

# **D65**

# **Draper Header for Windrowers**

Unloading and Assembly Instruction (North America)

214328 Revision A

2018 Model Year

Original Instruction

## D65 Draper Header for Windrowers



1003985

Published: June 2017

# Introduction

This instruction manual describes the unloading, setup, and predelivery requirements for the MacDon D65 Draper Header for Windrowers.

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

Some sections/steps apply to multiple header configurations and sizes. Refer to instructions for your specific header.

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

Retain this instruction for future reference.

## **NOTE:**

Keep your MacDon publications up-to-date. The latest version can be downloaded from our website ([www.macdon.com](http://www.macdon.com)) or from our Dealer portal (<https://portal.macdon.com>) (login required).

This instruction is available in the English language only.



# List of Revisions

The following list provides an account of major changes from the previous version of this document.

Summary of Change	Location
Removed images of reel shipping brace bolts and tags from beginning of topic; intended for export version only.	<a href="#">3.1 Attaching Reel Lift Cylinders, page 17</a>
Moved Assembling the Header chapter before the Attaching Header to Windrower chapter.	<ul style="list-style-type: none"> <li>• <a href="#">3 Assembling Header, page 17</a></li> <li>• <a href="#">4 Attaching Header to Windrower, page 35</a></li> </ul>
Added note about removing shipping wires from reel tines one row at a time.	<a href="#">3.2 Attaching Cam Arms, page 24</a>
Added step to check/remove lateral movement.	<a href="#">3.5 Installing Crop Dividers with Latch Option, page 27</a>
Bundles MD B#5426 and MD B#5194 superseded by MD B#5577.	<a href="#">4.2 Connecting Hydraulics, page 44</a>
Added important note to reposition breather plugs on both sides of a dual knife header.	<a href="#">5.4 Checking Knife Drive Box, page 53</a>
Deleted step as per product support feedback.	<a href="#">5.7.1 Checking Pointed Guard Hold-Downs, page 57</a>
Moved topics to keep all reel checking and adjusting topics together.	<a href="#">5.9 Measuring and Adjusting Reel Clearance to Cutterbar, page 64</a>
Added reel cam checking topic.	<a href="#">5.9.1 Checking and Adjusting Reel Cam, page 64</a>
<ul style="list-style-type: none"> <li>• Reorganized list per Product Support feedback</li> <li>• Added check knife hold-down</li> <li>• Added check for and remove all shipping wires and strapping</li> </ul>	<a href="#">Predelivery Checklist, page 99</a>



## TABLE OF CONTENTS

Introduction .....	i
List of Revisions .....	iii
<b>Chapter 1: Safety .....</b>	<b>1</b>
1.1 Signal Words .....	1
1.2 General Safety .....	2
1.3 Safety Signs .....	4
<b>Chapter 2: Unloading Header .....</b>	<b>5</b>
2.1 Unloading Header from Trailer .....	5
2.2 Lowering Header .....	7
2.2.1 Lowering Single-Reel Header .....	7
2.2.2 Lowering Double-Reel Header .....	9
2.3 Removing Shipping Supports .....	13
<b>Chapter 3: Assembling Header .....</b>	<b>17</b>
3.1 Attaching Reel Lift Cylinders .....	17
3.2 Attaching Cam Arms .....	24
3.3 Opening Endshield .....	25
3.4 Removing Crop Dividers from Storage .....	26
3.5 Installing Crop Dividers with Latch Option .....	27
3.6 Installing Crop Dividers without Latch Option .....	28
3.7 Closing Endshield .....	29
3.8 Installing Crop Divider Rods .....	30
3.9 Positioning Transport Lights .....	31
3.10 Installing Options .....	32
3.11 Adding Tire Ballast .....	33
<b>Chapter 4: Attaching Header to Windrower .....</b>	<b>35</b>
4.1 Connecting Center-Link .....	37
4.1.1 Mechanical Link .....	37
4.1.2 Hydraulic Link without Self-Alignment Kit .....	39
4.1.3 Hydraulic Link with Optional Self-Alignment Kit .....	42
4.2 Connecting Hydraulics .....	44
<b>Chapter 5: Performing Predelivery Checks .....</b>	<b>49</b>
5.1 Checking and Adjusting Skid Shoes .....	49
5.2 Checking Transport/Stabilizer Tire Pressure .....	51
5.3 Checking Wheel Bolt Torque .....	52
5.4 Checking Knife Drive Box .....	53
5.5 Checking and Adjusting Non-Timed Knife Drive Belt Tension .....	54

## TABLE OF CONTENTS

5.6 Checking and Adjusting Timed Double-Knife Drive Belt Tension .....	55
5.7 Checking and Adjusting Knife Hold-Downs .....	57
5.7.1 Checking Pointed Guard Hold-Downs .....	57
Adjusting Pointed Guard Hold-Downs .....	58
Adjusting Hold-Down at Double-Knife Center Pointed Guard .....	58
5.7.2 Checking Stub Guard Hold-Downs .....	59
Adjusting Stub Guard Hold-Downs .....	60
5.8 Centering Reel .....	62
5.9 Measuring and Adjusting Reel Clearance to Cutterbar .....	64
5.9.1 Checking and Adjusting Reel Cam .....	64
5.9.2 Measuring Reel Clearance .....	65
5.9.3 Adjusting Reel Clearance .....	67
5.10 Checking and Adjusting Draper Tension .....	68
5.11 Checking Draper Seal .....	71
5.12 Leveling Header .....	73
5.13 Checking and Adjusting Endshields .....	74
5.14 Lubricating Header .....	75
5.14.1 Greasing Procedure .....	75
5.14.2 Lubrication Points .....	75
5.15 Checking Manuals .....	80
<b>Chapter 6: Running up Header .....</b>	<b>81</b>
6.1 Performing Post Run-Up Adjustments .....	82
6.1.1 Adjusting Knife and Guards .....	82
<b>Chapter 7: Reference .....</b>	<b>85</b>
7.1 Torque Specifications .....	85
7.1.1 SAE Bolt Torque Specifications .....	85
7.1.2 Metric Bolt Specifications .....	87
7.1.3 Metric Bolt Specifications Bolting into Cast Aluminum .....	89
7.1.4 Flare-Type Hydraulic Fittings .....	90
7.1.5 O-Ring Boss (ORB) Hydraulic Fittings (Adjustable) .....	91
7.1.6 O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable) .....	93
7.1.7 O-Ring Face Seal (ORFS) Hydraulic Fittings .....	94
7.1.8 Tapered Pipe Thread Fittings .....	95
7.2 Conversion Chart .....	96
7.3 Definitions .....	97
<b>Predelivery Checklist .....</b>	<b>99</b>



# 1 Safety

## 1.1 Signal Words

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



### **DANGER**

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



### **WARNING**

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



### **CAUTION**

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

## 1.2 General Safety

### CAUTION

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

Protect yourself.

- When assembling, operating, and servicing machinery, wear all protective clothing and personal safety devices that could be necessary for job at hand. Do **NOT** take chances. You may need the following:
  - Hard hat
  - Protective footwear with slip resistant soles
  - Protective glasses or goggles
  - Heavy gloves
  - Wet weather gear
  - Respirator or filter mask
- Be aware that exposure to loud noises can cause hearing impairment or loss. Wear suitable hearing protection devices such as earmuffs or ear plugs to help protect against loud noises.



Figure 1.1: Safety Equipment



Figure 1.2: Safety Equipment

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

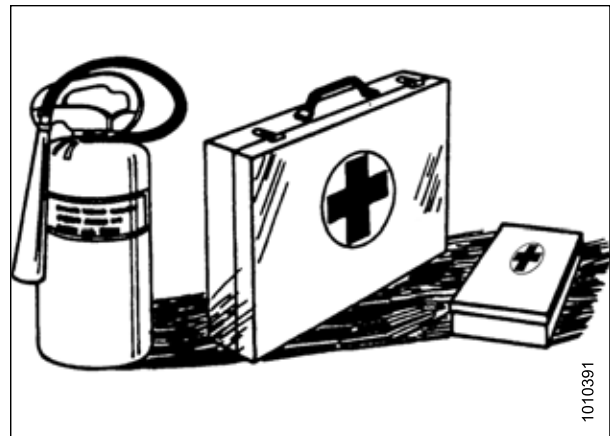


Figure 1.3: Safety Equipment

## 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 engine is running.
- Do **NOT** modify machine. Unauthorized modifications may impair machine function and/or safety. It may also shorten machine's life.
- To avoid bodily injury or death from unexpected startup of machine, **ALWAYS** stop the engine and remove the key from the ignition before leaving the operator's seat for any reason.

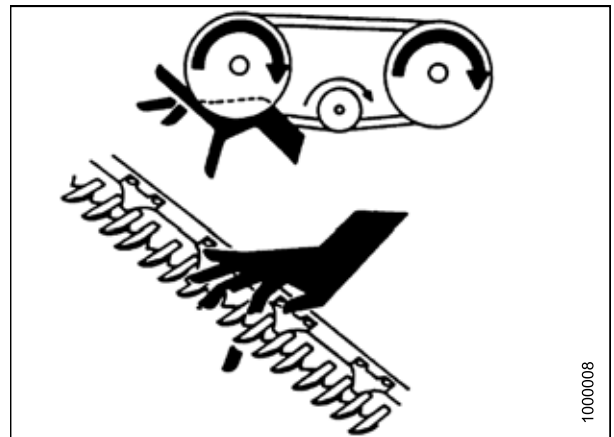


Figure 1.5: Safety around Equipment

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



Figure 1.6: Safety around Equipment

## 1.3 Safety Signs

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

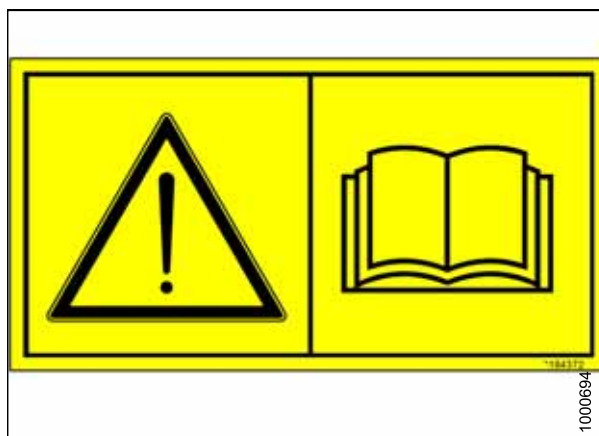


Figure 1.7: Operator's Manual Decal

## 2 Unloading Header

Perform all procedures in the order they are listed.

### 2.1 Unloading Header from Trailer

The following procedure applies when two headers are shipped on a 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 requirements specified below. Using inadequate equipment may result in chain breakage, vehicle tipping, or machine damage.

#### IMPORTANT:

Forklifts are normally rated with load centered 610 mm (24 in.) from 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

	15–25 Foot Header	30–40 Foot Header
<b>Minimum Lifting Capacity</b>	2270 kg (5000 lb.) load center (A) at 1220 mm (48 in.) (B) from back of forks	3178 kg (7000 lb.) load center (A) at 1220 mm (48 in.) (B) from back of forks
<b>Minimum Fork Length (C)</b>	1981 mm (78 in.)	

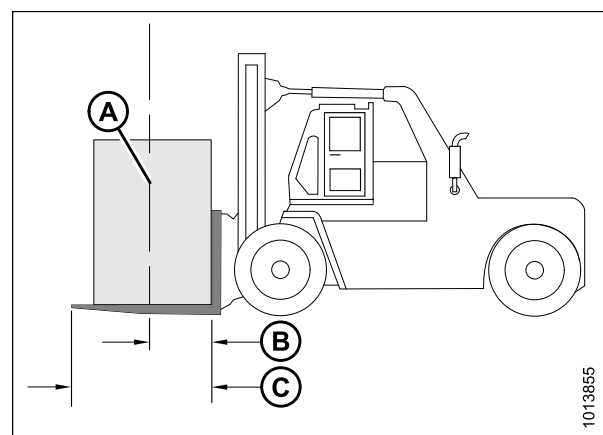


Figure 2.1: Minimum Lifting Capacity

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 headers from a trailer, follow these steps:

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

#### IMPORTANT:

Avoid lifting second header and ensure forks do not interfere with shipping frame. If forks contact second header, damage to headers may occur.

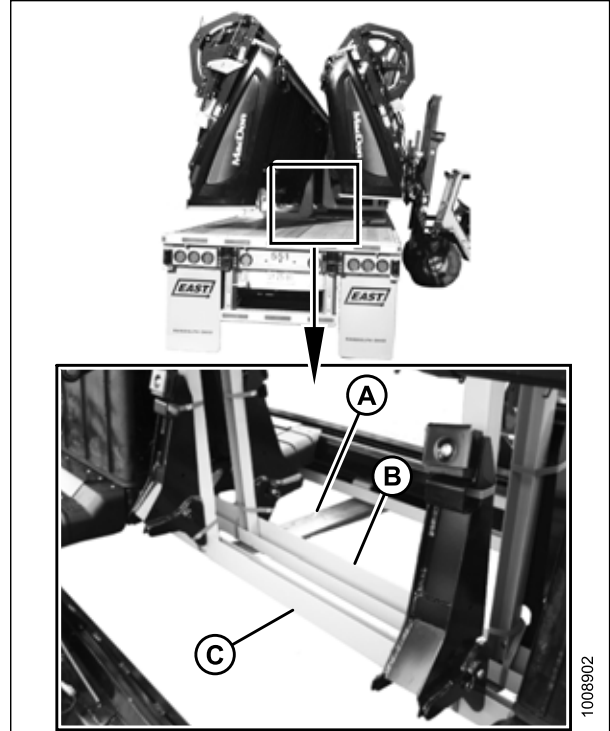
## UNLOADING HEADER

3. Approach header and line up forks (A) with fork slider channels (B) under adapter frame.
4. Approach header and slide forks (A) underneath shipping support (B) as far as possible without contacting shipping support of opposite header (C).
5. Remove hauler's tie-down straps, chains, and wooden blocks.

### **WARNING**

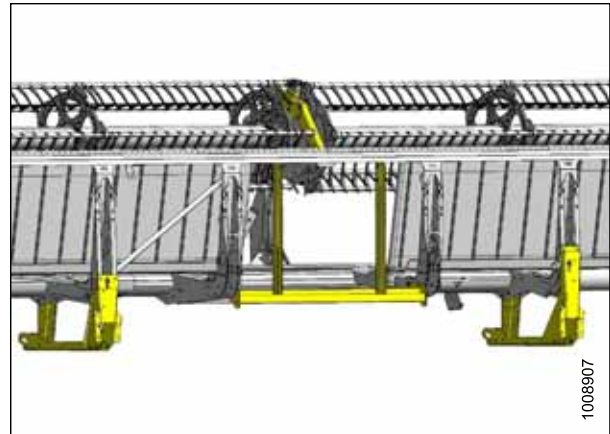
**Be sure forks are secure before moving away from load. Stand clear when lifting.**

6. Slowly raise header off trailer deck.
7. Back up until unit clears trailer and slowly lower to 150 mm (6 in.) from ground.



**Figure 2.2: Header Shipping Supports**

8. Take header to storage or setup area. Ensure ground is flat and free of rocks or debris that could damage header.
9. Repeat Steps 3, page 6 to 8, page 6 for second header.
10. Check for shipping damage and missing parts.



**Figure 2.3: Header after Unloading**

## 2.2 Lowering Header

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

- [2.2.1 Lowering Single-Reel Header, page 7](#)
- [2.2.2 Lowering Double-Reel Header, page 9](#)

### 2.2.1 Lowering Single-Reel Header

Reposition 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 frame and secure other end to lifting vehicle.

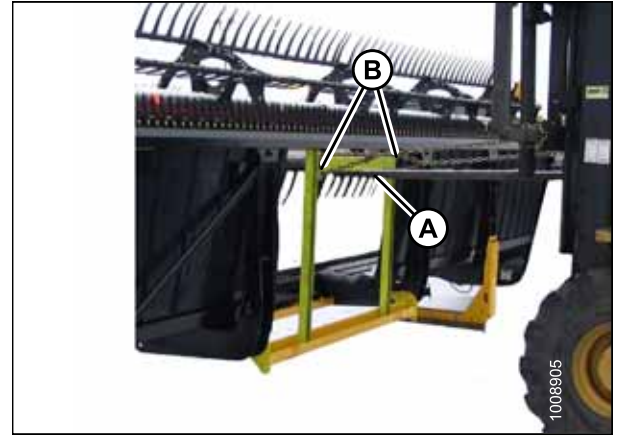


Figure 2.4: Single-Reel Header



## UNLOADING HEADER

### CAUTION

Stand clear when lowering, as machine may swing.

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

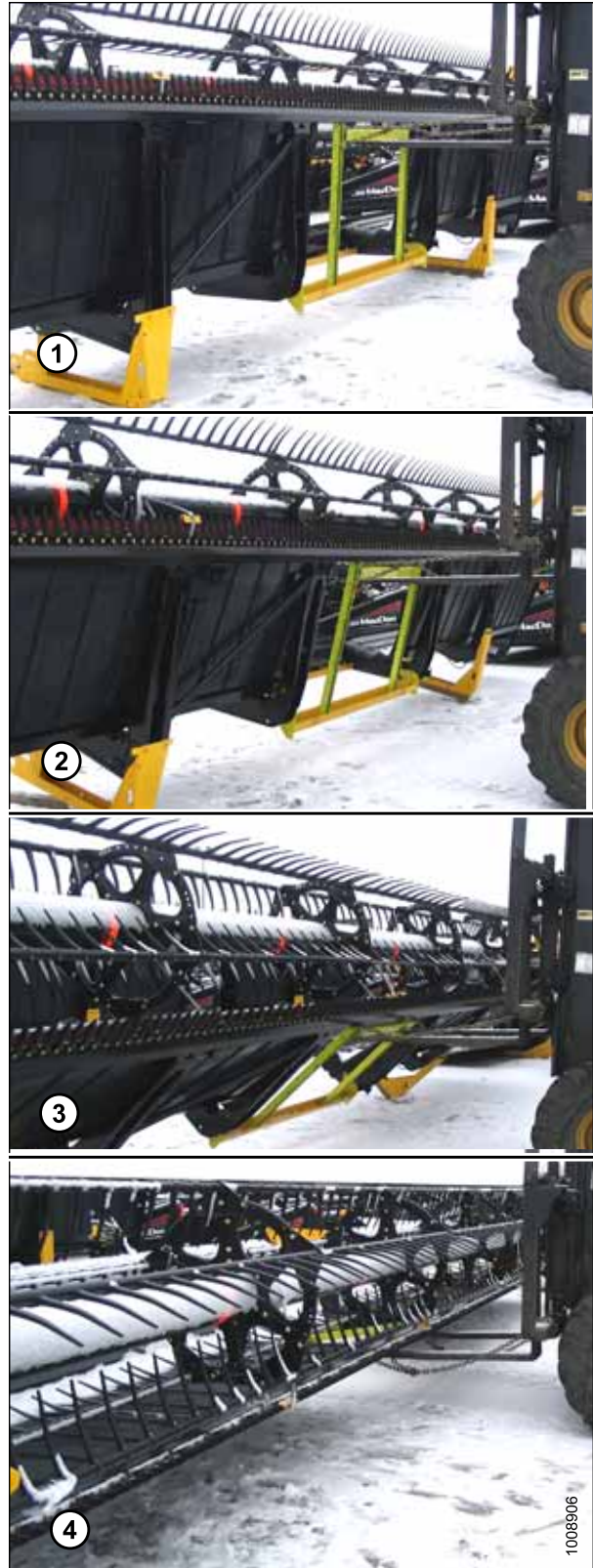


Figure 2.5: Lowering Header



## UNLOADING HEADER

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

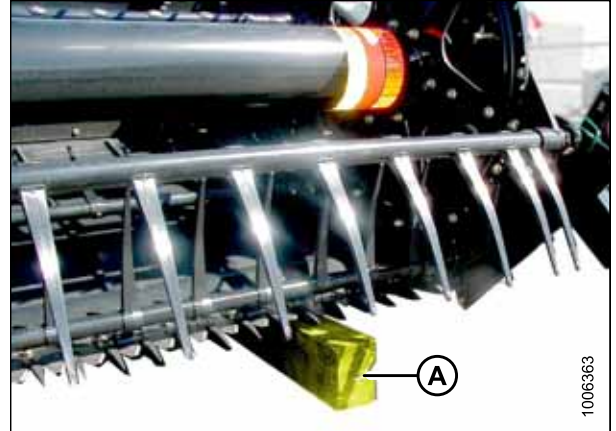


Figure 2.6: Blocks at Each End and Center of Cutterbar

8. Lower header stand: pull pin (A), lower stand (B), and releasing pin (A) to secure stand in place.
9. Lower header onto stand.

**NOTE:**

If ground is soft, place a block under the stand.

10. Remove chain.

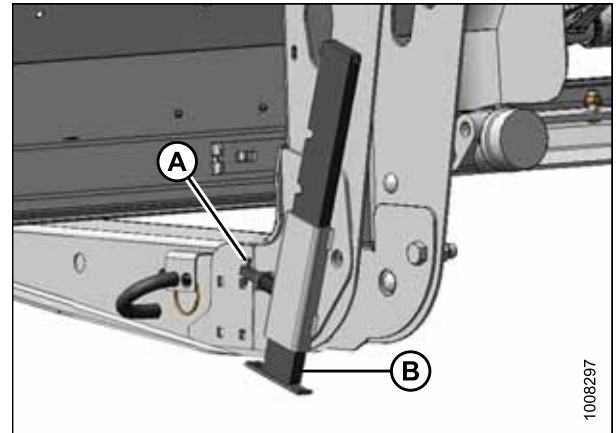


Figure 2.7: Header Stand

### 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.

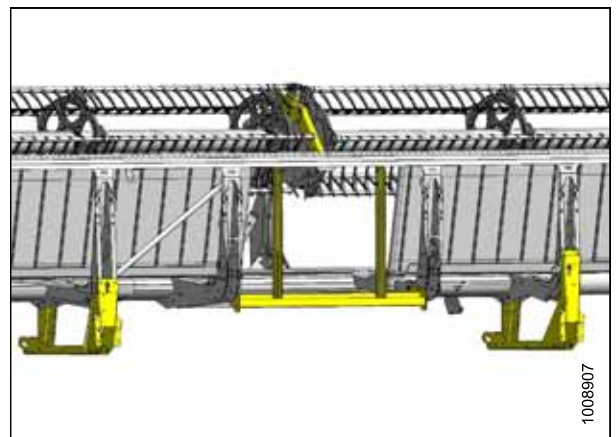


Figure 2.8: Header on Shipping Stands

## UNLOADING HEADER

3. Attach a chain to shipping support (A) at center of header.

**IMPORTANT:**

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

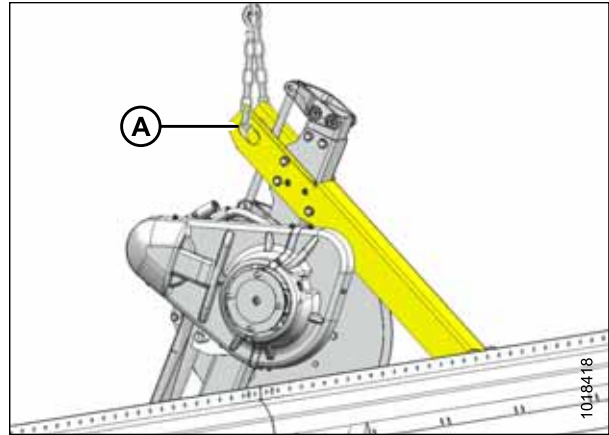


Figure 2.9: Double Reel Shipping Support

## UNLOADING HEADER

### **CAUTION**

Stand clear when lowering, as machine may swing.

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



Figure 2.10: Lowering Header

## UNLOADING HEADER

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

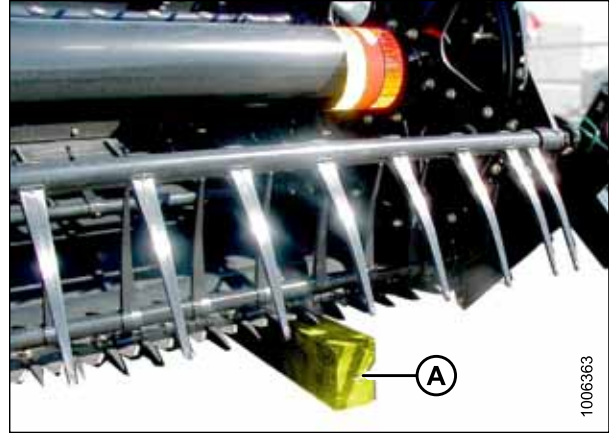


Figure 2.11: Blocks at Each End and Center of Cutterbar

8. Lower header stand: pull pin (A), lower stand (B), and release pin (A) to secure stand in place.

9. Lower header onto stand.

**NOTE:**

If ground is soft, place a block under the stand.

10. Remove chain.

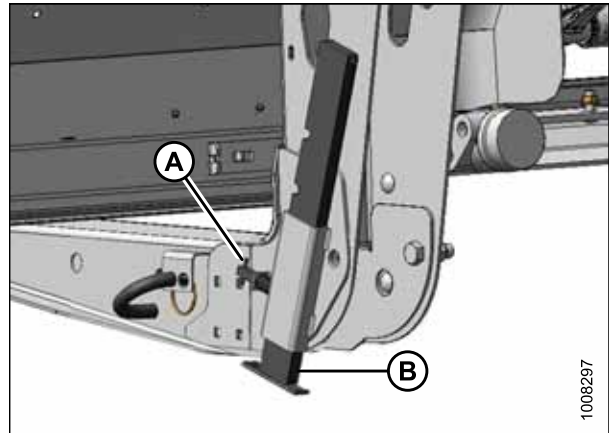


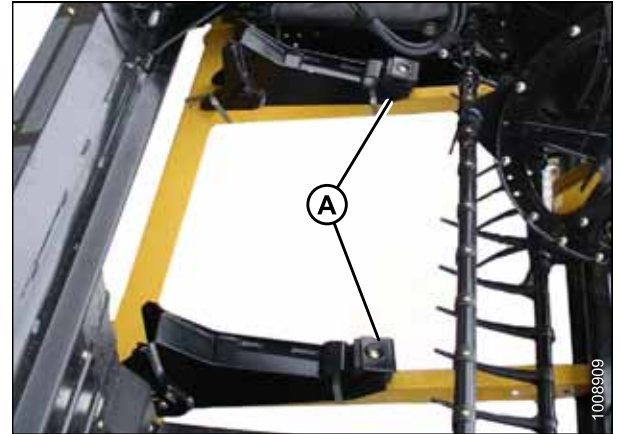
Figure 2.12: Header Stand

## 2.3 Removing Shipping Supports

**NOTE:**

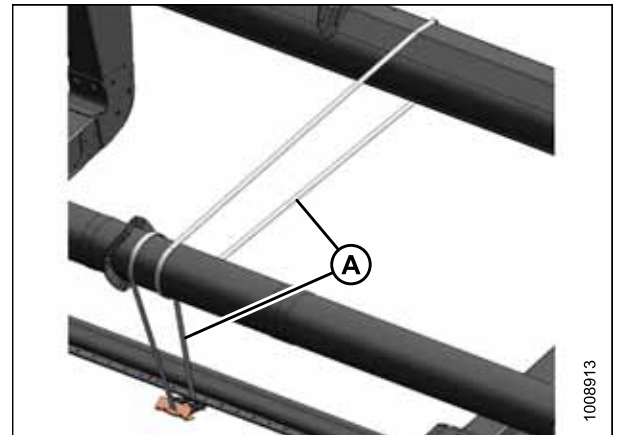
Unless otherwise specified, discard all shipping materials and hardware.

1. Cut straps and remove header boots (A) from shipping support. Set boots aside for reinstallation.



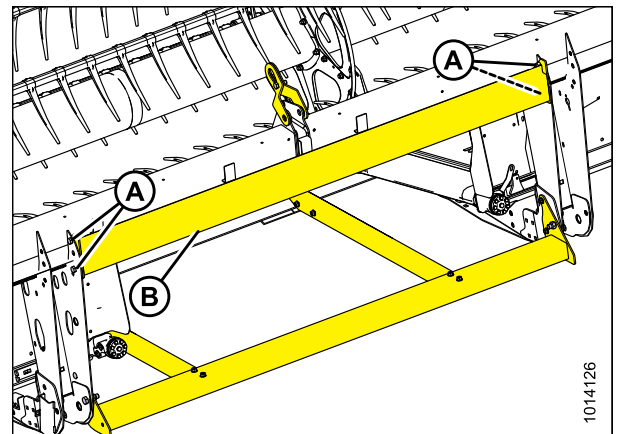
**Figure 2.13: Straps, Header Boots, and Shipping Supports**

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



**Figure 2.14: Single Reel**

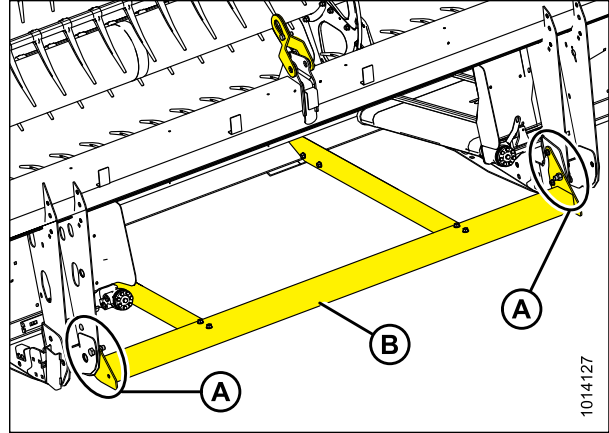
3. Remove four bolts (A) securing upper support (B) to header legs and remove support.



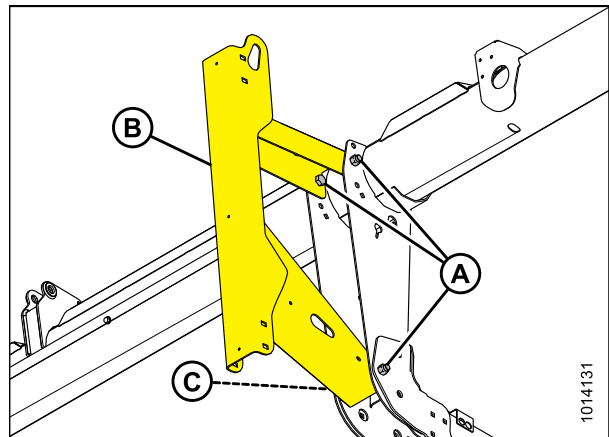
**Figure 2.15: Upper Support**

## UNLOADING HEADER

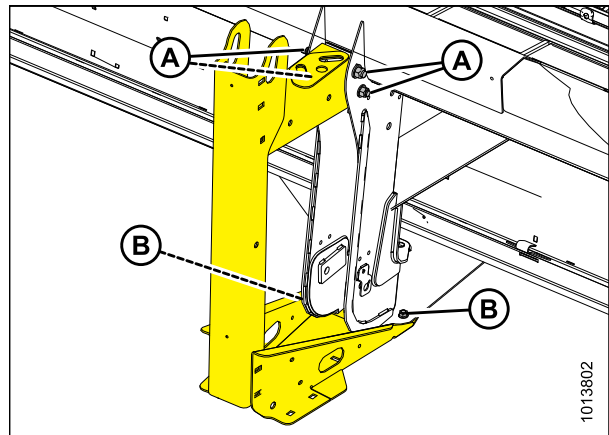
4. Remove six bolts (A) securing lower support (B) to header legs, and remove support.



5. **15-, 20-, and 25-foot:** Remove two bolts (A) from top of shipping stand (B).
6. **15-, 20-, and 25-foot:** Remove one remaining bolt (A) from bottom of stand. Remove shipping stand.
7. Repeat for opposite side.



8. **30-foot and larger:** Remove four bolts (A) and two bolts (B) from shipping stands at both outboard header legs, and then remove shipping stands.



## UNLOADING HEADER

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

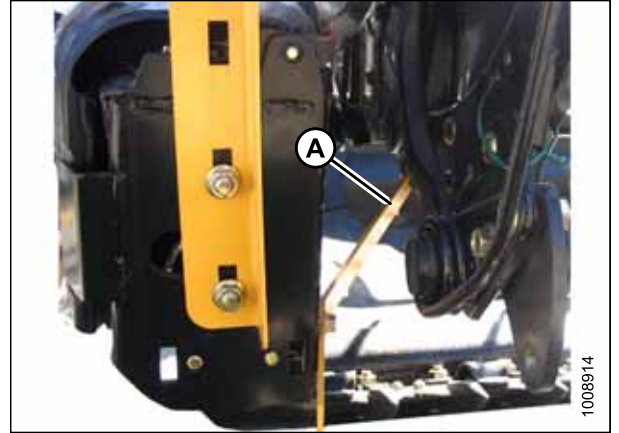


Figure 2.19: Anti-Rotation Brace





### 3 Assembling Header

Perform all procedures in the order they are listed.

#### 3.1 Attaching Reel Lift Cylinders

Unless otherwise stated, the following procedure applies to single- and double-reel headers.

1. Remove two top bolts (A) on outboard reel arm supports. Repeat for opposite side.

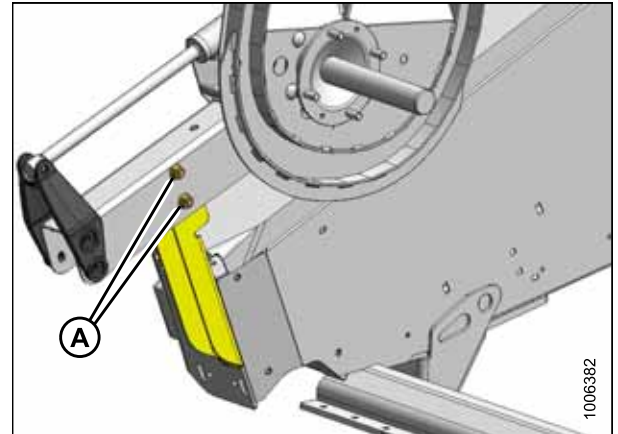


Figure 3.1: Reel Outboard Support Arm

2. **Double-reel headers:** Remove two top bolts (A) on center reel arm to allow center reel arm to move.

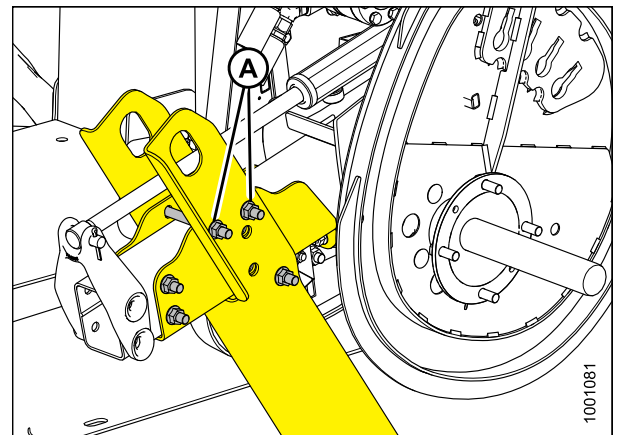


Figure 3.2: Reel Center Arm: Double-Reel Header

## ASSEMBLING HEADER

3. Position sling (A) around reel tube (B) close to outboard end of reel, and attach sling to a forklift (or equivalent).
4. Remove shipping wire/banding from reel lift cylinder.

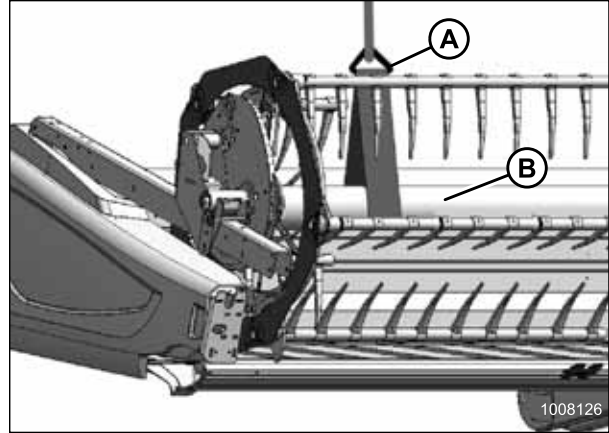


Figure 3.3: Right End Reel Lift

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

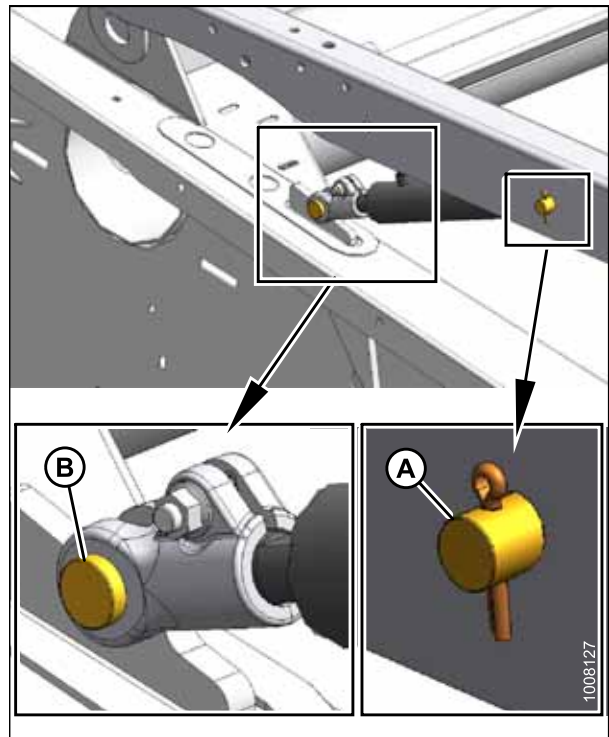


Figure 3.4: Reel Right Arm

## ASSEMBLING HEADER

8. **Double reel:** Position sling (A) around reel tube near reel center support arm. Raise lifting device to relieve load on shipping supports.

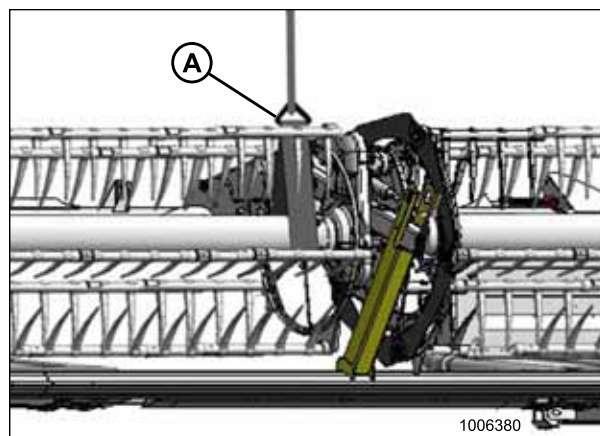


Figure 3.5: Lifting Double Reel

9. **Double reel:** Lift reel to gain access to center lift cylinder.
10. **Double reel:** Remove shipping wire and banding from reel center lift cylinder. Remove socket head bolt and nut from cylinder rod.
11. **Double reel:** Lift reel so that hole in lift cylinder rod lines up with mounting hole (A) in reel arm.
12. **Double reel:** Attach rod end of cylinder to reel arm with socket head bolt and nut (A). Access hardware through holes in reel arm braces (C).
13. **Double reel:** Torque bolt and nut (A) to 54–61 Nm (40–45 lbf-ft).
14. **Double reel:** Remove pin at barrel end of cylinder.
15. **Double reel:** Adjust reel height so pin (B) can be installed at barrel end of cylinder and mounting structure.
16. Reposition sling (A) around reel tube near opposite outboard reel arm.
17. Remove shipping wire and banding from reel lift cylinder.

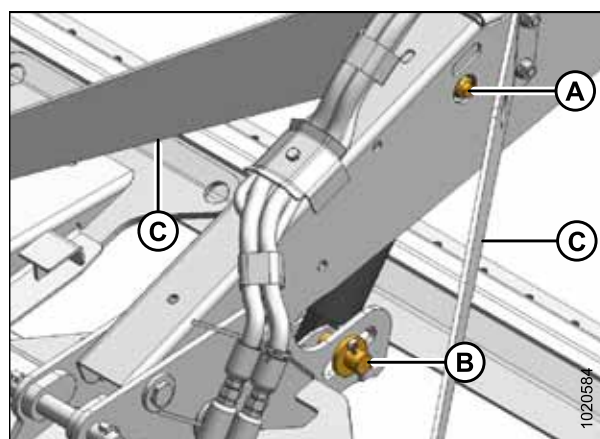


Figure 3.6: Reel Arm Braces

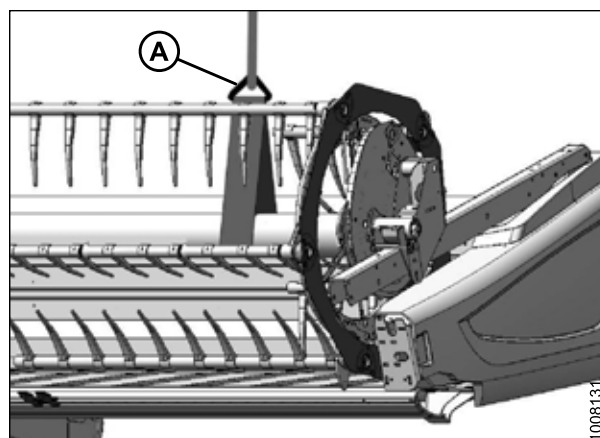
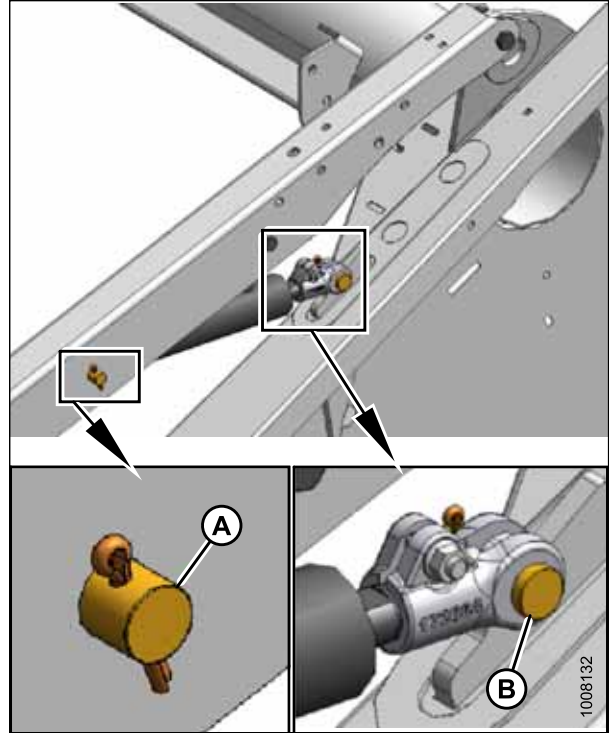


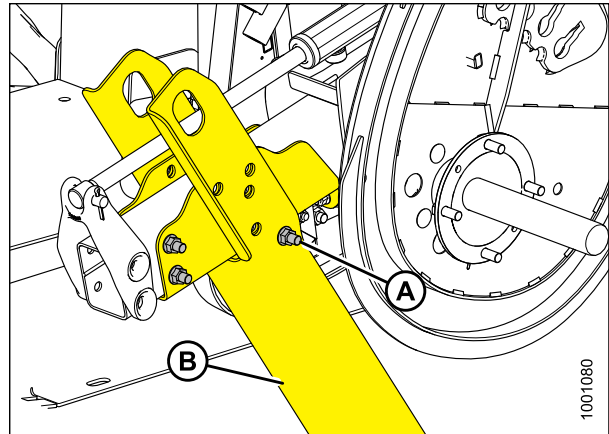
Figure 3.7: Left End Reel Lift

## ASSEMBLING HEADER

18. Lift reel and remove pins from endsheet and reel arm.
19. Align reel lift cylinder mounting holes until they line up with lug on endsheet and hole in reel arm.
20. Secure cylinder to endsheet and reel arm with clevis pins (A) and (B) as shown.
  - Insert cotter pin into clevis pin (A) at **OUTBOARD** side of reel arm
  - Insert cotter pin into clevis pin (B) at **INBOARD** side of endsheet



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



## ASSEMBLING HEADER

22. Remove bolts (A) from reel arm support at endsheet, and remove support. Repeat at other side.

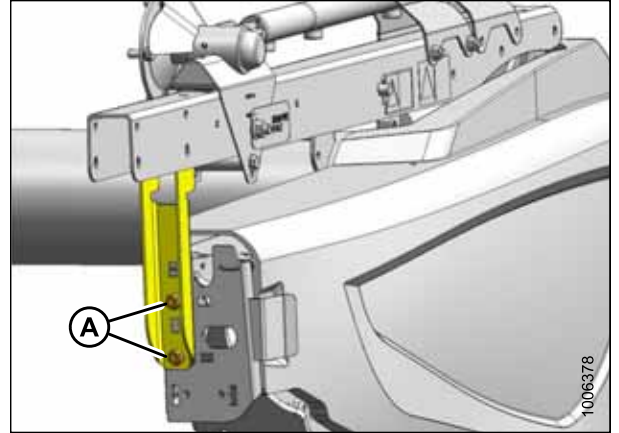


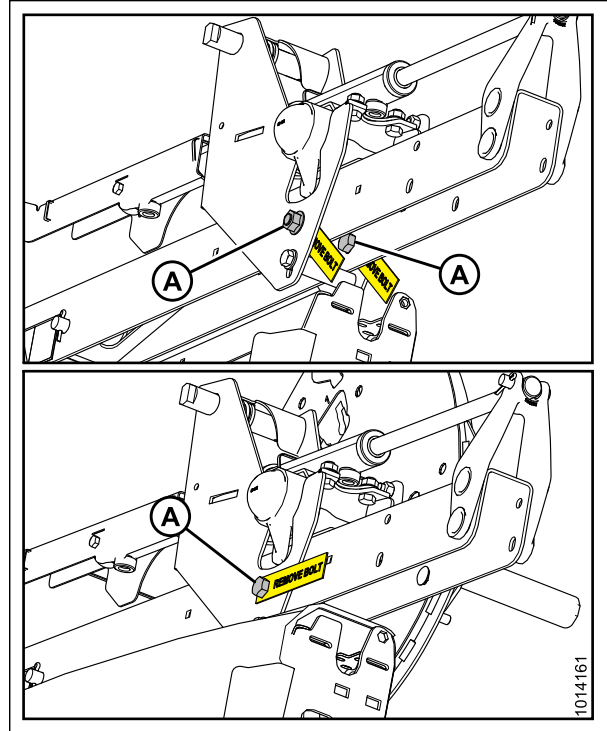
Figure 3.10: Reel Outboard Arm Support

## ASSEMBLING HEADER

23. Remove brace bolts (A) and tags locking reel fore-aft position at outer reel arms.

**IMPORTANT:**

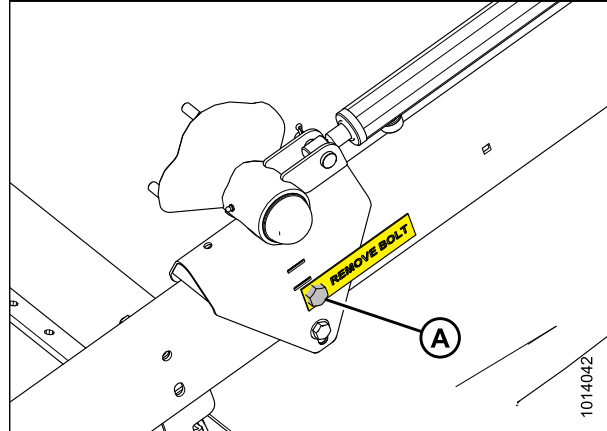
To prevent damaging fore-aft cylinders or structure, do **NOT** use fore-aft cylinders to assist with removing bolts.



**Figure 3.11: Reel Right Arm**

Top Image - Single Reel

Bottom Image - Double Reel



**Figure 3.12: Reel Left Arm**

## ASSEMBLING HEADER

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

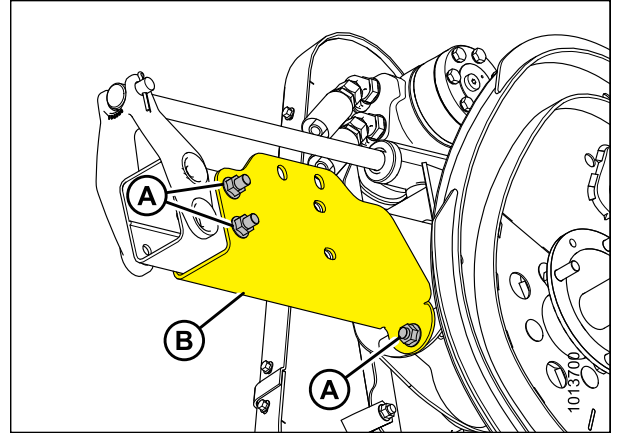


Figure 3.13: Reel Center Arm Shipping Channel (Double-Reel Header)



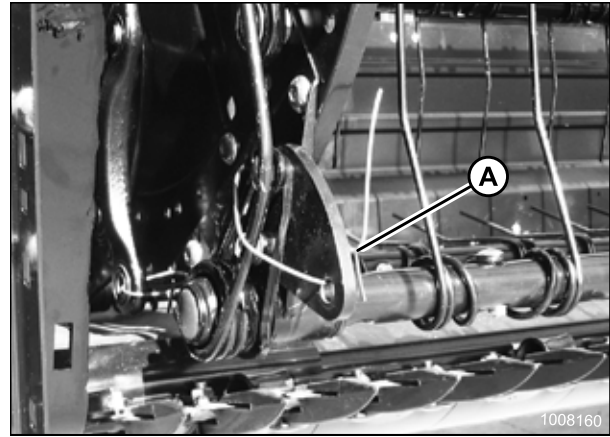
## 3.2 Attaching Cam Arms

To attach reel cam arms, follow these steps:

1. Rotate reel manually to access the tine tube cranks (A) that are not connected to cam links.
2. Remove shipping wires one row at a time.

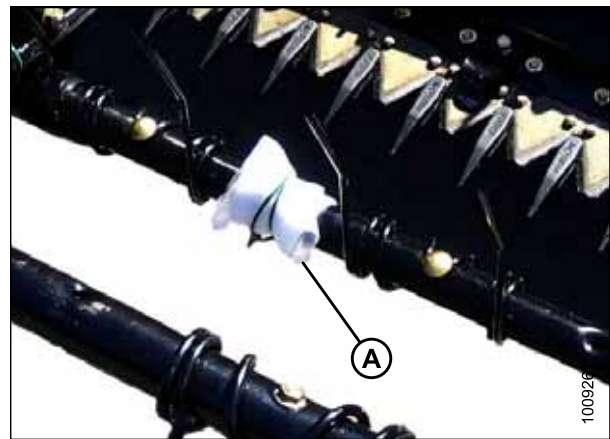
**NOTE:**

To prevent reel cams from rotating over center, remove shipping wires one row at a time.



**Figure 3.14: Disconnected Cam Links and Shipping Wire**

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



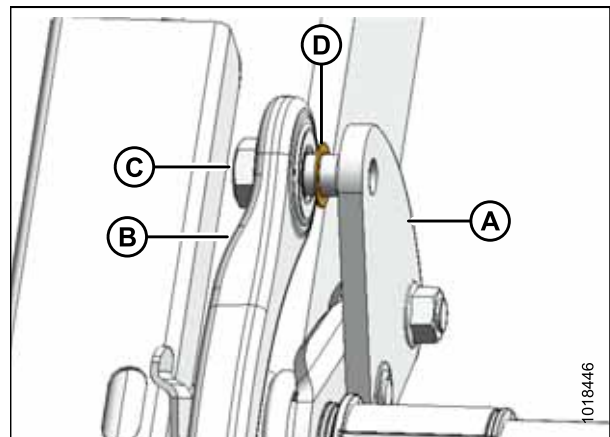
**Figure 3.15: Hardware Bag Right Reel**

4. Rotate tine tube crank (A) and position link (B) so attachment holes in bar crank are aligned with hole in link.
5. 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.

6. Realign link (B) and tine bar crank (A), and thread in bolt (C).
7. Repeat for remaining tine bars and torque bolts to 165 Nm (120 lbf·ft).



**Figure 3.16: Tine Bar Crank and Link**



### 3.3 Opening Endshield

1. Remove lynch pin (A) and tool (B) from pin (C) at top rear of endshield.

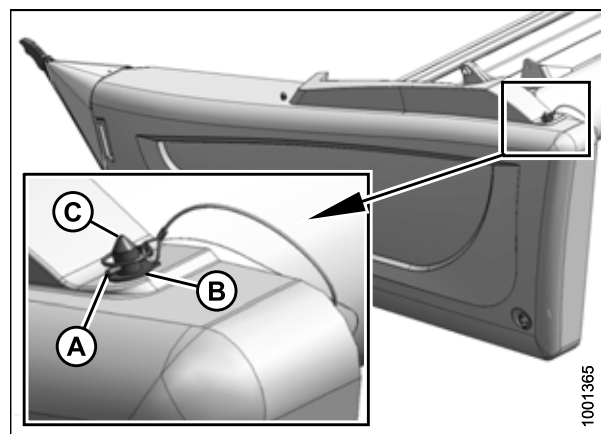


Figure 3.17: Left Endshield

2. Use tool (B) to unlock latch (A) at lower rear corner of endshield.
3. Lift endshield at aft end to clear pin at top rear of endshield.
4. Swing endshield out and away from header while maintaining forward pressure to prevent endshield from slipping out of tab (C) at front of endsheet.

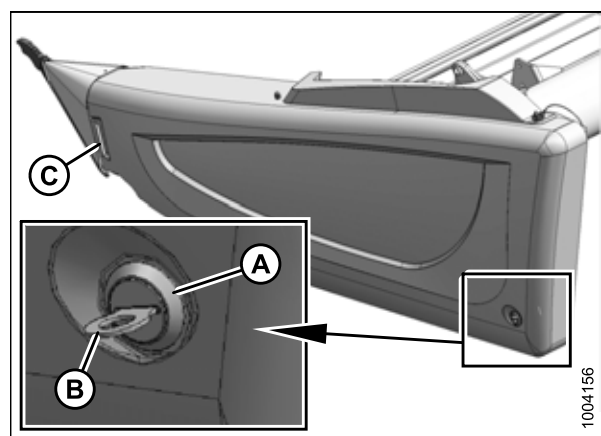


Figure 3.18: Left Endshield

**IMPORTANT:**

Do **NOT** force endshield once it has reached its end of travel or damage to endshield structure may result. The endshield is designed to open sufficiently to allow access to drive system and manual case.

**NOTE:**

To access the knife drive box, carefully disengage front of endshield from tab at front of endsheet and swing front of endshield away from header.

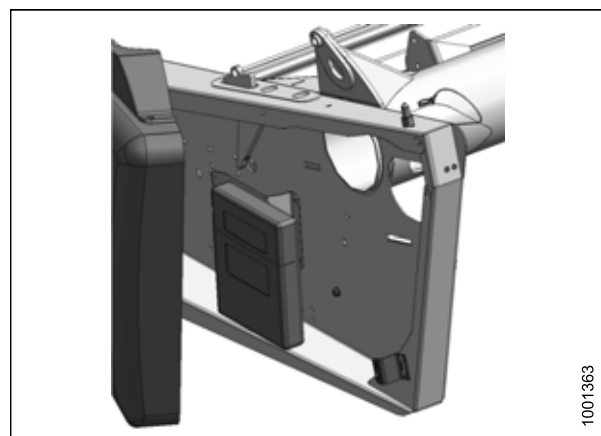


Figure 3.19: Left Endshield Open

### 3.4 Removing Crop Dividers from Storage

Crop dividers are shipped attached to inboard side of endsheets. To remove crop dividers, follow these steps:

1. Open endshields. Refer to [3.3 Opening Endshield, page 25](#).
2. Support crop divider and remove shipping wire at front end (A).
3. Remove bolt (B).
4. Remove bolt with washer (C) and retain for installation.
5. Repeat above steps for opposite end.

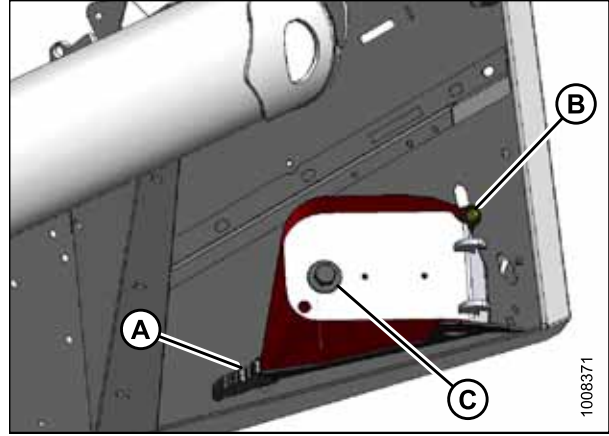


Figure 3.20: Crop Divider Storage

### 3.5 Installing Crop Dividers with Latch Option

1. If not already open, open endshields. Refer to [3.3 Opening Endshield, page 25](#).
2. Position crop divider as shown by inserting lugs (A) into holes in endsheet.
3. Lift forward end of divider until pin (B) engages and closes latch (C).
4. Push safety lever (D) down to lock pin in latch.

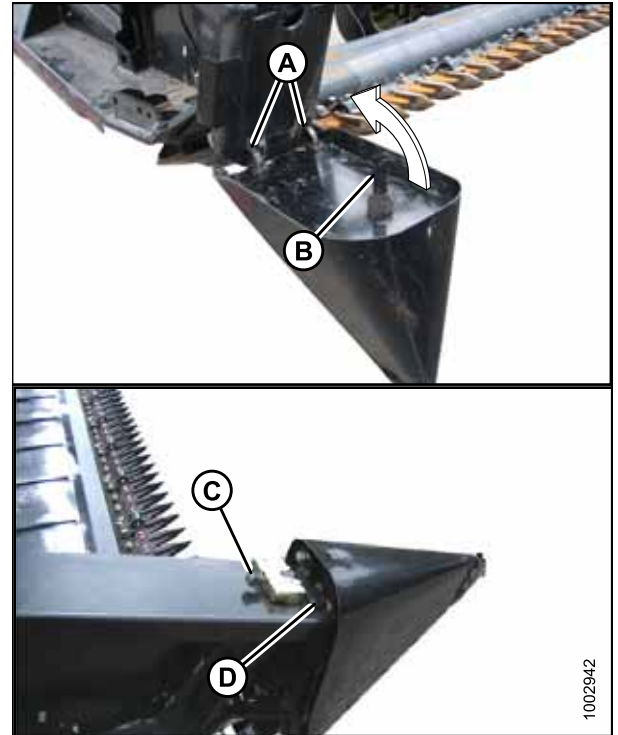


Figure 3.21: Crop Divider Installation

5. Check that divider does not move laterally. Adjust bolts (A) as required to tighten divider and remove lateral play when pulling at divider tip.
6. Close endshield. Refer to [3.7 Closing Endshield, page 29](#).

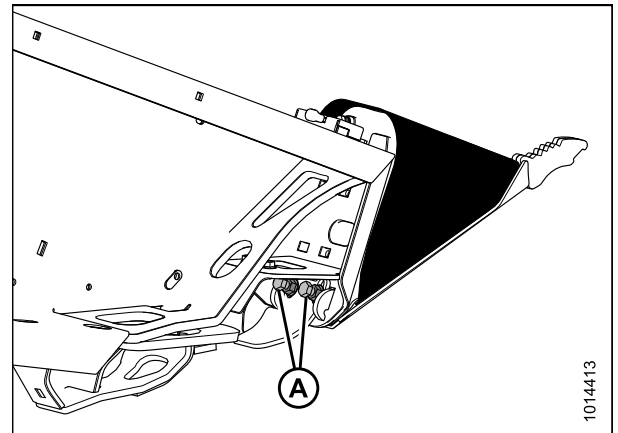


Figure 3.22: Crop Divider Adjustment

### 3.6 Installing Crop Dividers without Latch Option

**NOTE:**

If crop divider latch option was ordered with header, proceed to [3.5 Installing Crop Dividers with Latch Option, page 27](#). Otherwise, complete the following procedure:

1. If not already open, open endshields. Refer to [3.3 Opening Endshield, page 25](#).
2. Position crop divider as shown by inserting lugs (A) into holes (B) in endsheet.

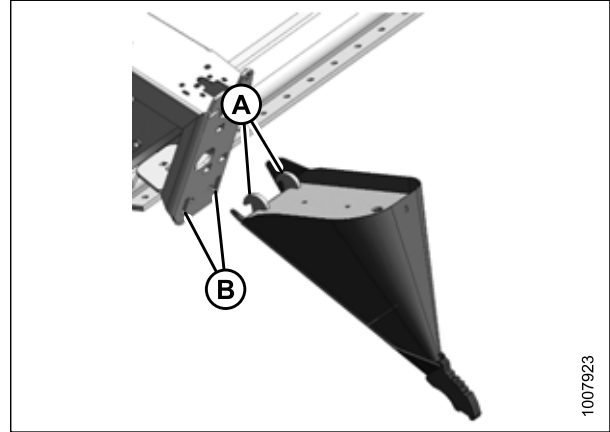


Figure 3.23: Crop Divider Installation

3. Lift forward end of crop divider and install bolt (B) and special stepped washer (A) (step towards divider). Tighten bolt.

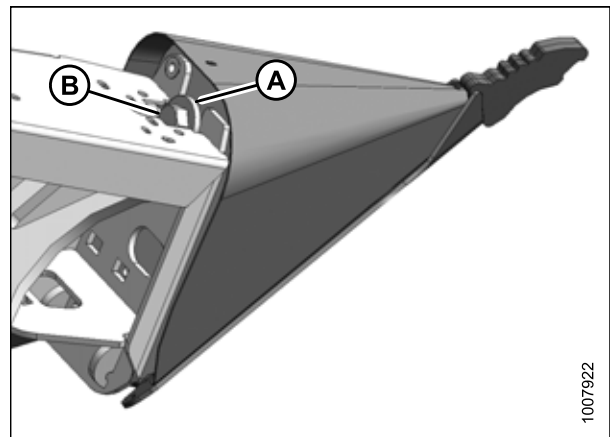


Figure 3.24: Crop Divider Installation

4. Check that divider does not move laterally. Adjust bolts (A) as required to tighten divider and remove lateral play when pulling at divider tip.
5. Close endshield. Refer to [3.7 Closing Endshield, page 29](#).

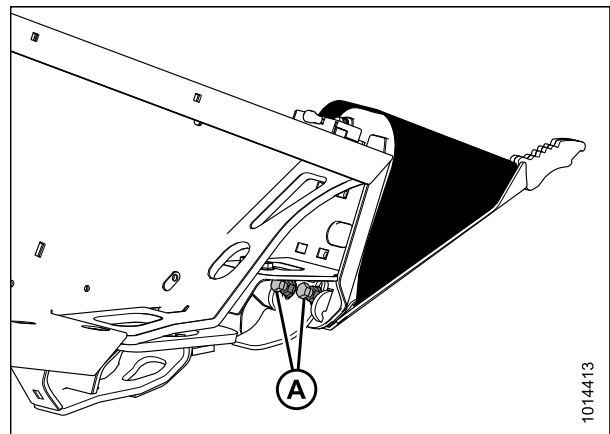


Figure 3.25: Crop Divider Adjustment

### 3.7 Closing Endshield

1. Maintain forward pressure and swing the rear of the endshield towards the header.
2. Lift the endshield and engage pin (A) located on the top of the endsheet frame with the hole in endshield (B).

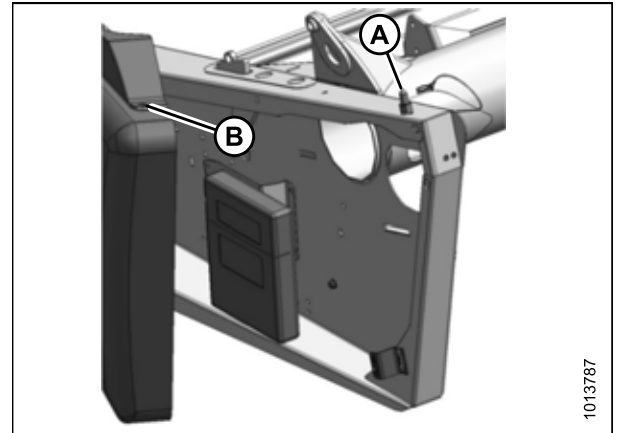


Figure 3.26: Left Endshield

3. Push in the endshield to engage lower latch (A).
4. Use tool (B) to lock lower latch (A).

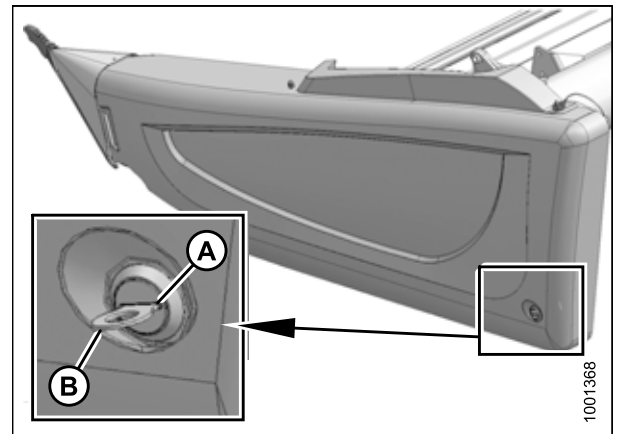


Figure 3.27: Left Endshield

5. Replace tool (B) and lynch pin (A) on top pin (C).

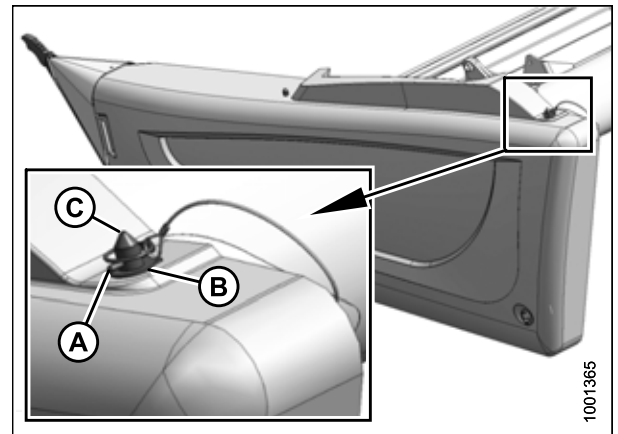


Figure 3.28: Left Endshield Pin

### 3.8 Installing Crop Divider Rods

1. Remove divider rods from shipping location on header endsheet.
2. Position crop divider rod (B) on tip of crop divider as shown, and tighten bolt (A).
3. Repeat procedure at opposite end of header.

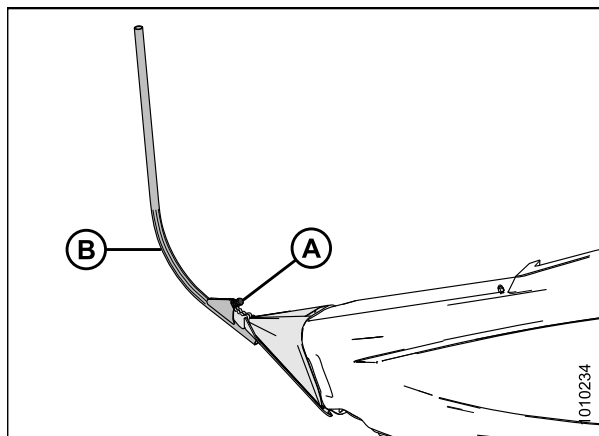


Figure 3.29: Divider Rod on Crop Divider

### 3.9 Positioning Transport Lights

Transport lights are located on each outboard reel arm.

1. Position light (A) perpendicular to header. Light arm should move with normal hand force yet maintain its position. If not, proceed to next step.
2. Loosen jam nut (B) on light attachment bolt, and adjust hex nut (C) as required. Tighten jam nut (B).
3. Repeat above for opposite side.

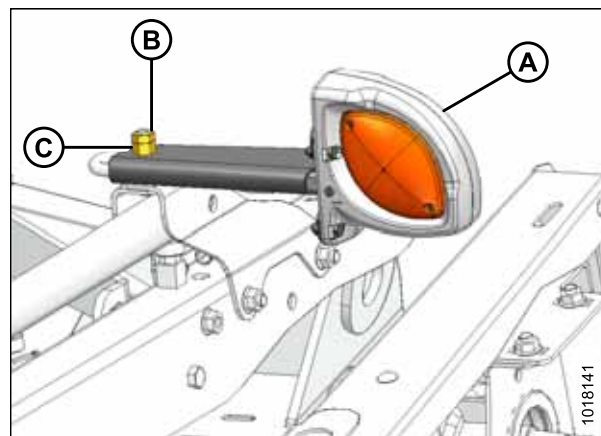


Figure 3.30: Transport Light

## 3.10 Installing Options

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



### 3.11 Adding Tire Ballast

When using large headers on windrower, adding fluid ballast to 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 fluid is level with valve stem when stem is positioned at 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 3.1 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 3.2 Recommended Ballast**

Header Size and Type	Applicable Windrower	Recommended 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.)
<b>25 ft. and less</b>	All	7.5 x 16 10 x 16 16.5 x 16.1	0	0	0	0
<b>30 ft. Single Reel or Double Reel (without conditioner)</b>  <b>35 ft. Single Reel</b>	All	7.5 x 16 10 x 16 16.5 x 16.1	0	0	38 (10)	91 (200)
<b>30 ft. Double Reel (with steel fingers and conditioner)</b>  <b>35 ft. Double Reel (5- or 6-bat)</b>	All	Level ground: 10 x 16 16.5 x 16.1  Hills: 16.5 x 16.1	69 (18)	170 (380)	115 (30)	288 (630)
<b>40 ft.</b>	M150 M200 M155E4 M205	16.5 x 16.1	115 (30)	288 (630)	158 (41)	377 (830)

When recommended fluid ballast has been added, proceed to [5 Performing Predelivery Checks, page 49](#).

- 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.



## 4 Attaching Header to Windrower

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

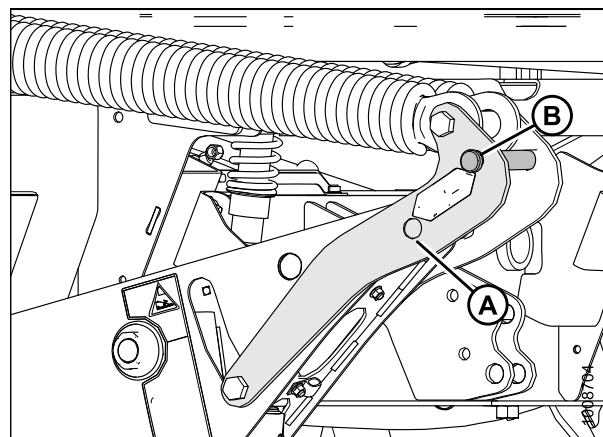


Figure 4.1: Header Float Linkage

### NOTE:

If header boots (supplied with header) are already installed to windrower lift linkage, proceed to Step 5, [page 36](#).

1. Remove hairpin to remove clevis pin (B) from boot (A).

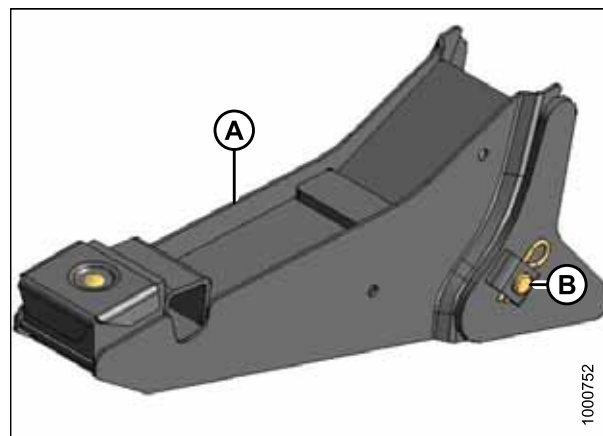


Figure 4.2: Header Boot

## ATTACHING HEADER TO WINDROWER

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

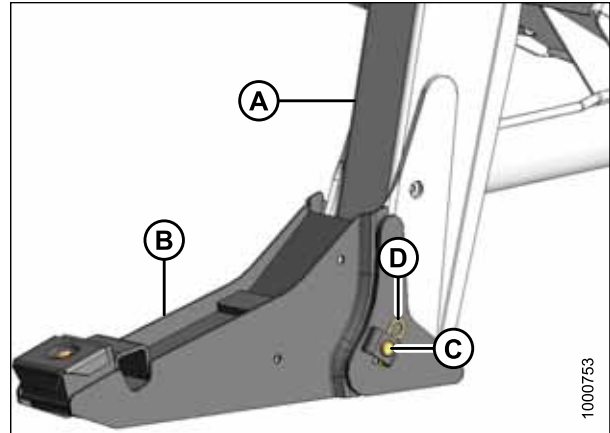


Figure 4.3: Header Boot

5. Remove hairpins from pins (A) and remove pins from header legs.

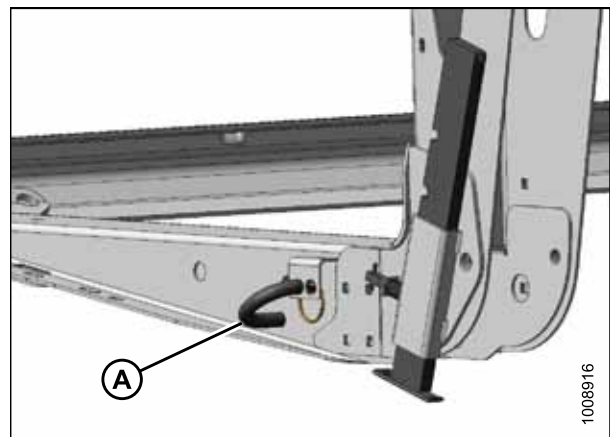


Figure 4.4: Header Leg

### CAUTION

Check to be sure all bystanders have cleared the area.

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

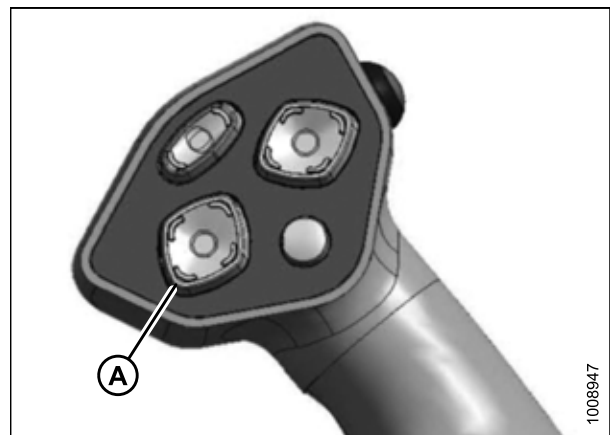


Figure 4.5: GSL

## ATTACHING HEADER TO WINDROWER

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

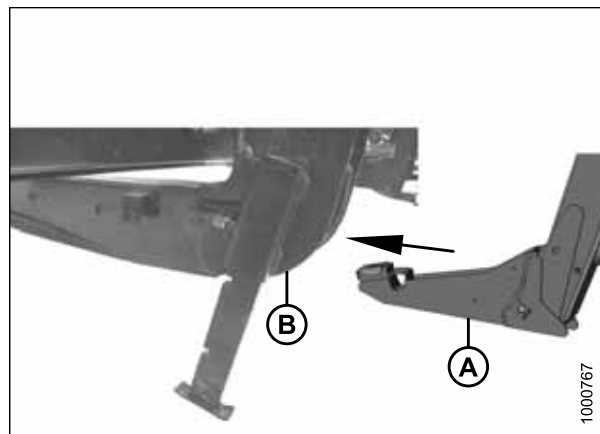


Figure 4.6: Boot Engaging Header

### 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 37](#)
- [4.1.2 Hydraulic Link without Self-Alignment Kit, page 39](#)
- [4.1.3 Hydraulic Link with Optional Self-Alignment Kit, page 42](#)

#### 4.1.1 Mechanical Link

The following connection procedure applies to M100, M105, M150, and M155 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 making adjustments to machine.**

1. Stop engine and remove key.
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.

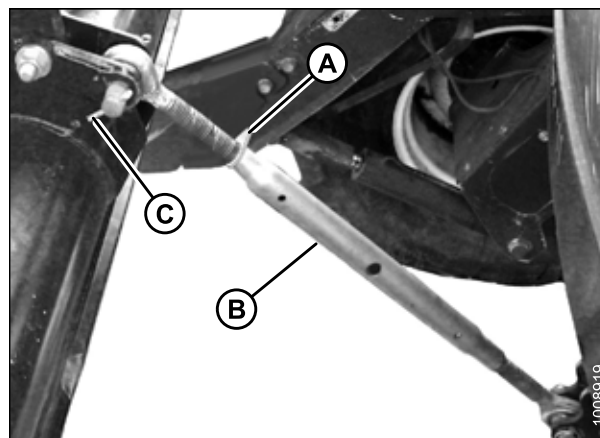


Figure 4.7: Mechanical Center-Link

## ATTACHING HEADER TO WINDROWER

### 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. Stop engine and remove key.
8. Engage safety props on both lift cylinders.
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.
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.

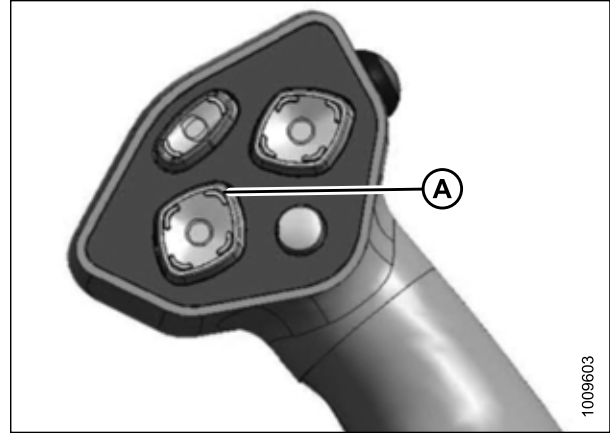


Figure 4.8: Ground Speed Lever (GSL)

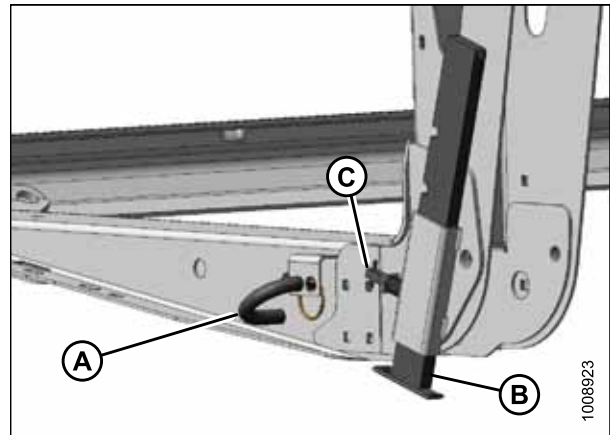


Figure 4.9: Header Stand



Figure 4.10: Float Springs Engaged

## ATTACHING HEADER TO WINDROWER

### 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. Stop engine and remove key.

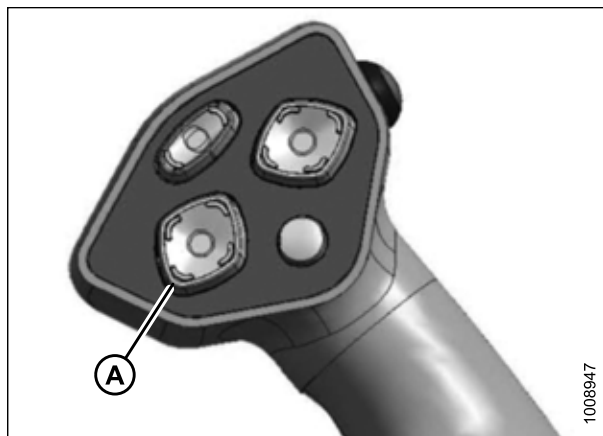


Figure 4.11: GSL

### 4.1.2 Hydraulic Link without Self-Alignment Kit

The following connection procedure applies to M155E4, M200, and M205 windrowers with non-self aligning hydraulic center-links. This center-link configuration is optional for M105, M150, and M155 windrowers.

### WARNING

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

1. Stop engine and remove key.
2. Relocate pin (A) at frame linkage as required to position hook (B) over header pin (not shown).

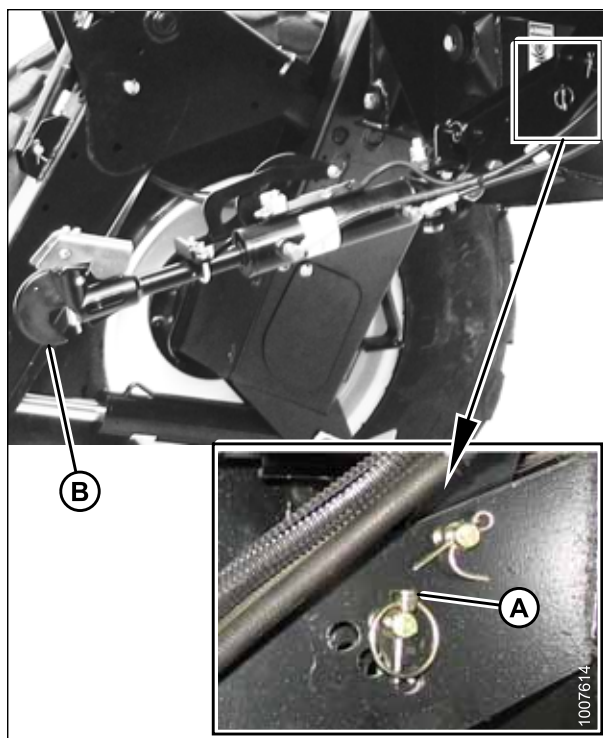


Figure 4.12: Center-Link

## ATTACHING HEADER TO WINDROWER

### CAUTION

Check to be sure all bystanders have cleared the area.

3. Start engine and activate HEADER TILT switches on ground speed lever (GSL) to extend or retract center-link cylinder so that hook lines-up with header attachment pin.
4. Stop engine.

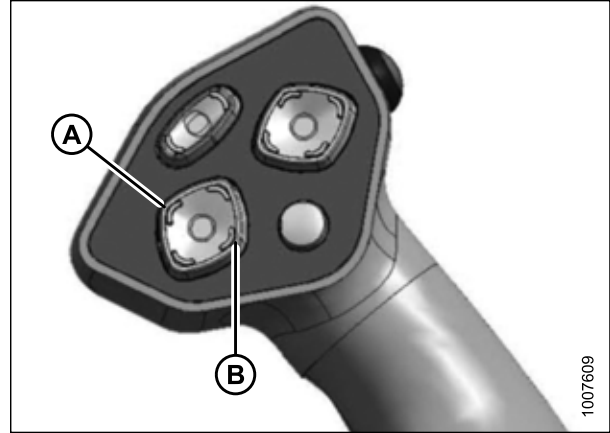


Figure 4.13: GSL

A - HEADER TILT DOWN Switch B - HEADER TILT UP Switch

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

#### IMPORTANT:

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

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

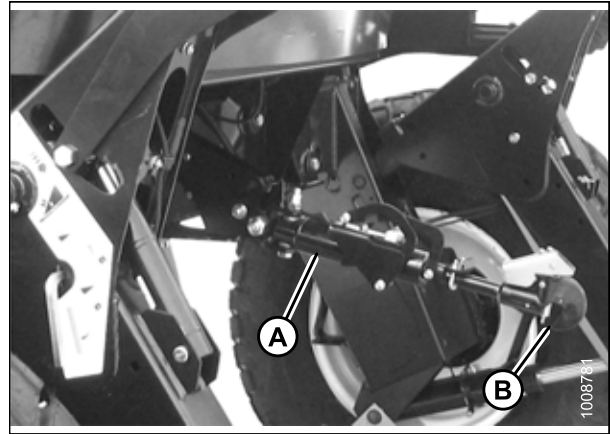


Figure 4.14: Center-Link

### CAUTION

Check to be sure all bystanders have cleared the area.

7. Start engine.
8. Raise header fully with HEADER UP switch (A) on the GSL.
9. Stop engine and remove key.
10. Engage safety props on both lift cylinders.

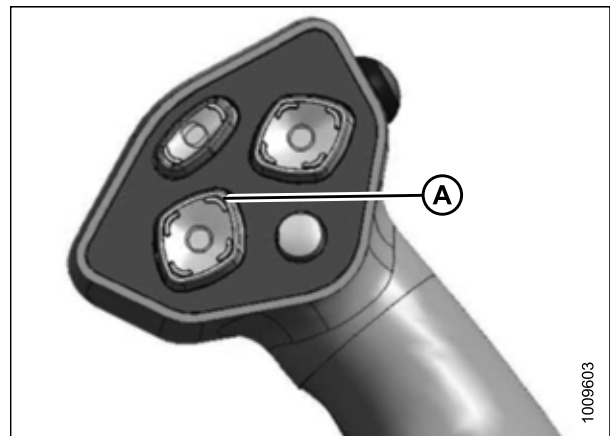


Figure 4.15: GSL



## ATTACHING HEADER TO WINDROWER

11. Install pin (A) through header leg (engaging U-bracket in header leg). Repeat for opposite side of header.
12. 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.

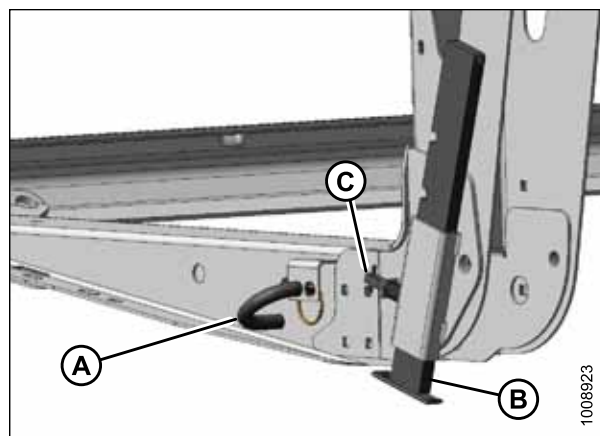


Figure 4.16: Header Stand

13. 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.
14. Disengage safety props.

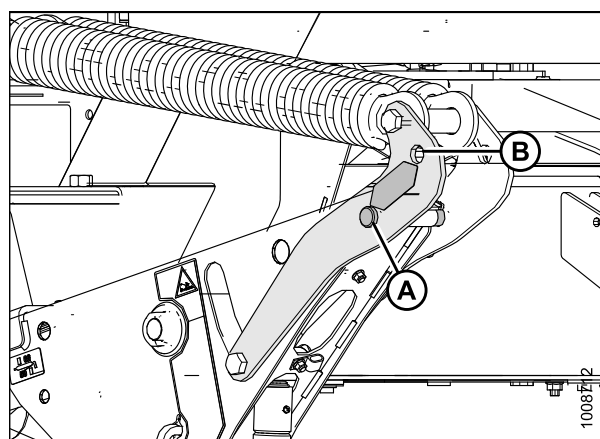


Figure 4.17: Float Springs Engaged



### CAUTION

**Check to be sure all bystanders have cleared the area.**

15. Start engine and activate HEADER DOWN switch (A) on GSL to lower header fully.
16. Stop engine and remove key.

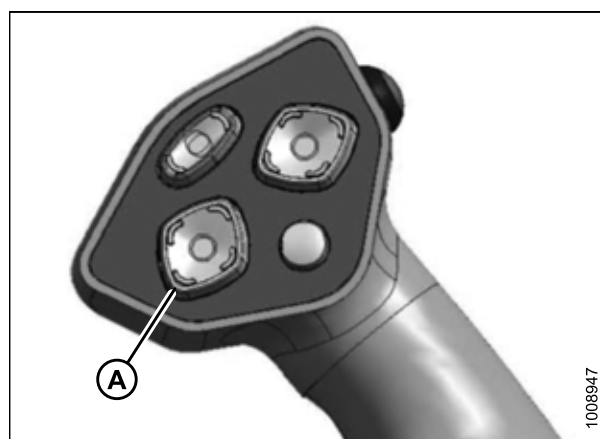


Figure 4.18: GSL

## 4.1.3 Hydraulic Link with Optional Self-Alignment Kit

The following connection procedure applies to M150, M155, M155E4, M200, and M205 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 making adjustments to machine.

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

#### IMPORTANT:

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

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

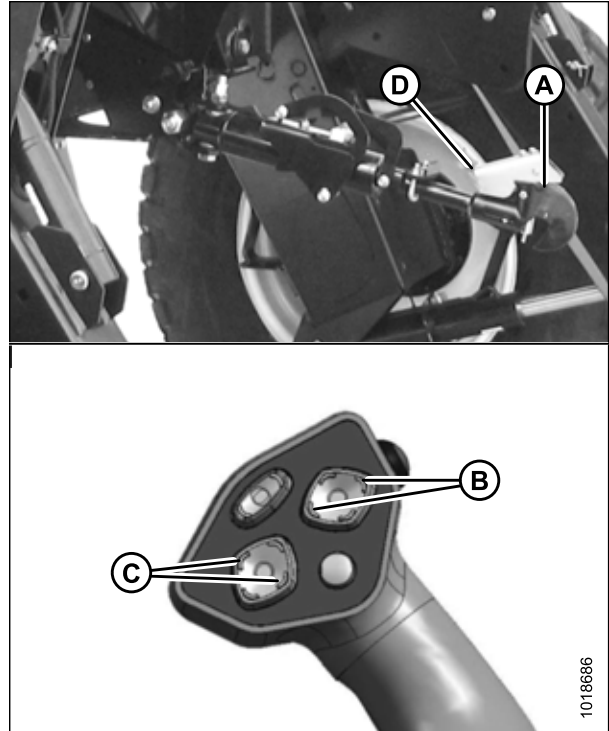


Figure 4.19: Hydraulic Center-Link

### CAUTION

Check to be sure all bystanders have cleared the area.

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

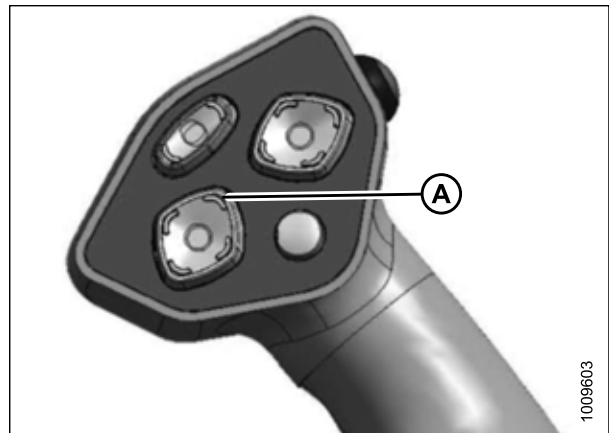


Figure 4.20: GSL

## ATTACHING HEADER TO WINDROWER

8. Install pin (A) through header leg (engaging U-bracket in header leg). Repeat for opposite side of header.
9. 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.

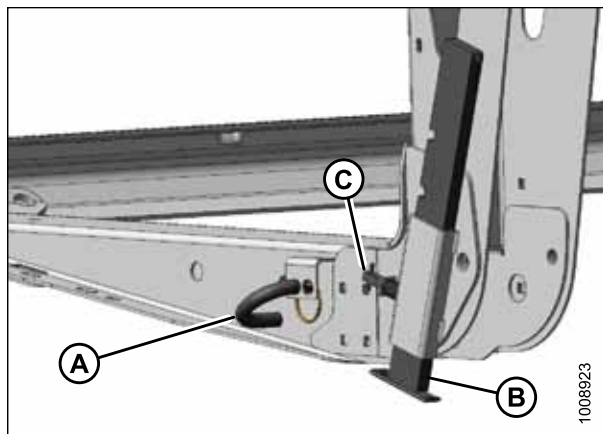


Figure 4.21: Header Stand

10. 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.
11. Disengage safety props.

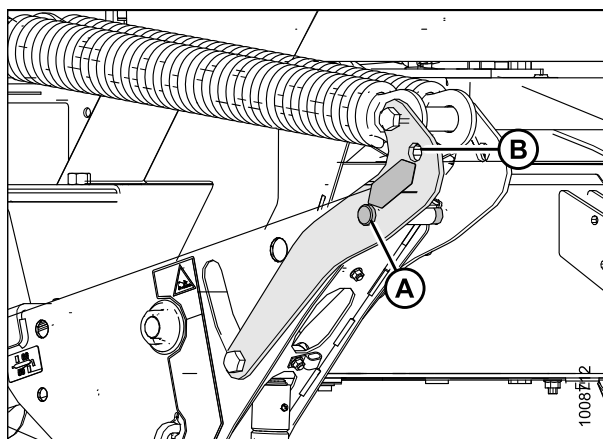


Figure 4.22: Float Springs Engaged



### CAUTION

**Check to be sure all bystanders have cleared the area.**

12. Start engine and activate HEADER DOWN switch (A) on GSL to lower header fully.
13. Stop engine and remove key.

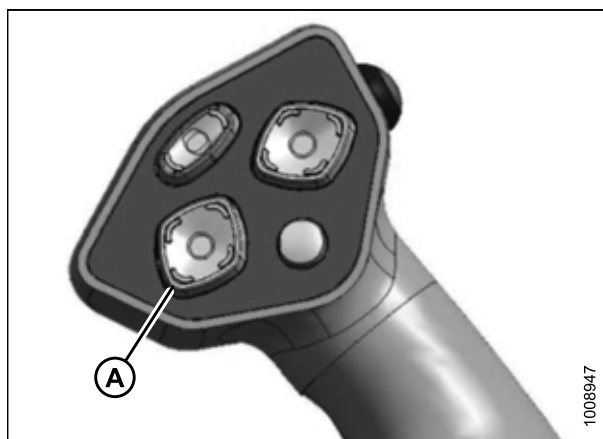


Figure 4.23: GSL

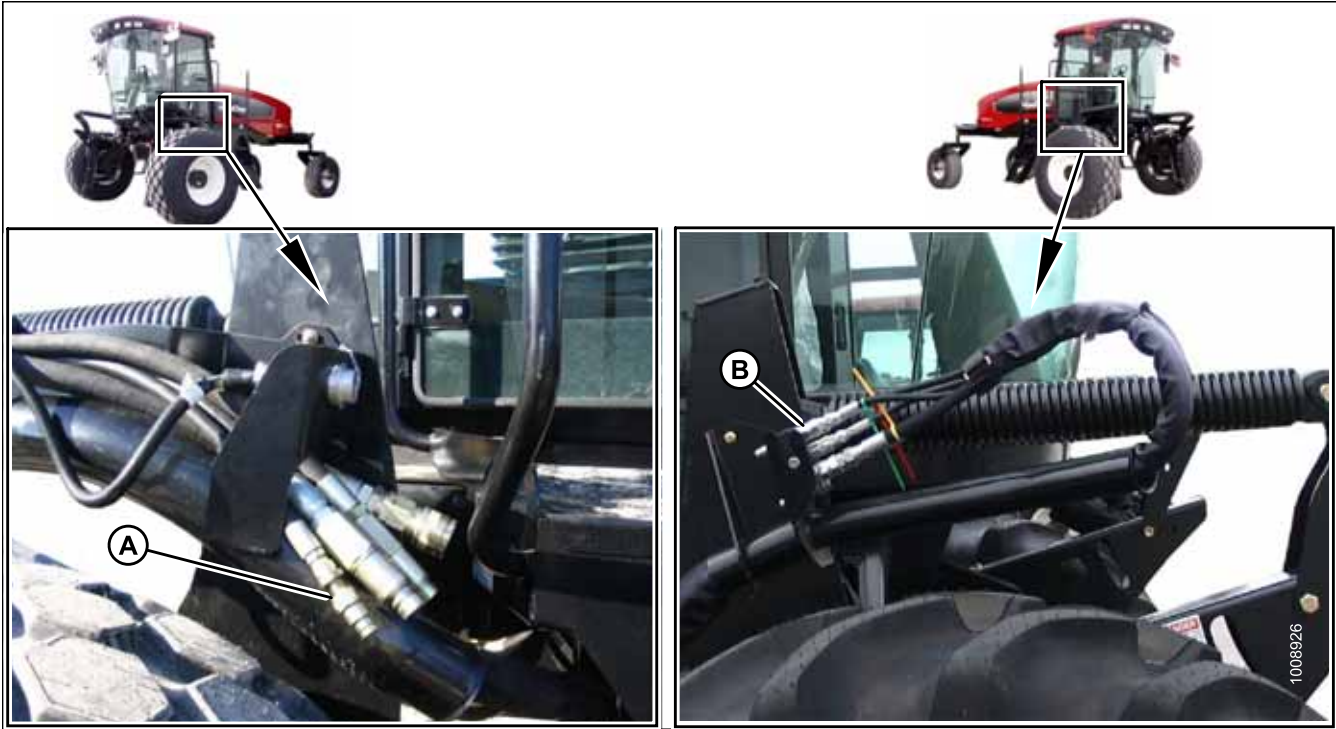
## 4.2 Connecting Hydraulics

M150, M200, and M205 windrowers may not come equipped with D Series header and reel hydraulics as shown below.

**NOTE:**

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

**Figure 4.24: D 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 44. If windrower is equipped, proceed directly to Step 12, page 46.

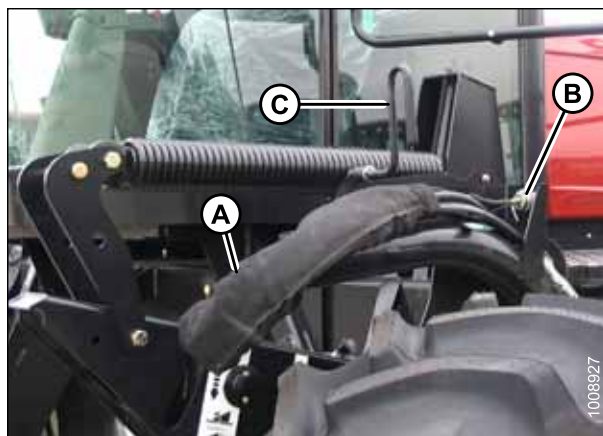
**Table 4.1 Optional Drive/Lift Kits for D Series Header**

Windrower	Part Numbers for D Series Draper Header Optional Kits			
	Reel Drive/Lift	Reel Fore-Aft	Reverser	Coupler
M100	MD #B5577	MD #B5577	—	—
M105	MD #B5577	MD #B5577	—	—
M150	MD #B5577	MD #B5577	MD #B4656	—
M155	MD #B5577	MD #B5577	MD #B4656	—
M155E4	MD #B5577	MD #B5577	MD #B4656	—
M200	MD #B5577 MD #B4651	MD #B5577	MD #B4656	—
M205	MD #B5491	MD #B5496	MD #B5492	MD #B5497

## ATTACHING HEADER TO WINDROWER

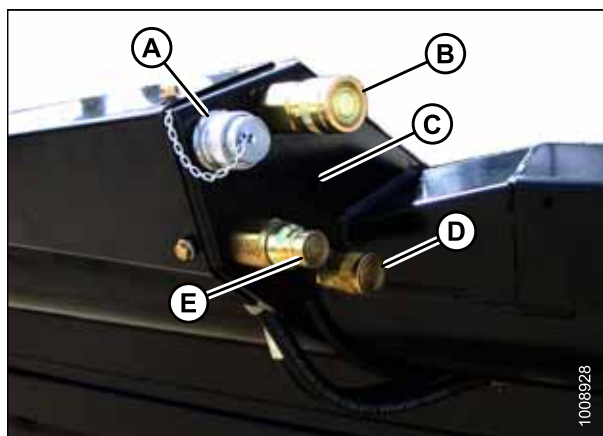
**Connect header-drive hydraulics and electrical harness to header as follows:**

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.

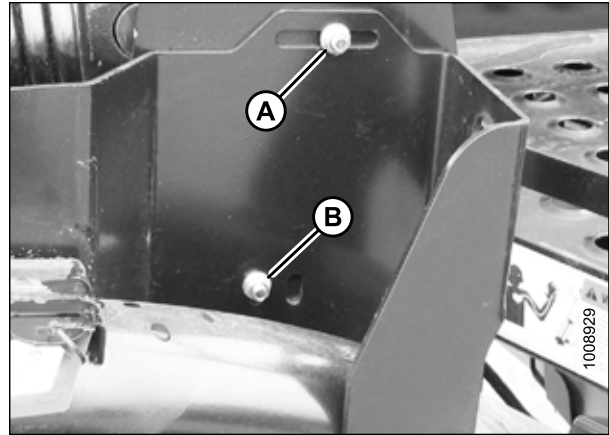


Figure 4.28: Hose Support

### ***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.

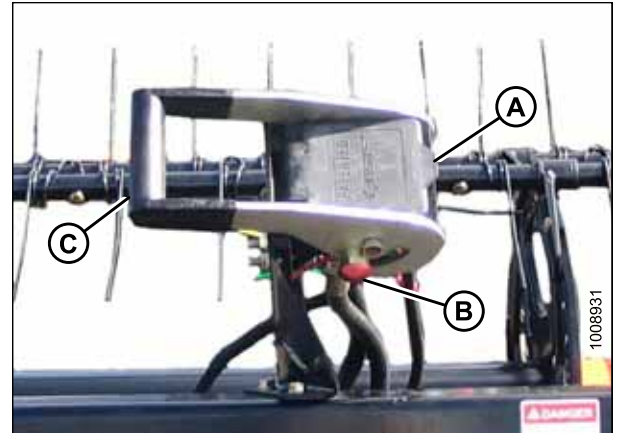


Figure 4.30: Header Receptacle

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.

### NOTE:

It is not necessary to bleed system by loosening fittings.

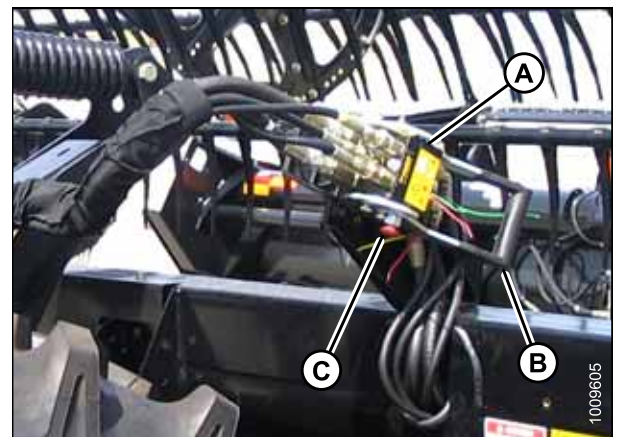


Figure 4.31: Multicoupler on Header





## 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 making adjustments to machine.

#### **IMPORTANT:**

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

1. Perform final checks as listed on **Predelivery Checklist** (yellow sheet attached to this instruction – [Predelivery Checklist, page 99](#)) to ensure machine is field-ready. Refer to following pages for detailed instructions as indicated on Checklist. The completed Checklist should be retained either by Operator or Dealer.

### 5.1 Checking and Adjusting Skid Shoes

If optional skid shoes are installed, check position and adjust if necessary.

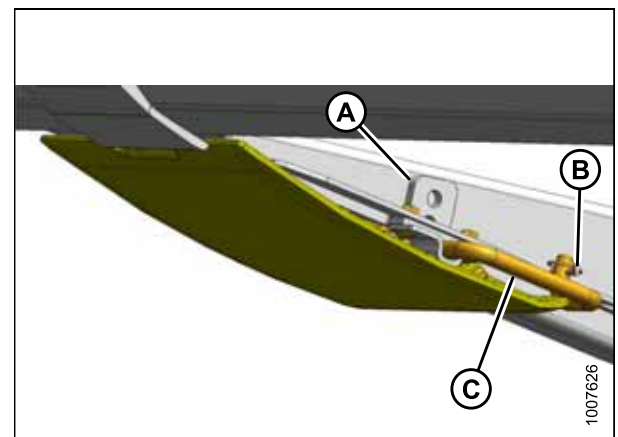
### **WARNING**

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.

### **DANGER**

Engage header safety props and reel props before working under header or reel.

1. Check skid shoes are set to same position.
2. If necessary, adjust skid shoe as follows:
  - a. Raise header fully and engage header safety props. Shut down engine and remove key from ignition.
  - b. Remove lynch pin (B).
  - c. Hold shoe and remove pin (C) by disengaging frame and then pulling away from shoe.
  - d. Raise or lower skid shoe to desired position using holes in support (A) as a guide.
  - e. Reinsert pin (C), engage in frame, and secure with lynch pin (B).
  - f. Check that all skid shoes are adjusted to same position.



**Figure 5.1: Inner Skid Shoe**

## PERFORMING PREDELIVERY CHECKS

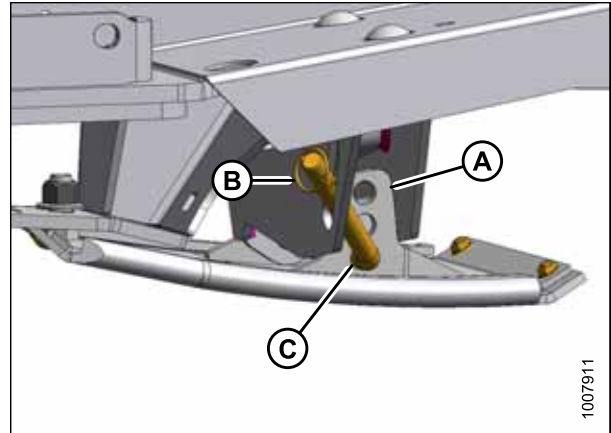


Figure 5.2: Outer Skid Shoe

## 5.2 Checking Transport/Stabilizer Tire Pressure

Check tire inflation pressure. If necessary, adjust pressure according to following table:

**Table 5.1 Tire Inflation Pressure**

Size	Load Range	Pressure
ST205/75 R15	D	448 kPa (65 psi)
	E	552 kPa (80 psi)

**IMPORTANT:**

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

## 5.3 Checking Wheel Bolt Torque

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

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

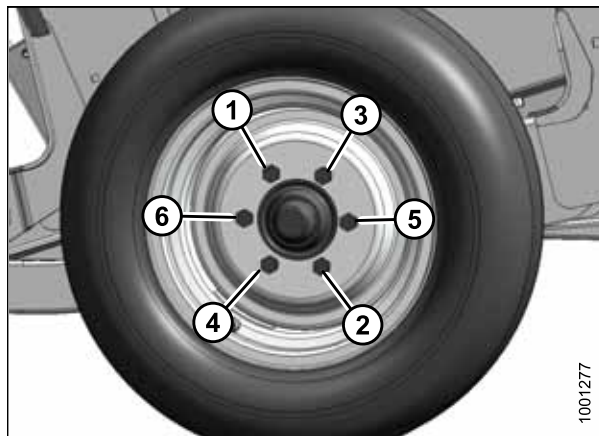


Figure 5.3: Bolt Tightening Sequence

## 5.4 Checking Knife Drive Box

1. Fully open endshield(s) for access to knife drive box.  
Refer to [3.3 Opening Endshield, page 25](#).

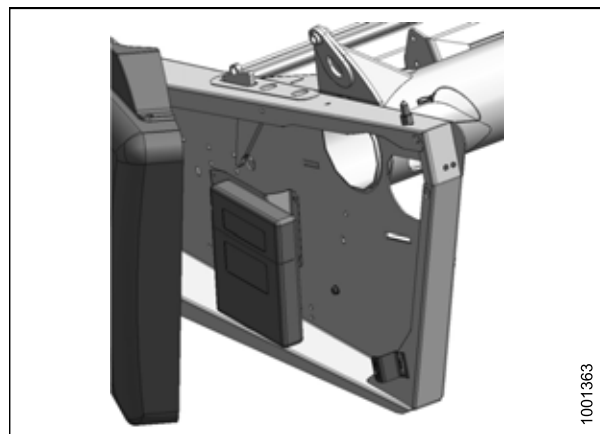


Figure 5.4: Left Endshield Open

### IMPORTANT:

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

2. Check position of plug (A) and breather (B) at knife drive box. The breather **MUST** be repositioned to location (B) to prevent oil loss during normal operation.
3. Check oil level. It should be between lower hole (C) on dipstick and bottom end of dipstick. If necessary, add oil. Use clean SAE 85W-140 lubricant.

### IMPORTANT:

Check oil level with top of knife drive box horizontal.

4. Close endshield(s). Refer to [3.7 Closing Endshield, page 29](#).

### IMPORTANT:

If header has dual knife drive (DKD), repeat on opposite side.

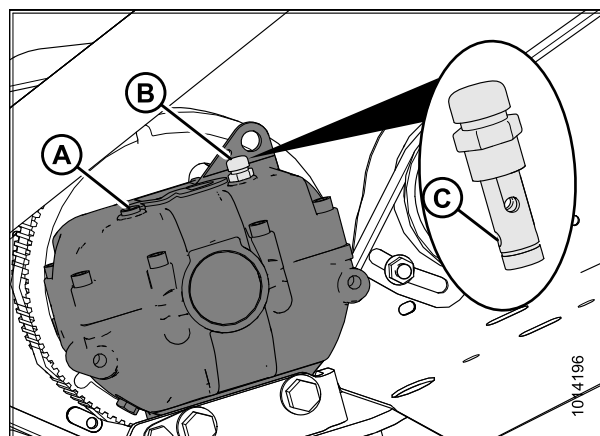


Figure 5.5: Knife Drive Box

## 5.5 Checking and Adjusting Non-Timed Knife Drive Belt Tension

This procedure applies to single- and double-knife headers with non-timed knife drives.

1. Shut down windrower and remove key from ignition.
2. Open endshield(s). Refer to [3.3 Opening Endshield, page 25](#).

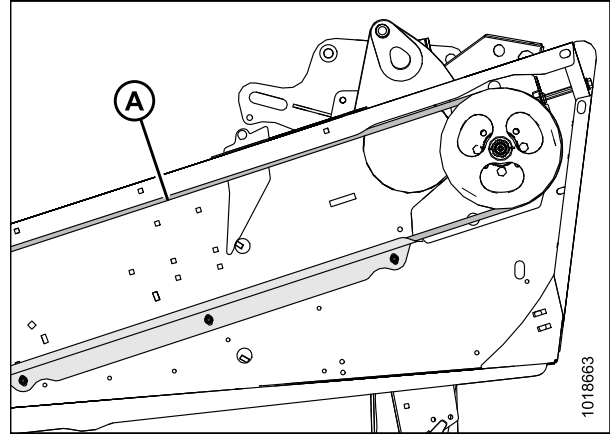
**NOTE:**

The knife drive is identical on both sides of the header for double-knife headers.

3. Apply a force of 90 N (20 lbf) to midspan (A) of belt. The belt should deflect 18 mm (3/4 in.). If necessary, adjust tension as per the following steps.

**IMPORTANT:**

To prolong belt and drive life, do **NOT** over-tighten belt.

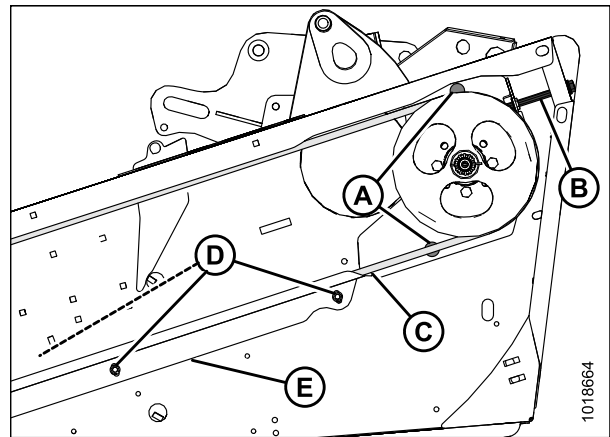


**Figure 5.6: Knife Drive (Left Shown – Right Opposite)**

4. Loosen two bolts (A) that secure motor assembly to header endsheet.
5. Turn adjuster bolt (B) as required to move drive motor to achieve belt deflection as per above. Tighten bolts (A).
6. Ensure that clearance between belt (C) and belt guide (E) is 1 mm (1/32 in.).
7. Loosen three bolts (D), and adjust position of guide (E) as required.
8. Tighten bolts (D).
9. Close endshield(s). Refer to [3.7 Closing Endshield, page 29](#).

**NOTE:**

Readjust tension of a new belt after a five hour run-in period.



**Figure 5.7: Knife Drive (Left Shown – Right Opposite)**

## 5.6 Checking and Adjusting Timed Double-Knife Drive Belt Tension

This procedure applies to double-knife drive headers with timed knife drives. Use this procedure at each end of header.

1. Open endshield(s). Refer to [3.3 Opening Endshield](#), [page 25](#).
2. Apply a force of 27 N (6 lbf) to timing belt at midspan (A). Belt should deflect 13 mm (1/2 in.).



Figure 5.8: Knife Drive (Left Shown – Right Opposite)

If necessary, adjust belt tension at both ends of header as follows:

**IMPORTANT:**

To prolong belt and drive life, do **NOT** over-tighten belt.

3. Loosen two nuts (A) on knife drive belt idler mounting bracket. Belt will loosen.

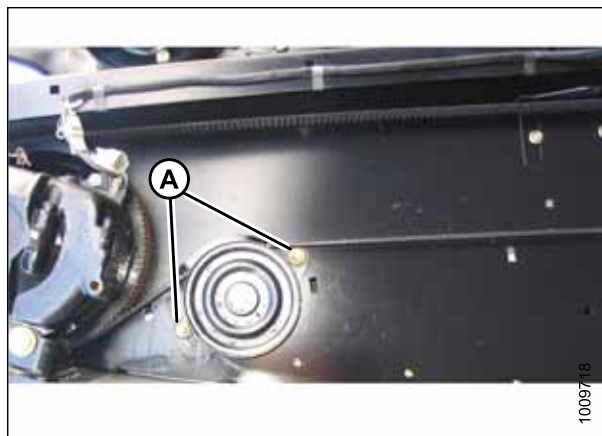


Figure 5.9: Knife Drive

## PERFORMING PREDELIVERY CHECKS

4. Insert a long punch (or equivalent) into hole (A) in idler bracket.
5. Pry downward until a force of 27 N (6 lbf) deflects timing belt 13 mm (1/2 in.) at midspan as per [2, page 55](#).



Figure 5.10: Tensioning Belt

6. Tighten nuts (A) on idler mounting bracket.
7. Close endshield(s). Refer to [3.7 Closing Endshield, page 29](#).

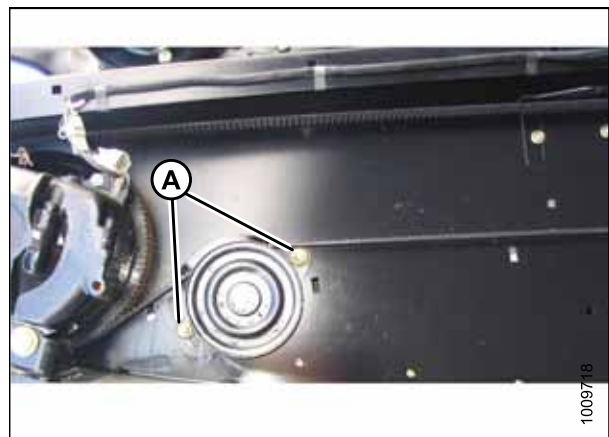


Figure 5.11: Knife Drive



## 5.7 Checking and Adjusting Knife Hold-Downs

### NOTE:

Align guards prior to checking and adjusting hold-downs. Refer to [6.1.1 Adjusting Knife and Guards, page 82](#).

Refer to following procedures:

- [5.7.1 Checking Pointed Guard Hold-Downs, page 57](#)
- [5.7.2 Checking Stub Guard Hold-Downs, page 59](#)

### 5.7.1 Checking Pointed Guard Hold-Downs

This procedure is applicable to headers with pointed guards.

1. Check guard alignment and adjust as required. Refer to [6.1.1 Adjusting Knife and Guards, page 82](#).

Measure clearance between hold-downs and knife sections as follows:

#### WARNING

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

2. Shut down windrower, and remove key from ignition.
3. Manually stroke knife to locate section (A) under hold-down (B).
4. At standard guard locations, push knife section (A) down against guard (C) and measure clearance between hold-down (B) and knife section (A) with a feeler gauge. The clearance should be 0.1–0.6 mm (0.004–0.024 in.).
5. If necessary, refer to [Adjusting Pointed Guard Hold-Downs, page 58](#).

#### **Double-knife:**

6. Manually stroke knife to locate sections (A) and (C) under center hold-down (B).
7. Measure between knife sections (A) and (C) with a feeler gauge. The clearances should be as follows:
  - At tip of hold-down: 0.1–0.4 mm (0.004–0.016 in.)
  - At rear of hold-down: 0.1–1.0 mm (0.004–0.040 in.)
8. If necessary, refer to [Adjusting Hold-Down at Double-Knife Center Pointed Guard, page 58](#).

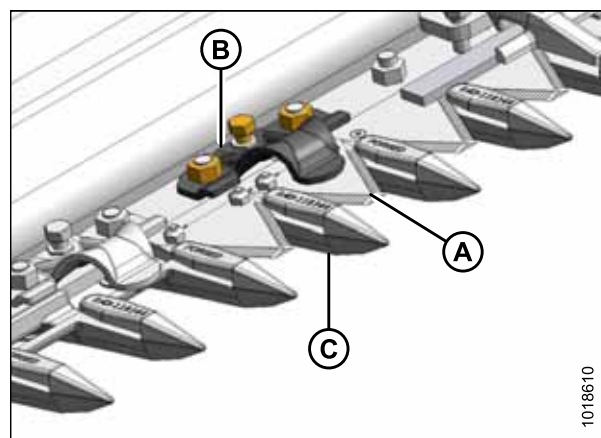


Figure 5.12: Normal Guard Hold-Down

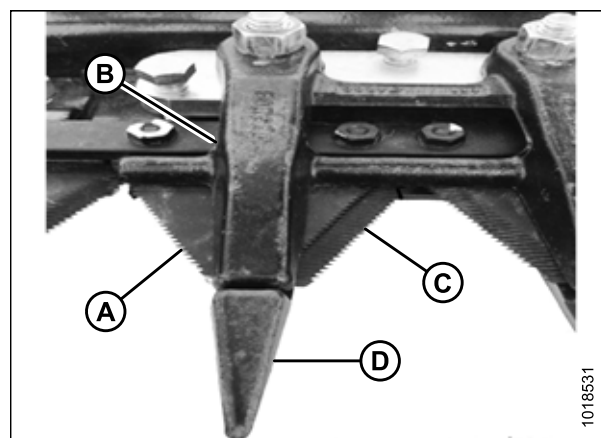


Figure 5.13: Double-Knife Center Guard Hold-Down

## PERFORMING PREDELIVERY CHECKS

### Adjusting Pointed Guard Hold-Downs

This procedure is applicable to formed sheet metal hold-downs. Do **NOT** use this procedure for hold-down at center guard position where knives overlap on double-knife headers. For center guard, refer to [Adjusting Hold-Down at Double-Knife Center Pointed Guard](#), page 58.

#### **WARNING**

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

1. Shut down windrower, and remove key from ignition.
2. Decrease clearance by turning bolt (B) clockwise to lower front of hold-down (A).
3. Increase clearance by turning bolt (B) counterclockwise to raise front of hold-down.

#### **NOTE:**

For larger adjustments, it may be necessary to loosen nuts (C), turn adjuster bolt (B), and then retighten nuts.

4. Check clearance again and adjust as required.

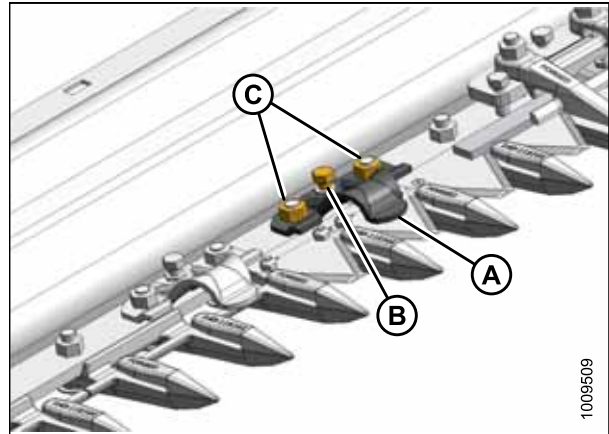


Figure 5.14: Cutterbar

### Adjusting Hold-Down at Double-Knife Center Pointed Guard

#### **WARNING**

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

1. Shut down windrower, and remove key from ignition.
2. Manually stroke knives so that sections (A) are under hold-down (B) as shown.
3. Loosen nuts (C) and back off bolts (D) until they don't contact cutterbar.
4. Lightly clamp hold-down (B) to guard (E) with a C-clamp or equivalent. Position clamp on trash-bar at (F) as shown.
5. Turn bolts (D) until they contact cutterbar, then tighten **ONE** turn.
6. Remove clamp.
7. Tighten nuts (C) and torque to 45 Nm (35 lbf·ft).
8. Check clearances. Refer to [5.7.1 Checking Pointed Guard Hold-Downs](#), page 57.

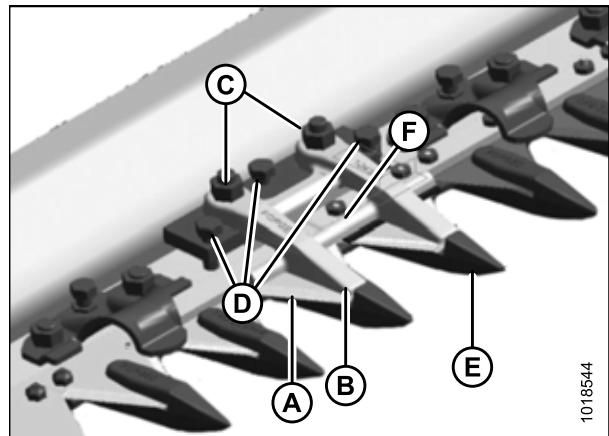


Figure 5.15: Center Guard

## 5.7.2 Checking Stub Guard Hold-Downs

This procedure is applicable to single- and double-knife headers with stub guards.

### WARNING

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

Measure clearance between hold-downs and knife sections as follows:

1. Shut down windrower, and remove key from ignition.
2. Manually stroke knife to locate section under hold-down (A).
3. **Standard guard:** At standard guard locations, push knife section (B) down against guard (C) and measure clearance between hold-down (A) and knife section (B) with a feeler gauge. The clearance should be as follows:
  - **At hold-down tip (D):** 0.1–0.4 mm (0.004–0.016 in.)
  - **At rear of hold-down (E):** 0.1–1.0 mm (0.004–0.040 in.)
  - **At sheet metal hold-down (F):** 0.1–0.6 mm (0.004–0.024 in.)
4. If necessary, refer to [Adjusting Stub Guard Hold-Downs](#), page 60.

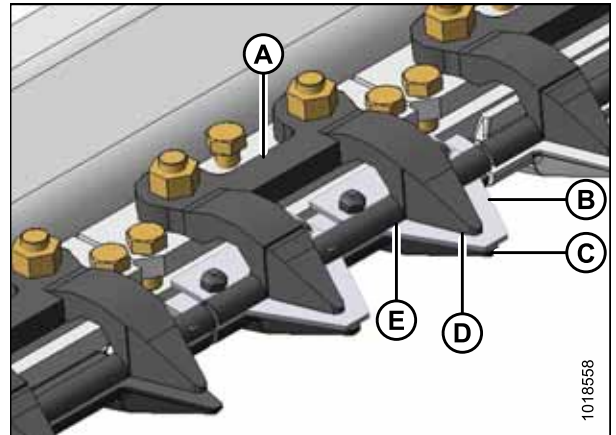


Figure 5.16: Standard Stub Forged Hold-Down

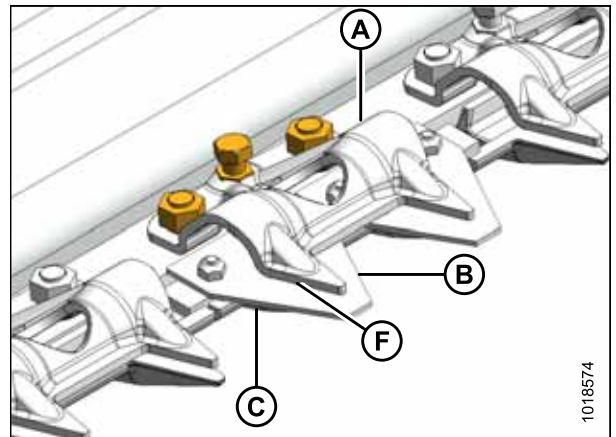


Figure 5.17: Standard Stub Sheet Metal Hold-Down

## PERFORMING PREDELIVERY CHECKS

5. **Double-knife center stub guard:** Manually stroke knife to locate sections under hold-down (B).
6. Measure clearance between knife sections (A) and (C) with a feeler gauge. The clearance should be as follows:
  - **At hold-down tip (E):** 0.1–0.4 mm (0.004–0.016 in.)
  - **At rear of hold-down (F):** 0.1–1.0 mm (0.004–0.040 in.)
7. If necessary, refer to [Adjusting Stub Guard Hold-Downs](#), page 60.

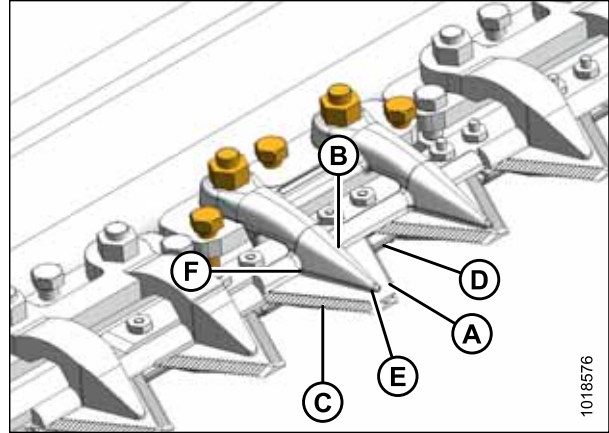


Figure 5.18: Double-Knife Center Stub Guard Hold-Down

### Adjusting Stub Guard Hold-Downs

#### **WARNING**

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

1. Shut down windrower, and remove key from ignition.

#### **Forged hold-down:**

2. Manually stroke knife to center section(s) (A) under hold-down (B) as shown.
3. Loosen nuts (C) and back off bolts (D) clear of cutterbar.
4. Lightly clamp hold-down (B) to guard (E) with a C-clamp or equivalent. Position clamp on trash-bar at (F).
5. Turn bolts (D) until they contact cutterbar, then tighten **ONE** turn.
6. Remove clamp.
7. Tighten nuts (B) and torque to 45 Nm (35 lbf·ft).
8. Check that specified clearances are achieved. Refer to [5.7.2 Checking Stub Guard Hold-Downs](#), page 59.

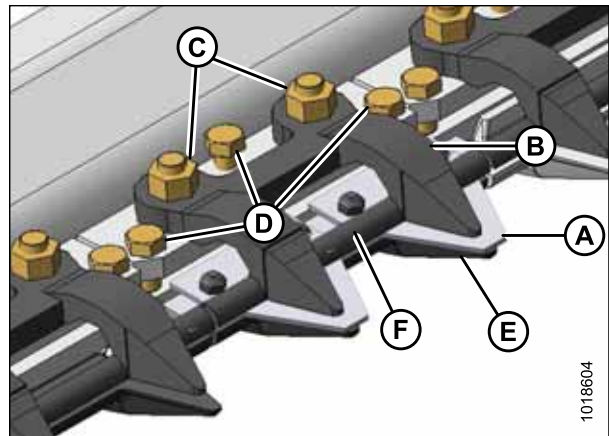


Figure 5.19: Normal Stub Guard Forged Hold-Down

## PERFORMING PREDELIVERY CHECKS

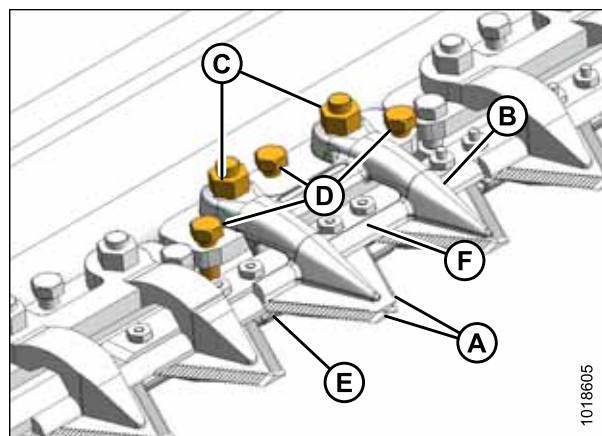


Figure 5.20: Double-Knife Center Stub Guard

### Sheet metal hold-down:

9. Manually stroke knife to center section (A) under hold-down (B) as shown.
10. Decrease clearance by turning bolt (C) clockwise to lower front of hold-down. Clearance should be 0.1–0.6 mm (0.004–0.024 in.).
11. Increase clearance by turning bolt (C) counterclockwise to raise front of hold-down.

#### NOTE:

For larger adjustments, it may be necessary to loosen nuts (D), turn adjuster bolt (C), and then retighten nuts.

12. Torque nuts (D) to 72 Nm (53 lbf·ft) after all adjustments are complete and specified clearances are achieved.

Refer to [5.7.2 Checking Stub Guard Hold-Downs](#), page 59.

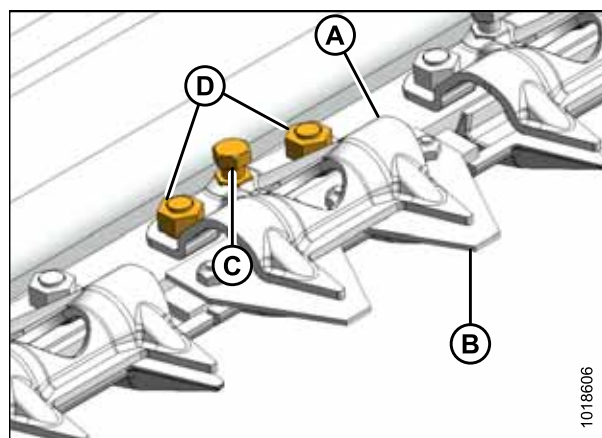


Figure 5.21: Stub Guard Sheet Metal Hold-Down



## 5.8 Centering Reel

### WARNING

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

1. Start engine and set cutterbar height at approximately 150 mm (6 in.) above ground.
2. Lower reel and adjust fore-aft position to 5 on reel arm indicator decal.
3. Stop engine and remove key from ignition.
4. Manually rotate reel to position a tine tube above cutterbar.
5. Measure clearance (A) between reel tine tube and endsheet at both ends of header. If the reel is centered, the clearances will be the same. Refer to following steps to center reel.

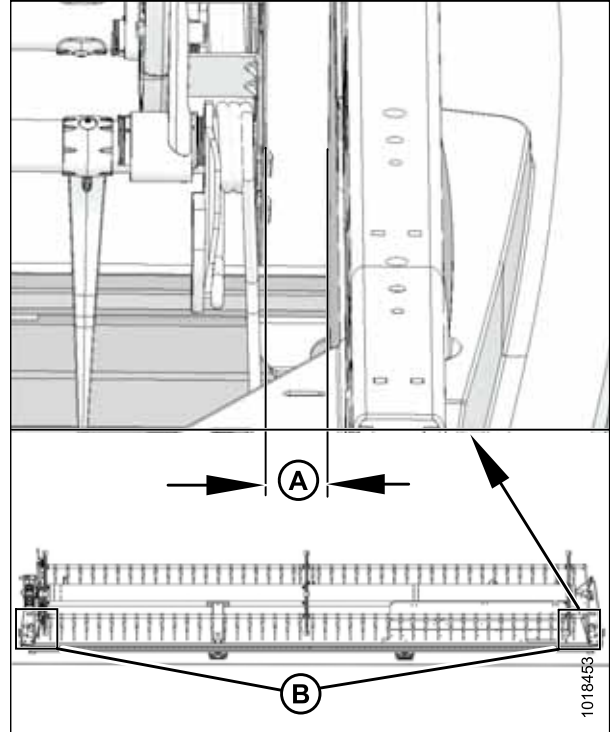


Figure 5.22: Centering Reel – Single Reel (Double Reel Similar)

#### *Single-reel headers:*

6. Loosen bolt (A) on brace (B) at both ends of the reel.
7. Move forward end of reel support arm (C) laterally as required to center reel.
8. Tighten bolts (A) and torque to 359 Nm (265 lbf·ft).

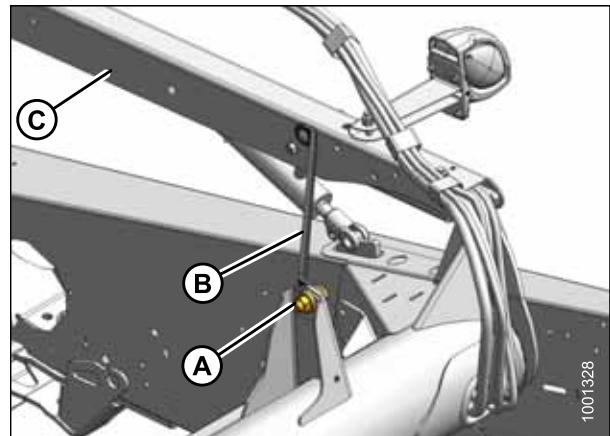
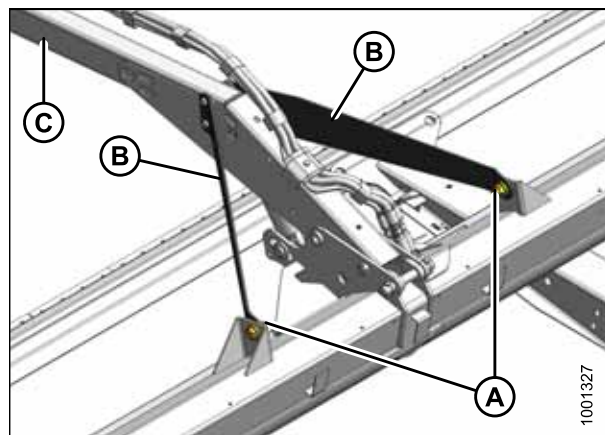


Figure 5.23: Reel Outboard Support Arm

## PERFORMING PREDELIVERY CHECKS

### ***Double-reel headers:***

9. Loosen bolts (A) on braces (B) at center support arm.
10. Move forward end of reel support arm (C) laterally as required to center reel.
11. Tighten bolts (A) and torque to 359 Nm (265 lbf·ft).



**Figure 5.24: Double-Reel Center Support Arm**

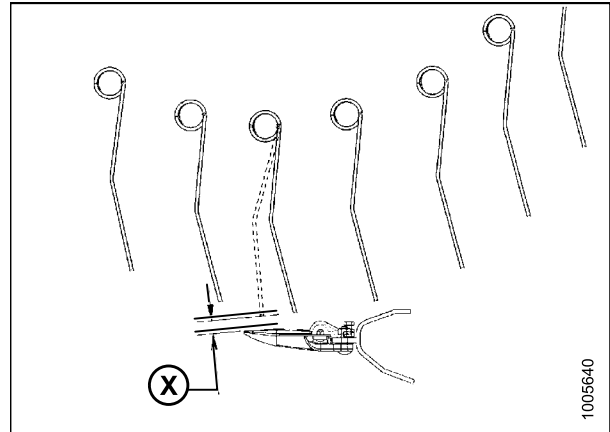
## 5.9 Measuring and Adjusting Reel Clearance to Cutterbar

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

The finger to guard/cutterbar clearances with reel fully lowered are shown in Table 5.2, page 64.

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

Header Width	(X) +/- 3 mm (1/8 in.) at Reel Ends	
	Single Reel	Double Reel
15 ft.	20 mm (3/4 in.)	—
20 ft.	20 mm (3/4 in.)	—
25 ft.	25 mm (1 in.)	—
30 ft.	45 mm (1-3/4 in.)	20 mm (3/4 in.)
35 ft.	60 mm (2-3/8 in.)	20 mm (3/4 in.)
40 ft.	—	20 mm (3/4 in.)



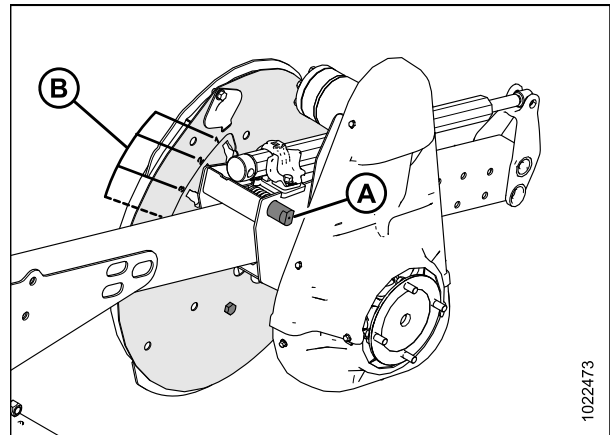
**Figure 5.25: Finger Clearance**

### 5.9.1 Checking and Adjusting Reel Cam

#### **⚠ DANGER**

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

1. Ensure reel cam latch pin (A) is in the same cam position (B) at both the center cam disc and right cam disc (not shown). If latch pin position is not the same on both cams, proceed to Step 2, page 65 to adjust reel cam position.



**Figure 5.26: Cam Disc Center Reel Arm Dual Reel Only**



## PERFORMING PREDELIVERY CHECKS

2. Turn the latch pin (A) counterclockwise using a 3/4 in. wrench to release the cam disc.
3. Use the wrench on bolt (B) to rotate the cam disc and align the latch pin (A) with the desired cam disc hole position (C) (1 to 4).

### NOTE:

Bolt (B) is positioned through the cam disc (transparent view shown in illustration for improved clarity).

4. Turn the latch pin (A) clockwise to engage and lock the cam disc.
5. Repeat the above procedure for the opposite reel.

### IMPORTANT:

Ensure the cam is secured into position before operating the machine.

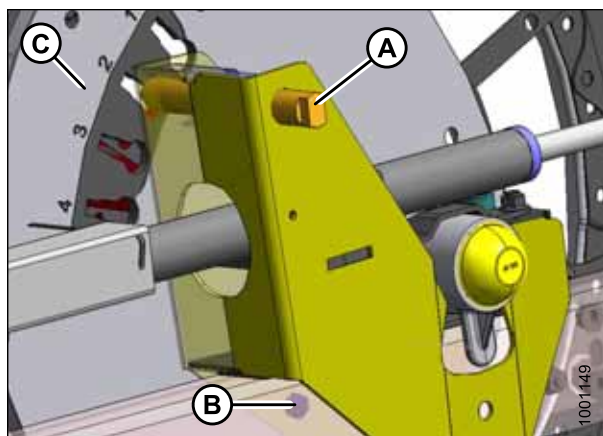


Figure 5.27: Cam Disc Positions

## 5.9.2 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.

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

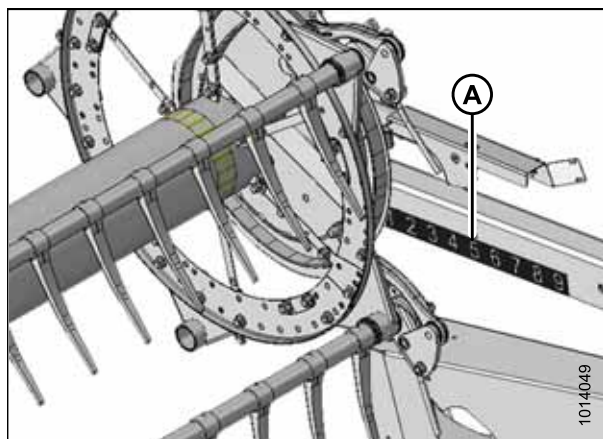


Figure 5.28: Fore-Aft Position

## PERFORMING PREDELIVERY CHECKS

5. Measure clearance at ends of each reel at locations (A).

**NOTE:**

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

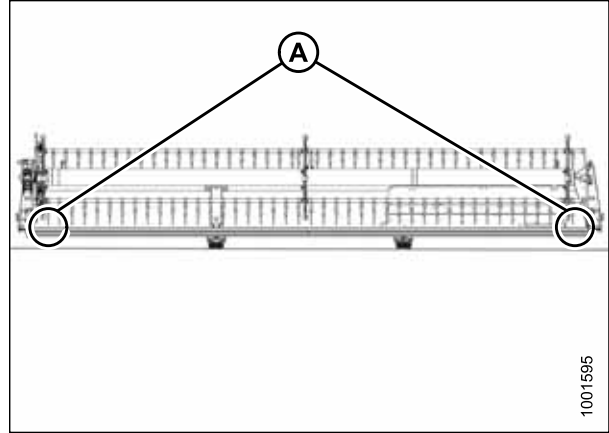


Figure 5.29: Single-Reel Header

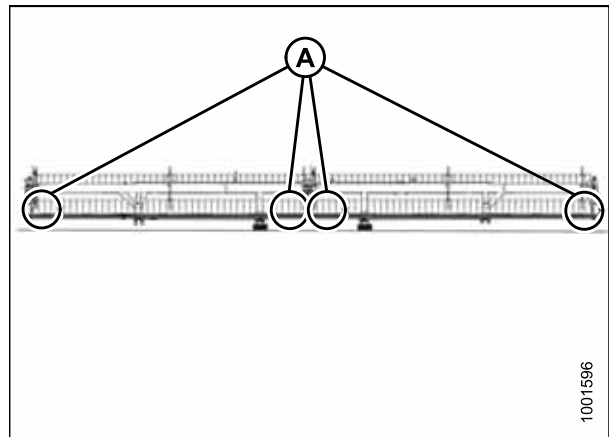


Figure 5.30: Double-Reel Header

6. Check clearance (X) between (B) and (C). Depending on reel fore-aft position, minimum clearance can result at guard tine, hold-down, or cutterbar.
7. Adjust reel if necessary. Refer to [5.9.3 Adjusting Reel Clearance](#), page 67.

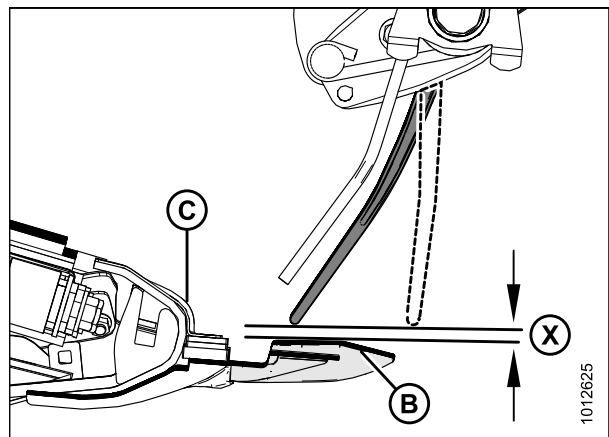


Figure 5.31: Reel Clearance

### 5.9.3 Adjusting Reel Clearance

Perform this procedure with reel at mid-point of fore-aft range and fully lowered.

#### **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. Adjust outboard reel arm lift cylinders to set clearance 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.

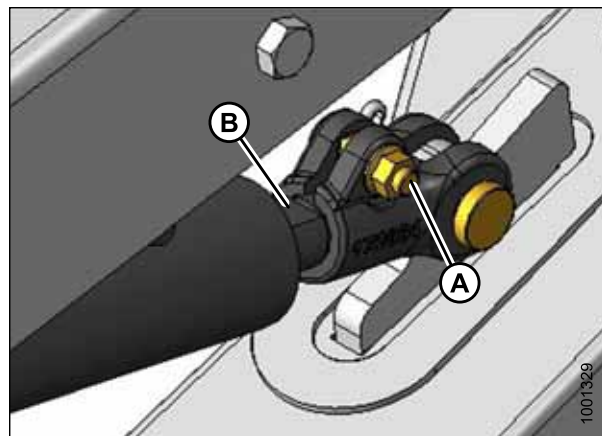


Figure 5.32: Reel Outboard Arm

2. **Double Reel:** Adjust center arm lift cylinder link (A) to set clearance at center of reel as follows:

**NOTE:**

This adjustment is most easily performed from underside of arm.

- a. Loosen 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).

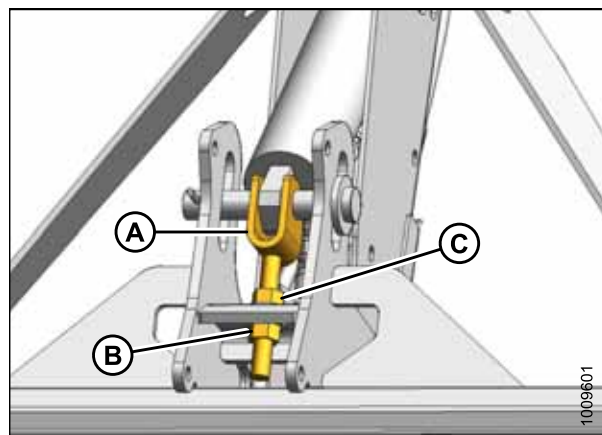


Figure 5.33: Double-Reel Center Arm

3. Move reel back to ensure steel end fingers do not contact deflector shields.
4. If contact is evident, adjust reel upward to maintain clearance at all reel fore/aft positions. Alternatively, trim steel end fingers to obtain proper clearance.
5. Periodically check for evidence of contact, and adjust clearance as required.

## 5.10 Checking and Adjusting Draper Tension

### WARNING

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.

The drapers are tensioned at the factory and should not require adjustment. Draper tension should be just enough to prevent slipping and to keep draper from sagging below cutterbar.

1. Check that white bar (A) is approximately halfway in window.

#### NOTE:

Draper tension should be just enough to prevent slipping and to keep draper from sagging below cutterbar.

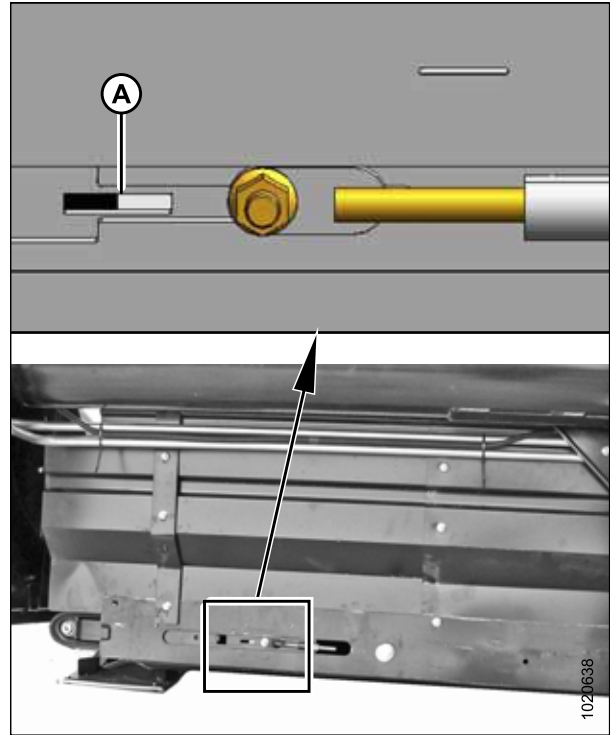


Figure 5.34: Tension Adjuster (Left Shown – Right Opposite)

To adjust draper tension, follow these steps:

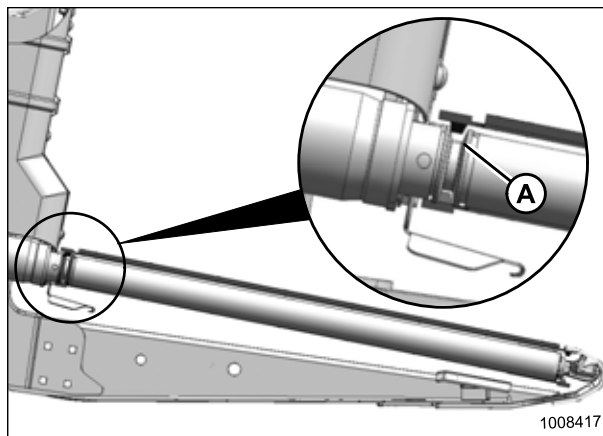
### CAUTION

Check to be sure all bystanders have cleared the area.

1. Start engine and raise header.
2. Stop engine, remove key from ignition, and engage header safety props.

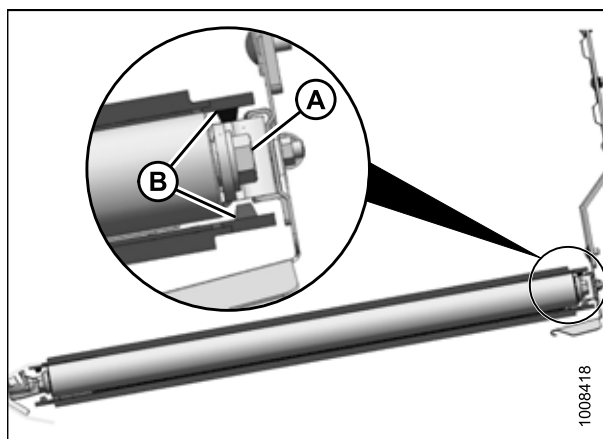
## PERFORMING PREDELIVERY CHECKS

3. Check that draper guide (rubber track on underside of draper) is properly engaged in groove (A) of drive roller.



**Figure 5.35: Drive Roller**

4. Check that idler roller (A) is between guides (B).



**Figure 5.36: Idler Roller – Typical Both Ends of Roller**

## PERFORMING PREDELIVERY CHECKS

### IMPORTANT:

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

5. If draper is too tight, turn adjuster bolt (A) counterclockwise to loosen draper. The white indicator bar (B) will move outboard in direction of arrow (D) to indicate that draper is loosening. Loosen until bar is about halfway in window.
6. If draper is too loose, turn adjuster bolt (A) clockwise to tighten draper. The white indicator bar (B) will move inboard in direction of arrow (E) to indicate that draper is tightening. Tighten until bar is about halfway in window.

### IMPORTANT:

- To avoid premature failure of draper, draper rollers, and/or tightener components, operate **ONLY** with the white bar visible.
- To prevent draper from scooping dirt, ensure draper is tight enough that it does **NOT** sag below point where cutterbar contacts the ground.

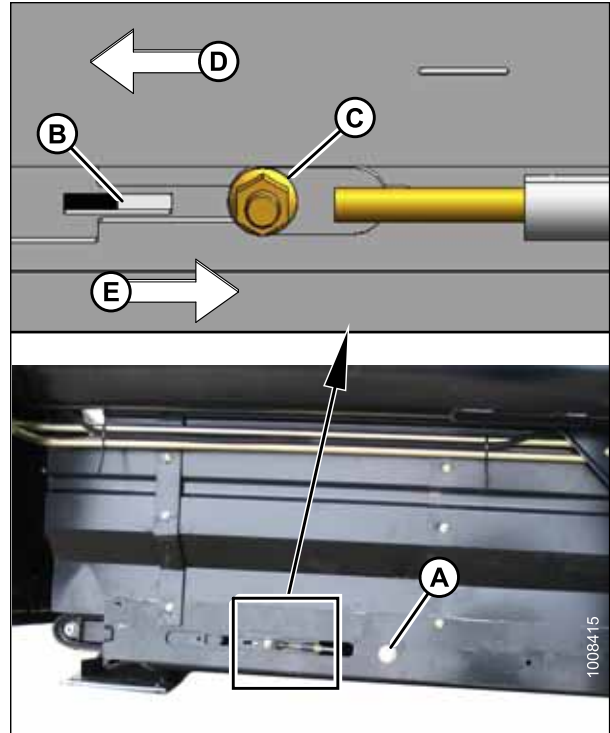


Figure 5.37: Tension Adjuster (Left Shown – Right Opposite)

## 5.11 Checking Draper Seal

### WARNING

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

1. Lower header to working position. Stop engine, and remove key from ignition.
2. Check that clearance (A) between draper (B) and cutterbar (C) is 0–3 mm (1/8 in.). Take measurements at deck support locations. Refer to chart and illustration on following page for approximate support locations.

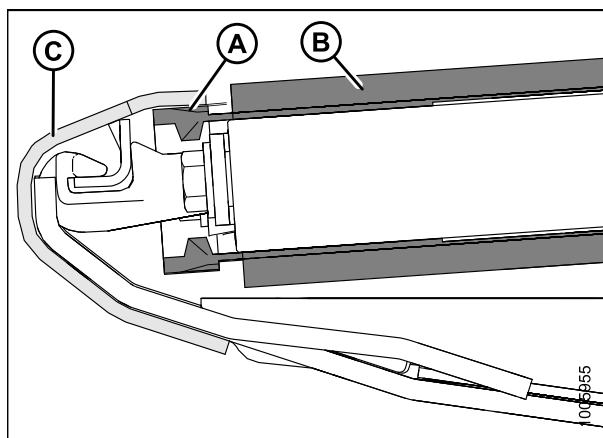


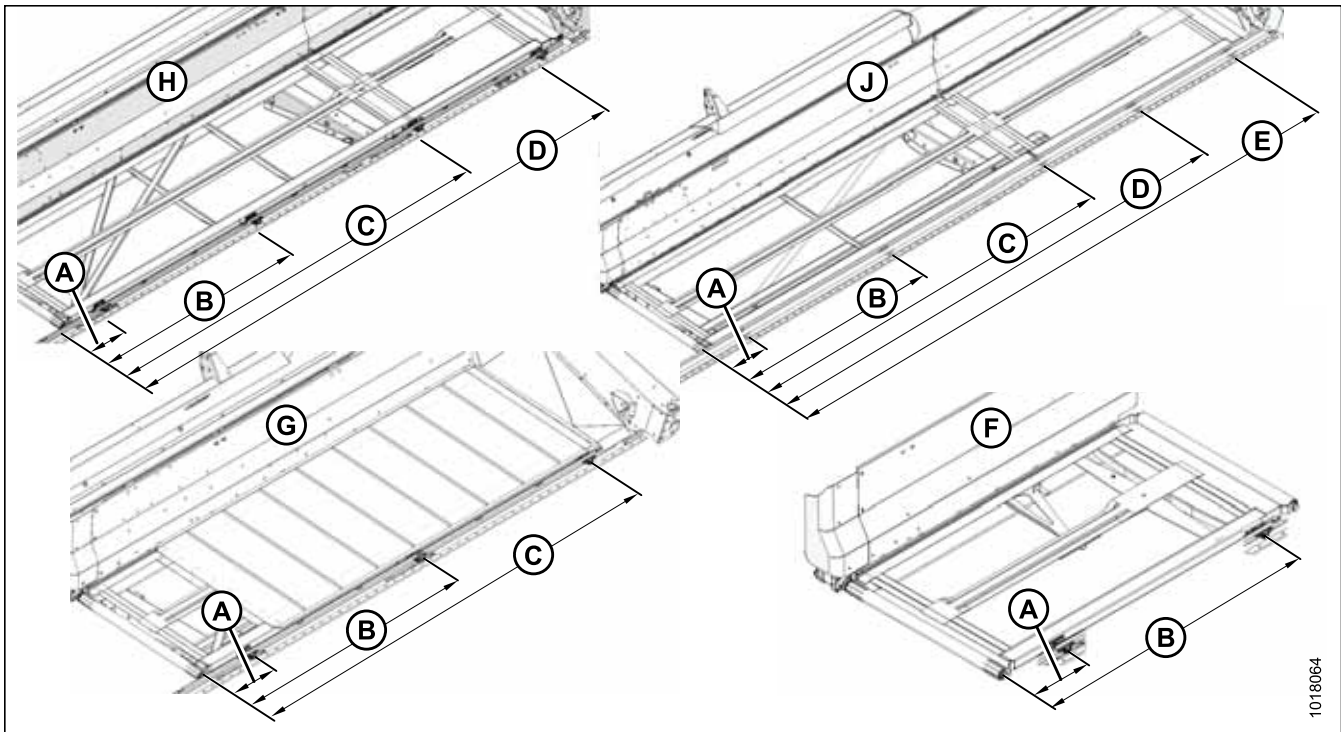
Figure 5.38: Draper Seal

## PERFORMING PREDELIVERY CHECKS

**Table 5.3 Deck Support Locations**

Header Size	Approximate Location of Support from Drive Roller (mm [in.])				
	A	B	C	D	E
15-ft. (F)	354 (13-15/16)	994 (39-1/8)	–	–	–
20-ft. (F)	354 (13-15/16)	1662 (65-7/16)	–	–	–
25-ft. (G)	354 (13-15/16)	1392 (54-13/16)	2427 (95-9/16)	–	–
30-ft. (G)	354 (13-15/16)	1773 (69-13/16)	3191 (125-5/8)	–	–
35-ft. (H)	354 (13-15/16)	1550 (61)	2747 (108-3/16)	3949 (155-7/16)	–
40-ft. (H)	354 (13-15/16)	1809 (71-1/8)	3258 (128-1/4)	4710 (185-7/16)	–

**Figure 5.39: Deck Support Locations – Left Shown, Right Opposite**





## 5.12 Leveling Header

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

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

**NOTE:**

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

## 5.13 Checking and Adjusting Endshields

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

1. Check gap (X) between front end of shields and header frame and compare to values in Table 5.4, page 74.

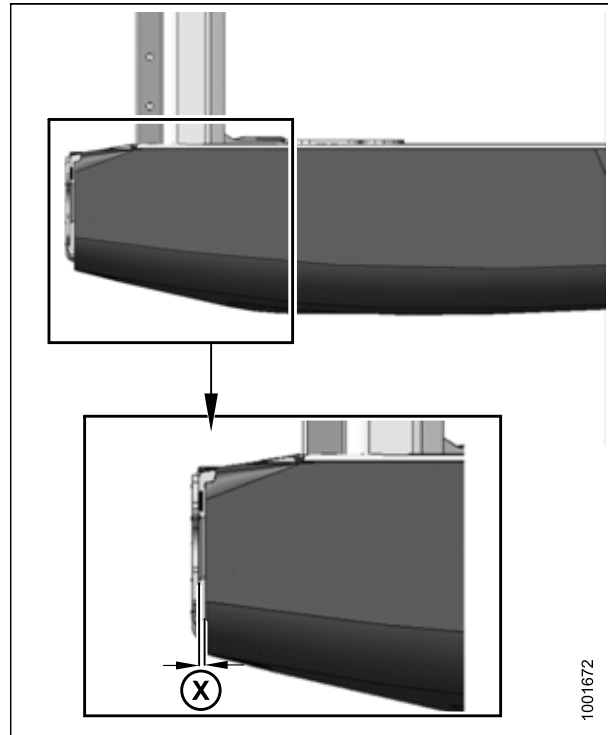
**Table 5.4 Endshield Gap at Various Temperatures**

Temperature °C (°F)	Gap (X) mm (in.)
-4 (25)	28 (1-1/10)
7 (45)	24 (1)
18 (65)	20 (13/16)
29 (85)	16 (5/8)
41 (105)	12 (1/2)
52 (125)	8 (5/16)
63 (145)	4 (3/16)
89 (165)	0

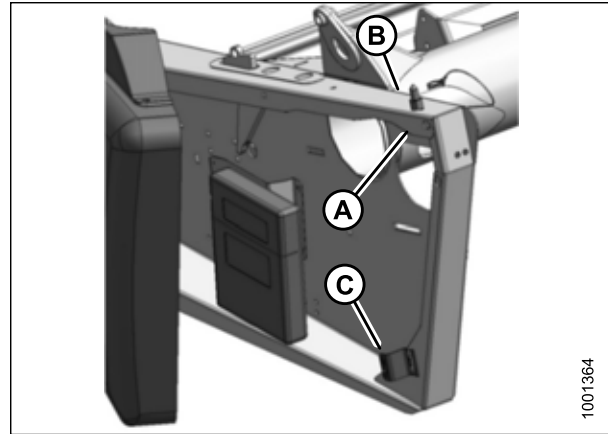
**NOTE:**

If endshield gap is correct, skip to next procedure. If adjustment is required, follow these steps:

2. Open endshield. Refer to 3.3 *Opening Endshield*, page 25.
3. Loosen nut (A) on pin (B) from inside endsheet.
4. Close endshield and adjust position to achieve desired gap between front end of shield and header frame in accordance with Table 5.4, page 74.
5. Open endshield and tighten nut (A).
6. Check for a snug fit between top of shield and header frame, and for full engagement of endshield on pin (B).
7. If necessary, loosen bolts on catch (C) and adjust catch as required to reposition shield.
8. Tighten bolts on catch (C).
9. Close endshield. Refer to 3.7 *Closing Endshield*, page 29.



**Figure 5.40: Gap Between Endshield and Header Frame**



**Figure 5.41: Endshield Adjustment**

## 5.14 Lubricating Header

### 5.14.1 Greasing Procedure

Greasing points are marked on machine by decals showing a grease gun and grease interval in hours of operation. Master grease point location decals are provided on header.



#### **DANGER**

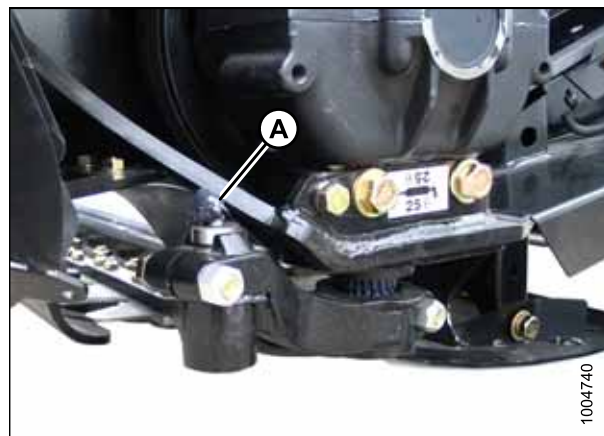
To avoid bodily injury or death from unexpected start-up of machine, always stop engine and remove key from ignition before leaving operator's seat for any reason.

1. Wipe grease fitting with a clean cloth before greasing to avoid injecting dirt and grit.
2. Use high temperature, extreme pressure (EP2) performance with 1% max molybdenum disulphide (NLGI Grade 2) lithium base unless otherwise specified.
3. Inject grease through fitting with grease gun until grease overflows fitting (except where noted).
4. Leave excess grease on fitting to keep out dirt.
5. Replace any loose or broken fittings immediately.
6. Remove and thoroughly clean any fitting that will not take grease. Also clean lubricant passageway. Replace fitting if necessary.

### 5.14.2 Lubrication Points

#### **IMPORTANT:**

- To prevent binding and/or excessive wear caused by knife pressing on guards, do **NOT** over-grease knifehead (A).
- Check for signs of excessive heating on first few guards after greasing. If required, relieve some pressure by pressing check-ball in grease fitting or loosening the grease fitting.
- Only 1–2 pumps with a mechanical grease gun is required (do **NOT** use an electric grease gun).
- If more than 6–8 pumps of grease gun are required to fill cavity, replace seal in knifehead.

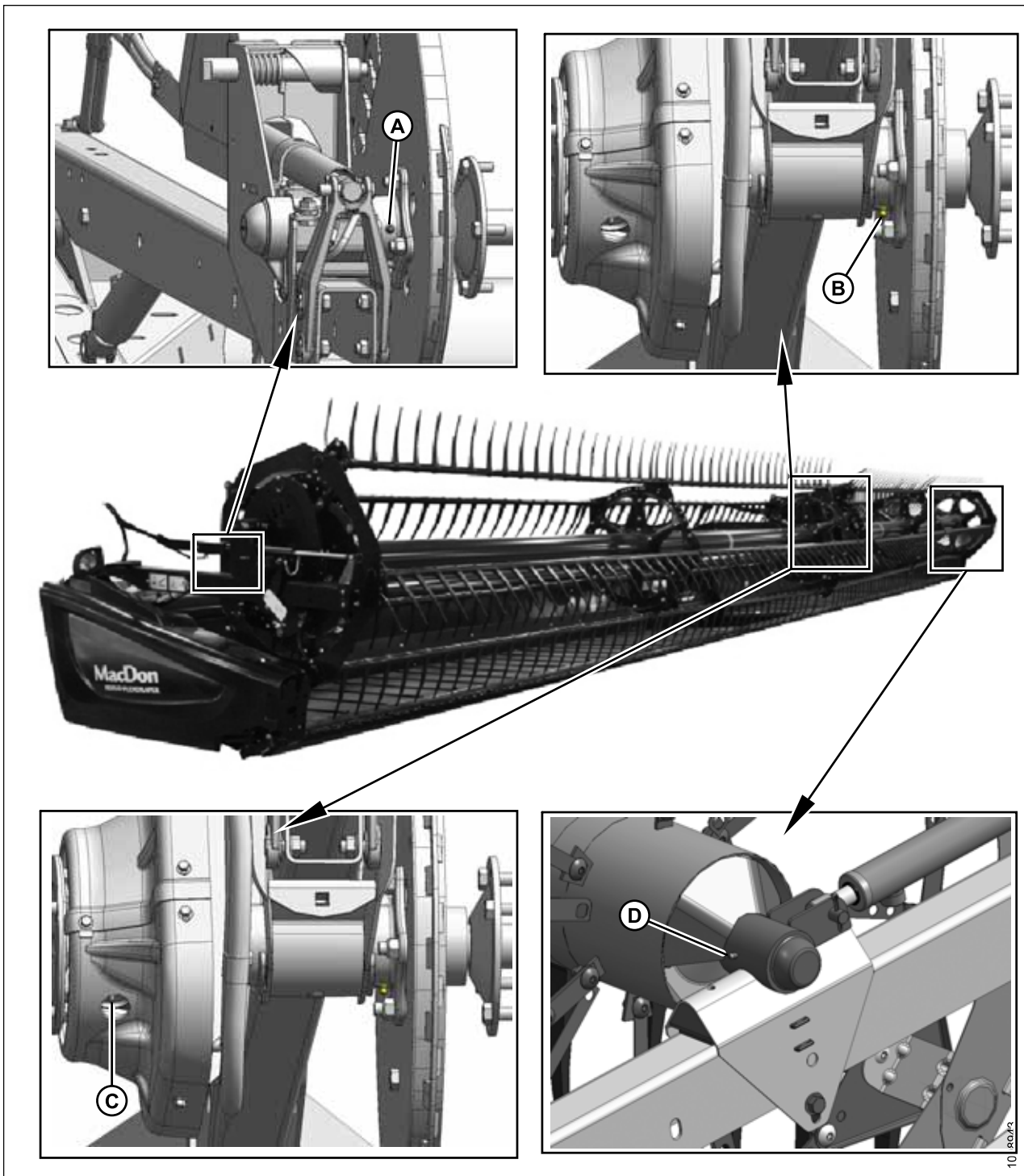


**Figure 5.42: Knifehead**

A - Knifehead (Single Knife - 1 Place) (Double Knife - 2 Places)

## PERFORMING PREDELIVERY CHECKS

Figure 5.43: Lubrication Points



A - Reel Shaft Right Bearing (1 Place)  
C - Reel Universal (1 Place - Double Reel)

B - Reel Center Bearing (1 Place - Double Reel)  
D - Reel Shaft Left Bearing (1 Place)

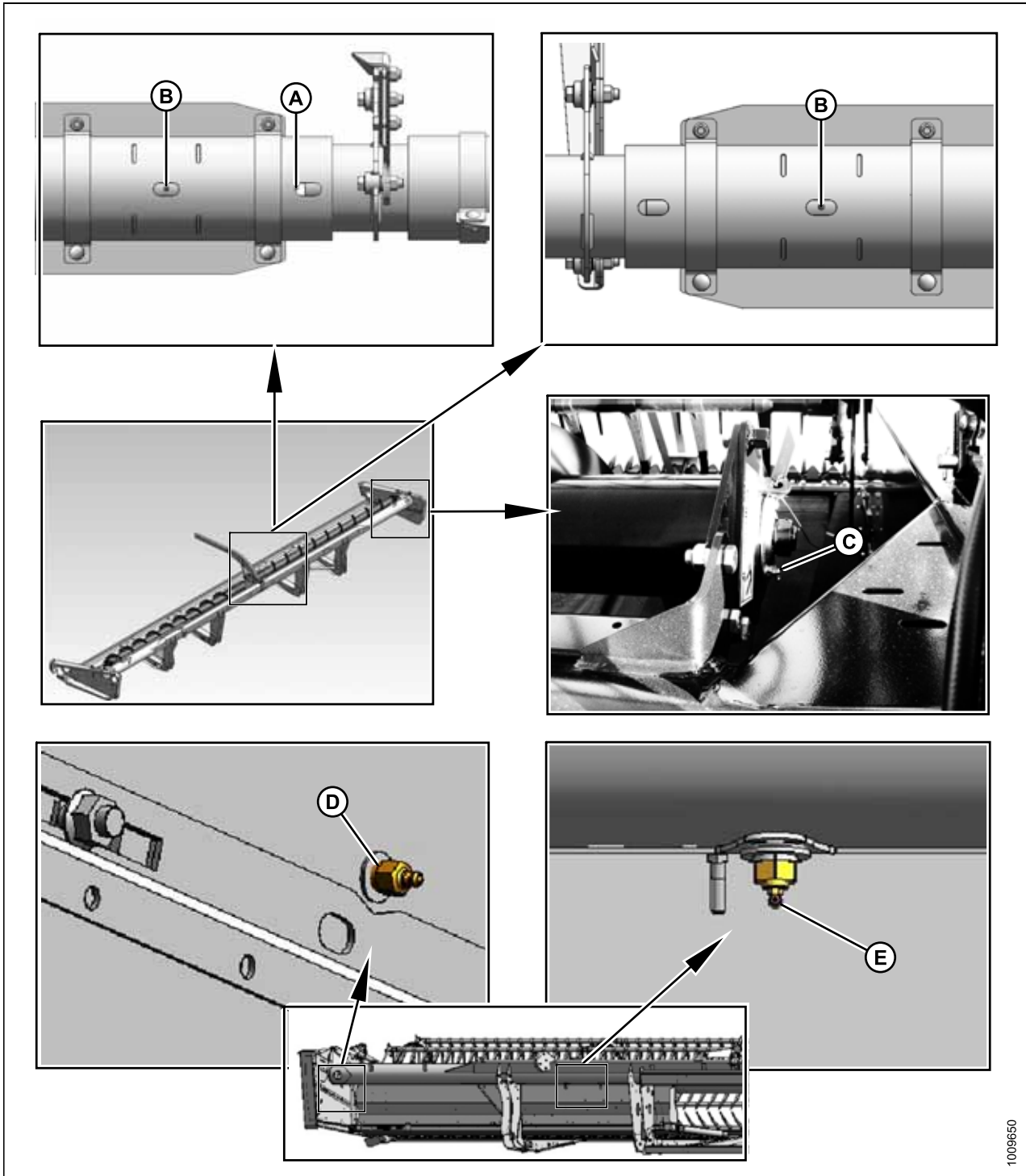
## PERFORMING PREDELIVERY CHECKS

### **IMPORTANT:**

The U-joint has an extended lubrication cross and bearing kit. Stop greasing when greasing becomes difficult, or if U-joint stops taking grease. **OVER-GREASING WILL DAMAGE THE U-JOINT.** Six to eight pumps is sufficient at first grease (factory).

## PERFORMING PREDELIVERY CHECKS

Figure 5.44: Upper Cross Auger and Double-Knife Timed Drive



1009650

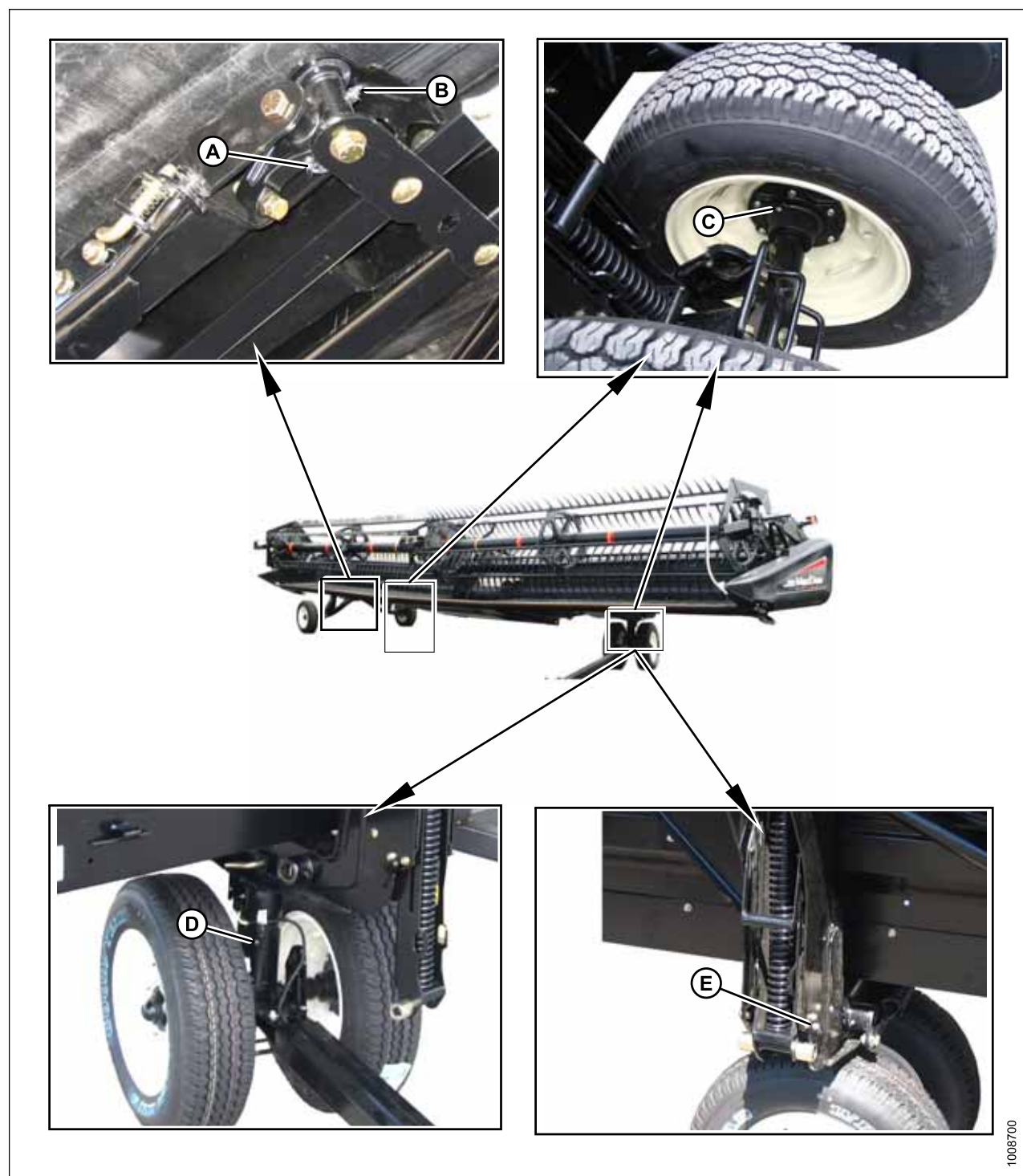
A - Upper Cross Auger U-Joint  
D - Knife Drive Bearing (Both Sides)

B - Upper Cross Auger Bearing  
E - Knife Drive Shaft (Both Sides) 15 Pumps Min.

C - Upper Cross Auger (1 Place)

## PERFORMING PREDELIVERY CHECKS

Figure 5.45: Slow Speed Transport / Stabilizer Wheels



A - Rear Wheel Axle  
D - Front Wheel Pivot (1 Place)

B - Rear Wheel Axle<sup>3</sup>  
E - Frame/Wheel Pivot (1 Place - Both Sides)

C - Wheel Bearings (4 Places)

3. If a grease fitting is not installed, this is a greaseless joint. Do **NOT** lubricate.



## 5.15 Checking Manuals

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

1. Open left endshield and remove cable tie on manual case.

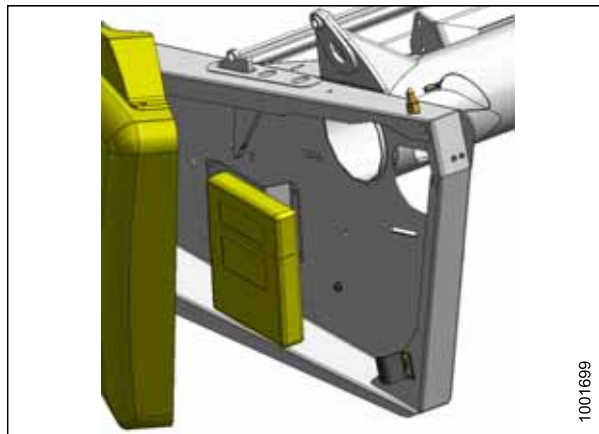


Figure 5.46: Manual Case

2. Confirm that case contains following manuals:
  - D65 Draper Header for Self-Propelled Windrowers Operator's Manual
  - D65 Draper Header for Self-Propelled Windrowers Quick Card
  - D65 Draper Header Parts Catalog
3. Close case and endshield.



Figure 5.47: D65 Manuals



## 6 Running up Header

### 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 engine, engage parking brake, and remove key.

To run-up the header, follow these steps:

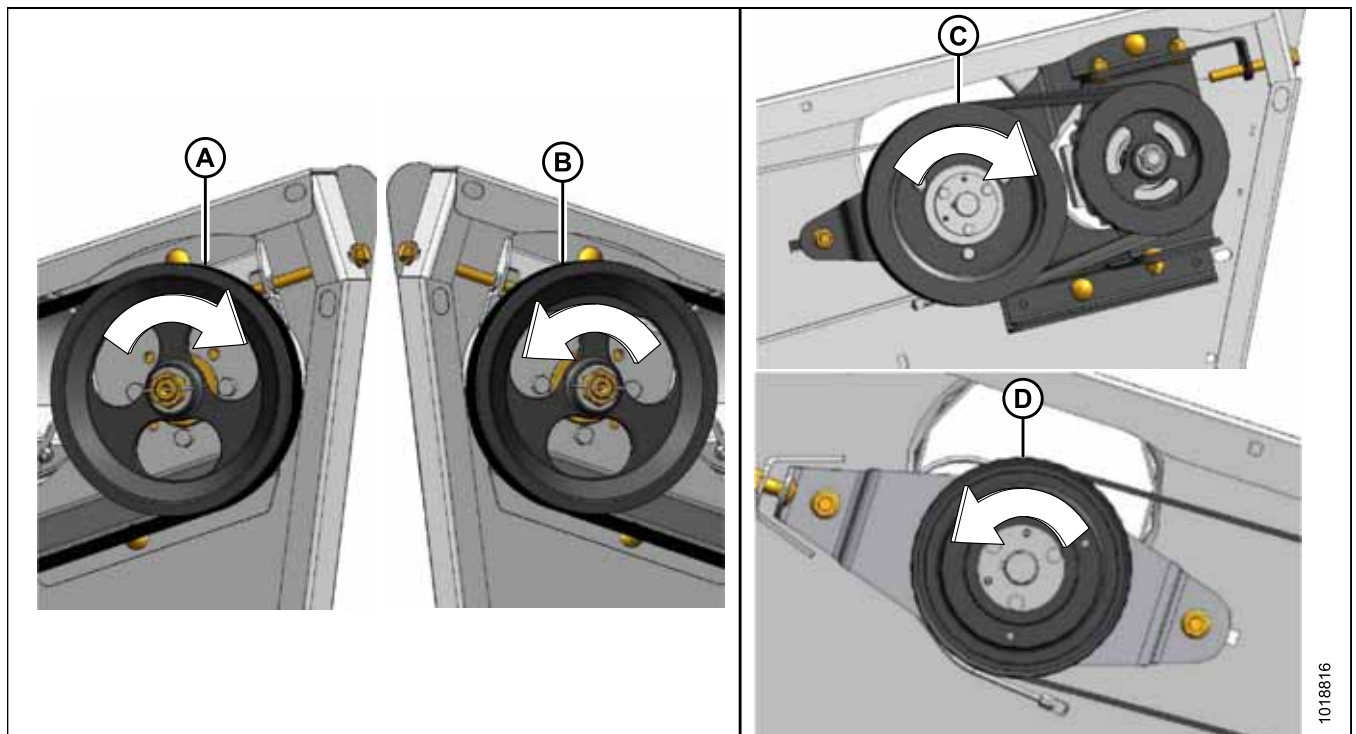
1. Start windrower and run header slowly for 5 minutes, watching and listening **FROM THE OPERATOR'S SEAT** for binding or interfering parts.

#### NOTE:

Reel and drapers will not operate until oil is flowing freely through lines.

2. Check rotation of knife drive pulley(s).

**Figure 6.1: Knife Drives**



A - Untimed Drive Single and Double Knife Left Side  
B - Untimed Drive Double Knife Right Side

C - Timed Drive Double Knife Left Side  
D - Timed Drive Double Knife Right Side

## RUNNING UP HEADER

- Run header for an additional 10 minutes at operating speed, watching and listening **FROM THE OPERATOR'S SEAT** for binding or interfering parts.
- Have someone check rpm of knife drive box pulley (A) with a hand-held tachometer.

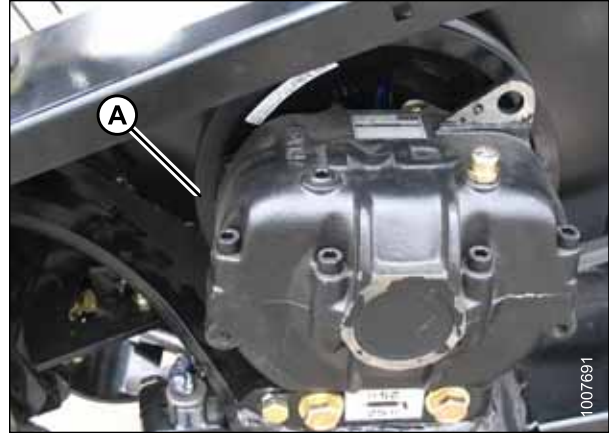


Figure 6.2: Knife Drive Box

- Compare actual pulley rpm with values in following chart. Refer to SP Windrower Operator's Manual if adjustments are required.

Table 6.1 Knife Speed Guidelines

Header Size (ft.)	Recommended Knife Speed Range (rpm)	
	Single Knife	Double Knife
15 ft.	—	750–950
20, 25 ft.	600–700	700–850
30 ft.	600–700	600–800
35 ft.	550–650	600–700
40 ft.	525–600	550–700

- Shut down windrower and remove key.
- Perform post run-up check as listed on the Predelivery Checklist. Refer to yellow sheet [Predelivery Checklist, page 99](#) attached to this instruction.

## 6.1 Performing Post Run-Up Adjustments

Perform post run-up check as listed on Predelivery Checklist. Refer to yellow sheet [Predelivery Checklist, page 99](#) attached to this instruction 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 making adjustments to machine.

Some adjustments may be necessary after run-up. Refer to [6.1.1 Adjusting Knife and Guards, page 82](#).

### 6.1.1 Adjusting Knife and Guards

#### WARNING

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

## RUNNING UP HEADER

1. Stop engine and remove 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 gap. If not, adjust gap by loosening bolt and tapping knifehead (A) with a hammer. Retighten bolt.

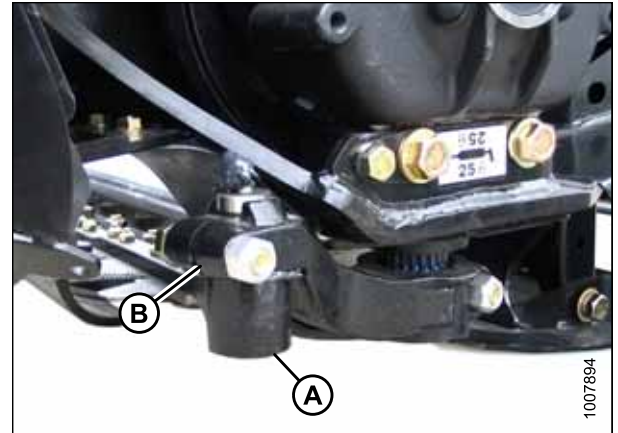


Figure 6.3: Knifehead and Pitman Arm

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 6.4: Guard Tips – Upward Adjustment

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

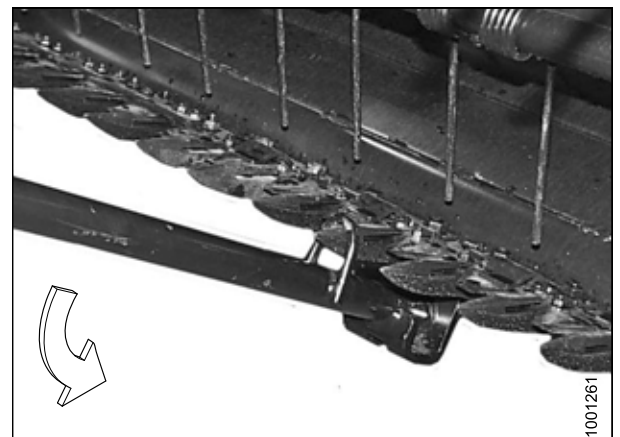


Figure 6.5: Guard Tips – Downward Adjustment



## 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***

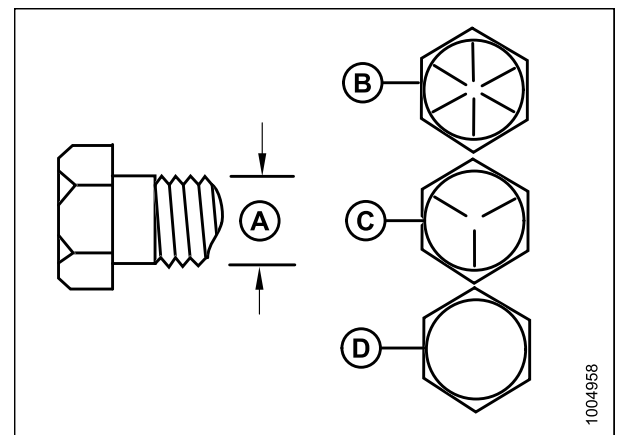
Standard torque is to be used (not to be used on critical or structurally important joints).

#### 7.1.1 SAE Bolt Torque Specifications

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

**Table 7.1 SAE Grade 5 Bolt and Grade 5 Free Spinning Nut**

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



**Figure 7.1: Bolt Grades**

A - Nominal Size  
C - SAE-5

B - SAE-8  
D - SAE-2

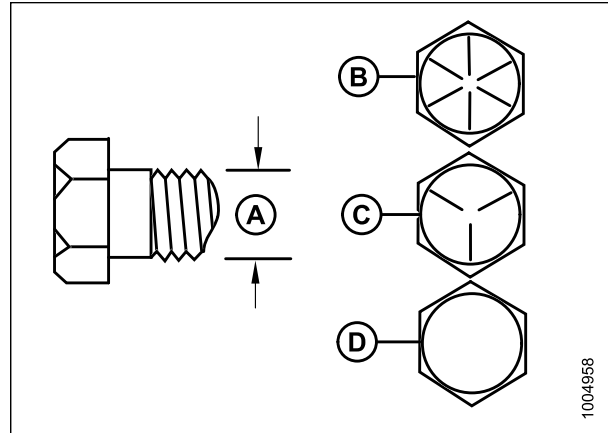
## REFERENCE

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

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

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

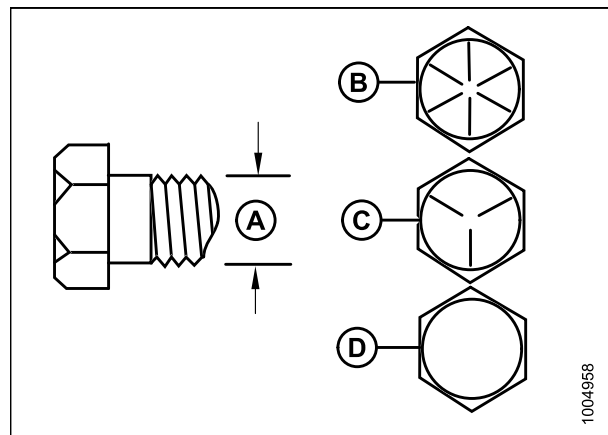
Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
1/4-20	16.8	18.6	*150	*165
5/16-18	24	26	18	19
3/8-16	42	46	31	34
7/16-14	67	74	50	55
1/2-13	102	113	76	84
9/16-12	148	163	109	121
5/8-11	204	225	151	167
3/4-10	362	400	268	296
7/8-9	583	644	432	477
1-8	874	966	647	716



**Figure 7.2: Bolt Grades**

A - Nominal Size  
C - SAE-5

B - SAE-8  
D - SAE-2



**Figure 7.3: Bolt Grades**

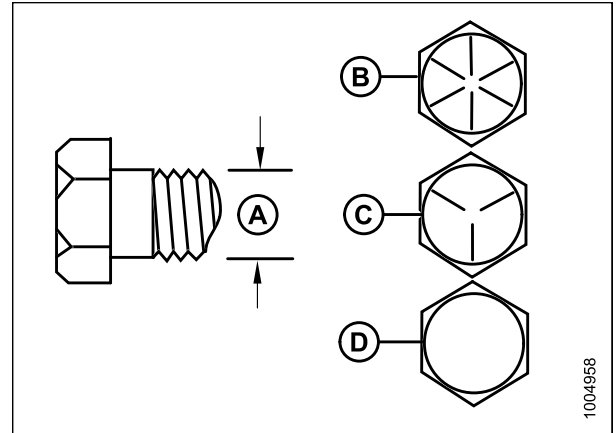
A - Nominal Size  
C - SAE-5

B - SAE-8  
D - SAE-2

## REFERENCE

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

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



**Figure 7.4: Bolt Grades**

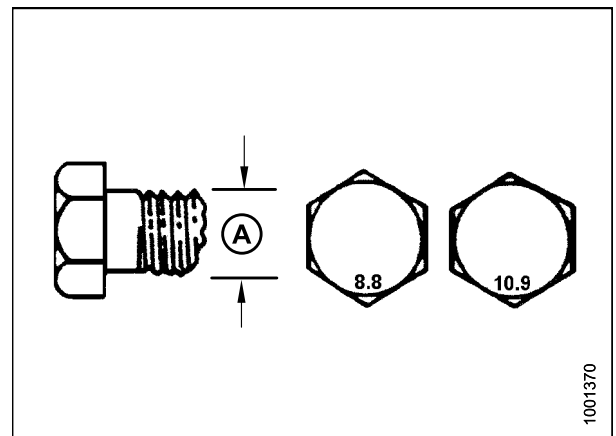
A - Nominal Size  
C - SAE-5

B - SAE-8  
D - SAE-2

### 7.1.2 Metric Bolt Specifications

**Table 7.5 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

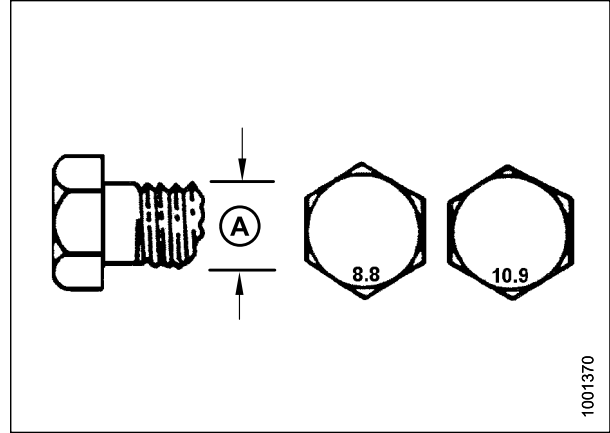


**Figure 7.5: Bolt Grades**

## REFERENCE

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

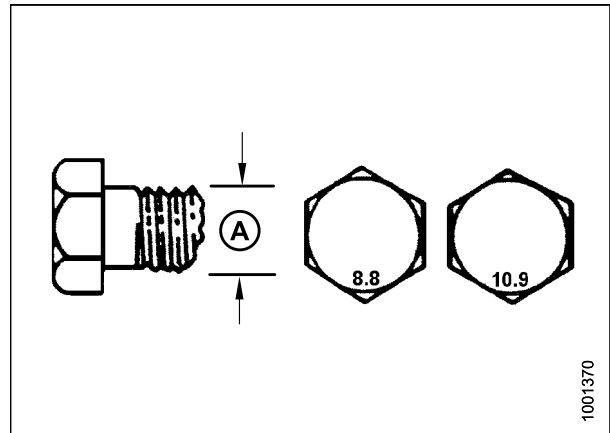
Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
3-0.5	1	1.1	*9	*10
3.5-0.6	1.5	1.7	*14	*15
4-0.7	2.3	2.5	*20	*22
5-0.8	4.5	5	*40	*45
6-1.0	7.7	8.6	*69	*76
8-1.25	18.8	20.8	*167	*185
10-1.5	37	41	28	30
12-1.75	65	72	48	53
14-2.0	104	115	77	85
16-2.0	161	178	119	132
20-2.5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



**Figure 7.6: Bolt Grades**

**Table 7.7 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



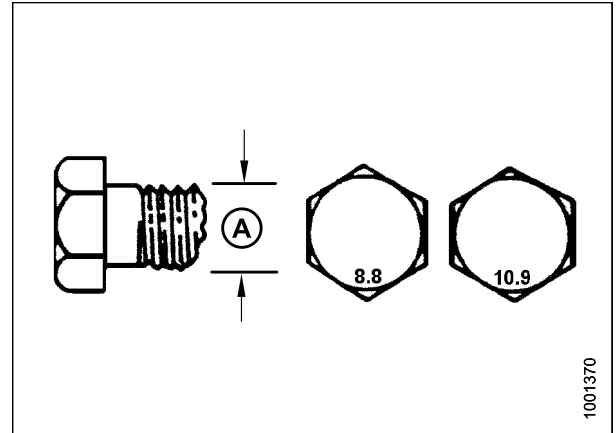
**Figure 7.7: Bolt Grades**



## REFERENCE

**Table 7.8 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

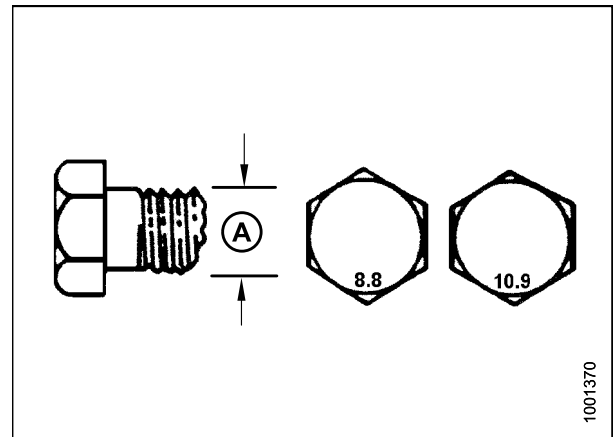


**Figure 7.8: Bolt Grades**

### 7.1.3 Metric Bolt Specifications Bolting into Cast Aluminum

**Table 7.9 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 7.9: Bolt Grades**

## 7.1.4 Flare-Type Hydraulic Fittings

1. Check flare (A) and flare seat (B) for defects that might cause leakage.
2. Align tube (C) with fitting (D) and thread nut (E) onto fitting without lubrication until contact has been made between flared surfaces.
3. Torque fitting nut (E) to specified number of flats from finger tight (FFFT) or to a given torque value in Table 7.10, page 90.
4. Use two wrenches to prevent fitting (D) from rotating. Place one wrench on fitting body (D), and tighten nut (E) with other wrench to torque shown.
5. Assess final condition of connection.

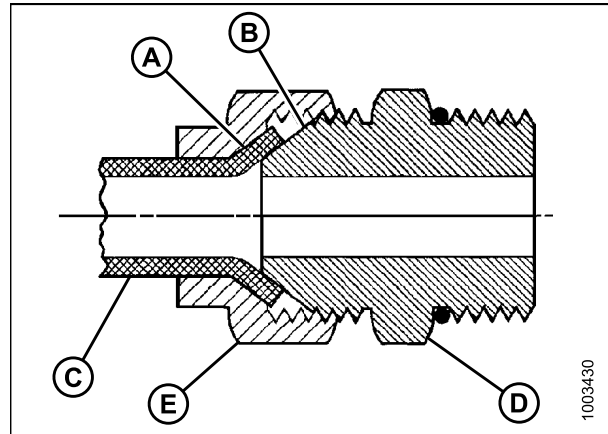


Figure 7.10: Hydraulic Fitting

Table 7.10 Flare-Type Hydraulic Tube Fittings

SAE Dash Size	Thread Size (in.)	Torque Value <sup>4</sup>		Flats from Finger Tight (FFFT)	
		Nm	lbf·ft	Tube	Swivel Nut or Hose
-2	5/16–24	4–5	3–4	—	—
-3	3/8–24	7–8	5–6	—	—
-4	7/16–20	18–19	13–14	2-1/2	2
-5	1/2–20	19–21	14–15	2	2
-6	9/16–18	30–33	22–24	2	1-1/2
-8	3/4–16	57–63	42–46	2	1-1/2
-10	7/8–14	81–89	60–66	1-1/2	1-1/2
-12	1-1/16–12	113–124	83–91	1-1/2	1-1/4
-14	1-3/16–12	136–149	100–110	1-1/2	1-1/4
-16	1-5/16–12	160–176	118–130	1-1/2	1
-20	1-5/8–12	228–250	168–184	1	1
-24	1-7/8–12	264–291	195–215	1	1
-32	2-1/2–12	359–395	265–291	1	1
-40	3–12	—	—	1	1

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

### 7.1.5 O-Ring Boss (ORB) 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).

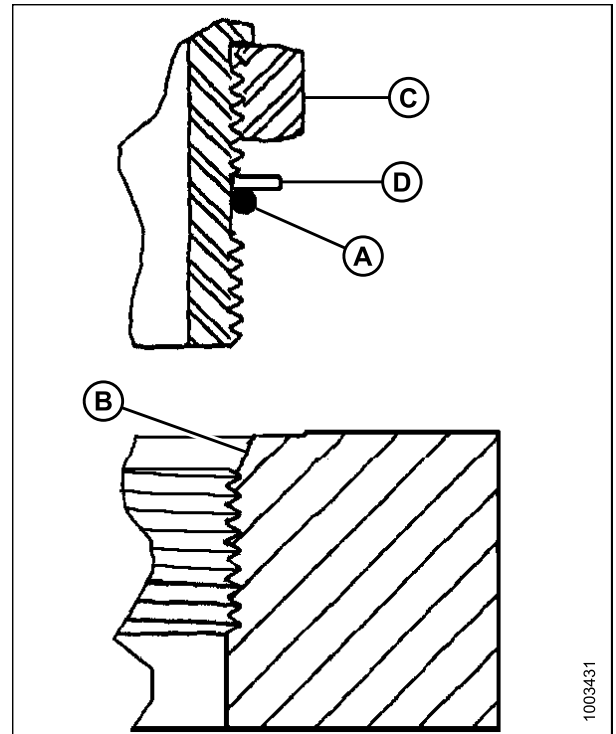


Figure 7.11: Hydraulic Fitting

5. Install fitting (B) into port until back up 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.

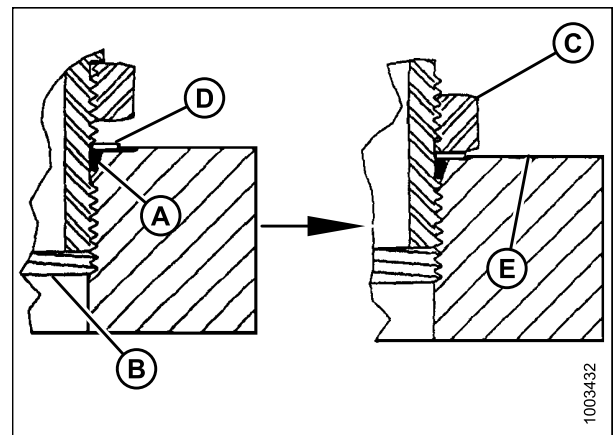


Figure 7.12: Hydraulic Fitting

## REFERENCE

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

SAE Dash Size	Thread Size (in.)	Torque Value <sup>5</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

---

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

## REFERENCE

### 7.1.6 O-Ring Boss (ORB) 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 7.12, page 93.
6. Check final condition of fitting.

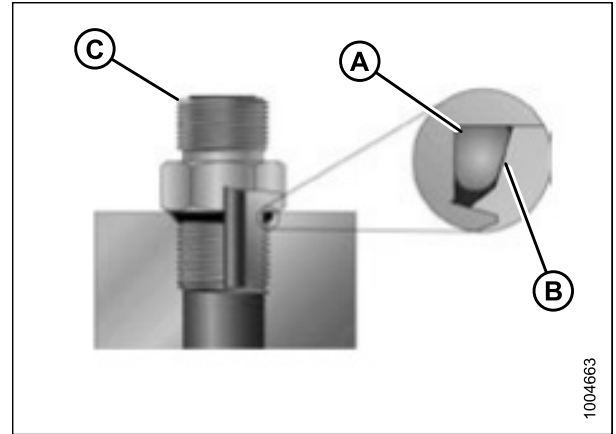


Figure 7.13: Hydraulic Fitting

Table 7.12 O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable)

SAE Dash Size	Thread Size (in.)	Torque Value <sup>6</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

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

## 7.1.7 O-Ring Face Seal (ORFS) Hydraulic Fittings

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



Figure 7.14: 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 7.13, page 94.

**NOTE:**

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

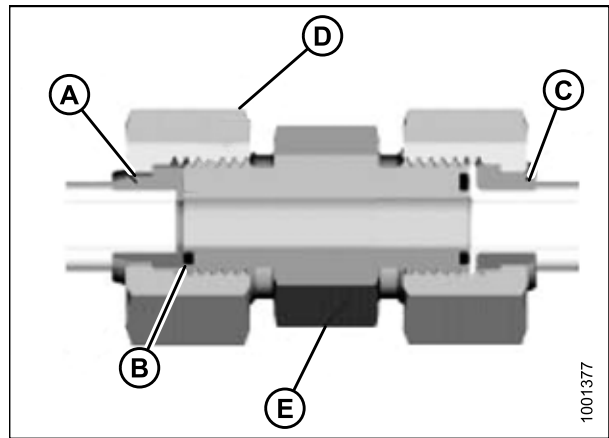


Figure 7.15: Hydraulic Fitting

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

**Table 7.13 O-Ring Face Seal (ORFS) Hydraulic Fittings**

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

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

## REFERENCE

**Table 7.13 O-Ring Face Seal (ORFS) Hydraulic Fittings (continued)**

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value <sup>9</sup>	
			Nm	lbf·ft
-14	Note <sup>8</sup>	7/8	—	—
-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

### 7.1.8 Tapered Pipe Thread Fittings

Assemble pipe fittings as follows:

1. Check components to ensure that fitting and port threads are free of burrs, nicks and 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 (T.F.F.T.) values are shown in Table 7.14, page 95. 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 7.14 Hydraulic Fitting Pipe Thread**

Tapered Pipe Thread Size	Recommended T.F.F.T.	Recommended F.F.F.T.
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

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

## 7.2 Conversion Chart

Table 7.15 Conversion Chart

Quantity	SI Units (Metric)		Factor	Inch-Pound Units (Imperial)	
	Unit Name	Abbreviation		Unit Name	Abbreviation
Area	hectares	ha	$\times 2.4710 =$	acres	acres
Flow	liters per minute	L/min	$\times 0.2642 =$	US gallons per minute	gpm
Force	Newtons	N	$\times 0.2248 =$	pounds force	lbf
Length	millimeters	mm	$\times 0.0394 =$	inch	in.
Length	meters	m	$\times 3.2808 =$	foot	ft.
Power	kilowatts	kW	$\times 1.341 =$	horsepower	hp
Pressure	kilopascals	kPa	$\times 0.145 =$	pounds per square inch	psi
Pressure	megapascals	MPa	$\times 145.038 =$	pounds per square inch	psi
Pressure	bar (Non-SI)	bar	$\times 14.5038 =$	pounds per square inch	psi
Torque	Newton meters	Nm	$\times 0.7376 =$	pound feet or foot pounds	lbf·ft
Torque	Newton meters	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	liters	L	$\times 0.2642 =$	US gallons	US gal
Volume	milliliters	ml	$\times 0.0338 =$	ounces	oz.
Volume	cubic centimeters	cm <sup>3</sup> or cc	$\times 0.061 =$	cubic inches	in. <sup>3</sup>
Weight	kilograms	kg	$\times 2.2046 =$	pounds	lb.



## REFERENCE

### 7.3 Definitions

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

Term	Definition
API	American Petroleum Institute
ASTM	American Society of Testing and Materials
Bolt	A headed and externally threaded fastener that is designed to be paired with a nut
Center-link	A hydraulic cylinder link between header and machine used to change header angle
CGVW	Combined vehicle gross weight
D Series header	MacDon D50, D60, and D65 rigid draper headers
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
FFFT	Flats from finger tight
GSL	Ground speed lever
GVW	Gross vehicle weight
Hard joint	A joint made with use of a fastener where joining materials are highly incompressible
Hex key	A tool of hexagonal cross-section used to drive bolts and screws that have a hexagonal socket in head (internal-wrenching hexagon drive); also known as an Allen key and various other synonyms
hp	Horsepower
ISC	Intermediate Speed Control
JIC	Joint Industrial Council: A standards body that developed standard sizing and shape for original 37° flared fitting
M Series windrower	MacDon M100, M105, M150, M155, M155E4, M200, and M205 windrowers
n/a	Not applicable
Nut	An internally threaded fastener that is designed to be paired with a bolt
NPT	National Pipe Thread: A style of fitting used for low pressure port openings. Threads on NPT fittings are uniquely tapered for an interference fit
ORB	O-ring boss: A style of fitting commonly used in port opening on manifolds, pumps, and motors
ORFS	O-ring face seal: A style of fitting commonly used for connecting hoses and tubes. This style of fitting is also commonly called ORS, which stands for O-ring seal
RoHS (Reduction of Hazardous Substances)	A directive by the European Union to restrict use of certain hazardous substances (such as hexavalent chromium used in some yellow zinc platings)
SAE	Society of Automotive Engineers
Screw	A headed and externally threaded fastener that threads into preformed threads or forms its own thread into a mating part

## REFERENCE

Term	Definition
Self-Propelled (SP) Windrower	Self-propelled machine consisting of a power unit with a header
Soft joint	A joint made with use of a fastener where joining materials are compressible or experience relaxation over a period of time
Truck	A four-wheel highway/road vehicle weighing no less than 3400 kg (7500 lb.)
Tension	Axial load placed on a bolt or screw, usually measured in Newtons (N) or pounds (lb.)
TFFT	Turns from finger tight
Torque	The product of a force X lever arm length, usually measured in Newton-meters (Nm) or foot-pounds (lbf-ft)
Torque angle	A tightening procedure where fitting is assembled to a precondition (finger tight) and then nut is turned farther a number of degrees to achieve its final position
Torque-tension	The relationship between assembly torque applied to a piece of hardware and axial load it induces in bolt or screw
Washer	A thin cylinder with a hole or slot located in the center that is to be used as a spacer, load distribution element, or a locking mechanism

# Predelivery Checklist

Perform these checks and adjustments 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 Operator or 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:

**Table .16 D65 Predelivery Checklist – North America**

✓	Item	Reference
	Check for shipping damage or missing parts. Be sure all shipping material is removed.	—
	Check for loose hardware. Tighten to required torque.	<a href="#">7.1 Torque Specifications, page 85</a>
	Check tire pressure (Transport/Stabilizer Option).	<a href="#">5.2 Checking Transport/Stabilizer Tire Pressure, page 51</a>
	Check wheel bolt torque (Transport/Stabilizer Option).	<a href="#">5.3 Checking Wheel Bolt Torque, page 52</a>
	Check knife drive box breather position.	<a href="#">5.4 Checking Knife Drive Box, page 53</a>
	Check knife drive box lube level.	<a href="#">5.4 Checking Knife Drive Box, page 53</a>
	Check knife drive belt(s) tension.	<a href="#">5.6 Checking and Adjusting Timed Double-Knife Drive Belt Tension, page 55</a> <a href="#">5.5 Checking and Adjusting Non-Timed Knife Drive Belt Tension, page 54</a>
	Check reel is centered between header endsheets.	<a href="#">5.8 Centering Reel, page 62</a>
	Check reel tine to cutterbar clearance.	<a href="#">5.9 Measuring and Adjusting Reel Clearance to Cutterbar, page 64</a>
	Check draper tension.	<a href="#">5.10 Checking and Adjusting Draper Tension, page 68</a>
	Check draper seal.	<a href="#">5.11 Checking Draper Seal, page 71</a>
	Check knife hold-down adjustment.	<a href="#">5.7 Checking and Adjusting Knife Hold-Downs, page 57</a>
	Check skid shoes are evenly adjusted an appropriate setting for first crop.	<a href="#">5.1 Checking and Adjusting Skid Shoes, page 49</a>
	Check fit of endshields.	<a href="#">5.13 Checking and Adjusting Endshields, page 74</a>
	Check that header is level.	<a href="#">5.12 Leveling Header, page 73</a>
	Grease all bearings and U-joints.	<a href="#">5.14 Lubricating Header, page 75</a>
	Check entire machine for shipping wires or strapping and remove.	—

## REFERENCE

**Table .16 D65 Predelivery Checklist – North America (continued)**

✓	Item	Reference
<b>Run-up procedure</b>		<i>6 Running up Header, page 81</i>
	Check hydraulic hose and wiring harness routing for clearance when raising or lowering header and reel.	—
	Check knife drive pulley(s) is rotating in proper direction: clockwise on left side; counterclockwise on right side (double knife only).	—
	Check lights are functional.	—
	Check reel lift cylinders extend fully.	—
	Confirm reel movement: tilt, fore, and aft.	—
<b>Post run-up check. Stop engine.</b>		<i>6.1 Performing Post Run-Up Adjustments, page 82</i>
	Check belt drives for heated bearings.	—
	Check knife sections for discoloration caused by misaligned components.	<i>6.1.1 Adjusting Knife and Guards, page 82</i>
	Check for hydraulic leaks.	—
	Check manual storage case contains operator's manual and parts catalog.	<i>5.15 Checking Manuals, page 80</i>

**Date checked:**

**Checked by:**



**MacDon Industries Ltd.**

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

**MacDon, Inc.**

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

**MacDon Australia Pty. Ltd.**

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

**MacDon Brasil Agribusiness Ltda.**

Rua Grã Nicco, 113, sala 202, B. 02  
Mossunguê, Curitiba, Paraná  
CEP 81200-200 Brasil  
t. +55 (41) 2101-1713  
f. +55 (41) 2101-1699

**LLC MacDon Russia Ltd.**

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

**CUSTOMERS**

**MacDon.com**

**DEALERS**

**Portal.MacDon.com**

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

Printed in Canada