

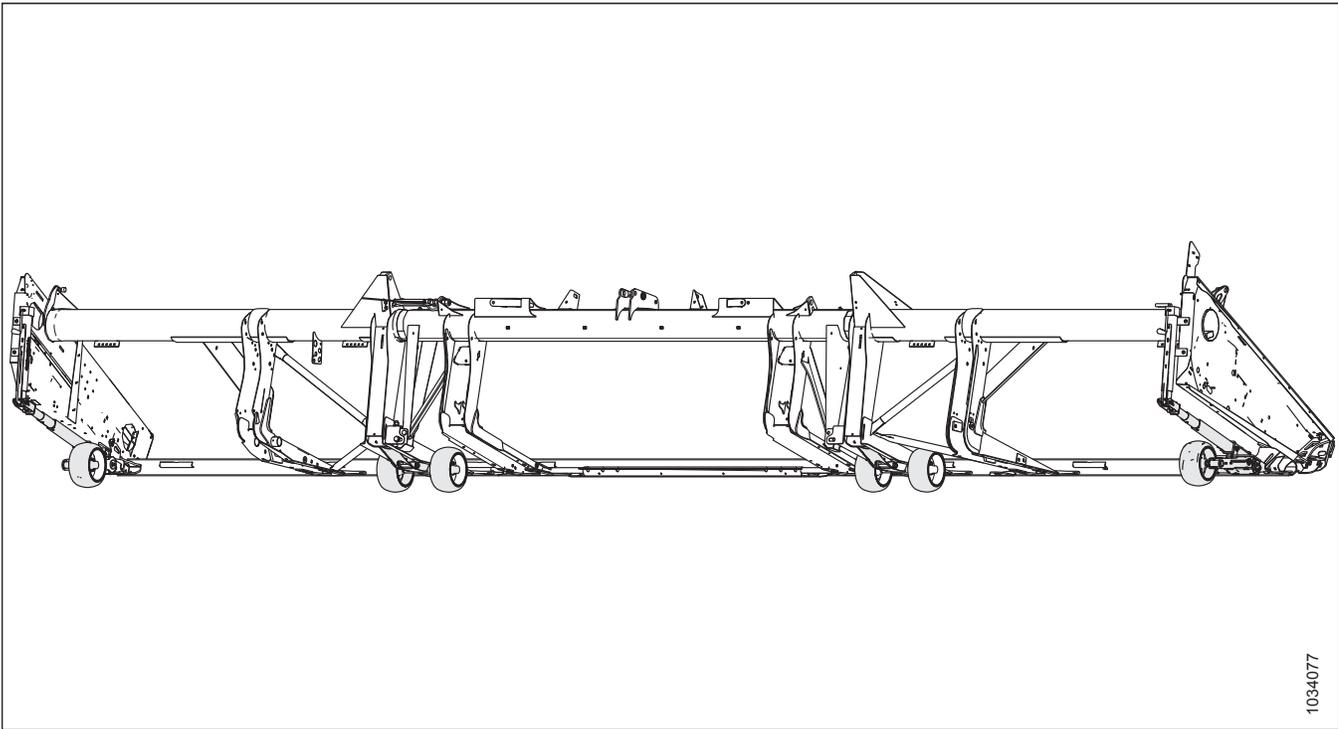
**Contour Buddy™  
for FD1 Series, FD75, and FD70  
FlexDraper® Headers**

Setup, Operation, and Parts Manual

215587 Revision A

Original Instruction

Contour Buddy™ for FD1 Series, FD75, and FD70 FlexDraper® Headers.



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## Introduction

This manual contains safety information, setup instructions, operating and maintenance procedures, and parts information for the Contour Buddy™ kit.

The Contour Buddy™ kit contains inboard and outboard wheel assemblies that mount to the underside of a FlexDraper® header and allow the header to operate in flex mode while cutting above the ground. The Contour Buddy™ kit is designed for use with MacDon FD1 Series, FD75, and FD70 FlexDraper® Headers.

If the shipment is damaged or is missing parts, contact [shortageanddamage@macdon.com](mailto:shortageanddamage@macdon.com).

When setting up the machine or making adjustments, review and follow the recommended machine settings in all relevant original equipment manufacturer (OEM) publications. Failure to do so may compromise safety, machine function, and machine life.

### **Conventions**

The following conventions are used in this document:

- Right and left are determined from the operator's position. The front of the header faces the crop.
- Unless otherwise noted, use the standard torque values provided in this manual.

### **Installation Time**

This kit takes approximately 3 hours to install.

### **IMPORTANT:**

- When operating a MacDon header with Contour Buddy, you must have the float and wing balance adjusted to the specifications in the operators manual and use automatic header height control, or damage could occur.
- Tight or aggressive turns place high side loads on the contour buddy components which can bend or damage them. If a tight turn is needed, it is recommended to raise the header so the contour buddy is not touching the ground.

### **NOTE:**

Header float and wing balance must be reset after the kit is installed, and anytime the wheels are removed while cutting low crop.

### **NOTE:**

Keep your MacDon publications up-to-date. The most current version of this instruction can be downloaded from our Dealer-only site (<https://portal.macdon.com>) (login required).

### **NOTE:**

This document is currently available in English only.

## Summary of Changes

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

Section	Summary of Change	Internal Use Only
<i>Introduction, page i</i>	Added contact information for damaged and missing parts.	Technical Publications
<i>Introduction, page i</i>	Added Important notes about float and wing balance, and tight turns.	Product Support
<i>Introduction, page i</i>	Added Note about latest version in dealer portal and public website.	Technical Publications
<i>2.1 Unloading Contour Buddy™, page 9</i>	Changed Warning to Danger.	Technical Publications
<i>2.2 Installing Contour Buddy™, page 11</i>	Deleted duplicate step.	Technical Publications
<i>5.2 Contour Buddy™ – Jacks and Wheel Assemblies (Left Side), page 38</i>	Replaced LH isolator support (MD #284722) with LH isolator support (MD #284811).	ECN 61691
<i>3.3.3 Moving Left Outboard Wheel to Transport Position, page 31</i>	Deleted duplicate step.	Technical Publications
<i>3.3.4 Moving Left Outboard Wheel to Working Position, page 32</i>	Deleted duplicate step.	Technical Publications
<i>2.3 Preparing Contour Buddy™ for Use, page 25</i>	Added information and Important note.	Engineering
<i>5.3 Contour Buddy™ – Jacks and Wheel Assemblies (Right Side and Middle), page 40</i>	Replaced RH beam (MD #284576) with RH beam (MD #284799).	ECN 60473
<i>5.3 Contour Buddy™ – Jacks and Wheel Assemblies (Right Side and Middle), page 40</i>	Replaced clamp plate (MD #284568) with bottom support (MD #284797).	ECN 60473
<i>5.3 Contour Buddy™ – Jacks and Wheel Assemblies (Right Side and Middle), page 40</i>	Replaced RH isolator support (MD #284723) with RH isolator support (MD #284812).	ECN 61691

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# Chapter 1: Safety

Understanding and consistently following safety procedures helps to ensure the safety of machine operators and bystanders.

## 1.1 Safety Alert Symbols

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

This symbol means:

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

Carefully read and follow the safety message accompanying this symbol.

### Why is safety important to you?

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



Figure 1.1: Safety Symbol

## 1.2 Signal Words

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

Signal words are selected using the following guidelines:

### **DANGER**

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

### **WARNING**

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

### **CAUTION**

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

#### **IMPORTANT:**

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

#### **NOTE:**

Provides additional information or advice.

## 1.3 General Safety

Protect yourself when assembling, operating, and servicing machinery.

### CAUTION

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

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

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

In addition, take the following precautions:

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



Figure 1.2: Safety Equipment



Figure 1.3: Safety Equipment

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

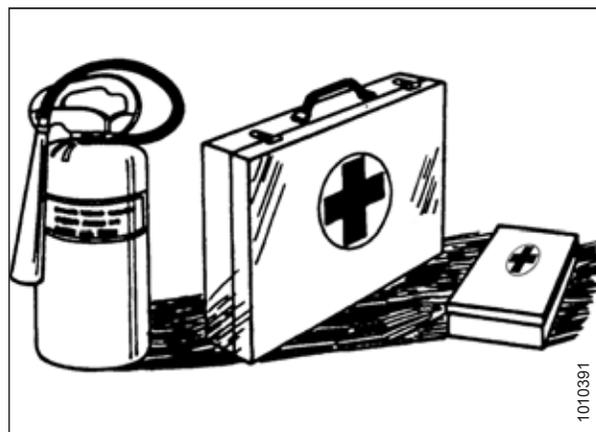


Figure 1.4: Safety Equipment

## SAFETY

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



Figure 1.5: Safety around Equipment

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

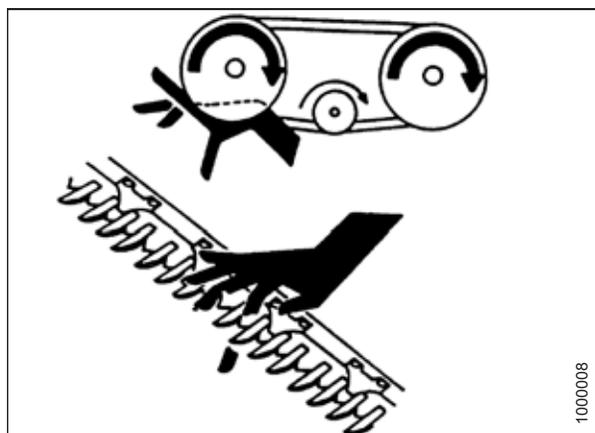


Figure 1.6: Safety around Equipment

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



Figure 1.7: Safety around Equipment

## 1.4 Maintenance Safety

Protect yourself when servicing machinery.

To ensure your safety while maintaining the machine:

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



Figure 1.8: Safety around Equipment

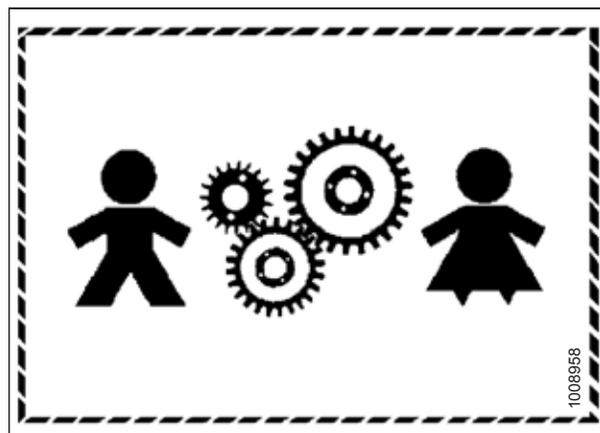


Figure 1.9: Equipment is NOT Safe for Children



Figure 1.10: Safety Equipment

## 1.5 Hydraulic Safety

Protect yourself when assembling, operating, and servicing hydraulic components.

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

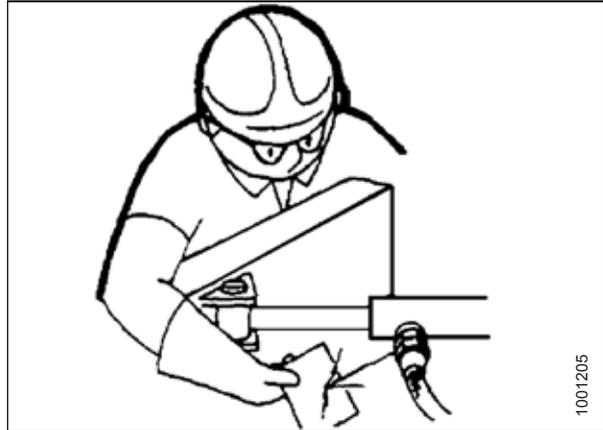


Figure 1.11: Testing for Hydraulic Leaks

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



Figure 1.12: Hydraulic Pressure Hazard

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

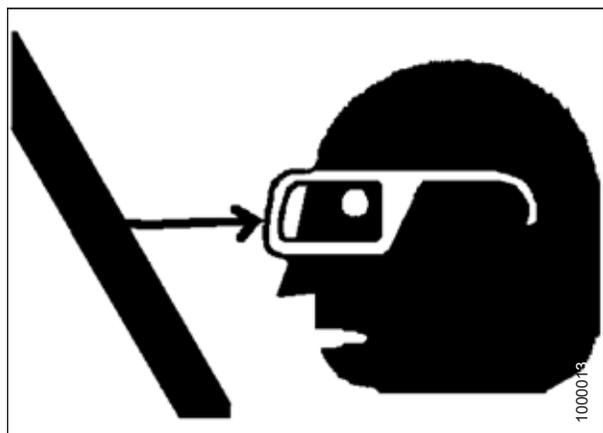


Figure 1.13: Safety around Equipment

## 1.6 Safety Signs

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

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

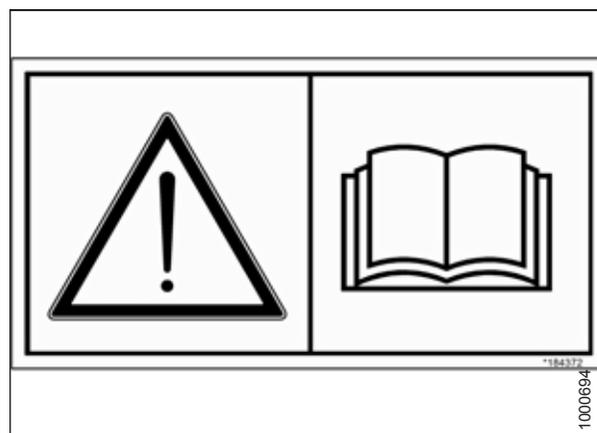


Figure 1.14: Operator's Manual Decal

### 1.6.1 Installing Safety Decals

If a safety decal is damaged it should be replaced.

1. Decide exactly where you are going to place the decal.
2. Clean and dry the installation area.
3. Remove the smaller portion of the split backing paper.
4. Place the decal in position and slowly peel back the remaining paper, smoothing the decal as it is applied.
5. Prick small air pockets with a pin and smooth them out.



## Chapter 2: Assembly/Setup Instructions

Follow each of the procedures in this chapter in order.

### 2.1 Unloading Contour Buddy™

To unload the Contour Buddy™, follow these steps:

#### DANGER

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

#### DANGER

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

Table 2.1 Lifting Vehicle

Minimum Capacity	908 kg (2000 lb.)
Minimum Fork Length	198 cm (78 in.)

#### IMPORTANT:

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

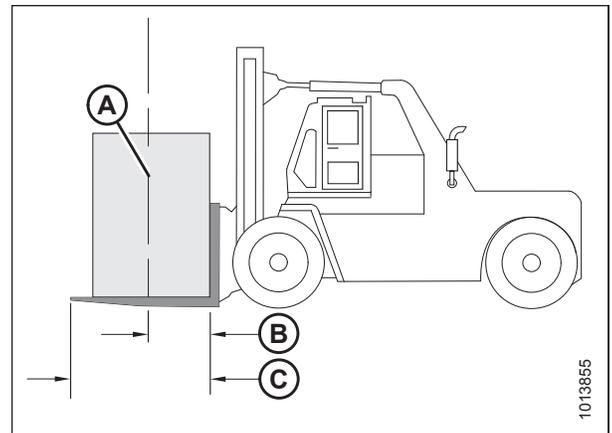


Figure 2.1: Minimum Lifting Capacity

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

1. Remove hauler's tie-down straps and chains.

#### WARNING

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

2. Use forklift to lift pallet (A) off of the trailer deck.
3. Back up until the unit clears trailer, and slowly lower to 150 mm (6 in.) from the ground.
4. Take to storage or setup area.
5. Set pallet down on secure, level ground.

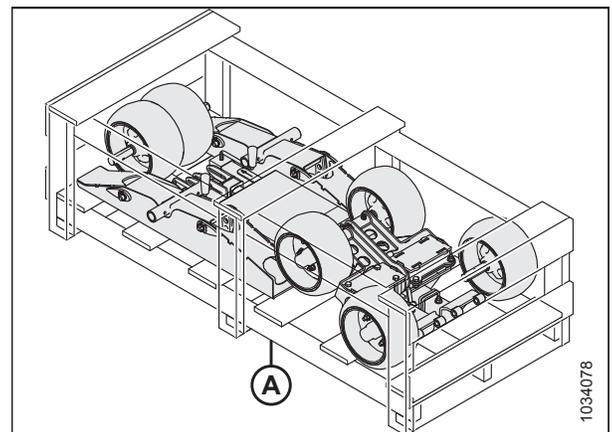


Figure 2.2: Pallet

## ASSEMBLY/SETUP INSTRUCTIONS

6. Remove shipping banding and check bundles for damage and missing parts. The following bundles should have been shipped in the Contour Buddy™ kit:

- Wheel and hub assemblies (A)
- Inboard arm assemblies (B)
- Outboard wheel assemblies (C)
- Jacks (D)
- Parts bag (E)

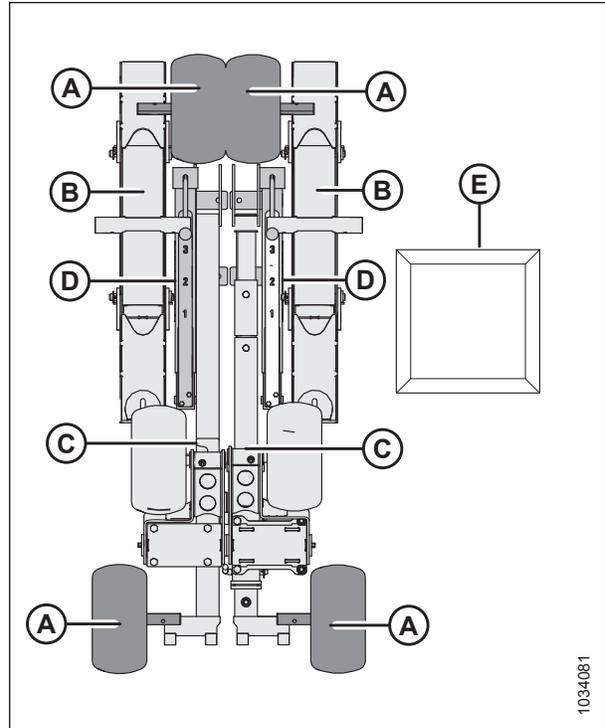


Figure 2.3: Contour Buddy™ Shipping Configuration – View from Above

## 2.2 Installing Contour Buddy™

To install the Contour Buddy™, follow these steps:

### DANGER

To avoid bodily injury or death from unexpected startup or fall of raised header, stop the engine, remove the key, and engage the safety props before going under the header. If you are using a lifting device to support the header, be sure that the header is secure before proceeding.

1. Start the engine.
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the header safety props or support the header on blocks on level ground. If using blocks to support the header, ensure the header is approximately 914 mm (36 in.) off the ground.
5. Perform the following procedures in order:
  - a. [2.2.1 Installing Inboard Wheel Assemblies, page 11](#)
  - b. [2.2.2 Installing Outboard Wheel Assemblies and Jacks, page 14](#)
  - c. [2.2.3 Installing Transport Light Extension Bracket – FD75 and FD1 Series FlexDraper® Headers, page 17](#)

### 2.2.1 Installing Inboard Wheel Assemblies

1. Position inboard arm assembly (A) underneath the left header leg on the outboard side of left flex frame hinge (B).
2. Slide the front of inboard arm assembly (A) into front pocket (C) on the left header leg as shown.

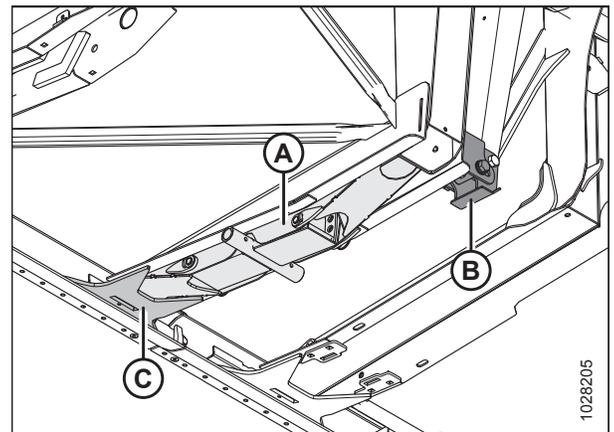


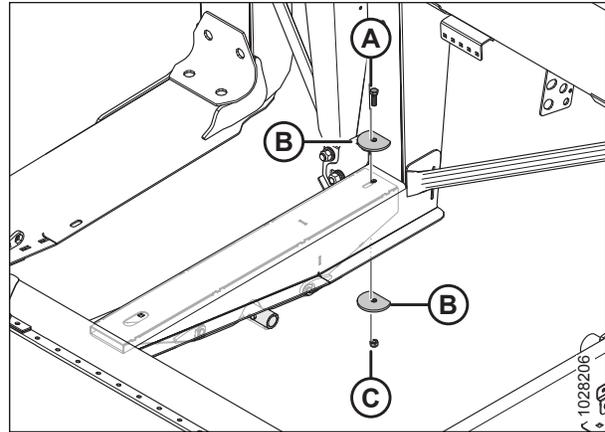
Figure 2.4: Inboard Arm Assembly Installed in Left Header Leg – View from Below

## ASSEMBLY/SETUP INSTRUCTIONS

3. Attach inboard arm assembly to the left header leg with one 1/2 X 1 1/2 in. hex head bolt (A) (MD #252641), two channel washers (B) (MD #284602), and one 1/2 in. hex lock nut (C) (MD #18697) as shown.

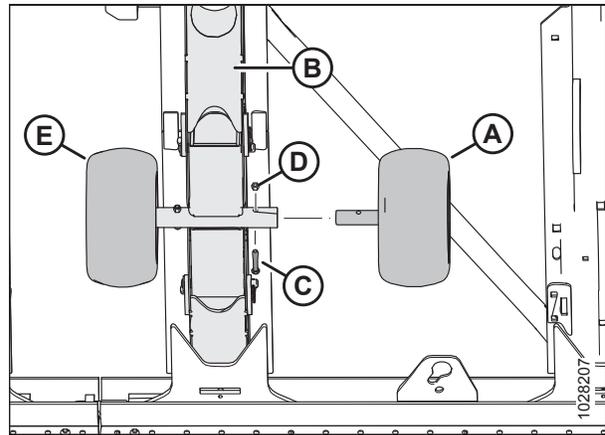
**NOTE:**

Lower header frame brace removed from illustration for clarity.



**Figure 2.5: Inboard Arm Assembly and Left Header Leg – View from Above**

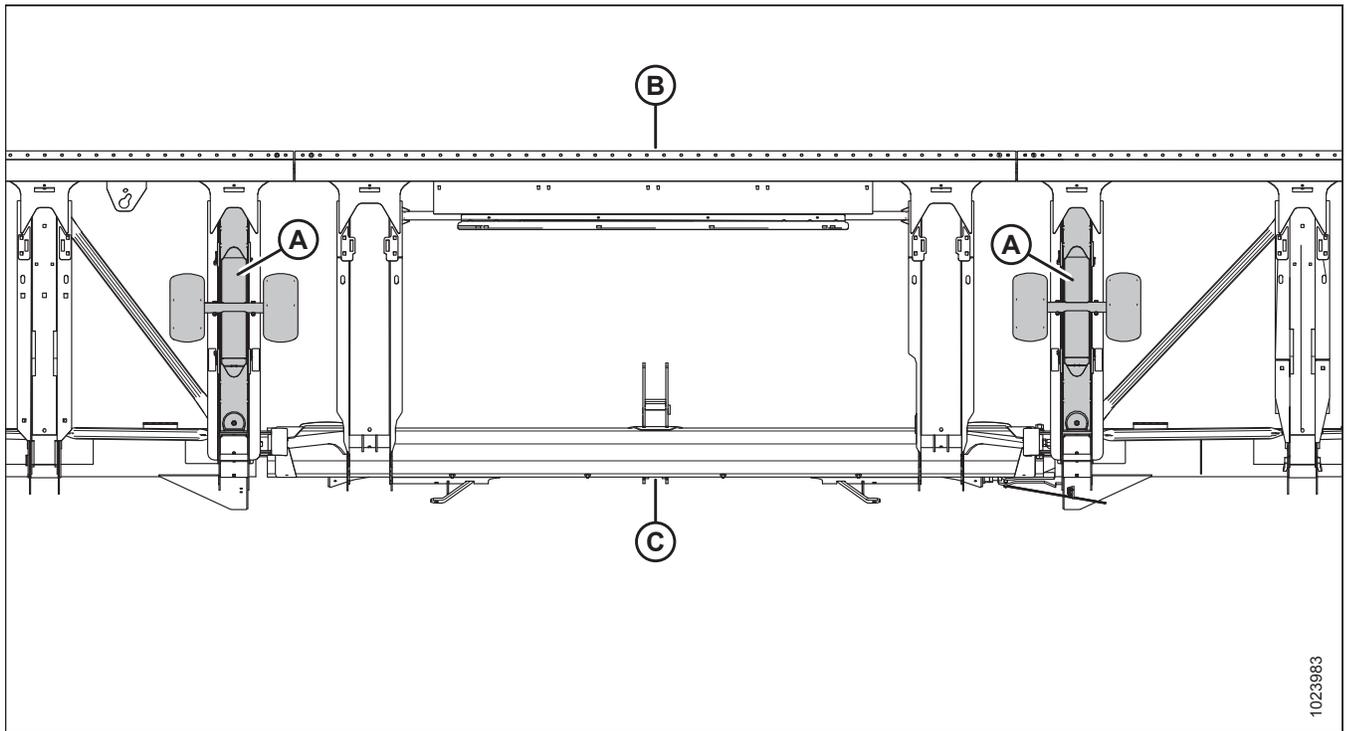
4. Slide the axle of one wheel and hub assembly (A) into the axle receptor tube in the inboard arm assembly (B), and secure in place with a 3/8 x 2 1/4 in. hex head bolt (C) (MD #20055) and center lock nut (D) (MD #135511).
5. Repeat Step 4, [page 12](#) with a second wheel and hub assembly (E) and set of hardware on the opposite side of inboard arm assembly (B).



**Figure 2.6: Inboard Wheel Assembly – View from Below**

## ASSEMBLY/SETUP INSTRUCTIONS

- Repeat Step 1, page 11 to Step 4, page 12 for the other inboard wheel assembly on the right side of the header. Refer to Figure 2.7, page 13.



**Figure 2.7: Inboard Wheel Assemblies Installed – View from Below**

A - Inboard Wheel Assemblies

B - Cutterbar

C - Backtube

## 2.2.2 Installing Outboard Wheel Assemblies and Jacks

FD1 headers model year 2020 or later have predrilled mounting holes. For FD70, FD75, and older model FD1 headers, follow the model-specific drilling locations described below.

1. To drill holes on the FD75 headers, do the following:
  - a. Open or remove left endshield. For instructions, refer to header operator's manual.
  - b. Drill one 12.7 mm (1/2 in.) hole (A) on the back of the left endsheet as shown.

**IMPORTANT:**

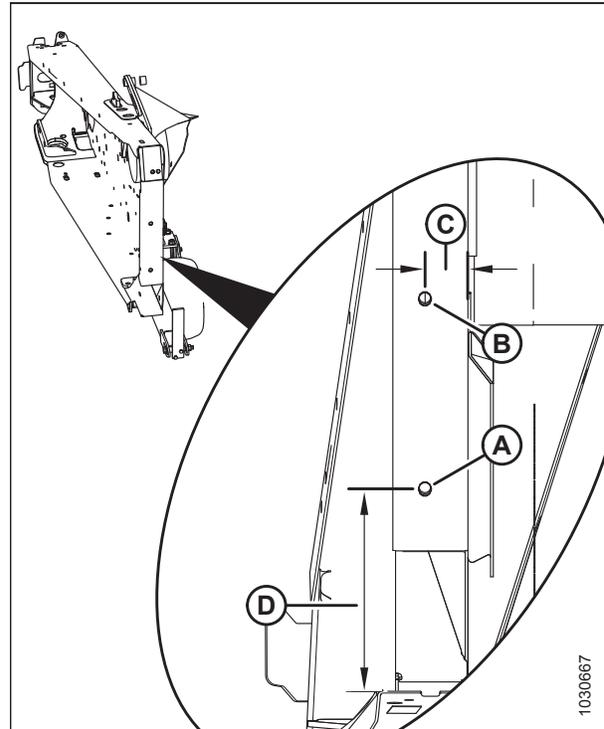
Drill lower jack mounting hole (A) **ONLY**. Upper jack mounting hole (B) will be drilled once jack has been positioned using lower hole.

**IMPORTANT:**

Do **NOT** damage drive belt when drilling holes.

**Table 2.2 Mounting Hole Spacing – FD75**

Model	Mounting Hole Locations
FD75	218 mm (8 3/8 in.) from bottom of endshield



**Figure 2.8: Jack Mounting Hole Locations, View from Rear – FD75**

A - Lower Jack Mounting Hole  
C - 47.6 mm (1 7/8 in.)

B - Upper Jack Mounting Hole  
D - 218 mm (8 3/8 in.)

## ASSEMBLY/SETUP INSTRUCTIONS

2. To drill holes on the FD1 and FD70 headers, do the following:
  - a. Open or remove left endshield. For instructions, refer to header operator's manual.
  - b. Drill one 12.7 mm (1/2 in.) hole (A) on the back of the left endsheet as shown.

**IMPORTANT:**

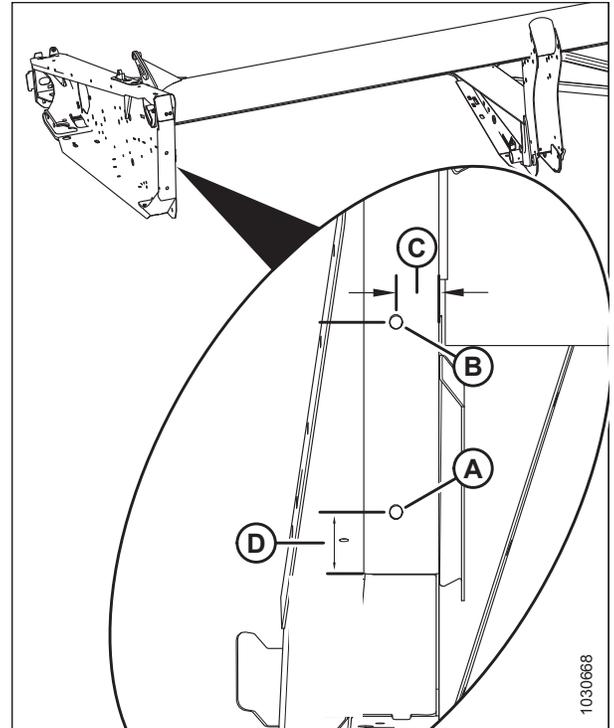
Drill lower jack mounting hole (A) **ONLY**. Upper jack mounting hole (B) will be drilled once jack has been positioned using lower hole.

**IMPORTANT:**

Do **NOT** damage drive belt when drilling holes.

**Table 2.3 Mounting Hole Spacing – FD1 and FD70**

Model	Mounting Hole Locations
FD1 and FD70	69 mm (2 3/4 in.) from weld line



**Figure 2.9: Jack Mounting Hole Locations, View from Rear – FD1/FD70**

A - Lower Jack Mounting Hole  
C - 47.6 mm (1 7/8 in.)

B - Upper Jack Mounting Hole  
D - 69 mm (2 3/4 in.)

3. Secure left jack (A) onto endsheet using 1/2 x 1 in. button head screw (B) (MD #136085) and flange lock nut (C) (MD #50186) at lower hole (D) as shown.

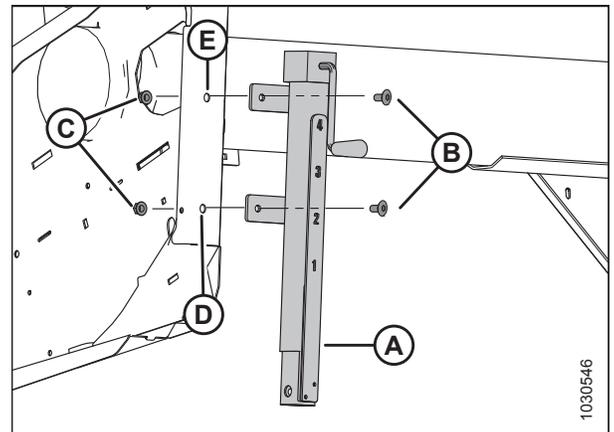
**NOTE:**

Some parts have been removed from the endshield assembly for clarity.

4. Ensure jack is parallel to the end of the header, and drill upper mounting hole (E) on the back of the endsheet. The hole should be 12.7 mm (1/2 in.) in diameter.
5. Install a 1/2 x 1 in. button head screw (B) (MD #136085) and flange lock nut (C) (MD #50186) at upper hole (E) as shown.

**IMPORTANT:**

Do **NOT** damage drive belt when drilling holes.



**Figure 2.10: Jack Installation, View from Rear – FD75 Shown, FD1 Series Similar**

## ASSEMBLY/SETUP INSTRUCTIONS

- Remove lynch pin (A) and rod (B) from left outboard skid shoe. Retain lynch pin and rod for reinstallation.

**NOTE:**

Do **NOT** remove Belleville washers and hex lock nut (C) from outboard skid shoe (D).

- Remove wheel from outboard wheel assembly. For instructions, refer to [3.3.5 Removing Contour Buddy™ Wheel Assemblies](#), page 33.

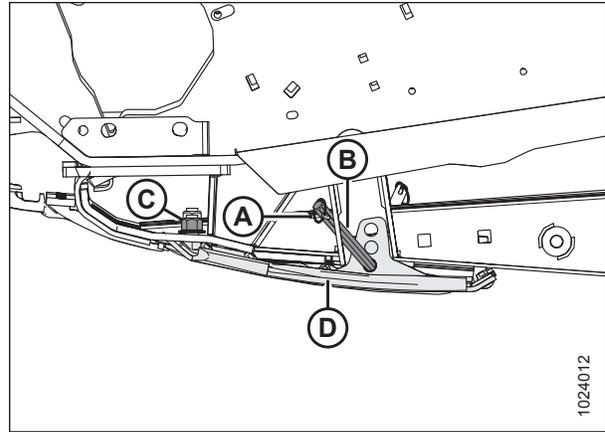


Figure 2.11: Outboard Skid Shoe – View from Left

- Position front connection of left outboard wheel assembly (A) between the lugs on the existing outboard skid shoe mount (B) underneath the header frame.
- Reinstall rod (C) and lynch pin (D) retained from Step 6, page 16.

**NOTE:**

Adjust height of outboard skid shoe as necessary to allow enough clearance for outboard wheel assembly to pivot. Skid shoe has been removed from the illustration at right for clarity.

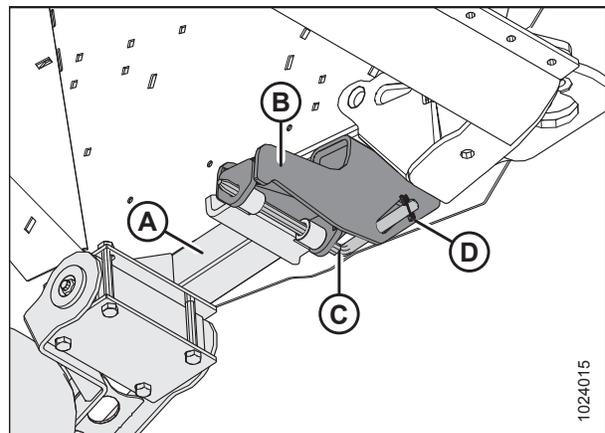


Figure 2.12: Outboard Wheel Assembly – View from Below

- Position rear connection of left outboard wheel assembly (B) on left jack (A) as shown.
- Install 1/2 x 4 in. hex head bolt (C) (MD #21589), two 1/2 in. hardened washers (D) (MD #135369), and 1/2 in. flange lock nut (E) (MD #50186) as shown. Tighten hardware snug, then back-off one turn.

**NOTE:**

Bolt should be able to slide in slot of outboard wheel assembly.

- Reinstall wheel from outboard wheel assembly that was removed in Step 7, page 16.

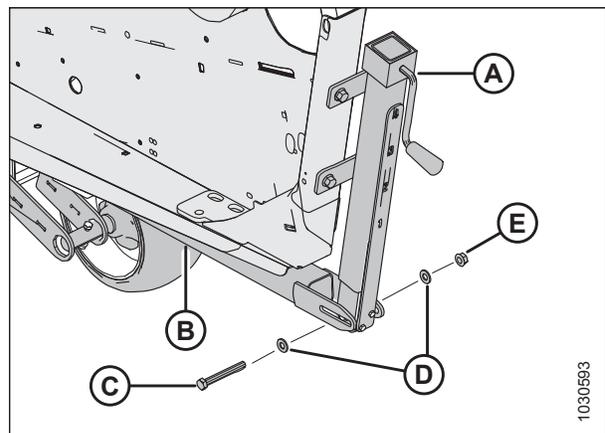


Figure 2.13: Jack and Outboard Wheel Assembly – View from Rear

## ASSEMBLY/SETUP INSTRUCTIONS

### NOTE:

Alignment of jack and outboard wheel assembly may be difficult. If necessary, loosen hardware (A) securing outboard skid shoe mount to endsheet to improve alignment, then tighten hardware (A) once hardware in Step 11, page 16 has been installed.

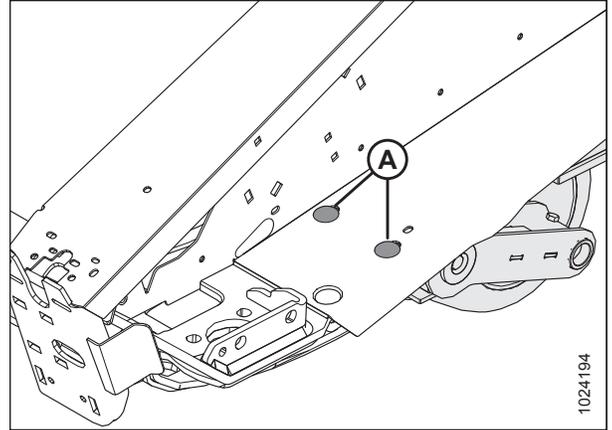


Figure 2.14: Outboard Skid Shoe Mount Hardware – View from Left

13. Reinstall and/or close left endshield. Refer to header operator's manual for procedure.
14. Repeat steps for the jack and outboard wheel assembly on the right side of the header.
15. Check and adjust header float. Refer to the header operator's manual for procedures.
16. Check and adjust header wing balance. Refer to the header operator's manual for procedures.

### 2.2.3 Installing Transport Light Extension Bracket – FD75 and FD1 Series FlexDraper® Headers

Transport lights are an important safety features. The extension bracket will ensure the lights visibility.

1. If divider rods (A) are in storage position, remove and store divider rods for installation at a later time. If divider rods are in field position, proceed to the next step.

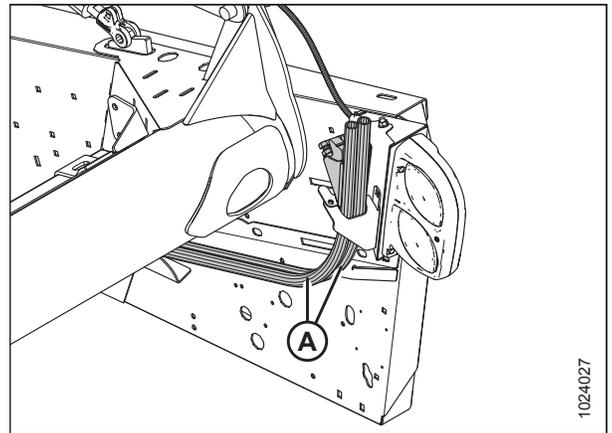


Figure 2.15: Divider Rods in Storage Position – View from Rear

## ASSEMBLY/SETUP INSTRUCTIONS

2. Open or remove right endshield (A). For instructions, refer to the header operator's manual.

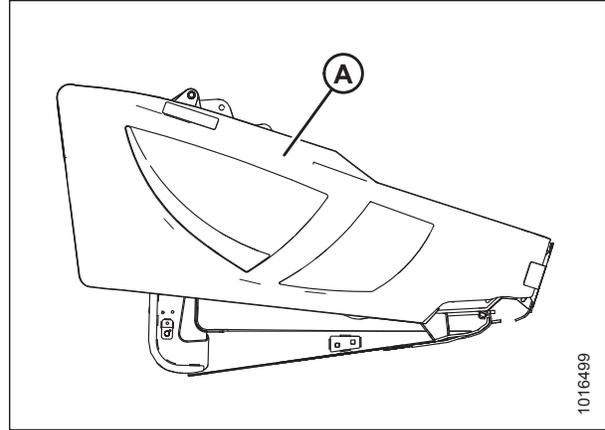


Figure 2.16: Right Endshield – FD1 Series Shown

3. Remove square neck carriage head bolts (A) and flange nuts securing rear transport light assembly (B) to the right endsheet. Retain hardware and light assembly for reinstallation.

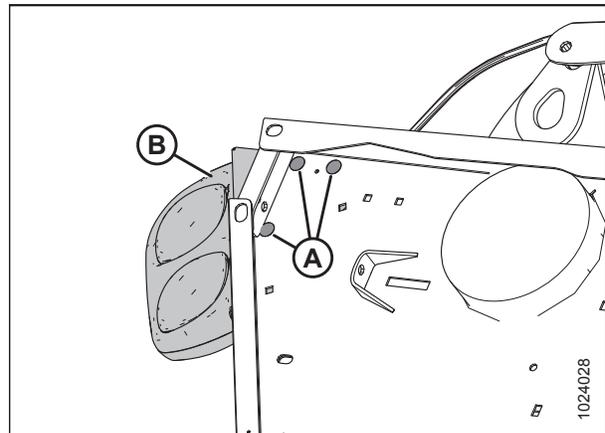


Figure 2.17: Rear Transport Light Assembly – View from Right

4. Install light extension bracket (A) (MD #304523) onto the right endsheet using two 3/8 x 1 in. square neck carriage head bolts (MD #100456) and two 3/8 in. flange nuts (B) (MD #21452) as shown.

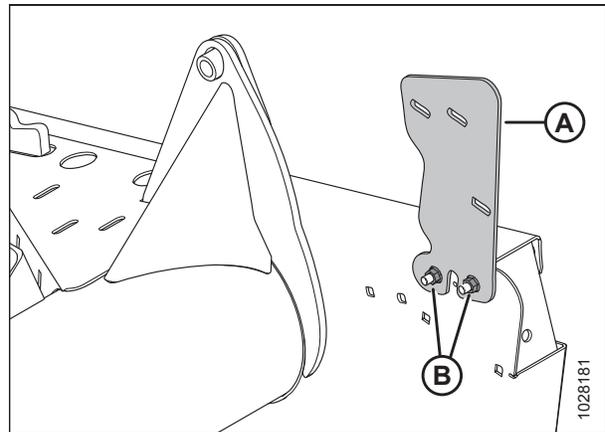


Figure 2.18: Transport Light Extension Bracket – View from Rear

## ASSEMBLY/SETUP INSTRUCTIONS

5. Reinstall light assembly (A) onto extension bracket (B) using hardware (C) retained from Step 3, page 18.

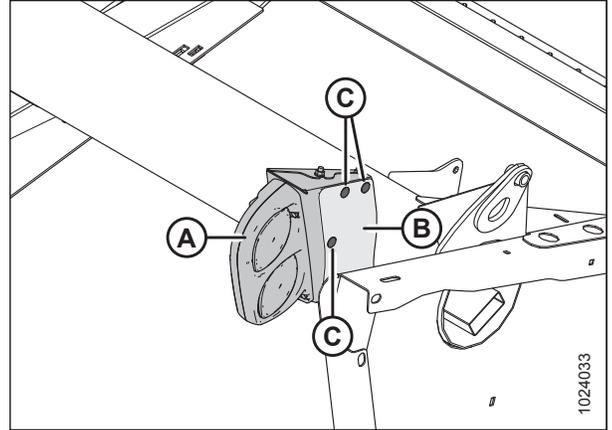
**NOTE:**

Wiring harness P-clips may have to be removed and wiring harness may need to be adjusted to ensure enough of the harness loom reaches under the light cover. P-clips may be used to support the harness by using the adjacent hole.

**NOTE:**

Reel arm and transport light harness removed from illustration for clarity.

6. Close or reinstall right endshield. For instructions, refer to header operator's manual.



**Figure 2.19: Rear Transport Light Assembly – View from Right**

## 2.2.4 Installing Transport Light Extension Bracket – FD70 FlexDraper® Headers

Transport lights are an important safety features. The extension bracket will ensure the lights visibility.

**NOTE:**

Some parts have been removed from the illustrations for clarity.

1. If divider rods (A) are in storage position, remove and store divider rods for installation at a later time. If divider rods are in field position, proceed to the next step.

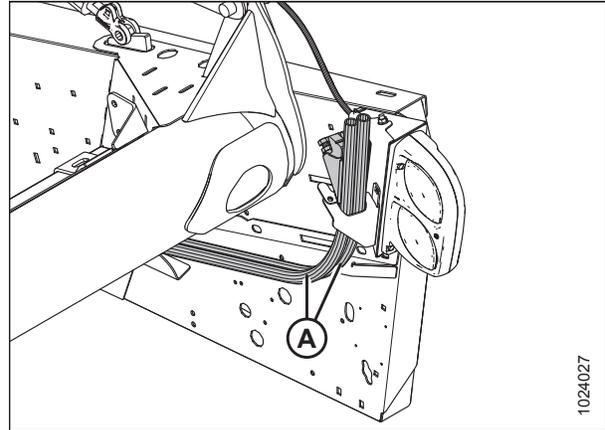


Figure 2.20: Divider Rods in Storage Position – View from Rear

2. Open right end shield (A).



Figure 2.21: Right Endshield

3. Remove square neck carriage head bolts (A) and flange nuts securing rear transport light assembly (B) to the right endsheet. Retain hardware and light assembly for reinstallation.
4. **Single-knife headers only:** Proceed to Step [10, page 22](#).

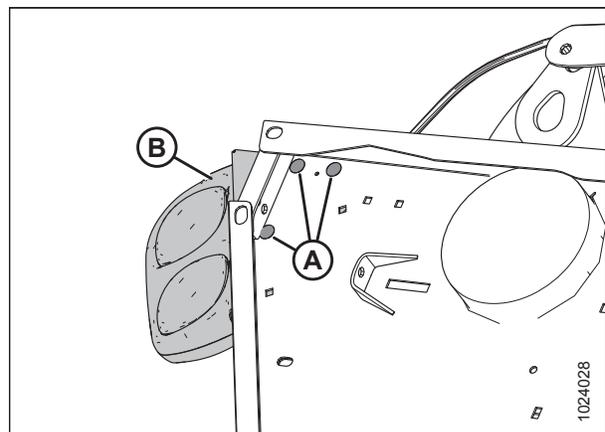


Figure 2.22: Rear Transport Light Assembly – View from Right

## ASSEMBLY/SETUP INSTRUCTIONS

5. **Double-knife headers only:** Loosen bolts (A) holding motor assembly (B) tight to the header endsheet.

**NOTE:**

Motor mount assembly (B) includes the knife drive motor, the motor mount bracket visible through the holes in the header endsheet, and the pulley on the other side of the endsheet.

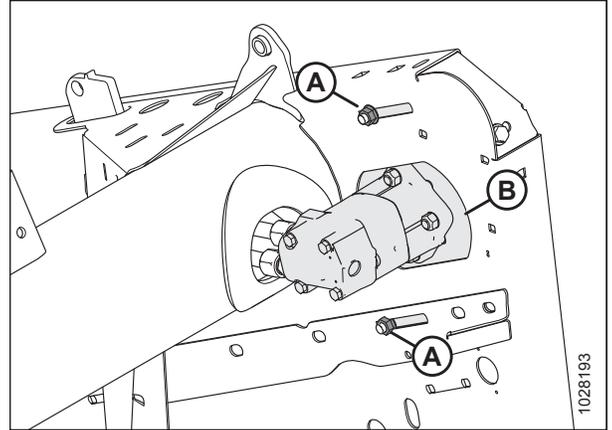


Figure 2.23: Knife Drive Motor – Double-Knife Header, View from Rear

6. **Double-knife headers only:** On the other side of the header endsheet, loosen the tension on belt (A) by turning bolt (B) counterclockwise.
7. **Double-knife headers only:** Remove belt (A). Retain for reinstallation.

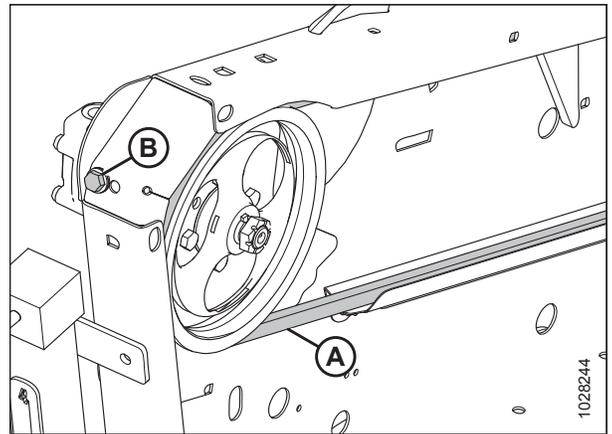


Figure 2.24: Knife Drive Belt and Pulley – Double-Knife Header, View from Rear

8. **Double-knife headers only:** Remove hardware (A) securing motor (B) to motor mount bracket (C), and then detach motor. Retain parts for reassembly.

**NOTE:**

There are four mounting locations (A), but only three are visible in the illustration. The fourth location is on the other side of the motor.

**NOTE:**

Motor mount bracket (C) is installed on the outboard side of the header endsheet. It is visible through the holes in the endsheet.

9. **Double-knife headers only:** Remove hardware (D) securing motor mount bracket (C) to the header endsheet, then remove the motor mount bracket. Retain parts for reassembly.

**NOTE:**

Leave the pulley attached to the other side of the motor mount bracket.

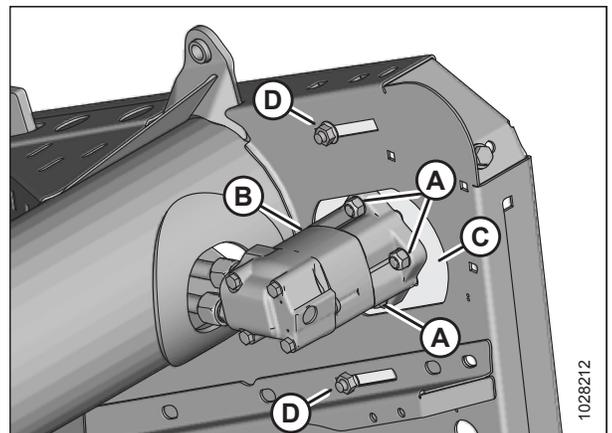


Figure 2.25: Knife Drive Motor – Double-Knife Header View from Rear

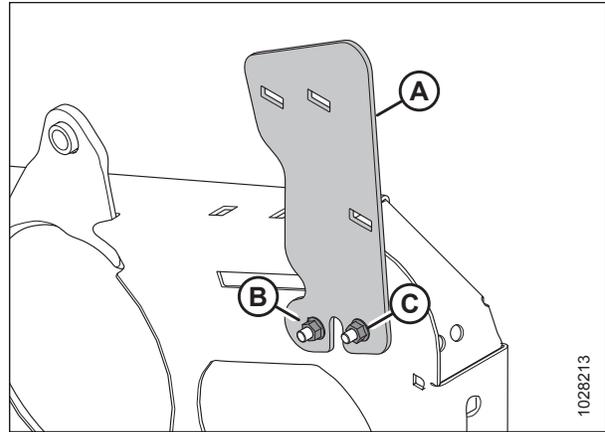
## ASSEMBLY/SETUP INSTRUCTIONS

10. Position light extension bracket (A) (MD #304523) upright on the right endsheet. Secure the bracket to the right endsheet using a 3/8 x 1 in. square neck carriage bolt (MD #100456) and flange nut (B) (MD #21452).

**NOTE:**

Two 1/2 in. holes may need to be drilled if the holes do not line up correctly.

11. Holding bracket (A) in a vertical position and using it as a template, drill a 3/8 in. hole through the right endsheet at location (C).
12. Secure bracket (A) to the right end panel with a 3/8 x 1 in. hex head bolt (MD #20077) and flange nut (MD #21452) at location (C).



**Figure 2.26: Transport Light Extension Bracket – View from Rear**

13. Reinstall light assembly (A) onto extension bracket (B) using hardware (C) retained from Step 3, page 20.

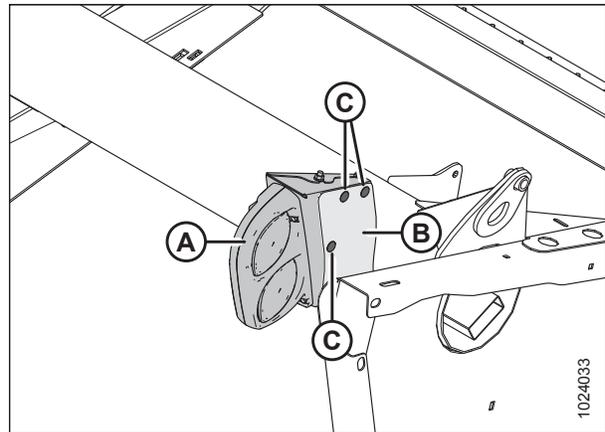
**NOTE:**

Wiring harness P-clips may need to be removed and harness adjusted to ensure harness loom reaches under light cover. P-clips may be used to support the harness by using an adjacent hole.

**NOTE:**

Reel arm and transport light harness removed from illustration for clarity.

14. **Single-knife headers only:** Proceed to [2.3 Preparing Contour Buddy™ for Use, page 25](#).



**Figure 2.27: Rear Transport Light Assembly – View from Right**

## ASSEMBLY/SETUP INSTRUCTIONS

15. **Double-knife headers only:** Reinstall motor mount bracket (A) with attached pulley on header endsheet, and secure in place with hardware (B) retained from Step 9, [page 21](#).
16. **Double-knife headers only:** Reinstall motor (C) on motor mount bracket (A) with hardware (D) retained from Step 8, [page 21](#).

**NOTE:**

There are four mounting locations (D) holding motor (C) in place, but only three are visible in the illustration. The fourth location is on the other side of the motor.

**NOTE:**

Light assembly removed from illustration for clarity.

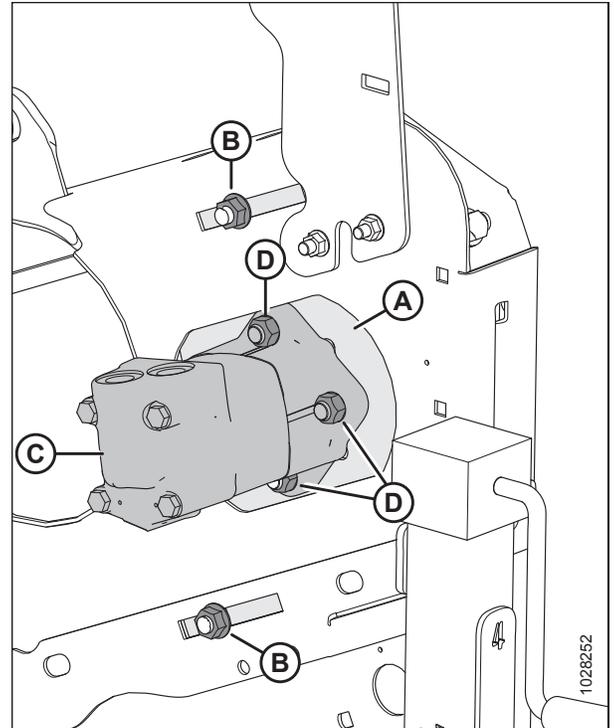


Figure 2.28: Knife Drive Motor – Double-Knife Header, View from Rear

17. **Double-knife headers only:** Reinstall belt (A).

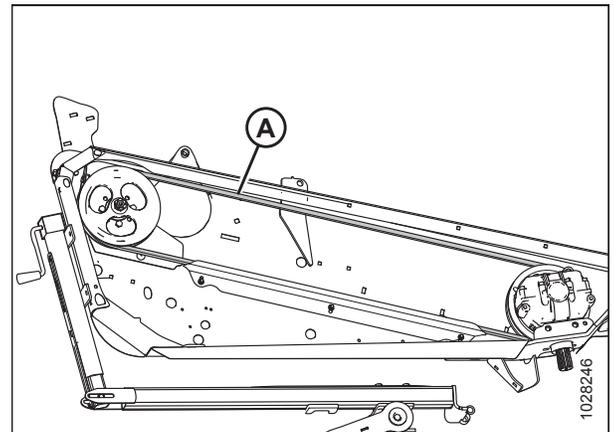


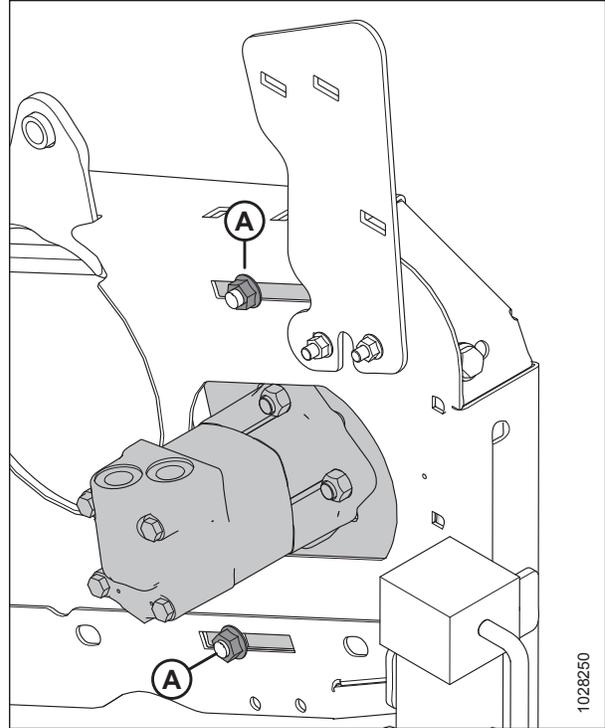
Figure 2.29: Right Side of Double-Knife Header

## ASSEMBLY/SETUP INSTRUCTIONS

18. **Double-knife headers only:** Tighten bolts (A) securing the motor assembly to the header end sheet.

**NOTE:**

Light assembly removed from illustration for clarity.



**Figure 2.30: Knife Drive Motor– Double-Knife Header, View from Rear**

19. **Double-knife headers only:** Adjust belt tension. For instructions, refer to the header operator's manual.

## 2.3 Preparing Contour Buddy™ for Use

Once all parts have been installed, prepare the Contour Buddy™ for first use.

1. Close the header endshields. For instructions, refer to the header operator's manual.
2. Check and adjust the header float. For instructions, refer to the header operator's manual.
3. Check and adjust wing balance. For instructions, refer to the header operator's manual.

**NOTE:**

Skewing of the wheels is normal when ground pressure is applied.

4. Use the auto header height control (AHHC) when operating the Contour Buddy™. For instructions, refer to the header operator's manual.
5. Do **NOT** make aggressive or tight turns while Contour Buddy™ is on the ground.

**IMPORTANT:**

Tight or aggressive turns place high side loads on the Contour Buddy™ components which can bend or damage them. If a tight turn is needed, it is recommended to raise the header so the Contour Buddy™ is not touching the ground.



## Chapter 3: Operation

Safely operating your machine requires familiarizing yourself with its capabilities.

### 3.1 Owner/Operator Responsibilities

Owning and operating heavy equipment comes with certain duties.



#### **CAUTION**

- **It is your responsibility to read and understand this manual completely before operating the header. Contact your Dealer if an instruction is not clear to you.**
- **Follow all safety messages in the manual and on safety decals on the machine.**
- **Remember that YOU are the key to safety. Good safety practices protect you and the people around you.**
- **Before allowing someone to operate the header, for however short a time or distance, make sure they have been instructed in its safe and proper use.**
- **Review the manual and all safety related items with all Operators annually.**
- **Be alert for other Operators not using recommended procedures or not following safety precautions. Correct these mistakes immediately, before an accident occurs.**
- **Do NOT modify the machine. Unauthorized modifications may impair the function and/or safety of the machine and may reduce the length of service you receive from your machine.**
- **The safety information given in this manual does not replace safety codes, insurance needs, or laws governing your area. Be sure your machine meets the standards set by these regulations.**

### 3.2 Operational Safety

Follow all the safety and operational instructions given in this manual.

**⚠ CAUTION**

Adhere to the following safety precautions:

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



Figure 3.1: No Riders

**⚠ CAUTION**

- Never start or move the machine until you are sure all bystanders have cleared the area.
- Avoid travelling over loose fill, rocks, ditches, or holes.
- Drive slowly through gates and doorways.
- When working on inclines, travel uphill or downhill whenever possible. Be sure to keep transmission in gear when travelling downhill.
- Never attempt to get on or off a moving machine.
- Do NOT leave the operator’s station while the engine is running.
- To avoid bodily injury or death from the unexpected startup of a machine, always stop the engine and remove the key before adjusting or removing plugged material from the machine.
- Check for excessive vibration and unusual noises. If there is any indication of trouble, shut down and inspect the machine. Follow the proper shutdown procedure. For instructions, refer to the header operator’s manual.
- Operate only in daylight or good artificial light.

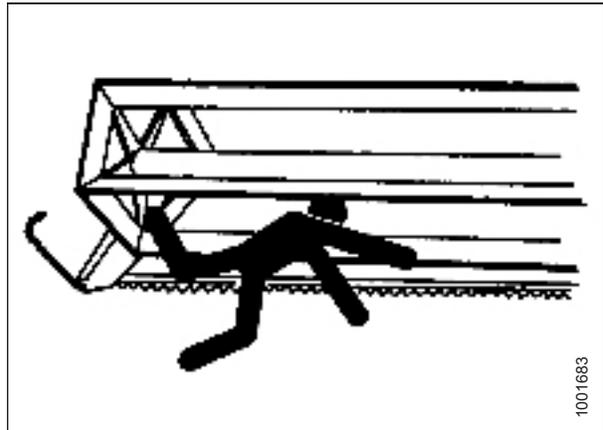


Figure 3.2: Bystander Safety

### 3.3 Adjusting Wheel Height

Adjust wheel height according to soil conditions, weight of crop on header, and angle of feeder house faceplate relative to the ground.

#### DANGER

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

1. Start combine, and raise header fully.
2. Stop engine and remove key from ignition.
3. Engage header safety props or support header on blocks on level ground. If using blocks to support header, ensure header is approximately 914 mm (36 in.) off the ground.
4. Perform the following procedures in order:
  - a. [3.3.1 Adjusting Contour Buddy Inboard Wheel Height, page 29](#)
  - b. [3.3.2 Adjusting Contour Buddy Outboard Wheel Height, page 31](#)

#### 3.3.1 Adjusting Contour Buddy Inboard Wheel Height

Adjust wheel height according to soil conditions, weight of crop on header, and angle of feeder house faceplate relative to the ground.

1. Support inboard axle support (A), and remove ring (B) and pin (C) to release rear of axle support. Retain ring and pin for reinstallation.

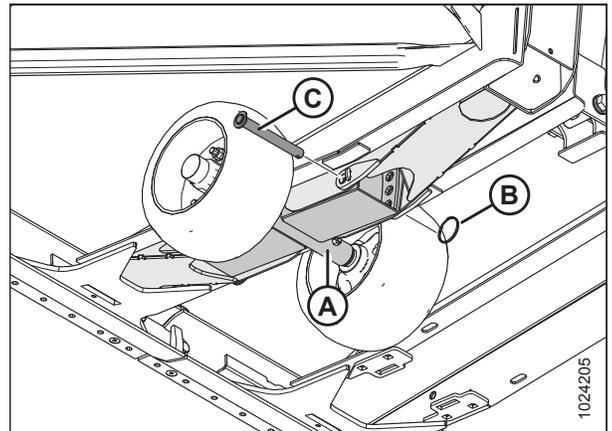


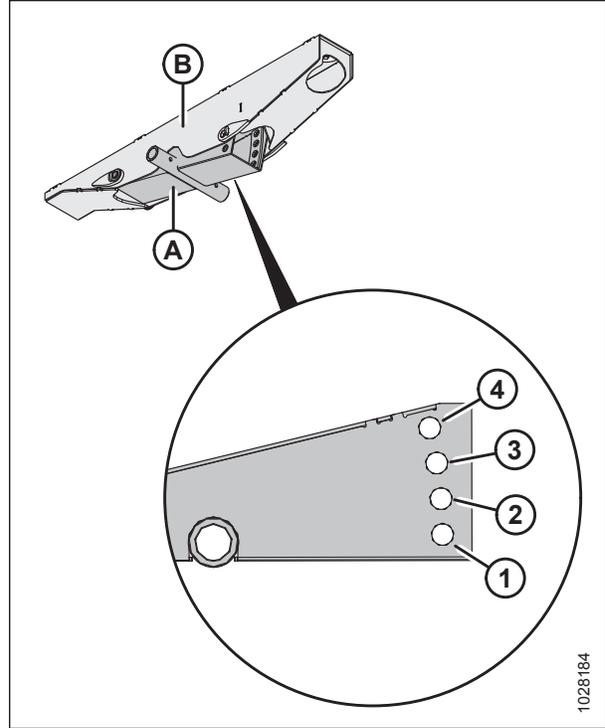
Figure 3.3: Inboard Wheel Assembly and Left Header Leg – View from Below, Right Opposite

## OPERATION

**NOTE:**

Parts have been removed from the illustration at right for clarity.

2. Align the appropriate hole in inboard axle support (A) with axle frame support (B) to achieve desired inboard wheel height. Refer to Table 3.1, page 30.
3. Reinstall pin and ring removed in Step 1, page 29.
4. Repeat above procedure for opposite inboard wheel assembly.



**Figure 3.4: Inboard Axle Support – View from Below**

**Table 3.1 Inboard Wheel Height**

Hole	Header Tilt Setting			
	A	B	C	D
1	229 mm (9.0 in.)	196 mm (7.7 in.)	160.0 mm (6.3 in.)	127.0 mm (5.0 in.)
2	236 mm (9.3 in.)	211 mm (8.3 in.)	178 mm (7.0 in.)	145 mm (5.7 in.)
3	262 mm (10.3 in.)	229 mm (9.0 in.)	196 mm (7.7 in.)	163 mm (6.4 in.)
4	279 mm (11.0 in.)	249 mm (9.8 in.)	211 mm (8.3 in.)	180 mm (7.1 in.)

**NOTE:**

Refer to Figure 3.4, page 30 for hole positions. Heights listed above may vary depending on soil conditions, weight of crop on header, and angle of feeder house faceplate relative to the ground.

### 3.3.2 Adjusting Contour Buddy Outboard Wheel Height

Adjust wheel height according to soil conditions, weight of crop on header, and angle of feeder house faceplate relative to the ground.

1. Turn handle (A) on jack (B) clockwise to lower outboard wheel assembly (C), and counterclockwise to raise outboard wheel assembly.
2. Level the cutterbar by adjusting the outboard wheel assemblies up or down until the distance from the outboard ends of the cutterbar to the ground matches the distance from the center of the cutterbar to the ground.

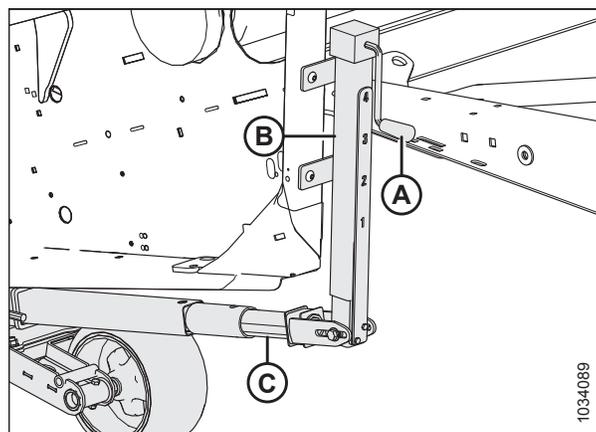


Figure 3.5: Jack and Outboard Wheel Assembly – View from Rear, Left Shown, Right Opposite

### 3.3.3 Moving Left Outboard Wheel to Transport Position

The left outboard wheel need to be moved to the transport position before the header can be towed.

#### DANGER

To avoid bodily injury or death from unexpected startup or fall of raised header, stop the engine, remove the key, and engage the safety props before going under the header. If you are using a lifting device to support the header, be sure that the header is secure before proceeding.

1. Start the engine.
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the header safety props or support the header on blocks on level ground. If using blocks to support the header, ensure the header is approximately 914 mm (36 in.) off the ground.
5. Remove two lynch pins (B).
6. Remove two locking pins (A).
7. Slide left wheel assembly (C) towards the back of the header until it is on round tube (D).

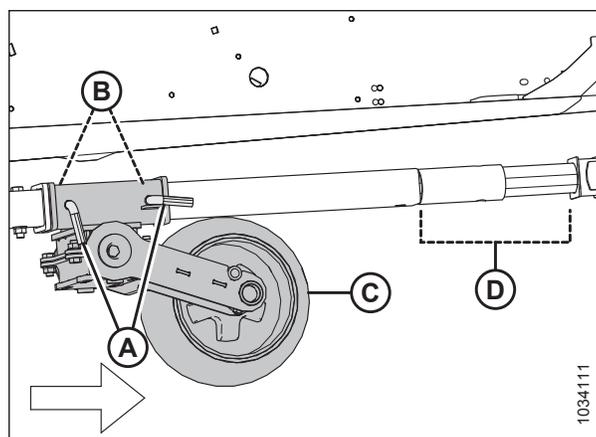


Figure 3.6: Left Wheel Assembly

## OPERATION

8. Rotate left wheel assembly (A) inward 90°.
9. Align the wheel assembly with square tube (B), and slide it slightly towards the front of the header until the pin holes line up.
10. Install two locking pins (C).
11. Install two lynch pins (D).

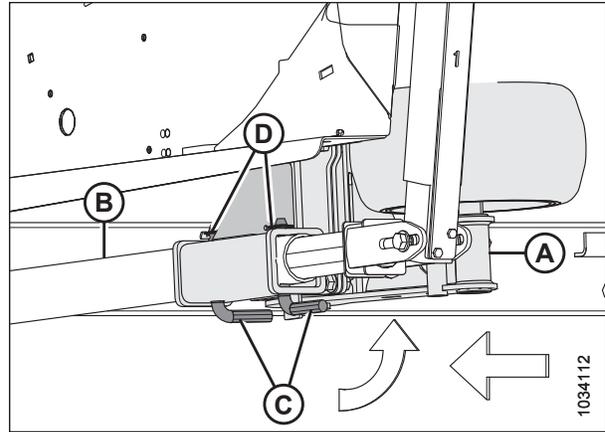


Figure 3.7: Left Wheel Assembly

### 3.3.4 Moving Left Outboard Wheel to Working Position

The left outboard wheel need to be moved to the working position after being in the transport position.

#### DANGER

To avoid bodily injury or death from unexpected startup or fall of raised header, stop the engine, remove the key, and engage the safety props before going under the header. If you are using a lifting device to support the header, be sure that the header is secure before proceeding.

1. Start the engine.
2. Raise the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the header safety props or support the header on blocks on level ground. If using blocks to support the header, ensure the header is approximately 914 mm (36 in.) off the ground.
5. Remove two lynch pins (D).
6. Remove two locking pins (C).
7. Slide wheel assembly (A) slightly towards the back, until left wheel assembly (A) can be rotated downward 90°.

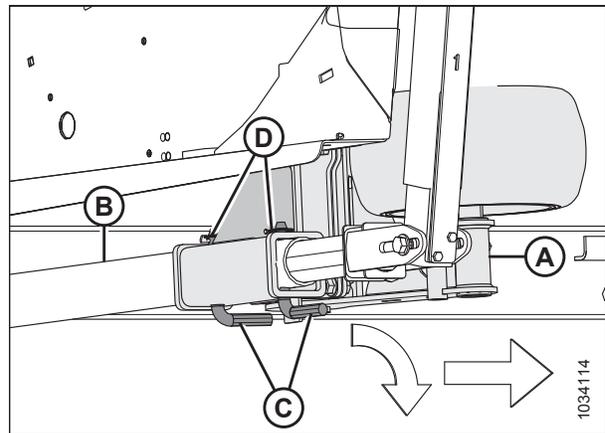


Figure 3.8: Left Wheel Assembly

## OPERATION

- Align the wheel assembly with square tube (B), and slide towards the front of the header until the pin holes line up.
- Install two locking pins (A).
- Install two lynch pins (B).

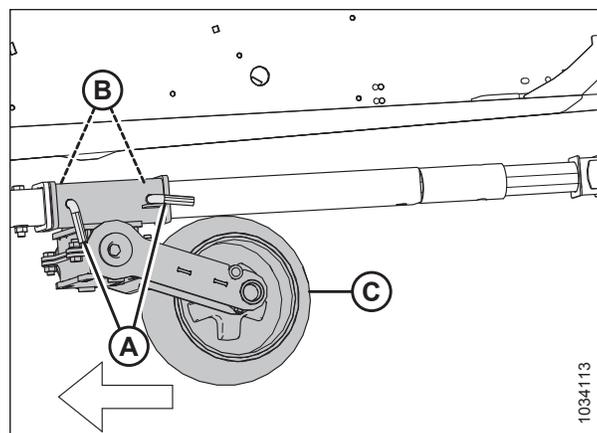


Figure 3.9: Left Wheel Assembly

### 3.3.5 Removing Contour Buddy™ Wheel Assemblies

Removing inboard and outboard wheel assemblies may be required when using header in low crop conditions.

#### *Inboard Wheels*

- To remove wheel assemblies, remove 1/2 in. hex head nut (C), channel washers (B), and 1 1/2 in. hex head bolt (A).

**NOTE:**

Wheels can be removed from assembly beforehand to lighten assembly during lowering.

**NOTE:**

The lower header frame brace removed from illustration for clarity.

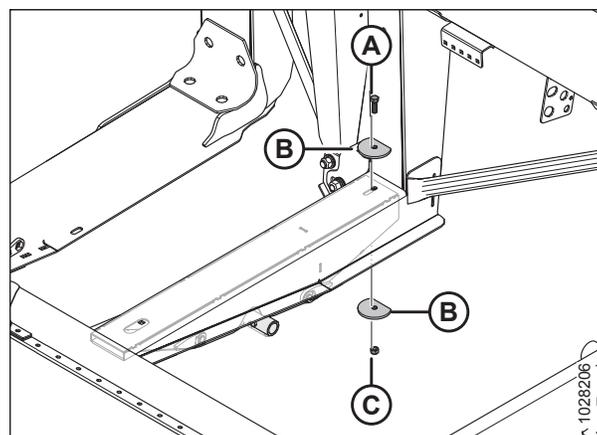


Figure 3.10: Inboard Arm Assembly and Left Header Leg – View from Above

- Slide the front inboard arm assembly (A) out of front pocket (C) on the left header leg as shown.
- Remove inboard arm assembly (A) from flex frame hinge (B).

**NOTE:**

To reinstall wheel assemblies, refer to [2.2.1 Installing Inboard Wheel Assemblies, page 11](#).

**NOTE:**

Header float and wing balance **MUST** be reset after removing or reinstalling wheel assemblies.

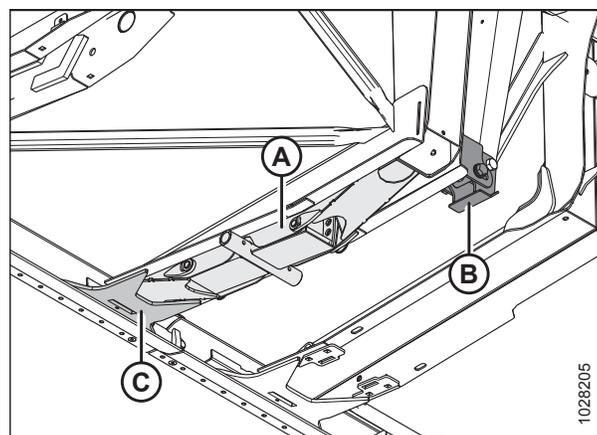


Figure 3.11: Inboard Arm Assembly Installed in Left Header Leg – View from Below

## OPERATION

### Outboard Wheels

- Remove 1/2 in. flange locknut (E), 1/2 in. hardened washers (D), and 4 in. hex head bolt (C) from outboard wheel assembly (B) on left jack (A).

**NOTE:**

Outboard jacks (A) do not have to be removed when cutting in low crop conditions.

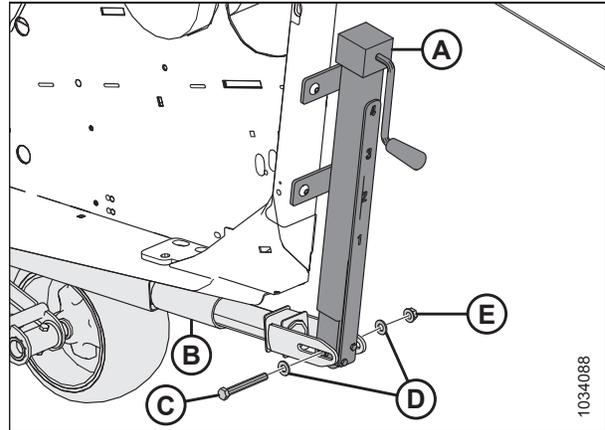


Figure 3.12: Jack and Outboard Wheel Assembly – View from Rear

- Remove lynch pin (D) and rod (C).
- Separate front connection of left outboard wheel assembly (A) from the lugs on the existing outboard skid shoe mount (B) underneath the header frame.

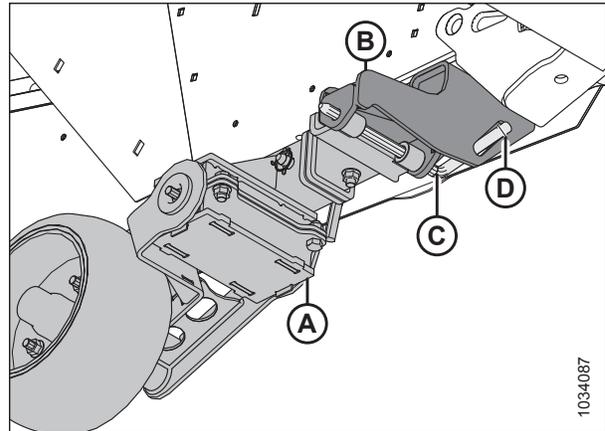


Figure 3.13: Outboard Wheel Assembly – View from Below

- Install rod (B) and lynch pin (A) into left outboard skid shoe.

**NOTE:**

Do **NOT** remove Belleville washers and hex lock nut (C) from outboard skid shoe (D).

**NOTE:**

To reinstall wheel assemblies, refer to [2.2.2 Installing Outboard Wheel Assemblies and Jacks, page 14](#).

**NOTE:**

Header float and wing balance **MUST** be reset after removing or reinstalling wheel assemblies.

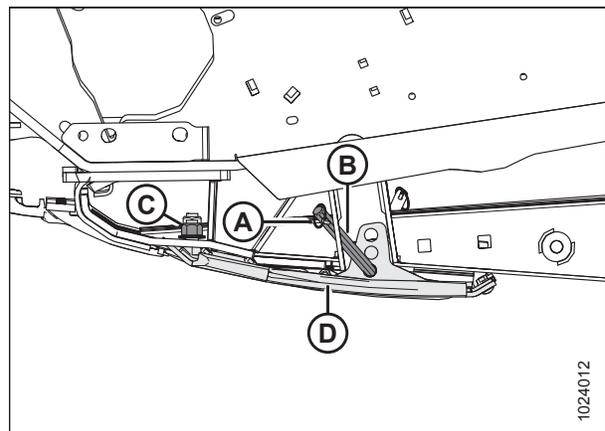


Figure 3.14: Outboard Skid Shoe – View from Left

## Chapter 4: Maintenance

This section provides information about routine servicing for the Contour Buddy™.

### 4.1 Lubricating Wheel Axles

Wheel axles should be lubricated annually.

#### DANGER

To avoid bodily injury or death from unexpected startup or fall of raised header, stop the engine, remove the key, and engage the safety props before going under the header. If you are using a lifting device to support the header, be sure that the header is secure before proceeding.

1. Use a lifting vehicle to raise header, or attach header to combine and fully raise header.
2. Stop engine and remove key from ignition.
3. Engage the header safety props or support the header on blocks on level ground. If using blocks to support the header, ensure the header is approximately 914 mm (36 in.) off the ground.
4. Locate wheel assembly (A).

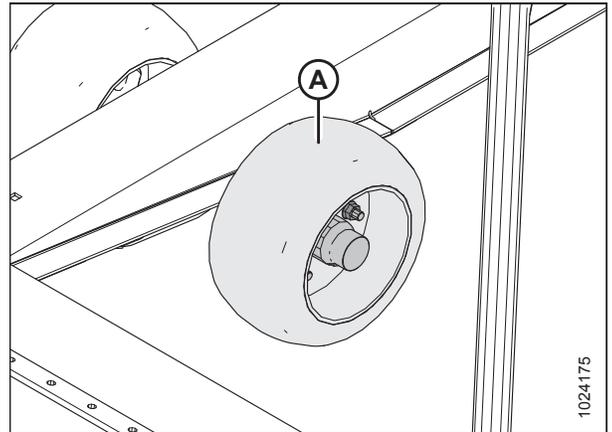


Figure 4.1: Wheel Assembly

5. Remove rubber plug (A). Retain plug for reinstallation.

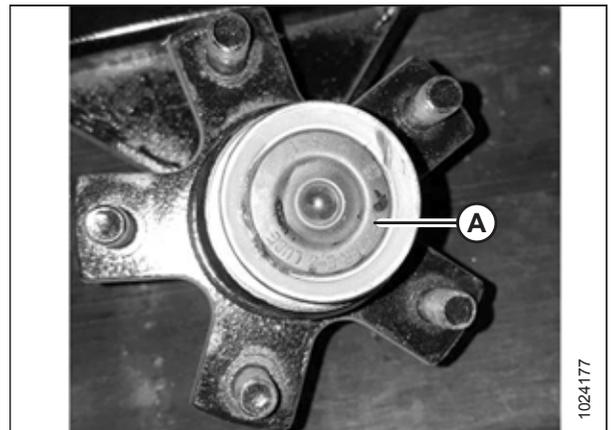


Figure 4.2: Rubber Plug on Wheel Axle

## MAINTENANCE

### IMPORTANT:

Grease **SLOWLY**. Rapid greasing may force rear seal to move.

6. Apply grease at lubrication point (A), and allow excess grease to flow out the front of the axle hub.
7. Reinstall rubber plug removed in Step 5, [page 35](#).
8. Repeat procedure for each wheel assembly as required.

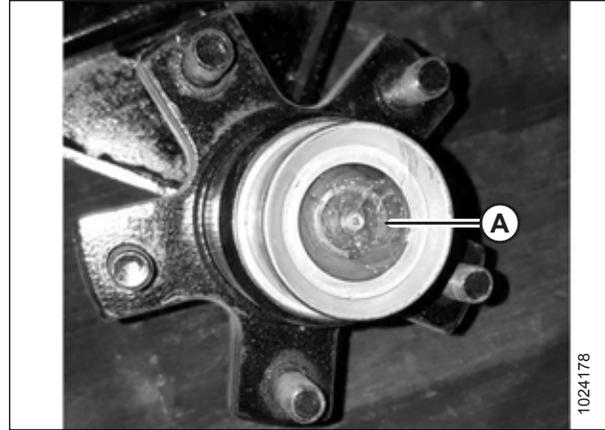


Figure 4.3: Lubrication Point on Wheel Axle

# Chapter 5: Repair Parts

This chapter lists all the replacement parts that can be ordered for a Contour Buddy™.

**Bold text is used to indicate updates made at the current revision level.** With each new revision of the manual, previous revisions are returned to regular text.

In this manual, right and left are determined from the operator's position, facing forward with the machine in cab-forward position. An arrow is sometimes used in illustrations to indicate cab-forward position.

## 5.1 Abbreviations

The following abbreviations are used in this manual.

A/R – as required (quantity varies)  
C/W – complete with  
CSK – countersink  
DK – double knife  
DT – distorted thread  
FLG – flange  
I.D. – inside diameter  
LH – left hand (determined from Operator's position, facing forward)  
NC – national coarse thread  
NF – national fine thread  
NSS – not serviced separately  
O.D. – outside diameter  
OPT – optional  
PT – pull-type (mower conditioner)  
REF – reference, part number called up elsewhere in manual  
RH – right hand (determined from Operator's position, facing forward)  
RHSN – round head, square neck or square neck carriage bolt  
RHSSN – round head, short, square neck  
SMV – slow moving vehicle  
SP – self-propelled (header)

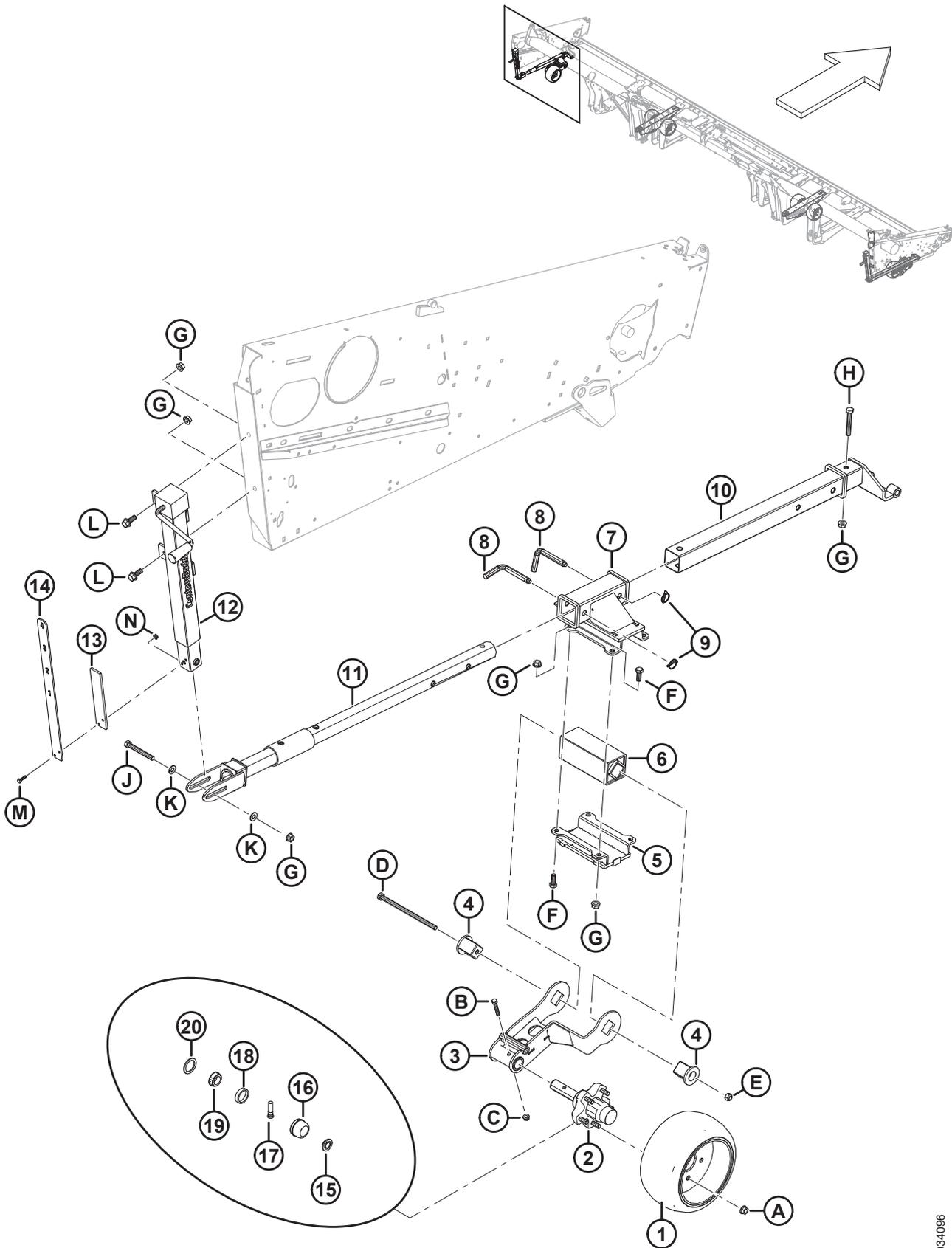
### 5.1.1 Serial Number Breaks

The side of the serial number on which the dash (–) appears determines whether the part is used "up to" or "after" the serial number given.

**Example:**

- –162249 Used on machines up to and including serial number 166249
- 166250– Used on machines including and after serial number 166250

## 5.2 Contour Buddy™ – Jacks and Wheel Assemblies (Left Side)



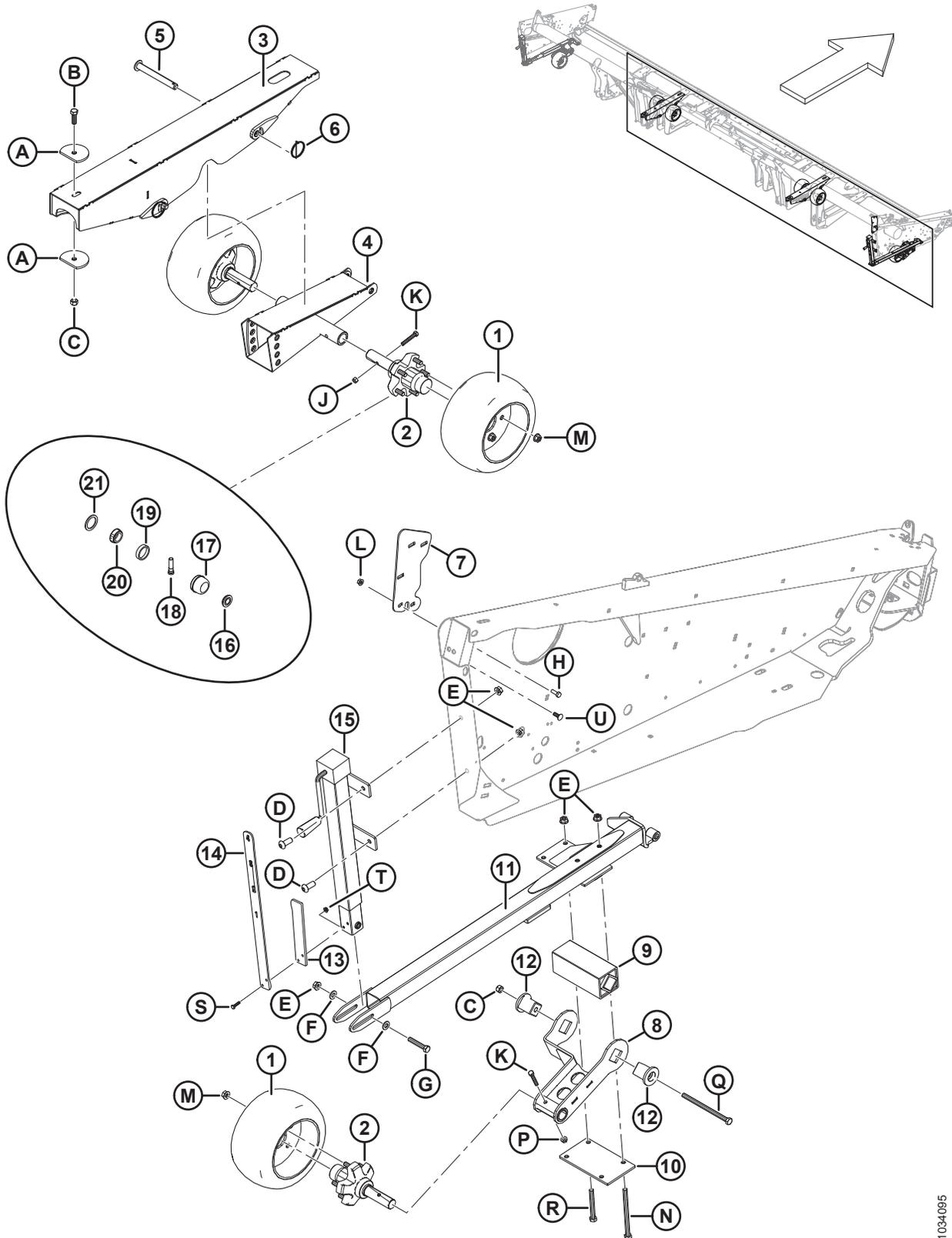
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**REPAIR PARTS**

Ref	Part Number	Description	Qty	Serial Number
	284802	KIT – CONTOUR BUDDY <sup>1</sup>		
1	284584	WHEEL – SOLID TIRE 6 X 8	1	
2	284583	HUB – AXLE 5 X 4.5 MACHINED	1	
3	<b>284811</b>	SUPPORT – LH ISOLATOR	1	
4	284688	RETAINER – ISOLATOR	2	
5	284792	SUPPORT – BOTTOM WELDMENT	1	
6	258054	HOUSING – TORSION ISOLATOR	1	
7	284773	SUPPORT – TOP WELDMENT	1	
8	284784	PIN– LOCKING	2	
9	50193	PIN – LYNCH, 4.5 MM, 31.8 MM	2	
10	284770	BEAM WELDT – LH	1	
11	284777	SUPPORT – BACK WELDT	1	
12	284664	JACK – LH W/ CB DECAL <sup>2</sup>	1	
13	284705	PLUG – RUBBER	1	
14	284700	PLATE – JACK SCALE	1	
15	284705	PLUG – RUBBER	1	
16	284706	CAP – EZ LUBE	1	
17	284707	STUD	1	
18	284708	BEARING – CUP, 47 MM	1	
19	284709	BEARING – CONE, 44 MM	1	
20	284710	SEAL	1	
A	188470	NUT – FLANGE LOCK SM FACE DT 0.500-20 UNF GR G		
B	20055	BOLT – HH 3/8 NC X 2.25 LG GR 5 ZP		
C	30228	NUT – FLANGE DT SMOOTH FACE 0.375-16 UNC		
D	109091	BOLT – HH 1/2 NC X 9.0 LG GR 5 ZP		
E	18697	NUT – HEX LOCK DT .500-13 UNC		
F	21491	BOLT – HEX HD 1/2-13 X 1.25 GR5-AA1J		
G	50186	NUT – FLANGE LOCK SM FACE DT 0.500-13 UNC GR 5		
H	30011	BOLT – HEX HD 1/2-13 X 3.25 GR5-AA1J		
J	21589	BOLT – HH 1/2 NC X 4.0 LG GR 5 ZP		
K	135369	WASHER – HARDENED ASTM F436 1/2		
L	135965	BOLT – HEX FLG SM HD 1/2-13 X 1.25 GR5 -AA1J		
M	21573	BOLT – HEX HD 1/4 NC X 1.0 LG GR 5 ZP		
N	135248	NUT – HEX FLG CTR LOC		

1. Includes all listed parts and hardware for right side, left side, and two middle. For decals, refer to Section [5.4 Contour Buddy™ – Decals, page 44](#).
2. Includes Contour Buddy Decal. Refer to Section [5.4 Contour Buddy™ – Decals, page 44](#).

### 5.3 Contour Buddy™ – Jacks and Wheel Assemblies (Right Side and Middle)



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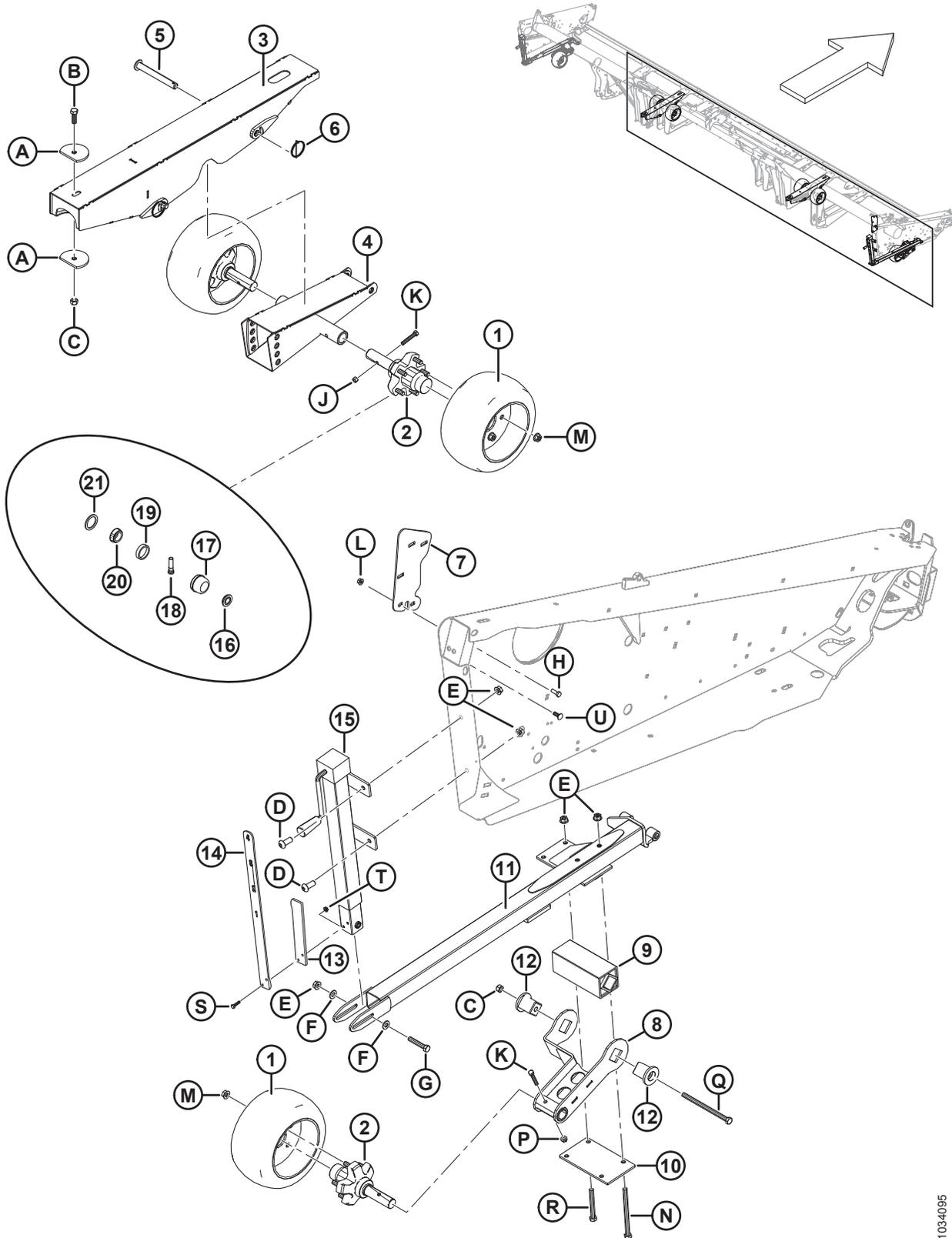
**REPAIR PARTS**

Ref	Part Number	Description	Qty	Serial Number
	284802	KIT – CONTOUR BUDDY <sup>34</sup>		
1	284584	WHEEL – SOLID TIRE 6 X 8	5	
2	284583	HUB – AXLE 5 X 4.5 MACHINED	5	
3	284694	SUPPORT – AXLE FRAME	2	
4	284683	SUPPORT – INBOARD AXLE	2	
5	284675	PIN	4	
6	50193	PIN-LYNCH, 4.5 mm, 31.8 mm	4	
7	304523	PLATE – LIGHT EXT. BRACKET	1	
8	<b>284812</b>	SUPPORT – RH ISOLATOR	1	
9	258054	HOUSING – TORSION ISOLATOR	1	
10	<b>284797</b>	<b>BUTTOM SUPPORT</b>	1	
11	<b>284799</b>	BEAM – RH	1	
12	284688	RETAINER – ISOLATOR	2	
13	284699	SPACER – INDICATOR	1	
14	284700	PLATE – JACK SCALE	1	
15	284665	JACK – RH W/ CB DECAL <sup>4</sup>	1	
16	284705	PLUG – RUBBER	1	
17	284706	CAP – EZ LUBE	1	
18	284707	STUD	1	
19	284708	BEARING – CUP, 47 MM	1	
20	284709	BEARING – CONE, 44 MM	1	
21	284710	SEAL	1	
A	284602	WASHER – CHANNEL		
B	252641	BOLT – HH 1/2-13 X 1.5-GR8-AA3L		
C	18697	NUT – HEX LOCK DT .500-13 UNC		
D	136085	SCR-HEX SOC BTN HD1/2X1.25		
E	50186	NUT – FLANGE LOCK SM FACE DT 0.500-13 UNC GR 5		
F	135369	WASHER – HARDENED ASTM F436 1/2		
G	21589	BOLT – HH 1/2 NC X 4.0 LG GR 5 ZP		
H	100456	BOLT – RHSSN 3/8 NC X 1.0 GR 5 ZP		
J	135511	NUT – CENTER LOCK .375-16 UNC GR 5 ZP		
K	20055	BOLT – HH 3/8 NC X 2.25 LG GR 5 ZP		
L	21452	NUT – FLANGE (SER FACE) .375-16 UNC		
M	188470	NUT – FLANGE LOCK SM FACE DT 0.500-20 UNF GR G		
N	50009	BOLT – HH 1/2 NC X 7.0 LG GR 5 ZP		
P	30228	NUT – FLANGE DT SMOOTH FACE 0.375-16 UNC		
Q	109091	BOLT – HH 1/2 NC X 9.0 LG GR 5 ZP		

3. Includes all listed parts and hardware for right side, left side, and two middle.

4. For decals, refer to Section [5.4 Contour Buddy™ – Decals, page 44](#)

REPAIR PARTS

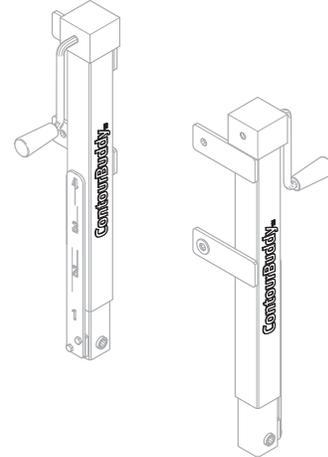


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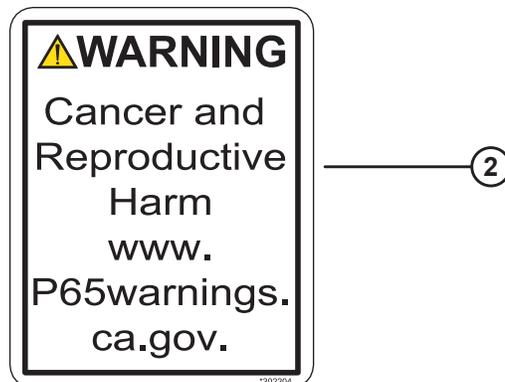
## REPAIR PARTS

Ref	Part Number	Description	Qty	Serial Number
R	30209	BOLT – HH 1/2 NC X 4.5 LG GR 5 ZP		
S	21573	BOLT – HEX HD 1/4 NC X 1.0 LG GR 5 ZP		
T	135248	NUT – HEX FLG CTR LOC		
U	20077	BOLT – HEX HD TFL 3/8–16 UNC X 1 IN. GR5 AA1J (for FD70 Double-Knife Headers only)		

## 5.4 Contour Buddy™ – Decals



①  
*Contour* **Buddy™**



**REPAIR PARTS**

<b>Ref</b>	<b>Part Number</b>	<b>Description</b>	<b>Qty</b>	<b>Serial Number</b>
	284618	KIT – CONTOUR BUDDY <sup>5</sup>	1	
1	284663	DECAL – CONTOUR BUDDY	2	
2	302204	DECAL – CA PROPOSITION 65	1	

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5. Includes all listed parts. For jacks and wheel assemblies, refer to Section *5.2 Contour Buddy™ – Jacks and Wheel Assemblies (Left Side)*, page 38 or *5.3 Contour Buddy™ – Jacks and Wheel Assemblies (Right Side and Middle)*, page 40.



# Chapter 6: Reference

## 6.1 Torque Specifications

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

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

### Jam nuts

Jam nuts require less torque than nuts used for other purposes. When applying torque to finished jam nuts, multiply the torque applied to regular nuts by  $f=0.65$ .

### Self-tapping screws

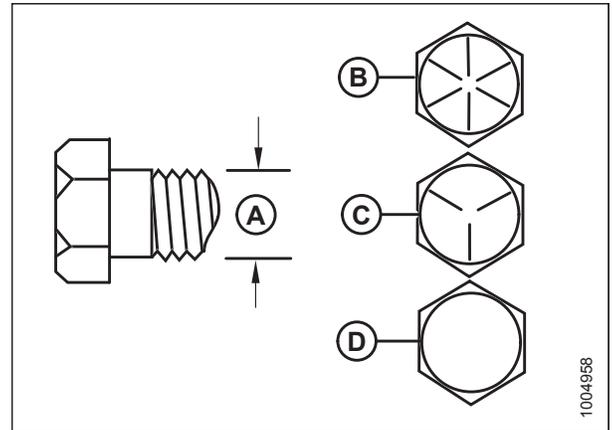
Use the standard torque values when installing self-tapping screws. Do **NOT** install self-tapping screws on structural or otherwise critical joints.

### 6.1.1 SAE Bolt Torque Specifications

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

**Table 6.1 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 6.1: Bolt Grades**

A - Nominal Size  
C - SAE-5

B - SAE-8  
D - SAE-2

1004958

REFERENCE

Table 6.2 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

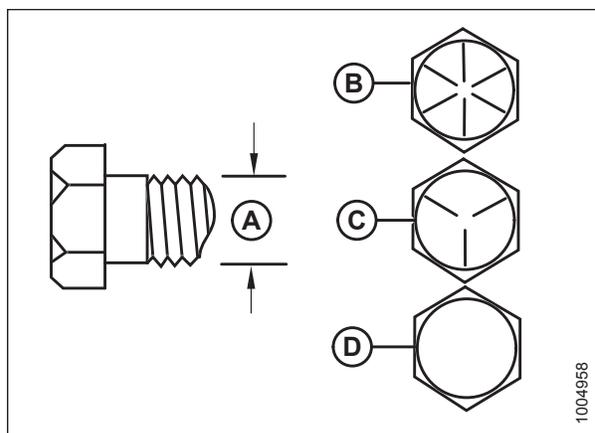


Figure 6.2: Bolt Grades

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

Table 6.3 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

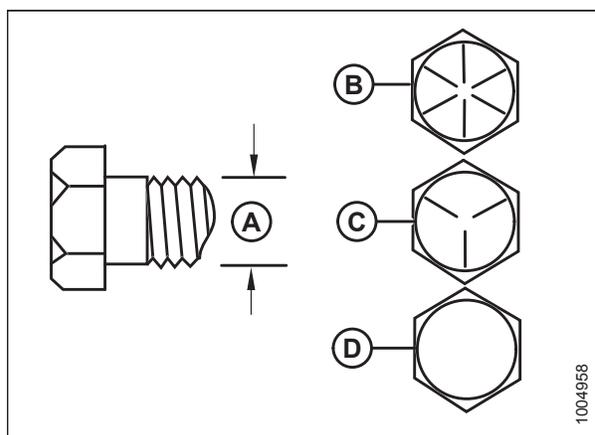


Figure 6.3: Bolt Grades

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

Table 6.4 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

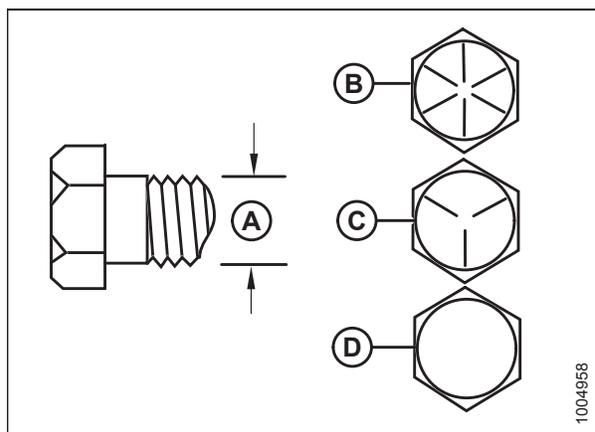


Figure 6.4: Bolt Grades

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

REFERENCE

### 6.1.2 Metric Bolt Specifications

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

**Table 6.5 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

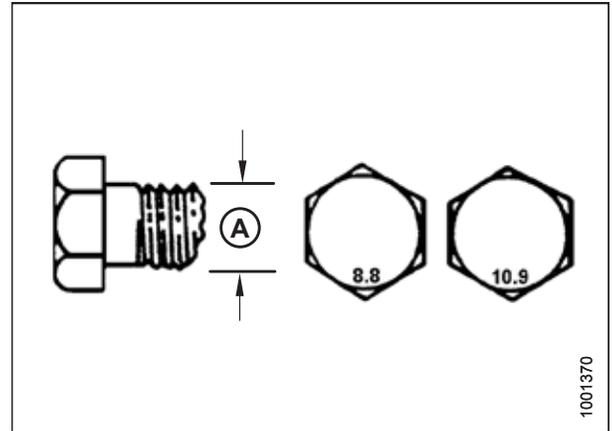


Figure 6.5: Bolt Grades

**Table 6.6 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

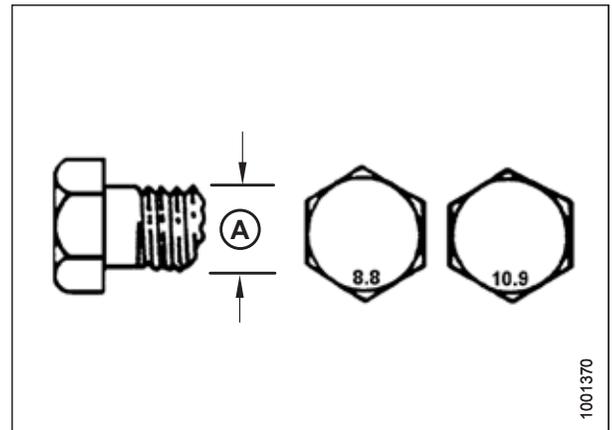


Figure 6.6: Bolt Grades

REFERENCE

Table 6.7 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

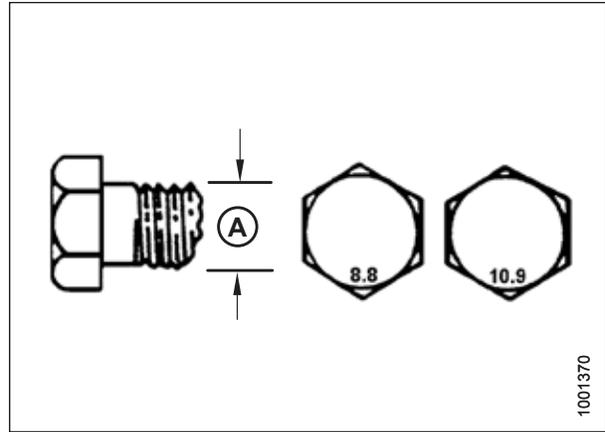


Figure 6.7: Bolt Grades

Table 6.8 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

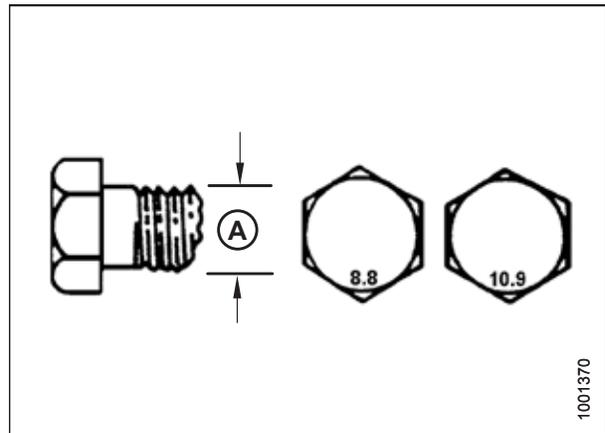


Figure 6.8: Bolt Grades

### 6.1.3 Metric Bolt Specifications Bolting into Cast Aluminum

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 6.9 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	–	–	–	–

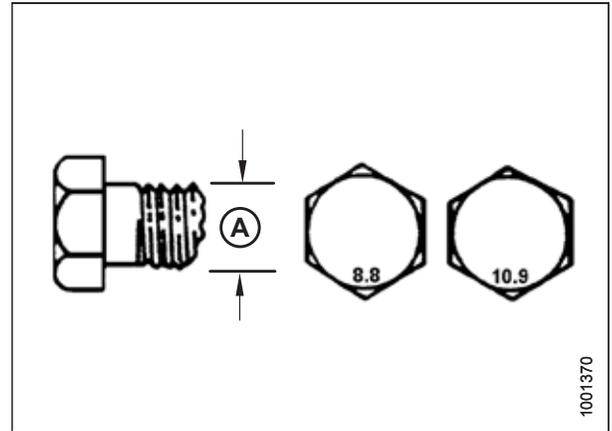


Figure 6.9: Bolt Grades

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

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

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 the threads. Adjust O-ring (A) if necessary.
4. Apply hydraulic system oil to O-ring (A).

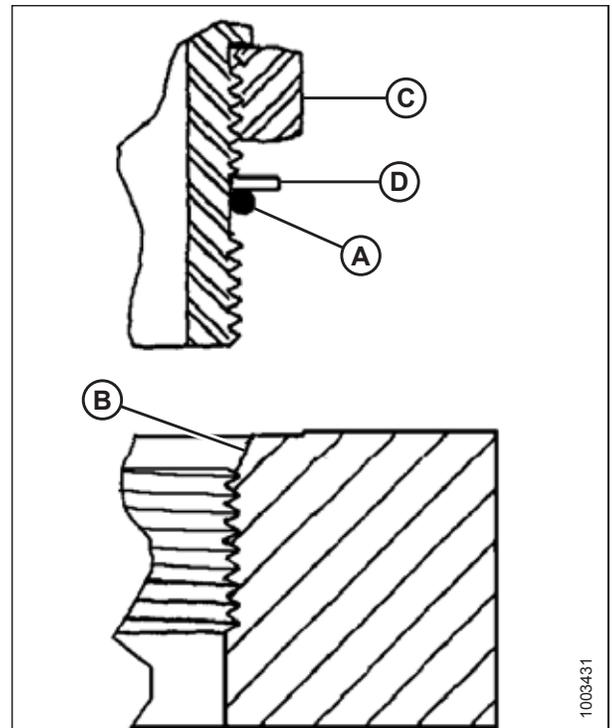


Figure 6.10: Hydraulic Fitting

REFERENCE

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

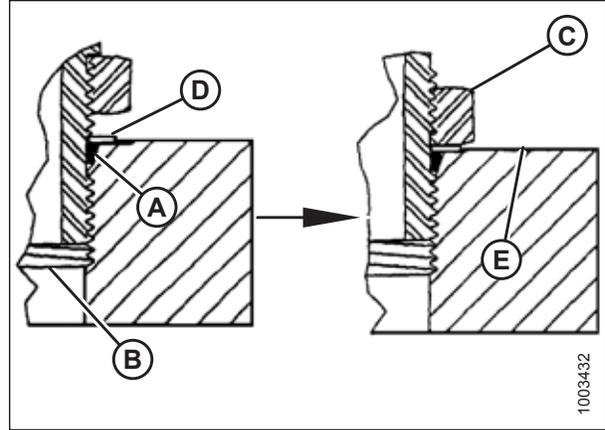


Figure 6.11: Hydraulic Fitting

Table 6.10 O-Ring Boss (ORB) Hydraulic Fittings – 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.

### 6.1.5 O-Ring Boss Hydraulic Fittings – Non-Adjustable

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

Torque values are shown in following table below.

1. Inspect O-ring (A) and seat (B) for dirt or obvious defects.
2. Check that O-ring (A) is **NOT** on the threads. Adjust O-ring (A) if necessary.
3. Apply hydraulic system oil to the O-ring.
4. Install fitting (C) into the port until the fitting is hand-tight.
5. Torque fitting (C) according to values in Table 6.11, page 53.
6. Check the final condition of the fitting.

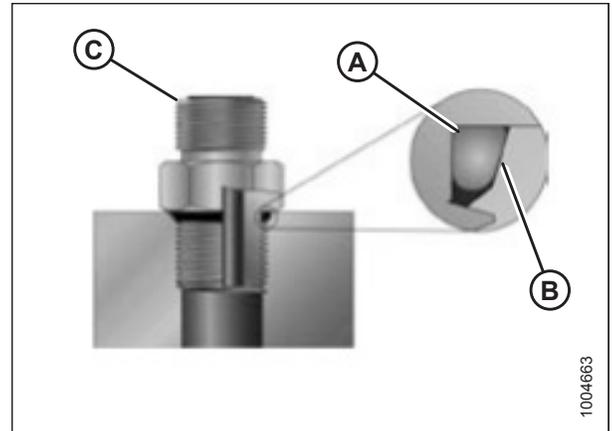


Figure 6.12: Hydraulic Fitting

Table 6.11 O-Ring Boss (ORB) Hydraulic Fittings – Non-Adjustable

SAE Dash Size	Thread Size (in.)	Torque Value <sup>7</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

### 6.1.6 O-Ring Face Seal Hydraulic Fittings

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

Torque values are shown in following table below.

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

## REFERENCE

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



Figure 6.13: Hydraulic Fitting

2. Apply hydraulic system oil to O-ring (B).
3. Align the tube or hose assembly so that the flat face of sleeve (A) or (C) comes in full contact with O-ring (B).
4. Thread tube or hose nut (D) until it is hand-tight. The nut should turn freely until it bottoms out.
5. Torque the fittings according to values in Table 6.12, page 54.

**NOTE:**

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

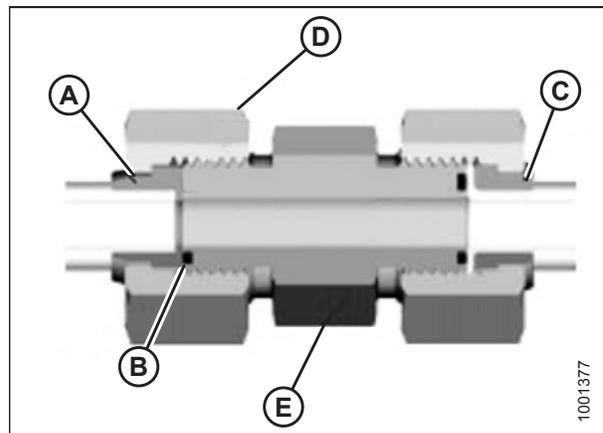


Figure 6.14: Hydraulic Fitting

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

**Table 6.12 O-Ring Face Seal (ORFS) Hydraulic Fittings**

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value <sup>8</sup>	
			Nm	lbf-ft
-3	Note <sup>9</sup>	3/16	–	–
-4	9/16	1/4	25–28	18–21
-5	Note <sup>9</sup>	5/16	–	–
-6	11/16	3/8	40–44	29–32
-8	13/16	1/2	55–61	41–45
-10	1	5/8	80–88	59–65
-12	1 3/16	3/4	115–127	85–94
-14	Note <sup>9</sup>	7/8	–	–
-16	1 7/16	1	150–165	111–122
-20	1 11/16	1 1/4	205–226	151–167

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

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

## REFERENCE

**Table 6.12 O-Ring Face Seal (ORFS) Hydraulic Fittings (continued)**

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value <sup>10</sup>	
			Nm	lbf-ft
-24	1-2	1 1/2	315-347	232-256
-32	2 1/2	2	510-561	376-414

### 6.1.7 Tapered Pipe Thread Fittings

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

Assemble pipe fittings as follows:

1. Check the components to ensure that the fitting and the port threads are free of burrs, nicks, scratches, and any form of contamination.
2. Apply paste-type pipe thread sealant to the external pipe threads.
3. Thread the fitting into the port until it is hand-tight.
4. Torque the connector to the appropriate torque angle. The turns from finger tight (TFFT) and flats from finger tight (FFFT) values are shown in Table 6.13, page 55. Make sure that the tube end of a shaped connector (typically 45° or 90°) is aligned to receive the incoming tube or hose assembly. Always finish the alignment of the fitting in the direction of tightening. Never back off (loosen) the threaded connectors to achieve alignment.
5. Clean all residue and any excess thread conditioner with an appropriate cleaner.
6. Assess the final condition of the fitting. Pay special attention to the possibility of cracks in the port opening.
7. Mark the final position of the fitting. If a fitting leaks, disassemble the fitting and check it for damage.

**NOTE:**

The failure of fittings due to overtorquing may not be evident until the fittings are disassembled.

**Table 6.13 Hydraulic Fitting Pipe Thread**

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

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

## 6.2 Conversion Chart

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

**Table 6.14 Conversion Chart**

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

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# Predelivery Checklist

Perform these checks and adjustments prior to delivery to your Customer. The completed checklist should be retained by either the Operator or the Dealer.

 **CAUTION**

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

✓	Item	Reference
	Check for shipping damage or missing parts. Be sure all shipping material is removed.	<i>2.1 Unloading Contour Buddy™, page 9</i>
	Check for loose hardware. Tighten to required torque.	<i>6.1 Torque Specifications, page 47</i>
	Adjust inboard wheel height.	<i>3.3.1 Adjusting Contour Buddy Inboard Wheel Height, page 29</i>
	Adjust outboard wheel height.	<i>3.3.2 Adjusting Contour Buddy Outboard Wheel Height, page 31</i>
	Check and adjust header float.	Refer to header operator's manual.
	Check and adjust header wing balance.	Refer to header operator's manual.

**Date Checked:**

**Checked by:**





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