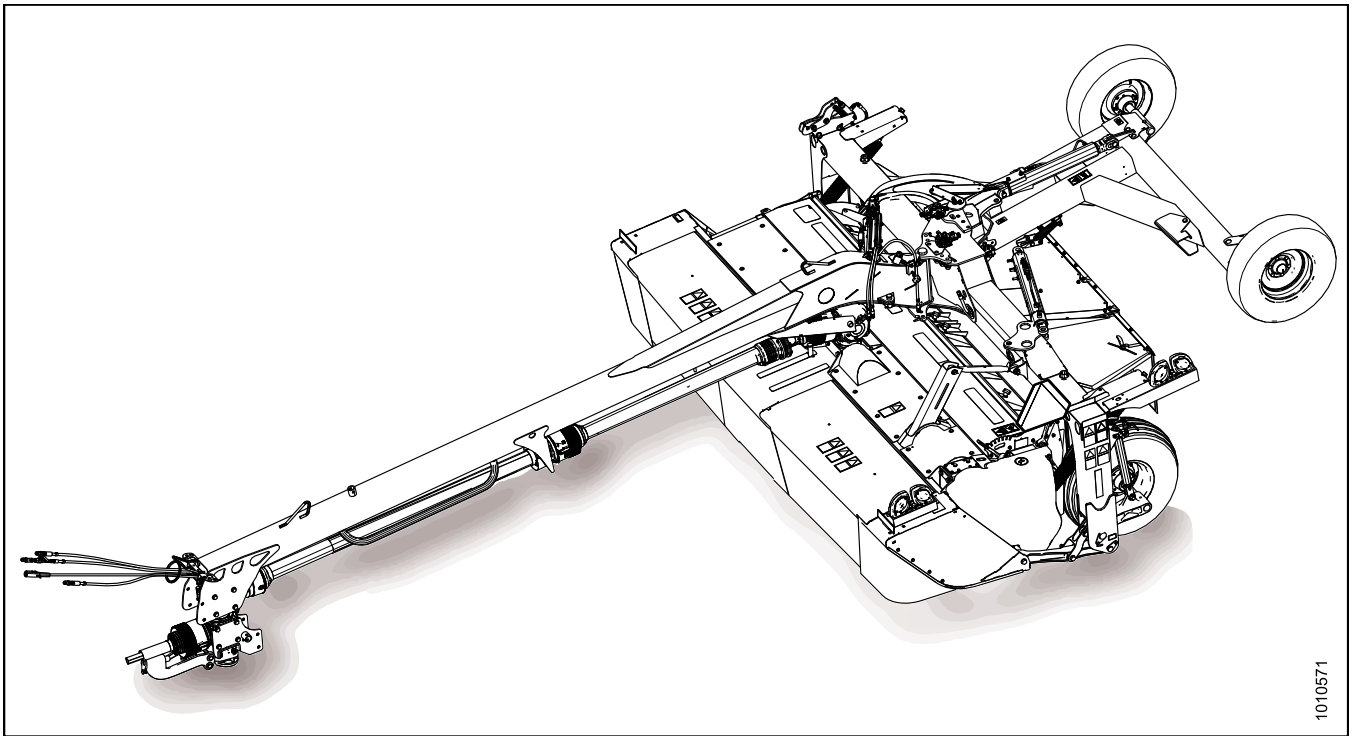


**R113/R116  
Pull-Type Rotary Disc Mower  
Conditioner**

Unloading and Assembly Instruction

214004 Revision A  
Original Instruction  
Model Year 2016

R113/R116 Pull-Type Rotary Disc Mower Conditioner



1010571

Published: March, 2016

# Introduction

This instruction manual describes the unloading, setup, and predelivery requirements for the MacDon R113/R116 Pull-Type Rotary Disc Mower Conditioner.

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.

Retain this instruction for future reference.

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

**NOTE:**

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

## List of Revisions

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

<b>Summary of Change</b>	<b>Location</b>
Rearranged some sections to improve readability	Various
Updated Repositioning Center-Link Top Anchor	<a href="#">3.1 Repositioning Center-Link Top Anchor, page 9</a>
Updated Priming the Hitch Swing Cylinder	<a href="#">3.11 Priming the Hitch Swing Cylinder, page 58</a>
Added Installing Road Friendly Transport™ Wheels	<a href="#">4.13 Installing Road Friendly Transport™ Wheels, page 112</a>
Updated Checking Header Float	<a href="#">6.6 Checking Mower Conditioner Float, page 140</a>
Updated Adjusting Header Float (Dealer and Factory Install)	<a href="#">6.6.1 Adjusting Mower Conditioner Float, page 140</a>
Added Checking Tire Pressure	<a href="#">6.2 Checking Tire Pressure, page 136</a>
Updated Converting from Field to Transport Mode	<a href="#">6.18.1 Converting from Field to Transport Mode, page 157</a>

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# 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 the protective clothing and personal safety devices that **could** be necessary for the job at hand. Don't 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 ear muffs or ear plugs to help protect against objectionable or loud noises.

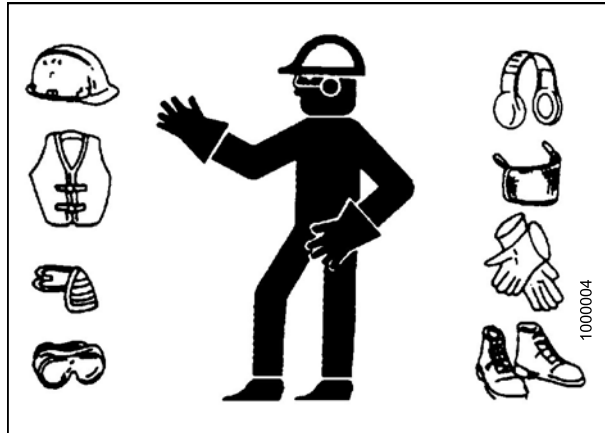


Figure 1.1: Safety Equipment



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

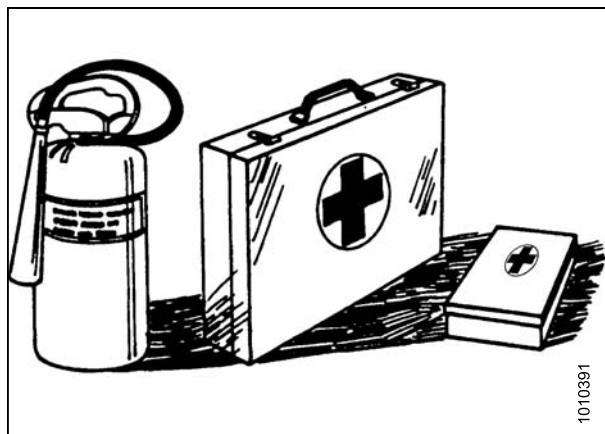


Figure 1.3: Safety Equipment

## 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 the shaft and can telescope freely.
- Use only service and repair parts made or approved by the equipment manufacturer. Substituted parts may not meet strength, design, or safety requirements.



Figure 1.4: Safety around Equipment

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

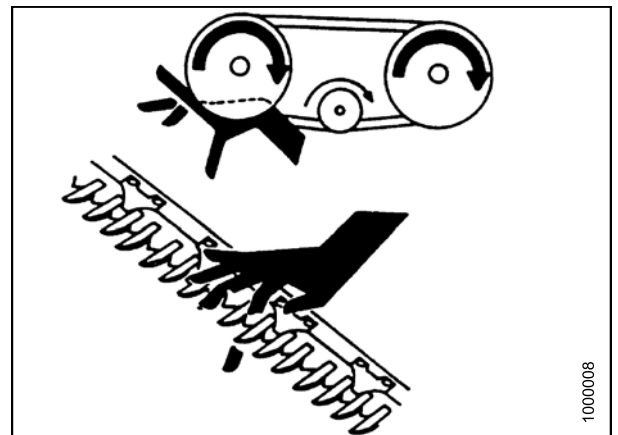


Figure 1.5: Safety around Equipment

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

### WARNING

- Keep all sparks and flames away from the batteries, as a gas given off by electrolyte is explosive.
- Ventilate when charging in enclosed space.

### WARNING

- Wear safety glasses when working near batteries.
- Do NOT tip batteries more than 45° to avoid electrolyte loss.
- Battery electrolyte causes severe burns. Avoid contact with skin, eyes, or clothing.
- Electrolyte splashed into the eyes is extremely dangerous. Should this occur, force the eye open, and flood with cool, clean water for five minutes. Call a doctor immediately.
- If electrolyte is spilled or splashed on clothing or the body, neutralize it immediately with a solution of baking soda and water, then rinse with clear water.

### WARNING

- To avoid injury from spark or short circuit, disconnect battery ground cable before servicing and part of electrical system.
- Do NOT operate the engine with alternator or battery disconnected. With battery cables disconnected and engine running, a high voltage can be built up if terminals touch the frame. Anyone touching the frame under these conditions would be severely shocked.
- When working around storage batteries, remember that all of the exposed metal parts are live. Never lay a metal object across the terminals because a spark or short circuit will result.
- Keep batteries out of reach of children.



Figure 1.7: Safety around Batteries

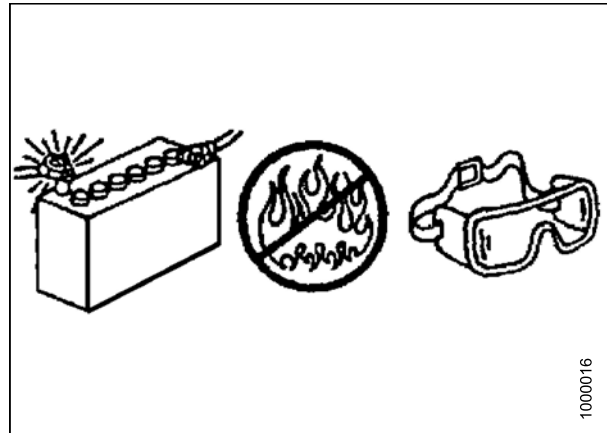


Figure 1.8: Safety around Batteries

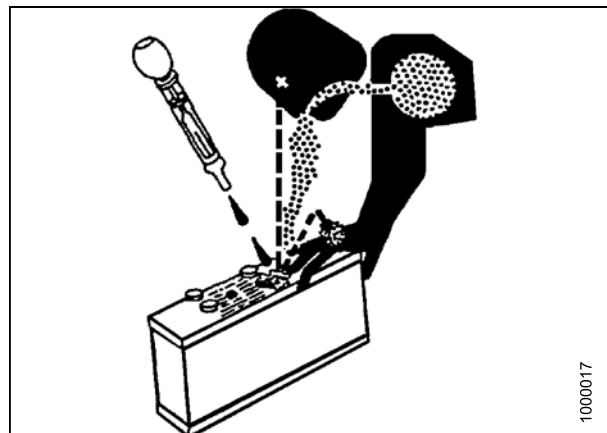


Figure 1.9: Safety around Batteries

## 1.4 Safety Signs

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

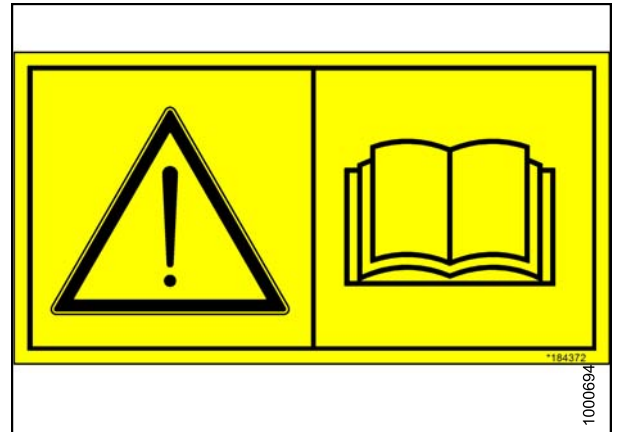


Figure 1.10: Operator's Manual Decal



## 2 Unloading Shipment

### CAUTION

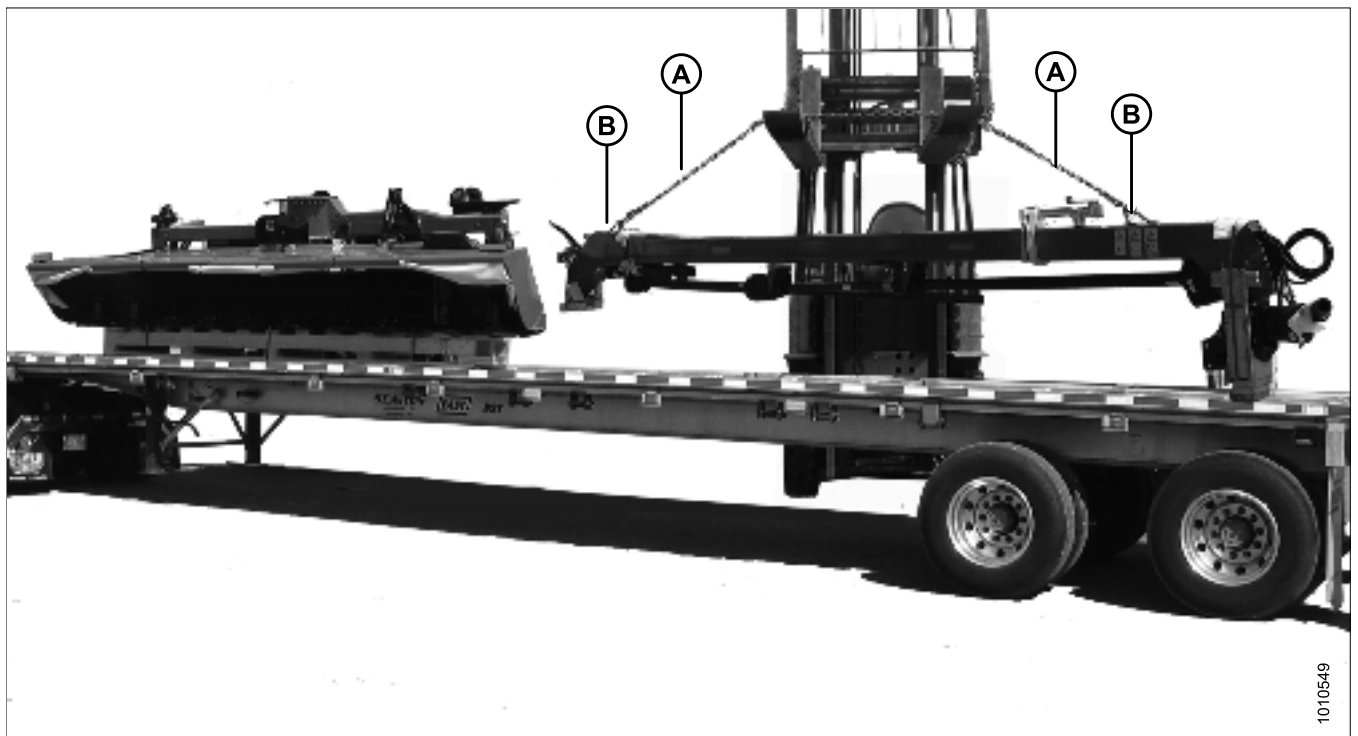
To avoid injury to bystanders from being struck by machinery, do NOT allow persons to stand in unloading area.

### CAUTION

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

Lifting Vehicle	
Minimum Capacity	8000 lb. (3630 kg)
Minimum Height	15 ft. (4.5 m)

Chain	
Overhead Lifting Quality (1/2 inch)	5000 lb. (2270 kg) minimum working load



**Figure 2.1: Unloading Hitch**

1. Remove hauler's tie-down straps and chains.
2. Attach chain (A) to two brackets (B) on top of hitch as shown.
3. Adjust chain lengths so hitch is lifted evenly.
4. Raise hitch off deck, back up until unit clears trailer, and slowly lower to 6 in. (150 mm) from ground.

## UNLOADING SHIPMENT

### IMPORTANT:

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

5. Take to storage or assembly area, and set hitch down securely on level ground.
6. Repeat for second hitch (if required).
7. Check for shipping damage and missing parts.
1. Approach mower conditioner (A) from back with forklift (B) as shown, and slide forks into pallet as far as possible.

### NOTE:

Pallet is designed to be lifted from the backside only.

2. Raise mower conditioner off deck.

### IMPORTANT:

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

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

### NOTE:

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

5. Repeat for second mower conditioner (if required).
6. Check for shipping damage and missing parts.

### IMPORTANT:

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

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

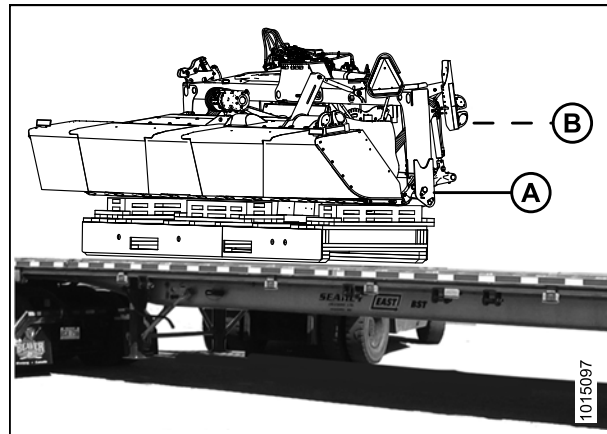


Figure 2.2: Unloading Header



### 3 Assembling the Mower Conditioner (with or without Dealer Installed Road Friendly Transport™)

Perform the following steps to assemble the mower conditioner with or without Dealer Installed Road Friendly Transport™.

#### 3.1 Repositioning Center-Link Top Anchor

Perform this procedure to reposition the center-link top anchor into working position.

1. Place forklift forks (B) under top beam and lift carrier frame (A) slightly until pin at base of center-link anchor is loose. Use a piece of wood (C) to protect paint on frame.

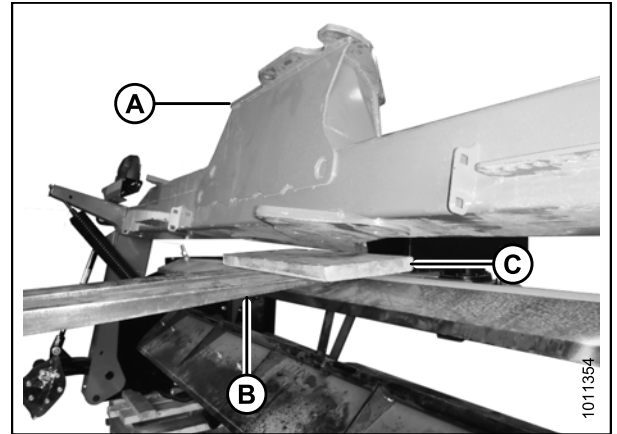


Figure 3.1: Carrier

2. Loosen jam nut (A) and fully loosen float springs (B).

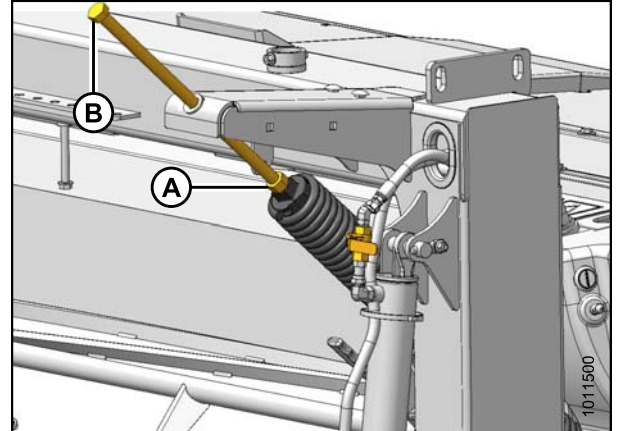
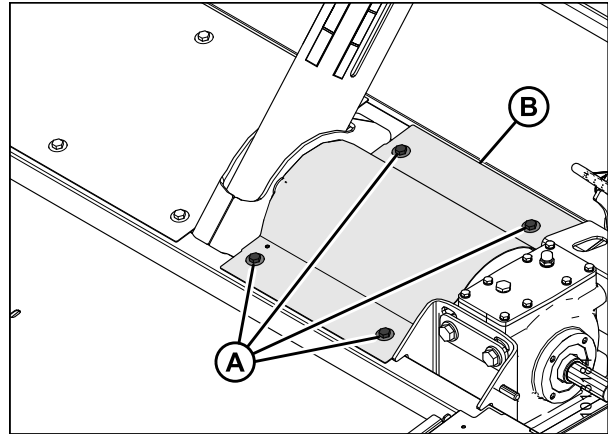


Figure 3.2: Float Spring

**ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER  
INSTALLED ROAD FRIENDLY TRANSPORT™)**

3. Remove four M10 hex head bolts (A) and flat washers, and remove top shield (B).



**Figure 3.3: Top Shield**

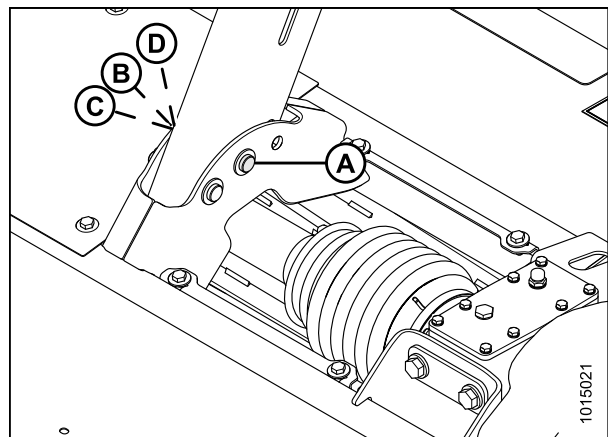
**⚠ CAUTION**

To avoid injury, keep fingers clear of opening at base of anchor.

4. Remove cotter pin (B), washer (C) and shipping tag (D).
5. Remove pin (A) from center location and lower forks on forklift.

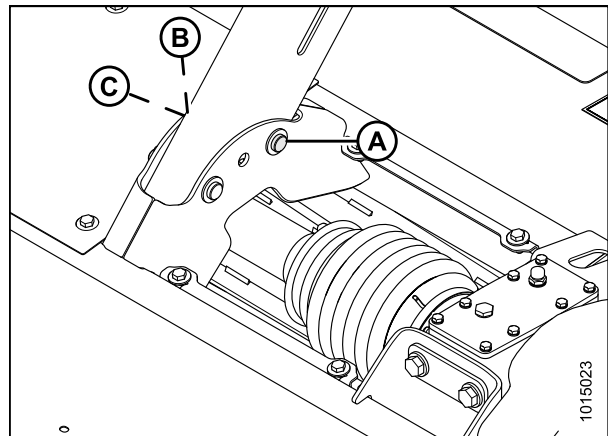
**NOTE:**

Pin should slide out freely. Adjust forklift or move carrier until pin is loose. Avoid using a hammer to remove pin.



**Figure 3.4: Center-Link Anchor**

6. Install pin (A) and secure with washer (B) and cotter pin (C). Move the carrier and anchor so the pin can be installed in working location.



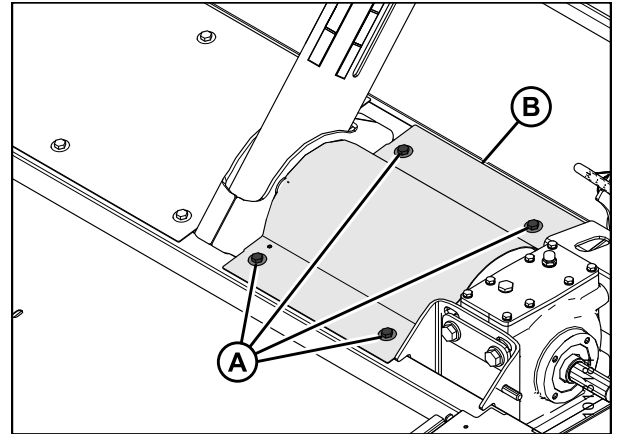
**Figure 3.5: Center-Link Anchor**

## ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER INSTALLED ROAD FRIENDLY TRANSPORT™)

7. Install top shield (B) and secure with four M10 hex head bolts (A) and flat washers. Torque to 20–22 ft·lbf (27–30 N·m).

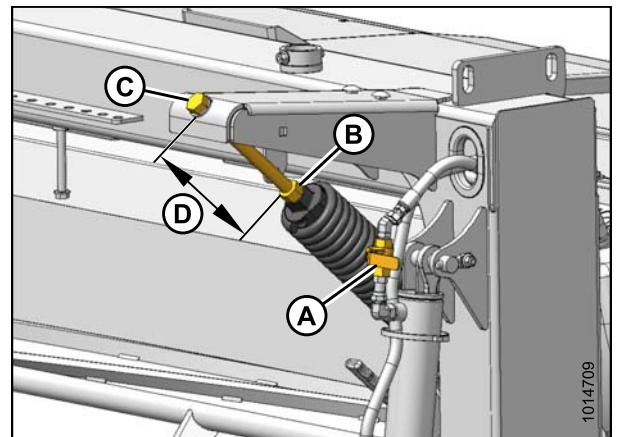
**NOTE:**

If transport is also being installed, leave bolts (A) loose. These bolts will be tightened when installing the lighting harness.



**Figure 3.6: Top Shield**

8. Close the mower conditioner's lift cylinder lock-out valve (A) on each lift cylinder by turning the handle to the horizontal position.
9. Loosen jam nut (B) away from the spring.
10. Turn the adjuster bolt (C) and set dimension (D) to 5-1/8 in (130 mm).
  - Turn bolt clockwise (towards spring) to increase float
  - Turn bolt counterclockwise (away from spring) to decrease float
11. Tighten jam nut (B) against spring.

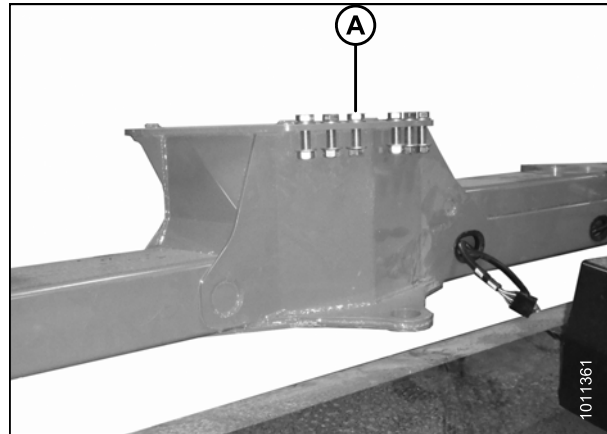


**Figure 3.7: Lift Cylinder Lock-Out Valve, Jam Nut, and Adjuster Bolt**

**ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER  
INSTALLED ROAD FRIENDLY TRANSPORT™)**

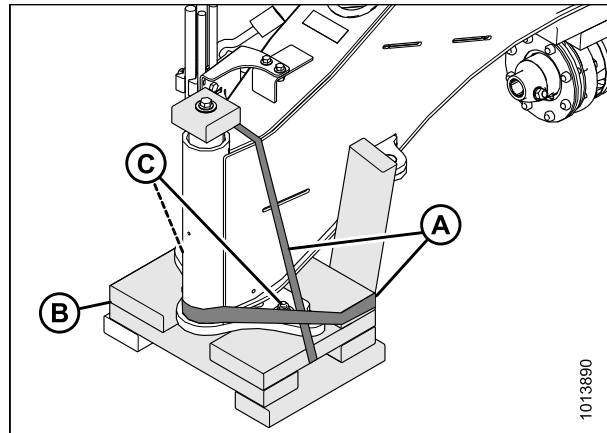
### 3.2 Attaching Hitch to Carrier

1. Remove M20 bolts (A) washers, and nuts from carrier at the hitch attachment location. Retain bolts washers, and nuts.



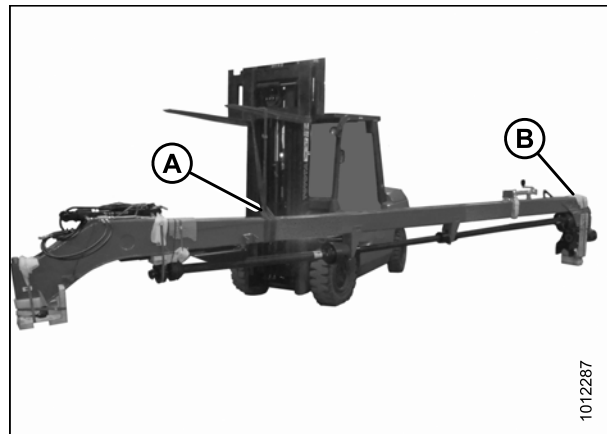
**Figure 3.8: Carrier**

2. Cut banding (A) securing wood supports, then remove supports (B).
3. Remove the two bolts securing wood support to hitch pin (C). Discard bolts.



**Figure 3.9: Hitch Packing**

4. Place sling (A) around the hitch frame. Adjust sling position until hitch is balanced when lifting.
  - R113: Approximately 106 in. (2700 mm) from the edge of the tractor end of the hitch (B)
  - R116: Approximately 138 in. (3500 mm) from the edge of the tractor end of the hitch (B)
5. Raise the hitch approximately 24 in. (610 mm) off the ground.



**Figure 3.10: Lifting Hitch**

## ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER INSTALLED ROAD FRIENDLY TRANSPORT™)

### NOTE:

Hitch pin (C) is heavy, support it appropriately before removing bolt (A).

- Support hitch pin (C), remove bolt (A) and wood block (B) from top of pin, and remove hitch pin (C).

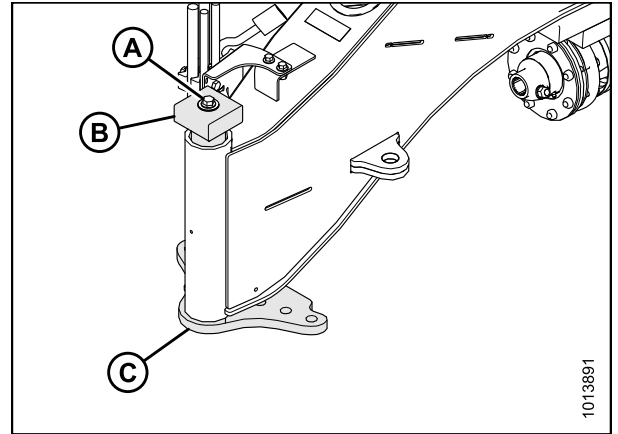


Figure 3.11: Hitch Packing

- Install hitch pin (A) fully into hitch.

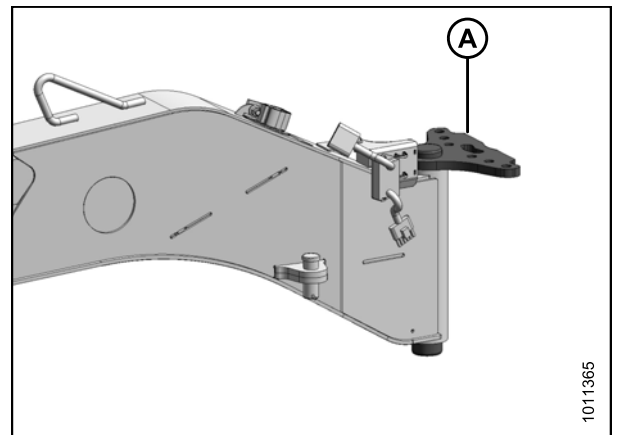


Figure 3.12: Hitch Pin

- Pivot the gearbox towards the right side of the header. This will increase the clearance to the driveline clutch, when installing hitch onto carrier frame.

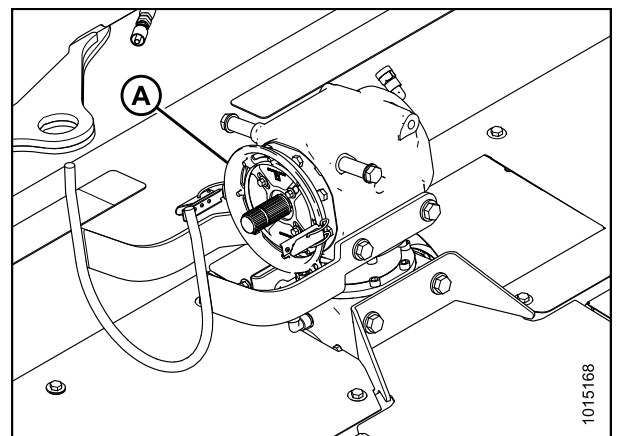


Figure 3.13: Driveline Shield

## ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER INSTALLED ROAD FRIENDLY TRANSPORT™)

9. Maneuver hitch pivot (C) into attachment location (D) on carrier and line up hitch pin with hole in carrier.

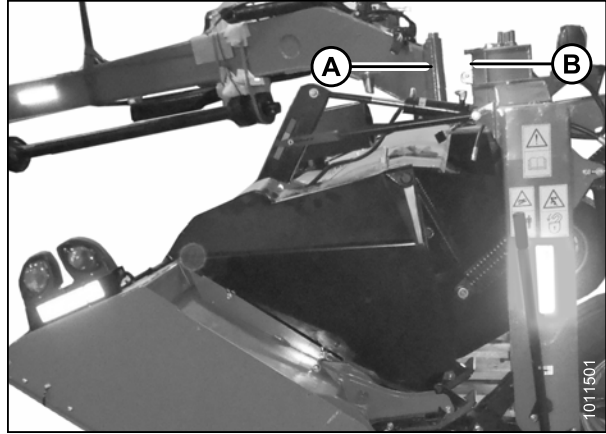


Figure 3.14: Hitch to Carrier

10. Slowly lower hitch while maintaining pin alignment until hitch pin is fully inserted. Use a large soft hammer if necessary to seat hitch pin.

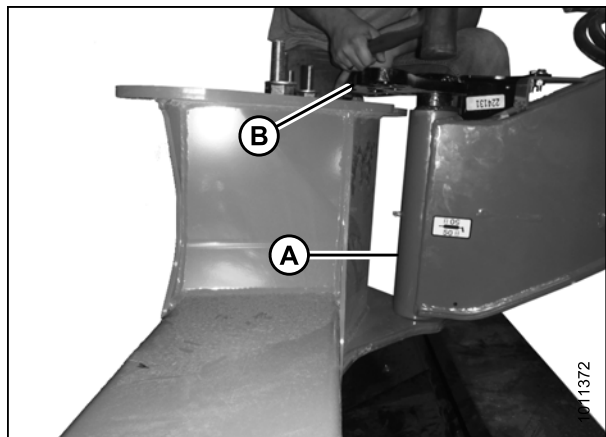


Figure 3.15: Hitch Pin

11. Line up holes in hitch pin (A) with holes in the carrier frame. Install six M20 x 65 bolts (B) with hardened washers under the bolt head and lock nuts (C).

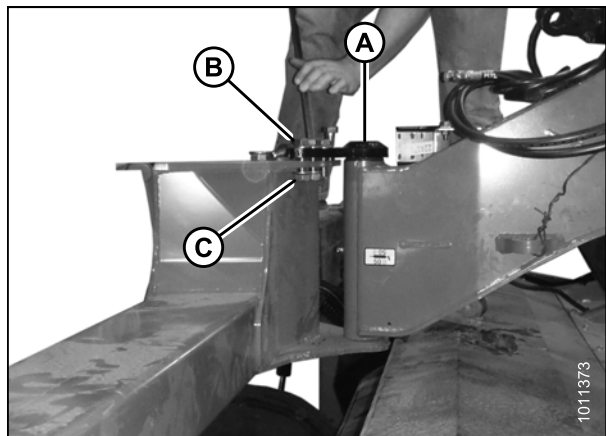
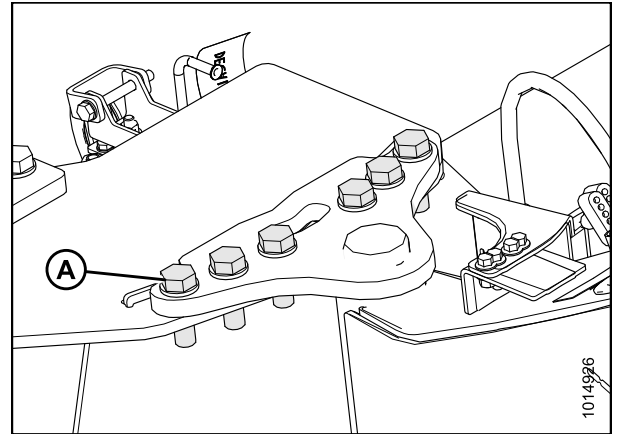


Figure 3.16: Hitch Pin

**ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER  
INSTALLED ROAD FRIENDLY TRANSPORT™)**

12. Tighten the outer bolts (A) first to draw the plate against the frame. Then tighten the inner bolts.
13. Torque bolts to 340 ft·lbf (461 N·m).



**Figure 3.17: Hitch Pin**

ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER  
INSTALLED ROAD FRIENDLY TRANSPORT™)

### 3.3 Installing Tractor Mating Hitch to Carrier Hitch

Depending on mower conditioner configuration, refer to the applicable installation procedure:

- [3.3.1 Installing Drawbar Hitch, page 16](#)
- [3.3.2 Installing Two-Point Hitch \(Cat. II\) Adapter, page 18](#)

#### 3.3.1 Installing Drawbar Hitch

If attaching the mower conditioner to a tractor with a drawbar hitch, proceed as follows. If attaching the mower conditioner to a tractor with a two-point hitch, refer to [3.3.2 Installing Two-Point Hitch \(Cat. II\) Adapter, page 18](#).

1. Remove shipping wire or banding (A) securing shipping blocks (B) at front of hitch, and remove blocks.

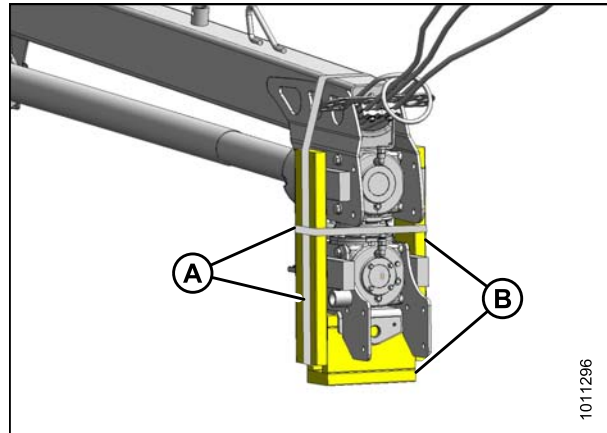


Figure 3.18: Hitch End Packing

2. Remove shipping wire (A) from jack (B) on drawbar hitch shipment, and remove jack from pallet.

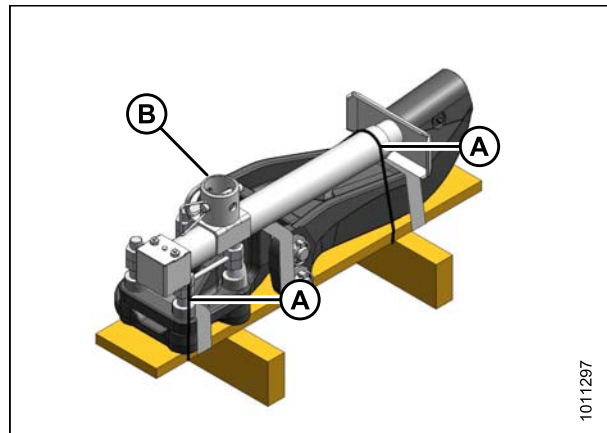


Figure 3.19: Jack Packing



## ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER INSTALLED ROAD FRIENDLY TRANSPORT™)

3. Install at jack (A) location at front of hitch, and secure with pin (B).
4. Swivel driveline and lower gearbox (C) so that driveline (D) is facing forward.
5. Lower forklift until hitch is resting on hitch jack (A).

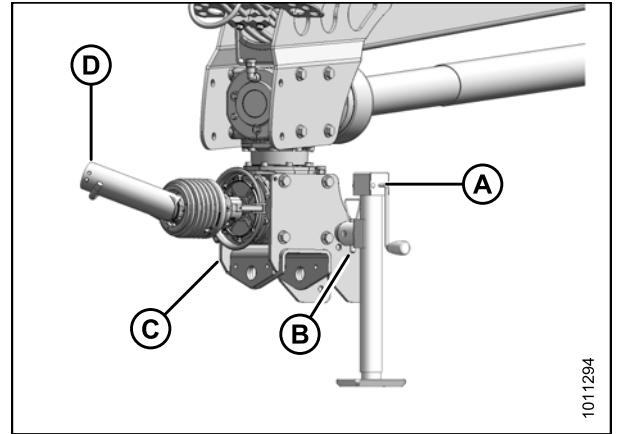


Figure 3.20: Hitch

6. Remove shipping wire (A) that secures pin (B) in casting. Do not remove other strapping.
7. Remove pin (B) from casting and remove bolt (C) and nut from pin.

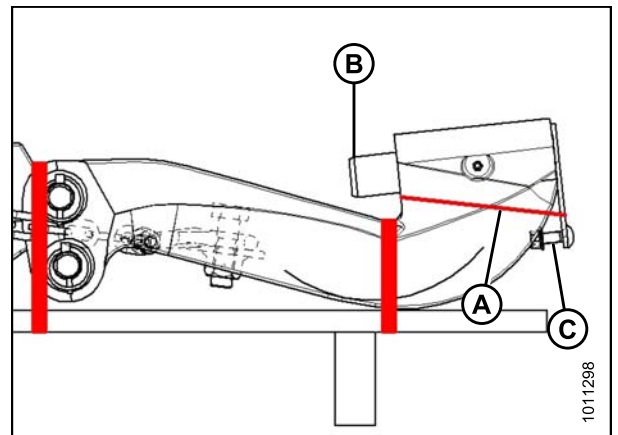


Figure 3.21: Hitch Casting

8. Using a floor jack or equivalent under pallet (A), raise hitch adapter (B) into position under the gearbox.
9. Maneuver hitch adapter (B) so that pin (C) can be installed to secure adapter to hitch.
10. Secure pin with bolt (D) and nut.
11. Remove floor jack and if necessary remove remaining strapping and pallet (A) from hitch adapter.

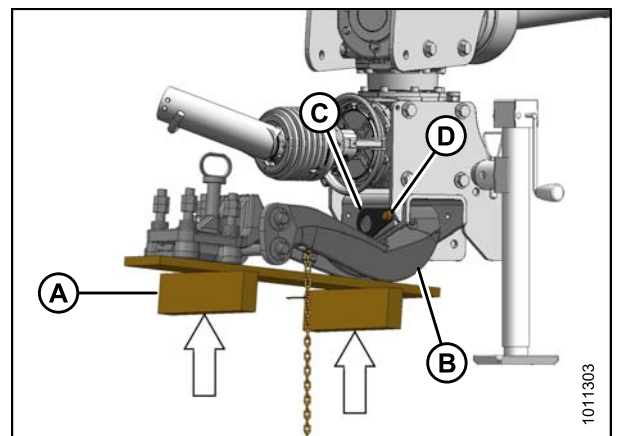


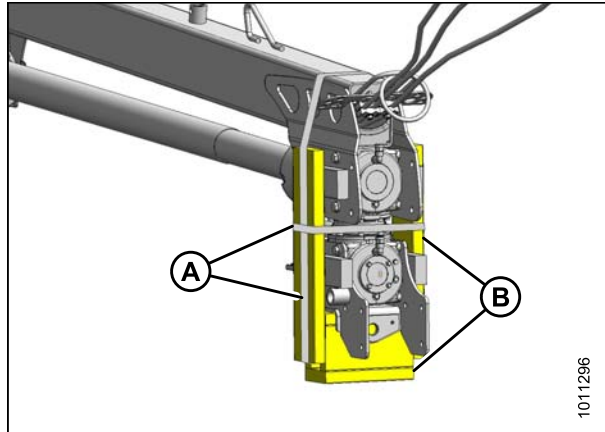
Figure 3.22: Drawbar Hitch

**ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER  
INSTALLED ROAD FRIENDLY TRANSPORT™)**

### 3.3.2 Installing Two-Point Hitch (Cat. II) Adapter

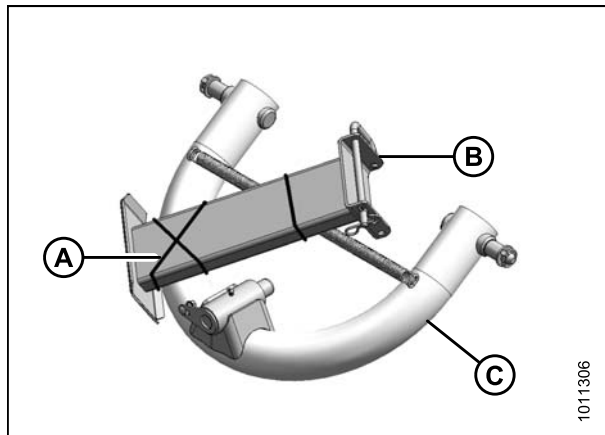
To set up the two-point hitch:

1. Remove shipping wire or banding (A) securing shipping blocks (B) at front of hitch, and remove blocks.
2. Swivel driveline and gearbox so that driveline is facing forward.



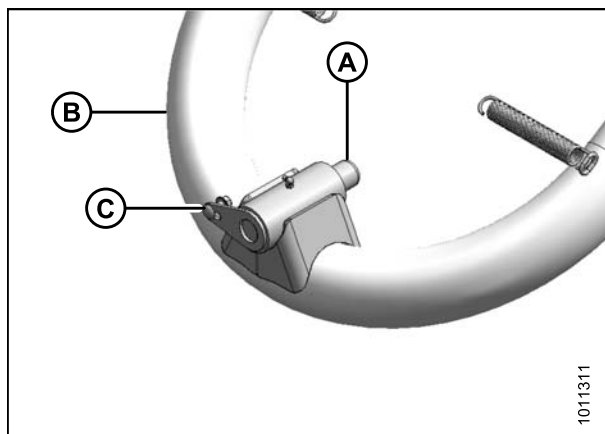
**Figure 3.23: Hitch Packing**

3. Retrieve two-point hitch adapter shipment.
4. Remove shipping wire (A) and material from stand (B) and remove stand from hitch adapter (C). Set aside for later installation.



**Figure 3.24: Two-Point Hitch Packing**

5. Remove strapping that secures pin (A) to adapter (B). Do not remove other strapping.
6. Remove pin (A) from adapter, and remove bolt (C) and nut from pin (A).



**Figure 3.25: Two-Point Hitch Adapter**

## ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER INSTALLED ROAD FRIENDLY TRANSPORT™)

- Using a floor jack or equivalent, raise two-point hitch adapter (A) into position under the gearbox.
- Maneuver adapter (A) so that pin (B) can be installed to secure adapter to hitch.
- Secure pin with bolt (C) and nut.
- Remove floor jack, and remove remaining strapping and pallet from hitch adapter.

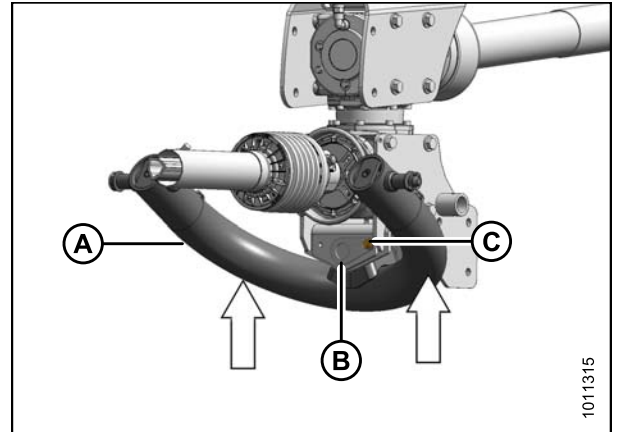


Figure 3.26: Two-Point Hitch Adapter

- Install springs (A) as shown.
- Assemble power take-off (PTO) driveline male half (B) onto female half on hitch gearbox. Push male half so that PTO shaft is at its fully compressed length.
- Locate driveline on hook (C).

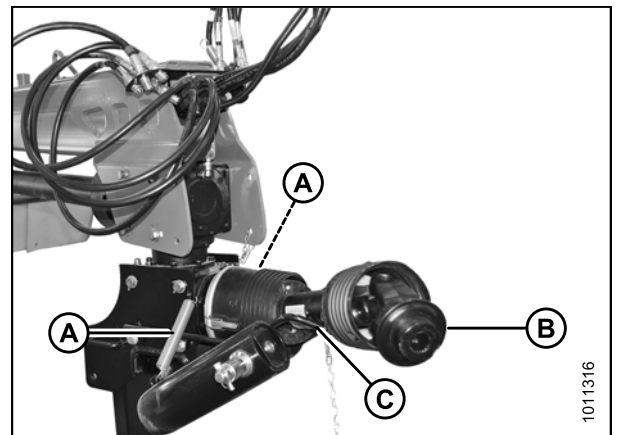


Figure 3.27: Driveline

- Retrieve stand (A).
- Position stand (A) under gearbox as shown, and install hitch pin (B) to secure stand.
- Install hairpins (C) to secure hitch pin (B).
- Lower hitch onto stand.

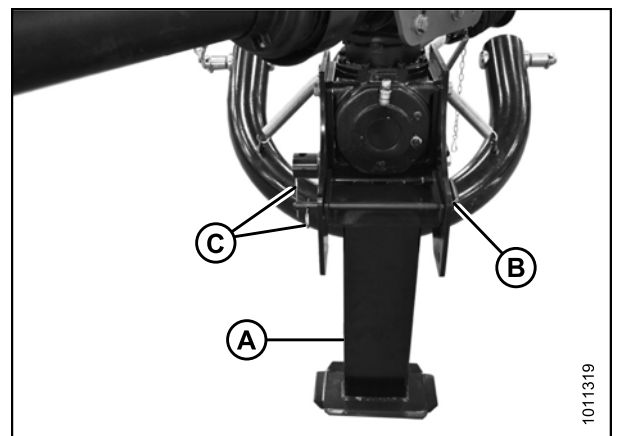


Figure 3.28: Stand

ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER  
INSTALLED ROAD FRIENDLY TRANSPORT™)

### 3.4 Installing Hitch Swing Cylinder

The hitch swing cylinder can be installed on either side of the hitch, depending on whether or not the Road Friendly Transport™ system will be installed. Be sure to follow the instructions carefully.

1. Remove the banding (A) securing the hitch swing cylinder (B) to the hitch.
2. Remove pin (C) securing cylinder (B) to hitch.

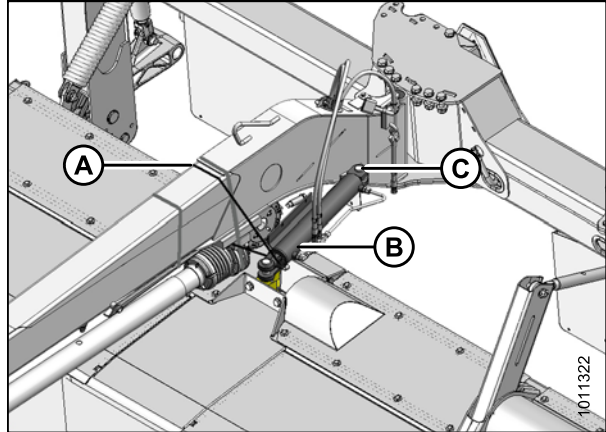


Figure 3.29: Steering Cylinder

To install cylinder on unit without the Road Friendly Transport™ system, proceed as follows:

3. Reposition cylinder (A) at left side of hitch and attach rod end to carrier frame lug with pin at (B). Secure with cotter pin (C).
4. Remove pin at (D) from clevis end.

**NOTE:**

Place a container or rag under cylinder to catch oil.

5. Swing the hitch until clevis lines up with lug on hitch.
6. Install clevis pin at (D) and secure with cotter pin (E).
7. Tighten fittings on cylinder.

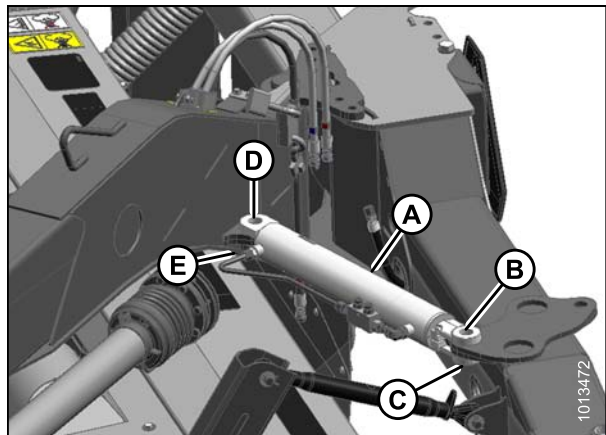


Figure 3.30: Hitch Swing Cylinder

**ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER  
INSTALLED ROAD FRIENDLY TRANSPORT™)**

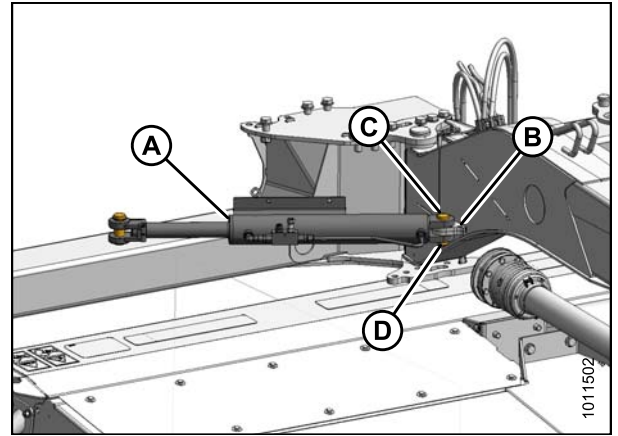
**To install cylinder on unit with the Road Friendly Transport™ system, proceed as follows:**

8. Disconnect the hoses at the cylinder and cap off openings on cylinder and hoses.
9. Reposition cylinder (A) at right side of hitch and attach barrel end to lug (B) on hitch with pin (C). Secure with cotter pin (D).

**NOTE:**

Clevis end of cylinder will be attached to Road Friendly Transport™ system casting when the system is primed. Refer to [3.11 Priming the Hitch Swing Cylinder, page 58](#).

10. Turn the valve on the hitch swing cylinder 180 degrees, so that fittings are pointing up.



**Figure 3.31: Hitch Swing Cylinder**

ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER  
INSTALLED ROAD FRIENDLY TRANSPORT™)

### 3.5 Attaching Aft Driveline

This procedure describes the attachment of the driveline to the header drive gearbox.

**IMPORTANT:**

If a conditioner swap is required before delivery to the customer, do **NOT** perform this step at this time. Skip to [3.10 Installing Field Wheels](#), page 56.

1. Support driveline and remove strapping (A) securing driveline (B) to hitch. Remove all packing material.

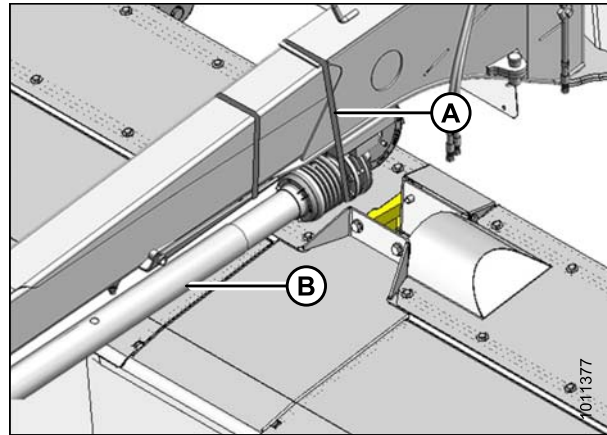


Figure 3.32: Driveline Strapping

2. Remove strapping (A) and packing material securing steering arm (B) to hitch. Pivot steering arm to the side for now.

**NOTE:**

Strapped contents maybe under pressure.

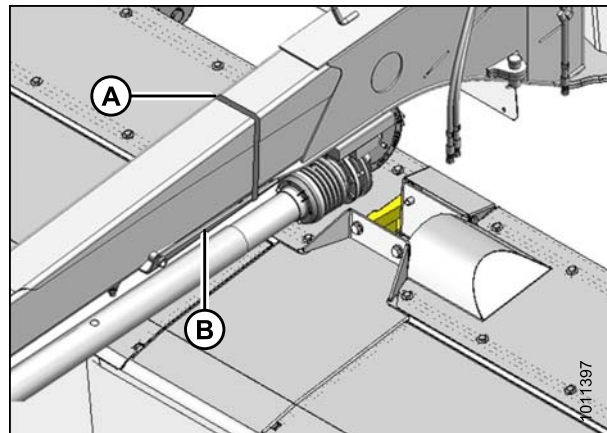


Figure 3.33: Steering Arm Strapping

3. Remove two bolts (A) with spacers (B) at top of aft gearbox. Retain hardware.
4. Undo latches (C) securing driveshield cone (D) to gearbox and remove cone. If necessary, use a screwdriver or equivalent to undo latches (C).
5. Rotate the gearbox until the input shaft is facing towards the driveline.

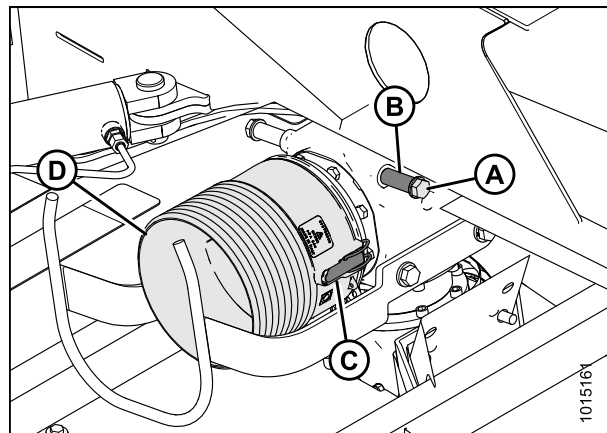


Figure 3.34: Driveline Shield

## ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER INSTALLED ROAD FRIENDLY TRANSPORT™)

- Slide cone (A) onto driveline with latches (B) towards the gearbox.
- Remove nut (C) and washer (E) from tapered pin (D), and tap out pin from yoke with a hammer.

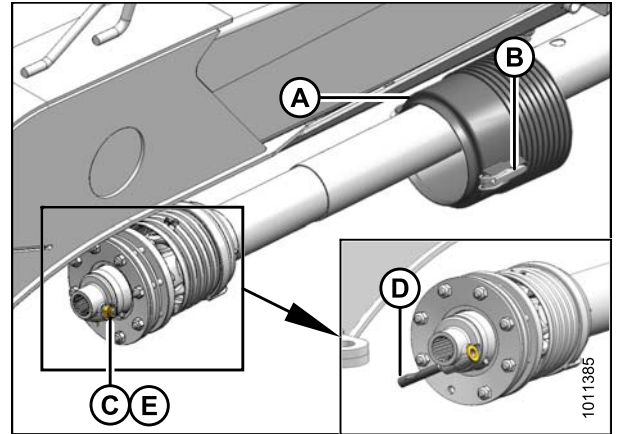


Figure 3.35: Clutch Driveline

- Attach driveline (A) to gearbox shaft.

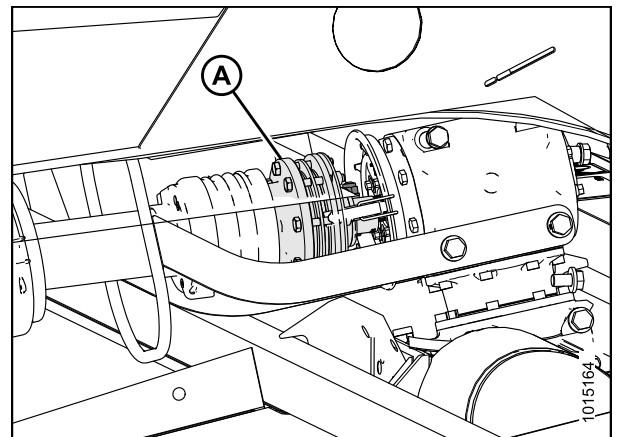


Figure 3.36: Clutch Driveline

- Insert tapered pin (A) by hand. Ensure the pin lines up with groove in yoke and is fully inserted. The notch in the pin should be facing toward the shaft.
- Clean the threads on pin (A) after it has been inserted.
- Install washer (B) and nut (C) on tapered pin and torque to 110 ft·lbf (149 N·m). The end of the pin must be recessed approximately 0-0.08 in. (0-2 mm) (D).

**NOTE:**

Do NOT use an impact wrench to install or torque the nut.

- Install the cone onto gearbox. Use the latches to secure it to the gearbox.

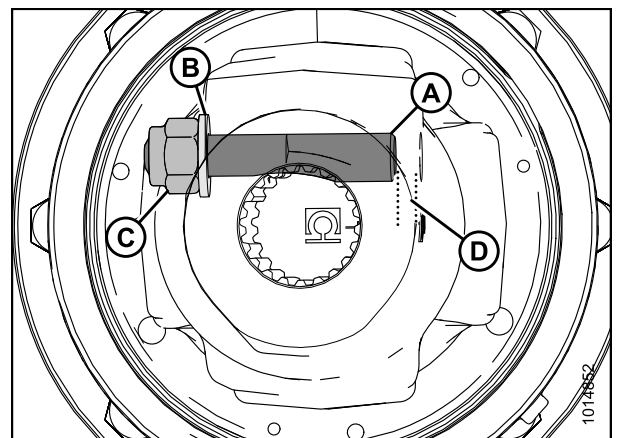


Figure 3.37: Clutch Driveline

ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER  
INSTALLED ROAD FRIENDLY TRANSPORT™)

### 3.6 Attaching Steering Arm

This procedure describes the attachment of the steering arm to the header drive gearbox.

**IMPORTANT:**

If a conditioner swap is required before delivery to the customer, do NOT perform this step at this time. Skip to [3.10 Installing Field Wheels](#), page 56.

1. Lower arm (A) from under the hitch and slide the arm weldment (B) off arm.
2. Apply grease to arm (A).
3. Slide the arm weldment (C) onto arm (A) in opposite orientation.
4. Position arm weldment (C) onto gearbox (D).

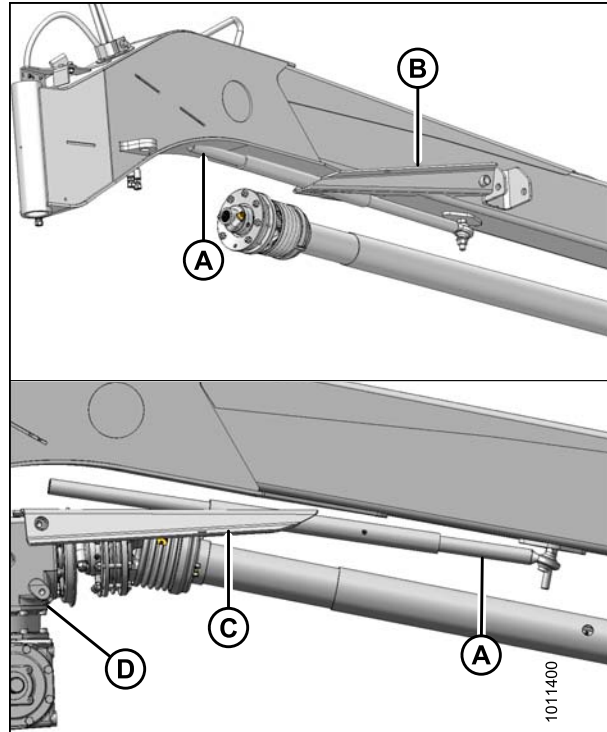


Figure 3.38: Steering Arm

5. Line up the two mounting holes in arm weldment with the forward threaded holes in the gearbox.
6. Install spacers (A) into arm weldment (B) and install M16 x 80 hex head bolts (C) with red Loctite® 262, and washers (D).
7. Torque bolts to 150 ft·lbf (203 N·m).

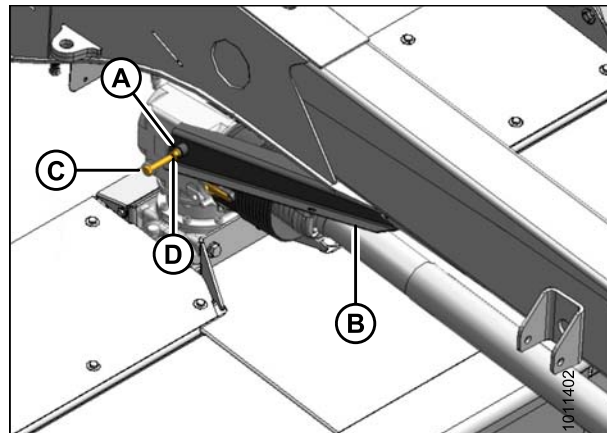


Figure 3.39: Steering Arm



**ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER  
INSTALLED ROAD FRIENDLY TRANSPORT™)**

8. Attach the safety chain (A) from driveshield cone to slotted hole in the arm weldment.



**Figure 3.40: Driveline Shield**

**ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER  
INSTALLED ROAD FRIENDLY TRANSPORT™)**

## 3.7 Installing Options

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

### 3.7.1 Installing Road Friendly Transport™ System

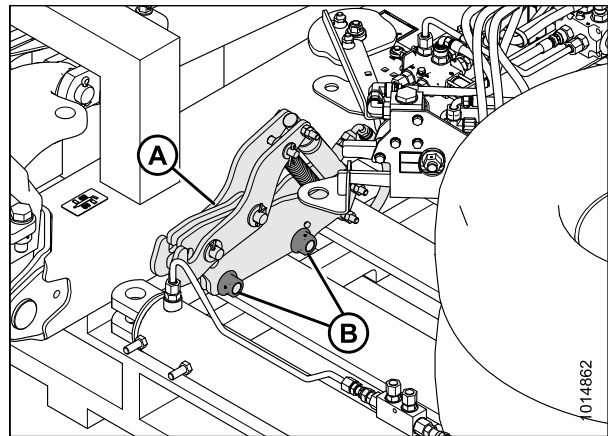
This section describes the installation of the Road Friendly Transport™ system. The basic components are installed first, then the hydraulic systems are connected, and the lighting and signage are installed last.

#### *Installing Components*

This section describes the installation of the basic parts of the Road Friendly Transport™ system.

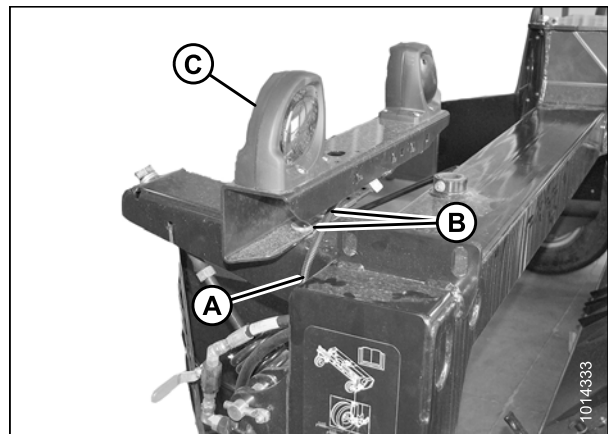
#### **Installing Latch Assembly**

1. Remove shipping banding and packing material from latch assembly (A) on transport pallet, and remove latch assembly.
2. Remove the two M20 mounting bolts (B) from the latch assembly.



**Figure 3.41: Latch Packing**

3. Disconnect right-hand electrical connection (A).
4. Remove the two bolts (B) that secure the right-hand light bracket (C) to the carrier frame.
5. Remove the light bracket (C). Retain light assembly and hardware for reinstallation at a later step.



**Figure 3.42: Light Bracket**

## ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER INSTALLED ROAD FRIENDLY TRANSPORT™)

6. Install latch assembly (A) onto carrier frame as shown and secure with the M20 bolts and nuts (B). Do not fully tighten bolts as it may be necessary to adjust position of latch assembly for proper operation.

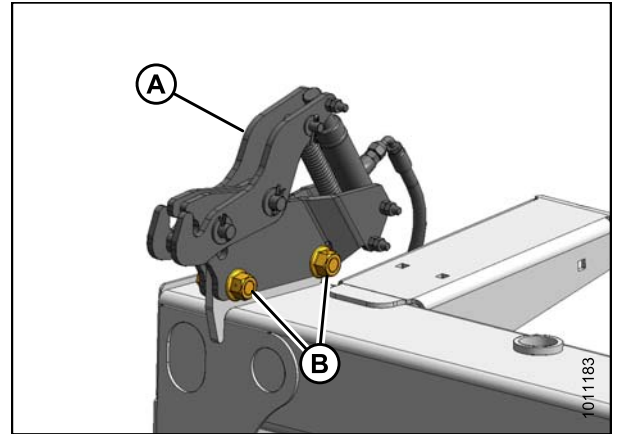


Figure 3.43: Latch Assembly

7. Ensure lift cylinder lock out valve (A) is closed.
8. Disconnect hose (B) from 45° fitting (C) at lift cylinder.
9. Remove plug and cap from tee (D) on hose (E).
10. Connect tee (D) to 45° fitting (C) and connect hose (B) to tee (D).
11. Tighten fittings.

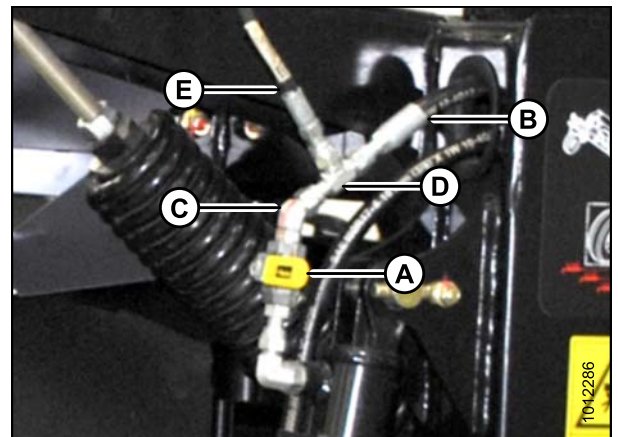


Figure 3.44: Latch Plumbing

12. Retrieve clevis pin (A) and cotter pin (B) from shipping bag and install onto hitch bracket at side of hitch.

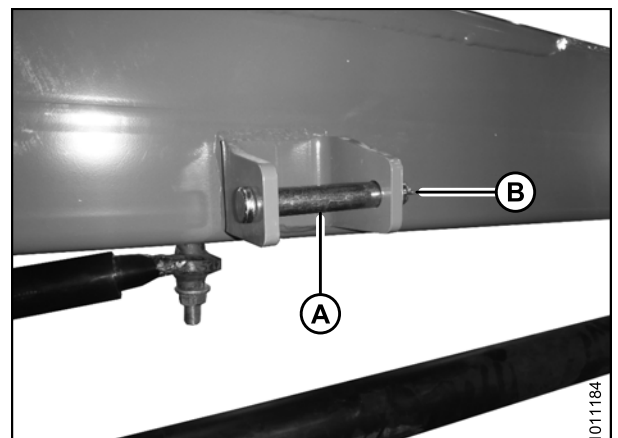


Figure 3.45: Latch Pin

## ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER INSTALLED ROAD FRIENDLY TRANSPORT™)

### Installing Transport Assembly

1. Remove bolt (A), hardened washer, and nut securing slow moving vehicle (SMV) sign (B) to carrier frame, and then remove sign. Retain sign and hardware for reinstallation.

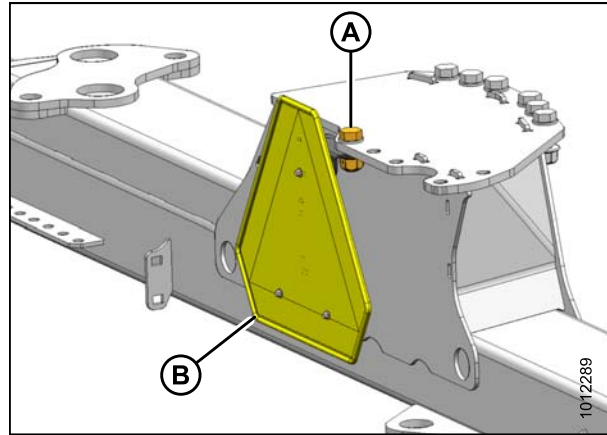


Figure 3.46: SMV Sign Attached to Carrier Frame

2. Remove transport wheels (A) from pallet.
3. Remove the five M20 hex head bolts (B) washers, and nuts in transport assembly pin (C). Do not remove pin.

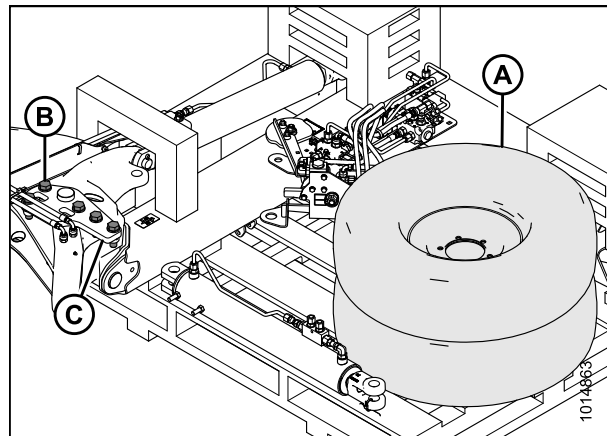


Figure 3.47: Transport Packing

4. Pick up pallet with transport assembly (A) using a forklift and approach the rear of the mower conditioner.
5. Position assembly up to frame and align pin (B) in transport assembly with hole (C) in carrier.
6. Maneuver assembly until pin can be inserted into hole. Use a soft hammer or equivalent to fully insert pin.

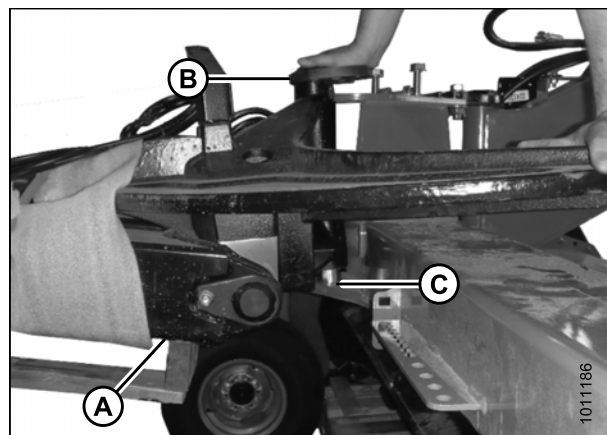


Figure 3.48: Road Friendly Transport™

## ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER INSTALLED ROAD FRIENDLY TRANSPORT™)

7. Install three M20 x 65 bolts (A), hardened washers, and nuts.
8. Install bolts (B) for alignment when torquing bolts (A).
9. Torque bolts (A) to 340 ft·lbf (461 N·m).
10. Remove bolts (B).

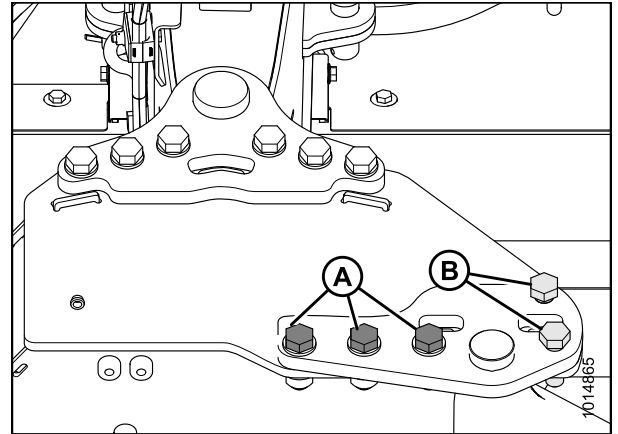


Figure 3.49: Road Friendly Transport™

### Installing Transport Valve

1. Retrieve valve assembly (A) from the pallet.
2. Position valve assembly (A) on the carrier hitch pin as shown.
3. Install two M20 x 65 bolts (B), hardened washers (C), and nuts.

**NOTE:**

Install bolts (C) with threads facing up before torquing bolts (B).

4. Torque bolts (B) to 340 ft·lbf (461 N·m).

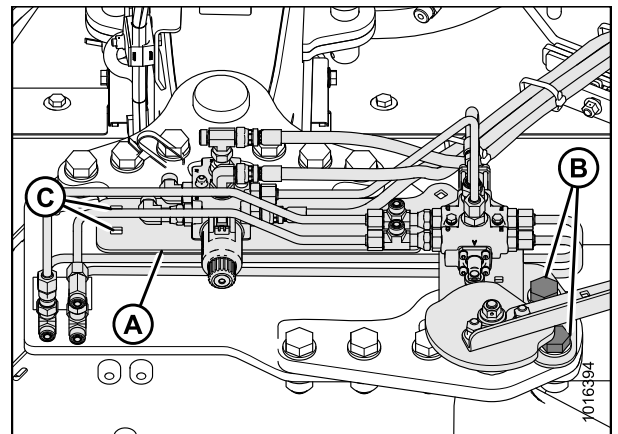


Figure 3.50: Selector Valve

5. Install support plate (A). Secure it with bolts (B).
6. Install bolts (C). Leave them loose at this point.

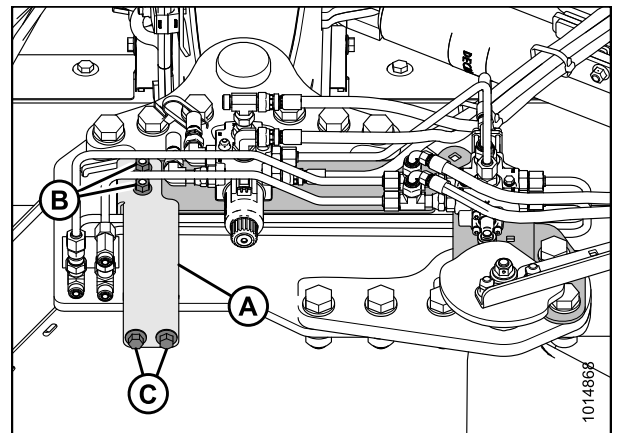


Figure 3.51: Support Plate

## ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER INSTALLED ROAD FRIENDLY TRANSPORT™)

7. Remove nut (A) from support (D).
8. Install bolt (B) through support (D) and support (C).  
Install nut (A).

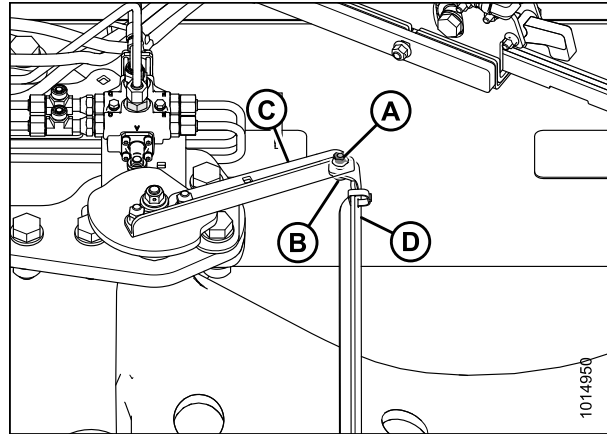


Figure 3.52: Support Plate

### Installing Transport Swing Cylinder

1. Remove shipping bag from pallet.
2. Retrieve clevis pin from shipping bag.
3. Support the transport swing cylinder (A). Cut straps securing the cylinder to the pallet.

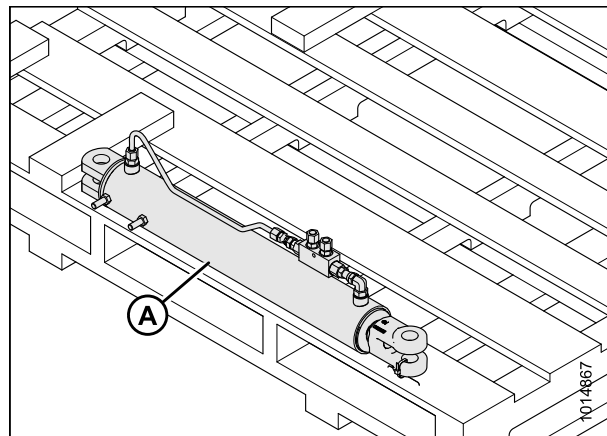


Figure 3.53: Swing Cylinder

#### IMPORTANT:

Transport swing cylinder (A) should be primed before installing it on the carrier frame.

4. Using a hydraulic power pack or tractor hydraulics, extend and retract the transport swing cylinder (A) until all the air has been removed.
5. Extend transport cylinder (A) to approximately 56 in. (1420 mm) between pins.

#### NOTE:

If cylinder length adjustment is required, remove the bolt (C) that secures the clevis end. Rotate the clevis to lengthen or shorten the distance between pins (B). Once correct measurement is achieved, reinstall bolt (C) to secure the clevis end.

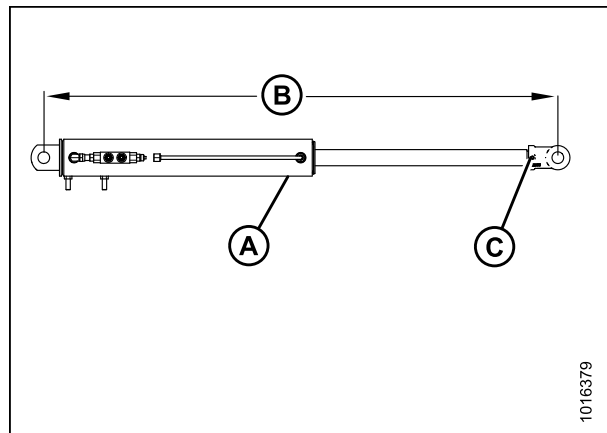


Figure 3.54: Transport Swing Cylinder

## ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER INSTALLED ROAD FRIENDLY TRANSPORT™)

6. Install barrel end of the transport swing cylinder (A) onto carrier frame with clevis pin (B). Secure clevis pin with cotter pin (C).

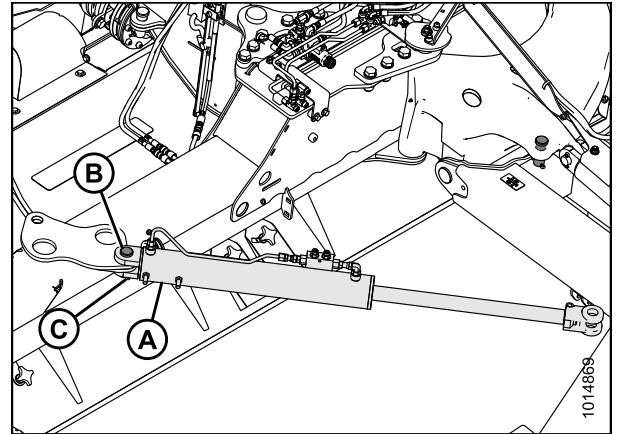


Figure 3.55: Transport Swing Cylinder

7. Connect clevis end (B) to transport casting. Align holes and install clevis pin (C). Secure with cotter pin (D).

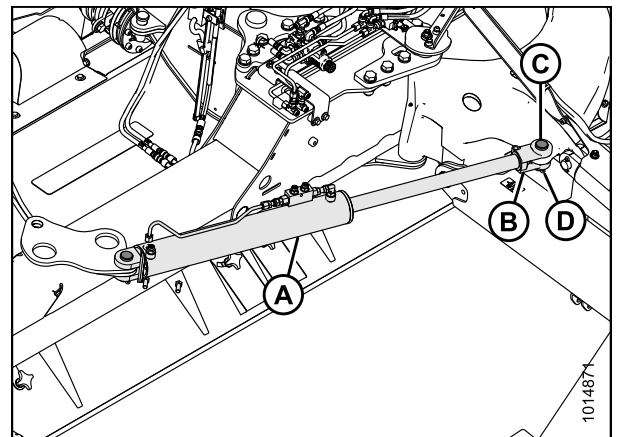


Figure 3.56: Swing Cylinder (Rear Left-Hand View)

### Installing Transport Wheels

1. Cut straps securing transport assembly to pallet.
2. Slowly lower forklift until transport assembly wheel spindles (A) are approximately 12 in. (305 mm) off the ground.
3. Remove wheel bolts (B) from the hub (A) on the left-hand side.

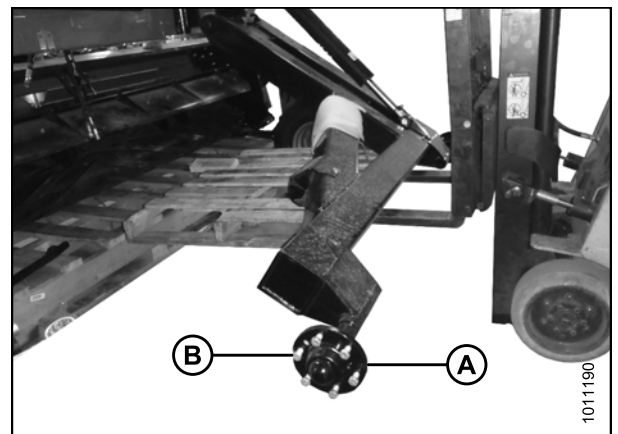


Figure 3.57: Transport Wheel

## ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER INSTALLED ROAD FRIENDLY TRANSPORT™)

4. Remove bolt (B) holding the axle assembly (A) in place.
5. Slide axle assembly (A) out of the support.

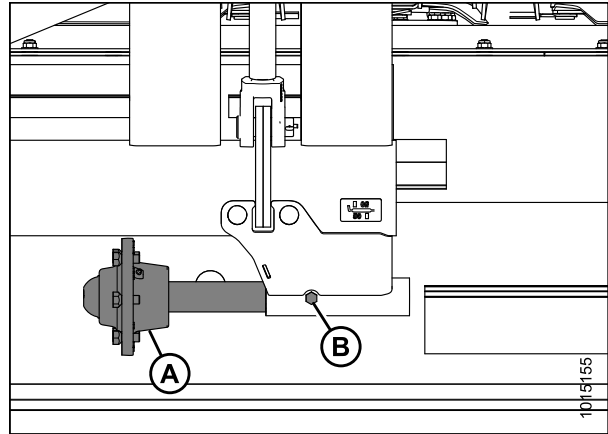


Figure 3.58: Axle Assembly Relocation

6. Install the axle assembly (A) into the support.
7. Install bolt (B) and nut to secure it. Torque to 50 ft.lbf (68 N m).
8. Remove wheel bolts from the hub (A).

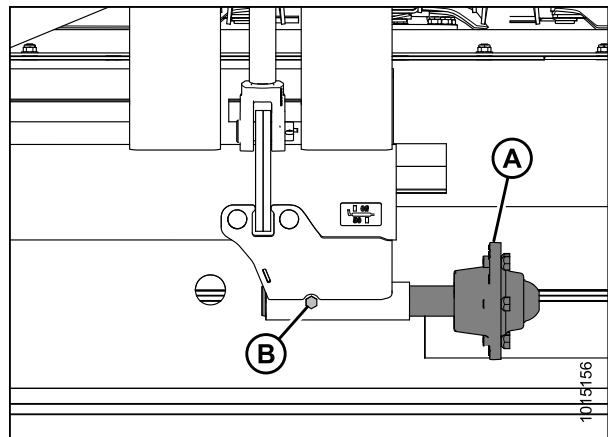


Figure 3.59: Axle Assembly Relocation

### CAUTION

When installing wheel, be sure to match countersunk holes with bolt head profiles. Holes that are not countersunk do NOT correctly seat the bolts.

9. Retrieve transport wheels and install wheels with wheel bolts. Ensure valve stem faces outboard. Do not fully tighten bolts.
10. Lower wheels to ground and back away forklift.
11. Torque wheel bolts to 120 ft-lbf (160 N·m) following the tightening sequence shown.

### NOTE:

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

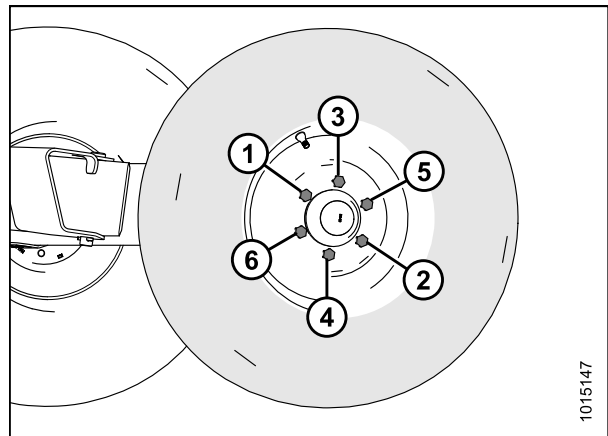


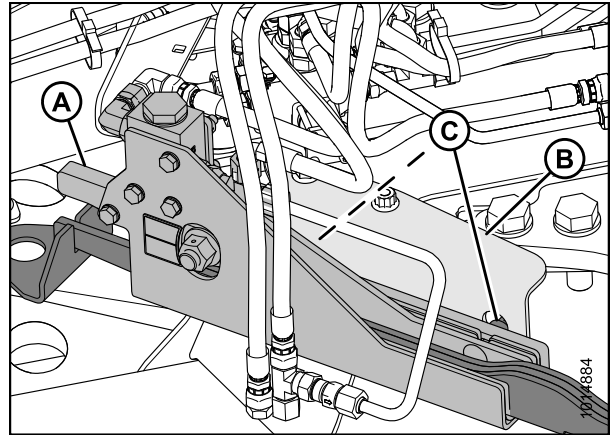
Figure 3.60: Tightening Sequence



## ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER INSTALLED ROAD FRIENDLY TRANSPORT™)

### Installing Transport Alignment Control

1. Remove the cam assembly (A), from the shipping support (B).
2. Remove nuts (C) from the cam assembly.

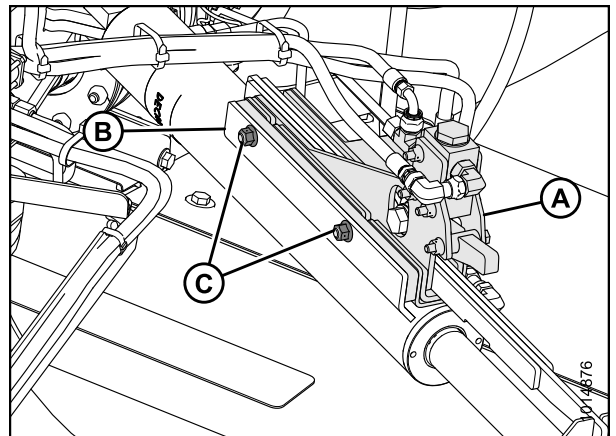


**Figure 3.61: Alignment Controls (Front Right-Hand View)**

3. Install the cam assembly (A) onto the hitch swing cylinder plate (B) with bolts using existing holes in plate. Install nuts (C) and torque to 40–45 ft-lbf (55–60 N m).

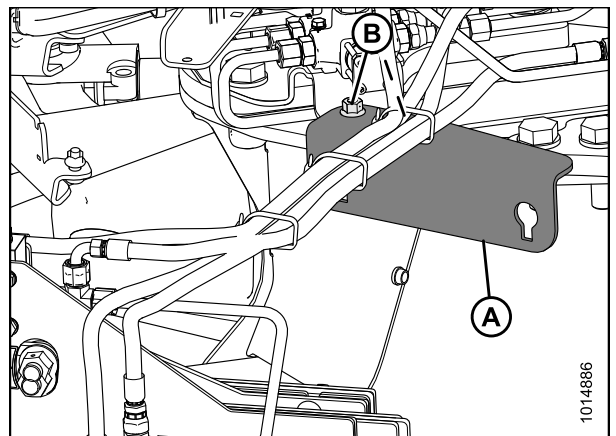
**NOTE:**

When installing the cam assembly (A), check for hose twisting. If required, loosen hose fitting to allow hose to untwist. Torque fitting once complete.



**Figure 3.62: Alignment Control (Rear Right-Hand View)**

4. Remove bolt (B), then remove the shipping support (A) and discard.



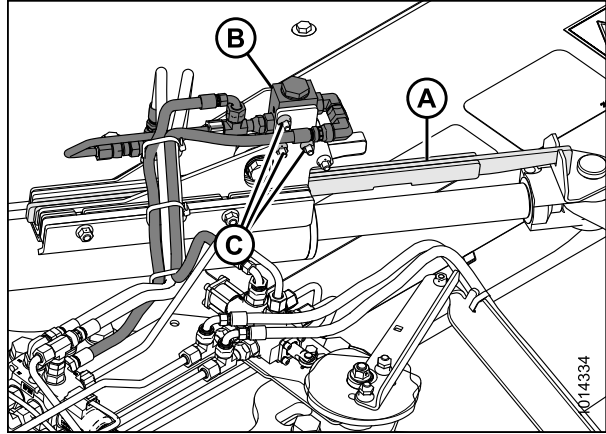
**Figure 3.63: Shipping Support (Front Right-Hand View)**

## ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER INSTALLED ROAD FRIENDLY TRANSPORT™)

5. Check the travel of the cam arm (A) by sliding it in and out of the cam assembly (B).

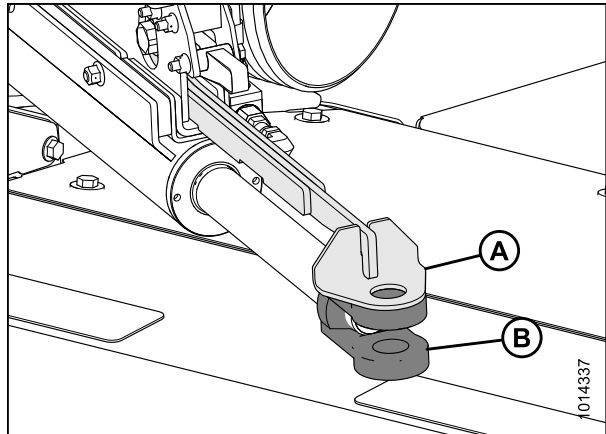
**NOTE:**

If the cam arm does not slide easily, loosen valve mounting bolts (C). Slide the valve (B) upwards the top of the mounting holes. Retighten valve mounting bolts (C).



**Figure 3.64: Alignment Control (Rear Right-Hand View)**

6. Align the hole in the cam arm (A) with the hole in the cylinder clevis (B).



**Figure 3.65: Alignment Control (Rear Right-Hand View)**

## ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER INSTALLED ROAD FRIENDLY TRANSPORT™)

7. Ensure the end of the cam arm (A) is parallel with the clevis end (B) of the cylinder. If adjustment is required, use a bar and turn the clevis until the clevis is parallel with the cam arm (A).

**NOTE:**

Clevis end of cylinder will be attached to Road Friendly Transport™ system casting when the system is primed. Refer to [3.11 Priming the Hitch Swing Cylinder, page 58](#).

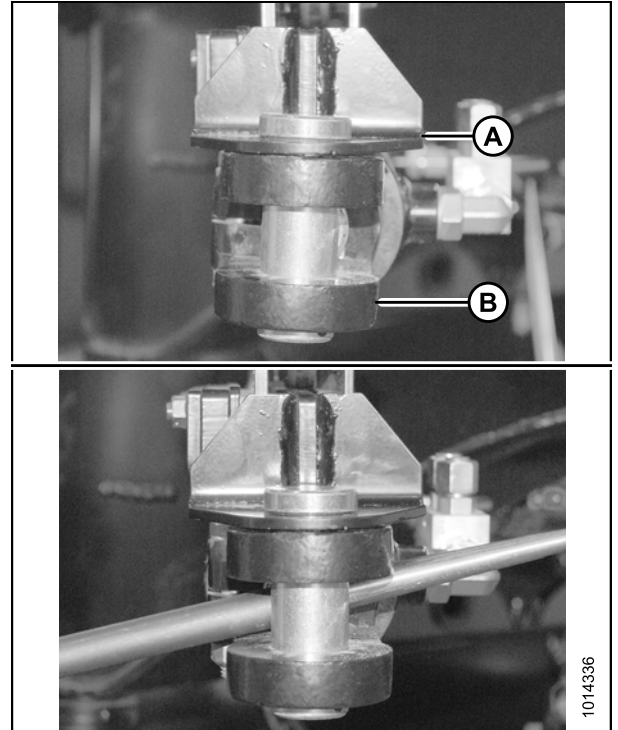


Figure 3.66: Cam Arm Alignment

8. Retrieve completion valve assembly (A) and one M12 x 25 flanged hex head bolt from shipping bag A.
9. Remove bolts (B) from the standoffs on rear of carrier. Install valve assembly (A) behind support plate (C). Secure it to the standoffs using the three M12 x 25 flanged hex head bolts (B).

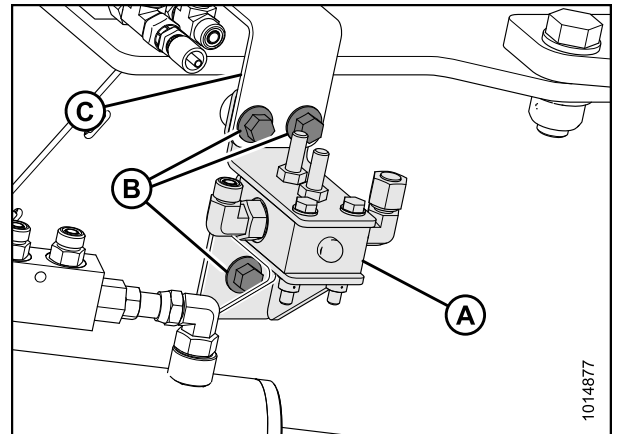


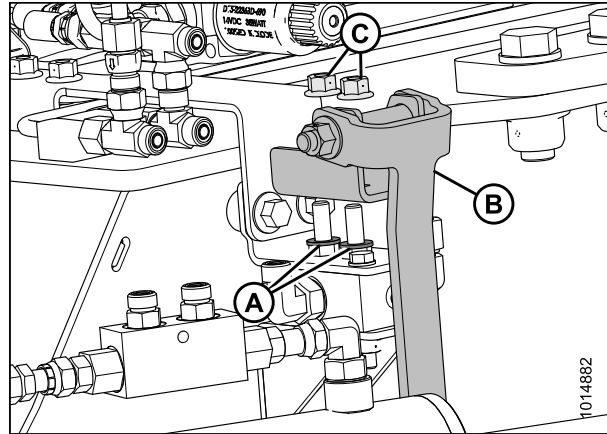
Figure 3.67: Control Valve

## ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER INSTALLED ROAD FRIENDLY TRANSPORT™)

10. Retrieve paddle assembly (B) from shipping bag.
11. Install washers (A) onto bolts welded to the completion valve assembly.
12. Install lever assembly onto the welded bolts, secure with nuts (C).

**NOTE:**

Make sure that paddle (B) is centered on the on the valve.



**Figure 3.68: Control Valve**

### *Installing Hydraulics*

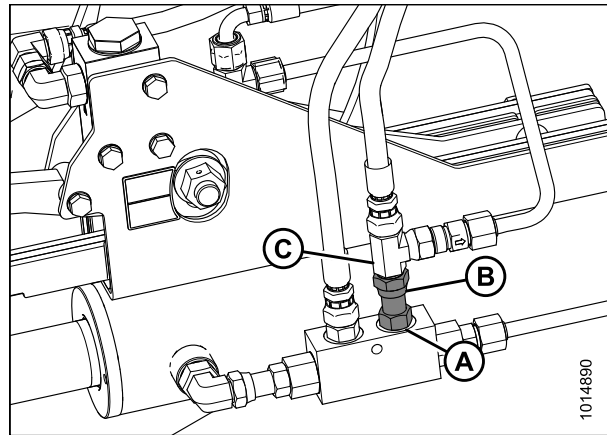
This section describes the installation of the transport hydraulic control system.

#### **Installing Hydraulic Lines and Hoses**

**NOTE:**

Refer to [10.2 Torque Specifications, page 206](#) for hydraulic fitting installation details.

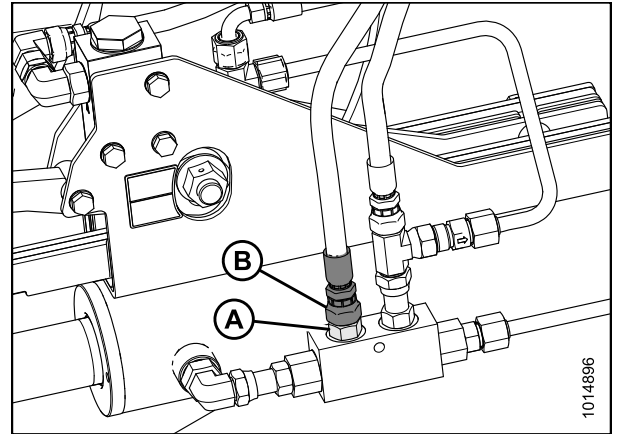
1. Retrieve steel lines and hoses from shipping bag.
2. Place a container or rag under fitting on hitch swing cylinder.
3. Remove existing fitting at location (A) from the block.
4. Remove cap from fitting (C).
5. Retrieve ORFS-6 x ORB-6 connector (B) from shipping bag A and install into location (A).



**Figure 3.69: Alignment Valve Fitting**

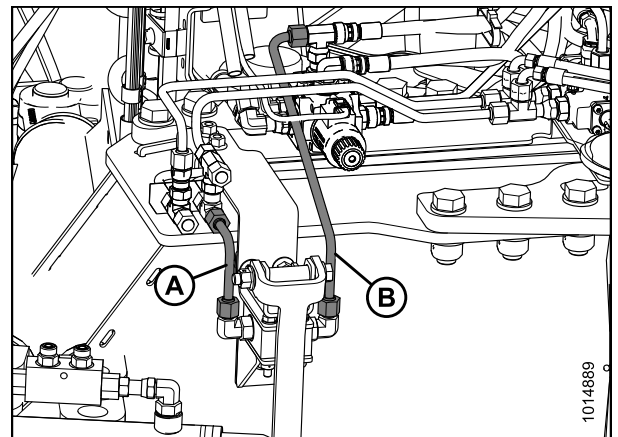
**ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER  
INSTALLED ROAD FRIENDLY TRANSPORT™)**

6. Remove cap from fitting (A).
7. Remove plug from hose (B). Install hose to fitting at location (A).



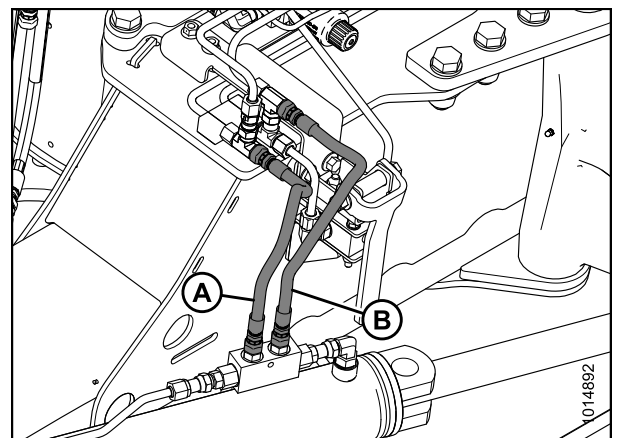
**Figure 3.70: Alignment Valve Fitting**

8. Install steel line (MD #246954) (A) from port A on the completion assembly to tee fitting.
9. Install steel line (MD #247335) (B) from port B on the completion assembly to tee fitting.



**Figure 3.71: Completion Assembly Plumbing**

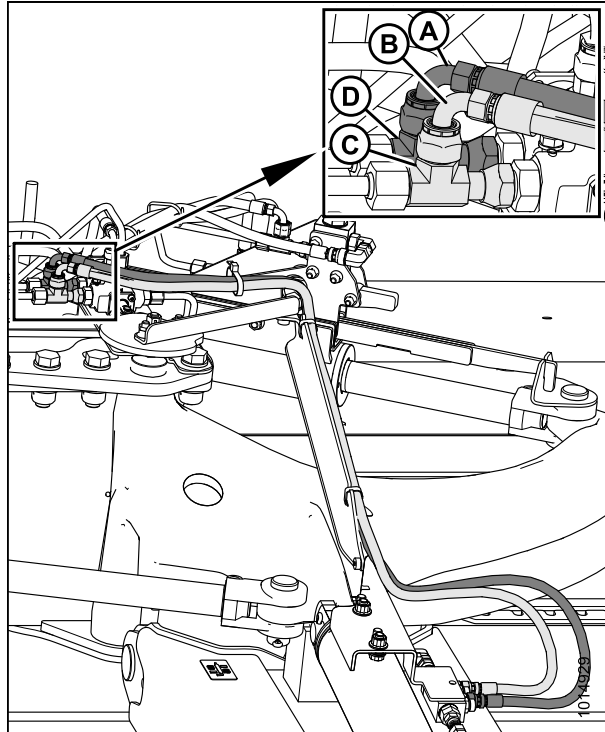
10. Install hose (A) to steel line connecting to port C of transport swing control.
11. Install hose (B) to steel line connecting to port D of transport swing control.
12. Use a cable tie and tie hoses (A) and (B) together.



**Figure 3.72: Transport Swing Cylinder**

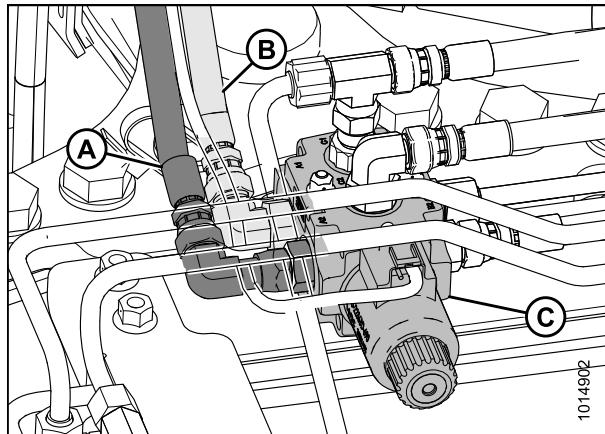
**ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER  
INSTALLED ROAD FRIENDLY TRANSPORT™)**

13. Install hose (A) from outer port (rod end) on transport cylinder block to tee fitting (D) in port D of transport swing control.
14. Install hose (B) from inner port (base end) on transport cylinder block to tee fitting (C) in port C of transport swing control.



**Figure 3.73: Transport Swing Control**

15. Connect hose (red collar #2) (B) to fitting in port A1 on selector valve (C).
16. Connect hose (blue collar #2) (A) to fitting in port A2 of the selector valve (C).
17. Use a cable tie and tie hoses (A) and (B) together.



**Figure 3.74: Selector Valve Supply**

## ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER INSTALLED ROAD FRIENDLY TRANSPORT™)

### Installing Secondary Lift Hose for Field Wheels

**NOTE:**

The secondary lift hose is required to lift the field wheels fully into storage position when the mower conditioner is in transport mode.

18. Retrieve the following secondary lift hoses from shipping bag according to your mower conditioner size:
  - **13-Foot headers:** Use hose MD #224160
  - **16-Foot headers:** Use hose MD #224162
19. Retrieve the blue collars with the number one (blue collar #1) on them from the shipping bag. Place one collar on both ends of the secondary lift hose (B).
20. Undo adjustable strap (A) around hoses at aft end of hitch.
21. Feed male orb end of hose (B) into access hole (C) at rear of hitch through hitch to opening at front.

**NOTE:**

If you are installing a hydraulic center-link (MD #B5760), install hydraulic hoses at this time.

**NOTE:**

There is a green wire pre installed in the hitch for pulling hoses through the hitch.

22. Position long hose (A) so that the exposed length at front of hitch matches existing hose (B). Route hose through guide (C).
23. At front of hitch, loosen nut (D) on hose clamp (E) until hose (A) can be positioned in clamp.
24. Tighten nut (D).

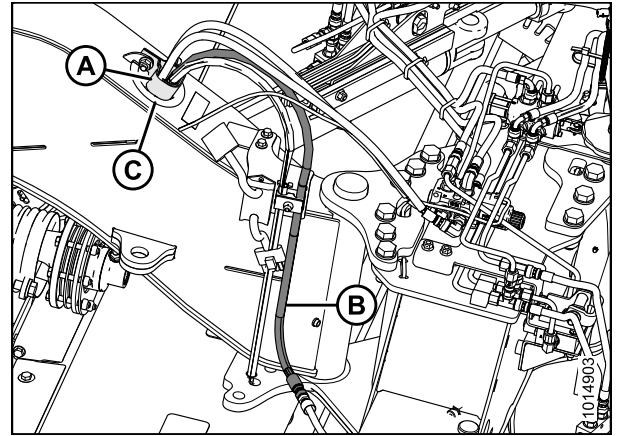


Figure 3.75: Lift Hoses

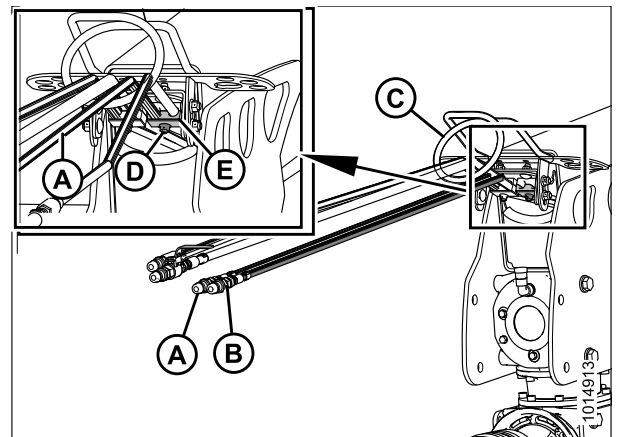
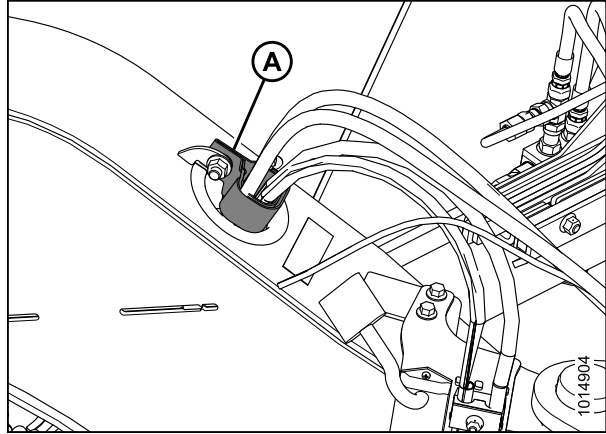


Figure 3.76: Lift Hoses

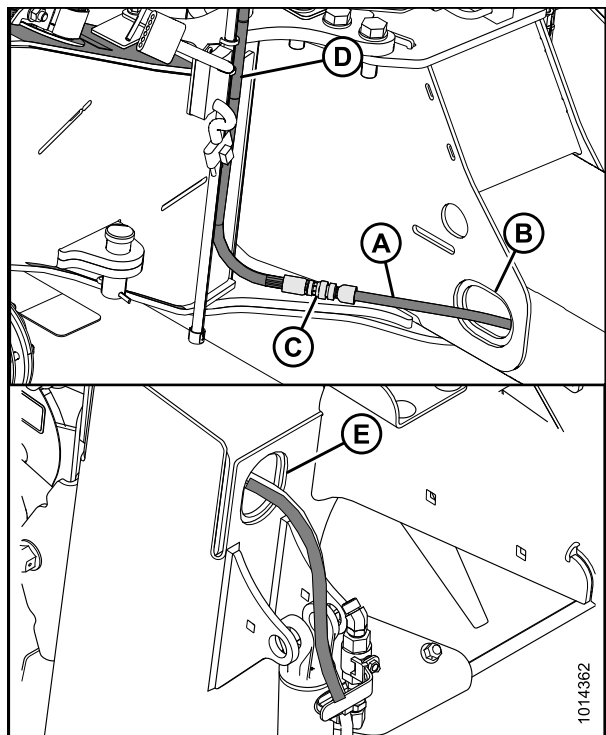
**ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER  
INSTALLED ROAD FRIENDLY TRANSPORT™)**

25. At rear of hitch, secure hoses with adjustable strap (A).



**Figure 3.77: Lift Hose**

26. Route hose (MD #247106) (A) through opening (E) at the rear of frame through opening B at the front of the frame.
27. Feed shortest hose (A) through opening (B) in carrier frame as shown with male end (C) at hitch pivot.
28. Connect hoses (MD #247106) (A) and (MD #224160 or MD #224162) (D) at the hitch pivot.



**Figure 3.78: Lift Hose**



## ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER INSTALLED ROAD FRIENDLY TRANSPORT™)

29. Retrieve ORFS-6 x ORB-8 elbow from hardware bag.
30. Remove plug at base of lift cylinder and install elbow (A) as shown.
31. Connect hose (B) to elbow and tighten.
32. Tighten remaining connections.
33. Secure hose to cylinder with cable tie (C).

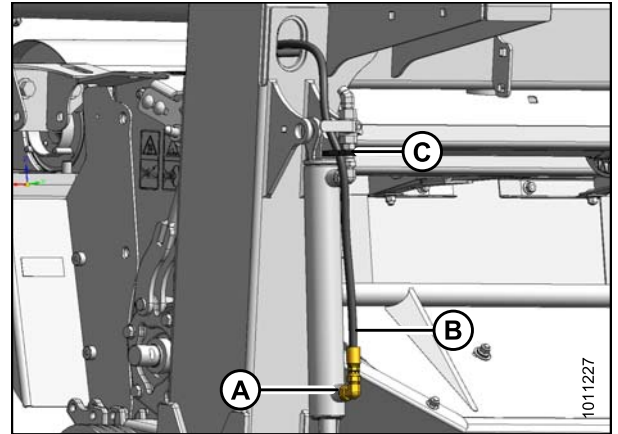


Figure 3.79: Lift Cylinder

34. Retrieve ORB-8 coupler (A) and plastic cap (B) from hardware bag.
35. At forward end of hitch, install coupling (A) and plastic cap (B) onto secondary lift hose (D). Do **NOT** attach hoses to tractor at this time.

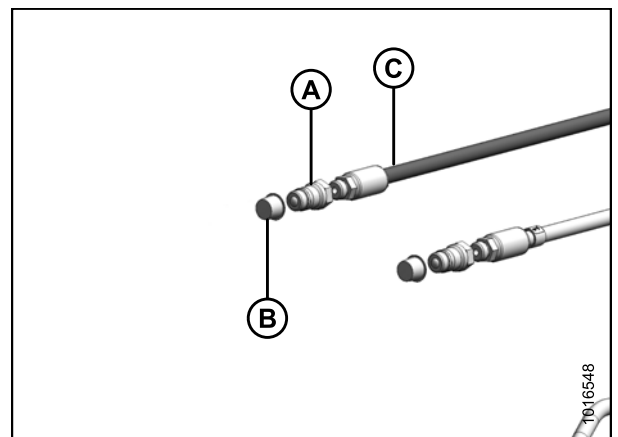


Figure 3.80: Lift Hose Fittings

### *Installing Electrical Components*

#### **Connecting Selector Valve**

1. Connect the selector valve harness (A) to the selector valve.

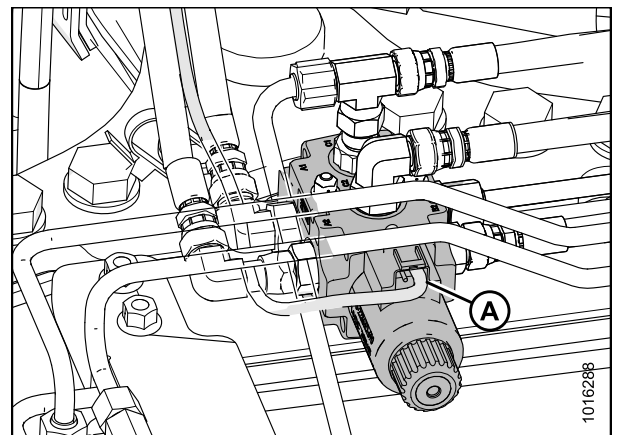


Figure 3.81: Selector Valve Supply

## ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER INSTALLED ROAD FRIENDLY TRANSPORT™)

### Installing Light Assemblies

1. Disconnect the wiring harnesses at the left-hand light assembly, there are two connectors per assembly.
2. Remove the left-hand side light assembly (A).

**NOTE:**

Right-hand side was removed in a earlier step.

3. Locate the right-hand light assembly that was removed earlier. Remove the red lamp (C) and install into pre-drilled holes next to amber lamp with existing hardware, as shown.
4. Install the right end light assembly (A) on left float spring mount with bolts (B) removed in Step 2., [page 42](#). The red (C) light should be towards rear of machine when in transport mode.

5. Retrieve new light bracket (C) from shipment.
6. Install amber lamp (A) and red lamp (B) onto new bracket (C) as shown with hardware provided.

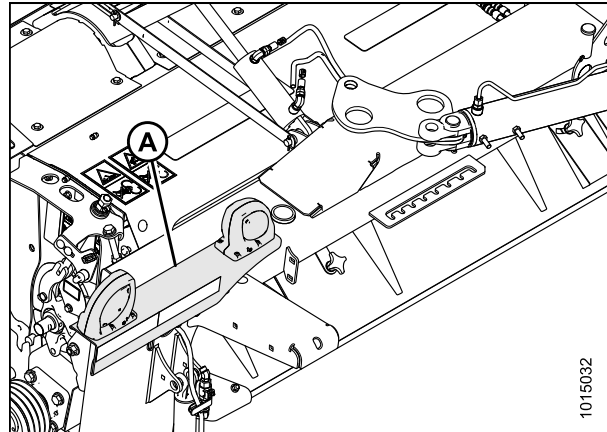


Figure 3.82: Transport Lighting

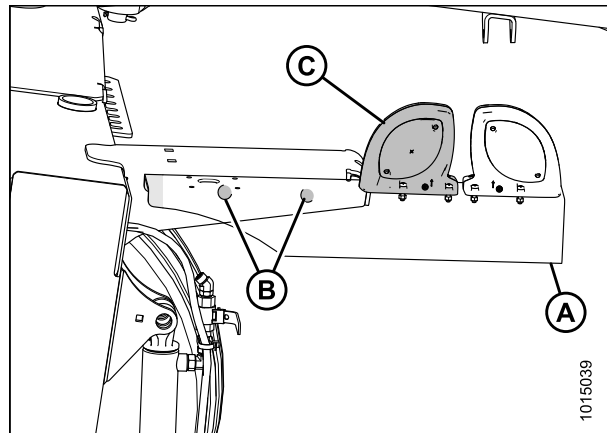


Figure 3.83: Left Side of Carrier

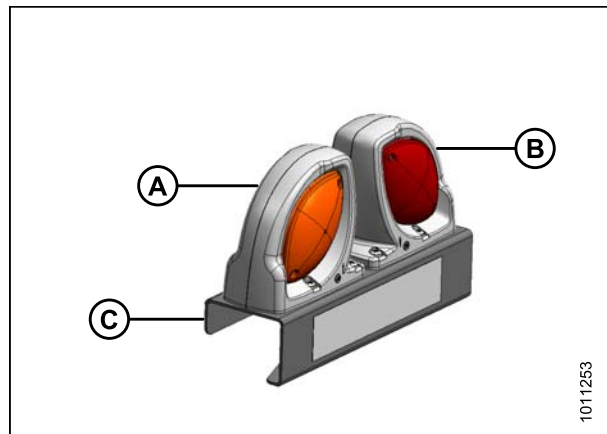


Figure 3.84: Light Assembly

## ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER INSTALLED ROAD FRIENDLY TRANSPORT™)

7. Install the light assembly (A) onto header left end with two M10 x 20 carriage bolts (B) and lock nuts from shipping bag (A). Ensure amber lamp is toward front of header and reflector faces outboard.

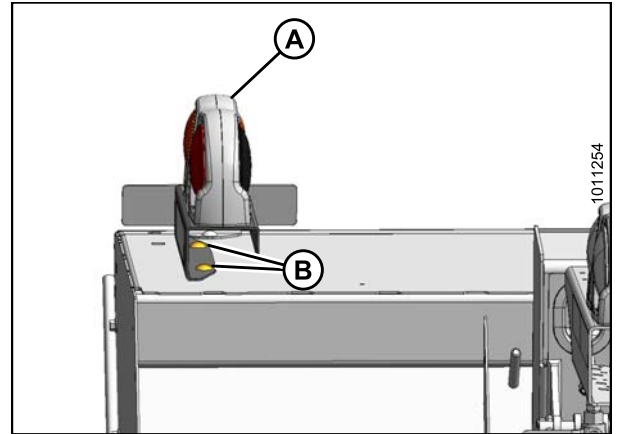


Figure 3.85: Header Left Side Lighting

### Installing Left-Hand Electrical Harness

1. Retrieve electrical harness (MD #247884) from shipping bag.

**NOTE:**

Check harness label before routing it through the carrier frame.

2. Use a draw tape or equivalent to route connectors P3 and P4 into opening (B) at front of carrier to opening (C) adjacent to center-link.
3. Pull harness (A) with connectors P3 and P4 until they reach the left-hand light assembly on the header.
4. Disconnect the carrier frame harness receptacle P1 from the transport lighting module (D).
5. Connect existing harness receptacle P1 to plug P2 on the new harness (MD #247884).
6. Place the existing harness into opening (B) at front of the carrier.
7. Connect the new harness (MD #247884) receptacle P1 to the transport lighting module (D).

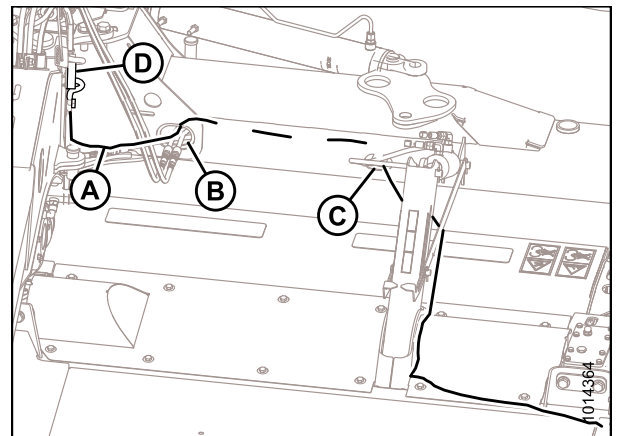


Figure 3.86: Harness Routing

## ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER INSTALLED ROAD FRIENDLY TRANSPORT™)

- Route harness (A) to light (B) on header as shown.
- Retrieve P-clips, plastic clamps, and cable ties from shipping bag.
- Remove bolts (C) on header at locations shown.
- Secure harness (A) with P-clips, existing bolts (C), and plastic clamp (D) into existing hole.

### NOTE:

Harness for 13-foot mower conditioner is secured with one plastic clamp (D).

### NOTE:

Harness for 16-foot mower conditioner is secured with two plastic clamps (D).

- Secure harness (A) to light bracket with two cable ties (E).
- Push excess harness into carrier frame.
- Connect plug P3 and P4 into the light (B).

### Connecting Right-Hand Electrical Harness

- Route harness (A) from opening into light bracket (B) and plug into light connectors.
- Secure harness (A) to light bracket with two cable ties (C).
- Push excess harness into carrier frame.

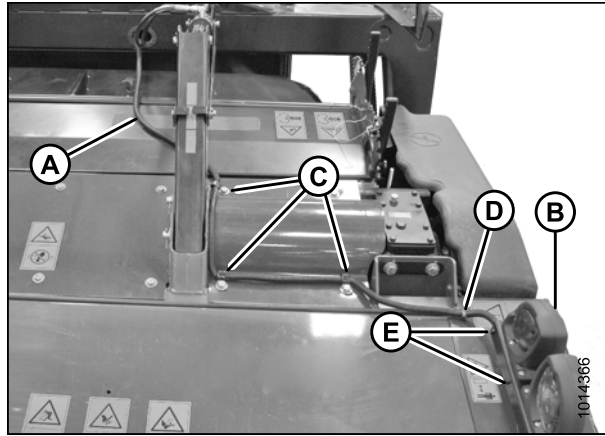


Figure 3.87: Harness Routing

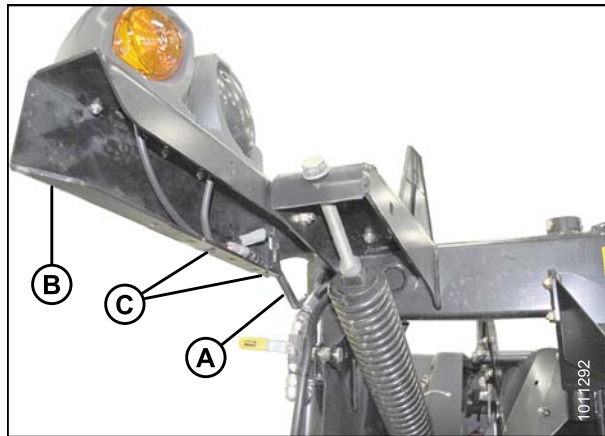


Figure 3.88: Transport Light

## ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER INSTALLED ROAD FRIENDLY TRANSPORT™)

### Installing Remote Control

1. Retrieve remote control (A) with wiring harness.
2. Place remote control (A) on hitch temporarily.

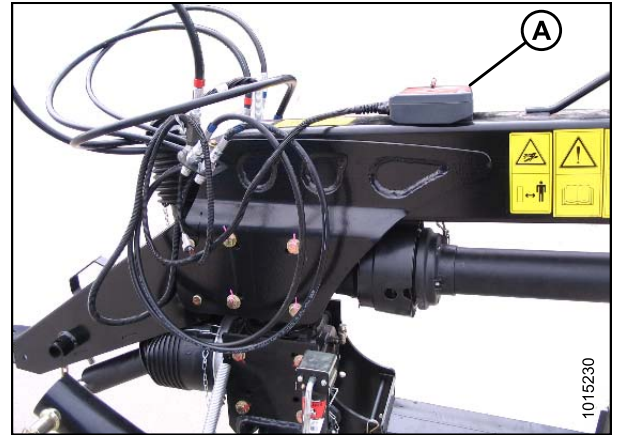


Figure 3.89: Remote Control on Top of Hitch

3. Locate the connector (C) that branches off the seven pole trailer plug (A) and attach it to the remote wiring harness (B).

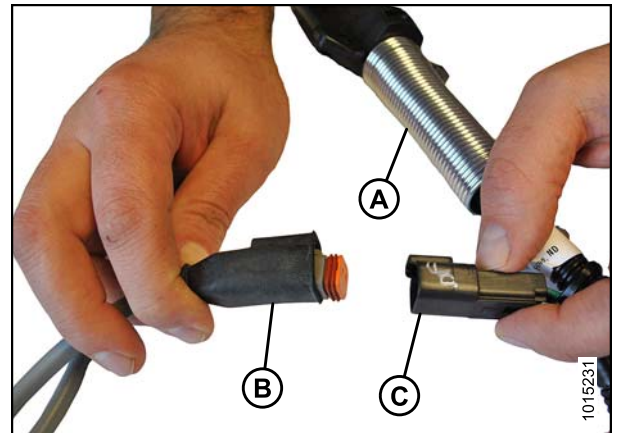


Figure 3.90: Transport Harness

## ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER INSTALLED ROAD FRIENDLY TRANSPORT™)

4. Connect the remote control power wire (B) to the tractor's power supply, then place it in the cab of the tractor.
  - Connect wire (C) with no tag to tractor ground.
  - Connect wire (D) with the red tag to tractor power.

### NOTE:

If the red tag is missing, identify the power by locating the wire with the number one printed on it. The ground wire has a number two printed on it.

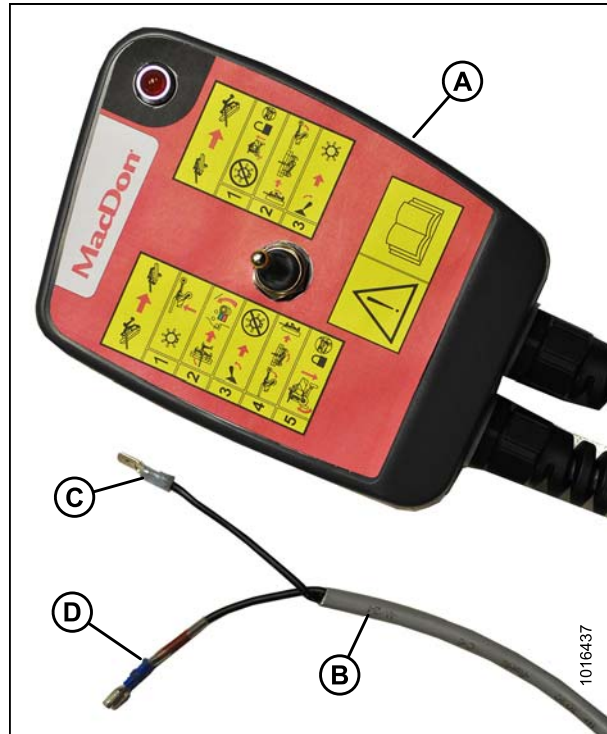


Figure 3.91: Remote Control

### Installing Slow Moving Vehicle (SMV) Sign

1. Retrieve SMV sign that was previously removed.
2. Remove existing bracket (A) from SMV sign and discard.

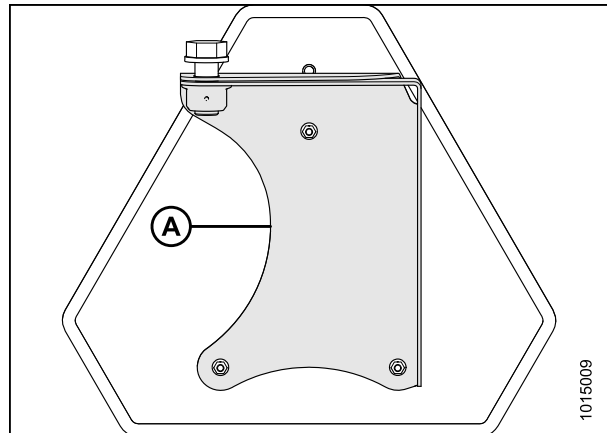


Figure 3.92: SMV Sign

## ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER INSTALLED ROAD FRIENDLY TRANSPORT™)

3. Retrieve new bracket (A), two M12 x 30 bolts and M12 nuts from shipment bag.
4. Attach bracket (A) to left end float spring member with M12 bolts (B) and nuts.
5. Attach sign (C) to bracket and secure with three M6 lock nuts (D) provided in shipment bag.

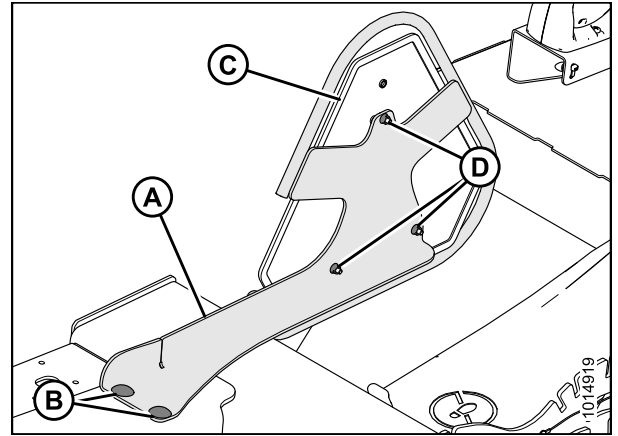


Figure 3.93: SMV Sign

### 3.7.2 Installing Hydraulic Center-Link

The hydraulic center-link kit is supplied in a separate shipment. Refer to instructions supplied with the kit for installation procedure.

### 3.7.3 Installing Tall Crop Divider

**IMPORTANT:**

If header will be transported on public roads in the Road Friendly Transport™ mode, do not install the tall crop dividers. Install the dividers after the machine is delivered to the customer.

## 3.8 Setting up the Tractor

### 3.8.1 Adjusting the Drawbar

#### CAUTION

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

1. Adjust tractor drawbar to meet the specifications listed in Table 3.1 ASAE Standard A482 Specifications, page 48.
2. Secure the tractor drawbar so the hitch pin hole is directly below the driveline.

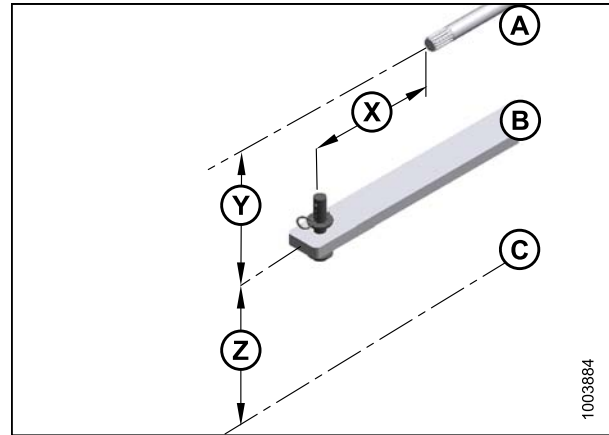


Figure 3.94: Tractor Drawbar Adjustments

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

Table 3.1 ASAE Standard A482 Specifications

Dimension	1000 rpm Power Take-Off	
	1-3/8 in. Diameter	1-3/4 in. Diameter
X	16 in. (406 mm)	20 in. (508 mm)
Y	7-7/8–13-3/4 in. (200–350 mm) 8 in. (203 mm) recommended	
Z	13–17 in. (330–432 mm) 16 in. (406 mm) recommended	

### 3.8.2 Installing Drawbar Hitch Adapter

#### CAUTION

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

1. Remove hairpin (A) and pin (B).
2. If necessary, loosen four jam nuts (C), and then loosen four nuts (D) so that hitch adapter (E) will slide onto tractor drawbar (F).
3. Align hole in adapter (E) with hole in drawbar (F) and install pin (B). Secure with hairpin (A).
4. Gradually tighten the four nuts (D) to 400 ft-lbf (540 N·m).

**NOTE:**

Ensure hardened washers, and Class 10 nuts supplied with adapter are used.

5. Tighten four jam nuts (C).

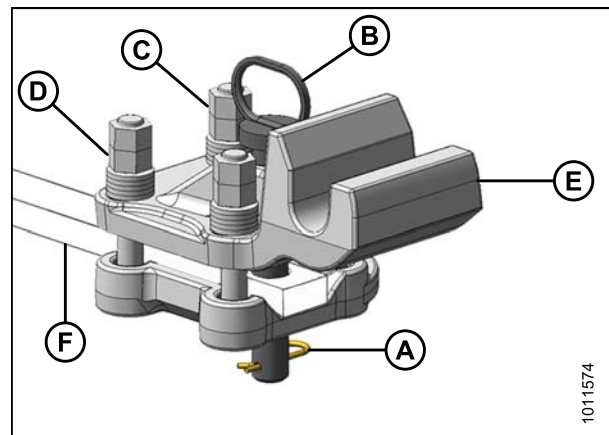


Figure 3.95: Drawbar Hitch Adapter



## 3.9 Attaching Mower Conditioner to the Tractor

Depending on tractor configuration, refer to the applicable attaching procedure:

- [3.9.1 Attaching with Drawbar Hitch, page 49](#)
- [3.9.2 Attaching with Two-Point Hitch, page 51](#)

### 3.9.1 Attaching with Drawbar Hitch

#### CAUTION

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

1. Remove lynch pin (A) from clevis pin (B), and remove clevis pin from mower conditioner hitch.

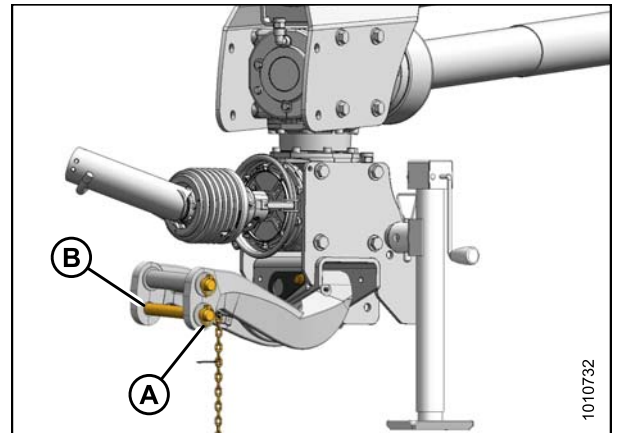


Figure 3.96: Mower Conditioner Hitch

2. Move tractor to position drawbar hitch adapter (A) under pin (B) in mower conditioner hitch. Adjust height as necessary with jack (C).
3. Shut down tractor and remove key from ignition.

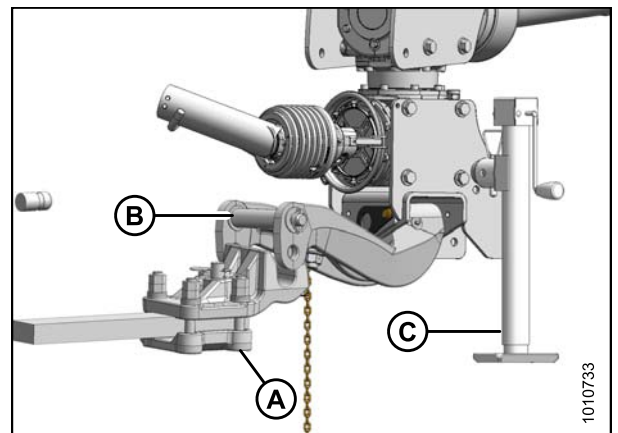


Figure 3.97: Mower Conditioner Hitch

## ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER INSTALLED ROAD FRIENDLY TRANSPORT™)

4. Lower hitch with jack (A) so that pin (B) engages drawbar hitch adapter (C).
5. Install clevis pin (D) and secure with lynch pin (E).

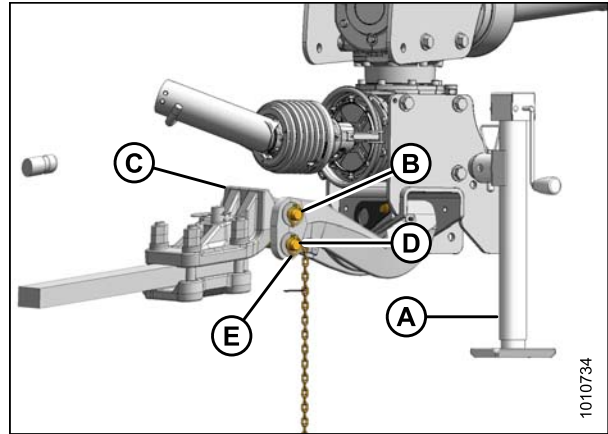


Figure 3.98: Mower Conditioner Hitch

6. Position driveline (A) onto tractor power take-off (PTO).
7. Pull back collar (B) on driveline (A), and push driveline until it locks. Release collar.
8. Route safety chain (C) from mower conditioner through chain support (D) on drawbar hitch adapter and around tractor drawbar support. Lock hook on chain.

**NOTE:**

If the tractor has a three-point hitch, lift the links as far as possible to prevent damage to the hitch.

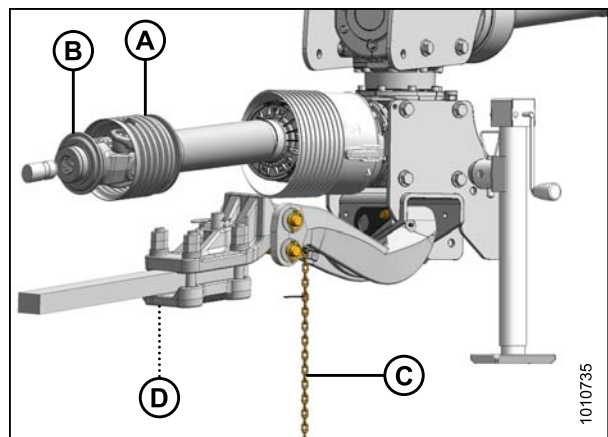


Figure 3.99: PTO Driveline

9. Raise jack (A), and remove pin (B).

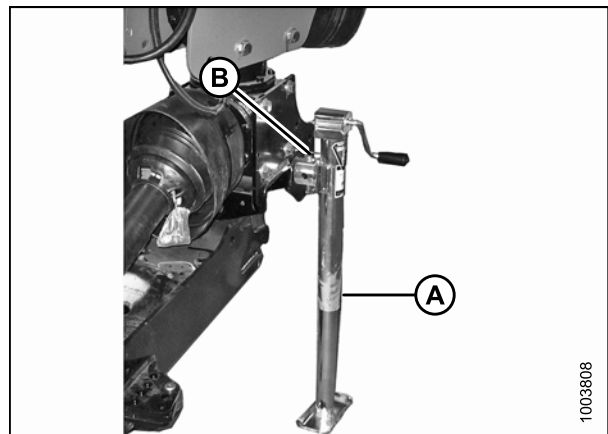


Figure 3.100: Hitch Jack

## ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER INSTALLED ROAD FRIENDLY TRANSPORT™)

10. Move jack (A) to storage position on top of hitch, and secure with pin (B).
11. Proceed to [3.9.3 Connecting Hydraulics, page 53](#).

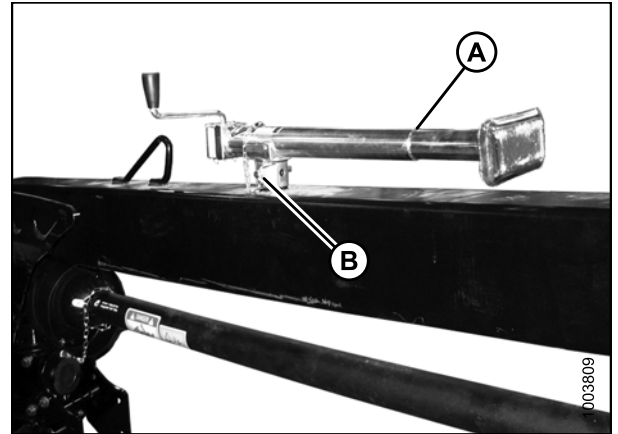


Figure 3.101: Jack Storage

### 3.9.2 Attaching with Two-Point Hitch

Follow these steps to attach Category II, IIIN, and III two-point hitches:

#### CAUTION

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

1. Position tractor and align tractor hitch arms (A) with hitch adapter (B).
2. Shut off tractor and remove key.
3. Remove lynch pins (C) and washers from hitch adapter.

#### NOTE:

If tractor is equipped with a Category III hitch, use a bushing (MD #224322) on each hitch pin (D).

4. Secure arms (A) onto adapter pins (D) with lynch pins (C).
5. Install anti-sway bars (not shown) on tractor hitch to stabilize lateral movement of hitch arms (A). Refer to your tractor operator's manual.

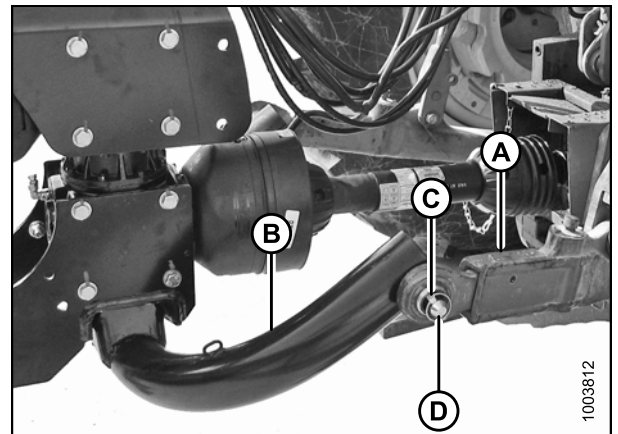


Figure 3.102: Two-Point Hitch Configuration

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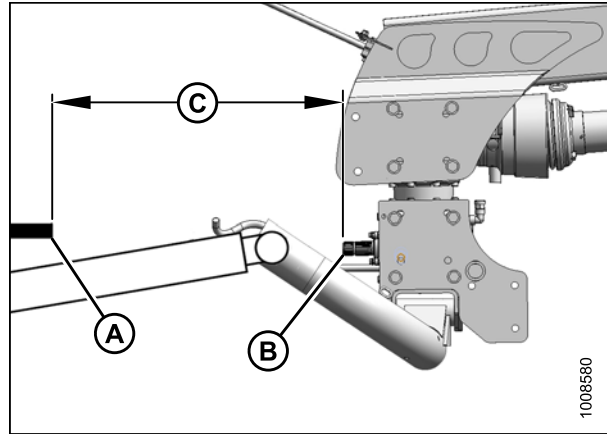
6. Check distance (C) between tractor power take-off (PTO) shaft (A) and mower conditioner hitch gearbox shaft (B) (without the front half of the driveline attached).
7. Ensure that measurement does NOT exceed the dimensions listed in Table 3.2 *Distance between Hitch Gearbox and Tractor PTO*, page 52.

**Table 3.2 Distance between Hitch Gearbox and Tractor PTO**

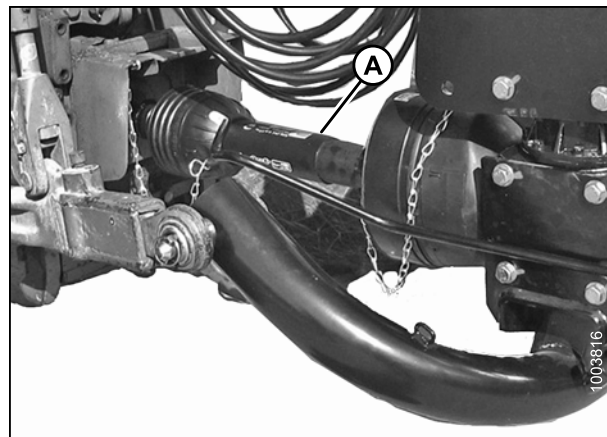
Driveline Shaft Size	Distance (C)
1-3/8 in. (34 mm)	27 in. (750 mm)
1-3/4 in. (43 mm)	31 in. (800 mm)

8. Position driveline (A) onto tractor PTO shaft making sure that driveline is approximately level.
9. Pull back collar on driveline (A) and push driveline until it locks. Release collar.

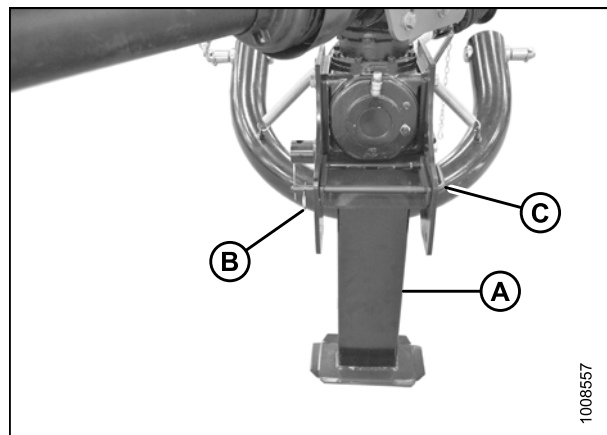
10. Start tractor and raise hitch so that stand (A) is off the ground. Shut down tractor and remove key from ignition.
11. Remove inner hairpin (B) and pull lock (C) to release stand.



**Figure 3.103: Allowable Driveline Length**



**Figure 3.104: Mower Conditioner Driveline Attached to Tractor PTO**



**Figure 3.105: Hitch Stand**

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12. Raise stand (A), rotate lock (B) clockwise to vertical position, and re-engage lock (B) to hold the stand in the storage location.

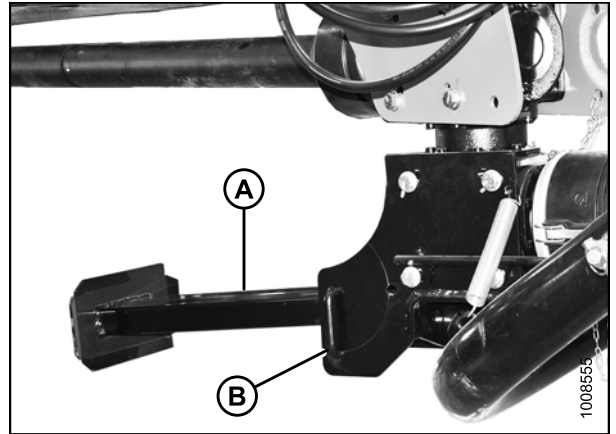


Figure 3.106: Hitch Stand

13. Secure lock with lynch pin (A).

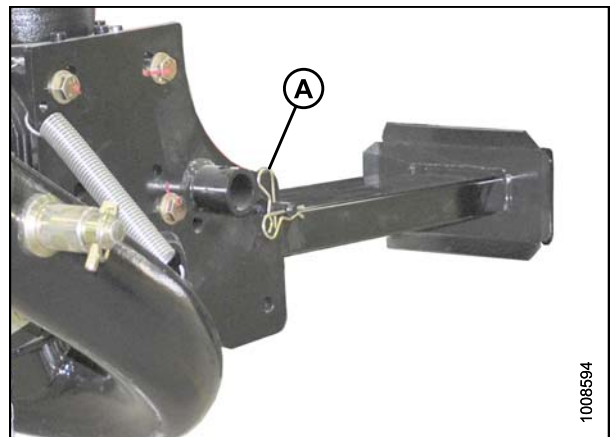


Figure 3.107: Hitch Stand

### 3.9.3 Connecting Hydraulics

#### **WARNING**

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

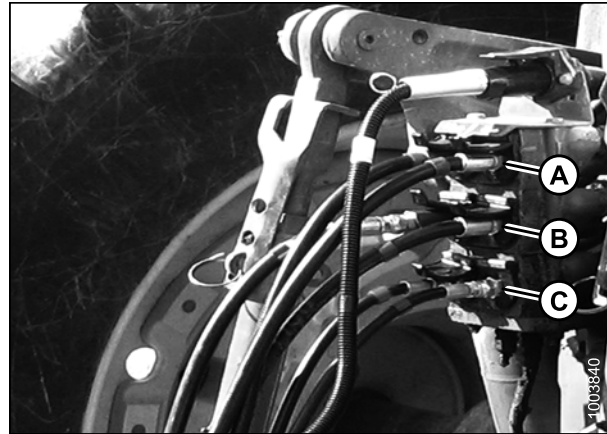
#### **NOTE:**

Refer to numbered/colored bands on hoses to identify lift, swing/transport, and tilt hose sets.

**ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER  
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**Table 3.3 Hydraulic System Hoses**

System	Hose Identification	Tractor Hydraulics
Lift (A)	Red #1 - pressure Blue #1 - return (only with Road Friendly Transport™ system installed)	Control 1
Swing/ Transport (B)	Red #2 - pressure Blue #2 - return	Control 2
Tilt (C) <sup>1</sup>	Red #3 - pressure Blue #3 - return	Control 3



**Figure 3.108: Hydraulic Connections**

1. Connect the lift cylinder hose (red label with #1) to the tractor's hydraulic receptacle. The second hose (blue #1) is required only when the Road Friendly Transport™ system installed. Refer to Table [3.4 Lift System, page 54](#).

**Table 3.4 Lift System**

Control Lever Position	Cylinder Movement	Mower Conditioner Movement
Forward	Retract	Lower
Backward	Extend	Raise

2. Connect the two hitch swing cylinder hoses (labelled #2) to the tractor hydraulic receptacles. Refer to Table [3.5 Hitch Swing and Transport System, page 54](#).

**Table 3.5 Hitch Swing and Transport System**

Control Lever Position	Cylinder Movement	Mower Conditioner Direction
Forward	Extend	Right
Backward	Retract	Left

3. Connect the two mower conditioner tilt cylinder hoses (labelled #3) to the tractor hydraulic receptacles. Refer to Table [3.6 Mower Conditioner Tilt System, page 54](#). (Not required with mechanical center-link.)

**Table 3.6 Mower Conditioner Tilt System**

Control Lever Position	Cylinder Movement	Mower Conditioner Movement
Forward	Retract	Lower
Backward	Extend	Raise

<sup>1</sup> Available with hydraulic tilt option installed.

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### 3.9.4 Connecting Electrical Wiring Harness

1. Ensure that Pin #4 (A) in the tractor receptacle is **NOT** continuously energized (refer to your tractor operator's manual). If necessary, remove the appropriate fuse.

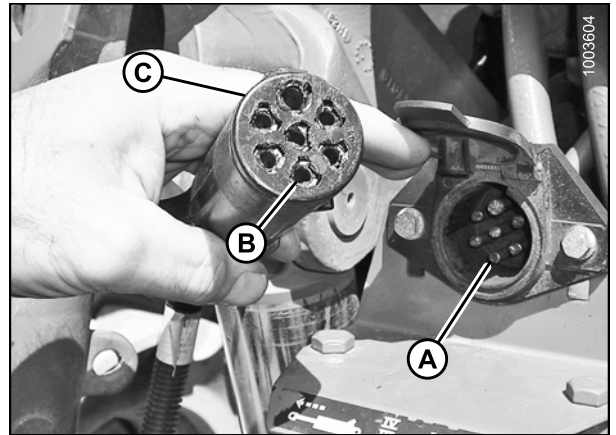
**IMPORTANT:**

Older model tractors may have Pin #4 (A) energized as an accessory circuit; however, pin position (B) is used to supply power to the mower conditioner's brake lights.

2. Connect the mower conditioner wiring harness connector (C) to the tractor receptacle.

**NOTE:**

The connector is designed to fit tractors equipped with a round seven-pin receptacle (SAE J560).



**Figure 3.109: Electrical Wiring Harness and Receptacle**

ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER  
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### 3.10 Installing Field Wheels

1. Remove the shipping wire (B) from the wheel spindle (A). Do this to each side.

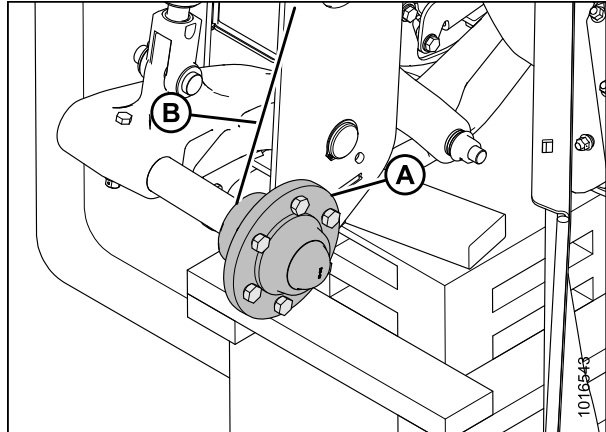


Figure 3.110: Wheel Spindle

2. Remove wheel bolts (A) from spindle (B).

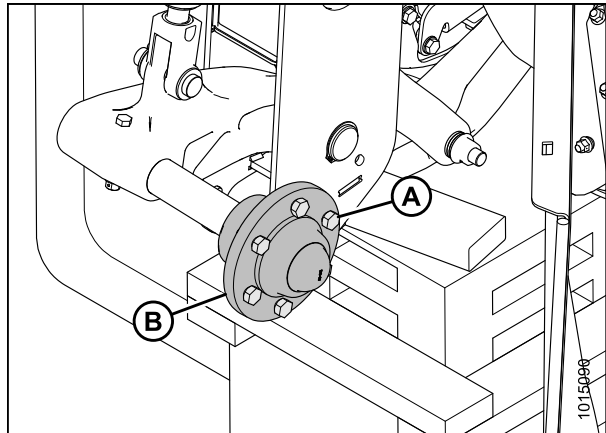


Figure 3.111: Wheel Spindle

#### CAUTION

When installing wheel, be sure to match countersunk holes with bolt head profiles. Holes that are not countersunk do NOT correctly seat the bolts.

3. Position wheel (A) on spindle, install bolts (B), and partially tighten.

#### IMPORTANT:

Be sure valve stem (C) points away from wheel support.

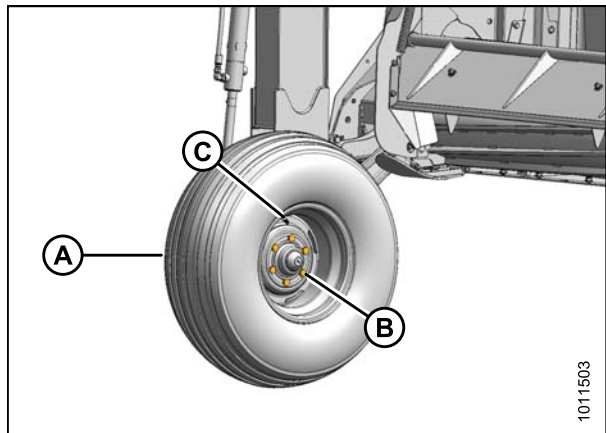


Figure 3.112: Installing Wheel Bolts



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4. Lower wheels to the ground and torque wheel bolts to 120 ft·lbf (160 N·m) using the tightening sequence shown.

**NOTE:**

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

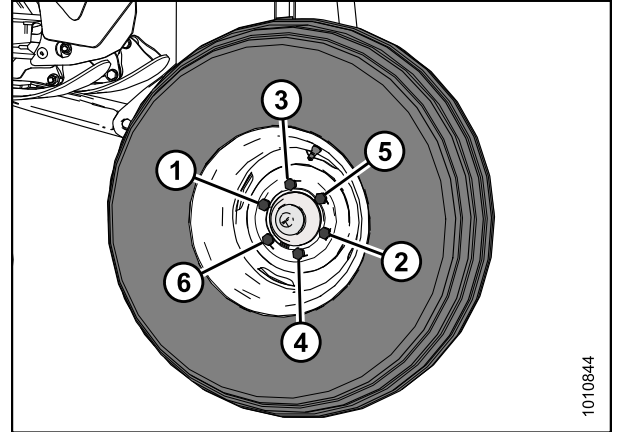


Figure 3.113: Tightening Sequence

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ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER  
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### 3.11 Priming the Hitch Swing Cylinder

1. On the remote control, move the transport switch to the lower position (B) and ensure that light (A) is illuminated. The hitch swing circuit will now be active.



Figure 3.114: Transport Switch

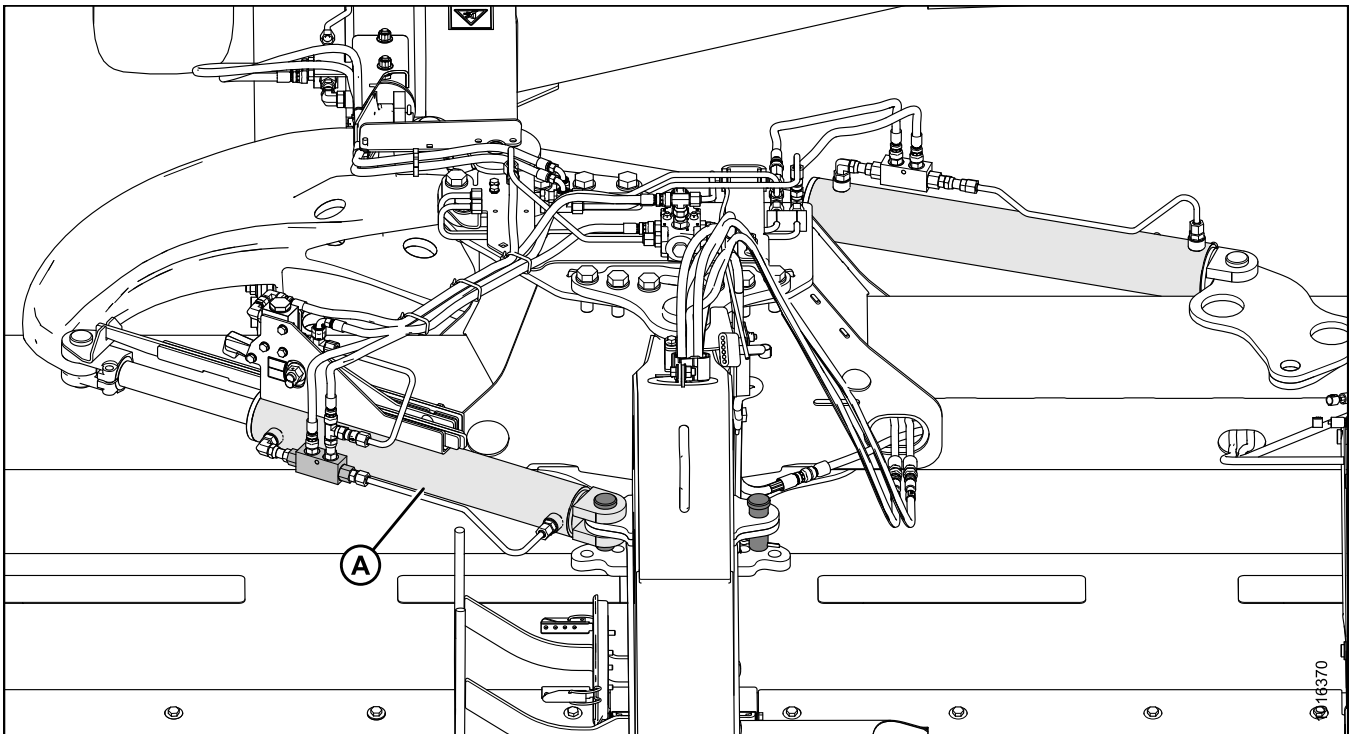


Figure 3.115: Hydraulic System

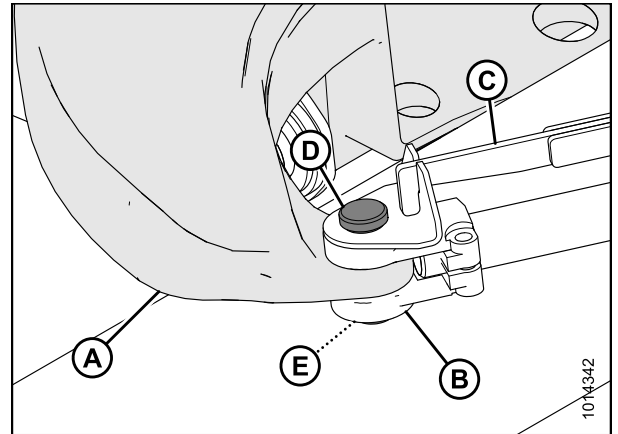
2. Using the tractor's hydraulics, extend and retract the swing cylinder (A) several times to purge any air in the cylinder.

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**NOTE:**

Ensure there is no contact with the rear link arm when the hitch swing cylinder extends.

3. Align the clevis pin hole in the cylinder clevis (B), cam arm (C) and rear link arm (D). Install clevis pin (D) and secure with a cotter pin (E).



**Figure 3.116: Rear Arm Link**

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## 3.12 Setting up Forming Shields

Each type of conditioner uses a different configuration for the swath forming shield. Refer to the applicable instruction for the conditioner supplied with the machine.

If a finger conditioner is installed, continue to [3.12.1 Setting up Forming Shield for Finger Conditioner, page 60](#).

If a roll conditioner is installed, continue to [3.12.2 Setting up Forming Shield for Roll Conditioner, page 65](#).

If a conditioner is not installed, continue to [3.14 Discharge Shield \(No Conditioner\), page 68](#).

### 3.12.1 Setting up Forming Shield for Finger Conditioner

**NOTE:**

Transport not shown in illustrations for clarity.

**NOTE:**

Before setting up the forming shields, convert the header to field mode. Refer to [6.18.2 Converting from Transport to Field Mode, page 160](#).

1. Remove shipping wire (A) securing forming shield covers (B) to pallet.
2. Remove the two outboard forming shields (A).

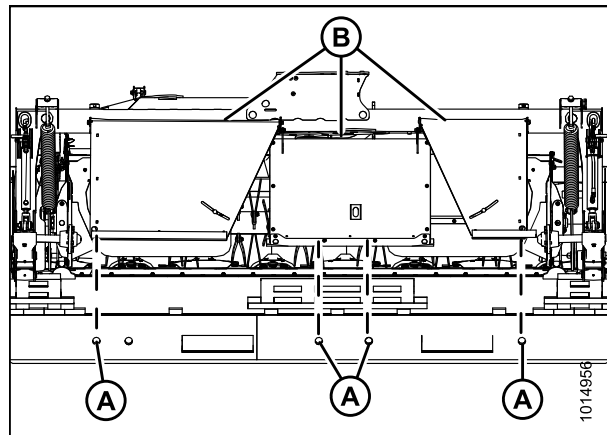


Figure 3.117: Header Strapping

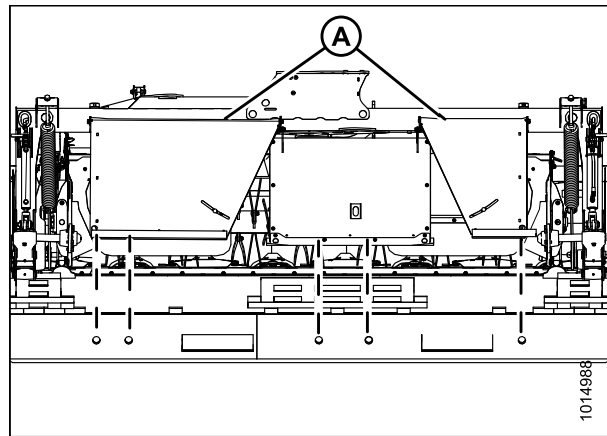
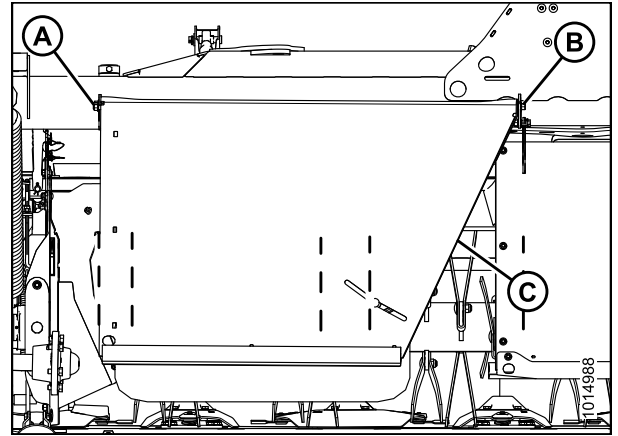


Figure 3.118: Outboard Top Cover

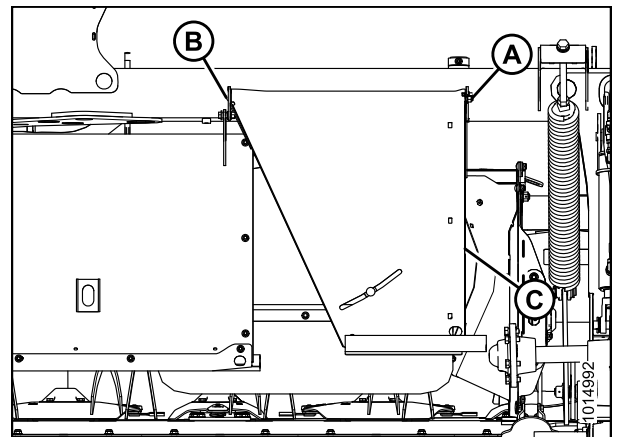
**ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER  
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- Support cover (C) and remove two bolts at (A and B).



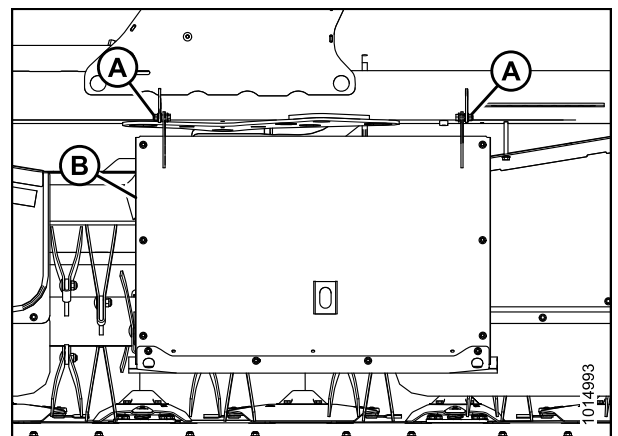
**Figure 3.119: Outboard Top Cover**

- Support cover (C) and remove two bolts at (A and B).



**Figure 3.120: Outboard Top Cover**

- Remove nuts (A) from center shield (B). Do not remove the bolts.



**Figure 3.121: Center Shield**

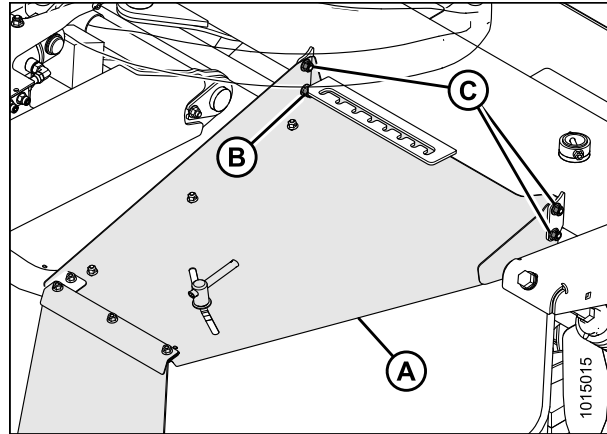
**ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER  
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6. Flip top cover horizontally and install as follows:
  - a. Position top cover (A) as shown and position onto hex head bolt (B). Loosely install nut to hold top cover in place.

**NOTE:**

If installing the Road Friendly Transport™ system, install the top cover (A) after the transport assembly is in place.

- b. Install carriage bolts (C) with heads facing towards center of top cover. Install nuts and tighten.
  - c. Repeat for opposite top cover.

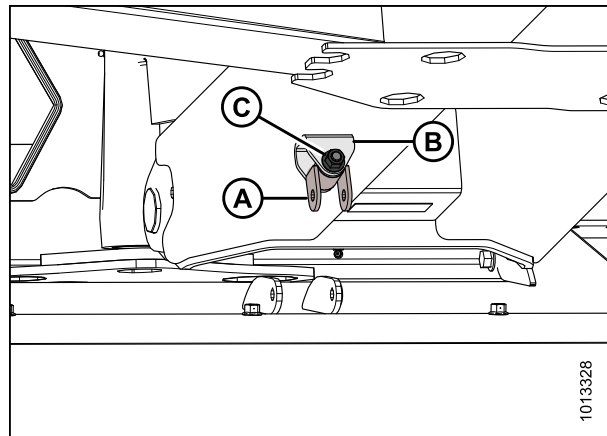


**Figure 3.122: Outboard Top Cover (Right-Hand Side)**

**NOTE:**

If installing the Road Friendly Transport™ system, Steps 7., page 62 to 9., page 62 apply. Install the Road Friendly Transport™ system before installing top covers and spring. If not installing the Road Friendly Transport™ system, skip Steps 7., page 62 to 9., page 62.

7. On the underside of the Road Friendly Transport™ support, secure joint weldment (A) to link bracket (B) using M12 hex head bolt and flanged center lock nut (C).

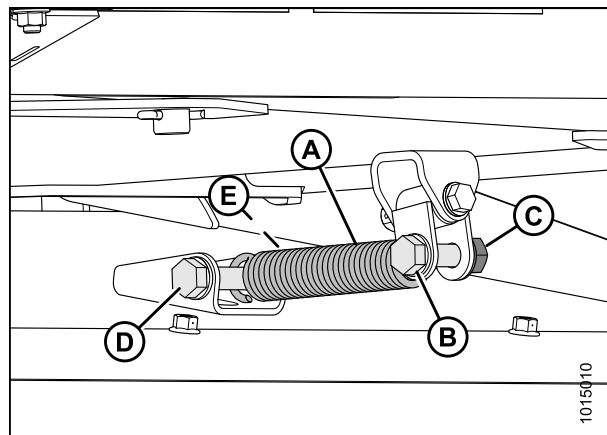


**Figure 3.123: Joint Weldment on Link Bracket**

8. Attach spring (A) to M12 x 55 hex head bolt (B) and flanged center lock nut (C).
9. Lift center top cover, attach spring (A) to M12 x 100 hex head bolt (D) and flanged center lock nut (E).

**IMPORTANT:**

Do **NOT** attach center cover to outboard covers. If hardware is installed on both sides of the center cover to attach it to the side covers, remove it at this time and discard.



**Figure 3.124: Spring Attached to Transport**

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### NOTE:

Perform this step if the Road Friendly Transport™ system will not be installed.

10. Lift center cover (A) and install six M10 x 20 carriage bolts and lock nuts (B) (three per side) to secure center cover (A) to outboard covers (C). Tighten bolts.

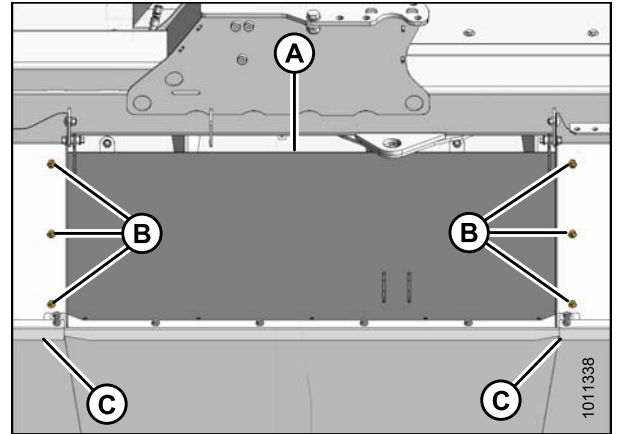


Figure 3.125: Center Cover Assembly

11. Remove and discard bolt (A) securing deflector (B) to frame.

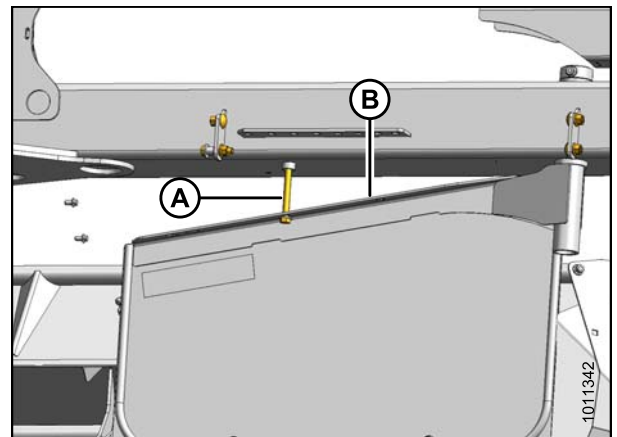


Figure 3.126: Side Deflector Assembly

12. Remove handle (A), washers, and bolt from top cover (B).
13. Swing deflector (C) under outboard top cover (B) so that handle can be installed into deflector and top cover.

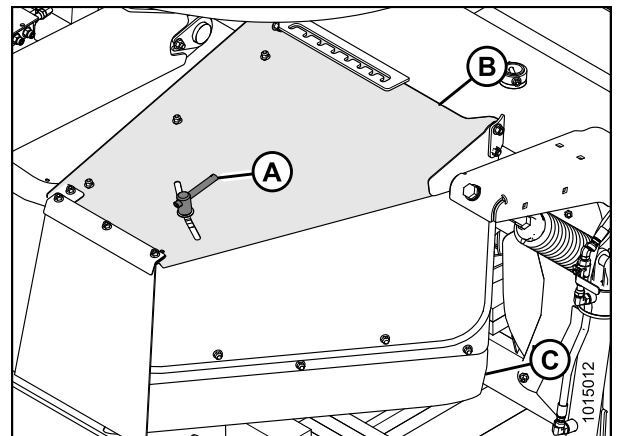
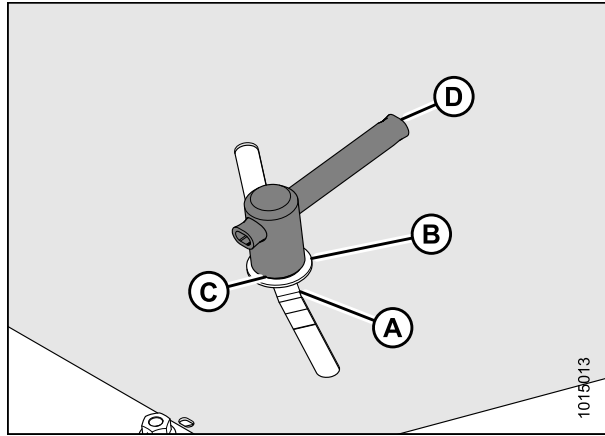


Figure 3.127: Side Deflector Assembly

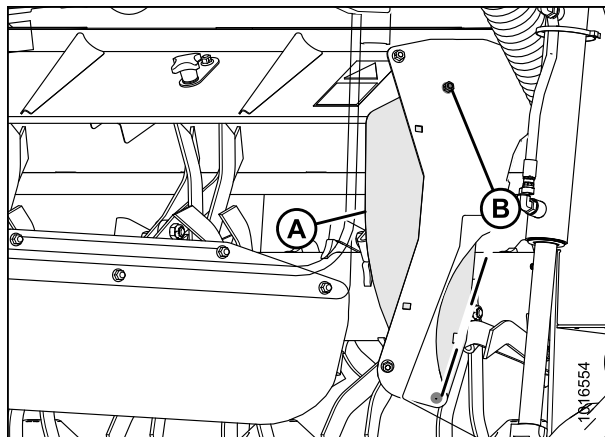
**ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER  
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14. Install carriage bolt (A), washer (B), spring washer (C), and handle (D) as shown.
15. Position deflector so the handle (D) is approximately centered in slot, and tighten handle.



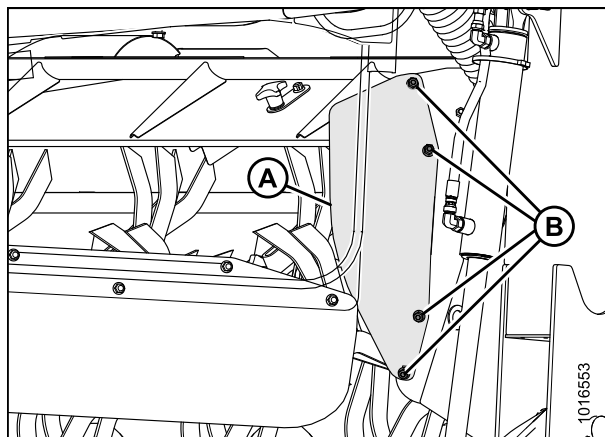
**Figure 3.128: Deflector Adjustment**

16. Remove two M10 carriage bolts (A) securing left-hand deflector shield in shipping position. Repeat for opposite deflector shield.



**Figure 3.129: Right-Hand Deflector Shield  
Shown - Left-Hand Deflector Shield Opposite**

17. Reposition deflector shield (A) so the holes align with the fixed shield, and secure with four M10 carriage bolts (B) and hex head flange nuts.



**Figure 3.130: Right-Hand Deflector Shield  
Shown - Left-Hand Deflector Shield Opposite**



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18. Remove shipping wires (A) securing curtains (B) to covers (C). Allow curtains to unfold before operating machine.

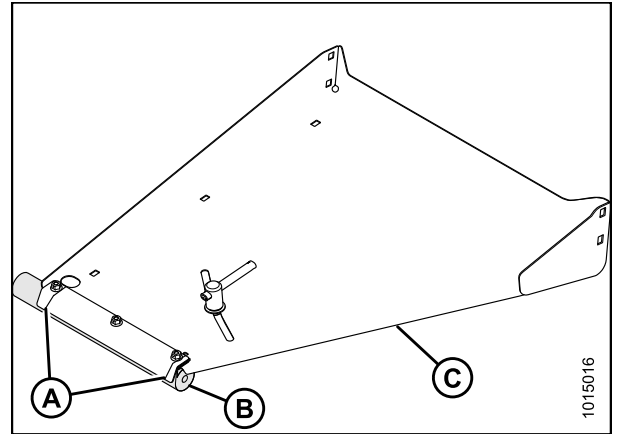


Figure 3.131: Forming Shield Curtain

### 3.12.2 Setting up Forming Shield for Roll Conditioner

Use these instructions to set up the forming shield on a machine with a roll conditioner.

1. Remove and discard bolt (A) securing deflector (B) to frame.
2. Swivel deflector (B) to open position.

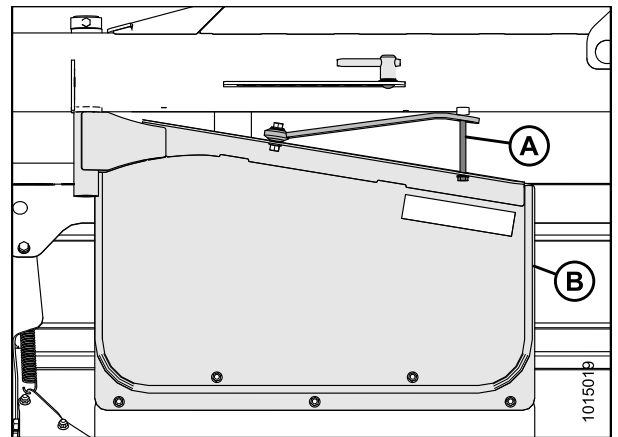


Figure 3.132: Side Deflector

3. Rotate clamp (B) until you can remove bolt (C).
4. Swing adjuster bar (A) and align with a hole on carrier plate (D).
5. Install bolt through adjuster bar (A) and carrier plate (D). Install clamp (B) onto bolt. Tighten clamp until shield does not move.
6. Repeat above steps for opposite deflector.

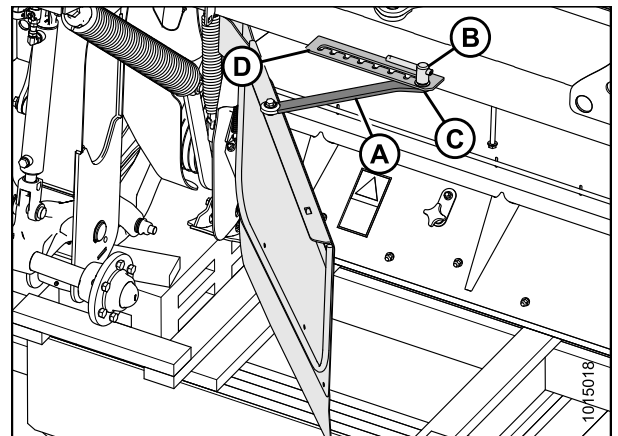


Figure 3.133: Adjuster Bar

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### 3.13 Unpacking Curtains

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

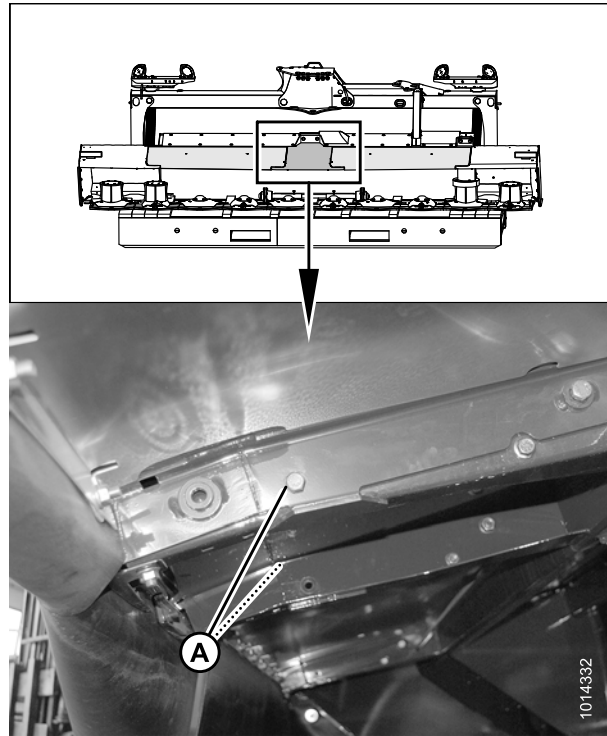


Figure 3.134: Underside of Cutterbar Doors

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

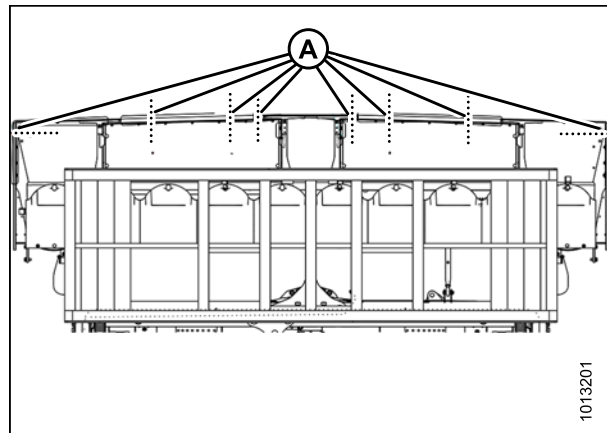
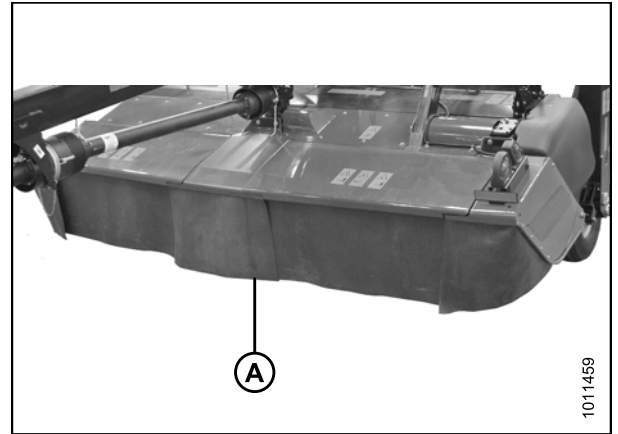


Figure 3.135: Underside of Mower Conditioner

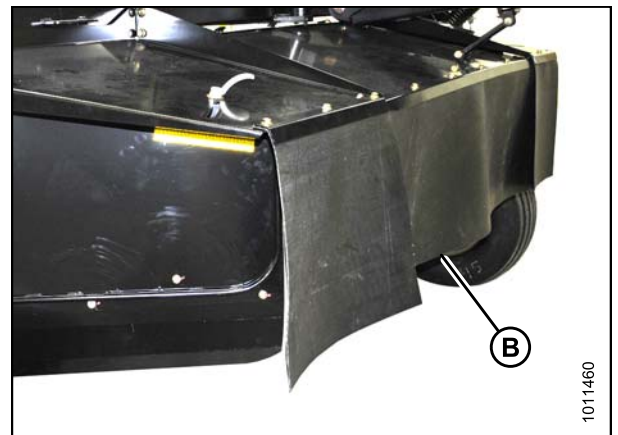
**ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER  
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3. Straighten cutterbar door curtains (A) and remove folds or creases (minor creases will eventually straighten out).



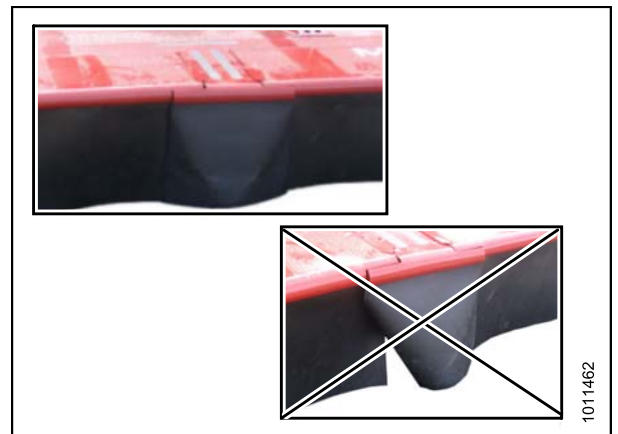
**Figure 3.136: Cutterbar Door Curtains**

4. If forming shields are installed, straighten forming shield curtains (B) and remove folds or creases (minor creases will eventually straighten out).



**Figure 3.137: Forming Shield Curtains**

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



**Figure 3.138: Cutterbar Door Curtains**

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## 3.14 Discharge Shield (No Conditioner)

### 3.14.1 Removing Shield (No Conditioner)

Follow these steps to remove the shielding installed on a mower configured without a conditioner:

**⚠ DANGER**

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

1. Raise the mower fully and extend the center-link to maximize the space between the shield (A) and the carrier frame (B).

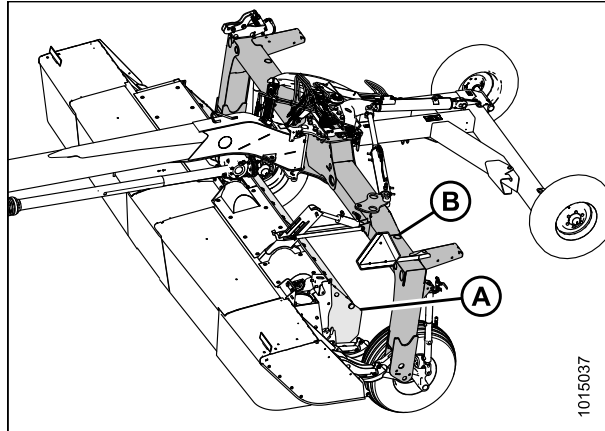


Figure 3.139: Mower with Transport

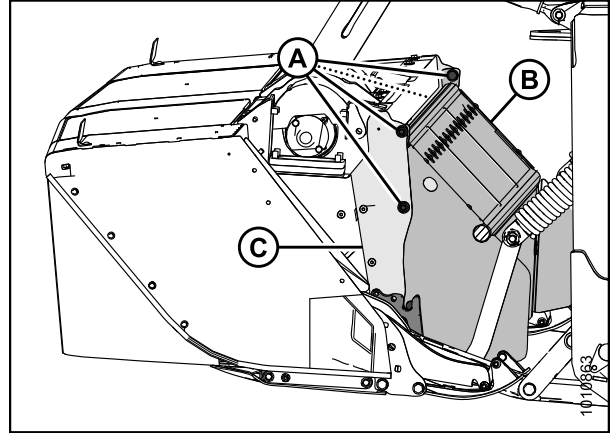
2. Close the lift cylinder lock-out valves (A) on both sides of the mower. Valve handles should be in the horizontal position.



Figure 3.140: Lift Cylinder Lock-Out Valves

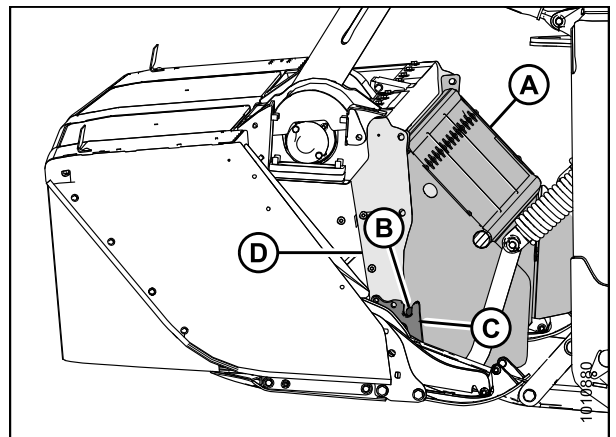
**ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER  
INSTALLED ROAD FRIENDLY TRANSPORT™)**

3. Remove four M16 hex head bolts (A), nuts, and flat washers securing the shield (B) to the panel on mower (C).



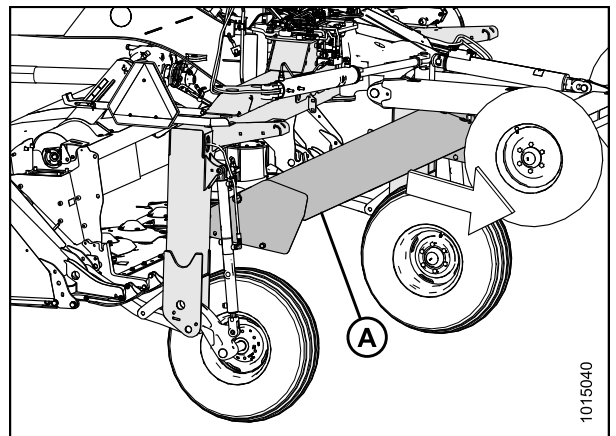
**Figure 3.141: Mower (Left Side View)**

4. Lift the shield (A) until pins (B) disengage from slots in support (C) and shield on panel (D).



**Figure 3.142: Mower (Left Side View)**

5. Rotate the shield (A) 90 degrees and move it away from the carrier frame.



**Figure 3.143: Shield Rotated**

ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER  
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### 3.14.2 Installing Shield (No Conditioner)

Follow these steps to install the shielding on a mower configured without a conditioner:

**⚠ DANGER**

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

1. Raise the mower fully and extend the center-link to maximize the space between the field wheels (A) and the carrier frame (B).

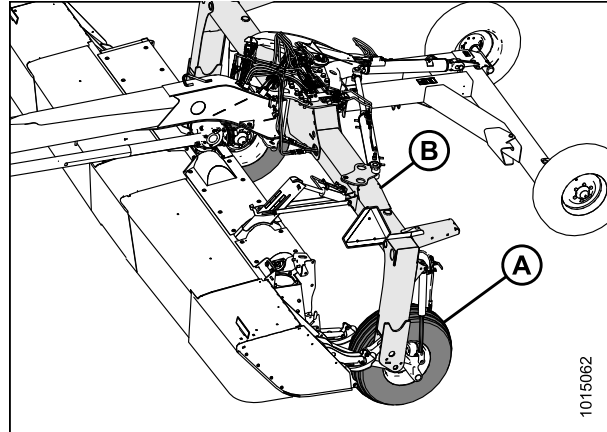


Figure 3.144: Mower with Transport

2. Close the lift cylinder lock-out valves (A) on both sides of the mower. Valve handles should be in the horizontal position.



Figure 3.145: Lift Cylinder Lock-Out Valves

3. Rotate the shield (A) and pass it between the field wheels and the carrier frame toward the mower.

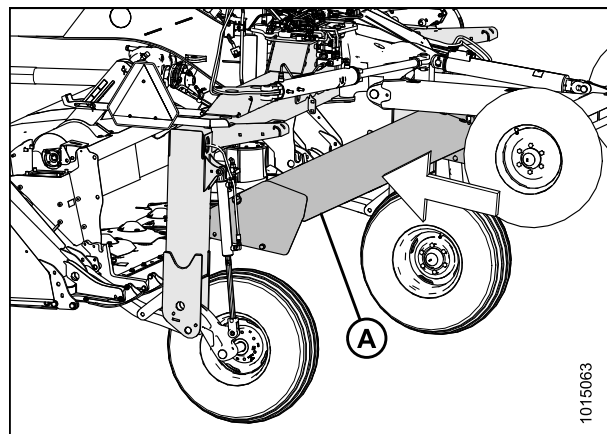
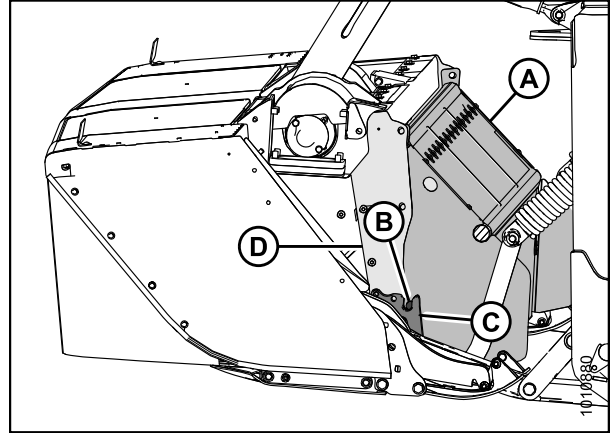


Figure 3.146: Shield Rotated

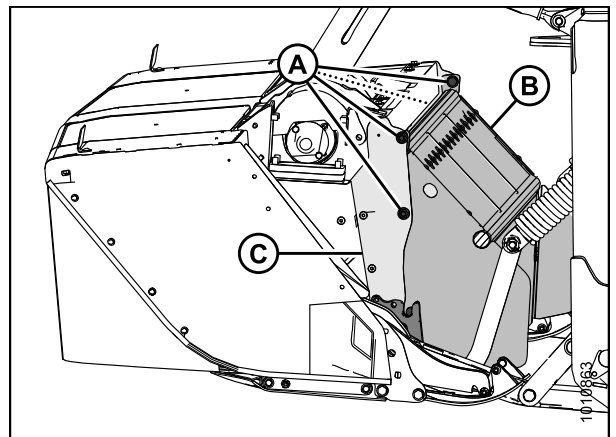
**ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER  
INSTALLED ROAD FRIENDLY TRANSPORT™)**

4. Position shielding (A) until pins (B) engage the slots in cutterbar support (C) and the bolt holes align with panel (D).



**Figure 3.147: Positioning the Shield on Mower**

5. Install four M16 hex head bolts (A), nuts, and flat washers to secure shield (B) to the panel (C). Ensure bolt heads face inboard.



**Figure 3.148: Shield (No Conditioner)**

ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER  
INSTALLED ROAD FRIENDLY TRANSPORT™)

### 3.15 Removing Mower Conditioner from Shipping Pallet (No Transport Installed)

**NOTE:**

If you have the Road Friendly Transport™ system, refer to [3.16 Removing Mower Conditioner from Shipping Pallet](#), page 73.

1. Cut strapping (B) securing cutterbar to pallet (C).
2. Place forks from lifting device at openings (A). Spread them as far apart as possible to spread the load out.
3. Lift header high enough that the pallet can be removed.
4. Use a chain or forklift to remove shipping pallet (A) from underneath the mower conditioner.
5. Lower header to the ground.

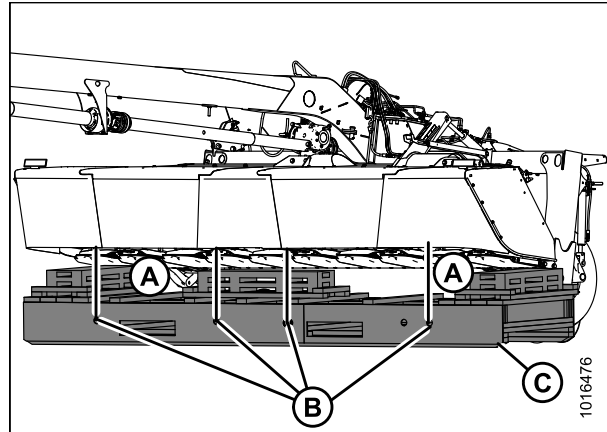


Figure 3.149: Strapping

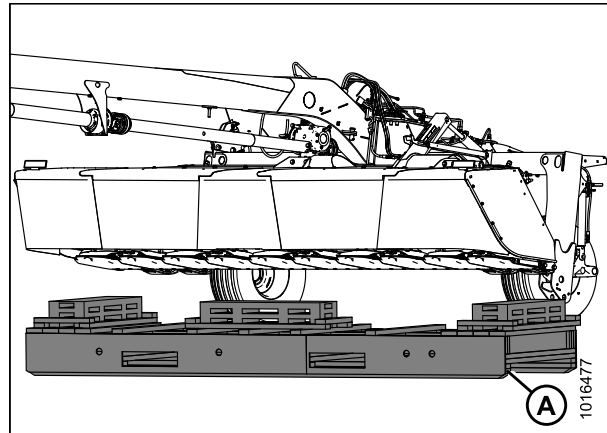


Figure 3.150: Removing Shipping Pallet



ASSEMBLING THE MOWER CONDITIONER (WITH OR WITHOUT DEALER  
INSTALLED ROAD FRIENDLY TRANSPORT™)

### 3.16 Removing Mower Conditioner from Shipping Pallet

1. Cut strapping (B) securing cutterbar to pallet (A).
2. Use the transport to lift the header high enough that the pallet can be removed.

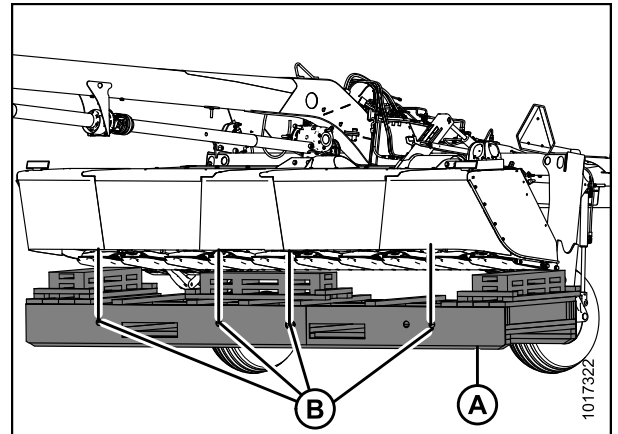


Figure 3.151: Strapping

3. Use a chain or forklift to remove shipping pallet (A) from underneath the mower conditioner.
4. Lower header to the ground.

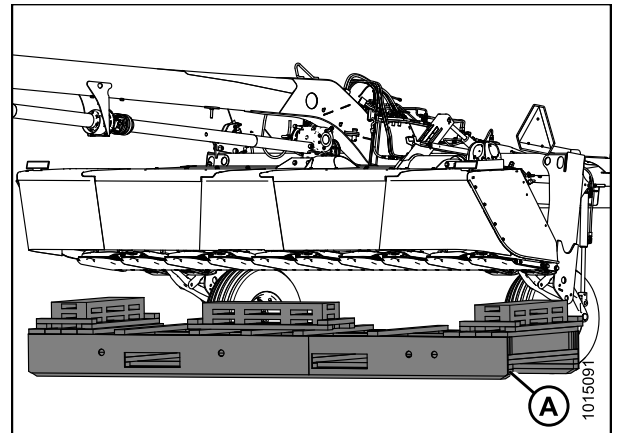


Figure 3.152: Removing Shipping Pallet



# 4 Assembling the Mower Conditioner (Factory Installed Transport)

## 4.1 Repositioning Center-Link Top Anchor

Perform this procedure to reposition the center-link top anchor into working position.

1. Cut straps (C) securing transport assembly (A) to pallet (B).

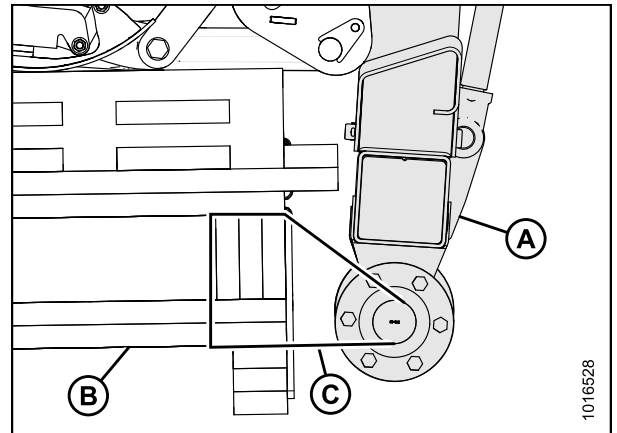


Figure 4.1: Transport Assembly

2. Remove the bolt (A) securing the center shield (B) to the frame. Lower the shield.

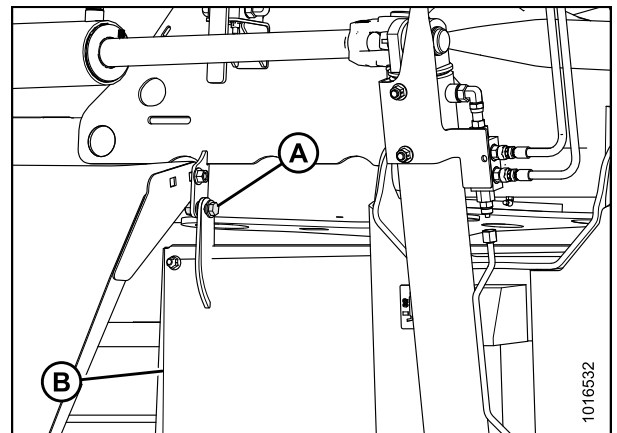


Figure 4.2: Center Shield

3. Place forklift forks under top beam (A) at opening (B). Lift carrier frame slightly until pin at base of center-link anchor is loose. Use a piece of wood to protect paint on frame.

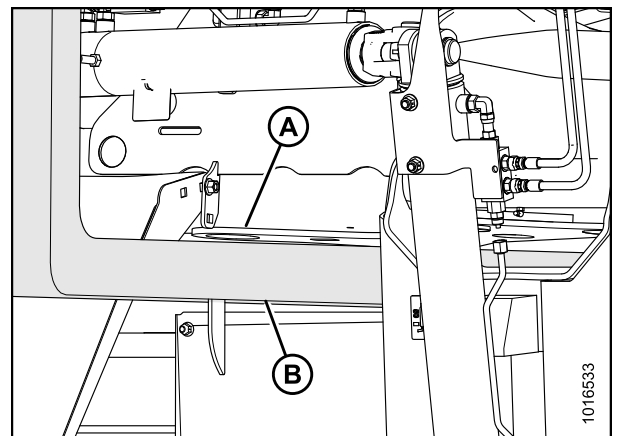


Figure 4.3: Carrier Frame

## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

- Loosen jam nut (A) and fully loosen float springs (B).

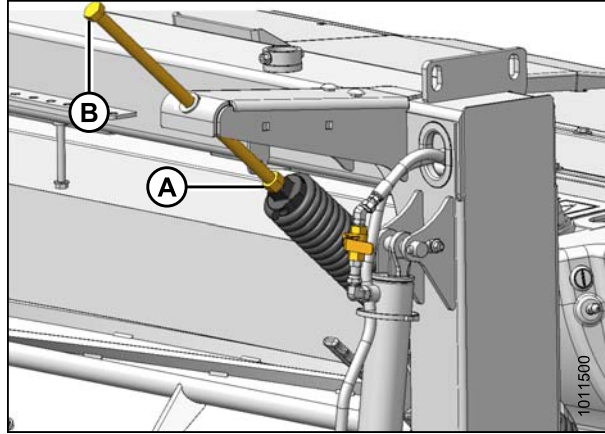


Figure 4.4: Float Spring

- Remove four M10 hex head bolts (A) and flat washers, and remove top shield (B).

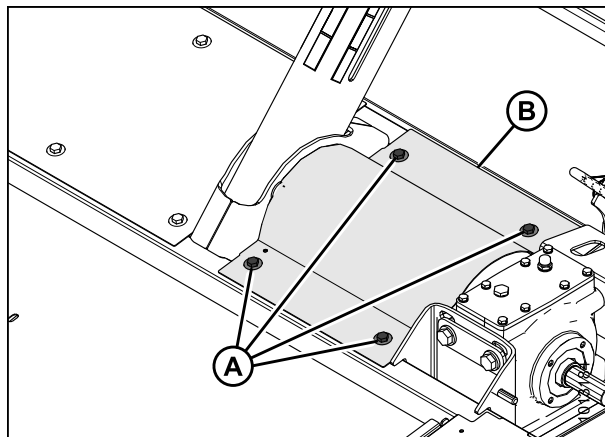


Figure 4.5: Top Shield

### CAUTION

To avoid injury, keep fingers clear of opening at base of anchor.

- Remove cotter pin (B), washer (C) and shipping tag (D).
- Remove pin (A) from center location and lower forks on forklift.

#### NOTE:

Pin should slide out freely. Adjust forklift or move carrier until pin is loose. Avoid using a hammer to remove pin.

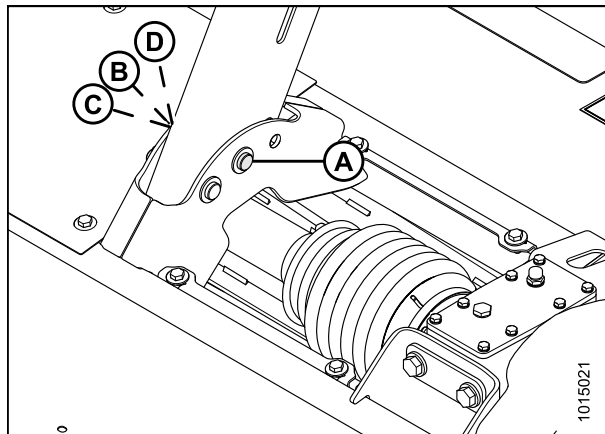


Figure 4.6: Center-Link Anchor

## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

8. Install pin (A) and secure with washer (B) and cotter pin (C). Move the carrier and anchor so the pin can be installed in working location.

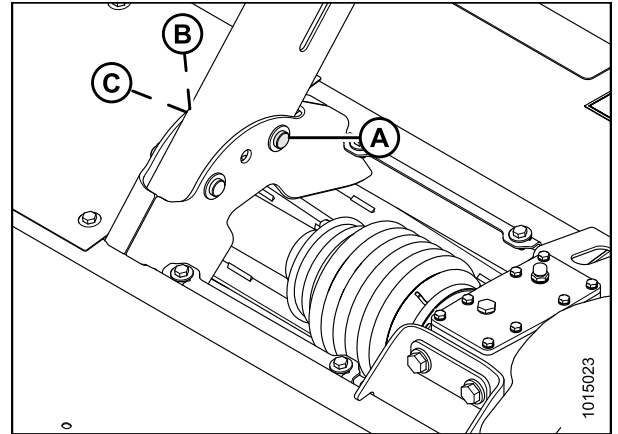


Figure 4.7: Center-Link Anchor

9. Install top shield (B) and secure with four M10 hex head bolts (A) and flat washers. Torque to 20–22 ft·lbf (27–30 N·m).

**NOTE:**

If transport is also being installed, leave bolts (A) loose. These bolts will be tightened when installing the lighting harness.

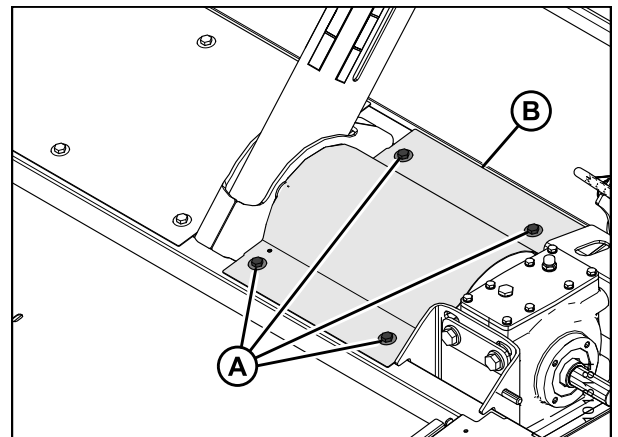


Figure 4.8: Top Shield

10. Close the mower conditioner's lift cylinder lock-out valve (A) on each lift cylinder by turning the handle to the horizontal position.
11. Loosen jam nut (B) away from the spring.
12. Turn the adjuster bolt (C) and set dimension (D) to 5-1/8 in (130 mm).
  - Turn bolt clockwise (towards spring) to increase float
  - Turn bolt counterclockwise (away from spring) to decrease float
13. Tighten jam nut (B) against spring.

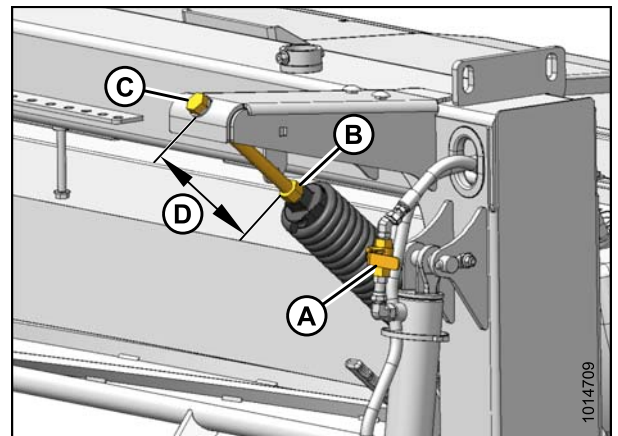
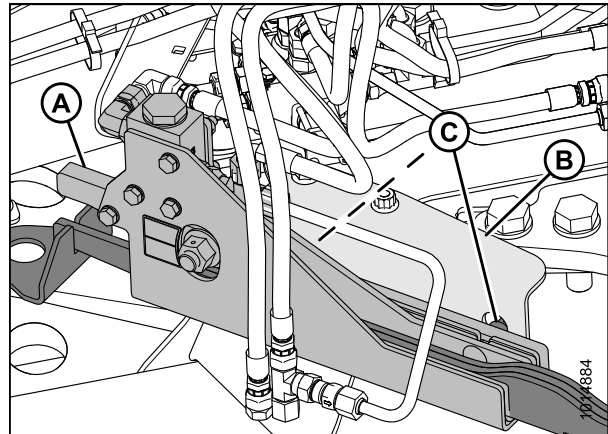


Figure 4.9: Lift Cylinder Lock-Out Valve, Jam Nut, and Adjuster Bolt

## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

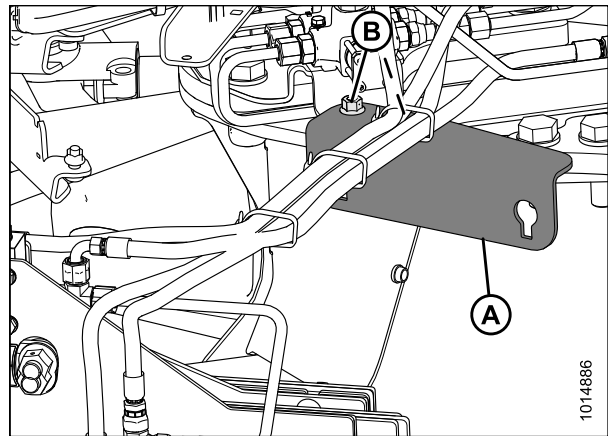
### 4.2 Attaching Hitch to Carrier

1. Remove the cam assembly (A), from the shipping support (B).
2. Remove nuts (C) from the cam assembly.



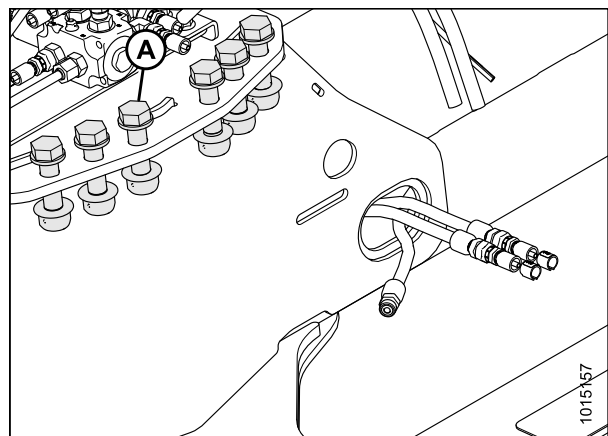
**Figure 4.10: Alignment Controls (Front Right-Hand View)**

3. Remove bolts (B) then remove the shipping support (A) and discard.



**Figure 4.11: Shipping Support (Front Right-Hand View)**

4. Remove M20 bolts (A), washers, and nuts from carrier at the hitch attachment location. Retain bolts washers, and nuts.



**Figure 4.12: Carrier**

## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

5. Cut banding (A) securing wood supports, then remove supports (B).
6. Remove the two bolts securing wood support to hitch pin (D). Discard bolts.

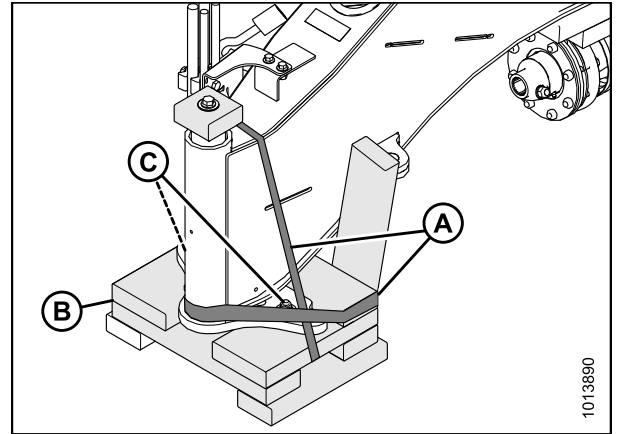


Figure 4.13: Hitch Packing

7. Place sling (A) around the hitch frame. Adjust sling position until hitch is balanced when lifting.
  - **R113:** Approximately 106 in. (2700 mm) from the edge of the tractor end of the hitch
  - **R116:** Approximately 138 in. (3500 mm) from the edge of the tractor end of the hitch
8. Raise the hitch approximately 24 in. (610 mm) off the ground.

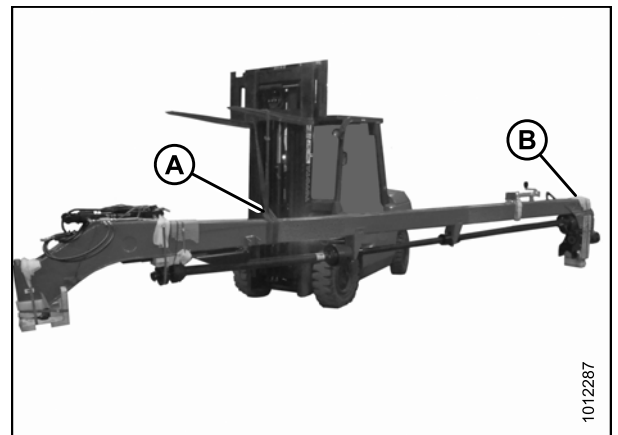


Figure 4.14: Lifting Hitch

### NOTE:

Pin (C) is heavy, support it appropriately before removing bolt (A).

9. Support pin (C), remove bolt (A) and wood block (B) from top of pin, and remove pin (C).

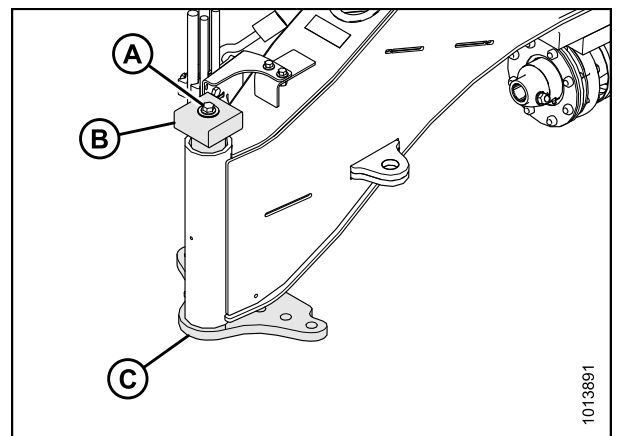


Figure 4.15: Hitch Packing

## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

10. Install hitch pin (A) fully into hitch.

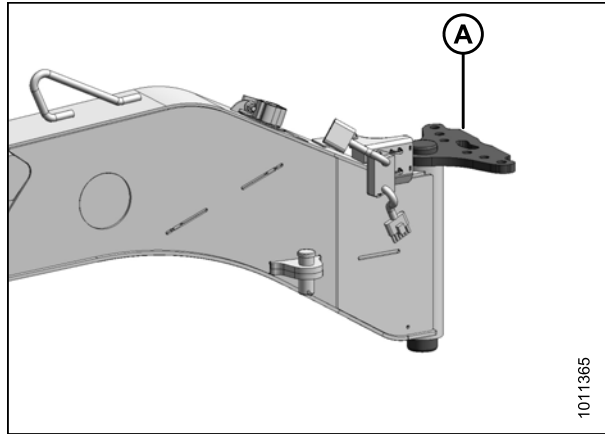


Figure 4.16: Pivot Pin

11. Pivot the gearbox towards the right side of the header. This will increase the clearance to the driveline clutch, when installing hitch onto carrier frame.

**NOTE:**

Align hitch pivot at a slight angle when installing. If not the driveline will contact the header drive gearbox.

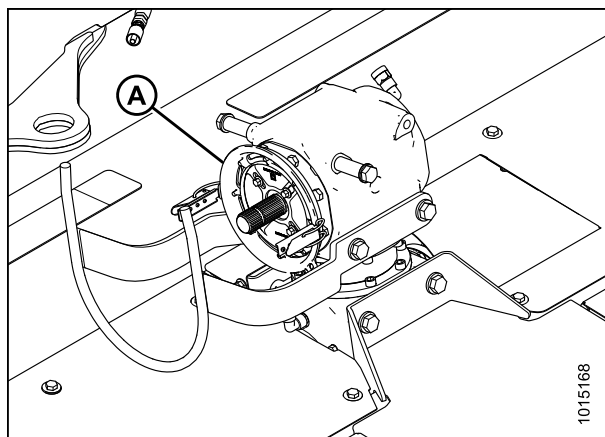


Figure 4.17: Driveline Shield

12. Maneuver hitch pivot (A) into attachment location (B) on carrier and line up pin with hole in carrier.

**NOTE:**

Align hitch pivot at a slight angle when installing. If not the driveline will contact the header drive gearbox.

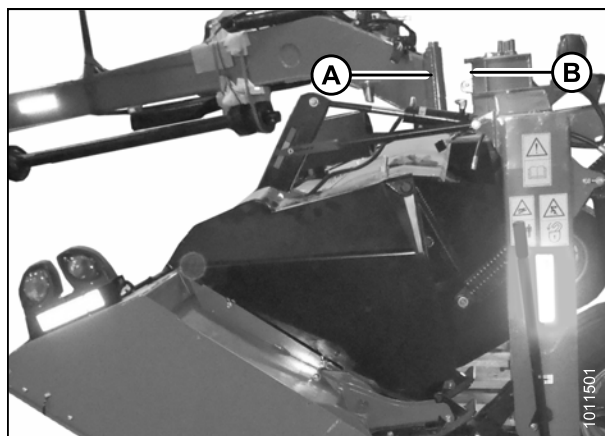


Figure 4.18: Hitch to Carrier



## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

13. Slowly lower hitch while maintaining pin alignment until pin is fully inserted. Use a large soft hammer if necessary to seat pin.

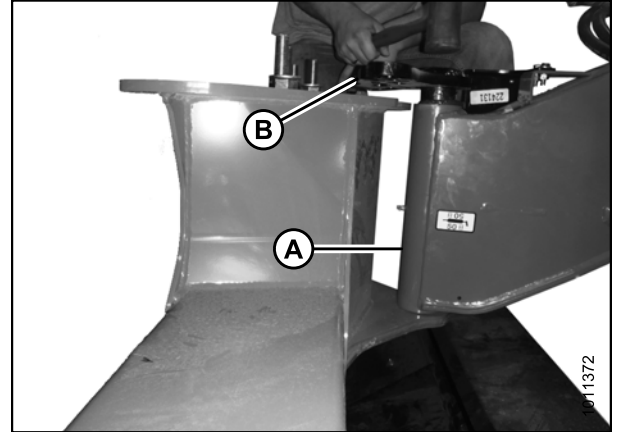


Figure 4.19: Pivot Pin

14. Line up holes in pin (A) with holes in the carrier frame. Install six M20 x 65 bolts (B) with hardened washers under the bolt head and lock nuts (C).

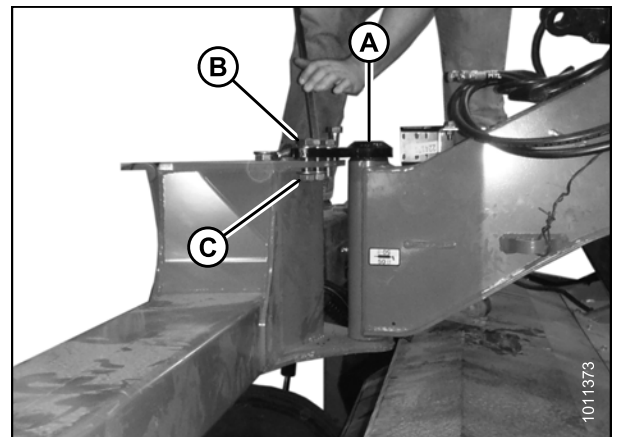


Figure 4.20: Pivot Pin

15. Tighten the outer bolts (A) first to draw the plate against the frame. Then tighten the inner bolts.
16. Torque bolts to 340 ft·lbf (461 N·m).

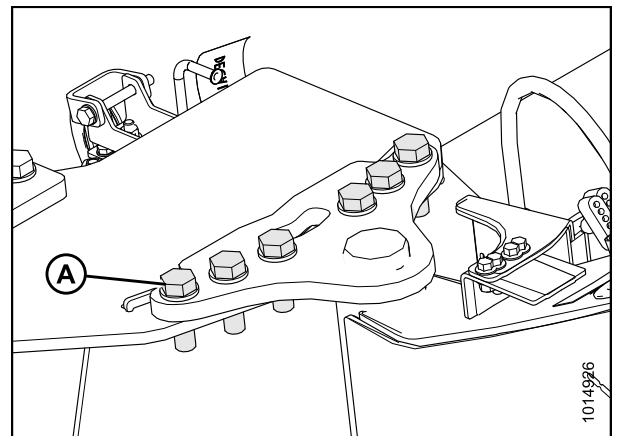


Figure 4.21: Pivot Pin

## 4.3 Installing Tractor Mating Hitch to Carrier Hitch

Depending on mower conditioner configuration, refer to the applicable installation procedure:

- [3.3.1 Installing Drawbar Hitch, page 16](#)
- [3.3.2 Installing Two-Point Hitch \(Cat. II\) Adapter, page 18](#)

### 4.3.1 Installing Drawbar Hitch

If attaching the mower conditioner to a tractor with a drawbar hitch, proceed as follows. If attaching the mower conditioner to a tractor with a two-point hitch, refer to [3.3.2 Installing Two-Point Hitch \(Cat. II\) Adapter, page 18](#).

1. Remove shipping wire or banding (A) securing shipping blocks (B) at front of hitch, and remove blocks.

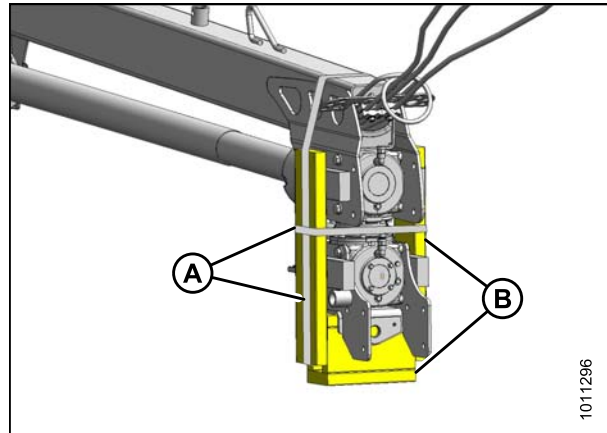


Figure 4.22: Hitch End Packing

2. Remove shipping wire (A) from jack (B) on drawbar hitch shipment, and remove jack from pallet.

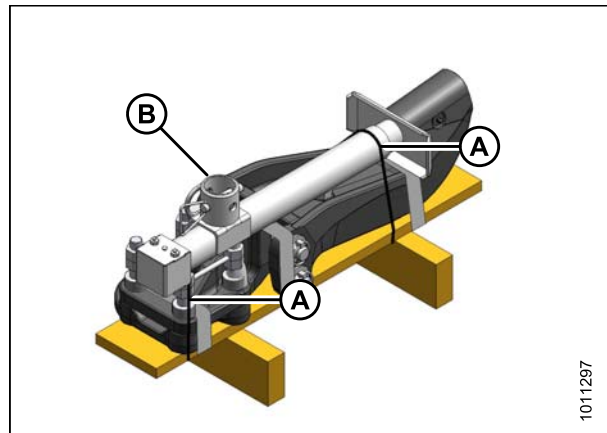


Figure 4.23: Jack Packing

## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

3. Install at jack (A) location at front of hitch, and secure with pin (B).
4. Swivel driveline and lower gearbox (C) so that driveline (D) is facing forward.
5. Lower forklift until hitch is resting on hitch jack (A).

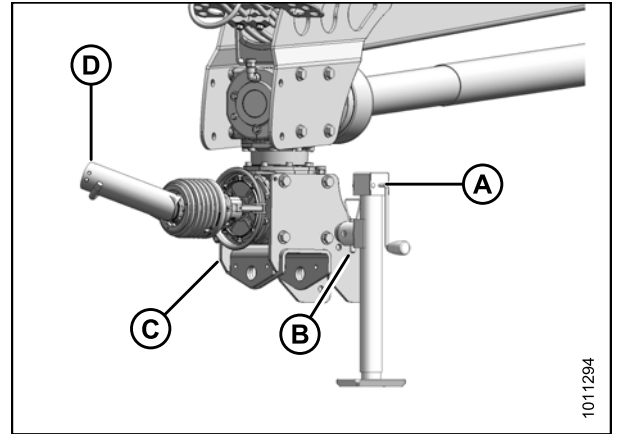


Figure 4.24: Hitch

6. Remove shipping wire (A) that secures pin (B) in casting. Do not remove other strapping.
7. Remove pin (B) from casting and remove bolt (C) and nut from pin.

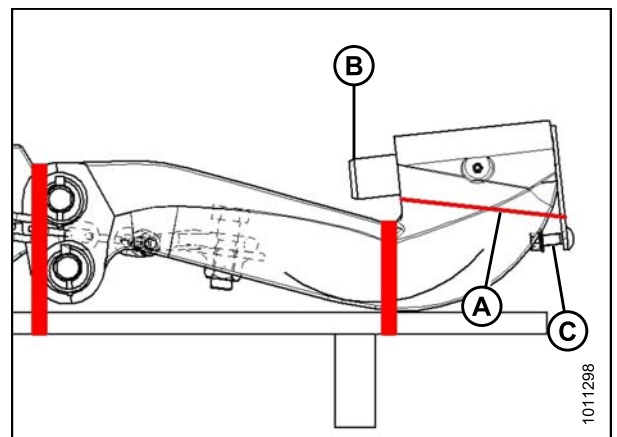


Figure 4.25: Hitch Casting

8. Using a floor jack or equivalent under pallet (A), raise hitch adapter (B) into position under the gearbox.
9. Maneuver hitch adapter (B) so that pin (C) can be installed to secure adapter to hitch.
10. Secure pin with bolt (D) and nut.
11. Remove floor jack and if necessary remove remaining strapping and pallet (A) from hitch adapter.

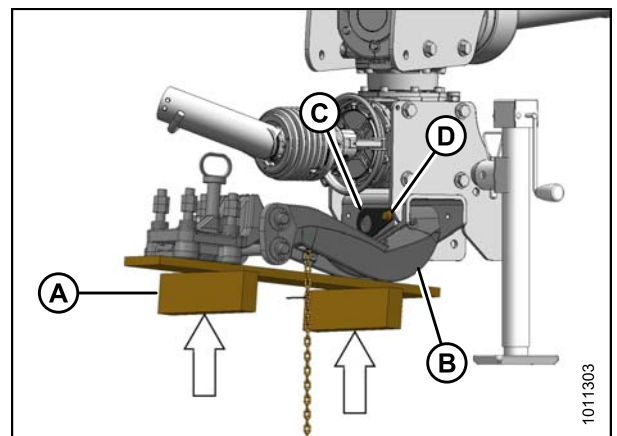


Figure 4.26: Drawbar Hitch

### 4.3.2 Installing Two-Point Hitch (Cat. II) Adapter

To set up the two-point hitch:

1. Remove shipping wire or banding (A) securing shipping blocks (B) at front of hitch, and remove blocks.
2. Swivel driveline and gearbox so that driveline is facing forward.

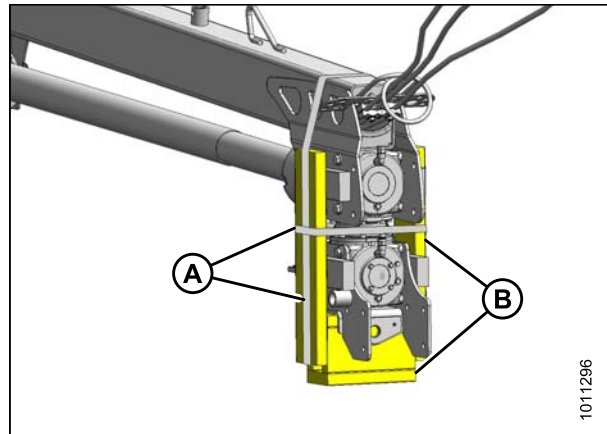


Figure 4.27: Hitch Packing

3. Retrieve two-point hitch adapter shipment.
4. Remove shipping wire (A) and material from stand (B) and remove stand from hitch adapter (C). Set aside for later installation.

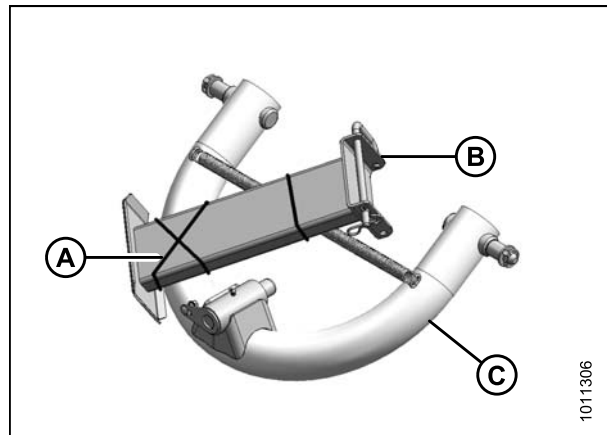


Figure 4.28: Two-Point Hitch Packing

5. Remove strapping that secures pin (A) to adapter (B). Do not remove other strapping.
6. Remove pin (A) from adapter, and remove bolt (C) and nut from pin (A).

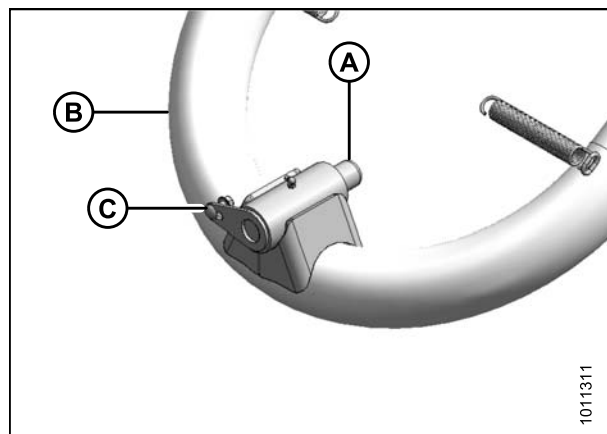


Figure 4.29: Two-Point Hitch Adapter

## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

- Using a floor jack or equivalent, raise two-point hitch adapter (A) into position under the gearbox.
- Maneuver adapter (A) so that pin (B) can be installed to secure adapter to hitch.
- Secure pin with bolt (C) and nut.
- Remove floor jack, and remove remaining strapping and pallet from hitch adapter.

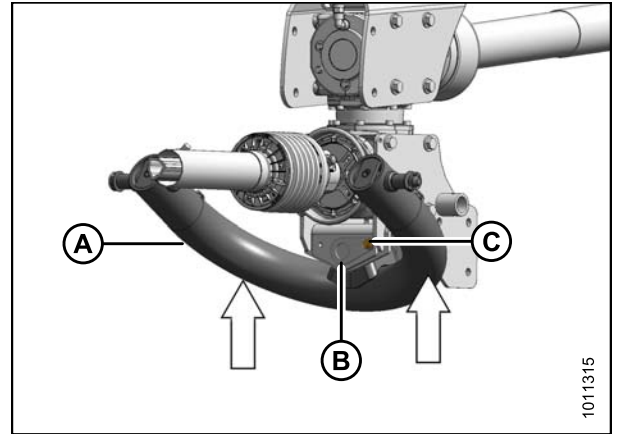


Figure 4.30: Two-Point Hitch Adapter

- Install springs (A) as shown.
- Assemble power take-off (PTO) driveline male half (B) onto female half on hitch gearbox. Push male half so that PTO shaft is at its fully compressed length.
- Locate driveline on hook (C).

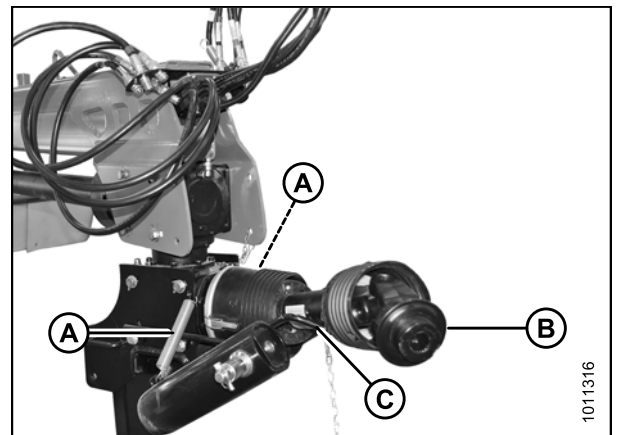


Figure 4.31: Driveline

- Retrieve stand (A).
- Position stand (A) under gearbox as shown, and install hitch pin (B) to secure stand.
- Install hairpins (C) to secure hitch pin (B).
- Lower hitch onto stand.

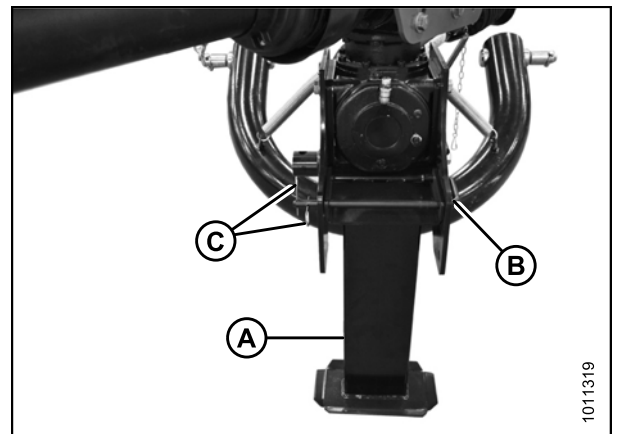


Figure 4.32: Stand

## 4.4 Installing Hitch Swing Cylinder

The hitch swing cylinder can be installed on either side of the hitch, depending on whether or not the Road Friendly Transport™ system will be installed. Be sure to follow the instructions carefully.

1. Remove the banding (A) securing the hitch swing cylinder (B) to the hitch.
2. Remove pin (C) securing cylinder (B) to hitch.

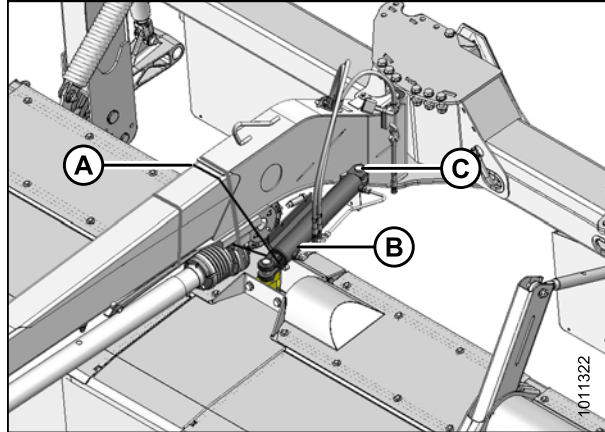


Figure 4.33: Hitch Swing Cylinder

To install cylinder on unit with the Road Friendly Transport™ system, proceed as follows:

3. Disconnect the hoses at the cylinder and cap off openings on cylinder and hoses.
4. Reposition cylinder (A) at right side of hitch and attach barrel end to lug (B) on hitch with pin (C). Secure with cotter pin (D).

**NOTE:**

Clevis end of cylinder will be attached to Road Friendly Transport™ system casting when the system is primed. Refer to [3.11 Priming the Hitch Swing Cylinder, page 58](#).

5. Turn valve (E) 180 degrees, so that the fittings are pointing up.

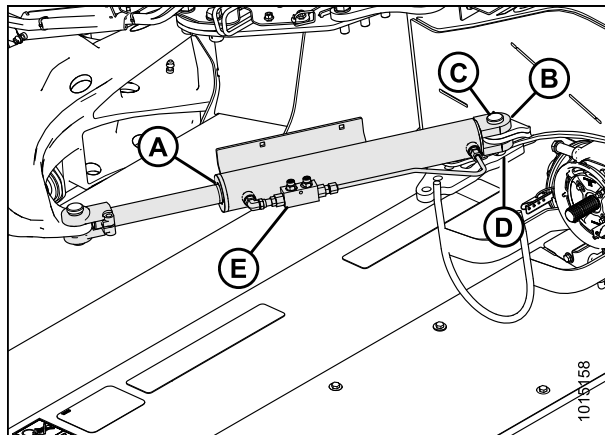


Figure 4.34: Hitch Swing Cylinder

## 4.5 Attaching Aft Driveline

This procedure describes the attachment of the driveline to the header drive gearbox.

### IMPORTANT:

If a conditioner swap is required before delivery to the customer, do **NOT** perform this step at this time. Skip to [3.10 Installing Field Wheels](#), page 56.

1. Support driveline and remove strapping (A) securing driveline (B) to hitch. Remove all packing material.

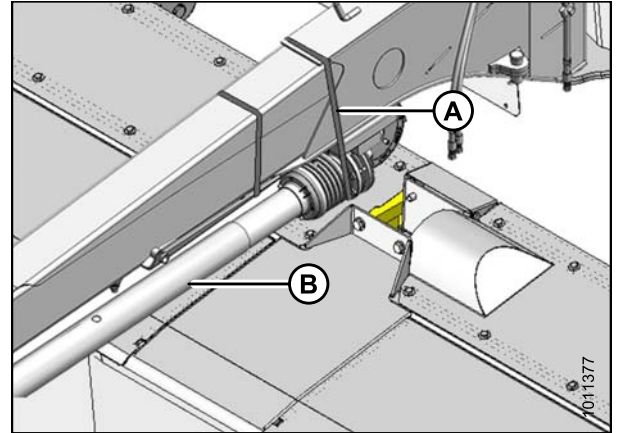


Figure 4.35: Driveline Strapping

2. Remove strapping (A) and packing material securing steering arm (B) to hitch. Pivot steering arm to the side for now.

### NOTE:

Strapped contents maybe under pressure.

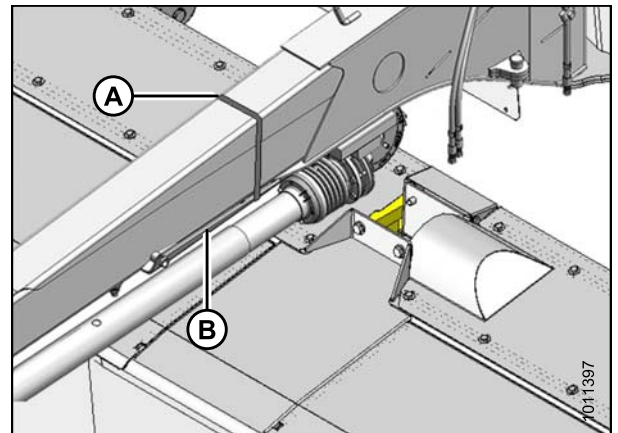


Figure 4.36: Steering Arm Strapping

3. Remove two bolts (A) with spacers (B) at top of aft gearbox. Retain hardware.
4. Undo latches (C) securing driveshield cone (D) to gearbox and remove cone. If necessary, use a screwdriver or equivalent to undo latches (C).
5. Rotate the gearbox until the input shaft is facing towards the driveline.

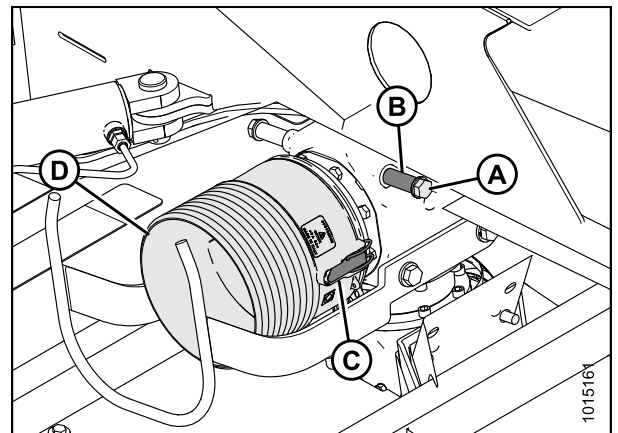


Figure 4.37: Driveline Shield

## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

- Slide cone (A) onto driveline with latches (B) towards the gearbox.
- Remove nut (C) and washer (E) from tapered pin (D), and tap out pin from yoke with a hammer.

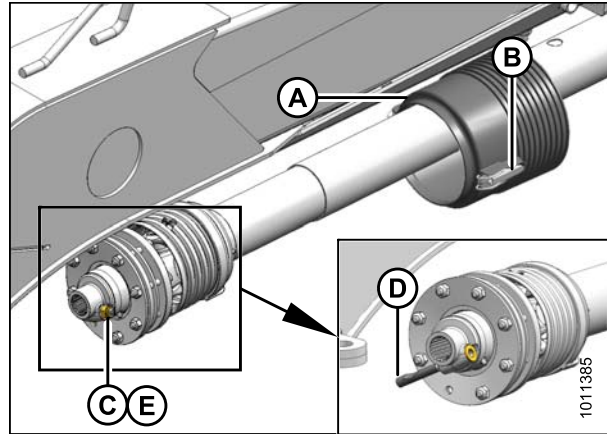


Figure 4.38: Clutch Driveline

- Attach driveline (A) to gearbox shaft.

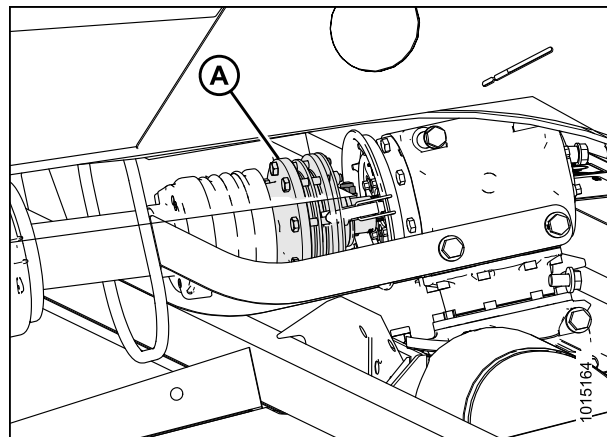


Figure 4.39: Clutch Driveline

- Insert tapered pin (A) by hand. Ensure the pin lines up with groove in yoke and is fully inserted. The notch in the pin should be facing toward the shaft.
- Clean the threads on pin (A) after it has been inserted.
- Install washer (B) and nut (C) on tapered pin and torque to 110 ft·lbf (149 N·m). The end of the pin must be recessed approximately 0-0.08 in. (0-2 mm) (D).

### NOTE:

Do NOT use an impact wrench to install or torque the nut.

- Install the cone onto gearbox. Use the latches to secure it to the gearbox.

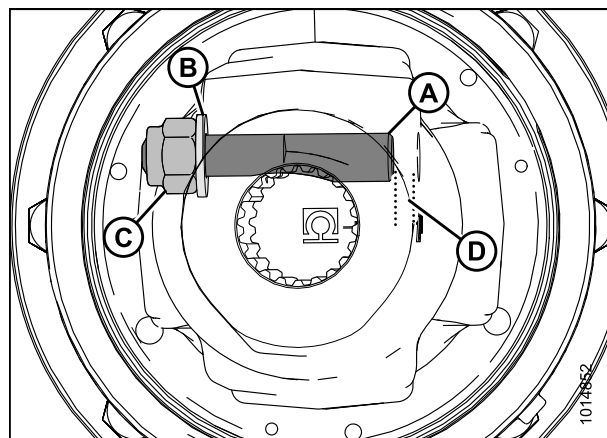


Figure 4.40: Clutch Driveline



## 4.6 Attaching Steering Arm

This procedure describes the attachment of the steering arm to the header drive gearbox.

**IMPORTANT:**

If a conditioner swap is required before delivery to the customer, do NOT perform this step at this time. Skip to [3.10 Installing Field Wheels](#), page 56.

1. Lower arm (A) from under the hitch and slide the arm weldment (B) off arm.
2. Apply grease to arm (A).
3. Slide the arm weldment (C) onto arm (A) in opposite orientation.
4. Position arm weldment (C) onto gearbox (D).

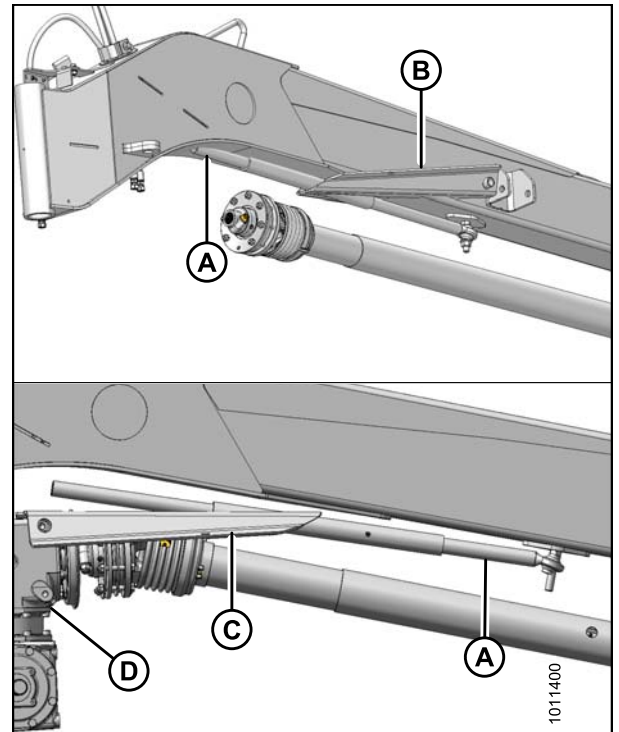


Figure 4.41: Steering Arm

5. Line up the two mounting holes in arm weldment with the forward threaded holes in the gearbox.
6. Install spacers (A) into arm weldment (B) and install M16 x 80 hex head bolts (C) with red Loctite® 262, and washers (D).
7. Torque bolts to 150 ft·lbf (203 N·m).

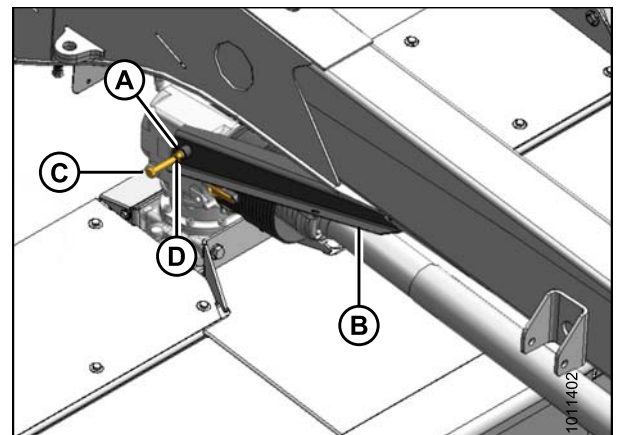
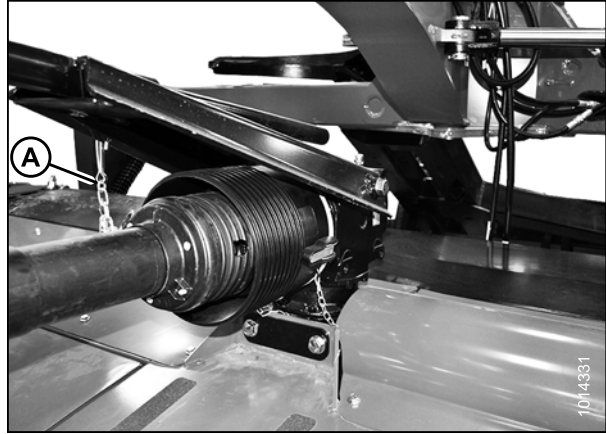


Figure 4.42: Steering Arm

## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

8. Attach the safety chain (A) from driveshield cone to slotted hole in the arm weldment.



**Figure 4.43: Driveshield Shield**

## 4.7 Removing Slow Moving Vehicle Sign (SMV) Covering

1. Remove the covering from the SMV sign (A).

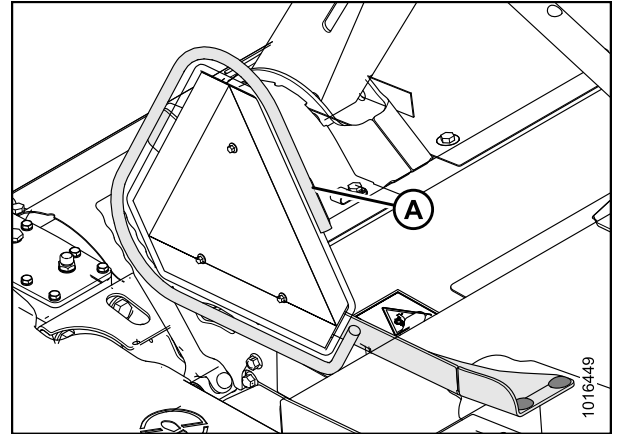


Figure 4.44: SMV Sign

## 4.8 Installing Options

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

### 4.8.1 Completing Road Friendly Transport™ System Installation

This section describes the installation of the Road Friendly Transport™ system. The basic components are installed first, the hydraulic systems are connected, and the lighting and signage are installed last.

#### *Installing Components*

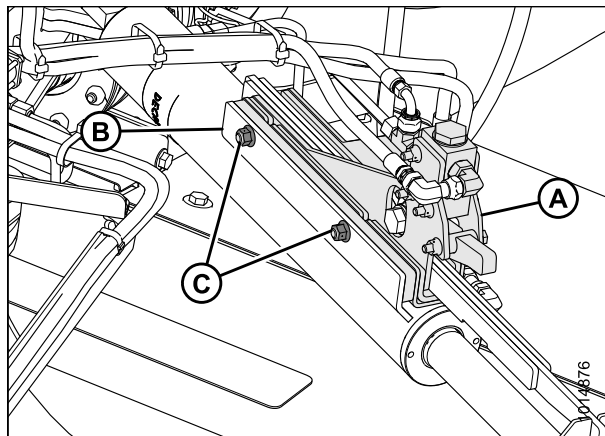
##### **Installing Transport Alignment Control**

This section describes the installation of the basic parts of the Road Friendly Transport™ system.

1. Install the cam assembly (A) onto swing cylinder plate (B) with bolts using existing holes in plate. Install nuts (C) and torque to 40–45 ft-lbf (55–60 N-m).

**NOTE:**

When installing the cam assembly (A), check for hose twisting. If required, loosen hose fitting to allow hose to untwist. Torque fitting once complete.

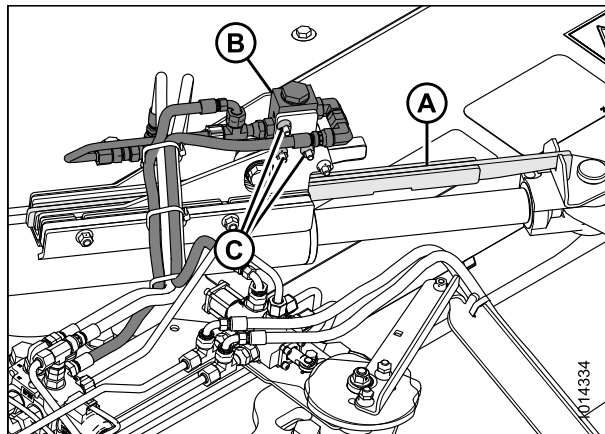


**Figure 4.45: Alignment Control (Rear Right-Hand View)**

2. Check the travel of the cam arm (A) by sliding it in and out of the cam assembly (B).

**NOTE:**

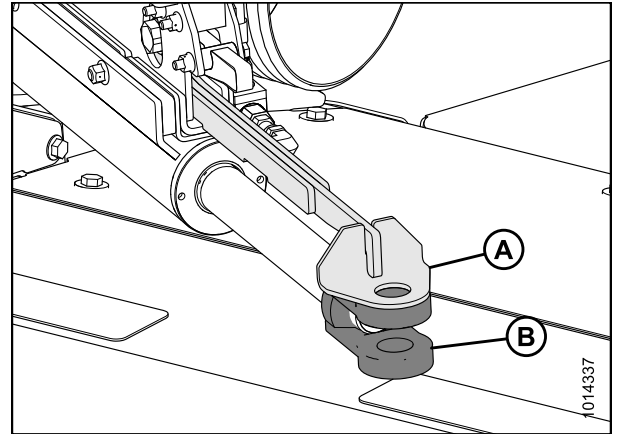
If the cam arm does not slide easily. Loosen valve mounting bolts (C). Slide the valve (B) upwards the top of the mounting holes. Retighten valve mounting bolts (C).



**Figure 4.46: Alignment Control (Rear Right-Hand View)**

## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

3. Align the hole in the cam arm (A) with the hole in the cylinder clevis (B).

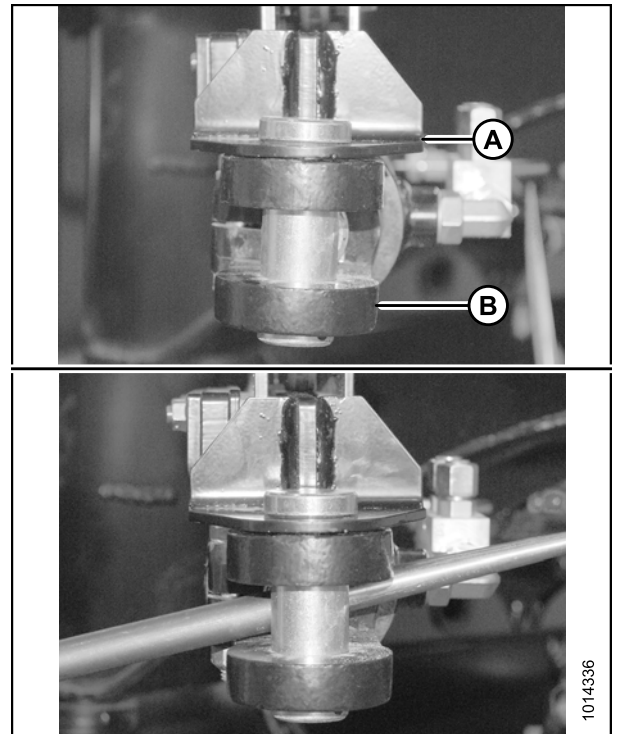


**Figure 4.47: Alignment Control (Rear Right-Hand View)**

4. Ensure the end of the cam arm (A) is parallel with the clevis end (B) of the cylinder. If adjustment is required, use a bar and turn the clevis until the clevis is parallel with the cam arm (A).

**NOTE:**

Clevis end of cylinder will be attached to Road Friendly Transport™ system casting when the system is primed. Refer to [3.11 Priming the Hitch Swing Cylinder, page 58](#).



**Figure 4.48: Cam Arm Alignment**

### *Installing Hydraulic Lines and Hoses*

This section describes the installation of the transport hydraulic control system.

**NOTE:**

Refer to [10.2 Torque Specifications, page 206](#) for hydraulic fitting installation details.

## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

1. Place a container or rag under fitting on hitch swing cylinder.
2. Remove existing fitting at location (A) from the block.
3. Remove cap from fitting (C).
4. Retrieve ORFS-6 x ORB-6 connector (B) from shipping bag A and install into location (A).

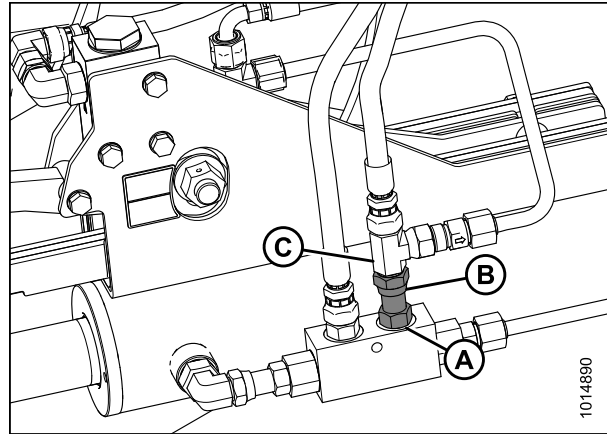


Figure 4.49: Alignment Valve Fitting

5. Remove cap from fitting (A).
6. Remove plug from hose (B). Install hose to fitting at location (A).

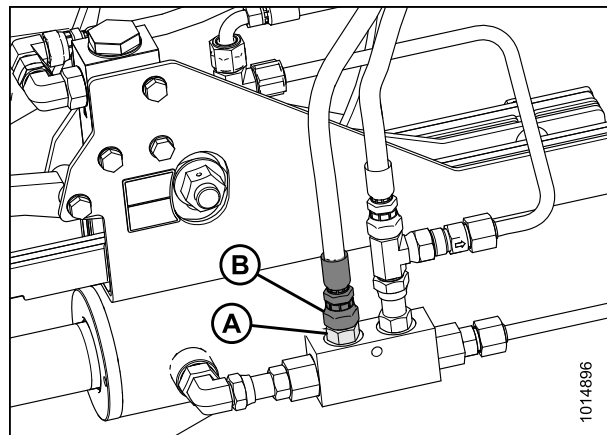


Figure 4.50: Alignment Valve Fitting

7. Connect hose (red collar #2) (B) to fitting in port A1 on selector valve (C).
8. Connect hose (blue collar #2) (A) to fitting in port A2 of the selector valve (C).
9. Use a cable tie and secure hoses (A) and (B) together.

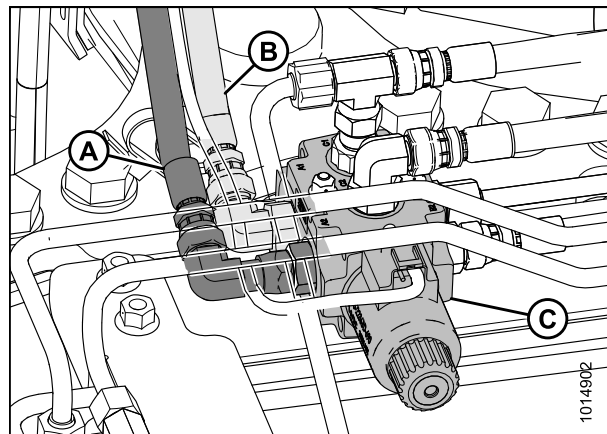


Figure 4.51: Selector Valve Supply

## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

### Installing Secondary Lift Hose for Field Wheels

**NOTE:**

The secondary lift hose is required to lift the field wheels fully into storage position when the mower conditioner is in transport mode.

10. Retrieve the following secondary lift hoses from shipping bag according to your header size:
  - **13-Foot Headers:** Use hose MD #224160
  - **16-Foot Headers:** Use hose MD #224162
11. Retrieve the blue collars with the number one (blue collar #1) on them from the shipping bag. Place one collar on both ends of the secondary lift hose (B).
12. Undo adjustable strap (A) around hoses at aft end of hitch.
13. Feed male orb end of hose (B) into access hole (C) at rear of hitch through hitch to opening at front.

**NOTE:**

If you are installing a hydraulic center-link (MD #B5760), install hydraulic hoses at this time.

**NOTE:**

There is a green wire pre installed in the hitch for pulling hoses through the hitch.

14. Position long hose (A) so that the exposed length at front of hitch matches existing hose (B). Route hose through guide (C).
15. At front of hitch, loosen nut (D) on hose clamp (E) until hose (A) can be positioned in clamp.
16. Tighten nut (D).

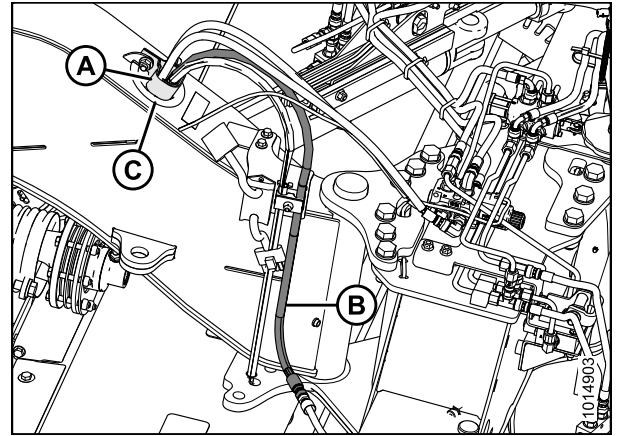


Figure 4.52: Lift Hoses

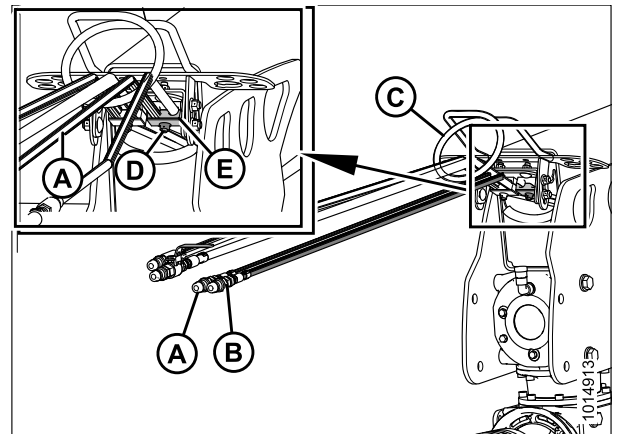


Figure 4.53: Lift Hoses

## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

17. At rear of hitch, secure hoses with adjustable strap (A).

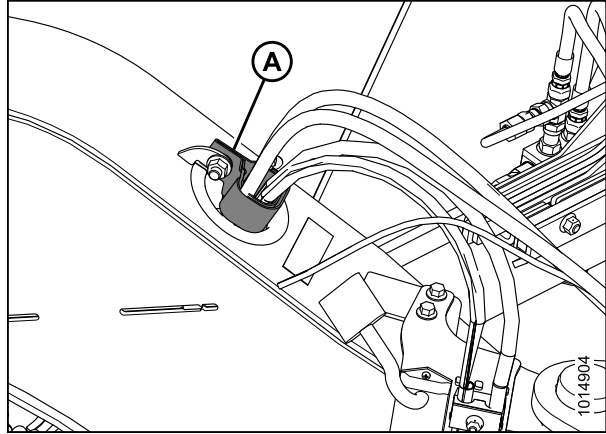


Figure 4.54: Lift Hose

18. Connect hoses (MD #247106) (A) and (MD #224160 or MD #224162) (B) at the hitch pivot.

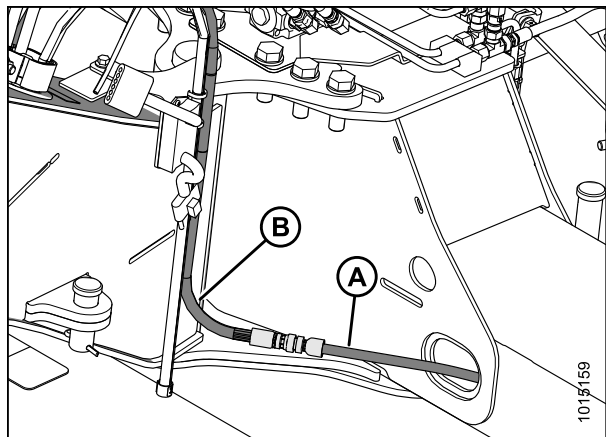


Figure 4.55: Lift Hose

19. Retrieve ORB-8 coupler (A), and plastic cap (B) from hardware bag.
20. At forward end of hitch, install coupling (A), and plastic cap (B) onto secondary lift hose (C). Do **NOT** attach hoses to tractor at this time.

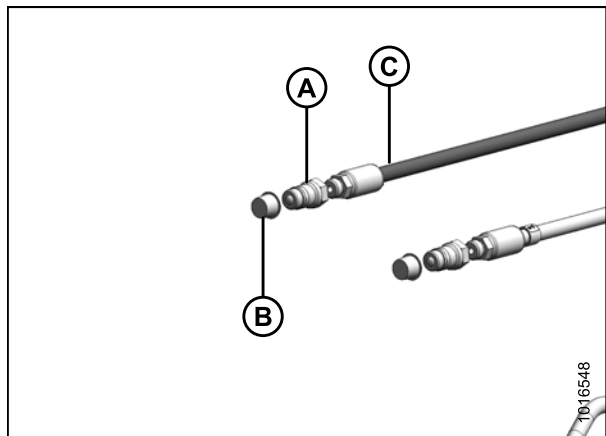


Figure 4.56: Lift Hose Fittings

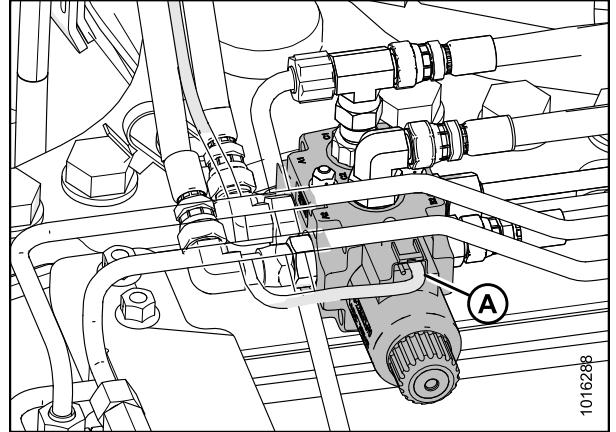


## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

### *Installing Electrical Components*

#### **Connecting Selector Valve**

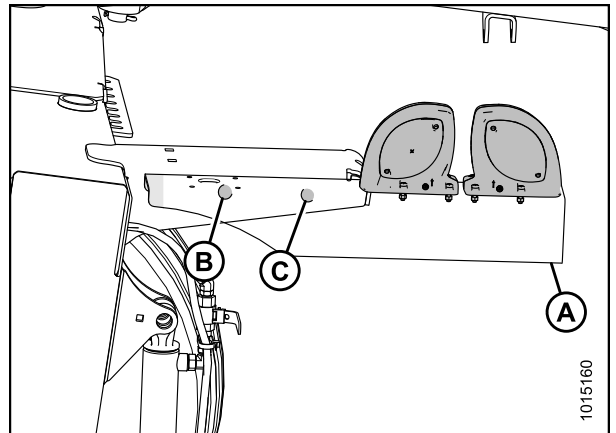
1. Connect the selector valve harness (A) to the selector valve.



**Figure 4.57: Selector Valve Supply**

#### **Installing Light Assembly**

1. Locate the right-hand light assembly (A).
2. Loosen bolt (C). Rotate the light assembly (A).
3. Install bolt (B).



**Figure 4.58: Left Side of Carrier**

## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

### Connecting Transport Lighting Module

1. Connect the harness (A) to the transport lighting module (B).

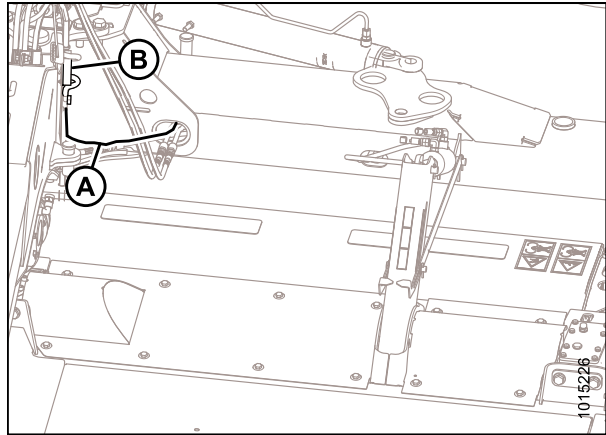


Figure 4.59: Transport Lighting Module

### Installing Remote Control

1. Retrieve remote control (A) with wiring harness.
2. Place remote control (A) on hitch temporarily.

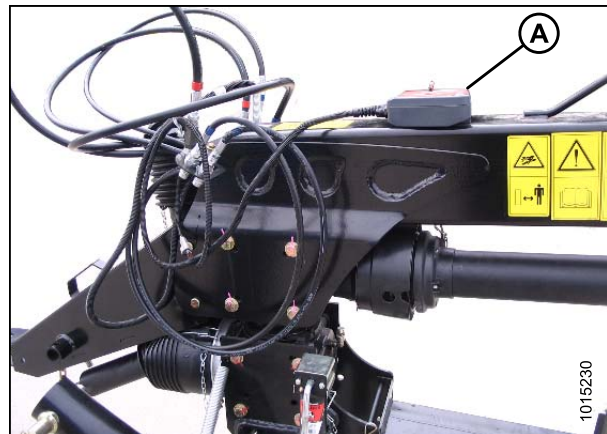


Figure 4.60: Remote Control on Top of Hitch

3. Locate the connector (C) that branches off the seven pole trailer plug (A) and attach it to the remote wiring harness (B).

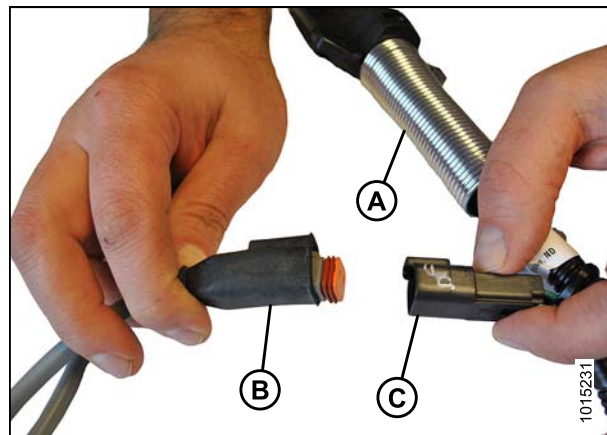


Figure 4.61: Transport Harness

## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

4. Connect the remote control power wire (B) to the tractor's power supply, then place it in the cab of the tractor.
  - Connect wire (C) with no tag to tractor ground.
  - Connect wire (D) with the red tag to tractor power.

**NOTE:**

If the red tag is missing, identify the power by locating the wire with the number one printed on it. The ground wire has a number two printed on it.

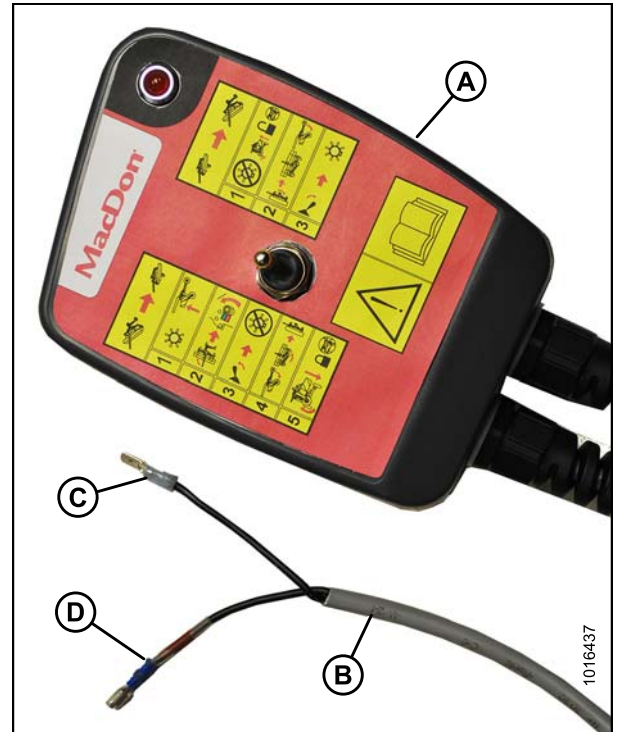


Figure 4.62: Remote Control

### 4.8.2 Installing Hydraulic Center-Link

The hydraulic center-link kit is supplied in a separate shipment. Refer to instructions supplied with the kit for installation procedure.

### 4.8.3 Installing Tall Crop Divider

**IMPORTANT:**

If header will be transported on public roads in the Road Friendly Transport™ mode, do not install the tall crop dividers. Install the dividers after the machine is delivered to the customer.

## 4.9 Setting up the Tractor

### 4.9.1 Adjusting the Drawbar

#### CAUTION

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

1. Adjust tractor drawbar to meet the specifications listed in Table 4.1 ASAE Standard A482 Specifications, page 100.
2. Secure the tractor drawbar so the hitch pin hole is directly below the driveline.

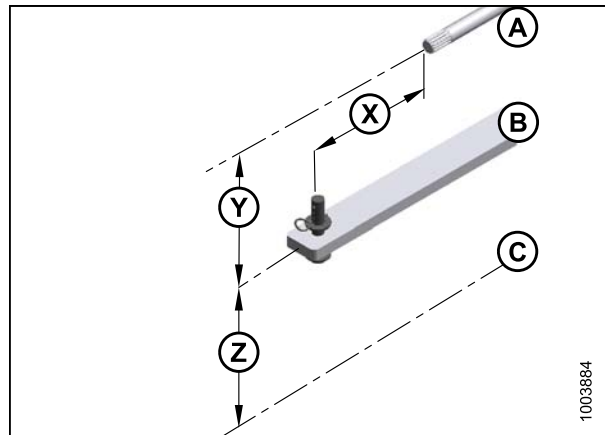


Figure 4.63: Tractor Drawbar Adjustments

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

Table 4.1 ASAE Standard A482 Specifications

Dimension	1000 rpm Power Take-Off	
	1-3/8 in. Diameter	1-3/4 in. Diameter
X	16 in. (406 mm)	20 in. (508 mm)
Y	7-7/8–13-3/4 in. (200–350 mm) <b>8 in. (203 mm) recommended</b>	
Z	13–17 in. (330–432 mm) <b>16 in. (406 mm) recommended</b>	

### 4.9.2 Installing Drawbar Hitch Adapter

#### CAUTION

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

1. Remove hairpin (A) and pin (B).
2. If necessary, loosen four jam nuts (C), and then loosen four nuts (D) so that hitch adapter (E) will slide onto tractor drawbar (F).
3. Align hole in adapter (E) with hole in drawbar (F) and install pin (B). Secure with hairpin (A).
4. Gradually tighten the four nuts (D) to 400 ft-lbf (540 N·m).

**NOTE:**

Ensure hardened washers, and Class 10 nuts supplied with adapter are used.

5. Tighten four jam nuts (C).

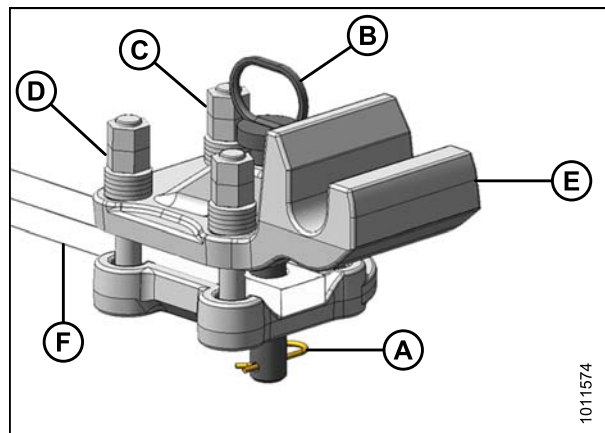


Figure 4.64: Drawbar Hitch Adapter

## 4.10 Attaching Mower Conditioner to the Tractor

Depending on tractor configuration, refer to the applicable attaching procedure:

- [3.9.1 Attaching with Drawbar Hitch, page 49](#)
- [3.9.2 Attaching with Two-Point Hitch, page 51](#)

### 4.10.1 Attaching with Drawbar Hitch

#### CAUTION

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

1. Remove lynch pin (A) from clevis pin (B), and remove clevis pin from mower conditioner hitch.

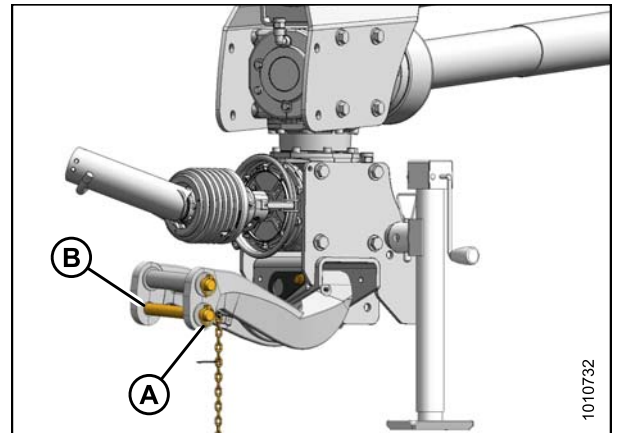


Figure 4.65: Mower Conditioner Hitch

2. Move tractor to position drawbar hitch adapter (A) under pin (B) in mower conditioner hitch. Adjust height as necessary with jack (C).
3. Shut down tractor and remove key from ignition.

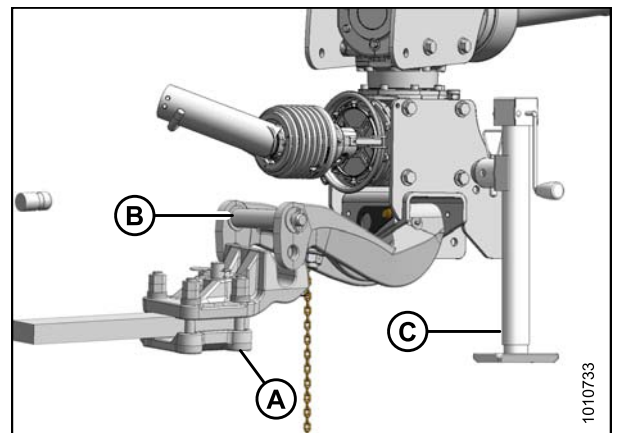


Figure 4.66: Mower Conditioner Hitch

## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

4. Lower hitch with jack (A) so that pin (B) engages drawbar hitch adapter (C).
5. Install clevis pin (D) and secure with lynch pin (E).

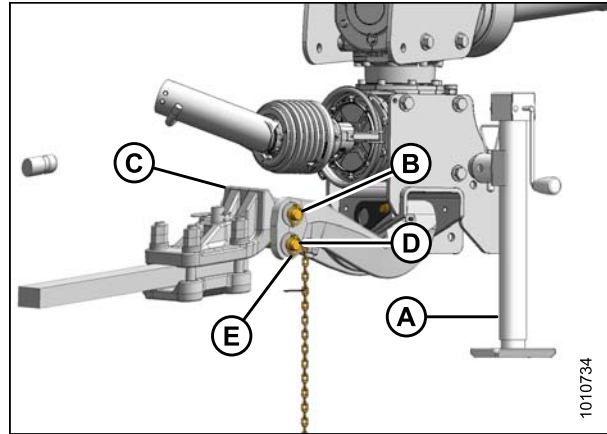


Figure 4.67: Mower Conditioner Hitch

6. Position driveline (A) onto tractor power take-off (PTO).
7. Pull back collar (B) on driveline (A), and push driveline until it locks. Release collar.
8. Route safety chain (C) from mower conditioner through chain support (D) on drawbar hitch adapter and around tractor drawbar support. Lock hook on chain.

**NOTE:**

If the tractor has a three-point hitch, lift the links as far as possible to prevent damage to the hitch.

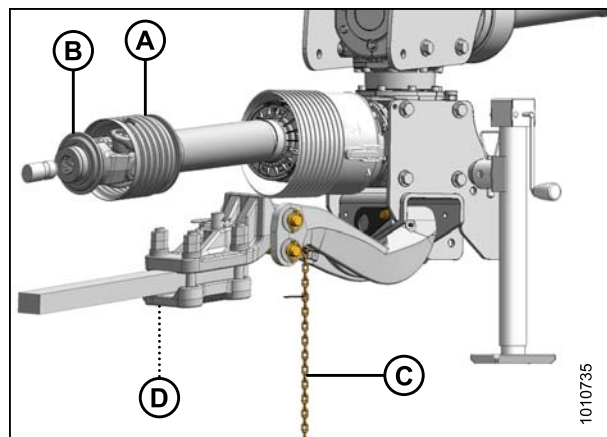


Figure 4.68: PTO Driveline

9. Raise jack (A), and remove pin (B).

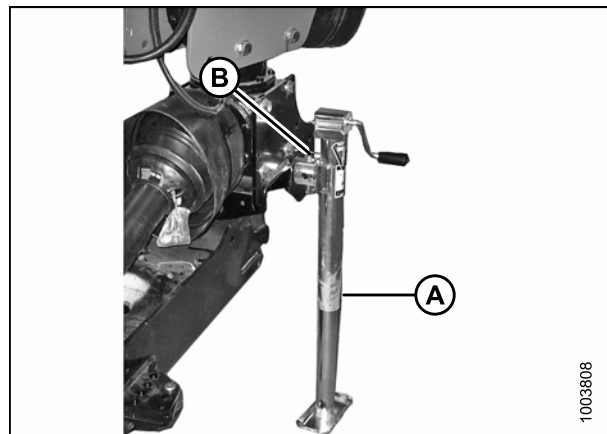


Figure 4.69: Hitch Jack

## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

10. Move jack (A) to storage position on top of hitch, and secure with pin (B).
11. Proceed to [3.9.3 Connecting Hydraulics, page 53](#).

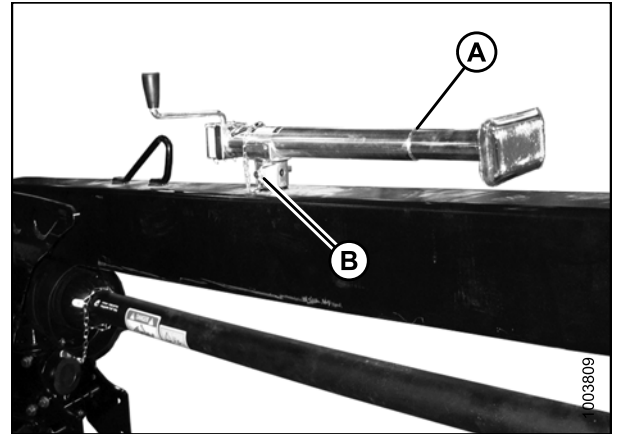


Figure 4.70: Jack Storage

### 4.10.2 Attaching with Two-Point Hitch

Follow these steps to attach Category II, IIIN, and III two-point hitches:

#### CAUTION

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

1. Position tractor and align tractor hitch arms (A) with hitch adapter (B).
2. Shut off tractor and remove key.
3. Remove lynch pins (C) and washers from hitch adapter.

#### NOTE:

If tractor is equipped with a Category III hitch, use a bushing (MD #224322) on each hitch pin (D).

4. Secure arms (A) onto adapter pins (D) with lynch pins (C).
5. Install anti-sway bars (not shown) on tractor hitch to stabilize lateral movement of hitch arms (A). Refer to your tractor operator's manual.

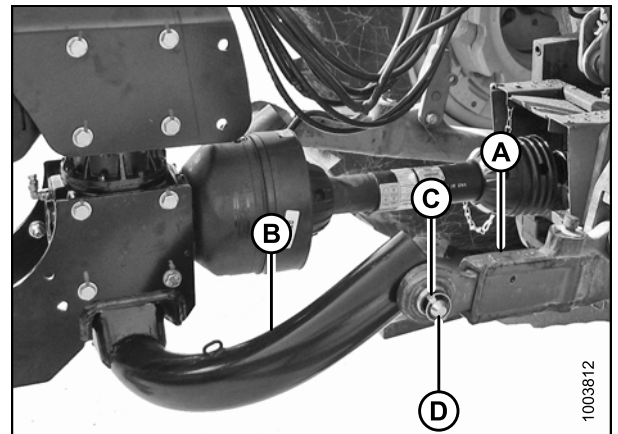


Figure 4.71: Two-Point Hitch Configuration

## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

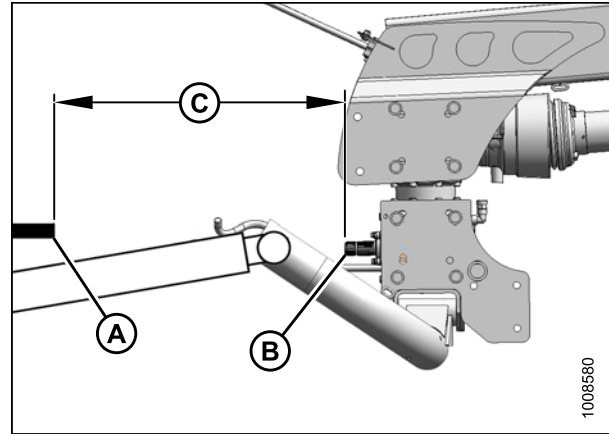
6. Check distance (C) between tractor power take-off (PTO) shaft (A) and mower conditioner hitch gearbox shaft (B) (without the front half of the driveline attached).
7. Ensure that measurement does NOT exceed the dimensions listed in Table 4.2 *Distance between Hitch Gearbox and Tractor PTO*, page 104.

**Table 4.2 Distance between Hitch Gearbox and Tractor PTO**

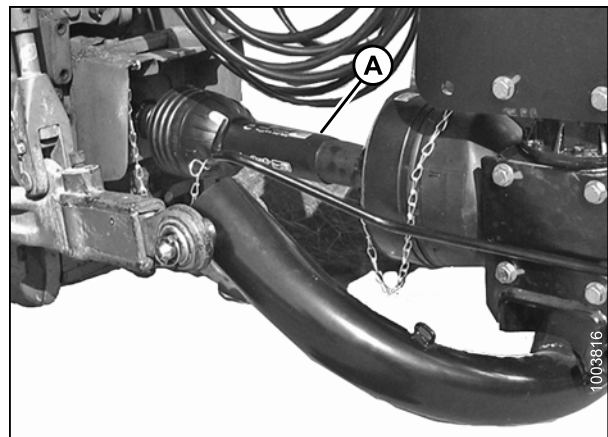
Driveline Shaft Size	Distance (C)
1-3/8 in. (34 mm)	27 in. (750 mm)
1-3/4 in. (43 mm)	31 in. (800 mm)

8. Position driveline (A) onto tractor PTO shaft making sure that driveline is approximately level.
9. Pull back collar on driveline (A) and push driveline until it locks. Release collar.

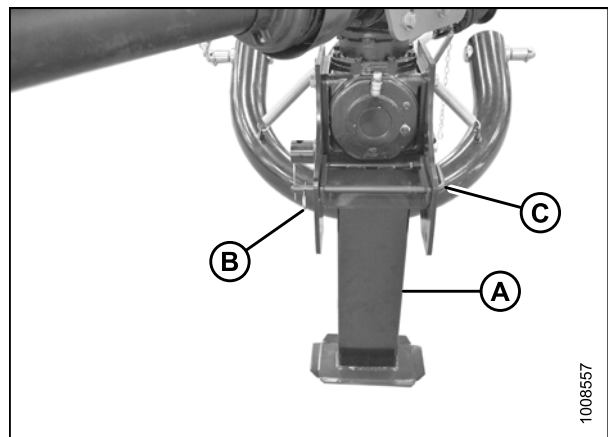
10. Start tractor and raise hitch so that stand (A) is off the ground. Shut down tractor and remove key from ignition.
11. Remove inner hairpin (B) and pull lock (C) to release stand.



**Figure 4.72: Allowable Driveline Length**



**Figure 4.73: Mower Conditioner Driveline Attached to Tractor PTO**



**Figure 4.74: Hitch Stand**



## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

12. Raise stand (A), rotate lock (B) clockwise to vertical position, and re-engage lock (B) to hold the stand in the storage location.

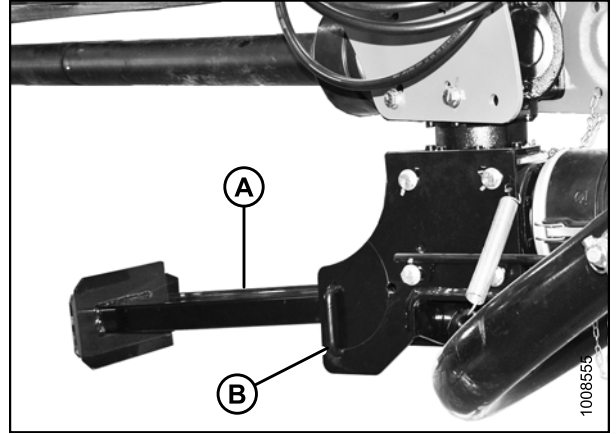


Figure 4.75: Hitch Stand

13. Secure lock with lynch pin (A).

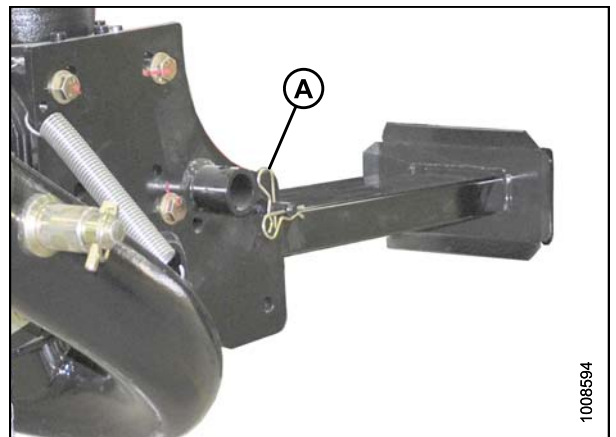


Figure 4.76: Hitch Stand

### 4.10.3 Connecting Hydraulics

#### **WARNING**

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

#### **NOTE:**

Refer to numbered/colored bands on hoses to identify lift, swing/transport, and tilt hose sets.

## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

**Table 4.3 Hydraulic System Hoses**

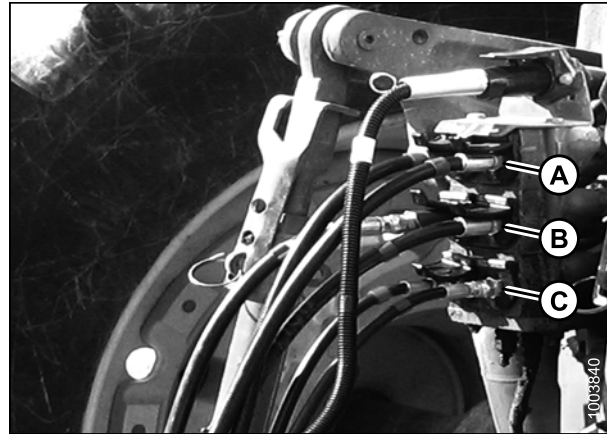
System	Hose Identification	Tractor Hydraulics
Lift (A)	Red #1 - pressure Blue #1 - return (only with Road Friendly Transport™ system installed)	Control 1
Swing/ Transport (B)	Red #2 - pressure Blue #2 - return	Control 2
Tilt (C) <sup>2</sup>	Red #3 - pressure Blue #3 - return	Control 3

1. Connect the lift cylinder hose (red label with #1) to the tractor's hydraulic receptacle. The second hose (blue #1) is required only when the Road Friendly Transport™ system installed. Refer to [Table 4.4 Lift System, page 106](#).

2. Connect the two hitch swing cylinder hoses (labelled #2) to the tractor hydraulic receptacles. Refer to [Table 4.5 Hitch Swing and Transport System, page 106](#).

3. Connect the two mower conditioner tilt cylinder hoses (labelled #3) to the tractor hydraulic receptacles. Refer to [Table 4.6 Mower Conditioner Tilt System, page 106](#). (Not required with mechanical center-link.)

<sup>2</sup> Available with hydraulic tilt option installed.



**Figure 4.77: Hydraulic Connections**

**Table 4.4 Lift System**

Control Lever Position	Cylinder Movement	Mower Conditioner Movement
Forward	Retract	Lower
Backward	Extend	Raise

**Table 4.5 Hitch Swing and Transport System**

Control Lever Position	Cylinder Movement	Mower Conditioner Direction
Forward	Extend	Right
Backward	Retract	Left

**Table 4.6 Mower Conditioner Tilt System**

Control Lever Position	Cylinder Movement	Mower Conditioner Movement
Forward	Retract	Lower
Backward	Extend	Raise

#### 4.10.4 Connecting Electrical Wiring Harness

1. Ensure that Pin #4 (A) in the tractor receptacle is **NOT** continuously energized (refer to your tractor operator's manual). If necessary, remove the appropriate fuse.

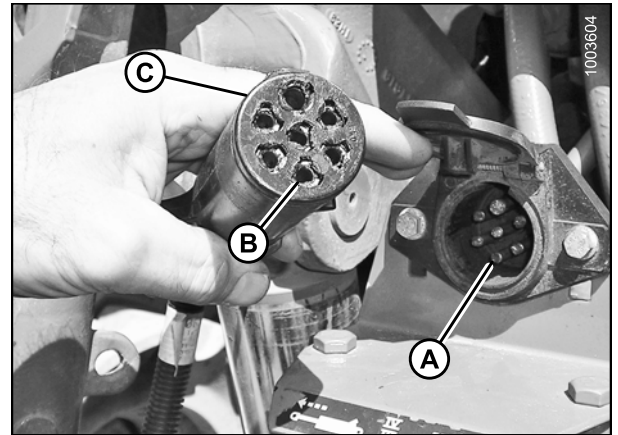
**IMPORTANT:**

Older model tractors may have Pin #4 (A) energized as an accessory circuit; however, pin position (B) is used to supply power to the mower conditioner's brake lights.

2. Connect the mower conditioner wiring harness connector (C) to the tractor receptacle.

**NOTE:**

The connector is designed to fit tractors equipped with a round seven-pin receptacle (SAE J560).



**Figure 4.78: Electrical Wiring Harness and Receptacle**

## 4.11 Installing Field Wheels

1. Remove the shipping wire (B) from the wheel spindle (A). Do this to each side.

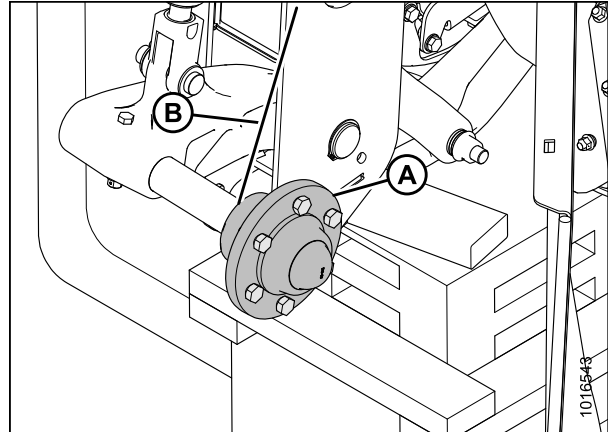


Figure 4.79: Wheel Spindle

2. Remove wheel bolts (A) from spindle (B).

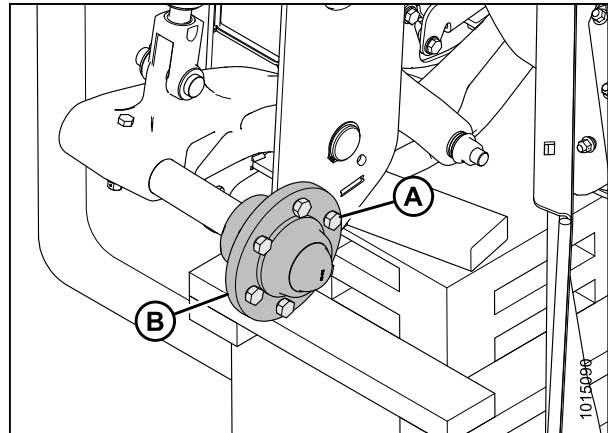


Figure 4.80: Wheel Spindle

### CAUTION

When installing wheel, be sure to match countersunk holes with bolt head profiles. Holes that are not countersunk do NOT correctly seat the bolts.

3. Position wheel (A) on spindle, install bolts (B), and partially tighten.

#### IMPORTANT:

Be sure valve stem (C) points away from wheel support.

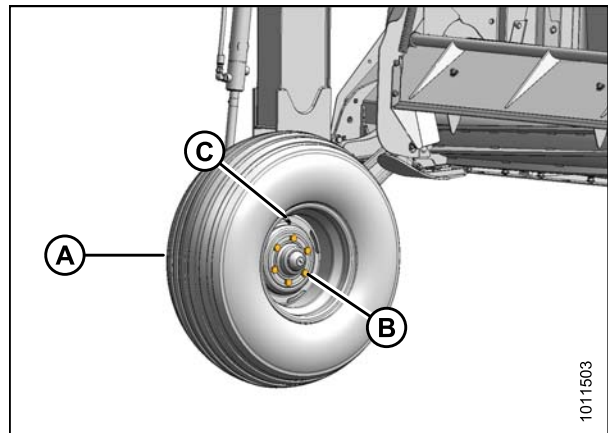


Figure 4.81: Installing Wheel Bolts

## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

4. Lower wheels to the ground and torque wheel bolts to 120 ft·lbf (160 N·m) using the tightening sequence shown.

**NOTE:**

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

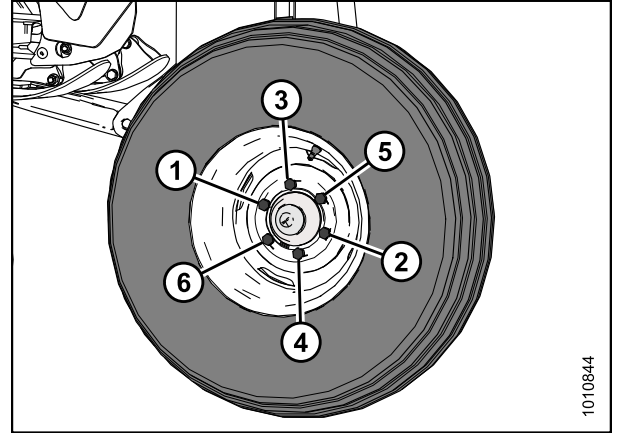


Figure 4.82: Tightening Sequence

## 4.12 Priming the Hitch Swing Cylinder

1. On the remote control, move the transport switch to the lower position (B) and ensure that light (A) is illuminated. The hitch swing circuit will now be active.



Figure 4.83: Transport Switch

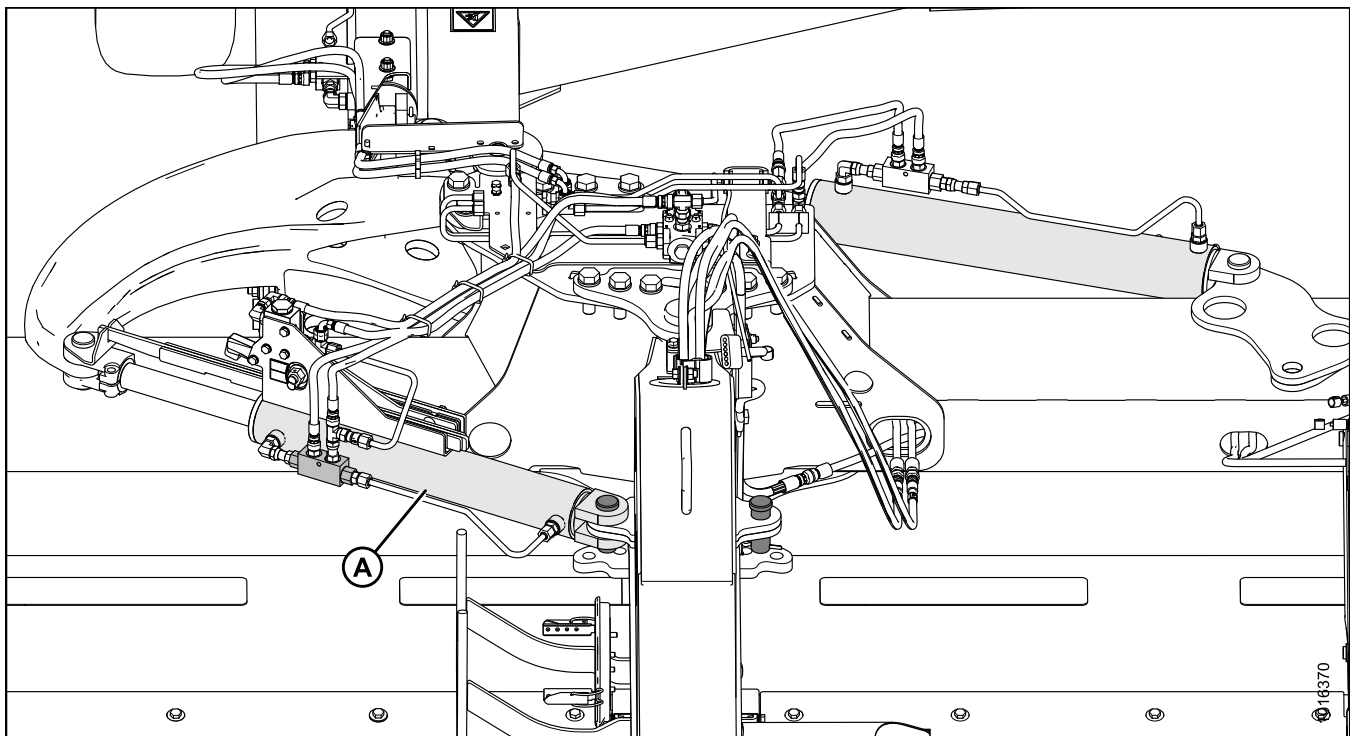


Figure 4.84: Hydraulic System

2. Using the tractor's hydraulics, extend and retract the swing cylinder (A) several times to purge any air in the cylinder.

## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

### NOTE:

Ensure there is no contact with the rear link arm when the hitch swing cylinder extends.

3. Align the clevis pin hole in the cylinder clevis (B), cam arm (C) and rear link arm (D). Install clevis pin (D) and secure with a cotter pin (E).

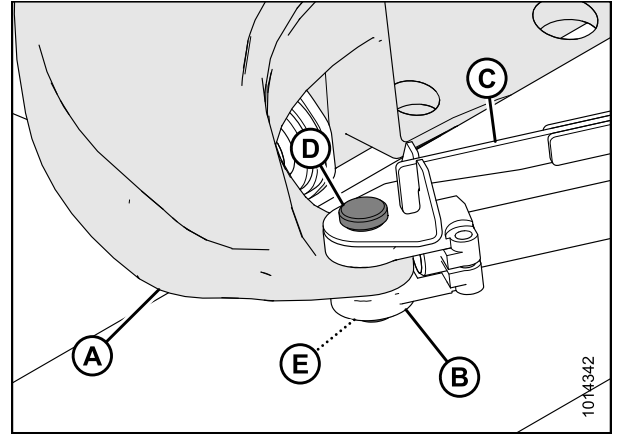


Figure 4.85: Rear Arm Link

## 4.13 Installing Road Friendly Transport™ Wheels

1. Retrieve clevis pin (A) and cotter pin (B) from shipping bag and install onto hitch bracket at side of hitch.

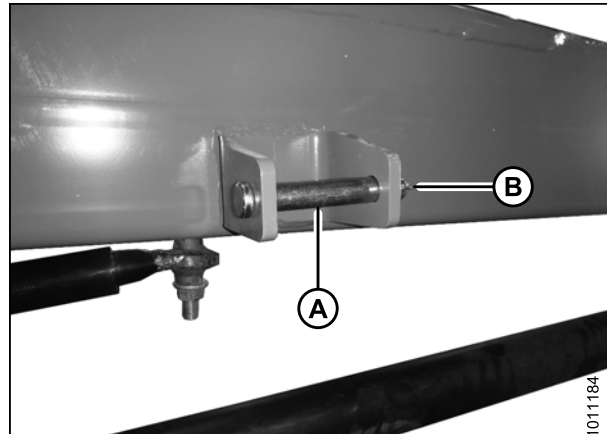


Figure 4.86: Latch Pin

2. Remove bolt (B) holding the axle assembly (A) in place.
3. Slide axle assembly (S) out of the support.

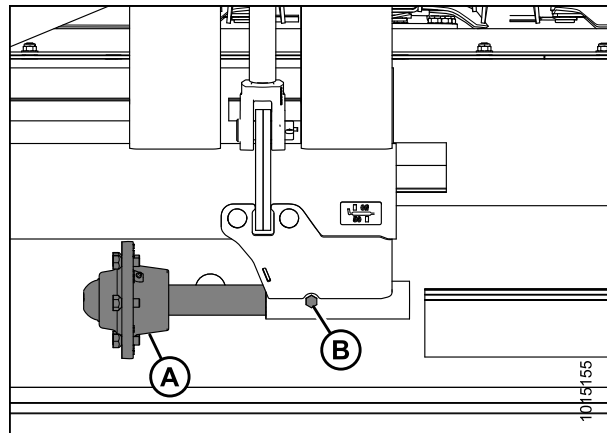


Figure 4.87: Axle Assembly Relocation

4. Install the axle assembly (A) into the support.
5. Install bolt (B) and nut to secure it. Torque to 50 ft lbf (68 N m).
6. Remove wheel bolts from the hub (A).

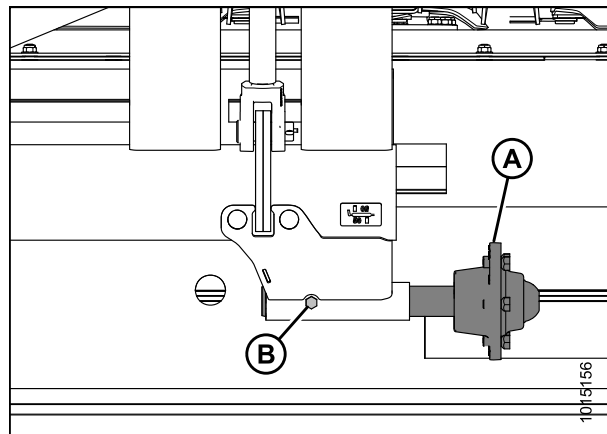


Figure 4.88: Axle Assembly Relocation



## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

7. In the cab, move transport switch to the upper position (B) and ensure that light (A) is NOT illuminated. The hitch swing circuit is now deactivated and the transport circuit is active.
8. Using tractor hydraulics, raise the transport assembly high enough to install the wheels.



Figure 4.89: Transport Switch

### CAUTION

When installing wheel, be sure to match countersunk holes with bolt head profiles. Holes that are not countersunk do NOT correctly seat the bolts.

9. Retrieve transport wheels and install wheels with wheel bolts. Ensure valve stem faces outboard. Do not fully tighten bolts.
10. Lower wheels to the ground.
11. Torque wheel bolts to 120 ft-lbf (160 N·m) following the tightening sequence shown.

#### NOTE:

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

12. Check tire pressure. Refer to [6.2 Checking Tire Pressure, page 136](#).

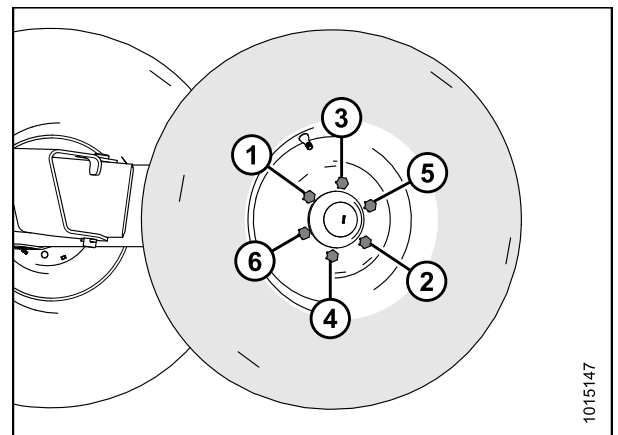


Figure 4.90: Tightening Sequence

## 4.14 Setting up Forming Shields

Each type of conditioner uses a different configuration for the swath forming shield. Refer to the applicable instruction for the conditioner supplied with the machine.

**NOTE:**

Before setting up the forming shields, convert the header to field mode. Refer to [6.18.2 Converting from Transport to Field Mode](#), page 160.

If a finger conditioner is installed, continue to [4.14.1 Setting up Forming Shield for Finger Conditioner](#), page 114.

If a roll conditioner is installed, continue to [4.14.2 Setting up Forming Shield for Roll Conditioner](#), page 118.

If a conditioner is not installed, continue to [4.16 Discharge Shield \(No Conditioner\)](#), page 122.

### 4.14.1 Setting up Forming Shield for Finger Conditioner

**NOTE:**

Transport not shown in illustrations for clarity.

**NOTE:**

Before setting up the forming shields, convert the header to field mode. Refer to [6.18.2 Converting from Transport to Field Mode](#), page 160.

1. Remove shipping wire (A) securing forming shield covers (B) to pallet.

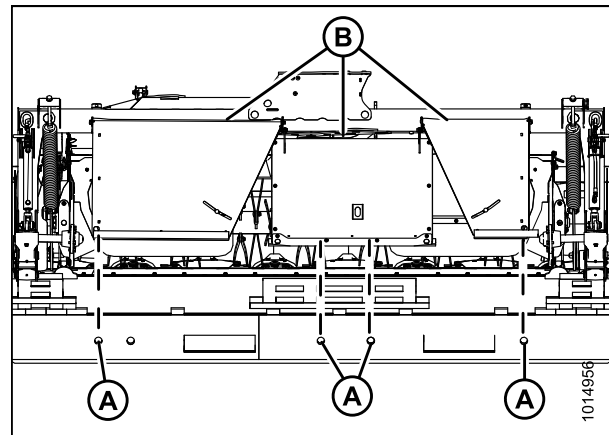


Figure 4.91: Header Strapping

2. Remove the two outboard forming shields (A).

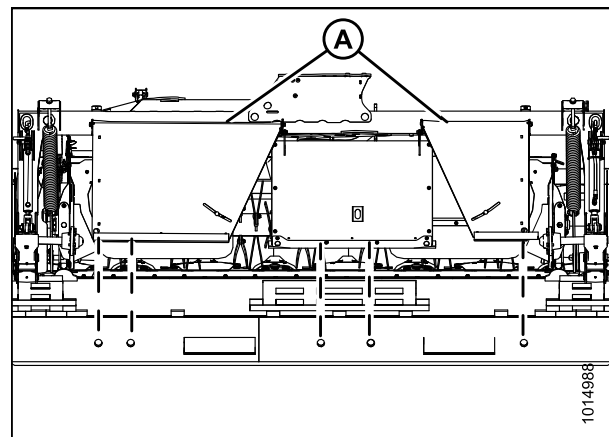


Figure 4.92: Outboard Top Cover

## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

- Support cover (C) and remove two bolts at (A and B).

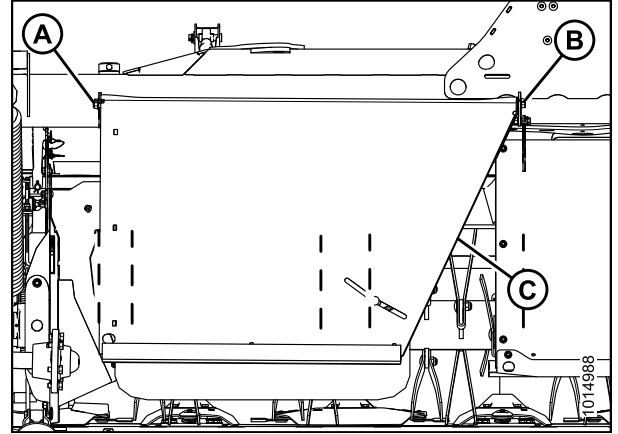


Figure 4.93: Outboard Top Cover

- Support cover (C) and remove two bolts at (A and B).

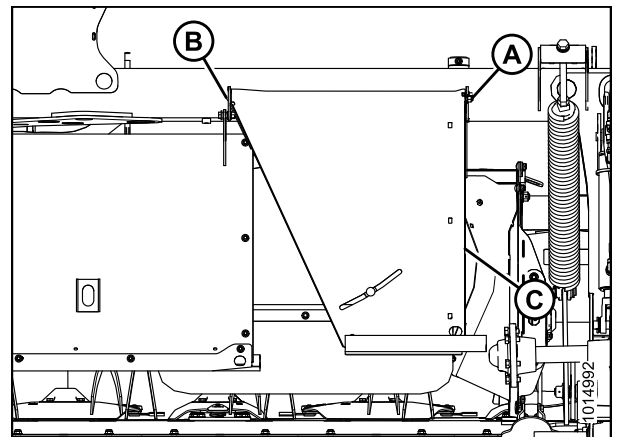


Figure 4.94: Outboard Top Cover

- Remove nuts (A) from center shield (B). Do not remove the bolts.

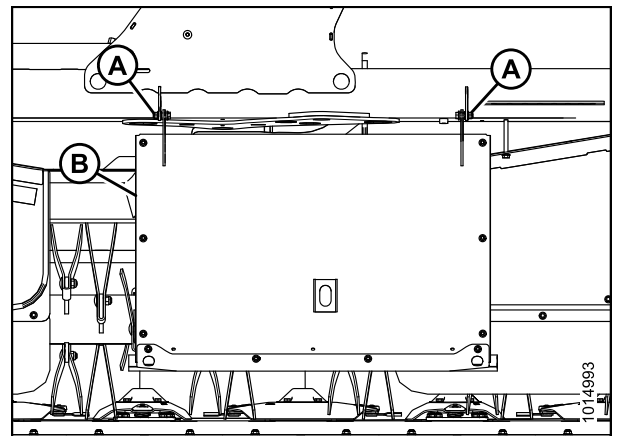
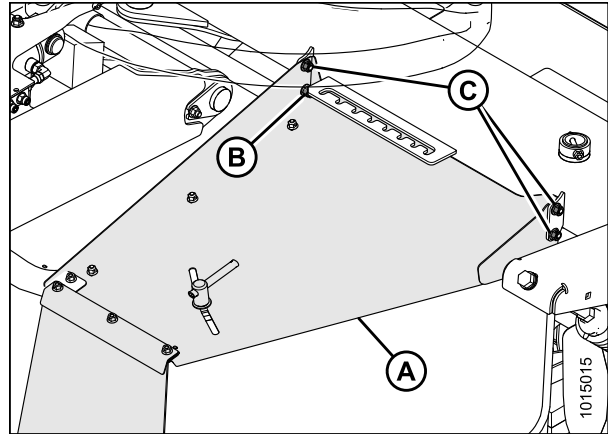


Figure 4.95: Center Shield

## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

6. Flip top cover horizontally and install as follows:
  - a. Position top cover (A) as shown and position onto hex head bolt (B). Loosely install nut to hold top cover in place.  
**NOTE:**  
If installing Road Friendly Transport™ system, install top cover (A) after it is in place.
  - b. Install carriage bolts (C) with heads facing towards center of top cover. Install nuts and tighten.
  - c. Repeat for opposite top cover.

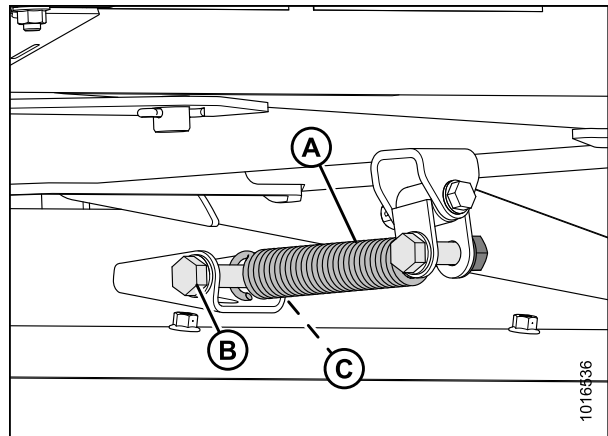


**Figure 4.96: Outboard Top Cover (Right-Hand Side)**

7. Remove bolt (B) and nut (C) from center top cover. Lift center top cover, and attach spring (A) to bolt (B). Secure with nut (C).

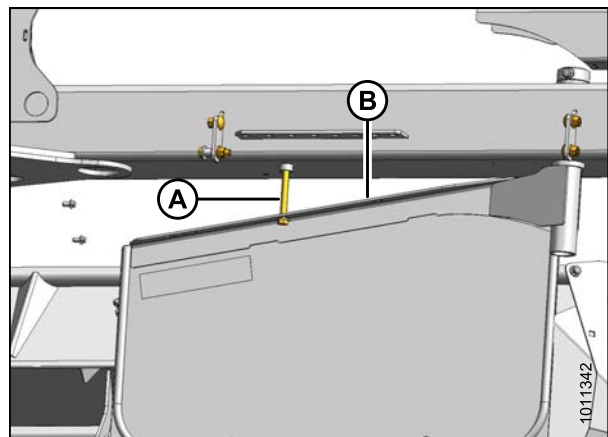
**IMPORTANT:**

Do **NOT** attach center cover to outboard covers. If hardware is installed on both sides of the center cover to attach it to the side covers, remove it at this time and discard.



**Figure 4.97: Spring Attached to Transport**

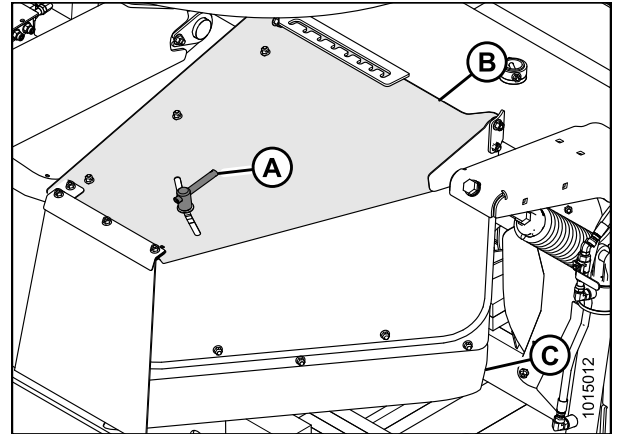
8. Remove and discard bolt (A) securing deflector (B) to frame.



**Figure 4.98: Side Deflector Assembly**

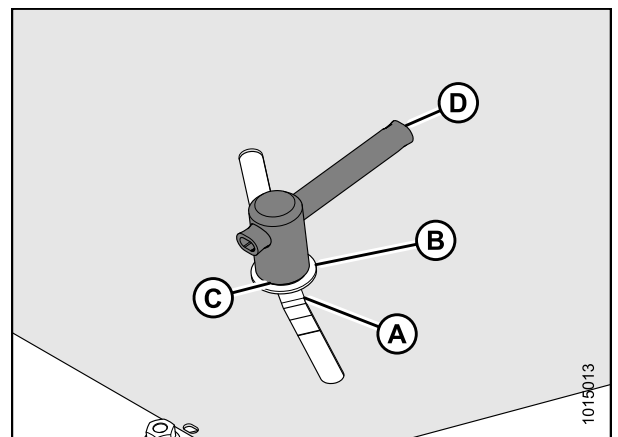
## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

9. Remove handle (A), washers, and bolt from top cover (B).
10. Swing deflector (C) under outboard top cover (B) so that handle can be installed into deflector and top cover.



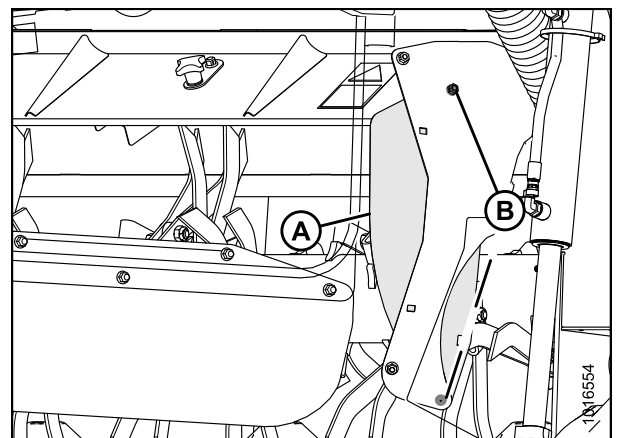
**Figure 4.99: Side Deflector Assembly**

11. Install carriage bolt (A), washer (B), spring washer (C), and handle (D) as shown.
12. Position deflector so the handle (D) is approximately centered in slot, and tighten handle.



**Figure 4.100: Deflector Adjustment**

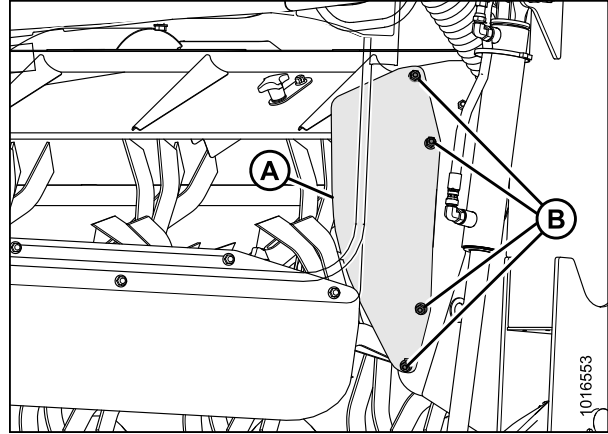
13. Remove two M10 carriage bolts (A) securing left-hand deflector shield in shipping position. Repeat for opposite deflector shield.



**Figure 4.101: Right-Hand Deflector Shield Shown – Left-Hand Deflector Shield Opposite**

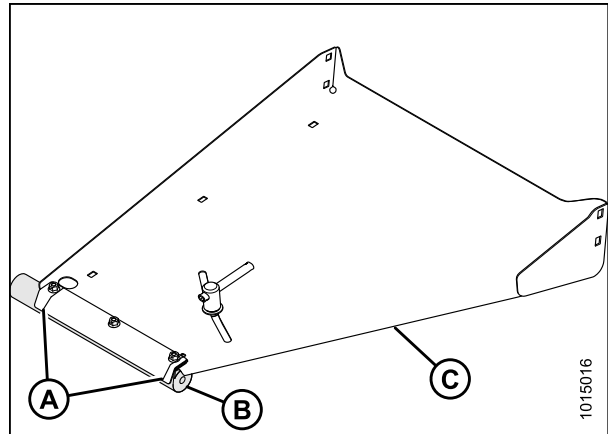
## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

14. Reposition deflector shield (A) so the holes align with the fixed shield, and secure with four M10 carriage bolts (B) and hex head flange nuts. Repeat for opposite deflector shield.



**Figure 4.102: Right-Hand Deflector Shield Shown – Left-Hand Deflector Shield Opposite**

15. Remove shipping wires (A) securing curtains (B) to covers (C). Allow curtains to unfold before operating machine.

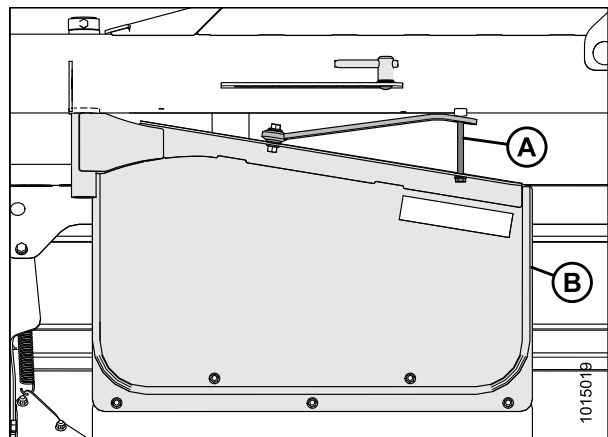


**Figure 4.103: Forming Shield Curtain**

### 4.14.2 Setting up Forming Shield for Roll Conditioner

Use these instructions to set up the forming shield on a machine with a roll conditioner.

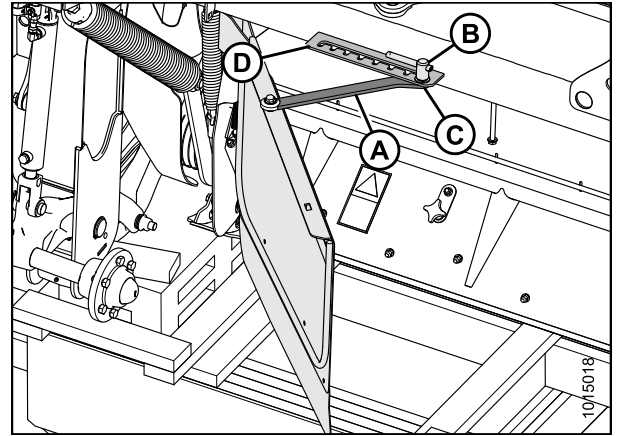
1. Remove and discard bolt (A) securing deflector (B) to frame.
2. Swivel deflector (B) to open position.



**Figure 4.104: Side Deflector**

## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

3. Rotate clamp (B) until you can remove bolt (C).
4. Swing adjuster bar (A) and align with a hole on carrier plate (D).
5. Install bolt through adjuster bar (A) and carrier plate (D). Install clamp (B) onto bolt. Tighten clamp until shield does not move.
6. Repeat above steps for opposite deflector.



**Figure 4.105: Adjuster Bar**

## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

### 4.15 Unpacking Curtains

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

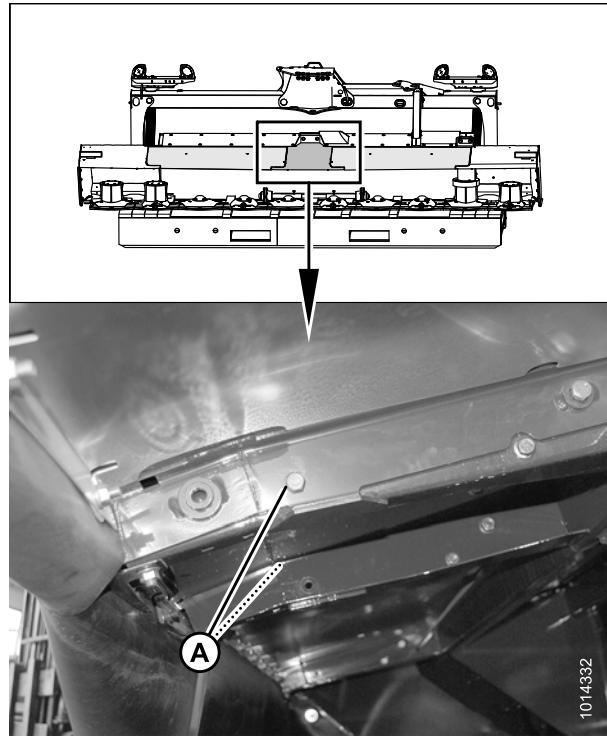


Figure 4.106: Underside of Cutterbar Doors

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

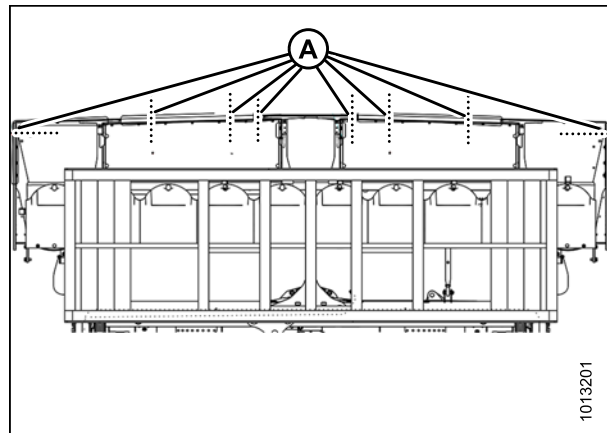
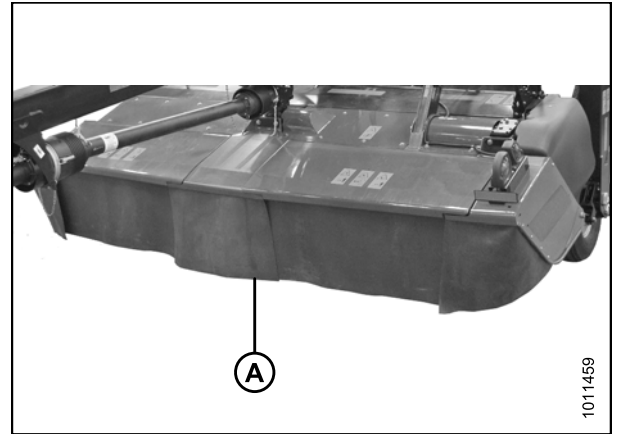


Figure 4.107: Underside of Mower Conditioner



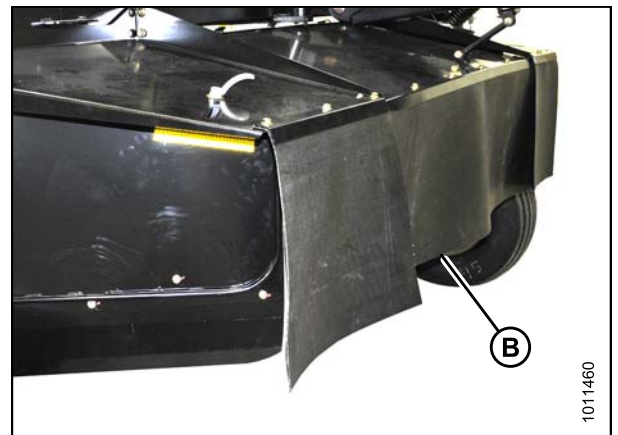
## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

3. Straighten cutterbar door curtains (A) and remove folds or creases (minor creases will eventually straighten out).



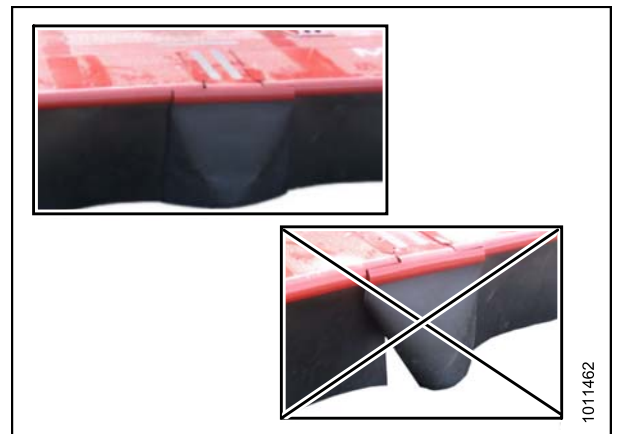
**Figure 4.108: Cutterbar Door Curtains**

4. If forming shields are installed, straighten forming shield curtains (B) and remove folds or creases (minor creases will eventually straighten out).



**Figure 4.109: Forming Shield Curtains**

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



**Figure 4.110: Cutterbar Door Curtains**

## 4.16 Discharge Shield (No Conditioner)

### 4.16.1 Removing Shield (No Conditioner)

Follow these steps to remove the shielding installed on a mower configured without a conditioner:

#### DANGER

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

1. Raise the mower fully and extend the center-link to maximize the space between the shield (A) and the carrier frame (B).

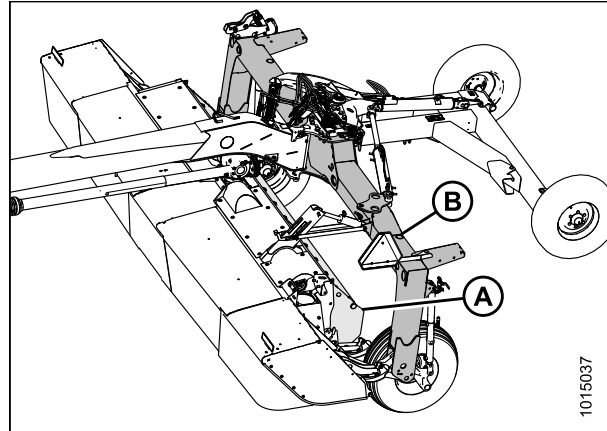


Figure 4.111: Mower with Transport

2. Close the lift cylinder lock-out valves (A) on both sides of the mower. Valve handles should be in the horizontal position.



Figure 4.112: Lift Cylinder Lock-Out Valves

## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

3. Remove four M16 hex head bolts (A), nuts, and flat washers securing the shield (B) to the panel on mower (C).

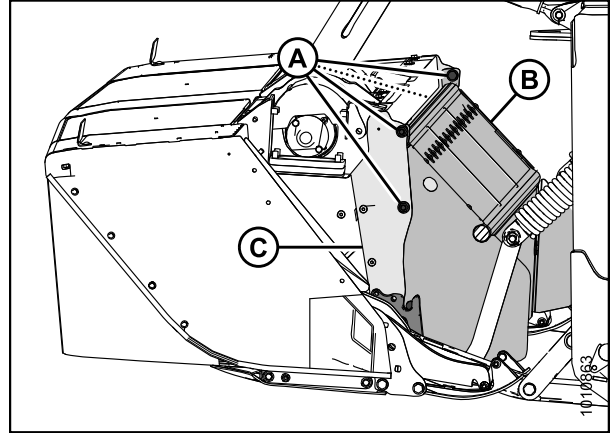


Figure 4.113: Mower (Left Side View)

4. Lift the shield (A) until pins (B) disengage from slots in support (C) and shield on panel (D).

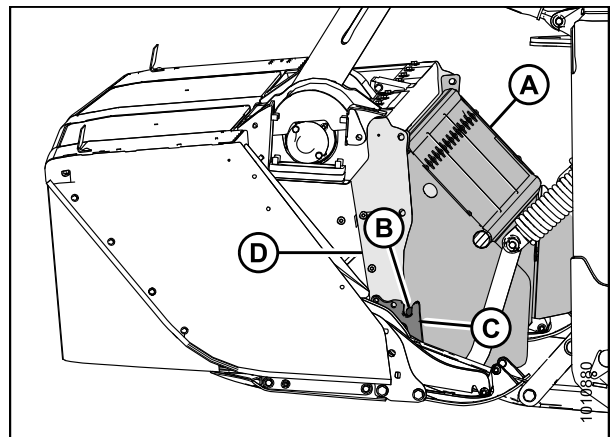


Figure 4.114: Mower (Left Side View)

5. Rotate the shield (A) 90 degrees and move it away from the carrier frame.

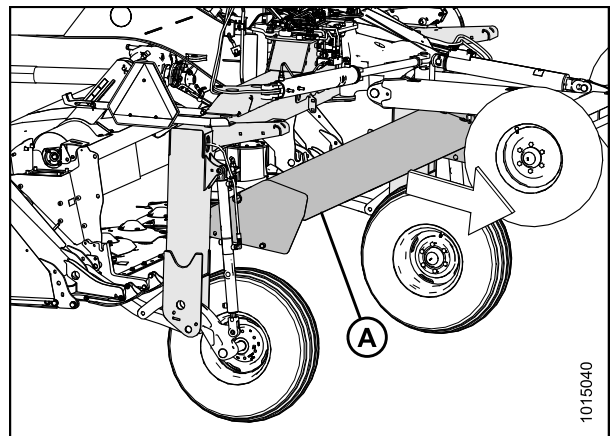


Figure 4.115: Shield Rotated

## 4.16.2 Installing Shield (No Conditioner)

Follow these steps to install the shielding on a mower configured without a conditioner:

### DANGER

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

1. Raise the mower fully and extend the center-link to maximize the space between the field wheels (A) and the carrier frame (B).

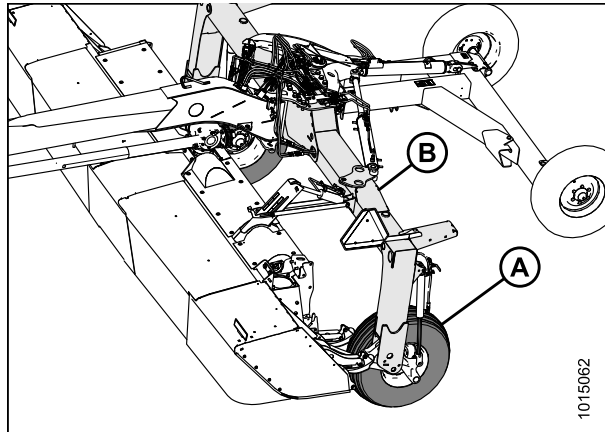


Figure 4.116: Mower with Transport

2. Close the lift cylinder lock-out valves (A) on both sides of the mower. Valve handles should be in the horizontal position.



Figure 4.117: Lift Cylinder Lock-Out Valves

3. Rotate the shield (A) and pass it between the field wheels and the carrier frame toward the mower.

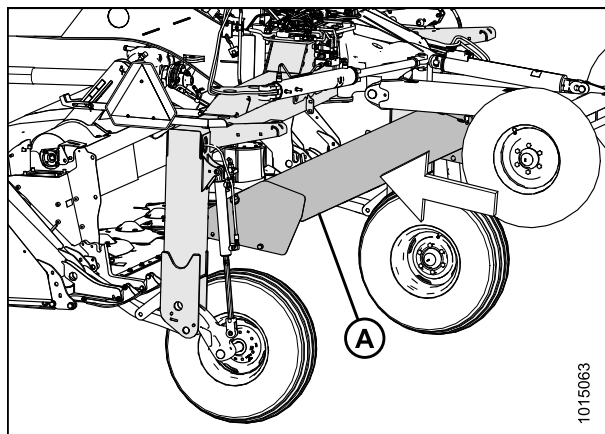


Figure 4.118: Shield Rotated

## ASSEMBLING THE MOWER CONDITIONER (FACTORY INSTALLED TRANSPORT)

4. Position shielding (A) until pins (B) engage the slots in cutterbar support (C) and the bolt holes align with panel (D).

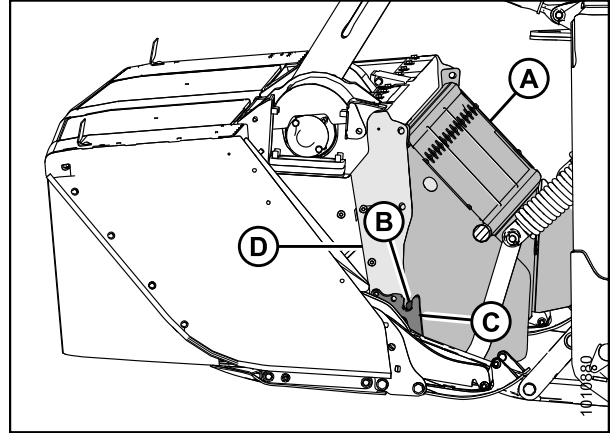


Figure 4.119: Positioning the Shield on Mower

5. Install four M16 hex head bolts (A), nuts, and flat washers to secure shield (B) to the panel (C). Ensure bolt heads face inboard.

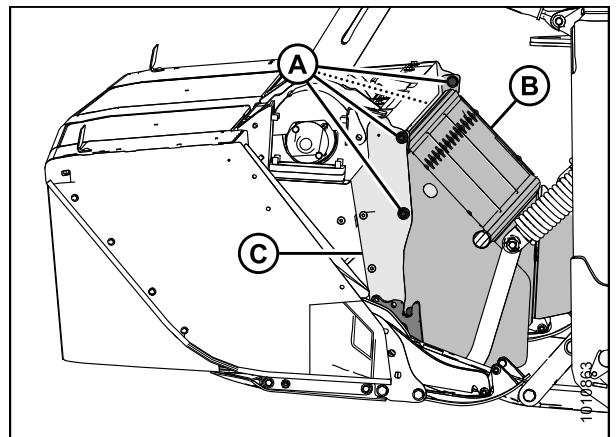


Figure 4.120: Shield (No Conditioner)

## 4.17 Removing Mower Conditioner from Shipping Pallet

1. Cut strapping (B) securing cutterbar to pallet (A).
2. Use the transport to lift the header high enough that the pallet can be removed.

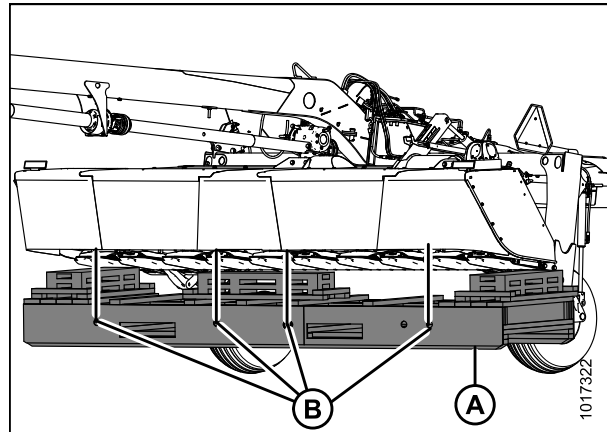


Figure 4.121: Strapping

3. Use a chain or forklift to remove shipping pallet (A) from underneath the mower conditioner.
4. Lower header to the ground.

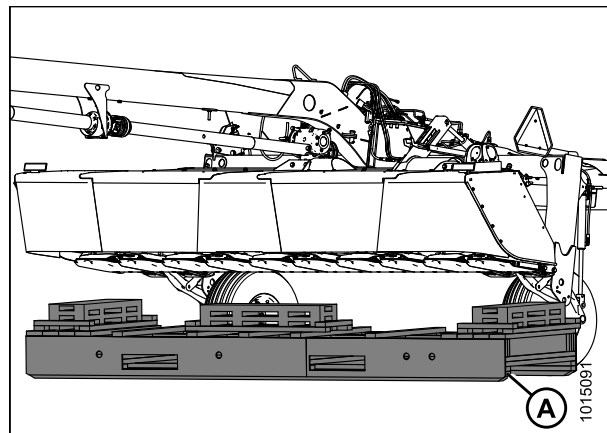


Figure 4.122: Removing Shipping Pallet

## 5 Lubricating the Mower Conditioner

### WARNING

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

The mower conditioner has been lubricated at the factory. However, the mower conditioner should be lubricated prior to delivery to offset the effects of weather during outside storage and transport, and to familiarize the Dealer with the machine.

### 5.1 Opening Driveshields

#### CAUTION

Do NOT operate the machine without the driveshields in place and secured.

#### NOTE:

Images shown are for left side driveshield—right side driveshield is similar.

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

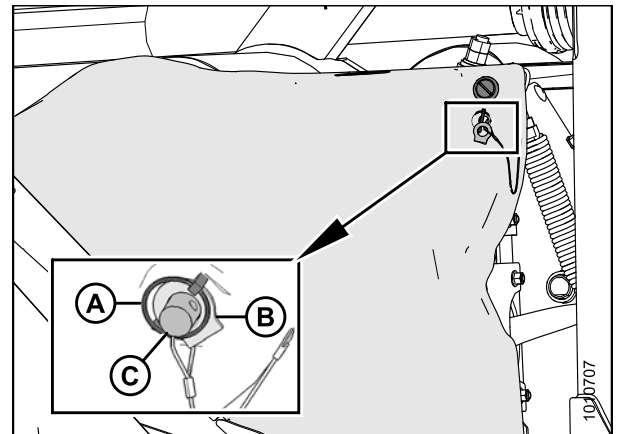


Figure 5.1: Driveshield

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

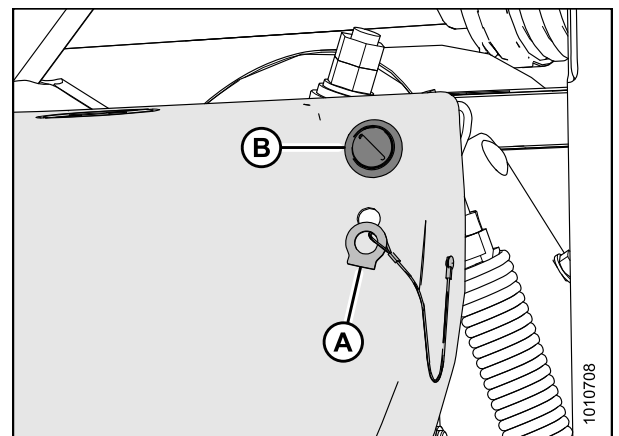


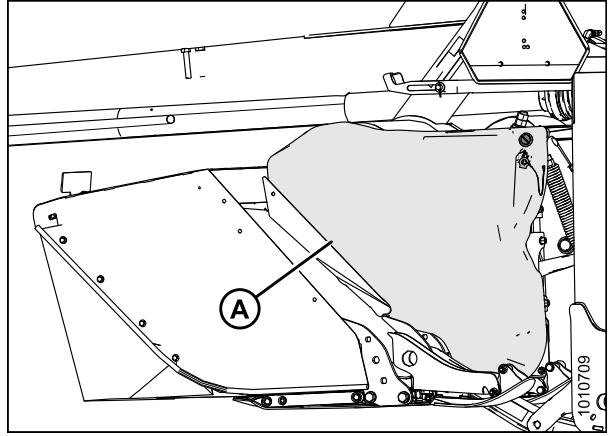
Figure 5.2: Driveshield Latch

## LUBRICATING THE MOWER CONDITIONER

3. Pull top of driveshield (A) away from mower conditioner to open.

**NOTE:**

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



**Figure 5.3: Driveshield**



## 5.2 Closing Driveshields

### CAUTION

Do NOT operate the machine without the driveshields in place and secured.

#### NOTE:

Images shown are for left side driveshield—right side driveshield is similar.

1. Position driveshield onto pins at base of driveshield (if necessary).
2. Push driveshield (A) to engage latch (B).
3. Check that driveshield is properly secured.

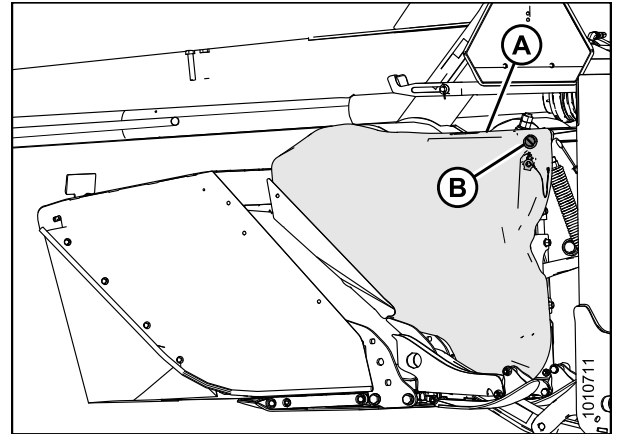


Figure 5.4: Driveshield and Latch

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

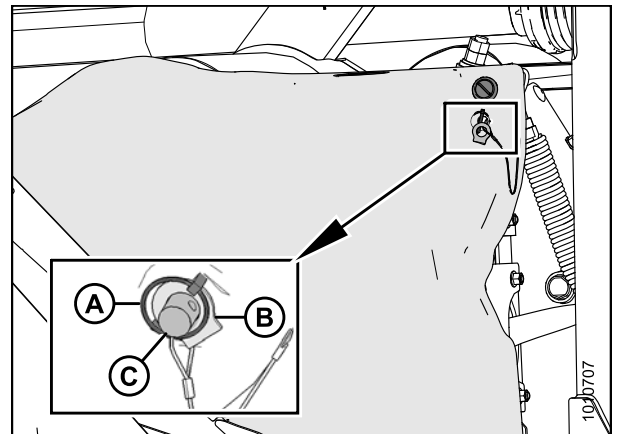
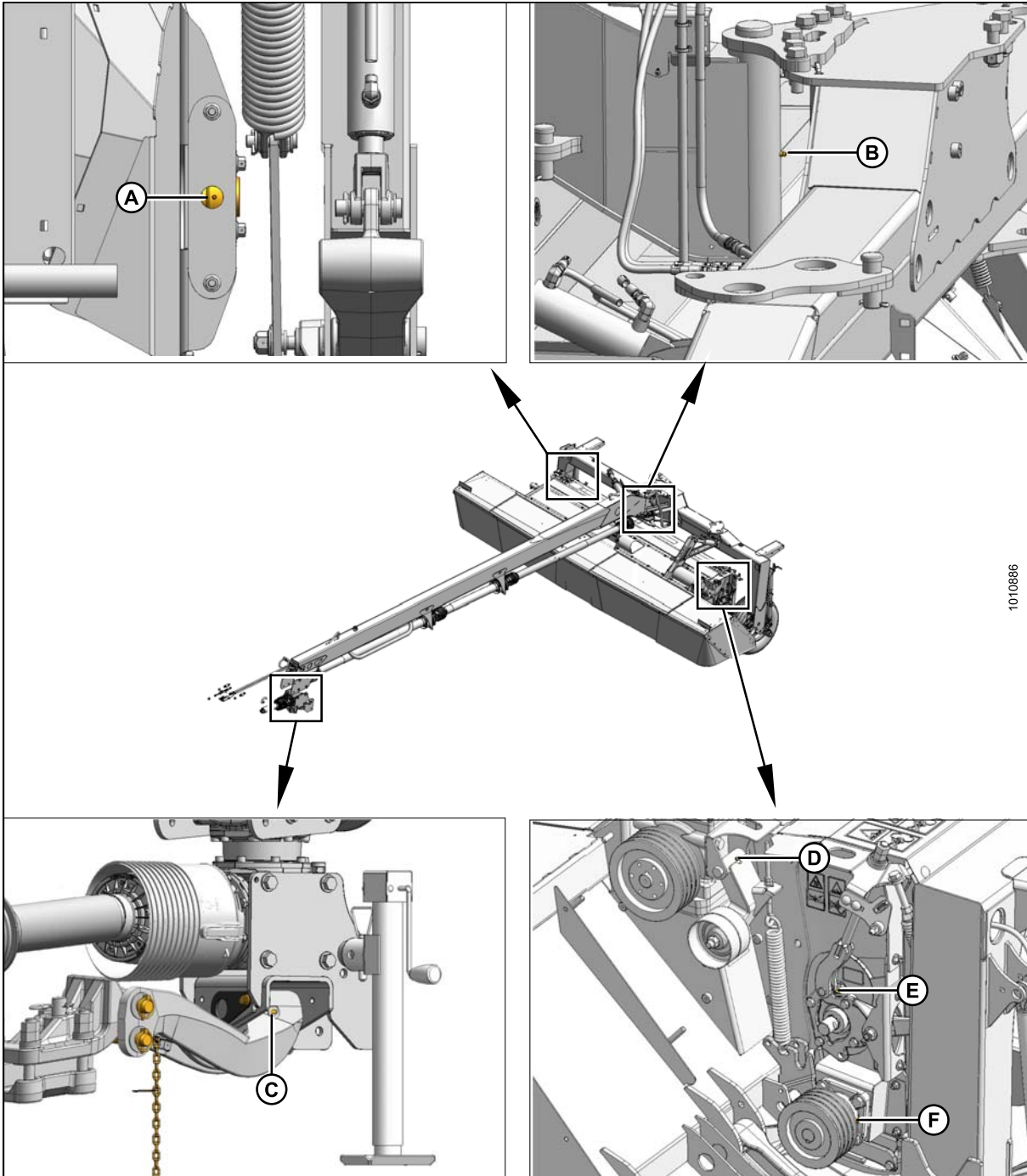


Figure 5.5: Tool to Unlock Driveshield

### 5.3 Lubrication Procedure

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



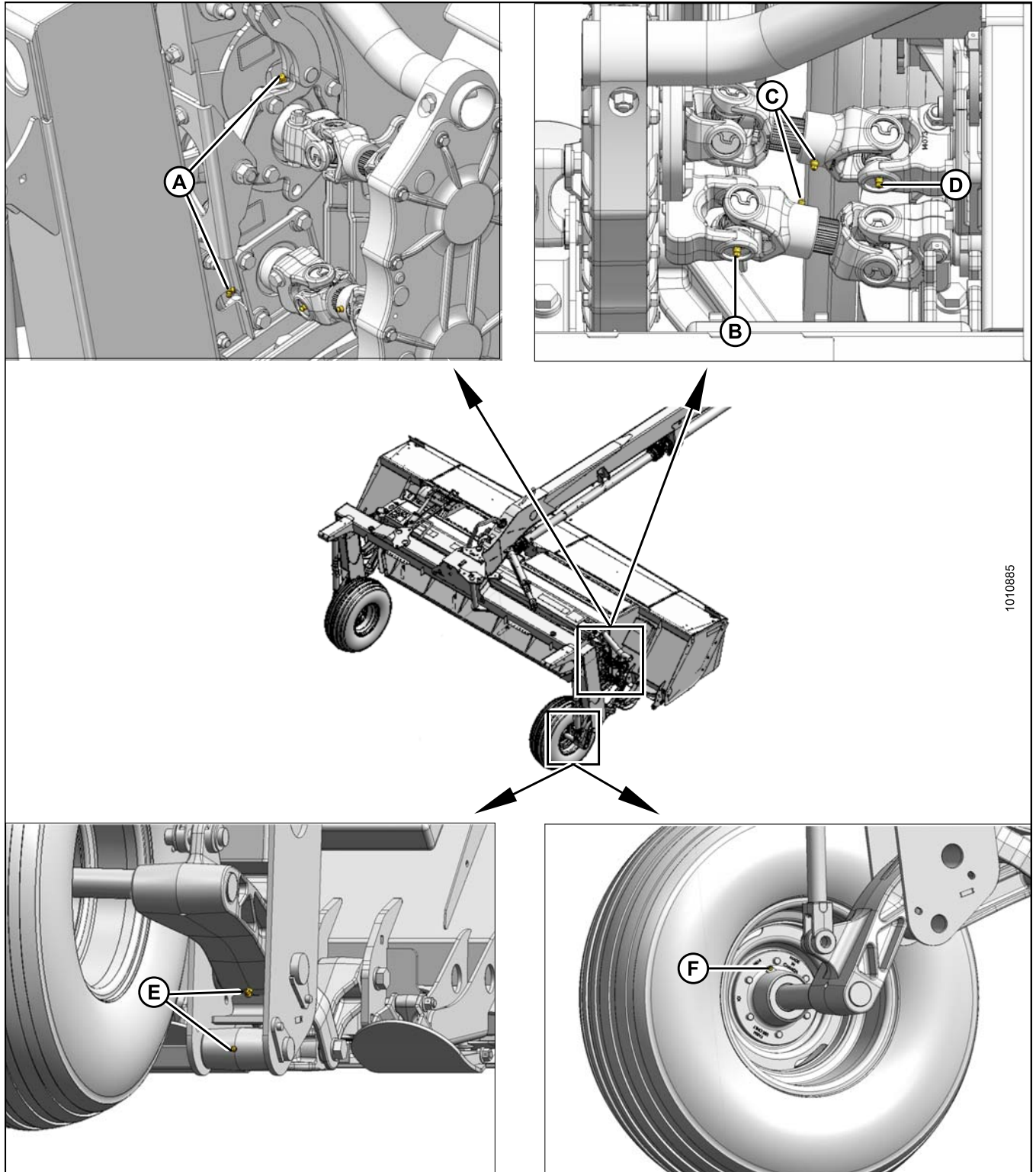
**Figure 5.6: Lubrication**

A - Bearing, Finger Conditioner  
D - Idler Pivot

B - Hitch Pivot  
E - Bearing, Roller Conditioner

C - Hitch Swivel  
F - Bearing, Roller Conditioner

## LUBRICATING THE MOWER CONDITIONER



**Figure 5.7: Lubrication**

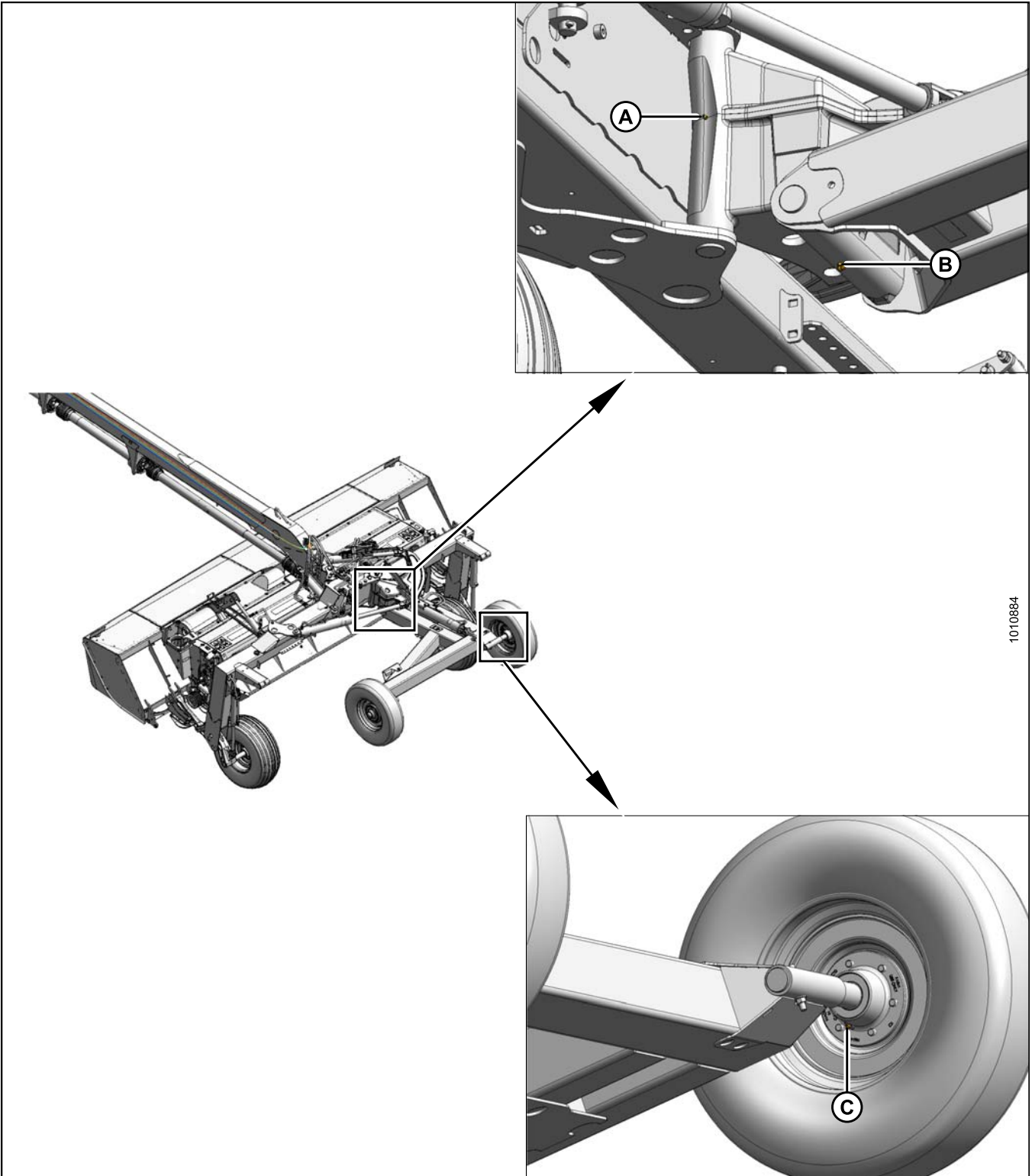
A - Bearings, Roller Conditioner  
 D - U-Joint, Upper Driveline (2 Places)

B - U-Joint, Lower Driveline (2 Places)  
 E - Lift Linkage (Both Sides)

C - Slip Joints, Conditioner Drivelines<sup>3</sup>  
 F - Bearing, Field Wheel (2 Places)

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

# LUBRICATING THE MOWER CONDITIONER



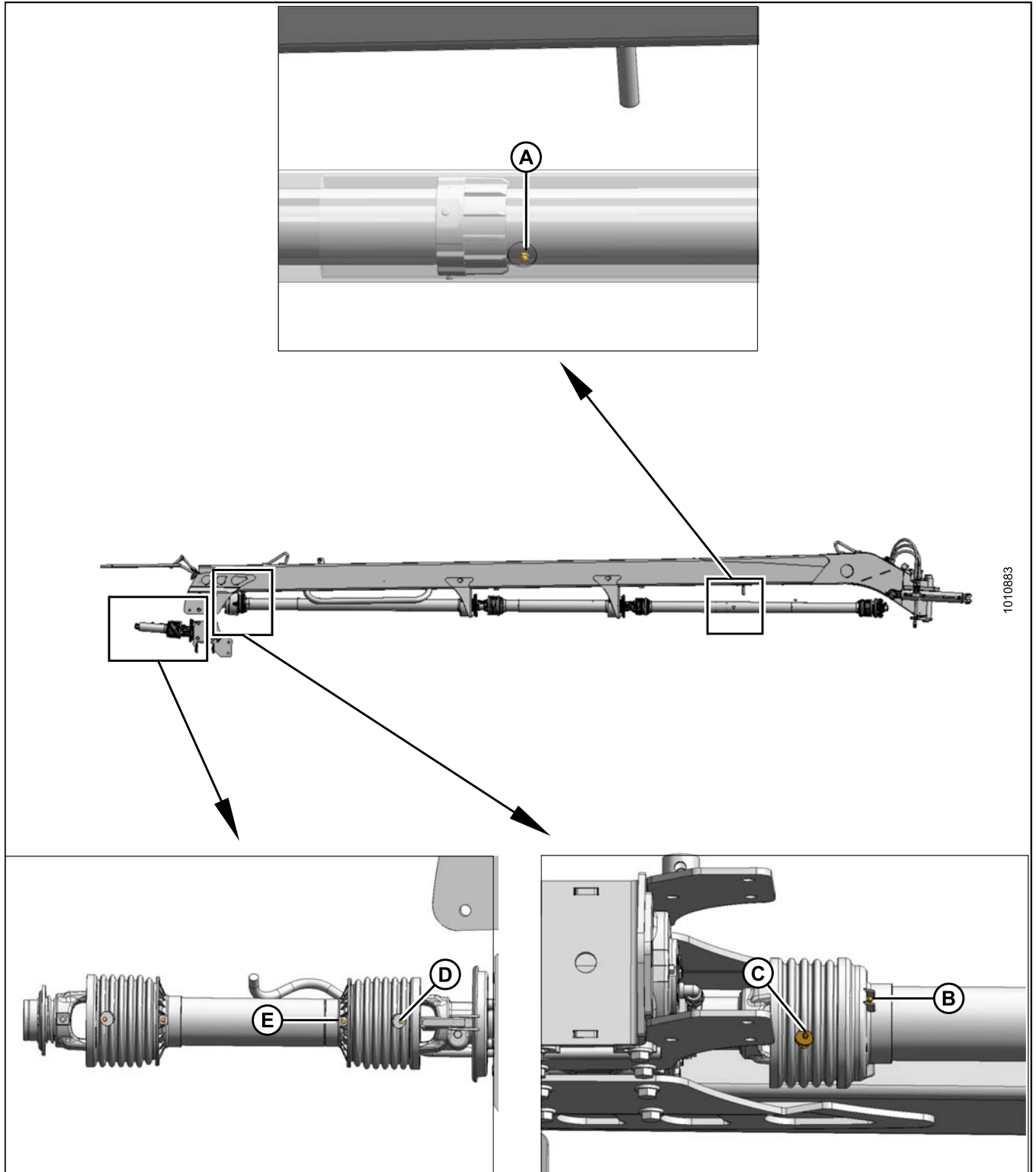
**Figure 5.8: Lubrication**

A - Vertical Pivot, Road Friendly Transport™

B - Horizontal Pivot, Road Friendly Transport™

C - Bearing, Transport Wheel (2 Places)

## LUBRICATING THE MOWER CONDITIONER



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**Figure 5.9: Lubrication**

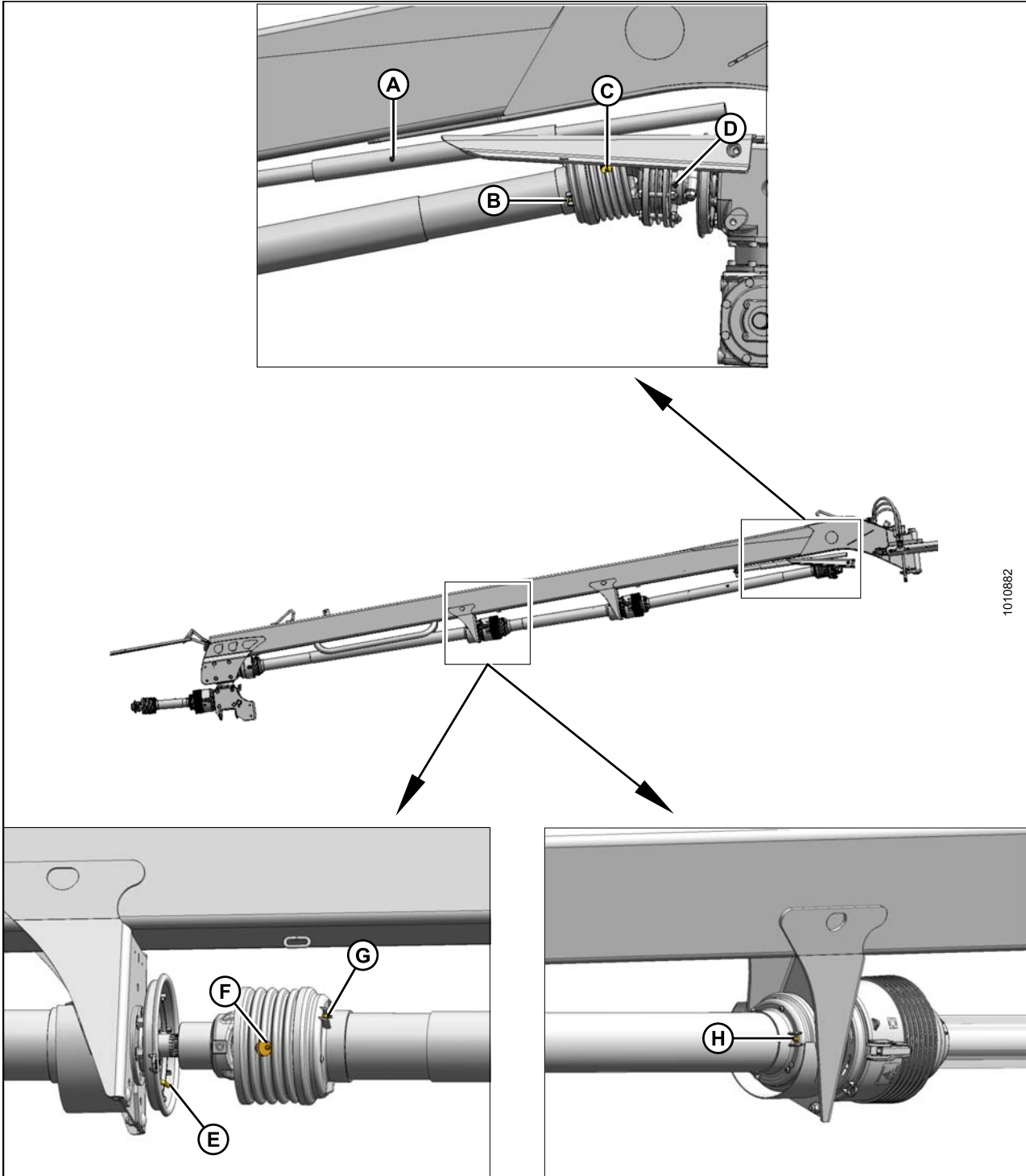
A - Slip Joint, Drivelines (13' 2 Places) (16' 3 Places)<sup>4</sup>  
 D - U-Joint, Primary Driveline (2 Places)

B - Guard, Driveline  
 E - Guard, Primary Driveline (2 Places)

C - U-Joint, Main Driveline

4. Use High Temperature Extreme Pressure (EP2) Performance with 10% Max Molybdenum Disulphide (NLGI Grade 2) Lithium Base

# LUBRICATING THE MOWER CONDITIONER



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**Figure 5.10: Lubrication**

- A - Slip Joint, Steering Link
- B - Guard, Clutch Driveline
- C - U-Joint, Clutch Driveline
- D - Clutch
- E - Bearing, Driveline (13' 1 Place) (16' 2 Places)
- F - U-Joint, Driveline (13' 1 Places) (16' 2 Places)
- G - Guard, Driveline (13' 1 Place) (16' 2 Places)
- H - Guard, (13' 1 Place) (16' 2 Places)

## 6 Performing Predelivery Checks

### WARNING

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

#### IMPORTANT:

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

1. Perform the final checks and adjustments as listed on the Predelivery Checklist (yellow sheet attached to back of this instruction) to ensure the machine is field-ready. Refer to the following pages for detailed instructions as indicated on the [Predelivery Checklist, page 223](#).
2. The completed Checklist should be retained either by the Operator or the Dealer.

#### NOTE:

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

### 6.1 Checking Wheel Bolts

#### DANGER

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

#### IMPORTANT:

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

1. Torque wheel bolts to 120 ft·lbf (160 N·m) using the tightening sequence shown.

#### NOTE:

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

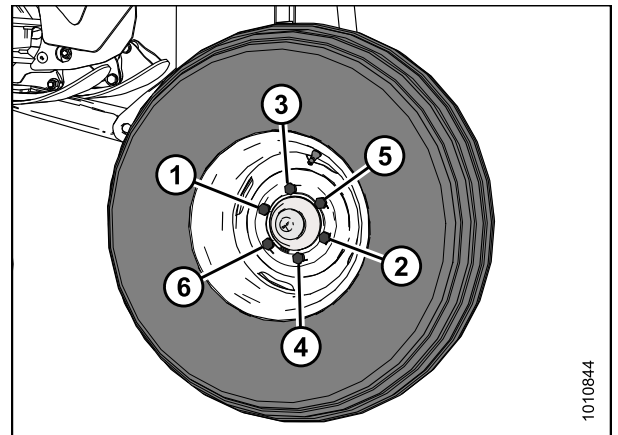


Figure 6.1: Tightening Sequence

## 6.2 Checking Tire Pressure

### WARNING

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

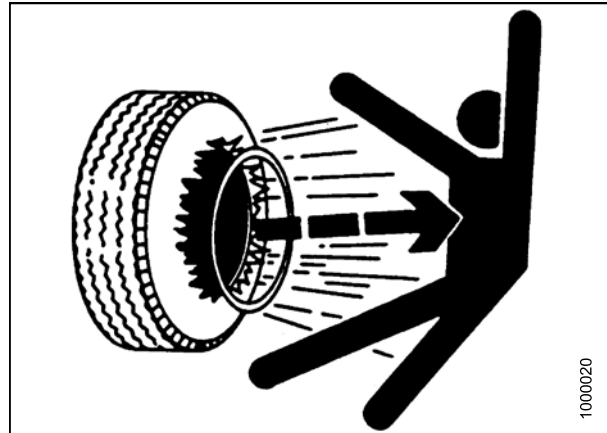


Figure 6.2: Overinflated Tire

1. Check tire pressure daily.
  - Maintain pressure at 30 psi (207 kPa) for field wheels (A)
  - Maintain pressure at 80 psi (552 kPa) for optional Road Friendly Transport wheels (B)

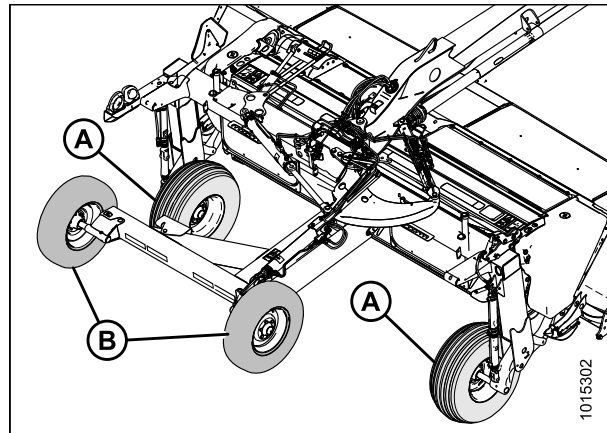


Figure 6.3: Safely Filling a Tire with Air



## 6.3 Checking Conditioner Drive Belt

1. Open the left driveshield. Refer to [5.1 Opening Driveshields, page 127](#).
2. Check that the belt (A) is properly located on the pulleys and tensioned. Overall spring length (B) should be 14–3/8 in. (365 mm).
3. Check that the adjuster nuts (C) are tight.
4. Check that spring is hooked at the correct location:
  - Hole (D) for roll conditioner
  - Hole (E) for finger conditioner
5. Close driveshield. Refer to [5.2 Closing Driveshields, page 129](#).

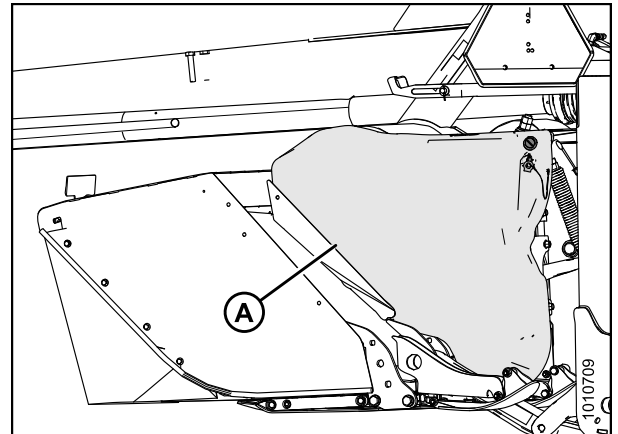


Figure 6.4: Left Driveshield

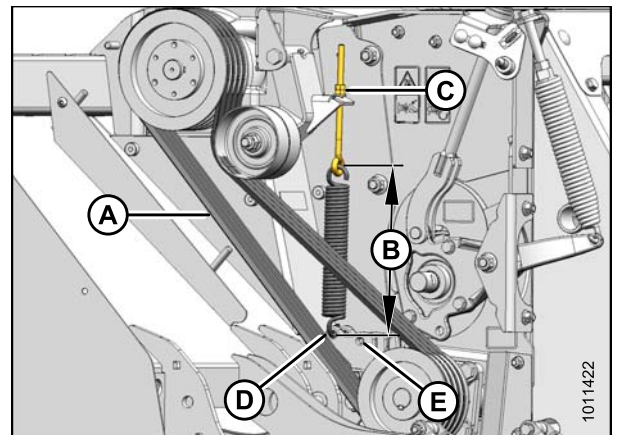


Figure 6.5: Conditioner Belt

## 6.4 Checking Header Angle

For mower conditioners equipped with hydraulic center-link (A), the mid-point for header angle is indicated with the indicator bars (B) in the center (orange) of the indicator decal.

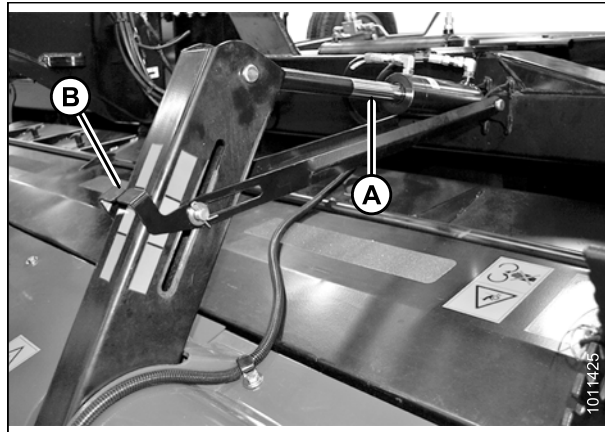


Figure 6.6: Hydraulic Center-Link

For mower conditioners equipped with mechanical center-link (A), the mid-point for header angle is the middle of the adjustment range on the link.

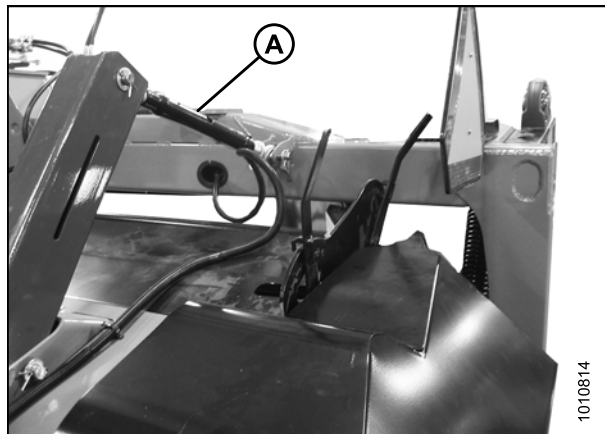


Figure 6.7: Mechanical Center-Link

## 6.5 Checking Skid Shoes

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

**NOTE:**

The 13-foot mower conditioner is equipped with one skid shoe at each end, and the 16-foot machine has two at each end.

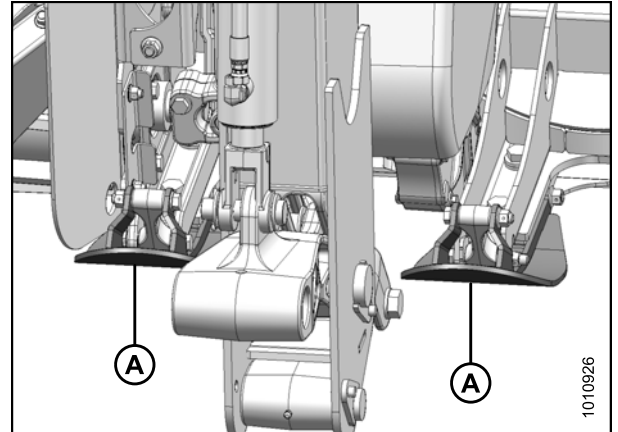


Figure 6.8: Skid Shoes

## 6.6 Checking Mower Conditioner Float

1. Lower the mower conditioner fully, and shut down the tractor. Remove key from ignition.
2. Grasping the front corner of mower conditioner and lifting. The force to lift should be 95–105 lbf (426–471 N) and should be approximately the same at both ends. If adjustment is required, refer to [6.6.1 Adjusting Mower Conditioner Float, page 140](#).

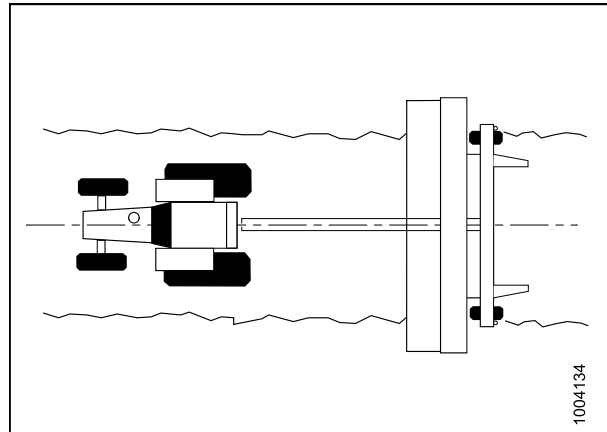


Figure 6.9: Hitch Aligned to Tractor

### 6.6.1 Adjusting Mower Conditioner Float

The mower conditioner's float setting (or lifting force) changes depending on the conditioner type and options. The setting must be equal at both ends of the mower conditioner. Follow these steps to adjust float:

#### **WARNING**

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

#### **NOTE:**

Changes to the mower conditioner's operating position can affect the float settings. After adjusting cutting height or the cutting angle, check float and adjust as necessary.

#### **NOTE:**

If the tractor's drawbar height is greater or less than 16 in. (406 mm), float may be affected. Check the float and adjust as necessary.

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

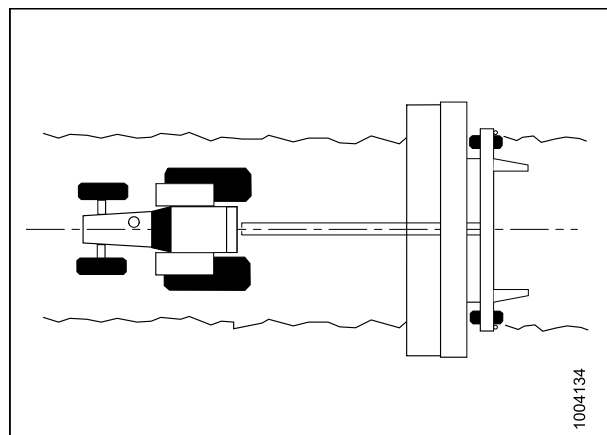
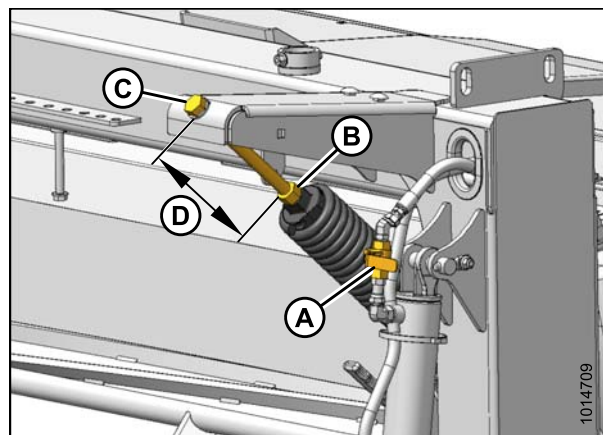


Figure 6.10: Mower Conditioner Centered behind Tractor

## PERFORMING PREDELIVERY CHECKS

3. Close the mower conditioner's lift cylinder lock-out valve (A) on each lift cylinder by turning the handle to the horizontal position.
4. Loosen jam nut (B) away from the spring.
5. Turn the adjuster bolt (C) to achieve the recommended measurement (D) for the conditioner type.
  - Turn bolt clockwise (towards spring) to increase float
  - Turn bolt counterclockwise (away from spring) to decrease float
6. Tighten jam nut (B) against spring.
7. Measure the length of exposed thread (D) on the float spring tension bolts. Refer to [Table 6.1 Starting Point Float Settings, page 141](#).
8. Repeat Steps [4., page 141](#) to [7., page 141](#) on the opposite side of the mower conditioner.



**Figure 6.11: Lift Cylinder Lock-Out Valve, Jam Nut, and Adjuster Bolt**

### NOTE:

Check float by lowering the header to cutting position and grasping the front corner of mower conditioner and lifting. The force to lift should be 95–105 lbf (426–471 N) and should be approximately the same at both ends.

9. Open the cylinder lock-out valve (A) on each lift cylinder by turning the handle to the vertical position.

**Table 6.1 Starting Point Float Settings**

Header Size	Conditioner Type	Length of Exposed Thread
13 foot	No conditioner	11–11-5/32 in. (280–290 mm)
	Roll conditioner	4-3/4–5-1/8 in. (120–130 mm)
	Finger conditioner	Right side: 5-3/4–6-1/8 in. (145–155 mm)
Left side: 4-1/2–4-15/16 in. (115–125 mm)		
16 foot	No conditioner	9–9-1/2 in. (230–240 mm)
	Roll conditioner	2-3/4–3-1/8 in. (70–80 mm)
	Finger conditioner	Right side: 3-3/4–4-1/8 in. (95–105 mm)
		Left side: 2-1/2–3 in. (65–75 mm)

## 6.7 Checking Roll Timing

### DANGER

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

1. Lower mower conditioner fully, stop engine, and remove key from ignition.
2. Open the right side driveshield. Refer to [5.1 Opening Driveshields, page 127](#).

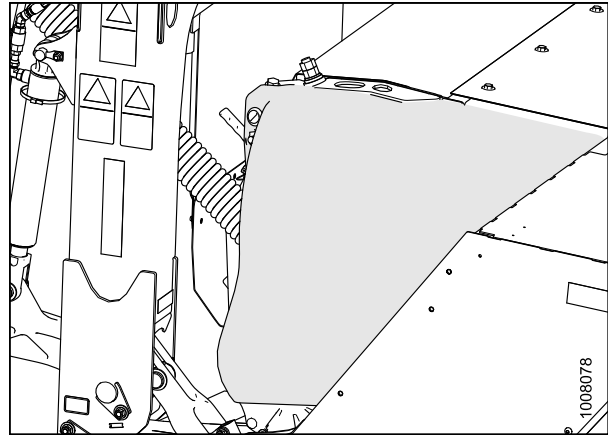


Figure 6.12: Right Side Driveshield

3. Examine the four bolts (A) in slots of yoke plate (B) on upper roll universal shaft. Bolts should be approximately centered in slots and should be tight. The timing is set during assembly at the factory.

**NOTE:**

Only three bolts are shown in the illustration.

**NOTE:**

Roll timing should not require adjustment. If adjustment is required, refer to the R113/R116 Pull-Type Rotary Disc Mower Conditioner Operator's Manual.

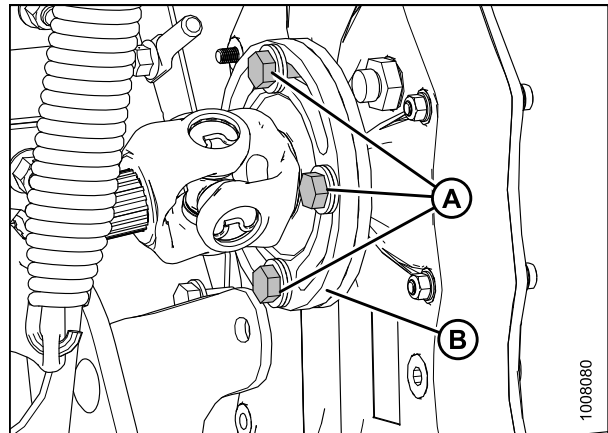


Figure 6.13: Bolts in Slots of Yoke Plate

## 6.8 Checking Conditioner Drive Gearbox Lubricant

The conditioner drive gearbox is located inside the drive compartment at the right side of the mower conditioner.

### IMPORTANT:

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

### DANGER

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

1. Lower mower conditioner fully, fully retract the header, turn off engine, and remove key.
2. Open the right driveshield (A). Refer to [5.1 Opening Driveshields, page 127](#).

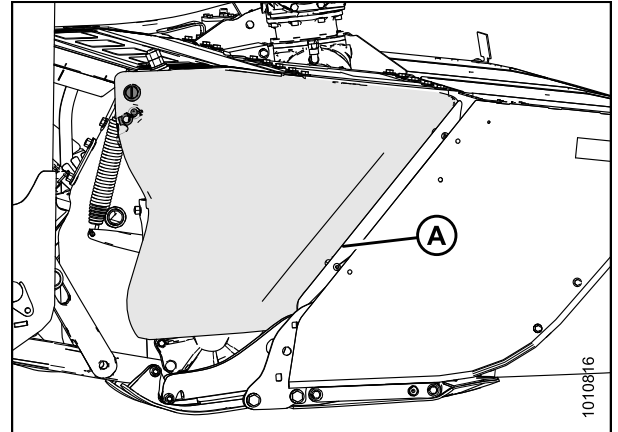


Figure 6.14: Right Driveshield

3. Clean around lubricant level plug (A) on inboard side of the conditioner drive gearbox.
4. Remove lubricant level plug (A).
5. Check that lubricant level is even with the bore hole.
6. Add SAE 85W-140 gear oil until the lubricant level is even with the bore hole (if necessary).
7. Replace lubricant level plug (A) and tighten.
8. Close right driveshield. Refer to [5.2 Closing Driveshields, page 129](#).

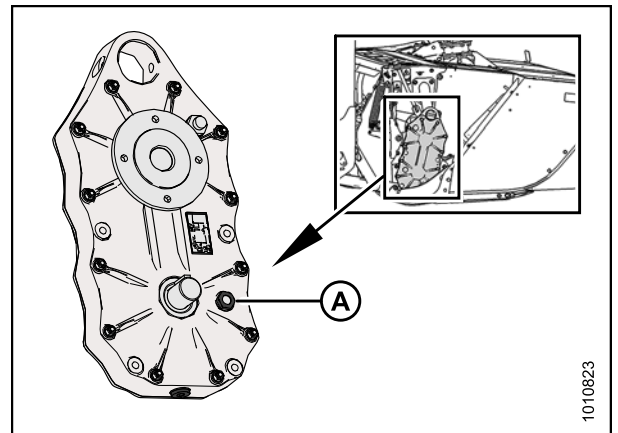


Figure 6.15: Oil Level Plug

## 6.9 Checking and Adding Mower Conditioner Drive Gearbox Lubricant

The mower conditioner drive gearbox is located inside the drive compartment at the left side of the mower conditioner.

### DANGER

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

1. Retract the center-link completely.
2. Lower mower conditioner, turn off engine, and remove key.
3. Detach the tractor from the hitch. Refer to the R113/R116 Pull-Type Rotary Disc Mower Conditioner Operator's Manual.
4. Open the left driveshield (A). Refer to [5.1 Opening Driveshields, page 127](#).

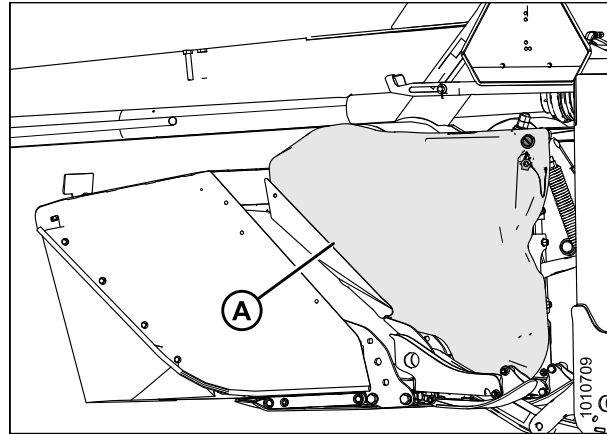


Figure 6.16: Left Driveshield

5. Adjust the hitch jack (A) until the drive gearbox is parallel to the ground.

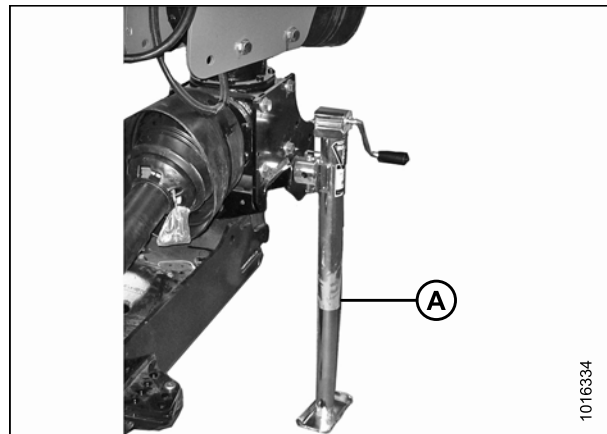
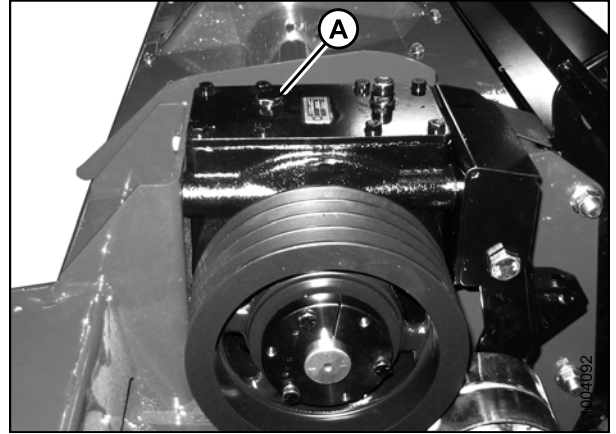


Figure 6.17: Hitch Jack



## PERFORMING PREDELIVERY CHECKS

6. Clean area around dipstick (A).
7. Remove dipstick (A) using a 22 mm socket.
8. Check lubricant level on dipstick and ensure level is to the mark.
9. Add gear lubricant to gearbox through dipstick hole (A). Refer to [10.1 Recommended Lubricants, page 205](#) for capacity of gearbox.
10. Reinstall dipstick (A) and tighten.
11. Close left driveshield. Refer to [5.2 Closing Driveshields, page 129](#).



**Figure 6.18: Left Side of Mower Conditioner**

## 6.10 Checking Forward and Rear Swivel Gearbox Lubricant

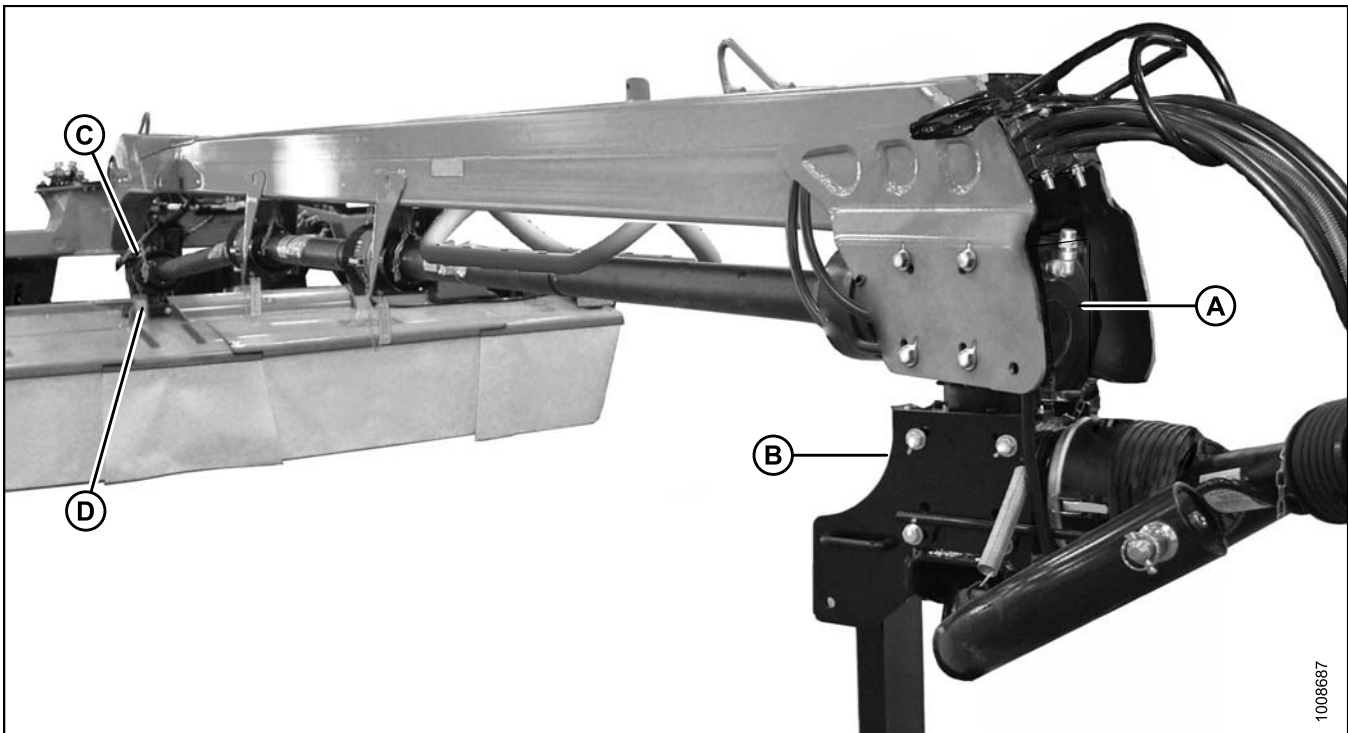
There are two swivel gearboxes located on the mower conditioner. The swivel gearbox consists of an upper and lower gearbox. Check plugs are located at the same position on each gearbox and need to be removed in order to check the lubricant level.

**IMPORTANT:**

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

**⚠ DANGER**

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



**Figure 6.19: Forward and Rear Swivel Gearboxes**

A - Upper Forward Gearbox

B - Lower Forward Gearbox

C - Upper Rear Gearbox

D - Lower Rear Gearbox

## PERFORMING PREDELIVERY CHECKS

### NOTE:

Perform this procedure on both upper and lower gearboxes.

### Forward Swivel and Rear Swivel Gearboxes

1. Raise or lower the hitch until the top of the gearbox is parallel with the ground.
2. Retract the mower until the top of the gearbox is parallel with the ground.
3. Turn off engine and remove key.
4. Clean area around check plug (A).
5. Remove check plug using a 13 mm socket.
6. Check lubricant level and ensure lubricant is visible or slightly draining from the port.
7. Add SAE 85W-140 gear oil to gearboxes through breather/filler plug (B) (if necessary).
8. Reinstall check plug (A) and breather/filler plug (B) and tighten.

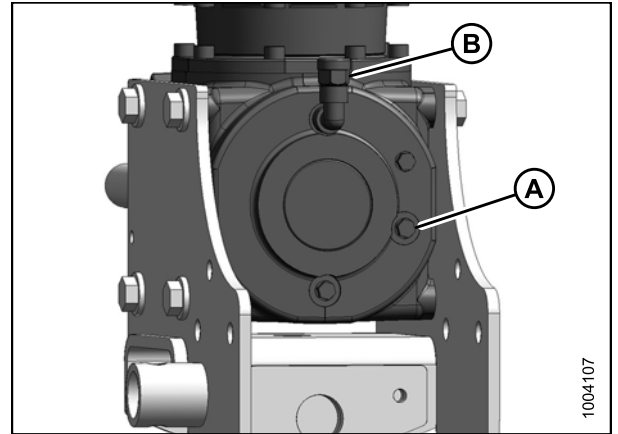


Figure 6.20: Swivel Gearbox

## 6.11 Checking Cutterbar Lubricant

### DANGER

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

1. Park the mower conditioner on level ground.
2. Position header so the cutterbar is approximately level.
3. Shut down the mower conditioner and remove key.
4. Open the cutterbar doors.

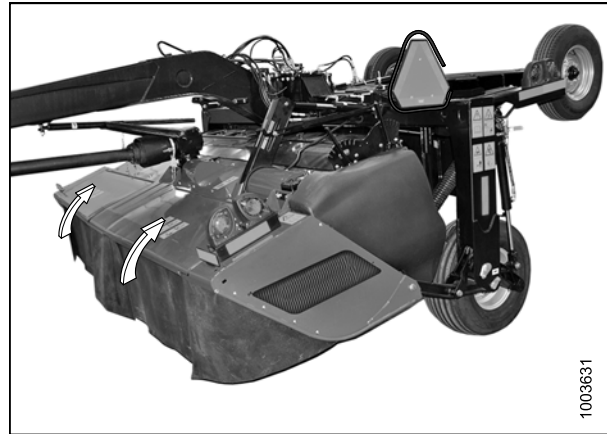


Figure 6.21: Cutterbar Doors

### CAUTION

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

5. Use a level to ensure the cutterbar is level in both directions. Raise or lower mower conditioner accordingly.

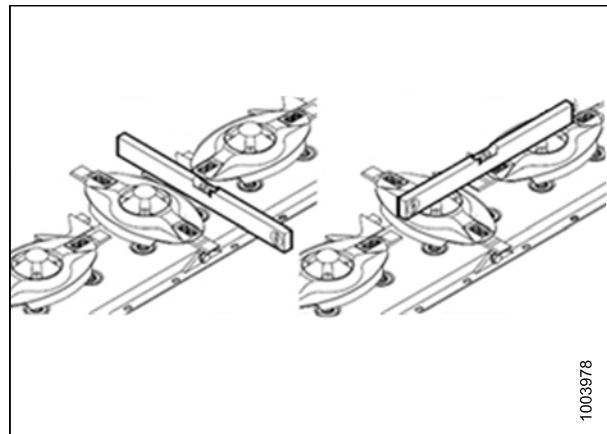


Figure 6.22: Spirit Level on Cutterbar

6. Remove oil level inspection plug (A) and O-ring (B) from cutterbar.
7. Check that lubricant level is even with the bore hole.
8. Replace oil level inspection plug (A) and O-ring (B).

**NOTE:**

If lubricant is required. Refer to [6.11.1 Adding Cutterbar Lubricant, page 149](#).

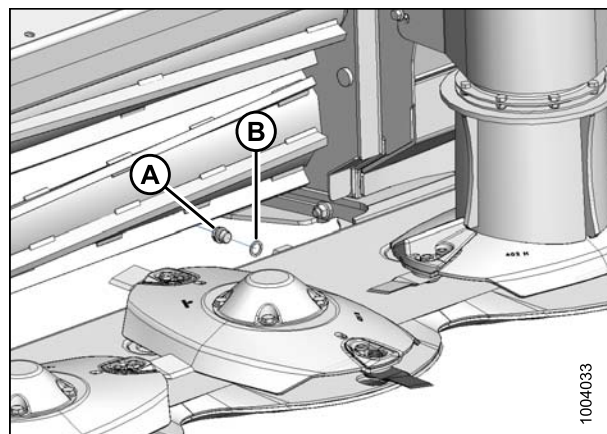


Figure 6.23: Inspection Plug and O-ring

## 6.11.1 Adding Cutterbar Lubricant

### DANGER

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

1. Park the mower conditioner on level ground.
2. Position header so the cutterbar is approximately level.
3. Shut down the mower conditioner and remove key.
4. Open the cutterbar doors.

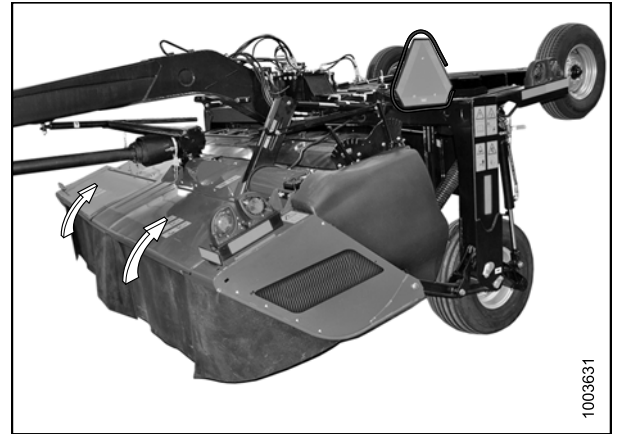


Figure 6.24: Cutterbar Doors

5. Start engine and raise mower conditioner.
6. Place a block under the side of the mower conditioner with the M18 cutterbar breather (A) so it is higher than the opposite side.
7. Lower mower conditioner onto block, shut down mower conditioner, and remove key.
8. Clean area around M18 cutterbar breather (A) and remove breather.

**IMPORTANT:**

Do NOT remove M10 hex head bolts (B) securing cutterbar end plate (C) to cutterbar or lubricant leaks could result.

9. Add SAE 90 lubricant until the lubricant level is even with the bore hole (if necessary).

**IMPORTANT:**

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

10. Install M18 cutterbar breather (A).
11. Start engine and raise mower conditioner.
12. Stop engine, remove key, and engage mower conditioner lift cylinder lock-outs.
13. Remove blocks.
14. Recheck lubricant level. Refer to [6.11 Checking Cutterbar Lubricant, page 148](#).

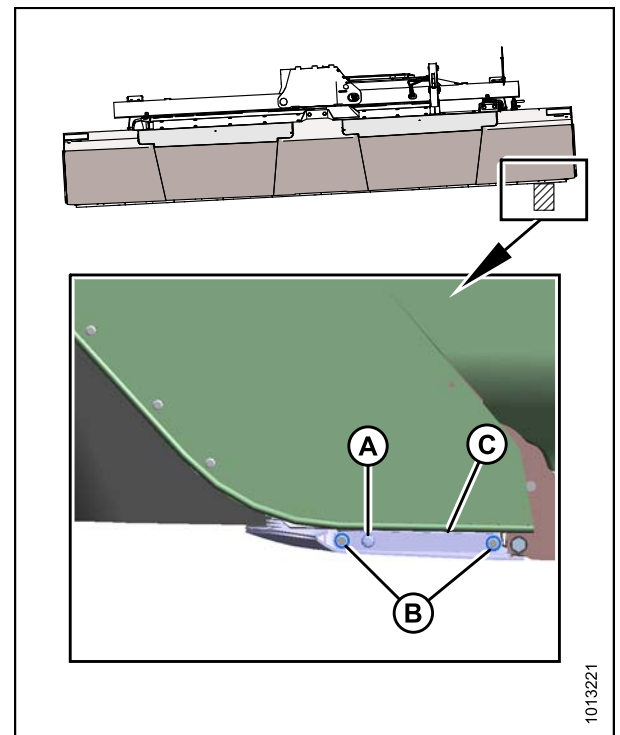


Figure 6.25: Left Side Shown – Right Side Similar

## 6.12 Checking Roll Gap

The roll gap is indicated by the amount of thread protruding beyond the jam nut on the gap adjuster bolt.

**NOTE:**

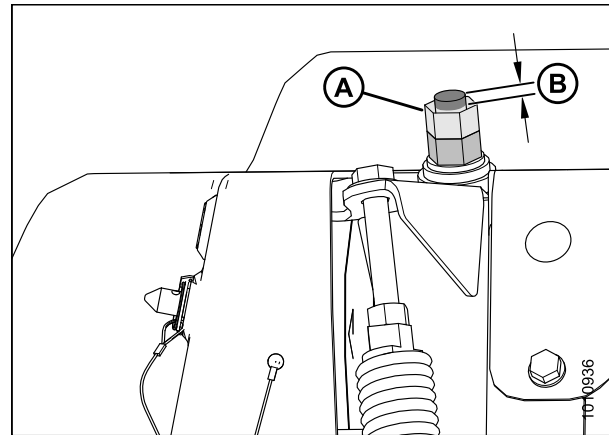
The amount of thread that extends above nut (A) is identical to the gap between the conditioner rolls.

1. Measure the amount of thread protruding beyond the jam nut (A) on the roll gap adjuster bolt at each end of the conditioner. The measurement (B) should be as follows:

- Polyurethane roll conditioner: 0.118 in. (3 mm)
- Steel roll conditioner: 0.25 in. (6 mm)

**NOTE:**

If adjustment is required, refer to the R113/R116 Pull-Type Rotary Disc Mower Conditioner Operator's Manual.



**Figure 6.26: Roll Gap Adjuster**

## 6.13 Checking Roll Tension

Roll tension is indicated by the exposed thread on the roll tension adjuster bolt. Not applicable to finger conditioners.

1. Measure the amount of exposed thread on the roll tension adjuster bolt (A) at each end of the conditioner. Measurement (B) should be  $1/2$ – $9/16$  in. (12–15 mm) for both polyurethane and steel roll conditioners.

**NOTE:**

If adjustment is required, refer to the R113/R116 Pull-Type Rotary Disc Mower Conditioner Operator's Manual.

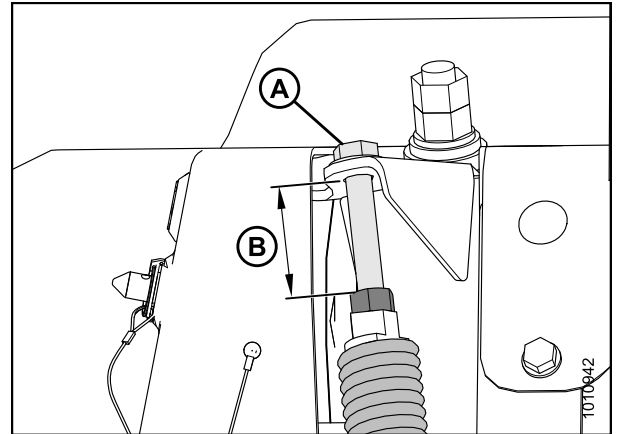


Figure 6.27: Roll Tension Adjuster

## 6.14 Checking Conditioner Baffle Settings

1. On finger conditioners, move baffle adjustment handles (A) and (B) to the middle positions (C) and (D) respectively on adjustment plates.

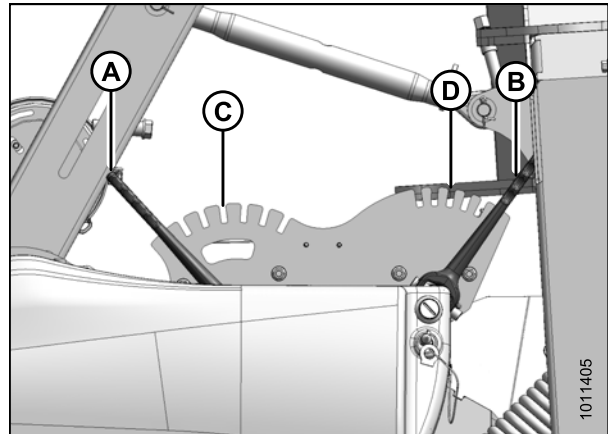


Figure 6.28: Baffle Adjusters

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

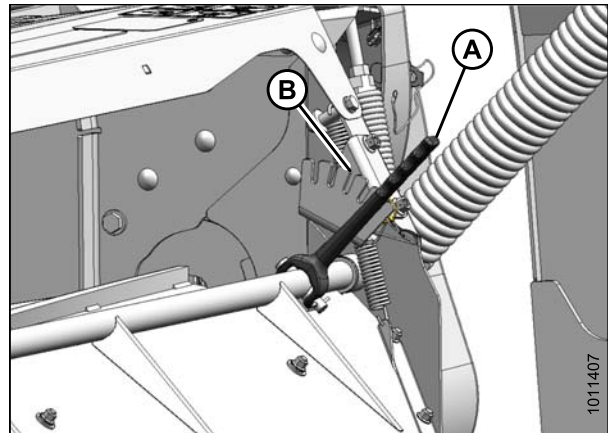


Figure 6.29: Baffle Adjuster



## 6.15 Checking Lights

1. Check that lights (A) and (B) are properly located on the mower conditioner to suit the set up configuration.
2. Check light mountings for security and damage.
3. Check operation of hazard lights (A) and brake lights (B) during machine run-up.

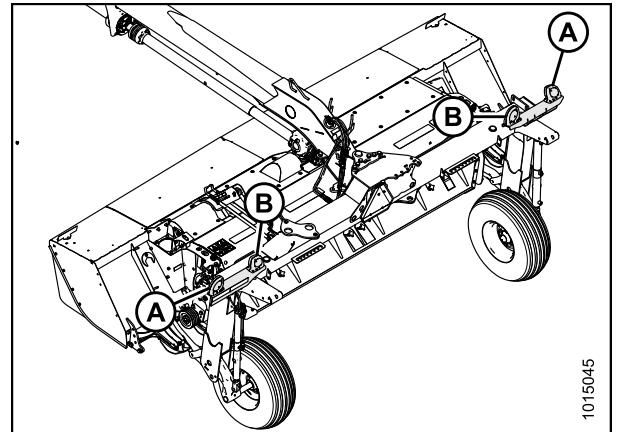


Figure 6.30: Standard Configuration

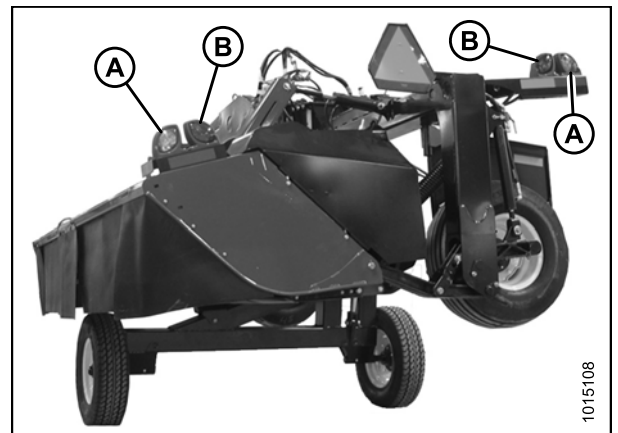


Figure 6.31: Road Friendly Transport™ Configuration

## 6.16 Checking Manuals

The following manuals should be stored in the manual storage case (A) at the right end of the mower conditioner. Open the right drive shield to access the case.

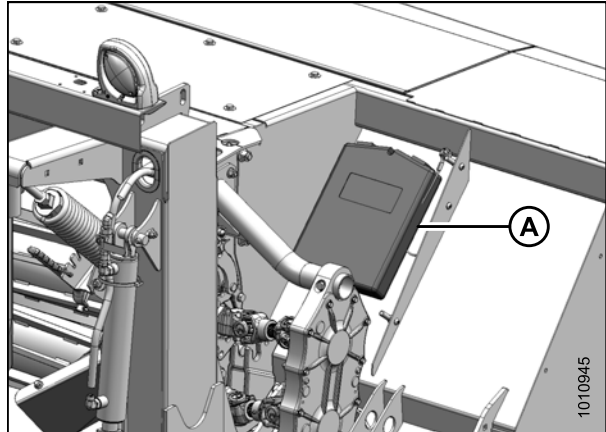


Figure 6.32: Manual Case

## 6.17 Running up the Mower Conditioner

### DANGER

- Keep everyone several hundred feet away from your operation. Ensure bystanders are never in line with the front or rear of the machine. Stones or other foreign objects can be ejected from either end with force.
- Take extreme care to avoid injury from thrown objects. Do NOT, under any circumstances, operate the mower conditioner when other people are in the vicinity. Stones and other objects can be thrown great distances by the rotating cutting blades.
- Check cutterbar area carefully for loose parts and hardware on the cutterbar. These objects can be ejected with considerable force when the machine is started, and may result in serious injury or machine damage.
- The cutterbar curtains are very important to reduce the potential for thrown objects. Always keep these curtains down when operating the mower conditioner. Replace the curtains if they should become worn or damaged.

### DANGER

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

### CAUTION

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

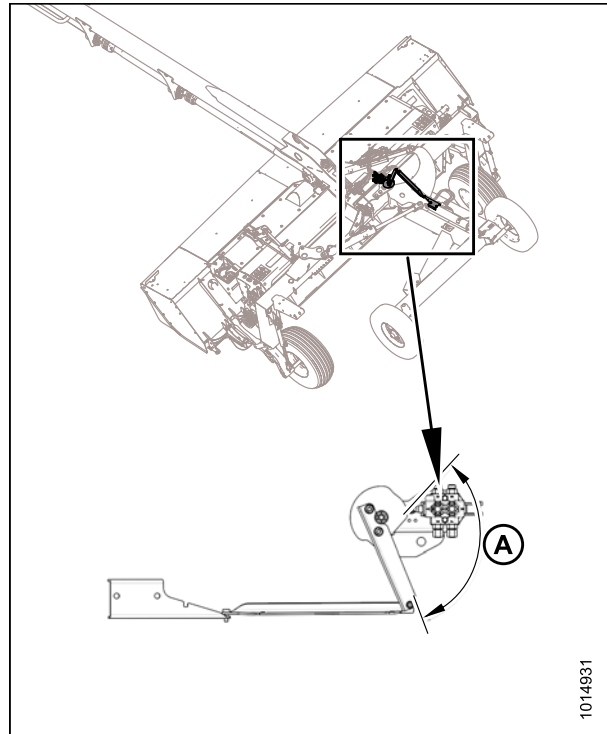
#### NOTE:

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

1. Start tractor.
2. Set header 6-12 in. (152-305 mm) above the ground and adjust center-link to mid-position.
3. Run the machine slowly for 5 minutes, watching, and listening FROM **THE OPERATOR'S SEAT** for binding or interfering parts.
4. Run the machine at operating speed for 15 minutes. Listen for any unusual sounds or abnormal vibration.
5. Perform the run-up check as listed on the Predelivery Checklist (yellow sheet attached to this instruction) to ensure the machine is field-ready. Refer to [Predelivery Checklist, page 223](#).
6. Retain the Checklist and if desired, retain this instruction for future reference.

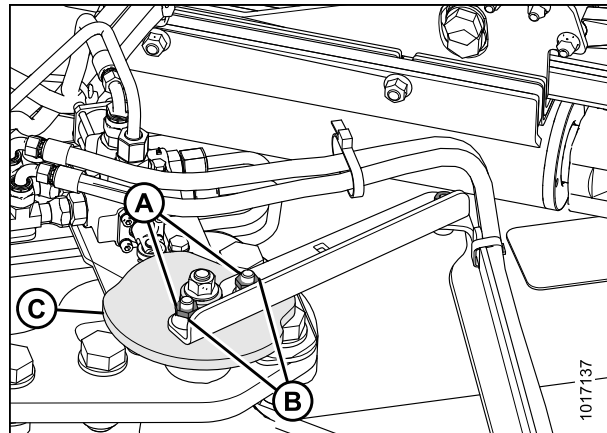
## 6.18 Checking and Adjusting the Cam on the Transport Deploy/Swing Mechanism

The cam on the transport deploy/swing mechanism assembly is factory-set to 112° (A), and the valve clearance is set to 2-1/2 in. (63 mm) (B). It may be necessary to adjust the cam angle and valve position if the Road Friendly Transport™ system does not properly deploy.



**Figure 6.33: Transport Deploy/Swing Mechanism Assembly**

1. Loosen two M10 jam nuts (A), two M10 hex flange nuts (B), and the cam (C) to achieve the proper angle. Reposition cam as follows:
  - Rotate **counterclockwise** if the header transitions to transport swing before transport tires pass by header tires.
  - Rotate **clockwise** if the tires go underneath the header, but the header does not transition into transport swing.
2. Tighten two M10 hex flange nuts (B) and two M10 jam nuts (A).



**Figure 6.34: Transport Deploy/Swing Mechanism Assembly**

### 6.18.1 Converting from Field to Transport Mode

**⚠ DANGER**

Do not convert the machine into, or from, transport mode until you are certain that all people, animals, and objects are clear of the unit's rotational range.

**⚠ WARNING**

Ensure cutterbar doors are properly closed before converting the machine from field to transport mode to prevent equipment damage.

1. Loosen bolts (B) on the transport latch (A).

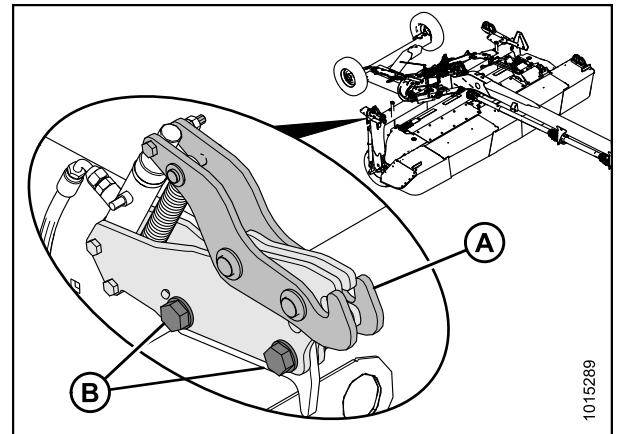


Figure 6.35: Transport Latch

2. Start tractor if not running. Do **NOT** operate the mower conditioner.
3. Following the field to transport decal (A), move transport switch to the lower position (C) and ensure that light (B) is illuminated.



Figure 6.36: Remote Control

## PERFORMING PREDELIVERY CHECKS

4. While light is illuminated, raise the mower conditioner fully.

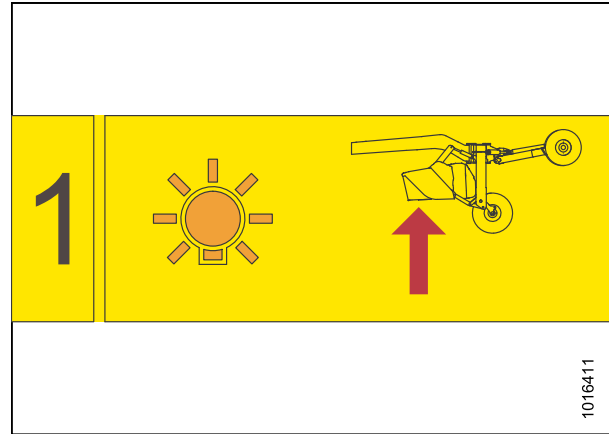


Figure 6.37: Raising Mower Conditioner

5. Operate the hitch swing control lever to rotate the mower conditioner to the right until cam bearing nut is aligned with the green section of the transport alignment gauge decal.

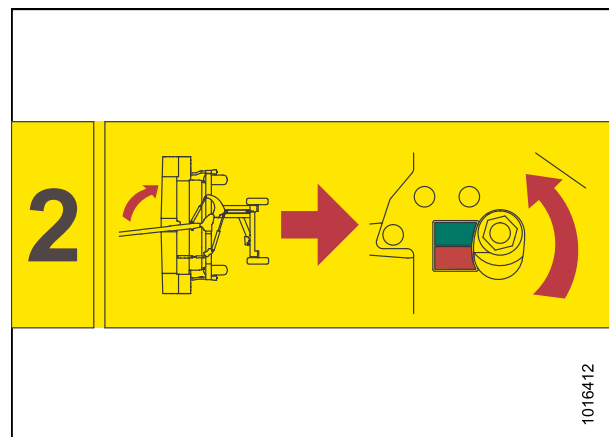


Figure 6.38: Mower Conditioner Rotation

6. Move transport switch to the upper position and ensure that the light is **NOT** illuminated. The hitch swing circuit is now deactivated and the transport circuit is active.

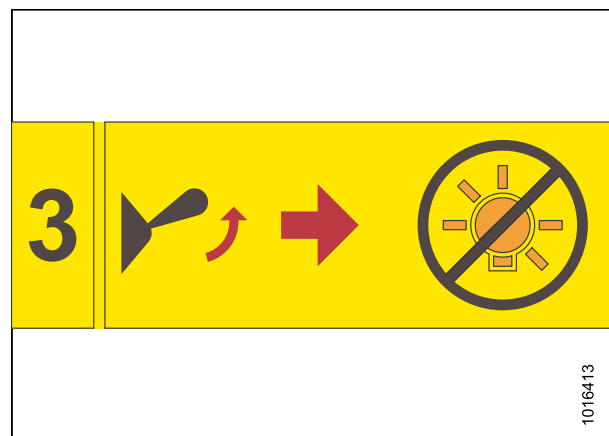


Figure 6.39: Transport Switch

## PERFORMING PREDELIVERY CHECKS

7. Operate hitch swing control lever to lower transport wheels (A) and hold lever until mower conditioner is lifted off the ground.
8. Continue to hold the hitch swing control lever so that the mower conditioner (B) rotates to the left and under the hitch.
9. Release hitch swing control lever when mower conditioner (C) stops rotating.

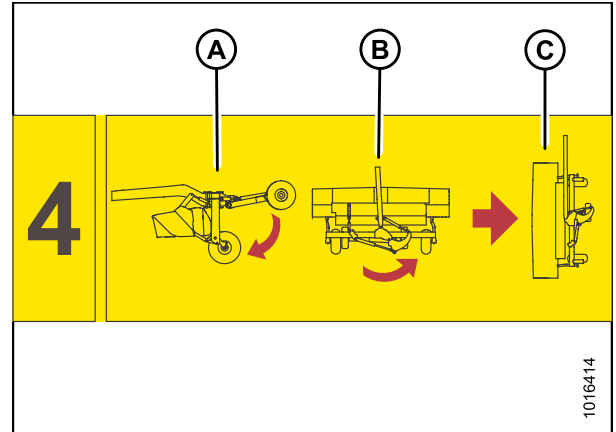


Figure 6.40: Transport Assembly Rotation

10. Operate the lift control lever to lower the mower conditioner onto the transport assembly, to raise the field wheels, and to engage transport latch onto hitch.

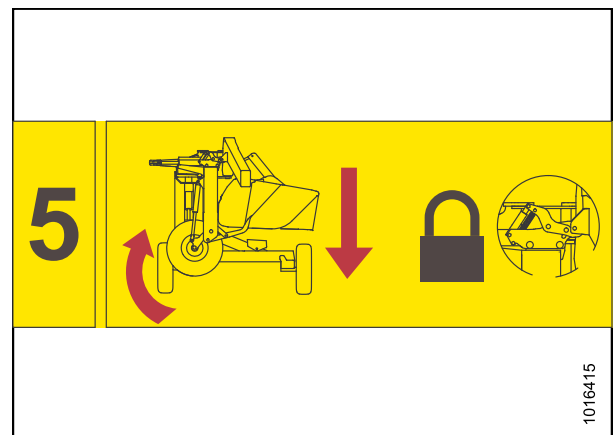


Figure 6.41: Transport Assembly Lowering

11. Torque bolts (B) on transport latch (A) to 340 ft-lbf (460 N·m).

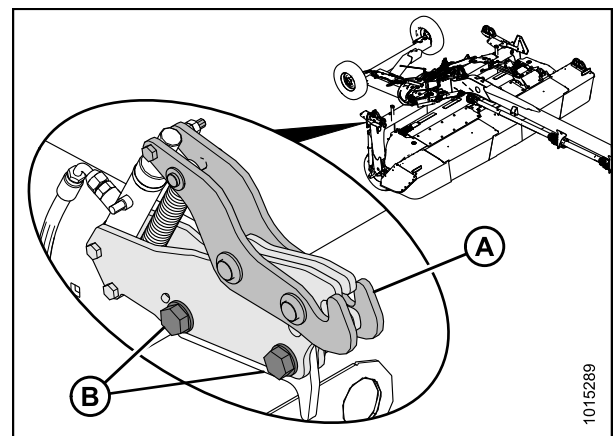


Figure 6.42: Transport Latch

## PERFORMING PREDELIVERY CHECKS

12. Operate the hitch swing control lever to ensure the carrier frame (A) and hitch (B) are locked together.
13. Activate the hazard lights (C) on the mower conditioner. Check that all lights are working.
14. Ensure that the slow moving vehicle sign (D) is visible from behind the mower conditioner.

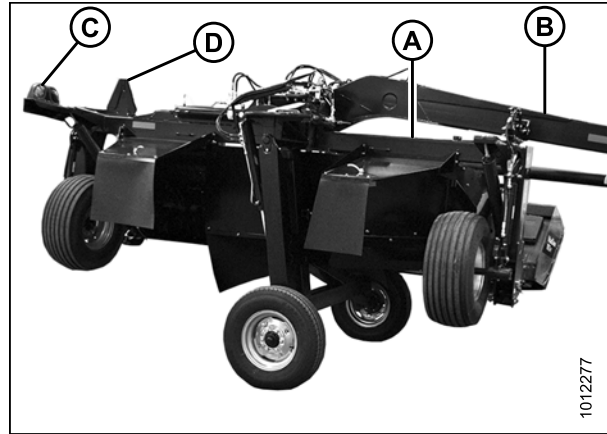


Figure 6.43: Transport Mode

15. Once the field to transport conversion (A) is complete, leave the switch in the upper position (C). Ensure that light (B) is **NOT** illuminated.

For a reference on converting, refer to [10.5 Converting Road Friendly Transport™ Decal](#), page 221.



Figure 6.44: Remote Control

### 6.18.2 Converting from Transport to Field Mode

#### DANGER

Do not convert the machine into, or from, transport mode until you are certain that all people, animals, and objects are clear of the unit's rotational range.

#### WARNING

Ensure cutterbar doors are properly closed before converting the machine from field to transport mode to prevent equipment damage.



## PERFORMING PREDELIVERY CHECKS

1. Following the transport to field decal (A), move transport switch to the upper position (C) and ensure that light (B) is **NOT** illuminated.



Figure 6.45: Remote Control

2. While the light is **NOT** illuminated, operate the lift control lever (as if raising the mower conditioner) to fully extend the lift cylinders and raise the cutterbar off the transport assembly support. The carrier frame latch will automatically open.

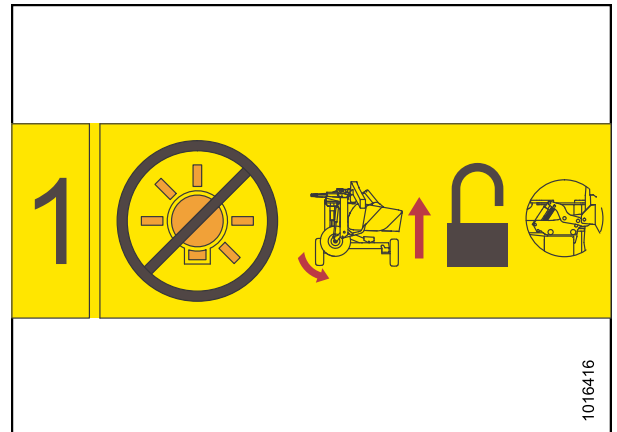
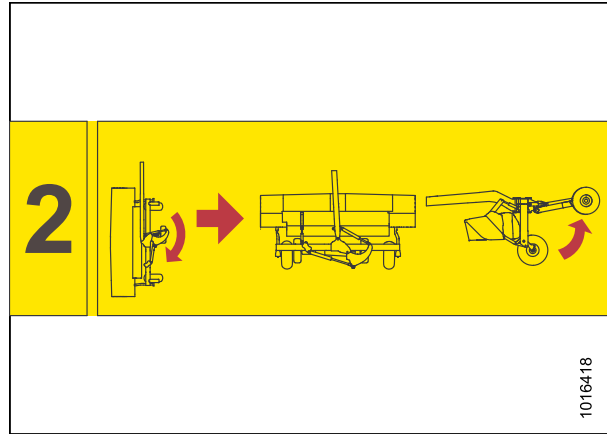


Figure 6.46: Raising Mower Conditioner

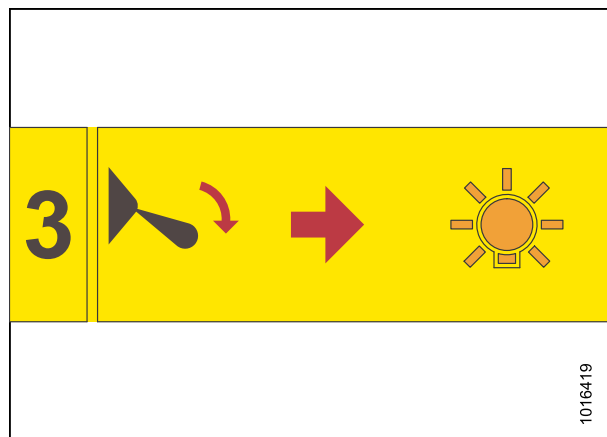
## PERFORMING PREDELIVERY CHECKS

3. Operate the hitch swing control lever to rotate the mower conditioner to the right. The mower conditioner will stop when it reaches operating position.



**Figure 6.47: Mower Conditioner Rotation**

4. Continue operating the hitch swing control lever to fully raise the transport assembly and lower the mower conditioner onto the field wheels.
5. Move transport switch to the lower position and ensure that the light on the remote control is illuminated. Transport conversion is now complete and the hitch swing circuit is active.



**Figure 6.48: Transport Switch**

## PERFORMING PREDELIVERY CHECKS

6. Once the transport to field conversion (A) is complete, leave the switch in lower position (C). Ensure that light (B) is illuminated.

For a reference on converting, refer to [10.5 Converting Road Friendly Transport™ Decal](#), page 221.



Figure 6.49: Remote Control



## 7 Transporting the Mower Conditioner

You can tow the mower conditioner on public roads in either normal field mode or Road Friendly Transport™ mode.

- To prepare a mower conditioner for towing with a tractor or a truck without using the Road Friendly Transport™ option, refer to [7.1 Preparing Mower Conditioner for Transport, page 165](#).
- To prepare a mower conditioner for endwise towing with the Road Friendly Transport™ option, refer to [6.18.1 Converting from Field to Transport Mode, page 157](#).

### CAUTION

- Obey all highway traffic regulations in your area when transporting on public roads. Use flashing amber lights unless prohibited by law
- Be aware of roadside obstructions, oncoming traffic, and bridges.
- Travel at safe speeds to ensure complete machine control and stability at all times. Do NOT exceed 20 mph (32 km/h). Reduce speed for corners and slippery conditions.
- Use tractor lights and mower conditioner flashing amber and red taillights when transporting on roads in order to provide adequate warning to operators of other vehicles.
- Do NOT transport the mower conditioner on a road or highway at night or in reduced visibility conditions such as rain or fog.
- Ensure that hitch on transporting vehicle is capable of handling a 2000 lb. (907 kg) static vertical load.

### 7.1 Preparing Mower Conditioner for Transport

Follow these instructions to prepare the mower conditioner for transport without deploying the optional Road Friendly Transport™ system.

### DANGER

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

### WARNING

Do NOT tow unless the hitch swing cylinder is fully charged. If hitch swing cylinder is not fully charged, loss of control, injury, or death could result.

1. Connect the mower conditioner hitch to the tractor. Refer to [4.10 Attaching Mower Conditioner to the Tractor, page 101](#).
2. Move jack (A) to storage position on side of hitch, and secure with pin (B).

#### NOTE:

If unit is equipped with a two-point hitch, rotate the hitch stand to the storage position.

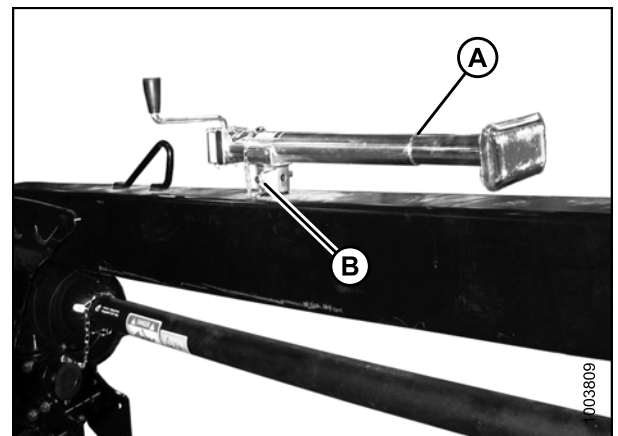


Figure 7.1: Jack in Storage Position

## TRANSPORTING THE MOWER CONDITIONER

3. Connect the hitch swing cylinder hoses (labelled red #2 and blue #2) to the tractor's hydraulic circuit (A). Refer to [4.10.3 Connecting Hydraulics, page 105](#).
4. Swing the mower conditioner completely to the left, then completely to the right. Repeat three or four times to charge the hitch swing circuit.
5. Swing the mower conditioner so that it is centered behind the towing vehicle.

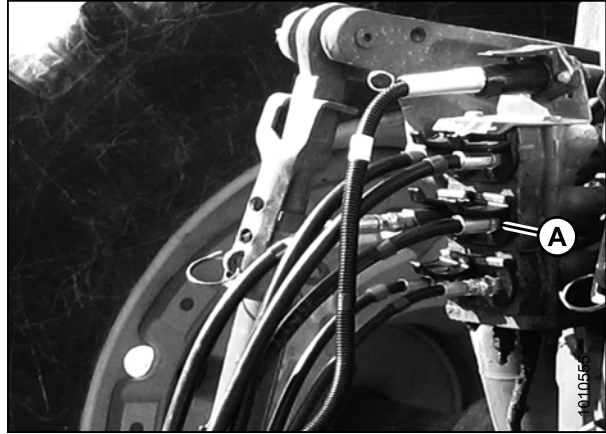


Figure 7.2: Hydraulic Connection

6. Close the hitch swing lock-out valve (A) by turning the handle to the closed (vertical) position.

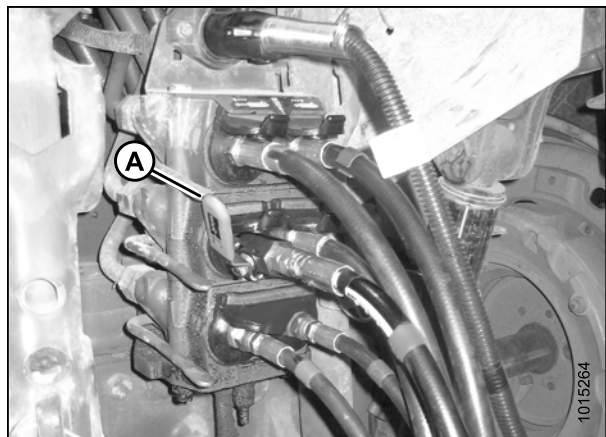


Figure 7.3: Hitch Swing Lock-Out Valve Shown in Closed Position

7. Raise the mower conditioner fully and close the lift cylinder lock-out valve (A) on each lift cylinder by turning the handle to the closed position.
8. Ensure tires are properly inflated.
9. Ensure the slow moving vehicle (SMV) sign, reflectors, and lights are clean and visible at rear of mower conditioner.



Figure 7.4: Cylinder Lock-Out Valve

10. Proceed to the procedure relevant to your equipment.
  - If towing the mower conditioner with a tractor, refer to [7.2 Transporting with a Tractor, page 167](#).
  - If towing the mower conditioner with a truck, refer to [7.3 Transporting with a Truck, page 168](#).

## 7.2 Transporting with a Tractor

If towing endwise with the optional Road Friendly Transport™ system, refer to [6.18.1 Converting from Field to Transport Mode, page 157](#).

1. Before proceeding to transport the mower conditioner with a tractor, ensure the machine is prepared for transport. Refer to [7.1 Preparing Mower Conditioner for Transport, page 165](#).
2. Ensure that hitch safety chain is properly attached to towing tractor. Provide only enough slack in chain to permit turning.
3. Move jack (A) to storage position on side of hitch, and secure with pin (B).

**NOTE:**

If unit is equipped with a two-point hitch, rotate the stand to the storage position.

4. Keep the slow moving vehicle (SMV) sign, reflectors, and lights clean and visible at rear of mower conditioner.
5. Ensure tires are properly inflated.
6. Do NOT exceed 20 mph (32 km/h).

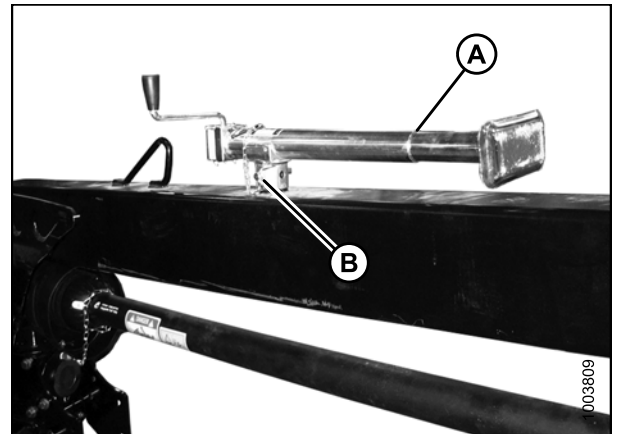


Figure 7.5: Jack in Storage Position

## 7.3 Transporting with a Truck

Follow these instructions if the machine will be transported from the Dealer to the end user with a truck.

### **⚠ CAUTION**

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

If towing endwise with the optional Road Friendly Transport™ system, refer to [6.18.2 Converting from Transport to Field Mode, page 160](#).

1. Before proceeding to transport the mower conditioner with a truck, ensure the machine is prepared for transport. Refer to [7.1 Preparing Mower Conditioner for Transport, page 165](#).

2. Ensure the hydraulic hoses (A) are securely stored on the hitch.

**NOTE:**

Hydraulic hoses do not need to be attached to the tractor for towing.

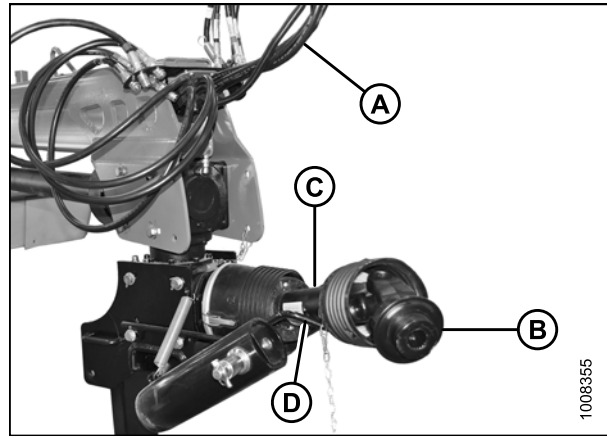
3. Remove the forward half (B) of driveline and store in the cab for transport.

4. Store driveline (C) on hook (D) (if power take-off (PTO) driveline is not attached).

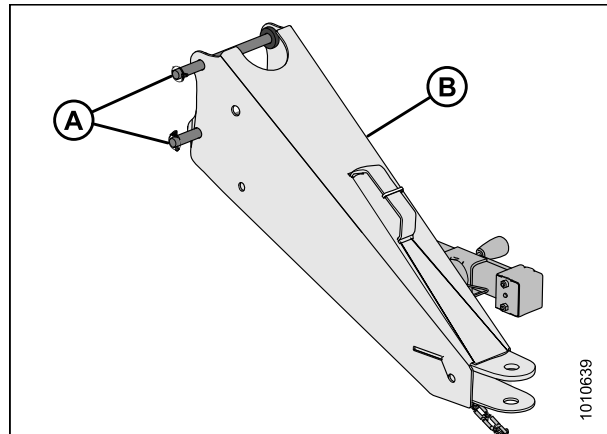
**NOTE:**

The PTO driveline (C) does not need to be attached for towing purposes.

5. Remove pins (A) from transport hitch (B).



**Figure 7.6: Mower Conditioner Hitch**



**Figure 7.7: Transport Hitch**



## TRANSPORTING THE MOWER CONDITIONER

6. Position transport hitch (A) on mower conditioner hitch, install pins (B), and secure with lynch pins.
7. Lift the mower conditioner hitch with jack and attach mower conditioner to truck.

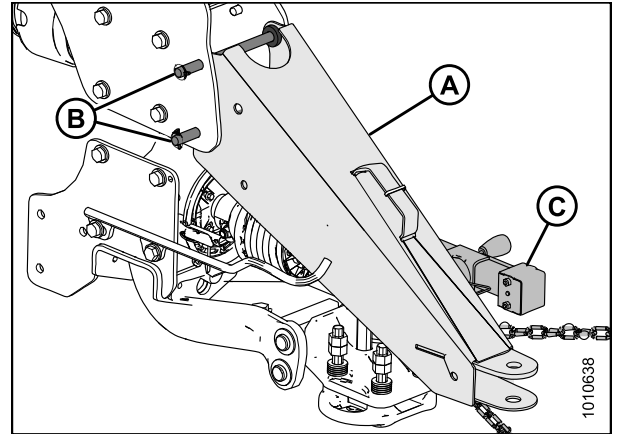


Figure 7.8: Transport Hitch Installed

8. Move jack (A) to storage position on side of hitch, and secure with pin (B).

**NOTE:**

If unit is equipped with a two-point hitch, rotate the stand to the storage position.

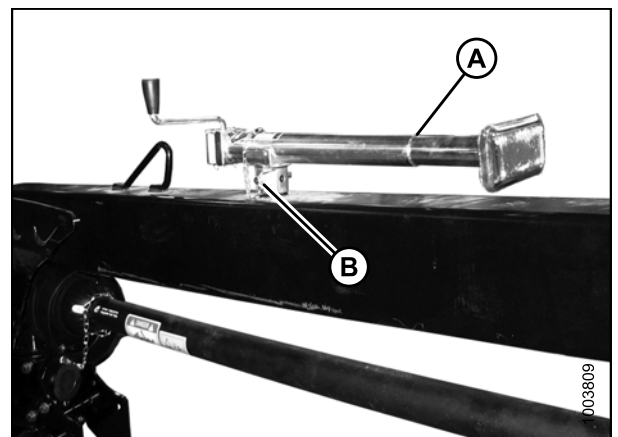


Figure 7.9: Jack in Storage Position

9. Wrap safety chain (A) around hitch and attach to truck frame. Provide only enough slack in chain to permit turning.
10. Connect electrical harness (B).
11. Keep the slow moving vehicle (SMV) sign, reflectors, and lights clean and visible at rear of mower conditioner.
12. Ensure tires are properly inflated.
13. Do NOT exceed 20 mph (32 km/h).

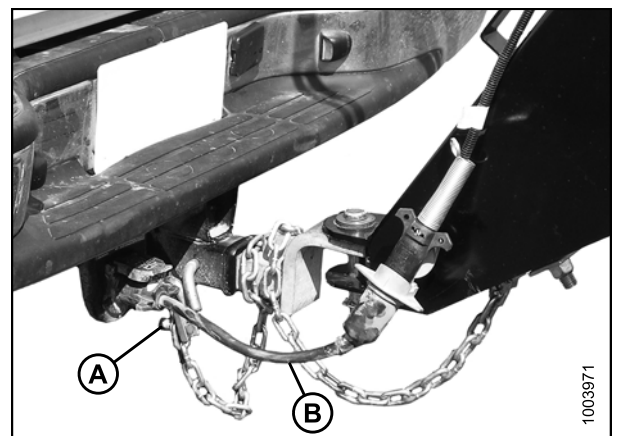


Figure 7.10: Safety Chain and Electrical Harness



# 8 Hydraulic Schematics



HYDRAULIC SCHEMATICS

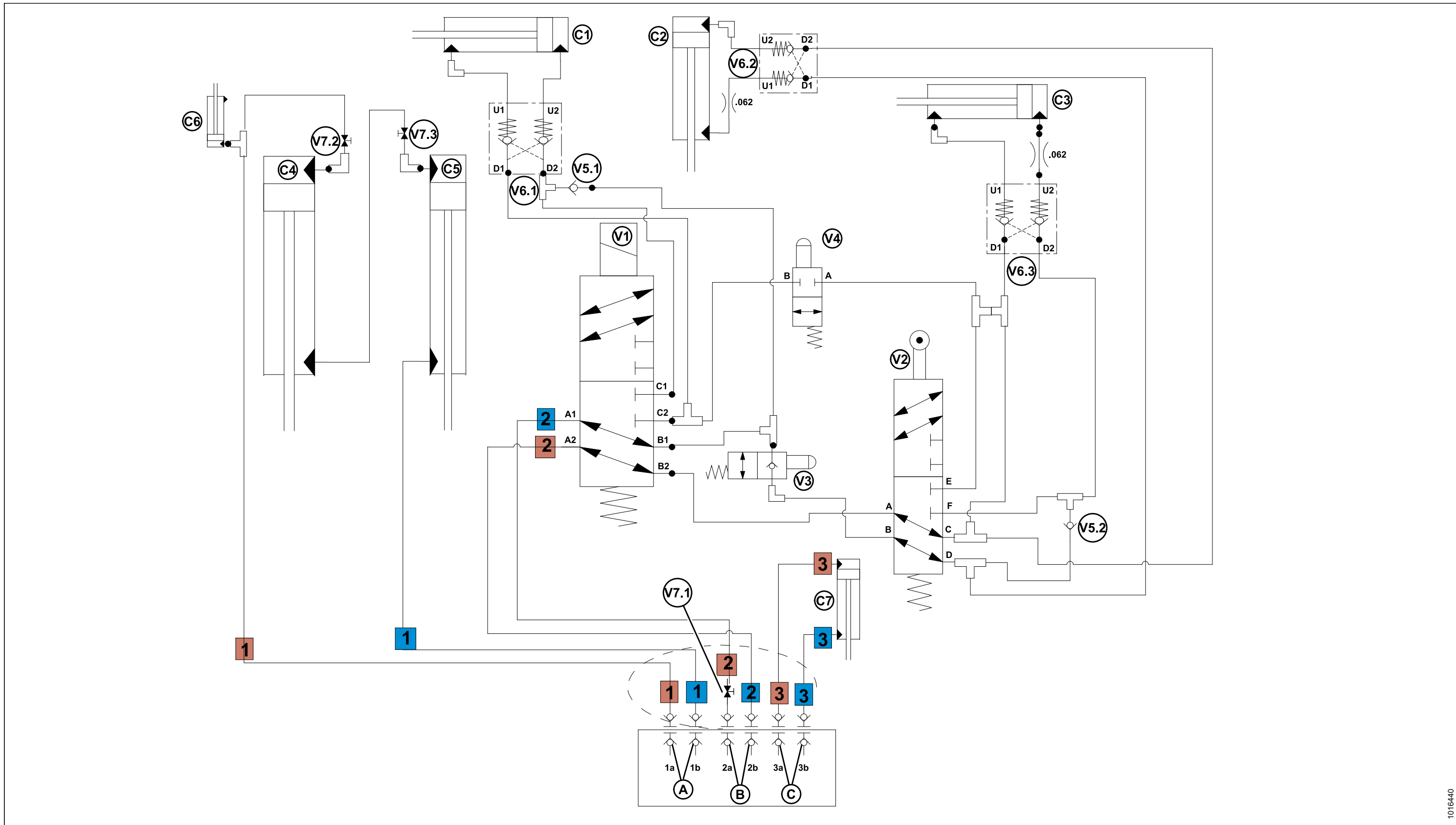


Figure 8.1: 2015 Hydraulic Schematic with Transport

## HYDRAULIC SCHEMATICS

### Table 8.1 Cylinder Legend

C1 - Hitch Swing Cylinder (located between hitch and transport casting)  
C3 - Transport Swing Cylinder (located between carrier frame and transport casting)  
C5 - Slave Lift Cylinder (located on LH side of carrier frame)  
C7 - Tilt Cylinder [Option] (located between carrier frame and header)

### Table 8.2 Valve Legend

V1 - 6-way Solenoid Valve (located top of hitch mount) [non energized for Transport]  
V3 - 2-way NC directional valve with check. [Red/Green Indicator] (located on hitch alignment mechanism)  
V5.1, 5.2 - In-line check valve  
V7.1, 7.2, 7.3 - Shut Off Valves for lift and swing cylinder circuit

C2 - Transport Deploy Cylinder (located on transport frame)  
C4 - Master Lift Cylinder (located on RH side of carrier frame)  
C6 - Transport Lock Cylinder (located on transport lock mechanism)

V2 - 6-way Mechanical Valve cam actuated (located on top of transport casting mount)  
V4 - 2-way NC directional valve with mechanical paddle actuator (located on back of carrier frame.)  
V6.1, 6.2, 6.3 - Pressure Balance Valves C1, C2, C3

HYDRAULIC SCHEMATICS

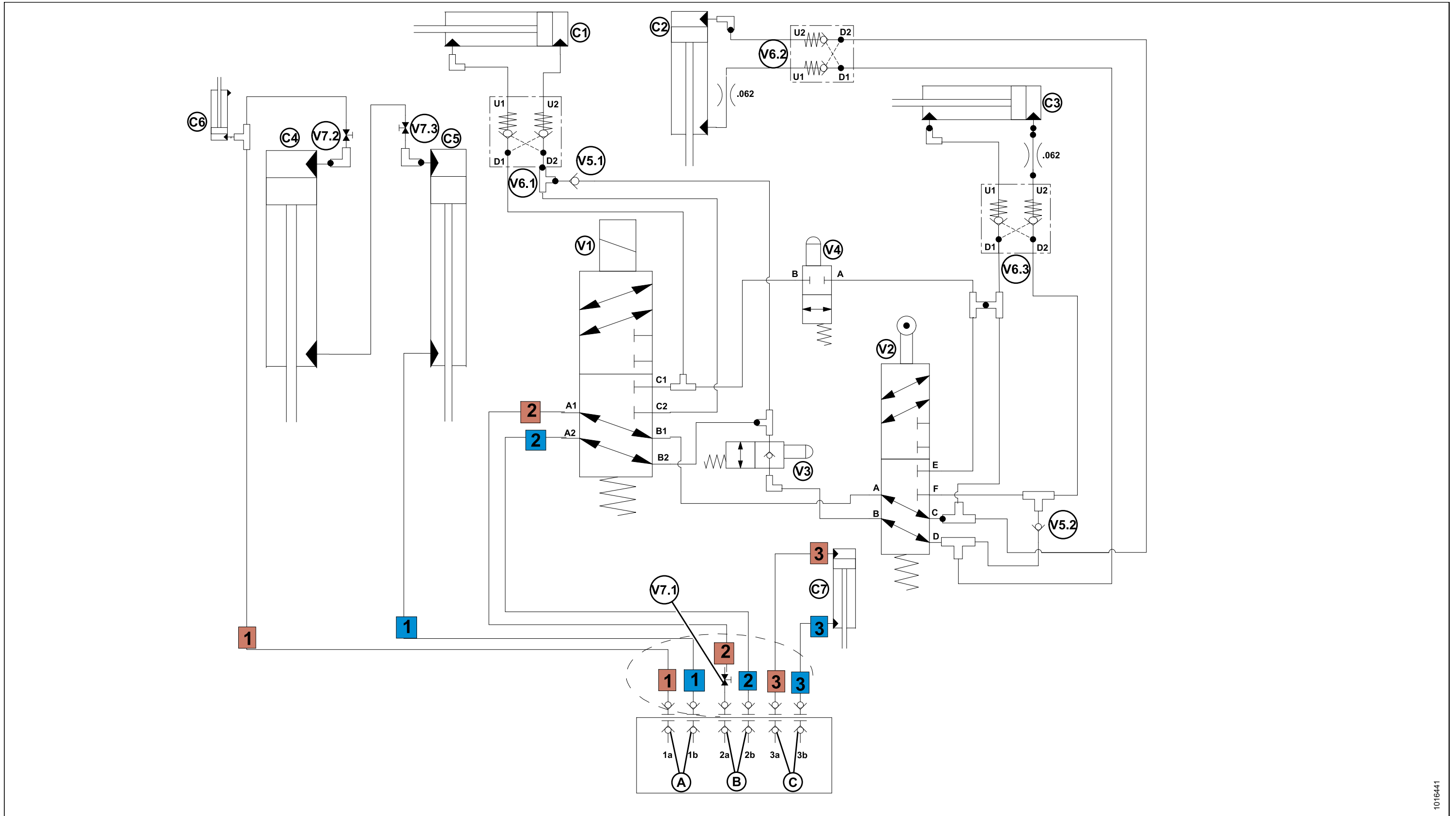


Figure 8.2: 2016 Hydraulic Schematic with Transport

## HYDRAULIC SCHEMATICS

### Table 8.3 Cylinder Legend

C1 - Hitch Swing Cylinder (located between hitch and transport casting)  
C3 - Transport Swing Cylinder (located between carrier frame and transport casting)  
C5 - Slave Lift Cylinder (located on LH side of carrier frame)  
C7 - Tilt Cylinder [Option] (located between carrier frame and header)

### Table 8.4 Valve Legend

V1 - 6-way Solenoid Valve (located top of hitch mount) [non energized for Transport]  
V3 - 2-way NC directional valve with check. [Red/Green Indicator] (located on hitch alignment mechanism)  
V5.1, 5.2 - In-line check valve  
V7.1, 7.2, 7.3 - Shut Off Valves for lift and swing cylinder circuit

C2 - Transport Deploy Cylinder (located on transport frame)  
C4 - Master Lift Cylinder (located on RH side of carrier frame)  
C6 - Transport Lock Cylinder (located on transport lock mechanism)

V2 - 6-way Mechanical Valve cam actuated (located on top of transport casting mount)  
V4 - 2-way NC directional valve with mechanical paddle actuator (located on back of carrier frame.)  
V6.1, 6.2, 6.3 - Pressure Balance Valves C1, C2, C3



HYDRAULIC SCHEMATICS

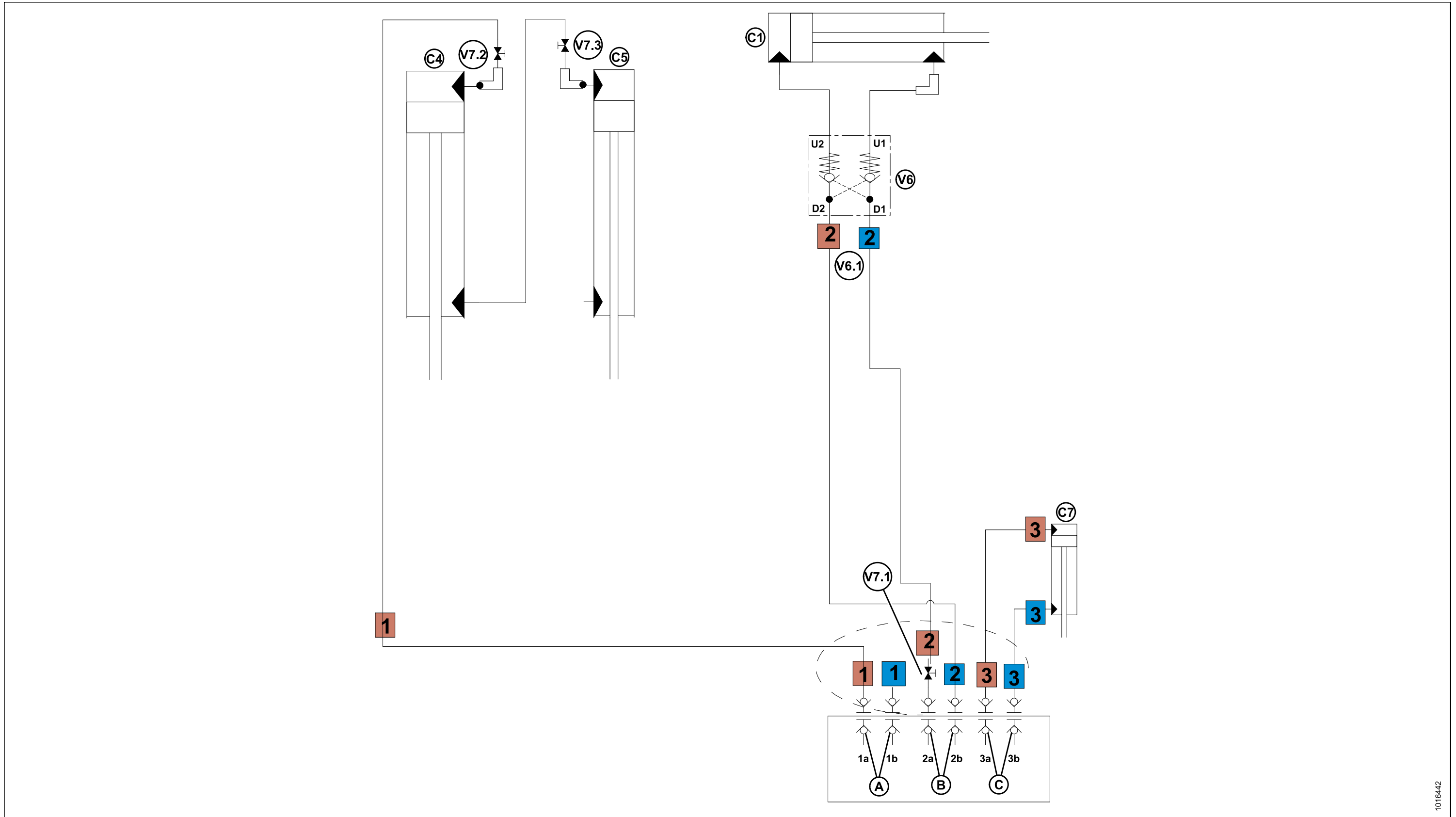


Figure 8.3: 2016 Hydraulic Schematic without Transport

## HYDRAULIC SCHEMATICS

### Table 8.5 Cylinder Legend

C1 - Hitch Swing Cylinder (located between hitch and transport casting)  
C5 - Slave Lift Cylinder (located on LH side of carrier frame)

### Table 8.6 Valve Legend

V6 - Pressure Balance Valves (3) at C1,C2,C3

C4 - Master Lift Cylinder (located on RH side of carrier frame)  
C7 - Tilt Cylinder [Option] (located between carrier frame and header)

V7 - Shut Off Valves (3) for lift and swing cylinder circuit

HYDRAULIC SCHEMATICS

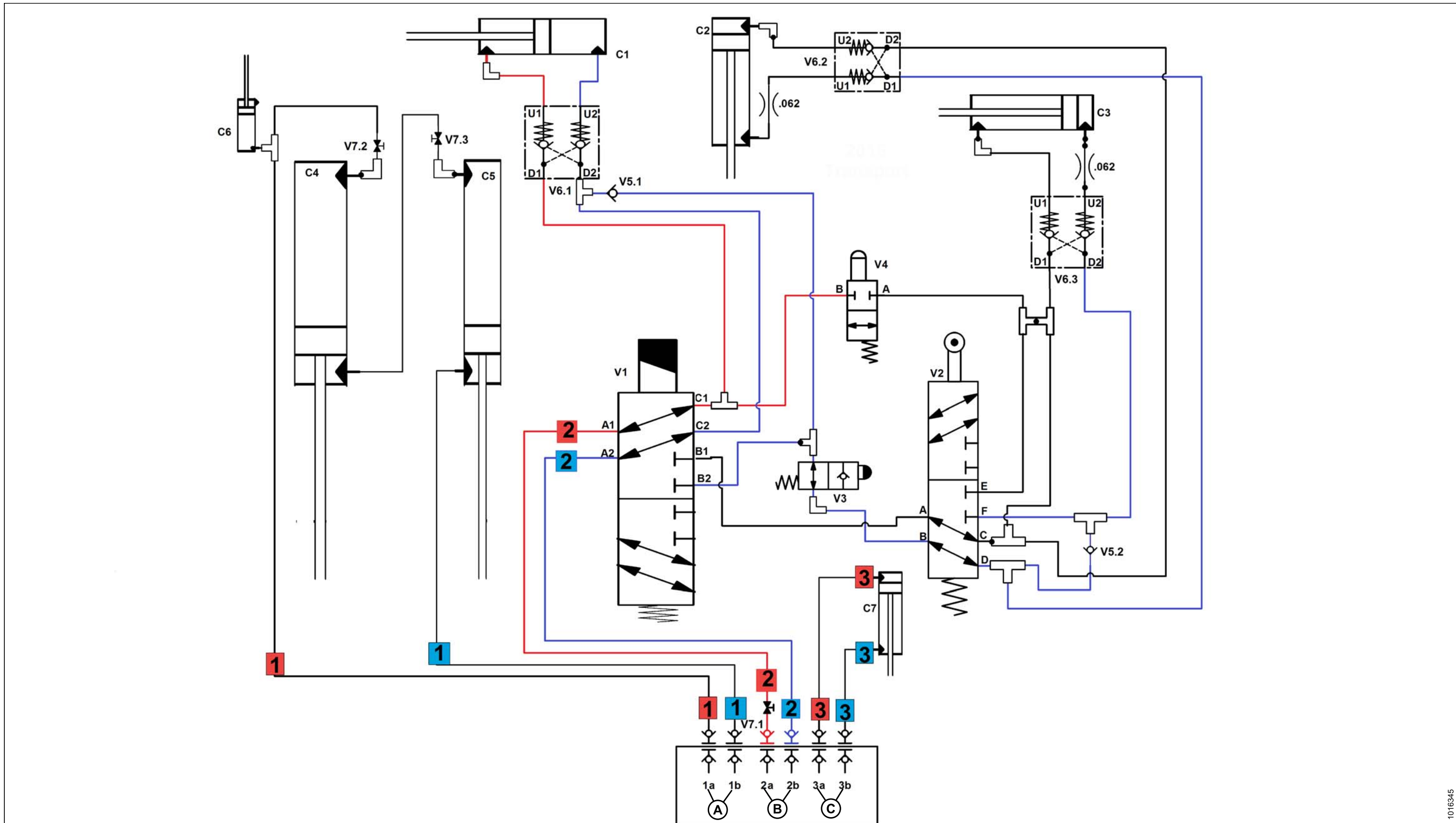


Figure 8.4: 2016 Hydraulic Schematic – Header Swing

## HYDRAULIC SCHEMATICS

### Table 8.7 Cylinder Legend

C1 - Hitch Swing Cylinder (located between hitch and transport casting)  
C3 - Transport Swing Cylinder (located between carrier frame and transport casting)  
C5 - Slave Lift Cylinder (located on LH side of carrier frame)  
C7 - Tilt Cylinder [Option] (located between carrier frame and header)

### Table 8.8 Valve Legend

V1 - 6-way Solenoid Valve (located top of hitch mount) [non energized for Transport]  
V3 - 2-way NC directional valve with check. [Red/Green Indicator] (located on hitch alignment mechanism)  
V5.1, 5.2 - In-line check valve  
V7.1, 7.2, 7.3 - Shut Off Valves for lift and swing cylinder circuit

C2 - Transport Deploy Cylinder (located on transport frame)  
C4 - Master Lift Cylinder (located on RH side of carrier frame)  
C6 - Transport Lock Cylinder (located on transport lock mechanism)

V2 - 6-way Mechanical Valve cam actuated (located on top of transport casting mount)  
V4 - 2-way NC directional valve with mechanical paddle actuator (located on back of carrier frame.)  
V6.1, 6.2, 6.3 - Pressure Balance Valves C1, C2, C3

HYDRAULIC SCHEMATICS

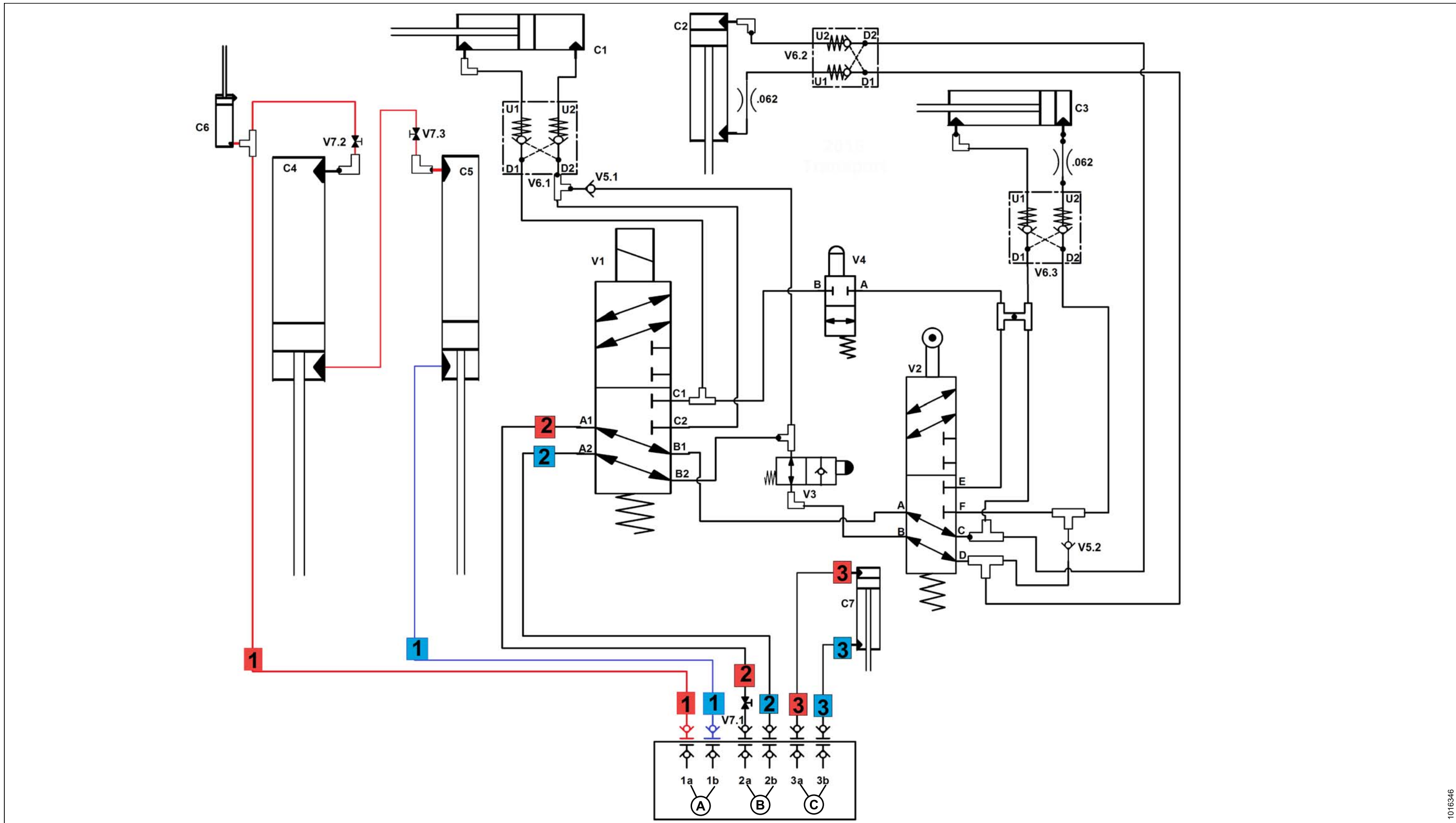


Figure 8.5: 2016 Hydraulic Schematic – Header Raise

## HYDRAULIC SCHEMATICS

### Table 8.9 Cylinder Legend

C1 - Hitch Swing Cylinder (located between hitch and transport casting)  
C3 - Transport Swing Cylinder (located between carrier frame and transport casting)  
C5 - Slave Lift Cylinder (located on LH side of carrier frame)  
C7 - Tilt Cylinder [Option] (located between carrier frame and header)

### Table 8.10 Valve Legend

V1 - 6-way Solenoid Valve (located top of hitch mount) [non energized for Transport]  
V3 - 2-way NC directional valve with check. [Red/Green Indicator] (located on hitch alignment mechanism)  
V5.1, 5.2 - In-line check valve  
V7.1, 7.2, 7.3 - Shut Off Valves for lift and swing cylinder circuit

C2 - Transport Deploy Cylinder (located on transport frame)  
C4 - Master Lift Cylinder (located on RH side of carrier frame)  
C6 - Transport Lock Cylinder (located on transport lock mechanism)

V2 - 6-way Mechanical Valve cam actuated (located on top of transport casting mount)  
V4 - 2-way NC directional valve with mechanical paddle actuator (located on back of carrier frame.)  
V6.1, 6.2, 6.3 - Pressure Balance Valves C1, C2, C3

HYDRAULIC SCHEMATICS

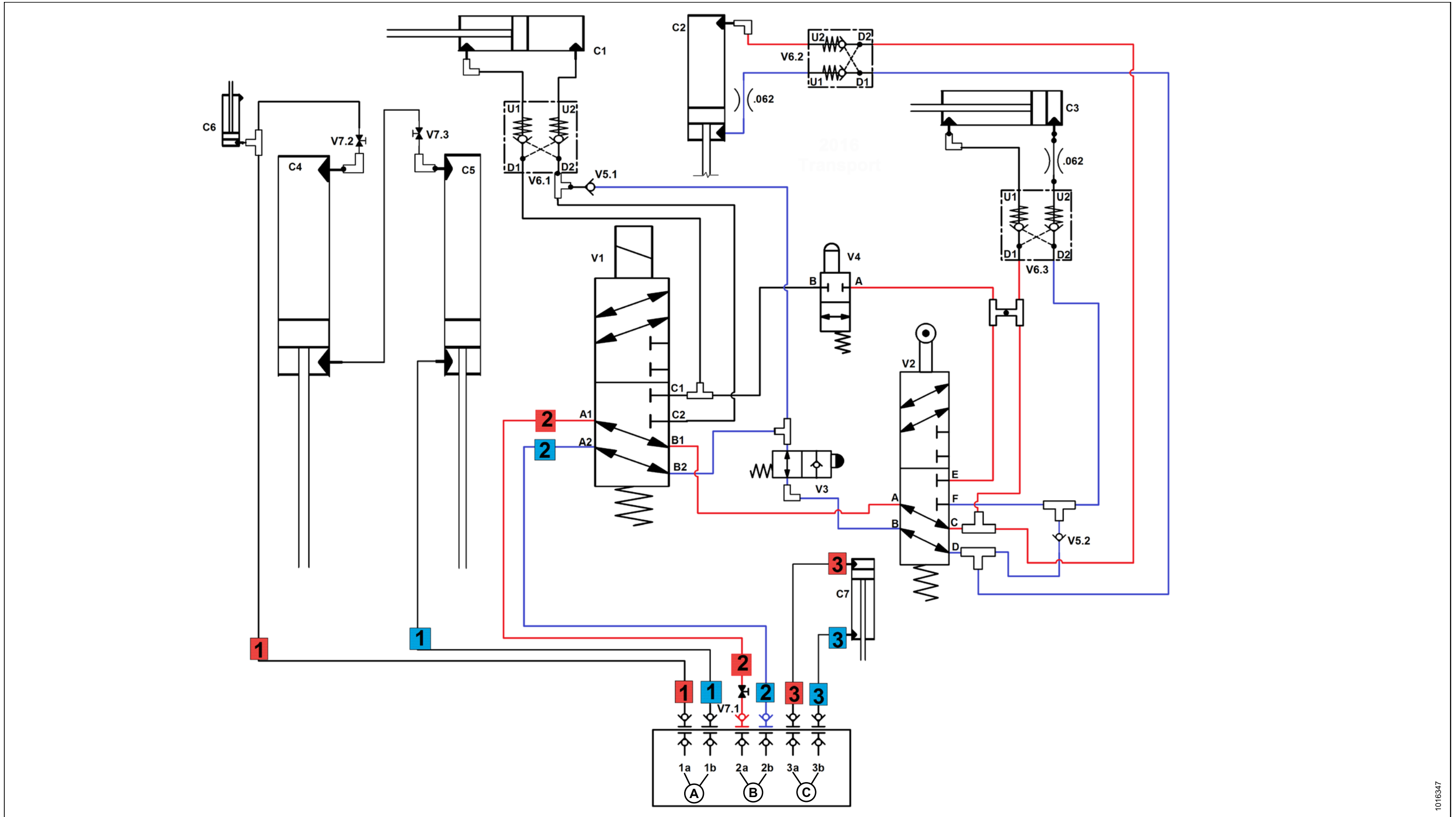


Figure 8.6: 2016 Hydraulic Schematic – Header Transport Deploy

## HYDRAULIC SCHEMATICS

### Table 8.11 Cylinder Legend

C1 - Hitch Swing Cylinder (located between hitch and transport casting)  
C3 - Transport Swing Cylinder (located between carrier frame and transport casting)  
C5 - Slave Lift Cylinder (located on LH side of carrier frame)  
C7 - Tilt Cylinder [Option] (located between carrier frame and header)

### Table 8.12 Valve Legend

V1 - 6-way Solenoid Valve (located top of hitch mount) [non energized for Transport]  
V3 - 2-way NC directional valve with check. [Red/Green Indicator] (located on hitch alignment mechanism)  
V5.1, 5.2 - In-line check valve  
V7.1, 7.2, 7.3 - Shut Off Valves for lift and swing cylinder circuit

C2 - Transport Deploy Cylinder (located on transport frame)  
C4 - Master Lift Cylinder (located on RH side of carrier frame)  
C6 - Transport Lock Cylinder (located on transport lock mechanism)

V2 - 6-way Mechanical Valve cam actuated (located on top of transport casting mount)  
V4 - 2-way NC directional valve with mechanical paddle actuator (located on back of carrier frame.)  
V6.1, 6.2, 6.3 - Pressure Balance Valves C1, C2, C3



HYDRAULIC SCHEMATICS

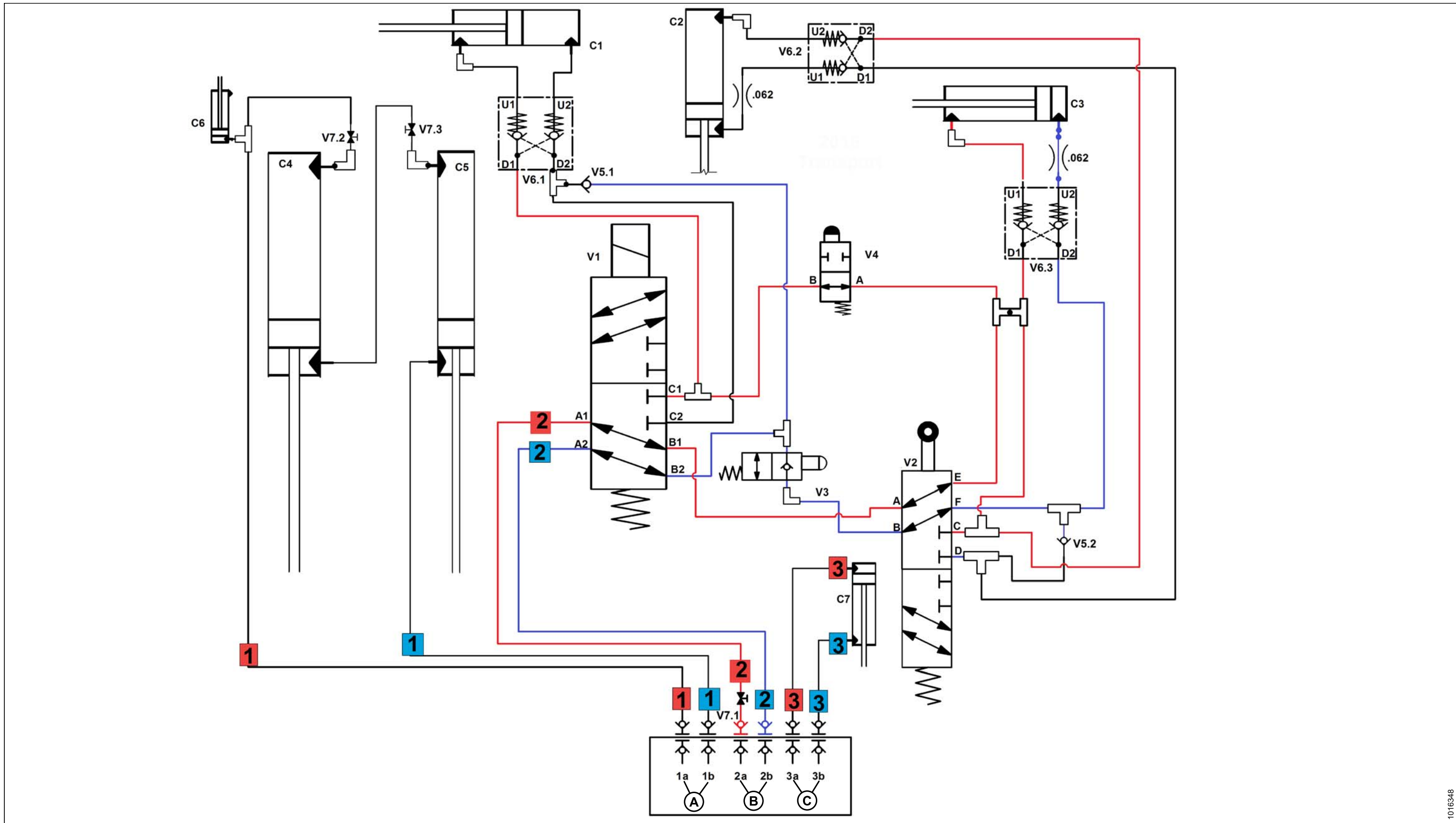


Figure 8.7: 2016 Hydraulic Schematic – Header Transport Swing

## HYDRAULIC SCHEMATICS

### Table 8.13 Cylinder Legend

C1 - Hitch Swing Cylinder (located between hitch and transport casting)  
C3 - Transport Swing Cylinder (located between carrier frame and transport casting)  
C5 - Slave Lift Cylinder (located on LH side of carrier frame)  
C7 - Tilt Cylinder [Option] (located between carrier frame and header)

### Table 8.14 Valve Legend

V1 - 6-way Solenoid Valve (located top of hitch mount) [non energized for Transport]  
V3 - 2-way NC directional valve with check. [Red/Green Indicator] (located on hitch alignment mechanism)  
V5.1, 5.2 - In-line check valve  
V7.1, 7.2, 7.3 - Shut Off Valves for lift and swing cylinder circuit

C2 - Transport Deploy Cylinder (located on transport frame)  
C4 - Master Lift Cylinder (located on RH side of carrier frame)  
C6 - Transport Lock Cylinder (located on transport lock mechanism)

V2 - 6-way Mechanical Valve cam actuated (located on top of transport casting mount)  
V4 - 2-way NC directional valve with mechanical paddle actuator (located on back of carrier frame.)  
V6.1, 6.2, 6.3 - Pressure Balance Valves C1, C2, C3

HYDRAULIC SCHEMATICS

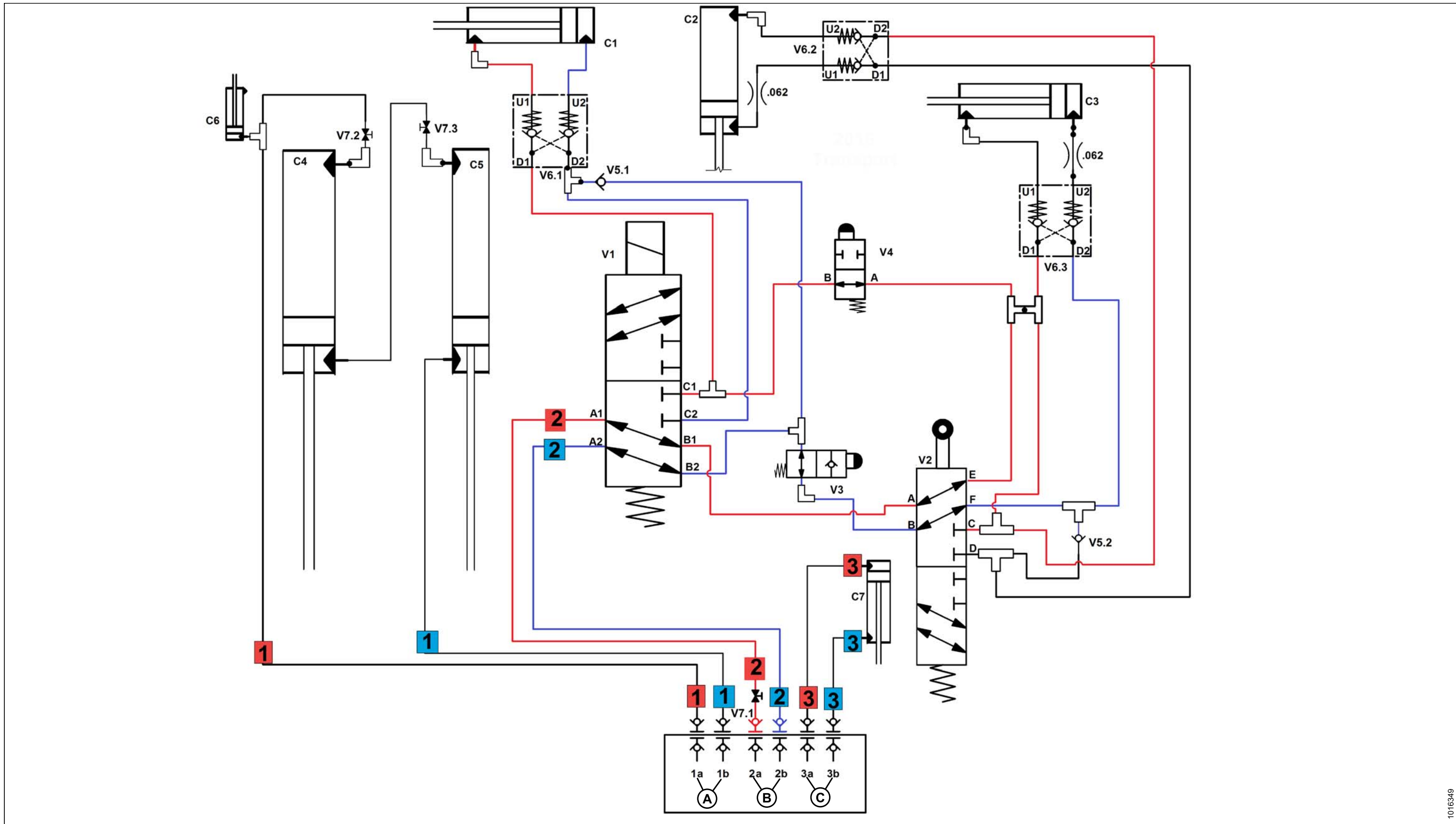


Figure 8.8: 2016 Hydraulic Schematic – Header Transport Swing Complete

## HYDRAULIC SCHEMATICS

### Table 8.15 Cylinder Legend

C1 - Hitch Swing Cylinder (located between hitch and transport casting)  
C3 - Transport Swing Cylinder (located between carrier frame and transport casting)  
C5 - Slave Lift Cylinder (located on LH side of carrier frame)  
C7 - Tilt Cylinder [Option] (located between carrier frame and header)

### Table 8.16 Valve Legend

V1 - 6-way Solenoid Valve (located top of hitch mount) [non energized for Transport]  
V3 - 2-way NC directional valve with check. [Red/Green Indicator] (located on hitch alignment mechanism)  
V5.1, 5.2 - In-line check valve  
V7.1, 7.2, 7.3 - Shut Off Valves for lift and swing cylinder circuit

C2 - Transport Deploy Cylinder (located on transport frame)  
C4 - Master Lift Cylinder (located on RH side of carrier frame)  
C6 - Transport Lock Cylinder (located on transport lock mechanism)

V2 - 6-way Mechanical Valve cam actuated (located on top of transport casting mount)  
V4 - 2-way NC directional valve with mechanical paddle actuator (located on back of carrier frame.)  
V6.1, 6.2, 6.3 - Pressure Balance Valves C1, C2, C3

HYDRAULIC SCHEMATICS

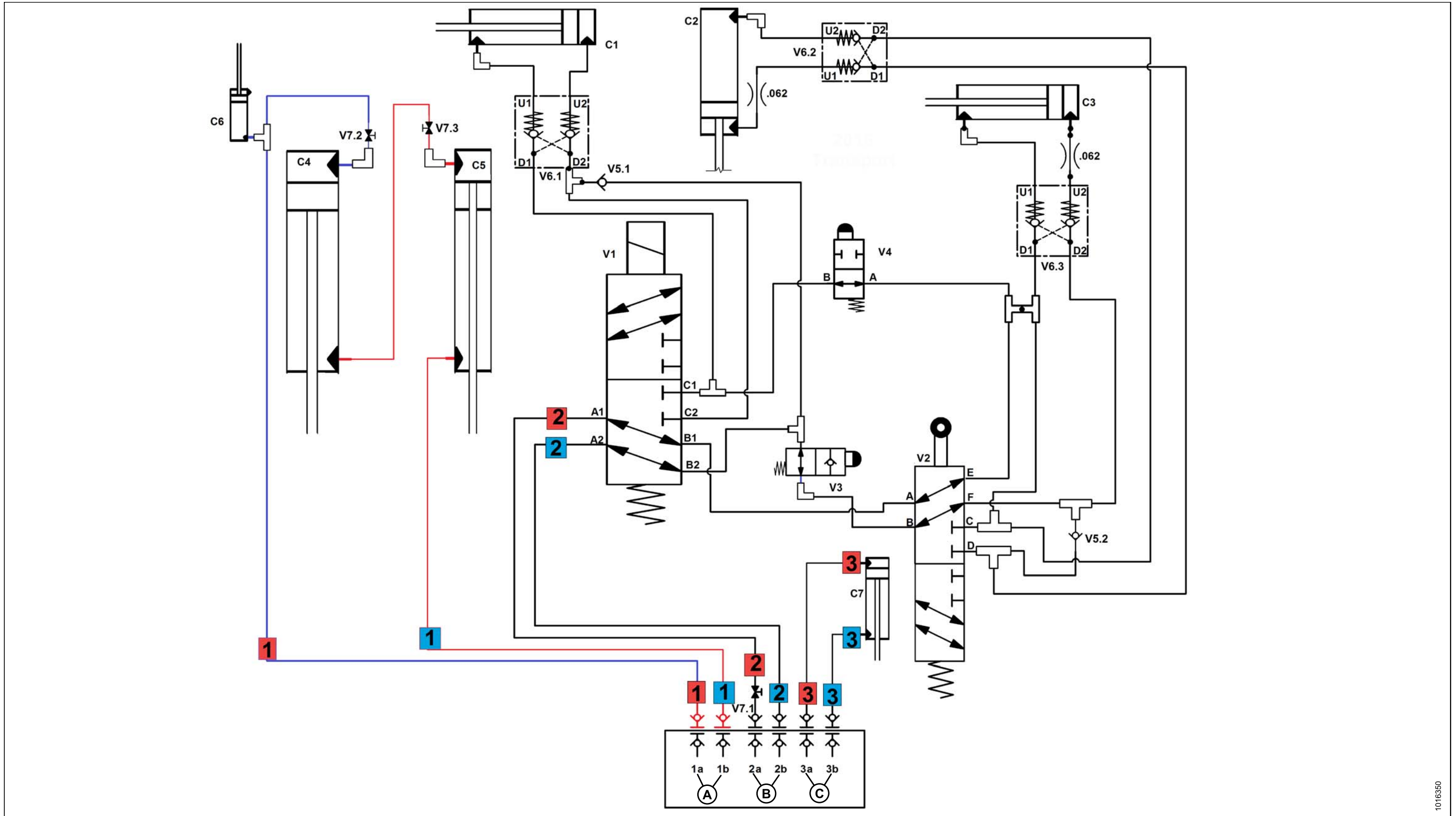


Figure 8.9: 2016 Hydraulic Schematic – Header Transport Lock

## HYDRAULIC SCHEMATICS

### Table 8.17 Cylinder Legend

C1 - Hitch Swing Cylinder (located between hitch and transport casting)  
C3 - Transport Swing Cylinder (located between carrier frame and transport casting)  
C5 - Slave Lift Cylinder (located on LH side of carrier frame)  
C7 - Tilt Cylinder [Option] (located between carrier frame and header)

### Table 8.18 Valve Legend

V1 - 6-way Solenoid Valve (located top of hitch mount) [non energized for Transport]  
V3 - 2-way NC directional valve with check. [Red/Green Indicator] (located on hitch alignment mechanism)  
V5.1, 5.2 - In-line check valve  
V7.1, 7.2, 7.3 - Shut Off Valves for lift and swing cylinder circuit

C2 - Transport Deploy Cylinder (located on transport frame)  
C4 - Master Lift Cylinder (located on RH side of carrier frame)  
C6 - Transport Lock Cylinder (located on transport lock mechanism)

V2 - 6-way Mechanical Valve cam actuated (located on top of transport casting mount)  
V4 - 2-way NC directional valve with mechanical paddle actuator (located on back of carrier frame.)  
V6.1, 6.2, 6.3 - Pressure Balance Valves C1, C2, C3

## 9 Changing the Conditioner

### NOTE:

This section applies only to machines that require a conditioner change prior to delivery to the customer. If the change is not required, proceed to [5 Lubricating the Mower Conditioner, page 127](#).

R113/R116 Pull-Type Rotary Disc Mower Conditioners can be equipped with either a finger conditioner, a polyurethane roll conditioner, or a steel roll conditioner. Follow these instructions to change conditioners (disregard this if the mower conditioner will be delivered to the customer as is).

These instructions apply to all conditioners. Exceptions are identified where applicable.

### 9.1 Separating Header from Carrier

The mower conditioner includes a header and conditioner attached to a carrier frame. Before removing or installing the conditioner, the mower conditioner and carrier must be separated.

#### DANGER

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

1. Connect the mower conditioner to the tractor. Refer to [4.10 Attaching Mower Conditioner to the Tractor, page 101](#).
2. Start tractor and center mower conditioner behind tractor.
3. Raise mower conditioner fully, set center-link to mid-position, and shut down the tractor. Remove key from ignition.

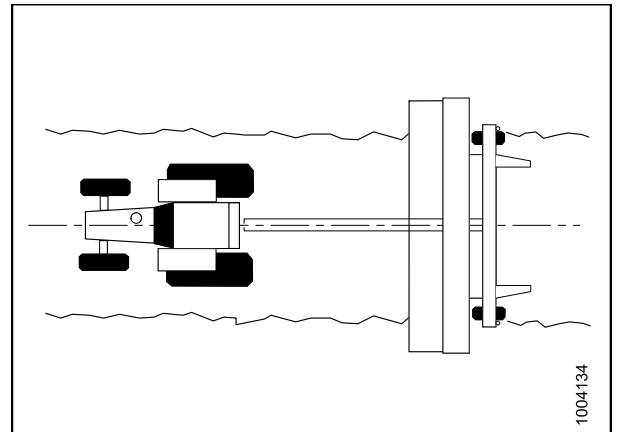


Figure 9.1: Hitch Aligned to Tractor

### NOTE:

The float adjuster bolt is easier to turn when the mower conditioner is in the raised position.

4. Close mower conditioner lift cylinder lock-out valves (A).
5. Loosen jam nut (B) on adjuster bolt.
6. Turn out adjuster bolt (C) on each float spring until 17-3/4 in. (400 mm) of thread (D) is exposed.

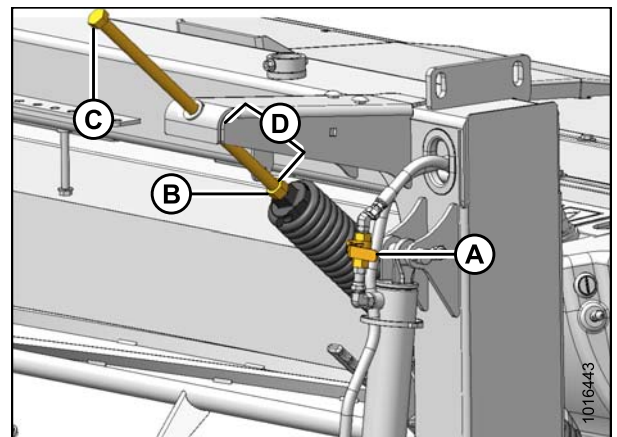
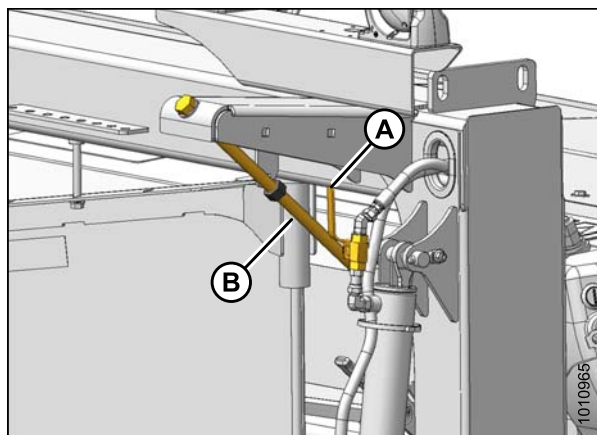


Figure 9.2: Float Adjuster

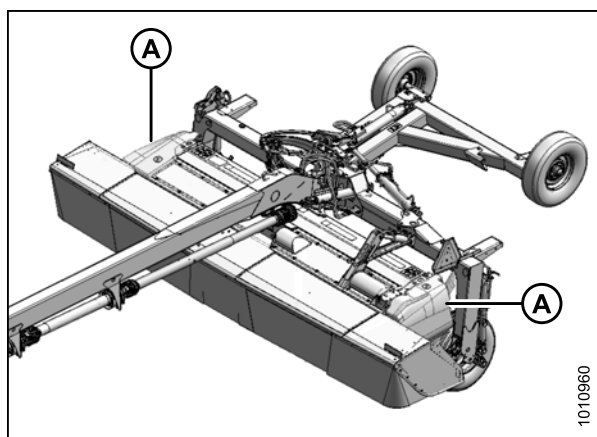
## CHANGING THE CONDITIONER

7. Open lift cylinder lock-out valves (A) (handle is vertical).
8. Start tractor and fully lower mower conditioner.
9. Shut down tractor and remove key from ignition.
10. Check that float adjuster bolts (B) are loose. Back off adjuster bolts as required.
11. Remove float adjuster bolt (B) from spring on **LEFT** side only. Keep spring from dropping when bolt is removed.



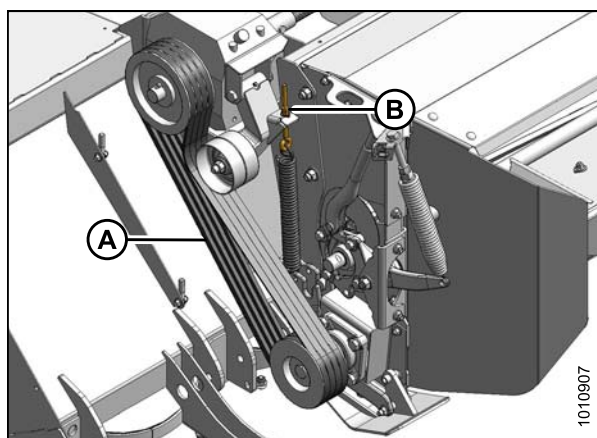
**Figure 9.3: Float Adjuster**

12. Remove left and right driveshields (A). Refer to [5.1 Opening Driveshields, page 127](#).



**Figure 9.4: Driveshields**

13. On the left-hand side of the mower conditioner, remove the conditioner drive belt as follows:
  - a. Back off jam nut and tensioner nut (B) on belt idler until belts (A) are loose and can be removed.
  - b. Remove the four belts.



**Figure 9.5: Conditioner Drive**



## CHANGING THE CONDITIONER

14. On the right-hand side of the mower conditioner, remove the M20 nut (A), washers, and hex head bolt (B) securing the carrier leg (C) and float spring arm (D) to the mower conditioner.
15. Move float spring arm (D) clear of conditioner.

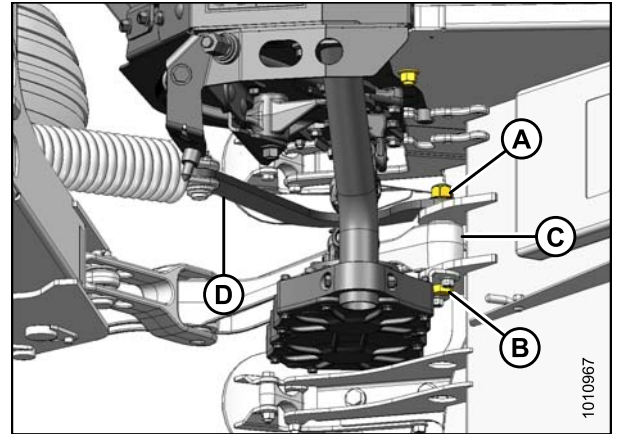


Figure 9.6: Right Side of Carrier

16. Remove the M20 nut (A), washers, and hex head bolt (B) securing carrier leg (C) to the left end of the mower conditioner.

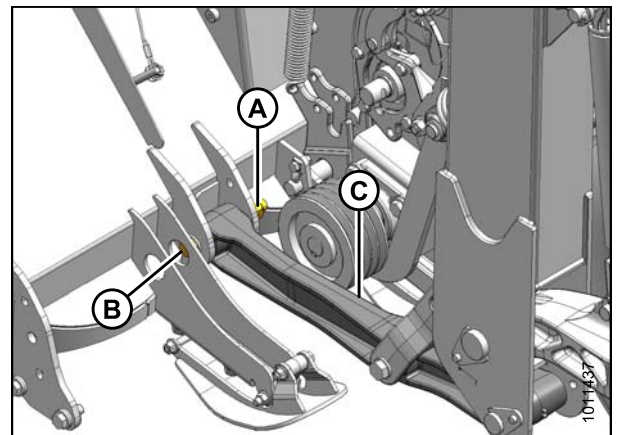


Figure 9.7: Left Side of Conditioner

17. Remove forward pin (A) connecting center-link (B) to anchor (C) and separate center-link from anchor. Reinstall pin in anchor to store.
18. Remove forward pin (D) and four washers (E) attaching indicator links (F) to anchor (B). Reinstall pin and washers in anchor to store.
19. Secure center-link and indicator links to carrier frame with a strap or wire to prevent them from contacting the mower conditioner during separation.

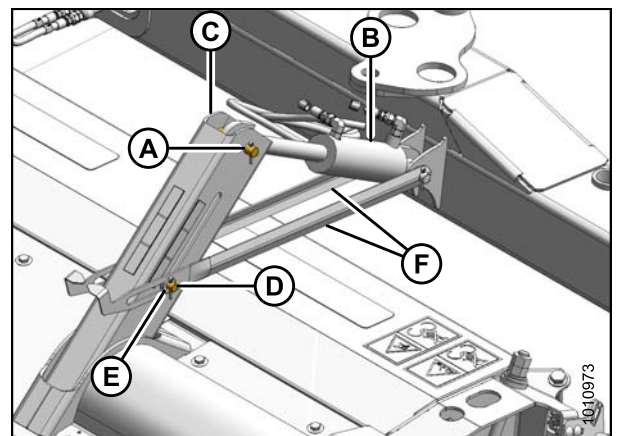
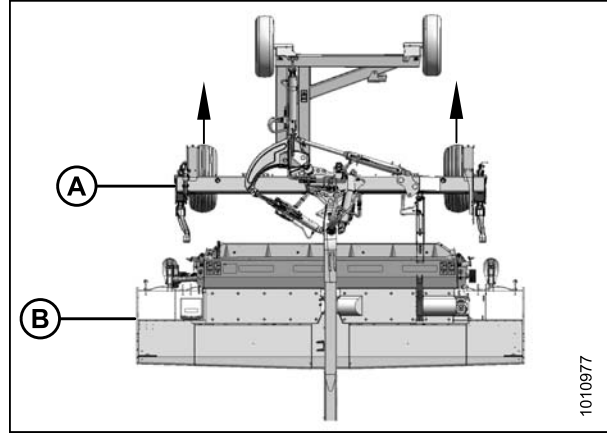


Figure 9.8: Center-Link and Indicator Links

## CHANGING THE CONDITIONER

20. Start tractor, slowly back carrier (A) off header (B), and maneuver carrier away from header.



**Figure 9.9: Carrier Removed from Header**

## 9.2 Removing the Conditioner

### CAUTION

Ensure spreader bar is secured to the forks so that it cannot slide off the forks or towards the mast while detaching the conditioner from the mower.

1. Attach a spreader bar (A) to a forklift or equivalent, and attach chains to lugs (B) on conditioner. Use a chain rated for overhead lifting with a minimum working load of 2500 lb. (1135 kg).

### DANGER

To prevent the conditioner from falling backward, ensure lifting chains are secure and tight. Failure to do so may result in death or serious injury.

2. Move forward baffle adjustment handle (A) to fully lowered position as shown.
3. Move rear baffle adjustment handle (B) to fully raised position as shown.

**NOTE:**

Access to upper bolts (C) is easiest from the rear of the conditioner.

4. Lift conditioner slightly forward to take load off bolts (A) and to hold the conditioner after the bolts are removed. Retain hardware for reinstallation.

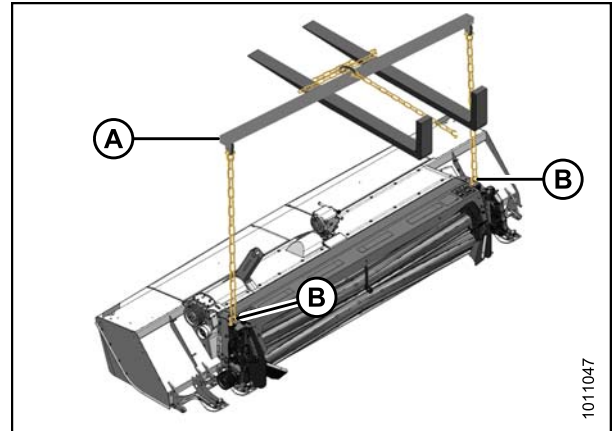


Figure 9.10: Spreader Bar

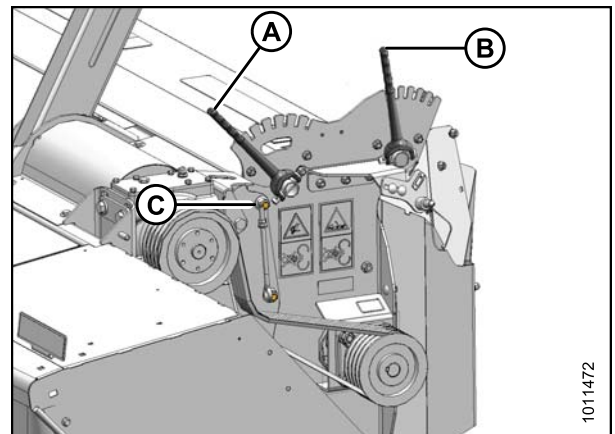


Figure 9.11: Left Side of Conditioner

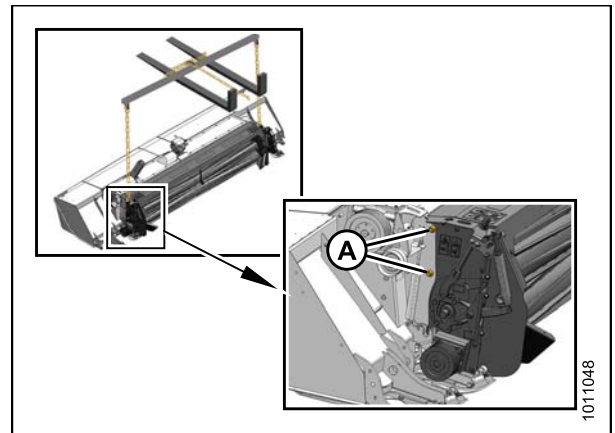
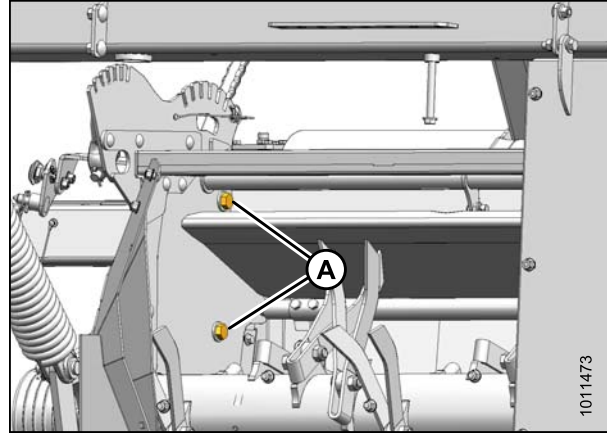


Figure 9.12: Left Side of Conditioner – Right Side Similar

## CHANGING THE CONDITIONER

5. Remove two M16 hex head bolts (A) from each side of conditioner that secure it to mower.

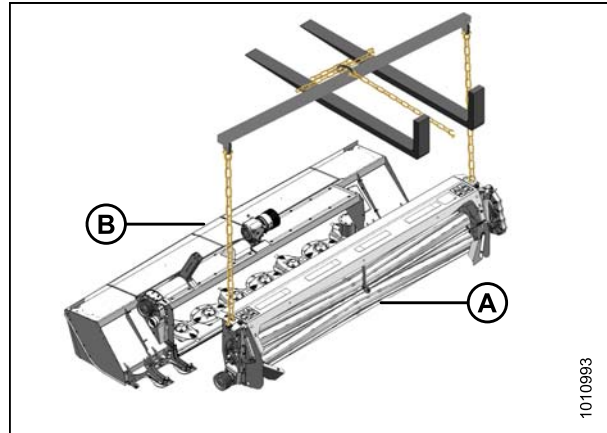


**Figure 9.13: Left Side of Conditioner – Right Side Similar**

### CAUTION

Stand clear when detaching the conditioner.

6. Lift conditioner (A) off mower (B), and move it away from work area.



**Figure 9.14: Conditioner Lift**

## 9.3 Installing the Conditioner

### CAUTION

Ensure spreader bar is secured to the forks so that it cannot slide off the forks or towards the mast while detaching the conditioner from the mower.

1. Attach a spreader bar (A) to a forklift or equivalent and attach chains to lugs (B) on conditioner. Use a chain rated for overhead lifting with a minimum working load of 2500 lb. (1135 kg).
2. Lift conditioner (A) and position it into mower opening.
3. Carefully align pin (A) at each end of conditioner with lug (B) on mower, and lower conditioner so that pins (A) engage lugs (B) on mower.

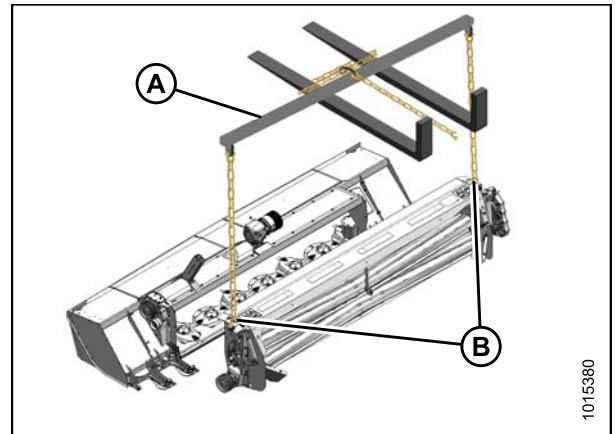


Figure 9.15: Conditioner Lift

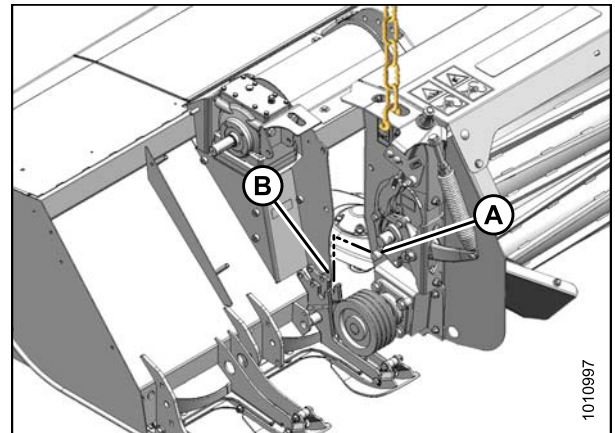


Figure 9.16: Conditioner Pins

4. Align mounting holes and install four M16 x 40 hex head bolts (A) with heads facing inboard (two per side). Secure with M16 center lock flanged nuts and torque to 126 ft-lbf (170 N·m).
5. Remove lifting chains from conditioner and move lifting device clear of work area.
6. If necessary, install conditioner drive components. Refer to [9.3.1 Installing Conditioner Drive, page 198](#).

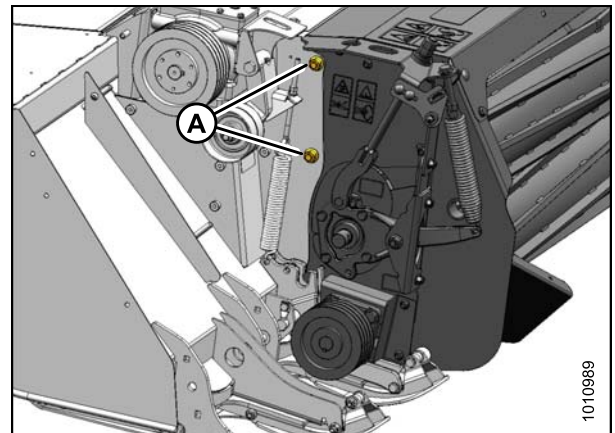


Figure 9.17: Left Side of Conditioner – Right Side Similar

### 9.3.1 Installing Conditioner Drive

This procedure describes the installation of the conditioner drive components on a machine that was originally supplied with no conditioner.

1. Retrieve bag of following parts from conditioner shipment:
  - Shaft key
  - Pulley
  - Bushing with three M10 bolts
  - Tensioner assembly
  - M16 hex head bolt
  - M16 nut
  - Two M10 nuts
  - Eye bolt
  - Hardened washer
  - Spring
2. Remove two screws (A) from cover (B) and remove cover from gearbox shaft. Retain parts for future use.

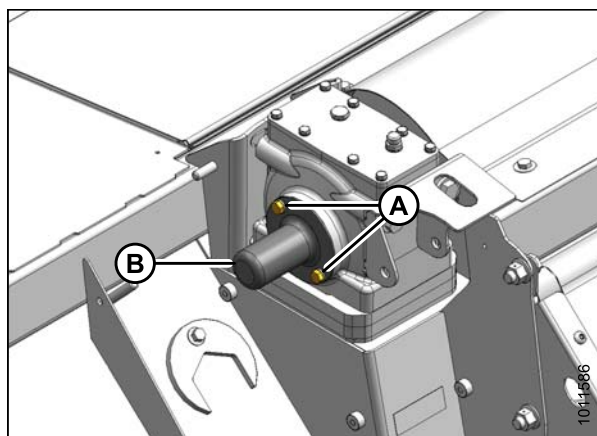


Figure 9.18: Shaft Cover

3. Assemble pulley (A) and bushing (B) onto gearbox shaft with key (C).
4. Install three M10 hex head bolts (D) through bushing (B) into pulley (A).

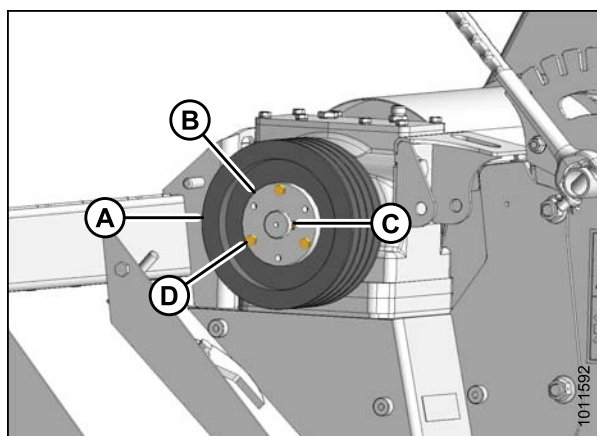


Figure 9.19: Drive Pulley

## CHANGING THE CONDITIONER

5. Tighten the three M10 bolts while maintaining 7/16 in. (11 mm) dimension (E) between pulley (A) and gearbox (F). Torque bolts to 25–29 ft·lbf (34–39 N·m).

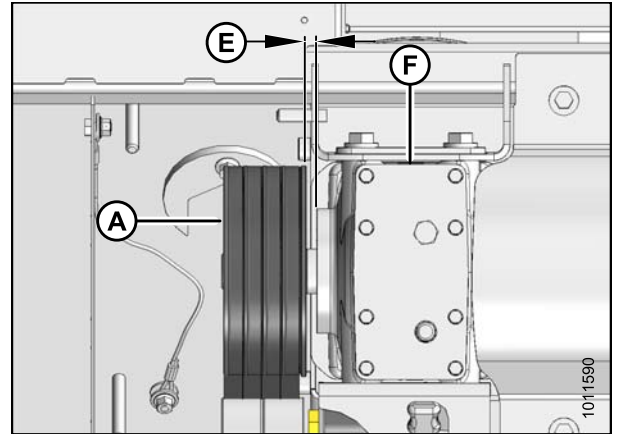


Figure 9.20: Drive Pulley

6. Position tensioner assembly (A) as shown and secure with M16 x 120 bolt (B) and nut (C). Torque nut to 35-40 ft·lbf (47-54 N·m).
7. Install spring (D) onto frame [rear hole (E) for finger conditioner, forward hole (F) for roll conditioner].
8. Install eyebolt (G) onto tensioner (A) and spring (D). Secure eyebolt with hardened washer (H) and two M10 nuts (J).

**NOTE:**

Conditioner drive belt will be installed after the carrier and header are reattached.

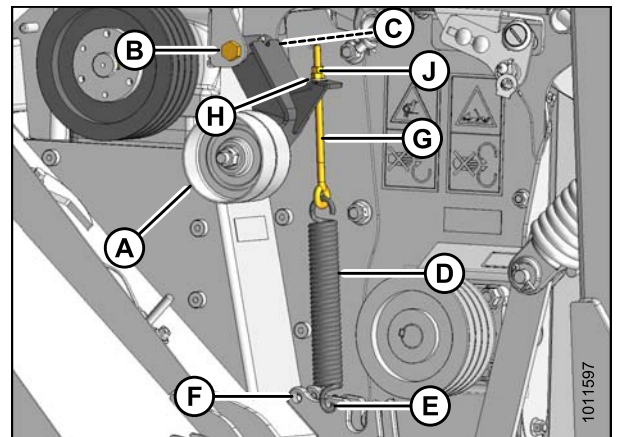


Figure 9.21: Tensioner

## 9.4 Assembling Header and Carrier

The carrier must be attached to a tractor for the header and carrier to be assembled.

### DANGER

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

1. Start tractor and maneuver carrier (A) directly behind the mower conditioner (B) so carrier legs line up with the header attachment points.
2. Drive slowly forward to engage the carrier legs (C) into the header attachment brackets.

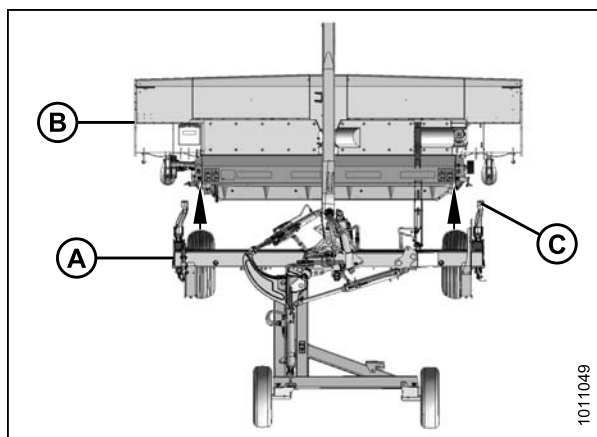


Figure 9.22: Carrier Aligned with Mower Conditioner

3. Inspect carrier leg (A) for excess gap between inner steel sleeve of the bushing and the header brackets. If there is a gap, install washer (MD #5113, 0.047 in. [1.2 mm thick]) to both sides of the carrier leg to minimize the gap.
4. Align left side carrier leg (A) with header brackets, and install M20 x 40 bolt (B) with hardened washer (C).
5. Install three hardened washers (D) and flanged lock nut (E) on bolt (B).
6. Torque bolt (B) to 250 ft-lbf (339 N-m).

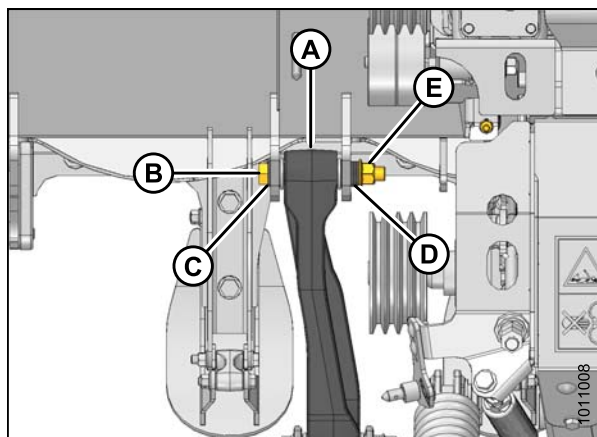


Figure 9.23: Left Leg



## CHANGING THE CONDITIONER

7. Inspect carrier leg (A) for excess gap between inner steel sleeve of the bushing and the header brackets. If there is a gap, install washer (MD #5113, 0.047 in [1.2 mm thick]) to both sides of the carrier leg to minimize the gap.
8. Align right side carrier leg (A) with header brackets, and install M20 x 40 bolt (B) with hardened washer (C).
9. Install hardened washer (D), spacer (E), float tension arm (F), and flanged lock nut (G) on bolt (B).
10. Torque bolt (B) to 250 ft·lbf (339 N·m).

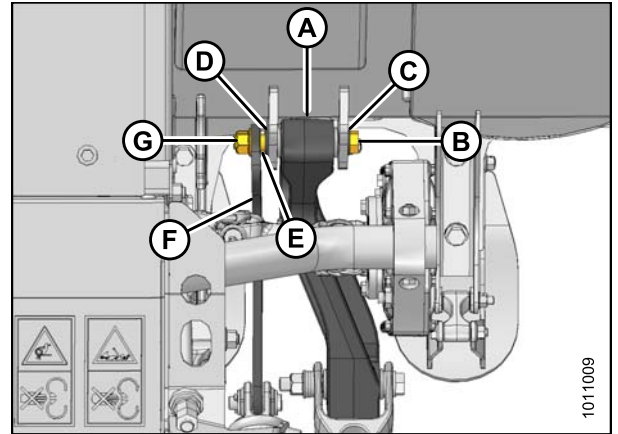


Figure 9.24: Right Leg

11. Undo strapping or wire supporting driveline to hitch (D), and connect driveline (E) to header drive gearbox. Refer to [4.5 Attaching Aft Driveline, page 87](#).
12. Remove hex head bolts (A) and spacers (B) from gearbox.
13. Undo strapping or wire supporting steering arm to hitch, and position steering arm weldment (C) on gearbox.
14. Secure steering arm to gearbox with spacers (B) and hex head bolts (A). Apply red Loctite® to front holes and torque bolts to 150 ft·lbf (203 N·m).

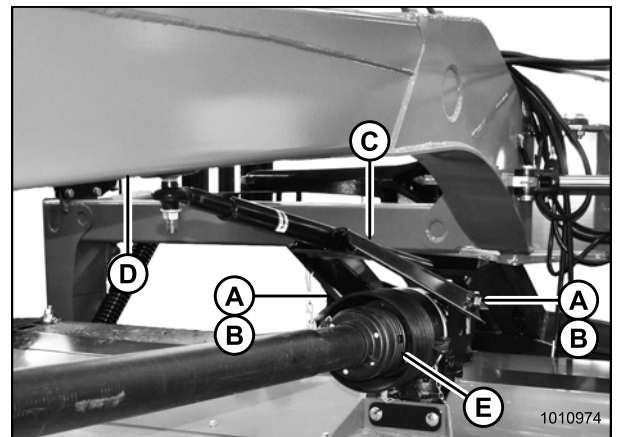


Figure 9.25: Aft Driveline and Steering Arm

15. Undo strapping or wire securing center-link (B) and indicator links (F) to carrier frame.
16. Remove pins and hardware from anchor (C).
17. Attach center-link (B) to anchor (C) with clevis pin (A) and secure with cotter pin.
18. Attach indicator links (F) to anchor with clevis pin (D) and washers (E). Install washers (E) on both sides of each indicator link (F).

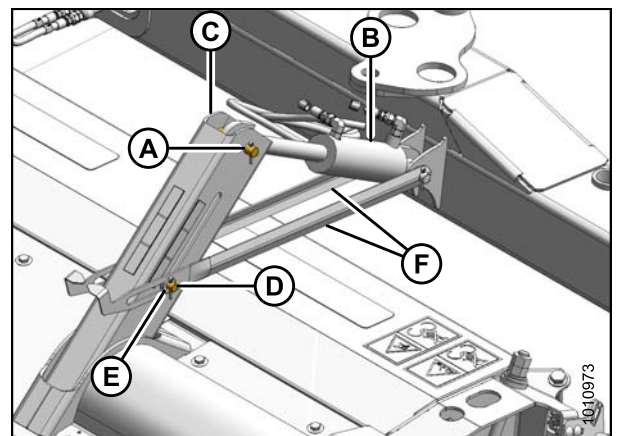


Figure 9.26: Center-Link and Indicator Links

## CHANGING THE CONDITIONER

### NOTE:

Ensure proper pulley configuration installation—large pulley installed onto gearbox for roll conditioner, and small pulley installed onto gearbox for finger conditioner.

19. Install conditioner drive belts (A) onto pulleys.
20. Check that tensioner spring is installed at correct location:
  - Hole (D) for roll conditioner
  - Hole (E) for finger conditioner
21. Tighten idler tensioner nut (C) until spring length (B) measures 14-3/8 in. (365 mm).
22. Tighten jam nut.
23. Check that lift cylinder lock-out valves (A) are open.
24. Start tractor and fully raise header.
25. Shut down tractor and remove key from ignition.

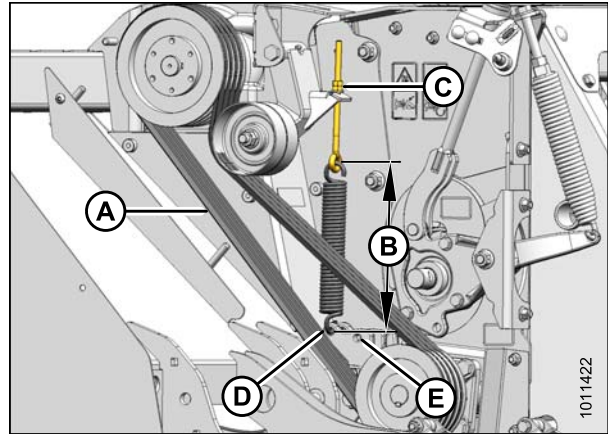


Figure 9.27: Conditioner Drive

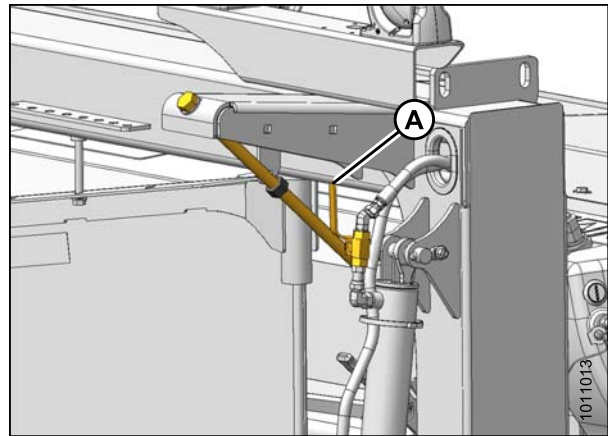


Figure 9.28: Lift Cylinder Lock-Out Valve

26. Close both lift cylinder lock-out valves (A).
27. At left side of carrier, install tensioner bolt (B) into spring.
28. Turn in both float spring tensioner bolts (B) to achieve the following exposed thread (C) measurements:
  - 5-11/16–6-1/8 in. (145–155 mm) for 13-foot
  - 3-3/4–4-1/8 in. (95–105 mm) for 16-foot
29. Replace the driveshields. Refer to [5.2 Closing Driveshields, page 129](#).

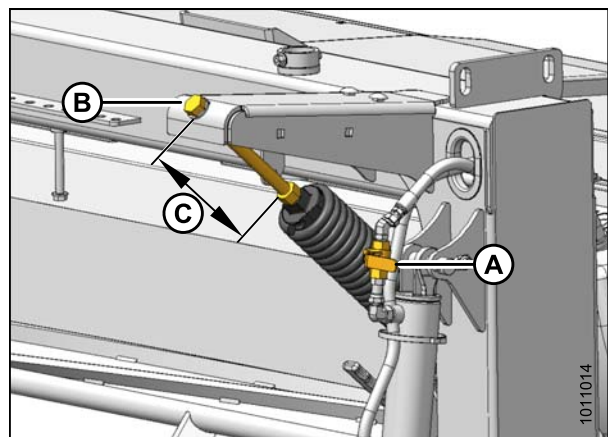
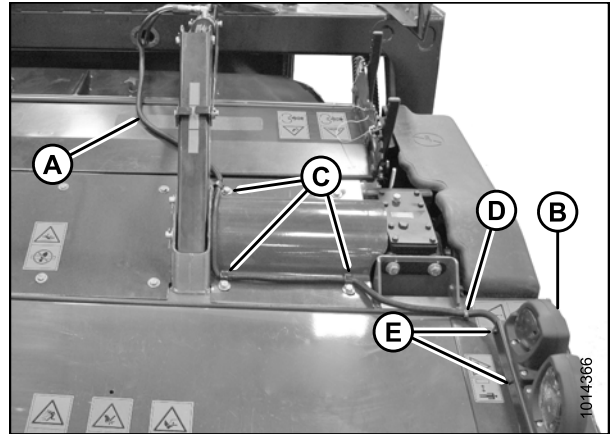


Figure 9.29: Right Side Shown – Left Side Similar

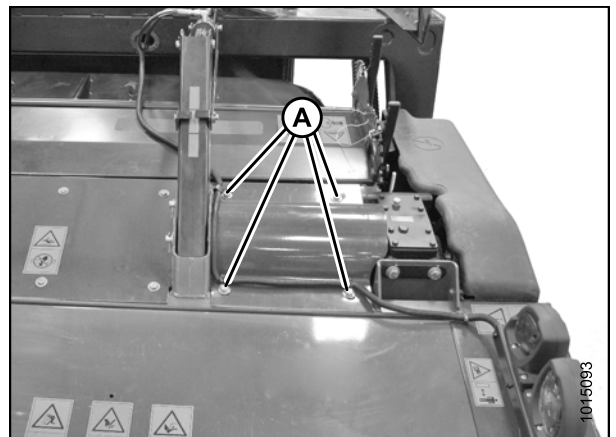
## CHANGING THE CONDITIONER

30. If Road Friendly Transport™ system is installed, reconnect electrical harness (A) to the lights (B) and secure harness to shielding using existing clips (C) and (D).
31. Secure harness to light bracket with cable ties (E).



**Figure 9.30: Electrical Harness**

32. Tighten the four M10 hex head bolts (A) and flat washers. Torque to 20–22 ft·lbf (27–30 N·m).



**Figure 9.31: Electrical Harness**



# 10 Reference

## 10.1 Recommended Lubricants

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

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

**IMPORTANT:**

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

**Table 10.1 Recommended Lubricants**

Lubricant	Specification	Description	Use	Capacities
<b>Grease</b>	SAE Multipurpose	High temperature extreme pressure (EP) performance with 1% max. Molybdenum Disulphide (NLGI Grade 2) lithium base	As required unless otherwise specified	—
		High temperature extreme pressure (EP) performance with 10% max. Molybdenum Disulphide (NLGI Grade 2) lithium base	Driveline slip-joints	—
<b>Gear Lubricant</b>	SAE 80W-90	High thermal and oxidation stability API service class GL-5	Cutterbar	13-foot: 8.5 qts (US) (8 liters)
				16-foot: 10.5 qts (US) (10 liters)
	SAE 85W-140	Gear lubricant API service class GL-5	Conditioner drive gearbox	0.75 qts (US) (0.7 liters)
			Mower conditioner drive gearbox	1.9 qts (US) (1.8 liters)
			Front and rear swivel gearbox	Upper: 1.3 qts (US) (1.3 liters)
Lower: 2 qts (US) (1.9 liters)				

## REFERENCE

# 10.2 Torque Specifications

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

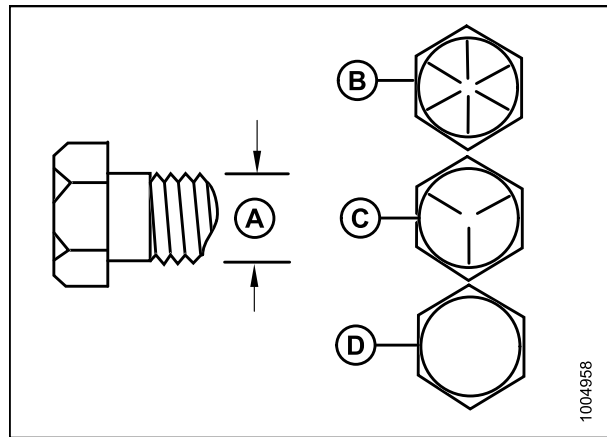
- Tighten all bolts to the torque values specified in the charts (unless otherwise noted throughout this manual).
- Replace hardware with the same strength and grade of bolt.
- Use the torque value tables as a guide and periodically check tightness of bolts.
- Understand torque categories for bolts and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

## 10.2.1 SAE Bolt Torque Specifications

Torque values shown in the 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 10.2 SAE Grade 5 Bolt and Grade 5 Free Spinning Nut**

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



**Figure 10.1: Bolt Grades**

A - Nominal Size  
C - SAE-5

B - SAE-8  
D - SAE-2

REFERENCE

Table 10.3 SAE Grade 5 Bolt and Grade F Distorted Thread Nut

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

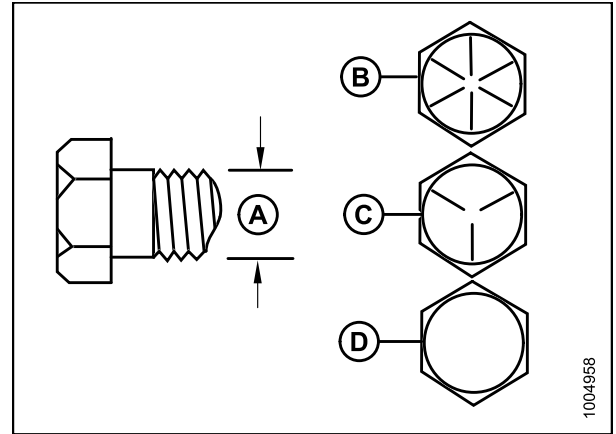


Figure 10.2: Bolt Grades

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

Table 10.4 SAE Grade 8 Bolt and Grade G Distorted Thread Nut

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

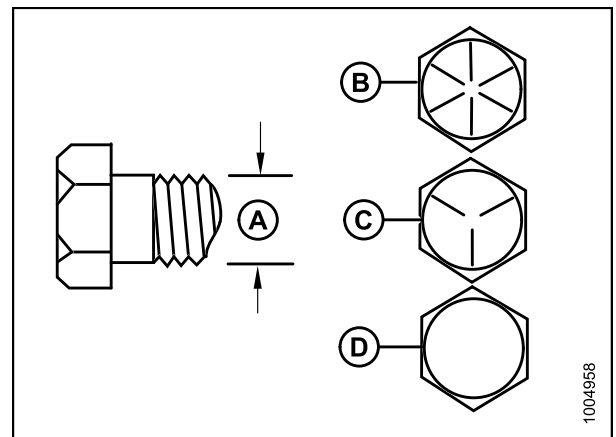


Figure 10.3: Bolt Grades

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

REFERENCE

Table 10.5 SAE Grade 8 Bolt and Grade 8 Free Spinning Nut

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

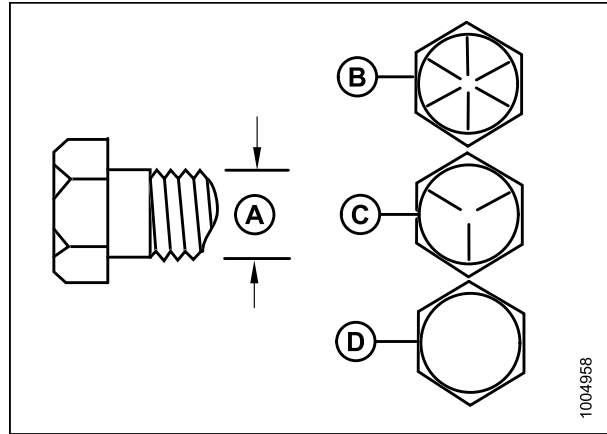


Figure 10.4: Bolt Grades

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

10.2.2 Metric Bolt Specifications

Table 10.6 Metric Class 8.8 Bolts and Class 9 Free Spinning Nut

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

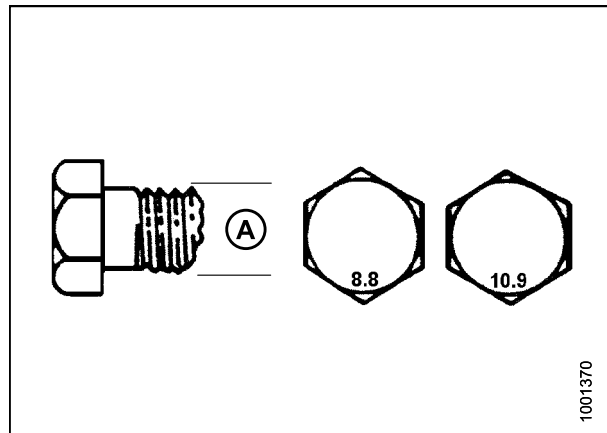


Figure 10.5: Bolt Grades



REFERENCE

Table 10.7 Metric Class 8.8 Bolts and Class 9 Distorted Thread Nut

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

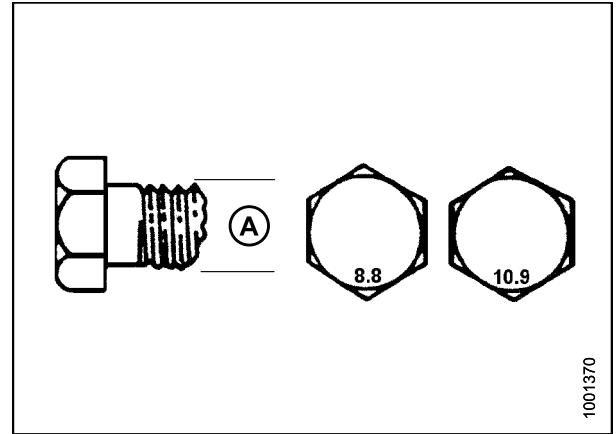


Figure 10.6: Bolt Grades

Table 10.8 Metric Class 10.9 Bolts and Class 10 Free Spinning Nut

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

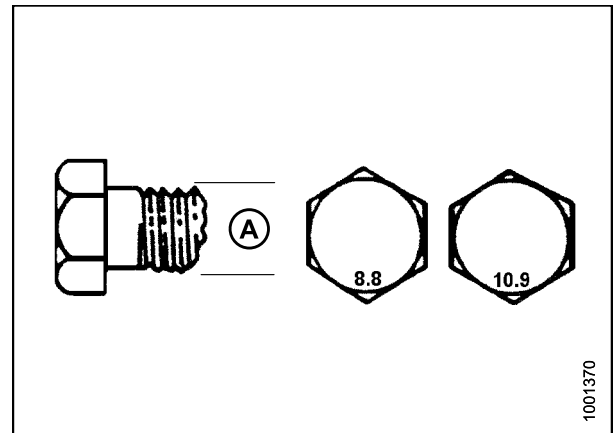


Figure 10.7: Bolt Grades

REFERENCE

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

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

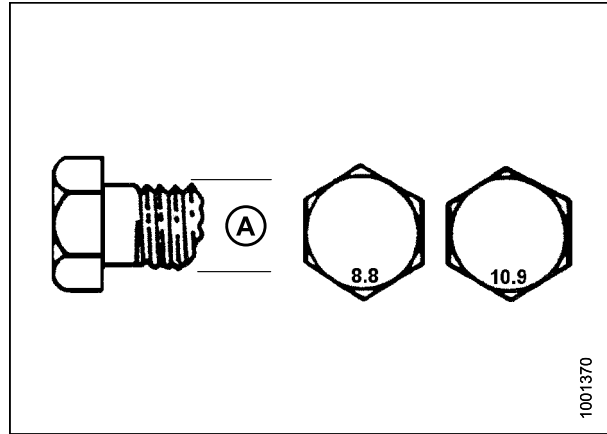


Figure 10.8: Bolt Grades

### 10.2.3 Metric Bolt Specifications Bolting into Cast Aluminum

Table 10.10 Metric Bolt Bolting into Cast Aluminum

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

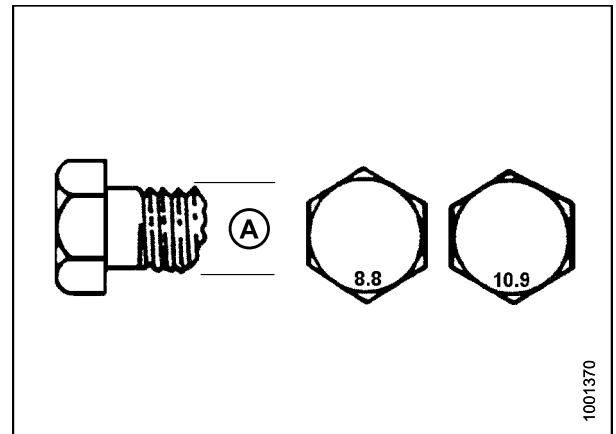


Figure 10.9: Bolt Grades

### 10.2.4 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 the flared surfaces.
3. Torque the fitting nut (E) to the specified number of flats from finger tight (FFFT) or to a given torque value in [Table 10.11 Flare-Type Hydraulic Tube Fittings, page 212](#).
4. Use two wrenches to prevent fitting (D) from rotating. Place one wrench on the fitting body (D) and tighten nut (E) with the other wrench to the torque shown.
5. Assess the final condition of the connection.

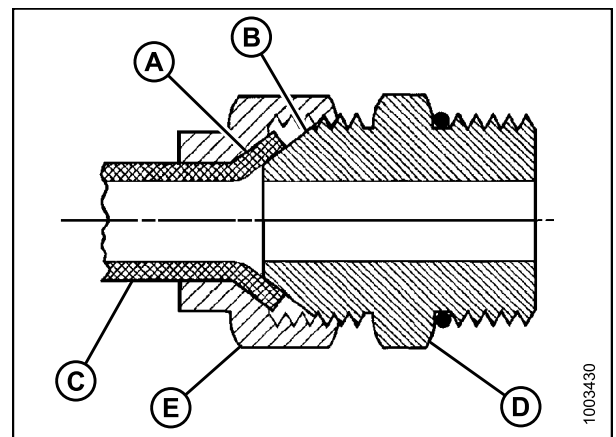


Figure 10.10: Hydraulic Fitting

**REFERENCE**

**Table 10.11 Flare-Type Hydraulic Tube Fittings**

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

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

### 10.2.5 O-Ring Boss (ORB) Hydraulic Fittings (Adjustable)

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

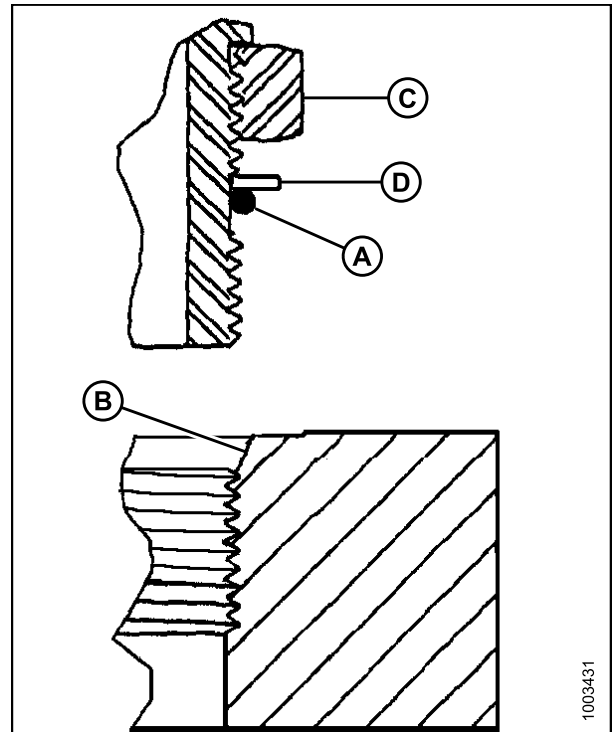


Figure 10.11: Hydraulic Fitting

5. Install fitting (B) into port until back up washer (D) and O-ring (A) contact the 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 the other on lock nut (C).
8. Check the final condition of the fitting.

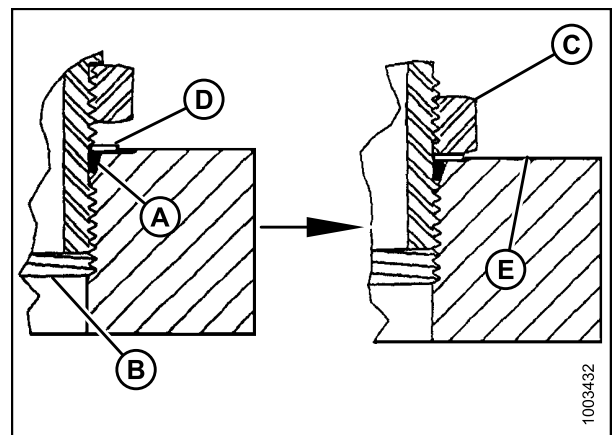


Figure 10.12: Hydraulic Fitting

**REFERENCE**

**Table 10.12 O-Ring Boss (ORB) Hydraulic Fittings (Adjustable)**

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

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

## REFERENCE

### 10.2.6 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 the threads and adjust if necessary.
3. Apply hydraulic system oil to the O-ring.
4. Install fitting (C) into port until fitting is hand tight.
5. Torque fitting (C) according to the values in Table 10.13 *O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable)*, page 215.
6. Check the final condition of the fitting.

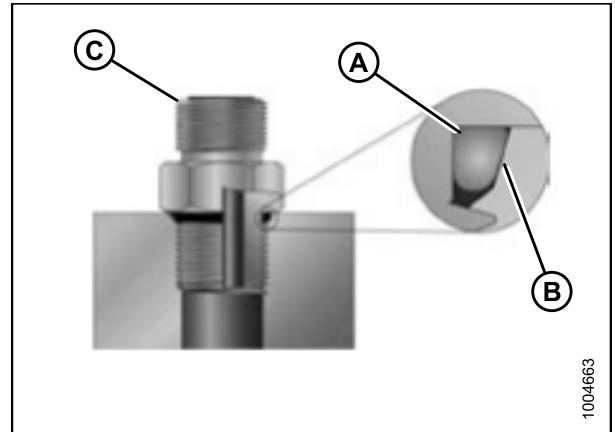


Figure 10.13: Hydraulic Fitting

Table 10.13 O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable)

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

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

## REFERENCE

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

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



Figure 10.14: Hydraulic Fitting

2. Apply hydraulic system oil to the O-ring (B).
3. Align the tube or hose assembly so that the flat face of the 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 the values in Table [10.14 O-Ring Face Seal \(ORFS\) Hydraulic Fittings, page 217](#).

**NOTE:**

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

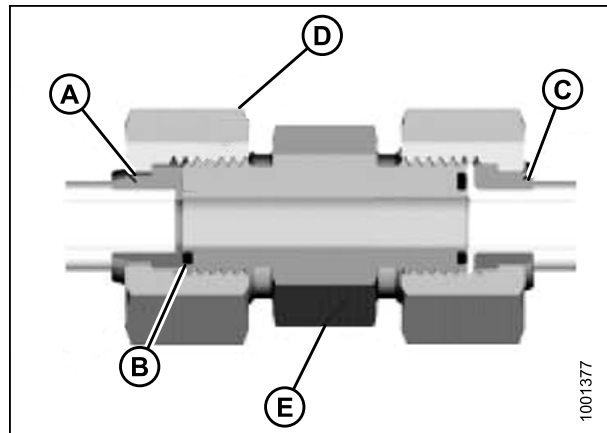


Figure 10.15: Hydraulic Fitting

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



**REFERENCE**

**Table 10.14 O-Ring Face Seal (ORFS) Hydraulic Fittings**

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value <sup>8</sup>	
			ft-lbf	N·m
-3	Note <sup>9</sup>	3/16	–	–
-4	9/16	1/4	18–21	25–28
-5	Note <sup>9</sup>	5/16	–	–
-6	11/16	3/8	29–32	40–44
-8	13/16	1/2	41–45	55–61
-10	1	5/8	59–65	80–88
-12	1-3/16	3/4	85–94	115–127
-14	Note <sup>9</sup>	7/8	–	–
-16	1-7/16	1	111–122	150–165
-20	1-11/16	1-1/4	151–167	205–226
-24	1–2	1-1/2	232–256	315–347
-32	2-1/2	2	376–414	510–561

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

## 10.3 Conversion Chart

Table 10.15 Conversion Chart

Quantity	Inch-Pound Units		Factor	SI Units (Metric)	
	Unit Name	Abbreviation		Unit Name	Abbreviation
Area	acres	acres	$\times 0.4047 =$	hectares	ha
Flow	US gallons per minute	gpm	$\times 3.7854 =$	liters per minute	L/min
Force	pounds force	lbf	$\times 4.4482 =$	Newtons	N
Length	inch	in.	$\times 25.4 =$	millimeters	mm
	foot	ft.	$\times 0.305 =$	meters	m
Power	horsepower	hp	$\times 0.7457 =$	kilowatts	kW
Pressure	pounds per square inch	psi	$\times 6.8948 =$	kilopascals	kPa
			$\times .00689 =$	megapascals	MPa
			$\div 14.5038 =$	bar (Non-SI)	bar
Torque	pound feet or foot pounds	ft-lbf	$\times 1.3558 =$	Newton meters	N-m
	pound inches or inch pounds	in-lbf	$\times 0.1129 =$	Newton meters	N-m
Temperature	degrees Fahrenheit	°F	$(^{\circ}\text{F}-32) \times 0.56 =$	Celsius	°C
Velocity	feet per minute	ft/min	$\times 0.3048 =$	meters per minute	m/min
	feet per second	ft/s	$\times 0.3048 =$	meters per second	m/s
	miles per hour	mph	$\times 1.6063 =$	kilometers per hour	km/h
Volume	US gallons	US gal	$\times 3.7854 =$	liters	L
	ounces	oz.	$\times 29.5735 =$	milliliters	ml
	cubic inches	in <sup>3</sup>	$\times 16.3871 =$	cubic centimeters	cm <sup>3</sup> or cc
Weight	pounds	lb.	$\times 0.4536 =$	kilograms	kg

## REFERENCE

### 10.4 Definitions

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

<b>Term</b>	<b>Definition</b>
API	American Petroleum Institute
APT	Articulated Power Turn
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 the header and the machine to which it is attached: It is used to change header angle
CGVW	Combined vehicle gross weight
Export mower conditioner	Machine configuration typical outside North America
Finger tight	Finger tight is a reference position where sealing surfaces or components are making contact with each other and the fitting has been tightened to a point where the fitting is no longer loose
FFFT	Flats from finger tight
GSL	Ground speed lever
GVW	Gross vehicle weight
Hard joint	A joint made with the use of a fastener where the joining materials are highly incompressible
Hex key	A hex key or Allen key (also known by various other synonyms) is a tool of hexagonal cross-section used to drive bolts and screws that have a hexagonal socket in the head (internal-wrenching hexagon drive)
hp	Horsepower
JIC	Joint Industrial Council: A standards body that developed the standard sizing and shape for original 37° flared fitting
Mower conditioner	A machine that cuts and conditions hay and is pulled by an agricultural tractor
n/a	Not applicable
Nut	An internally threaded fastener that is designed to be paired with a bolt
North American mower conditioner	Machine configuration typical in North America
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
PTO	Power take-off
RoHS (Reduction of Hazardous Substances)	A directive by the European Union to restrict the use of certain hazardous substances (such as hexavalent chromium used in some yellow zinc platings)
SAE	Society of Automotive Engineers

## REFERENCE

<b>Term</b>	<b>Definition</b>
Screw	A headed and externally threaded fastener that threads into preformed threads or forms its own thread in one of the mating parts
Soft joint	A joint made with the use of a fastener where the joining materials are compressible or experience relaxation over a period of time
Tractor	Agricultural type tractor
Truck	A four-wheel highway/road vehicle weighing no less than 7500 lb. (3400 kg)
Tension	Axial load placed on a bolt or screw, usually measured in pounds (lb.) or Newtons (N)
TFFT	Turns from finger tight
Torque	The product of a force X lever arm length, usually measured in foot-pounds (ft-lbf) or Newton-meters (N·m)
Torque angle	A tightening procedure where the fitting is assembled to a precondition (finger tight) and then the nut is turned further a number of degrees or a number of flats to achieve its final position
Torque-tension	The relationship between the assembly torque applied to a piece of hardware and the axial load it induces in the 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

## 10.5 Converting Road Friendly Transport™ Decal

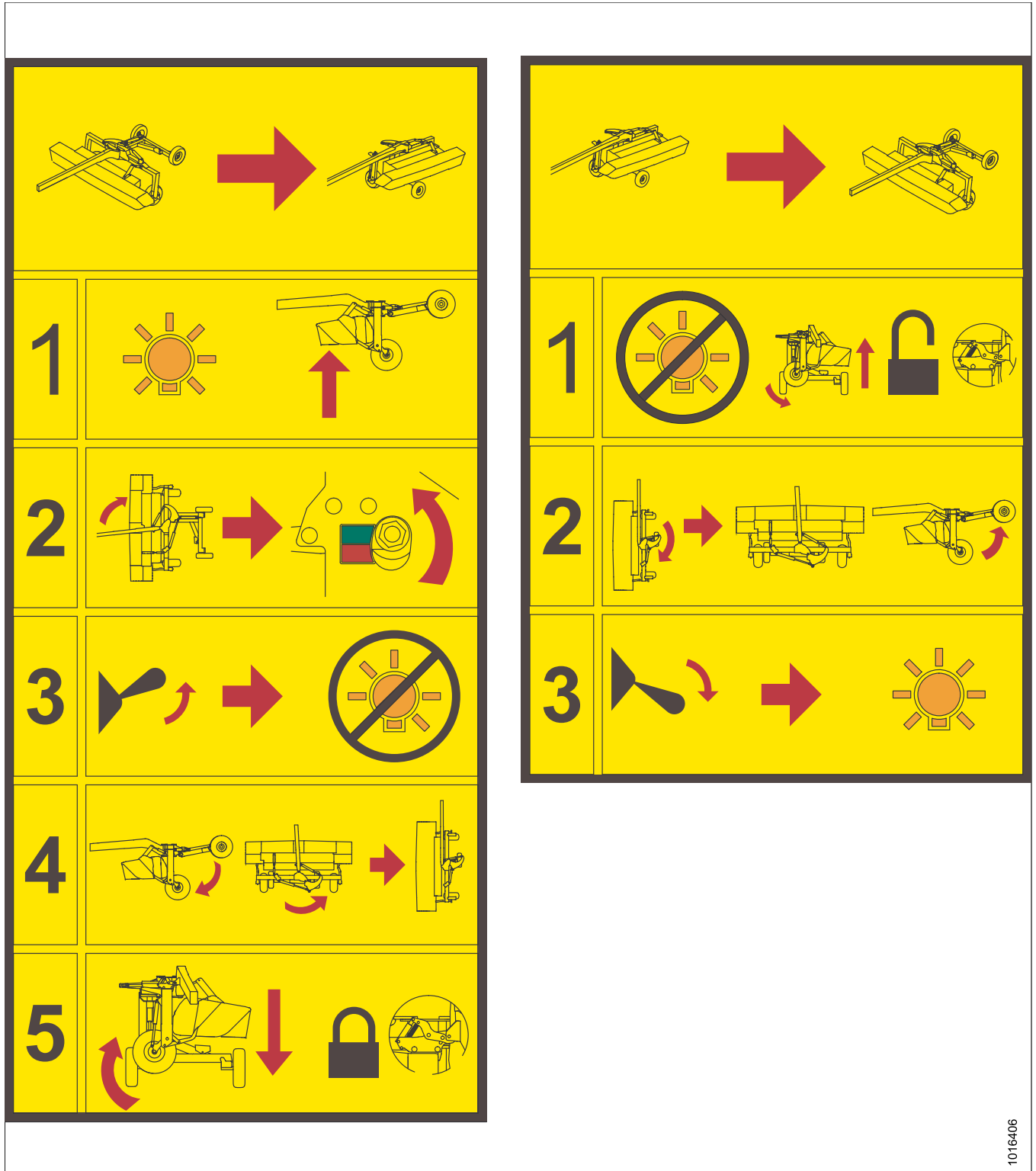


Figure 10.16: Converting Road Friendly Transport™ Decal



# Predelivery Checklist

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

## **WARNING**

Do **NOT** operate the machine with the driveshields open. High speed rotating components may throw debris and could result in death or serious injury.

## **CAUTION**

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


Mower Conditioner Serial Number:

APT Serial Number:

**Table 1 R113/R116 Pull-Type Rotary Disc Mower Conditioner Predelivery Checklist**

✓	Item	Reference
	Check for shipping damage or missing parts. Be sure all shipping dunnage is removed.	—
	Check for loose hardware. Tighten to required torque if applicable.	<a href="#">10.2 Torque Specifications, page 206</a>
	Check that hydraulic hoses have adequate slack before rotating header.	—
	Check main drive belt tension.	<a href="#">6.3 Checking Conditioner Drive Belt, page 137</a>
	Check header angle to middle of adjustment range.	<a href="#">6.4 Checking Header Angle, page 138</a>
	Check header float.	<a href="#">6.6 Checking Mower Conditioner Float, page 140</a>
	Check tire pressure: Field tires – 30 psi (207 kPa), optional transport tires – 80 psi (552 kPa)	—
	Check wheel bolts are torqued to 120 ft-lbf (160 N·m).	<a href="#">6.1 Checking Wheel Bolts, page 135</a>
	Check side forming shields evenly set to desired position.	<a href="#">3.12 Setting up Forming Shields, page 60</a>
	Check rear baffle is about mid-position (roll conditioner).	<a href="#">6.14 Checking Conditioner Baffle Settings, page 152</a>
	Check forward baffle lever is set to approximate mid-position (finger conditioner).	
	Check rear baffle lever is set to approximate mid-position (finger conditioner).	
	Check conditioner roll gap (roll conditioner).	<a href="#">6.12 Checking Roll Gap, page 150</a>
	Check conditioner roll tension (roll conditioner).	
	Check conditioner roll timing hardware is securely tightened (roll conditioner).	<a href="#">6.7 Checking Roll Timing, page 142</a>

## PREDELIVERY CHECKLIST

✓	Item	Reference
	Check that tall crop dividers are not installed for road transport.	<a href="#">4.8.3 Installing Tall Crop Divider, page 99</a>
	Check that cutterbar doors are unbolted from centre channel frame, shipping wire is removed from cutterbar curtains, and cutterbar curtains are hanging properly.	<a href="#">4.15 Unpacking Curtains, page 120</a>
	Grease all bearings and drivelines.	<a href="#">5.3 Lubrication Procedure, page 130</a>
	Check conditioner drive gearbox lubricant.	<a href="#">6.8 Checking Conditioner Drive Gearbox Lubricant, page 143</a>
	Check mower conditioner drive gearbox lubricant.	<a href="#">6.9 Checking and Adding Mower Conditioner Drive Gearbox Lubricant, page 144</a>
	Check forward and rear swivel gearbox lubricant.	<a href="#">6.10 Checking Forward and Rear Swivel Gearbox Lubricant, page 146</a>
	Check cutterbar lubricant.	<a href="#">6.11 Checking Cutterbar Lubricant, page 148</a>
	<p>Check cutterbar area carefully for loose parts and hardware on the cutterbar.</p> <p> <b>WARNING</b></p> <p><b>Objects can be ejected with considerable force when the machine is started and may result in serious injury or machine damage.</b></p>	—
<b>RUN-UP PROCEDURE</b>		<a href="#">6.17 Running up the Mower Conditioner, page 155</a>
	Check hydraulic hose and wiring harness routing to ensure adequate clearance when raising, lowering or swinging the header.	—
	Check that tail lights and hazard lights are functional.	<a href="#">6.15 Checking Lights, page 153</a>
<b>POST RUN-UP CHECK – STOP ENGINE</b>		
	Check belt drive for proper idler alignment and overheating bearings.	<a href="#">6.3 Checking Conditioner Drive Belt, page 137</a>
	Check for hydraulic leaks.	—
	Check that header manuals are in storage compartment.	<a href="#">6.16 Checking Manuals, page 154</a>

**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

**LLC MacDon Russia Ltd.**

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

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