

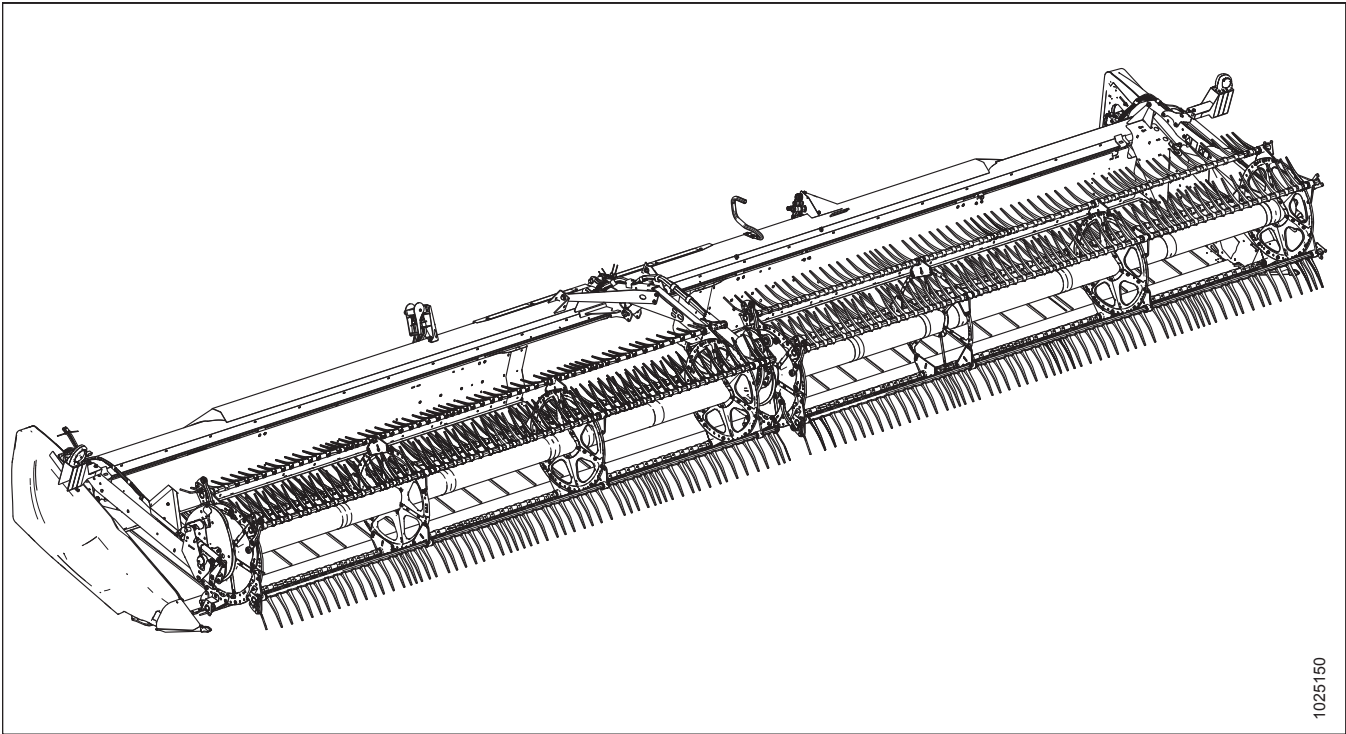
# **D1 Series Draper Header for M Series Windrowers**

Unloading and Assembly Instructions (North America)

215020 Revision A

Original Instruction

D1 Series Draper Header for M Series Windrowers



1025150

Published: September 2019

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## Introduction

This instruction manual describes the unloading, setup, and predelivery requirements for the MacDon D1 Series Draper Header for M Series Self-Propelled Windrowers.

To ensure the best performance of this product and the safety of your customers, carefully follow the unload and assembly procedure from the beginning through to completion.

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

Retain this instruction for future reference.

### NOTE:

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This document is currently available in English only.

## Summary of Changes

At MacDon, we're continuously making improvements: occasionally these improvements affect product documentation. The following list provides an account of major changes from the previous version of this document.

Section	Summary of Change	Internal Use Only
<a href="#">1.3 Welding Precaution, page 4</a>	New topic added.	Tech Pubs
<a href="#">2.3 Removing Shipping Supports, page 15</a>	Updated outer leg shipping support illustration and endsheet shipping support illustration.	ECN 57607, ECN 57608
<a href="#">3.1 Attaching Reel Lift Cylinders, page 19</a>	Updated outer leg shipping support illustrations.	ECN 57607
<a href="#">3.2 Positioning Transport Lights, page 27</a>	Updated light bracket illustrations.	ECN 57670
<a href="#">5.6 Adjusting Draper Tension, page 60</a>	Updated illustration to show tension adjuster location on the header.	Tech Pubs
<a href="#">5.7 Checking and Adjusting Draper Seal, page 62</a>	Edited IMPORTANT note clarifying range for adjusting draper seal after 50 hour break-in period.	Product Support
<a href="#">5.10 Checking and Adjusting the Float, page 66</a>	Added new topic.	Product Support
<a href="#">5.11.1 Measuring Reel Clearance, page 67</a>	Updated topic.	Tech Pubs
<a href="#">5.12 Checking and Adjusting Endshields, page 70</a>	Included torque values for latch assembly and tube bracket in adjusting endshield gap procedure.	Tech Pubs
<a href="#">6.1.1 Adjusting Knife, page 78</a>	Updated knifehead and pitman arm illustration.	Tech Pubs
<a href="#">Predelivery Checklist, page 91</a>	Updated predelivery checklist to include float checking and adjusting.	Product Support

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# Chapter 1: Safety

## 1.1 Signal Words

Three signal words, **DANGER**, **WARNING**, and **CAUTION**, are used to alert you to hazardous situations. Two signal words, **IMPORTANT** and **NOTE**, identify non-safety related information. Signal words are selected using the following guidelines:

### **DANGER**

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

### **WARNING**

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

### **CAUTION**

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

### **IMPORTANT:**

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

### **NOTE:**

Provides additional information or advice.

## 1.2 General Safety

### CAUTION

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

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



Figure 1.1: Safety Equipment



Figure 1.2: Safety Equipment

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

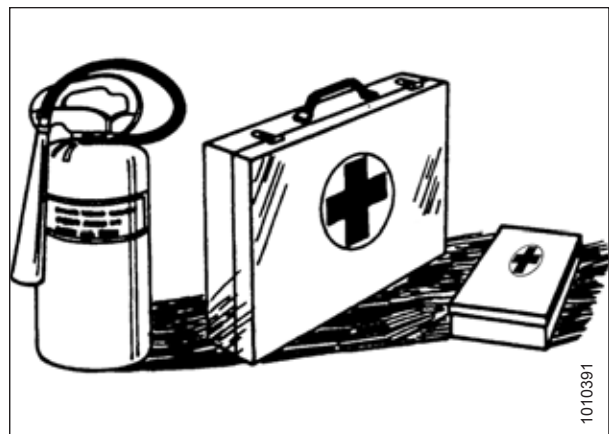


Figure 1.3: Safety Equipment



## SAFETY

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



Figure 1.4: 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 machine function and/or safety. It may also shorten the machine's life.
- To avoid 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.

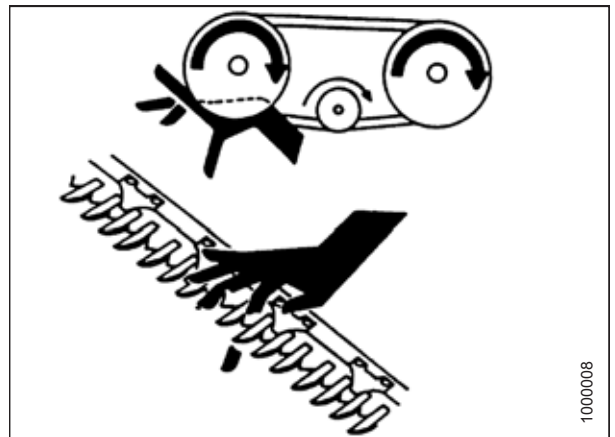


Figure 1.5: Safety around Equipment

- Keep service area clean and dry. Wet and/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 fire hazards. 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 1.6: Safety around Equipment

## 1.3 Welding Precaution

Welding should never be attempted on the header while it is connected to a windrower.

### WARNING

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

If you need to do any welding on the header, it should first be disconnected and removed from the windrower.

If it is unfeasible to disconnect the header from the windrower before attempting welding, refer to the windrower's technical manual for welding precautions detailing all electrical components that must be disconnected first for safe welding.

## 1.4 Safety Signs

- 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, be sure the repair part displays the current safety sign.

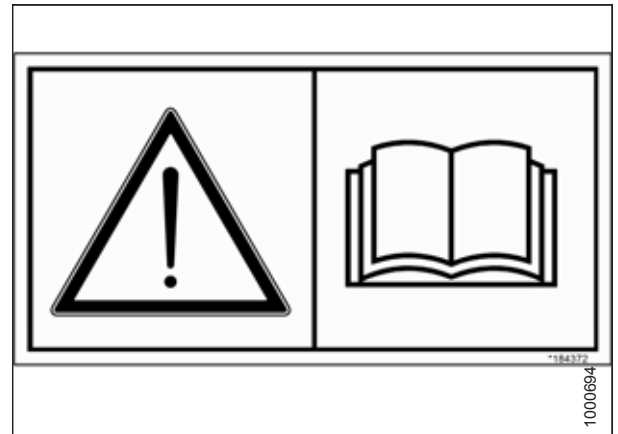


Figure 1.7: Operator's Manual Decal



## Chapter 2: Unloading

Perform all procedures in this chapter in the order they are listed.

### 2.1 Unloading Header from Trailer

The following procedure assumes that two headers were shipped on the trailer.

#### CAUTION

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

#### 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.

#### IMPORTANT:

Forklifts are normally rated with the load centered 610 mm (24 in.) from the back end of forks. To obtain forklift capacity for a load centered at 1220 mm (48 in.), check with your forklift distributor.

Table 2.1 Lifting Vehicle

<b>Minimum Lifting Capacity</b>	3178 kg (7000 lb.) load center (A) at 1220 mm (48 in.) (B) from the back of the forks
<b>Minimum Fork Length (C)</b>	1981 mm (78 in.)

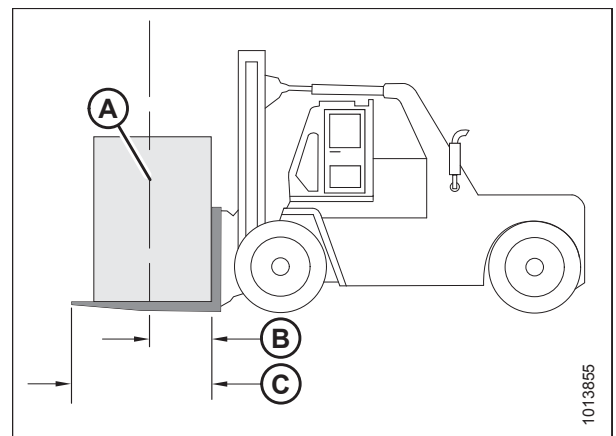


Figure 2.1: Minimum Lifting Capacity

A - Load Center of Gravity  
B - Load Center 1220 mm (48 in.) from Back of Forks  
C - Minimum Fork Length 1981 mm (78 in.)

To unload the headers from a trailer, follow these steps:

1. Move the trailer into position and block the trailer wheels.
2. Lower the trailer storage stands.

## UNLOADING

3. Approach one of the headers and slide forks (A) underneath the shipping support (B) as far as possible without contacting the shipping support of second header (C).

### IMPORTANT:

Avoid lifting the second header and ensure the forks do not interfere with the shipping frame. If the forks contact the second header, the header could be damaged.

4. Remove the hauler's tie-down straps, chains, and wooden blocks.
5. Slowly raise the header off the trailer deck.

### WARNING

Be sure forks are secure before moving away from load. Stand clear when lifting.

6. Back up until the header clears the trailer and slowly it lower to 150 mm (6 in.) from the ground.
7. Take the header to the storage or setup area. Ensure the ground is flat and free of rocks or debris that could damage the header.
8. Repeat the previous steps for unloading the second header.
9. Check for shipping damage and missing parts.

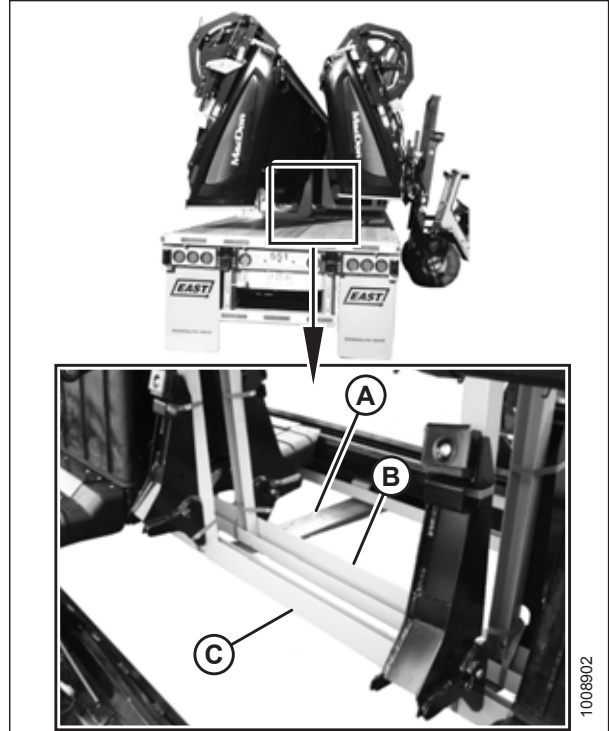


Figure 2.2: Header Shipping Supports

## 2.2 Lowering Header

The procedure for lowering the header varies depending on whether the header has a single or double reel. Refer to the following:

- [2.2.1 Lowering Single-Reel Header, page 9](#)
- [2.2.2 Lowering Double-Reel Header, page 12](#)

### 2.2.1 Lowering Single-Reel Header

Reposition the header in preparation for assembly and setup as follows:

1. Choose an area with level ground.
2. Approach header from its underside and place forks under top of shipping frame (A).
3. Attach a chain (B) at each end of the shipping frame and secure other end to lifting vehicle.

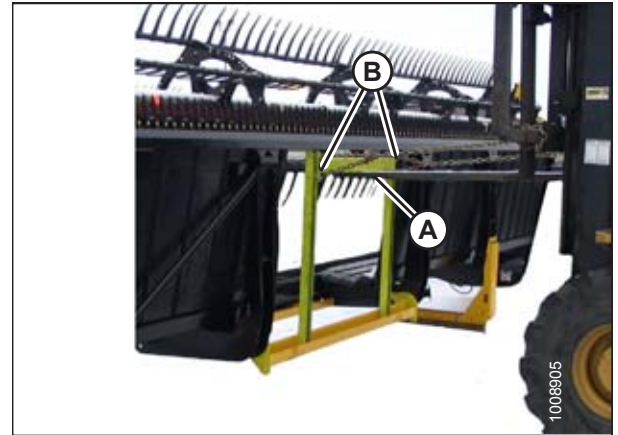


Figure 2.3: Shipping Frame

## UNLOADING

### CAUTION

Stand clear when lowering, as machine may swing.

4. Back up **SLOWLY** while lowering forks until header is just above the ground. Refer to the four positions in the illustration.

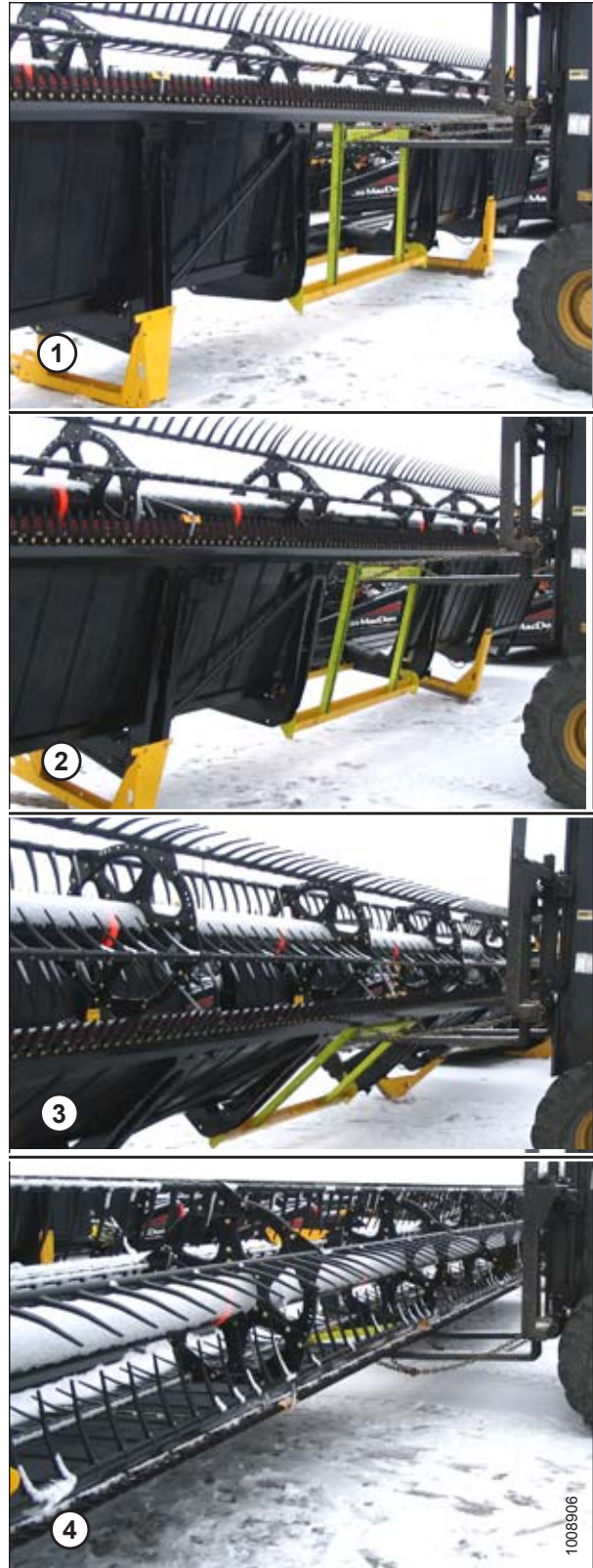


Figure 2.4: Lowering the Header



## UNLOADING

5. Place 150 mm (6 in.) blocks (A) under the center and each end of the cutterbar, and then lower the header onto blocks.
6. Remove the chain and move the lifting vehicle to the rear of the header.
7. Attach the chain to the center-link anchor on the frame tube and raise the rear of the header so that the stand can be lowered.

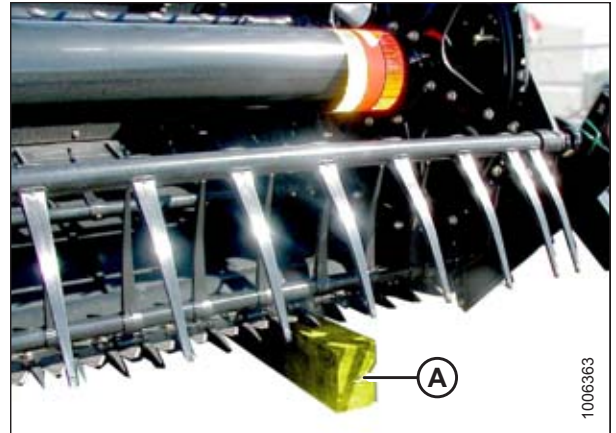


Figure 2.5: Block under Cutterbar

8. Lower the header stand by pulling pin (A), lowering stand (B), and releasing pin (A) to secure the stand in place.
9. If the ground is soft, place a block under the stand.
10. Lower the header onto the stand.

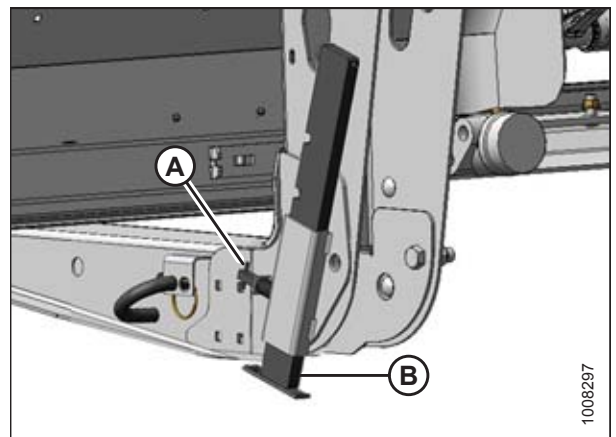


Figure 2.6: Header Stand

## UNLOADING

### 2.2.2 Lowering Double-Reel Header

Reposition header in preparation for assembly and setup as follows:

1. Choose an area with level ground.
2. Drive lifting vehicle to approach header from its underside.



Figure 2.7: Underside of Header

3. Attach a chain to shipping support (A) at center reel arm.

**IMPORTANT:**

Do **NOT** lift the header at this location. This procedure is only for laying the machine over into working position.

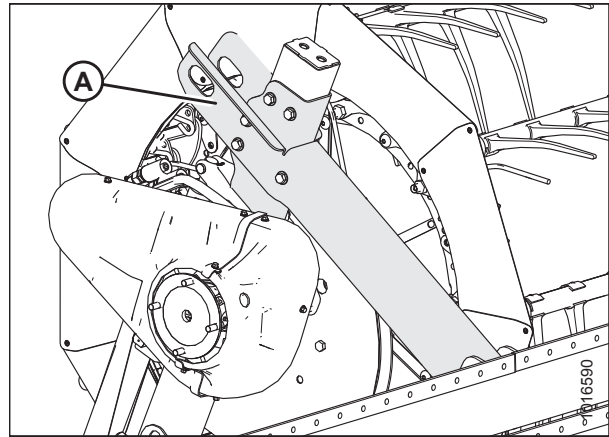


Figure 2.8: Shipping Support

## UNLOADING

### CAUTION

Stand clear when lowering, as machine may swing.

4. Back up **SLOWLY** while lowering forks until header is just above the ground. Refer to the four positions in the illustration.



Figure 2.9: Lowering the Header

## UNLOADING

5. Place 150 mm (6 in.) blocks (A) under the center and under each end of the cutterbar, and then lower the header onto blocks.
6. Remove the chain and move the lifting vehicle to the rear of the header.
7. Attach the chain to the center-link anchor on the frame tube and raise the rear of the header so that the stand can be lowered.

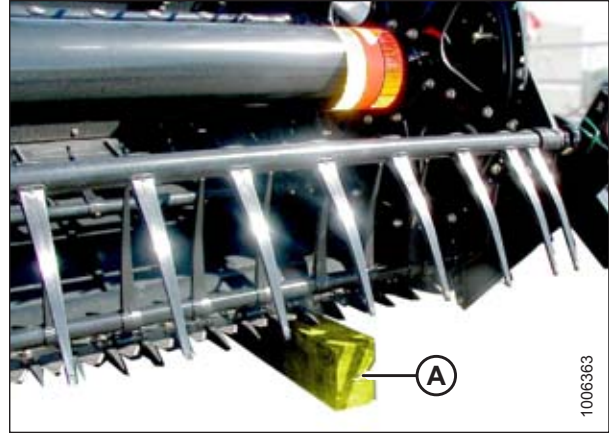


Figure 2.10: Block under Cutterbar

8. Lower the header stand: pull pin (A), lower stand (B), and release pin (A) to secure the stand in place.
9. If the ground is soft, place a block under the stand.
10. Lower the header onto the stand.
11. Remove the chain.

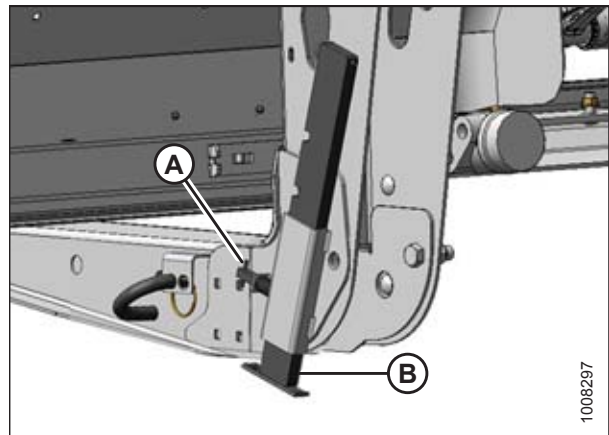


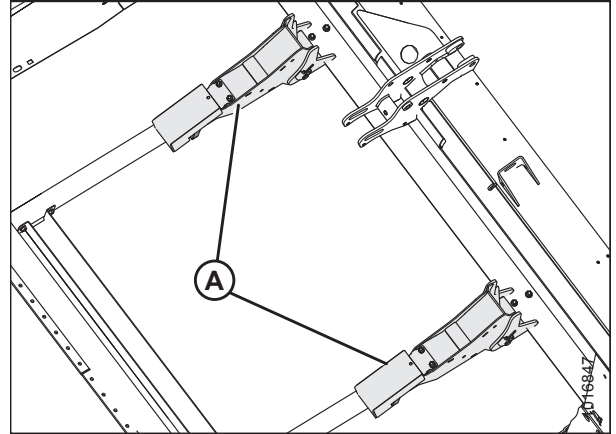
Figure 2.11: Header Stand

## 2.3 Removing Shipping Supports

**NOTE:**

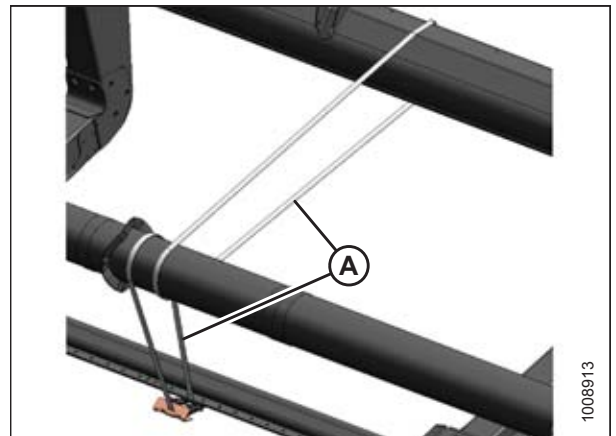
Unless otherwise specified, discard all shipping materials and hardware.

1. Cut straps and remove draper header supports (A) from the shipping support. Set the draper header supports aside for installation.



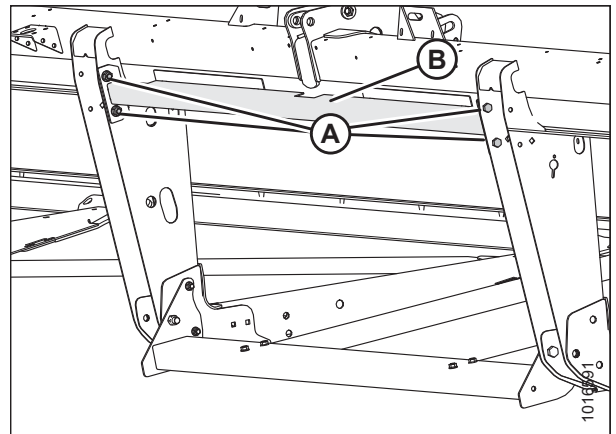
**Figure 2.12: Draper Header Supports and Shipping Supports**

2. **Single reel only:** Cut banding (A) securing the reel to the cutterbar and backtube.



**Figure 2.13: Single Reel**

3. Remove four bolts (A) securing upper support (B) to the header legs and remove the support.



**Figure 2.14: Upper Support**

## UNLOADING

4. Remove six bolts (A) securing lower support (B) to the header legs and remove the support.

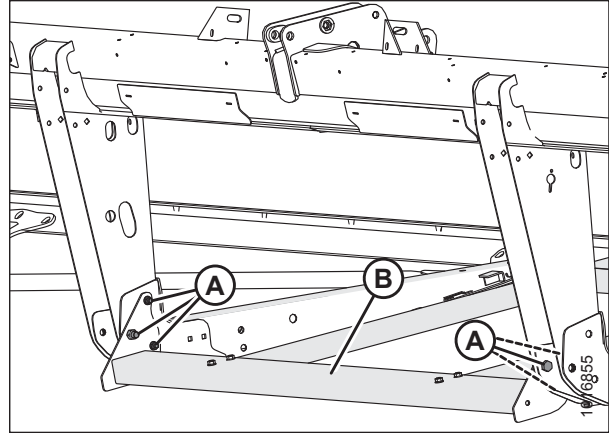


Figure 2.15: Lower Support

5. Remove four bolts (A) from the shipping stands at both outboard header legs and remove the shipping stands.

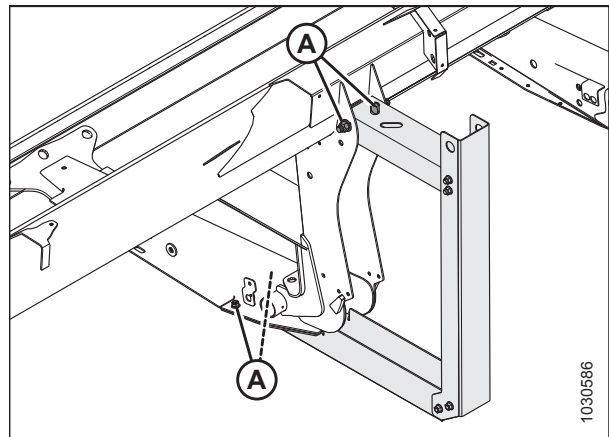


Figure 2.16: Outer Leg Shipping Support for D130, D135, and D140

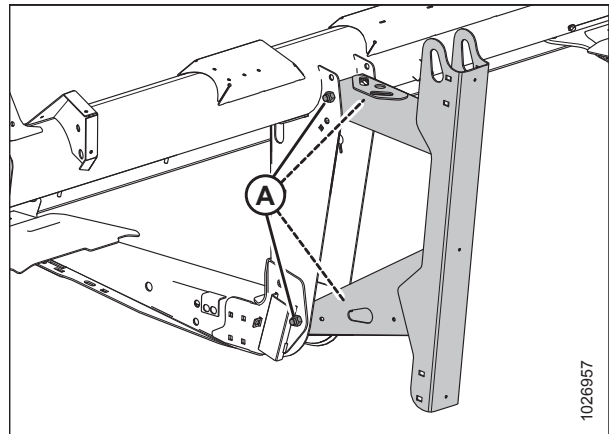


Figure 2.17: Outer Leg Shipping Support for D115, D120, and D125

## UNLOADING

6. Remove reel anti-rotation brace (A) from between the reel and endsheet.

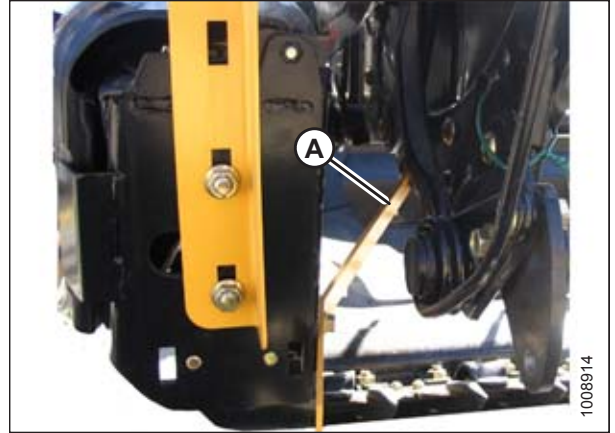


Figure 2.18: Anti-Rotation Brace

7. At the left side of the header, cut and remove wire (A) securing the endshield to the panel. Repeat at the opposite side.
8. Loosen two nuts (B) securing shipping support (C) to the endsheet.
9. Slide shipping support (C) backward and remove.
10. Tighten nuts (B).

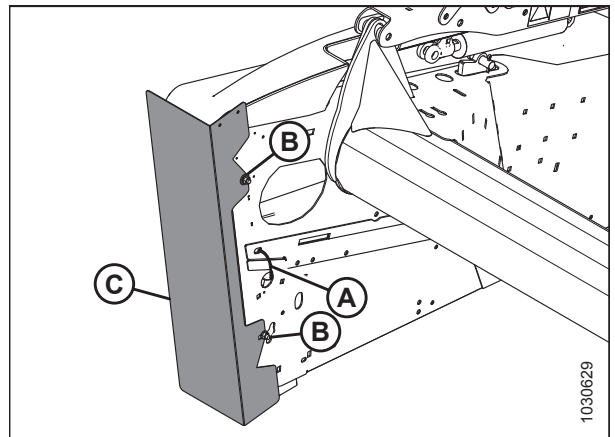


Figure 2.19: Endsheet Shipping Support

11. At the right side of the header, loosen two nuts (A) securing shipping support (B) to the endsheet.
12. Slide shipping support (B) backward to remove.
13. Tighten nuts (A).

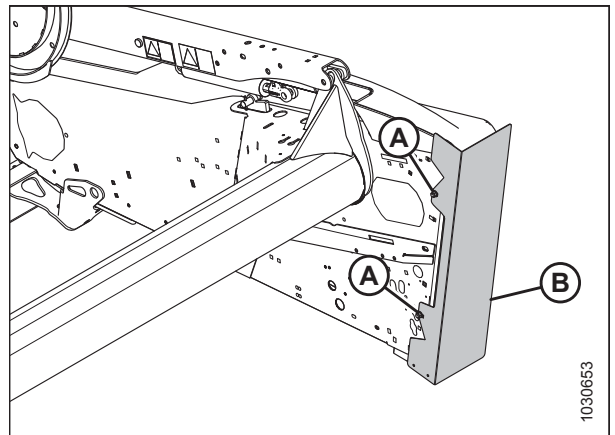


Figure 2.20: Endsheet Shipping Support





# Chapter 3: Assembling the Header

Perform all the procedures in this chapter in the order in which they are listed.

## 3.1 Attaching Reel Lift Cylinders

### CAUTION

Tagged bolts (A) on the reel arms keep the reel from sliding forward. Ensure the fore-aft cylinders are attached before removing the bolts.

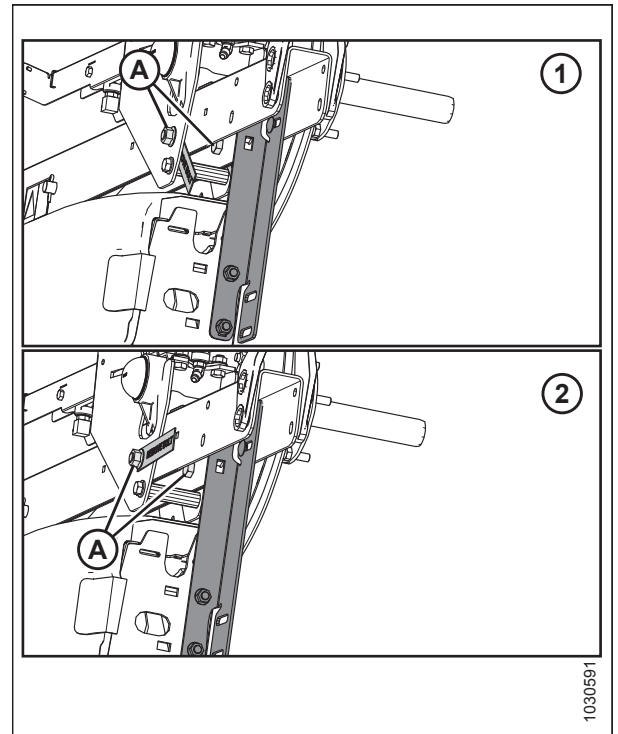


Figure 3.1: Right Reel Arm

1 - Single Reel

2 - Double Reel

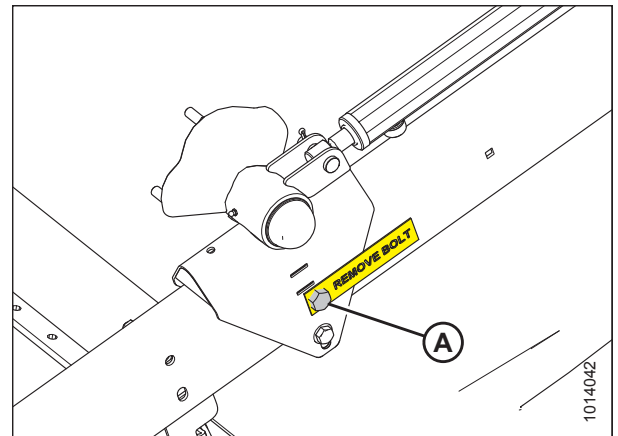


Figure 3.2: Left Reel Arm

## ASSEMBLING THE HEADER

### NOTE:

Some parts have been removed from the illustration for clarity.

1. Position sling (A) around reel tube (B) close to the outboard end of the reel and attach a sling to a forklift or an equivalent lifting device.
2. Remove the shipping wire/banding from the reel lift cylinder.

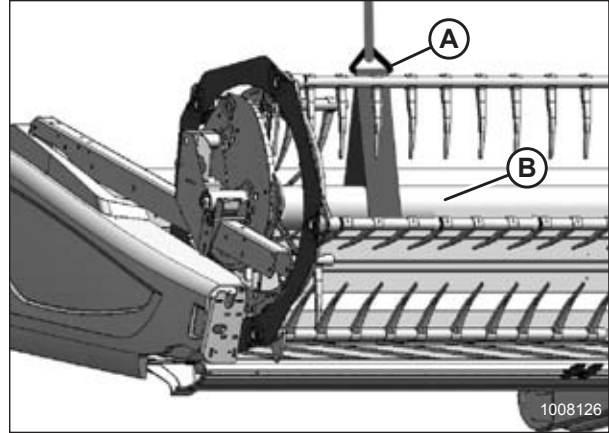


Figure 3.3: Reel Tube

3. Lift the reel and remove two top bolts (A) on the outboard reel arm supports. Repeat for the opposite side.

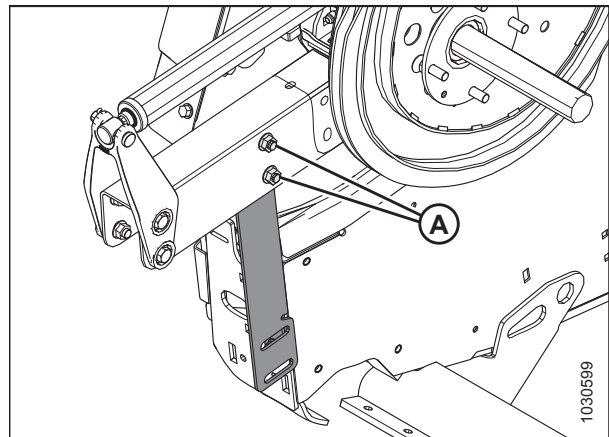


Figure 3.4: Outboard Reel Arm Support

4. **Double-reel headers only:** Lift the reel and remove two top bolts (A) on the center reel arm to allow the center reel arm to move.

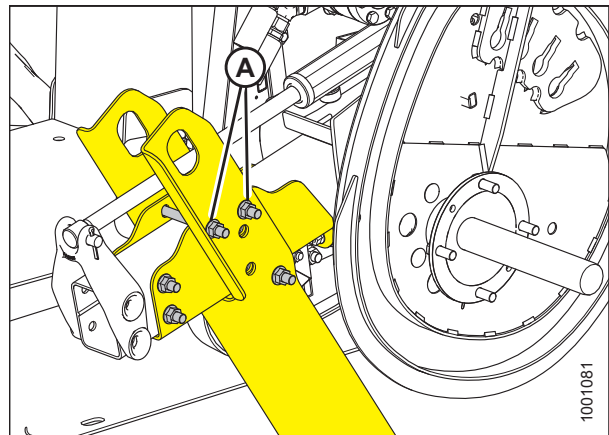


Figure 3.5: Center Reel Arm – Double Reel Only

## ASSEMBLING THE HEADER

5. Lift the reel and remove pins from the endsheet and the reel arm.
6. Align the reel lift cylinder mounting holes until they line up with the lug on the endsheet and the hole in the reel arm.
7. Secure the cylinder to the endsheet and the reel arm with pins as shown.
  - Insert cotter pin (A) **OUTBOARD** on the reel arm
  - Insert cotter pin (B) **INBOARD** of the endsheet

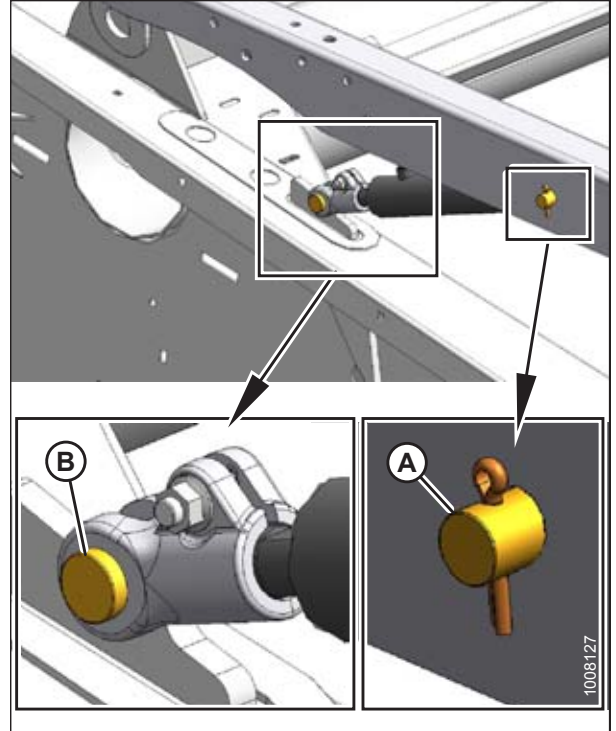


Figure 3.6: Right Reel Lift Cylinder

8. Move reel safety props (A) to engaged position (B) on the outer arm.

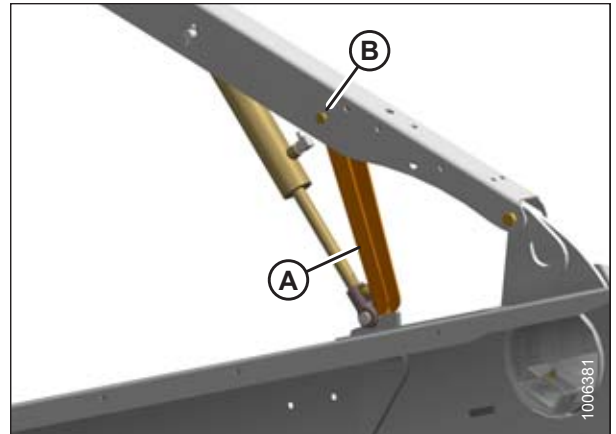


Figure 3.7: Reel Safety Props

## ASSEMBLING THE HEADER

### 9. *For double reel only:*

- a. Position sling (A) around the reel tube near the reel center support arm.
- b. Lift the reel to gain access to the center lift cylinder.
- c. Remove shipping wire and banding from the center reel lift cylinder.

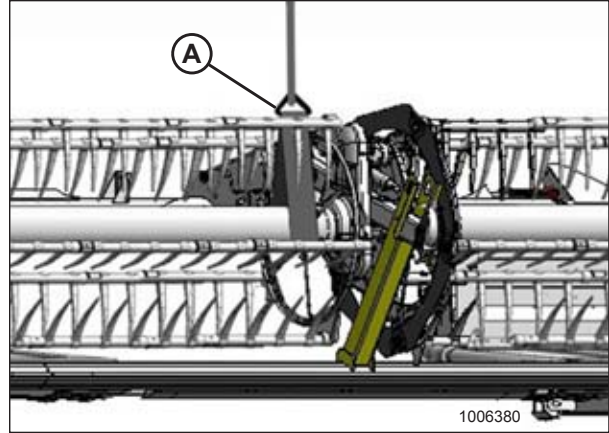


Figure 3.8: Lifting the Reel – Double Reel Only

### 10. *For double reel only:*

- a. Remove the 3/4 in. socket head bolt and 5/8 in. nut from the cylinder rod end. Retain hardware.
- b. Attach rod end of cylinder (B) to the reel arm with socket head bolt and nut (A). Access the hardware through the holes in the reel arm braces.
- c. Torque bolt and nut (A) to 54–61 Nm (40–45 lbf-ft).
- d. Remove the pin at the barrel end of the cylinder.
- e. Adjust the reel height so the pin can be installed at the barrel end of the cylinder and mounting structure.

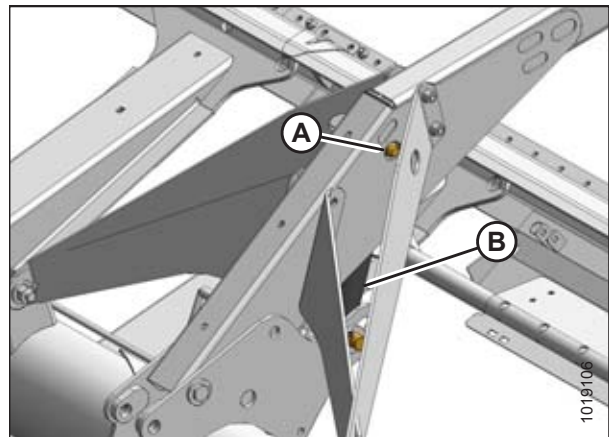


Figure 3.9: Reel Arm Braces

11. Reposition sling (A) around the reel tube near the opposite outboard reel arm.
12. Remove shipping wire and banding from the reel lift cylinder.

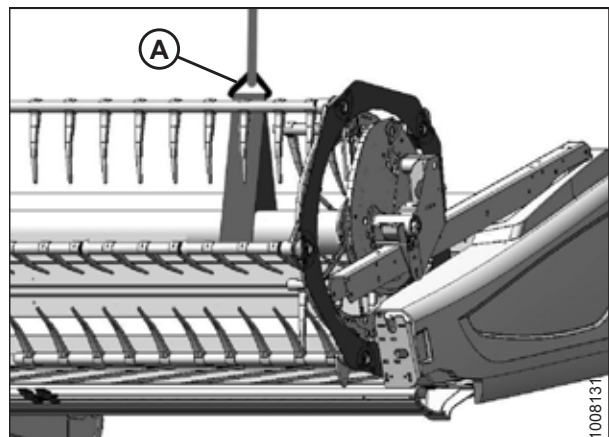


Figure 3.10: Outboard Reel Arm

## ASSEMBLING THE HEADER

13. Lift the reel and remove the pins from endsheet (B) and reel arm (A).
14. Align the reel lift cylinder mounting holes until they line up with the lug on the endsheet and the hole in the reel arm.
15. Secure the cylinder to the endsheet and reel arm with pins as shown.
  - Insert cotter pin (A) **OUTBOARD** at reel arm
  - Insert cotter pin (B) **INBOARD** at endsheet

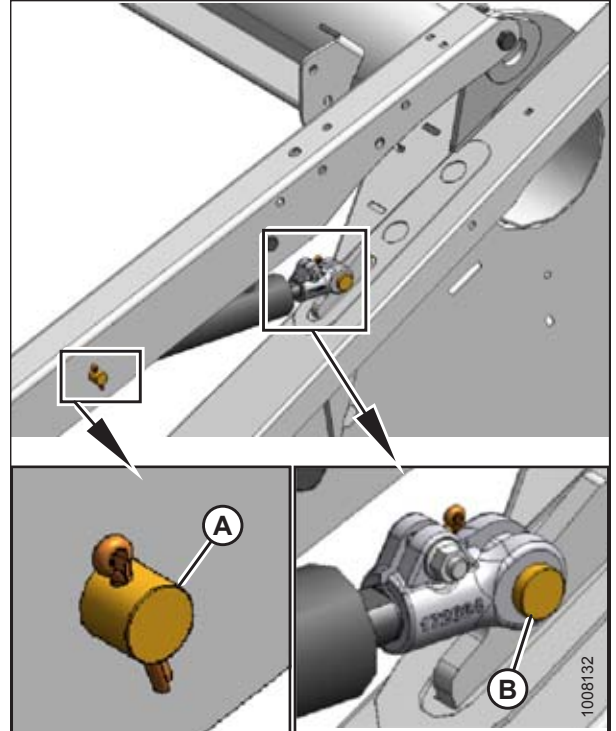


Figure 3.11: Left Reel Lift Cylinder

16. Move reel safety props (A) to engaged position (B).

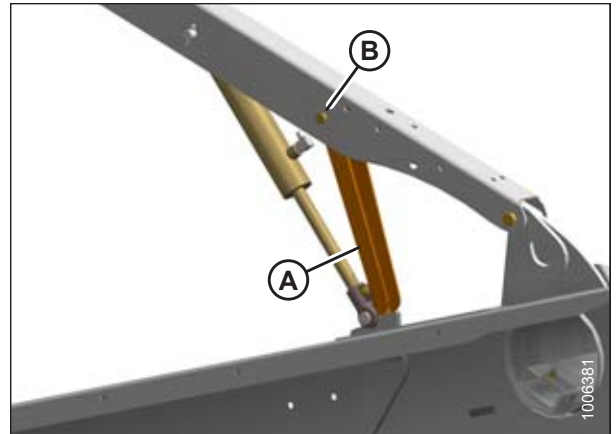


Figure 3.12: Reel Safety Prop

## ASSEMBLING THE HEADER

17. **Double reel only:** Remove remaining bolt (A), disengage center reel arm shipping support (B) from the cutterbar, and remove the shipping support.

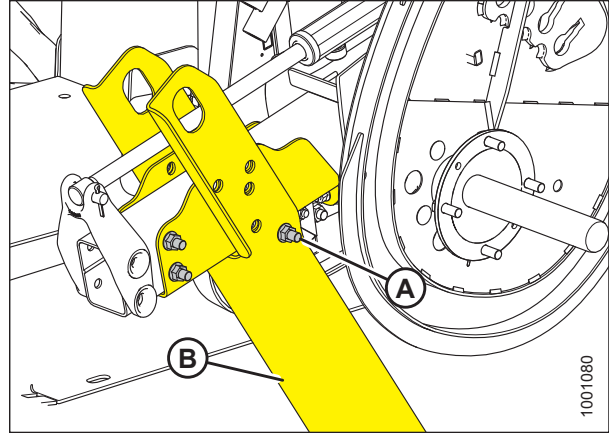


Figure 3.13: Center Reel Arm Shipping Support

18. Remove bolts (A) from reel arm support (B) at the endsheet and remove the support. Repeat at the other side.

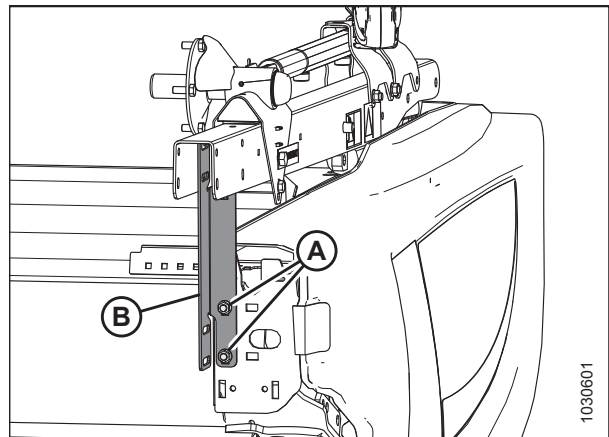


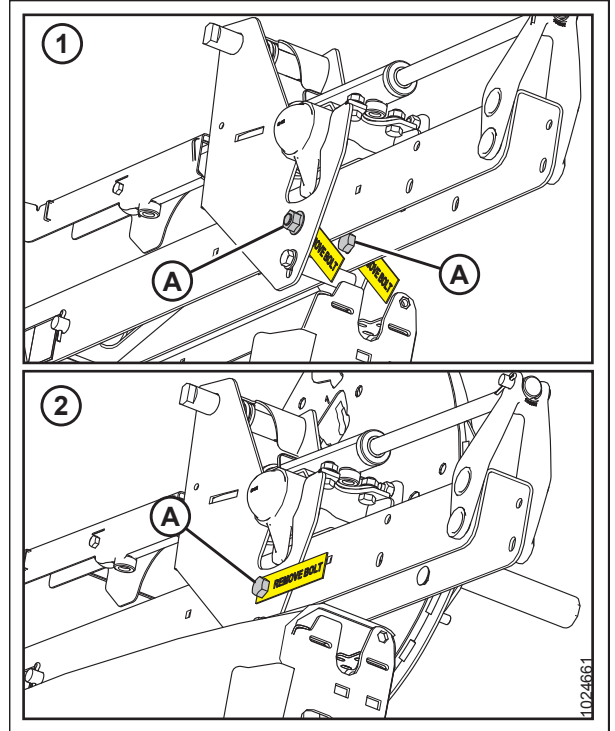
Figure 3.14: Outboard Reel Arm Supports

## ASSEMBLING THE HEADER

19. Remove brace bolts and tags (A) locking the reel fore-aft position on the outer reel arms.

**NOTE:**

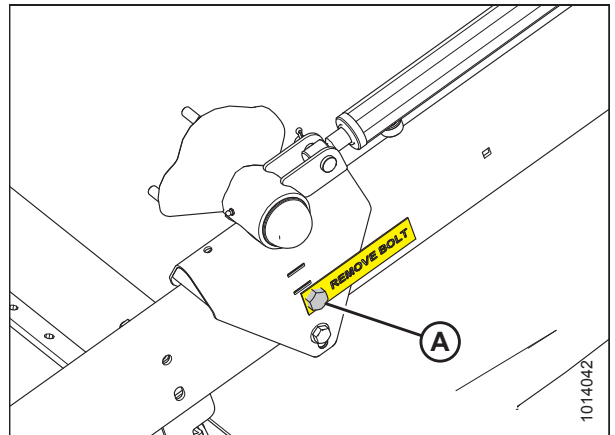
Do **NOT** use hydraulic pressure to move the fore-aft cylinder to aid brace bolts removal. The cylinder could be damaged.



**Figure 3.15: Right Reel Arm**

1 - Single Reel

2 - Double Reel



**Figure 3.16: Left Reel Arm**

## ASSEMBLING THE HEADER

20. **Double reel only:** Remove remaining three bolts (A) locking the reel fore-aft position at the center reel arm and remove shipping channel (B).

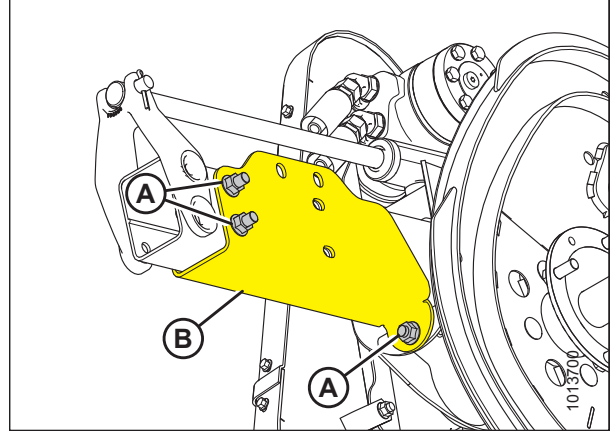


Figure 3.17: Center Reel Arm Shipping Channel – Double-Reel Only



### 3.2 Positioning Transport Lights

Transport lights are located on each outboard reel arm. They are shipped in an inverted position on the inboard sides of the reel arms.

1. Remove lock nuts (B) holding right light assembly (A) to the reel arm and remove the light assembly. Retain the lock nuts.

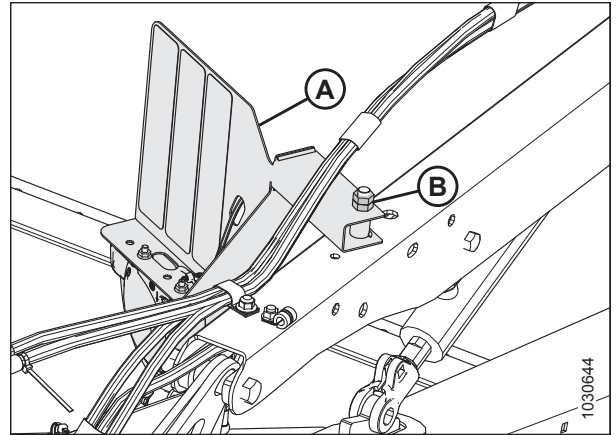


Figure 3.18: Right Light Assembly in Shipping Position

2. Position right light assembly (A) perpendicular to the right reel arm and attach it using retained lock nuts (B).

**NOTE:**

The light assembly should rotate with normal hand force yet maintain its position.

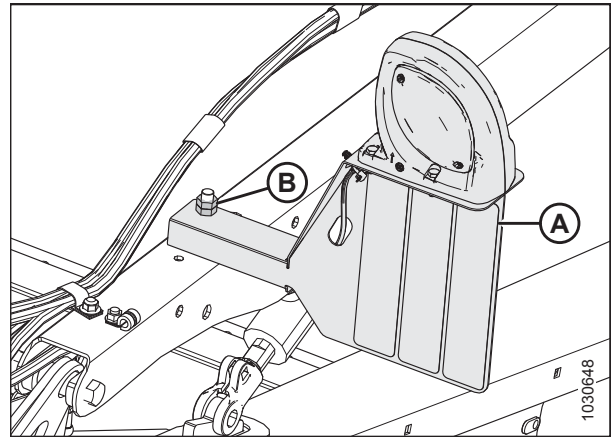


Figure 3.19: Right Transport Light

3. Remove lock nuts (A) holding left light assembly (B) to the reel arm and remove the light assembly. Retain lock nuts.

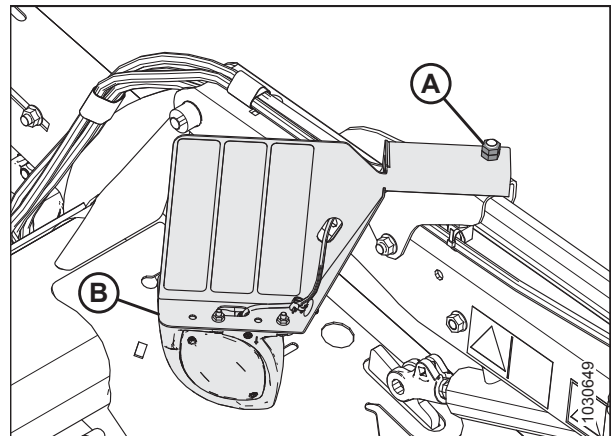


Figure 3.20: Left Light Assembly in Shipping Position

## ASSEMBLING THE HEADER

4. Position left light assembly (B) perpendicular to the left reel arm and attach it using retained lock nuts (A).

**NOTE:**

The light assembly should rotate with normal hand force yet maintain its position.

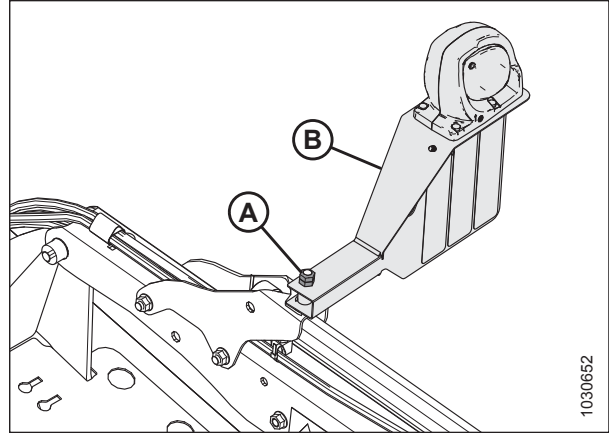


Figure 3.21: Left Transport Light

### 3.3 Attaching Cam Arms

To attach the reel cam arms, follow these steps:

**NOTE:**

On nine-bat reel headers, one cam arm assembly was removed and secured to the tine tube for shipping purposes.

1. **Nine-bat reel headers:** Remove shipping wire (A) and foam, and remove cam arm assembly (B) from the tine tube.



Figure 3.22: Cam Arm in Shipping Position

2. **Nine-bat reel headers:** Install cam arm assembly (A) onto arm (B), and secure with 1/2 in. smooth face lock nut (C). Torque to 75 Nm (55 lbf-ft).

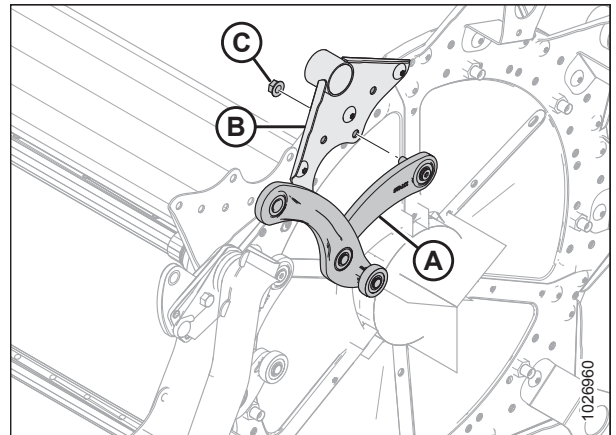


Figure 3.23: Cam Arm Assembly

3. Rotate the reel manually until the tine bars with disconnected cam links are accessible.
4. Remove shipping wire (A) (if not already removed).

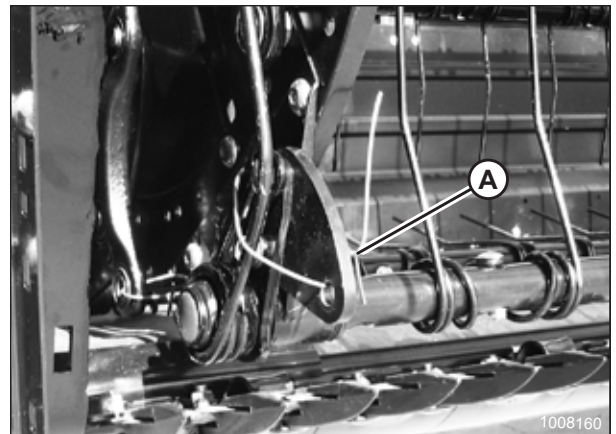


Figure 3.24: Disconnected Cam Links and Shipping Wire

## ASSEMBLING THE HEADER

5. Remove bag of hardware (A) from tine bar. It contains hardware for cam links and endshields.

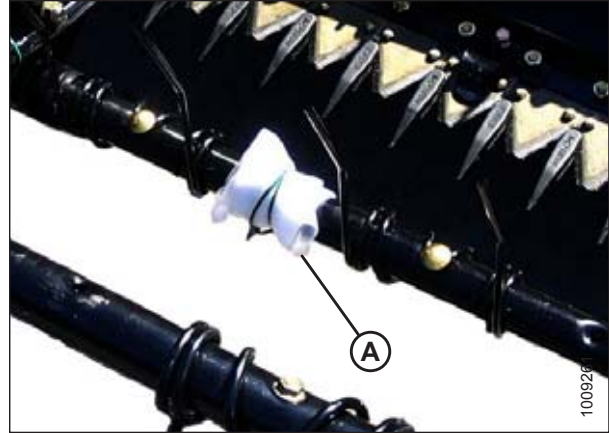


Figure 3.25: Hardware Bag Right Reel

6. Rotate tine bar crank (A) and position link (B) so attachment holes in bar crank are aligned with hole in link.
7. Install bolt (C) in link and position shim (D) on bolt so that shim is between link and tine bar crank.

**NOTE:**

Bolts are precoated with Loctite®, so no further locking method is required.

8. Realign link (B) and tine bar crank (A) and thread in bolt (C).
9. Repeat for remaining tine bars and torque bolts to 165 Nm (120 lbf-ft).

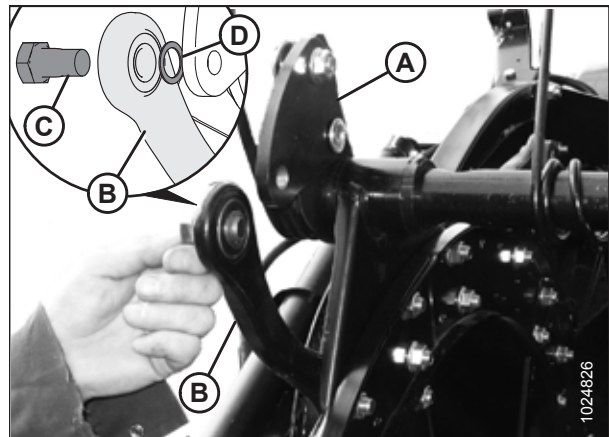


Figure 3.26: Bar Crank Attachment Holes and Link Alignment

### 3.4 Opening Endshields

1. Push release lever (A) located on the backside of the endshield to unlock the shield.
2. Pull the endshield open using handle depression (B).

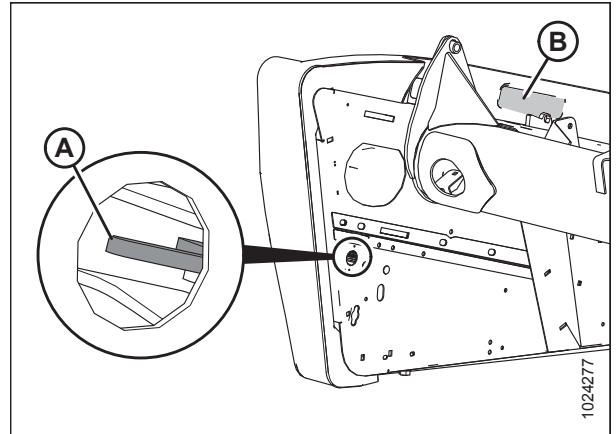


Figure 3.27: Left Endshield

3. Pull the endshield at handle depression (A). The endshield is retained by hinge tab (B) and will open in direction (C).

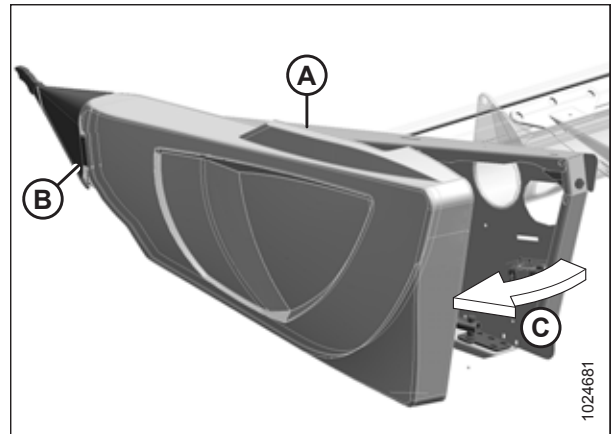


Figure 3.28: Left Endshield

4. If additional clearance is required, pull the endshield free of hinge tab (A) and swing the endshield toward the rear of the header.
5. Engage safety latch (B) on the hinge arm to secure the shield in the fully open position.

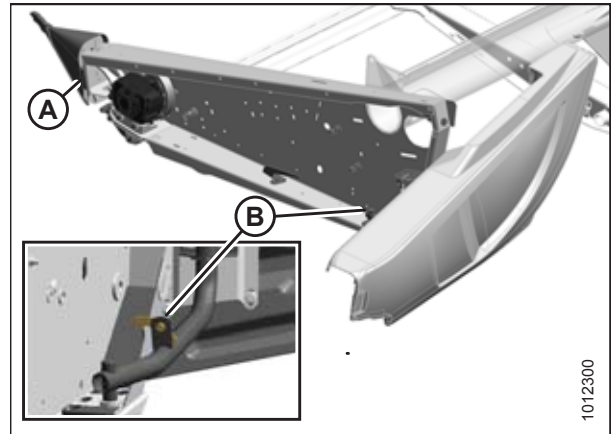


Figure 3.29: Left Endshield

### 3.5 Installing Crop Dividers

One crop divider and two divider rods are stored on the right inboard side of the endsheet; the other crop divider is stored on the left inboard side of the endsheet.

1. Loosen the bolt at location (A) on the lock tab securing divider rods (B) to storage bracket (C).
2. Remove divider rods (B) from storage bracket (C) and pull away from lower divider rod support (D). Set aside for installation later.
3. Return lock tab to its original position and tighten bolt at location (A).

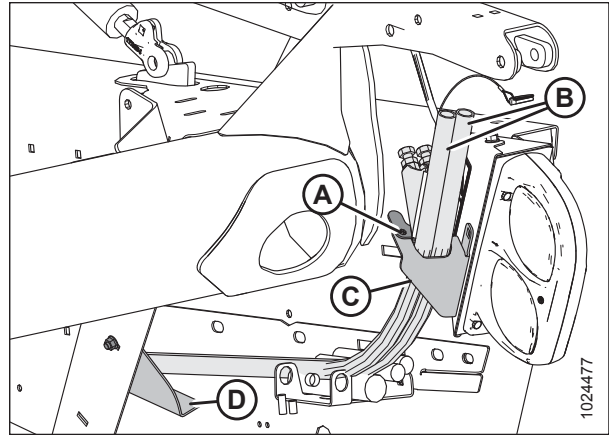


Figure 3.30: Divider Rods on Endsheets

4. Support the crop divider, remove shipping wire (A) at front end, and remove bolt (B).
5. Remove bolt and washer (C).

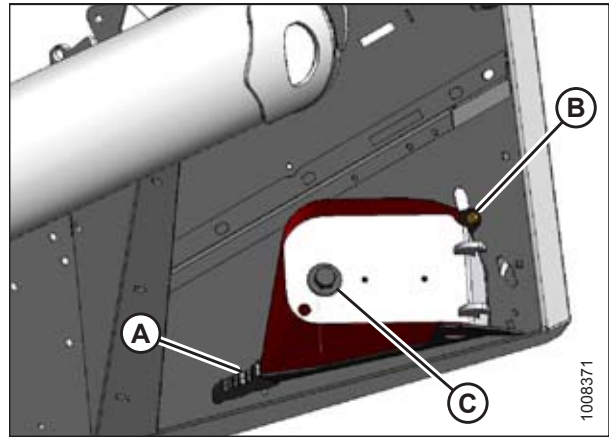


Figure 3.31: Crop Divider on Endsheets

6. Position crop divider as shown and insert lugs (A) into slots (B) in endsheet.

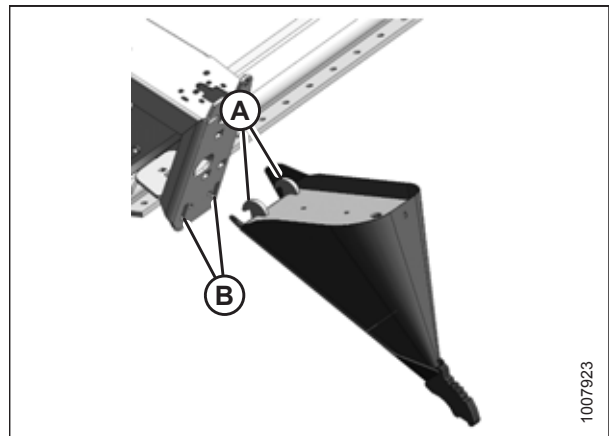


Figure 3.32: Crop Divider Lugs and Endsheets Slots

## ASSEMBLING THE HEADER

7. Lift the forward end of the divider up to the endsheet and install washer (A) and bolt (B).

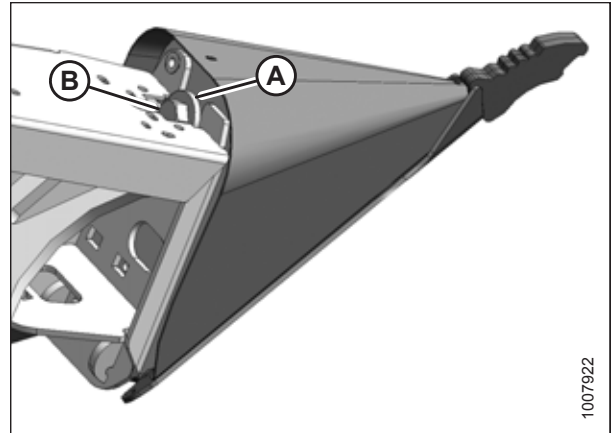


Figure 3.33: Installing Divider

8. Position divider rod (B) on the tip of the crop divider as shown and tighten bolt (A).

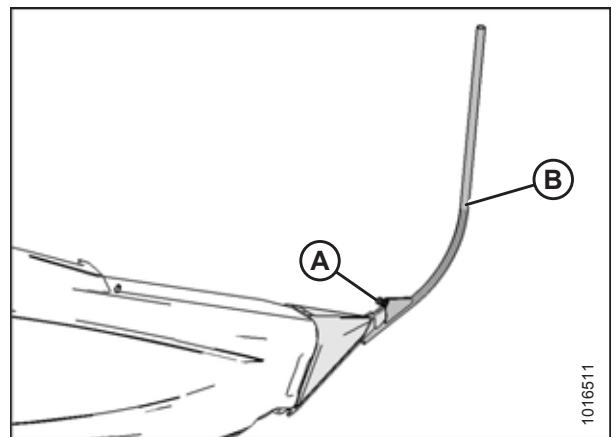


Figure 3.34: Divider Rod on Crop Divider

9. Check that the divider does **NOT** move laterally. Adjust bolts (A) as required to tighten the divider and remove lateral play when pulling at the divider tip.
10. Repeat Step 4, page 32 to Step 9, page 33 on the left side of the header.

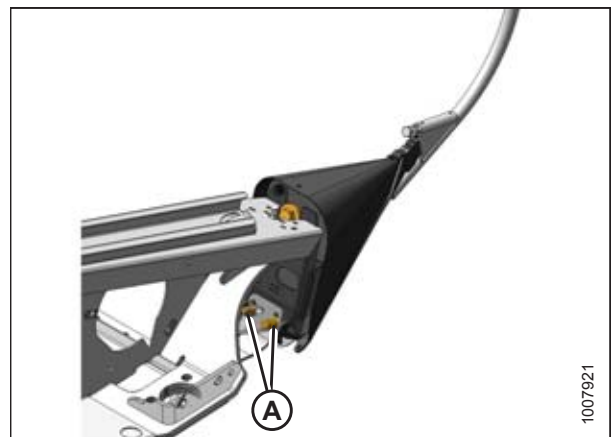


Figure 3.35: Adjustment Hardware

### 3.6 Closing Endshields

1. Disengage lock (B) to allow the endshield to move.
2. Insert the front of the endshield behind hinge tab (A) and into the divider cone.

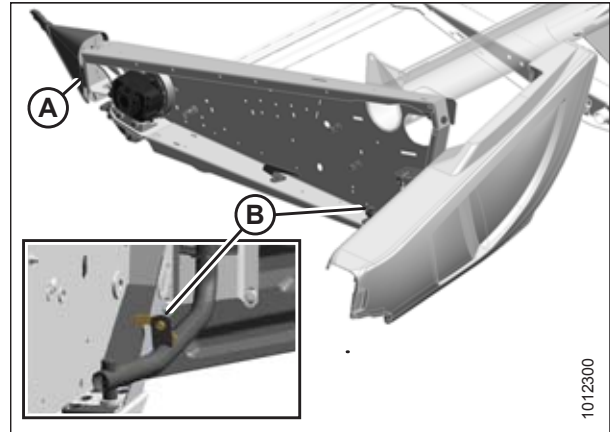


Figure 3.36: Left Endshield

3. Swing the endshield in direction (A) into its closed position. Engage the lock with a firm push.
4. Check that the endshield is locked.

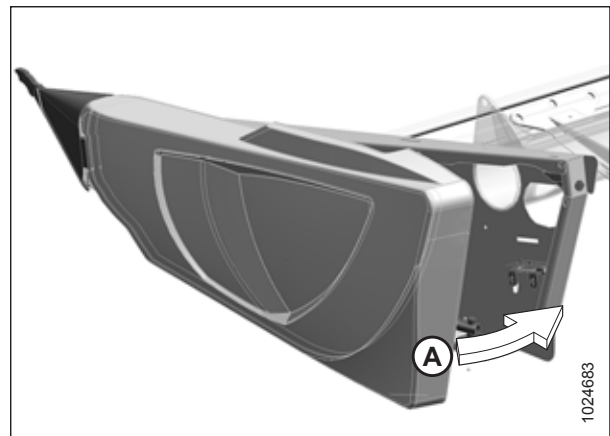


Figure 3.37: Left Endshield



### 3.7 Installing Disc Segments of Outboard Reel Endshields

To meet the trucking load regulations for the maximum load width and height, two disc segments of reel endshields (A) may have been removed from the right reel (tail end) and left reel (cam end).

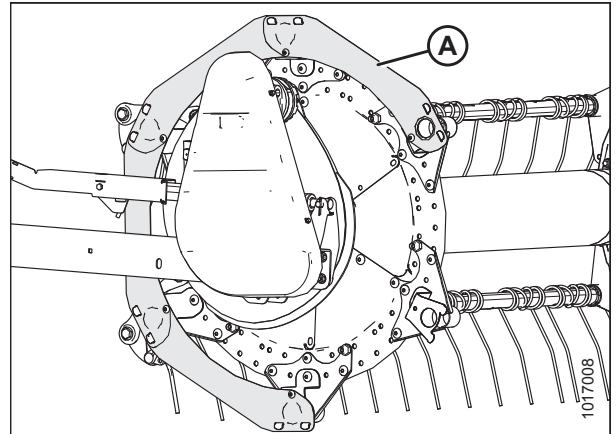


Figure 3.38: Partially Installed Reel Endshield – Cam End Shown, Tail End Similar

1. Check if the reel endshields are completely installed. If not, install the two disc segments as follows:
2. Retrieve the bag of hardware removed from the center draper support.
3. Remove two bolts (A) securing the disc segments to the support tabs. Retain the bolts for reinstallation later.
4. Engage the slots on disc segment (B) on endshield support tabs (C).

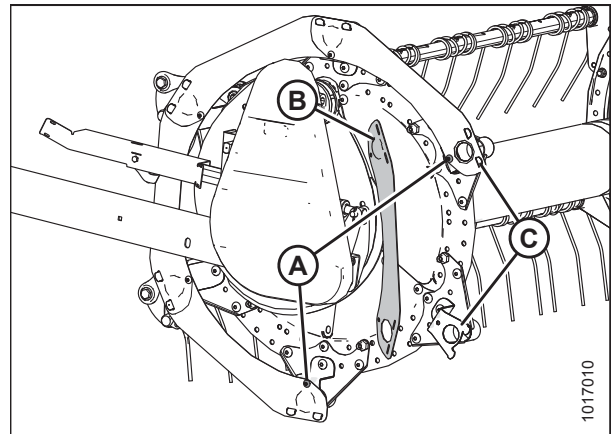


Figure 3.39: Reel Endshield

5. Secure the other end of the disc segment to the support using bolt (A) that was removed earlier.
6. Position last disc segment (B) in front of disc segment (C) and behind disc segment (D), engage the endshield support tabs through all disc segments, and secure them with two bolts (E).

**NOTE:**

It may be necessary to loosen hardware and use a pry tool to secure the last disc segment in place.

7. Repeat the procedure at the opposite side.

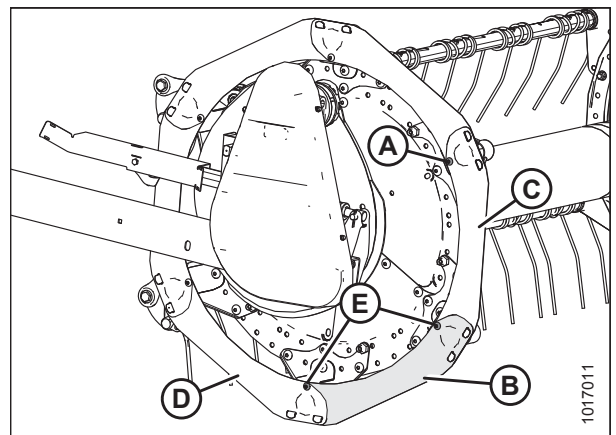


Figure 3.40: Reel Endshield

## 3.8 Installing Options

Retrieve the kits supplied as options with the header, and install them according to the instructions supplied with each kit.

## Chapter 4: Attaching Header to Windrower

### WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before adjusting machine.

#### IMPORTANT:

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

#### NOTE:

If header supports (supplied with the header) are already installed on the windrower lift linkage, proceed to Step 5, [page 38](#).

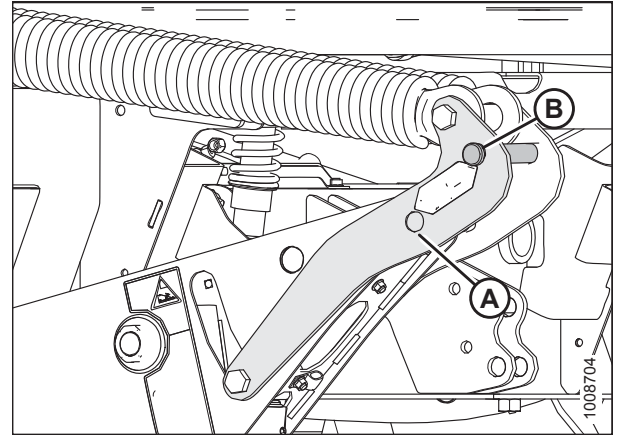


Figure 4.1: Header Float Linkage

1. Remove the hairpin and remove clevis pin (B) from support (A).

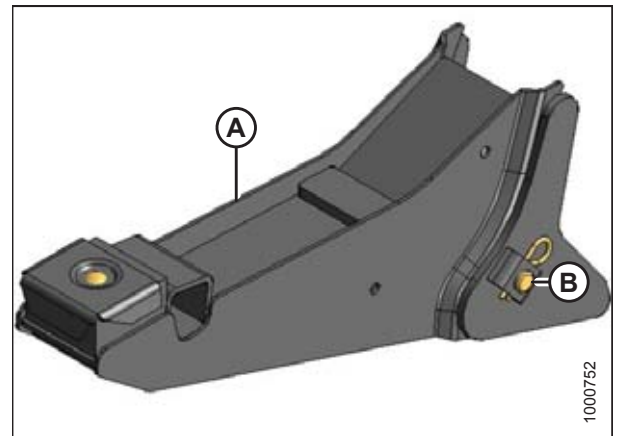


Figure 4.2: Header Support

2. Position support (B) on lift linkage (A) and reinstall clevis pin (C). Pin (C) may be installed from either side of the support.
3. Secure clevis pin (C) with hairpin (D).
4. Repeat for the opposite lift linkage.

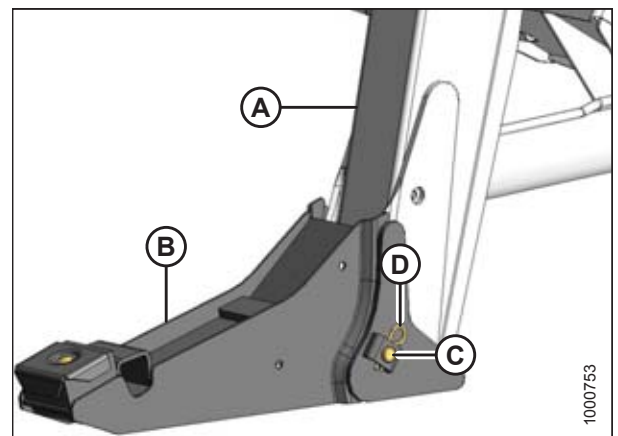


Figure 4.3: Header Support

## ATTACHING HEADER TO WINDROWER

5. Remove the retaining rings from pins (A) and remove the pins from the header legs.

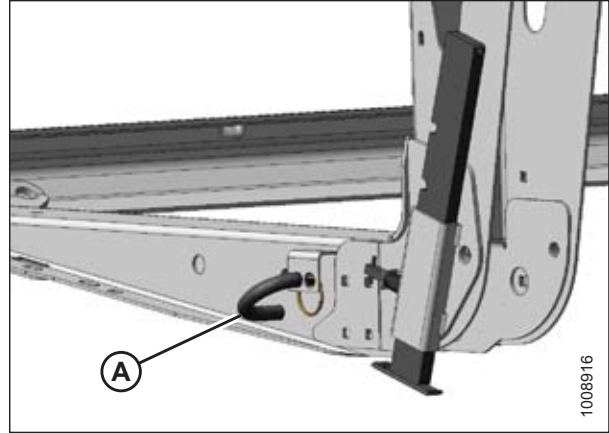


Figure 4.4: Header Leg

### CAUTION

Check that all bystanders have cleared the area.

6. Start the engine and activate HEADER DOWN switch (A) on the ground speed lever (GSL). Fully retract the header lift cylinders.

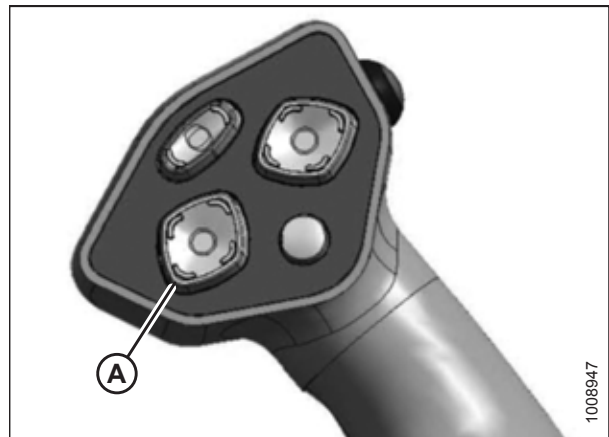


Figure 4.5: Ground Speed Lever (GSL)

7. Drive the windrower forward slowly so that supports (A) enter header legs (B). Continue to slowly drive forward until the linkages contact the support plates in the lower header legs and the header nudges forward.
8. Check that the linkages are properly engaged in the header legs and contact the support plates.

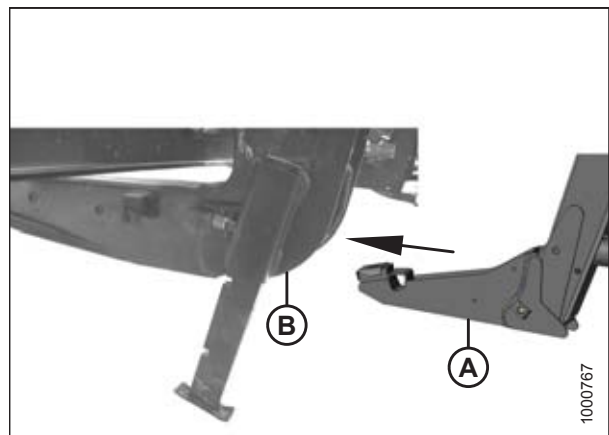


Figure 4.6: Support Engaging Header

## 4.1 Connecting Center-Link

The procedure for connecting the center-link varies depending on the type of center-link installed on the machine. Refer to the applicable topic:

- [4.1.1 Mechanical Link, page 39](#)
- [4.1.2 Hydraulic Link without Optional Self-Alignment Kit, page 41](#)
- [4.1.3 Hydraulic Link with Optional Self-Alignment Kit, page 44](#)

### 4.1.1 Mechanical Link

The following connection procedure applies to M155 and M155E4 Self-Propelled Windrowers with a mechanical center-link.

#### WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before adjusting machine.

1. Shut down the engine, and remove the key from the ignition.
2. Loosen nut (A) and rotate barrel (B) to adjust length so that link lines up with header bracket.
3. Install pin (C) and secure with cotter pin.
4. Adjust link to required length for proper header angle by rotating barrel (B). Tighten nut (A) against barrel. A slight tap with a hammer is sufficient.

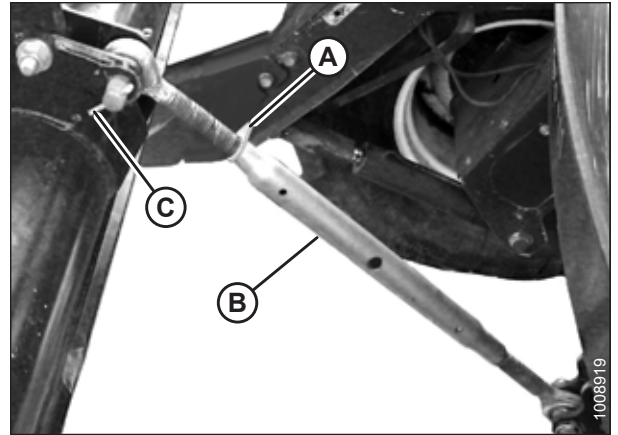


Figure 4.7: Mechanical Center-Link

#### CAUTION

Check to be sure all bystanders have cleared the area.

5. Start engine.
6. Raise header fully with HEADER UP switch (A) on ground speed lever (GSL).
7. Shut down the engine, and remove the key from the ignition.
8. Engage safety props on both lift cylinders.

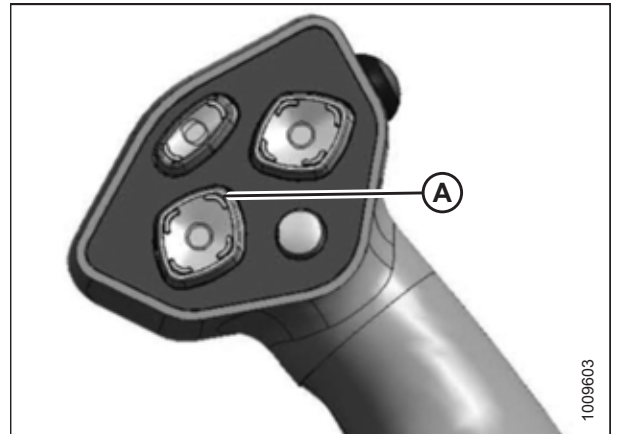


Figure 4.8: Ground Speed Lever (GSL)

## ATTACHING HEADER TO WINDROWER

9. Install pin (A) through header leg (engaging U-bracket in header leg). Repeat for opposite side of header.
10. Raise header stand (B) to storage position by pulling pin (C) and lifting stand into uppermost position. Release pin (C) to secure stand in place.

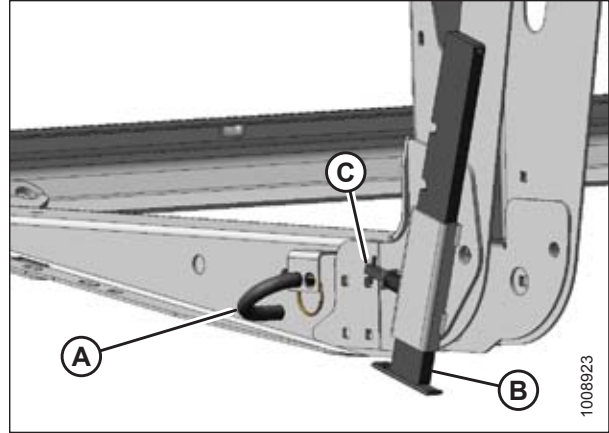


Figure 4.9: Header Stand

11. Remove pin from storage position (B) in linkage and insert into hole (A) to engage float springs. Secure with hairpin and repeat for opposite side of windrower.
12. Disengage safety props.



Figure 4.10: Float Springs Engaged

### CAUTION

Check to be sure all bystanders have cleared the area.

13. Start engine and activate HEADER DOWN switch (A) on GSL to lower header fully.
14. Shut down the engine, and remove the key from the ignition.

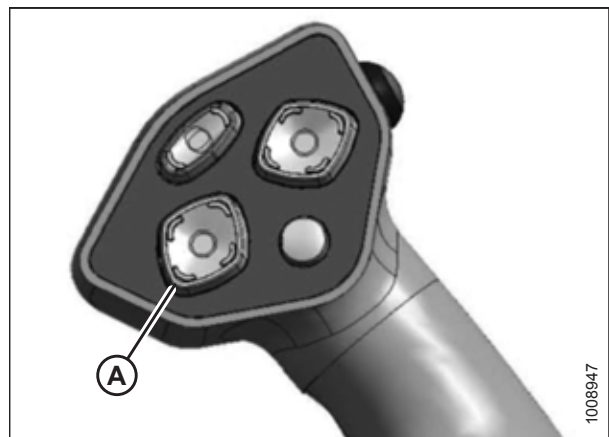


Figure 4.11: GSL

### 4.1.2 Hydraulic Link without Optional Self-Alignment Kit

The following connection procedure applies to M155, M155E4, and M205 Self-Propelled Windrowers without self-aligning hydraulic center-links.

#### **WARNING**

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before adjusting machine.

1. Shut down the engine, and remove the key from the ignition.
2. Relocate pin (A) at the frame linkage as required to position hook (B) over header pin (not shown).

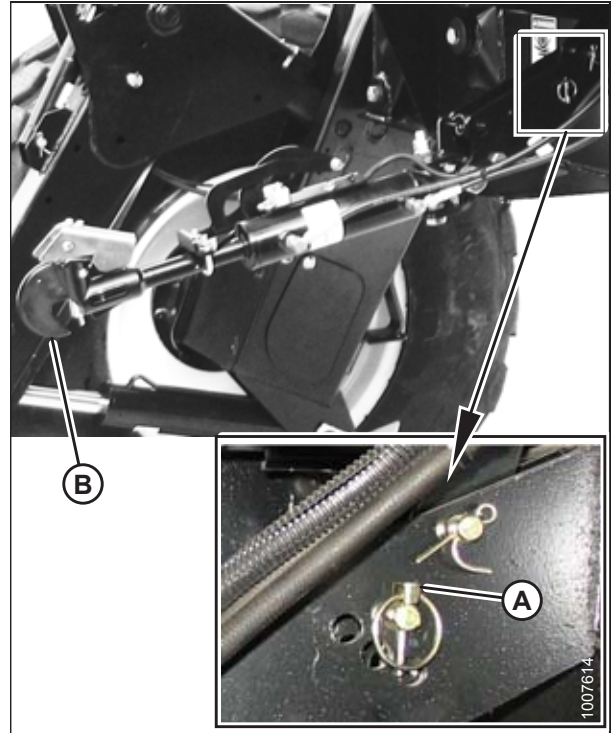


Figure 4.12: Center-Link

#### **CAUTION**

Check to be sure all bystanders have cleared the area.

3. Start the engine and activate the HEADER TILT switches on the ground speed lever (GSL) to extend or retract the center-link cylinder so that hook lines up with the header attachment pin.
4. Shut down the engine, and remove the key from the ignition.

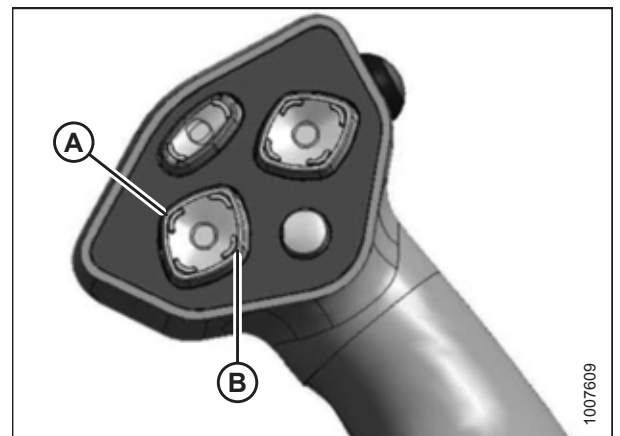


Figure 4.13: GSL

A - HEADER TILT DOWN Switch

B - HEADER TILT UP Switch

## ATTACHING HEADER TO WINDROWER

5. Push down on rod end (B) of center-link (A) until the hook engages the pin on the header and is locked.

### IMPORTANT:

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

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

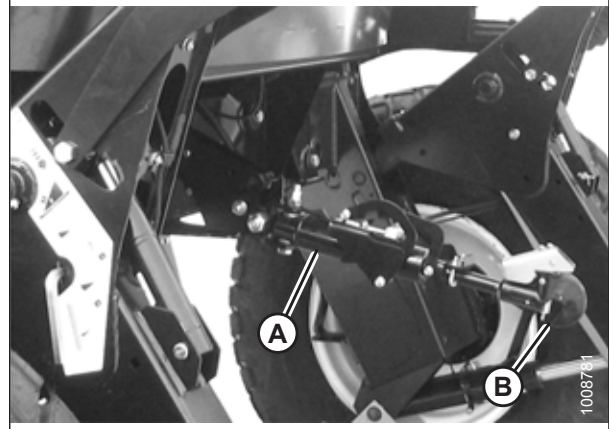


Figure 4.14: Center-Link

### CAUTION

Check to be sure all bystanders have cleared the area.

7. Start the engine.
8. Raise the header fully with HEADER UP switch (A) on the GSL.
9. Shut down the engine, and remove the key from the ignition.
10. Engage the safety props on both lift cylinders.
11. Install pin (A) through the header leg (engaging the U-bracket in the header leg). Repeat for the opposite side of the header.
12. Raise header stand (B) into storage position by pulling pin (C) and lifting the stand into the uppermost position. Release pin (C) to secure the stand in place.

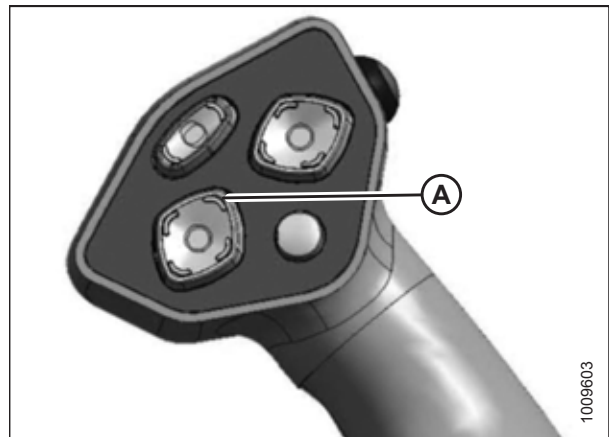


Figure 4.15: Ground Speed Lever (GSL)

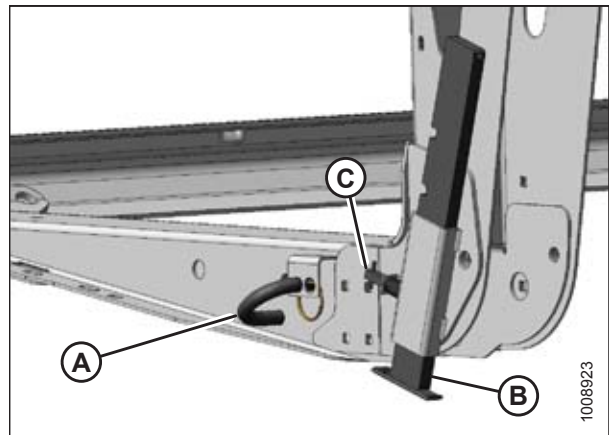


Figure 4.16: Header Stand



## ATTACHING HEADER TO WINDROWER

13. Remove the pin from storage position (B) in the linkage and insert it into hole (A) to engage the float springs. Secure with its hairpin and repeat for the opposite side of the windrower.
14. Disengage the safety props.

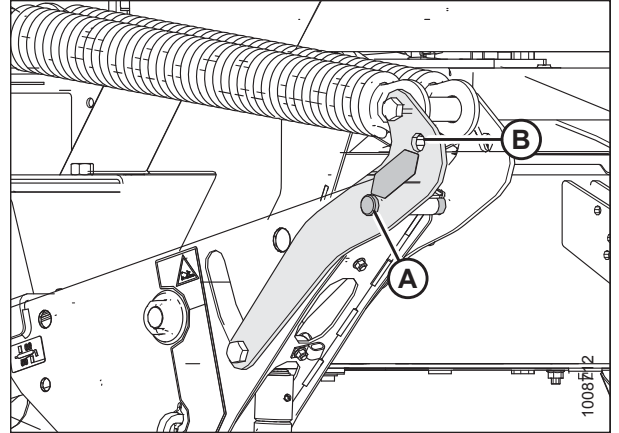


Figure 4.17: Float Springs Engaged

### CAUTION

Check to be sure all bystanders have cleared the area.

15. Start the engine and activate HEADER DOWN switch (A) on the GSL to fully lower the header.
16. Shut down the engine, and remove the key from the ignition.

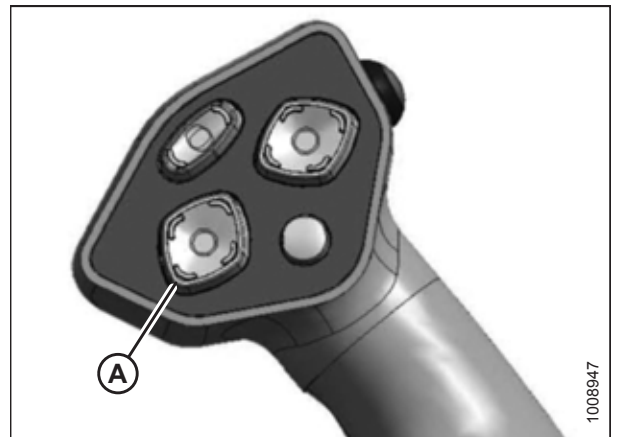


Figure 4.18: GSL

### 4.1.3 Hydraulic Link with Optional Self-Alignment Kit

The following connection procedure applies to M155, M155E4, and M205 Self-Propelled Windrowers with a hydraulic center-link and optional self-alignment kit installed.

#### WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before adjusting machine.

1. Adjust the position of center-link hook (A) with reel position switches (B), and header tilt switches (C) on the Ground Speed Lever (GSL) until hook (A) is above the header attachment pin.

#### IMPORTANT:

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

2. Lower center-link hook (A) onto the header with REEL DOWN switch on GSL until it locks into position (and hook release [D] is down).
3. Check that the center-link is locked onto the header by pressing the REEL UP switch on the GSL.

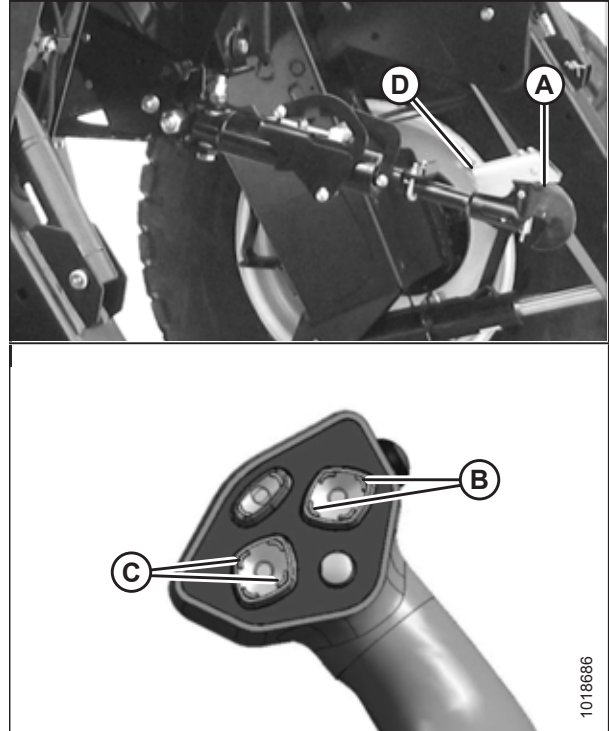


Figure 4.19: Hydraulic Center-Link

#### CAUTION

Check to be sure all bystanders have cleared the area.

4. Start the engine.
5. Raise the header fully with HEADER UP switch (A) on the GSL.
6. Shut down the engine, and remove the key from the ignition.
7. Engage the safety props on both lift cylinders.

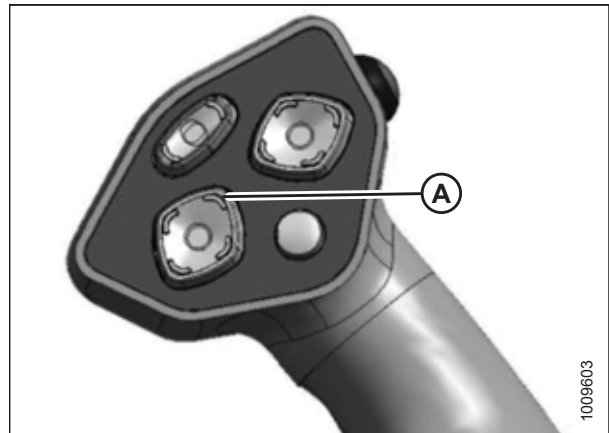


Figure 4.20: Ground Speed Lever (GSL)

## ATTACHING HEADER TO WINDROWER

8. Install pin (A) through the header leg (engaging U-bracket in the header leg) and secure it using the retaining ring. Repeat for the opposite side of the header.
9. Raise header stand (B) to storage position by pulling pin (C) and lifting the stand into its uppermost position. Release pin (C) to secure the stand in place.

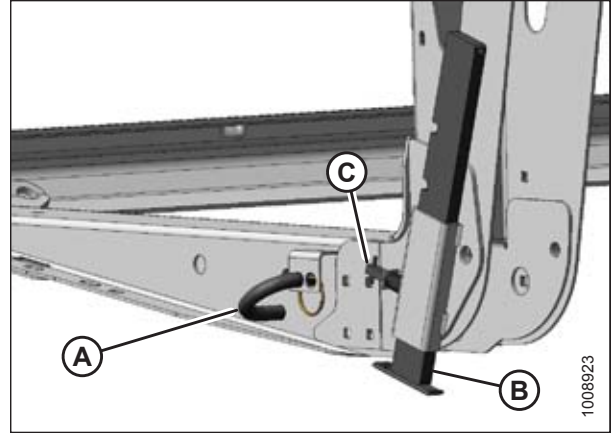


Figure 4.21: Header Stand

10. Remove the pin from storage position (B) in the linkage and insert it into hole (A) to engage the float springs. Secure with a hairpin and repeat for the opposite side of the windrower.
11. Disengage the safety props.

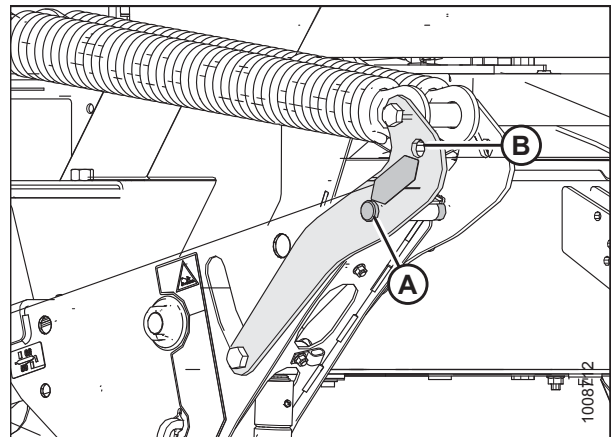


Figure 4.22: Float Springs Engaged



### CAUTION

Check to be sure all bystanders have cleared the area.

12. Start the engine and activate HEADER DOWN switch (A) on the GSL to fully lower the header.
13. Shut down the engine, and remove the key from the ignition.

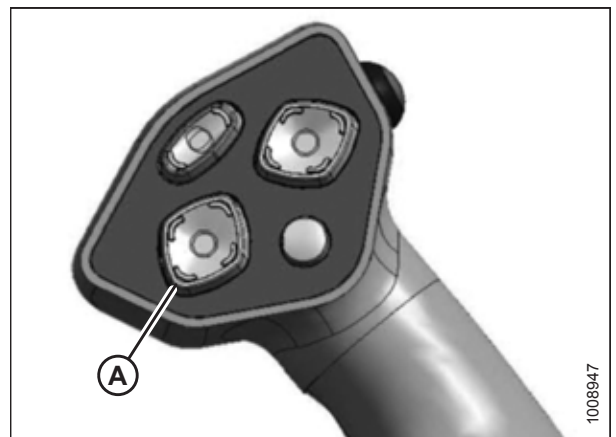


Figure 4.23: GSL

## 4.2 Connecting Hydraulics

**NOTE:**

Windrowers equipped with D1 Series hydraulics have four header-drive hoses on the left side and up to five reel-drive hoses on the right.

Figure 4.24: M Series Hydraulics



A - Header-Drive Hydraulics

B - Reel-Drive Hydraulics

1. If not already equipped, install optional drive/lift kits as shown in Table 4.1, page 46. If windrower is equipped, proceed directly to Step 12, page 48.

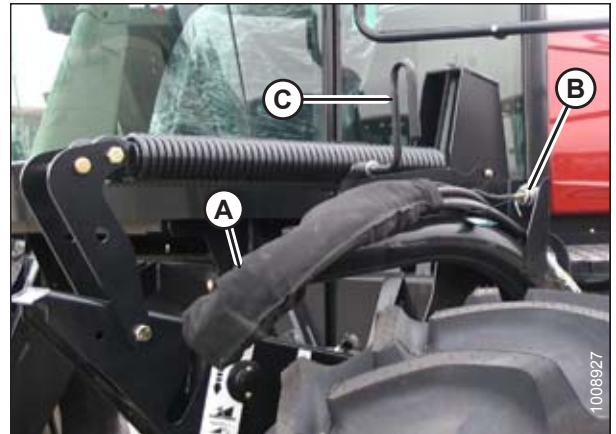
Table 4.1 Optional Drive/Lift Kits for D1 Series Header

Windrower	Part Numbers for D1 Series Header Optional Kits			
	Reel Drive/Lift	Reel Fore-Aft	Reverser	Coupler
M155	MD #B5577	MD #B5577	MD #B4656	–
M155E4	MD #B5577	MD #B5577	MD #B4656	–
M205	MD #B5491	MD #B5496	MD #B5492	MD #B5497

## ATTACHING HEADER TO WINDROWER

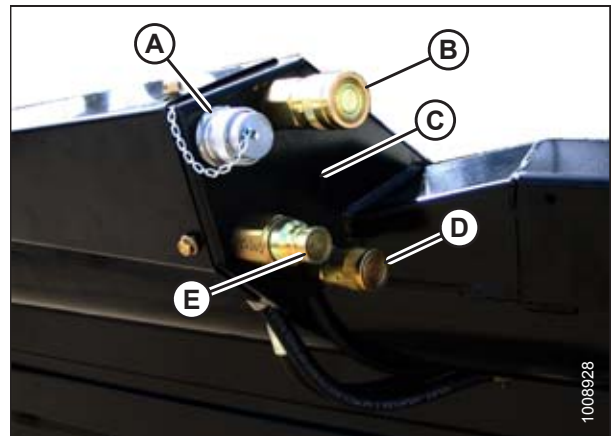
*Connect header-drive hydraulics and electrical harness to header as follows:*

2. Check connectors and clean if required.
3. Disengage and rotate lever (C) counterclockwise to fully-up position.
4. Remove cap securing electrical connector (B) to frame.
5. Move hose bundle (A) from windrower around hose support on header.



**Figure 4.25: Header-Drive Hydraulics and Electrical Harness**

6. Push each hose connector onto receptacle until collar on receptacle snaps into lock position.
7. Remove cover on electrical receptacle (A).
8. Push electrical connector onto receptacle and turn collar on connector to lock it in place.
9. Attach cover to mating cover on windrower wiring harness.



**Figure 4.26: Header Receptacles**

A - Electrical Connector      B - Knife Drive  
C - Case Drain (Double Knife)      D - Draper Drive  
E - Return

10. Lower lever (A), and engage in down position.



**Figure 4.27: Hose Support**

## ATTACHING HEADER TO WINDROWER

11. Check that hose support is positioned so that top bolt (A) is midway in slot, and lower bolt (B) is in forward hole. Loosen bolts and adjust as required.

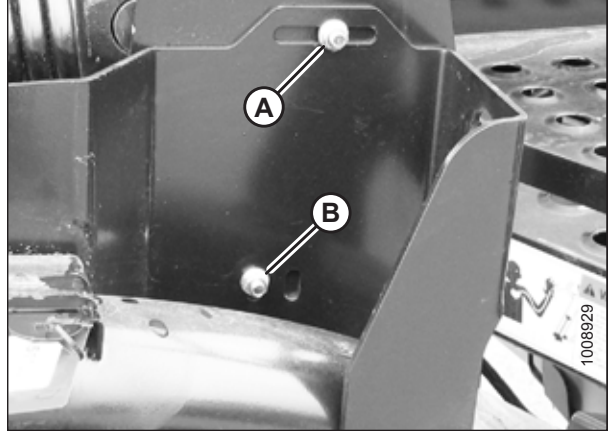


Figure 4.28: Hose Support

### *Connect reel-drive hydraulics (A) as follows:*

12. Check connectors (A) and clean if required.



Figure 4.29: Reel-Drive Hydraulics

## ATTACHING HEADER TO WINDROWER

13. Open cover (A) on header receptacle.
14. Push in lock button (B) and pull handle (C) to half-open position.

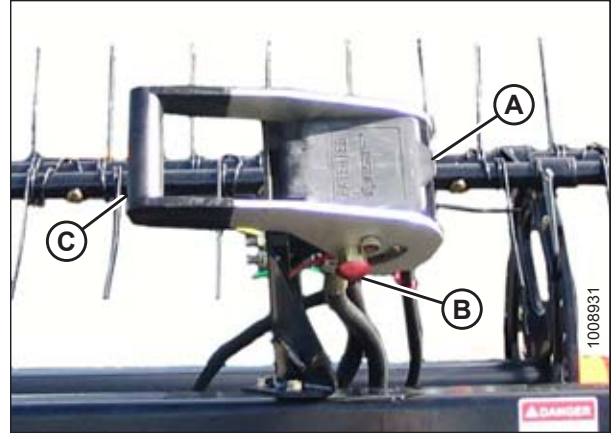


Figure 4.30: Header Receptacle

15. Remove hose bundle with multicoupler (A) from windrower and position onto header receptacle.
16. Push handle (B) to engage pins on connector.
17. Push handle away from hoses until lock button (C) snaps out.

### CAUTION

Check to be sure all bystanders have cleared the area.

18. Start engine, and raise and lower header and reel a few times to allow trapped air to pass back to reservoir.
19. Stop engine and remove key.

### NOTE:

It is not necessary to bleed system by loosening fittings.

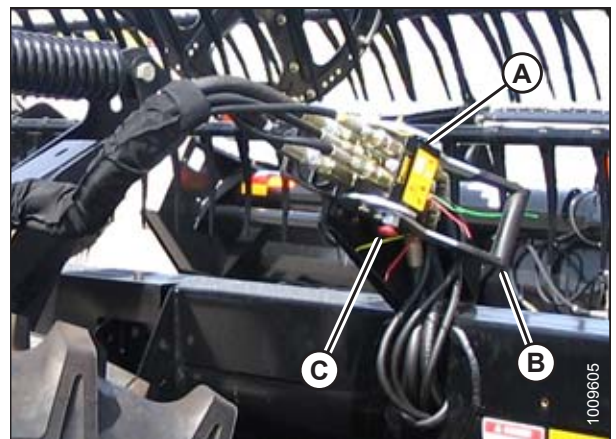


Figure 4.31: Multicoupler on Header

### 4.3 Adding Tire Ballast

When using large headers on the windrower, adding fluid ballast to the rear caster tires will improve machine stability.

Machine stability is also affected by different attachments, windrower options, terrains, and driving techniques.

Ballast capability per tire is at a maximum fill of 75% or when the fluid is level with the valve stem when the stem is positioned at the 12 o'clock position. Always add an equal amount of fluid on both sides. Fluid can be added to any level up to maximum fill.

**Table 4.2 Fluid per Tire**

Tire Size	Fluid per Tire at 75% Fill liters (U.S. Gal.)	Total Weight of Both Tires kg (lb.) <sup>1</sup>
7.5 x 16	38 (10)	91 (200)
10 x 16	69 (18)	170 (380)
16.5 x 16.1	158 (41)	377 (830)

**Table 4.3 Recommended Ballast**

Header Size	Applicable Windrower	Rec. Tire Size	Recommended Ballast			
			Level Ground		Hills	
			Per Tire liters (U.S. Gal.)	Both Tires kg (lb.) <sup>2</sup>	Per Tire liters (U.S. Gal.)	Both Tires kg (lb.) <sup>2</sup>
7.6 m (25 ft.) and less	All	7.5 x 16 10 x 16 16.5 x 16.1	0	0	0	0
9.1 m (30 ft.) Single Reel or Double Reel (without conditioner)	All	7.5 x 16 10 x 16 16.5 x 16.1	0	0	38(10)	91 (200)
10.6 m (35 ft.) Single Reel						
9.1 m (30 ft.) Double Reel (with steel fingers and conditioner)	All	Level ground: 10 x 16 16.5 x 16.1	69 (18)	170 (380)	115 (30)	288 (630)
10.6 m (35 ft.) Double Reel (5- or 6-bat)		Hills: 16.5 x 16.1				
12.2 m (40 ft.)	M155E4	16.5 x 16.1	115 (30)	288 (630)	158 (41)	377 (830)

When the recommended fluid ballast has been added, proceed to [5 Performing Predelivery Checks, page 51](#).

- Weights given are for typical calcium chloride and water mixtures. Weight is reduced by 20% if only water is used (for areas that do not require antifreeze protection).
- If only water is used, increase volume of water by 20% (up to maximum allowable fill per tire) to compensate.



## Chapter 5: Performing Predelivery Checks

This machine has been set at the factory and should not require further adjustments; however, the following checks will ensure your machine provides maximum performance. If adjustments are necessary, follow the procedures in this chapter.

### **WARNING**

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before adjusting machine.

#### **IMPORTANT:**

To avoid machine damage, check that no shipping material has fallen into the machine.

1. Perform the final checks as listed on the **Predelivery Checklist** (yellow sheet attached to this instruction – [Predelivery Checklist, page 91](#)) to ensure the machine is field-ready. Refer to the following pages for detailed instructions as indicated on the Checklist. The completed Checklist should be retained by either the Operator or the Dealer.

### 5.1 Checking Tire Pressure – Transport and Stabilizer Wheels

Check tire inflation pressure. If necessary, inflate tires according to the following table:

**Table 5.1 Tire Inflation Pressure**

Tire	Size	Pressure
Goodyear Wrangler RT/S	205/75 R15	276 kPa (40 psi)
Carlisle and Titan	ST205/75 R15	448 kPa (65 psi)

#### **IMPORTANT:**

Do **NOT** exceed maximum pressure specified on tire sidewall.

## 5.2 Checking Wheel Bolt Torque

Perform the following procedure to ensure that transport and stabilizer wheel bolts are correctly torqued:

1. Check that wheel bolt torque is 110–120 Nm (80–90 lbf·ft).
2. If necessary, adjust torque. Refer to bolt tightening sequence illustration at right.

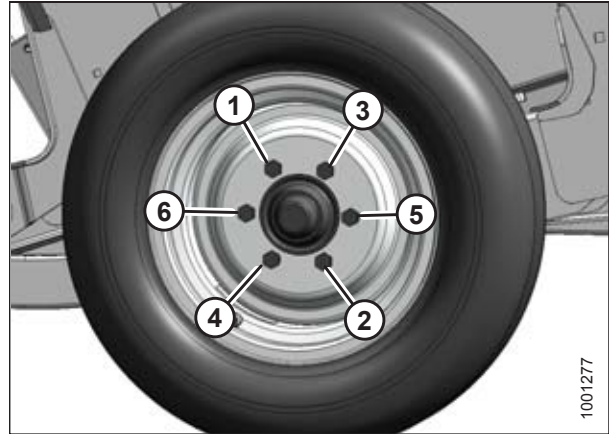


Figure 5.1: Sequence for Tightening Bolts

### 5.3 Checking Knife Drive Box

Single-knife headers have one knife drive box and double-knife headers have two knife drive boxes. To access the knife drive box(es), the endshield(s) must be fully opened.

#### **WARNING**

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before making adjustments to machine.

1. Press down on latch (A) in the opening on the inboard side of the endsheet.
2. Pull endshield open using handle depression (B).

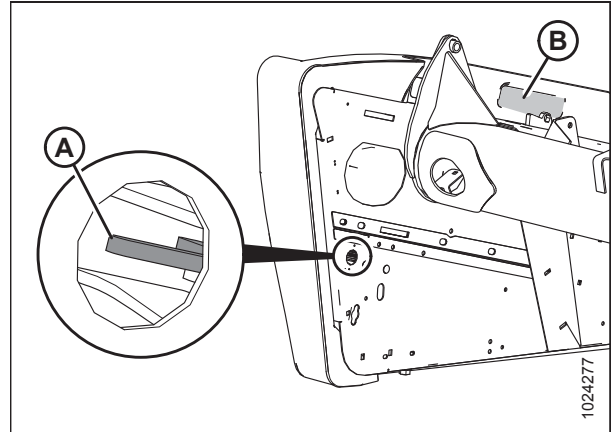


Figure 5.2: Endshield Latch Access

3. Swivel the endshield toward the back of the header and use safety latch (B) to secure endshield support tube (A) to the endsheet.

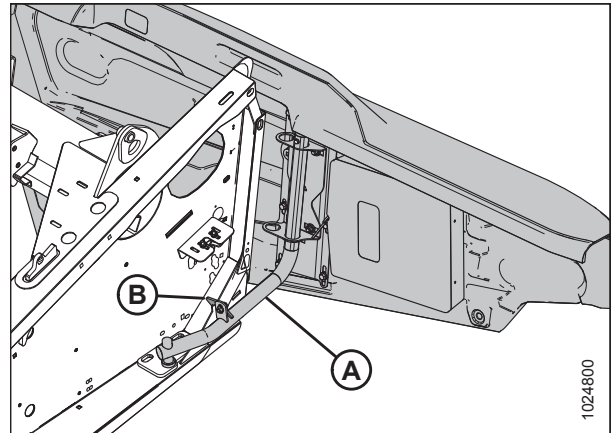


Figure 5.3: Left Endshield Support Tube

## PERFORMING PREDELIVERY CHECKS

### IMPORTANT:

The knife drive box breather is shipped in position (A) (forward) to prevent oil loss during transport. The breather **MUST** be repositioned to location (B) to prevent oil loss during normal operation. Failure to do so can result in damage to the knife drive box.

4. Check position of plug (A) and breather (B) at knife drive box. Position **MUST** be as shown.
5. Remove breather (B) and check oil level. The oil level should be between the bottom edge (C) of lower hole (D) and bottom (E) of the breather.

### NOTE:

Check oil level with top of knife drive box horizontal and with breather (B) screwed in.

6. Reinstall breather and tighten.

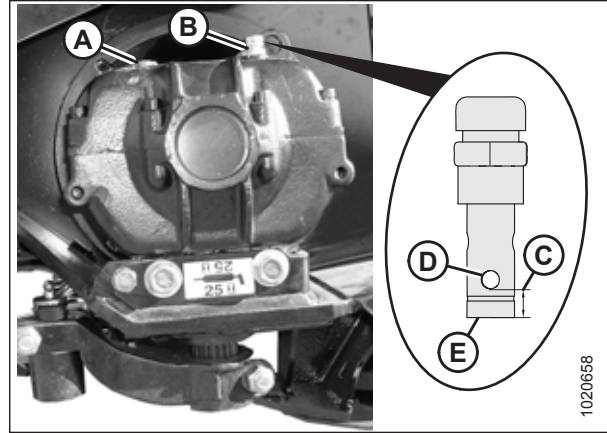


Figure 5.4: Knife Drive Box

## 5.4 Checking and Adjusting Knife Drive Belt Tension

Proceed to the section that applies to the header's knife drive configuration:

- 5.4.1 *Checking and Tensioning Single and Untimed Double-Knife Drive Belts, page 55*
- 5.4.2 *Checking and Tensioning Timed Double-Knife Drive Belts, page 56*
- 5.4.3 *Tensioning Timed Knife Drive V-Belts, page 57*

Single-knife headers have one knife-drive belt and double-knife headers have two knife-drive belts.

### 5.4.1 Checking and Tensioning Single and Untimed Double-Knife Drive Belts

#### WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before making adjustments to machine.

#### IMPORTANT:

To prolong the belt and drive life, do **NOT** overtighten the belt.

1. Open the left endshield.
2. Loosen two bolts (A) securing the motor assembly to the header endsheet.

#### NOTE:

The belt guide has been removed from the illustrations for clarity.

3. Check drive belt tension. A properly tensioned drive belt (C) should deflect 24–28 mm (15/16–1 1/8 in.) when 133 N (30 lbf) of force is applied at the midspan.
4. If the belt needs to be tensioned, turn adjuster bolt (B) clockwise to move the drive motor until proper tension is set.

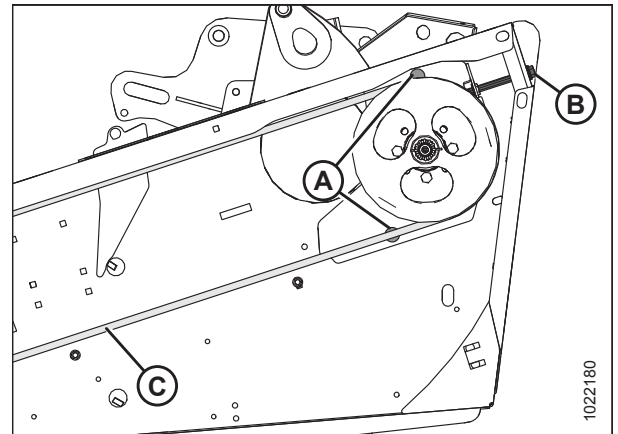


Figure 5.5: Knife Drive

5. Ensure clearance between belt (A) and belt guide (B) is 1 mm (1/16 in.).
6. Loosen three bolts (C), and adjust the position of guide (B) as required.
7. Tighten three bolts (C).
8. Close the endshield.
9. Repeat procedure on the other side of the header.

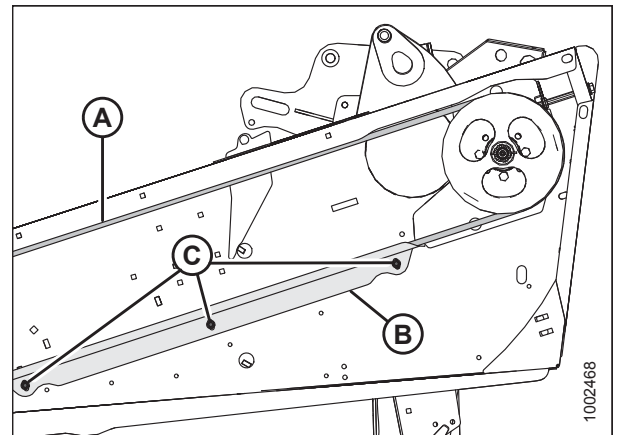


Figure 5.6: Knife Drive

### 5.4.2 Checking and Tensioning Timed Double-Knife Drive Belts

The procedure for tensioning timed knife drive belts is the same for both sides of the header. The illustrations show the left side of the header.

**WARNING**

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before making adjustments to machine.

**IMPORTANT:**

To prolong belt and drive life, do **NOT** overtighten belt.

**IMPORTANT:**

Do **NOT** use the adjuster bolt at the drive pulley to adjust timing belt tension.

1. Shut down the engine, and remove the key from the ignition.
2. Open the endshield.
3. Check drive belt tension. A properly tensioned belt (A) should deflect 13 mm (1/2 in.) at the midpoint of the upper span when a force of 27 N (6 lbf) is applied.

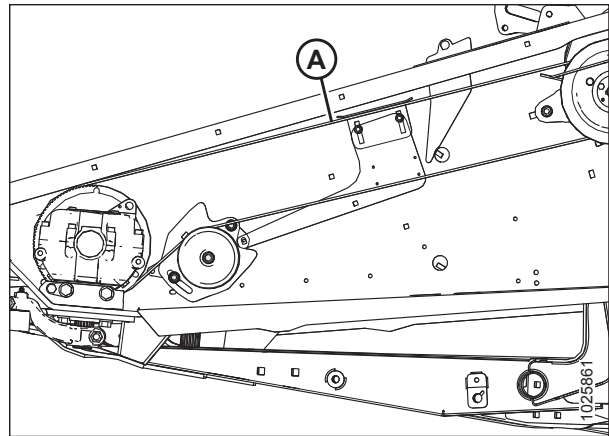


Figure 5.7: Knife Drive – Left Side

4. If the belt needs to be tensioned, loosen two nuts (A) on knife drive belt idler bracket (B).
5. Position pry bar (C) under the idler bracket, and push the bracket upwards until a force of 27 N (6 lbf) deflects the belt 13 mm (1/2 in.) at the midpoint of the upper span.

**IMPORTANT:**

Protect the machine's paint by placing a piece of wood (D) under pry bar (C).

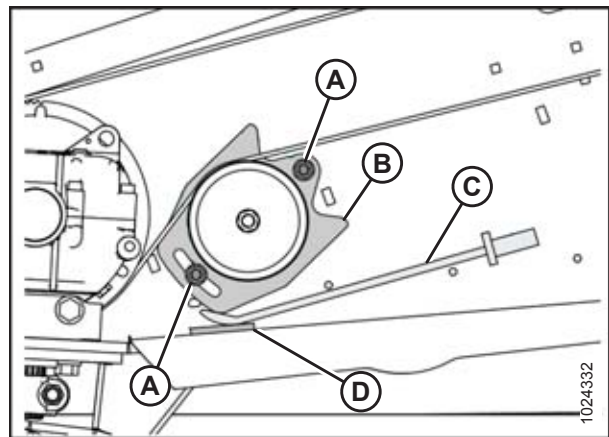


Figure 5.8: Knife Drive – Left Side

## PERFORMING PREDELIVERY CHECKS

6. After achieving the proper belt tension, tighten nuts (C) to 73–80 Nm (54–59 lbf-ft).
7. Remove pry bar (A) and wood (B).
8. Readjust the tension of a new belt after a short run-in period (about 5 hours).

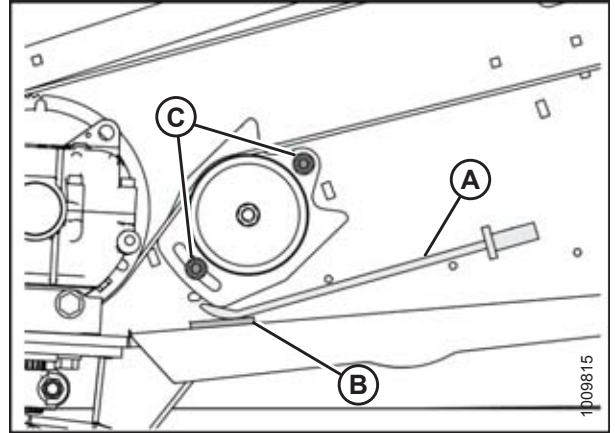


Figure 5.9: Knife Drive – Left Side

9. Ensure clearance (A) between belt (B) and guide (C) is 0.5–1.5 mm (1/32–1/16 in.).
10. Loosen bolts (D) and adjust the guide if necessary. Tighten bolts.
11. Close the endshield.
12. Repeat procedure for the opposite side of the header.

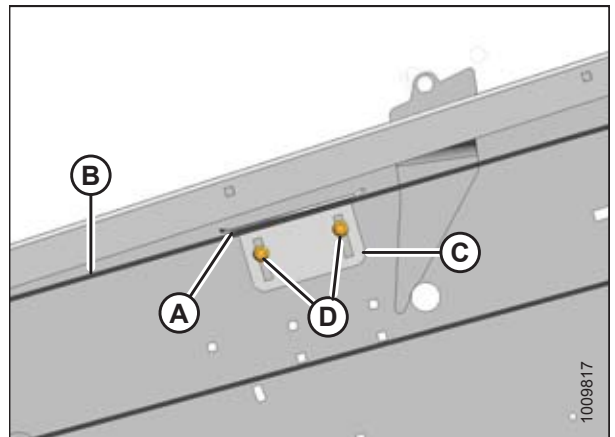


Figure 5.10: Belt Guide – Left Side

### 5.4.3 Tensioning Timed Knife Drive V-Belts

1. Loosen two bolts (A).
2. Turn drawbolt (B) clockwise to tighten or counterclockwise to loosen belts (C) tension.

**NOTE:**

Tension is checked at the belts' midspan. The belts should deflect 4 mm (5/32 in.) with 52–77 N (12–17 lbf) of force applied to each belt.

3. Tighten bolts (A).

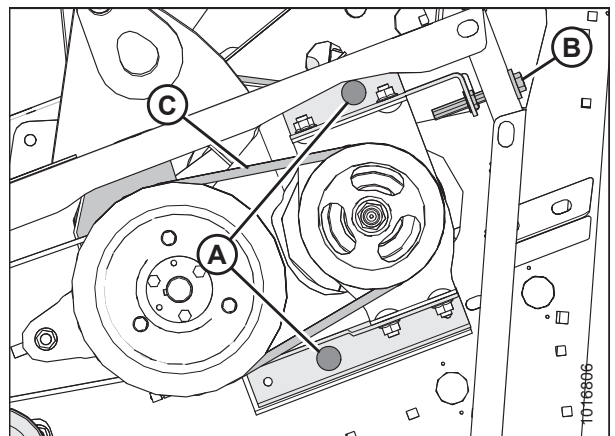


Figure 5.11: Knife Drive V-belts

## 5.5 Centering the Reel

### 5.5.1 Centering Double Reels

#### WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before adjusting machine.

1. Shut down the engine, and remove the key from the ignition.
2. Measure clearances at locations (A) between reels and both endsheets. The clearances should be the same if the reels are centered. If the reels are not centered, proceed to Step 3, page 58.

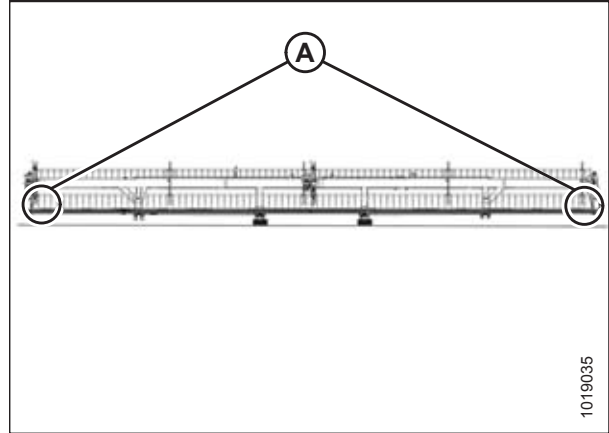


Figure 5.12: Double Reel Measurement Locations

3. Loosen bolts (A) on each brace (B) located on both sides of reel center support arm (C).
4. Move the forward end of reel center support arm (C) laterally as required to center both reels.
5. Tighten bolts (A) and torque to 382 Nm (282 lbf-ft).

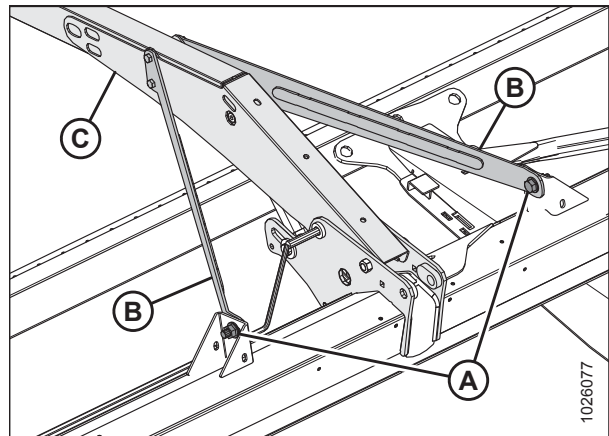


Figure 5.13: Reel Center Support Arm



## 5.5.2 Centering Reel on a Single Reel Header

### WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before adjusting machine.

1. Shut down the engine, and remove the key from the ignition.
2. Loosen bolt (A) on brace (B) at both ends of the reel.
3. Move the forward end of reel support arm (C) laterally as required to center the reel.
4. Tighten bolt (A) and torque to 359 Nm (265 lbf-ft). Repeat at opposite side.

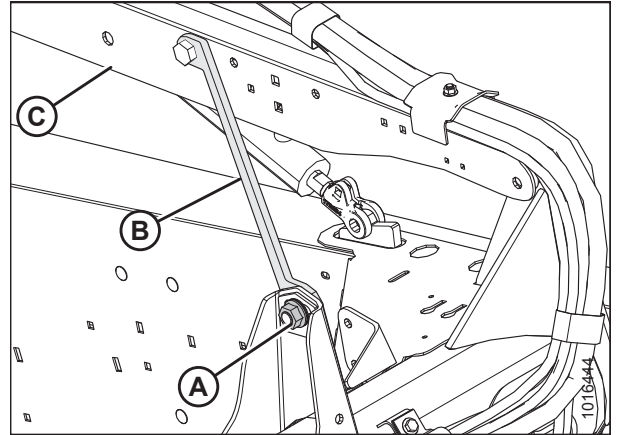


Figure 5.14: Reel Support Arm

## 5.6 Adjusting Draper Tension

The drapers are tensioned at the factory and rarely need adjustment. If adjustment is required, tension the drapers just enough to prevent slipping and to keep the draper from sagging below the cutterbar. Adjust drapers on both sides of the header.

### DANGER

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

1. Ensure white indicator bar (A) is at the halfway point in the window.

### WARNING

Check to be sure all bystanders have cleared the area.

2. Start the engine and fully raise the header.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the header safety props.

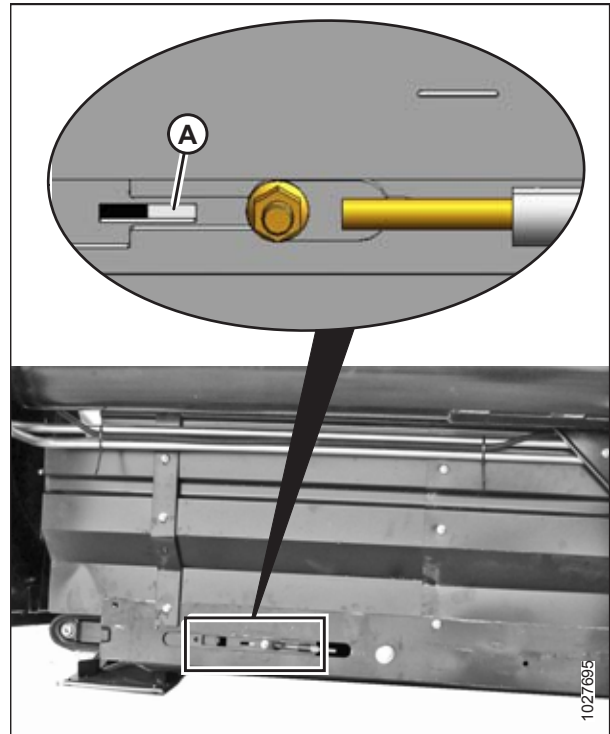


Figure 5.15: Left Side Tension Adjuster Shown – Right Side Opposite

5. Ensure the draper guide (the rubber track on the underside of the draper) is properly engaged in groove (A) on the drive roller.

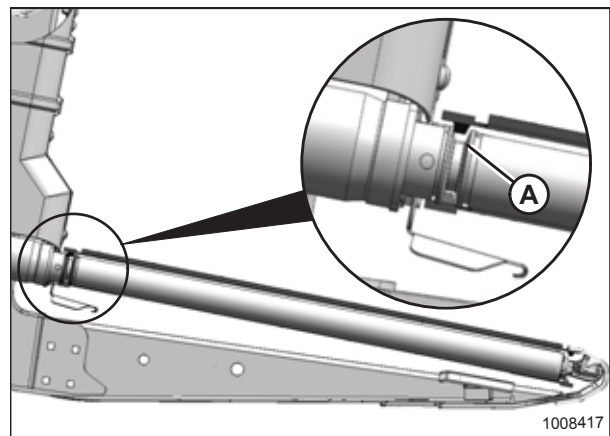


Figure 5.16: Drive Roller

## PERFORMING PREDELIVERY CHECKS

6. Ensure idler roller (A) is between draper guides (B).

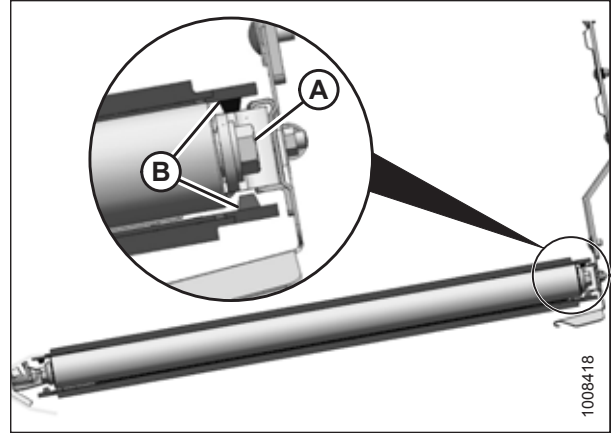


Figure 5.17: Idler Roller

### IMPORTANT:

Do **NOT** adjust nut (C). This nut is used for draper alignment only.

7. To loosen draper tension:
  - Turn adjuster bolt (A) counterclockwise. The white indicator bar (B) will move outboard in the direction of arrow (D) to indicate that the draper is loosening. Loosen until the white indicator bar is at the halfway point in the window.
8. To tighten draper tension:
  - Turn adjuster bolt (A) clockwise. White indicator bar (B) will move inboard in direction of arrow (E) to indicate that the draper is tightening. Tighten until the white indicator bar is at the halfway point in the window.

### IMPORTANT:

To avoid premature failure of the draper, draper rollers, and/or tightener components, do **NOT** operate if the white bar is not visible.

### IMPORTANT:

To prevent scooping dirt, ensure the draper is tight enough that it does not sag below the point where the cutterbar contacts the ground.

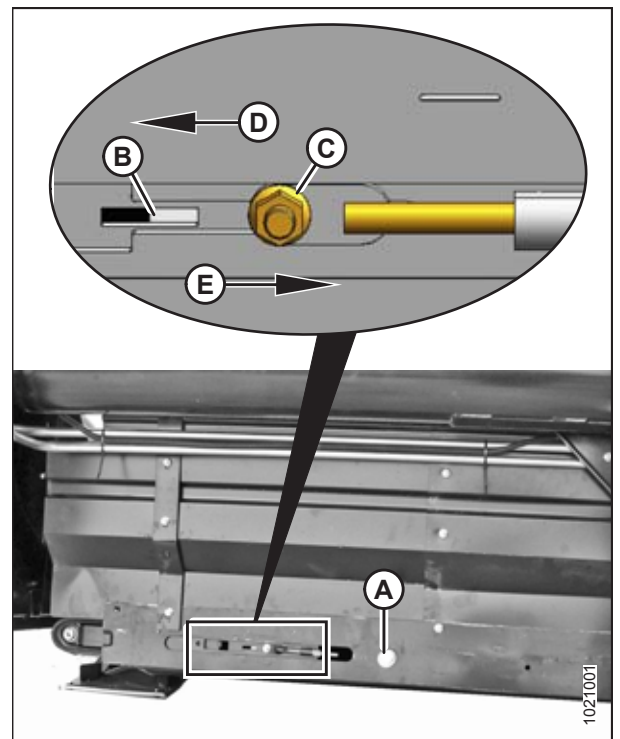


Figure 5.18: Left Side Tension Adjuster Shown – Right Side Opposite

## 5.7 Checking and Adjusting Draper Seal

Maintain the deck height such that the draper runs just below the cutterbar.

**IMPORTANT:**

New factory-installed drapers are pressure and heat checked at the factory. The gap between draper (A) and cutterbar (B) is set to 0–3 mm (1/32–1/8 in.) at the factory. To prevent material from entering the drapers and cutterbar while in the field, you may need to decrease the deck clearance closer to 0 mm (0 in.) after an initial break-in period of approximately 50 hours. Do **NOT** set the gap to zero as this could result in damage to the draper or hydraulic system.

1. Check the deck height. Draper (A) should run just below cutterbar (B) with a gap of 1–3 mm (1/32–1/8 in.) between the top of the deck front track and the cutterbar.
  - If the deck height is acceptable, skip the remaining steps and proceed to [5.8 Checking and Adjusting Skid Shoe Settings](#), page 64.
  - If the deck height is **NOT** acceptable, adjust the seal as described in the following steps:

**NOTE:**

Take the measurement at deck supports (A) with the header in working position. Depending on header size, there are two supports per deck.

2. Loosen the draper tension. For instructions, refer to [5.6 Adjusting Draper Tension](#), page 60.

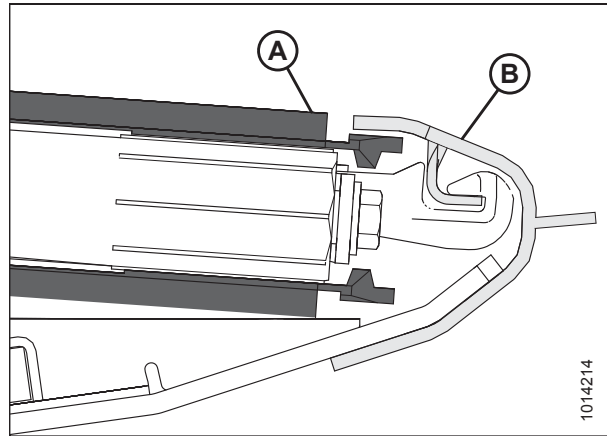


Figure 5.19: Draper to Cutterbar Gap

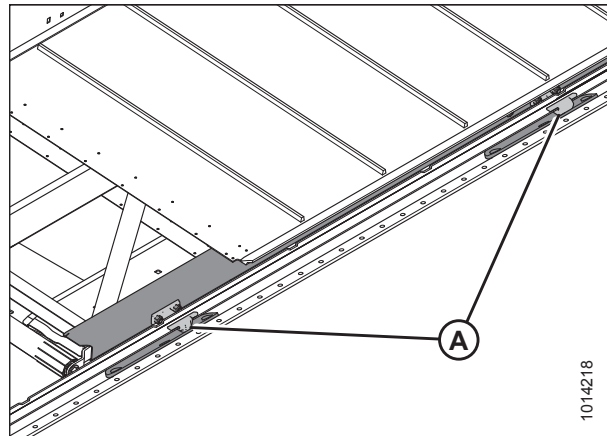


Figure 5.20: Draper Deck Supports

## PERFORMING PREDELIVERY CHECKS

3. Lift draper (A) up at the front edge past cutterbar (B).

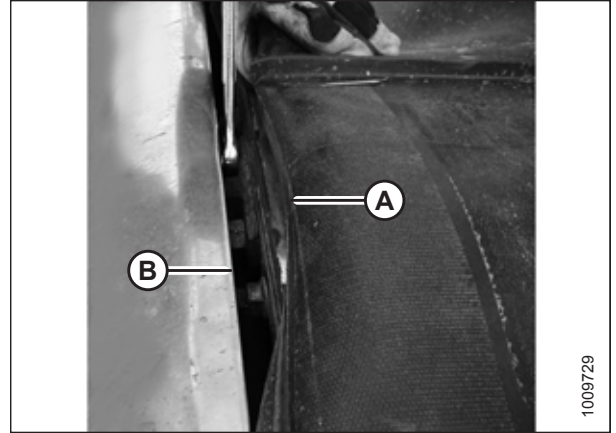


Figure 5.21: Draper and Cutterbar

4. Loosen two lock nuts (A) a half-turn on deck support (B).

**NOTE:**

The deck is shown with the draper removed.

5. Tap deck (C) to lower it relative to the supports and achieve the recommended setting. Tap support (B) using a punch to raise the deck relative to the supports.
6. Tighten deck support hardware (A).
7. Tension the drapers. For instructions, refer to [5.6 Adjusting Draper Tension, page 60](#).

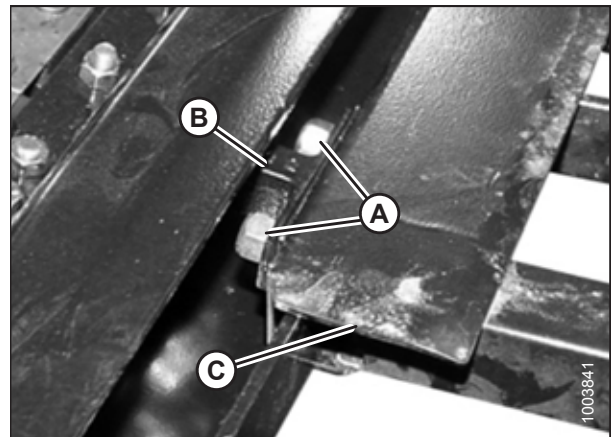


Figure 5.22: Draper Deck Supports

## 5.8 Checking and Adjusting Skid Shoe Settings

To check and adjust skid shoes, follow these steps:

### DANGER

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

1. Check the adjustment hole positions on lugs (A) on each skid shoe. They should be the same.
2. If necessary, adjust skid shoe as follows:
  - a. Remove lynch pin (B).
  - b. Hold shoe and remove pin (C) by disengaging frame and then pulling away from shoe.
  - c. Raise or lower skid shoe to desired position using holes in support as a guide.
  - d. Reinsert pin (C), engage in frame, and secure with lynch pin (B).
  - e. Check that all skid shoes are adjusted to the same position.

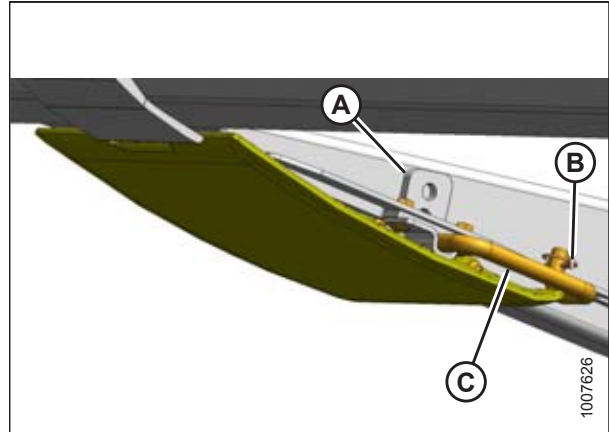


Figure 5.23: Inner Skid Shoe

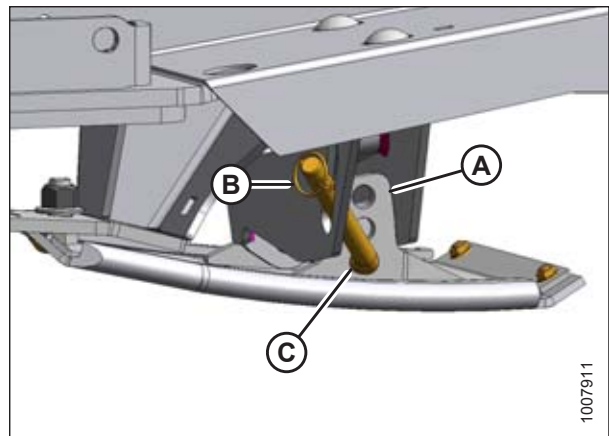


Figure 5.24: Outer Skid Shoe

## 5.9 Leveling the Header

The windrower linkages are factory-set to provide the proper level for the header and should not normally require adjustment.

1. If the header is not level, check the pressure of the windrower's tires to ensure they are properly inflated (refer to your windrower operator's manual).
2. If the header is still not level, adjust the windrower linkages as required (refer to the appropriate section in the windrower operator's manual).

**NOTE:**

The float springs are **NOT** used to level the header.

## 5.10 Checking and Adjusting the Float

Check the header float and adjust if necessary. Refer to the appropriate section of the windrower operator's manual for instructions.



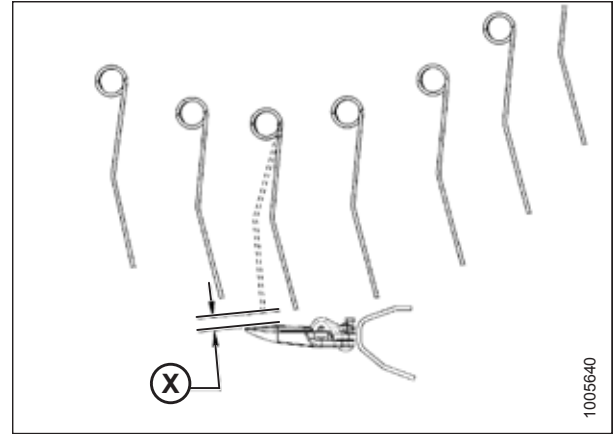
## 5.11 Reel Clearance to Cutterbar

The minimum clearance between the reel fingers and the cutterbar ensures that the reel fingers do not contact the cutterbar during operation. The clearance is set at the factory, but some adjustment may be necessary before operation.

The finger to guard/cutterbar clearances with reels fully lowered are shown in the table below.

**Table 5.2 Finger to Guard/Cutterbar Clearance**

Header Width	(X) 3 mm (+/- 1/8 in.) at Reel Ends	
	Single-Reel	Double-Reel
6.1 m (20 ft.)	20 mm (3/4 in.)	—
7.6 m (25 ft.)	25 mm (1 in.)	—
9.1 m (30 ft.)	45 mm (1-3/4 in.)	20 mm (3/4 in.)
10.7 m (35 ft.)	60 mm (2-3/8 in.)	20 mm (3/4 in.)
12.2 m (40 ft.)	—	20 mm (3/4 in.)
13.7 m (45 ft.)	—	20 mm (3/4 in.)



**Figure 5.25: Finger Clearance**

### 5.11.1 Measuring Reel Clearance

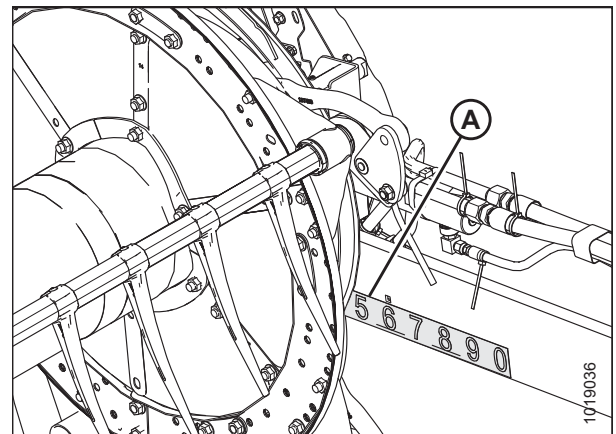
#### DANGER

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

#### CAUTION

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

1. Start the engine.
2. Lower the header fully on level ground.
3. Set the fore-aft position to the middle position (5) on fore-aft position decal (A).
4. Lower the reel fully.
5. Shut down the engine, and remove the key from the ignition.



**Figure 5.26: Fore-Aft Position**

## PERFORMING PREDELIVERY CHECKS

6. Measure clearance (X) between points (A) and (B) at certain measurement locations. For clearance specifications, refer to [5.11 Reel Clearance to Cutterbar, page 67](#).

For the measurement locations, refer to:

- [Figure 5.28, page 68](#) – single reel
- [Figure 5.29, page 68](#) – double reel

**NOTE:**

The reel is factory-set to provide more clearance at the center of the reel than at the ends (frown) to compensate for reel flexing.

**NOTE:**

When measuring reel clearance at the center of a double-reel header, measure the lowest reel.

**Measurement location (A):** Outer ends of the reel (two places).

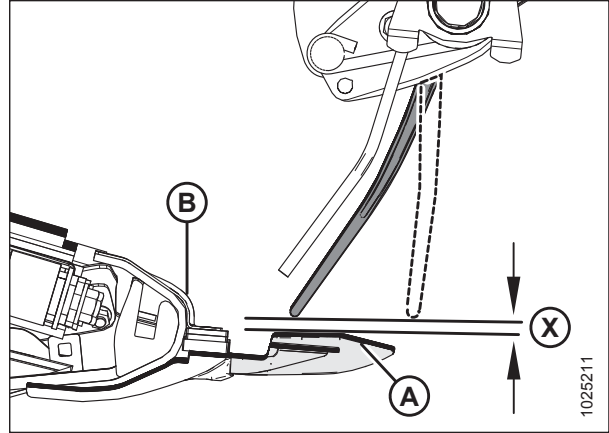


Figure 5.27: Clearance

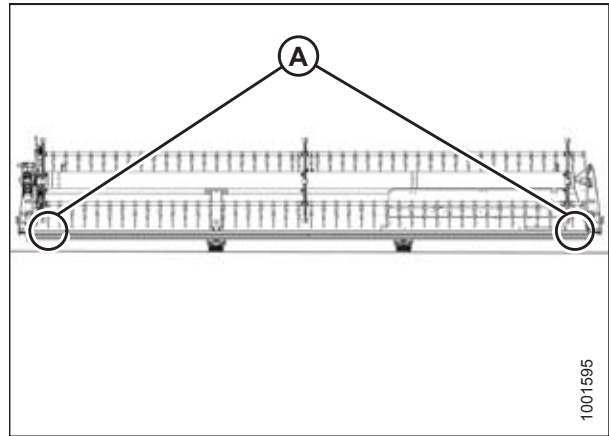


Figure 5.28: Single-Reel Measurement Locations

**Measurement location (A):** Both ends of both reels (four places).

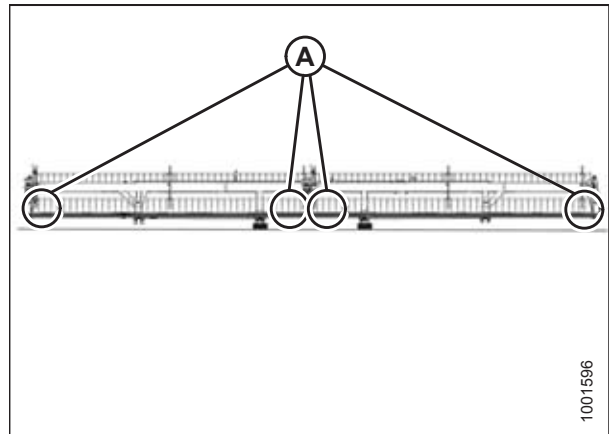


Figure 5.29: Double-Reel Measurement Locations

7. Adjust the reel clearance, if required. For instructions, refer to [5.11.2 Adjusting Reel Clearance, page 69](#).

### 5.11.2 Adjusting Reel Clearance

**⚠ DANGER**

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

1. Raise reel to full height and engage safety props.
2. Shut down the engine, and remove the key from the ignition.
3. Adjust the outboard reel arm lift cylinders to set the clearance at the outboard ends of the reel as follows:
  - a. Loosen bolt (A).
  - b. Turn cylinder rod (B) out of clevis to raise reel and increase clearance to cutterbar, or turn cylinder rod into clevis to lower reel and decrease clearance.
  - c. Tighten bolt (A).
  - d. Repeat at opposite side.

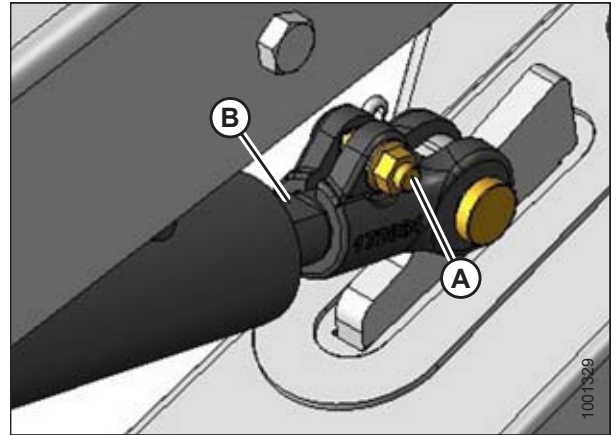


Figure 5.30: Outside Reel Arm

4. **For double reel:** Adjust center arm lift cylinder stop (A) to change clearance at inboard ends of reels as follows:
  - a. Loosen nut (B).

**NOTE:**

To make adjustment easier, lower reel onto the safety props after loosening nut (B).

- b. Turn nut (C) counterclockwise to raise reel and increase clearance to cutterbar, or clockwise to lower reel and decrease clearance.
- c. Tighten nut (B).

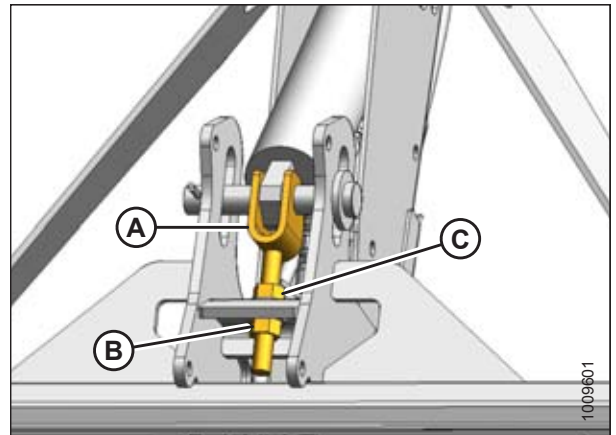


Figure 5.31: Underside of Center Arm

5. Check measurements and, if necessary, repeat adjustment procedures.
6. Move the reel back to ensure the steel end fingers do **NOT** contact the deflector shields.
7. If contact occurs, adjust the reel upward to maintain the clearance at all reel fore-aft positions. If contact cannot be avoided after adjusting the reel, trim the steel end fingers to obtain proper clearance.
8. Periodically check for evidence of contact during operation, and adjust clearance as required.

## 5.12 Checking and Adjusting Endshields

Endshields are subject to expansion or contraction caused by large temperature variations. The position of the top pin and lower latch can be adjusted to compensate for dimensional changes.

### Checking the endshield:

1. Check gap (X) between front end of the shields and the header frame and compare to the values in Table 5.3, page 70.

Table 5.3 Endshield Gap at Various Temperatures

Temperature in °C (°F)	Gap (X) mm (in.)
7 (45)	13–18 (1/2–23/32)
18 (65)	10–15 (3/8–19/32)
29 (85)	7–12 (9/32–15/32)
41 (105)	4–9 (5/32–11/32)

2. If the endshield gap is correct, proceed to the next procedure. If adjustment is required, proceed to Step 1, page 71.

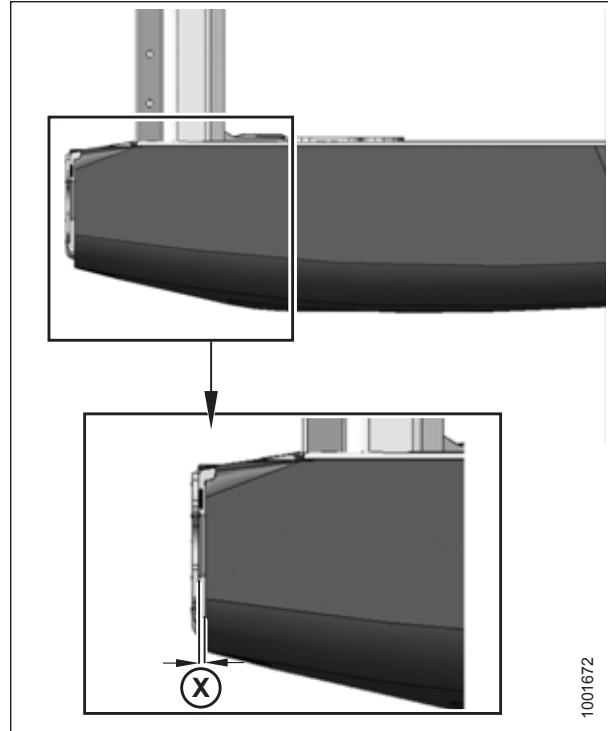


Figure 5.32: Gap between Endshield and Header Frame

## PERFORMING PREDELIVERY CHECKS

### Opening the endshield:

1. To unlock the shield, push release lever (A) located on the backside of the endshield.
2. Pull endshield open using handle depression (B).

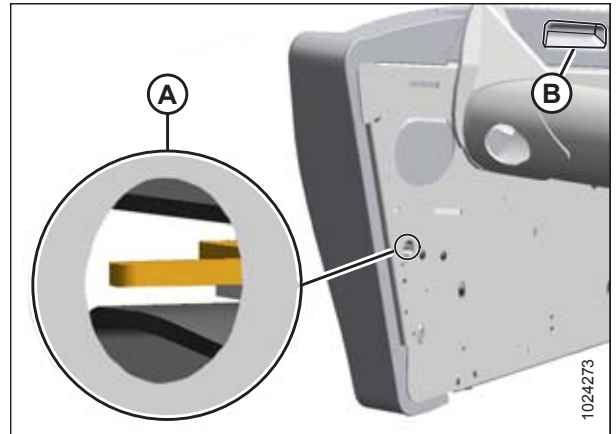


Figure 5.33: Left Endshield

3. Pull endshield at handle depression (A). Endshield is retained by hinge tab (B) and will open in direction (C).

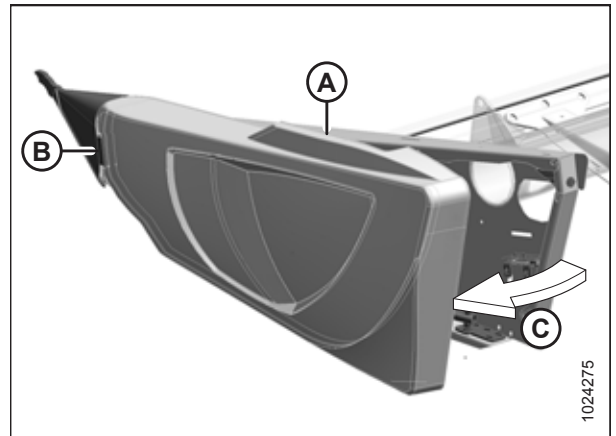


Figure 5.34: Left Endshield

4. Pull the endshield free of hinge tab (A) if additional clearance is required, and swing shield towards the rear of the header.
5. Engage safety catch (B) on hinge arm to secure the shield in fully-open position.

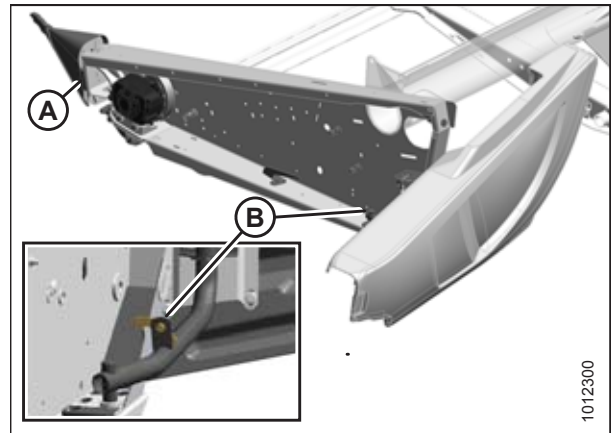


Figure 5.35: Left Endshield

## PERFORMING PREDELIVERY CHECKS

### Adjusting the endshield gap:

1. Loosen four bolts (A) on support tube bracket (B).

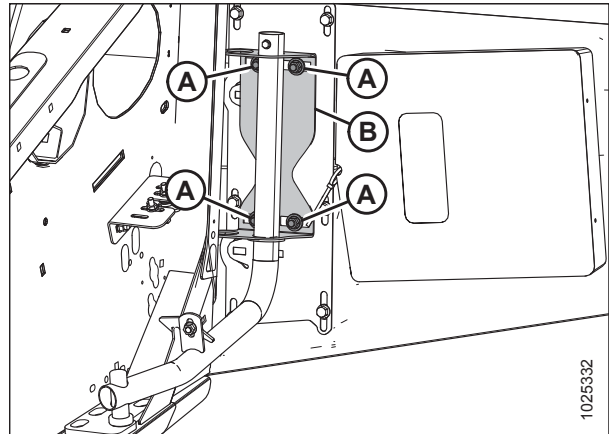


Figure 5.36: Left Endshield Support Tube

2. Loosen three bolts (A) on latch assembly (B).
3. Adjust latch assembly (B) to achieve the desired gap between the front end of the shield and the header frame. Refer to Table 5.3, page 70 for the recommended endshield gap at various temperatures.
4. Tighten three bolts (A) on the latch assembly to 27 Nm (20 lbf-ft).

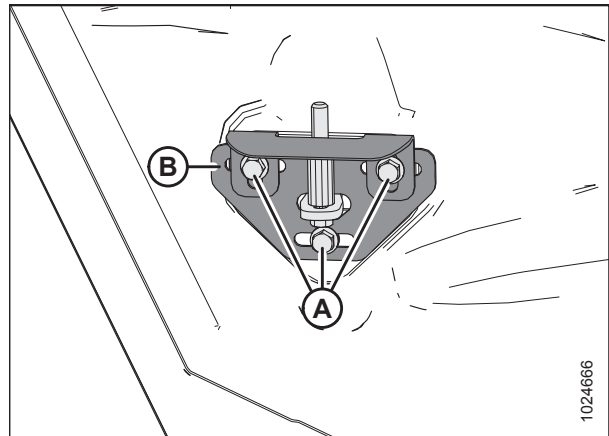


Figure 5.37: Left Endshield Latch Assembly

5. Tighten four bolts (A) on support tube bracket (B) to 31 Nm (23 lbf-ft).
6. Close endshield.

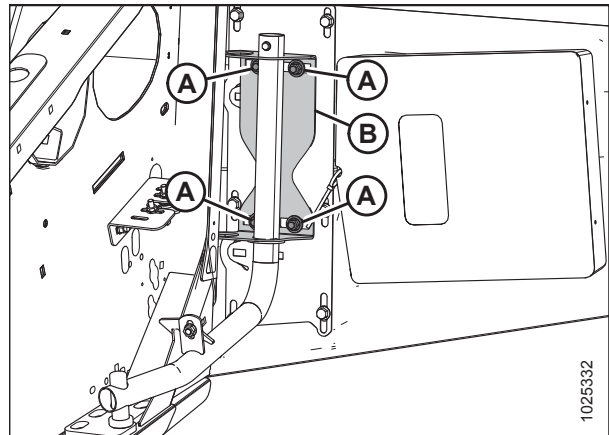


Figure 5.38: Left Endshield Support Tube

## PERFORMING PREDELIVERY CHECKS

### *Closing the endshield:*

1. Disengage lock (B) to allow endshield to move.
2. Insert front of endshield behind hinge tab (A) and into divider cone.

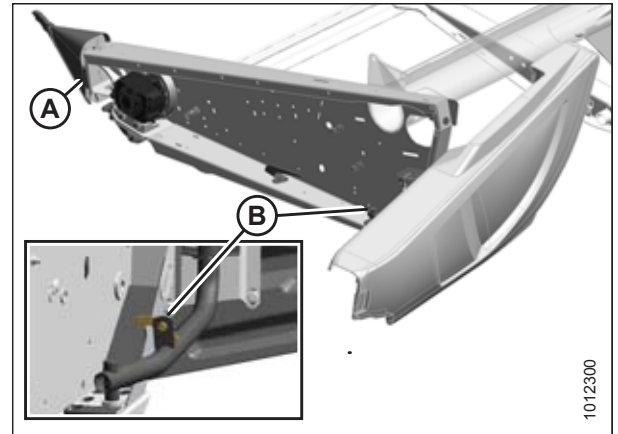


Figure 5.39: Left Endshield

3. Swing endshield in direction (A) into closed position. Engage lock with a firm push.
4. Verify that endshield is locked.

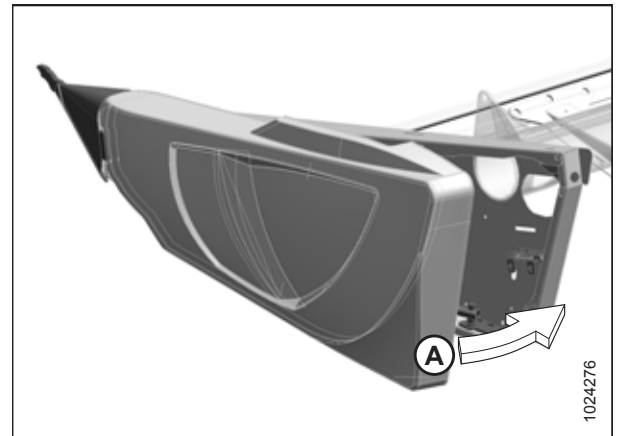


Figure 5.40: Left Endshield

## 5.13 Lubricating Header

Table 5.4 Recommended Lubricant

Specification	Description	Use
SAE multipurpose	High temperature, extreme pressure (EP2) 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

### 5.13.1 Greasing Procedure

Greasing points are identified on the machine by decals showing a grease gun and grease interval in hours of operation. Grease point layout decals are located on the header.

#### WARNING

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

1. Wipe grease fitting with a clean cloth before greasing to avoid injecting dirt and grit.

**IMPORTANT:**

Use clean, high-temperature, extreme-pressure grease only.

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. Remove and thoroughly clean any fitting that will not take grease. Also clean lubricant passageway. Replace fitting if necessary.

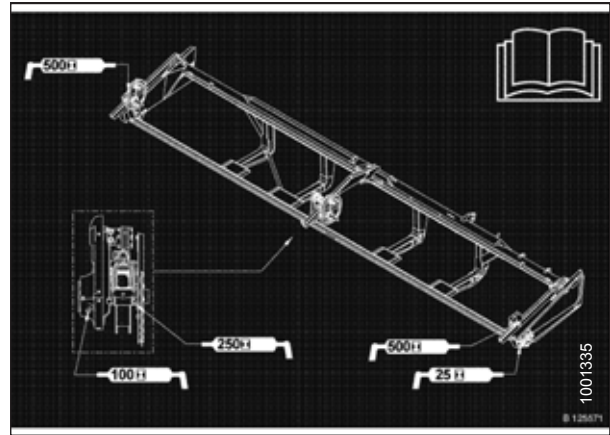


Figure 5.41: Single-Knife Header Grease Point Decal

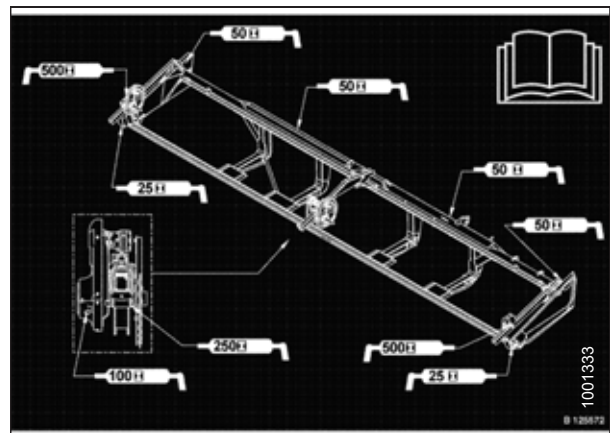


Figure 5.42: Double-Knife Header Grease Point Decal



## 5.13.2 Lubrication Points

### *Knifehead*

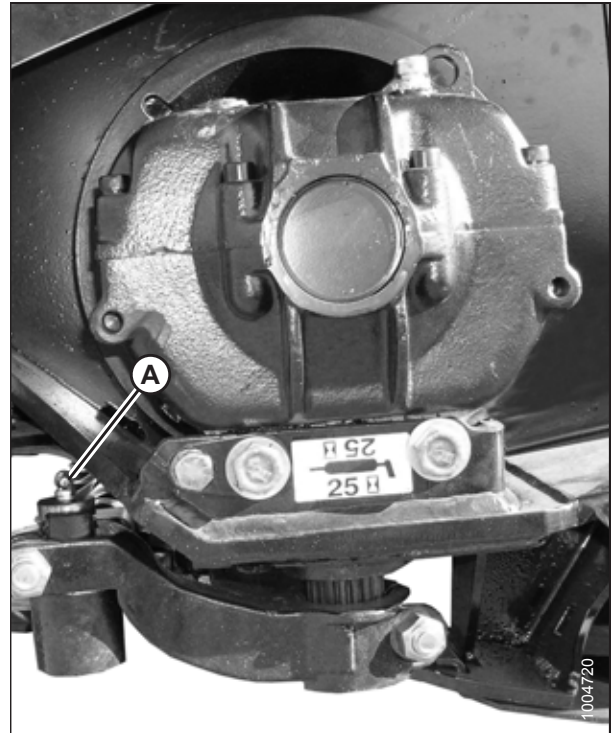
**IMPORTANT:**

Overgreasing can cause the knife to bend and make contact with the guards closest to the knifehead. Check for signs of excessive heating on first few guards after greasing. If required, relieve some pressure by removing the grease fitting.

- To prevent binding and/or excessive wear caused by knife pressing on guards, do **NOT** overgrease knifehead (A).
- Apply only 1–2 pumps of grease with a grease gun, or just until the knifehead starts to move away from the arm. Do **NOT** use an electric grease gun.
- If more than 6–8 pumps of the grease gun are required to fill the cavity, replace the seal in the knifehead.
- Check for signs of excessive heating on first few guards after greasing. If required, relieve pressure by pressing check-ball in grease fitting.

**NOTE:**

Use high temperature extreme pressure (EP2) performance with 1% max molybdenum disulphide (NLGI Grade 2) lithium base grease unless otherwise specified.



**Figure 5.43: Knifehead**

Single Knife – One Place

Double Knife – Two Places

## 5.14 Checking Manuals

Check the manual case contents. The manual case is located inside the left endshield.

1. Open the left endshield. Remove the cable tie on manual case (A).
2. Confirm that the case contains the following manuals:
  - D1 Series Draper Header for Self-Propelled Windrowers Operator's Manual
  - D1 Series Draper Header for Self-Propelled Windrowers Quick Card
  - D1 Series Draper Header for Self-Propelled Windrowers Technical Service Manual
3. Close the case and endshield.

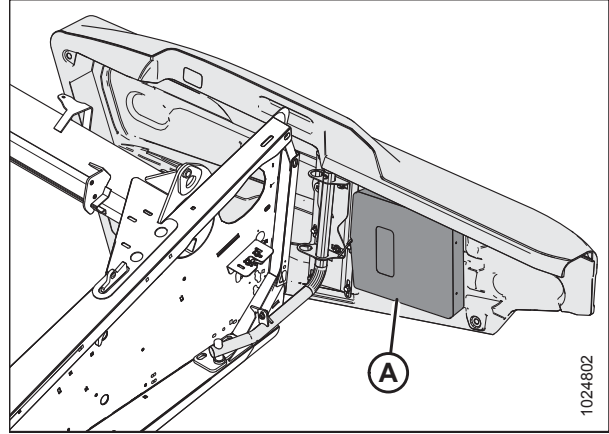


Figure 5.44: Manual Case

## Chapter 6: Running up the Header

To run up the header, follow these steps:

### CAUTION

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

### CAUTION

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

1. Start the windrower and run header for 5 minutes, watching and listening **FROM THE OPERATOR'S SEAT** for binding or interfering parts.

#### NOTE:

Reels and drapers will not operate until oil flow fills the lines.

2. Run header for an additional 10 minutes at operating speed, watching and listening **FROM THE OPERATOR'S SEAT** for binding or interfering parts.
3. Shut down the windrower and remove key.
4. Perform the run-up check as listed on the Predelivery Checklist (yellow sheet attached to this instruction) *Predelivery Checklist, page 91*.

## 6.1 Performing Post Run-Up Adjustments

Stop engine and perform post run-up check as listed on the Predelivery Checklist (yellow sheet attached to this instruction *Predelivery Checklist, page 91*) to ensure machine is field-ready.

### WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before adjusting machine.

It may be necessary to adjust the knife after the run-up. Refer to *6.1.1 Adjusting Knife, page 78*.

### 6.1.1 Adjusting Knife

#### WARNING

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before adjusting machine.

1. Stop engine and remove the key.
2. Check guards for signs of heating during run-up due to insufficient clearance between guard and knife.
3. If heating is evident, check gap between knifehead (A) and pitman arm (B). A business card should slide easily through the gap. If not, adjust gap by loosening bolt and tapping knifehead (A) with a hammer. Retighten bolt.

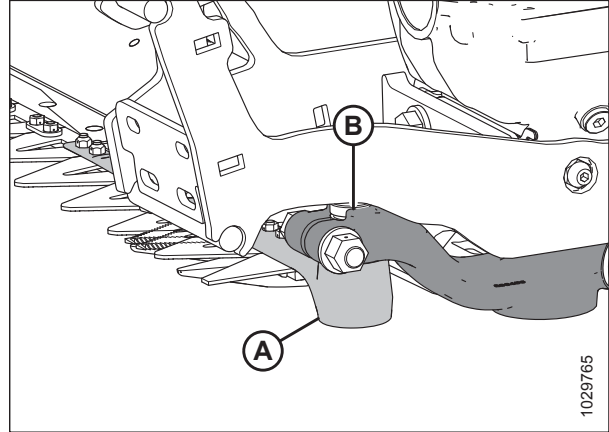


Figure 6.1: Knifehead and Pitman Arm

4. Adjust guard alignment as necessary using guard straightening tool (MD #140135). Adjust guard tips upwards by positioning tool as shown, and pulling up.



Figure 6.2: Straightening Tool – Upward Adjustment

5. Adjust guard tips downward by positioning tool as shown, and pushing down.

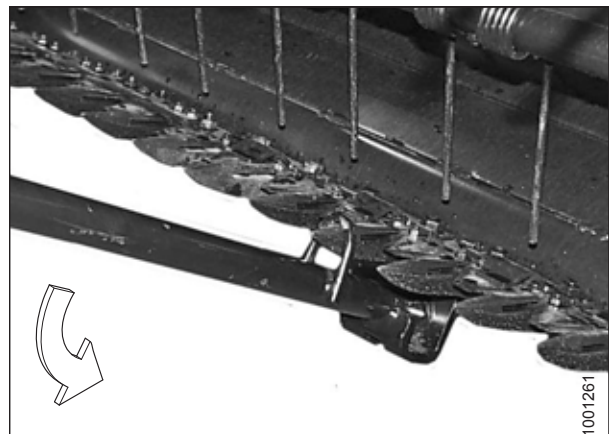


Figure 6.3: Straightening Tool – Downward Adjustment

# Chapter 7: Reference

## 7.1 Torque Specifications

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

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

### Jam nuts

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

### Self-tapping screws

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

### 7.1.1 Metric Bolt Specifications

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

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

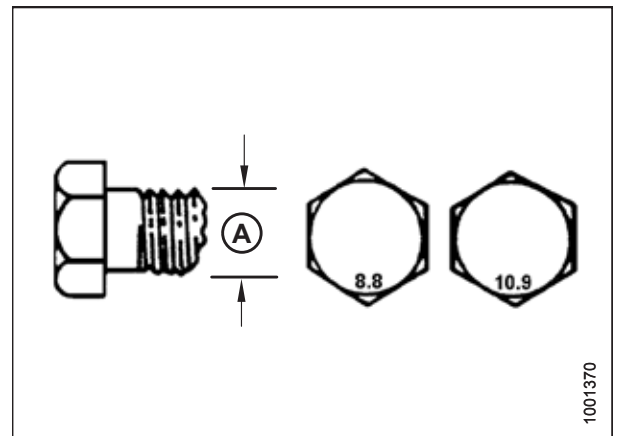


Figure 7.1: Bolt Grades

1001370

REFERENCE

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

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

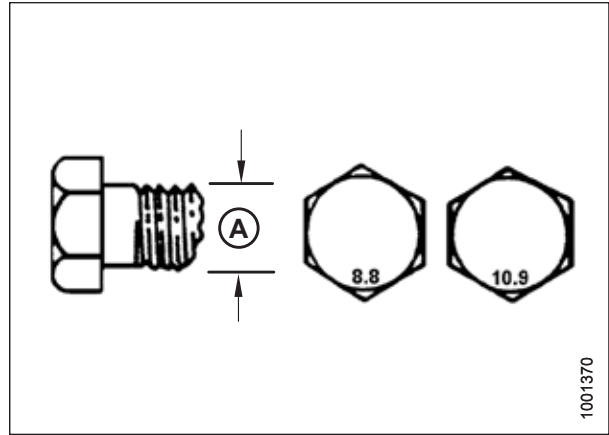


Figure 7.2: Bolt Grades

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

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

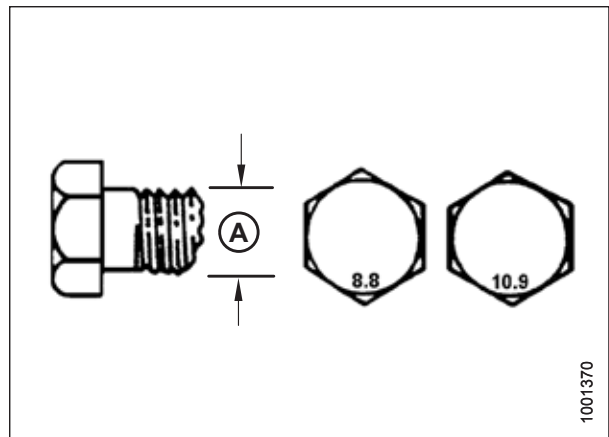


Figure 7.3: Bolt Grades

REFERENCE

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

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

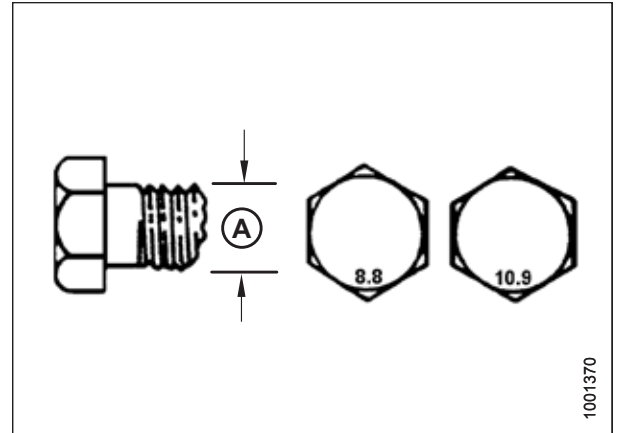


Figure 7.4: Bolt Grades

### 7.1.2 Metric Bolt Specifications Bolting into Cast Aluminum

Table 7.5 Metric Bolt Bolting into Cast Aluminum

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

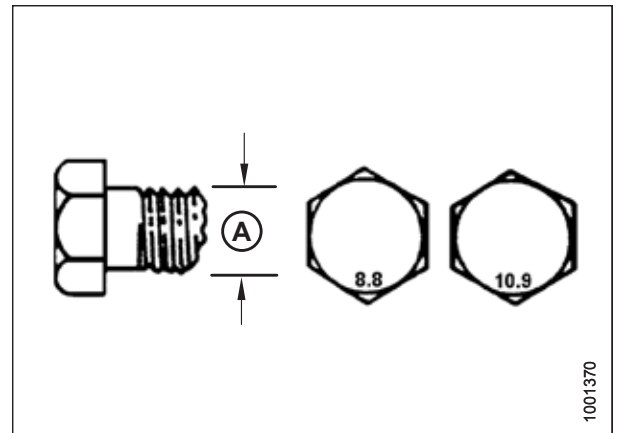


Figure 7.5: Bolt Grades

### 7.1.3 O-Ring Boss Hydraulic Fittings – Adjustable

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

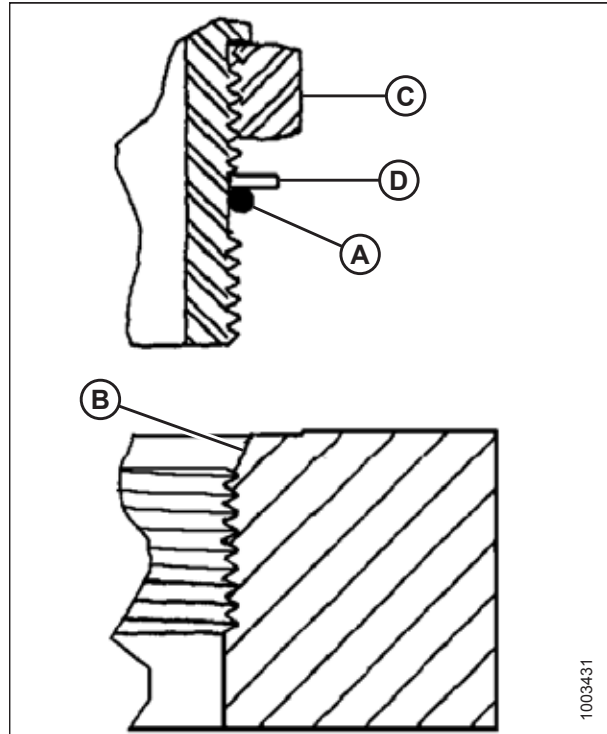


Figure 7.6: Hydraulic Fitting

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

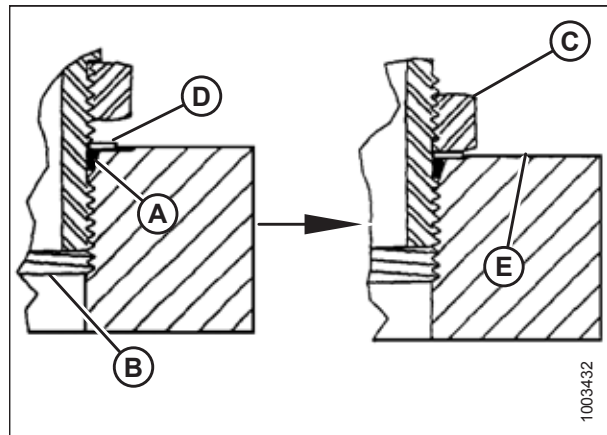


Figure 7.7: Hydraulic Fitting



REFERENCE

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

SAE Dash Size	Thread Size (in.)	Torque Value <sup>3</sup>	
		Nm	lbf·ft (*lbf·in)
-2	5/16-24	6-7	*53-62
-3	3/8-24	12-13	*106-115
-4	7/16-20	19-21	14-15
-5	1/2-20	21-33	15-24
-6	9/16-18	26-29	19-21
-8	3/4-16	46-50	34-37
-10	7/8-14	75-82	55-60
-12	1 1/16-12	120-132	88-97
-14	1 3/8-12	153-168	113-124
-16	1 5/16-12	176-193	130-142
-20	1 5/8-12	221-243	163-179
-24	1 7/8-12	270-298	199-220
-32	2 1/2-12	332-365	245-269

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

REFERENCE

**7.1.4 O-Ring Boss Hydraulic Fittings – Non-Adjustable**

1. Inspect O-ring (A) and seat (B) for dirt or obvious defects.
2. Check that O-ring (A) is **NOT** on threads and adjust if necessary.
3. Apply hydraulic system oil to O-ring.
4. Install fitting (C) into port until fitting is hand-tight.
5. Torque fitting (C) according to values in Table 7.7, page 84.
6. Check final condition of fitting.

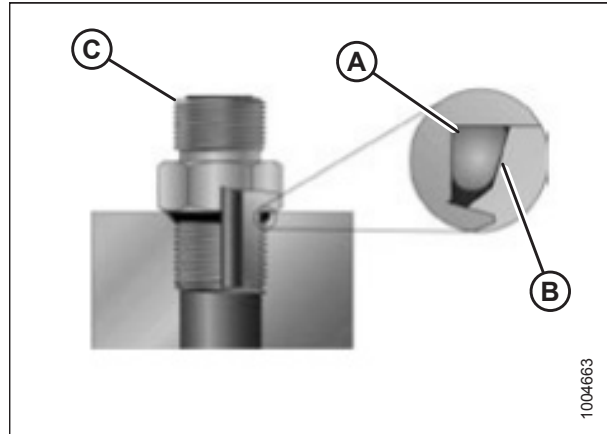


Figure 7.8: Hydraulic Fitting

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

SAE Dash Size	Thread Size (in.)	Torque Value <sup>4</sup>	
		Nm	lbf-ft (*lbf-in)
-2	5/16-24	6-7	*53-62
-3	3/8-24	12-13	*106-115
-4	7/16-20	19-21	14-15
-5	1/2-20	21-33	15-24
-6	9/16-18	26-29	19-21
-8	3/4-16	46-50	34-37
-10	7/8-14	75-82	55-60
-12	1 1/16-12	120-132	88-97
-14	1 3/8-12	153-168	113-124
-16	1 5/16-12	176-193	130-142
-20	1 5/8-12	221-243	163-179
-24	1 7/8-12	270-298	199-220
-32	2 1/2-12	332-365	245-269

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

### 7.1.5 O-Ring Face Seal Hydraulic Fittings

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



Figure 7.9: Hydraulic Fitting

2. Apply hydraulic system oil to O-ring (B).
3. Align tube or hose assembly so that flat face of sleeve (A) or (C) comes in full contact with O-ring (B).
4. Thread tube or hose nut (D) until hand-tight. The nut should turn freely until it is bottomed out.
5. Torque fittings according to values in Table 7.8, page 85.

**NOTE:**

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

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

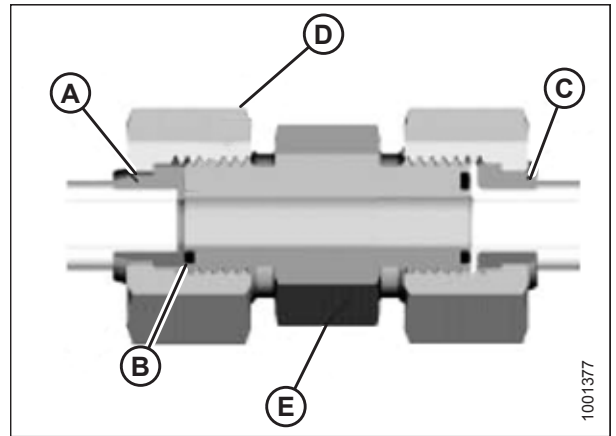


Figure 7.10: Hydraulic Fitting

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

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value <sup>5</sup>	
			Nm	lbf-ft
-3	Note <sup>6</sup>	3/16	-	-
-4	9/16	1/4	25-28	18-21
-5	Note <sup>6</sup>	5/16	-	-
-6	11/16	3/8	40-44	29-32
-8	13/16	1/2	55-61	41-45
-10	1	5/8	80-88	59-65
-12	1 3/16	3/4	115-127	85-94
-14	Note <sup>6</sup>	7/8	-	-

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

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

**REFERENCE**

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

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value <sup>7</sup>	
			Nm	lbf-ft
-16	1 7/16	1	150–165	111–122
-20	1 11/16	1 1/4	205–226	151–167
-24	1–2	1 1/2	315–347	232–256
-32	2 1/2	2	510–561	376–414

### 7.1.6 Tapered Pipe Thread Fittings

Assemble pipe fittings as follows:

1. Check components to ensure that fitting and port threads are free of burrs, nicks, scratches, or any form of contamination.
2. Apply pipe thread sealant (paste type) to external pipe threads.
3. Thread fitting into port until hand-tight.
4. Torque connector to appropriate torque angle. The turns from finger tight (TFFT) and flats from finger tight (FFFT) values are shown in Table 7.9, page 86. Make sure that tube end of a shaped connector (typically 45° or 90°) is aligned to receive incoming tube or hose assembly. Always finish alignment of fitting in tightening direction. Never back off (loosen) pipe threaded connectors to achieve alignment.
5. Clean all residue and any excess thread conditioner with appropriate cleaner.
6. Assess final condition of fitting. Pay special attention to possibility of cracks to port opening.
7. Mark final position of fitting. If a fitting leaks, disassemble fitting and check for damage.

**NOTE:**

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

**Table 7.9 Hydraulic Fitting Pipe Thread**

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

---

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

## 7.2 Lifting Equipment Requirements

The following topic describes the minimum equipment requirements for lifting headers.

### WARNING

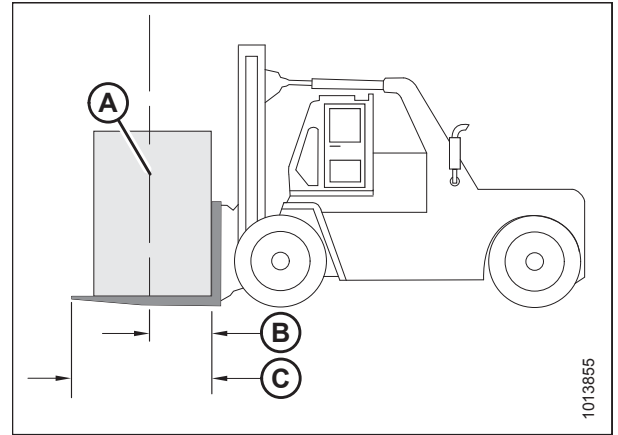
To avoid injury to bystanders from being struck by machinery, do NOT allow people to stand in unloading area.

### CAUTION

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

#### IMPORTANT:

Forklifts are normally rated for a load center 610 mm (24 in.) ahead of back end of the forks. To obtain the forklift capacity for a load center (A) at 1220 mm (48 in.) (B), check with your forklift distributor. The minimum fork length (C) is 1981 mm (78 in.).



**Figure 7.11: Minimum Lifting Capacity**

A - Load Center of Gravity  
 B - Load Center 1220 mm (48 in.) from Back of Forks  
 C - Minimum Fork Length 1981 mm (78 in.)

**Table 7.10 Lifting Vehicle Requirements**

<b>Minimum Capacity</b>	3178 kg (7000 lb.) at 1220 mm (48 in.) from back end of forks
<b>Minimum Fork Length</b>	1981 mm (78 in.)

**Table 7.11 Lifting Chain Requirements**

<b>Type</b>	Overhead lifting quality (1/2 in.)
<b>Minimum Load</b>	2270 kg (5000 lb.)

REFERENCE

## 7.3 Conversion Chart

Table 7.12 Conversion Chart

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

REFERENCE

## 7.4 Definitions

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

Term	Definition
API	American Petroleum Institute
ASTM	American Society of Testing and Materials
Bolt	A headed and externally threaded fastener that is designed to be paired with a nut
Cab-forward	Windrower operation with Operator and cab facing in direction of travel
CDM	Cab display module on a windrower
Center-link	A hydraulic cylinder link between header and machine used to change header angle
CGVW	Combined gross vehicle weight
D1 SP Series Header	MacDon D115, D120, D125, D130, D135, and D140 SP rigid draper headers
DDD	Double-draper drive
DK	Double knife
DKD	Double-knife drive
DR	Double reel
DWA	Double Windrow Attachment
Engine-forward	Windrower operation with Operator and engine facing in direction of travel
Export header	Header configuration typical outside North America
FFFT	Flats from finger tight
Finger tight	Finger tight is a reference position where sealing surfaces or components are making contact with each other, and fitting has been tightened to a point where fitting is no longer loose
GVW	Gross vehicle weight
Hard joint	A joint made with use of a fastener where joining materials are highly incompressible
Header	A machine that cuts and lays crop into a windrow and is attached to a windrower
Hex key	A tool of hexagonal cross-section used to drive bolts and screws that have a hexagonal socket in head (internal-wrenching hexagon drive); also known as an Allen key and various other synonyms
HDS	Hydraulic deck shift
hp	Horsepower
ISC	Intermediate Speed Control
JIC	Joint Industrial Council: A standards body that developed standard sizing and shape for original 37° flared fitting
Knife	A cutting device which uses a reciprocating cutter (also called a sickle)
M Series windrower	MacDon M100, M105, M150, M155, M155E4, M200, and M205 windrowers
MDS	Mechanical deck shift
n/a	Not applicable
North American header	Header configuration typical in North America

## REFERENCE

Term	Definition
NPT	National Pipe Thread: A style of fitting used for low-pressure port openings. Threads on NPT fittings are uniquely tapered for an interference fit
Nut	An internally threaded fastener that is designed to be paired with a bolt
ORB	O-ring boss: A style of fitting commonly used in port openings on manifolds, pumps, and motors
ORFS	O-ring face seal: A style of fitting commonly used for connecting hoses and tubes. This style of fitting is also commonly called ORS, which stands for O-ring seal
rpm	Revolutions per minute
SAE	Society of Automotive Engineers
Screw	A headed and externally threaded fastener that threads into preformed threads or forms its own thread into a mating part
SDD	Single-draped drive
Self-Propelled (SP) Windrower	Self-propelled machine consisting of a power unit with a header
SK	Single knife
SKD	Single-knife drive
Soft joint	A joint made with use of a fastener where joining materials are compressible or experience relaxation over a period of time
spm	Strokes per minute
SR	Single reel
Tension	Axial load placed on a bolt or screw, usually measured in Newtons (N) or pounds (lb.)
TFFT	Turns from finger tight
Timed knife drive	Synchronized motion applied at cutterbar to two separately driven knives from a single hydraulic motor
Torque	The product of a force X lever arm length, usually measured in Newton-meters (Nm) or foot-pounds (lbf·ft)
Torque angle	A tightening procedure where fitting is assembled to a precondition (finger tight) and then nut is turned farther a number of degrees to achieve its final position
Torque-tension	The relationship between assembly torque applied to a piece of hardware and axial load it induces in bolt or screw
UCA	Upper cross auger
Untimed knife drive	Unsynchronized motion applied at cutterbar to two separately driven knives from a single hydraulic motor or two hydraulic motors
Washer	A thin cylinder with a hole or slot located in the center that is to be used as a spacer, load distribution element, or locking mechanism
Windrower	Power unit for a header



# Predelivery Checklist

Perform these checks prior to delivery to your Customer. **Adjustments are normally not required as the machine is factory-assembled and adjusted.** 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.

## CAUTION

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

Header Serial Number: \_\_\_\_\_

### Predelivery Checklist for D1 Series Draper Headers – North America

✓	Item	Reference
	Check for shipping damage or missing parts. Be sure all shipping dunnage is removed.	—
	Check for loose hardware. Tighten to required torque.	<i>7.1 Torque Specifications, page 79</i>
	Check tire pressure (Transport/Stabilizer option).	<i>5.1 Checking Tire Pressure – Transport and Stabilizer Wheels, page 51</i>
	Check wheel bolt torque (Transport/Stabilizer option).	<i>5.2 Checking Wheel Bolt Torque, page 52</i>
	Check knife drive box breather position.	<i>5.3 Checking Knife Drive Box, page 53</i>
	Check knife drive box lube level.	<i>5.3 Checking Knife Drive Box, page 53</i>
	Check knife drive belt(s) tension.	<i>5.4 Checking and Adjusting Knife Drive Belt Tension, page 55</i>
	Check if reel is centered between header endsheets.	<i>5.5 Centering the Reel, page 58</i>
	Grease all bearings and U-joints.	<i>5.13 Lubricating Header, page 74</i>
	Check draper tension.	<i>5.6 Adjusting Draper Tension, page 60</i>
	Check draper seal.	<i>5.7 Checking and Adjusting Draper Seal, page 62</i>
	Check reel tine to cutterbar clearance.	<i>5.11.1 Measuring Reel Clearance, page 67</i>
	Check if skid shoes are evenly adjusted an appropriate setting for first crop.	<i>5.8 Checking and Adjusting Skid Shoe Settings, page 64</i>
	Check fit of endshields.	<i>5.12 Checking and Adjusting Endshields, page 70</i>
	Check that header is level.	<i>5.9 Leveling the Header, page 65</i>
	Check header float.	<i>5.10 Checking and Adjusting the Float, page 66</i>
	Check hydraulic hose and wiring harness routing for clearance when raising or lowering header and reel.	—
	<b>Run-up procedure</b>	<i>6 Running up the Header, page 77</i>
	Check if the knife drive pulley(s) is rotating in proper direction: clockwise on left side; counterclockwise on right side (double knife only).	<i>5.4 Checking and Adjusting Knife Drive Belt Tension, page 55</i>
	Check if lights are functional.	—
	Check if reel lift cylinders extend fully.	—

**REFERENCE**

✓	Item	Reference
	Check if reel moves fully fore and aft.	—
<b>Post run-up check. Stop engine.</b>		<i>6.1 Performing Post Run-Up Adjustments, page 77</i>
	Check belt drives for heated bearings.	<i>5.4 Checking and Adjusting Knife Drive Belt Tension, page 55</i>
	Check knife sections for discoloration caused by misaligned components.	<i>6.1.1 Adjusting Knife, page 78</i>
	Check for hot spots on the cutterbar above the draper seal. Adjust deck height as required.	<i>5.7 Checking and Adjusting Draper Seal, page 62</i>
	Check for hydraulic leaks.	—
	Check that manual storage case contains operator's manual and parts catalog.	<i>5.14 Checking Manuals, page 76</i>

**Date checked:**

**Checked by:**



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