MacDon

Double Windrow Attachment (DWA) for M1 Series Windrowers

DWA Serial Number 371190 and Later

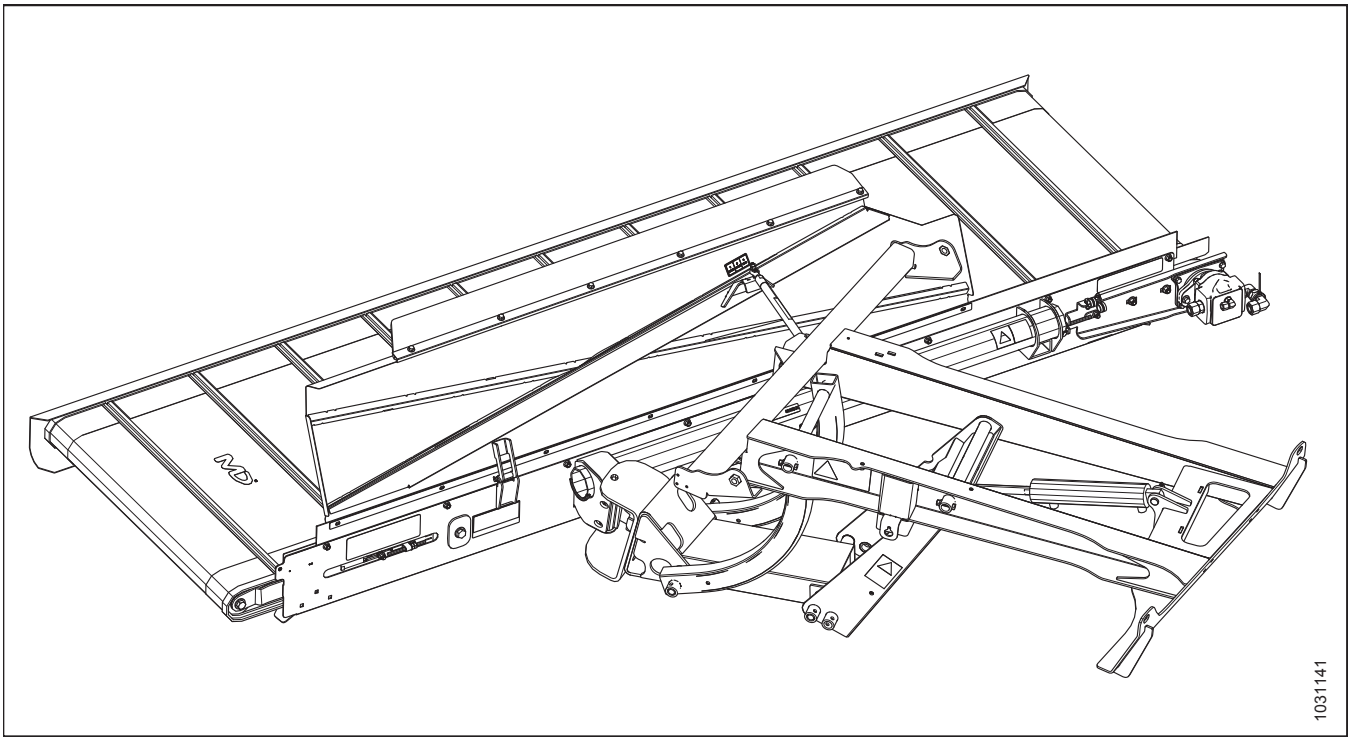
Setup, Operation, and Parts Manual

215592 Revision A

Original Instruction

The Harvesting Specialists.

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



Published: May 2021

Introduction

IMPORTANT:

This manual applies to Double Windrow Attachment (DWA) serial number 371190 and later, for DWA's mounted onto an M1 Series Windrower. If the DWA serial number is prior to 371190 and mounted onto an M1 Series Windrower, refer to manual MD #214763.

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 (Non-Grass Seed Only)
- R85 Rotary Disc Headers
- R216 Rotary Disc Headers

IMPORTANT:

The DWA is incompatible with R1 Series Rotary Disc Headers.

When the DWA system is engaged, conditioned crop is deposited onto the side draper and then delivered 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*) or from our Dealer-only site (*https://portal.macdon.com*) (login required).

The following conventions are used in this document:

- 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 *6.1 Torque Specifications, page 105* of this document.

Call your MacDon Dealer if you need assistance, information, or additional copies of this manual.

This instruction is currently available in English only.

Summary of Changes

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.

Section	Summary of Change	Internal Use Only
2.6 Connecting the Hydraulics to an M1170 Windrower, page 34	Corrected callout G to E in step 17. Changed "hoses" to "all 3 hoses" to provide a better explanation.	Audit
5.3 Deck, Draper, and Rollers, page 86	Added backsheet link kit 176910, ball joint link 176733, plate 176905, and screw 252292. Updated illustration from 1033189 to 1036341 to show changes.	ECN 61064
5.4 Linkage and Deck Support, page 94	Removed ball joint link 176733 from section and added a reference to Deck, Draper, and Rollers section. Updated illustration from 1033186 to 1036342 to show changes.	ECN 61064
	Added seal kit 176031 for hydraulic cylinder 208966.	Parts

Serial Number Location

The serial number helps identify your machine and ensures you get the best information quickly when working with MacDon for Product Support or Parts.

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).

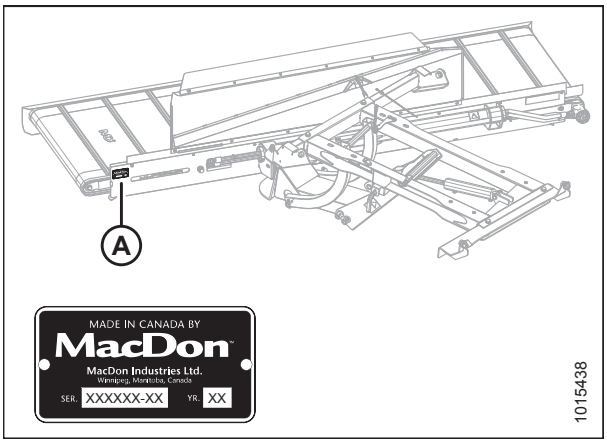


Figure 1: Serial Number Location

Chapter 1: Safety

1.1 Safety Alert Symbols

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

This symbol means:

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

Carefully read and follow the safety message accompanying this symbol.

Why is safety important to you?

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

Figure 1.1: Safety Symbol

1.2 Signal Words

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

Signal words are selected using the following guidelines:

DANGER

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

WARNING

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

CAUTION

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

IMPORTANT:

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

NOTE:

Provides additional information or advice.

1.3 General Safety

Protect yourself when assembling, operating, and servicing machinery.

CAUTION

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

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

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

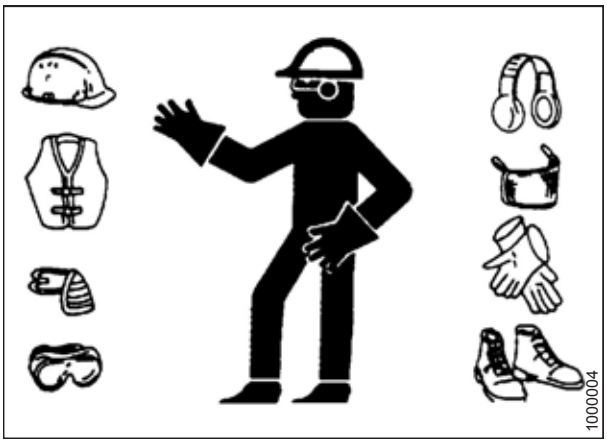


Figure 1.2: Safety Equipment

In addition, take the following precautions:

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

Figure 1.3: Safety Equipment

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

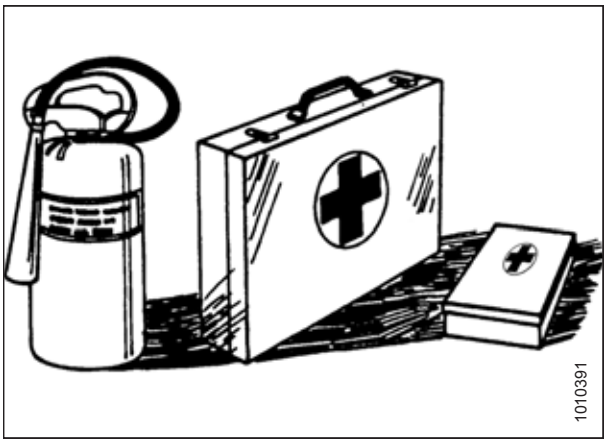


Figure 1.4: Safety Equipment

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

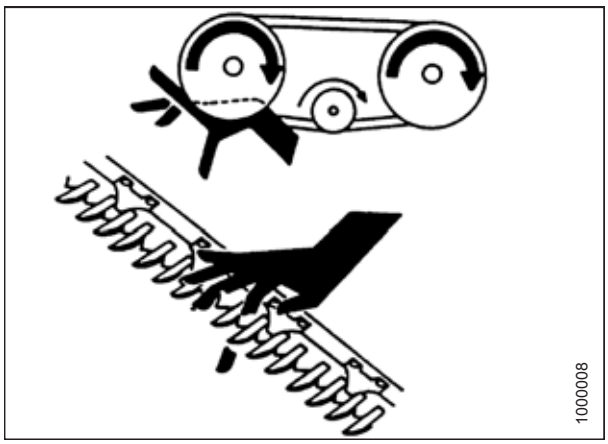


Figure 1.6: Safety around Equipment

- Keep service area clean and dry. Wet and/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 are fire hazards. 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

Protect yourself when servicing machinery.

To ensure your safety while maintaining machine:

- Review the operator's manual and all safety items before operation and/or maintenance of the 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

Figure 1.8: Safety around Equipment

- Relieve pressure from hydraulic circuits before servicing and/or disconnecting the 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 the area of bystanders, especially children, when carrying out any maintenance, repairs, or adjustments.
- Install transport lock or place safety stands under the frame before working under the machine.

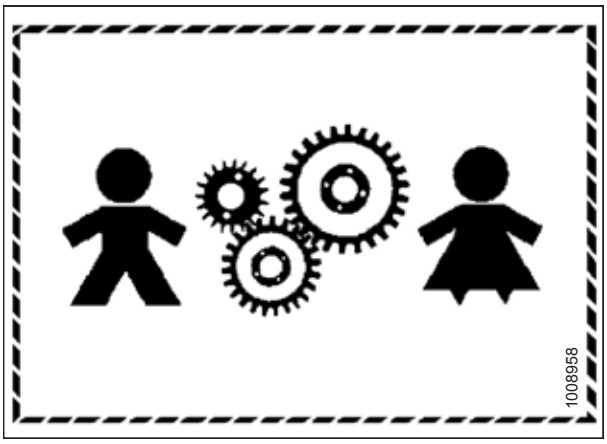


Figure 1.9: Equipment NOT Safe for Children

- If more than one person is servicing the machine at the same time, be aware that rotating a driveline or other mechanically-driven component by hand (for example, accessing a lubricant fitting) will cause drive components in other areas (belts, pulleys, and knives) to move. Stay clear of driven components at all times.
- Wear protective gear when working on the machine.
- Wear heavy gloves when working on knife components.

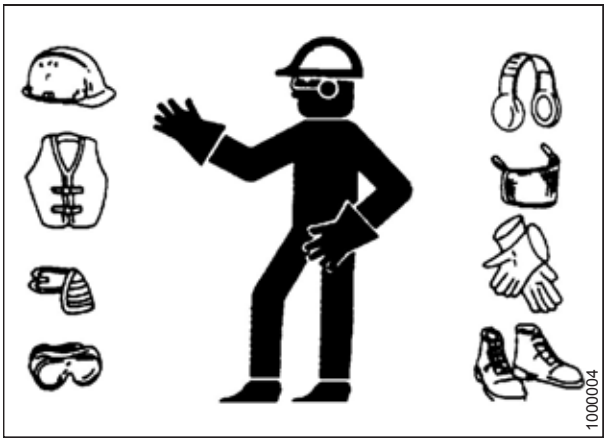


Figure 1.10: Safety Equipment

1.5 Hydraulic Safety

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

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

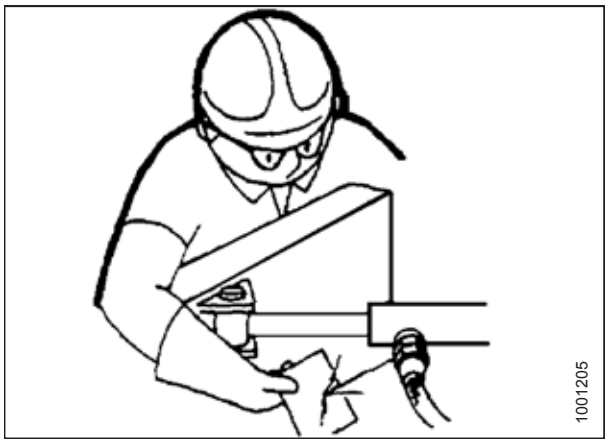


Figure 1.11: Testing for Hydraulic Leaks

- 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.

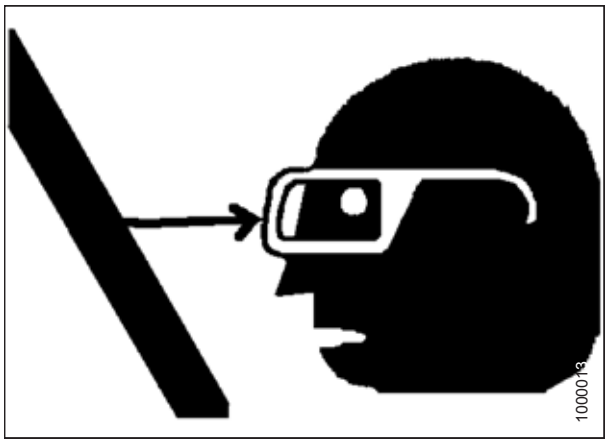


Figure 1.13: Safety around Equipment

1.6 Tire Safety

Service tires safely.

WARNING

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

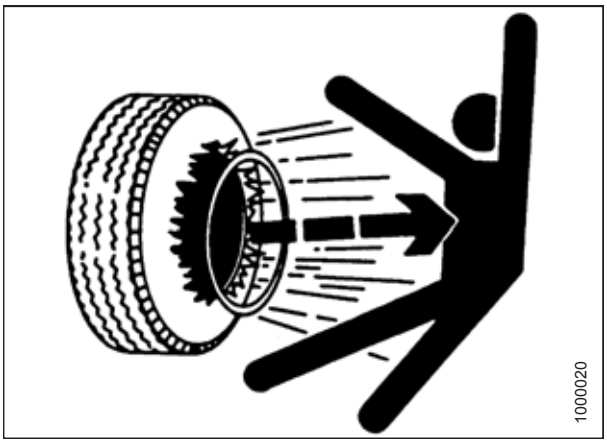


Figure 1.14: Overinflated Tire

WARNING

- **Do NOT remove, install, or repair a tire on a rim unless you have proper equipment and experience to perform job. Take the tire and rim to a qualified tire repair shop.**
- **Make sure the tire is correctly seated before inflating to operating pressure. If the tire is not correctly positioned on the rim or is overinflated, the tire bead can loosen on one side causing air to escape at high speed and with great force. An air leak of this nature can thrust the tire in any direction, endangering anyone in area.**
- **Do NOT stand over tire when inflating. Use a clip-on chuck and extension hose.**
- **Do NOT exceed maximum inflation pressure indicated on tire label.**

Figure 1.15: Safely Inflating Tire

- **Never use force on an inflated or partially inflated tire.**
- **Make sure all air is removed from the tire before removing the tire from the rim.**
- **Never weld a wheel rim.**
- **Replace tires that have defects and replace wheel rims that are cracked, worn, or severely rusted.**

1.7 Battery Safety

Protect yourself when handling batteries.

WARNING

- **Keep all sparks and flames away from batteries; an explosive gas is given off by electrolyte.**
- **Ventilate when charging in enclosed space.**

Figure 1.16: Safety around Batteries

WARNING

- **Wear safety glasses when working near batteries.**
- **To avoid an electrolyte loss, do NOT tip batteries more than 45°.**
- **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.**

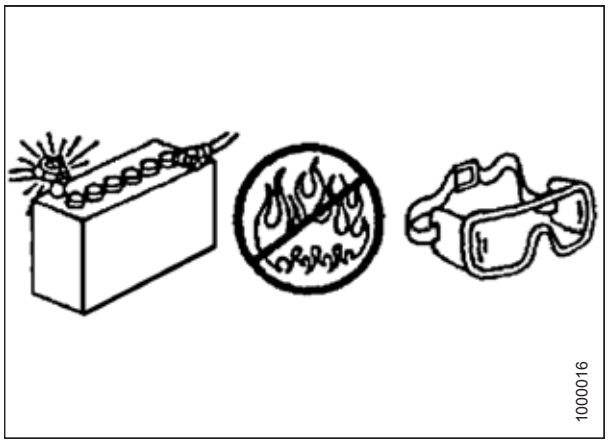


Figure 1.17: Safety around Batteries

WARNING

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

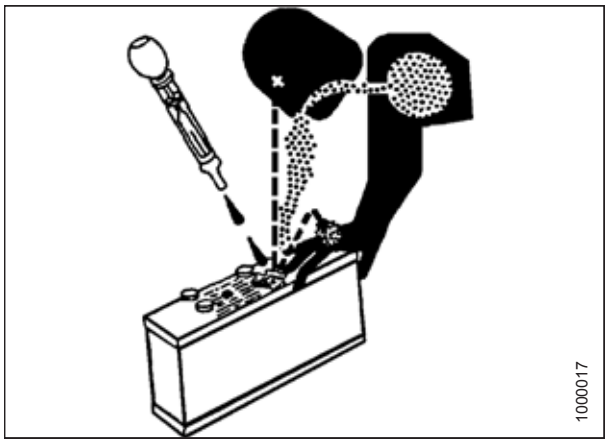


Figure 1.18: Safety around Batteries

1.8 Welding Precaution

It is very important that correct procedures be followed when welding anything connected to the windrower.

IMPORTANT:

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.

IMPORTANT:

Ensure that windrower is parked on a level surface, the ignition is turned off, and the key is removed before disconnecting anything.

The following items need to be disconnected:

- Negative battery terminals (A) (two connections)

  IMPORTANT:

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

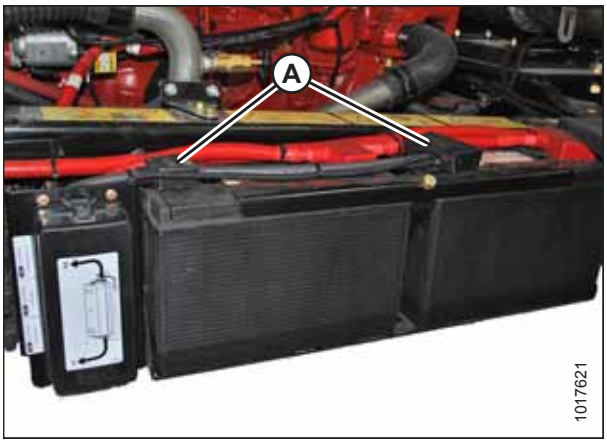


Figure 1.19: Negative Terminals

- 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

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

  Location: Behind cab, near header lift/fan manifold

  To disconnect the connectors, insert the end of a a small 3–6 mm (1/8–1/4 in.) blade screwdriver 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.

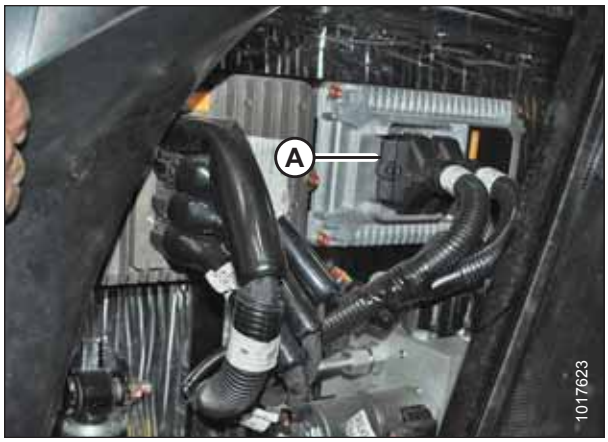


Figure 1.21: Firewall Extension Module

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

  Location: Under cab, inside left frame rail

  To disconnect the connectors, insert the end of a small 3–6 mm (1/8–1/4 in.) blade screwdriver 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.

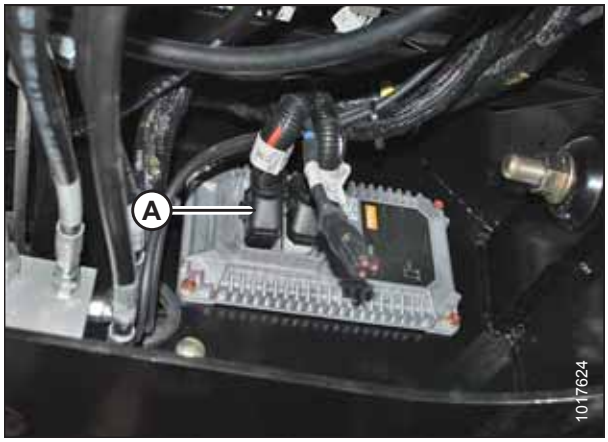


Figure 1.22: Chassis Extension Module

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

  Location: On engine

  To disconnect the connectors, 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.

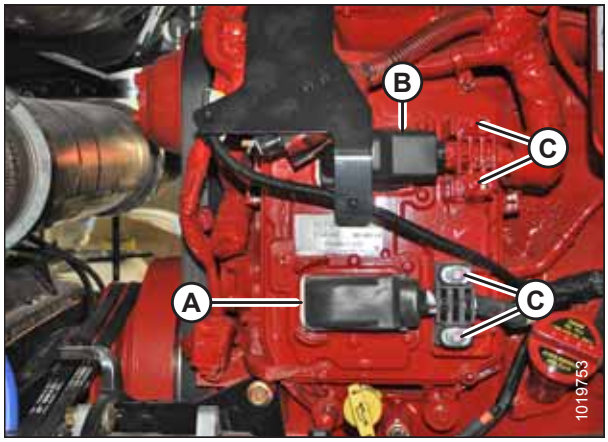


Figure 1.23: Engine Control Module

NOTE:

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

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

  Location: Under cab

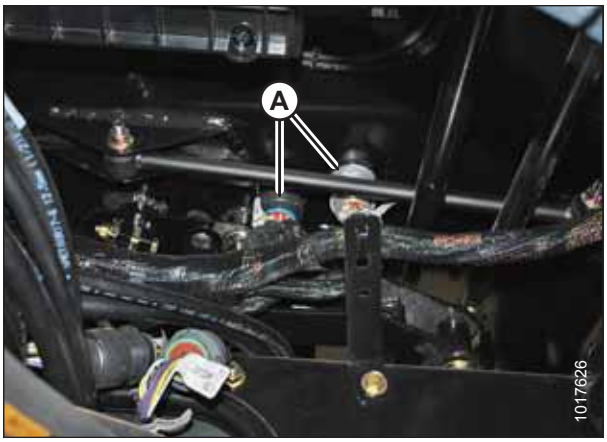


Figure 1.24: Cab Connectors

- Roof connectors (A)
  Four connectors: C10, C12, C13, and C14

  Location: Under cab at base of left cab post

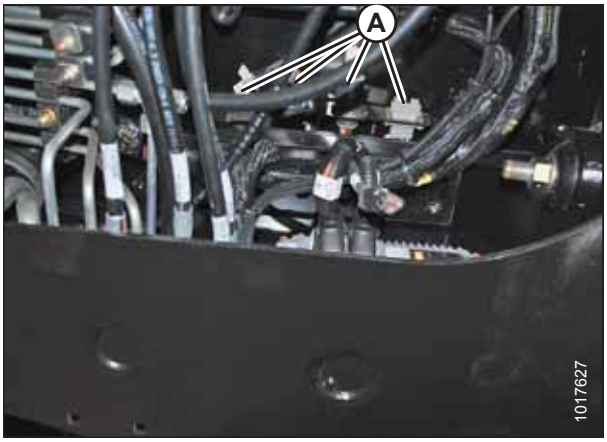


Figure 1.25: Roof Connectors

- Chassis relay module (A)
  Three connectors: P240, P241, and P242

  Location: Outside left frame rail near batteries

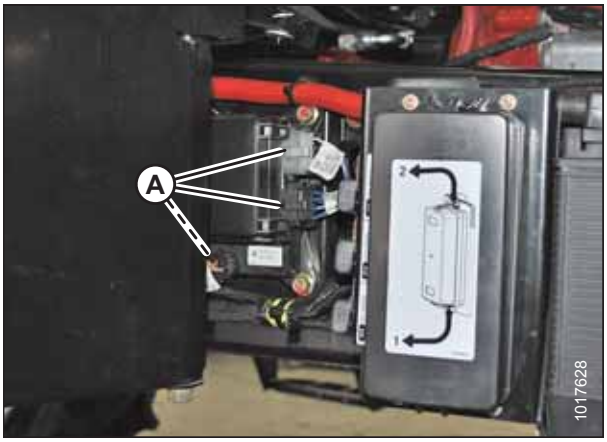


Figure 1.26: Chassis Relay Module

- Engine harness (A)
  Two round connectors: C30 and C31

  Location: Inside left frame rail, at rear of windrower

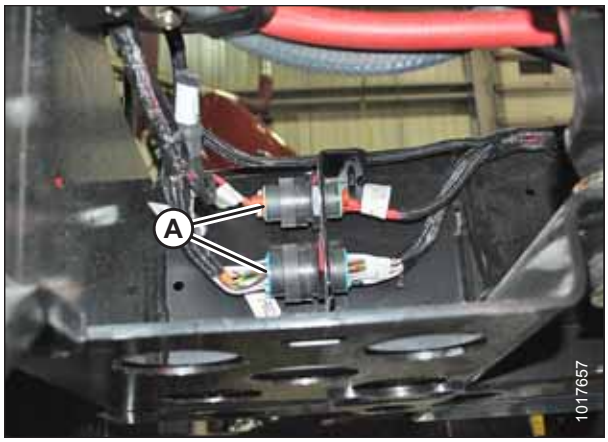


Figure 1.27: Engine Harness

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

  Location: Rear of A/C box

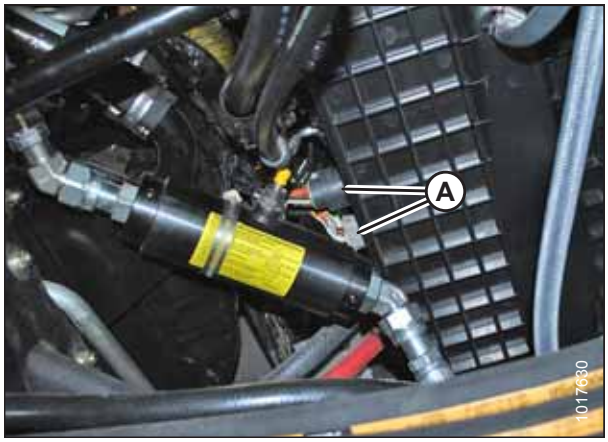


Figure 1.28: A/C Box Connectors

- Wheel motor connectors (A)
  Two round connectors: C25 and C26

  Location: Under center of frame, just behind front cross member

  IMPORTANT:

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

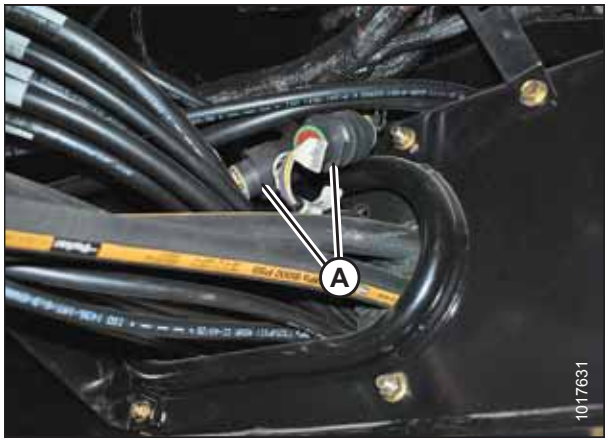


Figure 1.29: Wheel Motor Connectors

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 towards 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 to prevent an overspeed. Do this by shutting off the air and/or fuel supply to the engine.**
- **Do NOT bypass or disable automatic shutoff circuits. The circuits help prevent personal injury, and prevent engine damage. Contact your Dealer for repairs and adjustments.**
- **Inspect the engine for potential hazards.**
- **Before starting the engine, ensure no one is on, underneath, or close to the engine. Ensure that people clear the area.**
- **All protective guards and covers must be installed if the engine must be started to perform service procedures.**
- **To help prevent an accident, work around rotating parts carefully.**
- **If a warning tag is attached to the engine start switch or controls, do NOT start the engine or move the controls. Consult whoever attached the warning tag before starting the engine.**
- **Start the engine from the operator's station. Follow the procedure in the Starting Engine section of the operator's manual. Following the correct procedure will help prevent major damage to engine components and prevent personal injury.**
- **To ensure that the jacket water heater (if equipped) and/or lubricant oil heater (if equipped) are 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 and operate the engine in a well-ventilated area. If the engine is started in an enclosed area, vent exhaust to the outside.**
- **Engine exhaust gases become very hot during operation and can burn people and common materials. Stay clear of the rear of machine and avoid exhaust gases when the engine is running.**

NOTE:

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

WARNING

- **Before disconnecting fuel lines or any other components under high-pressure between the fuel pump and high-pressure common rail fuel system, confirm that the fuel pressure is relieved.**
- **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 is 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 engine monitoring system can initiate the following actions:

- Warning
- Derate
- Shut down

Abnormalities in the following monitored conditions can 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

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

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

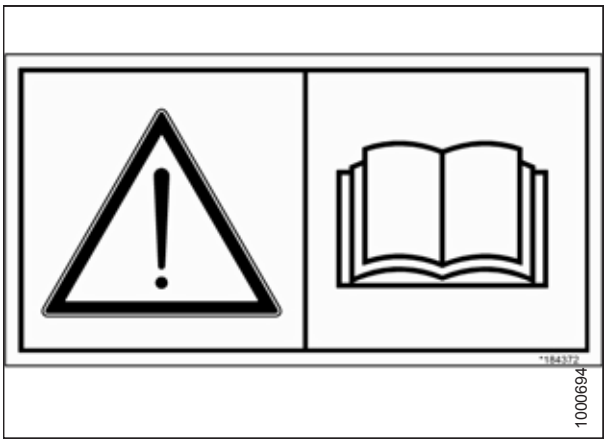


Figure 1.30: Operator's Manual Decal

1.10.1 Installing Safety Decals

If a safety decal is damaged it should be replaced.

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

1.11 Safety Sign Decals

MD #166466

High-pressure oil hazard

WARNING

To prevent serious injury, gangrene, or death:

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

Figure 1.31: MD #166466

MD #174683

Pinch point hazard

CAUTION

To prevent injury:

- Do **NOT** reach into pinch area.

Figure 1.32: MD #174683

MD #176295

Deck crushing hazard

DANGER

To avoid injury or death from fall of raised deck:

- Fully raise deck, stop engine, remove key, and engage mechanical safety lock (red pin) before going under deck.

Figure 1.33: MD #176295

1.12 Safety Decal Locations

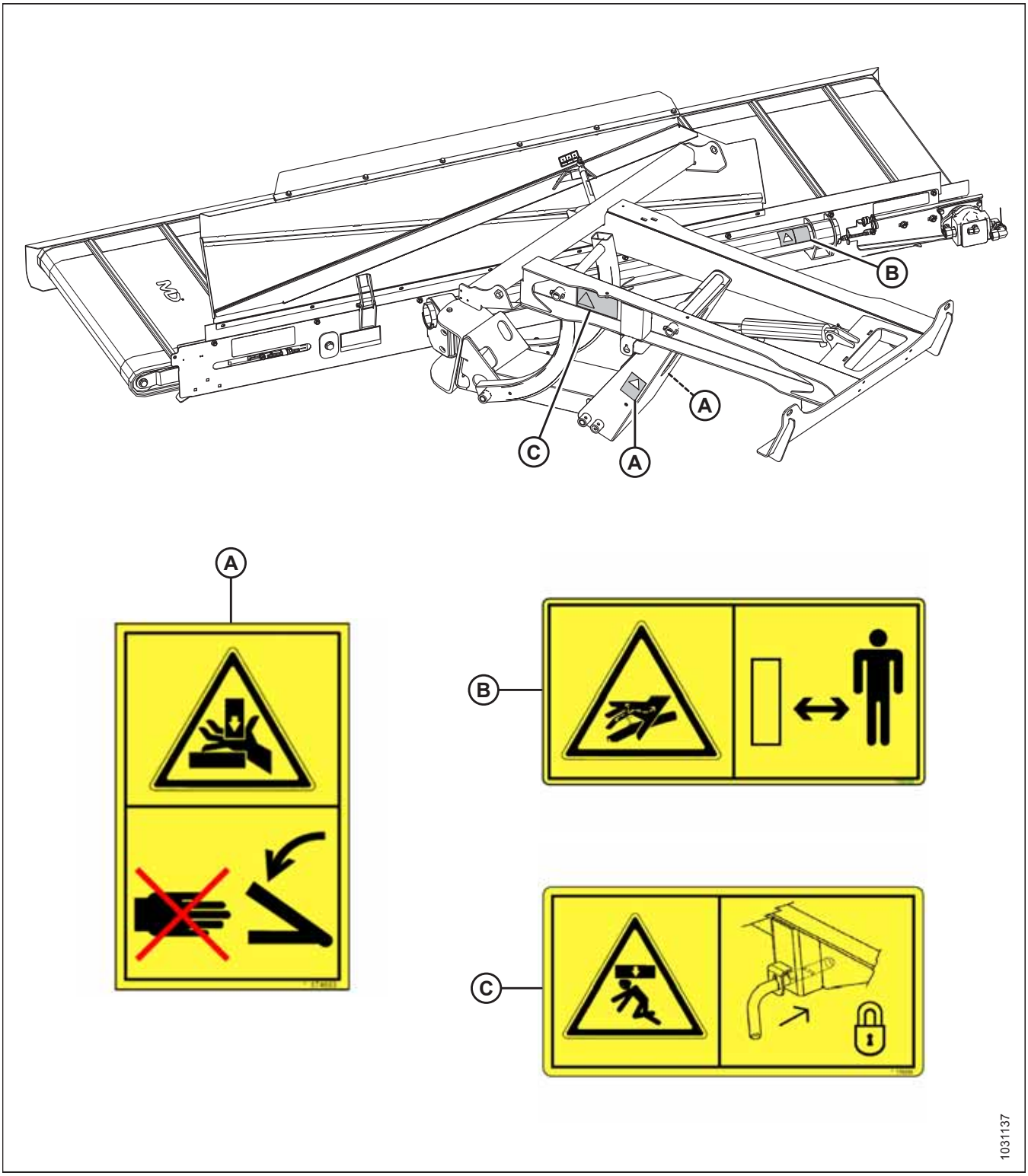


Figure 1.34: DWA Safety Decal Locations

A - MD #174683 – Pinch Point (2 Places) **B - MD #166466 – High Pressure Hydraulics** **C - MD #176295 – Deck Lift Lock**

Chapter 2: Assembly/Setup Instructions

NOTE:

The Double Windrow Attachment (DWA) for M1 Series Windrowers will only fit M1170 and M1240 Windrowers.

2.1 Raising the Right Stairs

Raise the right 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.

   NOTE:

   Rubber bumper (C) stops the stairs from going past the upright position. Stairs are held in the down position by gas shock (D).

   IMPORTANT:

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

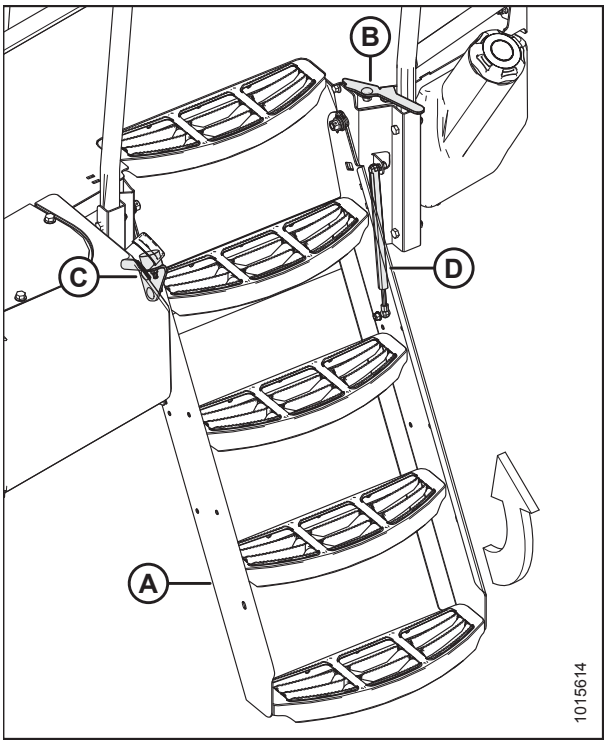


Figure 2.1: Right Stairs – Down Position

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.

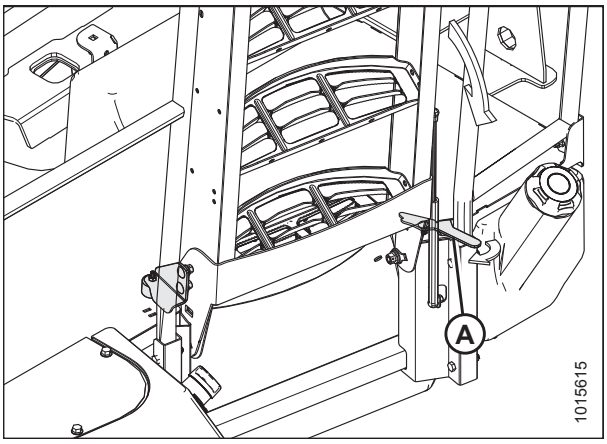


Figure 2.2: Right Stairs – Up Position

2.2 Configuring the Double Windrow Attachment

The Double Windrow Attachment (DWA) has two recommended configurations: Disc Mode (D1) optimizes the deck position for use with an R85 or R216 Rotary Disc header; Sickle Mode (D2) optimizes the deck position for use with an A Series Auger header. The Option configuration, which is linkage pin front position (A2), tall bracket (B2), and option position for the backsheet ball joint link, are **NOT** recommended for normal operation. For instructions, refer to *3.6 Raising the Deck Height, page 60*.

Table 2.1 DWA Setup Configurations

Callout	Adjustment	Disc Header (D1)	Auger Header (D2)
A	Linkage pivot pin	Rear (A1)	Rear (A1)
B	Upper ball joint bracket size	Short (B1)	Short (B1)
C	Upper ball joint bracket position	Upper	Lower
D	Backsheet ball joint link	Disc	Sickle
E	Deck turnbuckle	Disc	Sickle

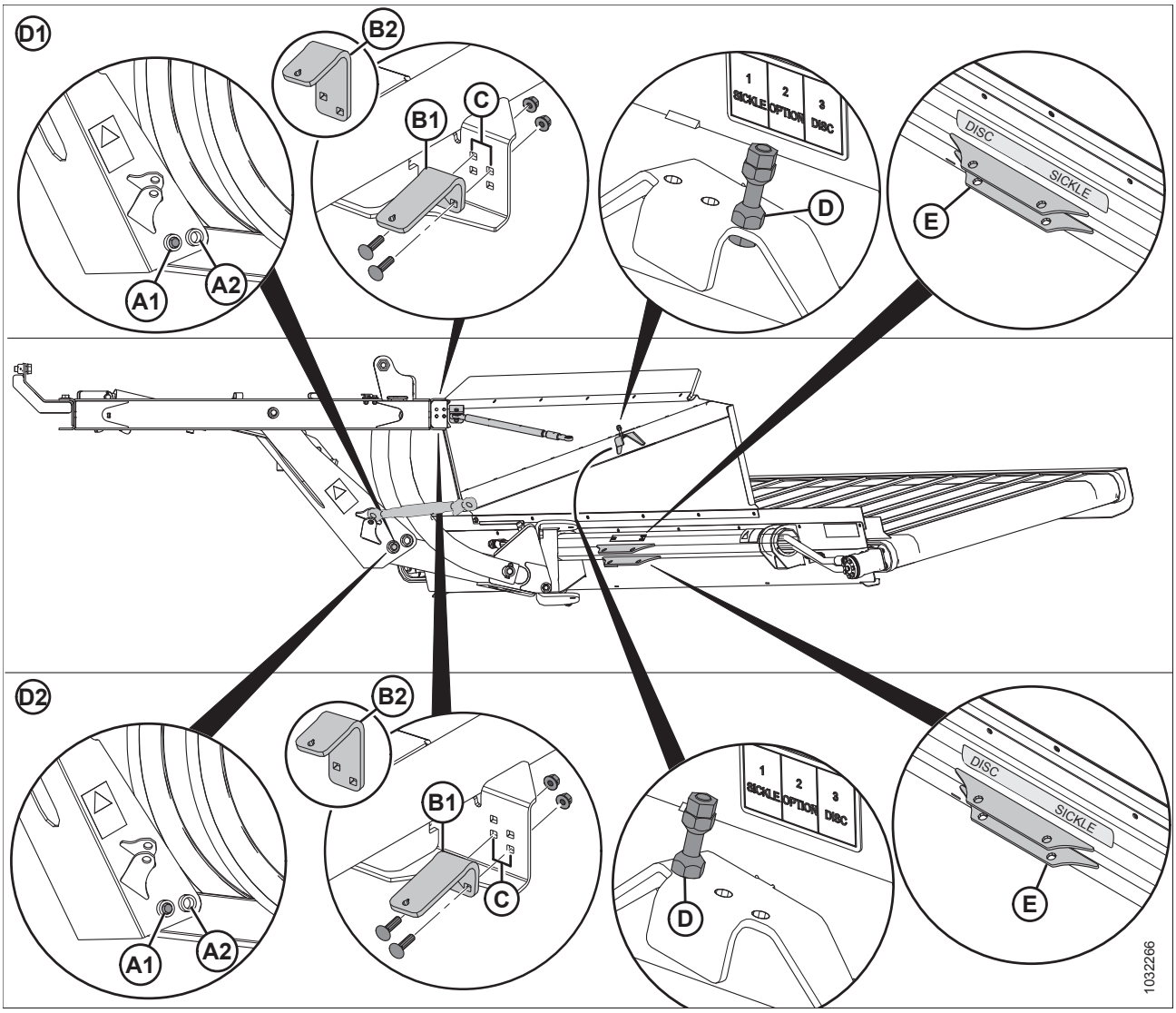
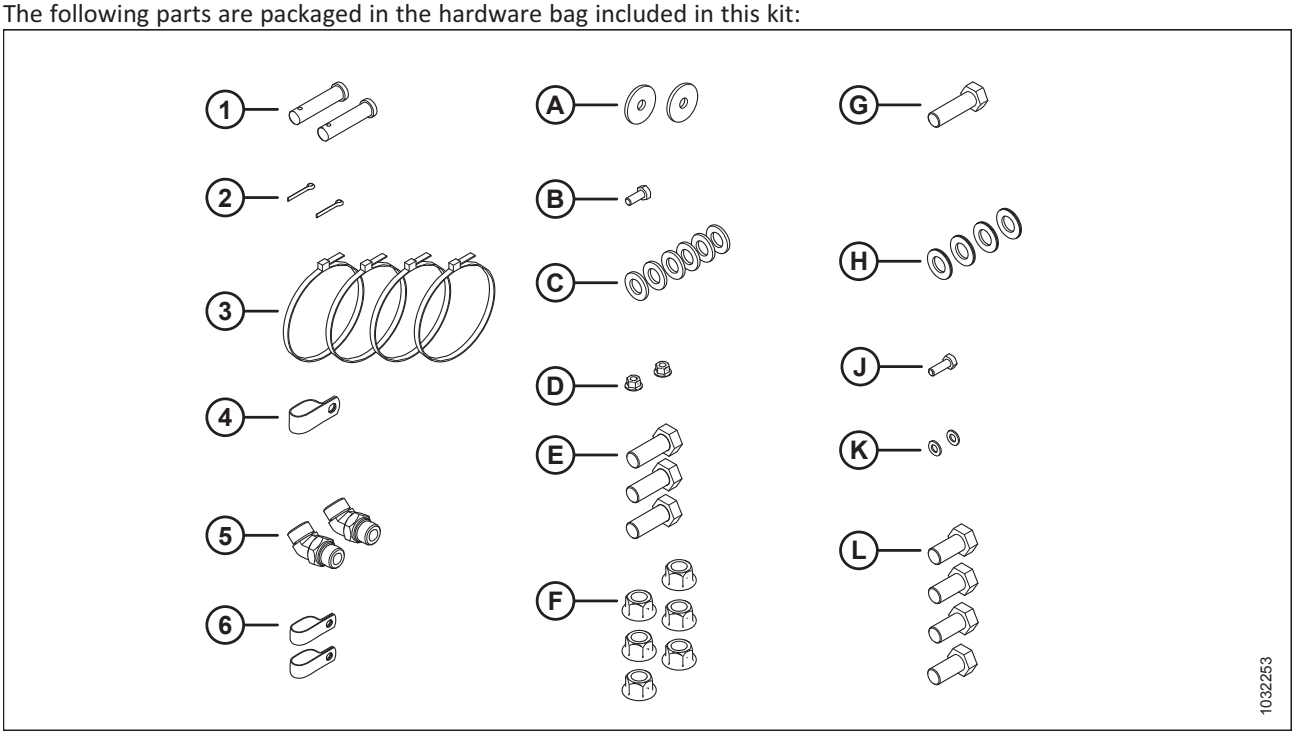


Figure 2.3: DWA Setup Configurations

2.3 Parts List – Hardware Bag

The following parts are packaged in the hardware bag included in this kit:



Bolt length is measured from under the head of the bolt to the tip of the threads. Be sure you are using the correct bolt.

Ref	Part Number	Description	Quantity
1	18627	PIN – CLEVIS	2
2	18648	PIN – COTTER 3/16 DIA X 1.25 ZP	2
3	30753	FASTENER – CABLE TIE BLACK	4
4	103738	CLAMP – PVC INSULATED 13/16 IN. TUBE SIZE	1
5	136418	FITTING – ELBOW 45° HYD	2
6	300577	CLAMP – DBL INSULATED 3/4 IN	2
A	11695	WASHER – FLAT	2
B	30627	BOLT – HEX HD TFL M10 X 1.5 X 25-8.8-A3L (25 MM LONG)	1
C	112130	WASHER – HARD ASTM F436 3/4 IN. NOM. ID AB0C	6
D	135799	NUT – HEX FLG CTR LOC M10 X 1.5-10	2
E	136082	BOLT – HEX HD TFL M20 X 2.5 X 50-8.8-AA3L (50 MM LONG)	3
F	136122	NUT – HEX FLG CTR LOC M20 X 2.5-10-AA1J	6
G	136157	BOLT – HEX HD M20 X 2.5 X 65-10.9-AA1J (65 MM LONG)	1
H	136701	WASHER – NORDLOCK M20	4

Ref	Part Number	Description	Quantity
J	184661	BOLT – HEX HD TFL M10 X 1.5 X 30-8.8-AA1J (30 MM LONG)	1
K	184711	WASHER – FLAT REG M10-200HV-AA1J	2
L	252303	BOLT – HEX HD TFL M20 X 2.5 X 40-10.9-A3L (40 MM LONG)	4

2.4 Installing the Linkage

The linkage is the mechanical interface that connects the windrower to the DWA draper deck.

1. Lift the stairs on the right of the windrower to create access. For instructions, refer to *2.1 Raising the Right Stairs, page 19*.
2. Remove clevis (A) by removing one bolt and two nuts at location (B). Set clevis and hardware aside.
3. Remove turnbuckle (C) (MD #144996) and set aside.

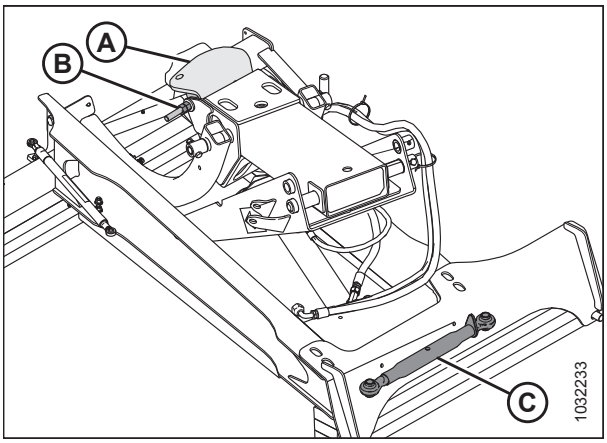


Figure 2.4: Clevis and Cylinder Shipping Location

4. Identify the four connection points on the windrower frame. For connection point locations, refer to the illustration below.

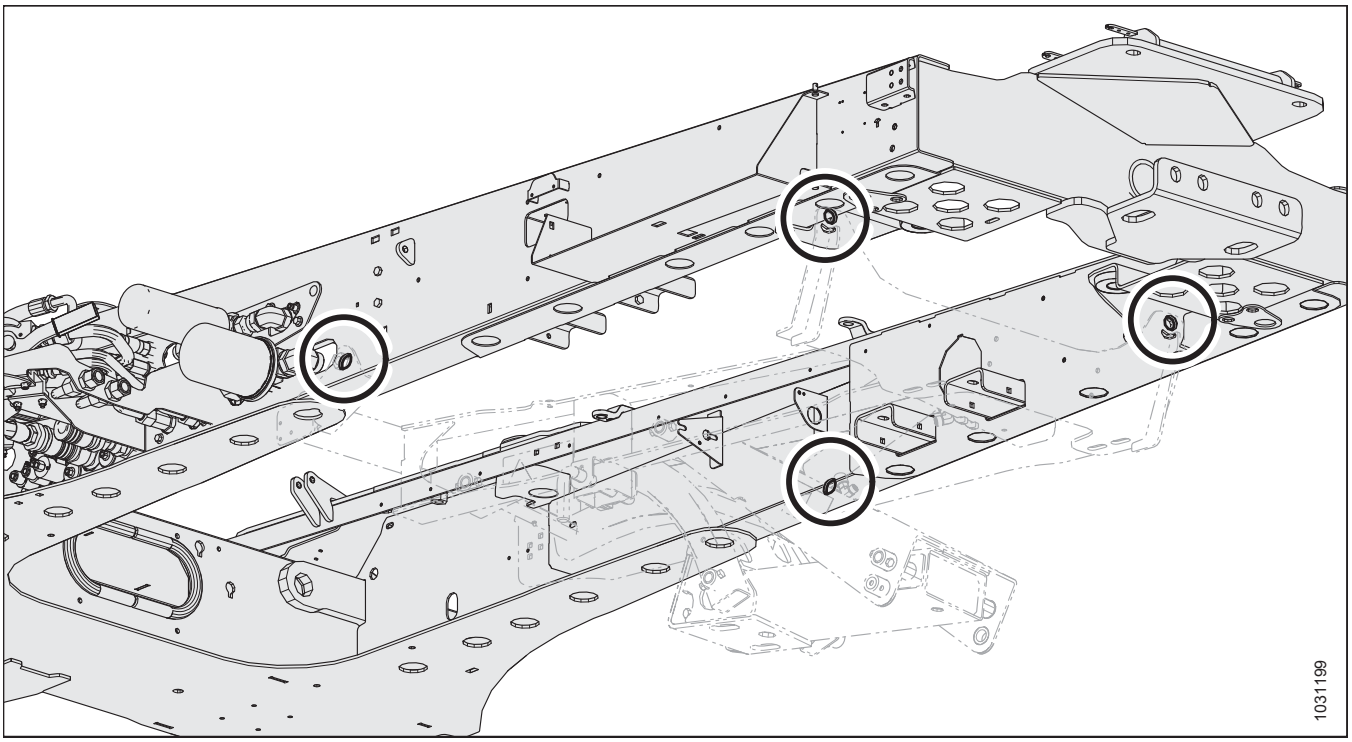


Figure 2.5: Connection Points – View from below Windrower

5. Support the linkage assembly with a forklift and lift into place under windrower.

   NOTE:

   Make sure the forks do **NOT** lift against the cylinder fitting.

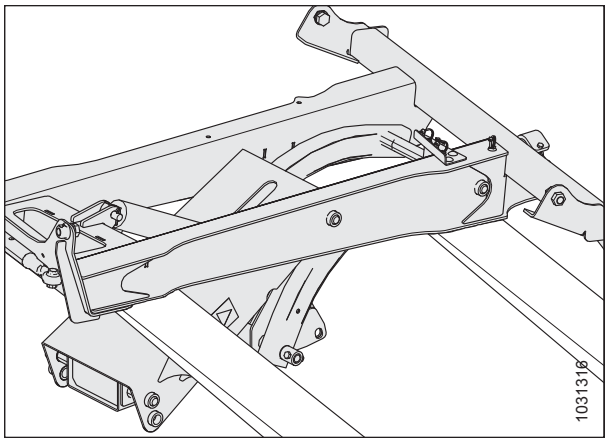


Figure 2.6: Linkage on Forks

6. Align linkage (A) with the windrower connection points.
7. Retrieve the following parts from the bag shipped with the DWA:
   - Six washers (MD #112130)
   - Two nuts (MD #136122)
   - Four bolts (MD #252303), 40 mm long.

   NOTE:

   Bolt length is measured from under the head of the bolt to the tip of the threads.

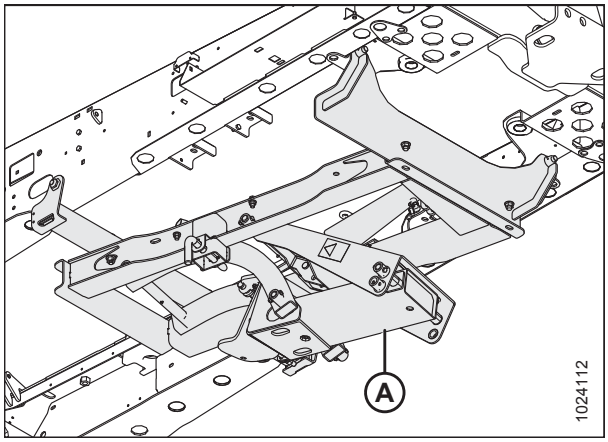


Figure 2.7: DWA Linkage under Windrower

8. At locations (A) and (B), attach the front of the linkage frame to the windrower using two 40 mm long bolts (C) (MD #252303) and four washers (D) (MD #112130). Right side (A) requires three washers, and left side (B) requires one washer. Install the bolt from the inside of the frame into welded nut (E).

   IMPORTANT:

   Make sure you are installing the correct bolts by measuring bolt length, there are bolts with the same width and varying lengths. Using the wrong bolts could result in machine failure. Length is measured from under the head of the bolt to the tip of the threads.

   IMPORTANT:

   Make sure to install the three washers on right side (A) as required, otherwise a lack of clearance may cause bolt (C) to damage the fuel tank.

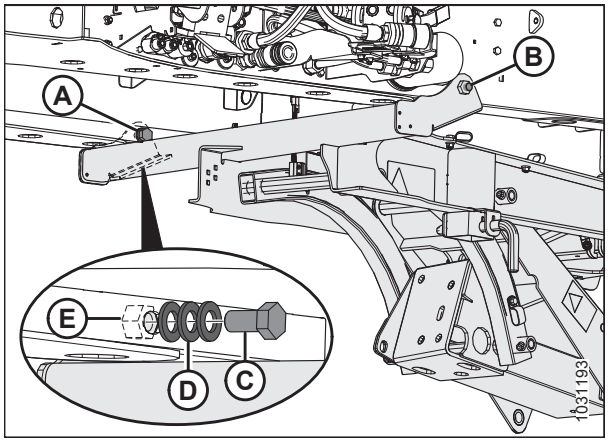


Figure 2.8: Linkage Frame under Windrower

9. Attach the rear of the linkage frame to the windrower using two 40 mm long bolts (B) (MD #252303), two washers (C) (MD #112130), and two nuts (D) (MD #136122) at locations (A).

   IMPORTANT:

   Make sure you are installing the correct bolts by measuring bolt length, there are bolts with the same width and varying lengths. Using the wrong bolts could result in machine failure. Length is measured from under the head of the bolt to the tip of the threads.

10. Torque all hardware to 461 Nm (340 lbf·ft).

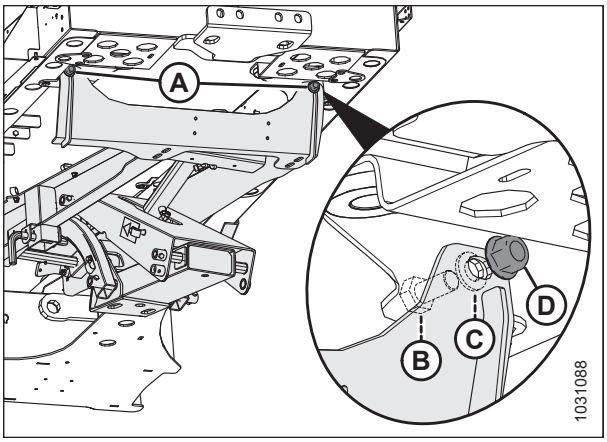


Figure 2.9: Linkage Frame under Windrower

11. Remove shipping wire (B) from hoses (A).

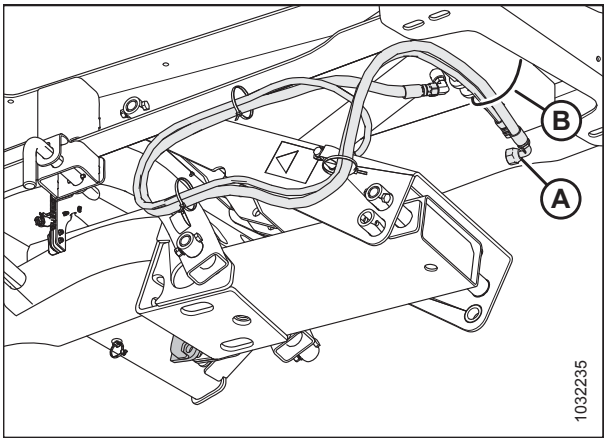


Figure 2.10: Hoses Strapped to Linkage

12. On the left side of the linkage, rotate safety pin (A) to allow the roll pin to clear the slot in the linkage frame.

13. Pull safety pin (A) outward to allow the linkage arm to lower.

    NOTE:

    If the linkage arm will not lower, **TEMPORARILY** connect the lift cylinder hoses to the windrower, set the valve setting to 5, and cycle the cylinder to full extension/retraction until the air is removed. For instructions, refer to Step *1, page 34* to Step *5, page 35*. After lowering the linkage arm, disconnect the lift cylinder hoses, return to this page, and proceed to Step *14, page 26*.

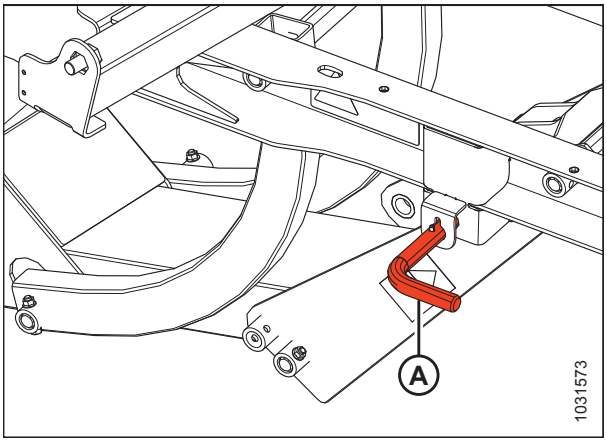


Figure 2.11: DWA Linkage

14. Secure the lift cylinder pivot into the correct hole depending on header type:
    - R85 and R216 Rotary Disc Headers: insert pin in upper hole (A)
    - A Series Auger Headers: insert pin in lower hole (B)

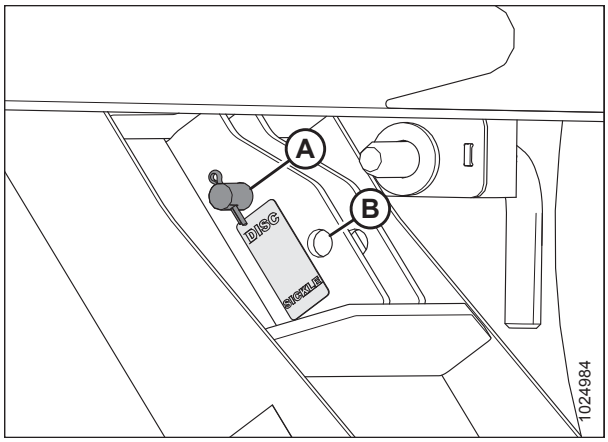


Figure 2.12: Lift Cylinder Pivot

2.5 Installing the Deck

The DWA deck provides the conveyor to distribute crop beside the windrower.

1. Remove shipping boards (A) by removing transport banding (B). Remove shipping wire securing deck motor hoses to deck (not shown).

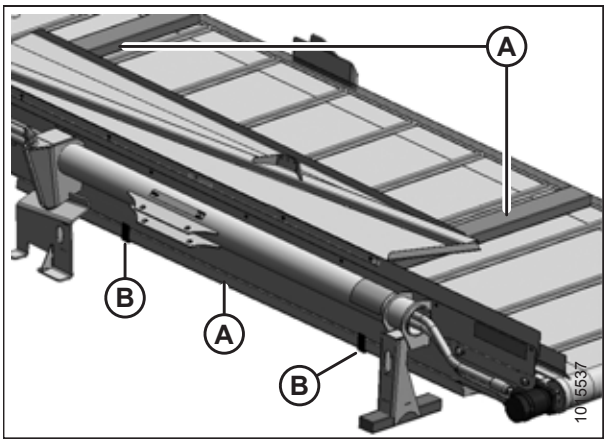


Figure 2.13: DWA Deck

2. Support the deck with a forklift. Forks (A) should be inboard of shipping stand (B).

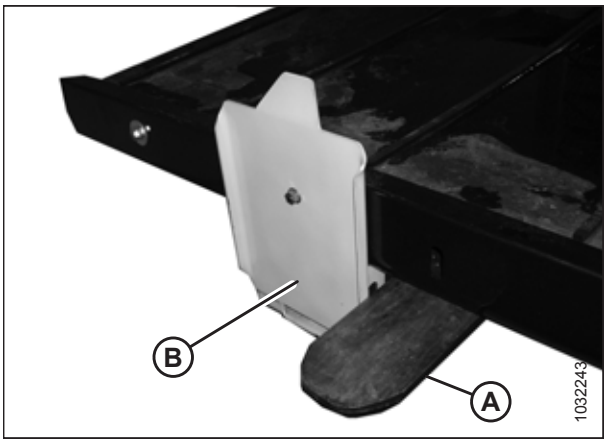


Figure 2.14: Deck Shipping Stand

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

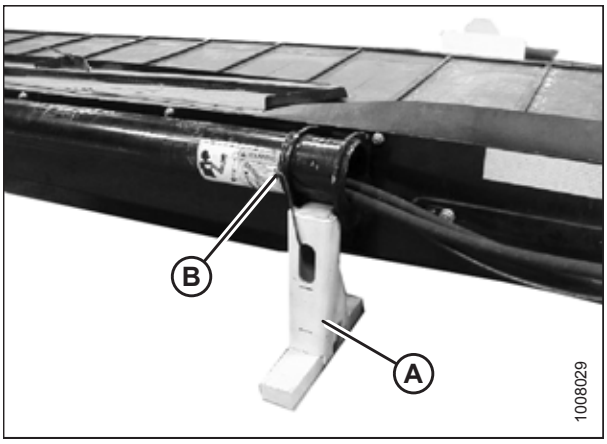


Figure 2.15: Deck Shipping Stand

4. Remove shipping stand (A) from the rear of the deck by removing two nuts (B) and washers (C). Retain the two nuts for installing the clevis onto the deck pivot.

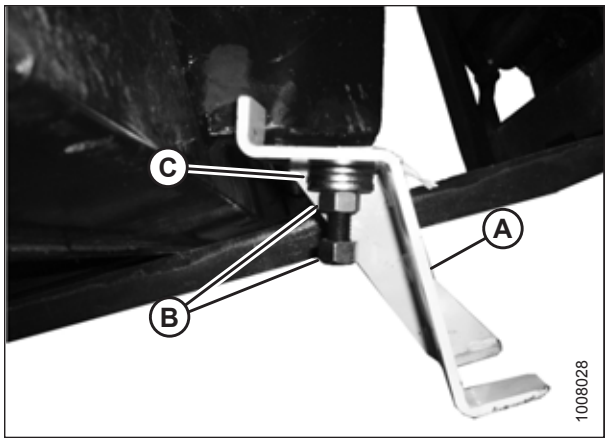


Figure 2.16: Deck Shipping Stand

5. Position clevis (B) onto deck pivot (A).

   NOTE:

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

6. Install rod (C) with preinstalled hex nut (D) and lock nut (E) through the top of the deck pivot.
7. Install retained hex nut (D) to the bottom of the deck pivot shaft. Do **NOT** torque the hardware at this time.

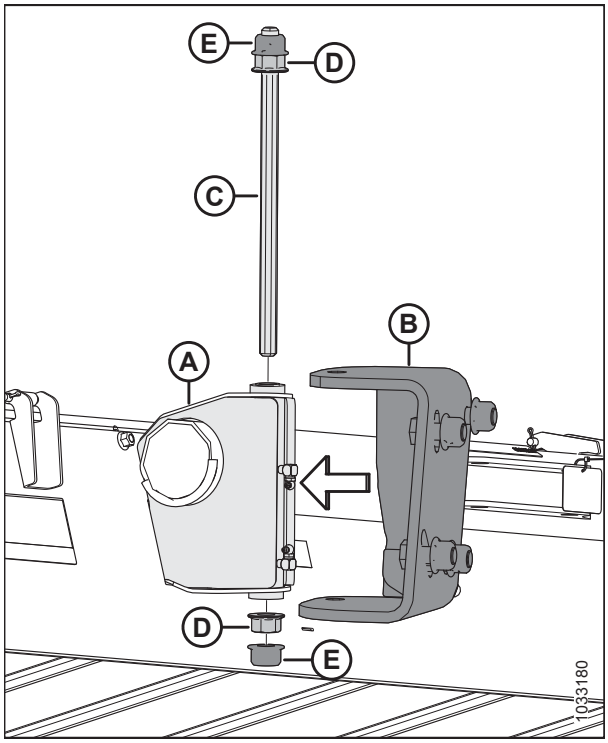


Figure 2.17: Deck Pivot and Linkage Clevis

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

   NOTE:

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

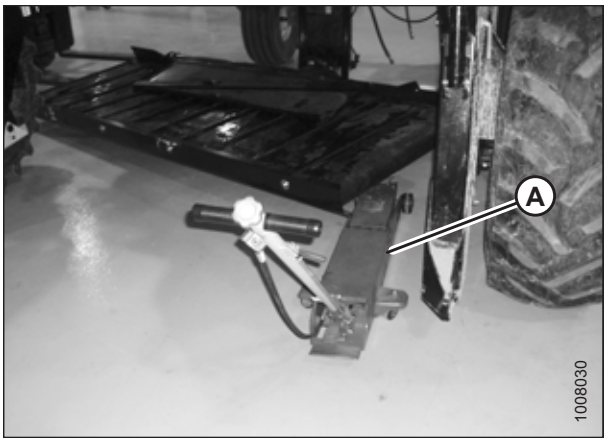


Figure 2.18: DWA Deck Supported with Floor Jack

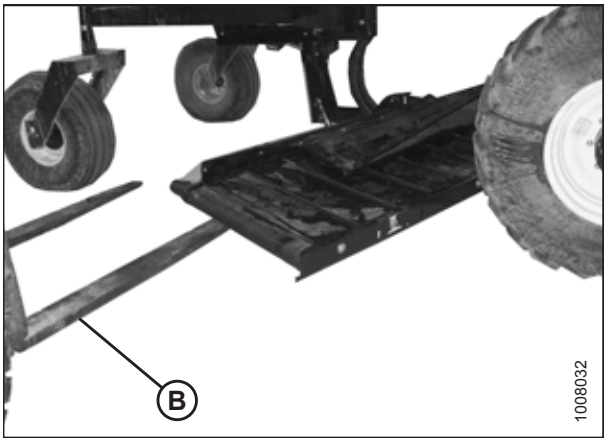


Figure 2.19: DWA Deck Supported with Forklift

10. Align linkage arm (A) with holes in clevis (B) by raising or lowering the floor jack / forklift.
11. Retrieve the following clevis hardware from the bag:
    - Three bolts (MD #136082), 50 mm long
    - One bolt (MD #136157), 65 mm long
    - Four washers (MD #136701)
    - Four nuts (MD #136122)

    NOTE:

    Bolt length is measured from under the head of the bolt to the tip of the threads.

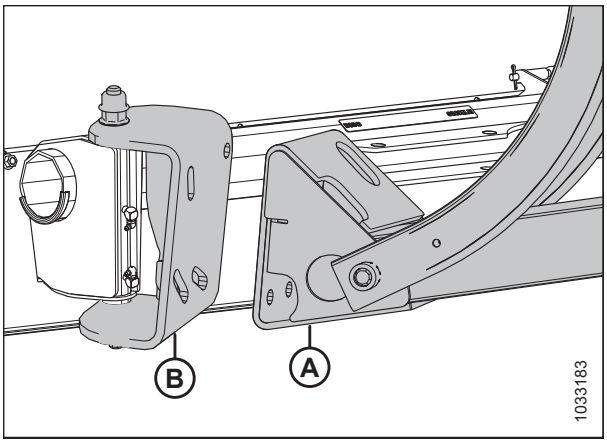


Figure 2.20: Aligning Linkage

12. Install one 65 mm long bolt (A) (MD #136157) in the top right corner as shown. Install three 50 mm long bolts (B) (MD #136082) in remaining clevis slots. Secure bolts (A) and (B) with Nord-Lock washers (C), and nuts (D). Do **NOT** torque the hardware at this time.

    IMPORTANT:

    Make sure you are installing the correct bolts by measuring bolt length, there are bolts with the same width and varying lengths. Using the wrong bolts could result in machine failure. Length is measured from under the head of the bolt to the tip of the threads.

    IMPORTANT:

    Nord-Lock washers (C) are supplied Theclevis ed together, but it is possible that the two halves separated during transport. Ensure finer serrations (E) are to the outside and mating surfaces (F) are locked in place.

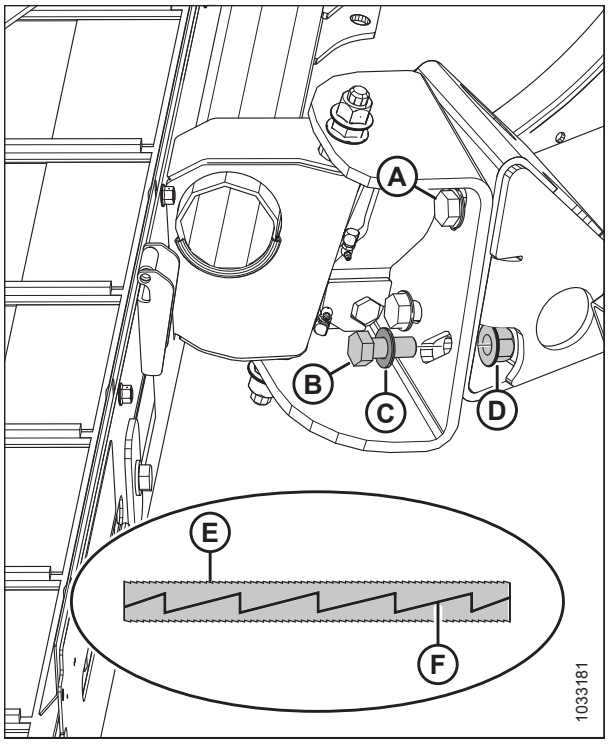


Figure 2.21: Linkage Mounting Hardware

13. Install adjustment bolt (A), flat washer (B), and two hex nuts (C) and (D).

    NOTE:

    The clevis has been made transparent to show hardware on both sides.

14. Adjust bolt (A) until the deck is parallel with the ground.

15. Tighten jam nut (D) against nut (C).

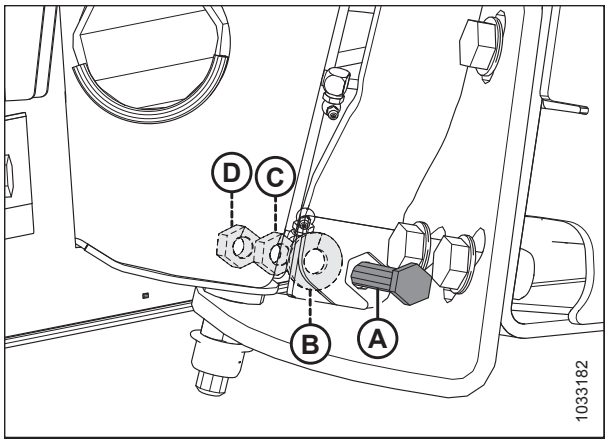


Figure 2.22: Installing Adjustment Bolt

16. Torque four mounting bolts (A) to 332 Nm (245 lbf·ft).
17. Torque nuts (B) to 330 Nm (243 lbf·ft), then snug up nuts (C).
18. Add grease to grease zerks (D). Use high temperature extreme pressure (EP2) performance grease with 1.5–5% molybdenum disulphide (NLGI grade 2) lithium base.

    IMPORTANT:

    Do **NOT** overgrease. Overgreasing creates excessive friction and heat.

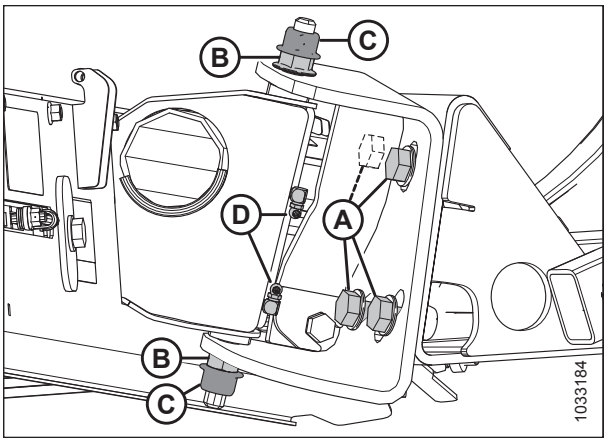


Figure 2.23: Clevis Hardware

19. Remove two shipping stands (A) from the front of the deck by removing bolt (B).

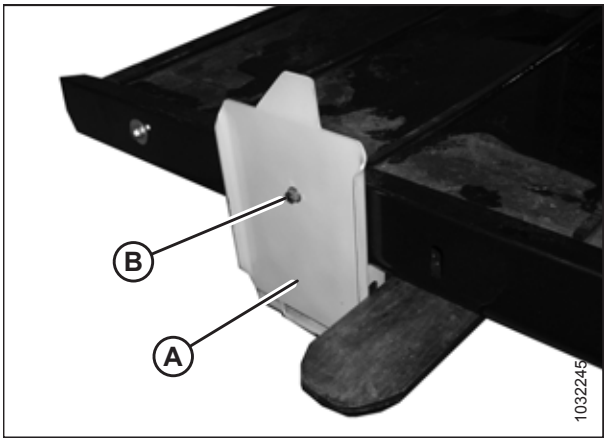


Figure 2.24: Deck Shipping Stand

20. Reinstall bolt (B) and add a washer (A) (MD #11695). Washers are included in the bag of assembly hardware.

    IMPORTANT:

    Apply Medium-strength threadlocker (Loctite 242, 243 or equivalent) to bolt before reinstalling.

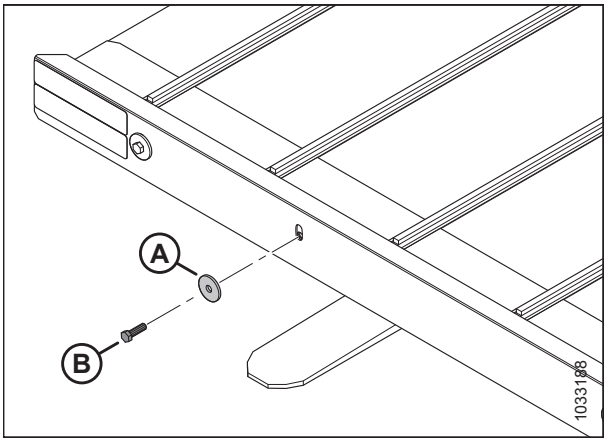


Figure 2.25: Deck Hardware

21. To make Step *22, page 32* (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 59*.

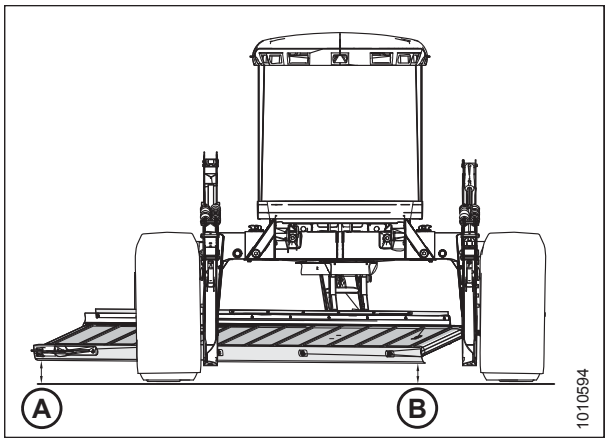


Figure 2.26: Deck Angle

22. Retrieve two clevis pins (MD #18627) and two cotter pins (MD #18648) from the hardware bag. Attach turnbuckle (A) (MD #144996) from linkage to deck using a clevis pin (MD #18627) on each end. Secure clevis pins with cotter pins (MD #18648).
    - Use connection point (B) for R85 or R216 Rotary Disc Headers. The approximate turnbuckle length is 530 mm (21 in.).
    - Use connection point (C) for A Series Auger Headers. The approximate turnbuckle length is 630 mm (25 in.).

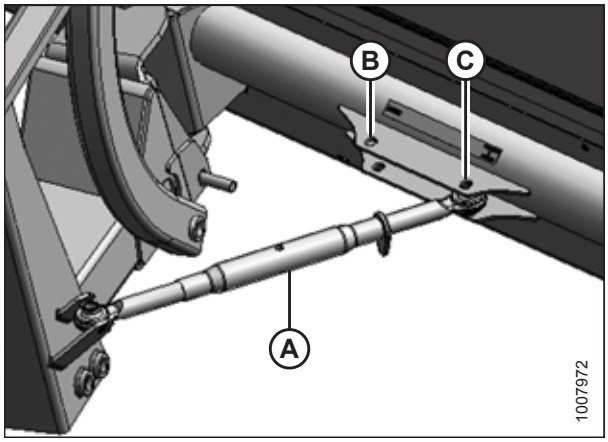


Figure 2.27: Adjustable Turnbuckle

23. Adjust the turnbuckle length so that 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.

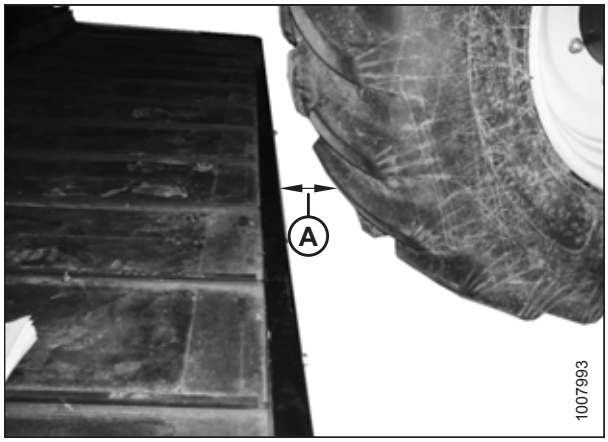


Figure 2.28: Deck and Right Drive Wheel

24. Using the existing carriage bolts and nuts, install short ball joint link bracket (A) at the correct position for your header:
    - Upper holes (B) for R85 or R216 Rotary Disc Headers
    - Lower holes (C) for A Series Auger Headers

    NOTE:

    A tall ball joint link bracket (D) is also provided. Do **NOT** use the tall bracket in standard configuration. Refer to *3.6 Raising the Deck Height, page 60* for more information.

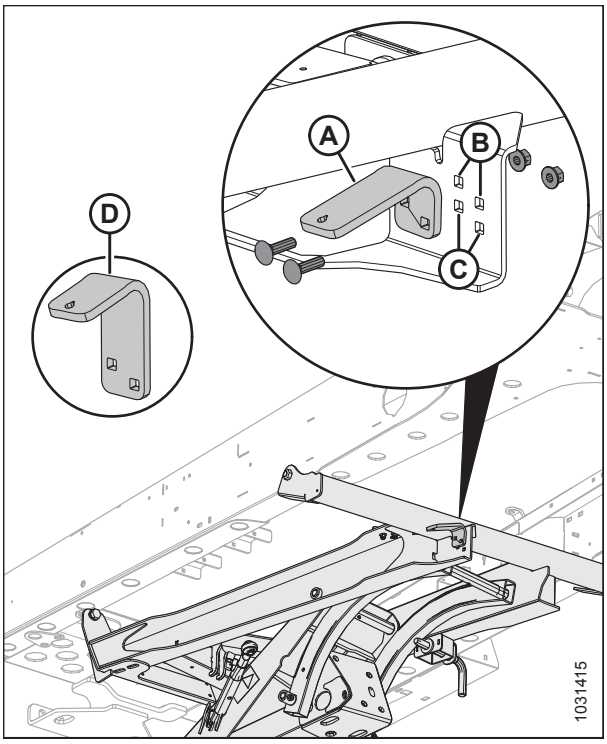


Figure 2.29: Ball Joint Link Bracket

25. Raise backsheet (A) off the deck and remove top nut (B) and tapered nut (C).
26. Install ball joint link (D) onto the bolt on the backsheet at the correct position for your header:
    - Hole 3 for R85 or R216 Rotary Disc Headers
    - Hole 1 for A Series Auger Headers
    - Hole 2 (Option); refer to *3.6 Raising the Deck Height, page 60*.
27. Install tapered nut (C) and torque the nut to 26 Nm (19 lbf ft). Install nut (B) and torque the nut to 26 Nm (19 lbf ft).

    IMPORTANT:

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

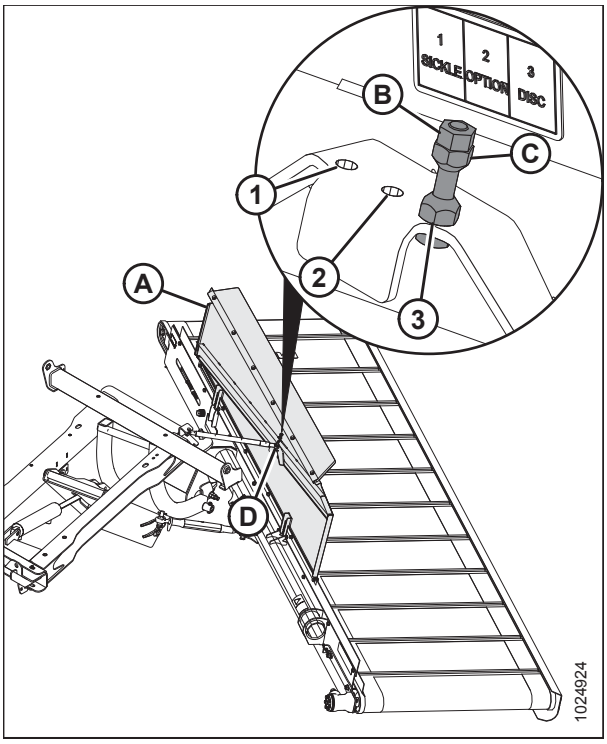


Figure 2.30: Ball Joint Link

2.6 Connecting the Hydraulics to an M1170 Windrower

The hydraulic connections allow the windrower's hydraulics to power and control the DWA system.

DANGER

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

WARNING

Check to be sure all bystanders have cleared the area.

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

Figure 2.31: Windrower Console Switches

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

   NOTE:

   DWA linkage and windrower have quick couplers preinstalled for easy connection.

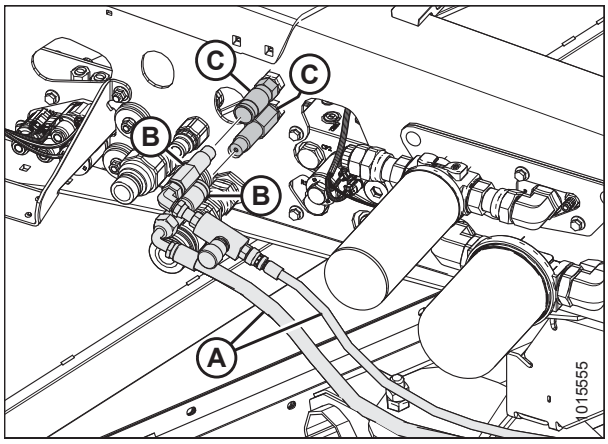


Figure 2.32: DWA Linkage Hydraulics

5. Set the lift valve setting to **5** as follows:

   a. Loosen set screw (A).

   b. Turn valve (B) all the way clockwise, and take note of the zero position.

   c. Rotate the valve counterclockwise so that 5 is in that same position.

   d. Tighten the set screw.

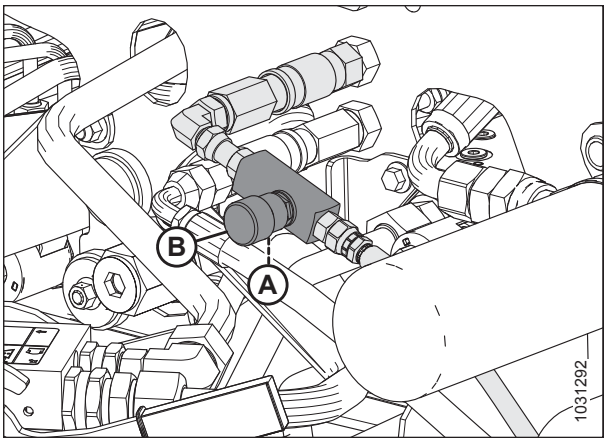


Figure 2.33: Deck Lift Valve

6. Retrieve the following parts from the bag:

   - Two clamps (MD #300577)
   - One clamp (MD #103738)
   - One bolt (MD #30627), 25 mm long
   - One bolt (MD #184661), 30 mm long
   - Two washers (MD #184711)
   - Two nuts (MD #135799)

   NOTE:

   Bolt length is measured from under the head of the bolt to the tip of the threads.

7. Secure two lift cylinder hoses (A) to the top of the DWA frame at locations shown using two clamps (B) (MD #300577) and (C) (MD #300577):

   Attach clamp (B) (MD #300577) to the **TOP** of the frame, and clamp (F) (MD #103738) to the **BOTTOM** of the frame using the following hardware:

   - One bolt (D) (MD #184661), 30 mm long
   - One washer (E) (MD #184711)
   - One nut (G) (MD #135799)

   IMPORTANT:

   Make sure you are installing the correct bolts by measuring bolt length, there are bolts with the same width and varying lengths. Using the wrong bolts could result in machine failure. Length is measured from under the head of the bolt to the tip of the threads.

   NOTE:

   Do **NOT** tighten nut (G). Clamp (F) will be used for the deck motor pressure and return hoses.

   Attach clamp (C) (MD #300577) to the top of the frame using the following hardware:

   - One bolt (H) (MD #30627), 25 mm long
   - One washer (J) (MD #184711)
   - One nut (K) (MD #135799)

   IMPORTANT:

   Make sure you are installing the correct bolts by measuring bolt length, there are bolts with the same width and varying lengths. Using the wrong bolts could result in machine failure. Length is measured from under the head of the bolt to the tip of the threads.

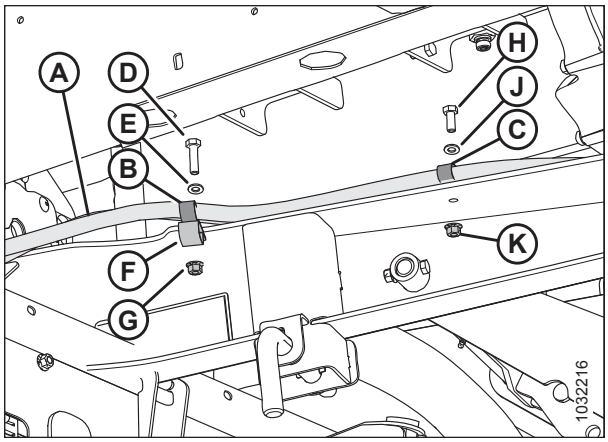


Figure 2.34: Linkage Cylinder Hoses

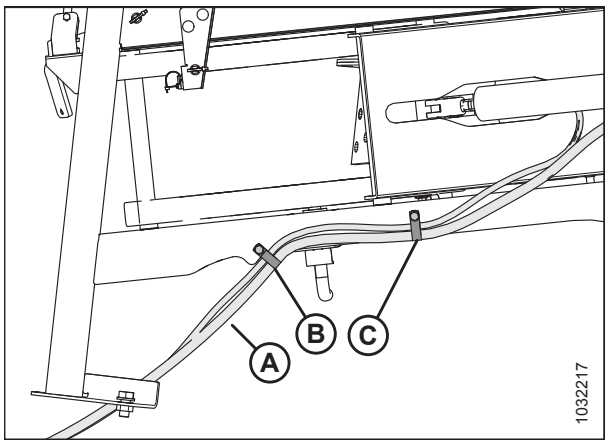


Figure 2.35: Linkage Lift Cylinder Hoses – Top View

8. Retrieve three cable ties (MD #30753) from the bag. Secure the cylinder hoses together at three locations (A) using cable ties.

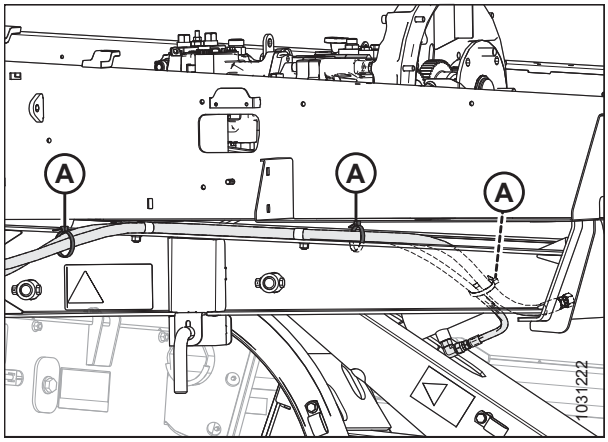


Figure 2.36: Linkage Lift Cylinder Hoses

9. Remove caps (A) from the fittings on the back of multicoupler support (B).

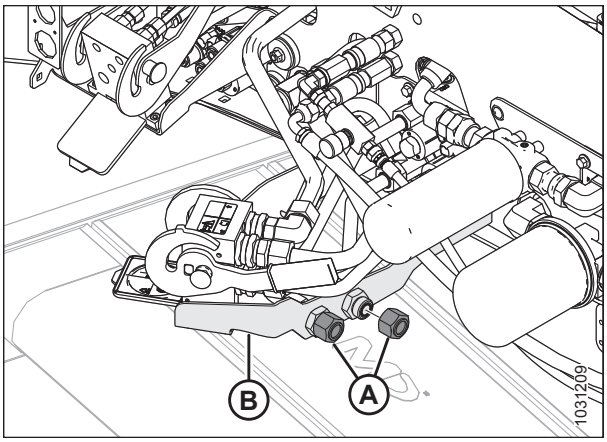


Figure 2.37: Multicouplers

10. Locate pump case drain hose (A) connected to elbow fitting (B) on lift/fan pump (C).
11. Disconnect hose (A) from elbow fitting (B).

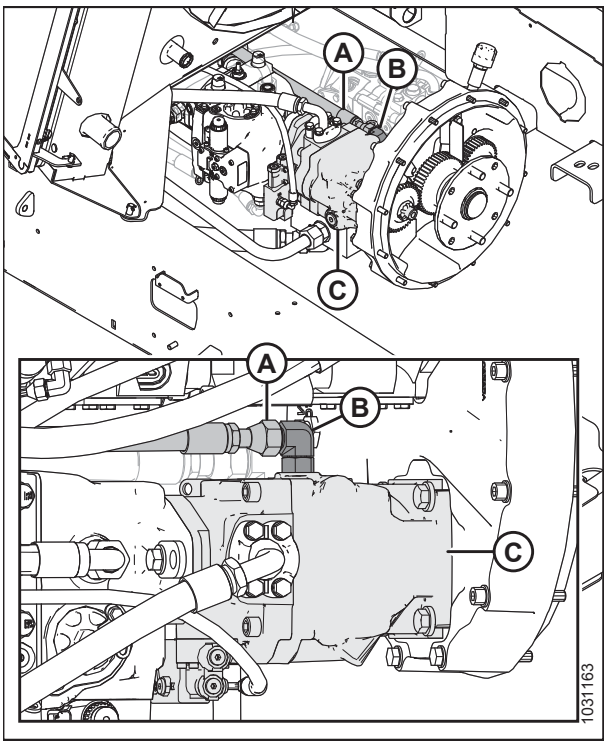


Figure 2.38: Lift/Fan Pump

12. On the deck motor case drain hose (A), install reducer (B) (MD #252893) and tee fitting (C) (MD #135784).
13. Torque reducer (B) to 84 Nm (62 lbf·ft).
14. Torque case drain hose (A) to 42 Nm (31 lbf·ft).

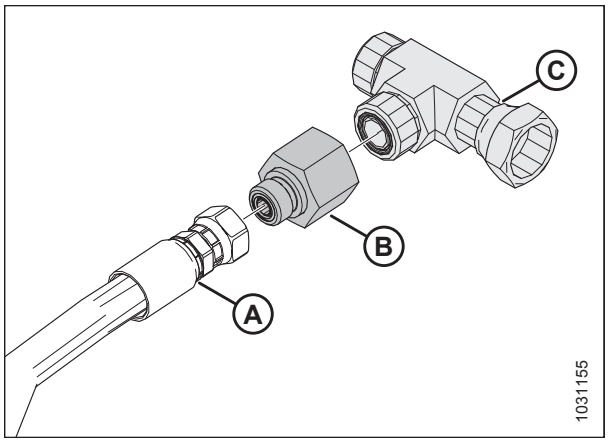


Figure 2.39: Case Drain Hose and Fittings

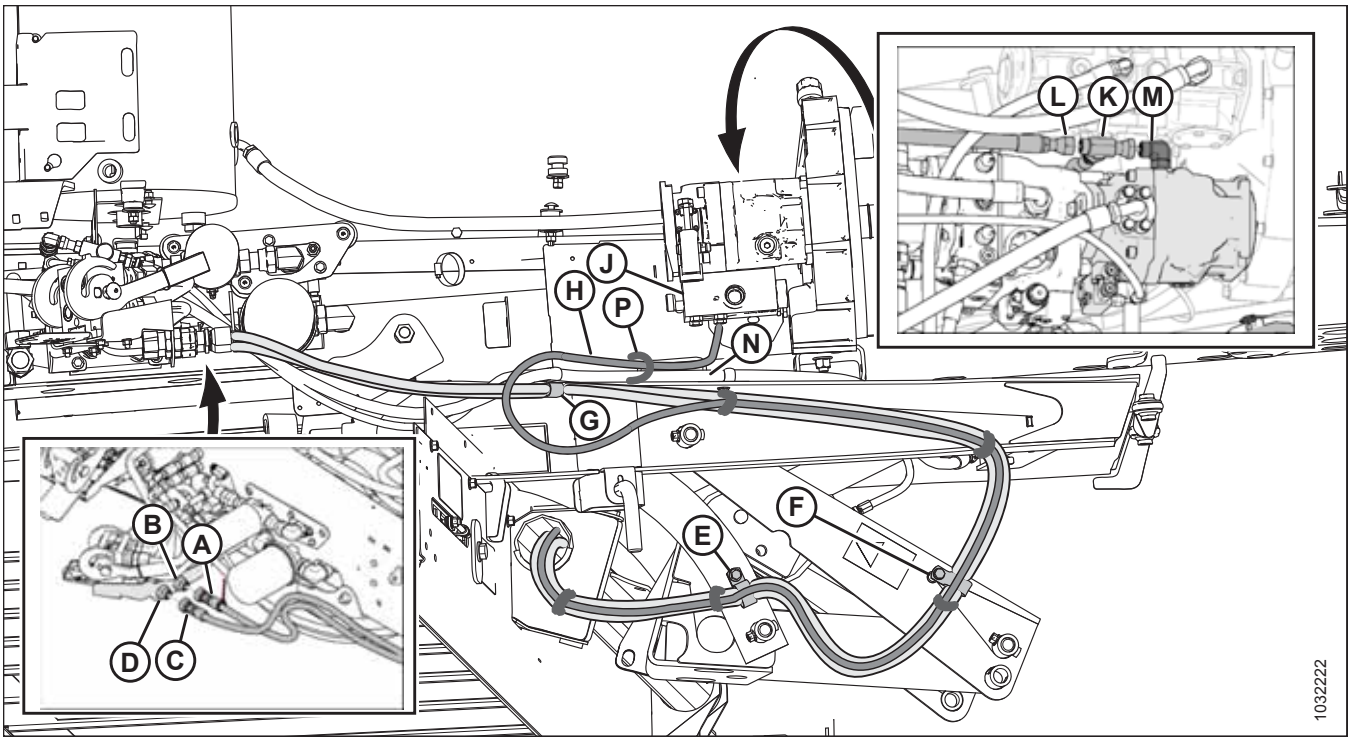


Figure 2.40: Deck Motor Hose Routing – M1170

15. Install deck pressure hose (A) (red cable tie, MD #176575) onto fitting (B). Torque fittings to 120 Nm (88 lbf·ft).
16. Install deck return hose (C) (MD #176575) onto fitting (D). Torque fittings to 120 Nm (88 lbf·ft).
17. Secure pressure hose and return hose using two clamps (E) and (F) mounted to the DWA, and one clamp (G) (previously left loose) mounted below the frame.
    - For rotary disc headers, ensure clamp (E) is located at the yellow tape on all 3 hoses.
    - For auger headers, ensure clamp (E) is located at the red tape on all 3 hoses.
    - Ensure clamps (E) and (F) are located at the yellow tape on all 3 hoses.
18. Route case drain hose (H) (MD #176680[1]) under the windrower frame and under inlet manifold (J).
19. Install tee-fitting end (K) of motor case drain hose between existing hose (L) and elbow fitting (M).
20. Torque hose (L) and tee fitting (K) to 84 Nm (62 lbf·ft).
21. Tie the case drain hose (H) to lift cylinder hose (N) using cable tie (P).
22. Tighten all clamps.

1. Case drain hose MD #176680 is serviced with MD #176883 in Parts Catalog. For the parts catalog, refer to section *5.5 Hydraulic Hoses, page 98*

2.7 Connecting the Hydraulics to an M1240 Windrower

The hydraulic connections allow the windrower's hydraulics to power and control the DWA system.

DANGER

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

WARNING

Check to be sure all bystanders have cleared the area.

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

Figure 2.41: 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:

   DWA linkage and windrower have quick couplers preinstalled for easy connection.

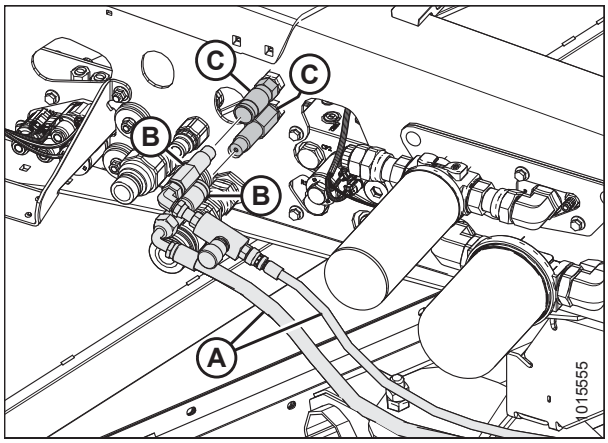


Figure 2.42: DWA Linkage Hydraulics

5. Set the lift valve setting to **5** as follows:

   a. Loosen set screw (A).

   b. Turn valve (B) all the way clockwise, and take note of the zero position.

   c. Rotate the valve counterclockwise so that 5 is in that same position.

   d. Tighten the set screw.

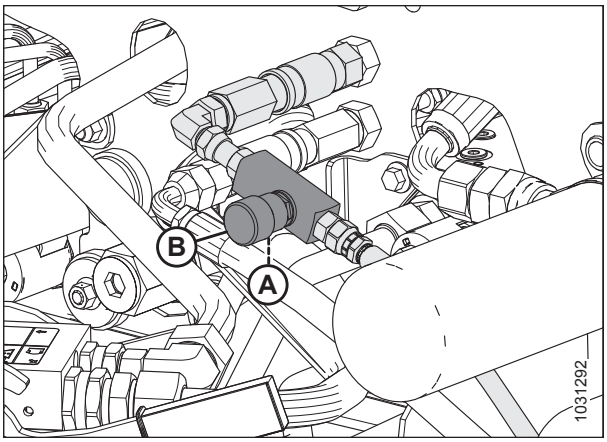


Figure 2.43: Deck Lift Valve

6. Retrieve the following parts from the bag:

   - Two clamps (MD #300577)
   - One clamp (MD #103738)
   - One bolt (MD #30627), 25 mm long
   - One bolt (MD #184661), 30 mm long
   - Two washers (MD #184711)
   - Two nuts (MD #135799)

   NOTE:

   Bolt length is measured from under the head of the bolt to the tip of the threads.

7. Secure two lift cylinder hoses (A) to the top of the DWA frame at locations shown using two clamps (B) (MD #300577) and (C) (MD #300577):

   Attach clamp (B) (MD #300577) to the TOP of the frame, and clamp (F) (MD #103738) to the BOTTOM of the frame using the following hardware:

   - One bolt (D) (MD #184661), 30 mm long
   - One washer (E) (MD #184711)
   - One nut (F) (MD #135799)

   IMPORTANT:

   Make sure you are installing the correct bolts by measuring bolt length, there are bolts with the same width and varying lengths. Using the wrong bolts could result in machine failure. Length is measured from under the head of the bolt to the tip of the threads.

   NOTE:

   Do **NOT** tighten nut (G). Clamp (F) will be used for the deck motor pressure and return hoses.

   Attach clamp (C) (MD #300577) to the top of the frame using the following hardware:

   - One bolt (H) (MD #30627), 25 mm long
   - One washer (J) (MD #184711)
   - One nut (K) (MD #135799)

   IMPORTANT:

   Make sure you are installing the correct bolts by measuring bolt length, there are bolts with the same width and varying lengths. Using the wrong bolts could result in machine failure. Length is measured from under the head of the bolt to the tip of the threads.

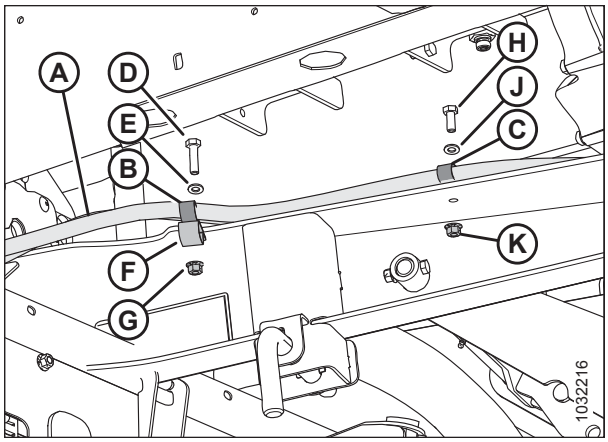


Figure 2.44: Linkage Cylinder Hoses

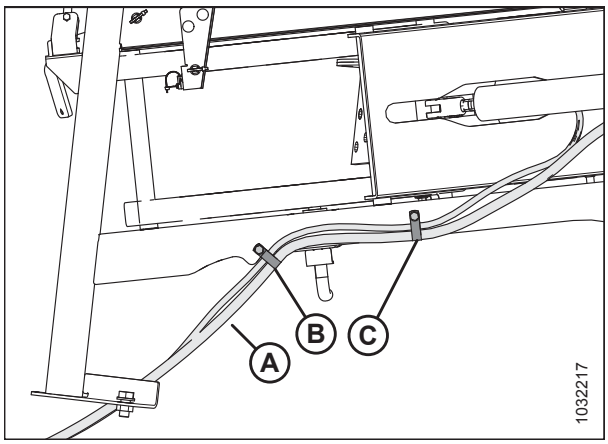


Figure 2.45: Linkage Lift Cylinder Hoses – Top View

8. Retrieve three cable ties (MD #30753) from the bag. Secure the cylinder hoses together at three locations (A) using cable ties.

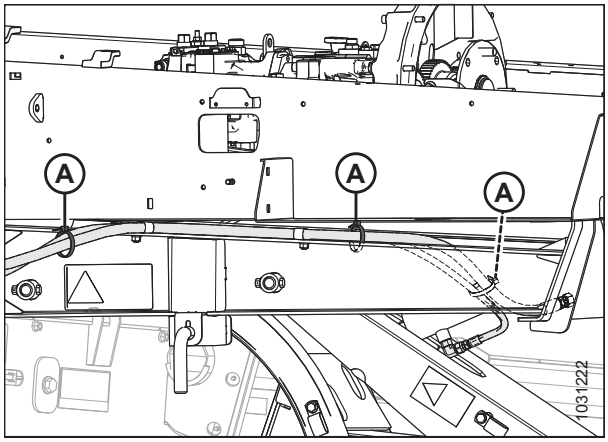


Figure 2.46: Linkage Lift Cylinder Hoses

9. Locate case drain cooler hose (A) that routes along the back of disc/knife pump (C) and is clamped to the gearbox.
10. Disconnect hose (A) from hose (B).

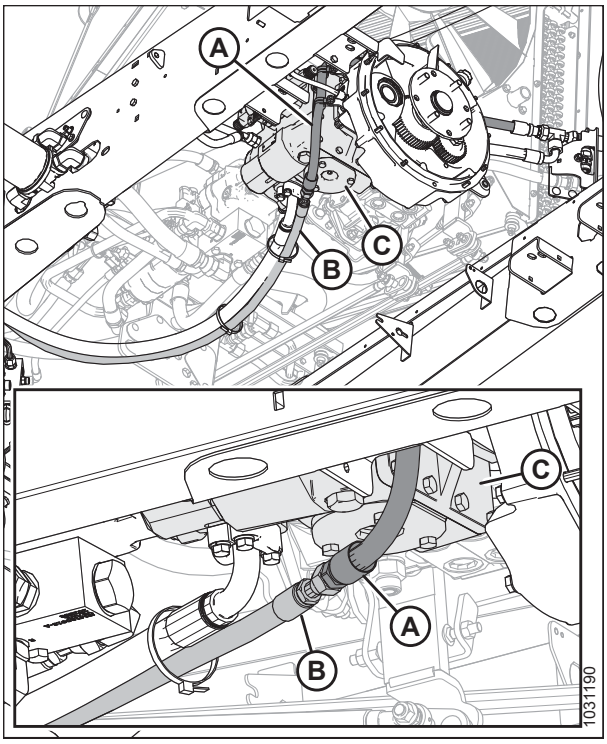


Figure 2.47: Disc/Knife Pump

11. On deck motor case drain hose (A), loosely install reducer (B) (MD #252893) and tee fitting (C) (MD #135784).
12. Torque reducer (B) to 84 Nm (62 lbf·ft).
13. Torque case drain hose (A) to 42 Nm (31 lbf·ft).

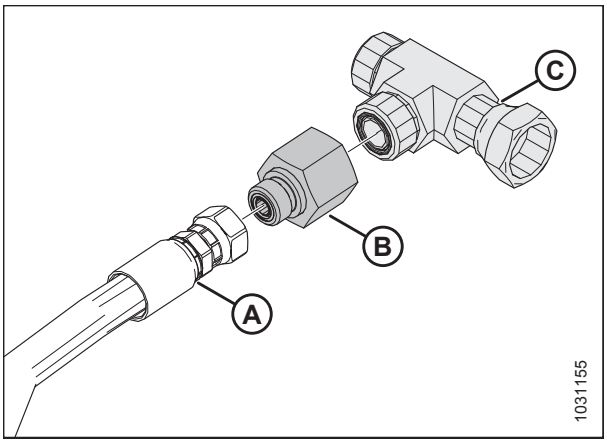


Figure 2.48: Case Drain Hose and Fittings

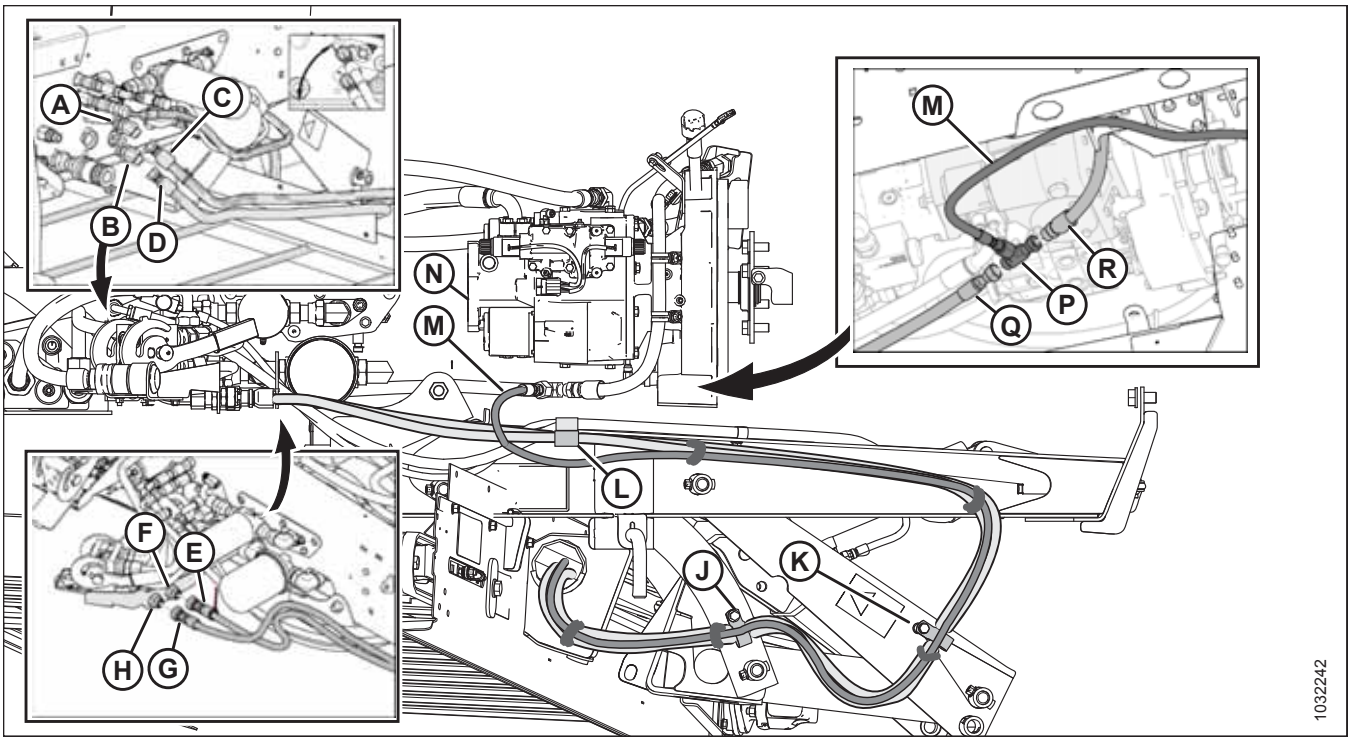


Figure 2.49: Deck Motor Hose Routing – M1240

14. Install the deck pressure and return hoses as follows:

    - ***Disc-Only Configuration:*** Install 45° fittings (A) and (B) into the hydraulic manifold and torque to 120 Nm (88 lbf·ft). Install deck pressure hose (C) (red cable tie, MD #176575) on top fitting (A). Install deck return hose (D) (MD #176575) onto bottom fitting (B). Torque to 120 Nm (88 lbf·ft).

      NOTE:

      Orient fittings to 60° from vertical as shown.

    - ***Disc/Draper Configuration:*** Install deck pressure hose (E) (red cable tie, MD #176575) onto fitting (F). Install deck return hose (G) (MD #176575) onto fitting (H). Torque hoses to 120 Nm (88 lbf·ft).

15. Secure pressure hose and return hose using two clamps (J) and (K) mounted to the DWA, and one clamp (L) (previously left loose) mounted below the frame.

    - For rotary disc headers, ensure clamp (J) is located at the yellow tape on the hoses.
    - For auger headers, ensure clamp (J) is located at the red tape on the hoses.
    - Ensure clamps (K) and (L) are located at the yellow tape on the hoses.

16. Route case drain hose (M) (MD #176680[2]) under the windrower frame and under disc/knife pump (N).

17. Install tee-fitting end (P) of motor case drain hose between existing hoses (Q) and (R).

18. Torque hose (Q) and tee fitting (P) to 84 Nm (62 lbf·ft).

19. Tighten all clamps.

2. Case drain hose MD #176680 is serviced with MD #176883 in Parts Catalog. For the parts catalog, refer to section *5.5 Hydraulic Hoses, page 98*

2.8 Connecting the Proximity Sensor

The DWA proximity sensor communicates the position of the DWA deck to the windrower's electronic control system and controls when the draper turns on or off.

NOTE:

The proximity sensor comes preinstalled on the DWA linkage.

1. On the inner right side of the windrower frame, locate DWA extension connector C24A (A). The DWA extension is tied to the chassis harness.
2. Remove cable ties (B) binding the DWA extension to the chassis harness.

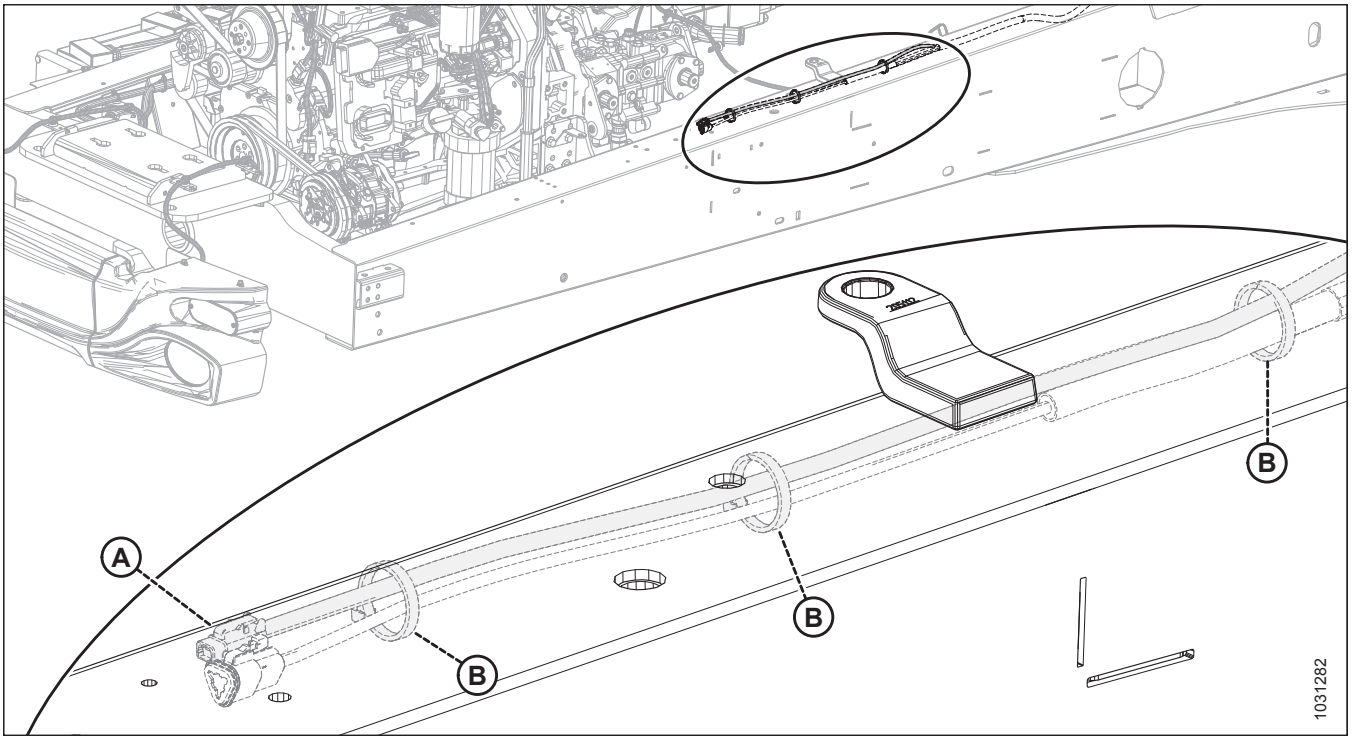


Figure 2.50: Chassis Harness – DWA Extension C24A

3. Locate proximity sensor connector (A) at the top right side of the DWA linkage.

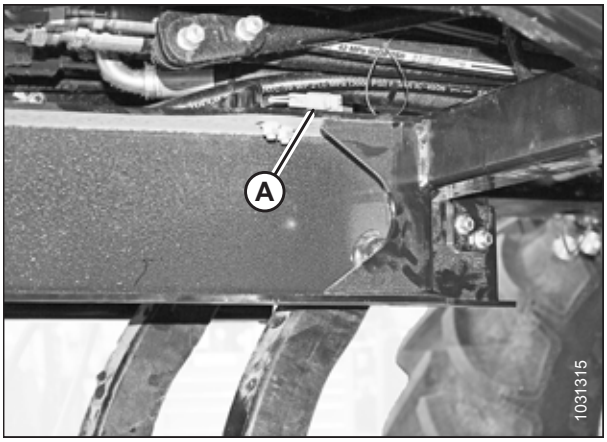


Figure 2.51: DWA Proximity Sensor

4. Connect DWA extension C24A to DWA proximity sensor (A).
5. Secure extension harness (B) to the linkage frame using existing fir tree clips (C).

   IMPORTANT:

   Ensure extension harness (B) is secured under the linkage frame as shown to prevent interference with steering components.

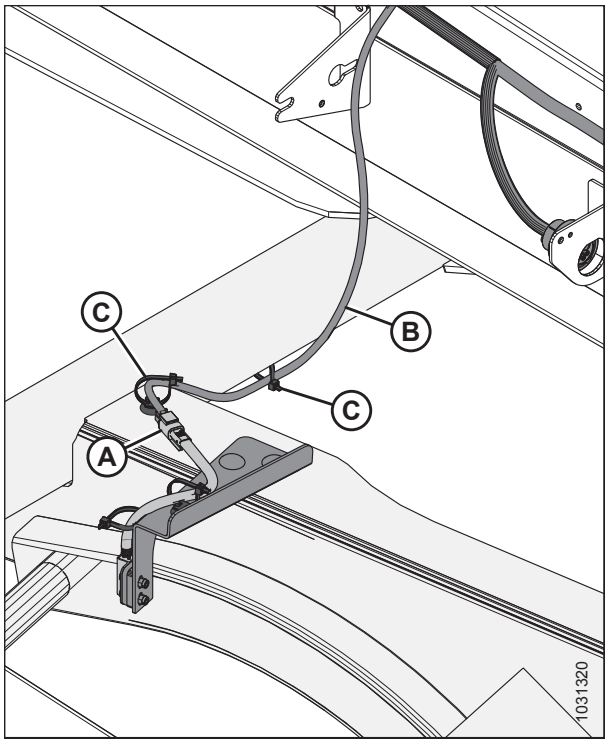


Figure 2.52: DWA Proximity Sensor

2.9 Checking Clearance between Front Skid and Draper

Excess space between the DWA's front skid and draper can lead to crop build-up; too little clearance can cause premature draper wear.

1. Check if skid height (A) is 1.5–3 mm (1/16–1/8 in.) above the draper.

   IMPORTANT:

   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.

2. Adjust the skid height if required. For instructions, refer to *4.1.5 Adjusting Front Skid, page 71*.

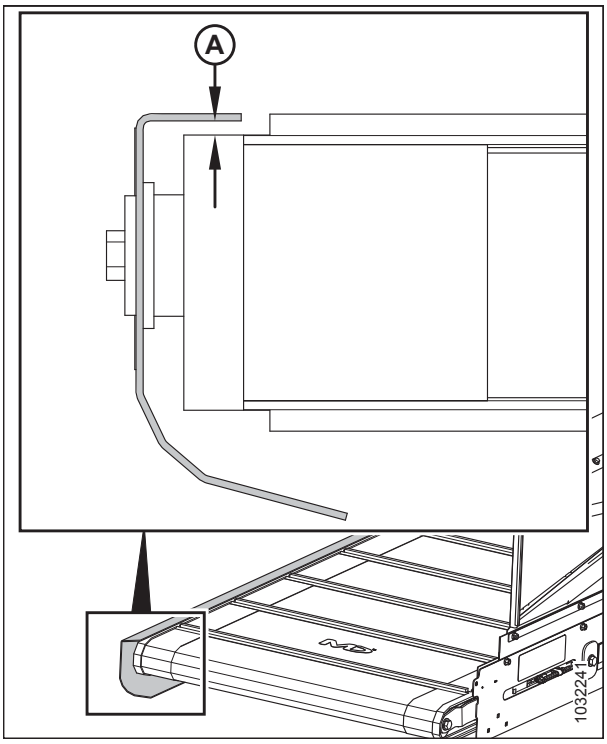


Figure 2.53: Draper Deck Front Skid

2.10 Activating the Double Windrow Attachment

Before using the DWA, the feature must be activated in the windrower's harvest performance tracker.

NOTE:

The ground speed lever (GSL) controls for the Double Windrow Attachment (DWA) will only work when there is a recognized header ID (wired or forced) and the DWA has been activated for that header type. For more information on header setup and recognizing the header ID, 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).

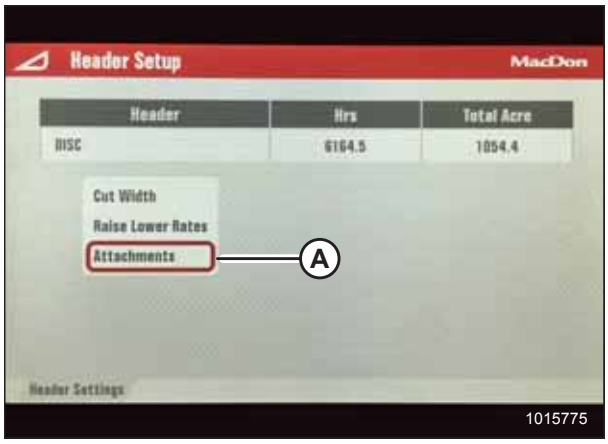


Figure 2.54: Header Setup – Attachments

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.

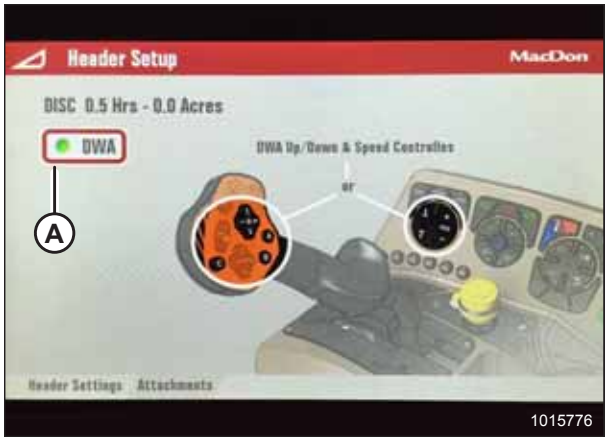


Figure 2.55: Selecting DWA

2.10.1 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 Harvest Performance Tracker (HPT) scroll knob (B) or ground speed lever (GSL) scroll wheel (not shown), place the red cursor over SETTINGS icon (C) and press SELECT with scroll knob (B) or the GSL SELECT button (not shown).

Figure 2.56: Opening the Main Menu

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

   NOTE:

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

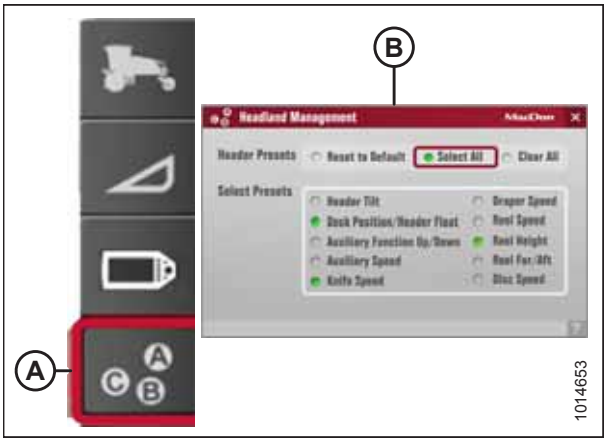


Figure 2.57: One-Touch-Return Icon and Menu List

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 Double Windrow Attachment (DWA):

- DWA up/down
- DWA speed

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

Figure 2.58: One-Touch-Return Buttons on the GSL

2.10.2 Setting Draper Pressure Alarm

The draper pressure alarm indicates when the DWA draper is operating above the desired pressure, such as when crop is lodged between the draper and the deck.

1. Open the QuickMenu system by pressing scroll knob (A) on the Harvest Performance Tracker (HPT) or SELECT button (B) on the ground speed lever (GSL) while the run screen is showing the Double Windrow Attachment (DWA) speed and pressure alarm

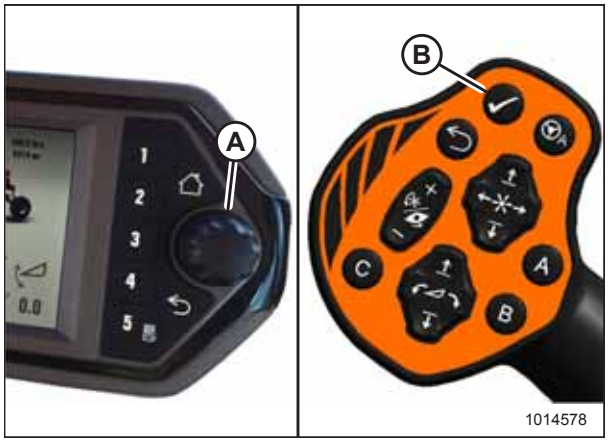


Figure 2.59: HPT Scroll Knob and GSL Select Button

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

Figure 2.60: QuickMenu / Draper Pressure Alarm

3. Adjust alarm setpoint (A) 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 2.61: QuickMenu / Draper Pressure Alarm

Chapter 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 and Disengaging the Deck Safety Pin

The Double Windrow Attachment (DWA) deck safety pin prevents the deck from lowering unexpectedly. You can only engage the pin when the deck is fully raised. Engage the pin before going under the deck for any reason. Make sure to disengage the pin before lowering the DWA.

- To engage the deck safety pin, refer to *3.2.1 Engaging the Deck Safety Pin, page 52*.
- To disengage the deck safety pin, refer to *3.2.2 Disengaging the Deck Safety Pin, page 52*.

3.2.1 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 pin (A) 90°.

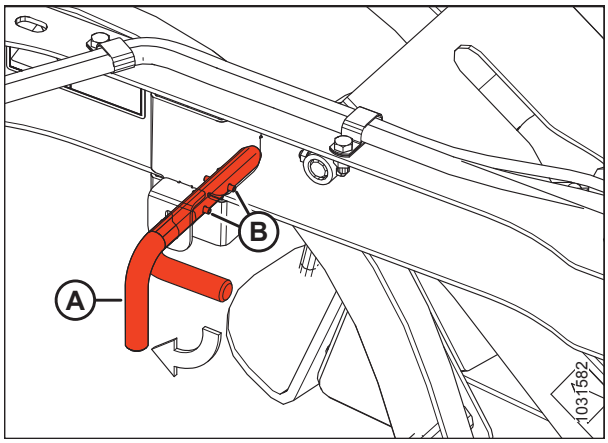


Figure 3.1: Deck Safety Pin – Engaged

3.2.2 Disengaging the Deck Safety Pin

Disengage the deck safety pin as follows:

1. Rotate pin (A) 90°.
2. Pull pin (A) outboard until roll pin (B) is outside the channel.

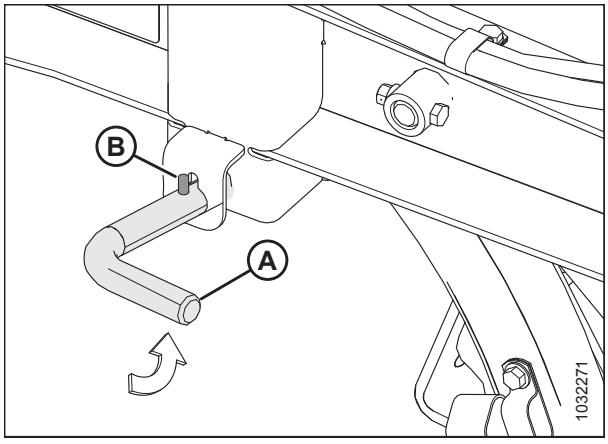


Figure 3.2: Deck Safety Pin – Disengaged

3. Rotate pin (A) 90°.

   NOTE:

   This will allow roll pin (B) to prevent the safety pin from sliding inboard and damaging the linkage during operation.

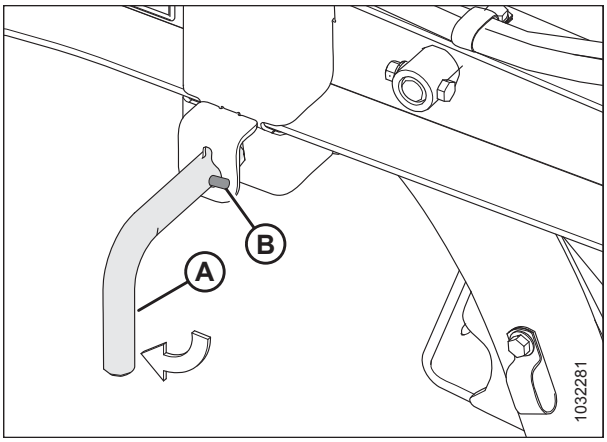


Figure 3.3: Deck Safety Pin – Disengaged

3.3 Raising and Lowering the Deck

DWA raise and lower can be controlled in three ways; pressing reel raise/lower buttons on the ground speed lever (GSL), pressing raise/lower buttons on the operator's console, and presetting deck position with headland management position buttons.

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, adjust the proximity sensor. For instructions, refer to *3.3.2 Adjusting the Proximity Sensor, page 56*.

NOTE:

The ground speed lever (GSL) controls for the Double Windrow Attachment (DWA) will only work when there is a recognized header ID (wired or forced) and the DWA has been activated for that header type.

- For more information on header setup and recognizing the header ID, refer to your header or windrower operator's manual.
- For instructions on activating the DWA, refer to *2.10 Activating the Double Windrow Attachment, page 48*.

1. Remove/disengage the deck safety pin. For instructions, refer to *3.2.2 Disengaging the Deck Safety Pin, page 52*.
2. Raise and lower the DWA deck by using REEL RAISE button (A) and REEL LOWER button (B) on the ground speed lever (GSL). The operator can interrupt raising and lowering the deck by letting go of the buttons.

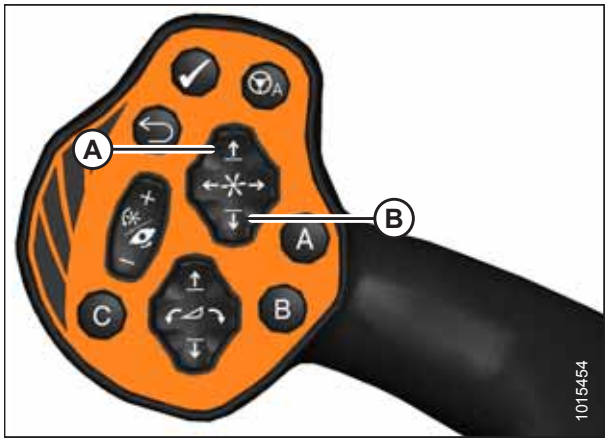


Figure 3.4: Ground Speed Lever (GSL)

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 raising and lowering the deck by letting go of the button.

   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. For instructions, refer to *2.10.1 Setting One-Touch-Return Buttons (A, B, C), page 49*.

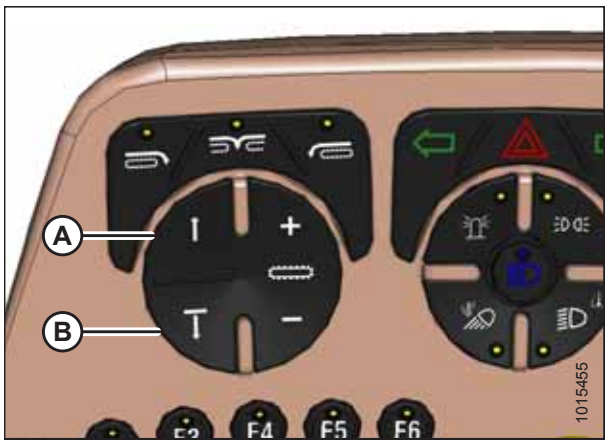


Figure 3.5: Operator's Console

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

Figure 3.6: 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 hex socket screw (A) to lock the adjusting knob into position. Loosen locking screw enough to allow 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 adjuster valve knob (B) to the right.
- If the deck lift speed is too slow, turn 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.

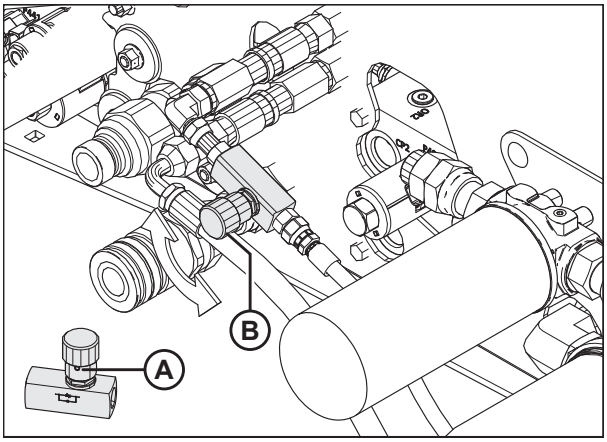


Figure 3.7: Deck Lift Speed Valve

3.3.2 Adjusting the Proximity Sensor

Carefully adjust the proximity sensor when running up the Double Windrow Attachment (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 the backsheet touching the draper before it shuts off), lower the proximity sensor at the linkage as follows:

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

   NOTE:

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

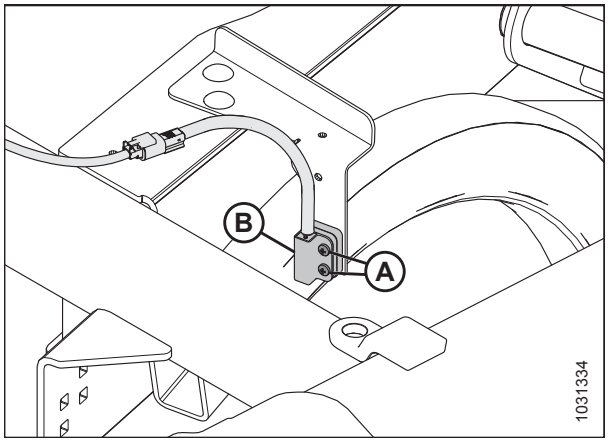


Figure 3.8: Proximity Sensor

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. 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).

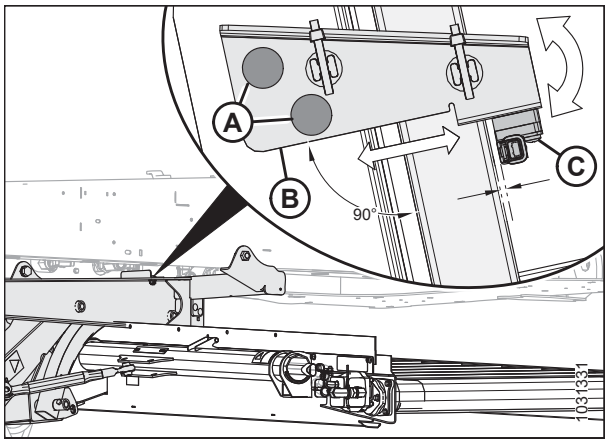


Figure 3.9: Proximity Sensor

3.4 Setting Draper Speed

DWA draper speed is adjustable from the GSL or the operator's console.

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.

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

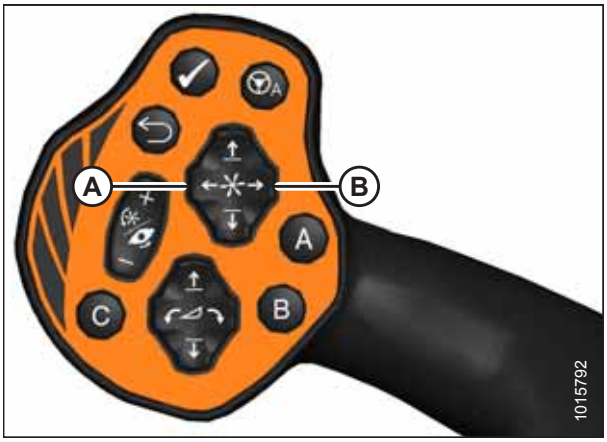


Figure 3.10: GSL

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.

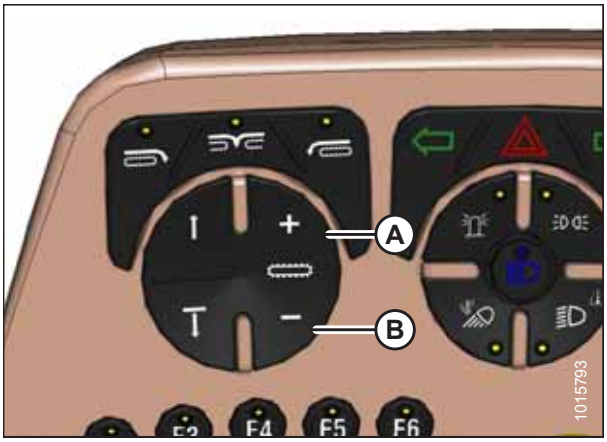


Figure 3.11: Operator's Console

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

Figure 3.12: 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.

NOTE:

If set up with an R85 or R216 Rotary Disc Header, the DWA deck will only be in its most forward position when the windrower is running. 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.

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 58*.

To adjust the deck angle relative to the ground, refer to *3.5.2 Adjusting Deck Angle Relative to the Ground, page 59*.

3.5.1 Adjusting Deck Angle Relative to the Drive Tire

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

1. Loosen locking tab (D) on the adjustable turnbuckle.
2. Rotate center tube (A) to the desired length.
   - Use connection point (B) for R85 or R216 Rotary Disc Headers. The approximate turnbuckle length is 530 mm (21 in.).
   - Use connection point (C) for A Series Auger Headers. The approximate turnbuckle length is 630 mm (25 in.).

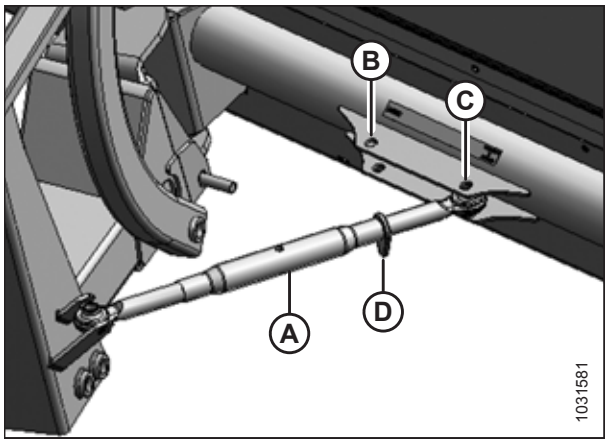


Figure 3.13: Adjustable Turnbuckle

3. Adjust the turnbuckle length so that 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.

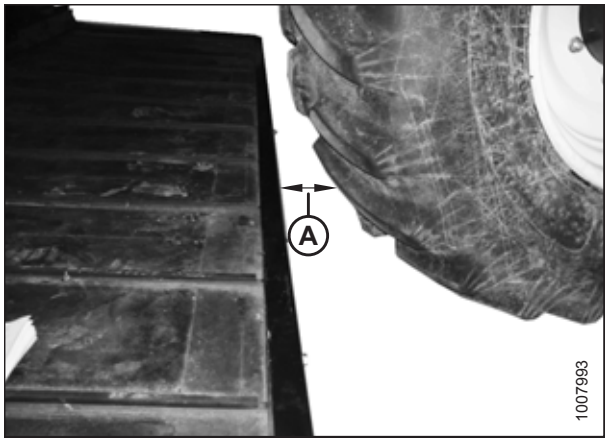


Figure 3.14: Distance from Deck to Tire

3.5.2 Adjusting Deck Angle Relative to the Ground

When the deck is in its normal running position, 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 or R216 Rotary Disc Header in lighter crop, distance (A) should be equal to distance (B).
- If the crop needs to be thrown farther, increase distance (A).

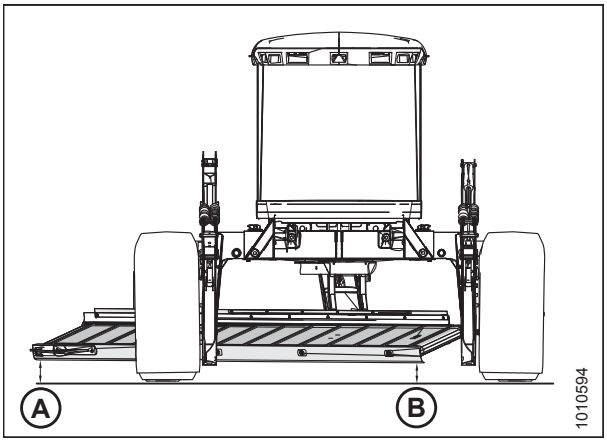


Figure 3.15: DWA Deck

IMPORTANT:

Ensure at least 25 mm (1 in.) clearance between the backsheet and the fuel tank with the DWA in working position.

To adjust deck angle:

1. Loosen longer bolt (B) (MD #136157) and three shorter bolts (A) (MD #136082).

   NOTE:

   One of shorter bolts (A) is hidden behind bracket (C) and is not shown in Figure *3.16, page 59*.

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

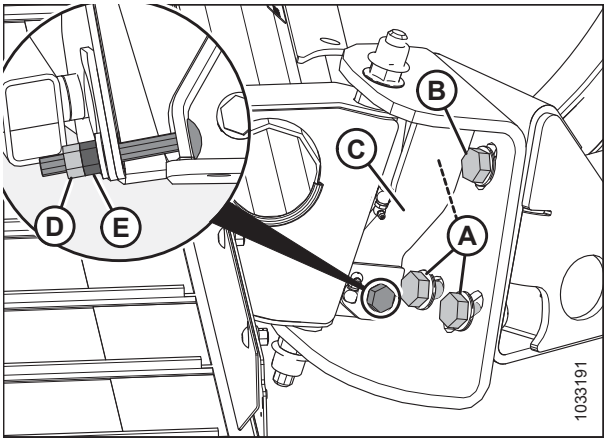


Figure 3.16: Deck Pivot

3.6 Raising the Deck Height

IMPORTANT:

Raising deck height is **NOT** recommended. Ensure at least 25 mm (1 in.) clearance between backsheet and fuel tank with Double Windrow Attachment (DWA) in working position.

To avoid excessive wear to draper deck components, do **NOT** allow the deck to touch the ground. If absolutely necessary, raise the deck as follows:

IMPORTANT:

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

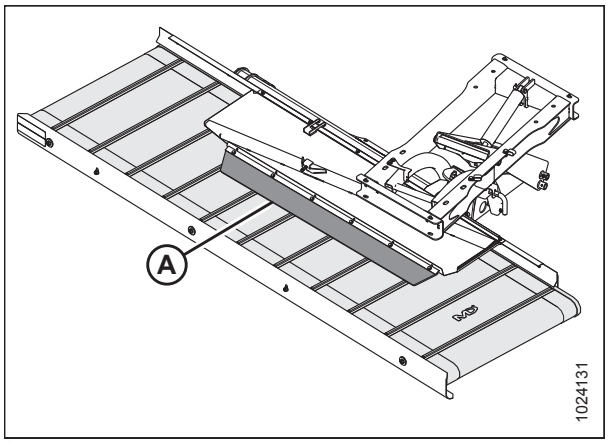


Figure 3.17: Draper Deck

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

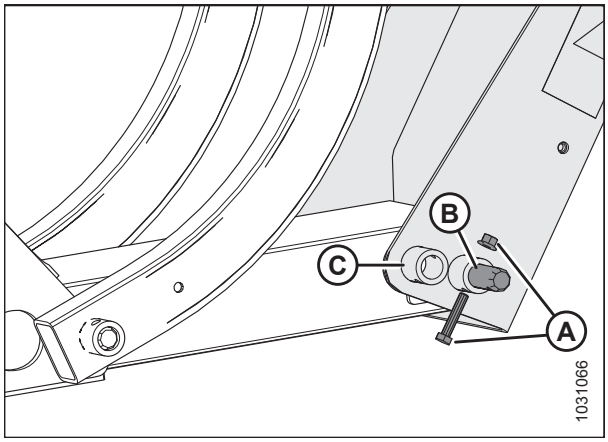


Figure 3.18: DWA Linkage

4. Reinstall bolt and nut (A) to secure pivot pin (B) to rear arm (C).

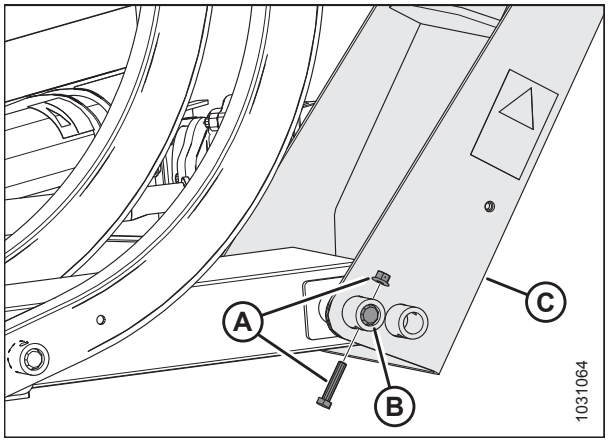


Figure 3.19: DWA Linkage

5. With the deck in the raised position, install the correct ball joint link bracket according to your header:
   - For R85 and R216 Rotary Disc Headers, install tall bracket (A) at upper holes (C)
   - For A Series Auger Headers, install short bracket (B) at upper holes (C)

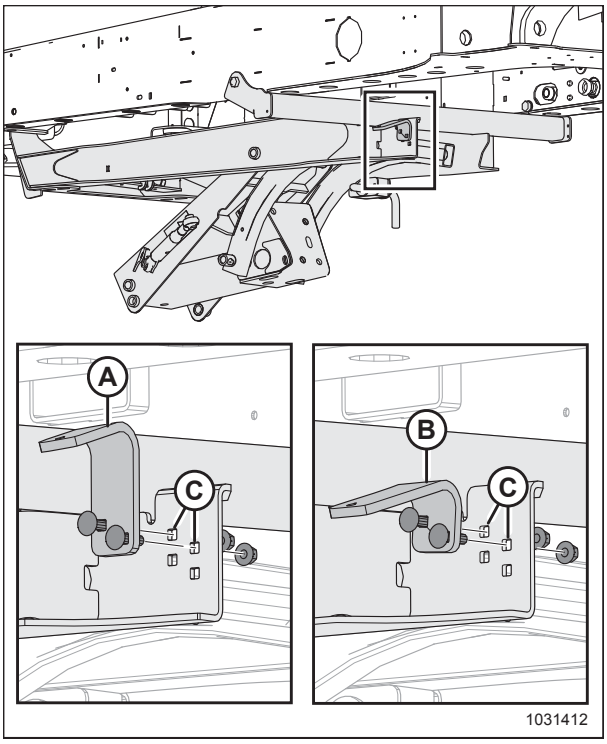


Figure 3.20: Ball Joint Link Bracket

IMPORTANT:

Ensure at least 25 mm (1 in.) clearance between backsheet and fuel tank with DWA in working position.

6. Install ball joint link (D) at middle hole (Option) on backsheet panel (A).
7. Install tapered nut (C) and torque the nut to 26 Nm (19 lbf ft.). Install nut (B) and torque the nut to 26 Nm (19 lbf ft.).

IMPORTANT:

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

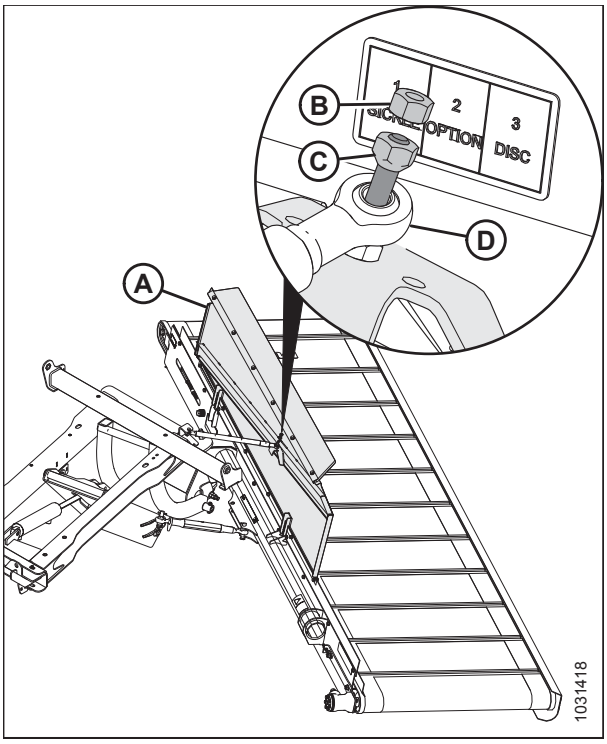


Figure 3.21: Ball Joint Link

3.7 Positioning the Conditioner Forming Shield

Forming shields help direct the crop flow onto the DWA draper for best performance.

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

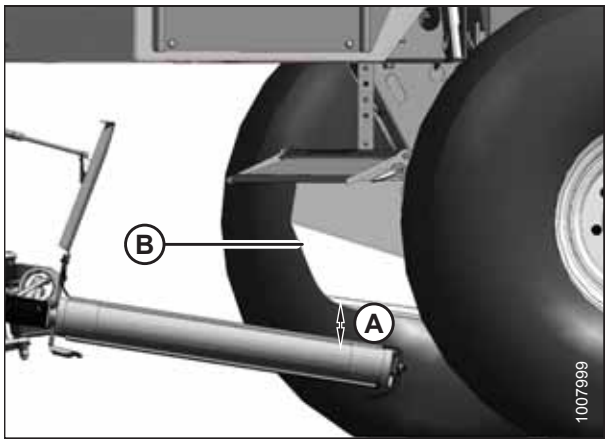


Figure 3.22: Deck Lowered

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

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

   NOTE:

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

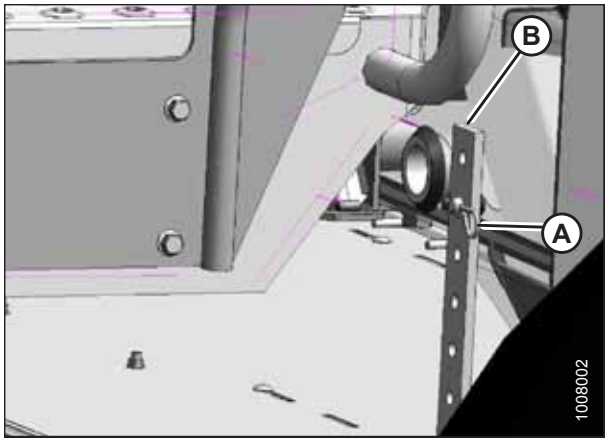


Figure 3.23: Forming Shield

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

   NOTE:

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

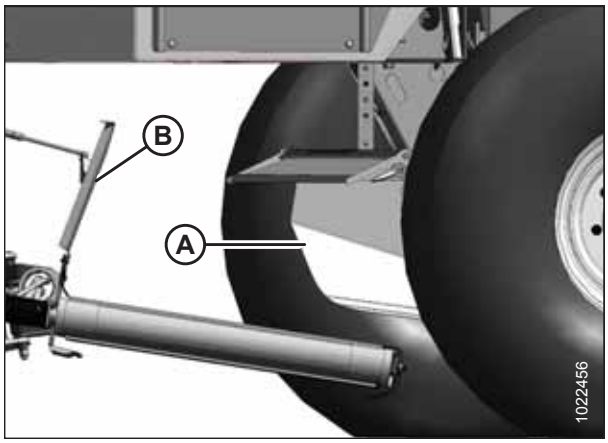


Figure 3.24: Deck Lowered

6. Adjust 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.

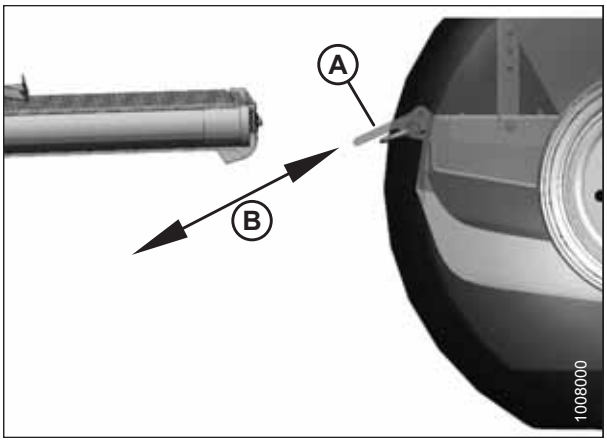


Figure 3.25: Deck Raised

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

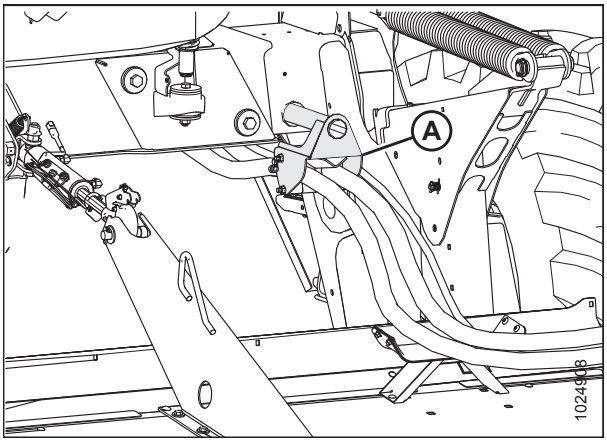


Figure 3.26: Header Hose Support

NOTE:

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

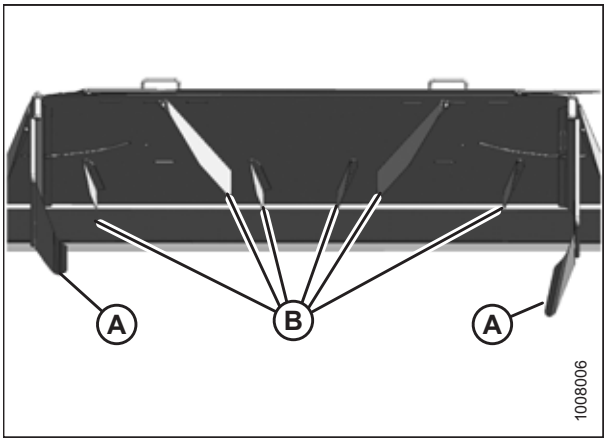


Figure 3.27: Fins under Forming Shield

A - Side Deflectors **B - Fins under Forming Shield**

3.8 Positioning the Conditioner Rolls

The conditioner roll gap must be adjusted to throw crop onto the Double Windrow Attachment.

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 header operator's manual.

3.9 Operating Recommendations

3.9.1 Operating with an A Series Auger Header (Non-Grass Seed Only):

Refer to the following operating recommendations when using the Double Windrow Attachment (DWA) with an A Series Auger Header (Non-Grass Seed Only) configured for use with a M1 Series Windrower:

- On the first pass, raise the DWA and deposit the crop between the wheels of the windrower.
- On the return pass, lower the DWA 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 or R216 Rotary Disc Header

Because the conditioner rolls on a rotary disc 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 (for more information, 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 (for more information, refer to the header operator's manual).
- **R216 – Light crops such as alfalfa:** Configure the cutterbar to produce two crop streams. For instructions, refer to the header operator's manual.

Crop flow from the conditioner rolls to the forming shield:

- **R85:** The rear baffle on the rotary disc header should be in the uppermost position; however, it may need to be lowered for center windrowing.
- **R216:** Adjust the rear baffle so that it is slightly lower than the uppermost position. If using the manual baffle, move the handle (A) to the second notch (B).
- The crop trajectory arc is higher with a steeper header angle. Set header angle to throw crop at the maximum arc height without contacting the top forming shield excessively.
- Removing the fins on the rear baffle may improve crop trajectory to the rear baffle.
- It may be possible to throw crop above the forming shield with extreme header angle and rear baffle positions.

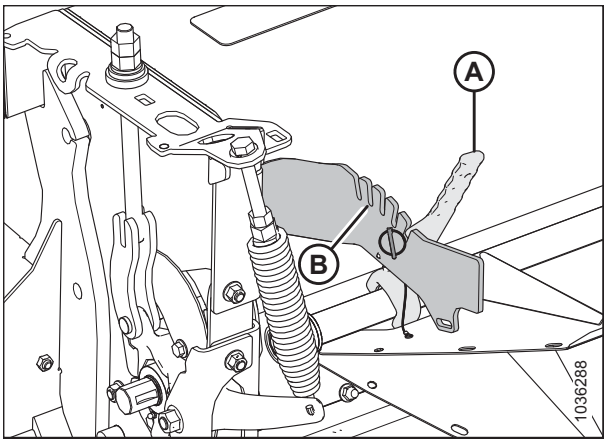


Figure 3.28: Left Side of Conditioner

- 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.

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.
- For instructions, refer to *3.7 Positioning the Conditioner Forming Shield, page 62*.

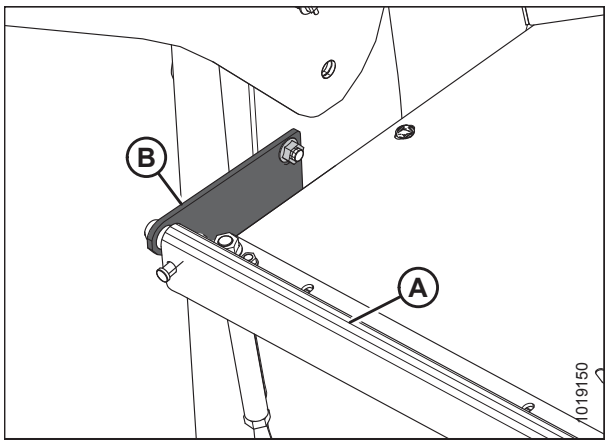


Figure 3.29: Forming Shield – For use with R85 Rotary Disc Header

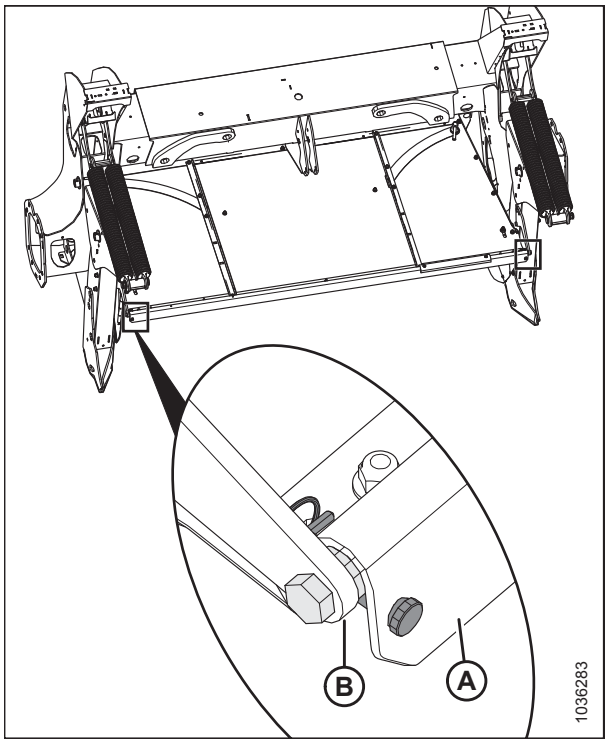


Figure 3.30: Forming Shield – For use with R216 Rotary Disc Header

Chapter 4: Maintenance and Servicing

4.1 Draper Maintenance

The following topics explain how to service the Double Windrow Attachment (DWA) draper properly.

4.1.1 Adjusting Draper Tension

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

Set the draper tension as follows:

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

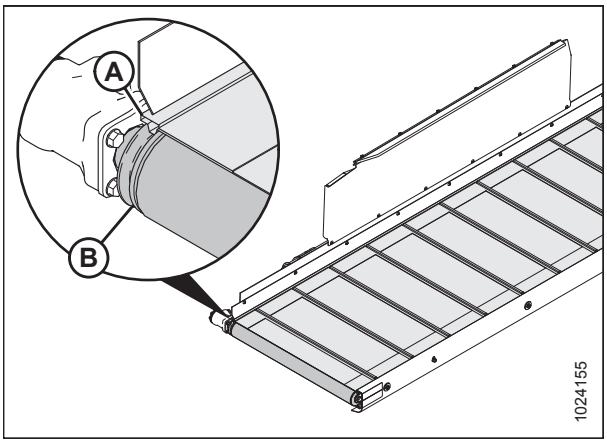


Figure 4.1: Draper Guide – Cutaway View

2. Turn bolt (A) clockwise to tighten. 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.

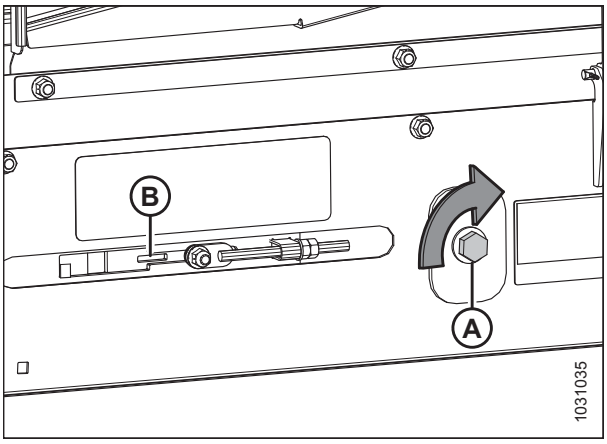


Figure 4.2: Draper Tension

4.1.2 Checking Draper Tracking

During the first run up, ensure the draper is tracking in the center of the deck and **NOT** running to one side unevenly; otherwise, damage to the draper can occur. To adjust the tracking, refer to *4.1.3 Adjusting Draper Tracking, page 68*.

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.

1. Raise the Double Windrow Attachment (DWA) deck fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the deck safety pin. For instructions, refer to *3.2.1 Engaging the Deck Safety Pin, page 52*.

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

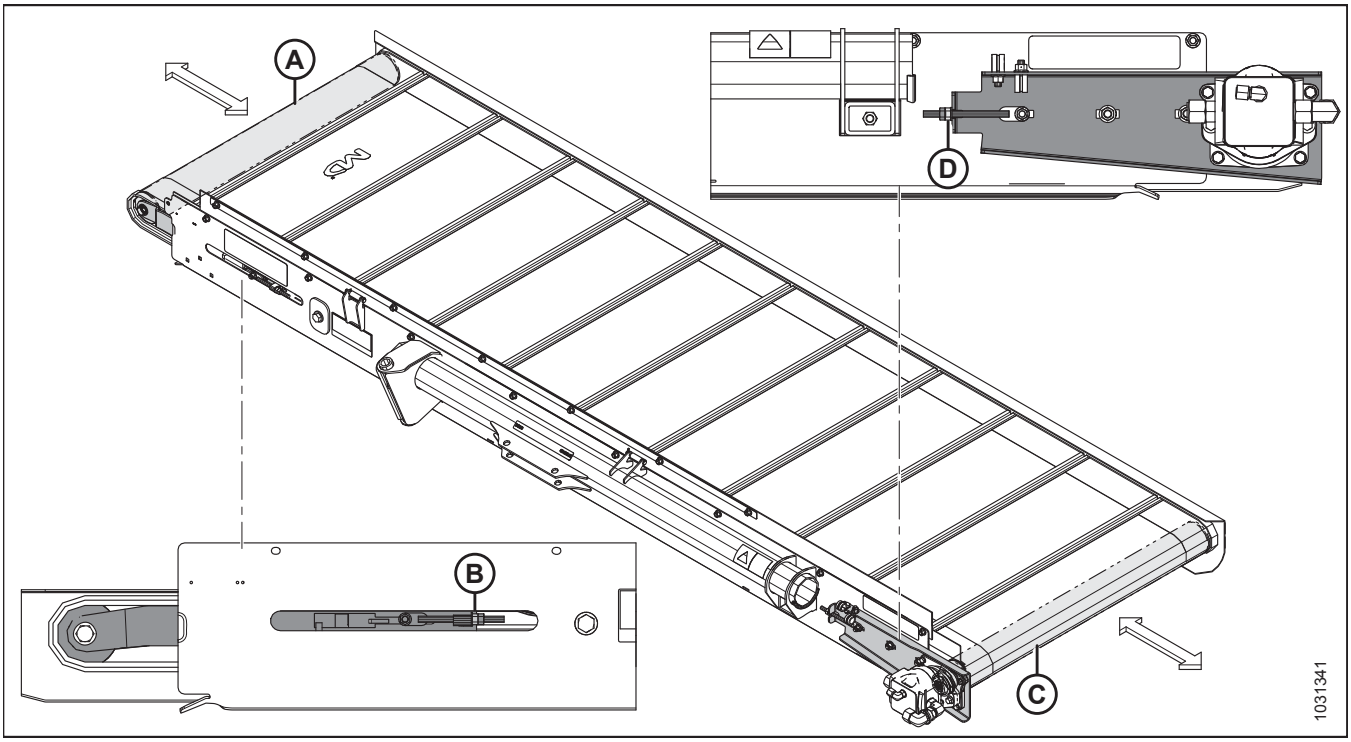


Figure 4.3: Draper Tracking Adjustments

Table 4.1 Draper Tracking Adjustments

Tracking	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)

To adjust tracking on the idler roller side:

4. Loosen two nuts (A).
5. Adjust nut (B) according to Table *4.3, page 68*.
6. Secure the idler roller by tightening two nuts (A).
7. After adjusting draper tracking, readjust the draper tension. For instructions, refer to *4.1.1 Adjusting Draper Tension, page 67*.

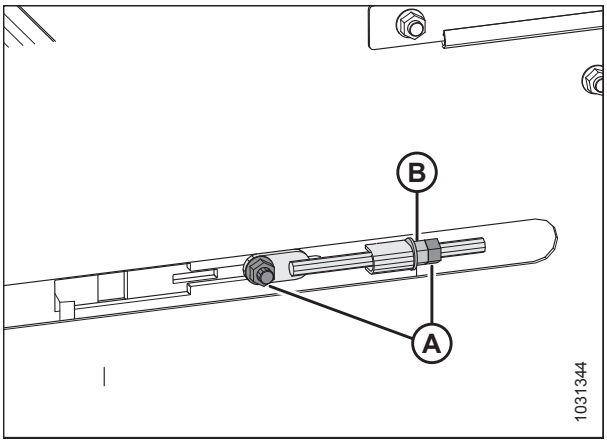


Figure 4.4: Idler Roller Tracking Adjuster

To adjust tracking on the drive roller side:

1. Loosen four locking nuts (A).
2. Adjust nut (D) according to Table *4.3, page 68*.
3. Tighten four nuts (A) to secure the drive roller.
4. After adjusting the draper tracking, adjust the draper tension. For instructions, refer to *4.1.1 Adjusting Draper Tension, page 67*.

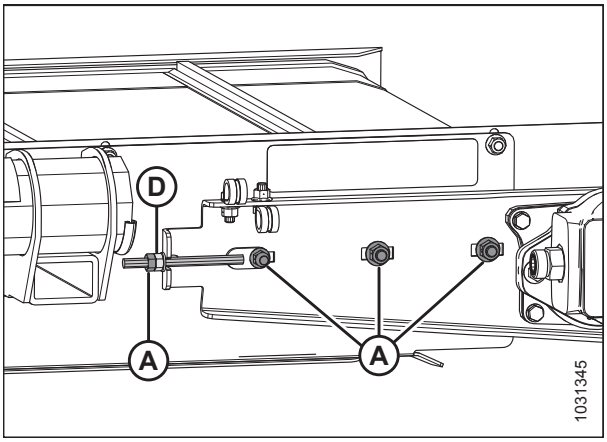


Figure 4.5: Drive Roller Tracking Adjuster

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 high enough to increase the space between the deck and the right drive tire.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the deck safety pin. For instructions, refer to *3.2.1 Engaging the Deck Safety Pin, page 52*.
4. Remove front skid (A) by removing five bolts (B) and washers (C).
5. Loosen the draper tension, and push the idler roller inward as far as possible.

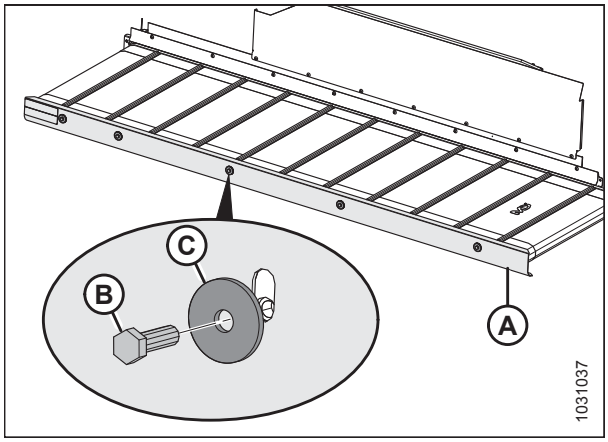


Figure 4.6: Front Skid

6. Disconnect turnbuckle (A) and allow deck to rotate rearward to increase the space between the deck and tire.
7. Remove old draper and install the new one. The draper is bidirectional so orientation does not matter.
8. Tension the draper. For instructions, refer to *4.1.1 Adjusting Draper Tension, page 67*.
9. Reinstall turnbuckle (A) and the front skid.
10. Adjust the front skid to achieve a 1.5–3.0 mm (1/16–1/8 in.) gap to draper.
11. Run the new draper and check alignment. Adjust alignment if necessary, refer to *4.1.3 Adjusting Draper Tracking, page 68*
12. Recheck draper tension after a few hours of operation.

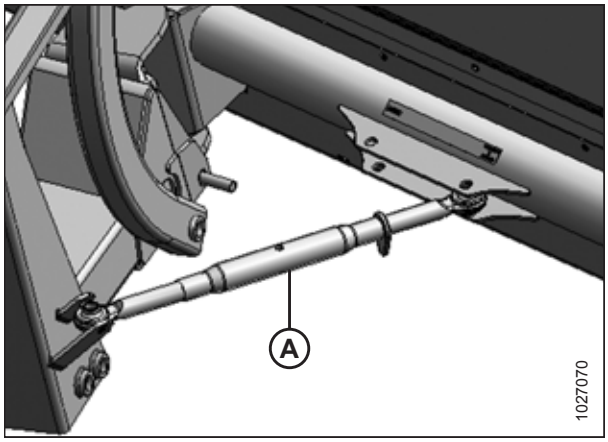


Figure 4.7: Deck Angle Turnbuckle

4.1.5 Adjusting Front Skid

Excess space between the DWA's front skid and draper can lead to crop build-up; too little clearance can cause premature draper wear.

To adjust the front skid, follow these steps:

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

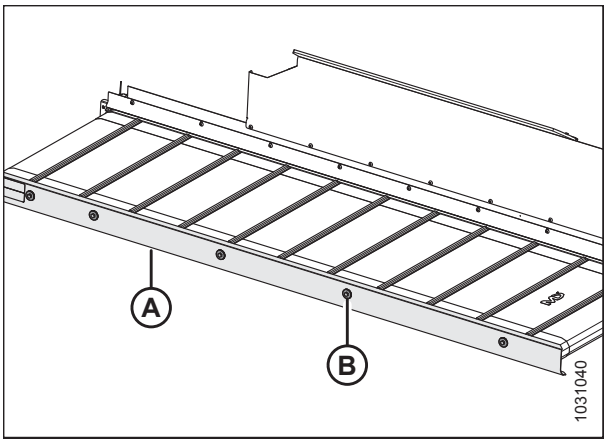


Figure 4.8: Draper Deck Front Skid

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

   IMPORTANT:

   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 bolts (B) to 90 Nm (66 lbf·ft).

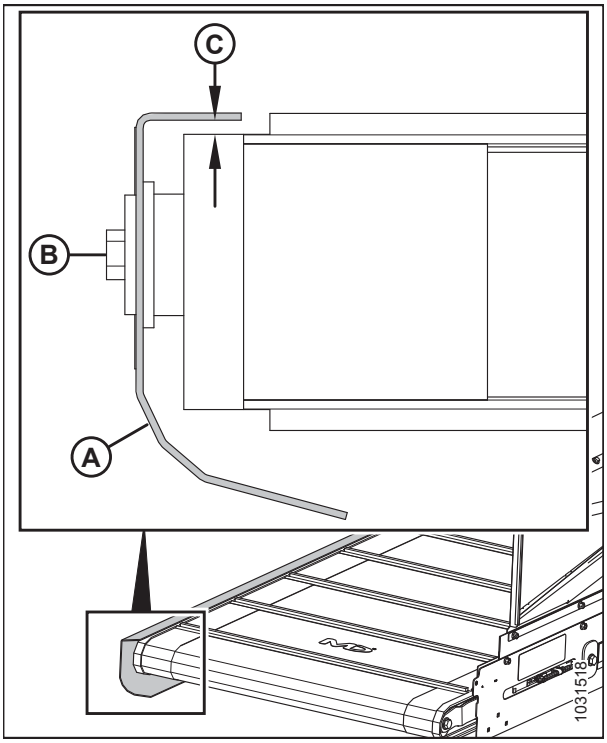


Figure 4.9: Draper Deck Front Skid

4.1.6 Adjusting Rear Deflector

Rear deflector prevents crop from entering inside the draper.

1. Loosen eight nuts (B) securing rear deflector (A) along the length of the deck.

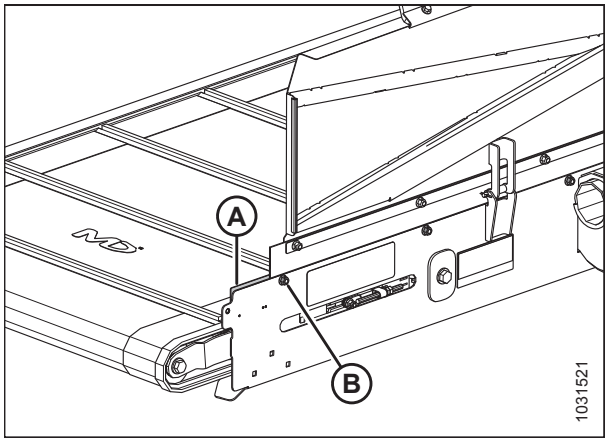


Figure 4.10: Draper Deck Rear Deflector

2. Set deflector (A) height (C) to be 1.5–8 mm (1/16–5/16 in.) above the draper.
3. Tighten nuts (B).

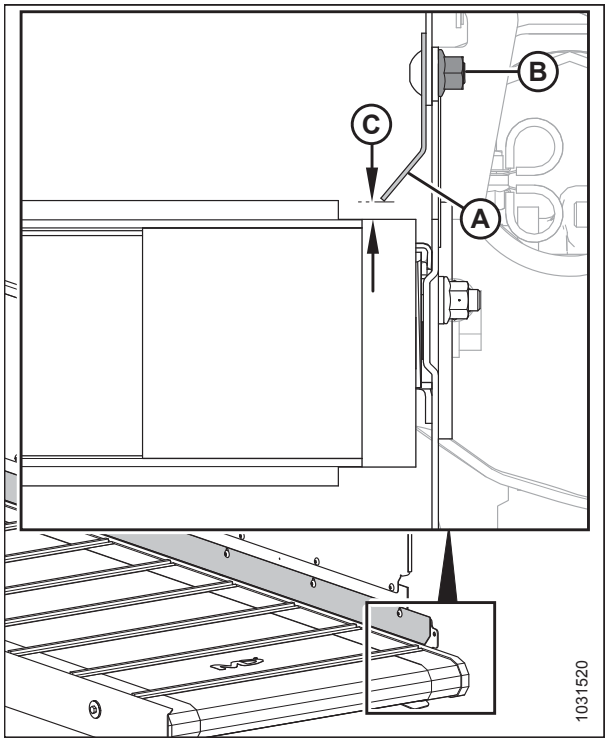


Figure 4.11: Draper Deck Rear Deflector

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 the Double Windrow Attachment (DWA) deck fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage safety pin (A).
4. Remove the front skid, then loosen and remove the draper. For instructions, refer to *4.1.4 Replacing Draper, page 70*.

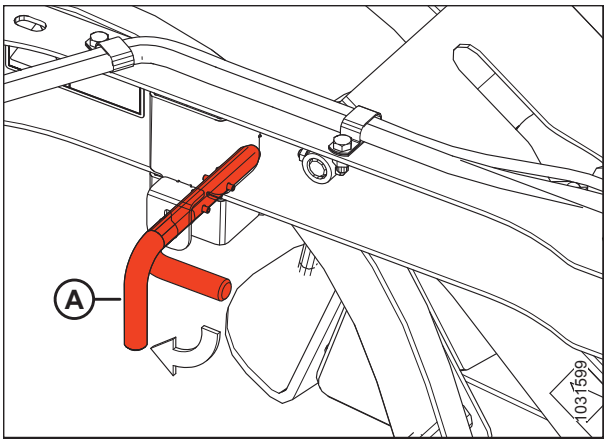


Figure 4.12: Safety Pin

5. Loosen set screw (A) on the drive roller bearing.
6. Using a hammer and drift or punch at hole (B), unlock the bearing collar by tapping the collar in the opposite direction of rotation.

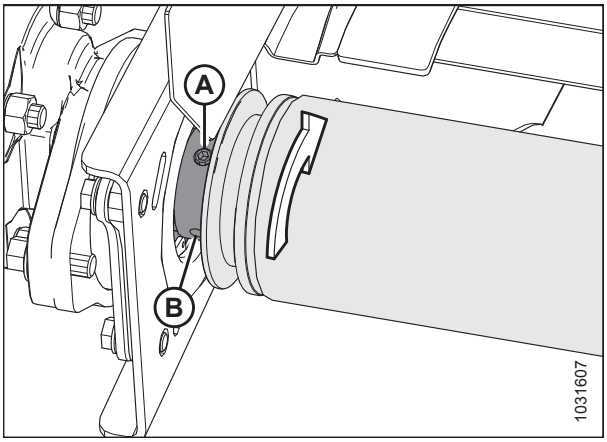


Figure 4.13: Draper Drive Roller

7. Remove drive roller (A) by removing bolt and washer (B) at end of the roller.
8. Slide the drive roller off the motor shaft.
9. If you need to repair the bearing or seal, refer to *4.1.8 Replacing Draper Roller Bearing and Seal, page 76*.

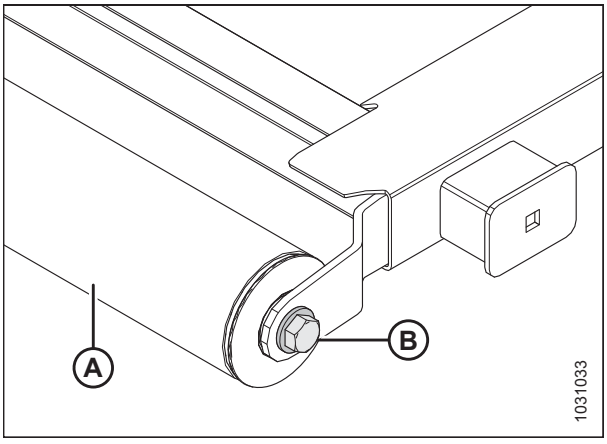


Figure 4.14: Draper Drive Roller

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

1. Slide drive roller (A) into bearing (B) and onto the motor shaft.
2. Push roller onto motor until contact is made with the motor shaft shoulder. Make sure the roller is fully engaged.

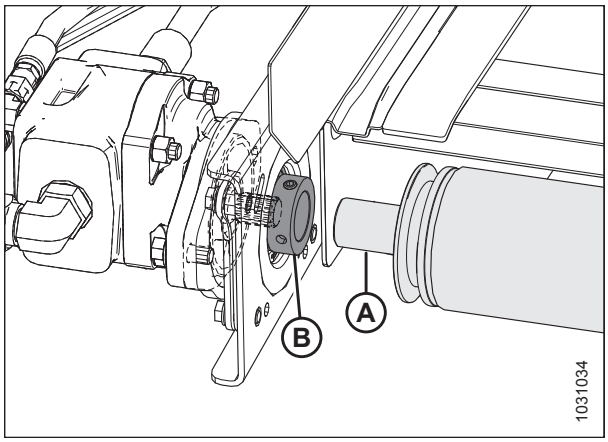


Figure 4.15: Draper Drive Roller

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

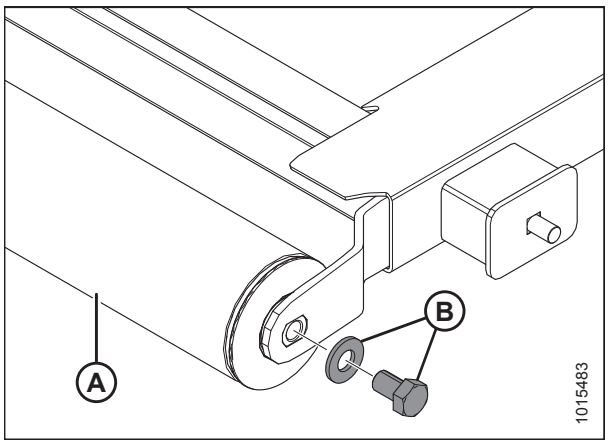


Figure 4.16: Draper Drive Roller

4. Using a hammer and drift or punch at hole (B), lock the collar by tapping it in the same direction as rotation.
5. When the lock collar is set, tighten set screw (A) to 27 Nm (20 lbf·ft).

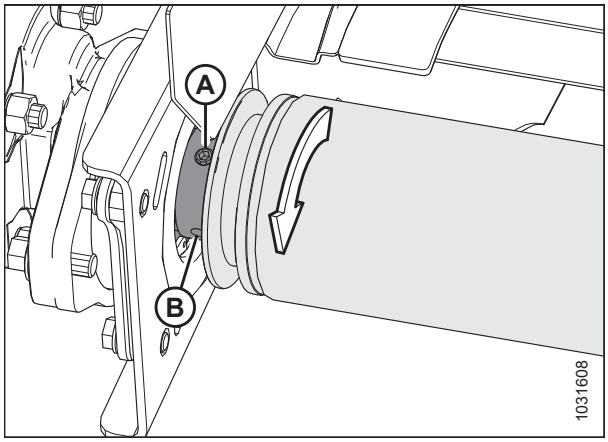


Figure 4.17: Draper Drive Roller

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 Double Windrow Attachment (DWA) deck fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage safety pin (A).

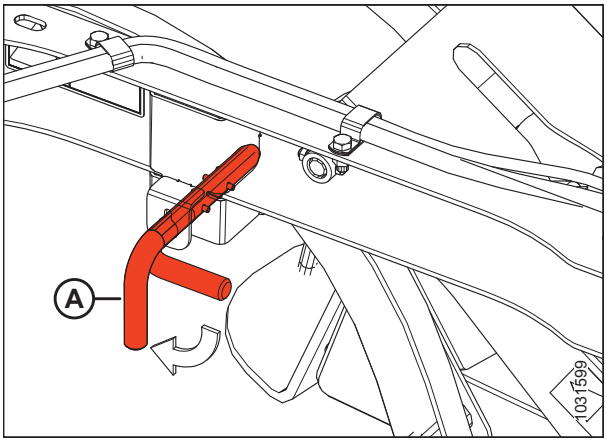


Figure 4.18: Safety Pin

4. Remove front skid (A) by removing five bolts (B) and washers (C).

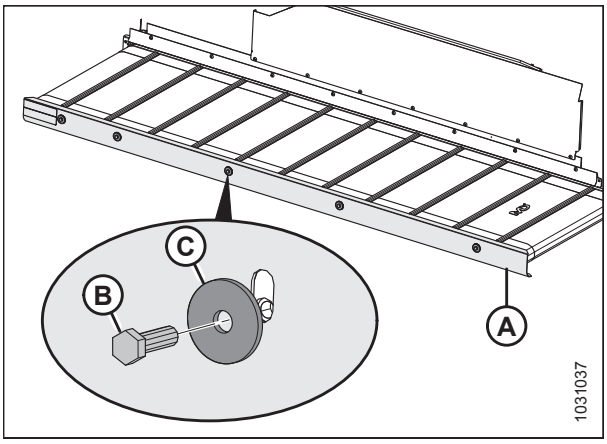


Figure 4.19: Front Skid

5. Loosen the draper.

   NOTE:

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

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

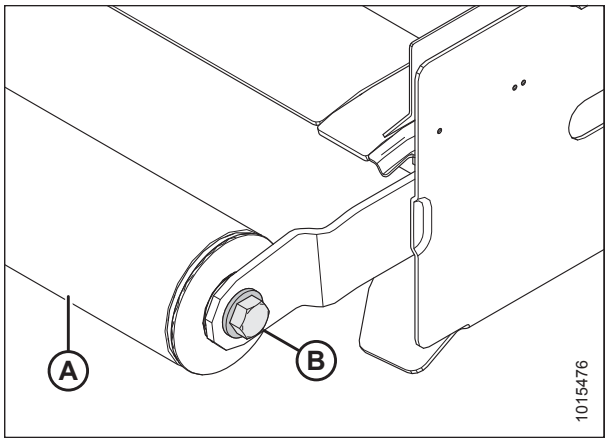


Figure 4.20: Idler Roller

To reinstall the idler roller, follow these steps:

1. Reattach bolt and washer (B) at each end of idler roller (A). Torque bolts to 95 Nm (70 lbf·ft).
2. Tighten the draper. For instructions, refer to *4.1.1 Adjusting Draper Tension, page 67*.
3. Reattach the front skid. For instructions, refer to *4.1.5 Adjusting Front Skid, page 71*.

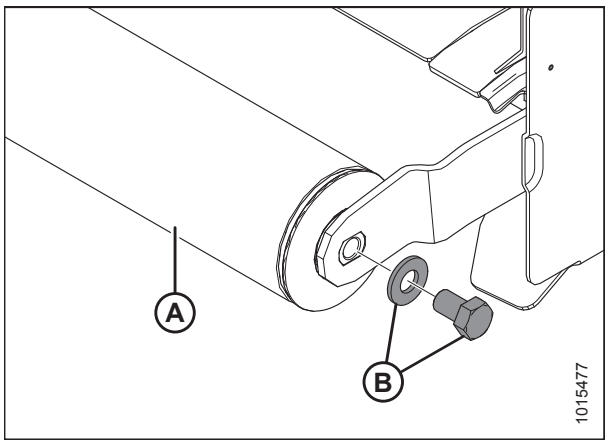


Figure 4.21: Idler Roller

4.1.8 Replacing Draper Roller Bearing and Seal

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

1. Remove the roller assembly. For instructions, refer to *4.1.7 Maintaining Draper Rollers, page 72*.
2. Remove bearing assembly (B) and seal (A) from roller tube (C) as follows:
   a. Attach slide hammer (D) to threaded shaft.
   b. Tap out the bearing assembly.
3. Clean the inside of roller tube (C) and check for wear or damage. Replace if necessary.

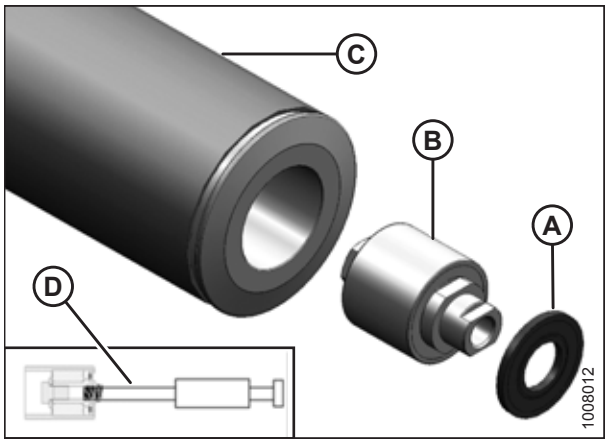


Figure 4.22: Roller Bearing

4. Install 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.

   IMPORTANT:

   Use SAE multi-purpose high temperature extreme pressure (EP2) performance with 0–1% max molybdenum disulphide (NLGI grade 2) lithium base.

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.

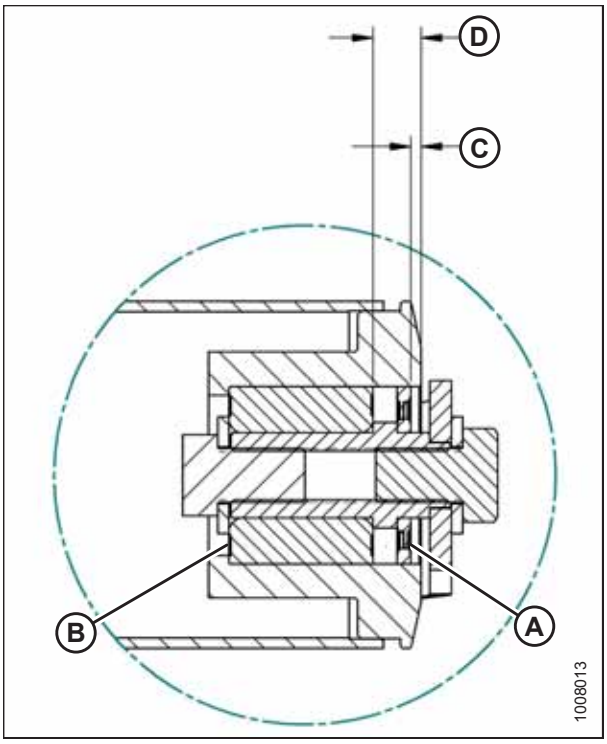


Figure 4.23: Roller Bearing Cross Section

4.2 Greasing the DWA

Grease the following six pivot points (A) every 25 hours.

NOTE:

Use high temperature extreme pressure (EP2) performance grease with 1.5–5% molybdenum disulphide (NLGI grade 2) lithium base.

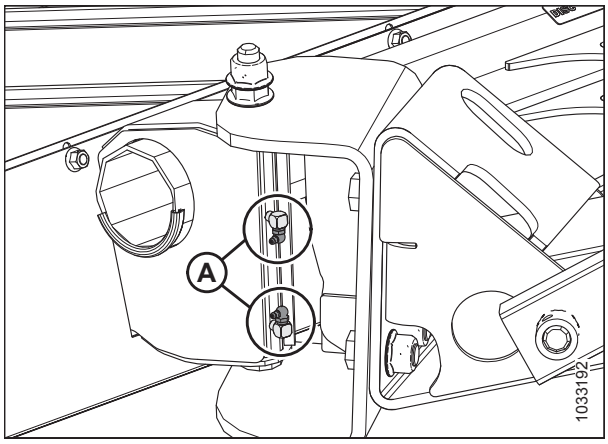


Figure 4.24: Deck Pivot

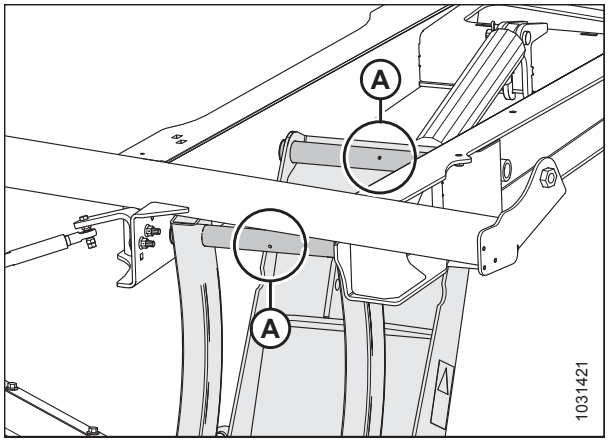


Figure 4.25: Linkage Pivot

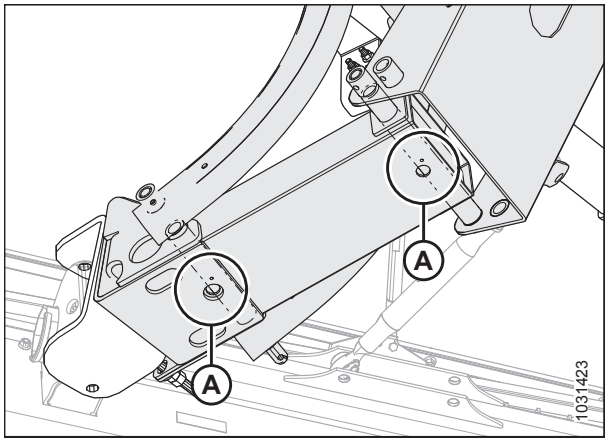
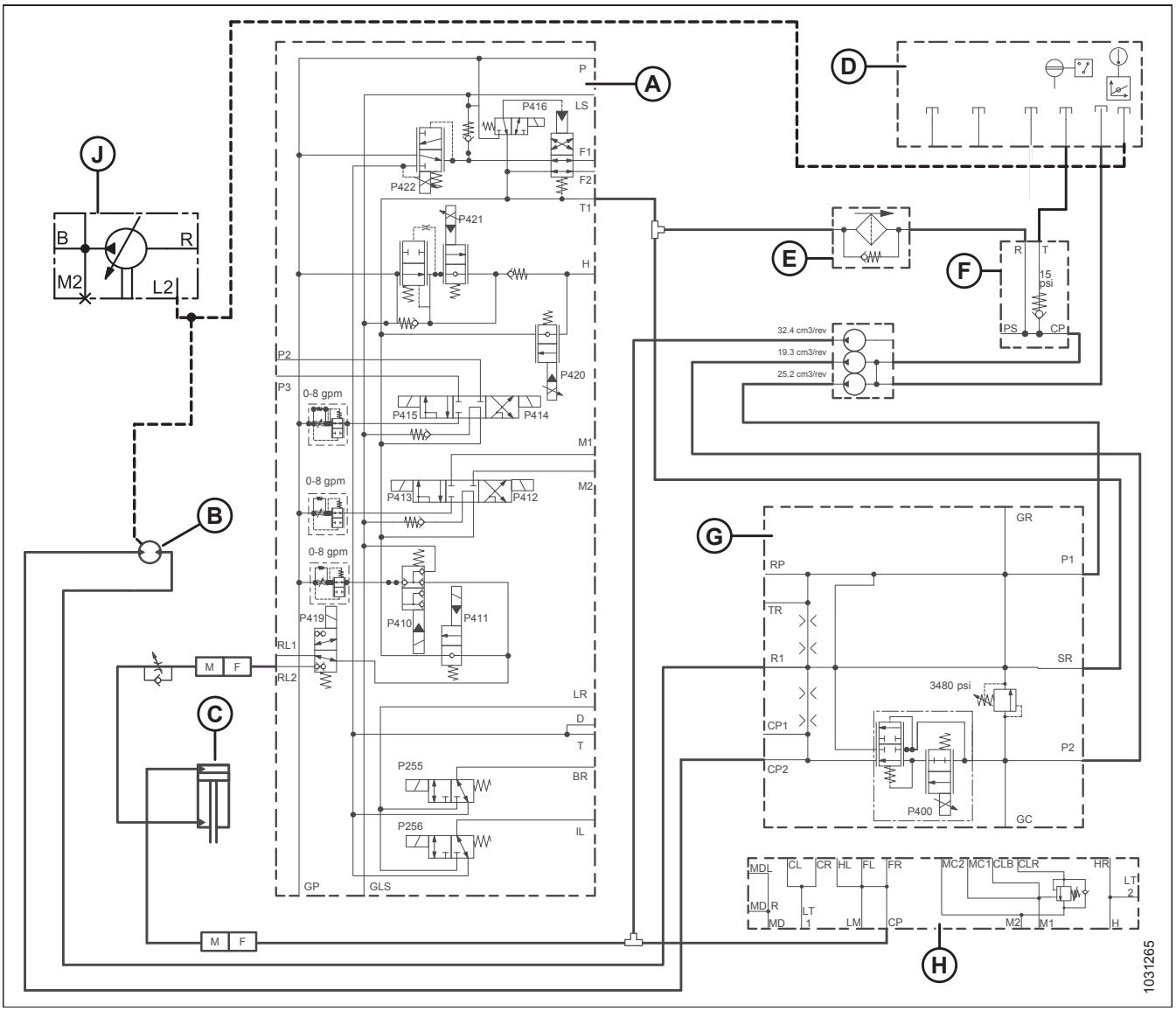


Figure 4.26: Linkage Pivot – Bottom View of DWA

4.3 Hydraulic Schematic – Double Windrow Attachment (DWA) on M1170

For detailed hydraulic schematics, contact your MacDon dealer.

Figure 4.27: DWA Hydraulic Schematic – M1170

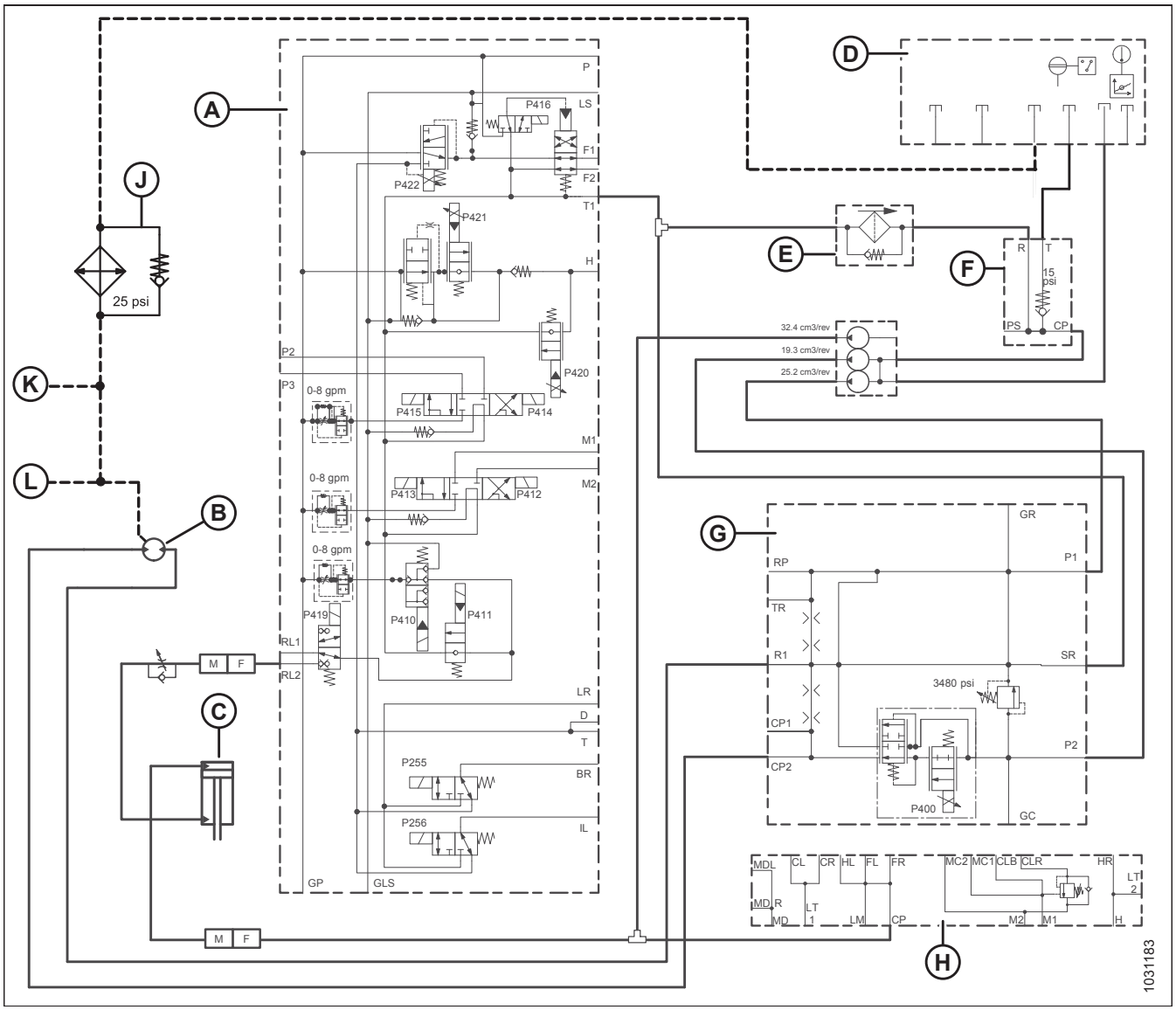


A - Lift Manifold
B - DWA Drive Motor
C - DWA Lift Cylinder
D - Hydraulic Tank
E - Hydraulic Filter Element
F - Inlet Manifold
G - Drive Manifold
H - Junction Manifold
J - Lift/Fan Pump

4.4 Hydraulic Schematic – Double Windrow Attachment (DWA) on M1240

For detailed hydraulic schematics, contact your MacDon dealer.

Figure 4.28: DWA Hydraulic Schematic – M1240



A - Lift Manifold
B - DWA Drive Motor
C - DWA Lift Cylinder
D - Hydraulic Tank
E - Hydraulic Filter Element
F - Inlet Manifold
G - Drive Manifold
H - Junction Manifold
J - Case Drain Cooler
K - From Header Drive Pump
L - From Disc Motor Case Drain

4.5 Double Windrow Attachment Proximity Switch

Double Windrow Attachment (DWA) proximity switch (A) information:

Magnetic reed switch:

- Normally open
- Temperature range: -40°C to 105°C (-40°F to 221°F)
- Maximum voltage: 100 VAC/VDC
- Maximum current: 300 mA DC

Deutsch DTM04-2P Connector:

- Pin 1 power: connects to C24A (B)
  (12V+ Sensors EXT MOD - CH) — pin 26 on chassis extension module
- Pin 2 switched output signal: connects to C24A (B)
  pin 22 on chassis extension module (C)

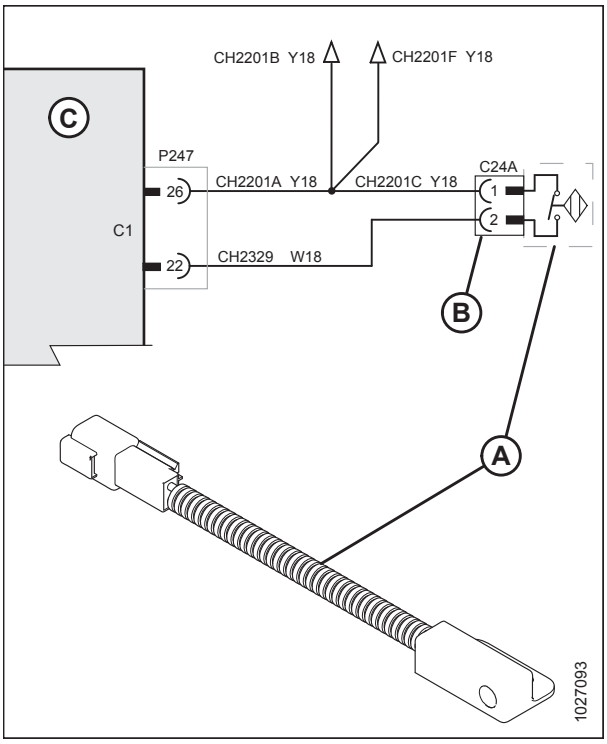


Figure 4.29: Proximity Switch – MD #200974

Chapter 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.

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

5.1 Abbreviations

A/R – as required (quantity varies)	ASSY – assembly	BHRN – button head rib neck
BV – ball valve	CCW – counterclockwise	CON – conical (spring washer)
CSK – countersink	C/W – complete with	CW – clockwise
DBLE – double	DK – double knife	DR – double reel
DT – distorted thread	FLG – flange	GA – gauge
GR – grade	GS – grass seed	HD – head
HDR – header	HFA – hydraulic fore-aft	HH – hex head
HNBR – hydrogenated nitrile butadiene rubber	HYD – hydraulic	I.D. – inside diameter
IP – internal plus (torx plus)	KP – knife pressure	KR – knife return
LG – long	LH – left hand (determined from Operator's position, facing forward)	LK – lock
MACH – machine	MD – MacDon	MFA – manual fore-aft
MY – model year	NC – national coarse thread	NF – national fine thread
NSS – not sold separately	NT – narrow transport	O.D. – outside diameter
OPT – optional	PO – pilot operated	PT – pull-type (mower conditioner)
RC – roller chain	REF – reference, part number called up elsewhere in catalog	REG – regular
RH – right hand (determined from Operator's position, facing forward)	RHSN – round head, square neck or square neck carriage bolt	RHSSN – round head, short, square neck
RTD – rotating tine drum	SAE – Society of Automotive Engineers (part produced to comply with)	SD – side draper
SER – serrated	SK – single knife	SKT HD – socket head
SMTH – smooth	SMV – slow moving vehicle	SOCK – socket
SP – self-propelled (windrower) header	SPCL – special	SPH – spherical
SPI – serrations per inch (knife Sections)	SR – single reel	STL – steel (stainless)
STR – standard	STVR – Stover	TFL – thread full length
THD – thread		UCA – upper cross auger
UDK – untimed double knife	UNC – unified coarse thread	UNEF – unified extra fine thread
UNF – unified fine thread	UNS – unified special thread series	VK – veritcal knife
WF – wide frame	ZP – zinc plated	

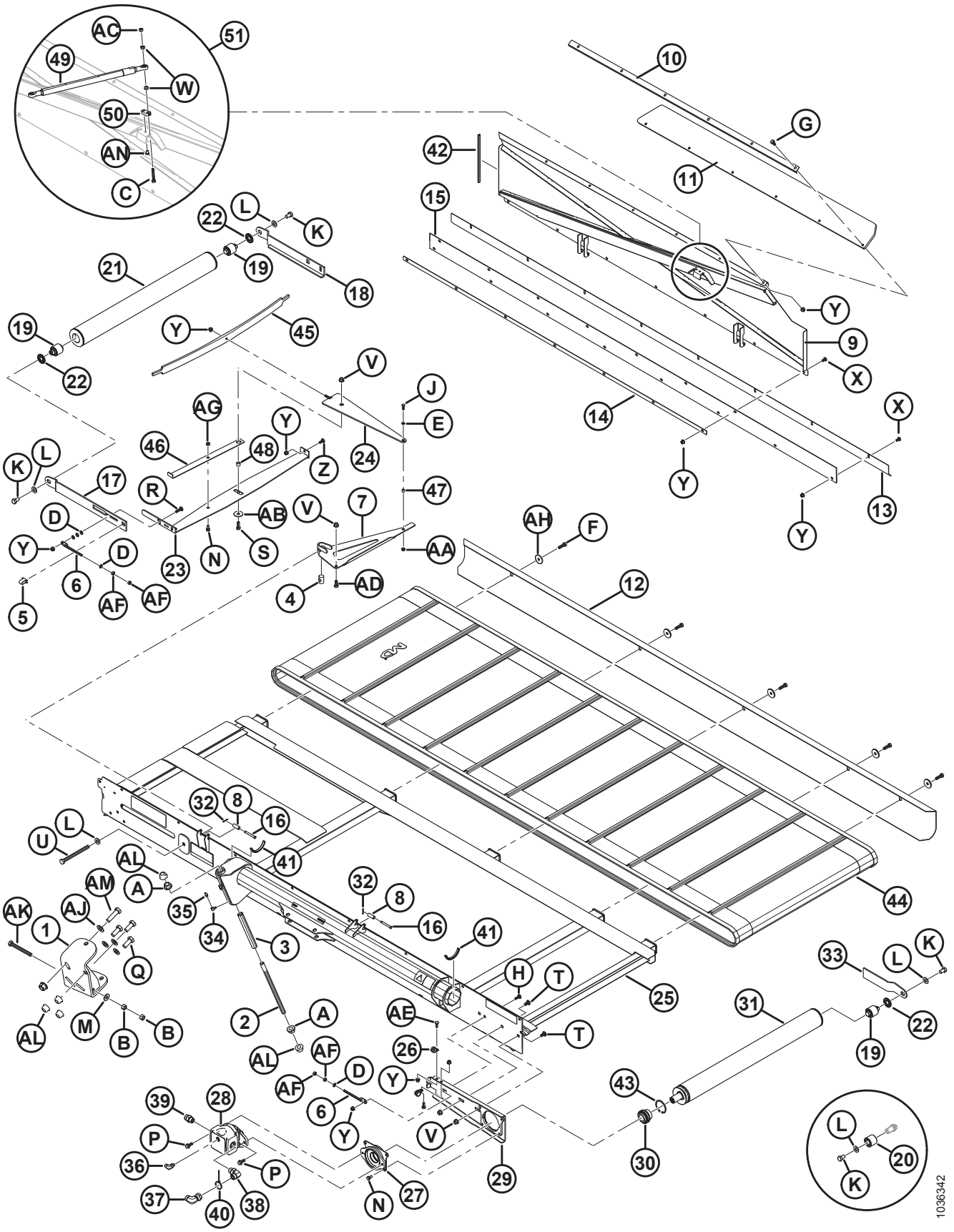
5.2 Serial Number Breaks

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

Example:

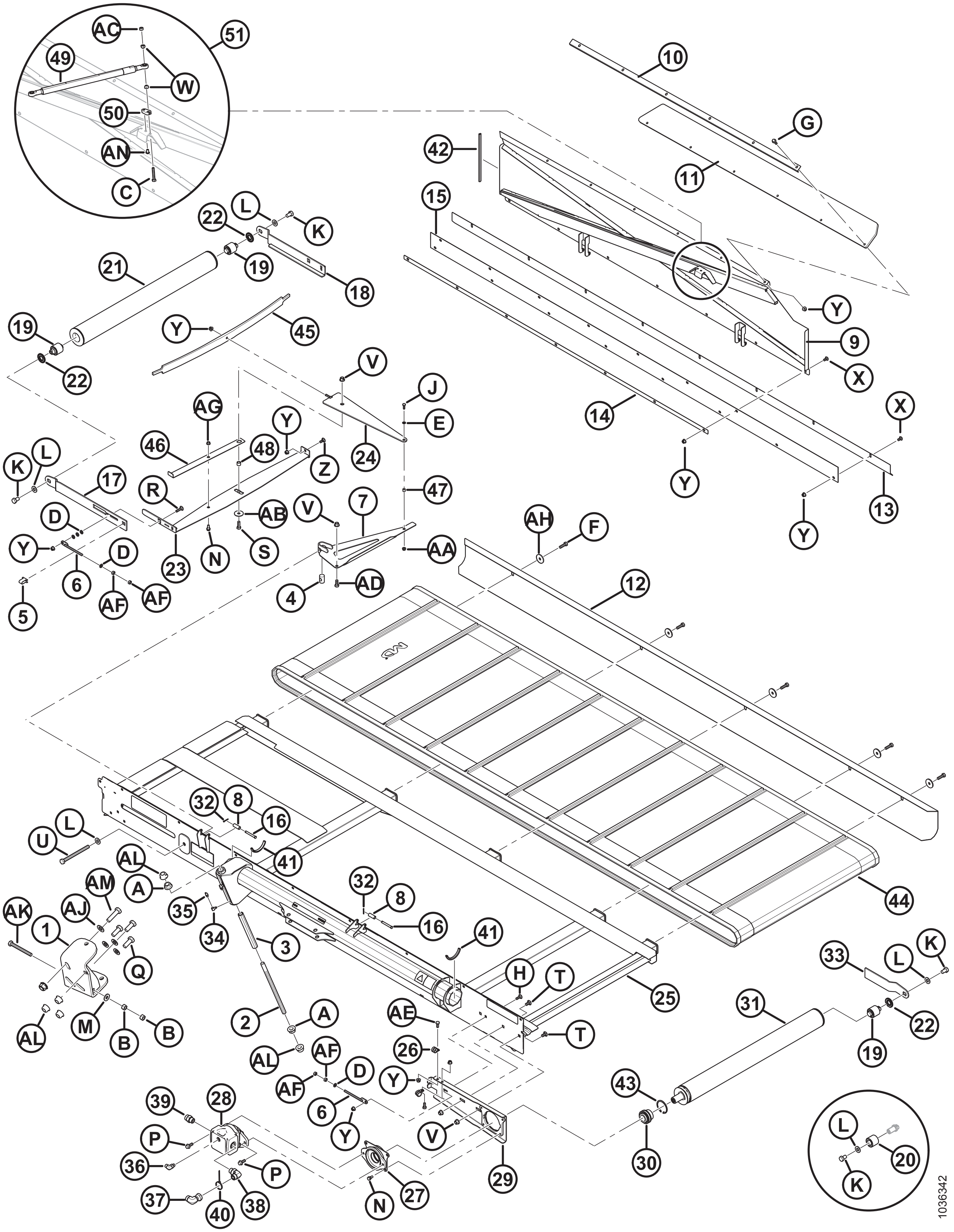
- –162249 Used on machines up to and including serial number 166249
- 166250– Used on machines including and after serial number 166250

5.3 Deck, Draper, and Rollers



Ref	Part Number	Description	Qty	Serial Number
1	176591	CLEVIS – WELDMENT	1	
2	176583	ROD – THREADED M20 X 2.5 X 385-8.8-A3L	1	
3	176582	BUSHING – MACHINED	1	
4	275758	NUT – SPECIAL	1	
5	275232	SUPPORT – ADJUSTER SCREW	1	
6	227914	BOLT – ADJUSTER WELDMENT	2	
7	220181	BELL CRANK WELDMENT	1	
8	176862	SPACER	2	
9	176852	PANEL – REAR, DECAL [3]	1	
10	176839	FLANGE	1	
11	176838	SHIELD – DUST	1	
12	176817	CHANNEL – DECAL ASSEMBLY, SKID [4]	1	
13	176663	DEFLECTOR – SEAL	1	
14	176589	BAR – STIFFENER	1	
15	176588	SEAL – BACKSHEET	1	
16	13249	PIN – CLEVIS	2	
17	176587	ARM – SUPPORT REAR	1	
18	176585	ARM – SUPPORT WELDMENT	1	
19	165735	PIN ASSEMBLY – DRAPER ROLLER [5]	3	
20	132607	BEARING – DOUBLE ROW BALL 52 OD X 25 BORE	3	
21	144833	ROLLER – IDLER WELDMENT	1	
22	120845	SEAL – NILOS LSTO STEEL DISK	3	
23	176578	MEMBER – LH STABILIZER WELDMENT	1	
24	176564	MEMBER – COMPRESSION WELDMENT	1	
25	176553	DECK – DECAL ASSEMBLY DWA [6]	1	
26	135709	CLAMP – INSULATED 3/4 IN.	2	
27	176784	HUB – WELDMENT MACHINED	1	

3. Includes back panel adjustment decal (MD #176832). Refer to *5.6 Decals and Reflectors, page 100*.
4. Includes reflectors (MD #115145 and 115147). Refer to *5.6 Decals and Reflectors, page 100*.
5. Includes pin (NSS), bearing (MD #132607), washer (MD #30441), and bolt (MD #145249).
6. Includes decals (MD #176875, 220084, 176767, 166466, 115146). Refer to *5.6 Decals and Reflectors, page 100*.



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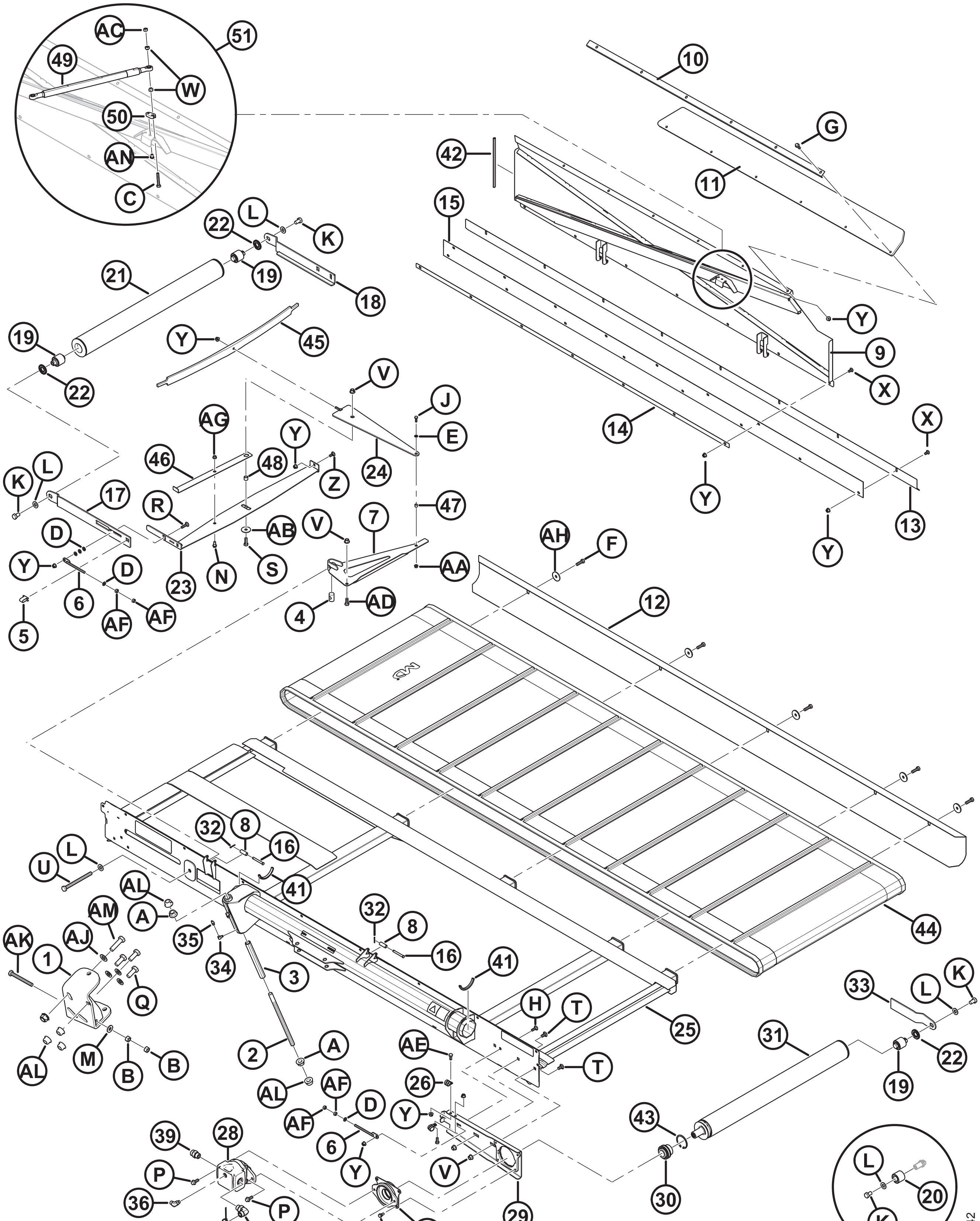
Ref	Part Number	Description	Qty	Serial Number
28	176890	MOTOR – HYDRAULIC	1	
	176845	SEAL – DIRT EXCLUDER (OUTER) [7]		
	176846	SEAL – LIP (INNER) [8]		
	176847	RING – SNAP		
29	176557	ARM – WELDMENT, MOTOR	1	
30	176544	BEARING – BALL CYL OD CW LC	1	
31	176355	ROLLER – DRIVE WELDMENT SPLINE	1	
32	18605	PIN – COTTER 1/8 DIA X 1 ZP	2	
33	144499	ARM – ROLLER SUPPORT	1	
34	50187	FITTING – LUBRICATION 90° ELBOW ADAPTER	2	
35	21194	FITTING – LUBRICATION 90° 1/8 NPT	2	
36	136095	FITTING – ELBOW 90° HYD	1	
37	135888	FITTING – ELBOW 90° HYD	1	
	135868	O-RING – Ø1.78 X Ø18.77		
38	135821	FITTING – ELBOW 90° HYD	1	
	30971	O-RING – Ø2.95 X Ø23.47 [9]		
	135868	O-RING – Ø1.78 X Ø18.77 [10]		
39	135788	FITTING – ADAPTER	1	
	30971	O-RING – Ø2.95 X Ø23.47 [9]		
	135868	O-RING – Ø1.78 X Ø18.77 [10]		
40	40702	FASTENER – CABLE TIE (RED)	1	
41	109791	MOULDING	2	
42	37687	MOULDING	1	
43	38854	RING – INT RETAINING	1	
44	165304	DRAPER – ENDLESS 30FT	1	
45	145548	SPRING – LEAF, TENSIONER	1	
46	145428	INDICATOR	1	
47	132532	SPACER	1	
48	132531	SPACER	1	

7. To be installed with lip facing away from gear.
8. To be installed with lip facing gear.
9. MD #30971 is for the end of the fitting with a size of 1 3/16 - 12 (-12 ORFS).
10. MD #135686 is for the end of the fitting with a size of 1 1/16 - 12 (-12 ORB).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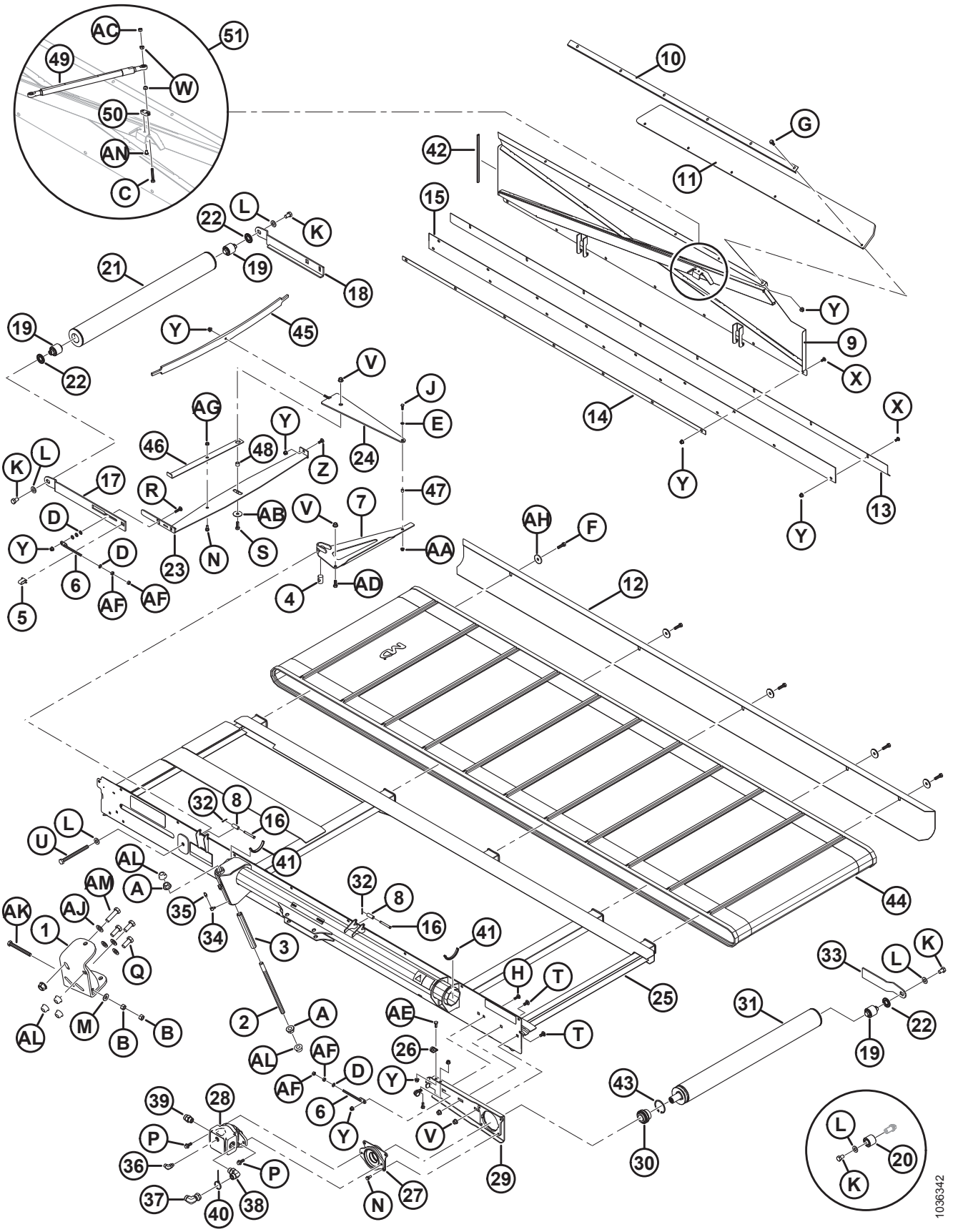
Ref	Part Number	Description	Qty	Serial Number
49	**176733**	**LINK – BALL JOINT**	**1**	
50	**176905**	**PLATE – MACHINED** [11]	**1**	
51	**176910**	**KIT – BACKSHEET LINK** [12]	**A/R**	
A	252476	NUT – HEX SMTH FLG M20 X 2.5-10-AA1J		
B	184699	NUT – HEX M16 X 2-8-AA1J		
C	252270	BOLT – HEX HD TFL M8 X 1.25 X 50-8.8-BO		
D	184711	WASHER – FLAT REG M10-200HV-AA1J		
E	184708	WASHER – FLAT M8-200HV-AA1J		
F	184669	BOLT – HEX HD M12 X 1.75 X 40-8.8-AA1J		
G	184665	BOLT – HEX FLG HD M10 X 1.5 X 30-10.9-AA1J		
H	184662	BOLT – RHSN TFL M10 X 1.5 X 30-8.8-AA1J		
J	184652	BOLT – HEX HD TFL M8 X 1.25 X 25-8.8-AA1J		
K	145249	BOLT – HEX HD TFL 5/8 - 18 X 1.0 GR5 -AA1J		
L	30441	WASHER – HARDENED ASTM F436 5/8		
M	22072	WASHER – FLAT		
N	172259	BOLT – SHOULDER .375-16 UNC - AA1J		
P	148798	BOLT – HEX FLG HD M12 X 1.75 X 30-10.9-AA1J		
Q	136082	BOLT – HEX HD TFL M20 X 2.5 X 50-8.8-AA3L		
R	152732	BOLT – RHSN M10 X 1.5 X 40-8.8-AA1J		
S	152730	BOLT – HEX HD TFL M12 X 1.75 X 35-10.9-AA1J		
T	152439	BOLT – RHSSN M12 X 1.75 X 25-8.8-AA1J		
U	136504	BOLT – HEX HD TFL M16 X 2 X 190-8.8-AA1J		
V	136431	NUT – HEX FLG CTR LOC M12 X 1.75-10		
W	136417	NUT – HEX SPCL M8 X 1.25		
X	136395	SCREW – TORX TRUSS HD M10 X 1.5 X 20 X SPCL-8.8-A3L		
Y	135799	NUT – HEX FLG CTR LOC M10 X 1.5-10		
Z	135785	BOLT – RHSN M10 X 1.5 X 25-8.8-AA1J		

11. Plate may not be included in your model year DWA. It is part of kit MD #176910 which can be purchased to improve to durability of your DWA.
12. Kit provides an improved design to avoid ball joint link from bottoming out. Kit includes ball joint link (MD #176733), machined plate (MD #176905), screw (MD #252292), bolt (MD #252270), two nuts (MD #136417), and nut (MD #30856).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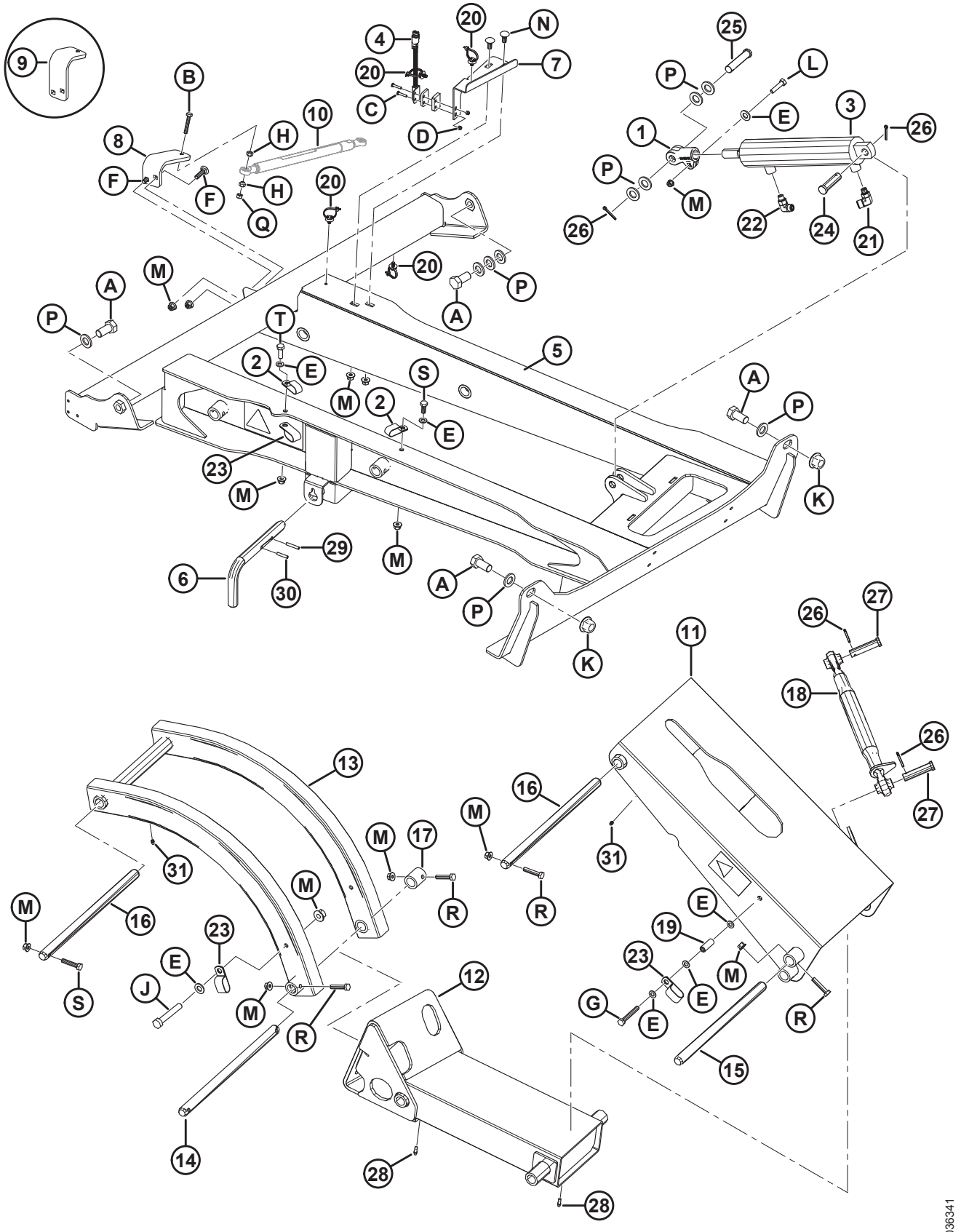
Ref	Part Number	Description	Qty	Serial Number
AA	135337	NUT – HEX FLG CTR LK M8 X 1.25-8-AA1J		
AB	42592	WASHER – FLAT		
AC	30856	NUT – HEX M8 X 1.25-9-AA1J		
AD	30630	BOLT – HEX HD TFL M12 X 1.75 X 30-8.8-A3L		
AE	30627	BOLT – HEX HD TFL M10 X 1.5 X 25-8.8-A3L		
AF	30505	NUT – HEX M10 X 1.5-10-AA1J		
AG	30228	NUT – FLG DT SM FACE 3/8-16 UNC-GR5-AA1J		
AH	11695	WASHER – FLAT		
AJ	136701	WASHER – NORDLOCK M20		
AK	136172	BOLT – HEX HD TFL M16 X 2 X 140-8.8-AA1J		
AL	136122	NUT – HEX FLG CTR LOC M20 X 2.5-10-AA1J		
AM	136157	BOLT – HEX HD M20 X 2.5 X 65-10.9-AA1J		
AN	**252292**	**SCREW – HEX SOC BTN HD M8 X 1.25 X 12-10.9-AA1J** [13]		

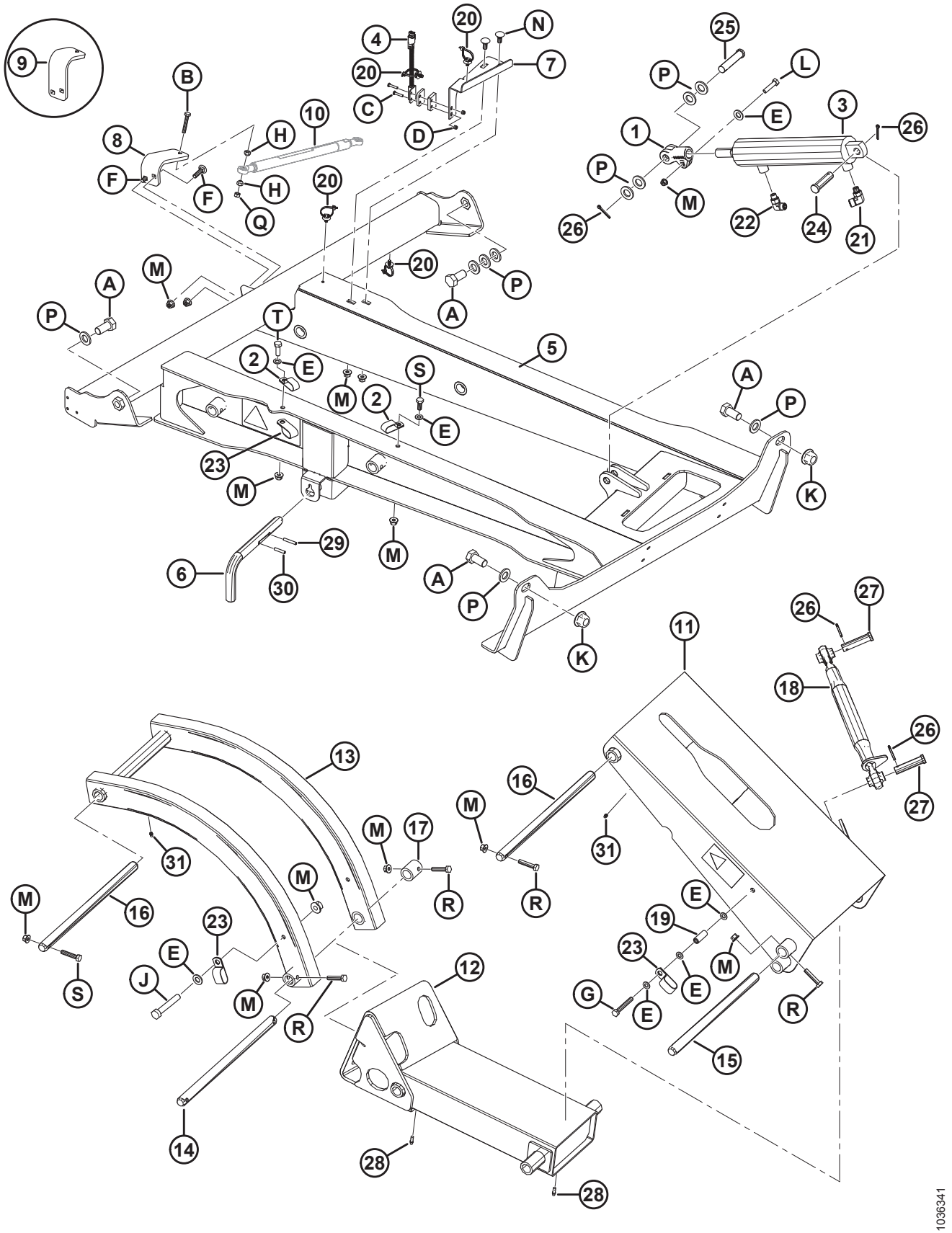
13. Screw may not be included in your model year DWA. It is part of kit MD #176910 which can be purchased to improve to durability of your DWA.

5.4 Linkage and Deck Support



Ref	Part Number	Description	Qty	Serial Number
1	304314	CLEVIS	1	
2	300577	CLAMP – DBL INSULATED 3/4 IN.	2	
3	208966	CYLINDER – HYD	1	
	176031	**SEAL KIT**		
4	200974	SWITCH – PROXIMITY, C/W SPACERS	1	
5	176864	DWA SUPPORT, DECAL ASSY [14]	1	
6	176860	PIN – L	1	
7	176829	SUPPORT – PROXIMITY SENSOR	1	
8	176861	BRACKET – LINKAGE, SHORT (STANDARD)	1	
9	176812	BRACKET – LINKAGE, TALL (OPTION)	1	
10	**REF**	**LINK – BALL JOINT** [15]		
11	176891	ARM – DECAL ASSY [16]	1	
12	176568	ARM – BOTTOM WELDMENT	1	
13	176145	ARM – FRONT WELDMENT	1	
14	176023	SHAFT	1	
15	176018	SHAFT	1	
16	172910	SHAFT	2	
17	172903	TUBE	1	
18	144996	JOINT ASSEMBLY	1	
19	142825	SPACER	1	
20	136655	FASTENER – FIR TREE MT W/ TIE	4	
21	136238	FITTING – ELBOW 90° HYD	1	
22	136095	FITTING – ELBOW 90° HYD	1	
23	103738	CLAMP – PVC INSULATED 13/16 IN. TUBE SIZE	3	
24	30463	PIN – CLEVIS	1	
25	20312	PIN – CLEVIS	1	
26	18648	PIN – COTTER 3/16 DIA X 1.25 ZP	4	
27	18627	PIN – CLEVIS	2	
28	7536	FITTING – LUBRICATION 1/4 28 TAPER THD	2	

14. Includes DWA lift lock decal (MD #176295). Refer to *5.6 Decals and Reflectors, page 100*.
15. For ball joint link, Refer to *5.3 Deck, Draper, and Rollers, page 86*.
16. Includes header position decal (MD #176768) and two pinch point decals (MD #174683). Refer to *5.6 Decals and Reflectors, page 100*.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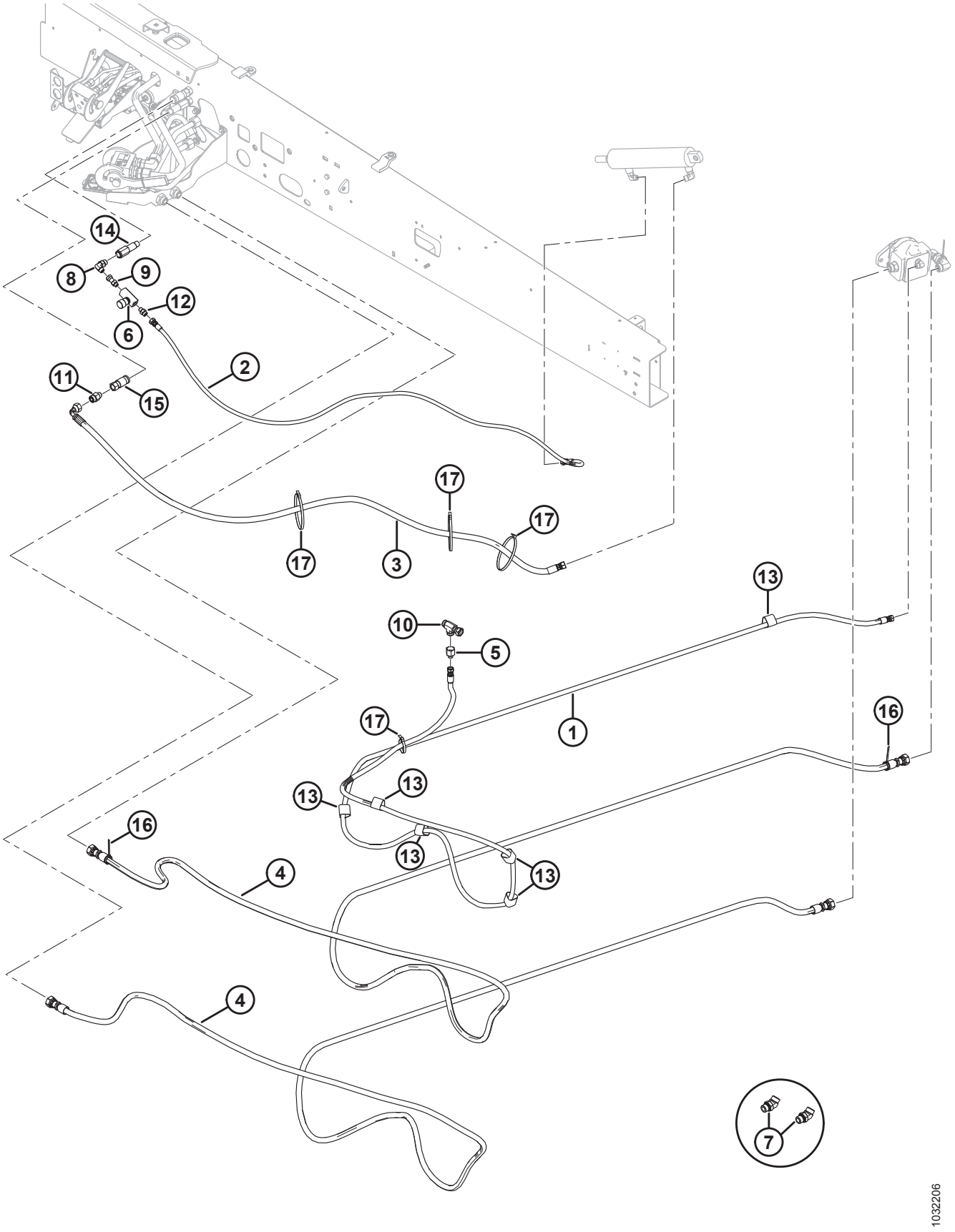
Ref	Part Number	Description	Qty	Serial Number
29	2147	PIN – SPRING 1/4 DIA X 1.5 LG	1	
30	16266	PIN – SPRING 1/4 DIA X 1.25 LG	1	
31	18671	FITTING – LUBRICATION 1/4 28 UNF	2	
A	252303	BOLT – HEX HD TFL M20 X 2.5 X 40-10.9-A3L		
B	252270	BOLT – HEX HD TFL M8 X 1.25 X 50-8.8-BO		
C	252183	SCREW – PAN HD M5 X 0.8 X 25-4.8-AA1J		
D	197230	NUT – HEX NYLOC M5 X 0.8-8-AA1J		
E	184711	WASHER – FLAT REG M10-200HV-AA1J		
F	152732	BOLT – RHSN M10 X 1.5 X 40-8.8-AA1J		
G	184659	BOLT – HEX HD M10 X 1.5 X 75-8.8-AA1J		
H	136417	NUT – HEX SPCL M8 X 1.25		
J	108172	BOLT – HEX HD M10 X 1.5 X 65-8.8-AA1J		
K	136122	NUT – HEX FLG CTR LOC M20 X 2.5-10-AA1J		
L	135319	BOLT – HEX HD M10 X 1.5 X 40-8.8-AA1J		
M	135799	NUT – HEX FLG CTR LOC M10 X 1.5-10		
N	135785	BOLT – RHSN M10 X 1.5 X 25-8.8-AA1J		
P	112130	WASHER – HARD ASTM F436 3/4 IN. NOM. ID AB0C		
Q	30856	NUT – HEX M8 X 1.25-9-AA1J		
R	30629	BOLT – HEX HD M10 X 1.5 X 50-8.8-A3L		
S	30627	BOLT – HEX HD TFL M10 X 1.5 X 25-8.8-A3L		
T	184661	BOLT – HEX HD TFL M10 X 1.5 X 30-8.8-AA1J		

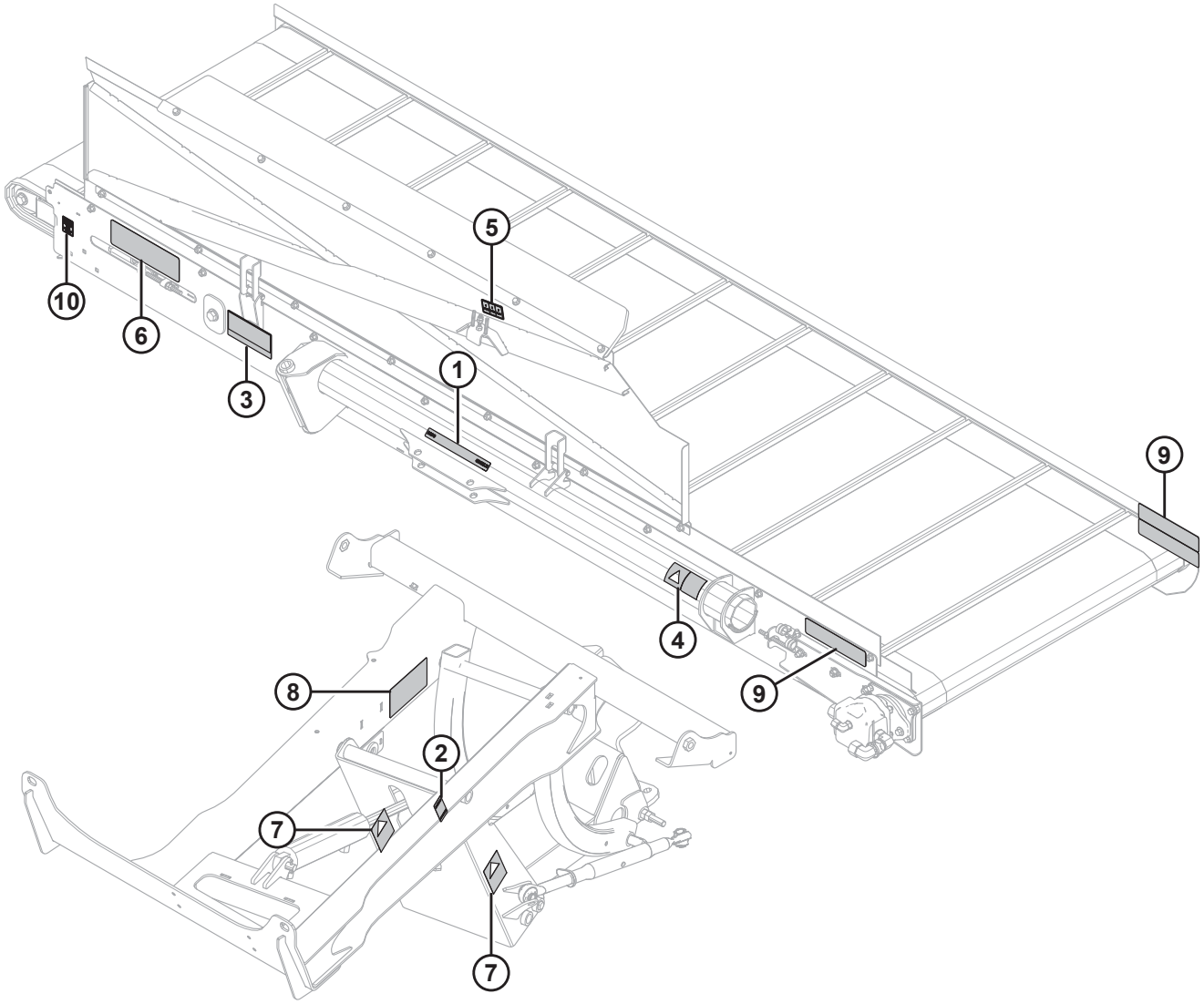
5.5 Hydraulic Hoses

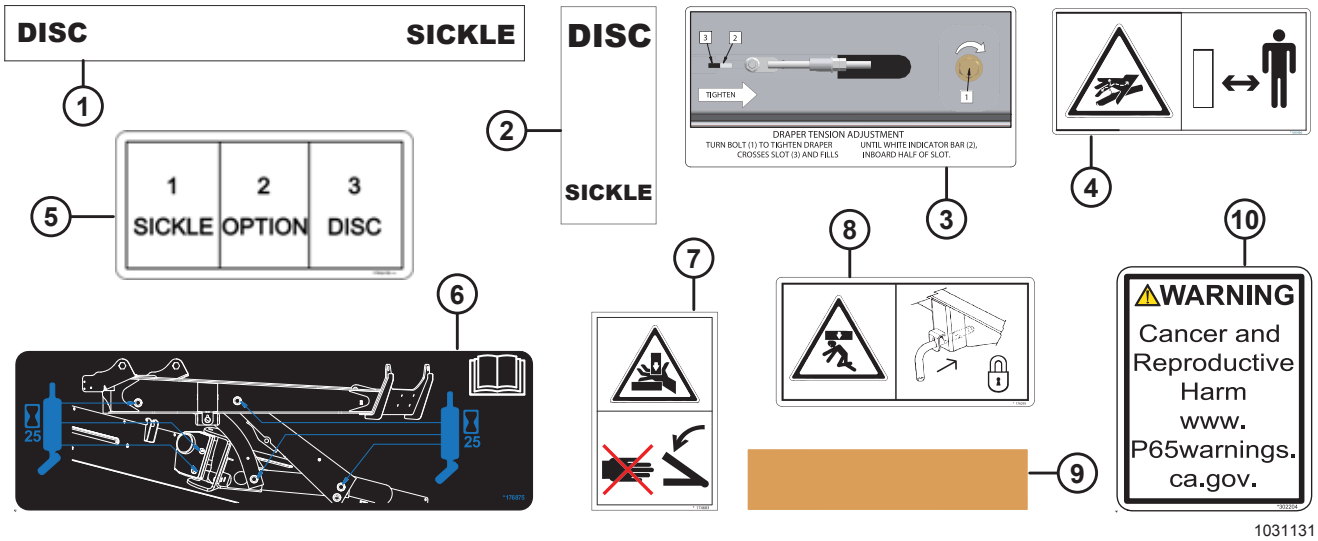


Ref	Part Number	Description	Qty	Serial Number
1	176883	HOSE – CASE DRAIN	1	
2	176498	HOSE – HYDRAULIC	1	
3	176497	HOSE – HYDRAULIC	1	
4	176575	HOSE – HYDRAULIC	2	
5	252893	FITTING – REDUCER HYD	1	
6	183211	VALVE	1	
7	136418	FITTING – ELBOW 45° HYD [17]	2	
	30971	O-RING – Ø2.95 X Ø23.47 [18]		
	135868	O-RING – Ø1.78 X Ø18.77 [19]		
8	136149	FITTING – ELBOW 90° HYD	1	
9	136147	FITTING – CONNECTOR HYD	1	
10	135784	FITTING – TEE HYD	1	
	135867	O-RING Ø1.78 X Ø15.60		
11	135781	FITTING – ADAPTER	1	
12	135778	FITTING – ADAPTER	1	
13	135443	CINCH STRAP 4 IN. LG	6	
14	135386	COUPLER – MALE HYD. 3/8 IN. (FASTER) [20]	1	
	111978	SEAL KIT – FOR 3/8 MALE COUPLER (FASTER)		
15	135312	COUPLER – FEMALE HYD. 3/8 IN. FLAT FACE	1	
16	40702	FASTENER – CABLE TIE (RED)	2	
17	30753	FASTENER – CABLE TIE (BLACK)	4	

17. Used on M1240 Windrowers configured for disc only.
18. MD #30971 is for the end of the fitting with a size of 1 3/16 - 12 (-12 ORFS).
19. MD #135686 is for the end of the fitting with a size of 1 1/16 - 12 (-12 ORB).
20. Faster coupler (MD #135386) is interchangeable with Parker Hannifin coupler (NSS). Seal kit (MD #111978) is only intended for Faster coupler and cannot be used with Parker Hannifin coupler. Length can be used to differentiate the two couplers; Faster coupler = 101 mm and Parker Hannifin coupler = 84 mm.

5.6 Decals and Reflectors





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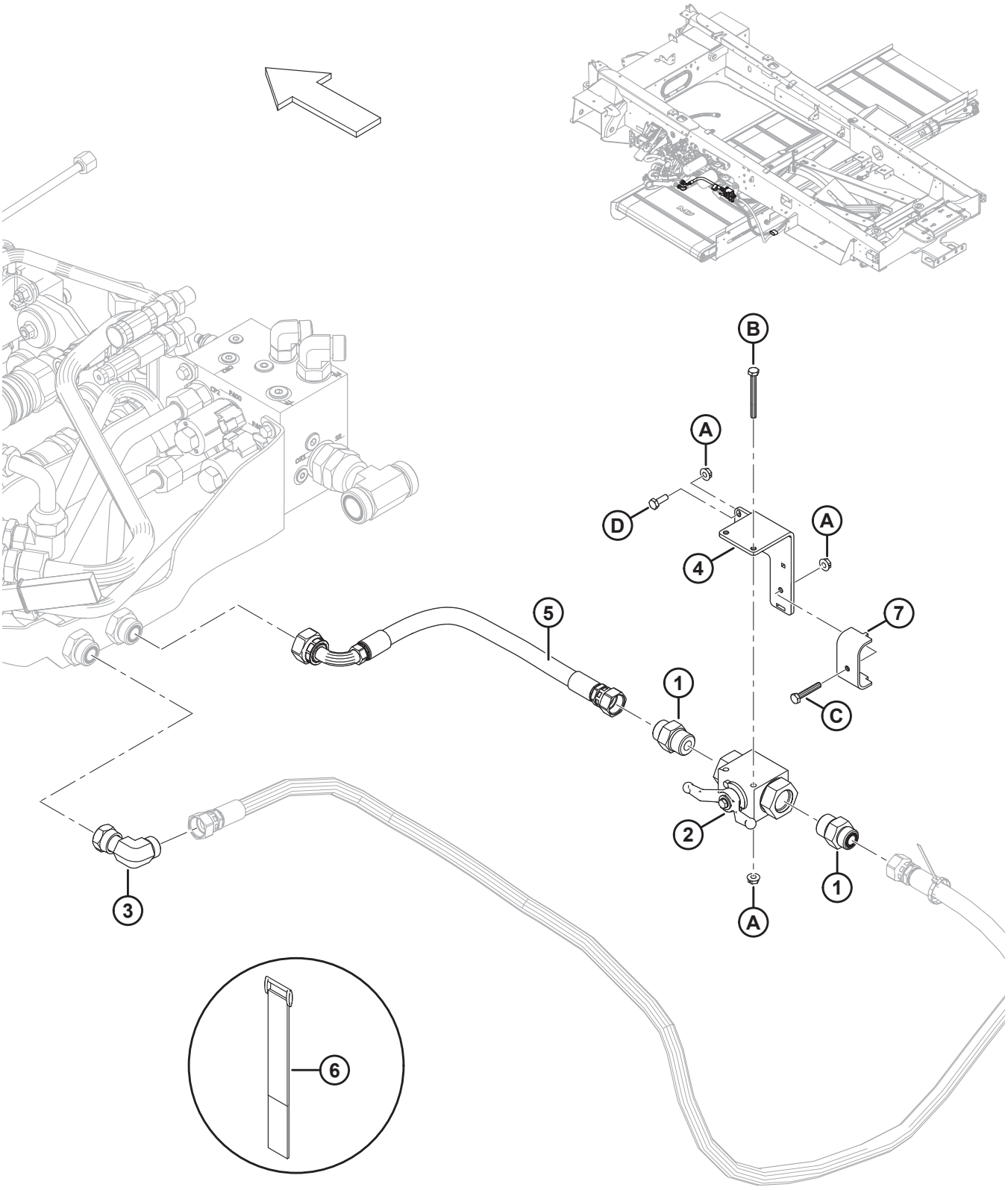
Ref	Part Number	Description	Qty	Serial Number
1	176767	DECAL – HEADER POSITION, HORIZONTAL		
2	176768	DECAL – HEADER POSITION, VERTICAL		
3	220084	DECAL – DRAPER TENSION		
4	166466	DECAL – WARNING, HIGH PRESSURE HYDRAULICS		
5	176832	DECAL – BACK PANEL ADJUSTMENT		
6	176875	DECAL – MASTER GREASE		
7	174683	DECAL – WARNING DWA LINKAGE PINCH POINT		
8	176295	DECAL – DECK LIFT LOCK		
9	115145	REFLECTOR – FLUORESCENT RED-ORANGE		
	115146	REFLECTOR – AMBER		
	115147	REFLECTOR – RED		
10	302204	DECAL – CA PROPOSITION 65		

(Option) DWA Shut-Off Kit



(OPTION) DWA SHUT-OFF KIT

Ref	Part Number	Description	Qty	Serial Number
	299704	**KIT – M1 DWA SHUT-OFF** [21]		
1	**135786**	**FITTING – ADAPTER**	**2**	
	30971	**O-RING – #12 ORB**		
	135867	**O-RING – #10 ORFS**		
2	**294263**	**VALVE – BALL**	**1**	
3	**136846**	**FITTING – SWIVEL 90 DEG HYD 10-10**	**1**	
4	**299820**	**BRACKET – BV MOUNT, DWA**	**1**	
5	**299822**	**HOSE – HYD, 100R17, 0.5 IN. DIA, 430 MM LG**	**1**	
6	**135444**	**FASTENER – CINCH STRAP 6 IN. LG**	**2**	
7	**299898**	**HOLDER – HOSES**	**1**	
A	**135248**	**NUT – HEX FLG CTR LOC**		
B	**21854**	**BOLT – HEX HD 1/4 NC X 2.5 LG GR 5 ZP**		
C	**21574**	**BOLT – HEX HD 1/4 NC X 1.5 LG GR 5 ZP**		
D	**21566**	**BOLT – HEX HD 1/4 NC X 0.75 LG GR 5 ZP**		

21. Includes all listed parts and instructions.

Chapter 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

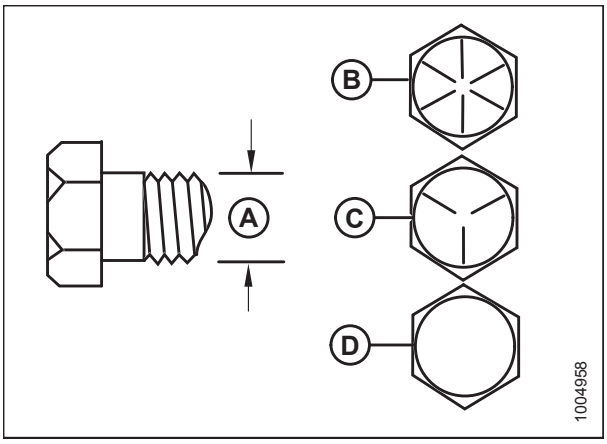


Figure 6.1: Bolt Grades

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

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

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

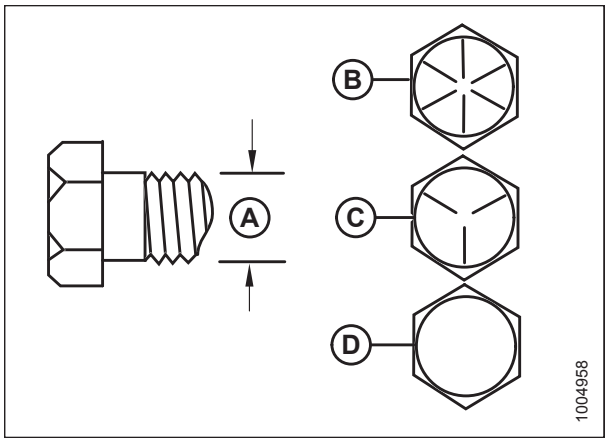


Figure 6.2: Bolt Grades

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

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

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

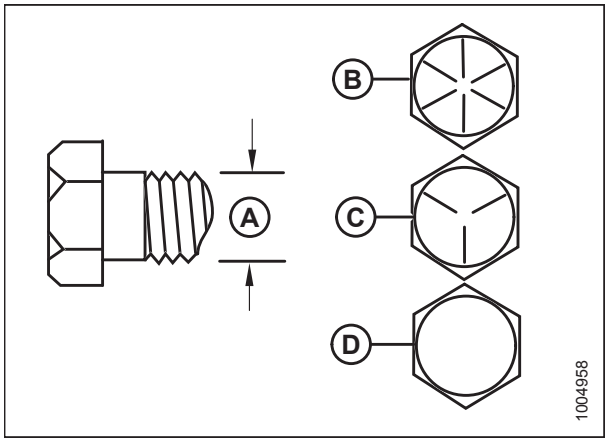


Figure 6.3: Bolt Grades

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

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

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

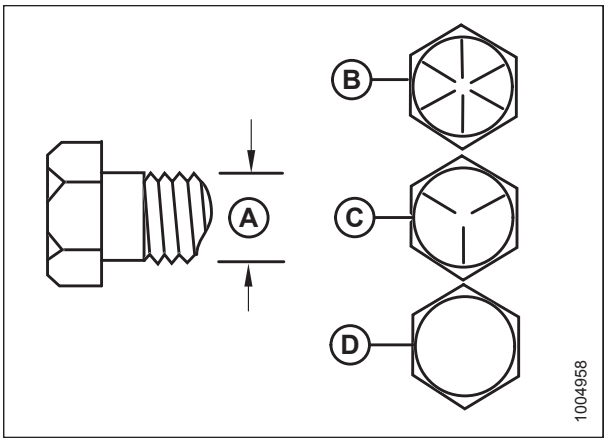


Figure 6.4: Bolt Grades

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

6.1.2 Metric Bolt Specifications

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

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

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

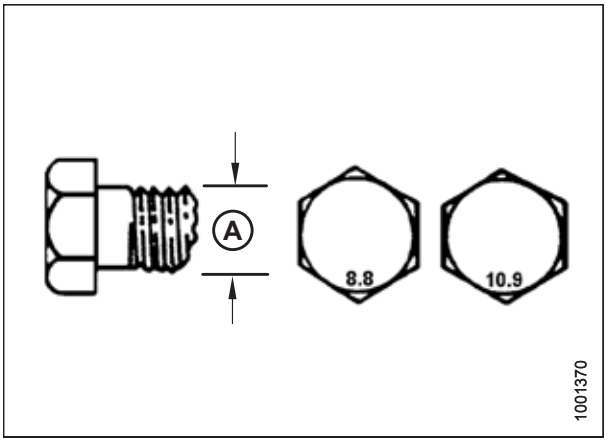


Figure 6.5: Bolt Grades

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

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

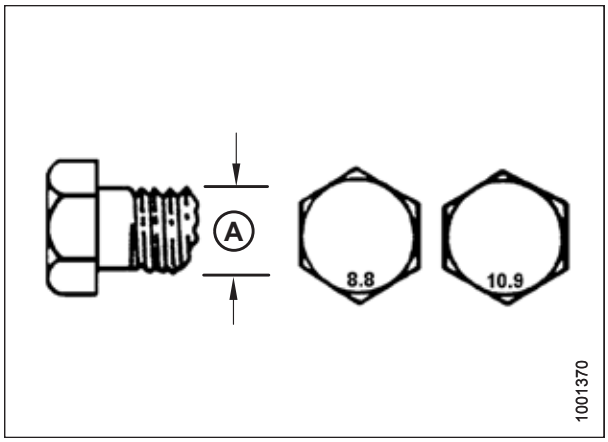


Figure 6.6: Bolt Grades

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

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

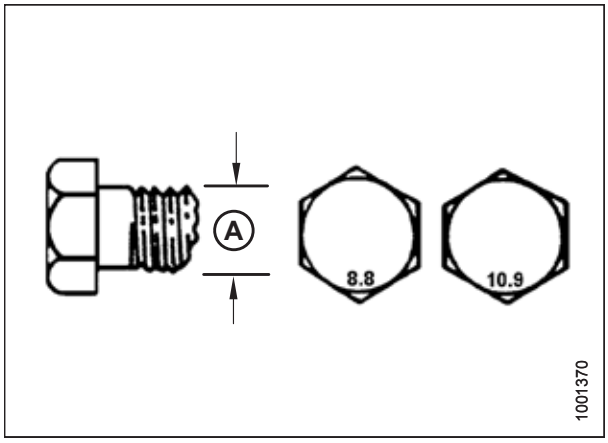


Figure 6.7: Bolt Grades

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

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

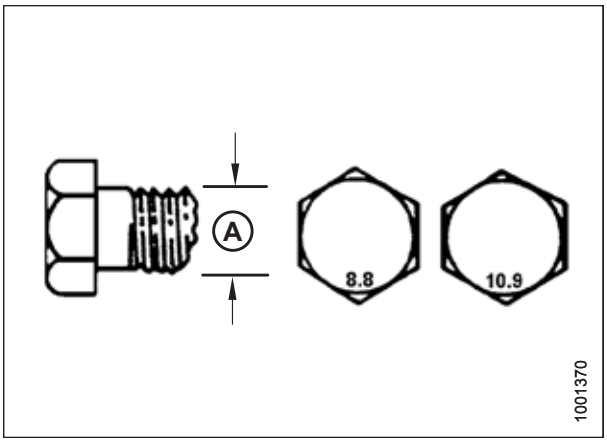


Figure 6.8: Bolt Grades

6.1.3 Metric Bolt Specifications Bolting into Cast Aluminum

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

Table 6.9 Metric Bolt Bolting into Cast Aluminum

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

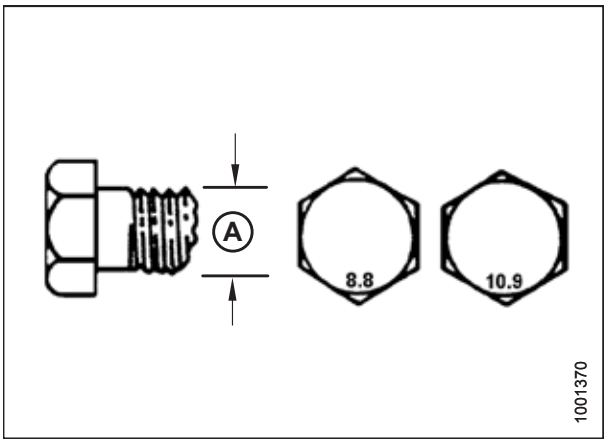


Figure 6.9: Bolt Grades

6.1.4 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 110*.
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.

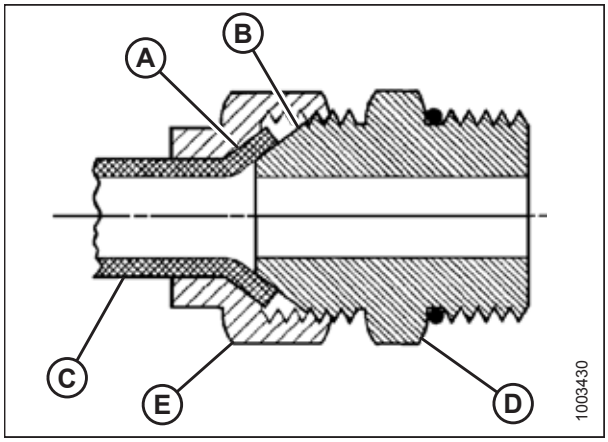


Figure 6.10: Hydraulic Fitting

Table 6.10 Flare-Type Hydraulic Tube Fittings

SAE Dash Size	Thread Size (in.)	Torque Value[22]		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

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

6.1.5 O-Ring Boss Hydraulic Fittings – Adjustable

Torque values are shown in following table below.

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

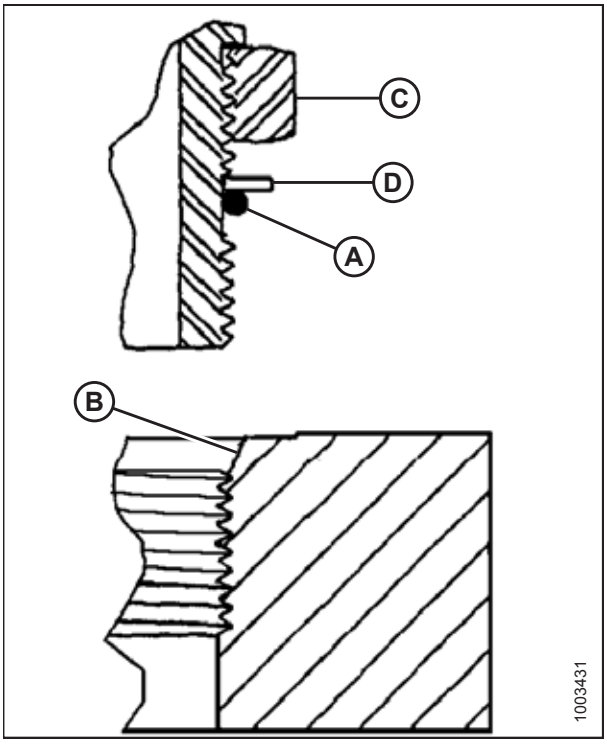


Figure 6.11: Hydraulic Fitting

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

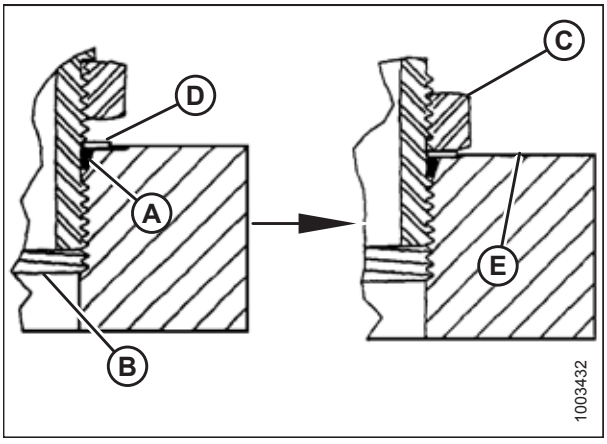


Figure 6.12: Hydraulic Fitting

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

SAE Dash Size	Thread Size (in.)	Torque Value[23]	
		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

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

6.1.6 O-Ring Boss Hydraulic Fittings – Non-Adjustable

Torque values are shown in following table below.

1. Inspect O-ring (A) and seat (B) for dirt or obvious defects.
2. Check that O-ring (A) is **NOT** on the threads and adjust if necessary.
3. Apply hydraulic system oil to the O-ring.
4. Install fitting (C) into port until the fitting is hand-tight.
5. Torque fitting (C) according to values in Table *6.12, page 113*.
6. Check the final condition of the fitting.

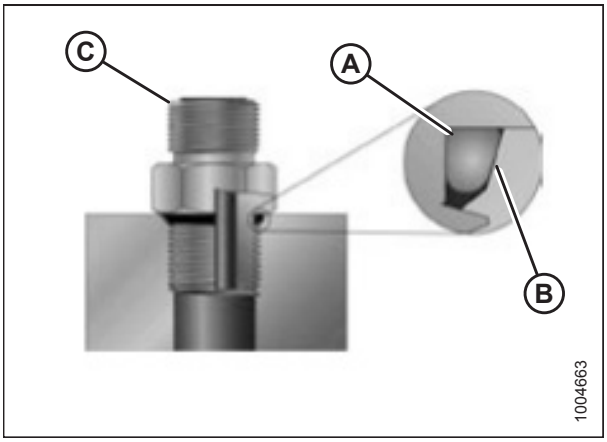


Figure 6.13: Hydraulic Fitting

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

SAE Dash Size	Thread Size (in.)	Torque Value[24]	
		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

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

6.1.7 O-Ring Face Seal Hydraulic Fittings

Torque values are shown in following table below.

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

Figure 6.14: Hydraulic Fitting

2. Apply hydraulic system oil to O-ring (B).
3. Align the tube or hose assembly so that the flat face of sleeve (A) or (C) comes in full contact with O-ring (B).
4. Thread tube or hose nut (D) until it is hand-tight. The nut should turn freely until it is bottomed out.
5. Torque the fittings according to values in Table *6.13, page 114*.

   NOTE:

   If applicable, hold the hex on fitting body (E) to prevent the rotation of fitting body and the hose when tightening fitting nut (D).
6. Use three wrenches when assembling unions or joining two hoses together.
7. Check the final condition of the fitting.

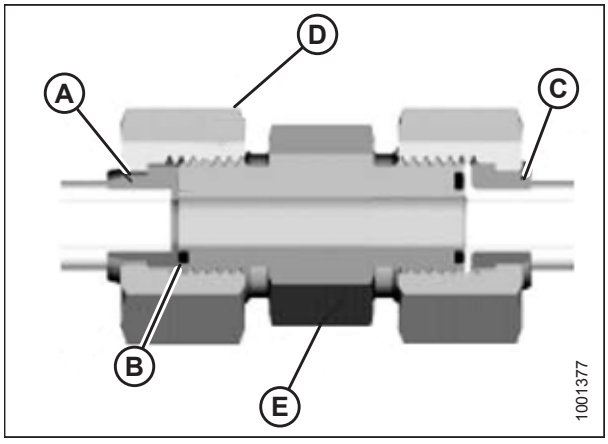


Figure 6.15: Hydraulic Fitting

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

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value[25]	
			Nm	lbf·ft
-3	Note[26]	3/16	–	–
-4	9/16	1/4	25–28	18–21
-5	Note[26]	5/16	–	–
-6	11/16	3/8	40–44	29–32
-8	13/16	1/2	55–61	41–45

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

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

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value[27]	
			Nm	lbf·ft
-10	1	5/8	80–88	59–65
-12	1 3/16	3/4	115–127	85–94
-14	Note[26]	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

Torque values are shown in following table below.

Assemble pipe fittings as follows:

1. Check components to ensure that the fitting and port threads are free of burrs, nicks, scratches, and any form of contamination.
2. Apply pipe thread sealant (paste type) to the external pipe threads.
3. Thread the fitting into the port until it is hand-tight.
4. Torque the connector to the appropriate torque angle. The turns from finger tight (TFFT) and flats from finger tight (FFFT) values are shown in Table *6.14, page 115*. Make sure that the tube end of a shaped connector (typically 45° or 90°) is aligned to receive the incoming tube or hose assembly. Always finish alignment of fitting in the direction of tightening. Never back off (loosen) the pipe threaded connectors to achieve alignment.
5. Clean all the residue and any excess thread conditioner with an appropriate cleaner.
6. Assess the final condition of the fitting. Pay special attention to the possibility of cracks to port opening.
7. Mark the final position of the fitting. If a fitting leaks, disassemble the fitting and check it for damage.

   NOTE:

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

Table 6.14 Hydraulic Fitting Pipe Thread

Tapered Pipe Thread Size	Recommended TFFT	Recommended FFFT
1/8–27	2–3	12–18
1/4–18	2–3	12–18
3/8–18	2–3	12–18
1/2–14	2–3	12–18
3/4–14	1.5–2.5	12–18

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

Table 6.14 Hydraulic Fitting Pipe Thread (continued)

Tapered Pipe Thread Size	Recommended TFFT	Recommended FFFT
1–11 1/2	1.5–2.5	9–15
1 1/4–11 1/2	1.5–2.5	9–15
1 1/2–11 1/2	1.5–2.5	9–15
2–11 1/2	1.5–2.5	9–15

6.2 Conversion Chart

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

Table 6.15 Conversion Chart

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

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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.	*6.1 Torque Specifications, page 105*
	Check that all shipping stands have been removed.	*2.5 Installing the Deck, page 27*
	Check and adjust front skid to correct height above the draper. Tighten securing nuts.	*4.1.5 Adjusting Front Skid, page 71*
	Check and adjust rear deflector to correct height above the draper. Tighten securing nuts.	*4.1.6 Adjusting Rear Deflector, page 72*
	Check external draper roller seal condition. Seal should be secure and without gaps.	*4.1.7 Maintaining Draper Rollers, page 72*
	Check that draper pivot points are properly greased.	*4.2 Greasing the DWA, page 78*

DWA Serial Number:

Date Checked: **Checked by:**

Recommended Lubricants

WARNING

To avoid injury or death, do NOT allow ANY machine fluids to enter the body.

Table: System Capacities

Lubricant/Fluid	Location	Description	Capacity
Grease	Deck pivots	SAE multi-purpose high temperature extreme pressure (EP2) performance with 1.5–5 % max molybdenum disulphide (NLGI Grade 2) lithium base	As required unless otherwise specified
Grease	Linkage pivots	SAE multi-purpose high temperature extreme pressure (EP2) performance with 1.5–5 % max molybdenum disulphide (NLGI Grade 2) lithium base	As required unless otherwise specified
Grease	Draper drive roller bearing	SAE multi-purpose high temperature extreme pressure (EP2) performance with 0–1 % max molybdenum disulphide (NLGI Grade 2) lithium base	As required unless otherwise specified
Grease	Draper idler roller bearing	SAE multi-purpose high temperature extreme pressure (EP2) performance with 0–1 % max molybdenum disulphide (NLGI Grade 2) lithium base	As required unless otherwise specified

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