

# **Double Windrow Attachment (DWA) for M1 Series Windrowers**

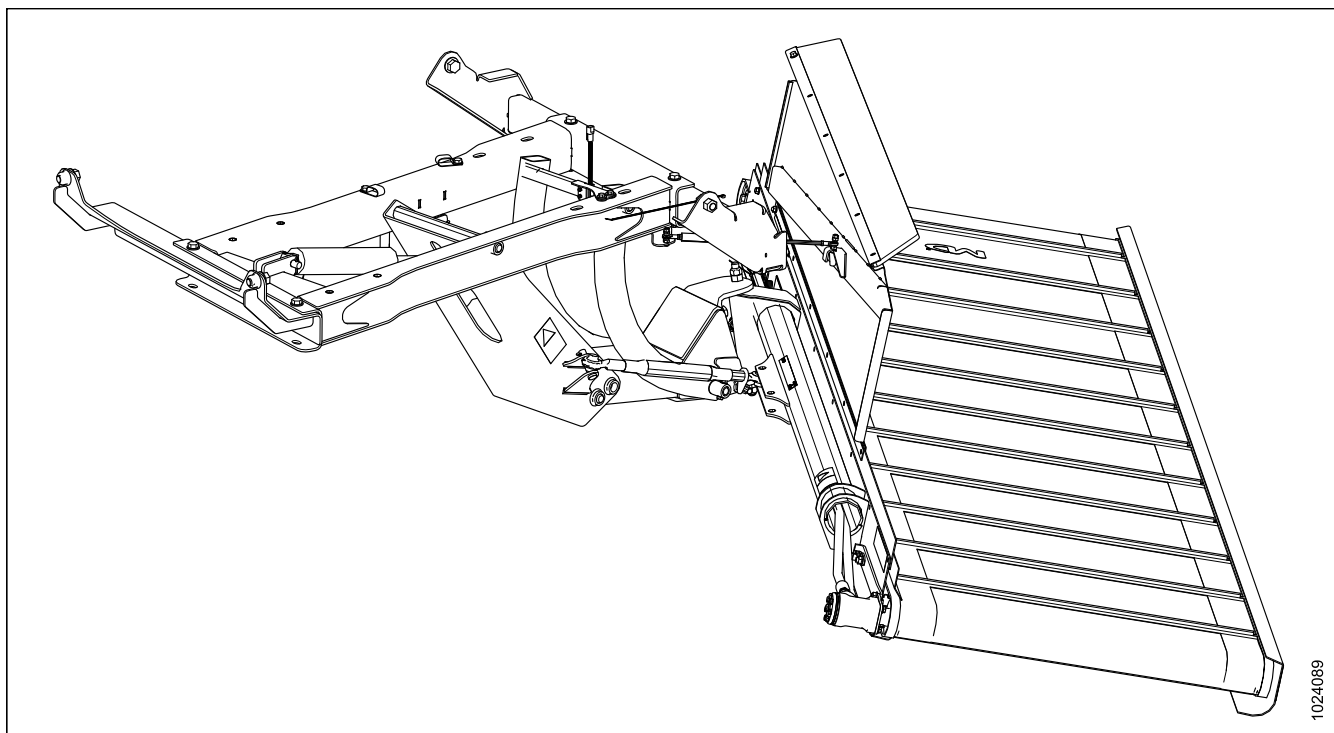
Setup, Operation, and Parts Manual

214641 Revision A

2018 Model Year

Original Instruction

This instruction contains the setup procedures, operation instructions, and parts lists for the MacDon Double Windrow Attachment (DWA) for M1 Series Windrowers.



Published: February 2018

# Introduction

The Double Windrow Attachment (DWA) provides the ability to place two or three windrows of conditioned material close together. The DWA can be mounted on the following MacDon Windrowers:

- M1170
- M1240

The DWA is for use with the following headers:

- A Series Auger Headers
- R85 Disc Headers

When the DWA system is engaged, the conditioned crop is deposited onto the side draper and placed to the right side of the windrower. Raising the side delivery disengages the DWA, allowing the crop to be deposited between the windrower's wheels.

**Carefully read all the material provided before attempting to use the machine.**

When setting up the machine or making adjustments, review and follow the recommended machine settings in all relevant MacDon publications. Failure to do so may compromise machine function and machine life and may result in a hazardous situation.

MacDon provides warranty for Customers who operate and maintain their equipment as described in this manual. A copy of the MacDon Industries Limited Warranty Policy, which explains this warranty, should have been provided to you by your Dealer. Damage resulting from any of the following conditions will void the warranty:

- Accident
- Misuse
- Abuse
- Improper maintenance or neglect
- Abnormal or extraordinary use of the machine
- Failure to use the machine, equipment, component, or part in accordance with the manufacturer's instructions

## NOTE:

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

## Conventions

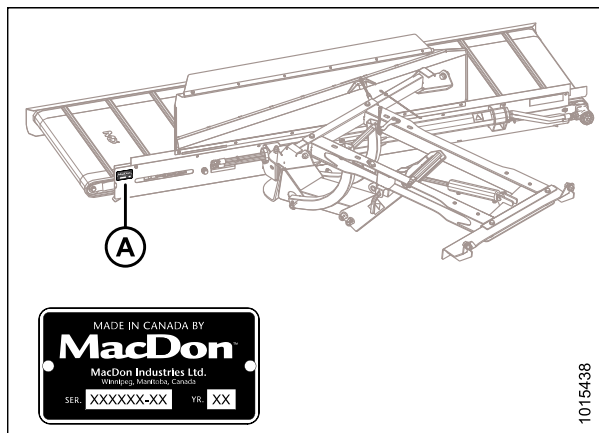
- Right and left are determined from the operator's position, facing forward with the windrower in cab-forward position.
- Unless otherwise noted, use the standard torque values provided in Chapter of this document.

## Serial Number Location

Record the serial number of the Double Windrow Attachment (DWA) in the space provided.

**DWA serial number:** \_\_\_\_\_

The serial number plate is located on the deck (A).



**Figure 1. Serial Number Location**

## List of Revisions

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

Summary of Change	Location
Revised instruction and illustration.	<a href="#">8, page 21</a>
Revised steps for installing the ball joint link between linkage and backsheet.	<ul style="list-style-type: none"> <li>• <a href="#">17, page 26</a></li> <li>• <a href="#">19, page 26</a></li> </ul>
Revised the installation procedure and recommended torque for hydraulic hoses and fittings.	<ul style="list-style-type: none"> <li>• <a href="#">2.4 Installing the Hydraulics to M1170 Windrower, page 27</a></li> <li>• <a href="#">2.5.1 M1240 Disc-Only Configuration, page 28</a></li> </ul>
Edited note to be relevant for M1 Series windrowers.	<a href="#">3.5 Adjusting Deck Angle, page 42</a>
Added note stating that windrower engine must be running for the deck to be in its most forward position.	<a href="#">3.5.1 Adjusting Deck Angle Relative to the Drive Tire, page 42</a>
Revised steps for installing the ball joint link between linkage and backsheet with deck raised.	<ul style="list-style-type: none"> <li>• <a href="#">4, page 45</a></li> <li>• <a href="#">5, page 45</a></li> </ul>
Revised the note recommending removal of fins on forming shield when paired with a disc header, and added a step to check clearance between forming shield and hose support.	<a href="#">3.7 Positioning the Conditioner Forming Shield, page 46</a>
Revised instruction for positioning forming shield rear deflector baffle.	<a href="#">6, page 47</a>
Removed operating recommendations for incompatible headers.	—
Updated the following backsheet parts: <ul style="list-style-type: none"> <li>• 176607 superseded by 176831</li> <li>• 176523 superseded by 176838</li> <li>• 176532 superseded by 176839</li> </ul>	<a href="#">5.1 Deck, Draper, and Rollers, page 66</a>
Revised the illustration and parts list (items 39 and 40) to show the correct ball joint linkage bracket.	<a href="#">5.2 Linkage and Deck Support, page 72</a>
Added Contact Decal (MD #176830) and Back Panel Adjustment Decal (MD #176832) to the parts list. Revised the backsheet illustration.	<a href="#">5.3 Decals and Reflectors, page 78</a>



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# 1 Safety

## 1.1 Safety Alert Symbols

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

This symbol means:

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

Carefully read and follow the safety message accompanying this symbol.

### Why is safety important to you?

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



Figure 1.1: Safety Symbol

## 1.2 Signal Words

Three signal words, **DANGER**, **WARNING**, and **CAUTION**, are used to alert you to hazardous situations. 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.

## 1.3 General Safety

### CAUTION

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

Protect yourself.

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



Figure 1.2: Safety Equipment



Figure 1.3: Safety Equipment

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

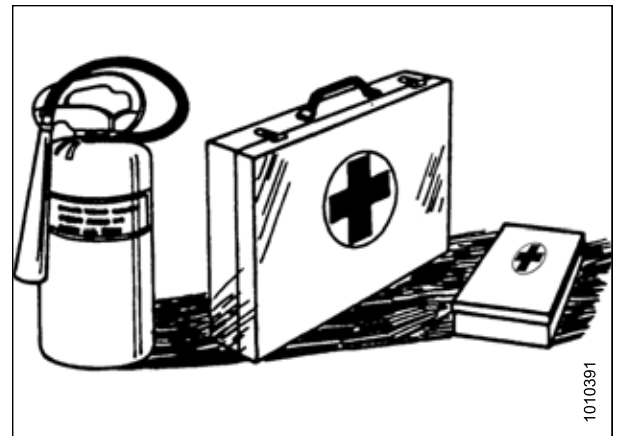


Figure 1.4: Safety Equipment

## SAFETY

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



Figure 1.5: Safety around Equipment

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

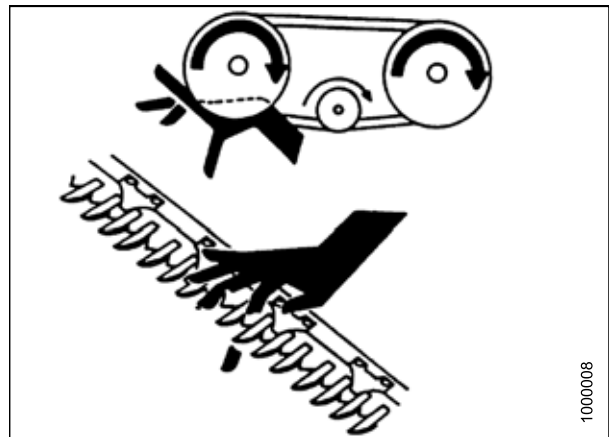


Figure 1.6: Safety around Equipment

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



Figure 1.7: Safety around Equipment

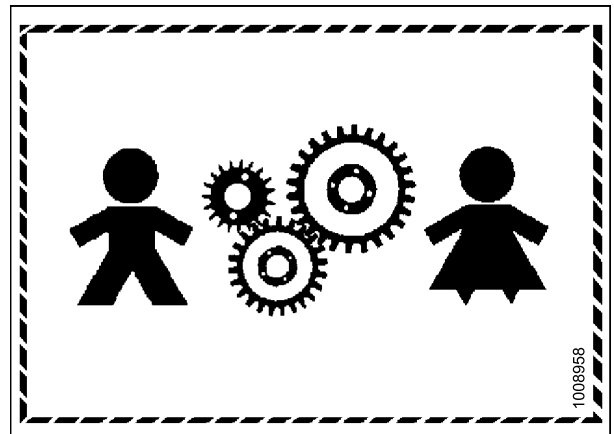
## 1.4 Maintenance Safety

To ensure your safety while maintaining machine:

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



**Figure 1.8: Safety around Equipment**



**Figure 1.9: Equipment NOT Safe for Children**



**Figure 1.10: Safety Equipment**

## 1.5 Hydraulic Safety

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

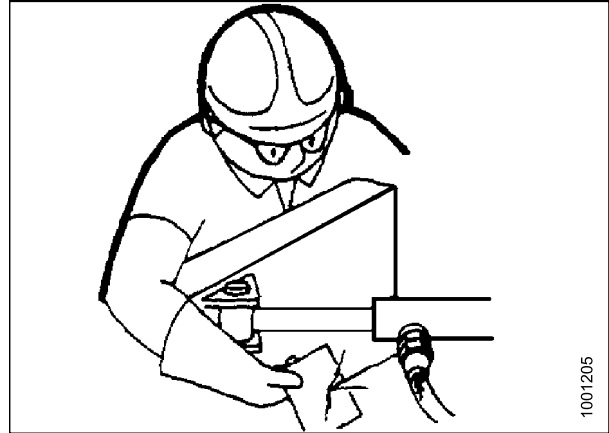


Figure 1.11: Testing for Hydraulic Leaks

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



Figure 1.12: Hydraulic Pressure Hazard

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

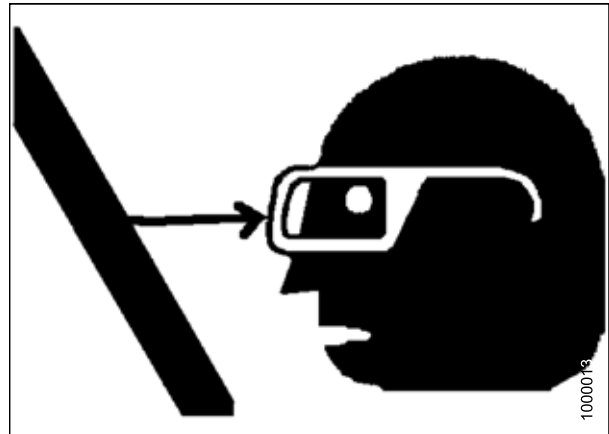


Figure 1.13: Safety around Equipment

## 1.6 Tire Safety

### WARNING

- Service tires safely.
- 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.

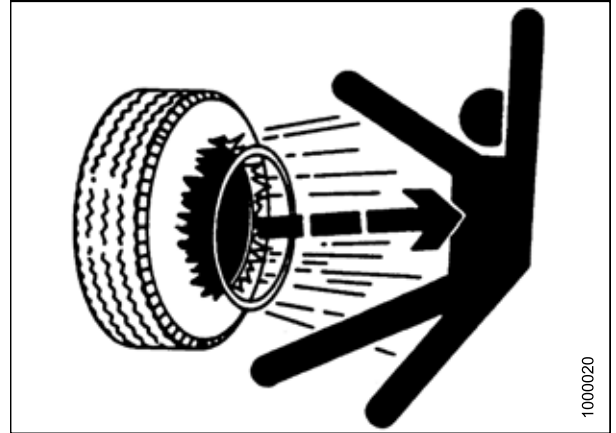


Figure 1.14: Overinflated Tire

### WARNING

- Do NOT stand over tire. Use a clip-on chuck and extension hose.
- Do NOT exceed maximum inflation pressure indicated on tire label.
- Replace tires that have defects.
- Replace wheel rims that are cracked, worn, or severely rusted.
- Never weld a wheel rim.
- Never use force on an inflated or partially inflated tire.
- Make sure tire is correctly seated before inflating to operating pressure.
- If tire is not correctly positioned on rim or is overinflated, 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 tire in any direction endangering anyone in area.
- Make sure all air is removed from tire before removing tire from rim.
- Do NOT remove, install, or repair a tire on a rim unless you have proper equipment and experience to perform job.
- Take tire and rim to a qualified tire repair shop.

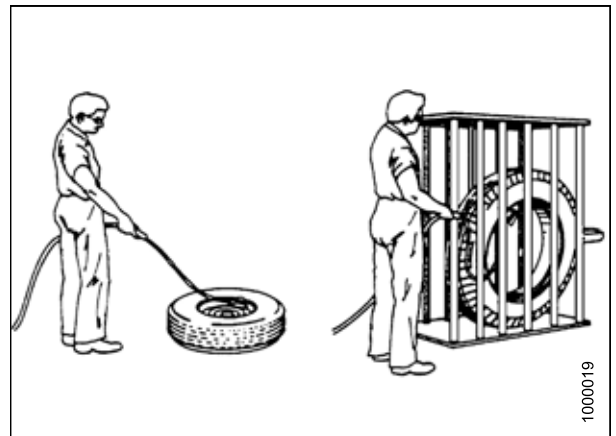


Figure 1.15: Safely Inflating Tire

## 1.7 Battery Safety

### WARNING

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



Figure 1.16: Safety around Batteries

### WARNING

- Wear safety glasses when working near batteries.
- Do NOT tip batteries more than 45° to avoid electrolyte loss.
- Battery electrolyte causes severe burns. Avoid contact with skin, eyes, or clothing.
- Electrolyte splashed into eyes is extremely dangerous. Should this occur, force eye open, and flood with cool, clean water for 5 minutes. Call a doctor immediately.
- If electrolyte is spilled or splashed on clothing or body, neutralize it immediately with a solution of baking soda and water, then rinse with clear water.

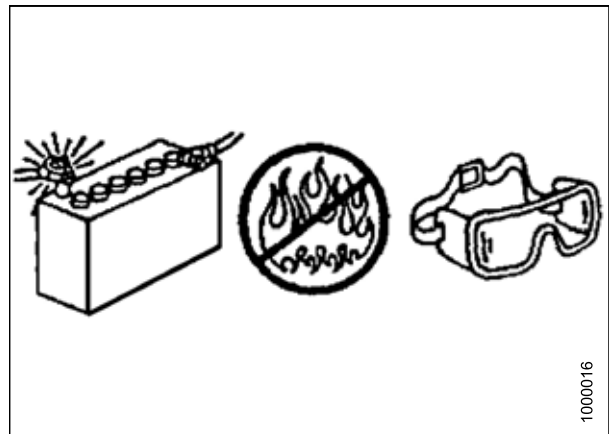


Figure 1.17: Safety around Batteries

### WARNING

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

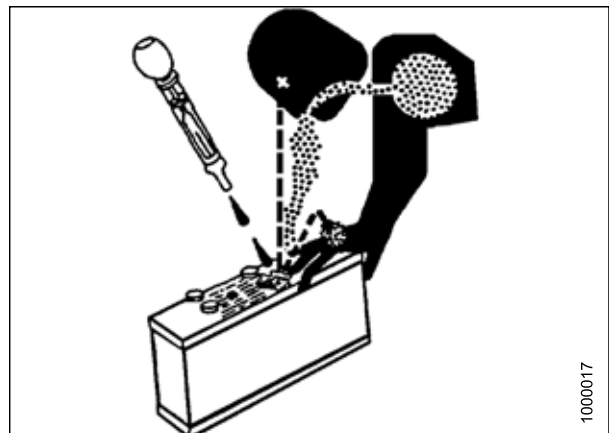


Figure 1.18: Safety around Batteries

## 1.8 Welding Precaution

### WARNING

It is very important that correct procedures be followed when welding anything connected to the windrower. If procedures are not followed, it could result in severe damage to sensitive, expensive electronics. Even if complete failure of a module doesn't happen immediately, it is impossible to know what effect high current could have with regard to future malfunctions or shorter lifespan.

Due to the number of connectors, components to be welded should be removed from the windrower whenever possible rather than welded in place. When work needs to be completed on a header, disconnect the header completely from the windrower before welding. These same guidelines apply to plasma cutting, or any other high current electrical operation performed on the machine.

**The following items need to be disconnected:**

- Negative battery terminals (A) (two connections)

**IMPORTANT:**

Always disconnect the battery terminals first, and reconnect them last.

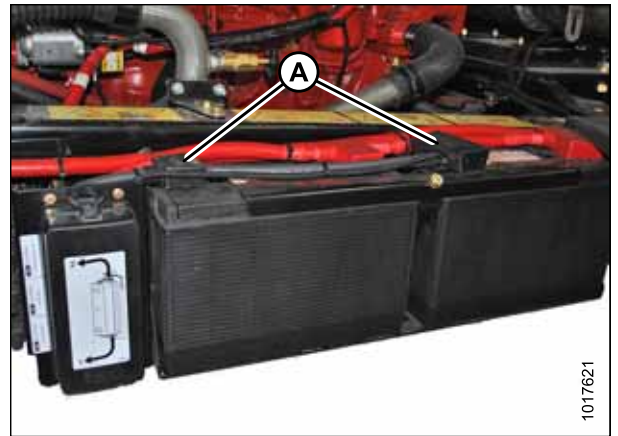


Figure 1.19: Negative Terminals

- Master controller (A)  
Four connectors: P231, P232, P233, and P234  
Location: Behind cab, near header lift/fan manifold

To disconnect the connectors, press the two outer tabs, and pull the connector away from master controller.

**IMPORTANT:**

When reconnecting these connectors, double-check that the connectors are fully seated into the master controller, and that the two locking tabs on each end of all four connectors have popped outward. If the tabs are not popped outward, the connector is not fully seated.

**IMPORTANT:**

Do **NOT** power up or operate the windrower until these connectors are locked into place.



Figure 1.20: Master Controller

## SAFETY

- Firewall extension module (A)  
Two connectors: P235 and P236

Location: Behind cab, near header lift/fan manifold.

To disconnect, use a small 3–6 mm (1/8–1/4 in.) blade screwdriver to insert into the connector's locking tab. Gently pry upward (no more than 6 mm [1/4 in.]) to unlock the connector tab, and then pull the connector away from the module.



Figure 1.21: Firewall Extension Module

- Chassis extension module (A)  
Two connectors: P247 and P248

Location: Under cab, inside left frame rail

To disconnect, use a small 3–6 mm (1/8–1/4 in.) blade screwdriver to insert into the connector's locking tab. Gently pry upward (no more than 6 mm [1/4 in.]) to unlock the connector tab, and then pull the connector away from the module.

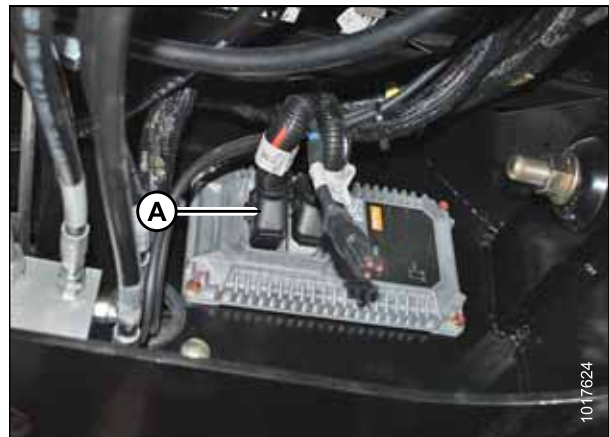


Figure 1.22: Chassis Extension Module

- Engine Control Module (ECM)  
Two connectors for Cummins: P100 (A) and J1 Cummins Proprietary ECM Connector (B)

Location: On engine

To disconnect, pull the rubber boot off the cover, unlock the latch, and undo the main over-center latch. Remove strain relief bolts (C) so the connectors can be pulled away from the ECM.

### IMPORTANT:

Be sure to disconnect both connectors. Note connector locations.

### IMPORTANT:

Be sure to reconnect connectors in the proper locations. Do **NOT** cross connect.

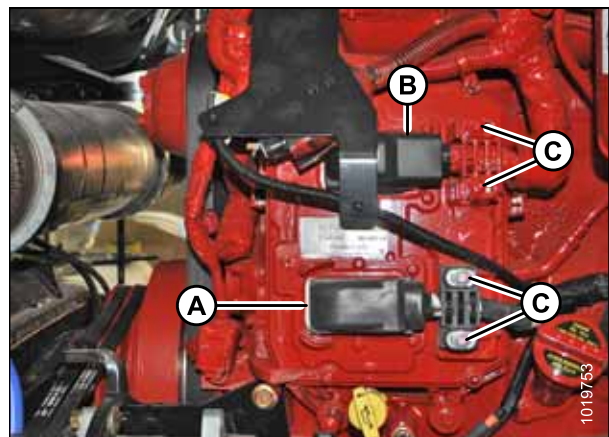


Figure 1.23: Engine Control Module

## SAFETY

### NOTE:

To disconnect the remaining circular Deutsch connectors, rotate outer collar counterclockwise.

- Cab connectors (A)  
Two round connectors: C1 and C2

Location: Under cab

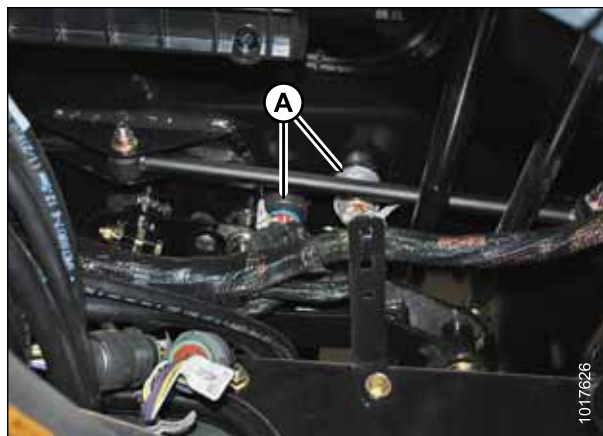


Figure 1.24: Cab Connectors

- Roof connectors (A)  
Four connectors: C10, C12, C13, and C14  
Location: Under cab at base of left cab post

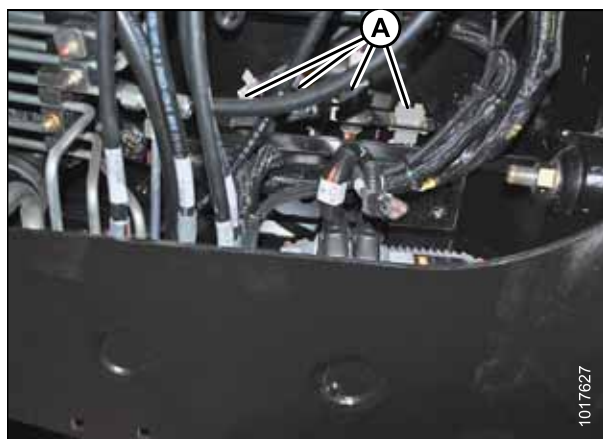


Figure 1.25: Roof Connectors

- Chassis relay module (A)  
Three connectors: P240, P241, and P242  
Location: Outside left frame rail near batteries



Figure 1.26: Chassis Relay Module

## SAFETY

- Engine harness (A)  
Two round connectors: C30 and C31  
Location: Inside left frame rail, at rear of windrower

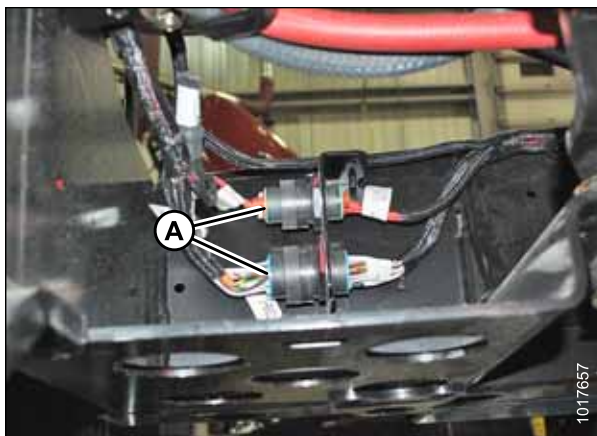


Figure 1.27: Engine Harness

- Air conditioning (A/C) box connectors (A)  
Two connectors: C15 and C16  
Location: Rear of A/C box



Figure 1.28: A/C Box Connectors

- Wheel motor connectors (A)  
Two round connectors: C25 and C26  
Location: Under center of frame, just behind front cross member

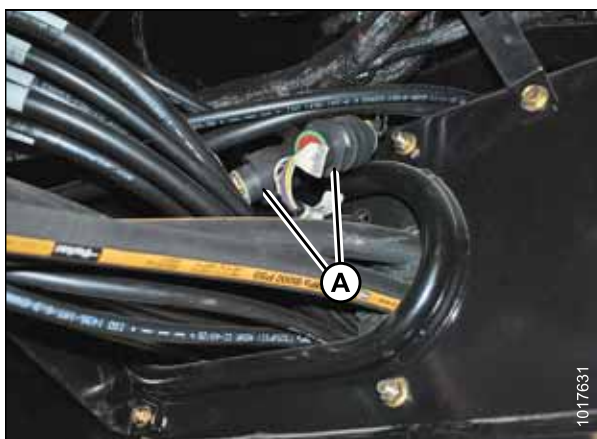


Figure 1.29: Wheel Motor Connectors

## **SAFETY**

### **IMPORTANT:**

To connect circular Deutsch connectors without bending the pins, align connector with receptacle before attempting to reconnect.

To align the connectors:

1. Observe the channel cuts and mating channel protrusions on the inner part of the circular walls of the connectors.
2. Face the mating connectors to each other, and rotate connectors so that channels are aligned.
3. Press connectors together while turning the outer connector clockwise until collar locks.

## 1.9 Engine Safety

### WARNING

Do NOT use aerosol starting aids such as ether. Such use could result in an explosion and personal injury.

### CAUTION

- On initial start-up of a new, serviced, or repaired engine, always be ready to stop the engine in order to stop an overspeed. This may be accomplished by shutting off the air and/or fuel supply to the engine.
- Do NOT bypass or disable automatic shutoff circuits. The circuits are provided in order to help prevent personal injury. The circuits are also provided in order to help prevent engine damage. Refer to your Dealer for repairs and adjustments.
- Inspect the engine for potential hazards.
- Before starting the engine, ensure that no one is on, underneath, or close to the engine. Ensure that people clear the area.
- All protective guards and all protective covers must be installed if the engine must be started in order to perform service procedures.
- To help prevent an accident that is caused by parts in rotation, work around parts carefully.
- If a warning tag is attached to engine start switch or to controls, do NOT start engine or move controls. Consult with person who attached warning tag before engine is started.
- Start engine from operator's compartment. Always start engine according to procedure that is described in Starting Engine section of operator's manual. Knowing correct procedure will help to prevent major damage to engine components and prevent personal injury.
- To ensure that the jacket water heater (if equipped) and/or lube oil heater (if equipped) is working correctly, check the water temperature gauge and/or oil temperature gauge during heater operation.
- Engine exhaust contains products of combustion which can be harmful to your health. Always start the engine and operate the engine in a well ventilated area. If the engine is started in an enclosed area, vent the engine exhaust to the outside.

#### NOTE:

The engine may be equipped with a device for cold starting. If the engine will be operated in very cold conditions, then an additional cold starting aid may be required.

### 1.9.1 High Pressure Rail

#### CAUTION

Contact with high pressure fuel may cause fluid penetration and burn hazards. High pressure fuel spray may cause a fire hazard. Failure to follow these instructions may cause personal injury or death.

## **1.9.2 Engine Electronics**

### **WARNING**

Tampering with electronic system installation or original equipment manufacturer (OEM) wiring installation can be dangerous and could result in personal injury or death and/or engine damage.

### **WARNING**

**Electrical Shock Hazard.** The electronic unit injectors use DC voltage. The engine control module (ECM) sends this voltage to the electronic unit injectors. Do NOT come in contact with the harness connector for the electronic unit injectors while engine is operating. Failure to follow this instruction could result in personal injury or death.

This engine has a comprehensive, programmable engine monitoring system. The ECM has the ability to monitor engine operating conditions. If conditions exceed the allowable range, the ECM will initiate immediate action.

The following actions are available for engine monitoring control:

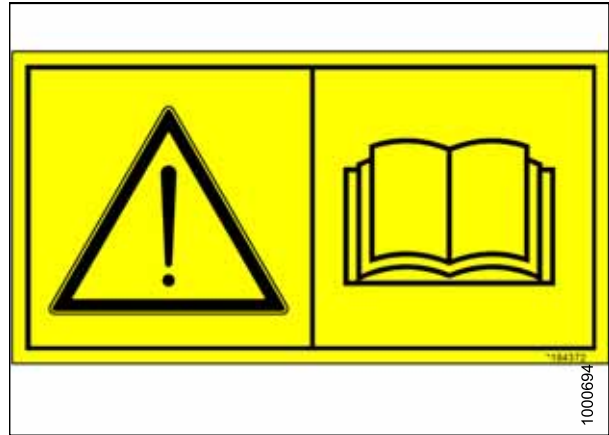
- Warning
- Derate
- Shut down

The following monitored engine operating conditions have the ability to limit engine speed and/or engine power:

- Engine coolant temperature
- Engine oil pressure
- Engine speed
- Intake manifold air temperature
- Diesel exhaust fluid (DEF) system performance
- Aftertreatment system performance

## **1.10 Safety Signs**

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



**Figure 1.30: Operator's Manual Decal**

### **1.10.1 Installing Safety Decals**

1. Clean and dry installation area.
2. Decide on exact location before you remove decal backing paper.
3. Remove smaller portion of split backing paper.
4. Place decal in position and slowly peel back remaining paper, smoothing decal as it is applied.
5. Prick small air pockets with a pin and smooth out.

## 1.11 Safety Sign Decals

MD #166466

HIGH PRESSURE HYDRAULICS

### DO NOT GO NEAR LEAKS

Located on deck

- High pressure oil easily punctures skin causing serious injury, gangrene, or death
- If injured, seek emergency medical help. Immediate surgery is required to remove oil
- Do **NOT** use finger or skin to check for leaks
- Lower load or relieve hydraulic pressure before loosening fittings

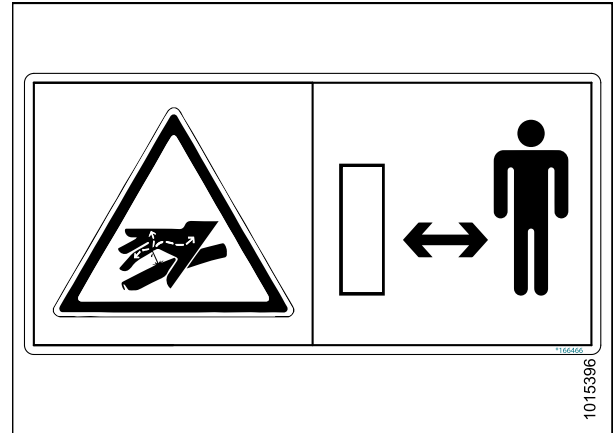


Figure 1.31: MD #166466

MD #174683

PINCH POINT - MOVING PARTS

### STAND CLEAR

Located on linkage arm (both sides)

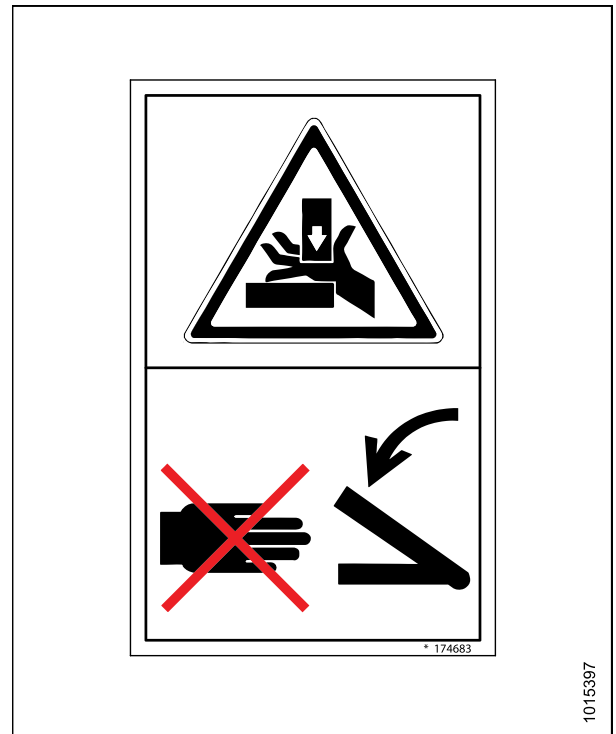


Figure 1.32: MD #174683

## SAFETY

MD #176295

DECK LIFT LOCK

Located on deck linkage

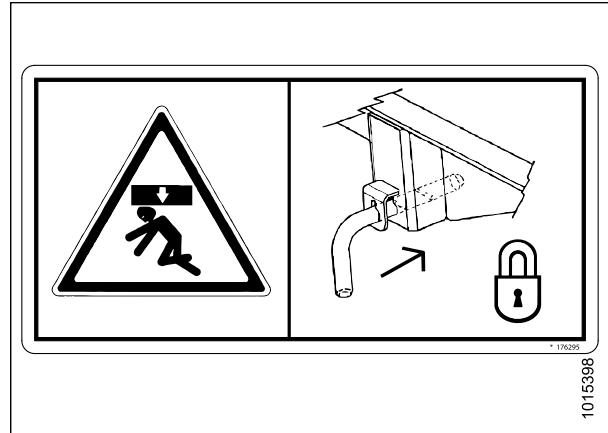


Figure 1.33: MD #176295

## 2 Assembly/Setup Instructions

### NOTE:

The Double Windrow Attachment (DWA) for M1 Series will only fit windrower models listed in the [Introduction, page i](#).

### 2.1 Raising the Right Stairs

Raise the right side stairs when installing and operating the Double Windrow Attachment (DWA).

1. Lift stairs (A) by hand until spring-loaded latch (B) locks steps in the upright position. Rubber bumper (C) stops the stairs from going past the upright position. Stairs are held in the down position by the extension of the gas shock (D).

### IMPORTANT:

Do **NOT** use the DWA deck as a step or a platform.

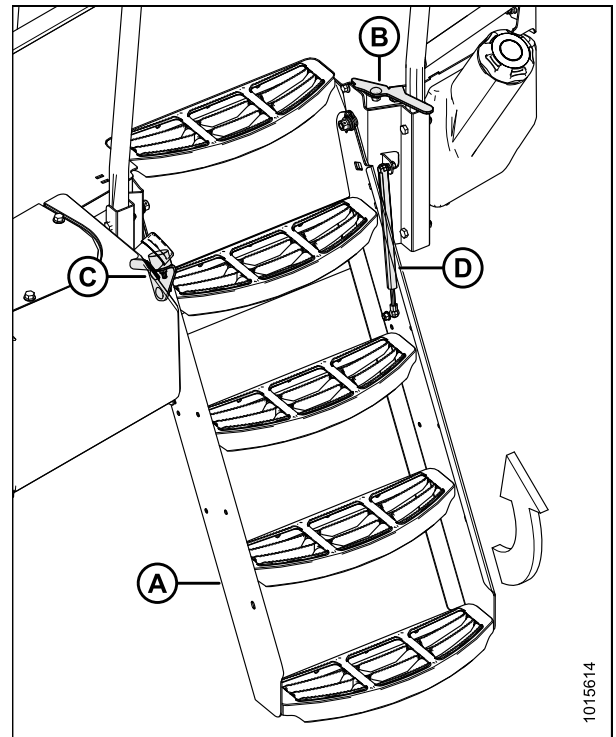


Figure 2.1: Right Stairs – Down Position

### To lower/release stairs, follow these steps:

1. Release stairs by pulling spring-loaded latch handle (A) to the left. Lower by hand.
2. Push stairs down until gas shock extension holds stairs in the down position.

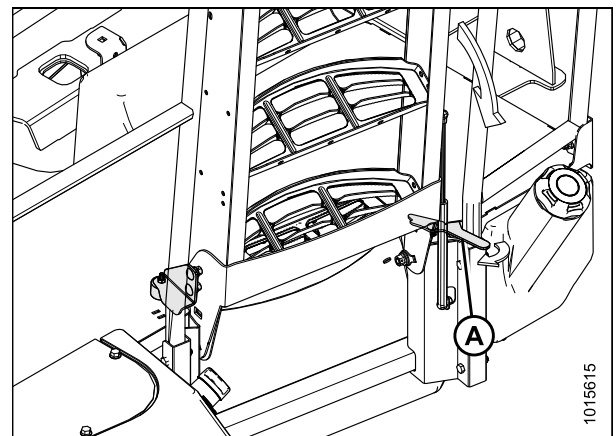


Figure 2.2: Right Stairs – Up Position

## 2.2 Installing the Linkage

To install the linkage, follow these steps:

1. Remove four bolts (A), four washers (B) and two nuts (C) that are loosely installed on the DWA linkage. Keep hardware for mounting.

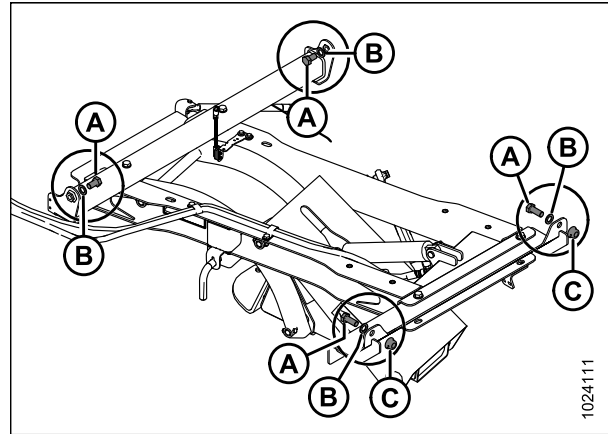


Figure 2.3: Linkage Support

2. Support linkage assembly (A) with a forklift and lift into place under windrower.

**NOTE:**

Approach the windrower with a forklift from the right (cab-forward) side. Lift the right stairs to create access. Refer to [2.1 Raising the Right Stairs, page 19](#). Make sure the forks do **NOT** lift against the cylinder fitting.

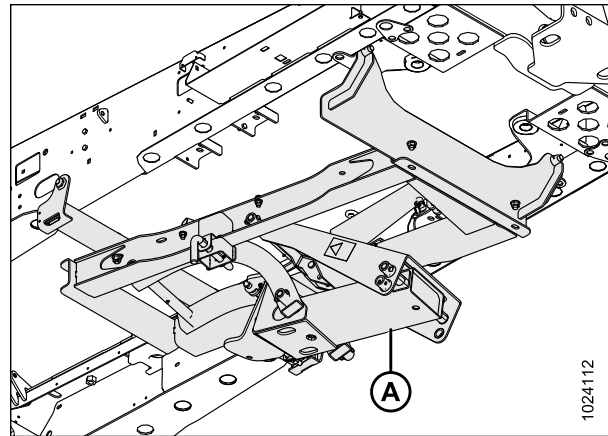


Figure 2.4: DWA Linkage under Windrower

3. Align the DWA linkage with the windrower connection points.

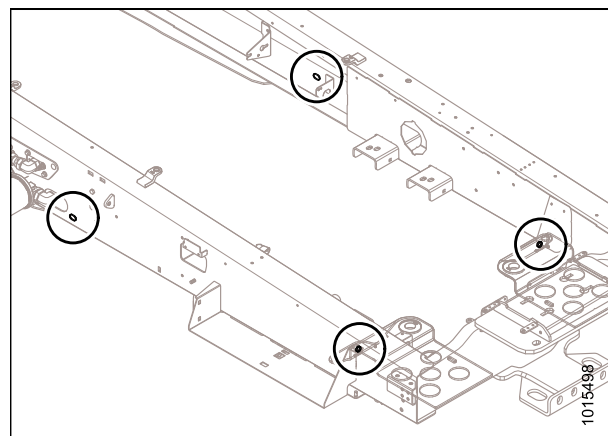


Figure 2.5: Windrower Connection Points

## ASSEMBLY/SETUP INSTRUCTIONS

4. Install hardware (A) (removed in Step 1, page 20) and attach linkage assembly to windrower frame. Torque to 461 Nm (340 lbf·ft).
5. Torque four bolts (B) on DWA linkage to 144–160 Nm (107–118 lbf·ft).

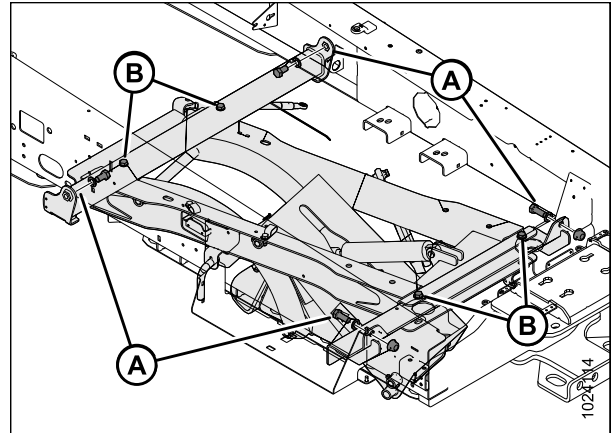


Figure 2.6: Linkage Support under Windrower

6. Lower linkage by pulling out safety pin (A) on the left side of linkage. Allow frame to lower.
7. Replace safety pin (A).

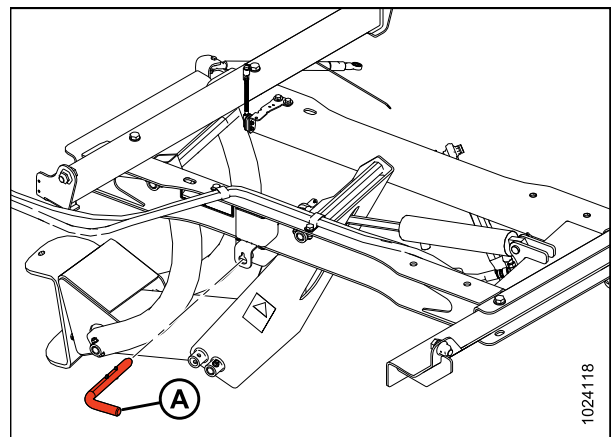


Figure 2.7: DWA Linkage

8. Secure the lift cylinder pivot into the correct hole depending on header type:
  - R85 Disc Headers: insert pin in the upper hole (A)
  - A Series Auger Headers: insert pin in the lower hole (B)

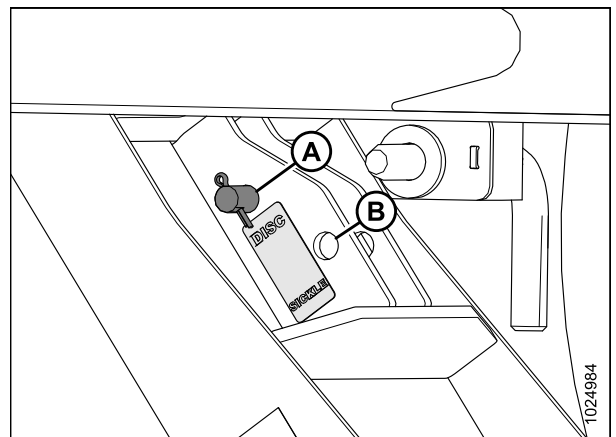


Figure 2.8: Lift Cylinder Pivot

## 2.3 Installing the Deck

To install the DWA deck, follow these steps:

1. Remove the shipping boards (A) by removing the transport banding (B).

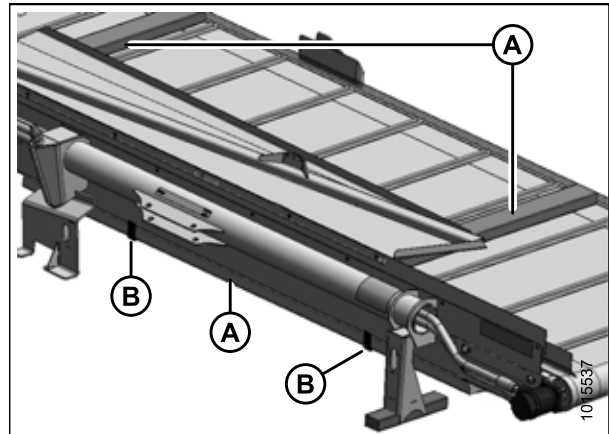


Figure 2.9: DWA Deck

2. Support the deck with a forklift. Forks (C) should be inboard of shipping stand (A).
3. Remove the two shipping stands (A) from the front of the deck by removing nut (B).
4. Reinstall nut (B) with a washer (MD #11695). Washers are included in the bag of assembly hardware.

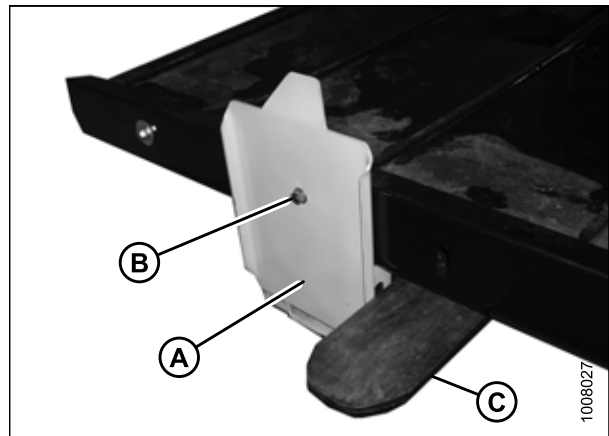


Figure 2.10: Deck Shipping Stand

5. Remove the shipping stand (A) from the rear of the deck by removing the two nuts (B) and washers (C).

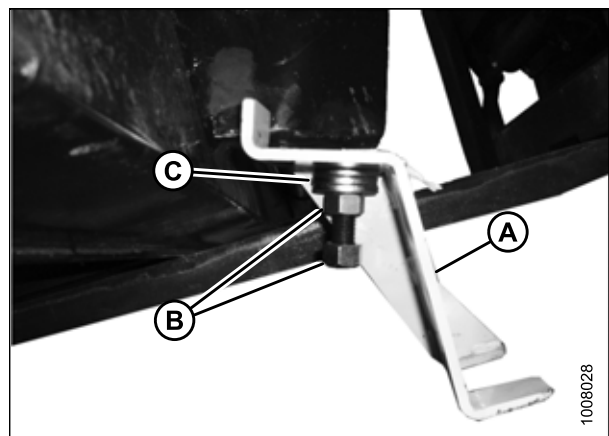


Figure 2.11: Deck Shipping Stand

## ASSEMBLY/SETUP INSTRUCTIONS

6. Remove the shipping stand (A) by removing the transport wire (B). The DWA deck is now ready to be assembled to the linkage underneath the windrower.

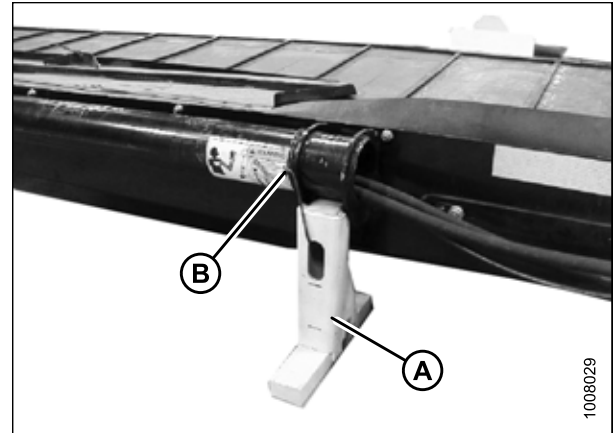


Figure 2.12: Deck Shipping Stand

7. Position the DWA deck on the right side of the windrower.
8. Support the deck with a floor jack (A) or a forklift (B) at each end.

**NOTE:**

Floor jack (A) shown at right, forklift (B) shown below.



Figure 2.13: DWA Deck Supported with Floor Jack

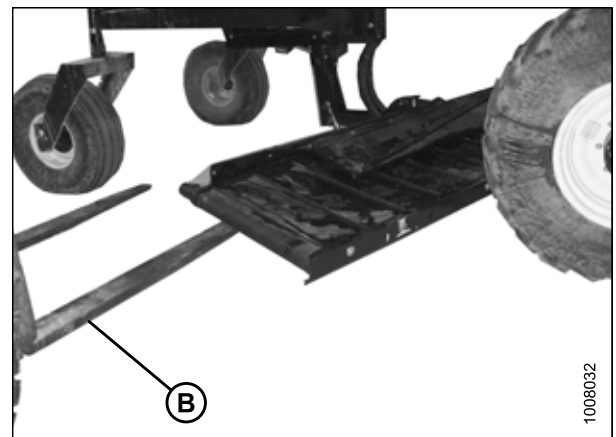


Figure 2.14: DWA Deck Supported with Forklift

## ASSEMBLY/SETUP INSTRUCTIONS

- Position the deck pivot (A) into the linkage clevis (B).

**NOTE:**

Make sure there is a loose bushing inside the deck pivot (A).

- Align the deck pivot (A) with the holes in the clevis (B) by raising or lowering the floor jack, and insert shaft (C) with preinstalled hex nut (D) and lock nut (E) through the top.
- Install a regular hex nut (D) to the bottom of the deck pivot shaft and torque the nut to 339 Nm (250 lbf-ft).
- Install a lock nut (E), and tighten against nut (D).

**IMPORTANT:**

Apply proper torque to nuts.

- Add grease to grease zerk (F).

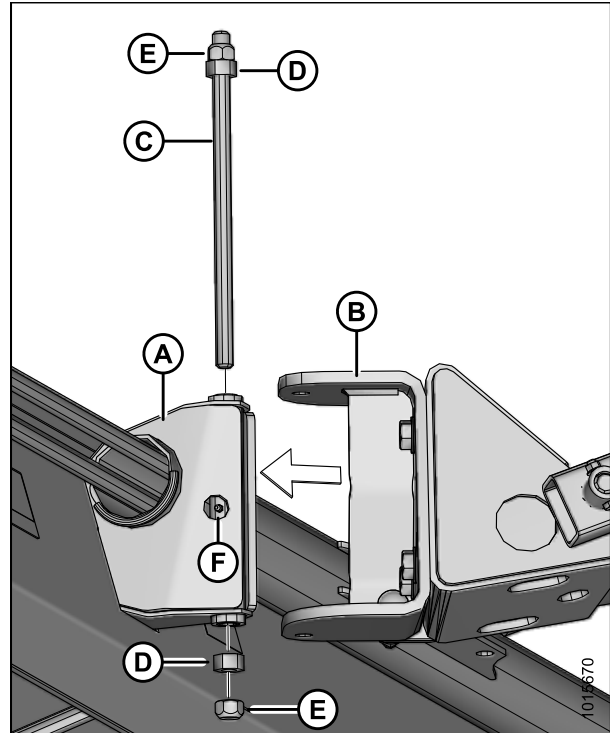


Figure 2.15: Deck Pivot and Linkage Clevis

- To make Step [15, page 25](#) (attaching the turnbuckle) easier, deck angle should be horizontal or at a slight incline relative to the ground. Distance (A) should be equal to or greater than distance (B). To adjust angle, refer to [3.5.2 Adjusting Deck Angle Relative to the Ground, page 43](#).

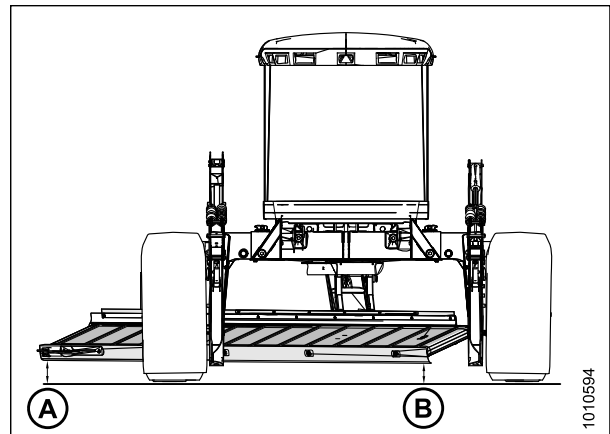


Figure 2.16: Deck Angle

## ASSEMBLY/SETUP INSTRUCTIONS

15. Attach turnbuckle (A) from linkage to deck.

- Use connection point (B) for R85 header (approximate turnbuckle length 530 mm (21 in.))
- Use connection point (C) for A Series Header (approximate turnbuckle length 630 mm (25 in.))

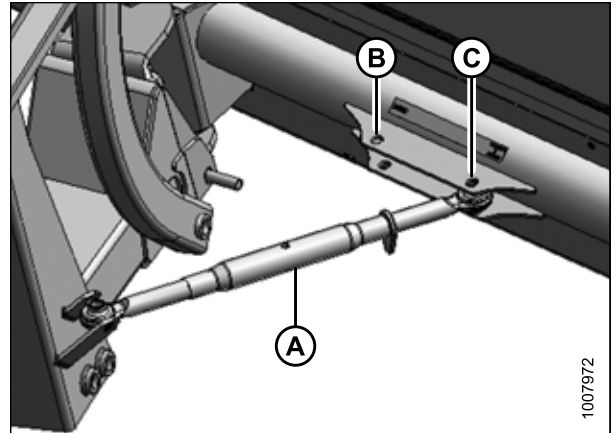


Figure 2.17: Adjustable Turnbuckle

16. Adjust the turnbuckle length so the space (A) between the deck and the right drive tire is approximately 100 mm (4 in.).

**NOTE:**

The single-acting lift cylinder is pressurized with the draper drive circuit. Therefore, when evaluating deck setup, the windrower must be running for the deck to be in its most forward position. This adjustment can be fine-tuned when the hydraulics setup is complete.

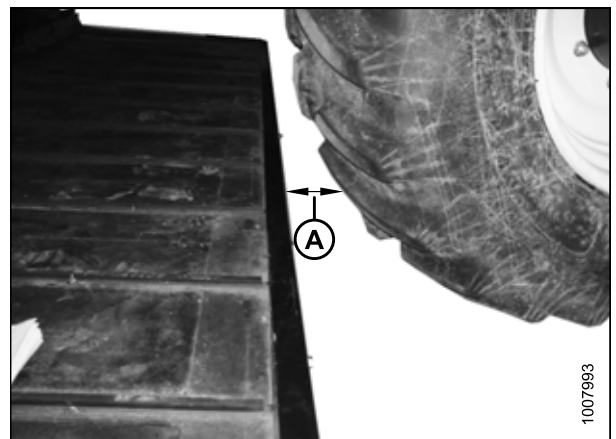


Figure 2.18: Deck and Right Drive Wheel

## ASSEMBLY/SETUP INSTRUCTIONS

17. Using existing carriage bolts and nuts, install the short ball joint link bracket (A) at the correct position for your header:

- Upper holes (B) for R85 Disc Headers (factory default)
- Lower holes (C) for A Series Auger Headers

**NOTE:**

A tall ball joint link bracket (D) is attached to the linkage assembly with a cable tie. Do **NOT** use the tall bracket in standard configuration. Refer to [3.6 Raising the Deck Height](#), page 44 for more information.

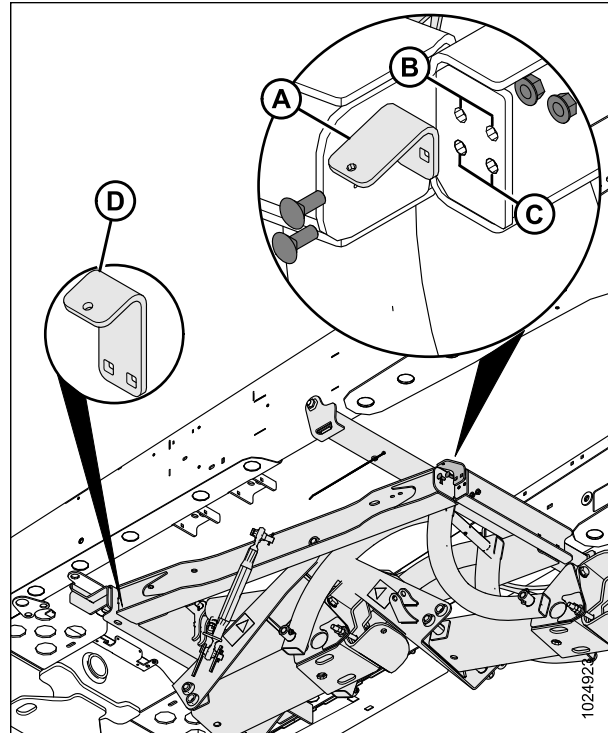


Figure 2.19: Ball Joint Link Bracket

18. Raise backsheet (A) off the deck and remove the top nut (B) and tapered nut (C).

19. Install ball joint link (D) onto the bolt on the backsheet at the correct position for your header:

- Hole 3 for R85 Disc Headers (factory default)
- Hole 1 for A Series Auger Headers

**NOTE:**

Hole 2 (Option) **NOT** used in standard configuration. Refer to [3.6 Raising the Deck Height](#), page 44 for more information.

20. Install tapered nut (C) and torque the nut to 24–27 Nm (218–241 lbf-in). Install nut (B) and torque the nut to 24–27 Nm (218–241 lbf-in).

**IMPORTANT:**

Make sure the taper of nut (C) faces the ball joint as shown.

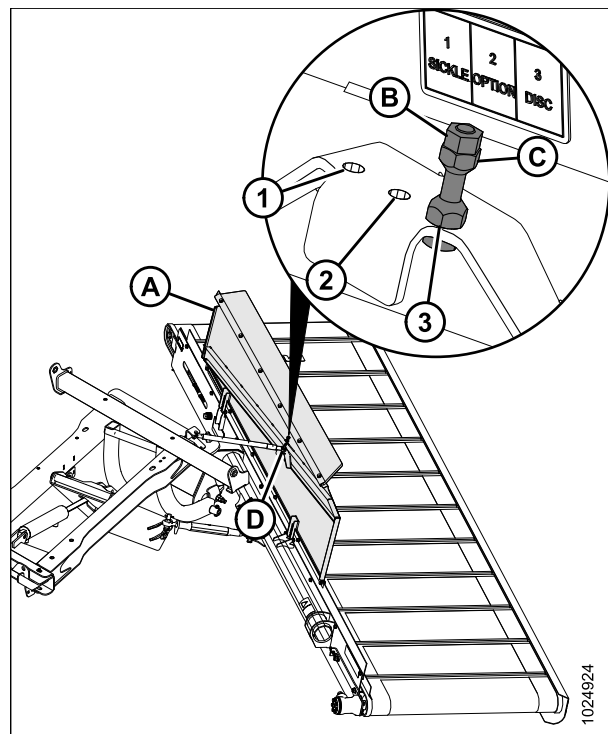


Figure 2.20: Ball Joint Link

## 2.4 Installing the Hydraulics to M1170 Windrower

To connect the linkage and draper deck hydraulics from the DWA to your M1170 windrower, follow these steps:

*Install the DWA linkage hydraulics to the windrower.*

### CAUTION

Check to be sure all bystanders have cleared the area.

1. Start the windrower and press and hold the AUXILIARY LOWER switch (A) for five seconds to relieve pressure behind the couplers.
2. Shut off the engine and remove the key.



Figure 2.21: Windrower Console Switches

3. Route hoses (A) underneath both filters as shown.
4. Connect linkage quick couplers (B) to quick couplers (C) on windrower frame.

#### NOTE:

Linkage and windrower have quick couplers preinstalled for easy connection.

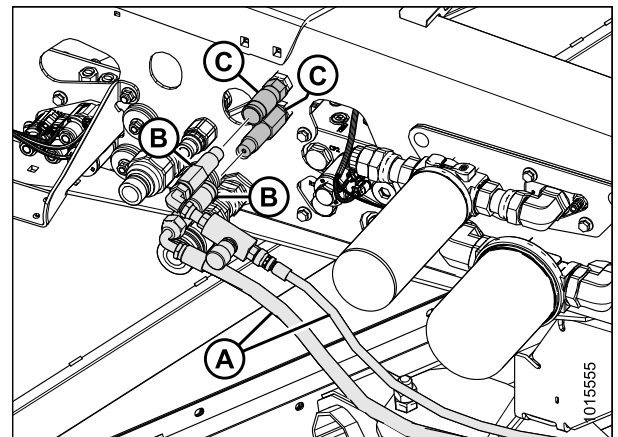


Figure 2.22: DWA linkage hydraulics

*Install the DWA deck hydraulics to windrower.*

5. Install fittings (A) onto fittings (C) and torque to 120 Nm (88 lbf·ft).
6. Install hoses (B) onto fittings (A) ensuring that hose with cable tie (D) is installed on the inboard fitting. Torque to 85 Nm (63 lbf·ft).

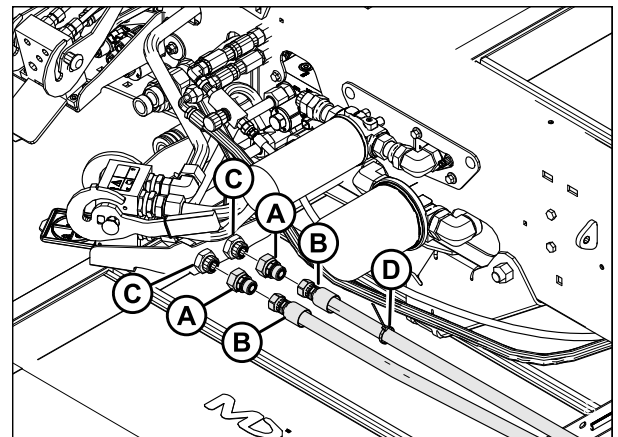


Figure 2.23: DWA deck hydraulics to M1170

## 2.5 Installing the Hydraulics to M1240 Windrower

### 2.5.1 M1240 Disc-Only Configuration

To install the DWA hydraulics to an M1240 windrower configured for disc header only, follow these steps:

#### CAUTION

Check to be sure all bystanders have cleared the area.

1. Start the windrower and press and hold the AUXILIARY LOWER switch (A) for five seconds to release pressure behind the couplers.
2. Shut off the engine and remove the key.



Figure 2.24: Windrower Console Switches

3. Route hoses (A) underneath both filters as shown.

**NOTE:**

Multicoupler hidden for clarity.

4. Connect linkage quick couplers (B) to quick couplers (C) on windrower frame.

**NOTE:**

Linkage and windrower have quick couplers preinstalled for easy connection.

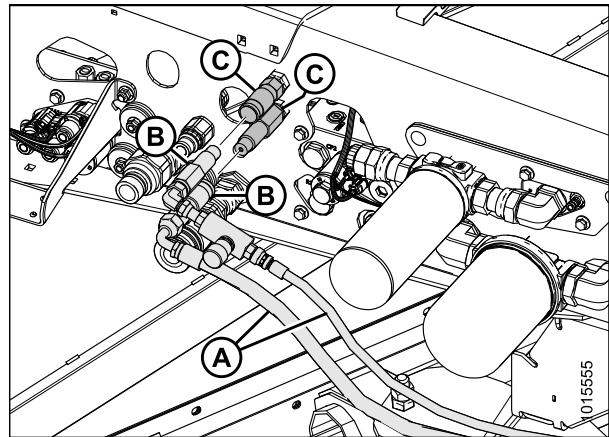


Figure 2.25: DWA Linkage Hydraulics

**Install the DWA deck hydraulics to windrower.**

5. Install 45° fittings (A) into the hydraulic manifold and torque to 120 Nm (88 lbf·ft).

**NOTE:**

Orient fittings to 60° from vertical as shown.

6. Install hoses (B) onto 45° fittings (A), ensuring that hose with cable tie (C) is installed on the top fitting. Torque to 85 Nm (63 lbf·ft).

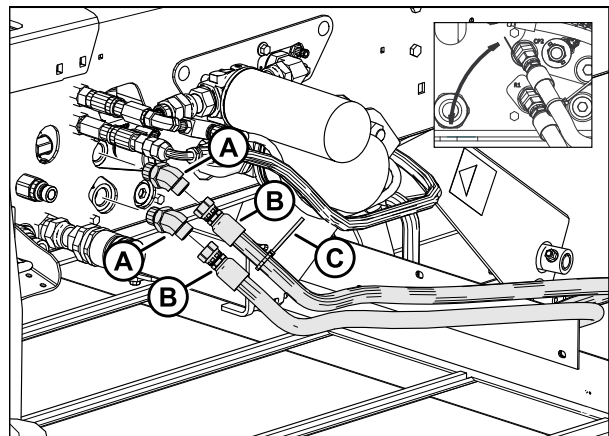


Figure 2.26: DWA Deck Hydraulics to M1240

## 2.5.2 M1240 Disc/Draper Configuration

In addition to disc header connections, M1240 windrowers have four point multicouplers for connecting draper headers. To connect DWA hydraulics to an M1240 windrower configured for disc/draper headers, follow these steps:

### CAUTION

Check to be sure all bystanders have cleared the area.

1. Start the windrower and press and hold the AUXILIARY LOWER switch (A) for five seconds to release pressure behind the couplers.
2. Shut off the engine and remove the key.



Figure 2.27: Windrower Console Switches

3. Route hoses (A) underneath both filters as shown.

#### NOTE:

Multicoupler hidden for clarity.

4. Connect linkage quick couplers (B) to quick couplers (C) on windrower frame.

#### NOTE:

Linkage and windrower have quick couplers preinstalled for easy connection.

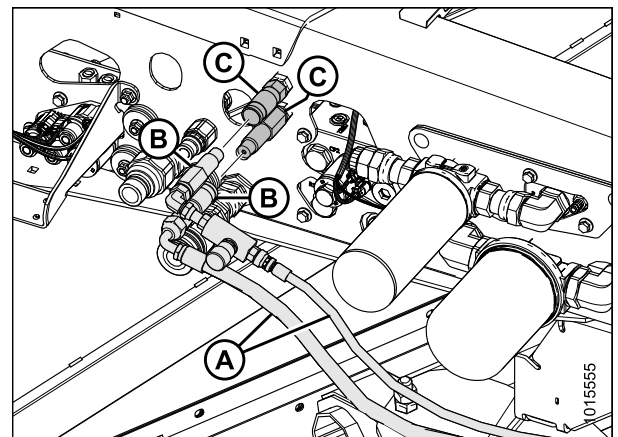


Figure 2.28: DWA Linkage Hydraulics

**Install the DWA deck hydraulics to windrower.**

5. Remove shipping plugs (A) from deck hydraulic hoses (B).

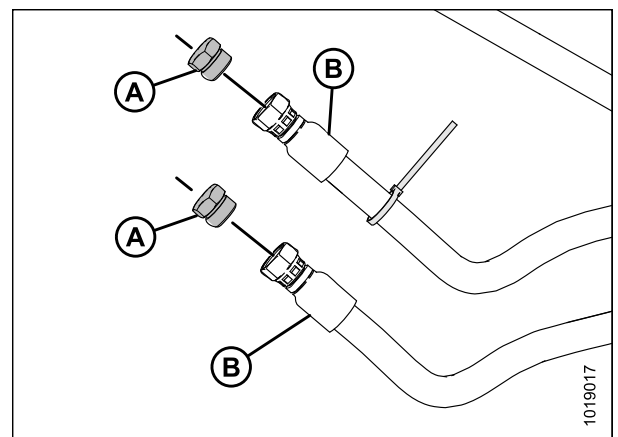
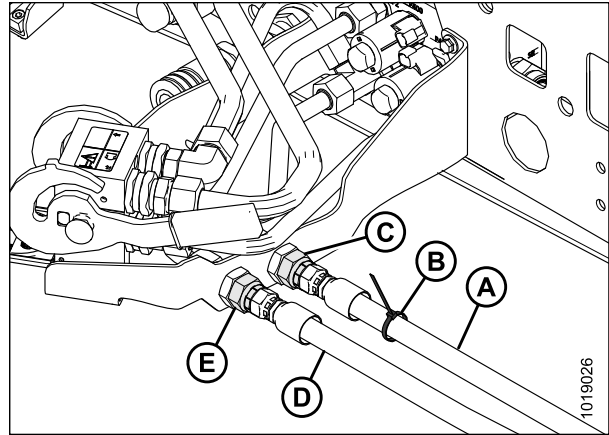


Figure 2.29: Deck Hydraulic Hoses and Protective Shipping Plugs

## ASSEMBLY/SETUP INSTRUCTIONS

6. Connect the hydraulic hose (A) with the blue fastener (B) to the reducer (C) on the multicoupler bulkhead fitting closest to the windrower.
7. Connect the other hydraulic hose (D) to the remaining reducer (E) on the multicoupler bulkhead fitting.



**Figure 2.30: Deck Hydraulic Hoses and Multicoupler Connections**

## 2.6 Connecting the Proximity Sensor

To connect the proximity sensor for the Double Windrow Attachment (DWA), follow these steps:

**NOTE:**

The proximity sensor comes preinstalled on the DWA linkage.

1. Remove the cable tie binding the DWA extension (A) to the chassis harness (B) from windrower.
2. Connect DWA extension C24A (A) to DWA proximity sensor (C) and secure to linkage with fir tree cable tie (D).

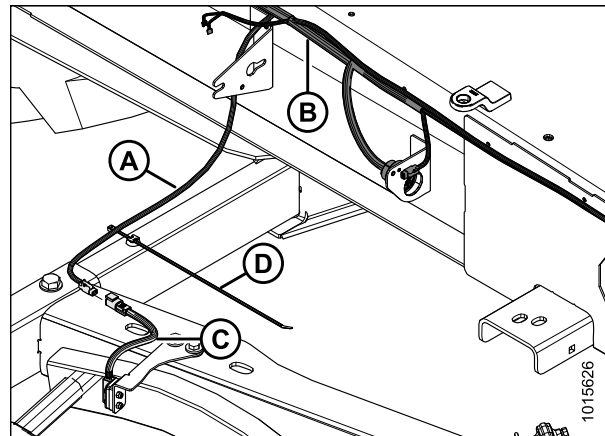


Figure 2.31: DWA Proximity Sensor

## 2.7 Activating the Double Windrow Attachment (DWA)

### NOTE:

The DWA is associated with the header ID setup. For more information on header setup, refer to your header or windrower operator's manual.

To activate the DWA, follow these steps:

1. During header setup, scroll down and select attachments (A).

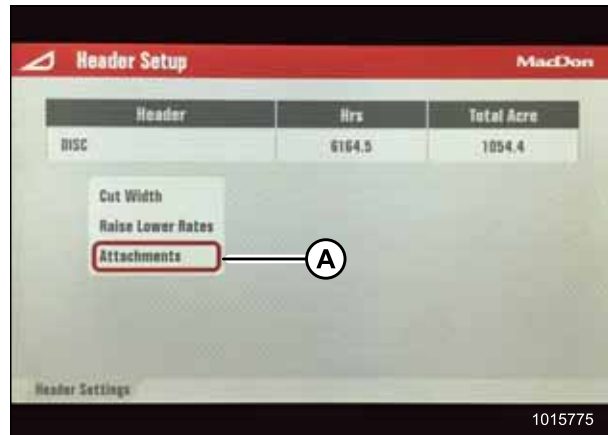


Figure 2.32: Header Setup – Attachments

2. Select DWA (A). The display will show an image of the buttons that control the DWA with each particular header. The DWA is activated.

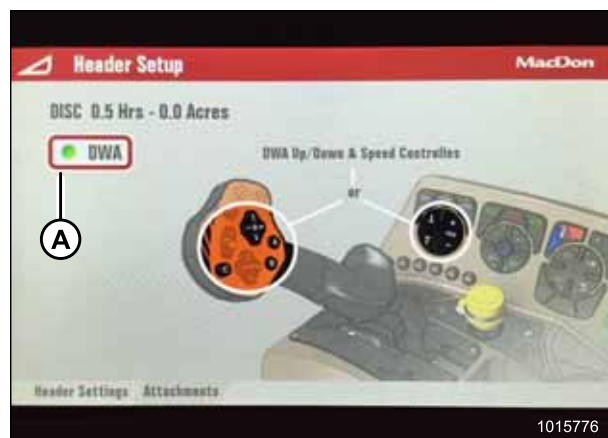


Figure 2.33: Selecting DWA

## 2.7.1 Setting One-Touch-Return Buttons (A, B, C)

The One-Touch-Return buttons (A, B, and C) on the ground speed lever (GSL) handle allow you to save three presets.

1. Press soft key 5 (A) to open the main menu.
2. Using the Harvest Performance Tracker (HPT) scroll knob (B) or ground speed lever (GSL) scroll wheel (not shown), place the red cursor over the SETTINGS icon (C) and press SELECT with the scroll knob (B) or the GSL SELECT button (not shown).



Figure 2.34: Opening the Main Menu

3. Scroll to the ONE-TOUCH-RETURN icon (A) and press SELECT with the HPT scroll knob or the GSL SELECT button (not shown) to open the HEADLAND MANAGEMENT menu (B).

**NOTE:**

The F2 shortcut button on the operator's console also opens the ONE-TOUCH-RETURN menu (B).

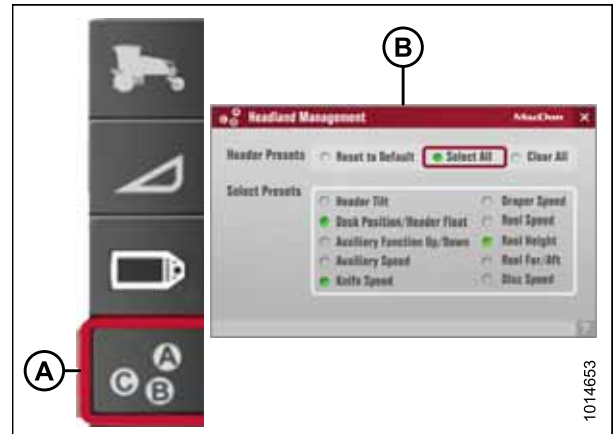


Figure 2.35: One-Touch-Return Icon and Menu List

To program the ONE-TOUCH-RETURN buttons, press and hold button A, B, or C on the GSL handle for 3 seconds until an audible tone is heard. The tone confirms that header settings are saved to that button.

The ONE-TOUCH-RETURN buttons will always save header height settings, but you can also save the following settings for the DWA:

- DWA up/down
- DWA speed

Refer to your windrower operator's manual for more One-Touch-Return information.



Figure 2.36: One-Touch-Return Buttons on the GSL

## 2.7.2 Setting Draper Pressure Alarm

1. Press the scroll knob (A) on the Harvest Performance Tracker (HPT) or the SELECT button (B) on the ground speed lever (GSL) while in any run screen to open the QuickMenu system.

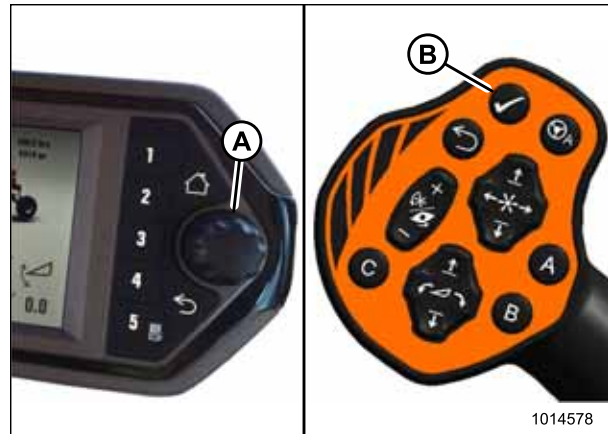


Figure 2.37: HPT Scroll Knob and GSL Select Button

2. Scroll to place the red cursor over the DWA DRAPER PRESSURE icon (A).



Figure 2.38: QuickMenu/Draper Pressure Alarm

3. Adjust alarm setpoint (B) to desired value by scrolling until the pressure reaches the desired alarm point. The alarm can be turned off by scrolling to the right end of the pressure graph. The digital value is replaced with three dashed lines, indicating that it's possible to adjust the alarm setpoint value.

Refer to your windrower manual for more information about alarm settings.



Figure 2.39: QuickMenu/Draper Pressure Alarm

## 3 Operation

### 3.1 Operational Safety



#### **CAUTION**

To avoid bodily injury:

- Review the safety sections of your windrower and header operator's manuals.
- Keep all shields in place.
- Engage the deck safety pin when deck is raised fully for transport, service, and storage—or before going under deck for any reason.
- Keep away from moving draper and rollers.
- Keep clear of the deck while it is being raised or lowered.

## 3.2 Engaging the Deck Safety Pin

Engage the deck safety pin as follows:

1. Raise the Double Windrow Attachment (DWA) deck.
2. Push pin (A) inward until both roll pins (B) are inside the channel. Rotate the pin (A) 90 degrees.

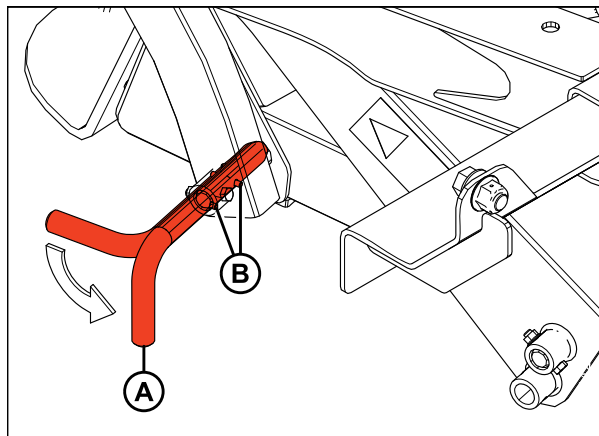


Figure 3.1: DWA Deck Safety Pin

### 3.3 Raising and Lowering the Deck

**IMPORTANT:**

Use extra caution when raising the deck for the first time. The deck rotates as it raises and lowers, and the backsheet folds onto the deck. Make sure the deck and backsheet are not interfering with windrower parts or the forming shield. If interference does occur the proximity sensor will need to be adjusted. Refer to Section 3.3.2 [Adjusting the Proximity Sensor, page 38](#).

DWA raise and lower can be controlled in three ways:

1. Remove/disengage the deck safety pin.
2. Raise and lower the DWA deck by using the REEL RAISE button (A) and the REEL LOWER button (B) respectively on the ground speed lever (GSL). The operator can interrupt the raising and lowering of the deck by letting go of the buttons.

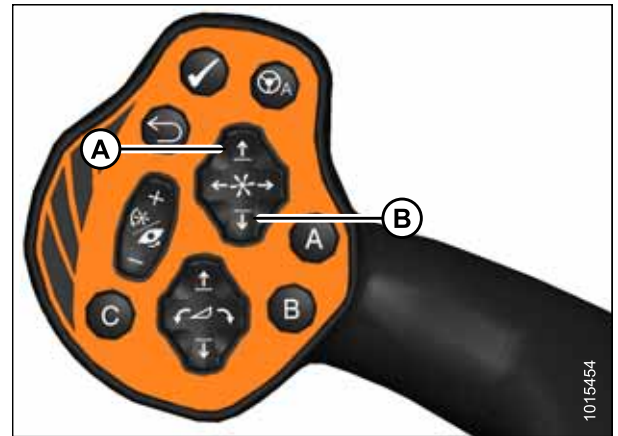


Figure 3.2: Ground Speed Lever (GSL)

3. Raise the DWA deck by pressing button (A) or lower the deck by pressing button (B) on the operator's console. The operator can interrupt the raising and lowering of the deck by letting go of the buttons. The operator can interrupt the raising and lowering of the deck by letting go of the buttons.

**NOTE:**

When setting deck position with the ONE-TOUCH-RETURN buttons A, B, and C on the GSL, the deck movement (raise/lower) cannot be interrupted. Refer to Section 2.7.1 [Setting One-Touch-Return Buttons \(A, B, C\), page 33](#).



Figure 3.3: Operator's Console

## OPERATION

The DWA deck position (up or down) is displayed on the HPT at (A). If the raise/lower motion is interrupted, the HPT defines up or down as disengaged or engaged.



Figure 3.4: Harvest Performance Tracker (HPT)

### 3.3.1 Adjusting the Deck Lift Speed

Finding the proper Double Windrow Attachment (DWA) deck lift speed is essential to proper operation. The deck must lift fast enough to clear a windrow, and slow enough not to stop abruptly against the bottom of the windrower.

The deck lift valve uses a hex socket screw (A) to lock the adjusting knob into position. Loosen locking screw enough to allow the adjustment valve knob (B) to turn. Do **NOT** remove screw. Tighten screw after adjustments.

Refer to the following to adjust the deck lift speed:

- If the deck lift speed is too fast, turn the adjuster valve knob (B) to the right.
- If the deck lift speed is too slow, turn the adjuster valve knob (B) to the left.

#### NOTE:

The lift valve only restricts the lift speed of the DWA. The DWA deck drop speed remains constant.

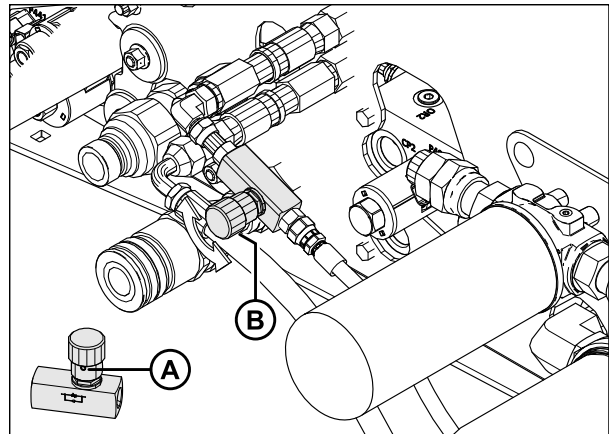


Figure 3.5: Deck Lift Speed Valve

### 3.3.2 Adjusting the Proximity Sensor

Carefully adjust the proximity sensor when running up the DWA for the first time.

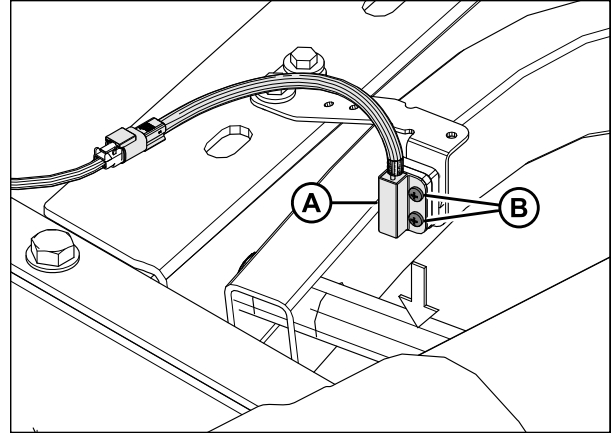
**Adjusting sensor height:** The draper shuts off automatically when the deck is raised about 2/3 of the way. If the deck does not shut off soon enough (resulting in backsheet touching draper before it shuts off), the proximity sensor (A) at the linkage needs to be lowered as follows:

## OPERATION

1. Loosen screws (B) to lower the switch (A).
2. When adjustment is complete, tighten screws (B) and torque to 1.4 Nm (12 lbf-in).

**NOTE:**

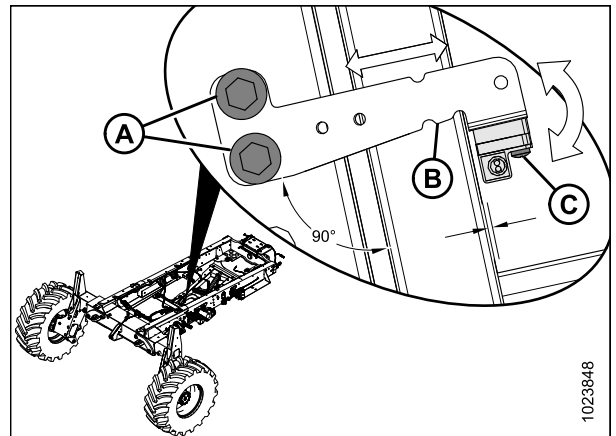
Do **NOT** overtighten the screws or the sensor will not work.



**Figure 3.6: Proximity Sensor**

**Positioning the sensor 90° to the frame:** If the sensor is not positioned at 90° to the DWA frame, the adjacent frame can activate the switch, and prevent the draper from running. Follow these steps to position the sensor:

1. If adjustment is necessary, loosen bolts (A) and adjust sensor bracket (B) fore or aft until it is 90° to the DWA linkage arm.
2. Ensure sensor (C) is positioned 4 mm (5/32 in.) from the linkage arm, and then tighten bolts (A).



**Figure 3.7: Proximity Sensor**

## 3.4 Setting Draper Speed

### NOTE:

The first time the Double Windrower Attachment (DWA) is run up on the windrower, it is likely that the default speed will be zero. This means the header may be engaged, but the DWA deck may not be turning. Increase the speed, and check that the deck has started to turn.

DWA draper speed can be controlled in three ways:

1. Adjust draper speed by using the REEL FORE/AFT buttons on the ground speed lever (GSL). Press the REEL FORE button (A) to increase speed and the REEL AFT button (B) to decrease speed.

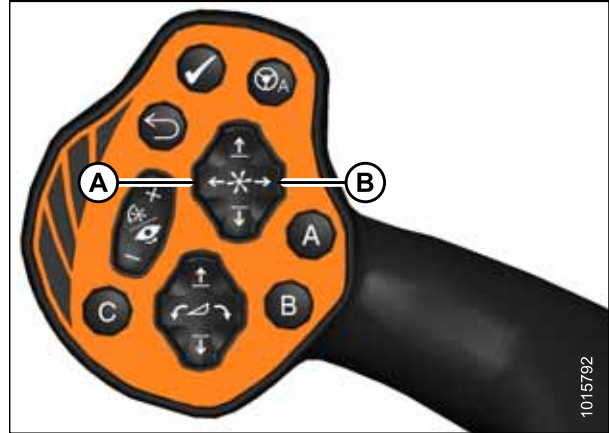


Figure 3.8: Ground Speed Lever (GSL)

2. Adjust draper speed from the operator's console by pressing button (A) to increase the speed or pressing button (B) to decrease the speed.

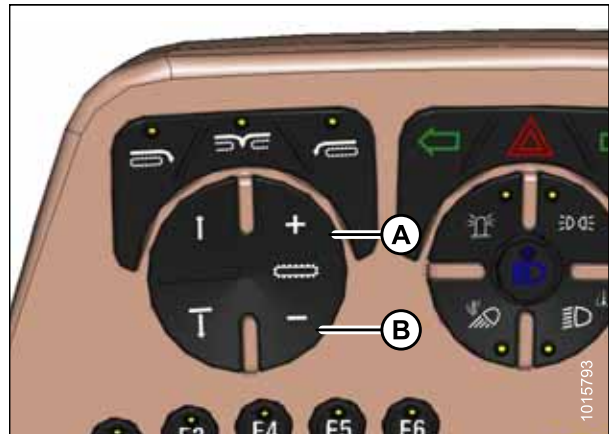


Figure 3.9: Operator's Console

## OPERATION

- Speed can be controlled with the GSL buttons A, B, and C. Refer to Section [2.7.1 Setting One-Touch-Return Buttons \(A, B, C\)](#), page 33.



Figure 3.10: GSL – Headland Management

- DWA draper speed is displayed on the Harvest Performance Tracker (HPT) at (A).



Figure 3.11: Harvest Performance Tracker (HPT)

## 3.5 Adjusting Deck Angle

The Double Windrow Attachment (DWA) deck angle can be adjusted to maximize performance and prevent contact with the windrower.

To adjust the deck angle relative to the right drive tire, refer to [3.5.1 Adjusting Deck Angle Relative to the Drive Tire, page 42](#).

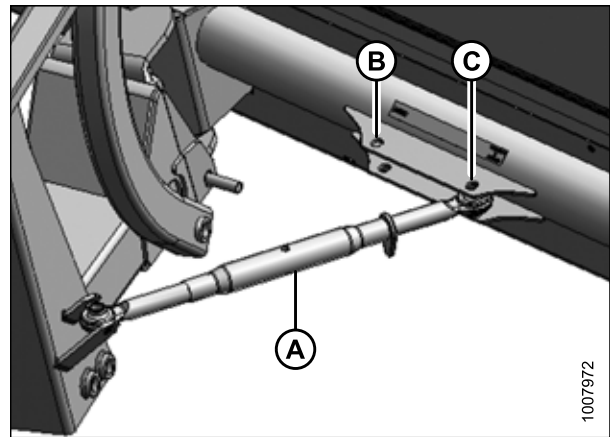
To adjust the deck angle relative to the ground, refer to [3.5.2 Adjusting Deck Angle Relative to the Ground, page 43](#).

### NOTE:

The lift cylinder is single acting and not pressurized when the windrower is shut off. When the windrower is running, a supply of low pressure oil moves the deck forward.

### 3.5.1 Adjusting Deck Angle Relative to the Drive Tire

The deck angle, relative to the right drive tire, is adjustable with turnbuckle (A).

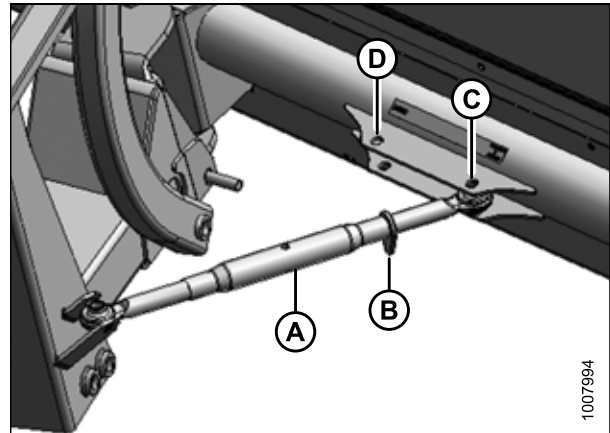


**Figure 3.12: Deck Angle Turnbuckle**

A - Turnbuckle  
B - R85 Connection  
C - A Series Connection

To adjust the deck angle relative to the right drive tire, follow these steps:

1. Loosen the locking tab (B) on the adjustable turnbuckle.
2. Rotate the center tube (A) to the desired length.
  - Use connection point (D) for R85 headers approximate turnbuckle length 530 mm (21 in.)
  - Use connection point (C) for A Series Header approximate turnbuckle length 630 mm (25 in.)



**Figure 3.13: Adjustable Turnbuckle**

## OPERATION

3. Adjust the turnbuckle length so the space (A) between the deck and the right drive tire is approximately 100 mm (4 in.).

### NOTE:

The single-acting lift cylinder is pressurized with the draper drive circuit. Therefore, when evaluating deck setup, the windrower must be running for the deck to be in its most forward position.

4. Retighten the locking tab against the center tube.

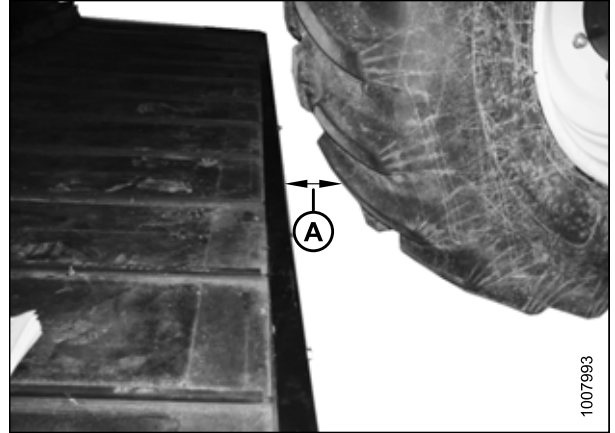


Figure 3.14: Distance from Deck to Tire

### 3.5.2 Adjusting Deck Angle Relative to the Ground

The deck angle should be horizontal or at a **SLIGHT** incline relative to the ground. Distance (A) should be equal to or greater than distance (B).

- If used with an R85 Disc Header in lighter crop, distance (A) should be equal to distance (B).
- If the crop needs to be thrown farther, increase distance (A).

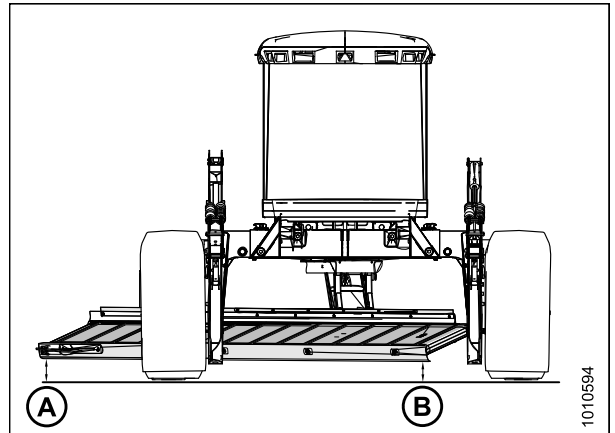


Figure 3.15: DWA Deck

#### *To adjust deck angle:*

1. Loosen the four 3/4 in. bolts (A).
2. Loosen jam nut (C).
3. To increase distance between the ground and the deck, tighten nut (B).
4. To decrease distance between the ground and the deck, loosen nut (B).
5. After adjustment, tighten jam nut (C).
6. Torque the four 3/4 in. bolts (A) to 332 Nm (245 lbf·ft).

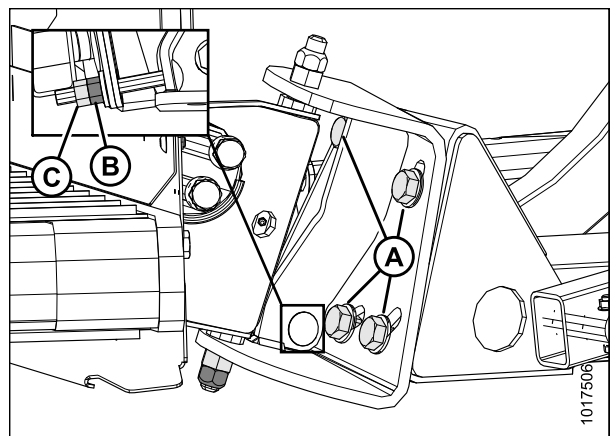


Figure 3.16: Deck Pivot

## 3.6 Raising the Deck Height

To avoid excessive wear to draper deck components, do **NOT** allow the deck to touch the ground. If the deck is too low, raise it as follows:

### IMPORTANT:

The raised draper deck setup can result in premature draper wear due to contact with the rear panel dust shield (A).

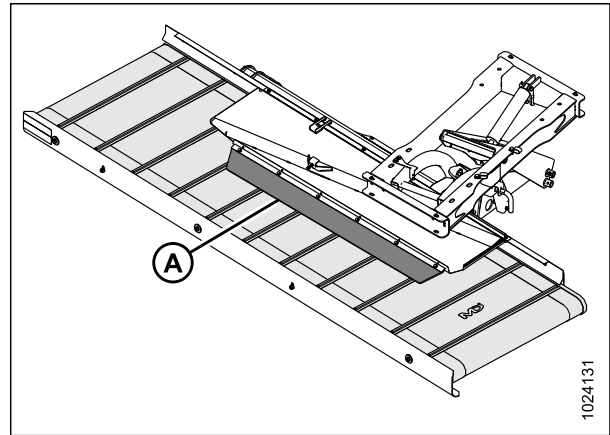


Figure 3.17: Draper Deck

1. Lower linkage by fully extending cylinder.
2. Remove bolt and nut (A), and move pivot pin (B) to lower position (C). This will raise the front of the deck approximately 100 mm (4 in.).

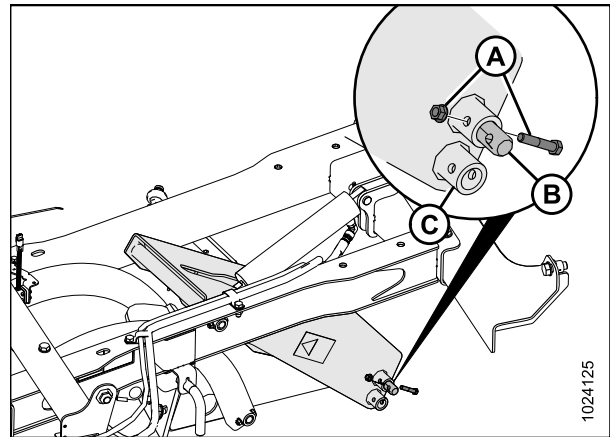


Figure 3.18: DWA Linkage

3. Reinstall bolt and nut (A) securing the pivot pin (B) to the rear arm (C).

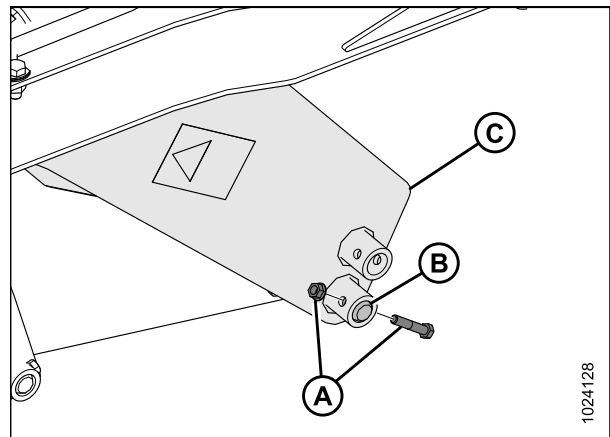


Figure 3.19: DWA Linkage

## OPERATION

4. With the deck in the raised position, install the correct ball joint link bracket according to your header:

- For R85 Disc Headers, install tall bracket (A) at upper holes (C)
- For A Series Auger Headers, install short bracket (B) at upper holes (C)

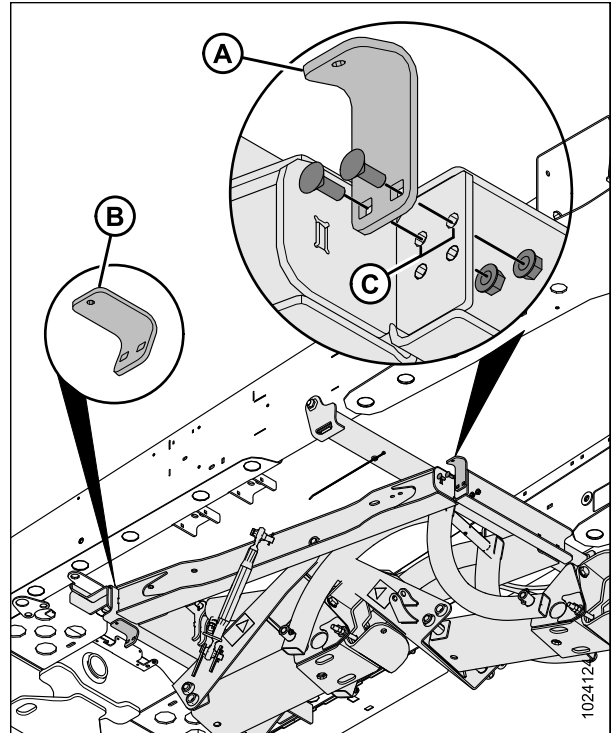


Figure 3.20: Ball Joint Link Bracket

5. Install ball joint link (D) at middle hole (Option) on backsheet panel (A).
6. Install tapered nut (C) and torque the nut to 24–27 Nm (218–241 lbf-in). Install nut (B) and torque the nut to 24–27 Nm (218–241 lbf-in).

**IMPORTANT:**

Make sure the taper of nut (C) faces the ball joint as shown.

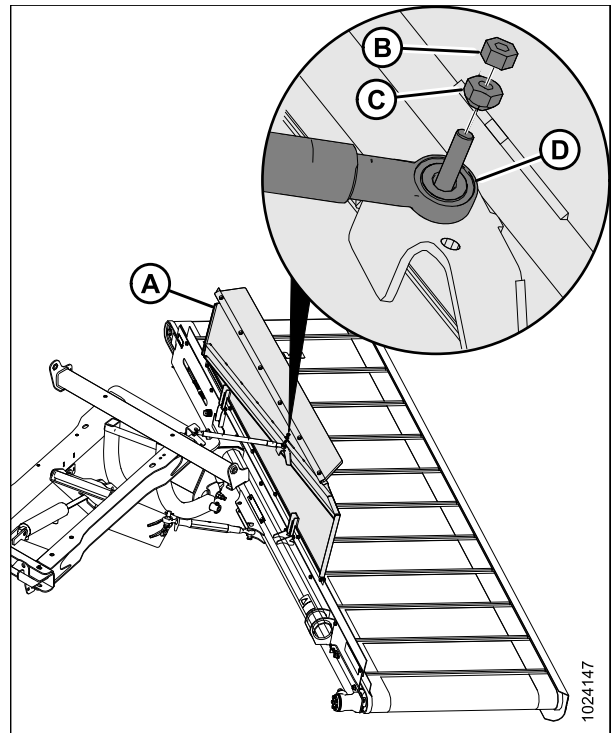
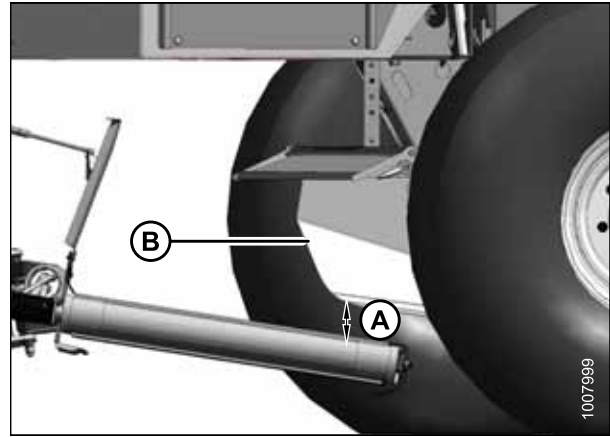


Figure 3.21: Ball Joint Link

### 3.7 Positioning the Conditioner Forming Shield

To adjust the position of the conditioner forming shields, follow these steps:

1. Make sure the forming shield (B) is high enough to clear the deck when it is lowered.



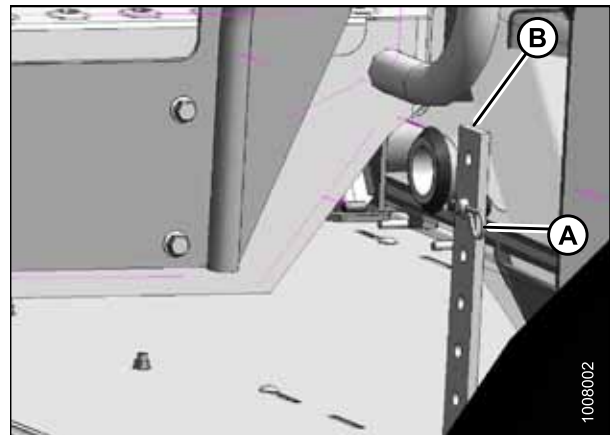
**Figure 3.22: Deck Lowered**

A - Clearance between Forming Shield (B) and the Deck

2. Remove the hairpin (A).
3. Adjust strap (B) to achieve the ideal position.

**NOTE:**

The forming shield should be as low as possible without interfering with deck.

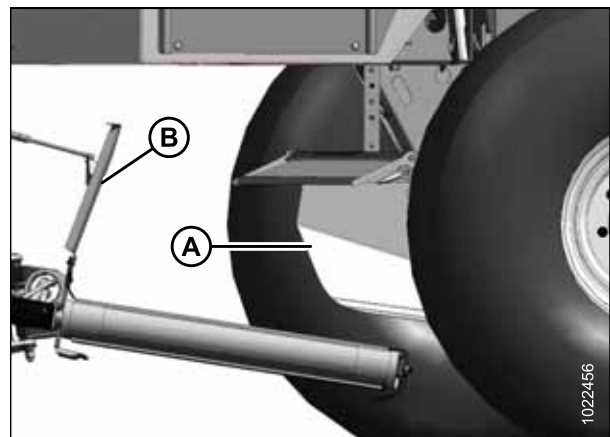


**Figure 3.23: Forming Shield**

4. Adjust the left side deflector (A) to direct crop towards the inboard side of the DWA backsheet (B).
5. Adjust the right side deflector to the widest position without affecting crop flow. This is where the deck is farthest from the conditioner rolls.

**NOTE:**

When using header to produce single windrows (for bailing), position the side forming shields for desired windrow width.



**Figure 3.24: Deck Lowered**

## OPERATION

6. Adjust the rear deflector baffle (A) so crop flow (B) does not interfere with the deck when fully raised:

- Set the left end of the rear deflector lower to direct crop down toward the DWA draper.
- Set the right end of the rear deflector higher to allow space for crop to flow to the DWA deck.

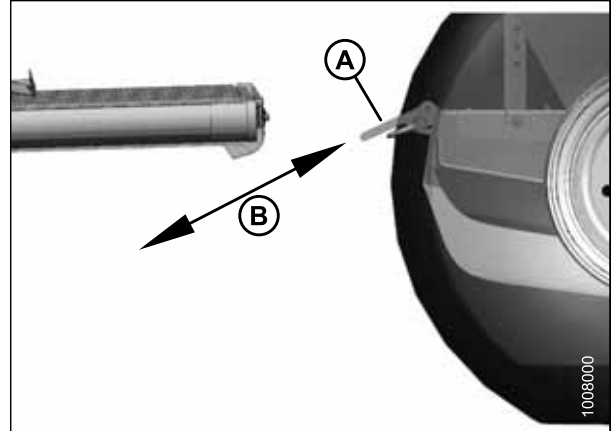


Figure 3.25: Deck Raised

7. After installing the forming shield, raise header fully and ensure adequate clearance between top of forming shield and the header drive hose support (A) attached to the windrower frame.

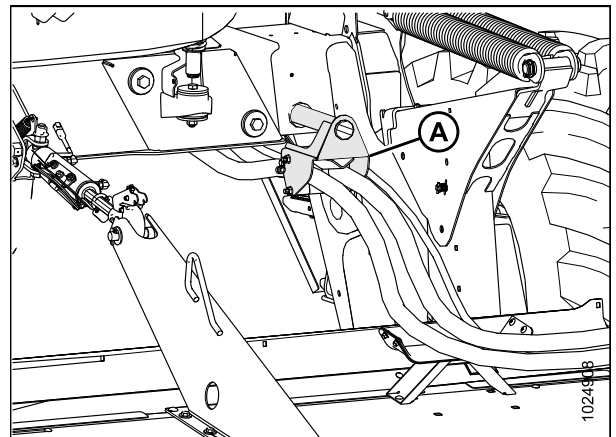


Figure 3.26: Header Hose Support

### NOTE:

When using DWA with disc headers, remove fins (B) under forming shield.

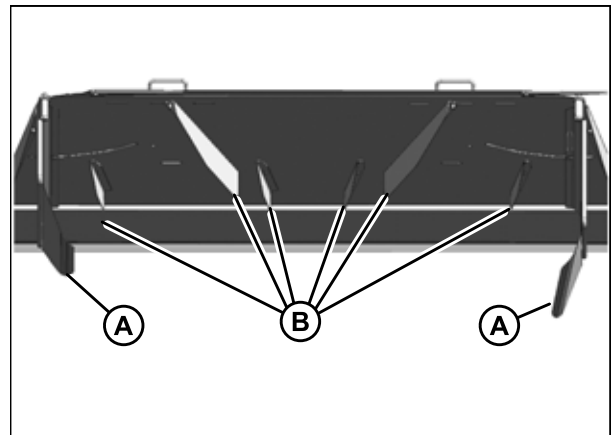


Figure 3.27: Fins under Forming Shield

A - Side Deflectors

B - Fins Under Forming Shield

## 3.8 Positioning the Conditioner Rolls

The gap between the conditioner rolls must be small enough to throw the crop onto the Double Windrow Attachment.

The gap size depends on the crop type and yield.

- A gap that is too small for a heavy crop will use excessive engine power and be hard on affected components.
- A gap that is too large will not throw the crop with enough velocity to reach the side delivery deck.

Refer to the conditioner roll adjustment procedure in your A Series or R85 operator's manual.

## 3.9 Operating Recommendations

### 3.9.1 Operating with 4.3, 4.9, 5.5 m, (14, 16, 18 ft.) Headers

Refer to the following operating recommendations when using the Double Windrow Attachment (DWA) with 4.3–5.5 m, (14–18 ft.) headers:

- On the first pass, raise the side delivery system and deposit the crop between the wheels of the windrower.
- On the return pass, lower the side delivery system and deposit the crop beside the previously laid windrow.
- With a center-delivered crop, the position of the crop can be adjusted by using the side deflectors on the forming shields.
- With a side-delivered crop, the position of the crop can be adjusted by adjusting the draper speed (faster draper speeds will throw the crop farther).

### 3.9.2 Operating with an R85 Disc Header

Because the conditioner rolls on an R85 header are farther ahead than all other headers, delivering light crop from the conditioner rolls to the side delivery deck on the Double Windrow Attachment (DWA) may require special attention.

The following three areas can affect crop flow to the deck:

#### ***Crop flow from the cutterbar to the rolls***

- Keep the right side of the header as full as possible. Less than 75% of capacity may have adverse effects on feeding.
- Feed plates must be installed for appropriate crop. They are required for forage but not for alfalfa (refer to the header operator's manual).
- Higher ground speeds will usually result in better crop flow from the conditioner rolls to the deck. Ground speed should be a minimum of 10 km/h (6 mph) for light crops.
- Disc speed must be within the recommended range for the specific crop/yield (refer to the header operator's manual).

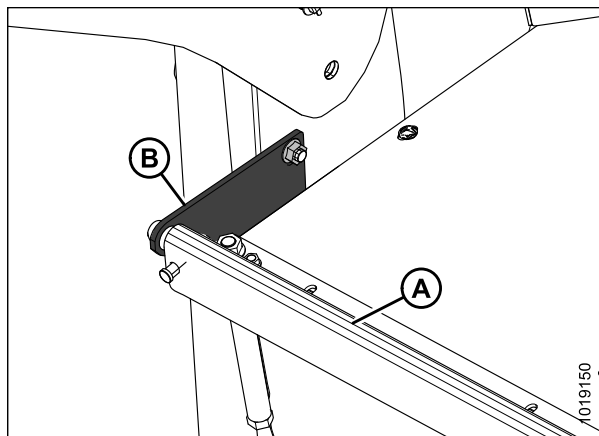
#### ***Crop flow from the conditioner rolls to the forming shield***

- The rear baffle on the R85 header should be in the uppermost position. However, it may need to be lowered for center windrowing.
- Remove the fins on the rear baffle to prevent interference with the crop flow.
- The crop trajectory arc is higher with a steeper header angle. Header angle should be set such that the crop is projected at a maximum arc height without excessive contact with the top forming shield.
- It may be possible to shoot crop above the forming shield with extreme header angle and rear baffle positions.
- In rocky conditions where a DWA is necessary, adjust gauge rollers to achieve correct stubble height while maintaining proper crop trajectory.
- Header height affects the header angle. Ideally the lift linkage should be fully down at all times.
- The conditioner roll gap should be small enough to properly grab the crop and throw it.
- The roll speed is mechanically tied to the disc speed and can affect how fast the crop is projected. Roll speed should be in the recommended range.

## OPERATION

### **Forming shield settings**

- Make sure forming shield (A) is installed correctly with bracket (B).
- Periodically remove buildup of sticky crop residue on deflector sliding surfaces.
- Refer to [3.7 Positioning the Conditioner Forming Shield](#), [page 46](#).



**Figure 3.28: Forming Shield**

## 4 Maintenance and Servicing

### 4.1 Draper Maintenance

#### 4.1.1 Adjusting Draper Tension

Adjust the draper tension enough to prevent slipping and eliminate sagging.

Set draper tension as follows:

1. Check that draper guide (A) (rubber track on underside of draper) is properly engaged in groove (B) of drive roller, and that idler roller is between the guides (A).

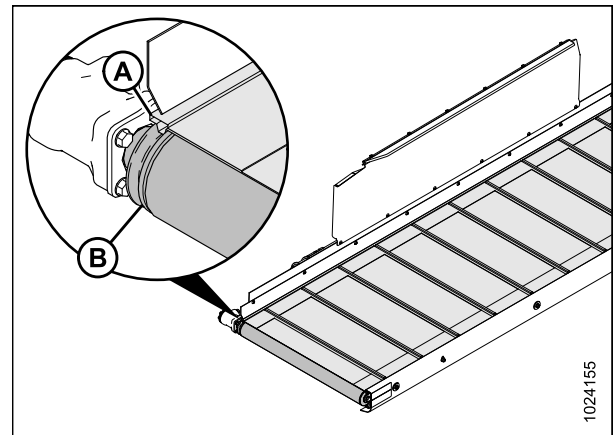


Figure 4.1: Draper Guide (Cutaway View)

3. Turn bolt (A) clockwise (tighten).

**NOTE:**

The white indicator bar (B) will move to the right, indicating the draper is tightening. Tighten until the white indicator sits halfway within the window.

**IMPORTANT:**

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

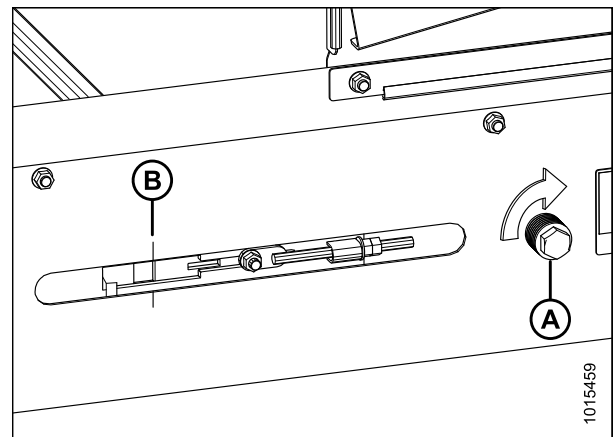


Figure 4.2: Draper Tension

#### 4.1.2 Checking Draper Tracking

Draper tracking needs to be checked when the draper is first run up; otherwise, damage to the draper can occur. Refer to [4.1.3 Adjusting Draper Tracking, page 52](#) to adjust the tracking.

4.1.3 Adjusting Draper Tracking

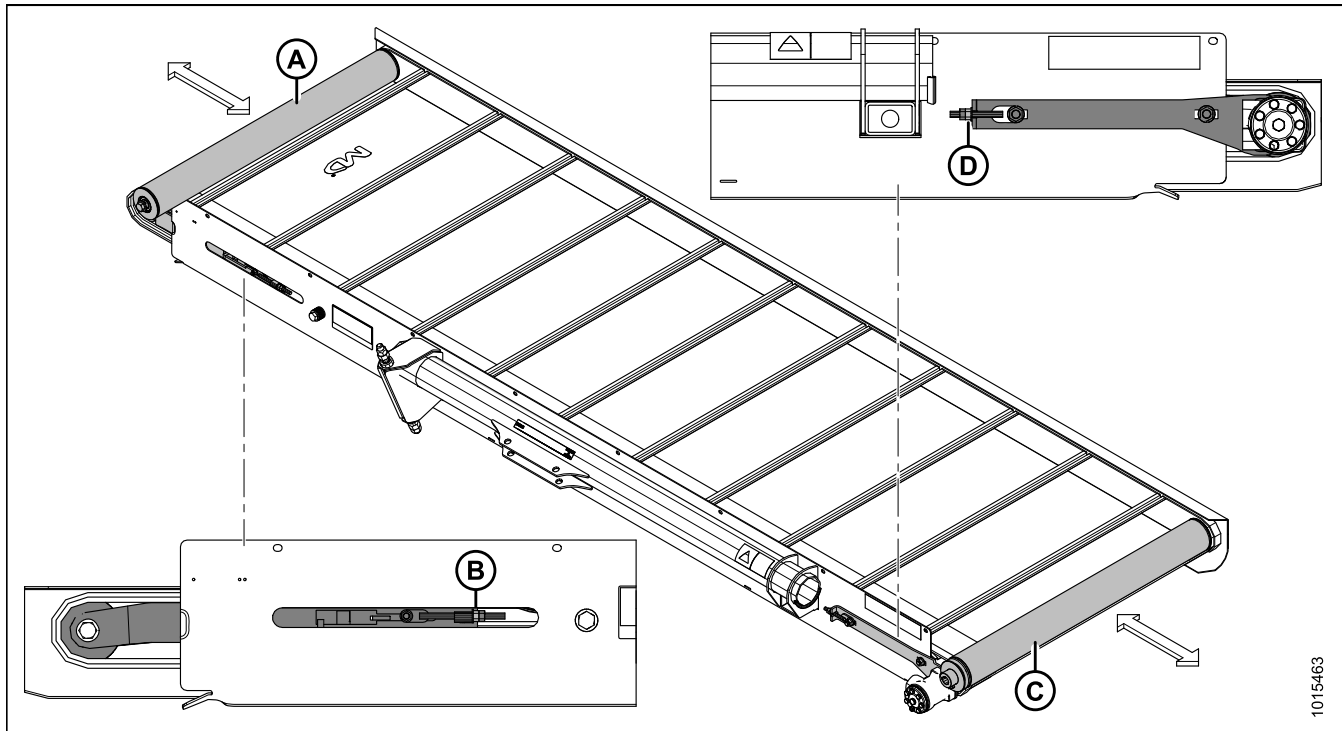
The draper deck has one fixed drive roller and one spring-loaded idler roller. The spring loaded idler roller is located at the same end of the deck as the draper tensioner. Both rollers can be aligned with adjuster rods to adjust draper tracking.

**⚠ DANGER**

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

If the draper is tracking incorrectly, use the following table to adjust the rollers:

Table 4.1 Draper Tracking Adjustments

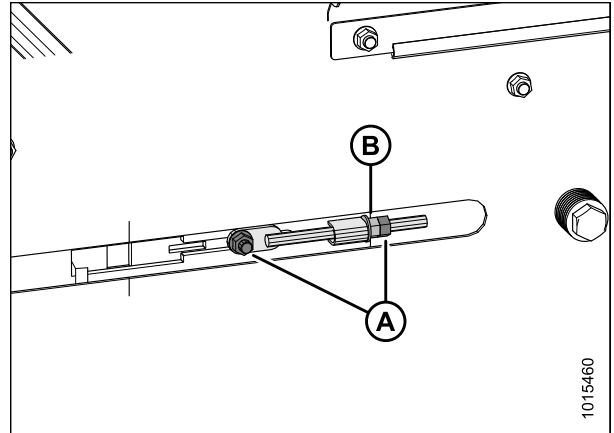


Tracking	At Location	Adjustment	Method
Rearward	Idler roller	Move roller (A) outward	Tighten nut (B)
Forward		Move roller (A) inward	Loosen nut (B)
Rearward	Drive roller	Move roller (C) outward	Tighten nut (D)
Forward		Move roller (C) inward	Loosen nut (D)

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### ***To adjust tracking on the idler roller side:***

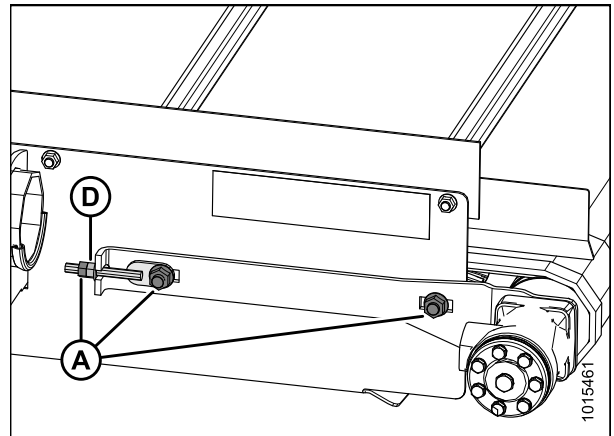
1. Loosen the two nuts (A).
2. Adjust nut (B) according to Table 4.1, page 52.
3. Secure the idler roller by tightening the two nuts (A).
4. After adjusting draper tracking, readjust the draper tension. Refer to [4.1.1 Adjusting Draper Tension, page 51](#).



**Figure 4.3: Idler Roller Tracking Adjuster**

### ***To adjust tracking on the drive roller side:***

5. Loosen the three locking nuts (A).
6. Adjust nut (D) according to Table 4.1, page 52.
7. Tighten the three nuts (A) to secure the drive roller.
8. After adjusting draper tracking, adjust the draper tension. Refer to [4.1.1 Adjusting Draper Tension, page 51](#).



**Figure 4.4: Drive Roller Tracking Adjuster**

#### 4.1.4 Replacing Draper

##### DANGER

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

1. Raise the deck up enough to increase the space between the deck and the right drive tire.
2. Remove the front skid (A) by removing five nuts (B).
3. Loosen the draper tension, and push the idler roller inward as far as possible.
4. Disconnect turnbuckle (A) and allow the deck to rotate rearward to increase the space between the deck and tire.
5. Remove the old draper and install the new one. The draper is bidirectional so orientation does not matter.
6. Tension the draper. Refer to [4.1.1 Adjusting Draper Tension, page 51](#).
7. Reinstall turnbuckle (A) and the front skid.
8. Adjust the front skid to achieve a 1.5–3.0 mm (1/16–1/8 in.) gap to draper.
9. Run the new draper and check alignment. Adjust alignment if necessary.
10. Recheck draper tension after a few hours of operation.

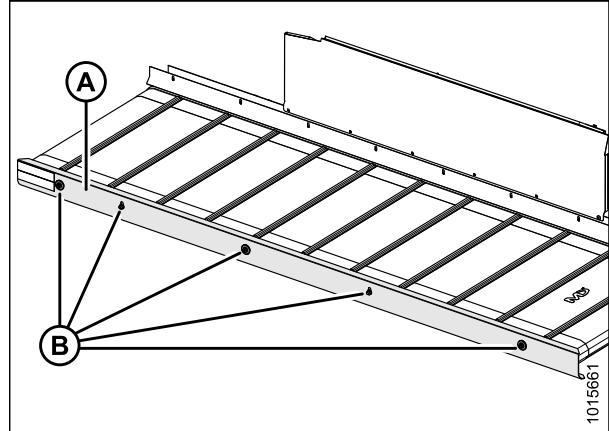


Figure 4.5: Front Skid

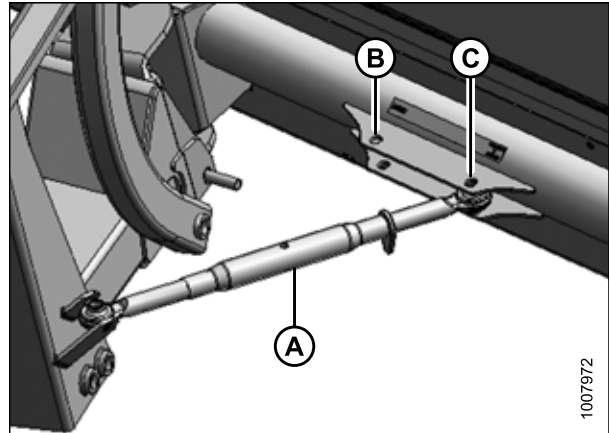


Figure 4.6: Deck Angle Turnbuckle

### 4.1.5 Adjusting Front Skid

To adjust the front skid (A), follow these steps:

1. Loosen five nuts (B) on the front of the skid.

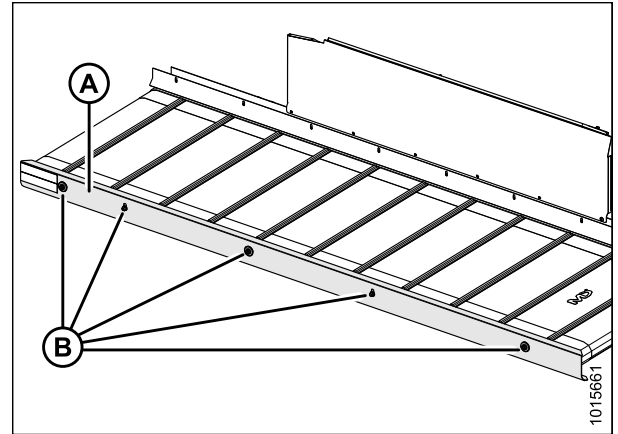


Figure 4.7: Draper Deck Front Skid

2. Adjust the front skid (A) so skid height (C) is 1.5–3 mm (1/16–1/8 in.) above the draper.

**NOTE:**

Improper skid height can result in draper wear or excessive crop build up.

- Constant contact between the skid and draper will cause excessive heat and melt the draper.
- If gap is too large, crop can enter the draper.

3. Tighten nuts (B).

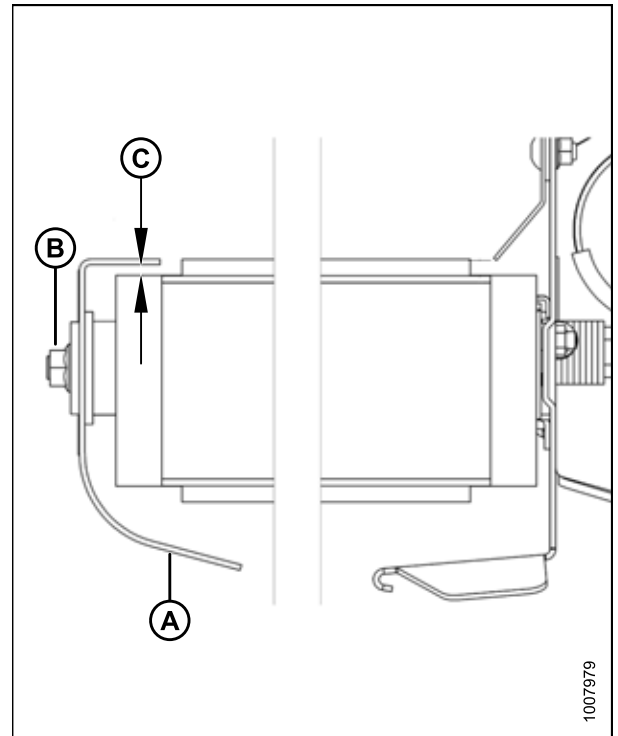


Figure 4.8: Draper Deck Cross Section

### 4.1.6 Adjusting Rear Deflector

The rear deflector (A) prevents crop from entering inside the draper. To adjust the rear deflector, follow these steps:

1. Loosen all eight nuts (B) along the length of the deck.
2. Set the deflector height (C) to be 1.5–8 mm (1/16–5/16 in.) above the draper.
3. Tighten nuts (B).

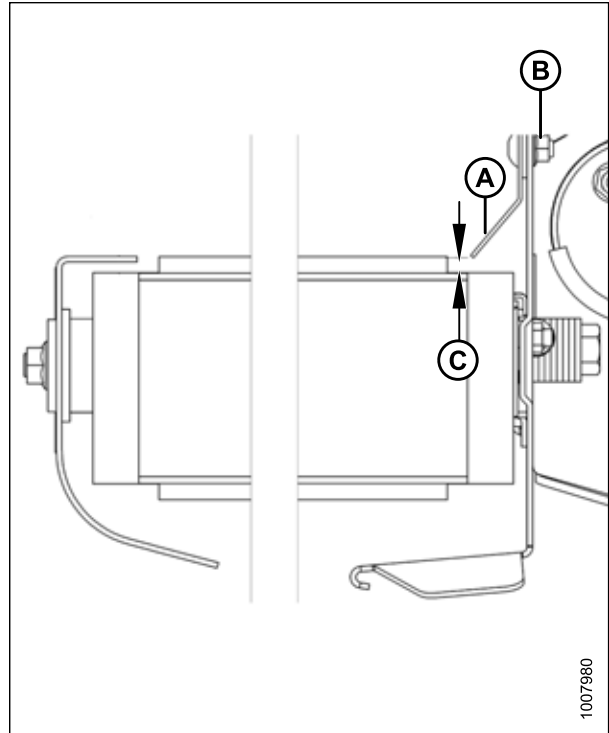


Figure 4.9: Draper Deck Cross Section

### 4.1.7 Maintaining Draper Rollers

The draper rollers have nongreaseable bearings. The external seal should be checked every 200 hours (more frequently in sandy conditions) to maximize bearing life. Remove front skid to inspect seals.

## Removing and Reinstalling the Drive Roller

### DANGER

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

To remove the drive roller from the deck, follow these steps:

1. Raise deck, and engage safety pin (A).
2. Remove front skid, loosen, and remove draper. Refer to [Step 4.1.4 Replacing Draper](#), page 54.

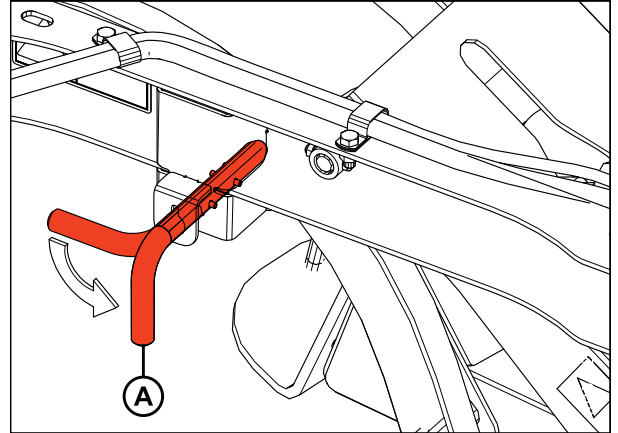


Figure 4.10: Safety Pin

3. Loosen the two jam nuts (A) and two setscrews (B).

**NOTE:**

The second jam nut and setscrew are on the opposite side and are not visible in this illustration.

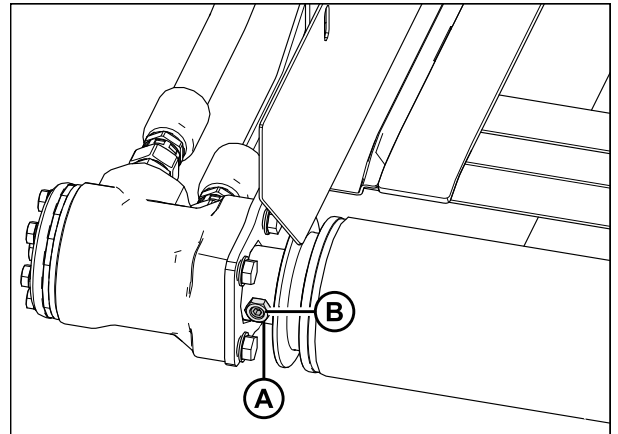


Figure 4.11: Draper Drive Roller

4. Remove the drive roller (A) by removing bolt and washer (B) at end of the roller.
5. Slide the drive roller off the motor shaft.
6. If you need to repair the bearing or seal, refer to [4.1.8 Replacing Draper Roller Bearing/Seal](#), page 60.

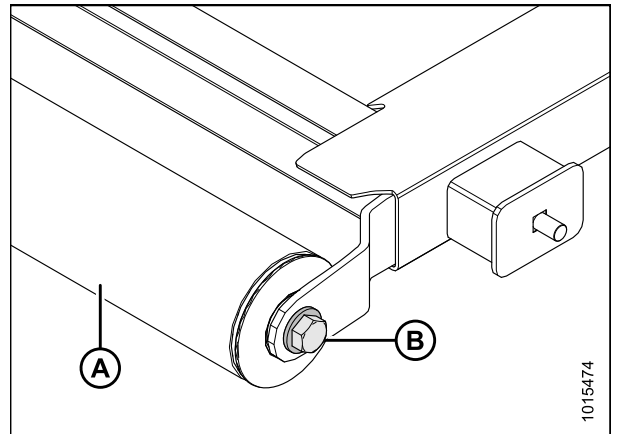


Figure 4.12: Draper Drive Roller

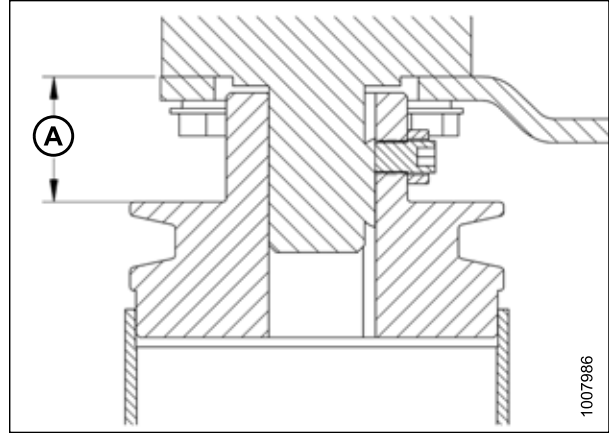
## MAINTENANCE AND SERVICING

**To reinstall the drive roller on the deck, follow these steps:**

1. Slide the drive roller onto the motor shaft. Make sure it is fully engaged.

**NOTE:**

The drive roller should be 33 mm (1-1/3 in.) (A) from the face of the motor.

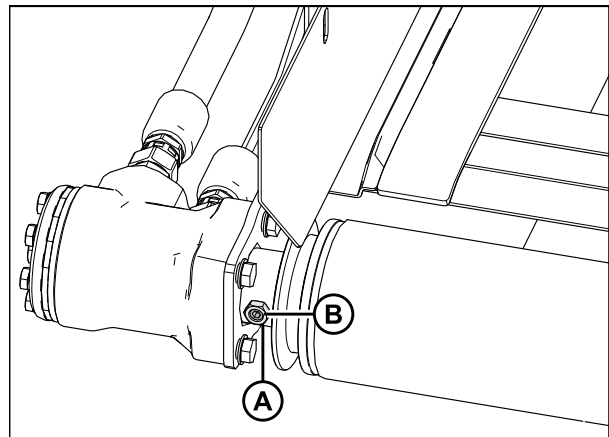


**Figure 4.13: Drive Roller Cross Section**

2. Install the two setscrews (B) and torque to 27 Nm (20 lbf·ft).
3. Install the two jam nuts (A).

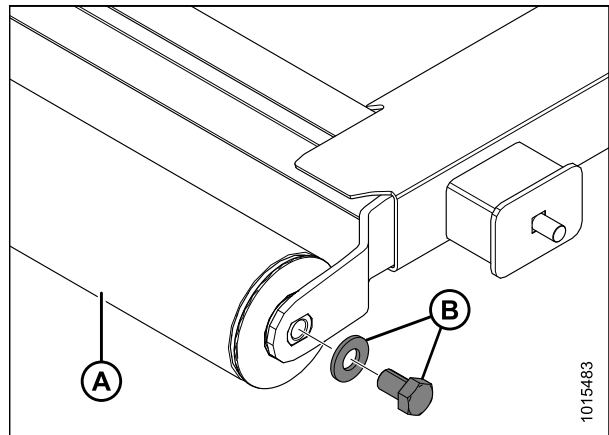
**NOTE:**

The second jam nut and setscrew are on the opposite side and are not visible in this illustration.



**Figure 4.14: Draper Drive Roller**

4. Install washer and bolt (B) into drive roller (A) and torque to 95 Nm (70 lbf·ft).



**Figure 4.15: Draper Drive Roller**

## Removing and Reinstalling the Idler Roller

### **DANGER**

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

*To remove the idler roller follow these steps:*

1. Raise the deck and engage the safety pin (A).

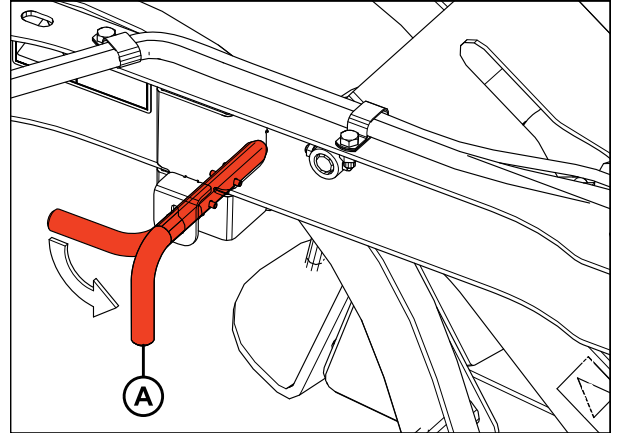


Figure 4.16: Safety Pin

2. Remove the front skid (A) by removing five nuts (B).

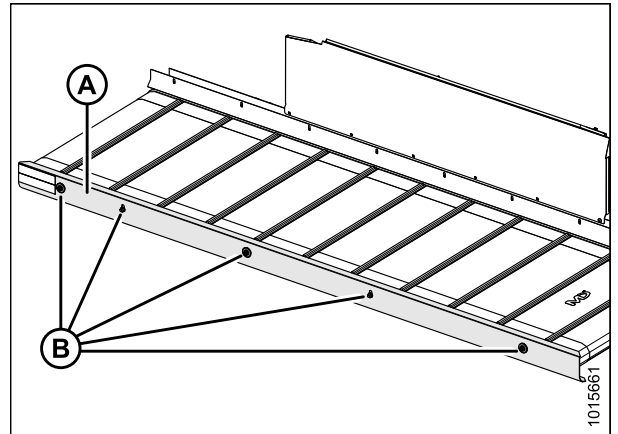


Figure 4.17: Draper Deck Front Skid

3. Loosen the draper.

**NOTE:**

Draper does not need to be removed, but removal will ease roller disassembly. Draper removed in illustration.

4. Remove the idler roller (A) by removing bolt and washer (B) at each end of the roller.

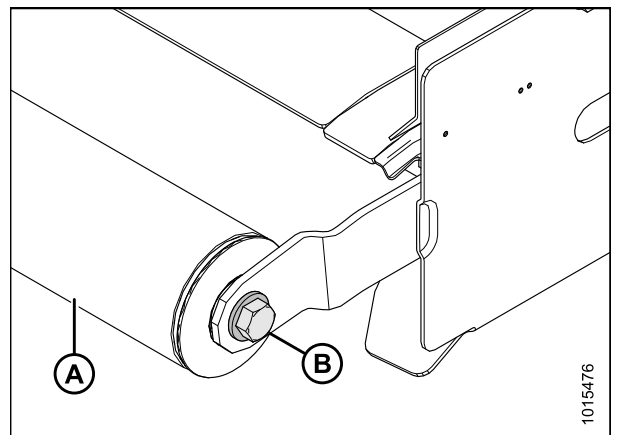


Figure 4.18: Idler Roller

## MAINTENANCE AND SERVICING

**To reinstall the idler roller (A), follow these steps:**

1. Reattach bolt and washer (B) at each end of the idler roller (A). Torque bolts to 95 Nm (70 lbf·ft).
2. Tighten the draper. Refer to [4.1.1 Adjusting Draper Tension, page 51](#).
3. Reattach the front skid. Refer to [4.1.5 Adjusting Front Skid, page 55](#).

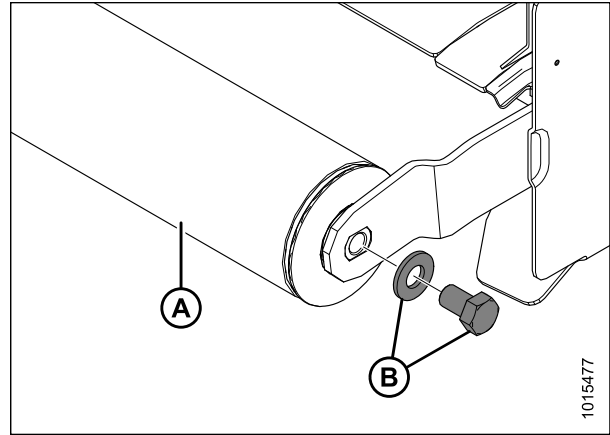


Figure 4.19: Idler Roller

### 4.1.8 Replacing Draper Roller Bearing/Seal

To replace the draper roller bearing and seal, follow these steps:

1. Remove the roller assembly. Refer to [4.1.7 Maintaining Draper Rollers, page 56](#).
2. Remove bearing assembly (B) and seal (A) from roller tube (C) as follows:
  - a. Attach a slide hammer (D) to threaded shaft.
  - b. Tap out the bearing assembly.
3. Clean inside the roller tube (C) and check for wear or damage. Replace if necessary.

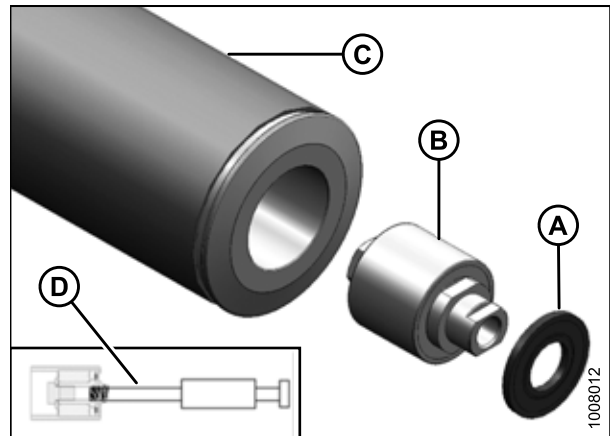


Figure 4.20: Roller Bearing

## MAINTENANCE AND SERVICING

4. Install the bearing assembly (B) into roller by pushing on the outer race of bearing.

**NOTE:**

The bearing is fully positioned when the 14 mm (0.55 in.) dimension (D) is achieved.

5. Apply grease in front of the bearing.
6. Install seal (A) into roller by pushing on the outer and inner race of the seal.

**NOTE:**

The seal is fully positioned when the 3 mm (0.12 in.) dimension (C) is achieved. A flat washer (1.0 in. ID x 2.0 in. OD) works well to push against the seal.

7. Ensure the bearing and seal turn freely.
8. Reinstall roller assembly into deck.

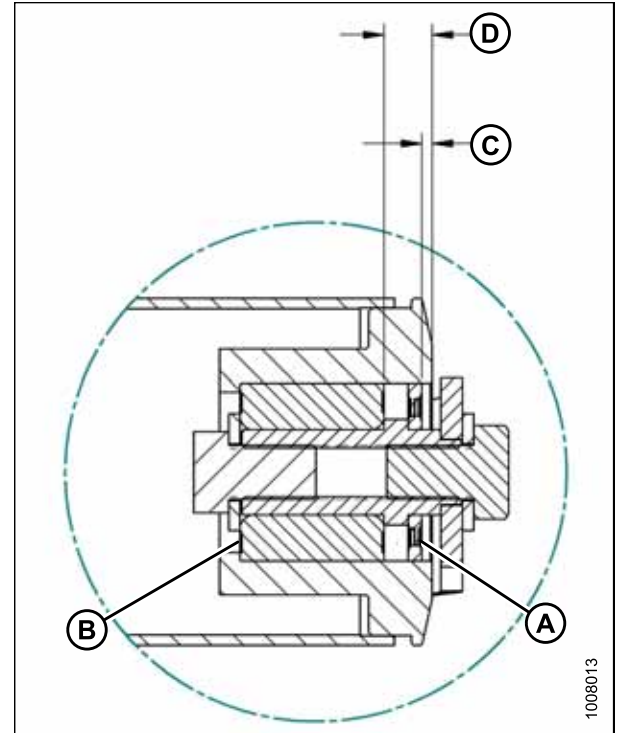


Figure 4.21: Roller Bearing Cross Section

## 4.2 Lubrication

Grease the following five pivot points (A) every 250 hours and/or at the end of each season.

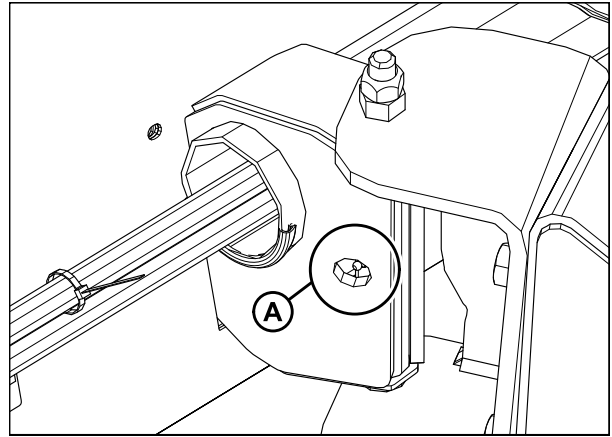


Figure 4.22: Deck Pivot

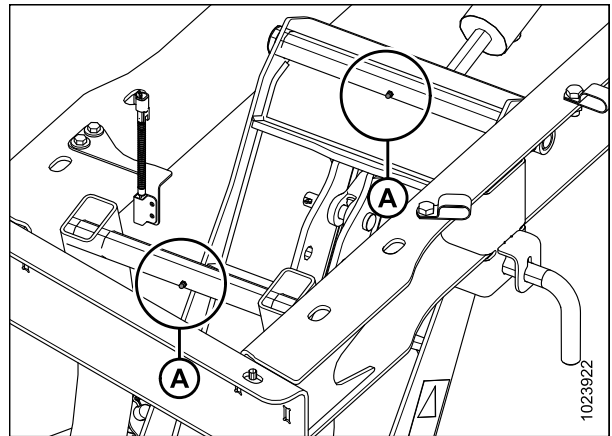


Figure 4.23: Linkage Pivot

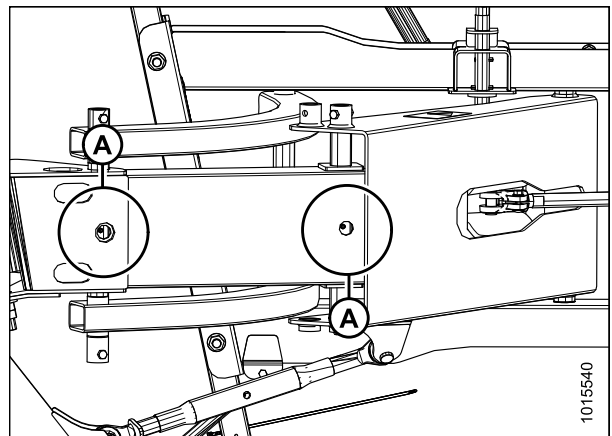
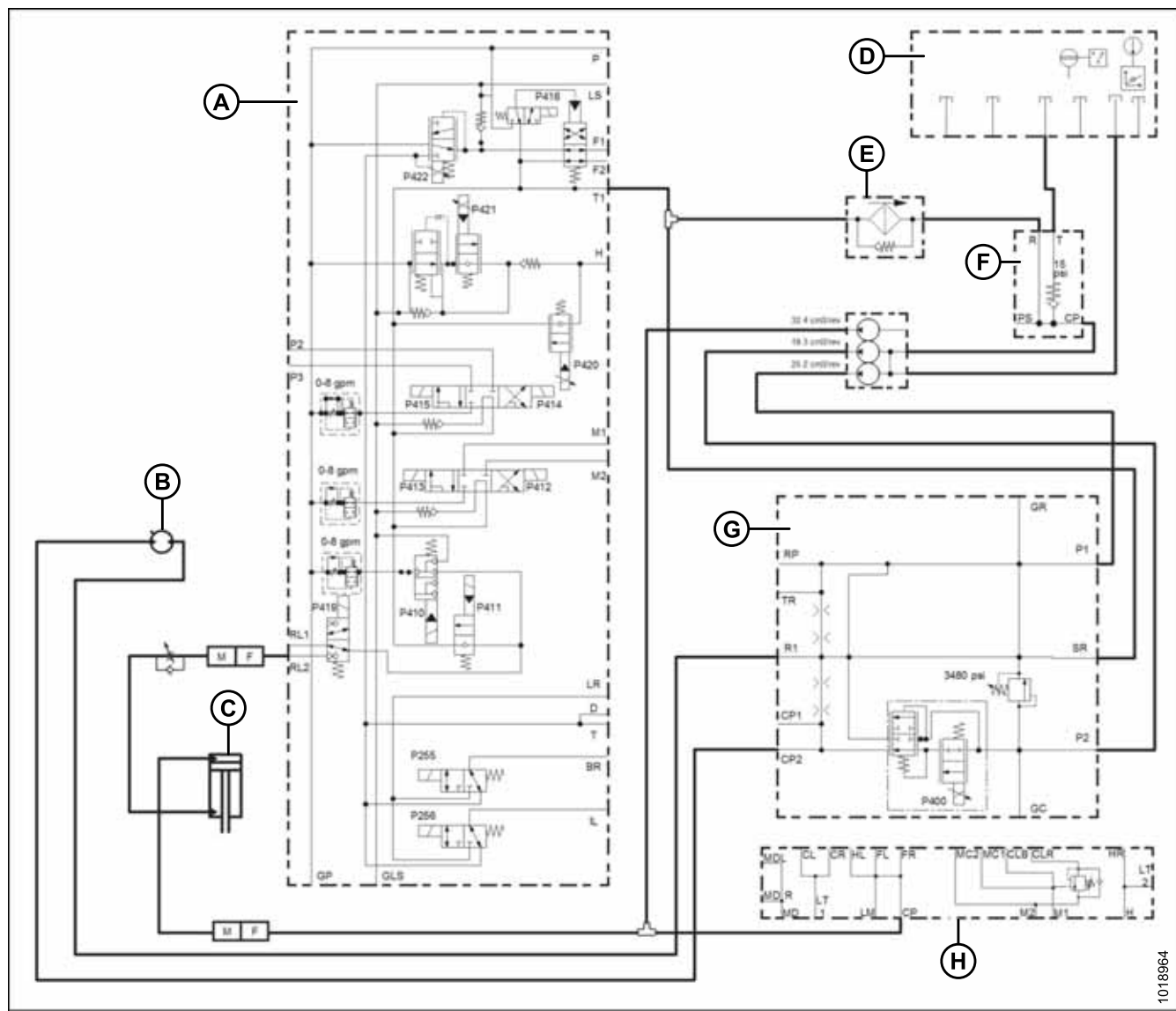


Figure 4.24: Linkage Pivot – Bottom View of DWA

### 4.3 Hydraulic Schematic

For detailed hydraulic schematics, contact your MacDon dealership.

**Figure 4.25: DWA Hydraulic Schematic**



**A - Lift Manifold**  
**C - DWA Lift Cylinder**  
**E - Hydraulic Filter Element**  
**G - Drive Manifold**

B - DWA Drive Motor  
D - Hydraulic Tank  
F - Inlet Manifold  
H - Junction Manifold

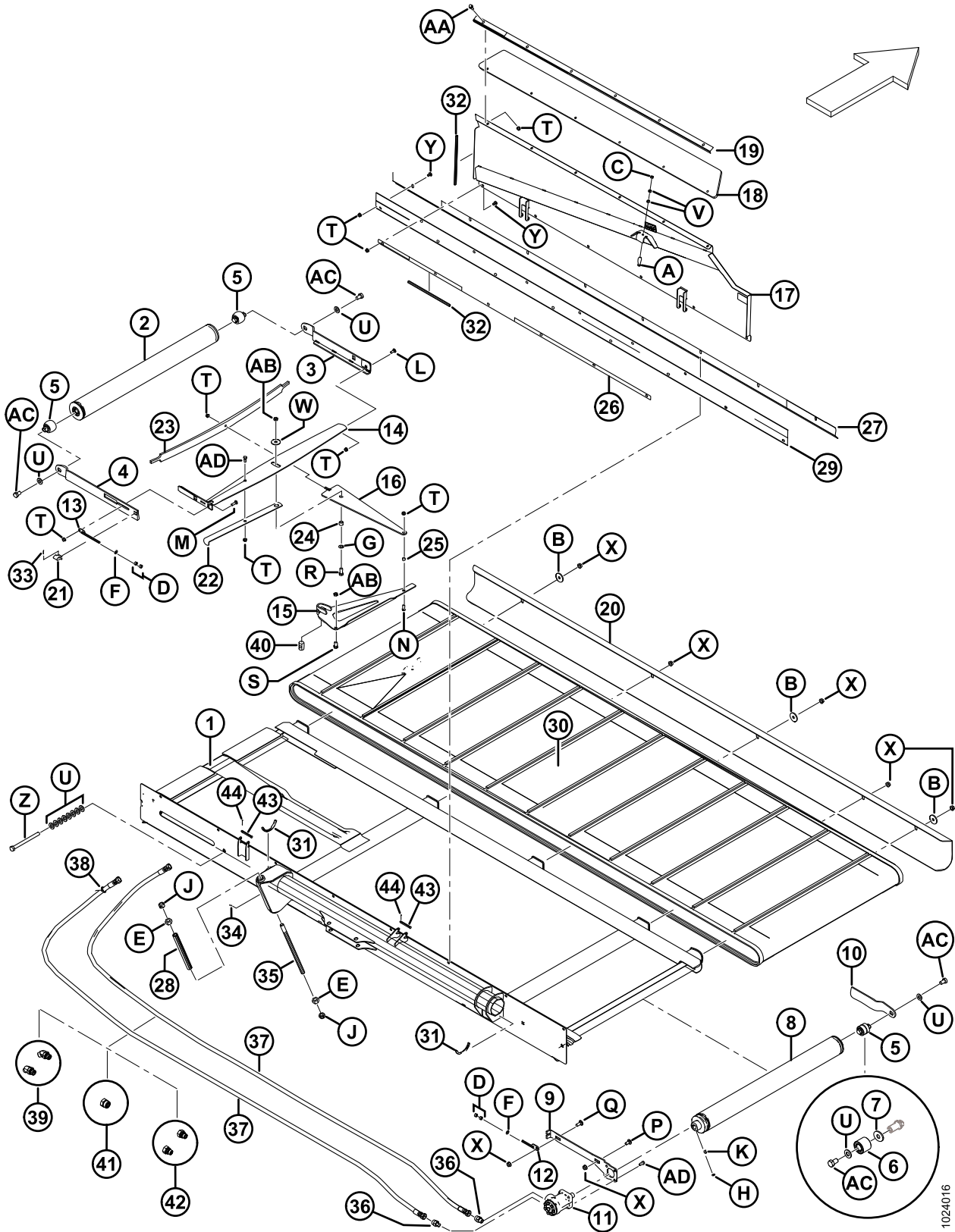


## 5 Repair Parts

This section lists all the replacement parts that can be ordered for a Double Windrow Attachment (DWA) for M1 Series Windrowers.

When ordering, be sure the correct part number is given.

## 5.1 Deck, Draper, and Rollers

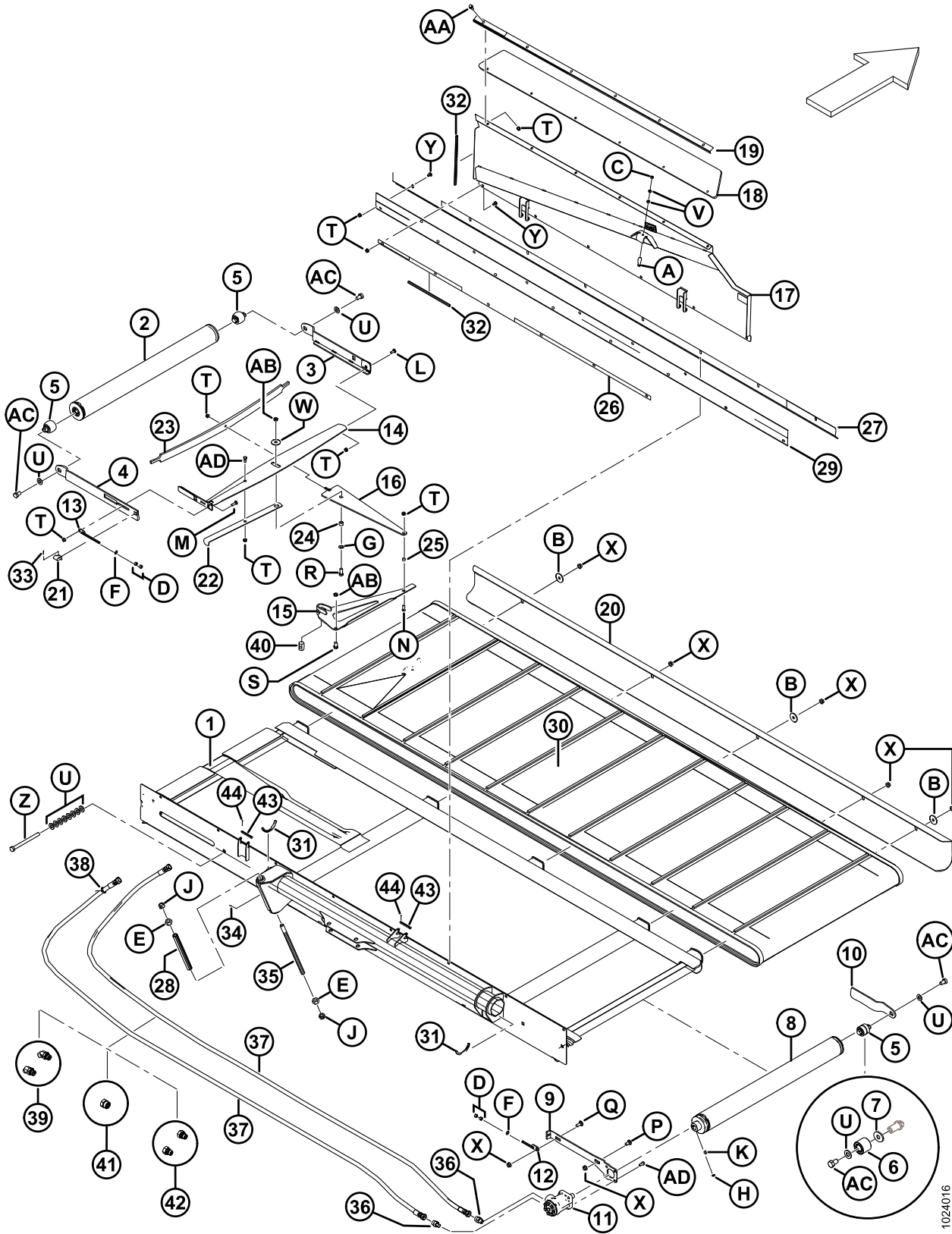


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## REPAIR PARTS

Ref	Part Number	Description	Qty	Serial Number
1	176745	DECK – DECAL ASSEMBLY	1	
2	144833	ROLLER – IDLER WELDT	1	
3	176000	ARM SUPPORT WELDT FRONT	1	
4	144837	ARM SUPPORT REAR	1	
5	165735	PIN ASSY – DRAPER ROLLER	3	
6	132607	BEARING – DOUBLE ROW BALL 52 OD X 25 BORE	3	
7	120845	SEAL – NILOS LSTO STEEL DISK	3	
8	176678	ROLLER – DRIVE WELDT	1	
9	144501	ARM – SUPPORT, REAR	1	
10	144499	ARM – ROLLER SUPPORT, FRONT	1	
11	176508	MOTOR – HYD DANFOSS	1	
12	145593	ROD – ADJUSTER WELDT	1	
13	145345	ROD – ADJUSTER WELDT	1	
14	120449	MEMBER – LH STABILIZER WELDT	1	
15	220181	BELL CRANK WELDT – LH	1	
16	120462	MEMBER – COMPRESSION WELDT	1	
17	<b>176831</b>	<b>PANEL – REAR WELDT</b>	1	
18	<b>176838</b>	<b>SHIELD – DUST</b>	1	
19	<b>176839</b>	<b>FLANGE</b>	1	
20	172747	SKID – ASSY, C/W DECALS	1	
21	145357	BRACKET – IDLER ARM	1	
22	145428	INDICATOR	1	
23	145548	SPRING – LEAF (TENSIONER)	1	
24	132531	SPACER	1	
25	132532	SPACER	1	
26	176664	STRIP – STIFFENER	1	
27	176663	DEFLECTOR – SEAL	1	
28	144558	BUSHING – STEEL	1	
29	176665	SEAL – BACKSHEET	1	
30	165304	DRAPER – ENDLESS 30 FT	1	
31	109791	MOULDING	2	
32	37687	MOULDING	2	
33	18604	PIN – COTTER 3/32 DIA X 3/4 ZP	1	

# REPAIR PARTS

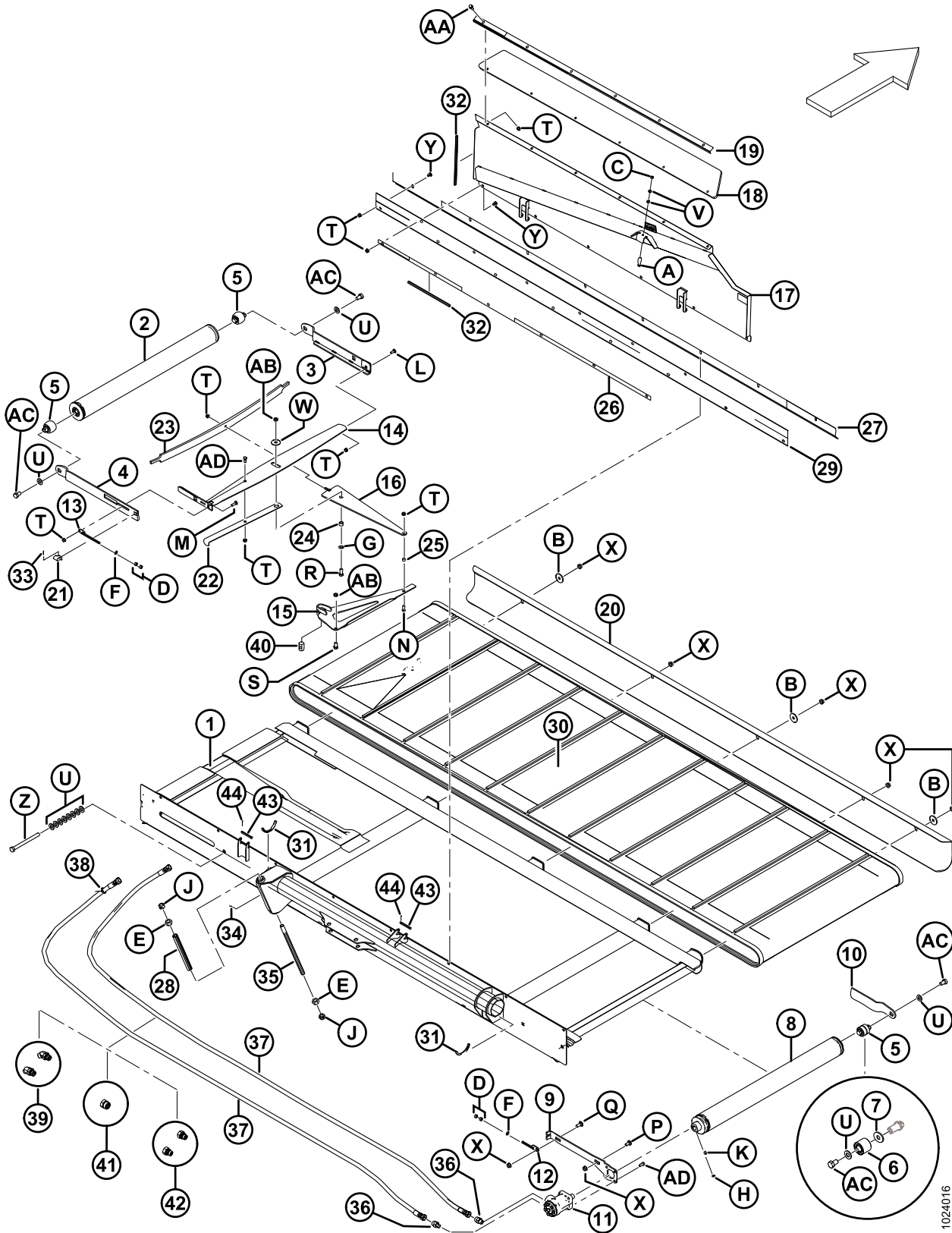


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## REPAIR PARTS

Ref	Part Number	Description	Qty	Serial Number
34	18671	FITTING – LUBE 1/4 - 28 UNF	1	
35	176063	SHAFT	1	
36	184461	FITTING – ADAPTER 10 MORFS X 10 MORB	2	
37	176534	HOSE – HYDRAULIC	2	
38	135266	FASTENER – CABLE TIE (LIGHT BLUE)	1	
39	136458	FITTING – ELBOW 45° HYD (M1240 ONLY)	2	
40	145361	NUT – SPECIAL	1	
41	136266	PLUG – HYD SAE, 10 ORFS (SHIPPING ONLY)	2	
42	252525	FITTING – ADAPTER HYD	2	
43	13249	PIN – CLEVIS	2	
44	184631	PIN – COTTER- 5/32"X1" ZP	2	
A	176067	BOLT – HH 5/16 NC X 1.75 TFL GR5 ZP		
B	11695	WASHER – FLAT		
C	18589	NUT – HEX 5/16 - 18 UNC GR5 ZP		
D	18590	NUT – HEX 3/8 - 16 UNC GR5 ZP		
E	18593	NUT – HEX 3/4 - 10 UNC GR5 ZP		
F	18598	WASHER – SAE FLAT 13/32 ID X 13/16 IN OD ZP		
G	18599	WASHER – SAE FLAT 17/32 ID X 1 1/16 IN OD ZP		
H	18664	NUT – HEX JAM 3/8 - 16 UNC GR5 ZP		
J	18689	NUT – HEX LOCK DT .750-10 UNC		
K	18709	SCREW – SET HEX SOC CUP PT 3/8 NC X 5/8 LG		
L	19965	BOLT – RHSN 3/8 NC X 1.0 GR5 ZP		
M	19966	BOLT – RHSN 3/8 NC X 1.25 LG GR5 ZP		
N	20077	BOLT – HEX HD 3/8 NC X 1.0 LG GR5 ZP		
P	21066	BOLT – RHSN 1/2 NC X 1 GR5 ZP		
Q	21471	BOLT – RHSN 1/2 NC X 1.25 GR5 ZP		
R	21491	BOLT – HH 1/2 NC X 1.25 LG GR5 ZP		
S	21575	BOLT – HH 1/2 NC X 1.0 GR 5 ZP		
T	30228	NUT – FLANGE DT SMOOTH FACE 0.375-16 UNC		
U	30441	WASHER – HARDENED		
V	35689	NUT – SPECIAL		
W	42592	WASHER – FLAT		

# REPAIR PARTS

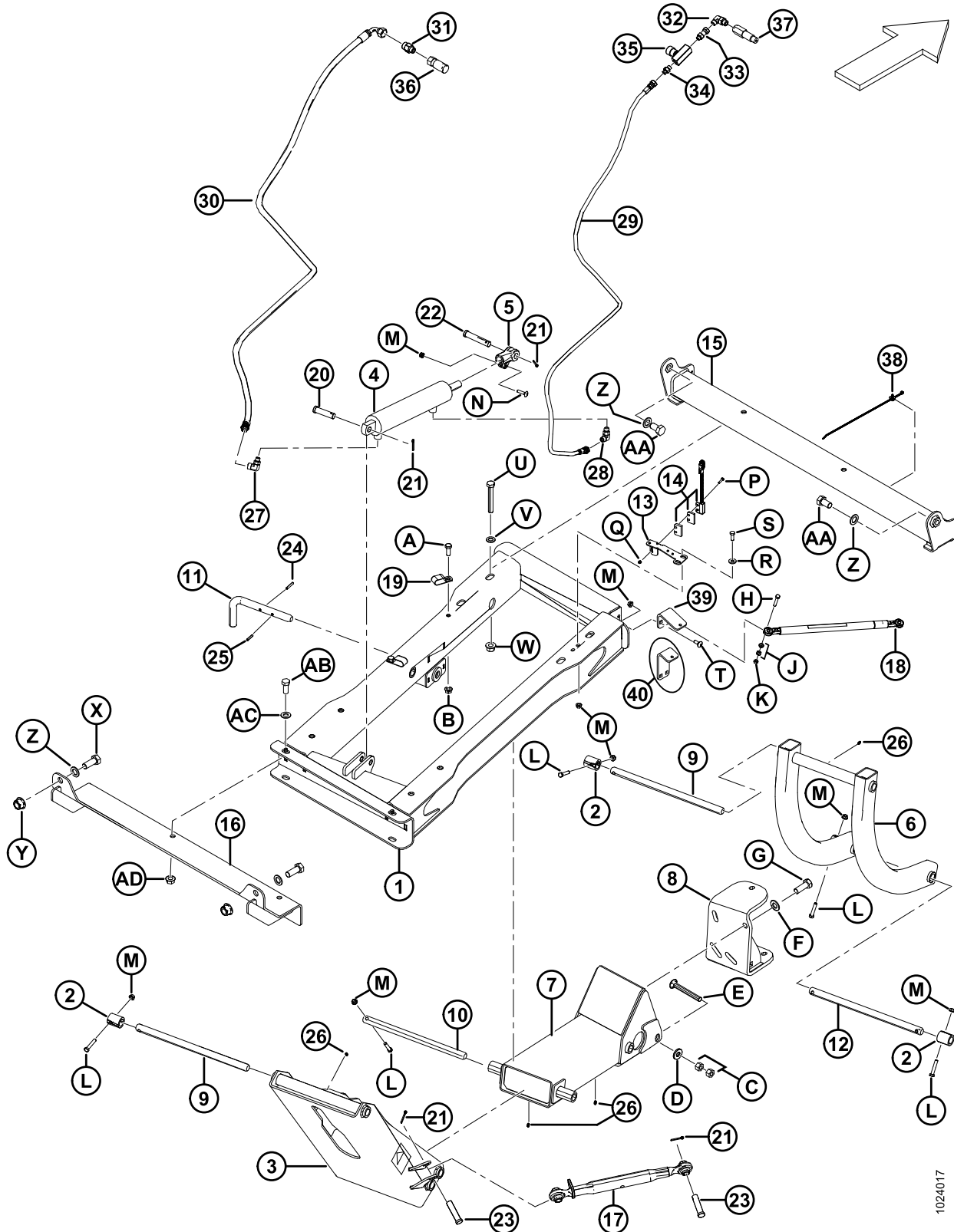


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## REPAIR PARTS

Ref	Part Number	Description	Qty	Serial Number
X	50186	NUT – FLANGE LOCK SM FACE DT 0.500-13 UNC GR5		
Y	135157	SCREW – MACHINE		
Z	135906	BOLT – HH 5/8 NC X 7.5 LG TFL GR 5 ZP		
AA	135966	BOLT – HH FLG (SM FACE) 3/8 NC X 1.0 GR5 ZP		
AB	137727	NUT – HEX JAM - DIST THD. 1/2-13 UNC GR5 ZP		
AC	145249	BOLT – HH 5/8 NF X 1.0 LG GR5 ZP		
AD	172259	BOLT – SHOULDER .375-16 UNC		

## 5.2 Linkage and Deck Support

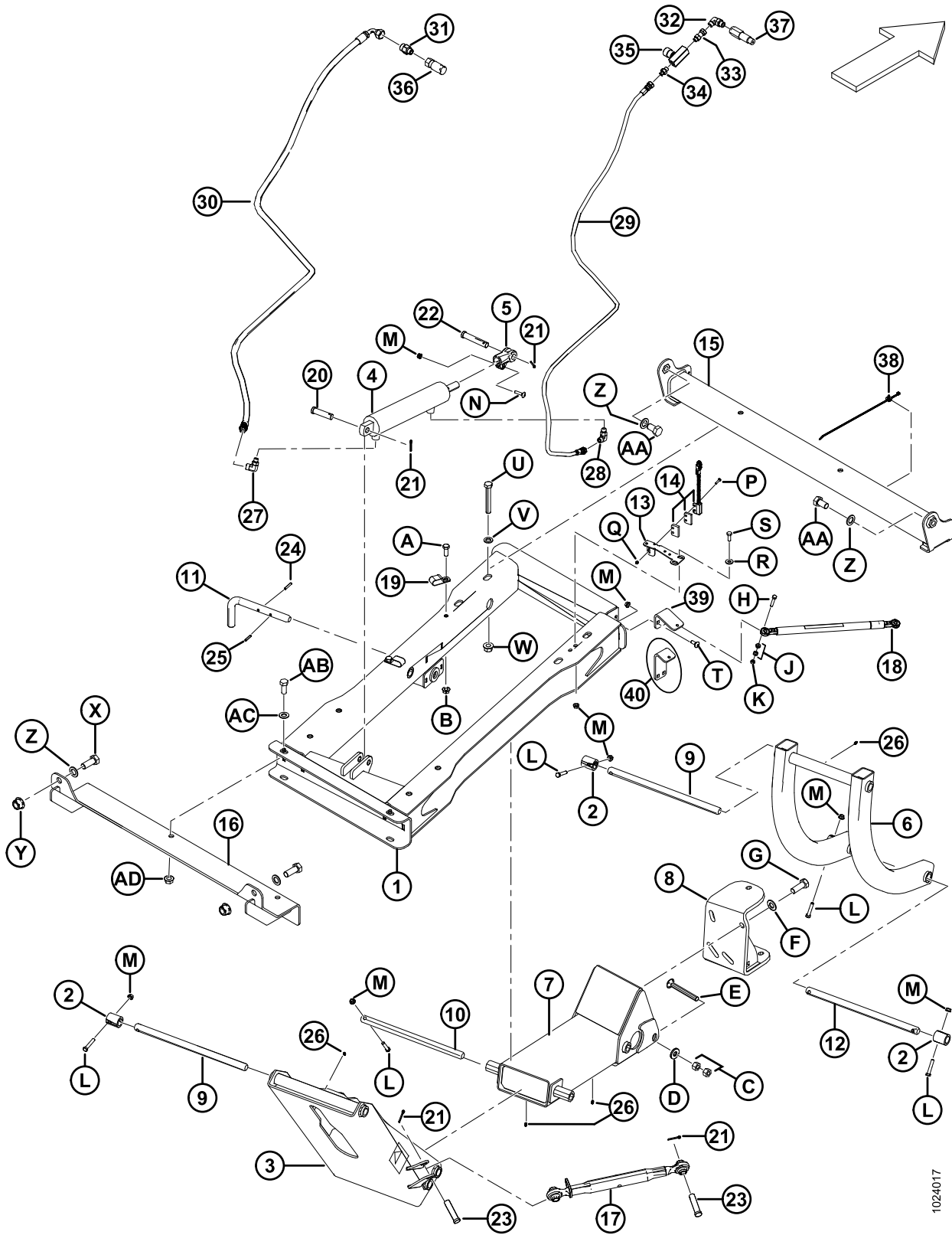


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## REPAIR PARTS

Ref	Part Number	Description	Qty	Serial Number
1	176647	SUPPORT – LINKAGE	1	
2	172903	TUBE	3	
3	176637	ARM – ASSY, C/W DECALS	1	
4	208966	CYLINDER – HYD	1	
	176031	SEAL KIT		
5	172664	CLEVIS	1	
6	144592	ARM – FRONT WELDT	1	
7	144593	ARM – BOTTOM WELDT	1	
8	144594	CLEVIS – WELDT	1	
9	172910	SHAFT – 25 MM OD, 450 MM LG	2	
10	176018	SHAFT – 25 MM OD, 420 MM LG	1	
11	176016	PIN – L	1	
12	176023	SHAFT – 25 MM OD, 420 MM LG	1	
13	176655	SUPPORT – PROXIMITY SENSOR	1	
14	200974	SWITCH – PROXIMITY, C/W SPACERS	1	
15	176652	SUPPORT – LINKAGE	1	
16	176509	SUPPORT – REAR WELDT, DWA	1	
17	144996	JOINT ASSEMBLY	1	
18	176733	LINK – BALL JOINT	1	
19	103738	CLAMP – PVC INSULATED 13/16 IN. TUBE SIZE	2	
20	30463	PIN – CLEVIS, 18.89 MM-58 MM	1	
21	18648	PIN – COTTER 3/16 DIA X 1.25 ZP	4	
22	20312	PIN – CLEVIS, 18.89 MM-82 MM	1	
23	18627	PIN – CLEVIS, 18.89 MM-64 MM	2	
24	16266	PIN – SPRING 1/4 DIA X 1.25 LG	1	
25	2147	PIN – SPRING 1/4 DIA X 1.5 LG	1	
26	18671	FITTING – LUBE 1/4-28 UNF	4	
27	136238	FITTING – ELBOW 90° HYD	1	
28	136095	FITTING – ELBOW 90° HYD	1	
	50219	O-RING – #6 ORB		
	135865	O-RING – #12 ORB		
29	176498	HOSE – HYD, 1/4 IN ID, 2050 MM LG	1	
30	176497	HOSE – HYD, 1/2 IN ID, 2100 MM LG	1	

# REPAIR PARTS

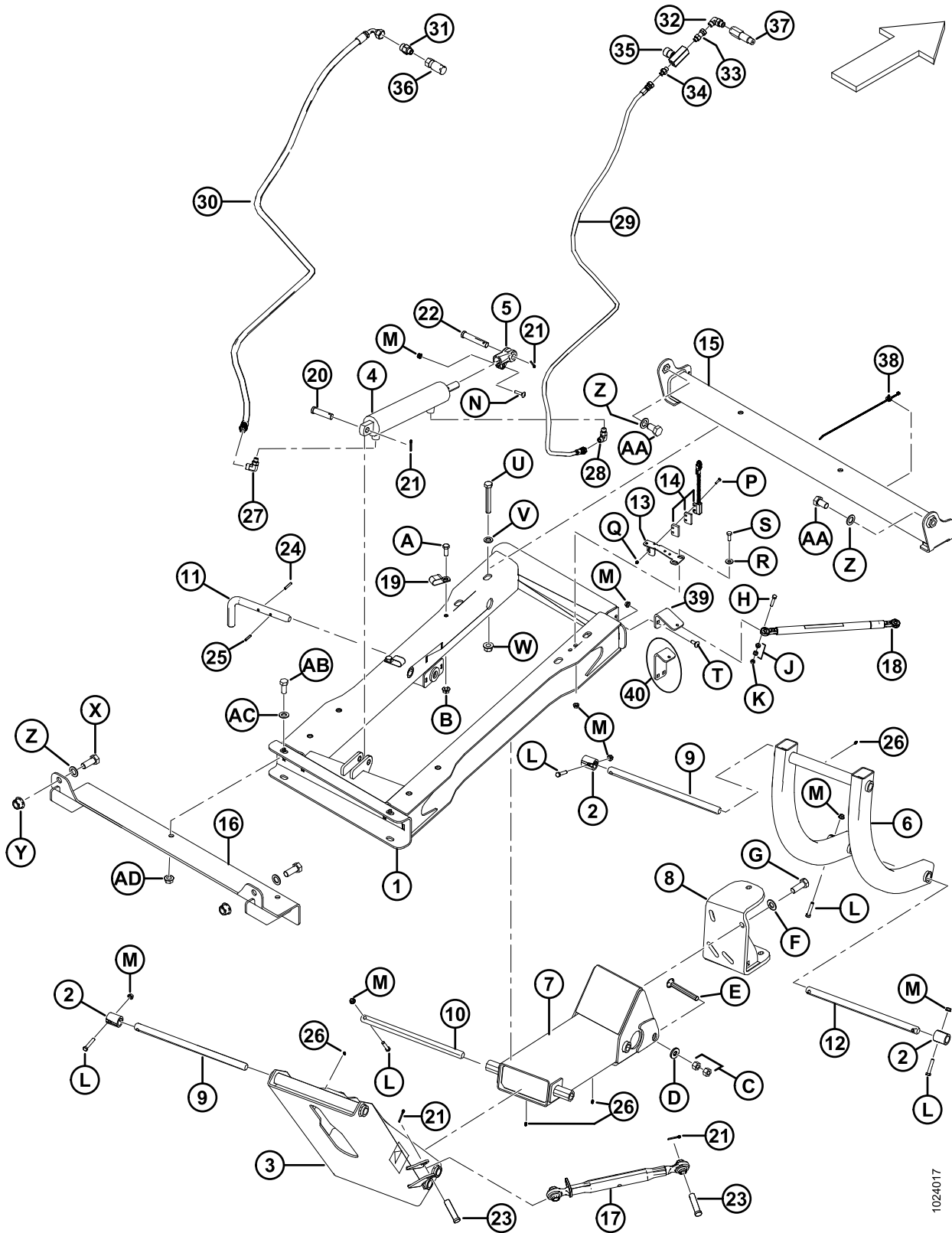


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## REPAIR PARTS

Ref	Part Number	Description	Qty	Serial Number
31	135781	FITTING – ADAPTER	1	
	44209	O-RING – #8 ORB		
	135867	O-RING – #10 ORFS		
32	136149	FITTING – ELBOW 90° HYD C/W O-RINGS	1	
	50219	O-RING – #6 ORB		
	135865	O-RING – #12 ORB		
33	136147	FITTING – CONNECTOR HYD	1	
	50219	O-RING – #6 ORB		
34	135778	FITTING – ADAPTER	1	
	50219	O-RING – #6 ORB		
	135865	O-RING – #12 ORB		
35	183211	VALVE – HYD FLOW CONTROL	1	
36	135312	COUPLER – FEMALE HYD. 3/8 IN. FLAT FACE	1	
37	135386	COUPLER – MALE HYD. 3/8 IN. FLAT FACE	1	
38	136655	FASTENER – FIR TREE MOUNT, W/ CABLE TIE	1	
39	176659	BRACKET – LINKAGE - STANDARD	1	
40	176670	BRACKET – LINKAGE-OPTION	1	
A	21491	BOLT – HH 1/2 NC X 1.25 LG GR5 ZP		
B	50186	NUT – FLANGE LOCK SM FACE DT 0.500-13 UNC GR5		
C	18592	NUT – HEX 5/8-11 UNC GR5 ZP		
D	22072	WASHER – FLAT		
E	30816	BOLT – RHSN TFL 5/8-11 X 5-GR5-ZP		
F	176009	WASHER – NORDLOCK 3/4 IN. SP		
G	30512	BOLT – HH 3/4 NC X 2.0 LG GR5 ZP		
H	176067	BOLT – HH 5/16 NC X 1.75 TFL GR5 ZP		
J	35689	NUT – SPECIAL		
K	18589	NUT – HEX 5/16-18 UNC GR5 ZP		
L	21354	BOLT – HH 3/8 NC X 2.0 LG GR5 ZP		
M	30228	NUT – FLANGE DT SMOOTH FACE 0.375-16 UNC		
N	136050	BOLT – RHSN M8 X 1.25 X 35-8.8-AA1J		
P	252183	SCREW – PAN HD ISO 7045 M5 X 0.8 X 25-4.8-A2L		
Q	197230	NUT – HEX NYLOC M5 X 0.8-8-A2L		
R	20535	WASHER – FLAT		
S	20077	BOLT – HEX HD 3/8 NC X 1.0 LG GR5 ZP		
T	19965	BOLT – RHSN 3/8-16 X 1 GR5 ZP		

# REPAIR PARTS

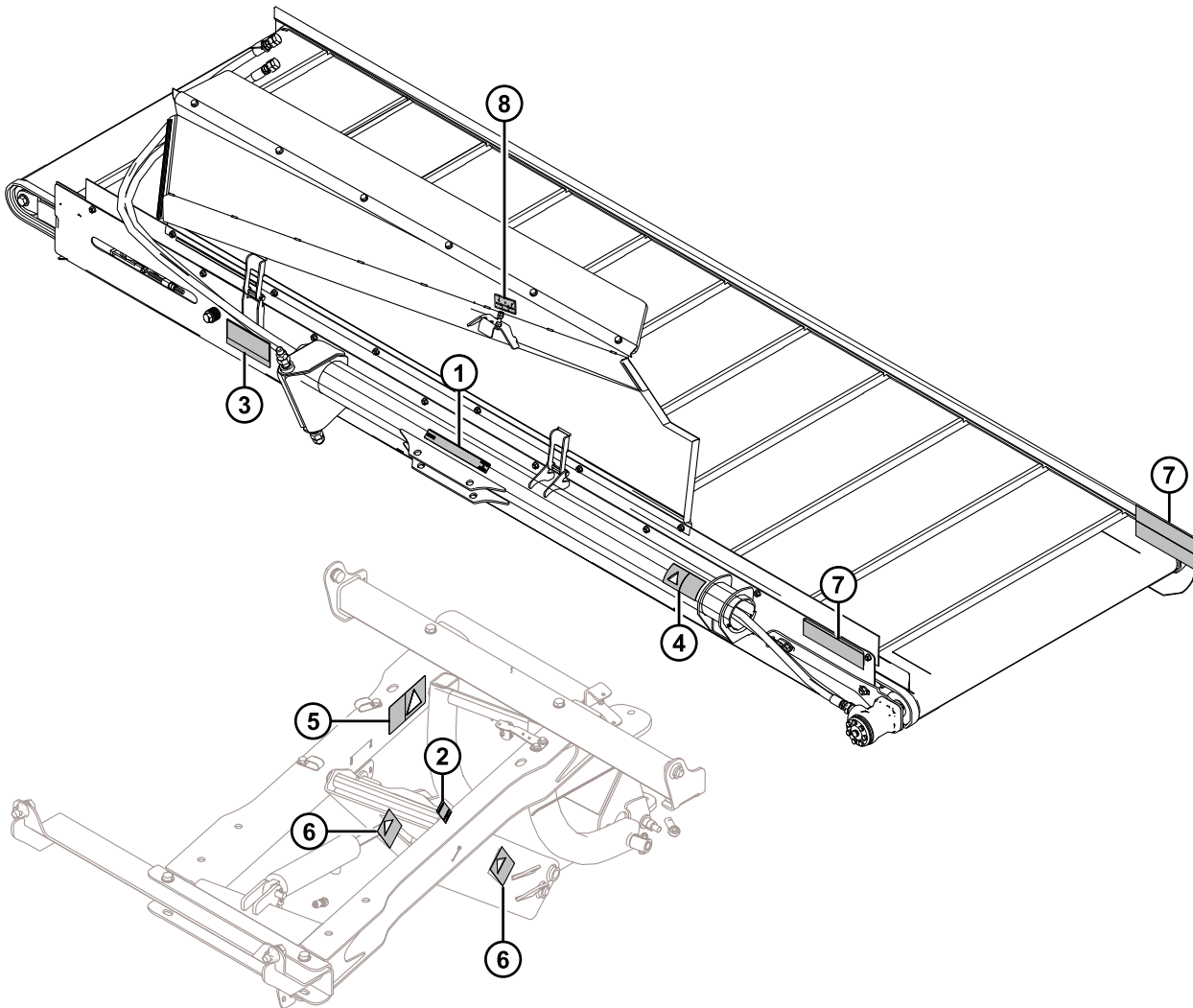


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## REPAIR PARTS

Ref	Part Number	Description	Qty	Serial Number
U	136159	BOLT – HEX HD M16 X 2 X 110-8.8-AA3L		
V	184717	WASHER – FLAT REG M16-200HV-AA1J		
W	136440	NUT – HEX FLG CTR LOC M 16 X 2-10-A3L		
X	136082	BOLT – HEX FLG HD TFL M20 X 40-10.9-A3L ASTM568M		
Y	136122	NUT – HEX FLG CTR LOC M20 X 2.5-10-A3L		
Z	136477	WASHER – FLAT REG M20-200HV-A3L		
AA	252891	BOLT – HEX HD TFL M20 X 2.5 X 35-8.8-AA1J		
AB	21594	BOLT – HEX HD 0.625 -11 UNC X 1.50		
AC	18600	WASHER – SAE FLAT 21/32 ID X 1-5/16 IN OD ZP		
AD	50225	NUT – FLANGE DT SMOOTH FACE .625-11UNC		

## 5.3 Decals and Reflectors



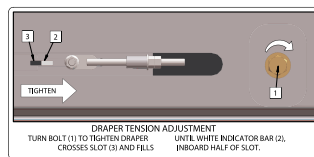
**DISC** **SICKLE**

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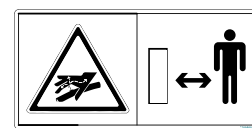
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**SICKLE**

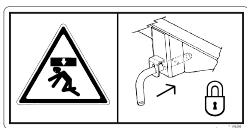
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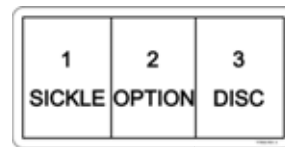
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## REPAIR PARTS

Ref	Part Number	DESCRIPTION	Qty
1	176767	DECAL – HEADER POSITION, HORIZONTAL	
2	176768	DECAL – HEADER POSITION, VERTICAL	
3	220084	DECAL – DRAPER TENSION	
4	166466	DECAL – WARNING, HIGH PRESSURE HYDRAULICS	
5	176295	DECAL – DECK LIFT LOCK	
6	174683	DECAL – WARNING DWA LINKAGE PINCH POINT	
7	115145	REFLECTOR – FLUORESCENT RED-ORANGE	
	115146	REFLECTOR – AMBER	
	115147	REFLECTOR – RED	
8	176832	DECAL – BACK PANEL ADJUSTMENT	



## 6 Reference

### 6.1 Torque Specifications

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

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

#### ***Jam nuts***

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

#### ***Self-tapping screws***

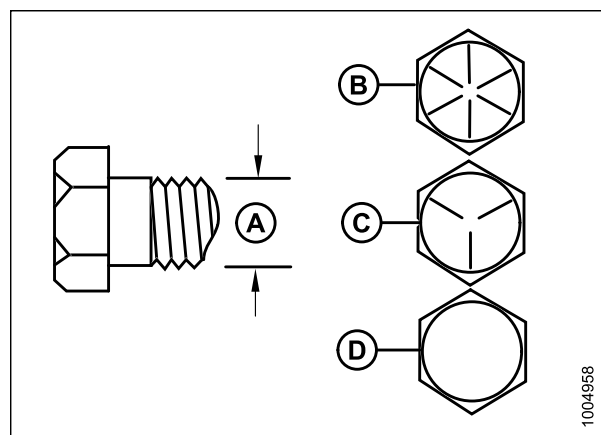
Standard torque is to be used (**NOT** to be used on critical or structurally important joints).

#### 6.1.1 SAE Bolt Torque Specifications

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

**Table 6.1 SAE Grade 5 Bolt and Grade 5 Free Spinning Nut**

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



**Figure 6.1: Bolt Grades**

A - Nominal Size  
C - SAE-5

B - SAE-8  
D - SAE-2

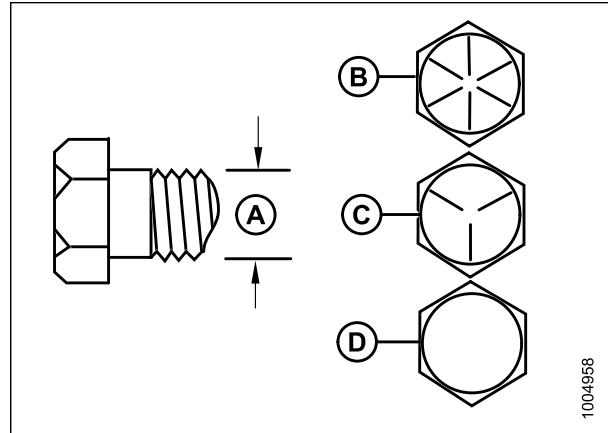
## REFERENCE

**Table 6.2 SAE Grade 5 Bolt and Grade F Distorted Thread Nut**

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

**Table 6.3 SAE Grade 8 Bolt and Grade G Distorted Thread Nut**

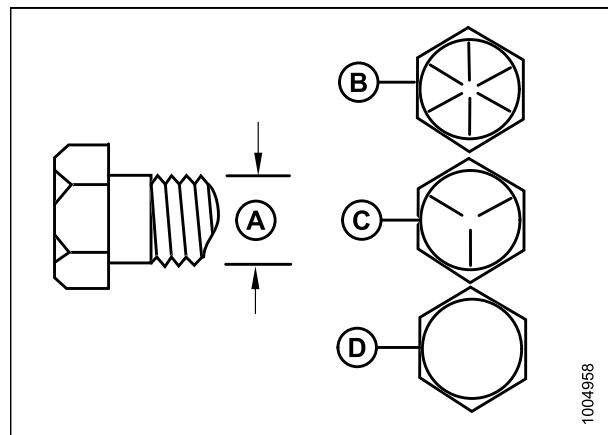
Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
1/4-20	16.8	18.6	*150	*165
5/16-18	24	26	18	19
3/8-16	42	46	31	34
7/16-14	67	74	50	55
1/2-13	102	113	76	84
9/16-12	148	163	109	121
5/8-11	204	225	151	167
3/4-10	362	400	268	296
7/8-9	583	644	432	477
1-8	874	966	647	716



**Figure 6.2: Bolt Grades**

A - Nominal Size  
C - SAE-5

B - SAE-8  
D - SAE-2



**Figure 6.3: Bolt Grades**

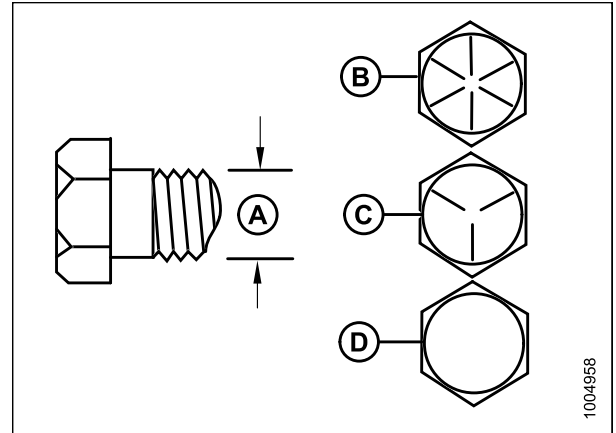
A - Nominal Size  
C - SAE-5

B - SAE-8  
D - SAE-2

## REFERENCE

**Table 6.4 SAE Grade 8 Bolt and Grade 8 Free Spinning Nut**

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



**Figure 6.4: Bolt Grades**

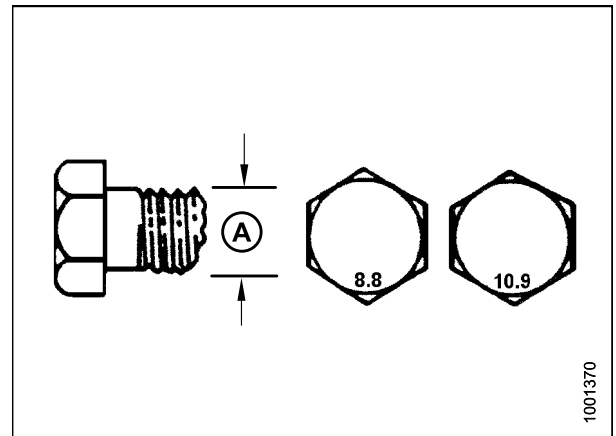
A - Nominal Size  
C - SAE-5

B - SAE-8  
D - SAE-2

### 6.1.2 Metric Bolt Specifications

**Table 6.5 Metric Class 8.8 Bolts and Class 9 Free Spinning Nut**

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

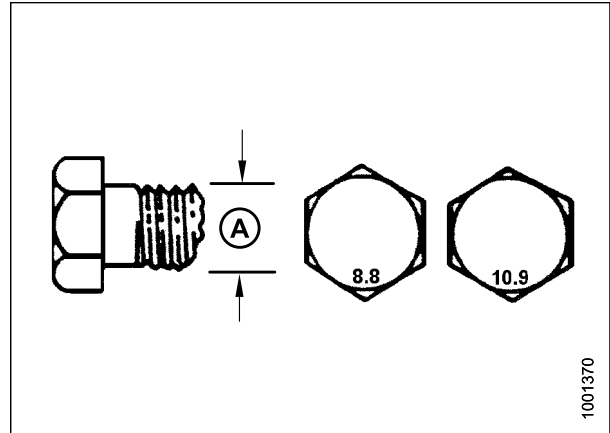


**Figure 6.5: Bolt Grades**

## REFERENCE

**Table 6.6 Metric Class 8.8 Bolts and Class 9 Distorted Thread Nut**

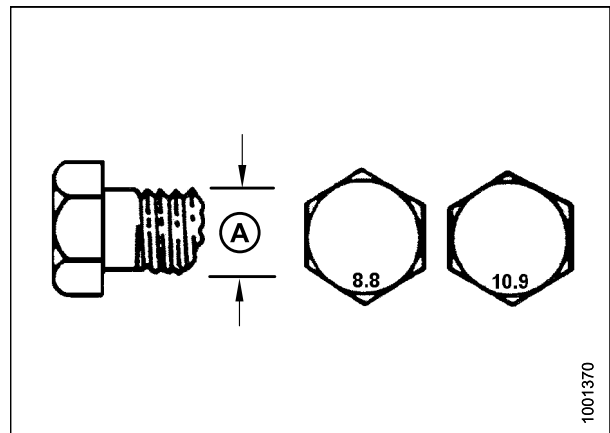
Nominal Size (A)	Torque (Nm)		Torque (lbf·ft) (*lbf·in)	
	Min.	Max.	Min.	Max.
3-0.5	1	1.1	*9	*10
3.5-0.6	1.5	1.7	*14	*15
4-0.7	2.3	2.5	*20	*22
5-0.8	4.5	5	*40	*45
6-1.0	7.7	8.6	*69	*76
8-1.25	18.8	20.8	*167	*185
10-1.5	37	41	28	30
12-1.75	65	72	48	53
14-2.0	104	115	77	85
16-2.0	161	178	119	132
20-2.5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



**Figure 6.6: Bolt Grades**

**Table 6.7 Metric Class 10.9 Bolts and Class 10 Free Spinning Nut**

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

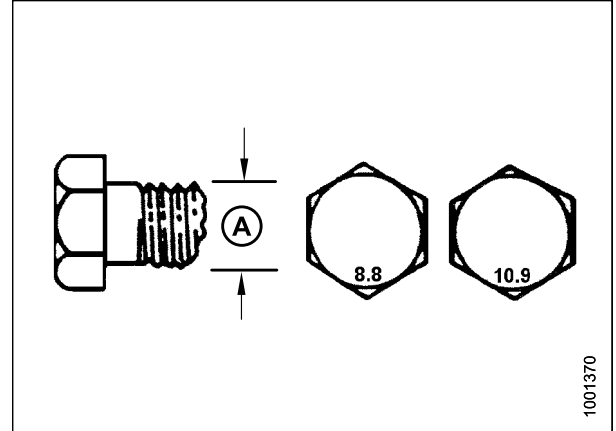


**Figure 6.7: Bolt Grades**

## REFERENCE

**Table 6.8 Metric Class 10.9 Bolts and Class 10 Distorted Thread Nut**

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

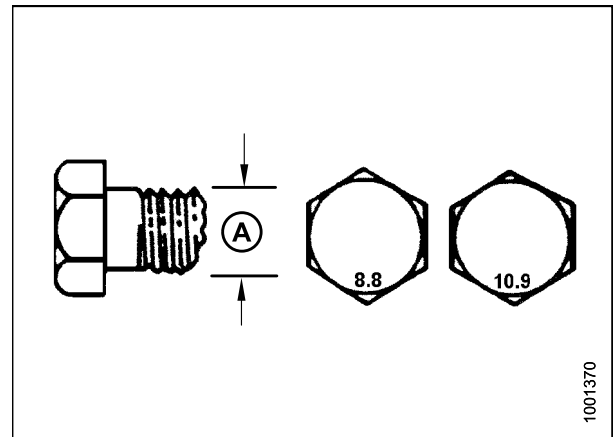


**Figure 6.8: Bolt Grades**

### 6.1.3 Metric Bolt Specifications Bolting into Cast Aluminum

**Table 6.9 Metric Bolt Bolting into Cast Aluminum**

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



**Figure 6.9: Bolt Grades**

## 6.1.4 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 6.10, page 86.
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.

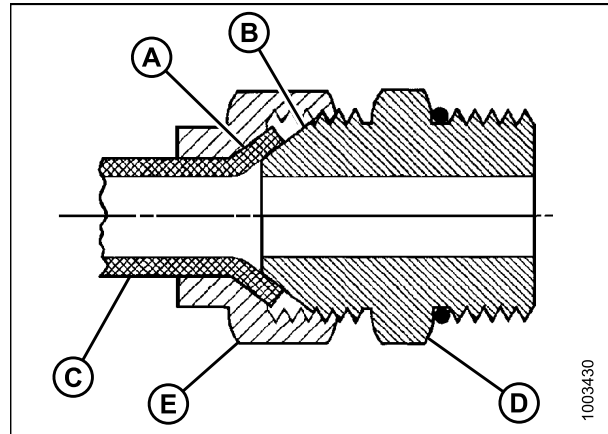


Figure 6.10: Hydraulic Fitting

Table 6.10 Flare-Type Hydraulic Tube Fittings

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

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

### 6.1.5 O-Ring Boss (ORB) Hydraulic Fittings (Adjustable)

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

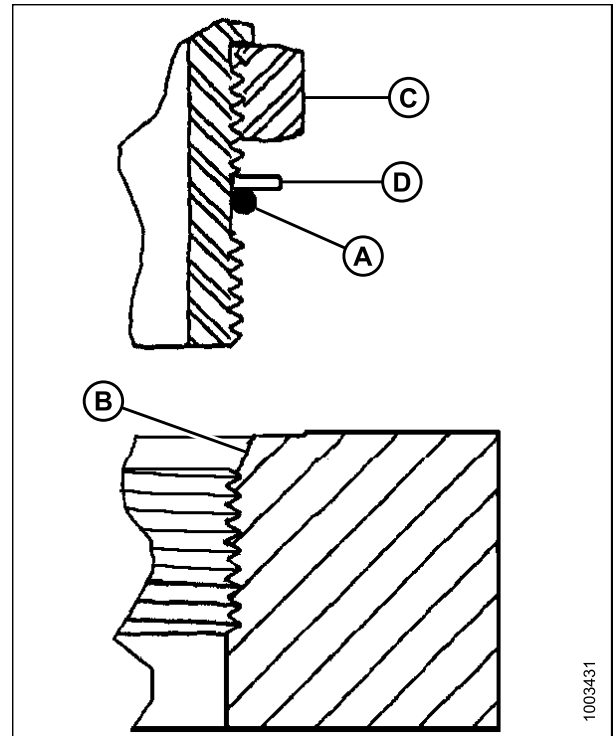


Figure 6.11: Hydraulic Fitting

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

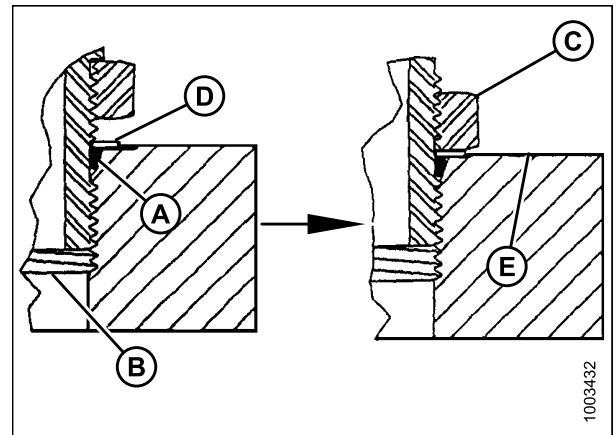


Figure 6.12: Hydraulic Fitting

## REFERENCE

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

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

---

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

## REFERENCE

### 6.1.6 O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable)

1. Inspect O-ring (A) and seat (B) for dirt or obvious defects.
2. Check that O-ring (A) is **NOT** on threads and adjust if necessary.
3. Apply hydraulic system oil to O-ring.
4. Install fitting (C) into port until fitting is hand-tight.
5. Torque fitting (C) according to values in Table 6.12, page 89.
6. Check final condition of fitting.

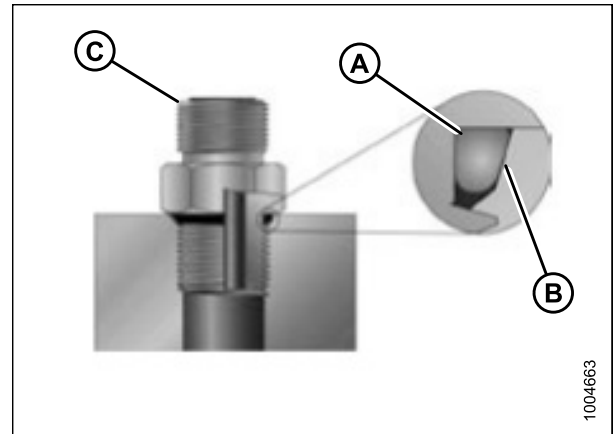


Figure 6.13: Hydraulic Fitting

Table 6.12 O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable)

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

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

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

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



Figure 6.14: Hydraulic Fitting

2. Apply hydraulic system oil to O-ring (B).
3. Align tube or hose assembly so that flat face of sleeve (A) or (C) comes in full contact with O-ring (B).
4. Thread tube or hose nut (D) until hand-tight. The nut should turn freely until it is bottomed out.
5. Torque fittings according to values in Table 6.13, page 90.

**NOTE:**

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

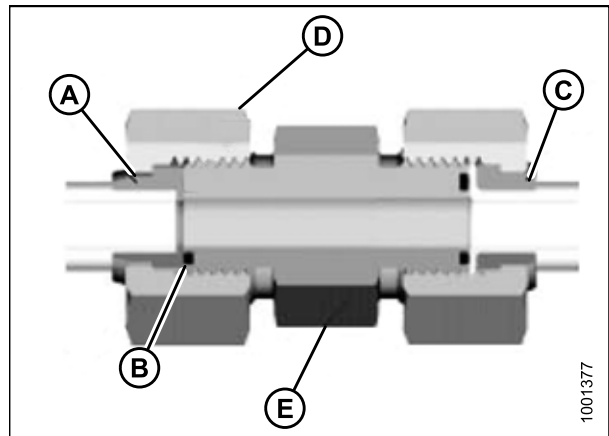


Figure 6.15: Hydraulic Fitting

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

**Table 6.13 O-Ring Face Seal (ORFS) Hydraulic Fittings**

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

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

## REFERENCE

**Table 6.13 O-Ring Face Seal (ORFS) Hydraulic Fittings (continued)**

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value <sup>6</sup>	
			Nm	lbf·ft
-14	Note <sup>5</sup>	7/8	—	—
-16	1-7/16	1	150–165	111–122
-20	1-11/16	1-1/4	205–226	151–167
-24	1–2	1-1/2	315–347	232–256
-32	2-1/2	2	510–561	376–414

### 6.1.8 Tapered Pipe Thread Fittings

Assemble pipe fittings as follows:

1. Check components to ensure that fitting and port threads are free of burrs, nicks and scratches, or any form of contamination.
2. Apply pipe thread sealant (paste type) to external pipe threads.
3. Thread fitting into port until hand-tight.
4. Torque connector to appropriate torque angle. The Turns From Finger Tight (T.F.F.T.) values are shown in Table 6.14, page 91. Make sure that tube end of a shaped connector (typically 45° or 90°) is aligned to receive incoming tube or hose assembly. Always finish alignment of fitting in tightening direction. Never back off (loosen) pipe threaded connectors to achieve alignment.
5. Clean all residue and any excess thread conditioner with appropriate cleaner.
6. Assess final condition of fitting. Pay special attention to possibility of cracks to port opening.
7. Mark final position of fitting. If a fitting leaks, disassemble fitting and check for damage.

**NOTE:**

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

**Table 6.14 Hydraulic Fitting Pipe Thread**

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

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

## 6.2 Conversion Chart

Table 6.15 Conversion Chart

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

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# Predelivery Checklist

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



## CAUTION

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

Table .16 DWA for M1 Series Windrower Predelivery Checklist

✓	Item	Reference
	Check for shipping damage or missing parts. Be sure all shipping dunnage is removed.	—
	Check for loose hardware. Tighten to required torque.	<a href="#">6.1 Torque Specifications, page 81</a>
	Check that all shipping stands have been removed.	<a href="#">2.3 Installing the Deck, page 22</a>
	Check and adjust front skid to correct height above the draper. Tighten securing nuts.	<a href="#">4.1.5 Adjusting Front Skid, page 55</a>
	Check and adjust rear deflector to correct height above the draper. Tighten securing nuts.	<a href="#">4.1.6 Adjusting Rear Deflector, page 56</a>
	Check external draper roller seal condition. Seal should be secure and without gaps.	<a href="#">4.1.7 Maintaining Draper Rollers, page 56</a>
	Check that draper pivot points are properly greased.	<a href="#">4.2 Lubrication, page 62</a>

DWA Serial Number:

Date Checked:

Checked by:







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