MacDon

M155*E4*
Self-Propelled Windrower

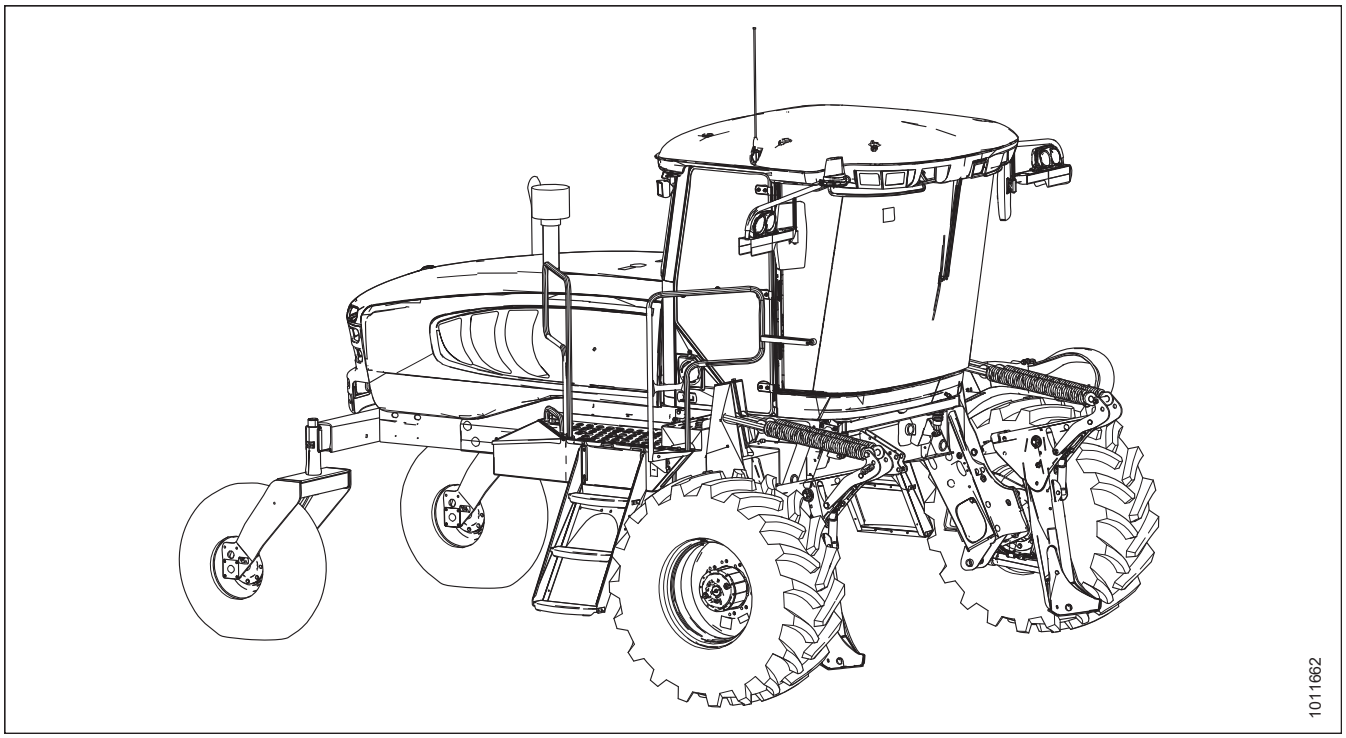
Unloading and Assembly Instruction (North America)

215794 Revision A

Original Instruction

The Harvesting Specialists.

M155*E4* Self-Propelled Windrower, featuring Dual Direction® and Ultra Glide® suspension.



Published in January 2022

Introduction

This instruction manual describes the unloading, setup, and predelivery requirements for the MacDon M155*E4* Self-Propelled Windrower.

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

Retain this instruction for future reference.

Conventions

The windrower is Dual Direction® and can be driven in cab-forward or engine-forward mode.

Right and left designations are determined by the operator's position facing the direction of travel. This manual uses the terms right cab-forward, left cab-forward, right engine-forward, and left engine-forward when referencing specific locations on the machine.

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 instruction is available in English only and can be downloaded from our Dealer-only site.

Summary of Changes

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

Section	Summary of Change	Internal Use Only
Introduction, page i	Added contact information to the introduction so that the Dealer knows who to contact in the event that the machine is shipped with damaged or missing parts.	Technical Publications; Global Product Support
• *2.1 Using Two Forklifts to Unload Windrower, page 13* • *2.2.1 Method 1: Pulling from Trailer Deck, page 15* • *2.2.2 Method 2: Lifting from Trailer Deck, page 16* • *3.3 Installing Caster Wheels, page 23*	Upgraded the hazard statement regarding equipment used for unloading from Warning to Danger.	Product Safety and Compliance
2.1 Using Two Forklifts to Unload Windrower, page 13	Revised the lifting requirements table to include more information relevant to determining lifting vehicle capacity.	Product Support
2.2.1 Method 1: Pulling from Trailer Deck, page 15	Added chain grade row and required chain grade to the lifting requirements table.	Product Support
3.1 Installing Drive Wheel, page 19	Added instructions for repeating the installation of the drive wheel on the opposite side of the windrower.	Technical Publications
4.3 Checking and Adding Wheel Drive Lubricant, page 41	Moved this topic from the end of Chapter 4 and closer to the topics related to conducting predelivery checks on the wheels.	Product Support
4.4 Opening Hood, page 42	Added a topic about opening the hood of the M155*E4* windrower. Placed this topic in the chapter on performing predelivery checks and immediately prior to the part of the chapter where under-hood predelivery inspections are described.	Technical Publications
4.12 Closing Hood, page 51	Added a topic about closing the hood of the M155*E4* windrower. Placed this topic in the chapter on performing predelivery checks and immediately after the part of the chapter where under-hood predelivery inspections are described.	Technical Publications
4.13 Replacing Diesel Exhaust Fluid, page 52	Added instructions for opening and closing the right platform of the windrower. Specific instructions on opening the platform—which is required for accessing the DEF tank—were previously missing from this topic.	Technical Publications
6.2 Checking Operator Presence System, page 130	Revised the steps regarding the testing of the operator's presence system.	Product Support

Section	Summary of Change	Internal Use Only
• *8.5 Attaching R2 Series Rotary Disc Header , page 185* • *8.5.1 Attaching R2 Series Rotary Disc Header – Hydraulic Center-Link with Self-Alignment, page 185* • *8.5.2 Attaching R2 Series Rotary Disc Header – Hydraulic Center-Link without Self-Alignment, page 191* • *8.5.3 Completing Hydraulic and Electrical Connections, page 197*	Added topics related to attaching the M155*E4* windrower to an R216 header, as the M155*E4* is now compatible with the R216 if the proper hydraulic drive kit has been installed.	ECN 61467
9.4 Lubricants, Fluids, and System Capacities, page 213	• Updated the name of the recommended antifreeze in the System Capacities table. • Revised the note at the end of the table regarding alternatives to the recommended antifreeze (the note now references the currently recommended anti-freeze and includes more extensive information on the types of alternatives to use).	ECN 62224

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 not avoided, will result in death or serious injury.

WARNING

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

CAUTION

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

IMPORTANT:

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

NOTE:

Provides additional information or advice.

1.3 General Safety

Protect yourself when assembling, operating, and servicing machinery.

CAUTION

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

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

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

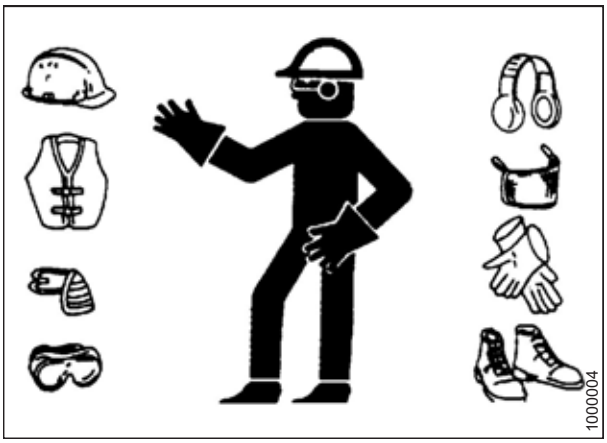


Figure 1.2: Safety Equipment

In addition, take the following precautions:

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

Figure 1.3: Safety Equipment

- Provide a first aid kit in case of emergencies.
- Keep a properly maintained fire extinguisher on the machine. 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.

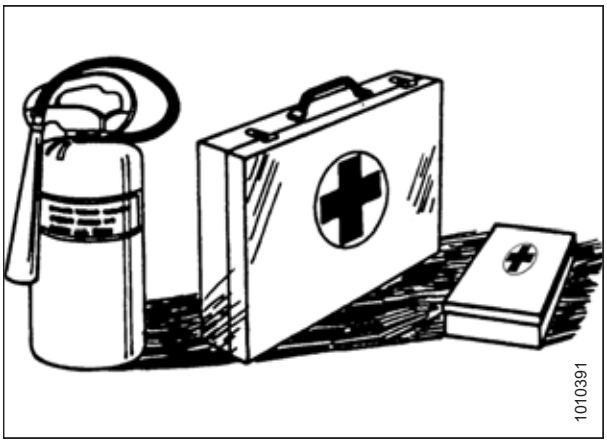


Figure 1.4: Safety Equipment

- Wear close-fitting clothing and cover long hair. **NEVER** wear dangling items such as scarves or bracelets.
- Keep all shields in place. **NEVER** alter or remove safety equipment. 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.

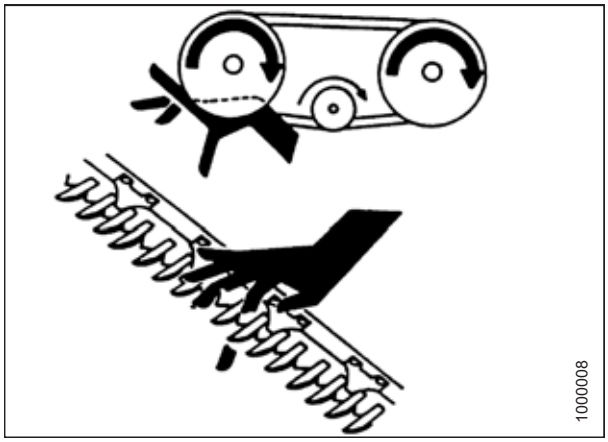


Figure 1.6: Safety around Equipment

- 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 Maintenance Safety

Protect yourself when maintaining machinery.

To ensure your safety while maintaining the machine:

- Review the operator's manual and all safety items before operating or performing maintenance on the machine.
- Place all controls in Neutral, stop the engine, set the parking brake, remove the ignition key, and wait for all moving parts to stop before servicing, adjusting, or repairing the machine.
- Follow good shop practices:
  - Keep service areas clean and dry
  - Ensure that electrical outlets and tools are properly grounded
  - Keep the work area well lit

Figure 1.8: Safety around Equipment

- Relieve pressure from hydraulic circuits before servicing and/or disconnecting the machine.
- Ensure that all components are tight and that steel lines, hoses, and couplings are in good condition before applying pressure to hydraulic systems.
- Keep hands, feet, clothing, and hair away from all moving and/or rotating parts.
- Clear the area of bystanders, especially children, when carrying out any maintenance, repairs, or adjustments.
- Install the transport lock or place safety stands under the frame before working under the machine.
- If more than one person is servicing the machine at the same time, be aware that rotating a driveline or another mechanically driven component by hand (for example, accessing a lubricant fitting) will cause drive components in other areas (belts, pulleys, and knives) to move. Stay clear of driven components at all times.
- Wear protective gear when working on the machine.
- Wear heavy gloves when working on knife components.

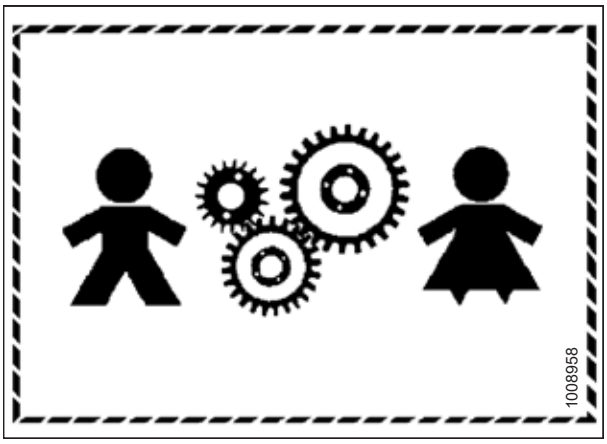


Figure 1.9: Equipment is NOT Safe for Children

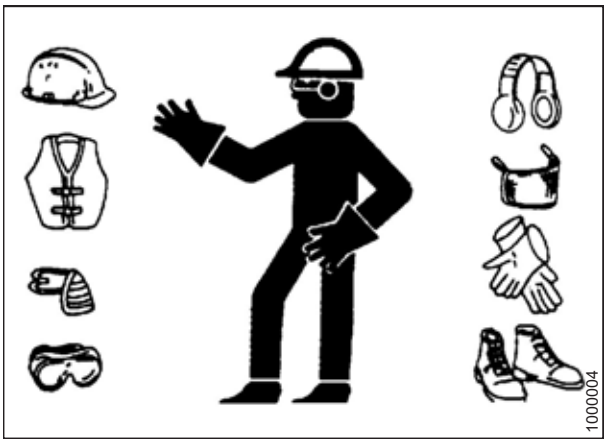


Figure 1.10: Safety Equipment

1.5 Hydraulic Safety

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

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

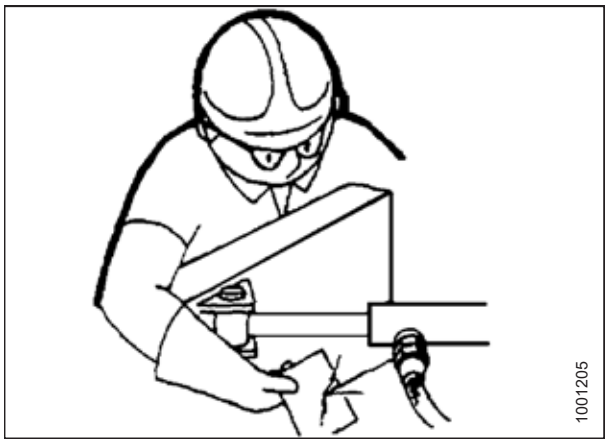


Figure 1.11: Testing for Hydraulic Leaks

- 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 1.12: 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.

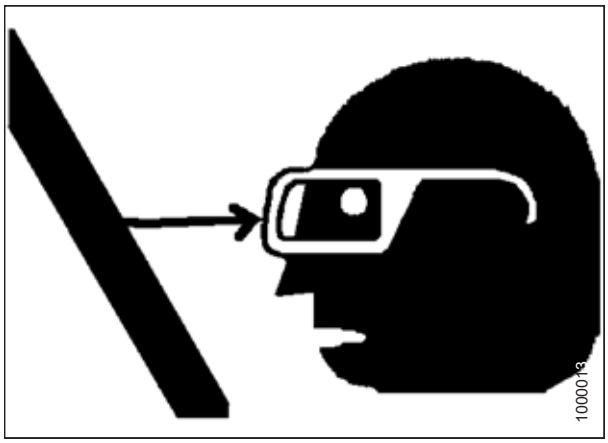


Figure 1.13: Safety around Equipment

1.6 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.**

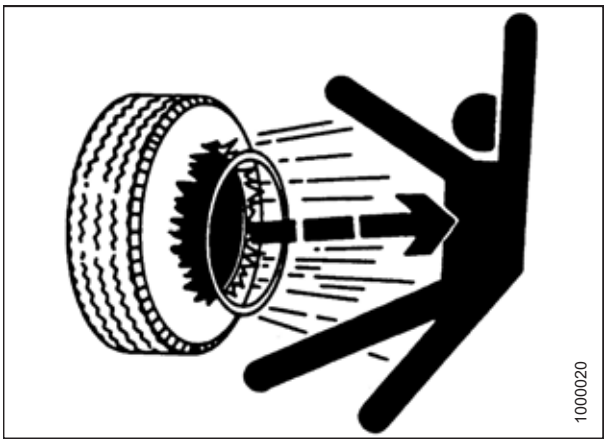


Figure 1.14: Overinflated Tire

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.**

Figure 1.15: Safely Inflating Tire

- **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.**

1.7 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 1.16: 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.**

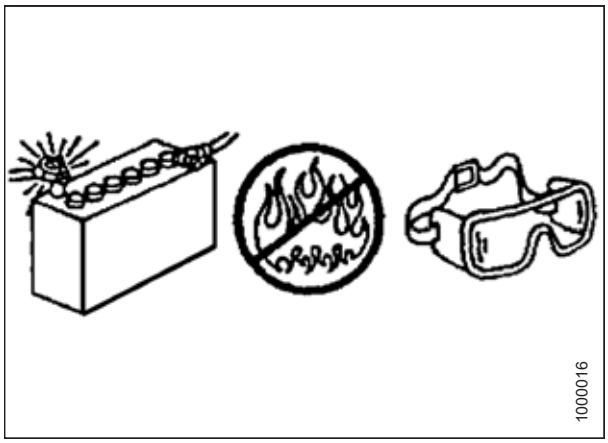


Figure 1.17: Safety around Batteries

WARNING

- **To avoid injury from a spark or short circuit, disconnect the battery ground cable before servicing any part of the electrical system.**
- **Do NOT operate the engine with the alternator or battery disconnected. With 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.**

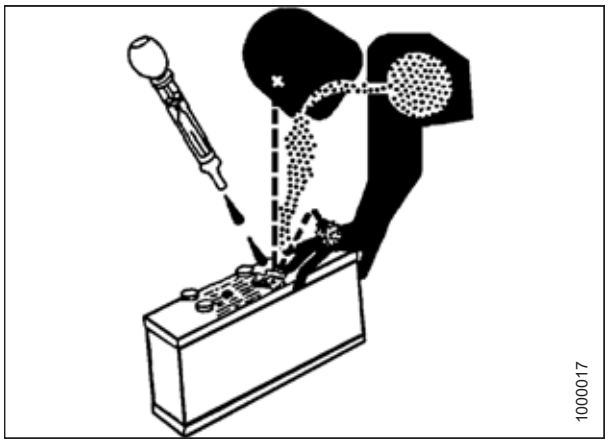


Figure 1.18: Safety around Batteries

1.8 Welding Precautions

High currents and voltage spikes associated with welding can cause damage to electronic components. Before welding on any part of the windrower or an attached header, disconnect all electronic module harness connections as well as battery cables. For instructions, refer to the windrower's technical manual.

1.9 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.

1.9.1 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.**

1.9.2 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

1.10 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.

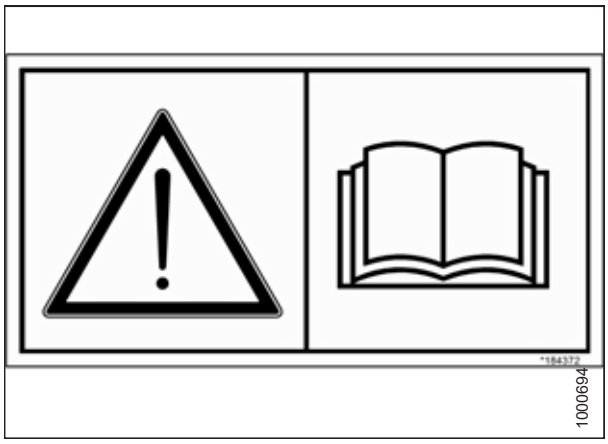


Figure 1.19: Operator's Manual Decal

1.10.1 Installing Safety Decals

Replace any safety decals that are worn or damaged.

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

Chapter 2: Unloading Windrower

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

You can use one or two forklifts to unload the windrower. Refer to *2.1 Using Two Forklifts to Unload Windrower, page 13* or *2.2 Using One Forklift to Unload Windrower, page 15*.

2.1 Using Two Forklifts to Unload Windrower

The windrower can be unloaded from the transport vehicle using two forklifts with sufficient lifting capacity.

Figure 2.1: Two-Forklift Unloading Method

DANGER

To prevent injury to bystanders and to avoid striking them with machinery, do NOT allow people to stand in the unloading area.

DANGER

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

Table 2.1 Lifting Vehicle Requirements

Minimum Lifting Capacity at 122.2 cm (48 in.) from the Back End of the Forks	2500 kg (5500 lb.)
Minimum Fork Length	1981 mm (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 at 122.2 cm (48 in.), check with your forklift distributor.

1. Move the trailer onto level ground and block the trailer wheels.
2. Set the forklift tines to the widest possible setting.
3. Position one forklift on either side of the trailer, and position the forks under the windrower frame.

NOTE:

The windrower's center of gravity is approximately 139.7 cm (55 in.) rearwards from the center of the drive wheel.

4. Lift with both forklifts simultaneously until the windrower is clear of the trailer deck.

WARNING

Ensure the forks are secure before moving the trailer away from the load. Stand clear when lifting.

5. Drive the truck slowly forward until the trailer deck is clear of the windrower.
6. Lower the unit slowly to the ground using both forklifts simultaneously. If the ground is soft, place wooden blocks under the front shipping stands.
7. Back the forklifts away from the windrower.
8. Check the windrower for shipping damage, and check the shipment for missing parts.

2.2 Using One Forklift to Unload Windrower

The windrower can be unloaded from the trailer using one forklift. Ensure that you use a forklift which meets the minimum length and capacity requirements when unloading the windrower.

There are two different methods for unloading a windrower using one forklift. If you will be using a chain to pull the windrower to a level that is equal to, or slightly lower than, the height of the trailer deck, proceed to *2.2.1 Method 1: Pulling from Trailer Deck, page 15*. If you will be lifting the windrower from the left or the right side of the trailer deck, proceed to *2.2.2 Method 2: Lifting from Trailer Deck, page 16*.

2.2.1 Method 1: Pulling from Trailer Deck

The windrower can be pulled from the transport vehicle onto an unloading dock using chains and a forklift of sufficient lifting capacity.

DANGER

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

Table 2.2 Lifting Vehicle Requirements

Minimum Capacity[1]	2500 kg (5500 lb.)

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 at 1220 mm (48 in.), check with your forklift distributor.

Table 2.3 Pulling Chain Requirements

Type	Overhead lifting quality (1/2 in.)
Chain Grade	Grade 80 or higher
Minimum Working Load	2270 kg (5000 lb.)

1. Position the rear of the trailer against an unloading dock that is the same height, or slightly lower than, the trailer deck.
2. Remove shipped parts from underneath the windrower frame.
3. Set the forklift tines to the widest possible setting.
4. Drive the forklift up to the rear of the windrower and place the forks under the rear frame cross member.
5. Install chains between the forklift mast and the jacking brackets on both front legs of the windrower. The chains must be the same length.

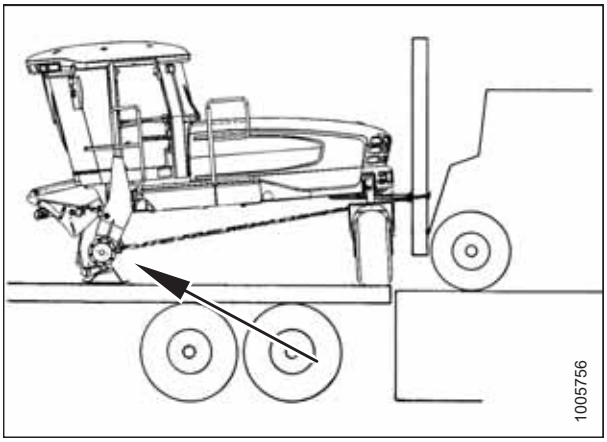


Figure 2.2: Chain Installation Location

1. At 1220 mm (48 in.) from the back end of the forks.

CAUTION

The front legs rest on the trailer deck on skid shoes. Ensure there are no obstructions preventing the skid shoes from sliding rearwards, and watch carefully while dragging the unit to ensure the skid shoes do not slide sideways towards the edge of the trailer deck.

6. Drag the windrower rearwards off of the carrier.
7. Remove the chains and back off the forklift.
8. Check the windrower for damage, and inspect the shipment for missing parts.

2.2.2 Method 2: Lifting from Trailer Deck

The windrower can be lifted from the transport vehicle using one forklift of sufficient lifting capacity.

DANGER

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

Table 2.4 Lifting Vehicle Requirements

Minimum Capacity[2]	4994 kg (11,000 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 at 122.2 cm (48 in.), check with your forklift distributor.

WARNING

Ensure the forks are secure before moving the trailer away from the load. Stand clear when lifting.

1. Move the trailer onto level ground and block the trailer wheels.
2. Set the forklift tines to the widest possible setting.
3. Position the forklift on the left or right side of the trailer, and position forks (A) under the windrower frame.

   NOTE:

   The windrower's center of gravity is approximately 139.7 cm (55 in.) rearwards from the center of the drive wheel.

Figure 2.3: Windrowers on Trailer

WARNING

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

4. Lift the windrower until it is clear of the trailer deck.
5. Back the forklift slowly away from the trailer until the windrower is clear of the trailer deck.
6. Lower the unit slowly to the ground. If the ground is soft, place wooden blocks under the front shipping stands.

2. At 122.2 cm (48 in.) from back end of forks.

7. Back the forklift away from the windrower.

8. Check the windrower for damage, and inspect the shipment for missing parts.

Chapter 3: Assembling Windrower

Once the various shipping assemblies have been unloaded and separated, the windrower can be assembled into field position.

3.1 Installing Drive Wheel

The drive wheel will need to be handled with a lifting device to be safely installed on the windrower.

CAUTION

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

1. Lift the front of the windrower off of the ground using a lifting device of sufficient capacity.
2. Support the front of the windrower off the ground using stand (A).
3. Remove shipping stand (B) from the lift leg. Repeat this step at the opposite side.

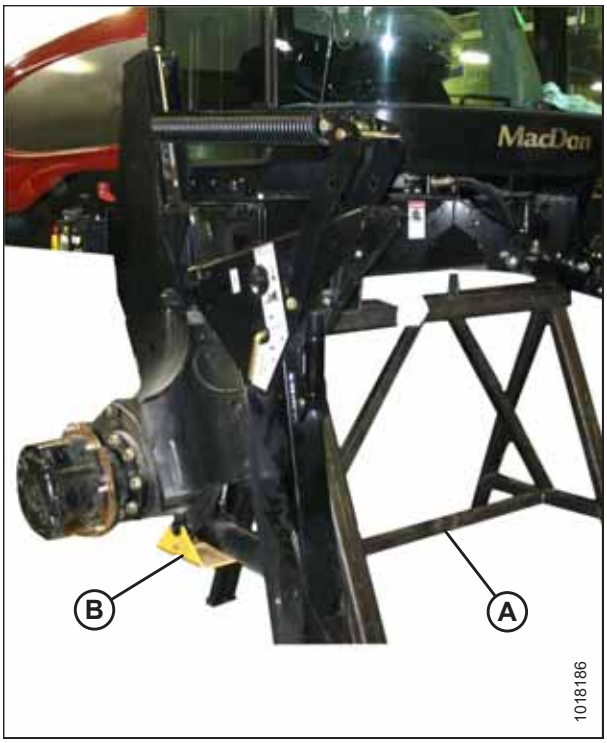


Figure 3.1: Windrower on Stand

4. Position drive wheel (A) against wheel drive hub (B) so that air valve (C) faces away from the windrower, and tire tread (D) points in the cab-forward direction.

   NOTE:

   For turf tires (diamond-treaded), ensure that the arrow on the sidewall points in the cab-forward rotation.

5. Lift the wheel onto the hub using a suitable lifting device.

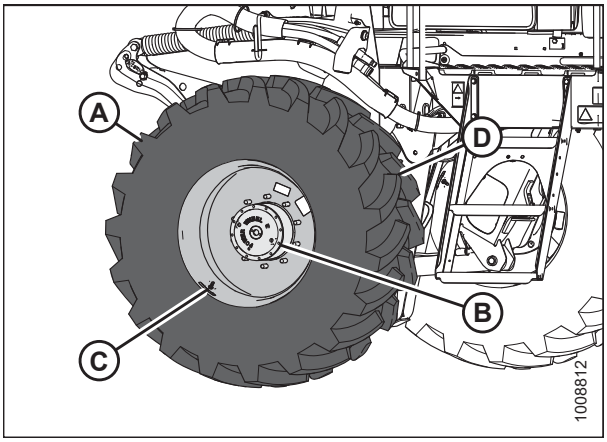


Figure 3.2: Drive Wheel

6. Line up the holes in the rim with the studs on the wheel drive hub. Install wheel nuts (A).

   IMPORTANT:

   To avoid damaging the wheel rims and studs, tighten the nuts by hand. Do **NOT** use an impact wrench. Do **NOT** apply lubricant or anti-seize compound to the threads of the wheel studs. Do **NOT** overtighten the wheel nuts.

7. Remove the lifting device.

8. Torque the drive wheel nuts to 510 Nm (375 lbf·ft) using the tightening sequence shown.

   IMPORTANT:

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

9. Repeat the tightening sequence two additional times ensuring the specified torque of 510 Nm (375 lbf·ft) is achieved each time.

10. Repeat Step *4, page 19* to Step *9, page 20* to install the wheel on the opposite side.

11. Repeat the torque procedure every hour until two consecutive checks confirm there is no movement of the nuts.

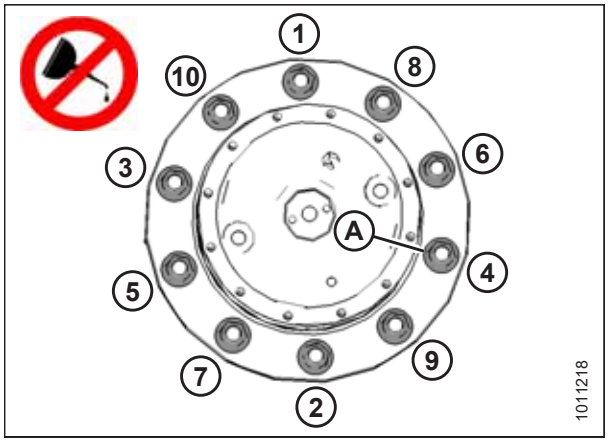


Figure 3.3: Drive Wheel Nuts

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

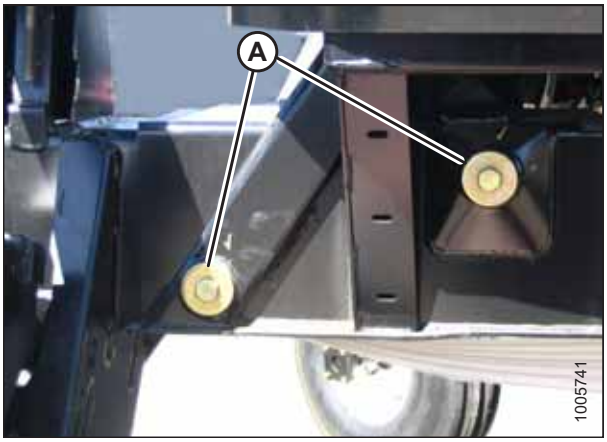


Figure 3.4: Windrower Right Leg Bolts

2. With the support stand from Step *2, page 19* in place, position lifting device (A) under right drive wheel (B). Raise the right drive wheel so that the right cab-forward leg is not bearing any of its weight.

   NOTE:

   The support stand is not shown in the illustration.

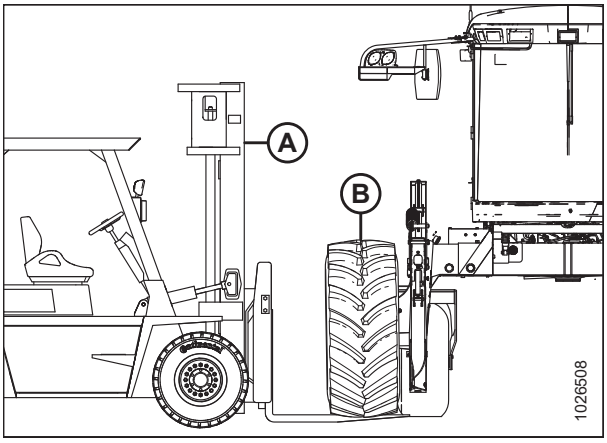


Figure 3.5: Right Leg

3. Adjust the lifting device's lift height until pin (A) is loose. Extract the pin from the front of the frame using slide hammer (B) or a leg pin removal tool (MD #209816) .

   NOTE:

   Use of a slide hammer or leg pin removal tool is required due to the limited amount of space in front of the diesel exhaust fluid (DEF) tank.

   NOTE:

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

Figure 3.6: Windrower Frame

4. Move the right leg outwards to expose hole (A).
5. Reinstall the pins and secure them with bolts, washers, and nuts (B). Torque the nuts to 136 Nm (100 lbf·ft).
6. Lower the right wheel and move the lifting device away from the right leg.

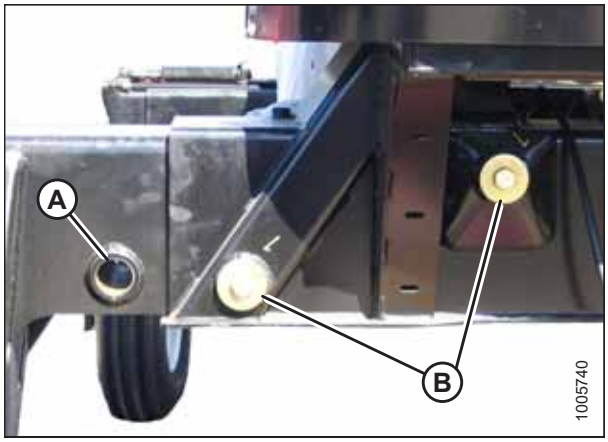


Figure 3.7: Windrower Frame

3.3 Installing Caster Wheels

Some windrower shipping configurations require installation of the rear caster wheels. Follow these steps to install the caster wheels into the walking beam.

If the windrower was shipped with caster wheels installed, proceed to *3.4 Repositioning Caster Wheels, page 25*.

DANGER

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

1. Using a forklift, raise the rear end of the windrower approximately 152 cm (60 in.) off the ground, and place a suitable stand under the rear frame to help support the back of the windrower.
2. Lower the windrower onto the stand to partially unload the forks.
3. Remove the packing material from the caster wheels, and retrieve the bag of hardware that is attached to the walking beam.

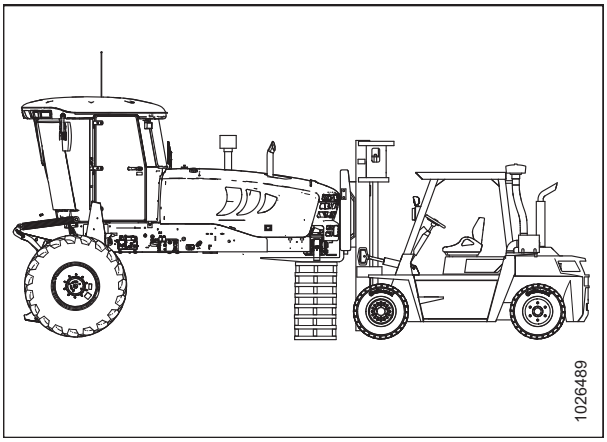


Figure 3.8: Supporting the Rear of Windrower

4. Install two flat washers (A) onto the caster wheel spindle.

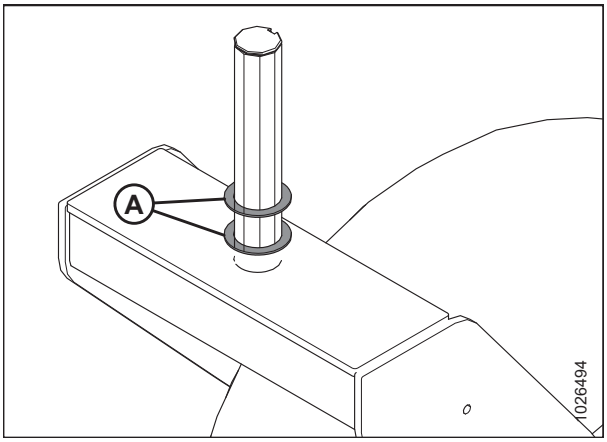


Figure 3.9: Caster Wheel

CAUTION

Ensure all bystanders are clear of the area when lifting, as the caster wheel may swing.

5. Attach sling (A) to caster wheel assembly (B) and use a suitable lifting device to move the caster wheel into position next to walking beam (C).

6. Tilt the walking beam and maneuver the caster assembly to insert the spindle into the walking beam.

Figure 3.10: Caster Wheel Supported by Sling

7. Install flat washer (A) onto the spindle.

8. Install key (B) and arm (C) onto the spindle.

   NOTE:

   Ensure there is no clearance at the top and bottom of the walking beam extension.

9. Install retaining ring (D).

10. Torque anti-shimmy shock arm nut (C) to 170 Nm (125 lbf·ft).

11. Repeat the caster wheel installation procedure for the opposite side.

12. Remove the stand and lifting device from the rear of the windrower.

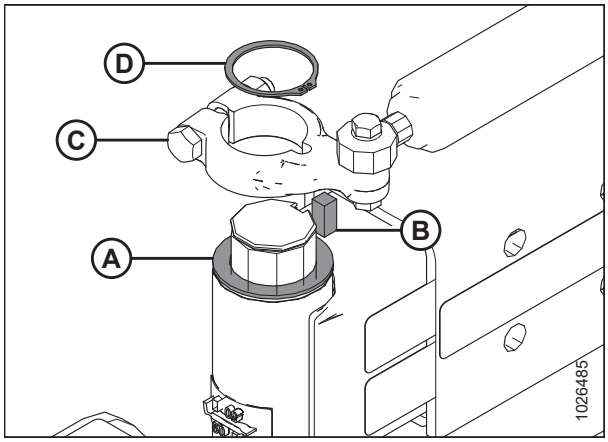


Figure 3.11: Caster Wheel

3.4 Repositioning Caster Wheels

The caster wheels can be positioned in two different widths: narrow tread width and wider tread width. Ensure the caster wheels are set at the desired width, and reposition the wheels if necessary.

A narrow tread width is better suited for smaller headers because it allows more space to the uncut crop and provides more maneuverability around poles, irrigation inlets, and other obstacles.

A wider tread width is preferable for reducing run-over in heavy crops that produce large windrows.

To reposition the caster wheels, do the following:

1. Raise the rear of the windrower slightly using a jack or other lifting device under the frame at location (A) until most of the weight is off the casters.

   NOTE:

   The lifting device must have a lifting capacity of at least 2270 kg (5000 lb.).

2. Remove six bolts and washers (B) (four on the backside and two on the underside) from the left and right sides of the walking beam.

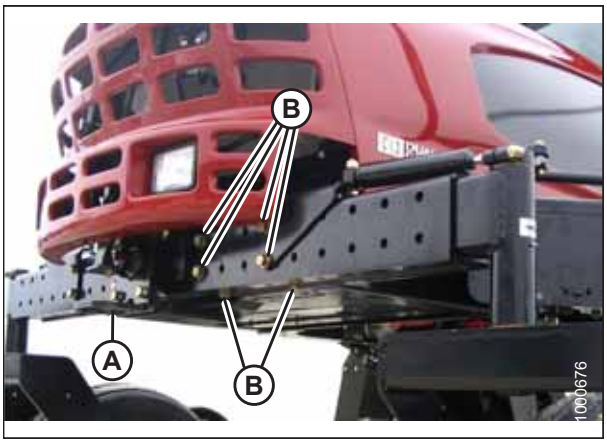


Figure 3.12: Walking Beam

3. Slide the left and right side extensions equal distances in the outboard direction, and align the holes at the preferred locations.

   NOTE:

   Rotate the caster so the wheel is parallel to the axle to facilitate extension repositioning.

Figure 3.13: Walking Beam

4. Ensure the caster wheels are positioned at equal distances from the center of the windrower.

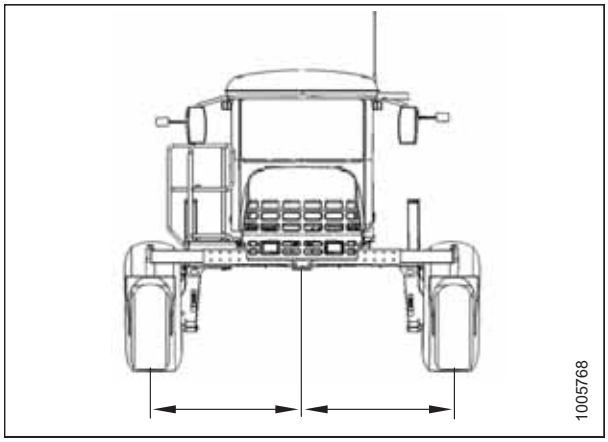


Figure 3.14: Widest Tread Width Shown

5. Position bracket (A) as shown.
6. Install two 3/4 in. x 2-3/4 in. hex head bolts (B) at the back outboard location, and install two 3/4 in. x 2-1/4 in. hex head bolts (C) at the back inboard location. Tighten the bolts until they are snug; do not torque the bolts yet.
7. Install two 3/4 in. x 2-1/4 in. hex head bolts (D) on the underside of the beam. Tighten the bolts until they are snug; do not torque the bolts yet.
8. Torque all bolts (B) and (C) at the back location to 447 Nm (330 lbf·ft).
9. Torque all bolts (D) on the underside to 447 Nm (330 lbf·ft).
10. Lower the windrower to the ground.

    IMPORTANT:

    Torque all bolts to 447 Nm (330 lbf·ft) after the first 5 hours of operation. Repeat the torquing procedure after 10 hours of operation.

11. Remove the banding and wooden blocks from the center of the walking beam.

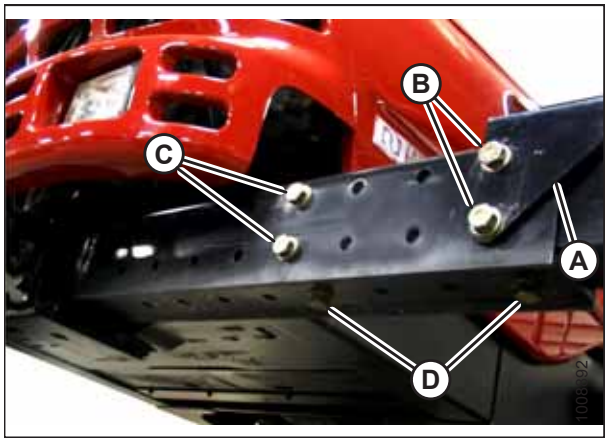


Figure 3.15: Walking Beam

3.5 Installing Steps

The windrower steps must be moved from their shipping position and installed.

NOTE:

The procedure for installing the left steps is shown—installation of the right steps is similar.

1. Remove two bolts (A) securing the steps to the platform and remove the steps.
2. Remove bolt (B) and retain it for reinstallation.

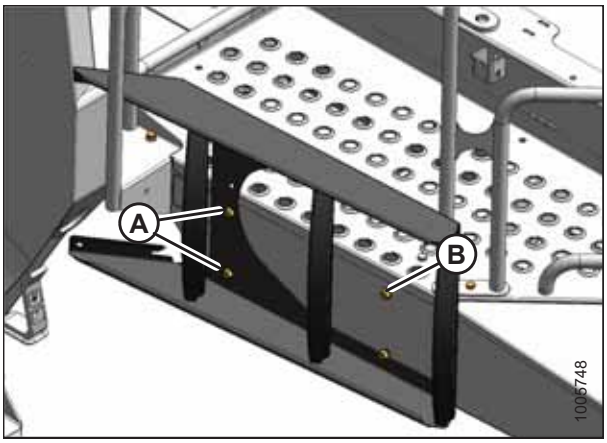


Figure 3.16: Left Steps in Shipping Position

3. Install bolt (A) into the lower hole of the platform. Do **NOT** fully thread in the bolt.
4. Hang the step assembly on lower bolts (B). Back off the bolts, if necessary.
5. Install two bolts (A) in the upper holes of the step and the platform.
6. Torque all bolts to 20 Nm (15 lbf·ft).
7. Repeat Step *1, page 27* to Step *6, page 27* to install the opposite step assembly.

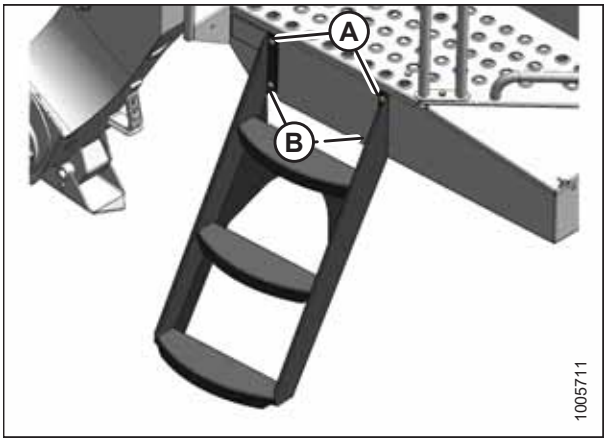


Figure 3.17: Left Steps Installed

3.6 Installing the Slow Moving Vehicle Sign

The slow moving vehicle (SMV) sign is placed inside the cab for shipping. It must be installed on the windrower in a location where it will be visible during road travel.

1. Retrieve SMV sign (A) from inside the cab.
2. Install SMV sign (A) onto the windrower in accordance with the instructions supplied with the sign. SMV signs must be visible when travelling on the road.

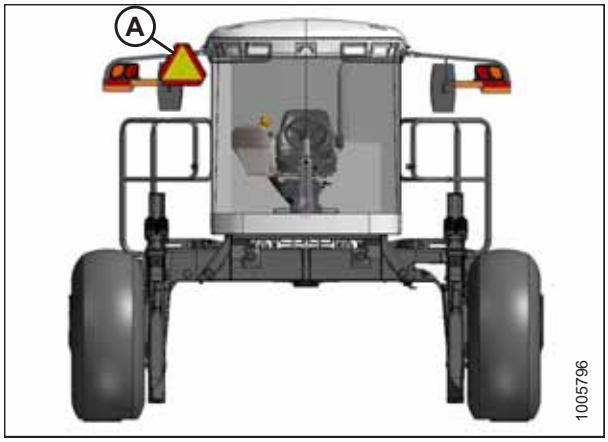


Figure 3.18: Engine-Forward Location

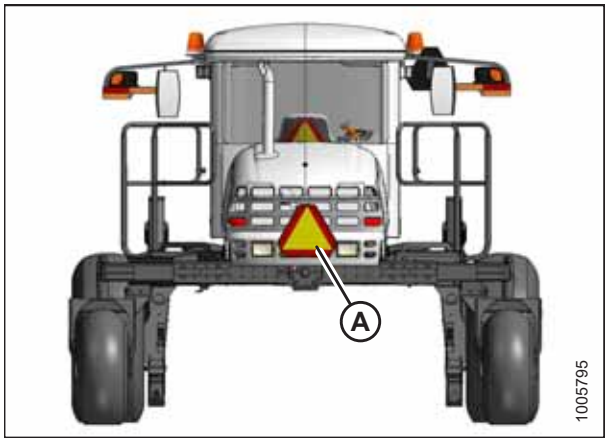


Figure 3.19: Cab-Forward Location

3.7 Lubrication

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

For information on the type of lubricants to use, refer to *9.4 Lubricants, Fluids, and System Capacities, page 213*.

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

3.7.2 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.

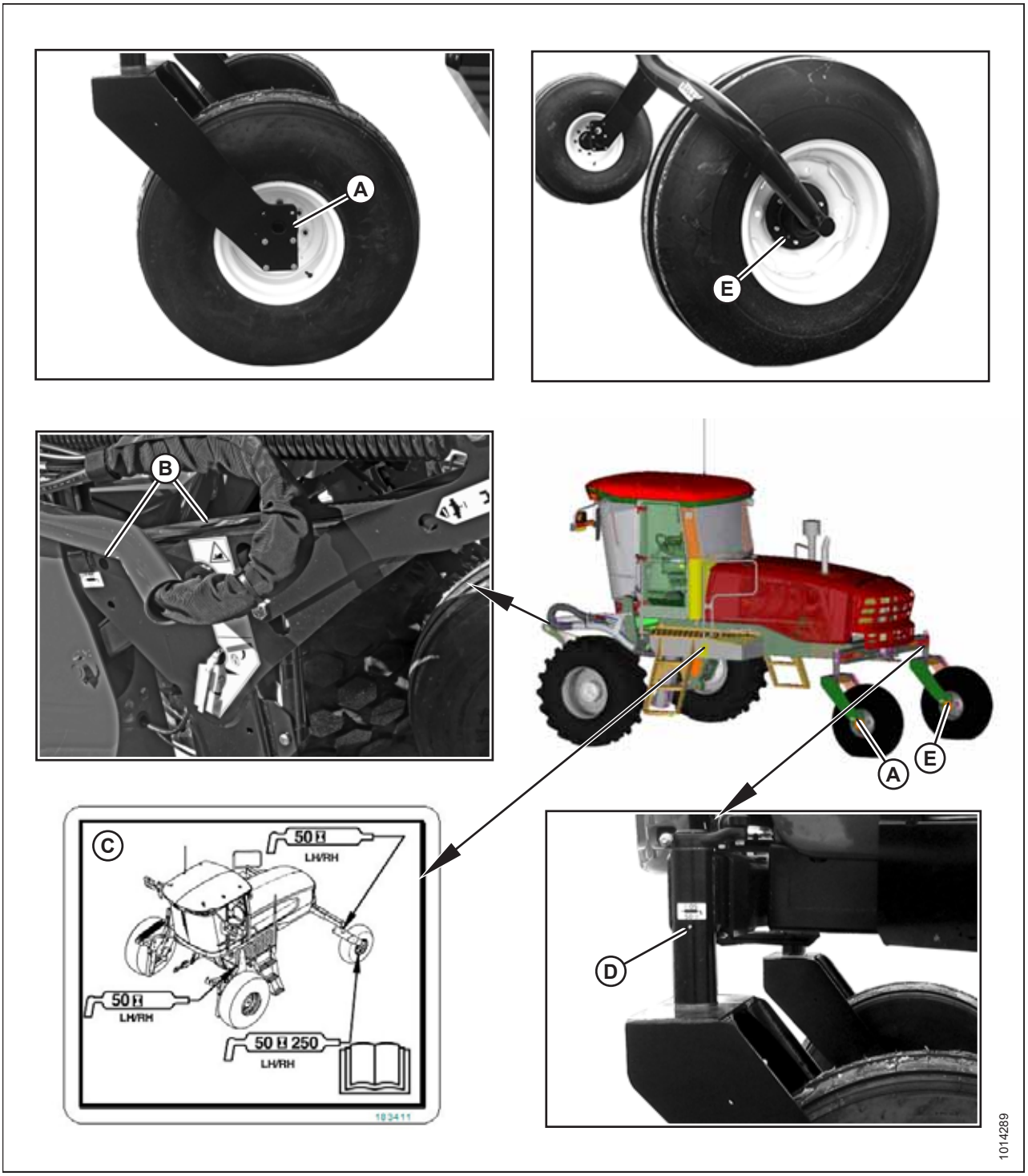


Figure 3.20: Lubrication Points

A - Forked Caster Wheel Bearing (Two Places) (Outer – Both Wheels)
B - Top-Link (Two Places) (Both Sides)
C - Lubrication Decal (MD #183411)
D - Caster Pivot (Both Sides)
E - Forked/Formed Caster Wheel Bearing (Two Places) (Inner – Both Wheels) (50 Hrs/250 Hrs)

3.8 Installing AM/FM Radio

The windrower is designed to accommodate an AM/FM radio of a specific size and type.

M155*E4* Windrowers are designed to accept a DIN E style AM/FM radio with depth (X) of 161 mm, and with a 5 mm threaded centered on the rear of the radio for support in location (A). Adjustments are possible if the radio falls outside these parameters.

In order to retain the radio's settings and preset memory with the battery disconnect turned off, select a radio with non-volatile settings memory.

NOTE:

An approved radio package is available from Radio Engineering Industries (REI) of Omaha, Nebraska.

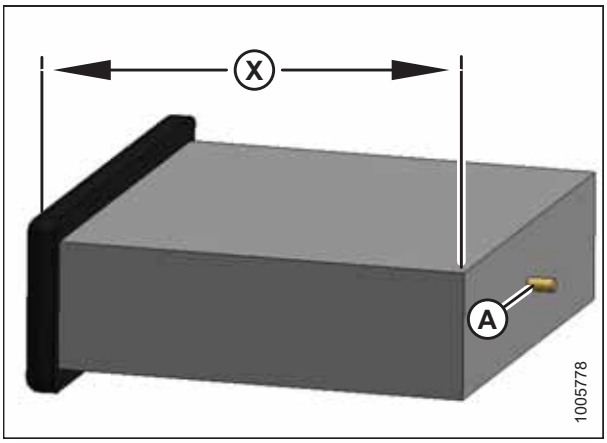


Figure 3.21: Mounting Dimension

To install the radio, follow these procedures:

1. Ensure battery switch (A) is turned to the OFF position.
2. Ensure the ignition is turned OFF, and remove the key.

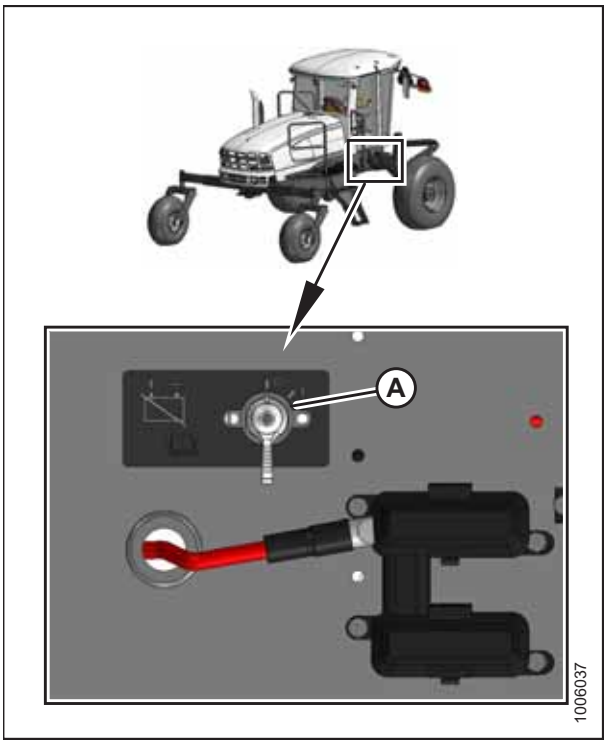


Figure 3.22: Battery Main Disconnect Switch

3. Remove the radio panel by removing four screws (A).

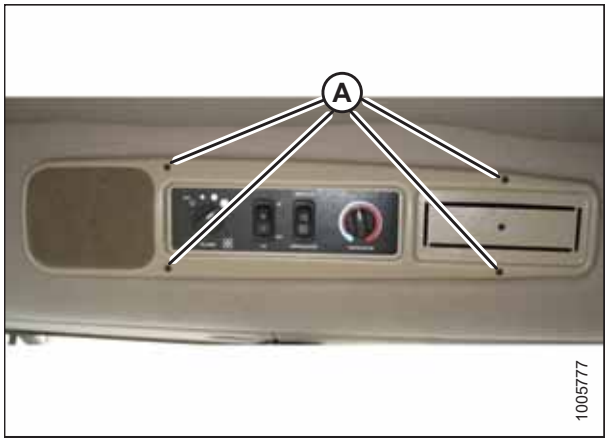


Figure 3.23: Radio Panel

4. Remove screw (A) and nut (C) to remove support (B) from the panel. Retain nut (C) and the lock washer.

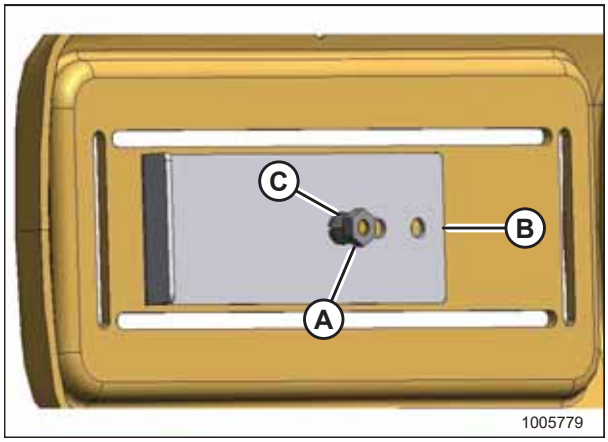


Figure 3.24: Panel Support

5. Remove the cutout by cutting tabs (A) in the panel. Remove the sharp edges from the panel.

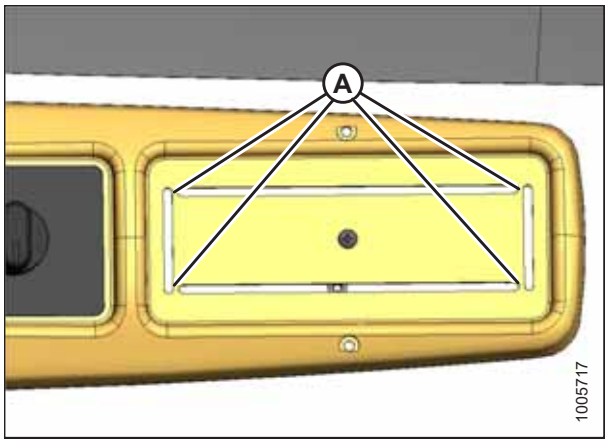


Figure 3.25: Radio Panel

6. Position receptacle (A) (supplied with the radio) into the opening, and secure it by bending tabs (B) on the receptacle against the panel.

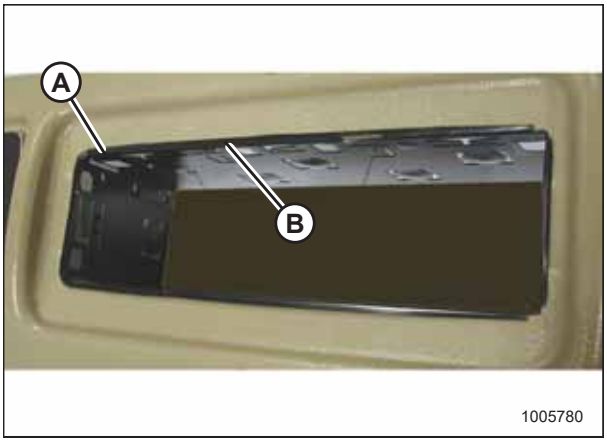


Figure 3.26: Radio Receptacle

7. Insert the radio into the receptacle and attach the radio bezel. Ensure the radio locks into position and faceplate (A) is against the panel.

Figure 3.27: Radio Installed

8. Ensure the radio has a six-pin connector (Packard #2977042) and that the terminal arrangement is as shown at right.

9. Attach the following two additional wires from the wiring harness to the radio:

   a. **Circuit 503:** The red live wire with a 1/4 in. female blade terminal provides power for the radio clock/ memory if the radio is equipped with this feature.

   b. **Circuit 315:** The black ground wire attaches to the radio body.

10. Plug the antenna cable into the radio.

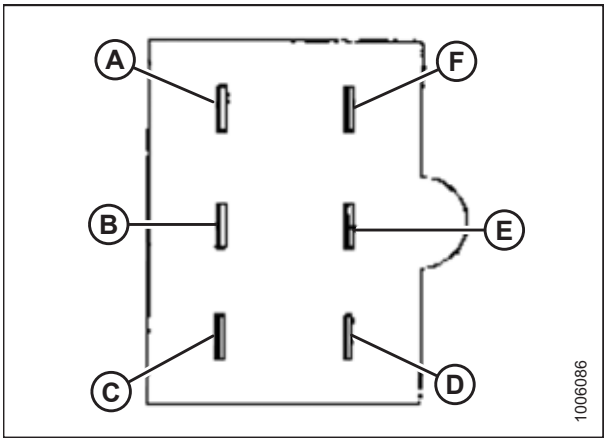


Figure 3.28: Six-Pin Connector Terminal Arrangement

A - Left Speaker Power (+)
B - Left Speaker Ground (–)
C - Radio Ground (–)
D - Right Speaker Ground (–)
E - Right Speaker Power (+)
F - Radio Power (+) (Live when Ignition is ON)

11. Attach the stud (supplied with the radio) to the center rear of the radio.
12. Attach support (B) to the stud on the back of the radio with nut (A) and the lock washer supplied with the support.

    NOTE:

    The support can be attached to the radio in multiple locations to allow for proper radio mounting.

13. Install the radio panel using the original screws.

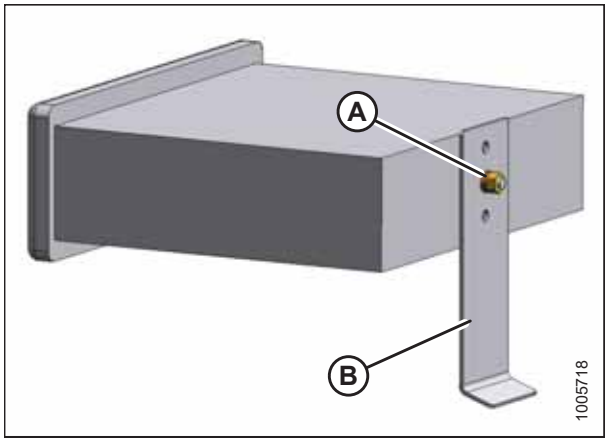


Figure 3.29: Radio and Support

14. Adjust bracket (A) (if necessary) by loosening nuts (B) to allow the radio to slide into the opening and securely capture support (C).

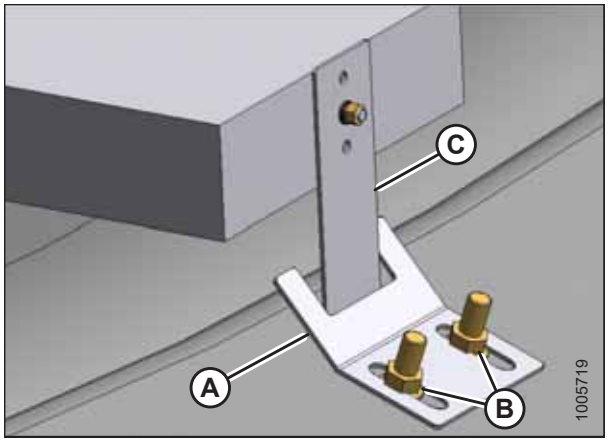


Figure 3.30: Radio and Support

15. Retrieve the antenna from inside the cab and remove the protective cover from the base.
16. Remove protective cover (A) from the antenna mount on the cab roof and thread the antenna onto the base until it is hand-tight.

    NOTE:

    Store the protective cover in the cab and reinstall it to protect the antenna mount in the event that the antenna needs to be removed.

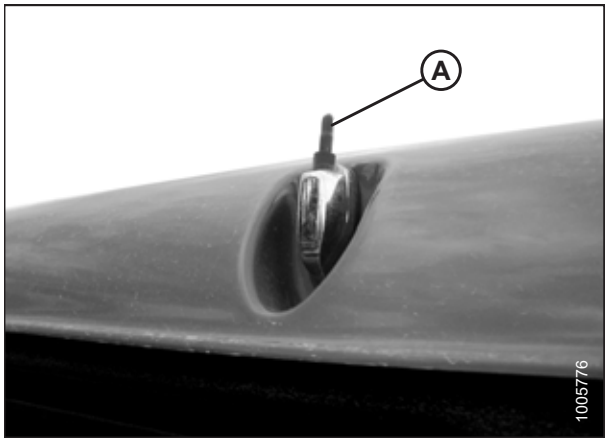


Figure 3.31: Antenna Mount on Cab Roof

17. Turn battery switch (A) to the ON position.

18. Turn the ignition key to ACC, switch the radio ON, and check the operation in accordance with the instructions supplied with the radio.

19. Turn the ignition key to the OFF position, and remove the key.

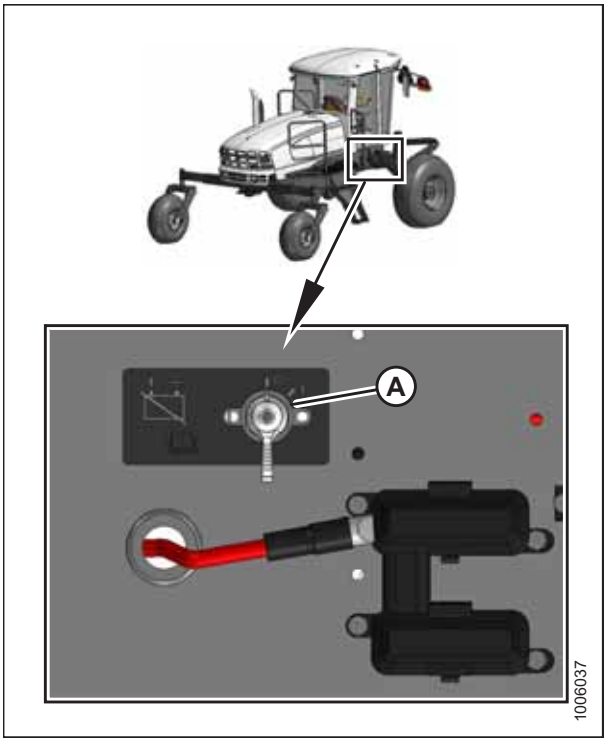


Figure 3.32: Battery Main Disconnect Switch

Chapter 4: Performing Predelivery Checks

The windrower must be inspected before delivery to ensure proper functioning.

IMPORTANT:

The machine should not require further adjustments after the assembly process is completed. However, to ensure that the machine is performing properly, conduct the following checks and complete the yellow predelivery checklist at the end of this book. Make adjustments only if absolutely necessary and in accordance with the instructions in this manual.

4.1 Recording Serial Numbers

Serial numbers identify the specific windrower, its engine, and its factory configuration.

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

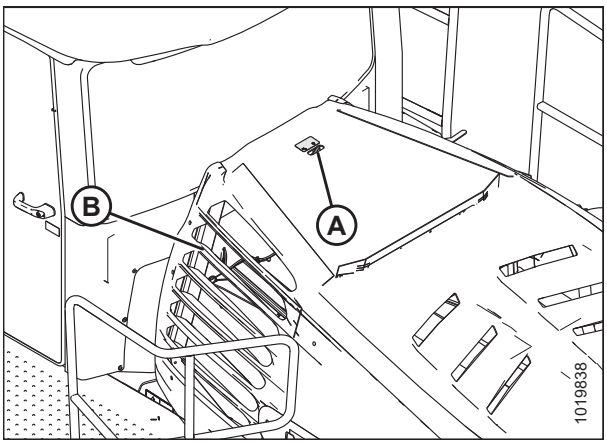


Figure 4.1: Hood

3. Record the windrower and engine serial numbers on the *Predelivery Checklist, page 217*. 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.

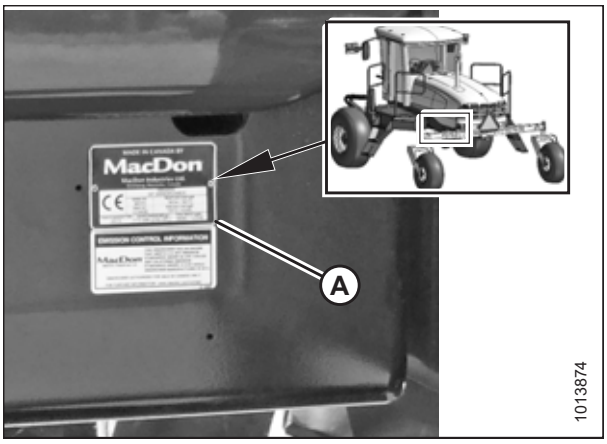


Figure 4.2: Serial Number Location

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

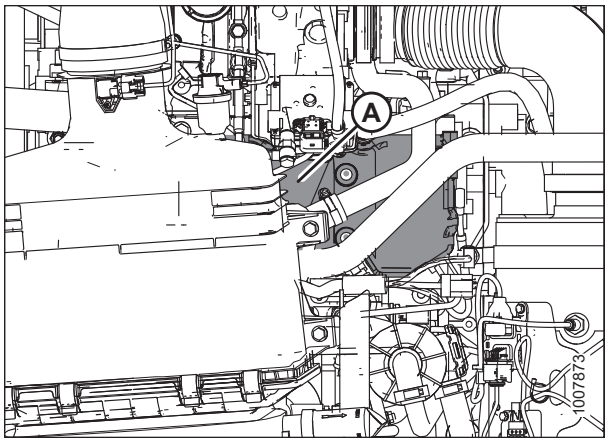


Figure 4.3: Engine Serial Number Location

4.2 Checking Tire Pressures and Adding Tire Ballast

Checking the tire pressure and possibly adding tire ballast will help ensure the proper operation of the windrower.

4.2.1 Checking Tire Pressure

The tires must be at the correct operating pressure. Check the pressure of the windrower tires using a tire pressure gauge.

To inspect a tire's air pressure level:

1. Determine the type and size of tire installed on the windrower.
2. Refer to the following table to determine the appropriate air pressure:

Table 4.1 Tire Pressures

Tire Type	Size	Pressure
Bar	18.4–26	317 kPa (46 psi)
	600/65R28	241 kPa (35 psi)
Turf	18.4–26	317 kPa (46 psi)
	23.1–26	234 kPa (34 psi)
Rear Caster	All	69 kPa (10 psi)

3. Adjust the tire pressure as needed.

   NOTE:

   Check the maximum inflation rating on the tire's sidewall. Do **NOT** inflate the tire beyond the maximum pressure specification.

4.2.2 Adding Tire Ballast

When using a large header on a windrower, adding fluid ballast to the caster tires will improve machine stability. Machine stability is also affected by different attachments, windrower options, terrains, and driving techniques.

The maximum fluid ballast capability per tire is 75% of full, or when the fluid is level with the valve stem at the 12 o'clock position. Always add an equal amount of fluid on both sides. Fluid can be added to any level up to maximum fill. Consult the following tables before adding fluid ballast to the tires:

Table 4.2 Maximum Fluid per Tire

Tire Size	Fluid per Tire at 75% Fill liters (U.S. Gal.)	Total Weight of Both Tires kg (lb.)[3]
7.5 x 16	38 (10)	91 (200)
10 x 16	69 (18)	170 (380)
16.5 x 16.1	158 (41)	377 (830)

3. Weights typical for calcium chloride and water mixtures. Reduce weight by 20% if only water is used (for areas that do not freeze).

Table 4.3 Recommended Ballast

			Recommended Ballast			
			Level Ground		Hills	
Type	**Size**	**Recommended Tire Size**	**Per Tire liters (U.S. Gal.)**	**Both Tires kg (lb.)[4]**	**Per Tire liters (U.S. Gal.)**	**Both Tires kg (lb.)[4]**
A Series (all options)	All	7.5 x 16 10 x 16 16.5 x 16.1	0	0	0	0
D/D1 Series	7.6 m (25 ft.) and less	7.5 x 16 10 x 16 16.5 x 16.1	0	0	0	0
D/D1 Series	9.1 m (30 ft.) single reel or double reel (without conditioner) 10.7 m (35 ft.) single reel	7.5 x 16 10 x 16 16.5 x 16.1	69 (18)	170 (380)	115 (30)	288 (630)
D/D1 Series	9.1 m (30 ft.) double reel (with steel fingers and conditioner) 10.7 m (35 ft.) double reel (5- or 6-bat)	Level ground: 10 x 16 16.5 x 16.1 Hills: 16.5 x 16.1	115 (30)	288 (630)	158 (41)	377 (830)
D/D1 Series	12.2 m (40 ft.)	16.5 x 16.1	115 (30)	288 (630)	158 (41)	377 (830)
R/R1 Series (all options)	4 m (13 ft.)	7.5 x 16 10 x 16 16.5 x 16.1	0	0	0	0

4. If only water is used, increase volume of water by 20% (up to maximum allowable fill per tire) to compensate.

4.3 Checking and Adding Wheel Drive Lubricant

Ensure that the wheel drive lubricant level is correct to maximize the service life of the components.

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 N-DETENT position and the steering wheel in the locked (centered) position. Wait for the cab display module (CDM) to beep and display an "In Park" message to confirm that the parking brake is engaged.

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). The lubricant should be visible through the port.
5. If lubricant needs to be added, remove plug (B), and add lubricant until lubricant runs out from port (A) or (B). For lubricant specifications, refer to *9.4 Lubricants, Fluids, and System Capacities, page 213*.
6. Reinstall the plugs and tighten them.

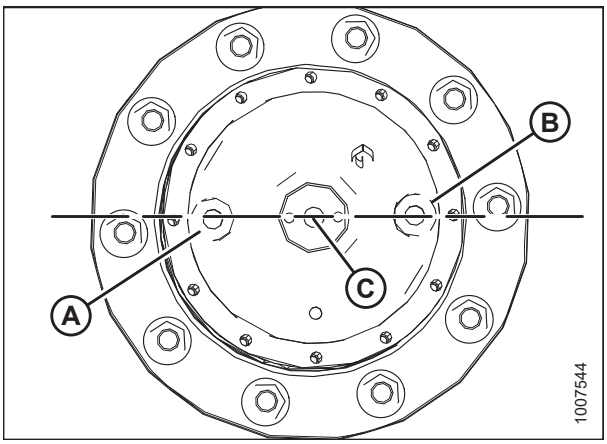


Figure 4.4: Drive Wheel Hub

4.4 Opening Hood

Many of the predelivery checks must be performed with the windrower hood open.

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. Locate latch (A) behind the grill and lift the latch to release the hood.
3. Raise the hood until strap (B), which should be looped under hooks (C) and (D), stops at approximately a 40° angle.
4. Remove strap (B) from hook (C) and allow the hood to rise slightly farther.
5. Remove the strap from hook (D) and allow the hood to rise fully to approximately a 65° angle.

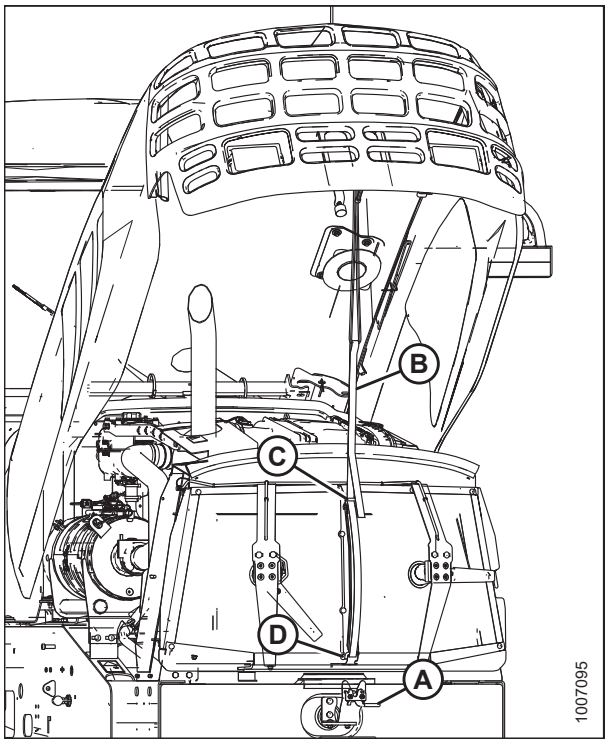


Figure 4.5: Hood Open – Highest Position

4.5 Checking Engine Air Intake

The air intake system must be inspected to ensure air intake components have been installed and tightened correctly.

1. Ensure clips (A) are properly latched, and that plenum box (C) is securely attached to cover (B).

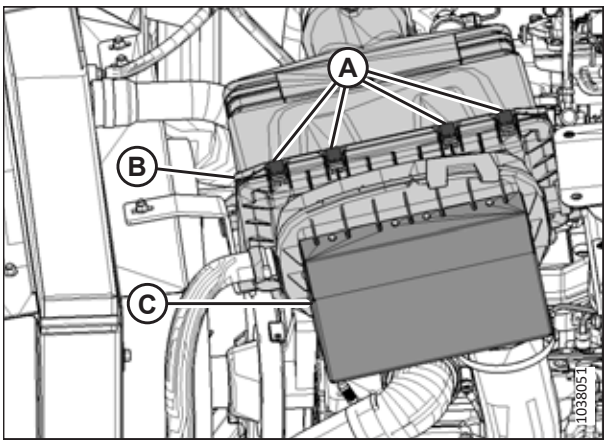


Figure 4.6: Air Intake System

Checking constant torque gaps:

2. Check each of the constant torque clamps referenced in Step *3, page 43* and Step *4, page 44* as follows:

   a. Check spring coil gap (A) on the constant torque clamp by holding a 0.46 mm (0.018 in.) gauge between middle coils (B)

   b. Tighten the clamps until the gauge is snug, and remove the gauge.

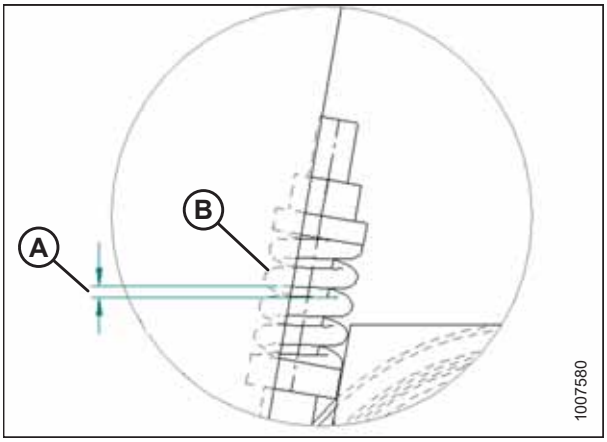


Figure 4.7: Constant Torque Clamp

3. Check four constant torque clamps (A) (two at air intake duct [B] and two at turbocharger tube [C]).

   NOTE:

   Some parts have been removed from the illustration for clarity.

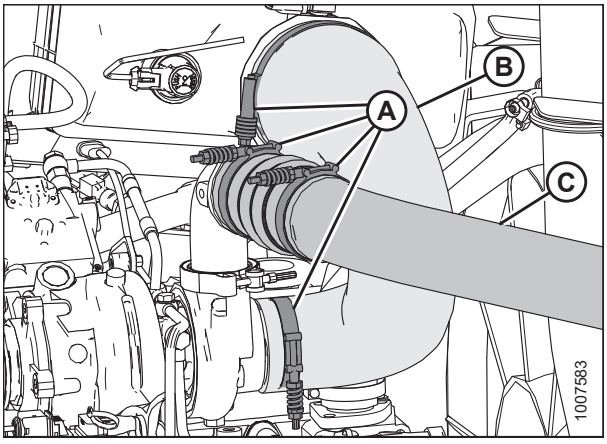


Figure 4.8: Air Intake System

4. Check constant torque clamps (A) securing tube (B), which runs from the cooler to the engine air intake.

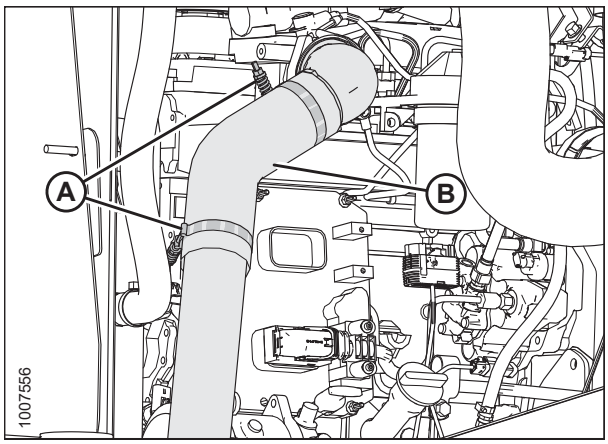


Figure 4.9: Air Intake System

4.6 Checking Hydraulic Oil Level

The hydraulic oil reservoir can be found in the engine bay. The hydraulic oil level can be inspected using the sight glass on the side of the reservoir, or by using the dipstick.

1. Stand on the left cab-forward platform to access the filler pipe.
2. Clean cap (A) and the surrounding area.
3. Turn filler cap (A) counterclockwise to unlock the cap. Remove the dipstick.

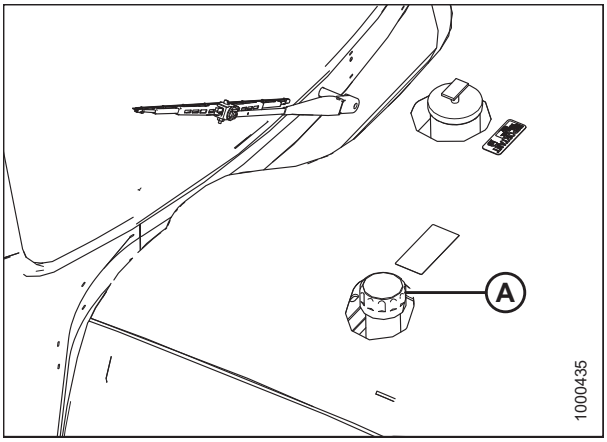


Figure 4.10: Engine Hood

4. Inspect the dipstick. The hydraulic oil level should be between the low (L) and high (H) marks on the dipstick.
5. If necessary, add hydraulic oil. Do not overfill the reservoir. Refer to Table *9.16, page 213* for specifications.
6. Reinstall the dipstick and filler cap, and turn it clockwise to tighten and lock it.

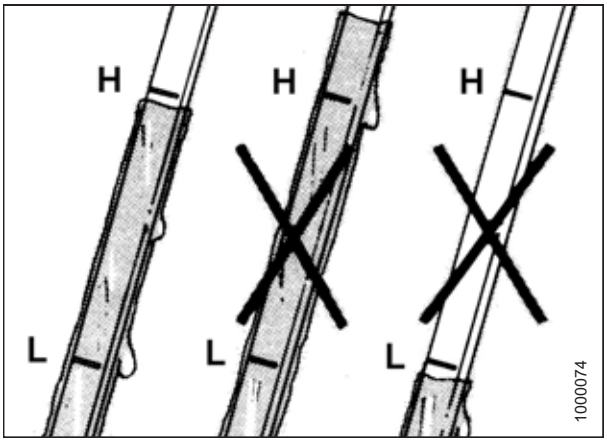


Figure 4.11: Hydraulic Oil Levels

4.7 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.

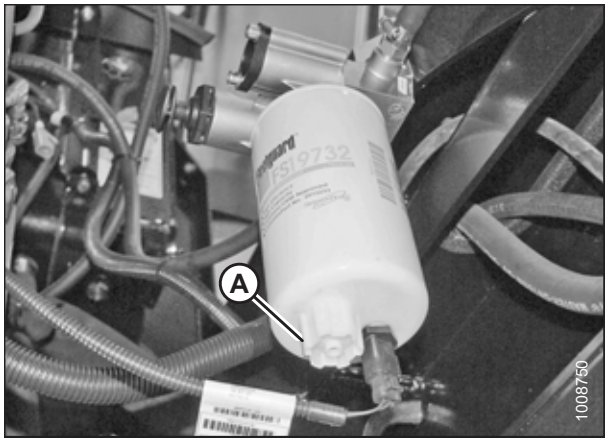


Figure 4.12: Fuel Filter

4.8 Checking Engine Oil Level

Ensure the engine oil is filled to the correct level.

1. Remove dipstick (A) by turning it counterclockwise to unlock it.
2. Wipe the dipstick clean and reinsert it into the engine.
3. Remove the dipstick again and check the oil level.

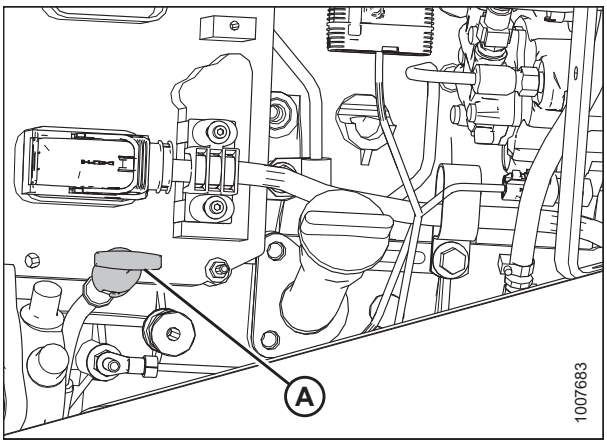


Figure 4.13: Engine Oil Dipstick

4. Add oil if the level is below the low (L) mark.

   IMPORTANT:

   The oil level should be maintained between the low (L) and high (H) marks on the dipstick.

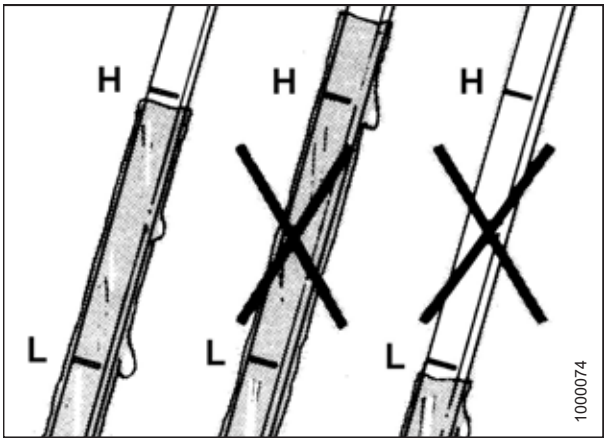


Figure 4.14: Engine Oil Level

5. Replace dipstick (A) and turn it clockwise to lock it.

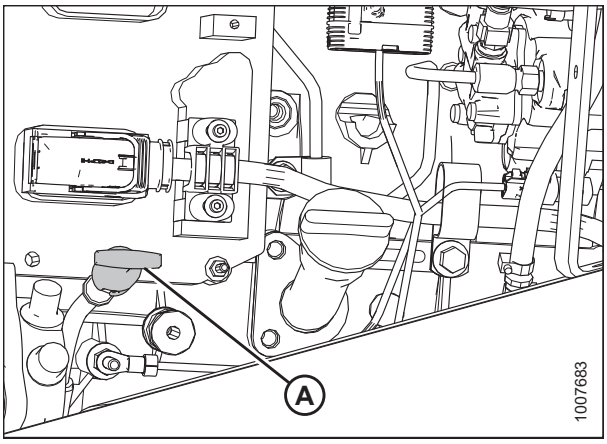


Figure 4.15: Engine Oil Dipstick

4.9 Checking Gearbox Lubricant Level

Ensure the gearbox lubricant is filled to the correct level.

1. Locate gearbox oil level check plug (A) under the machine. Remove plug (A) and ensure lubricant is visible or slightly running out.
2. If lubricant is required, add gearbox oil. Refer to Table *9.16, page 213* for specifications.
3. Ensure there is thread sealant on the threads of plug (A). Replace plug (A) and tighten it.

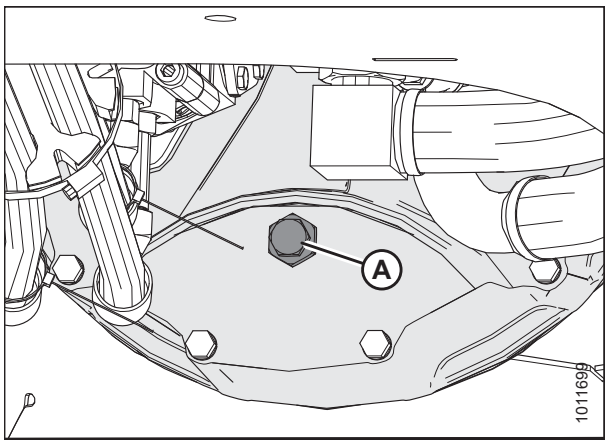


Figure 4.16: Gearbox

4.10 Checking Engine Coolant

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

1. Visually inspect the coolant level in the pressurized coolant tank (A).

   NOTE:

   Allow the engine to cool before checking the coolant level. The pressurized coolant tank has MAX COLD and MIN COLD coolant level indicators (B), and coolant levels should be between these lines.

2. If necessary, add coolant. Refer to Table *9.16, page 213* for specifications.

3. Ensure the coolant concentration in the radiator is rated for -34°C (-30°F).

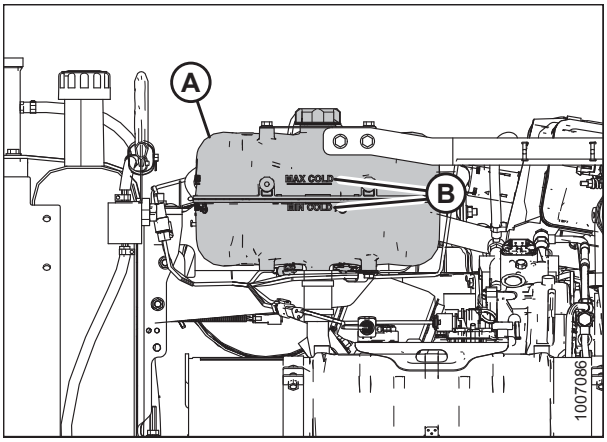


Figure 4.17: Pressurized Coolant Tank

4.11 Checking Air Conditioning Compressor Belt

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 A/C compressor belt (A) is tensioned so that a force of 45 N (10 lbf) applied to the midspan of the belt deflects it by 5 mm (3/16 in.).

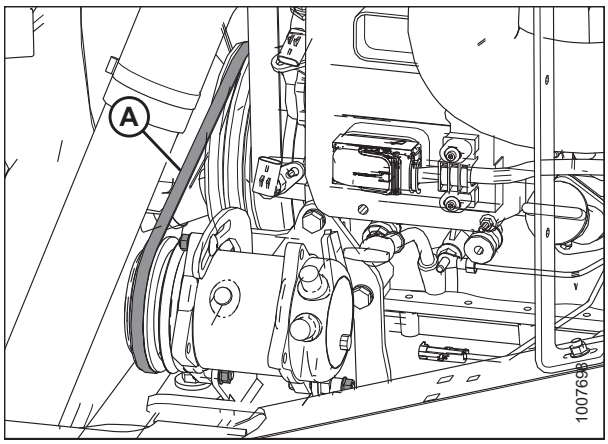


Figure 4.18: A/C Compressor Belt

4.12 Closing Hood

Close the hood after completing the under-hood portion of the predelivery inspection.

1. Pull down on strap (B) and loop it under lower hook (D).
2. Grasp strap (B) and loop it under upper hook (C).

   IMPORTANT:

   Failure to hook the strap may result in it becoming entangled with the screen cleaners or the latch.

3. Pull down on strap (B), grasp the hood when it is within reach, and lower it until the hood engages latch (A).

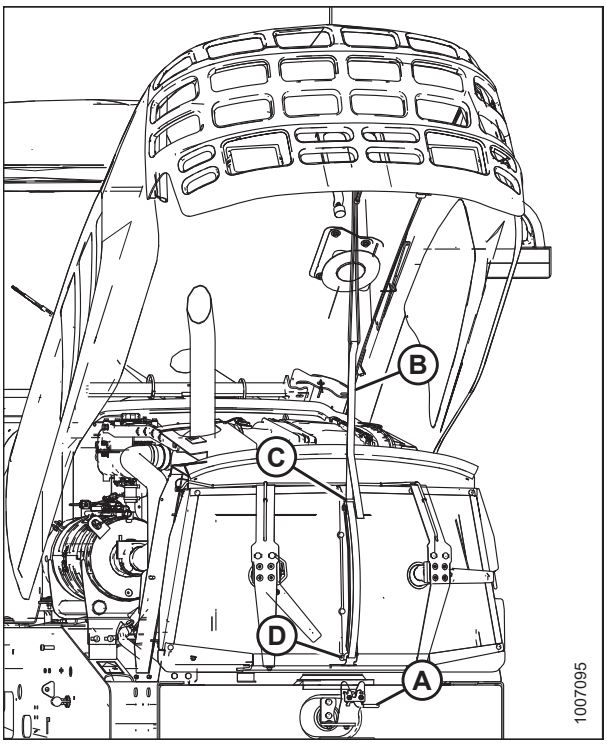


Figure 4.19: Hood Open – Highest Position

4.13 Replacing Diesel Exhaust Fluid

The diesel exhaust fluid (DEF) tank has to be drained and refilled with fresh DEF when the windrower is received.

1. Open the right platform by pushing latch (A) and pulling platform (B) toward the walking beam until it stops and the latch is engaged in the open position.
2. Place a drain pan under the DEF tank. Use a drain pan large enough to hold 29 L (7.5 U.S. gal).

IMPORTANT:

Any spilled diesel exhaust fluid (DEF) must be contained and absorbed by a non-combustible absorbent material such as sand. The contaminated absorbent should then be placed into a leak-proof container and disposed of. DEF is corrosive. If DEF is spilled on the DEF tank or on any other surface of the vehicle, rinse the contaminated surface thoroughly with water.

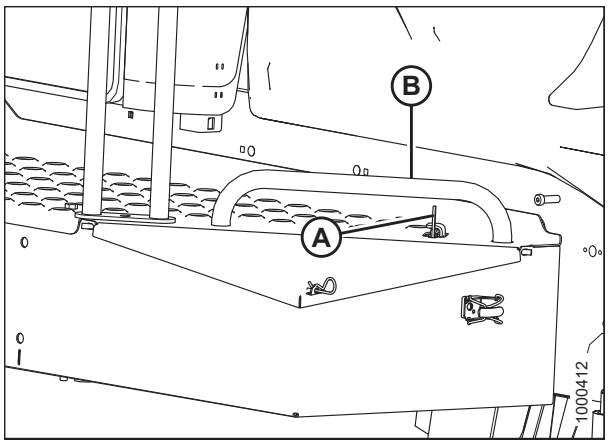


Figure 4.20: Platform Latch

WARNING

Diesel exhaust fluid (DEF) contains urea, which can irritate the skin, eyes, digestive, and respiratory systems. Do NOT get the substance in your eyes. In case of contact, immediately flush your eyes with water for a minimum of 15 minutes. Do NOT ingest DEF. If DEF is ingested, contact a doctor immediately.

3. Remove drain plug (A) from under tank (B). Allow the tank to drain completely.
4. Add a small amount of DEF to tank (B) to flush any remaining contaminants.
5. Allow the DEF that was used to clean the tank to drain.
6. Reinstall drain plug (A).

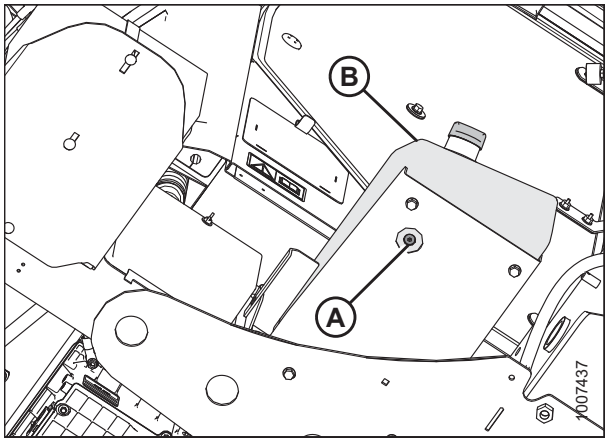


Figure 4.21: View from beneath Tank

IMPORTANT:

Before filling the DEF tank, perform the following steps. These instructions can also be found on decal (A), which is located on the DEF tank's cover.

- Before storing the machine for longer than six months, drain the DEF tank.
- Before storing the machine in ambient temperatures below 0°C (32°F), ensure that the level of fluid in the DEF tank is 75 % of the tank's capacity or lower.

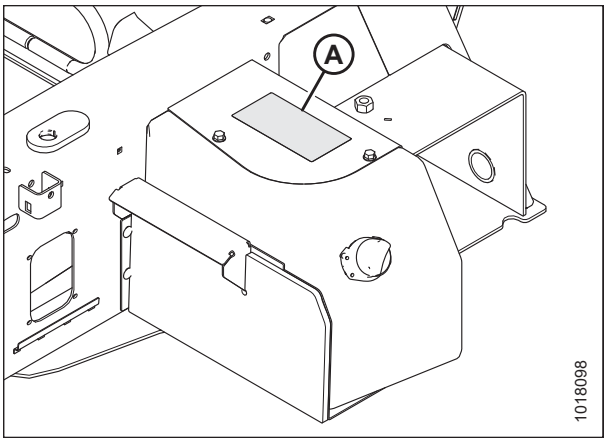


Figure 4.22: DEF Tank

Take the following precautions when handling DEF:

- Use a clean funnel. Avoid using funnels and containers that have been used with other fuels or lubricants.
- Use only distilled water to rinse the components that store or deliver DEF; tap water can contaminate DEF.
- If distilled water is not available, use clean tap water, then rinse the affected components with DEF.

7. Clean around filler cap (A).
8. Turn cap (A) counterclockwise until it is loose. Remove the cap.
9. Fill the tank with an approved DEF. Refer to the windrower operator's manual for specifications.
10. Replace filler cap (A) and turn it clockwise until it is tight.
11. Close the maintenance platform.

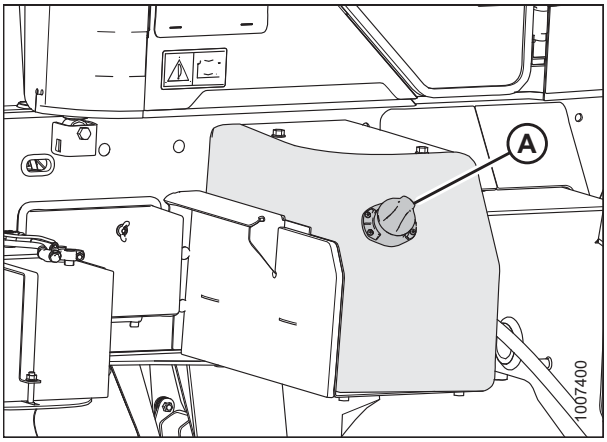


Figure 4.23: DEF Tank

12. To close the right platform, push latch (A) to unlock it, and grasp handle (B) and push forward until it stops and latch (A) is engaged.

    NOTE:

    Ensure that the platform is latched properly before standing on it.

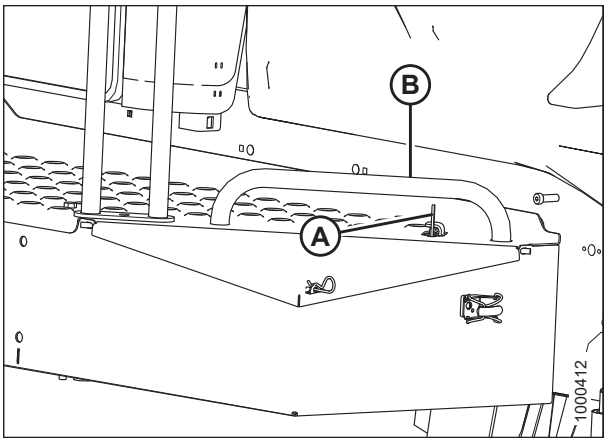


Figure 4.24: Platform Latch

4.14 Starting Engine

The procedure for starting the windrower's engine varies depending on the ambient temperature. In cold weather, the engine must go through a warm-up cycle before the engine speed can be increased.

CAUTION

Park on a level surface with the ground speed lever (GSL) in the N-DETENT position and the steering wheel in the locked (centered) position. Wait for the cab display module (CDM) to beep and display an "In Park" message to confirm that the parking brake is engaged.

1. Ensure that there is sufficient diesel exhaust fluid (DEF) in the DEF tank. This will prevent DEF level errors from occurring.
2. Ensure that lock (A) is engaged at the cab-forward or engine-forward position.

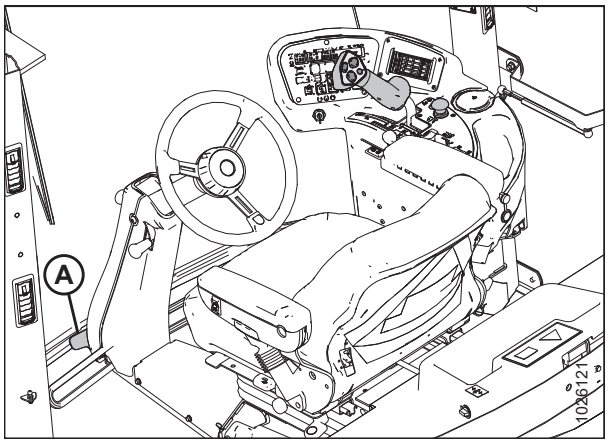


Figure 4.25: Operator Console

3. Move GSL (A) into the N-DETENT position.
4. Turn the steering wheel until it locks (center).
5. Push header drive switch (B) to the OFF position.

DANGER

Ensure that all bystanders have cleared the area.

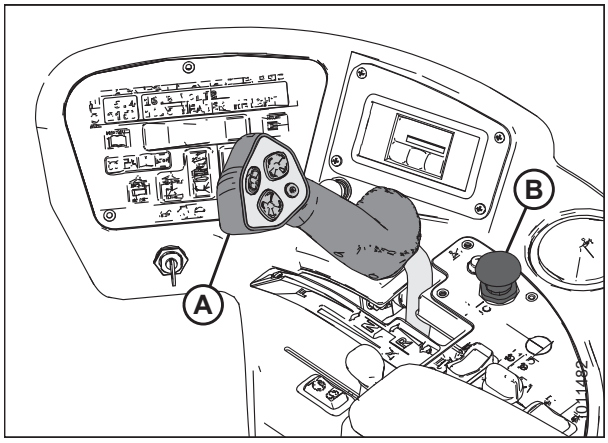


Figure 4.26: Operator Console

Normal start:

6. Follow these steps when starting the engine when the ambient temperature is above 16°C (60°F):

   a. Move the throttle fully back to START position (A).

   b. Sound the horn three times.

   c. Turn ignition key (B) to the RUN position.

      NOTE:

      A single loud tone will sound, the engine warning lights will turn on, and the cab display module will display HEADER DISENGAGED and IN PARK.

   d. Turn ignition key (B) to the START position until the engine starts and then release the key. The tone will cease and warning lights will go out.

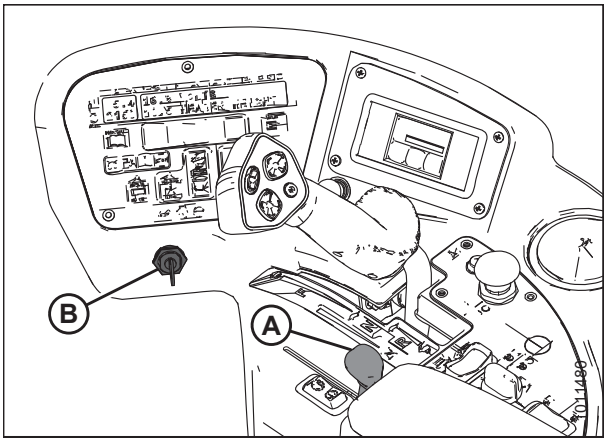


Figure 4.27: Operator Console

WARNING

If the starter is able to engage when the steering wheel is unlocked, when the ground speed lever (GSL) is out of the NEUTRAL position, or when the header clutch is engaged, do NOT start the engine. Refer to the windrower's technical manual for further details.

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 attempting to start the engine again.
- After the third 15-second crank attempt, allow the starter motor to cool for 10 minutes before attempting to start the engine again.
- If the engine still does **NOT** start, refer to Table *4.4, page 56*.

Cold start:

NOTE:

The windrower's engine is equipped with a cold-start assist system.

7. When the engine temperature is below 5°C (40°F), follow the procedure for a normal start. Refer to Step *6, page 55*, but adhere to the following *NOTE* and *IMPORTANT* statements while starting the engine.

   NOTE:

   When starting the engine 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 nonresponsive while the engine is in warm-up mode. Warm-up mode lasts between 30 seconds and 3 minutes depending on the temperature. The throttle will become active after the engine has stabilized and is idling normally.

   IMPORTANT:

   Do **NOT** operate the engine above 1500 rpm until the engine's coolant temperature is above 40°C (100°F).

Table 4.4 Engine Start Troubleshooting

Problem	Solution
Controls are not in the NEUTRAL position	• Move the GSL to NEUTRAL • Move the steering wheel to the locked (centered) position • Disengage the HEADER switch
Operator's station is not locked	• Adjust the position of the operator's station • Ensure that the lock is engaged
Neutral interlock is out of adjustment	• Refer to the windrower's technical manual
Fuel not reaching the engine	• Fill the fuel tank • Replace the fuel filter • Ensure that the fuel shut off valve is in the open position
Old fuel in the fuel tank	• Drain the fuel tank • Refill the fuel tank with fresh fuel
Water, dirt, or air in the fuel system	• Drain, flush, fill, and prime the fuel system
Improper type of fuel in the fuel tank	• Drain the fuel tank • Refill the fuel tank with the correct type of fuel
Crankcase oil too heavy	• Replace with recommended oil
Low voltage output from the battery	• Test the battery • Check the battery's electrolyte levels
Poor battery connection	• Clean and tighten loose battery connections
Faulty starter	• Refer to the windrower's technical manual
Wiring is shorted or the circuit breaker is open	• Check the continuity of the wiring and the breaker; manually reset the circuit breaker
Faulty fuel injectors	• Refer to the windrower's technical manual

Chapter 5: Cab Display Module

Although the other procedures in this instruction are intended to be followed in the order in which they are listed, the sections in this chapter can be referred to in any order according to your specific requirements.

5.1 Cab Display Module – Configuration Functions

Use the cab display module's (CDM) configuration functions to set up the windrower, to change the appearance of the CDM itself, to enter diagnostic mode, and to calibrate the header sensors.

Figure 5.1: CDM

A - Side Display
B - Main Display
C - Select Switch
D - Menu Item Scroll Forward
E - Menu Item Scroll Backward
F - Program Switch

Side Display: Displays the current revision level of the windrower's operating software.

- Upper line – C### (CDM software revision level)
- Lower line – E### (Windrower control module [WCM] software revision level)

Main Display: Displays potential menu items and the current selection.

NOTE:

The current selection will flash.

- Upper line – Menu item
- Lower line – Current selection

Select Switch: Pressing this switch along with the PROGRAM switch puts the CDM into programming mode. Press SELECT to accept the highlighted menu item and to advance the selection to the next item.

Menu Item Scroll Forward: Displays the value of the currently selected menu item.

- Push the MENU ITEM SCROLL FORWARD button to scroll forward
- Hold the MENU ITEM SCROLL FORWARD button down to scroll rapidly

NOTE:

Fast scroll is available only when the Operator is changing the KNIFE SPEED, OVERLOAD PRESSURE, or TIRE SIZE settings.

Menu Item Scroll Backward: Displays the value of the currently selected menu item.

- Push the MENU ITEM SCROLL BACKWARD button to scroll backward
- Hold down the MENU ITEM SCROLL BACKWARD button to scroll rapidly

NOTE:

Fast scroll is available only when the Operator is changing the KNIFE SPEED, OVERLOAD PRESSURE, or TIRE SIZE settings.

Program Switch: Pressing this switch along with the SELECT switch puts the CDM into programming mode.

NOTE:

The following menus are available when the ignition key is in the RUN position:

- WINDROWER SETUP
- CAB DISPLAY SETUP
- DIAGNOSTIC MODE

The CALIBRATE SENSORS menu is available only when the engine is running.

5.2 Cab Display Options

The cab display module's (CDM) display settings, including the units of measurement, buzzer volume, and lighting options, can be changed by accessing the CDM's CAB DISPLAY SETUP menu.

NOTE:

The following procedures are current for CDM software version C512 and windrower control module (WCM) E237. The WCM is supplied with the latest released version of the operating software already installed. Any subsequent updates will be made available on the MacDon Dealer Portal *(https://portal.macdon.com)*.

NOTE:

The menus in the CDM in your windrower may differ from those depicted in the illustrations in this manual if your CDM or WCM have different software versions installed. In addition, not all features are available on every machine.

5.2.1 Setting Cab Display Language

The cab display module's (CDM) language settings can be changed by accessing the CDM's DISPLAY LANGUAGE sub-menu in the CAB DISPLAY SETUP menu.

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (B) simultaneously on the cab display module (CDM) to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
   - NO/YES will appear on the lower line.

Figure 5.2: Windrower Setup Display

3. Press SELECT (A) until CAB DISPLAY SETUP? appears on the upper line.
   - NO/YES will appear on the lower line.

Figure 5.3: Cab Display Setup

4. Press right arrow (C) to select YES. Press SELECT (D).
   - DISPLAY LANGUAGE? will appear on the upper line.
   - Default language will appear on the lower line.
5. Press left arrow (B) or right arrow (C) to select your preferred language.

   NOTE:

   The available languages are English, Russian, and Spanish.
6. Press PROGRAM (A) to exit programming mode or press SELECT (D) to proceed to the next CAB DISPLAY SETUP? action.

Figure 5.4: Language Display

5.2.2 Changing Windrower Display Units

The cab display module (CDM) can be configured so that units of measurement are displayed in metric or in standard (imperial) format.

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (B) simultaneously on the CDM to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
   - NO/YES will appear on the lower line.

Figure 5.5: CDM Programming Buttons

3. Press SELECT (B) until CAB DISPLAY SETUP? is displayed on the upper line.
   - NO/YES will appear on the lower line.
4. Press right arrow (A) to select YES. Press SELECT (B).
   - DISPLAY LANGUAGE? will appear on the upper line.

Figure 5.6: Cab Display Setup

5. Press SELECT (D) until DISPLAY UNITS? appears on the upper line.
   - The current setting will appear on the lower line.
6. Press left arrow (B) or right arrow (C) to select either METRIC or IMPERIAL.
7. Press PROGRAM (A) to exit programming mode or press SELECT (D) to proceed to the next CAB DISPLAY SETUP? option.

Figure 5.7: Display Units

5.2.3 Adjusting Cab Display Buzzer Volume

The volume level of the alert tones generated by the cab display module (CDM) can be changed by accessing the BUZZER VOLUME sub-menu in the CAB DISPLAY SETUP menu.

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (B) simultaneously on the cab display module (CDM) to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
   - NO/YES will appear on the lower line.

Figure 5.8: CDM Programming Buttons

3. Press SELECT (B) until CAB DISPLAY SETUP? appears on the upper line.
   - NO/YES will appear on the lower line.
4. Press right arrow (A) to select YES. Press SELECT (B).
   - DISPLAY LANGUAGE? will appear on the upper line.

Figure 5.9: Cab Display Setup

5. Press SELECT (D) until BUZZER VOLUME appears on the upper line.
   - The current setting will appear on the lower line.
6. Press left (B) or right (C) arrows to adjust the buzzer volume to the preferred level.
7. Press PROGRAM (A) to exit programming mode or press SELECT (D) to proceed to the next CAB DISPLAY SETUP? option.

Figure 5.10: Buzzer Volume

5.2.4 Adjusting Cab Display Backlighting

The cab display module (CDM) is equipped with a backlight, which makes it easier to read the display in low-light situations. The degree of backlighting can be changed by accessing the BACKLIGHTING sub-menu in the CAB DISPLAY SETUP menu.

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (B) simultaneously on the cab display module (CDM) to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
   - NO/YES will appear on the lower line.

Figure 5.11: CDM Programming Buttons

3. Press SELECT (B) until CAB DISPLAY SETUP? appears on the upper line.
   - NO/YES will appear on the lower line.
4. Press right arrow (A) to select YES. Press SELECT (B).
   - DISPLAY LANGUAGE? will appear on the upper line.

Figure 5.12: Cab Display Setup

5. Press SELECT (D) until BACKLIGHTING appears on the upper line.
   - The current setting will appear on the lower line.
6. Press left arrow (B) or right arrow (C) to adjust the degree of backlighting.
7. Press PROGRAM (A) to exit programming mode or press SELECT (D) to proceed to the next CAB DISPLAY SETUP? option.

Figure 5.13: Display Backlighting Setting

5.2.5 Adjusting Cab Display Contrast

Contrast is the degree of difference between the lightest and darkest colours a display can produce. The contrast of the cab display module's (CDM) display screen can be adjusted by accessing the DISPLAY CONTRAST sub-menu in the CAB DISPLAY SETUP menu.

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (B) on the cab display module (CDM) to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
   - NO/YES will appear on the lower line.

Figure 5.14: CDM Programming Buttons

3. Press SELECT (B) until CAB DISPLAY SETUP? appears on the upper line.
   - NO/YES will appear on the lower line.
4. Press right arrow (A) to select YES. Press SELECT (B).
   - DISPLAY LANGUAGE? will appear on the upper line.

Figure 5.15: Cab Display Setup

5. Press SELECT (D) until DISPLAY CONTRAST appears on the upper line.
   - The current setting will appear on the lower line.
6. Press the left (B) or the right (C) arrow to adjust the CDM's contrast setting.
7. Press PROGRAM (A) to exit programming mode or press SELECT (D) to proceed to the next CAB DISPLAY SETUP? option.

Figure 5.16: Display Contrast Setting

5.3 Configuring Windrower

The Operator can configure several windrower, header, and other attachment performance options using the cab display module (CDM).

5.3.1 Setting Header Knife Speed

The speed of the knife on non-rotary headers can be set by accessing the cab display module's (CDM) SET KNIFE SPEED sub-menu, in the WINDROWER SETUP menu.

NOTE:

The header **MUST** be physically attached and hydraulically and electrically connected to the windrower before the Operator can perform this procedure. The CDM automatically adjusts its programming for each header.

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (C) simultaneously on the CDM to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
   - NO/YES will appear on the lower line.
3. Press right arrow (B) to select YES. Press SELECT (C).
   - SET KNIFE SPEED? will appear.
   - The current knife speed will appear on the lower line.

Figure 5.17: CDM Programming Buttons

4. Press left arrow (B) or right arrow (C) to select knife speed. Press SELECT (D).
5. Press PROGRAM (A) to exit programming mode or press SELECT (D) to proceed to the next WINDROWER SETUP action.

Figure 5.18: Knife Speed Setting

5.3.2 Setting Knife Overload Speed

The knife overload speed setting determines the reported header knife speed at which a knife overload speed warning will appear on the cab display module (CDM). By default, this is 75% of the configured header knife speed, but this setting can be changed by accessing the KNIFE OVERLOAD SPD sub-menu in the WINDROWER SETUP menu.

NOTE:

- The header **MUST** be attached to the windrower to perform this procedure. The cab display module automatically adjusts its programming for each header.
- The recommended knife overload speed is 75% of knife speed.

To set the knife overload speed:

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (C) simultaneously on the CDM to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
   - NO/YES will appear on the lower line.
3. Press right arrow (B) to select YES. Press SELECT (C).
   - SET KNIFE SPEED? will appear.

Figure 5.19: CDM Programming Buttons

4. Press SELECT (D) until KNIFE OVERLOAD SPD? appears on the upper line.
   - The currently configured knife overload speed will appear on the lower line.

   NOTE:

   The default knife overload speed setting is -300 strokes per minute (spm). The possible input range is -500 to -100 spm.
5. Press left arrow (B) or right arrow (C) to set the knife overload speed. Press SELECT (D).
6. Press PROGRAM (A) to exit programming mode or press SELECT (D) to proceed to the next WINDROWER SETUP option.

Figure 5.20: Knife Overload Speed

5.3.3 Setting Rotary Disc Overload Speed

The rotary disc overload speed setting determines the reported rotary disc speed at which a disc overload speed warning will appear on the cab display module (CDM). By default, this is 75% of the configured rotary disc speed, but this setting can be changed by accessing the DISC OVERLOAD SPD sub-menu in the WINDROWER SETUP menu.

NOTE:

- The header **MUST** be attached to the windrower to perform this procedure. The cab display module (CDM) automatically adjusts its programming for each header.
- The recommended disc overload speed is 75% of the configured disc speed. For more information, refer to the rotary disc header operator's manual to determine the appropriate disc overload speed setting.

To set the rotary disc overload speed:

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (C) on the CDM to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line. NO/YES will appear on the lower line.
3. Press right arrow (B) to select YES. Press SELECT (C).
   - SET KNIFE SPEED? will appear.

Figure 5.21: CDM Programming Buttons

4. Press SELECT (D) until DISC OVERLOAD SPD? appears on the upper line.
   - The current rotary disc overload speed will appear on the lower line.

   NOTE:

   The default setting is -300 rpm. The range of possible disc overload speeds is -500 to -100 rpm.
5. Press left (B) or right (C) arrows to set the disc overload speed. Press SELECT (D).
6. Press PROGRAM (A) to exit programming mode or press SELECT (D) to proceed to the next WINDROWER SETUP option.

Figure 5.22: Disc Overload Speed

5.3.4 Setting Hydraulic Overload Pressure

The hydraulic overload pressure setting determines the reported hydraulic pressure at which an overload pressure warning will appear on the cab display module (CDM). This setting can be changed by accessing the OVERLOAD PRESSURE sub-menu in the WINDROWER SETUP menu.

NOTE:

- This procedure requires the installation of the optional hydraulic pressure sensor kit (MD #B5574). For the appropriate overload pressure value, refer to the pressure sensor installation instructions supplied with the kit (MD #169031).
- To enable the hydraulic pressure sensor, refer to *5.8.2 Enabling or Disabling Header Sensors, page 105*.

To set the hydraulic overload pressure setting:

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (C) simultaneously on the cab display module (CDM) to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
   - NO/YES will appear on the lower line.
3. Press right arrow (B) to select YES. Press SELECT (C).
   - SET KNIFE SPEED? will appear.

Figure 5.23: CDM Programming Buttons

4. Press SELECT (D) until OVERLOAD PRESSURE? appears on the upper line.
   - The current overload pressure will appear on lower line.

   NOTE:

   The range of possible pressure settings is 17,237–34,474 kPa (2500–5000 psi).
5. Press left arrow (B) or right arrow (C) to configure the hydraulic overload pressure setting. Press SELECT (D).
6. Press PROGRAM (A) to exit programming mode or press SELECT (D) to proceed to the next WINDROWER SETUP option.

Figure 5.24: Hydraulic Overload Pressure

5.3.5 Setting Header Index Mode

Enabling header index mode in the cab display module (CDM) links the speed of the reel and the draper on draper headers to the windrower's ground speed. It can be configured in the CDM by accessing the HEADER INDEX MODE sub-menu in the WINDROWER SETUP menu.

NOTE:

The header **MUST** be attached to the windrower to perform this procedure. The cab display module (CDM) automatically adjusts its programming for each header.

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (C) simultaneously on the CDM to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
   - NO/YES will appear on the lower line.
3. Press right arrow (B) to select YES. Press SELECT (C).
   - SET KNIFE SPEED? will appear on the upper line.

Figure 5.25: CDM Programming Buttons

4. Press SELECT (D) until HEADER INDEX MODE? appears on the upper line.
   - REEL & CONVEYOR or REEL ONLY will appear on the lower line.
5. Press left arrow (B) or right arrow (C) to set HEADER INDEX mode. Press SELECT (D).
6. Press PROGRAM (A) to exit programming mode or press SELECT (D) to proceed to the next WINDROWER SETUP option.

Figure 5.26: Header Index Mode

5.3.6 Setting Return to Cut Mode

Enabling the return to cut feature in the cab display module (CDM) allows the Operator to make use of height and (optionally) tilt position presets. The return to cut feature can be configured by accessing the RETURN TO CUT MODE sub-menu in the WINDROWER SETUP menu.

NOTE:

The header **MUST** be attached to the windrower to perform this procedure. The cab display module (CDM) automatically adjusts its programming for each header. For more information, refer to *8 Attaching Headers to M Series Windrower, page 147*.

1. Turn the ignition key to the RUN position, or start the engine.

2. Press PROGRAM (A) and SELECT (C) simultaneously on the CDM to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
   - NO/YES will appear on the lower line.
3. Press right arrow (B) to select YES. Press SELECT (C).
   - SET KNIFE SPEED? will appear.

Figure 5.27: CDM Programming Buttons

4. Press SELECT (D) until RETURN TO CUT MODE? appears on the upper line.
   - HEIGHT & TILT or HEIGHT ONLY will appear on the lower line.
5. Press left arrow (B) or right arrow (C) to select RETURN TO CUT MODE. Press SELECT (D).
6. Press PROGRAM (A) to exit programming mode or press SELECT (D) to proceed to the next WINDROWER SETUP option.

Figure 5.28: Return to Cut Mode

5.3.7 Setting Auto Raise Height

Enabling the auto raise height feature in the cab display module (CDM) allows the Operator to raise the header to a preset height by quickly pressing the HEADER UP switch on the ground speed lever (GSL) twice. It can be enabled by accessing the AUTO RAISE HEIGHT sub-menu in the WINDROWER SETUP MENU in the CDM.

NOTE:

The header **MUST** be attached to the windrower to perform this procedure. The cab display module (CDM) automatically adjusts its programming for each header.

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (C) on the CDM to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
   - NO/YES will appear on the lower line.
3. Press right arrow (B) to select YES. Press SELECT (C).
   - SET KNIFE SPEED? will appear on the upper line.

Figure 5.29: CDM Programming Buttons

4. Press SELECT (D) until AUTO RAISE HEIGHT? appears on the upper line.
   - The current auto raise height setting will appear on the lower line.

   NOTE:

   The auto raise height setting ranges from 4.0 (minimum) to 9.5 (maximum), and can be adjusted in increments of 0.5. A setting of 10 disables the auto raise function.
5. Press left arrow (B) or right arrow (C) to change the auto raise height.
6. Press PROGRAM (A) to exit programming mode or press SELECT (D) to proceed to the next WINDROWER SETUP option.

Figure 5.30: Auto Raise Height

5.3.8 Configuring Double Windrow Attachment Controls

Once the Double Windrow Attachment (DWA) is installed on the windrower, it must be configured to work with the windrower's controls. The DWA can be configured in the cab display module's (CDM) WINDROWER SETUP menu.

NOTE:

- The DWA cannot be activated if the swath compressor is enabled.
- This procedure is also applicable to the installation of a drive manifold kit (MD #139508) onto the windrower.

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (C) simultaneously on the cab display module (CDM) to enter programming mode.
   - WINDROWER SETUP? appears on the upper line.
   - NO/YES appears on the lower line.
3. Press right arrow (B) to select YES. Press SELECT (C).
   - SET KNIFE SPEED? appears on the upper line.

Figure 5.31: CDM Programming Buttons

4. Press SELECT (B) until DWA INSTALLED? appears on the upper line.
   - NO/YES appears on the lower line.
5. Press right arrow (A) to select YES. Press SELECT (B).

Figure 5.32: DWA Controls

6. SWAP DWA CONTROLS? appears on the upper line.
   - NO/YES appears on the lower line.

   NOTE:

   This step is necessary to enable the ground speed lever's (GSL) reel fore-aft buttons to control the DWA.

Figure 5.33: DWA Controls

7. Press right arrow (C) to select YES. Press SELECT (D).
   - DWA AUTO UP/DOWN? appears on the upper line.
   - NO/YES appears on the lower line.

   NOTE:

   If YES is selected, the DWA Auto-Up function will be activated by the GSL reel fore-aft button.
8. Press right arrow (C) to select YES. Press SELECT (D).
9. Press PROGRAM (A) to exit programming mode or press SELECT (D) to proceed to the next windrower setup option.

Figure 5.34: DWA Auto Up/Down

5.3.9 Activating Hydraulic Center-Link

1. Turn the ignition key to RUN, or start the engine.
2. Press PROGRAM (A) and SELECT (C) on the cab display module (CDM) to enter programming mode.
   - WINDROWER SETUP? appears on the upper line.
   - NO/YES appears on the lower line.
3. Press right arrow (B) to select YES. Press SELECT (C).
   - SET KNIFE SPEED? is displayed on the upper line.

Figure 5.35: CDM Programming Buttons

4. Press SELECT (C) until TILT CYL INSTALLED? appears on the upper line.
   - NO/YES appears on the lower line.
5. Press right arrow (B) to select YES. Press SELECT (C).
6. Press PROGRAM (A) to exit programming mode or press SELECT (C) to proceed to next WINDROWER SETUP action.

Figure 5.36: Hydraulic Center-Link

5.3.10 Activating Rotary Disc Header Drive Hydraulics

To use a rotary disc header with the windrower, you must activate the header drive hydraulics option on the windrower's cab display module (CDM).

NOTE:

This procedure requires installation of the optional Disc Drive Kit (MD #B4657).

For more information, refer to the rotary disc header operator's manual.

1. In the windrower cab, turn the ignition key to RUN, or start the engine.
2. Press PROGRAM (A) and SELECT (C) on the cab display module (CDM) to enter programming mode.
   - WINDROWER SETUP? appears on the upper line.
   - NO/YES appears on the lower line.
3. Press right arrow (B) to select YES. Press SELECT (C).
   - SET KNIFE SPEED? appears on the upper line.

Figure 5.37: CDM Programming Buttons

4. Press SELECT (C) until DISC BLK INSTALLED? appears on the upper line.
   - NO/YES appears on the lower line.
5. Press right arrow (B) to select YES. Press SELECT (C).

   NOTE:

   When the disc drive kit (MD #B4657) is installed on the windrower, this setting must be YES even if a rotary header is not attached to the windrower.
6. Press PROGRAM (A) to exit programming mode, or press SELECT (C) to proceed to the next WINDROWER SETUP option.

Figure 5.38: Rotary Disc Hydraulics

5.3.11 Setting Header Cut Width

When a header is attached to the windrower, the windrower's computer automatically detects the type of header. However, the windrower is unable to determine the exact size of the header attached, only its type, and therefore defaults to the smallest available cut width for a given model. For example, A Series Auger Headers come in 4.3, 4.9, and 5.5 m (14, 16, and 18 ft.) sizes; if a 4.9 m (16 ft.) header is attached to the windrower, the windrower's computer will set the cut width to 4.3 m (14 ft.). The cut width setting must be manually adjusted in the cab display module (CDM).

NOTE:

- The header **MUST** be attached to the windrower to perform this procedure. The cab display module (CDM) automatically adjusts its programming for each header.
- Header cut width is set to less than the actual header width in order to accurately measure the number of acres cut.

To set the header cut width:

1. Turn the ignition key to RUN, or start the engine.
2. Press PROGRAM (A) and SELECT (C) on the CDM to enter programming mode.
   - WINDROWER SETUP? is displayed on the upper line.
   - NO/YES is displayed on the lower line.
3. Press right arrow (B) to select YES. Press SELECT (C).
   - SET KNIFE SPEED? is displayed.

Figure 5.39: CDM Programming Buttons

4. Press SELECT (D) until HDR CUT WIDTH? #### is displayed on the upper line.
   - Previous cutting width is displayed on the lower line.
5. Press left arrow (B) or right arrow (C) to change the header cut width. Press SELECT (D).
6. Press PROGRAM (A) to exit programming mode or press SELECT (D) to proceed to next WINDROWER SETUP action.

Figure 5.40: Header Cut Width

5.3.12 Activating Swath Compressor

An optional swath compressor (MD #C2061) is available. Before the swath compressor can be used, it must be activated in the cab display module (CDM).

NOTE:

- CDM5 (version 512 or later) and WCM2 (version 237 or later), or WCM3 (version 116 or later), are required to operate the swath compressor.
- The Double Windrow Attachment (DWA) system must be disabled in the CDM when setting up the swath compressor.
- Users can activate and set up the swath compressor via in-cab controls without a header attached to the windrower.

⚠ CAUTION

Check to be sure all bystanders have cleared the area.

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (C) simultaneously on the CDM to enter programming mode.
   - WINDROWER SETUP? appears on the upper line.
   - NO/YES appears on the lower line.
3. Press right arrow (B) to select YES. Press SELECT (C).
   - SET KNIFE SPEED? appears on the upper line.

Figure 5.41: M155 Programming Buttons Shown – M155*E4* Similar

4. Press SELECT (B) until SWATH COMPR INSTALL? appears on the upper line.
   - NO/YES appears on the lower line.
5. Press right arrow (A) to select YES. Press SELECT (B).
6. Press SELECT (B) until CALIBRATE SENSORS appears on the upper line. NO/YES appears on the lower line.
7. Press right arrow (A) to select YES. Press SELECT (B).
   - TO CALIBRATE SELECT appears on the upper line.
   - HEADER HEIGHT appears on the lower line.
8. Press right arrow (A) to scroll through choices until SWATH COMPR HT appears. Press SELECT (B).
   - SWATH SENSOR CAL appears on the upper line.
   - SWATH UP TO START appears on the lower line.
9. Press switch (A) on the console to raise the swath compressor.
   - CALIBRATING SWATH appears on the upper line.
   - The messages FORM UP and HOLD (HOLD will be flashing) appear, and will remain on the lower line until the system has received a signal from the fully-raised swath compressor.
   - The messages SWATH FORM UP and DONE (accompanied by a buzzer tone) will appear on the lower line when the calibration procedure is complete.
   - SWATH SENSOR CAL appears on the upper line.
   - PRESS SWATH DOWN appears on the lower line.

Figure 5.42: M155 Swath Compressor Controls Shown – M155*E4* Similar

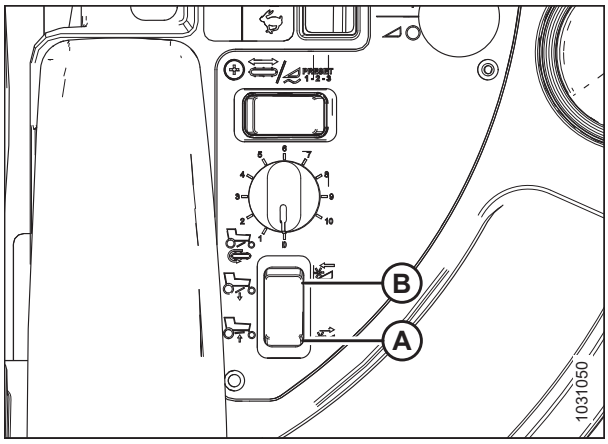


Figure 5.43: Swath Compressor Switch

10. Press switch (B) on the console to lower the swath compressor.
    - CALIBRATING SWATH appears on the upper line.
    - The messages FORM DOWN and HOLD appear on the lower line.
    - SWATH FORM COMPLETE flashes for two seconds on the lower line (accompanied by a buzzer tone) when the calibration procedure is complete.
11. Press PROGRAM (A) to exit programming mode or press SELECT (B) to proceed to the next windrower setup option.

Figure 5.44: M155 CDM Programming Buttons Shown – M155*E4* Similar

5.3.13 Activating Hay Conditioner

The HC10 Hay Conditioner feature must be enabled in the windrower's cab display module (CDM) before it can be used. The HAY CONDITIONER sub-menu can be accessed from the CDM's WINDROWER SETUP menu.

NOTE:

- This procedure applies to windrowers with an attached draper header only.
- The header **MUST** be attached to the windrower to perform this procedure. The cab display module (CDM) automatically adjusts its programming for each header. For more information, refer to *8 Attaching Headers to M Series Windrower, page 147*.

To activate the hay conditioner:

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (C) on the CDM to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
   - NO/YES will appear on the lower line.
3. Press right arrow (B) to select YES. Press SELECT (C).
   - SET KNIFE SPEED? will appear on the upper line.

Figure 5.45: CDM Programming Buttons

4. Press SELECT (C) until HAY CONDITIONER? appears on the upper line.
   - NO/YES will appear on the lower line.
5. Press right arrow (B) to select YES. Press SELECT (C).
6. Press PROGRAM (A) to exit programming mode or press SELECT (C) to proceed to the next WINDROWER SETUP option.

Figure 5.46: Hay Conditioner

5.3.14 Displaying Reel Speed

The preferred header reel speed can be set by accessing the HEADER REEL SPEED sub-menu in the WINDROWER SETUP menu in the windrower's cab display module (CDM).

NOTE:

- This procedure applies to windrowers with an attached draper or auger header only.
- The header **MUST** be attached to the windrower to perform this procedure. The cab display module (CDM) automatically adjusts its programming for each header. For more information, refer to *8 Attaching Headers to M Series Windrower, page 147*.

To display the header's reel speed:

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (C) on the CDM to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
   - NO/YES will appear on the lower line.
3. Press right arrow (B) to select YES. Press SELECT (C).
   - SET KNIFE SPEED? will appear on the upper line.

Figure 5.47: CDM Programming Buttons

4. Press SELECT (D) until HEADER REEL SPEED? appears on the upper line.
   - RPM/MPH or RPM/KPH will appear on the lower line.
5. Press left arrow (B) or right arrow (C) to select either IMPERIAL or METRIC units. Press SELECT (D).
6. Press PROGRAM (A) to exit programming mode or press SELECT (D) to proceed to the next WINDROWER SETUP option.

Figure 5.48: Reel Speed Display

5.3.15 Setting Tire Size

The windrower's tire size must be correctly configured in the cab display module (CDM) for the windrower's ground speed to be reported accurately. This setting can be configured by accessing the SET TIRE SIZE sub-menu in the WINDROWER SETUP menu.

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (C) on the cab display module (CDM) to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
   - NO/YES will appear on the lower line.
3. Press right arrow (B) to select YES. Press SELECT (C).
   - SET KNIFE SPEED? will appear on the upper line.

Figure 5.49: CDM Programming Buttons

4. Press SELECT (D) until SET TIRE SIZE? appears on the upper line.
   - The current tire size setting will appear on the lower line.

   NOTE:

   The following tire size options are available:

   - 18.4 x 26 TURF
   - 18.4 x 26 BAR
   - 23.1 x 26 TURF
   - 600 – 65 R28
5. Press left arrow (B) or right arrow (C) and select the desired tire size. Press SELECT (D).
6. Press PROGRAM (A) to exit programming mode or press SELECT (D) to proceed to the next WINDROWER SETUP option.

Figure 5.50: Tire Size

5.3.16 Setting Engine Intermediate Speed Control

The engine's Intermediate Speed Control (ISC) feature provides three selectable engine speeds (1900, 2050, or 2200 rpm) for reduced load conditions. This setting can be configured in the windrower's cab display module (CDM) by accessing the WINDROWER SETUP menu.

NOTE:

The engine **MUST** be running for this procedure to be performed.

1. Start the engine.
2. Press PROGRAM (A) and SELECT (C) on the cab display module (CDM) to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
   - NO/YES will appear on the lower line.
3. Press right arrow (B) to select YES. Press SELECT (C).
   - SET KNIFE SPEED? will appear on the upper line.

Figure 5.51: CDM Programming Buttons

4. Press SELECT (B) until SET ENGINE ISC RPM? appears on the upper line.
   - NO/YES will appear on the lower line.
5. Press right arrow (A) to select YES. Press SELECT (B).
   - PRESS HAZARD TO SET will appear on the upper line.
   - ISC RPM #### will appear on the lower line.

Table 5.1 ISC Settings

ISC and rpm		
Off[5]	1	2
High Idle	2050	1900

NOTE:

The previously selected ISC setting will flash.

6. Press right arrow (C) to cycle between the setting options. Press HAZARD (B) to confirm the desired setting.
7. Press SELECT (D).
   - EXIT ENGINE ISC? will appear on the upper line.
   - NO/YES will appear on the lower line.
8. Press right arrow (C) to select YES. Press SELECT (D).
9. Press PROGRAM (A) to exit programming mode.

Figure 5.52: Engine ISC RPM

Figure 5.53: ISC RPM

5. Off is always used when the header is not engaged.

5.3.17 Clearing Sub-Acres

The windrower has two counters for acres: one counter tracks the total number of acres harvested during the machine's lifetime, while the other counter tracks the acres harvested during individual harvesting instances. The sub-acre counter can be reset to zero as needed by accessing the SUB-ACRES menu in the windrower's cab display module (CDM).

1. With the key in the ON position and the operator's station in cab-forward mode, press SELECT until SUB-ACRES appears on the bottom line.
2. Press and hold PROGRAM button (A) until the counter is reset to zero.

Figure 5.54: Cab Display Module (CDM)

5.4 Activating Cab Display Lockouts

Some header configuration settings in the windrower's cab display module (CDM) can be locked, so that Operators lacking the proper authorization will be unable to change these settings. Use this feature to keep header settings constant when there are multiple Operators operating the windrower.

NOTE:

FUNCTION LOCKED will appear on the CDM when a header function switch which has been locked out is pressed.

5.4.1 Activating Header Tilt Control Lockout

Enabling the header tilt control lockout in the windrower's cab display module (CDM) prevents unauthorized Operators from changing the angle of the attached header.

NOTE:

- The header **MUST** be attached to the windrower to perform this procedure. The cab display module (CDM) automatically adjusts its programming for each header.

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (C) on the CDM to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
   - NO/YES will appear on the lower line.
3. Press right arrow (B) to select YES. Press SELECT (C).
   - SET KNIFE SPEED? will appear on the upper line.

Figure 5.55: CDM Programming Buttons

4. Press SELECT (B) until SET CONTROL LOCKS? appears on the upper line.
   - NO/YES will appear on the lower line.
5. Press right arrow (A) to select YES. Press SELECT (B).

Figure 5.56: Control Locks

6. Press SELECT (D) until HEADER TILT appears on the upper line.
   - ENABLED/LOCKED will appear on the lower line.
7. Press left arrow (B) to enable the use of the HEADER TILT control switch.

   Press right arrow (C) to lock the HEADER TILT control switch.
8. Press PROGRAM (A) to exit programming mode, or press SELECT (D) to proceed to the next WINDROWER SETUP option.

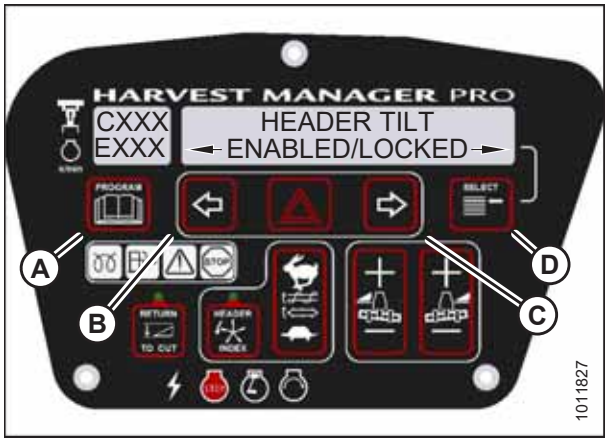


Figure 5.57: Header Tilt Control Lock

5.4.2 Activating Header Float Control Lockout

Enabling the header float control lockout in the windrower's cab display module (CDM) prevents unauthorized Operators from changing the float setting of the attached header.

NOTE:

The header **MUST** be attached to the windrower to perform this procedure. The cab display module (CDM) automatically adjusts its programming for each header.

For more information, refer to *8 Attaching Headers to M Series Windrower, page 147*.

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (C) on the cab display module (CDM) to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
   - NO/YES will appear on the lower line.
3. Press right arrow (B) to select YES. Press SELECT (C).
   - SET KNIFE SPEED? will appear on the upper line.

Figure 5.58: CDM Programming Buttons

4. Press SELECT (B) until SET CONTROL LOCKS? appears on the upper line.
   - NO/YES will appear on the lower line.
5. Press right arrow (A) to select YES. Press SELECT (B).

Figure 5.59: Control Locks

6. Press SELECT (D) until HEADER FLOAT appears on the upper line.
   - ENABLED/LOCKED will appear on the lower line.
7. Press left arrow (B) to enable the HEADER FLOAT control switch, or press right arrow (C) to lock the HEADER FLOAT control switch.
8. Press PROGRAM (A) to exit programming mode or press SELECT (D) to proceed to the next WINDROWER SETUP option.

Figure 5.60: Header Float Control Lock

5.4.3 Activating Reel Fore-Aft Control Lockout

Enabling the header reel fore-aft control lockout in the windrower's cab display module (CDM) prevents unauthorized Operators from changing the reel fore-aft setting of the attached header.

NOTE:

- This procedure applies to windrowers with attached draper headers only.
- The header **MUST** be attached to the windrower to perform this procedure. The cab display module (CDM) automatically adjusts its programming for each header.

To activate the reel fore-aft control lockout:

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (C) simultaneously on the CDM to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
   - NO/YES will appear on the lower line.
3. Press right arrow (B) to select YES. Press SELECT (C).
   - SET KNIFE SPEED? will appear on the upper line.

Figure 5.61: CDM Programming Buttons

4. Press SELECT (B) until SET CONTROL LOCKS? appears on the upper line.
   - NO/YES will appear on the lower line.
5. Press right arrow (A) to select YES. Press SELECT (B).

Figure 5.62: Control Locks

6. Press SELECT (D) until REEL FORE/AFT appears on the upper line.
   - ENABLED/LOCKED will appear on the lower line.
7. Press left arrow (B) to enable the REEL FORE/AFT control switch.

   Press right arrow (C) to lock the REEL FORE/AFT control switch.
8. Press PROGRAM (A) to exit programming mode, or press SELECT (D) to proceed to the next WINDROWER SETUP option.

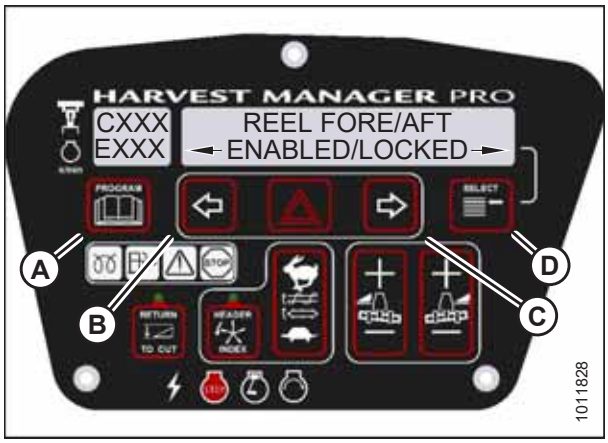


Figure 5.63: Reel Fore-Aft Control Lock

5.4.4 Activating Draper Speed Control Lockout

Enabling the header draper speed control lockout in the windrower's cab display module (CDM) prevents unauthorized Operators from changing the draper speed setting of the attached header.

NOTE:

- This procedure applies to windrowers with attached draper headers only.
- The header **MUST** be attached to the windrower to perform this procedure. The cab display module (CDM) automatically adjusts its programming for each header.

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (C) on the CDM to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
   - NO/YES will appear on the lower line.
3. Press right arrow (B) to select YES. Press SELECT (C).
   - SET KNIFE SPEED? will appear on the upper line.

Figure 5.64: CDM Programming Buttons

4. Press SELECT (B) until SET CONTROL LOCKS? appears on the upper line.
   - NO/YES will appear on the lower line.
5. Press right arrow (A) to select YES. Press SELECT (B).

Figure 5.65: Control Locks

6. Press SELECT (D) until DRAPER SPEED appears on the upper line.
   - ENABLED/LOCKED will appear on the lower line.
7. Press left arrow (B) to enable the DRAPER SPEED control switch, or press right arrow (C) to lock the DRAPER SPEED control switch.
8. Press PROGRAM (A) to exit programming mode or press SELECT (D) to proceed to the next WINDROWER SETUP option.

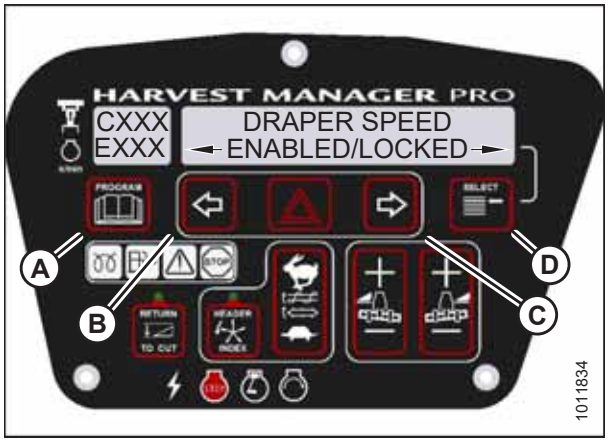


Figure 5.66: Draper Control Lock

5.4.5 Activating Auger Speed Control Lockout

Enabling the auger speed control lockout in the windrower's cab display module (CDM) prevents unauthorized Operators from changing the auger speed of the attached header.

NOTE:

- This procedure applies to windrowers with attached A40D Auger Headers only.
- An auger header **MUST** be attached to the windrower to perform this procedure. The cab display module (CDM) automatically adjusts its programming for each header.

To activate the auger speed control lockout:

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (C) on the CDM to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
   - NO/YES will appear on the lower line.
3. Press right arrow (B) to select YES. Press SELECT (C).
   - SET KNIFE SPEED? will appear on the upper line.

Figure 5.67: CDM Programming Buttons

4. Press SELECT (B) until SET CONTROL LOCKS? appears on the upper line.
   - NO/YES will appear on the lower line.
5. Press right arrow (A) to select YES. Press SELECT (B).

Figure 5.68: Control Locks

6. Press SELECT (D) until AUGER SPEED appears on the upper line.
   - ENABLED/LOCKED will appear on the lower line.
7. Press left arrow (B) to enable the AUGER SPEED control switch.

   Press right arrow (C) to lock the AUGER SPEED control switch.
8. Press PROGRAM (A) to exit programming mode, or press SELECT (D) to proceed to the next WINDROWER SETUP option.

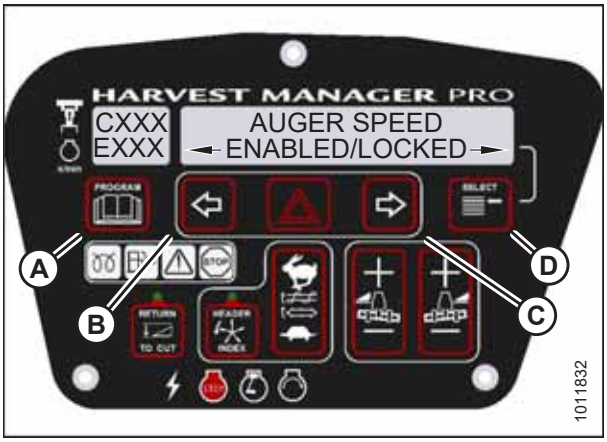


Figure 5.69: Auger Control Lock

5.4.6 Activating Knife Speed Control Lockout

Enabling the header knife speed control lockout in the windrower's cab display module (CDM) prevents unauthorized Operators from changing the knife speed of the attached header.

NOTE:

The header **MUST** be attached to the windrower to perform this procedure. The cab display module (CDM) automatically adjusts its programming for each header.

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (C) simultaneously on the CDM to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
   - NO/YES will appear on the lower line.
3. Press right arrow (B) to select YES. Press SELECT (C).
   - SET KNIFE SPEED? will appear on the upper line.

Figure 5.70: CDM Programming Buttons

4. Press SELECT (B) until SET CONTROL LOCKS? appears on the upper line.
   - NO/YES will appear on the lower line.
5. Press right arrow (A) to select YES. Press SELECT (B).

Figure 5.71: Control Locks

6. Press SELECT (D) until KNIFE SPEED appears on the upper line.
   - ENABLED/LOCKED will appear on the lower line.
7. Press left arrow (B) to enable the KNIFE SPEED control switch, or press right arrow (C) to lock the KNIFE SPEED control switch.
8. Press PROGRAM (A) to exit programming mode or press SELECT (D) to proceed to the next WINDROWER SETUP option.

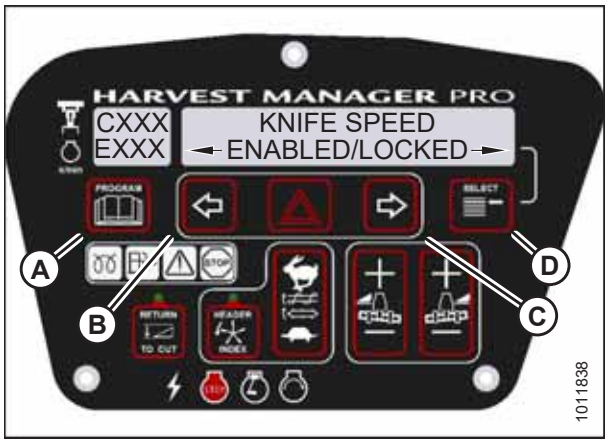


Figure 5.72: Knife Speed Control Lock

5.4.7 Activating Rotary Disc Speed Control Lockout

Enabling the rotary disc speed control lockout in the windrower's cab display module (CDM) prevents unauthorized Operators from changing the disc speed of the attached rotary header.

NOTE:

- This procedure applies to windrowers with attached rotary disc headers only.
- The header **MUST** be attached to the windrower to perform this procedure. The cab display module (CDM) automatically adjusts its programming for each header.

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (C) simultaneously on the CDM to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
   - NO/YES will appear on the lower line.
3. Press right arrow (B) to select YES. Press SELECT (C).
   - SET KNIFE SPEED? will appear on the upper line.

Figure 5.73: CDM Programming Buttons

4. Press SELECT (B) until SET CONTROL LOCKS? appears on the upper line.
   - NO/YES will appear on the lower line.
5. Press right arrow (A) to select YES. Press SELECT (B).

Figure 5.74: Control Locks

6. Press SELECT (D) until DISK SPEED appears on the upper line.
   - ENABLED/LOCKED will appear on the lower line.
7. Press left arrow (B) to enable the DISK SPEED control switch, or press right arrow (C) to lock the DISK SPEED control switch.
8. Press PROGRAM (A) to exit programming mode or press SELECT (D) to proceed to the next WINDROWER SETUP option.

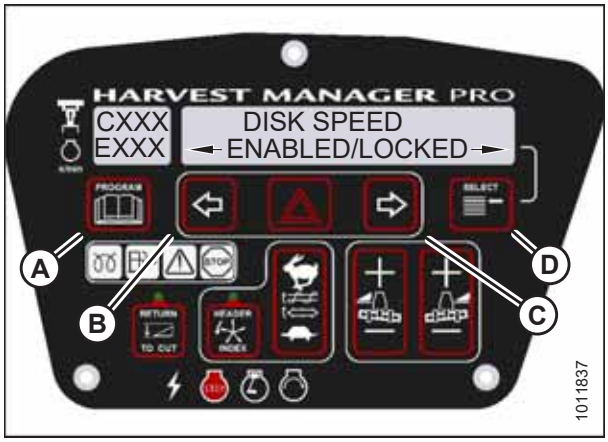


Figure 5.75: Disc Speed Control Lock

5.4.8 Activating Reel Speed Control Lockout

Enabling the reel speed control lockout in the windrower's cab display module (CDM) prevents unauthorized Operators from changing the reel speed of the attached rotary header.

NOTE:

This procedure applies to windrowers with attached draper headers only.

NOTE:

The header **MUST** be attached to the windrower to perform this procedure. The cab display module (CDM) automatically adjusts its programming for each header.

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (C) simultaneously on the CDM to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
   - NO/YES will appear on the lower line.
3. Press right arrow (B) to select YES. Press SELECT (C).
   - SET KNIFE SPEED? will appear on the upper line.

Figure 5.76: CDM Programming Buttons

4. Press SELECT (B) until SET CONTROL LOCKS? appears on the upper line.
   - NO/YES will appear on the lower line.
5. Press right arrow (A) to select YES. Press SELECT (B).

Figure 5.77: Control Locks

6. Press SELECT (D) until REEL SPEED appears on the upper line.
   - ENABLED/LOCKED will appear on the lower line.
7. Press left arrow (B) to enable the REEL SPEED control switch.

   Press right arrow (C) to lock the REEL SPEED control switch.
8. Press PROGRAM (A) to exit programming mode, or press SELECT (D) to proceed to the next WINDROWER SETUP option.

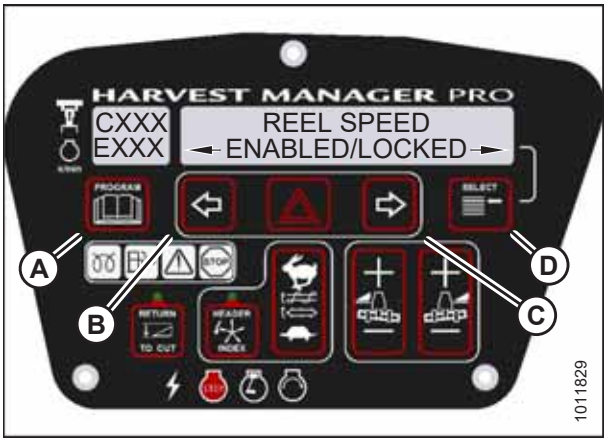


Figure 5.78: Reel Speed Control Lock

5.5 Displaying Active Cab Display Lockouts

The Operator can generate a list of all windrower features which have been locked out by accessing the cab display module's (CDM) VIEW CONTROL LOCKS sub-menu.

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (C) simultaneously on the CDM to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
   - NO/YES will appear on the lower line.
3. Press right arrow (B) to select YES. Press SELECT (C).
   - SET KNIFE SPEED? will appear on the upper line.

Figure 5.79: CDM Programming Buttons

4. Press SELECT (B) until VIEW CONTROL LOCKS? appears on the upper line.
   - NO/YES will appear on the lower line.
5. Press right arrow (A) to select YES. Press SELECT (B).

   HEADER TILT will appear on the upper line.
   - The control switch status will appear on the lower line. The hours displayed indicate when a switch was enabled or locked.

Figure 5.80: Control Locks

6. Press left arrow (B) or right arrow (C) to cycle between control switch lockouts. The displayed control switches are as follows:
   - HEADER TILT
   - HEADER FLOAT
   - REEL FORE/AFT
   - DRAPER SPEED
   - AUGER SPEED
   - KNIFE SPEED
   - DISK SPEED
   - REEL SPEED

   NOTE:

   Not all control lock options apply to every type of header.

Figure 5.81: Control Locks

7. Press SELECT (D).
   - EXIT VIEW LOCKOUTS? will appear on the upper line.
   - NO/YES will appear on the lower line.
8. Press right (C) to select YES.
9. Press PROGRAM (A) to exit programming mode or press SELECT (D) to proceed to the next WINDROWER SETUP option.

Figure 5.82: Control Locks

5.6 Calibrating Header Sensors

When a new header is attached to the windrower, the header's sensors must be calibrated using the cab display module (CDM) so that their output can be correctly interpreted by the windrower control module (WCM).

5.6.1 Calibrating Header Height Sensor

The header height sensor can be calibrated by accessing the cab display module's (CDM) WINDROWER SETUP menu. The calibration procedure must be completed for the sensor to be correctly calibrated.

NOTE:

- The header must be attached to the windrower to perform this procedure. The cab display module (CDM) automatically adjusts its configuration for each header type.
- The engine must be running to perform this procedure.

DANGER

Ensure that all bystanders have cleared the area.

To calibrate the header height sensor:

1. Start the engine.
2. Press PROGRAM (A) and SELECT (B) on the CDM to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
3. Press SELECT (B) until CALIBRATE SENSORS? appears on the upper line.
   - NO/YES will appear on the lower line.

Figure 5.83: CDM Programming Buttons

4. Press right arrow (B) to select YES. Press SELECT (C).
   - TO CALIBRATE SELECT will appear on the upper line.
5. Press left arrow (A) or right arrow (B) until HEADER HEIGHT appears on the lower line. Press SELECT (C).
   - CALIBRATING HEIGHT will appear on the upper line.
   - RAISE HEADER HOLD will appear on the lower line.

Figure 5.84: Header Height Calibration

6. Press and hold HEADER UP button (A) on the ground speed lever (GSL).
   - CALIBRATING HEIGHT will appear on the upper line.
   - RAISE HEADER HOLD will appear on the lower line.

   NOTE:

   The word HOLD will flash during calibration. RAISE HEADER DONE will display on the lower line once calibration is complete.

7. Release HEADER UP button (A).
   - HEIGHT SENSOR CAL will appear on the upper line.
   - PRESS LOWER HEADER will appear on the lower line.

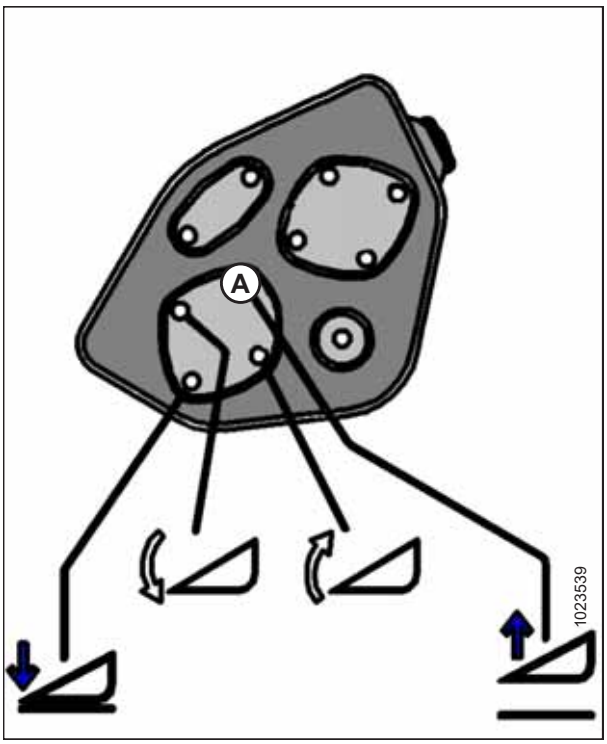


Figure 5.85: Header Height Controls on GSL

8. Press and hold HEADER DOWN button (A) on the GSL.

   NOTE:

   The word HOLD will flash during calibration. HT SENSOR COMPLETE will display on the lower line once calibration is complete.

9. Release HEADER DOWN button (A).
   - TO CALIBRATE SELECT will appear on the upper line.
   - HEADER HEIGHT will appear on the lower line.

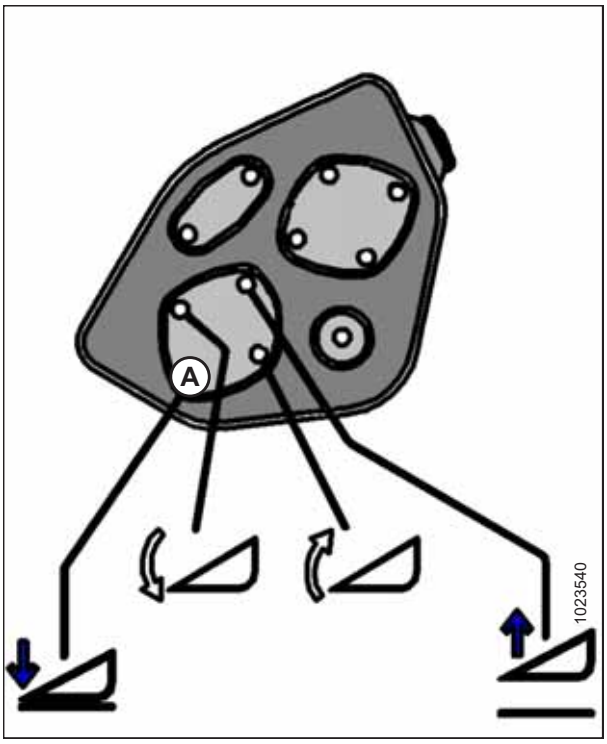


Figure 5.86: Header Height Controls on GSL

10. Press the right arrow to select the next header sensor calibration or select STOP & EXIT. Press SELECT.
11. Press PROGRAM to exit programming mode.

5.6.2 Calibrating Header Tilt Sensor

The header tilt sensor can be calibrated by accessing the cab display module's (CDM) WINDROWER SETUP menu. The calibration procedure must be completed for the sensor to be correctly calibrated.

NOTE:

- The header must be attached to the windrower to perform this procedure. The cab display module (CDM) automatically adjusts its programming for each header.
- The engine must be running to perform this procedure.

WARNING

Check to be sure all bystanders have cleared the area.

1. Start the engine.
2. Press PROGRAM (A) and SELECT (B) simultaneously on the CDM to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
3. Press SELECT (B) until CALIBRATE SENSORS? appears on the upper line.
   - NO/YES will appear on the lower line.

Figure 5.87: CDM Programming Buttons

4. Press right arrow (B) to select YES. Press SELECT (C).
   - TO CALIBRATE SELECT will appear in the upper line.
5. Press left arrow (A) or right arrow (B) until HEADER TILT appears on the lower line. Press SELECT (C).
   - HDR TILT SENSOR CAL will appear on the upper line.
   - EXTEND TILT TO START will appear on the lower line.

Figure 5.88: Header Tilt Calibration

6. Press and hold HEADER TILT EXTEND button (A) on the ground speed lever (GSL).
   - CALIBRATING TILT will appear on the upper line.
   - EXTEND TILT HOLD will appear on the lower line.

   NOTE:

   The word HOLD will flash during calibration. HEADER TILT DONE will display on the lower line once calibration is complete.

7. Release HEADER TILT EXTEND button (A).
   - HEADER TILT SENSOR CAL will appear on the upper line.
   - PRESS RETRACT TILT will appear on the lower line.

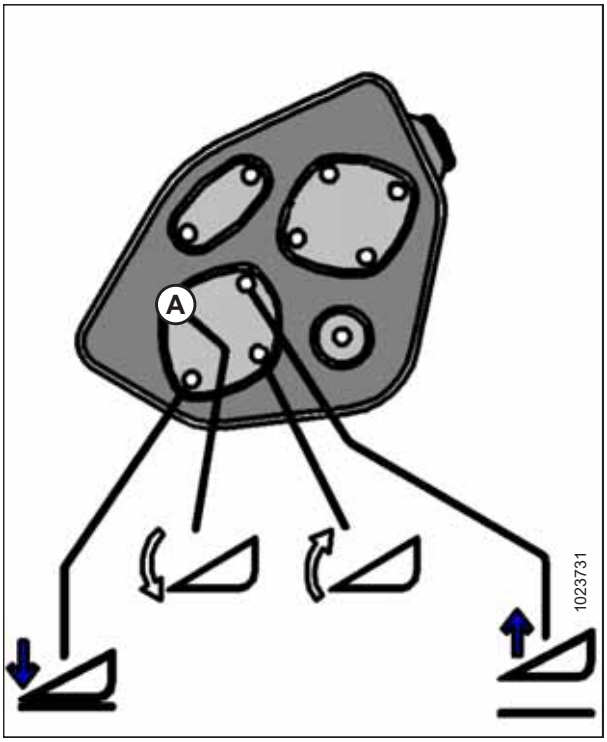


Figure 5.89: Header Tilt Controls on GSL

8. Press and hold HEADER TILT RETRACT button (A) on the GSL.
   - CALIBRATING TILT will appear on the upper line.
   - RETRACT TILT HOLD will appear on the lower line.

   NOTE:

   The word HOLD will flash during calibration. HEADER TILT COMPLETE will display on the lower line once calibration is complete.

9. Release HEADER TILT RETRACT button (A).
   - TO CALIBRATE SELECT will appear on the upper line.
   - HEADER TILT will appear on the lower line.

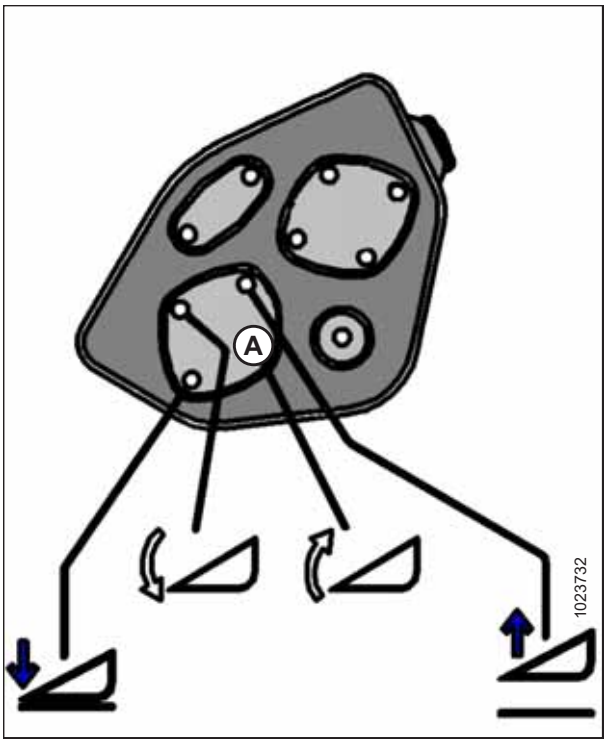


Figure 5.90: Header Tilt Controls on GSL

10. Press the right arrow to select the next header sensor calibration or select STOP & EXIT. Press SELECT.
11. Press PROGRAM to exit programming mode.

5.6.3 Calibrating Header Float Sensors

The header float sensors can be calibrated by accessing the cab display module's (CDM) WINDROWER SETUP menu. The calibration procedure must be completed for the sensors to be correctly calibrated.

NOTE:

- The header must be attached to the windrower to perform this procedure. The cab display module (CDM) automatically adjusts its programming for each header.
- Use the left or right FLOAT buttons on the CDM to perform this procedure.

WARNING

Check to be sure all bystanders have cleared the area.

IMPORTANT:

Ensure that float pins (A) are installed in the working position.

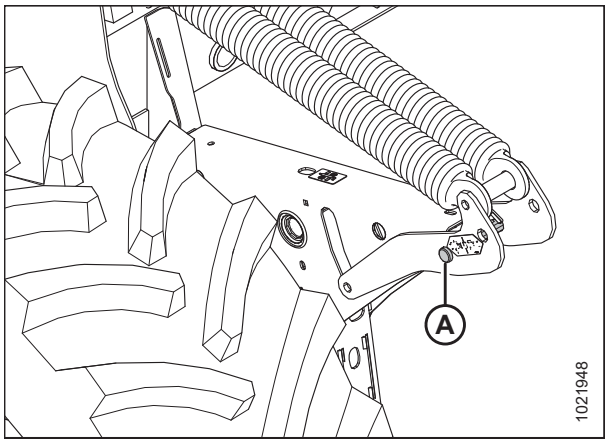


Figure 5.91: Float Pin – Right Side

1. Start the engine.
2. Press PROGRAM (A) and SELECT (B) simultaneously on the CDM to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
3. Press SELECT (B) until CALIBRATE SENSORS? appears on the upper line.
   - NO/YES will appear on the lower line.

Figure 5.92: CDM Programming Buttons

4. Press right arrow (B) to select YES. Press SELECT (C).
   - TO CALIBRATE SELECT will appear on the upper line.
5. Press left arrow (A) or right arrow (B) until HEADER FLOAT appears on the lower line. Press SELECT (C).
   - CALIBRATING FLOAT will appear on the upper line.
   - PRESS FLOAT + TO START will appear on the lower line.

Figure 5.93: Header Float Display

6. Press and hold FLOAT + button (A) on the CDM.
   - CALIBRATING FLOAT will appear on the upper line.
   - FLOAT (+) HOLD will appear on the lower line.

   NOTE:

   The word HOLD will flash during calibration. FLOAT (+) DONE will appear on the lower line once calibration is complete.
7. Release FLOAT + button (A).
   - CALIBRATING FLOAT will appear on the upper line.
   - FLOAT (–) HOLD will appear on the lower line.

Figure 5.94: Positive Header Float Display

8. Press and hold FLOAT – button (A) on the CDM.
   - CALIBRATING FLOAT will appear on the upper line.
   - FLOAT (–) HOLD will appear on the lower line.

   NOTE:

   The word HOLD will flash during calibration. HDR FLOAT COMPLETE will appear on the lower line once calibration is complete.
9. Release FLOAT – button (A).
   - TO CALIBRATE SELECT will appear on the upper line.
   - HEADER FLOAT will appear on the lower line.

Figure 5.95: Negative Header Float Display

10. Press the right arrow to select the next header sensor calibration or select STOP & EXIT. Press SELECT.
11. Press PROGRAM to exit programming mode.

5.7 Calibrating Swath Compressor Sensor

The swath compressor's sensor can be calibrated by accessing the cab display module's (CDM) WINDROWER SETUP menu. The calibration procedure must be completed for the sensor to be correctly calibrated. This procedure applies only to windrowers equipped with a swath compressor.

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (B) simultaneously on the cab display module (CDM) to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
3. Press SELECT (B) until CALIBRATE SENSORS? appears on the upper line.
   - NO/YES will appear on the lower line.

Figure 5.96: CDM Programming Buttons

4. Press right arrow (A) to select YES. Press SELECT (B).
   - TO CALIBRATE SELECT will appear on the upper line.
5. Press right arrow (A) to scroll through the choices until SWATH COMPR HT appears on the lower line. Press SELECT (B).
   - SWATH SENSOR CAL will appear on the upper line.
   - SWATH UP TO START will appear on the lower line.

Figure 5.97: Swath Compressor Sensor Calibration

6. Press and hold button (B) to raise the swath compressor.
   - CALIBRATING SWATH will appear on the upper line.
   - The messages FORM UP and HOLD (this message will flash) will appear on the lower line and will remain until the system has received a signal from the swath compressor indicating that it has risen fully.
   - SWATH FORM UP DONE (accompanied by a buzzer tone) will appear on the lower line when the process is complete.

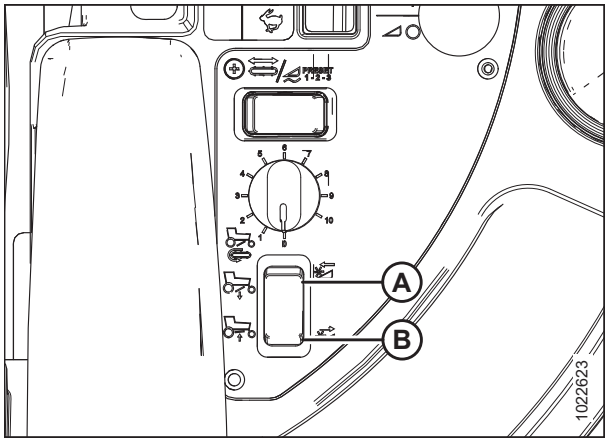


Figure 5.98: Swath Compressor Controls

A - Lower Swath Compressor
B - Raise Swath Compressor

- SWATH SENSOR CAL will appear on the upper line.
- PRESS SWATH DOWN will appear on the lower line.

Figure 5.99: Swath Compressor Sensor Calibration

7. Press and hold button (A) to lower the swath compressor.
   - CALIBRATING SWATH will appear on the upper line.
   - The messages FORM DOWN and HOLD (this message will flash) will appear on the lower line.
   - SWATH FORM COMPLETE will appear for two seconds on the lower line (accompanied by a buzzer tone) when the calibration procedure is complete.
8. Press PROGRAM to exit programming mode.

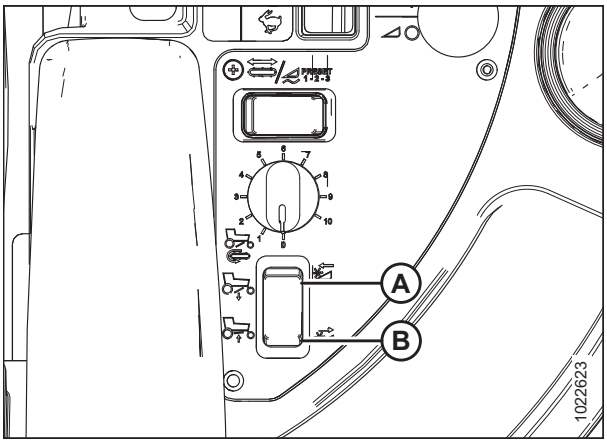


Figure 5.100: Swath Compressor Controls

A - Lower Swath Compressor
B - Raise Swath Compressor

5.8 Troubleshooting Windrower Problems

The cab display module (CDM) is a useful troubleshooting tool, providing information about sensor status and error codes.

5.8.1 Displaying Windrower and Engine Error Codes

The cab display module (CDM) stores any error codes that occur. Follow this procedure to review the CDM's stored error codes.

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (B) simultaneously on the CDM to enter programming mode. Press SELECT (B).
   - WINDROWER SETUP? will appear on the upper line.
3. Press SELECT (B) until DIAGNOSTIC MODE? appears on the upper line.
   - NO/YES will appear on the lower line.

Figure 5.101: CDM Programming Buttons

4. Press right arrow (A) to select YES. Press SELECT (B).
5. VIEW ERROR CODES? will appear on the upper line.
   - NO/YES will appear on the lower line.
6. Press right arrow (A) to select YES. Press SELECT (B).
   - VIEW WINDRWR CODES? will appear on the upper line.
   - NO/YES will appear on the lower line.

Figure 5.102: Diagnostic Functions

7. Press right arrow (A) to select YES. Press SELECT (C).
   - The most recent error code will appear.
8. Press right arrow (A) or left arrow (B) to cycle through the last ten recorded windrower error codes until EXIT WINDROWER CODES appears.
9. Press right arrow (A) to select YES. Press SELECT (C).
   - VIEW ENGINE CODES will appear on the upper line.
   - NO/YES will appear on the lower line.

Figure 5.103: Windrower Codes

10. Press right arrow (C) to select YES. Press SELECT (D).
11. Press left arrow (B) or right arrow (C) to cycle through the last ten recorded engine error codes until EXIT ENGINE CODES appears.
12. Press right arrow (C) to select YES. Press SELECT (D).
13. Press PROGRAM (A) to exit programming mode or press SELECT (D) to proceed to the next diagnostic option.

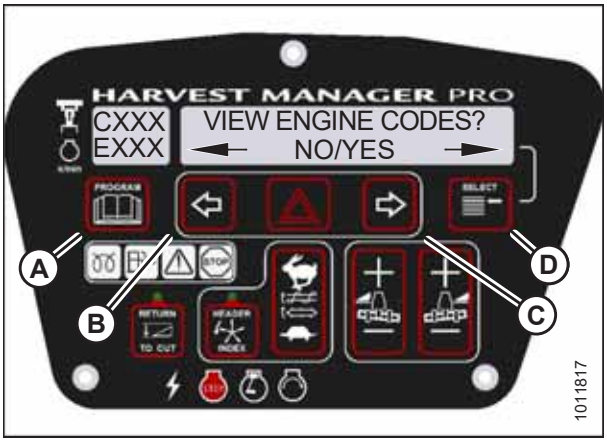


Figure 5.104: Engine Codes

5.8.2 Enabling or Disabling Header Sensors

You can selectively enable or disable specific header sensors using the windrower's cab display module (CDM).

NOTE:

- The header must be attached to the windrower to perform this procedure. The CDM automatically adjusts its programming for each header.
- Disabled sensors generate the flashing message SENSOR on the CDM during regular operation, indicating that output from this sensor has been suppressed.

To enable or disable certain header sensors:

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (C) on the CDM to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
   - NO/YES will appear on the lower line.
3. Press SELECT (C) until DIAGNOSTIC MODE? will appear on the upper line.
   - NO/YES will appear on the lower line.
4. Press right arrow (B) to select YES. Press SELECT (C).
   - VIEW ERROR CODES? will appear on the upper line.

Figure 5.105: CDM Programming Buttons

5. Press SELECT (B) until ENTER SENSOR SETUP? appears on the upper line.
   - NO/YES will appear on the lower line.
6. Press right arrow (A) to select YES. Press SELECT (B).
   - KNIFE SPEED SENSOR will appear on the lower line.
   - ENABLE/DISABLE will appear on the lower line.

Figure 5.106: Diagnostic Functions

7. Press left arrow (B) to enable the selected sensor. Press right arrow (C) to disable the selected sensor. Press SELECT (D) to confirm your selection and to proceed to the next sensor.

   These sensors can be enabled or disabled:
   - HEADER HT SENSOR
   - HEADER TILT SENSOR
   - KNIFE SPEED SENSOR
   - REEL SPEED SENSOR
   - HEADER FLOAT SENSOR
   - OVERLOAD PRESSURE SENSOR[6]
   - HYD OIL TEMP SENSOR

   Press SELECT (D) to display the EXIT SENSOR SETUP? selection.
8. Press right arrow (C) to select YES. Press SELECT.
9. Press PROGRAM (A) to exit programming mode or press SELECT to proceed to the next diagnostic option.

Figure 5.107: Header Sensors

5.8.3 Displaying Header Sensor Input Signals

Review the output voltage from individual header sensors by accessing the DIAGNOSTIC MODE sub-menu in the WINDROWER SETUP menu in the windrower's cab display module (CDM).

NOTE:

The header must be attached to the windrower to perform this procedure. The CDM automatically adjusts its programming for each header.

6. Requires installation of optional pressure sensor (MD #B5574).

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (B) simultaneously on the CDM to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.
   - NO/YES will appear on the lower line.

Figure 5.108: CDM Programming Buttons

3. Press SELECT (B) until DIAGNOSTIC MODE? appears on the upper line.
   - NO/YES will appear on the lower line.
4. Press right arrow (A) to select YES. Press SELECT (B).
   - VIEW ERROR CODES? will appear on the upper line.
5. Press SELECT (B) until READ SENSOR SETUP? appears on the upper line.
   - NO/YES will appear on the lower line.

Figure 5.109: Diagnostic Functions

6. Press right arrow (C) to select YES. Press SELECT (D).
   - SENSOR INPUT will appear on the upper line.
   - HDR HEIGHT 1.23 V will appear on the lower line.
7. Press left arrow (B) or right arrow (C) to review the outputs from different sensors.
8. Press SELECT (D) to skip to EXIT READ SENSORS? selection.
9. Press right arrow (C) to select YES. Press SELECT.
10. Press PROGRAM (A) to exit programming mode or press SELECT (D) to proceed to the next diagnostic option.

Figure 5.110: Header Sensors

5.8.4 Forcing Header Identification

The windrower's cab display module (CDM) must recognize the header in order to proceed with troubleshooting. If the header wiring has been damaged, or if no header is available, you can force the windrower control module (WCM) to behave as if a header is attached to the windrower by manually inputting a header identification code.

IMPORTANT:

Forcing a header ID that is different from that of the attached header can damage the windrower and/or the header. Doing so can cause the header to run too fast, which can cause excessive vibration and component failure.

NOTE:

The WCM will revert to reading NO HEADER each time the engine ignition is cycled.

1. Turn the ignition key to the RUN position, or start the engine.
2. Press PROGRAM (A) and SELECT (B) simultaneously on the CDM to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.

Figure 5.111: CDM Programming Buttons

3. Press SELECT (B) until DIAGNOSTIC MODE? appears on the upper line.
   - NO/YES will appear on the lower line.
4. Press right arrow (A) to select YES. Press SELECT (B).

Figure 5.112: Diagnostic Functions

5. Press SELECT (B) until FORCE HEADER TYPE? appears on the upper line.
   - NO/YES will appear on the lower line.
6. Press right arrow (A) to select YES. Press SELECT (B).
   - SELECT HEADER TYPE will appear on the upper line.
   - DISK HEADER will appear on the lower line.

Figure 5.113: Header Type

7. Press left arrow (A) or right arrow (B) to cycle through the list of header types.
8. When the desired header type appears, press SELECT (C).
   - EXIT FORCE HEADER? will appear on the upper line.
   - NO/YES will appear on the lower line.
9. Press right arrow (B) to select YES. Press SELECT (C).

   Proceed to the next diagnostic option, or press PROGRAM to exit programming mode.

Figure 5.114: Header Type

5.9 Troubleshooting Header Problems

Refer to this section if you are encountering difficulties configuring header features in the cab display module (CDM).

5.9.1 Testing Header Up/Down Activate Function Using Cab Display Module

The cab display module (CDM) can be used to change the height of the attached header, rather than using the height controls on the ground speed lever (GSL). Perform a test to ensure this feature is functioning properly.

NOTE:

- Before performing this procedure, the header must be attached to the windrower. The CDM automatically adjusts its programming for each header.
- The engine must be running to perform this procedure.

DANGER

Ensure that all bystanders have cleared the area.

1. Start the engine.
2. Press PROGRAM (A) and SELECT (B) simultaneously on the CDM to enter programming mode. Press SELECT (B).
   - WINDROWER SETUP? will appear on the upper line.

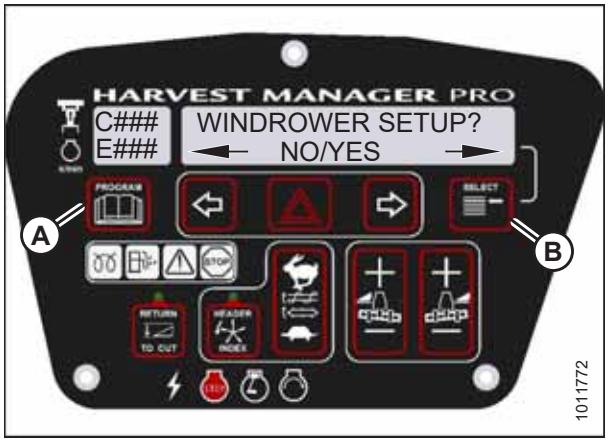


Figure 5.115: CDM Programming Buttons

3. Press SELECT (B) until DIAGNOSTIC MODE? appears on the upper line.
   - NO/YES will appear on the lower line.
4. Press right arrow (A) to select YES. Press SELECT (B).

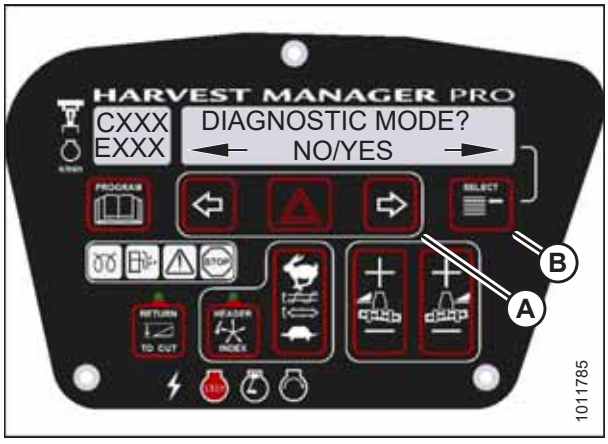


Figure 5.116: Diagnostic Functions

5. Press SELECT (B) until ACTIVATE FUNCTIONS? appears on the upper line.
   - NO/YES will appear on the lower line.
6. Press right arrow (A) to select YES. Press SELECT (B).

Figure 5.117: Functions

7. Press SELECT (D) until ACTIVATE HEADER HT appears on the upper line.
   - DOWN/UP will appear on the lower line.
8. Press and hold left arrow (B) to lower the header, or press and hold right arrow (C) to raise the header. Ensure that the header is working properly.
9. Press PROGRAM (A) to exit programming mode or press SELECT (D) to proceed to the next header function option.

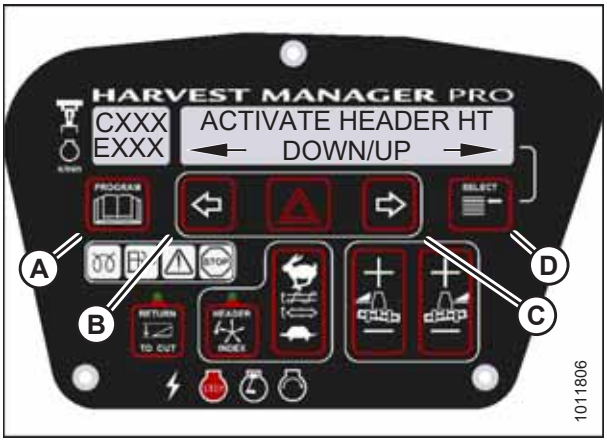


Figure 5.118: Header Height

5.9.2 Testing Reel Up/Down Activate Function Using Cab Display Module

The cab display module (CDM) can be used to change the height of the attached header's reel, rather than using the reel height controls on the ground speed lever (GSL). Perform a test to ensure this feature is functioning properly.

NOTE:

- This procedure applies to windrowers with attached draper headers only.
- The header must be attached to the windrower to perform this procedure. The CDM automatically adjusts its programming for each header.

DANGER

Ensure that all bystanders have cleared the area.

1. Start the engine.
2. Press PROGRAM (A) and SELECT (B) simultaneously on the CDM to enter programming mode. Press SELECT (B).
   - WINDROWER SETUP? will appear on the upper line.

Figure 5.119: CDM Programming Buttons

3. Press SELECT (B) until DIAGNOSTIC MODE? appears on the upper line.
   - NO/YES will appear on the lower line.
4. Press right arrow (A) to select YES. Press SELECT (B).

Figure 5.120: Diagnostic Functions

5. Press SELECT (B) until ACTIVATE FUNCTIONS? appears on the upper line.
   - NO/YES will appear on the lower line.
6. Press right arrow (A) to select YES. Press SELECT (B).

Figure 5.121: Functions

7. Press SELECT (D) until ACTIVATE REEL HT appears on the upper line.
   - DOWN/UP will appear on the lower line.

Figure 5.122: Reel Height

DANGER

Ensure that all bystanders have cleared the area.

8. Press and hold left arrow (B) to lower the reel. Press and hold right arrow (C) to raise the reel. Ensure that the reel is working properly.

9. Press PROGRAM (A) to exit programming mode or press SELECT (D) to proceed to next ACTIVATE FUNCTION.

5.9.3 Testing Header Tilt Activate Function Using Cab Display Module

It may be necessary to use the cab display module (CDM) to change the angle of the attached header, rather than using the header tilt controls on the ground speed lever (GSL).

NOTE:

- The header must be attached to the windrower to perform this procedure. The cab display module (CDM) automatically adjusts its programming for each header.
- The engine must be running to perform this procedure.

DANGER

Ensure that all bystanders have cleared the area.

1. Start the engine.

2. Press PROGRAM (A) and SELECT (B) simultaneously on the CDM to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.

Figure 5.123: CDM Programming Buttons

3. Press SELECT (B) until DIAGNOSTIC MODE? appears on the upper line.
   - NO/YES will appear on the lower line.
4. Press right arrow (A) to select YES. Press SELECT (B).

Figure 5.124: Diagnostic Functions

5. Press SELECT (B) until ACTIVATE FUNCTIONS? appears on the upper line.
   - NO/YES will appear on the lower line.
6. Press right arrow (A) to select YES. Press SELECT (B).

Figure 5.125: Functions

7. Press SELECT (D) until ACTIVATE HDR TILT appears on the upper line.
   - IN/OUT will appear on the lower line.
8. Press and hold left arrow (B) to tilt the header toward the ground. Press and hold right arrow (C) to tilt the header away from the ground. Ensure that the tilt functions are working correctly.
9. Press PROGRAM (A) to exit programming mode or press SELECT (D) to proceed to the next header function option.

Figure 5.126: Header Tilt Angle

5.9.4 Testing Knife Drive Circuit Using Cab Display Module

It may be necessary to use the cab display module (CDM) to test the knife drive circuit, rather than using the controls on the operator's station.

IMPORTANT:

Do **NOT** overspeed the header's knife drive. Overspeeding can lead to vibration, belt failures, or other overspeeding-related problems.

NOTE:

The header must be attached to windrower to perform this procedure.

DANGER

Ensure that all bystanders have cleared the area.

1. Start the engine.
2. Press PROGRAM (A) and SELECT (B) simultaneously on the cab display module (CDM) to enter programming mode. Press SELECT (B).
   - WINDROWER SETUP? will appear on the upper line.

Figure 5.127: CDM Programming Buttons

3. Press SELECT (B) until DIAGNOSTIC MODE? appears on the upper line.
   - NO/YES will appear on the lower line.
4. Press right arrow (A) to select YES. Press SELECT (B).

Figure 5.128: Diagnostic Functions

5. Press SELECT (B) until ACTIVATE FUNCTIONS? appears on the upper line.
   - NO/YES will appear on the lower line.
6. Press right arrow (A) to select YES. Press SELECT (B).
   - ACTIVATE HEADER HT will appear on the upper line.

Figure 5.129: Functions

7. Press SELECT (E) until KNIFE DRIVE SPD XXXX appears on the upper line.
8. Press and hold HAZARD (C) button.
   - Press left arrow (B) to decrease the knife speed.
   - Press right arrow (D) to increase the knife speed.

   IMPORTANT:

   Do **NOT** overspeed the knife drive.

   IMPORTANT:

   Ensure that the knife drive is working properly.
9. Release HAZARD button (C). The knife will stop.
10. Press PROGRAM (A) to exit programming mode or press SELECT (E) to proceed to the next header function option.

Figure 5.130: Knife Drive

5.9.5 Testing Draper Drive Circuit Activate Function Using Cab Display Module

The cab display module (CDM) can be used to test the draper drive circuit, rather than using the controls on the operator's station.

IMPORTANT:

Do **NOT** overspeed the draper drive. Overspeeding can lead to vibration, belt failures, or other overspeeding-related problems.

NOTE:

- A draper header must be attached to windrower to perform this procedure.
- The engine must be running to perform this procedure.

DANGER

Ensure that all bystanders have cleared the area.

1. Start the engine.
2. Press PROGRAM (A) and SELECT (B) simultaneously on the CDM to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.

Figure 5.131: CDM Programming Buttons

3. Press SELECT (B) until DIAGNOSTIC MODE? appears on the upper line.
   - NO/YES will appear on the lower line.
4. Press right arrow (A) to select YES. Press SELECT (B).

Figure 5.132: Diagnostic Functions

5. Press SELECT (B) until ACTIVATE FUNCTIONS? appears on the upper line.
   - NO/YES will appear on the lower line.
6. Press right arrow (A) to select YES. Press SELECT (B).
   - ACTIVATE HEADER HT will appear on the upper line.

Figure 5.133: Functions

7. Press SELECT (E) until DRAPER DRV SPD XXXX appears on the upper line.
8. Press and hold HAZARD button (C).
   - Press left arrow (B) to decrease the draper speed.
   - Press right arrow (D) to increase the draper speed.

   IMPORTANT:

   Do **NOT** overspeed the drapers.

   NOTE:

   Ensure that the draper drive is working properly.
9. Release the HAZARD (C) button. The drapers will stop.
10. Press PROGRAM (A) to exit programming mode or press SELECT (E) to proceed to the next header function option.

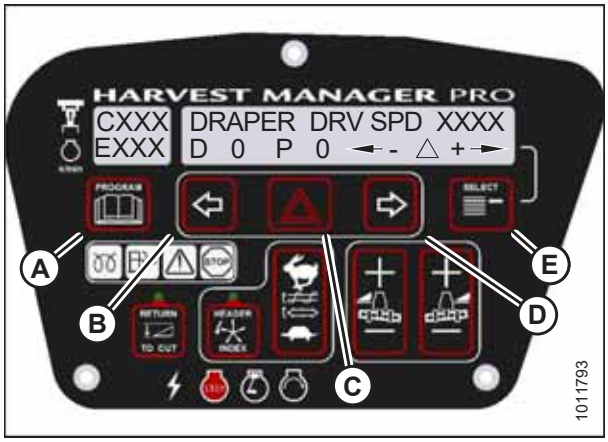


Figure 5.134: Draper Drive

5.9.6 Testing Reel Drive Circuit Activate Function Using Cab Display Module

The cab display module (CDM) can be used to test the reel drive circuit, rather than using the controls on the operator's station.

IMPORTANT:

Do **NOT** overspeed the reel drive. Overspeeding can lead to vibration, belt failures, or other overspeeding-related problems.

NOTE:

- The header must be attached to the windrower to follow this procedure. For more information, refer to *8 Attaching Headers to M Series Windrower, page 147*.
- This procedure does not apply to windrowers with attached rotary disc headers.
- The engine must be running to perform this procedure.

DANGER

Ensure that all bystanders have cleared the area.

1. Start the engine.
2. Press PROGRAM (A) and SELECT (B) simultaneously on the CDM to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.

Figure 5.135: CDM Programming Buttons

3. Press SELECT (B) until DIAGNOSTIC MODE? appears on the upper line.
   - NO/YES will appear on the lower line.
4. Press right arrow (A) to select YES. Press SELECT (B).

Figure 5.136: Diagnostic Functions

5. Press SELECT (B) until ACTIVATE FUNCTIONS? appears on the upper line.
   - NO/YES will appear on the lower line.
6. Press right arrow (A) to select YES. Press SELECT (B).
   - ACTIVATE HEADER HT will appear on the upper line.

Figure 5.137: Functions

7. Press SELECT (E) until REEL DRV SPD XXXX appears on the upper line.
8. Press and hold HAZARD (C) button.
   - Press left arrow (B) to decrease the reel speed.
   - Press right arrow (D) to increase the reel speed.

   IMPORTANT:

   Do **NOT** overspeed the reel.

   NOTE:

   Ensure that the reel drive is working properly.
9. Release HAZARD (C) button. The reel will stop.
10. Press PROGRAM (A) to exit programming mode or press SELECT (E) to proceed to the next header function option.

Figure 5.138: Reel Drive

5.9.7 Testing Rotary Disc Drive Circuit Activate Function Using Cab Display Module

The cab display module (CDM) can be used to test the rotary drive circuit, rather than using the controls on the operator's station.

IMPORTANT:

Do **NOT** overspeed the rotary drive. Overspeeding can lead to vibration, belt failures, or other overspeeding-related problems.

NOTE:

- A rotary disc header must be attached to windrower to follow this procedure.
- The engine must be running to perform this procedure.

DANGER

Ensure that all bystanders have cleared the area.

1. Start the engine.
2. Press PROGRAM (A) and SELECT (B) simultaneously on the CDM to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.

Figure 5.139: CDM Programming Buttons

3. Press SELECT (B) until DIAGNOSTIC MODE? appears on the upper line.
   - NO/YES will appear on the lower line.
4. Press right arrow (A) to select YES. Press SELECT (B).

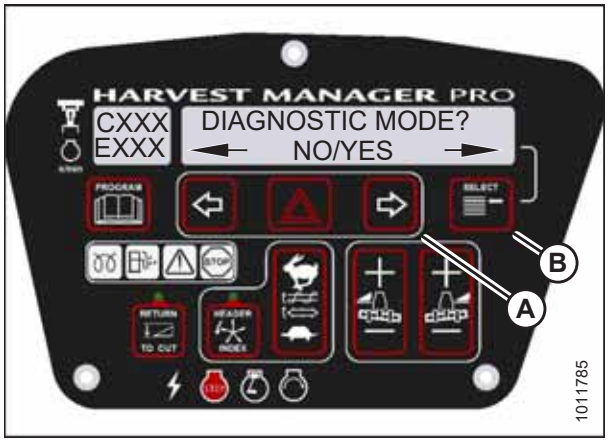


Figure 5.140: Diagnostic Functions

5. Press SELECT (B) until ACTIVATE FUNCTIONS? appears on the upper line.
   - NO/YES will appear on the lower line.
6. Press right arrow (A) to select YES. Press SELECT (B).
   - ACTIVATE HEADER HT will appear on the upper line.

Figure 5.141: Functions

7. Press SELECT (E) until DISC DRV SPD XXXX appears on the upper line.
8. Press and hold HAZARD button (C).
   - Press left arrow (B) to decrease the disc speed.
   - Press right arrow (D) to increase the disc speed.

   IMPORTANT:

   Do **NOT** overspeed the disc drive.

   NOTE:

   Ensure that the disc drive is working properly.
9. Release HAZARD button (C). The disc drive will stop.
10. Press PROGRAM (A) to exit programming mode or press SELECT to proceed to the next header function option.

Figure 5.142: Disc Drive

5.9.8 Testing Double Windrow Attachment Drive Activate Function Using Cab Display Module

The cab display module (CDM) can be used to test the Double Windrower Attachment (DWA) drive circuit, rather than using the controls on the operator's station.

IMPORTANT:

Do **NOT** overspeed the DWA drive. Overspeeding can lead to vibration, belt failures, or other overspeeding-related problems.

NOTE:

- The DWA must be attached to the windrower and must have been activated under the WINDROWER SETUP menu. For more information, refer to *5.3.8 Configuring Double Windrow Attachment Controls, page 71*.
- The engine must be running to perform this procedure.

DANGER

Ensure that all bystanders have cleared the area.

1. Start the engine.
2. Press PROGRAM (A) and SELECT (B) simultaneously on the CDM to enter programming mode. Press SELECT (B).
   - WINDROWER SETUP? will appear on the upper line.

Figure 5.143: CDM Programming Buttons

3. Press SELECT (B) until DIAGNOSTIC MODE? appears on the upper line.
   - NO/YES will appear on the lower line.
4. Press right arrow (A) to select YES. Press SELECT (B).

Figure 5.144: Diagnostic Functions

5. Press SELECT (B) until ACTIVATE FUNCTIONS? appears on the upper line.
   - NO/YES will appear on the lower line.
6. Press right arrow (A) to select YES. Press SELECT (B).
   - ACTIVATE HEADER HT will appear on the upper line.

Figure 5.145: Functions

7. Press SELECT (E) until ACTIVATE DWA DRV appears on the upper line.
8. Press and hold HAZARD button (C).
   - Press left arrow (B) to decrease the DWA drive speed.
   - Press right arrow (D) to increase the DWA drive speed.

   IMPORTANT:

   Do **NOT** overspeed the DWA drive.

   NOTE:

   Ensure that the DWA drive is working properly.
9. Release HAZARD button (C). The DWA drive will stop.
10. Press PROGRAM (A) to exit programming mode or press SELECT (E) to proceed to the next header function option.

Figure 5.146: DWA Drive

5.9.9 Testing Reel Fore-Aft Activate Function Using Cab Display Module

The cab display module (CDM) can be used to test the reel fore-aft circuit, rather than using the controls on the operator's station.

NOTE:

- The windrower must be attached to a header to perform this procedure. For more information, refer to *8 Attaching Headers to M Series Windrower, page 147*.
- The engine must be running to perform this procedure.

DANGER

Ensure that all bystanders have cleared the area.

1. Start the engine.
2. Press PROGRAM (A) and SELECT (B) simultaneously on the CDM to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.

Figure 5.147: CDM Programming Buttons

3. Press SELECT (B) until DIAGNOSTIC MODE? appears on the upper line.
   - NO/YES will appear on the lower line.
4. Press right arrow (A) to select YES. Press SELECT (B).

Figure 5.148: Diagnostic Functions

5. Press SELECT (B) until ACTIVATE FUNCTIONS? appears on the upper line.
   - NO/YES will appear on the lower line.
6. Press right arrow (A) to select YES. Press SELECT (B).

Figure 5.149: Functions

7. Press SELECT (D) until ACTIVATE REEL F/A appears on the upper line.
   - FORE/AFT will appear on the lower line.
8. Ensure that the reel fore-aft function is working properly.
   a. Press and hold left arrow (B) to move the reel forward. Press and hold right arrow (C) to move the reel aftward.
   b. Press PROGRAM (A) to exit programming mode or press SELECT (D) to proceed to the next header function option.

Figure 5.150: Reel Fore-Aft

5.9.10 Activating Hydraulic Purge Using Cab Display Module

The hydraulic purge removes air from the hydraulic pump system after it has been repaired or changed. A purge can be initiated by accessing the WINDROWER SETUP menu in the windrower's cab display module (CDM).

NOTE:

The engine must be running to perform this procedure.

DANGER

Ensure that all bystanders have cleared the area.

1. Start the engine.
2. Press PROGRAM (A) and SELECT (B) simultaneously on the cab display module (CDM) to enter programming mode.
   - WINDROWER SETUP? will appear on the upper line.

Figure 5.151: CDM Programming Buttons

3. Press SELECT (B) until DIAGNOSTIC MODE? appears on the upper line.
   - NO/YES will appear on the lower line.
4. Press right arrow (A) to select YES. Press SELECT (B).

Figure 5.152: Diagnostic Functions

5. Press SELECT (B) until ACTIVATE FUNCTIONS? appears on the upper line.
   - NO/YES will appear on the lower line.
6. Press right arrow (A) to select YES. Press SELECT (B).
   - ACTIVATE HEADER HT will appear on the upper line.
   - DOWN/UP will appear on the lower line.

Figure 5.153: Functions

7. Press SELECT (B) until ACTIVATE HYD PURGE? appears on the upper line.
   - NO/YES will appear on the lower line.
8. Press right arrow (A) to select YES. Press SELECT (B).
   - TO ACTIVATE PURGE will appear on the upper line.
   - PRESS AND HOLD will appear on the lower line.

   NOTE:

   Holding right arrow (A) activates a timed purge cycle. The CDM will jump to the exit menu if the arrow is released before the end of the timed cycle.

Figure 5.154: Hydraulic Purge

9. Press and hold right arrow (A) to begin the purge cycle.
   - PURGE CYCLE STARTED will appear on the upper line.
10. When the message PURGE CYCLE ENDED appears, release right arrow (A).
    - NO EXIT YES will appear on the lower line.
11. Press the right arrow to select YES. Press SELECT.
12. Press PROGRAM to exit programming mode or press SELECT to proceed to the next header function option.

Figure 5.155: Hydraulic Purge Cycle

Chapter 6: Performing Operational Checks

Perform all procedures in this chapter in the order in which they are listed.

6.1 Checking Safety System

The operating safety system protects the operator and the windrower from injury or damage. Perform these checks to ensure that the operating safety system is functioning correctly.

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.

A properly functioning safety system should operate as follows. If the system does not function as described, refer to the windrower technical manual for adjustment procedures.

- With the ground speed lever (GSL) in N-DETENT position and the steering wheel locked (centered), the park brakes should engage and the cab display module (CDM) should display IN PARK accompanied by an audible beep.
- The starter should engage **ONLY** when the GSL is in N-DETENT, the steering wheel is locked (centered), and the header drive switch is in the OFF position.
- The brake should engage and the machine should **NOT** move after engine start-up.
- The steering wheel should **NOT** lock with the engine running and the GSL out of N-DETENT.

1. Ensure the battery disconnect switch is in the POWER ON position.

   NOTE:

   The battery disconnect switch (A) is located on the right (cab-forward) frame rail behind the maintenance platform and can be accessed by moving the platform rearwards.

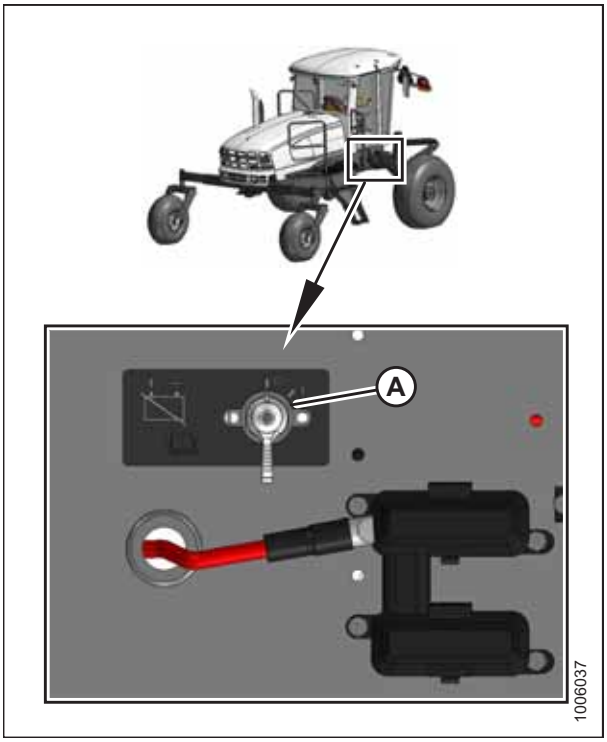


Figure 6.1: Battery Switch

Header drive engaged safety check:

2. Shut down the engine, and pull up on collar (B) while pressing down on switch (A) to engage the header drive.
3. Try starting the engine and confirm the cab display module (CDM) displays HEADER ENGAGED on the upper line and DISENGAGE HEADER on the lower line.
4. If the engine turns over, the safety system requires adjustment or repair. Refer to the windrower technical manual for adjustment procedures.

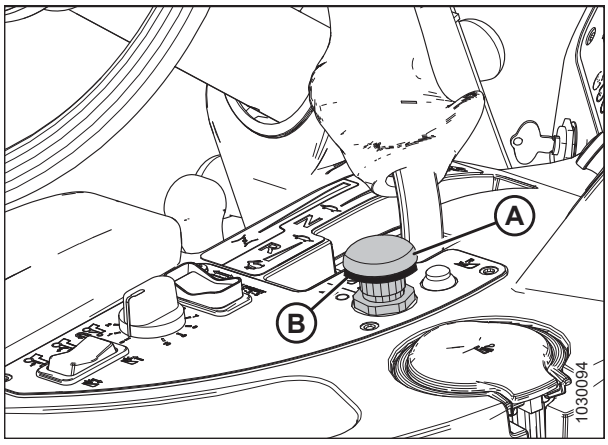


Figure 6.2: Header Drive Switch

Pintle switch safety check:

5. Shut down the engine, and remove the key.
6. Open the engine compartment hood.
7. Pry the steering interlock away from pintle arms (A) by inserting a wedge or pry bar between one of the interlock channels (B) and the pintle arm.
8. Insert a wooden block approximately 19 mm (3/4 in.) thick between the opposite channel and the pintle arm so the interlock channel is clear of the pintle arm.
9. Turn the steering wheel off-center, and move the GSL to N-DETENT.
10. Try starting the engine and confirm the CDM flashes CENTER STEERING accompanied by a short beep with each flash. The engine should **NOT** turn over.
11. If the engine turns over, the safety system requires adjustment or repair. Refer to the windrower technical manual for adjustment procedures.
12. Remove the key from the ignition.
13. Remove the wooden block and close the hood.

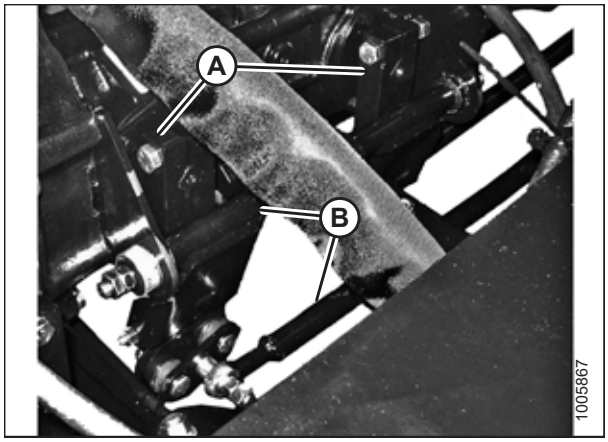


Figure 6.3: Pintle Arms

Steering and neutral safety check:

14. Shut down the engine and center the steering wheel. Place the GSL (A) in NEUTRAL, but not in N-DETENT.

15. Try starting the engine and confirm the CDM flashes CENTER STEERING on the upper line and PLACE GSL INTO N on the lower line accompanied by a short beep with each flash. The engine should **NOT** turn over.

16. If the engine turns over, the safety system requires adjustment. Refer to the windrower technical manual for adjustment procedures.

Figure 6.4: Operator's Station

Seat base lock safety check:

17. Ensure the operator's station is **NOT** locked. To unlock the operator's station, pull up and hold knob (B) to release latch (C), and turn the steering wheel to unlock the operator's station.

18. Center the steering wheel and place GSL (A) in N-DETENT. Try starting the engine and confirm that the engine cranks but does **NOT** start, and the CDM displays SEAT BASE NOT LOCKED.

19. If the engine starts, the safety system requires adjustment. Refer to the windrower technical manual for adjustment procedures.

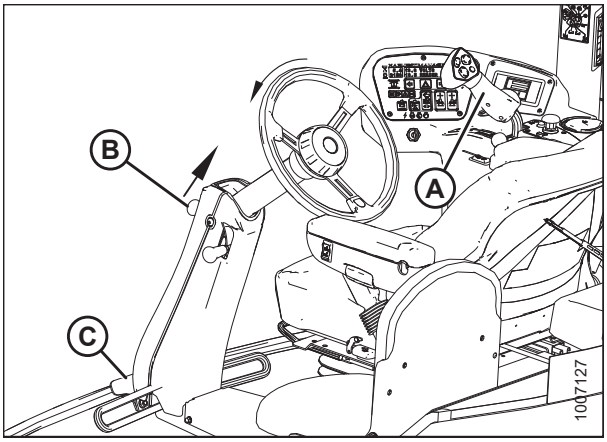


Figure 6.5: Operator's Station

6.2 Checking Operator Presence System

The operator presence system is a safety feature that requires someone to sit in the operator's seat in order for the windrower to be operational.

DANGER

Ensure that all bystanders have cleared the area.

NOTE:

A header must be installed on the windrower before this operational check can be performed.

1. Start the engine.
2. Place ground speed lever (GSL) (A) in NEUTRAL and turn the steering wheel until it locks.
3. Engage header drive switch (B).
4. Stand up from the operator's seat. The header should shut off after approximately 5 seconds. If the header does not shut off, the operator presence system requires adjustment. Refer to the windrower technical manual.

   NOTE:

   To restart the header, move header drive switch (B) to the OFF position and then back to the ON position.
5. Start the engine and position the GSL in NEUTRAL and N-DETENT:
   a. Swivel the operator's station but do **NOT** lock it into position.
   b. Move the GSL out of N-DETENT. The engine should shut down and the lower display will flash LOCK SEAT BASE —> CENTER STEERING WHEEL —> NOT IN NEUTRAL.
   c. Swivel and lock the operator's station. The display should return to normal.
   d. If the engine does not shut down, the seat position switches require adjustment. Refer to the technical manual.
6. Start the engine and drive the windrower at a speed **LESS THAN** 8 km/h (5 mph):
   a. Stand up from the operator's seat.
   b. Ensure the CDM flashes NO OPERATOR on the upper line and ENGINE SHUTDOWN 5…4…3…2…1…0 on the lower line accompanied by a steady tone. When the CDM display reaches 0, the engine will shut down.
   c. If the engine does not shut down, the operator presence system requires adjustment. Refer to the windrower technical manual.

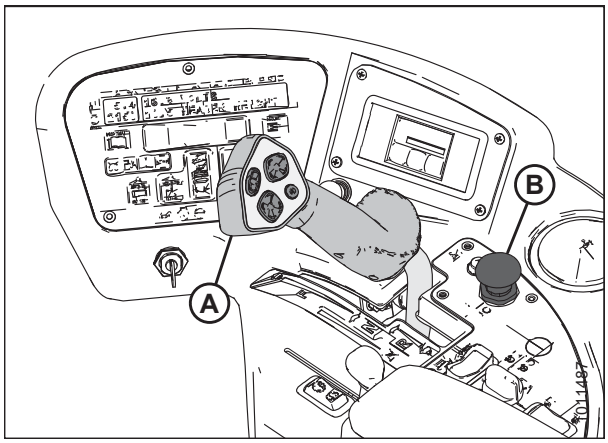


Figure 6.6: Operator Console

7. Start the engine and drive the windrower at a speed **MORE THAN** 8 km/h (5 mph):

   a. Stand up from the operator's seat.

   b. The CDM beeps once and displays NO OPERATOR on the lower line.

   c. If the CDM does not beep and display this message, the operator presence system requires adjustment. Refer to the windrower technical manual.

6.3 Checking Windrower Startup

Ensure that the windrower functions as expected after startup.

DANGER

Ensure that all bystanders have cleared the area.

1. Start the engine.

NOTE:

The brakes should engage and the machine should not move after engine start-up.

2. Ensure the steering wheel is centered. Move ground speed lever (GSL) (A) straight out of N-DETENT (neither forward nor reverse). The machine should not move.
3. Check that the steering wheel is free to move.
4. If the machine does not function as described, the system requires adjustment. Refer to the windrower technical manual.

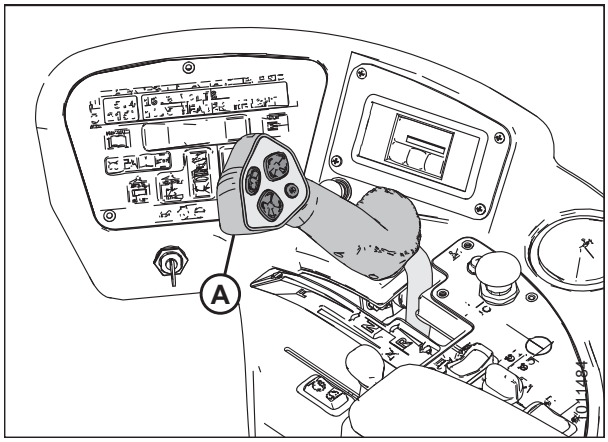


Figure 6.7: Operator Console

6.4 Checking Engine Speed

Check the idle speed and maximum speed of the engine to make sure it is running properly.

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 the engine speed on the cab display module (CDM) (A) and compare it to the value in the table below.
4. Move the throttle to the maximum rpm position.
5. Check the engine speed on CDM (A) and compare it to the value in the table below.

Table 6.1 Engine Speed

Idle rpm	Maximum rpm (No Load)
1000 +/- 30 rpm	2300 +/- 30 rpm

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

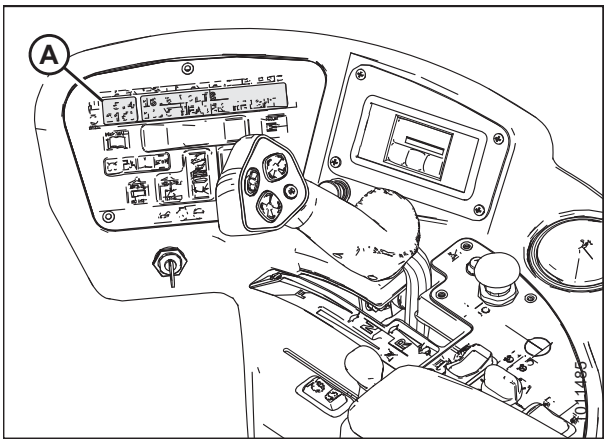


Figure 6.8: Cab Display Module (CDM)

6.5 Checking Gauges and Cab Display Module Display

All gauges in the cab must function as expected.

1. Check that the fuel and diesel exhaust fluid (DEF) gauges are working by pressing and holding fuel gauge icon (A) for 2 seconds—the brightness symbol and backlight function becomes active. The fuel gauge icon will reappear if nothing is pressed for 5 seconds.

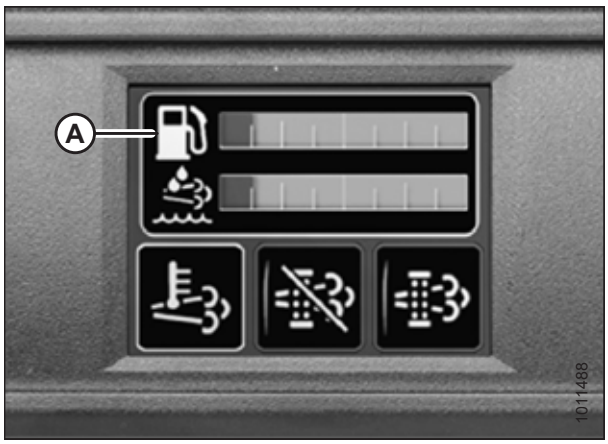


Figure 6.9: Fuel and DEF Gauges

2. Ensure cab display module (CDM) display (A) is working by pushing SELECT button (B) on the CDM or SELECT button (C) on the ground speed lever (GSL).
3. If the system does not function as described, refer to the windrower technical manual.

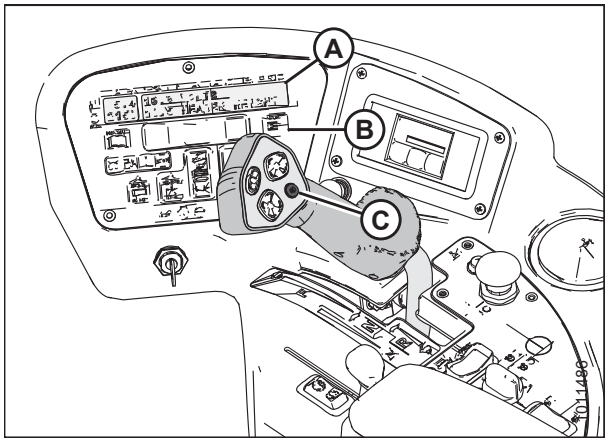


Figure 6.10: Operator Console

6.6 Checking Electrical System

The electrical system can be checked using the cab display module (CDM).

1. Push SELECT button (C) on the ground speed lever (GSL) or SELECT button (B) on the cab display module (CDM) until CDM display (A) shows VOLTS. The display indicates the condition of the battery and alternator. To evaluate the reading, refer to Table *6.2, page 135*.

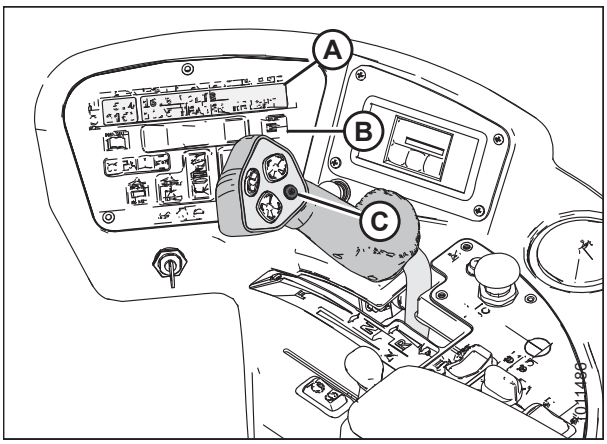


Figure 6.11: Operator Console

Table 6.2 Battery and Alternator Condition

Ignition	Engine	Reading	Indicated Condition
ON	Running	13.8–15.0	Normal
		>16.0 (see note)	Regulator out of adjustment
		<12.5 (see note)	Alternator not working Regulator out of adjustment
	Shut down	12.0	Battery normal

NOTE:

The display flashes the voltage reading accompanied by a single loud tone every 30 minutes until the condition is fixed.

6.7 Checking Exterior Lights

The windrower is equipped with a series of lights on its cab-forward and engine-forward ends. Ensure these lights are functioning.

1. Rotate the operator's seat to the cab-forward mode.

2. Turn field light switch (A) to the ON position and ensure front field lights (B) and rear swath lights (C) are functioning.

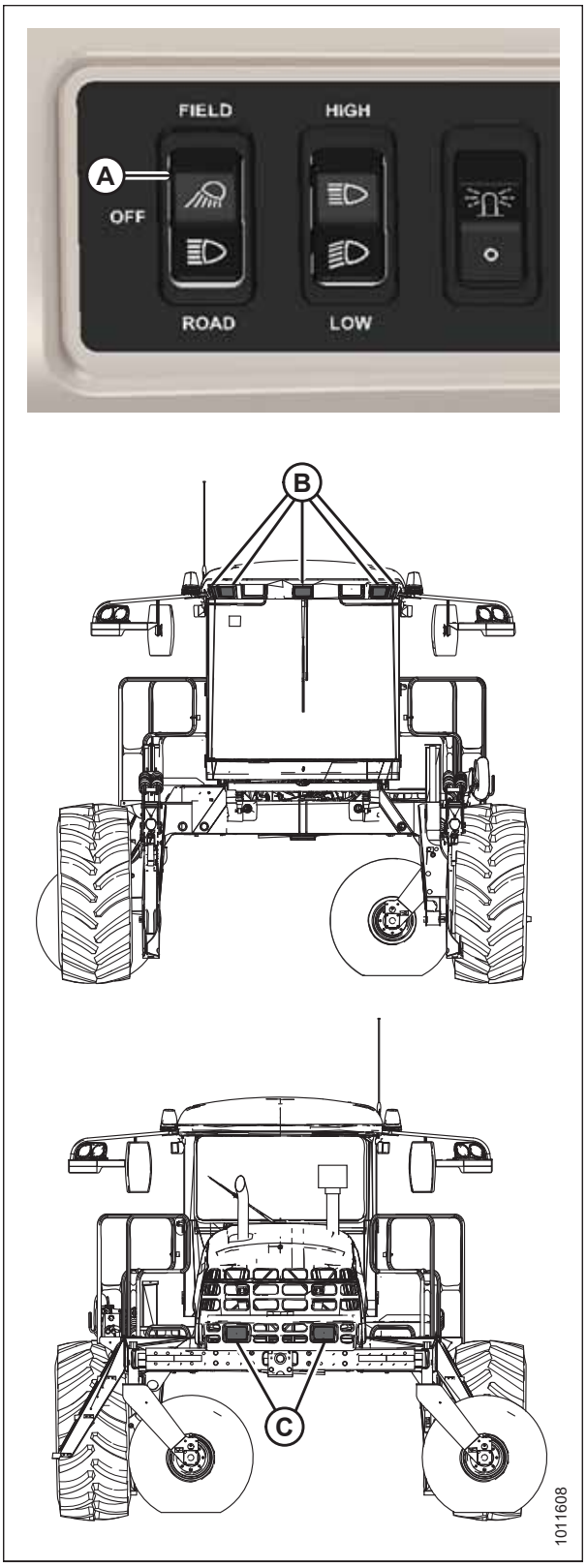


Figure 6.12: Exterior Lights – Cab Forward

3. Turn road light switch (A) to the ON position and ensure front road lights (B) and rear red tail/brake lights (C) (if equipped) are functioning.

4. Activate high/low switch (D) and check the lights.

5. Activate amber turn signal/hazard warning lights (E) using the switches on the cab display module (CDM) and check the lights.

   NOTE:

   An optional red tail lighting and marking kit must be installed so that road travel in the cab-forward mode complies with road travel regulations. See your MacDon Dealer. If you do not have the optional tail light kit installed, you will be prompted with a LH or RH stop lamp (E134 or E135) warning displayed in the cab display module (CDM) with engine running and the windrower in cab-forward mode.

6. Turn off the lights.

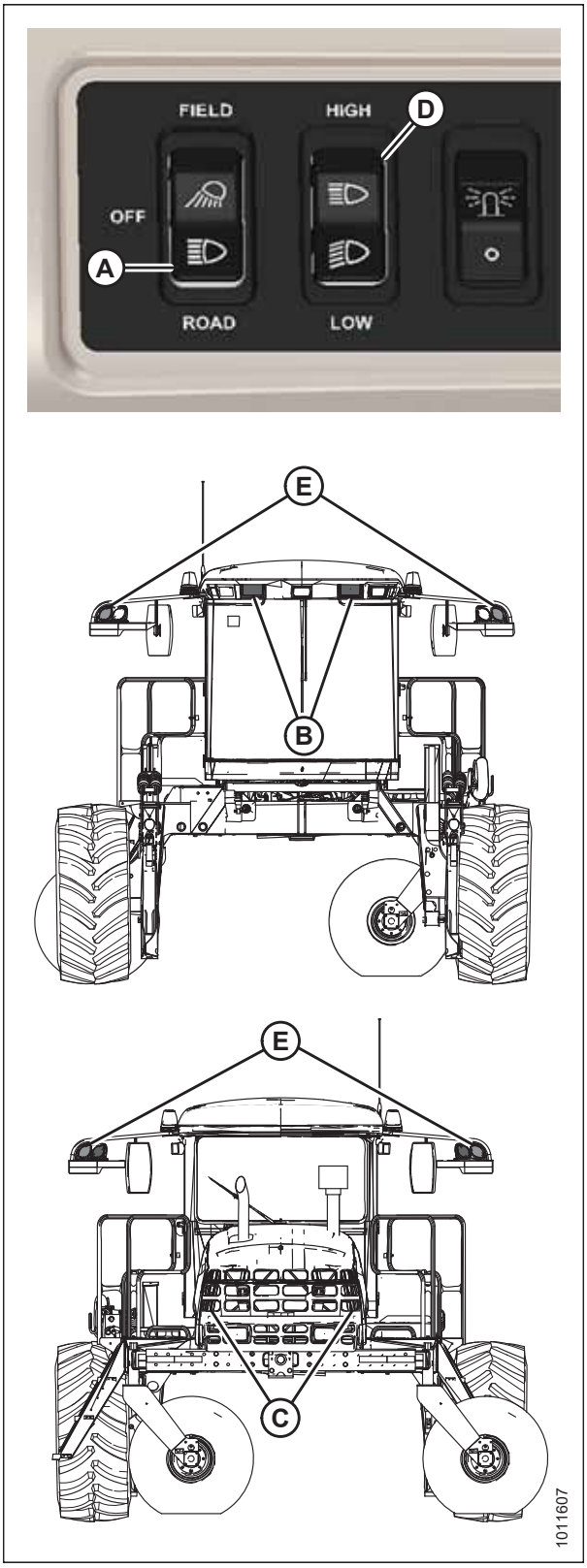


Figure 6.13: Exterior Lights – Cab Forward

7. Turn beacon switch (A) to the ON position and ensure amber beacons (B) are functioning.

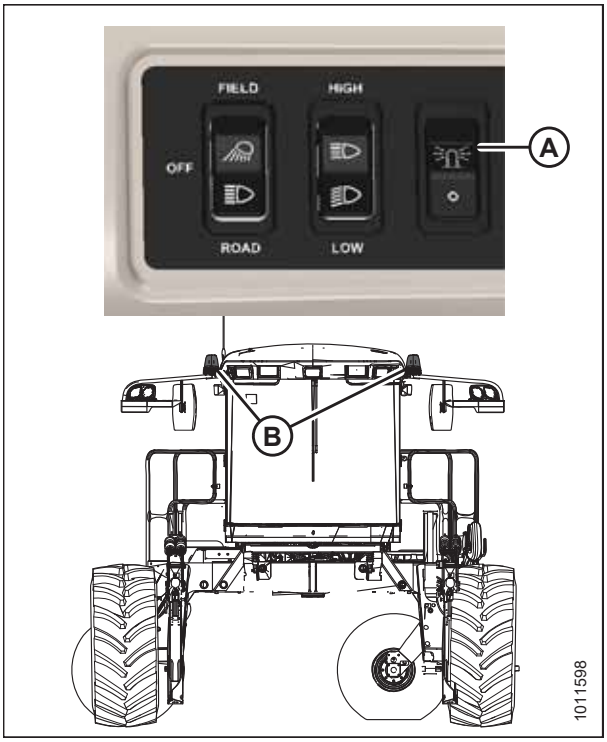


Figure 6.14: Exterior Lights – Beacons

6.7.1 Auto Road Light

The beacon and hazard lights are included in the auto road light feature. The beacon and hazard lights will turn on when this feature is activated, and can only be turned off by engaging the header drive.

This feature will activate when all of the following conditions are met:

- The windrower is in cab-forward or engine-forward mode
- The engine is running
- The header is disengaged
- The transmission is in either the mid or the high range

6.8 Checking Horn

The horn is a safety device for notifying other people of the windrower's presence.

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

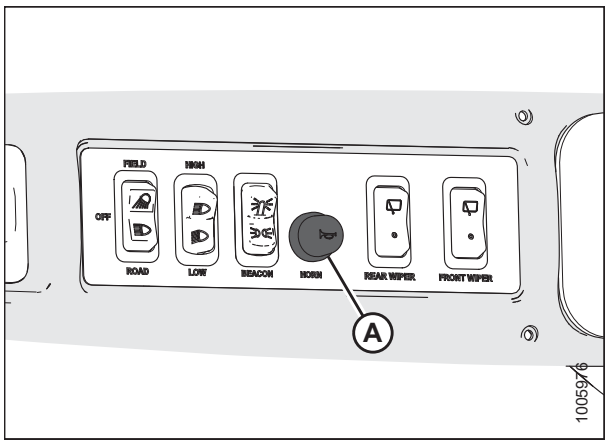


Figure 6.15: Horn Button

6.9 Checking Interior Lights

Interior lights provide visibility within the cab. Check all parts of the interior lighting system for functionality.

1. Switch road and field lights ON and OFF using switch (A).

   NOTE:

   Ambient light in roof liner (B) and interior light (C) work only when road or field lights (A) are switched ON.

2. If interior lights do not function properly, refer to windrower technical manual.

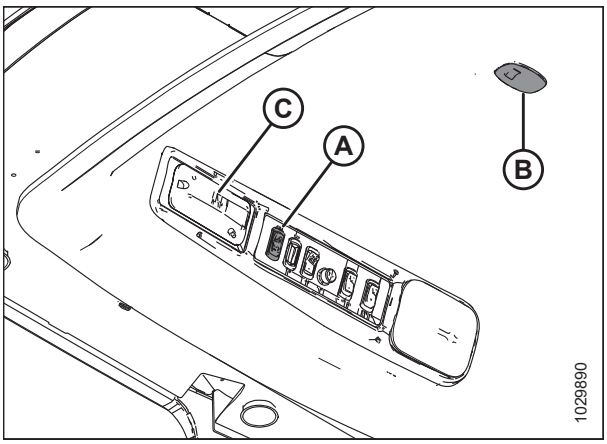


Figure 6.16: Interior Lights

6.10 Checking Air Conditioning and Heater

The windrower's cab is equipped with a heating, ventilation, and air conditioning system. Ensure that this system and its controls are functioning properly.

Figure 6.17: Air Conditioning (A/C) and Heater Controls

1Confirm that the following A/C and heating controls function properly:

- **Blower switch (A)**: Controls the blower speed. The switch settings are OFF, LO, MEDIUM, and HI.
- **Air conditioning switch (B)**: Controls the A/C system. When set to ON, the A/C operates if blower switch (A) is switched ON. When set to OFF, the A/C system does not operate.
- **Outside air switch (C)**: Controls the air source. When set to FRESH AIR, the booster fan starts and draws filtered outside air into the cab. When set to RECIRCULATED, the booster fan stops and air inside the cab is recirculated.
- **Temperature control (D)**: Controls the cab temperature. Turn the knob clockwise to increase the temperature, and turn the knob counterclockwise to decrease the temperature.

To distribute oil throughout the A/C system, perform the following steps:

2. Start the engine and turn blower switch (A) to the LO setting and then turn temperature control (D) to maximum heating, and turn A/C switch (B) to OFF.
3. Turn A/C switch (B) from the OFF to the ON position for 1 second, then back to OFF for 5 to 10 seconds. Repeat this step ten times.
4. Shut down the engine, and remove the key from the ignition.

6.11 Checking Manuals

MacDon includes manuals with every windrower to provide information on the windrower's safe operation and maintenance.

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

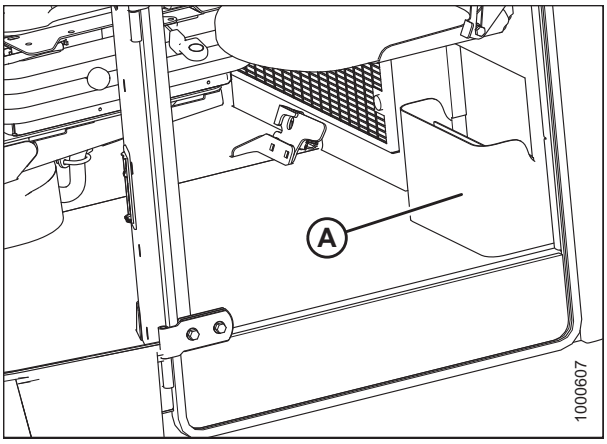


Figure 6.18: Manual Storage Case

1. Ensure that the following manuals are included with the windrower:
   - Operator's Manual
   - Parts Catalog
   - Quick Card
   - Engine Manual

Figure 6.19: Manuals and Quick Card

Chapter 7: Performing Final Steps

Prepare the windrower cab for the Operator and, if necessary, install any remaining kits.

1. After the predelivery checks are complete, remove the plastic covering from the cab display module (CDM) and the seats.
2. Locate the bag inside the cab containing the GPS mount kit. If you wish to install the kit, do so in accordance with the instructions provided in the kit. If you choose not to install the kit, label the bag “GPS Completion kit” and place it in a toolbox for safekeeping.
3. Do **NOT** remove the drive wheel torque procedure decal from the windshield.

Figure 7.1: Windshield Decal

Chapter 8: Attaching Headers to M Series Windrower

Follow these procedures to safely attach these MacDon headers to the windrower.

8.1 Attaching Header Boots

Header boots are required to attach a D Series or D1 Series Draper Header to the windrower. Attach header boots to the windrower's lift linkage if they are not already installed. Header boots are supplied with the header.

IMPORTANT:

To prevent damage to the lift system when lowering the header lift linkages without a header or a weight box attached to the windrower, ensure that the float engagement pin is installed in storage position (B) and **NOT** in engaged position (A).

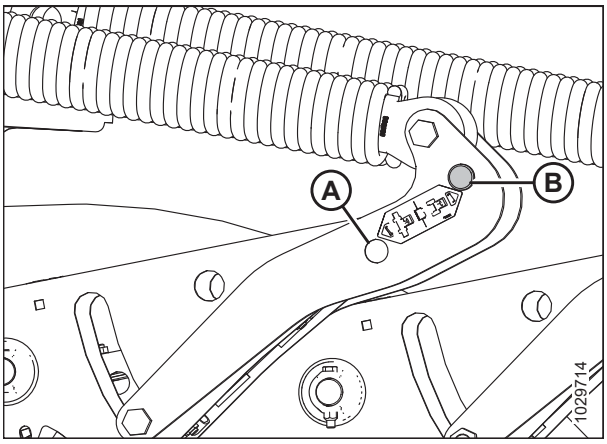


Figure 8.1: Header Float Linkage

1. Remove pin (B) from boot (A).

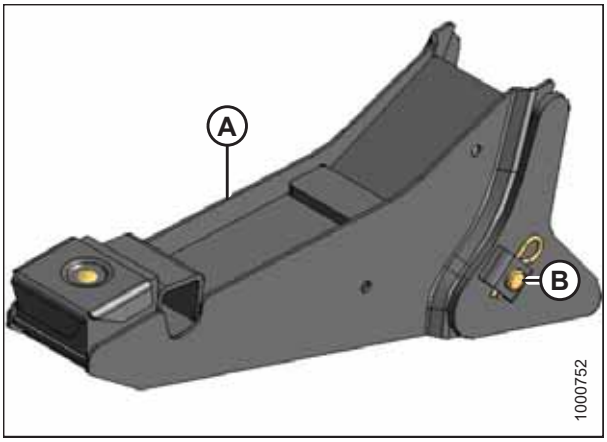


Figure 8.2: Header Boot

2. Position boot (B) onto lift linkage (A) and reinstall pin (C). The pin may be installed from either side of the boot.
3. Secure pin (C) with hairpin (D).
4. Repeat Step *1, page 147* to Step *3, page 148* to install the boot on the opposite side of the windrower.

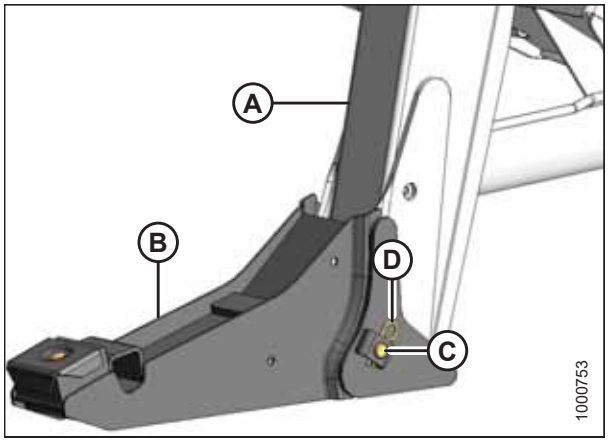


Figure 8.3: Header Boot

8.2 Attaching D Series or D1 Series Draper Header

M155*E4* Self-Propelled Windrowers are compatible with D and D1 Series Draper Headers.

If installing an HC10 Hay Conditioner, Reverser kit (MD #B4656) is recommended. If necessary, obtain the recommended kit and install it in accordance with the instructions supplied with the kit.

The procedure for attaching a D or D1 Series Draper Header to the windrower differs slightly depending on the configuration of the windrower. Proceed to the relevant topic:

- *8.2.1 Attaching D Series or D1 Series Draper Header – Hydraulic Center-Link with Self-Alignment, page 149*
- *8.2.2 Attaching D Series or D1 Series Draper Header – Hydraulic Center-Link without Self-Alignment, page 154*

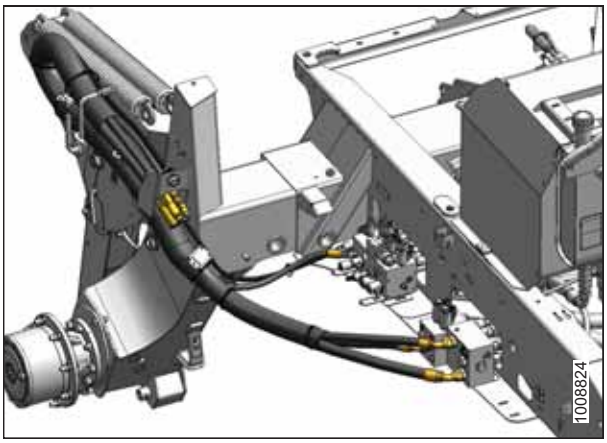


Figure 8.4: M155*E4* Draper Header Hydraulics

8.2.1 Attaching D Series or D1 Series Draper Header – Hydraulic Center-Link with Self-Alignment

The windrower may be equipped with an optional self-aligning hydraulic center-link, which allows the Operator to control the vertical position of the center-link from the cab.

NOTE:

Draper header boots must be installed onto the windrower lift linkage before beginning this procedure. For instructions, refer to *8.1 Attaching Header Boots, page 147*.

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 hairpin (A) from pins (B), and remove the pins from both header legs.

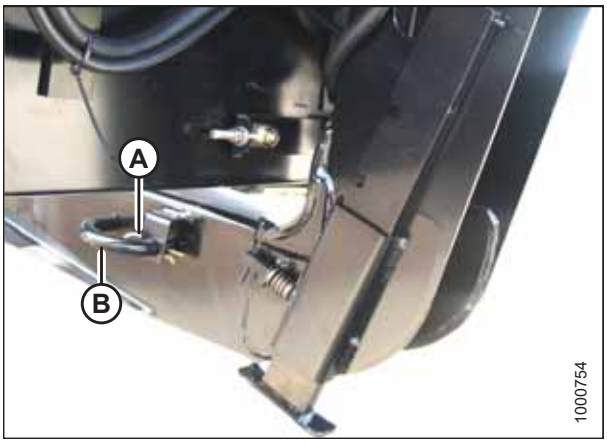


Figure 8.5: Header Leg

DANGER

Ensure that all bystanders have cleared the area.

3. Start the engine and activate HEADER DOWN button (A) on the ground speed lever (GSL) to fully retract the header lift cylinders.

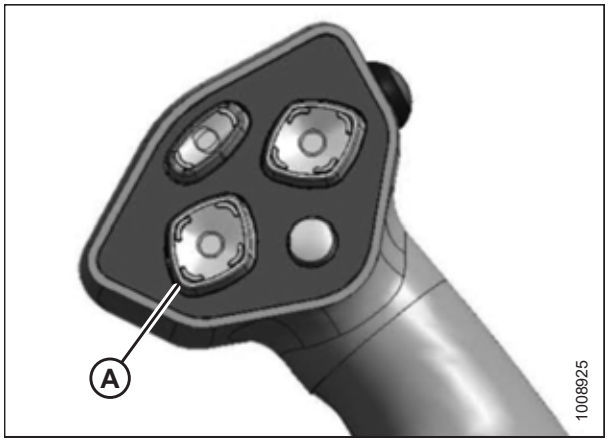


Figure 8.6: Ground Speed Lever

4. Press REEL UP switch (A) 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 for hookup.

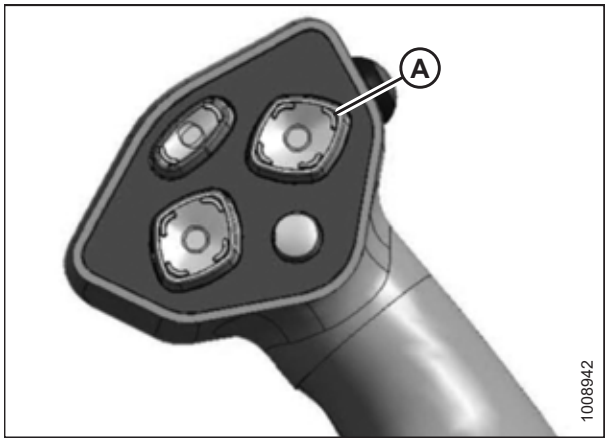


Figure 8.7: Ground Speed Lever

5. Drive the windrower slowly forward until boots (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.

6. Ensure that the lift linkages are properly engaged in the header legs and are contacting the support plates.

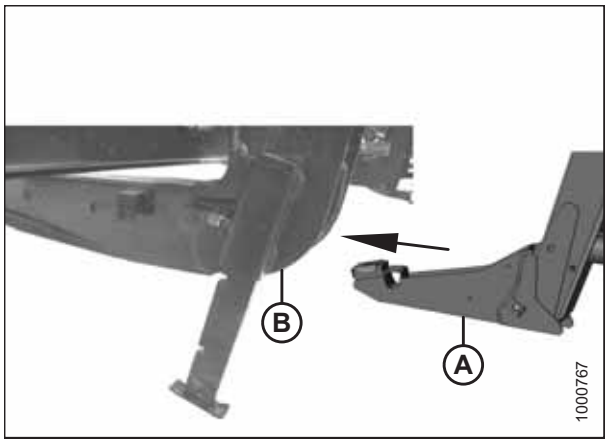


Figure 8.8: Header Leg and Boot

7. Use the following GSL functions to position the center-link hook above the header attachment pin:
   - REEL UP (A) to raise the center-link
   - REEL DOWN (B) to lower the center-link
   - HEADER TILT UP (C) to retract the center-link
   - HEADER TILT DOWN (D) to extend the center-link

   IMPORTANT:

   The hook release 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.

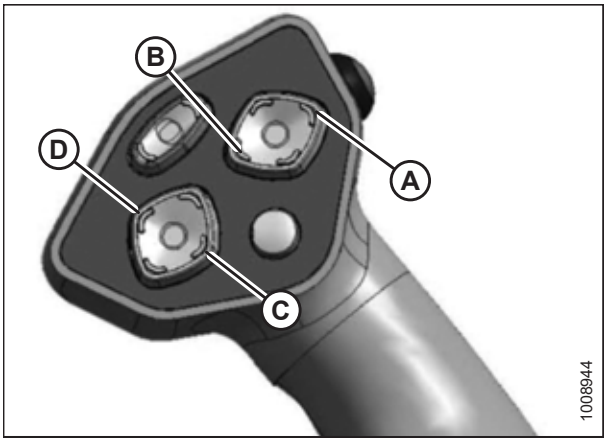


Figure 8.9: Ground Speed Lever

8. Lower center-link (A) onto the header with the REEL DOWN switch on the GSL until it locks into position (hook release [B] is down).
9. Check that center-link (A) is locked onto the header by pressing the REEL UP switch on the GSL.

DANGER

Ensure that all bystanders have cleared the area.

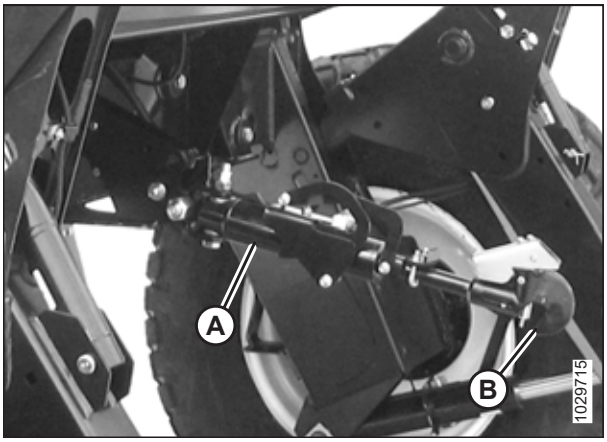


Figure 8.10: Hydraulic Center-Link

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

    NOTE:

    It may be necessary to repeat this procedure if there is air in the hydraulic system.

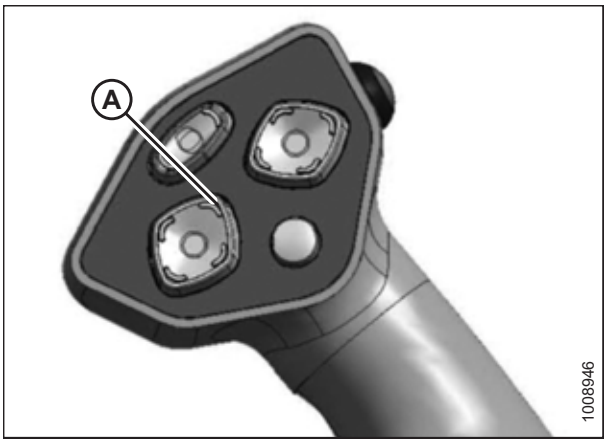


Figure 8.11: Ground Speed Lever

12. Engage the safety props on both lift cylinders:
    a. Shut down the engine, and remove the key from the ignition.
    b. Pull lever (A) and rotate it towards the header to release and lower safety prop (B) onto the lift cylinder.
    c. Repeat the previous steps for the opposite lift cylinder.

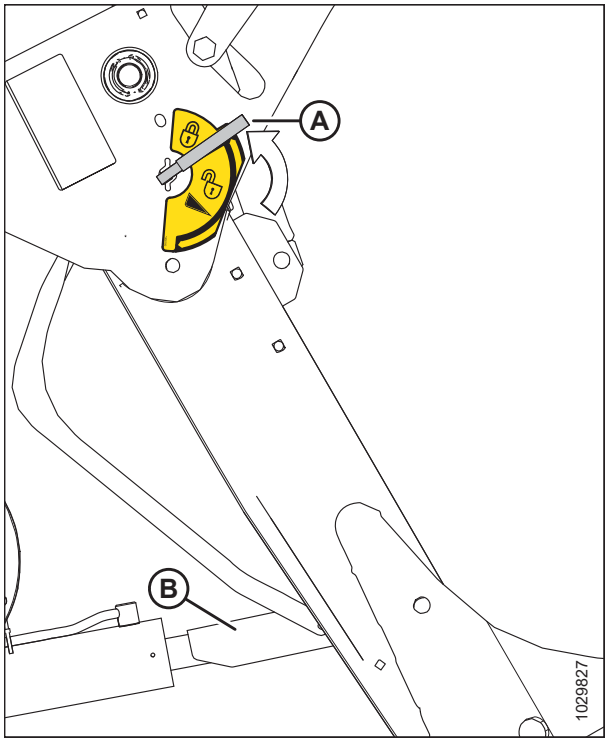


Figure 8.12: Safety Prop

13. Install pin (B) through the header leg, engaging the U-bracket in the lift linkage. Secure the pin with hairpin (A).
14. Repeat the previous step on the other side of the header.
15. Raise header stand (D) to its storage position by pulling spring pin (C) and lifting the stand into the uppermost position. Release the spring pin.

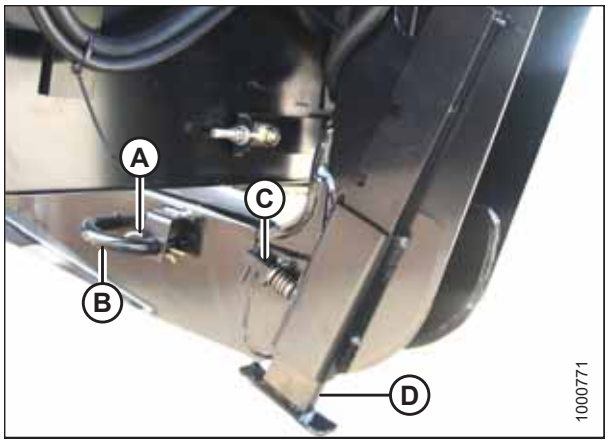


Figure 8.13: Header Leg

16. Remove the clevis pin from storage position (B) in the linkage and insert it into hole (A) to engage the float springs. Secure it with the hairpin. Repeat this step on the opposite float linkage.

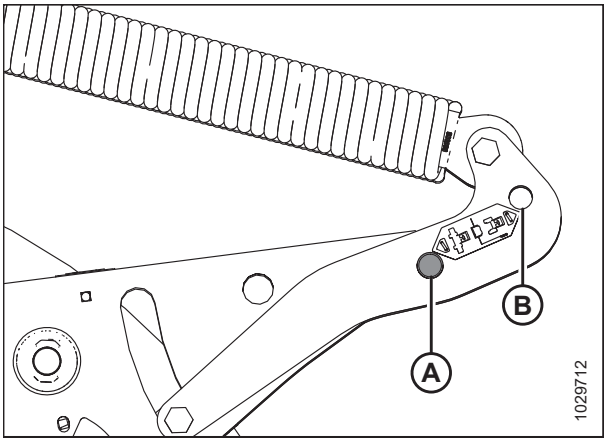


Figure 8.14: Header Float Linkage

17. Disengage the safety prop by turning lever (A) downwards until the lever locks into the vertical position.
18. Repeat the previous step for the opposite safety prop.

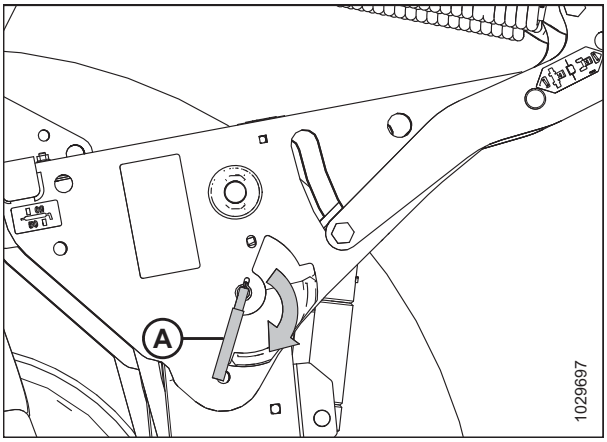


Figure 8.15: Safety Prop Lever

DANGER

Ensure that all bystanders have cleared the area.

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

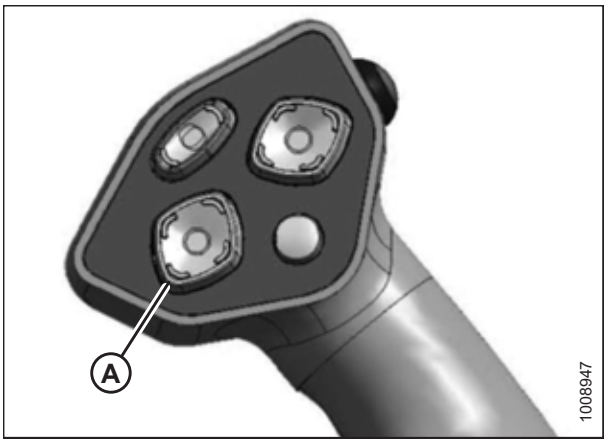


Figure 8.16: Ground Speed Lever

21. Connect header drive hoses (A) and electrical harness (B) to the header. For instructions, refer to the header operator's manual.

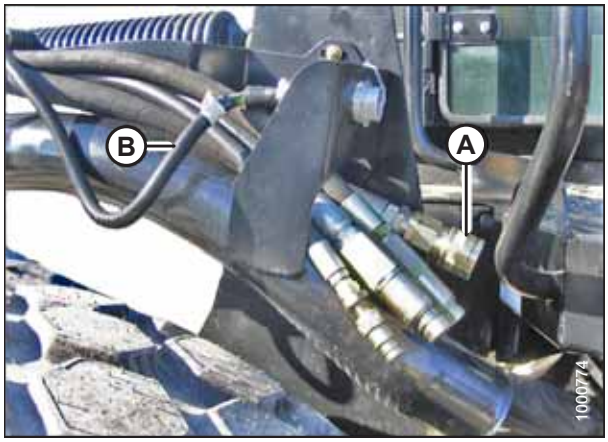


Figure 8.17: Header Drive Hoses and Harness

22. Connect reel hydraulics (A) at the right cab-forward side of the windrower. For instructions, refer to the draper header operator's manual.

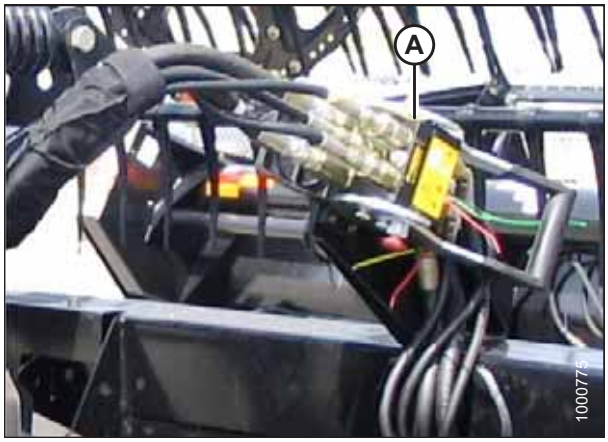


Figure 8.18: Reel Hydraulics

8.2.2 Attaching D Series or D1 Series Draper Header – Hydraulic Center-Link without Self-Alignment

If the windrower is equipped with a hydraulic center-link that lacks the self-alignment capability, the Operator will have to manually attach the hydraulic center-link's hook to the header's center pin.

NOTE:

Draper header boots must be installed onto the windrower's lift linkage before starting this procedure. For instructions, refer to *8.1 Attaching Header Boots, page 147*.

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 hairpin (A) from pins (B), and remove the pins from both header legs.

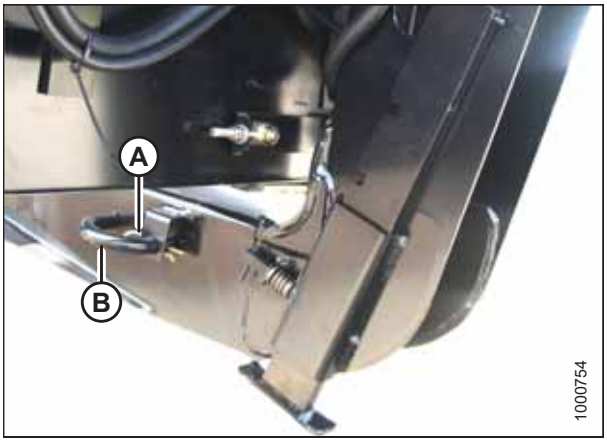


Figure 8.19: Header Leg

DANGER

Ensure that all bystanders have cleared the area.

3. Start the engine and activate HEADER DOWN button (A) on the ground speed lever (GSL) to fully retract the header lift cylinders.

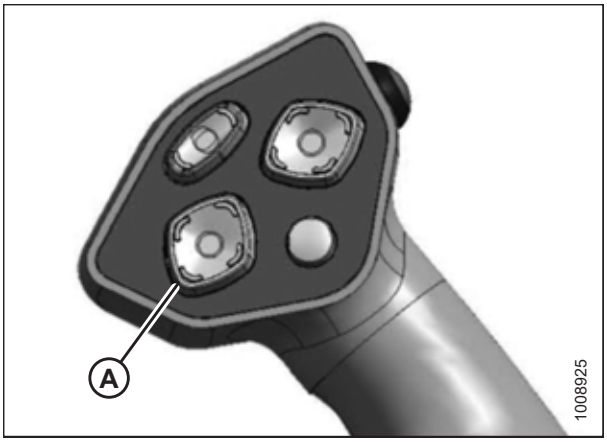


Figure 8.20: Ground Speed Lever

4. Remove pin (A) from the frame linkage 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:

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

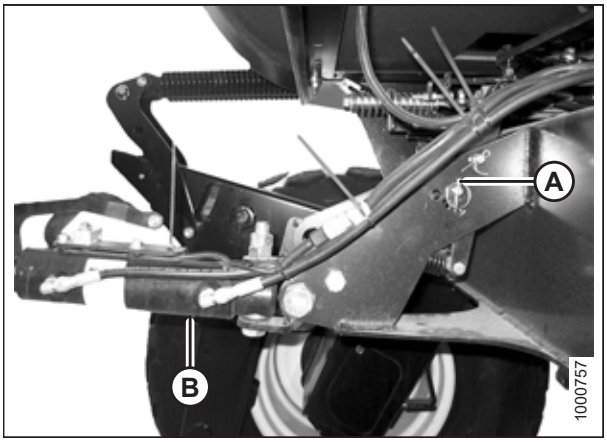


Figure 8.21: Hydraulic Center-Link without Self-Alignment Kit

5. Drive the windrower slowly forward until boots (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.

6. Ensure that the lift linkages are properly engaged in the header legs and are contacting the support plates.

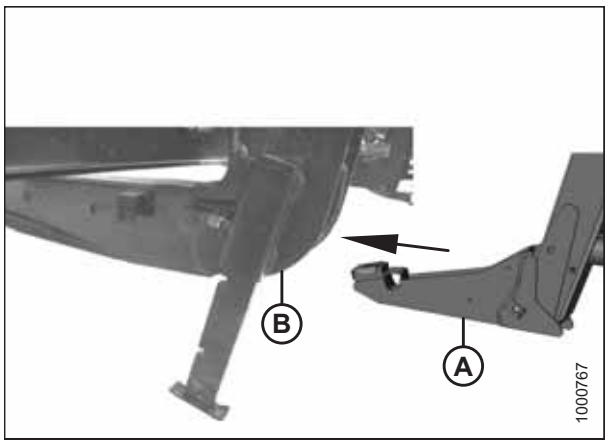


Figure 8.22: Header Leg and Boot

7. Use the following GSL functions to position the center-link hook above the header attachment pin:
   - HEADER TILT UP (A) to retract the center-link
   - HEADER TILT DOWN (B) to extend the center-link

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

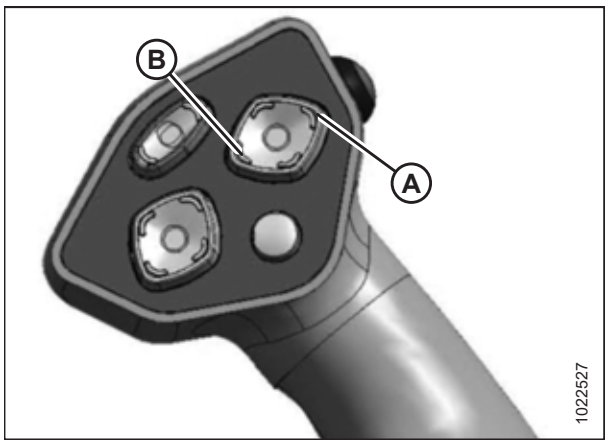


Figure 8.23: Ground Speed Lever

9. Push down on the rod end of link cylinder (A) until hook (B) engages and locks onto the header pin.

   IMPORTANT:

   The hook release 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.

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

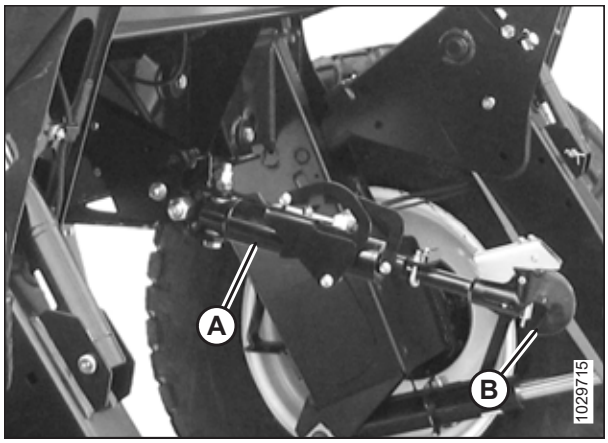


Figure 8.24: Hydraulic Center-Link

DANGER

Ensure that all bystanders have cleared the area.

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

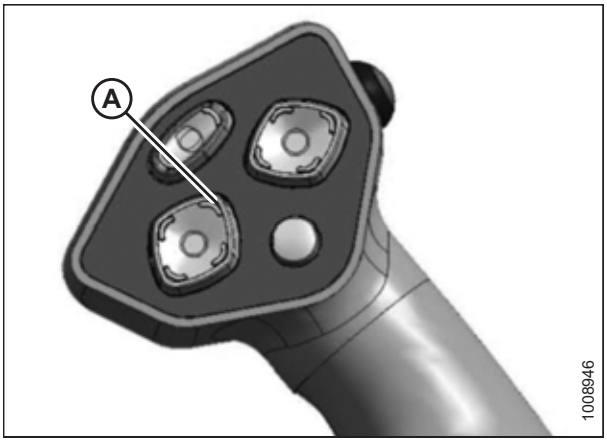


Figure 8.25: Ground Speed Lever

NOTE:

It may be necessary to repeat this procedure if there is air in the hydraulic system.

14. Engage the safety props on both lift cylinders:
    a. Shut down the engine, and remove the key from the ignition.
    b. Pull lever (A) and rotate it towards the header to release and lower safety prop (B) onto the lift cylinder.
    c. Repeat the previous steps for the opposite lift cylinder.

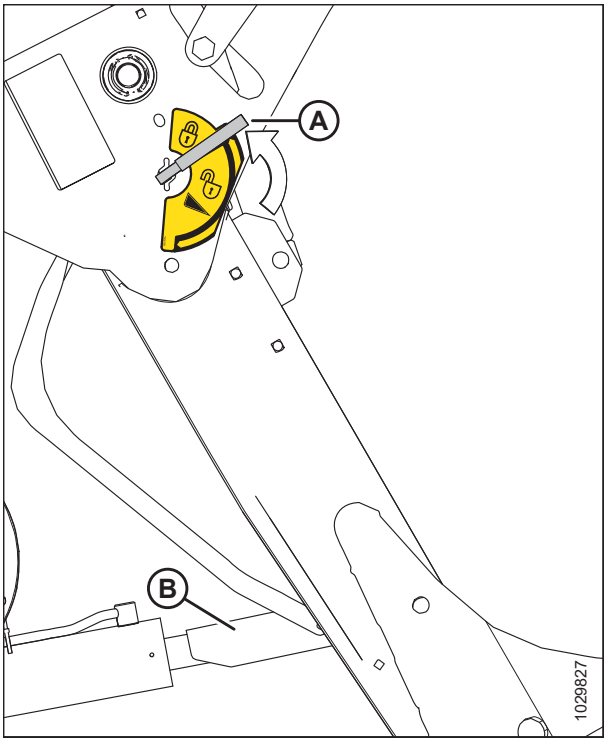


Figure 8.26: Safety Prop

15. Install pin (B) through the header leg, engaging the U-bracket in the lift linkage. Secure the pin with hairpin (A).

16. Raise header stand (D) to its storage position by pulling spring pin (C) and lifting the stand into the uppermost position. Release the spring pin.

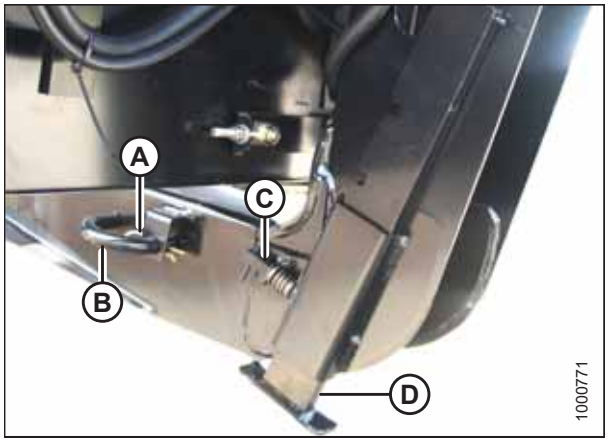


Figure 8.27: Header Leg

17. Remove the clevis pin from storage position (B) in the linkage and insert it into hole (A) to engage the float springs. Secure it with the hairpin. Repeat this step on the opposite float linkage.

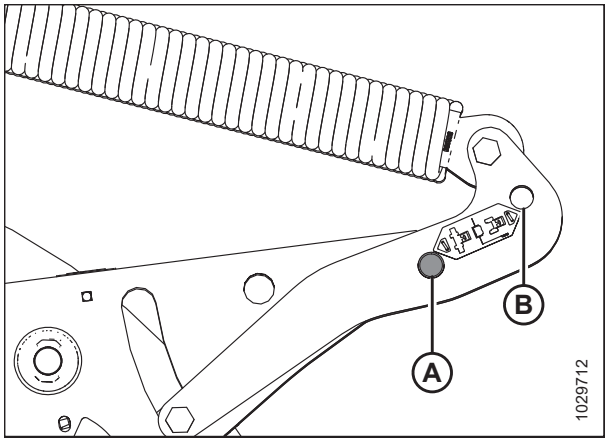


Figure 8.28: Header Float Linkage

18. Disengage the safety prop by turning lever (A) downwards until the lever locks into the vertical position.

19. Repeat the previous step for the opposite safety prop.

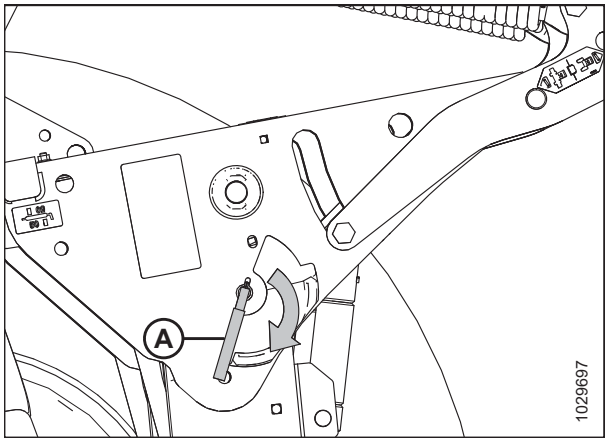


Figure 8.29: Safety Prop Lever

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.

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

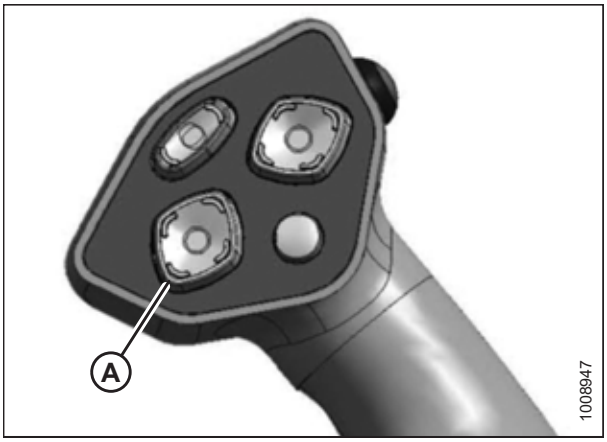


Figure 8.30: Ground Speed Lever

22. Connect header drive hoses (A) and electrical harness (B) to the header. For instructions, refer to the header operator's manual.

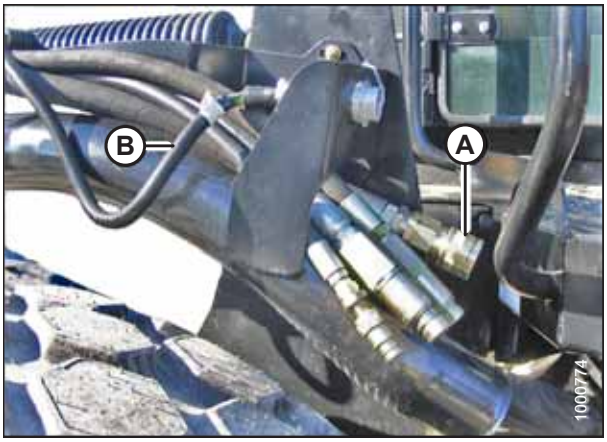


Figure 8.31: Header Drive Hoses and Harness

23. Connect reel hydraulics (A) at the right cab-forward side of the windrower. For instructions, refer to the draper header operator's manual.

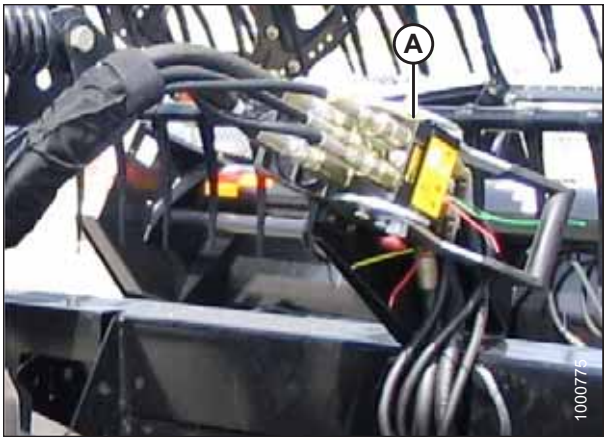


Figure 8.32: Reel Hydraulics

8.3 Attaching A Series Auger Header

M155*E4* Self-Propelled Windrowers are compatible with A30D, A30S, and A40D Auger Headers.

Windrowers equipped with A Series hydraulics have four header-drive hoses on the left side.

The attachment procedure varies depending on the type of center-link installed on the windrower. Refer to the following instructions based on the type of center-link installed on your windrower:

- *8.3.1 Attaching A Series Auger Header – Hydraulic Center-Link with Self-Alignment, page 160*
- *8.3.2 Attaching A Series Auger Header – Hydraulic Center-Link without Self-Alignment, page 166*

Figure 8.33: M155*E4* and A40D Auger Header

8.3.1 Attaching A Series Auger Header – Hydraulic Center-Link with Self-Alignment

The windrower may be equipped with an optional self-aligning hydraulic center-link, which allows the Operator to control 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.

1. Shut down the engine, and remove the key from the ignition.
2. Remove hairpin (A) from clevis pin (B) and remove the clevis pin from header boots (C) on both sides of the header.

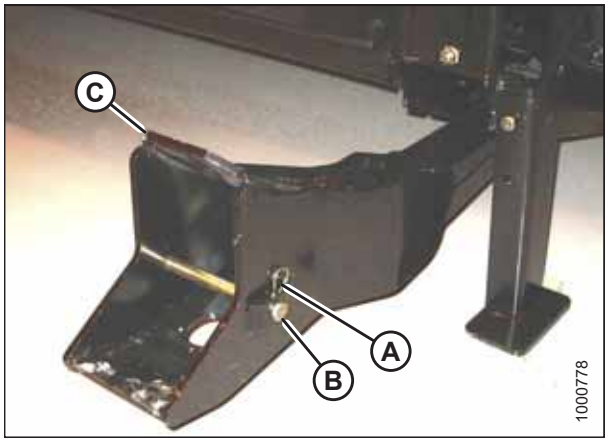


Figure 8.34: Header Boot

3. Check that the float engagement pin is installed in storage position (B) and **NOT** in engaged position (A).

   IMPORTANT:

   To prevent damage to the lift system when lowering the header lift linkages without a header or a weight box attached to the windrower, ensure that the float engagement pin is installed in storage position (B) and **NOT** in engaged position (A).

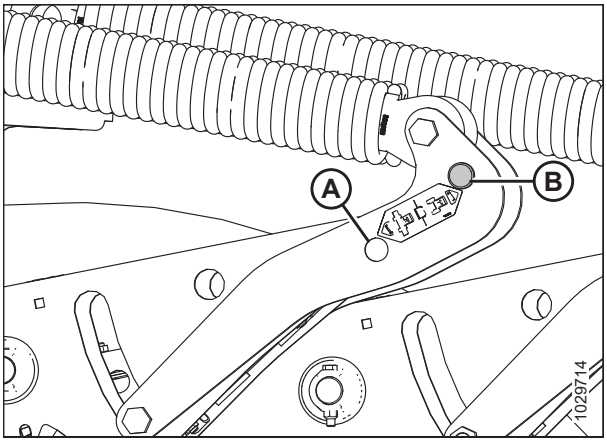


Figure 8.35: Header Float Linkage

DANGER

Ensure that all bystanders have cleared the area.

4. Start the engine and activate HEADER DOWN button (A) on the ground speed lever (GSL) to fully retract the header lift cylinders.

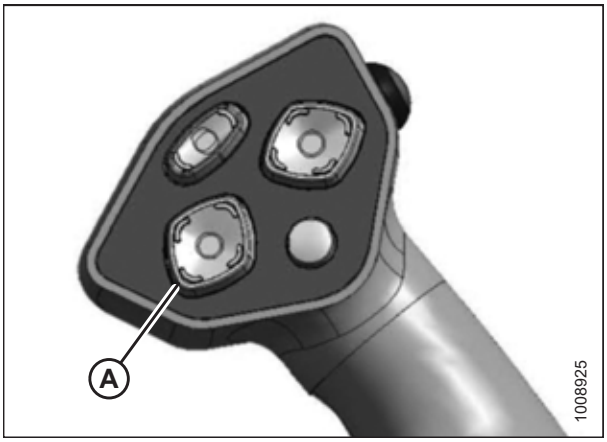


Figure 8.36: Ground Speed Lever

5. Press REEL UP switch (A) 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 for hookup.

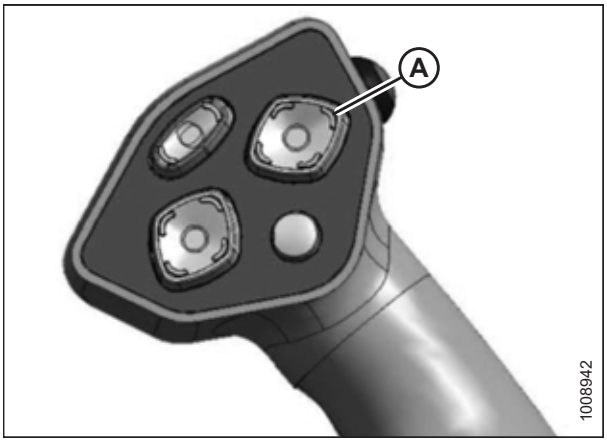


Figure 8.37: Ground Speed Lever

6. Drive the windrower slowly forward until windrower feet (A) enter header supports (B). Continue driving slowly forward until the feet engage the supports and the header is nudged forward.

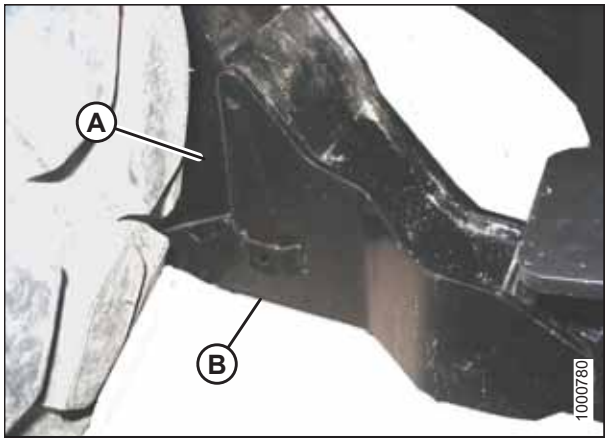


Figure 8.38: Header Support

7. Use the following GSL functions to position the center-link hook above the header attachment pin:
   - REEL UP (A) to raise the center-link
   - REEL DOWN (B) to lower the center-link
   - HEADER TILT UP (C) to retract the center-link
   - HEADER TILT DOWN (D) to extend the center-link

   IMPORTANT:

   The hook release 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.

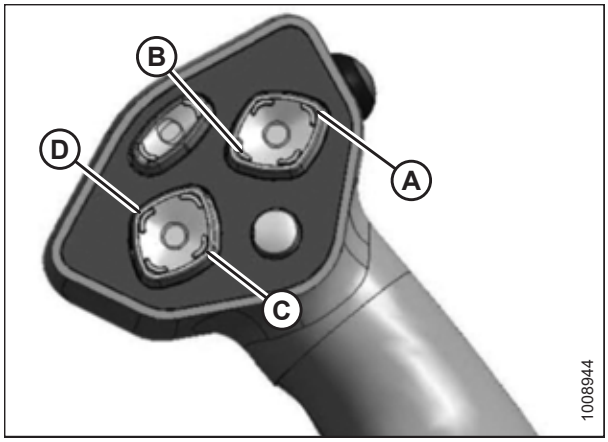


Figure 8.39: Ground Speed Lever

8. Adjust the position of center-link cylinder (A) with the REEL UP and REEL DOWN switches on the GSL until the hook is positioned above the header attachment pin.

   IMPORTANT:

   Hook release (B) 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.

9. Lower center-link (A) onto the header using the REEL DOWN switch on the GSL until the center-link locks into position and hook release (B) is down.

10. Check that the center-link is locked onto the header by pressing the REEL UP switch on the GSL.

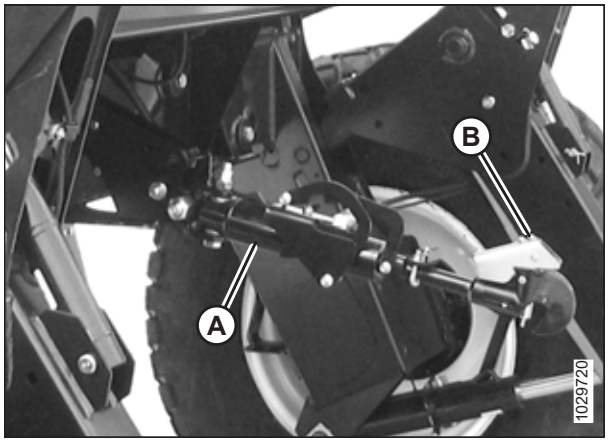


Figure 8.40: Hydraulic Center-Link

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

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

    a. Press and hold the HEADER UP switch until both cylinders stop moving.

    b. Continue to hold the switch for 3–4 seconds. The cylinders are now phased.

    NOTE:

    It may be necessary to repeat this procedure if there is air in the hydraulic system.

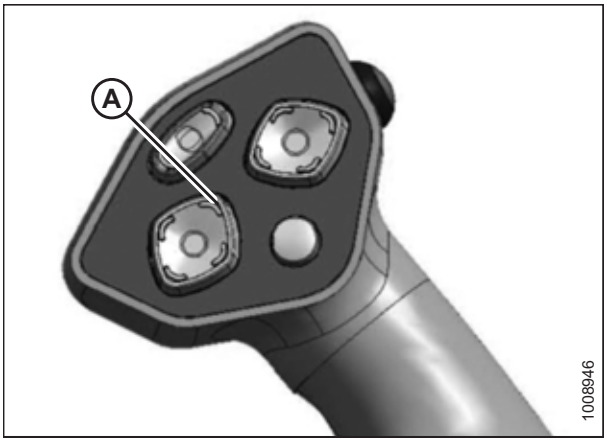


Figure 8.41: Ground Speed Lever

13. Engage the safety props on both lift cylinders:

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

    b. Pull lever (A) and rotate it towards the header to release and lower safety prop (B) onto the lift cylinder.

    c. Repeat the previous steps for the opposite lift cylinder.

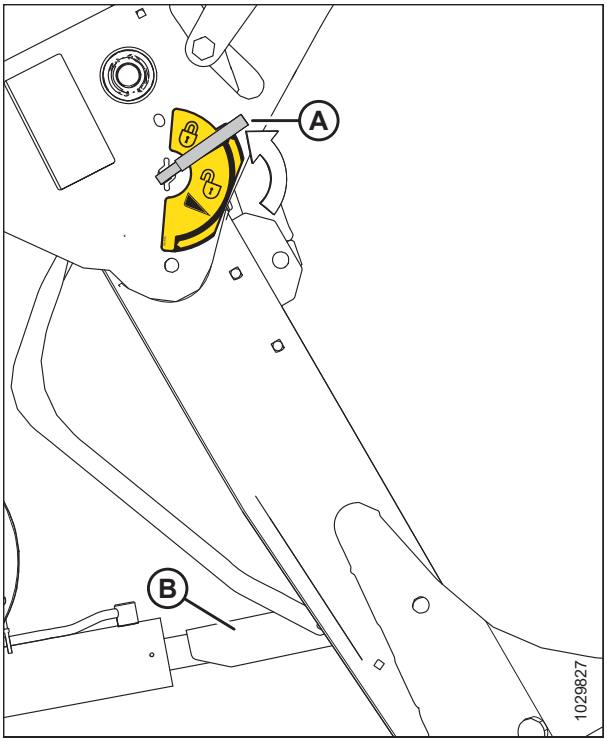


Figure 8.42: Safety Prop

14. Install clevis pin (A) through the support and the foot and secure it with the hairpin.

    IMPORTANT:

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

15. Repeat the previous step to secure the support on the other side of the header.

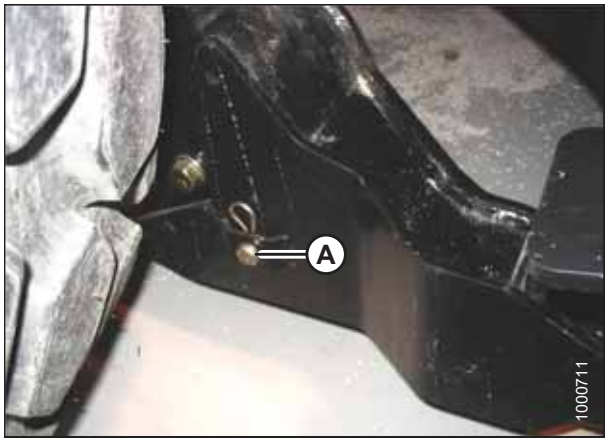


Figure 8.43: Header Support

16. Remove the lynch pin from clevis pin (A) in stand (B).
17. Hold stand (B) and remove pin (A).
18. Move stand (B) to the storage position by inverting it and relocating it onto the bracket as shown. Reinsert clevis pin (A) and secure it with the lynch pin.

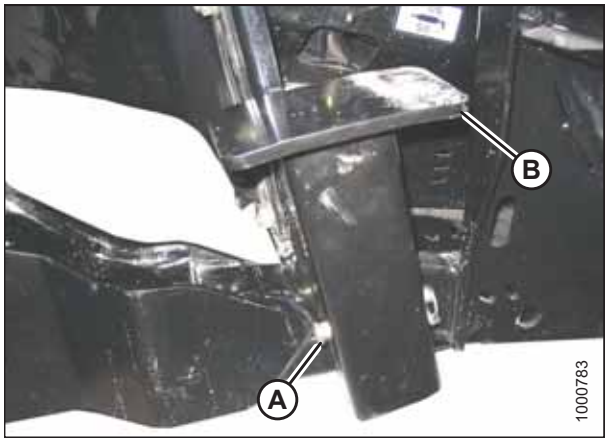


Figure 8.44: Header Stand

19. Remove the clevis pin from storage position (B) in the linkage and insert it into hole (A) to engage the float springs. Secure it with the hairpin. Repeat this step on the opposite float linkage.

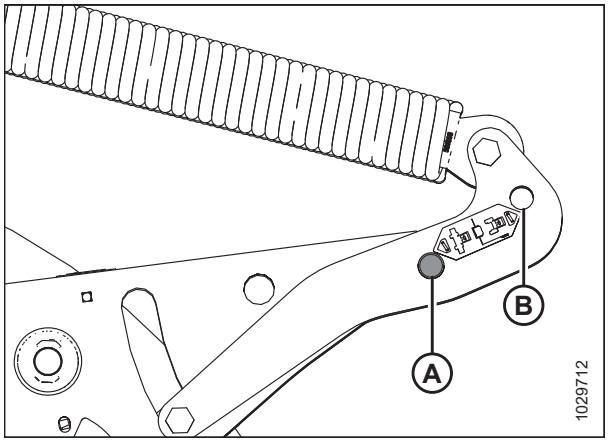


Figure 8.45: Header Float Linkage

20. Disengage the safety prop by turning lever (A) downwards until the lever locks into the vertical position.

21. Repeat the previous step for the opposite safety prop.

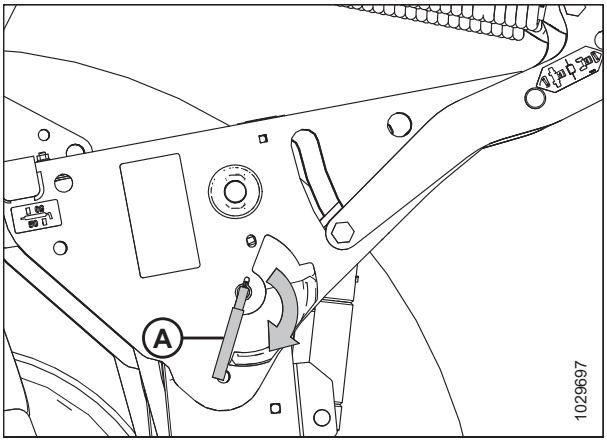


Figure 8.46: Safety Prop Lever

DANGER

Ensure that all bystanders have cleared the area.

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

23. Stop the engine, and remove the key from the ignition.

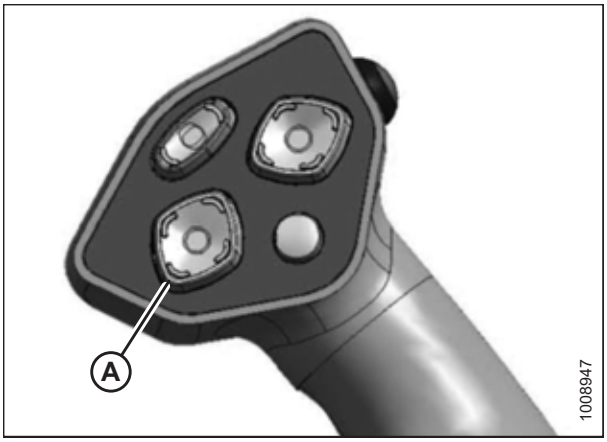


Figure 8.47: Ground Speed Lever

24. Connect header drive hoses (A) and electrical harness (B) to the header. For instructions, refer to the header operator's manual.

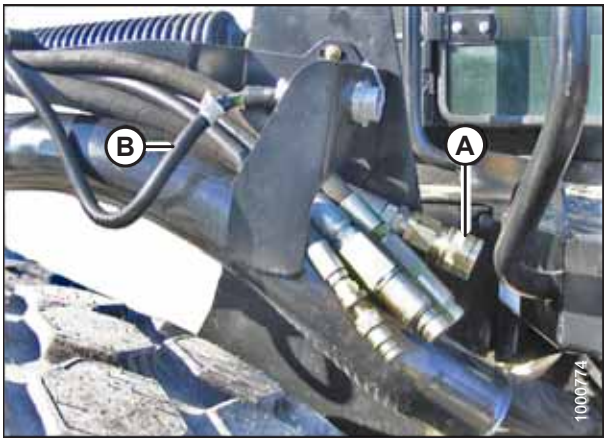


Figure 8.48: Header Drive Hoses and Harness

8.3.2 Attaching A Series Auger Header – Hydraulic Center-Link without Self-Alignment

If the windrower is equipped with a hydraulic center-link that lacks the self-alignment capability, the Operator will have to manually attach the hydraulic center-link's hook to the header's center pin.

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 hairpin (A) from clevis pin (B) and remove the clevis pin from header boots (C) on both sides of the header.

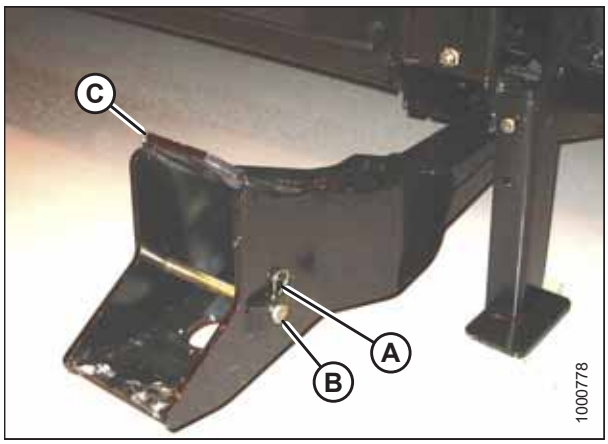


Figure 8.49: Header Boot

3. Check that the float engagement pin is installed in storage position (B) and **NOT** in engaged position (A).

   IMPORTANT:

   To prevent damage to the lift system when lowering the header lift linkages without a header or a weight box attached to the windrower, ensure that the float engagement pin is installed in storage position (B) and **NOT** in engaged position (A).

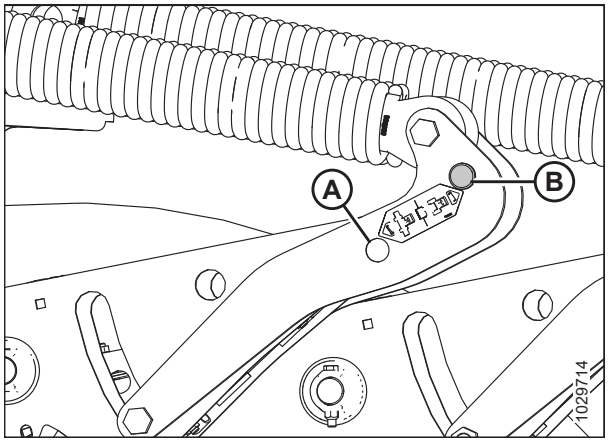


Figure 8.50: Header Float Linkage

DANGER

Ensure that all bystanders have cleared the area.

4. Start the engine and activate HEADER DOWN button (A) on the ground speed lever (GSL) to fully retract the header lift cylinders.

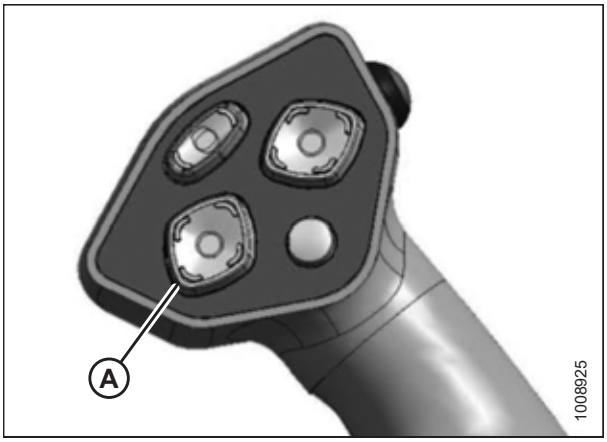


Figure 8.51: Ground Speed Lever

5. Remove pin (A) from the frame linkage 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:

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

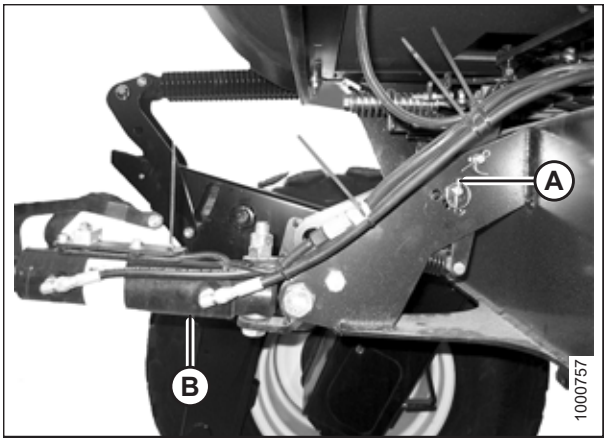


Figure 8.52: Hydraulic Center-Link without Self-Alignment Kit

6. Drive the windrower slowly forward until windrower feet (A) enter header supports (B). Continue driving slowly forward until the feet engage the supports and the header is nudged forward.

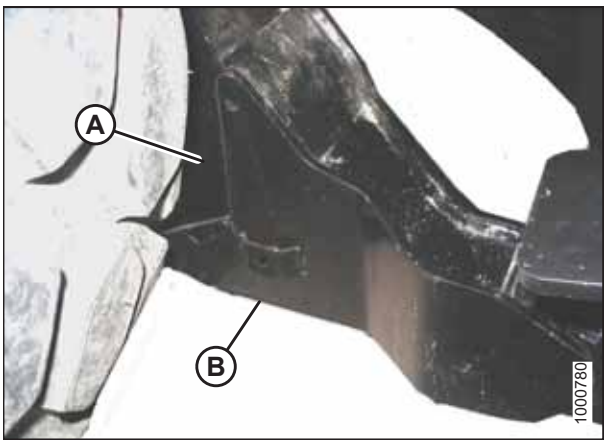


Figure 8.53: Header Support

7. Use the following ground speed lever functions to position the center-link hook above the header attachment pin:
   - HEADER TILT UP (A) to retract the center-link
   - HEADER TILT DOWN (B) to extend the center-link
8. Shut down the engine, and remove the key from the ignition.

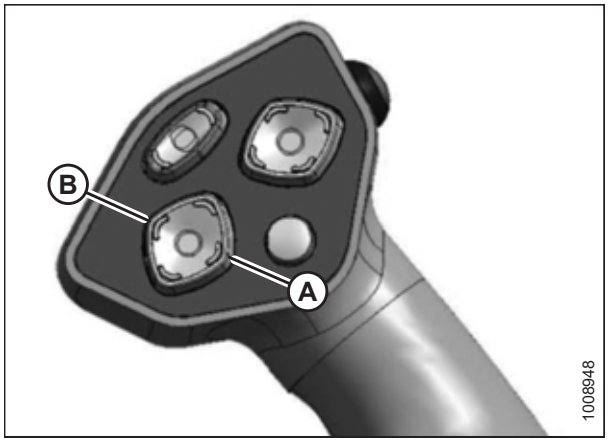


Figure 8.54: Ground Speed Lever

9. Push down on the rod end of link cylinder (A) until hook (B) engages and locks onto the header pin.

   IMPORTANT:

   The hook release 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.

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

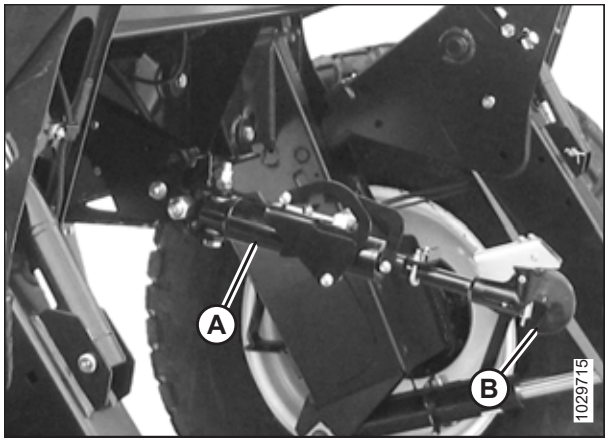


Figure 8.55: Hydraulic Center-Link

DANGER

Ensure that all bystanders have cleared the area.

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

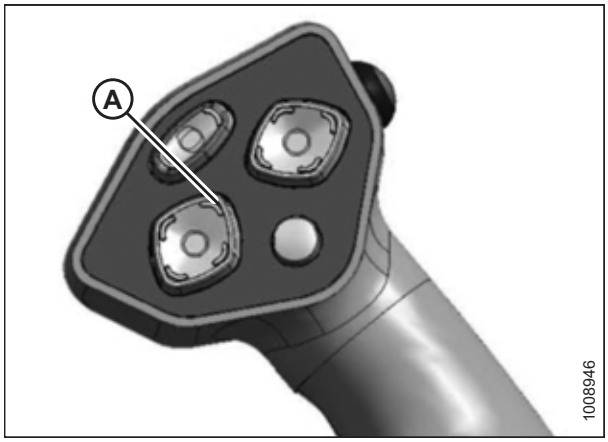


Figure 8.56: Ground Speed Lever

NOTE:

It may be necessary to repeat this procedure if there is air in the hydraulic system.

14. Engage the safety props on both lift cylinders:

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

    b. Pull lever (A) and rotate it towards the header to release and lower safety prop (B) onto the lift cylinder.

    c. Repeat the previous steps for the opposite lift cylinder.

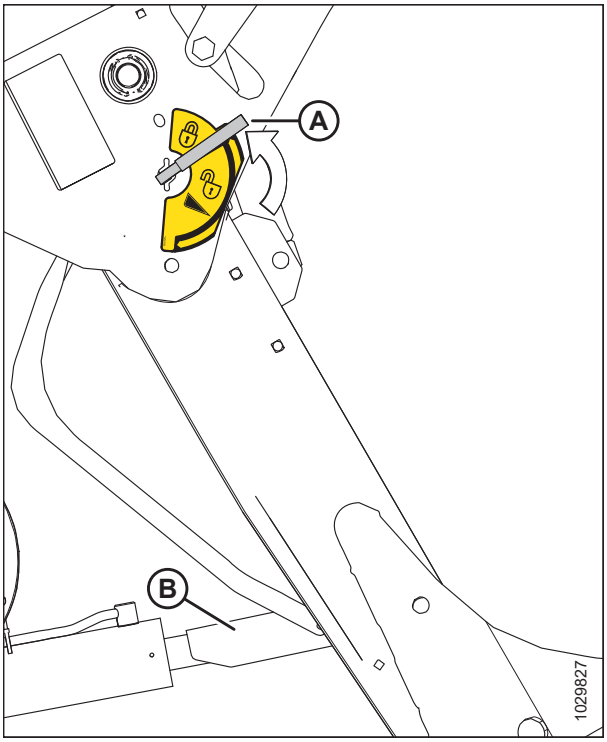


Figure 8.57: Safety Prop

15. Install clevis pin (A) through the support and the foot and secure it with the hairpin.

    IMPORTANT:

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

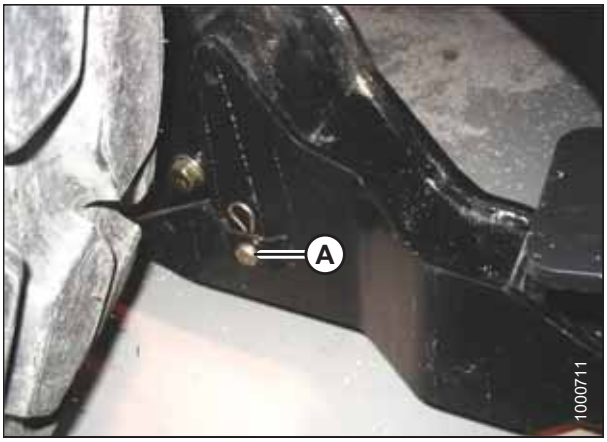


Figure 8.58: Header Support

16. Remove the lynch pin from clevis pin (A) in stand (B).
17. Hold stand (B) and remove pin (A).
18. Move stand (B) to the storage position by inverting it and relocating it onto the bracket as shown. Reinsert clevis pin (A) and secure it with the lynch pin.

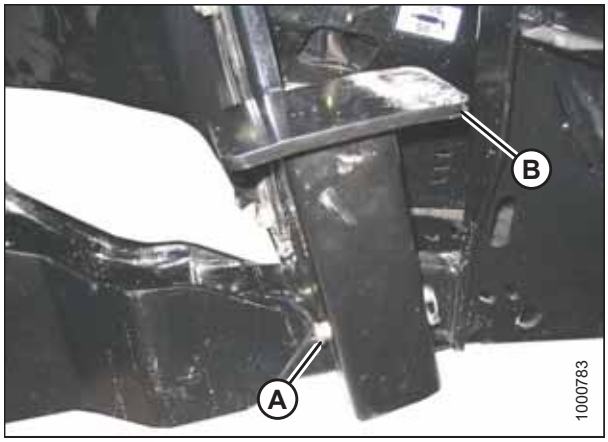


Figure 8.59: Header Stand

19. Remove the clevis pin from storage position (B) in the linkage and insert it into hole (A) to engage the float springs. Secure it with the hairpin. Repeat this step on the opposite float linkage.

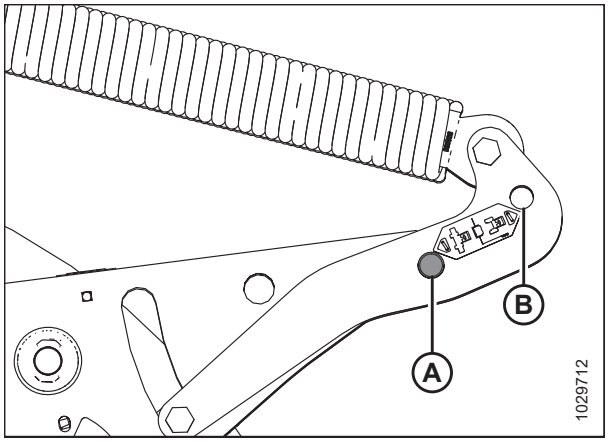


Figure 8.60: Header Float Linkage

20. Disengage the safety prop by turning lever (A) downwards until the lever locks into the vertical position.
21. Repeat the previous step for the opposite safety prop.

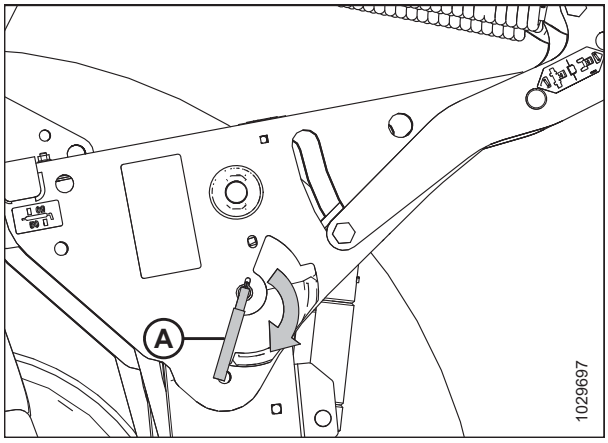


Figure 8.61: Safety Prop Lever

DANGER

Ensure that all bystanders have cleared the area.

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

23. Stop the engine, and remove the key from the ignition.

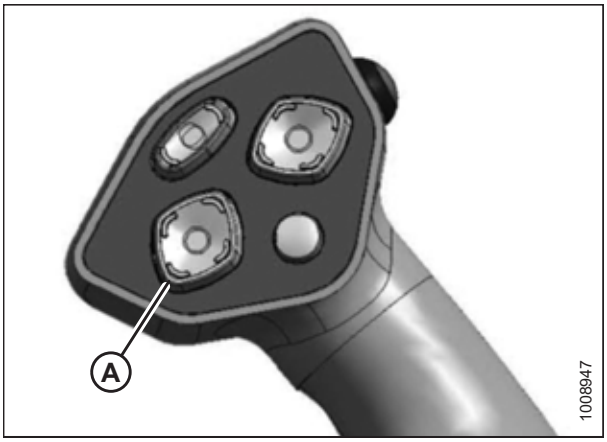


Figure 8.62: Ground Speed Lever

24. Connect header drive hoses (A) and electrical harness (B) to the header. For instructions, refer to the header operator's manual.

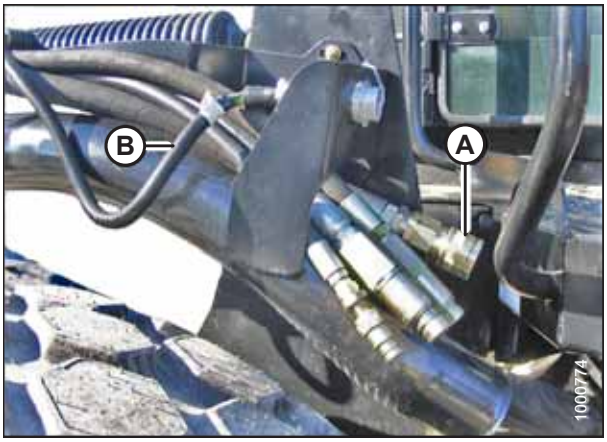


Figure 8.63: Header Drive Hoses and Harness

8.4 Attaching R Series or R1 Series Rotary Disc Header

M155*E4* Self-Propelled Windrowers are compatible with R and R1 Series Rotary Disc Headers.

NOTE:

Install 18.4 x 26 tires on the drive wheels when operating an M155*E4* Self-Propelled Windrower with an attached 4 m (13 ft.) R or R1 Series Rotary Disc Header. These drive tires are reversible and should be mounted inset at 3792 mm (149.3 in.) to provide the greatest amount of clearance to uncut crop. Mounting these tires outset or mounting any other drive tire option will result in the drive tires being slightly wider than the header. This may cause some uncut crop to be trampled by the tires when turning the windrower, and may leave some uncut strips of crop in the windrower's next pass.

The M155*E4* Self-Propelled Windrower can operate the following rotary disc headers:

- 4 m (13 ft.) R Series
- R1 Series

These headers are shipped without the motor or hoses installed, so a separate motor, hose bundle, and hydraulic valve kit is required to operate the header.

If necessary, obtain the following kits and install them in accordance with the instructions supplied with the kits.

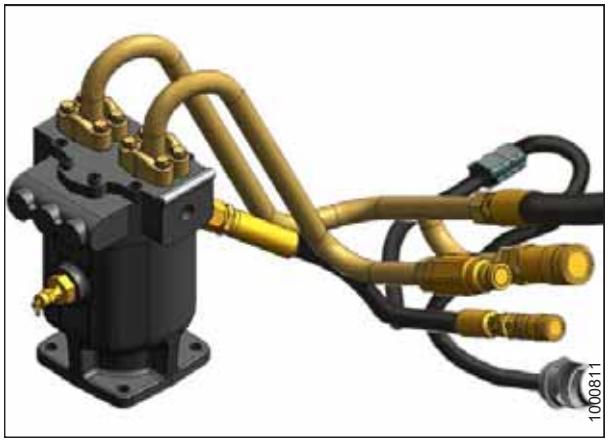


Figure 8.64: Hydraulic Drive Kit (MD #B5510)

Table 8.1 Rotary Disc Header Bundles – R Series

Kit Description	Kit Number
Hydraulic Drive kit	MD #B5510
Hydraulic Valve kit	MD #B4657

Table 8.2 Rotary Disc Header Bundles – R1 Series

Kit Description	Kit Number
Hydraulic Drive kit	MD #B6272

Refer to the following instructions based on the type of center-link installed on your windrower:

- *8.4.1 Attaching R or R1 Series Rotary Header – Hydraulic Center-Link with Self-Alignment, page 172*
- *8.4.2 Attaching R or R1 Series Rotary Header – Hydraulic Center-Link without Self-Alignment, page 178*

8.4.1 Attaching R or R1 Series Rotary Header – Hydraulic Center-Link with Self-Alignment

The windrower may be equipped with an optional self-aligning hydraulic center-link, which allows the Operator to control 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.

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

2. Locate header supports (A) on the rear of the header.

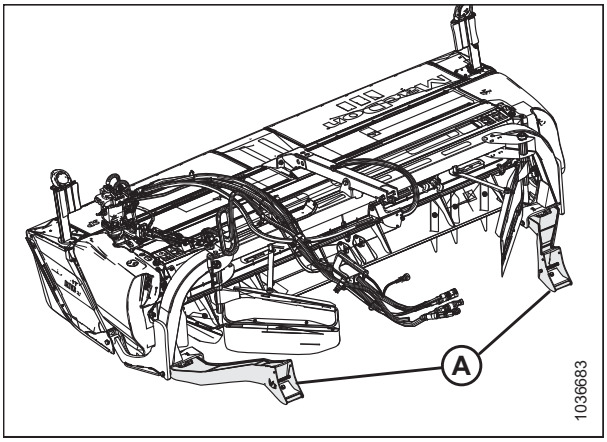


Figure 8.65: Header Supports – R113 SP

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

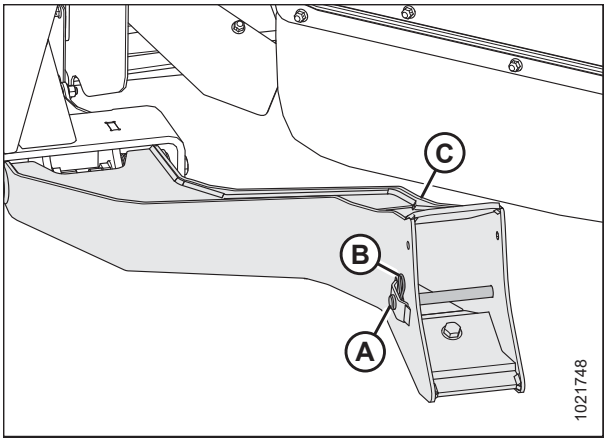


Figure 8.66: Header Support

4. Remove the float engagement pin from hole (A) to disengage the float springs, and insert the float engagement pin into storage hole (B). Secure the pin with the lynch pin. Repeat this step for the opposite linkage.

   IMPORTANT:

   To prevent damage to the lift system when lowering the header lift linkages without a header or a weight box attached to the windrower, ensure that the float engagement pin is installed in storage hole (B) and **NOT** in engaged position (A).

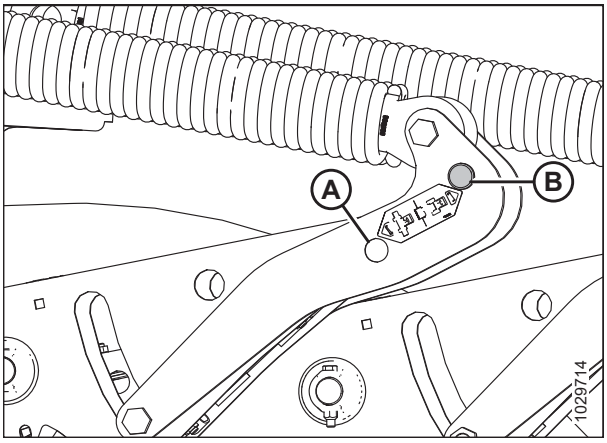


Figure 8.67: Float Linkage

DANGER

Ensure that all bystanders have cleared the area.

5. Start the engine and activate HEADER DOWN button (A) on the ground speed lever (GSL) to fully retract the header lift cylinders.

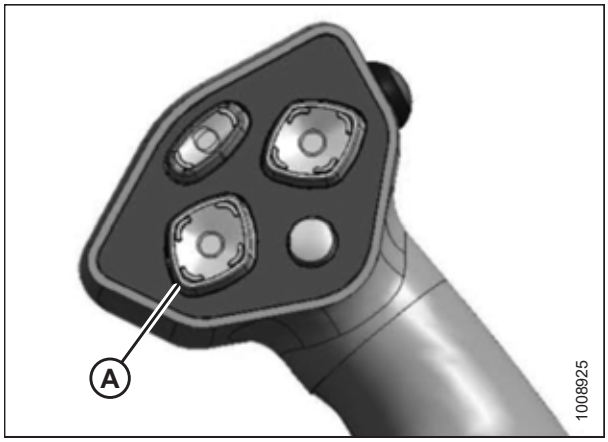


Figure 8.68: Ground Speed Lever

6. Press REEL UP switch (A) 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 for hookup.

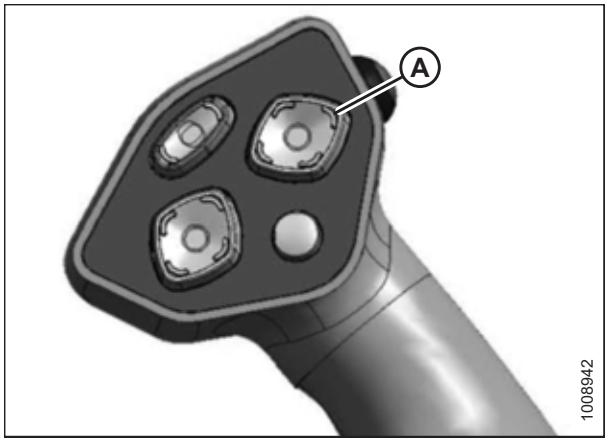


Figure 8.69: Ground Speed Lever

7. Slowly drive the windrower forward until windrower feet (A) enter header supports (B). Continue driving slowly forward until the feet engage the supports and the header is nudged forward.

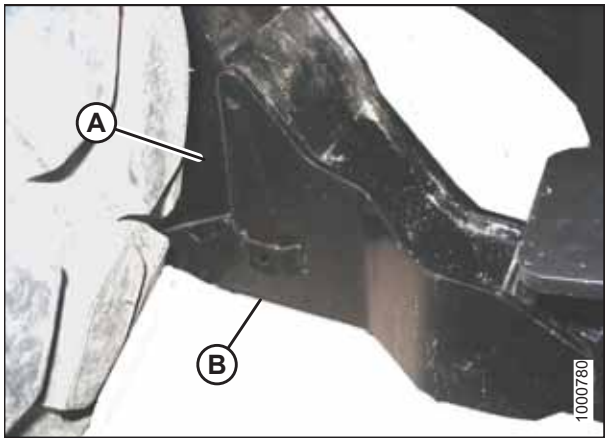


Figure 8.70: Header Support

8. Use the following GSL functions to position the center-link hook above the header attachment pin:
   - REEL UP (A) to raise the center-link
   - REEL DOWN (B) to lower the center-link
   - HEADER TILT UP (C) to retract the center-link
   - HEADER TILT DOWN (D) to extend the center-link

   IMPORTANT:

   The hook release 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.

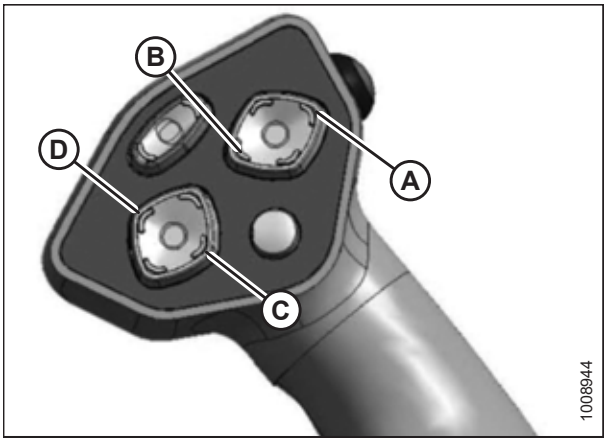


Figure 8.71: Ground Speed Lever

9. Adjust the position of center-link cylinder (A) with the REEL UP and REEL DOWN switches on the GSL until the hook is positioned above the header attachment pin.

   IMPORTANT:

   Hook release (B) 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.

10. Lower center-link (A) onto the header using the REEL DOWN switch on the GSL until the center-link locks into position and hook release (B) is down.

11. Check that the center-link is locked onto the header by pressing the REEL UP switch on the GSL.

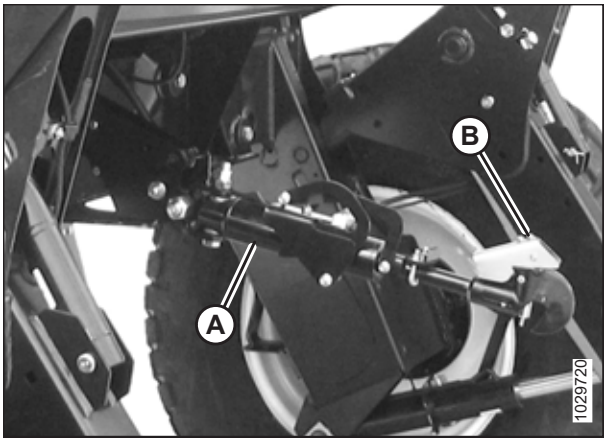


Figure 8.72: Hydraulic Center-Link

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

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

    a. Press and hold the HEADER UP switch until both cylinders stop moving.

    b. Continue to hold the switch for 3–4 seconds. The cylinders are now phased.

    NOTE:

    It may be necessary to repeat this procedure if there is air in the hydraulic system.

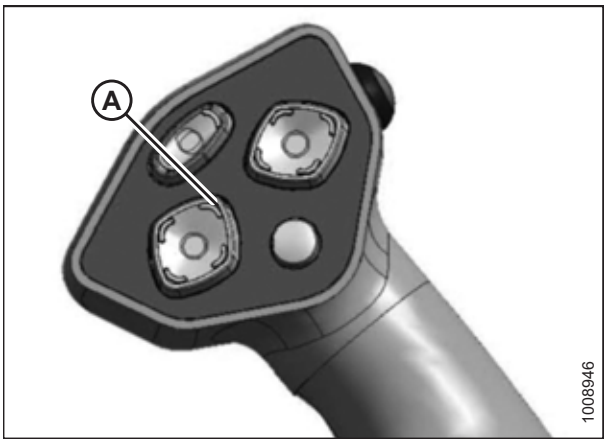


Figure 8.73: Ground Speed Lever

14. Engage the safety props on both lift cylinders:

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

    b. Pull lever (A) and rotate it towards the header to release and lower safety prop (B) onto the lift cylinder.

    c. Repeat the previous steps for the opposite lift cylinder.

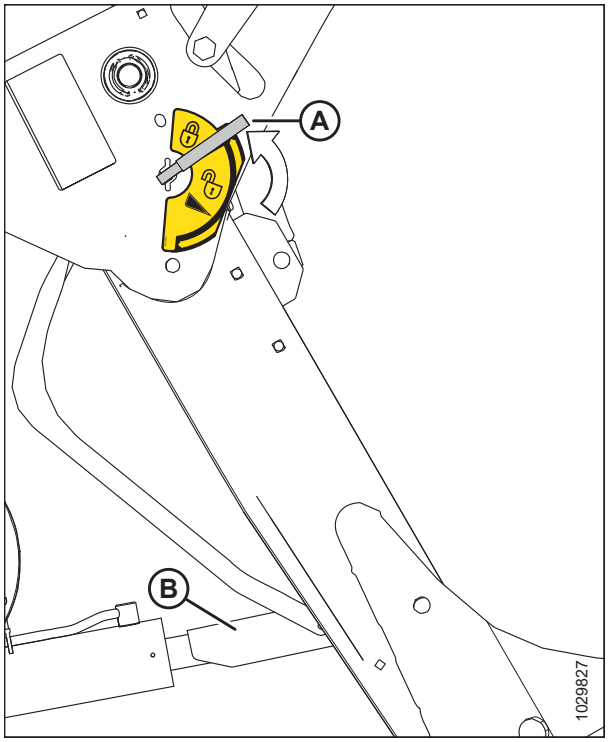


Figure 8.74: Safety Prop

15. Install clevis pin (A) through the support and the windrower lift member, and secure it with hairpin (B). Repeat this step for the opposite side of the machine.

    IMPORTANT:

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

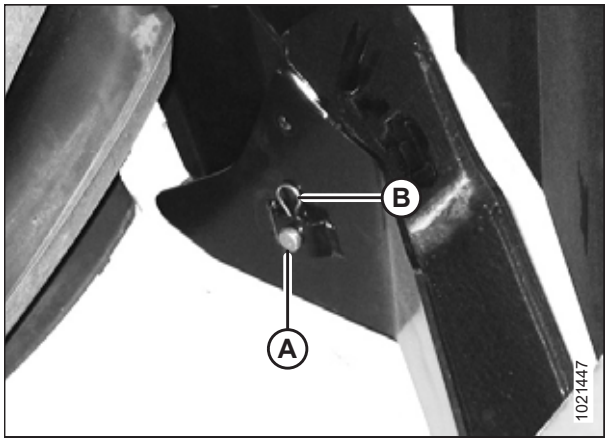


Figure 8.75: Header Support

16. Remove the clevis pin from storage position (B) in the linkage and insert it into hole (A) to engage the float springs. Secure it with the hairpin. Repeat this step on the opposite float linkage.

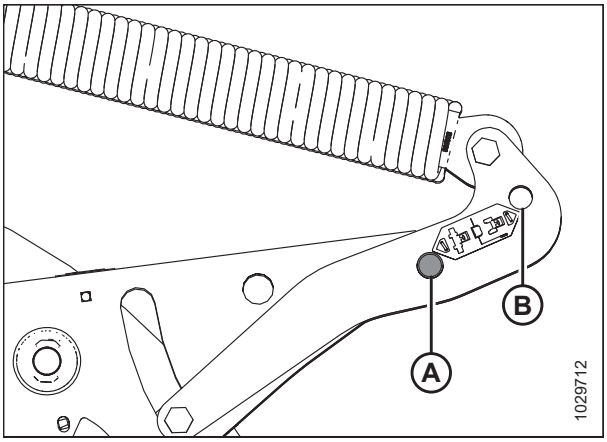


Figure 8.76: Header Float Linkage

17. Disengage the safety prop by turning lever (A) downwards until the lever locks into the vertical position.

18. Repeat the previous step for the opposite safety prop.

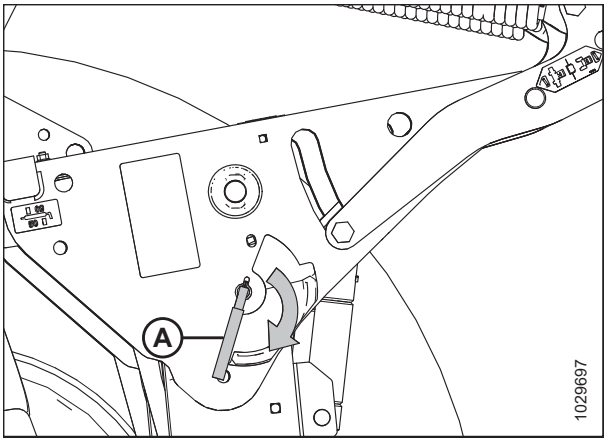


Figure 8.77: Safety Prop Lever

DANGER

Ensure that all bystanders have cleared the area.

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

20. Stop the engine, and remove the key from the ignition.

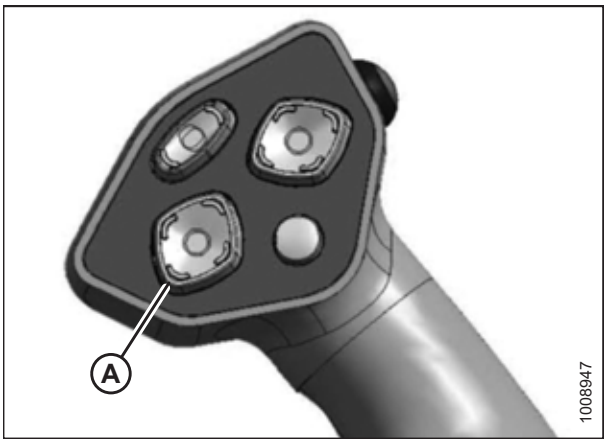


Figure 8.78: Ground Speed Lever

21. Connect header drive hoses (A) and electrical harness (B) to the header. For instructions, refer to the header operator's manual.

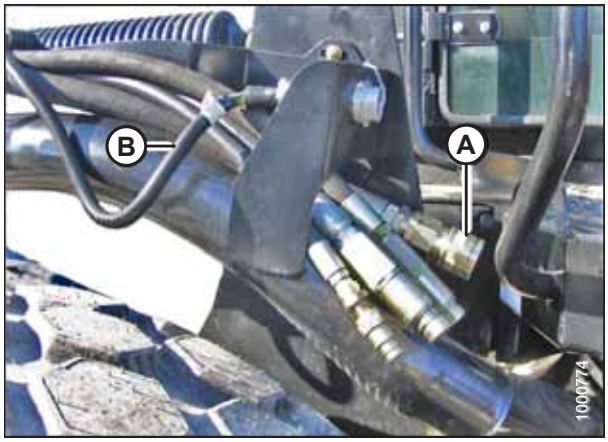


Figure 8.79: Header Drive Hoses and Harness

8.4.2 Attaching R or R1 Series Rotary Header – Hydraulic Center-Link without Self-Alignment

If the windrower is equipped with a hydraulic center-link that lacks the self-alignment capability; the Operator will have to manually attach the hydraulic center-link's hook to the header's center pin.

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. Locate header supports (A) on the rear of the header.

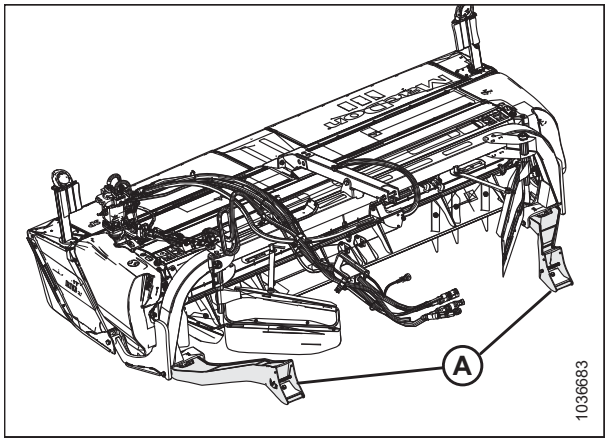


Figure 8.80: Header Supports – R113 SP

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

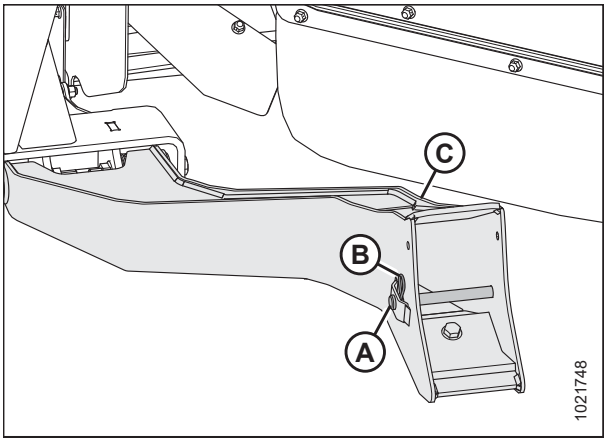


Figure 8.81: Header Support

4. To disengage the float springs, move the float engagement pin from engaged position (A) and insert the pin into storage hole (B). Secure the float engagement pin with a lynch pin. Repeat this step for the opposite linkage.

   IMPORTANT:

   To avoid damaging the lift system when lowering the header lift linkages without a header or a weight box attached, ensure that the float engagement pin is installed in storage position (B) and **NOT** in engaged position (A).

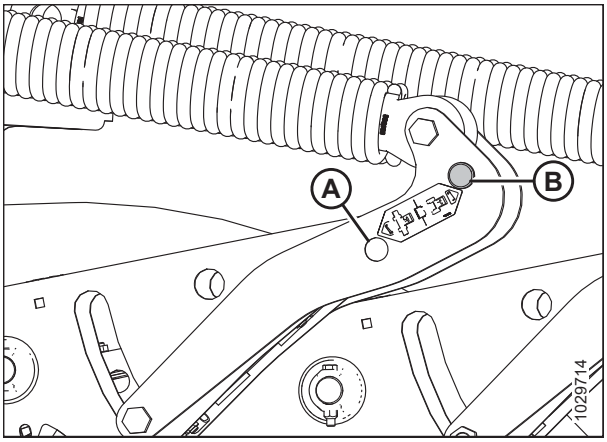


Figure 8.82: Header Float Linkage

DANGER

Ensure that all bystanders have cleared the area.

5. Start the engine and activate HEADER DOWN button (A) on the ground speed lever (GSL) to fully retract the header lift cylinders.

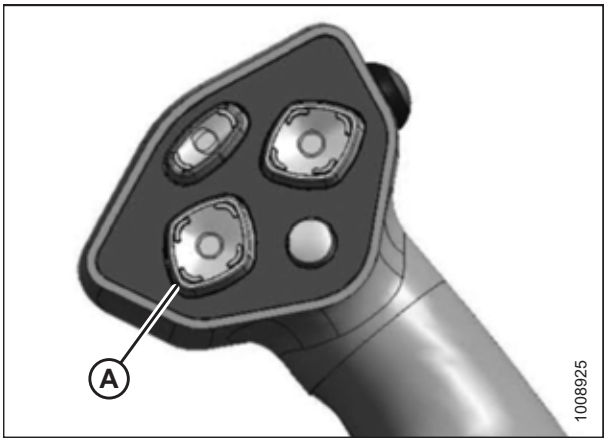


Figure 8.83: Ground Speed Lever

6. Remove pin (A) from the frame linkage 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:

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

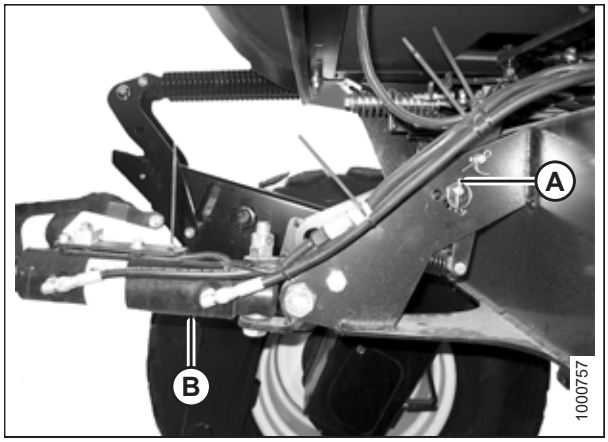


Figure 8.84: Hydraulic Center-Link without Self-Alignment Kit

7. Slowly drive the windrower forward until windrower feet (A) enter header supports (B). Continue driving slowly forward until the feet engage the supports and the header nudges forward.

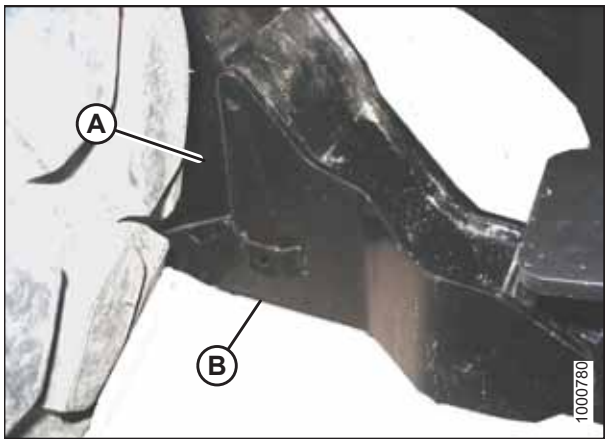


Figure 8.85: Header Support

8. Use the following GSL functions to position the center-link hook above the header attachment pin:
   - HEADER TILT UP (A) to retract the center-link
   - HEADER TILT DOWN (B) to extend the center-link
9. Stop the engine, and remove the key from the ignition.

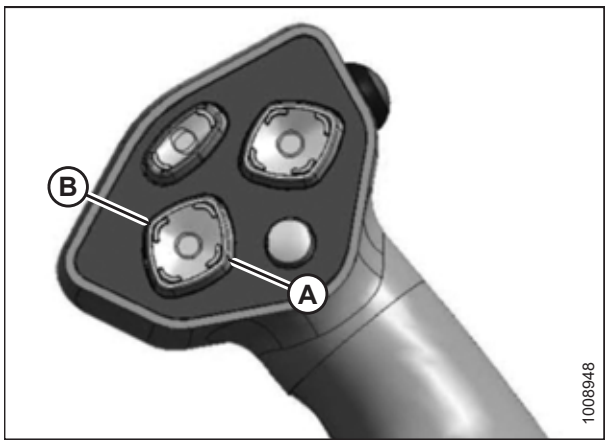


Figure 8.86: Ground Speed Lever

10. Push down on the rod end of link cylinder (A) until hook (B) engages and locks onto the header pin.

    IMPORTANT:

    The hook release 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.

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

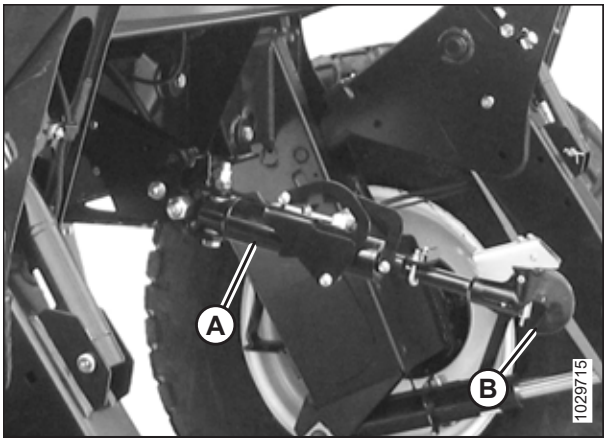


Figure 8.87: Hydraulic Center-Link

DANGER

Ensure that all bystanders have cleared the area.

12. Start the engine.

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

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

    a. Press and hold the HEADER UP switch until both cylinders stop moving.

    b. Continue to hold the switch for 3–4 seconds. The cylinders are now phased.

    NOTE:

    It may be necessary to repeat this procedure if there is air in the system.

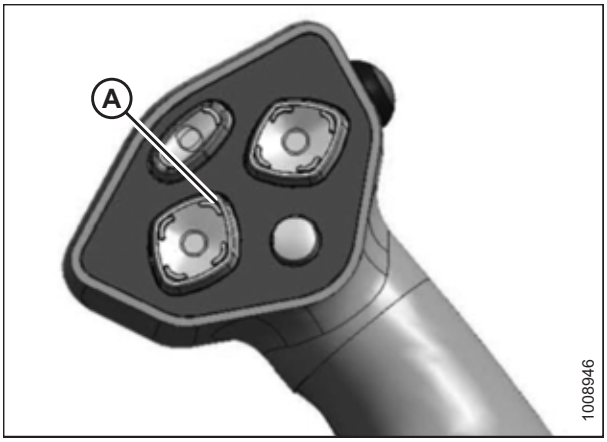


Figure 8.88: Ground Speed Lever

15. Engage the safety props on both lift cylinders:

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

    b. Pull lever (A) and rotate it towards the header to release and lower safety prop (B) onto the lift cylinder.

    c. Repeat the previous steps for the opposite lift cylinder.

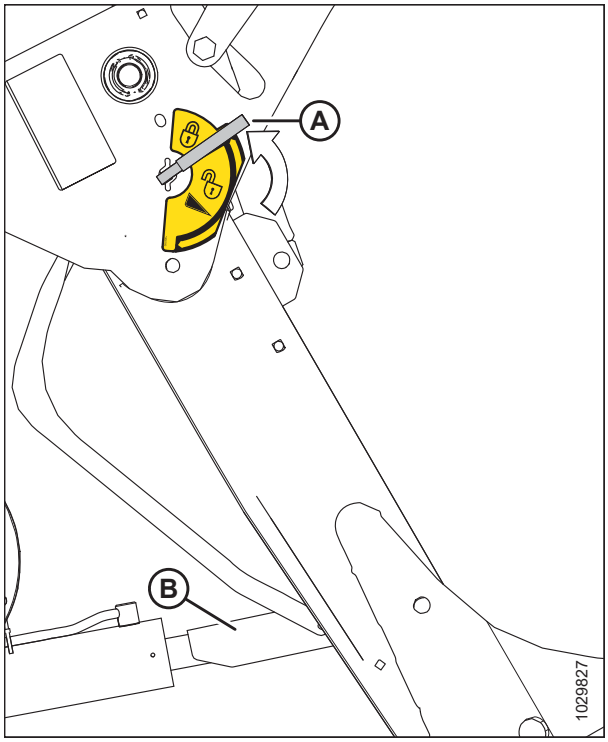


Figure 8.89: Safety Prop

16. Install clevis pin (A) through the support and the windrower lift member, and secure it with hairpin (B). Repeat this step for the opposite side of the machine.

    IMPORTANT:

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

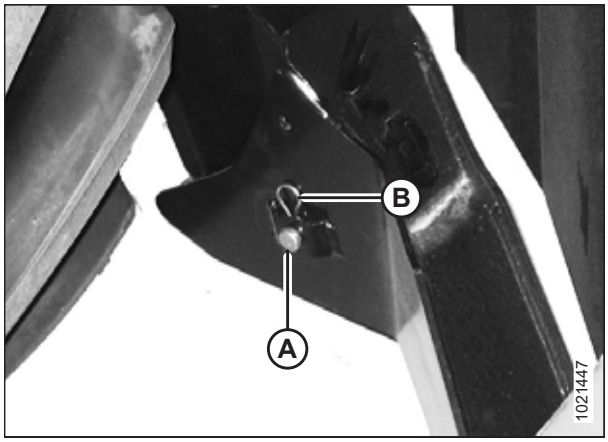


Figure 8.90: Header Support

17. Remove the clevis pin from storage position (B) in the linkage and insert it into hole (A) to engage the float springs. Secure it with the hairpin. Repeat this step on the opposite float linkage.

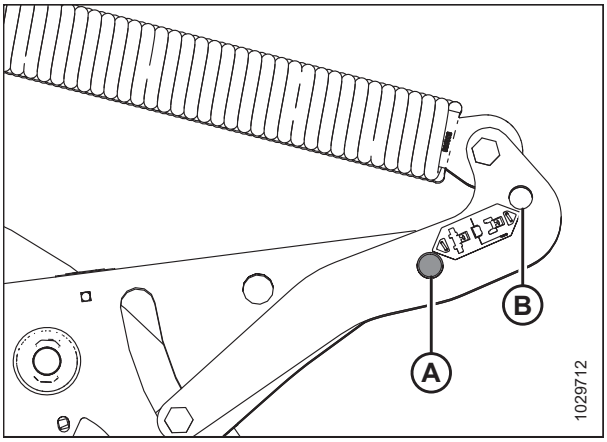


Figure 8.91: Header Float Linkage

18. Disengage the safety prop by turning lever (A) downwards until the lever locks into the vertical position.
19. Repeat the previous step for the opposite safety prop.

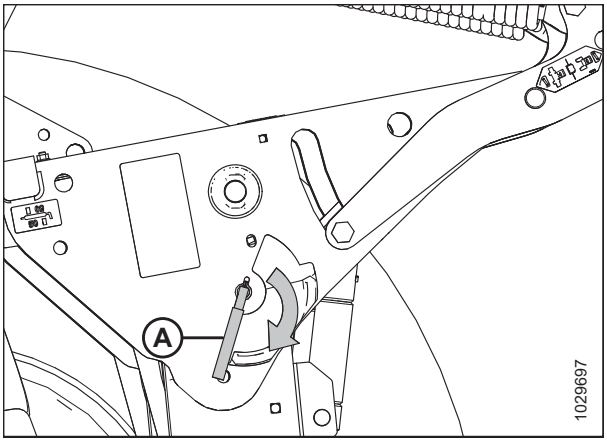


Figure 8.92: Safety Prop Lever

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.
21. Stop the engine, and remove the key from the ignition.

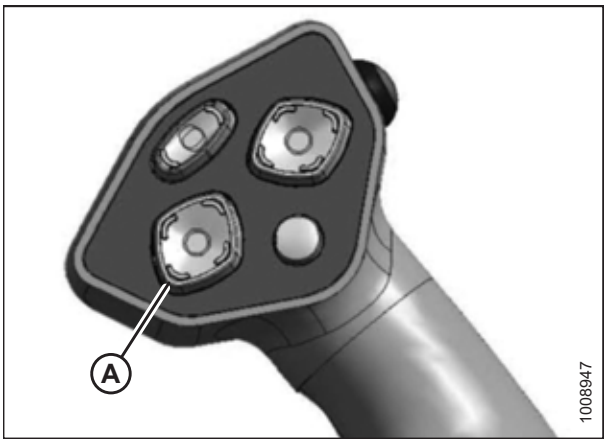


Figure 8.93: Ground Speed Lever

22. Connect header drive hoses (A) and electrical harness (B) to the header. For instructions, refer to the header operator's manual.

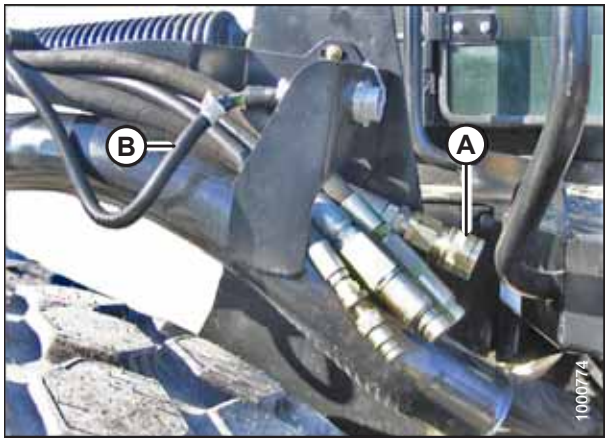


Figure 8.94: Header Drive Hoses and Harness

8.5 Attaching R2 Series Rotary Disc Header

Follow the procedures below to safely attach the R216 Rotary Disc Header to an M155*E4* Self-Propelled Windrower. The procedures differ somewhat depending on whether or not the windrower is equipped with a self-aligning hydraulic center-link.

NOTE:

To use an R216 Rotary Disc Header with an M155*E4* Self-Propelled Windrower, the following kits must be installed first:

- Disc drive kit (MD #B4657)
- M155*E4* hydraulic drive kit (MD #B7310)

Proceed to the relevant topic:

- To connect the header to an M155*E4* Self-Propelled Windrower equipped with a self-aligning hydraulic center-link, proceed to *8.5.1 Attaching R2 Series Rotary Disc Header – Hydraulic Center-Link with Self-Alignment, page 185*.
- To connect the header to an M155*E4* Self-Propelled Windrower equipped with a non-self-aligning hydraulic center-link, proceed to *8.5.2 Attaching R2 Series Rotary Disc Header – Hydraulic Center-Link without Self-Alignment, page 191*.

8.5.1 Attaching R2 Series Rotary Disc Header – Hydraulic Center-Link with Self-Alignment

The M155*E4* Self-Propelled Windrower may be equipped with an optional self-aligning hydraulic center-link, which allows the Operator to control the vertical position of the center-link from the cab. This simplifies the process of attaching the R216 Rotary Disc 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 hairpin (A) from clevis pin (B), and remove the pin from header support (C).
3. Repeat the previous step on the other side of the header.

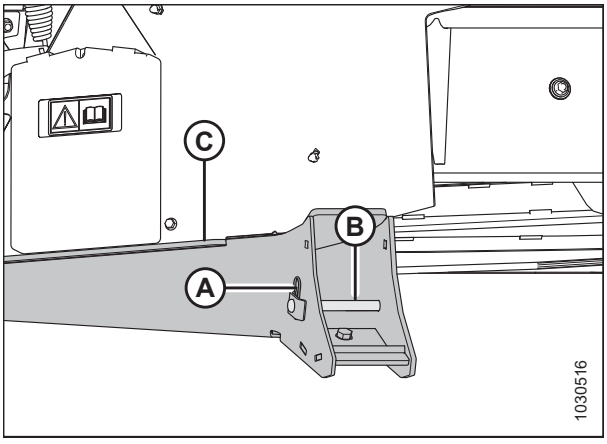


Figure 8.95: Header Support

4. Lift header support (A) and place 2 x 4 in. blocks (B) under the header support. A total of four 2 x 4 in. blocks (B) will be necessary to raise the boot up into field position. Ensure the boot's bottom edge (C) is parallel with the ground. Repeat for the opposite side.

   NOTE:

   Do **NOT** stack blocks (B) crosswise; doing so can make the header unstable. Stack blocks (B) so that the edges of the blocks are flush with each other.

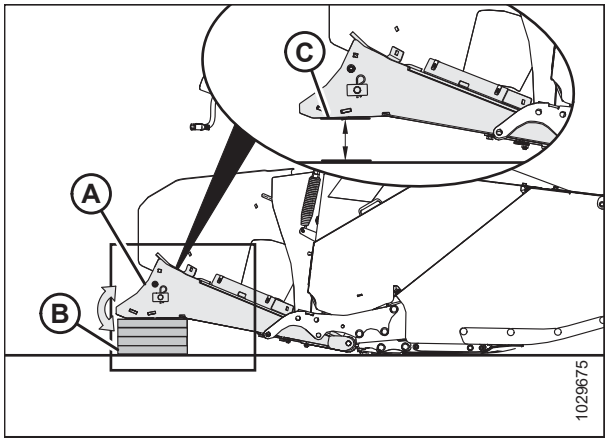


Figure 8.96: Header Support

5. Remove the float engagement pin from hole (A) to disengage the float springs. Insert the float engagement pin into storage hole (B). Secure the engagement pin with the lynch pin.

   IMPORTANT:

   To prevent damage to the lift system when lowering the header lift linkages without a header or a weight box attached to the windrower, ensure that the float engagement pin is installed in storage hole (B) and **NOT** in engaged position (A).

6. Repeat the previous step for the other float engagement pin.

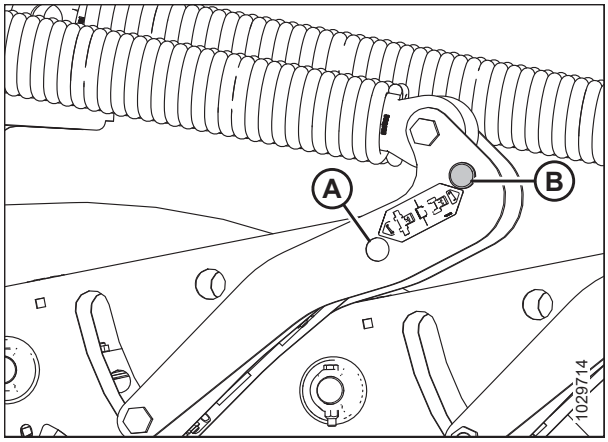


Figure 8.97: Float Linkage

DANGER

Ensure that all bystanders have cleared the area.

7. Start the engine and activate HEADER DOWN button (A) on the ground speed lever (GSL) to fully retract the header lift cylinders.

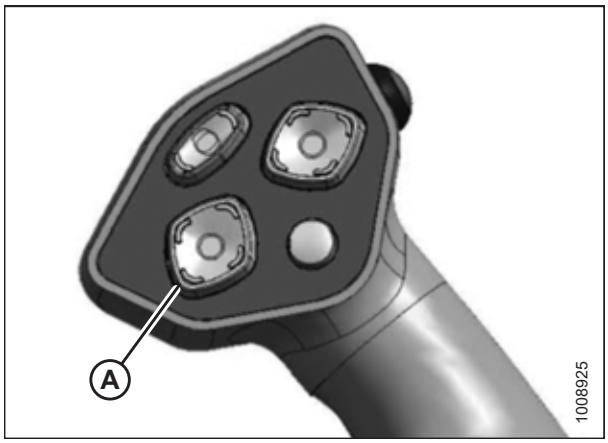


Figure 8.98: Ground Speed Lever

8. Press REEL UP switch (A) 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 for hookup.

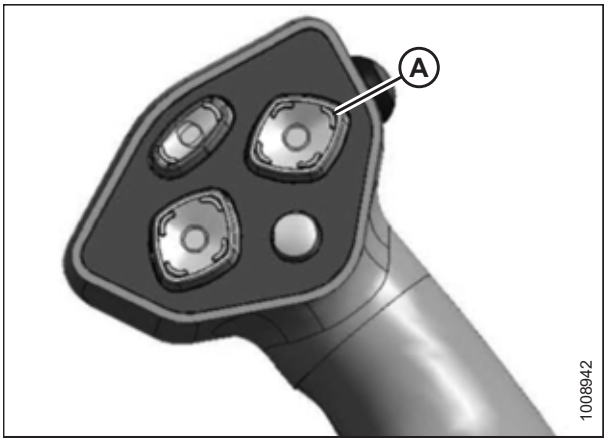


Figure 8.99: Ground Speed Lever

9. Slowly drive the windrower forward until windrower feet (A) enter header supports (B). Continue driving slowly forward until the feet engage the supports and the header is nudged forward.

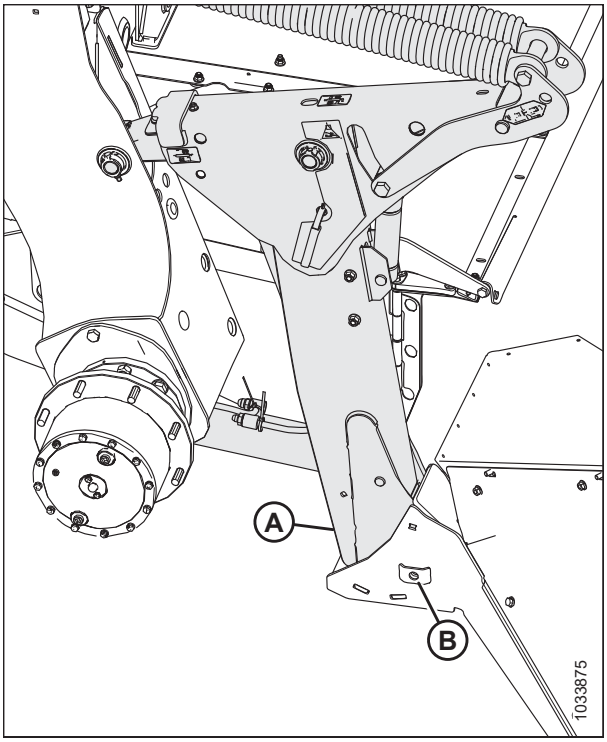


Figure 8.100: Header Support

10. Use the following GSL functions to position the center-link hook above the header attachment pin:
    - REEL UP (A) to raise the center-link
    - REEL DOWN (B) to lower the center-link
    - HEADER TILT UP (C) to retract the center-link
    - HEADER TILT DOWN (D) to extend the center-link

    IMPORTANT:

    The hook release 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.

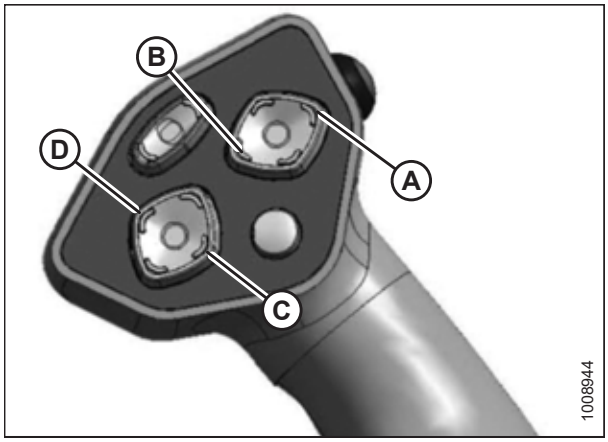


Figure 8.101: Ground Speed Lever

11. Adjust the position of center-link cylinder (A) with the REEL UP and REEL DOWN switches on the GSL until the hook is positioned above the header attachment pin.

    IMPORTANT:

    Hook release (B) 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.

12. Lower center-link (A) onto the header using the REEL DOWN switch on the GSL until the center-link locks into position and hook release (B) is down.

13. Check that the center-link is locked onto the header by pressing the REEL UP switch on the GSL.

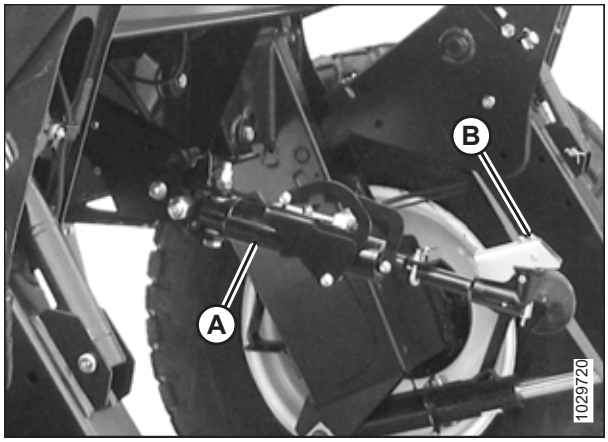


Figure 8.102: Hydraulic Center-Link

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

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

    a. Press and hold the HEADER UP switch until both cylinders stop moving.

    b. Continue to hold the switch for 3–4 seconds. The cylinders are now phased.

    NOTE:

    It may be necessary to repeat this procedure if there is air in the hydraulic system.

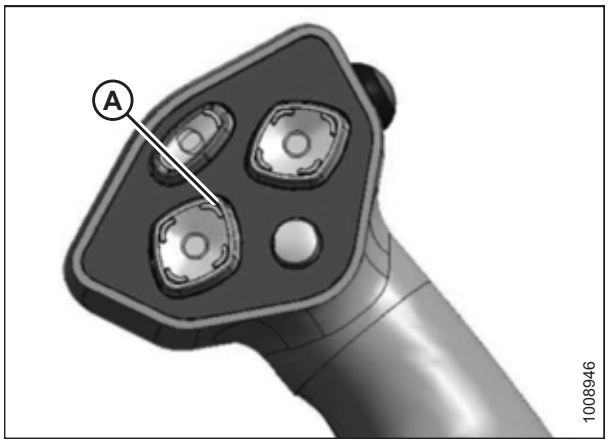


Figure 8.103: Ground Speed Lever

16. To lower the safety props:

    a. Pull lever (A) outward and rotate it toward the header to lower safety prop (B) onto the cylinder.

    b. Repeat the previous step for the other safety prop.

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

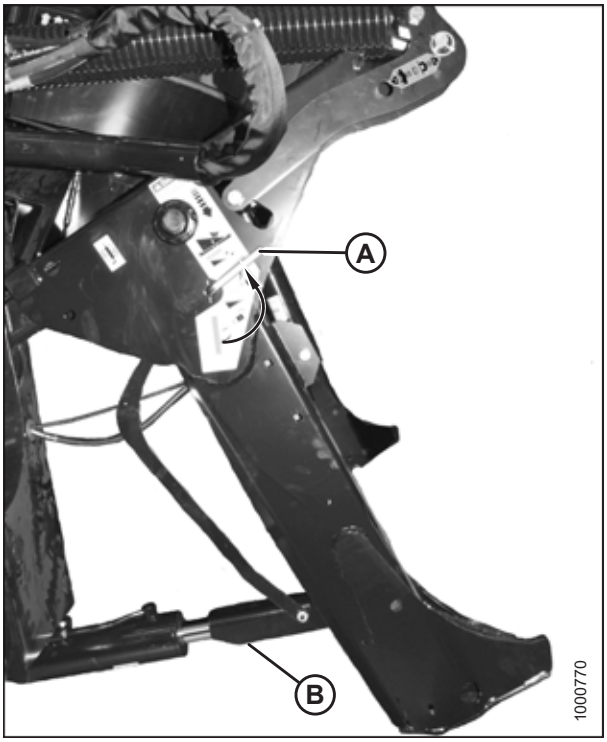


Figure 8.104: Safety Prop

17. Install clevis pin (A) through the support and the windrower foot. Secure the clevis pin with hairpin (B).

    IMPORTANT:

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

18. Repeat the previous step on the other side of the header.

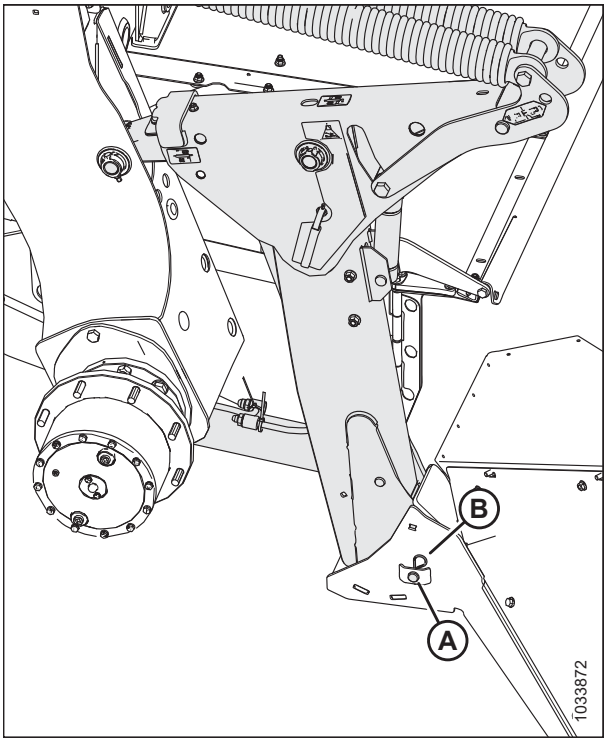


Figure 8.105: Header Support

19. Remove the clevis pin from storage position (B) in the linkage and insert it into hole (A) to engage the float springs. Secure it with the hairpin. Repeat this step on the opposite float linkage.

20. Repeat the previous step for the other float engagement pin.

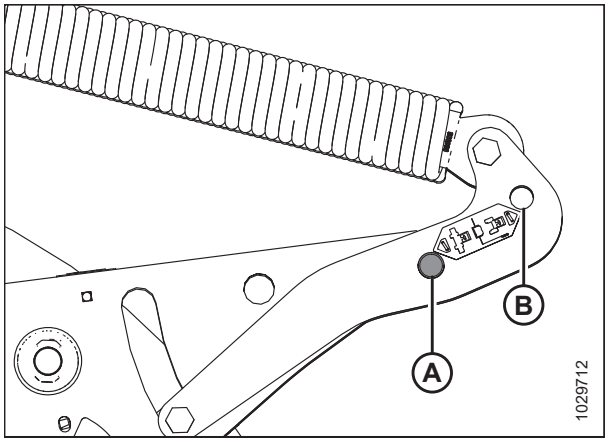


Figure 8.106: Header Float Linkage

21. Disengage the safety prop by turning lever (A) downwards until the lever locks into vertical position.

22. Repeat the previous step for the opposite safety prop.

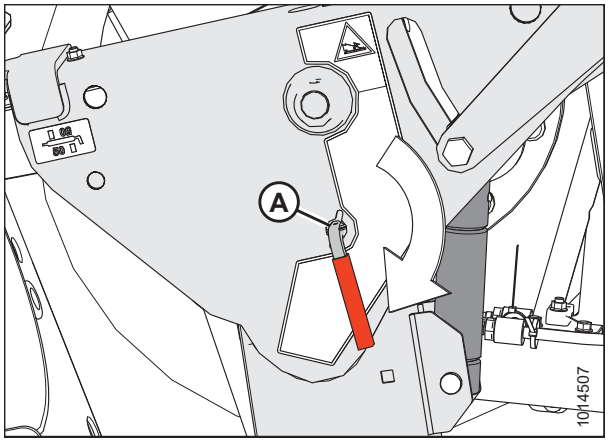


Figure 8.107: Safety Prop

DANGER

Ensure that all bystanders have cleared the area.

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

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

25. Proceed to *8.5.3 Completing Hydraulic and Electrical Connections, page 197*.

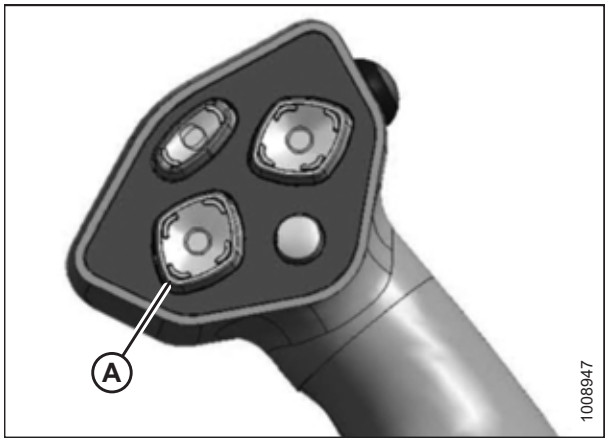


Figure 8.108: Ground Speed Lever

8.5.2 Attaching R2 Series Rotary Disc Header – Hydraulic Center-Link without Self-Alignment

If the M155*E4* Self-Propelled Windrower is equipped with a hydraulic center-link that lacks self-alignment capability, the Operator will have to manually attach the hydraulic center-link's hook to the R216 Rotary Disc Header's center pin.

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 hairpin (A) from clevis pin (B), and remove the pin from header support (C).
3. Repeat the previous step on the other side of the header.

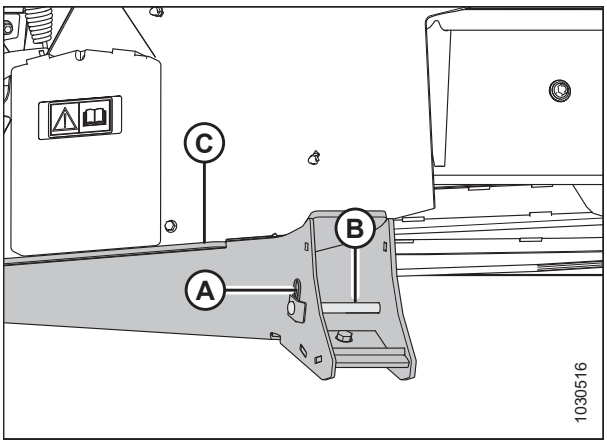


Figure 8.109: Header Support

4. Lift header support (A) and place 2 x 4 in. blocks (B) under the header support. A total of four 2 x 4 in. blocks (B) will be necessary to raise the boot up into field position. Ensure the boot's bottom edge (C) is parallel with the ground. Repeat for the opposite side.

   NOTE:

   Do **NOT** stack blocks (B) crosswise; doing so can make the header unstable. Stack blocks (B) so that the edges of the blocks are flush with each other.

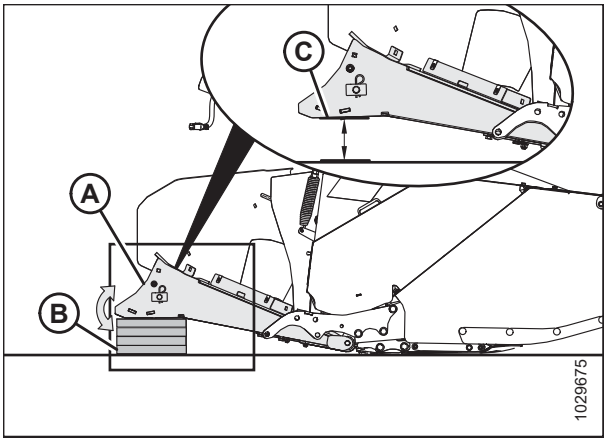


Figure 8.110: Header Support

5. Remove the float engagement pin from hole (A) to disengage the float springs. Insert the float engagement pin into storage hole (B). Secure the engagement pin with the lynch pin.

   IMPORTANT:

   To prevent damage to the lift system when lowering the header lift linkages without a header or a weight box attached to the windrower, ensure that the float engagement pin is installed in storage hole (B) and **NOT** in engaged position (A).

6. Repeat the previous step for the other float engagement pin.

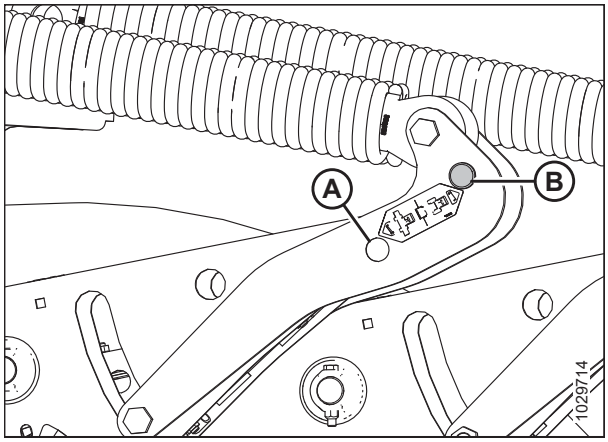


Figure 8.111: Float Linkage

DANGER

Ensure that all bystanders have cleared the area.

7. Start the engine and activate HEADER DOWN button (A) on the ground speed lever (GSL) to fully retract the header lift cylinders.

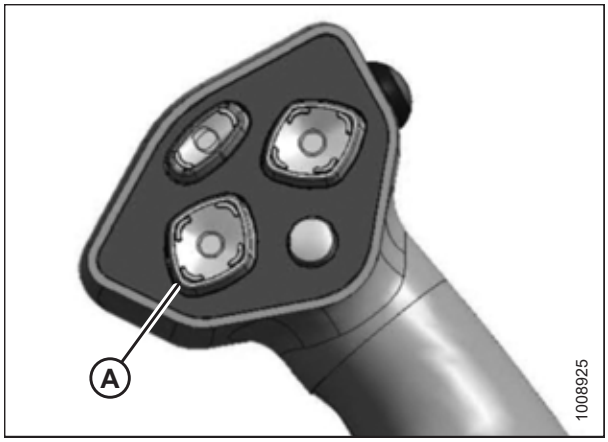


Figure 8.112: Ground Speed Lever

8. Remove pin (A) from the frame linkage 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:

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

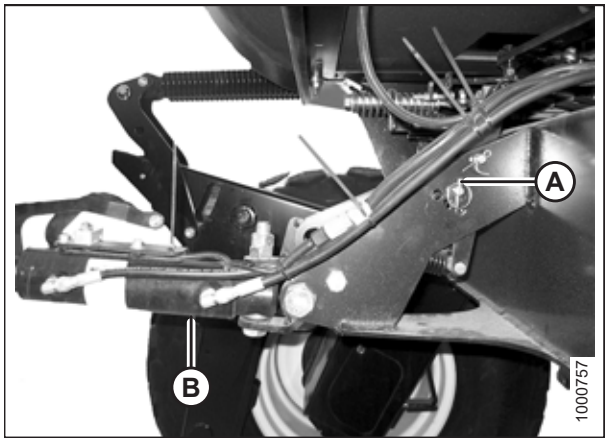


Figure 8.113: Hydraulic Center-Link without Self-Alignment Kit

9. Slowly drive the windrower forward until windrower feet (A) enter header supports (B). Continue driving slowly forward until the feet engage the supports and the header is nudged forward.

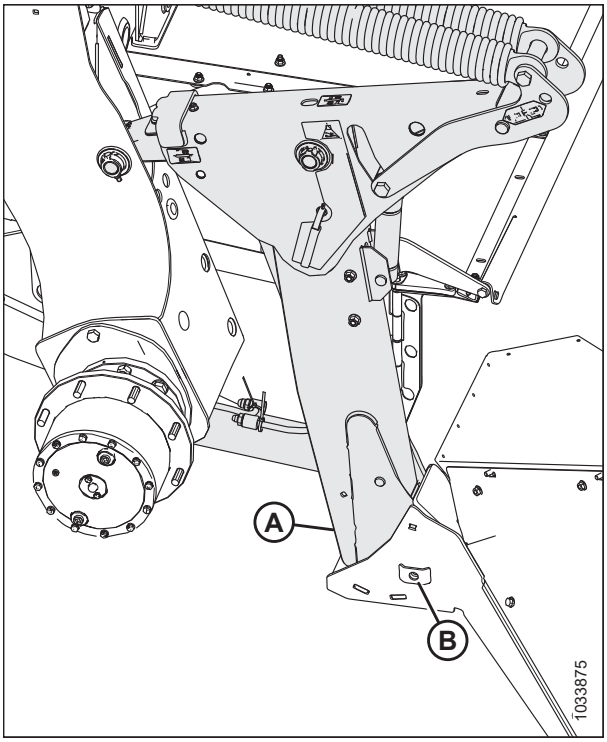


Figure 8.114: Header Support

10. Use the following GSL functions to position the center-link hook above the header attachment pin:
    - HEADER TILT UP (A) to retract the center-link
    - HEADER TILT DOWN (B) to extend the center-link
11. Stop the engine, and remove the key from the ignition.

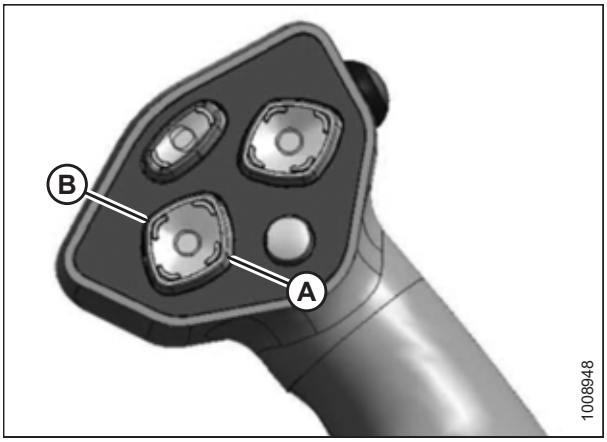


Figure 8.115: Ground Speed Lever

12. Push down on the rod end of link cylinder (A) until hook (B) engages and locks onto the header pin.

    IMPORTANT:

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

14. Start the engine.

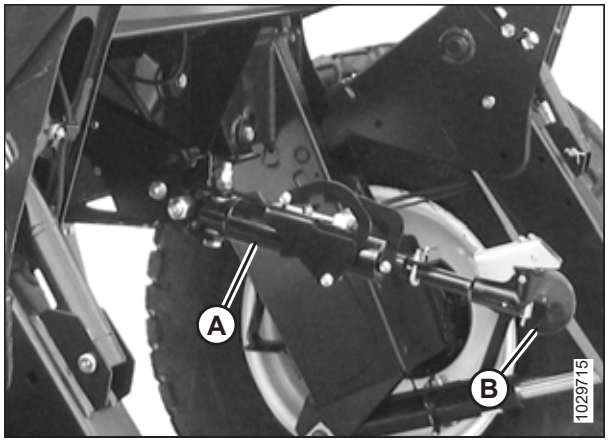


Figure 8.116: Hydraulic Center-Link

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 the HEADER UP switch until both cylinders stop moving.

    b. Continue to hold the switch for 3–4 seconds. The cylinders are now phased.

    NOTE:

    It may be necessary to repeat this procedure if there is air in the hydraulic system.

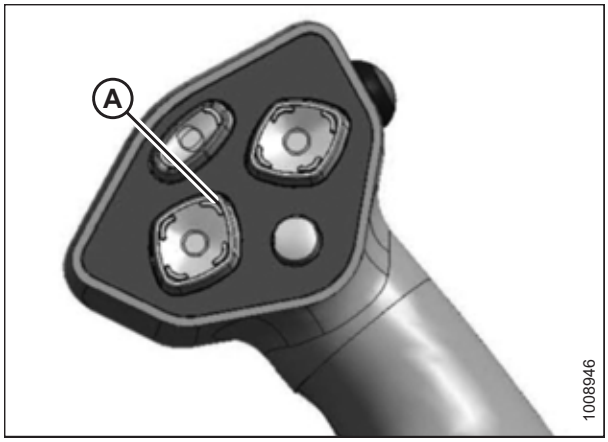


Figure 8.117: Ground Speed Lever

17. To lower the safety props:

    a. Pull lever (A) outward and rotate it toward the header to lower safety prop (B) onto the cylinder.

    b. Repeat the previous step for the other safety prop.

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

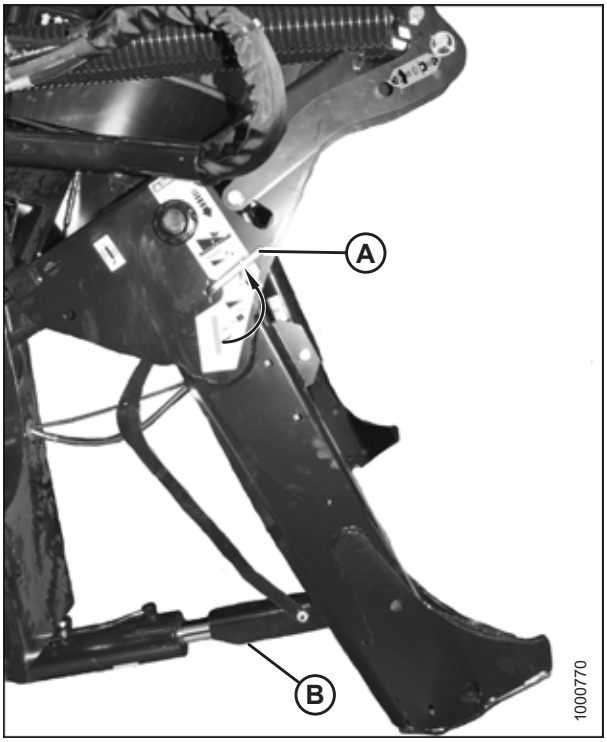


Figure 8.118: Safety Prop

18. Install clevis pin (A) through the support and the windrower foot. Secure the clevis pin with hairpin (B).

    IMPORTANT:

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

19. Repeat the previous step on the other side of the header.

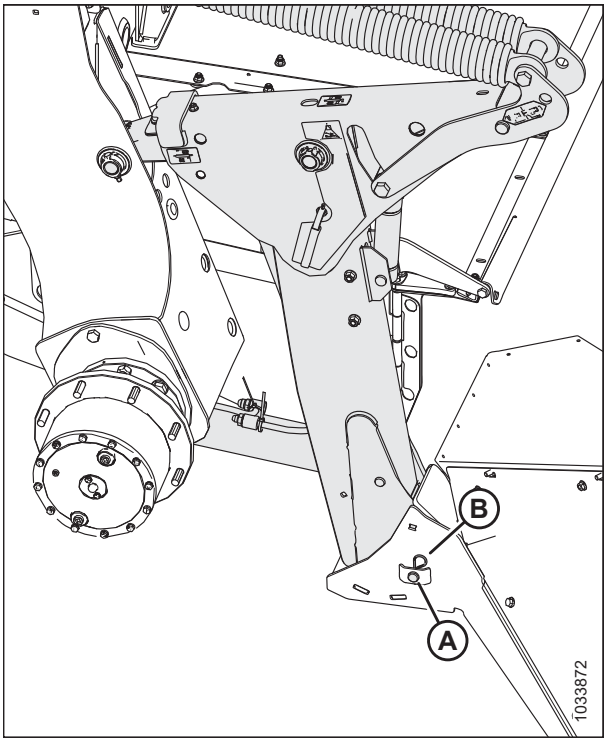


Figure 8.119: Header Support

20. Remove the clevis pin from storage position (B) in the linkage and insert it into hole (A) to engage the float springs. Secure it with the hairpin. Repeat this step on the opposite float linkage.

21. Repeat the previous step for the other float engagement pin.

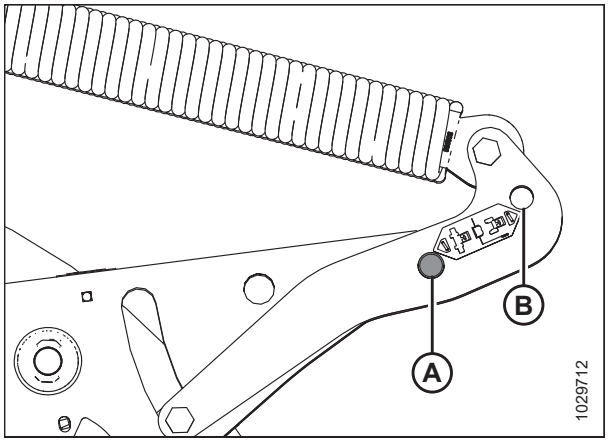


Figure 8.120: Header Float Linkage

22. Disengage the safety prop by turning lever (A) downwards until the lever locks into vertical position.

23. Repeat the previous step for the opposite safety prop.

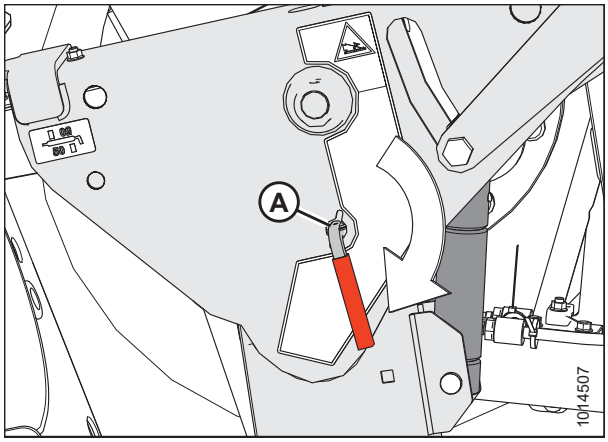


Figure 8.121: Safety Prop

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.

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

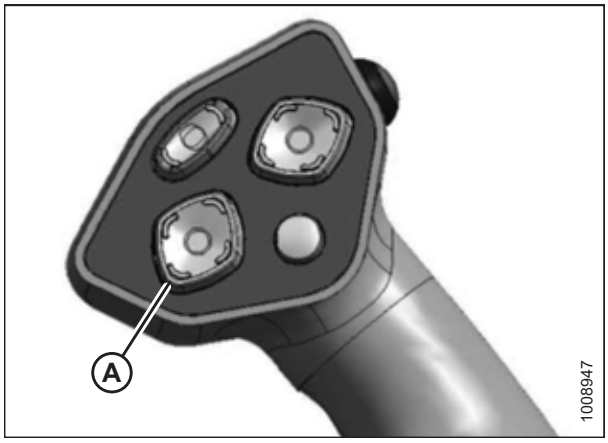


Figure 8.122: Ground Speed Lever

8.5.3 Completing Hydraulic and Electrical Connections

Once the R216 Rotary Disc Header is attached to the M155*E4* Self-Propelled Windrower, the hydraulic and electrical connections must be completed.

1. Connect the windrower's hydraulic hoses to the header's. Refer to the illustrations provided for guidance. The callout letters in the first illustration correspond to those in the second; for example, upper pressure hose (A) in the first illustration corresponds to upper pressure hose (A) in the second illustration:
   - (A) Upper pressure hose
   - (B) Lower pressure hose
   - (C) Return hose
   - (D) Case drain hose

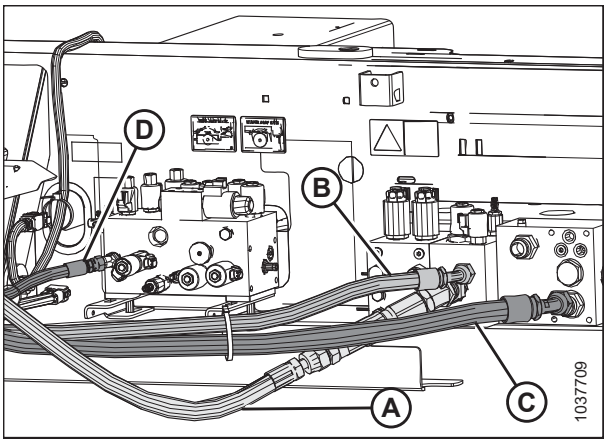


Figure 8.123: Windrower Hydraulic Hoses Connected to Hydraulic Block

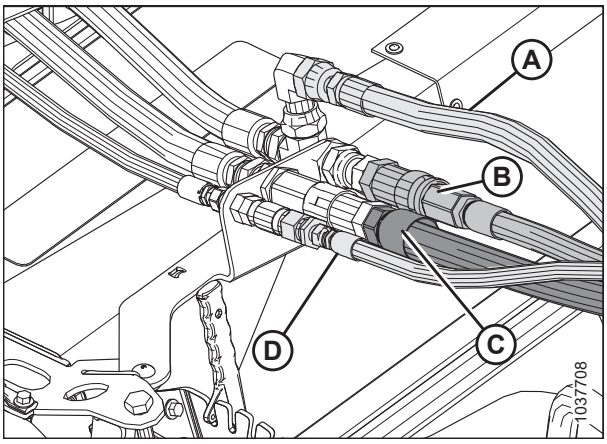


Figure 8.124: Windrower Hydraulic Hoses Connected to Header – View from Rear of Header

2. Locate windrower adapter harness (A) on the windrower's center-link. Remove windrower adapter harness (A) from its storage location on center-link (B).

3. Connect harness (A) to header harness (C).

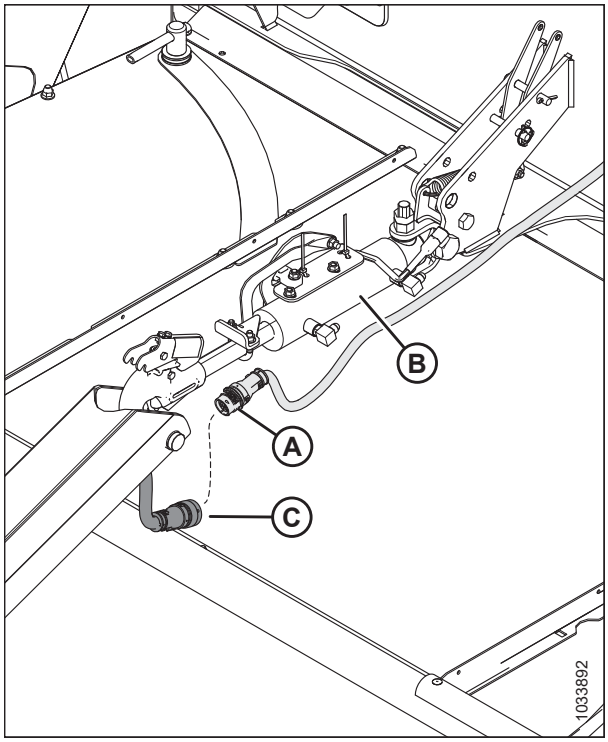


Figure 8.125: Windrower Adapter Harness

NOTE:

When the harness is not in use, secure harness (A) to the center-link tilt cylinder using strap (B).

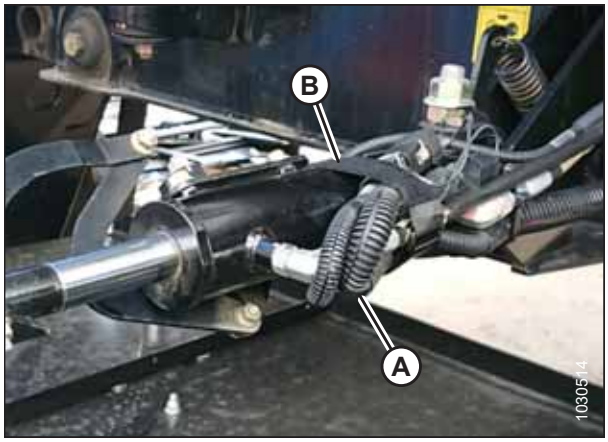


Figure 8.126: Adapter Harness Secured to Center-Link

Chapter 9: Reference

The reference section provides additional information on topics such as lubricants, fluids and their system capacities, fuel and torque specifications, and converting between metric and SAE measurement. It also details the acronyms, abbreviations, and technical terminology used in this publication.

9.1 Torque Specifications

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

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

9.1.1 SAE Bolt Torque Specifications

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

Table 9.1 SAE Grade 5 Bolt and Grade 5 Free Spinning Nut

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

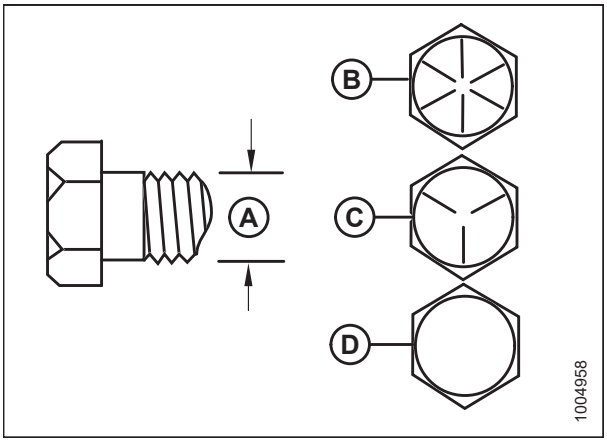


Figure 9.1: Bolt Grades

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

Table 9.2 SAE Grade 5 Bolt and Grade F Distorted Thread Nut

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

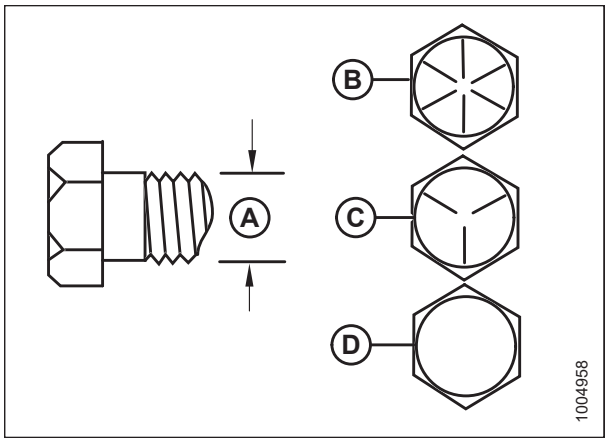


Figure 9.2: Bolt Grades

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

Table 9.3 SAE Grade 8 Bolt and Grade G Distorted Thread Nut

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

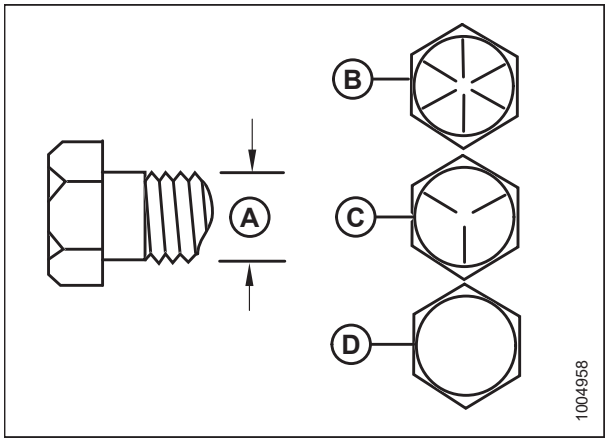


Figure 9.3: Bolt Grades

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

Table 9.4 SAE Grade 8 Bolt and Grade 8 Free Spinning Nut

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

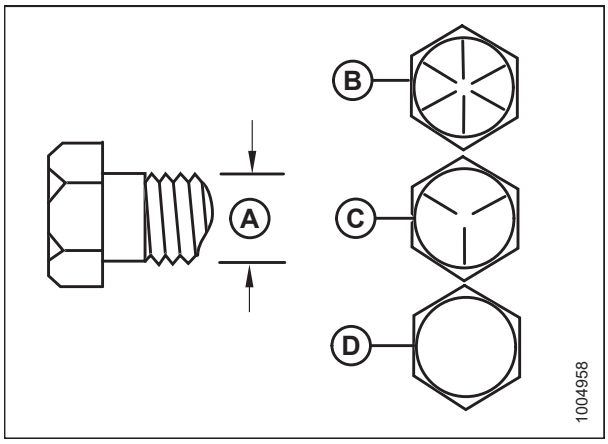


Figure 9.4: Bolt Grades

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

9.1.2 Metric Bolt Specifications

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** grease or oil bolts or cap screws unless directed to do so in this manual.

Table 9.5 Metric Class 8.8 Bolts and Class 9 Free Spinning Nut

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

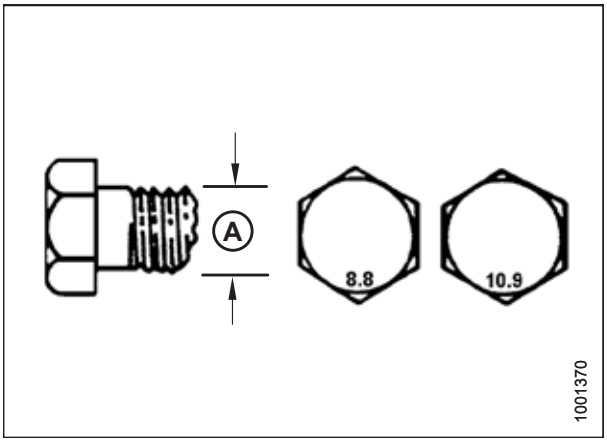


Figure 9.5: Bolt Grades

Table 9.6 Metric Class 8.8 Bolts and Class 9 Distorted Thread Nut

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

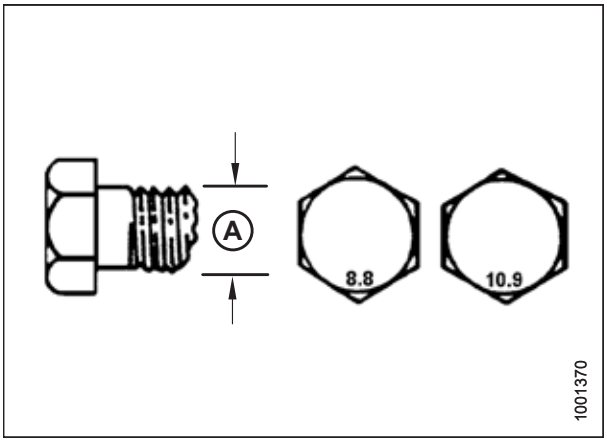


Figure 9.6: Bolt Grades

Table 9.7 Metric Class 10.9 Bolts and Class 10 Free Spinning Nut

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

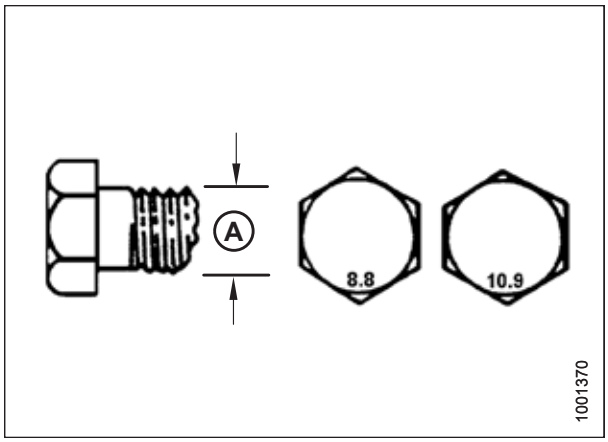


Figure 9.7: Bolt Grades

Table 9.8 Metric Class 10.9 Bolts and Class 10 Distorted Thread Nut

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

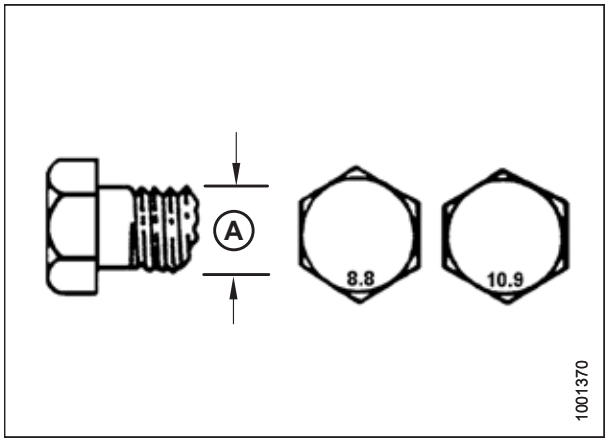


Figure 9.8: Bolt Grades

9.1.3 Metric Bolt Specifications Bolting into Cast Aluminum

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** grease or oil bolts or cap screws unless directed to do so in this manual.

Table 9.9 Metric Bolt Bolting into Cast Aluminum

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

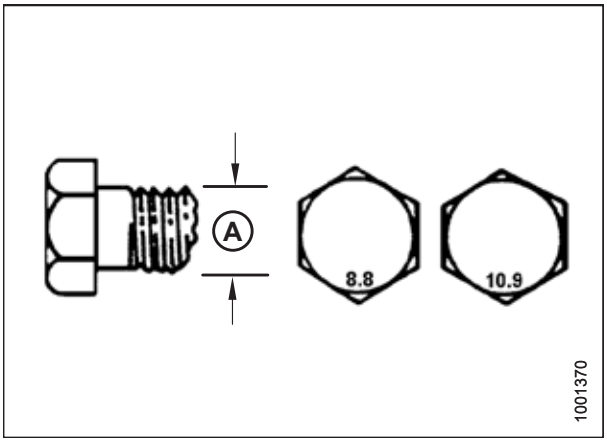


Figure 9.9: Bolt Grades

9.1.4 Flare-Type Hydraulic Fittings

1. Check flare (A) and flare seat (B) for defects that might cause leakage.
2. Align tube (C) with fitting (D) and thread nut (E) onto the fitting without lubrication until contact is made between the flared surfaces.
3. Torque fitting nut (E) to the specified number of flats from finger tight (FFFT) or to a given torque value in Table *9.10, page 203*.
4. Use two wrenches to prevent fitting (D) from rotating. Place one wrench on fitting body (D), and tighten nut (E) with the other wrench to the torque value shown.
5. Assess the final condition of connection.

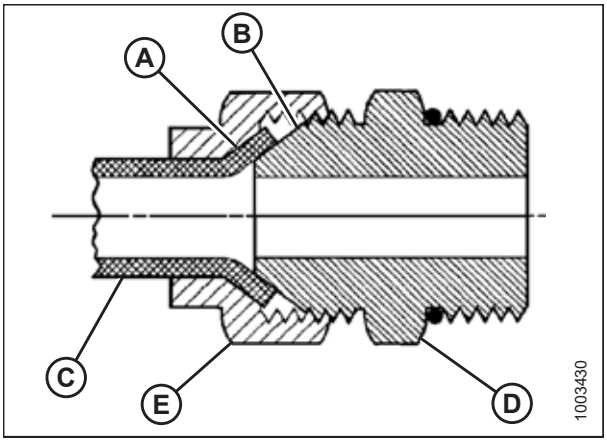


Figure 9.10: Hydraulic Fitting

Table 9.10 Flare-Type Hydraulic Tube Fittings

SAE Dash Size	Thread Size (in.)	Torque Value[7]		Flats from Finger Tight (FFFT)	
		Nm	lbf·ft	Tube	Swivel Nut or Hose
-2	5/16–24	4–5	3–4	—	—
-3	3/8–24	7–8	5–6	—	—
-4	7/16–20	18–19	13–14	2 1/2	2
-5	1/2–20	19–21	14–15	2	2
-6	9/16–18	30–33	22–24	2	1 1/2

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

Table 9.10 Flare-Type Hydraulic Tube Fittings (continued)

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

9.1.5 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, use the value specified in the procedure instead.

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

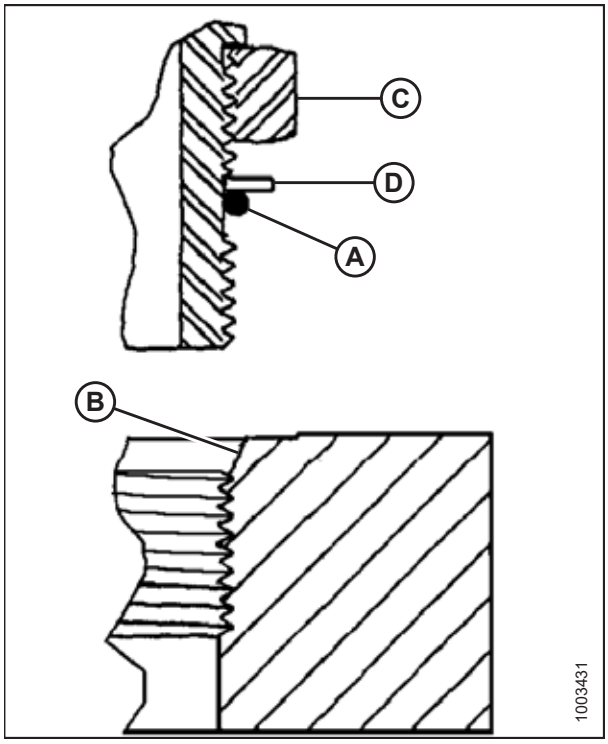


Figure 9.11: Hydraulic Fitting

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

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. Check the final condition of the fitting.

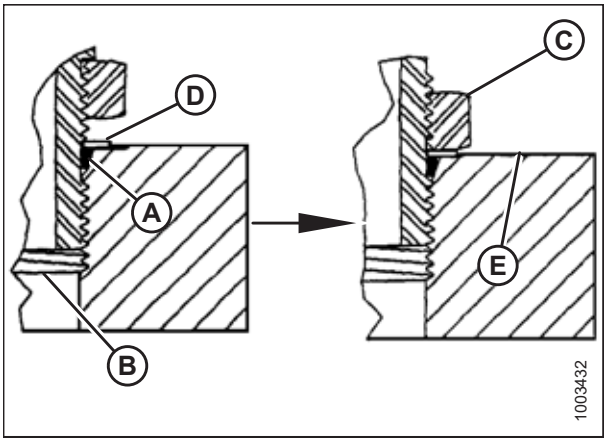


Figure 9.12: Hydraulic Fitting

Table 9.11 O-Ring Boss (ORB) Hydraulic Fittings – Adjustable

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

9.1.6 O-Ring Boss Hydraulic Fittings – Non-Adjustable

The standard torque values are provided for non-adjustable hydraulic fittings. 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.

Torque values are shown in the table below.

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

1. Inspect O-ring (A) and seat (B) for dirt or obvious defects.
2. Check 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 *9.12, page 207*.
6. Check the final condition of the fitting.

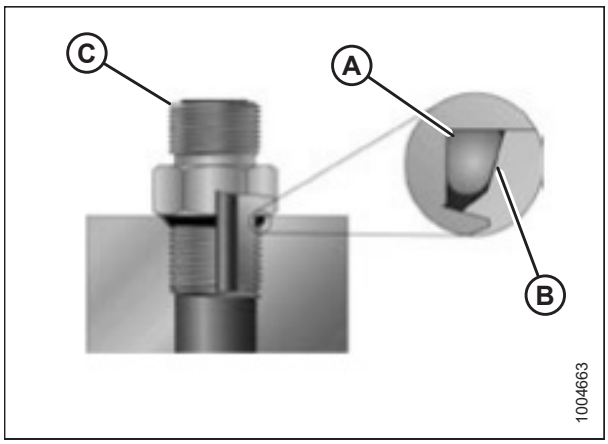


Figure 9.13: Hydraulic Fitting

Table 9.12 O-Ring Boss (ORB) Hydraulic Fittings – Non-Adjustable

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

9.1.7 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, use the value specified in the procedure instead.

Torque values are shown in the table below.

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

Figure 9.14: Hydraulic Fitting

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

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 *9.13, page 208*.

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

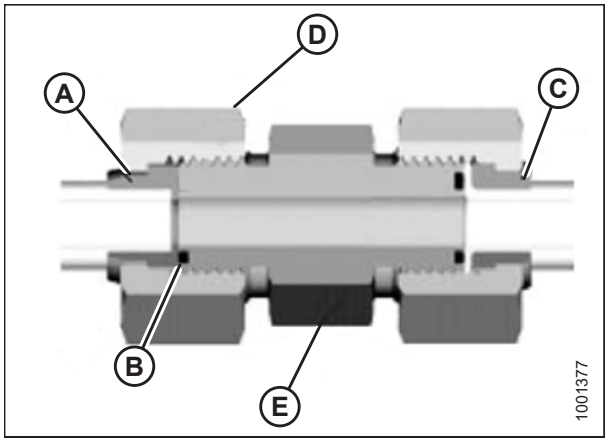


Figure 9.15: Hydraulic Fitting

Table 9.13 O-Ring Face Seal (ORFS) Hydraulic Fittings

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value[11]	
			Nm	lbf·ft
-3	Note[12]	3/16	–	–
-4	9/16	1/4	25–28	18–21
-5	Note[12]	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[12]	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

9.1.8 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, use the value specified in the procedure instead.

Assemble pipe fittings as follows:

1. Check the components to 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.

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

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 *9.14, page 209*. Make sure 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 back off (i.e., loosen) the threaded connectors to achieve alignment.

5. Clean all residue and any excess thread conditioner with an appropriate cleaner.

6. Assess the final condition of the fitting. Pay special attention to the possibility of cracks 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 overtorquing may not be evident until the fittings are disassembled and inspected.

Table 9.14 Hydraulic Fitting Pipe Thread

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

9.2 Conversion Chart

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

Table 9.15 Conversion Chart

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

9.3 Definitions

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

Term	Definition
A Series Header	MacDon A30D, A30S, and A40D 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
CDM	Cab display module on an M Series Windrower
Center-link	A hydraulic cylinder 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
D Series Header	MacDon D50, D60, and D65 rigid draper headers
D1 SP Series Header	MacDon D115, D120, D125, D130, D135, and D140 rigid draper headers for windrowers
DDD	Double-draper drive
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
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
HDS	Hydraulic deck shift
hp	Horsepower
ISC	Intermediate Speed Control
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
MDS	Mechanical Deck Shift

Term	Definition
n/a	Not applicable
N-DETENT	The slot opposite the NEUTRAL position on the operator's console of M Series SP Windrowers
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
R Series	MacDon R80 and R85 Rotary Disc Headers
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
SDD	Single-draper drive
Self-Propelled (SP) Windrower	Self-propelled machine consisting of a power unit and a header. It is designed to cut and lay crops into windrows for later harvest
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
UCA	Upper cross auger
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
WCM	Windrower control module
Windrower	The power unit for a header
WOT	Wide-open throttle

9.4 Lubricants, Fluids, and System Capacities

Refer to the table below for information on the appropriate lubricants and fluids for the windrower, and for the capacity of each system. Follow the procedures for filling each system provided in this manual.

WARNING

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

Table 9.16 Windrower System Capacities

Lubricant/Fluid	Location	Description	Capacity
Diesel exhaust fluid (DEF)	Diesel exhaust fluid tank	Must meet ISO 22241 requirements	29 L (7.5 U.S. gal)
Grease	As required unless otherwise specified	SAE multi-purpose high temperature extreme pressure (EP2) performance with 1% max molybdenum disulphide (NLGI Grade 2) lithium base	—
Diesel fuel	Fuel tank	Ultra low sulphur diesel (ULSD) Grade No. 2, or ULSD Grade No. 1 and 2 mix[13]; refer to *9.5 Fuel Specifications, page 215* for more information	378 L (97 U.S. gal)
Hydraulic oil	Hydraulic reservoir	SAE 15W-40 compliant with SAE specs for API class SJ and CH-4 engine oil.	65 L (17.2 U.S. gal)
Gear lubricant	Gearbox	SAE 80W-140[14], API service class GL-5. Fully synthetic gear lubricant (SAE J2360 preferred)	2.1 L (2.2 U.S. qt.)
Gear lubricant	Wheel drive[15]	SAE 75W-90, API service class GL-5. Fully synthetic gear lubricant (SAE J2360 preferred)	1.4 L (1.5 U.S. qt.)
Coolant	Engine cooling system	ASTM D-6210 and CES-14603, Peak Final Charge Global™, Fleetguard® ES Compleat™ OAT Refer to *notes* following this table	27.5 L (7.3 U.S. gal)[16]
Engine oil	Engine oil pan	SAE 15W-40 compliant with SAE specs for API class SJ and CJ-4 engine oil	11 L (11.6 U.S. qt.)
Air conditioning refrigerant	Air conditioning system	R134A	2.27 kg (5 lb.)
Air conditioning refrigerant oil[17]	Air conditioning system total capacity	PAG SP-15	240 cc (8.1 fl. oz.)

13. Optional when operating temperature is below 0°C (32°F).
14. SAE 75W-140 may be substituted for SAE 80W-140 if necessary.
15. SAE 85W-140 API Service Class GL-5. Extreme Pressure Gear Lubricant is used before initial change.
16. Equal parts with high quality, soft, deionized or distilled water as recommended by Supplier.
17. New compressor (MD #183515) comes filled.

NOTE:

If Peak Final Charge Global™ or Fleetguard ES Compleat™ OAT, use a coolant concentrate or prediluted coolant intended for use with heavy-duty diesel engines. Ensure the coolant meets a minimum of the following chemical and physical properties:

- Provides cylinder cavitation protection according to 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.

NOTE:

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

An additive package should contain 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 to 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. Ethylene glycol and propylene glycol may alter the freeze temperature. Verify that the mixture meets the freeze protection criteria of its intended use.

9.5 Fuel Specifications

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.

Table 9.17 Fuel Specification

Fuel	Specification	Sulphur (by weight)	Water and Sediment (by volume)	Cetane No.	Lubricity
No.2 ULSD	ASTM D975	0.5% maximum	0.05% maximum	40°C (104°F) minimum	520 microns
No.1 and No.2 mix[18] ULSD	n/a	0.5% maximum preferred (1% maximum)	0.1% maximum	45–55°C (113–131°F) cold weather / high altitude	460 microns

In extreme situations, when available fuels are of poor quality or problems exist which are specific to certain operations, additives can be used; however, the engine manufacturer recommends consulting 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 improve 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.
- A lubricity enhancer can be used to increase the lubricity of fuels so that they meet the requirements given in Table *9.17, page 215*.

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

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:**

Table .18 M155*E4* Self-Propelled Windrower Predelivery Checklist

✓	Item	Reference
	Check for shipping damage or missing parts. Be sure all shipping dunnage is removed.	—
	Check for loose hardware. Tighten to required torque.	*9 Reference, page 199*
	Check tire air pressures and adjust as required.	*4.2.1 Checking Tire Pressure, page 39*
	Check wheel drive hub lubricant level.	*4.3 Checking and Adding Wheel Drive Lubricant, page 41*
	Check engine coolant level and strength at the pressurized coolant tank.	*4.10 Checking Engine Coolant, page 49*
	Drain Diesel Exhaust Fluid (DEF) tank and refill with fresh DEF.	*4.13 Replacing Diesel Exhaust Fluid, page 52*
	Check air cleaner and clamps.	*4.5 Checking Engine Air Intake, page 43*
	Check hydraulic oil level and check for leaks along lines.	*4.6 Checking Hydraulic Oil Level, page 45*
	Check fuel separator for water and foreign material, drain and clean as necessary, and add fuel.	*4.7 Checking Fuel Separator, page 46*
	Check gearbox lubricant level.	*4.9 Checking Gearbox Lubricant Level, page 48*
	Check tension of A/C compressor belt.	*4.11 Checking Air Conditioning Compressor Belt, page 50*
	Check that machine is completely lubricated.	*3.7 Lubrication, page 29*
	Check neutral interlock system.	*6.1 Checking Safety System, page 127*
	Check horn operation.	*6.8 Checking Horn, page 140*
Start engine and run to operating temperature.		*6.3 Checking Windrower Startup, page 132*
	Check CDM and fuel and diesel exhaust fluid (DEF) gauges for operation.	*6.5 Checking Gauges and Cab Display Module Display, page 134*
	Check Operator's presence system.	*6.2 Checking Operator Presence System, page 130*
	Check alternator charge rate at instrument console.	*6.6 Checking Electrical System, page 135*
	Check that air conditioning is functioning properly.	*6.10 Checking Air Conditioning and Heater, page 142*
	Check that heater is functioning properly.	*6.10 Checking Air Conditioning and Heater, page 142*
	Check that interior lights are functioning properly.	*6.9 Checking Interior Lights, page 141*
	Check maximum (no load) engine speed at CDM.	*6.4 Checking Engine Speed, page 133*
	Check that exterior lights are functioning properly.	*6.7 Checking Exterior Lights, page 136*
	Check that hazard and signal lights are functioning properly.	*6.7 Checking Exterior Lights, page 136*
	Check that beacons are functioning properly (if installed).	*6.7 Checking Exterior Lights, page 136*

Table .18 M155*E4* Self-Propelled Windrower Predelivery Checklist (continued)

✓	Item	Reference
	Check that manuals are in the windrower manual case.	*6.11 Checking Manuals, page 143*
	Remove plastic coverings from cab interior.	*7 Performing Final Steps, page 145*

Date Checked: **Checked by:**

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