of hitch arms (A). Refer to your tractor operator's manual.

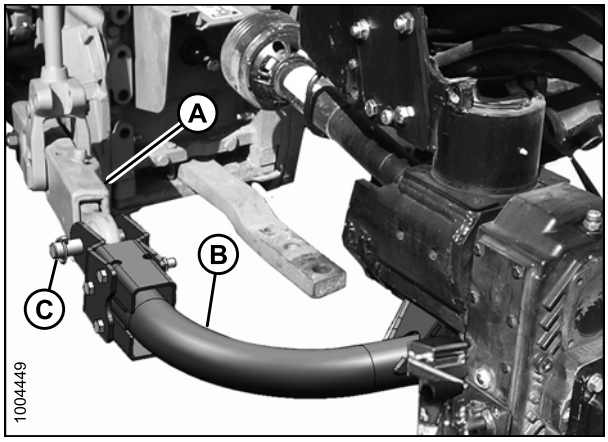


Figure 5.36

5. Check distance **'X'** between tractor power take-off (PTO) shaft (A) and implement input driveline (B) (without the front half of the driveline attached).

   NOTE: In the image, (C) is the mower conditioner hitch.
6. The measurement must NOT exceed the dimensions listed:

Driveline shaft size	Distance 'X'
1-3/8 in. (34 mm)	27 in. (685 mm)
1-3/4 in. (43 mm)	31 in. (790 mm)

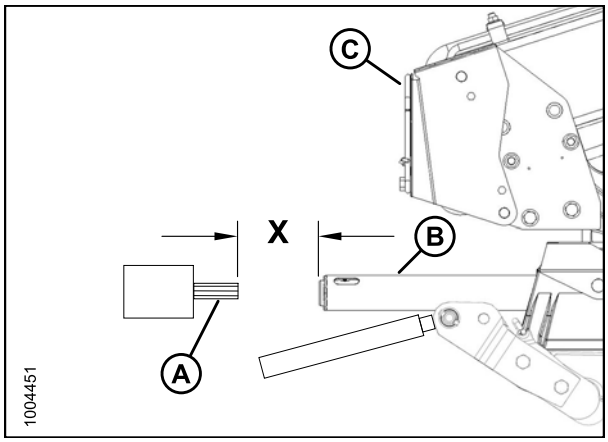


Figure 5.37

7. Position driveline (A) onto tractor PTO shaft. Driveline should be approximately level.

IMPORTANT

Front half of driveline (A) for 3-point hitch is longer than the driveline for draw-bar hitch. Ensure proper length driveline is used.

8. Pull back collar on driveline and push driveline until it locks. Release collar.
9. Rotate driveline storage hook (B) to upward position.

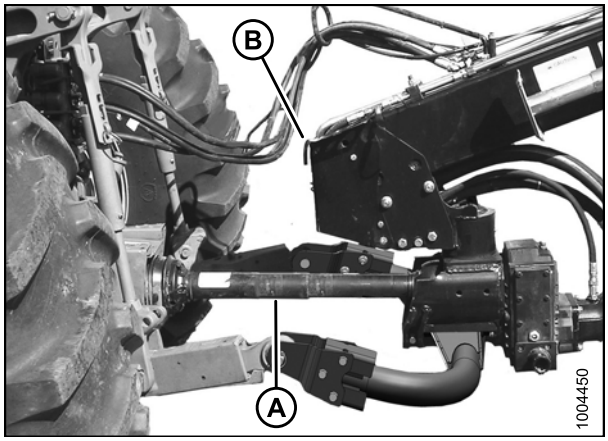


Figure 5.38

10. Raise jack (A) and pull pin (B).
11. Move jack to storage position (C) on side of articulated power turn (APT) hitch.
12. Secure jack with pin (D).

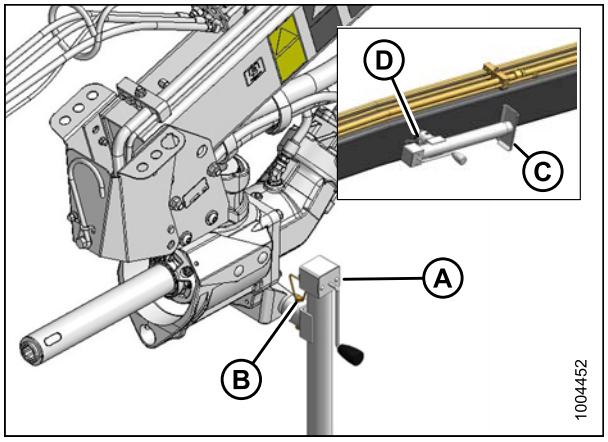


Figure 5.39

5.8.3 Connecting the Hydraulics

Follow these steps to connect the hydraulics:

WARNING

Do NOT use remote hydraulic system pressures over 3000 psi (20,684 kPa). Check your tractor operator's manual for remote system pressure.

System	Hose	Tractor hydraulics
Steering	A (2 Hoses)	Control 1
Lift	B (1 Hose)	Control 2
Mower conditioner tilt	C (2 Hoses)	Control 3

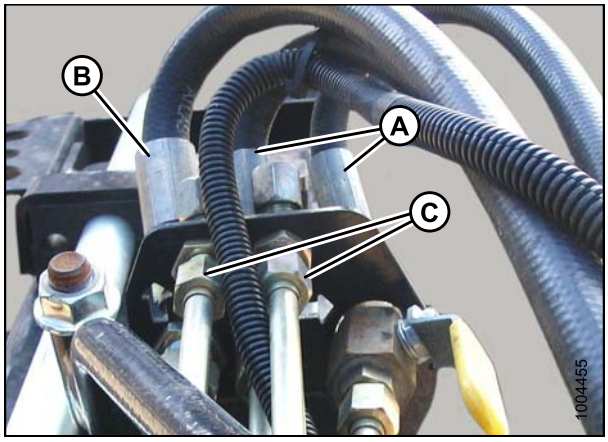


Figure 5.40

NOTE: Arrows (A) cut into plate indicate system for hoses (Lift ↑ steering ↔).

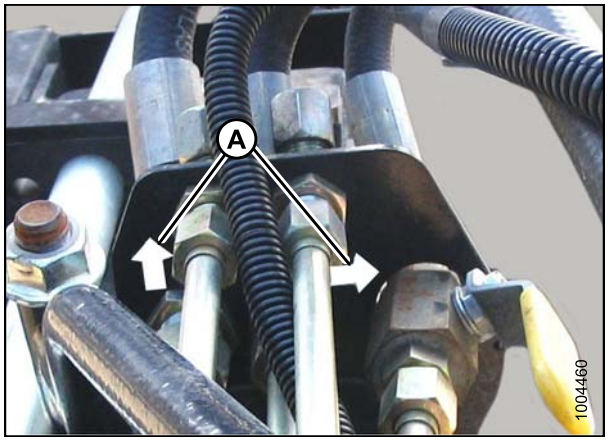


Figure 5.41

1. Ensure hoses are routed through guide (A) to provide proper hose arc as shown.

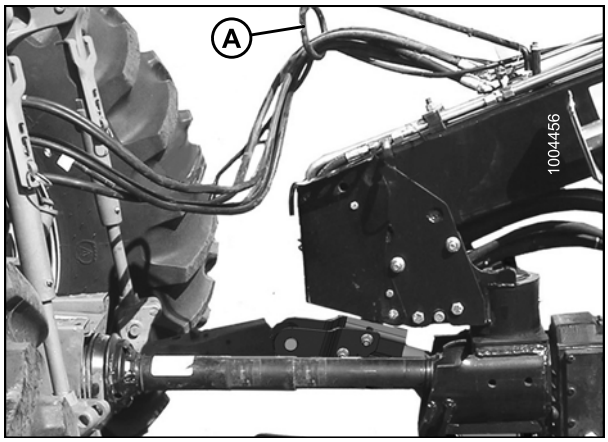


Figure 5.42

2. Connect two steering cylinder hoses (A) as follows:

Control lever position	Cylinder movement	Mower conditioner direction
Forward	Extend	Right
Backward	Retract	Left

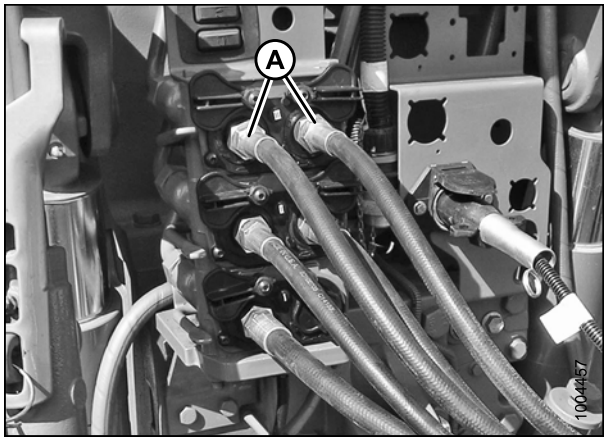


Figure 5.43

3. Connect one lift cylinder hose (A) as follows:

Control lever position	Cylinder movement	Mower conditioner movement
Forward	Retract	Lower
Backward	Extend	Raise

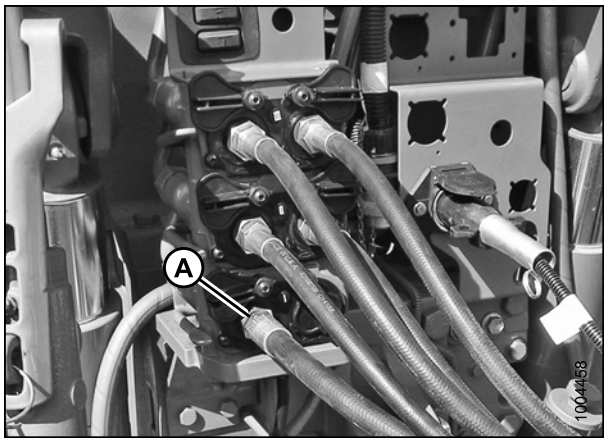


Figure 5.44

4. Connect two mower conditioner tilt cylinder hoses (A) as follows:

   NOTE: Not required with mechanical center-link.

Control lever position	Cylinder movement	Mower conditioner movement
Forward	Retract	Lower
Backward	Extend	Raise

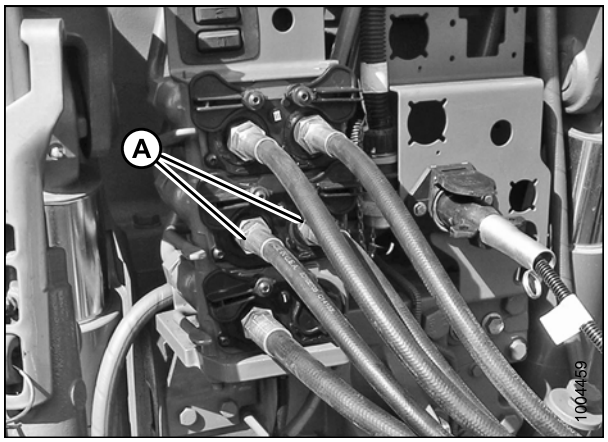


Figure 5.45

5.8.4 Connecting the Electrical

Follow these steps to connect the electrical wiring harness to the tractor:

IMPORTANT

Older model tractors will have pin #4 (A) energized as an accessory circuit. The mower conditioner uses this pin position (B) for brake lights.

1. Check that pin #4 (A) in the tractor receptacle is NOT constantly energized—see your tractor operator's manual and remove the appropriate fuse if required.
2. Connect the mower conditioner wiring harness connector (C) to tractor. The connector is designed to fit tractors equipped with a round 7-pin receptacle (SAE J560).

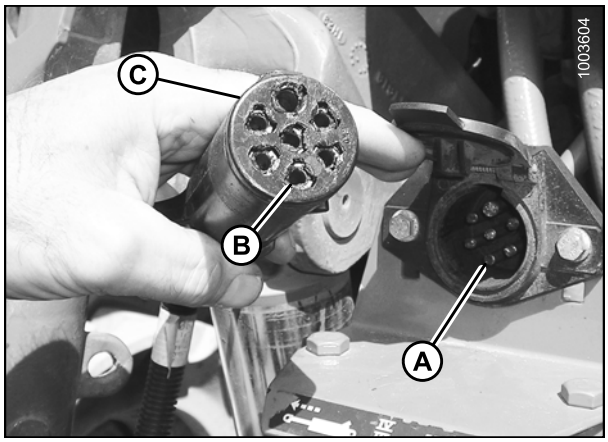


Figure 5.46

5.9 Disconnecting the Mower Conditioner from a Tractor

5.9.1 Disconnecting from a Drawbar Hitch

CAUTION

- **To prevent accidental movement of tractor, shut off engine, engage parking brake, and remove key.**
- **To maintain stability, always lower the machine completely.**
- **Block mower conditioner wheels before detaching from tractor.**

Follow these steps to disconnect from a drawbar hitch:

1. Park machine on flat level surface.
2. Lower mower conditioner onto blocks or leave mower conditioner in a raised position.

   NOTE: If leaving in raised a position, engage lift cylinder lock-out valves (A).

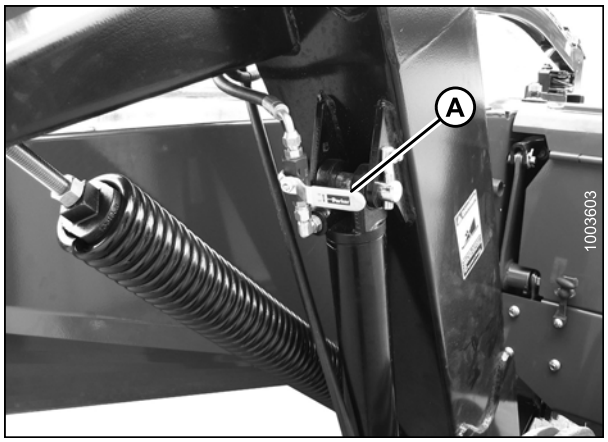


Figure 5.47

3. Shut off engine and remove the key.
4. Relieve the stored hydraulic pressure by moving your tractor cylinder control valve lever back and forth.
5. Disconnect hydraulic hoses and electrical harness. Store hose ends and electrical connector in holes at front of hitch (A).

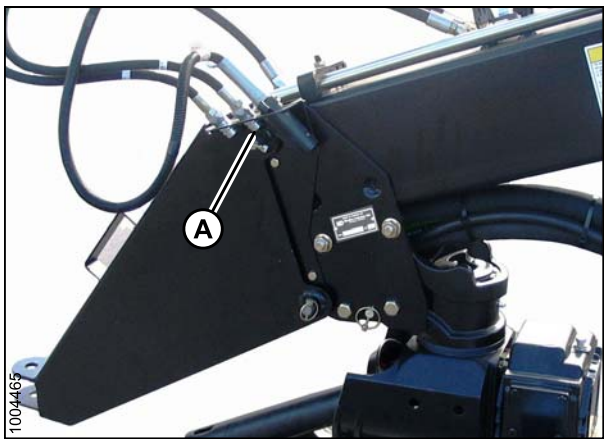


Figure 5.48

6. Remove pin (A).
7. Pull back collar on driveline (B) and slide coupler off tractor power take-off (PTO). Rest driveline on the drawbar (C).

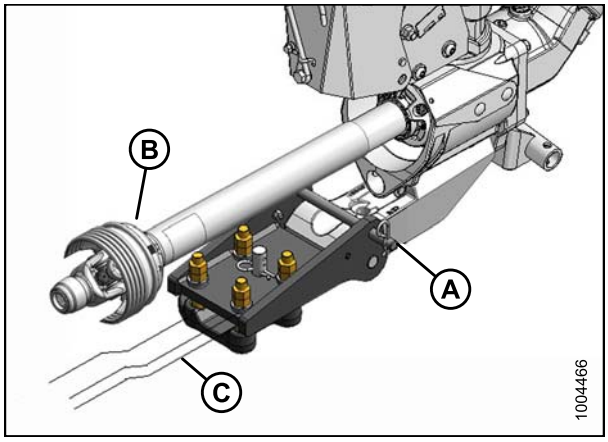


Figure 5.49

8. Rotate hook (A) to lower position and position driveline in hook.

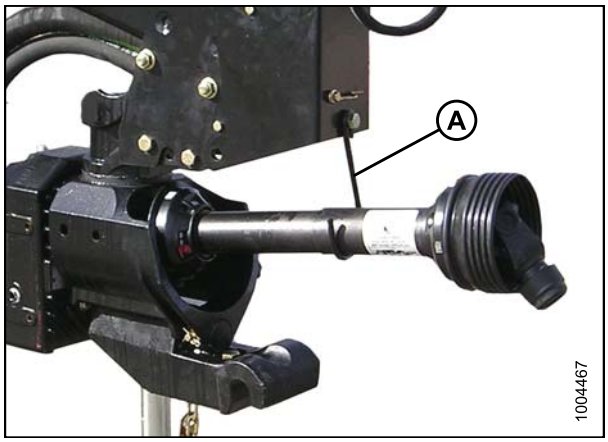


Figure 5.50

9. Pull pin (B) securing jack (A) at storage location.

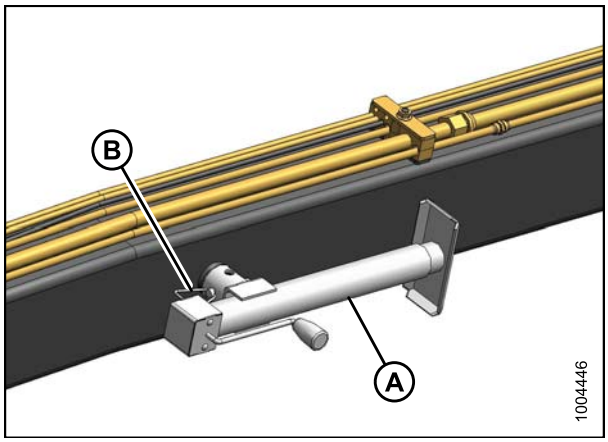


Figure 5.51

10. Move jack (A) to working position at front of hitch. Secure jack with pin (B).
11. Lower jack to take weight off drawbar (C).

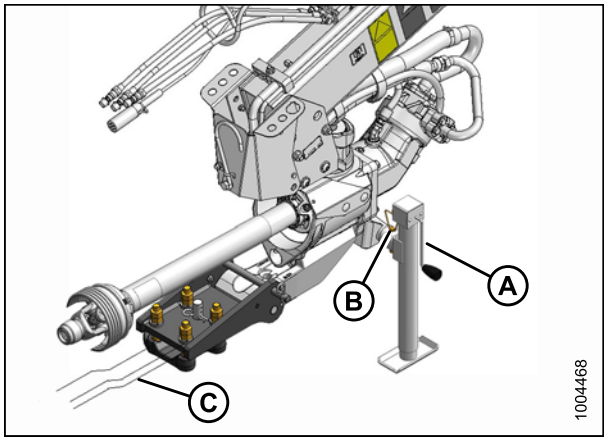


Figure 5.52

12. Remove chain lock (A) and unhook safety chain from tractor. Wrap chain around articulated power turn (APT) hitch for storage.
13. Lower jack to raise hitch clear of drawbar.
14. Slowly drive tractor away from mower conditioner.

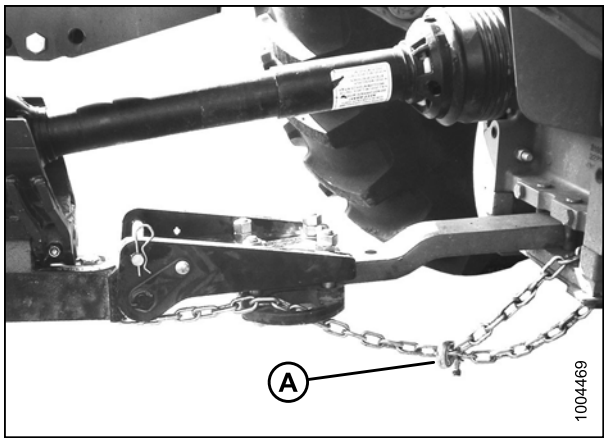


Figure 5.53

15. Replace hitch pin (A) and secure with hairpin.

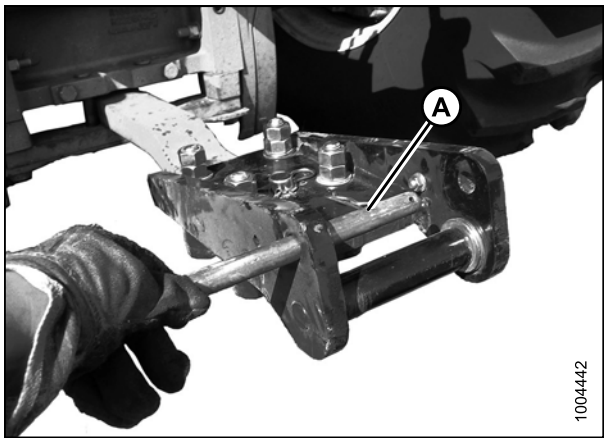


Figure 5.54

5.9.2 Disconnecting from a 3-Point Hitch

CAUTION

- **To prevent accidental movement of tractor, shut off engine, engage parking brake, and remove key.**
- **To maintain stability, always lower the machine completely.**
- **Block mower conditioner wheels before detaching from tractor.**

Follow these steps to disconnect from a 3-point hitch:

1. Park machine on flat level surface.
2. Lower mower conditioner onto blocks or leave mower conditioner in a raised position.

   NOTE: If leaving in raised a position, engage lift cylinder lock-out valves (A).

3. Shut off engine and remove the key.
4. Relieve the stored hydraulic pressure by moving your tractor cylinder control valve lever back and forth.

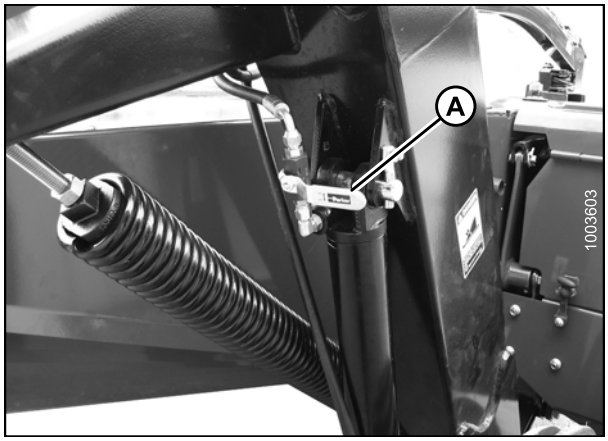


Figure 5.55

5. Disconnect hydraulic hoses and electrical harness. Store hose ends and electrical connector in holes at front of hitch (A).

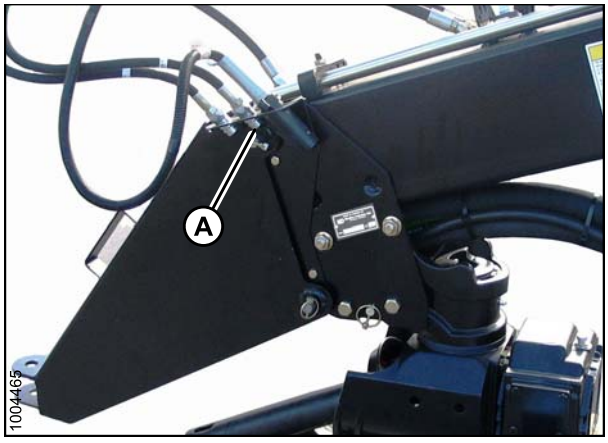


Figure 5.56

6. Pull pin (B) securing jack (A) at storage location.

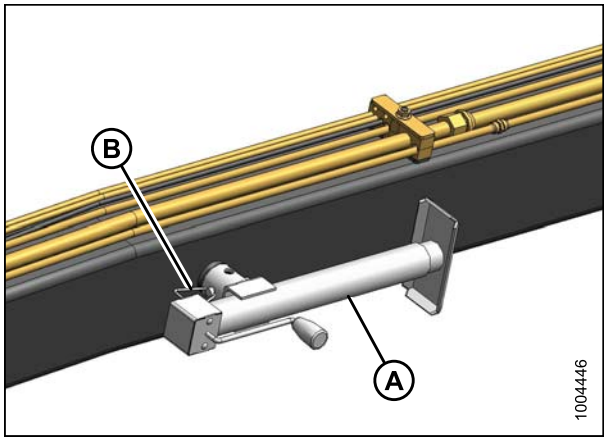


Figure 5.57

7. Move jack (A) to working position at front of hitch. Secure jack with pin (B).

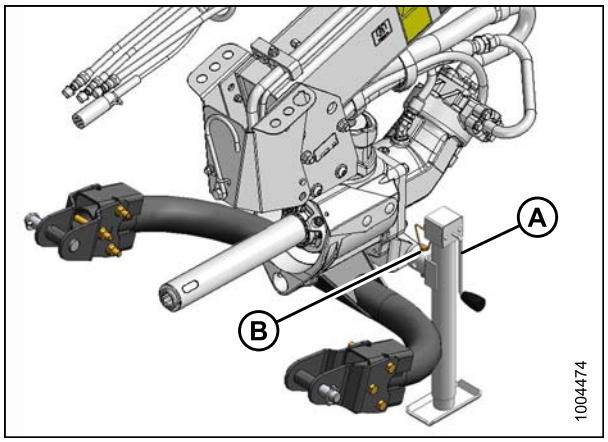


Figure 5.58

8. Pull back collar on driveline (A) and slide coupler off tractor power take-off (PTO).

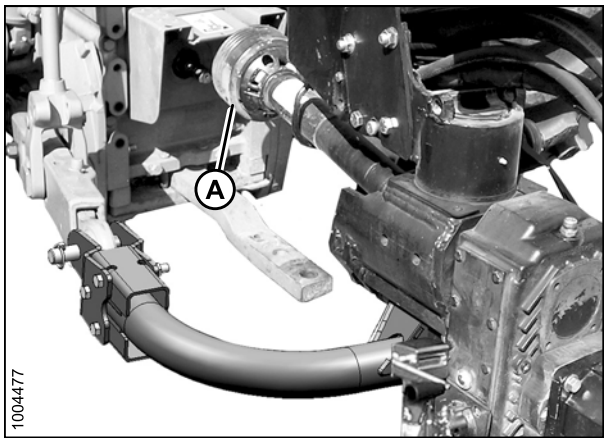


Figure 5.59

9. Rotate hook (A) to lower position and position driveline in hook.
10. Lower jack (B) to raise the hitch and take weight off hitch arms.

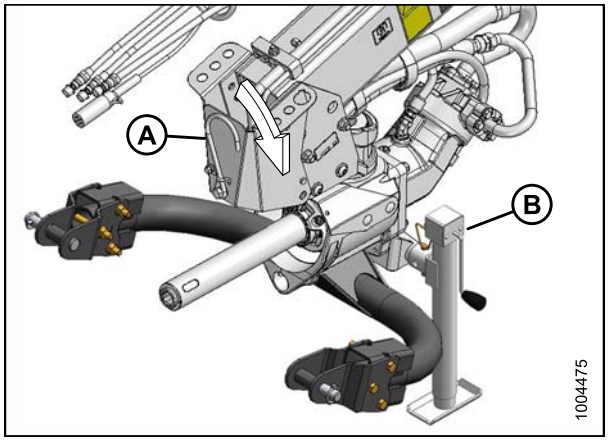


Figure 5.60

11. Remove lynch pins and remove pins (A).

    NOTE: If tractor is equipped with a quick hitch system, pins (A) do not need to be removed.

12. Swing hitch arms (B) clear of hitch.
13. Replace pins (A) in mower conditioner hitch.
14. Slowly drive tractor away from mower conditioner.

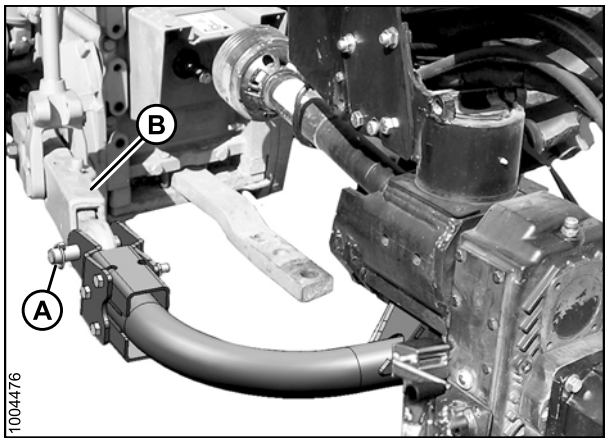


Figure 5.61

5.10 Engaging the Power Take-Off (PTO)

DANGER

Be sure all bystanders are clear of the machine before engaging the PTO. Never leave tractor seat with the PTO engaged.

1. Engage the PTO slowly, just before the mower conditioner is moved up to the standing crop.
2. Be sure tractor PTO is running at 1000 rpm before starting to cut.
3. Disengage the PTO when not operating the mower conditioner.
4. To prevent pump cavitation, run machine at low tractor idle for approximately 10 minutes when ambient temperature is 50°F (10°C) or less.

5.11 Raising and Lowering the Mower Conditioner

The mower conditioner raise/lower control is not normally used to control cutting height since cutting is usually performed with the cutterbar on the ground.

This control is used to raise the mower conditioner to clear obstacles and windrows during field operation, to adjust the mower conditioner height for maintenance and to raise the mower conditioner for transport behind a tractor or for storage.

DANGER

Be sure all bystanders are clear of the machine before raising or lowering mower conditioner.

Raise or lower mower conditioner by activating the cylinder control lever (A) in tractor:

- Move lever forward to position (B) to lower mower conditioner.
- Move lever backward to position (C) to raise mower conditioner.

IMPORTANT

Hoses should be connected so that moving control lever (A) backward raises the mower conditioner. See Section 5.8.3 Connecting the Hydraulics, page 51 for more information.

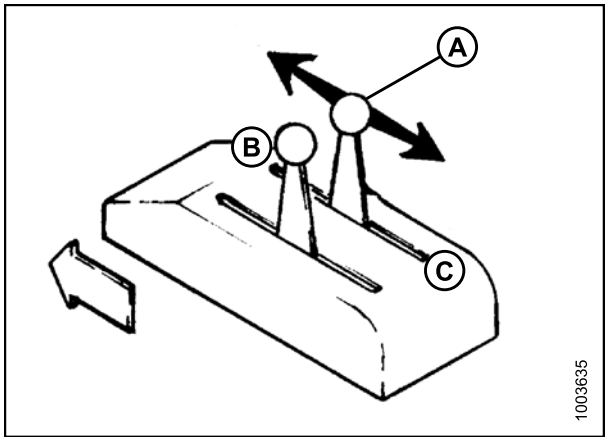


Figure 5.62

5.12 Break-in Period

After attaching the mower conditioner to the tractor for the first time, operate the machine slowly for 5 minutes, watching and listening from the tractor seat for binding or interfering parts.

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

CAUTION

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

NOTE: Perform the items specified in Section 8.6.2 Break-In Inspections, page 141.

5.13 Leaving the Tractor

CAUTION

Complete the following steps before leaving the tractor seat for any reason:

1. Park on level ground if possible.
2. Lower the mower conditioner fully.
3. Place all controls in NEUTRAL or PARK.
4. Disengage the power take-off (PTO).
5. Engage the park brake.
6. Stop engine and remove key from ignition.
7. Wait for all movement to stop.
8. Lock tractor anti-vandalism covers and closures when leaving the machine unattended.

5.14 Maneuvering/Steering the Mower Conditioner

IMPORTANT

The valve on the hitch (A) must be in the working or open position (handle in-line with hitch) for the steering system to be operational.

Steering is controlled by the tractor's remote hydraulic system. The articulated power turn (APT) hitch provides the Operator with the ability to

- move the mower conditioner into field position easily
- make right angle turns in either direction
- steer around objects on both sides
- perform straight line field cutting on either side of the tractor

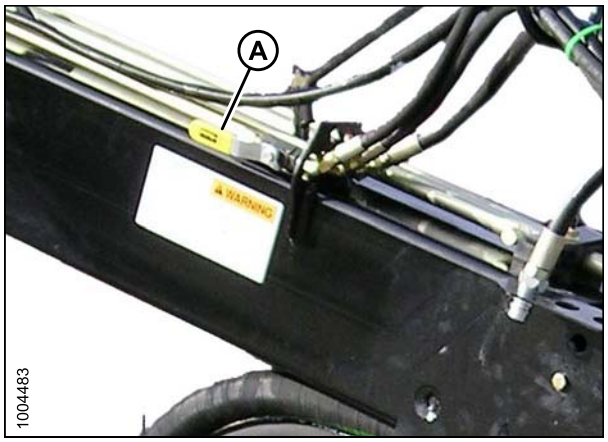


Figure 5.63

IMPORTANT

Hoses should be connected so that

- **moving tractor steering control lever (A) forward steers the mower conditioner to the right**
- **moving the lever (A) backward steers the mower conditioner left**

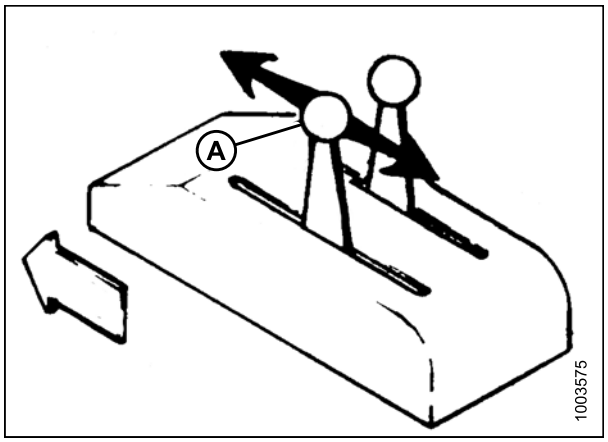


Figure 5.64: Steering control lever positions

IMPORTANT

The control lever (A) is operated momentarily for steering and must be returned to OFF or NEUTRAL position as soon as the mower conditioner reaches the desired path of travel.

5.14.1 Right-side Operation

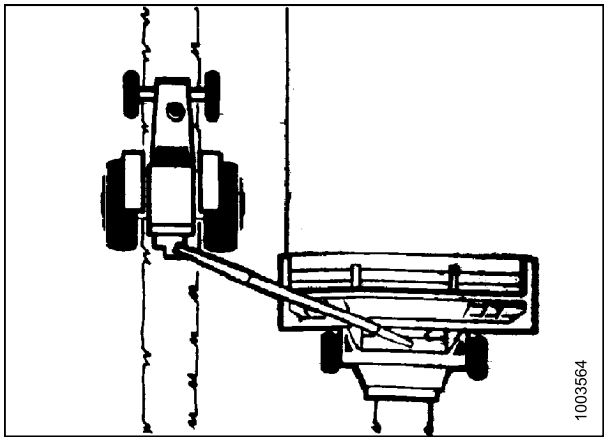


Figure 5.65: Right-side operation

Move the steering lever (A) **forward** to achieve the desired position of mower conditioner on the right side of tractor.

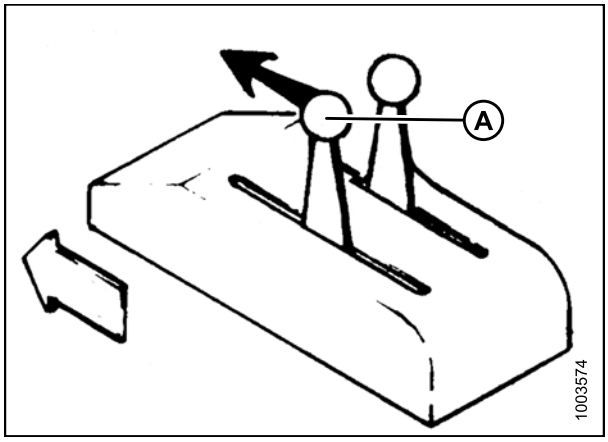


Figure 5.66: Steering lever forward

5.14.2 Left-side Operation

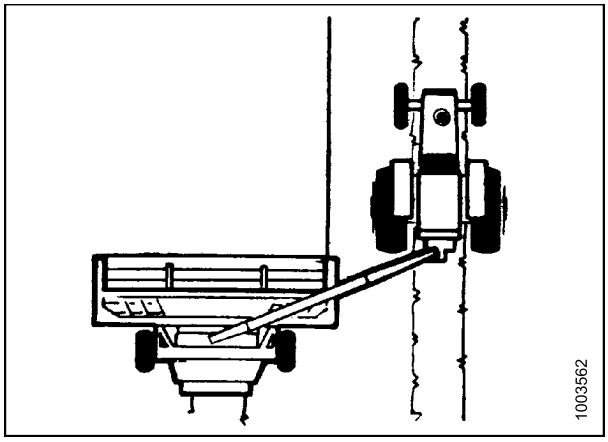


Figure 5.67: Left-side operation

Move the steering lever (A) **backward** to achieve desired position of mower conditioner on the left side of tractor.

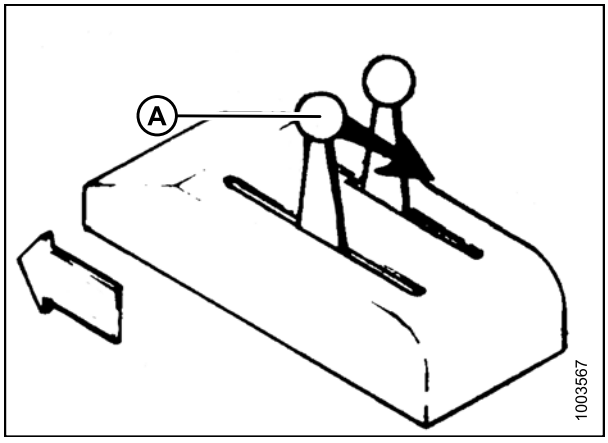


Figure 5.68: Steering lever backward

5.14.3 Avoiding Obstacles

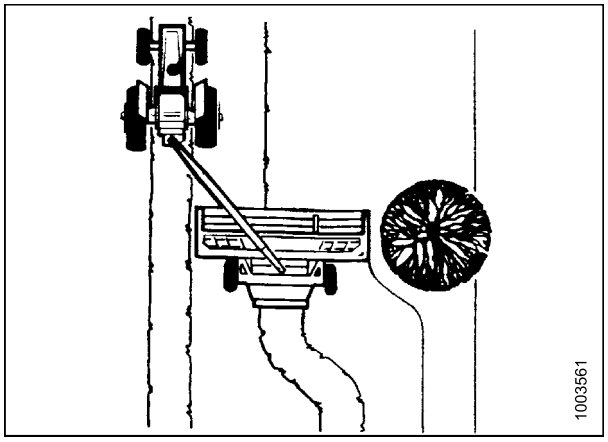


Figure 5.69: Avoid obstacles

Move the tractor control steering lever (A) as required to avoid obstacles:

- Forward to have the mower conditioner on the right side of the tractor
- Backward to have the mower conditioner on the left side of the tractor

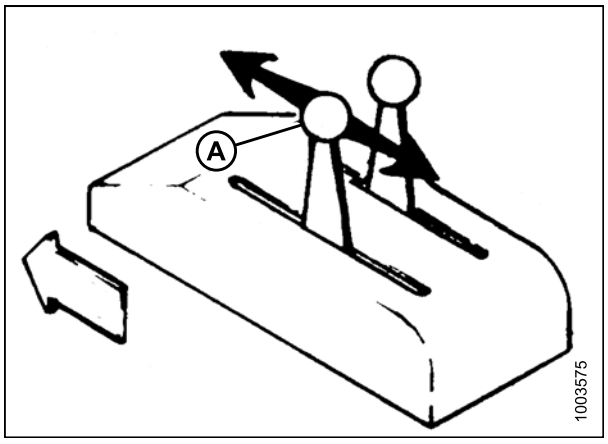


Figure 5.70: Move lever as required

5.14.4 Turning Square Corners

The following procedure is intended only as a guide to developing a turning procedure for the tractor being used. Specific distances are not given due to the variances in tractor maneuverability.

1. As the tractor approaches the corner, guide the tractor sharply away from the crop. Steer the mower conditioner to maintain a straight cut ahead as the tractor moves away from the crop.
2. As soon as the mower conditioner cuts past where the new corner will be, raise the mower conditioner sufficiently for skid shoes to clear the ground, then steer the mower conditioner to the extreme direction away from the uncut crop.
3. As the tractor passes the corner, steer it sharply back towards the uncut crop, taking care that the inside tractor tire does NOT contact the hitch.
4. Guide the tractor to straddle the last cut windrow. As the mower conditioner finishes turning, steer it back towards the uncut crop, align the mower conditioner with the crop edge, and lower mower conditioner to cutting height.

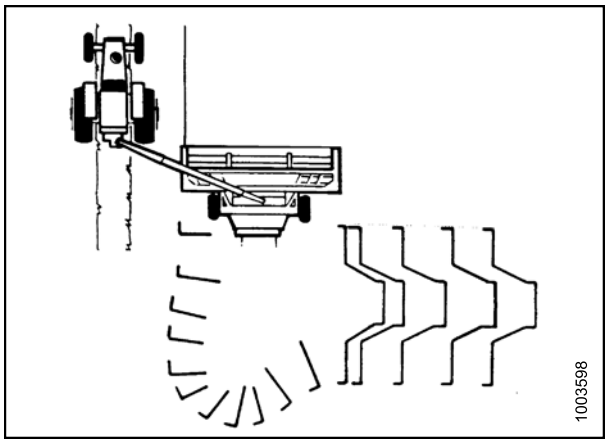


Figure 5.71: Square corners

5.14.5 Performing a 180-Degree Turn

NOTE: When cutting back and forth on one side of the field, approximately 50 ft. (15 m) is required at each end of the field to make a 180-degree turn-around.

1. Beginning at position (A), the tractor is guided away from the uncut crop, while the mower conditioner is guided straight ahead until cutting through the end.
2. As soon as the mower conditioner cuts through, raise the mower conditioner to lift the skid shoes clear of the ground, and steer the mower conditioner to the extreme direction away from the uncut crop.

   NOTE: For ease of operation, both levers can be activated with one hand, and held until steering cylinder completes its stroke.

3. At position (B), start turning the tractor back towards the uncut crop.

IMPORTANT

When turning, take care that the inside tractor tire does NOT contact the mower conditioner hitch.

1. In positions (C) and (D), continue turning towards the uncut crop, (with the mower conditioner steered towards the outside of the turning circle), being aware of hitch-to-tire clearance.
2. At position (E), the tractor completes the circle, and the front wheels are turned to straddle the last cut windrow. At this point, steer the mower conditioner to line up with the edge of the uncut crop.
3. At position (F), lower mower conditioner to cutting height, and begin a new cut through the field.

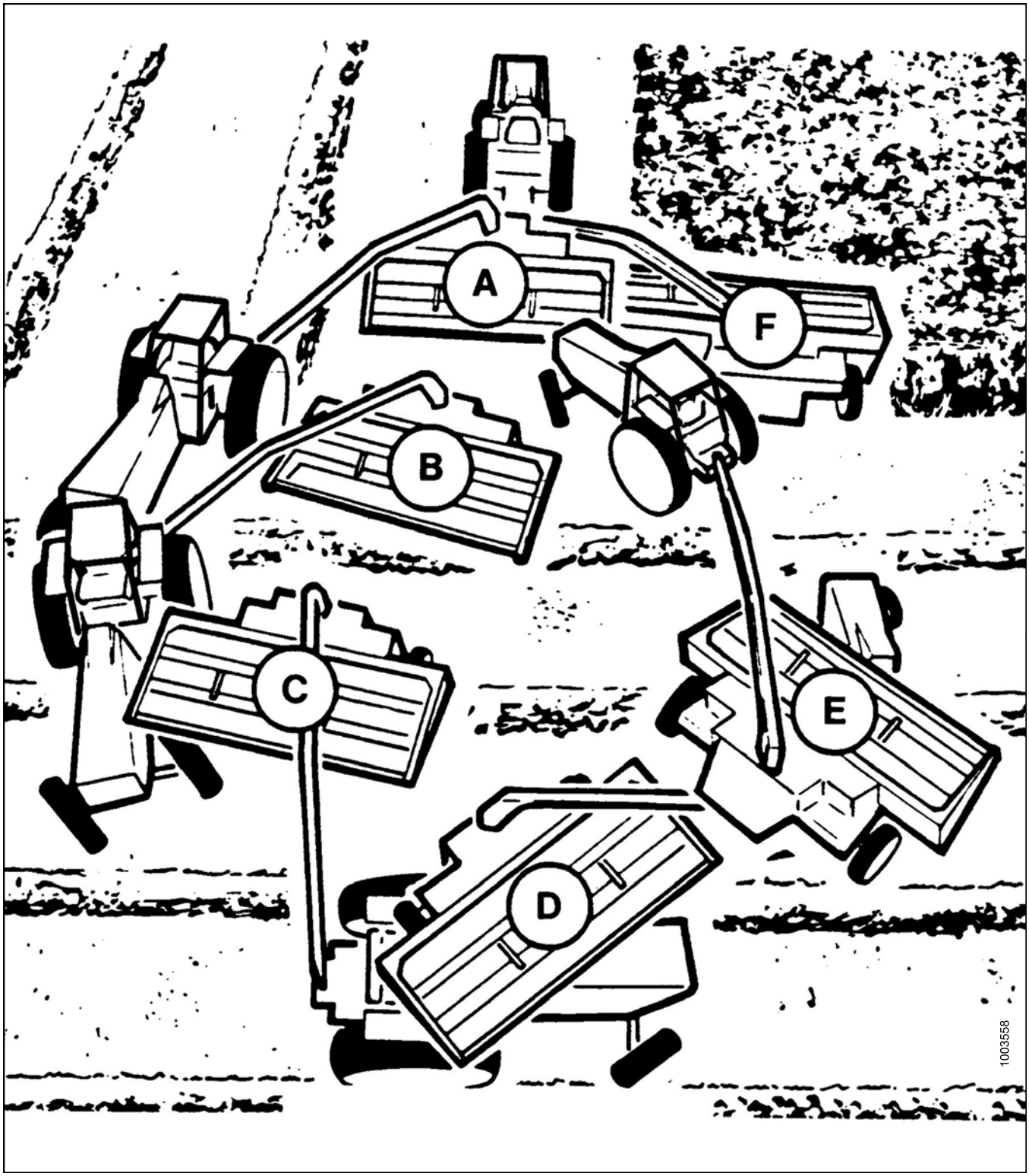


Figure 5.72: 180-degree turn

6 Transporting the Mower Conditioner

The R85 Mower Conditioner can be transported on public roads by towing with a tractor or a truck. Proceed to Section 6.1 Transporting with a Tractor, page 69 or Section 6.2 Transporting with a Truck, page 71.

CAUTION

- **Be aware of roadside obstructions, oncoming traffic, and bridges.**
- **Travel speed should be such that complete control and machine stability are maintained at all times. Do NOT exceed 20 mph (32 km/h). Reduce speed for corners and slippery conditions.**
- **When transporting on roads, use tractor lights and mower conditioner flashing amber and red tail-lights to provide adequate warning to operators of other vehicles.**
- **Do NOT transport the mower conditioner on a road or highway at night or in conditions which reduce visibility such as fog or rain.**

6.1 Transporting with a Tractor

If the mower conditioner is in Transport Mode, proceed as follows. Otherwise, see Section 6.4 Preparing Mower Conditioner for Transport, page 74.

1. Hookup mower conditioner to tractor. See Section 5.8 Mower Conditioner/Tractor Hookup, page 47 for details on attaching the mower conditioner to the tractor.

   NOTE: The hydraulic hoses do not need to be attached to the tractor for towing. Ensure they are securely stored on the hitch (A).

   NOTE: The power take-off (PTO) does not need to be attached for towing purposes.

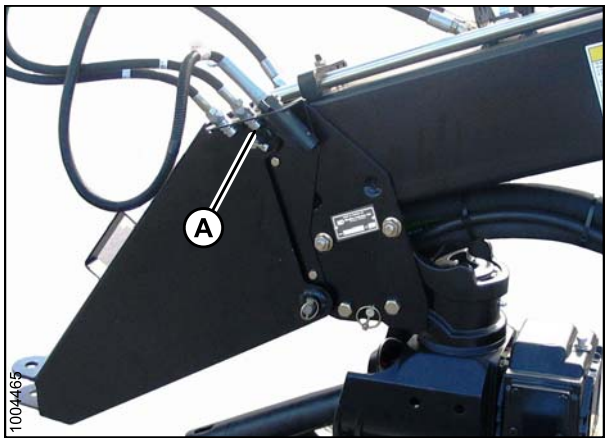


Figure 6.1

2. If not attached, store driveline (B) on hook (A) and remove forward half (C) of driveline. Store forward half in cab for transport.

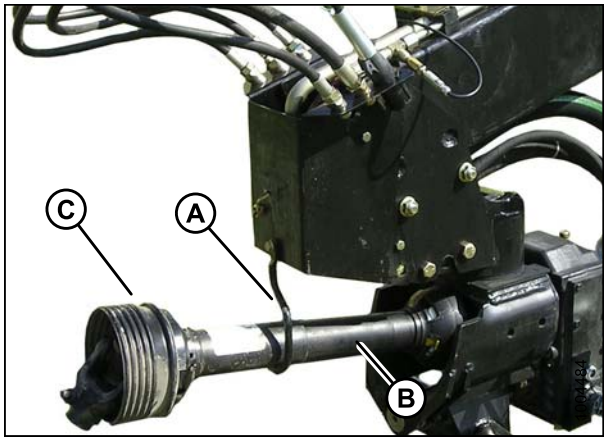


Figure 6.2

3. Ensure that hitch safety chain (A) is properly attached to towing vehicle. Provide only enough slack in chain to permit turning.

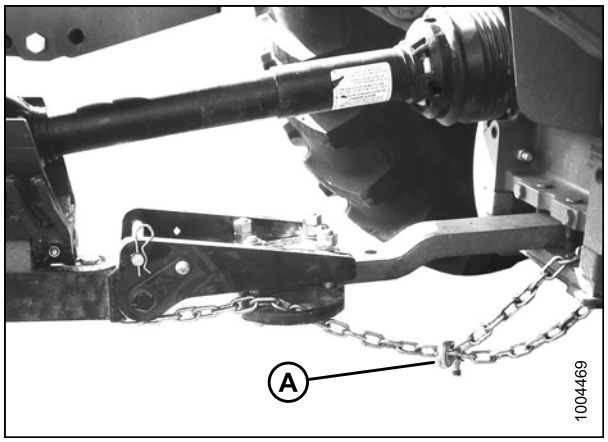


Figure 6.3

4. Ensure that electrical connector (A) is attached to tractor.

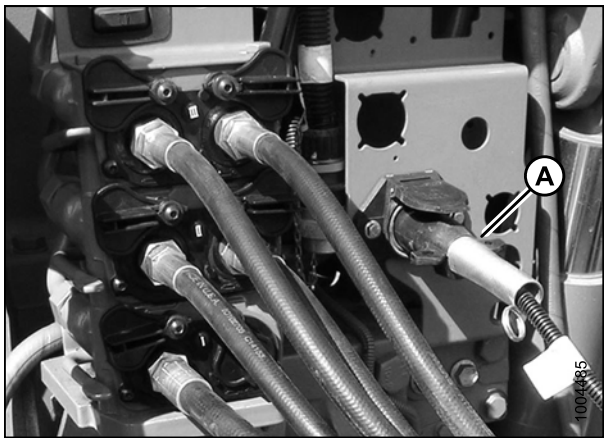


Figure 6.4

5. Check local laws for width regulations and lighting or marking requirements before transporting on roads.
6. Do NOT exceed 20 mph (32 km/h).

6.2 Transporting with a Truck

CAUTION

Do NOT tow with a vehicle weighing less than 7500 lb. (3400 kg). Ensure that the capacity of the towing vehicle is sufficient to maintain control.

If the mower conditioner is in Transport Mode, proceed as follows. Otherwise, see Section 6 Transporting the Mower Conditioner, page 69.

1. Store hydraulic hoses (A) on the articulated power turn (APT) hitch.

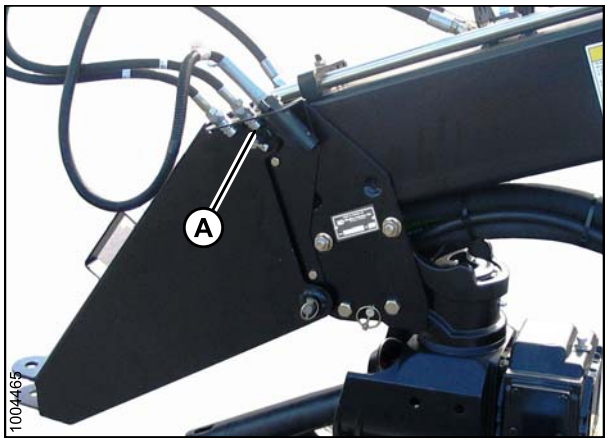


Figure 6.5

2. Place driveline (B) in hook (A).
3. Remove the forward half of driveline (C) and store in truck for transport.

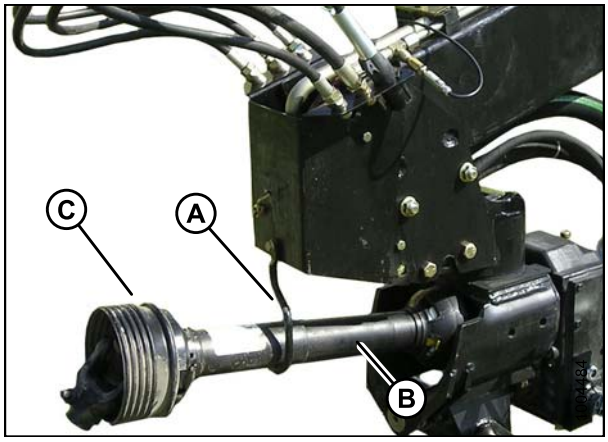


Figure 6.6

4. Position towing adapter (A) on hitch, and secure with pins (B).
5. Attach mower conditioner to truck.

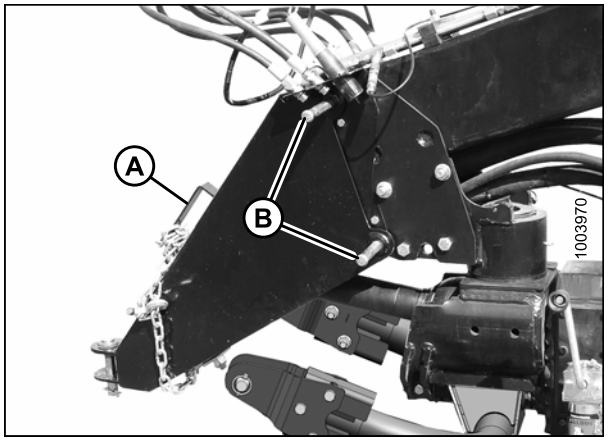


Figure 6.7

6. Remove jack (A) from working position and store on hitch. Secure with pin (B).

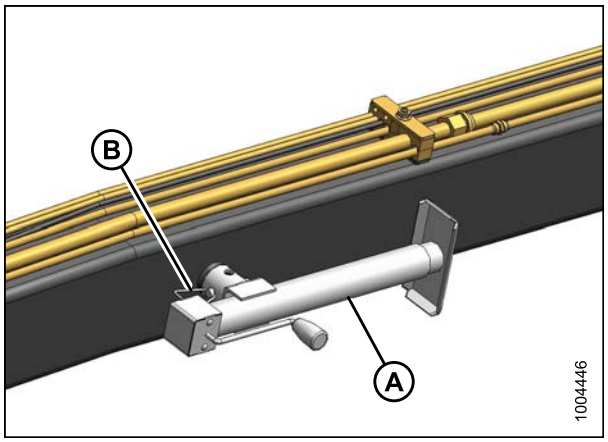


Figure 6.8

7. Wrap safety chain around hitch and attach to truck frame (A).
8. Connect electrical harness (B).
9. Check local laws for width regulations and lighting or marking requirements before transporting on roads.
10. Do not exceed 20 mph (32 km/h).

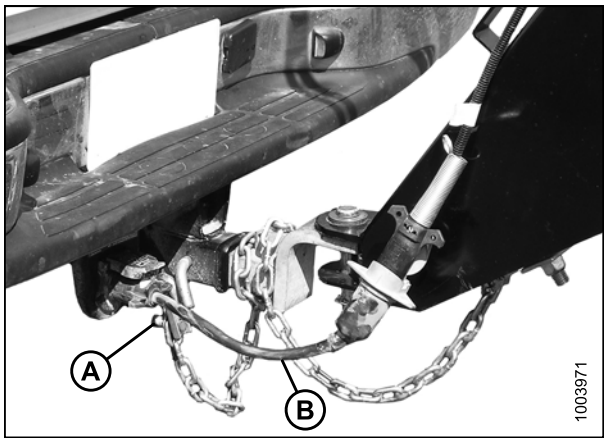


Figure 6.9

6.3 Transport Lighting

The mower conditioner is equipped with two amber lights (A) located on the extremities of the mower conditioner that also function as flashing hazard lights and turn signals.

Red tail lights (B) are located at the rear of the carrier frame and also function as brake lights. Refer to Section 5.8.4 Connecting the Electrical, page 53 for connection details for your tractor.

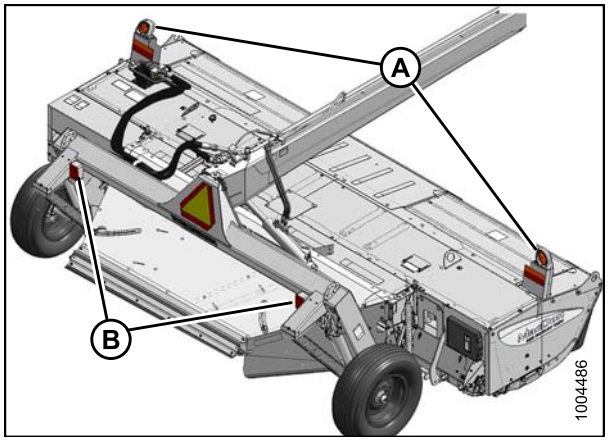


Figure 6.10

6.4 Preparing Mower Conditioner for Transport

1. Charge the steering circuit as follows:
   a. Connect the two hitch steering cylinder hoses to a tractor hydraulic circuit.
   b. Steer the mower conditioner completely to the left, then right. Repeat three or four times.
2. Steer the mower conditioner so that it is centered behind the towing vehicle.
3. Close the steering lock-out valve (A) on the hitch.

Figure 6.11

4. Raise the mower conditioner fully and engage both lift cylinder lock-out valves (A).

WARNING

- **Do NOT tow unless the steering cylinder is fully charged. If steering cylinder is not fully charged, loss of control can result in injury or death.**
- **Use the temporary transport lock pin if machine must be towed without a fully charged steering cylinder.**

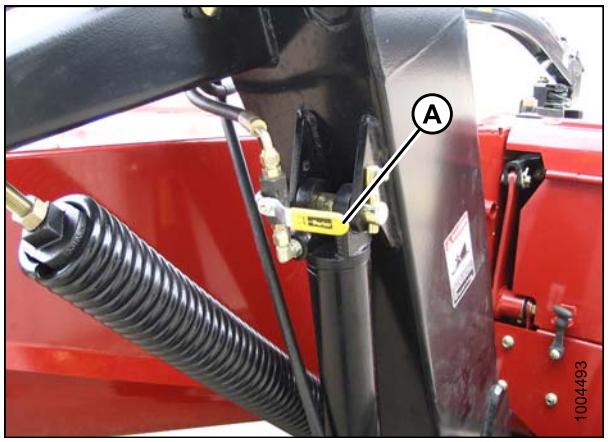


Figure 6.12

5. If steering cylinder is not fully charged, install temporary transport lock pin as follows. Otherwise, proceed to storing the jack for transport.

6. Remove transport lock pin from storage at the aft end of the hitch.

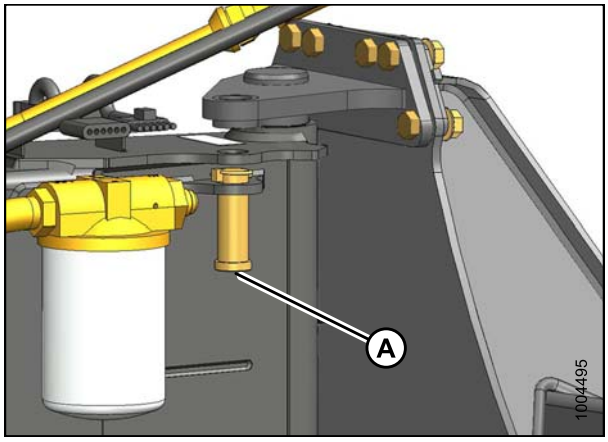


Figure 6.13

7. Line up holes in hitch and frame and install transport lock pin (A).
8. Secure with lynch pin (B).

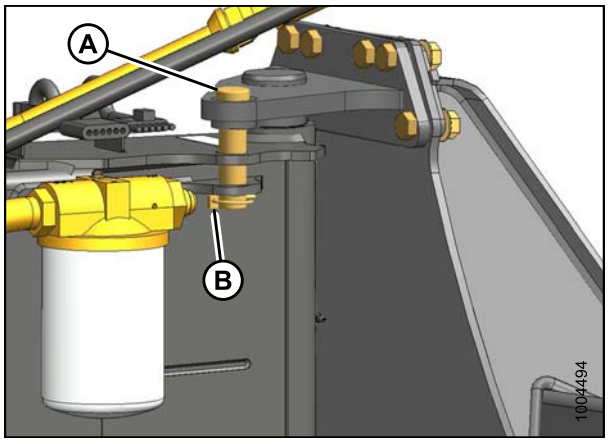


Figure 6.14

9. Check that jack (A) is properly attached in storage position on hitch and secured with pin (B).
10. Ensure tires are properly inflated.
11. Keep slow moving vehicle (SMV) sign, reflectors, and lights clean and visible at rear of mower conditioner.

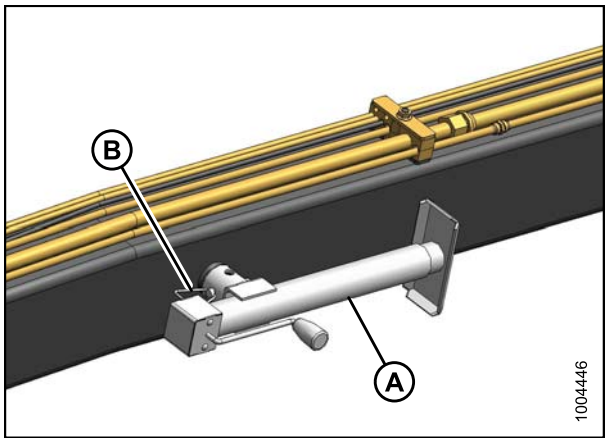


Figure 6.15

6.5 Loading onto a Flatbed Trailer

Follow these steps to load the mower conditioner on a flatbed trailer:

CAUTION

Use the following procedure when transporting the mower conditioner on a flatbed trailer.

1. Lower the mower conditioner to the ground and engage lift cylinder lock-out valves (A).

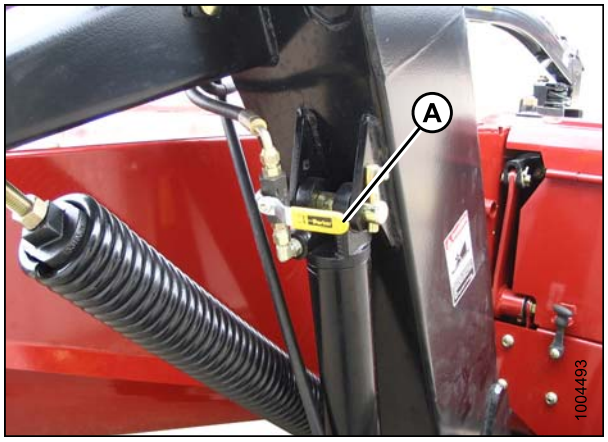


Figure 6.16

2. Retract mower conditioner angle control link (A) to minimum length.
3. Unhook tractor from mower conditioner. See Section 5.9 Disconnecting the Mower Conditioner from a Tractor, page 54.

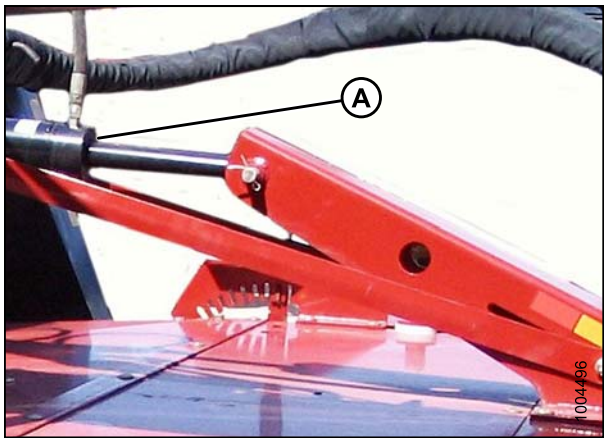


Figure 6.17

4. Remove pin (A) attaching steering cylinder (B) at frame and swing cylinder under hitch. Store pin in barrel end of cylinder.

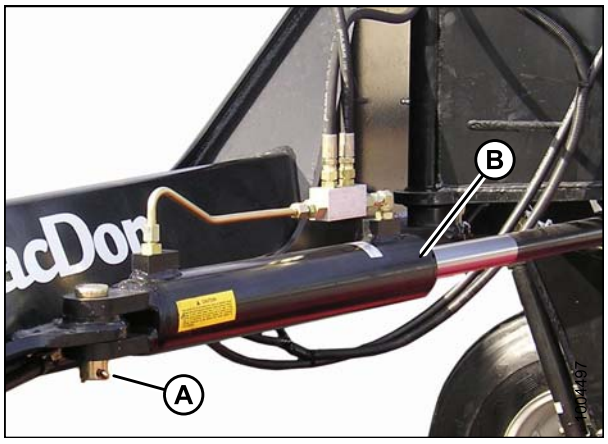


Figure 6.18

5. Secure cylinder (A) to hitch with shipping wire (B) or equivalent.

IMPORTANT

Ensure shipping wire (B) is NOT over the hydraulic lines (C).

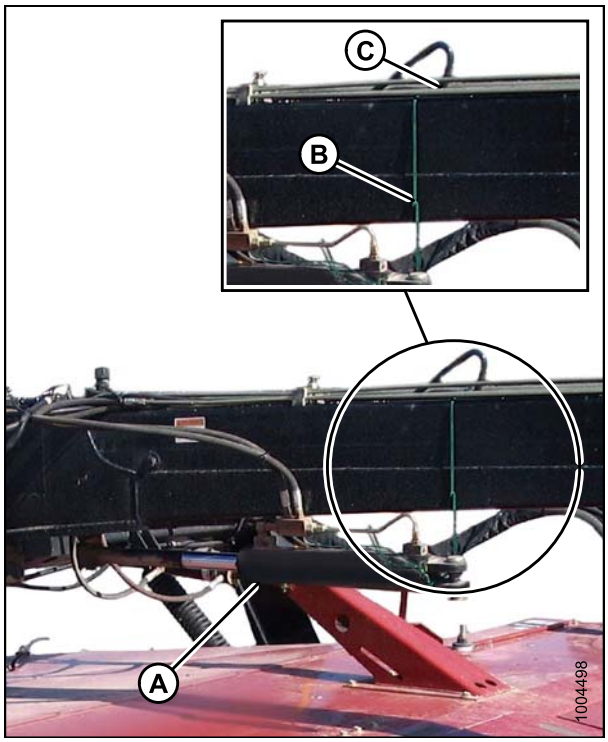


Figure 6.19

6. Attach a chain to front of articulated power turn (APT) hitch (A) and the other end to a forklift (or equivalent).
7. Lift front of APT hitch (A) and slowly swing hitch aft until it is approximately parallel with carrier frame. Lower hitch and remove chain.

IMPORTANT

Ensure hoses on carrier frame are free to move when hitch is moved to transport position.

Figure 6.20

8. Tie hitch to frame backtube with shipping wire (or equivalent).

IMPORTANT

Ensure shipping wire (A) is NOT over the hydraulic lines (B).

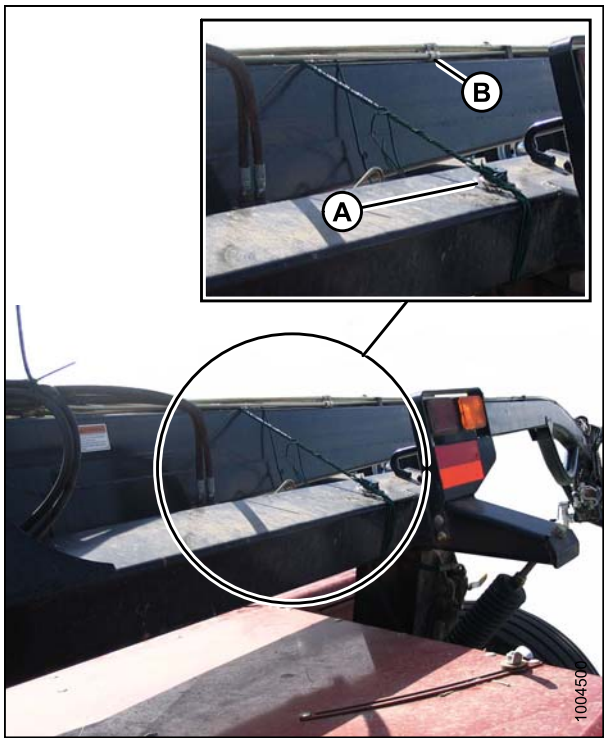


Figure 6.21

9. Locate two lifting slings (A) around APT hitch and frame approximately as shown and attach to forklift with chains.

   NOTE: Adjust position of slings so that mower conditioner is lifted evenly.

Figure 6.22

CAUTION

To avoid injury to bystanders from being struck by machinery, do NOT allow people to stand in loading area.

CAUTION

Equipment used for unloading must meet or exceed the requirements listed in Section 6.1 Lifting vehicle specifications, page 79 and Section 6.2 Chain specifications, page 79. Using inadequate equipment may result in chain breakage, vehicle tipping, or machine damage.

Table 6.1 Lifting vehicle specifications

Lifting vehicle	
Minimum capacity	8000 lb. (3630 kg)
Minimum lifting height	15 ft. (4.5 m)

Table 6.2 Chain specifications

Chain	
Overhead lifting quality (1/2 in.)	5000 lb. (2270 kg) minimum working load

10. Lift mower conditioner slightly to take weight off hitch.
11. Remove jack from working position and move to storage location (A) on hitch. Secure with pin (B).

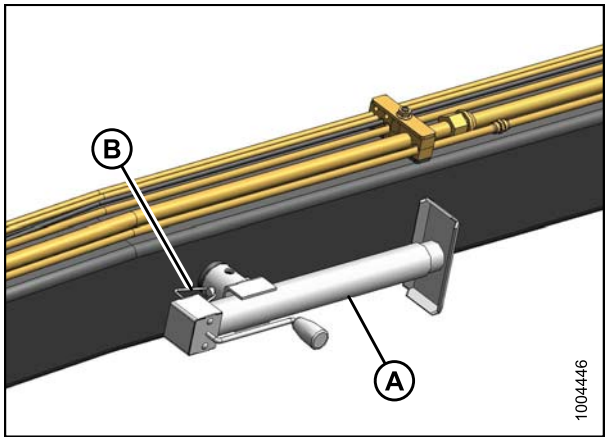


Figure 6.23

12. Slowly drive to flatbed and raise mower conditioner.
13. Lower mower conditioner onto flatbed. Blocking is not required. Remove slings from mower conditioner.

Figure 6.24

14. Secure mower conditioner to flatbed with straps.

Figure 6.25

6.6 Unloading from a Flatbed Trailer

Follow these steps to unload the mower conditioner from a flatbed trailer:

1. Remove tie downs.
2. Approach mower conditioner from backside with forklift.
3. Locate two lifting slings (A) around hitch and frame approximately as shown and attach to forklift with chains.

   NOTE: Adjust position of slings so that mower conditioner is lifted evenly.

Figure 6.26

CAUTION

To avoid injury to bystanders from being struck by machinery, do NOT allow persons to stand in loading area.

CAUTION

Equipment used for unloading must meet or exceed the requirements specified in Section 6.3 Lifting vehicle specifications, page 81 and Section 6.4 Chain specifications, page 81. Using inadequate equipment may result in chain breakage, vehicle tipping, or machine damage.

Table 6.3 Lifting vehicle specifications

Lifting vehicle	
Minimum capacity	8000 lb (3630 kg)
Minimum lifting height	15 ft. (4.5 m)

Table 6.4 Chain specifications

Chain	
Overhead lifting quality (1/2 in.)	5000 lb. (2270 kg) minimum working load

4. Lift mower conditioner off flatbed and back away slowly.
5. Lower mower conditioner to slightly above ground.

Figure 6.27

6. Remove jack (A) from storage location on hitch.

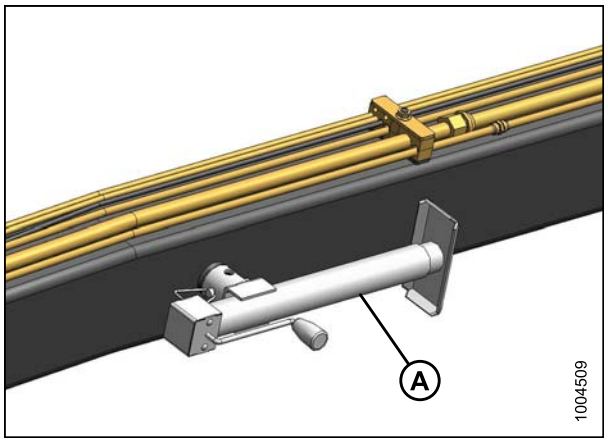


Figure 6.28

7. Install jack (A) at working position at front of hitch.
8. Lower mower conditioner to ground and remove slings.

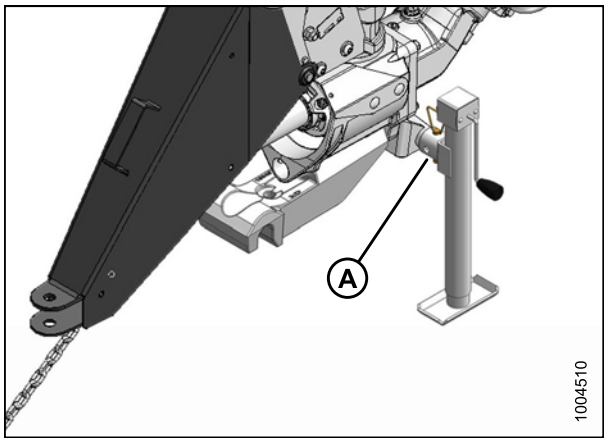


Figure 6.29

9. Cut shipping wire (A) securing hitch to carrier frame.

Figure 6.30

10. Attach a chain to front of hitch (A) and other end to a forklift (or equivalent).

IMPORTANT

Ensure hoses on carrier frame are not pinched when hitch is moved to working position.

11. Lift front of hitch and slowly swing hitch forward until it is approximately perpendicular to carrier frame. Lower hitch and remove chain.

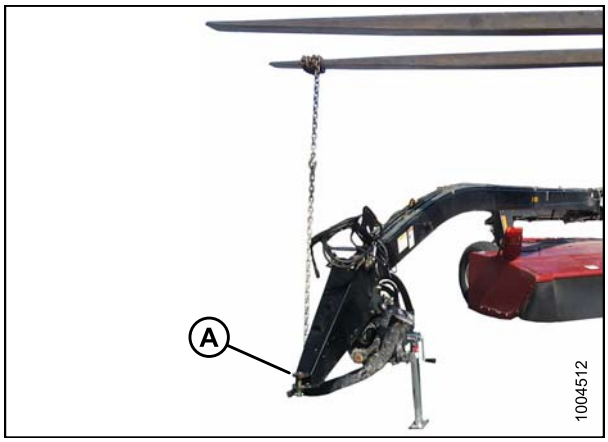


Figure 6.31

12. Cut shipping wire securing steering cylinder (A) to hitch. Swing cylinder to attachment bracket (B) on frame.

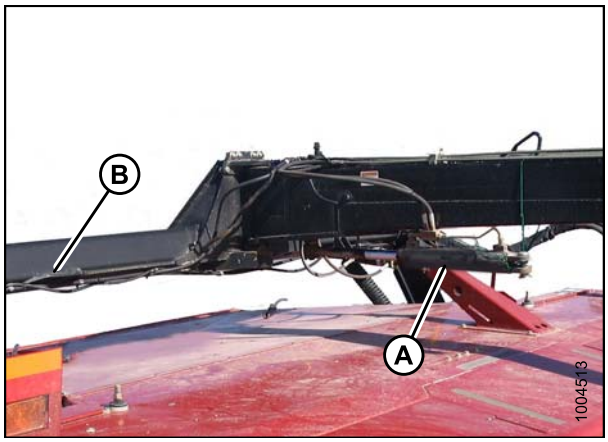


Figure 6.32

13. Remove pin (B) from cylinder (A).
14. Align yoke on cylinder with attachment bracket (C) and install pin (B). Secure with cotter pin.
15. Attach mower conditioner to tractor or towing vehicle.

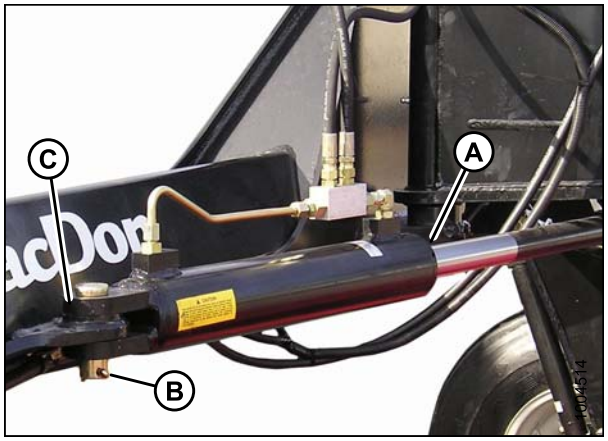


Figure 6.33

7 Operating the Mower Conditioner

Satisfactory operation of the mower conditioner 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 mower conditioner. 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
mower conditioner float	7.1 Float, page 85
Roll gap	7.2 Roll Gap, page 87
Roll tension	7.3 Roll Tension, page 90
Roll timing	7.4 Roll Timing, page 91
Forming shields	7.5 Forming Shields, page 93
mower conditioner angle	7.6 Mower Conditioner Angle, page 96
Cutting height	7.7 Cutting Height, page 98
Ground speed	7.8 Ground Speed, page 99

7.1 Float

mower conditioner float springs are normally set so 95–105 lbf (426–471 N) is required to lift either end of the mower conditioner 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.

Other operating variable adjustments may affect float setting.

Check the float and readjust if necessary after adjusting cutting height or mower conditioner angle.

NOTE: If using a tractor with drawbar height different than 16 in. (406 mm), float will be affected. Adjust as required.

7.1.1 Adjusting the Float

IMPORTANT

Float setting (or lifting force) MUST be equal on both ends of the mower conditioner. Left and right ends require different spring lengths to achieve equal float at both ends.

Follow these steps to adjust the mower conditioner float:

1. Center mower conditioner directly behind the tractor.
2. Raise mower conditioner fully, shut off engine, and remove 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.

WARNING

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

3. Close lift cylinder lock-out valves (A).
4. Back jam nut (B) away from spring.
5. To increase float, turn adjuster bolt (C) clockwise (further into spring).
6. To decrease float, turn adjuster bolt (C) counterclockwise (out of spring).
7. Tighten jam nut (B) against spring insert to secure the setting.
8. Open lock-out valves (A).
9. Lower mower conditioner and check mower conditioner float at each end.

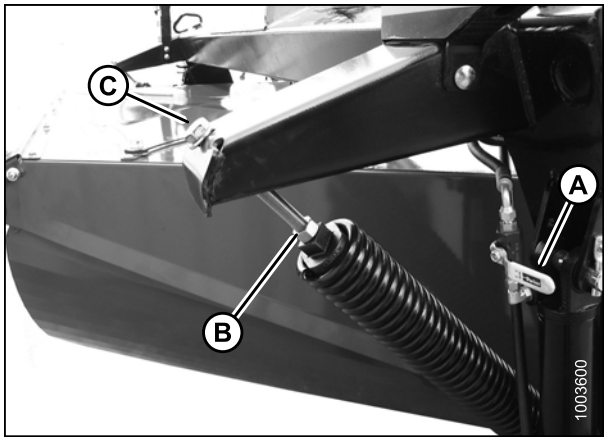


Figure 7.1

7.2 Roll Gap

Steel rolls condition the crop by crimping and crushing the stem in several places. This allows moisture to release for quicker drying. The degree to which the crop is conditioned as it passes through the rolls is controlled by roll gap that is factory-set at 1.0 in. (25 mm).

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

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

IMPORTANT

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

7.2.1 Checking the Roll Gap

Follow these steps to check the 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 mower conditioner fully.
2. Stop engine and remove key.
3. Open driveshield. See Section 5.4 Driveshields, page 32.

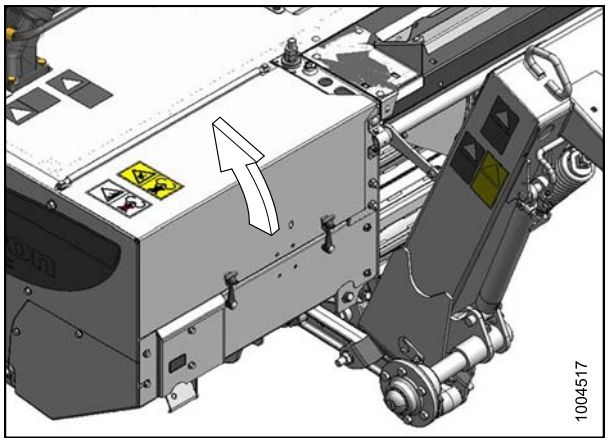


Figure 7.2

4. At each end of the rolls, loosen nuts (A), and slide cover (B) upwards to expose observation hole.

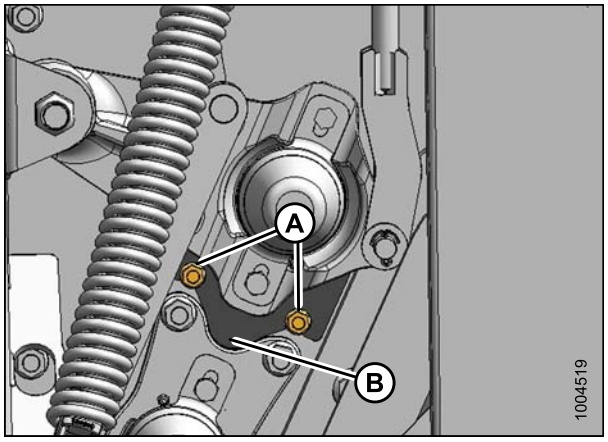


Figure 7.3

5. Check the gap (A) at each end of the rolls to verify setting and adjust as necessary.

IMPORTANT

Roll timing is critical when the roll gap is decreased because:

- **Conditioning is affected**
- **The bars may contact each other if the rolls are not properly timed. Refer to Section 7.4 Roll Timing, page 91.**

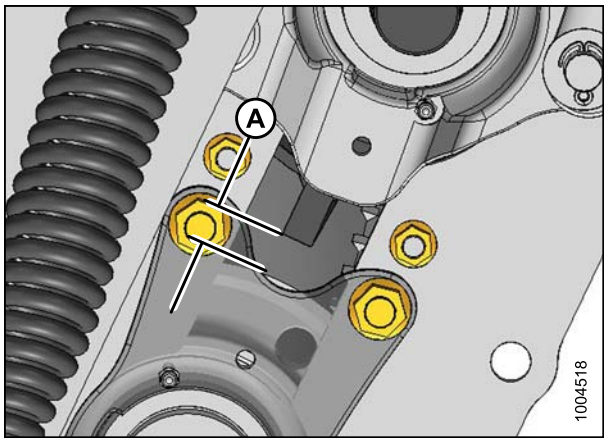


Figure 7.4

6. Reposition covers (B) and tighten nuts (A).
7. Close driveshield.

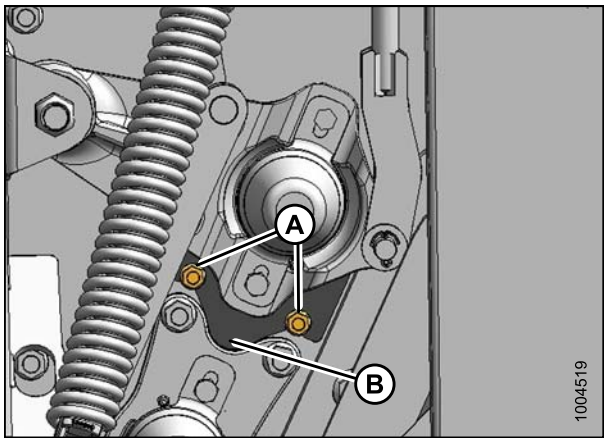


Figure 7.5

7.2.2 Adjusting the Roll Gap

Follow these steps to adjust the 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 mower conditioner fully.
2. Stop engine and remove key.
3. Loosen and back off upper jam nut (B) on both sides of conditioner.
4. Adjust the roll gap as needed.

   NOTE: The amount of thread (A) protruding through jam nut (B) should be 1-3/16 in. (30 mm). This equates to 1 in. (25 mm) of roll gap.

   a. To **INCREASE** roll gap, turn lower nut (C) clockwise.

   b. To **DECREASE** the roll gap, turn lower nut (C) counterclockwise.

   NOTE: When adjusting roll gap, be sure that the thread protruding (A) is the same on both sides of the conditioner roll to achieve a consistent gap across the rolls.

5. Tighten jam nuts (B) on both sides.

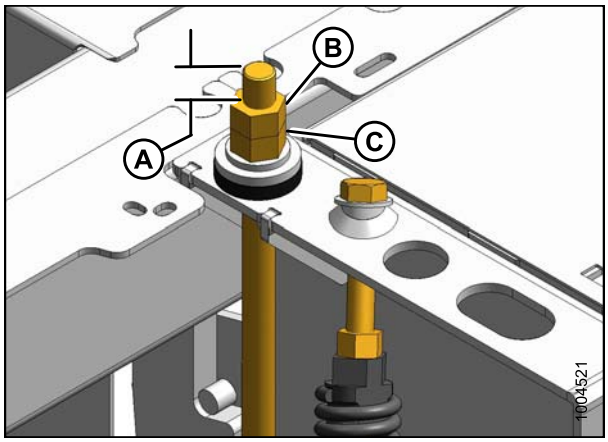


Figure 7.6

7.3 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.

7.3.1 Adjusting the Roll Tension

Follow these steps to adjust the 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.

1. Lower mower conditioner to ground, shut down mower conditioner, and remove key.
2. Open driveshield. See Section 5.4 Driveshields, page 32.

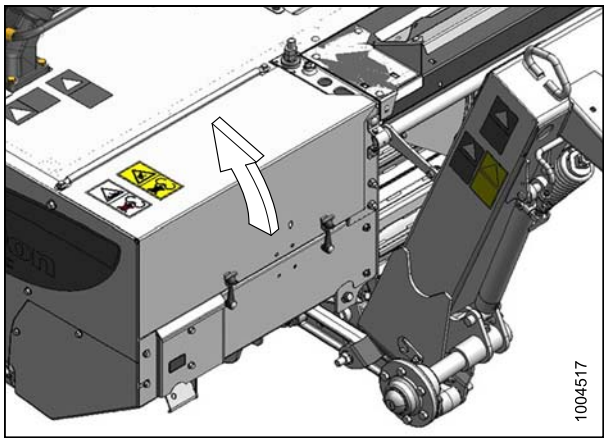


Figure 7.7

3. To **INCREASE** the roll tension, loosen jam nut (A) and turn the spring drawbolt (B) clockwise to tighten the spring (C).
4. Repeat above step for opposite end of roll.
5. To **DECREASE** the roll tension, turn the spring drawbolt (B) counterclockwise to loosen the springs.

IMPORTANT

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

6. Tighten jam nut (A) after adjusting tension.
7. Close driveshield.

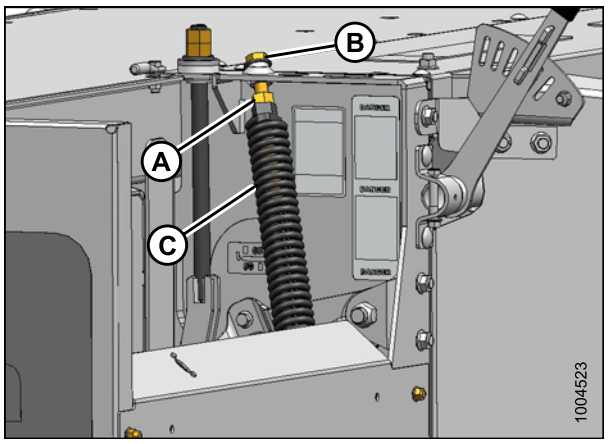


Figure 7.8

7.4 Roll Timing

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

IMPORTANT

Roll timing is critical when the roll gap is decreased because:

- **Conditioning is affected**
- **The bars may contact each other**

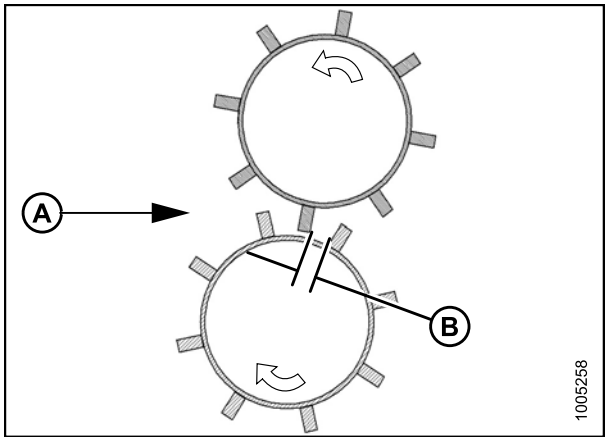


Figure 7.9

A - Crop flow **B - Roll gap**

7.4.1 Checking the Roll Timing

Follow these steps to check the 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.

1. Lower mower conditioner fully, stop engine, and remove key from ignition.
2. Open driveshield. See Section 5.4 Driveshields, page 32.

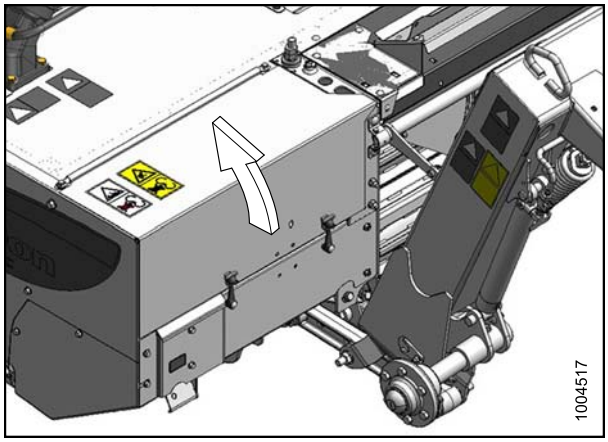


Figure 7.10

3. Examine roll timing at each end of the rolls with the mower conditioner fully lowered. Each steel bar on one roll should be centered between two bars of the other roll so that distance (B) is approximately equal on both sides of the bar. Refer to Section 7.2 Roll Gap, page 87.

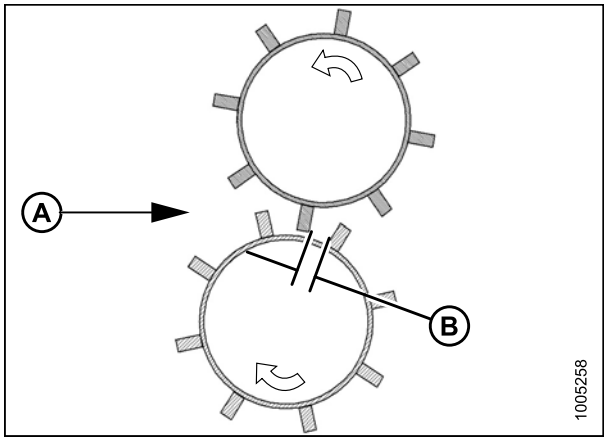


Figure 7.11

A – crop flow **B – roll timing distance**

7.4.2 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. Manually rotate upper roll until it stops. Make a mark on yoke flange to align with the center of one of the bolt heads (A).
3. Manually rotate upper roll in opposite direction until it stops. Make a second mark on yoke flange to align with the bolt.
4. Determine the center between the two marks and mark a third line on the yoke flange.
5. Rotate the upper roll until the bolt lines-up with the third line.
6. Tighten bolts (A) to secure the position. Torque to 70 lbf·ft (95 N·m).

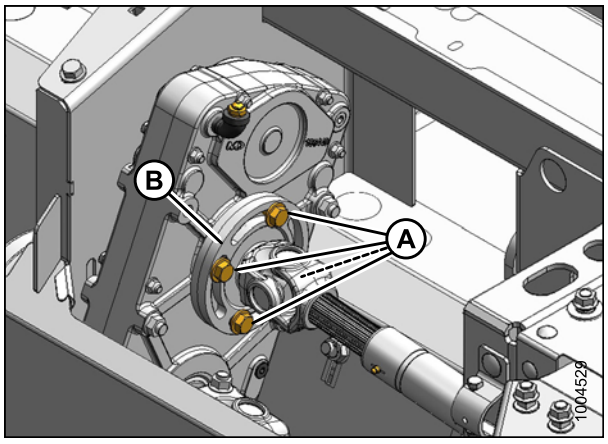


Figure 7.12

CAUTION

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

7.5 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 7.13 Haying Tips, page 118 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).

7.5.1 Adjusting the Side Deflectors

Adjust the side deflector shields as follows:

The position of the side deflector shields controls the width and placement of the windrow.

To ensure windrow placement is centered with respect to carrier wheels, adjust both side deflectors to the same position.

1. Loosen locking handle (A).
2. Move deflector (B) to desired position and tighten handle.
3. Repeat for other side.

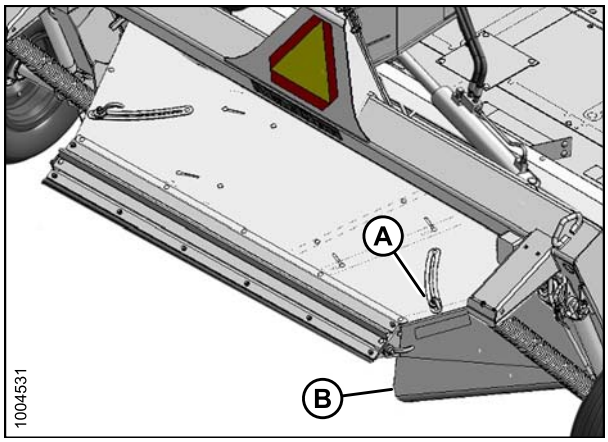


Figure 7.13

7.5.2 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.

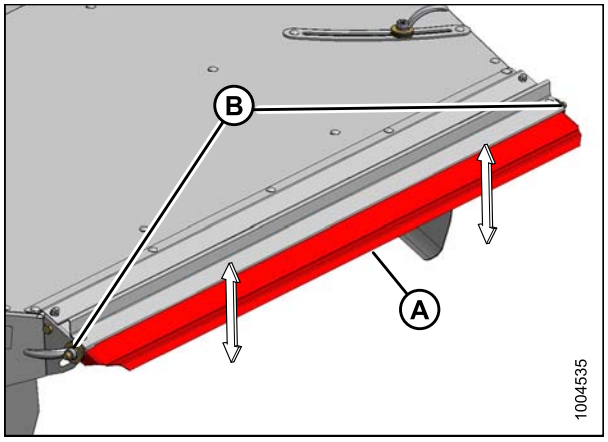


Figure 7.14

7.5.3 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

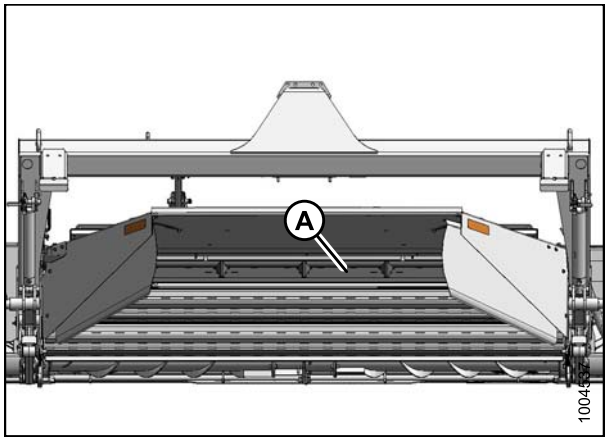


Figure 7.15

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.

Adjust the swath baffle as follows:

1. Remove hairpin from pin (A) and remove pin.
2. Move lever (B) to reposition swath baffle
   - forward to raise baffle
   - backward to lower baffle
3. Reinstall pin (A) through lever and bracket (C) and secure with hairpin.

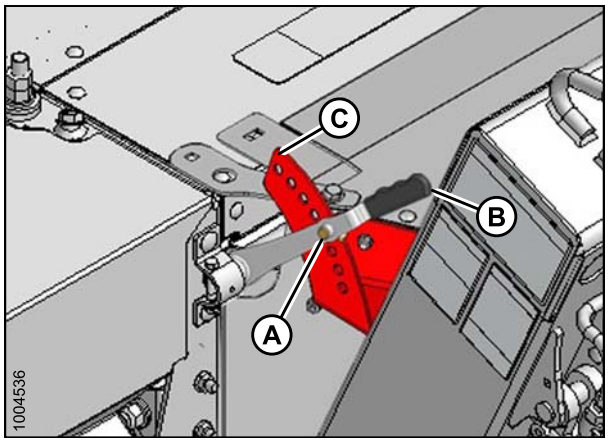


Figure 7.16

7.6 Mower Conditioner Angle

mower conditioner (or cutterbar) angle can be varied from 0–5° below horizontal with the mechanical center-link and 0–7° below horizontal with the hydraulic center-link.

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.

7.6.1 Adjusting Mower Conditioner Angle: Mechanical (if equipped)

Follow these steps to adjust mower conditioner angle on a mower conditioner with mechanical adjustment:

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 mower conditioner so that cutterbar is resting on the ground.
2. Loosen nut (A).
3. To decrease (flatten) mower conditioner angle, rotate the turnbuckle sleeve (B) so that the turnbuckle decreases in length.
4. To increase (steepen) mower conditioner angle, rotate the turnbuckle sleeve (B) so that the turnbuckle increases in length.
5. Snug up nut (A) but do not over-tighten. A slight tap with a small hammer is sufficient.

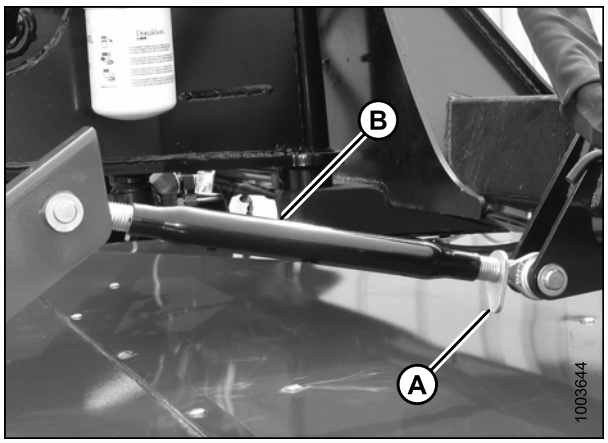


Figure 7.17

6. Check cutting height and adjust if required.
7. Check mower conditioner float and adjust if required. Refer to Section 7.1 Float, page 85.

7.6.2 Adjusting Angle: Hydraulic (if equipped)

The mower conditioner angle can be adjusted from the tractor without shutting down the mower conditioner.

1. To decrease (flatten) mower conditioner angle, operate tractor hydraulic control so that cylinder (C) retracts, moving the gauge (D) toward the GREEN zone (A).
2. To increase (steepen) mower conditioner angle, operate tractor hydraulic control so that cylinder (C) extends, moving the gauge (D) toward the RED zone (B).

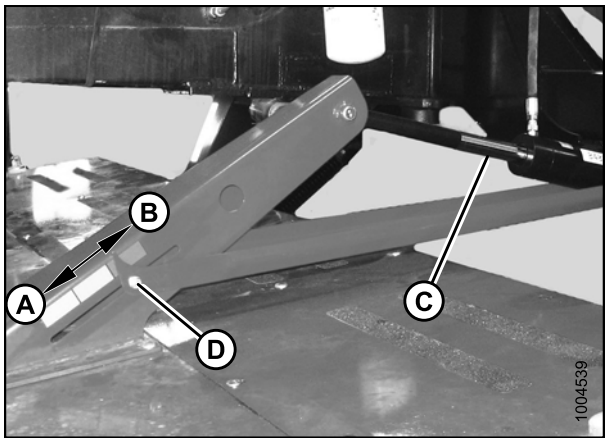


Figure 7.18

A - GREEN zone **B - RED zone**
C - cylinder **D - gauge**

7.7 Cutting Height

Cutting height is determined by a combination of the angle of the cutterbar/mower conditioner and the skid shoe settings.

Cutting height should be adjusted for optimum cutting performance without allowing excessive build-up of mud and soil inside the mower conditioner 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 7.6 Mower Conditioner Angle, page 96.

Optional adjustable skid shoes are available to also provide different cutting heights. Refer to Section 10 Options and Attachments, page 223.

- Lowering the skid shoes or decreasing mower conditioner 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 and increasing mower conditioner 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, mower conditioner 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.

7.7.1 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 lift cylinder lock-out valves before going under machine for any reason.

1. Raise mower conditioner fully, stop engine, and remove key.
2. Engage lift cylinder lock-out valves.
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 mower conditioner.
6. Check mower conditioner float as described in Section 7.1 Float, page 85.
7. Adjust mower conditioner angle to desired working position using the machine's mower conditioner angle controls. If angle is not critical, set it to mid-position. Refer to Section 7.6 Mower Conditioner Angle, page 96.

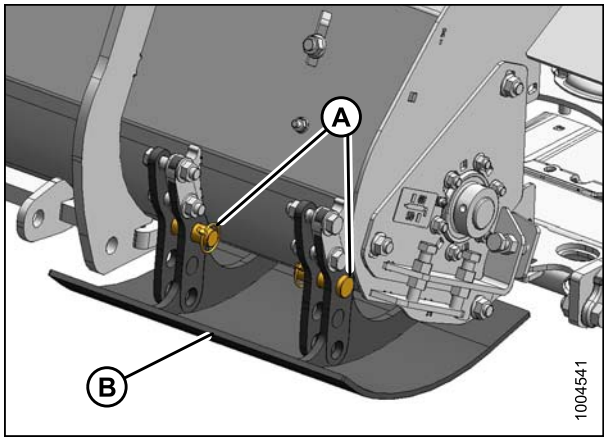


Figure 7.19

7.8 Ground Speed

CAUTION

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

Operate the power take-off (PTO) at rated speed.

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

In tough cutting conditions such as native grasses, the PTO speed will need to be maintained and ground speed decreased.

In light crops the PTO speed can be reduced. Reduce engine rpm and shift into a higher gear to maintain ground speed.

NOTE: Operating the mower conditioner at the minimum PTO speed will extend the wear life of components and save fuel.

The chart below indicates the relationship between ground speed and area cut for a 16-foot mower conditioner.

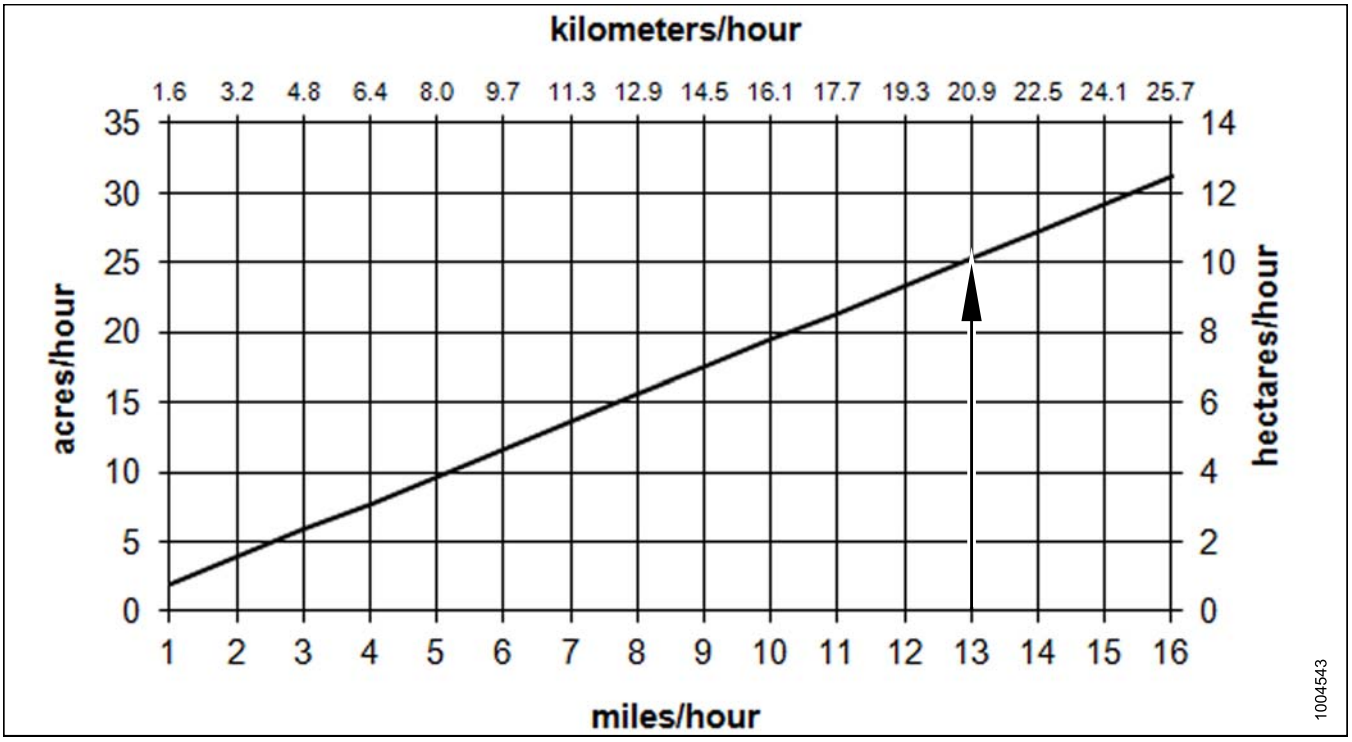


Figure 7.20: Ground speed

Example: At a ground speed of 13 mph (21 km/h) a 16-foot mower conditioner would cut approximately 25 acres (12 hectares) per hour.

7.9 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 mower conditioner.

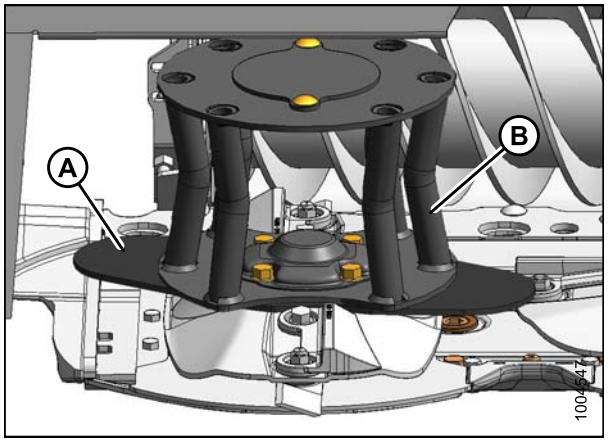


Figure 7.21

7.9.1 Installing Tall Crop Feed Plates

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 mower conditioner to the ground, shut off engine, and remove key from ignition.
2. Open cutterbar doors. Refer to Section 5.5 Cutterbar Doors, page 34.

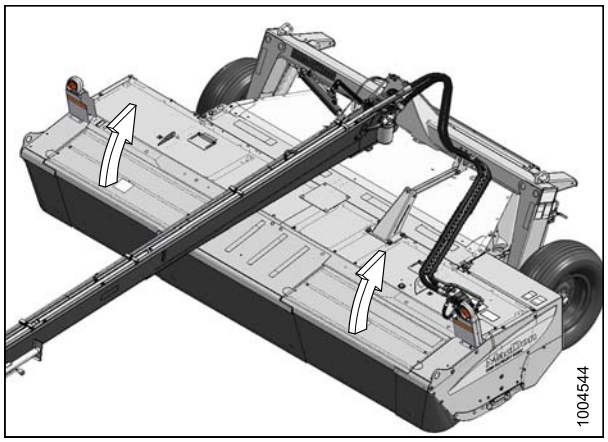


Figure 7.22

3. Remove three bolts (A) and remove compartment cover (B).

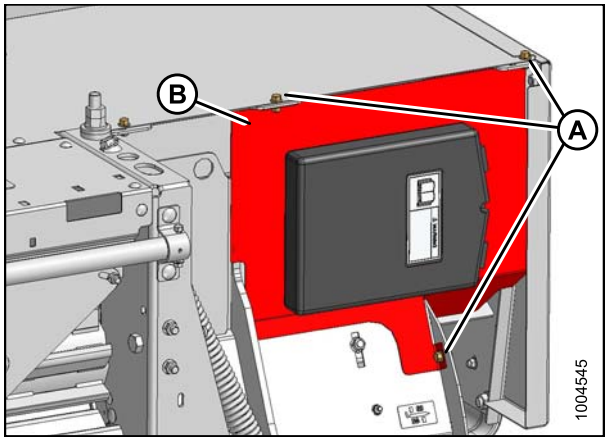


Figure 7.23

4. Remove nuts (A) securing feed plates (B) to side of compartment and remove plates. Reinstall nuts (A).

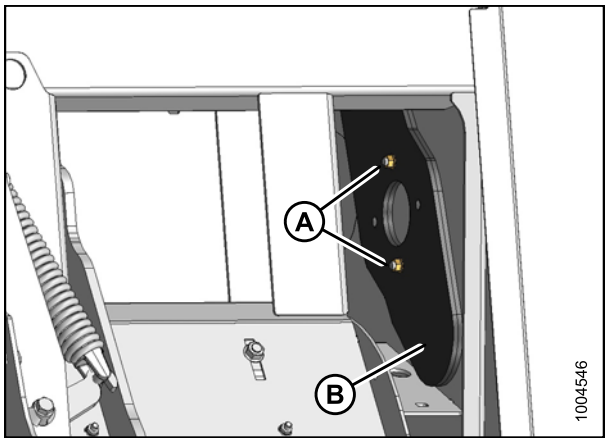


Figure 7.24

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

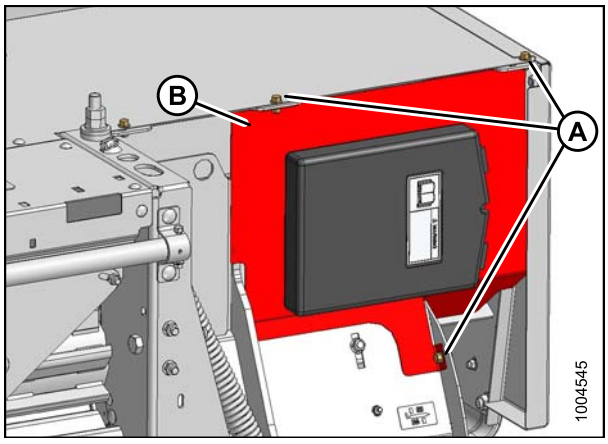


Figure 7.25

Installing Tall Crop Feed Plates: Driven Deflector RH End

CAUTION

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

1. Remove four bolts (A) and remove driven cage deflector (B) at RH end of cutterbar.
2. Locate feed plate (C) on the disc, ensuring that hole in feed plate registers on disc. Position plate approximately as shown and align holes.

IMPORTANT

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

3. Reposition deflector (B) and align holes.
4. Reinstall bolts (A) and tighten to 92 ft·lbf (125 N·m).

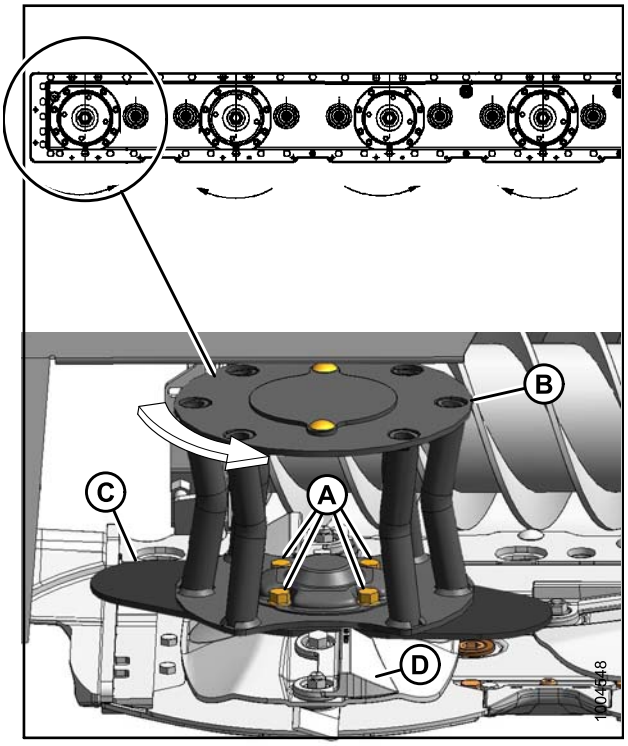


Figure 7.26: Counterclockwise rotation RH driven disc

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.

Installing Tall Crop Feed Plates: Driveline Deflector LH End

1. Remove the four bolts (A) that secure the driveline (B) and disc to the spindle.
2. Rotate the deflector (C) as required so that large opening in deflector faces you.
3. Remove the driveline (B) through the larger opening in the deflector.

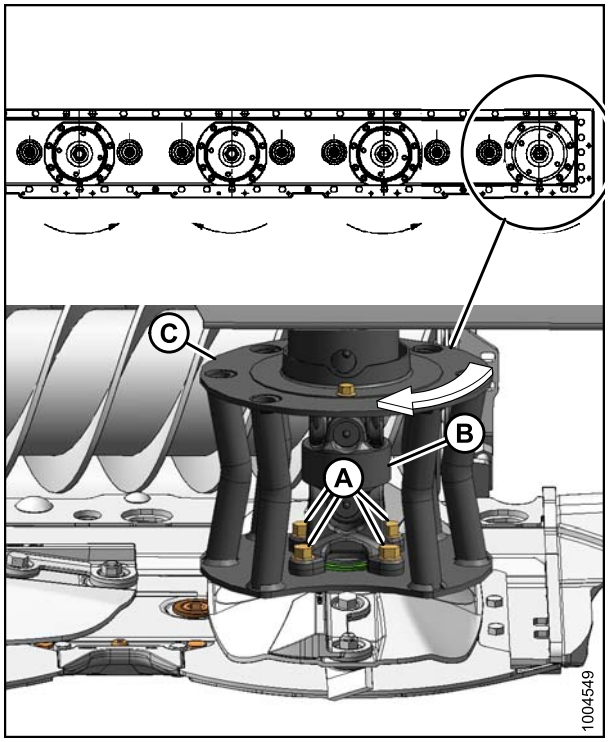


Figure 7.27: Clockwise rotation LH driveline disc

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

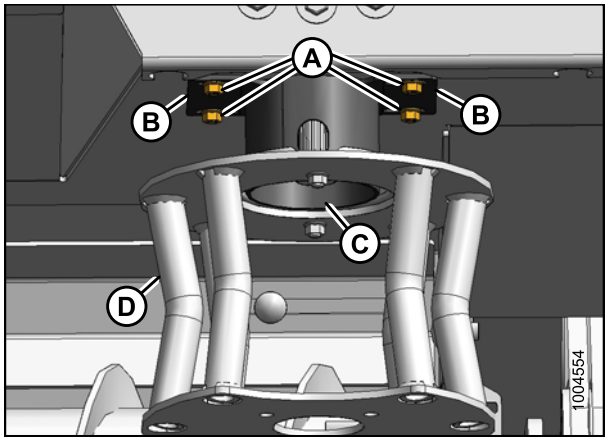


Figure 7.28

7. Locate feed plate (A) on the disc, ensuring that hole in feed plate registers on disc. Position plate approximately as shown and align holes.

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.

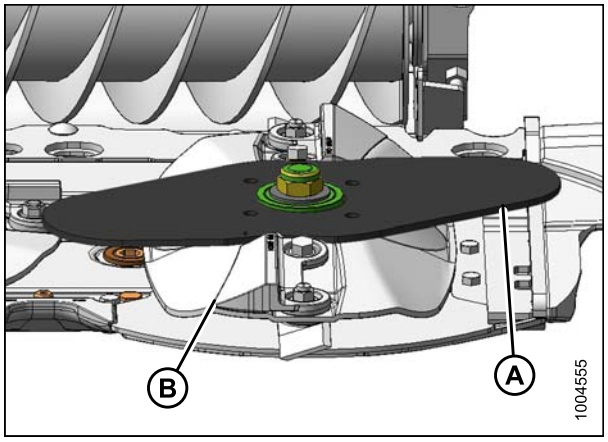


Figure 7.29

8. Locate deflector (A) and upper driveline shield (B) onto feed plate.
9. Raise upper driveline shield (B) into position and move plates (C) into slots in shield. Do **NOT** tighten bolts.
10. Insert driveline (D) into deflector (A) and install onto shaft. Ensure that driveline grease zerks will be accessible through large opening in deflector.

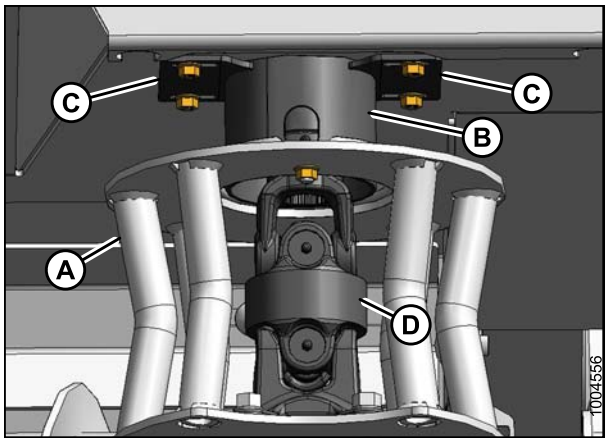


Figure 7.30

11. Align mounting holes in deflector (B), spindle, and driveline (D) and reinstall four bolts (A).
12. Torque bolts to 92 ft·lbf (125 N·m).
13. Adjust the upper driveline shield to achieve consistent gap around deflector shield (C).

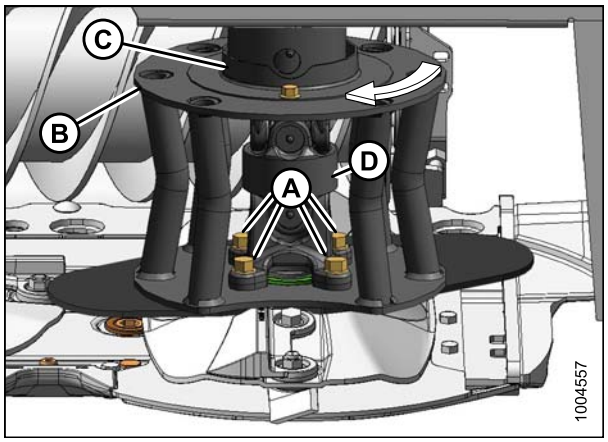


Figure 7.31: Clockwise rotation LH driveline disc

14. Tighten bolts (A) on shield plates (B).

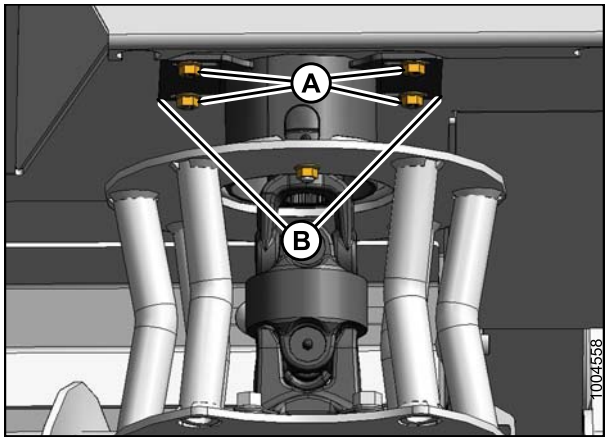


Figure 7.32

15. Remove block of wood (if used).
16. Manually rotate discs to check for interference of feed plate and adjacent parts.

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.

17. Close cutterbar doors.

7.9.2 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 mower conditioner to the ground, shut off engine, and remove key from ignition.
2. Open cutterbar doors. Refer to Section 5.5 Cutterbar Doors, page 34.

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.

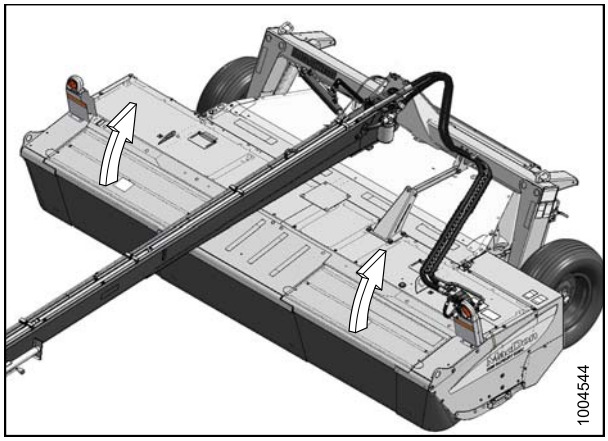


Figure 7.33

Removing Tall Crop Feed Plates: RH End

1. Remove four bolts (A) and remove driven cage deflector (B) at RH end of cutterbar.
2. Remove feed plate (C).
3. Reposition deflector (B) and align holes.
4. Reinstall bolts (A) and tighten to 92 ft·lbf (125 N·m).

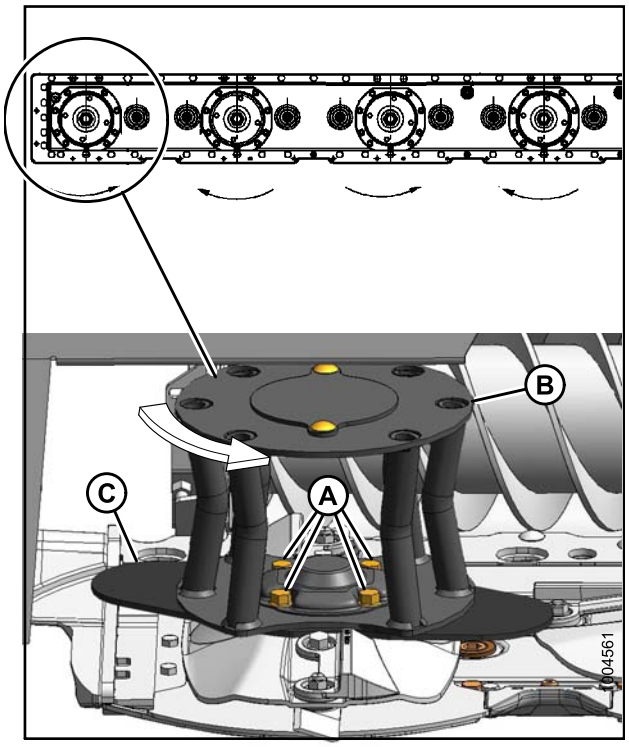


Figure 7.34: Counterclockwise rotation RH driven disc

Removing Tall Crop Feed Plates: LH End

Follow these steps to remove the tall crop left hand end feed plates:

1. Remove the four bolts (A) that secure the driveline (B) and disc to the spindle.
2. Rotate the deflector (C) as required so that large opening in deflector faces you.
3. Remove the driveline (B) through the larger opening in the deflector.

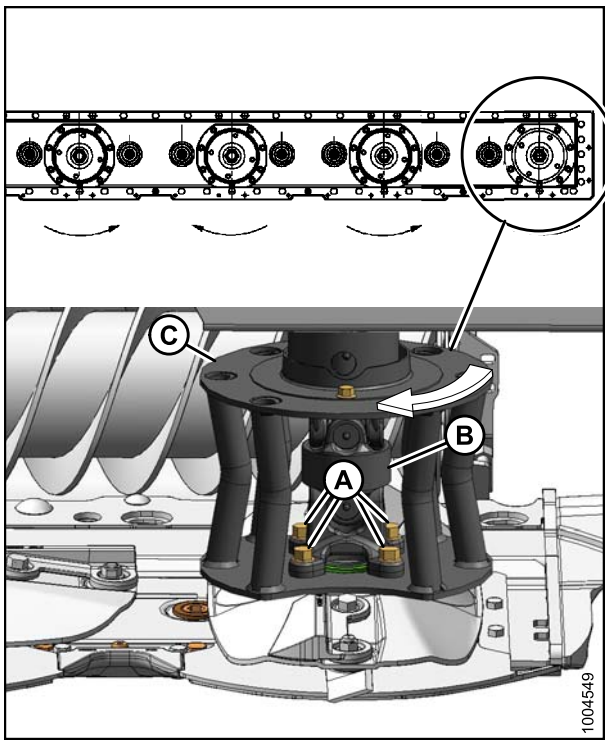


Figure 7.35: Clockwise rotation LH driveline disc

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

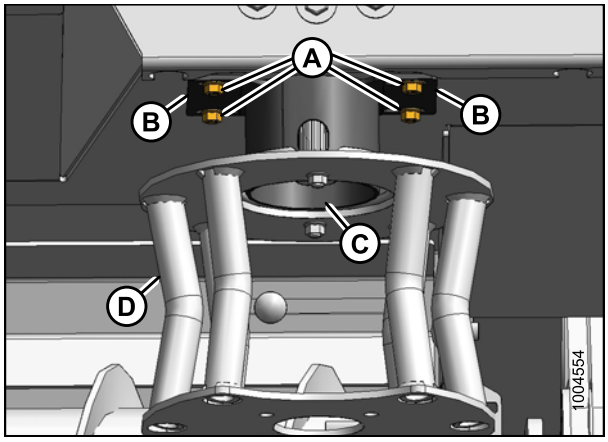


Figure 7.36

7. Remove feed plate (A).

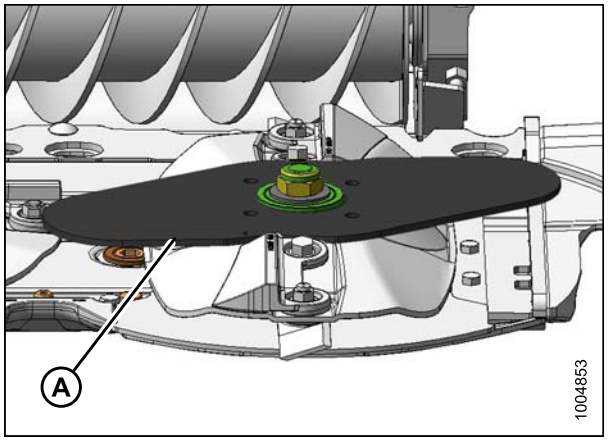


Figure 7.37

8. Locate deflector (A) and upper driveline shield (B) onto feed plate.
9. Raise upper driveline shield (B) into position and move plates (C) into slots in shield. Do not tighten bolts.
10. Insert driveline (D) into deflector (A) and install onto shaft. Ensure that driveline (D) grease zerks will be accessible through large opening in deflector.

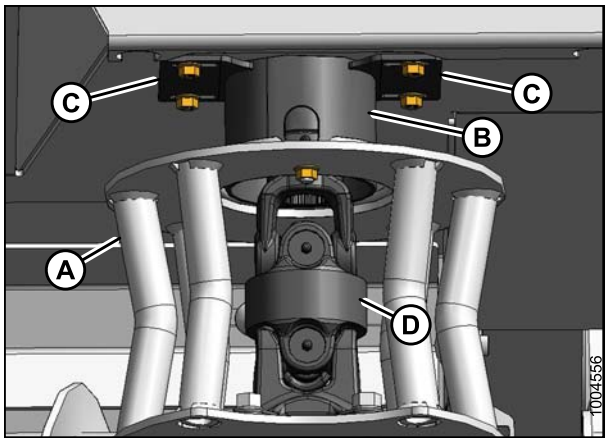


Figure 7.38

11. Align mounting holes in deflector (B), spindle, and driveline (D) and reinstall four bolts (A).
12. Torque bolts to 92 ft·lbf (125 N·m).
13. Adjust the upper driveline shield to achieve consistent gap around deflector shield (C).

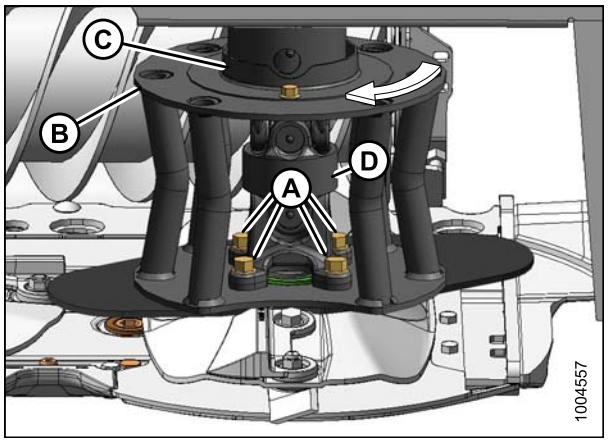


Figure 7.39: Clockwise rotation LH driveline disc

14. Tighten bolts (A) on shield plates (B).

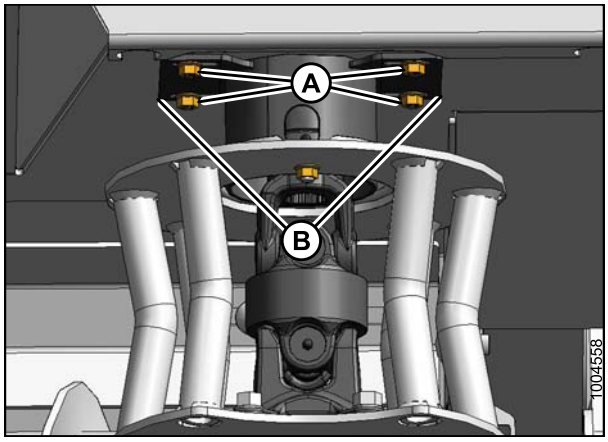


Figure 7.40

15. 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.

16. Close cutterbar doors.

17. Remove three bolts (A) and remove compartment cover (B).

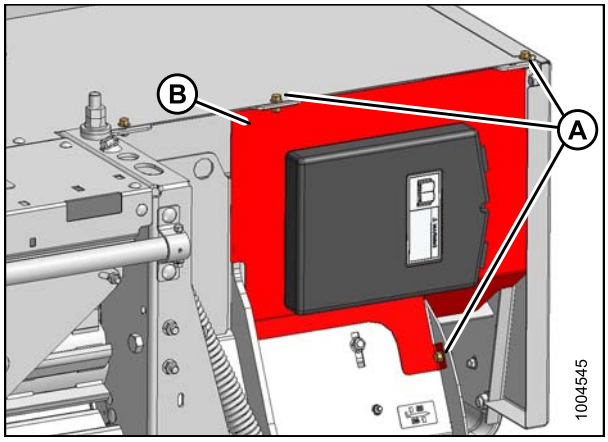


Figure 7.41

18. Remove nuts (A) from studs in storage compartment.
19. Secure feed plates (B) to side of compartment with nuts (A).

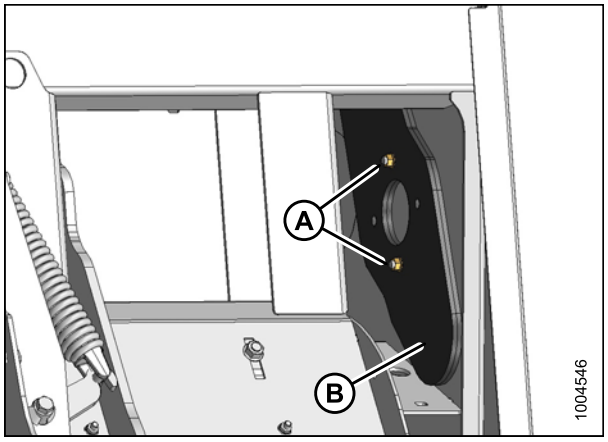


Figure 7.42

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

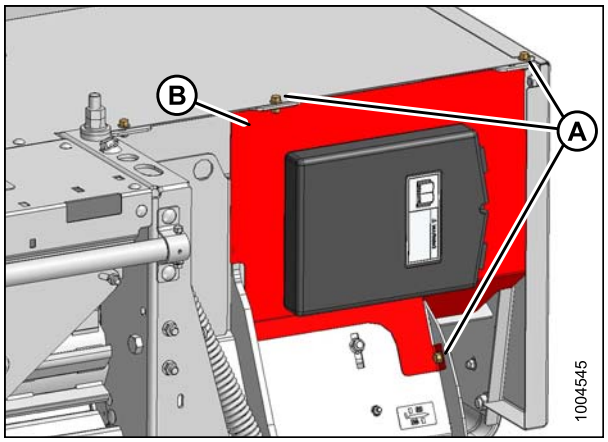


Figure 7.43

7.10 Tall Crop Dividers

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

7.10.1 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 mower conditioner to the ground, shut down tractor, and remove key.
2. Open cutterbar doors. Refer to Section 5.5 Cutterbar Doors, page 34.

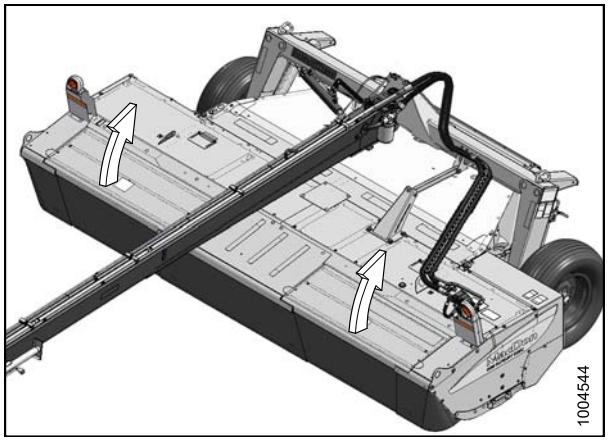


Figure 7.44

3. Remove the four bolts (A) and remove deflector (B).
4. Reinstall the four bolts (A).
5. Close cutterbar doors.

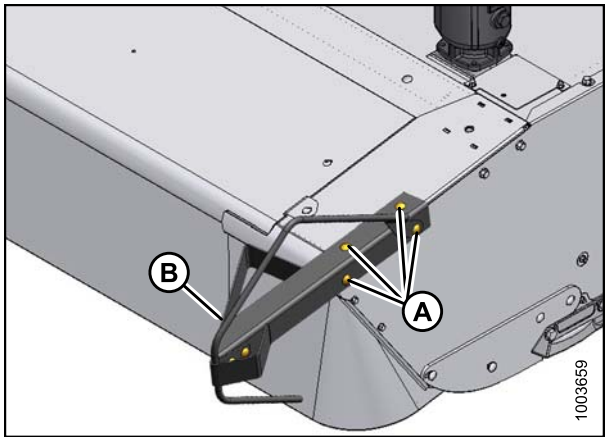


Figure 7.45

7.11 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.

7.11.1 Adjusting the Overshot Auger

If necessary, adjust the auger position 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. Raise mower conditioner to full height, shut down engine, and remove key from ignition.
2. Engage lift cylinder lock-out valves. See Section 5.3 Lift Cylinder Lock-Out Valves, page 30.
3. Remove/loosen four bolts (A) and remove cover (B).

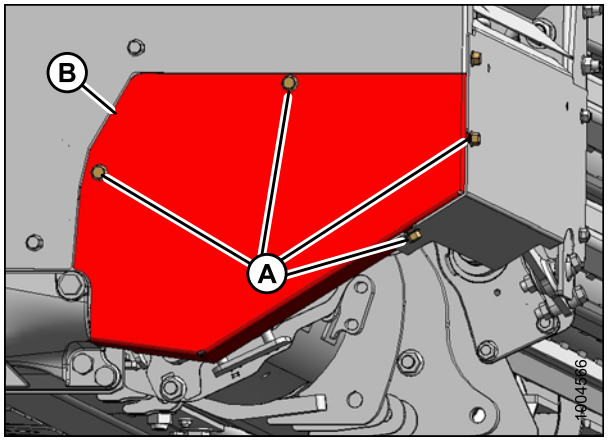


Figure 7.46

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.

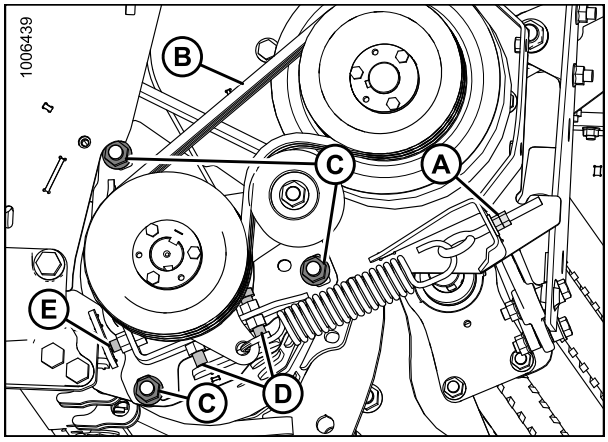


Figure 7.47

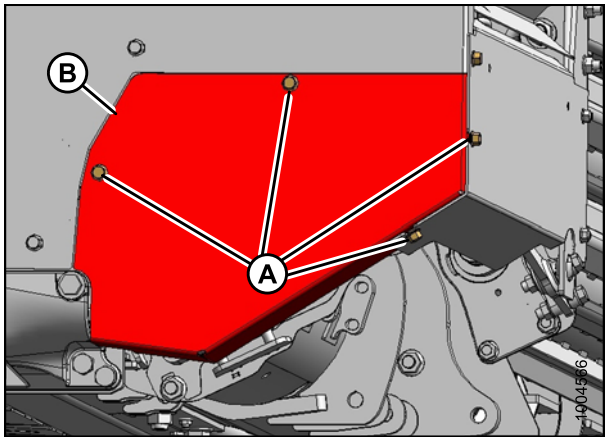


Figure 7.48

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 7.12 Stripper Bars, page 115.

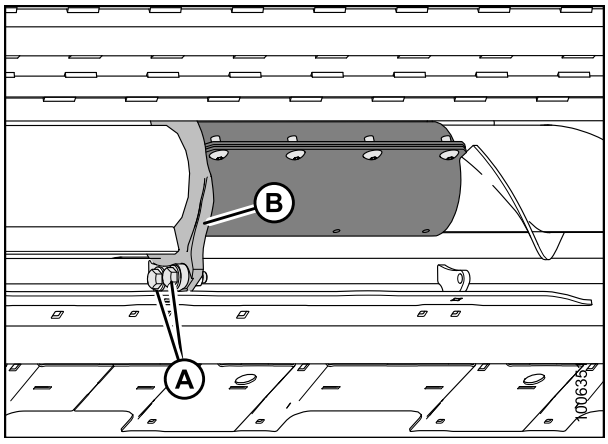


Figure 7.49

13. Adjust eye bolt (A) and secure with jam nut (B) to tighten auger drive belts (C). See Inspecting the Auger Drive Belts, page 194.

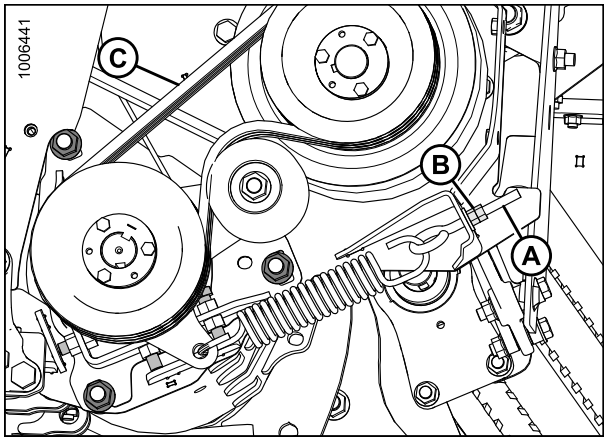


Figure 7.50

7.12 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.

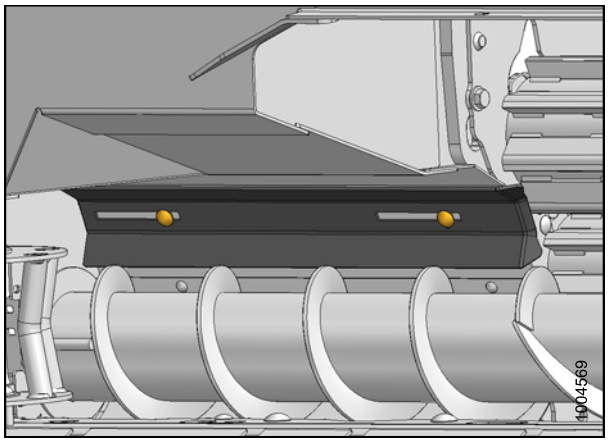


Figure 7.51: RH side shown, LH opposite

7.12.1 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 mower conditioner to ground, shut down tractor, and remove key.
2. Open cutterbar doors. Refer to Section 5.5 Cutterbar Doors, page 34.
3. Open driveshield. Refer to Section 5.4 Driveshields, page 32.
4. Loosen nuts (A) on the two bolts securing stripper bar to the pan sufficiently so that stripper bar can be moved.

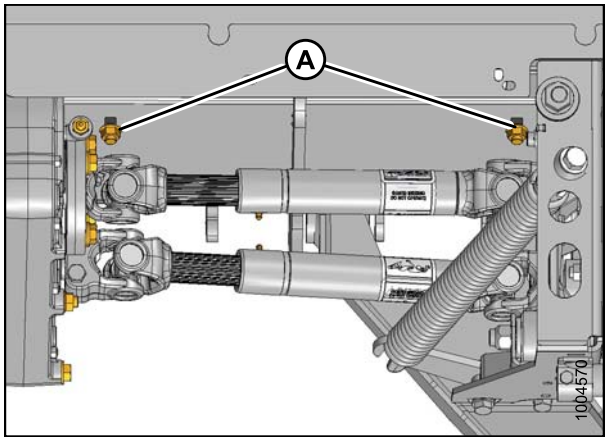


Figure 7.52: Left end

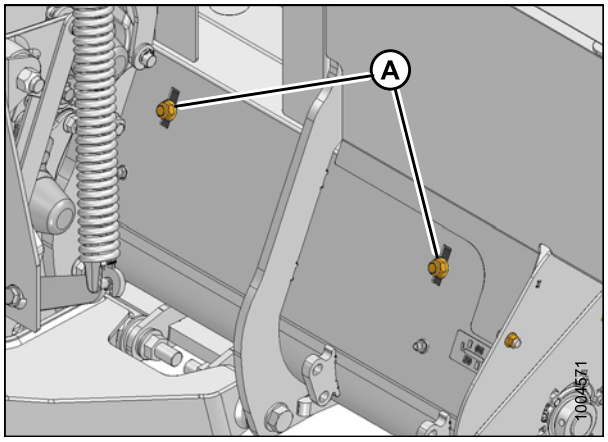


Figure 7.53: Right end

5. Position stripper bar (A) as close as possible to auger flighting, without contacting it.
6. Repeat above steps 4 and 5 for opposite side.
7. Manually rotate auger to check that auger does **NOT** contact stripper bars. Readjust as required.

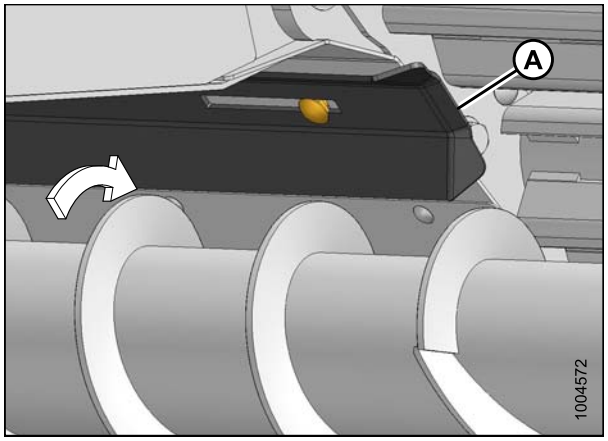


Figure 7.54

8. Tighten nuts (A).

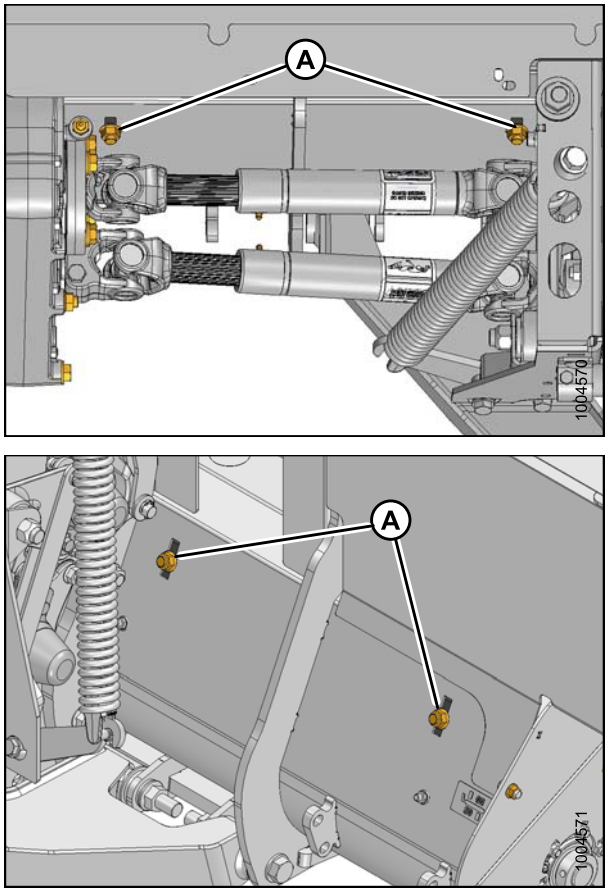


Figure 7.55: Both ends shown

7.13 Haying Tips

7.13.1 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.

7.13.2 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.

7.13.3 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.

7.13.4 Windrow Characteristics

Refer to Section 7 Operating the Mower Conditioner, page 85 for instructions on adjusting the mower conditioner.

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.

7.13.5 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.

7.13.6 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 tedded at less than 25% moisture or excessive yield losses will result.

7.13.7 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.

7.14 Levelling the Mower Conditioner

The support linkages are factory-set to provide the proper level for the mower conditioner and should not normally require adjustment. The float springs are NOT used to level the mower conditioner.

If the mower conditioner is NOT level, check the tire pressure and ensure they are properly inflated. Refer to Section 8.11.4 Inflating Tire, page 214.

Component damage in the mower conditioner support system may occur if the mower conditioner cannot be levelled. See your MacDon Dealer.

7.15 Unplugging the Mower Conditioner

Follow these steps to remove plugged material from the mower conditioner:

DANGER

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

1. Stop forward movement of the tractor and stop the power take-off (PTO).
2. Raise the mower conditioner fully, shut down the tractor engine, and remove the key.
3. Engage lift cylinder lock-out valves. See Section 5.3 Lift Cylinder Lock-Out Valves, page 30.

WARNING

Wear heavy gloves when working around cutterbar.

4. Open cutterbar doors. Refer to Section 5.5 Cutterbar Doors, page 34.
5. Clean off cutterbar or rolls by hand.

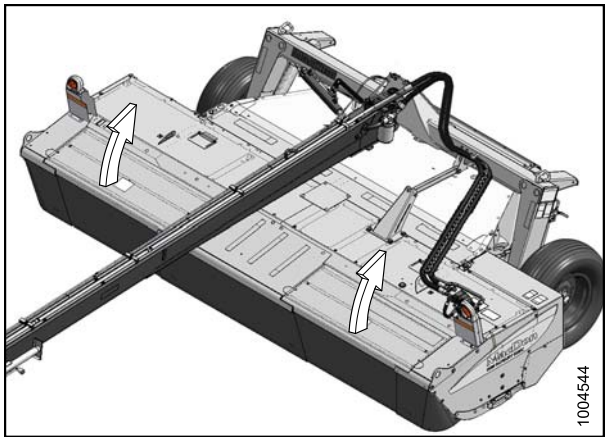


Figure 7.56

8 Maintenance and Servicing

The following instructions are provided to assist the Operator in servicing the mower conditioner. 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 mower conditioner.

Log hours of operation and use the Maintenance Schedule/Record provided to keep a record of scheduled maintenance. Refer to Section 8.6.1 Maintenance Schedule/Record, page 138.

8.1 Preparation for Servicing

CAUTION

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

1. Fully lower the mower conditioner.

   NOTE: If necessary to service in the raised position, always close lift cylinder lock-out valves. See Section 5.3.1 Engaging Locks, page 30.

2. Disengage power take-off (PTO).
3. Stop engine and remove key.
4. Engage park brake.
5. Wait for all moving parts to stop.

8.2 Recommended Safety Procedures

- Review Section 1 Safety, page 1 for information on general safety.
- Park on level surface when possible.
- Block wheels securely if mower conditioner is parked on an incline.
- Follow all recommendations in your tractor operator's manual.
- Wear close-fitting clothing and cover long hair.
- Never wear dangling items such as scarves or bracelets.
- Wear protective shoes with slip-resistant soles, a hard hat, protective glasses or goggles, and heavy gloves.
- 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 cutter blades) to move. Stay clear of driven components at all times.

Figure 8.1

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

Figure 8.2

- Be prepared if an accident should occur. Know where the first aid kit and fire extinguishers are located and how to use them.
- Use adequate light for the job at hand.
- Replace all shields removed or opened for service.
- Use only service and repair parts made or approved by the equipment manufacturer. Substituted parts may not meet strength, design or safety requirements.
- Keep the machine clean. Never use gasoline, naphtha, or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.

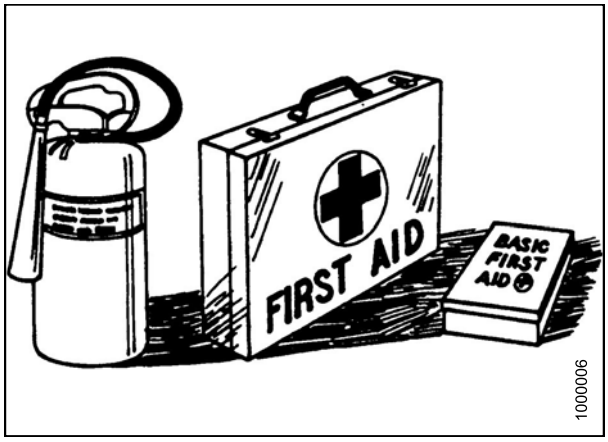


Figure 8.3

8.3 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.

8.3.1 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 8.1 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

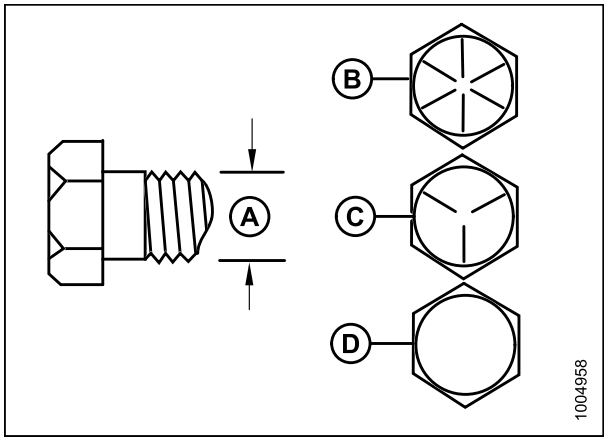


Figure 8.4

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

Table 8.2 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 8.3 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

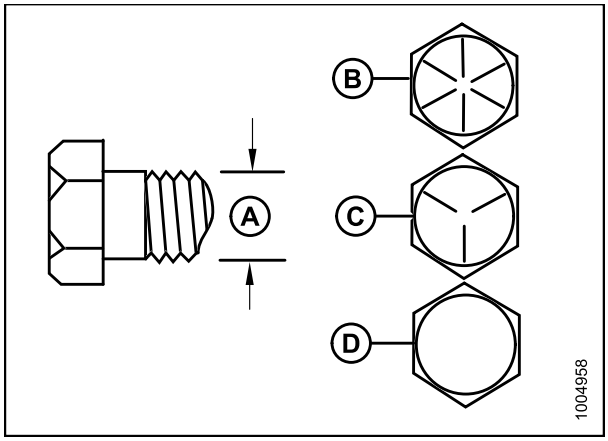


Figure 8.5

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

Table 8.4 SAE Grade 8 Bolt and Grade 8 Free Spinning Nut

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

8.3.2 Metric Bolt Specifications

Table 8.5 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

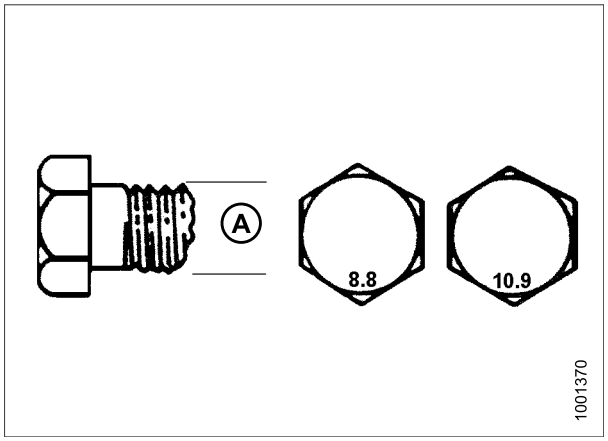


Figure 8.6
A - Nominal size

Table 8.6 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 8.7 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

Table 8.8 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

8.3.3 Metric Bolt Specifications Bolting into Cast Aluminum

Table 8.9 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				

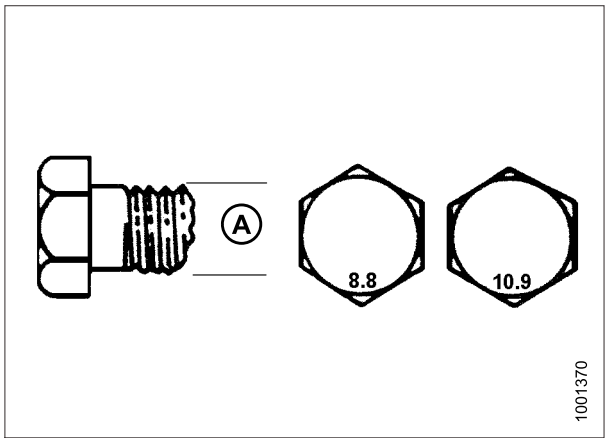


Figure 8.7

A - Nominal size

8.3.4 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.

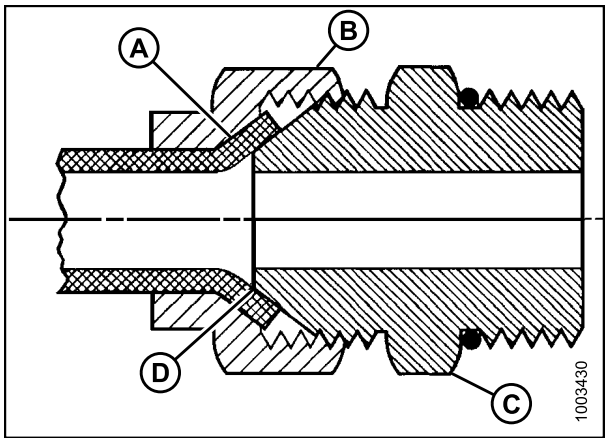


Figure 8.8

A - Flare **B - Nut**
C - Flareseat **D - Body**

Table 8.10 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

8.3.5 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 the following table, while holding body of fitting with a wrench.

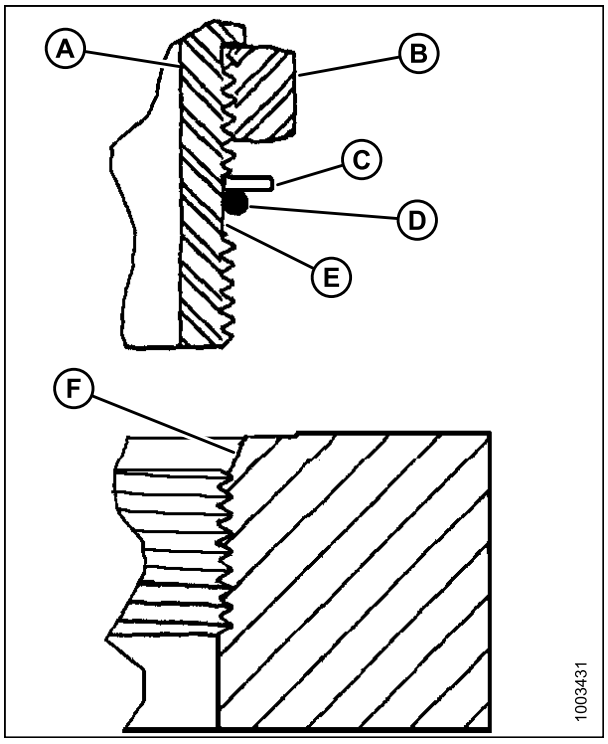


Figure 8.9

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.

Table 8.11 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

8.3.6 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 8.10

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

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 the table shown in the opposite column.

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

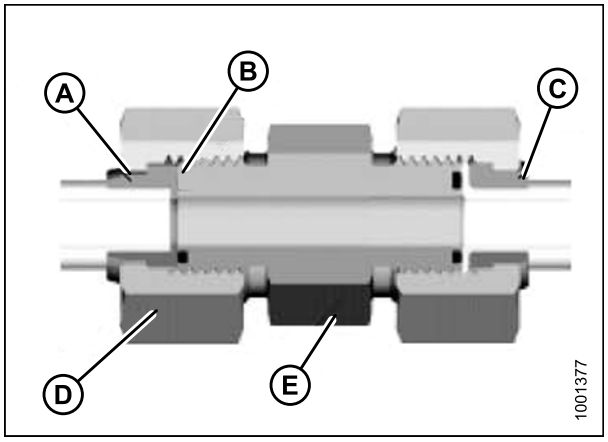


Figure 8.11

A - Brazed sleeve
B - O-ring
C - Two piece sleeve
D - Nut
E - Fitting body

Table 8.12 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.

8.4 Conversion Chart

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

8.5 Recommended 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.

IMPORTANT

Do NOT overfill the cutterbar when adding lubricant. Overheating and failure of cutterbar components may occur if overfilled.

Lubricant	Specification	Description	Use	Capacities
Grease	SAE Multi-purpose	High temperature extreme pressure (EP2) performance with 1% max Molybdenum Disulphide (NLGI grade 2) Lithium 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 SAE LS 80w90	High thermal and oxidation stability. API service class GL-5	Cutterbar	4.40 US quarts (4.25 liters)
	Traxon E 75w90	Fully synthetic gear lubricant. API service class GL-5	Bevel gearbox	13.6 oz. (400 ml)
	Traxon SAE LS 80w90		Conditioner gearbox	11.8 oz. (350 ml)
Hydraulic oil	Single grade trans-hydraulic oil[7]	Recommended brand names[8]	Hydraulic drive systems	48 US gallons (180 liters)[9]
		Acceptable brand names[10]		

7. For Australian Units - Use SAE 15W40 complying with SAE specs for API Class SJ and CH-4 engine oil.
8. Petro Canada Duratran, John Deere Quatrol® J20C, Case IH Hy-Tran Plus®, Agco Power Fluid 821XL
9. With header drive performance improvement kit, capacity is 46.76 US gallons (177 liters)
10. New Holland Hydraul, Esso/Exxon Hydraul 56, Shell Donax TD

8.6 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 8.5 Recommended Lubricants, page 136.

Log hours of operation and use Section 8.6.1 Maintenance Schedule/Record, page 138 to keep a record of scheduled maintenance.

Make copies of Section 8.6.1 Maintenance Schedule/Record, page 138 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 8.2 Recommended Safety Procedures, page 124.

8.6.1 Maintenance Schedule/Record

Action:	✓ - Check	♦ - Lubricate	▲ - Change

✎	Hour meter reading																				
✎	Service date																				
✎	Serviced by																				
First use		Refer to Section 8.6.2 Break-In Inspections, page 141.																			
100 hours or annually		Refer to Section 8.6.3 Preseason/Annual Service, page 141. It is recommended that annual maintenance be done prior to the start of the operating season.																			
▲	Hydraulic oil filter First 100 h only See 8.9.6 Changing the Hydraulic Oil Filter, page 205.																				
✓	Wheel bolt torque See 8.11.1 Checking Wheel Bolts, page 211.																				
♦	Wheel hub bearings See 8.6.6 Greasing Procedure, page 143.																				
✓	Auger drive belts See Inspecting the Auger Drive Belts, page 194.																				
✓	Conditioner drive belt See Inspecting the Conditioner Drive Belt, page 189.																				
✓	Conditioner gearbox lube level See 8.6.7 Lubrication and Servicing Intervals, page 144.																				
✓	Bevel gearbox lube level See 8.6.7 Lubrication and Servicing Intervals, page 144.																				
End of season		Refer to Section 8.6.4 End-of-Season Service, page 142.																			

10 hours or daily		
✓	Hydraulic hoses and lines See 8.9.7 Hydraulic Hoses and Lines, page 206.	
✓	Cutter blades, deflectors and discs See 8.7.1 Inspecting the Cutterbar Discs, page 157.	
✓	Tire pressure See 8.11.4 Inflating Tire, page 214.	
✓	Hydraulic oil level See 8.9.3 Checking the Hydraulic Oil Level, page 199.	**NOTE: A record of daily maintenance is not normally required, but is at the Owner/Operator's discretion.**
25 hours		
♦	Conditioner drivelines See 8.6.5 Lubrication and Servicing, page 142.	
♦	Cutterbar driveline See 8.6.5 Lubrication and Servicing, page 142.	
♦	Main driveline See 8.6.5 Lubrication and Servicing, page 142.	

50 HOURS																				
♦	Drive belt tensioner See 8.6.5 Lubrication and Servicing, page 142.																			
♦	Roll shaft bearings See 8.6.5 Lubrication and Servicing, page 142.																			
♦	Auger bearings See 8.6.5 Lubrication and Servicing, page 142.																			
♦	Lower link pivots See 8.6.5 Lubrication and Servicing, page 142.																			
♦	Lift cylinder pivots See 8.6.5 Lubrication and Servicing, page 142.																			
♦	Hitch swivel See 8.6.5 Lubrication and Servicing, page 142.																			

●	Steering cylinder pivot See 8.6.5 Lubrication and Servicing, page 142.																		
●	Hitch pivot See 8.6.5 Lubrication and Servicing, page 142.																		
250 hours																			
▲	Cutterbar lube See 8.6.8 Lubricating the Cutterbar, page 152.																		
▲	Bevel gearbox lube See Changing the Bevel Gearbox Lubricant, page 188.																		
▲	Conditioner gearbox lube See Changing the Conditioner Gearbox Lubricant, page 192.																		
▲	Hydraulic oil filter See 8.9.6 Changing the Hydraulic Oil Filter, page 205.																		
500 hours or 3 years																			
▲	Hydraulic oil See 8.9.5 Changing the Hydraulic Oil, page 202.																		

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

8.6.2 Break-In Inspections

Timing	Item	Refer to
At 1 hour	Check wheel bolts.	Section 8.11.1 Checking Wheel Bolts, page 211.
At 5 hours	Check for loose hardware. Tighten to required torque.	Section 8.3 Torque Specifications, page 126.
	Check drive belt tension.	Section Inspecting the Conditioner Drive Belt, page 189 and section Inspecting the Auger Drive Belts, page 194.
At 25 hours	Check drive belt tension.	
At 50 hours	Check drivebelt tension.	
	Change cutterbar lubricant.	Section 8.6.8 Lubricating the Cutterbar, page 152. Use Only Specified Amount. Do NOT overfill.
	Change bevel gearbox lubricant.	Section Changing the Bevel Gearbox Lubricant, page 188.
At 100 hours	Change hydraulic oil filter.	Section 8.9.6 Changing the Hydraulic Oil Filter, page 205.
At 150 hours	Change cutterbar lubricant.	Section 8.6.8 Lubricating the Cutterbar, page 152.
	Change bevel gearbox lubricant.	Section Changing the Bevel Gearbox Lubricant, page 188.

8.6.3 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 mower conditioner 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 8.6.5 Lubrication and Servicing, page 142.
- Perform all annual maintenance. Refer to Section 8.6.1 Maintenance Schedule/Record, page 138.

8.6.4 End-of-Season Service

CAUTION

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

CAUTION

Cover cutterbar to prevent injury from accidental contact.

Do the following at the end of each operating season:

- Clean the mower conditioner thoroughly.
- Store in a dry, protected place if possible. If stored outside, always cover the mower conditioner with a waterproof canvas or other protective material.
- Raise mower conditioner and engage lift cylinder lock-out valves.
- If possible, block up the mower conditioner to take weight off tires.
- Repaint all worn or chipped painted surfaces to prevent rust.
- Loosen drive belt.
- Lubricate the mower conditioner 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 8.3 Torque Specifications, page 126.
- Remove divider rods (if equipped) to reduce space required for inside storage.

8.6.5 Lubrication and Servicing

WARNING

To avoid personal injury, before servicing the mower conditioner or opening drive covers, follow procedures in Section 8.1 Preparation for Servicing, page 123.

Log hours of operation and use the Maintenance Checklist provided to keep a record of scheduled maintenance. Refer to Section 8.6.1 Maintenance Schedule/Record, page 138.

Access to the drive systems requires opening the driveshield and cutterbar doors. Refer to Section 5.4 Driveshields, page 32 and Section 5.5 Cutterbar Doors, page 34.

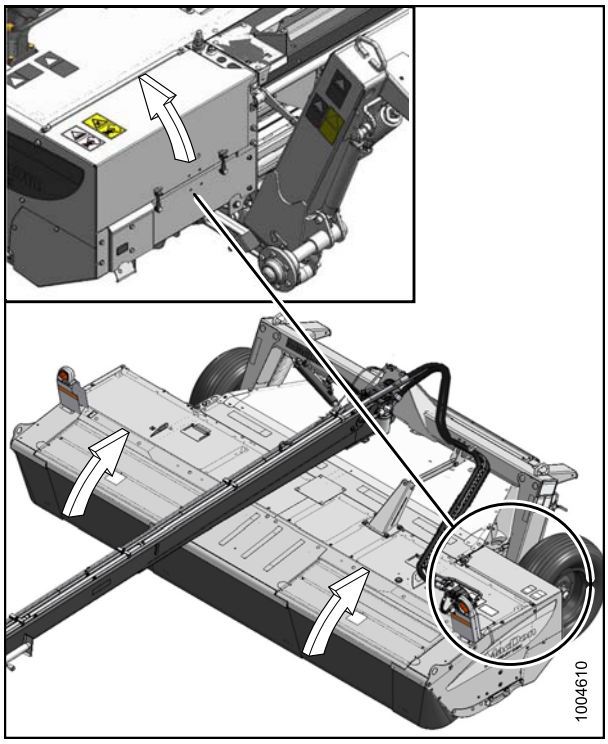


Figure 8.12

8.6.6 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 8.5 Recommended Lubricants, page 136.

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.

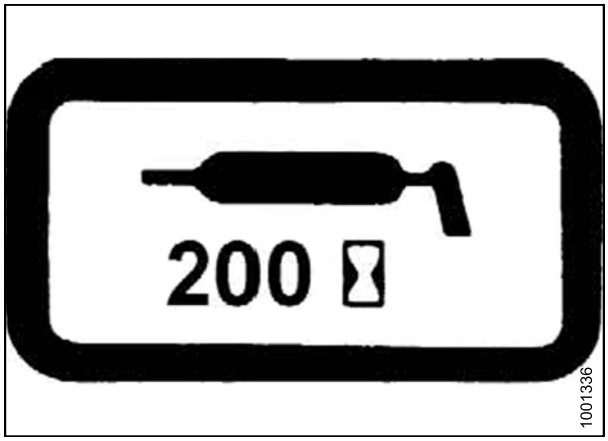


Figure 8.13

8.6.7 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 10 hours or daily

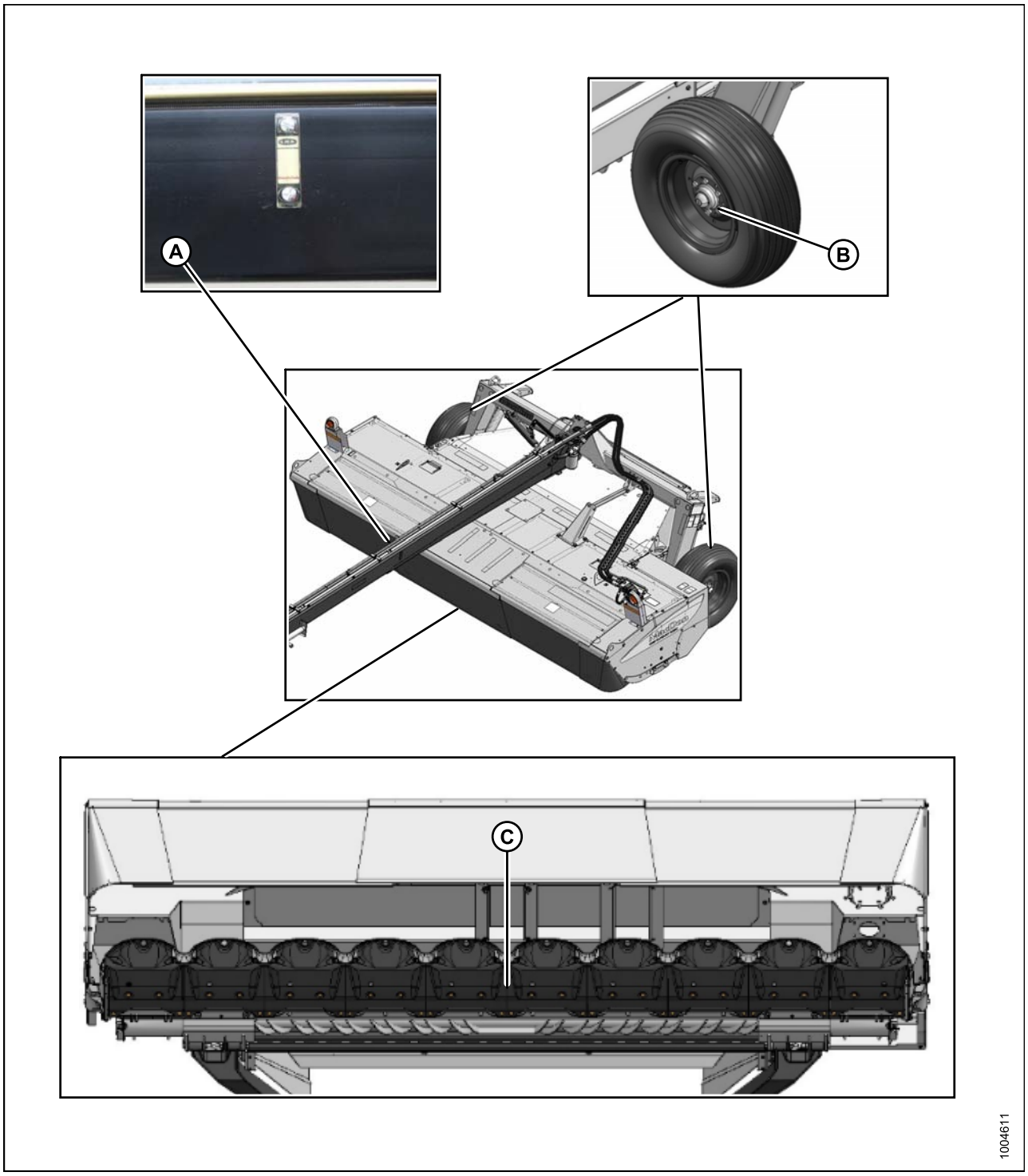


Figure 8.14

A - Hydraulic site gauge, located on articulated power turn (APT) hitch

B - Tire pressure - lesser of 30 psi (210 kPa) or max. pressure on tire

C - Visual check for damaged components

Every 25 hours

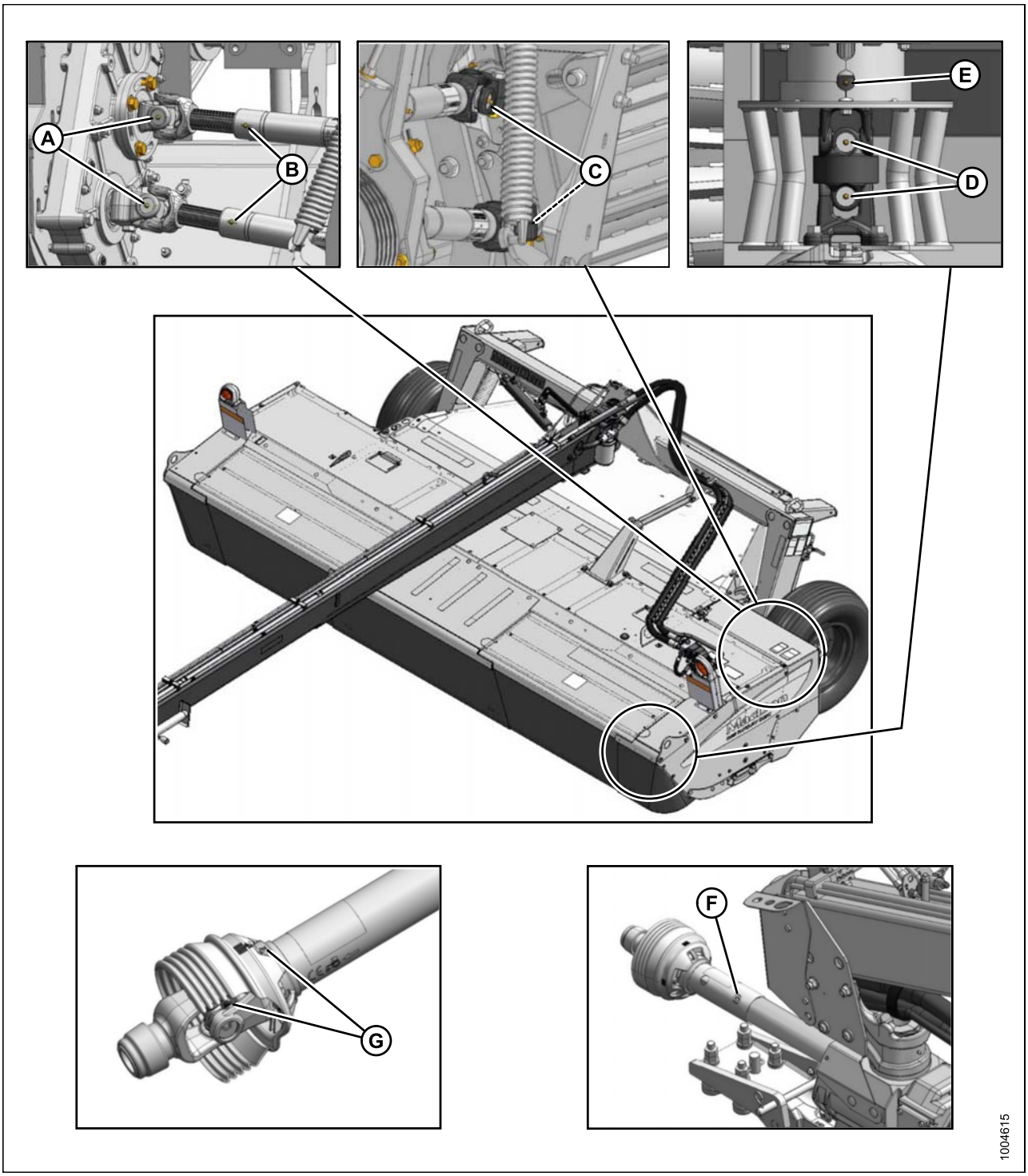


Figure 8.15

A - Conditioner driveline universals (4 places)

B - Driveline shaft (10% moly grease is recommended for driveline shaft slip joint only)

C - Conditioner driveline universals

D - Cutterbar driveline universals (2 places)

E - Driveshaft (10% moly grease is recommended for driveline shaft slip joint only)

F - Driveline (10% moly grease is recommended for driveline shaft slip joint only)

G - Driveline - both ends

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

Every 50 hours

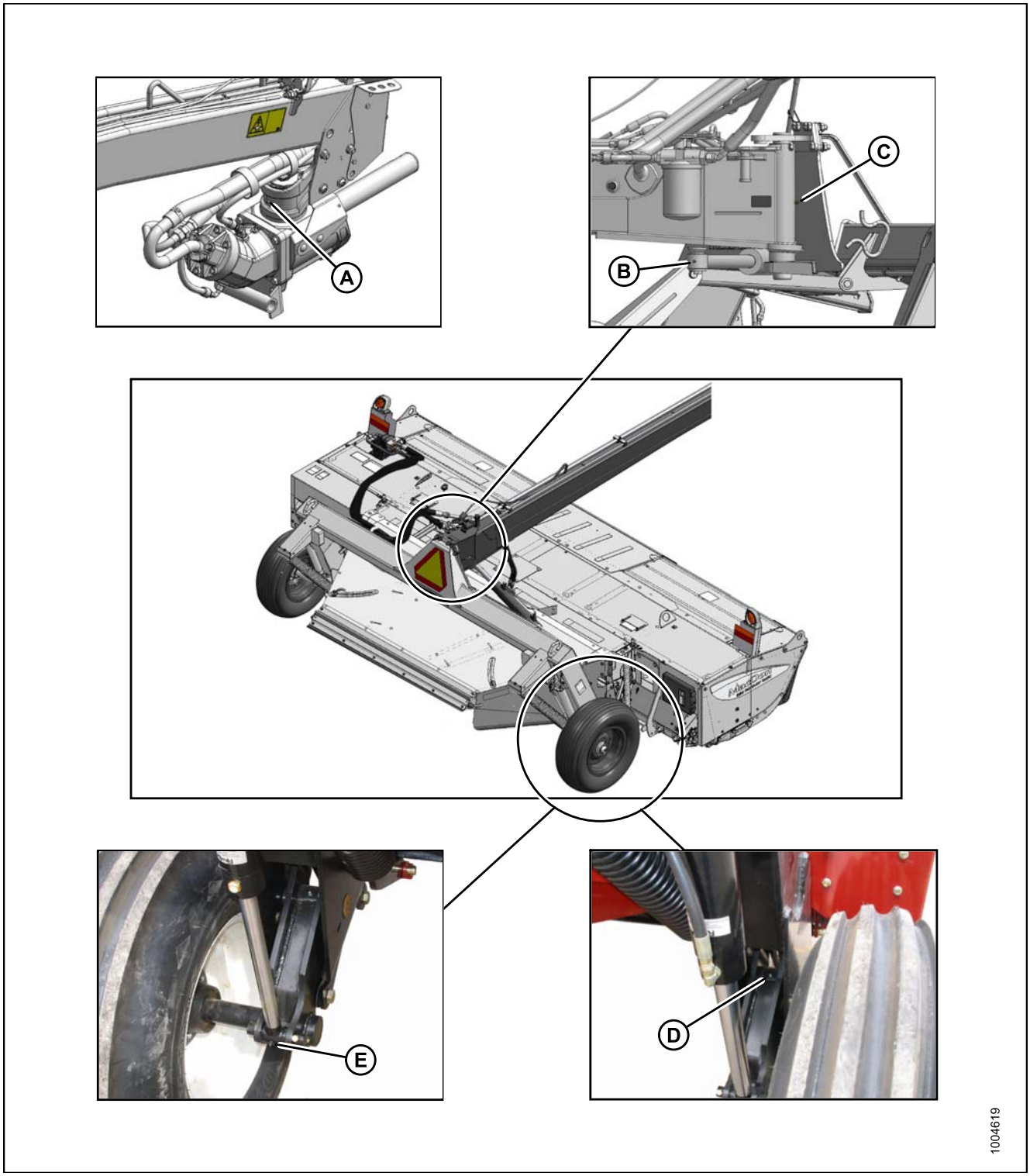


Figure 8.16

A - Articulated power turn (APT) hitch swivel (1 place)
B - Steering cylinder (1 place)
C - APT hitch pivot (1 place)
D - lift link (1 place) - both sides
E - Left lift cylinder pivot (1 place)

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

Every 50 hours

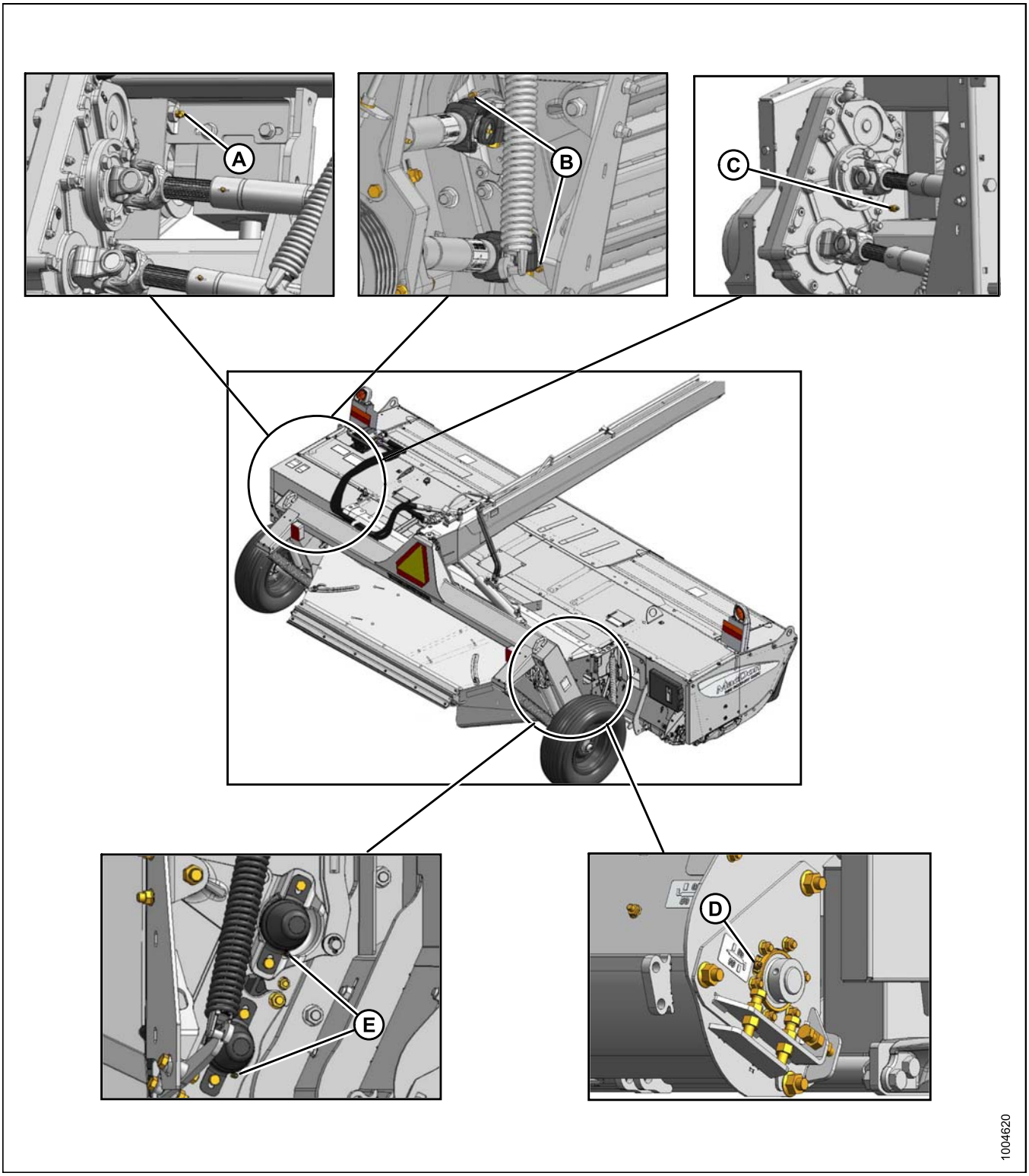


Figure 8.17

A - Belt tensioner pivot (1 place)
B - Roll shaft bearings (2 places)
C - Auger bearing (1 place)
D - Auger bearing (1 place)
E - Roll shaft bearings (2 places)

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

Every 100 hours or annually

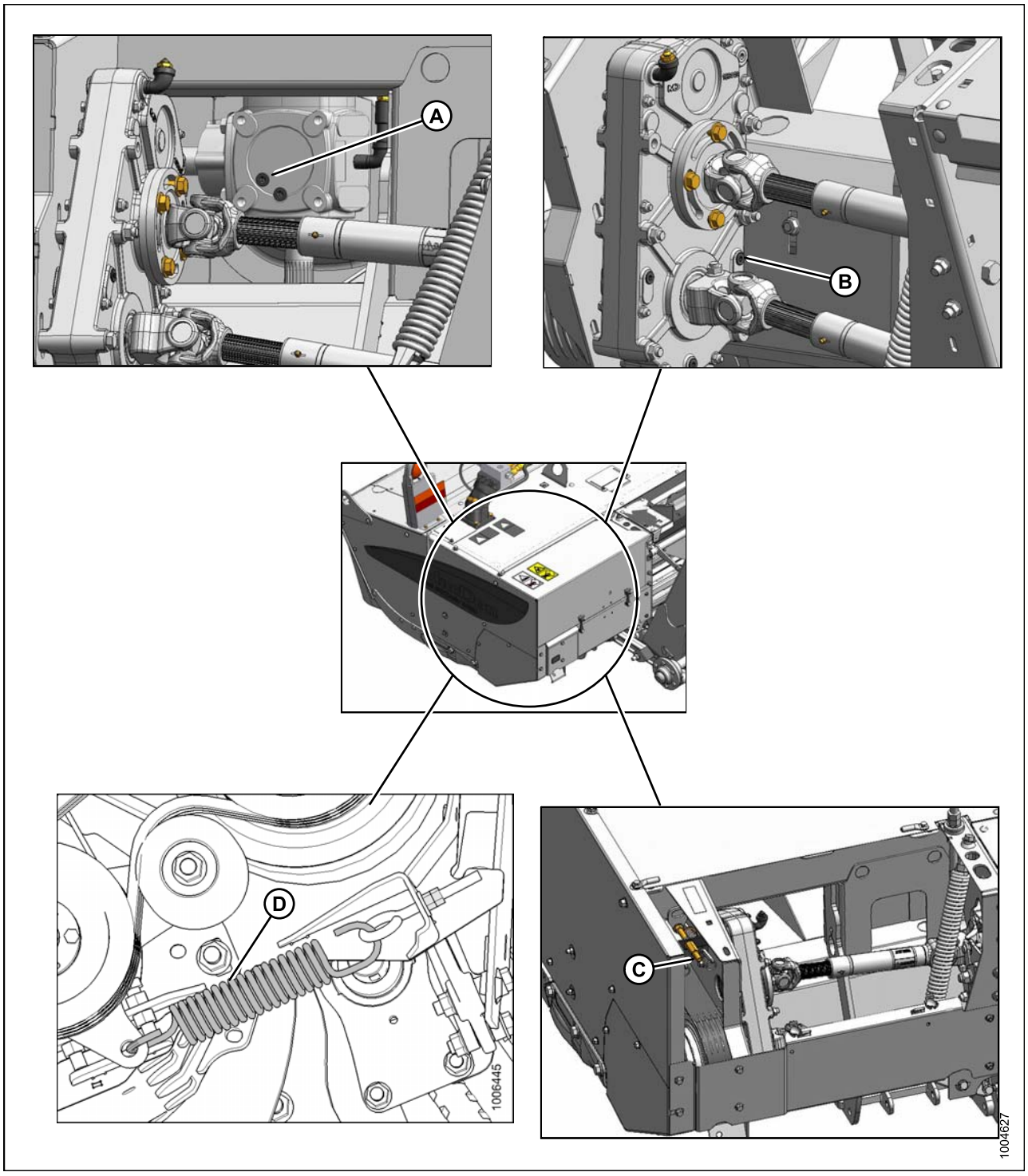


Figure 8.18

A - Bevel gearbox oil level (check with top of mower conditioner horizontal) oil should run out slightly when check plug removed.

B - Conditioner gearbox oil level (check with top of mower conditioner horizontal) oil should run out slightly when check plug removed.

C - Conditioner drive belt tension

D - Auger drive belt tension thru tensioner spring

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

Every 100 hours or annually

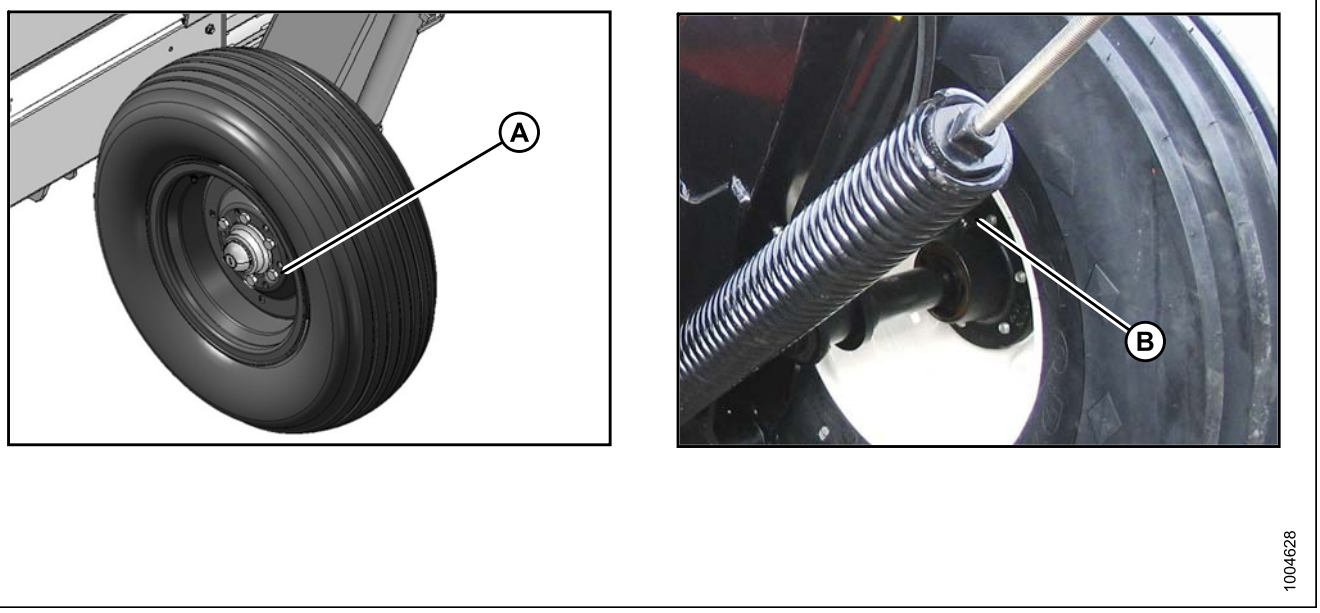


Figure 8.19

A - wheel bolt torque - 120 ft·lbf (160 N·m) **B - wheel bearing (1 place) - both wheels**

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

Every 250 hours

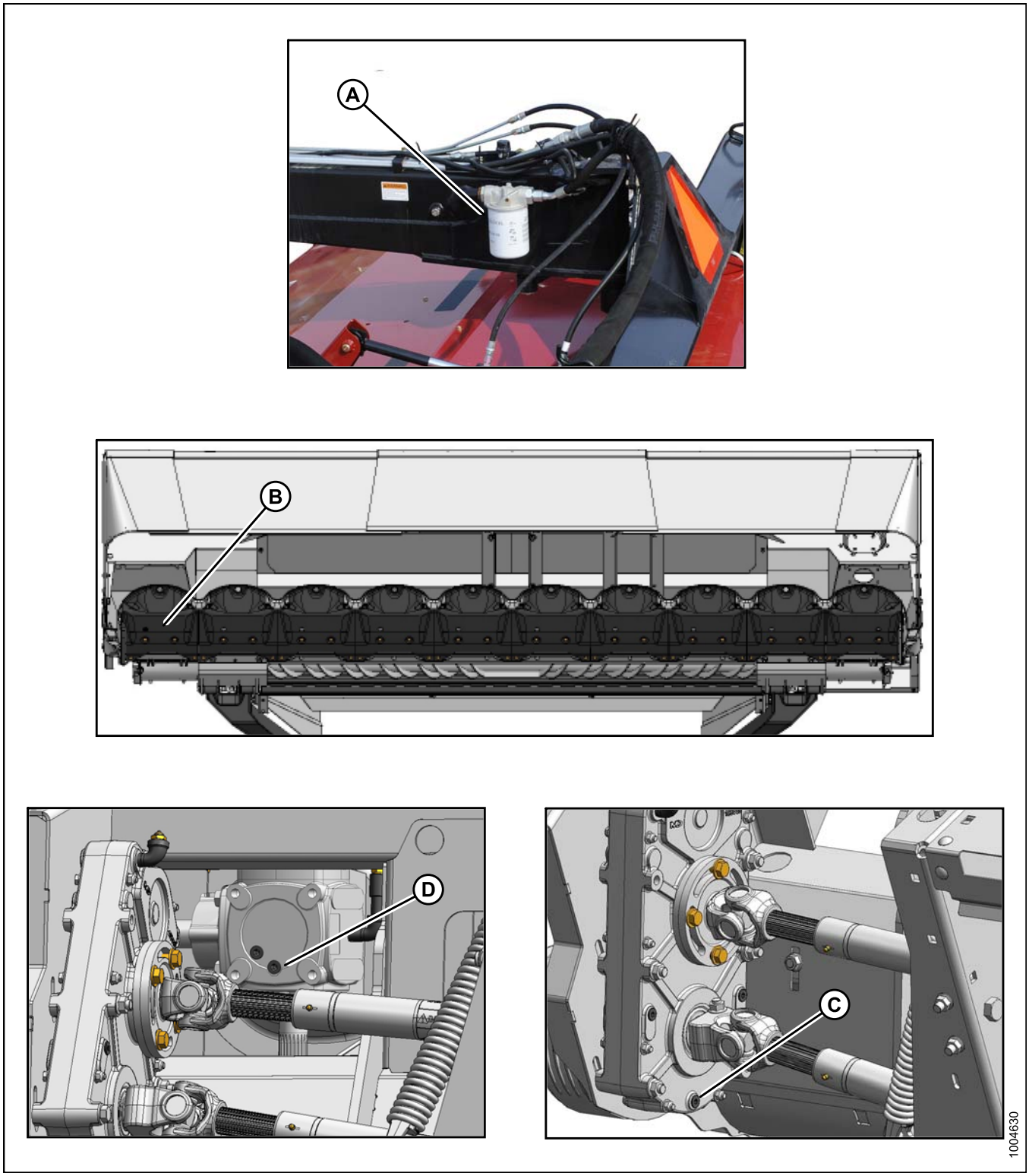
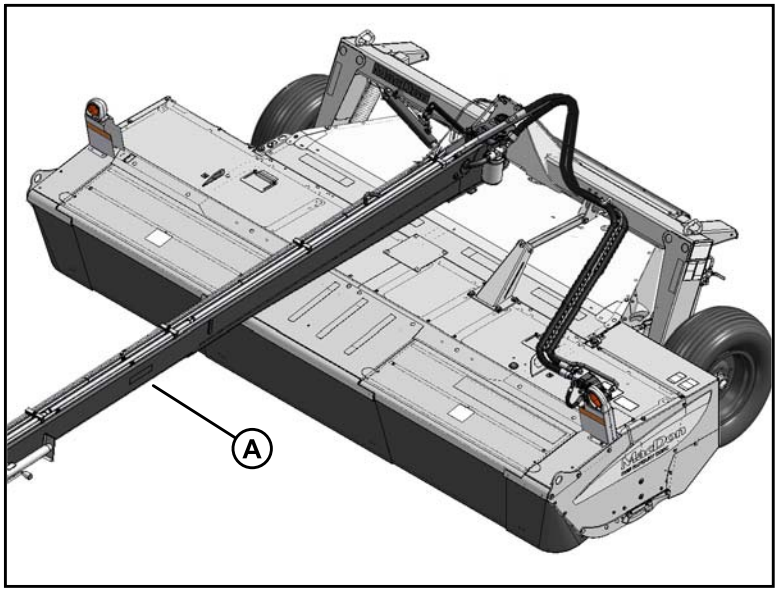


Figure 8.20

A - Change filter
B - Change cutterbar lube
C - Change conditioner gearbox oil
D - Change bevel gearbox oil

Every 500 hours or 3 years



1004631

Figure 8.21

A - Change hydraulic oil

8.6.8 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.

Follow these steps to drain the cutterbar lubricant:

1. Park the machine on level ground, raise mower conditioner fully, stop engine, and remove key.

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.

2. Engage lift cylinder lock-out valves. See Section 5.3 Lift Cylinder Lock-Out Valves, page 30.
3. Place a block under each end of the mower conditioner (A).

   NOTE: The block under the left end of the mower conditioner should be higher than the right end.

4. Disengage the lift cylinder lock-out valves, start tractor, and lower mower conditioner onto blocks. Shut down tractor and remove key from ignition.
5. Open cutterbar doors (B). Refer to Section 5.5 Cutterbar Doors, page 34.

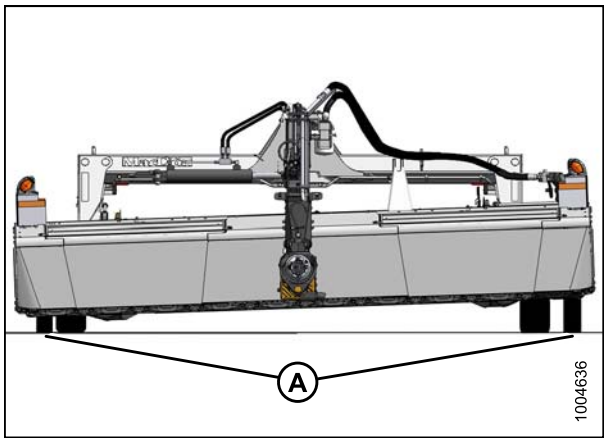


Figure 8.22

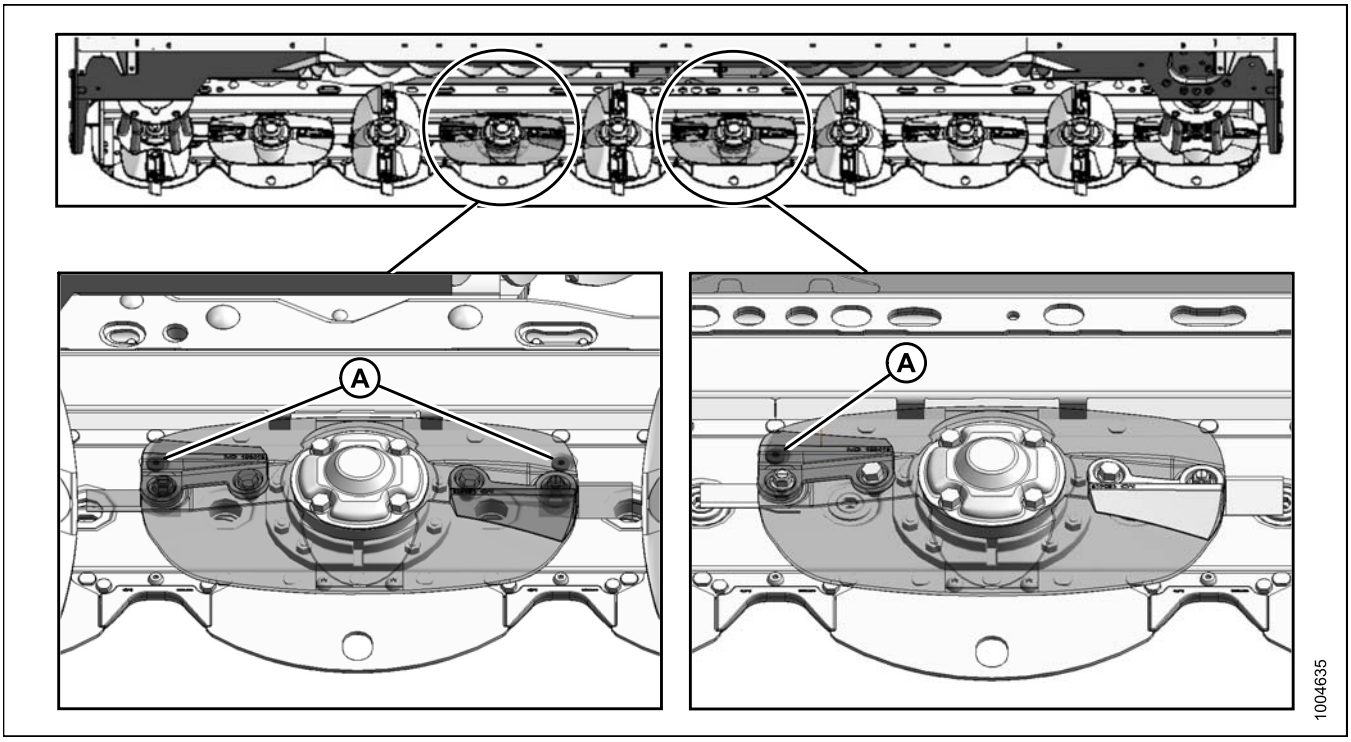


Figure 8.23: Cutterbar filler plug locations

6. Clean around either filler plug (A), refer to figure 8.23: Cutterbar filler plug locations, page 153 and remove plug with an 8 mm hex Allen L-key.

   NOTE: Rotate disc to expose filler plug if necessary.

7. Place a suitably sized container under the cutterbar drain hole (A).

8. 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.

9. Safely dispose of lubricant.

10. Add lubricant as per section Filling the Cutterbar Lubricant, page 154.

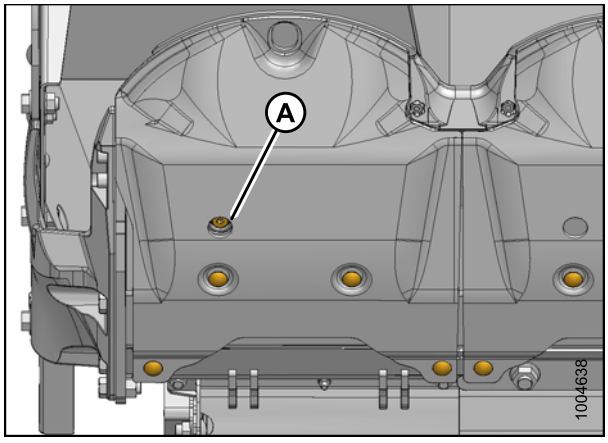


Figure 8.24

Filling the Cutterbar Lubricant

Follow these steps to fill 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 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. Start engine and raise mower conditioner fully.
2. Stop engine, remove key from ignition, and engage lift cylinder lock-out valvess. See Section 5.3 Lift Cylinder Lock-Out Valves, page 30.
3. Replace drain plug.
4. Move higher block to right end of mower conditioner and remove used lubricant container.

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

5. Disengage lift cylinder lock-out valves.
6. Start engine and lower mower conditioner onto blocks.
7. Stop engine and remove 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.

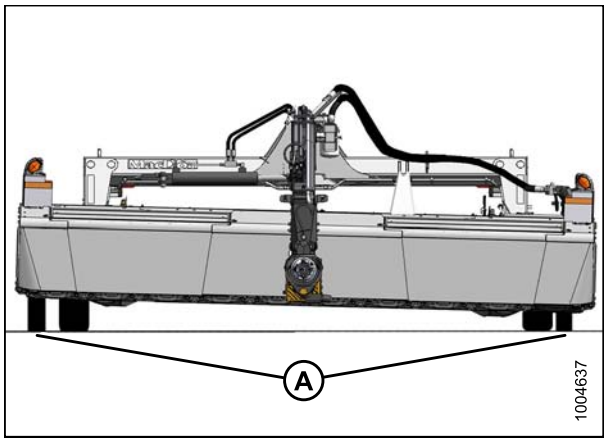


Figure 8.25

8. Remove filler plug at both locations (A).
9. Add exactly 4.4 quarts US (4.25 liters) of Traxon SAE 80W90 lubricant through filler hole (A) as follows:

   NOTE: See figure 8.23: Cutterbar filler plug locations, page 153 for locations of filler holes.

IMPORTANT

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

10. Replace filler plug (A).
11. Close cutterbar doors.
12. Start engine and raise mower conditioner off blocks.
13. Back away from blocks and lower mower conditioner.
14. Stop engine and remove key from ignition.

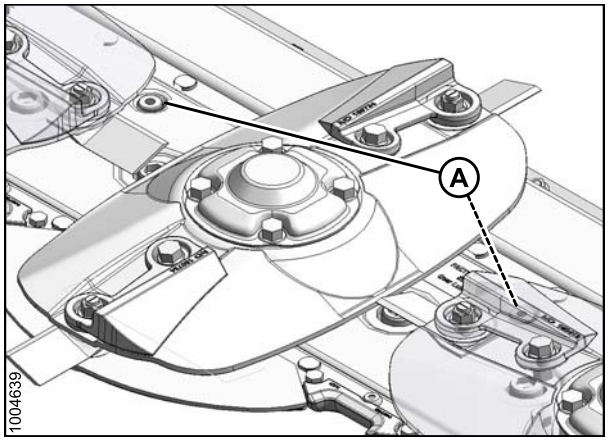


Figure 8.26

8.6.9 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 lift cylinder lock-out valves 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 mower conditioner fully, stop engine, and remove key.
2. Engage lift cylinder lock-out valves. See Section 5.3 Lift Cylinder Lock-Out Valves, page 30.
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.

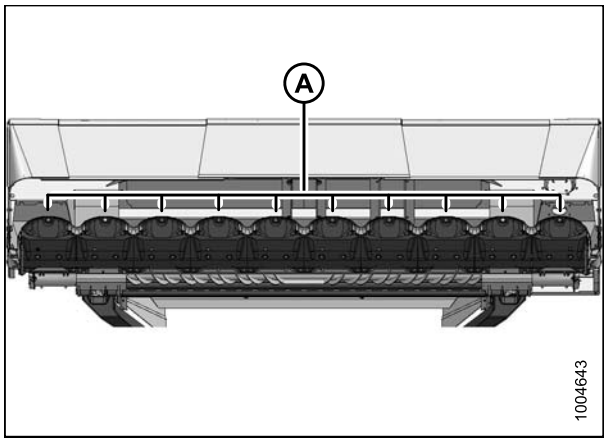


Figure 8.27

8.7 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.

8.7.1 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 mower conditioner to ground, shut off engine, and remove key.
2. Open cutterbar doors. Refer to Section 5.5 Cutterbar Doors, page 34.

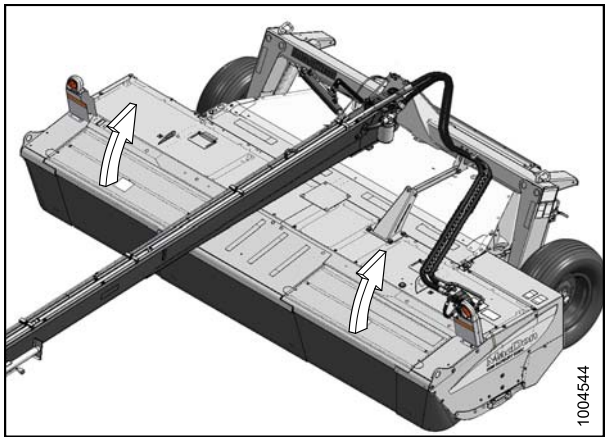


Figure 8.28

3. Check discs (A) for damage or loose fasteners.
4. Replace damaged discs. Refer to Section 8.7.2 Replacing a Disc, page 158.
5. Replace damaged fasteners. Tighten loose fasteners.
6. Close cutterbar doors.

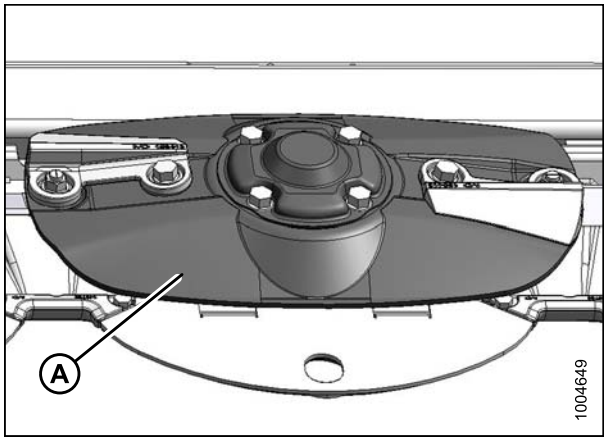


Figure 8.29

8.7.2 Replacing a Disc

Follow these steps to replace 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 doors.
2. Place a block of wood between two discs to prevent disc rotation while loosening blade bolts.
3. Remove four bolts (A) on disc cover (B) and remove cover and disc (C).
4. Position new disc (C) on spindle ensuring it is 90° to the adjacent discs.
5. Install cover (B) and secure with four bolts (A). Tighten bolts to 92 ft·lbf (125 N·m).

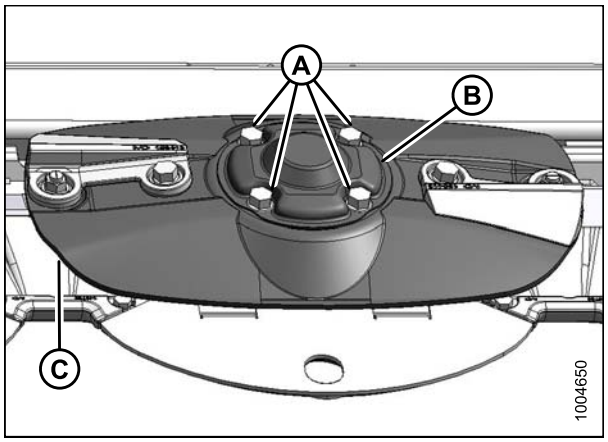


Figure 8.30

Replacing a Disc: Under Driven Deflector

1. Remove four bolts (A).
2. Remove cover (B), deflector (C), and disc (E).
3. Position new disc (E) on spindle, ensuring it is 90° to adjacent discs.
4. Position deflector (C) on spindle so that it clears accelerators (D).
5. Install cover (B) and secure with four bolts (A). Tighten bolts to 92 ft·lbf (125 N·m).

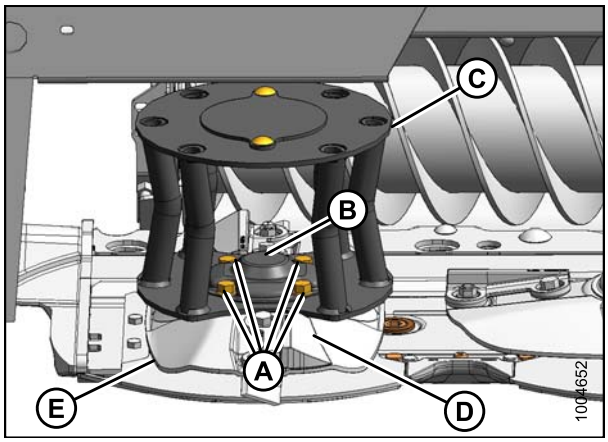


Figure 8.31

Replacing a Disc: Under Driveline Deflector

Follow these steps to replace a disc (B) under the driveline deflector (A):

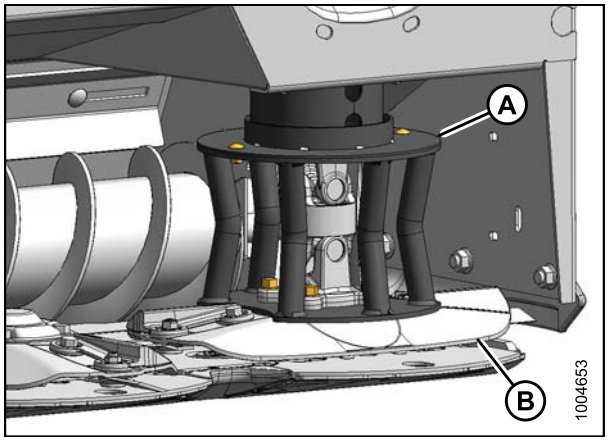


Figure 8.32

1. Remove the four bolts (A) that secure the driveline (B) and disc to the spindle.
2. Rotate the deflector (C) as required so that large opening in deflector faces you.
3. Remove the driveline (B) through the larger opening in the deflector.

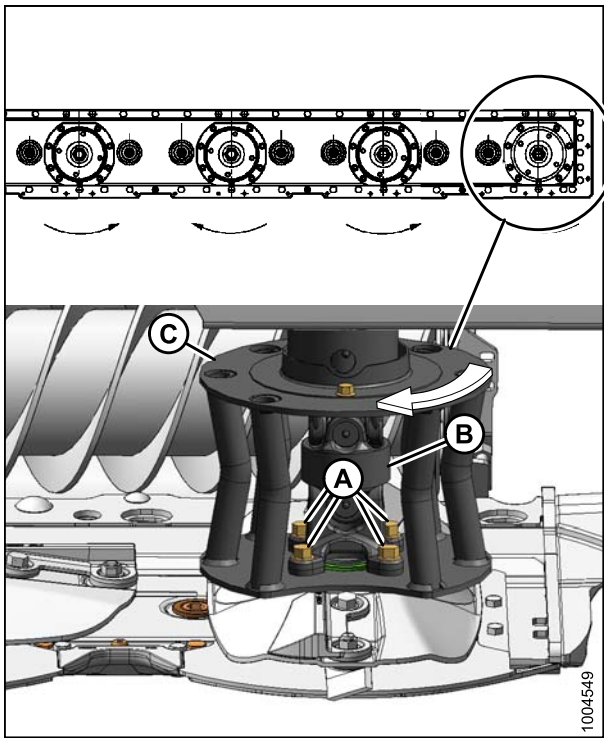


Figure 8.33: Clockwise rotation LH driveline disc

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

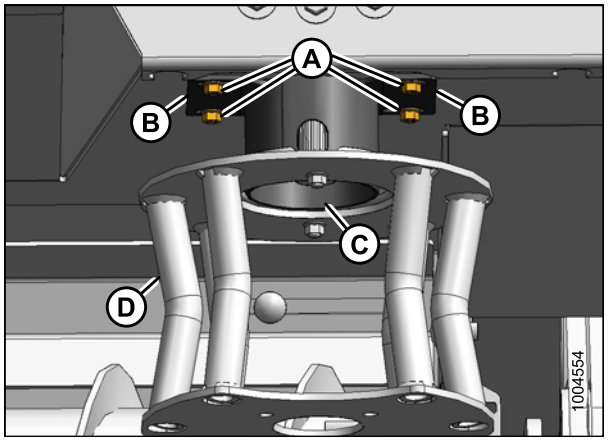


Figure 8.34

7. Remove disc (A).
8. Position new disc (A) on spindle ensuring it is 90° to adjacent discs.

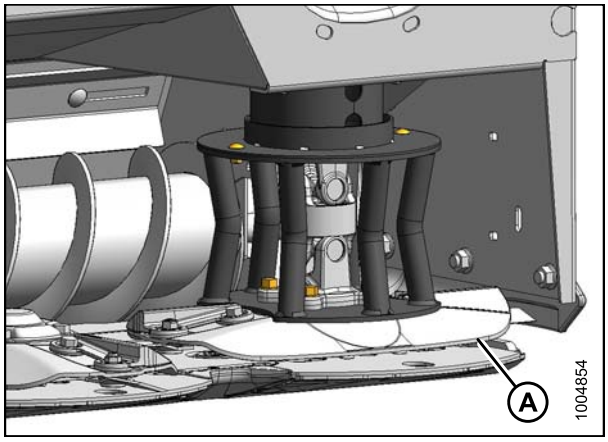


Figure 8.35

9. Locate deflector (A) and upper driveline shield (B) onto spindle.
10. Raise upper driveline shield (B) into position and move plates (C) into slots in shield. Do not tighten bolts.
11. Insert driveline (D) into deflector (A) and install onto shaft. Ensure that driveline (D) grease zerks will be accessible through large opening in deflector.

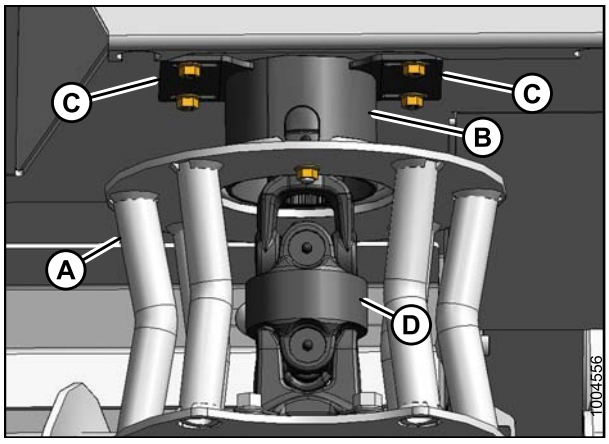


Figure 8.36

12. Align mounting holes in deflector (B), spindle, and driveline (D), and reinstall four bolts (A).
13. Torque bolts to 92 ft·lbf (125 N·m).
14. Adjust the upper driveline shield to achieve consistent gap around deflector shield (C).

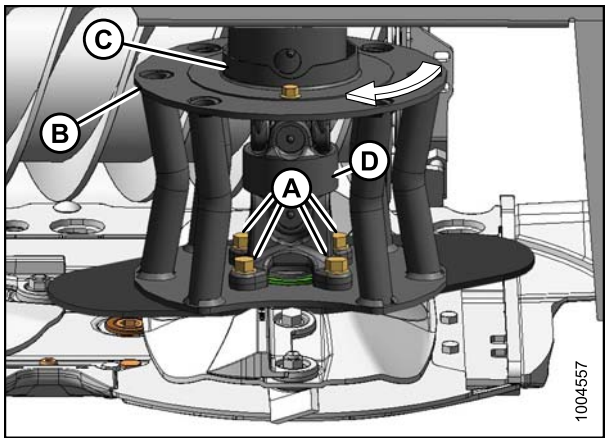


Figure 8.37

15. Tighten bolts (A) on shield plates (B).

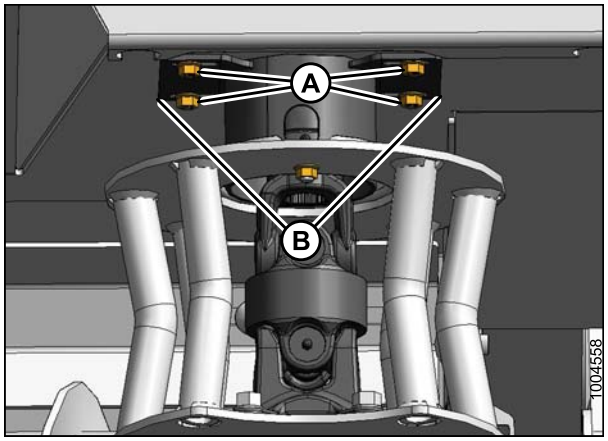


Figure 8.38

16. Remove block of wood (if used).
17. Close doors.

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.

8.7.3 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.

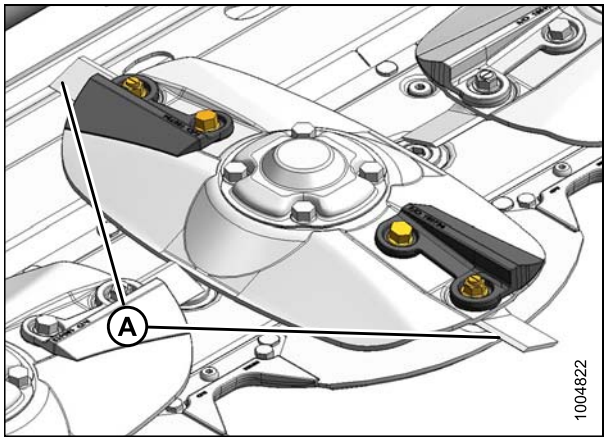


Figure 8.39

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.

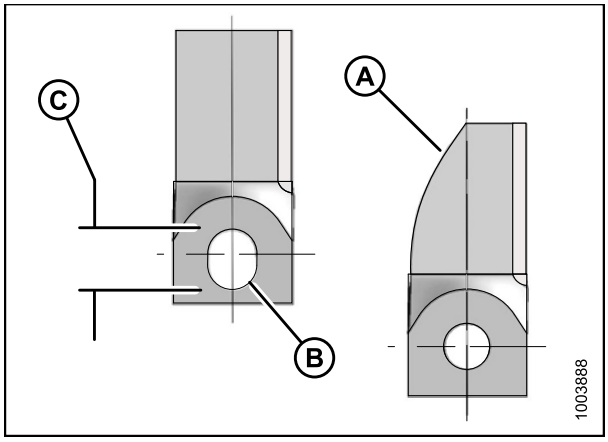


Figure 8.40

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.

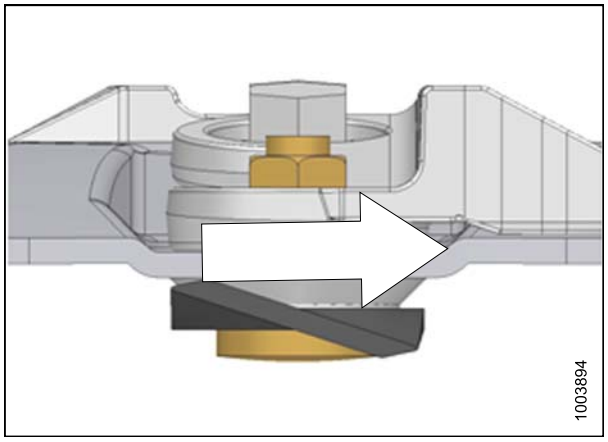


Figure 8.41: Counterclockwise disc rotation direction

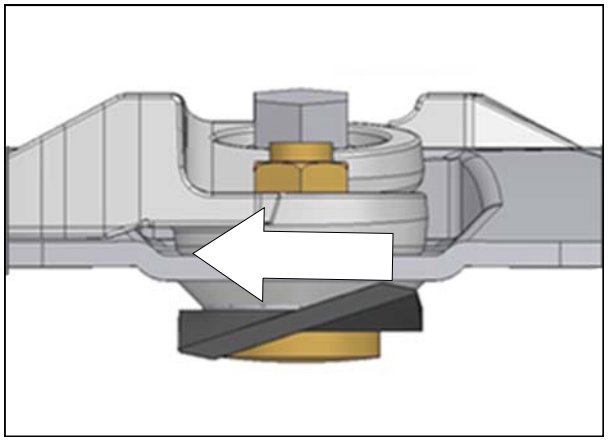


Figure 8.42: Clockwise disc rotation direction

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 lift cylinder lock-out valves before going under machine for any reason.

1. Raise mower conditioner fully, shut off engine, and remove key.
2. Engage lift cylinder lock-out valves. See Section 5.3 Lift Cylinder Lock-Out Valves, page 30.
3. Open cutterbar door(s). Refer to Section 5.5 Cutterbar Doors, page 34.

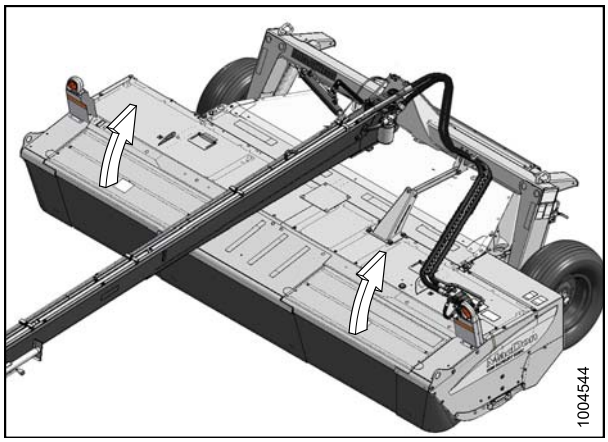


Figure 8.43

4. Rotate disc (A) so that blade (B) faces forward and lines up with hole (C) in rock guard.
5. Place a block of wood between two discs to prevent disc rotation while loosening blade bolts.
6. Clean debris from blade attachment area.

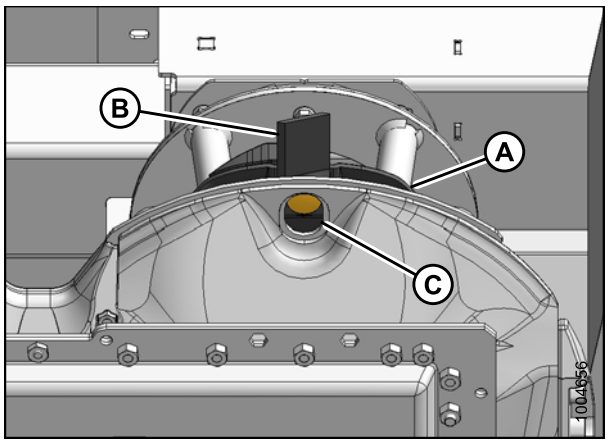


Figure 8.44

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

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

10. Install nut (A). Tighten nut to 100 ft·lbf (135 N·m).
11. 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.

12. Close doors.

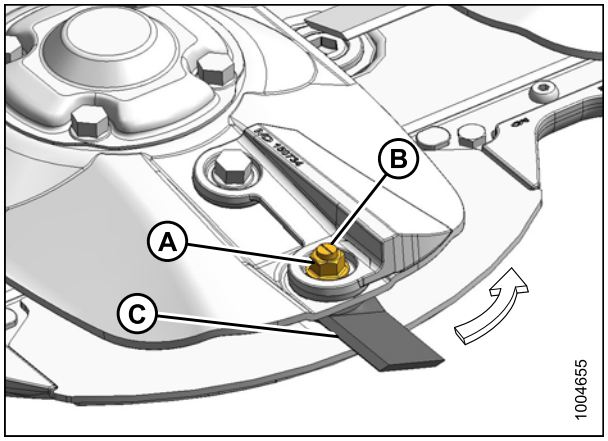


Figure 8.45

Cutterbar Hardware Inspection

Check blade attachment hardware each time blades are replaced. Refer to section Replacing the Cutter Blades, page 165 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.

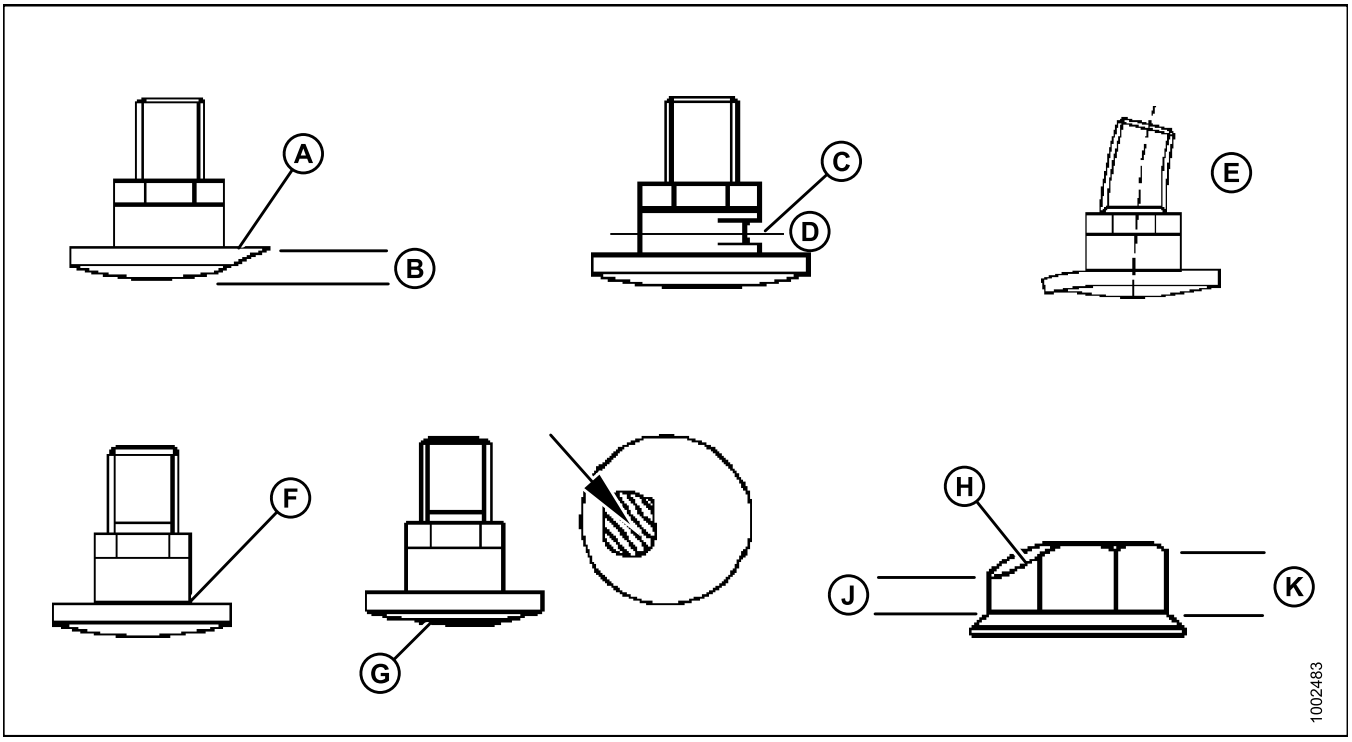


Figure 8.46

A - Bolt head worn
B - 0.0–0.16 in. (0.0–4 mm)
C - Bolt neck worn
D - 0.13 in. (3 mm)
E - Bolt distorted
F - Bolt neck cracked
G - Bolt interference
H - Nut wear
J - 0.00–0.24 in. (0.0–6.0 mm)
K - 0.5–0.51 in. (12.8–13mm)

8.7.4 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.

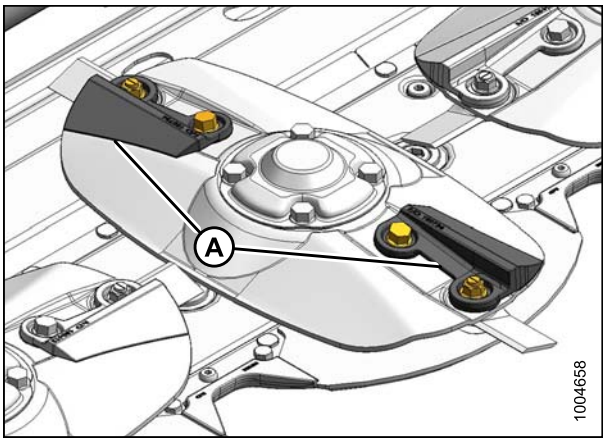


Figure 8.47: 16-foot mower conditioner shown

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 mower conditioner fully, stop engine, and remove key.
2. Engage lift cylinder lock-out valves. See Section 5.3 Lift Cylinder Lock-Out Valves, page 30.
3. Open cutterbar doors. Refer to Section 5.5 Cutterbar Doors, page 34.

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.

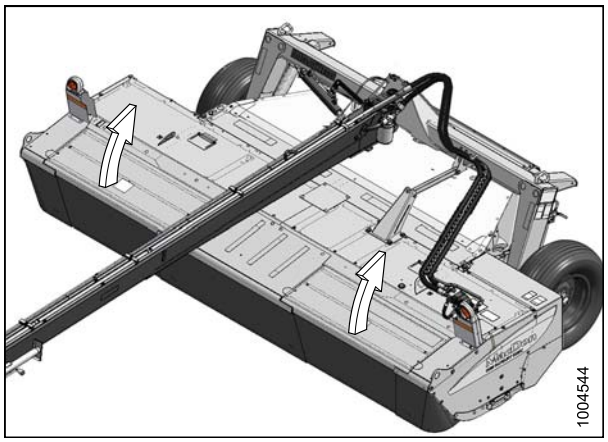


Figure 8.48

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 mower conditioner fully, shut off engine, and remove key.
2. Engage lift cylinder lock-out valves. See Section 5.3 Lift Cylinder Lock-Out Valves, page 30.
3. Remove disc. See Section 8.7.2 Replacing a Disc, page 158.

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

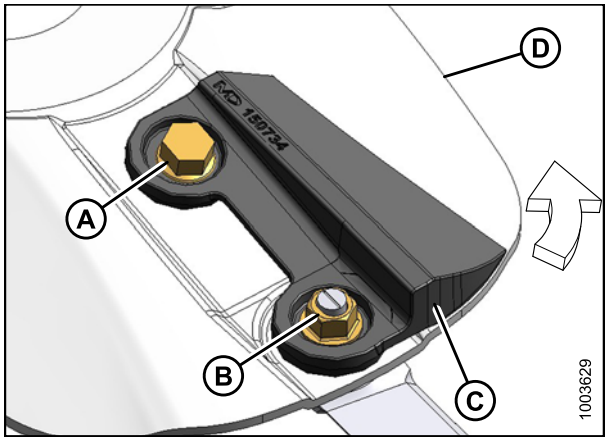


Figure 8.49

IMPORTANT

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

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

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

6. Install hex bolt (A) and nut at inboard hole. Bolt head faces up.
7. Tighten both nuts to 100 ft·lbf (135 N·m).
8. Repeat for other accelerator.
9. Reinstall disc (D) on spindle. Refer to Section 8.7.2 Replacing a Disc, page 158.
10. Remove block of wood (if used).

WARNING

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

11. Close cutterbar doors.

8.7.5 Rotary Deflectors

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

Rotary deflectors should be checked daily for damage or wear.

Inspecting Rotary Deflectors

DANGER

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 mower conditioner to ground, shut off engine, and remove key.

2. Open cutterbar doors. Refer to Section 5.5 Cutterbar Doors, page 34.

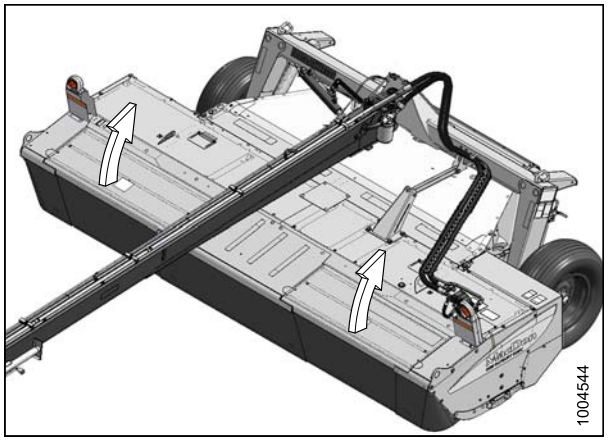


Figure 8.50

3. Check that deflectors (A) are not damaged or bent by rocks and for loose fasteners.
4. Replace deflectors (A) if they are severely damaged or worn. See section Replacing the Rotary Deflectors, page 170. Do **NOT** repair.
5. Tighten loose fasteners.

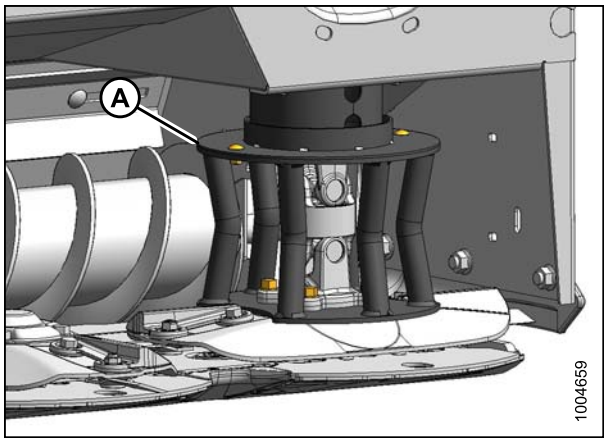


Figure 8.51

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.

6. Close cutterbar doors.

Replacing the Rotary Deflectors

Replacing the Driven Deflector

Follow these steps to replace the driven rotary deflector:

1. Place a block of wood between two discs to prevent disc rotation while loosening bolts.

2. Remove four bolts (A).
3. Remove cover (B) and deflector (C).
4. Position new deflector (C) on spindle so that it clears accelerators (D).
5. Install cover (B) and secure with four bolts (A).
6. Tighten bolts to 97–108 ft·lbf (132–145 N·m).

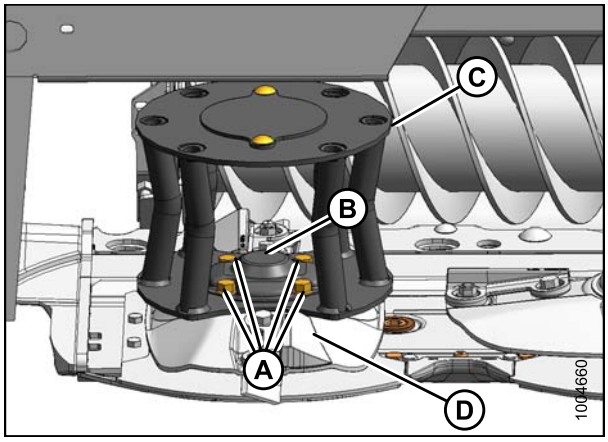


Figure 8.52

Replacing the Driveline Deflector

Follow these steps to replace the driveline deflector:

1. Remove the four bolts (A) that secure the driveline (B) and disc to the spindle.
2. Rotate the deflector (C) as required so that large opening in deflector faces you.
3. Remove the driveline (B) through the larger opening in the deflector.

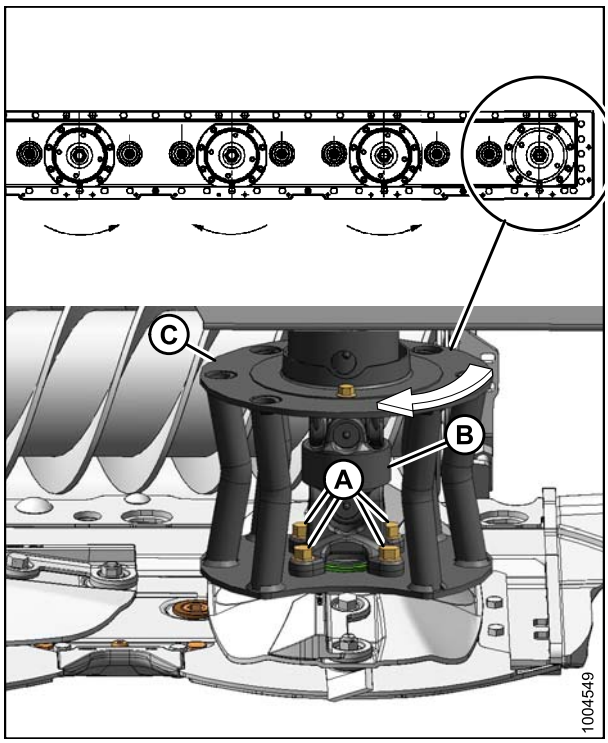


Figure 8.53: Clockwise rotation LH driveline disc

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

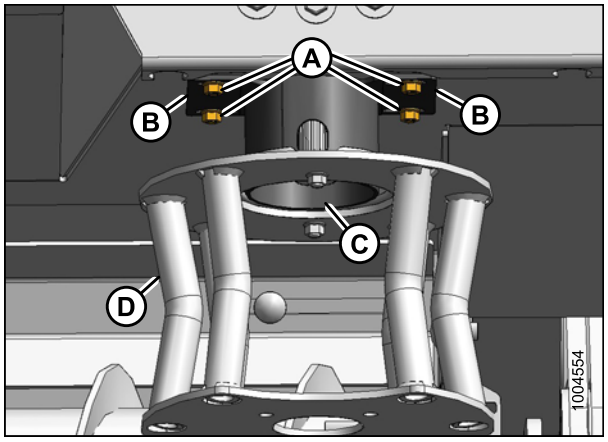


Figure 8.54

7. Locate new deflector (A) and upper driveline shield (B) onto feed plate.
8. Raise upper driveline shield (B) into position and move plates (C) into slots in shield. Do **NOT** tighten bolts.
9. Insert driveline (D) into deflector (A) and install onto shaft. Ensure that driveline (D) grease zerks will be accessible through large opening in deflector.

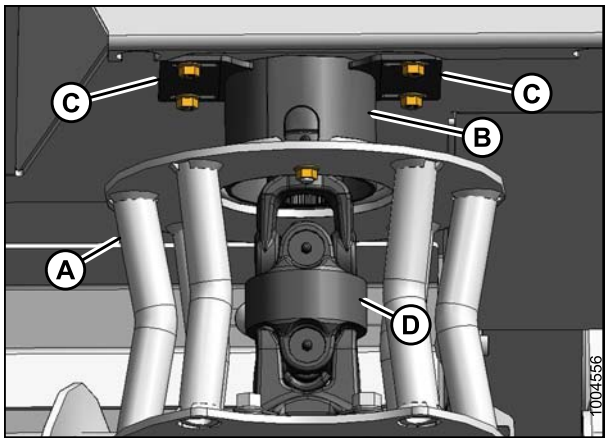


Figure 8.55

10. Align mounting holes in deflector (B), spindle, and driveline (D), and reinstall four bolts (A).
11. Torque bolts to 92 ft·lbf (125 N·m).
12. Adjust the upper driveline shield to achieve consistent gap around deflector shield (C).

    NOTE: Figure shows tall crop feed plate installed between the deflector and the disc.

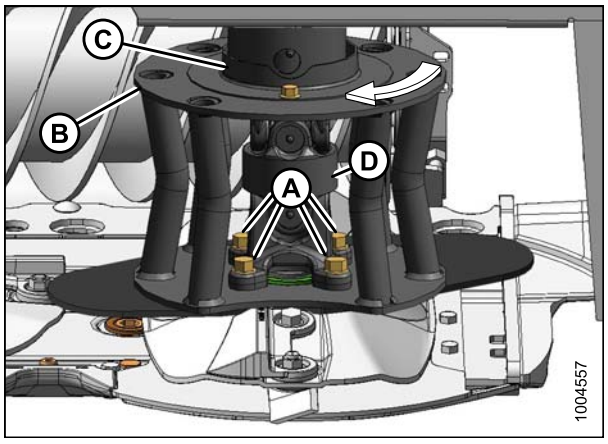


Figure 8.56: Clockwise rotation LH driveline disc

13. Tighten bolts (A) on shield plates (B).

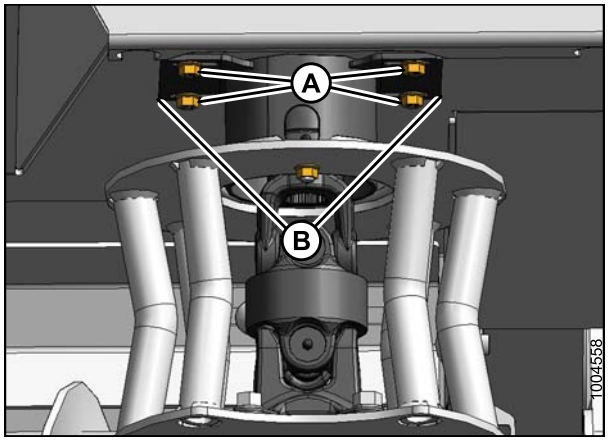


Figure 8.57

14. Remove block of wood (if used).
15. Manually rotate discs to check for interference of feed plate and adjacent parts.

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.

16. Close cutterbar doors.

8.7.6 Disc Spindles

To prevent damaging the cutterbar and drive systems, each disc is attached to a spindle which incorporates a key that shears if the disc contacts a large stone, a stump, or other large object. In the event of a sheared key, the disc stops rotating, but remains attached to the spindle.

Replacing a Spindle Key

Follow these steps to replace a spindle 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.

1. Lower mower conditioner to ground, shut off engine, and remove key.
2. Open cutterbar doors. Refer to Section 5.5 Cutterbar Doors, page 34.

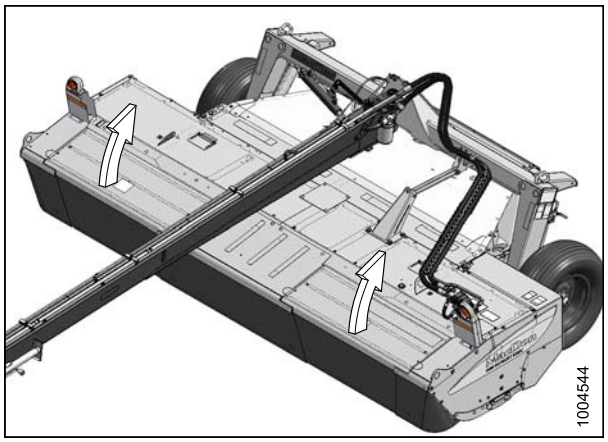


Figure 8.58

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.

3. Remove disc (A) from failed spindle. Refer to Section 8.7.2 Replacing a Disc, page 158.

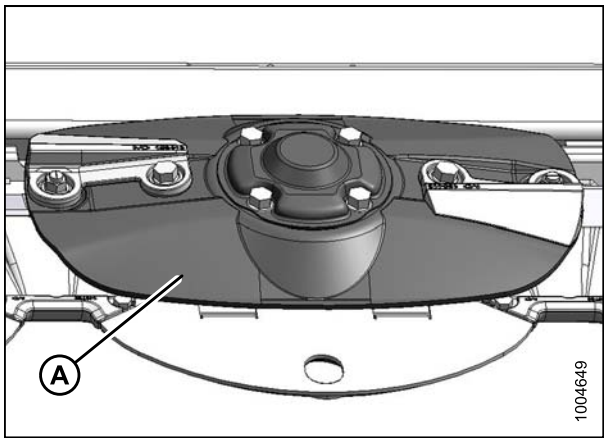


Figure 8.59

4. Using a 34 mm socket wrench, remove nut (A) and washer (B) from spindle.

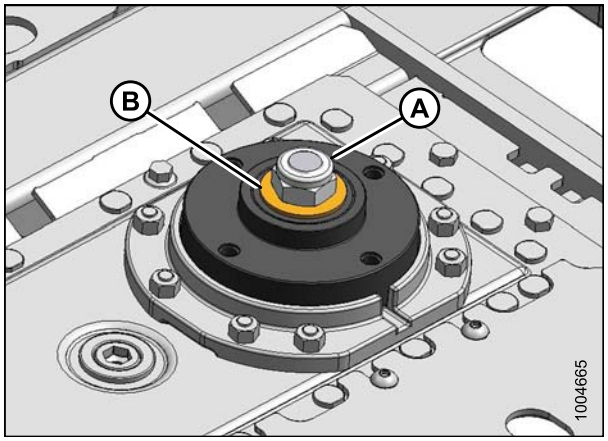


Figure 8.60

5. Install four M12 mm x 60 mm long bolts (A) into holes in plate (B).
6. Use bolts (A) as jacking screws to remove plate (B) from gear. Remove bolts from plate.

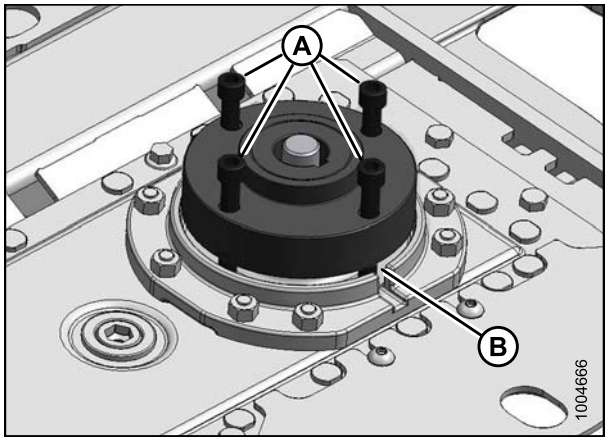


Figure 8.61

7. Pry out failed key (A) from gear (B) and plate.
8. Thoroughly clean metal debris from disassembled components and cutterbar.

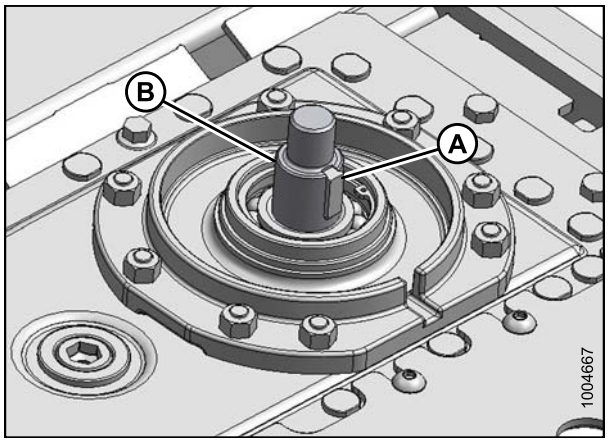


Figure 8.62

9. Inspect plate (C) and gear shaft (E) for damage. If seriously damaged, replace entire spindle assembly. Contact your MacDon Dealer.
10. Install new key (D) into gear (E) keyway as shown.
11. Align keyway in plate (C) with key in gear (E) and install plate (C) onto gear until sufficient threads are exposed to install washer (B) and nut (A).

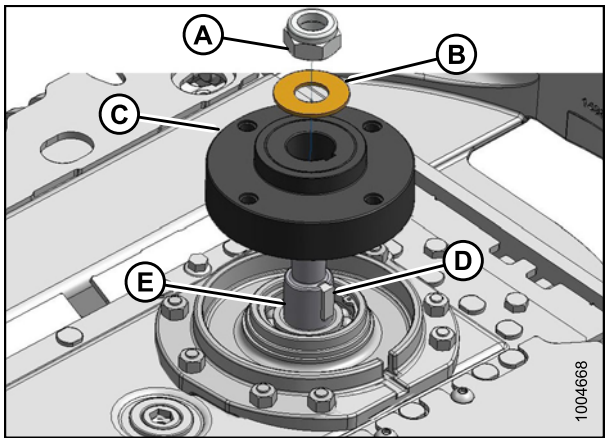


Figure 8.63

12. Tighten nut (A) until plate is in final position. Torque nut to 325 lbf·ft (440 (N·m).
13. Reinstall disc. Refer to Section 8.7.2 Replacing a Disc, page 158.

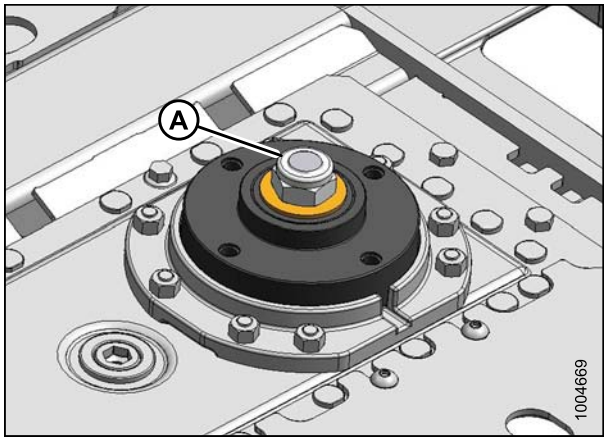


Figure 8.64

8.7.7 Cutterbar Doors

Inspecting Curtains

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

Inspecting Door Latches: Export Mower Conditioner

The cutterbar door latches should operate smoothly and remain engaged when the doors are down. Tighten latch hardware if loose. If the rubber bushing is damaged or does not allow the latch to operate properly, the latch should be replaced.

Adjusting Latches

Follow these steps to adjust the door latches:

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. Unlatch and lift curtain.
2. Loosen bolts (A) and move latch assembly to position as shown so that latch (B) engages pin.
3. Tighten bolts (A).
4. If necessary, loosen nut (C) and rotate latch (B) to position as shown.
5. Tighten nut (C).

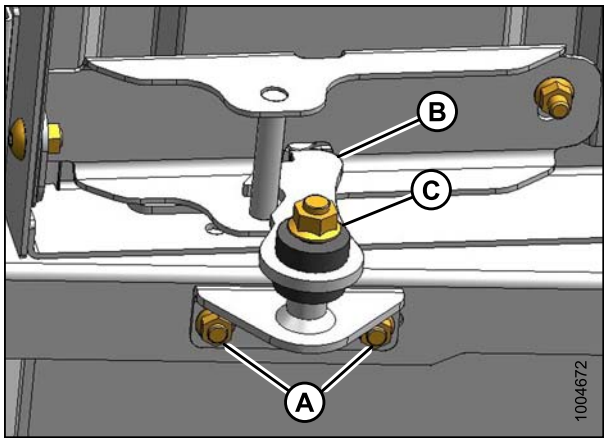


Figure 8.65

Replacing Latches

To replace cutterbar door latches, follow these steps:

1. Unlatch and lift curtain.
2. Remove bolts (A) and remove latch assembly from frame.
3. Locate new latch assembly on frame and reinstall bolts (A).
4. Adjust to position shown and tighten bolts (A).

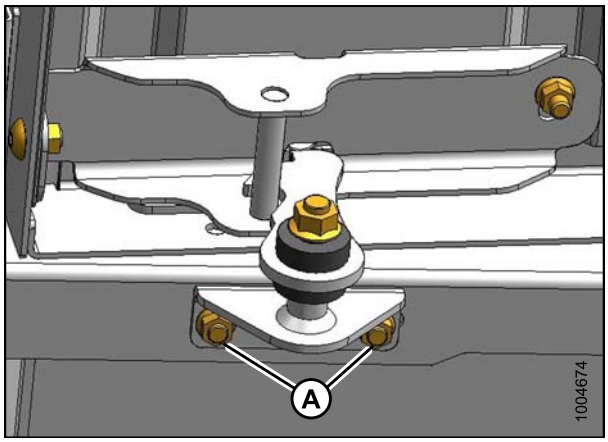


Figure 8.66

Replacing Latch Brackets

To replace the cutterbar door latch brackets, follow these steps:

1. Open cutterbar door.
2. Remove bolts (A), washers, and nuts, and remove latch bracket (B) from door.
3. Locate new latch bracket (B) on door and reinstall bolts (A), washers and nuts. Use three washers on aft bolt as spacers between bracket (B) and door.
4. Close door and check alignment with latch. Adjust as necessary and tighten bolts (A).

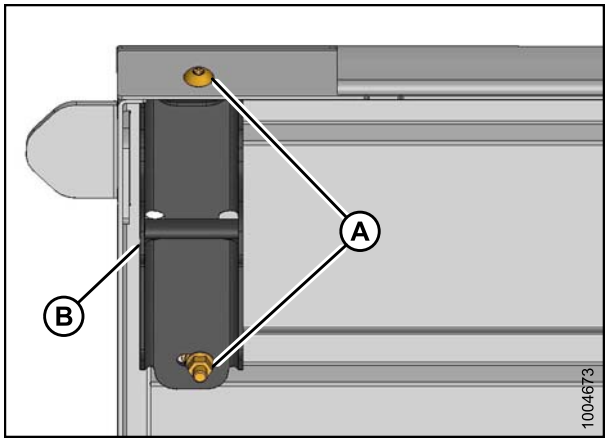


Figure 8.67

8.8 Drive Systems

8.8.1 Driveline

The driveline normally remains attached to the mower conditioner and is stored on the hook provided when not in use. Apart from normal lubrication, no maintenance or servicing is necessary. If driveline is damaged or worn, replace it.

Ensure driveline guard is not damaged and is in good condition. Replace it if damaged or improper fitment. Refer to Section 8.8.2 Driveline Guard, page 182.

Removing the Driveline

Follow these steps to remove the driveline:

1. Park mower conditioner on level ground, lower mower conditioner to ground, and block the wheels.
2. Support front of hitch with wooden blocks (or equivalent).
3. Remove the hitch drawbar adapter (A) or 3-point hitch adapter (B).

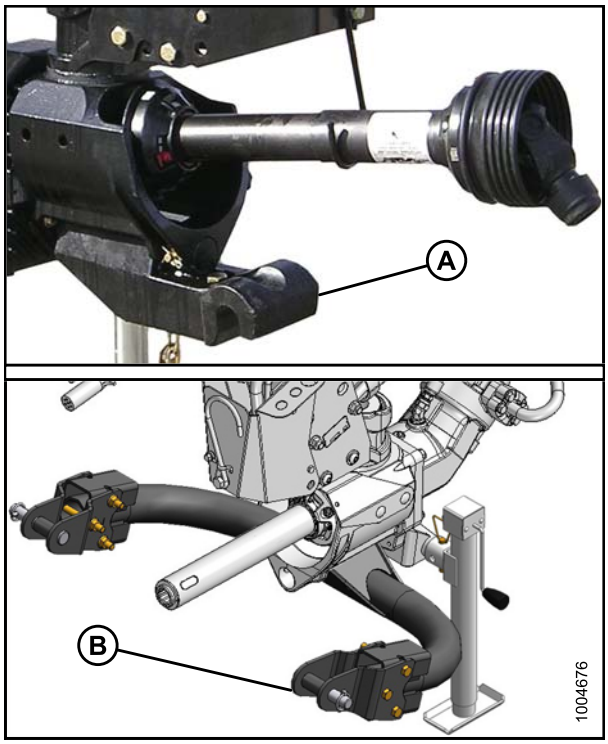


Figure 8.68

4. Remove cotter pin and washer on clevis pin (A) and remove clevis pin.

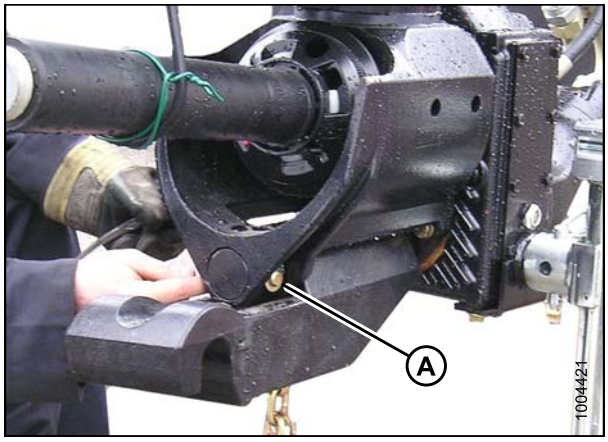


Figure 8.69: Drawbar adaptor shown

5. Hold hitch adapter (A) and remove swivel pin (B).
6. Remove hitch adapter.

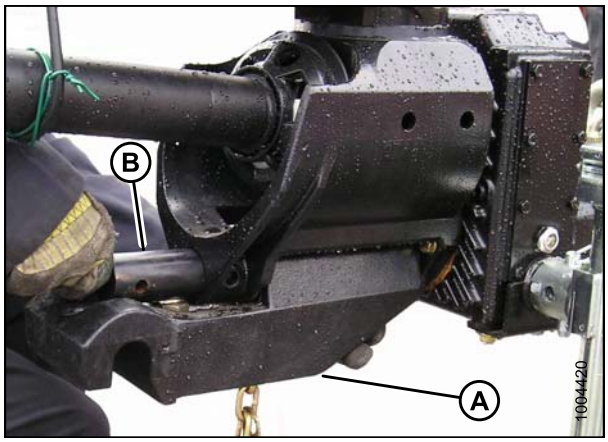


Figure 8.70

7. Turn driveline so that bolt (A) is accessible from underside of casting.
8. Use a large wrench to keep driveline from turning and remove bolt (A) and washers with a 15/16 in. wrench.

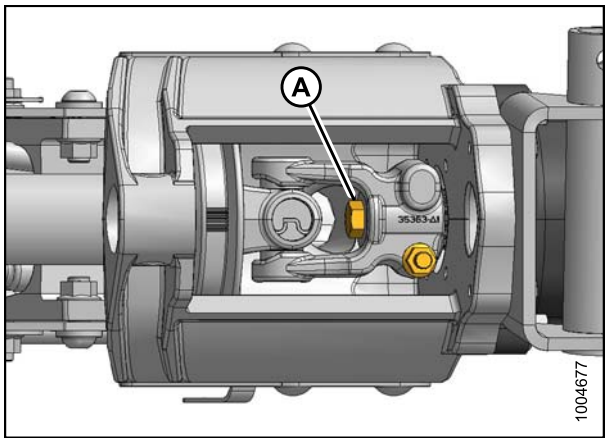


Figure 8.71

9. Rotate driveline 1/4 turn so that clamp bolt (A) in yoke is accessible.
10. Remove clamp bolt (A) with a 3/4 in. wrench.

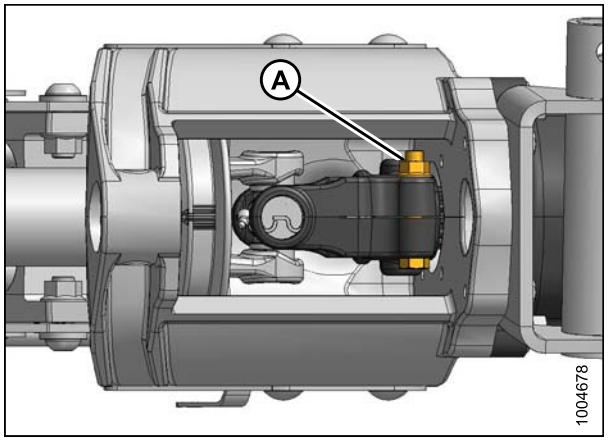


Figure 8.72

11. Insert a wedge into the split (A) to loosen yoke.
12. Slide driveline forward until clear of splined pump shaft.
13. Remove wedge (if necessary) and remove driveline from casting.

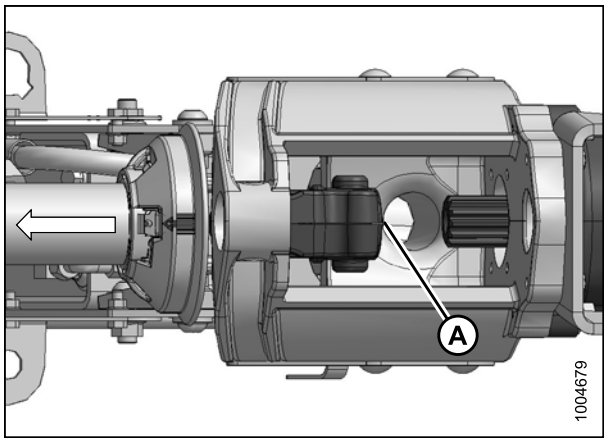


Figure 8.73

Installing the Driveline

Follow these steps to install the driveline:

1. Insert driveline into casting.
2. Drive a small wedge into split (B) in yoke.
3. Push yoke onto end of splined pump shaft (A).
4. Remove the wedge and rotate driveline so that opening in yoke is accessible.

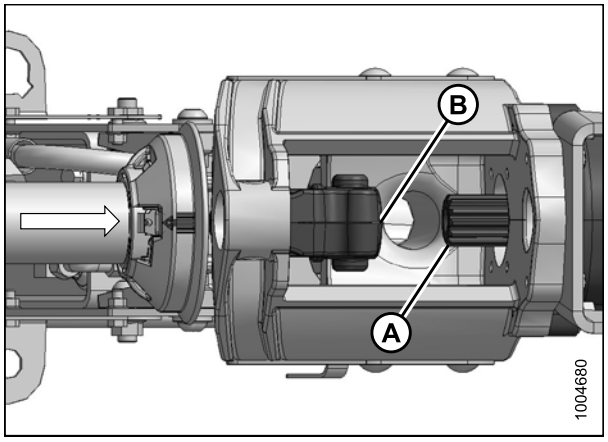


Figure 8.74

5. Insert bolt (A) with large washer (B) under head, two small washers (C), and one thin washer (D) into yoke, and thread onto pump shaft.
6. Tighten bolt (A) with a 15/16 in. wrench so that driveline is drawn onto pump shaft.

   NOTE: Ensure there is 0.060 in. (1.5 mm) minimum clearance (E) between the yoke and the casting. Add extra washer if necessary.

7. Torque bolt (A) to 150 lbf·ft (203 N·m).

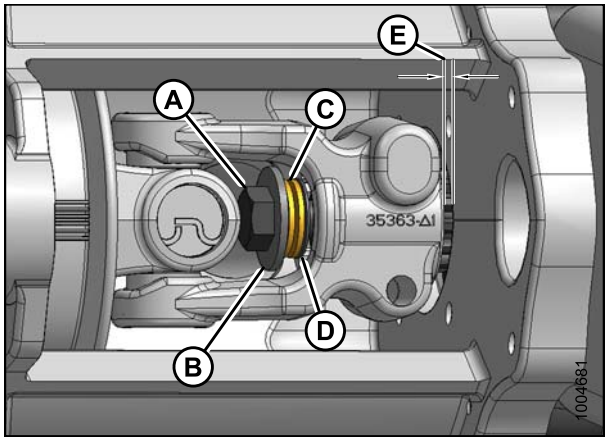


Figure 8.75

E - minimum clearance 0.060 in. (1.5 mm)

8. Rotate driveline 1/4 turn so that clamp bolt can be installed.
9. Install clamp bolt (A) and nut with a 3/4 in. wrench and torque to 55 lbf·ft (75 N·m).
10. Reinstall the drawbar adapter or 3-point hitch adapter.

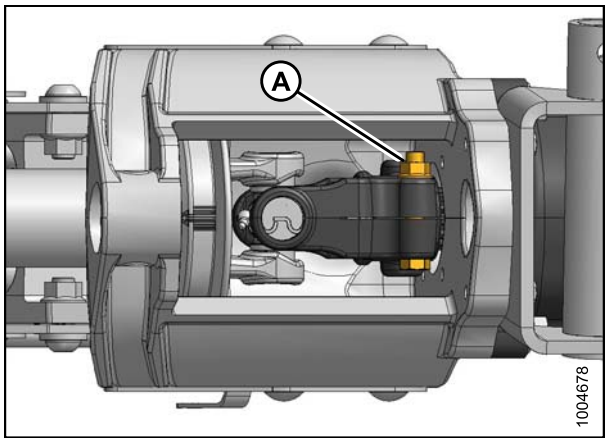


Figure 8.76

8.8.2 Driveline Guard

Removing the Driveline Guard

Follow these steps to remove the driveline guard:

1. Lift driveline (A) from hook (B) and extend driveline until it separates. Hold aft part (C) of driveline to prevent it from dropping.

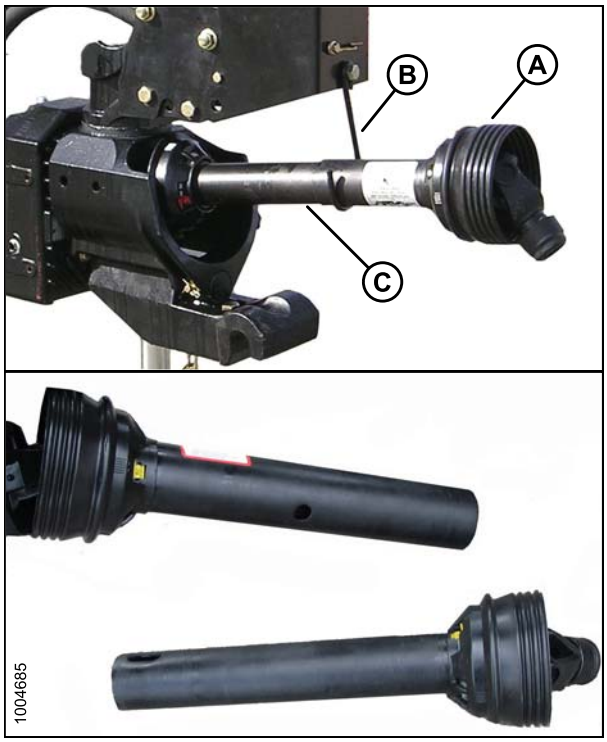


Figure 8.77

2. Release grease zerk/lock (A) with a screwdriver.

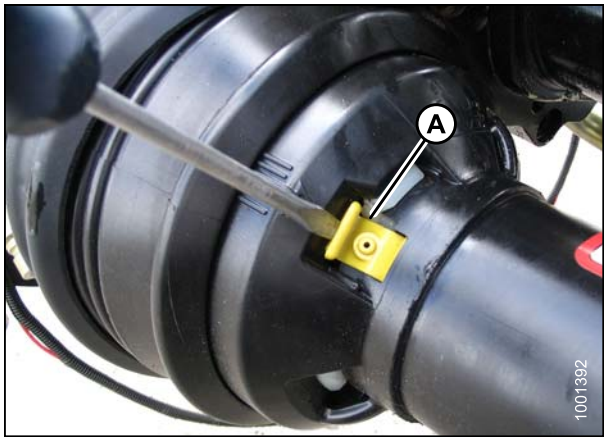


Figure 8.78

3. Rotate guard locking ring (A) counterclockwise with a screwdriver until lugs (B) line up with slots in guard.
4. Pull guard off driveline.
5. Repeat steps 2–4 for the other driveline guard.

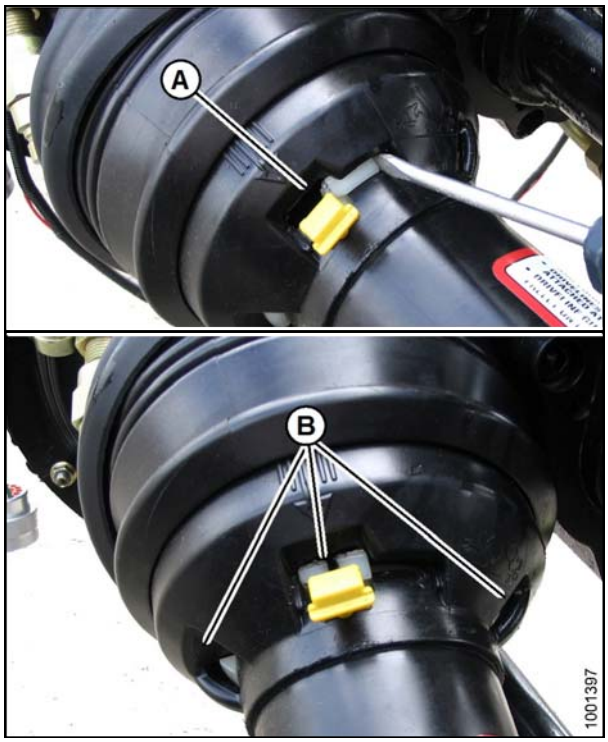


Figure 8.79

Installing the Driveline Guard

1. Slide guard onto driveline and line up slotted lug on guard locking ring (A) with arrow (B) on guard.

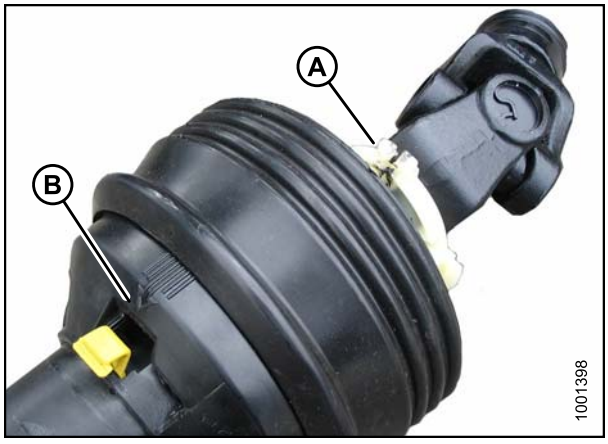


Figure 8.80

2. Push guard onto ring until locking ring is visible in slots (A).

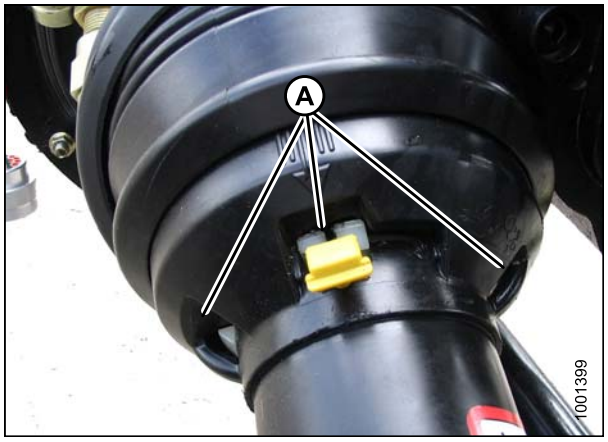


Figure 8.81

3. Rotate ring (A) clockwise with a screwdriver to lock ring in guard.

Figure 8.82

4. Push grease zerk (A) back into guard.
5. Repeat steps 1., Installing the Driveline Guard, page 183 to 4., Installing the Driveline Guard, page 184 for the other guard.
6. Reassemble driveline.

Figure 8.83

7. Replace driveline in hook (A), or connect to mower conditioner.

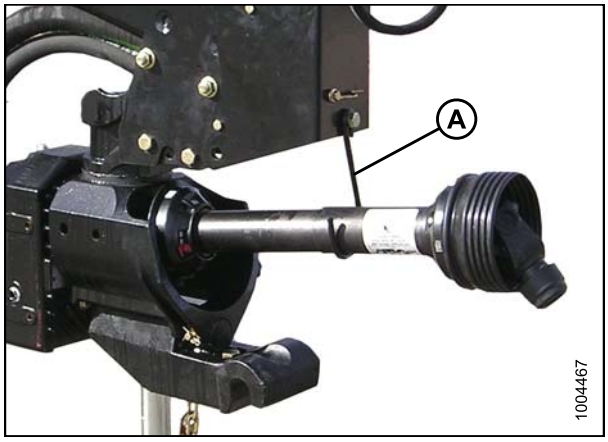


Figure 8.84

8.8.3 Drive Pump

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

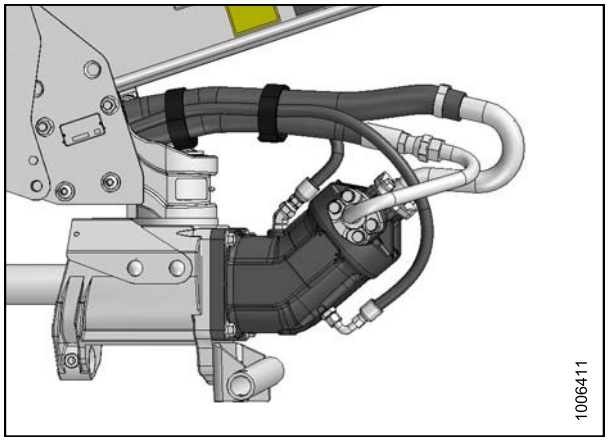


Figure 8.85

Removing the Drive Pump

Follow these steps to remove the main drive pump:

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 tractor, lower mower conditioner to ground, turn off engine, and remove key.

2. Remove straps (A) to ease removal and handling of hydraulic hoses.
3. Disconnect hoses (B) and (C) from pump and install caps on hose ends and pump ports.
4. Loosen clamp (D) and remove supply hose. Plug supply hose immediately to minimize loss of oil. Do NOT remove bolted fittings. Plug pump inlet line.
5. Disconnect pressure line at fitting (E). Do NOT remove bolted fittings. Plug open lines.
6. Remove driveline from pump shaft. Refer to section Removing the Driveline, page 178.

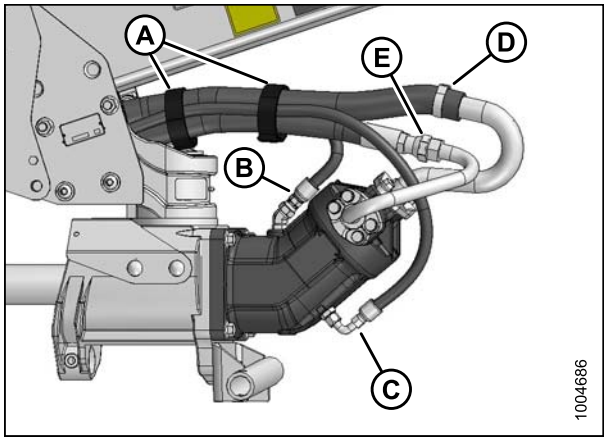


Figure 8.86

7. Remove four bolts (A) and remove pump (B).

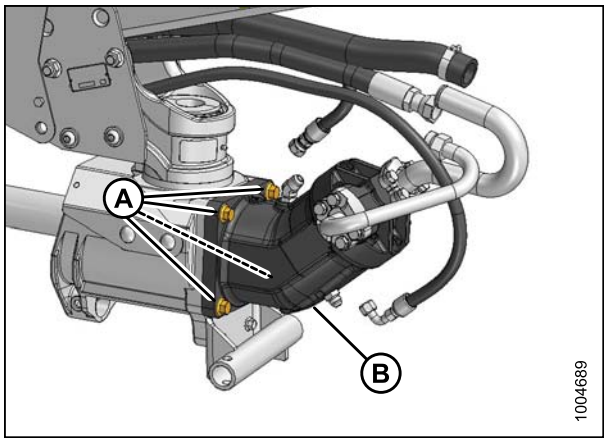


Figure 8.87

Installing the Drive Pump

Follow these steps to install the drive pump:

1. Apply SAE multi-purpose extreme pressure grease to pump spline (A) and position pump (B) on housing.
2. Reinstall four bolts (C) and torque to 92 ft·lbf (125 N·m).

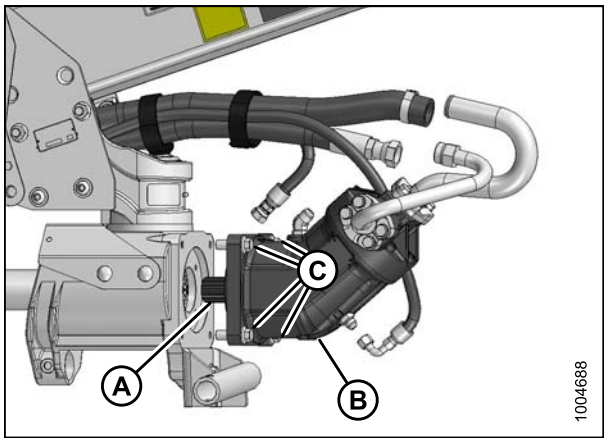


Figure 8.88

3. Reconnect hoses EXCEPT at fitting (A) to pump.
4. Fill pump case with clean hydraulic oil at fitting (A).
5. Attach case drain hose to fitting (A) and tighten.
6. Install hose straps.
7. Reinstall driveline. Refer to section Installing the Driveline, page 180.
8. Check reservoir oil level and add oil if required. See Section 8.9.2 Hydraulic Oil Reservoir, page 199.

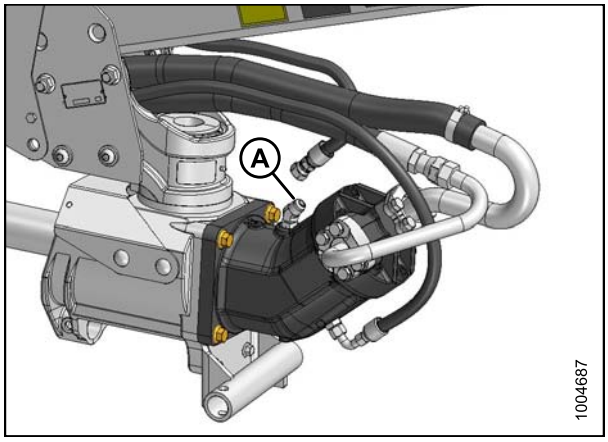


Figure 8.89

8.8.4 Bevel Gearbox

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

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 8.6.1 Maintenance Schedule/Record, page 138.

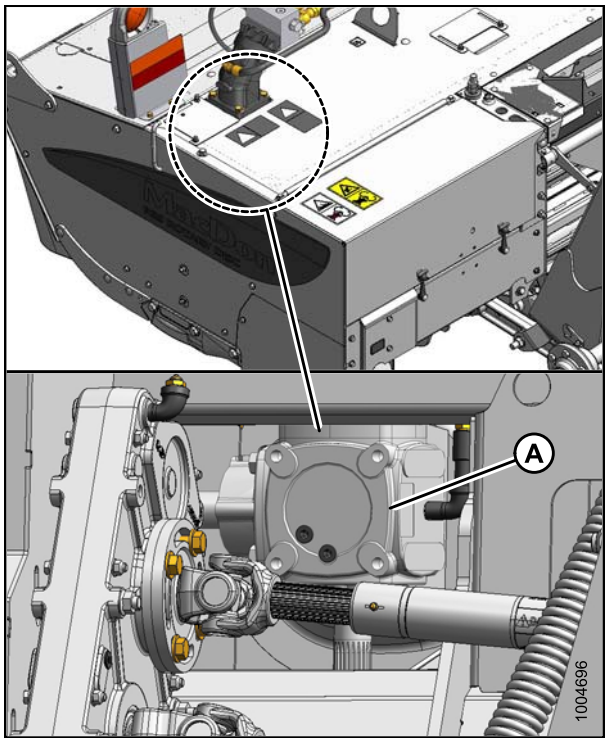


Figure 8.90

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 mower conditioner to full height, stop engine, and remove key from ignition.
3. Engage lift cylinder lock-out valves. See Section 5.3 Lift Cylinder Lock-Out Valves, page 30.
4. Open the driveshield. See Section 5.4 Driveshields, page 32.

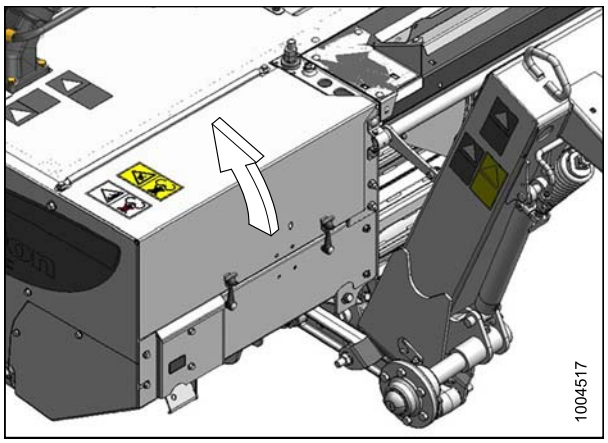


Figure 8.91

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 lift cylinder lock-out valves, start engine, and lower mower conditioner 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.

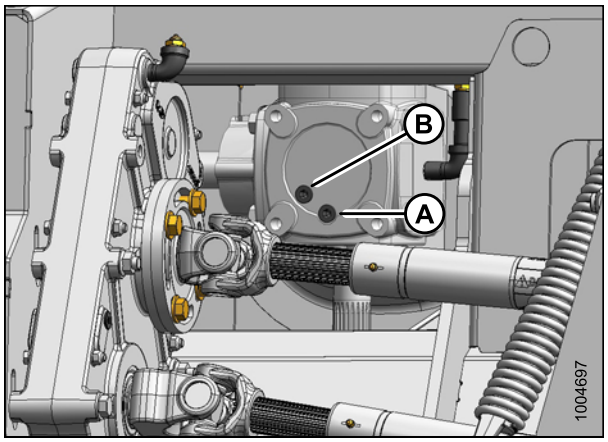


Figure 8.92

8.8.5 Conditioner Drive Belt

The conditioner drive belt is located inside the drive compartment at the left hand side of the mower conditioner and is tensioned with a spring tensioner.

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).

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 mower conditioner to ground, turn off engine, and remove key.
2. Open the driveshield. See Section 5.4 Driveshields, page 32.

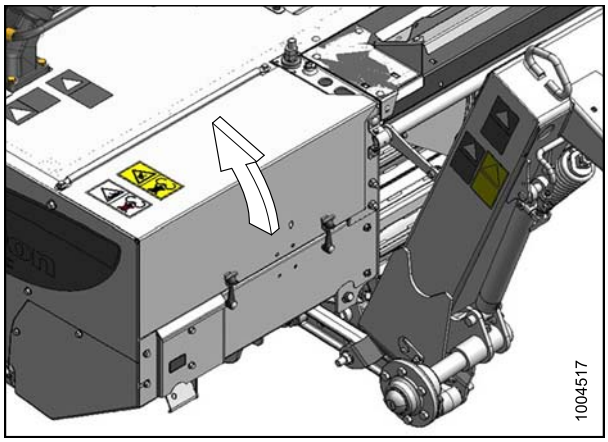


Figure 8.93

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.

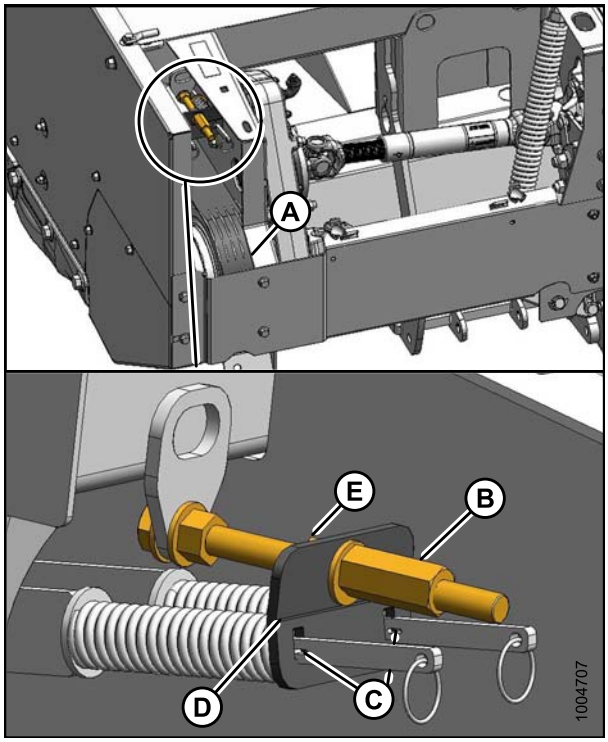


Figure 8.94

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 mower conditioner to ground, turn off engine, and remove key.

2. Open the driveshield. See Section 5.4 Driveshields, page 32.

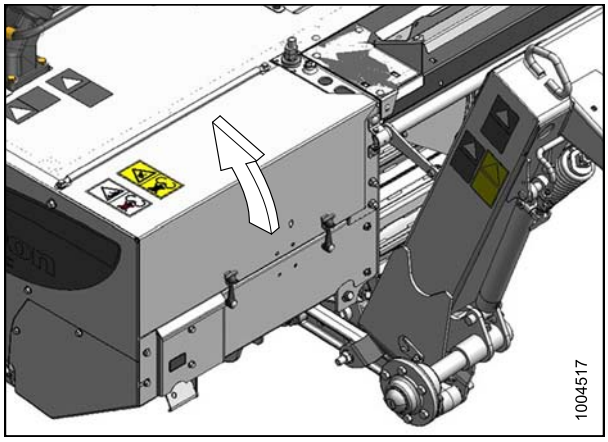


Figure 8.95

3. Remove the auger drive belts (A). See section Replacing the Auger Drive Belts, page 195 steps 3–7.

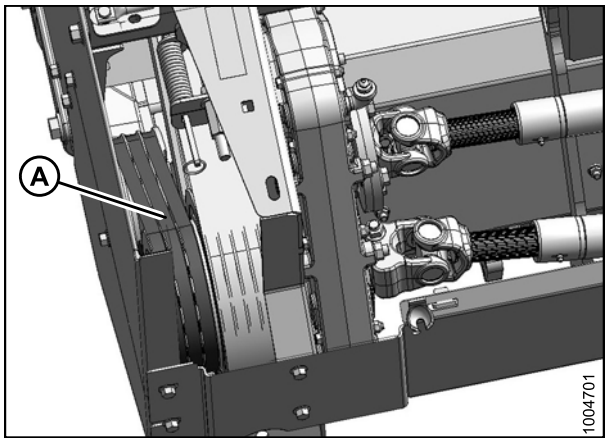


Figure 8.96

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

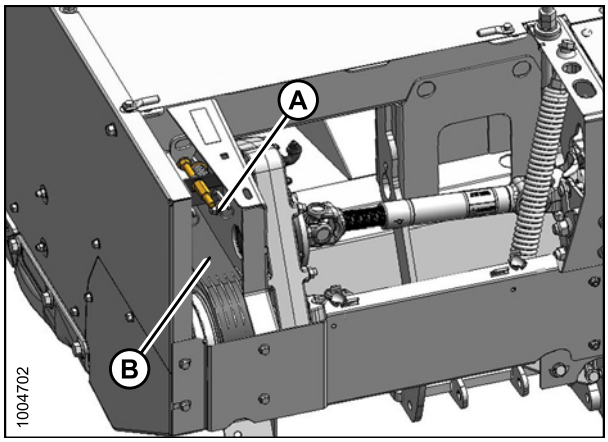


Figure 8.97

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 section Inspecting the Conditioner Drive Belt, page 189.
8. Install and tension auger drive belts. See section Replacing the Auger Drive Belts, page 195.
9. Close driveshield.

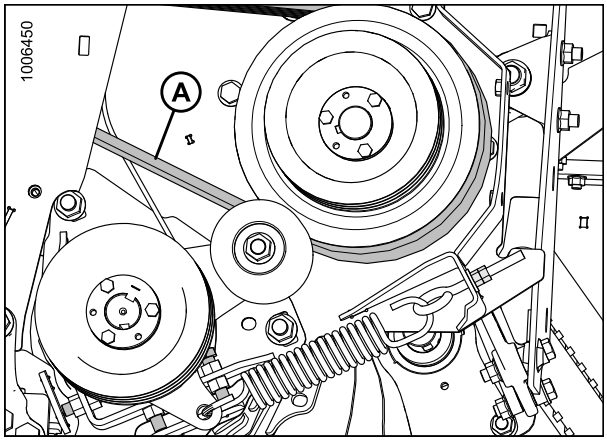


Figure 8.98

8.8.6 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 mower conditioner.

The only regular servicing required is maintaining the lubricant level and changing the lubricant according to the intervals specified in this manual. See Section 8.6.1 Maintenance Schedule/Record, page 138.

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

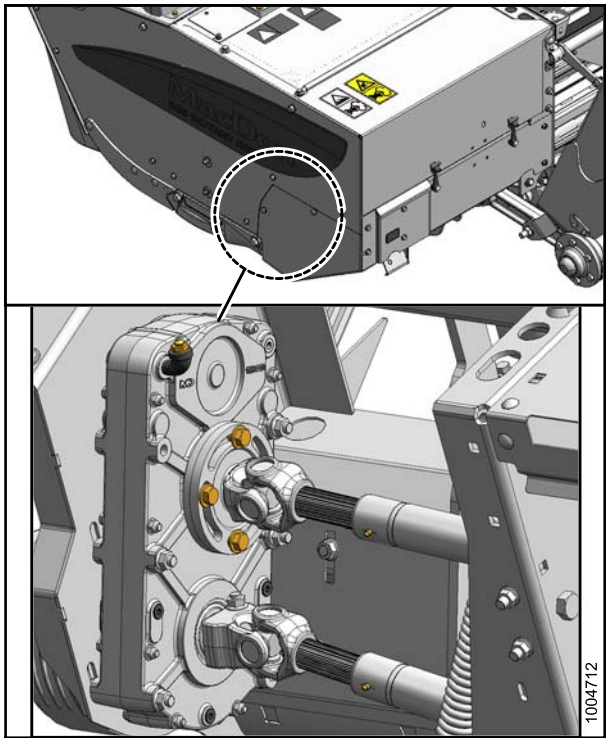


Figure 8.99

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 mower conditioner to full height, stop engine, and remove key from ignition.
2. Engage lift cylinder lock-out valves. See Section 5.3 Lift Cylinder Lock-Out Valves, page 30.
3. Open driveshield. See Section 5.4 Driveshields, page 32.

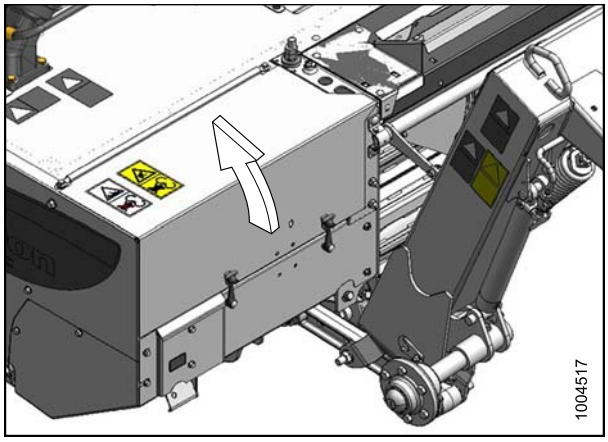


Figure 8.100

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.

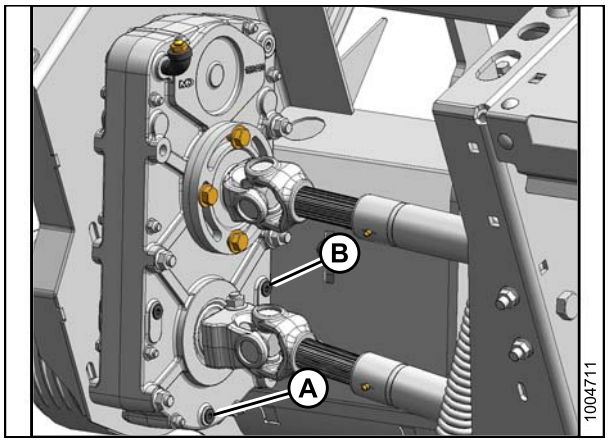


Figure 8.101

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.

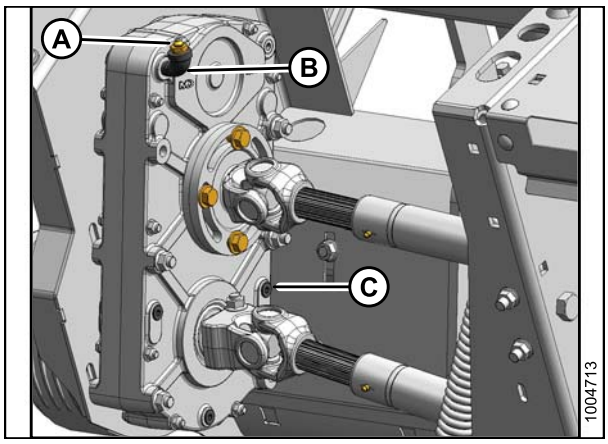


Figure 8.102

8.8.7 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 mower conditioner to ground, turn off engine, and remove key.
2. Open driveshield. See Section 5.4 Driveshields, page 32.

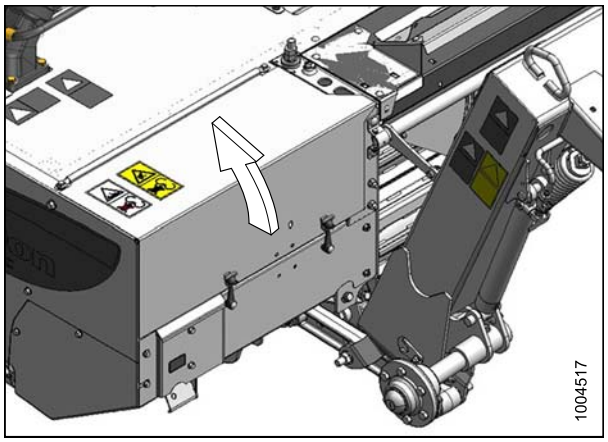


Figure 8.103

3. Check condition of auger drive belts (A). If severely worn or damaged, replace them. Refer to Replacing the Auger Drive Belts, page 195.

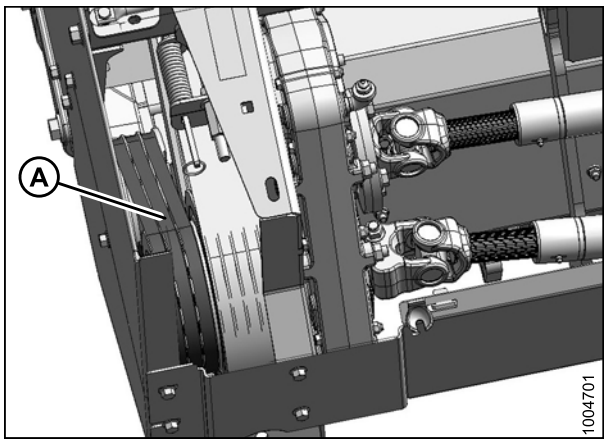


Figure 8.104

4. Raise mower conditioner fully, turn off engine, and remove key.
5. Engage lift cylinder lock-out valves. See Section 5.3 Lift Cylinder Lock-Out Valves, page 30.

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.

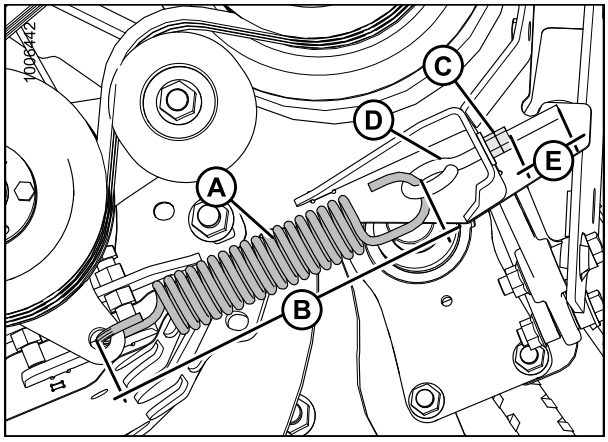


Figure 8.105

Replacing the Auger Drive Belts

Follow these steps to replace the auger drive belts:

1. Raise mower conditioner fully, turn off engine, and remove key from ignition.
2. Engage lift cylinder lock-out valves. See Section 5.3 Lift Cylinder Lock-Out Valves, page 30.
3. Open driveshield. See Section 5.4 Driveshields, page 32.
4. Remove/loosen four bolts (A) and remove cover (B).

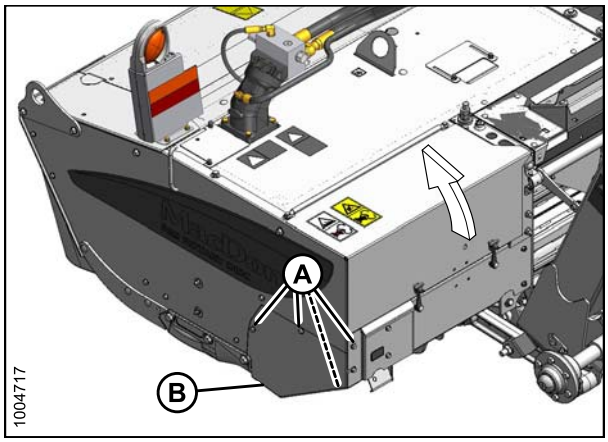


Figure 8.106

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 194.

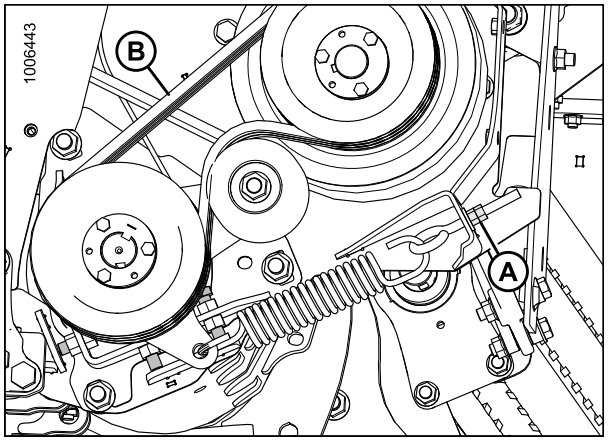


Figure 8.107

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).

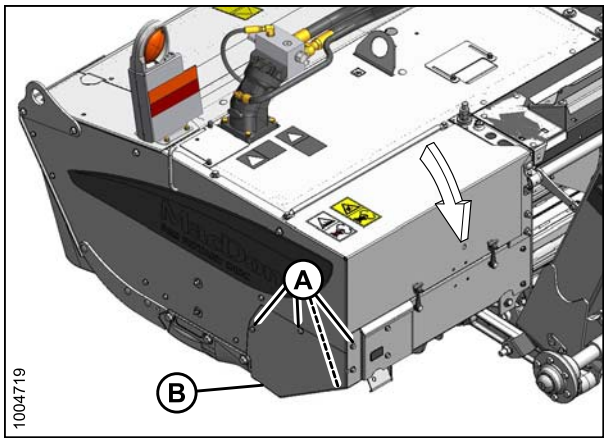


Figure 8.108

8.8.8 Sealed Bearing Installation

Follow these steps to install sealed bearings:

1. Clean shaft and coat with rust preventative.
2. Install flangette (A), bearing (B), second flangette (C), and lock collar (D).

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

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

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

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

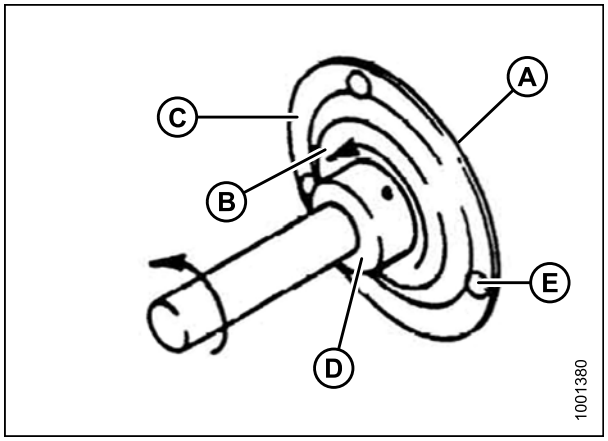


Figure 8.109

8.9 Hydraulics

The pull-type mower conditioner is hydraulically powered using the following systems:

- A self-contained hydraulic system to operate the mower conditioner functions.
- The tractor remote system to operate themower conditioner lift cylinders, steering, and mower conditioner tilt (if equipped).

8.9.1 Hydraulic Motor

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

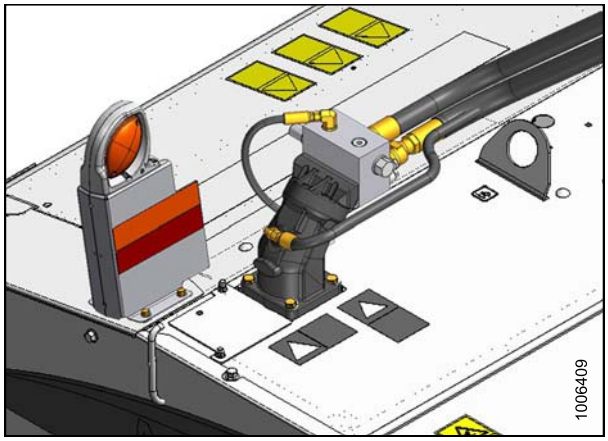


Figure 8.110

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 tractor, lower mower conditioner 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.

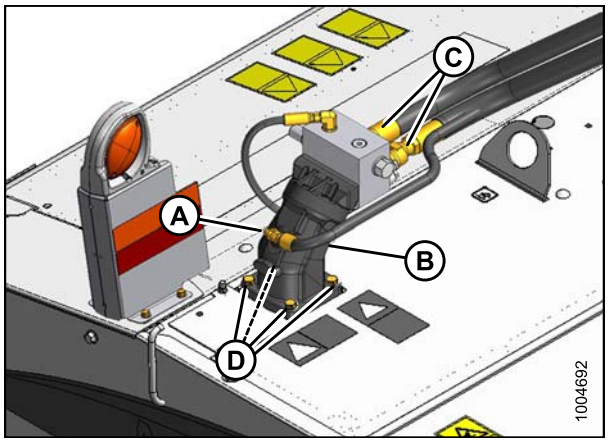


Figure 8.111

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

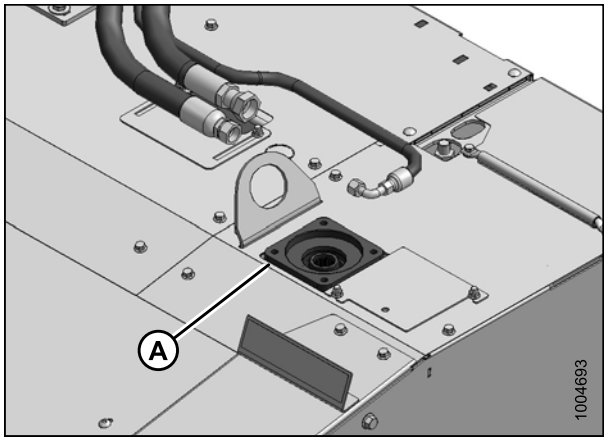


Figure 8.112

Installing the Hydraulic Motor

Follow these steps to install the hydraulic motor:

1. Remove covering from gearbox (A) opening.

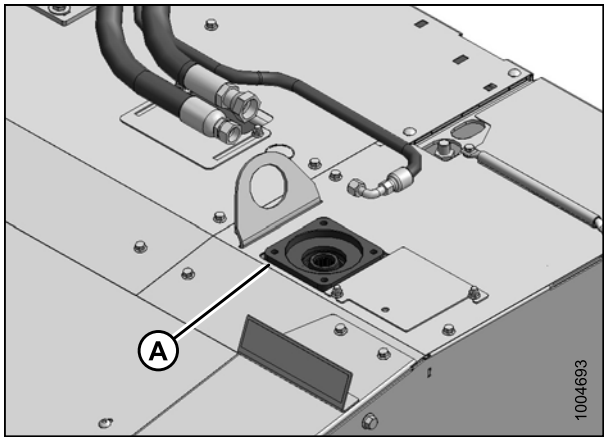


Figure 8.113

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.

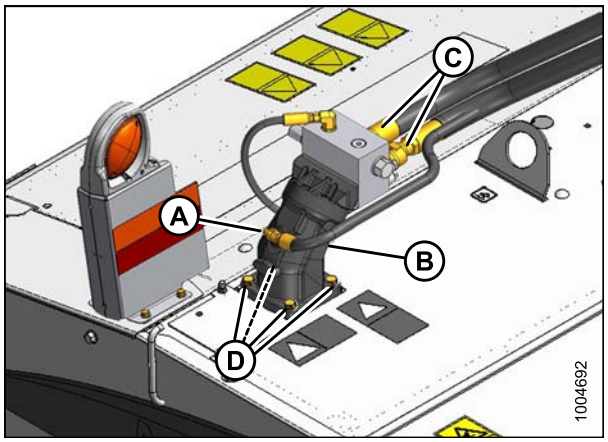


Figure 8.114

8.9.2 Hydraulic Oil Reservoir

The mower conditioner's self-contained hydraulic system uses the articulated power turn (APT) hitch of the machine for the hydraulic oil reservoir.

8.9.3 Checking the Hydraulic Oil Level

Check oil level daily (before start-up) when oil is cold.

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.

Follow these steps to check the hydraulic oil level:

1. Ensure top surface of hitch (A) is level.

   NOTE: If header drive performance improvement system is installed see Checking the Hydraulic Oil Level: Performance Upgrade Installed, page 200.

2. Oil level should be at or near the FULL mark on the gauge (B).
3. To add oil, proceed to Section 8.9.4 Adding Hydraulic Oil, page 200.

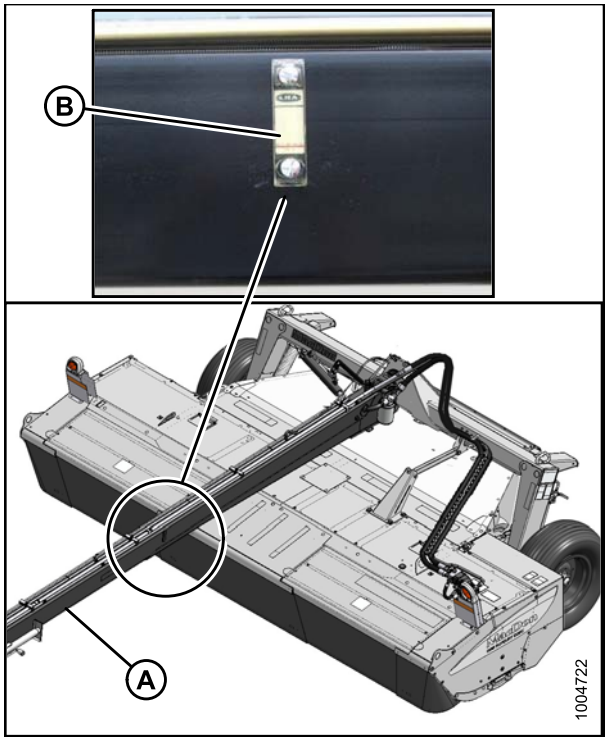


Figure 8.115

WARNING

To avoid injury from contact with hot oil, do NOT remove cap when system is hot. When removing cap, unscrew it slowly to vent the build-up of air pressure in the reservoir.

Checking the Hydraulic Oil Level: Performance Upgrade Installed

Follow these steps to check the hydraulic oil level on mower conditioner with the performance improvement system installed:

1. Ensure hitch is level.
2. Remove filler cap (A).
3. Oil level should be approximately 3-3/4–4-1/8 in. (97–104 mm) below top surface of filler pipe.
4. Replace filler cap (A).

To add oil, proceed to Section 8.9.4 Adding Hydraulic Oil, page 200.

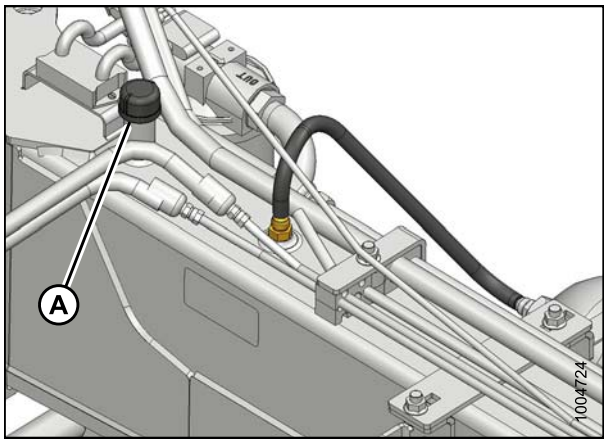


Figure 8.116

8.9.4 Adding Hydraulic Oil

NOTE: Use single grade trans-hydraulic oil. See Section 8.5 Recommended Lubricants, page 136.

Follow these steps to add oil to the hydraulic system:

1. If header drive performance improvement system is installed, see Adding Hydraulic Oil: Performance Upgrade Installed, page 201 otherwise, proceed to next step.
2. Level hitch by parking on level ground or with the jack.
3. Slowly unscrew cap (A) from filler tube.
4. Add oil until level is between ADD and FULL marks on gauge. See Section 8.9.3 Checking the Hydraulic Oil Level, page 199.
5. Replace cap (A).

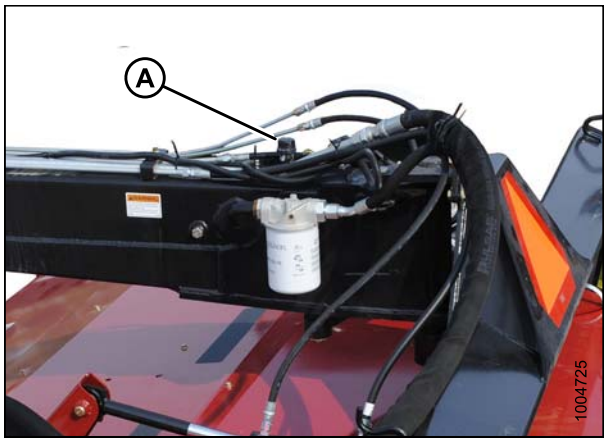


Figure 8.117

Adding Hydraulic Oil: Performance Upgrade Installed

Follow these steps to add oil to a hydraulic system with the performance improvement installed:

1. Clean area around hose (A) and fitting (B) on hitch.
2. Loosen the hose (A) at fitting (B).
3. Remove fitting (B).

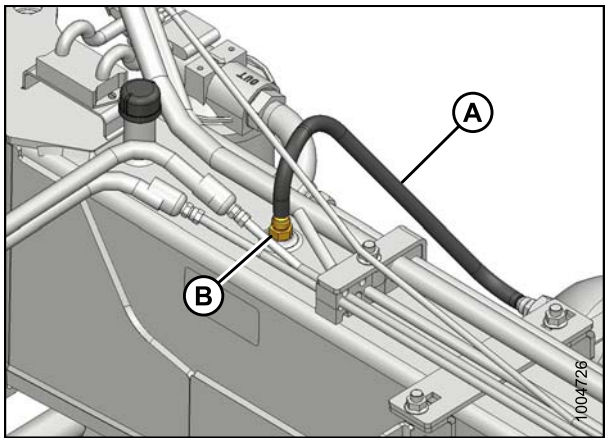


Figure 8.118

4. Add oil through port (A) until level is approximately 1–1-1/4 in. (25–32 mm) below top face of port. Ensure hitch is level.

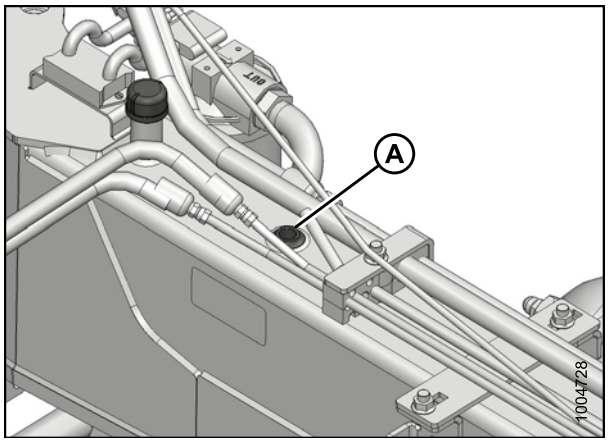


Figure 8.119

5. Replace hose (A) and tighten fitting (B).

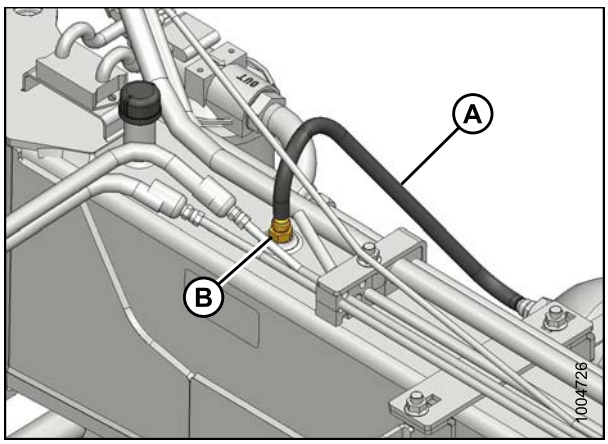


Figure 8.120

8.9.5 Changing the Hydraulic Oil

Change hydraulic oil every 500 hours or three years. See Section 8.5 Recommended Lubricants, page 136.

Follow these steps to change the hydraulic oil:

NOTE: A drain pan with a capacity of 180 liters (48 U.S. gallons) will be required.

NOTE: Mower conditioner must be disconnected from tractor. Refer to Section 5.9 Disconnecting the Mower Conditioner from a Tractor, page 54.

1. Unscrew cap from filler pipe (A).
2. Lower hitch as low as possible with jack.

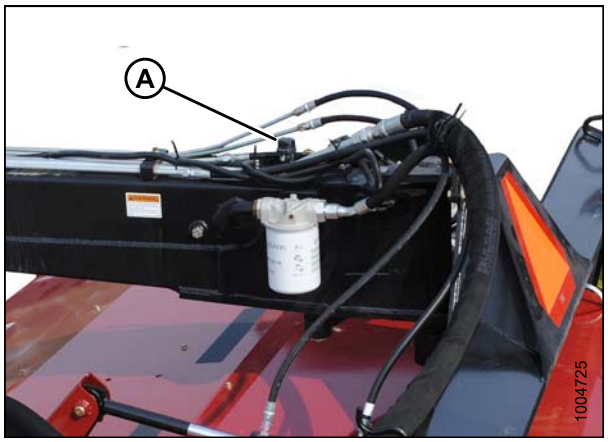


Figure 8.121

3. Place drain pan under pump (A).
4. Loosen straps (B) and hose clamp (C) on the pump suction hose then pull the hose off the fitting.
5. Allow oil to drain into drain pan.
6. Reconnect pump suction hose to pump. Tighten clamp (C) and straps (B).
7. Level hitch with the jack.

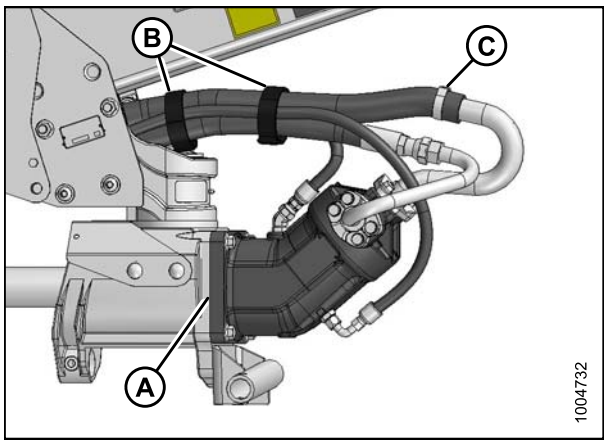


Figure 8.122

8. If header drive performance improvement system is installed, proceed to section Changing the Hydraulic Oil: Performance Upgrade Installed, page 204; otherwise, proceed to next step.
9. Check sight glass (B) on articulated power turn (APT) hitch (A) for proper oil level.

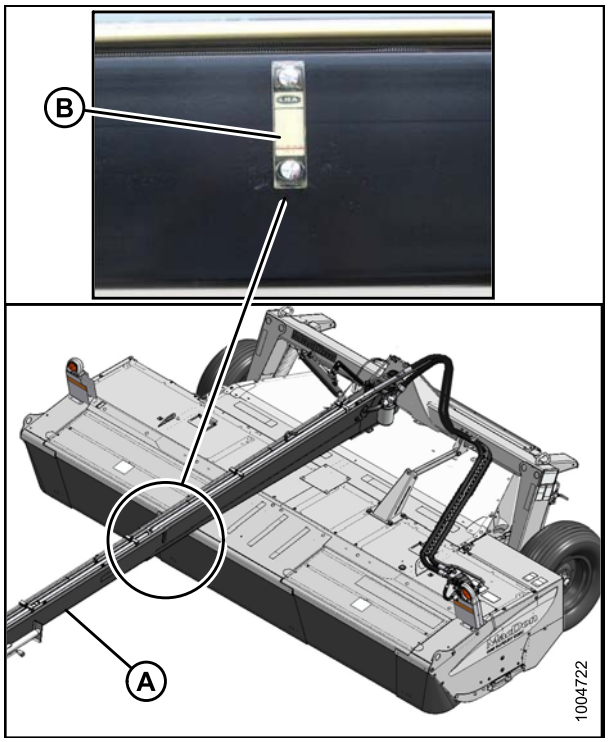


Figure 8.123

10. Replace cap (A) on filler pipe.

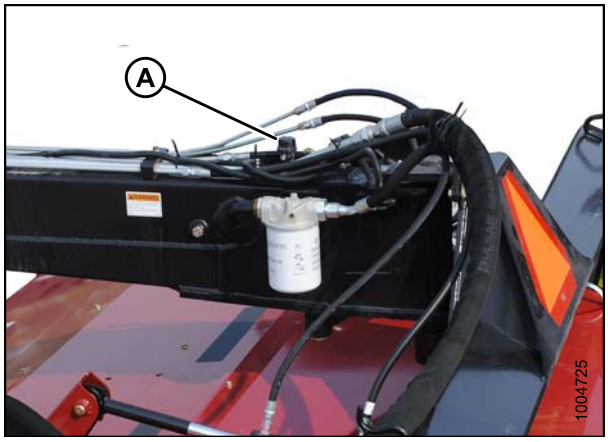


Figure 8.124

Changing the Hydraulic Oil: Performance Upgrade Installed

Follow these steps to change the hydraulic oil with the performance improvement system installed:

1. Clean area around hose (A) and fitting (B) on hitch.
2. Loosen the fitting (B) at hose (A).
3. Remove fitting (B).
4. Add approximately 46 US gallons (174 liters) of clean single grade trans-hydraulic oil through filler pipe (C) until level reaches bottom of filler pipe.

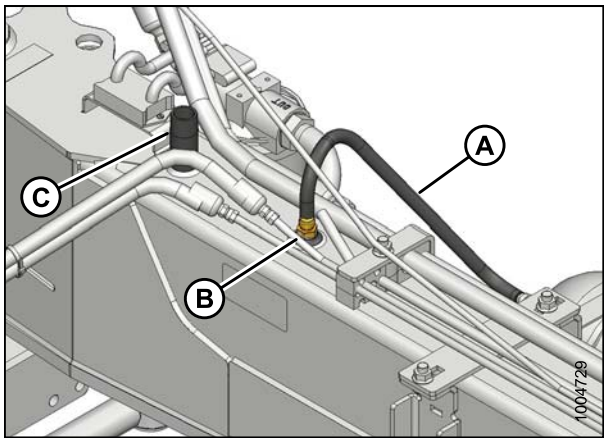


Figure 8.125

5. Ensure hitch is level. Top up the oil through port (A) until level is approximately 1–1-1/4 in. (25–32 mm) below top face of port (A).

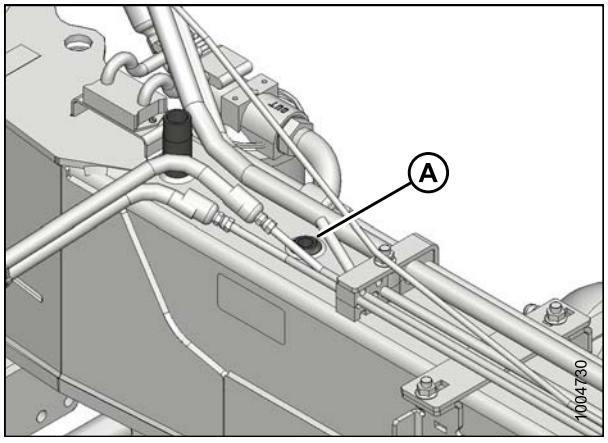


Figure 8.126

6. Replace hose (B) and tighten fitting (A).
7. Replace cap on filler pipe (C).

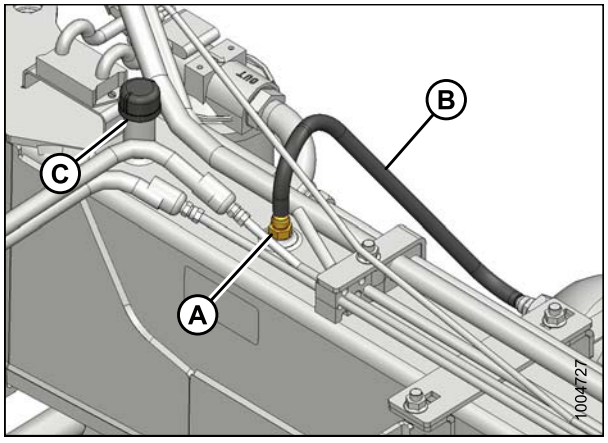


Figure 8.127

8.9.6 Changing the Hydraulic Oil Filter

Change hydraulic oil filter after the first 100 hours operation and every 250 hours thereafter.

To change the hydraulic oil filter, follow these steps:

1. Clean around the filter head (A).
2. Remove the filter (B) and clean the gasket surface of the filter head. If oil runs out of filter head, lower the front of hitch as low as possible.
3. Apply a thin film of clean oil to the gasket on the new filter.
4. Install new filter. Turn the filter onto the mount until the gasket contacts the filter head. Tighten the filter an additional 1/2–3/4 turn by hand.

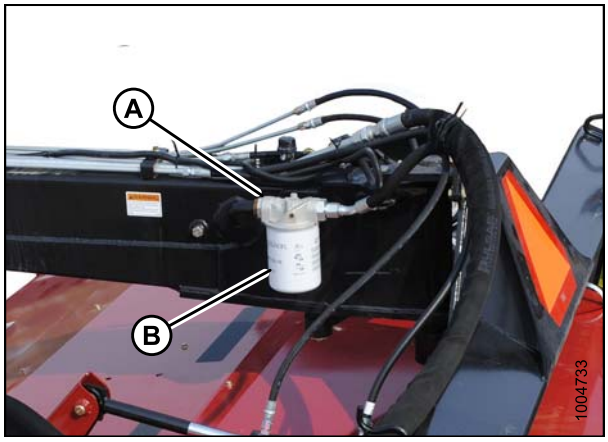


Figure 8.128

IMPORTANT

Do NOT use a filter wrench to install the filter. Overtightening can damage gasket and filter.

Pressure Relief Valve

A possible cause of poor cutting performance and/or excessive heating of hydraulic oil is low relief pressure.

The relief valve (A) is factory set at 5800 psi (40 MPa). See your MacDon Dealer for adjustment or service.

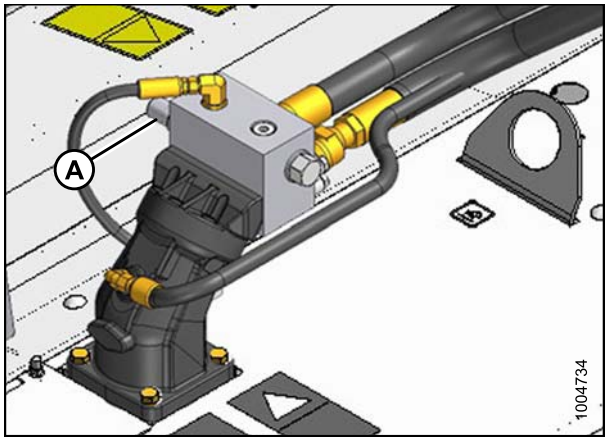


Figure 8.129

8.9.7 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 8.130

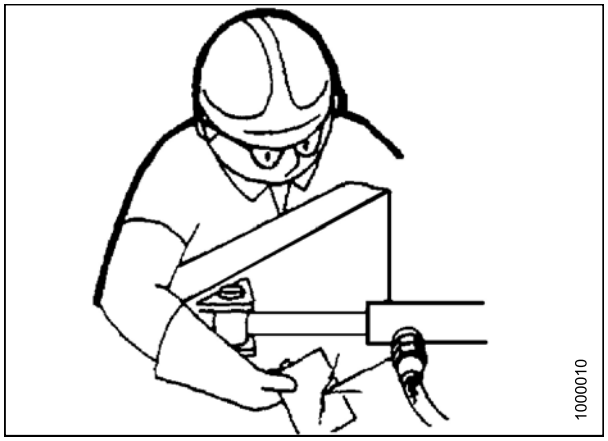


Figure 8.131

8.9.8 Optional Header Drive Performance Kit

The optional header drive performance system does not require regular maintenance or servicing

Periodically check the accumulator tank, attachment straps, and hose connections for looseness or damage.

- Tighten hardware or hose connections as necessary.
- If the hose or supports are damaged, they should be repaired or replaced.
- If the tank is damaged, replace it.
- If the tank needs to be recharged with nitrogen, it should be performed only by a qualified individual.

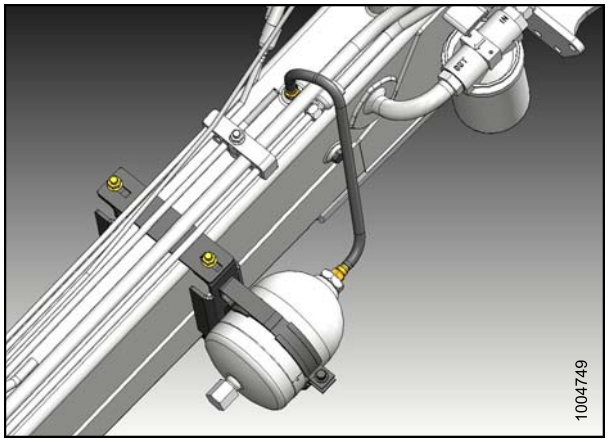


Figure 8.132

8.10 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.

8.10.1 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.

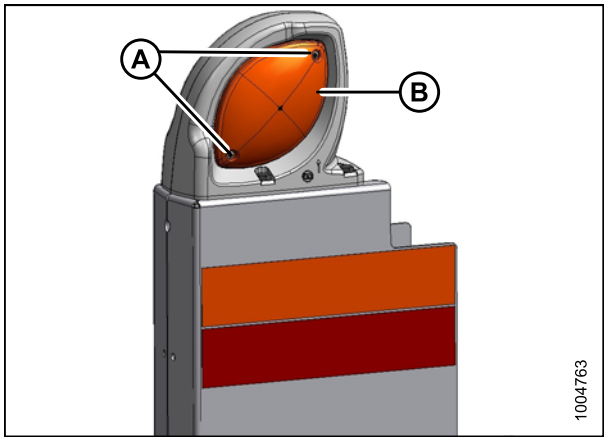


Figure 8.133

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.

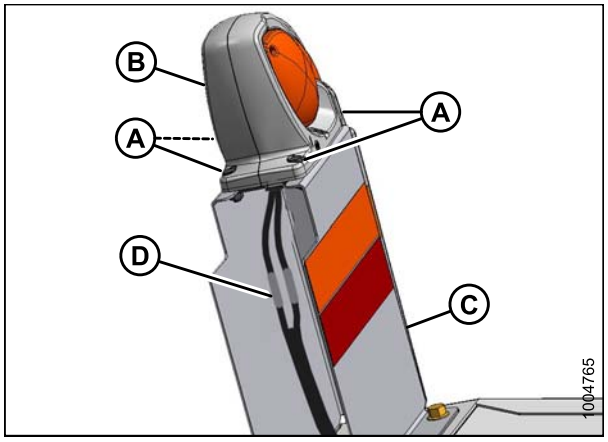


Figure 8.134

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 mower conditioner.
3. Place new lamp assembly (C) on mower conditioner 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).

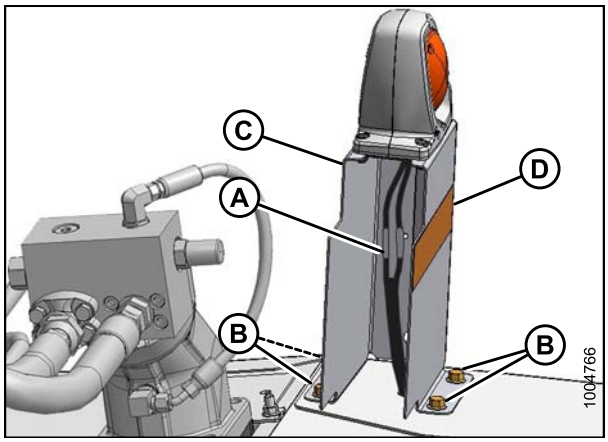


Figure 8.135

8.10.2 Tail/Brake Lights

Tail/Brake Lights: Replacing Bulbs and Lenses

Follow these steps to replace tail/brake light bulbs or lenses:

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

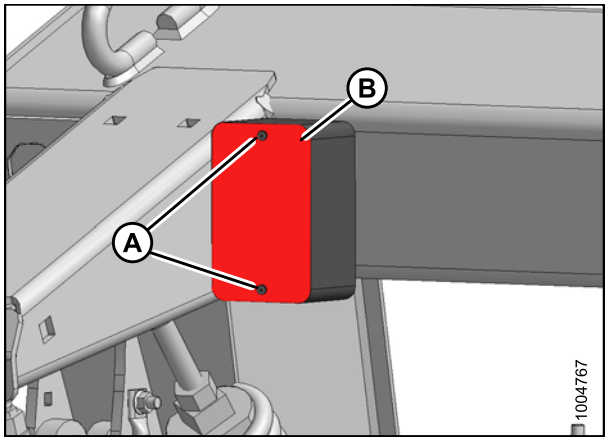


Figure 8.136

Tail/Brake Lights: Replacing the Lamp Assembly

Follow these steps to replace tail/brake light lamp assembly:

1. Cut cable tie (A) securing harness covering to light (B).
2. Retrieve connections (C) from inside harness covering approximately 6 in. (150 mm) from light and disconnect wires. If necessary, remove tape.
3. Remove nut (D) securing light to frame and remove light (B). Pull wires through hole in frame.
4. Feed connectors of new light (B) through hole in bracket and position light onto frame.
5. Install nut (D) and tighten.
6. Connect wires to connectors (C) in harness and secure harness covering with tape and cable tie (A) as required.

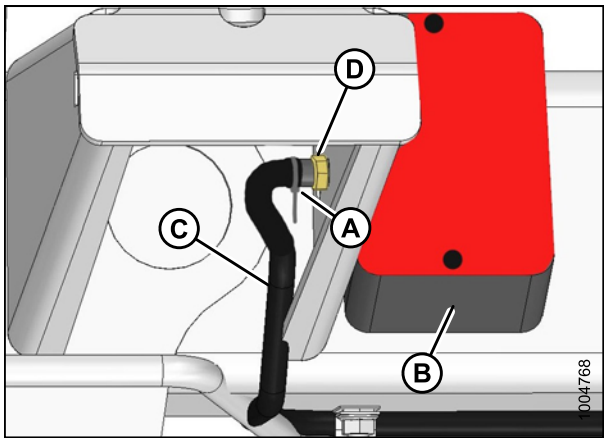


Figure 8.137

8.11 Wheels and Tires

8.11.1 Checking Wheel Bolts

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.

IMPORTANT

Check and tighten field wheel bolts and transport system (if installed) wheel bolts after the first hour of operation and every 100 hours thereafter.

Torque wheel bolts using tightening sequence as shown. Maintain 120 ft·lbf (160 N·m).

Whenever a wheel is installed, check torque after one hour of operation.

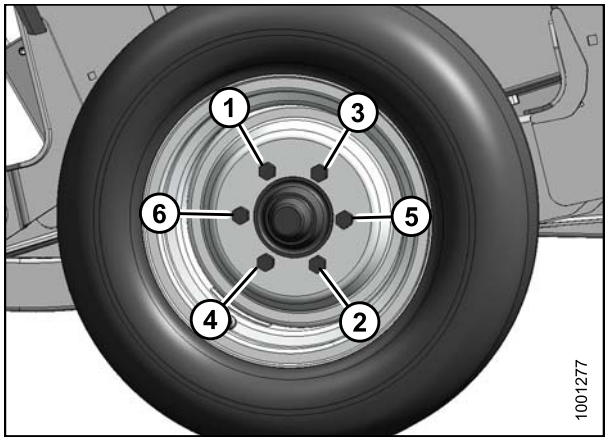


Figure 8.138: Tightening sequence

8.11.2 Removing Wheels

1. Loosen wheel bolts slightly.
2. Jack up the mower conditioner using one of the following three recommended procedures.
   NOTE: Minimum jack capacity: 5000 lb. (2270 kg).

Removing Wheels: Field Application (bottle jack)

Follow these steps to raise mower conditioner for wheel removal using a bottle jack under the frame leg:

1. Lower mower conditioner to the ground.
2. Position a bottle jack (A) and a block under frame leg (B).

IMPORTANT

Ensure jack locates on flat area under frame.

3. Operate jack to raise wheel off ground.
4. Remove wheel bolts and remove wheel.

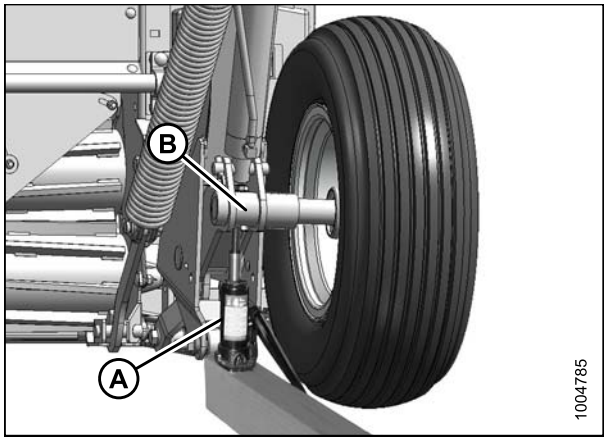


Figure 8.139

Removing Wheels: Field or Road Application (bottle jack)

Follow these steps to raise the mower conditioner for wheel removal using a bottle jack under the end of mower conditioner:

1. Raise mower conditioner to full height (if mower conditioner is in working position).
2. Close lift cylinder lock-out valves. See Section 5.3 Lift Cylinder Lock-Out Valves, page 30.
3. Locate a bottle jack (or equivalent) under end of mower conditioner (A).
   NOTE: If ground is soft, use a block under jack.
4. Operate jack to raise wheel off ground.
5. Remove wheel bolts and remove wheel.

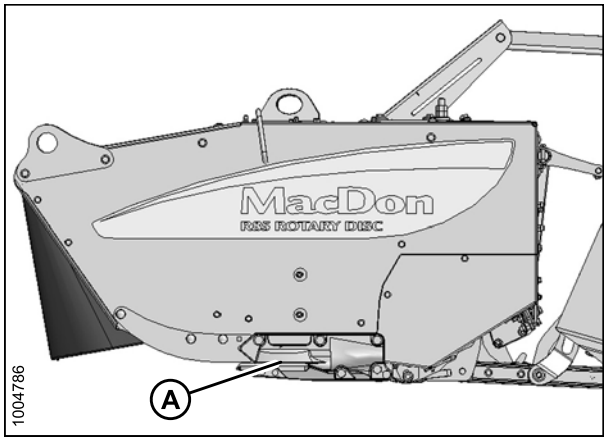


Figure 8.140

Removing Wheels: Shop Application (floor jack)

Follow these steps to raise mower conditioner for wheel removal using a floor jack under frame leg:

1. Raise mower conditioner to full height.
2. Close lift cylinder lock-out valves. See Section 5.3 Lift Cylinder Lock-Out Valves, page 30.
3. Position floor jack (A) under frame leg (B).
4. Operate jack to raise wheel off ground.
5. Place blocks or a stand under frame leg (B).
6. Remove wheel bolts and remove wheel.

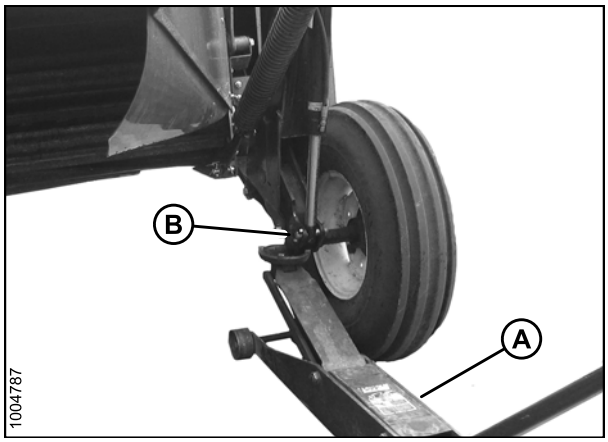


Figure 8.141

8.11.3 Installing Wheel

CAUTION

When installing wheel be sure to use the holes that are countersunk to match bolt head profile. The uncountersunk holes do NOT seat the bolts correctly.

IMPORTANT

Be sure valve stem points away from wheel support.

1. Position wheel on spindle and install bolts. Partially tighten.
2. Remove blocks or stand and lower jack until tire contacts the ground.
3. Torque bolts to 120 ft·lbf (160 N·m) in accordance with tightening sequence shown.
4. Lower jack completely and remove from work area.

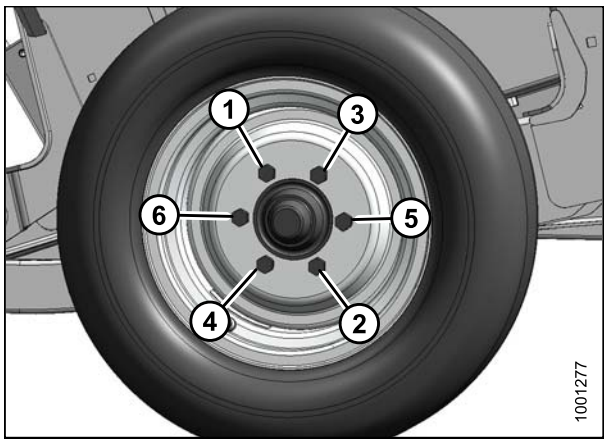


Figure 8.142

8.11.4 Inflating Tire

Check tire pressure daily. Maintain pressure at 30 psi (207 kPa) for field wheels and 80 psi (552 kPa) for optional transport system wheels.

WARNING

- **Service tires safely.**
- **A tire can explode during inflation and cause serious injury or death.**

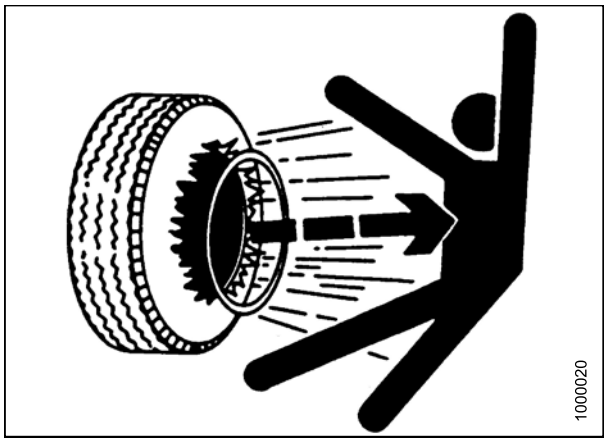


Figure 8.143

WARNING

- **Do NOT stand over tire. Use a clip-on chuck and extension hose.**
- **Never increase air pressure beyond 35 psi (241 kPa) to seat the bead on the rim for field tires and 40 psi (276 kPa) for transport tires.**
- **Do NOT exceed maximum inflation pressure as per label on tire.**
- **Replace the tire if it has a defect.**
- **Replace a wheel rim which has cracks, wear, or severe rust.**
- **Never weld a wheel rim.**
- **Never use force on an inflated or partially inflated tire.**
- **Make sure the tire is correctly seated before inflating to operating pressure.**
- **If the tire is not in correct position on the rim or is too full of air, the tire bead can loosen on one side, causing air to leak at high speed and with great force. An air leak of this nature can thrust the tire in any direction, endangering anyone in the area.**
- **Make sure all the air is removed from a tire before removing the tire from a rim.**
- **Do NOT remove, install, or make repairs to a tire on a rim unless you have the proper equipment and experience to perform the job.**
- **Take the tire and rim to a qualified tire repair shop.**

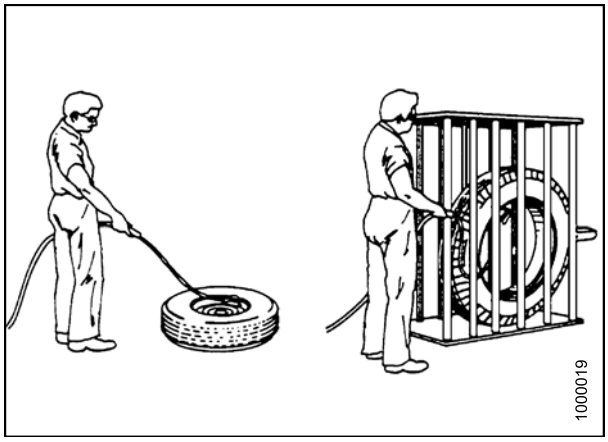


Figure 8.144

9 Troubleshooting

9.1 Mower Performance

Symptom	Problem	Solution	Section
Cutterbar plugging.	Dull, bent, or badly worn blades.	Replace blades.	Replacing the Cutter Blades, page 165
	Build-up of dirt between rock guards.	Decrease mower conditioner angle and increase flotation. In some conditions, it may be necessary to carry mower conditioner slightly with mower conditioner lift cylinders.	7.6 Mower Conditioner Angle, page 96 and 7.1.1 Adjusting the Float, page 86
	Auger drive belt slipping.	Change belts.	Replacing the Auger Drive Belts, page 195
	Conditioner drive belt slipping.	Adjust conditioner drive belt tension.	Replacing the Conditioner Drive Belt, page 190
Conditioner rolls plugging.	Ground speed too fast.	Reduce ground speed.	7.8 Ground Speed, page 99
	Roll gap too large for proper feeding.	Decrease roll gap.	7.2.2 Adjusting the Roll Gap, page 89
	Roll gap too small in thick-stemmed cane-type crops.	Increase roll gap.	
	Baffle set too low.	Raise baffle.	7.5.3 Adjusting the Swath Baffle, page 95
	Rolls improperly timed.	Adjust roll timing.	7.4.2 Adjusting the Roll Timing, page 92
	Roll speed too low.	Maintain rated PTO speed.	—
	Foreign object between rolls.	Disengage mower conditioner and stop engine. When all moving parts are completely stopped, remove foreign object.	7.15 Unplugging the Mower Conditioner, page 121
	Cutting height too low.	Decrease mower conditioner angle to raise cutting height.	7.6 Mower Conditioner Angle, page 96
	Backing into windrow.	Raise mower conditioner before backing up.	—
Plugging behind cage deflectors.	Ground speed too slow.	Increase ground speed.	7.8 Ground Speed, page 99
	Not cutting full mower conditioner width.	Cut full mower conditioner width.	—

Symptom	Problem	Solution	Section
Ragged or uneven cutting of crop.	Mower conditioner flotation too light, causing bouncing.	Adjust to heavier float setting.	7.1.1 Adjusting the Float, page 86
	Excessive ground speed.	Reduce ground speed.	7.8 Ground Speed, page 99
	Downed crop.	Adjust mower conditioner angle to cut closer to ground.	7.6 Mower Conditioner Angle, page 96
Slow crop drying.	Rolls not crimping crop sufficiently.	Decrease roll gap.	7.2.2 Adjusting the Roll Gap, page 89
	Crop is bunched in windrow.	Adjust forming shields/baffle.	7.5.3 Adjusting the Swath Baffle, page 95
Strips of uncut crop left on field.	Bent cutter blades.	Replace blades.	Replacing the Cutter Blades, page 165
	Build-up of dirt between rock guards.	Decrease mower conditioner angle and increase flotation.	7.6 Mower Conditioner Angle, page 96 and 7.1.1 Adjusting the Float, page 86
	Foreign object on cutterbar.	Disengage mower conditioner and stop engine. When all moving parts are completely stopped, remove foreign object.	7.15 Unplugging the Mower Conditioner, page 121
Uneven formation and bunching of windrow.	Rear deflector bypassing or dragging crop.	Adjust rear deflector for proper crop control.	7.5.2 Adjusting the Rear Deflector (Fluffer Shield), page 94
	Forming shields improperly adjusted.	Adjust forming shields.	7.5.3 Adjusting the Swath Baffle, page 95
	Conditioner rolls running too slow.	Maintain rated PTO speed.	—
	Roll gap too large.	Adjust roll gap.	7.2.2 Adjusting the Roll Gap, page 89
Uneven windrow formation in light crop.	Uneven feeding.	Reduce PTO speed.	—
Cutting height varies from one side to the other.	Flotation not properly balanced.	Adjust mower conditioner flotation.	7.1.1 Adjusting the Float, page 86
Not cutting short enough in down crop.	Broken, bent, or dull blades.	Replace blades or turn blades over.	Replacing the Cutter Blades, page 165
	Ground speed too fast.	Reduce ground speed.	—
	Cutting height too high.	Adjust mower conditioner angle steeper to lower cutting height if field conditions allow.	7.6 Mower Conditioner Angle, page 96

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.	7.2.2 Adjusting the Roll Gap, page 89
Damaged leaves and broken stems.	Insufficient roll gap.		
	Roll timing off.	Check roll timing and adjust if necessary.	7.4.1 Checking the Roll Timing, page 91 and 7.4.2 Adjusting the Roll Timing, page 92
Excessive drying or bleaching of crop.	Excessive crimping.	Increase roll gap.	7.2.2 Adjusting the Roll Gap, page 89
	Windrow too wide and thin.	Adjust forming shields.	7.5.3 Adjusting the Swath Baffle, page 95

9.2 Mechanical

Symptom	Problem	Solution	Section
Excessive noise.	Bent cutter blade.	Replace blade.	Replacing the Cutter Blades, page 165
	Conditioner roll timing off.	Check roll timing and adjust if necessary.	7.4.2 Adjusting the Roll Timing, page 92
	Conditioner roll gap too small.	Check gap and adjust if necessary.	7.2.1 Checking the Roll Gap, page 87 and 7.2.2 Adjusting the Roll Gap, page 89
Excessive vibration or noise in mower conditioner.	Mud deposits on conditioner rolls.	Clean rolls.	7.15 Unplugging the Mower Conditioner, page 121
	Conditioner rolls contacting each other.	Increase roll gap.	7.2.2 Adjusting the Roll Gap, page 89
		Check roll timing.	7.4.1 Checking the Roll Timing, page 91
Excessive heat in cutterbar.	Too much oil in cutterbar.	Drain oil and refill with specified amount.	Draining the Cutterbar Lubricant, page 152 and Filling the Cutterbar Lubricant, page 154
Frequent blade damage.	Mud on cutterbar.	Remove mud from cutterbar. Do not allow mud to dry on cutterbar.	7.15 Unplugging the Mower Conditioner, page 121
	Spindle bearing failure.	Replace spindle bearing.	See MacDon Dealer
	Material wrapped around spindle.	Remove disc and remove material.	8.7.2 Replacing a Disc, page 158
	Cutting too low in rocky field conditions.	Decrease mower conditioner angle. Increase flotation.	7.6 Mower Conditioner Angle, page 96 and 7.1.1 Adjusting the Float, page 86
	Mower conditioner float set too heavy.	Increase flotation.	7.1.1 Adjusting the Float, page 86
	Ground speed too high in rocky field conditions. At high ground speed, mower conditioner tends to dig rocks from ground instead of floating over them.	Reduce ground speed.	7.8 Ground Speed, page 99
	Blade incorrectly mounted.	Check all blade mounting hardware and ensure blades are free to move.	Inspecting Cutter Blades, page 163

Symptom	Problem	Solution	Section
Excessive wear of cutting components.	Mower conditioner angle too steep.	Reduce mower conditioner angle.	7.6 Mower Conditioner Angle, page 96
	Crop residue and dirt deposits on cutterbar.	Clean cutterbar.	7.15 Unplugging the Mower Conditioner, page 121
Discs stop when engaging 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.	Inspecting the Conditioner Drive Belt, page 189
	Belt not in proper groove in pulley.	Move belt to proper groove.	
	Belt pulleys and idlers misaligned.	Align pulleys and idler.	See MacDon Dealer.
Machine pulling to one side.	Mower conditioner dragging on one end and pulling to that side.	Adjust mower conditioner flotation on both ends.	7.1.1 Adjusting the Float, page 86
	Low tire pressure on one side.	Check and correct tire pressure (30 psi [207 kPa]).	—
Lights Malfunctioning.	Improper ground connection.	Check for proper ground between light base and mower conditioner.	—
	Defective bulb.	Replace bulb.	Tail/Brake Lights: Replacing Bulbs and Lenses, page 209
	Poor connection.	Check connector at tractor.	—
Mower conditioner turns while unloaded, but slows or stops when starting to cut.	Low reservoir oil level.	Add oil to reservoir.	8.9.4 Adding Hydraulic Oil, page 200
	Defective motor.	Repair/replace motor.	See MacDon Dealer.
	Defective hydraulic pump.	Repair/replace pump.	
	Defective relief valve.	Repair/replace relief valve.	
	PTO slipping on tractor.	Repair tractor PTO system.	
	Cold oil in system.	Reduce ground speed until oil reaches operating temperature.	7.8 Ground Speed, page 99
Mower conditioner slows when travelling uphill.	Low reservoir oil level.	Add oil to reservoir.	8.9.4 Adding Hydraulic Oil, page 200
	Insufficient oil to pump.	Install header drive performance improvement kit.	See MacDon Dealer.

10 Options and Attachments

10.1 Kits

10.1.1 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 intructions.

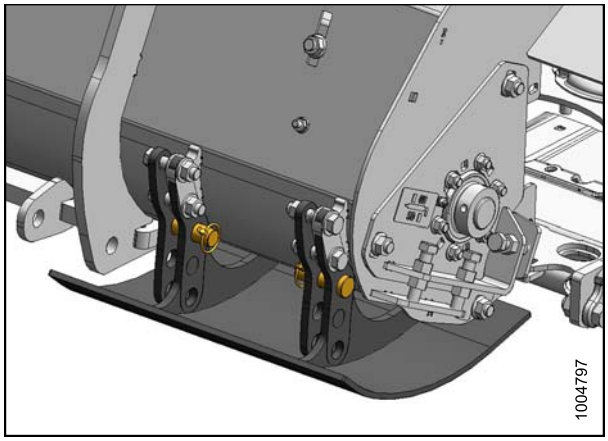


Figure 10.1: MD #B5660

10.1.2 Tall Crop Divider Kit

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

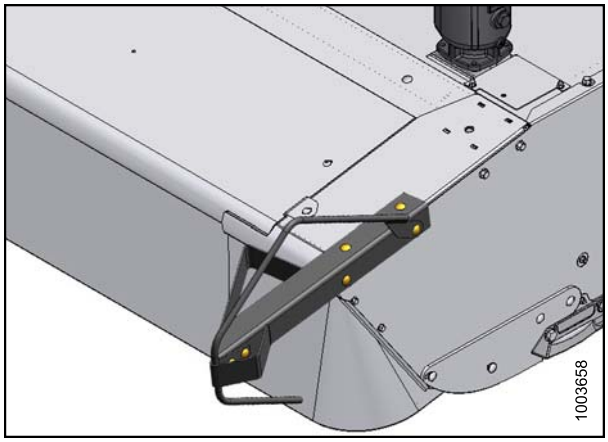


Figure 10.2: MD #B5509

10.1.3 Cutterbar Repair Tool Kit

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

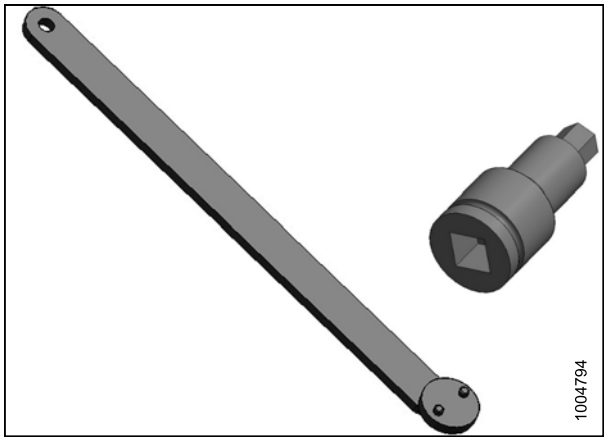


Figure 10.3: MD #B4905

10.1.4 Hydraulic Center-Link Kit

This kit allows the mower conditioner angle to be adjusted hydraulically with a cylinder replacing the standard mechanical link and uses a separate hydraulic circuit from the tractor. Installation instructions are included with the kit.

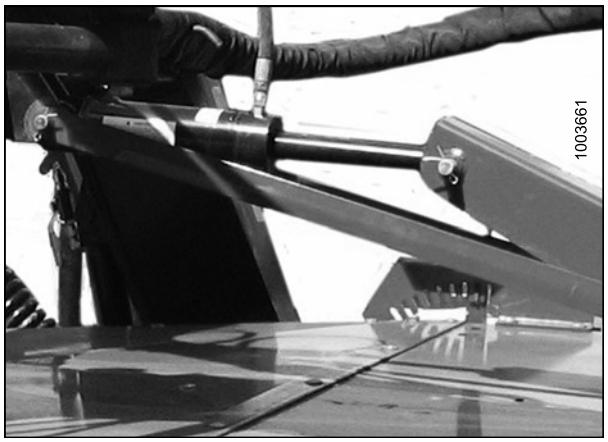


Figure 10.4: MD #B5564

10.1.5 Pressure Gauge Kit

This kit allows the Operator to monitor the mower conditioner operating load on the machine with the installation of a pressure gauge on the articulated power turn (APT) hitch. Installation instructions are included with the kit.

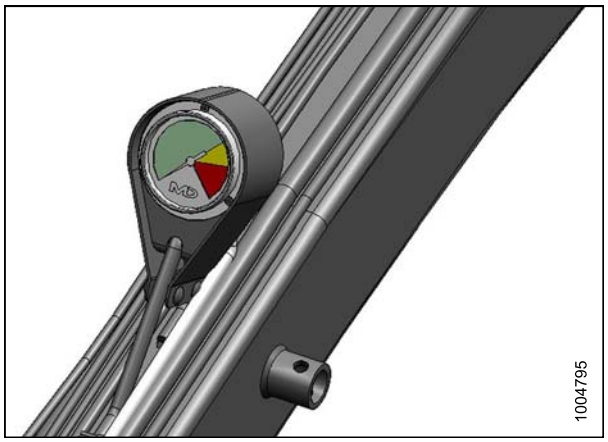


Figure 10.5: MD #B4904

10.1.6 Truck Transport Hitch

This kit allows the mower conditioner to be hooked onto a truck for towing on the road. The kit includes the transport hitch, attachment hardware, and safety chain.

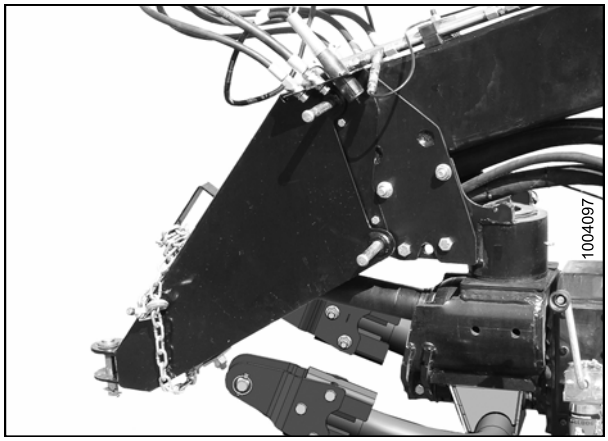


Figure 10.6: MD #B4897

10.1.7 Header Drive Performance Improvement Kit

This kit allows the hydraulic reservoir to hold additional oil so that the pump is always supplied with oil when operating on very hilly terrain. The kit includes an accumulator tank, attachment brackets, hardware, and installation instructions.

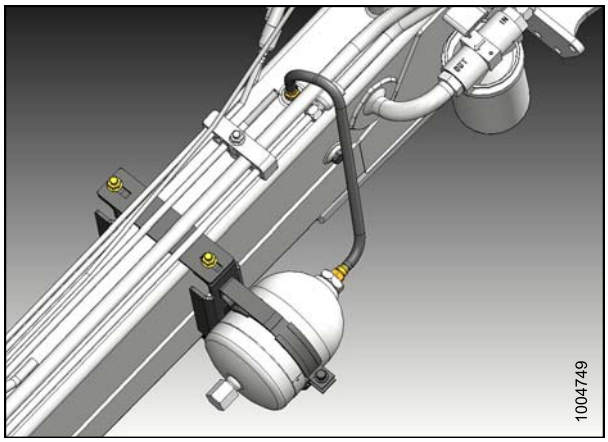


Figure 10.7: MD #B5662

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W

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

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

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

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

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