

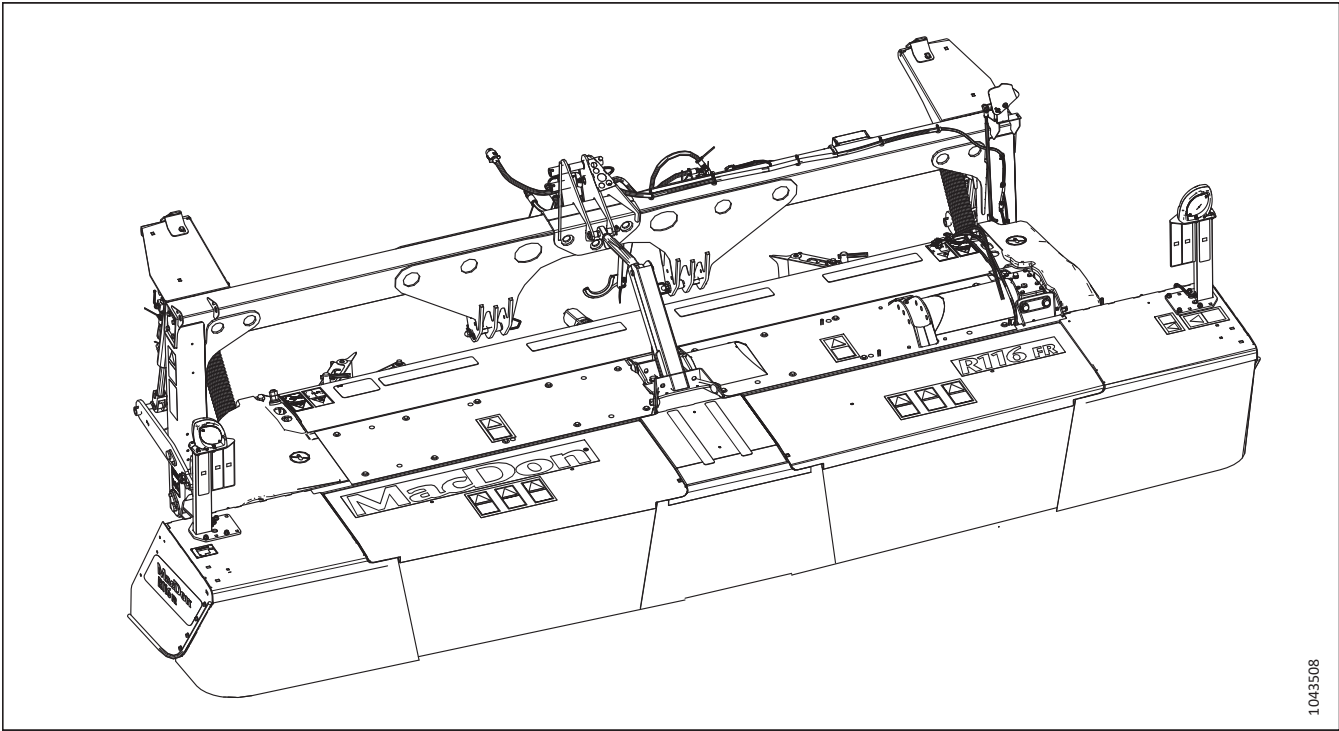
R1 FR Series Front Mount Rotary Disc

Unloading and Assembly Instruction

262487 Revision A

Original Instruction

R1 FR Series Rotary Disc



1043508

© 2024 MacDon Industries, Ltd.

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

Introduction

This instruction describes the unloading, setup, and predelivery requirements for the MacDon R113 and R116 FR Rotary Disc Header.

To ensure the customer receives all of the performance and safety benefits from this product, carefully follow the unloading and assembly procedure from the beginning through to completion.

Retain this instruction for future reference.

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

Conventions

The following conventions are followed in this document:

- Right and left are determined from the operator's position, facing the direction of travel.
- Unless otherwise noted, use the standard torque values provided in this manual.

If the shipment is damaged or is missing parts, contact the following according to your region:

- Australia: service@macdon.com.au
- Brazil: garantia-brasil@macdon.com
- Europe (except Russia): MarketingEurope@macdon.com
- Russia: shortageanddamage@macdon.com

TABLE OF CONTENTS

Introduction	i
Chapter 1: Safety	1
1.1 Safety Alert Symbols	1
1.2 Signal Words	2
1.3 General Safety	3
1.4 Hydraulic Safety	5
1.5 Safety Signs	6
Chapter 2: Unloading Truck Shipment.....	7
Chapter 3: Assembling the R1 Front Mount Rotary Disc	9
3.1 Installing Options	9
3.1.1 Installing Hydraulic Center-Link – Optional.....	9
3.1.2 Installing Tall Crop Divider – Optional	9
3.2 Removing Rotary Disc from Shipping Pallet	10
Chapter 4: Connecting the Tractor to the Front Mount Rotary Disc	11
4.1 Connecting the Tractor to the Rotary Disc Header	11
4.2 Shortening the Power Take-Off Driveline	15
Chapter 5: Completing Rotary Disc Header Assembly.....	21
5.1 Unpacking Curtains	21
Chapter 6: Lubricating	23
6.1 Opening Driveshields	23
6.2 Lubrication Points.....	25
6.3 Closing Driveshields	27
Chapter 7: Performing Predelivery Checks.....	29
7.1 Auxiliary Lift Lock Pins	29
7.1.1 Installing Auxiliary Lift Lock Pins.....	29
7.1.2 Removing Auxiliary Lift Locking Pins	30
7.2 Checking Conditioner Drive Belt	32
7.2.1 Adjusting Conditioner Drive Belt	32
7.3 Checking Cutting Angle	33
7.4 Checking Skid Shoes.....	34
7.5 Checking Sensors.....	35
7.6 Checking Float	37
7.6.1 Adjusting Float	37
7.7 Checking and Adding Lubricant – Conditioner Roll Timing Gearbox.....	41
7.8 Checking and Adding Lubricant – Drive Gearbox	44
7.9 Checking and Adding Lubricant – Cutterbar.....	45

TABLE OF CONTENTS

7.10 Checking Roll Gap	47
7.10.1 Adjusting Roll Gap – Steel Rolls	47
7.11 Checking Roll Timing	49
7.12 Checking Roll Tension	50
7.12.1 Adjusting Roll Tension	50
7.13 Adjusting Conditioner Baffle Position	51
7.14 Checking Lights.....	52
7.15 Checking Manuals	53
7.16 Checking Disc Timing Tool	54
7.17 Running up Header	55
7.18 Checking and Removing Clear Vinyl Decal Protectors.....	56
Chapter 8: Reference	57
8.1 Engaging Auxiliary Lift Cylinder Locks	57
8.2 Disengaging Locks.....	58
8.3 Recommended Lubricants	59
8.4 Torque Specifications	60
8.4.1 Metric Bolt Specifications	60
8.4.2 Metric Bolt Specifications – Cast Aluminum	62
8.4.3 O-Ring Boss Hydraulic Fittings – Adjustable	63
8.4.4 O-Ring Boss Hydraulic Fittings – Non-Adjustable.....	64
8.4.5 O-Ring Face Seal Hydraulic Fittings.....	65
8.4.6 Tapered Pipe Thread Fittings.....	66
8.5 Conversion Chart.....	68
8.6 Definitions	69
Predelivery Checklist	71

Chapter 1: Safety

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

1.1 Safety Alert Symbols

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

This symbol means:

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

Carefully read and follow the safety message accompanying this symbol.

Why is safety important to you?

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



Figure 1.1: Safety Symbol

1.2 Signal Words

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

Signal words are selected using the following guidelines:

DANGER

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

WARNING

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

CAUTION

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

IMPORTANT:

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

NOTE:

Provides additional information or advice.

1.3 General Safety

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

CAUTION

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

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

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

In addition, take the following precautions:

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

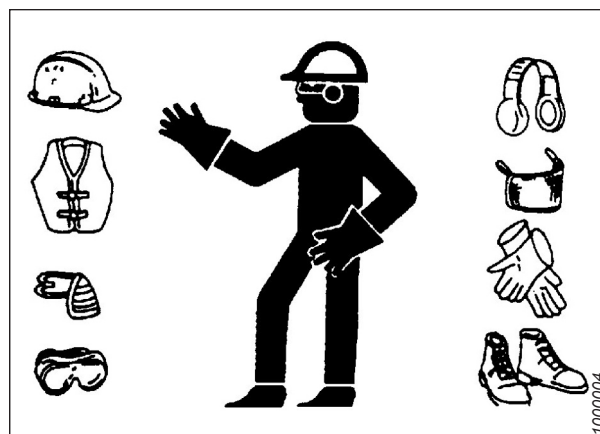


Figure 1.2: Safety Equipment



Figure 1.3: Safety Equipment

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

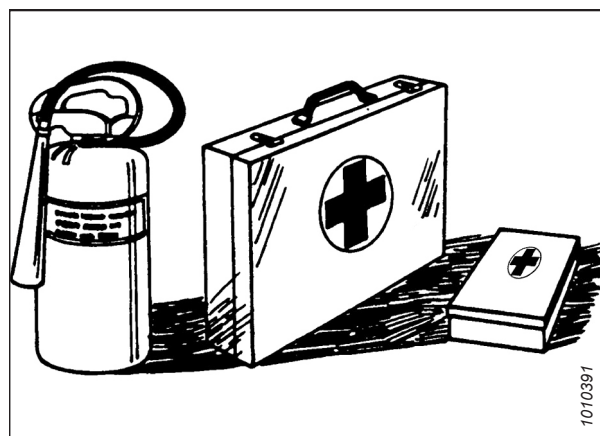


Figure 1.4: Safety Equipment

SAFETY

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



Figure 1.5: Safety around Equipment

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

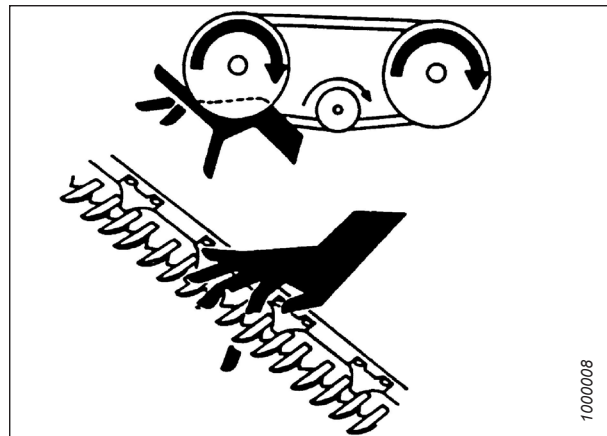


Figure 1.6: Safety around Equipment

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



Figure 1.7: Safety around Equipment

1.4 Hydraulic Safety

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

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

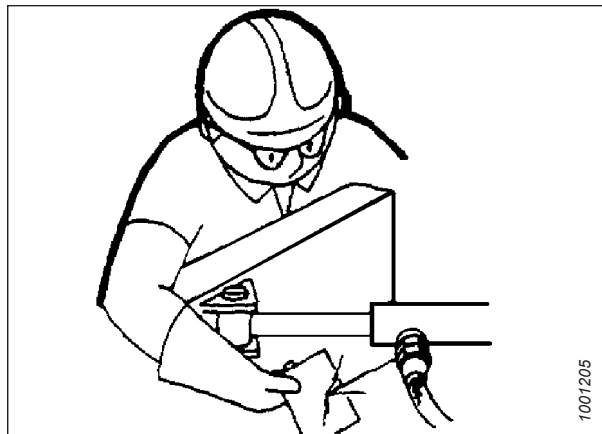


Figure 1.8: Testing for Hydraulic Leaks

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

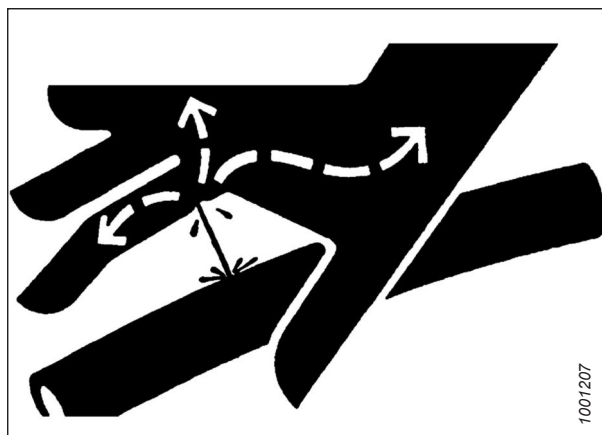


Figure 1.9: Hydraulic Pressure Hazard

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

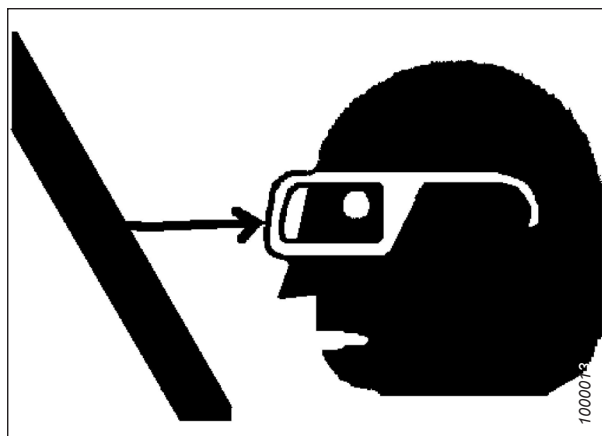


Figure 1.10: Safety around Equipment

1.5 Safety Signs

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

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

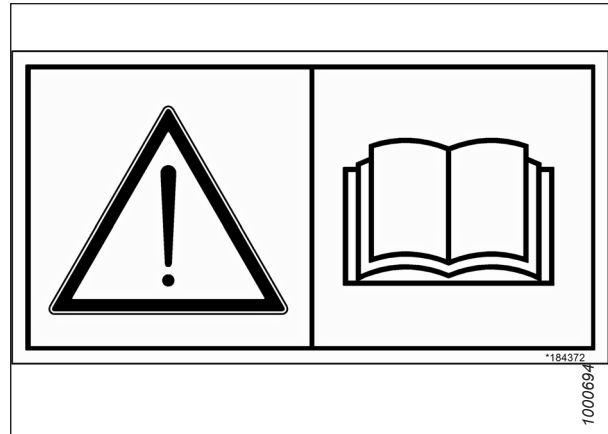


Figure 1.11: Operator's Manual Decal

Chapter 2: Unloading Truck Shipment

To unload machines from a truck shipment safely and without damage, understand the weights and lifting requirements, and familiarize yourself with the procedure.

DANGER

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

CAUTION

Equipment used for unloading must meet or exceed the requirements specified below. Using inadequate equipment may result in chain breakage, vehicle tipping or machine damage.

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

Chain	
Overhead lifting quality 12.7 mm (1/2 in.)	2270 kg (5000 lb.) minimum working load

1. Approach rotary disc header (A) from back with forklift (B) as shown, and slide forks as far as possible into pallet.

NOTE:

Pallet is designed to be lifted from the backside only.

2. Raise rotary disc header off deck.

IMPORTANT:

Take care not to contact the other machine if load is two-headers wide.

3. Back up until unit clears trailer, and slowly lower to 150 mm (6 in.) from ground.
4. Take the machine to a storage or set-up area, and set machine down securely on level ground.

NOTE:

When possible, approach from the backside to minimize potential for contacting the unit.

5. Repeat for second rotary disc header (if required).
6. Check for shipping damage and missing parts.

IMPORTANT:

Do **NOT** remove header from pallet until instructed.

7. Unload remaining pallets and boxes, and take to assembly area.

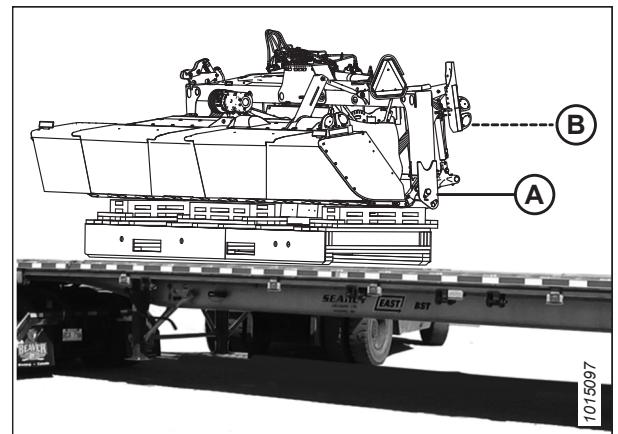


Figure 2.1: Unloading Header

Chapter 3: Assembling the R1 Front Mount Rotary Disc

Perform the following procedures in the order provided to assemble the R1 Front Mount Rotary Disc.

3.1 Installing Options

Install the following optional kits if they were supplied with your header.

3.1.1 Installing Hydraulic Center-Link – Optional

The hydraulic center-link option is supplied in a separate shipment. For instructions, refer to the installation instructions supplied with the kit.

3.1.2 Installing Tall Crop Divider – Optional

The tall crop divider is supplied in a separate shipment. For instructions, refer to the installation instructions supplied with the kit.

3.2 Removing Rotary Disc from Shipping Pallet

A shipping pallet is strapped to the header and must be removed before delivery to the customer.

1. Cut strapping (B) securing the cutterbar to pallet (C).
2. Place the forks from the lifting device at openings (A). Spread them as far apart as possible to spread the load out.
3. Lift the header high enough that the pallet can be removed.

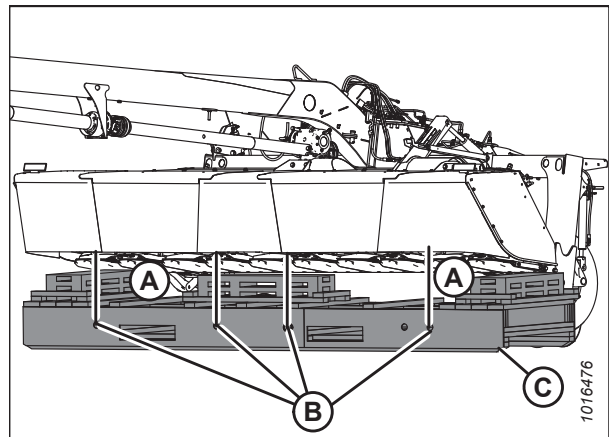


Figure 3.1: Strapping — R1 PT Shown, R1 FR Similar

4. Use a chain or forklift to remove shipping pallet (A) from underneath the rotary disc header.
5. Lower the rotary disc header to the ground.

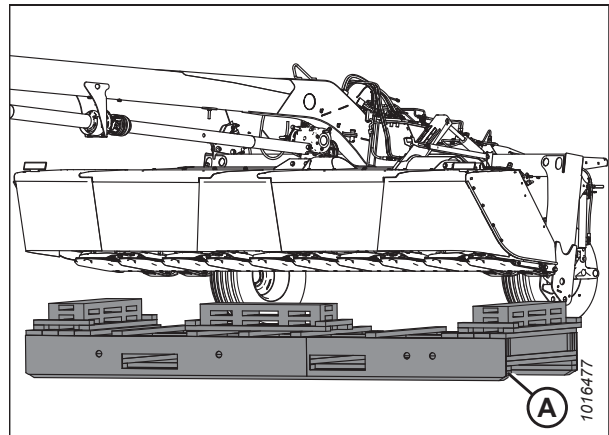


Figure 3.2: Removing Shipping Pallet — R1 PT Shown, R1 FR Similar

Chapter 4: Connecting the Tractor to the Front Mount Rotary Disc

Connecting the front mount rotary disc to the tractor involves connecting the hydraulic and electrical systems.

4.1 Connecting the Tractor to the Rotary Disc Header

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

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

1. Ensure the machine is set on a flat level surface.
2. Connect your tractor's 3-point hitch to the following locations on the header frame according to the hitch type.
 - Category 3: connect to upper linkage (A) and lower linkages (D).
 - Category 3N: connect to upper linkage (A) and lower linkages (C).
 - Category 2: connect upper linkage (B) and lower linkages (C).
3. Attach 3-point hitch (A) to carrier frame linkage (B). Refer to your tractor hitch instructions to properly secure the connections.
4. Lower the header fully.
5. Shut down the engine, and remove the key from the ignition.

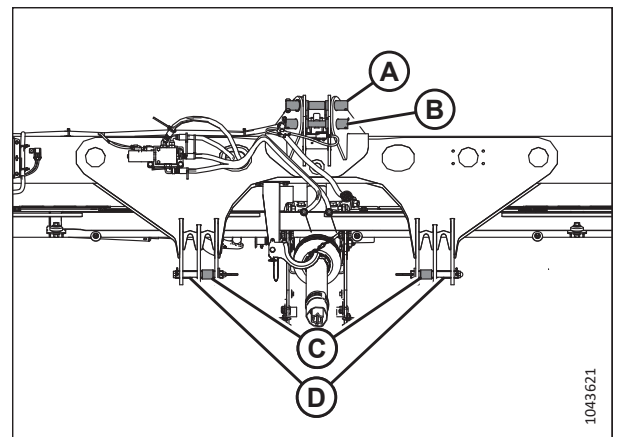


Figure 4.1: Front Linkage Connections

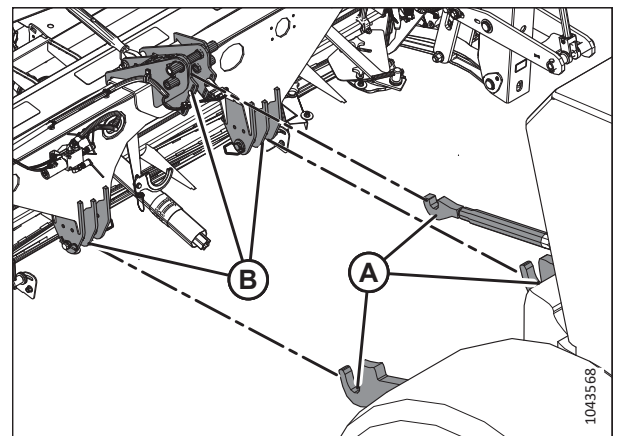


Figure 4.2: Alignment with Header Carrier Frame

CONNECTING THE TRACTOR TO THE FRONT MOUNT ROTARY DISC

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

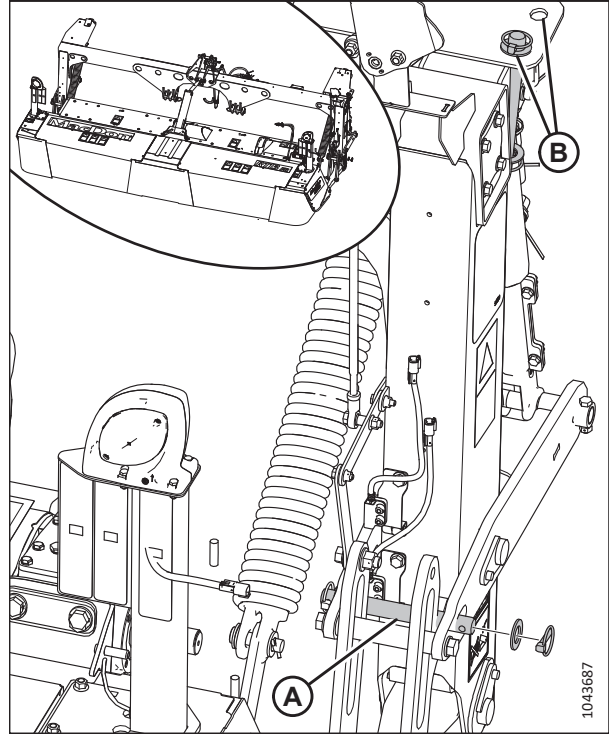
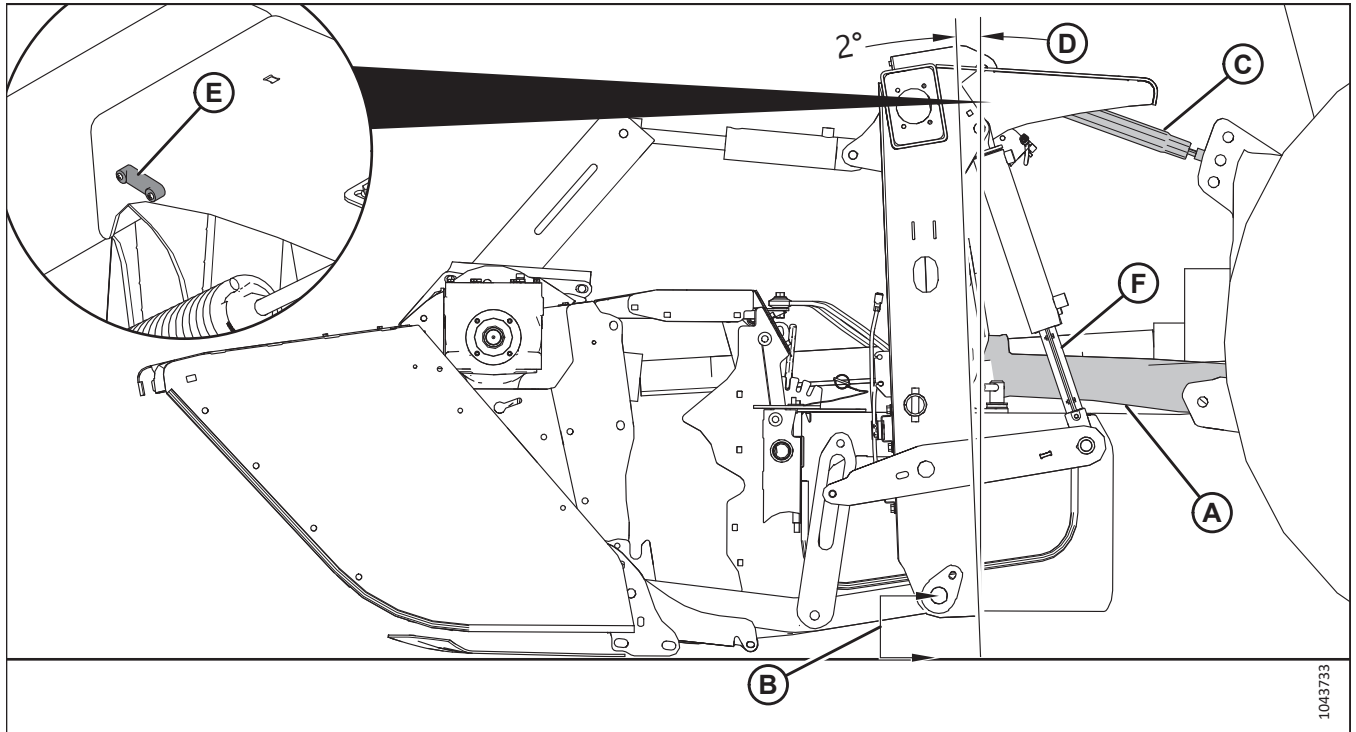


Figure 4.3: Auxiliary Lift Lock Pins – Left Side

CONNECTING THE TRACTOR TO THE FRONT MOUNT ROTARY DISC

Figure 4.4: Alignment with Header Carrier Frame



7. Adjust lower link arms (A) on the 3-point hitch until dimension (B) between the bottom of the carrier frame and the ground is 184 mm (7.25 in).

NOTE:

The lift assist cylinders must be lowered onto downstops (F) before aligning the carrier frame.

8. Adjust the length of top link (C) on the 3-point hitch until carrier frame angle (D) is approximately 2° forward. Use bubble level (E), located on the right side of the carrier frame to set the angle.
9. Position the driveline onto the tractor's PTO shaft.
10. Pull back collar (A) on the driveline and push the driveline onto the PTO shaft until it locks. Release the collar.

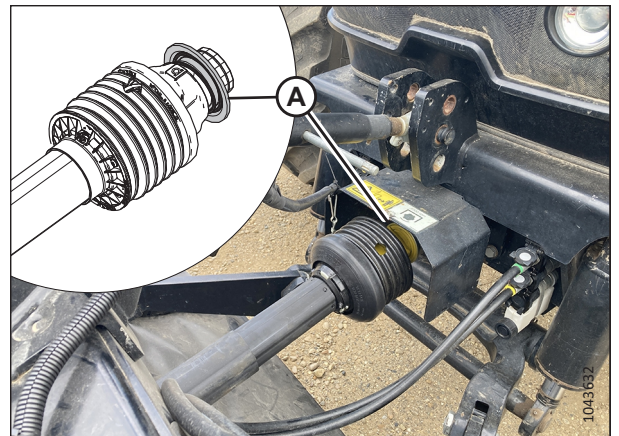


Figure 4.5: Tractor Front PTO Connection

CONNECTING THE TRACTOR TO THE FRONT MOUNT ROTARY DISC

11. Locate pressure and return hoses (A):

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

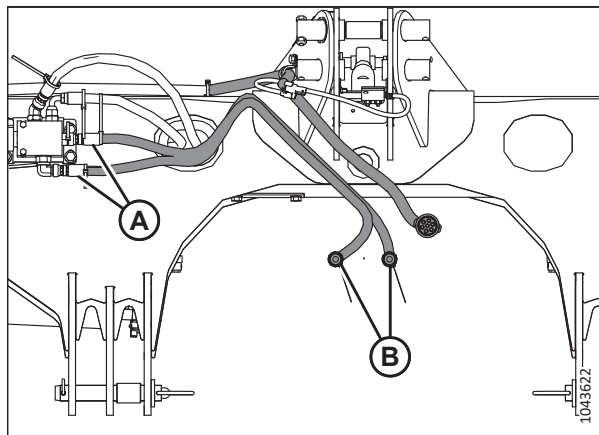


Figure 4.6: Hydraulic Control Hoses

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

NOTE:

Ensure the hoses are connected to the same remote set.

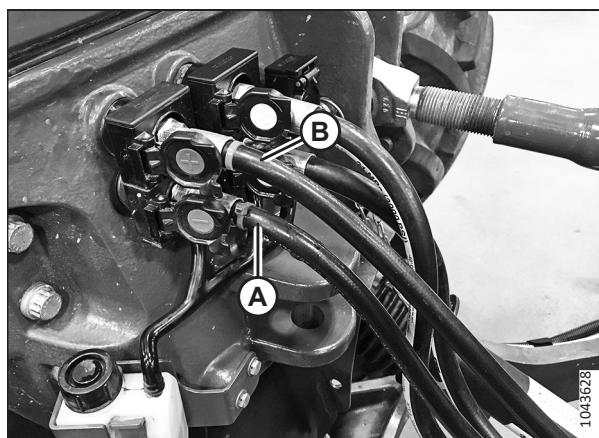


Figure 4.7: Hydraulic Connections

13. Connect the 7-pin electrical connector (A) on the header to the tractor's front electrical plug.

14. Set the tractor's front hydraulic channel to ON, and adjust flow to 15–20 %. For instructions, refer to the tractor operator's manual.

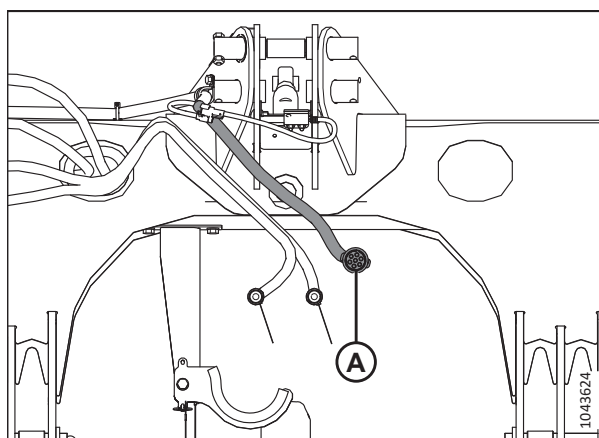


Figure 4.8: Header Electrical Harness

4.2 Shortening the Power Take-Off Driveline

It may be necessary to shorten the power take-off (PTO) driveline so that it does not bottom out when the three-point linkage is fully raised and to ensure that there is enough room to remove the driveline's quick disconnect from the tractor PTO shaft.

1. Ensure the float module is set to operating height and angle (10 degrees forward and 400 mm [15 3/4 in.] above the ground).
2. Separate driveline halves (A) and (B).

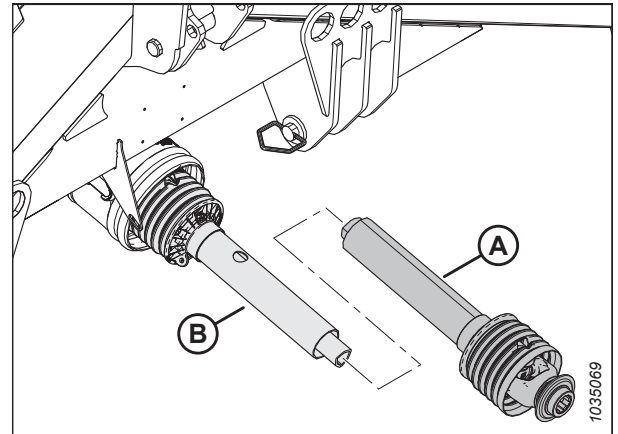


Figure 4.9: Driveline Halves

3. Clean and grease the tractor PTO and implement shaft before installing the driveline.
4. Pull back collar (B) on the driveline half, and slide the driveline onto tractor's PTO shaft (A) until it locks in place. Release the collar and ensure the yoke is locked onto the shaft.
5. Fully raise the tractor's three-point linkage.

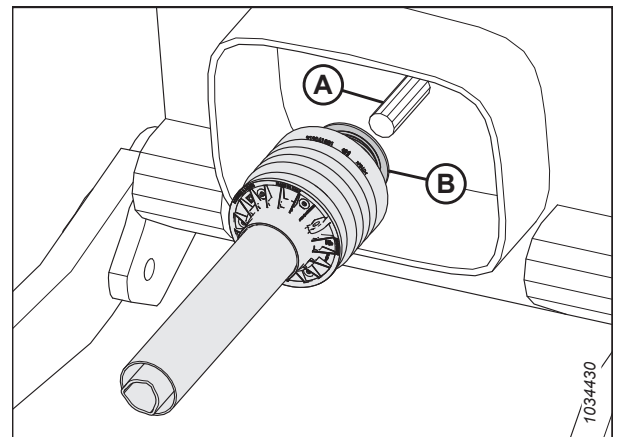


Figure 4.10: Tractor PTO

CONNECTING THE TRACTOR TO THE FRONT MOUNT ROTARY DISC

- Align the two driveline halves so they are parallel to each other. Check that PTO half (A) is short enough that it will not bottom out when the three-point linkage is fully raised, and there is enough room to remove the driveline's quick-disconnect from the tractor PTO shaft.

IMPORTANT:

Ensure you cut only as much as necessary to meet the above conditions. Telescoping tubes must always overlap by at least 1/2 of their length in normal operation and at least 1/3 of their length in all working conditions in order to keep the tubes aligned and allow them to slide freely.

- If driveline half (A) needs to be shortened, measure the length (L) that needs to be removed.
- Remove driveline (A) from the tractor's PTO shaft.
- Remove three Phillips head screws (A) from the shielding.

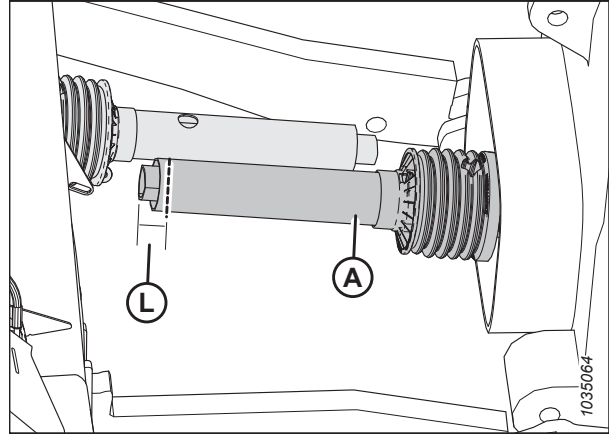


Figure 4.11: PTO Driveline Halves

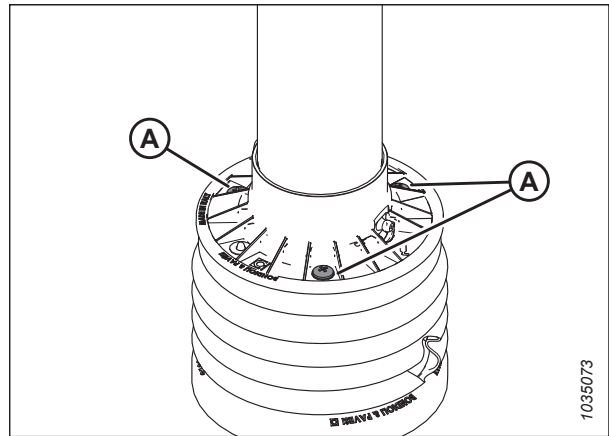


Figure 4.12: Removing Shielding

- Remove shield tube (A) from driveline shaft (B).

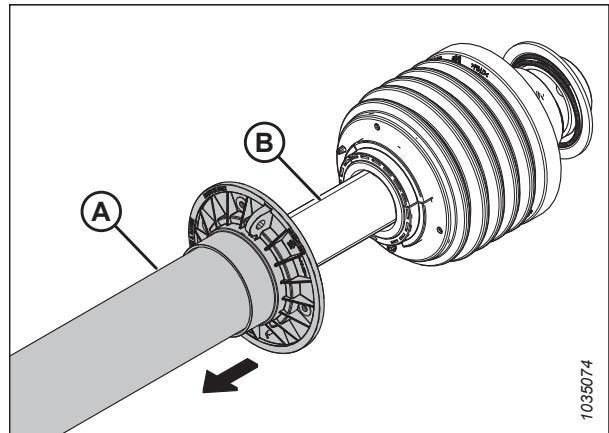


Figure 4.13: Removing Shielding

CONNECTING THE TRACTOR TO THE FRONT MOUNT ROTARY DISC

11. Remove grease collar (A) by using a large punch and gently tapping around the circumference.

IMPORTANT:

The grease collar is fitted over small barbs in the metal tube so it may take some effort to remove. Be careful to not damage the collar when removing it.

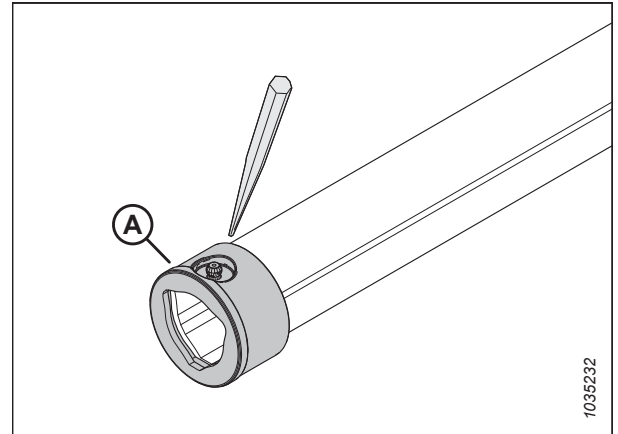


Figure 4.14: Grease Collar

12. Secure the driveline shaft in a vise. Using measurement (L) taken in Step 7, page 16, mark shaft (A) and cut to the required length.

IMPORTANT:

Carefully file away burrs from the end of the tube, and remove all filings.

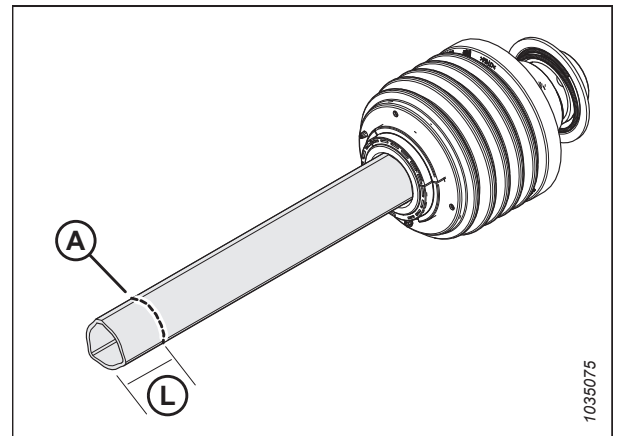


Figure 4.15: Driveline Shaft

13. Cut shield tube (A) using the same measurement (L) used for cutting the driveline shaft.

NOTE:

This will ensure the shaft extends out of the shield tube as it did previously. If the shield tube is flush with the shaft, it will be difficult to align the driveline halves together when joining them.

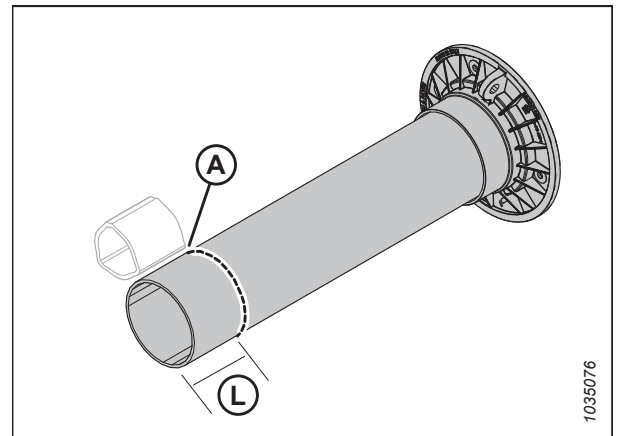


Figure 4.16: Shield Tube

CONNECTING THE TRACTOR TO THE FRONT MOUNT ROTARY DISC

14. Before reinstalling the grease collar, make three small indentations at a 45° angle on each of the three rounded surfaces (A) of shaft (B). This is to raise a small burr of metal to ensure the grease collar will stay in position.

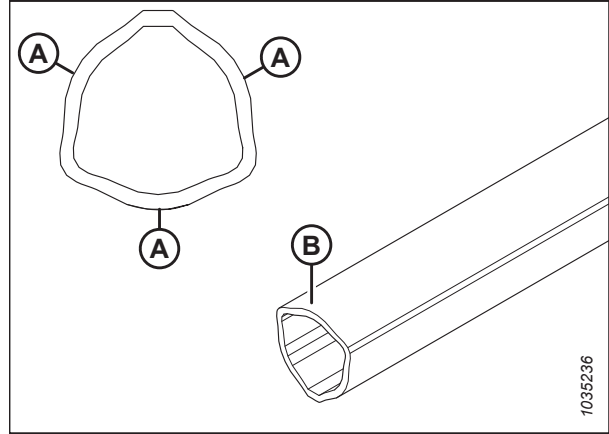


Figure 4.17: Driveline Shaft

15. Line up flat notch (A) with the shape of the shaft tube to ensure proper fit, and use a rubber mallet or block of wood to drive the grease collar back onto the shaft.

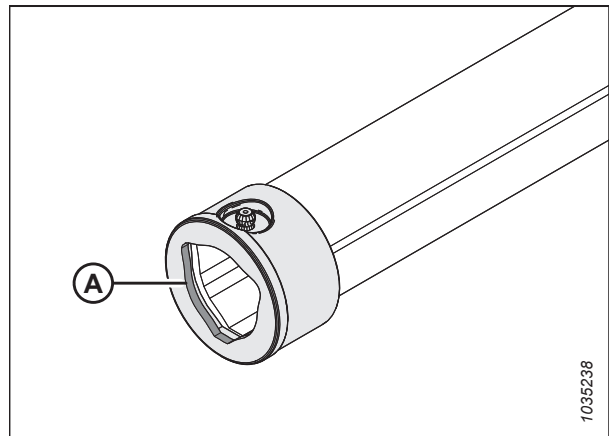


Figure 4.18: Grease Collar

16. Grease the internal drive tube and reattach outer cone (A) and shield tube (B) using three screws (C).

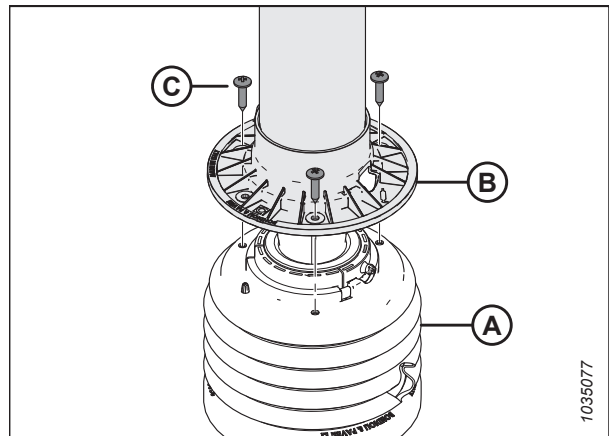


Figure 4.19: Installing Shielding

CONNECTING THE TRACTOR TO THE FRONT MOUNT ROTARY DISC

17. Remove the other driveline half from the TM100 gearbox as follows:
 - a. Remove nut (C) and washer (B).
 - b. Tap out pin (A) retaining the yoke onto the shaft.
 - c. Pull the driveline off the gearbox shaft.

18. Cut the inner half of the driveline, using the same measurement used to cut the outer half.

NOTE:

The steps involving the grease collar do not apply to the inner half of the driveline.

19. Join the two driveline halves together, and connect the PTO driveline to the TM100 gearbox and the tractor's PTO. For instructions, refer to .
20. Check the length of the driveshaft at its minimum and maximum extensions.
21. With the linkage in field position as per Step 1, page 15, check to make sure grease fitting (A) on the sliding element is accessible.
22. If the grease fitting is not accessible, cut a 25.4 mm (1 in.) access hole in the driveline's outer shield.

23. Find a suitable location to attach driveline chain (B) to the tractor.

IMPORTANT:

To avoid safety shield failure, ensure plastic driveline guard (A) is chained to the tractor.

IMPORTANT:

Allow some slack in the chain to avoid damage to the shield when the three-point linkage is lowered or raised. Ensure the slack in the chain does not allow for the chain to wrap around the shield during operation.

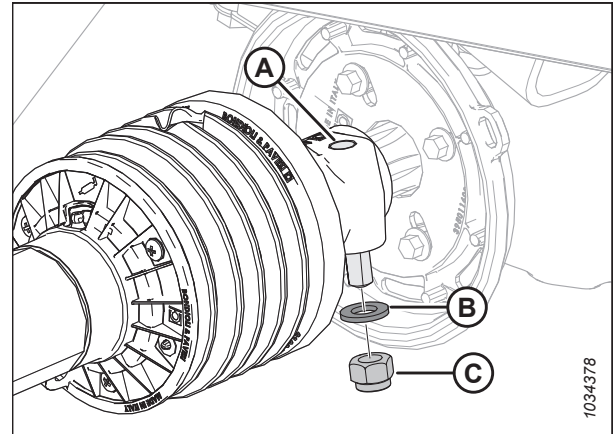


Figure 4.20: Installing Shielding

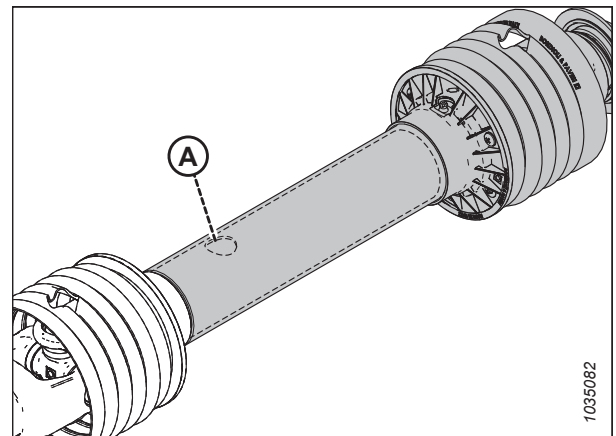


Figure 4.21: Grease Point

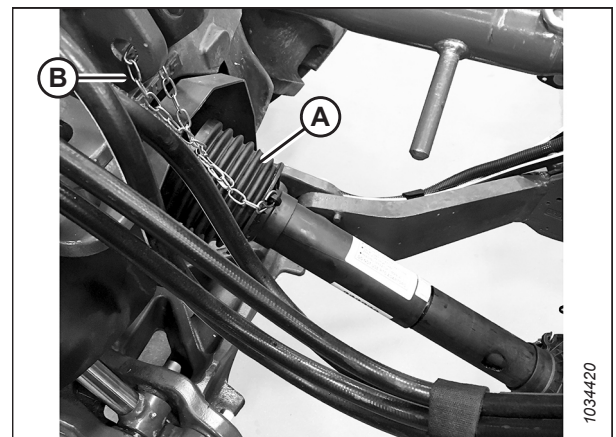


Figure 4.22: Tractor PTO

Chapter 5: Completing Rotary Disc Header Assembly

5.1 Unpacking Curtains

Curtains provide protection from objects and debris thrown at high velocity from the cutterbar.

1. Remove two M10 hex head bolts (A) and the center lock flange nuts securing cutterbar door supports to the center channel frame.

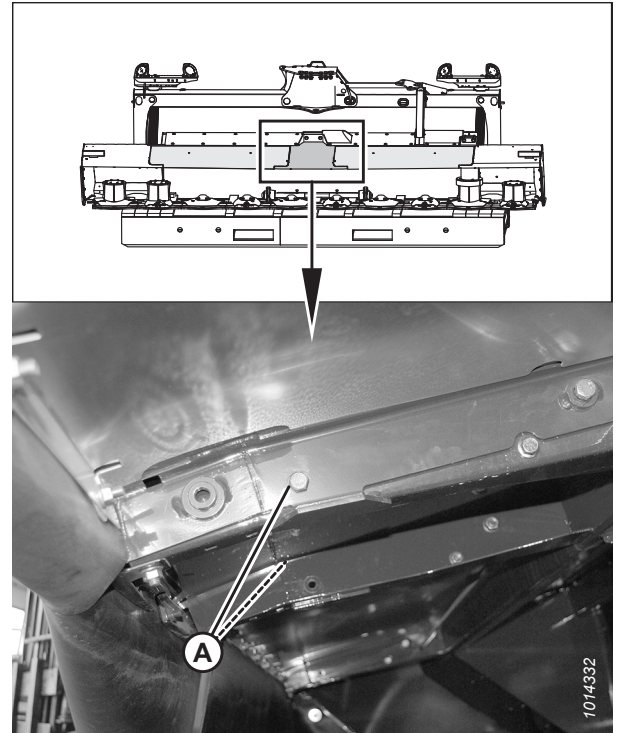


Figure 5.1: Underside of Cutterbar Doors

2. Remove shipping wire (A) from the cutterbar door curtains and forming shield covers, and pull the curtains down.

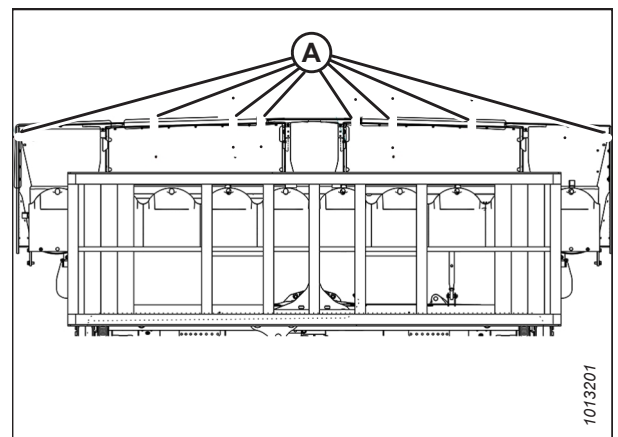


Figure 5.2: Underside of Rotary Disc HeaderPull-Type

COMPLETING ROTARY DISC HEADER ASSEMBLY

3. Straighten cutterbar door curtains (A) and remove any folds or creases.

NOTE:

Minor creases will eventually straighten out.

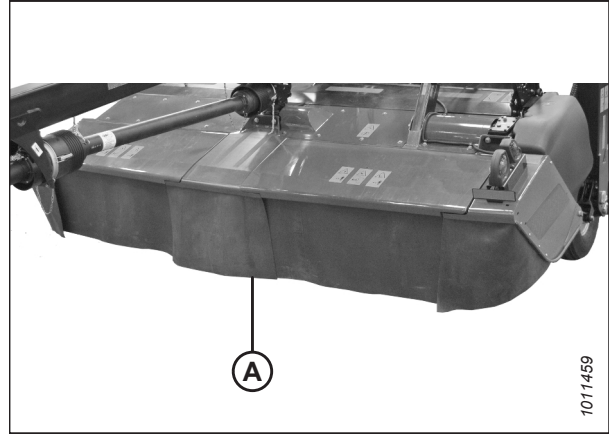


Figure 5.3: Cutterbar Door Curtains

4. Ensure the cutterbar door curtains and forming shield covers hang properly and completely enclose the cutterbar area.

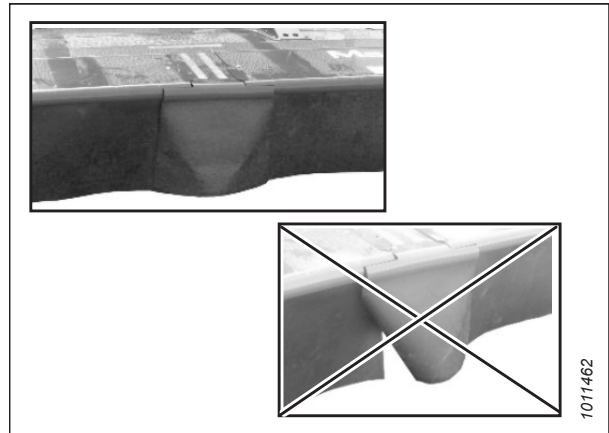


Figure 5.4: Cutterbar Door Curtains

Chapter 6: Lubricating

has been lubricated at the factory; however, you should lubricate prior to delivery to offset the effects of weather during outside storage and transport.

DANGER

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

6.1 Opening Driveshields

The driveshields offer protection for its sensitive components. Open them only when you intend to service the header.

DANGER

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

WARNING

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

NOTE:

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

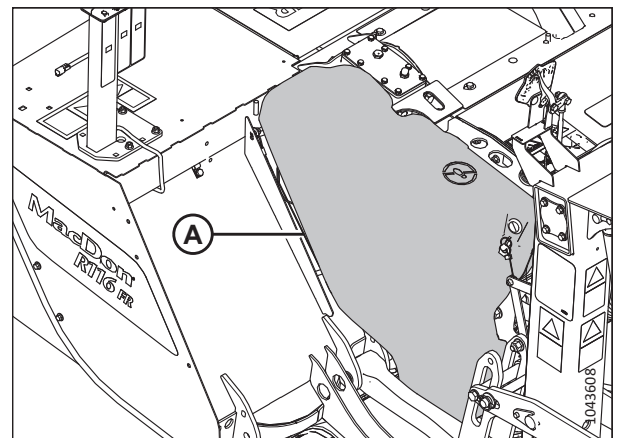


Figure 6.1: Left Driveshield

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

LUBRICATING

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

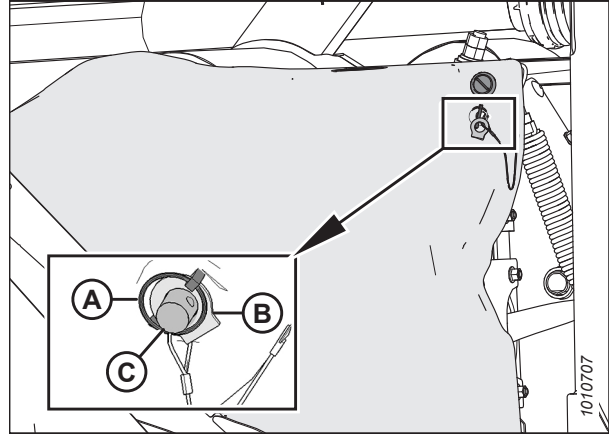


Figure 6.2: Left Driveshield

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

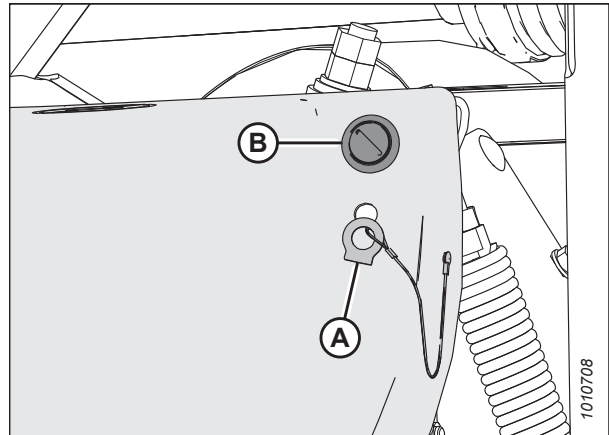


Figure 6.3: Driveshield Latch

- Pull the top of driveshield (A) away from the header to open it.

NOTE:

For improved access, lift the driveshield off the pins at the base of the shield, and lay the shield on the header.

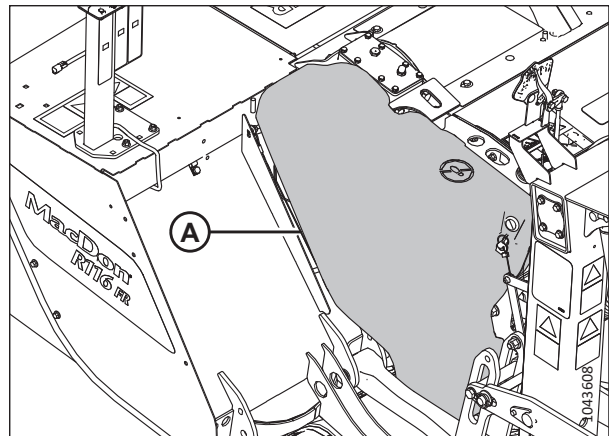


Figure 6.4: Left Driveshield

6.2 Lubrication Points

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

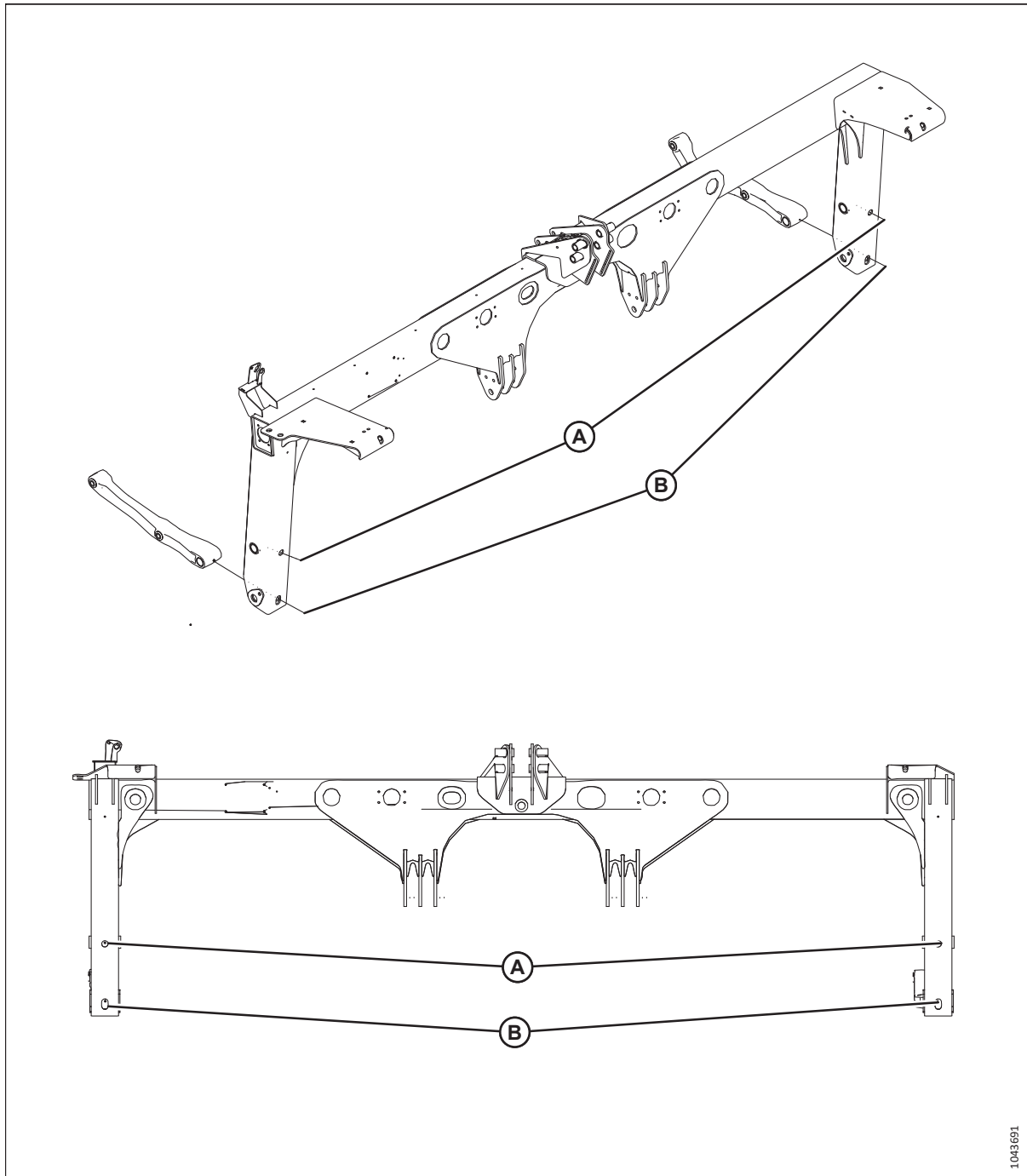
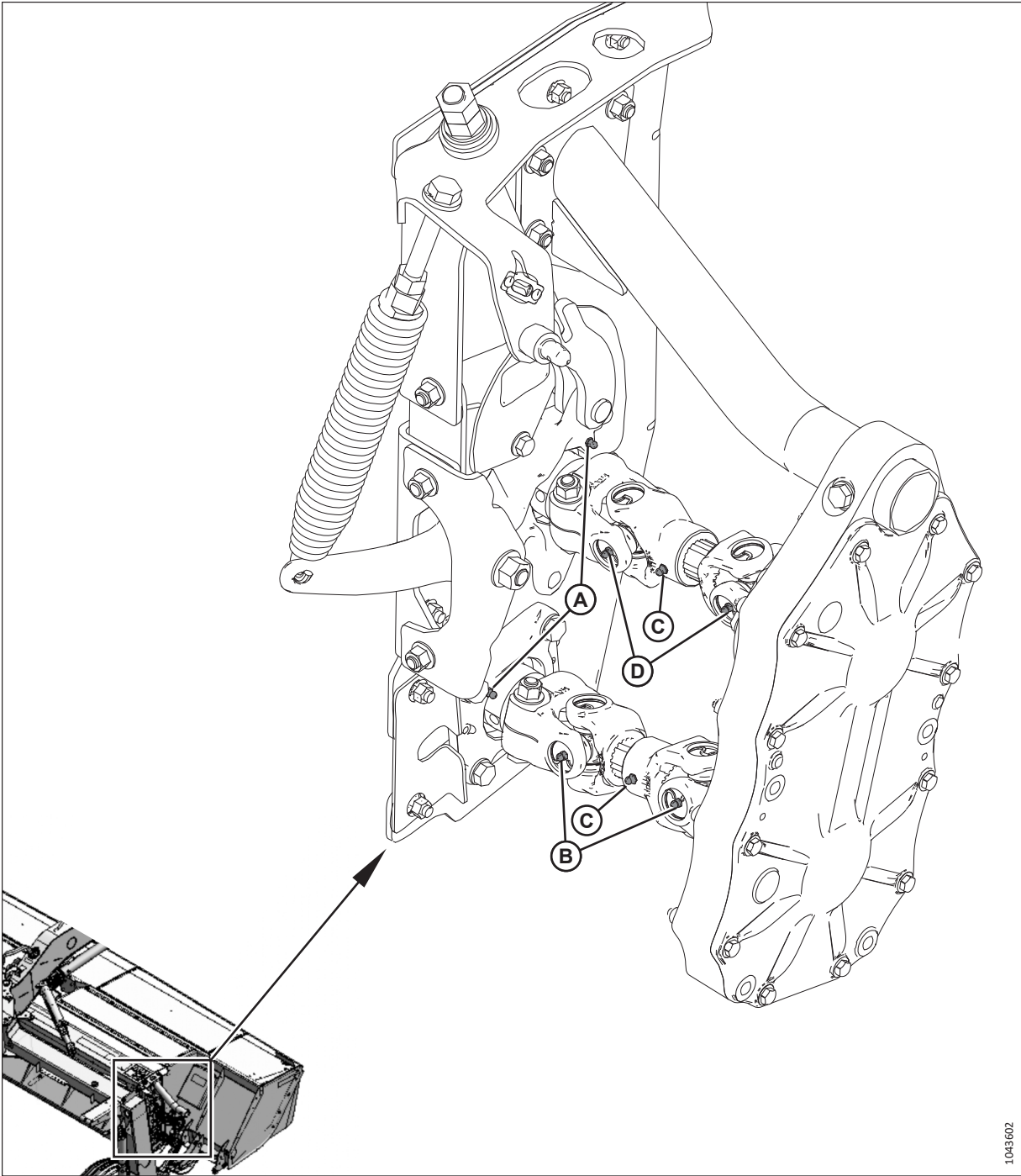


Figure 6.5: Lubrication Points

A - Right and Left Lift Arms Points

B - Adapter Frame Pivot Points

LUBRICATING



1045602

Figure 6.6: Lubrication Points

A - Bearings, Roller Conditioner

B - U-Joint, Lower Driveline (Two Places)

C - Slip Joints, Conditioner Drivelines¹

D - U-Joint, Upper Driveline (Two Places)

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

6.3 Closing Driveshields

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

WARNING

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

NOTE:

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

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

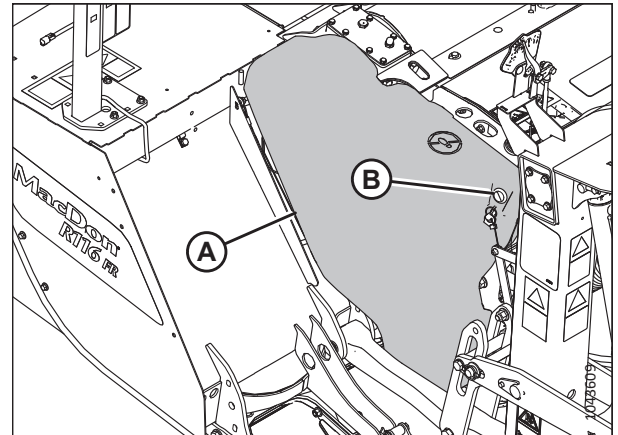


Figure 6.7: Left Driveshield

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

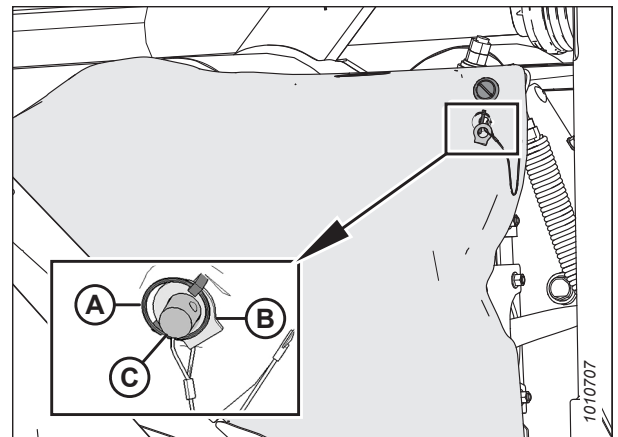


Figure 6.8: Left Driveshield

Chapter 7: Performing Predelivery Checks

To ensure the machine is field-ready, perform the final checks and adjustments listed on the Predelivery Checklist.

IMPORTANT:

To avoid machine damage, check that no shipping dunnage has fallen into cutterbar.

IMPORTANT:

Run the hydraulic flow rate between 15–20 percent to provide optimal flow to the auxiliary lift cylinder control valve.

1. Perform the final checks and adjustments as listed on the Predelivery Checklist (yellow sheet inside the back cover of this instruction) to ensure the machine is field-ready. Refer to the following pages for detailed instructions as indicated on the *Predelivery Checklist, page 71*.
2. The completed Checklist should be retained either by the Operator or the Dealer.

NOTE:

The majority of checks and adjustments are performed during the setup procedures. The following additional inspections should be performed after the setup is complete.

7.1 Auxiliary Lift Lock Pins

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

7.1.1 Installing Auxiliary Lift Lock Pins

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



DANGER

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



DANGER

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

IMPORTANT:

Do **NOT** disconnect the header before installing the auxiliary lift locking pins. When disconnected from a tractor without the auxiliary lift lock pins installed, the carrier frame may move and contact the machine.

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

PERFORMING PREDELIVERY CHECKS

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

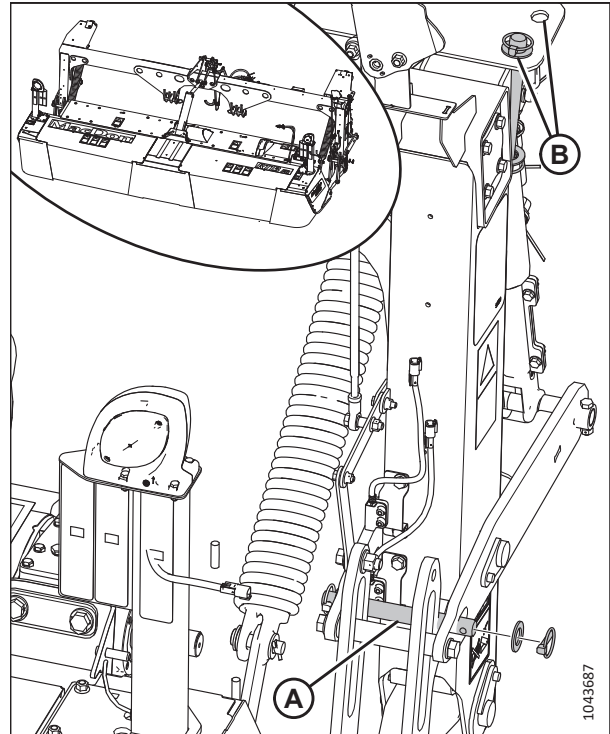


Figure 7.1: Auxiliary Lift Lock Pins – Left Side

7.1.2 Removing Auxiliary Lift Locking Pins

The auxiliary lift lock pins prevent the carrier frame from moving when the header is not attached to a tractor. Auxiliary lift lock pins must be removed before raising the header with a tractor.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

- Connect the tractor's 3-point hitch to the header. For instructions, refer to [4.1 Connecting the Tractor to the Rotary Disc Header, page 11](#).

IMPORTANT:

Do **NOT** raise the header when the auxiliary lift lock pins are installed. Doing so engages the hydraulic lift cylinders and can damage the float system linkage.

PERFORMING PREDELIVERY CHECKS

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

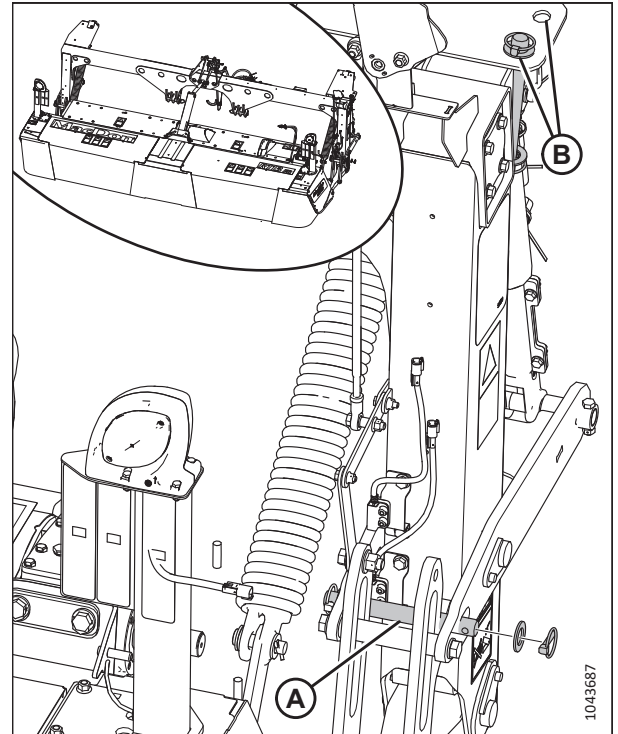


Figure 7.2: Auxiliary Lift Lock Pins – Left Side

7.2 Checking Conditioner Drive Belt

Ensure that the conditioner drive belt tensioning spring is set at the correct length.

1. Open the left driveshield. For instructions, refer to [6.1 Opening Driveshields, page 23](#).
2. Check that belt (A) is properly tensioned and positioned on the pulleys. Overall spring length (B) should be 365 mm (14 3/8 in.). If adjustment is required, refer to [7.2.1 Adjusting Conditioner Drive Belt, page 32](#).
3. Check that adjuster nuts (C) are tight.
4. Close the driveshield. For instructions, refer to [6.3 Closing Driveshields, page 27](#).

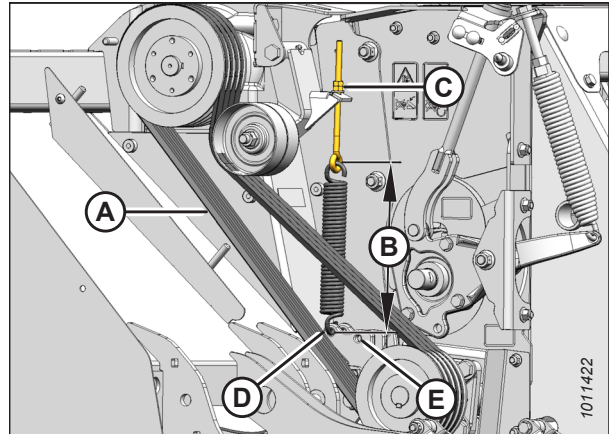


Figure 7.3: Conditioner Drive Belt

7.2.1 Adjusting Conditioner Drive Belt

If necessary, adjust the conditioner drive belt tensioning spring to the correct length.

1. Open the left driveshield. For instructions, refer to [6.1 Opening Driveshields, page 23](#).
2. Check that the spring is hooked at the correct location:
 - Hole (A) for a roll conditioner
 - Hole (B) for a finger conditioner
3. Turn jam nut (C) counterclockwise to unlock the tension adjustment.
4. Turn adjuster nut (D) clockwise to increase the spring length (tension). To decrease the spring length (relax), turn adjuster nut (D) counterclockwise.
5. Set overall spring length (E) to 365 mm (14 3/8 in.).
6. Close the driveshield. For instructions, refer to [6.3 Closing Driveshields, page 27](#).

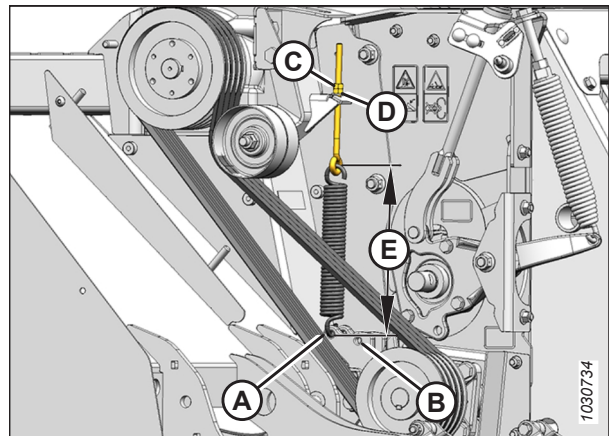


Figure 7.4: Conditioner Drive Belt

7.3 Checking Cutting Angle

Ensure the cutting angle is not set to an extreme position that could affect performance.

For a rotary disc pull-type equipped with mechanical center-link (A), the mid-point for header angle is the middle of the adjustment range on the link.

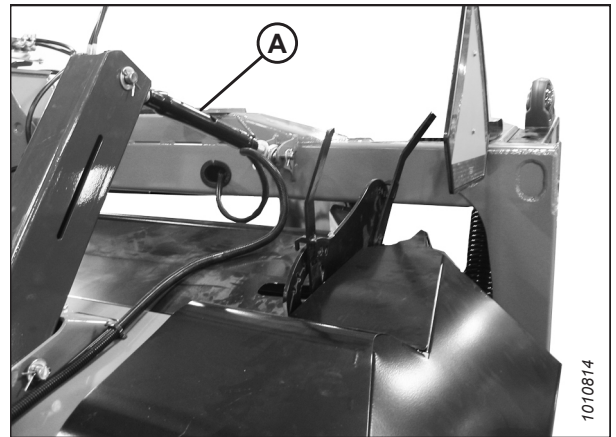


Figure 7.5: Mechanical Center-Link

7.4 Checking Skid Shoes

The skid shoes are located on both sides of the header.

All skid shoes (A) should be at the same position, either up (shown at right) or down.

NOTE:

The R113 is equipped with one skid shoe at each end; the R116 is equipped with two skid shoes at each end.

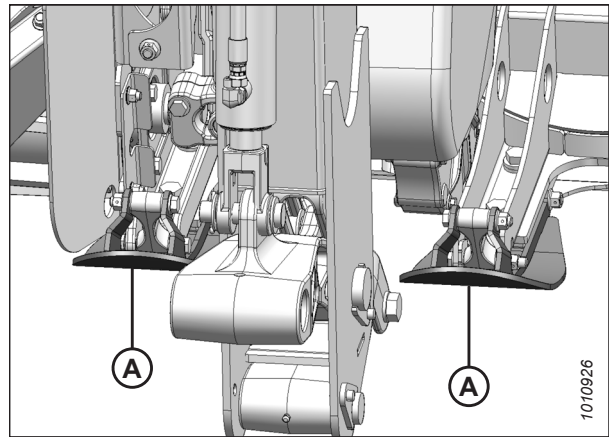


Figure 7.6: Skid Shoes – R116 PT (R113 PT and R113 / R116 FR Similar)

7.5 Checking Sensors

Functioning sensors will allow the header to operate as intended.

DANGER

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

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

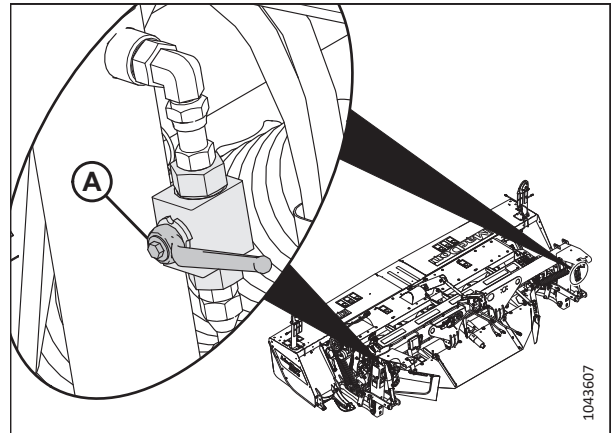


Figure 7.7: Cylinder Lock-Out Valve – Closed Position

4. When the 3-point hitch is fully raised, top link (A) moves to within 1–3 mm (1/32–1/8 in.) of upper proximity sensor (B) (inset).

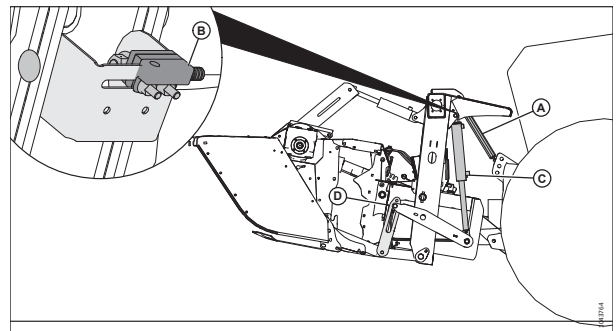


Figure 7.8: R1 FR – Fully Raised Position

PERFORMING PREDELIVERY CHECKS

- Adjust the sensor by loosening bolts (B) and ensuring that sensor (A) is within 1–3 mm of the top link arm. Retighten bolts (B).

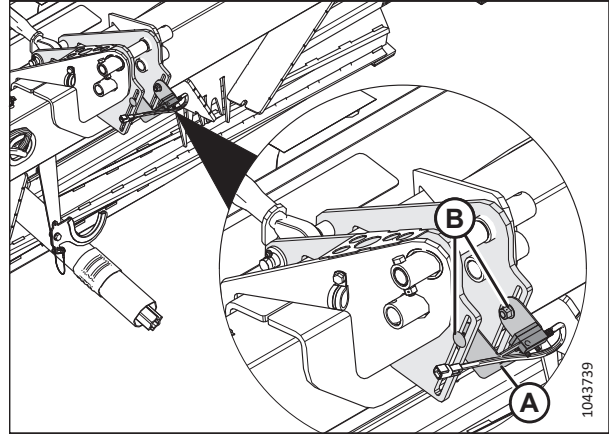


Figure 7.9: R1 FR – Top Link Sensor

- Check both auxiliary lift cylinder sensors (A) to see if they are within 1–3 mm of the linkage (B).

NOTE:

If sensors (A) are out of range, loosen the bracket bolts and slide the bracket and sensor within range of the linkage. Retighten the bolts.

- Repeat step 6, page 36 on the opposite side of the carrier frame.

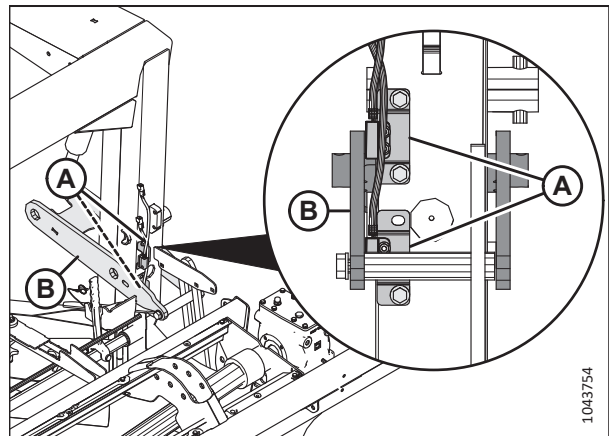


Figure 7.10: Auxiliary Lift Cylinder Sensors

7.6 Checking Float

Correct float ensures the cutterbar is able to closely follow ground contours.

DANGER

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

1. Lower the rotary disc header until the float indicator is at 2.
2. Grasp the front corner of the rotary disc pull-type and lift; the weight should feel approximately like 45 kg (100 lb.) at both ends. If adjustment is required, refer to .

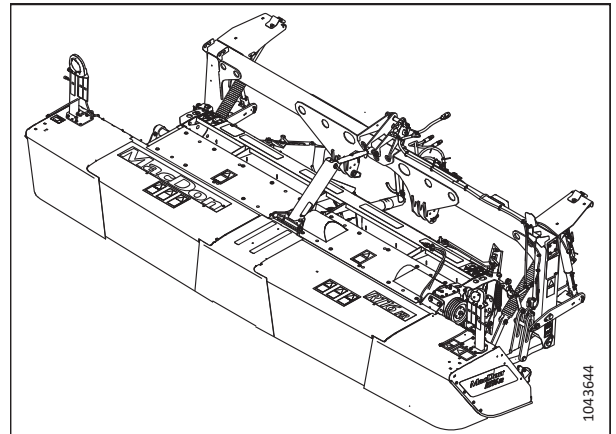


Figure 7.11: R116 FR Header

7.6.1 Adjusting Float

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

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

NOTE:

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

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

PERFORMING PREDELIVERY CHECKS

- Close the rotary disc header's auxiliary lift cylinder lock-out valve (A) on each lift cylinder by turning the handle to the horizontal position (90° to the hose). Repeat this step on the opposite side.

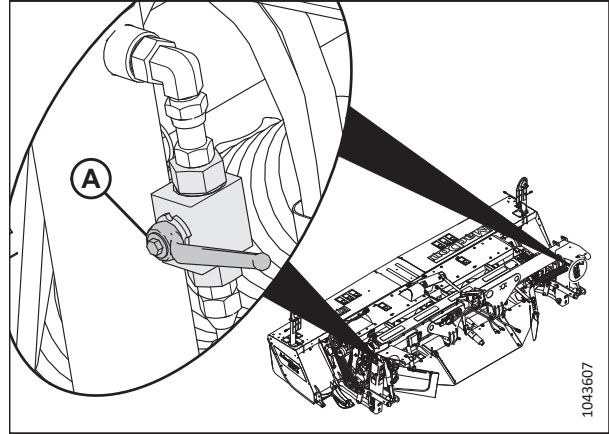


Figure 7.12: Cylinder Lock-Out Valve – Closed Position

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

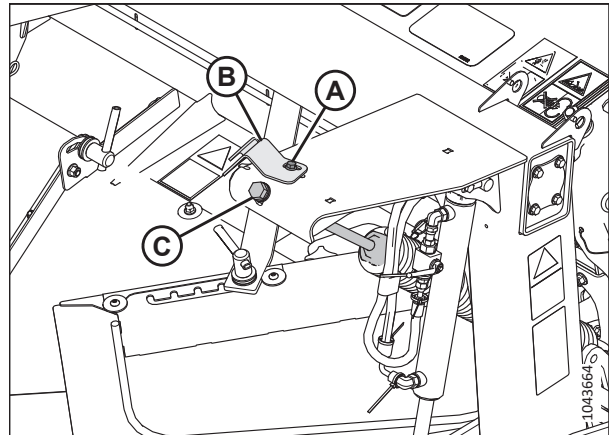


Figure 7.13: Float Spring – Right Side

- Turn adjuster bolt (A) to achieve the recommended measurement (B) for the conditioner type. Refer to Table 7.1, page 39 for measurements.

NOTE:

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

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

Repeat this step on the opposite side.

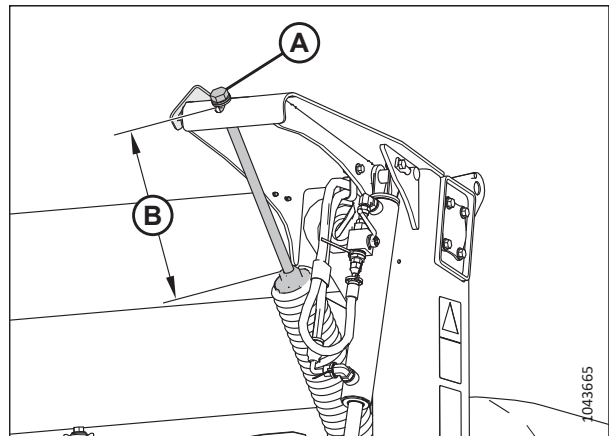


Figure 7.14: Adjuster Bolt

PERFORMING PREDELIVERY CHECKS

Table 7.1 Float Setting Starting Point

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

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

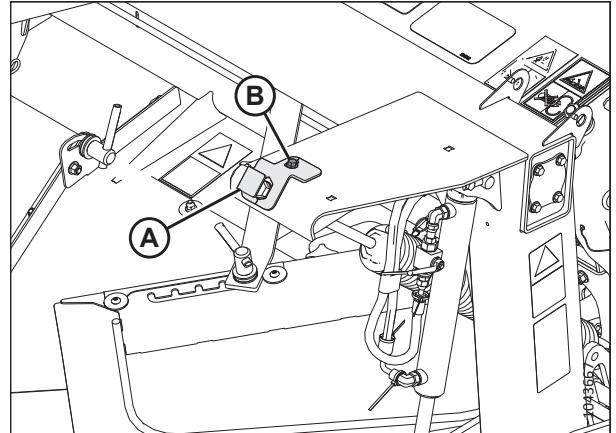


Figure 7.15: Adjuster Bolt Cover Plate

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

NOTE:

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

NOTE:

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

10. Repeat the adjustment procedures until the desired weight is achieved at both ends of the header.

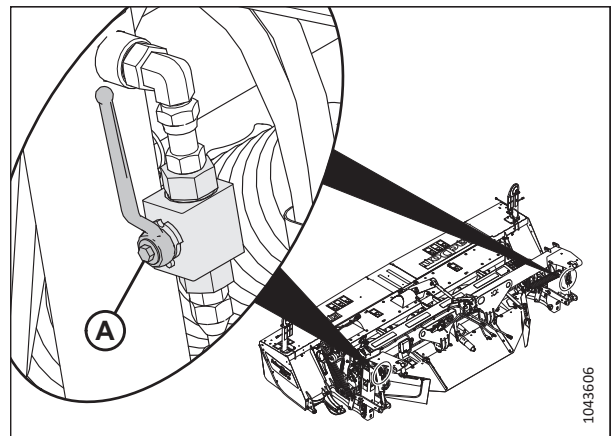


Figure 7.16: Lock-Out Valve – Open Position

PERFORMING PREDELIVERY CHECKS

11. With the header on level ground in cutting position, calibrate float indicator (A) by loosening jam nut (B), and turning the adjustable rod until the needle is centered on the number "2".

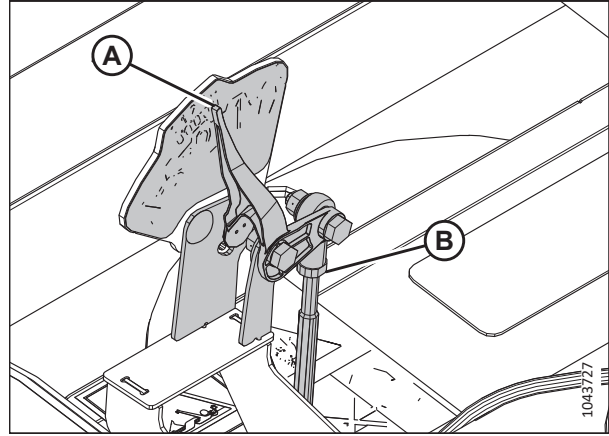


Figure 7.17: Float Indicator – Left Side

7.7 Checking and Adding Lubricant – Conditioner Roll Timing Gearbox

The conditioner roll timing gearbox is located inside the drive compartment at the right side of the rotary disc header.

DANGER

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

IMPORTANT:

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

1. Lower the header to the ground.
2. Adjust the header angle with the center-link so that the cutterbar is level.
3. Shut down the engine, and remove the key from the ignition.
4. Locate latch access holes (A) for each door.

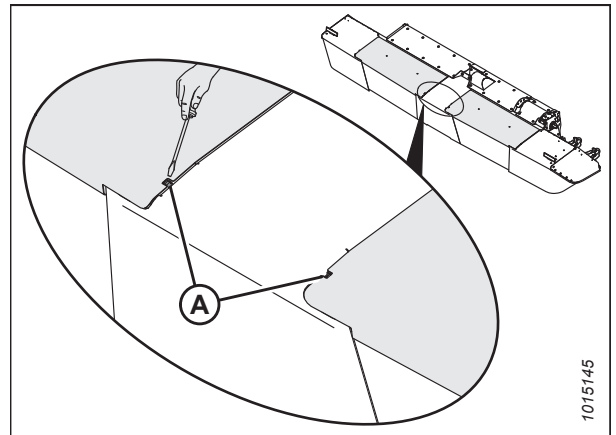


Figure 7.18: Cutterbar Door Latch Access Hole – Export Only

5. Use a rod or screwdriver to press down on latch (A) to release the cutterbar door.

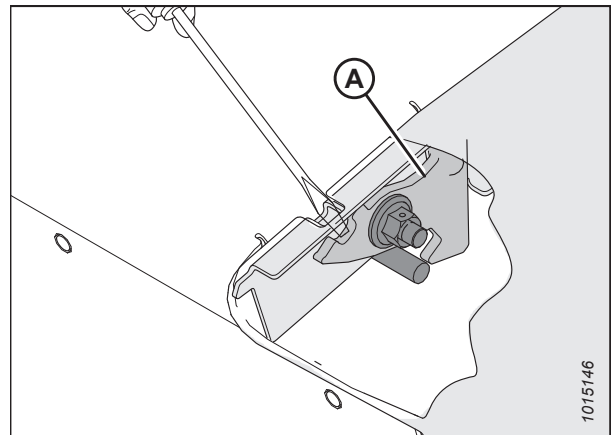


Figure 7.19: Cutterbar Door Latch – Cutaway View

PERFORMING PREDELIVERY CHECKS

- Lift up on doors (A) while pressing down on the latch.

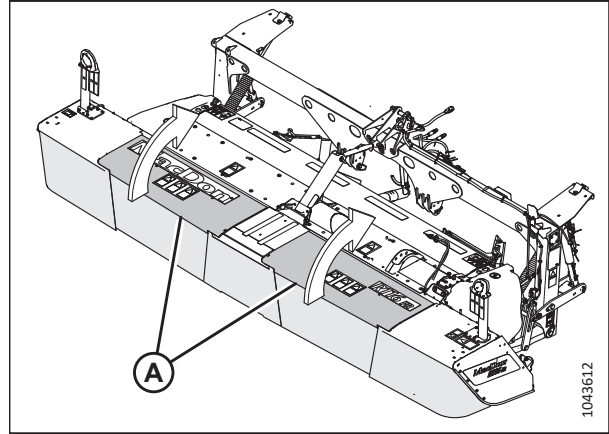


Figure 7.20: Cutterbar Doors and Curtains

- Use a spirit (bubble) level and check that cutterbar is level in fore-aft direction. Adjust the header angle as required.
- Open the right driveshield. For instructions, refer to [6.1 Opening Driveshields, page 23](#).
- Clean around lubricant sight glass (A) and breather plug (B) on the inboard side of the conditioner roll timing gearbox.
- Ensure that the lubricant level is at the top of the sight glass. If necessary, add lubricant through plug (B).

NOTE:

Refer to [8.3 Recommended Lubricants, page 59](#) for lubricant information.

- Replace plug (B) and tighten it.
- Close the right driveshield. For instructions, refer to [6.3 Closing Driveshields, page 27](#).

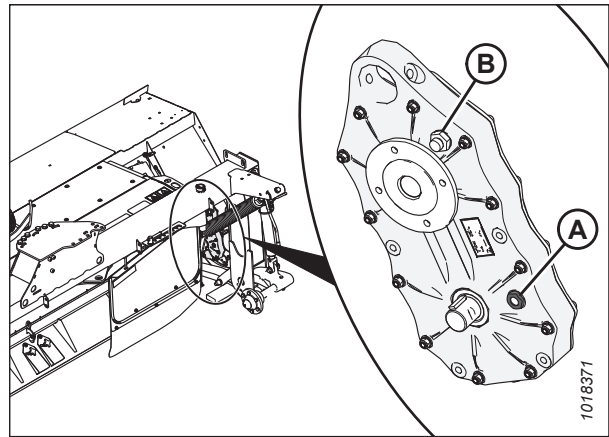


Figure 7.21: Roll Timing Gearbox

CAUTION

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

PERFORMING PREDELIVERY CHECKS

13. Pull at the top of the cutterbar door, and move it to the closed position. Ensure latch (A) has engaged the door.
14. Ensure that the curtains hang properly and completely enclose the cutterbar area.

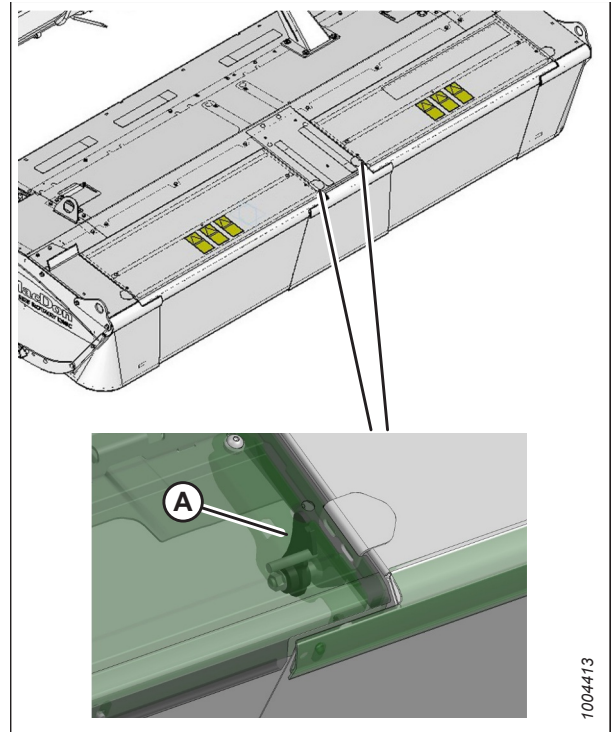


Figure 7.22: Cutterbar Door Latch

7.8 Checking and Adding Lubricant – Drive Gearbox

The cutterbar/conditioner drive gearbox is located inside the drive compartment at the left side of the header.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

1. Lower the header on to level ground.
2. Shut down the engine, and remove the key from the ignition.
3. Open the left driveshield. For instructions, refer to [6.1 Opening Driveshields, page 23](#).
4. Clean the area around dipstick (A).
5. Remove dipstick using a 22 mm socket.
6. Ensure the lubricant level is to the full line on the dipstick.
7. If necessary, add gear lubricant through dipstick hole (A). For recommended lubricants and quantities, refer to [8.3 Recommended Lubricants, page 59](#).
8. Reinstall the dipstick and tighten it.
9. Close the left driveshield. For instructions, refer to [6.3 Closing Driveshields, page 27](#).

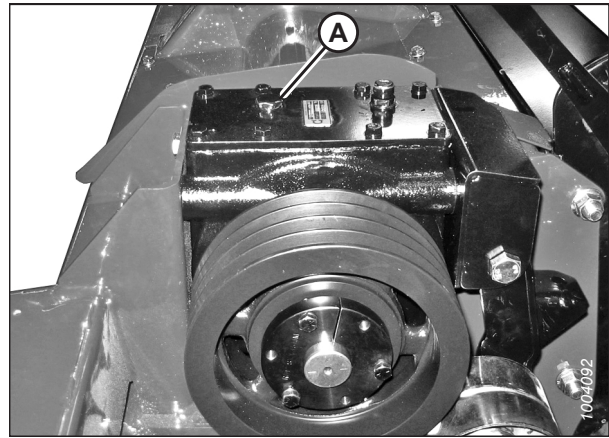


Figure 7.23: Left Side of Rotary Header

7.9 Checking and Adding Lubricant – Cutterbar

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

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

WARNING

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

1. Park the machine on a flat, level surface.
2. Shut down the engine, and remove the key from the ignition.
3. Place blocks under each end, or just inside each end, of the cutterbar.
4. Lower the onto the blocks.
5. Shut down the engine, and remove the key from the ignition.
6. Open the cutterbar doors. For instructions, refer to .
7. Use spirit level (A) to ensure that the cutterbar is level in both directions. Adjust the cutterbar position accordingly.

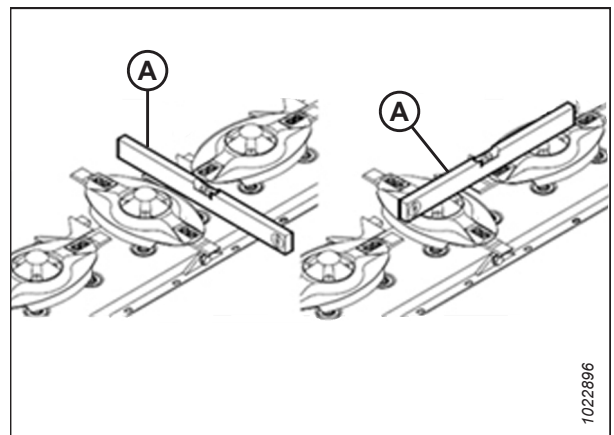


Figure 7.24: Spirit Level on Cutterbar

PERFORMING PREDELIVERY CHECKS

- Clean the area around plug (A). Place a 5 liter (5.2 US qts) capacity container under the plug.
- Remove plug (A) and O-ring (B) from the cutterbar. The oil level must be up to the inspection plug hole.

NOTE:

If additional lubricant is required, proceed to Step [10, page 46](#). If additional lubricant is **NOT** required, proceed to Step [16, page 46](#).

IMPORTANT:

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

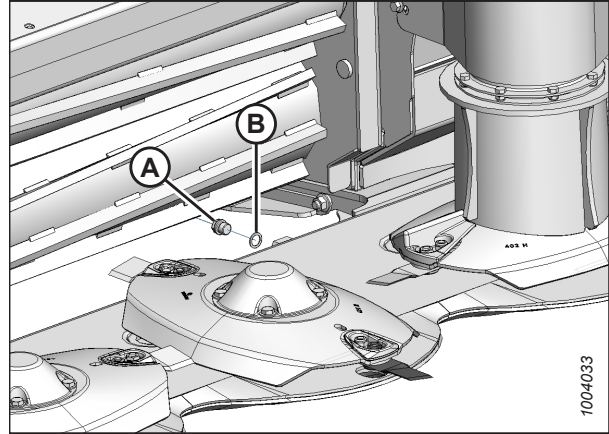


Figure 7.25: Cutterbar Oil Inspection Plug

- Reinstall the inspection plug.
- Start the engine, and raise the header slightly.
- Lower the header onto blocks, so that the left end is slightly higher than the right end.
- Shut down the engine, and remove the key from the ignition.
- Add lubricant through the inspection hole used to check the oil level.

IMPORTANT:

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

- Recheck the oil level.
- Check O-ring (B) for breaks or cracks, and replace it if necessary.
- Install plug (A) and O-ring (B).
- Close the cutterbar doors. For instructions, refer to .

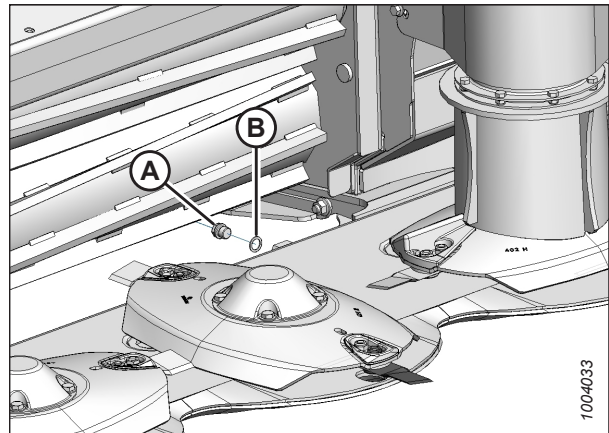


Figure 7.26: Cutterbar Oil Inspection Plug

7.10 Checking Roll Gap

The correct roll gap is required for proper conditioning. The setting is different for steel and polyurethane rolls.

DANGER

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

1. Lower the header to the ground.
2. Shut down the engine, and remove the key from the ignition.
3. **Steel rolls:** The length of thread (A) extending above the jam nut on the adjustment rods can be used as an approximation of roll gap, but does **NOT** provide consistent roll gap measurements. To ensure that the roll gap is at the factory setting, refer to [7.10.1 Adjusting Roll Gap – Steel Rolls, page 47](#).

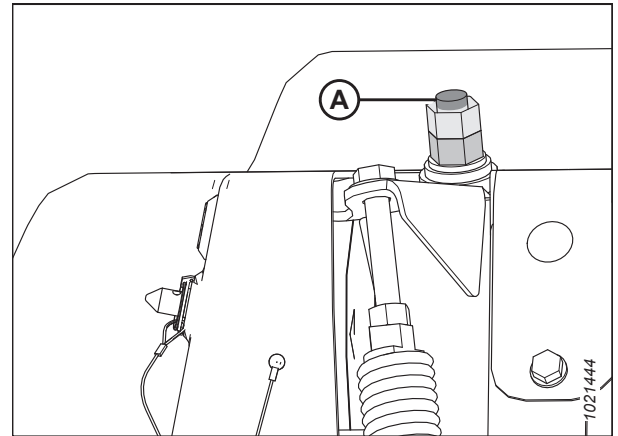


Figure 7.27: Roll Gap Adjustment

7.10.1 Adjusting Roll Gap – Steel Rolls

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

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

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

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

PERFORMING PREDELIVERY CHECKS

3. Loosen jam nut (A) on both sides of the conditioner.
4. Turn lower nut (B) counterclockwise until the upper roll rests on the lower roll. Ensure the rolls intermesh.
5. Turn lower nut (B) two and a half full turns clockwise to raise the upper roll and achieve a 6 mm (1/4 in.) roll gap.
6. Hold nut (B) and tighten jam nut (A) on both sides of the conditioner.

IMPORTANT:

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

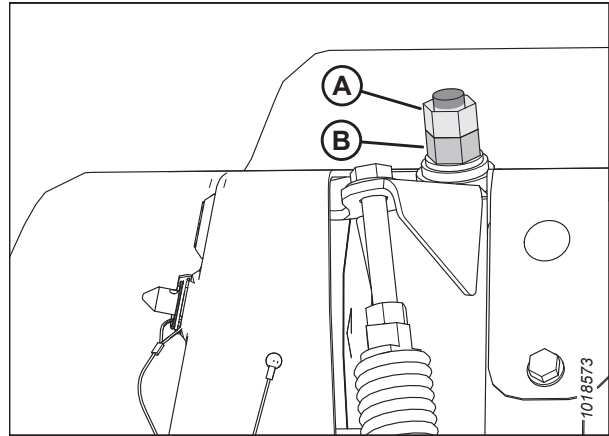


Figure 7.28: Roll Gap Adjustment

7.11 Checking Roll Timing

Check the roll timing if excessive noise is coming from the conditioner rolls.

The roll timing is factory-set and should not require adjustment; however, if there is excessive noise coming from the conditioner rolls, the timing will need to be adjusted. Listen to the rollers. Excessive noise may come from dirt build up, or the rollers being out of time and would require adjustment. For instructions, refer to the header operator's manual.

7.12 Checking Roll Tension

Roll tension is indicated by the exposed thread on the roll tension adjuster bolt.

1. Measure the amount of exposed thread on the roll tension adjuster bolt (A) at each end of the conditioner. Measurement (B) should be 12–15 mm (1/2–9/16 in.) for steel roll conditioners.
2. If the tension requires adjusting, refer to [7.12.1 Adjusting Roll Tension, page 50](#).

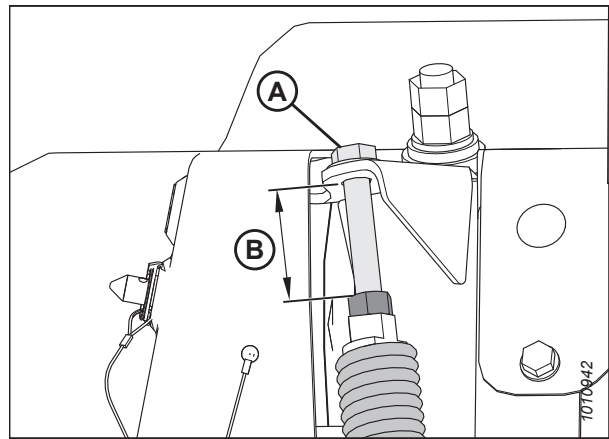


Figure 7.29: Roll Tension Adjuster

7.12.1 Adjusting Roll Tension

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

DANGER

Ensure that all bystanders have cleared the area.

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

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

IMPORTANT:

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

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

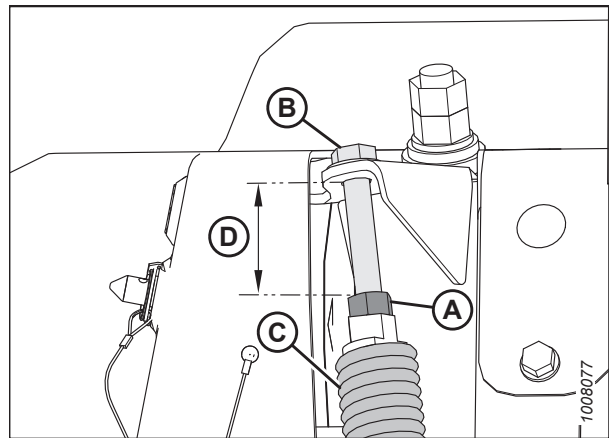


Figure 7.30: Adjusting Roll Tension

7.13 Adjusting Conditioner Baffle Position

The position of the adjustable conditioner baffle, along with the forming shields, determines the height and width of the windrow: raising the baffle produces a fluffier, narrower windrow; lowering the baffle produces a flatter, wider windrow.

1. On roll conditioners, move baffle adjustment handle (A) to middle position (B) on the adjustment plate.

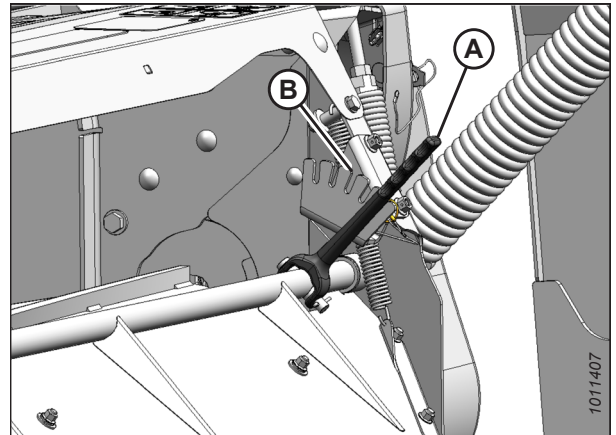


Figure 7.31: Baffle Adjuster – Roll Conditioners

7.14 Checking Lights

Ensure all lights function correctly.

1. Check that lights (A) are properly located on the rotary disc pull-type to suit the setup configuration.
2. Check the light mountings for security and damage.

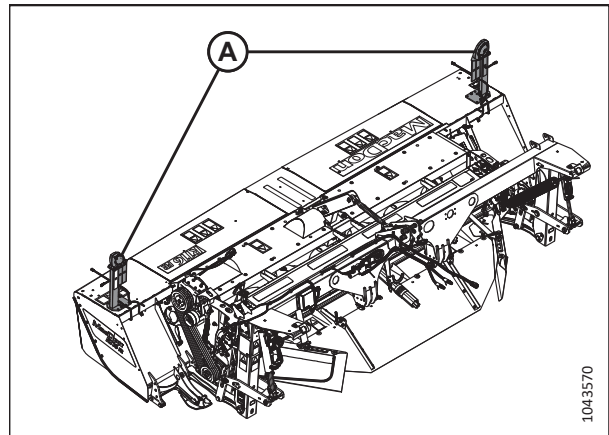


Figure 7.32: Standard Configuration

7.15 Checking Manuals

Ensure that the manuals and quick card are stored in the manual case.

The following manuals should be stored in manual storage case (A) at the right end of the header:

- R113/R116 FR Rotary Disc Pull-Type Operator's Manual
- R113/R116 FR Rotary Disc Pull-Type Parts Catalog
- R113/R116 FR Rotary Disc Pull-Type Quick Card

Open the right driveshield to access the manual case. For instructions, refer to [6.1 Opening Driveshields, page 23](#).

7.16 Checking Disc Timing Tool

Ensure that the disc timing tool is stored in place.

Disc timing tool (A) should be stored on the machine at the left end of the header.

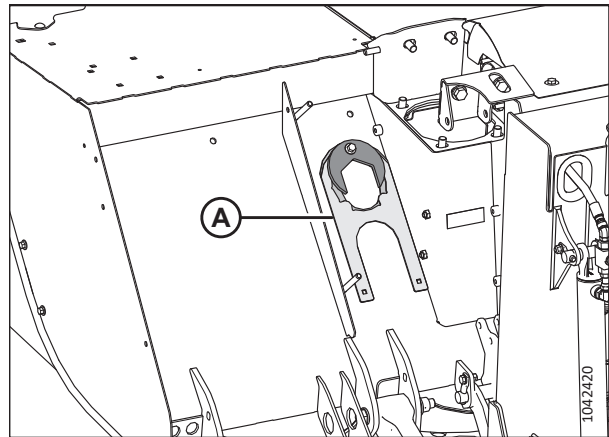


Figure 7.33: Disc Timing Tool

7.17 Running up Header

Run up the header to ensure that the machine is ready to deliver to the Customer.



WARNING

- Ensure that bystanders remain at least 100 m (330 ft.) from the header while it is operating. Stones and other objects can be ejected from the header with great force.
- Inspect the cutterbar area carefully for loose hardware. These objects can be ejected with great force when the header is engaged, resulting in serious injury or damage.
- Cutterbar curtains reduce the potential for thrown objects. Always keep these curtains down when operating the disc header. Replace the curtains if they become worn or damaged.
- The cutterbar curtain mitigates the damage potential of thrown objects. Always keep the curtain down when operating the header. Replace the curtain if it becomes worn or is damaged.



DANGER

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



DANGER

Ensure that all bystanders have cleared the area.

NOTE:

A higher engine rpm may be required to engage the header. Do **NOT** exceed 1800 rpm.

1. Start the engine.
2. Set the header 152–305 mm (6–12 in.) above the ground and adjust the center-link to mid-position.
3. Run the machine slowly for 5 minutes, and watch and listen **FROM THE OPERATOR'S SEAT** for binding or interfering parts.
4. Run the machine at operating speed for 15 minutes. Listen for any unusual sounds or abnormal vibration.
5. Perform the run-up check as listed on the Predelivery Checklist (the yellow sheet inside the back cover of this instruction) to ensure that the machine is field-ready.
6. Shut down the engine, and remove the key from the ignition.
7. Retain the Predelivery Checklist and this instruction for future reference.

7.18 Checking and Removing Clear Vinyl Decal Protectors

Clear vinyl protectors prevent damage to the decals during the manufacturing and shipping process.

Remove the protective film during Pre-Delivery Inspection.

NOTE:

Remove when ambient temperature is 10°C (50°F) or higher. Lower temperatures may cause film to become brittle, making it challenging to remove in one piece.

Chapter 8: Reference

Additional information and commonly repeated procedures are included in the reference chapter.

8.1 Engaging Auxiliary Lift Cylinder Locks

Hydraulic lock-out are valves provided to safely transport and service the machine.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

1. Move lift control lever (A) backward to position (B) to fully raise the machine.
2. Shut down the engine, and remove the key from the ignition.

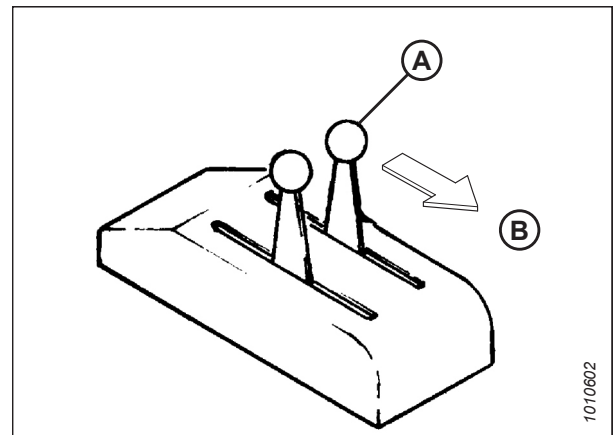


Figure 8.1: Tractor Control Lever

3. Close lock-out valve (A) on each auxiliary lift cylinder by turning the handle to the closed position (90° angle to the hose).

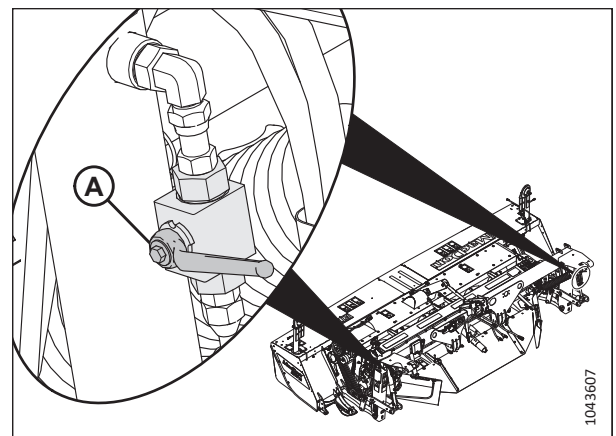


Figure 8.2: Lift Cylinder Lock-Out Valve in Closed Position

8.2 Disengaging Locks

Engage the hydraulic lock-out valves when you are transporting or servicing the machine.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

1. Shut down the engine, and remove the key from the ignition.
2. Open lock-out valve (A) on each lift cylinder by turning the handle to the open position (in line with the hose).

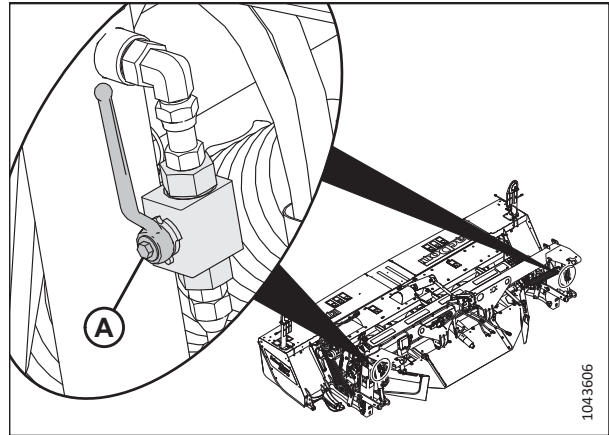


Figure 8.3: Lift Cylinder Lock-Out Valve in Open Position

3. Move cylinder control lever (A) forward to position (B) to lower the machine.

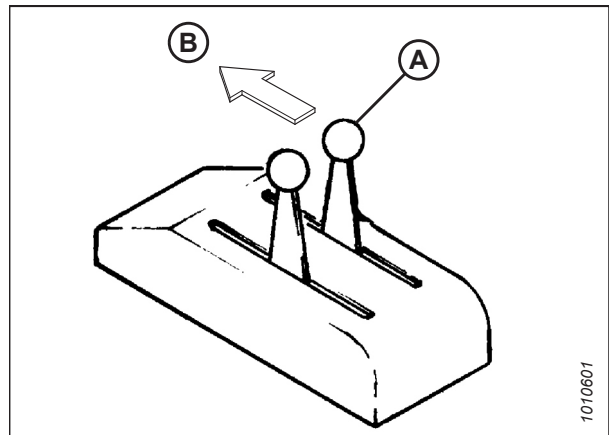


Figure 8.4: Tractor Cylinder Control Lever

8.3 Recommended Lubricants

The recommended lubricants are listed to ensure that the machine is running smoothly.

Keep your machine operating at top efficiency by using only clean lubricants and by ensuring the following:

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

IMPORTANT:

Do **NOT** overfill the cutterbar when adding lubricant. Overfilling could result in overheating and failure of the cutterbar components.

Table 8.1 Recommended Lubricants

Specification	Description	Use	Capacities
Lubricant: Grease			
SAE Multipurpose	High temperature, extreme pressure (EP) performance with 1% max. molybdenum disulphide (NLGI Grade 2) lithium base	As required unless otherwise specified	—
SAE Multipurpose	High temperature, extreme pressure (EP) performance with 10% max. molybdenum disulphide (NLGI Grade 2) lithium base	Driveline slip-joints	—
Lubricant: Gear Lubricant			
SAE 85W-140	Gear lubricant API service class GL-5	Conditioner roll timing gearbox	0.7 L (0.75 qts [US])
SAE 85W-140	Gear lubricant API service class GL-5	Cutterbar and conditioner drive gearbox	1.9 L (2.0 qts [US])

8.4 Torque Specifications

The following tables provide torque values for various bolts, cap screws, and hydraulic fittings. Refer to these values only when no other torque value has been specified in a given procedure.

- Tighten all bolts to the torque values specified in the charts below, unless you are directed otherwise in this manual.
- Replace removed hardware with hardware of the same strength and grade.
- Refer to the torque value tables as a guide when periodically checking the tightness of bolts.
- Understand the torque categories for bolts and cap screws by reading the markings on their heads.

Jam nuts

Jam nuts require less torque than nuts used for other purposes. When applying torque to finished jam nuts, multiply the torque applied to regular nuts by 0.65 to obtain the modified torque value.

Self-tapping screws

Refer to the standard torque values when installing the self-tapping screws. Do **NOT** install the self-tapping screws on structural or otherwise critical joints.

8.4.1 Metric Bolt Specifications

Specifications are provided for the appropriate final torque values to secure various sizes of metric bolts.

NOTE:

The torque values provided in the following metric bolt torque tables apply to hardware installed dry; that is, hardware with no grease, oil, or threadlocker on the threads or heads. Do **NOT** add grease, oil, or threadlocker to bolts or cap screws unless you are directed to do so in this manual.

Table 8.2 Metric Class 8.8 Bolts and Class 9 Free Spinning Nut

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

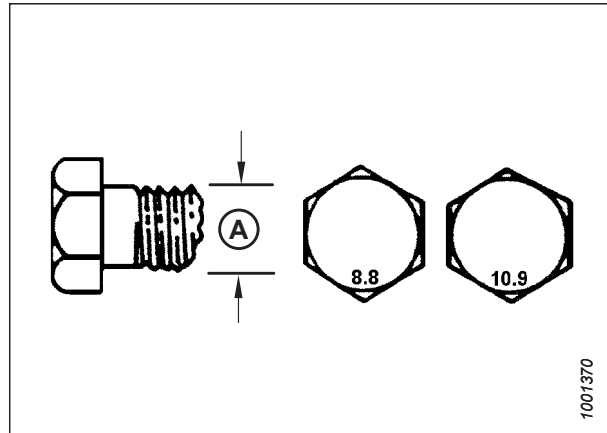


Figure 8.5: Bolt Grades

REFERENCE

Table 8.3 Metric Class 8.8 Bolts and Class 9 Distorted Thread Nut

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

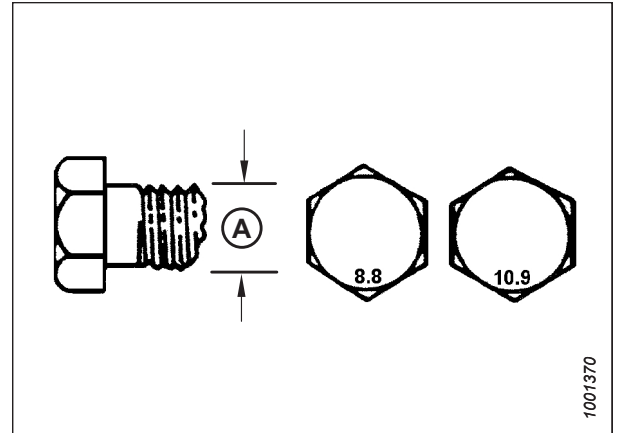


Figure 8.6: Bolt Grades

Table 8.4 Metric Class 10.9 Bolts and Class 10 Free Spinning Nut

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

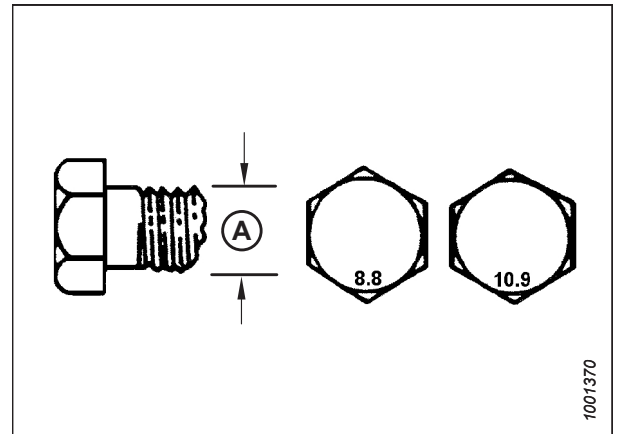


Figure 8.7: Bolt Grades

REFERENCE

Table 8.5 Metric Class 10.9 Bolts and Class 10 Distorted Thread Nut

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

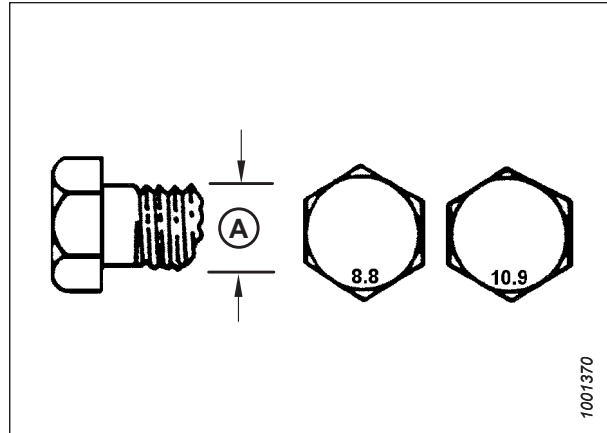


Figure 8.8: Bolt Grades

8.4.2 Metric Bolt Specifications – Cast Aluminum

Specifications are provided for the appropriate final torque values for various sizes of metric bolts in cast aluminum.

NOTE:

The torque values provided in the following metric bolt torque tables apply to hardware installed dry; that is, hardware with no grease, oil, or threadlocker on the threads or heads. Do **NOT** add grease, oil, or threadlocker to bolts or cap screws unless you are directed to do so in this manual.

Table 8.6 Metric Bolt Bolting into Cast Aluminum

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

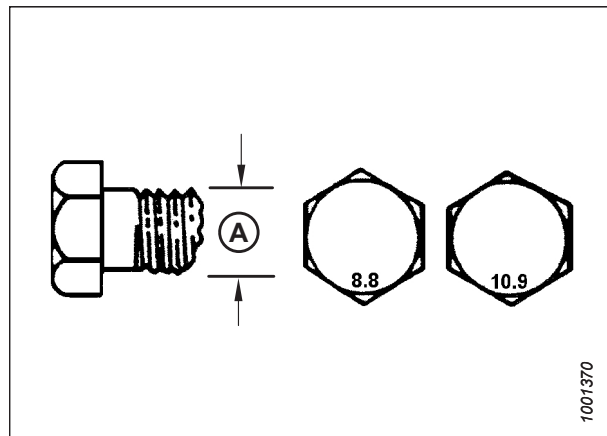


Figure 8.9: Bolt Grades

8.4.3 O-Ring Boss Hydraulic Fittings – Adjustable

The standard torque values are provided for adjustable hydraulic fittings. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, refer to the value specified in the procedure instead.

1. Inspect O-ring (A) and seat (B) for dirt or defects.
2. Back off lock nut (C) as far as possible. Ensure that washer (D) is loose and that it is pushed toward lock nut (C) as far as possible.
3. Ensure that O-ring (A) is **NOT** on the threads. Adjust O-ring (A) if necessary.
4. Apply hydraulic system oil to O-ring (A).

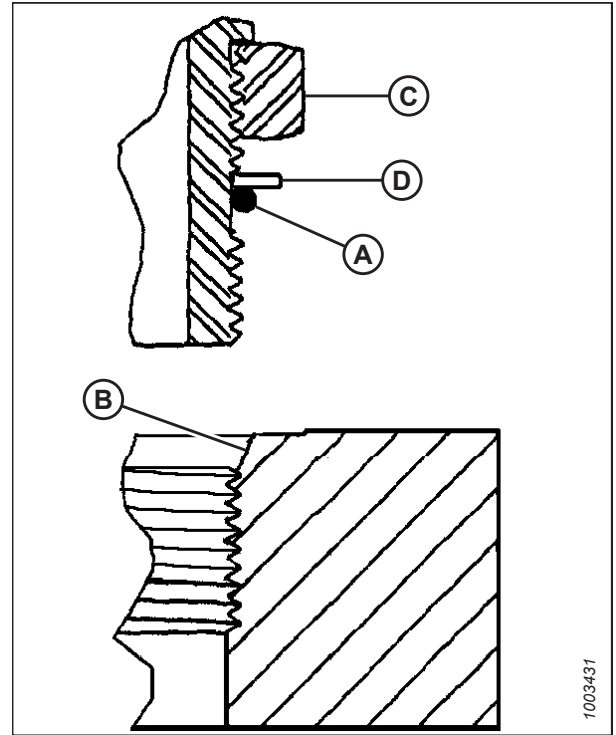


Figure 8.10: Hydraulic Fitting

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

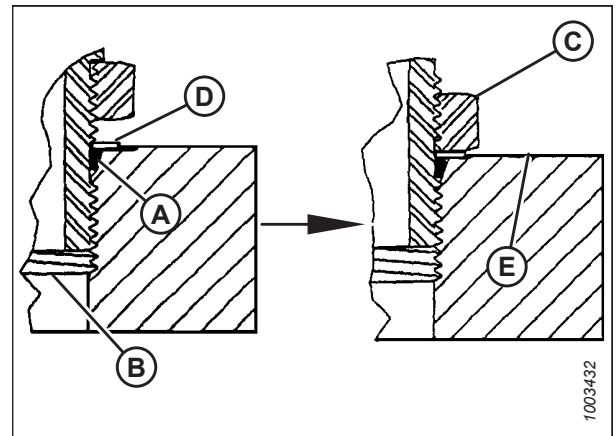


Figure 8.11: Hydraulic Fitting

REFERENCE

Table 8.7 O-Ring Boss (ORB) Hydraulic Fittings – Adjustable and Non-Adjustable

SAE Dash Size	Thread Size (in.)	Torque Value ²	
		Nm	lbf·ft (*lbf·in)
-2	5/16–24	10–11	*89–97
-3	3/8–24	18–20	*159–177
-4	7/16–20	29–32	21–24
-5	1/2–20	32–35	24–26
-6	9/16–18	40–44	30–32
-8	3/4–16	70–77	52–57
-10	7/8–14	115–127	85–94
-12	1 1/16–12	183–201	135–148
-14	1 3/16–12	237–261	175–193
-16	1 5/16–12	271–298	200–220
-20	1 5/8–12	339–373	250–275
-24	1 7/8–12	414–455	305–336
-32	2 1/2–12	509–560	375–413

8.4.4 O-Ring Boss Hydraulic Fittings – Non-Adjustable

The standard torque values for non-adjustable hydraulic fittings are provided. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, use the value specified in the procedure instead.

1. Inspect O-ring (A) and seat (B) for dirt or defects.
2. Ensure that O-ring (A) is **NOT** on the threads. Adjust O-ring (A) if necessary.
3. Apply hydraulic system oil to the O-ring.
4. Install fitting (C) into the port until the fitting is hand-tight.
5. Torque fitting (C) according to values in Table 8.8, page 64.
6. Verify the final condition of the fitting.

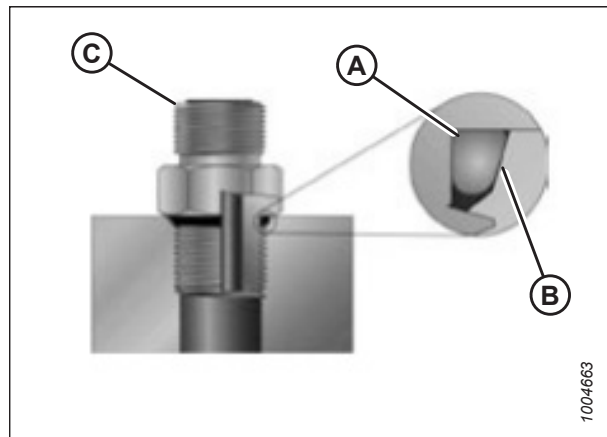


Figure 8.12: Hydraulic Fitting

Table 8.8 O-Ring Boss (ORB) Hydraulic Fittings – Adjustable and Non-Adjustable

SAE Dash Size	Thread Size (in.)	Torque Value ²	
		Nm	lbf·ft (*lbf·in)
-2	5/16–24	10–11	*89–97
-3	3/8–24	18–20	*159–177
-4	7/16–20	29–32	21–24
-5	1/2–20	32–35	24–26

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

REFERENCE

Table 8.8 O-Ring Boss (ORB) Hydraulic Fittings – Adjustable and Non-Adjustable (continued)

SAE Dash Size	Thread Size (in.)	Torque Value ³	
		Nm	lbf-ft (*lbf-in)
-6	9/16-18	40-44	30-32
-8	3/4-16	70-77	52-57
-10	7/8-14	115-127	85-94
-12	1 1/16-12	183-201	135-148
-14	1 3/16-12	237-261	175-193
-16	1 5/16-12	271-298	200-220
-20	1 5/8-12	339-373	250-275
-24	1 7/8-12	414-455	305-336
-32	2 1/2-12	509-560	375-413

8.4.5 O-Ring Face Seal Hydraulic Fittings

The standard torque values are provided for O-ring face seal hydraulic fittings. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, refer to the value specified in the procedure instead.

Torque values are shown in the Table 8.9, page 66.

1. Ensure that the sealing surfaces and the fitting threads are free of burrs, nicks, scratches, and any foreign material.



Figure 8.13: Hydraulic Fitting

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

REFERENCE

2. Apply hydraulic system oil to O-ring (B).
3. Align the tube or hose assembly so that the flat face of sleeve (A) or (C) comes into full contact with O-ring (B).
4. Thread tube or hose nut (D) until it is hand-tight. The nut should turn freely until it bottoms out.
5. Torque the fittings according to values in Table 8.9, page 66.

NOTE:

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

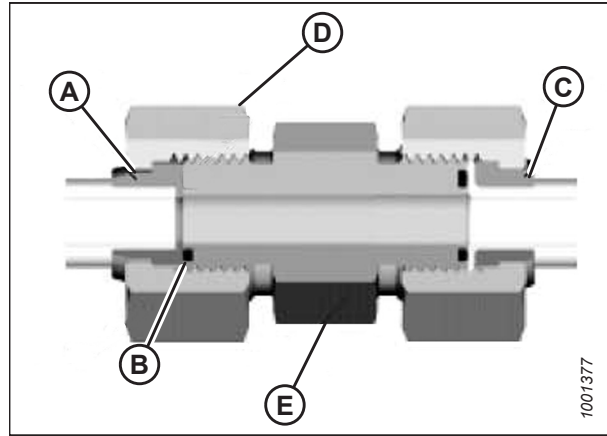


Figure 8.14: Hydraulic Fitting

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

Table 8.9 O-Ring Face Seal (ORFS) Hydraulic Fittings

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value ⁴	
			Nm	lbf-ft
-3	Note ⁵	3/16	–	–
-4	9/16	1/4	25–28	18–21
-5	Note ⁵	5/16	–	–
-6	11/16	3/8	40–44	30–32
-8	13/16	1/2	55–61	41–45
-10	1	5/8	80–88	59–65
-12	1 3/16	3/4	115–127	85–94
-14	Note ⁵	7/8	–	–
-16	1 7/16	1	150–165	111–122
-20	1 11/16	1 1/4	205–226	151–167
-24	2	1 1/2	315–347	232–256
-32	2 1/2	2	510–561	376–414

8.4.6 Tapered Pipe Thread Fittings

The standard torque values are provided for tapered pipe thread fittings. If a procedure specifies a different torque value for the same type and size of fitting found in this topic, refer to the value specified in the procedure instead.

Assemble pipe fittings as follows:

1. Ensure that the fitting and the port threads are free of burrs, nicks, scratches, and any other form of contamination.
2. Apply paste-type pipe thread sealant to the external pipe threads.
3. Thread the fitting into the port until it is hand-tight.

4. Torque values and angles shown are based on lubricated connection as in reassembly.
5. O-ring face seal type end not defined for this tube size.

REFERENCE

4. Torque the connector to the appropriate torque angle. The turns from finger tight (TFFT) and flats from finger tight (FFFT) values are shown in Table 8.10, page 67. Ensure that the tube end of a shaped connector (typically a 45° or 90° elbow) is aligned to receive the incoming tube or hose assembly. Always finish the alignment of the fitting in the direction of tightening. Never loosen the threaded connectors to achieve alignment.
5. Clean all residue and any excess thread conditioner with an appropriate cleaner.
6. Inspect the final condition of the fitting. Pay special attention to the possibility of cracks in the port opening.
7. Mark the final position of the fitting. If a fitting leaks, disassemble the fitting and check it for damage.

NOTE:

The failure of fittings due to over-torquing may not be evident until the fittings are disassembled and inspected.

Table 8.10 Hydraulic Fitting Pipe Thread

Tapered Pipe Thread Size	Recommended TFFT	Recommended FFFT
1/8-27	2-3	12-18
1/4-18	2-3	12-18
3/8-18	2-3	12-18
1/2-14	2-3	12-18
3/4-14	1.5-2.5	12-18
1-11 1/2	1.5-2.5	9-15
1 1/4-11 1/2	1.5-2.5	9-15
1 1/2-11 1/2	1.5-2.5	9-15
2-11 1/2	1.5-2.5	9-15

8.5 Conversion Chart

This manual uses both SI units (including metric) and US customary units (sometimes referred to as standard units) of measurement. A list of those units along with their abbreviations and conversion factors is provided here for your reference.

Table 8.11 Conversion Chart

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

8.6 Definitions

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

Table 8.12 Definitions

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

Predelivery Checklist

Perform these checks and adjustments before delivering the machine to your Customer. If adjustments are required, refer to the appropriate page number in this manual. The completed Checklist should be retained by either the Operator or the Dealer.


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.

CAUTION

Carefully follow the instructions given. Be alert for safety-related messages that bring your attention to hazards and unsafe practices.

Rotary Disc Header Serial Number:

✓	Item	Reference
	Check for shipping damage or missing parts. Be sure all shipping dunnage is removed.	—
	Check for loose hardware. Tighten to required torque if applicable.	8.4 Torque Specifications, page 60
	Check main drive belt tension.	7.2 Checking Conditioner Drive Belt, page 32
	Check header angle. Set center-link to middle of adjustment range.	7.3 Checking Cutting Angle, page 33
	Check header float.	7.6 Checking Float, page 37
	Check side forming shields evenly set to desired position.	
	Check rear baffle is about mid-position (roll conditioner).	7.13 Adjusting Conditioner Baffle Position, page 51
	Check conditioner roll gap (roll conditioner).	7.10 Checking Roll Gap, page 47
	Check conditioner roll tension (roll conditioner).	7.12.1 Adjusting Roll Tension, page 50
	Check conditioner roll timing hardware is securely tightened (roll conditioner).	7.11 Checking Roll Timing, page 49
	Check that cutterbar doors are unbolted from center channel frame, shipping wire is removed from cutterbar curtains, and cutterbar curtains are hanging properly.	5.1 Unpacking Curtains, page 21
	Grease all bearings and drivelines.	6.2 Lubrication Points, page 25
	Check conditioner roll timing gearbox lubricant.	7.7 Checking and Adding Lubricant – Conditioner Roll Timing Gearbox, page 41
	Check rotary disc cutterbar and conditioner drive gearbox lubricant.	7.8 Checking and Adding Lubricant – Drive Gearbox, page 44
	Check cutterbar lubricant.	7.9 Checking and Adding Lubricant – Cutterbar, page 45
	<p>Check cutterbar area carefully for loose parts and hardware on the cutterbar.</p> <p> WARNING</p> <p>These objects can be ejected with considerable force when the machine is started, and may result in serious injury or machine damage.</p>	—

REFERENCE

✓	Item	Reference
Run-Up Procedure		<i>7.17 Running up Header, page 55</i>
	Check hydraulic hose and wiring harness routing to ensure adequate clearance when raising, lowering the header.	—
	Check that the hazard lights are functional.	<i>7.14 Checking Lights, page 52</i>
Post Run-Up Check – Stop Engine		
	Check belt drive for proper idler alignment and overheating bearings.	<i>7.2 Checking Conditioner Drive Belt, page 32</i>
	Check for hydraulic leaks.	—
	Check that header manuals are in storage compartment.	<i>7.15 Checking Manuals, page 53</i>
	Check that the disc timing tool is in place.	<i>7.16 Checking Disc Timing Tool, page 54</i>
	Check and remove protective film on top surface of the header.	<i>7.18 Checking and Removing Clear Vinyl Decal Protectors, page 56</i>

Date Checked:

Checked by:

MacDon®

CUSTOMERS
MacDon.com

DEALERS
Portal.MacDon.com

Trademarks of products are the marks of their
respective manufacturers and/or distributors.

Printed in Canada