

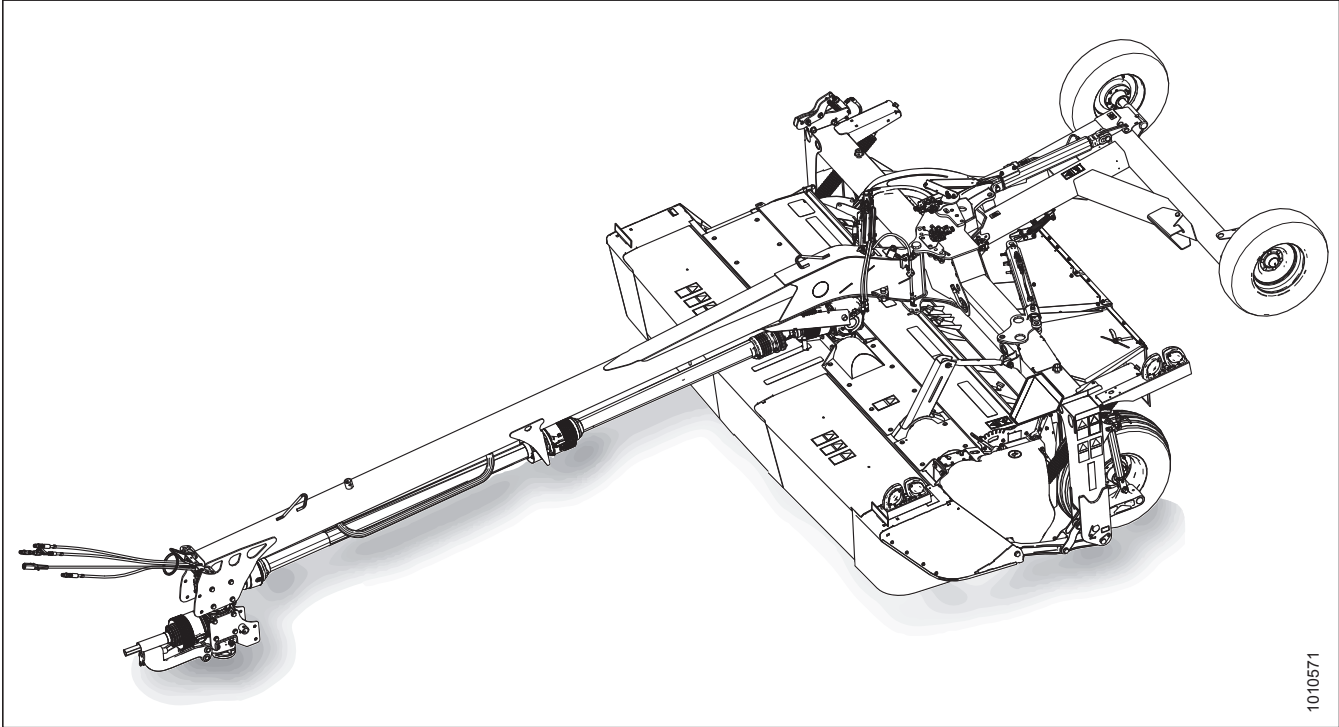
R113/R116 Rotary Disc Pull-Type

Unloading and Assembly Instruction (North America)

215585 Revision A

Original Instruction

R1 Series Rotary Disc Pull-Type



1010571

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Introduction

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

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

Retain this instruction for future reference.

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

If the shipment is damaged or is missing parts, contact shortageanddamage@macdon.com.

Conventions

The following conventions are followed in this document:

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

NOTE:

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

This instruction is available in English and French.

Summary of Changes

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

| Section | Summary of Change | Internal Use Only |
|---|--|-------------------|
| Throughout | Added or modified topic short descriptions. | Tech Pubs |
| Topic removed | Removed procedure for checking and adjusting driveline clutch. New driveline clutch is not adjustable. | ECN 60892 |
| Topic removed | Removed topic Transporting with Tractor because it contained no new information. | Tech Pubs |
| <i>Introduction, page i</i> | Added email contact for shipments with damage or missing parts. | Product Support |
| <i>3.5 Attaching Clutch Driveline, page 28</i> | Revised illustrations to show new driveline clutch. | ECN 60892 |
| <i>Installing Slow Moving Vehicle Sign, page 57</i> | Added torque value for mounting slow moving vehicle sign. | ECN 60772 |
| <i>5.3 Attaching Rotary Disc Pull-Type to the Tractor, page 101</i> | Changed chapter title to more accurately describe subtopics. | Tech Pubs |
| <i>6 Completing Rotary Disc Pull-Type Assembly, page 109</i> | Added new chapter. | Tech Pubs |
| <i>6.1 Installing Field Wheels, page 109</i> | Added a note that field wheels must be installed inboard of carrier frame. | ECN 59619 |
| <i>Predelivery Checklist, page 201</i> | Removed check for driveline clutch slippage. Clutch no longer adjustable. | ECN 60892 |

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Chapter 1: Safety

1.1 Signal Words

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

Signal words are selected using the following guidelines:



DANGER

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



WARNING

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



CAUTION

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

IMPORTANT:

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

NOTE:

Provides additional information or advice.

1.2 General Safety

Protect yourself when assembling, operating, and servicing machinery.

CAUTION

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

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

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

In addition, take the following precautions:

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

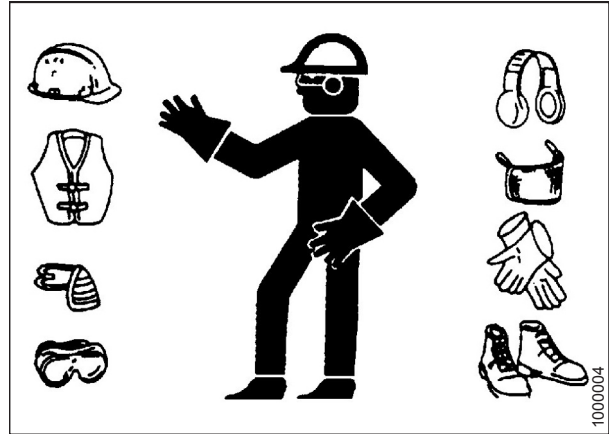


Figure 1.1: Safety Equipment



Figure 1.2: Safety Equipment

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

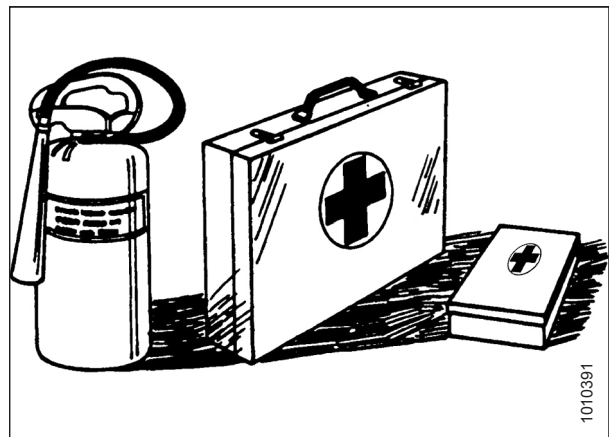


Figure 1.3: Safety Equipment

SAFETY

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



Figure 1.4: Safety around Equipment

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

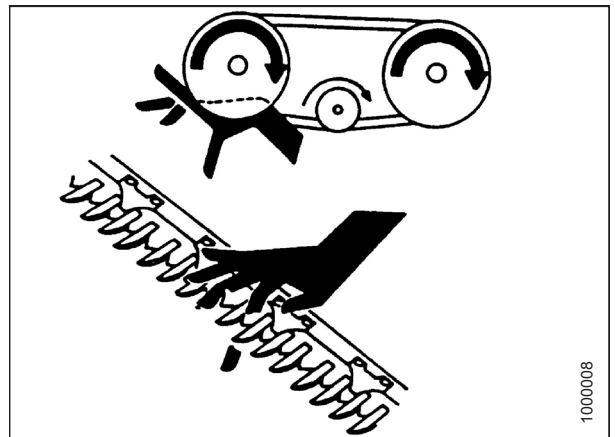


Figure 1.5: Safety around Equipment

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



Figure 1.6: Safety around Equipment

1.3 Tire Safety

Handle tires safely.

WARNING

- A tire can explode during inflation, which could cause serious injury or death.
- Follow proper procedures when mounting a tire on a wheel or rim. Failure to do so can produce an explosion that may result in serious injury or death.

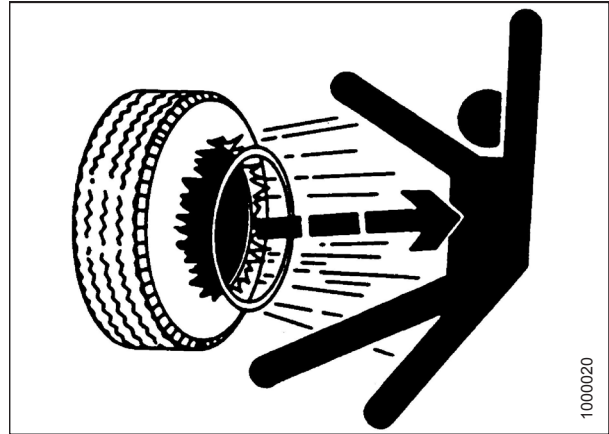


Figure 1.7: Overinflated Tire

WARNING

- Do NOT remove, install, or repair a tire on a rim unless you have proper equipment and experience to perform job. Take the tire and rim to a qualified tire repair shop.
- Make sure the tire is correctly seated before inflating to operating pressure. If the tire is not correctly positioned on the rim or is overinflated, the tire bead can loosen on one side causing air to escape at high speed and with great force. An air leak of this nature can thrust the tire in any direction, endangering anyone in area.
- Do NOT stand over tire when inflating. Use a clip-on chuck and extension hose.
- Do NOT exceed maximum inflation pressure indicated on tire label.
- Never use force on an inflated or partially inflated tire.
- Make sure all air is removed from the tire before removing the tire from the rim.
- Never weld a wheel rim.
- Replace tires that have defects and replace wheel rims that are cracked, worn, or severely rusted.

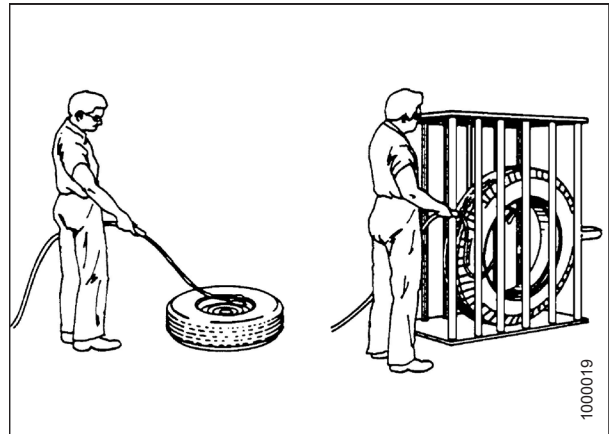


Figure 1.8: Safely Inflating Tire

1.4 Safety Signs

Safety signs are decals placed on the machine where there is a risk of personal injury, or where the operator should take extra precautions before operating the controls. They are usually yellow. Operator manuals and technical manuals list the location and explain the meaning of all safety signs placed on the machine.

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

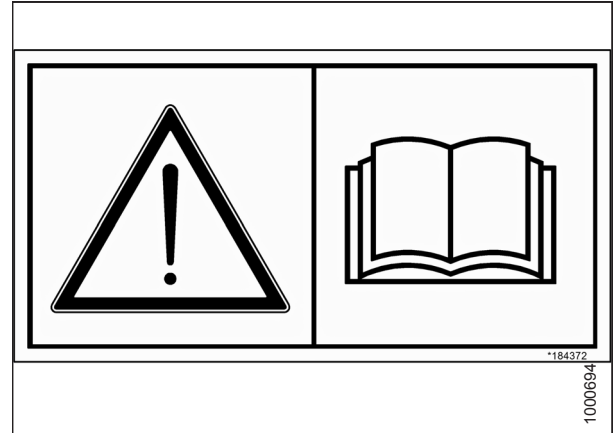


Figure 1.9: Operator's Manual Decal

Chapter 2: Unloading Truck Shipment

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

DANGER

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

CAUTION

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

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

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

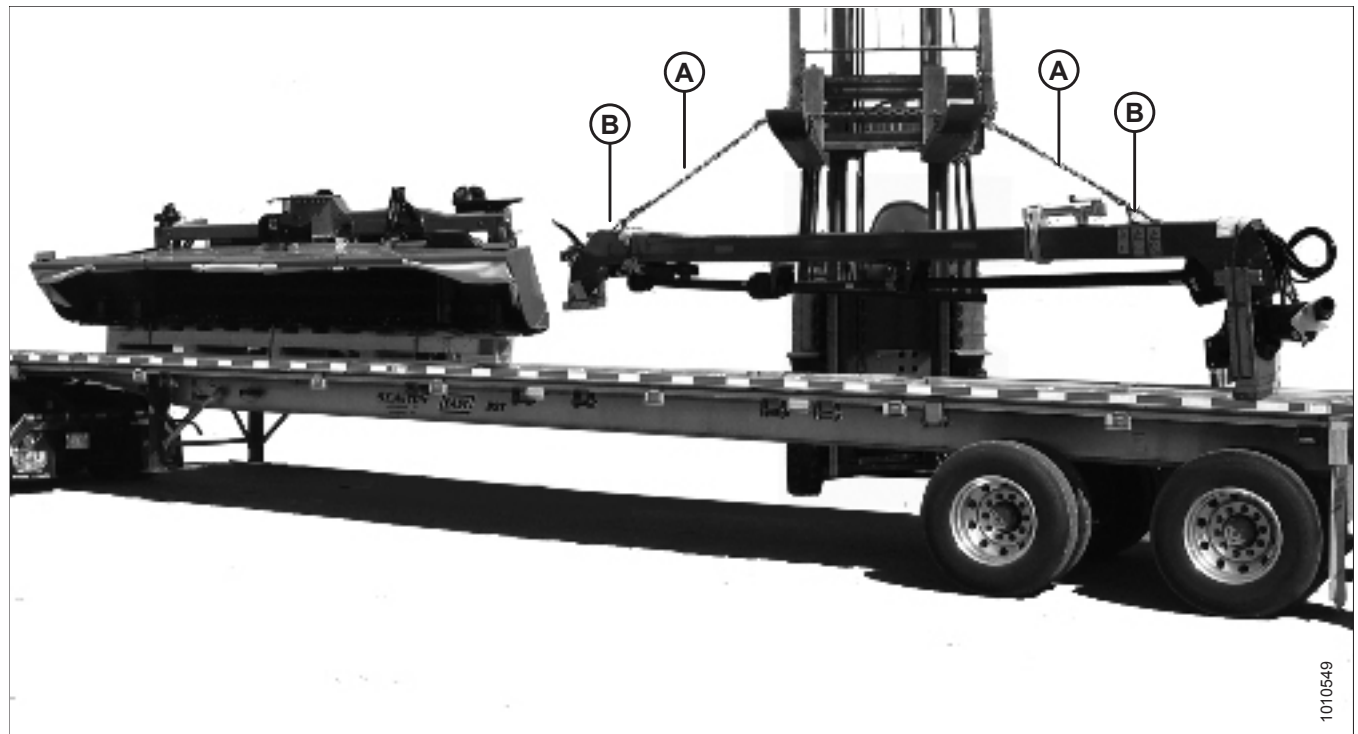


Figure 2.1: Unloading Hitch

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.

UNLOADING TRUCK SHIPMENT

4. Raise hitch off deck, back up until unit clears trailer, and slowly lower to 150 mm (6 in.) from ground.

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.
8. Approach rotary disc pull-type (A) from back with forklift (B) as shown, and slide forks as far as possible into pallet.

NOTE:

Pallet is designed to be lifted from the backside only.

9. Raise rotary disc pull-type off deck.

IMPORTANT:

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

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

NOTE:

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

12. Repeat for second rotary disc pull-type (if required).
13. Check for shipping damage and missing parts.

IMPORTANT:

Do **NOT** remove rotary disc pull-type from pallet until instructed.

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

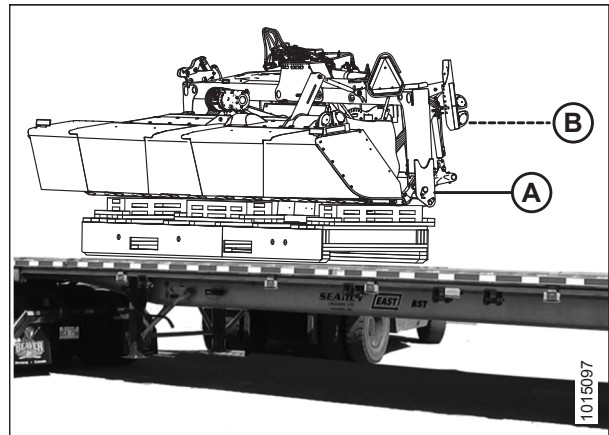


Figure 2.2: Unloading Rotary Disc Pull-Type

Chapter 3: Assembling the Rotary Disc Pull-Type – With or Without the Dealer-Installed Transport

Perform the following procedures in the order provided to assemble the rotary disc pull-type without the transport system, or when the transport will be installed by the Dealer.

To assemble a rotary disc pull-type with the factory-installed transport, refer to [4 Assembling the Rotary Disc Pull-Type – Factory-Installed Transport](#), page 61.

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 piece of wood (C) to protect paint on frame.

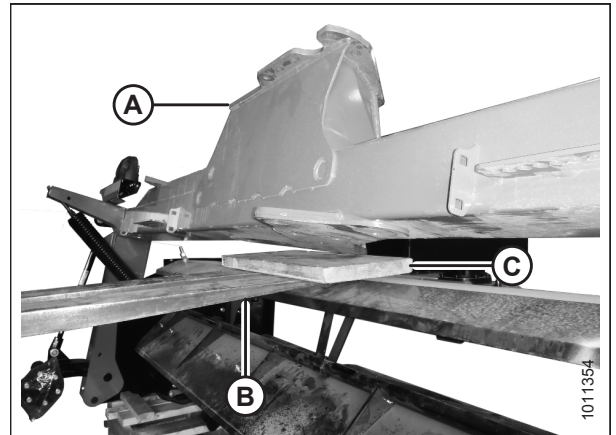


Figure 3.1: Carrier

2. Loosen retaining bolt (A) and rotate cover plate (B) away from float spring bolt (C). Repeat on opposite side.
3. Fully loosen float spring bolt (C). Repeat on opposite side.

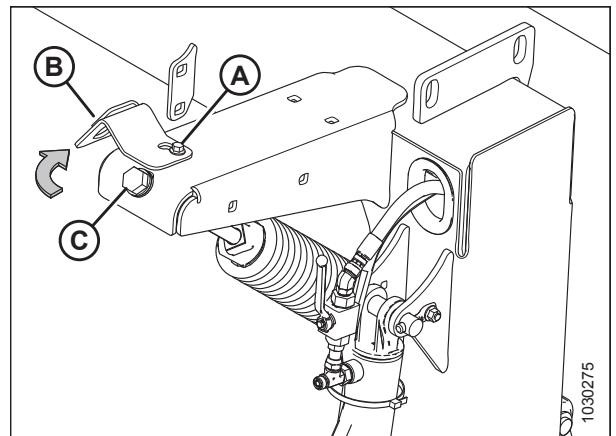


Figure 3.2: Float Spring – Right Side

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

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

CAUTION

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

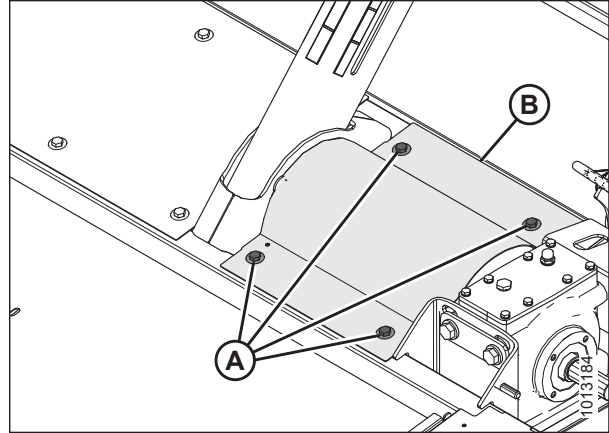


Figure 3.3: Top Shield – Left of Center-Link

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

NOTE:

Pin should slide out freely. Adjust forklift fork or move carrier frame until pin is loose. Do **NOT** use hammer to remove pin.

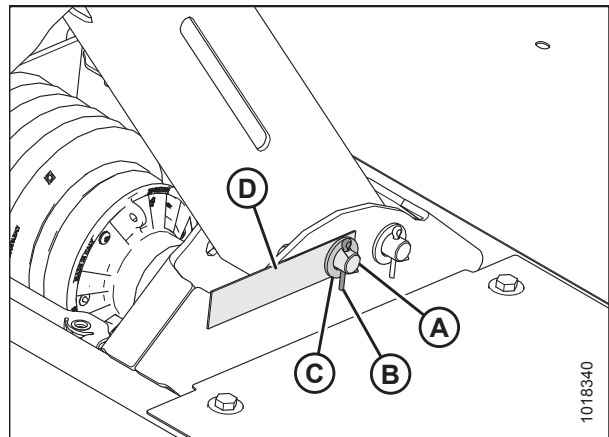


Figure 3.4: Center-Link Anchor – Right of Center-Link

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

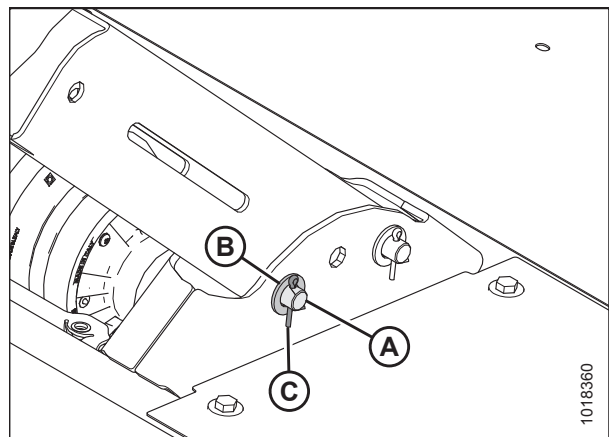


Figure 3.5: Center-Link Anchor – Right of Center-Link

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

8. Install top shield (B) and secure with four M10 hex head bolts (A) and flat washers. Torque to 28.5 Nm (21 lbf-ft).

NOTE:

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

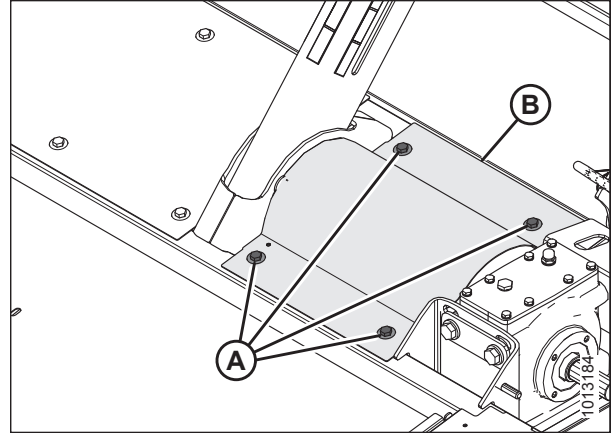


Figure 3.6: Top Shield – Left of Center-Link

9. Close lock-out valve (A) on each rotary disc pull-type lift cylinder by turning the handle to the horizontal position. Repeat on opposite side.
10. Turn adjuster bolt (B) to set dimension (C) to 130 mm (5 1/8 in.). Repeat on opposite side.
 - Turn bolt clockwise (towards spring) to increase float
 - Turn bolt counterclockwise (away from spring) to decrease float

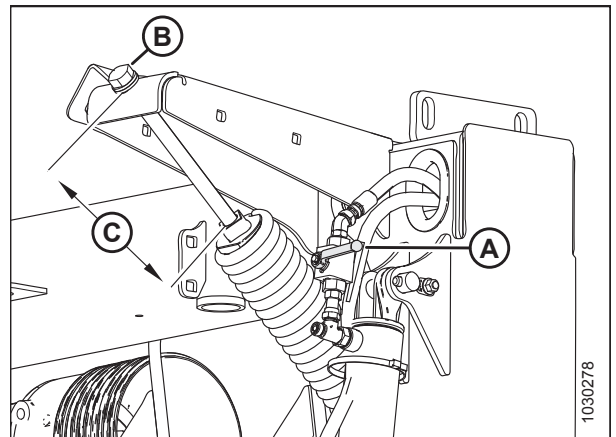


Figure 3.7: Lift Cylinder Lock-Out Valve and Adjuster Bolt

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

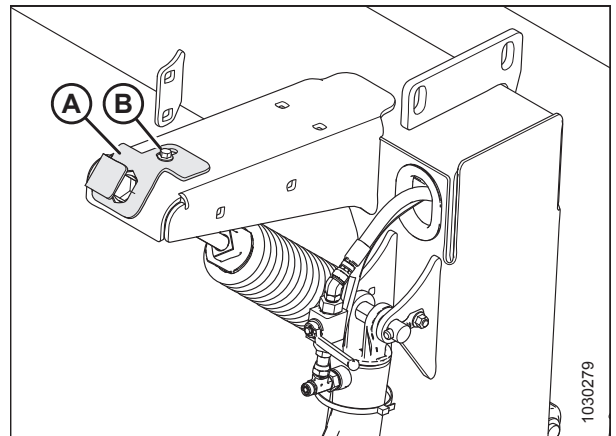


Figure 3.8: Adjuster Bolt Cover Plate

3.2 Attaching Hitch to Carrier Frame

The connection point on the carrier frame secures the hitch to the frame and allows the pull-type to pivot.

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

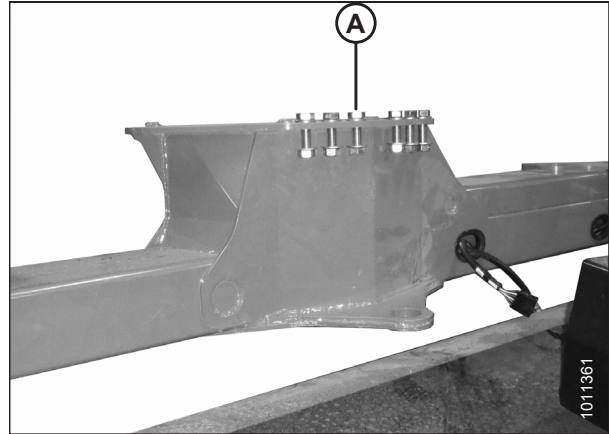


Figure 3.9: Carrier Frame

2. Place sling (A) around the hitch frame. Adjust sling position until hitch is balanced when lifting.
 - **R113 PT:** Approximately 2.7 m (106 in.) from the edge of tractor end (B) of the hitch
 - **R116 PT:** Approximately 3.5 m (138 in.) from the edge of tractor end (B) of the hitch
3. Raise the hitch approximately 610 mm (24 in.) off the ground.

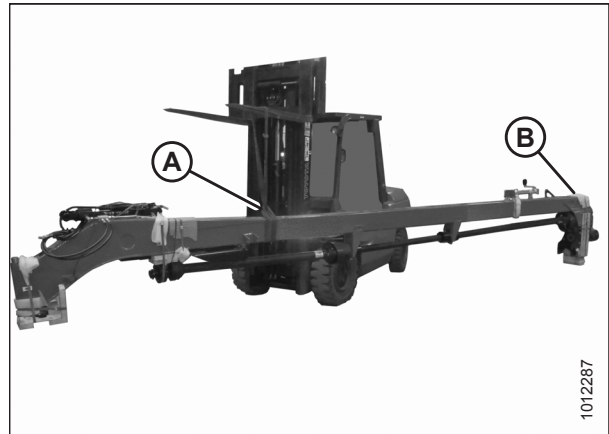


Figure 3.10: Lifting Hitch

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

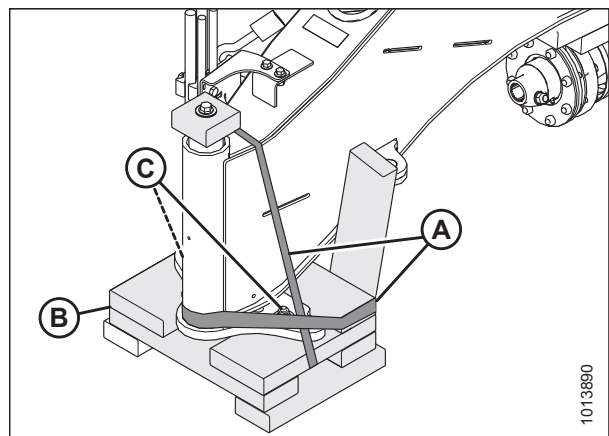


Figure 3.11: Hitch Packing

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED 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).

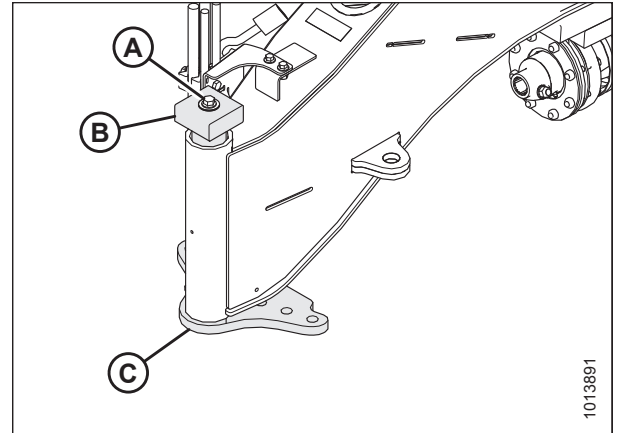


Figure 3.12: Hitch Packing

- Install hitch pin (A) fully into hitch.

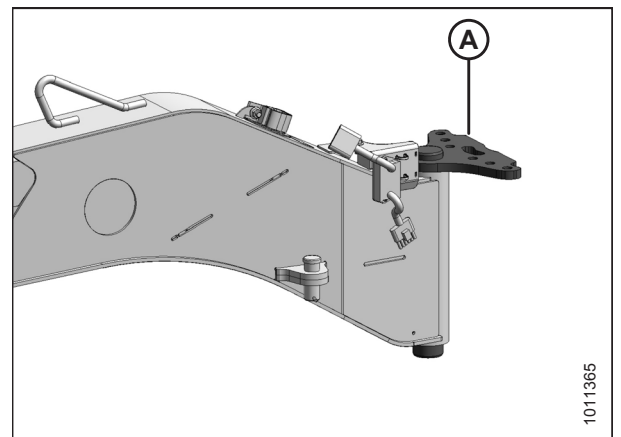


Figure 3.13: Hitch Pin

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

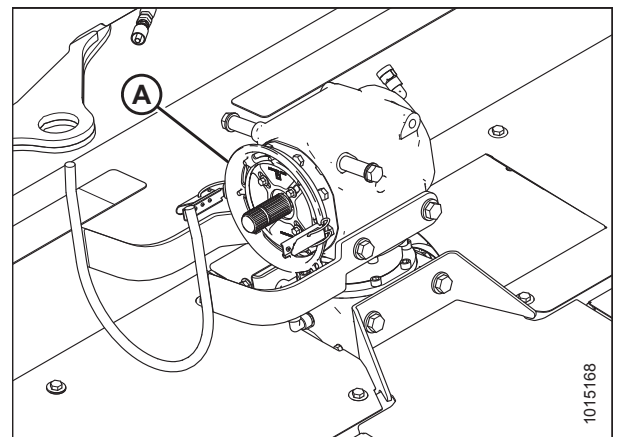


Figure 3.14: Gearbox

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

9. Move hitch pivot (A) into attachment location (B) on carrier frame, and line up hitch pin with hole in carrier frame.

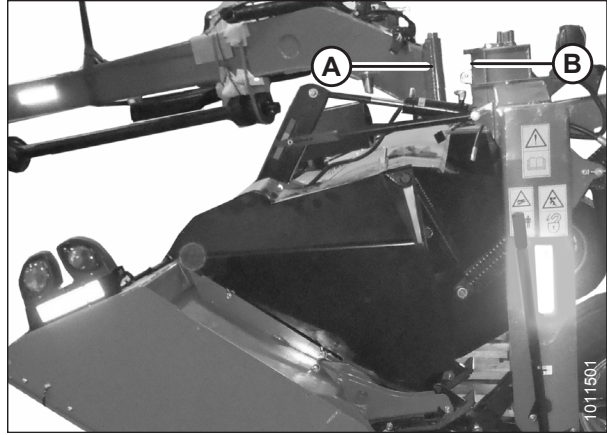


Figure 3.15: Hitch to Carrier Frame

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

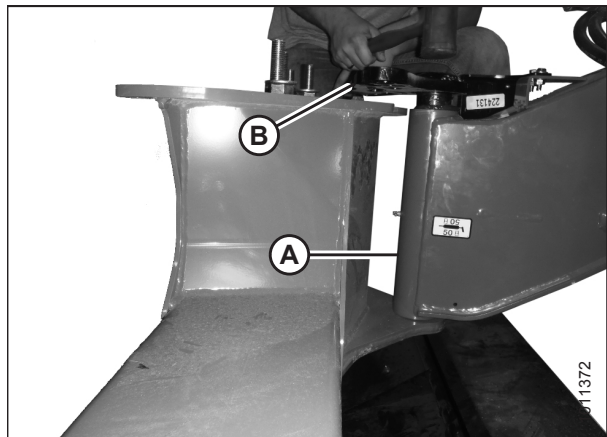


Figure 3.16: Hitch Pin

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 bolt head and lock nuts (C).

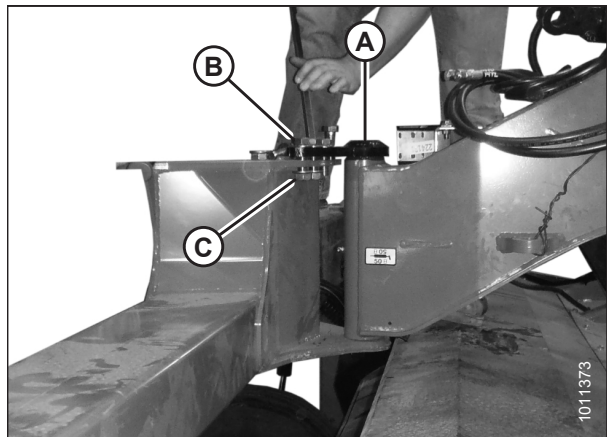


Figure 3.17: Hitch Pin

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

12. Tighten outer bolts (A) first to draw the plate against the frame, and then tighten the inner bolts.
13. Torque bolts to 461 Nm (340 lbf-ft).

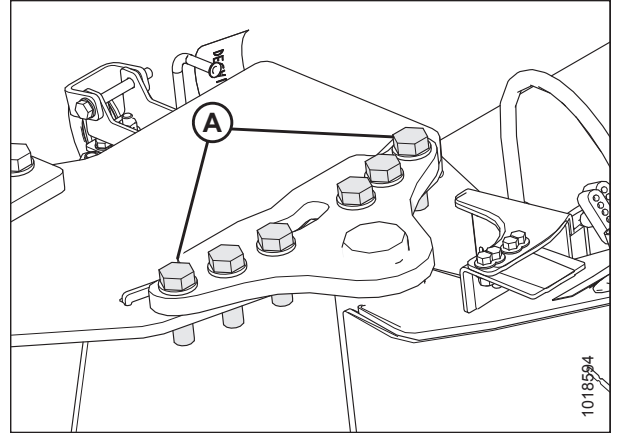


Figure 3.18: Hitch Pin

3.3 Installing Tractor Mating Hitch to Carrier Hitch

The tractor mating hitch connects the carrier hitch to the style of hitch on the tractor.

Depending on rotary disc pull-type 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 21](#)

3.3.1 Installing Drawbar Hitch

The drawbar swivel hitch allows the pull-type to connect to a single point hitch connection and swing behind the tractor without sacrificing turning range.

If attaching the rotary disc pull-type to a tractor with a drawbar hitch, proceed as follows. If attaching the rotary disc pull-type to a tractor with a two-point hitch, refer to [3.3.2 Installing Two-Point Hitch \(Cat. II\) Adapter, page 21](#).

1. Remove shipping wire or banding (A) securing shipping blocks (B) at front of hitch, and remove blocks.
2. Swivel lower gearbox until the input shaft is facing forward.

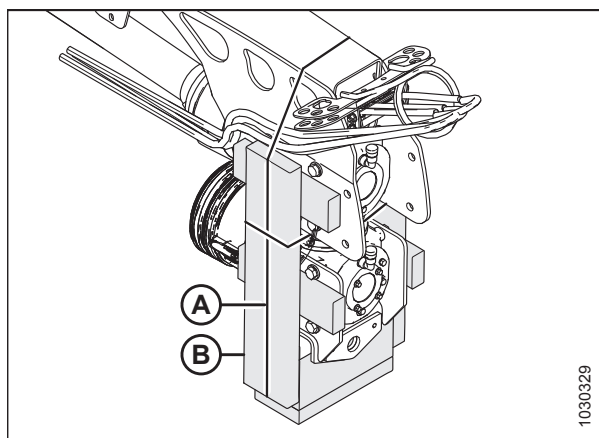


Figure 3.19: Hitch End Packing

3. Remove shipping wire (A) from jack (B), toolbox (C), and jack stand support (D).
4. Remove jack (B), toolbox (C), and jack stand support (D) from the pallet. Leave drawbar hitch (E) attached to the pallet.
5. Remove the hardware bag from the jack stand support.

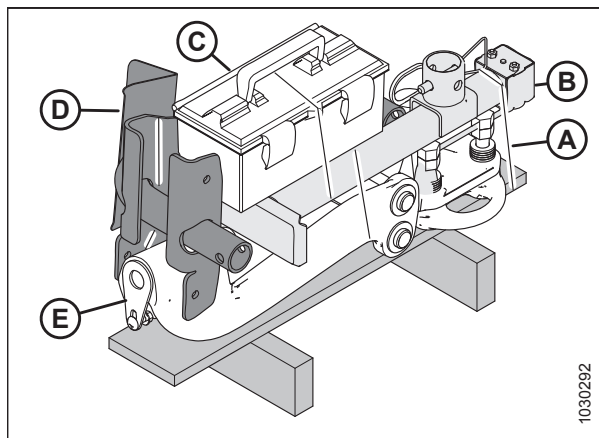


Figure 3.20: Jack and Drawbar Hitch Packing

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

6. Install jack support stand (A) as shown. Secure with two M12 x 1.75 x 40 bolts (B), M12 washers, and M12 center lock nuts per side. Torque hardware to 69 Nm (51 lbf·ft).

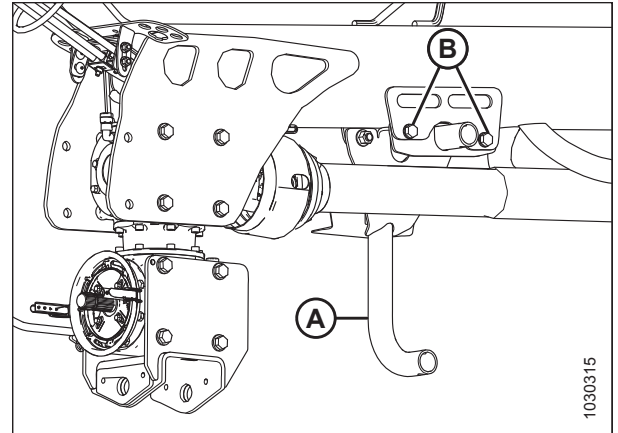


Figure 3.21: Jack Stand Support

7. Install jack (A) at front of hitch, and secure with pin (B).
8. Lower forklift until hitch is resting on jack (A).

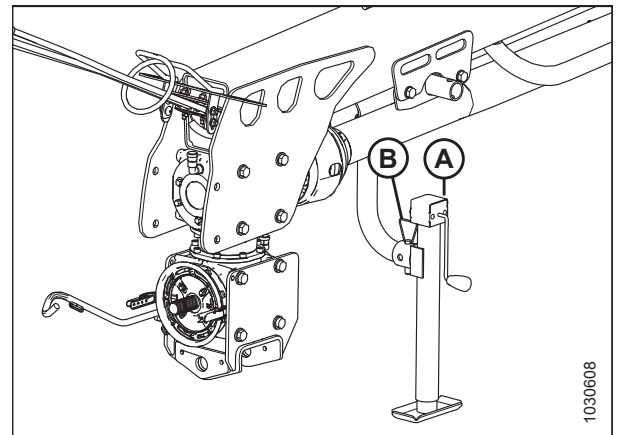


Figure 3.22: Jack Stand

9. Remove shipping wire (A) that secures pin (B) in casting. Do **NOT** remove other strapping.
10. Remove pin (B) from casting, and remove bolt (C) and nut from pin.

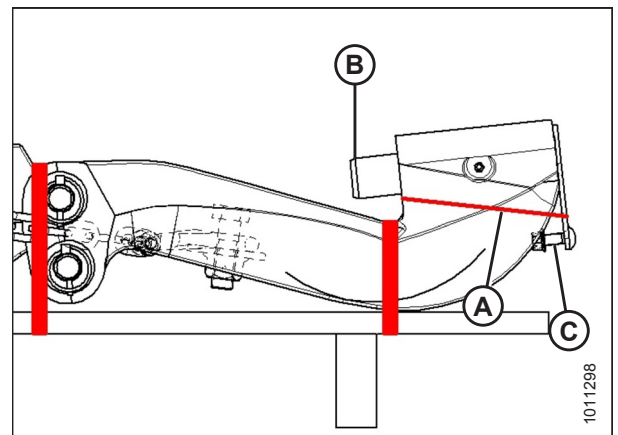


Figure 3.23: Hitch Casting

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

11. Using a floor jack or equivalent under pallet (A), raise drawbar hitch (B) into position under the gearbox.
12. Move drawbar hitch (B) so pin (C) can be installed.
13. Secure pin with bolt (D) and nut.
14. Remove any remaining strapping from pallet (A). Lower pallet. Remove floor jack and pallet.

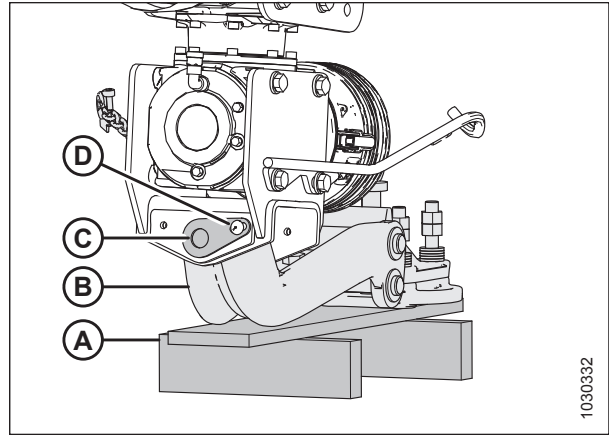


Figure 3.24: Drawbar Hitch

15. Remove cone shield (A).

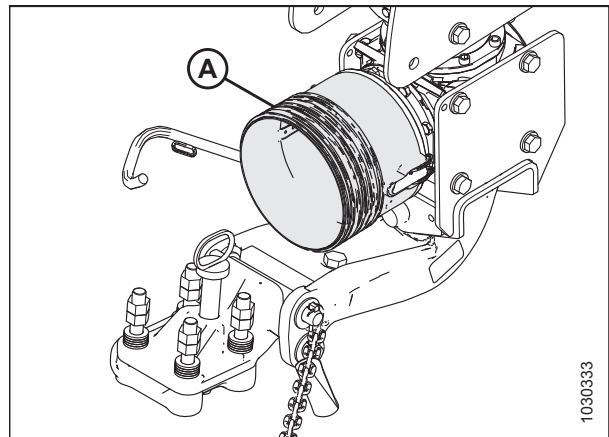


Figure 3.25: Cone Shield

16. Retrieve primary driveline (D) from the shipping location.
17. Remove nut (C), washer (B), and pin (A) from rotary disc pull-type end of primary driveline (D).

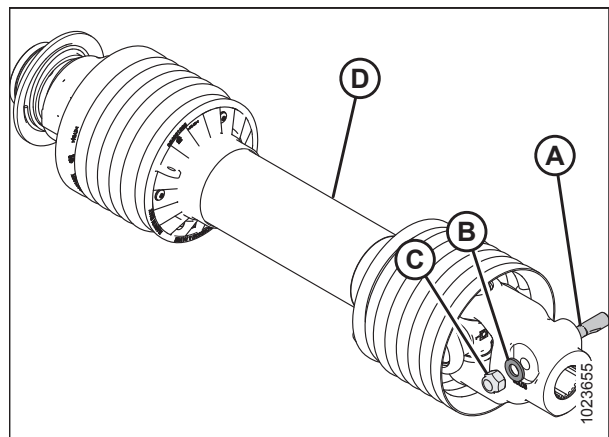


Figure 3.26: Primary Driveline

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

- Slide primary driveline (A) onto the gearbox input shaft. Align pinhole (B) in the yoke with the groove on the input shaft.

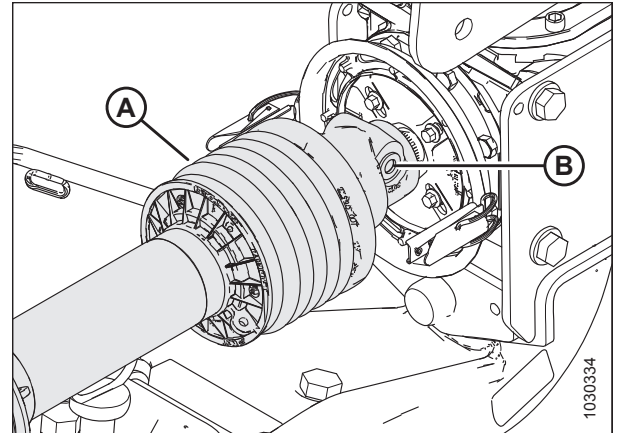


Figure 3.27: Primary Driveline

- 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 threads on pin (A) after inserting pin.
- Install washer (B) and nut (C) on the tapered pin and torque nut to 149 Nm (110 lbf-ft). The end of the pin must be recessed approximately 9–11 mm (0.35–0.43 in.) (D).

NOTE:

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

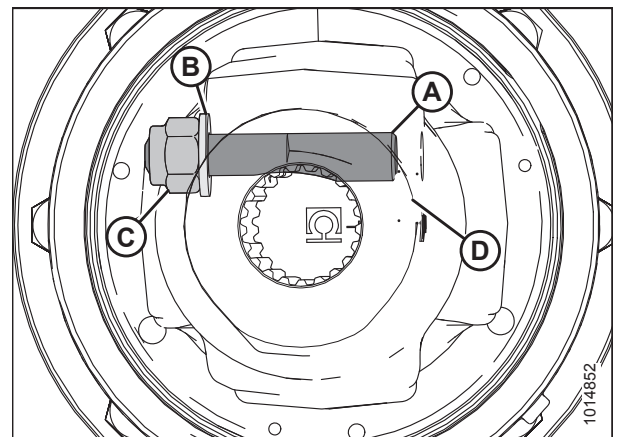


Figure 3.28: Primary Driveline

- Install cone shield (A) over primary driveline (B). Use the latches to secure it to the gearbox.
- Place primary driveline (B) on driveline support (C).

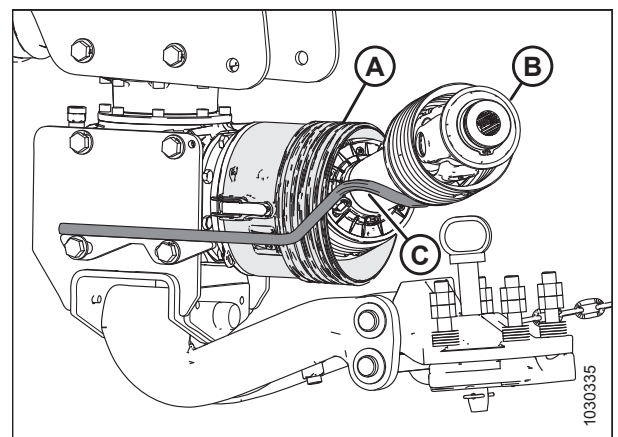


Figure 3.29: Cone Shield

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

24. Place toolbox groove (A) onto jack stand bracket (B) as shown.

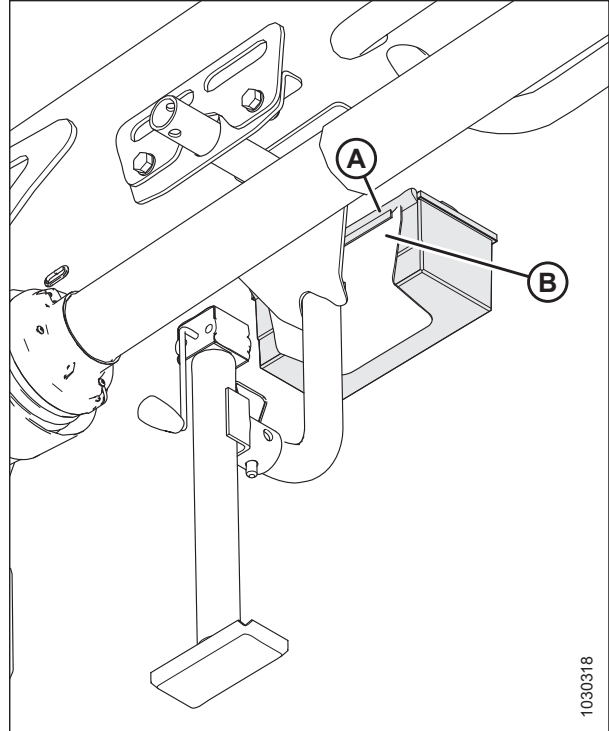


Figure 3.30: Toolbox Mounted on Jack Stand Bracket

25. Insert bracket tab (B) through the slot in the rear of toolbox (A).
26. Retrieve lynch pin (C) from the bag of hardware supplied with the jack. Secure toolbox (A) by inserting lynch pin (C) into tab (B).
27. Install hitch swing cylinder. For instructions, refer to [3.4 Installing Hitch Swing Cylinder, page 26](#).

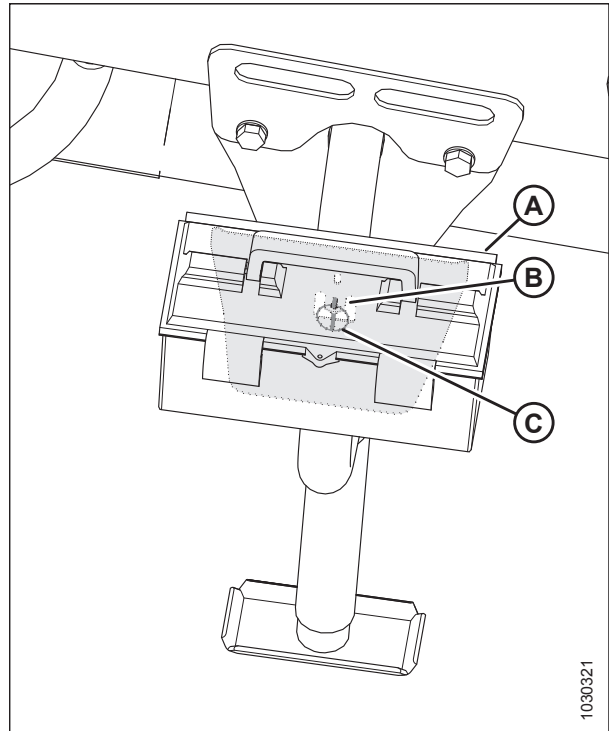


Figure 3.31: Toolbox Mounted on Jack Stand Bracket

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

The two-point hitch adapter allows the pull-type to connect to an existing two-point hitch connection.

1. Remove shipping wire or banding (A) securing shipping blocks (B) at front of hitch, and remove blocks.
2. Swivel lower gearbox until the input shaft is facing forward.

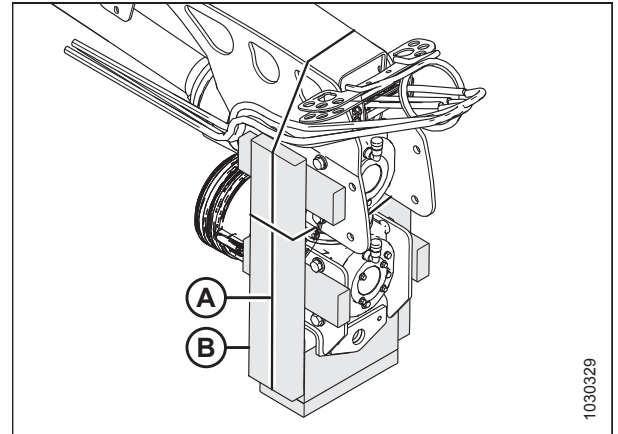


Figure 3.32: Hitch End Packing

3. Retrieve two-point hitch adapter shipment.

NOTE:

Do **NOT** remove any strapping that secures hitch adapter (A) to pallet (B).

4. Remove strapping that secures pin (C) to adapter (A).
5. Remove pin (C) from adapter, and remove bolt (D) and nut from pin (C).
6. Remove strapping from toolbox (E), jack stand support (F), and jack (G). Remove these parts from the pallet.
7. Remove the hardware bag from the jack stand support.

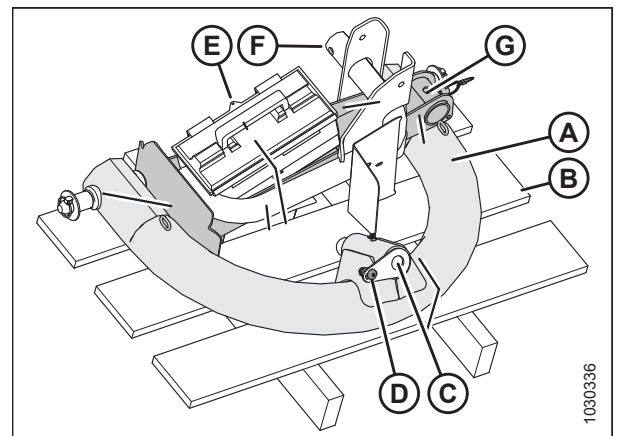


Figure 3.33: Two-Point Hitch Packing

8. Install jack support stand (A) as shown. Secure with two M12 x 1.75 x 40 bolts (B), M12 washers, and M12 center lock nuts per side. Torque hardware to 69 Nm (51 lbf-ft).

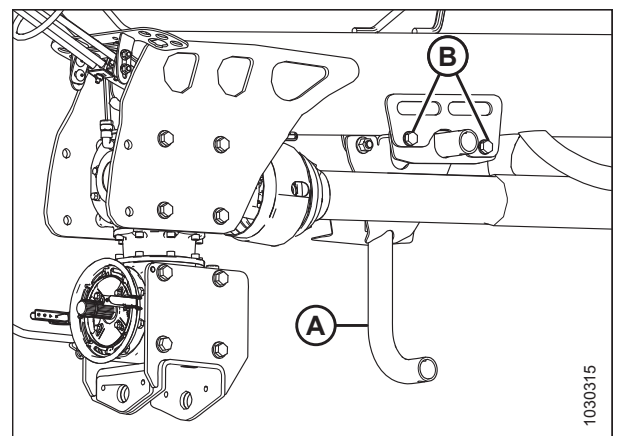


Figure 3.34: Jack Stand Support

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

9. Insert jack (A) onto the jack stand support and secure with pin (B).

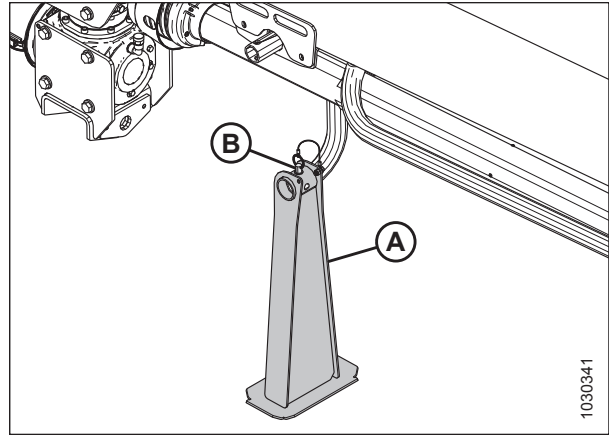


Figure 3.35: Jack – Working Position

10. Using a floor jack or equivalent, raise two-point hitch adapter (A) into position under the gearbox.
11. Maneuver adapter (A) so that pin (B) can be installed to secure adapter to hitch.
12. Secure pin with bolt (C) and nut.
13. Remaining any remaining strapping from pallet. Lower pallet. Remove jack and pallet.
14. Lower hitch and stand to the ground.

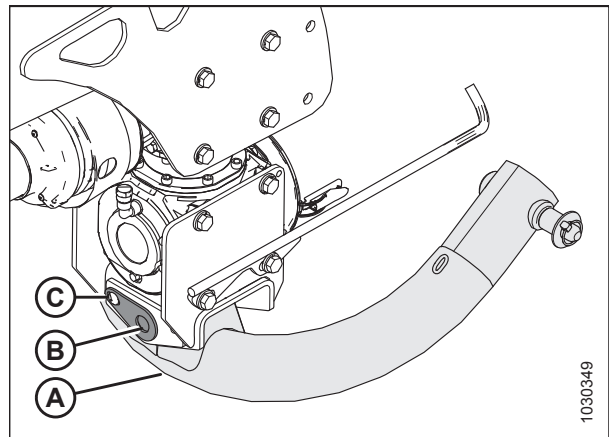


Figure 3.36: Two-Point Hitch Adapter

15. Install springs (A) into hooks (B).
16. Remove cone shield (C).

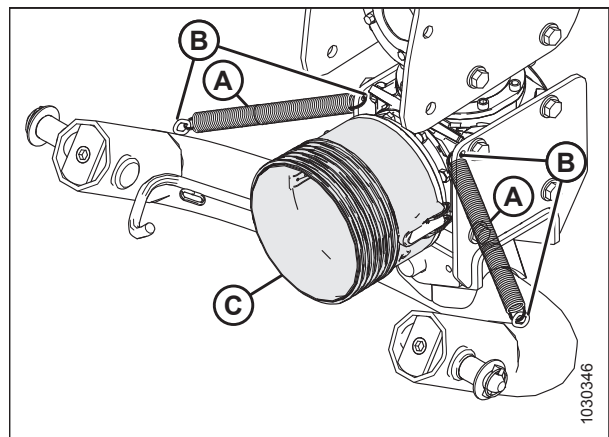


Figure 3.37: Springs

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

17. Retrieve primary driveline (D) from the shipping location.
18. Remove nut (C), washer (B), and pin (A) from rotary disc pull-type end of primary driveline (D).

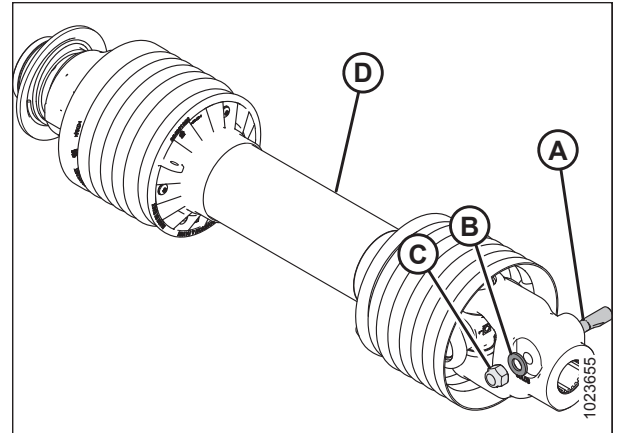


Figure 3.38: Primary Driveline

19. Slide driveline (A) onto gearbox input shaft (B). Align pinhole (C) in the yoke with the groove on the input shaft.

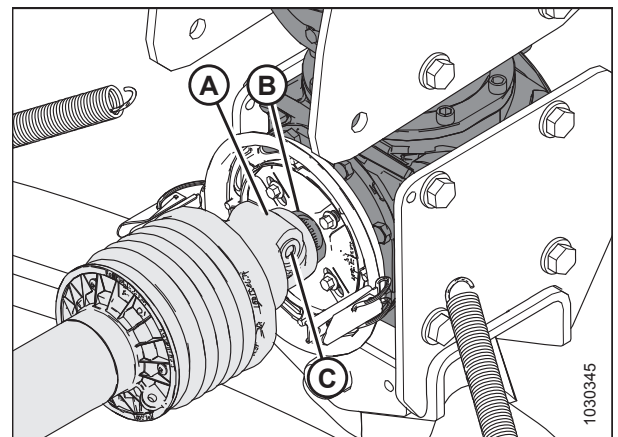


Figure 3.39: Primary Driveline

20. Insert tapered pin (A) by hand. Ensure the pin lines up with groove in the yoke and is fully inserted. The notch in the pin should be facing toward the shaft.
21. Clean threads on pin (A) after inserting pin.
22. Install washer (B) and nut (C) on the tapered pin and torque to nut 149 Nm (110 lbf-ft). The end of the pin must be recessed 9–11 mm (0.35–0.43 in.) (D).

NOTE:

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

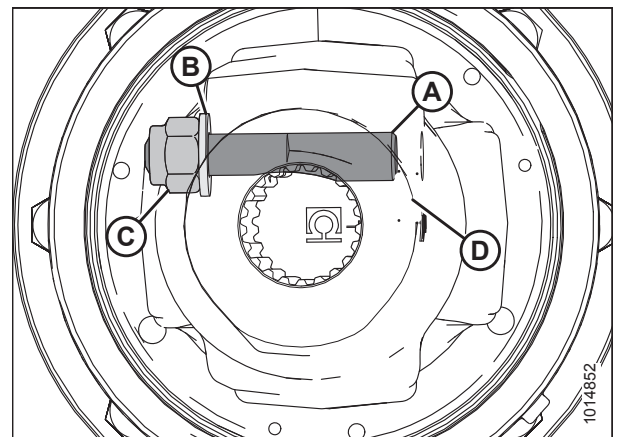


Figure 3.40: Primary Driveline

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

23. Install cone shield (A) over the primary driveline. Place driveline (B) on driveline support (C).

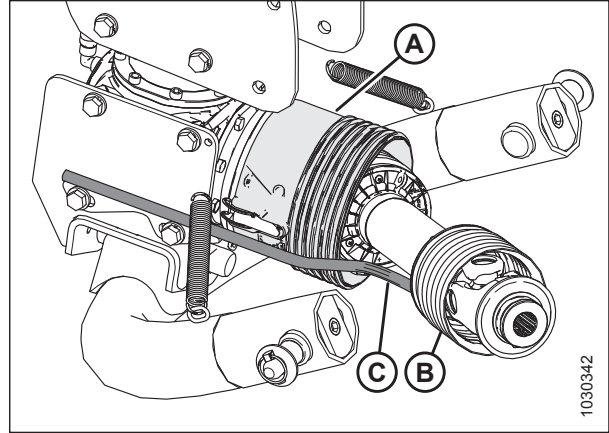


Figure 3.41: Cone Shield

24. Place toolbox groove (A) onto jack stand bracket (B) as shown.

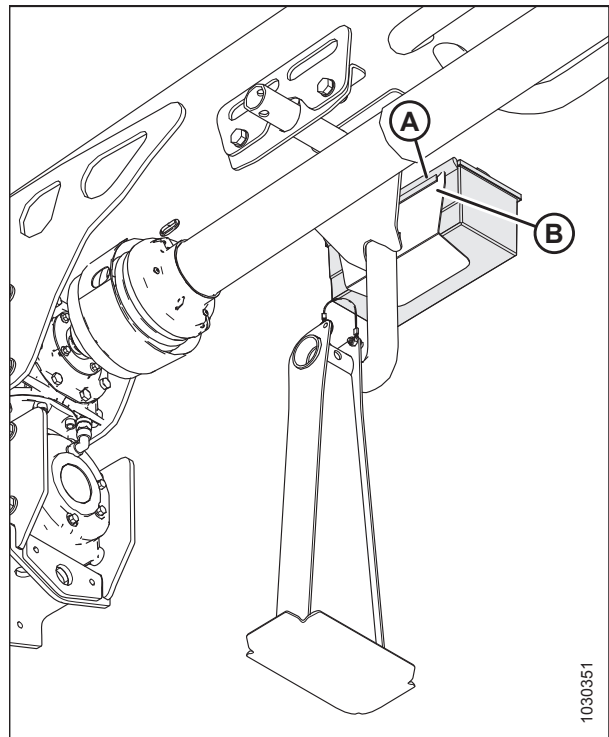


Figure 3.42: Toolbox Mounted on Jack Stand Bracket

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

25. Insert bracket tab (B) through the slot in the rear of toolbox (A).
26. Retrieve lynch pin (C) from the bag of hardware supplied with the jack. Secure toolbox (A) by inserting lynch pin (C) into tab (B).
27. Install hitch swing cylinder. For instructions, refer to [3.4 Installing Hitch Swing Cylinder, page 26](#).

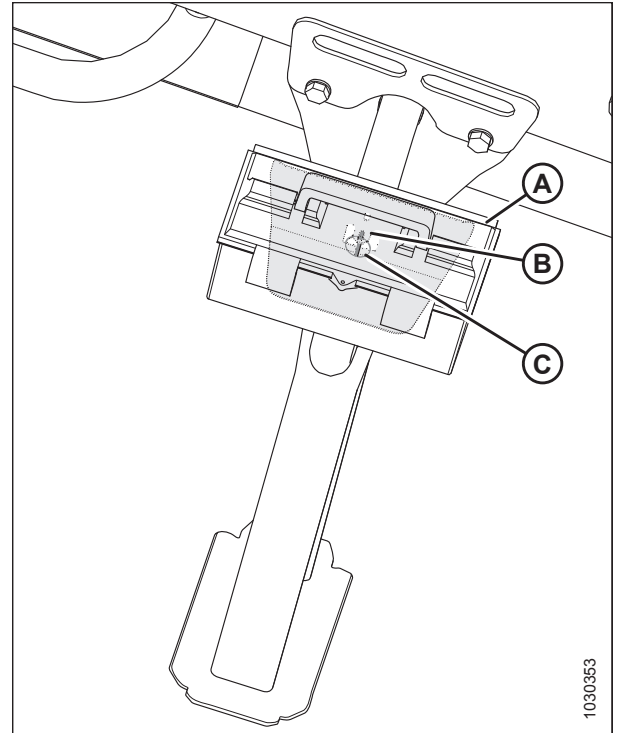


Figure 3.43: Toolbox Mounted on Jack Stand Bracket

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 transport system will be installed. Be sure to follow the instructions carefully.

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

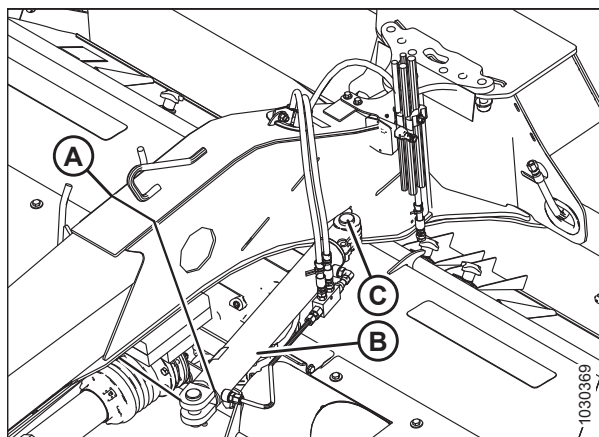


Figure 3.44: Steering Cylinder

To install cylinder on unit WITHOUT the transport system, proceed as follows:

1. Reposition cylinder (A) at left side of hitch and attach rod end to carrier frame lug with pin at location (B). Secure with cotter pin (C).
2. Place a container or rag under the cylinder to catch oil.
3. Remove pin from location (D) at the clevis end of the cylinder.
4. Swing the hitch until clevis lines up with lug on hitch.
5. Install clevis pin at location (D) and secure with cotter pin (E).

NOTE:

If assistance is required to align the clevis and lug, loosen the hydraulic fittings.

6. If loosened, tighten the fittings on cylinder.

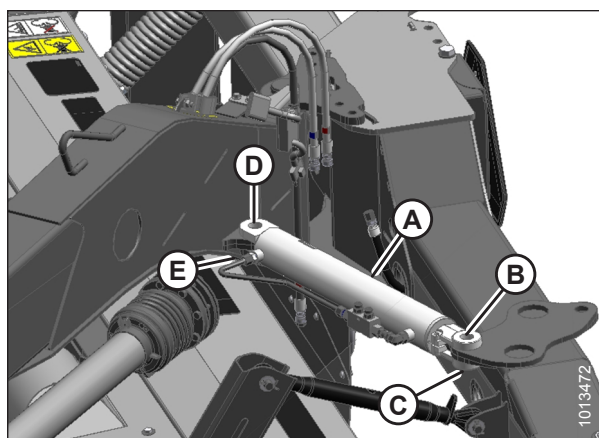


Figure 3.45: Hitch Swing Cylinder

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

To install cylinder on unit WITH the transport system, proceed as follows:

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

NOTE:

The rod end of cylinder will be attached to the transport system casting after the system is primed. For instructions, refer to [6.2 Priming the Hitch Swing Cylinder, page 111](#).

3. Turn valve (E) on the hitch swing cylinder 180° so that fittings are pointing up.

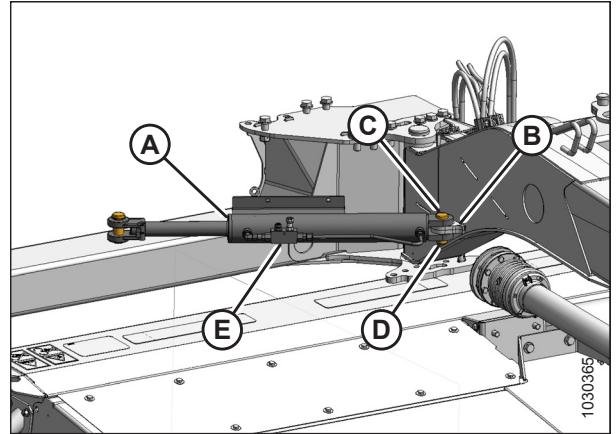


Figure 3.46: Hitch Swing Cylinder

3.5 Attaching Clutch Driveline

The clutch driveline on the carrier hitch, connects to the rotary disc pull-type drive gearbox.

IMPORTANT:

If a conditioner swap is required before delivery to the customer, swap the conditioner **BEFORE** attaching the clutch driveline. For conditioner swap instructions, refer to the pull-type technical manual. After swapping the conditioner, attach the clutch driveline then follow the remaining chapters in this manual in sequential order to complete the setup.

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

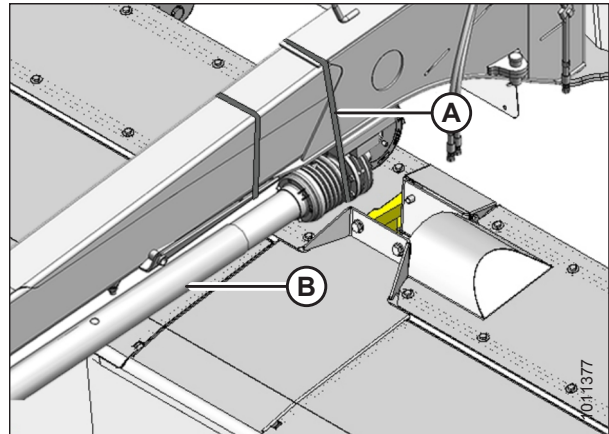


Figure 3.47: Driveline Strapping

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

NOTE:

Strapped contents may be under pressure.

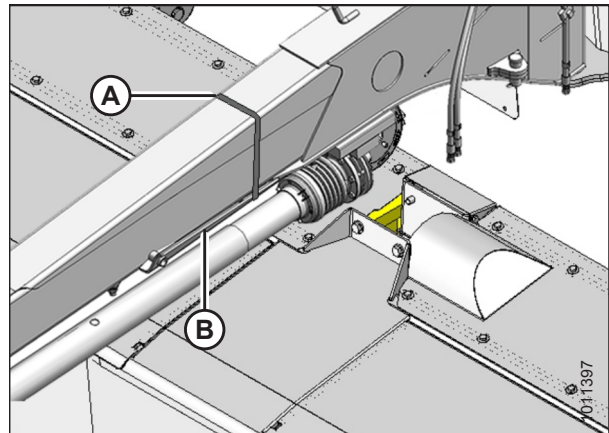


Figure 3.48: Steering Arm Strapping

3. At the top of the upper rear swivel gearbox, remove two bolts (A) with washers (B) and spacers (C). Retain hardware.
4. Undo latches (D) securing driveline shield (E) to the upper rear swivel gearbox and remove the shield. If necessary, use a screwdriver or equivalent to undo latches (D).
5. Rotate the upper rear swivel gearbox until the input shaft is facing towards the driveline.

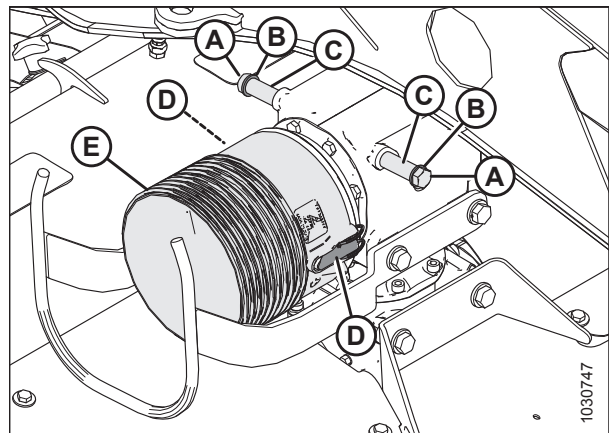


Figure 3.49: Driveline Shield

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

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

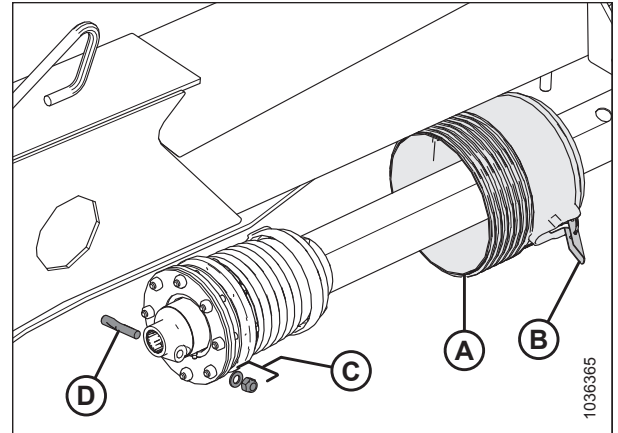


Figure 3.50: Clutch Driveline

- Attach driveline (A) to the upper rear swivel gearbox shaft.

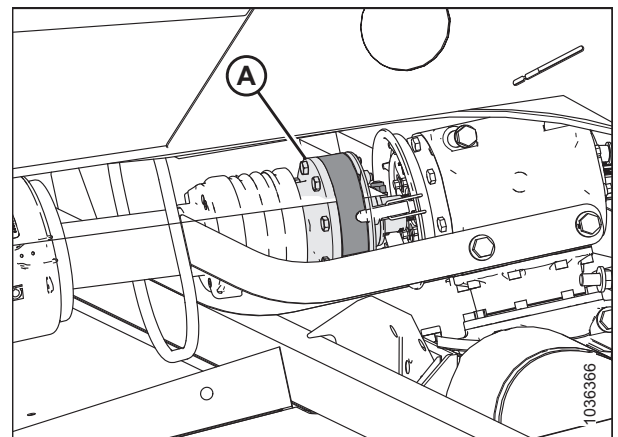


Figure 3.51: Clutch Driveline

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

NOTE:

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

- Install the shield onto the upper rear swivel gearbox. Use the latches to secure it.

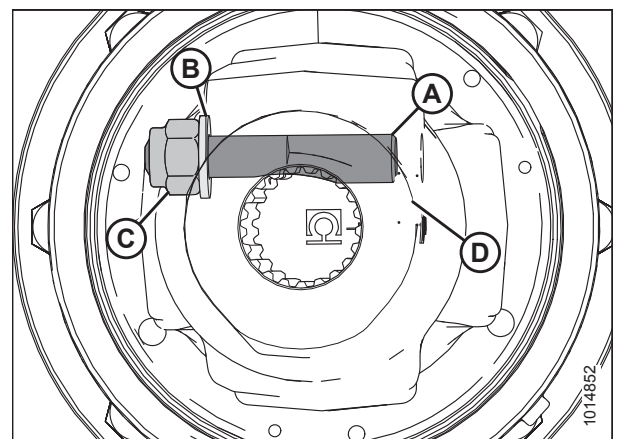


Figure 3.52: Clutch Driveline

3.6 Attaching Steering Arm

The steering arm connects to the header drive gearbox.

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

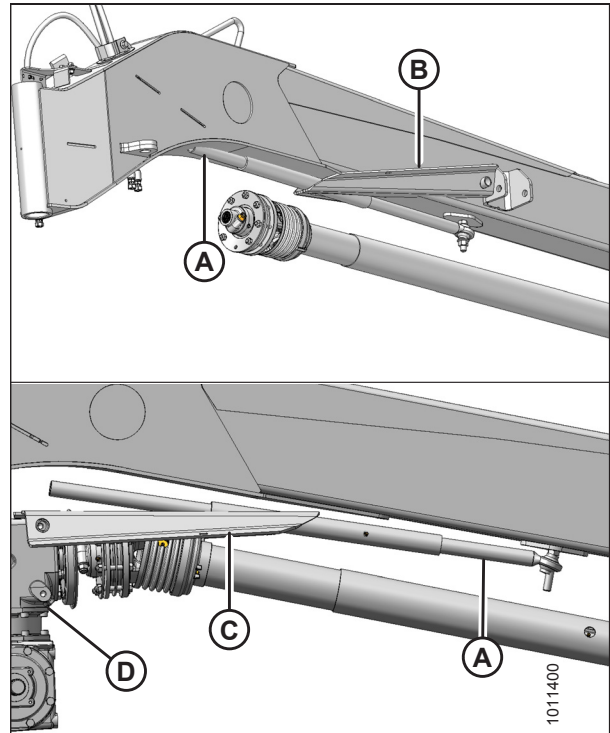


Figure 3.53: Steering Arm

5. Line up the two mounting holes in arm weldment with the forward threaded holes in the upper rear swivel gearbox.
6. Install spacers (A) into steering arm (B).
7. Install washer (D) onto the M16 x 80 hex head bolts (C). Apply high-strength threadlocker (Loctite® 262 or equivalent) onto the bolt threads.
8. Torque bolts to 203 Nm (150 lbf-ft).

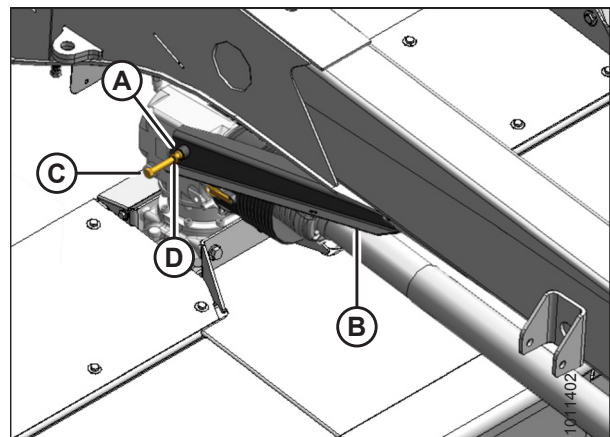


Figure 3.54: Steering Arm

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

9. Attach safety chain (A) from driveline shield to slotted hole in the steering arm.

NOTE:

Ensure chain is shortened to prevent any driveline wrapping.

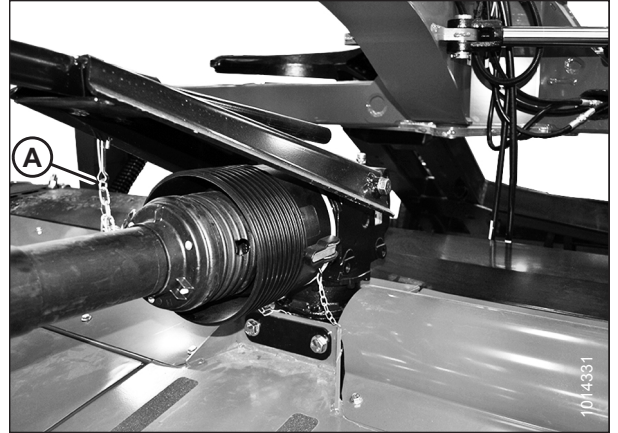


Figure 3.55: Driveline Shield

3.7 Connecting Transport Lighting Module – Without Dealer-Installed Transport

The hitch assembly lighting harness must be connected to the lighting module on the header.

NOTE:

Follow these instructions if **NOT** installing the dealer-installed transport kit.

1. Remove plug (A) from the upper input receptacle on transport lighting module.

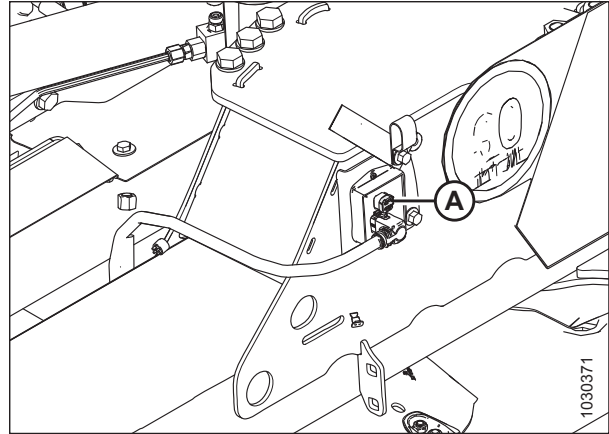


Figure 3.56: Lighting Module Plug

2. Locate plug P102 on trailer harness (A) at the header end of the hitch. Route plug P102 towards the transport lighting module.
3. Secure the trailer harness with existing P-clip (D).
4. Connect plug P102 (B) to the upper input receptacle on transport lighting module (C).

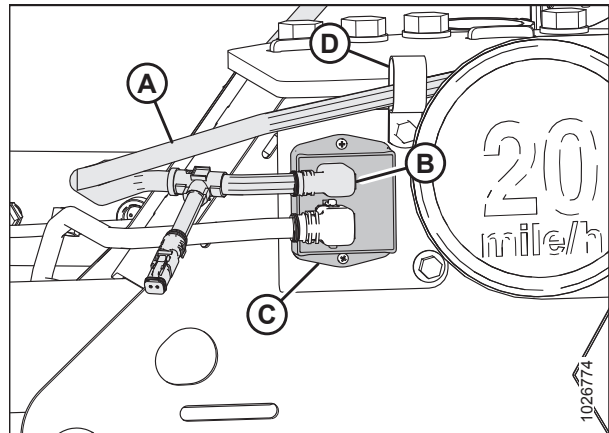


Figure 3.57: Trailer Harness

3.8 Installing Options

Install the following optional kits if they were supplied with your rotary disc pull-type.

3.8.1 Installing Transport System

When installing the transport system (MD #C2002), the main mechanical components are installed first, then the hydraulic systems, and then the lighting and signage.

Installing Components

This section explains how to install the basic parts of the transport system.

Installing Latch Assembly

1. Disconnect right light electrical connection (A).
2. Remove two bolts (B) that secure right light assembly (C) to the carrier frame.
3. Remove light assembly (C). Retain the light assembly and hardware for installation later.

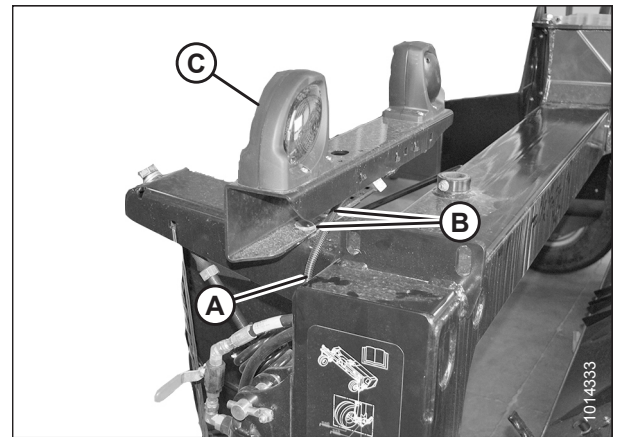


Figure 3.58: Light Bracket

4. Cap right light connector P406 with cap (A).
5. Cap right light connector P403 with cap (B).
6. Tuck connectors P406 and P403 into frame (C).
7. Remove cap (D) from tee fitting (E).

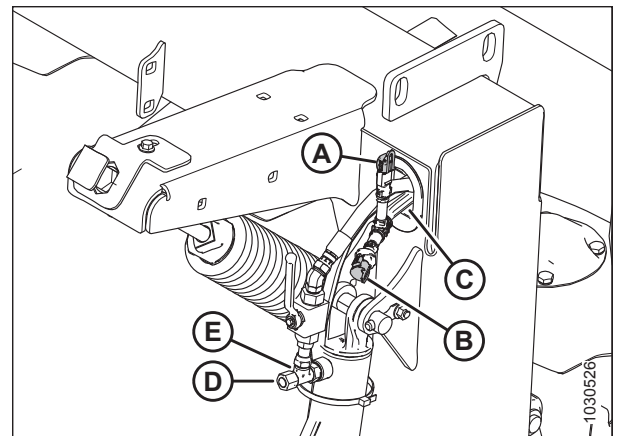


Figure 3.59: Capped Connectors

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

8. On the transport pallet, remove the shipping banding and packing material from latch assembly (A). Remove the latch assembly.
9. Remove two M20 mounting bolts, washers, and nuts (B) from the latch assembly, and retain for use later.

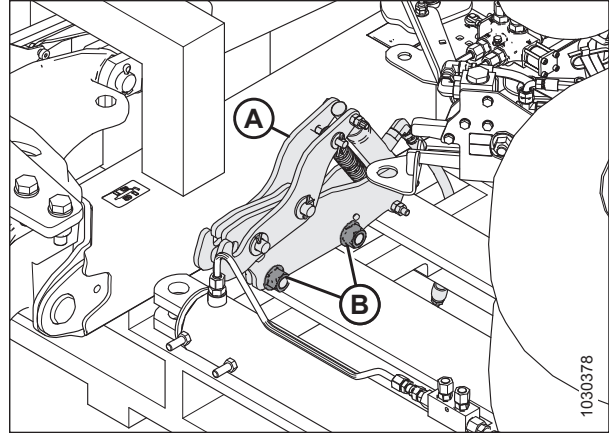


Figure 3.60: Latch Packing

10. Install latch assembly (A) onto the carrier frame as shown, and secure with the M20 bolts, washers, and nuts (B) retained in Step 9, page 34. Do **NOT** fully tighten bolts; adjustment of the latch assembly may be necessary.
11. Attach hydraulic hose (C) from the latch assembly to tee fitting (D) as shown.

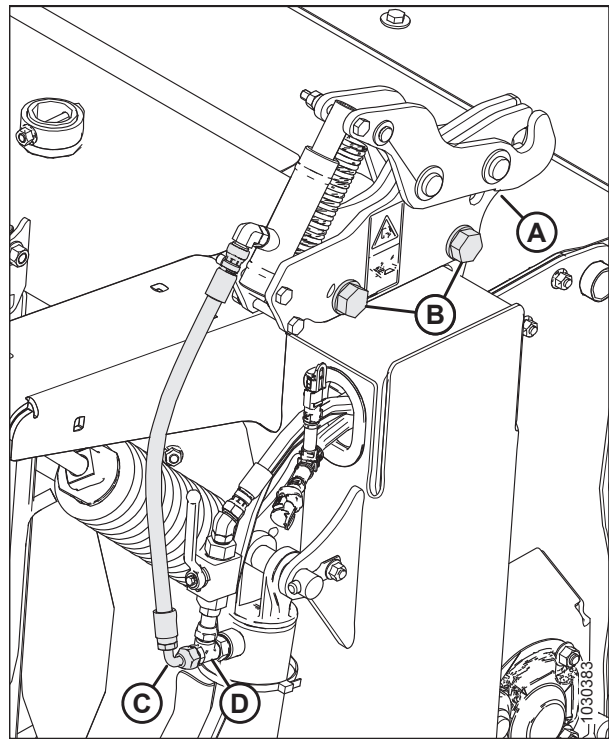


Figure 3.61: Latch Assembly

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

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

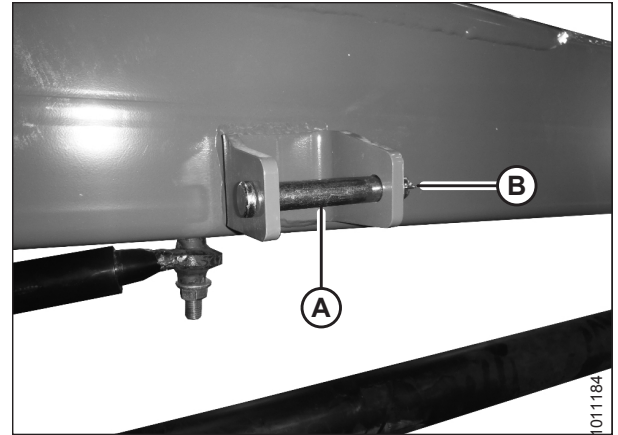


Figure 3.62: Latch Pin

Installing Transport Assembly

- Remove bolts (A), hardened washers, and nuts securing slow moving vehicle (SMV) sign (B) to the carrier frame. Remove the sign. Retain the sign for reinstallation. Discard the two bolts, washers, and nuts.

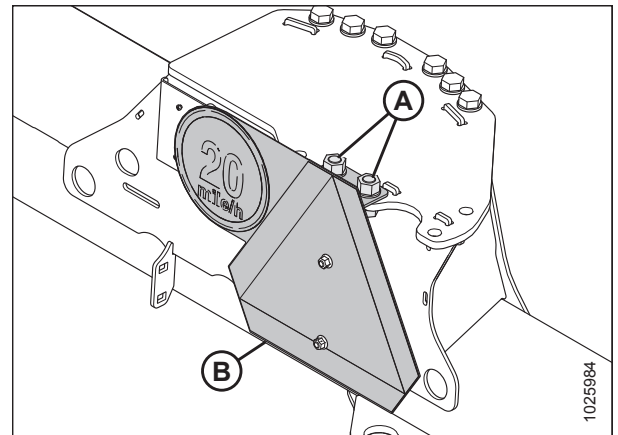


Figure 3.63: SMV Sign Attached to Carrier Frame

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

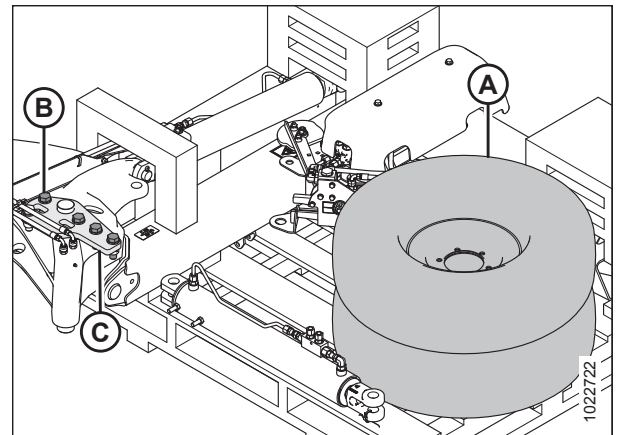


Figure 3.64: Transport Packing

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

- Using a forklift, pick up the pallet holding transport assembly (A) and align it with the rear of the rotary disc pull-type.
- Position the assembly close behind the frame and align pin (B) in transport assembly with hole (C) in the carrier. Use a soft hammer or equivalent to fully insert pin (B).

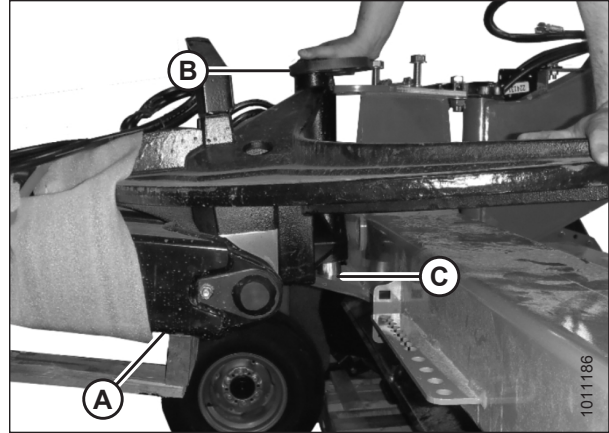


Figure 3.65: Transport System

- Install two M20 x 65 bolts (A), hardened washers, and nuts.
- Temporarily install bolts (B) to help align the assembly.

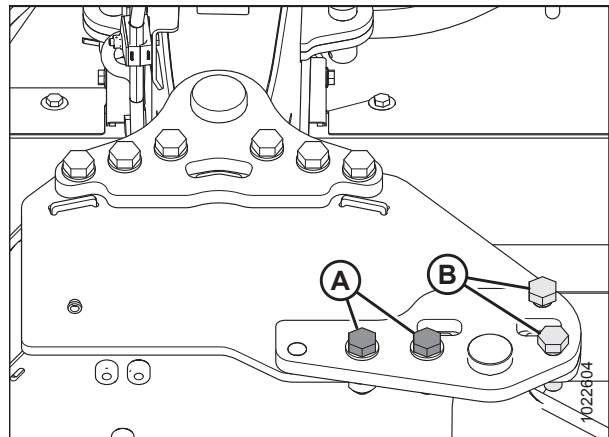


Figure 3.66: Pin Support

- Rotate pin (A) until hole in pin aligns with holes in welded collar (B). Insert pin (C) through the collar and pin.
- Insert cotter pin (D) and bend over the legs to secure it.

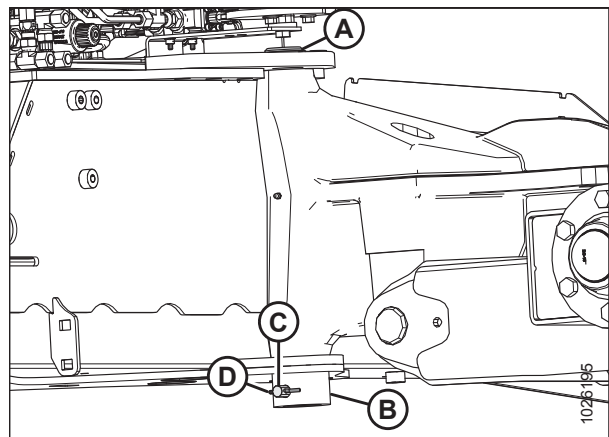


Figure 3.67: Pin Installation

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

10. Retrieve cover assembly (B) from the shipping location.
11. Remove two bolts (A) from cover assembly (B). Retain the bolts and cover for installation later.

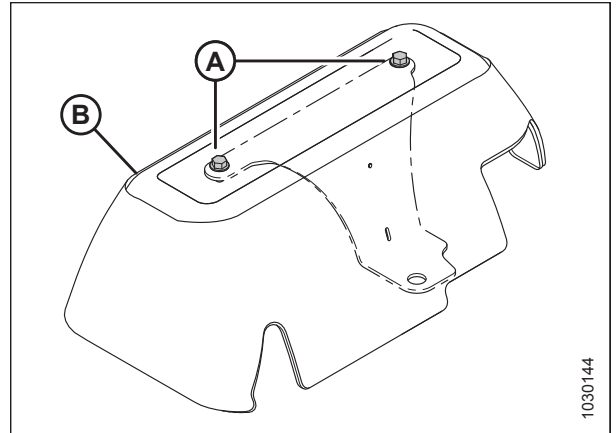


Figure 3.68: Cover Assembly

12. Disconnect P301 (A) from the transport lighting module.
13. Remove bolts (B) and remove the transport lighting module, complete with support bracket (C).
14. Discard P-clip (D) and tag (E).

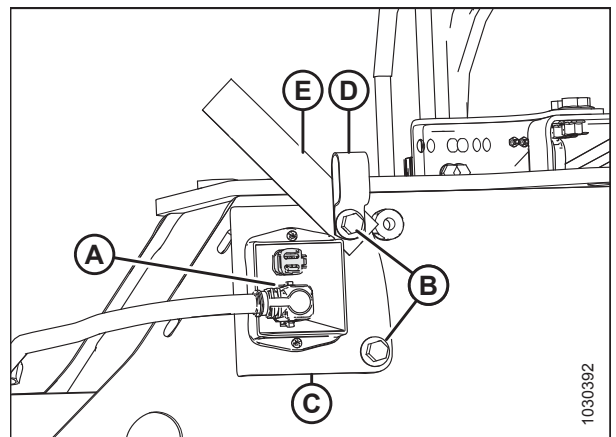


Figure 3.69: Lighting Module Harness

15. Remove two screws (A) and nuts attaching module (B) to bracket (C). Retain module (B). Discard the two screws (A) and nuts.

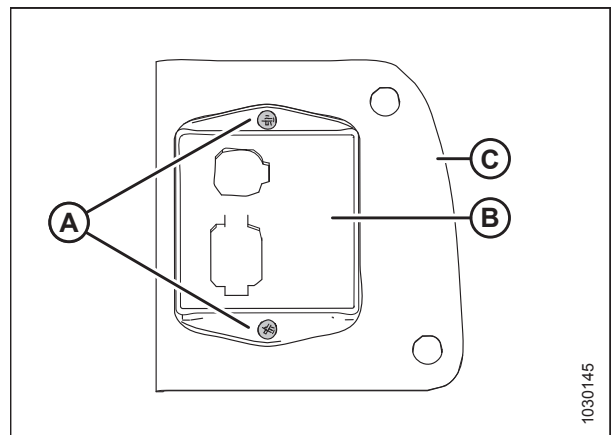


Figure 3.70: Lighting Module Attached to Bracket

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

16. Attach module (A) to cover assembly bracket (B) using two M4 x 16 screws (C) and M4 nuts supplied with the kit. Torque hardware to 3 Nm (27 lbf·in).

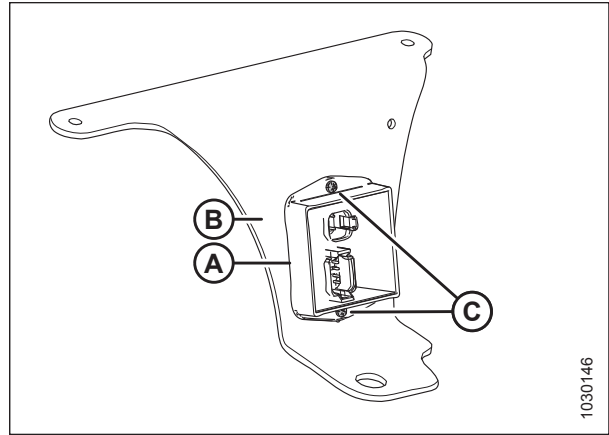


Figure 3.71: Lighting Module Attached to Bracket

17. Install cover support (B).
18. Secure cover support (B) in place with one M20 x 65 bolt (A), hardened washer, and nut.

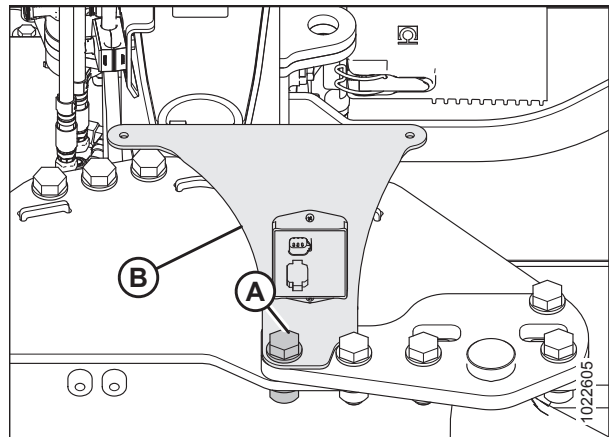


Figure 3.72: Cover Support

19. Torque bolts (A) to 461 Nm (340 lbf·ft).
20. Remove and retain bolts (B).

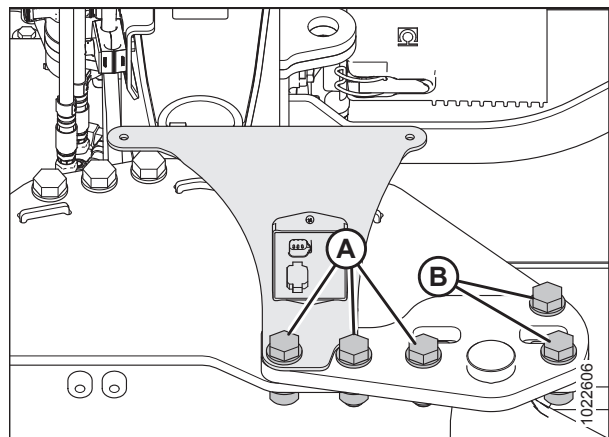


Figure 3.73: Cover Support

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

Installing Transport Valve

NOTE:

Cover support bracket removed from illustrations for clarity.

1. Retrieve valve assembly (A) from the pallet.
2. Position valve assembly (A) on the carrier hitch pin plate as shown.
3. Install two M20 x 65 bolts (B), hardened washers, and nuts.
4. Retrieve two M10 x 20 bolts from the shipping bag and install bolts at location (C) with threads facing up. Install nuts, but do **NOT** tighten.
5. Torque bolts (B) to 461 Nm (340 lbf-ft).

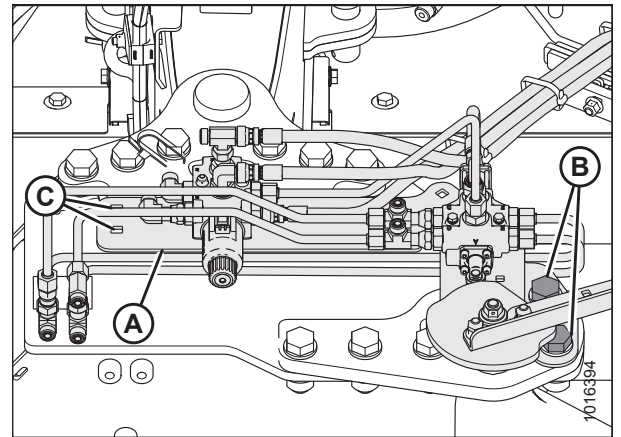


Figure 3.74: Selector Valve

6. Install support plate (A) and secure it with bolts (B).
7. Install bolts (C), but do **NOT** tighten.

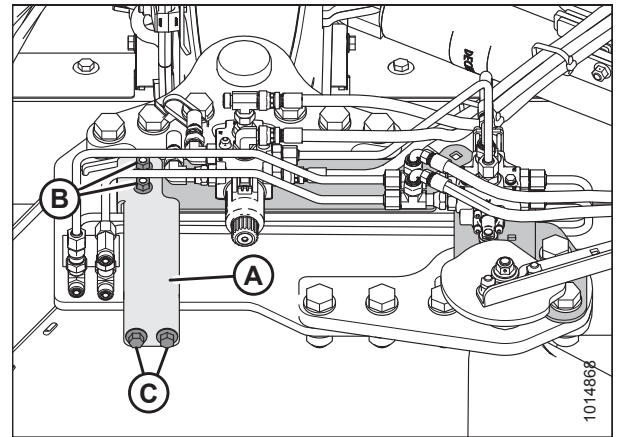


Figure 3.75: Support Plate

8. Remove nut (A) from support (D).
9. Install bolt (B) through support (D) and support (C), and then reinstall nut (A).

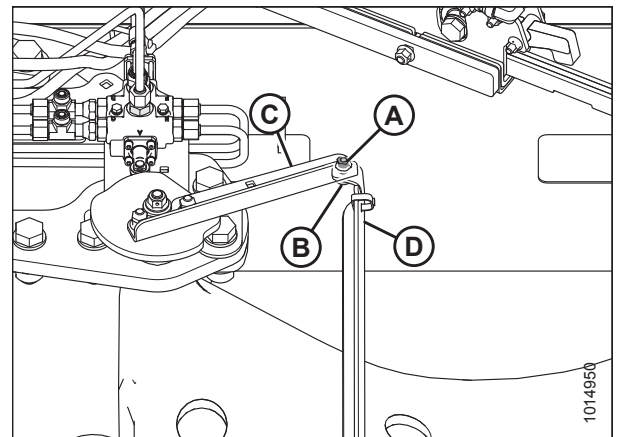


Figure 3.76: Support Plate

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

Installing Transport Swing Cylinder

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

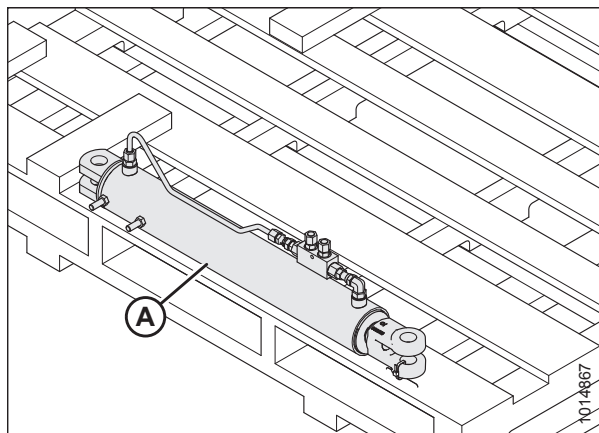


Figure 3.77: Transport Swing Cylinder

IMPORTANT:

Prime transport swing cylinder (A) **BEFORE** installing it on the carrier frame.

4. To prime the cylinder, use a hydraulic power pack or tractor hydraulics. Extend and retract transport swing cylinder (A) until all the air has been removed. Extend transport cylinder (A) to dimension (B) of 142 cm (56 in.) between center of pins.

NOTE:

If you need to adjust the cylinder length, remove bolt (C) that secures the clevis end. Rotate the clevis to lengthen or shorten distance between pins (B). When the cylinder length is correct, reinstall bolt (C) to secure the clevis end.

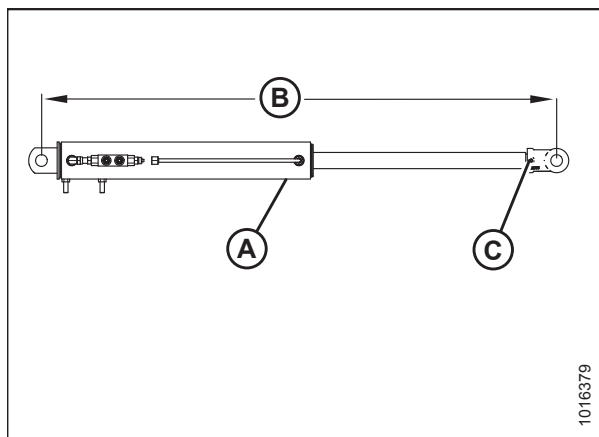


Figure 3.78: Transport Swing Cylinder

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

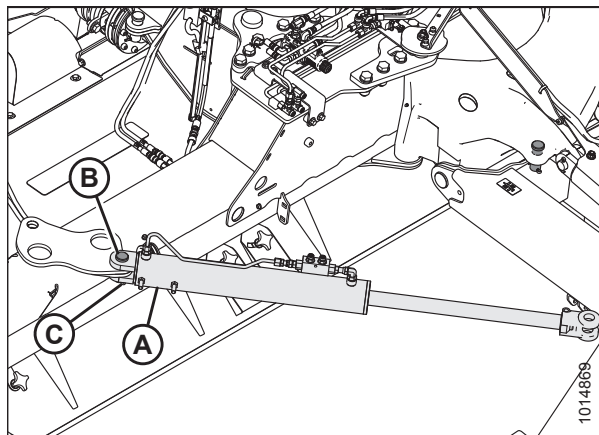


Figure 3.79: Transport Swing Cylinder

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

6. Connect rod end (B) of transport swing cylinder (A) to transport casting. Align holes and install clevis pin (C). Secure with cotter pin (D).

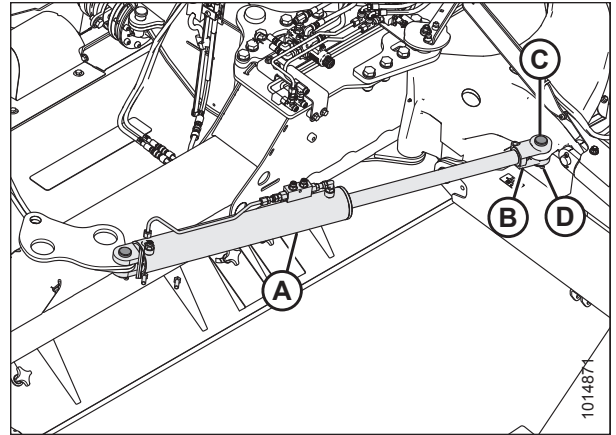


Figure 3.80: Swing Cylinder – Rear Left View

Installing Transport Wheels

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

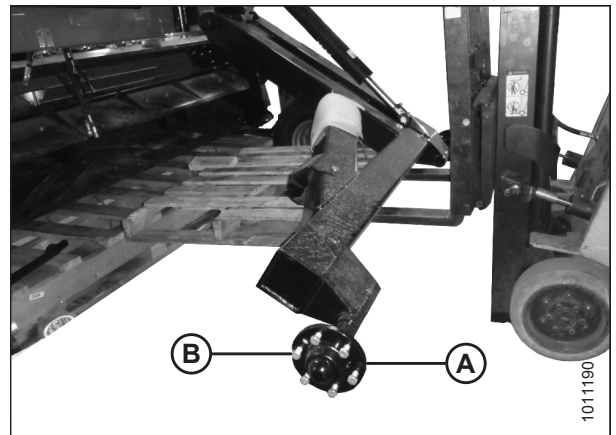


Figure 3.81: Transport Wheel

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.

4. Retrieve the transport wheels and install with the wheel bolts. Ensure the valve stem faces outboard. Do **NOT** fully tighten bolts.
5. Lower the wheels to the ground and back the forklift away.
6. Torque wheel bolts to 160 Nm (120 lbf-ft) following the tightening sequence shown.

IMPORTANT:

Whenever a wheel is installed, check torque after 1 hour of operation.

7. Check tire pressure and adjust as required. For instructions, refer to [8.2 Checking Tire Pressure, page 138](#).

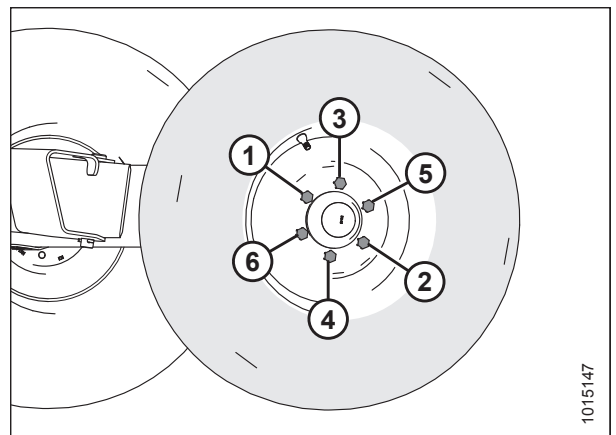


Figure 3.82: Tightening Sequence

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

Installing Transport Alignment Control

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

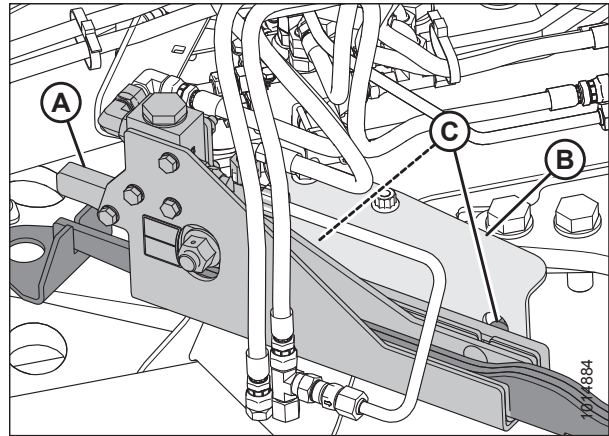


Figure 3.83: Alignment Controls – Front Right View

3. Secure cam assembly (A) onto hitch swing cylinder plate (B) with bolts and nuts (C). Torque nuts (C) to 58 Nm (43 lbf-ft).

NOTE:

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

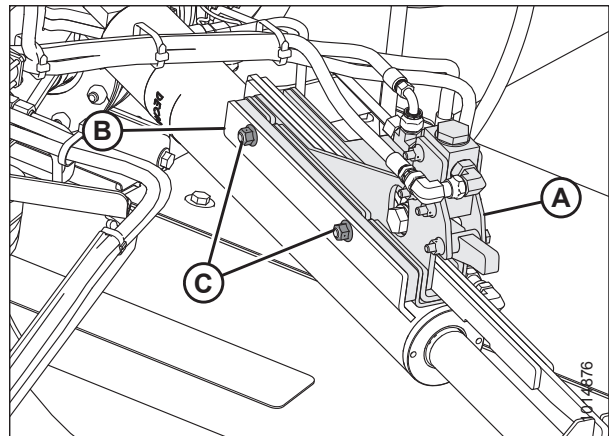


Figure 3.84: Alignment Control – Rear Right View

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

NOTE:

If the cam arm does **NOT** slide easily, loosen valve mounting bolts (C) and position valve (B) at the top of the mounting holes. Retighten valve mounting bolts (C).

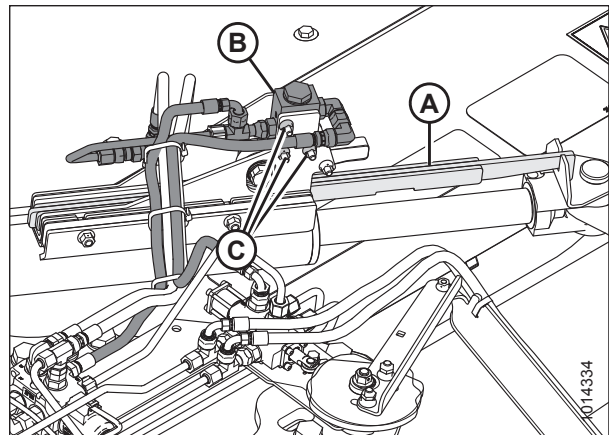


Figure 3.85: Alignment Control – Rear Right View

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

5. Align hole in cam arm (A) with hole in clevis (B) on the rod end of the cylinder.

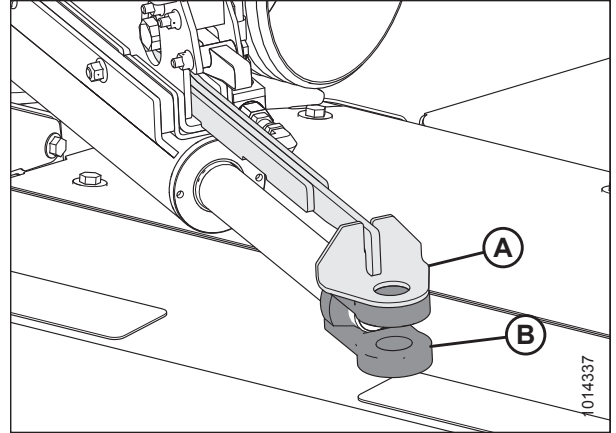


Figure 3.86: Alignment Control – Rear Right View

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

NOTE:

The rod end of the cylinder will be attached to the transport casting after the system is primed. For instructions, refer to [6.2 Priming the Hitch Swing Cylinder, page 111](#).

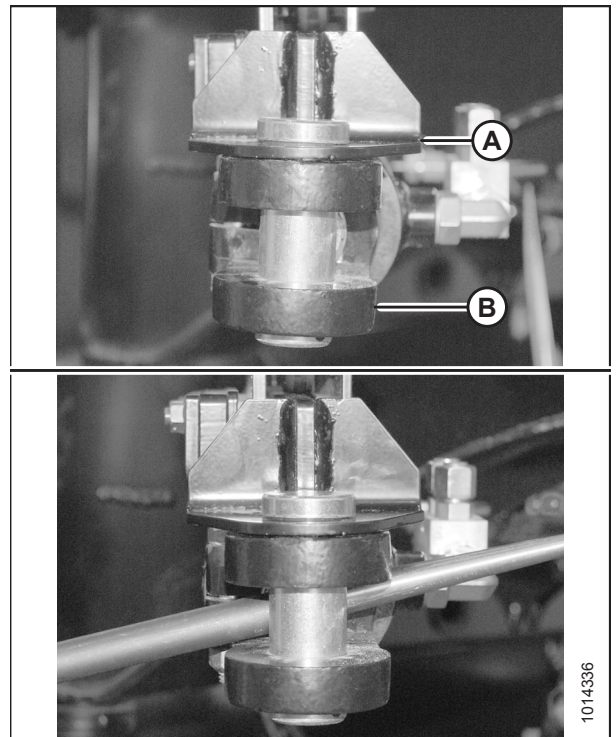


Figure 3.87: Cam Arm Alignment

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

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

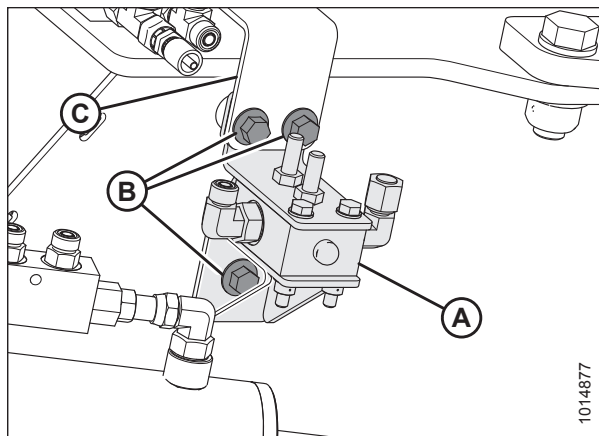


Figure 3.88: Control Valve

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

NOTE:

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

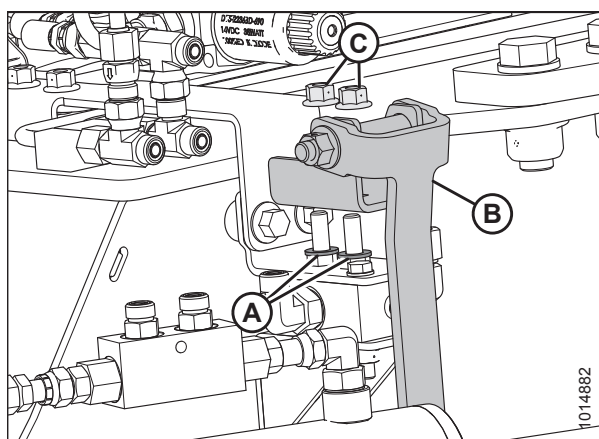


Figure 3.89: Control Valve

Installing Hydraulics

This section explains how to install the transport hydraulic control system.

Installing Hydraulic Lines and Hoses

Hydraulic hoses and lines distribute hydraulic fluid to the various components on the pull-type.

NOTE:

The cover support bracket has been removed from the illustrations for clarity.

NOTE:

Refer to [10.4 Torque Specifications, page 184](#) for torque details.

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

1. Retrieve steel lines and hoses from shipping bag.
2. Place a container or rag under the fitting on the hitch swing cylinder to catch oil.
3. Remove existing fitting (A) from the block.
4. Remove cap (B) from tee fitting.

IMPORTANT:

Ensure O-ring is in place.

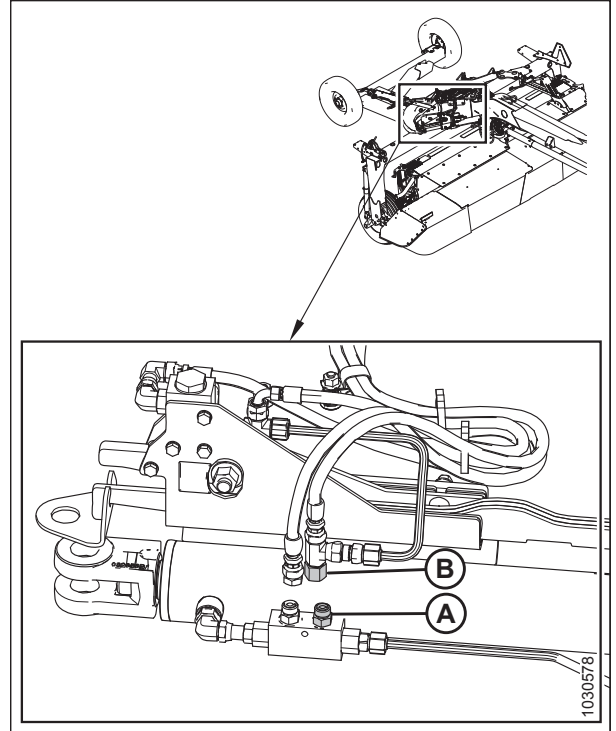


Figure 3.90: Alignment Valve Fitting

5. Retrieve ORFS-6 x ORB-6 connector (B) from the shipping bag and install at location (A).

NOTE:

Ensure that the direction arrow on check valve (D) points away from tee fitting (C).

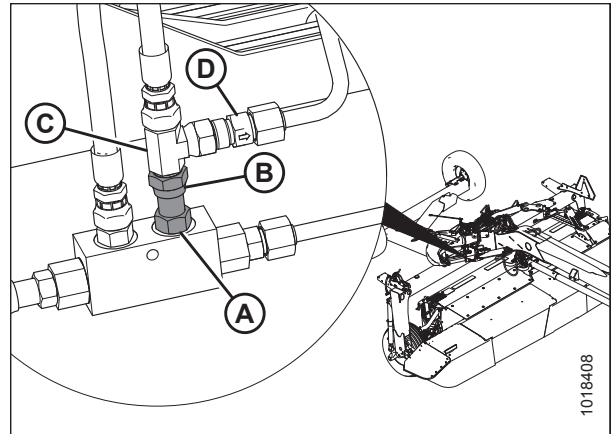


Figure 3.91: Alignment Valve Fitting

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

6. Remove the cap from fitting (A).
7. Remove the plug from hose (B). Install hose to fitting (A) as shown.

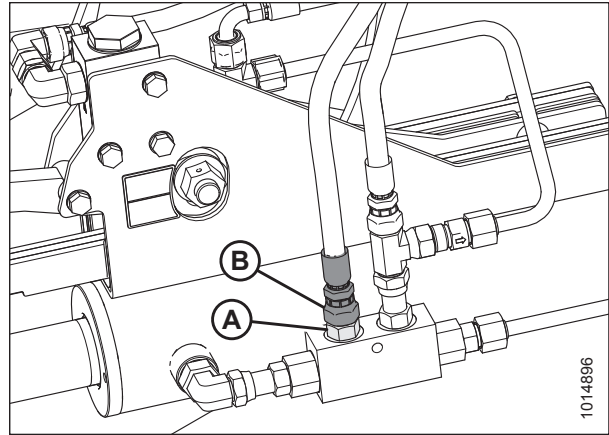


Figure 3.92: Alignment Valve Fitting

8. Install steel line (A) from port A on the completion assembly to tee fitting (D).
9. Install steel line (B) from port B on the completion assembly to tee fitting (C).

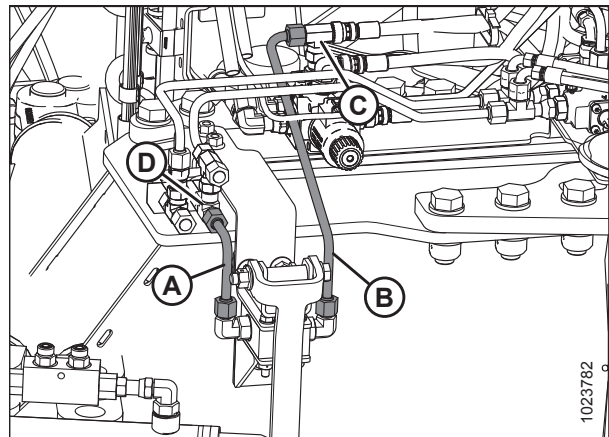


Figure 3.93: Completion Assembly Plumbing

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

NOTE:

Ensure that direction arrow on check valve (C) points toward tee fitting.

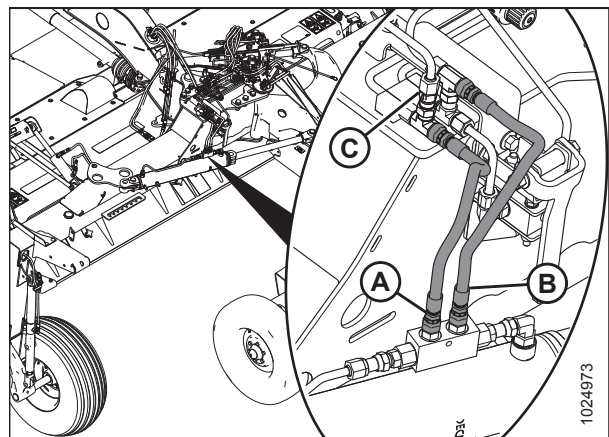


Figure 3.94: Transport Swing Cylinder

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

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

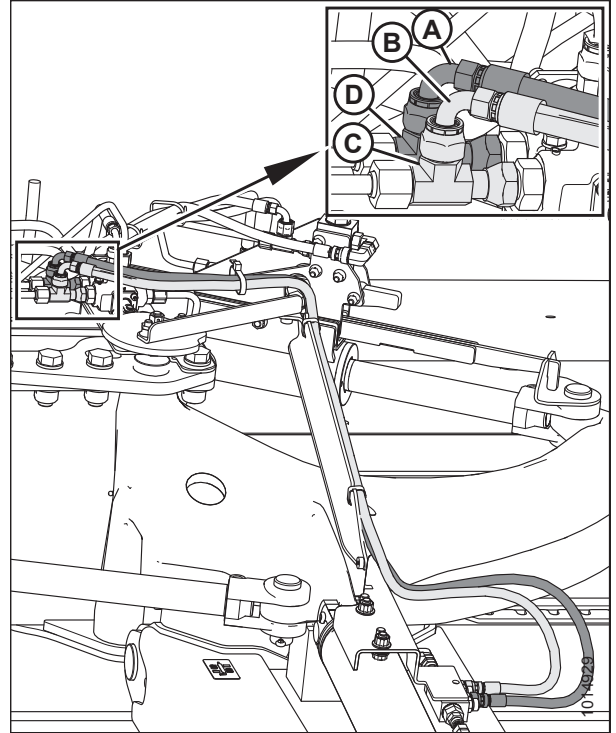


Figure 3.95: Transport Swing Control

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

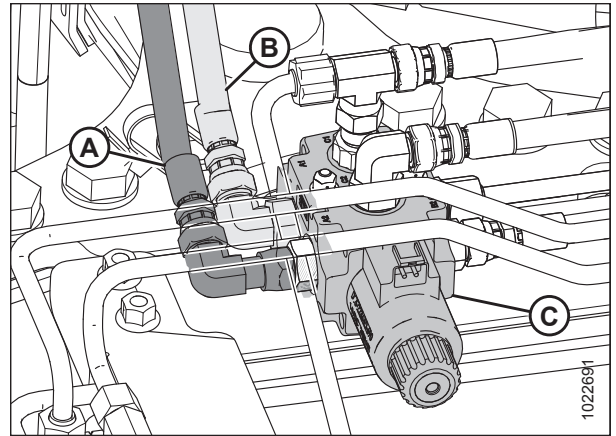


Figure 3.96: Selector Valve Supply

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-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 rotary disc pull-type is in transport mode.

Retrieve the following secondary lift hose from the shipping bag:

- **R113 PT:** Use hose MD #224160.
 - **R116 PT:** Use hose MD #224162.
18. Retrieve the blue collars with the number one (blue collar #1) on them from the shipping bag. Place one collar on each end of secondary lift hose (B).
 19. Undo adjustable strap (A) around hoses at the aft end of the hitch.
 20. Locate the green wire preinstalled in the hitch for pulling hoses through the hitch.

NOTE:

If you are installing a hydraulic center-link, pull the hydraulic hoses through the hitch at the same time as the lift hose.

21. At the rear of the hitch, feed the male ORB end of hose (B) into access hole (C). Route the hose through the hitch to the opening at front.
22. Position long hose (A) so that the exposed length at the front of the hitch matches existing hose (B). Route the hose through guide (C).
23. At the front of the hitch, loosen nut (D) on hose clamp (E) until hose (A) can be positioned in the clamp.
24. Tighten nut (D).

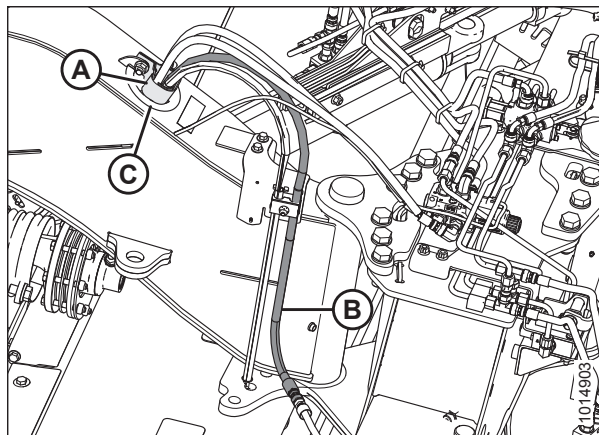


Figure 3.97: Lift Hoses

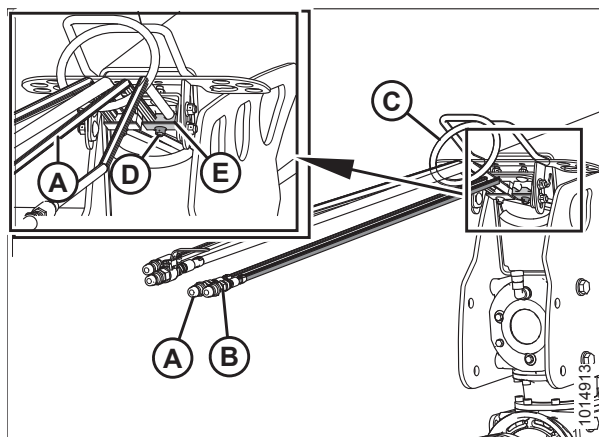


Figure 3.98: Lift Hoses

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

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

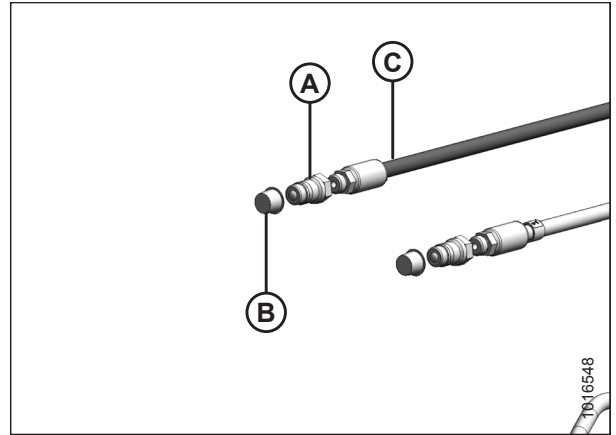


Figure 3.99: Lift Hose Fittings

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

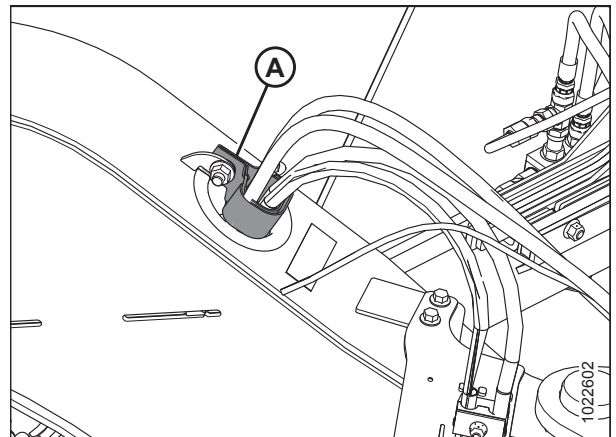


Figure 3.100: Lift Hoses

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

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

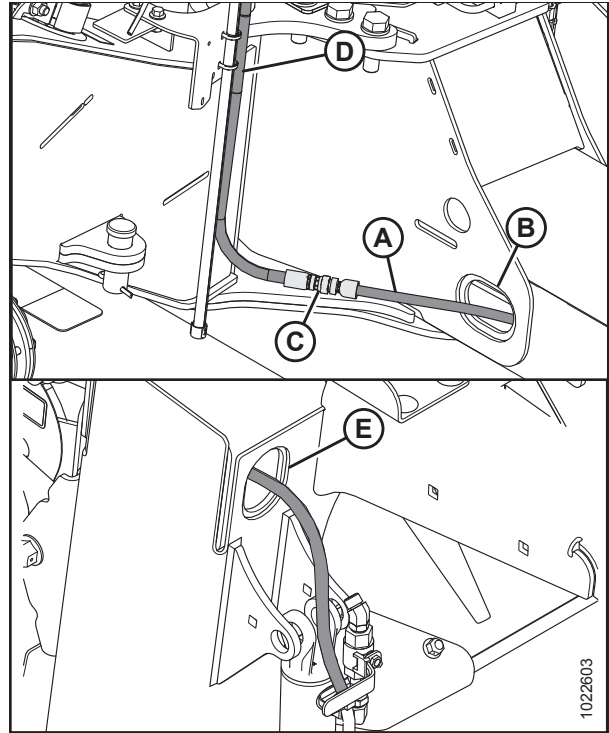


Figure 3.101: Lift Hose

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

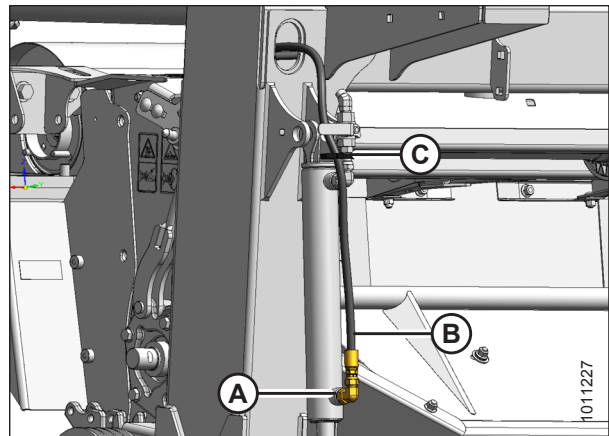


Figure 3.102: Lift Cylinder

Installing Electrical Components

Wiring harnesses, lighting assemblies, the selector valve and lighting module, and the remote control are components on the electrical system.

Installing Light Assemblies

Light assemblies provide position, hazard, turning direction, and braking information.

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

NOTE:

The right light assembly was removed earlier.

3. Remove lamps (B). Retain lamps and hardware for installation.

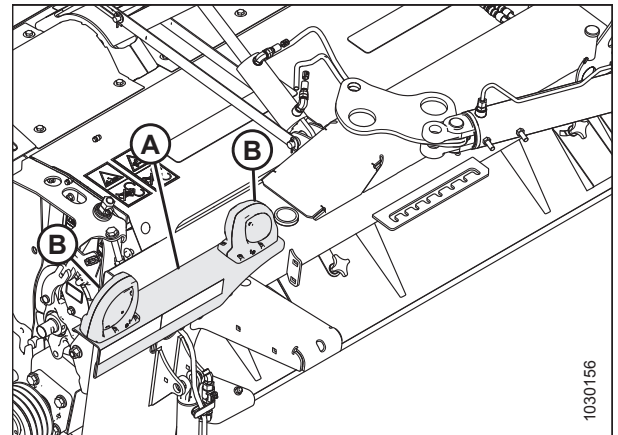


Figure 3.103: Transport Lighting

4. Remove red lamp (C) from the right light assembly (removed in an earlier procedure). Align red lamp (C) with the predrilled holes in the right lamp bracket, next to amber lamp. Secure the red lamp with existing hardware, as shown.
5. Install right light assembly (A) on the left float spring mount using two nuts (B) and two bolts from the shipping bag.

NOTE:

Red lamp (C) should be towards rear of machine when in transport mode.

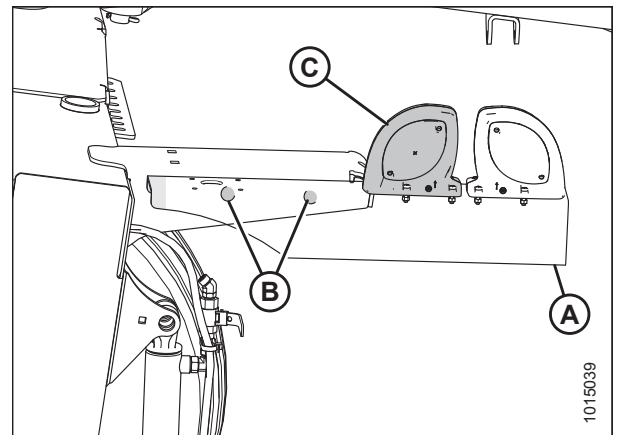


Figure 3.104: Left Side of Carrier

6. Retrieve new light bracket (C) from shipment.
7. Install amber lamp (A) and red lamp (B) onto new bracket (C), previously removed from the left lamp bracket, with hardware provided.

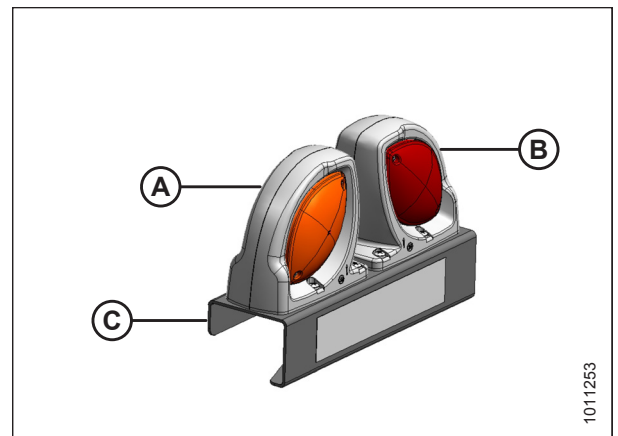


Figure 3.105: Light Assembly

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

8. Install light assembly (A) onto the header left end with two M10 x 20 carriage bolts (B) and lock nuts from the shipping bag.

NOTE:

Ensure the amber lamp faces the front of header and reflector faces outboard.

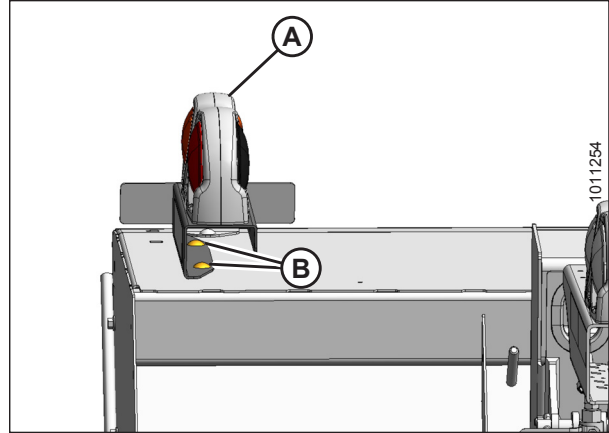


Figure 3.106: Header Lighting – Left Side

Installing Left Transport Harness

1. Retrieve transport harness (A) from the shipping bag.
2. Route connectors P201 and P202 on the end of harness (A) to cover support (D).
3. Using a draw tape or equivalent, route connectors P401 and P404 on the other end of harness (A) through opening (B) at front of carrier to opening (C) adjacent to center-link.
4. Route the harness until the plugs reach left light assembly (E) on the header.

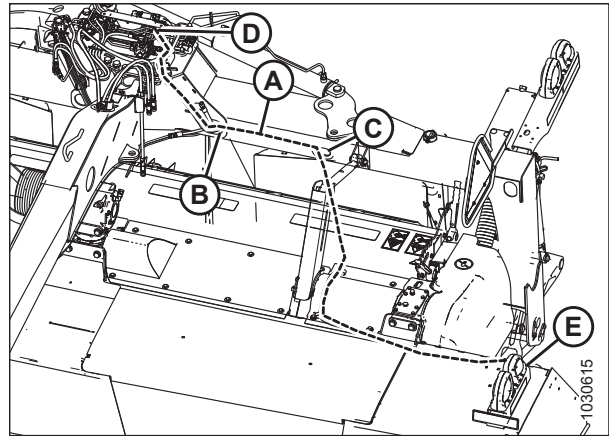


Figure 3.107: Harness Routing

5. Connect plug P301 (A) from harness (B) to receptacle P202 (C) on harness (D) (supplied with kit).

NOTE:

Plug P301 (A) was disconnected from the lighting module.

6. Connect plug P201 (E) on harness (D) (supplied with kit) into the lower output receptacle on the lighting module.

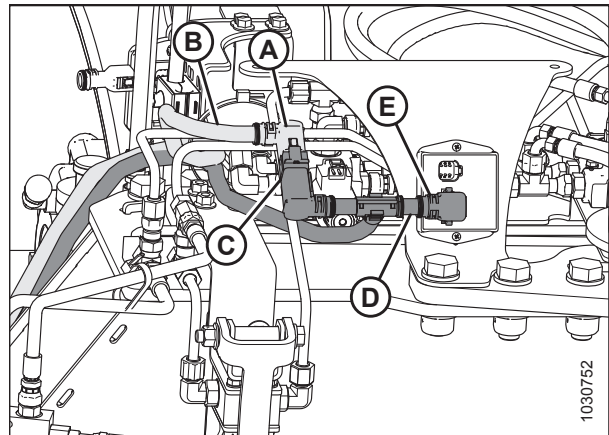


Figure 3.108: Harness Connection

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

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

NOTE:

R113 PT: Harness for rotary disc pull-type is secured with one plastic clamp (D).

NOTE:

R116 PT: Harness for rotary disc pull-type is secured with two plastic clamps.

11. Secure harness (A) to the light bracket with two cable ties (E).
12. Push any excess harness into the carrier frame.
13. Connect plug P401 and P404 into light (B).

Connecting Right Transport Harness

1. Route transport harness (A) from opening (B) into light bracket (C) and plug it into the light connectors.
2. Secure harness (A) to the light bracket with two cable ties (D).
3. Push any excess harness into the carrier frame.

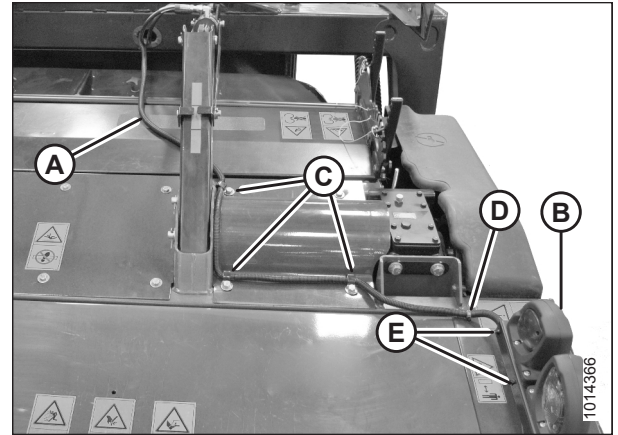


Figure 3.109: Harness Routing – R113 PT Shown, R116 PT Similar

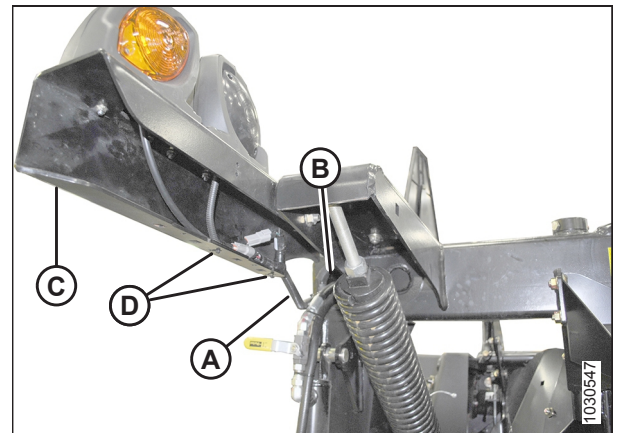


Figure 3.110: Transport Light

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

Connecting Selector Valve and Transport Lighting Module

The electronically controlled selector valve manages the hydraulics for the transport system; the lighting module is the hub for signal and hazard lighting.

1. Remove valve connector plug (A) and module connector plug (B).

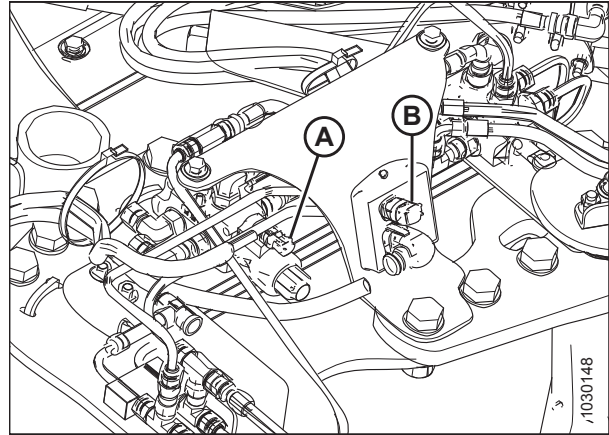


Figure 3.111: Connector Plugs

2. Locate plugs P102 (A) and P502 (B) on the transport harness at the header end of the hitch. Route plugs P102 (A) and P502 (B) towards selector valve (C).
3. Connect plug P502 (B) to the receptacle on selector valve (C).
4. Connect plug P102 (A) to the upper input receptacle on transport lighting module (D).

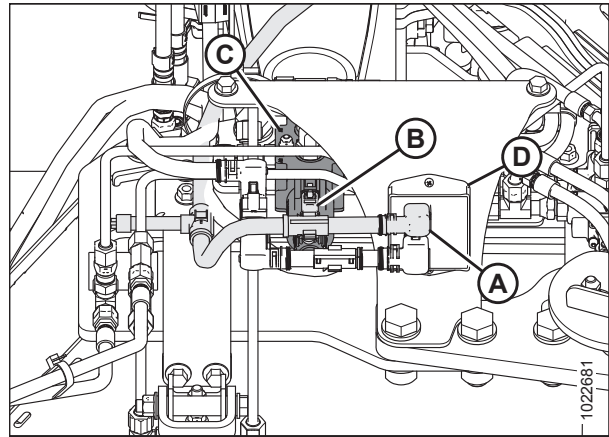


Figure 3.112: Selector Valve Supply

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

Installing Remote Control

The remote control allows the operator to convert the pull-type from field to road mode from the within the tractor cab.

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

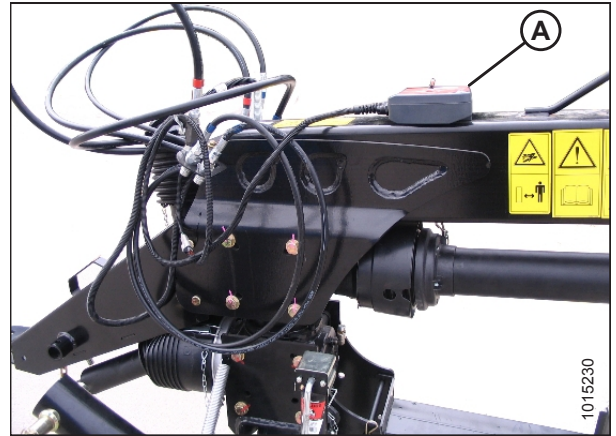


Figure 3.113: Remote Control on Top of Hitch

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

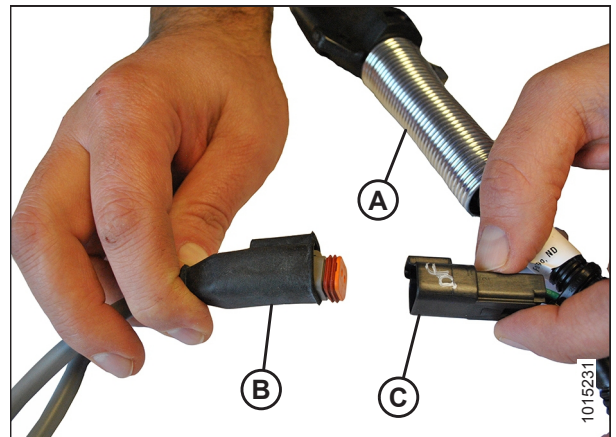


Figure 3.114: Transport Harness

4. *If your tractor has a three-pin auxiliary power connection:*

NOTE:

The remote control has internal protection which prevents damage caused by incorrect wiring, short circuits, or overload conditions.

Connect two wires (B) from three-pin auxiliary connector (A) to remote control wires (C) on the remote control, wrap connections with electrical tape, and proceed to Step 6, page 57.

- The wire with no tag connects to the tractor ground.
- The wire with the red tag connects to the tractor power.

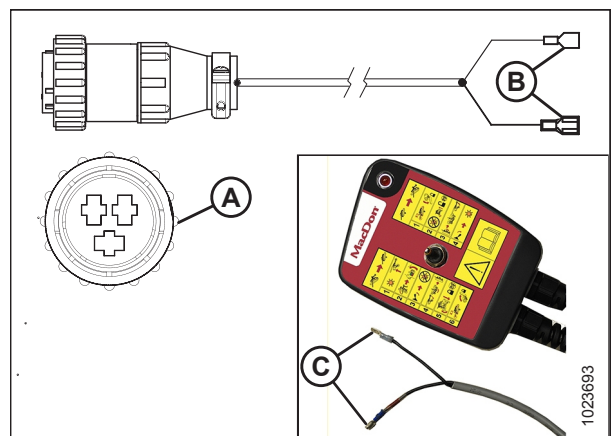


Figure 3.115: Three-Pin Auxiliary Connector

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

NOTE:

If connections are reversed, the lamp will not illuminate when the toggle switch is in field mode. Try the following to correct the issue:

- Check if 10 amp fuse (A) located inside the transport control box has blown.
- Check for short in wires to solenoid valve on header.
- Check for incorrect wire connections (reversed) at the power supply or solenoid valve.

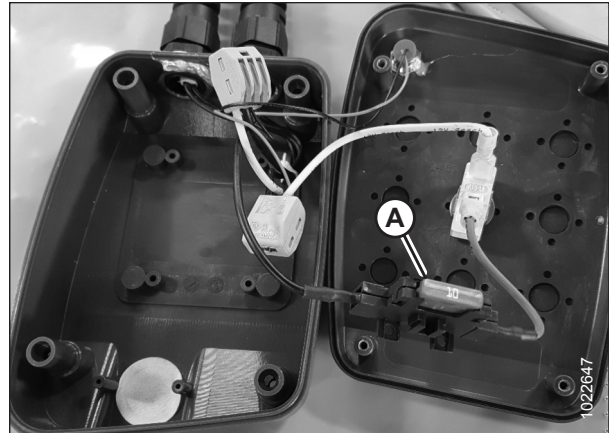


Figure 3.116: Control Box Interior

5. **If your tractor does NOT have a three-pin auxiliary power connection:**

NOTE:

The remote control has internal protection which prevents damage caused by incorrect wiring, short circuits, or overload conditions.

Connect remote control wires (A) to the tractor's power supply as follows:

- Connect wire (B) with no tag to tractor ground.
- Connect wire (C) with the red tag to tractor power.

NOTE:

If the red tag is missing, identify the power by locating the wire with the number 1 printed on it. The ground wire has a number 2 printed on it.

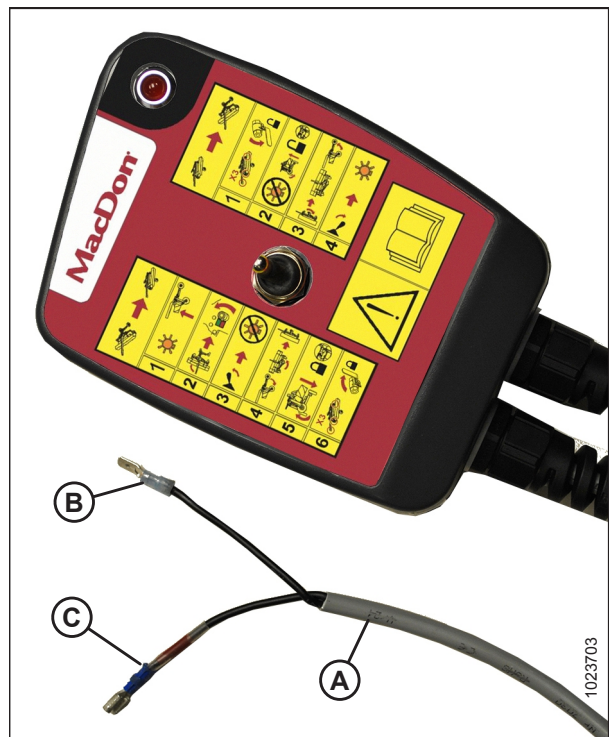


Figure 3.117: Remote Control

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

NOTE:

If connections are reversed, the lamp will not illuminate when the toggle switch is in field mode. Try the following to correct the issue:

- Check if 10 amp fuse (A) located inside the transport control box has blown.
- Check for short in wires to solenoid valve on header.
- Check for incorrect wire connections (reversed) at the power supply or solenoid valve.

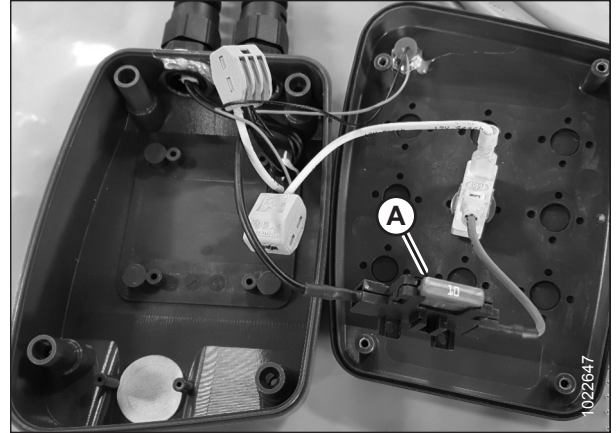


Figure 3.118: Control Box Interior

6. Place the remote control inside the tractor cab.

Installing Slow Moving Vehicle Sign

The slow moving vehicle (SMV) sign warns road users that your vehicle is moving 40 km/h (25 mph) or less.

1. Retrieve the slow moving vehicle (SMV) sign that was previously removed.
2. Remove bolts (A), and discard existing bracket (B). Retain the two bolts, nuts, and washers.

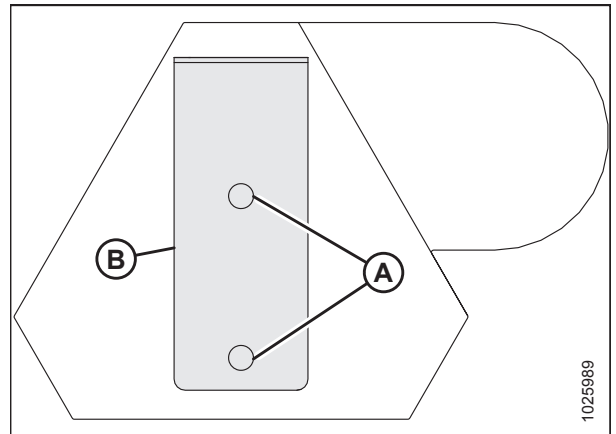


Figure 3.119: SMV Sign

ASSEMBLING THE ROTARY DISC PULL-TYPE – WITH OR WITHOUT THE DEALER-INSTALLED TRANSPORT

3. Retrieve bracket (A).
4. Attach bracket (A) to left end float spring member with M12 bolts (B) and nuts retrieved from the shipping bag.
5. Attach sign (C) to bracket (A) and secure with two bolts (D), washers (E), and nuts (F).
6. Torque nuts (F) to 20 Nm (14.75 lbf-ft). Do **NOT** overtighten.

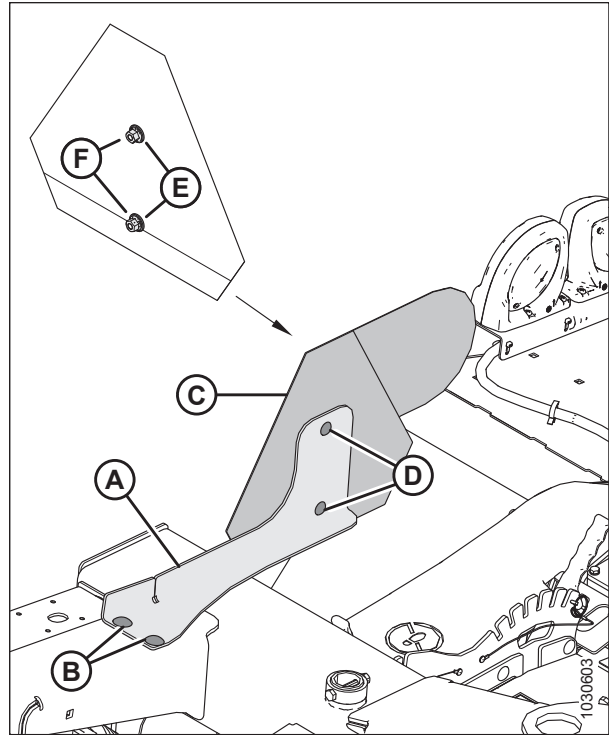


Figure 3.120: SMV Sign

7. Remove decal bag (B) taped to SMV bracket (A).
8. Choose appropriate speed decal (C) or (D) depending on region. Orient decal as shown when installing it on the SMV bracket.

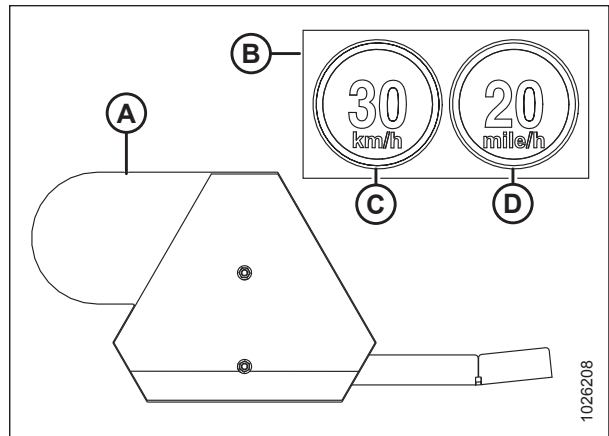


Figure 3.121: SMV Decals

Installing Cover

The transport cover protects the hydraulic valves and electrical components from debris.

1. Install cover (A) onto the cover support.
2. Install bolts (B). Torque bolts to 60 Nm (45 lbf·ft).

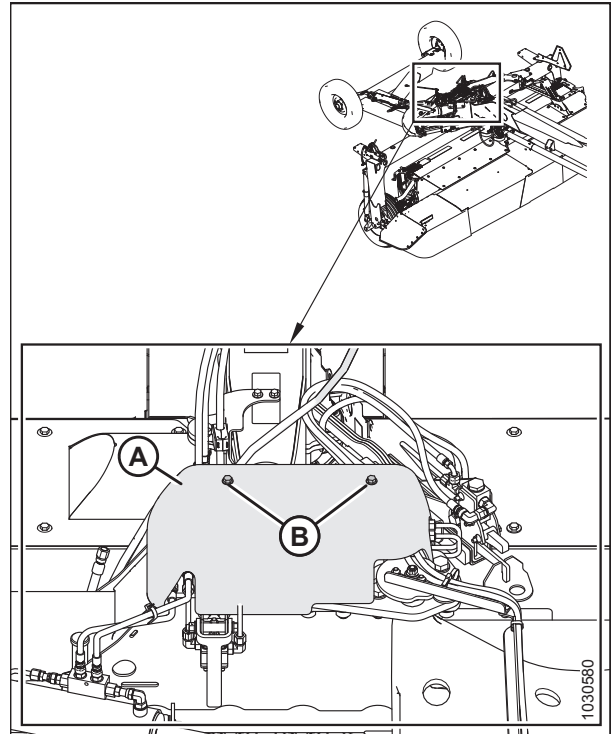


Figure 3.122: Cover

3.8.2 Installing Hydraulic Center-Link – Optional

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

3.8.3 Installing Tall Crop Divider – Optional

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

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:

If the rotary disc pull-type will be transported on public roads in the transport mode, do **NOT** install the tall crop dividers. Install the dividers after the machine is delivered to the customer.

Chapter 4: Assembling the Rotary Disc Pull-Type – Factory-Installed Transport

Perform the following procedures in order when assembling a rotary disc pull-type with a factory-installed transport.

4.1 Repositioning Center-Link Top Anchor

The center-link top anchor must be repositioned into working position.

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

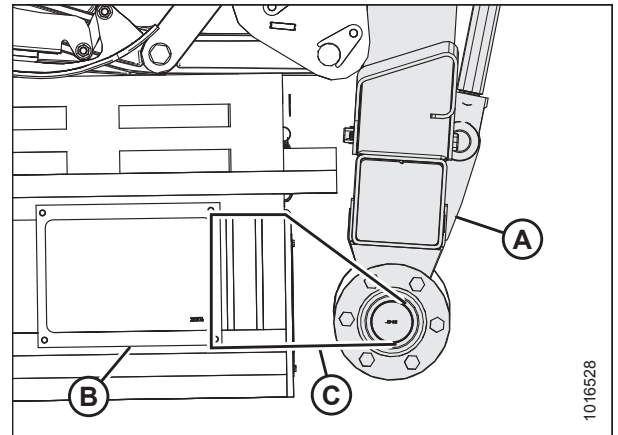


Figure 4.1: Transport Assembly

2. **For rotary disc pull-types with finger conditioners only:** Remove bolt (A) securing center shield (B) to the frame. Lower the shield.

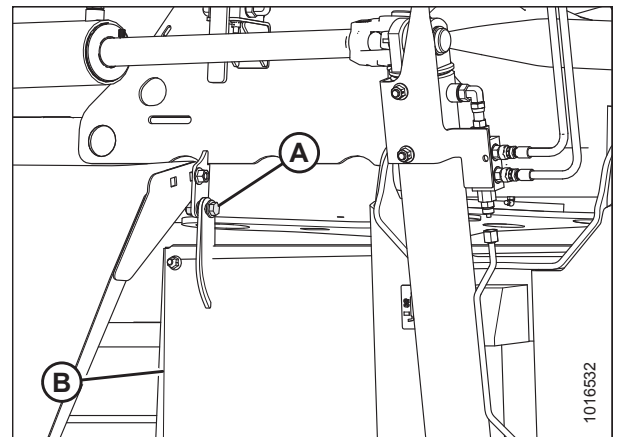


Figure 4.2: Center Shield – Finger Conditioners Only

ASSEMBLING THE ROTARY DISC PULL-TYPE – FACTORY-INSTALLED TRANSPORT

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

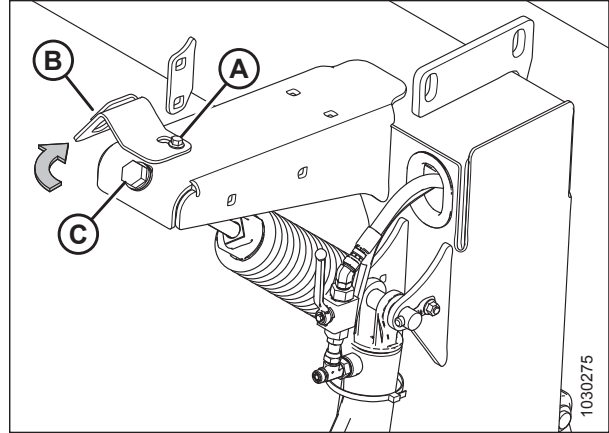


Figure 4.3: Float Spring – Right Side

- 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.

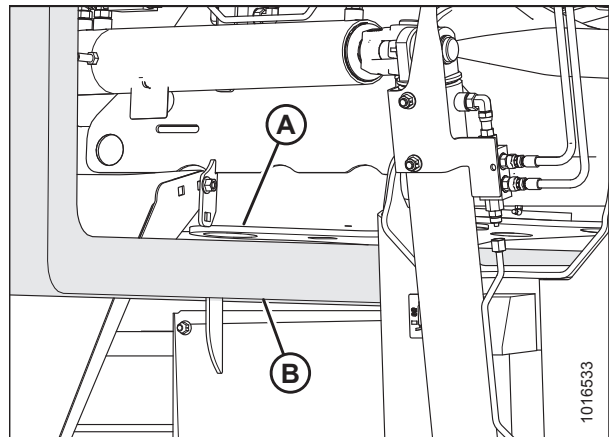


Figure 4.4: Carrier Frame

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

CAUTION

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

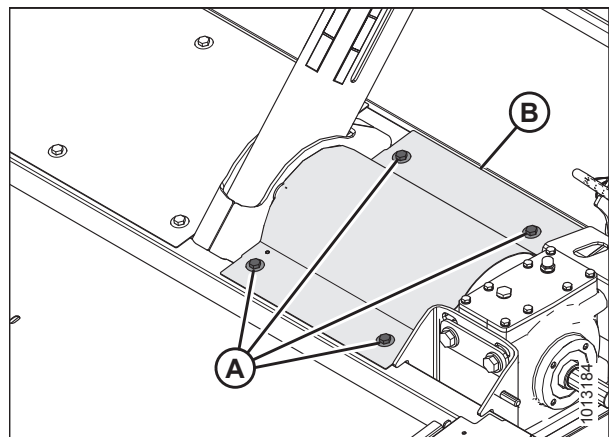


Figure 4.5: Top Shield – Left of Center-Link

ASSEMBLING THE ROTARY DISC PULL-TYPE – FACTORY-INSTALLED TRANSPORT

7. Remove cotter pin (B), washer (C), and shipping tag (D) from pin (A).

NOTE:

Pin (A) should slide out freely. Do **NOT** use a hammer to remove pin (A).

8. Adjust the center-link and/or forklift until pin (A) is loose.

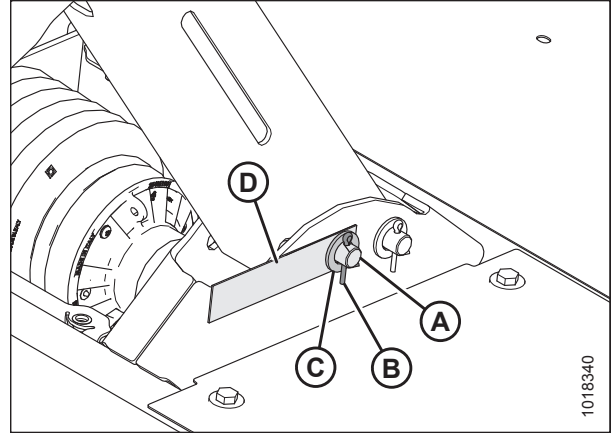


Figure 4.6: Center-Link Anchor – Right of Center-Link

9. Adjust the carrier frame so the pin can be installed in the working location. Install pin (A) and secure with washer (B) and cotter pin (C).

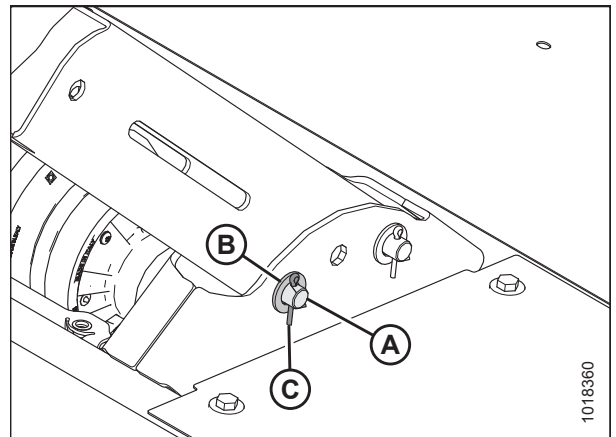


Figure 4.7: Center-Link Anchor – Right of Center-Link

10. Install top shield (B) and secure with four M10 hex head bolts (A) and flat washers. Torque hardware to 28.5 Nm (21 lbf-ft).

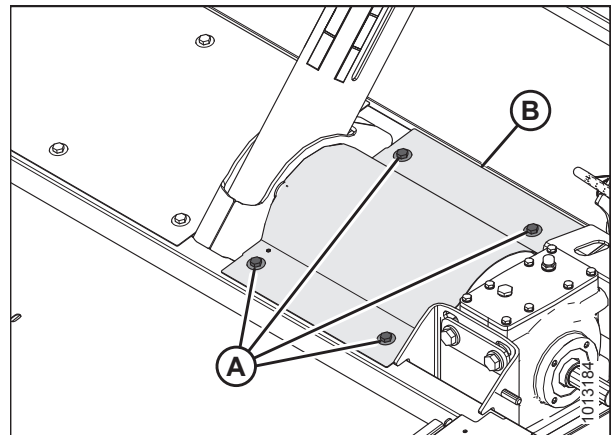


Figure 4.8: Top Shield – Left of Center-Link

ASSEMBLING THE ROTARY DISC PULL-TYPE – FACTORY-INSTALLED TRANSPORT

11. Close lock-out valve (A) on each rotary disc pull-type lift cylinder by turning the handle to the horizontal position. Repeat on opposite side.
12. Turn adjuster bolt (B) to set dimension (C) to 130 mm (5 1/8 in.). Repeat on opposite side.
 - Turn bolt clockwise (towards spring) to increase float
 - Turn bolt counterclockwise (away from spring) to decrease float

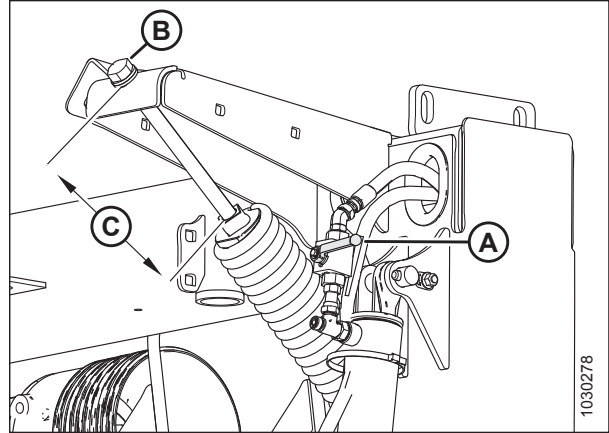


Figure 4.9: Lift Cylinder Lock-Out Valve and Adjuster Bolt

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

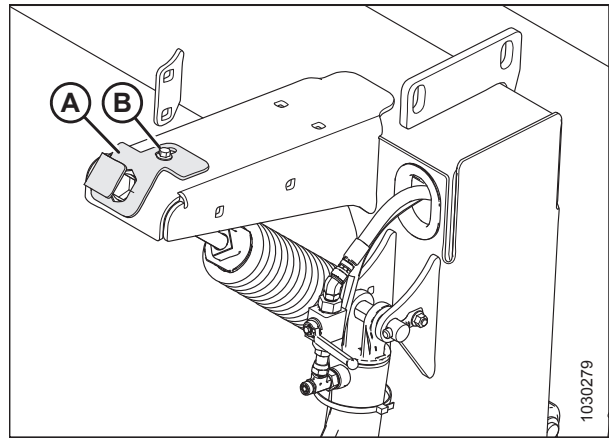


Figure 4.10: Adjuster Bolt Cover Plate

4.2 Attaching Hitch to Carrier

The connection point on the carrier frame secures the hitch to the frame and allows the pull-type to pivot.

1. Remove cam assembly (A) from shipping support (B) by loosening nuts (C) and sliding the cam assembly off of the shipping support.
2. Rest the cam assembly on the carrier hydraulics.

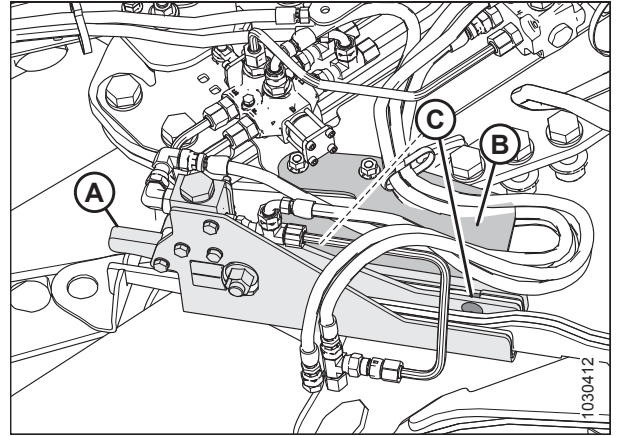


Figure 4.11: Alignment Controls – Front Right View

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

NOTE:

You may need to pry up the shipping support to remove the hardware.

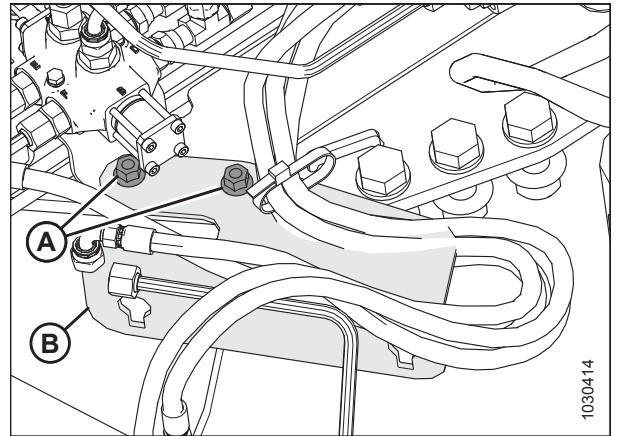


Figure 4.12: Shipping Support – Front Right View

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

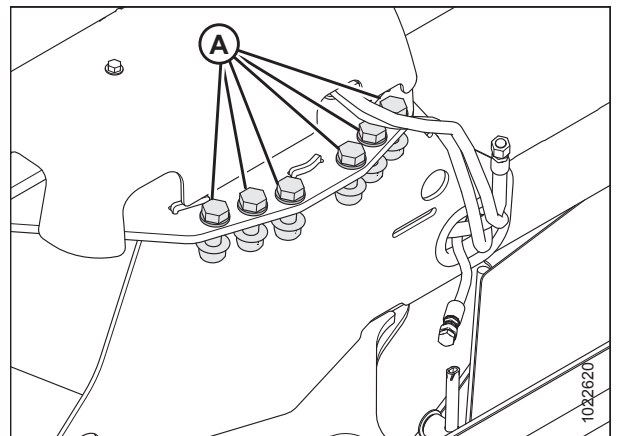


Figure 4.13: Carrier Frame

ASSEMBLING THE ROTARY DISC PULL-TYPE – FACTORY-INSTALLED TRANSPORT

5. Place sling (A) around the hitch frame. Adjust sling position until hitch is balanced when lifting.
 - **R113 PT:** Approximately 270 cm (106 in.) from the edge of the tractor end (B) of the hitch
 - **R116 PT:** Approximately 350 cm (138 in.) from the edge of the tractor end (B) of the hitch
6. Raise the hitch approximately 610 mm (24 in.) off the ground.

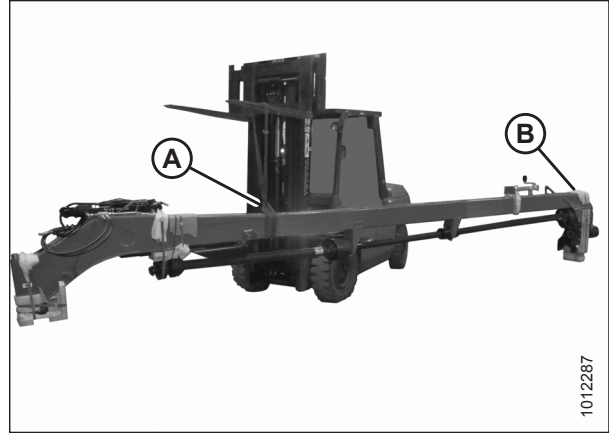


Figure 4.14: Lifting Hitch

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

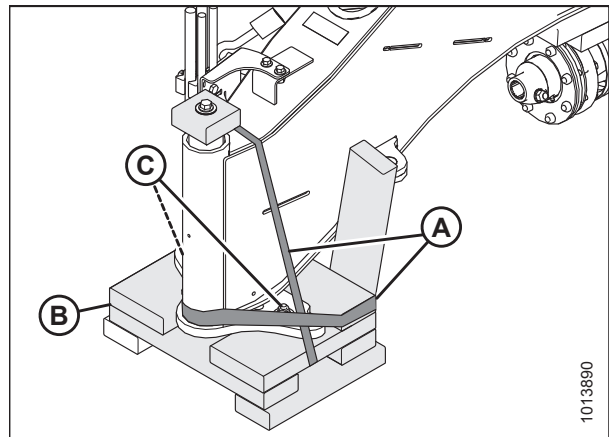


Figure 4.15: Hitch Packing

NOTE:

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

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

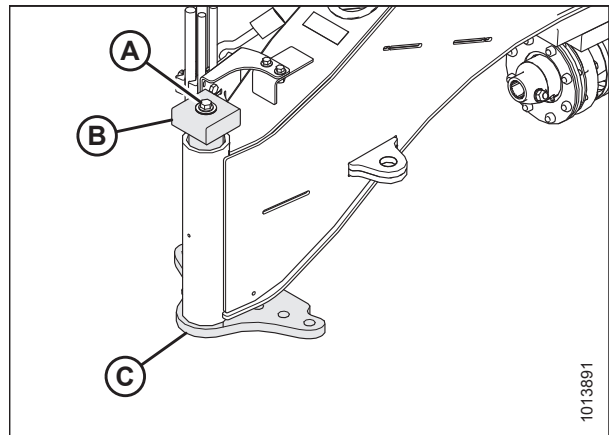


Figure 4.16: Hitch Packing

ASSEMBLING THE ROTARY DISC PULL-TYPE – FACTORY-INSTALLED TRANSPORT

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

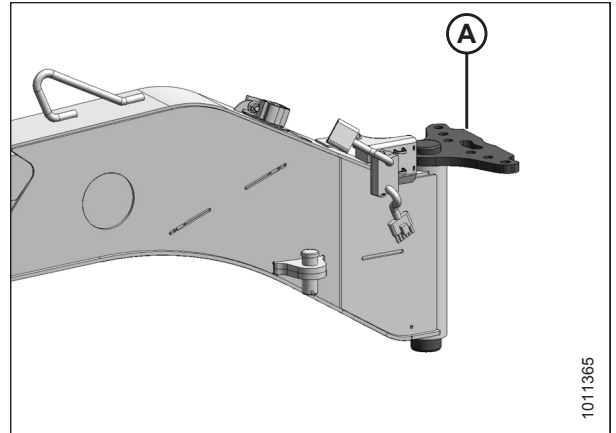


Figure 4.17: Pivot Pin

11. Pivot gearbox (A) towards the right side of the rotary disc pull-type. This will increase the clearance to the driveline clutch when installing hitch onto carrier frame.

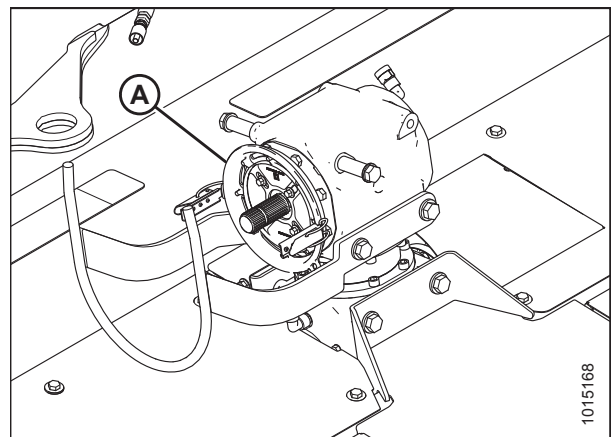


Figure 4.18: Driveline Shield

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 to prevent the driveline from contacting the header drive gearbox.

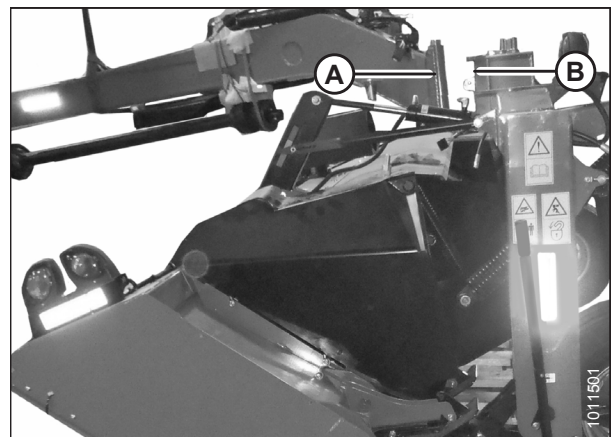


Figure 4.19: Hitch to Carrier

ASSEMBLING THE ROTARY DISC PULL-TYPE – FACTORY-INSTALLED TRANSPORT

13. Slowly lower hitch (A) while maintaining pin alignment until pin (B) is fully inserted. If necessary, use a large soft hammer to seat pin.

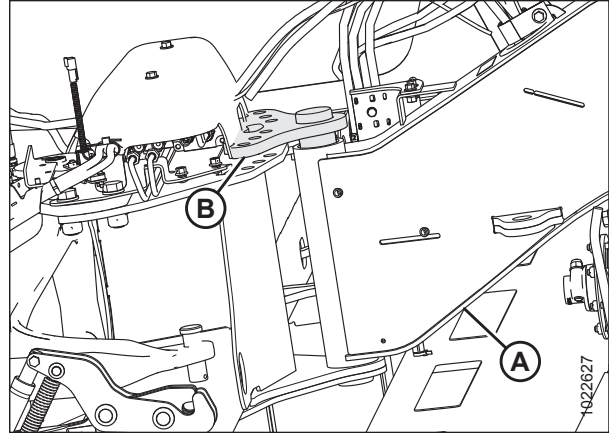


Figure 4.20: Pivot Pin

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 secure with lock nuts (C).
15. Tighten outer bolts (B) first to draw the plate against the frame, then tighten the inner bolts. Torque bolts to 461 Nm (340 lbf-ft).

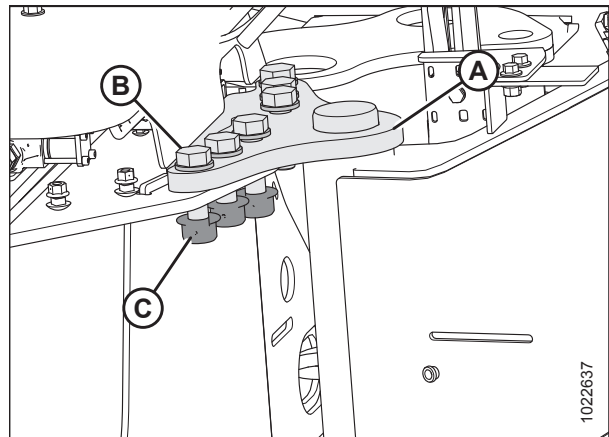


Figure 4.21: Pivot Pin

4.3 Installing Tractor Mating Hitch to Carrier Hitch

The tractor mating hitch connects the carrier hitch to the style of hitch on the tractor.

Depending on rotary disc pull-type configuration, refer to the applicable installation procedure:

- 4.3.1 *Installing Drawbar Hitch, page 69*
- 4.3.2 *Installing Two-Point Hitch (Cat. II) Adapter, page 74*

4.3.1 Installing Drawbar Hitch

The drawbar swivel hitch allows the pull-type to connect to a single point hitch connection and swing behind the tractor without sacrificing turning range.

1. Remove shipping wire or banding (A) securing shipping blocks (B) at front of hitch, and remove blocks.
2. Swivel lower gearbox until the input shaft is facing forward.

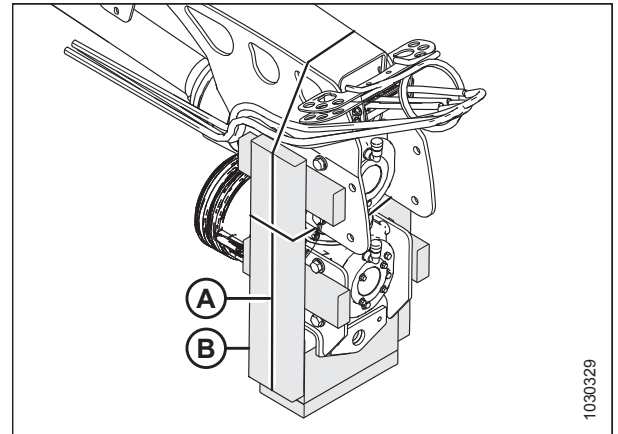


Figure 4.22: Hitch End Packing

3. Remove shipping wire (A) from jack (B), toolbox (C), and jack stand support (D).
4. Remove jack (B), toolbox (C), and jack stand support (D) from the pallet. Leave drawbar hitch (E) attached to the pallet.
5. Remove the hardware bag from the jack stand support.

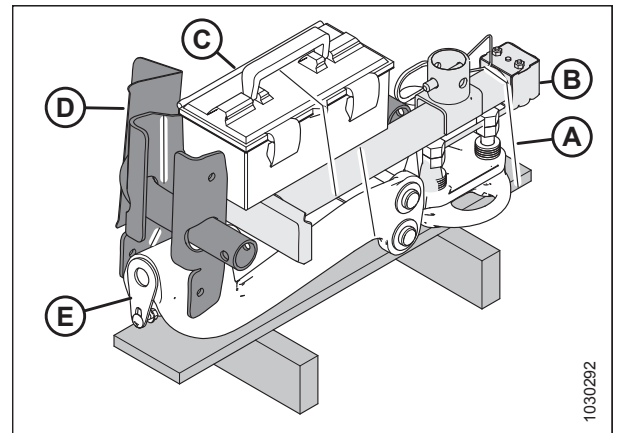


Figure 4.23: Jack and Drawbar Hitch Packing

ASSEMBLING THE ROTARY DISC PULL-TYPE – FACTORY-INSTALLED TRANSPORT

6. Install jack support stand (A) as shown. Secure with two M12 x 1.75 x 40 bolts (B), M12 washers, and M12 center lock nuts per side. Torque hardware to 69 Nm (51 lbf·ft).

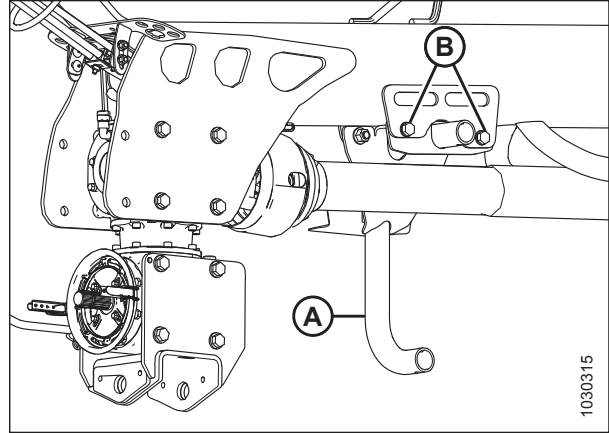


Figure 4.24: Jack Stand Support

7. Install jack (A) at front of hitch, and secure with pin (B).
8. Lower forklift until hitch is resting on jack (A).

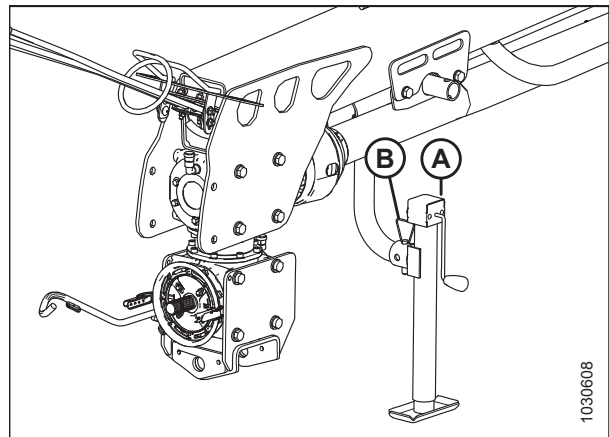


Figure 4.25: Jack Stand

9. Remove shipping wire (A) that secures pin (B) in casting. Do **NOT** remove other strapping.
10. Remove pin (B) from casting, and remove bolt (C) and nut from pin.

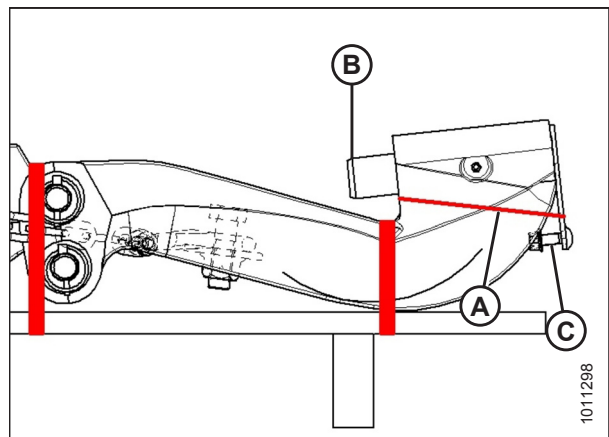


Figure 4.26: Hitch Casting

ASSEMBLING THE ROTARY DISC PULL-TYPE – FACTORY-INSTALLED TRANSPORT

11. Using a floor jack or equivalent under pallet (A), raise drawbar hitch (B) into position under the gearbox.
12. Move drawbar hitch (B) so pin (C) can be installed.
13. Secure pin with bolt (D) and nut.
14. Remove any remaining strapping from pallet (A). Lower pallet. Remove floor jack and pallet.

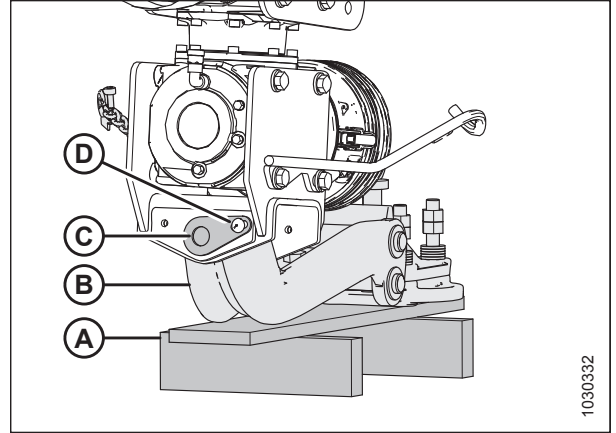


Figure 4.27: Drawbar Hitch

15. Remove cone shield (A).

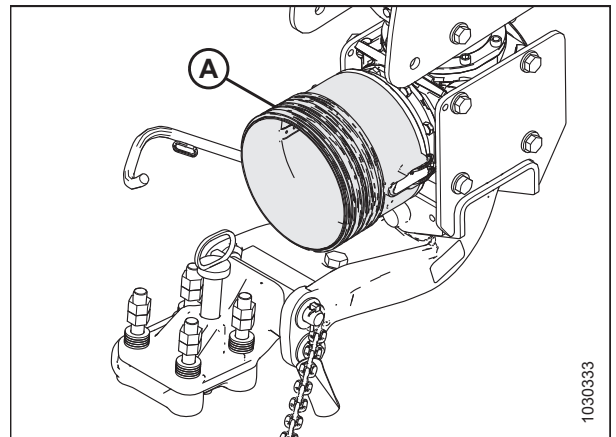


Figure 4.28: Cone Shield

16. Retrieve primary driveline (D) from the shipping location.
17. Remove nut (C), washer (B), and pin (A) from rotary disc pull-type end of primary driveline (D).

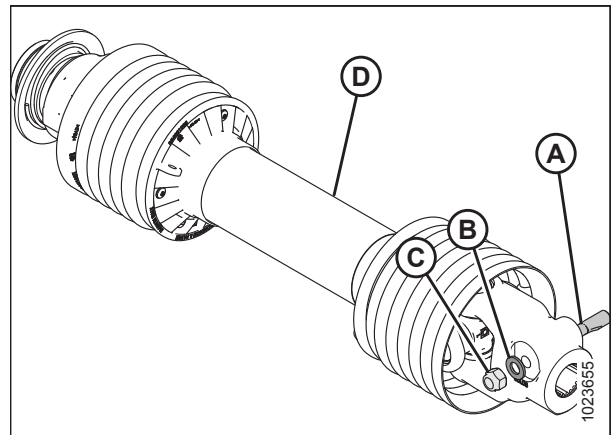


Figure 4.29: Primary Driveline

ASSEMBLING THE ROTARY DISC PULL-TYPE – FACTORY-INSTALLED TRANSPORT

- Slide primary driveline (A) onto the gearbox input shaft. Align pinhole (B) in the yoke with the groove on the input shaft.

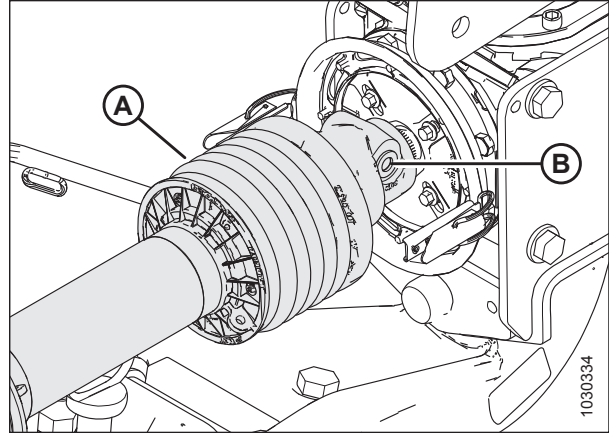


Figure 4.30: Primary Driveline

- 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 threads on pin (A) after inserting pin.
- Install washer (B) and nut (C) on the tapered pin and torque nut to 149 Nm (110 lbf-ft). The end of the pin must be recessed approximately 9–11 mm (0.35–0.43 in.) (D).

NOTE:

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

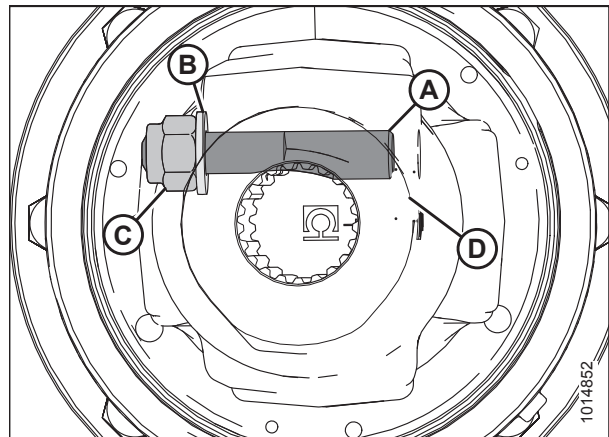


Figure 4.31: Primary Driveline

- Install cone shield (A) over primary driveline (B). Use the latches to secure it to the gearbox.
- Place primary driveline (B) on driveline support (C).

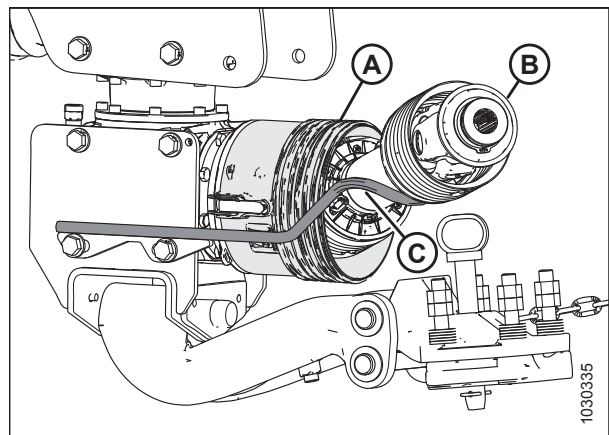


Figure 4.32: Cone Shield

ASSEMBLING THE ROTARY DISC PULL-TYPE – FACTORY-INSTALLED TRANSPORT

24. Place toolbox groove (A) onto jack stand bracket (B) as shown.

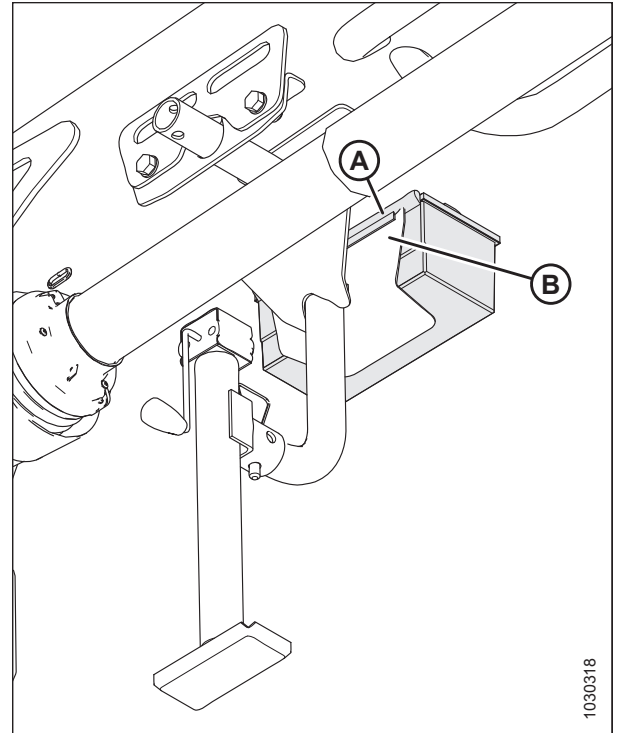


Figure 4.33: Toolbox Mounted on Jack Stand Bracket

25. Insert bracket tab (B) through the slot in the rear of toolbox (A).
26. Retrieve lynch pin (C) from the bag of hardware supplied with the jack. Secure toolbox (A) by inserting lynch pin (C) into tab (B).
27. Install the hitch swing cylinder. For instructions, refer to [4.4 Installing Hitch Swing Cylinder, page 79](#).

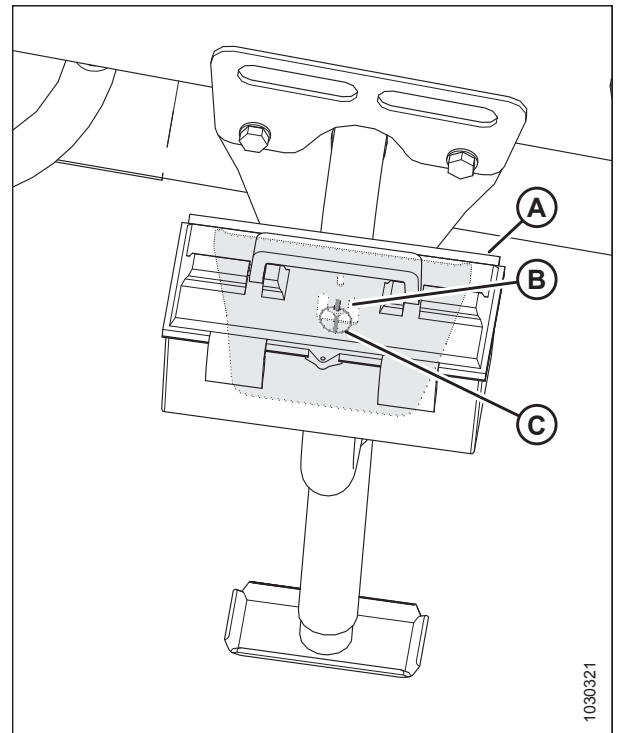


Figure 4.34: Toolbox Mounted on Jack Stand Bracket

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

The two-point hitch adapter allows the pull-type to connect to an existing two-point hitch connection.

1. Remove shipping wire or banding (A) securing shipping blocks (B) at front of hitch, and remove blocks.
2. Swivel lower gearbox until the input shaft is facing forward.

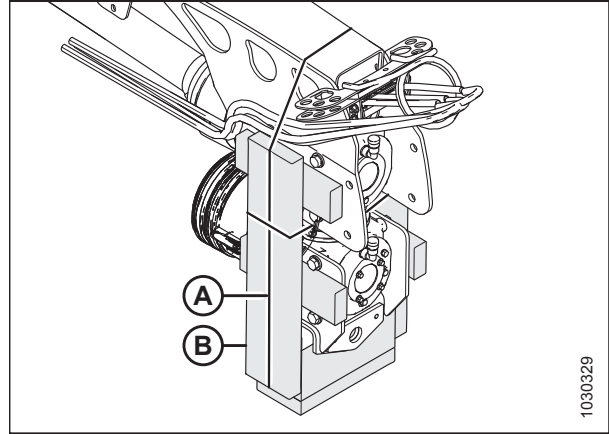


Figure 4.35: Hitch End Packing

3. Retrieve two-point hitch adapter shipment.

NOTE:

Do **NOT** remove any strapping that secures hitch adapter (A) to pallet (B).

4. Remove strapping that secures pin (C) to adapter (A).
5. Remove pin (C) from adapter, and remove bolt (D) and nut from pin (C).
6. Remove strapping from toolbox (E), jack stand support (F), and jack (G). Remove these parts from the pallet.
7. Remove the hardware bag from the jack stand support.

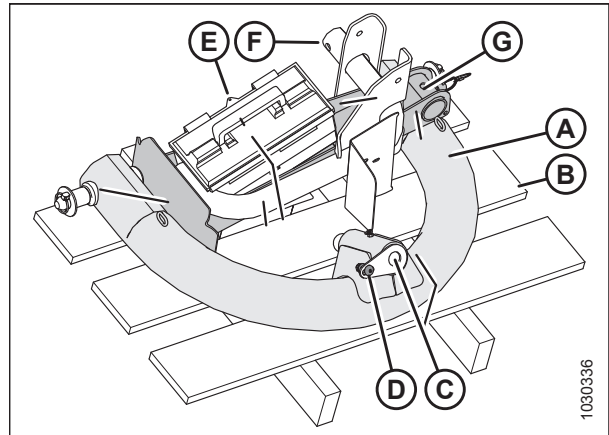


Figure 4.36: Two-Point Hitch Packing

8. Install jack support stand (A) as shown. Secure with two M12 x 1.75 x 40 bolts (B), M12 washers, and M12 center lock nuts per side. Torque hardware to 69 Nm (51 lbf-ft).

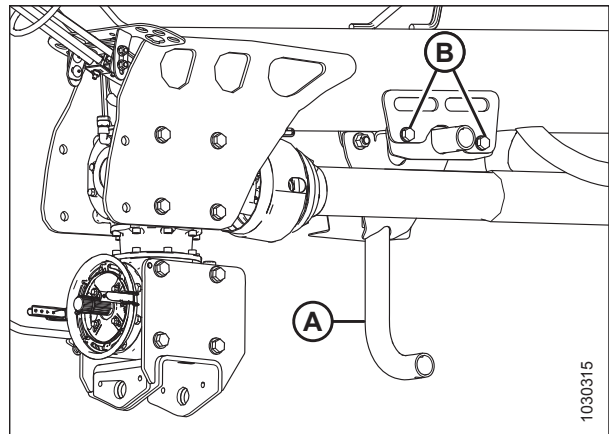


Figure 4.37: Jack Stand Support

ASSEMBLING THE ROTARY DISC PULL-TYPE – FACTORY-INSTALLED TRANSPORT

9. Insert jack (A) onto the jack stand support and secure with pin (B).

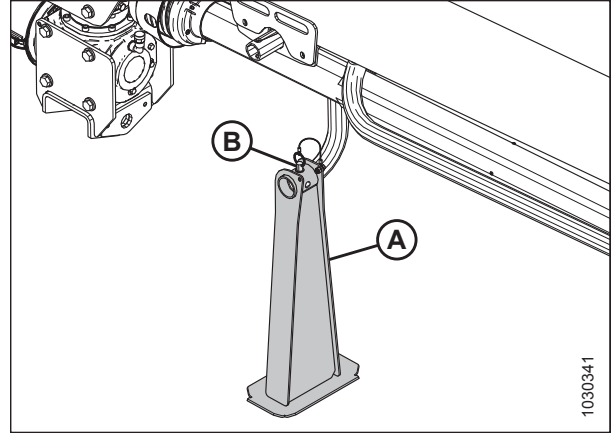


Figure 4.38: Jack – Working Position

10. Using a floor jack or equivalent, raise two-point hitch adapter (A) into position under the gearbox.
11. Maneuver adapter (A) so that pin (B) can be installed to secure adapter to hitch.
12. Secure pin with bolt (C) and nut.
13. Remaining any remaining strapping from pallet. Lower pallet. Remove jack and pallet.
14. Lower hitch and stand to the ground.

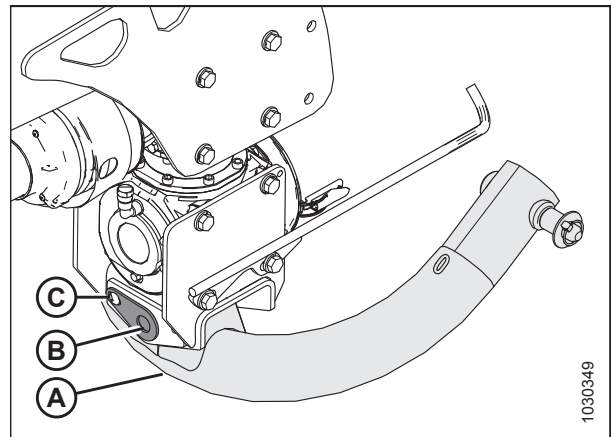


Figure 4.39: Two-Point Hitch Adapter

15. Install springs (A) into hooks (B).
16. Remove cone shield (C).

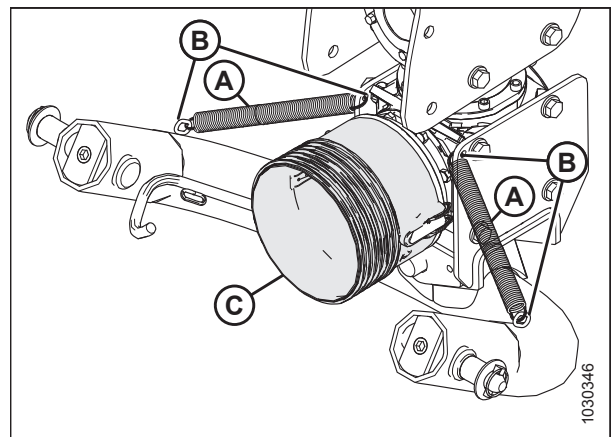


Figure 4.40: Springs

ASSEMBLING THE ROTARY DISC PULL-TYPE – FACTORY-INSTALLED TRANSPORT

17. Retrieve primary driveline (D) from the shipping location.
18. Remove nut (C), washer (B), and pin (A) from rotary disc pull-type end of primary driveline (D).

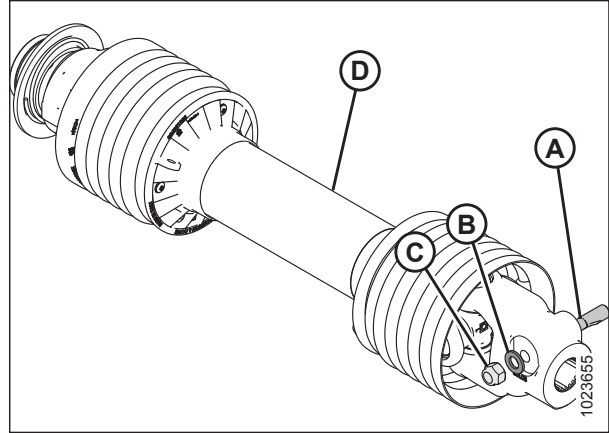


Figure 4.41: Primary Driveline

19. Slide driveline (A) onto gearbox input shaft (B). Align pinhole (C) in the yoke with the groove on the input shaft.

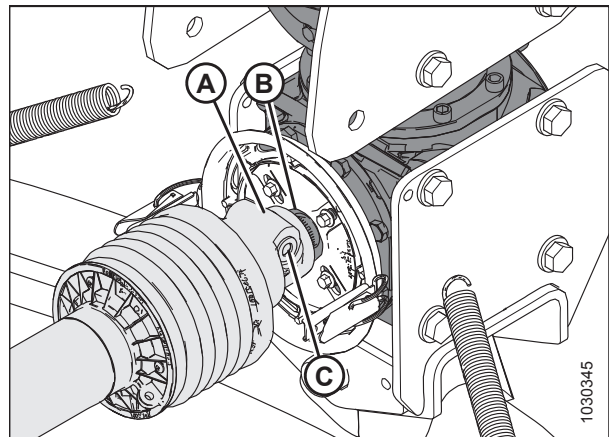


Figure 4.42: Primary Driveline

20. Insert tapered pin (A) by hand. Ensure the pin lines up with groove in the yoke and is fully inserted. The notch in the pin should be facing toward the shaft.
21. Clean threads on pin (A) after inserting pin.
22. Install washer (B) and nut (C) on the tapered pin and torque to nut 149 Nm (110 lbf-ft). The end of the pin must be recessed 9–11 mm (0.35–0.43 in.) (D).

NOTE:

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

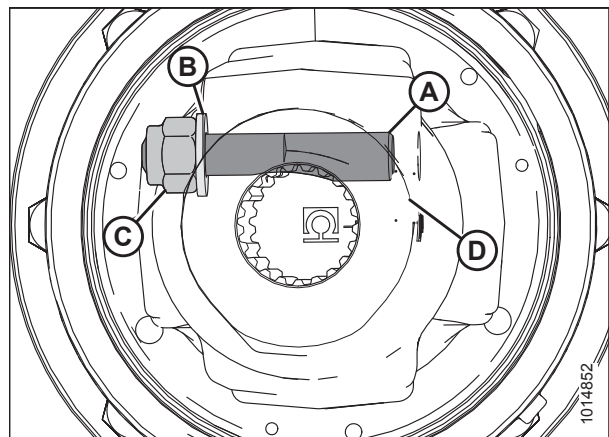


Figure 4.43: Primary Driveline

ASSEMBLING THE ROTARY DISC PULL-TYPE – FACTORY-INSTALLED TRANSPORT

23. Install cone shield (A) over the primary driveline. Place driveline (B) on driveline support (C).

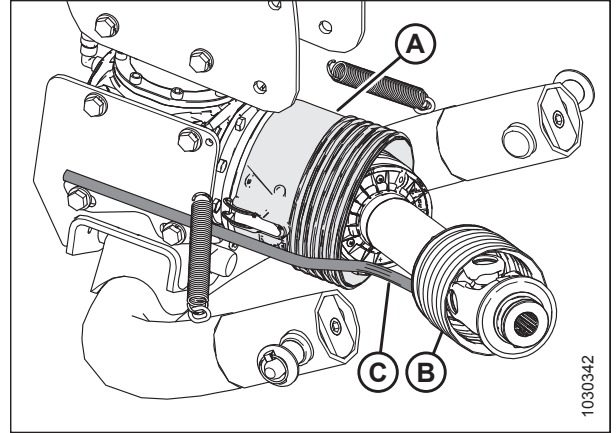


Figure 4.44: Cone Shield

24. Place toolbox groove (A) onto jack stand bracket (B) as shown.

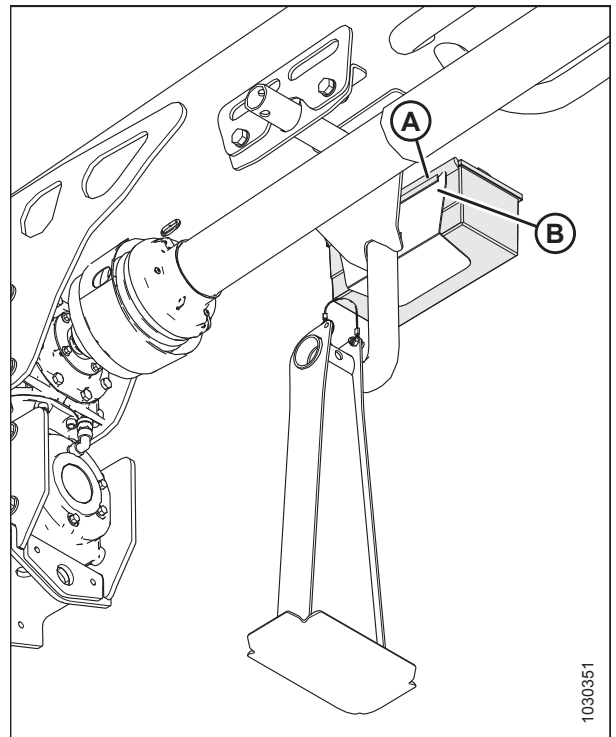


Figure 4.45: Toolbox Mounted on Jack Stand Bracket

ASSEMBLING THE ROTARY DISC PULL-TYPE – FACTORY-INSTALLED TRANSPORT

25. Insert bracket tab (B) through the slot in the rear of toolbox (A).
26. Retrieve lynch pin (C) from the bag of hardware supplied with the jack. Secure toolbox (A) by inserting lynch pin (C) into tab (B).
27. Install the hitch swing cylinder. For instructions, refer to [4.4 Installing Hitch Swing Cylinder, page 79](#).

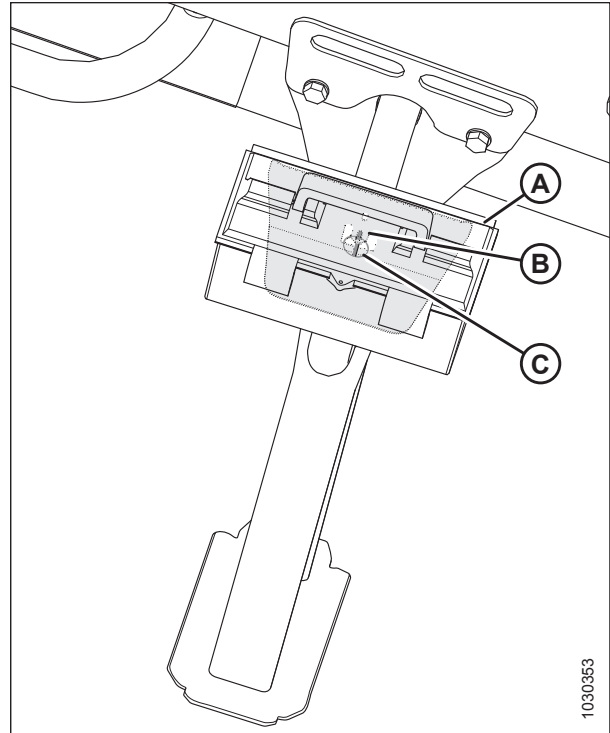


Figure 4.46: Toolbox Mounted on Jack Stand Bracket

4.4 Installing Hitch Swing Cylinder

The hitch swing cylinder is used to steer and rotate the pull-type between field and transport positions. The hitch swing cylinder can be installed on either side of the hitch, depending on whether or not the transport system will be installed. Be sure to follow the instructions carefully.

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

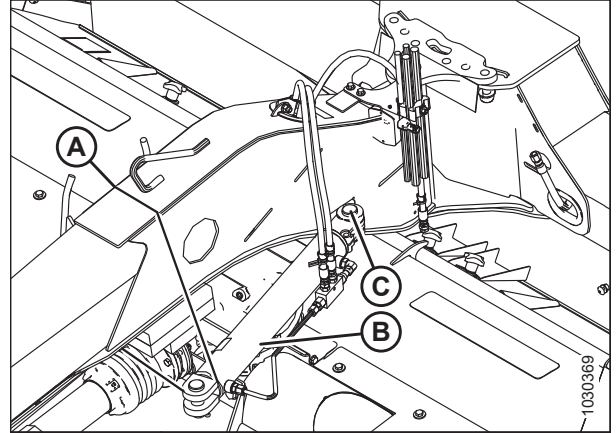


Figure 4.47: Steering Cylinder

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

NOTE:

The rod end of cylinder will be attached to the transport system casting after the system is primed. For instructions, refer to [6.2 Priming the Hitch Swing Cylinder, page 111](#).

5. Turn valve (E) on the hitch swing cylinder 180° so that fittings are pointing up.

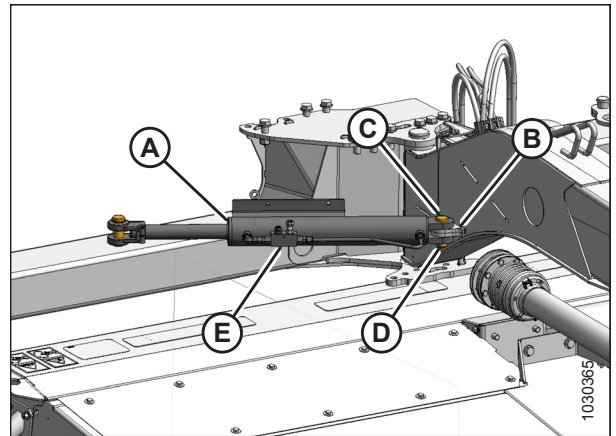


Figure 4.48: Hitch Swing Cylinder

4.5 Attaching Clutch Driveline

The clutch driveline on the carrier hitch, connects to the rotary disc pull-type drive gearbox.

IMPORTANT:

If a conditioner swap is required before delivery to the customer, swap the conditioner **BEFORE** attaching the clutch driveline. For conditioner swap instructions, refer to the pull-type technical manual. After swapping the conditioner, attach the clutch driveline then follow the remaining chapters in this manual in sequential order to complete the setup.

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

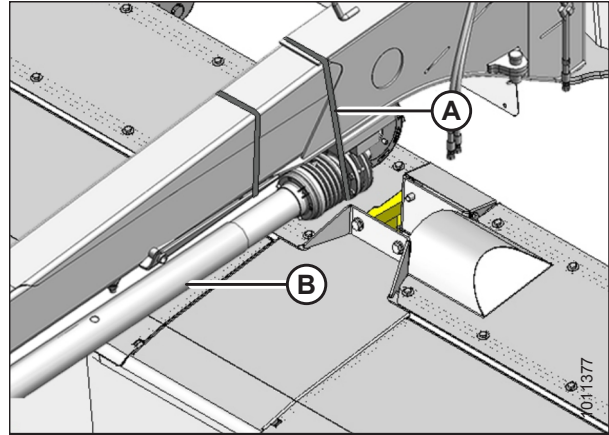


Figure 4.49: Driveline Strapping

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

NOTE:

Strapped contents may be under pressure.

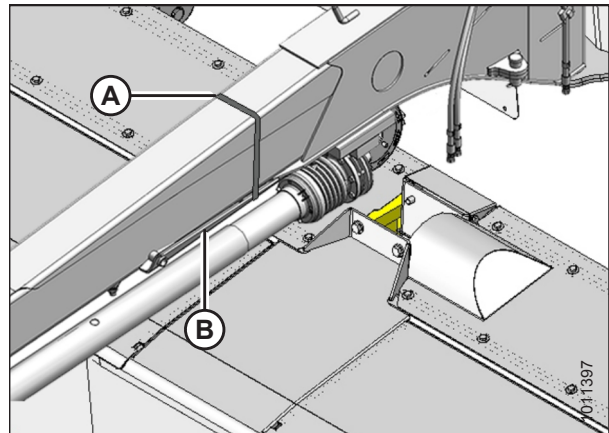


Figure 4.50: Steering Arm Strapping

3. At the top of the upper rear swivel gearbox, remove two bolts (A) with washers (B) and spacers (C). Retain hardware.
4. Undo latches (D) securing driveline shield (E) to the upper rear swivel gearbox and remove the shield. If necessary, use a screwdriver or equivalent to undo latches (D).
5. Rotate the upper rear swivel gearbox until the input shaft is facing towards the driveline.

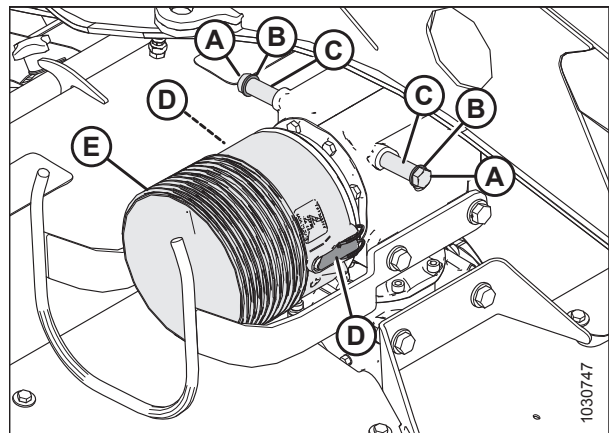


Figure 4.51: Driveline Shield

ASSEMBLING THE ROTARY DISC PULL-TYPE – FACTORY-INSTALLED TRANSPORT

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

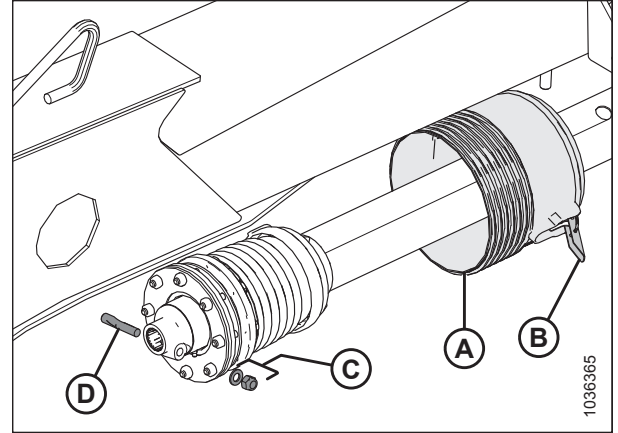


Figure 4.52: Clutch Driveline

- Attach driveline (A) to the upper rear swivel gearbox shaft.

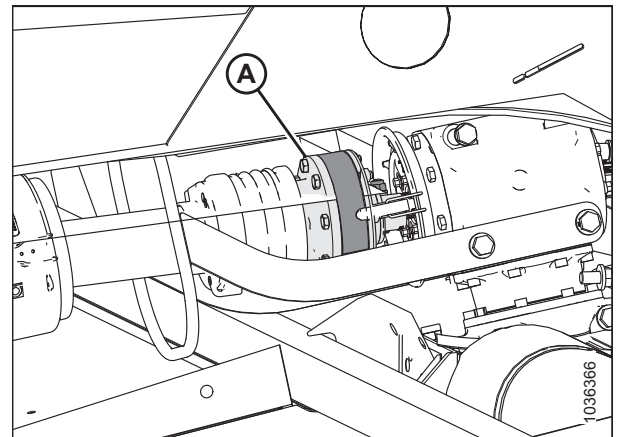


Figure 4.53: Clutch Driveline

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

NOTE:

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

- Install the shield onto the upper rear swivel gearbox. Use the latches to secure it.

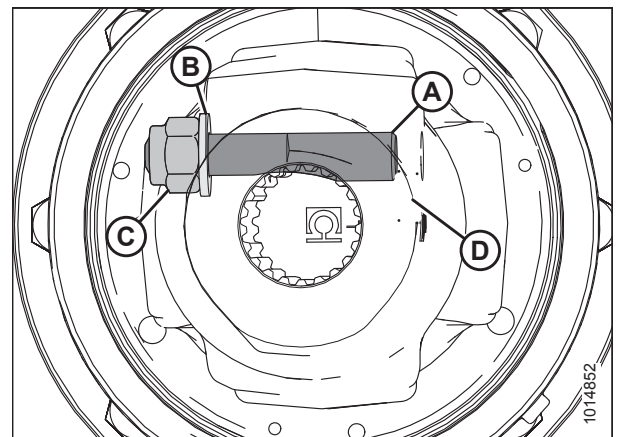


Figure 4.54: Clutch Driveline

4.6 Attaching Steering Arm

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

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

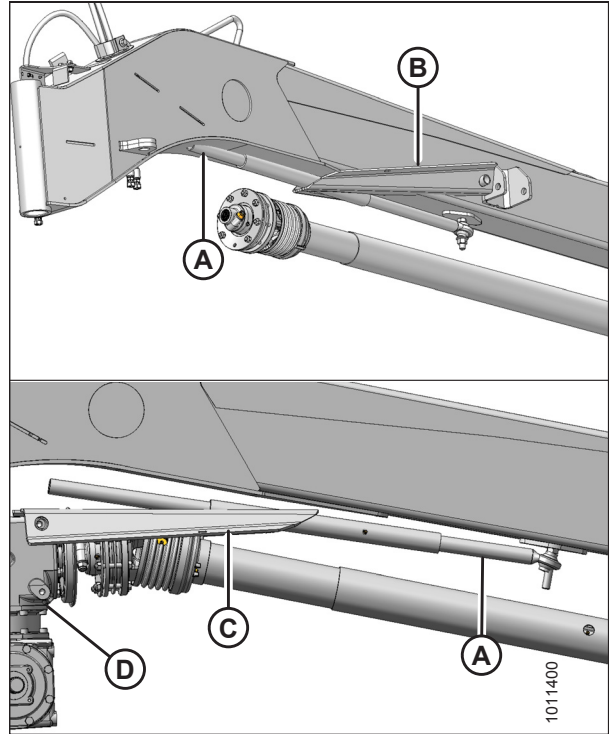


Figure 4.55: Steering Arm

5. Line up the two mounting holes in arm weldment with the forward threaded holes in the upper rear swivel gearbox.
6. Install spacers (A) into steering arm (B).
7. Install washer (D) onto the M16 x 80 hex head bolts (C). Apply high-strength threadlocker (Loctite® 262 or equivalent) onto the bolt threads.
8. Torque bolts to 203 Nm (150 lbf-ft).

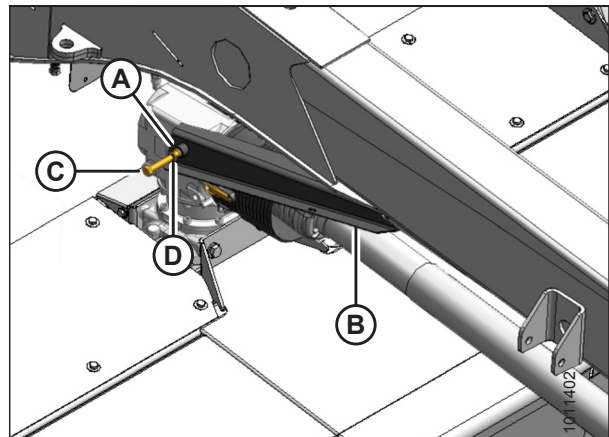


Figure 4.56: Steering Arm

ASSEMBLING THE ROTARY DISC PULL-TYPE – FACTORY-INSTALLED TRANSPORT

9. Attach safety chain (A) from driveline shield to slotted hole in the steering arm.

NOTE:

Ensure chain is shortened to prevent any driveline wrapping.

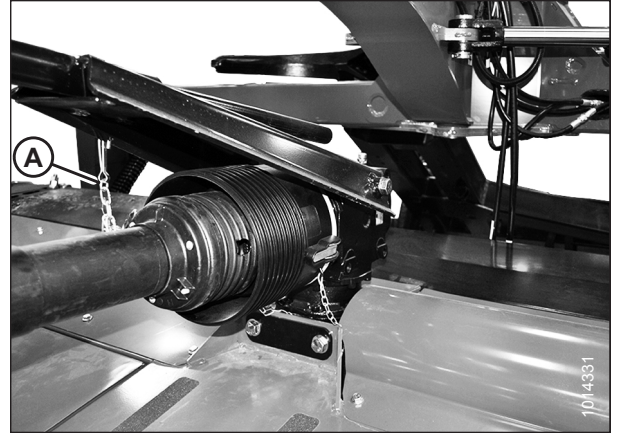


Figure 4.57: Driveline Shield

4.7 Preparing Slow Moving Vehicle Sign

The slow moving vehicle sign includes decals for km/h and mph.

1. Remove the covering from slow moving vehicle (SMV) sign (A).

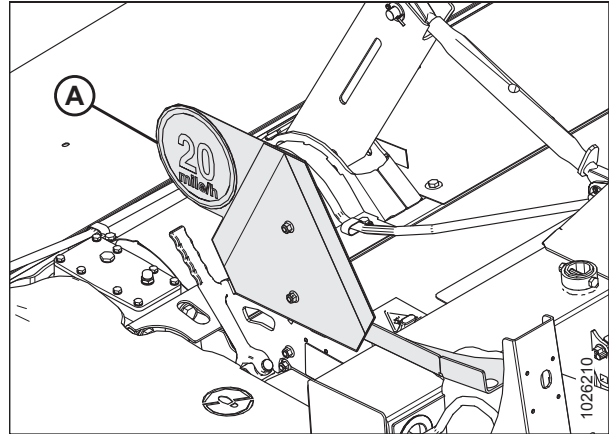


Figure 4.58: SMV Sign

2. Remove decal bag (B) taped to SMV bracket (A).
3. Choose appropriate speed decal (C) or (D) depending on region. Orient decal as shown when installing it on the SMV bracket.

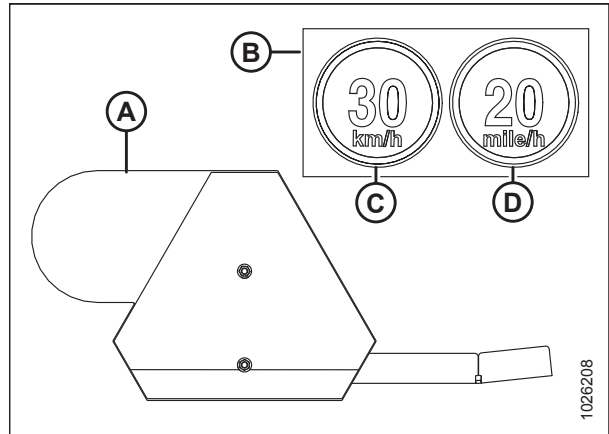


Figure 4.59: SMV Decals

4.8 Completing Transport System Installation

This section describes the installation of the base components, the hydraulic lines and hoses, and the electrical connections for the transport system.

4.8.1 Removing Cover

1. Remove bolts (B) from cover (A).
2. Remove cover (A).

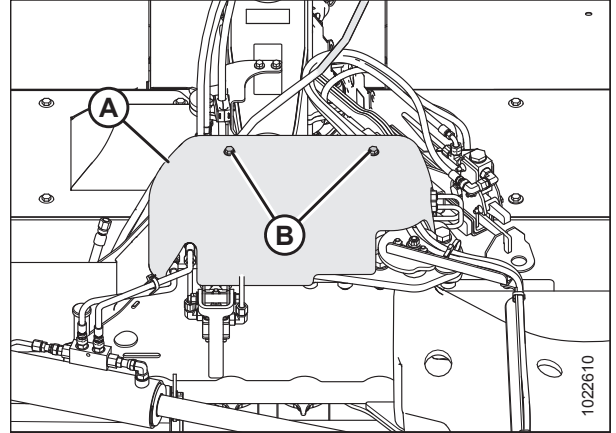


Figure 4.60: Cover – Top View

4.8.2 Installing Transport Alignment Control

The transport alignment control ensures that the pull-type can only go into or out of transport mode from a specific position.

1. Secure cam assembly (A) onto hitch swing cylinder plate (B) with bolts and nuts (C). Torque nuts (C) to 58 Nm (43 lbf-ft).

NOTE:

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

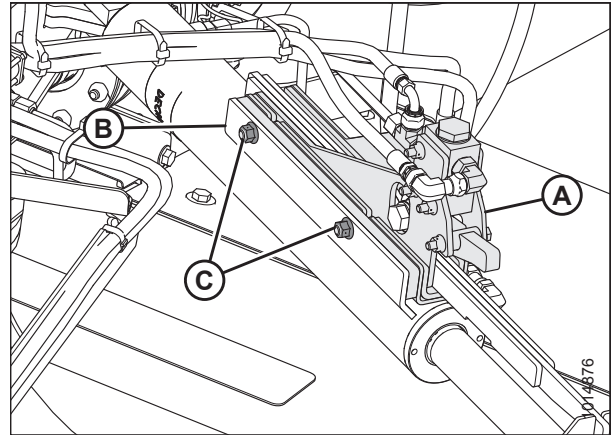


Figure 4.61: Alignment Control – Rear Right View

ASSEMBLING THE ROTARY DISC PULL-TYPE – FACTORY-INSTALLED TRANSPORT

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

NOTE:

If the cam arm does **NOT** slide easily, loosen valve mounting bolts (C), and slide valve (B) up to the top of the mounting holes. Retighten valve mounting bolts (C).

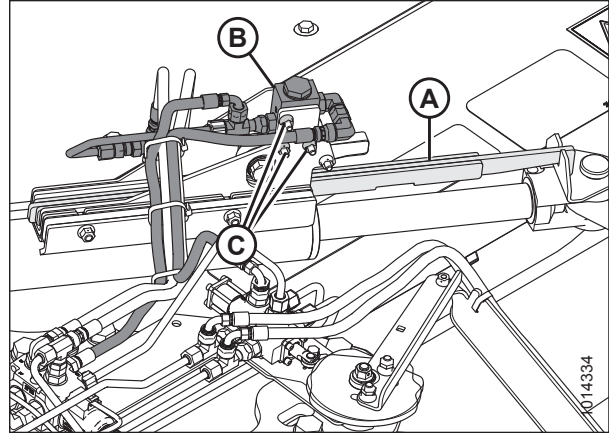


Figure 4.62: Alignment Control – Rear Right View

3. Align hole in cam arm (A) with hole in clevis (B) at the rod end of the cylinder.

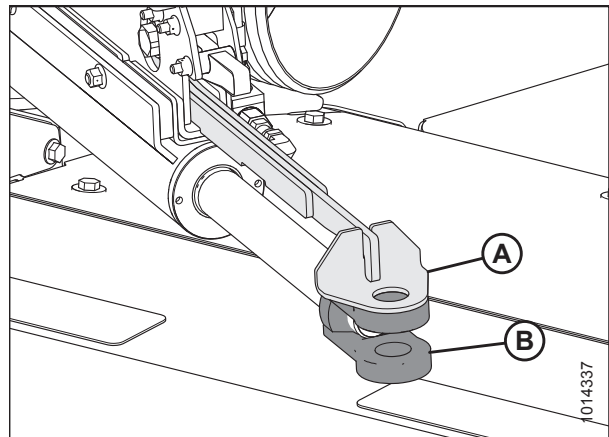


Figure 4.63: Alignment Control – Rear Right View

ASSEMBLING THE ROTARY DISC PULL-TYPE – FACTORY-INSTALLED TRANSPORT

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

NOTE:

The rod end of cylinder will be attached to the transport system casting after the system is primed. For instructions, refer to [6.2 Priming the Hitch Swing Cylinder, page 111](#).

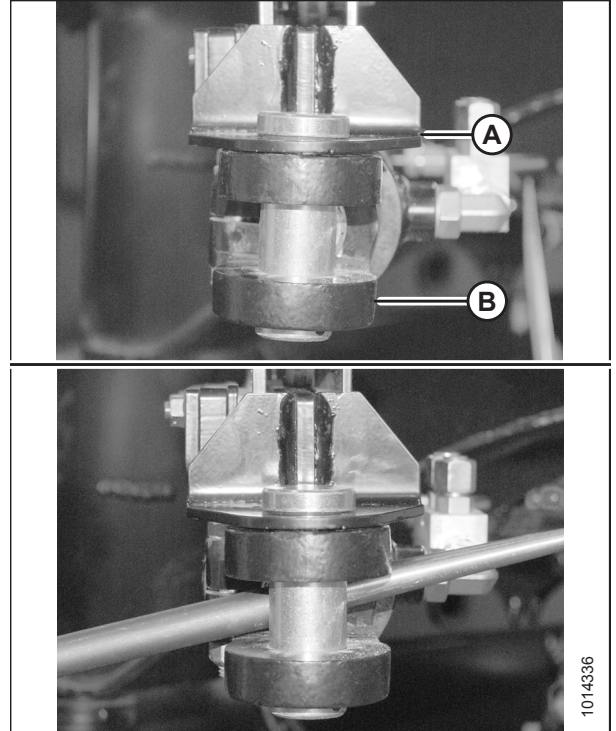


Figure 4.64: Cam Arm Alignment

4.8.3 Installing Hydraulic Lines and Hoses

Hydraulic hoses distribute hydraulic fluid to the various components on the pull-type.

NOTE:

Refer to *10.4 Torque Specifications, page 184* for torque details.

1. Retrieve steel lines and hoses from shipping bag.
2. Place a container or rag under the fitting on the hitch swing cylinder to catch oil.
3. Remove existing fitting (A) from the block.
4. Remove cap (B) from tee fitting.

IMPORTANT:

Ensure O-ring is in place.

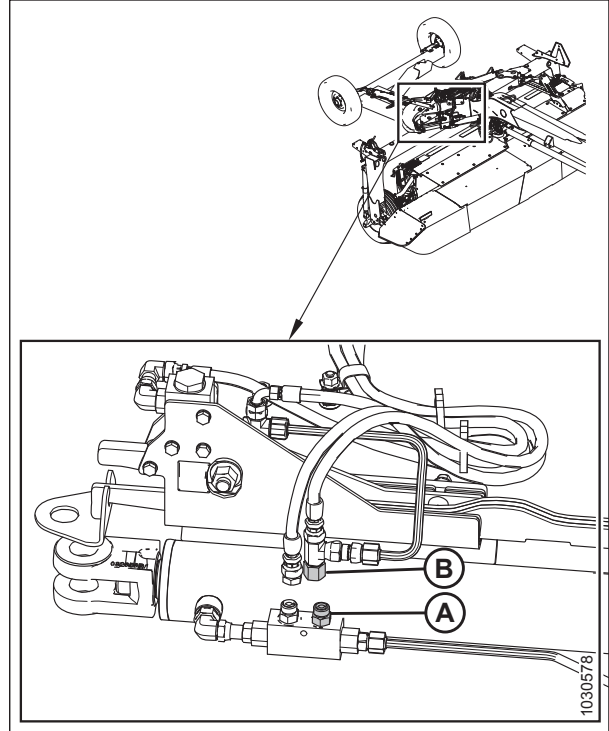


Figure 4.65: Alignment Valve Fitting

5. Retrieve ORFS-6 x ORB-6 connector (B) from the shipping bag and install at location (A).

NOTE:

Ensure that the direction arrow on check valve (D) points away from tee fitting (C).

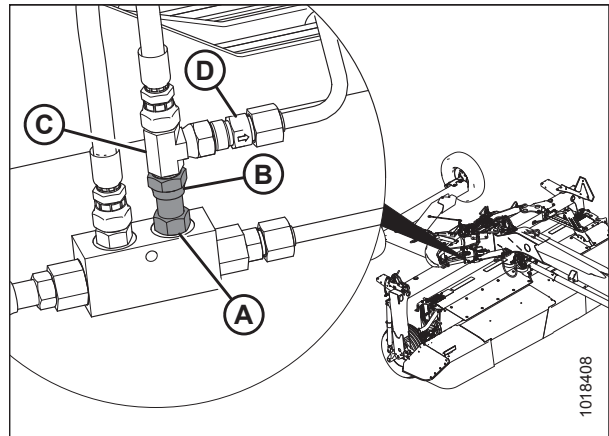


Figure 4.66: Alignment Valve Fitting

ASSEMBLING THE ROTARY DISC PULL-TYPE – FACTORY-INSTALLED TRANSPORT

6. Remove the cap from fitting (A).
7. Remove the plug from hose (B). Install hose to fitting (A) as shown.

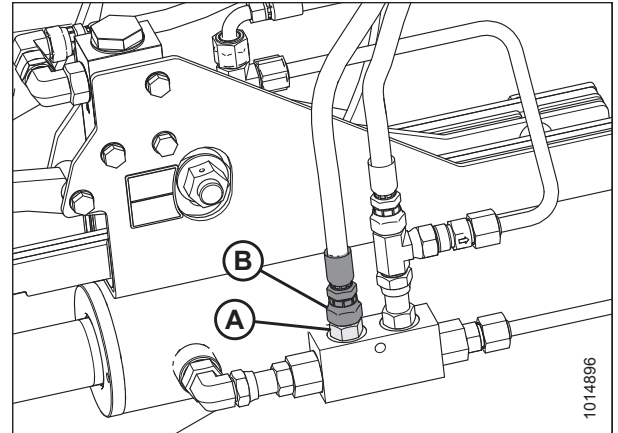


Figure 4.67: Alignment Valve Fitting

8. Connect hose (B) (with red collar #2), from the rear of the hitch, to the fitting in port A1 on selector valve (C).
9. Connect hose (A) (with blue collar #2), from the rear of the hitch, to the fitting in port A2 of selector valve (C).
10. Secure hoses (A) and (B) together with a cable tie.

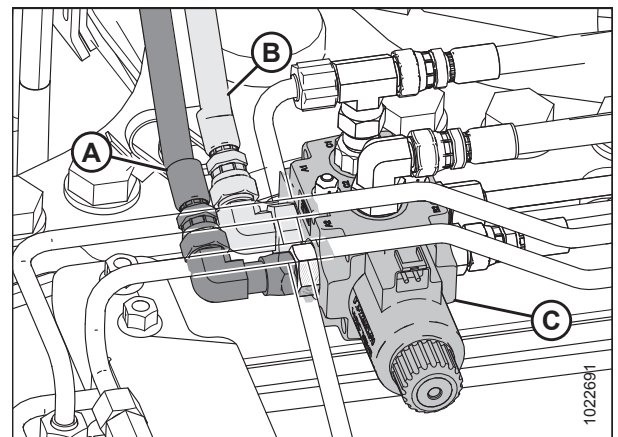


Figure 4.68: Selector Valve Supply

ASSEMBLING THE ROTARY DISC PULL-TYPE – 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 rotary disc pull-type is in transport mode.

Retrieve the following secondary lift hose from the shipping bag:

- **R113 PT:** Use hose MD #224160.
- **R116 PT:** 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 each end of secondary lift hose (B).
12. Undo adjustable strap (A) around hoses at the aft end of the hitch.
13. Locate the green wire preinstalled in the hitch for pulling hoses through the hitch.

NOTE:

If you are installing a hydraulic center-link, pull the hydraulic hoses through the hitch at the same time as the lift hose.

14. At the rear of the hitch, feed the male ORB end of hose (B) into access hole (C). Route the hose through the hitch to the opening at front.
15. Position long hose (A) so that the exposed length at the front of the hitch matches existing hose (B). Route the hose through guide (C).
16. At the front of the hitch, loosen nut (D) on hose clamp (E) until hose (A) can be positioned in the clamp.
17. Tighten nut (D).

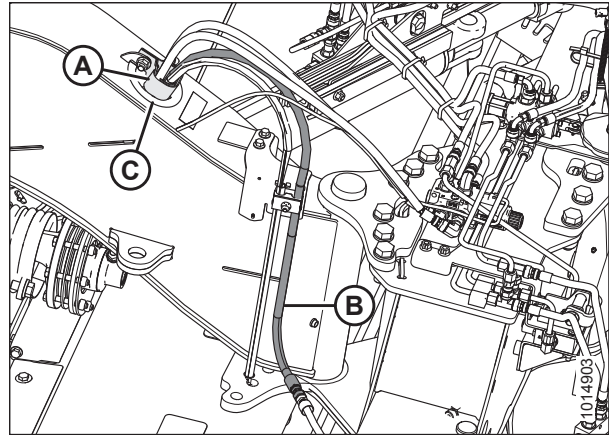


Figure 4.69: Lift Hoses

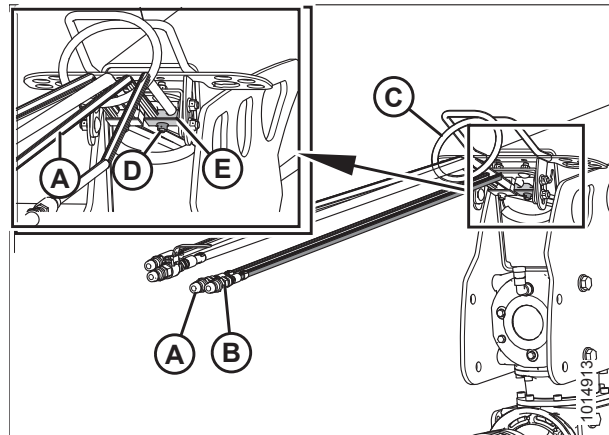


Figure 4.70: Lift Hoses

ASSEMBLING THE ROTARY DISC PULL-TYPE – FACTORY-INSTALLED TRANSPORT

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

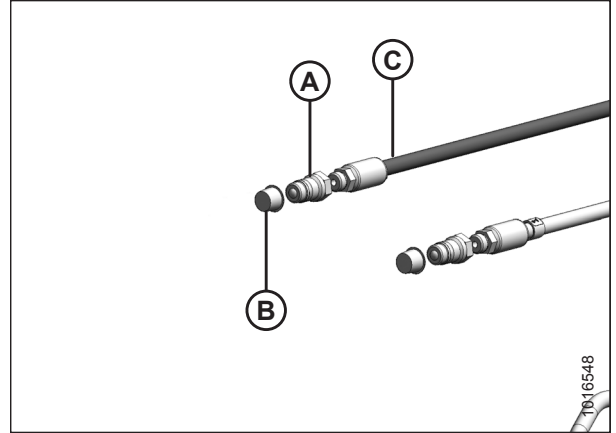


Figure 4.71: Lift Hose Fittings

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

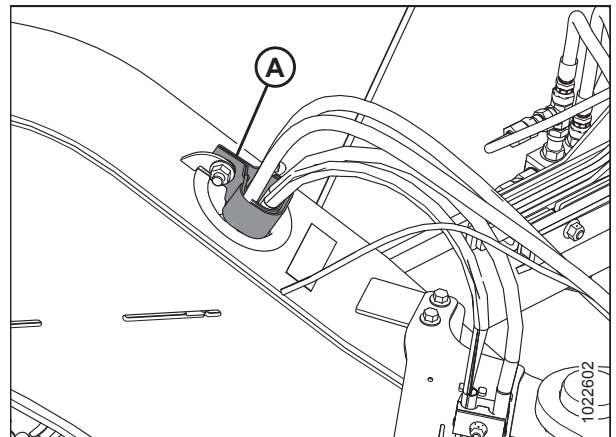


Figure 4.72: Lift Hoses

21. Connect hose (A) from left lift cylinder and hose (B) (MD #224160 or MD #224162) at the hitch pivot.

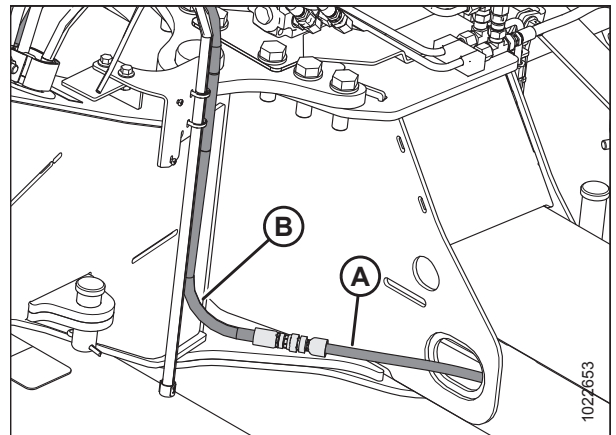


Figure 4.73: Lift Hoses

4.8.4 Installing Electrical Components

Wiring harnesses, lighting assemblies, the selector valve and lighting module, and the remote control are components on the electrical system.

Connecting Selector Valve and Transport Lighting Module

The electronically controlled selector valve manages the hydraulics for the transport system; the lighting module is the hub for signal and hazard lighting.

1. Remove valve connector plug (A) and module connector plug (B).

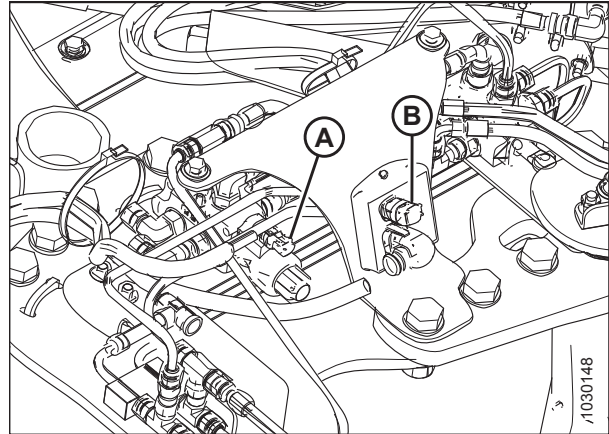


Figure 4.74: Connector Plugs

2. Locate plugs P102 (A) and P502 (B) on the transport harness at the header end of the hitch. Route plugs P102 (A) and P502 (B) towards selector valve (C).
3. Connect plug P502 (B) to the receptacle on selector valve (C).
4. Connect plug P102 (A) to the upper input receptacle on transport lighting module (D).

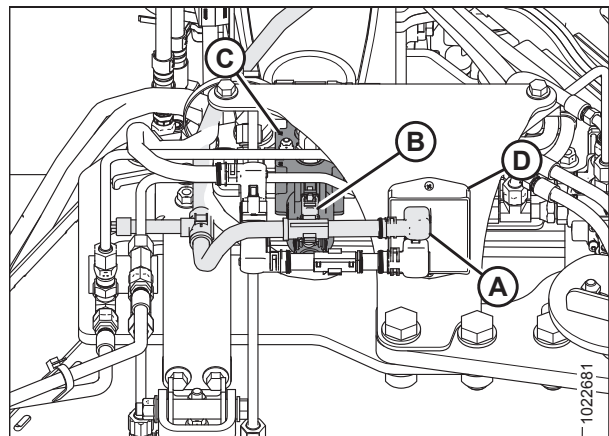


Figure 4.75: Selector Valve Supply

ASSEMBLING THE ROTARY DISC PULL-TYPE – FACTORY-INSTALLED TRANSPORT

Installing Light Assembly

Light assemblies provide position, hazard, turning direction, and braking information.

1. Locate right light assembly (A).

NOTE:

When the pull-type is in field position, the right light assembly is located on the left, rear side of the pull-type. When the machine is being towed, it will be on the right side.

2. Loosen bolt (C). Rotate light assembly (A) up to position shown at right.
3. Install bolt (B).

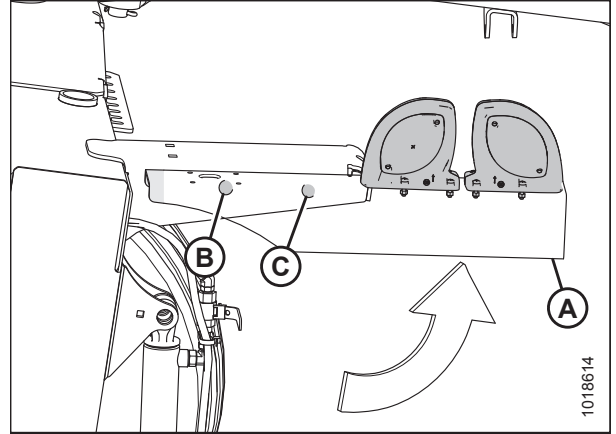


Figure 4.76: Left, Rear End of Pull-Type

Connecting Transport Lighting Module

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

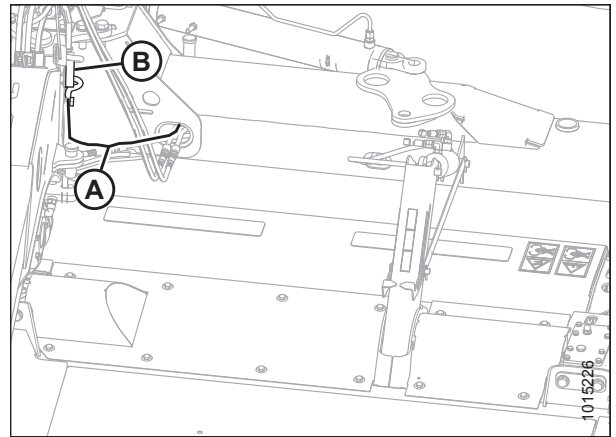


Figure 4.77: Transport Lighting Module

ASSEMBLING THE ROTARY DISC PULL-TYPE – FACTORY-INSTALLED TRANSPORT

Installing Remote Control

The remote control allows the operator to convert the pull-type from field to road mode from the within the tractor cab.

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

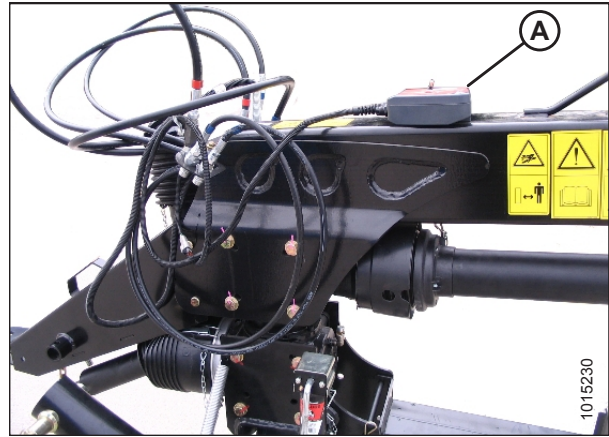


Figure 4.78: Remote Control on Top of Hitch

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

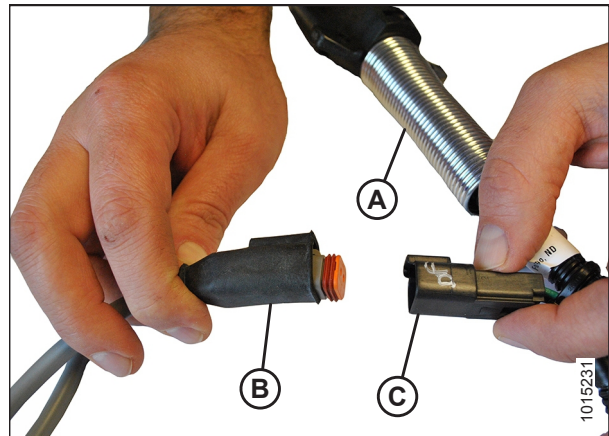


Figure 4.79: Transport Harness

4. **If your tractor has a three-pin auxiliary power connection:**

NOTE:

The remote control has internal protection which prevents damage caused by incorrect wiring, short circuits, or overload conditions.

Connect two wires (B) from three-pin auxiliary connector (A) to remote control wires (C) on the remote control, wrap connections with electrical tape, and proceed to Step 6, page 96.

- The wire with no tag connects to the tractor ground.
- The wire with the red tag connects to the tractor power.

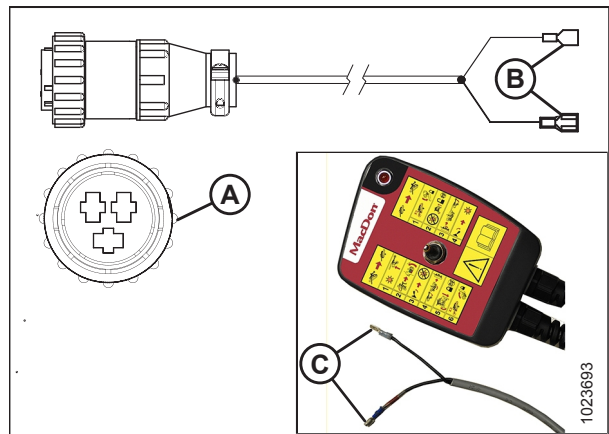


Figure 4.80: Three-Pin Auxiliary Connector

ASSEMBLING THE ROTARY DISC PULL-TYPE – FACTORY-INSTALLED TRANSPORT

NOTE:

If connections are reversed, the lamp will not illuminate when the toggle switch is in field mode. Try the following to correct the issue:

- Check if 10 amp fuse (A) located inside the transport control box has blown.
- Check for short in wires to solenoid valve on header.
- Check for incorrect wire connections (reversed) at the power supply or solenoid valve.

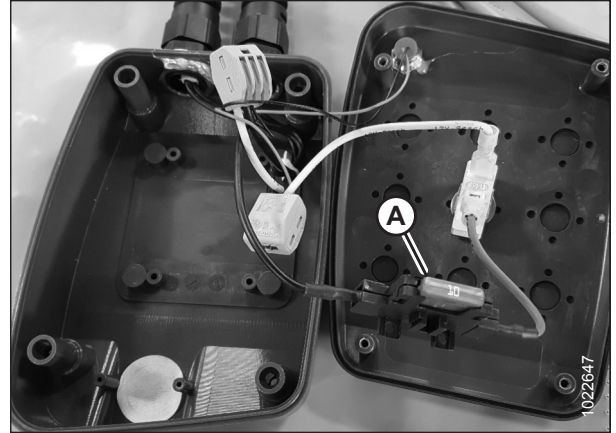


Figure 4.81: Control Box Interior

5. *If your tractor does NOT have a three-pin auxiliary power connection:*

NOTE:

The remote control has internal protection which prevents damage caused by incorrect wiring, short circuits, or overload conditions.

Connect remote control wires (A) to the tractor's power supply as follows:

- Connect wire (B) with no tag to tractor ground.
- Connect wire (C) with the red tag to tractor power.

NOTE:

If the red tag is missing, identify the power by locating the wire with the number 1 printed on it. The ground wire has a number 2 printed on it.

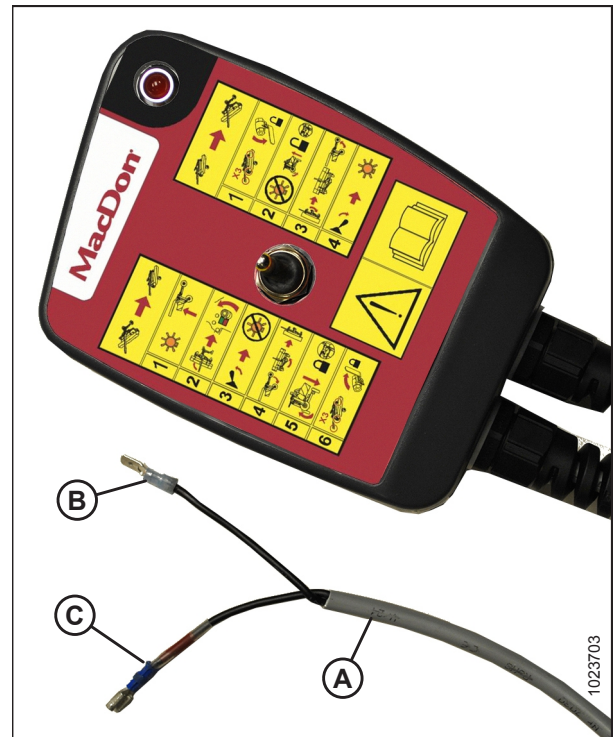


Figure 4.82: Remote Control

ASSEMBLING THE ROTARY DISC PULL-TYPE – FACTORY-INSTALLED TRANSPORT

NOTE:

If connections are reversed, the lamp will not illuminate when the toggle switch is in field mode. Try the following to correct the issue:

- Check if 10 amp fuse (A) located inside the transport control box has blown.
- Check for short in wires to solenoid valve on header.
- Check for incorrect wire connections (reversed) at the power supply or solenoid valve.

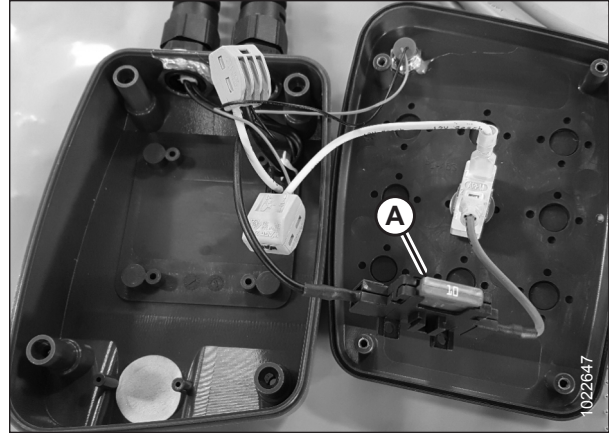


Figure 4.83: Control Box Interior

6. Place the remote control inside the tractor cab.

4.8.5 Installing Cover

The transport cover protects the hydraulic valves and electrical components from debris.

1. Install cover (A) onto the cover support.
2. Install bolts (B). Torque bolts to 60 Nm (45 lbf·ft).

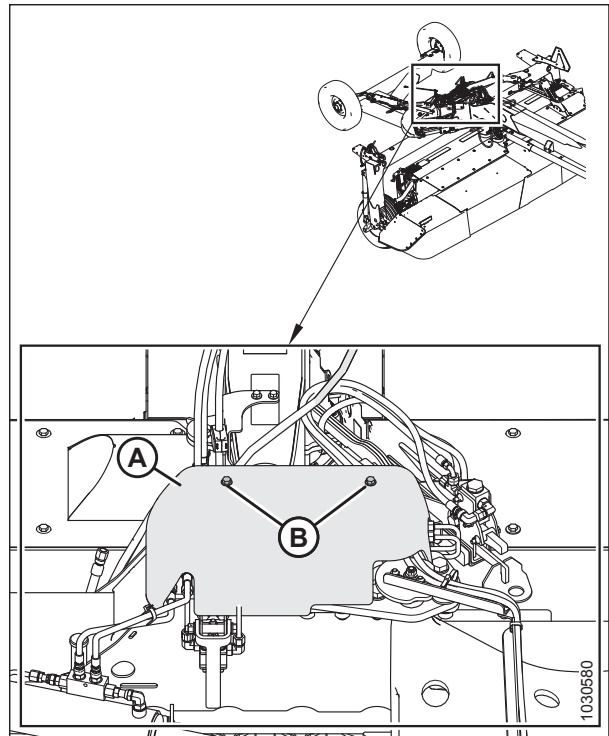


Figure 4.84: Cover

4.9 Installing Options

Install the following optional kits if they were supplied with your rotary disc pull-type.

4.9.1 Installing Hydraulic Center-Link – Optional

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

4.9.2 Installing Tall Crop Divider – Optional

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



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:

If the rotary disc pull-type will be transported on public roads in the transport mode, do **NOT** install the tall crop dividers. Install the dividers after the machine is delivered to the customer.

Chapter 5: Connecting the Tractor to the Rotary Disc Pull-Type

Connecting the pull-type to the tractor involves connecting the hydraulic and electrical systems, and may also require adjusting the length of the drawbar hitch.

5.1 Adjusting the Drawbar

When attaching the pull-type to a tractor with a drawbar type connection, the distance between the PTO shaft and the hitch connection must be adjusted correctly.

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Adjust the tractor drawbar to meet the specifications listed in Table 5.1, page 99.
3. Secure the tractor drawbar so the hitch pinhole is directly below the driveline.

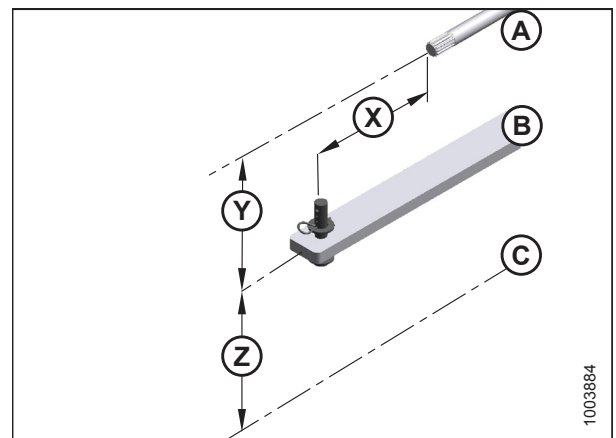


Figure 5.1: Tractor Drawbar Adjustments

A - Power Take-Off (PTO) B - Tractor Drawbar
 C - Ground X - Dimension X
 Y - Dimension Y Z - Dimension Z

Table 5.1 SAE Standard A482 Specifications

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

5.2 Installing Drawbar Hitch Adapter

The hitch adapter allows the drawbar to connect with the hitch casting.

IMPORTANT:

The hitch adapter is compatible with Class 2 and Class 3 hitches only. Class 4 hitches are too big. Do **NOT** attempt to modify a Class 4 hitch or hitch adapter to make them fit together.

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

NOTE:

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

5. Tighten four jam nuts (C).

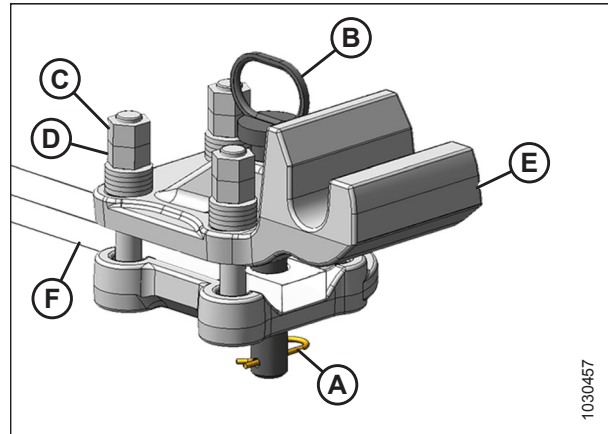


Figure 5.2: Drawbar Hitch Adapter

5.3 Attaching Rotary Disc Pull-Type to the Tractor

Refer to the attachment procedure that applies to your tractor:

- [5.3.1 Attaching with Drawbar Hitch, page 101](#)
- [5.3.2 Attaching with Two-Point Hitch, page 103](#)

5.3.1 Attaching with Drawbar Hitch

If the pull-type was configured for a tractor with a drawbar hitch, and the tractor's hitch has been adjusted correctly, then the pull-type can now be attached to the tractor.

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Remove lynch pin (A) from clevis pin (B), and remove the clevis pin from the rotary disc pull-type hitch.

DANGER

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

3. Move the tractor to position drawbar hitch adapter (A) under pin (B) in the hitch. Adjust height as necessary with jack.

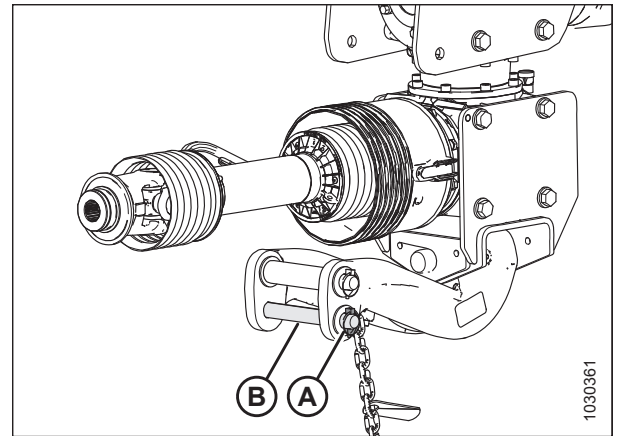


Figure 5.3: Rotary Disc Pull-Type Hitch

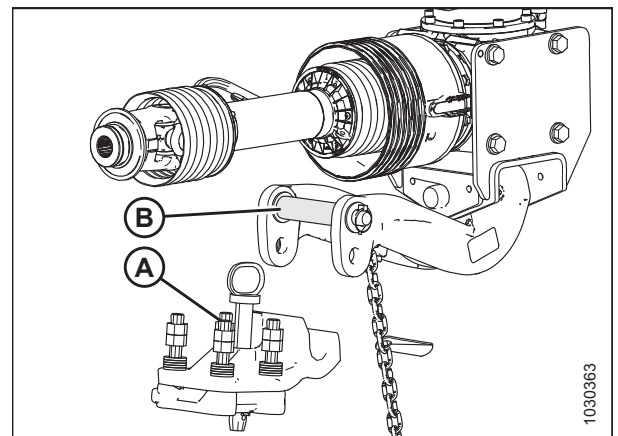


Figure 5.4: Rotary Disc Pull-Type Hitch

CONNECTING THE TRACTOR TO THE ROTARY DISC PULL-TYPE

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

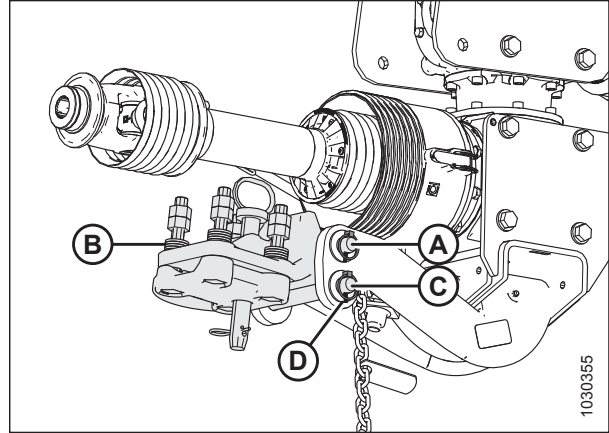


Figure 5.5: Rotary Disc Pull-Type Hitch

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

IMPORTANT:

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

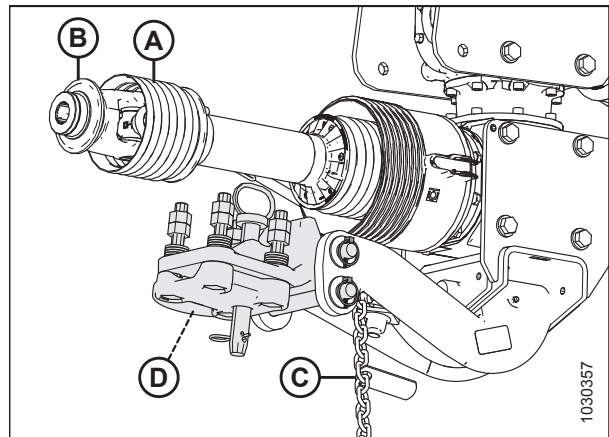


Figure 5.6: Primary Driveline

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

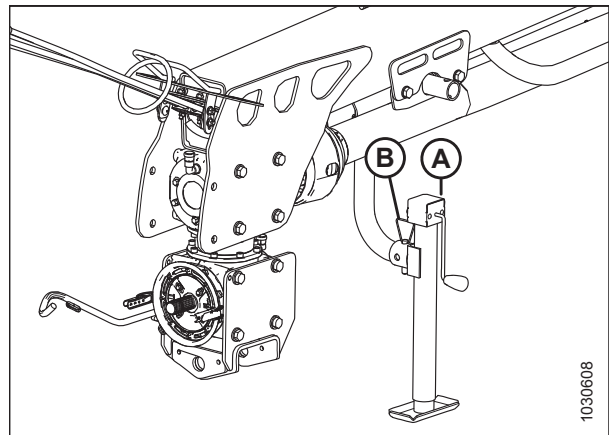


Figure 5.7: Hitch Jack

CONNECTING THE TRACTOR TO THE ROTARY DISC PULL-TYPE

10. Move jack (A) to storage position on top of hitch, and secure with pin (B).
11. Proceed to [5.3.3 Connecting Hydraulics, page 106](#).

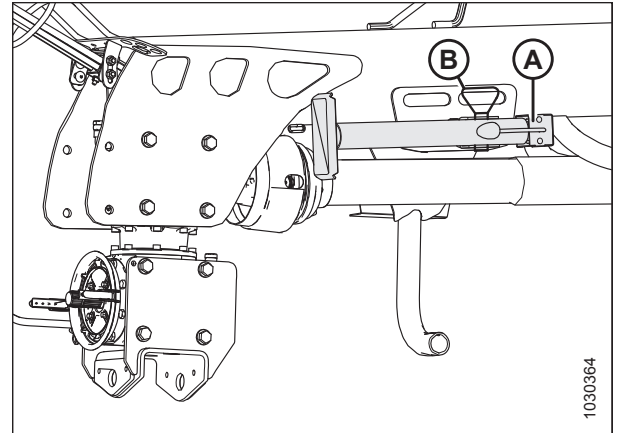


Figure 5.8: Drawbar Jack Storage

5.3.2 Attaching with Two-Point Hitch

If the pull-type was configured for a tractor with a two-point hitch, then the pull-type can now be attached to the tractor.

DANGER

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

1. Position the tractor and align hitch arms (A) with hitch adapter (B).
2. Shut down the engine, and remove the key from the ignition.
3. Remove lynch pins (C) and washers from the hitch adapter.
4. Secure hitch arms (A) onto adapter pins (D) with lynch pins (C).

NOTE:

If the tractor is equipped with a category III hitch, use a bushing (MD #224322) on each hitch pin (D). Two bushings (MD #224322) are included with the two-point hitch assembly.

NOTE:

If using a category III hitch, a longer driveshaft may be required.

5. Install anti-sway bars (not shown) on the tractor hitch to stabilize lateral movement of hitch arms (A). For instructions, refer to your tractor operator's manual.

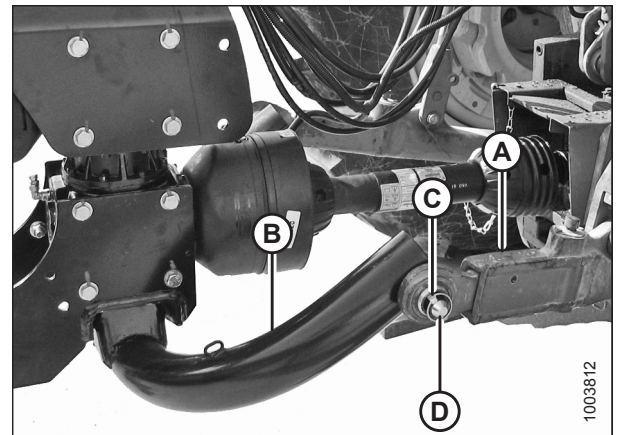


Figure 5.9: Two-Point Hitch Configuration

CONNECTING THE TRACTOR TO THE ROTARY DISC PULL-TYPE

6. Check distance (C) between tractor primary power take-off (PTO) shaft (A) and rotary disc pull-type hitch gearbox shaft (B) without the front half of the driveline attached.
7. Ensure that distance (C) does **NOT** exceed the dimensions listed in Table 5.2, page 104.

Table 5.2 Distance between Hitch Gearbox and Tractor PTO

| Driveline Shaft Size | Distance (C) ¹ |
|----------------------|---------------------------|
| 34 mm (1 3/8 in.) | 650 mm (25 9/16 in.) |
| 43 mm (1 3/4 in.) | 750 mm (29 1/2 in.) |

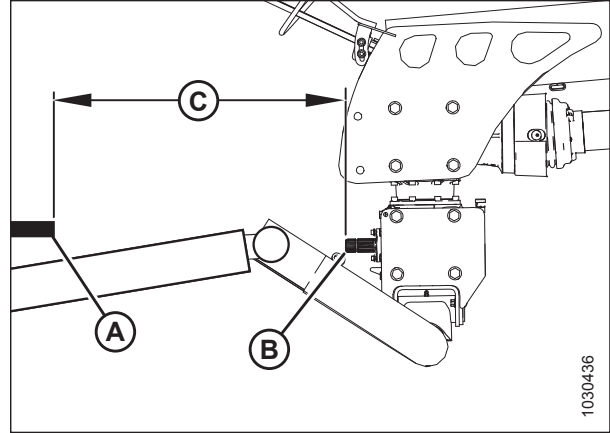


Figure 5.10: Allowable Driveline Length

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

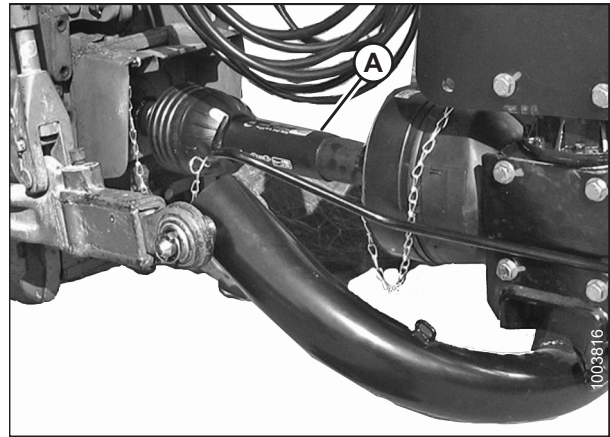


Figure 5.11: Driveline Attached to Tractor PTO

CAUTION

Check to be sure all bystanders have cleared the area.

10. Clear bystanders from the area and start the tractor. Do **NOT** operate the rotary disc pull-type.
11. Raise the hitch so that stand (A) is off the ground.
12. Shut down the engine, and remove the key from the ignition.
13. Remove inner hairpin (B) to release stand (A).

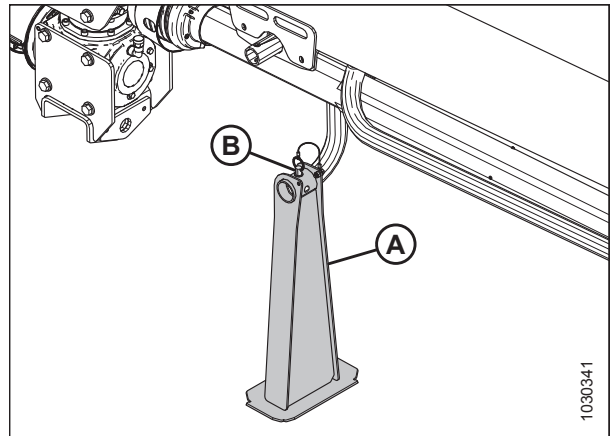


Figure 5.12: Hitch Stand in Working Position

1. If distance (C) is greater than the values shown, a longer driveline is required. Refer to the rotary disc pull-type operator's manual, options and attachments section for ordering information.

CONNECTING THE TRACTOR TO THE ROTARY DISC PULL-TYPE

14. Rotate stand (A) upward and into storage position.

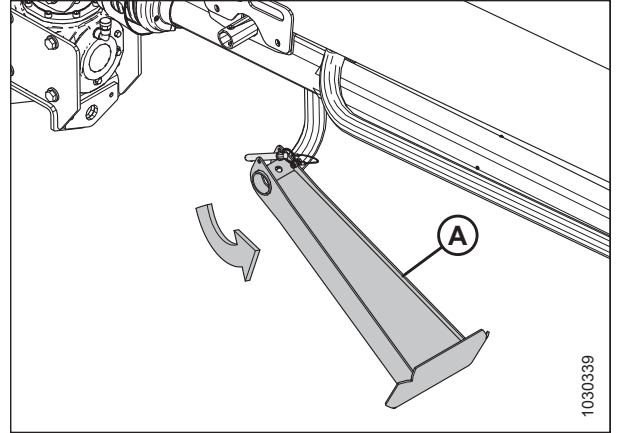


Figure 5.13: Repositioning Hitch Stand

15. Insert pin (A) and secure stand (B) in storage position.

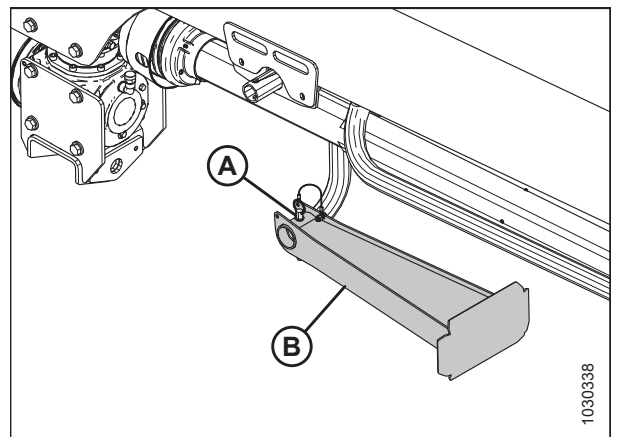


Figure 5.14: Hitch Stand in Storage Position

5.3.3 Connecting Hydraulics

Hydraulic hoses and lines distribute hydraulic fluid to the various components on the pull-type.

WARNING

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

NOTE:

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

Table 5.3 Hydraulic System Hoses

| System | Hose Identification | Tractor Hydraulics |
|-------------------------|---|--------------------|
| Lift (A) | Red #1 - pressure Blue #1 - return (only with transport installed) | Control 1 |
| Swing/ Transport (B) | Red #2 - pressure Blue #2 - return | Control 2 |
| Tilt (C) ² | Red #3 - pressure Blue #3 - return | Control 3 |

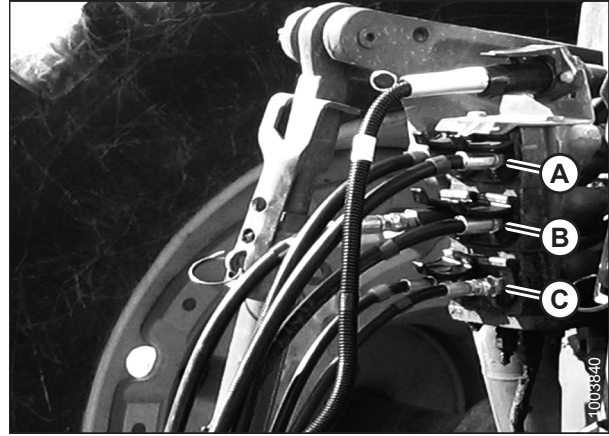


Figure 5.15: Hydraulic Connections

1. Connect the lift cylinder hose (red collar with #1) to the tractor’s hydraulic receptacle. Connect the second hose (blue collar with #1) only when the transport is installed. Refer to Table 5.4, page 106 to confirm the system is functioning correctly.

2. Connect the two hitch swing cylinder hoses (collars with #2) to the tractor hydraulic receptacles. Refer to Table 5.5, page 106 to confirm the system is functioning correctly.

3. For machines with hydraulic center-link only, connect the two tilt cylinder hoses (collars with #3) to the tractor hydraulic receptacles. Refer to Table 5.6, page 106 to confirm the system is functioning correctly.

Table 5.4 Lift System

| Control Lever Position | Cylinder Movement | Rotary Disc Pull-Type Movement |
|------------------------|-------------------|--------------------------------|
| Forward | Retract | Lower |
| Backward | Extend | Raise |

Table 5.5 Hitch Swing and Transport System

| Control Lever Position | Cylinder Movement | Rotary Disc Pull-Type Direction |
|------------------------|-------------------|---------------------------------|
| Forward | Extend | Right |
| Backward | Retract | Left |

Table 5.6 Tilt System

| Control Lever Position | Cylinder Movement | Rotary Disc Pull-Type Movement |
|------------------------|-------------------|--------------------------------|
| Forward | Retract | Lower |
| Backward | Extend | Raise |

2. Available with hydraulic tilt option installed.

5.3.4 Connecting Electrical Wiring Harness

The electrical wiring harness allows the tractor to control the pull-type's electrical components.

1. Ensure that pin #4 (A) in the tractor receptacle is **NOT** continuously energized (for instructions, 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 rotary disc pull-type brake lights.

2. Connect rotary disc pull-type 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).

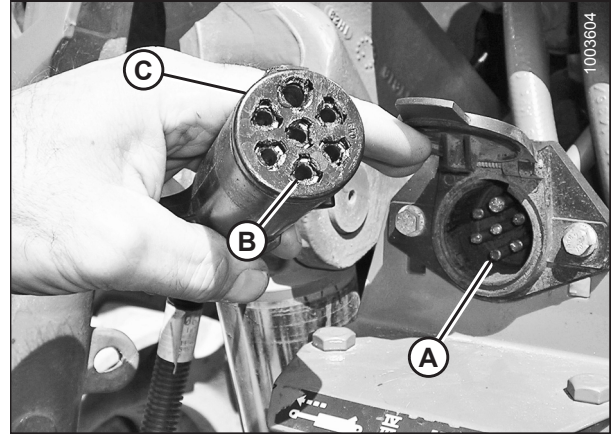


Figure 5.16: Electrical Wiring Harness and Receptacle

Chapter 6: Completing Rotary Disc Pull-Type Assembly

6.1 Installing Field Wheels

The pull-type rolls on the field wheels when in the field position. When transport is deployed (if equipped), field wheels are raised off the road.

1. Remove shipping strap (B) from wheel spindle (A). Repeat on opposite side.

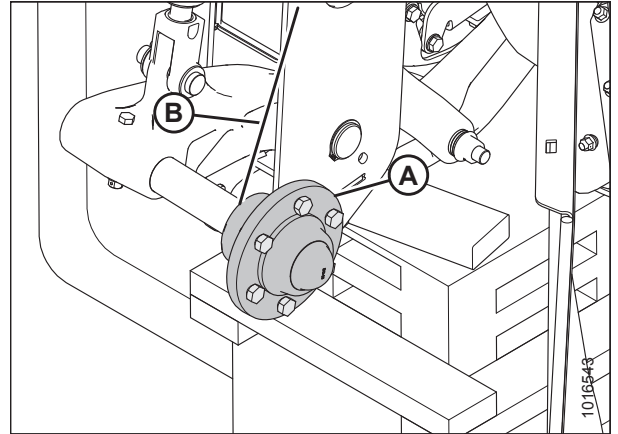


Figure 6.1: Wheel Spindle

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

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.

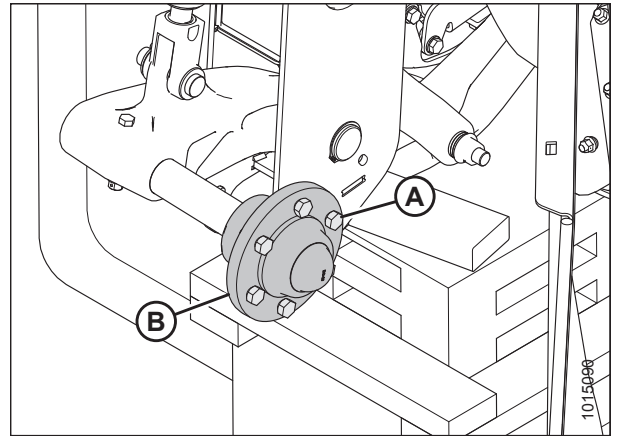


Figure 6.2: Wheel Spindle

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

IMPORTANT:

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

NOTE:

Field wheels must be installed inboard on carrier frame.

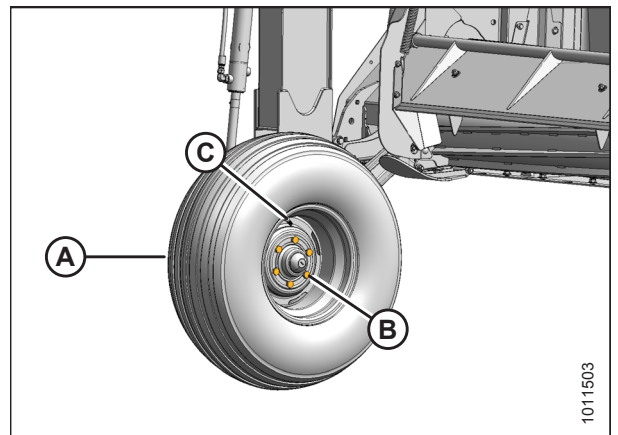


Figure 6.3: Installing Wheel Bolts

COMPLETING ROTARY DISC PULL-TYPE ASSEMBLY

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

IMPORTANT:

Whenever a wheel is installed, check torque after 1 hour of operation.

5. Check tire pressure and adjust as required. For instructions, refer to [8.2 Checking Tire Pressure, page 138](#).

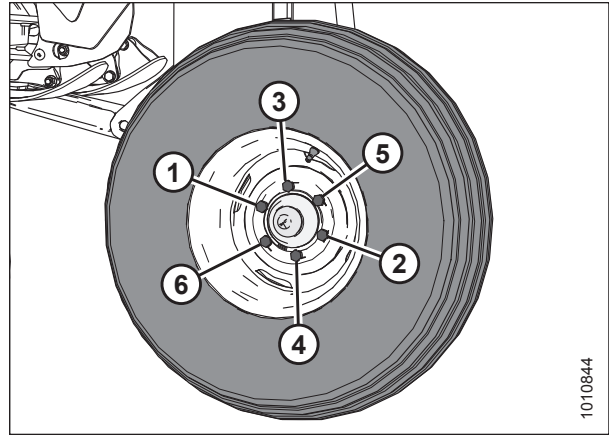


Figure 6.4: Tightening Sequence

6.2 Priming the Hitch Swing Cylinder

The hitch swing cylinder must be primed before it is connected to the rear arm link.

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



Figure 6.5: Remote Control

COMPLETING ROTARY DISC PULL-TYPE ASSEMBLY

NOTE:

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

2. With the cylinder disconnected from the rear arm link, using the tractor's hydraulics, extend and retract swing cylinder (A) several times to purge any air in the cylinder.

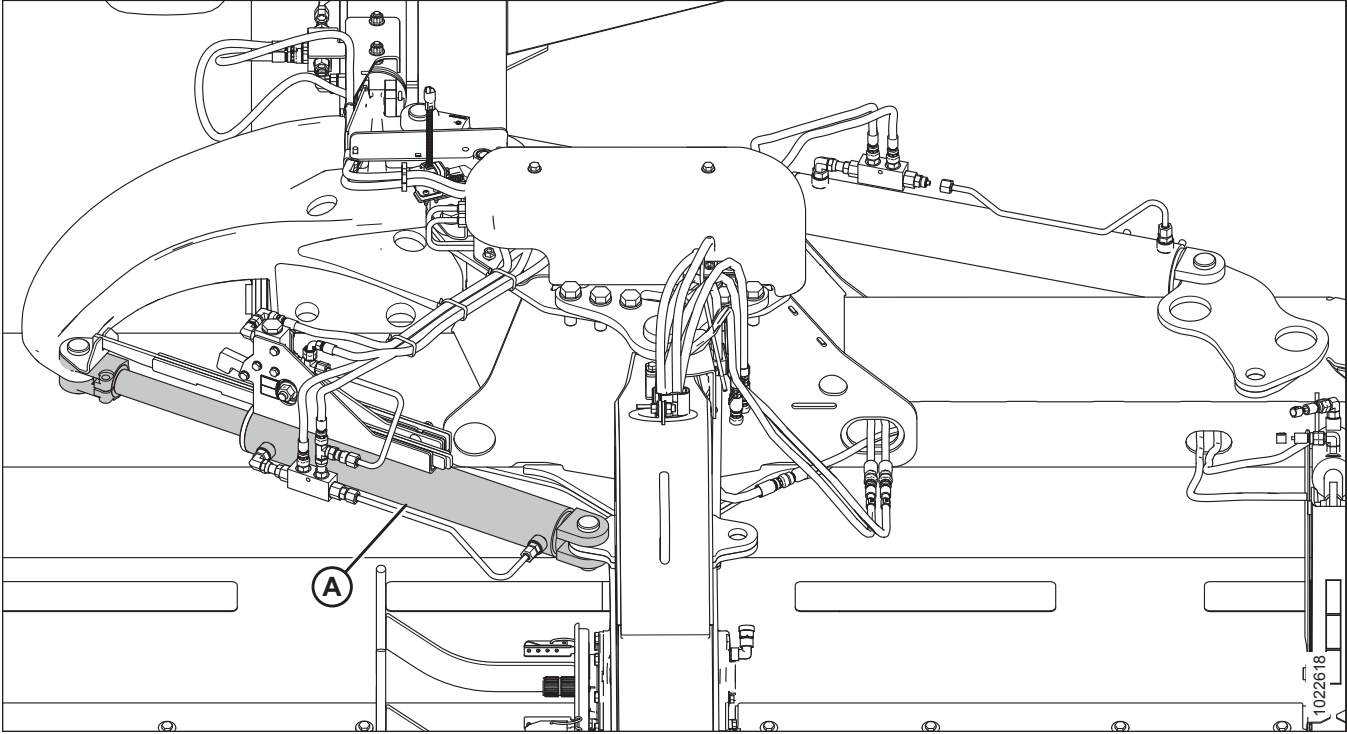


Figure 6.6: Hydraulic System

3. Align the clevis pinholes in cylinder clevis (B), cam arm (C), and rear link arm (A).
4. Install clevis pin (D) and secure with cotter pin (E) (not shown).

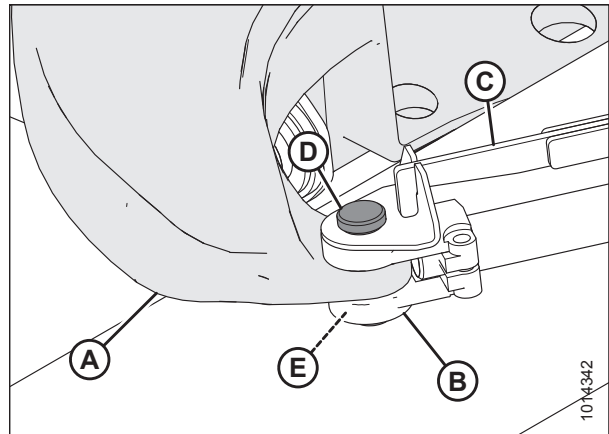


Figure 6.7: Rear Arm Link

6.3 Installing Transport Wheels – Factory-Installed Transport

The pull-type rolls on the transport wheels when the transport is deployed into road mode. They are also used to convert the pull-type between field and road mode.

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

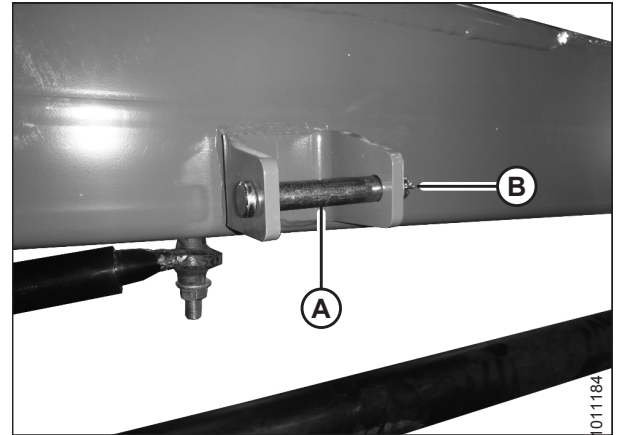


Figure 6.8: Latch Pin

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

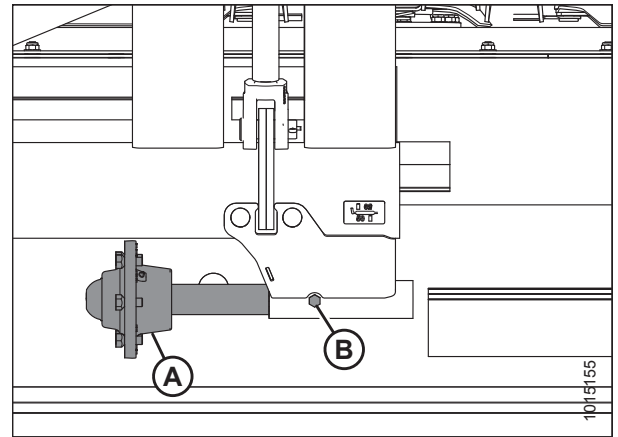


Figure 6.9: Axle Assembly Relocation

4. Install axle assembly (A) into the opposite side of the support as shown.
5. Install bolt (B) and nut to secure it. Torque nut to 68 Nm (50 lbf-ft).
6. Remove wheel bolts from hub (A).

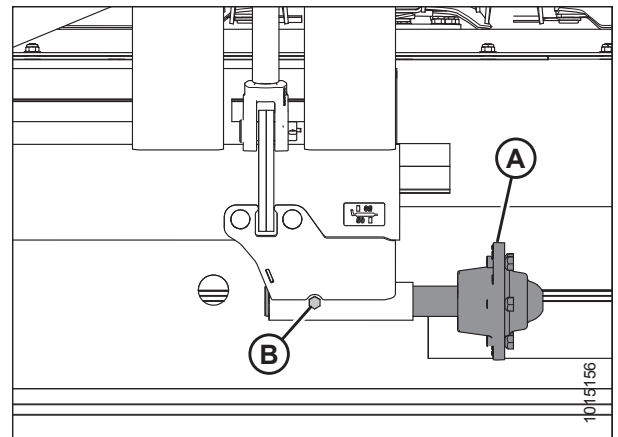


Figure 6.10: Axle Assembly Relocation

COMPLETING ROTARY DISC PULL-TYPE ASSEMBLY

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

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.



Figure 6.11: Transport Remote Control

- Retrieve transport wheels and install wheels with wheel bolts. Ensure valve stem faces outboard. Do **NOT** fully tighten bolts.
- Lower wheels to the ground.
- Torque wheel bolts to 160 Nm (120 lbf-ft) following the tightening sequence shown.

IMPORTANT:

Whenever a wheel is installed, check torque after 1 hour of operation.

- Check tire pressure and adjust as required. For instructions, refer to [8.2 Checking Tire Pressure, page 138](#).

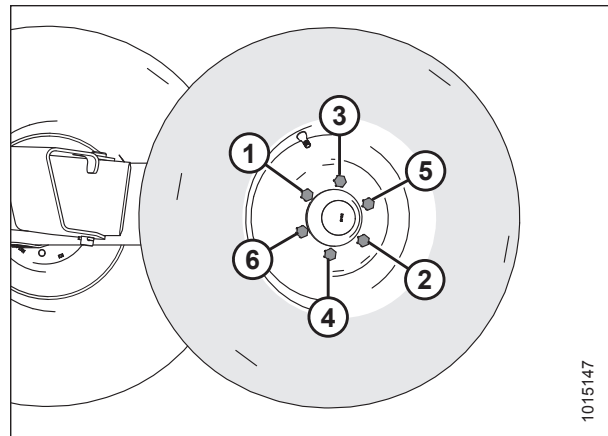


Figure 6.12: Tightening Sequence

6.4 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, refer to [6.4.1 Setting up Forming Shields for Finger Conditioner, page 115](#).

If a roll conditioner is installed, refer to [6.4.2 Setting up Forming Shields for Roll Conditioner, page 120](#).

If no conditioner is installed, refer to [6.6 Discharge Shield – No Conditioner, page 123](#).

6.4.1 Setting up Forming Shields for Finger Conditioner

On a machine equipped with a finger conditioner, the shields provide an enclosure for the fingers to flail the crop and control distribution onto the field.

NOTE:

Transport not shown in illustrations for clarity.

1. Before setting up the forming shields, convert the header to field mode. For instructions, refer to [9.2.2 Converting from Transport to Field Mode – with Transport, page 175](#).
2. Remove shipping wires (A) securing forming shield covers (B) to pallet.

3. Support shield (C), remove two bolts at locations (A) and (B), and remove the shield.

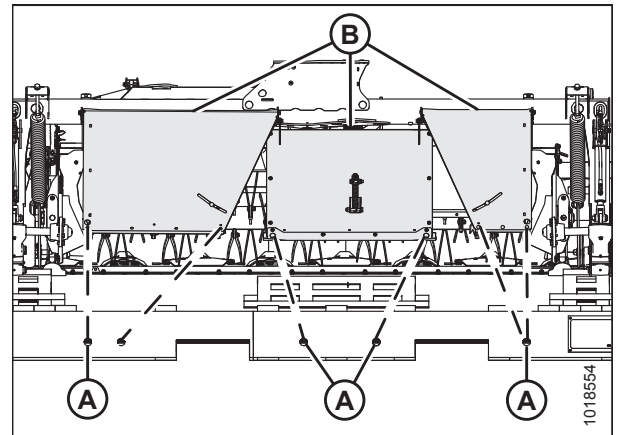


Figure 6.13: Forming Shields Strapped to Pallet

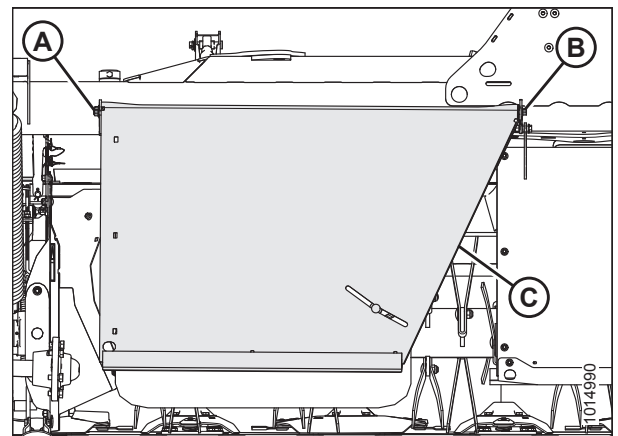


Figure 6.14: Outboard Top Cover

COMPLETING ROTARY DISC PULL-TYPE ASSEMBLY

- Support shield (C), remove the two bolts at locations (A) and (B), and remove the shield.

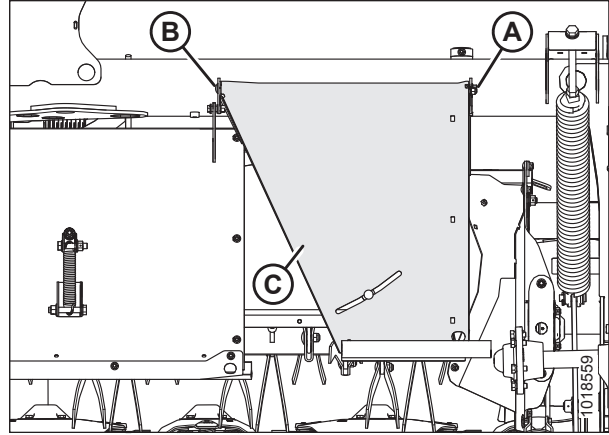


Figure 6.15: Outboard Top Cover

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

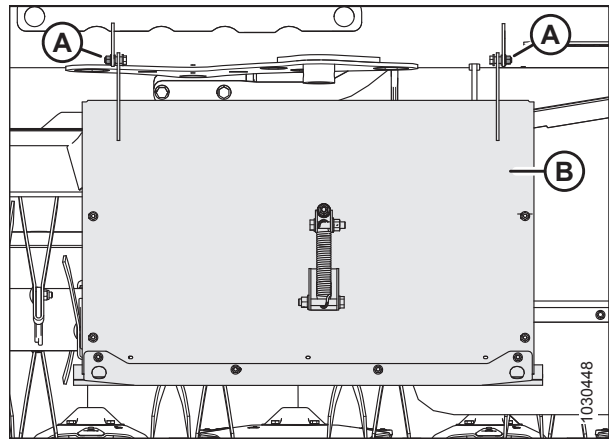


Figure 6.16: Center Shield

- Flip right forming shield over so the adjustment handle is facing up and install it as follows:

NOTE:

If installing the transport system, install shield (A) after transport assembly is in place.

- Position shield (A) onto hex head bolt (B). Loosely install nut to hold shield in place.
- Install carriage bolts (C) with heads facing towards center of shield. Install nuts on bolts (C).
- Tighten nuts on bolts (B) and (C).
- Repeat for the left forming shield.

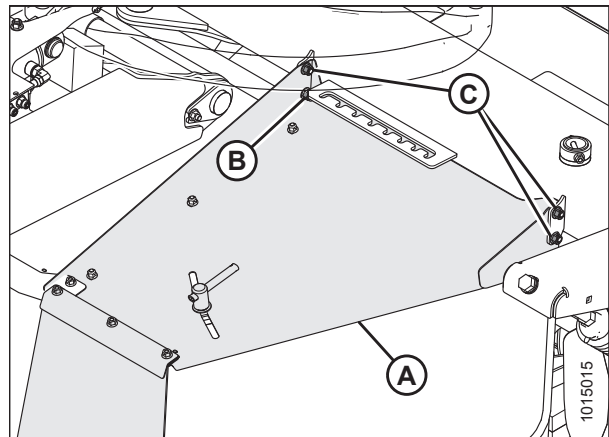


Figure 6.17: Forming Shield – Right Side

COMPLETING ROTARY DISC PULL-TYPE ASSEMBLY

IMPORTANT:

For rotary disc pull-types without the transport system, proceed to Step 9, page 117.

7. Remove nut, bolt, and washer (A) securing spring assembly (B) onto the center shield. Retain nut, bolt, and washer for attaching to transport.

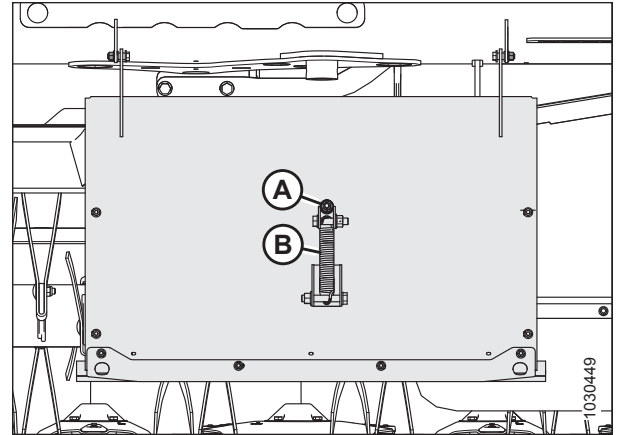


Figure 6.18: Spring on Center Shield

8. Lift center shield and attach spring assembly (A) to link bracket (B) on transport with existing bolt, nut, and washer (C) removed in Step 7, page 117.

IMPORTANT:

Do **NOT** bolt center shield to the left and right shields. If the hardware to attach the center shield to side shields is installed, remove it and discard.

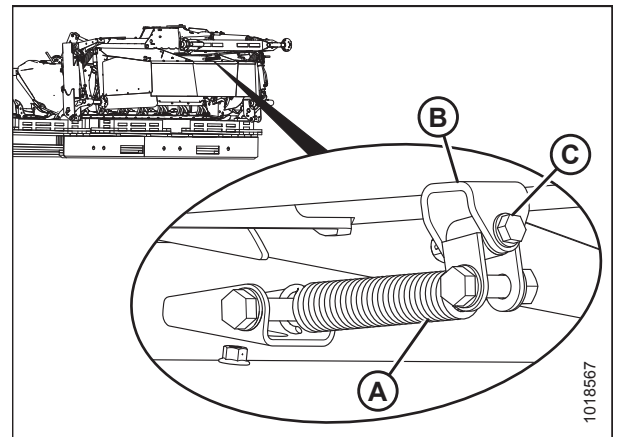


Figure 6.19: Spring Attached to Transport

IMPORTANT:

Only perform this step if **NOT** installing the transport system.

9. Lift center shield (A) and install four M10 x 20 carriage bolts and lock nuts (B) (two per side) to secure center shield (A) to outboard shields (C). Tighten bolts.

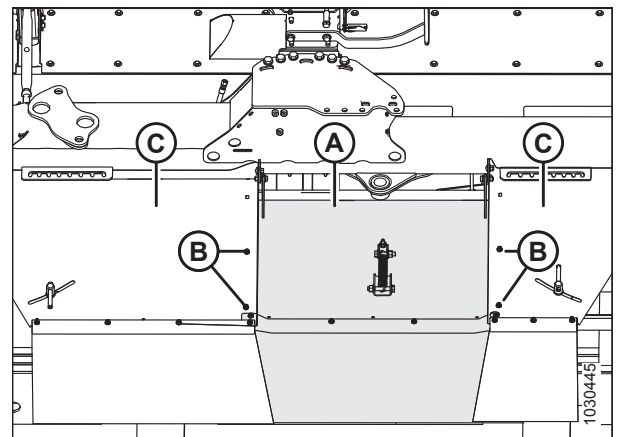


Figure 6.20: Center Cover Assembly

COMPLETING ROTARY DISC PULL-TYPE ASSEMBLY

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

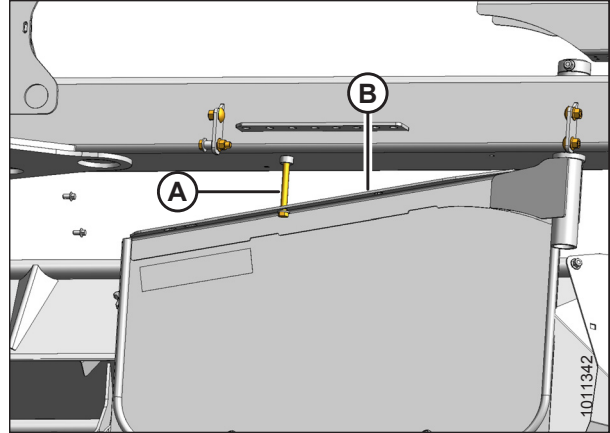


Figure 6.21: Side Deflector Assembly

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

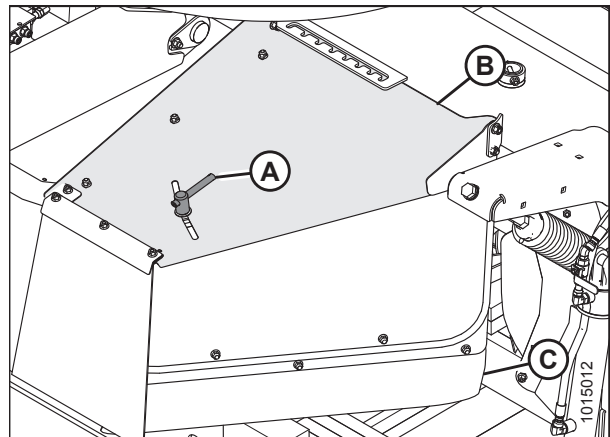


Figure 6.22: Side Deflector Assembly

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

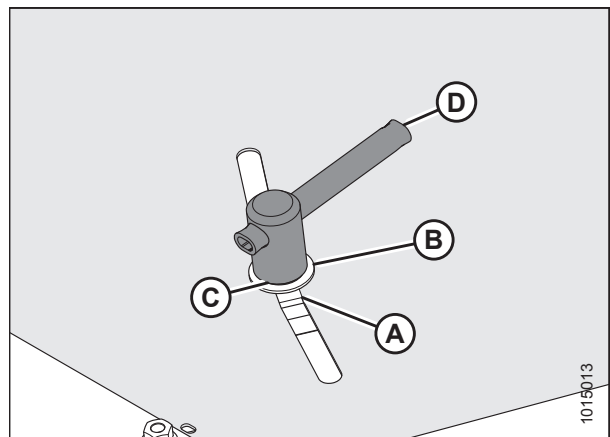


Figure 6.23: Deflector Adjustment

COMPLETING ROTARY DISC PULL-TYPE ASSEMBLY

15. Remove two M10 carriage bolts (B) securing left deflector (A) in shipping position. Repeat for opposite deflector.

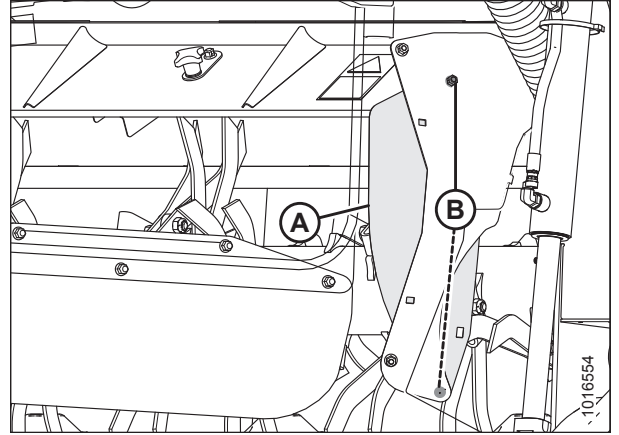


Figure 6.24: Right Deflector Shield Shown – Left Deflector Shield Opposite

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

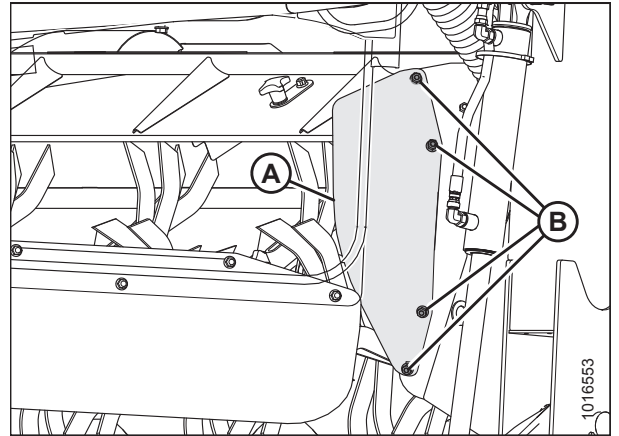


Figure 6.25: Right Deflector Shield Shown – Left Deflector Shield Opposite

17. Remove shipping wires (A) securing curtains (B) to covers (C) and allow curtains to unfold before operating machine.

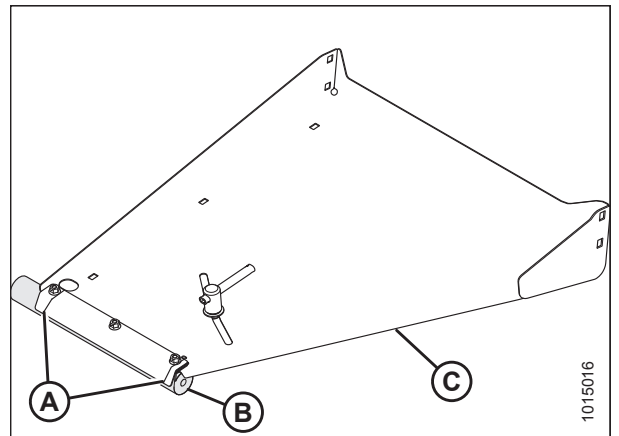


Figure 6.26: Forming Shield Curtain

6.4.2 Setting up Forming Shields for Roll Conditioner

On a machine equipped with a roll conditioner, the forming shields shape and control the distribution of conditioned crop.

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

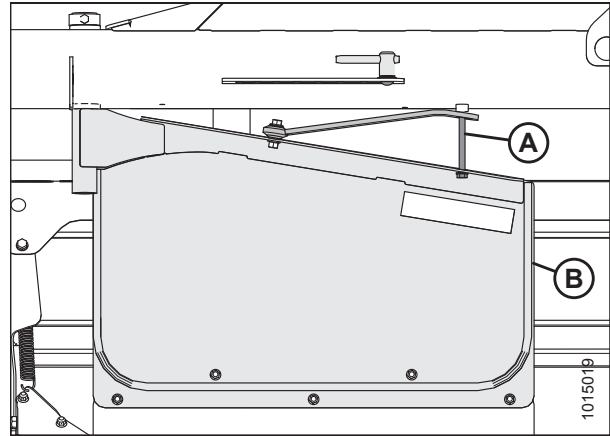


Figure 6.27: Left Forming Shield

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 Steps 1, page 120 to 5, page 120 for opposite shield.

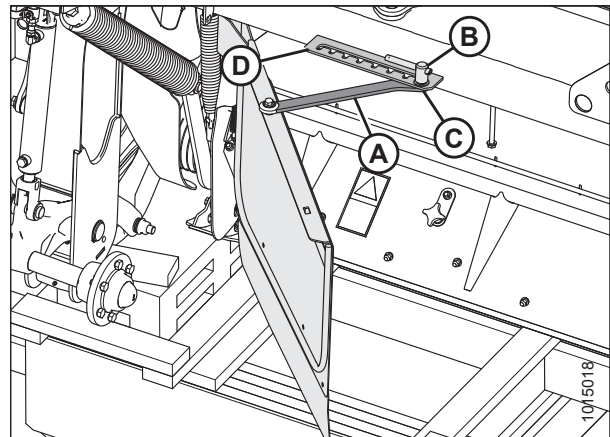


Figure 6.28: Adjuster Bar

6.5 Unpacking Curtains

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

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

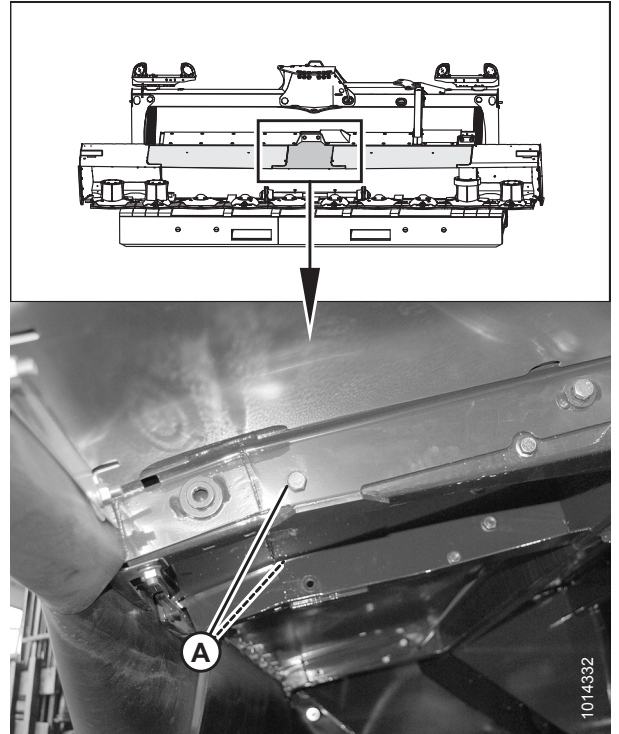


Figure 6.29: Underside of Cutterbar Doors

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

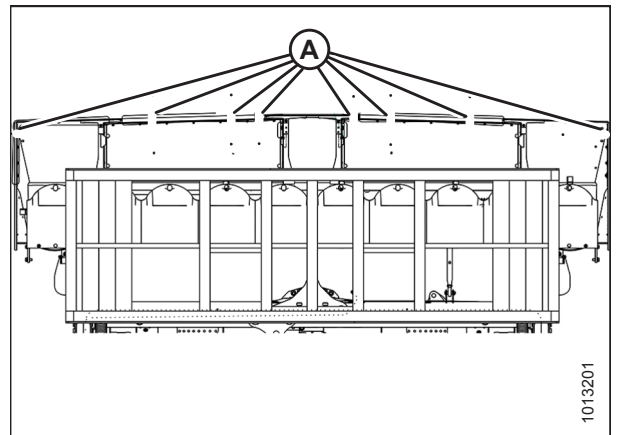


Figure 6.30: Underside of Rotary Disc Pull-Type

COMPLETING ROTARY DISC PULL-TYPE ASSEMBLY

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

NOTE:

Minor creases will eventually straighten out.

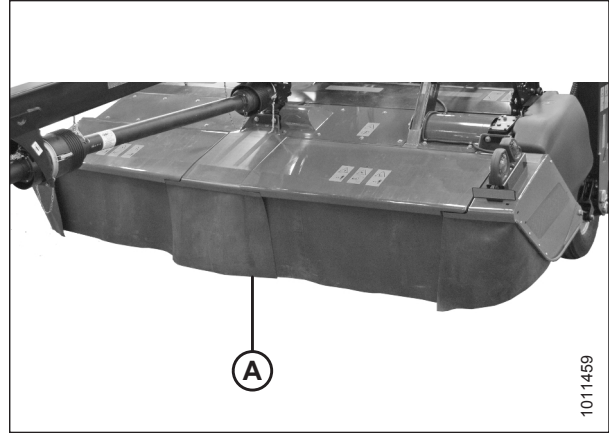


Figure 6.31: Cutterbar Door Curtains

4. If forming shields are installed, straighten forming shield curtains (A) and remove folds or creases.

NOTE:

Minor creases will eventually straighten out.

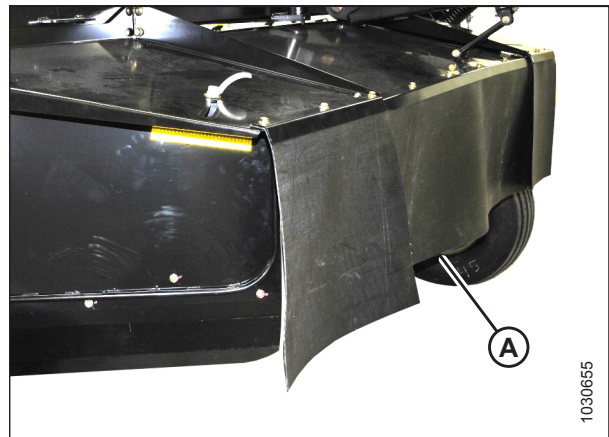


Figure 6.32: Forming Shield Curtains

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

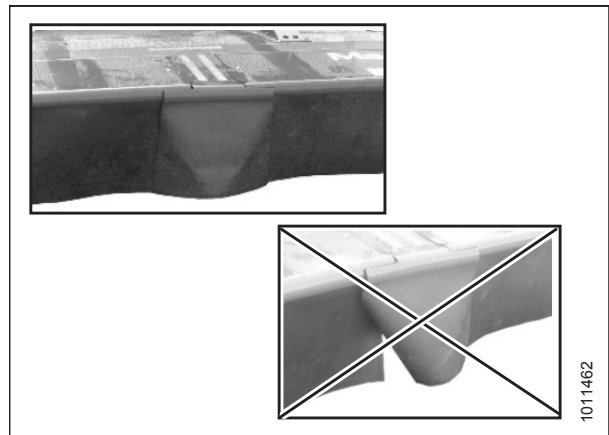


Figure 6.33: Cutterbar Door Curtains

6.6 Discharge Shield – No Conditioner

Discharge shields control the distribution of unconditioned crop when no conditioner is installed.

- If a conditioner is being installed, the discharge shield needs to be removed. For instructions, refer to [6.6.1 Removing Discharge Shield – No Conditioner, page 123](#).
- If a conditioner is being removed, the discharge shield needs to be installed. For instructions, refer to [6.6.2 Installing Discharge Shield – No Conditioner, page 125](#).

6.6.1 Removing Discharge Shield – No Conditioner

Discharge shields may need to be removed for machine service, but a rotary disc pull-type without a conditioner should **NOT** be operated without the discharge shield.

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

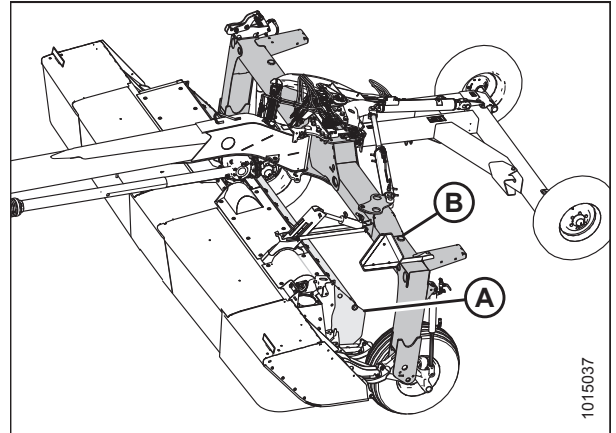


Figure 6.34: Rotary Disc Pull-Type with Transport

2. Close lift cylinder lock-out valves (A) on both sides of the rotary disc pull-type. Valve handles should be in the closed position (90° angle to the hose).

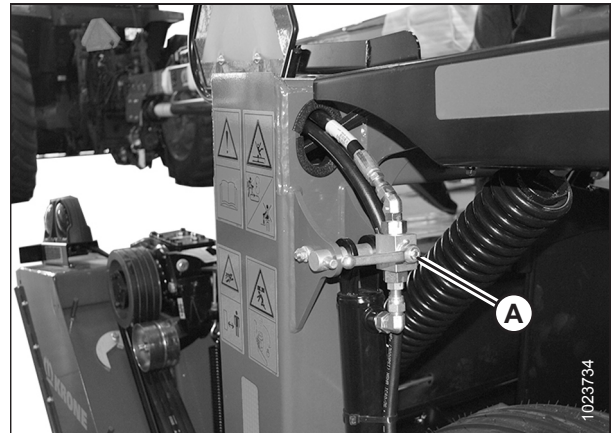


Figure 6.35: Lift Cylinder Lock-Out Valves

COMPLETING ROTARY DISC PULL-TYPE ASSEMBLY

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

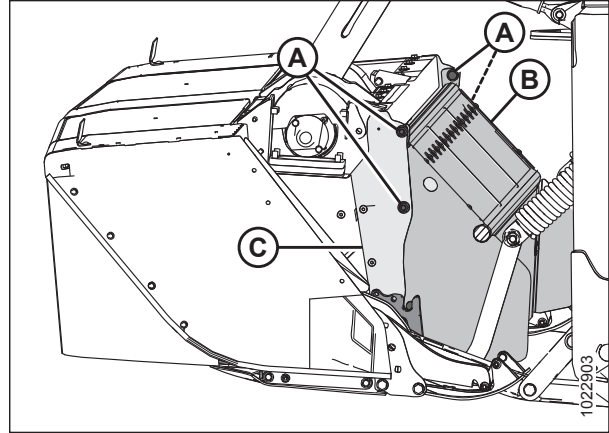


Figure 6.36: Header – View from Left

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

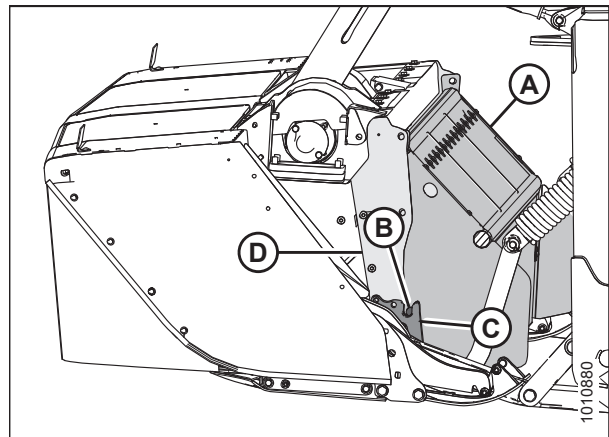


Figure 6.37: Header – View from Left

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

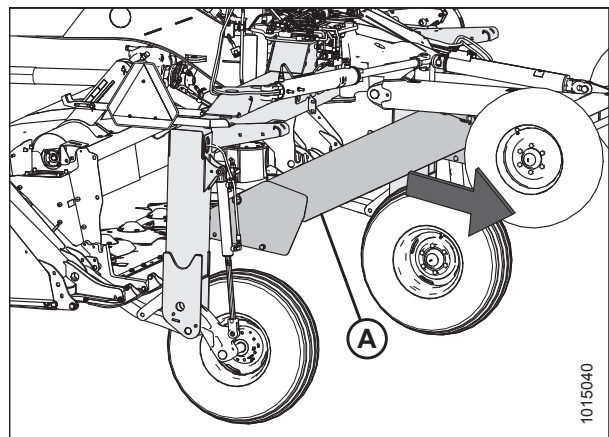


Figure 6.38: Shield Rotated

6.6.2 Installing Discharge Shield – No Conditioner

Discharge shields may need to be removed for machine service, but a rotary disc pull-type without a conditioner should **NOT** be operated without the discharge shield.

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

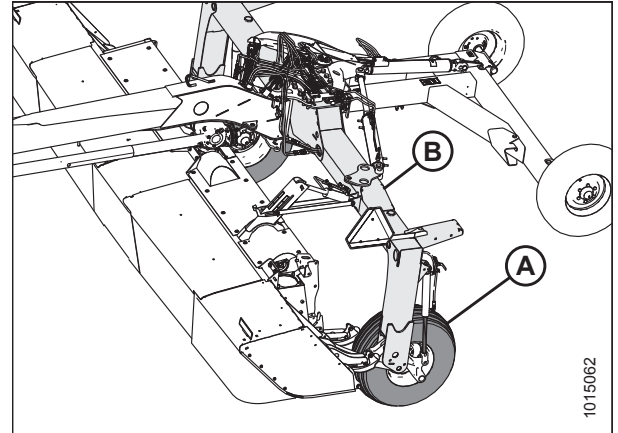


Figure 6.39: Rotary Disc Pull-Type with Transport

2. Close lift cylinder lock-out valves (A) on both sides of the rotary disc pull-type. Valve handles should be in the closed position (90° angle to the hose).

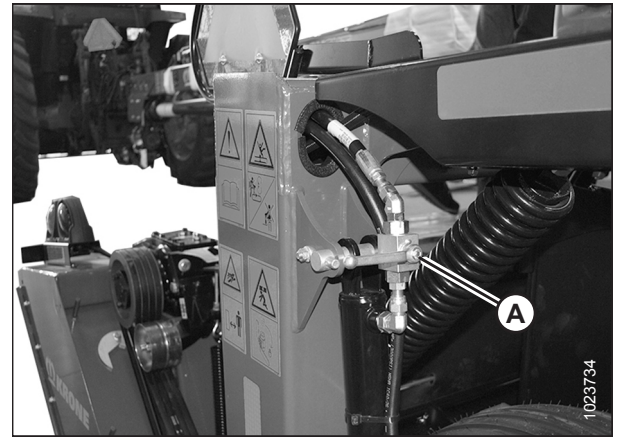


Figure 6.40: Lift Cylinder Lock-Out Valves – Closed Position

3. Rotate shield (A) and pass it between the field wheels and the carrier frame toward the rotary disc pull-type.

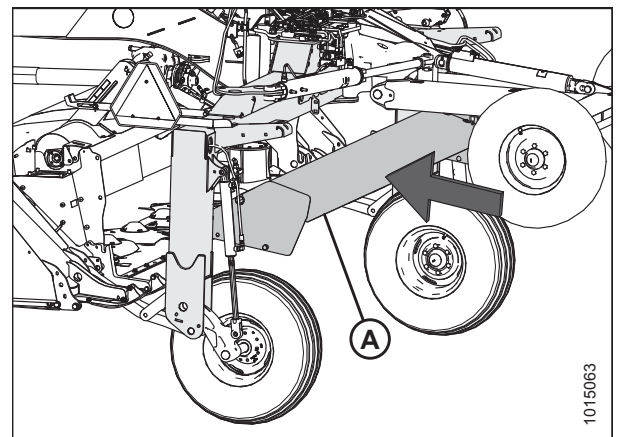


Figure 6.41: Shield Rotated

COMPLETING ROTARY DISC PULL-TYPE ASSEMBLY

4. Position shield (A) so that pins (B) (one on each side) engage the slots in cutterbar support (C) and the bolt holes align with panel (D).

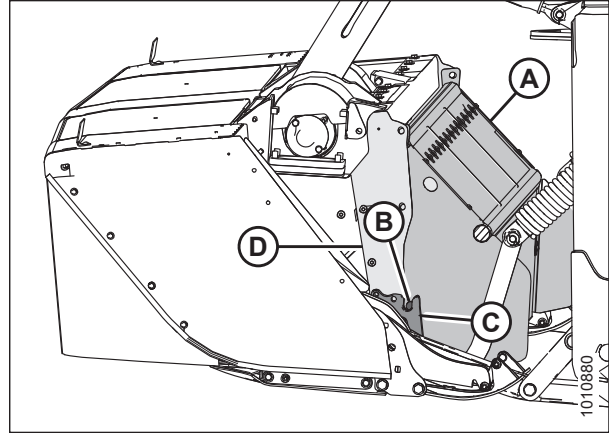


Figure 6.42: Left Side of Header – Right Opposite

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

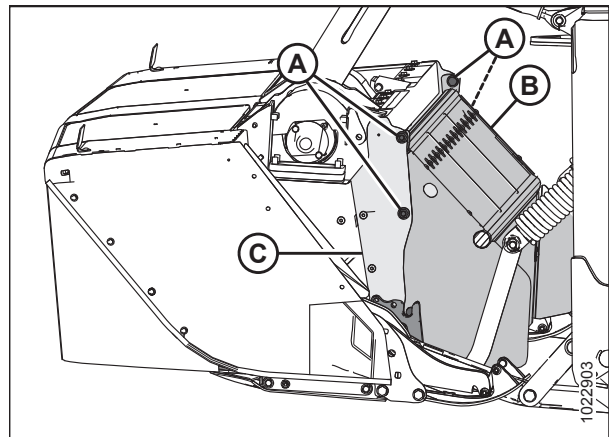


Figure 6.43: Left Side of Header – Right Opposite

6. Open lift cylinder lock-out valves (A) on both sides of the rotary disc pull-type. Valve handles should be in the open position (in line with the hose).

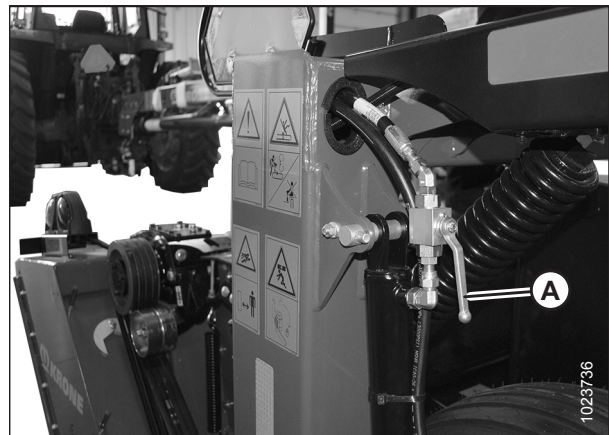


Figure 6.44: Lift Cylinder Lock-Out Valves – Open Position

6.7 Removing Rotary Disc Pull-Type from Shipping Pallet – No Transport Installed

A shipping pallet is strapped to the pull-type and must be removed before delivery to the customer.

NOTE:

If you have the transport system, refer to [6.8 Removing Rotary Disc Pull-Type from Shipping Pallet – Transport Installed](#), [page 128](#) for instructions.

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 rotary disc pull-type high enough that the pallet can be removed.

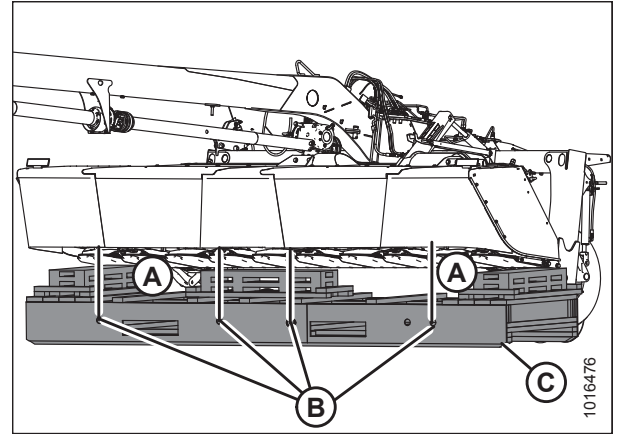


Figure 6.45: Strapping

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

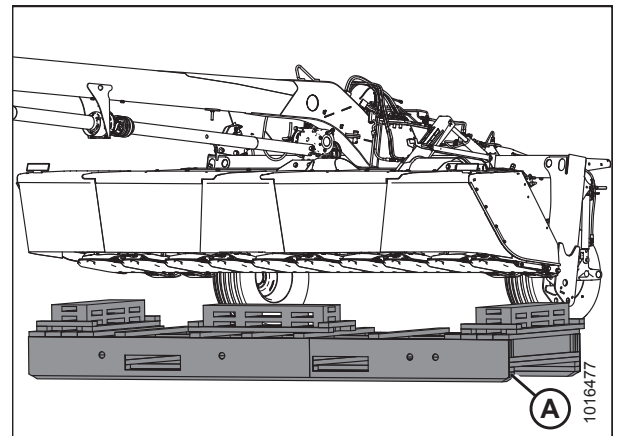


Figure 6.46: Removing Shipping Pallet

6.8 Removing Rotary Disc Pull-Type from Shipping Pallet – Transport Installed

A shipping pallet is strapped to the pull-type and must be removed before delivery to the customer.

1. Cut strapping (B) securing cutterbar to pallet (A).

IMPORTANT:

To prevent the pull-type from dropping, ensure float springs were retensioned after repositioning the center-link top anchor. For instructions, refer to Step 11, page 64 to Step 13, page 64.

2. Use the transport wheels to lift the rotary disc pull-type high enough that the pallet can be removed.

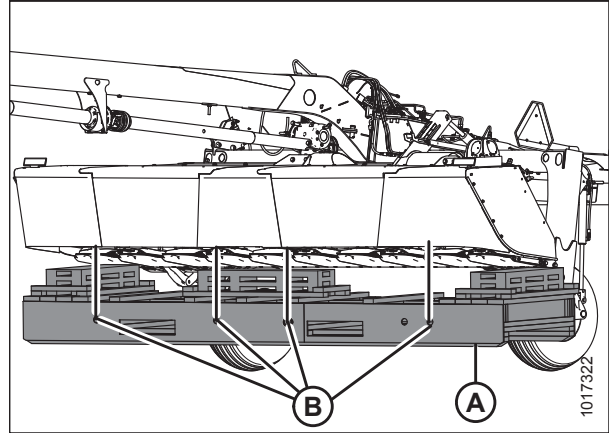


Figure 6.47: Strapping

3. Use a chain or forklift to remove shipping pallet (A) from underneath the rotary disc pull-type.
4. Lower pull-type to the ground.

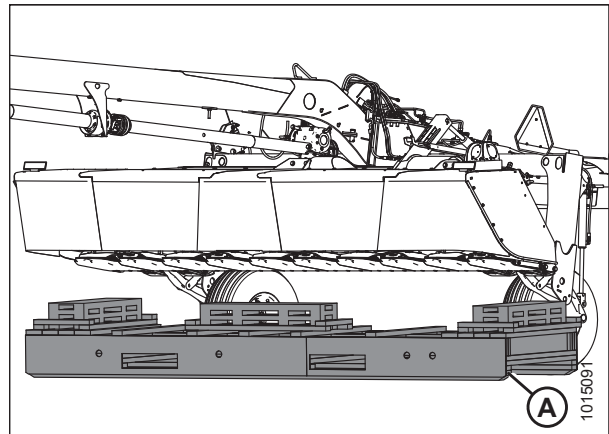


Figure 6.48: Removing Shipping Pallet

Chapter 7: Lubricating the Rotary Disc Pull-Type

The rotary disc pull-type has been lubricated at the factory. However, you should lubricate the rotary disc pull-type prior to delivery to offset the effects of weather during outside storage and transport.

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.

7.1 Opening Driveshields

Driveshields protect people from rotating belts and drives.

WARNING

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

NOTE:

Images shown in this procedure are for the left driveshield—the right driveshield is similar.

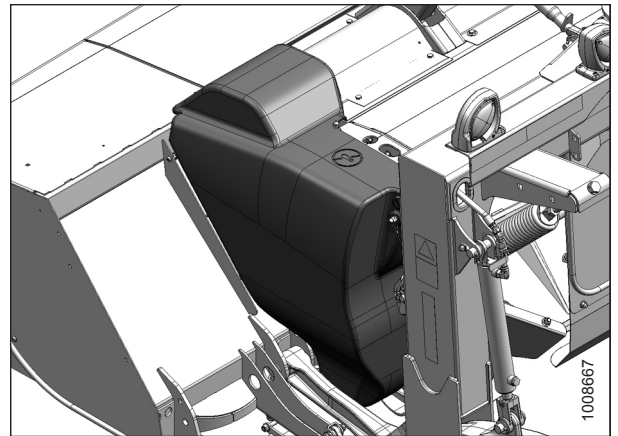


Figure 7.1: Left Driveshield

1. Shut down the engine, and remove the key from the ignition.
2. Remove lynch pin (A) and tool (B) from pin (C).

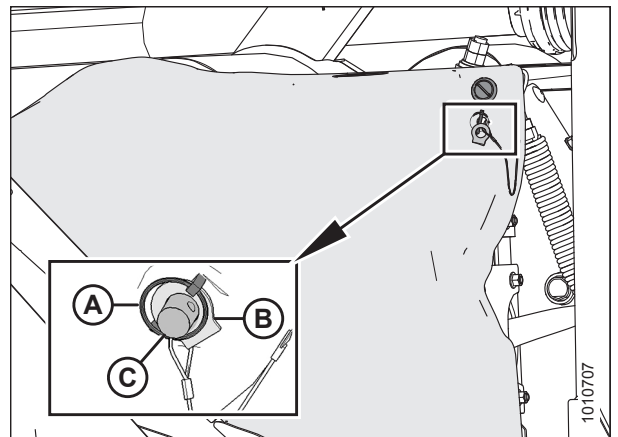


Figure 7.2: Left Driveshield

LUBRICATING THE ROTARY DISC PULL-TYPE

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

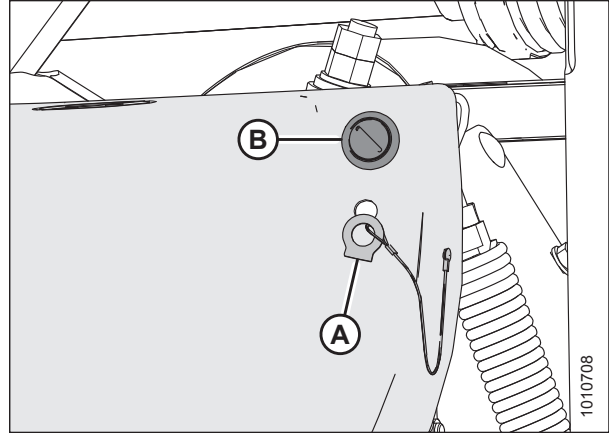


Figure 7.3: Driveshield Latch

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

NOTE:

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

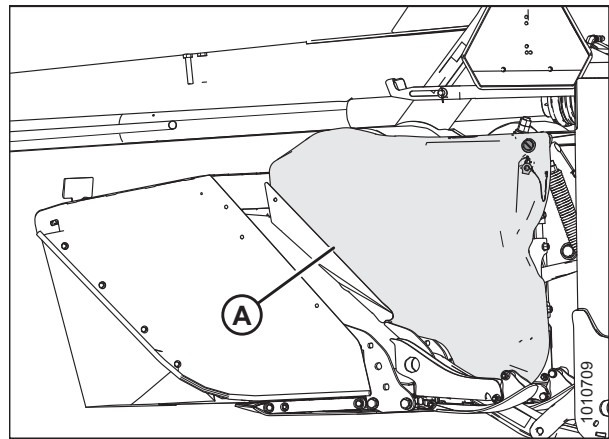


Figure 7.4: Driveshield

7.2 Lubrication Points

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

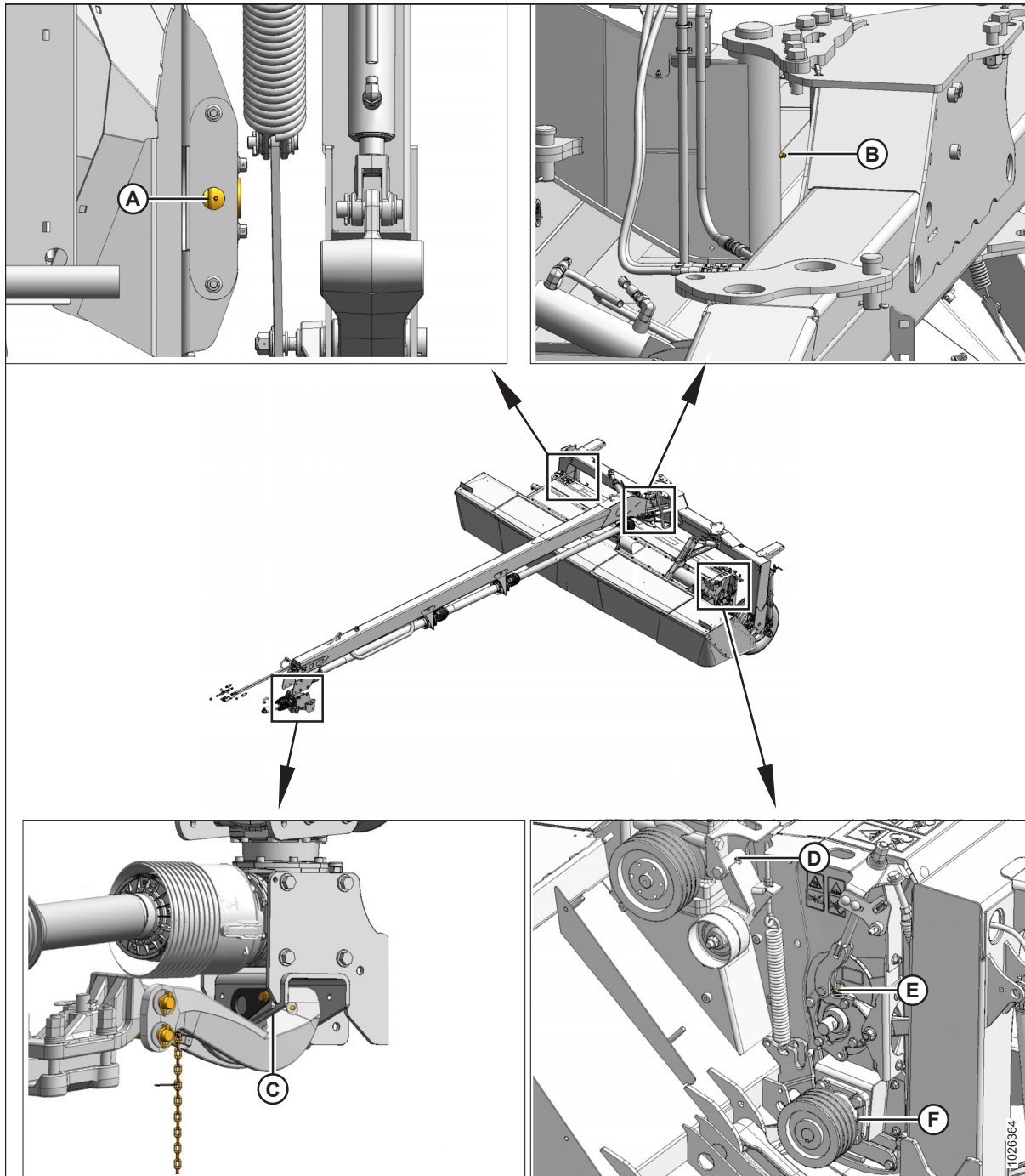


Figure 7.5: Lubrication Points

A - Bearing, Finger Conditioner
D - Idler Pivot

B - Hitch Pivot
E - Bearing, Roller Conditioner

C - Hitch Swivel
F - Bearing, Roller Conditioner

LUBRICATING THE ROTARY DISC PULL-TYPE

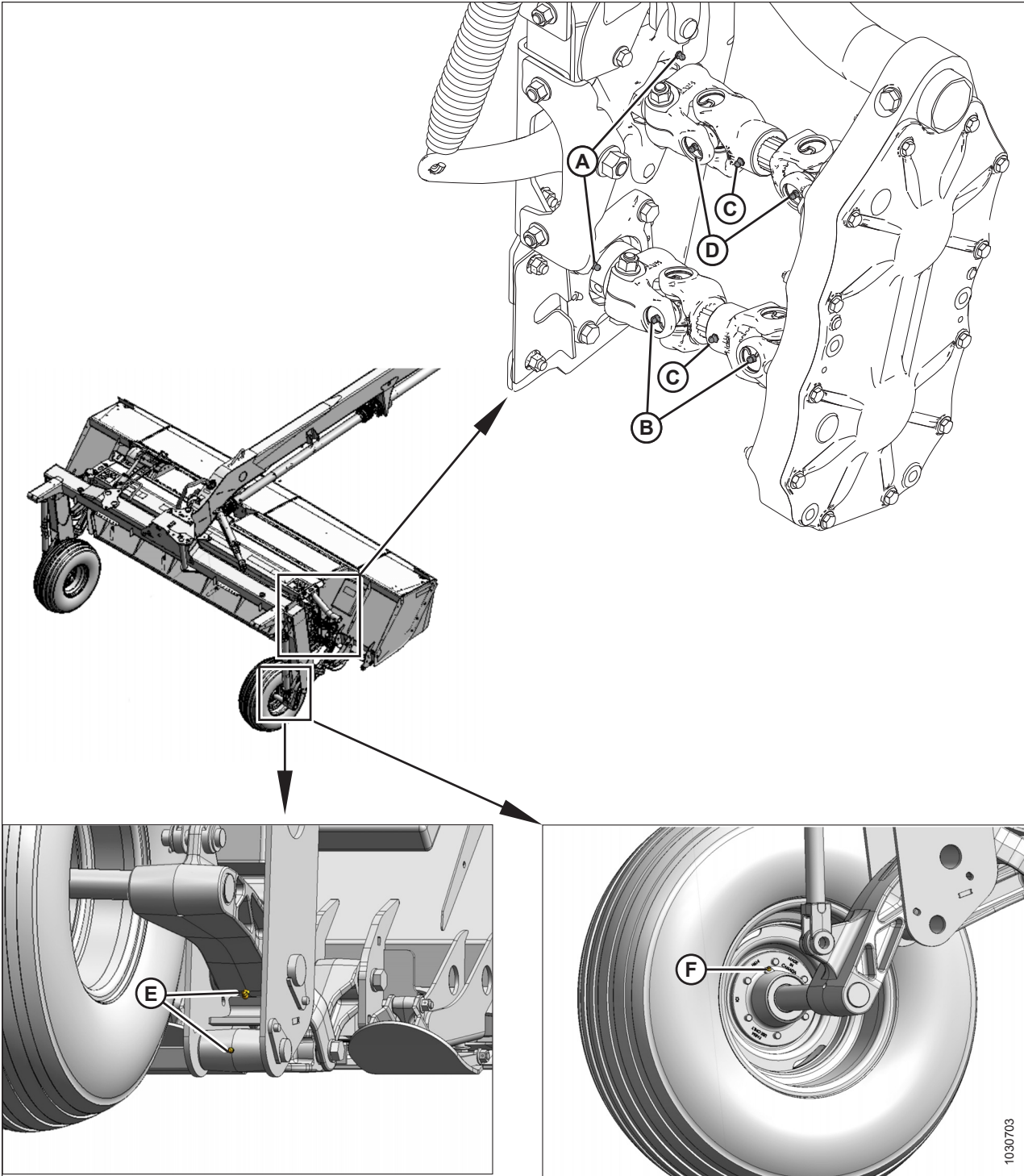


Figure 7.6: Lubrication Points

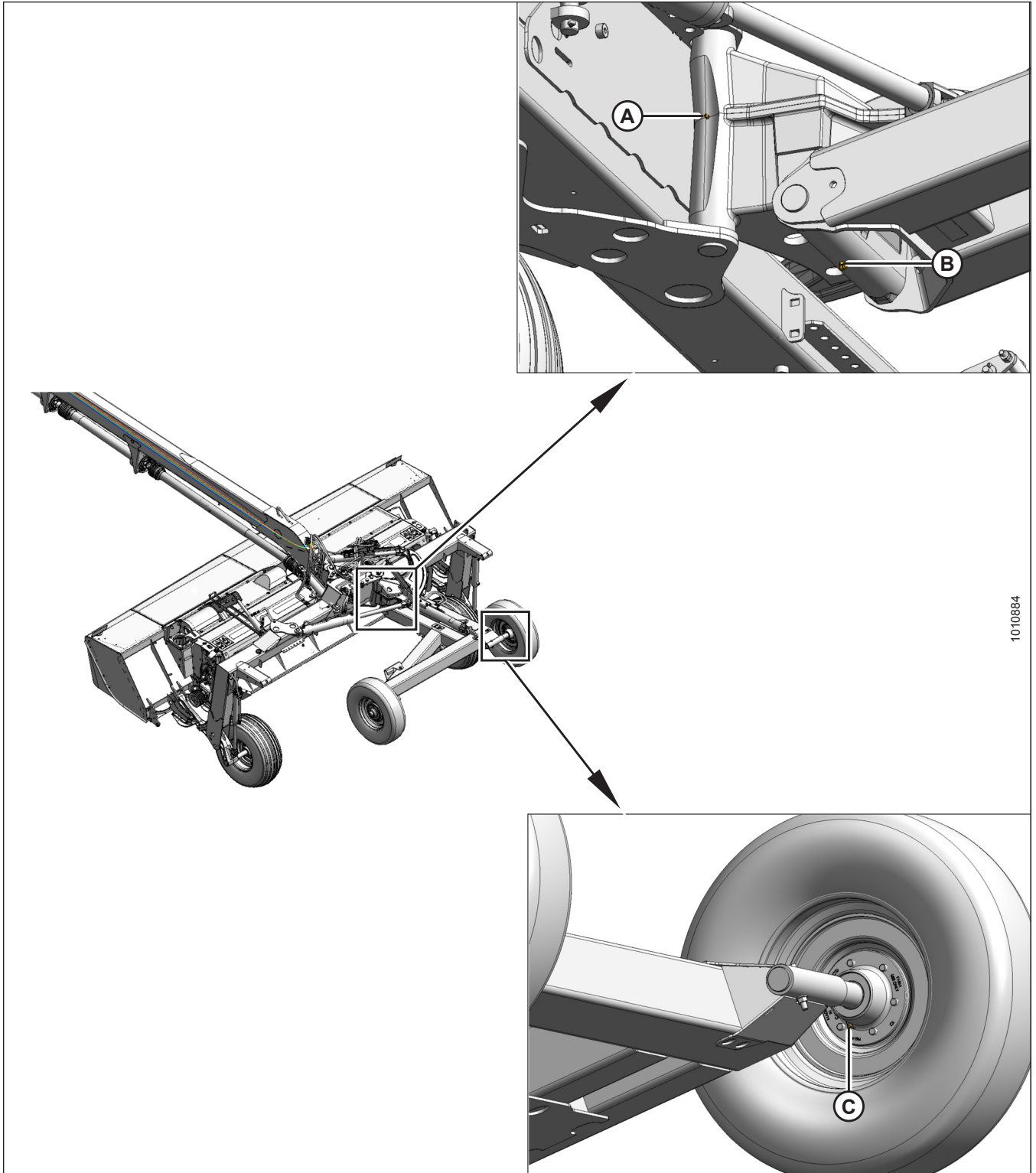
A - Bearings, Roller Conditioner
D - U-Joint, Upper Driveline (Two Places)

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

C - Slip Joints, Conditioner Drivelines³
F - Bearing, Field Wheel (Two Places)

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

LUBRICATING THE ROTARY DISC PULL-TYPE



1010884

Figure 7.7: Lubrication Points

A - Vertical Pivot, Transport

B - Horizontal Pivot, Transport

C - Bearing, Transport Wheel (Two Places)

LUBRICATING THE ROTARY DISC PULL-TYPE

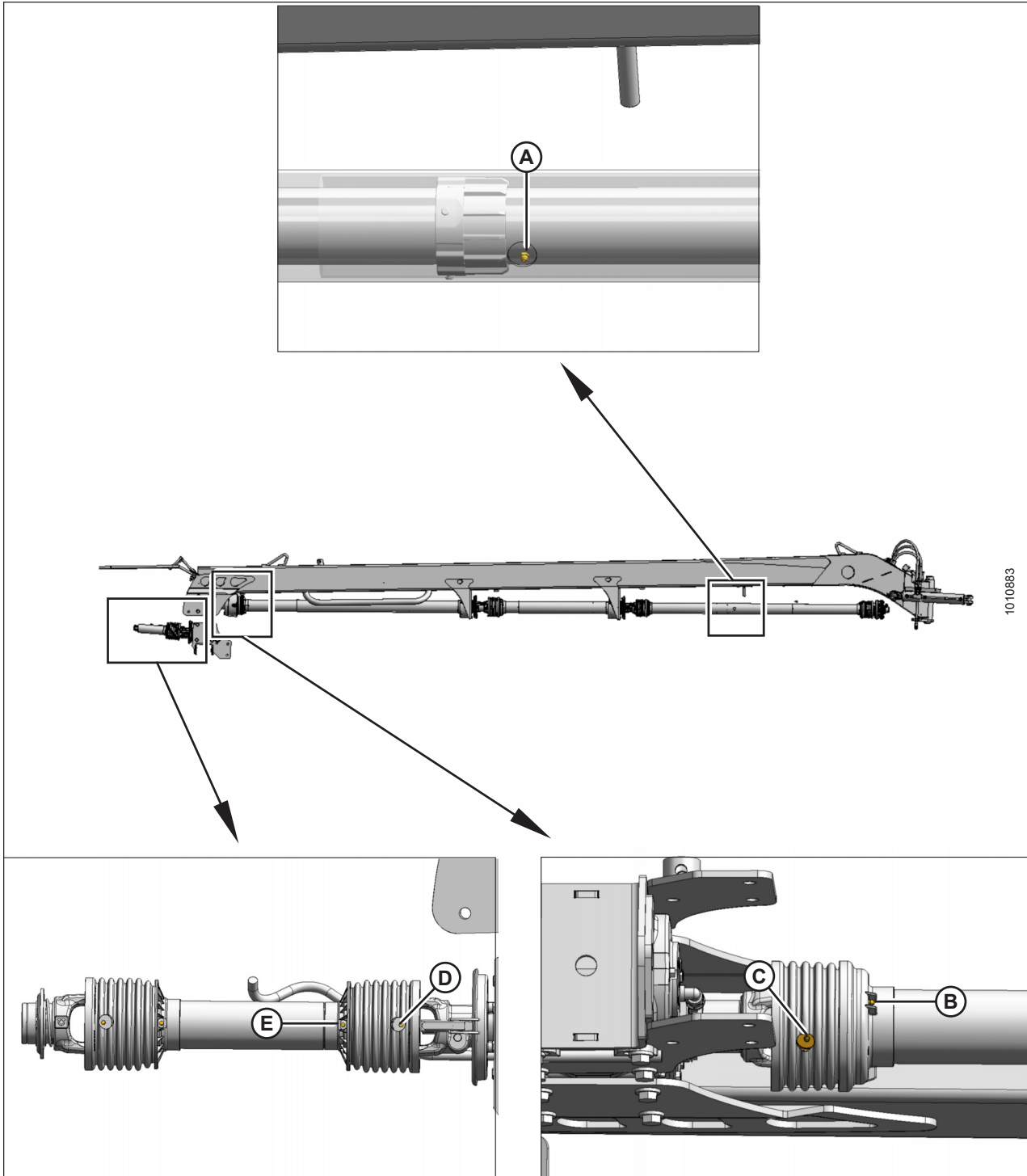


Figure 7.8: Lubrication Points

A - Slip Joint, Drivelines (R113 PT, Two Places) (R116 PT, Three Places)⁴

C - U-Joint, Main Driveline

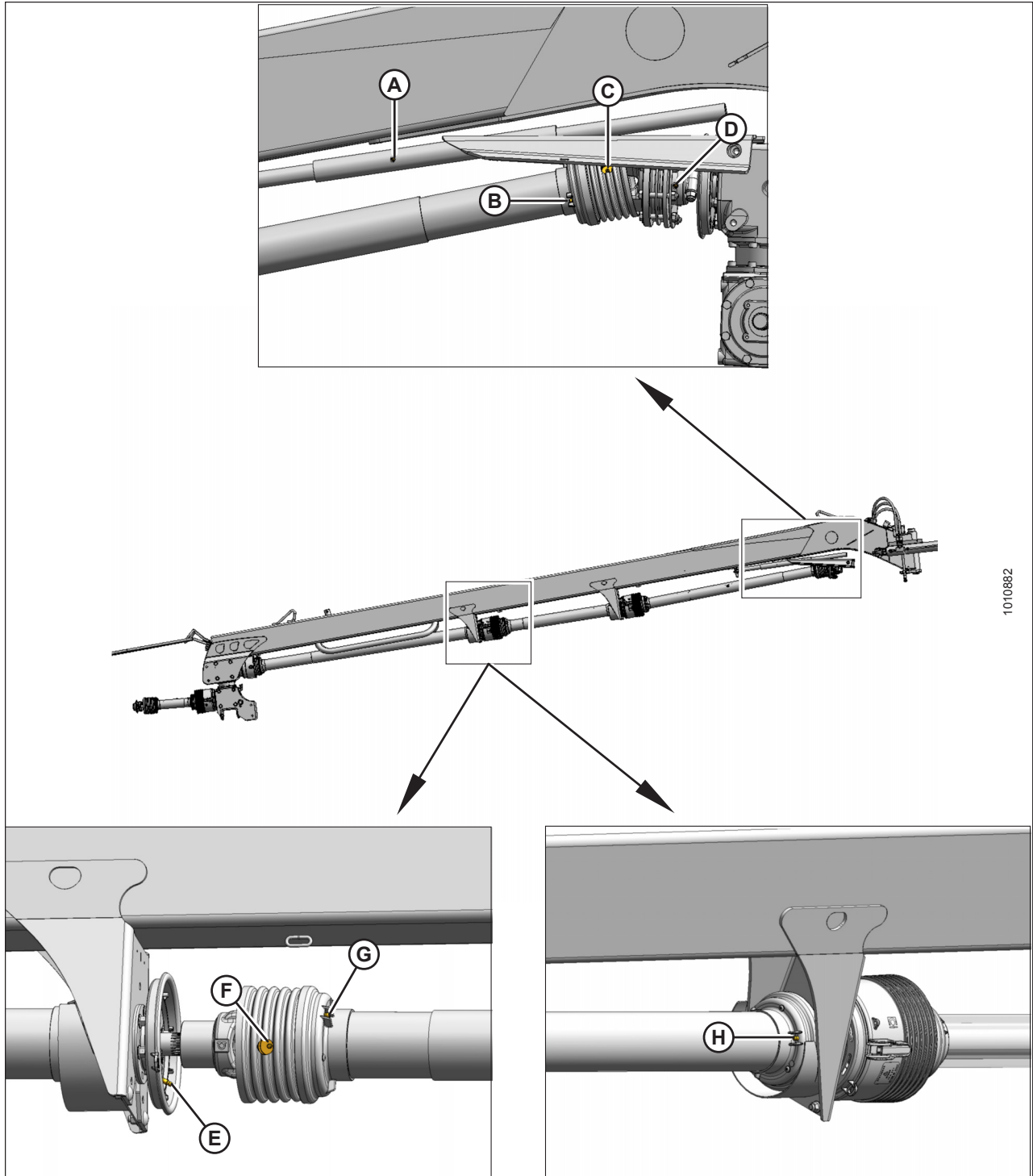
E - Guard, Primary Driveline (Two Places)

B - Guard, Driveline

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

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

LUBRICATING THE ROTARY DISC PULL-TYPE



1010882

Figure 7.9: Lubrication Points

A - Slip Joint, Steering Link

C - U-Joint, Clutch Driveline

E - Bearing, Driveline (R113 PT, One Place) (R116 PT, Two Places)

G - Guard (R113 PT, One Place) (R116 PT, Two Places)

B - Guard, Clutch Driveline

D - Clutch

F - U-Joint, Driveline (R113 PT, One Place) (R116 PT, Two Places)

H - Guard (R113 PT, One Place) (R116 PT, Two Places)

7.3 Closing Driveshields

Driveshields protect people from rotating belts and drives.

WARNING

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

NOTE:

Images shown in this procedure are for the left driveshield—the right driveshield is similar.

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

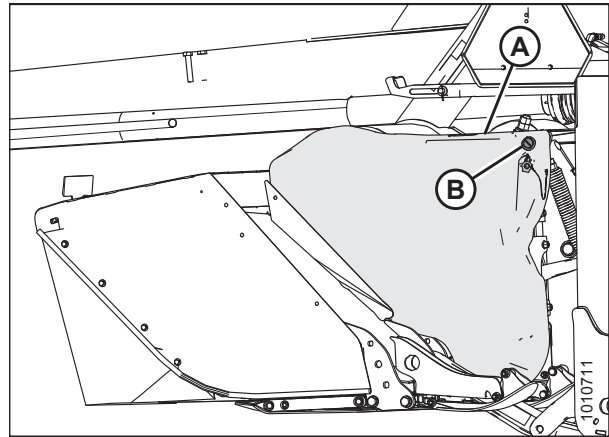


Figure 7.10: Driveshield and Latch

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

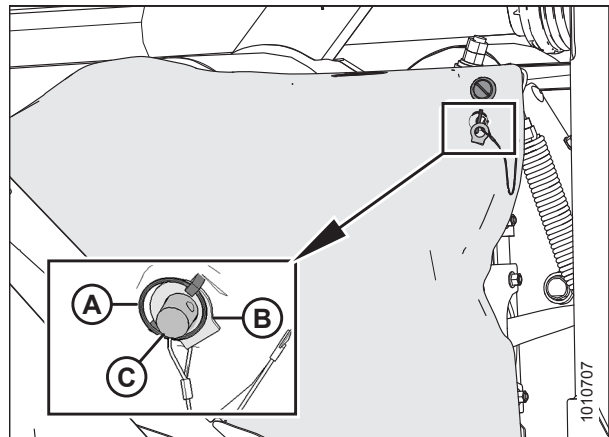


Figure 7.11: Left Driveshield

Chapter 8: Performing Predelivery Checks

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

IMPORTANT:

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

1. Perform the final checks and adjustments as listed on the Predelivery Checklist (yellow sheet inside the back cover of this instruction) to ensure the machine is field-ready. Refer to the following pages for detailed instructions as indicated on the *Predelivery Checklist, page 201*.
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.

8.1 Checking Wheel Bolts

Check wheel bolts on field and optional transport wheels to ensure the required torque.

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. Shut down the engine, and remove the key from the ignition.
2. Torque wheel bolts to 160 Nm (120 lbf-ft) using the tightening sequence shown at right.

IMPORTANT:

Whenever a wheel is installed, check torque after 1 hour of operation.

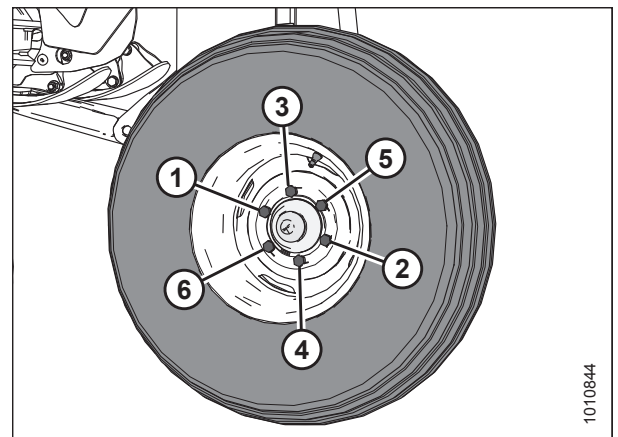


Figure 8.1: Tightening Sequence

8.2 Checking Tire Pressure

Ensure proper inflation of field and optional transport tires.

WARNING

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

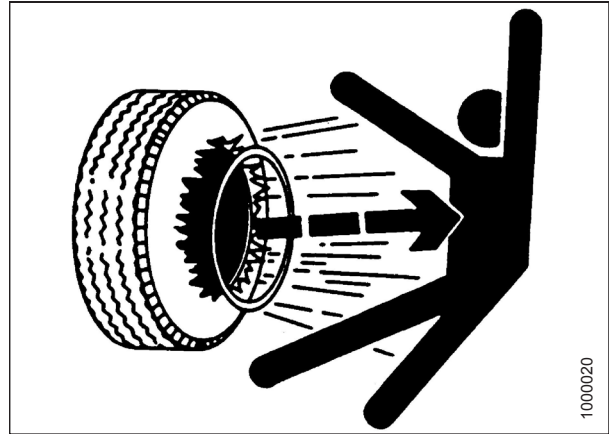


Figure 8.2: Overinflated Tire

Check tire pressure daily:

- Maximum pressure is 310 kPa (45 psi) for field wheels (A).
- Maximum pressure is 552 kPa (80 psi) for optional transport wheels (B).

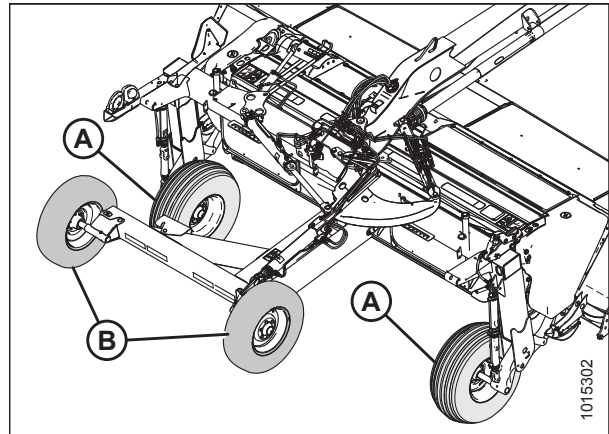


Figure 8.3: Field and Transport Wheels

8.3 Checking Conditioner Drive Belt

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

NOTE:

If no conditioner is installed, proceed to [8.4 Checking Cutting Angle, page 140](#).

1. Open left driveshield. For instructions, refer to [7.1 Opening Driveshields, page 129](#).
2. Check that belt (A) is properly tensioned and positioned on the pulleys. Overall spring length (B) should be 365 mm (14 3/8 in.). If adjustment is required, refer to [8.3.1 Adjusting Conditioner Drive Belt, page 139](#).
3. Check that adjuster nuts (C) are tight.
4. Check that the spring is hooked at the correct location:
 - Hole (D) for roll conditioner
 - Hole (E) for finger conditioner
5. Close driveshield. For instructions, refer to [7.3 Closing Driveshields, page 136](#).

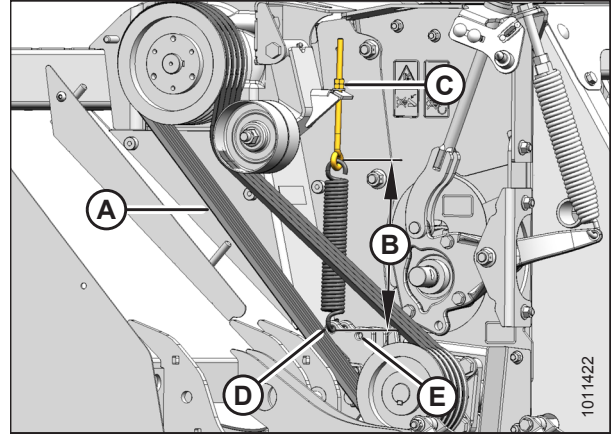


Figure 8.4: Conditioner Drive Belt

8.3.1 Adjusting Conditioner Drive Belt

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

1. Open the left driveshield. For instructions, refer to [7.1 Opening Driveshields, page 129](#).
2. Check that the spring is hooked at the correct location:
 - Hole (A) for roll conditioner
 - Hole (B) for finger conditioner
3. Turn jam nut (C) counterclockwise to unlock tension adjustment.
4. Turn adjuster nut (D) clockwise to increase spring length (tension). To decrease spring length (relax), turn adjuster nut (D) counterclockwise.
5. Set overall spring length (E) to 365 mm (14 3/8 in.).
6. Close driveshield. For instructions, refer to [7.3 Closing Driveshields, page 136](#).

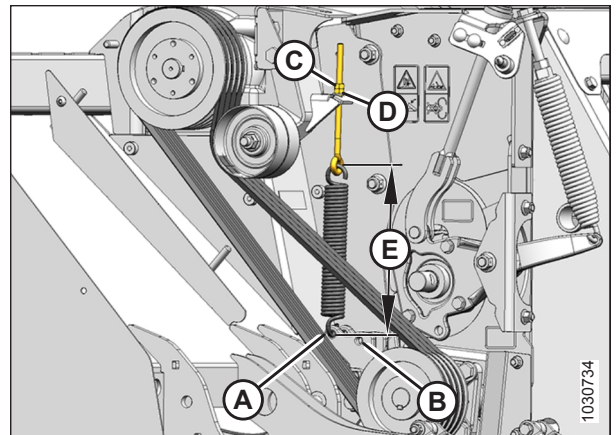


Figure 8.5: Conditioner Drive Belt

8.4 Checking Cutting Angle

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

For a rotary disc pull-type equipped with hydraulic center-link (A), the mid-point for header angle is indicated with indicator bars (B) in the center (orange) of the indicator decal.

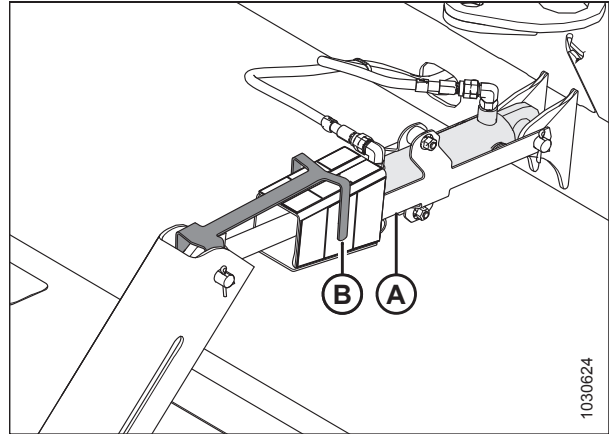


Figure 8.6: Hydraulic Center-Link

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

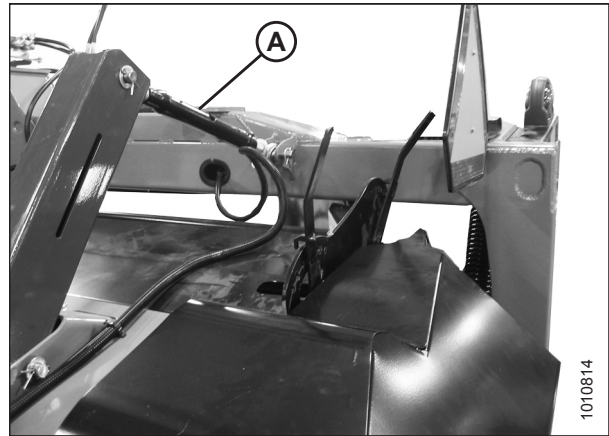


Figure 8.7: Mechanical Center-Link

8.5 Checking Skid Shoes

All skid shoes should be in the same position.

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

NOTE:

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

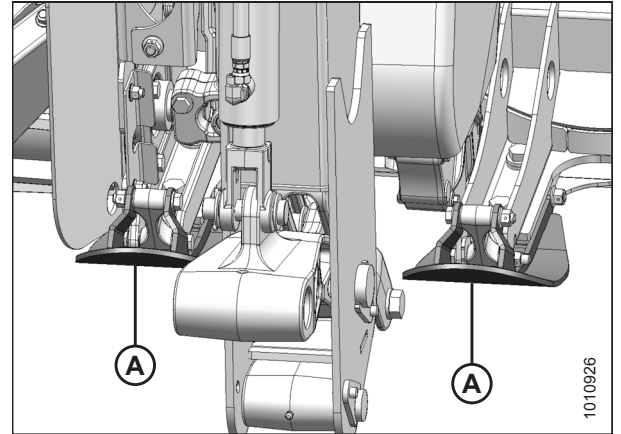


Figure 8.8: Skid Shoes – R116 PT (R113 PT Similar)

8.6 Checking Rotary Disc Pull-Type Float

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

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. Center the rotary disc pull-type directly behind the tractor.
2. Lower the rotary disc pull-type to the ground.
3. Shut down the engine, and remove the key from the ignition.
4. Grasp the front corner of the rotary disc pull-type and lift; the weight should feel approximately like 45 kg (100 lb.) at both ends. If adjustment is required, refer to [8.6.1 Adjusting Float, page 142](#).

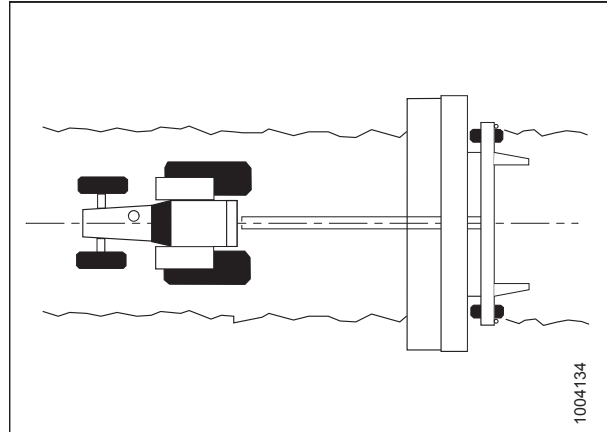


Figure 8.9: Rotary Disc Pull-Type Centered behind the Tractor

8.6.1 Adjusting Float

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

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.

NOTE:

Changes to the rotary disc pull-type operating position can affect the float settings. After adjusting the cutting height or the cutterbar angle, check the float and adjust as necessary.

1. Center the rotary disc pull-type directly behind the tractor and set the cutterbar to an appropriate orientation and tilt for the crop type and cutting conditions. Refer to the rotary disc pull-type operator's manual for the cutterbar angle adjustment.

NOTE:

Ensure skid shoes are in correct position before setting rotary disc pull-type angle, float, and tilt.

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

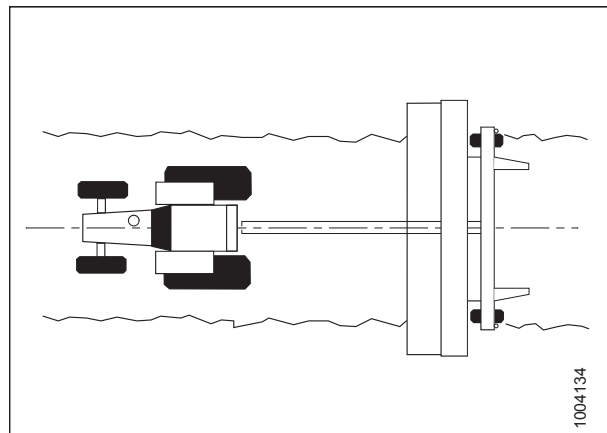


Figure 8.10: Rotary Disc Pull-Type Centered behind Tractor

PERFORMING PREDELIVERY CHECKS

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

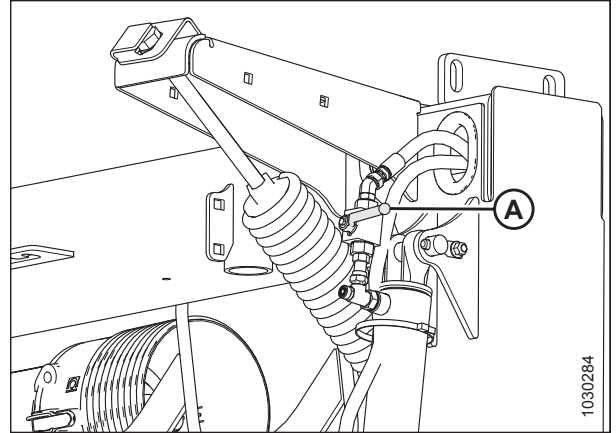


Figure 8.11: Cylinder Lock-Out Valve – Closed Position

5. Loosen retaining bolt (A) and rotate cover plate (B) away from float spring bolt (C). Repeat on opposite side.
6. Fully loosen float spring bolt (C). Repeat on opposite side.

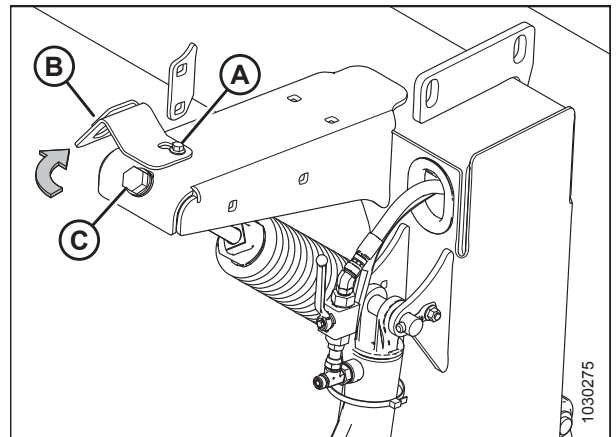


Figure 8.12: Float Spring – Right Side

7. Turn adjuster bolt (A) to achieve the recommended measurement (B) for the conditioner type. Refer to Table 8.1, page 144 for measurements.

NOTE:

Float settings indicated in the table are starting points only. Float force should still be checked with the rotary disc pull-type float and cutting angle set as planned for use in the field.

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

Repeat on opposite side.

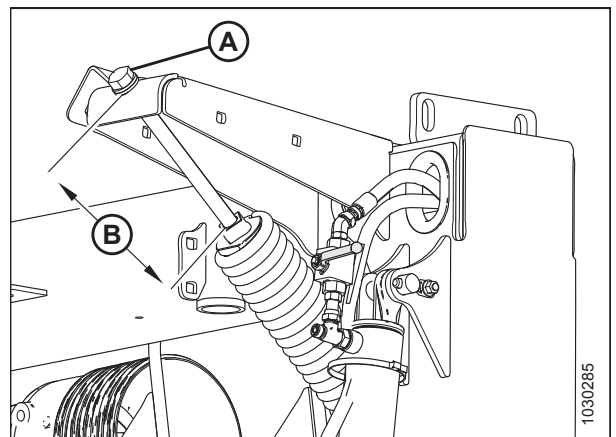


Figure 8.13: Adjuster Bolt

PERFORMING PREDELIVERY CHECKS

Table 8.1 Float Setting Starting Point

| Model | Conditioner Type | Length of Exposed Thread |
|---------|------------------|---------------------------------------|
| R113 PT | None | 280–290 mm (11 – 11 5/32 in.) |
| | Roll | 120–130 mm (4 3/4 – 5 1/8 in.) |
| | Finger | Right: 145–155 mm (5 3/4 – 6 1/8 in.) |
| | Finger | Left: 15–125 mm (4 1/2 – 4 15/16 in.) |
| R116 PT | None | 230–240 mm (9 – 9 1/2 in.) |
| | Roll | 70–80 mm (2 3/4 – 3 1/8 in.) |
| | Finger | Right: 95–105 mm (3 3/4 – 4 1/8 in.) |
| | Finger | Left: 65–75 mm (2 1/2 – 3 in.) |

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

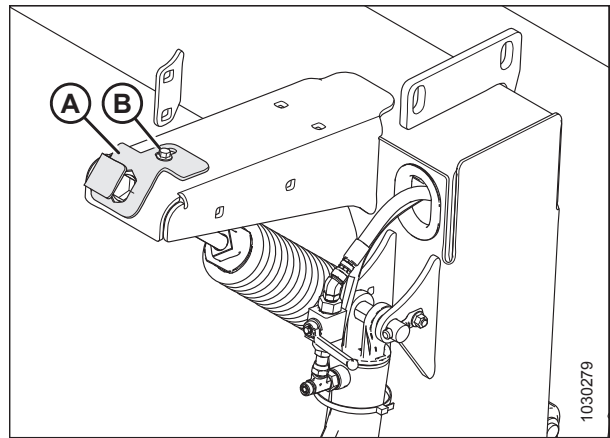


Figure 8.14: Adjuster Bolt Cover Plate

9. Open lift cylinder lock-out valve (A) on each cylinder by turning the handle to the open position (in line with the hose).
10. To check float, lower the rotary disc pull-type to cutting position, grasp the front corner of the rotary disc pull-type, and lift; the weight should feel like approximately 45 kg (100 lb.) at both ends.
11. Repeat adjustment procedures until the desired weight is achieved at both ends of the rotary disc pull-type.

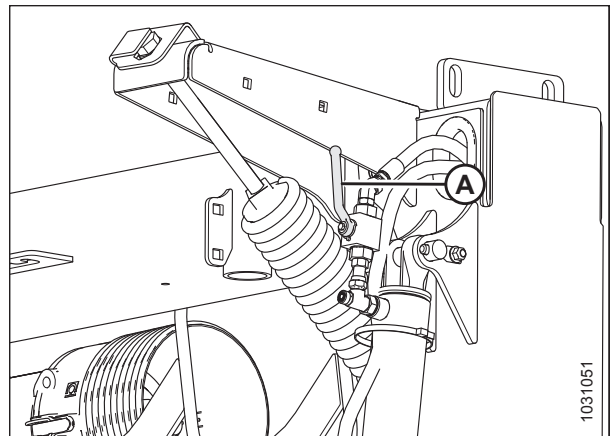


Figure 8.15: Cylinder Lock-Out Valve – Open Position

8.7 Checking and Adding Lubricant – Conditioner Roll Timing Gearbox

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

DANGER

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

IMPORTANT:

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

1. If both doors need to be opened, center the pull-type beneath the hitch.
2. Lower rotary disc pull-type to the ground, and adjust header angle with center-link so that cutterbar is level.
3. Shut down the engine, and remove the key from the ignition.
4. Lift up doors (A) at the front of the machine.

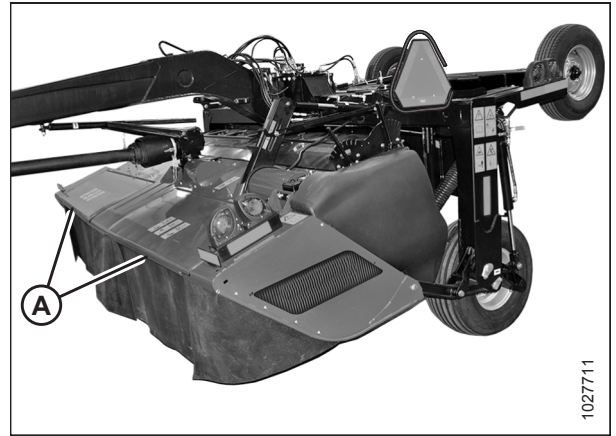


Figure 8.16: Cutterbar Doors and Curtains

5. Use a spirit (bubble) level and check that cutterbar is level in fore-aft direction. Adjust header angle as required.
6. Open the right driveshield. For instructions, refer to [7.1 Opening Driveshields, page 129](#).
7. Clean around lubricant sight glass (A) and breather plug (B) on inboard side of the conditioner roll timing gearbox.
8. Ensure that the lubricant level is at the top of the sight glass. If necessary, add lubricant through plug (B). Refer to [10.3 Recommended Lubricants, page 183](#) for lubricant information.
9. Replace plug (B) and tighten.
10. Close the right driveshield. For instructions, refer to [7.3 Closing Driveshields, page 136](#).

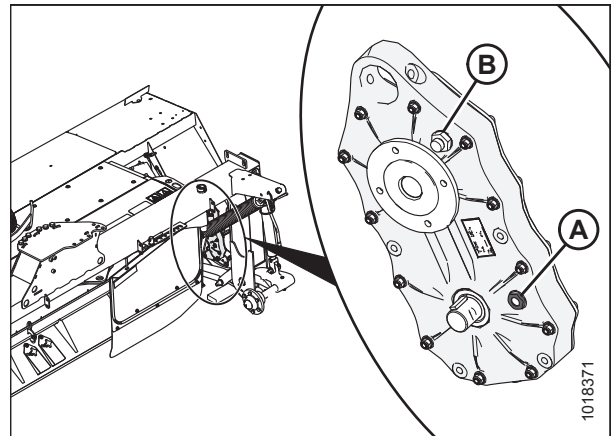


Figure 8.17: Roll Timing Gearbox

CAUTION

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

PERFORMING PREDELIVERY CHECKS

11. Pull down on door (A) from the top to close.
12. Ensure that curtains hang properly and completely enclose the cutterbar area.

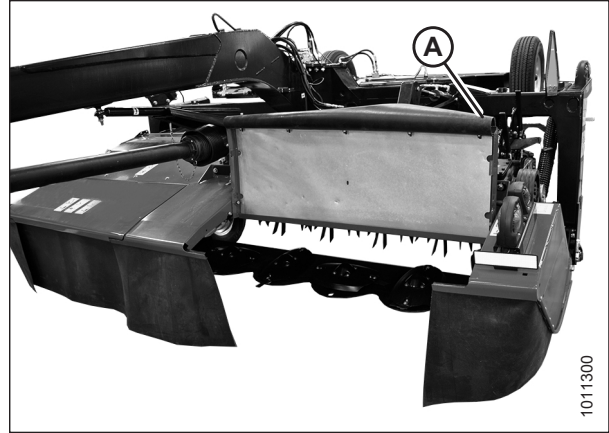


Figure 8.18: Cutterbar Doors and Curtains

8.8 Checking and Adding Lubricant – Rotary Disc Pull-Type Drive Gearbox

The rotary disc pull-type drive gearbox is located inside the drive compartment at the left side of the rotary disc pull-type.

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 the rotary disc pull-type until it is level with the ground.

NOTE:

To help ensure an accurate oil level reading for the cutterbar-conditioner drive gearbox, set the rotary disc pull-type's skid shoes in the fully raised position. For instructions, refer to the rotary disc pull-type operator's manual.

3. Shut down the engine, and remove the key from the ignition.
4. Detach the tractor from the hitch. For instructions, refer to the rotary disc pull-type operator's manual.
5. Open the left driveshield. For instructions, refer to [7.1 Opening Driveshields, page 129](#).
6. **If equipped with a drawbar hitch:** Install jack (A) and secure with pin (B). Adjust hitch jack (A) until the drive gearbox is parallel to the ground.

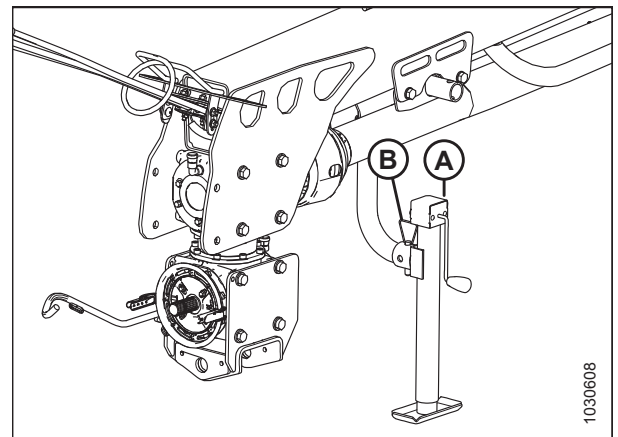


Figure 8.19: Drawbar Hitch Jack

7. **If equipped with a two-point hitch:** Install jack (A). Make sure the drive gearbox is parallel to the ground. Secure jack with pin (B).

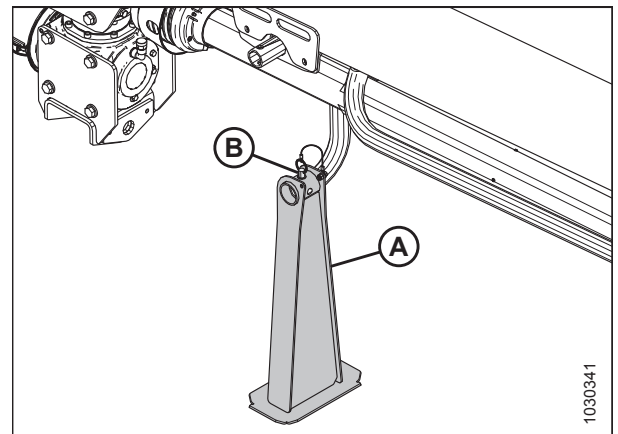


Figure 8.20: Two-Point Hitch Jack

PERFORMING PREDELIVERY CHECKS

8. Clean area around dipstick (A).
9. Remove dipstick (A) using a 22 mm socket.
10. Ensure lubricant level is to the line on dipstick.
11. If necessary, add gear lubricant to gearbox through dipstick hole (A). For recommended lubricants and quantities, refer to [10.3 Recommended Lubricants, page 183](#).
12. Reinstall dipstick and tighten.
13. Close left driveshield. For instructions, refer to [7.3 Closing Driveshields, page 136](#).

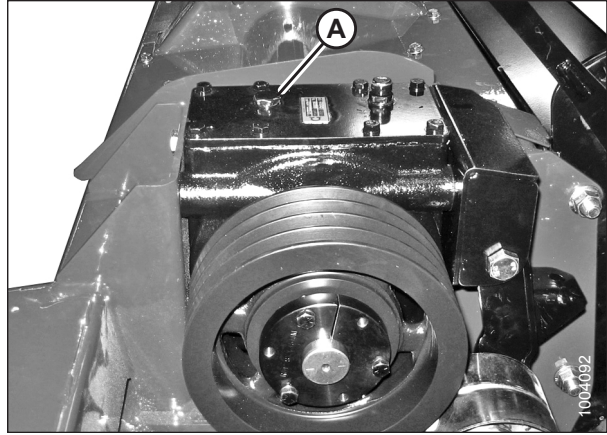


Figure 8.21: Left Side of Rotary Disc Pull-Type

8.9 Checking and Adding Lubricant – Forward and Rear Swivel Gearboxes

There are two swivel gearboxes on the rotary disc pull-type. Each swivel gearbox consists of an upper and a lower gearbox. Oil check plugs are located at the same position on each gearbox and need to be removed in order to check the lubricant level.

DANGER

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

IMPORTANT:

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

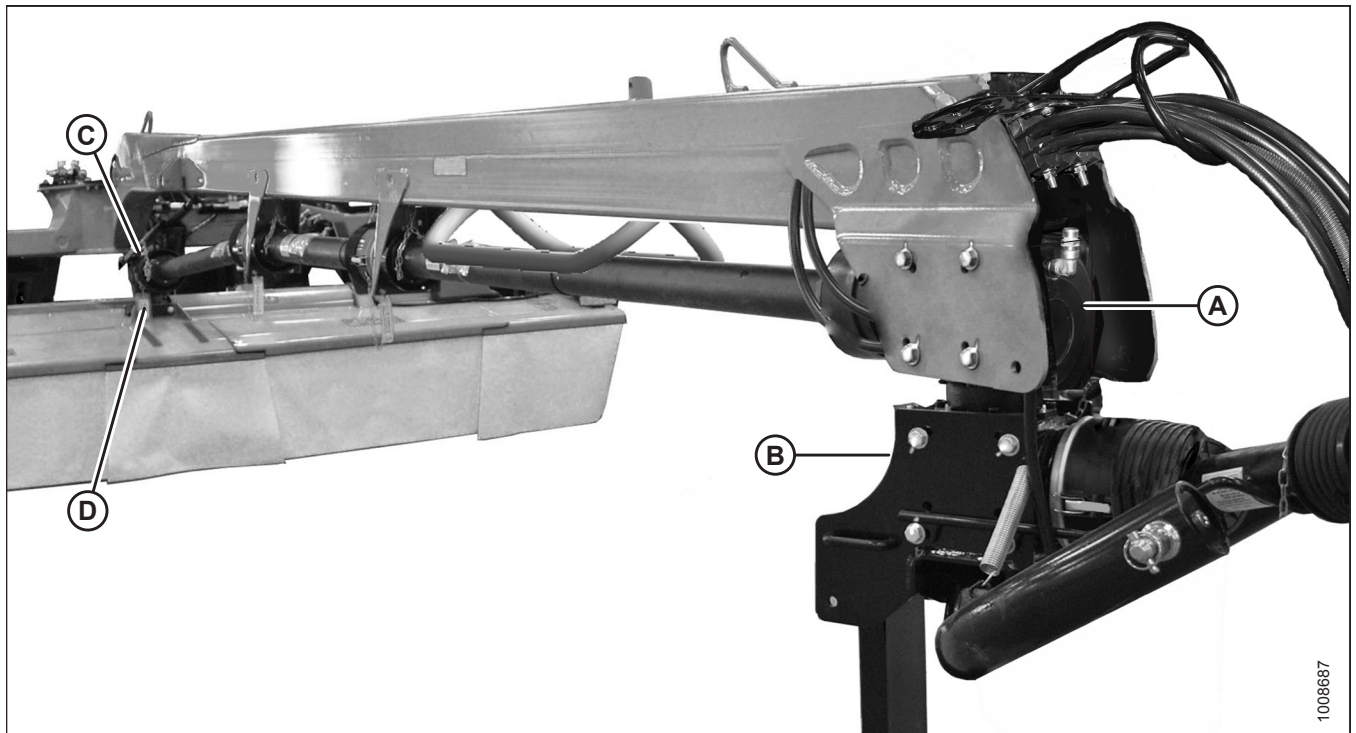


Figure 8.22: Forward and Rear Swivel Gearboxes

A - Upper Forward Gearbox

B - Lower Forward Gearbox

C - Upper Rear Gearbox

D - Lower Rear Gearbox

PERFORMING PREDELIVERY CHECKS

Perform this procedure on both upper and lower gearboxes:

NOTE:

The oil should be checked when the gearboxes are parallel to the ground.

1. Adjust the height and angle of the hitch until the upper and lower gearboxes are parallel to the ground.
2. Shut down the engine, and remove the key from the ignition.
3. Clean area around check plug (A).
4. Remove check plug using a 13 mm socket.
5. Check lubricant level and ensure lubricant is visible or slightly draining from the port.
6. If necessary, add gear oil to gearboxes through breather/filler plug (B). For recommended lubricants and quantities, refer to [10.3 Recommended Lubricants, page 183](#).
7. Reinstall check plug (A) and breather/filler plug (B) and tighten.

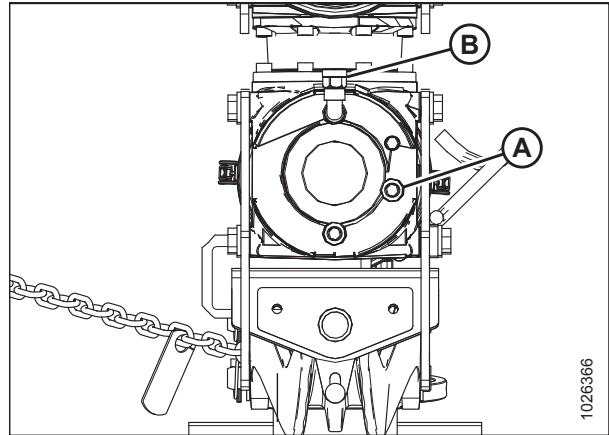


Figure 8.23: Swivel Gearbox

8.10 Checking and Adding Lubricant – Cutterbar

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

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.

WARNING

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

1. Park the machine on a flat, level surface.
2. Lower the rotary disc pull-type onto 25 cm (10 in.) blocks under both ends of the cutterbar.
3. Shut down the engine, and remove the key from the ignition.
4. Open the cutterbar doors.
5. Use a spirit (bubble) level (A) to ensure the cutterbar is level in both directions. Adjust position accordingly.

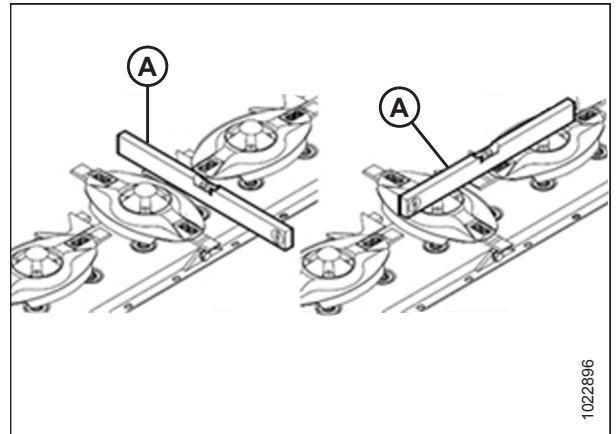


Figure 8.24: Spirit Level on Cutterbar

6. Clean area around plug (A). Place a 5 liter (5.2 US qts) capacity container under plug (A).
7. Use a 17 mm socket to remove plug (A) and O-ring (B) from the cutterbar. The oil level must be up to the inspection plug hole.

NOTE:

If additional lubricant is required, proceed to Step 8, page 151. If additional lubricant is **NOT** required, proceed to Step 17, page 152.

IMPORTANT:

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

8. Reinstall the inspection plug.

WARNING

Check to be sure all bystanders have cleared the area.

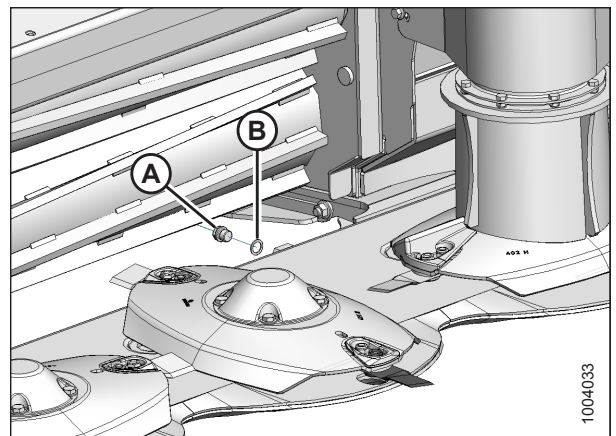


Figure 8.25: Cutterbar Oil Inspection Plug

PERFORMING PREDELIVERY CHECKS

9. Clear all bystanders from the area.
10. Start the engine, and raise the rotary disc pull-type fully.
11. Shut down the engine, and remove the key from the ignition.
12. Close the lift cylinder lock-out valves on both sides of the rotary disc pull-type. Valve handles should be in the closed position (90° angle to the hose).
13. Remove the inspection plug, and add some oil. Loosely install the inspection plug.
14. Open the lift cylinder lock-out valves on both sides of the rotary disc pull-type. Valve handles should be in the open position (parallel to the hose).
15. Lower the rotary disc pull-type onto the blocks, then repeat Step 5, [page 151](#).
16. Recheck the oil level.
17. Check O-ring (B) for breaks or cracks, and replace if necessary.
18. Install plug (A) and O-ring (B). Tighten securely.
19. Close the cutterbar doors.

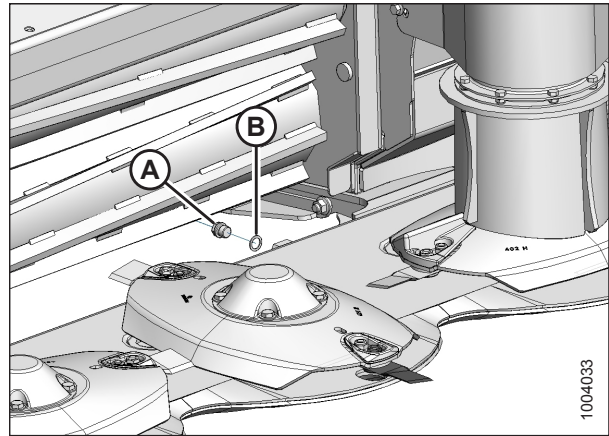


Figure 8.26: Cutterbar Oil Inspection Plug

8.11 Checking Roll Gap

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

WARNING

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

1. Lower the rotary disc pull-type to the ground.
2. Shut down the engine, and remove the key from the ignition.
3. **Steel Rolls:** The length of thread (A) extending above the jam nut on the adjustment rods can be used as an approximation of roll gap, but does **NOT** provide consistent roll gap measurements. To ensure roll gap is at the factory setting, refer to [8.11.1 Adjusting Roll Gap – Steel Rolls, page 153](#).
4. **Polyurethane Rolls:** Insert a feeler gauge between rolls from either front or rear of header. Factory setting is 3 mm (1/8 in.). If adjustments are required, refer to [8.11.2 Adjusting Roll Gap – Polyurethane Rolls, page 154](#).

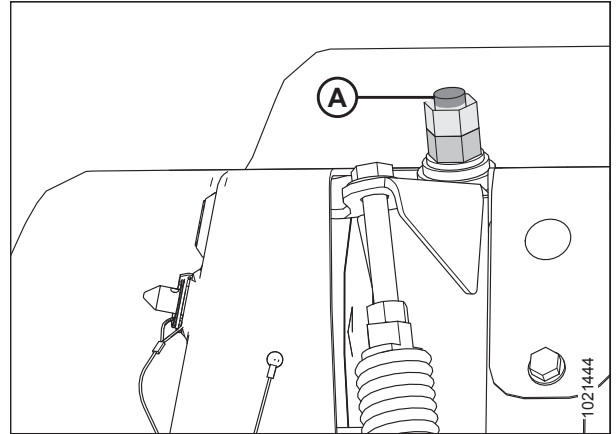


Figure 8.27: Roll Gap Adjustment

8.11.1 Adjusting Roll Gap – Steel Rolls

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

DANGER

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

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

1. Lower the rotary disc pull-type fully.
2. Shut down the engine, and remove the key from the ignition.

PERFORMING PREDELIVERY CHECKS

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

IMPORTANT:

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

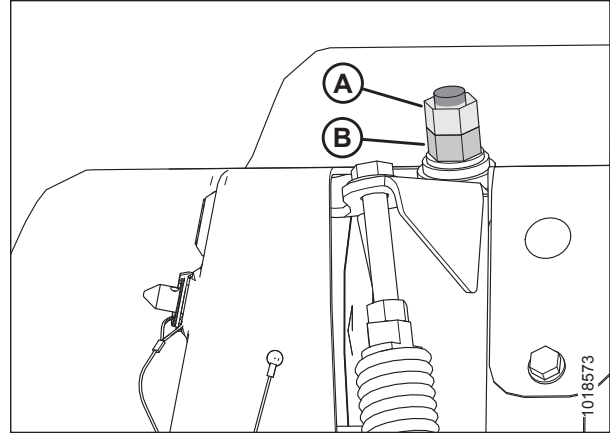


Figure 8.28: Roll Gap Adjustment

8.11.2 Adjusting Roll Gap – Polyurethane Rolls

Because polyurethane rolls operate at smaller gaps and the conditioning is less aggressive, the roll gap setting is more sensitive than on steel rolls.

DANGER

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

- Lower the rotary disc pull-type fully.
- Shut down the engine, and remove the key from the ignition.
- Loosen upper jam nut (A) on both sides of the conditioner attachment.
- Turn lower nut (B) counterclockwise until the upper roll rests on the lower roll.
- Turn lower nut (B) one full turn clockwise to raise the upper roll and achieve a 3 mm (1/8 in.) roll gap.
- Hold nut (B) and tighten jam nut (A) on both sides of the conditioner attachment.

IMPORTANT:

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

- Rotate the rolls manually and use a feeler gauge at the ends of the rolls to check that the actual gap is no less than 2 mm (5/64 in.) and no more than 4 mm (5/32 in.).

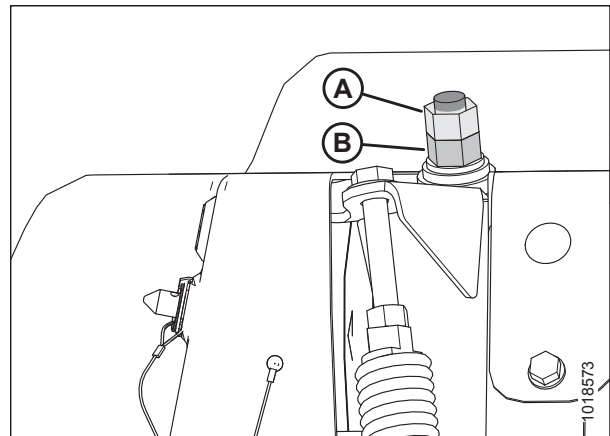


Figure 8.29: Roll Gap Adjustment

8.12 Checking Roll Timing

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

Roll timing is factory-set and should not require adjustment; however, if there is excessive noise coming from the conditioner rolls, the timing will need to be adjusted. For instructions, refer to the rotary disc pull-type operator's manual.

8.13 Checking Roll Tension

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

1. Measure the amount of exposed thread on the roll tension adjuster bolt (A) at each end of the conditioner. Measurement (B) should be 12–15 mm (1/2–9/16 in.) for polyurethane and steel roll conditioners.
2. If the tension requires adjusting, refer to [8.13.1 Adjusting Roll Tension](#), page 156.

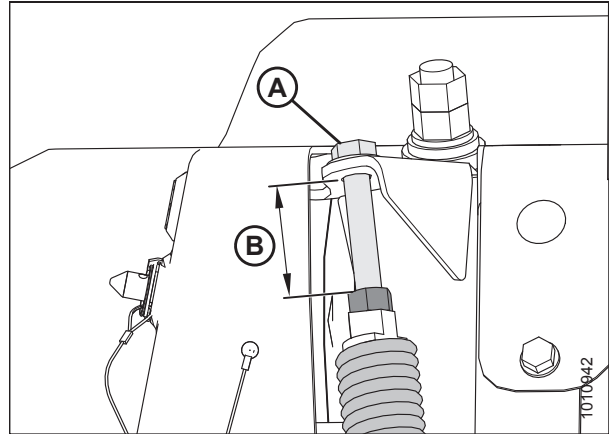


Figure 8.30: Roll Tension Adjuster

8.13.1 Adjusting Roll Tension

The amount of pressure that is applied to the crop as it passes through the roll conditioner is adjusted with the roll tension setting.

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

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

IMPORTANT:

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

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

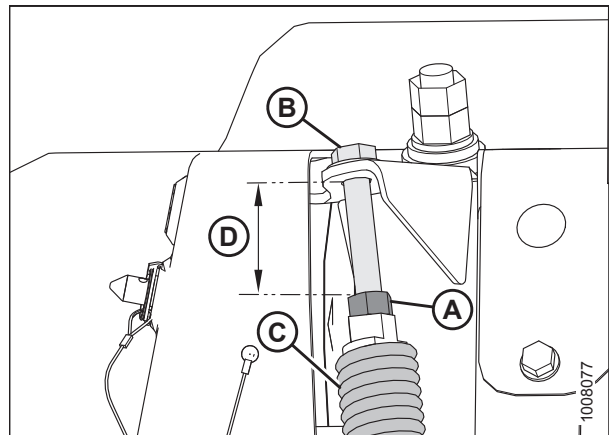


Figure 8.31: Adjusting Roll Tension

8.14 Adjusting Conditioner Baffle Position

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

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

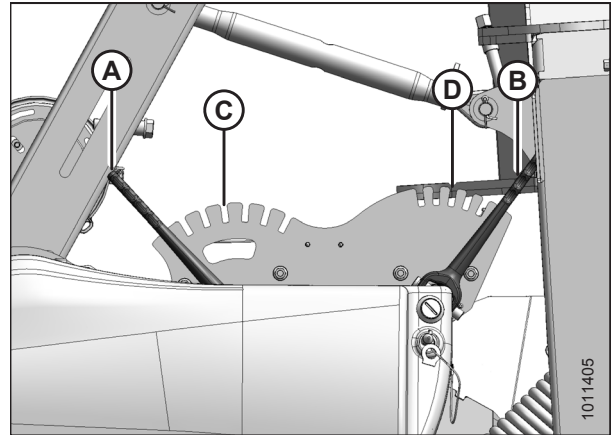


Figure 8.32: Baffle Adjusters – Finger Conditioners

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

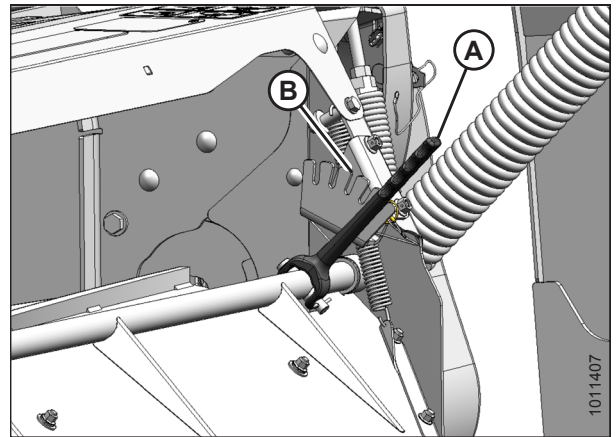


Figure 8.33: Baffle Adjuster – Roll Conditioners

8.15 Checking Lights

Ensure lights function correctly.

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

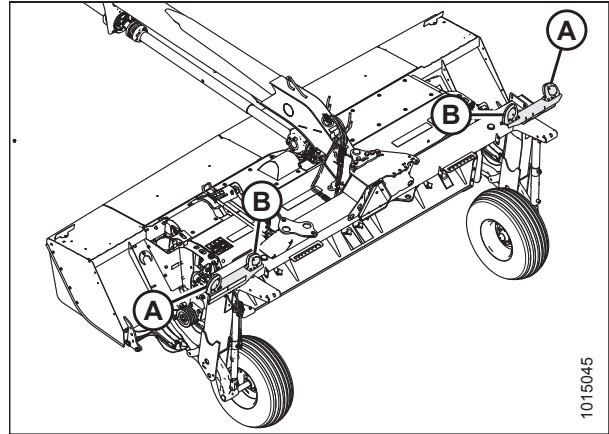


Figure 8.34: Standard Configuration

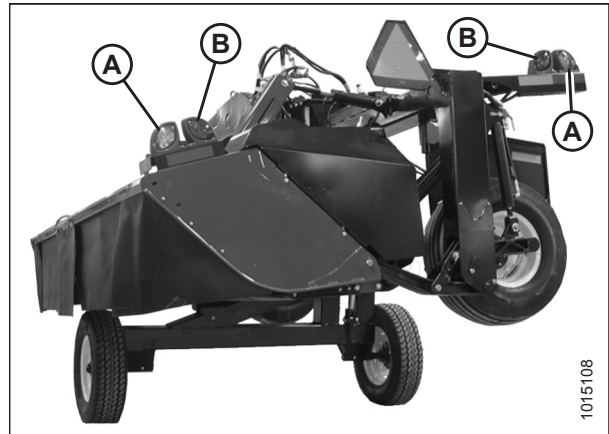


Figure 8.35: Transport Configuration

8.16 Checking Manuals

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

The following manuals should be stored in manual storage case (A) at the right end of the rotary disc pull-type:

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

Open the right driveshield to access the manual case. For instructions, refer to [7.1 Opening Driveshields, page 129](#).

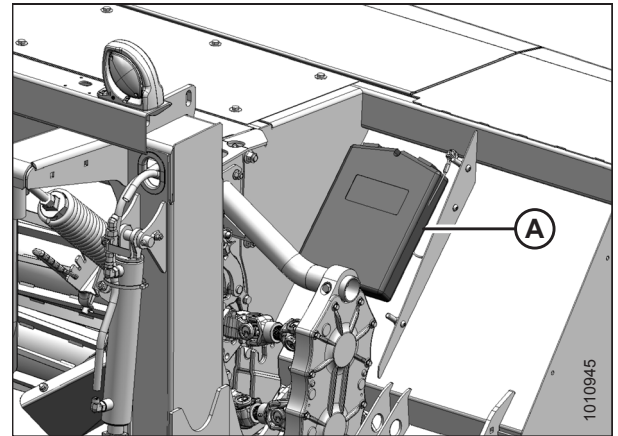


Figure 8.36: Manual Case

8.17 Running up the Header

Running up the header to ensure that everything is working as expected, and the machine is ready for delivery to the customer.

WARNING

- Keep everyone 100 m (330 ft.) away from your operation. Ensure bystanders are never in line with the front or rear of the machine. Stones and 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 pull-type when other people are nearby.
- 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.
- Cutterbar curtains reduce the potential for thrown objects. Always keep the curtain down when operating the pull-type. Replace the curtains if they become worn or damaged.

DANGER

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

WARNING

Check to be sure all bystanders have cleared the area.

NOTE:

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

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

8.18 Checking and Adjusting the Cam on the Transport Deploy / Swing Mechanism

The transport deploy/swing mechanism is factory-set, but if the header does not start rotating when the transport wheels reach the end of their travel, then adjustment may be necessary.

Cam angle (A) on the transport deploy/swing mechanism assembly is factory-set to 112°. It may be necessary to adjust the cam angle if the transport does **NOT** properly deploy. When the system is functioning properly, the header should start to rotate as the transport wheels reach the end of their travel (beneath the header).

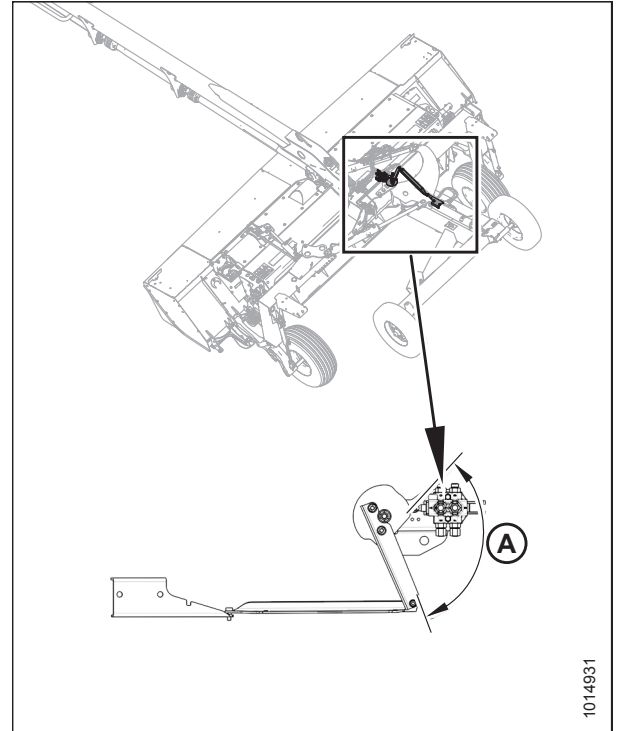


Figure 8.37: Transport Deploy / Swing Mechanism Assembly

1. Loosen two M10 jam nuts (A), two M10 hex flange nuts (B), and rotate cam plate (C) to achieve the proper angle. Reposition cam as follows:
 - Rotate **COUNTERCLOCKWISE** if the transport tires deploy too close to the header tires, before the transport wheels are fully under the header.
 - Rotate **CLOCKWISE** if the tires go underneath the header, but the header does not begin to rotate.
2. Tighten two M10 hex flange nuts (B) and two M10 jam nuts (A).
3. To test the transport deploy/swing mechanism, refer to:
 - [9.2.1 Converting from Field to Transport Mode – with Transport, page 169](#)
 - [9.2.2 Converting from Transport to Field Mode – with Transport, page 175](#)

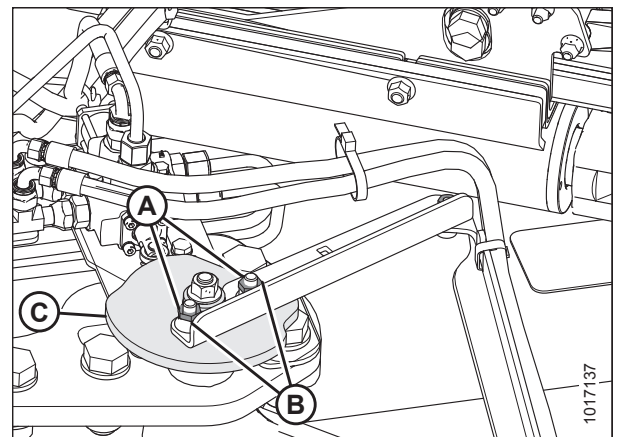


Figure 8.38: Transport Deploy / Swing Mechanism Assembly

Chapter 9: Transporting the Rotary Disc Pull-Type

You can transport the rotary disc pull-type using a tractor in either field mode or transport mode.

- To prepare a rotary disc pull-type for towing with a tractor in field mode without using the transport option, refer to [9.1 Preparing Rotary Disc Pull-Type for Transport, page 163](#).
- To prepare a rotary disc pull-type for towing with a tractor using the transport option, refer to [9.2.1 Converting from Field to Transport Mode – with Transport, page 169](#).



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 32 km/h (20 mph). Reduce speed for corners and slippery conditions.
- Use tractor lights and rotary disc pull-type flashing amber and red taillights when transporting on roads in order to provide adequate warning to operators of other vehicles.
- Do NOT transport the rotary disc pull-type 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 907 kg (2000 lb.) static vertical load.
- Do NOT tow with any highway-capable vehicle. Use only an agricultural tractor with a sufficient weight such that the fully loaded implement weighs no more than 1.5 times the weight of the tractor.

9.1 Preparing Rotary Disc Pull-Type for Transport

The rotary disc pull-type can be transported without deploying the optional transport system.



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.



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. Shut down the engine, and remove the key from the ignition.
2. Connect the rotary disc pull-type hitch to the tractor, and store the jack stand. For instructions, refer to the rotary disc pull-type operator's manual.

TRANSPORTING THE ROTARY DISC PULL-TYPE

3. **If equipped with a drawbar hitch:** Turn the handle on jack stand (A) to raise the stand. Remove pin (B) and stand (A).

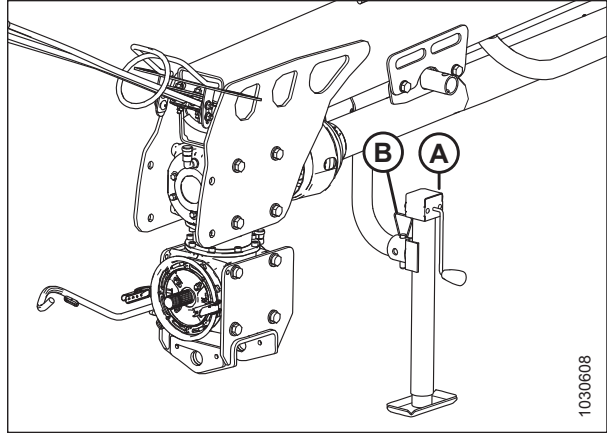


Figure 9.1: Drawbar Jack in Working Position

4. **If equipped with a drawbar hitch:** Move jack (A) to the storage position on the side of the hitch, align the mounting holes, and secure with pin (B).

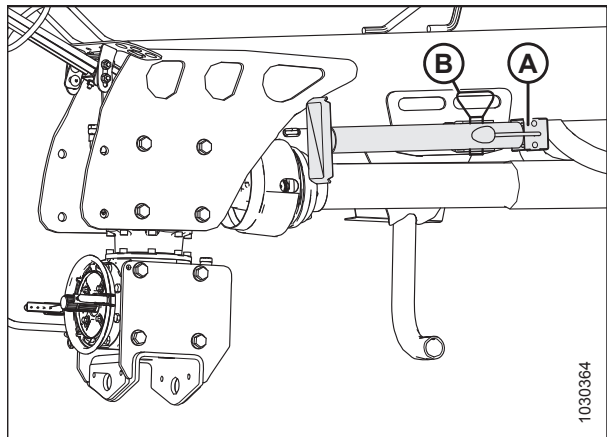


Figure 9.2: Drawbar Jack in Storage Position

5. **If equipped with a two-point hitch:** Raise the rotary disc pull-type slightly off the ground using the tractor. Remove pin (B) and stand (A).

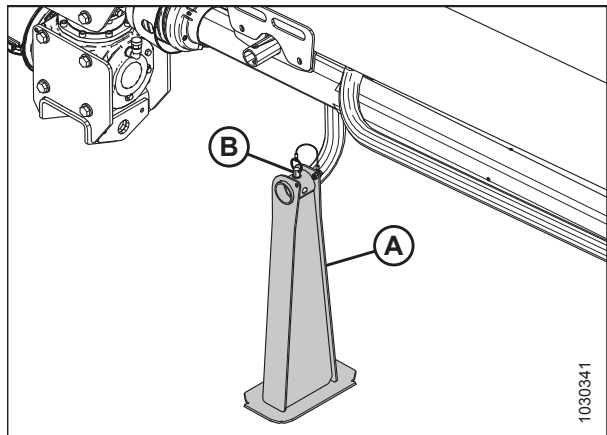


Figure 9.3: Two-Point Hitch Jack in Working Position

TRANSPORTING THE ROTARY DISC PULL-TYPE

6. **If equipped with a two-point hitch:** Insert pin (A) and secure stand (B) in storage position.

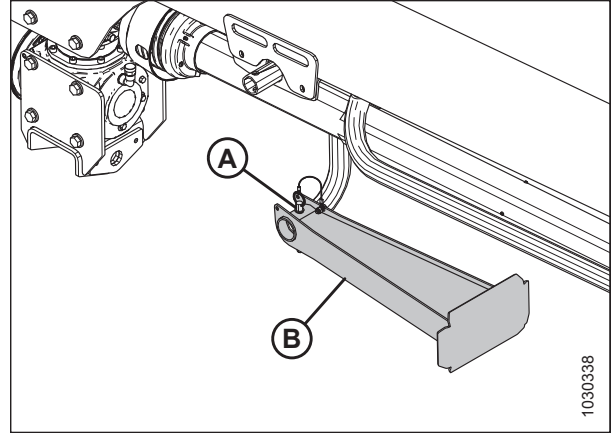


Figure 9.4: Two-Point Hitch Jack in Storage Position

7. Connect the hitch swing cylinder hoses (collars with #2) to tractor's hydraulic circuit (A). For instructions, refer to [5.3.3 Connecting Hydraulics](#), page 106.



Figure 9.5: Hydraulic Connection

8. Raise the rotary disc pull-type fully and close the lift cylinder lock-out valve by turning handle (A) to the closed position (90° to the hose). Repeat on the opposite side.
9. Swing the rotary disc pull-type completely to the left, then completely to the right. Repeat three or four times to charge the hitch swing circuit.
10. Swing the rotary disc pull-type so that it is centered behind the tractor.

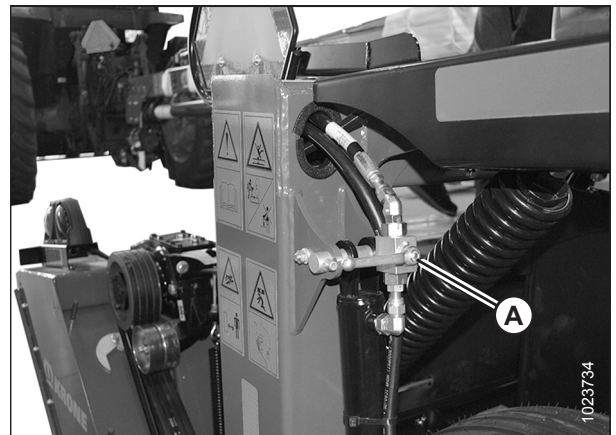


Figure 9.6: Cylinder Lock-Out Valve in Closed Position

TRANSPORTING THE ROTARY DISC PULL-TYPE

11. Close the hitch swing lock-out valve by turning handle (A) to the closed position (90° angle to the hose).
12. Ensure the hydraulic hoses are securely stored on the hitch.

NOTE:

The primary driveline and hydraulic hoses do **NOT** need to be attached to the tractor for towing.

13. Ensure tires are properly inflated.

IMPORTANT:

Do **NOT** exceed 32 km/h (20 mph).

14. Ensure the slow moving vehicle (SMV) sign, reflectors, and lights are clean and visible at rear of rotary disc pull-type.

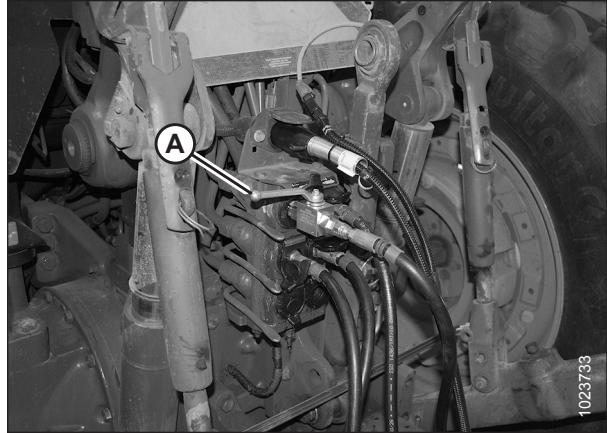


Figure 9.7: Hitch Swing Lock-Out Valve Shown in Closed Position

9.1.1 Converting from Transport to Field Mode – Without Transport

Before operating in the field, the hydraulic steering and lift cylinders must be enabled.

⚠ 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. Shut down the engine, and remove the key from the ignition.
2. Connect all hydraulic hoses (refer to [5.3.3 Connecting Hydraulics, page 106](#) for instructions), and connect electrical wiring harness.
3. Open the steering lock-out valve by turning handle (A) to the open position (in line with hose).

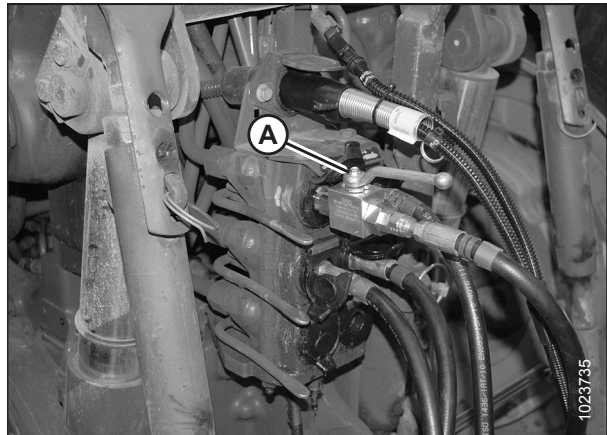


Figure 9.8: Steering Lock-Out Valve in Open Position

TRANSPORTING THE ROTARY DISC PULL-TYPE

4. Open lock-out valve (A) on each lift cylinder by turning the handle to the open position (in line with hose).

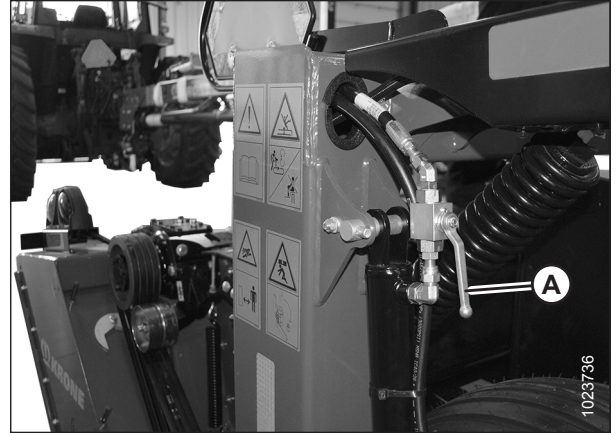


Figure 9.9: Lift Cylinder Lock-Out Valve in Open Position

9.1.2 Converting from Field to Transport Mode – Without Transport

Before operating on the road, the hydraulic steering and lift cylinders must be disabled.

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. Raise rotary disc pull-type.
2. Move rotary disc pull-type fully to the left, then fully to the right. Repeat this a couple times.
3. Center the rotary disc pull-type.
4. Shut down the engine, and remove the key from the ignition.
5. Close the steering lock-out valve by turning handle (A) to the closed position (90° angle to the hose).

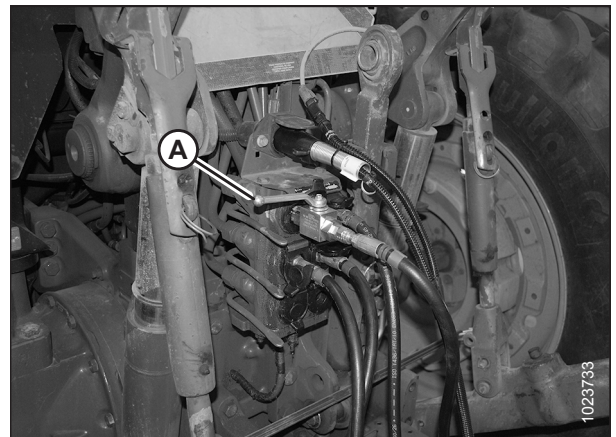


Figure 9.10: Steering Lock-Out Valve in Closed Position

TRANSPORTING THE ROTARY DISC PULL-TYPE

6. Close the lift cylinder lock-out valve by turning handle (A) to the closed position (90° angle to the hose). Repeat on opposite side.
7. Disconnect all hydraulic hoses (refer to [5.3.3 Connecting Hydraulics, page 106](#) for instructions), and disconnect electrical wiring harness.

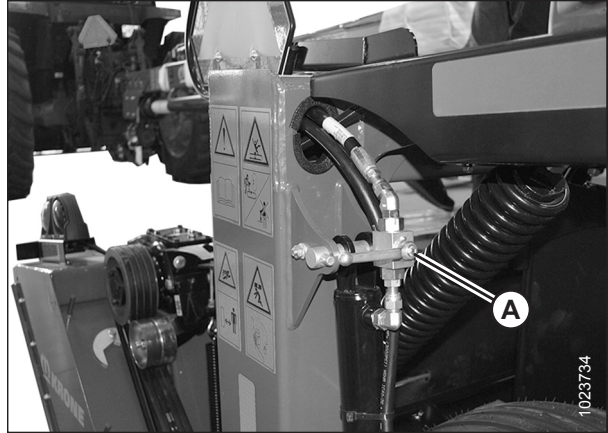


Figure 9.11: Lift Cylinder Lock-Out Valve in Closed Position

9.2 Transport Option

The optional transport system allows the rotary disc pull-type to be towed while remaining within the legal width restrictions on most roads and highways.

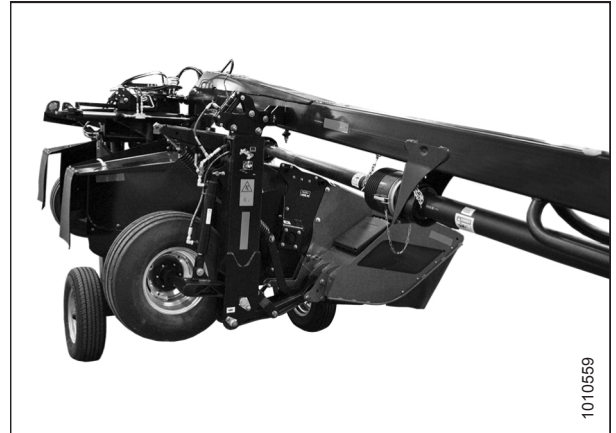


Figure 9.12: Transport System

9.2.1 Converting from Field to Transport Mode – with Transport

In transport mode, the pull-type is rotated into its narrowest position to comply with road width restrictions. Steering and lift functions are disabled.

DANGER

To prevent serious injury or death, do NOT convert the machine into, or from transport mode until all people, animals, and objects are clear of the unit's rotational range.

DANGER

Stop the power take-off (PTO) before converting the unit into transport mode. The cutting discs continue to spin after the drive is turned off.

CAUTION

To prevent injury or equipment damage, ensure cutterbar doors are properly closed before converting the machine from field to transport mode.

IMPORTANT:

In some jurisdictions, having tall crop dividers installed can make the rotary disc pull-type too wide for public roads when in transport mode. If necessary, remove the dividers, and reinstall them after the machine is transported. For instructions, refer to the rotary disc pull-type operator's manual.

TRANSPORTING THE ROTARY DISC PULL-TYPE

1. If tightened, loosen bolts (B) on transport latch (A).

NOTE:

This step only needs to be completed the first time the machine is converted from field to transport.

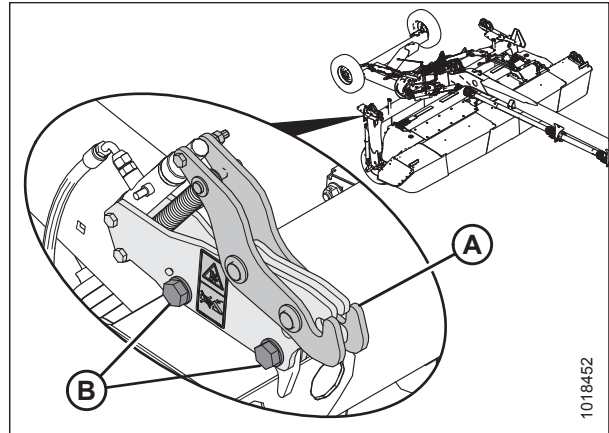


Figure 9.13: Transport Latch

2. Clear bystanders from the area and start tractor. Do **NOT** operate the rotary disc pull-type.
3. Following the steps on field-to-transport decal (A), move transport switch to lower position (C) and ensure that light (B) is illuminated.



Figure 9.14: Control Box

TRANSPORTING THE ROTARY DISC PULL-TYPE

4. While the light is illuminated, raise the rotary disc pull-type fully by extending the field wheel cylinders.

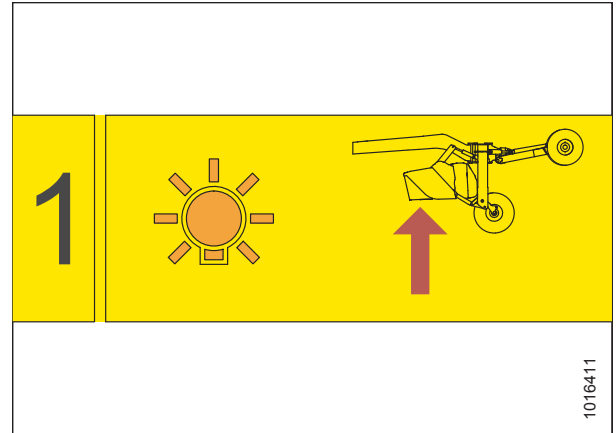


Figure 9.15: Raising Rotary Disc Pull-Type

5. Operate the hitch swing control lever to rotate the rotary disc pull-type to the right until the cam bearing nut is aligned with the green section of the transport alignment gauge decal.

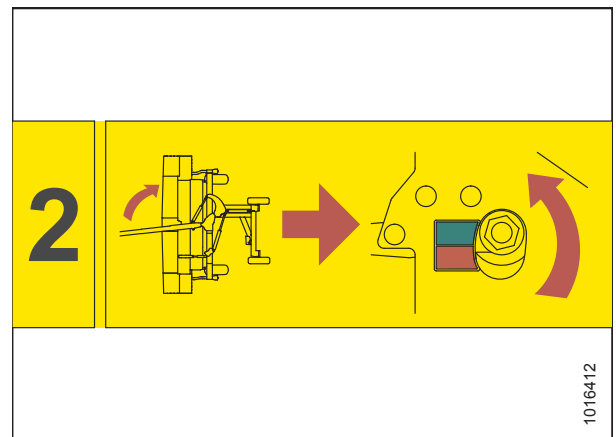


Figure 9.16: Rotary Disc Pull-Type Rotation

6. Move the 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.

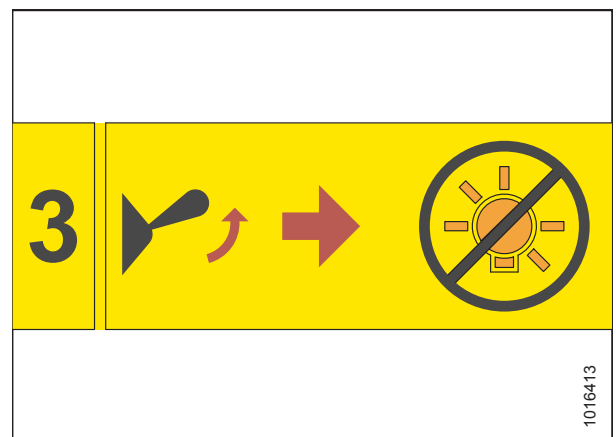


Figure 9.17: Transport Switch

TRANSPORTING THE ROTARY DISC PULL-TYPE

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

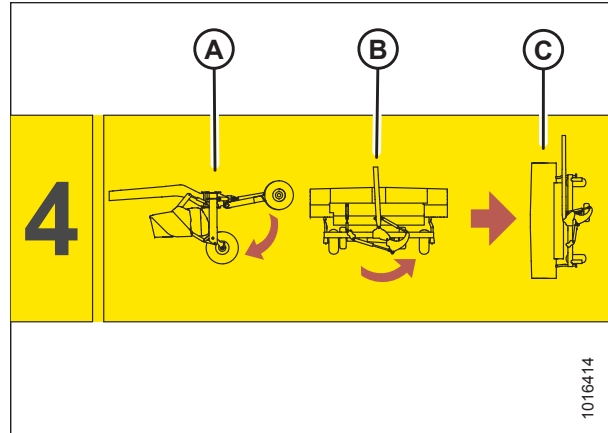


Figure 9.18: Transport Assembly Rotation

10. Operate the lift control lever to lower the rotary disc pull-type onto the transport assembly, raise the field wheels, and engage the transport latch onto the hitch.

IMPORTANT:

Once the latch has engaged, do **NOT** operate any hydraulic circuits.

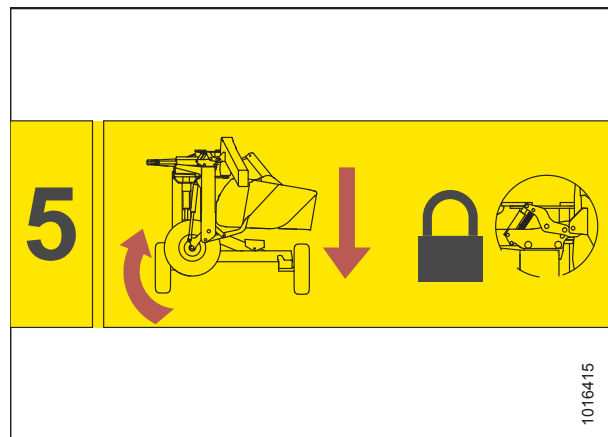


Figure 9.19: Transport Assembly Lowering

11. Close the steering lock-out valve and the two lift cylinder lock-out valves by turning the handles to the closed position. For instructions, refer to Figure 9.21, page 173 and Figure 9.22, page 173.

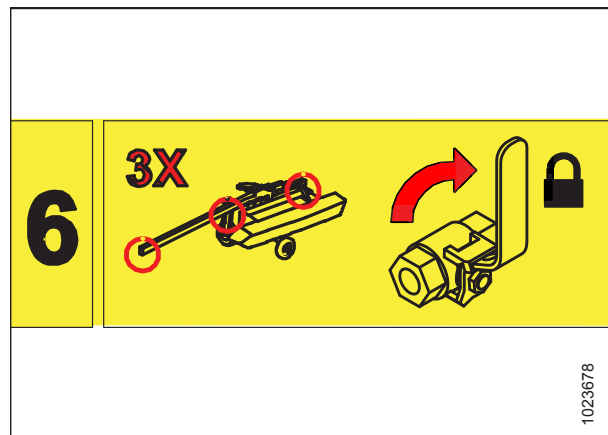


Figure 9.20: Hydraulic Lockout

TRANSPORTING THE ROTARY DISC PULL-TYPE

Steering lock-out: Close the valve by turning handle (A) to the closed position (90° to the hose).

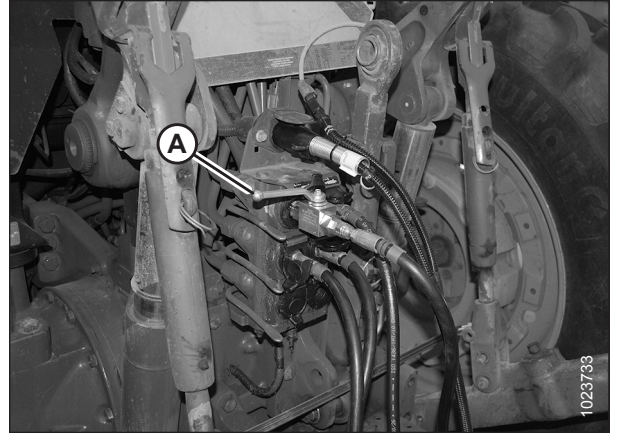


Figure 9.21: Steering Lock-Out Valve

Lift cylinder lock-out: Close the valve by turning handle (A) to the closed position (90° to the hose). Repeat on opposite side.

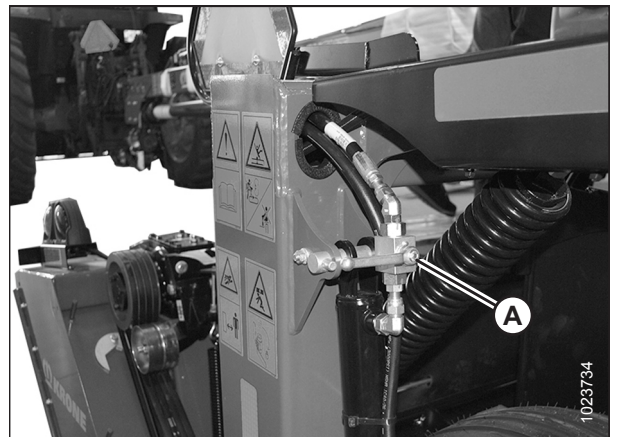


Figure 9.22: Lift Cylinder Lock-Out Valve

- Torque bolts (B) on transport latch (A) to 460 Nm (340 lbf-ft).

NOTE:

This step only needs to be completed the first time the machine is converted from field to transport.

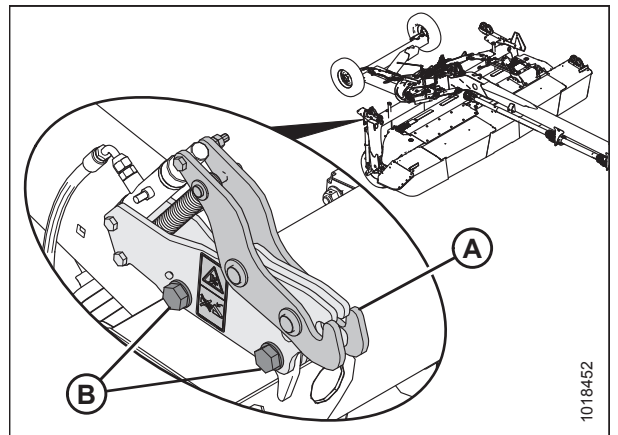


Figure 9.23: Transport Latch

TRANSPORTING THE ROTARY DISC PULL-TYPE

13. Activate hazard lights (A) on the rotary disc pull-type. Ensure all lights are working.
14. Ensure that slow moving vehicle sign (B) is visible from behind the rotary disc pull-type.

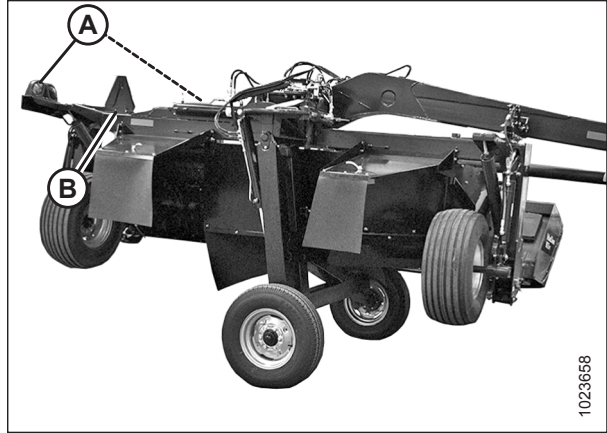


Figure 9.24: Transport Mode

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



Figure 9.25: Control Box

9.2.2 Converting from Transport to Field Mode – with Transport

In field mode, the pull-type is rotated from the narrow road position to full width field position. Steering and lift functions are operational.

DANGER

To prevent serious injury or death, do **NOT** convert the machine into, or from transport mode until all people, animals, and objects are clear of the unit's rotational range.

CAUTION

To prevent injury or equipment damage, ensure cutterbar doors are properly closed before converting the machine from field to transport mode.

1. Clear bystanders from the area and start tractor. Do **NOT** operate the rotary disc pull-type.
2. Following the steps on transport-to-field decal (A), move the transport switch to upper position (C) and ensure that light (B) is **NOT** illuminated.

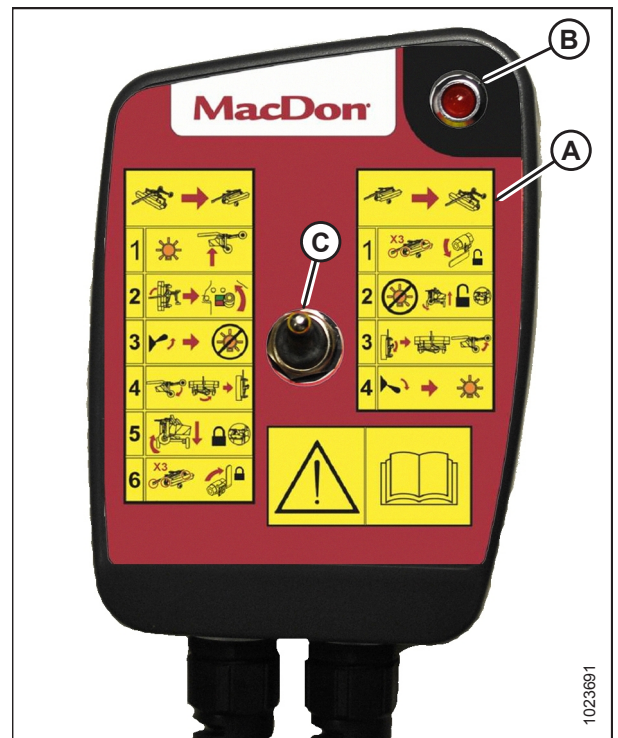


Figure 9.26: Control Box

TRANSPORTING THE ROTARY DISC PULL-TYPE

3. Open the steering lock-out valve and the two lift cylinder lock-out valves by turning the handles to the open position.

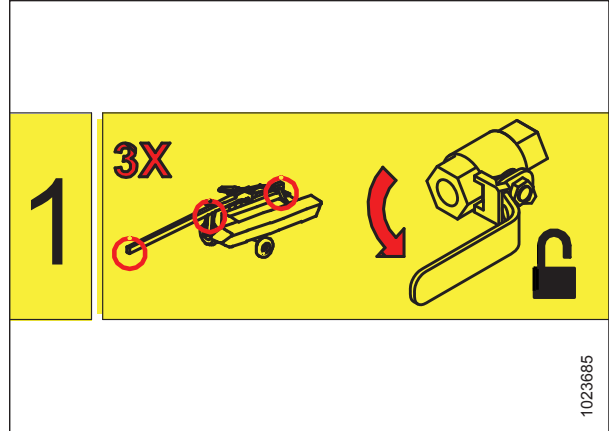


Figure 9.27: Hydraulic Lockout

Steering lock-out: Open the valve by turning handle (A) to the open position (in line with the hose).

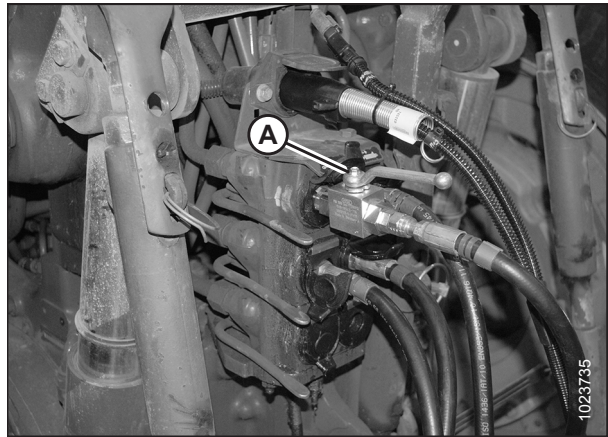


Figure 9.28: Steering Lock-Out Valve

Lift cylinder lock-out: Open the valve by turning handle (A) to the open position (in line with the hose). Repeat on opposite side.

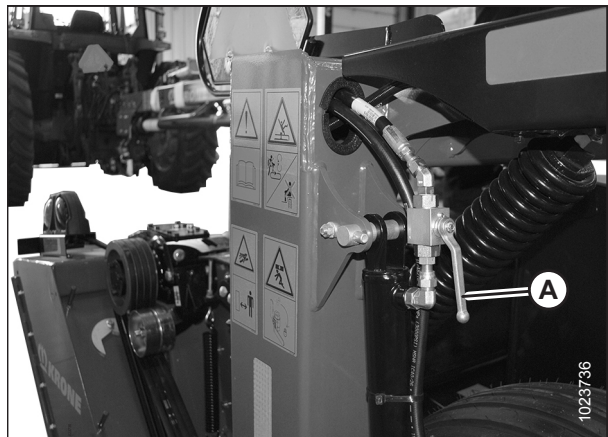


Figure 9.29: Lift Cylinder Lock-Out Valve

TRANSPORTING THE ROTARY DISC PULL-TYPE

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

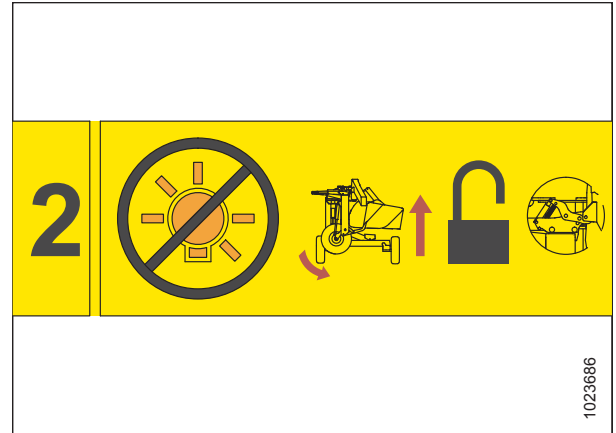


Figure 9.30: Raising Rotary Disc Pull-Type

5. Operate the hitch swing control lever to rotate the rotary disc pull-type to the right. The rotary disc pull-type will stop when it reaches operating position.

NOTE:

A sequenced movement transitions the rotary disc pull-type from transport to field mode. This is accomplished by the rear transport swing cylinder, and the transport deploy cylinder. During the transition, continue to hold the hitch swing lever in the active position to allow oil to be supplied to the two cylinders sequentially.

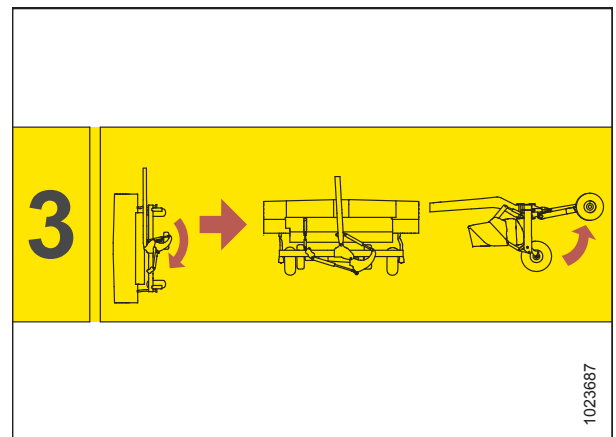


Figure 9.31: Rotary Disc Pull-Type Rotation

6. Continue operating the hitch swing control lever to fully raise the transport assembly and lower the rotary disc pull-type onto the field wheels.
7. Move transport switch to the lower position and ensure that the light on the control box is illuminated. Transport conversion is now complete and the hitch swing circuit is active.

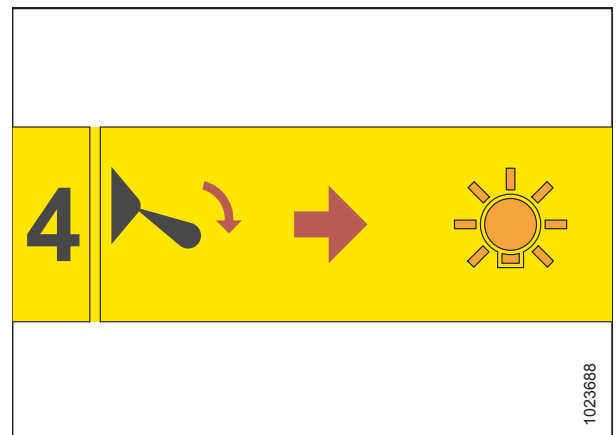


Figure 9.32: Transport Switch

TRANSPORTING THE ROTARY DISC PULL-TYPE

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



Figure 9.33: Control Box

9.3 Transport Lighting

Light assemblies provide position, hazard, turning direction, and braking information.

9.3.1 Lighting – With Transport Option

When the optional transport system is installed, the lights mount to the left side of the machine.

The rotary disc pull-type is equipped with two bidirectional amber lights (A) that function as flashing hazard lights and turn signals.

Red lights (B) located on the inboard side of the amber lights function as both tail and brake lights. Refer to the rotary disc pull-type operator's manual for information about connecting the electrical harness to the tractor.

Amber reflective tape is applied to various locations on the front and sides of the rotary disc pull-type, hitch, and carrier frame. Red reflective tape is applied to the rear of the rotary disc pull-type.

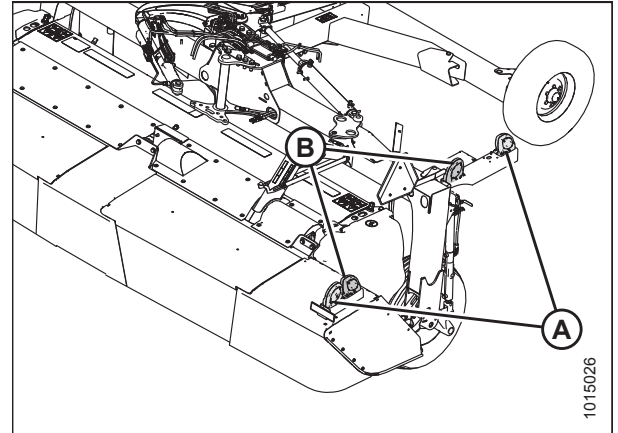


Figure 9.34: Lighting Locations – with Transport

9.3.2 Lighting – Without Transport Option

When no optional transport system is installed, the lights mount to the left and right corners of the carrier frame.

The rotary disc pull-type is equipped with two bidirectional amber lights (A) located on the outboard edges of the carrier frame that function as flashing hazard lights and turn signals.

Red lights (B) located on the inboard side of the amber lights function as both tail and brake lights. Refer to the rotary disc pull-type operator's manual for information about connecting the electrical harness to the tractor.

Amber reflective tape is applied to various locations on the front and sides of the rotary disc pull-type, hitch, and carrier frame. Red reflective tape is applied to various locations on the rotary disc pull-type.

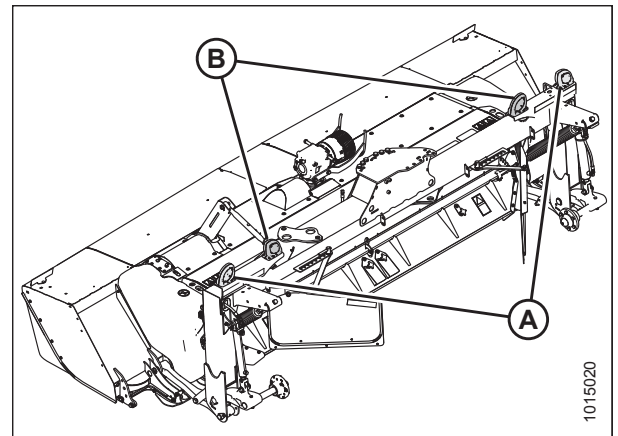


Figure 9.35: Lighting Locations

Chapter 10: Reference

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

10.1 Engaging Locks

Hydraulic lock-out valves are provided for safely transporting and servicing machinery.

DANGER

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

IMPORTANT:

Connect hoses so that moving the cylinder control lever backward raises the rotary disc pull-type, and moving the cylinder control lever forward lowers the rotary disc pull-type. Refer to [5.3.3 Connecting Hydraulics, page 106](#) for more information.

1. Move cylinder control lever (A) backward to position (B) to fully raise machine.

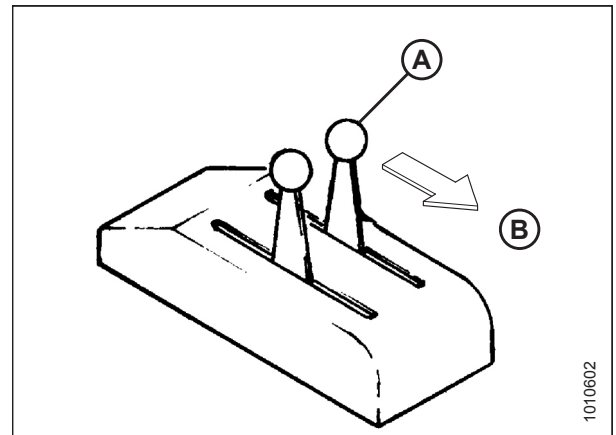


Figure 10.1: Tractor Cylinder Control Lever

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

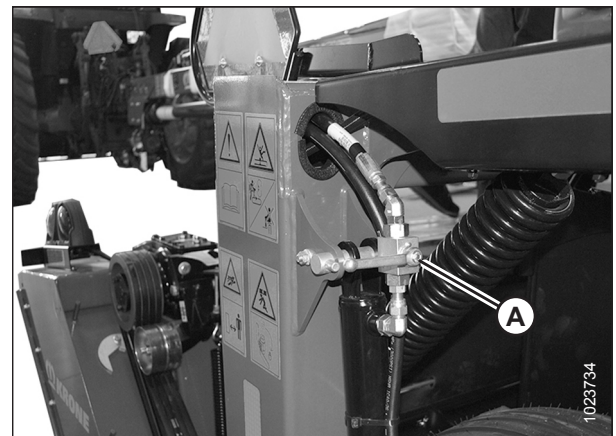


Figure 10.2: Lift Cylinder Lock-Out Valve in Closed Position

10.2 Disengaging Locks

Hydraulic lock-out valves are provided for safely transporting and servicing machinery.

DANGER

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

1. Open lock-out valve (A) on each lift cylinder by turning the handle to the open position (in line with the hose).

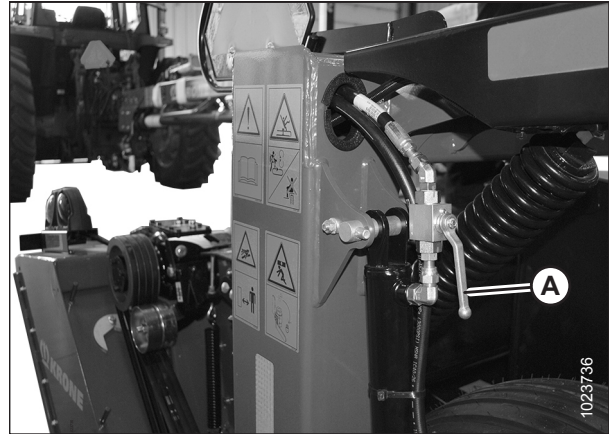


Figure 10.3: Lift Cylinder Lock-Out Valve in Open Position

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

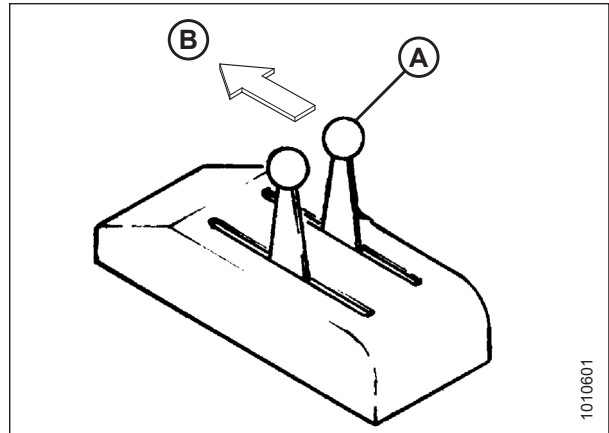


Figure 10.4: Tractor Cylinder Control Lever

10.3 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

| Specification | Description | Use | Capacities |
|----------------------------------|---|--|---|
| Lubricant: Grease | | | |
| SAE Multipurpose | High temperature, extreme pressure (EP) performance with 1% max. molybdenum disulphide (NLGI Grade 2) lithium base | As required unless otherwise specified | — |
| SAE Multipurpose | High temperature, extreme pressure (EP) performance with 10% max. molybdenum disulphide (NLGI Grade 2) lithium base | Driveline slip-joints | — |
| Lubricant: Gear Lubricant | | | |
| SAE 80W-90 | High thermal and oxidation stability API service class GL-5 | R113 Cutterbar | 8 L (8.5 qts [US]) |
| SAE 80W-90 | High thermal and oxidation stability API service class GL-5 | R116 Cutterbar | 10 L (10.5 qts [US]) |
| SAE 85W-140 | Gear lubricant API service class GL-5 | Conditioner roll timing gearbox | 0.7 L (0.75 qts [US]) |
| SAE 85W-140 | Gear lubricant API service class GL-5 | Pull-type roll timing gearbox | 1.8 L (1.9 qts [US]) |
| SAE 85W-140 | Gear lubricant API service class GL-5 | Hitch (front) swivel gearbox | Upper: 1.2 L (1.3 qts [US]) Lower: 1.7 L (1.8 qts [US]) |
| SAE 85W-140 | Gear lubricant API service class GL-5 | Header (rear) swivel gearbox | Upper: 1.2 liters (1.3 qts [US]) Lower: 1.7 L (1.8 qts [US]) |

10.4 Torque Specifications

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

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

Jam nuts

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

Self-tapping screws

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

10.4.1 SAE Bolt Torque Specifications

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

Table 10.2 SAE Grade 5 Bolt and Grade 5 Free Spinning Nut

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

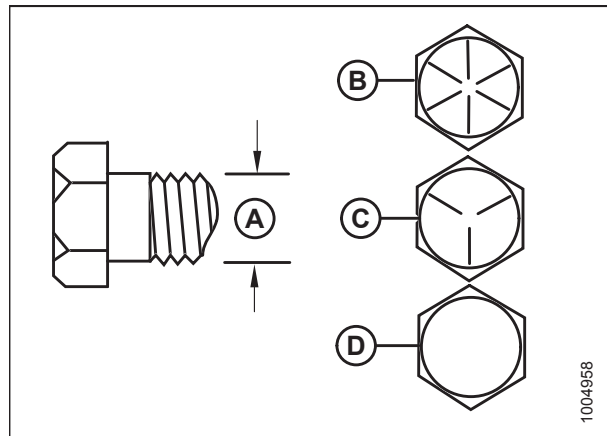


Figure 10.5: Bolt Grades

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

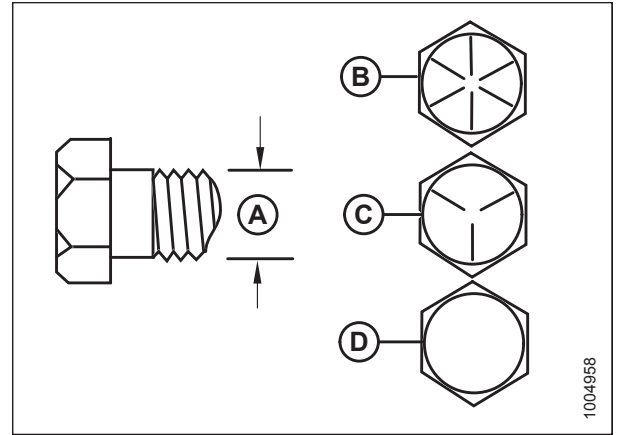


Figure 10.6: Bolt Grades

A - Nominal Size
C - SAE-5

B - SAE-8
D - SAE-2

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

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

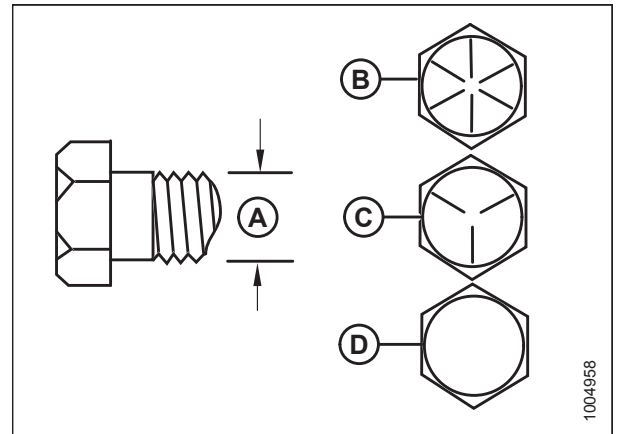


Figure 10.7: Bolt Grades

A - Nominal Size
C - SAE-5

B - SAE-8
D - SAE-2

REFERENCE

Table 10.5 SAE Grade 8 Bolt and Grade 8 Free Spinning Nut

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

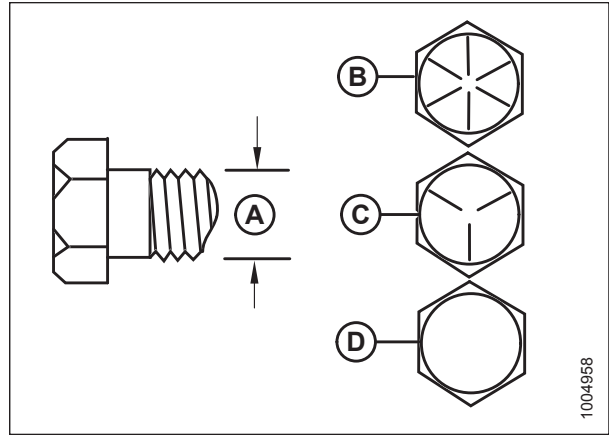


Figure 10.8: Bolt Grades

A - Nominal Size
C - SAE-5

B - SAE-8
D - SAE-2

10.4.2 Metric Bolt Specifications

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

Table 10.6 Metric Class 8.8 Bolts and Class 9 Free Spinning Nut

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

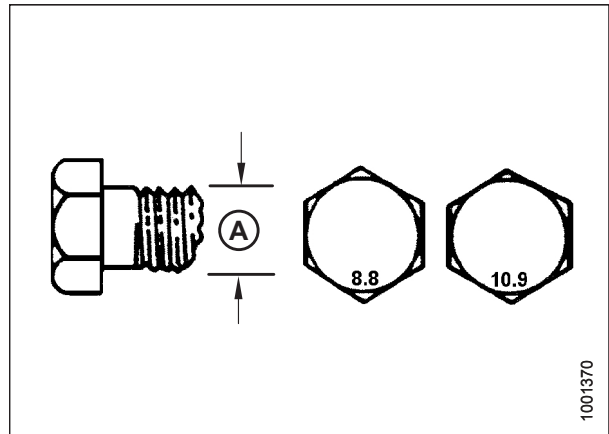


Figure 10.9: Bolt Grades

REFERENCE

Table 10.7 Metric Class 8.8 Bolts and Class 9 Distorted Thread Nut

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

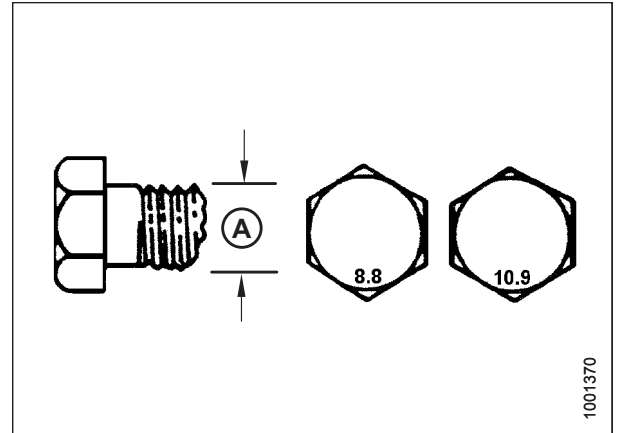


Figure 10.10: Bolt Grades

Table 10.8 Metric Class 10.9 Bolts and Class 10 Free Spinning Nut

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

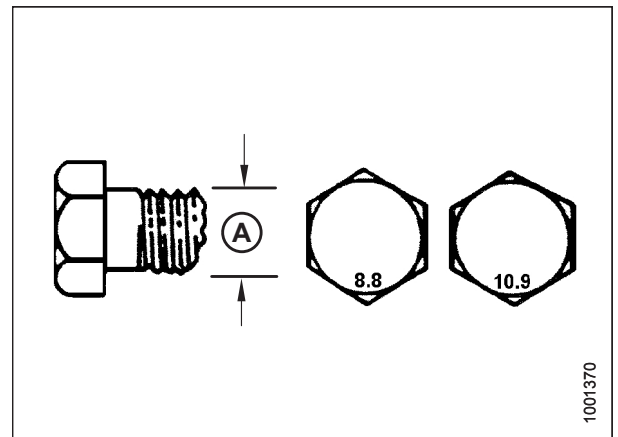


Figure 10.11: Bolt Grades

REFERENCE

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

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

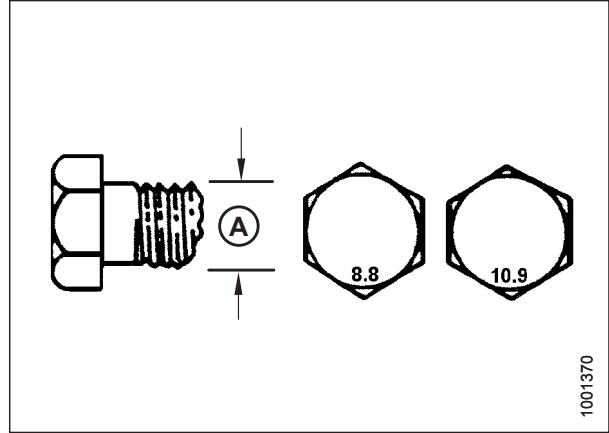


Figure 10.12: Bolt Grades

10.4.3 Metric Bolt Specifications Bolting into Cast Aluminum

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

Table 10.10 Metric Bolt Bolting into Cast Aluminum

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

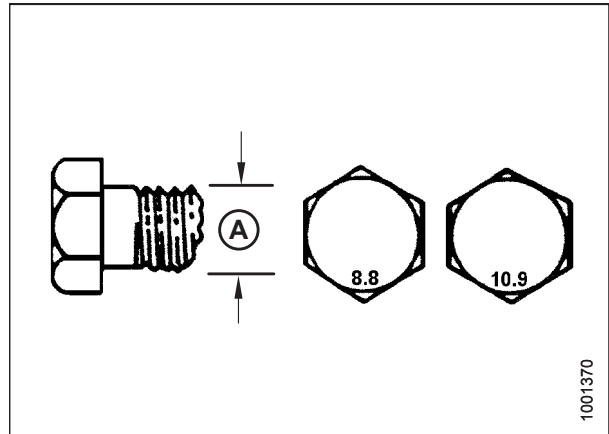


Figure 10.13: Bolt Grades

10.4.4 Flare-Type Hydraulic Fittings

1. Check flare (A) and flare seat (B) for defects that might cause leakage.
2. Align tube (C) with fitting (D) and thread nut (E) onto fitting without lubrication until contact has been made between flared surfaces.
3. Torque fitting nut (E) to specified number of flats from finger tight (FFFT) or to a given torque value in Table 10.11, page 189.
4. Use two wrenches to prevent fitting (D) from rotating. Place one wrench on fitting body (D), and tighten nut (E) with other wrench to torque shown.
5. Assess final condition of connection.

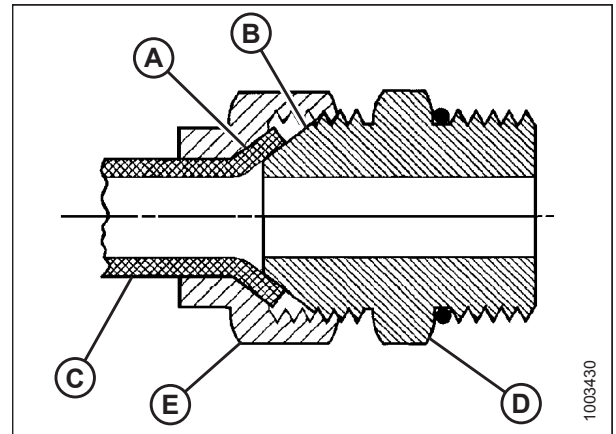


Figure 10.14: Hydraulic Fitting

Table 10.11 Flare-Type Hydraulic Tube Fittings

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

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

10.4.5 O-Ring Boss Hydraulic Fittings – Adjustable

Torque values are shown in following table below.

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

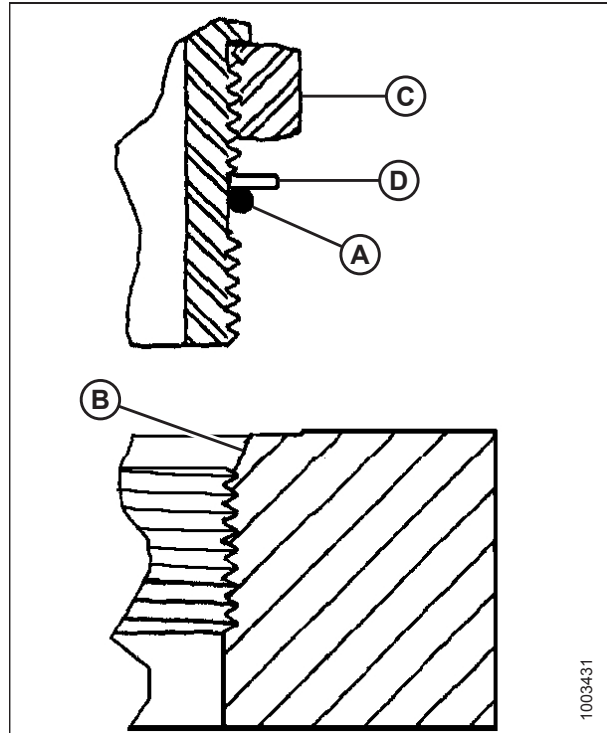


Figure 10.15: Hydraulic Fitting

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

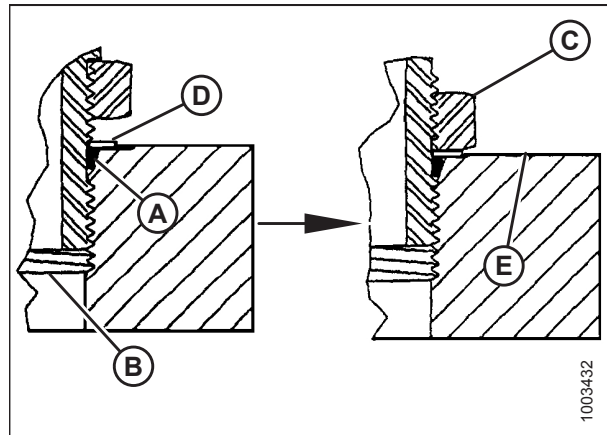


Figure 10.16: Hydraulic Fitting

REFERENCE

Table 10.12 O-Ring Boss (ORB) Hydraulic Fittings – Adjustable

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

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

REFERENCE

10.4.6 O-Ring Boss Hydraulic Fittings – Non-Adjustable

Torque values are shown in following table below.

1. Inspect O-ring (A) and seat (B) for dirt or obvious defects.
2. Check that O-ring (A) is **NOT** on the threads and adjust if necessary.
3. Apply hydraulic system oil to the O-ring.
4. Install fitting (C) into port until the fitting is hand-tight.
5. Torque fitting (C) according to values in Table 10.13, page 192.
6. Check the final condition of the fitting.

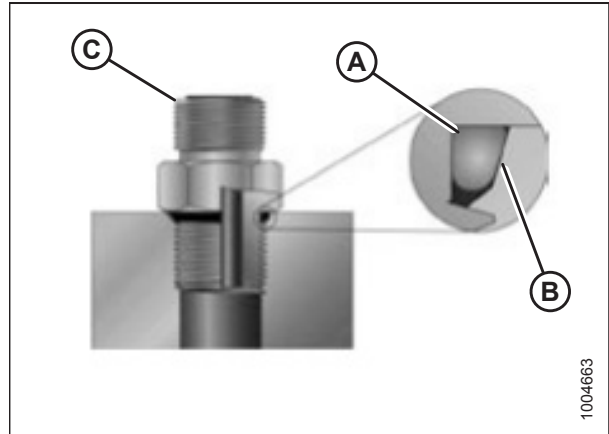


Figure 10.17: Hydraulic Fitting

Table 10.13 O-Ring Boss (ORB) Hydraulic Fittings – Non-Adjustable

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

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

10.4.7 O-Ring Face Seal Hydraulic Fittings

Torque values are shown in following table below.

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



Figure 10.18: Hydraulic Fitting

2. Apply hydraulic system oil to O-ring (B).
3. Align the tube or hose assembly so that the flat face of sleeve (A) or (C) comes in full contact with O-ring (B).
4. Thread tube or hose nut (D) until it is hand-tight. The nut should turn freely until it is bottomed out.
5. Torque the fittings according to values in Table 10.14, page 193.

NOTE:

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

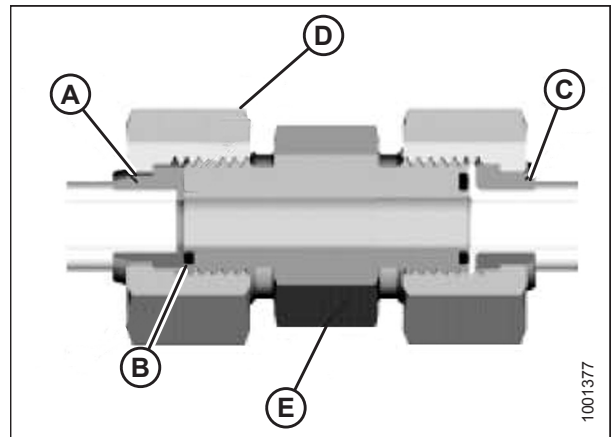


Figure 10.19: Hydraulic Fitting

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

Table 10.14 O-Ring Face Seal (ORFS) Hydraulic Fittings

| SAE Dash Size | Thread Size (in.) | Tube O.D. (in.) | Torque Value ⁸ | |
|---------------|-------------------|-----------------|---------------------------|--------|
| | | | Nm | lbf-ft |
| -3 | Note ⁹ | 3/16 | – | – |
| -4 | 9/16 | 1/4 | 25–28 | 18–21 |
| -5 | Note ⁹ | 5/16 | – | – |
| -6 | 11/16 | 3/8 | 40–44 | 29–32 |
| -8 | 13/16 | 1/2 | 55–61 | 41–45 |

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

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

REFERENCE

Table 10.14 O-Ring Face Seal (ORFS) Hydraulic Fittings (continued)

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

10.4.8 Tapered Pipe Thread Fittings

Torque values are shown in following table below.

Assemble pipe fittings as follows:

1. Check components to ensure that the fitting and port threads are free of burrs, nicks, scratches, and any form of contamination.
2. Apply pipe thread sealant (paste type) to the external pipe threads.
3. Thread the fitting into the port until it is hand-tight.
4. Torque the connector to the appropriate torque angle. The turns from finger tight (TFFT) and flats from finger tight (FFFT) values are shown in Table 10.15, page 194. Make sure that the tube end of a shaped connector (typically 45° or 90°) is aligned to receive the incoming tube or hose assembly. Always finish alignment of fitting in the direction of tightening. Never back off (loosen) the pipe threaded connectors to achieve alignment.
5. Clean all the residue and any excess thread conditioner with an appropriate cleaner.
6. Assess the final condition of the fitting. Pay special attention to the possibility of cracks to port opening.
7. Mark the final position of the fitting. If a fitting leaks, disassemble the fitting and check it for damage.

NOTE:

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

Table 10.15 Hydraulic Fitting Pipe Thread

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

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

REFERENCE

Table 10.15 Hydraulic Fitting Pipe Thread (continued)

| Tapered Pipe Thread Size | Recommended TFFT | Recommended FFFT |
|--------------------------|------------------|------------------|
| 1-11 1/2 | 1.5-2.5 | 9-15 |
| 1 1/4-11 1/2 | 1.5-2.5 | 9-15 |
| 1 1/2-11 1/2 | 1.5-2.5 | 9-15 |
| 2-11 1/2 | 1.5-2.5 | 9-15 |

REFERENCE

10.5 Conversion Chart

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

Table 10.16 Conversion Chart

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

REFERENCE

10.6 Definitions

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

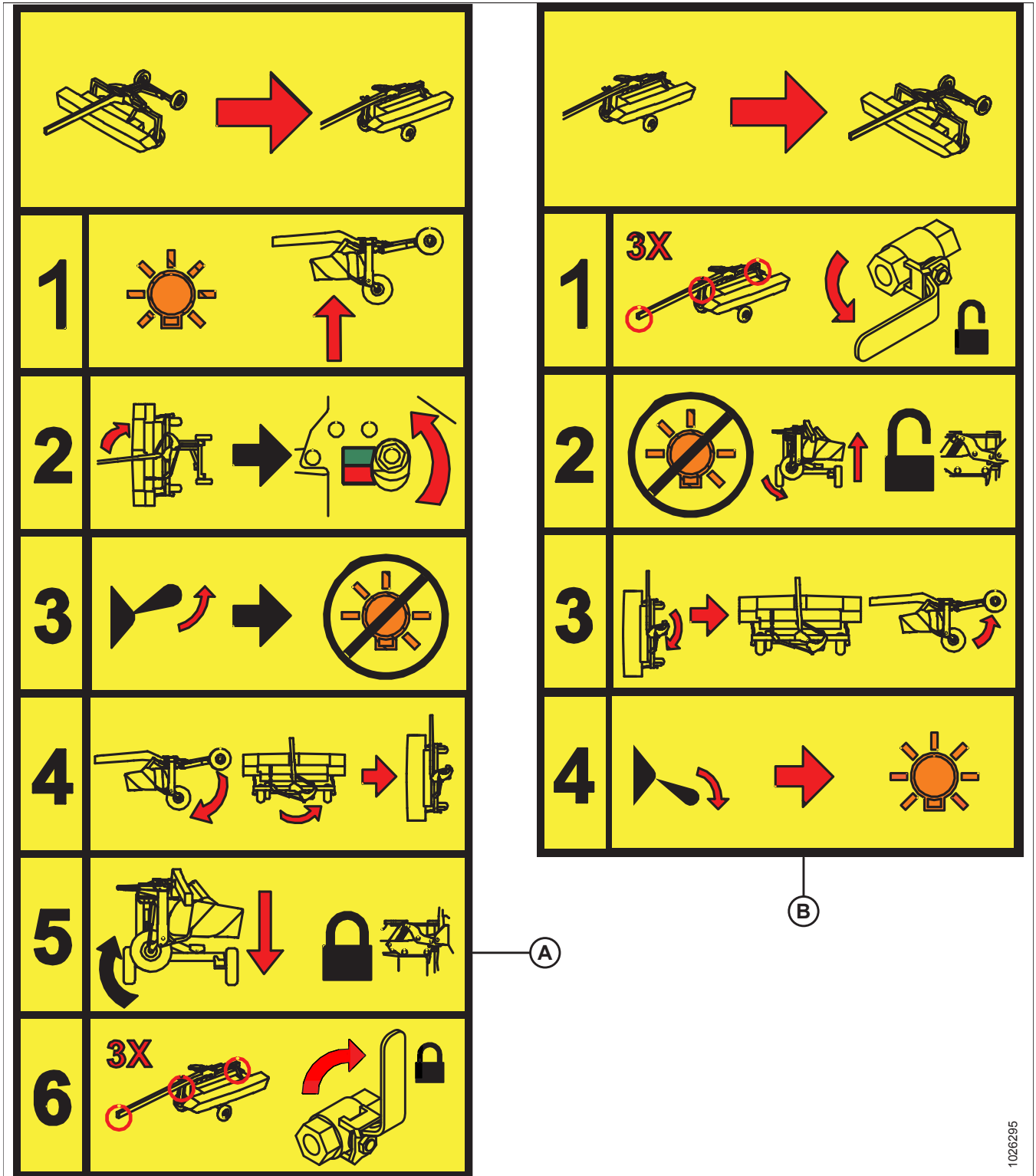
| Term | Definition |
|--|---|
| API | American Petroleum Institute |
| APT | Articulated Power Turn |
| ASTM | American Society of Testing and Materials |
| Bolt | A headed and externally threaded fastener that is designed to be paired with a nut |
| Center-link | A hydraulic cylinder link between the header and machine used to change header angle |
| CGVV | Combined gross vehicle weight |
| Export rotary disc pull-type | Machine configuration typical outside North America |
| FFFT | Flats from finger tight |
| Finger tight | Finger tight is a reference position where sealing surfaces or components are making contact with each other, and fitting has been tightened to a point where fitting is no longer loose |
| GVW | Gross vehicle weight |
| Hard joint | A joint made with use of a fastener where joining materials are highly incompressible |
| Header or rotary header | The part of the rotary disc pull-type that cuts and conditions the crop |
| Hex key | A tool of hexagonal cross-section used to drive bolts and screws that have a hexagonal socket in head (internal-wrenching hexagon drive); also known as an Allen key and various other synonyms |
| hp | Horsepower |
| JIC | Joint Industrial Council: A standards body that developed standard sizing and shape for original 37° flared fitting |
| n/a | Not applicable |
| North American rotary disc pull-type | Rotary disc pull-type 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 |
| Nut | An internally threaded fastener that is designed to be paired with a bolt |
| ORB | O-ring boss: A style of fitting commonly used in port openings on manifolds, pumps, and motors |
| ORFS | O-ring face seal: A style of fitting commonly used for connecting hoses and tubes. This style of fitting is also commonly called ORS, which stands for O-ring seal |
| PTO | Power take-off |
| R1 PT Series | R113 and R116 Rotary Disc Pull-Types |
| RoHS (Reduction of Hazardous Substances) | A directive by the European Union to restrict use of certain hazardous substances (such as hexavalent chromium used in some yellow zinc platings) |
| Rotary disc pull-type | A machine that cuts and conditions hay and is pulled by an agricultural tractor |

REFERENCE

| Term | Definition |
|----------------|---|
| rpm | Revolutions per minute |
| SAE | Society of Automotive Engineers |
| Screw | A headed and externally threaded fastener that threads into preformed threads or forms its own thread into a mating part |
| Soft joint | A joint made with use of a fastener where joining materials are compressible or experience relaxation over a period of time |
| Tension | Axial load placed on a bolt or screw, usually measured in Newtons (N) or pounds (lb.) |
| TFFT | Turns from finger tight |
| Torque | The product of a force X lever arm length, usually measured in Newton-meters (Nm) or foot-pounds (lbf-ft) |
| Torque angle | A tightening procedure where fitting is assembled to a precondition (finger tight) and then nut is turned farther a number of degrees to achieve its final position |
| Torque-tension | The relationship between assembly torque applied to a piece of hardware and axial load it induces in bolt or screw |
| Tractor | Agricultural-type tractor |
| Washer | A thin cylinder with a hole or slot located in the center that is to be used as a spacer, load distribution element, or locking mechanism |

10.7 Converting Transport Decal

The transport decal on the remote control provides a pictorial instruction for operating the optional transport system.



A - Converting From Field to Transport

B - Converting From Transport to Field

Preelivery Checklist

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

WARNING

Do NOT operate the machine with the driveshields open. High speed rotating components may throw debris and could result in death or serious injury.

CAUTION


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

Rotary Disc Pull-Type Serial Number:

Hitch Serial Number:

| ✓ | Item | Reference |
|---|--|---|
| | Check for shipping damage or missing parts. Be sure all shipping dunnage is removed. | — |
| | Check for loose hardware. Tighten to required torque if applicable. | <i>10.4 Torque Specifications, page 184</i> |
| | Check that hydraulic hoses have adequate slack before rotating header. | — |
| | Check main drive belt tension. | <i>8.3 Checking Conditioner Drive Belt, page 139</i> |
| | Check header angle. Set center-link to middle of adjustment range. | <i>8.4 Checking Cutting Angle, page 140</i> |
| | Check header float. | <i>8.6 Checking Rotary Disc Pull-Type Float, page 142</i> |
| | Check tire pressure. | <i>8.2 Checking Tire Pressure, page 138</i> |
| | Ensure wheel bolts are torqued to 160 Nm (120 lbf-ft). | <i>8.1 Checking Wheel Bolts, page 137</i> |
| | Check side forming shields evenly set to desired position. | <i>6.4 Setting up Forming Shields, page 115</i> |
| | Check rear baffle is about mid-position (roll conditioner). | <i>8.14 Adjusting Conditioner Baffle Position, page 157</i> |
| | Check forward baffle lever is set to approximate mid-position (finger conditioner). | <i>8.14 Adjusting Conditioner Baffle Position, page 157</i> |
| | Check rear baffle lever is set to approximate mid-position (finger conditioner). | <i>8.14 Adjusting Conditioner Baffle Position, page 157</i> |
| | Check conditioner roll gap (roll conditioner). | <i>8.11 Checking Roll Gap, page 153</i> |
| | Check conditioner roll tension (roll conditioner). | <i>8.13.1 Adjusting Roll Tension, page 156</i> |
| | Check conditioner roll timing hardware is securely tightened (roll conditioner). | <i>8.12 Checking Roll Timing, page 155</i> |
| | Check that tall crop dividers are not installed for road transport. | <i>4.9.2 Installing Tall Crop Divider – Optional, page 97</i> |

REFERENCE

| ✓ | Item | Reference |
|--|--|--|
| | Check that cutterbar doors are unbolted from center channel frame, shipping wire is removed from cutterbar curtains, and cutterbar curtains are hanging properly. | <i>6.5 Unpacking Curtains, page 121</i> |
| | Grease all bearings and drivelines. | <i>7.2 Lubrication Points, page 131</i> |
| | Check conditioner roll timing gearbox lubricant. | <i>8.7 Checking and Adding Lubricant – Conditioner Roll Timing Gearbox, page 145</i> |
| | Check rotary disc pull-type roll timing gearbox lubricant. | <i>8.8 Checking and Adding Lubricant – Rotary Disc Pull-Type Drive Gearbox, page 147</i> |
| | Check forward and rear swivel gearbox lubricant. | <i>8.9 Checking and Adding Lubricant – Forward and Rear Swivel Gearboxes, page 149</i> |
| | Check cutterbar lubricant. | <i>8.10 Checking and Adding Lubricant – Cutterbar, page 151</i> |
| | <p>Check cutterbar area carefully for loose parts and hardware on the cutterbar.</p> <p> WARNING</p> <p>These objects can be ejected with considerable force when the machine is started, and may result in serious injury or machine damage.</p> | — |
| Run-Up Procedure | | <i>8.17 Running up the Header, page 160</i> |
| | 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. | <i>8.15 Checking Lights, page 158</i> |
| Post Run-Up Check – Stop Engine | | |
| | Check belt drive for proper idler alignment and overheating bearings. | <i>8.3 Checking Conditioner Drive Belt, page 139</i> |
| | Check for hydraulic leaks. | — |
| | Check that header manuals are in storage compartment. | <i>8.16 Checking Manuals, page 159</i> |

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