

M1170 Windrower

Unloading and Assembly Instructions (North America)

215981 Revision A

Original Instruction

M1170 Windrower, featuring Dual Direction® and CrossFlex™ rear suspension



1016391

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Introduction

This manual contains unloading, assembly, and predelivery information for the MacDon M1170 Windrower. When paired with one of MacDon's A40DX, R1 SP Series, R2 SP Series, D1X Series, or D1XL Series Headers, this windrower ably cuts and lays a variety of grain, hay, and specialty crops in windrows.

The M1170 Windrower features Dual Direction® capability, meaning that it can be driven in cab-forward or engine-forward mode.

The designations right and left are determined by which direction the Operator is facing. The Operator is considered to be looking cab-forward when they are facing the drive wheels, and engine-forward when facing the engine. This manual uses the terms right cab-forward, left cab-forward, right engine-forward, and left engine-forward to refer to specific locations on the machine.

The windrower's ignition keys should have been bundled with the shipping documents. They are used to start the engine and to lock the cab doors and tool box compartment.

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).

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

This document is currently available in English only.

Summary of Changes

The following list provides an account of major changes from the previous version of this document.

Section	Summary of Change	Internal Use Only
<i>1.1 Safety Alert Symbols, page 1</i>	Added topic.	Technical Publications
<i>1.4 Hydraulic Safety, page 5</i>	Added topic.	Technical Publications
<i>4.1.7 Checking And Adding Engine Coolant, page 48</i>	Revised title and added steps for adding coolant if necessary.	Technical Publications
<i>4.2.1 Checking Operating Safety System, page 60</i>	Moved this topic to the Performing Operational Checks section because it must happen after the engine is started.	Technical Publications
<i>Attaching Forming Shield, page 90</i>	Added topic.	Technical Publications
<i>Attaching Forming Shield, page 104</i>	Added topic.	Technical Publications
<i>6.1 Navigating Harvest Performance Tracker, page 133</i>	Moved topic to the Reference chapter.	Technical Publications
<i>6.2 Lubricants, Fluids, and System Capacities, page 135</i>	Revised coolant specification. Coolant must NOT contain	ECN 62224
<i>6.4 Coolant Specifications, page 137</i>	Added topic.	ECN 62224

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Chapter 1: Safety

Understanding and consistently following these safety procedures will help to ensure the safety of those operating the machine and of bystanders.

1.1 Safety Alert Symbols

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

This symbol means:

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

Carefully read and follow the safety message accompanying this symbol.

Why is safety important to you?

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



Figure 1.1: Safety Symbol

1.2 Signal Words

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

Signal words are selected using the following guidelines:



DANGER

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



WARNING

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



CAUTION

Indicates a potentially hazardous situation that, if it is not prevented, may result in minor or moderate injury. It may also be used to alert you to unsafe practices.

IMPORTANT:

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

NOTE:

Provides additional information or advice.

1.3 General Safety

Protect yourself when assembling, operating, and servicing machinery.

CAUTION

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

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

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

In addition, take the following precautions:

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



Figure 1.2: Safety Equipment



Figure 1.3: Safety Equipment

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

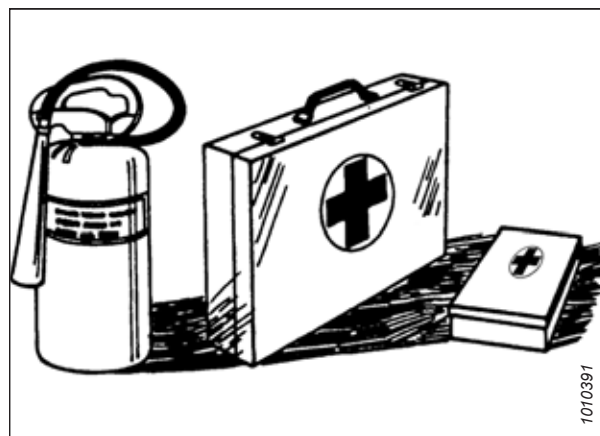


Figure 1.4: Safety Equipment

SAFETY

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



Figure 1.5: Safety around Equipment

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

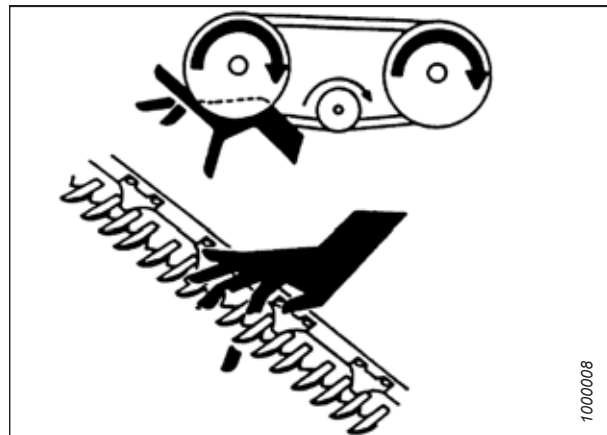


Figure 1.6: Safety around Equipment

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



Figure 1.7: Safety around Equipment

1.4 Hydraulic Safety

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

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

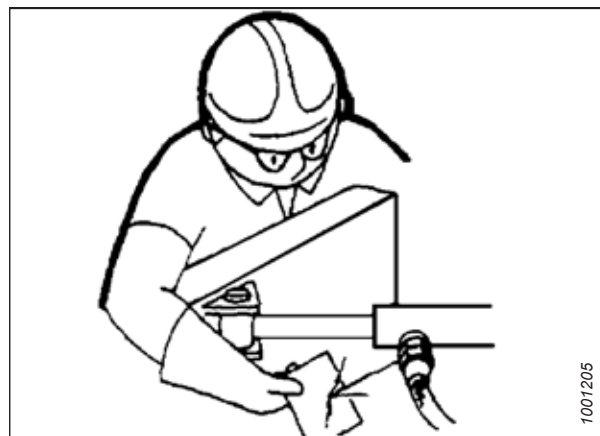


Figure 1.8: Testing for Hydraulic Leaks

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



Figure 1.9: Hydraulic Pressure Hazard

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

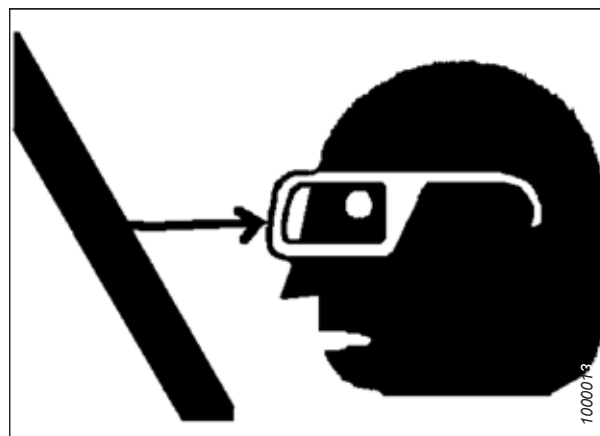


Figure 1.10: Safety around Equipment

1.5 Tire Safety

Understand the risks of handling tires before performing maintenance tasks.

WARNING

- A tire can explode during inflation, causing serious injury or death.
- Follow the proper procedures when mounting a tire. Failure to do so can produce an explosion, causing serious injury or death.



Figure 1.11: Overinflated Tire

WARNING

- Do NOT remove, install, or repair a tire on a rim unless you have the proper equipment and experience to perform the task. Take the tire and rim to a qualified tire repair shop if necessary.
- Ensure that the tire is correctly seated on the rim before inflating it. 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 the area.
- Do NOT stand over the tire when inflating it. Use a clip-on chuck and extension hose when inflating a tire.
- Do NOT exceed the maximum inflation pressure indicated on the tire label.
- Never use force on an inflated or partially-inflated tire.
- Ensure that all air is removed from the tire before removing the tire from the rim.
- Never weld a wheel rim.
- Replace tires that have defects. Replace wheel rims that are cracked, worn, or severely rusted.



Figure 1.12: Safely Inflating Tire

1.6 Battery Safety

Understand the risks of working with lead-acid batteries before performing installation or maintenance tasks.



WARNING

- Keep all sparks and flames away from batteries. The electrolyte fluid in the battery cells emits an explosive gas which can build up over time.
- Ensure that there is adequate ventilation when charging the battery.



Figure 1.13: Safety around Batteries



WARNING

- Wear safety glasses when working near batteries.
- To avoid the loss of electrolyte fluid, do NOT tip a battery more than 45° off of its base.
- Battery electrolyte causes severe burns. Ensure that it does not contact your skin, eyes, or clothing.
- Electrolyte splashed into the eyes is extremely damaging. If you are treating this condition: force the eye open and flush it with cool, clean water for 5 minutes. Call a doctor immediately.
- If electrolyte is spilled or splashed on one's clothing or their body, neutralize it immediately with a solution of baking soda and water, then rinse the strained area with clean water.

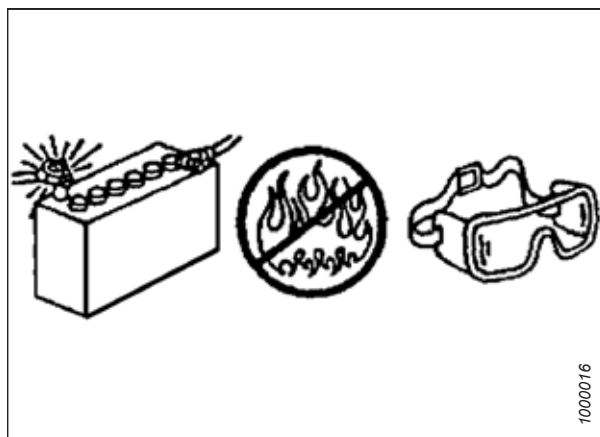


Figure 1.14: Safety around Batteries



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 the battery cables disconnected and the engine running, a high voltage can be built up if the cable terminals touch the machine frame. Anyone touching the machine frame under these conditions may be electrocuted.
- When working around batteries, remember that all of the exposed metal parts are live. Never lay a metal object across the terminals; this will generate a powerful spark and can electrocute the holder of the tool if they are not properly grounded.
- Keep batteries out of reach of children.

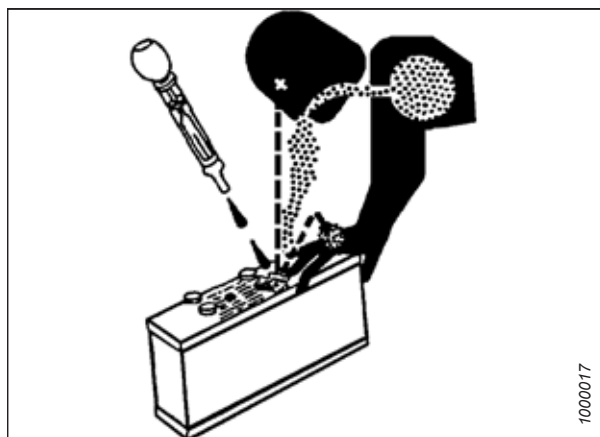


Figure 1.15: Safety around Batteries

1.7 Welding Precautions

Understand these critical precautions before attempting to weld anything on the windrower.

IMPORTANT:

If the procedures below are not followed, damage to the windrower's electronic components may result. Some components may only be partially damaged, which would result in some electrical components failing in an intermittent way. Such faults are very difficult to diagnose reliably.

The windrower is equipped with several sensitive electronic components. Therefore, components to be welded should be removed from the windrower whenever possible rather than welded in place.

When welding needs to be performed on a header, disconnect the header completely from the windrower before beginning. These same guidelines apply to plasma cutting, or any other high-current electrical operation performed on the machine.

IMPORTANT:

Ensure that the 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.

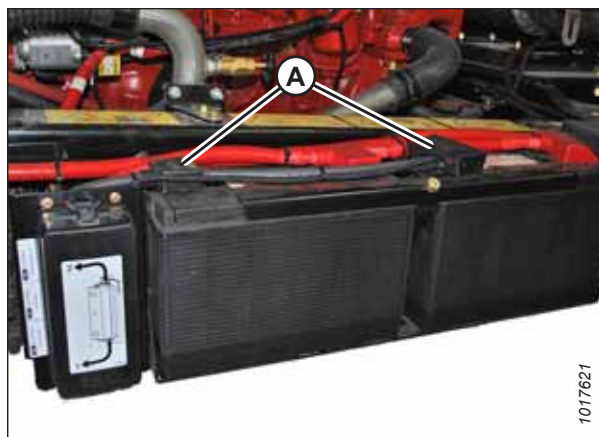


Figure 1.16: Negative Terminals

- Master controller (A)
Four connectors: P231, P232, P233, and P234

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

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

IMPORTANT:

When reconnecting these connectors, ensure 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 1.17: Master Controller

SAFETY

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

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

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 1.18: Firewall Extension Module

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

Location: Under the cab, inside the 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.

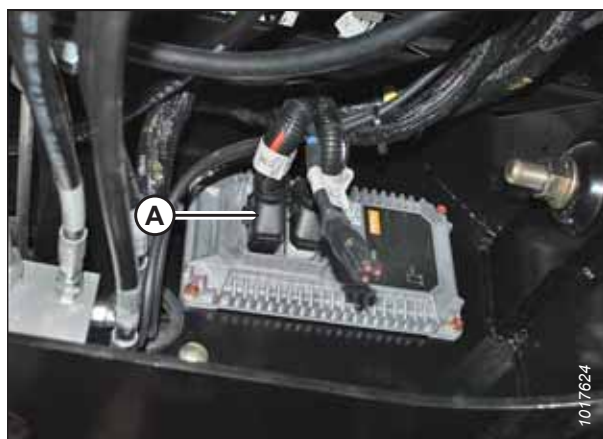


Figure 1.19: Chassis Extension Module

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

Location: On the engine

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

IMPORTANT:

Be sure to disconnect both connectors. Note the connector locations for reinstallation.

IMPORTANT:

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

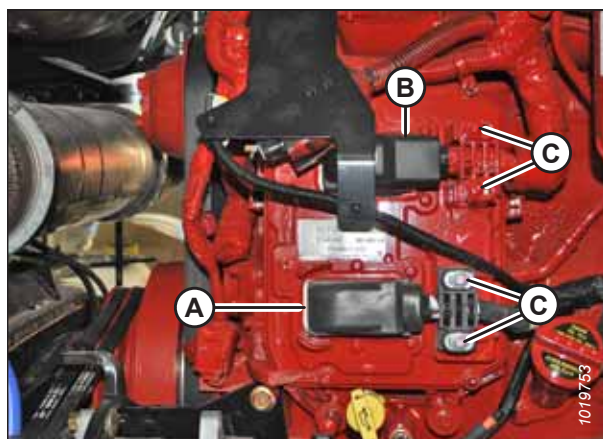


Figure 1.20: Engine Control Module

NOTE:

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

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

Location: Under the cab

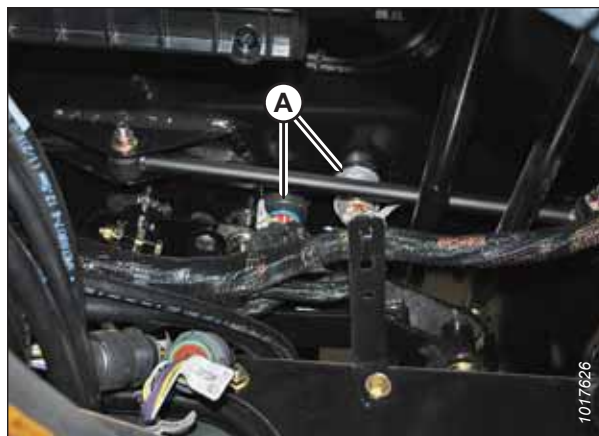


Figure 1.21: Cab Connectors

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

Location: Under the cab at the base of the left cab post

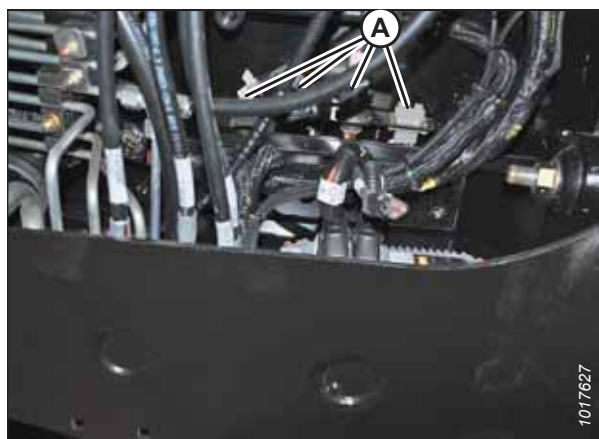


Figure 1.22: Roof Connectors

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

Location: Outside the left frame rail near the batteries

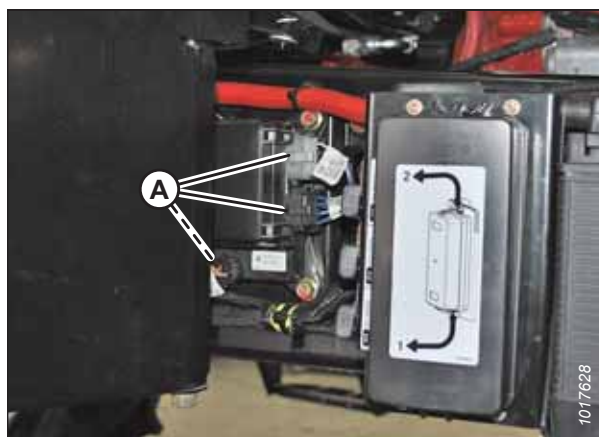


Figure 1.23: Chassis Relay Module

SAFETY

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

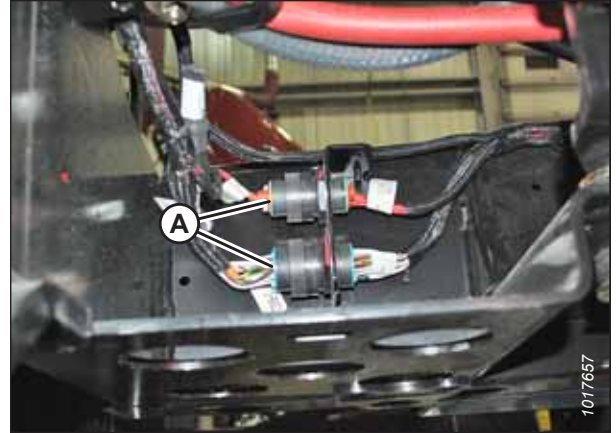


Figure 1.24: Engine Harness

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



Figure 1.25: A/C Box Connectors

- Wheel motor connectors (A)
Two round connectors: C25 and C26
Location: Under the center of the frame, just behind the front cross member
IMPORTANT:
To connect the circular Deutsch connectors without bending the pins, fully align the plug with the receptacle before pressing the connector in.

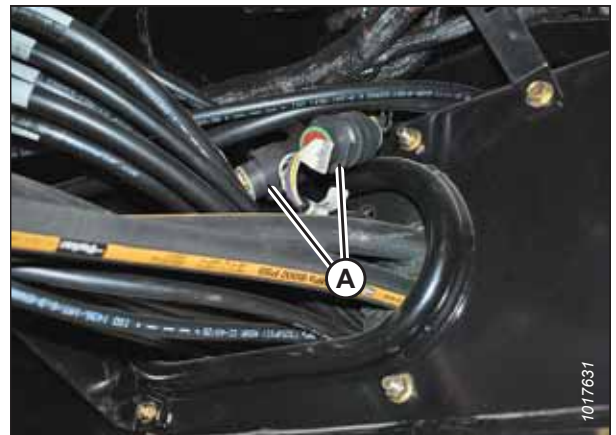


Figure 1.26: Wheel Motor Connectors

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 the connectors so that the channels are aligned.
3. Press the connectors together while turning the outer connector clockwise until the collar locks.

1.8 Engine Safety

For the safety of yourself and others, understand the hazards associated with the engine before operating the machine, or before servicing the engine or nearby components.

WARNING

Do NOT use aerosol starting aids such as ether when attempting to start the engine. Use of these substances could result in an explosion.

CAUTION

- When starting up a new, serviced, or repaired engine, always be ready to stop the engine to prevent overspeeding. Do this by shutting off the air and/or fuel supply to the engine.
- Do NOT bypass or disable automatic shutoff circuits. These circuits help prevent injury and damage to the engine. For instructions, refer to the technical manual.
- Inspect the engine for potential hazards.
- Before starting the engine, ensure that no one is on, underneath, or close to the engine. Ensure that bystanders are clear of the area.
- All protective guards and covers must be installed if the engine must be started to perform service procedures.
- 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 combustion products, 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 the 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.

1.8.1 High-Pressure Rail

Fuel is delivered to the engine under high pressure. Understand the hazards associated with the fuel delivery system before servicing it.

WARNING

- Before disconnecting fuel lines or any other components under high pressure between the fuel pump and the high-pressure common rail fuel system, confirm that the fuel pressure has been relieved.
- Contact with high-pressure fuel may cause fluid penetration and burn hazards. High-pressure fuel spray presents a potential fire hazard. Failure to follow these instructions may cause injury or death.

1.8.2 Engine Electronics

For the safety of yourself and of others, and to prevent damage to the engine control module (ECM), understand the hazards associated with engine electronics.



WARNING

Tampering with the electronic system or the original equipment manufacturer (OEM) wiring installation is dangerous and could result in injury to people, death, or damage to the equipment.



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 touch the harness connector for the electronic unit injectors while the 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 certain conditions exceed their 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

1.9 Safety Signs

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

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

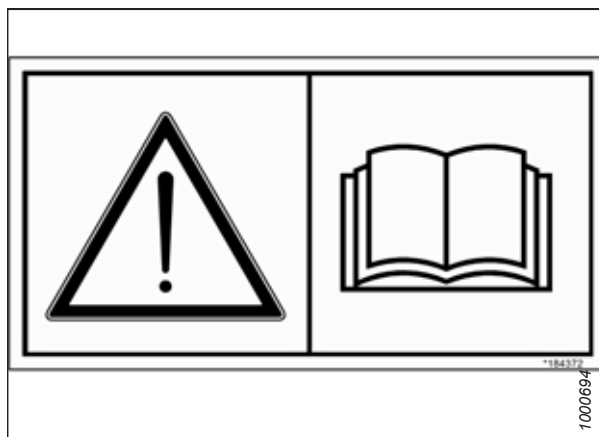


Figure 1.27: Operator's Manual Decal

Chapter 2: Unloading Windrower

Unload all windrower parts before beginning assembly. Carefully follow these procedures in the order in which they are presented.

2.1 Unloading Windrower

The windrower will need to be unloaded from the trailer with a forklift before it can be assembled.

DANGER

The equipment used to unload the shipment must meet or exceed the specifications listed below. Using inadequate equipment may result in damage to the equipment and/or personal injury.

Table 2.1 Forklift Requirements

Minimum capacity ¹	7037 kg (15,500 lb.)
Minimum fork length	198.1 cm (78 in.)

IMPORTANT:

Forklifts are normally rated for a load located 610 mm (24 in.) ahead of the back end of the forks. To determine the forklift capacity when the load sits 122.2 cm (48 in.) ahead of the back of the forks, check with your forklift distributor.

To unload the windrower, do the following:

1. Move the trailer onto level ground. Block the trailer wheels.
2. Set the forklift's forks to the widest possible setting.
3. Position the forklift so that it is on the side of the trailer opposite windrower fuel tank (A).

IMPORTANT:

Ensure that the forks do **NOT** contact fuel tank (A) or windrower engine oil pan (B) (not shown).

4. Position forks (C) under the windrower frame so that fuel tank (A) sits between the forks.

IMPORTANT:

Ensure that the forks extend beyond the far side of the frame.

NOTE:

The windrower's center of gravity is approximately 157.5 cm (62 in.) rearwards from the center of its drive wheel.

5. Lift the windrower until it clears the trailer deck.
6. Slowly back the forklift away from the trailer until the windrower is clear of the trailer deck.
7. Lower the windrower slowly to the ground. If the ground is soft, place wooden blocks under the front shipping stands.
8. Carefully back the forklift away from the windrower.

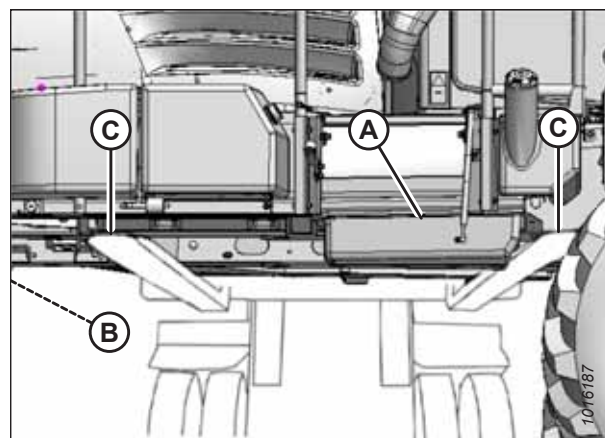


Figure 2.1: Windrower on Trailer

1. When the load is positioned 122.2 cm (48 in.) from the back end of the forks.

UNLOADING WINDROWER

9. Check the windrower for shipping damage. Check the rest of the shipment for missing parts.
10. In case of shipping damage or missing parts, confirm that the serial number matches the one written on the shipping manifest. If it does, contact MacDon immediately to make a claim.

Chapter 3: Assembling Windrower

Once the windrower has been unloaded, assembly can begin.

3.1 Lowering Steps

Lowering the steps allows safe and easy access to the cab. The drive wheel lug nuts are stored in the cab.

1. Locate the left cab-forward steps. Remove stop bolt (A) and discard it.
2. Loosen pivot bolts (B) securing steps (C).

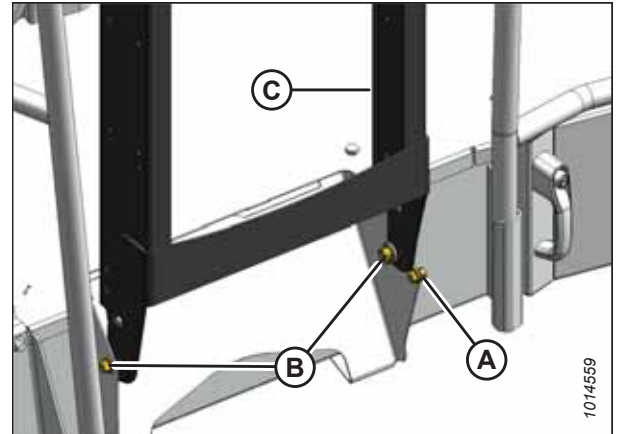


Figure 3.1: Left Step – Shipping Position

3. Lower left steps (A) to the working position.
4. Ensure that clips (B) are engaged in the steps.
5. Tighten pivot bolts (C) to 95 Nm (70 lbf-ft).

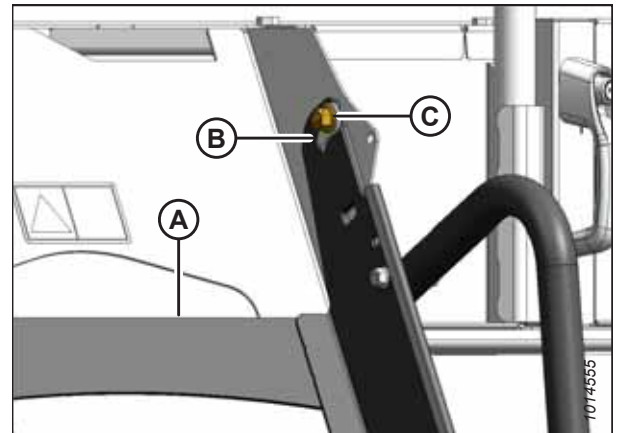


Figure 3.2: Left Step – Working Position

6. Retrieve the bag containing the drive wheel nuts from storage compartment (A) behind the training seat.

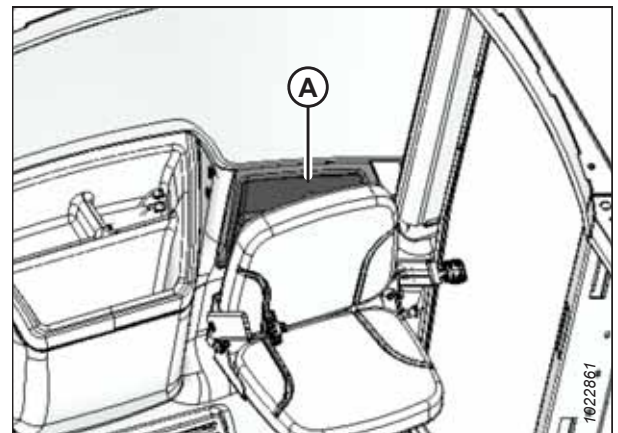


Figure 3.3: Storage Compartment

3.2 Installing Caster Wheels

The windrower's caster wheels may not have been installed at the factory. They will need to be installed now.

If the caster wheels are already installed, proceed to [3.3 Installing Drive Wheels, page 20](#).

1. Retrieve toolbox (A) from the storage compartment.
Remove the banding from the toolbox.

NOTE:

Use the ignition key to unlock the storage compartment.

2. Retrieve the caster wheel hardware from toolbox (A).

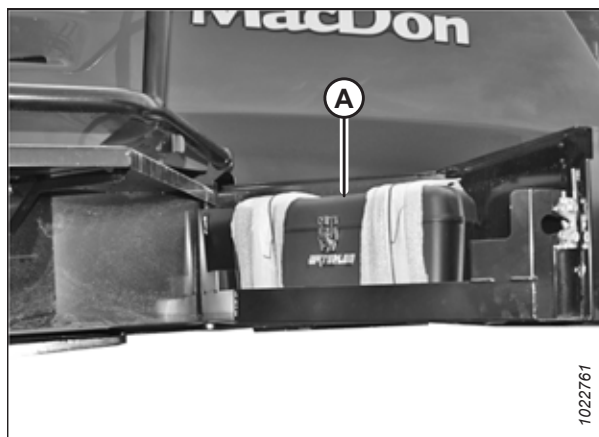


Figure 3.4: Windrower Toolbox

3. Remove banding and blocking (A) securing the walking beam to the frame.
4. Retrieve the caster wheel assemblies.

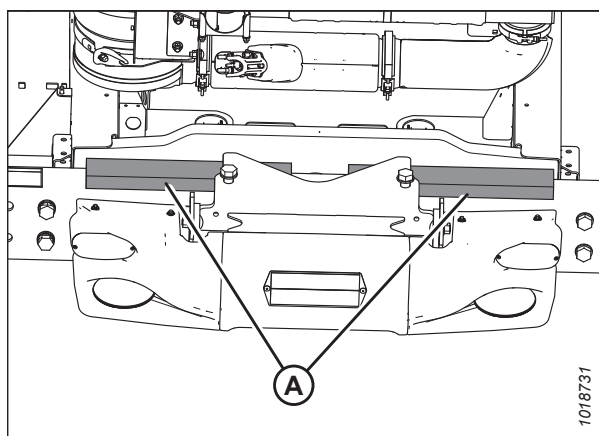


Figure 3.5: Walking Beam Secured to Frame

5. Have a forklift approach the front of the windrower. Slide the forks under the frame.

IMPORTANT:

Ensure that the forks do **NOT** contact fuel tank (A). Ensure that the forks lift **ONLY** the windrower's frame.

6. Raise the windrower approximately 152 cm (60 in.) off of the ground. Place suitable stands under the drive wheel legs and the rear frame. Lower the windrower onto the stands so that the forklift's forks are partially unloaded.



Figure 3.6: Lifting Windrower

ASSEMBLING WINDROWER

7. Attach sling (B) to caster assembly (A).
8. Retrieve two washers (C) from the toolbox and place them on caster wheel spindle (D).
9. If caster assembly (A) is on a pallet, remove the banding and shipping material securing the assembly to the pallet.

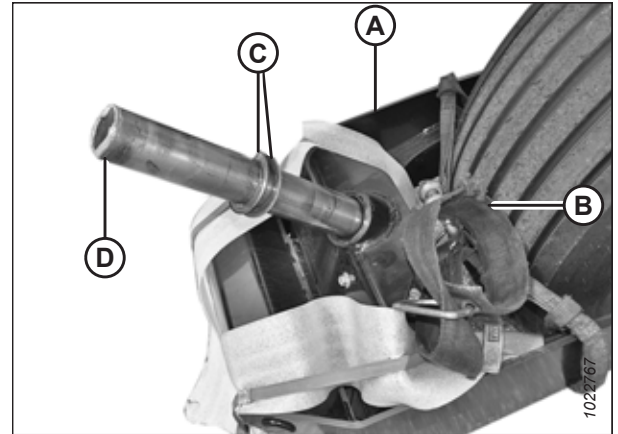


Figure 3.7: Caster Wheel Assembly in Shipping Configuration

10. Attach sling (A) on caster assembly (B) to a suitable lifting device.
11. Tilt walking beam (C) and maneuver caster assembly (B) so that spindle (D) can be installed onto walking beam (C).

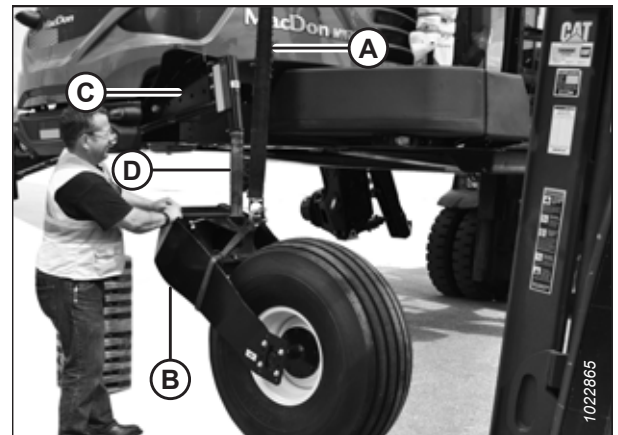


Figure 3.8: Caster Assembly Ready for Installation

12. Install flat washer (A) onto the spindle.
13. Install key (B) and arm (C) onto the spindle. Ensure that the arm is positioned so that there is no clearance at the top and bottom of the walking beam extension.
14. Install retaining ring (D).
15. Tighten nut (E). Torque the nut to 195 Nm (143 lbf-ft).
16. Remove the sling from the caster assembly.
17. Repeat Steps 7, page 19 to 16, page 19 to install the second caster assembly.

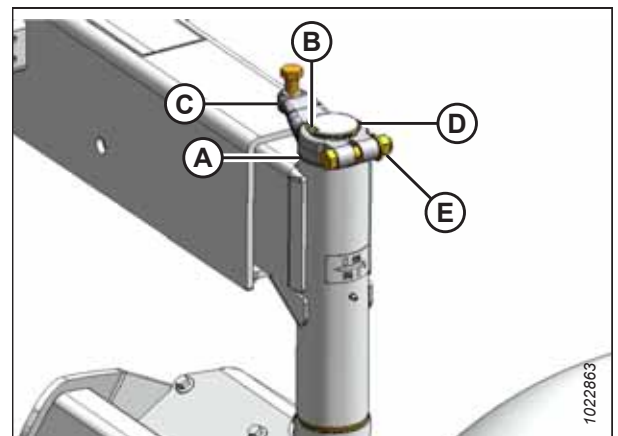


Figure 3.9: Caster Arm

3.3 Installing Drive Wheels

A drive wheel includes a rim and a bar or turf tire, depending on the application. A lifting device capable of supporting a minimum of 907 kg (2000 lb.) is required to lift the wheel assembly. The windrower is shipped with the drive wheels unattached. They will need to be installed on the windrower.

CAUTION

Use a lifting device capable of supporting a minimum of 907 kg (2000 lb.) to lift the wheel assembly.

IMPORTANT:

The windrower must be supported with stands while the drive wheels are being installed.

1. Have a forklift lift the cab end of the windrower approximately 130 cm (51 in.) (B) off of the ground, or enough so that left cab-forward drive wheel assembly (A) can be positioned as shown. Place stand (C) under the windrower frame.
2. Clean the mounting surface on the wheel drive and the rim.

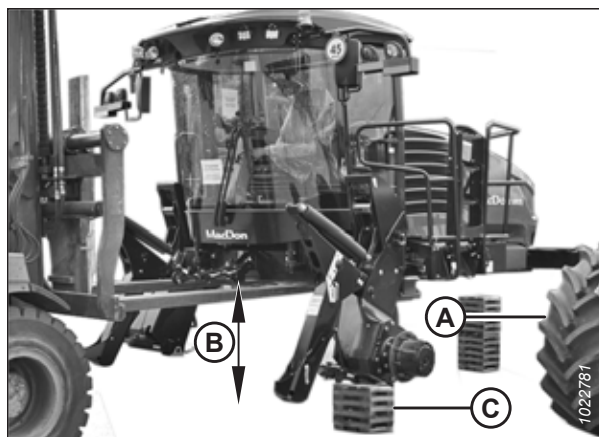


Figure 3.10: Windrower Supports in Place

3. Position lifting device (A) under the wheel as shown. Raise the wheel slightly.
4. Position the wheel against the wheel drive hub so that air valve (B) is on the outside and tread (C) points cab-forward.

NOTE:

For wheels equipped with turf tires (those with a diamond tread pattern), ensure that the arrow on the sidewall points cab-forward.

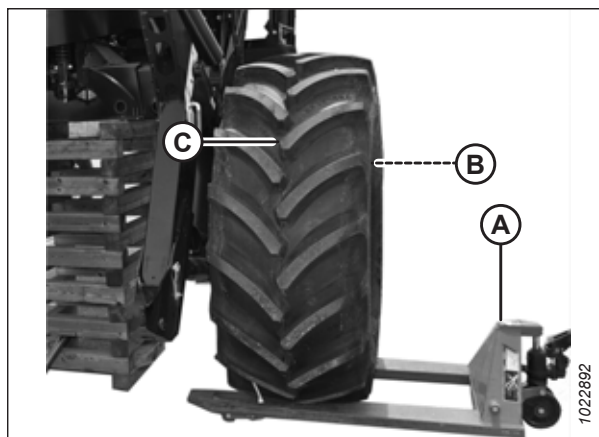


Figure 3.11: Drive Wheel Ready for Installation

ASSEMBLING WINDROWER

- Align the wheel rim with the studs on the hub. Push the wheel onto the hub.
- Install and hand-tighten wheel nuts (A).

IMPORTANT:

To prevent damage to the wheel rims and the studs, do **NOT** use an impact wrench to tighten the nuts. The stud threads must be clean and dry. Do **NOT** apply lubricant or anti-seize compound to the stud threads. Do **NOT** overtighten the wheel nuts.

- Torque the drive wheel nuts to 510 Nm (375 lbf-ft). Follow the tightening sequence shown in the illustration.

IMPORTANT:

Use only manufacturer-specified lug nuts (MD #205397).

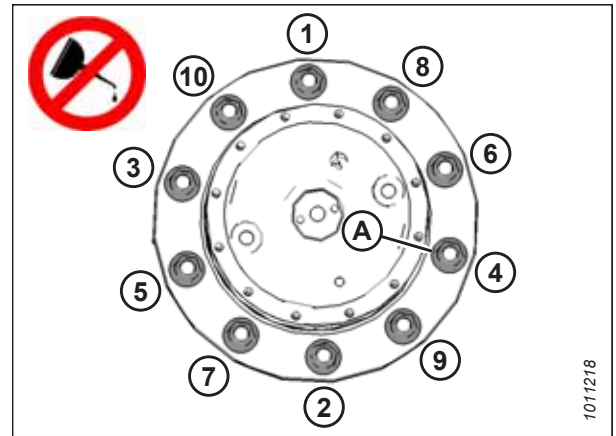


Figure 3.12: Tightening Sequence – 10-Bolt Wheel

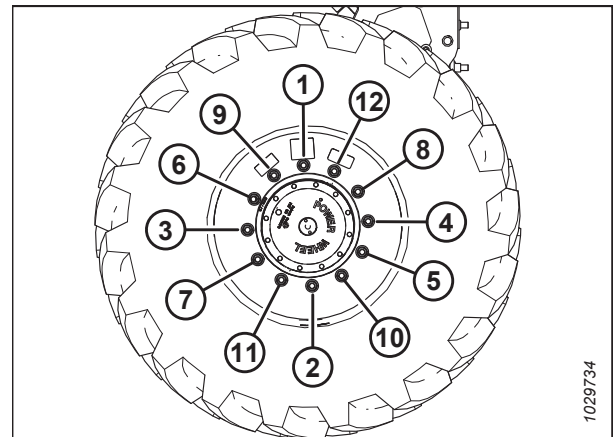


Figure 3.13: Tightening Sequence – 12-Bolt Wheel

- Repeat the tightening sequence two additional times. Ensure that the specified torque is achieved each time.
- Repeat Step 2, page 20 to Step 8, page 21 in order to install the other drive wheel.
- Use the forklift to raise the windrower. Remove the stand.
- Lower the windrower, and remove the jack.
- Repeat the wheel nut torquing procedure every hour of operation until two consecutive checks confirm that there is no movement of the nuts.

3.4 Repositioning Right Leg

The right cab-forward leg must be changed from the shipping configuration to the field configuration.

IMPORTANT:

Do **NOT** open the right cab-forward door when the right leg is in the shipping configuration. If the door contacts the leg, the door glass may shatter, or the door seals may be damaged.

1. Have a forklift lift the front of the windrower. Use stand (A) (or an equivalent) to support the front of the windrower so that right drive wheel (B) remains off of the ground.
2. Slowly lower the windrower onto stand (A).
3. Place pallet jack (C) (or an equivalent) under right drive wheel (B). Raise the pallet jack so that the right drive wheel is supported and the right cab-forward leg does not bear any of the wheel's weight.

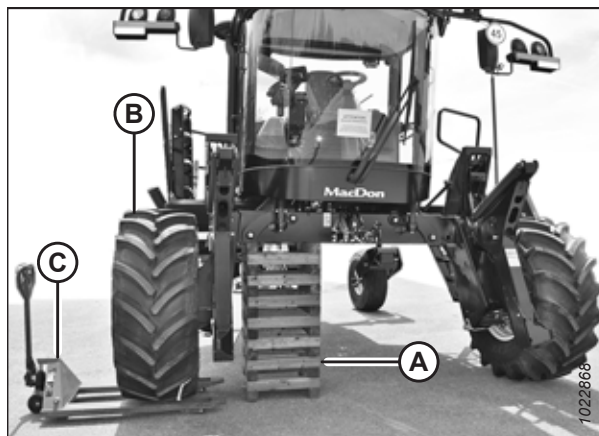


Figure 3.14: Windrower Right Leg Supported

4. Remove shipping tag and wire (A) from the traction drive hoses under the cab.

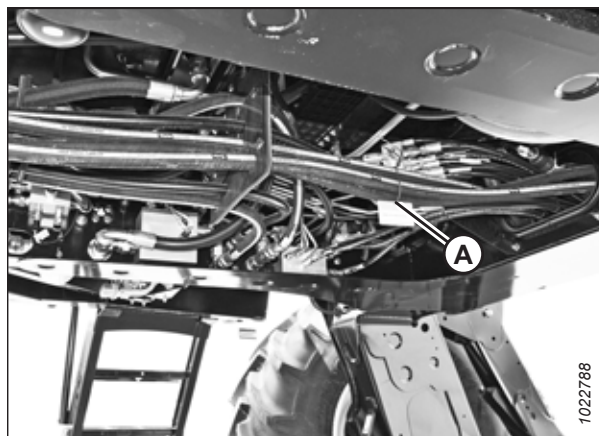


Figure 3.15: Shipping Tag Under Windrower Cab

5. Remove two bolts, washers, and nuts (A) from the frame.

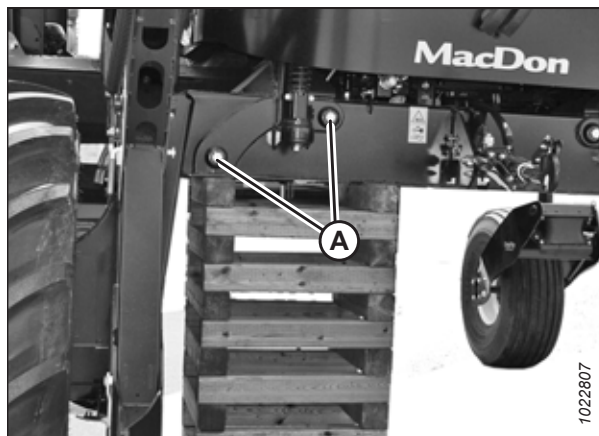


Figure 3.16: Windrower Right Leg Bolts

ASSEMBLING WINDROWER

- Adjust the lifting device's lift height until pin (A) is loose. Use slide hammer (B) (MD #209816) to extract the pin from the front of the frame.

NOTE:

Use of a special tool is necessary due to the limited amount of space in front of the fuel tank.

NOTE:

Removing the pins will be difficult if the right leg is bearing any of the wheel's weight.

- Remove the second pin.

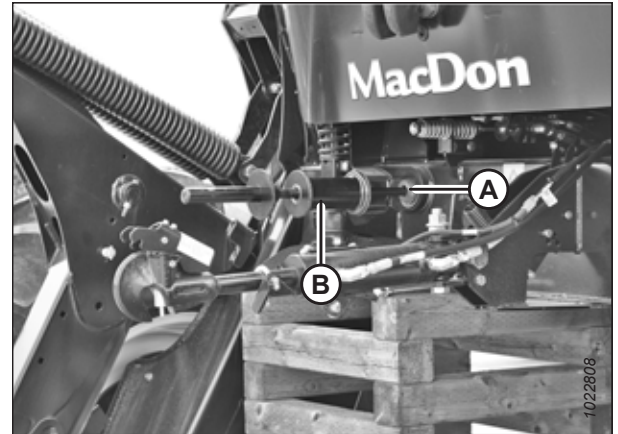


Figure 3.17: Slide Hammer

- Move the leg outward to expose hole (A) in the frame.



Figure 3.18: Right Leg Ready to Move

- Align the holes at the pin locations. Use slide hammer (B) to reinstall pins (A). If necessary, adjust the jack to prevent damage to the outer edges of the pins.

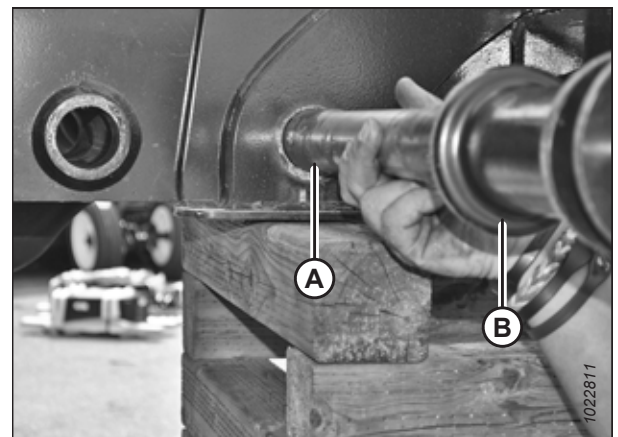


Figure 3.19: Leg Pin

ASSEMBLING WINDROWER

10. Secure the pins with bolts, washers, and nuts (A). Torque the nuts to 136 Nm (100 lbf·ft).
11. Lower the pallet jack. Remove the pallet jack from the work area.
12. Support the windrower with a forklift. Remove the stand. Lower the windrower to the ground.

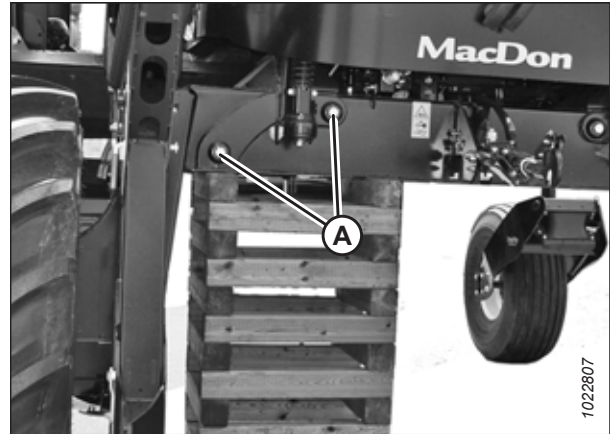


Figure 3.20: Right Leg Pins Installed

3.5 Repositioning Caster Wheels

The caster wheels can be positioned according to the windrower's intended use. The narrow setting is better suited for windrowers which will be paired with smaller headers; this setting provides more maneuverability around utility poles, irrigation inlets, and other obstacles, and allows more space for the uncut crop. Using the wide setting reduces trampling in heavy crops which, when swathed, produce large windrows.

1. Lift the windrower using the forklift so that the casters no longer bear any of the windrower's weight.



Figure 3.21: Supporting Windrower

2. Remove and retain four bolts and washers (A), shock support brackets (B), and slow moving vehicle (SMV) sign support bracket (C) from the right cab-forward walking beam.

NOTE:

There is one SMV support bracket (C) preinstalled on shock support brackets (B) at the left cab-forward walking beam.

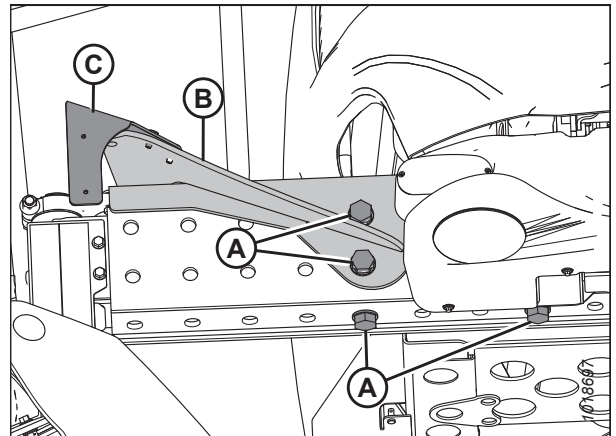


Figure 3.22: Walking Beam

3. Remove banding and blocking (A) securing the walking beam to the frame.

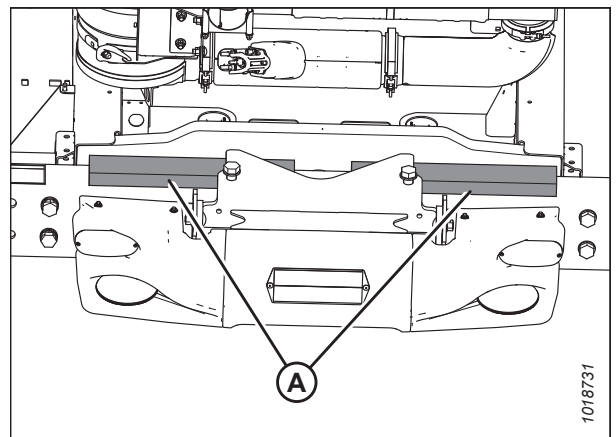


Figure 3.23: Windrower Rear

ASSEMBLING WINDROWER

4. Rotate the caster until wheel (A) is parallel to the walking beam.

NOTE:

This will make moving the extensions easier.

5. Pull walking beam extension (B) out to the desired position so that the holes in the extensions are lined up with the appropriate bolt holes on the frame.

NOTE:

Walking beam extension (B) can be adjusted into three working positions.

6. Install two retained M24 x 60 bolts and washers (C) on the bottom of the beam. Do **NOT** tighten the bolts yet.
7. Retrieve two M24 x 60 bolts and two M24 flat washers from the toolbox in the outboard side of the walking beam and apply anti-seize compound to the threads of the bolts. Install coated bolts and washers (A) as shown.

NOTE:

Depending on the position of the walking beam, the outboard bolts may need to be installed first.

8. Retrieve two M24 x 60 bolts and and M24 flat washers and apply anti-seize compound to the threads of the bolts. Place support brackets (B) onto the walking beam as shown and secure them with coated bolts and washers (C). Do **NOT** fully tighten the bolts yet.

IMPORTANT:

Ensure that support bracket plate (B) is parallel to the walking beam.

9. Tighten the walking beam bolts as follows:
 - a. Snug bottom bolts (A), then snug rear bolts (B).
 - b. Torque rear bolts (B) to 757 Nm (560 lbf-ft).
 - c. Torque bottom bolts (A) to 757 Nm (560 lbf-ft).

IMPORTANT:

Torque the bolts a second time after 5 hours of operation, and a third time after 10 hours.

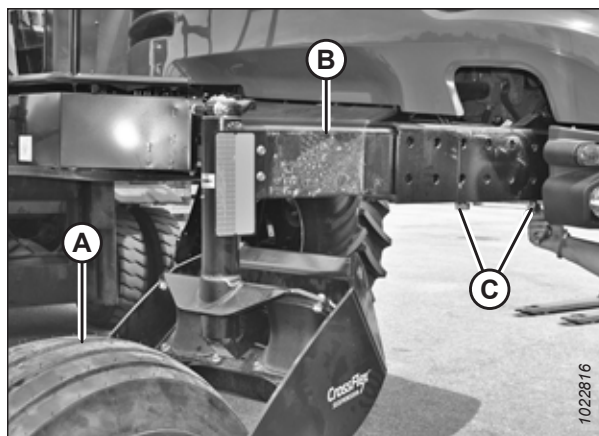


Figure 3.24: Walking Beam Extension

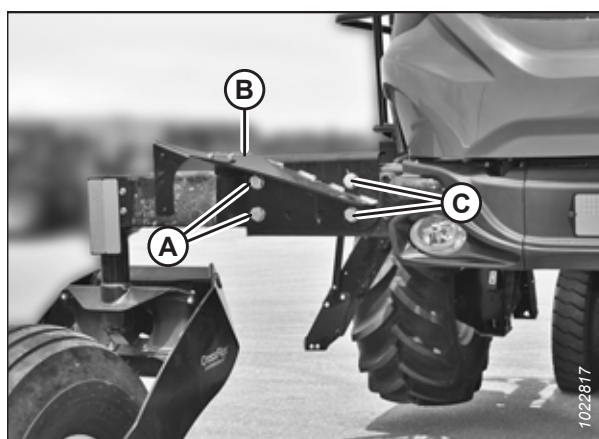


Figure 3.25: Anti-Shimmy Brackets

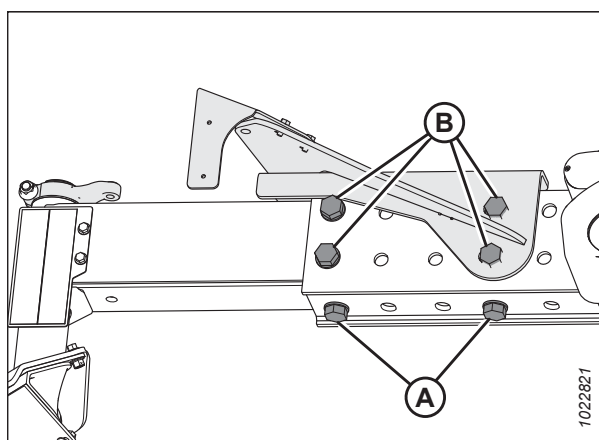


Figure 3.26: Walking Beam Bolts

ASSEMBLING WINDROWER

10. Repeat Steps 2, *page 25* to 9, *page 26* to reposition the left cab-forward caster.
11. Lower the windrower to the ground.

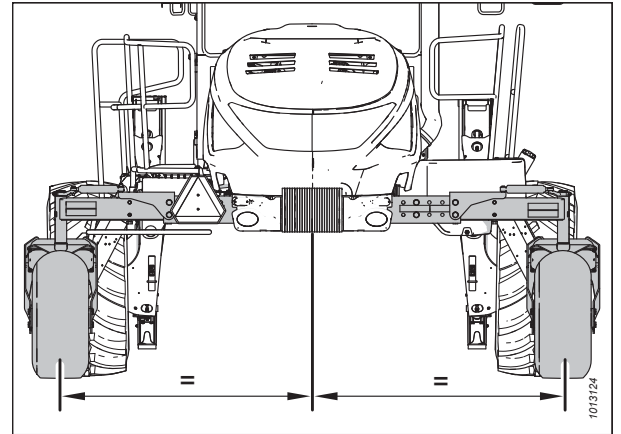


Figure 3.27: Walking Beam Adjustment

3.6 Installing Caster Anti-Shimmy Dampeners

Some of the steps for installing the caster anti-shimmy dampeners may have been completed at the factory.

1. Retrieve the anti-shimmy dampeners and their installation hardware from the bag in the toolbox.
2. If the unit was shipped with casters installed, then complete the following procedure. Otherwise, proceed to step 3, page 28.
 - a. On the left cab-forward caster wheel, remove retaining ring (A).
 - b. Remove and discard yellow spacer (B).
 - c. Retrieve the key and arm from the toolbox.
 - d. Install key and arm (D) and secure it with retaining ring (E) on the caster shaft as shown.
 - e. Tighten nut (C) and torque it to 195 Nm (144 lbf·ft).

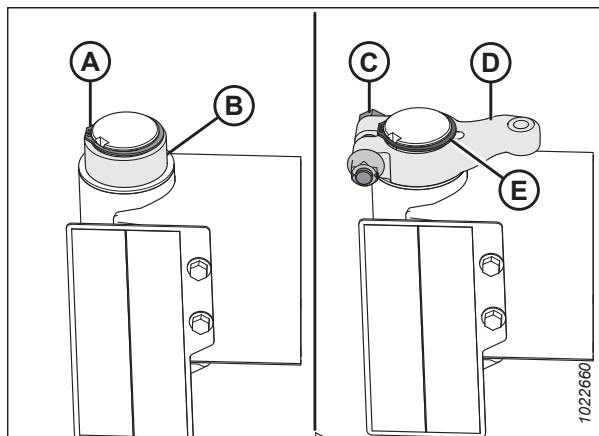


Figure 3.28: Anti-Shimmy Arm – Left Cab-Forward Side

3. Attach the barrel end of anti-shimmy dampener (A) to the forward hole in support (B) with one M16 x 75 flange head bolt (C) and one M16 lock nut (D). Install the bolt from under the support. Do **NOT** fully tighten the hardware yet.

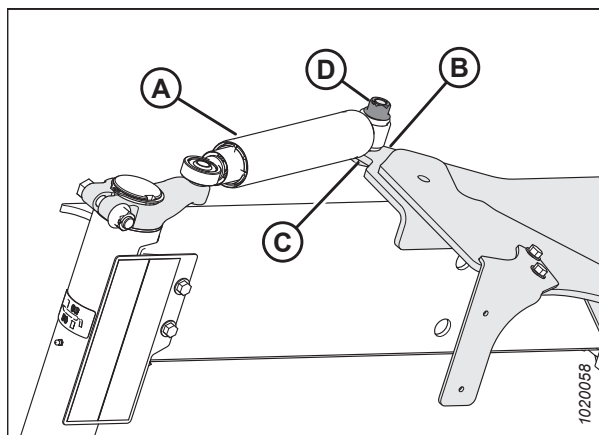


Figure 3.29: Anti-Shimmy System – Left Cab-Forward Side

4. Attach the barrel end of second anti-shimmy dampener (A) to support (B) at the aft hole location with one M16 x 90 flange head bolt and one M16 tech lock nut (C). Install the bolt from under the support. Do **NOT** fully tighten the hardware yet.
5. Rotate the caster until arm (D) is aligned with the walking beam.

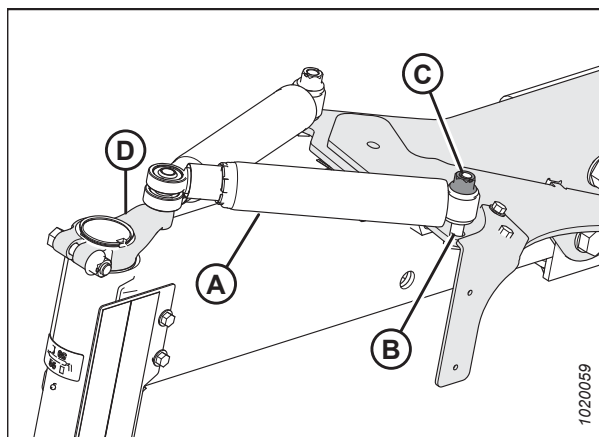


Figure 3.30: Anti-Shimmy System – Left Cab-Forward Side

ASSEMBLING WINDROWER

6. Attach the rod ends of the anti-shimmy dampeners to the arm with M16 x 90 flange head bolt (A) and three hardened washers (B).

NOTE:

Washers (B) are stamped with "L9".

7. Torque bolt (A) to 244 Nm (180 lbf·ft).
8. Install jam nut (C) and torque it to 138 Nm (102 lbf·ft).
9. Tighten bolts (D) at the barrel end of the anti-shimmy dampeners, and torque them to 138 Nm (102 lbf·ft).

IMPORTANT:

Ensure that the arm is parallel to the walking beam while torquing the hardware. Do **NOT** overtighten the hardware.

10. Repeat Steps 2, page 28 to 9, page 29 to install the anti-shimmy dampeners onto the right cab-forward caster.

IMPORTANT:

Torque the bolts again after the first 5 hours of operation, and then once more after 10 hours of operation.

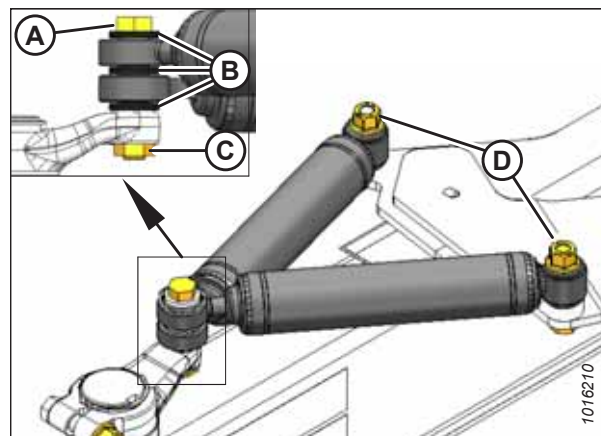


Figure 3.31: Anti-Shimmy System – Left Cab-Forward Side

3.7 Installing Windshield Access Step

The windshield access step will need to be installed onto the railing of the windrower's right cab-forward side platform.

1. Remove windshield access step (A) from the shipping location on the right platform. Remove packing materials (B) from the step and the railing.

2. Retrieve three self-tapping screws from the bag in the toolbox.

NOTE:

If necessary, use the ignition key to unlock the toolbox compartment.

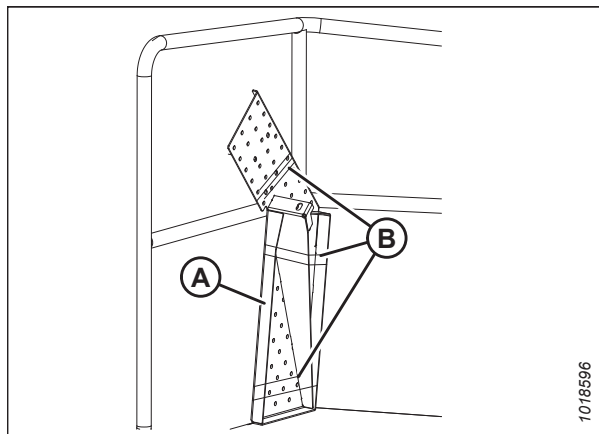


Figure 3.32: Step in Shipping Position

3. Position step (A) on the right cab-forward leg at the forward end of the platform as shown.
4. Install two M10 x 20 hex head screws (B) through the top of the step. Do **NOT** tighten the hardware yet.
5. Install one M10 x 20 hex head screw (C) through the step support.
6. Tighten the screws and torque them to 57 Nm (43 lbf-ft).

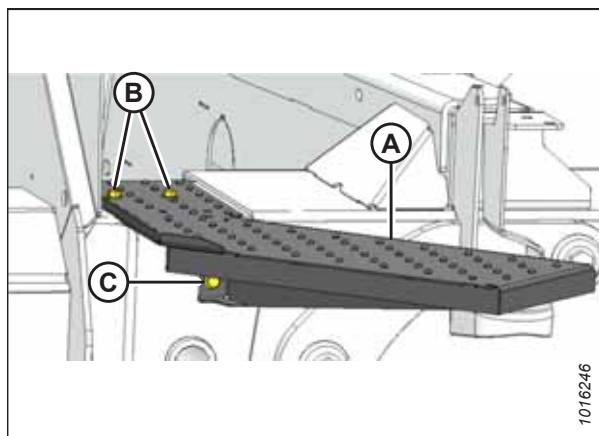


Figure 3.33: Windshield Access Step Installed

3.8 Positioning Mirror Arms

The mirror/light support arms must be moved from the shipping position to the working position.

1. Locate the mirror on the left cab-forward side of the windrower cab.
2. Loosen retaining nut (A) and pivot nut (B) on support arm (C).
3. Swivel support arm (C) cab-forward by 90°.

IMPORTANT:

Do **NOT** allow the wiring harness to get caught in the swivel mechanism.

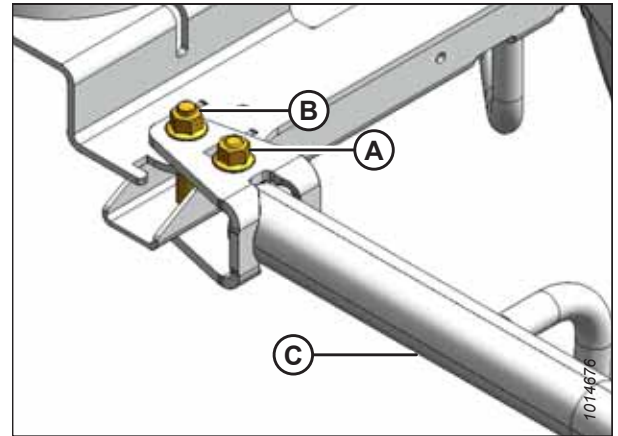


Figure 3.34: Mirror Arm in Shipping Position

4. Tighten retaining nut (A) to 39 Nm (29 lbf-ft).
5. Tighten pivot nut (B) to 26 Nm (19 lbf-ft).

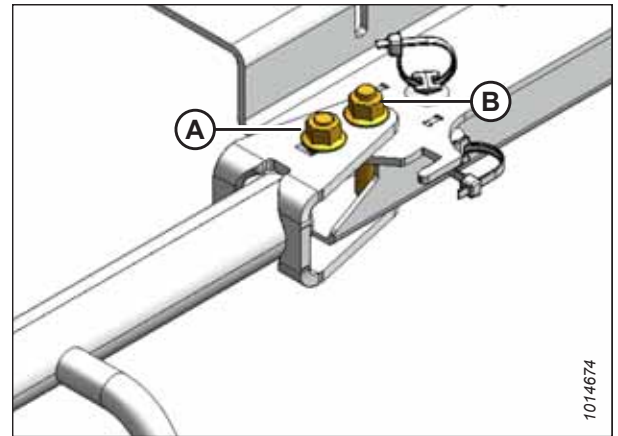


Figure 3.35: Mirror Arm in Working Position

6. To prevent wires from being pinched, ensure that roof harness (A) and power mirror harness (B) (if these are installed) are secured as follows:
 - Roof harness (A) to the supports with cable ties (C)
 - Mirror harness (B) (if installed) to roof harness (A) with cable tie (D)
 - Mirror harness (B) (if installed) to the mirror arm tube with cable tie (E)
7. Repeat Steps 1, page 31 to 6, page 31 to reposition the right cab-forward mirror.

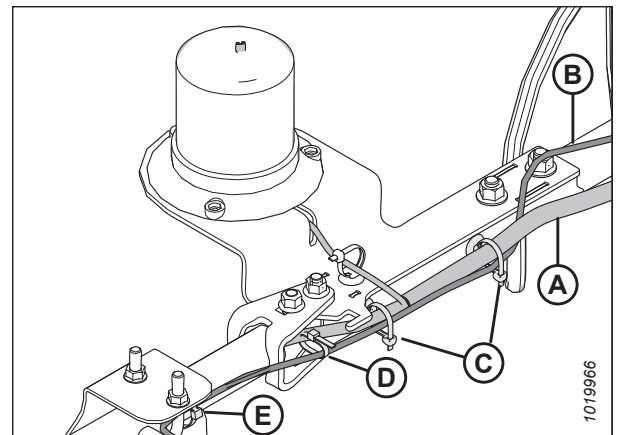


Figure 3.36: Roof Harness and Mirror Harness Secured

3.9 Installing Slow Moving Vehicle Signs

Slow moving vehicle (SMV) signs let other drivers know that the windrower is not capable of moving at a high speed. The signs will need to be installed on the windrower.

1. Retrieve the SMV signs from inside the cab and the installation hardware from the toolbox.

NOTE:

if necessary, use the ignition key to unlock the cab door and the toolbox compartment.

2. Position sign (A) on already installed bracket (B) on the right cab-forward side mirror/light support as shown. Secure the sign with two M6 x 20 hex head bolts and M6 lock nuts (C).

IMPORTANT:

Ensure that the SMV sign does **NOT** cover the brake light.

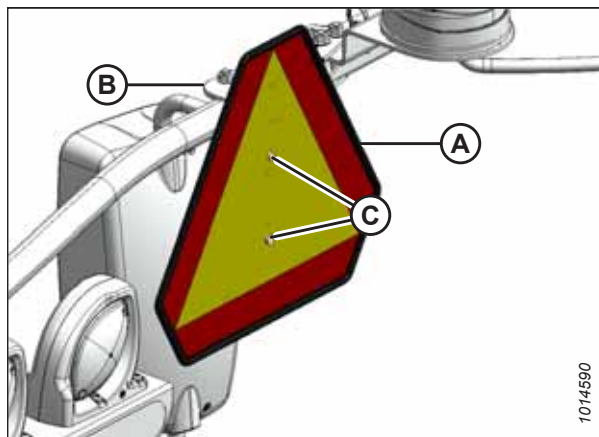


Figure 3.37: SMV Sign Installed on Mirror/Light Support – Right Cab-Forward Side

3. Locate support (A) on the left cab-forward side of the walking beam.
4. Position sign (B) on support (A) as shown. Secure the sign with two M6 x 20 hex head bolts and M6 lock nuts (C).

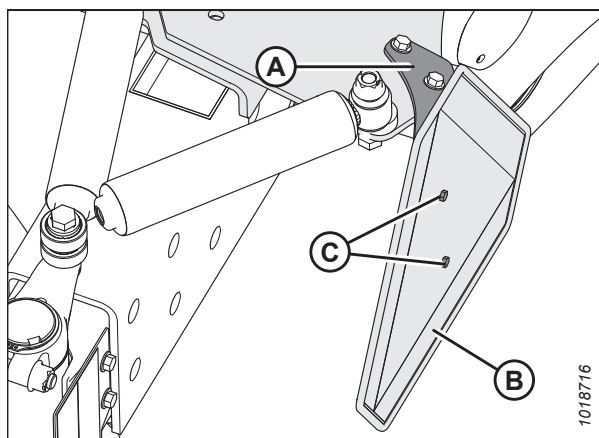


Figure 3.38: SMV Sign Installed – Left Cab-Forward Side

3.10 Replacing Speed Identification Symbol Decal – USA Only

The speed identification symbols will need to be installed on windrowers intended for use in the United States of America.

1. Locate the already installed speed identification symbol (SIS) decal bracket on the left mirror/lighting arm.
2. Wipe the already installed decal with a clean cloth to remove any dirt or grease.
3. Apply 30 mile/h SIS decal (A) over the already installed 45 km/h decal.

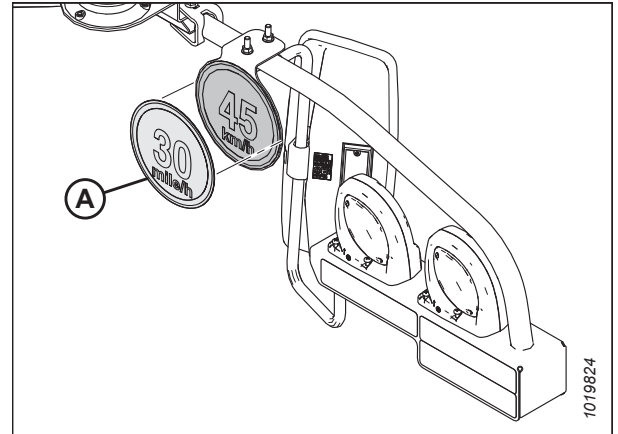


Figure 3.39: SIS Decal – USA Only

3.11 Installing Rear Ballast Package

Ballast must be added to the aft end of the windrower when it is paired with a heavy header.

Use the following table to determine the amount of ballast required.

NOTE:

Refer to [4.1.11 Checking Tire Pressure, page 51](#) for information on the appropriate tire pressures to use.

Table 3.1 Ballast Specifications

Header Type	Description	Installed Options	Base Kit	Additional Kits	Additional Float Springs (MD #)
D125X	7.6 m (25 ft.), single reel, double knife, timed	—	0	0	0
D130XL	9.1 m (30 ft.), single reel, double knife, timed	Base	0	0	0
D130XL	9.1 m (30 ft.), single reel, double knife, timed	Transport	1	0	0
D130XL	9.1 m (30 ft.), single reel, double knife, timed	Transport + upper cross auger + vertical knives	1	0	B6047
D135XL	10.6 m (35 ft.), single reel, double knife, untimed	Base	1	1	0
D135XL	10.6 m (35 ft.), single reel, double knife, untimed	Transport	1	1	B6047
D135XL	10.6 m (35 ft.), single reel, double knife, untimed	Transport + upper cross auger + vertical knives	1	2	B6047
D135XL	10.6 m (35 ft.), double reel, double knife, untimed	Base	1	1	0
D135XL	10.6 m (35 ft.), double reel, double knife, untimed	Transport	1	1	B6047
D135XL	10.6 m (35 ft.), double reel, double knife, untimed	Transport + upper cross auger + vertical knives	1	2	B6047
D140XL	12.2 m (40 ft.), double reel, double knife, untimed	Base	1	1	0
D140XL	12.2 m (40 ft.), double reel, double knife, untimed	Transport	1	1	B6047
D140XL	12.2 m (40 ft.), double reel, double knife, untimed	Transport + upper cross auger + vertical knives	1	2	B6047
D145XL	13.7 m (45 ft.), double reel, double knife, untimed	Base	1	1	B6047
D145XL	13.7 m (45 ft.), double reel, double knife, untimed	Transport	1	2	B6047
D145XL	13.7 m (45 ft.), double reel, double knife, untimed	Transport + upper cross auger + vertical knives	1	2	B6106

NOTE:

- A kit contains eight 20.4 kg (45 lb.) weights. The total weight of a single kit is 163 kg (360 lb.).
- Ballast is not required when the header is paired with an Auger or Rotary Disc Header.

ASSEMBLING WINDROWER

Installing rear ballast

1. Refer to Table 3.1, page 34 to determine the amount of ballast to add to the windrower.
2. Move latch (A) towards the right cab-forward side of the windrower.
3. Grasp louver (B), and lift the hood to open it.

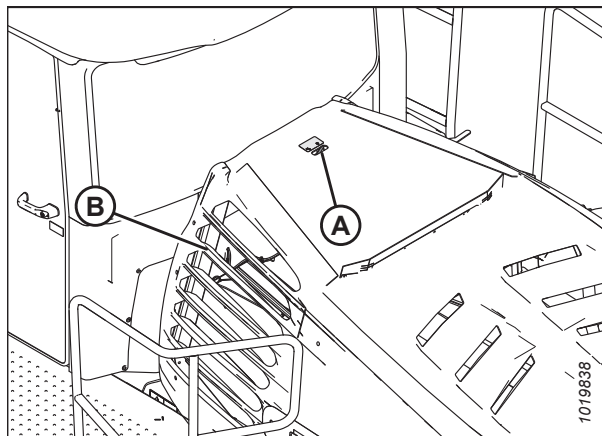


Figure 3.40: Engine Compartment Hood

4. Remove eight hex flange bolts (A).
5. Gently pull light bezel assembly (B) so that plugs P215 (C) and P210 (D) can be disconnected from the back of the red tail/brake lights inside the bezel.
6. Remove light bezel assembly (B).

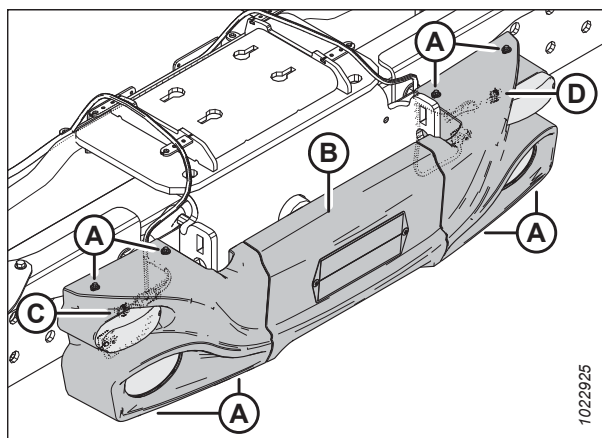


Figure 3.41: Rear Light Bezel Attached to Windrower

7. Separate light bezel assembly (A) by removing six hex screws (B).

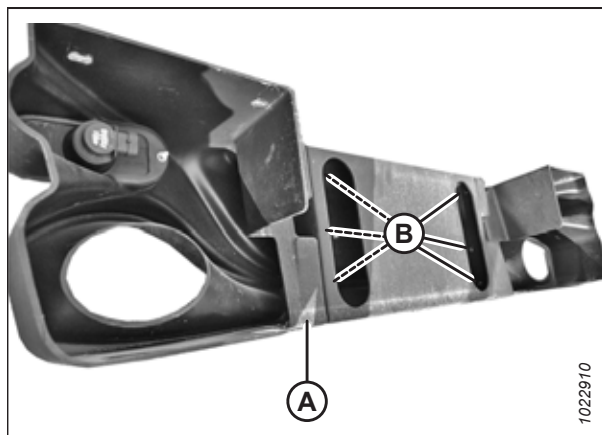


Figure 3.42: Bezel Assembly Removed from Windrower

ASSEMBLING WINDROWER

8. Retain center portion (A) of the light bezel assembly for reinstallation. Install six hex screws (B) on the side bezels.

NOTE:

These hex screws will be used when reinstalling the center portion of light bezel.

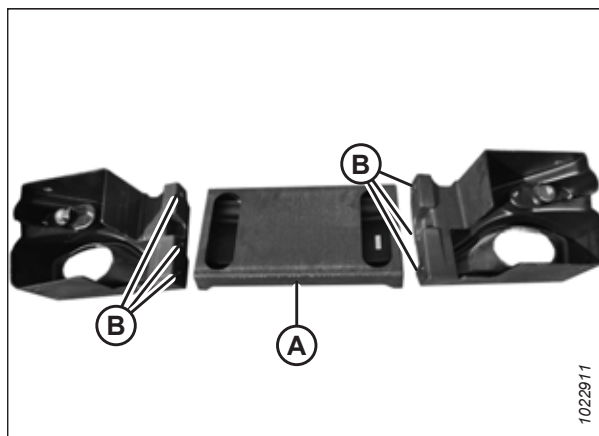


Figure 3.43: Bezel Assembly Separated

CAUTION

Keep your fingers clear of the weight bracket.

9. Install weights (A) from the outboard side of the windrower. Slide the weights to the middle of the bracket on the walking beam.
10. Install retaining bracket (B) on each side of the weight bundle.

IMPORTANT:

Ensure that retaining bracket (B) engages slot (C) in the bracket.

11. Install rod (D) through the retaining bracket and the weights. Use spacers (E) as needed.
12. Secure the rod with nuts (F). Tighten the nuts.

IMPORTANT:

Ensure that nuts (F) are flush with the rod.

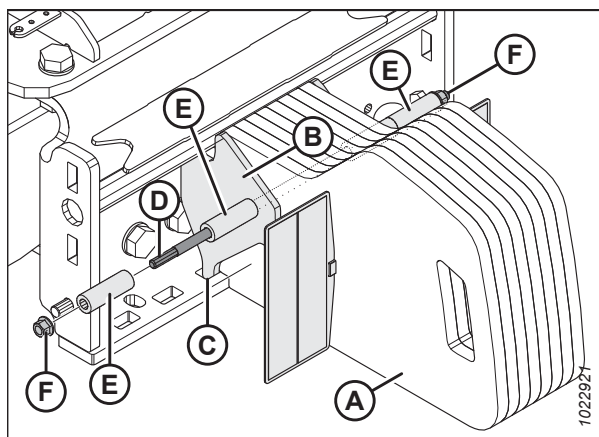


Figure 3.44: Ballast Weights Installed

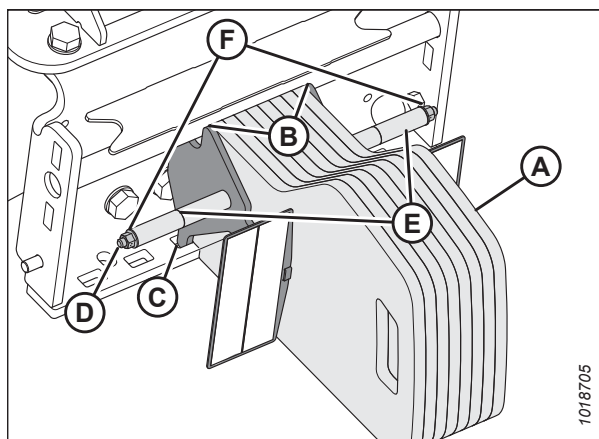


Figure 3.45: Base Ballast Kit Installed – 163 kg (360 lb.)

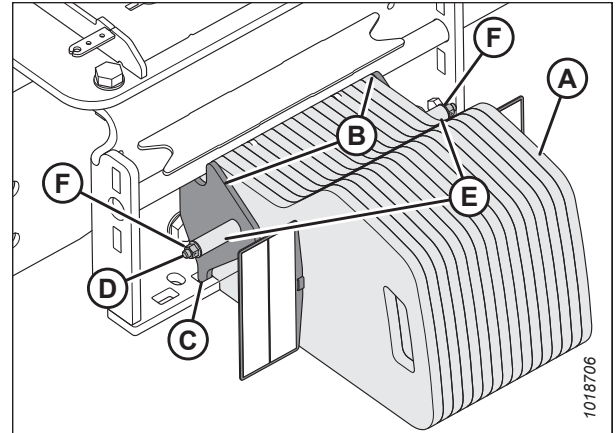


Figure 3.46: Two Ballast Kits Installed – 326 kg (720 lb.)

NOTE:

When all three sets of weights are installed, no spacers are required.

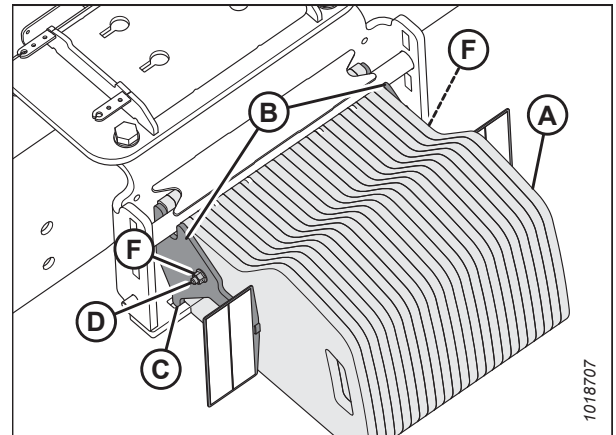


Figure 3.47: Three Ballast Kits Installed – 489 kg (1080 lb.)

13. Bring left bezel (A) close to the frame. Connect plug P215 to the back of red tail/brake light (E).
14. Loosely secure left bezel (A) to the frame with four hex flange bolts (B).
15. Repeat Step [12, page 37](#) and Step [13, page 37](#).
16. Attach plug P210 to right bezel (C).
17. Turn the IGNITION key to the RUN position. Ensure that rear swath lights (D) and red tail/brake lights (E) are working. If they are not working, determine the source of the fault and correct it.
18. Tighten hex flange bolts (B) to secure the left and right light bezels.

IMPORTANT:

Ensure that rear swath lights (D) are centered in the light bezel.

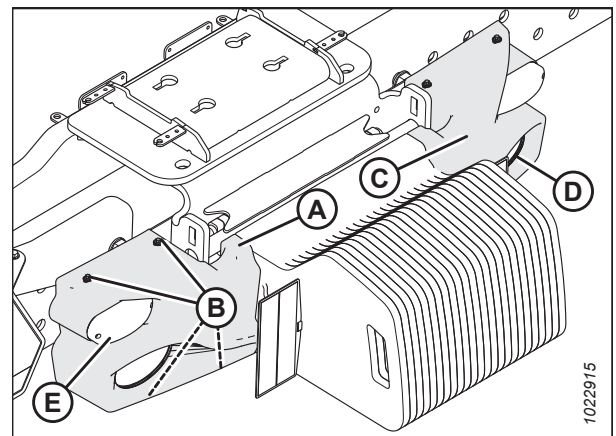


Figure 3.48: Rear Light Bezel with Ballast Kit(s) Installed

ASSEMBLING WINDROWER

19. Grasp the hood by louver (A) and lower it until the hood engages the latch.

NOTE:

To ensure the hood has latched securely, make sure that the latch lever is not tilted.

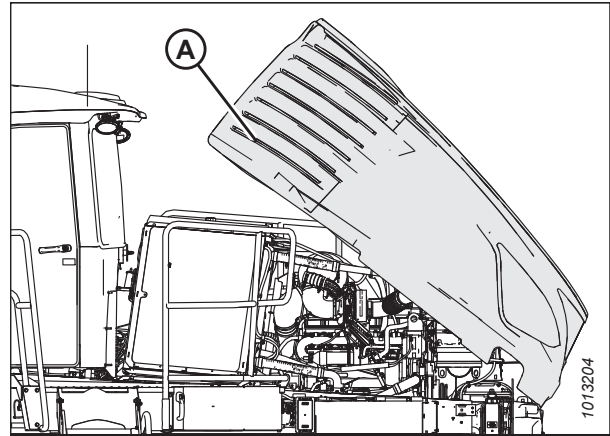


Figure 3.49: Engine Compartment

3.12 Lubrication

Proper lubrication is essential to ensuring the service life of the windrower.

For information on the type of lubricants to use, refer to [6.2 Lubricants, Fluids, and System Capacities, page 135](#).

3.12.1 Lubrication Procedure

This procedure should be followed when you are adding grease to each fitting.

DANGER

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

1. Wipe the grease fitting with a clean cloth before greasing to avoid injecting dirt and grit into the fitting.
2. Inject grease through the fitting with a grease gun until the grease overflows the fitting. Do **NOT** overgrease the wheel bearings.
3. Leave excess grease on the fitting to keep out dirt.
4. Replace any loose or broken fittings immediately.
5. Remove and thoroughly clean any fittings (including the lubricant passageway) that will not take grease. Replace the fitting, if necessary.

3.12.2 Lubrication Points

Add grease to these fittings before delivering the windrower. Be sure to leave a small blob of grease on top of each fitting to prevent contamination.

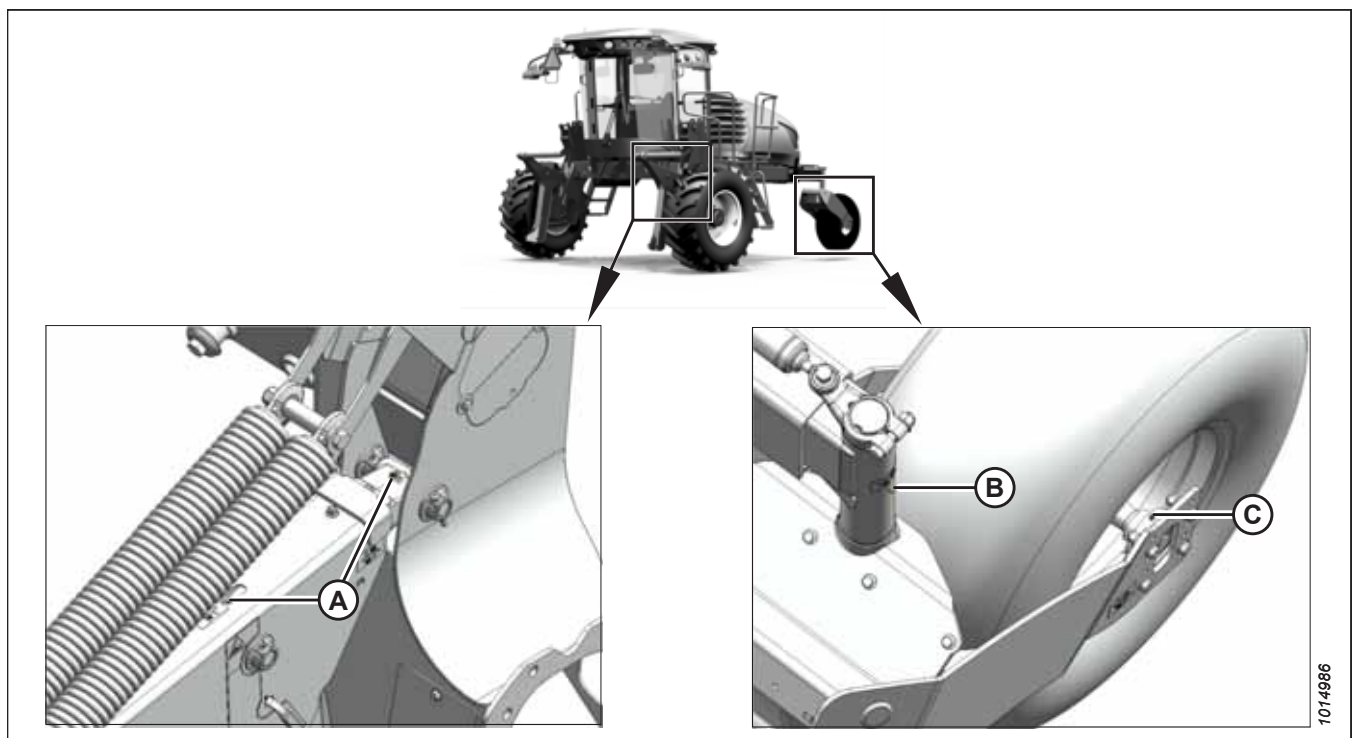


Figure 3.50: Lubrication Points

A - Top Link (Two Places) (Both Sides)

B - Caster Pivot (Both Sides)

C - Forked Caster Wheel Bearing (Two Places) (Both Wheels)

3.13 Connecting Battery

The windrower is shipped with the batteries disconnected. They will need to be connected to the windrower's electrical system.

1. Move latch (A) towards the right cab-forward side of the windrower.
2. Grasp louver (B) and lift the hood to open it.

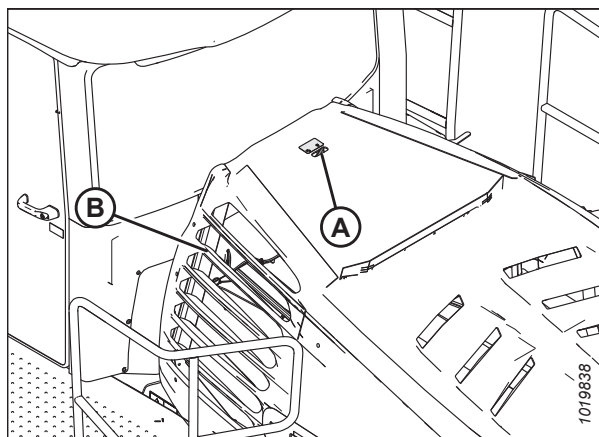


Figure 3.51: Engine Compartment Hood

3. Lift up on the cab-end of cover (A) to disengage it from retaining tab (B), and swing the cover away from the frame.
4. Remove the plastic caps from the battery posts, if these are present.

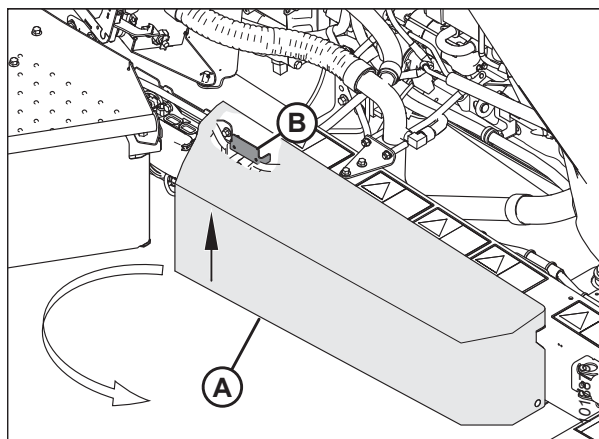


Figure 3.52: Battery Location

5. Attach the red positive (+) cable terminals to positive posts (B) on the batteries. Tighten the terminal clamps. Place the plastic covers over the clamps.

IMPORTANT:

The batteries are negative-grounded. Ensure that the starter cable is connected to the positive (+) terminal of the battery and the battery ground cable is connected to the negative (-) terminal of the battery. Connecting a cable to the wrong post can result in permanent damage to the electrical system.

NOTE:

Ensure that the batteries are oriented in the battery tray so that the positive (+) posts are on the right when facing them.

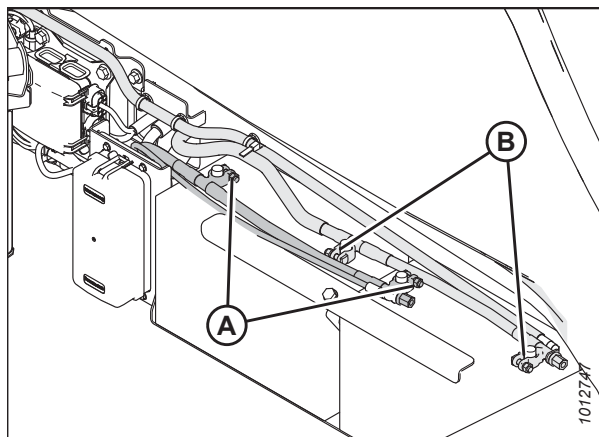


Figure 3.53: Battery Cables Installed

ASSEMBLING WINDROWER

6. Attach the black negative (–) cable terminals to negative posts (A) on the batteries. Tighten the terminal clamps. Place the plastic covers over the clamps.
7. Swing cover (A) towards the windrower frame. Lift up on the cab-end of the cover until it is secured by retaining tab (B) on the frame.
8. Grasp the hood by louver (C) and lower it until the hood engages the latch.

IMPORTANT:

To ensure that the hood is latched, make sure that the latch lever is not tilted.

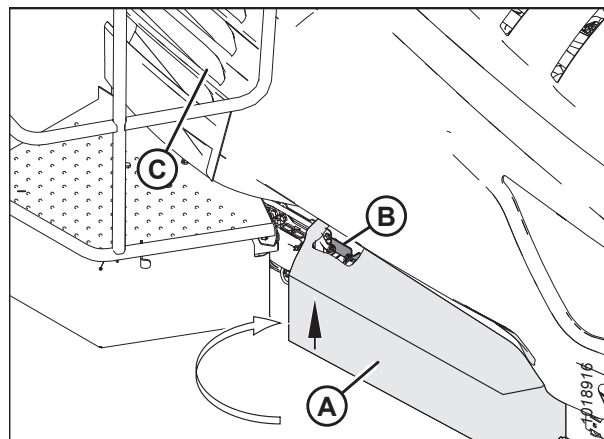


Figure 3.54: Battery Cover Secured

Chapter 4: Predelivery Checks

The predelivery checklist included with this manual and several operational checks will need to be completed before the windrower can be delivered to the customer.

1. Perform the predelivery checks listed in the *Predelivery Checklist, page 149*. Make adjustments to the windrower only if absolutely necessary and only in accordance with the instructions in this manual. Ensure that the predelivery checklist is retained by the Operator or the Dealer.
2. Perform the operational checks listed on the *Predelivery Checklist, page 149*.

4.1 Completing Predelivery Checklist

The predelivery checklist contains all the features of the machine that require inspection.

Perform the final checks and adjustments listed on the *Predelivery Checklist, page 149* (the yellow sheet attached to this instruction) to ensure that the machine is field-ready. Ensure that the Operator or the Dealer retains the completed Predelivery Checklist.

4.1.1 Recording Serial Numbers

Serial numbers identify the specific windrower, its engine, and its factory configuration. The serial number will need to be recorded on the Predelivery Checklist.

1. Move latch (A) toward the right cab-forward side of the windrower.
2. Grasp louver (B), and lift the hood to open it.

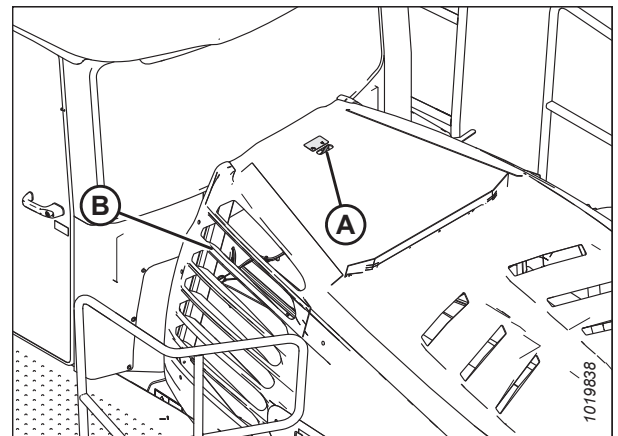


Figure 4.1: Hood

3. Record the windrower and engine serial numbers on the *Predelivery Checklist, page 149*. Confirm that the serial number recorded matches the one found on the shipping manifest or work order.

Windrower serial number plate (A) is located on the left side of the main frame near the walking beam as shown.

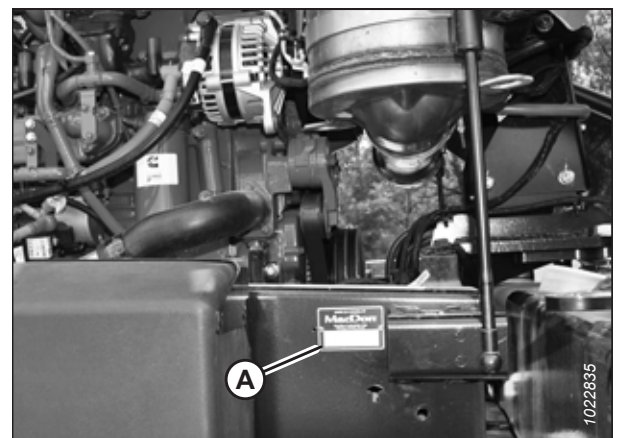


Figure 4.2: Windrower Serial Number Location

PREDELIVERY CHECKS

Engine serial number plate (A) is located on top of the engine cylinder head cover as shown.

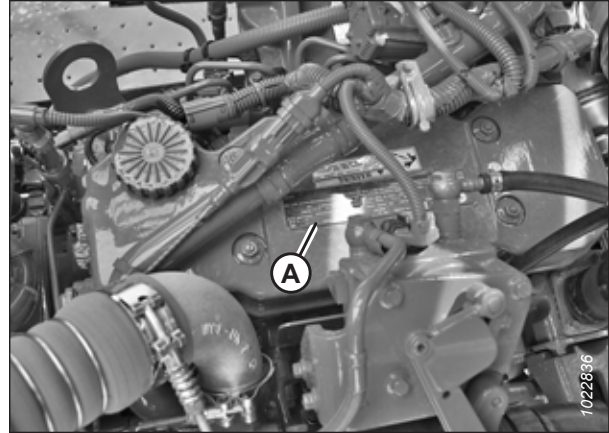


Figure 4.3: Engine Serial Number Location

4.1.2 Opening Hood

The hood will need to be opened any time parts in the engine compartment require service.

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Move latch (A) toward the right cab-forward side of the windrower.
3. Grasp louver (B), and lift the hood to open it.

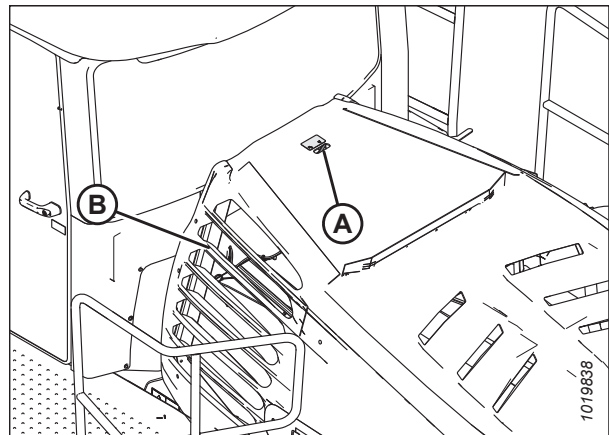


Figure 4.4: Hood

PREDELIVERY CHECKS

NOTE:

If the optional High Debris Cooler Intake kit (A) is installed, a louver can still be used to open the hood.

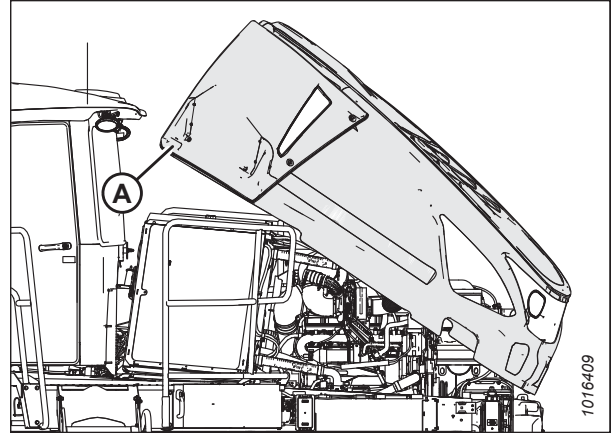


Figure 4.5: Hood with Optional High Debris Cooler Intake Kit

4.1.3 Checking Engine Air Intake

The engine air intake must be clear and all its components properly secured for the engine to work correctly.

1. Ensure that engine air intake ducting (A) is securely fastened. Tighten the hose clamps as needed.
2. Ensure that end cap (B) is secure.

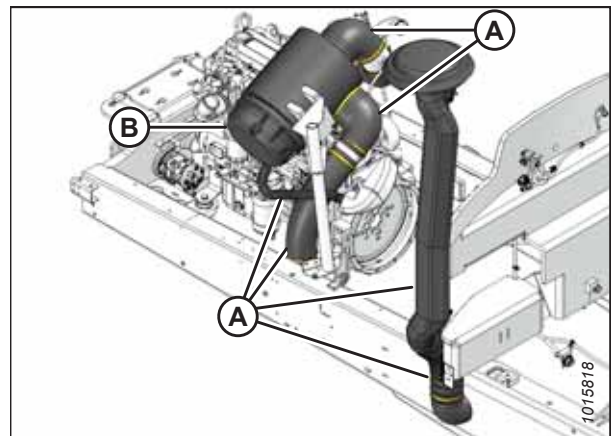


Figure 4.6: Engine Air Intake

3. Ensure that three constant torque hose clamps (A) and spring clamp (B) on the turbocharger intake duct are secure. Clamp (B) is secure when screw tip (C) extends beyond the housing and Belleville washers (D) are almost flat.

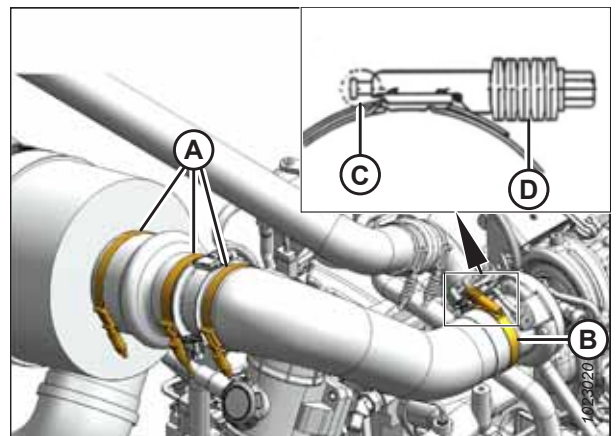


Figure 4.7: Constant Torque Clamps

4.1.4 Checking and Adding Engine Oil

The engine oil level will need to be inspected before the engine can be operated. It may be necessary to add oil to the crankcase.

Checking engine oil level

1. Locate engine oil dipstick (A) on the right side of the windrower. Turn the dipstick counterclockwise to unlock it. Remove the dipstick.
2. Wipe the dipstick clean. Reinsert the dipstick it into the dipstick tube.

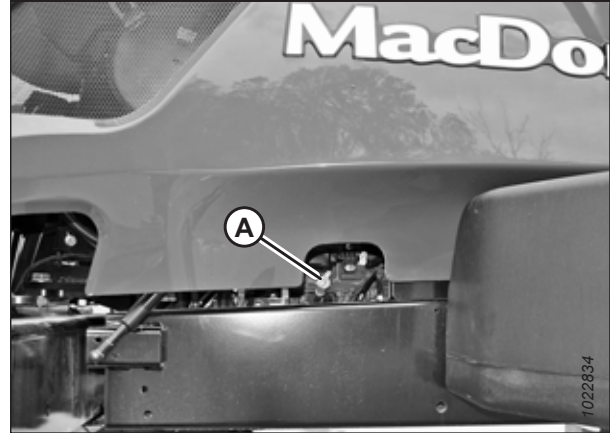


Figure 4.8: Engine Oil Dipstick Location

3. Remove the dipstick again. Check the oil level. The oil level should be between the LOW (L) and HIGH (H) marks on the dipstick. If the oil level is below the LOW mark, oil will need to be added to the crankcase.

NOTE:

Adding 1.9 liters (2 U.S. quarts) of engine oil will raise the level from LOW to HIGH.

4. Replace the dipstick. Turn the dipstick clockwise to lock it.

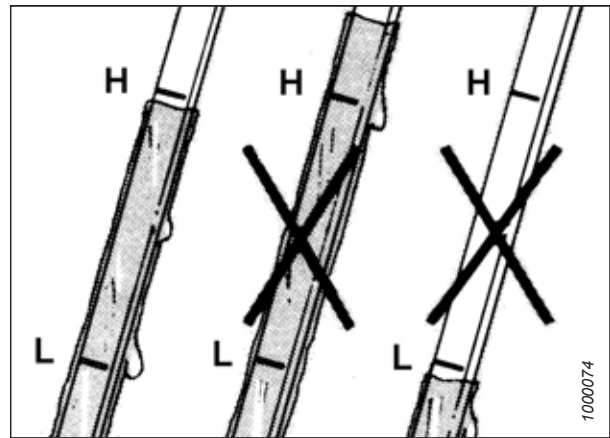


Figure 4.9: Engine Oil Level on Dipstick

Adding engine oil

5. Clean the area around filler cap (A). Turn the cap counterclockwise to unlock it. Remove the cap.
6. Use a funnel to add oil to the crankcase. For information on the oil specifications, refer to [6.2 Lubricants, Fluids, and System Capacities, page 135](#).

IMPORTANT:

Do **NOT** overfill the crankcase with oil. Operating the engine while it is overfilled with oil can damage the engine.

7. Install oil filler cap (A). Turn the cap clockwise until it is snug.

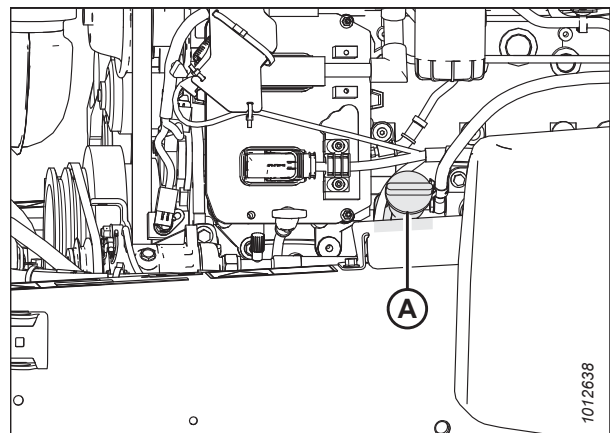


Figure 4.10: Oil Filler Cap

4.1.5 Checking and Adding Hydraulic Oil

The hydraulic oil level will need to be inspected before the windrower can be operated. It may be necessary to add hydraulic oil to the reservoir.



WARNING

Do NOT inspect the hydraulic system for leaks using a part of your body. High-pressure fluid escaping through a pinhole leak can penetrate the skin, causing serious injury.

Checking hydraulic oil level

1. Locate sight glass (A) on the right side of the hydraulic fluid tank.

NOTE:

The sight glass allows the Operator to visually inspect the oil level and its quality. The sight glass can be inspected while the hood is open or closed.

2. Ensure that the hydraulic oil level is between the low and full indicator marks on the sight glass.

IMPORTANT:

If oil is not visible in the sight glass, then the oil level is below the ADD mark on the dipstick. This problem should be addressed immediately.

3. If the hydraulic oil level is too low, add hydraulic oil to the reservoir.

Adding hydraulic oil

4. To add hydraulic oil to the hydraulic oil reservoir, do the following:
 - a. Refer to [6.2 Lubricants, Fluids, and System Capacities, page 135](#) to determine what type of hydraulic fluid is needed.
 - b. Clean the area around the filler plug to prevent debris from entering the tank.
 - c. Turn plug handle (B) counterclockwise until it is loose. Pull the plug out.
 - d. Open breather cap (A).
 - e. Add hydraulic oil through the filler plug until the level in the tank is at the FULL indicator mark.
 - f. Reinstall breather cap (A) and filler plug (B). Turn the filler plug handle clockwise until it is secure.

NOTE:

After a header is run up for the first time, check the oil level again.

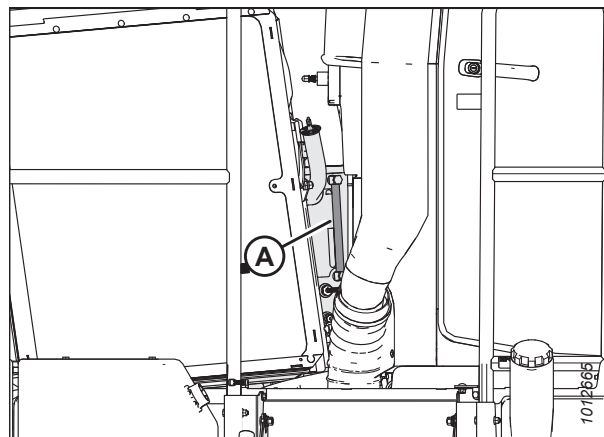


Figure 4.11: Hydraulic Oil Sight Glass

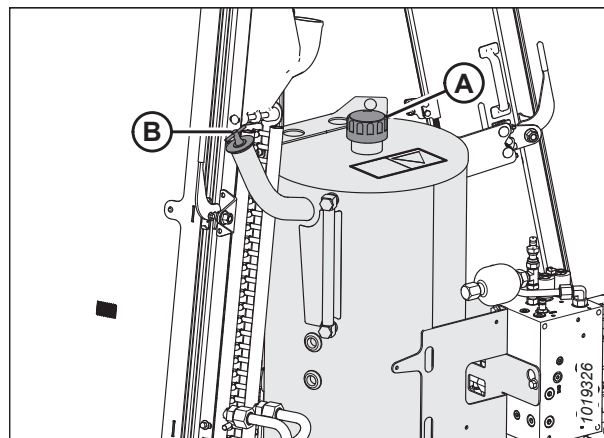


Figure 4.12: Hydraulic Oil Filler Neck and Breather Tube

4.1.6 Checking Fuel Separator

The fuel separator removes water and sediment from the fuel to prevent damage to the engine. It will need to be inspected to ensure that it is clean.

1. Place a container under filter drain valve (A).
2. Turn drain valve (A) by hand 1 1/2 to 2 turns counterclockwise until fuel begins draining.
3. Drain the filter sump of water and sediment until clear fuel is visible. Clean the sump as needed.
4. Turn drain valve (A) by hand 1 1/2 to 2 turns clockwise until it is tight.
5. Dispose of the fuel in a safe manner.

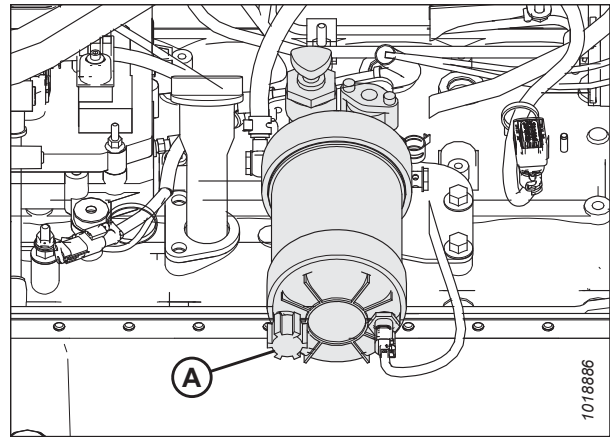


Figure 4.13: Fuel Filter

4.1.7 Checking And Adding Engine Coolant

Coolant is cycled through the engine to help reduce internal heat. The coolant must be at the appropriate level for the cooling system to work correctly.

Checking engine coolant level

1. Locate coolant recovery tank (A).
2. Visually inspect the coolant level. Ensure that the coolant level is at MAX COLD line (B). If the coolant level is too low, add coolant.

NOTE:

For the coolant specifications, refer to [6.2 Lubricants, Fluids, and System Capacities, page 135](#).

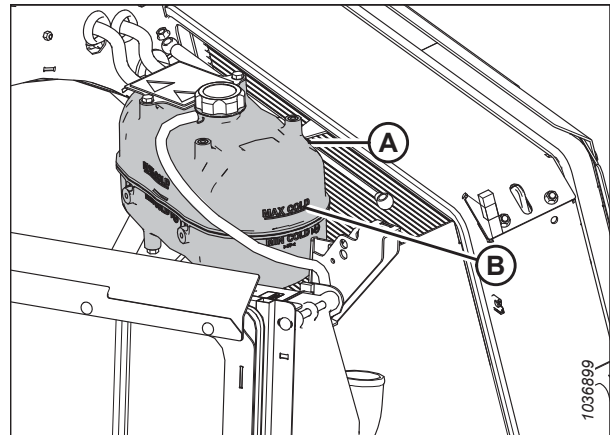


Figure 4.14: Coolant Recovery Tank

Adding engine coolant

3. Add coolant to the recovery tank as follows:
 - a. Remove pressurized cap (A) from the coolant recovery tank.
 - b. Add coolant to the recovery tank at a rate not exceeding 11 L/min (3 gpm) until the recovery tank is half-full and the coolant level is at MAX COLD line (B)
 - c. Replace cap (A).

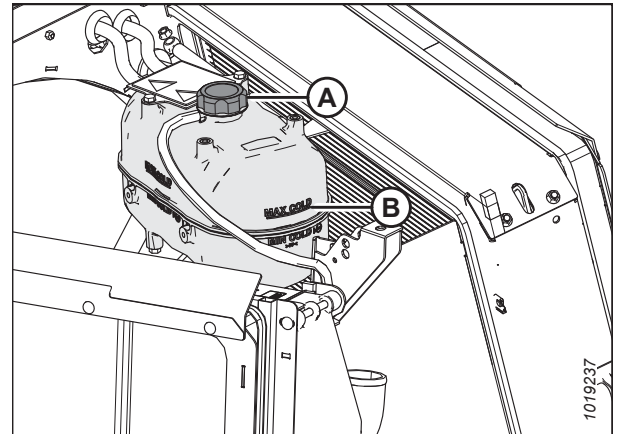


Figure 4.15: Coolant Recovery Tank Cap and MAX COLD Fill Line

4.1.8 Checking Engine Gearbox Lubricant Level and Adding Lubricant

Ensure that the gearbox lubricant level is correct in order to maximize the service life of its components.

1. Open the hood. For instructions, refer to [4.1.2 Opening Hood, page 44](#).
2. Locate gearbox oil level check plug (A) under the windrower.
3. Remove oil level check plug (A). The lubricant should be visible through the hole. Some lubricant may leak from the level check port.

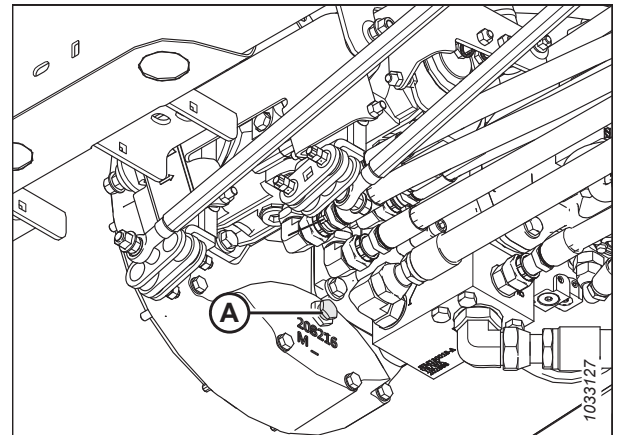


Figure 4.16: Gearbox Lubricant Check Plug

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4. If lubricant is needed, remove breather cap (A) and add lubricant until it runs out of the level check port.

NOTE:

Refer to [6.2 Lubricants, Fluids, and System Capacities, page 135](#) for information on the type and quantity of gearbox lubricant needed.

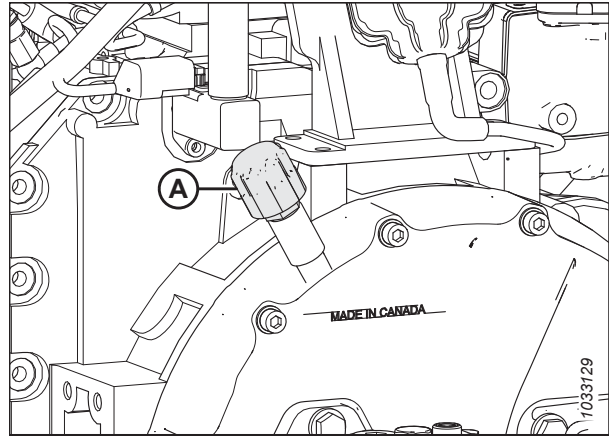


Figure 4.17: Gearbox Lubricant Filler

5. Replace oil level check plug (A) and the breather cap, and tighten both.

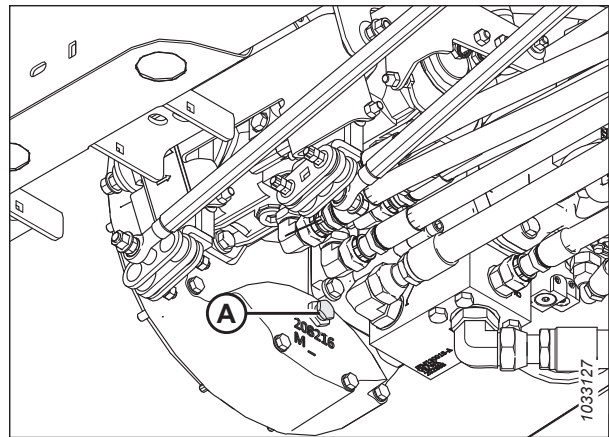


Figure 4.18: Gearbox Lubricant Check Plug

4.1.9 Checking Air Conditioning Compressor Belts

The windrower's air conditioner compressor is belt-driven. The belt must be tensioned correctly for the air conditioning system to function properly.

1. Ensure that air conditioning (A/C) compressor belts (A) are tensioned so that a force of 45 N (10 lbf) applied to the midspan of each belt deflects it by 5 mm (3/16 in.).

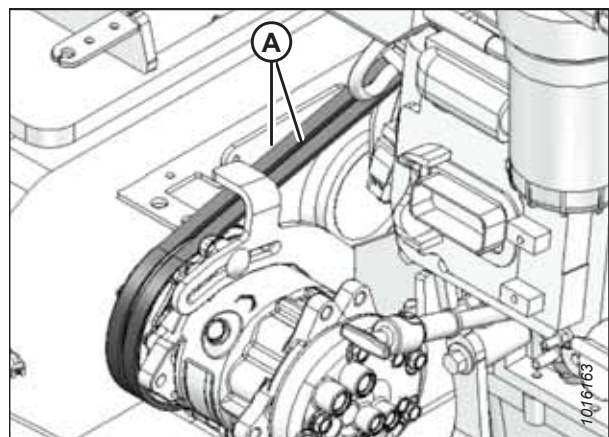


Figure 4.19: A/C Compressor Belts

4.1.10 Closing Hood

When you have finished working in the engine compartment, close the hood.

1. Grasp the hood by louver (A) and lower it until the hood engages the latch.

NOTE:

Check that the latch lever is not tilted to ensure the hood is latched.

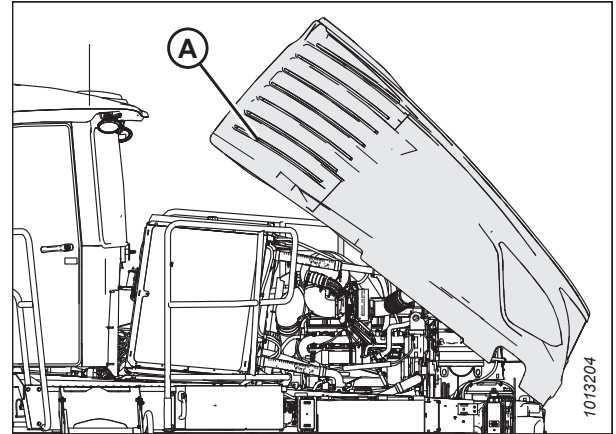


Figure 4.20: Engine Compartment

4.1.11 Checking Tire Pressure

The windrower's drive and caster tires must be inflated to the proper pressure level.

Caster wheel tires: Inflate all caster wheel tires (B) to 110 kPa (16 psi).

Drive wheel tires: Drive wheel (A) tire pressures are determined by tire type, header size, and by the options installed on the windrower. Refer to the following table to determine the appropriate tire pressure for the windrower:

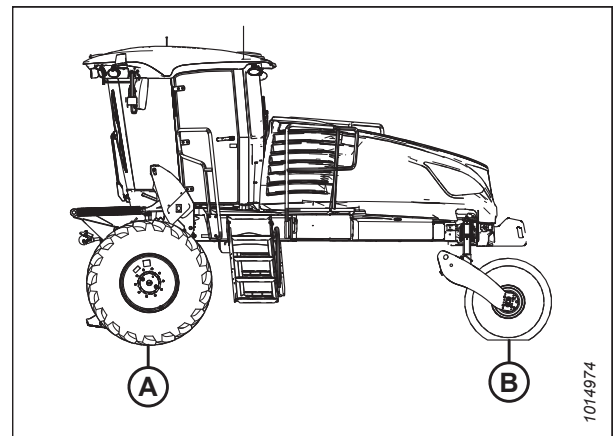


Figure 4.21: Windrower Tires

Table 4.1 Windrower Drive Tire Inflation Specifications by Tire Type, Paired Header, and Installed Options

Header Type	Description	Installed Options	Weight Kit	Tire Type	Pressure kPa (psi)
Draper Header					
D115X single reel	4.6 m (15 ft.), double knife, timed	—	—	Bar	138 (20)
D115X single reel	4.6 m (15 ft.), double knife, timed	—	—	Turf	138 (20)
D120X single reel	6.1 m (20 ft.), double knife, timed	—	—	Bar	138 (20)
D120X single reel	6.1 m (20 ft.), double knife, timed	—	—	Turf	138 (20)

PREDELIVERY CHECKS

Table 4.1 Windrower Drive Tire Inflation Specifications by Tire Type, Paired Header, and Installed Options (continued)

Header Type	Description	Installed Options	Weight Kit	Tire Type	Pressure kPa (psi)
D125X single reel	7.6 m (25 ft.), double knife, timed	—	—	Bar	159 (23)
D125X single reel	7.6 m (25 ft.), double knife, timed	—	—	Turf	159 (23)
D130XL single reel	9.1 m (30 ft.), double knife, timed	Transport	1	Bar	200 (29)
D130XL single reel	9.1 m (30 ft.), double knife, timed	Transport	1	Turf	241 (35)
D130XL single reel	9.1 m (30 ft.), double knife, timed	Transport + upper cross auger + vertical knives	1	Bar	241 (35)
D130XL single reel	9.1 m (30 ft.), double knife, timed	Transport + upper cross auger + vertical knives	1	Turf	241 (35)
D135XL single reel	10.7 m (35 ft.), double knife, untimed	Base	2	Bar	200 (29)
D135XL single reel	10.7 m (35 ft.), double knife, untimed	Base	2	Turf	241 (35)
D135XL single reel	10.7 m (35 ft.), double knife, untimed	Transport	2	Bar	241 (35)
D135XL single reel	10.7 m (35 ft.), double knife, untimed	Transport	2	Turf	241 (35)
D135XL single reel	10.7 m (35 ft.), double knife, untimed	Transport + upper cross auger + vertical knives	3	Bar	241 (35)
D135XL single reel	10.7 m (35 ft.), double knife, untimed	Transport + upper cross auger + vertical knives	3	Turf	241 (35)
D135XL double reel	10.7 m (35 ft.), double knife, untimed	Base	2	Bar	221 (32)
D135XL double reel	10.7 m (35 ft.), double knife, untimed	Base	2	Turf	241 (35)
D135XL double reel	10.7 m (35 ft.), double knife, untimed	Transport	2	Bar	241 (35)
D135XL double reel	10.7 m (35 ft.), double knife, untimed	Transport	2	Turf	241 (35)
D135XL double reel	10.7 m (35 ft.), double knife, untimed	Transport + upper cross auger + vertical knives	3	Bar	283 (41)
D135XL double reel	10.7 m (35 ft.), double knife, untimed	Transport + upper cross auger + vertical knives	3	Turf	241 (35)
D140XL double reel	12.2 m (40 ft.), double knife, untimed	Base	2	Bar	241 (35)
D140XL double reel	12.2 m (40 ft.), double knife, untimed	Base	2	Turf	241 (35)
D140XL double reel	12.2 m (40 ft.), double knife, untimed	Transport	2	Bar	241 (35)
D140XL double reel	12.2 m (40 ft.), double knife, untimed	Transport	2	Turf	241 (35)

PREDELIVERY CHECKS

Table 4.1 Windrower Drive Tire Inflation Specifications by Tire Type, Paired Header, and Installed Options (continued)

Header Type	Description	Installed Options	Weight Kit	Tire Type	Pressure kPa (psi)
D140XL double reel	12.2 m (40 ft.), double knife, untimed	Transport + upper cross auger + vertical knives	3	Bar	283 (41)
D140XL double reel	12.2 m (40 ft.), double knife, untimed	Transport + upper cross auger + vertical knives	3	Turf	241 (35)
D145XL double reel	13.7 m (45 ft.), double knife, untimed	Base	2	Bar	241 (35)
D145XL double reel	13.7 m (45 ft.), double knife, untimed	Base	2	Turf	241 (35)
D145XL double reel	13.7 m (45 ft.), double knife, untimed	Transport	3	Bar	262 (38)
D145XL double reel	13.7 m (45 ft.), double knife, untimed	Transport	3	Turf	241 (35)
D145XL double reel	13.7 m (45 ft.), double knife, untimed	Transport + upper cross auger + vertical knives	3	Bar	283 (41)
D145XL double reel	13.7 m (45 ft.), double knife, untimed	Transport + upper cross auger + vertical knives	3	Turf	241 (35)
Rotary Disc Header					
R113/R116	4 m (13 ft.) / 4.9 m (16 ft.)	No Conditioner	—	Bar or Turf	138 (20)
R113/R116	4 m (13 ft.) / 4.9 m (16 ft.)	Steel or Poly Roll	—	Bar	179 (26)
R113/R116	4 m (13 ft.) / 4.9 m (16 ft.)	Steel or Poly Roll	—	Turf	159 (23)
Auger Header					
A40DX	4.9 m (16 ft.)	—	—	Bar	200 (29)
A40DX	4.9 m (16 ft.)	—	—	Turf	200 (29)
A40DX GSS	4.9 m (16 ft.) (Grass Seed)	—	—	Bar	159 (23)
A40DX GSS	4.9 m (16 ft.) (Grass Seed)	—	—	Turf	159 (23)
A40DX	5.5 m (18 ft.)	—	—	Bar	200 (29)
A40DX	5.5 m (18 ft.)	—	—	Turf	220 (32)

4.1.12 Starting Engine

Once the other predelivery checks have been completed, the engine can be started. The windrower's computer will allow the engine to be started only when certain safety conditions have been met.

DANGER

- Start the engine only when the windrower is in a well-ventilated space.
- The windrower is equipped with safety devices which allow the engine to start only when the ground speed lever (GSL) is in PARK, the steering wheel is locked in the PARK position, and the HEADER ENGAGE switch is in the OFF position. Under NO circumstances are these devices to be deliberately rewired or adjusted so that the engine can be started when the GSL is out of the NEUTRAL position.
- Do NOT start the engine by creating a short across the starter or starter relay terminals. If the normal starting circuitry is bypassed, the machine can start while the drive is engaged and potentially start moving.
- Do NOT start the engine from any other position except the operator's seat.
- Do NOT start the engine while someone is under or near the machine.

IMPORTANT:

Do NOT tow the machine to start the engine. Damage to the hydrostatic drives will result.

NOTE:

When the windrower console receives a wake-up signal, the console awakens from sleep mode and closes the battery disconnect relay. The Harvest Performance Tracker (HPT) enters a boot-up sequence which takes approximately 40 seconds. The following items trigger a wake-up signal for the console:

- Key switch ignition or accessory positions
- Cab door switch
- Horn button
- Hazards button
- Field lights button
- Clearance lights button
- Road lights button
- High beam button

To start the windrower's engine, follow this procedure:

1. Ensure that engine exhaust pipe (A) is not covered or obstructed.



Figure 4.22: Engine Exhaust

PREDELIVERY CHECKS

2. Ensure that cab-forward or engine-forward directional lock (A) at the base of the steering column is engaged.

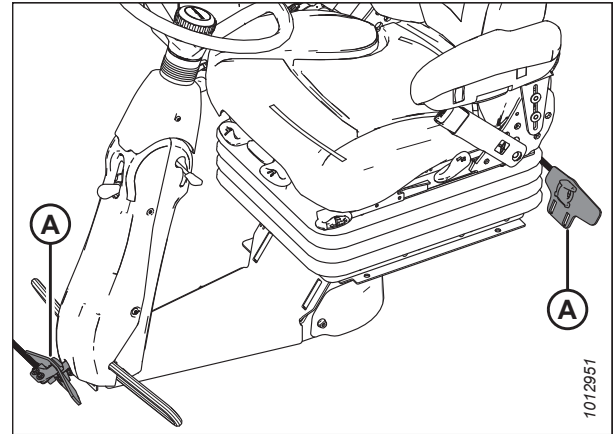


Figure 4.23: Direction Locks

3. Move GSL (A) into PARK (C).
4. Turn the steering wheel until it locks.

IMPORTANT:

Do **NOT** attempt to force the wheel out of the locked position or damage to the steering system may occur.

NOTE:

It may be possible to move the steering wheel slightly when it is in the locked position.

5. Fasten the seat belt.
6. Push HEADER ENGAGE switch (B) to ensure it is in the OFF position.

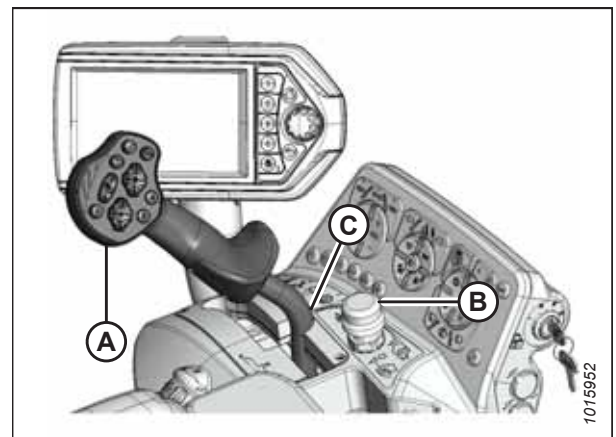


Figure 4.24: Operator Controls

PREDELIVERY CHECKS

7. Press HORN button (E) three times.
8. Turn IGNITION switch (A) to the ON position. HPT display (B) will light up. Wait for WAIT TO START (WTS) symbol (C) to disappear.
9. Ensure that red PARK symbol light (D) is ON and that there are no error messages on the screen.

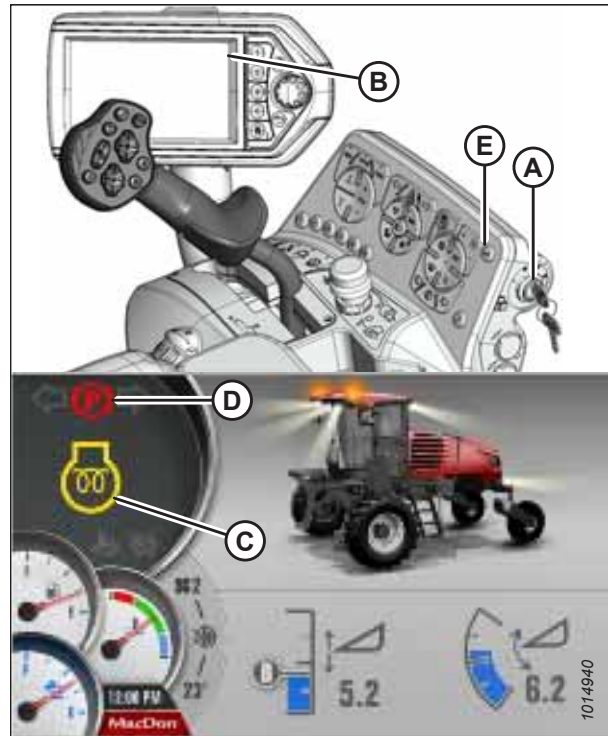


Figure 4.25: Console and HPT Run Screen

10. Turn the IGNITION switch to crank position (A).

IMPORTANT:

Do **NOT** move the GSL out of PARK until the hydraulic oil temperature is at least 32°C (90°F). The hydraulic oil temperature can be viewed on Run Screen 4 on the Harvest Performance Tracker (HPT) display.

IMPORTANT:

- Do **NOT** operate the starter for longer than 15 seconds at a time.
- If the engine does not start, wait at least 2 minutes before you attempt to start the engine again.
- If the engine is cranked for longer than 30 seconds in a 2-minute period, the windrower's computer will lock the starter circuit, and a flashing WTS symbol will appear on the display. Wait for the WTS symbol to stop flashing before attempting to crank the engine again.
- If the engine still does not start, refer to the windrower operator's manual.

NOTE:

When the engine is running and the header is not engaged, the HPT will display header disengaged page (B).



Figure 4.26: HPT Header Disengaged Screen

PREDELIVERY CHECKS

NOTE:

If the engine is started when the ambient temperature is below 5°C (40°F), the engine will cycle through a period during which it will sound as though it is struggling to stay running. This is the engine's warm-up mode. The throttle will be unresponsive while the engine is in warm-up mode. Warm-up mode lasts between 30 seconds and 3 minutes, depending on the ambient temperature. The throttle will become active after the engine has stabilized and is idling normally. Do **NOT** operate the engine above 1500 rpm until the HPT engine temperature gauge is above blue range (A).



Figure 4.27: HPT No Header Screen

Troubleshooting Engine Starting Problems

If the windrower's engine is difficult to start, the problem will need to be diagnosed. Follow the instructions in this section for troubleshooting the windrower's engine.

IMPORTANT:

Do **NOT** tow the machine to start the engine. Towing the windrower can cause damage to the hydrostatic drives.

Use the following table to diagnose problems with starting the windrower's engine:

Table 4.2 Engine Start Troubleshooting

Problem	Solution
Controls are not in the NEUTRAL position	<ul style="list-style-type: none"> Move the GSL to NEUTRAL Move the steering wheel to the locked (centered) position Disengage the HEADER switch
Operator's station is not locked	<ul style="list-style-type: none"> Adjust the position of the operator's station Ensure that the lock is engaged
Neutral interlock is out of adjustment	<ul style="list-style-type: none"> Refer to the windrower's technical manual
Fuel not reaching the engine	<ul style="list-style-type: none"> Fill the fuel tank Replace the fuel filter Check for blocked or damaged fuel lines
Old fuel in the fuel tank	<ul style="list-style-type: none"> Drain the fuel tank Refill the fuel tank with fresh fuel
Water, dirt, or air in the fuel system	<ul style="list-style-type: none"> Drain, flush, fill, and prime the fuel system
Improper type of fuel in the fuel tank	<ul style="list-style-type: none"> Drain the fuel tank Refill the fuel tank with the correct type of fuel
Crankcase oil too heavy	<ul style="list-style-type: none"> Replace with recommended oil
Low voltage output from the battery	<ul style="list-style-type: none"> Test the battery Check the battery's electrolyte levels

Table 4.2 Engine Start Troubleshooting (continued)

Problem	Solution
Poor battery connection	<ul style="list-style-type: none"> Clean and tighten loose battery connections
Faulty starter	<ul style="list-style-type: none"> Refer to the windrower's technical manual
Wiring is shorted or the circuit breaker is open	<ul style="list-style-type: none"> Check the continuity of the wiring and the breaker; manually reset the circuit breaker
Faulty fuel injectors	<ul style="list-style-type: none"> Refer to the windrower's technical manual
Aftertreatment error on start up	Check DEF (diesel exhaust fluid) coolant hose routing, ensure the coolant pressure lines, marked with red cable ties, are connected together, and not crossed with the return line.

4.1.13 Checking and Adding Wheel Drive Lubricant – 10 Bolt Wheels

The lubricant level in the windrower's wheel drives can be inspected through the lubricant ports.

DANGER

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

CAUTION

Park on a level surface with the ground speed lever (GSL) in the PARK position and the steering wheel in the locked (centered) position. Wait for the Harvest Performance Tracker (HPT) to beep and display a red P symbol to confirm that the parking brake is engaged.

The following procedure applies to windrowers equipped with 10-bolt drive wheels. If the windrower is equipped with the optional high torque power wheels, which are secured to the windrower with 12 bolts, refer to [4.1.14 Checking and Adding Wheel Drive Lubricant – 12 Bolt \(Optional\)](#), page 59.

1. Park the windrower on level ground.
2. Rotate the wheel drive so that the imaginary line running through plugs (A) and (B) and hub center (C) is parallel with the ground, as shown.
3. Shut down the engine, and remove the key from the ignition.
4. Remove plug (A) or (B). The lubricant should be visible through the port. Some fluid may spill from the port.
5. If necessary, add lubricant until lubricant runs out from open port (A) or (B). For lubricant specifications, refer to [6.2 Lubricants, Fluids, and System Capacities](#), page 135.

IMPORTANT:

The lubricant used for the first wheel drive lubricant change differs from the type of lubricant used at the factory. For lubricant specifications, refer to [6.2 Lubricants, Fluids, and System Capacities](#), page 135.

6. Reinstall the plug and tighten it to 24 Nm (18 lbf-ft).

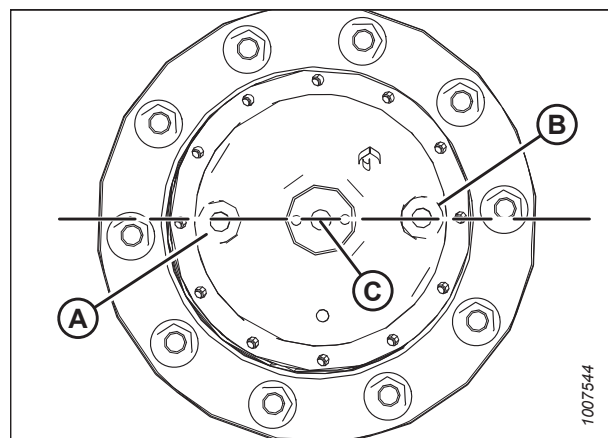


Figure 4.28: Drive Wheel Hub

4.1.14 Checking and Adding Wheel Drive Lubricant – 12 Bolt (Optional)

The lubricant level in the wheel drives of windrowers equipped with 12 bolt wheels can be inspected through the lubricant check port.

DANGER

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

1. Park the windrower on level ground.
2. Rotate the wheel drive until fill/drain plug (A) is at the 12 o'clock position and check plug (B) is at the 3 o'clock position as shown.
3. Shut down the engine, and remove the key from the ignition.

WARNING

Use caution when removing the plug, as the fluid may still be under pressure.

4. Remove check plug (B). The lubricant should be visible through the port. Some lubricant may leak from the port.
5. Reinstall check plug (B). Torque the plug to 7.5 Nm (6 lbf-ft).
6. If removed, reinstall fill/drain plug (A). Torque the plug to 24 Nm (18 lbf ft).

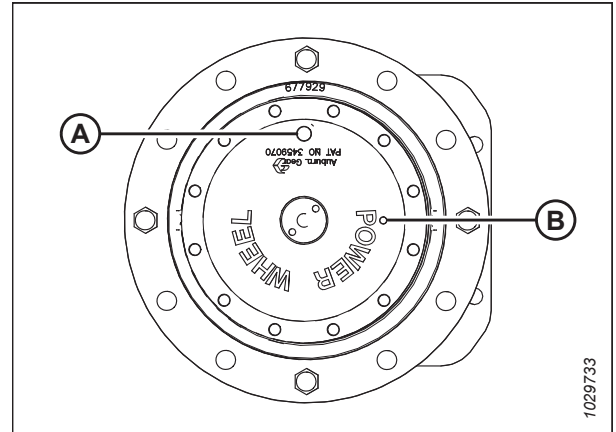


Figure 4.29: Wheel Drive – 12 Bolt

4.2 Performing Operational Checks

Once the predelivery checklist has been completed, the operating characteristics of the windrower will need to be inspected.

1. Perform the operational check procedures provided in this chapter and fill out the relevant items in the *Predelivery Checklist, page 149*.
2. Ensure that the Operator or the Dealer retains the completed Predelivery Checklist.

For information on navigating the windrower's Harvest Performance Tracket (HPT), refer to *6.1 Navigating Harvest Performance Tracker, page 133*.

4.2.1 Checking Operating Safety System

The operating safety system protects the Operator from injury and the windrower from damage. The functionality of the operating safety system will need to be verified.



DANGER

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



DANGER

Ensure that all bystanders have cleared the area.

1. With the engine running and the seat base in engine-forward mode, press the HEADER ENGAGE switch. Confirm that the header drive does **NOT** engage and that the Harvest Performance Tracker (HPT) displays LOCK SEAT BASE IN CAB-FORWARD.
2. With the engine running and the seat base in cab-forward mode, stand up and engage the HEADER DRIVE switch. The header drive should **NOT** engage and the HPT should display OPERATOR MUST BE SEATED.
3. With the engine running and the seat base unlocked, move the ground speed lever (GSL) out of PARK. Confirm that the engine immediately shuts down and that the HPT displays LOCK SEAT BASE and sounds a tone.
4. Shut down the engine and press the HEADER ENGAGE switch. Try starting the engine to confirm that the HPT displays DISENGAGE HEADER. If the engine turns over, the safety system requires adjustment. Refer to the windrower's technical manual for the adjustment procedures.
5. Shut down the engine and open the cooler box door. Try starting the engine to confirm that the HPT displays CLOSE COOLER BOX DOOR. If the engine turns over, the safety system requires adjustment. Refer to the windrower's technical manual for the adjustment procedures.

PREDELIVERY CHECKS

6. Shut down the engine and perform the following safety system checks:
 - a. Open the hood.
 - b. Pry the steering interlock away from pintle arms (A) by inserting a wedge or a pry bar between one of interlock channels (B) and the pintle arm.
 - c. Insert a wooden block approximately 19 mm (3/4 in.) thick between the opposite channel and the pintle arm so that the interlock channel is clear of the pintle arm.
 - d. Turn the steering wheel off-center and move the GSL to PARK.
 - e. Try starting the engine to confirm that the HPT displays LOCK STEERING WHEEL IN CENTER POSITION. The engine should **NOT** turn over. If the engine turns over, the safety system requires adjustment. Refer to the windrower's technical manual for the adjustment procedures.
 - f. Remove the key from the ignition.
 - g. Remove the wooden block and close the hood.
7. Center the steering wheel. Place the GSL in NEUTRAL but not in PARK. Try starting the engine to confirm that the HPT displays MOVE GSL INTO PARK. The engine should **NOT** turn over. If the engine turns over, the safety system requires adjustment. Refer to the windrower's technical manual for the adjustment procedures.
8. With the engine off, center the steering wheel. Place the GSL in PARK and ensure that the operator's station is **NOT** locked. Try starting the engine and confirm that the engine does **NOT** turn over, and the HPT displays LOCK SEAT BASE. If the engine starts, the safety system requires adjustment. Refer to the windrower's technical manual for the adjustment procedures.

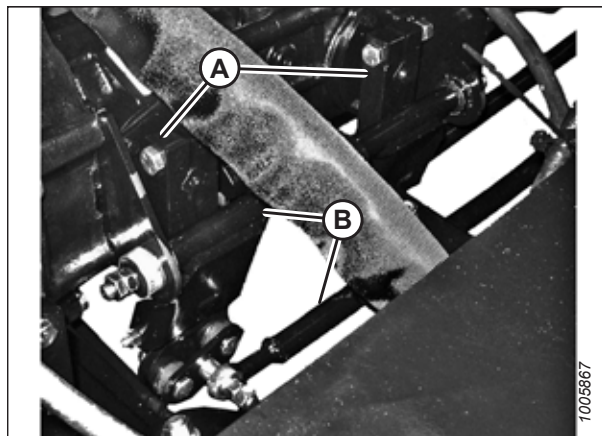


Figure 4.30: Pintle Arms

4.2.2 Checking Harvest Performance Tracker Status Screen and Auto Lights

The windrower's Harvest Performance Tracker (HPT) should be able to automatically detect the type of header attached to the windrower, and to turn the cab lights off automatically when the Operator leaves the cab. The functionality of these features will need to be verified.



DANGER

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

PREDELIVERY CHECKS

1. Open the cab door, turn the IGNITION switch to the ON position, and confirm that the HPT display boots up and shows the MacDon logo.



Figure 4.31: HPT Display – Boot-Up

2. Start the engine. For instructions, refer to [4.1.12 Starting Engine, page 54](#).
3. If a header is attached to the windrower, confirm that the HPT initially displays the header-disengaged screen.



Figure 4.32: HPT Display – Header Disengaged

4. If a header is not attached to the windrower, confirm that the HPT displays the no-header screen.



Figure 4.33: HPT Display – No Header

PREDELIVERY CHECKS

5. Press LIGHT switch (A) to turn on the headlights.
6. Shut down the engine. Leave the cab, but do not turn off the headlights. Confirm that the HPT display, the headlights, and the egress light shut off after 3 minutes.

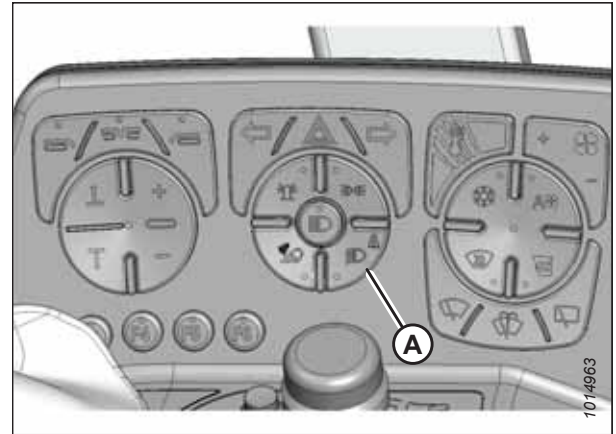


Figure 4.34: Headlight Switch

4.2.3 Checking Harvest Performance Tracker Display Gauges

The Harvest Performance Tracker (HPT) display shows the windrower's performance gauges. The functionality of this feature will need to be verified.



DANGER

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



DANGER

Ensure that all bystanders have cleared the area.

1. If the windrower engine is not already running, start it. For instructions, refer to [4.1.12 Starting Engine, page 54](#).
2. If a header is not attached to the windrower, check that the no-header page appears on the HPT display.



Figure 4.35: HPT Display – No Header

PREDELIVERY CHECKS

3. If a header is attached to the windrower, confirm that header screen (A) appears on the HPT display.
4. Ensure that red park symbol (B) is lit.
5. Ensure that engine rpm (C) appears on the HPT display.
6. Ensure that fuel gauge (D), DEF gauge (E), and temperature gauge (F) appear on the HPT display.

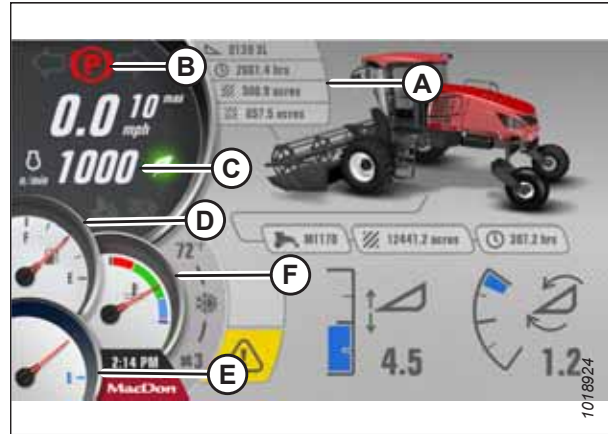


Figure 4.36: HPT Display – Header Attached

4.2.4 Setting Language and Units of Measurement

The language and unit of measurement options can be set in the Harvest Performance Tracker's (HPT) SETTINGS menu.

1. Navigate to the SETTINGS menu by pressing soft key 5 and the Harvest Performance Tracker (HPT) scroll knob. For instructions, refer to [6.1 Navigating Harvest Performance Tracker, page 133](#).
2. Scroll to SCREEN icon (A) and select it.
3. Scroll to LANGUAGE AND UNITS icon (B), and select it to open the adjustment window.

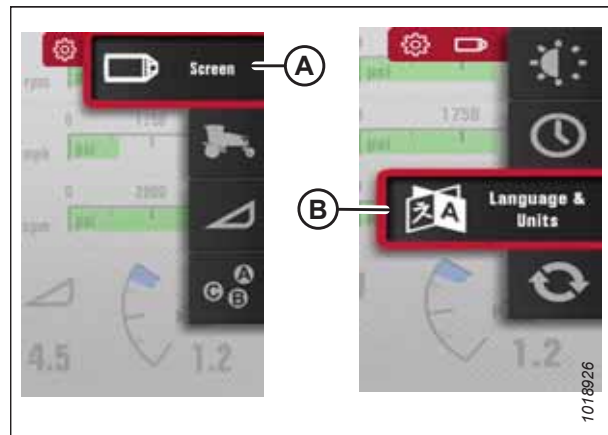


Figure 4.37: Language and Units

PREDELIVERY CHECKS

4. Scroll through the available options on the HPT, select the desired item, and rotate the scroll knob to move through the available options:

- **LANGUAGE**

- CZECH
- DANISH
- ENGLISH (default)
- FRENCH
- GERMAN
- LATVIAN
- SPANISH

- **UNITS**

- METRIC
- USA (default)

NOTE:

Refer to [6.6 Conversion Chart, page 146](#) for a comprehensive list of U.S. and metric units.

4.2.5 Setting Time and Date

The time and date can be set in the Harvest Performance Tracker's (HPT) SETTINGS menu.

1. Navigate to the SETTINGS menu by pressing soft key 5 and the HPT scroll knob. For instructions, refer to [6.1 Navigating Harvest Performance Tracker, page 133](#).
2. Scroll to SCREEN option (A) and select it.
3. Scroll to TIME AND DATE option (B), and select it to open the adjustment window.



Figure 4.38: Time and Date

PREDELIVERY CHECKS

4. Scroll through the available options on the HPT display, select the desired option, and rotate the scroll knob to make adjustments.



Figure 4.39: Time and Date

4.2.6 Setting Windrower Tire Size and Wheel Type

The Harvest Performance Tracker (HPT) is factory-configured for 600/65R28 bar tires. If the windrower is equipped with a different type of tire, this setting will need to be changed. Setting the proper tire size ensures that the HPT accurately tracks the windrower's ground speed, the area cut, and other productivity data.

1. Press soft key 5 and use the HPT scroll knob to navigate to the SETTINGS menu. For instructions, refer to [6.1 Navigating Harvest Performance Tracker, page 133](#).
2. Scroll to WINDROWER SETTINGS icon (A) and select it.
3. Scroll to TIRES icon (B) and select it. The adjustment window will appear.

NOTE:

Pressing the F3 shortcut button on the operator's console will also cause the WINDROWER SETTINGS menu to appear.

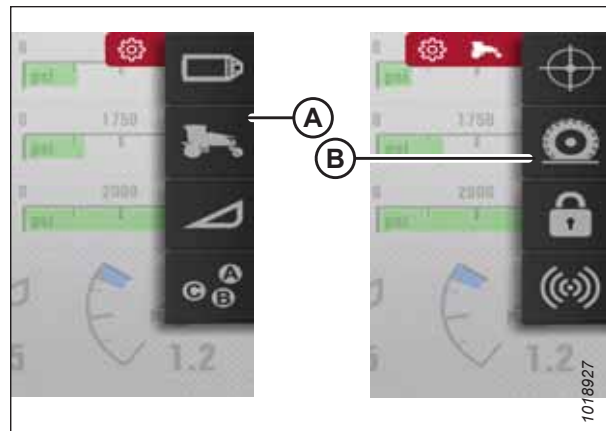


Figure 4.40: Tire Size

4. Scroll to highlight tire sizes (A) listed under SELECT DRIVE TIRES.
5. Press the scroll knob to select the list.

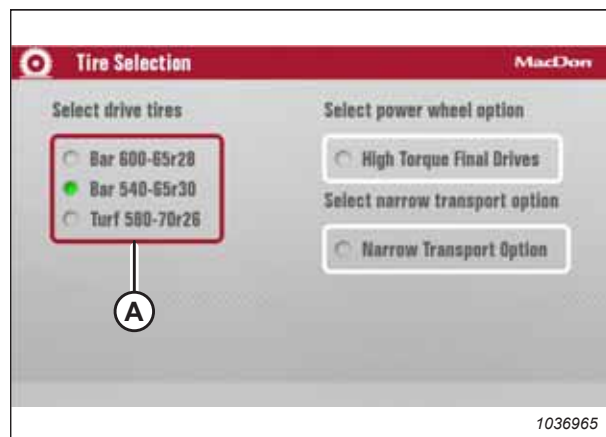


Figure 4.41: Tire Selection

PREDELIVERY CHECKS

6. Scroll until the correct tire size is highlighted (A).
7. Press the scroll knob. Ensure that green radio button (B) appears beside the tire size.
8. If the optional high-torque wheel drives are installed, proceed to Step 9, page 67. If the optional high-torque wheel drives are **NOT** installed, proceed to Step 12, page 67.



Figure 4.42: Tire Selection

9. **If the optional high-torque wheel drives are installed:** once the correct tire size is selected, press the BACK button to deselect the list of tire sizes. Scroll to SELECT POWER WHEEL OPTION (A).

NOTE:

Do **NOT** select this option unless the high-torque (36.82:1) wheel drives are installed.

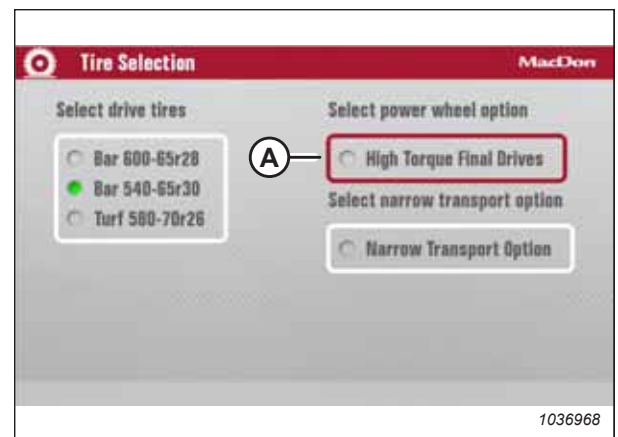


Figure 4.43: Tire Selection

10. Press the scroll knob to select list (A).
11. Press the scroll knob. Ensure that green radio button (B) appears beside HIGH TORQUE FINAL DRIVES. The high-torque wheel drive option is now enabled.
12. Press the BACK button to exit the menu, or press the HOME button to exit the TIRE SELECTION page.

NOTE:

Pressing the BACK or HOME buttons will save the settings to memory.

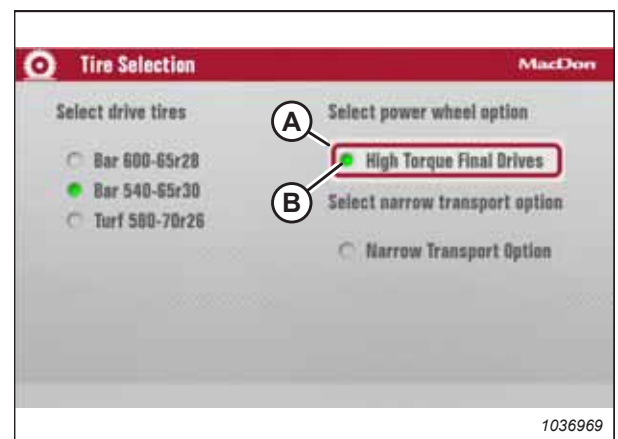


Figure 4.44: Tire Selection

4.2.7 Checking Engine Speed

The windrower's engine idle and maximum speeds must be verified.

DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

1. Start the engine.
2. Move the throttle to the idle position.
3. Check engine speed (A) on the Harvest Performance Tracker (HPT) display. Compare the current engine speed to the value in the table below.
4. Move the throttle to its highest possible setting.
5. Check engine speed (A) on the HPT. Compare the current engine speed to the value in the table below.

NOTE:

The engine speed specifications in the table below are provided on the assumption that the windrower's Eco Engine Control (EEC) feature is **NOT ACTIVE**. For more information about EEC, refer to the windrower operator's manual.

Table 4.3 Engine Speed

Idle	Maximum (No Load)
1000 rpm	2500 rpm

6. Shut down the engine, and remove the key from the ignition.



Figure 4.45: HPT Display

4.2.8 Checking Selective Catalytic Regeneration Conditioning Mode

The selective catalytic regeneration (SCR) system is part of the exhaust aftertreatment system. The SCR conditioning process can activate any time the windrower is running so long as the INHIBIT SCR CONDITIONING switch is set to OFF. The functionality of the INHIBIT SCR CONDITIONING feature will need to be verified.

The SCR conditioning inhibit mode is off when indicator (A) on the Harvest Performance Tracker (HPT) display is not highlighted.

If SCR conditioning mode is on, then indicator (A) will be highlighted. This will prevent the SCR process from occurring.

NOTE:

If the SCR system is inhibited for an extended period, the engine will begin to derate its power levels until manual SCR conditioning is performed. Refer to the windrower operator's manual for more information.

If the SCR conditioning inhibit symbol is highlighted, turn SCR inhibit mode off as follows:

1. Press soft key 5 (A) on the HPT.
2. Press soft key 5 (A) next to EXHAUST AFTERTREATMENT icon (B).
3. To turn off SCR conditioning inhibit mode, press soft key 5 (A) next to INHIBIT SCR CONDITIONING icon (B) and hold it for 3 seconds. Highlighted SCR CONDITIONING INHIBIT icon (C) will turn off.



Figure 4.46: HPT Display

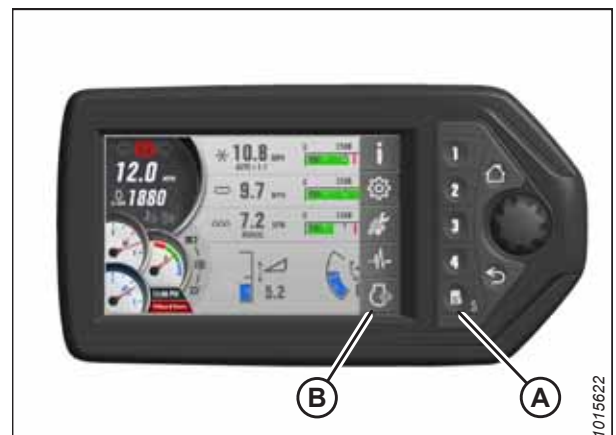


Figure 4.47: HPT Display



Figure 4.48: HPT Display

4.2.9 Checking Exterior Lights

The windrower's exterior lighting system consists of the following: field lights, swath lights, road lights, hazard lights, high/low beams, turn signals, and the rotary beacon. Any plastic film over these lights will need to be removed. All parts of the exterior lighting system will need to be checked for functionality.

PREDELIVERY CHECKS

1. **For models with LED lighting:** remove the plastic film from the LED lighting.
2. Rotate the operator's seat to the cab-forward position.
3. Press FIELD LIGHT switch (A).
4. Ensure that front field lights (B), rear field lights (C), and rear swath lights (D) are functional.

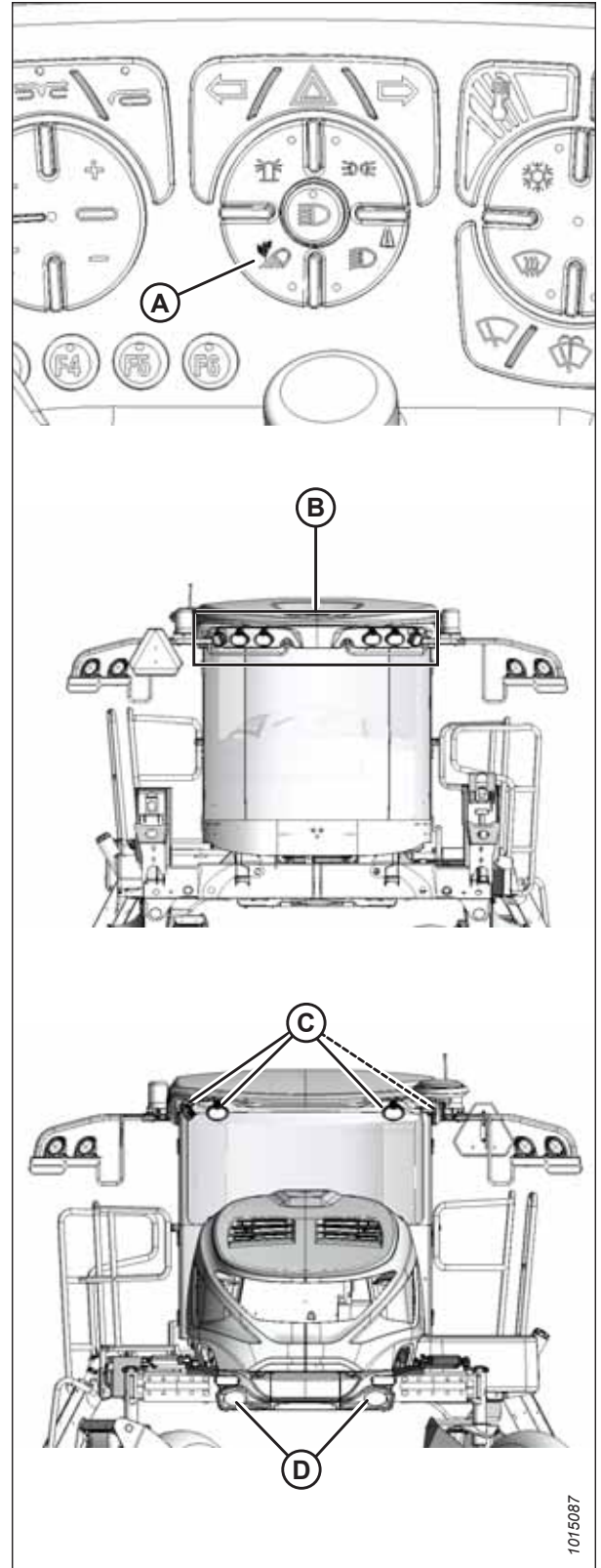


Figure 4.49: Field Lights

PREDELIVERY CHECKS

5. Press ROAD LIGHT switch (A). Ensure that front road lights (B) and rear red tail/brake lights (C) are functional.
6. Press HIGH/LOW switch (D). Ensure that lights (B) are functional.
7. Press TURN SIGNAL switches (E) on the console. Ensure that amber lights (F) are functional.
8. Press HAZARD LIGHT switch (G). Ensure that flashing hazard lights (F) are functional.
9. Press the switches to shut off the lights.

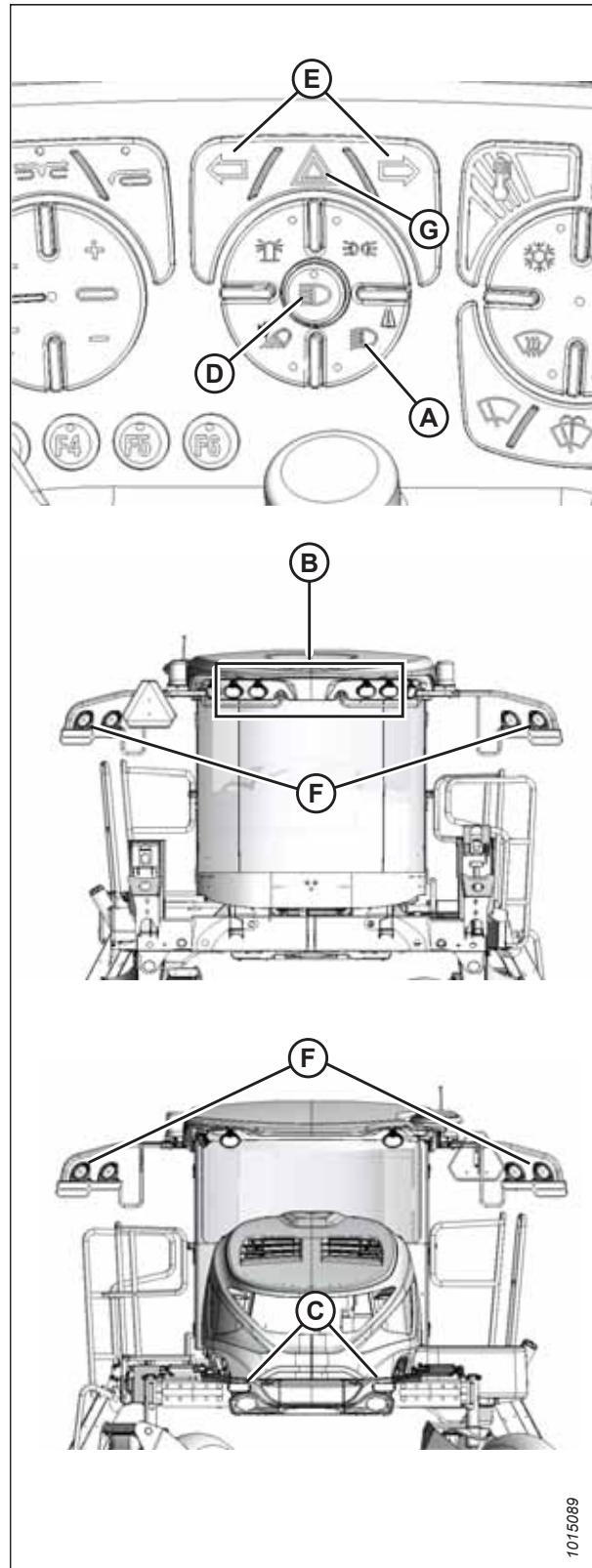


Figure 4.50: Road Lights – Cab-Forward

PREDELIVERY CHECKS

10. Rotate the operator's seat to the engine-forward position.
11. Press ROAD LIGHT switch (A). Ensure that front road lights (B) and rear red tail/brake lights (C) are functional.
12. Press HIGH/LOW switch (D). Ensure that lights (B) are functional.
13. Press TURN SIGNAL switches (E) on the console. Ensure that amber lights (F) are functional.
14. Press HAZARD LIGHT switch (G). Ensure that flashing hazard lights (F) are functional.
15. Press the switches again to shut off the lights.

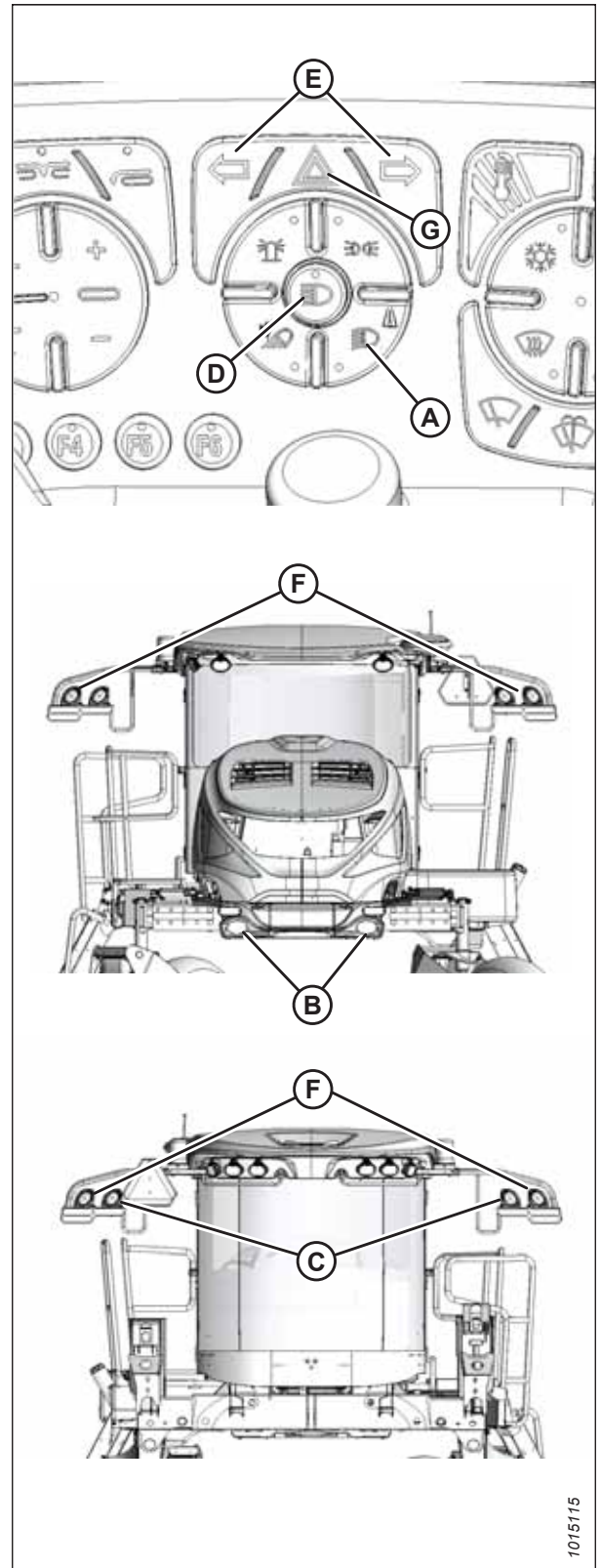


Figure 4.51: Road Lights – Engine-Forward

PREDELIVERY CHECKS

16. Push BEACON switch (A). Ensure that amber beacons (B) are functional.
17. Press BEACON switch (A) to shut off the beacons.

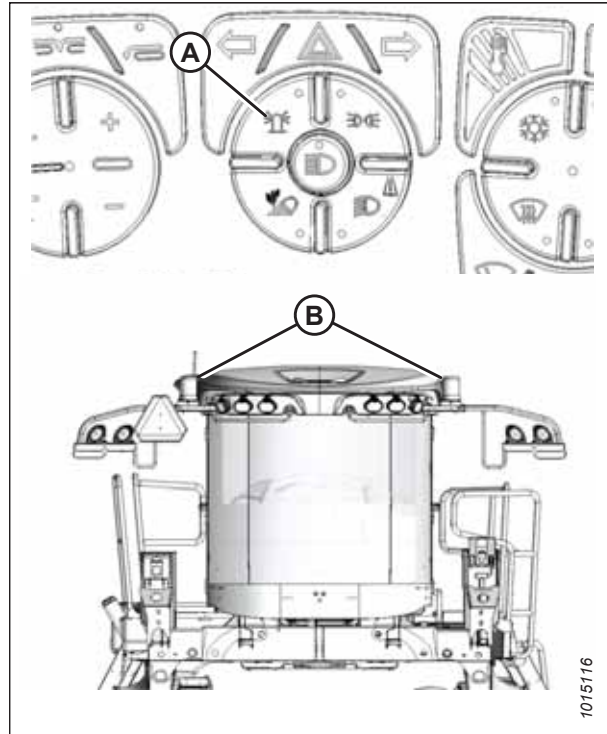


Figure 4.52: Beacons

4.2.10 Checking Horn

The horn is a safety device for notifying other people of the windrower's presence. The functionality of the horn will need to be verified.

Push HORN button (A) and listen for the horn.

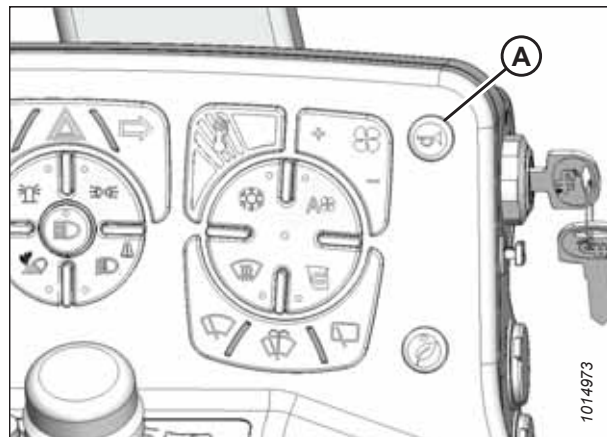


Figure 4.53: Horn Button

4.2.11 Checking Interior Lights

Interior lights provide visibility within the cab. The functionality of the interior lights will need to be verified.

1. Open the cab door. Confirm that interior light (A) turns on.
2. Enter the cab and close the door. Confirm that interior light (A) darkens.

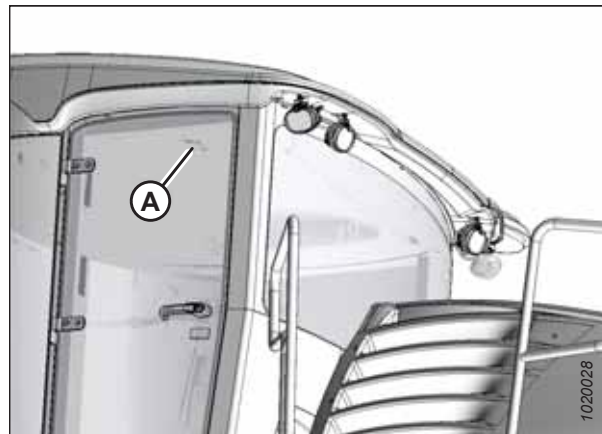


Figure 4.54: Interior Light

3. Turn the IGNITION key to the RUN position.
4. Push OVERHEAD DOME LIGHT switch (A) to ON position (B). Confirm that the light turns on.
5. Push the LIGHT switch to DOOR position (C). Confirm that the light is off.
6. Open the door and check that the light turns on. Leave the door open.
7. Push switch (A) to OFF position (D). Confirm that the light is off.

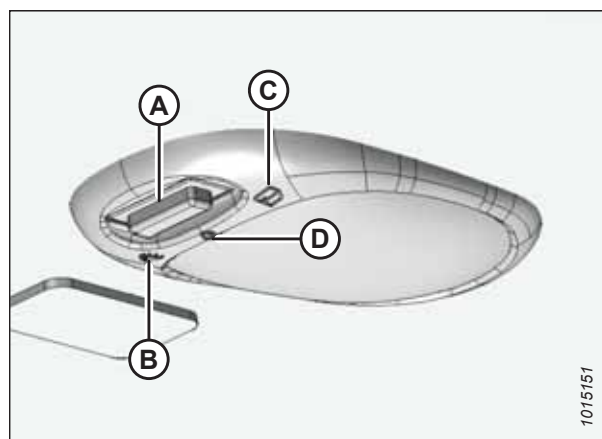


Figure 4.55: Interior Light

4.2.12 Checking Climate Controls

The cab climate system consists of the air conditioner (A/C), fans, vents, and the defroster. The functionality of these features will need to be verified.



DANGER

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



DANGER

Ensure that all bystanders have cleared the area.

PREDELIVERY CHECKS

1. Start the engine. Allow the engine to reach operating temperature.
2. If the windrower has not been operated in the past seven days, refresh the A/C system as follows:
 - a. Press + (A) on the FAN SPEED switch to start the fan.
 - b. Adjust temperature control (B) to the highest heat setting.
 - c. Press A/C switch (C) if necessary so that the LED light is **NOT** lit.
 - d. Move A/C switch (C) to the ON position. The A/C LED will light up. Leave the A/C switch in the ON position for 1 second.
 - e. Move A/C switch (C) to the OFF position for 5 to 10 seconds.
 - f. Repeat the A/C refresh procedure 10 more times.
3. Press AUTO FAN switch (A). The orange LED will light up.
4. Press RED TEMPERATURE CONTROL switch (B) until warm air flows through the cab vents.
5. Press BLUE TEMPERATURE CONTROL switch (C) until cool air enters the cab.
6. Press FAN SPEED switch (D) (+ or -). Note any change in airflow in the cab. The AUTO FAN light should be off.
7. Press RECIRCULATING AIR switch (E). Note any change in airflow in the cab.
8. Press WINDSHIELD DEFOG/DEFROST switch (F). Confirm that the windshield vents are blowing.

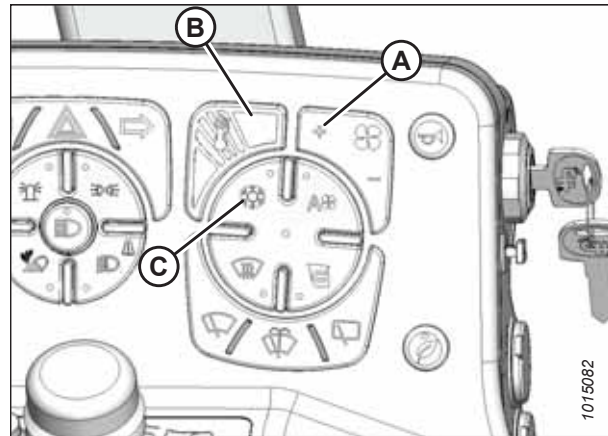


Figure 4.56: A/C Controls

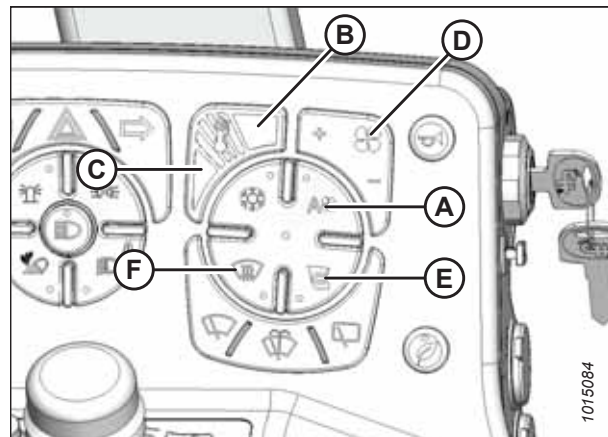


Figure 4.57: Climate Controls

4.2.13 Checking Radio and Activating Bluetooth® Feature

M1 Series Windrowers are factory-equipped with a Bluetooth®-enabled radio and CD/DVD player. The functionality of the radio's features will need to be verified.

Radio (A) and two speakers (B) are factory-installed in the cab headliner. The radio operates in AM, FM, CD/DVD, and USB modes. It also supports Bluetooth® wireless technology audio streaming and hands-free calling.

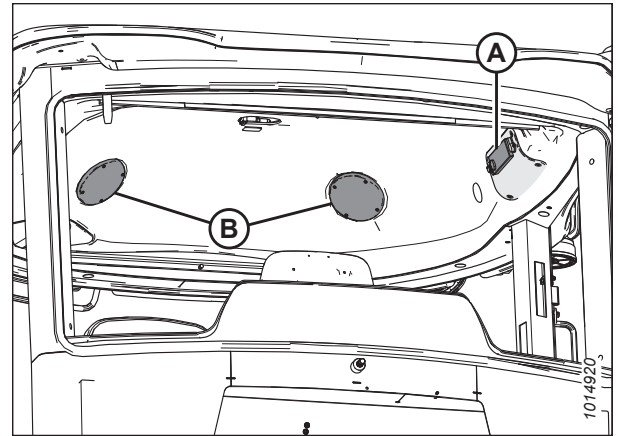


Figure 4.58: Radio and Speakers

1. To verify the functionality of the radio, follow these steps:
 - a. Turn the ignition key to the RUN position.
 - b. Press POWER button (A) to turn the radio on. Hold the POWER button to turn it off.

NOTE:

The button will light up red when OFF and blue when ON.

- c. Press BAND/BACK button (B) to change radio bands as follows:
 - FM1
 - FM2
 - FM3
 - AM1
 - AM2
- d. Rotate VOLUME/SELECT knob (C) to change the volume level.
- e. Insert a CD or DVD into disc slot (D), or connect a USB storage device to the unit. The radio will automatically switch modes and begin playback after the media is successfully loaded.

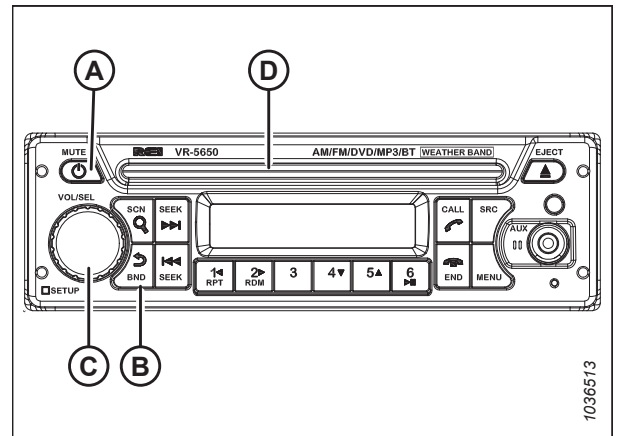


Figure 4.59: Radio

PREDELIVERY CHECKS

2. To activate the Bluetooth® feature:
 - a. Press POWER button (A) to turn the radio on.
 - b. Press and hold VOL/SEL knob (B) for 2 seconds. The menu will appear on screen (C).
 - c. Rotate VOL/SEL (B) to highlight the BT SET menu and press the VOL/SEL knob to select it. BLUETOOTH ON/OFF will appear on screen (C).
 - d. Press the VOL/SEL knob to select BLUETOOTH.
 - e. Rotate the VOL/SEL knob until ON appears. Press VOL/SEL.
 - f. Rotate the VOL/SEL knob and select DISCOVER.
 - g. Rotate the VOL/SEL knob until ON appears, and then press the VOL/SEL knob.

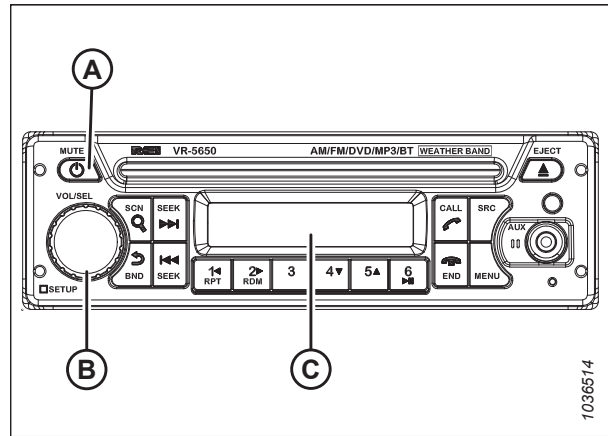


Figure 4.60: Bluetooth® Radio

4.3 Checking Manuals

MacDon includes manuals with every windrower to provide information on the windrower's safe operation and maintenance. The presence of the manuals in the windrower's manual storage case will need to be verified.

Manuals are stored in manual storage cases (A) behind the operator's seat.

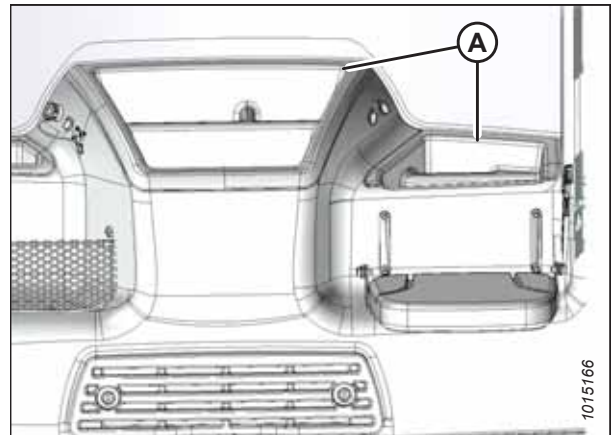


Figure 4.61: Manual Storage Case

Ensure that the following manuals are included with the windrower:

- Operator's Manual
- Parts Catalog
- Quick Card
- Engine Manual



Figure 4.62: Manuals and Quick Card

4.4 Performing Final Steps

Once the Predelivery Checklist and the operational checks have been completed, the windrower cab will need to be prepared for its Operator, and any remaining kits will need to be installed.

1. After the predelivery checks are complete, remove the plastic covering from the Harvest Performance Tracker (HPT) and the seats.
2. Inside the cab, locate the GPS mount parts bag which has label (A).
3. **If the optional GPS kit will be installed:** Install the GPS mount according to the instructions included with the EZ-Pilot® or Autopilot™ bundle.
4. **If the GPS kit will not be installed:** Store the GPS mount parts bag in the toolbox.
5. Remove the Keep This Door Closed sign from the right door AFTER the right leg is repositioned to field configuration.



Figure 4.63: Label for Optional GPS Mounting Kit

IMPORTANT:

Do **NOT** remove the drive wheel torque procedure decal from the windshield.

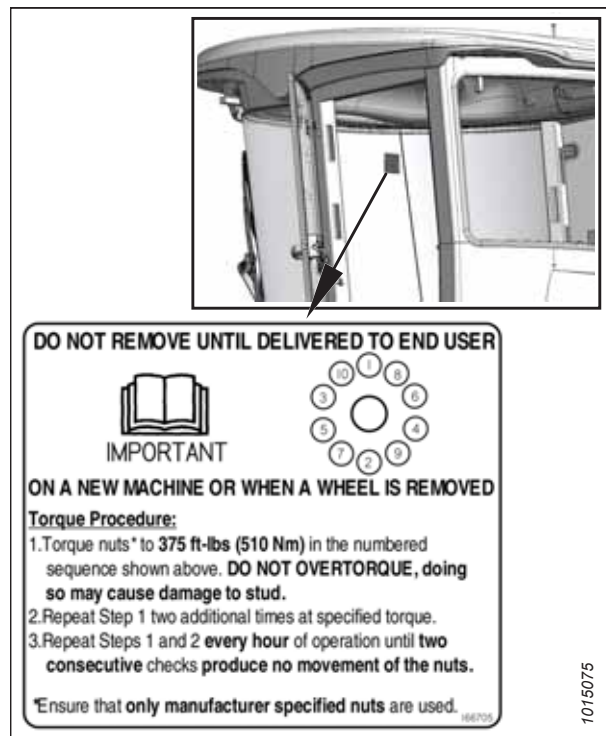


Figure 4.64: Windshield Decal

Chapter 5: Attaching Headers to Windrower

This section details the steps needed to attach various MacDon headers to the windrower. Be sure to follow only the steps that apply to your particular header and windrower configuration.

5.1 Attaching Headers to Windrower

Refer to this chapter for instructions on attaching MacDon headers to the windrower.

5.1.1 A40DX Auger Header

This section details the procedures necessary to physically attach an A40DX Auger Header to the windrower and to complete its hydraulic and electrical connections.

Attaching A40DX Auger Header

The windrower's support feet and center-link will need to be connected to the auger header. The windrower may be equipped with an optional self-aligning hydraulic center-link, which allows control over the vertical position of the center-link from the cab.

DANGER

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

1. Remove hairpin (A) from pin (B). Remove the pin from header supports (C) on both sides of the header.

DANGER

Ensure that all bystanders have cleared the area.

2. Start the engine.

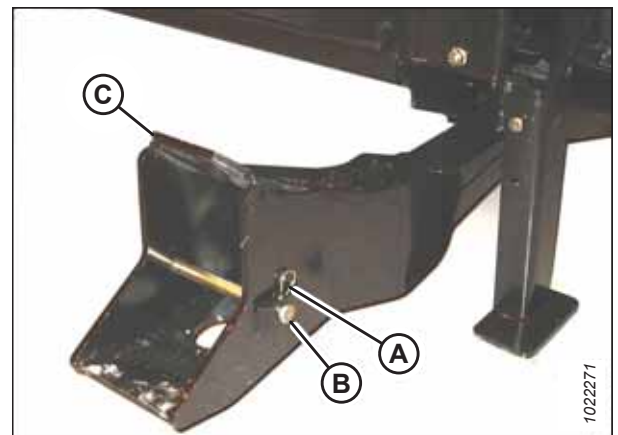


Figure 5.1: Header Support

ATTACHING HEADERS TO WINDROWER

3. If the header lift legs will be lowered **WITH** a header or weight box attached to the windrower, proceed to Step 7, [page 83](#).

If the header lift legs will be lowered **WITHOUT** a header or weight box attached to the windrower, fully release the tension in header float springs (A):

- If the Harvest Performance Tracker (HPT) displays a message saying that the float should be removed, then remove the float and proceed to Step 7, [page 83](#).
- If the HPT does **NOT** display a message saying that the float should be removed, then proceed to Step 4, [page 82](#) to remove the float manually.

IMPORTANT:

To lower the header lift legs without a header or a weight box attached to the windrower, ensure that the tension on the float springs is fully released. This will prevent damage to the header lift linkages.

4. Press HPT scroll knob (A) to highlight QuickMenu options.
5. Rotate HPT scroll knob (A) to highlight HEADER FLOAT symbol (B) and press the scroll knob to select it.

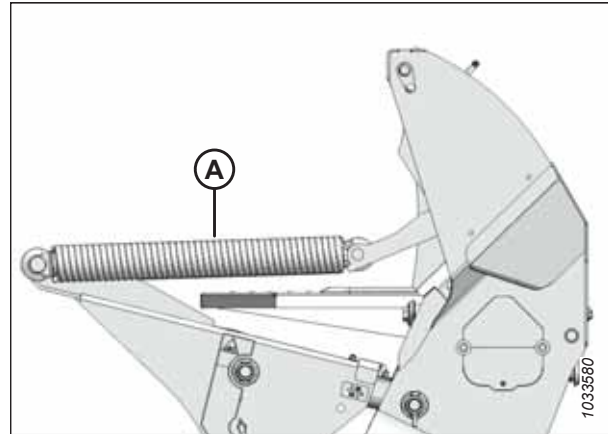


Figure 5.2: Header Float Springs



Figure 5.3: HPT Display

6. On the FLOAT ADJUST PAGE, press soft key 3 (A) to disable the float.



Figure 5.4: HPT Display

ATTACHING HEADERS TO WINDROWER

7. Press HEADER DOWN switch (A) on the ground speed lever (GSL) to fully retract the header lift cylinders.
8. **If the hydraulic center-link self-alignment kit is installed:** press REEL UP switch (B) on the GSL to raise the center-link until the hook is above the attachment pin on the header.

IMPORTANT:

Ensure that the center-link is positioned high enough that it does not contact the header as the windrower approaches the header.

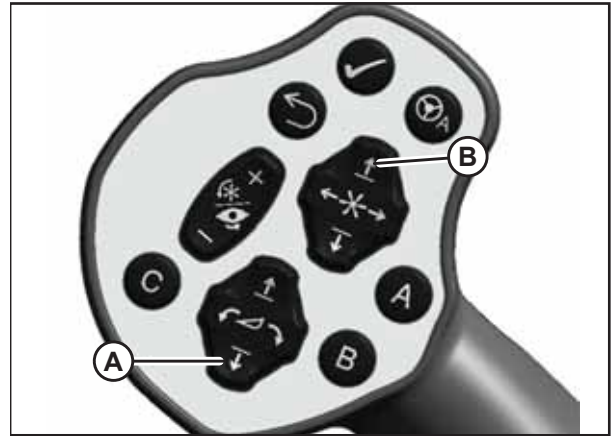


Figure 5.5: GSL

9. **If the hydraulic center-link self-alignment kit is NOT installed:** relocate pin (A) in the frame linkage as needed to raise center-link (B) until the hook is above the attachment pin on the header.

IMPORTANT:

If the center-link is too low, it may contact the header as the windrower approaches the header.

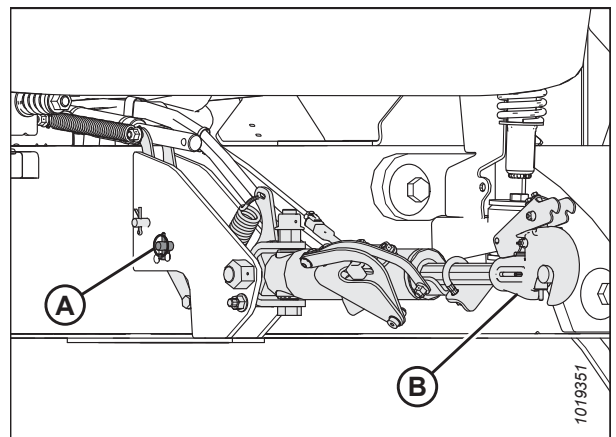


Figure 5.6: Hydraulic Center-Link without Self-Alignment Kit

10. Drive the windrower forward slowly, until feet (A) on the windrower enter supports (B) on the header. Continue to drive forward until the feet engage the supports and the header is nudged forward.

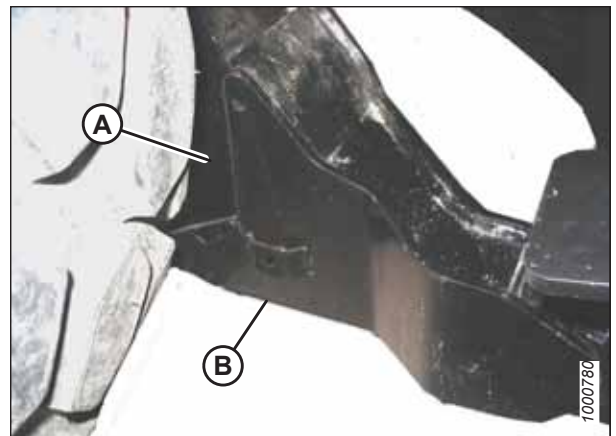


Figure 5.7: Header Support

ATTACHING HEADERS TO WINDROWER

11. **If the hydraulic center-link self-alignment kit is installed:** adjust the position of center-link cylinder (A) until hook (B) is above the header attachment pin.

12. **If the hydraulic center-link self-alignment kit is NOT installed:** push down on the rod end of link cylinder (C) until the hook engages and locks onto the header pin.

IMPORTANT:

Hook release (D) must be down to enable the self-locking mechanism. If the release is open (up), manually push it down after the hook engages the header pin.

13. **If the hydraulic center-link self-alignment kit is installed:** lower center-link (A) onto the header with the REEL DOWN switch on the GSL until it locks into position and hook release (D) is in the down position.

14. **If the hydraulic center-link self-alignment kit is installed:** check that the center-link is locked onto the header by pressing the REEL UP switch on the GSL.

DANGER

Ensure that all bystanders have cleared the area.

15. Press HEADER UP switch (A) to raise the header to its maximum height.
16. If one end of the header does **NOT** fully rise, rephase the lift cylinders as follows:
 - a. Press and hold HEADER UP switch (A) until both cylinders stop moving.
 - b. Continue to hold the switch for 3-4 seconds. The lift cylinders are now phased.

NOTE:

Repeating this procedure might be necessary if there is air in the hydraulic system.

17. Shut down the engine, and remove the key from the ignition.

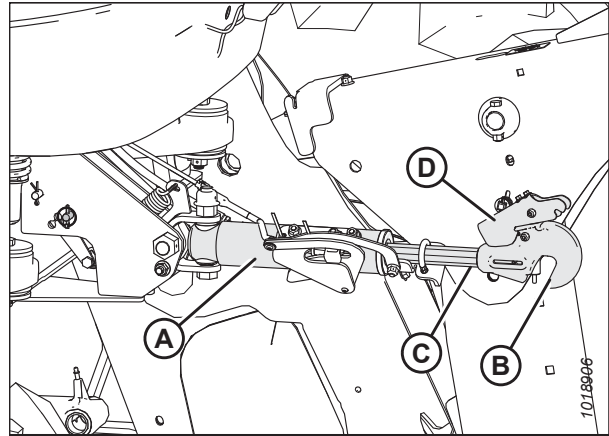


Figure 5.8: Hydraulic Center-Link



Figure 5.9: GSL

ATTACHING HEADERS TO WINDROWER

18. Engage the safety props on both lift cylinders as follows:
 - a. Pull lever (A) toward you to release it, and then rotate it toward the header to lower the safety prop onto the cylinder.
 - b. Repeat the previous step for the opposite lift cylinder.

IMPORTANT:

Ensure that the safety props engage over the cylinder piston rods. If the safety prop does **NOT** engage properly, raise the header until the safety prop fits over the rod.

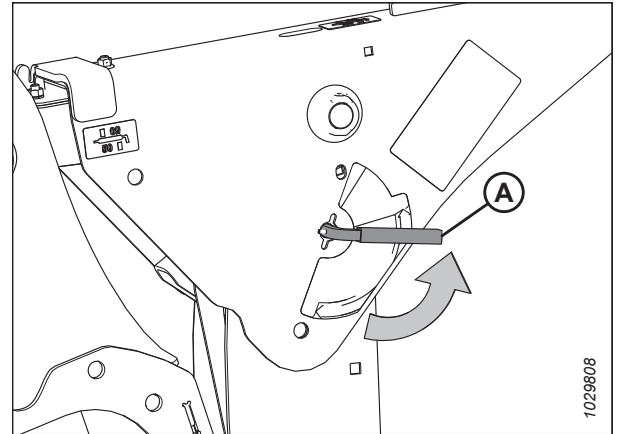


Figure 5.10: Safety Prop Lever

19. Install clevis pin (A) through the support and the foot, and secure it with a hairpin. Repeat this step for the opposite support.

IMPORTANT:

Ensure that clevis pin (A) is fully inserted into the support and foot holes, and that the hairpin is installed behind the bracket.

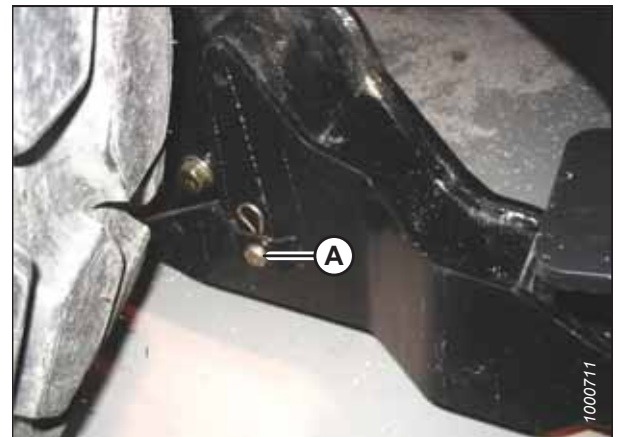


Figure 5.11: Header Support

20. Remove the lynch pin from clevis pin (A) in stand (B).
21. Hold stand (B) and remove pin (A).
22. Move the stand to its storage position by inverting it and positioning it onto the bracket as shown. Reinsert clevis pin (A) and secure it with the lynch pin.

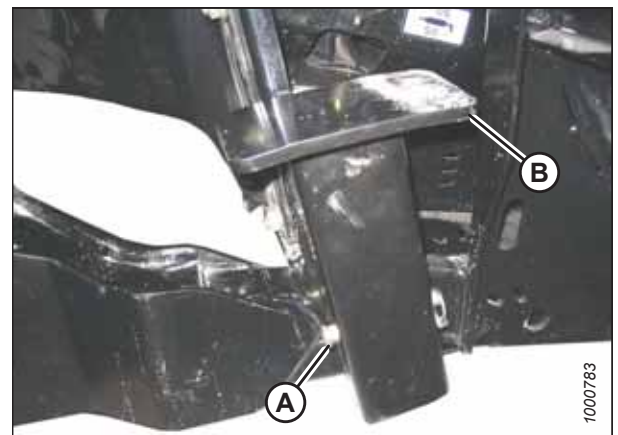


Figure 5.12: Header Stand

ATTACHING HEADERS TO WINDROWER

23. Disengage the safety props on both lift cylinders as follows:

- Turn lever (A) away from the header to raise the safety prop until the lever locks into the vertical position.
- Repeat the previous step for the opposite cylinder.

NOTE:

If the safety prop will **NOT** disengage, raise the header to release the prop.

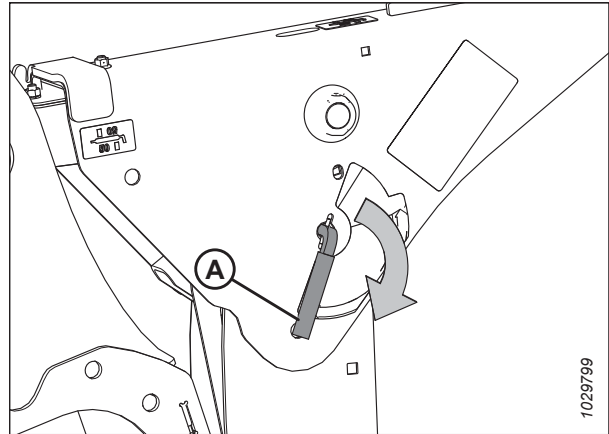


Figure 5.13: Safety Prop Lever



DANGER

Ensure that all bystanders have cleared the area.

24. Start the engine and press HEADER DOWN switch (A) on the GSL to fully lower the header.

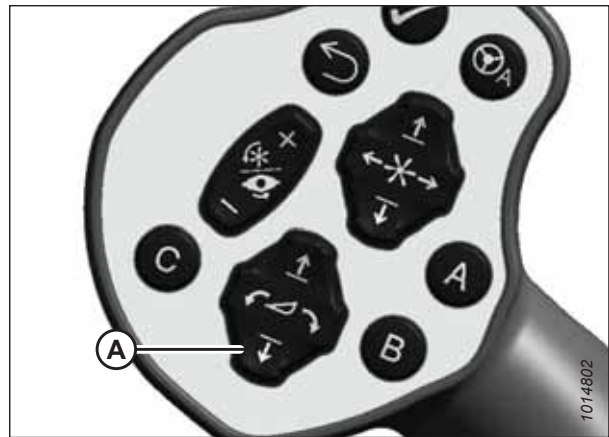


Figure 5.14: GSL

25. Press rotary scroll knob (A) on the HPT to highlight the QuickMenu options.

26. Rotate scroll knob (A) to highlight HEADER FLOAT symbol (B). Press the scroll knob to select it.



Figure 5.15: HPT Display

ATTACHING HEADERS TO WINDROWER

27. Turn scroll knob (A) to highlight left float (B) or right float (C). Press knob (A) to activate the selection.
28. Rotate scroll knob (A) to adjust the float setting. Press the knob to confirm the selection.

IMPORTANT:

Adjusting the float by increments of 1.0 (out of 10) changes the header weight at the cutterbar by approximately 91 kg (200 lb.). Adjust the float in increments of 0.05 to fine-tune the float setting.

29. Shut down the engine, and remove the key from the ignition.
30. Grasp one end of the auger header and lift it. The lifting force used should be 357 N (80 lbf). Repeat this step on the other side of the header.



Figure 5.16: HPT Display

Connecting A40DX Auger Header Hydraulic and Electrical Systems

The header's hydraulic and electrical multicoupler will need to be connected to the windrower.



CAUTION

Do NOT stand on an unlocked platform. It is unstable and may cause you to fall.

1. Approach platform (A) on the left cab-forward side of the windrower. Ensure that the cab door is closed.
2. Push latch (B) and pull platform (A) toward the walking beam until it stops and the latch engages.

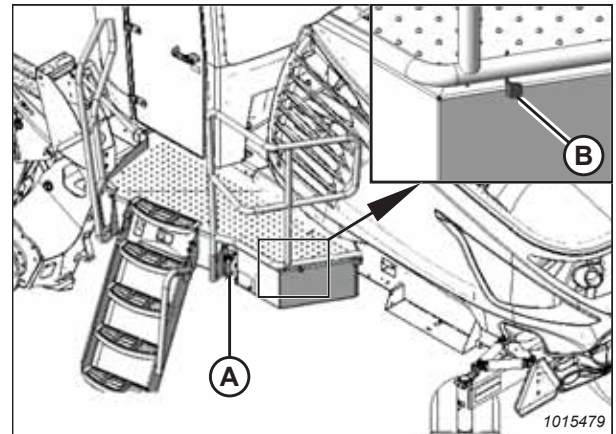


Figure 5.17: Left Cab-Forward Platform

ATTACHING HEADERS TO WINDROWER

3. Retrieve hydraulic multicouplers (A) and electrical harness (B) from the header.
4. Route the hose/harness bundle toward the windrower through support (C).

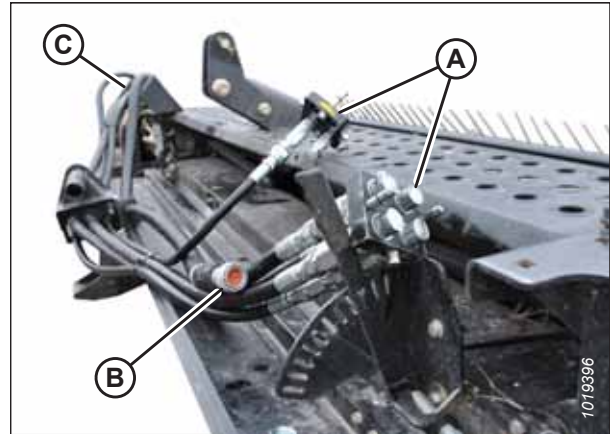


Figure 5.18: Hydraulic Hoses in Storage Position

5. Insert hose support (B) into hole (A) in the windrower's left leg. Route header hose bundle (C) under the windrower to the hydraulic and electrical couplers.

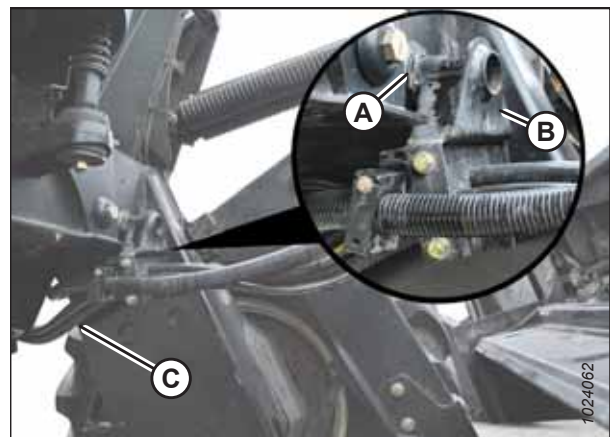


Figure 5.19: Multicoupler

6. Clean the multicouplers and receptacles to prevent contamination of the hydraulic system.
7. Push button (A) on the rear multicoupler receptacle and rotate handle (B) away from the windrower.
8. Open cover (C). Position multicoupler (D) onto the receptacle. Align the pins in the coupler with the slots in handle (B) and rotate the handle toward the windrower so that the coupler is locked onto the receptacle and button (A) pops out.
9. Push button (E) on the front multicoupler receptacle and rotate handle (F) away from the windrower.
10. Open cover (G) and position multicoupler (H) onto the receptacle. Align the pins in the coupler with the slots in the handle, and rotate the handle toward the windrower so that the coupler is locked onto the receptacle and button (E) snaps out.

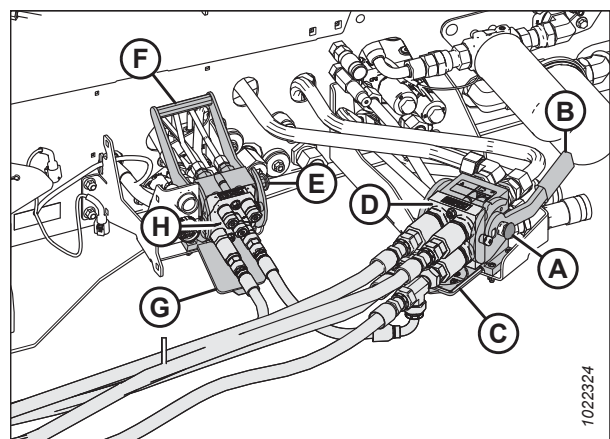


Figure 5.20: Knife/Reel/Auger Drive Multicoupler

ATTACHING HEADERS TO WINDROWER

11. If a rotary disc header is being replaced by an auger header: Remove hose (A) from storage location (B). Connect hose (A) to knife pressure receptacle (C) on the frame.

NOTE:

Hose quick-disconnect (C) is only present on M1170 Windrowers with the R1 Series Hydraulic Drive kit (MD #B6845) installed.

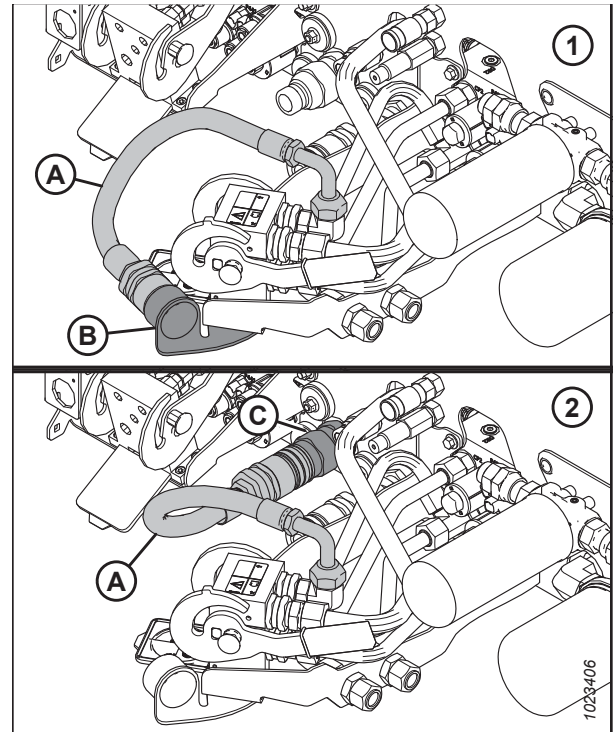


Figure 5.21: Knife Pressure Hose Positions

1 - Hose in Storage Position (Rotary Configuration)

2 - Hose to Knife Pressure Receptacle (Auger/Draper Configuration)

12. Remove the cover from receptacle (A). Connect the header's electrical harness to the receptacle.

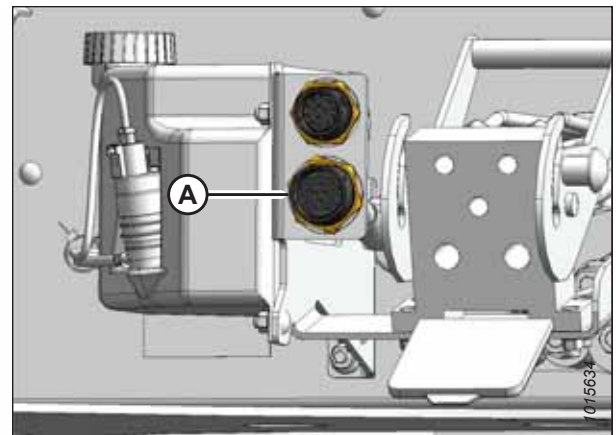


Figure 5.22: Electrical Connectors

ATTACHING HEADERS TO WINDROWER

13. Push latch (A) to unlock platform (B).

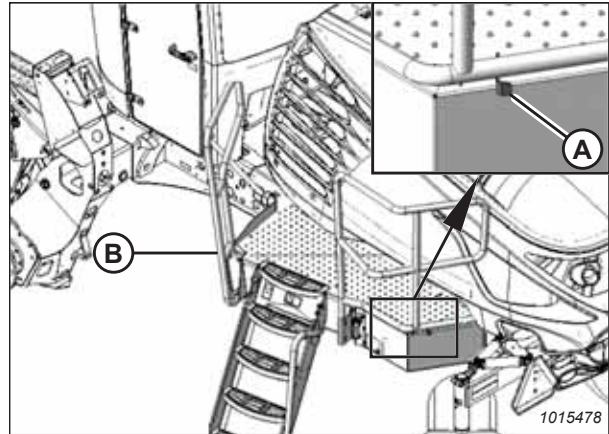


Figure 5.23: Left Cab-Forward Platform

14. Pull platform (A) toward the cab until it stops and the latch is engaged.

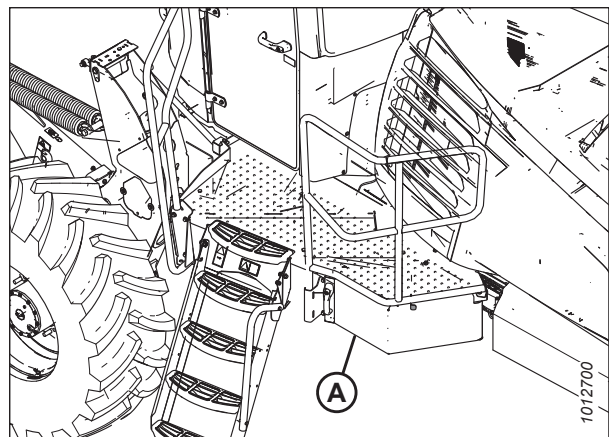


Figure 5.24: Left Cab-Forward Platform

Attaching Forming Shield

If the windrower will be paired with a MacDon A40DX Auger Header equipped with a conditioner, then the forming shield should be installed on the windrower. The forming shield is not required if the windrower will be paired with an A40DX GSS Auger Header, though it can be useful for crops such as radishes.

1. Place spacer (B) over 1/2 x 8 in. hex bolt (A). Insert the bolt into the windrower leg as shown. Secure the bolt with the 1/2 in. nut.
2. Repeat the previous step to install the bolt, spacer, and nut on the other windrower leg.

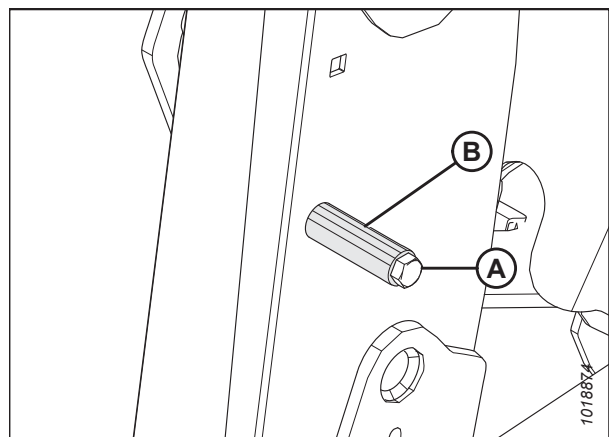


Figure 5.25: Bolt and Spacer Installed on Windrower Leg

ATTACHING HEADERS TO WINDROWER

3. Remove and retain the lynch pin from clevis pin (A) at the forward end of the forming shield. Remove and retain the clevis pin.
4. Repeat the previous step on the other side of the forming shield.

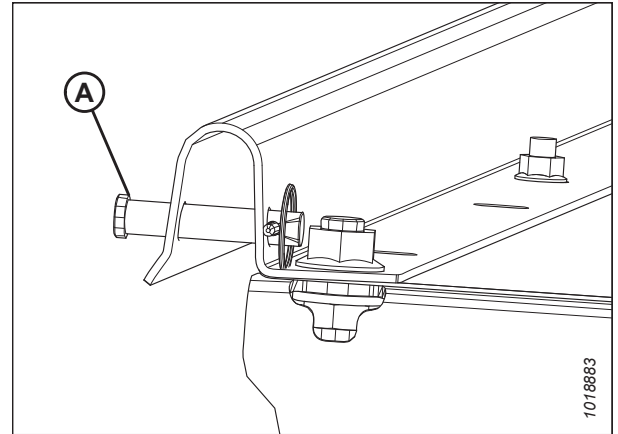


Figure 5.26: Clevis Pin at Forward End of Forming Shield

5. Position forming shield (A) under the windrower frame as shown.

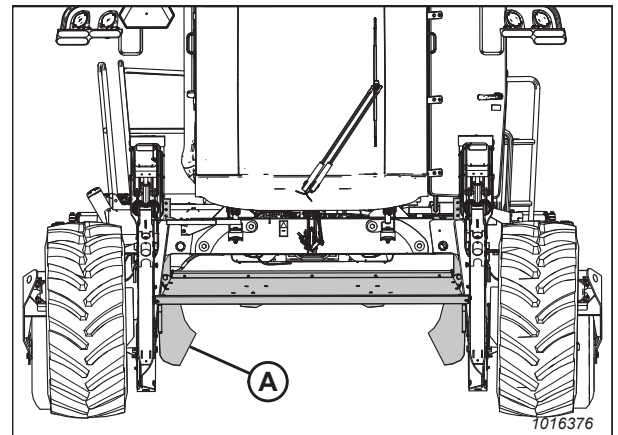


Figure 5.27: Forming Shield under Windrower Frame

ATTACHING HEADERS TO WINDROWER

6. Attach the forming shield to spacer (B) on the windrower leg. Secure the forming shield with retained clevis pin (A). Secure the clevis pin with the retained lynch pin.
7. Repeat the previous step to secure the other side of the forming shield.

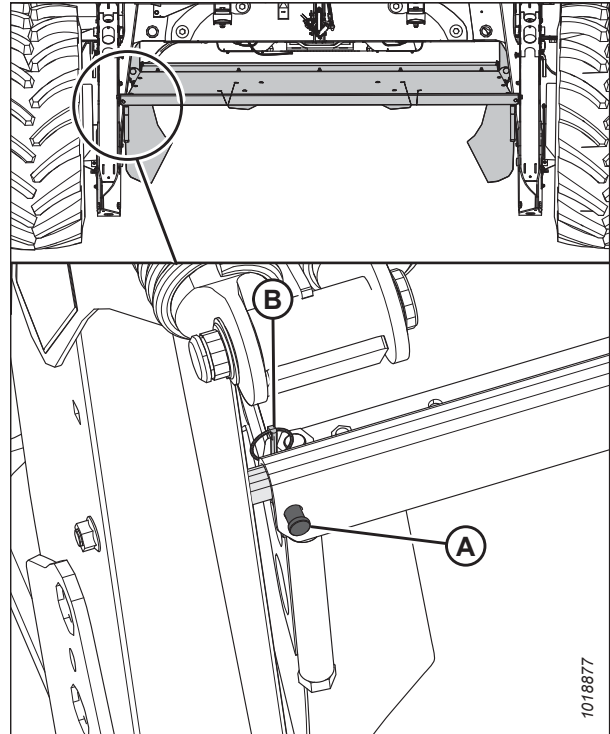


Figure 5.28: Forming Shield Secured to Windrower Leg

5.1.2 D1X and D1XL Series Draper Header

This section details the procedures necessary to physically attach a D1X or D1XL Series Draper Header to a windrower and to complete its hydraulic and electrical connections.

Attaching Draper Header Supports

Draper header supports are required to attach the header to the windrower.



DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Remove the hairpin from clevis pin (B) on draper header support (A). Remove clevis pin (B).

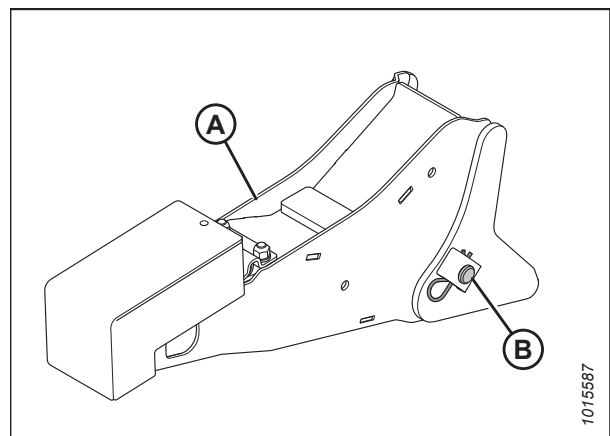


Figure 5.29: Draper Header Support

ATTACHING HEADERS TO WINDROWER

3. Position draper header support (B) on windrower lift linkage (A). Reinstall clevis pin (C).

NOTE:

To ensure that the pin doesn't snag the windrow, install the clevis pin on the outboard side of the draper header support.

4. Secure clevis pin (C) with hairpin (D).
5. Repeat Step 2, [page 92](#) to Step 4, [page 93](#) to install the remaining draper header support.

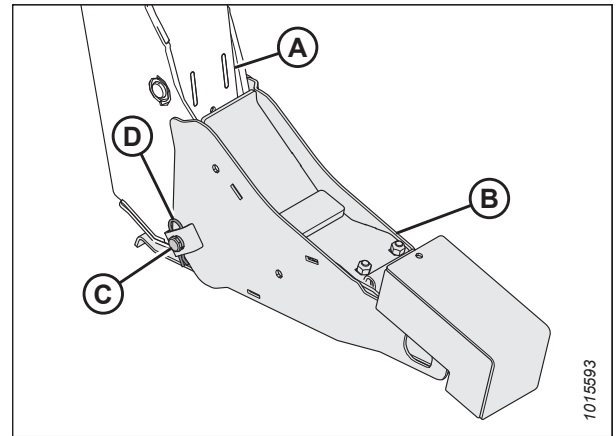


Figure 5.30: Draper Header Support

Attaching D1X and D1XL Series Draper Header

The windrower's support feet and center-link will need to be connected to the draper header. The windrower may be equipped with an optional self-aligning hydraulic center-link, which allows control over the vertical position of the center-link from the cab.



DANGER

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

NOTE:

Draper header supports must be installed onto the windrower lift linkage before starting this procedure. For instructions, refer to [Attaching Draper Header Supports, page 92](#).

1. Shut down the engine, and remove the key from the ignition.

ATTACHING HEADERS TO WINDROWER

2. **If the windrower is configured to work with an R85 or R2 Series Rotary Disc Header:** remove the forming shield support brackets attached to both windrower lift legs as follows:
 - a. Remove hardware (B).
 - b. Remove support bracket (A). Place the bracket and the hardware in the toolbox.
 - c. Repeat on the opposite side.

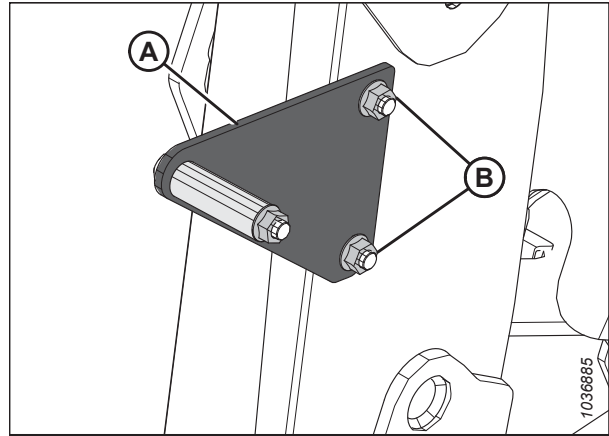


Figure 5.31: Forming Shield bracket – R85

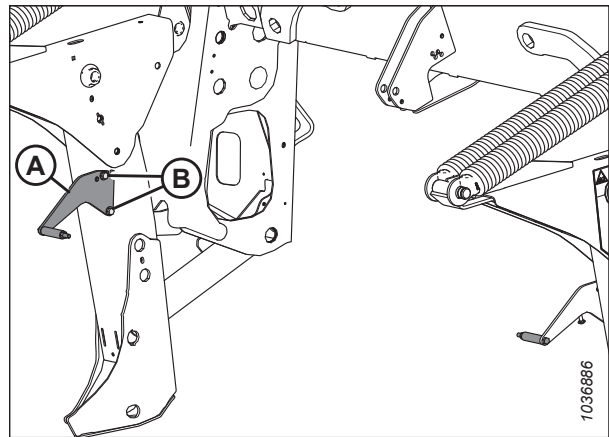


Figure 5.32: Forming Shield bracket – R2 Series

3. **Windrowers without the self-aligning center-link kit:** Relocate pin (A) in the frame linkage as needed to raise center-link (B) until the hook is above the attachment pin on the header.

IMPORTANT:

Ensure that the center-link is positioned high enough that it does not contact the header as the windrower approaches the header.

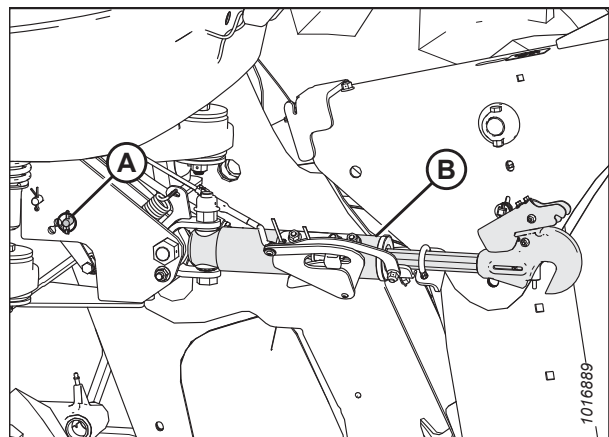


Figure 5.33: Center-Link without Self-Alignment

ATTACHING HEADERS TO WINDROWER

4. Remove hairpin (A) from pin (B), and remove pin (B) from the header leg. Repeat this step on the opposite header leg.

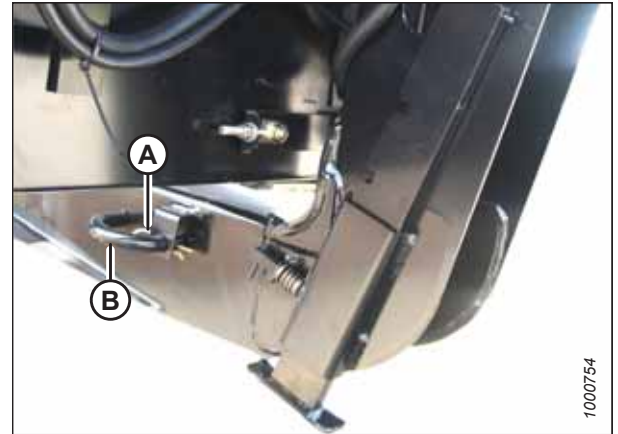


Figure 5.34: Header Leg

DANGER

Ensure that all bystanders have cleared the area.

5. Start the engine.
6. **If the header lift legs will be lowered WITH a header or weight box attached**, proceed to Step [10, page 96](#).

If the header lift legs will be lowered WITHOUT a header or weight box attached to the windrower, fully release the tension in header float springs (A):

- If the Harvest Performance Tracker (HPT) displays a message saying that the float should be removed, then remove the float and proceed to Step [10, page 96](#).
- If the HPT does **NOT** display a message saying that the float should be removed, then proceed to Step [7, page 96](#) to remove the float manually.

IMPORTANT:

To lower the header lift legs without a header or weight box attached to the windrower, ensure that the tension on the float springs is fully released. This will prevent damage to the header lift linkages.

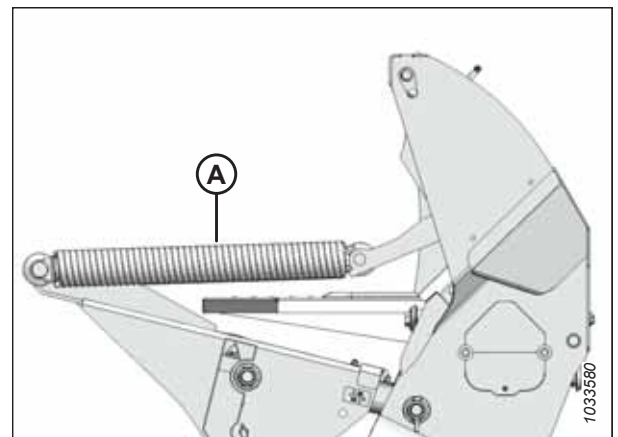


Figure 5.35: Header Float Springs

ATTACHING HEADERS TO WINDROWER

7. Press scroll knob (A) on the HPT to display the QuickMenu page.
8. Rotate scroll knob (A) to highlight HEADER FLOAT symbol (B) and press the scroll knob to select it.



Figure 5.36: HPT Display

9. On the FLOAT ADJUST page, press soft key 3 (A) to disable the float.



Figure 5.37: HPT Display

10. **Windrowers equipped with the self-aligning center-link kit:**
 - a. Press HEADER DOWN switch (E) on the ground speed lever (GSL) to fully retract the header lift cylinders.
 - b. Press REEL UP switch (B) on the GSL to raise the center-link until the hook is above the attachment pin on the header.

IMPORTANT:

If the center-link is too low, it may contact the header as the windrower approaches the header.

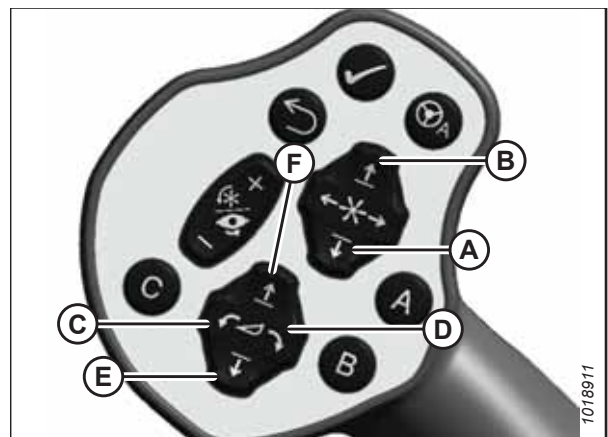


Figure 5.38: GSL Switches

- | | |
|----------------------|--------------------|
| A - Reel Down | B - Reel Up |
| C - Header Tilt Down | D - Header Tilt Up |
| E - Header Down | F - Header Up |

ATTACHING HEADERS TO WINDROWER

11. Drive the windrower slowly forward until draper header supports (A) enter header legs (B). Continue driving slowly forward until the lift linkages contact the support plates in the header legs and the header is nudged forward.
12. Ensure that the lift linkages are properly engaged in the header legs and are in contact with the support plates.

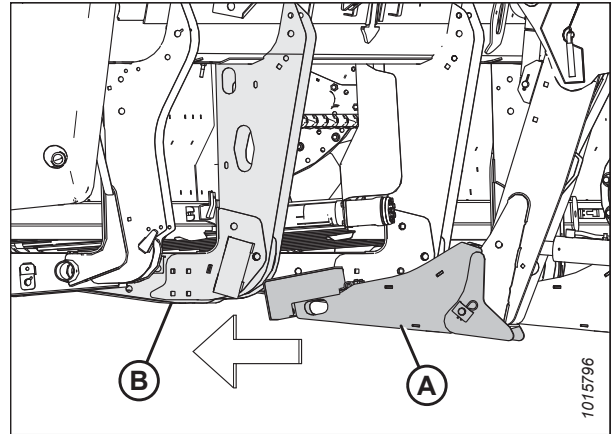


Figure 5.39: Header Leg and Draper Header Support

13. **Windrowers equipped with the self-aligning center-link kit:**
 - a. Adjust the position of center-link cylinder (A) with the switches on the GSL until hook (B) is above the header attachment pin.

IMPORTANT:

Hook release (C) must be down to enable the self-locking mechanism to function.

- b. If hook release (C) is open (in the up position), shut down the engine, and remove the key from the ignition. Manually push hook release (C) down after the hook engages the header pin.
 - c. Lower center-link (A) onto the header with the REEL DOWN switch on the GSL until the center-link locks into position and hook release (C) is down.
 - d. Check that the center-link is locked onto the header by pressing the REEL UP switch on the GSL.

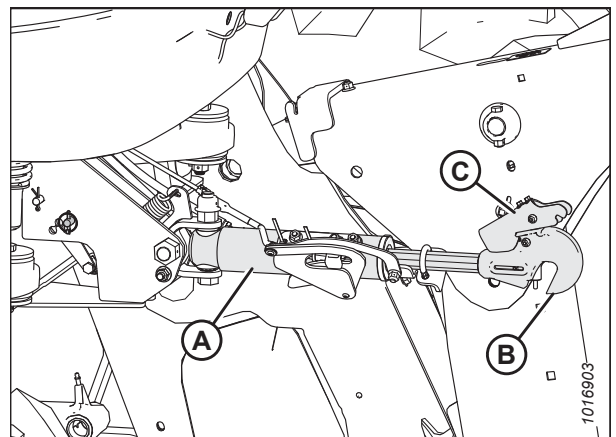


Figure 5.40: Hydraulic Center-Link

ATTACHING HEADERS TO WINDROWER

14. Windrowers without the self-aligning center-link kit:

- Press the HEADER TILT UP or HEADER TILT DOWN cylinder switches on the GSL to extend or retract the center-link cylinder until the hook is aligned with the header attachment pin.
- Shut down the engine, and remove the key from the ignition.
- Push down on rod end (B) of the link cylinder until the hook engages and locks onto the header pin.

IMPORTANT:

The hook release must be down to enable the self-locking mechanism to function. If the hook release is open (in the up position), manually push it down after the hook engages the pin.

- Check that center-link (A) is locked onto the header by pulling upward on rod end (B) of the cylinder.



DANGER

Ensure that all bystanders have cleared the area.

- Start the engine.

- Press HEADER UP switch (A) to raise the header to its maximum height.

NOTE:

If one end of the header does **NOT** fully rise, rephase the lift cylinders as follows:

- Press and hold HEADER UP switch (A) until both cylinders stop moving.
- Continue to hold the switch for 3–4 seconds. The cylinders are now phased.

- Shut down the engine, and remove the key from the ignition.

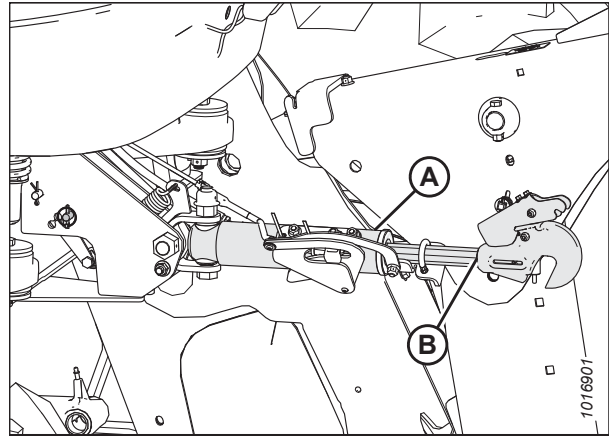


Figure 5.41: Hydraulic Center-Link



Figure 5.42: GSL

ATTACHING HEADERS TO WINDROWER

17. Engage the safety props on both lift cylinders as follows:
 - a. Pull lever (A) toward you to release it, and then rotate it toward the header to lower the safety prop onto the cylinder.
 - b. Repeat the previous step for the opposite lift cylinder.

IMPORTANT:

Ensure that the safety props engage over the cylinder piston rods. If the safety prop does **NOT** engage properly, raise the header until the safety prop fits over the rod.

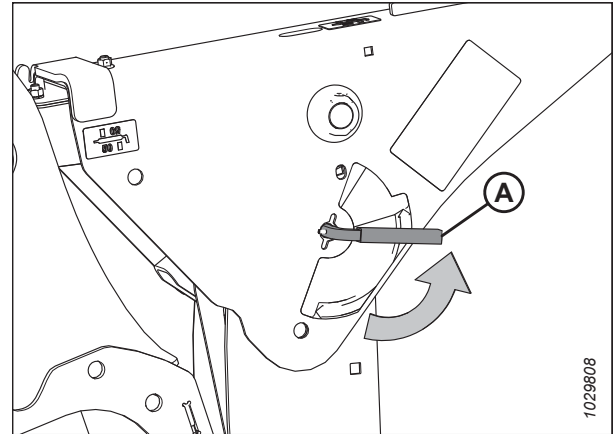


Figure 5.43: Safety Prop Lever

18. Install pin (B) through the header leg. Ensure that the pin engages the U-bracket in the draper header support. Secure the pin with hairpin (A). Repeat this step on the other side of the header.

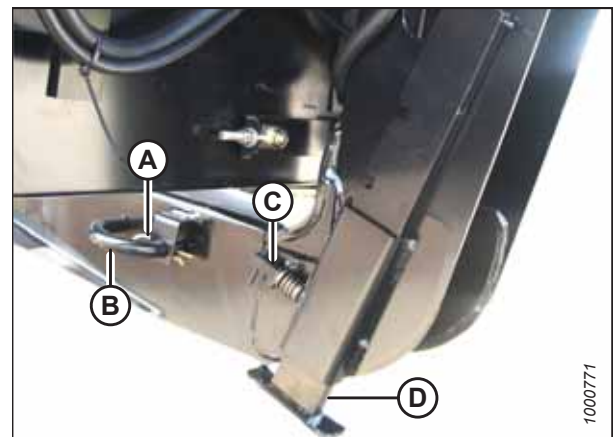


Figure 5.44: Header Leg

19. Disengage the safety props on both lift cylinders as follows:
 - a. Turn lever (A) away from the header to raise the safety prop until the lever locks into the vertical position.
 - b. Repeat the previous step for the opposite cylinder.

NOTE:

If the safety prop will **NOT** disengage, raise the header to release the prop.

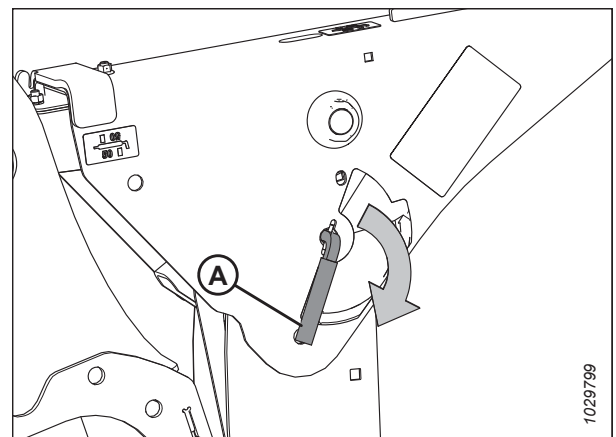


Figure 5.45: Safety Prop Lever

DANGER

Ensure that all bystanders have cleared the area.

20. Start the engine and press HEADER DOWN switch (A) on the GSL to fully lower the header.

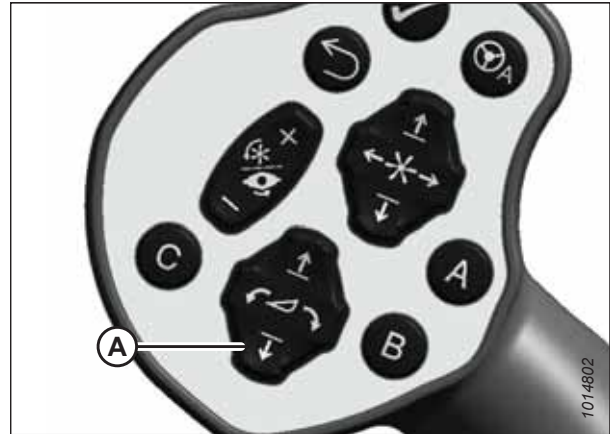


Figure 5.46: GSL

21. Press rotary scroll knob (A) on the HPT to highlight the QuickMenu options.
22. Rotate scroll knob (A) to highlight HEADER FLOAT symbol (B) and press the scroll knob to select it.



Figure 5.47: HPT Display

23. Turn scroll knob (A) to highlight left float (B) or right float (C). Press knob (A) to activate the selection.
24. Rotate scroll knob (A) to adjust the float setting. Press the knob to confirm the setting.

IMPORTANT:

Adjusting the float by increments of 1.0 (out of 10) changes the header weight at the cutterbar by approximately 91 kg (200 lb.). Adjust the float in increments of 0.05 to fine-tune the header's performance.

25. Shut down the engine, and remove the key from the ignition.
26. Grasp one end of the draper header and lift it. The lifting force should be 357 N (80 lbf). Repeat this step on the other side of the header.
27. Proceed to [Connecting D1X and D1XL Series Draper Header Hydraulic and Electrical Systems](#), page 101.



Figure 5.48: HPT Display

Connecting D1X and D1XL Series Draper Header Hydraulic and Electrical Systems

The header's hydraulic hose multicoupler will need to be connected to the windrower.

IMPORTANT:

To prevent contamination of the hydraulic system, use a clean rag to remove dirt and moisture from all hydraulic couplers.

1. Push the link on latch (C) and pull handle (A) on hydraulic hose management system (B) rearward to disengage the arm from the latch.
2. Move hydraulic hose management system (B) toward the left cab-forward side of the windrower.

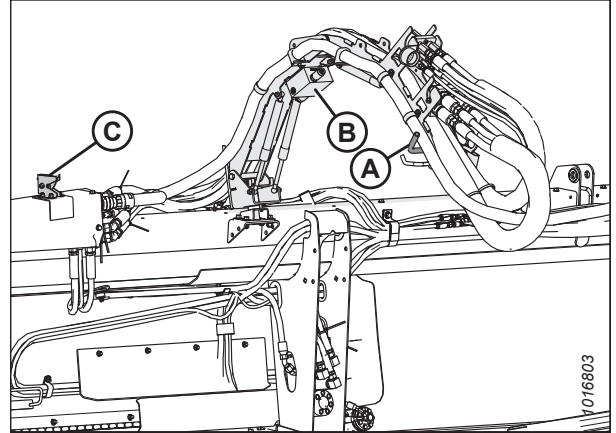


Figure 5.49: Hydraulic Hose Management System

3. Approach platform (A) on the left cab-forward side of the windrower. Ensure that the cab door is closed.
4. Push latch (B) and pull platform (A) toward the walking beam until it stops and the latch engages.

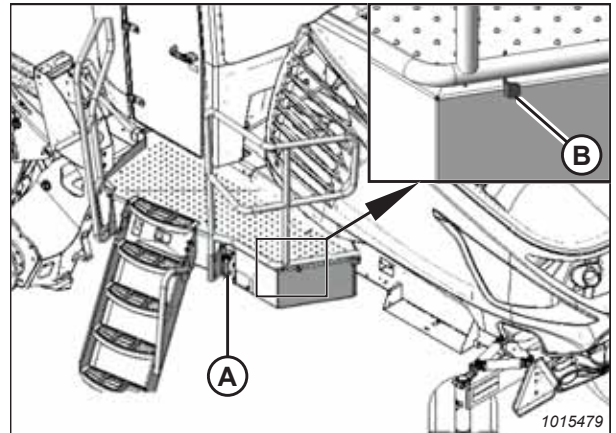


Figure 5.50: Left Cab-Forward Platform

5. Connect hydraulic hose management system (A) to the windrower by securing ball joint (B) to latch support (C) on the windrower leg.

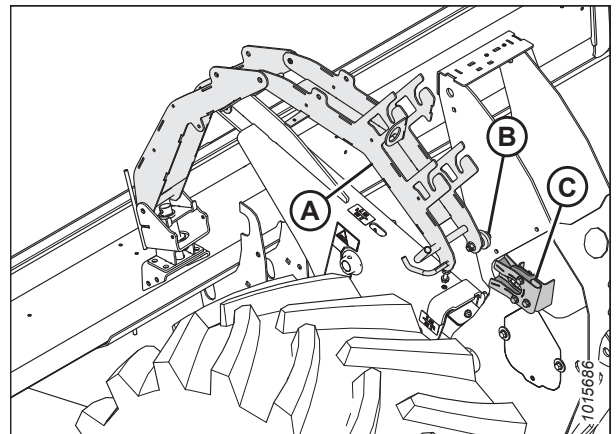


Figure 5.51: Hydraulic Hose Management System

ATTACHING HEADERS TO WINDROWER

6. Retrieve draper drive and reel control multicoupler (A) from the hydraulic hose management system.
7. Push knob (B) on the hydraulic receptacle and pull handle (C) fully away from the windrower.
8. Open cover (D) and position the coupler onto the receptacle. Align the pins in the coupler with the slots in handle (C) and push the handle toward the windrower so that the coupler locks onto the receptacle and knob (B) pops out.
9. Remove hose quick disconnect (F) from its storage location. Connect the quick disconnect to the receptacle on the frame.

NOTE:

Hose quick disconnect (F) is only present on M1170 Windrowers with the R1 Series Hydraulic Drive kit (MD #B6845) installed.

10. Remove the cover from electrical connector (E). Push the electrical connector onto the receptacle. Secure the connector by turning the collar on the electrical connector clockwise.
11. Retrieve knife and reel drive multicoupler (A) from the hydraulic hose management system.
12. Push knob (B) on the hydraulic receptacle and pull handle (C) fully away from the windrower.
13. Open cover (D) and position the coupler onto the receptacle. Align the pins in the coupler with the slots in handle (C), and push the handle toward the windrower so that the coupler locks onto the receptacle and knob (B) snaps out.

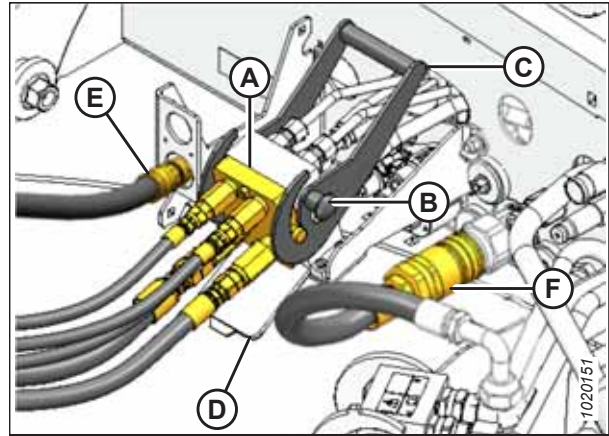


Figure 5.52: Draper/Reel Multicoupler

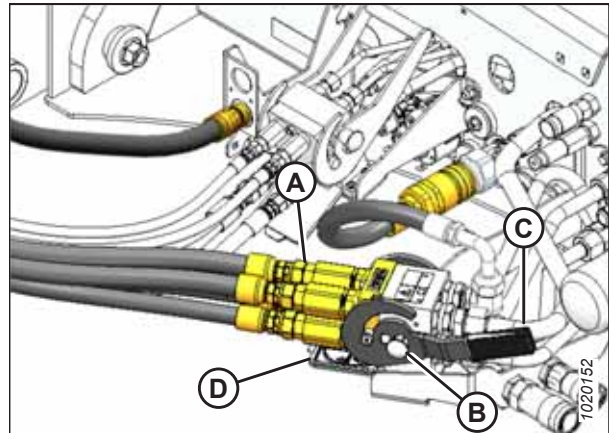


Figure 5.53: Knife/Reel Drive Multicoupler

ATTACHING HEADERS TO WINDROWER

14. Ensure that the hydraulic hose routing is as straight as possible.

IMPORTANT:

Straight routing will prevent abrasion damage to the hydraulic hoses.

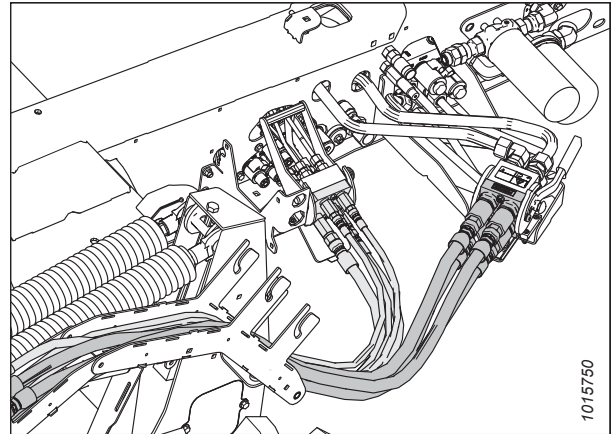


Figure 5.54: Hydraulic Multicouplers and Hose Routing

15. Push latch (A) to unlock platform (B).

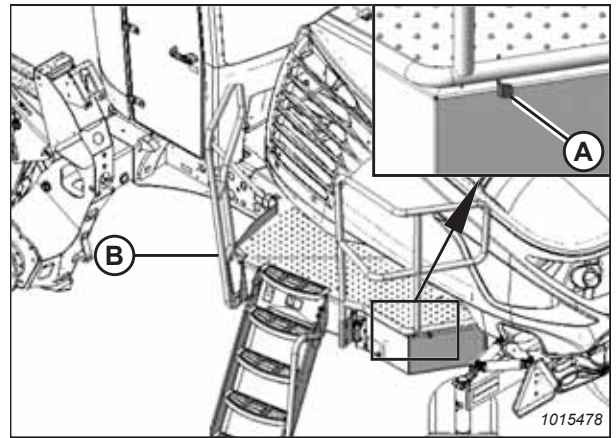


Figure 5.55: Left Cab-Forward Platform

16. Pull platform (A) toward the cab until it stops and the latch is engaged.

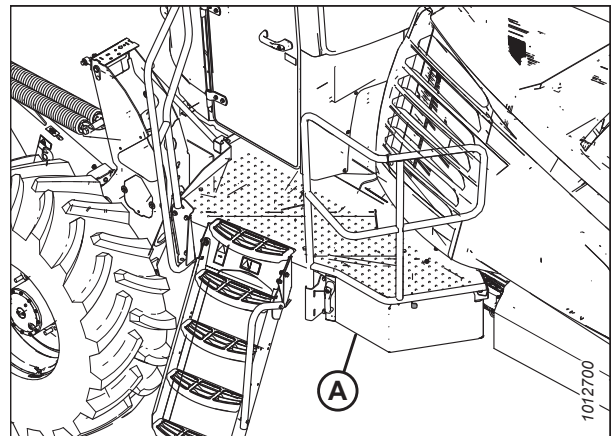


Figure 5.56: Left Cab-Forward Platform

5.1.3 R1 Series Rotary Disc Header

This section details the procedures necessary to physically attach an R1 Series Rotary Disc Header to a windrower and to complete its hydraulic and electrical connections.

Attaching Forming Shield

The forming shield determines the width and the placement of the windrow. The instructions in this section will show you how to properly attach the forming shield to the windrower.

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

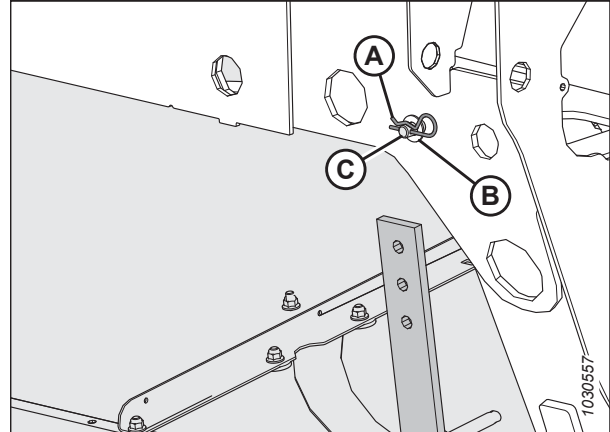


Figure 5.57: Lynch Pin and Washer at Rear of Windrower Leg

2. Attach rubber strap (D) to straight pin (C) at the rear of the windrower leg. Secure it with washer (B) and lynch pin (A).
3. Repeat Step 1, page 104 to Step 2, page 104 at the opposite side of the forming shield.

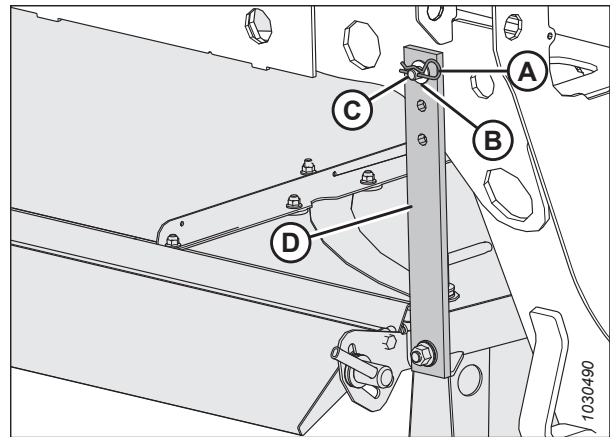


Figure 5.58: Rubber Strap Securing Forming Shield onto Windrower Leg

Attaching R1 Series Rotary Disc Header

The windrower's support feet and center-link will need to be connected to the rotary disc header. The windrower may be equipped with an optional self-aligning hydraulic center-link, which allows control over the vertical position of the center-link from the cab.



DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

1. Shut down the engine, and remove the key from the ignition.

2. **Windrowers without the self-aligning center-link kit:**
Remove pin (A) and raise center-link (B) until the hook is above the attachment pin on the header. Replace pin (A) to hold the center-link in place.

IMPORTANT:

Ensure that the center-link is positioned high enough that it does not contact the header as the windrower approaches the header.

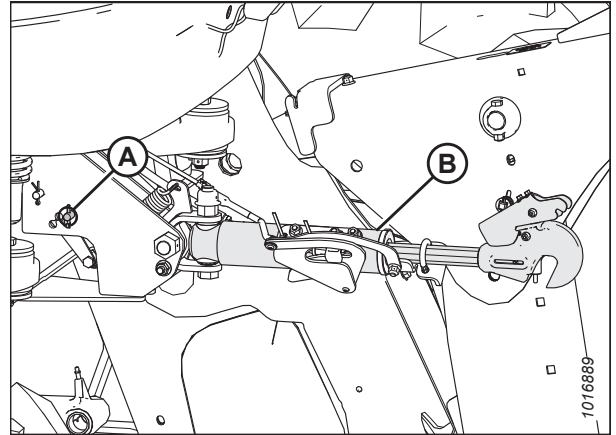


Figure 5.59: Hydraulic Center-Link

3. Remove hairpin (A) from clevis pin (B), and remove the pin from header support (C). Repeat this step on the other side of the header.
4. Start the engine.

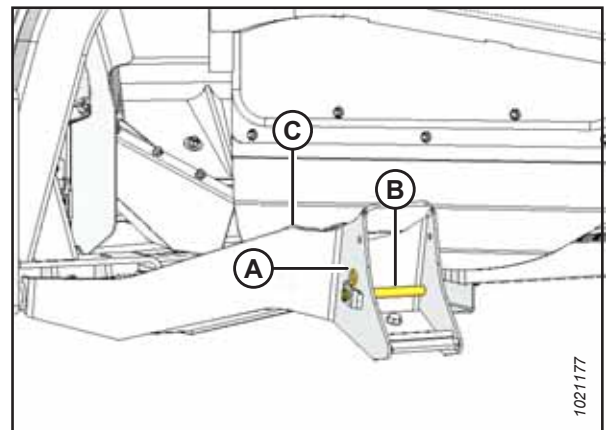


Figure 5.60: Header Support

ATTACHING HEADERS TO WINDROWER

5. If the header lift legs will be lowered **WITH** a header or weight box attached, proceed to Step 9, page 107.

If the header lift legs will be lowered **WITHOUT** a header or weight box attached to the windrower, fully release the tension in header float springs (A):

- If the Harvest Performance Tracker (HPT) displays a message saying that the float should be removed, then remove the float and proceed to Step 9, page 107.
- If the HPT does **NOT** display a message saying that the float should be removed, then proceed to Step 6, page 106 to remove the float manually.

IMPORTANT:

To lower the header lift legs without a header or weight box attached to the windrower, ensure that the tension on the float springs is fully released. This will prevent damage to the header lift linkages.

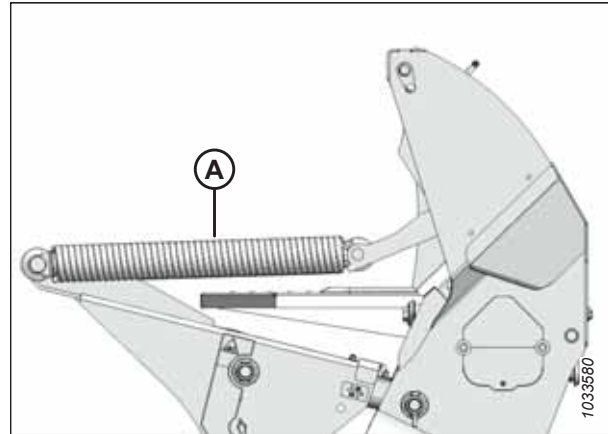


Figure 5.61: Header Float Springs

6. Press rotary scroll knob (A) on the HPT to highlight the QuickMenu options.
7. Rotate scroll knob (A) to highlight HEADER FLOAT symbol (B), then press the scroll knob to select it. The Float Adjust page will appear.



Figure 5.62: HPT Display

8. Press soft key 3 (A) to remove the header float.

NOTE:

If the header float is active, the icon at soft key 3 will say Remove Float; if the header float has been removed, the icon will say Resume Float.



Figure 5.63: HPT Display

ATTACHING HEADERS TO WINDROWER

9. Press HEADER DOWN switch (E) on the ground speed lever (GSL) to fully retract the header lift cylinders.
10. **Windrowers equipped with a self-aligning hydraulic center-link:** Press REEL UP switch (B) on the GSL to raise the center-link until the hook is above the attachment pin on the header.

IMPORTANT:

Ensure that the center-link is positioned high enough that it does not contact the header as the windrower approaches the header.

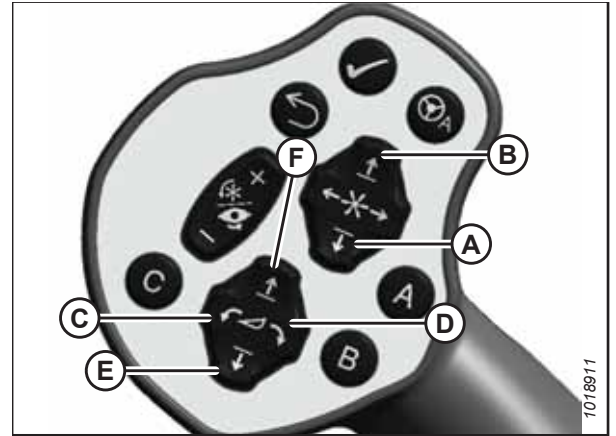


Figure 5.64: GSL

A - Reel Down
C - Header Tilt Down
E - Header Down

B - Reel Up
D - Header Tilt Up
F - Header Up

11. Drive the windrower slowly forward until feet (A) enter supports (B). Continue to drive slowly forward until the feet engage the supports and the header is nudged forward.
12. Ensure that feet (A) are properly engaged in supports (B).

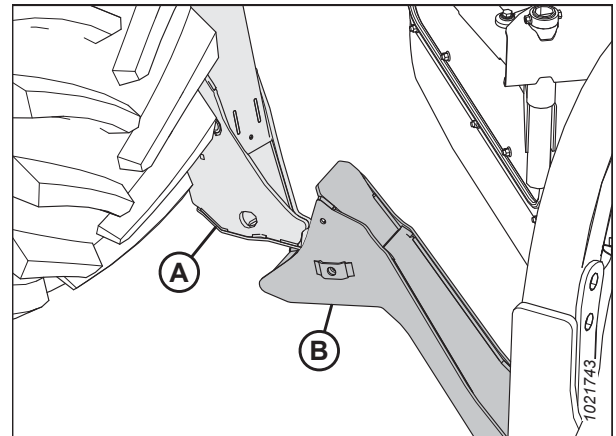


Figure 5.65: Header Support

13. **Windrowers equipped with the self-aligning center-link kit:**
 - a. Adjust the position of center-link cylinder (A) with the switches on the GSL until hook (B) is above the header attachment pin.

IMPORTANT:

Hook release (C) must be down to enable the self-locking mechanism to function.

- b. If hook release (C) is open (in the up position), shut down the engine, and remove the key from the ignition. Manually push hook release (C) down after the hook engages the header pin.
 - c. Lower center-link (A) onto the header with the REEL DOWN switch on the GSL until the center-link locks into position and hook release (C) is down.
 - d. Check that the center-link is locked onto the header by pressing the REEL UP switch on the GSL.

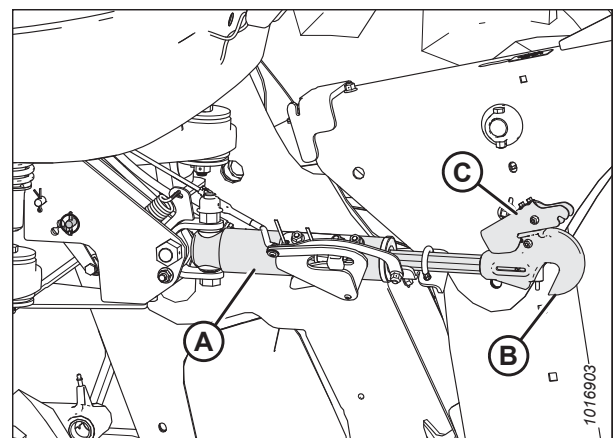


Figure 5.66: Hydraulic Center-Link

ATTACHING HEADERS TO WINDROWER

14. Windrowers without the self-aligning center-link kit:

- a. Press the HEADER TILT UP or HEADER TILT DOWN cylinder switches on the GSL to extend or retract the center-link cylinder until the hook is aligned with the header attachment pin.
- b. Shut down the engine, and remove the key from the ignition.
- c. Push down on rod end (B) of the link cylinder until the hook engages and locks onto the header pin.

IMPORTANT:

The hook release must be down to enable the self-locking mechanism to function. If the hook release is open (in the up position), manually push it down after the hook engages the pin.

- d. Check that center-link (A) is locked onto the header by pulling upward on rod end (B) of the cylinder.



DANGER

Ensure that all bystanders have cleared the area.

- e. Start the engine.

15. Press HEADER UP switch (A) to raise the header to its maximum height.

NOTE:

If one end of the header does **NOT** fully rise, rephase the lift cylinders as follows:

- a. Press and hold HEADER UP switch (A) until both cylinders stop moving.
- b. Continue to hold the switch for 3–4 seconds. The cylinders are now phased.

16. Shut down the engine, and remove the key from the ignition.

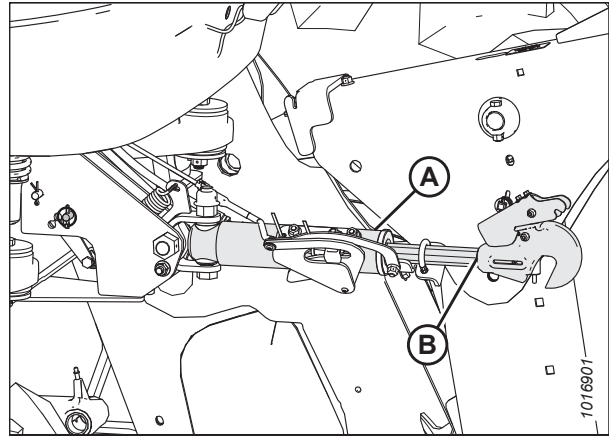


Figure 5.67: Hydraulic Center-Link



Figure 5.68: GSL

ATTACHING HEADERS TO WINDROWER

17. Engage the safety props on both lift cylinders as follows:
 - a. Pull lever (A) toward you to release it, and then rotate it toward the header to lower the safety prop onto the cylinder.
 - b. Repeat the previous step for the opposite lift cylinder.

IMPORTANT:

Ensure that the safety props engage over the cylinder piston rods. If the safety prop does **NOT** engage properly, raise the header until the safety prop fits over the rod.

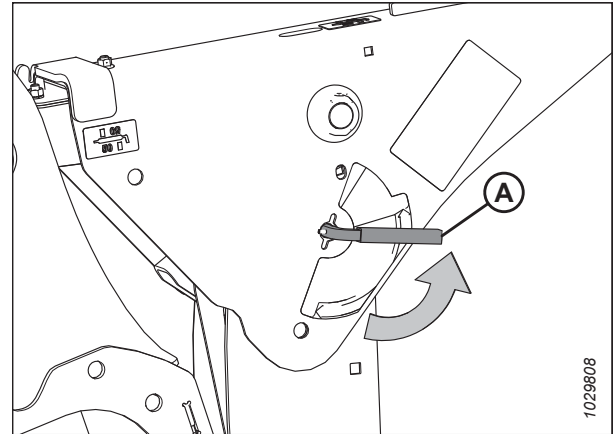


Figure 5.69: Safety Prop Lever

18. Install clevis pin (A) through the support and windrower lift arm and secure it with hairpin (B). Repeat this step for the opposite side of the header.

IMPORTANT:

Ensure that clevis pin (A) is inserted as far as possible, and that the hairpin is installed behind the bracket.

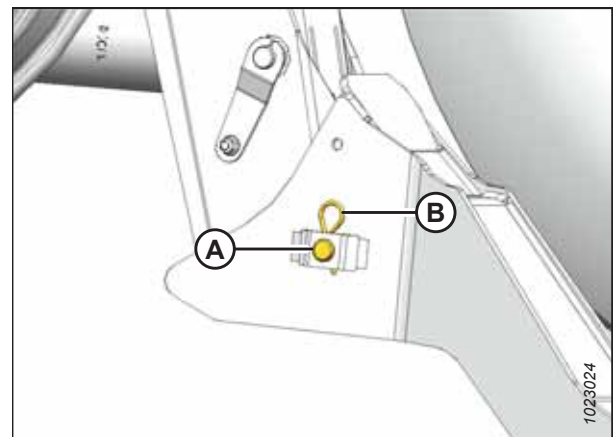


Figure 5.70: Header Support

19. Disengage the safety props on both lift cylinders as follows:
 - a. Turn lever (A) away from the header to raise the safety prop until the lever locks into the vertical position.
 - b. Repeat the previous step for the opposite cylinder.

NOTE:

If the safety prop will **NOT** disengage, raise the header to release the prop.

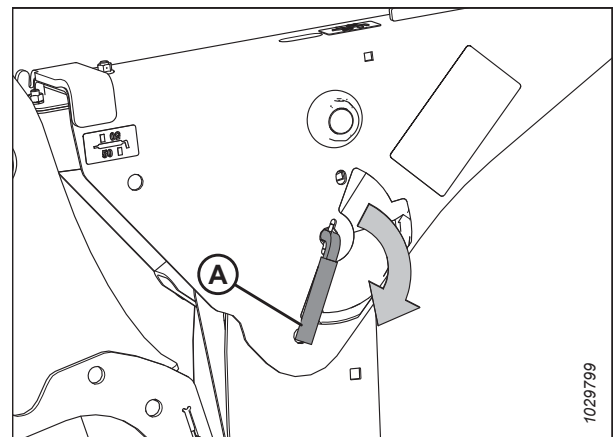


Figure 5.71: Safety Prop Lever

ATTACHING HEADERS TO WINDROWER

20. Start the engine and press HEADER DOWN switch (A) on the GSL to fully lower the header.
21. Shut down the engine, and remove the key from the ignition.

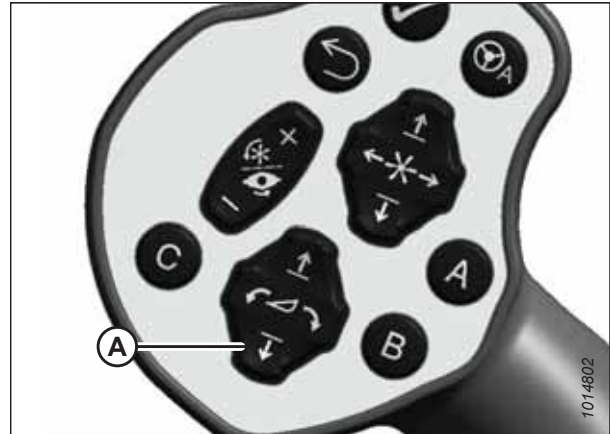


Figure 5.72: GSL

22. If you are not prompted by the HPT display to restore the header float, restore the header float manually:
 - a. Press rotary scroll knob (A) on the Harvest Performance Tracker (HPT) to highlight the QuickMenu options.
 - b. Rotate scroll knob (A) to highlight Header Float icon (B), and press the scroll knob to select it. The float setting page appears.



Figure 5.73: HPT Display

23. Press soft key 3 (A) to restore the header float.

NOTE:

If the header float is active, the icon at soft key 3 displays Remove Float; if the header float has been removed, the icon displays Resume Float.

24. Shut down the engine, and remove the key from the ignition.



Figure 5.74: HPT Display

Connecting R1 Series Rotary Disc Header Electrical and Hydraulics Systems

The header's hydraulic and electrical multicoupler will need to be connected to the windrower.

IMPORTANT:

To prevent contamination of the hydraulic system, use a clean rag to remove dirt and moisture from all hydraulic couplers.

ATTACHING HEADERS TO WINDROWER

1. Retrieve the hydraulic hoses from the header.
2. Push latch (A) to unlock platform (B).

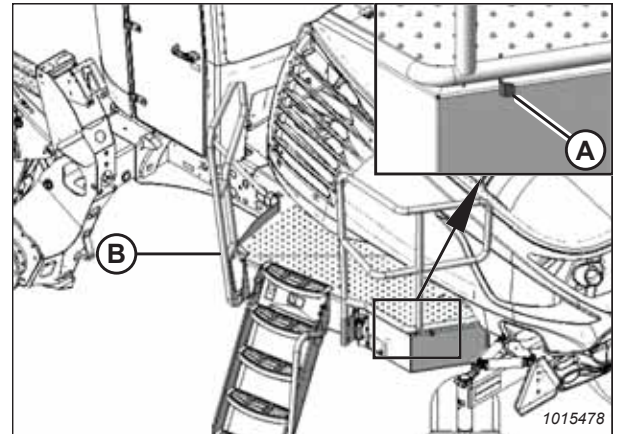


Figure 5.75: Left Cab-Forward Platform

3. Pull platform (A) toward the cab until it stops and the latch is engaged.

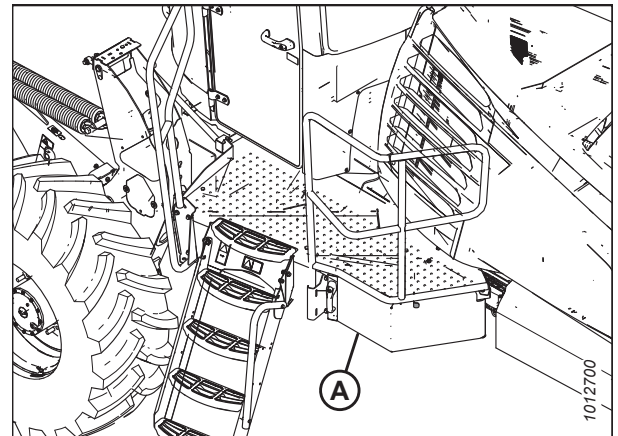


Figure 5.76: Left Cab-Forward Platform

4. Attach hose support (A) to the frame near the windrower left cab-forward leg. Route the hoses under the frame.

NOTE:

Ensure that the hoses remain as straight as possible and that they are not subject to damage from abrasion.

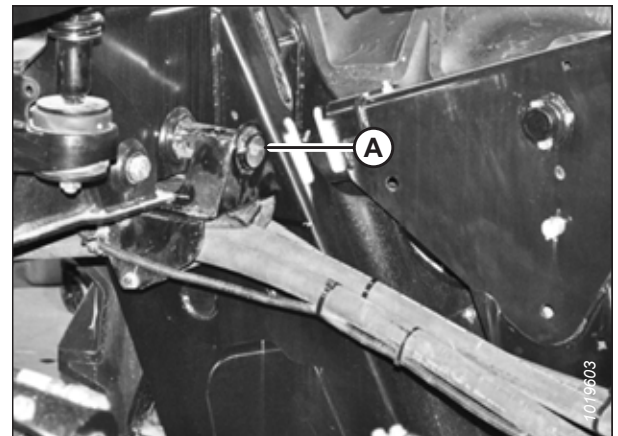


Figure 5.77: Hose Support Attachment

ATTACHING HEADERS TO WINDROWER

5. **If an auger header is being replaced by a rotary disc header:** Disconnect hose (A) from knife pressure receptacle (C) on the frame. Move the hose to storage location (B).

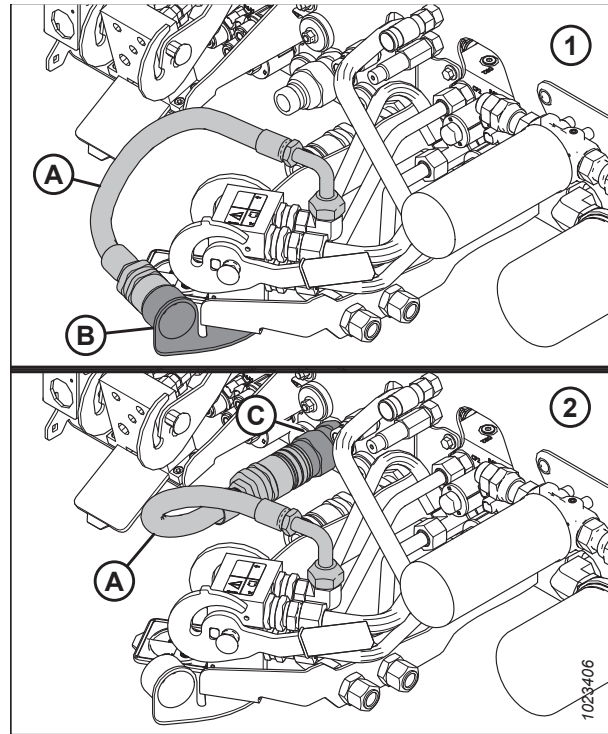


Figure 5.78: Knife Pressure Hose Positions

- 1 - Knife Pressure Hose in Storage Position – Rotary Configuration
2 - Hose to Knife Pressure Receptacle – Auger/Draper Configuration

6. Attach the couplers to the receptacles on the windrower as follows:
- Connect the pressure hose female coupler to receptacle (A)
 - Connect the return hose male coupler to receptacle (B)
 - Connect the case drain hose coupler to receptacle (C)
 - Connect the electrical harness to receptacle (D)

IMPORTANT:

The hydraulic hoses should have enough slack to pass by multicoupler (E) without coming into contact with it. This will protect the hoses from rubbing against the multicoupler and becoming damaged. The slack in the hoses can be increased by loosening and adjusting the hose holder on the front windrower leg before pulling the hoses backward toward the windrower.

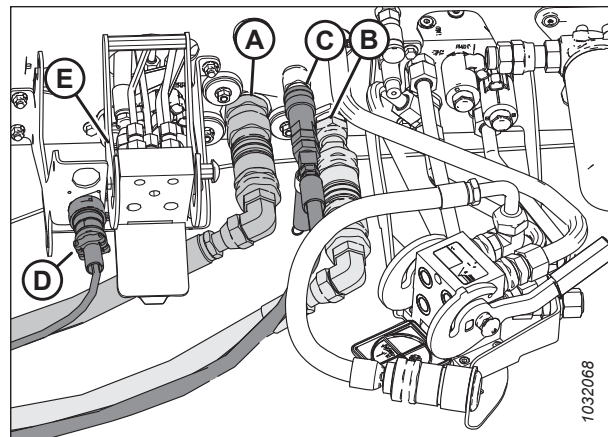


Figure 5.79: Hydraulic and Electrical Connections

ATTACHING HEADERS TO WINDROWER

7. Push latch (A) to unlock platform (B).

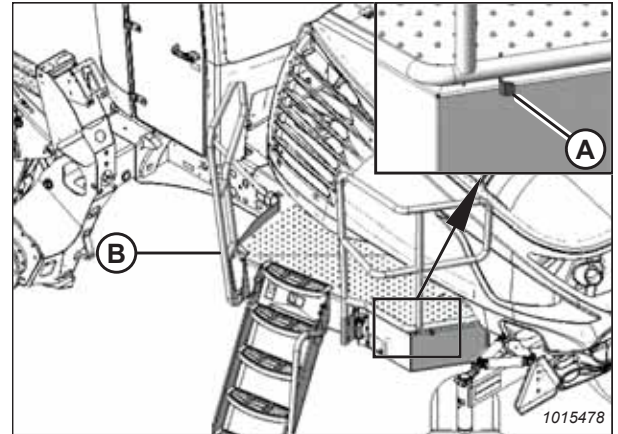


Figure 5.80: Left Cab-Forward Platform

8. Pull platform (A) toward the cab until it stops and the latch is engaged.

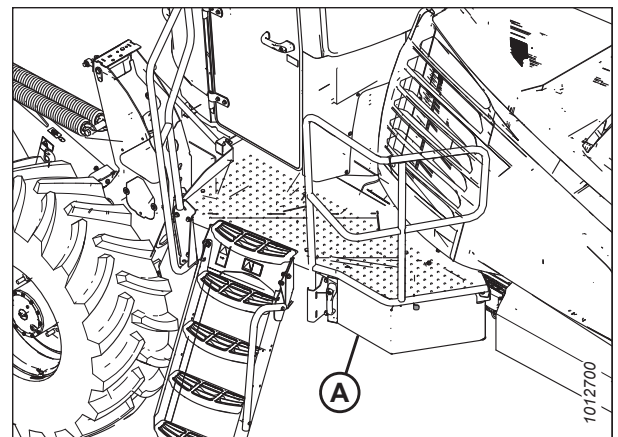


Figure 5.81: Left Cab-Forward Platform

9. If necessary, calibrate the knife drive. Calibrate the knife drive whenever you are:
 - Attaching the header to the windrower for the first time
 - Changing the speed sensor or hydraulic drive motor on the header
 - Changing the header drive pump associated with the knife drive, Harvest Performance Tracker (HPT), or the master controller on the windrower

For instructions on calibrating the knife drive, refer to [Calibrating Knife Drive on Harvest Performance Tracker Display](#), page 127.

5.1.4 R2 Series Rotary Disc Header

This section details the procedures necessary to physically attach an R2 Series Rotary Disc Header to a windrower and to complete its hydraulic and electrical connections.

Attaching Forming Shield

The forming shield determines the width and the placement of the windrow. The instructions in this section will show you how to properly attach the forming shield to the windrower.

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

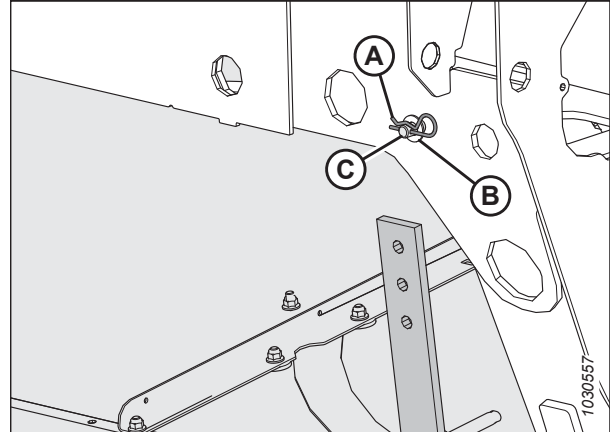


Figure 5.82: Lynch Pin and Washer at Rear of Windrower Leg

2. Attach rubber strap (D) to straight pin (C) at the rear of the windrower leg. Secure it with washer (B) and lynch pin (A).
3. Repeat Step 1, page 114 to Step 2, page 114 at the opposite side of the forming shield.

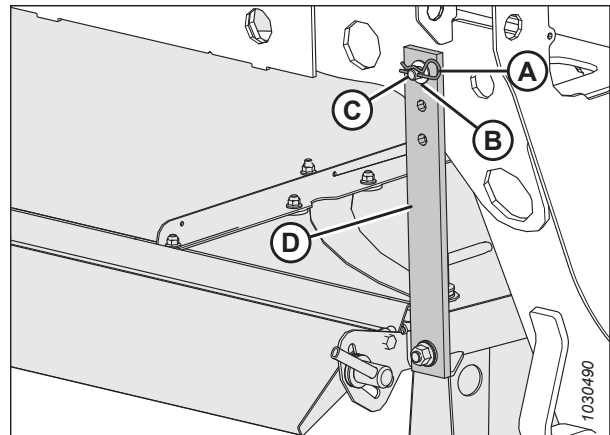


Figure 5.83: Rubber Strap Securing Forming Shield onto Windrower Leg

Attaching R2 Series Rotary Disc Header

The windrower's support feet and center-link will need to be connected to the rotary disc header. The windrower may be equipped with an optional self-aligning hydraulic center-link, which allows control over the vertical position of the center-link from the cab.



DANGER

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

DANGER

Ensure that all bystanders have cleared the area.

IMPORTANT:

To attach an R216 SP Rotary Disc Header to an M1 Series Windrower previously configured for a D1X Series Draper Header, ensure that two shield mount plates (A) are attached to the windrower and the forming shield.

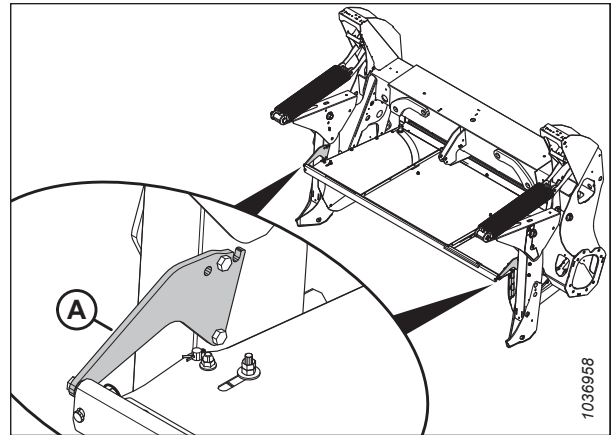


Figure 5.84: Shield Mount Plates on Forming Shield

1. Shut down the engine, and remove the key from the ignition.
2. **Windrowers equipped with a hydraulic center-link without self-alignment:** Remove pin (A) and raise center-link (B) until the hook is above the attachment pin on the header. Replace pin (A) to hold the center-link in place.

IMPORTANT:

Ensure that the center-link is positioned high enough that it does not contact the header as the windrower approaches the header.

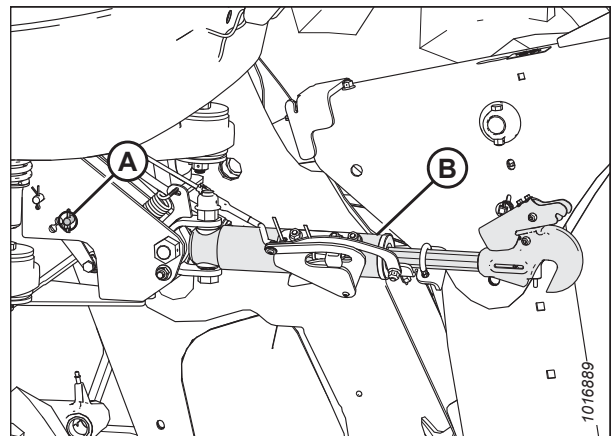


Figure 5.85: Hydraulic Center-Link

3. Remove hairpin (A) from clevis pin (B), and remove the pin from header support (C) on both sides of the header.
4. Start the engine.

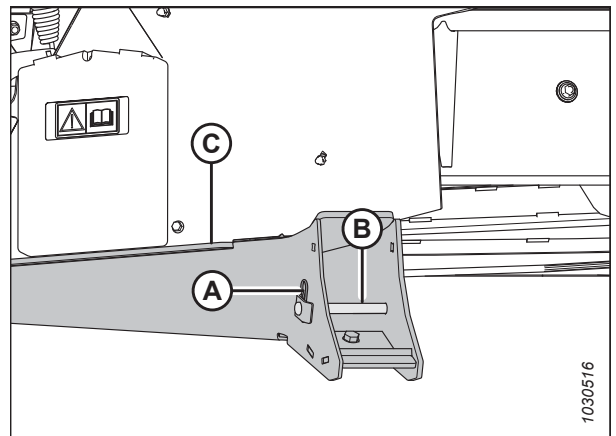


Figure 5.86: Header Support

ATTACHING HEADERS TO WINDROWER

5. Lift header support (A) and place four 35 x 89 mm (2 x 4 in.) blocks (B) under the header support. Ensure that the boot's bottom edge (C) is parallel with the ground.

NOTE:

Do **NOT** stack blocks (B) crosswise; doing so can make the header unstable when you are attempting to connect the header and the windrower. Stack blocks (B) so that they are aligned with each other.

6. Repeat Step 5, [page 116](#) on the opposite side of the header.

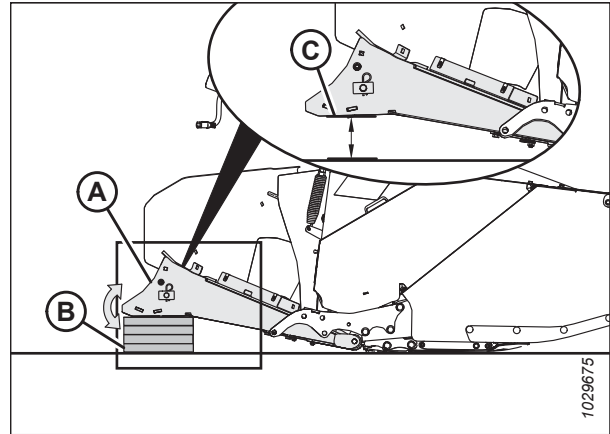


Figure 5.87: Header Support

7. **If the header lift legs will be lowered WITH a header or weight box attached**, proceed to Step 11, [page 117](#).

If the header lift legs will be lowered WITHOUT a header or weight box attached to the windrower, fully release the tension in header float springs (A):

- If the Harvest Performance Tracker (HPT) displays a message saying that the float should be removed, then remove the float and proceed to Step 11, [page 117](#).
- If the HPT does **NOT** display a message saying that the float should be removed, then proceed to Step 8, [page 116](#) to remove the float manually.

IMPORTANT:

To lower the header lift legs without a header or weight box attached to the windrower, ensure that the tension on the float springs is fully released. This will prevent damage to the header lift linkages.

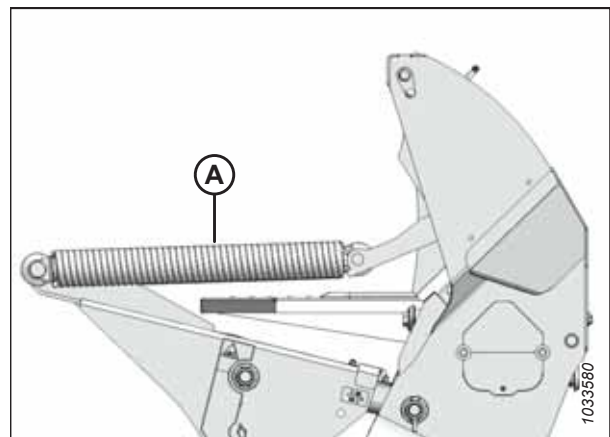


Figure 5.88: Header Float Springs

8. Press rotary scroll knob (A) on the Harvest Performance Tracker (HPT) to highlight the QuickMenu options.
9. Rotate scroll knob (A) to highlight HEADER FLOAT symbol (B). Press the scroll knob to select it. The Float Adjust page will appear.



Figure 5.89: HPT Display

ATTACHING HEADERS TO WINDROWER

10. Press soft key 3 (A) to remove the header float.

NOTE:

If the header float is active, the icon at soft key 3 displays Remove Float; if the header float has been removed, then the icon displays Resume Float.



Figure 5.90: HPT Display

11. Press HEADER DOWN switch (E) on the ground speed lever (GSL) to fully retract the header lift cylinders.
12. **Windrowers equipped with a self-aligning hydraulic center-link:** Press REEL UP switch (B) on the GSL to raise the center-link until the hook is above the attachment pin on the header.

IMPORTANT:

Ensure that the center-link is positioned high enough that it does not contact the header as the windrower approaches the header.

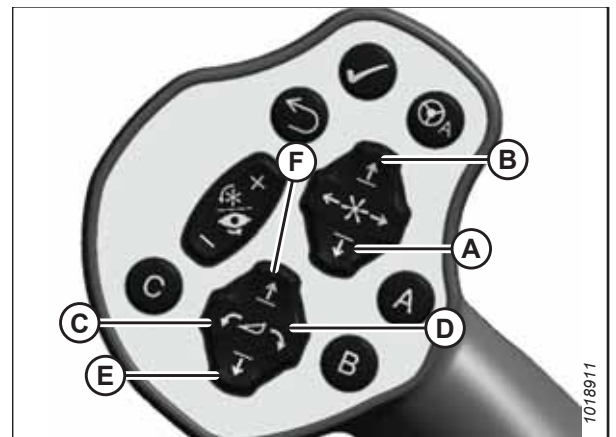


Figure 5.91: GSL

A - Reel Down
C - Header Tilt Down
E - Header Down

B - Reel Up
D - Header Tilt Up
F - Header Up

13. Drive the windrower slowly forward until feet (A) enter supports (B). Continue to drive slowly forward until the feet engage the supports and the header is nudged forward.
14. Ensure that feet (A) are properly engaged in supports (B).

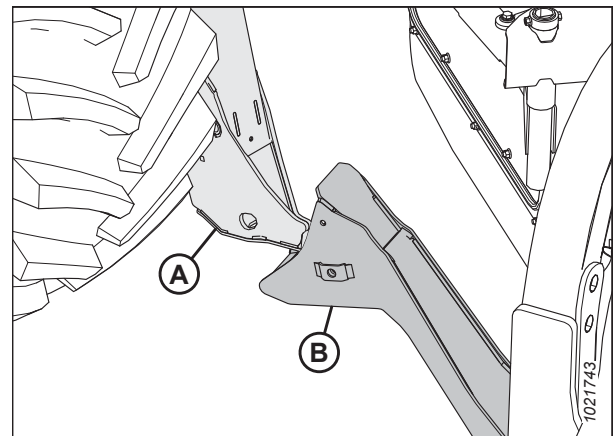


Figure 5.92: Header Support

15. Windrowers equipped with the self-aligning center-link kit:

- a. Adjust the position of center-link cylinder (A) with the switches on the GSL until hook (B) is above the header attachment pin.

IMPORTANT:

Hook release (C) must be down to enable the self-locking mechanism to function.

- b. If hook release (C) is open (in the up position), shut down the engine, and remove the key from the ignition. Manually push hook release (C) down after the hook engages the header pin.
- c. Lower center-link (A) onto the header with the REEL DOWN switch on the GSL until the center-link locks into position and hook release (C) is down.
- d. Check that the center-link is locked onto the header by pressing the REEL UP switch on the GSL.

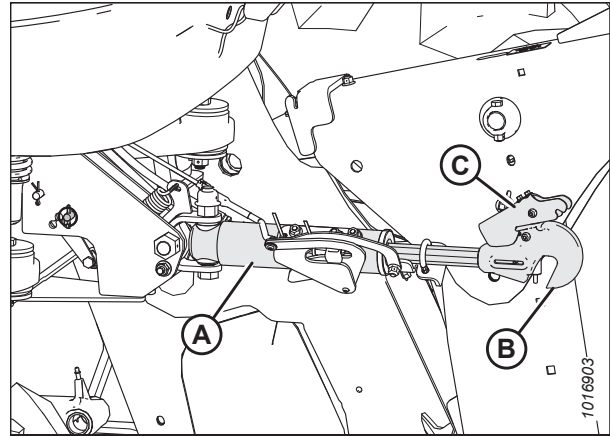


Figure 5.93: Hydraulic Center-Link

16. Windrowers without the self-aligning center-link kit:

- a. Press the HEADER TILT UP or HEADER TILT DOWN cylinder switches on the GSL to extend or retract the center-link cylinder until the hook is aligned with the header attachment pin.
- b. Shut down the engine, and remove the key from the ignition.
- c. Push down on rod end (B) of the link cylinder until the hook engages and locks onto the header pin.

IMPORTANT:

The hook release must be down to enable the self-locking mechanism to function. If the hook release is open (in the up position), manually push it down after the hook engages the pin.

- d. Check that center-link (A) is locked onto the header by pulling upward on rod end (B) of the cylinder.

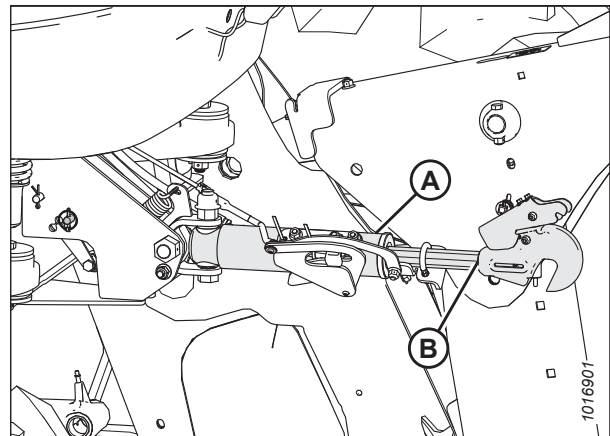


Figure 5.94: Hydraulic Center-Link

DANGER

Ensure that all bystanders have cleared the area.

- e. Start the engine.

ATTACHING HEADERS TO WINDROWER

17. Press HEADER UP switch (A) to raise the header to its maximum height.

NOTE:

If one end of the header does **NOT** fully rise, rephase the lift cylinders as follows:

- a. Press and hold HEADER UP switch (A) until both cylinders stop moving.
 - b. Continue to hold the switch for 3–4 seconds. The cylinders are now phased.
18. Shut down the engine, and remove the key from the ignition.

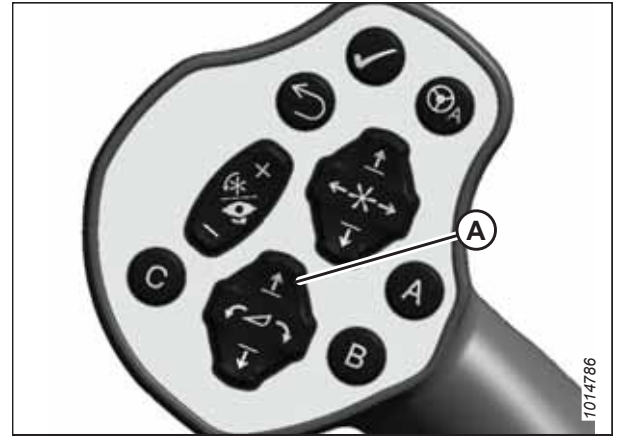


Figure 5.95: GSL

19. Engage the safety props on both lift cylinders as follows:
 - a. Pull lever (A) toward you to release it, and then rotate it toward the header to lower the safety prop onto the cylinder.
 - b. Repeat the previous step for the opposite lift cylinder.

IMPORTANT:

Ensure that the safety props engage over the cylinder piston rods. If the safety prop does **NOT** engage properly, raise the header until the safety prop fits over the rod.

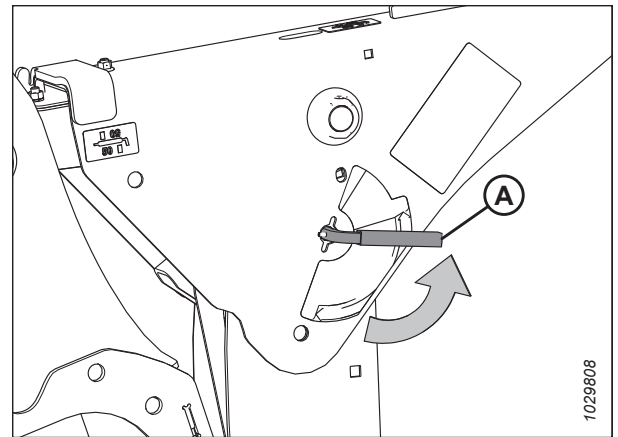


Figure 5.96: Safety Prop Lever

20. Install clevis pin (A) through the support and the windrower lift arm. Secure the clevis pin with hairpin (B). Repeat this step on the opposite side of the header.

IMPORTANT:

Ensure that clevis pin (A) is fully inserted, and that the hairpin is installed behind the bracket.

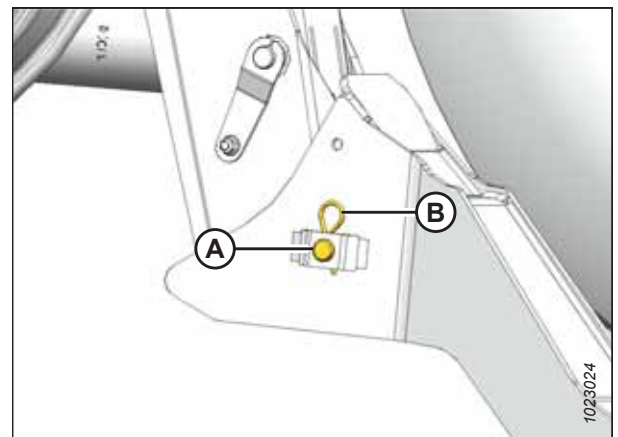


Figure 5.97: Header Support

ATTACHING HEADERS TO WINDROWER

21. Disengage the safety props on both lift cylinders as follows:

- Turn lever (A) away from the header to raise the safety prop until the lever locks into the vertical position.
- Repeat the previous step for the opposite cylinder.

NOTE:

If the safety prop will **NOT** disengage, raise the header to release the prop.

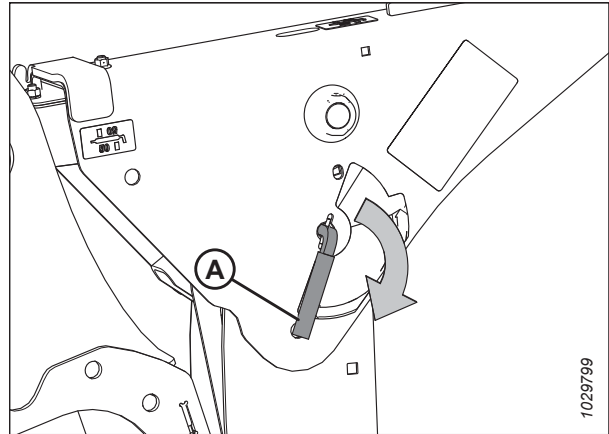


Figure 5.98: Safety Prop Lever

22. Start the engine and press HEADER DOWN switch (A) on the GSL to fully lower the header.

23. Shut down the engine, and remove the key from the ignition.

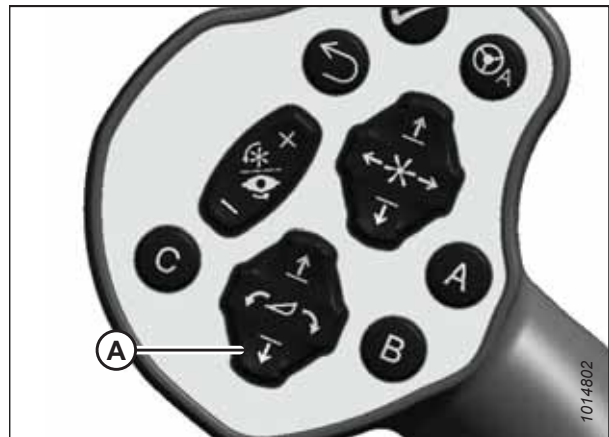


Figure 5.99: GSL

24. Restore the header float manually by doing the following:

- Press rotary scroll knob (A) on the Harvest Performance Tracker (HPT) to highlight the QuickMenu options.
- Rotate scroll knob (A) to highlight Header Float icon (B), and press the scroll knob to select it.



Figure 5.100: HPT Display

ATTACHING HEADERS TO WINDROWER

25. Press soft key 3 (A) to restore the header float.

NOTE:

If the header float is active, the icon at soft key 3 displays Remove Float; if the header float has been removed, then the icon displays Resume Float.

26. Shut down the engine, and remove the key from the ignition.



Figure 5.101: HPT Display

Connecting R2 Series Rotary Disc Header Hydraulic and Electrical Systems

Connecting the R2 Series Rotary Disc Header's hydraulic and electrical systems to the windrower involves attaching the header's knife drive, pressure, return, case drain, and electrical connectors to the windrower's receptacles.

IMPORTANT:

To prevent contamination of the hydraulic system, use a clean rag to remove dirt and moisture from all hydraulic couplers.

1. Approach platform (A) on the left cab-forward side of the windrower. Ensure that the cab door is closed.
2. Push latch (B) and pull platform (A) toward the walking beam until it stops and the latch engages.

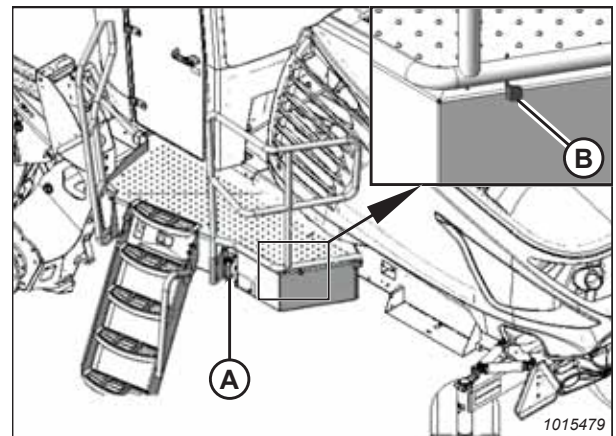


Figure 5.102: Left Cab-Forward Platform

3. Retrieve hydraulic hoses (A) from the header and route the hose bundle under the windrower frame.

NOTE:

Adding anti-seize compound to the hose holder pin will make future removal easier.

4. Insert pin (B) into hole (C) in the windrower frame.

IMPORTANT:

Route the hydraulic hoses as straight as possible, avoiding wear points that could damage the hoses. To prevent abrasion damage, the hoses should have enough slack to pass by the multicoupler bracket without contacting it. To adjust the slack in the hoses, loosen the clamps below pin (B), adjust the hoses, then retighten the hose holder.

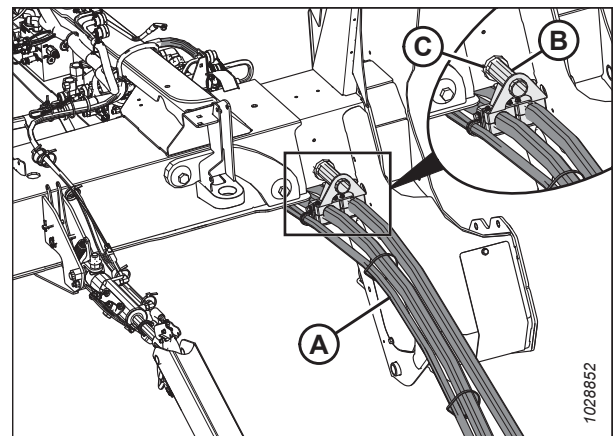


Figure 5.103: Hose Support Attachment

ATTACHING HEADERS TO WINDROWER

5. If using hard-plumbed fittings (A), proceed to Step 6, [page 122](#). If using quick couplers (B), proceed to Step 7, [page 123](#).

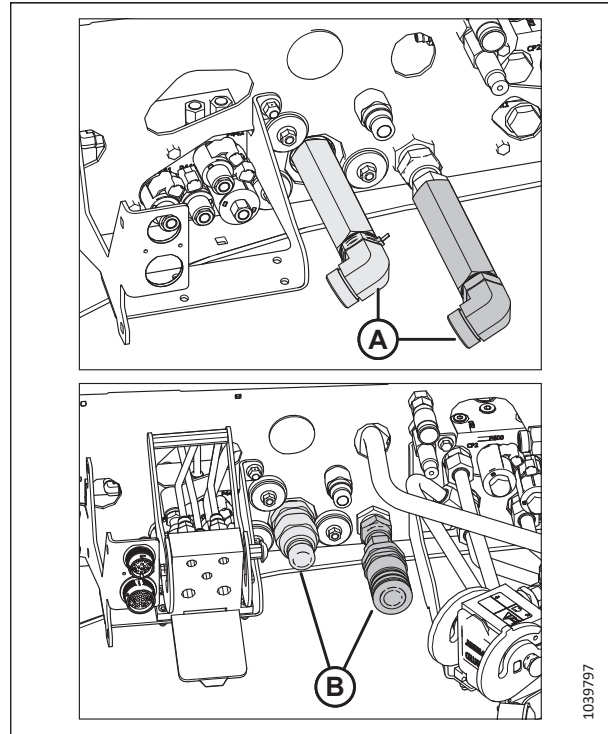


Figure 5.104: Hard-Plumbed Fittings Compared to Quick Couplers

6. **Hard-plumbed fittings:** Connect the hydraulic hoses to the windrower as follows:
- Connect disc pressure hose (A) (fitted with red cable tie [B]) to hard plumb fitting (C) (fitted with a red cable tie) and torque the connection to 215 Nm (159 lbf-ft).
 - Connect disc return hose (D) to hard plumb fitting (E) and torque the connection to 215 Nm (159 lbf-ft).
 - Connect case drain hose (F) to fitting (G).
 - If connecting to a grass seed header, proceed to Step 9, [page 124](#). Otherwise proceed to Step 10, [page 124](#).

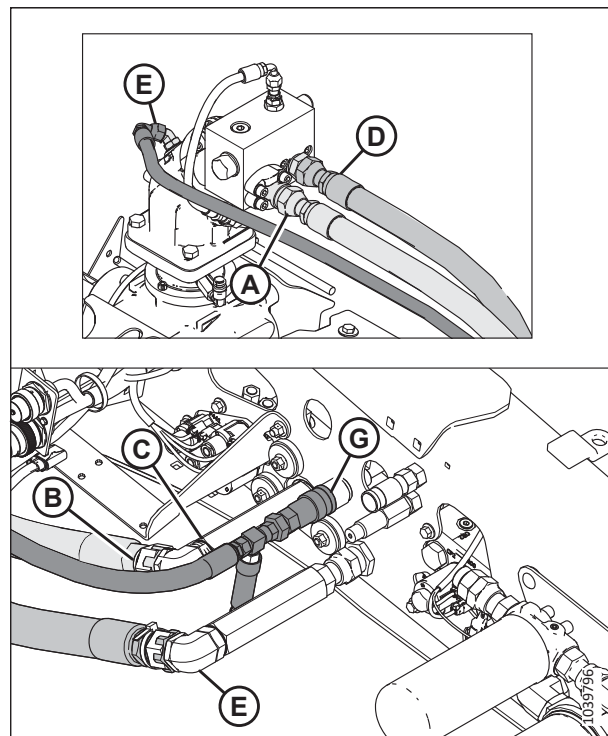


Figure 5.105: Hard-Plumbed Fittings

ATTACHING HEADERS TO WINDROWER

7. **Quick couplers:** If switching from an auger/drapper header to a rotary header, disconnect hose (A) from knife pressure receptacle (C) on the frame, and move it to storage location (B).

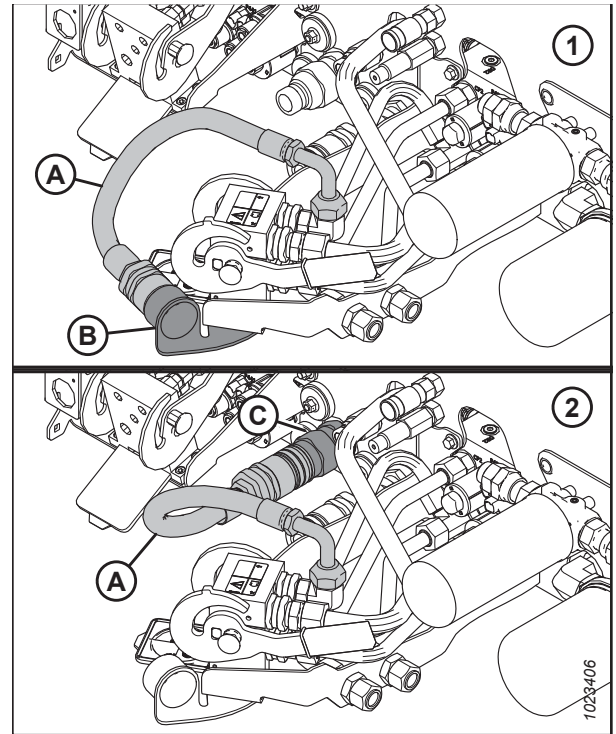


Figure 5.106: Knife Pressure Hose Positions

- 1 - Knife Pressure Hose in Storage Position – Rotary Configuration
- 2 - Hose to Knife Pressure Receptacle – Auger/Drapper Configuration

8. **Quick couplers:** Connect the hydraulic hoses to a windrower with quick coupler fittings as follows:
 - a. Connect disc pressure hose (A) to coupler (B). Torque the connection to 216 Nm (159 lbf·ft).
 - b. Connect disc return hose (C) to coupler (D). Torque the connection to 216 Nm (159 lbf·ft).
 - c. Connect case drain hose (E) to fitting (F), with the relief valve pointing towards the ground.

NOTE:

If necessary, loosen fitting (F) and retighten it to ensure that the relief valve is pointing straight down.

- d. If connecting to a grass seed header, proceed to Step 9, [page 124](#). Otherwise proceed to Step 10, [page 124](#).

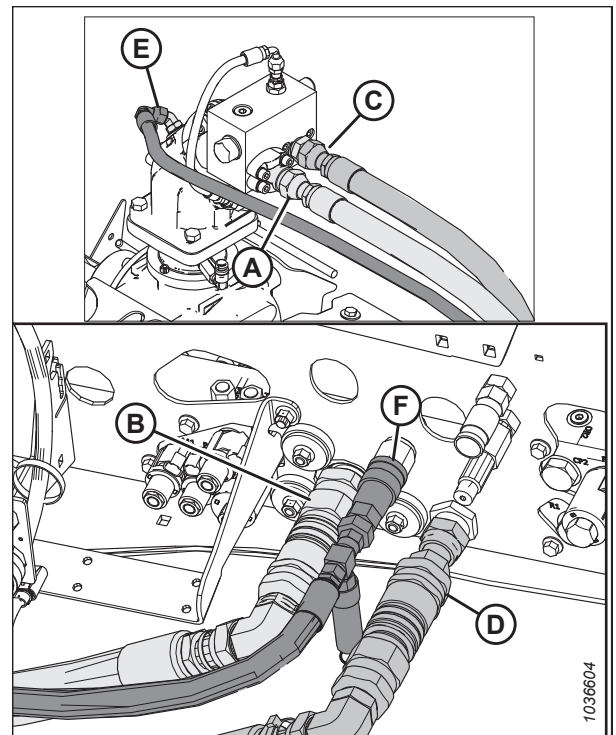


Figure 5.107: Quick Couplers

ATTACHING HEADERS TO WINDROWER

9. **To connect a grass seed header (GSS):** Connect the four additional hydraulic hoses supplied with the grass seed version of the header as follows:
- Connect hose (green cable tie) with female quick coupler (A) to coupler (B) on the windrower frame.
 - Connect hose (yellow cable tie) with male quick coupler (C) to coupler (D) on the windrower frame.
 - Remove the cap (not shown) from inboard bulkhead fitting (E). Connect hose (F) (red cable tie) to inboard bulkhead fitting (E).
 - Remove the cap (not shown) from outboard bulkhead fitting (G). Connect hose (H) (blue cable tie) to inboard bulkhead fitting (G).

NOTE:

The other end of hose (F) connects to the grass seed module drum on the left side of the header.

NOTE:

The other end of hose (H) connects to the grass seed module drum on the right side of the header.

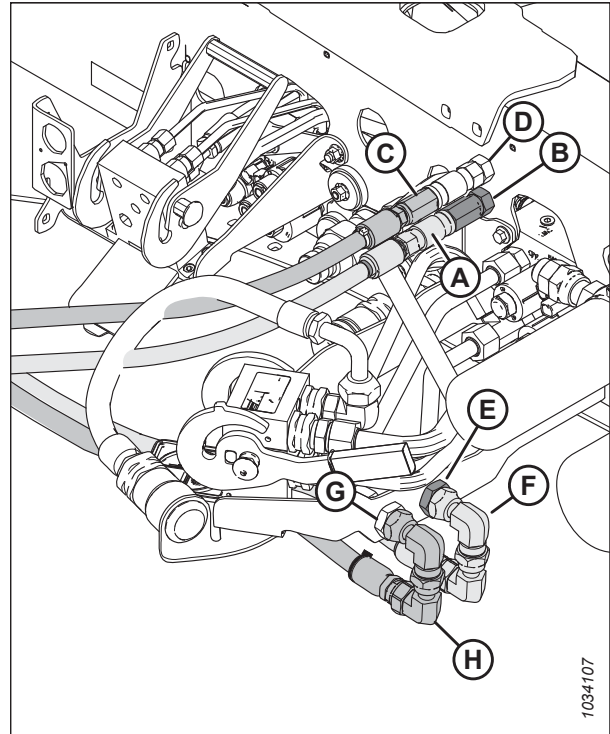


Figure 5.108: Grass Seed Header Hydraulic Connections

10. Free electrical harness (A) from adjustable strap (B).

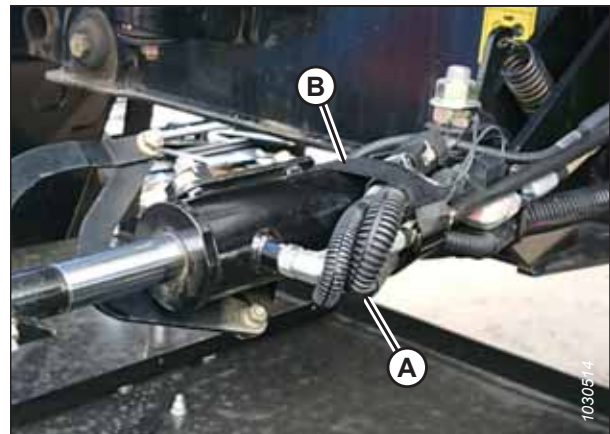


Figure 5.109: Electrical Harness Secured to Center-Link

ATTACHING HEADERS TO WINDROWER

11. Connect main header harness (A) to adapter harness (B).
12. **Headers equipped with the electric baffle control kit:** Connect electric baffle control harness (C) to adapter harness (D).
13. **Grass seed headers (GSS):** Connect actuator harness (C) to adapter harness (D).

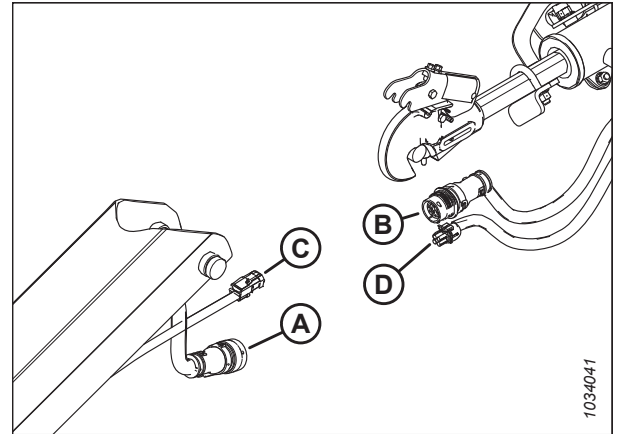


Figure 5.110: Electrical Harness Connection at Center-Link

14. Push latch (A) to unlock platform (B).

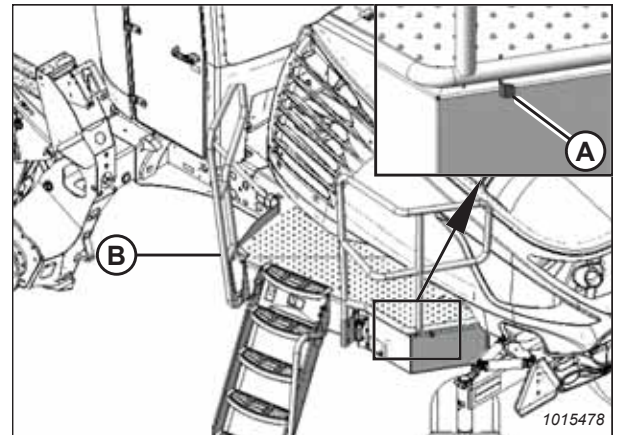


Figure 5.111: Left Cab-Forward Platform

15. Pull platform (A) toward the cab until it stops and the latch is engaged.

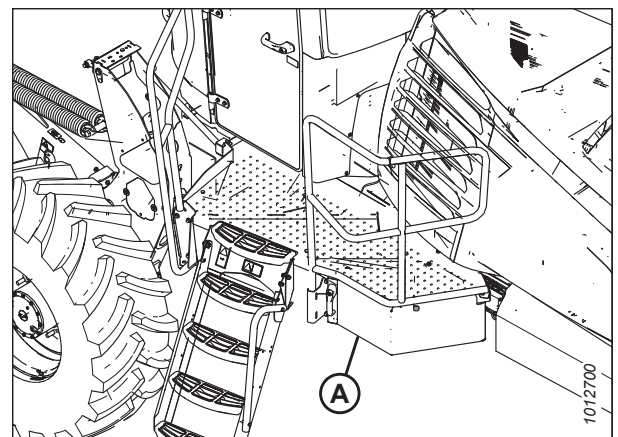


Figure 5.112: Left Cab-Forward Platform

DANGER

Ensure that all bystanders have cleared the area.

16. Start the engine.
17. Extend center-link (A) fully. Ensure that there is some slack in harness (B).
18. Retract center-link (A) fully. Ensure that there is not an excessive amount of harness (B) hanging down.
19. Shut down the engine, and remove the key from the ignition.
20. Adjust harness (B) as needed.
21. Tighten all the cables along the harness.
22. If necessary, calibrate the knife drive. Calibrate the knife drive whenever you are:
 - Attaching the header to the windrower for the first time
 - Changing the speed sensor or hydraulic drive motor on the header
 - Changing the header drive pump associated with the knife drive, Harvest Performance Tracker (HPT), or the master controller on the windrower

For instructions on calibrating the knife drive, refer to [Calibrating Knife Drive on Harvest Performance Tracker Display](#), page 127.

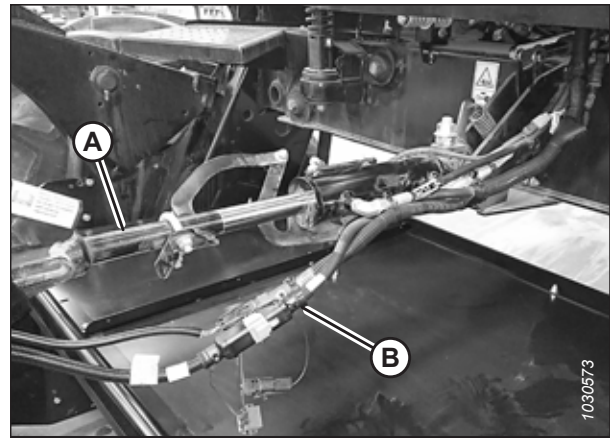


Figure 5.113: Electrical Connection

5.1.5 Adjusting Header Settings on Harvest Performance Tracker

The settings for the attached header can be changed by accessing the SET-UP HEADER menu in the windrower's Harvest Performance Tracker (HPT).

1. Navigate to the SETTINGS menu using soft key 5 and the HPT scroll knob. For instructions, refer to [6.1 Navigating Harvest Performance Tracker](#), page 133.

2. Scroll to SET-UP HEADER option (A) and press the scroll knob to select it.

NOTE:

The settings displayed will vary according to the type of header attached to the windrower.

3. Scroll to highlight the appropriate option and press the scroll knob to select it.

For example, if a draper header is attached, and ATTACHMENTS (B) is selected, the available choice will be DOUBLE DRAPER DRIVE.

4. Proceed to [5.1.6 Header System Calibration](#), page 127, and [Calibrating Knife Drive on Harvest Performance Tracker Display](#), page 127.

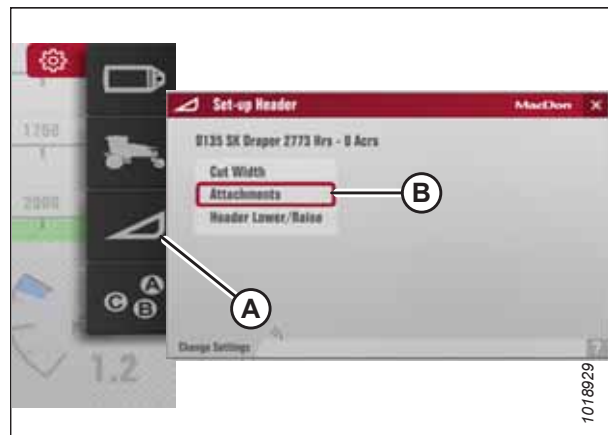


Figure 5.114: Header Settings

5.1.6 Header System Calibration

The Harvest Performance Tracker (HPT) recognizes when a header is attached to the windrower and determines which systems will require calibration.

The following sensors may require calibration, depending on the type of header attached to the windrower:

- Header height
- Header angle
- Header float left
- Header float right
- Reel height
- Reel fore-aft
- Swath compressor
- Knife drive

Recalibration is required in the following circumstances:

- The HPT is replaced
- A position sensor is replaced
- Sensor readouts are erratic
- A pump has been replaced
- A new header type or attachment is connected to the windrower

Calibrating Knife Drive on Harvest Performance Tracker Display

When a header is attached to the windrower, the windrower's Harvest Performance Tracker (HPT) will recognize the header ID and choose the appropriate settings for that header. Before it can be operated, however, the header's knife drive must be calibrated to ensure that the knife drive pump output is accurate.

DANGER

Ensure that all bystanders have cleared the area.

1. Start the engine.
2. Press soft key 5 (A) to open the Harvest Performance Tracker (HPT) main menu.

NOTE:

Calibrations **MUST** be performed with the engine running. Some calibrations will not be available with the engine off.

3. Use HPT scroll knob (B) or the ground speed lever (GSL) scroll wheel (not shown) to highlight SETTINGS icon (C).
4. Press HPT scroll knob (B) or the GSL SELECT button (not shown) to activate the settings menu options.

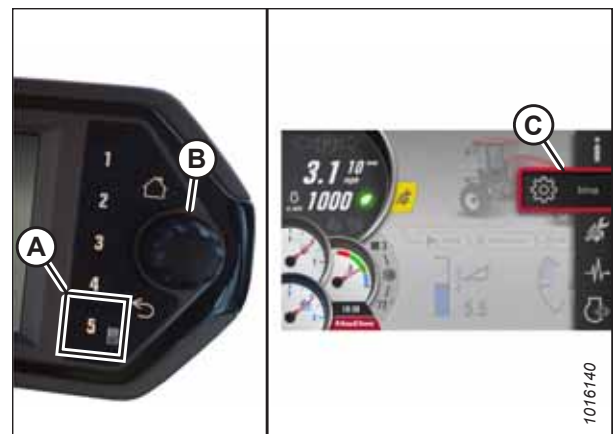


Figure 5.115: Opening the Main Menu

ATTACHING HEADERS TO WINDROWER

5. Scroll to WINDROWER SETTINGS icon (A) and press SELECT.
6. Scroll to CALIBRATION icon (B), and press SELECT to open the CALIBRATION SELECTION screen.

NOTE:

The F3 shortcut button on the operator's console will also open the WINDROWER SETTINGS menu.

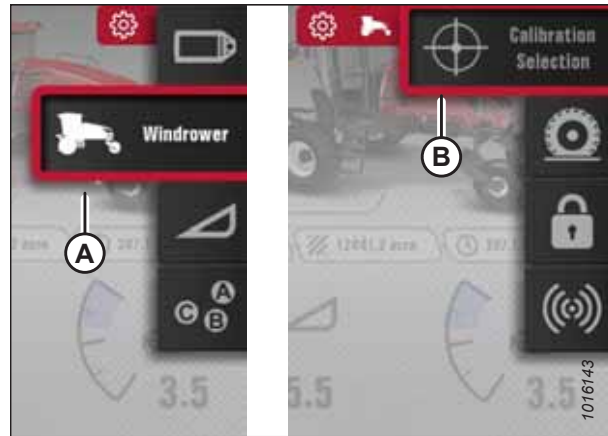


Figure 5.116: Windrower Settings Icon and Calibration Submenu Icon

7. In the Calibration Selection screen, scroll to KNIFE DRIVE (A) and press SELECT.
8. Engage the header.

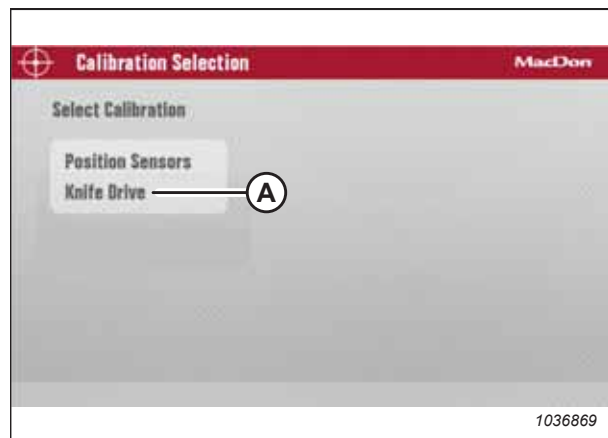


Figure 5.117: Calibration Selection Screen

NOTE:

If calibration is selected while the header is disengaged, WARNING (A) will appear. Engage the header. PLAY icon (B) appears after you engage the header.

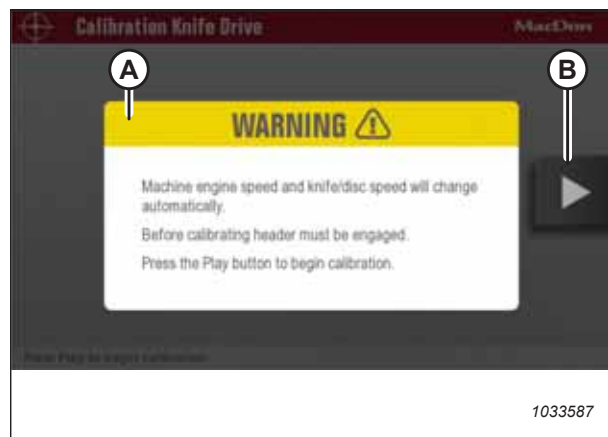


Figure 5.118: Engage Header Warning

ATTACHING HEADERS TO WINDROWER

9. Press the PLAY icon on the screen to begin the calibration process. The display on the screen changes to show that the calibration procedure has started.

NOTE:

If the engine speed is less than 1500 rpm prior to starting the calibration procedure, the system will raise the engine speed to 1500 rpm.



Figure 5.119: Calibration Screen

10. When Stage 1 of the calibration is complete, press PLAY icon (A) on the screen to continue with Stage 2 of the calibration process.

NOTE:

Knife drive calibration consists of nine stages.



Figure 5.120: Calibration Page

11. Press the PLAY icon to begin the calibration process.

NOTE:

During the calibration procedure, the speed of the header and of the engine will vary.

NOTE:

Press X icon (A) on the screen or use the HEADER DISENGAGE switch at any time during the calibration process to exit the procedure without saving your progress. The engine will resume the speed at which it was operating before the calibration process began.



Figure 5.121: Calibration Page

NOTE:

If error message (A) appears during the calibration process, follow the instructions in the message to fix the error. Press X (B) to exit the message. If the knife calibration procedure fails:

- Confirm that the engine and hydraulics are at operating temperature.
- Confirm that the hydraulic system is free of any restrictions and is in working order.
- Confirm that the throttle is working:
 - Check the engine codes to confirm that engine is not derated or throttle-inhibited.
 - The throttle is controlled via the powertrain's CAN network 1. Check the network's wiring and connectors for an open or intermittent connection.
- Confirm that the sensor mounting is secured properly and that the sensor's gap is set correctly.
- Check the sensor wiring and connectors for an intermittent connection.
- Replace the sensor.

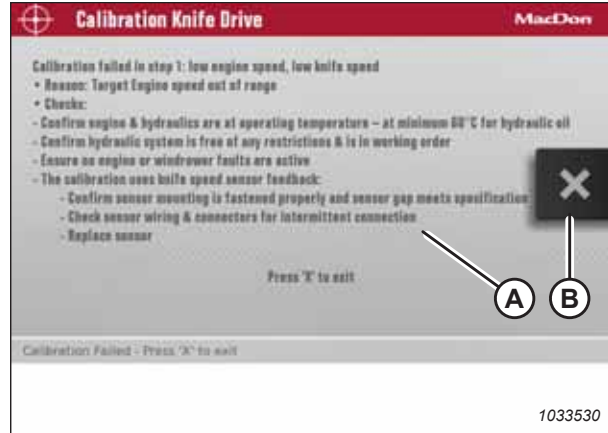


Figure 5.122: Calibration Page

Calibrating Header Position Sensors on Harvest Performance Tracker Display

The header position sensors need to be recalibrated whenever the Harvest Performance Tracker (HPT) is replaced, a position sensor is replaced, sensor readouts are erratic, a pump has been replaced, or when a new header type or attachment is connected to the windrower.

DANGER

Ensure that all bystanders have cleared the area.

1. Start the engine.
2. Press soft key 5 (A) to open the Harvest Performance Tracker (HPT) main menu.

NOTE:

Calibrations **MUST** be performed with the engine running. Some calibrations will not be available with the engine off.

3. Use HPT scroll knob (B) or the ground speed lever (GSL) scroll wheel (not shown) to highlight SETTINGS icon (C).
4. Press HPT scroll knob (B) or the GSL SELECT button (not shown) to activate the settings menu options.

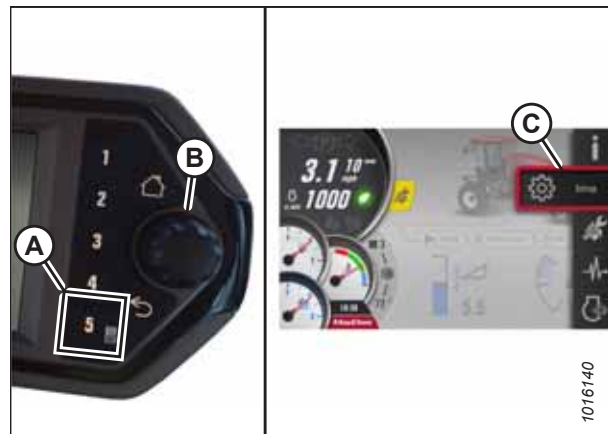


Figure 5.123: Opening the Main Menu

ATTACHING HEADERS TO WINDROWER

5. Scroll to WINDROWER SETTINGS icon (A) and press SELECT.
6. Scroll to CALIBRATION icon (B), and press SELECT to open the CALIBRATION SELECTION screen.

NOTE:

The F3 shortcut button on the operator's console will also open the WINDROWER SETTINGS menu.

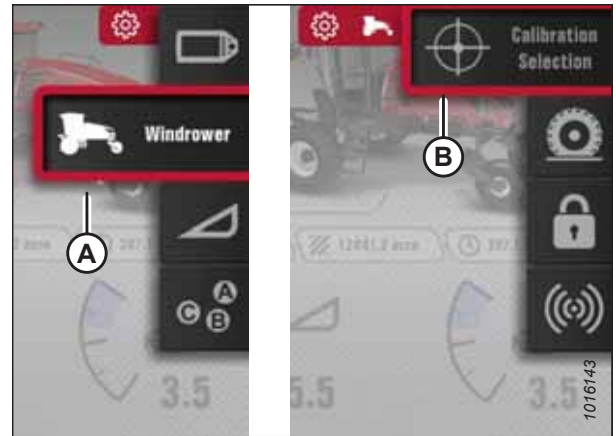


Figure 5.124: Windrower Settings Icon and Calibration Submenu Icon

7. In the CALIBRATION SELECTION screen, scroll to POSITION SENSORS (A) and press SELECT.

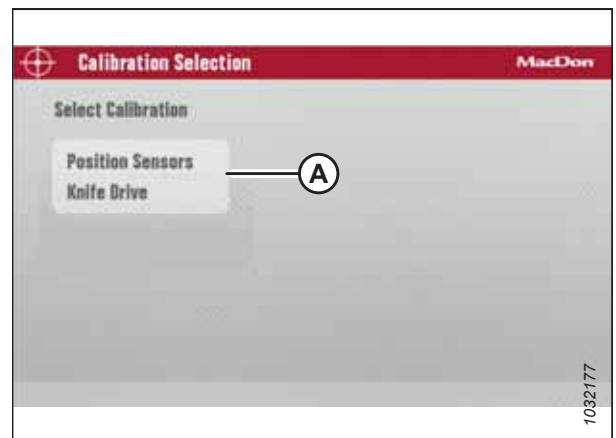


Figure 5.125: Calibration Selection Screen

NOTE:

Pressing X icon (A) on the screen (or pressing the HOME, BACK or any GSL button [buttons not shown]) at any time during the calibration process will EXIT the calibration procedure without saving your progress. The engine speed will also return to the original rpm prior to starting the calibration process.

NOTE:

If a sensor goes out of its normal operating range during the calibration process, calibration will stop and a message will appear on the screen indicating that a sensor is out of range.



Figure 5.126: Calibration Screen

ATTACHING HEADERS TO WINDROWER

8. When stage one of the calibration is complete, press PLAY icon (A) on the screen to continue with stage two of the calibration process.



Figure 5.127: Calibration Screen

9. When stage two of the calibration is complete, press RESUME icon (A) on the screen to configure the HEADER FLOAT setting, or press HOME or BACK button (not shown) to exit.

NOTE:

The engine speed returns to the speed prior to calibration when stage two calibration is complete.



Figure 5.128: Calibration Screen

NOTE:

If the voltage of any sensor falls below its acceptable range during calibration, a message appears after completing the calibration with a list of sensors reporting out-of-range voltages. Adjust the sensors as needed and repeat the calibration process from the beginning.



Figure 5.129: Sample of Failed Calibration Display Message

Chapter 6: Reference

The topics provided in this chapter can be consulted as needed.

6.1 Navigating Harvest Performance Tracker

Turning the scroll knob on the Harvest Performance Tracker (HPT) highlights the available options within a menu or changes a selected setting. Pushing the scroll knob selects a function or a menu item. The scroll and select functions are also duplicated on the ground speed lever (GSL) controls. Unless otherwise specified, these two buttons will always perform the same function. When the “select” instruction is given in this document, either the button on the GSL or the scroll knob on the HPT can be used.

1. Turn rotary scroll knob (A) clockwise to move the selection cursor down the screen, to the right of the screen, clockwise, or to increase a selected setting. Push the scroll knob to activate the selected item.
2. Turn rotary scroll knob (A) counterclockwise to move the selection cursor down the screen, to the left of the screen, counterclockwise, or to decrease a selected setting. Push the scroll knob to activate the selected item.

NOTE:

The scroll wheel on the back of the GSL and the SELECT button on the front of the GSL perform the same functions as the HPT scroll knob.



Figure 6.1: HPT Scroll Knob

3. Press soft key 5 (A) to open the main menu.
4. Use HPT scroll knob (B) or GSL scroll wheel to place the red cursor over SETTINGS icon (C).
5. Press HPT scroll knob (B) or the GSL SELECT button to activate a selected MENU option.

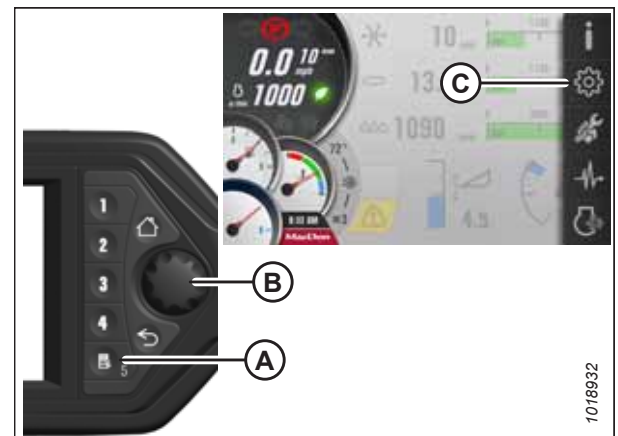


Figure 6.2: Main Menu

REFERENCE

6. Press BACK button (A) on the HPT to return to the previous level of the menu structure.
7. Press HOME button (B) on the HPT to return to the last selected run screen (or to the header-disengaged screen).



Figure 6.3: HPT

6.2 Lubricants, Fluids, and System Capacities

Only the fluids and lubricants recommended for use in MacDon publications should be used with MacDon windrowers. The system capacities and recommended fluids and lubricants for the M1 Series Windrower are listed in this section.

WARNING

The substances specified in the table below present various hazards to human health. Take note of each product's safe handling recommendations.

Lubricant/Fluid	Location	Description	Capacity
Diesel exhaust fluid (DEF)	Diesel exhaust fluid tank	Must meet ISO 22241 requirements.	28 liters (7.5 U.S. gallons)
Grease	As needed unless otherwise specified	SAE multi-purpose high temperature extreme pressure (EP2) performance with 1% max molybdenum disulphide (NLGI Grade 2) lithium base	As needed
Diesel fuel	Fuel tank	Ultra low sulphur diesel (ULSD) Grade No. 2, or ULSD Grade No. 1 and 2 mix ² ; refer to 6.3 Fuel Specifications, page 136 for more information	518 liters (137 U.S. gallons)
Hydraulic oil	Hydraulic reservoir	Single grade transmission/hydraulic fluid (THF) Viscosity at 60.1 cSt @ 40°C Viscosity at 9.5 cSt @ 100°C	60 liters (15.8 U.S. gallons) ³
Gearbox lubricant	Gearbox	SAE 75W-140 or 80W-140, API service class GL-5 fully synthetic gear lubricant (SAE J2360 preferred)	2.1 liters (2.2 U.S. quarts)
Gearbox lubricant	Standard wheel drive	SAE 75W-140 or 80W-140, API service class GL-5 fully synthetic gear lubricant (SAE J2360 preferred)	1.4 liters (1.5 U.S. quarts)
Gearbox lubricant	High-torque wheel drive	SAE 85W-140, API service class GL-5 fully synthetic gear lubricant	4.5 liters (4.8 U.S. quarts)
Engine coolant	Engine cooling system	ASTM D-6210 and CES-14603, Peak Final Charge Global™ or Fleetguard ES Compleat™ OAT Refer to 6.4 Coolant Specifications, page 137 for more information	31 liters (8.2 U.S. gallons)
Engine oil	Engine oil pan	SAE 15W-40 compliant with SAE specs for API Class SJ and CJ-4 engine oil	11 liters (11.6 U.S. quarts)
Air conditioning refrigerant	Air conditioning system	R134A	2.38 kg (5.25 lb.)
Air conditioning refrigerant oil	Air conditioning system total capacity	PAG SP-15	240 cc (8.1 fl. oz.)
Windshield washer fluid	Windshield washer fluid tank	SAE J942 compliant	4 liters (1 U.S. gallon)

2. Optional when operating temperature is below 0°C (32°F).

3. Denotes capacity of a dry system. Refill capacity is 58 liters (15 U.S. gallons).

6.3 Fuel Specifications

Follow the specifications for fuel quality to optimize system performance and prevent damage to the engine or fuel components.

Use only ultra low sulphur diesel (ULSD) from a reputable supplier. For most year-round service, No. 2 ULSD fuel meeting ASTM specification D975 Grade S15 will provide good performance.

If the vehicle is exposed to extreme cold (below -7°C [20°F]) or is required to operate at colder-than-normal conditions for prolonged periods, use climatized No. 2 diesel fuel, or dilute the No. 2 ULSD fuel with 50% No. 1 ULSD fuel. This will provide better protection from fuel gelling or wax-plugging of the fuel filters.

Table 6.1 Fuel Specifications

Fuel	Specification	Sulphur (by weight)	Water and Sediment (by volume)	Cetane No. °C (°F)	Lubricity
ULSD Grade No. 2	ASTM D975	0.5% maximum	0.05% maximum	40 (104) minimum	520 Microns
ULSD Grade No. 1 and 2 mix ⁴	n/a	1% maximum 0.5% maximum preferred	0.1% maximum	45–55 (113–130) cold weather / high altitude	460 Microns

In extreme situations, when available fuels are of poor quality or problems exist which are particular to certain operations, additives can be used; however, the engine manufacturer recommends consultation with the fuel supplier or engine manufacturer before using fuel additives. Situations where additives are useful include:

- A cetane improver additive can be used with low cetane fuels.
- A wax crystal modifier can help with fuels with high cold filter plugging points (CFPP).
- An anti-icer can help prevent ice formation in wet fuel during cold weather.
- An antioxidant or storage stability additive can help with fuel system deposits and poor storage stability.
- Diesel fuel conditioner can be used to increase the lubricity of fuels so that they meet the requirements given in Table 6.1, page 136.

4. Optional when operating temperature is below 0°C (32°F).

6.4 Coolant Specifications

Follow the specifications for coolant and water quality to optimize system performance and prevent damage to system components.

Recommended coolants: ASTM D-6210 and CES-14603, Peak Final Charge Global™, or Fleetguard ES Compleat™ OAT.

NOTE:

M1 Series Windrowers have Peak Final Charge Global™ coolant installed at the factory.

Mix equal parts of concentrated coolant to high quality, soft, deionized or distilled water as recommended by the supplier.

If Peak Final Charge Global™ or Fleetguard ES Compleat™ OAT is unavailable, use a coolant concentrate or prediluted coolant intended for use with heavy duty diesel engines with the following chemical and physical properties:

- Provides cylinder cavitation protection according to a fleet study run at or above 60% load capacity
- Protects the cooling system metals (cast iron, aluminum alloys, and copper alloys such as brass) from corrosion
- Coolant **MUST** be nitrite-free and **MUST** be free of 2-Ethylhexanoic (2-EH) acid

The additive package must be part of one of the following coolant mixtures:

- Ethylene glycol or propylene glycol base prediluted (40–60%) heavy duty coolant
- Ethylene glycol or propylene glycol base heavy-duty coolant concentrate in a 40–60% mixture of concentrate with quality water

Water quality is important for the performance of the cooling system. Distilled, deionized, or demineralized water is recommended for mixing with ethylene glycol and propylene glycol base engine coolant concentrate.

IMPORTANT:

Do **NOT** use cooling system sealing additives or antifreeze that contains sealing additives.

6.5 Torque Specifications

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

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

Jam nuts

Jam nuts require less torque than nuts used for other purposes. When applying torque to finished jam nuts, multiply the torque applied to regular nuts by 0.65 to obtain the modified torque value.

Self-tapping screws

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

6.5.1 Metric Bolt Specifications

Specifications are provided for the appropriate final torque values to secure various sizes of metric bolts.

NOTE:

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

Table 6.2 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

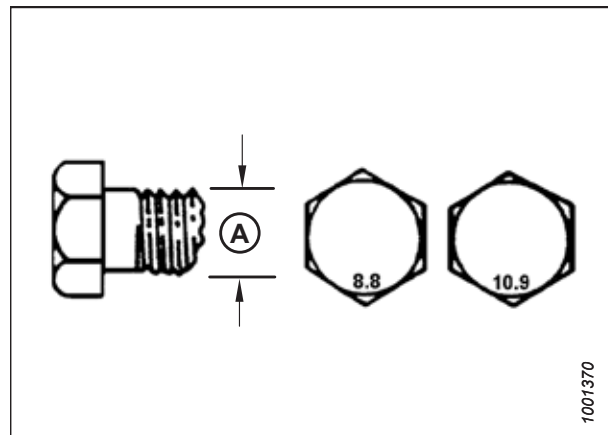


Figure 6.4: Bolt Grades

REFERENCE

Table 6.3 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

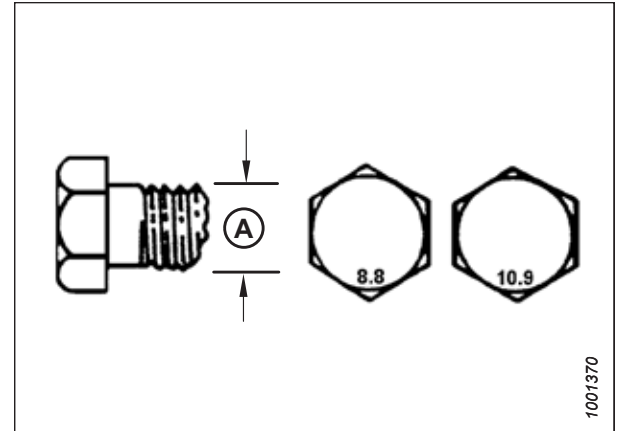


Figure 6.5: Bolt Grades

Table 6.4 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

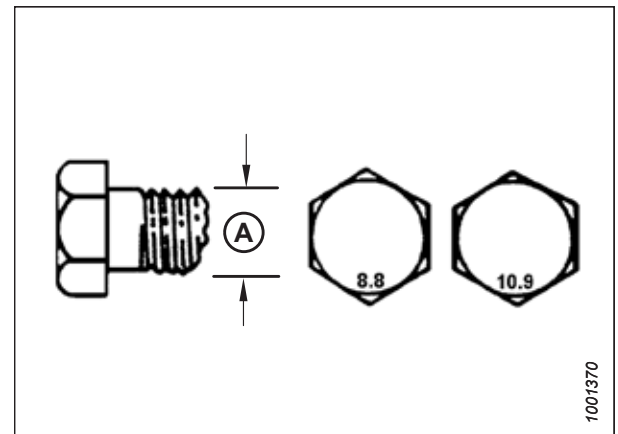


Figure 6.6: Bolt Grades

REFERENCE

Table 6.5 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

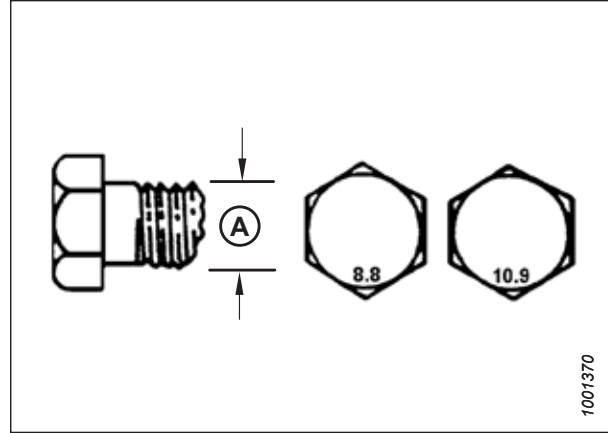


Figure 6.7: Bolt Grades

6.5.2 Metric Bolt Specifications – Cast Aluminum

Specifications are provided for the appropriate final torque values for various sizes of metric bolts in cast aluminum.

NOTE:

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

Table 6.6 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	–	–	–	–

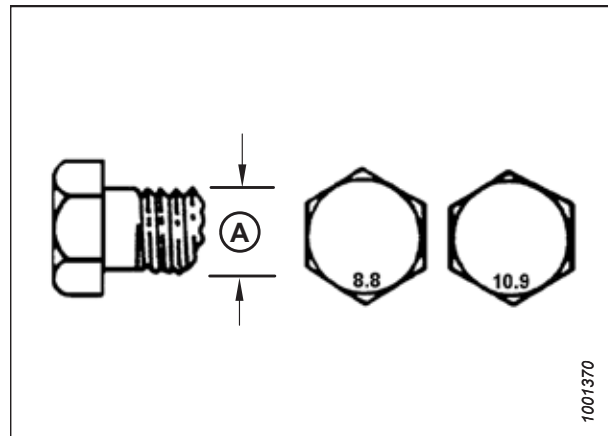


Figure 6.8: Bolt Grades

6.5.3 O-Ring Boss Hydraulic Fittings – Adjustable

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

1. Inspect O-ring (A) and seat (B) for dirt or 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. Ensure that O-ring (A) is **NOT** on the threads. Adjust O-ring (A) if necessary.
4. Apply hydraulic system oil to O-ring (A).

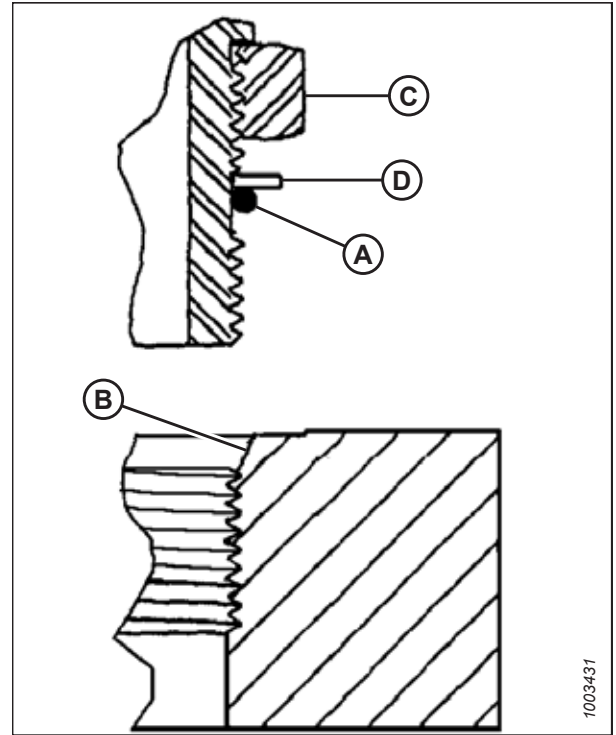


Figure 6.9: Hydraulic Fitting

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

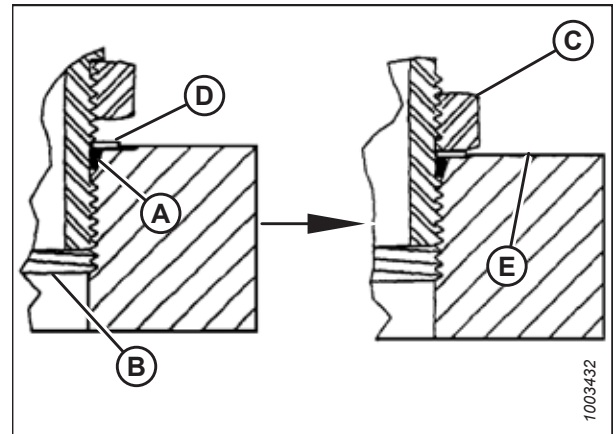


Figure 6.10: Hydraulic Fitting

Table 6.7 O-Ring Boss (ORB) Hydraulic Fittings – Adjustable

SAE Dash Size	Thread Size (in.)	Torque Value ⁵	
		Nm	lbf·ft (*lbf·in)
-2	5/16–24	6–7	*53–62
-3	3/8–24	12–13	*106–115

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

Table 6.7 O-Ring Boss (ORB) Hydraulic Fittings – Adjustable (continued)

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

6.5.4 O-Ring Boss Hydraulic Fittings – Non-Adjustable

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

1. Inspect O-ring (A) and seat (B) for dirt or defects.
2. Ensure that O-ring (A) is **NOT** on the threads. Adjust O-ring (A) if necessary.
3. Apply hydraulic system oil to the O-ring.
4. Install fitting (C) into the port until the fitting is hand-tight.
5. Torque fitting (C) according to values in Table 6.8, page 142.
6. Verify the final condition of the fitting.

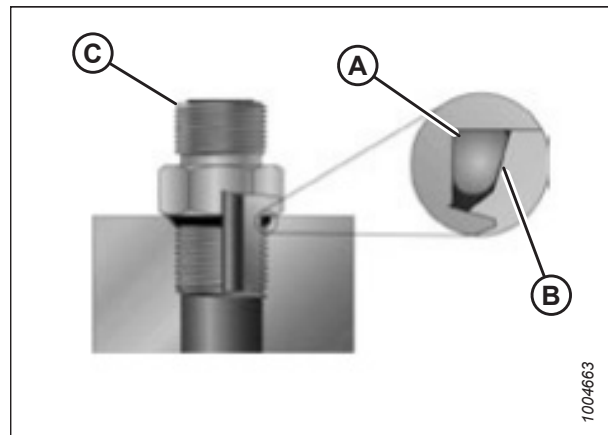


Figure 6.11: Hydraulic Fitting

Table 6.8 O-Ring Boss (ORB) Hydraulic Fittings – Non-Adjustable

SAE Dash Size	Thread Size (in.)	Torque Value ⁶	
		Nm	lbf·ft (*lbf·in)
-2	5/16–24	6–7	*53–62
-3	3/8–24	12–13	*106–115
-4	7/16–20	19–21	14–15
-5	1/2–20	21–33	15–24
-6	9/16–18	26–29	19–21
-8	3/4–16	46–50	34–37

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

Table 6.8 O-Ring Boss (ORB) Hydraulic Fittings – Non-Adjustable (continued)

SAE Dash Size	Thread Size (in.)	Torque Value ⁷	
		Nm	lbf-ft (*lbf-in)
-10	7/8-14	75-82	55-60
-12	1 1/16-12	120-132	88-97
-14	1 3/8-12	153-168	113-124
-16	1 5/16-12	176-193	130-142
-20	1 5/8-12	221-243	163-179
-24	1 7/8-12	270-298	199-220
-32	2 1/2-12	332-365	245-269

6.5.5 O-Ring Face Seal Hydraulic Fittings

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

Torque values are shown in the Table 6.9, page 144.

1. Ensure that the sealing surfaces and the fitting threads are free of burrs, nicks, scratches, and any foreign material.



Figure 6.12: 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 into full contact with O-ring (B).
4. Thread tube or hose nut (D) until it is hand-tight. The nut should turn freely until it bottoms out.
5. Torque the fittings according to values in Table 6.9, page 144.

NOTE:

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

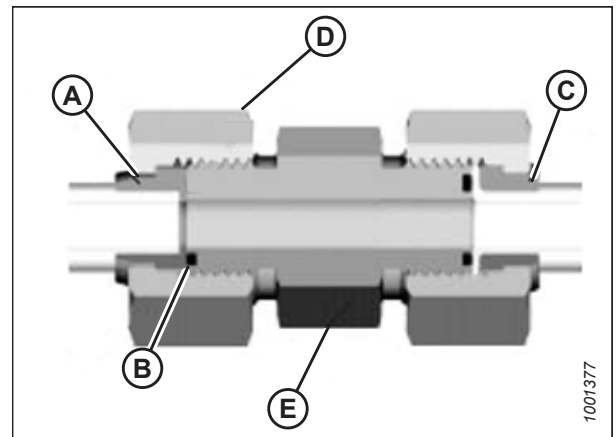


Figure 6.13: Hydraulic Fitting

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

REFERENCE

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

Table 6.9 O-Ring Face Seal (ORFS) Hydraulic Fittings

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value ⁸	
			Nm	lbf-ft
-3	Note ⁹	3/16	–	–
-4	9/16	1/4	25–28	18–21
-5	Note ⁹	5/16	–	–
-6	11/16	3/8	40–44	29–32
-8	13/16	1/2	55–61	41–45
-10	1	5/8	80–88	59–65
-12	1 3/16	3/4	115–127	85–94
-14	Note ⁹	7/8	–	–
-16	1 7/16	1	150–165	111–122
-20	1 11/16	1 1/4	205–226	151–167
-24	1–2	1 1/2	315–347	232–256
-32	2 1/2	2	510–561	376–414

6.5.6 Tapered Pipe Thread Fittings

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

Assemble pipe fittings as follows:

1. Ensure that the fitting and the port threads are free of burrs, nicks, scratches, and any other form of contamination.
2. Apply paste-type pipe thread sealant to the external pipe threads.
3. Thread the fitting into the port until it is hand-tight.
4. Torque the connector to the appropriate torque angle. The turns from finger tight (TFFT) and flats from finger tight (FFFT) values are shown in Table 6.10, page 145. Ensure that the tube end of a shaped connector (typically a 45° or 90° elbow) is aligned to receive the incoming tube or hose assembly. Always finish the alignment of the fitting in the direction of tightening. Never loosen the threaded connectors to achieve alignment.
5. Clean all residue and any excess thread conditioner with an appropriate cleaner.
6. Inspect the final condition of the fitting. Pay special attention to the possibility of cracks in the port opening.
7. Mark the final position of the fitting. If a fitting leaks, disassemble the fitting and check it for damage.

NOTE:

The failure of fittings due to over-torquing may not be evident until the fittings are disassembled and inspected.

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

REFERENCE

Table 6.10 Hydraulic Fitting Pipe Thread

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

6.6 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 6.11 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.

6.7 Definitions

The following terms, abbreviations, and acronyms are used in this instruction.

Term	Definition
A Series Header	MacDon A40D, A40DX, and Grass Seed auger headers
API	American Petroleum Institute
ASTM	American Society of Testing and Materials
Bolt	A headed and externally threaded fastener designed to be paired with a nut
Cab-forward	Windrower operation mode, in which the Operator's seat faces the header
Center-link	A hydraulic cylinder or manually adjustable turnbuckle type connection between the header and the vehicle, which is used to change the angle of the header relative to the vehicle
CGVW	Combined gross vehicle weight
D1X Series Header	MacDon D115X, D120X, and D125X rigid draper headers for M1 Series Windrowers
D1XL Series Header	MacDon D130XL, D135XL, D140XL, and D145XL rigid draper headers for M1 Series Windrowers
DEF	Diesel exhaust fluid; also known as AdBlue in Europe, and AUS 32 in Australia
DEF supply module	A pump that supplies diesel exhaust fluid through the exhaust aftertreatment system
DM	Dosing module
DK	Double knife
DKD	Double-knife drive
DOC	Diesel oxidation catalyst
DRT	Aftertreatment decomposition tube
DWA	Double Windrow Attachment
ECM	Engine control module
EEC	Eco engine control
Engine-forward	Windrower operation with Operator and engine facing in direction of travel
FFFT	Flats from finger tight
Finger tight	Finger tight is a reference position in which the given sealing surfaces or components are making contact with each other and the fitting has been tightened by hand to a point where the fitting is no longer loose and cannot be tightened further by hand
GSL	Ground speed lever
GSS	Grass Seed
GVW	Gross vehicle weight
Hard joint	A joint made with use of a fastener where joining materials are highly incompressible
Header	A machine that cuts and lays crop into a windrow when attached to a windrower
Hex key	A tool of hexagonal cross-section used to drive bolts and screws that have a hexagonal socket in the head (internal-wrenching hexagon drive); also known as an Allen key
HPT display	Harvest Performance Tracker display module on an M1 Series Windrower
JIC	Joint Industrial Council: A standards body that developed standard sizing and shape for original 37° flared fitting
Knife	A cutting device found on a header's cutterbar which uses a reciprocating cutter (also called a sickle) to cut crop so that it can be fed into the header
M1 Series Windrowers	MacDon M1170, M1170N75, and M1240 Windrowers
n/a	Not applicable

REFERENCE

Term	Definition
NPT	National Pipe Thread: A style of fitting used for low-pressure port openings. Threads on NPT fittings are uniquely tapered for an interference fit
Nut	An internally threaded fastener designed to be paired with a bolt
ORB	O-ring boss: A style of fitting commonly used in port openings on manifolds, pumps, and motors
ORFS	O-ring face seal: A style of fitting commonly used for connecting hoses and tubes. This style of fitting is also commonly called ORS, which stands for O-Ring Seal
PARK	The slot opposite the NEUTRAL position on operator's console of M1 Series windrowers
R1 SP Series	MacDon R113 and R116 Rotary Disc Headers for windrowers
R2 SP Series	MacDon R216 Rotary Disc Headers for windrowers
RoHS (Reduction of Hazardous Substances)	A directive by the European Union to restrict use of certain hazardous substances (such as hexavalent chromium used in some yellow zinc platings)
rpm	Revolutions per minute
SAE	Society of Automotive Engineers
SCR	Selective catalytic reduction
Screw	A headed and externally threaded fastener that threads into preformed threads or forms its own thread when inserted into a mating part
SK	Single knife
SKD	Single-knife drive
Soft joint	A flexible joint made by use of a fastener in which the joining materials compress or relax over a period of time
spm	Strokes per minute
Tension	An axial load placed on a bolt or screw, usually measured in Newtons (N) or pounds (lb.). This term can also be used to describe the force a belt exerts on a pulley or sprocket
TFFT	Turns from finger tight
Torque	The product of a force * the length of a lever arm, usually measured in Newton-meters (Nm) or foot-pounds (lbf·ft)
Torque angle	A tightening procedure in which a fitting is assembled to a specified tightness (usually finger tight) and then the nut is turned farther by a specified number of degrees until it achieves its final position
Torque-tension	The relationship between the assembly torque applied to a piece of hardware and the axial load it induces in a bolt or screw
ULSD	Ultra-low sulphur diesel
Washer	A thin cylinder with a hole or a slot located in the center, used as a spacer, a load distribution element, or a locking mechanism
Windrower	The power unit for a header
WOT	Wide-open throttle

Predelivery Checklist

Perform these checks and adjustments prior to delivery to your Customer. Complete this checklist and provide it to the Dealer or the Operator.



CAUTION

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

Windrower Serial Number:

Engine Serial Number:

M1170 Windrower Predelivery Checklist

✓	Item	Reference
	Check for shipping damage or missing parts. Ensure that all shipping material has been removed.	—
	Check for loose hardware. Tighten any loose hardware to the specified torque value.	6.5 Torque Specifications, page 138
	Check the pressure level of the drive and caster tires. Ensure that the pressures matches the specified values.	4.1.11 Checking Tire Pressure, page 51
	Check the lubricant level in the wheel drive hubs.	4.1.13 Checking and Adding Wheel Drive Lubricant – 10 Bolt Wheels, page 58 or 4.1.14 Checking and Adding Wheel Drive Lubricant – 12 Bolt (Optional), page 59
	Check the level of the engine coolant.	4.1.7 Checking And Adding Engine Coolant, page 48
	Check the engine air intake.	4.1.3 Checking Engine Air Intake, page 45
	Check the level of engine oil. Ensure that there are no engine oil leaks.	4.1.4 Checking and Adding Engine Oil, page 46
	Check the level of hydraulic oil. Ensure that there are no hydraulic fluid leaks.	4.1.5 Checking and Adding Hydraulic Oil, page 47
	Check the fuel separator for water and foreign material. Drain and clean the fuel separator as needed.	4.1.6 Checking Fuel Separator, page 48
	Check level of lubricant in the gearbox.	4.1.8 Checking Engine Gearbox Lubricant Level and Adding Lubricant, page 49
	Ensure that the air conditioning compressor belt is properly tensioned.	4.1.9 Checking Air Conditioning Compressor Belts, page 50
	Ensure that the operator presence system is working properly.	4.2.1 Checking Operating Safety System, page 60
	Ensure that the horn is working properly.	4.2.10 Checking Horn, page 74
Start the engine. Allow the engine to reach operating temperature. Perform the Operational Checks listed below.		4.1.12 Starting Engine, page 54
	Ensure that the fuel and diesel exhaust fluid (DEF) gauges on the Harvest Performance Tracker (HPT) work properly.	4.2.3 Checking Harvest Performance Tracker Display Gauges, page 63
	Ensure that the engine speed is displayed correctly on the HPT.	4.2.7 Checking Engine Speed, page 68
	Ensure that selective catalytic reduction (SCR) conditioning inhibit is turned off.	4.2.8 Checking Selective Catalytic Regeneration Conditioning Mode, page 69
	Ensure that the air conditioning and heater are functioning properly.	4.2.12 Checking Climate Controls, page 75

REFERENCE

✓	Item	Reference
	Ensure that the interior lights are functioning properly.	4.2.11 Checking Interior Lights, page 75
	Ensure that the exterior lights are functioning properly.	4.2.9 Checking Exterior Lights, page 70
	Ensure that the hazard and the signal lights are functioning properly.	4.2.9 Checking Exterior Lights, page 70
	Ensure that the beacons are functioning properly (if these are installed).	4.2.9 Checking Exterior Lights, page 70
	Complete the header's Predelivery Checklist (if applicable).	—
	Ensure that the manuals are in the windrower's manual case.	4.3 Checking Manuals, page 79
	Remove the plastic coverings and windshield decal from the cab.	4.4 Performing Final Steps, page 80

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