MacDon

M155*E4*
Self-Propelled Windrower

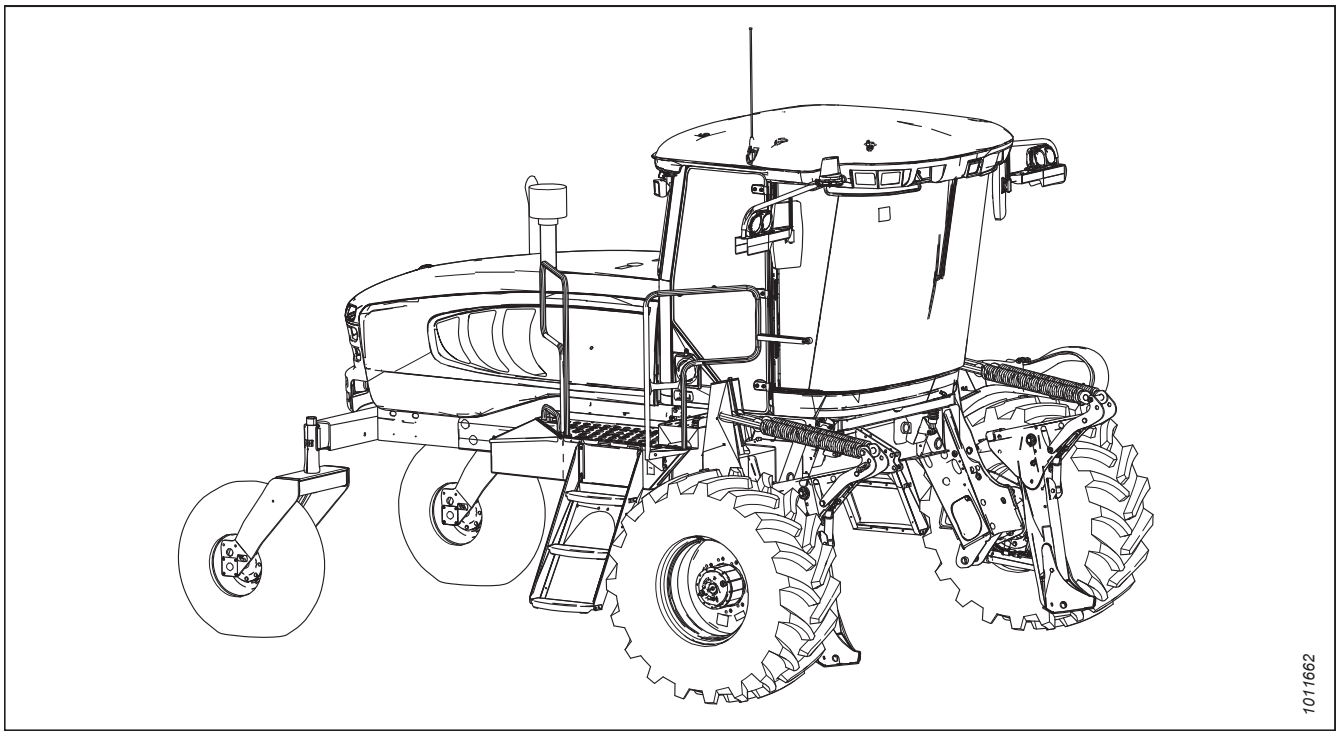
Operator's Manual

262105 Revision A

Original Instruction

The Harvesting Specialists.

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



Published December 2022

California Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm. Battery posts, terminals, and related accessories contain lead and lead components. Wash your hands after handling a battery.

Whole Body and Hand-Arm Vibration Levels

The weighted root mean square acceleration, to which the whole body is subjected, ranges from 0.59 to 1.07 m/s^2 as measured on a representative machine during typical operations and analyzed in accordance with ISO 5008.

During the same operations, the weighted root mean square hand-arm vibration was less than 1.81 m/s^2 when analyzed in accordance with ISO 5349. These acceleration values depend on the roughness of the ground, the speeds at which the windrower is operated, the operator's experience, weight, and driving habits.

Noise Levels

The A-weighted sound pressure levels inside the operator's station ranged from 66 to 67 dB(A) as measured on several representative machines in accordance with ISO 5131. The sound pressure level depends upon the engine speed and load, field and crop conditions, and the type of platform used.

Introduction

This manual contains information on the MacDon M155*E4* Self-Propelled Windrower which, when paired with one of MacDon's auger, rotary, or draper headers, ably cuts and lays in windrows a variety of grain, hay, and specialty crops.

Your machine

The M155*E4* Windrower is equipped with Dual Direction® capability, which allows the windrower to be driven either in cab-forward or in engine-forward mode. Right and left designations are therefore determined by the operator's position. For the sake of clarity, this manual uses the terms right cab-forward, left cab-forward, right engine-forward, and left engine-forward when referring to specific locations on the machine.

Your warranty

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

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

Your manual

Use this manual as your first source of information about the machine. Use the Table of Contents and the Index to guide you to specific content areas. Study the Table of Contents to familiarize yourself with how this material is organized.

When setting up the machine or making adjustments to it, review and follow the recommended machine settings in all relevant MacDon publications. Failure to do so may compromise the windrower's functionality and reduce its service life, and may result in a hazardous situation.

A manual storage case is provided in the cab. Keep this manual handy for frequent reference. Ensure that this manual is made available to any Owners or Operators of this machine. Call your Dealer if you need assistance, information, or additional copies of this manual.

Unless otherwise noted, use the standard torque values provided in Chapter *8.2 Recommended Torque Values, page 493*.

CAREFULLY READ ALL THE MATERIAL PROVIDED BEFORE ATTEMPTING TO USE THE MACHINE.

If you follow the instructions given here, your M155*E4* Self-Propelled Windrower will work well for many years.

Use this manual in conjunction with your header operator's manual.

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

NOTE:

This document is available in English only.

Summary of Changes

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

Section	Summary of Change	Internal Use Only
Declaration of Conformity	No longer required.	Marketing
1.3 General Safety, page 3	Updated to include hoodies as a dangling item that should never be worn around machinery.	Technical Publications
1.11 Safety Sign Locations, page 14	Updated safety sign locations table (E) MD #306756 and safety signs left side illustration.	ECN 63076
1.12 Understanding Safety Signs, page 18	Safety decal MD #166461 superseded by MD #306756 for model year 2022 and later.	ECN 63076
5.2 Maintenance Schedule, page 318	Removed 5.2 maintenance schedule topic and replaced it with 5.2.1 maintenance schedule topic as they were almost identical.	Technical Publications
Priming Fuel System , page 370	Removed System Priming topic. Added the content of this topic to the Priming Fuel System topic.	Technical Publications
Raising Drive Wheel, page 451	Updated jacking instructions.	Technical Publications
6.3.10 Spring with External Booster Spring, page 470	Table for available float springs has been replaced with one that is M155E4 compatible with D and D1 Series headers.	Technical Publications
6.3.12 Swath Compressor, page 471	Operator's manual MD #215210 superseded by MD #215953	Product Support
8.1.3 Lubricants, Fluids, and System Capacities, page 491	Updated coolant system capacity, and diesel fuel capacity.	Technical Publications
Inside back cover	Updated coolant system capacity, and diesel fuel capacity.	Technical Publications

Serial Numbers

The windrower's engine and chassis serial numbers can be found on the machine.

Record the model year and serial number of the windrower and its engine in the fields below.

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

Windrower serial number _____

Year of manufacture _____

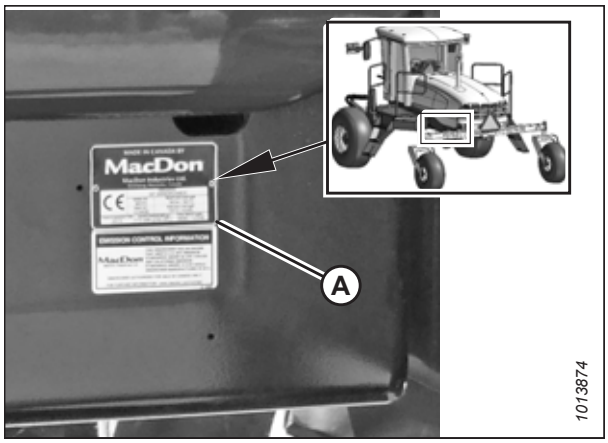


Figure 1: Windrower Serial Number Location

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

Engine serial number _____

Date of manufacture _____

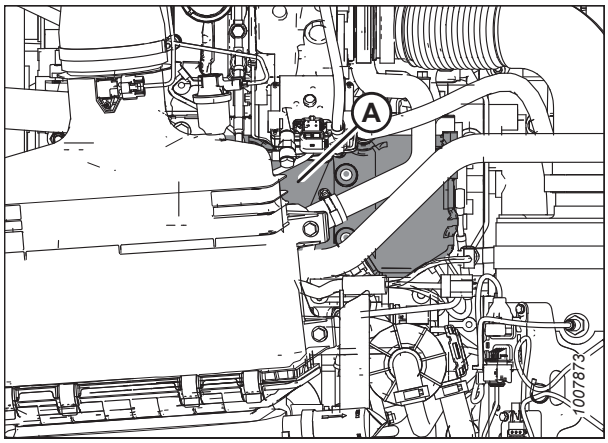


Figure 2: Engine Serial Number Location

Chapter 1: Safety

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

1.1 Safety Alert Symbols

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

This symbol means:

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

Carefully read and follow the safety message accompanying this symbol.

Why is safety important to you?

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

Figure 1.1: Safety Symbol

1.2 Signal Words

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

Signal words are selected using the following guidelines:

DANGER

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

WARNING

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

CAUTION

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

IMPORTANT:

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

NOTE:

Provides additional information or advice.

1.3 General Safety

Operating, servicing, and assembling machinery presents several safety risks. These risks can be reduced or eliminated by following the relevant safety procedures and wearing the appropriate personal protective equipment.

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

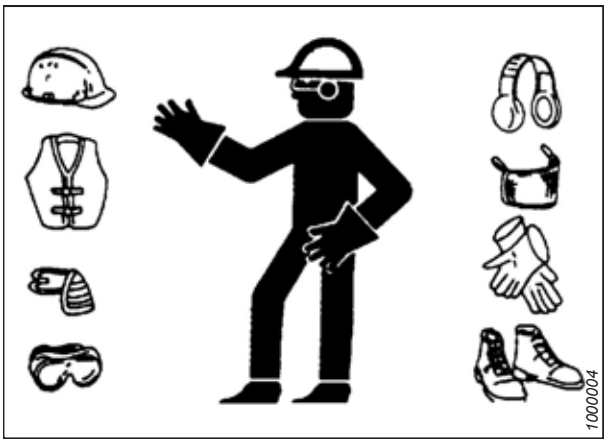


Figure 1.2: Safety Equipment

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.

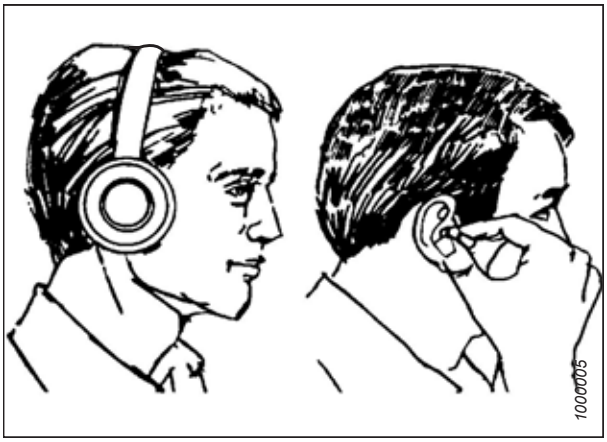


Figure 1.3: Safety Equipment

- 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.

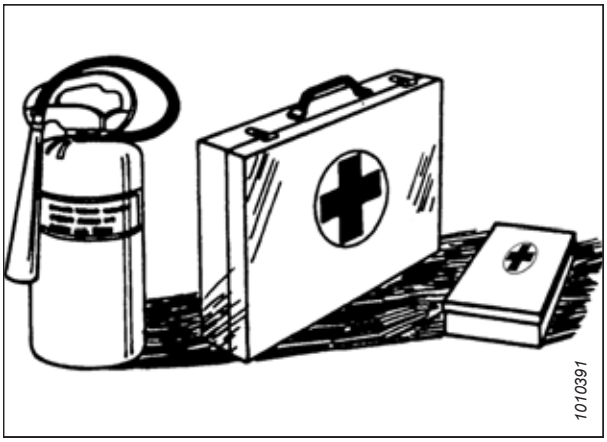


Figure 1.4: Safety Equipment

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

Figure 1.5: Safety around Equipment

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

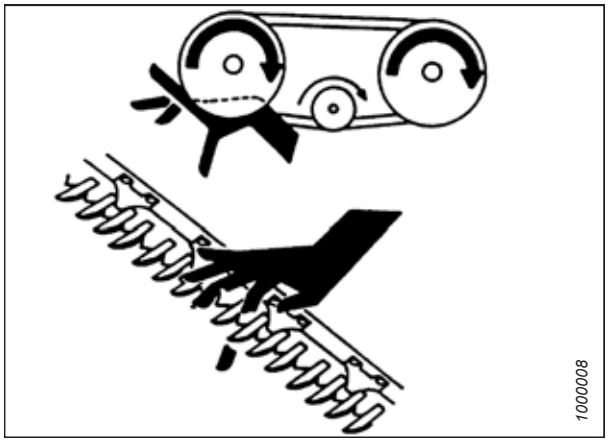


Figure 1.6: Safety around Equipment

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

Figure 1.7: Safety around Equipment

1.4 Maintenance Safety

Maintaining your equipment safely requires that you follow the relevant safety procedures and wear the appropriate personal protective equipment for the task.

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: Wet Floors Present Safety Risks

- 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.

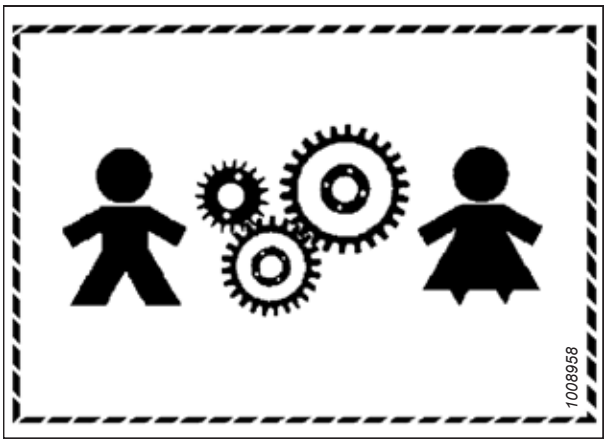


Figure 1.9: Equipment is NOT Safe for Children

- Wear protective gear when working on the machine.
- Wear heavy gloves when working on knife components.

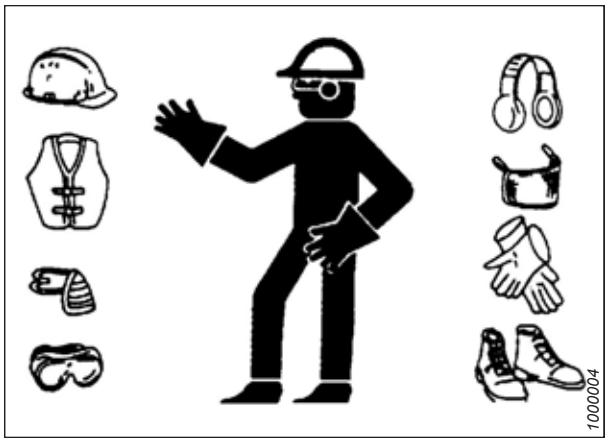


Figure 1.10: Personal Protective Equipment

1.5 Hydraulic Safety

Because hydraulic fluid is under extreme pressure, hydraulic fluid leaks can be very dangerous. The proper safety procedures must be followed when inspecting for hydraulic fluid leaks and servicing hydraulic equipment.

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

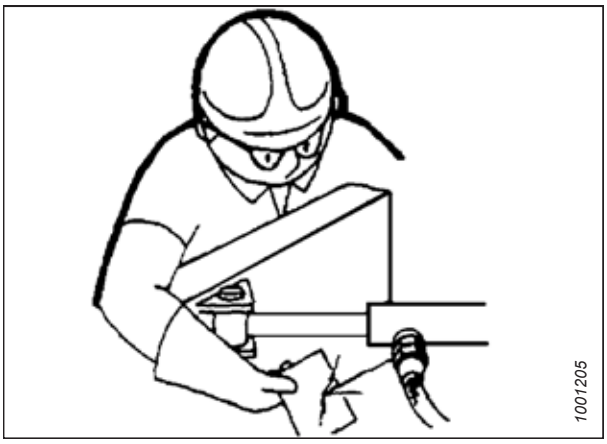


Figure 1.11: Testing for Hydraulic Leaks

- 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.

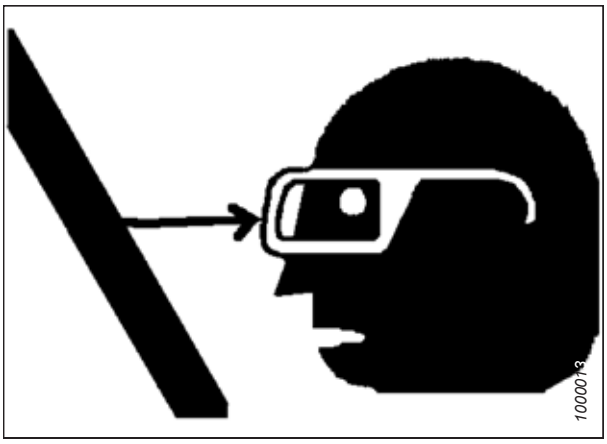


Figure 1.13: Safety around Equipment

1.6 Tire Safety

Inflating, installing, removing, and handling tires presents several safety risks that must be taken into account.

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.**

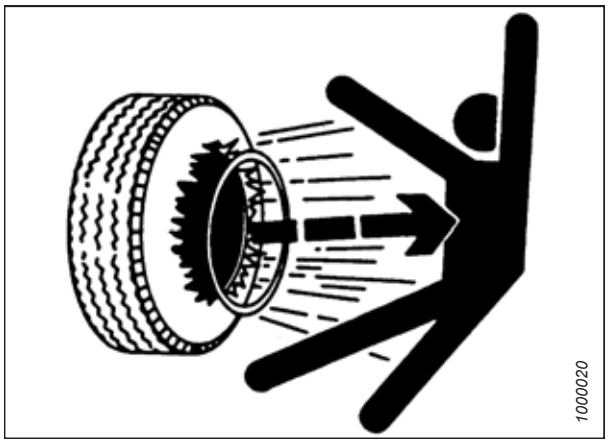


Figure 1.14: Overinflated Tire

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

Working with lead-acid vehicle batteries presents several safety risks.

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.**

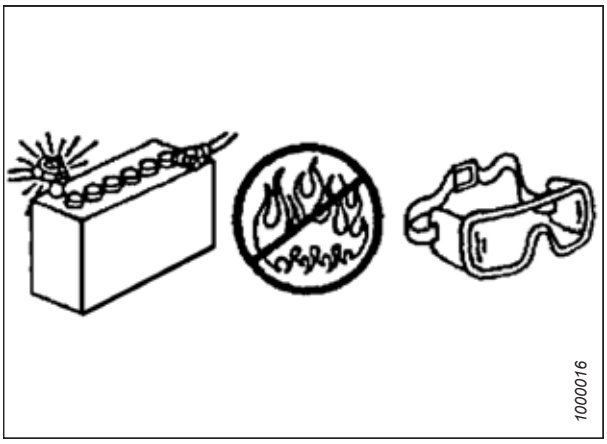


Figure 1.17: Safety around Batteries

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.**

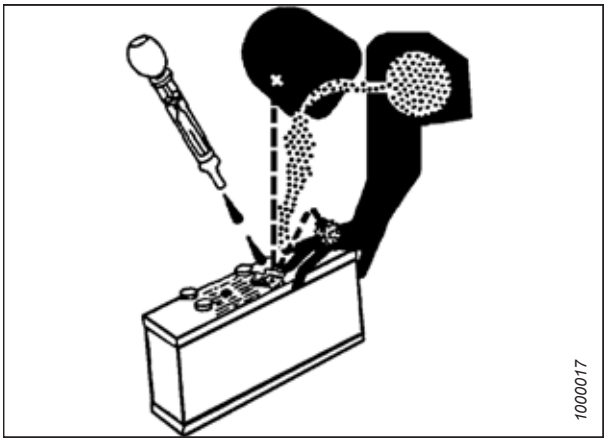


Figure 1.18: Safety around Batteries

1.8 Welding Precautions

The high current and voltage spikes associated with welding can cause damage to the electronic components on the windrower. Before attempting to weld any part of the windrower or an attached header, disconnect all of the electronic module harness connections as well as the battery cables. For further instructions, contact your Dealer.

1.9 Engine Safety

Operating, maintaining, and servicing an engine presents several safety risks. These risks can be reduced or eliminated by following the relevant safety procedures.

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. Contact your Dealer for repairs and adjustments.**
- **Inspect the engine for potential hazards.**
- **Before starting the engine, ensure that no one is on, underneath, or close to the engine. Ensure that 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. The risks of working with fuel under pressure must be understood before the fuel system can be serviced.

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

The engine control module (ECM) is a sensitive piece of equipment, which can be damaged if the proper safety procedures are not followed. The ECM also regulates various aspects of engine performance, which can affect the safe use of the machine.

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.
- Replacement safety signs are available from your MacDon Dealer.

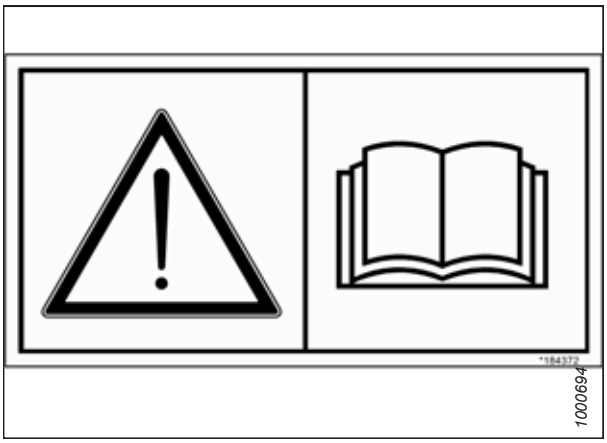


Figure 1.19: Operator's Manual Decal

1.10.1 Installing Safety Decals

Worn or damaged safety decals will need to be removed and replaced.

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

1.11 Safety Sign Locations

Safety signs are placed next to areas of potential danger. If a safety sign becomes illegible due to wear or damage, it should be replaced.

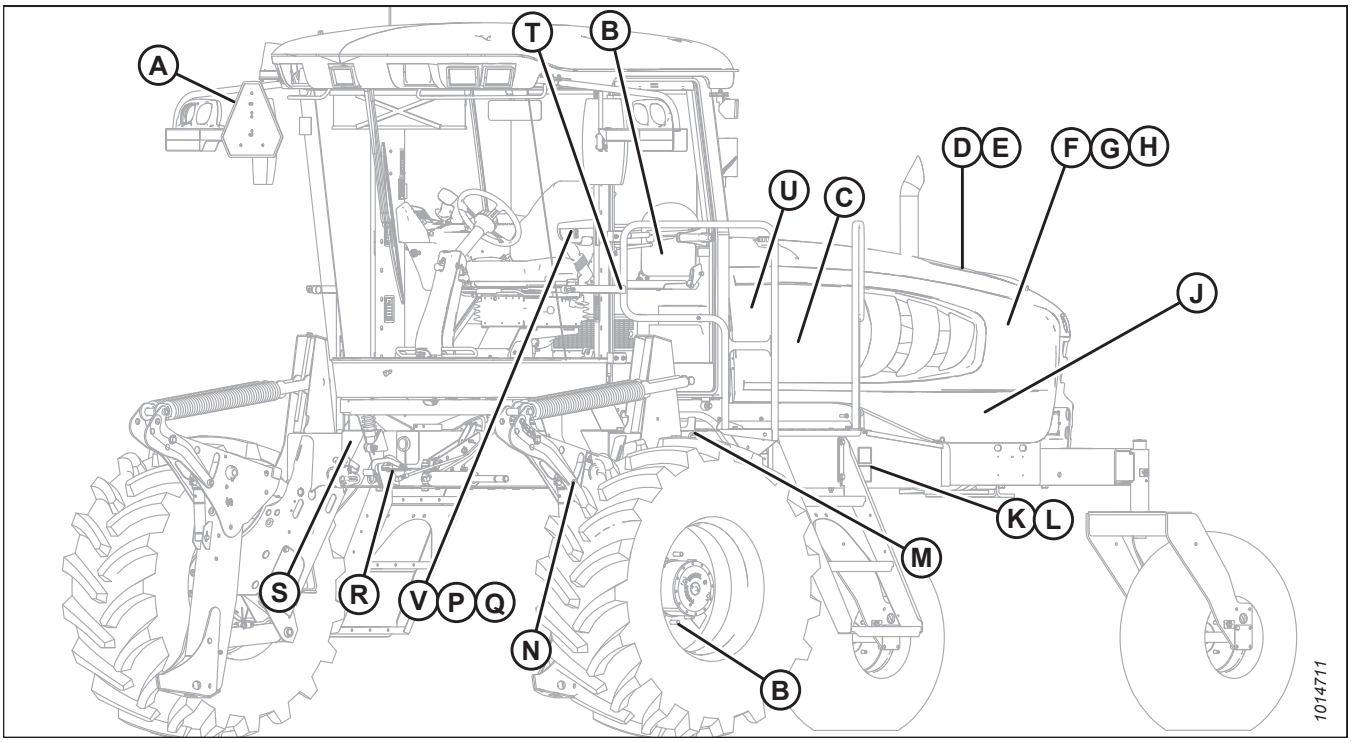


Figure 1.20: Safety Sign Locations – Left Side

A - Hazard Sign (MD #135378)
B - Cab Door and Rim (MD #166454)
C - Oil Reservoir under Hood (MD #166466)
D - Exhaust Cover (MD #166450)
E - Close to Radiator Cap (MD #306756)
F - Fan Shroud (Top) (MD #166450)
G - Fan Shroud (Middle) (MD #166451)
H - Fan Shroud (Bottom) (MD #166452)
J - Frame Opening (MD #166233)
K - Platform (Left of Step) (MD #166425)
L - Platform (Right of Step) (MD #166441)
M - Frame at Multifunction Manifold (MD #166466)
N - Lift Linkage (MD #306179/306181)
P - Inner Post (MD #166234)
Q - Inner Post (MD #166463)
R - Neutral Interlock (MD #166425)
S - Frame (MD #166425)
T - Trainers Seat (MD #167502)
U - Air Baffle (MD #166450)
V - Inner Post (MD #166457)

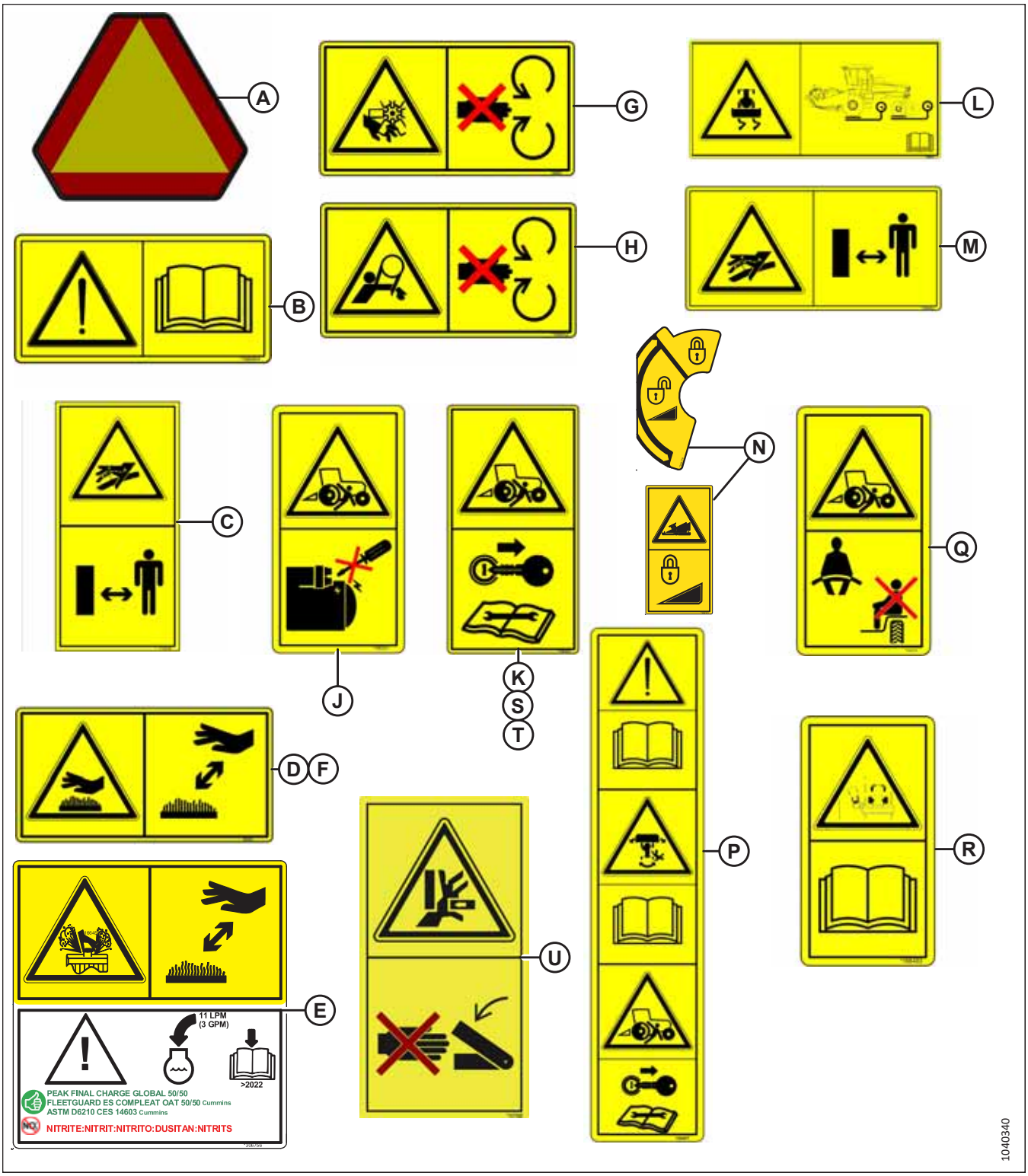


Figure 1.21: Safety Signs – Left Side

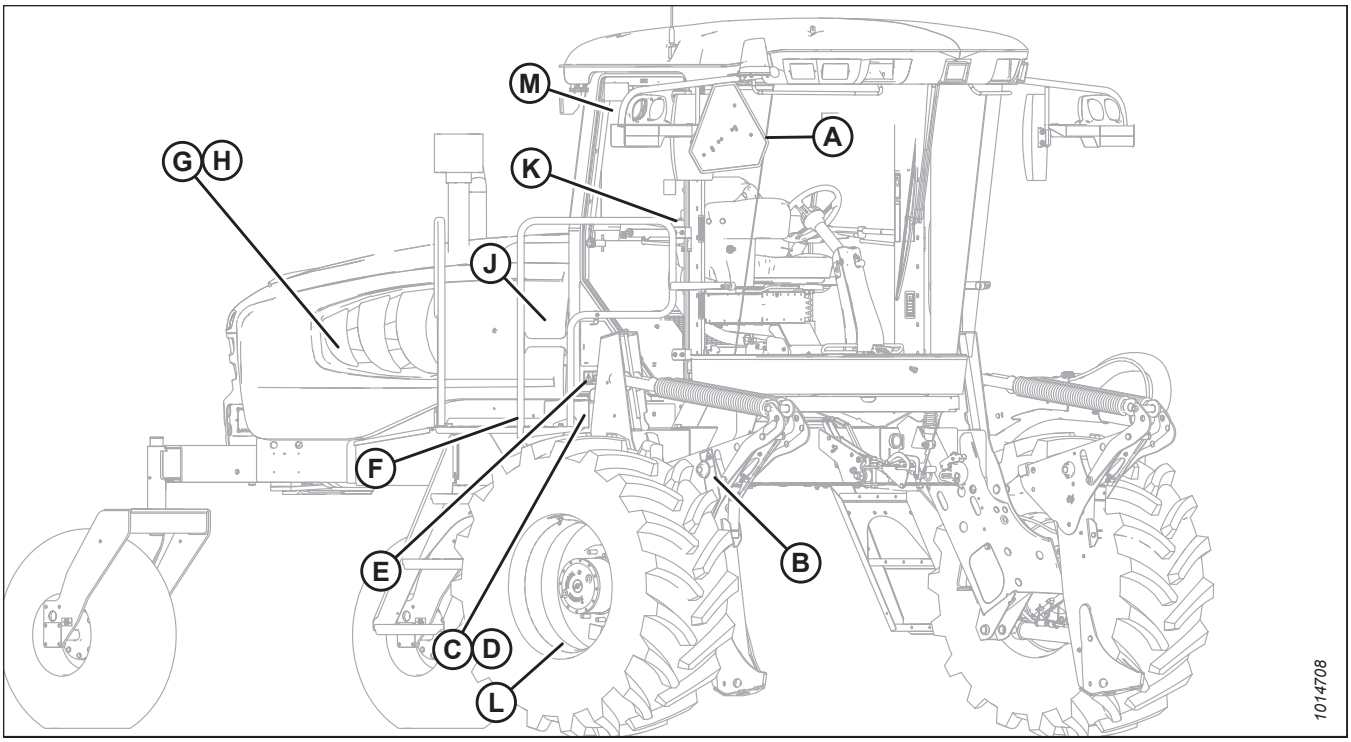


Figure 1.22: Safety Sign Locations – Right Side

A - Hazard Sign on Seat (MD #115148)
B - Lift Linkage (MD #306180/306181)
C - Frame (MD #166455)
D - Frame (MD #166456)
E - Cab Frame (MD #184372)
F - Platform (MD #166425)
G - Shroud (MD #166451)
H - Shroud (MD #166452)
J - Hydraulic Reservoir (MD #166466)
K - Wiper Cover (MD #166465)
L - Rim (MD #166454)
M - Window (MD #167504)

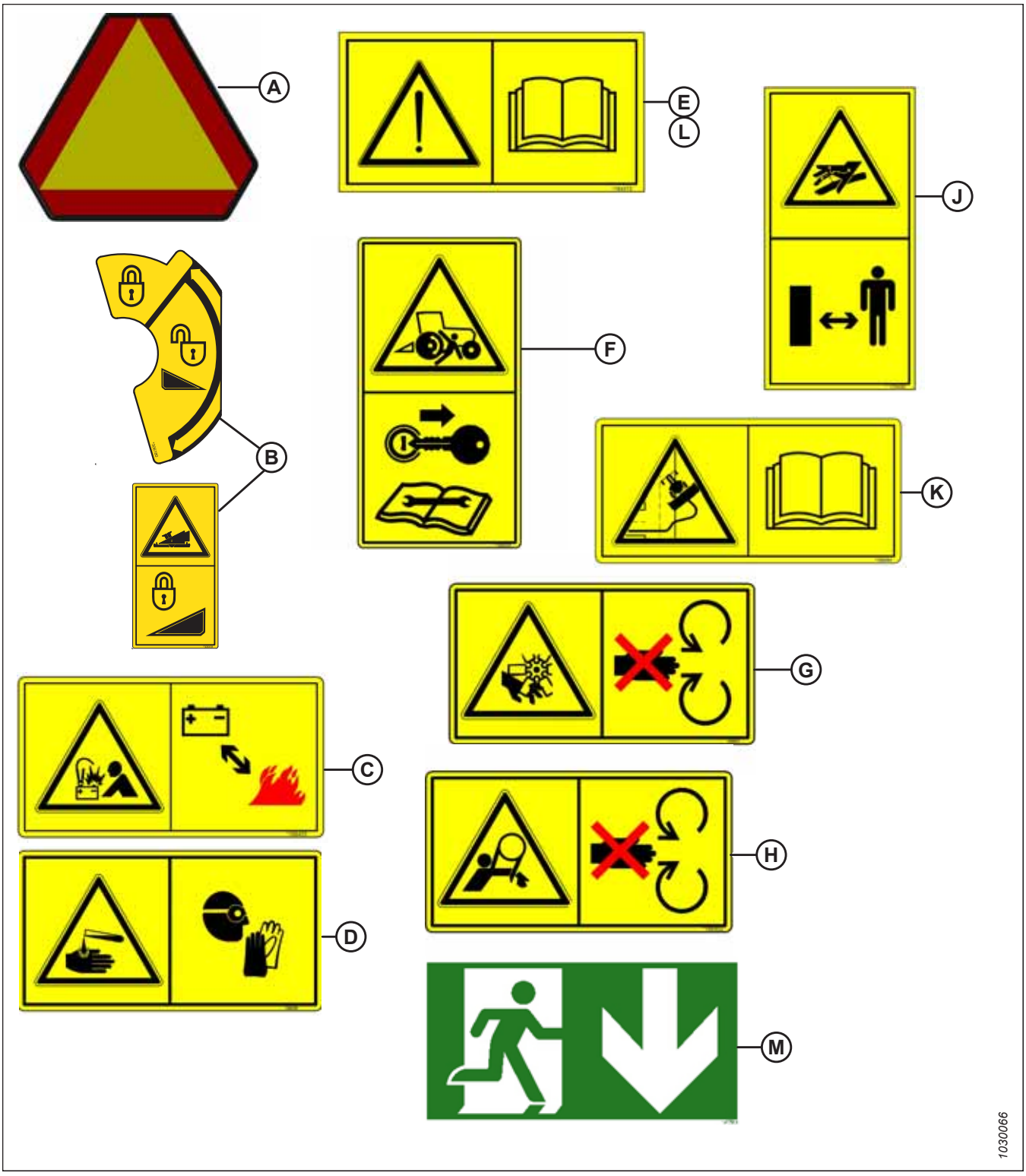


Figure 1.23: Safety Signs – Right Side

1.12 Understanding Safety Signs

Safety sign decals use illustrations to convey important safety or equipment maintenance information.

MD #166233

Run-over hazard

DANGER

- Starting the machine while it is in gear can lead to serious injury or death
- Do **NOT** start the engine by shorting the starter or the starter relay terminals. If the machine starts with the drive engaged, it can begin moving.
- Start the engine **ONLY** from the operator's seat. Do **NOT** try to start the engine with someone under or near the machine.

Figure 1.24: MD #166233

MD #166234

Run-over hazard

DANGER

- A training seat is provided so that an experienced Operator can instruct a new Operator on how to use the machine.
- The training seat is **NOT** intended as a passenger seat or for use by children.
- The Operator and the Passenger must wear their safety belts when they are operating the machine.
- Keep all other riders off of the machine.

Figure 1.25: MD #166234

MD #166425

Run-over hazard

DANGER

To prevent the machine from moving when there is no Operator at the controls:

- Stop the engine and remove the key from the ignition before you perform any maintenance or service on the steering linkage or the neutral interlock system.
- Refer to the windrower and header operator's manuals for maintenance and inspection procedures.

Figure 1.26: MD #166425

MD #166441

Loss-of-control hazard

DANGER

To prevent serious injury or death from losing control of the machine:

- It is essential that the machine be operated within its specified weight limits.
- The weight on the caster wheels must be greater than 1179 kg (2600 lb.) when the windrower is operated in the cab-forward position.
- To maintain the machine's balance, ensure that the recommended rear ballast kits are installed. When operating the machine on sloped terrain, additional rear ballast kits may be required.

Figure 1.27: MD #166441

MD #166450

Hot surface hazard

CAUTION

To prevent injury:

- Keep a safe distance from hot surfaces.
- Allow hot surfaces to cool before touching them.

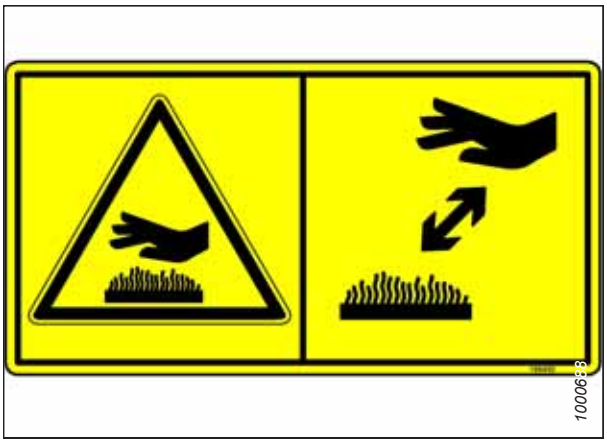


Figure 1.28: MD #166450

MD #166451

Rotating fan hazard

WARNING

To prevent injury:

- Do **NOT** operate the engine when the hood is open.
- Stop the engine and remove the key from the ignition before opening the hood.

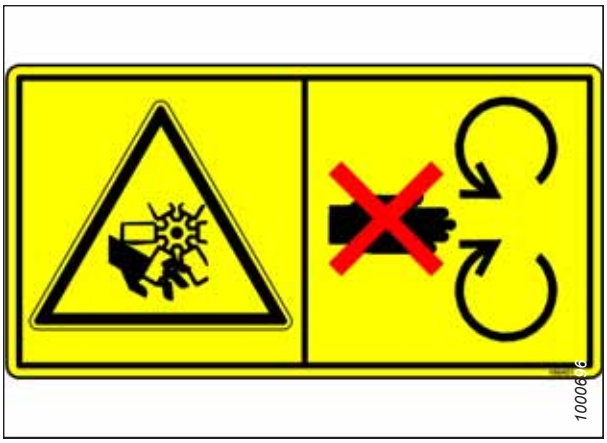


Figure 1.29: MD #166451

MD #166452

Hand and arm entanglement hazard

WARNING

To prevent injury:

- Do **NOT** operate the machine without the engine hood in place.
- Stop the engine and remove the key from the ignition before opening the engine hood.

Figure 1.30: MD #166452

MD #166454

General hazard pertaining to machine operation and servicing

DANGER

To prevent injury or death from improper or unsafe machine operation:

- Follow all of the safety instructions provided in the machine's manual.
- Do **NOT** allow untrained persons to operate the machine.
- Review the safety instructions in this manual with all Operators every year.
- Ensure that all safety signs are installed and legible.
- Ensure that everyone is clear of the machine before starting the engine and during its operation.
- Do not allow riders on the machine.
- Keep all shields in place. Stay clear of moving parts.
- Disengage the header drive, put the transmission in Neutral, and wait for all movement to stop before you leave the operator's seat.
- Stop the engine and remove the key from the ignition before you service, adjust, lubricate, clean, or unplug the machine.
- Engage the safety locks to the header or reel from falling before servicing the header when it is in the raised position.
- Use a slow-moving vehicle emblem and activate the machine's warning lights when operating on roadways, unless these actions are prohibited by law.

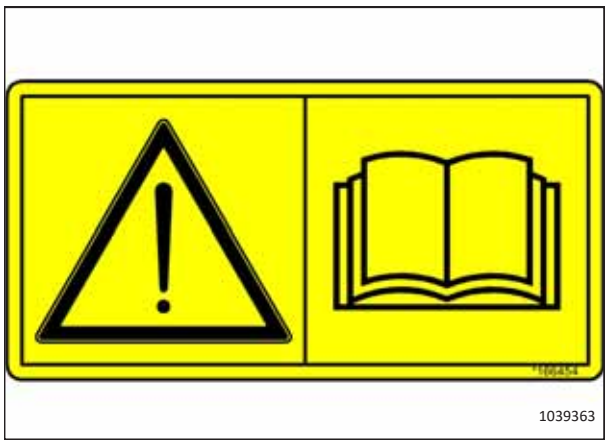


Figure 1.31: MD #166454

MD #166455

Battery explosion hazard

WARNING

Lead-acid batteries emit explosive gases. To prevent serious bodily injury caused by an explosion:

- Keep sparks and flames away from the battery.
- If you are attaching a booster battery to the windrower's battery, ensure that the booster cables are attached correctly.
- Refer to the operator's manual for the correct battery boosting and charging procedures.

Figure 1.32: MD #166455

MD #166456

Battery acid hazard

WARNING

Lead-acid batteries contain corrosive and poisonous acid, which can damage clothing and cause injury or death. To prevent injury:

- Wear protective clothing and personal protective devices when handling battery acid.

Figure 1.33: MD #166456

MD #166457

General hazard pertaining to machine operation and servicing

DANGER

To prevent injury or death from improper or unsafe machine operation:

- Read the operator's manual and follow all safety instructions.
- Do **NOT** allow untrained persons to operate the machine.
- Review these safety instructions with all Operators every year.
- Ensure that all safety signs are installed and are legible.
- Ensure that bystanders are clear of the machine before you start the engine. Keep bystanders clear of the machine while it is operating.
- Keep riders off of the machine.
- Keep all shields in place and stay clear of any moving parts.
- Disengage the header drive, put the transmission in Neutral, and wait for all movement to stop before you leave the operator's seat.
- Stop the engine and remove the key from the ignition before you service, adjust, lubricate, clean, or unplug the machine.
- Engage the safety locks to prevent the header or the reel from falling before you service the header when it is in the raised position.
- Use a slow moving vehicle emblem and activate the flashing warning lights when you operate the windrower on public roadways, unless doing so is prohibited by law.

Run-over hazard

DANGER

- The machine will move if the steering wheel is turned while the engine is running.
- Steering response is the opposite of what is normally expected when you are backing up the machine. Turn the bottom of the steering wheel in the direction in which you want to go.
- Always move the ground speed lever to the low end of the range before you move the high-low speed control.
- Stop the engine and remove the key from the ignition before you service, adjust, lubricate, clean, or unplug the machine, or before you perform maintenance or service on the steering linkage or neutral interlock system.
- Refer to the windrower and header operator's manuals for inspection and maintenance instructions.

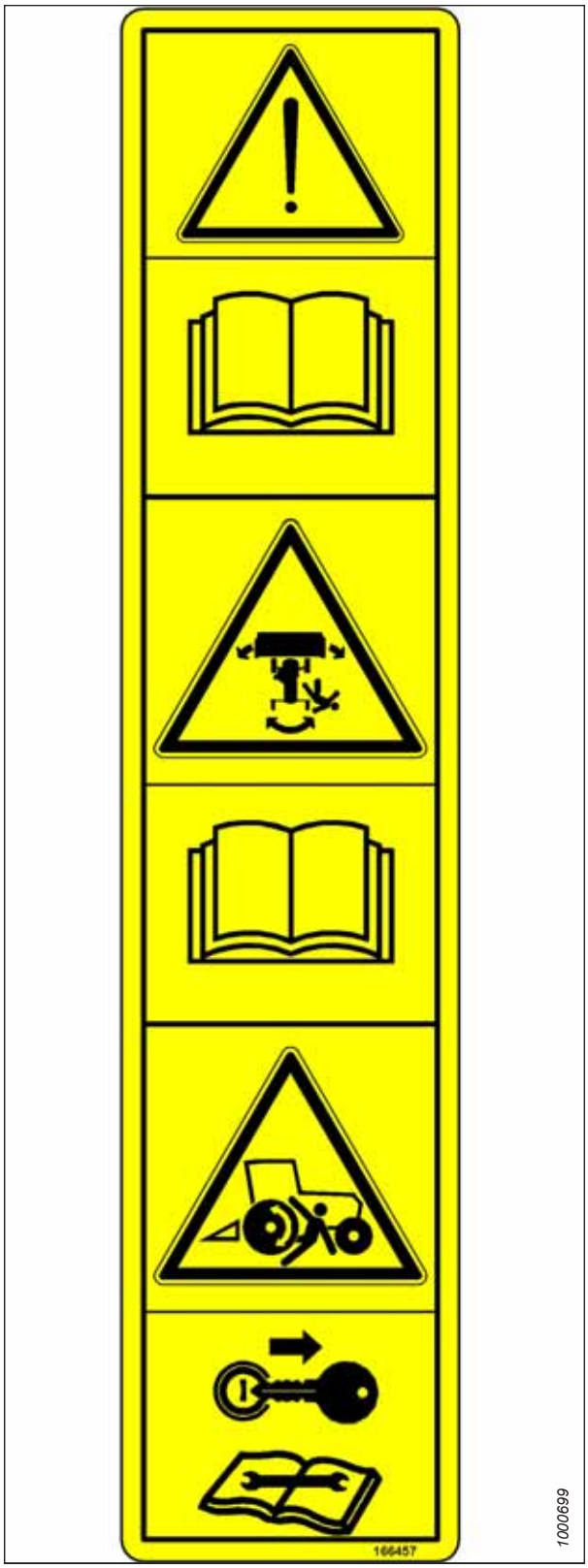


Figure 1.34: MD #166457

MD #166463

Collision hazard

DANGER

To prevent injury or death from a collision between the windrower and other vehicles when you are operating the windrower on public roadways:

- Obey all highway traffic regulations in your area. Use pilot vehicles in the front and the rear of the windrower (if you are required to do so by law).
- Use a slow-moving vehicle emblem and activate the machine's warning lights, unless these actions are prohibited by law.
- If the attached header impedes other vehicle traffic, remove the header and install a MacDon approved weight box onto the windrower. Refer to the windrower and header operator's manuals for instructions on safely towing the header.

Figure 1.35: MD #166463

MD #166465

Loss of control hazard

DANGER

To prevent serious injury or death from losing control of the machine:

- Do **NOT** make abrupt changes in the direction in which you are steering.
- Slow down before turning the machine.
- Do **NOT** make sudden, sharp changes to your speed while turning, such as hard braking.

When travelling on steep slopes:

- Reduce the machine's speed and lower the header.
- Move the ground speed lever to the slow end of the range.
- Shift the high-low speed control to the low range.

When the windrower is operating without a header attached, weight must be added over the drive wheels so that you can maintain steering control. If you must drive the windrower without a header or without a MacDon weight system:

- Operate the windrower in the low-speed range.
- Avoid slopes.
- Do **NOT** tow a header.
- If control of the machine is lost, immediately pull the ground speed lever to the neutral position.

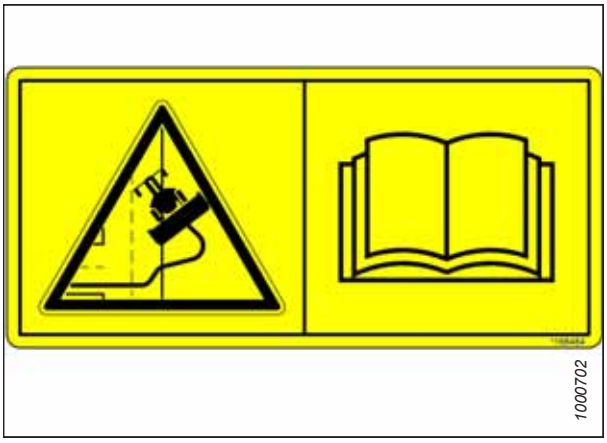


Figure 1.36: MD #166465

MD #166466

High-pressure oil hazard

WARNING

High-pressure hydraulic fluid can penetrate human skin, which can cause serious injury such as gangrene, which can be fatal. To prevent this:

- Do **NOT** go near hydraulic fluid leaks.
- Do **NOT** use a finger or skin to check for hydraulic fluid leaks.
- Lower the load or relieve the pressure in the hydraulic system before loosening any hydraulic fittings.
- If you are injured, seek emergency medical help. **IMMEDIATE** surgery is required to remove hydraulic fluid which has penetrated the skin.

Figure 1.37: MD #166466

MD #166843

Loss of control hazard

DANGER

To prevent serious injury or death from losing control of the machine:

- Do **NOT** make abrupt changes in the direction in which you are steering.
- Slow down before you begin turning the machine.
- Do **NOT** make sudden, sharp changes to the windrower's speed (such as hard braking) when you are turning the windrower.

When you are travelling on steep slopes:

- Reduce the machine's speed and lower the header.
- Move the ground speed lever to the low end of the range.
- Shift the high-low speed control to the low range (16 km/h [10 mph]).

When the windrower is operating without a header attached, weight must be added over the drive wheels so that you can maintain steering control. If you must drive the windrower without a header or without a MacDon weight system:

- Operate the windrower in the low-speed range (16 km/h [10 mph]).
- Avoid slopes.
- Do **NOT** tow a header.
- If control of the machine is lost, immediately pull the ground speed lever to the neutral position and shut off the engine.

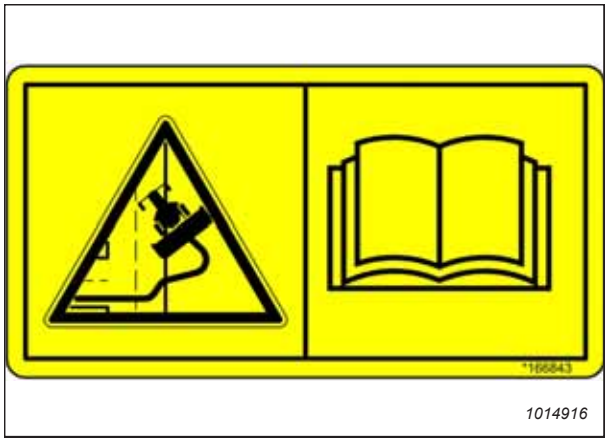


Figure 1.38: MD #166843

MD #167502

Pinch point hazard

CAUTION

To prevent injury:

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

Figure 1.39: MD #167502

MD #167504

Emergency exit information

ATTENTION

To exit the machine in case of an emergency:

- Follow the arrow on the sign.

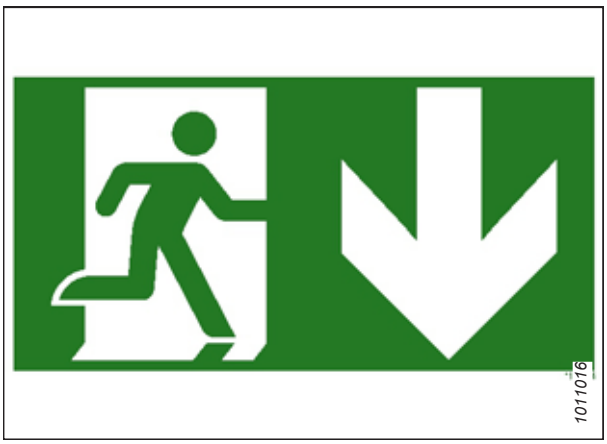


Figure 1.40: MD #167504

MD #184372

General hazard pertaining to machine operation and servicing

DANGER

To prevent injury or death from the improper or unsafe operation of the machine:

- Read the operator's manual and follow all safety instructions. If you do not have a manual, obtain one from your Dealer.
- Do **NOT** allow untrained persons to operate the machine.
- Review these safety instructions with all machine Operators every year.
- Ensure that all safety signs are installed and are legible.
- Make certain that bystanders are clear of the header before starting the engine and during operation of the header.
- Keep riders off of the machine.
- Keep all shields in place. Stay clear of moving parts.
- Disengage the header drive, put the transmission into Neutral, and wait for all movement to stop before leaving the operator's position.
- Stop the engine and remove the key from the ignition before servicing, adjusting, lubricating, cleaning, or unplugging the machine.
- Before servicing a header in the raised position, engage the cylinder safety props.
- Display a slow-moving vehicle emblem and activate the header's warning lights when operating the header on roadways (unless these actions are prohibited by law).

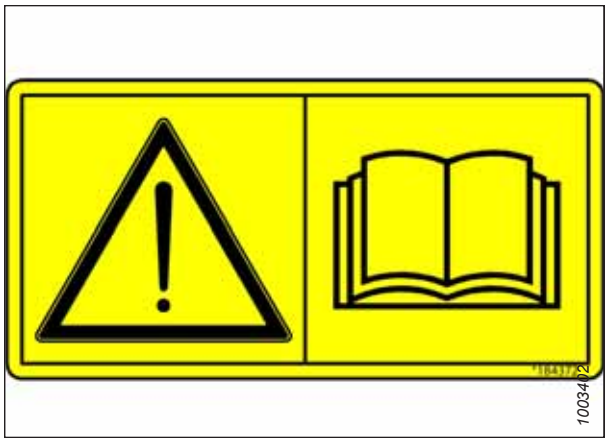


Figure 1.41: MD #184372

MD #190546

Slipping hazard

WARNING

To prevent injury or death:

- Do **NOT** use this area as a step or platform.

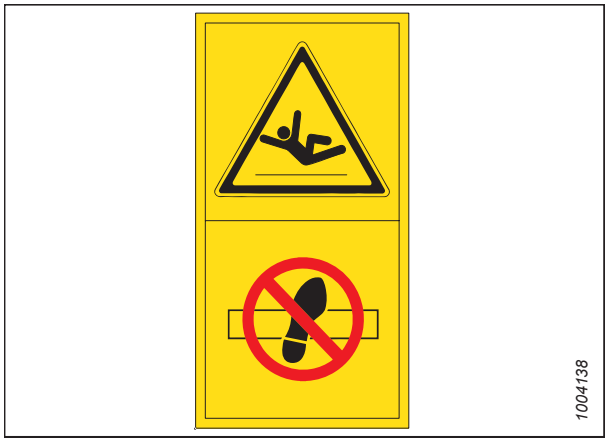


Figure 1.42: MD #190546

MD #306179/306180/306181

Header crushing hazard

DANGER

To prevent injury or death from the fall of a raised header:

- Fully raise the header, stop the engine, remove the key from the ignition, and engage the safety props before going under the header.

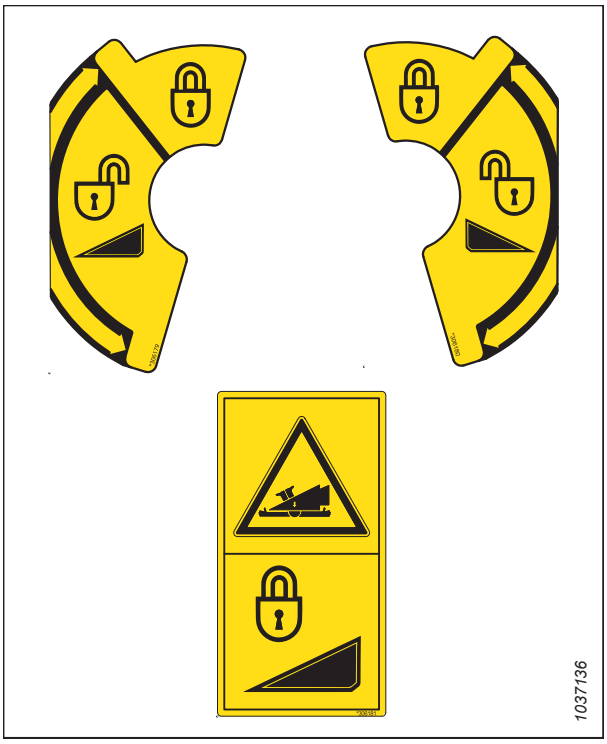


Figure 1.43: MD #306179/306180/306181

MD #306756 – MODEL YEAR 2022 and LATER

Hot fluid spray hazard, engine coolant fill rate instructions, and engine coolant specifications

CAUTION

The engine cooling system is under pressure when the engine coolant is hot. To prevent injury:

- Do **NOT** remove the fluid fill cap when the engine is hot.
- Allow the engine to cool down before you open the fluid fill cap.
- Use **ONLY** the specified types of nitrite-free coolant.
- Fill the tank slowly. Do **NOT** exceed a fill rate of 11 L/min (3 gpm).

Figure 1.44: MD #306756

Chapter 2: Product Overview

The definitions of the technical terms used in this manual, the machine's specifications, and the locations of key components on the machine are provided.

2.1 Definitions

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

Table 2.1 Definitions

Term	Definition
A Series Header	MacDon A30D, A30S, and A40D auger headersMacDon A40D, A40DX, and Grass Seed auger headersMacDon A30S, A30D, A40D, A40DX, and Grass Seed auger headers
API	American Petroleum Institute
ASTM	American Society of Testing and Materials
Bolt	A headed and externally threaded fastener designed to be paired with a nut
Cab-forward	Windrower operation mode, in which the Operator's seat faces the header
CDM	Cab display module on an M Series Windrower
Center-link	A hydraulic cylinder or manually adjustable turnbuckle type connection between the header and the vehicle, which is used to change the angle of the header relative to the vehicle
CGVW	Combined gross vehicle weight
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
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
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
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
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

Table 2.1 Definitions (continued)

Term	Definition
M Series Windrowers	MacDon M100, M105, M150, M155, M155*E4*, M200, and M205 Windrowers
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
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
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
SST	Slow speed transport
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

2.2 Specifications

Consult this section to learn about the physical characteristics of and equipment specifications for your windrower.

Engine		
Type		Cummins QSB-4.5L CM2350 4 cylinder turbo diesel, B20 biodiesel approved
Displacement		4.5 L (275 cu. in.)
Power	Rated	116 kW (156 hp) @ 2200 rpm
Electrical System		
Recommended battery (2)		12 Volt, maximum dimension: 334 x 188 x 232 mm (13.25 x 7.37 x 9.44 in.), group rating 29H or 31A. Heavy duty / off road / vibration resistant.
Minimum CCA per battery (cold cranking amps)		650
Battery BCI group rating		29H or 31A
Alternator		160 amp
Egress lighting		Standard
Warning beacons		Standard
Starter		Wet type
Working lights		11
GPS ready		Wiring harness factory installed for Trimble® and JD Greenstar
Traction Drive		
Type		Hydrostatic, three-speed electric shift
Speed	Field (cab-forward)	Low range: 0–18 km/h (11 mph), Mid range: 0–26 km/h (16 mph)
Speed	Reverse (cab-forward)	9.6 km/h (6 mph)
Speed	Transport (engine-forward)	High range: 0–37 km/h (23 mph)
Transmission	Type	Two piston pumps: one per drive wheel
Transmission	Displacement	44 cc (2.65 cu. in.)
Transmission	Flow	167 L/min (40 US gpm)
Transmission	Pressure	379 bar (5500 psi)
Final drive	Type	Planetary gearbox
Final drive	Ratio	30.5 : 1
Wheel motor displacement	Low range	68 cc (4.15 cu. in.)
Wheel motor displacement	Mid range	50 cc (3.01 cu. in.)
Wheel motor displacement	High range	32 cc (1.93 cu. in.)

System Capacities		
Fuel tank		367 L (97 US gallons)
Hydraulic reservoir		65 L (17.2 US gallons)
Diesel exhaust fluid (DEF) tank capacity		28.4 L (7.5 US gallons)
Header Drive (Refer to Table *2.2, page 34*).		
Header Lift/Tilt		
Type		Lift - Hydraulic double-acting cylinders Tilt - Optional hydraulic positioning Tilt - Hydraulic center-link
Function		Lift/tilt
Header Float		
Primary adjustment		Manual, external, drawbolt with springs (one per side), two inner booster spring
Fine adjustment		Hydraulic, in-cab switch
Automatic		Hydraulic, three programmable settings for all headers (Deck shift compensation on draper headers)
Cab		
Type		Spring/shock suspension
Dimensions	Width	1600 mm (63 in.)
Dimensions	Depth	1735 mm (68.3 in.) (at top of window)
Dimensions	Height	1640 mm (64.6 in.)
Dimensions	Volume	3540 L (125 cu. ft.)
Seat	Driver	Adjustable air-ride suspension, seat belt
Seat	Training	Folding, cab mounted, seat belt
Windshield wiper	Front	800 mm (31.5 in.) blade
Windshield wiper	Rear	560 mm (22 in.) blade
Heater		37,900 Btu/h (11,107 W)
Air conditioning		29,800 Btu/h (8734 W)
Electrical outlets		One live, two on ignition, one live/keyed
Mirrors		One inside (transport), two outside (field)
Radio		Two speakers and antenna are factory installed. Radio is dealer installed
System Monitoring		
Speeds		Ground (mph or km/h), engine (rpm), knife (spm), disc (rpm), reel (rpm or mph/km/h), conveyor (ref. no.)
Header		Height, angle, float, header drive load gauge (optional)
Tire Options (Refer to Table *2.3, page 35* for options.)		
Frame and Structure		
Dimensions		Refer to *2.3 Windrower Dimensions, page 35*
Frame to ground (crop clearance)		1160 mm (45.7 in.)

Weight	Base	4450 kg (9810 lb.)[1]
Weight	Maximum GVW	9750 kg (21,500 lb.)[1]
Weight	Maximum CGVW	10,480 kg (23,100 lb.)[1]
Header Compatibility		
Auger headers	A30D, A40D	All sizes
Draper headers	D50[2]	Up to 10.7 m (35 ft.)
Draper headers	D60 and D65[2]	Up to 12.2 m (40 ft.)
Draper headers	D1 Series	Up to 12.2 m (40 ft.)
Rotary disc headers	R80 and R85	4 m (13 ft.) only[3]
Rotary disc headers	R113, R116 and R216	4 m (13 ft.) and 4.9 m (16 ft.)

NOTE:

Specifications and design are subject to change without notice or obligation to revise previously sold units.

Pump locations:

- A – Piston pump (closest to engine) knife drive.
- B – Reel/conveyor pump (or M2 with disc).
- C – Oil from the inner gear pump is normally routed directly to the cooler bypass valve and combines with the return flow from the first gear pump. From there the oil is cooled and moves through the high pressure filter and then into the supercharge valve manifold. If a Double Windrow Attachment (DWA) is installed, oil is diverted to power the draper; the return flow proceeds to the supercharge valve manifold.
- D – Outboard gear pump (D) supplies oil to the multifunction control manifold. The returned oil combines with the return flow from inboard gear pump (C) at the cooler bypass and maintains standby pressure to operate the brake disengagement system (in either the low- or the high-speed range) and the neutral interlock cylinder.
- E – Traction drive double piston pump. The engine end of the pump drives the right wheel; the outboard pump drives the left wheel.

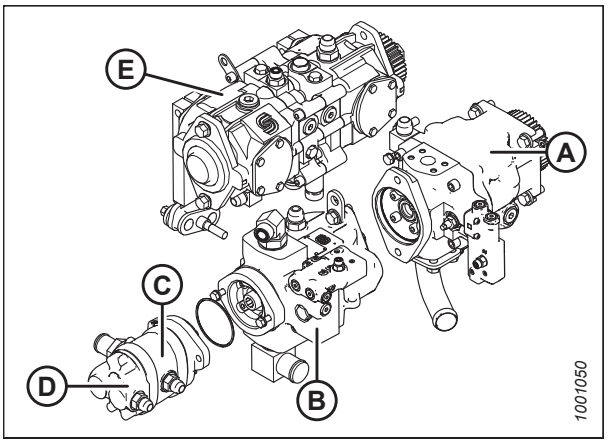


Figure 2.1: Pumps

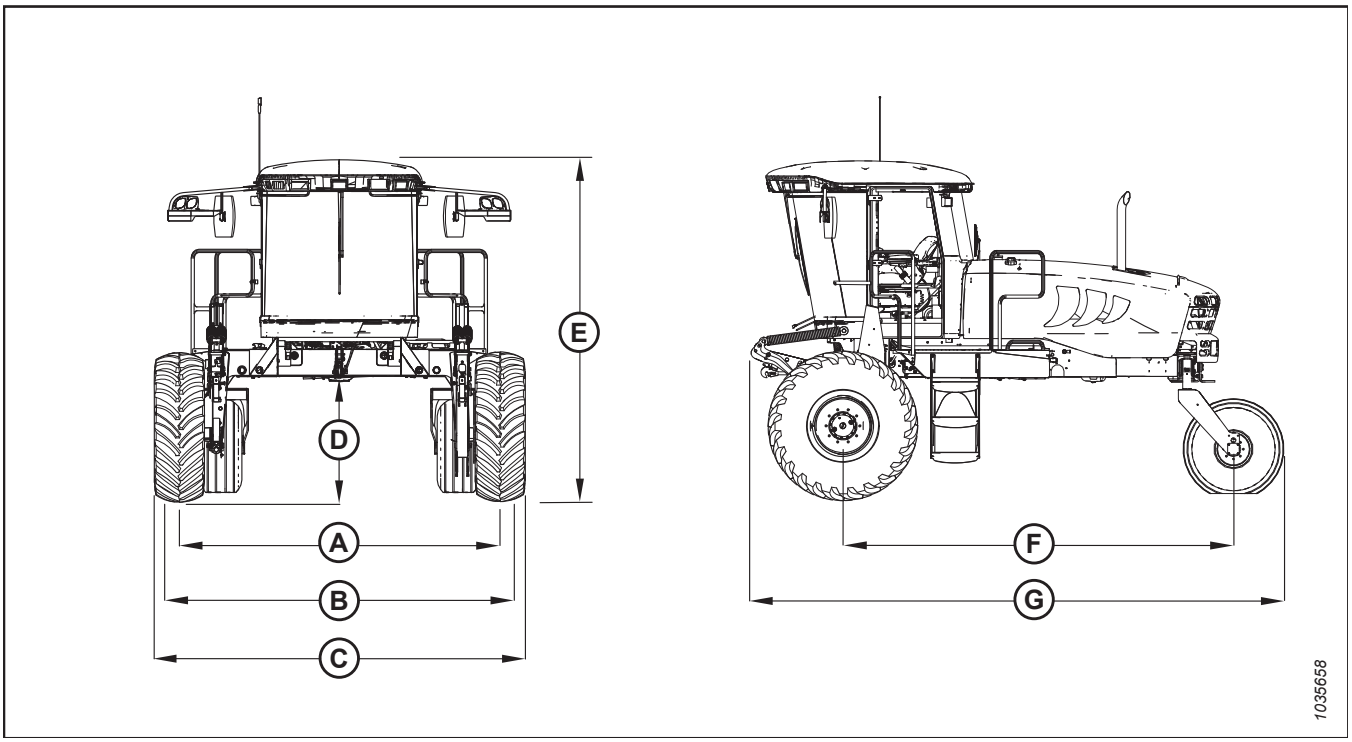
1. Weights do not include options.
2. Depending on header options.
3. Only 18.4 x 26 tires are compatible with the 4 m (13 ft.) R80 and R85.

Table 2.2 Hydraulic Pumps

Pump Type	Specifications	Controller Type	Function
Pump A - Load sense pressure compensated piston pump	Variable displacement: 0–45 cc (2.75 cu. in.) flow = 0–102 L/min (27 gpm) at 27.56 MPa (4000 psi)	Electric over hydraulic max. flow rate determined by header ID	Knife drive or part of disc drive (option) M1 circuit
Pump B - Load sense pressure compensated piston pump	Variable displacement: 0–38 cc (2.32 cu. in.) flow = 0–84 L/min (24 gpm) at 22.05 MPa (3200 psi)	Electric over hydraulic max. flow rate determined by header ID	Conveyor and reel drive or part of disc drive (option) M2 circuit
Pump C - Gear pump	Displacement: 16.7 cc (1.02 cu. in.) flow at full throttle 44 L/min (11.5 gpm) at 17.23 MPa (2500 psi)	Engine rpm	Supercharge flow and pressure for traction drive, brake release, neutral lock, and DWA draper drive (if installed)
Pump D - Gear pump	Displacement: 16.7 cc (1.02 cu. in.) flow at full throttle 44 L/min (11.5 gpm) at 17.23 MPa (2500 psi)	Engine rpm	Supercharge flow and pressure for traction drive, brake release, and neutral lock

2.3 Windrower Dimensions

The length and width of the windrower can be specified in several ways, including frame width, wheel-to-wheel width, frame length, and total length.



A - Drive Tire Tread
B - Drive Tire Hubs
C - Drive Tires
D - 1160 mm (45 3/4 in.)
E - 3378 mm (133 in.)
F - 4022 mm (158 5/16 in.)
G - 5280 mm (207 7/8 in.)

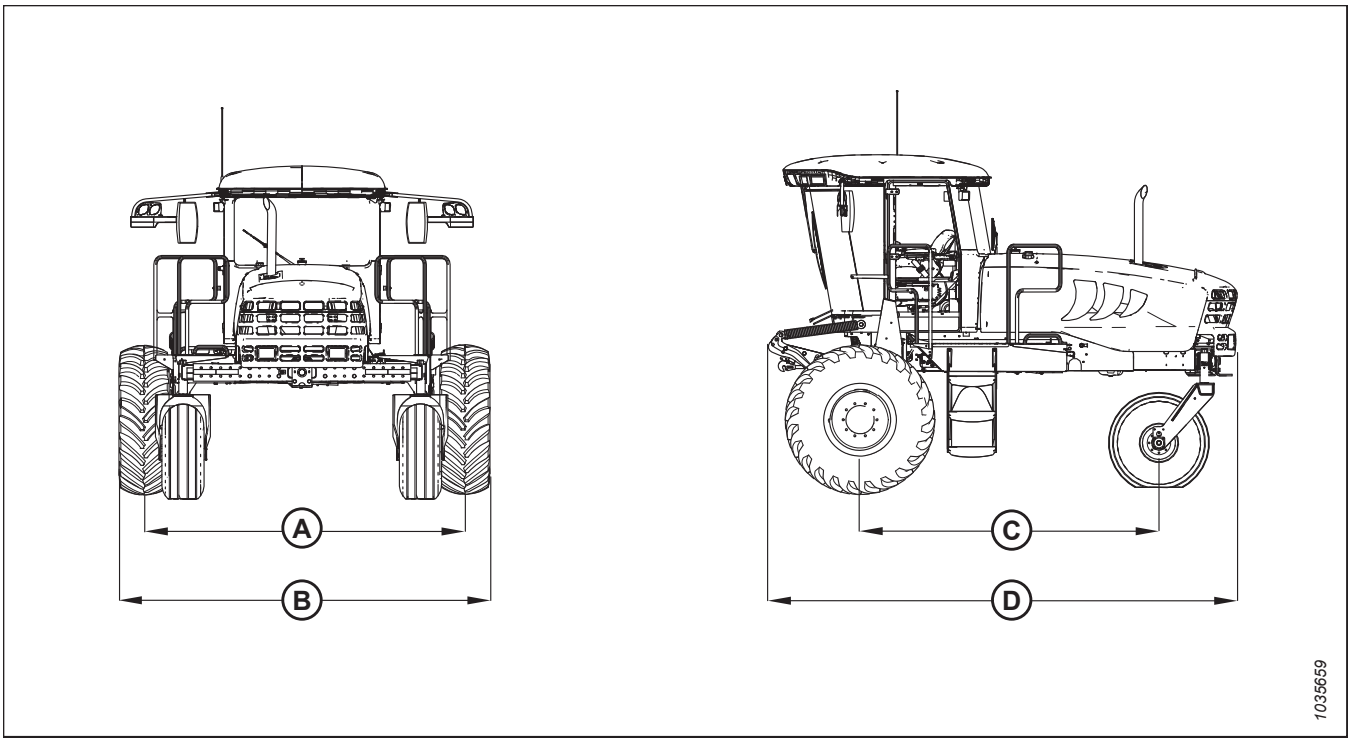
Table 2.3 Drive Tires

Tire Size	Wheel Position	Tread (A) mm (in.)	Hubs (B) mm (in.)	Tires (C) mm (in.)
18.4 x 26 bar and turf narrow track[4]	Inner/outer (shipping)	3144 (123 3/4)	3571 (140 9/16)	3644 (143 7/16)
18.4 x 26 bar and turf narrow track[4]	Outer/outer	3324 (130 7/8)	3751 (147 11/16)	3824 (150 5/8)
18.4 x 26 bar and turf narrow track[4]	Inner/inner	2964 (116 11/16)	3391 (133 1/2)	3464 (136 3/8)
18.4 x 26 bar and turf wide track[4]	Inner/outer (shipping)	3319 (130 11/16)	3571 (140 9/16)	3819 (150 3/8)
18.4 x 26 bar and turf wide track[4]	Outer/outer	3499 (137 3/4)	3751 (147 11/16)	3999 (157 7/16)

4. Only 18.4 x 26 tires are compatible with the 4.0 m (13 ft.) R80 and R85.

Table 2.3 Drive Tires (continued)

Tire Size	Wheel Position	Tread (A) mm (in.)	Hubs (B) mm (in.)	Tires (C) mm (in.)
18.4 x 26 bar and turf wide track[4]	Inner/inner	3139 (123 9/16)	3391 (133 1/2)	3639 (143 1/4)
600/65R28 radial tire	Inner/outer (shipping)	3139 (123 9/16)	3571 (140 9/16)	3758 (147 15/16)
600/65R28 radial tire	Outer/outer	3319 (130 11/16)	3751 (147 11/16)	3938 (155 1/16)
600/65R28 radial tire	Inner/inner	2959 (116 1/2)	3391 (133 1/2)	3578 (140 7/8)
23.1-26 and 580/70R26 turf tires	Inner/outer (shipping)	3203 (126 1/8)	3571 (140 9/16)	3793 (149 5/16)
23.1-26 and 580/70R26 turf tires	Outer/outer	3383 (133 3/16)	3751 (147 11/16)	3973 (156 7/16)
23.1-26 and 580/70R26 turf tires	Inner/inner	3023 (119)	3391 (133 1/2)	3613 (142 1/4)



A - Caster Tire Tread
B - Caster Tire Casters
C - 3064 mm (120 9/16 in.)
D - 4747 mm (186 7/8 in.)

Table 2.4 Caster Tires

Tire Size	Wheel Position	Tread (D) mm (in.)	Casters (E) mm (in.)
7.5-16SL	Minimum	2448 (96 7/16)	3032 (118 15/16)
7.5-16SL	Maximum	3448 (135 11/16)	4032 (158 3/4)
10-16 formed caster	Minimum	2448 (96 7/16)	3032 (118 15/16)
10-16 formed caster	Maximum	3448 (135 11/16)	4032 (158 3/4)
10-16 forked caster	Minimum	2448 (96 7/16)	3014 (118 11/16)
10-16 forked caster	Maximum	3448 (135 11/16)	4014 (158)
16.5 x 16.1	Minimum	2448 (96 7/16)	3014 (118 11/16)
16.5 x 16.1	Maximum	3448 (135 11/16)	4014 (158)

2.4 Component Location

Knowing the location and the identity of key windrower components is critical to operating and properly maintaining the machine.

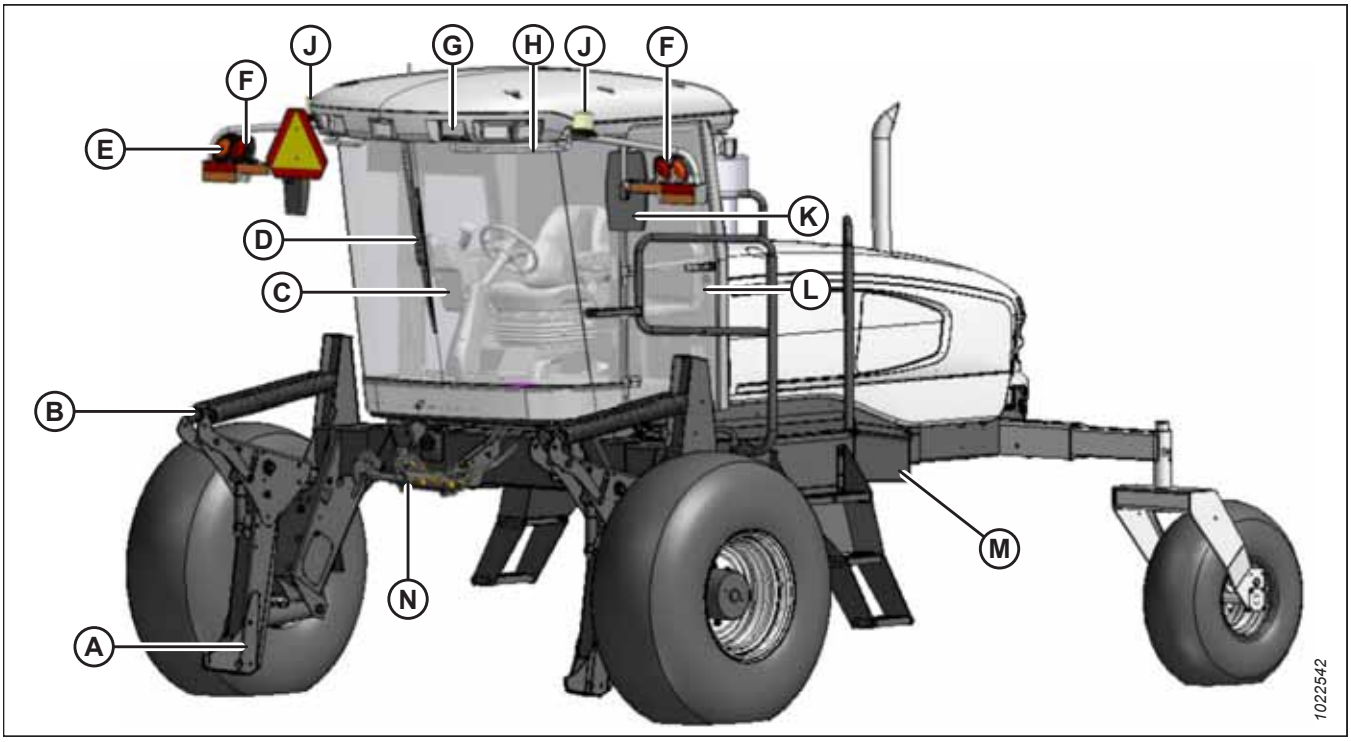


Figure 2.2: Front Cab-Forward View

A - Header Lift Leg
B - Header Float Springs
C - Operator's Station
D - Windshield Wiper
E - Turn Signal / Hazard Lights
F - Taillight Engine-Forward
G - Field/Road Lights
H - Handholds
J - Beacon
K - Mirror
L - Door
M - Maintenance Platform
N - Center-Link

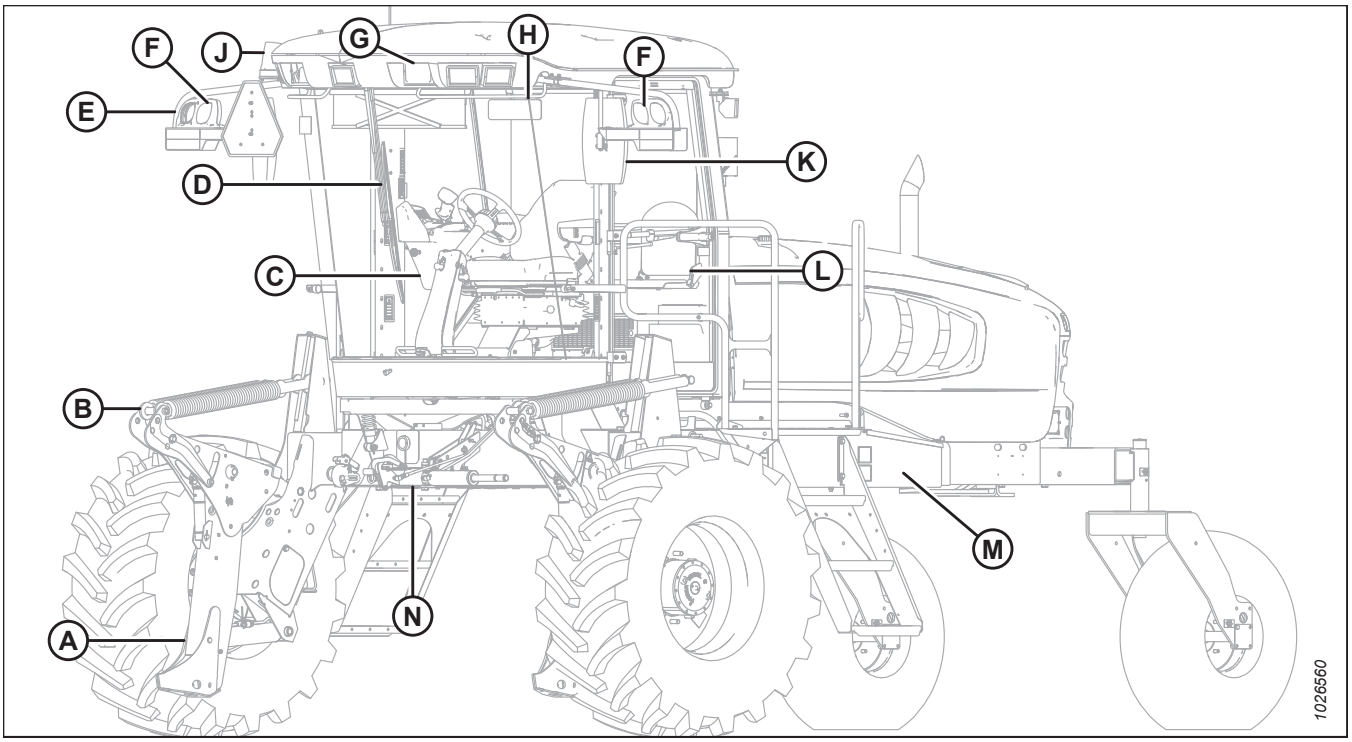


Figure 2.3: Front Cab-Forward View

A - Header Lift Leg
B - Header Float Springs
C - Operator's Station
D - Windshield Wiper
E - Turn Signal / Hazard Lights
F - Tail Light Engine-Forward
G - Field/Road Lights
H - Handholds
J - Beacon
K - Mirror
L - Door
M - Maintenance Platform
N - Center-Link

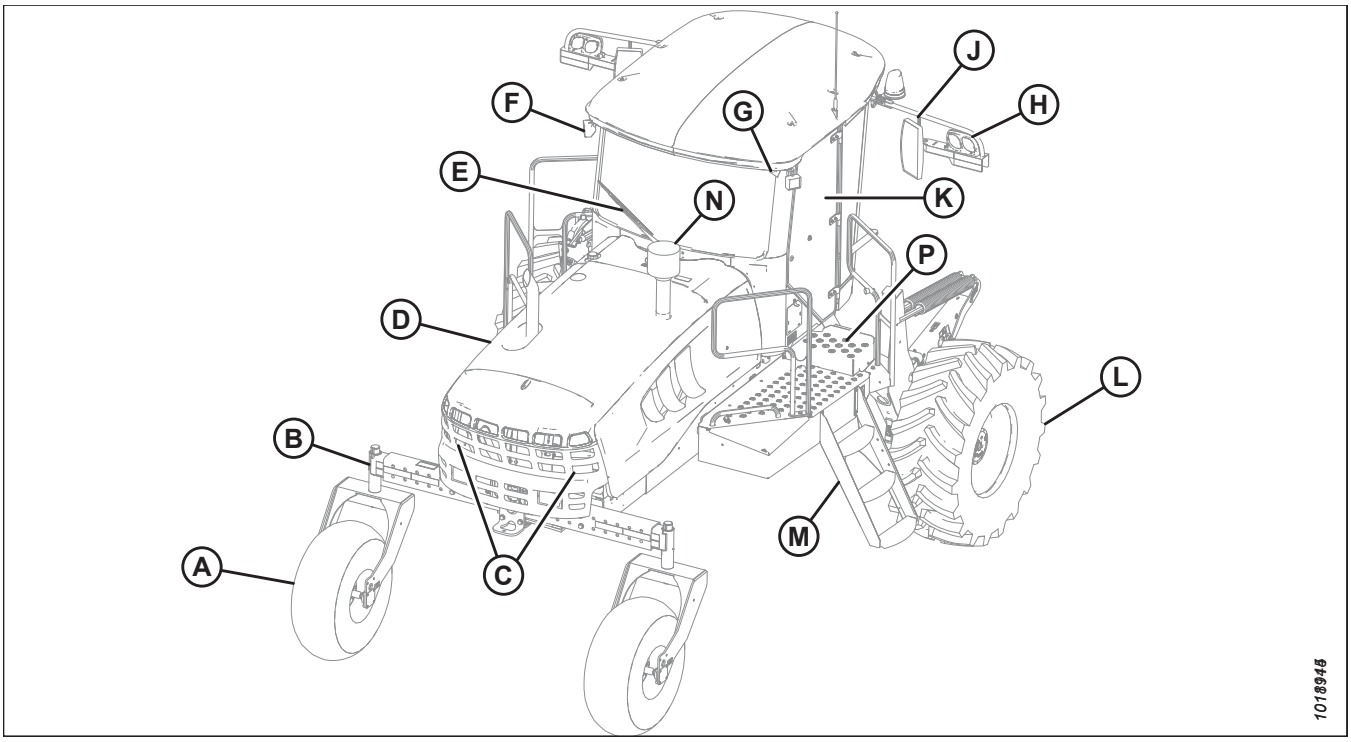


Figure 2.4: Rear Cab-Forward View

A - Caster Wheel
B - Walking Beam
C - Taillights - Cab-Forward (Option)
D - Engine Compartment Hood
E - Windshield Wiper
F - Field/Road Lights
G - Horn
H - Turn Signal / Hazard Lights
J - Mirror
K - Door
L - Drive Wheel
M - Maintenance Platform
N - Precleaner
P - Diesel Exhaust Fluid (DEF) Tank

Chapter 3: Operator’s Station

The operator’s station, which includes the seat, the operating console, and the steering column, contains all of the controls necessary to operate the windrower. It allows the Operator to operate the windrower in cab-forward mode (working mode) or in engine-forward mode (transport mode).

3.1 Operator’s Console

The operator's console contains the controls necessary to operate the windrower and its amenities. The console position can be adjusted to suit each Operator.

Note the position of each instrument on the operator's console.

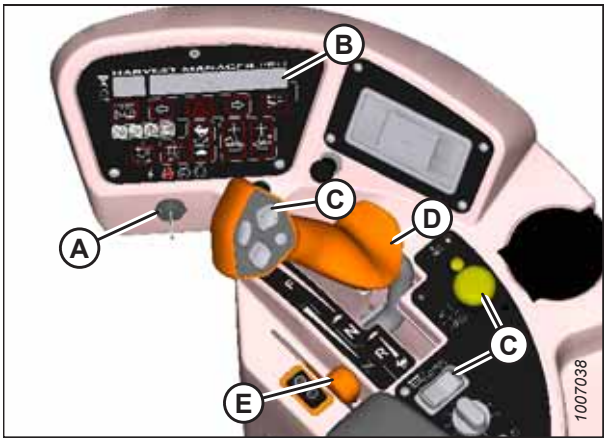


Figure 3.1: Operator’s Console

A - Ignition
B - Cab Display Module (CDM)
C - Header Controls
D - Ground Speed Lever (GSL)
E - Throttle

1. To adjust the operator console’s fore-aft setting and its height:

   a. Pull lever (A) and slide the console fore or aft to the desired position.

   b. Release the lever to lock the console.

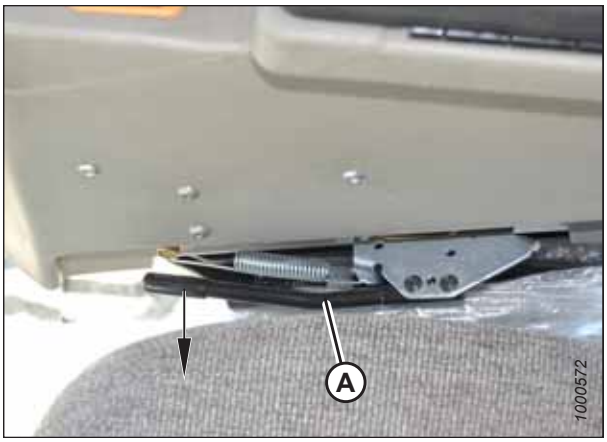


Figure 3.2: Console Fore-Aft Adjustment

2. To adjust only the operator console's fore-aft setting without adjusting its height:
   a. Loosen nuts (A) under the console.
   b. Move the console as needed.
   c. Tighten nuts (A).

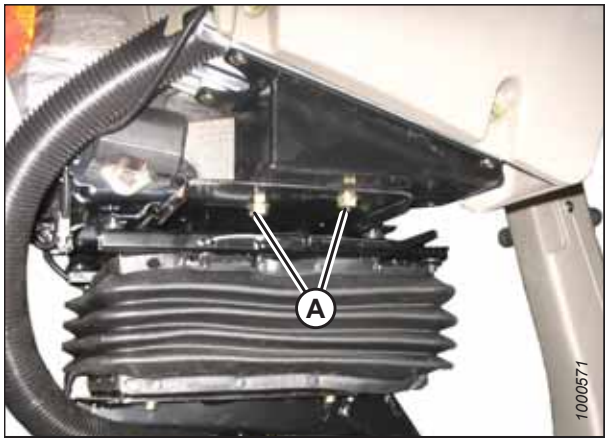


Figure 3.3: Console Fore-Aft Adjustment

3.2 Operator Presence System

The operator presence system is a safety feature designed to activate or deactivate certain systems when the Operator is not seated at the operator's station.

These systems are:

- Header drive
- Engine and transmission

3.2.1 Header Drive

The header drive system will only operate if allowed to do so by the operator presence system.

- To engage the header drive, the Operator must be seated in the operator's seat.
- If the Operator leaves the seat, power to the header drive is maintained for 5 seconds, then the header shuts down automatically.
- To restart the header after an automatic shut down, move the HEADER DRIVE switch to the OFF position and then to the ON position.

3.2.2 Engine and Transmission

The engine and transmission systems will only operate if allowed to do so by the operator presence system.

- If the HEADER DRIVE switch is engaged, the engine will not start.
- If the windrower is traveling at 8 km/h (5 mph) or slower and the Operator leaves the seat, the cab display module (CDM) will display the message NO OPERATOR on the upper line and ENGINE SHUT DOWN 5...4...3...2...1...0 on the lower line, and a steady tone will sound. When the countdown reaches 0, the engine will shut down.
- If the windrower is traveling at 8 km/h (5 mph) or faster, and the Operator leaves the seat for more than five seconds, an alarm will sound and the lower display line will display the message NO OPERATOR.
- If the operator's seat is in between the cab-forward and engine-forward positions and the transmission is not locked in the NEUTRAL position, the engine will shut down. The lower display will display the message LOCK SEAT BASE until the seat base is locked into position.

3.3 Operator's Seat Adjustments

The operator's seat can be adjusted in several ways so that the Operator remains comfortable while operating the machine.

3.3.1 Adjusting Fore-Aft Position

Changing the fore-aft setting moves the operator's chair closer to or father away from the front of the windrower.

1. Pull lever (A) up to release the fore-aft position lock.
2. Move the seat forward or rearward, as desired.
3. Release lever (A).

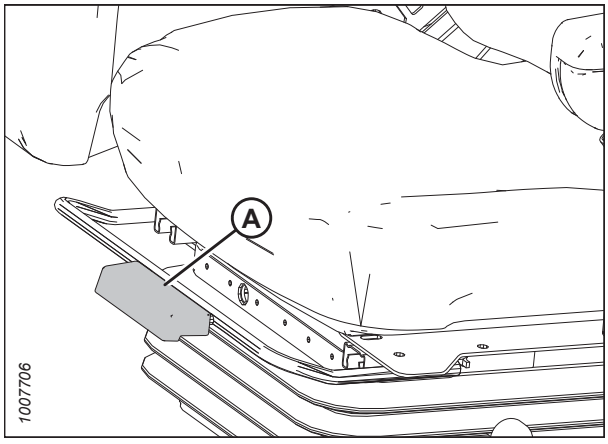


Figure 3.4: Fore-Aft Position

3.3.2 Adjusting Fore-Aft Isolator Lock

The fore-aft isolator provides a degree of shock absorption when the windrower is turned. It can be locked or unlocked.

To lock the fore-aft isolator, push lever (A) down.

To unlock the fore-aft isolator, push lever (A) up.

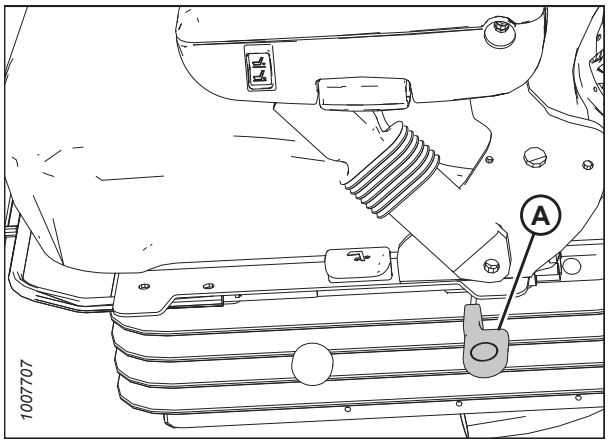


Figure 3.5: Fore-Aft Isolator Lock

3.3.3 Adjusting Seat Suspension and Height

The height of the operator's seat can be adjusted electrically by using the switch on the armrest.

To increase the seat's height, press upper switch (A).

To decrease the seat's height, press upper switch (B).

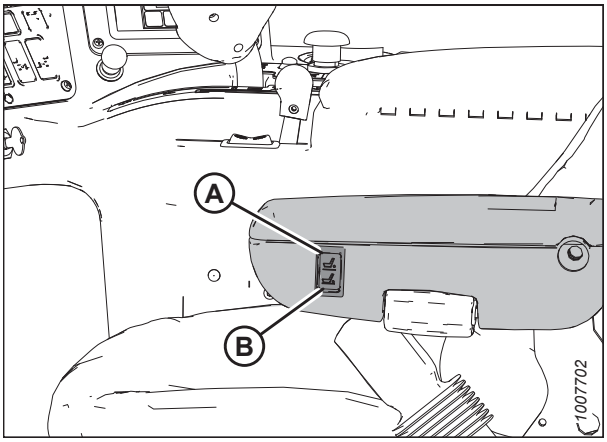


Figure 3.6: Seat Suspension and Height on Armrest

3.3.4 Adjusting Seat Tilt

The angle of the seat back relative to the operator's seat can be adjusted using the seat tilt lever.

1. Pull lever (A) to release the seat tilt lock.
2. Position the seat back as desired.
3. Release lever (A).

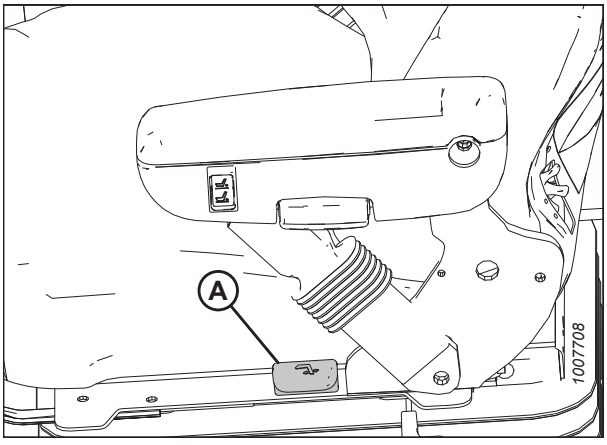


Figure 3.7: Seat Tilt

3.3.5 Adjusting Vertical Dampener

The vertical dampener regulates the degree of shock absorption the seat provides in the up-and-down plane.

To increase the seat's vertical dampening, turn knob (A) counterclockwise.

To decrease the seat's vertical dampening, turn knob (A) clockwise.

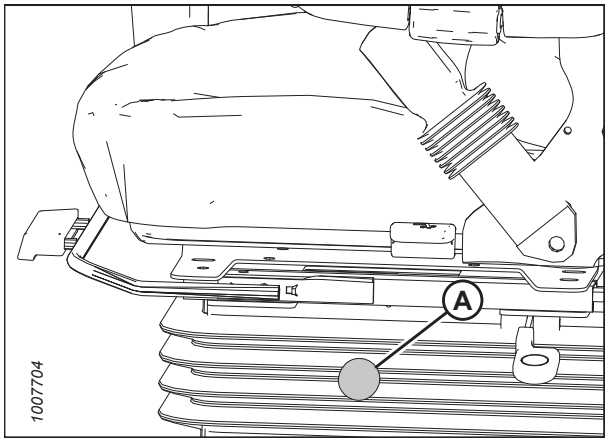


Figure 3.8: Vertical Dampener

3.3.6 Adjusting Armrest

The armrest can be put into the raised or the lowered position to facilitate access to the seat.

Raise armrest (A) so that the seat can be more easily accessed.

Lower armrest (A) after sitting down and buckling the operator's safety belt.

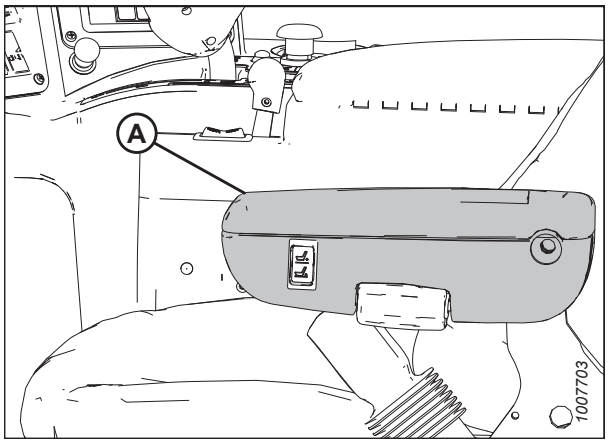


Figure 3.9: Armrest

3.3.7 Adjusting Armrest Angle

The angle of the armrest relative to the operator's seat can be adjusted using the knob on the bottom of the armrest.

To increase the armrest angle, rotate knob (A) clockwise.

To decrease the armrest angle, rotate knob (A) counterclockwise.

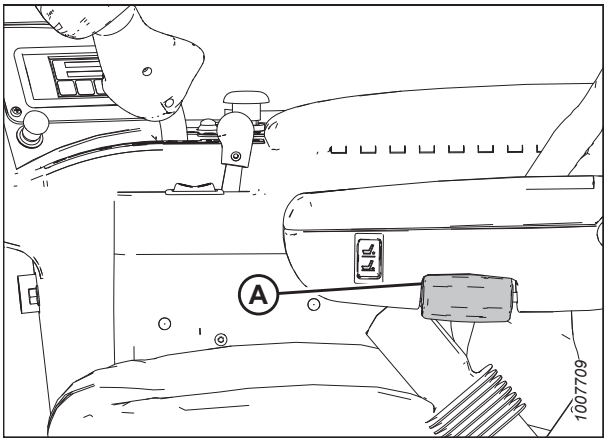


Figure 3.10: Armrest Angle

3.3.8 Adjusting Lumbar Support

Lumbar support fills in the gap between the curve of the spine of the lower back and the seat back so that the Operator can maintain proper posture. It can be adjusted by using the knob on the back of the seat back.

To increase the seat's lumbar support, rotate knob (A) upward.

To decrease the seat's lumbar support, rotate knob (A) downward.

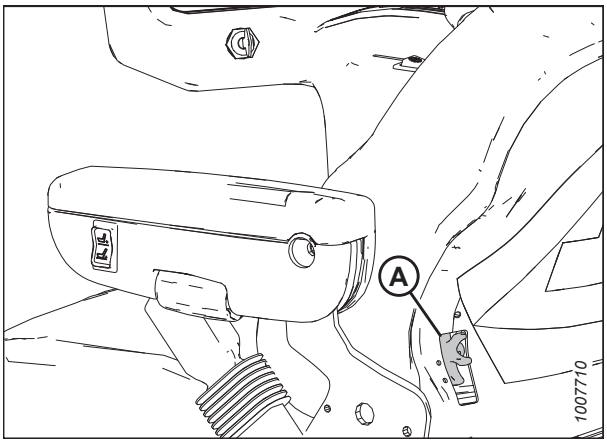


Figure 3.11: Lumbar Support

3.3.9 Using Seat Belts

The windrower is equipped with seat belts on the operator's and trainer's seats.

WARNING

Seat belts can help ensure your safety when they are properly used and maintained.

- **Before starting the engine, fasten your seat belt, and ensure that the training seat occupant's seat belt is securely fastened.**
- **Never wear a seat belt loosely or leave any slack in the belt system. Never wear the belt in a twisted condition or pinched between the seat structural members.**

To fasten a seat belt:

1. Pull metal eye (A) and pull the safety belt completely across your body.
2. Push metal eye (A) into buckle (B) until the eye is locked in place.
3. Adjust the position of the belt as low on your body as possible.

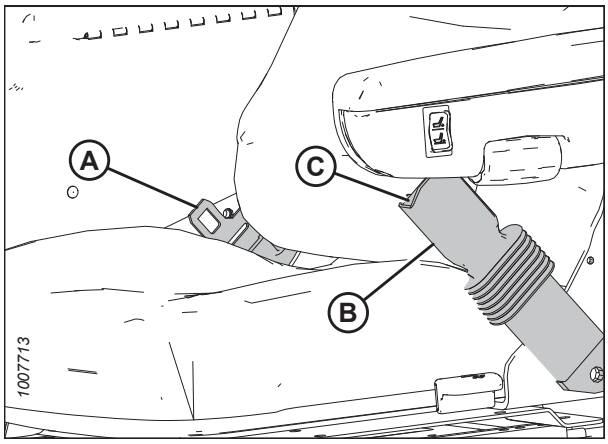


Figure 3.12: Seat Belt

To release a seat belt:

1. Push red button (C) at the end of the buckle.
2. Separate buckle (B) and metal eye (A).

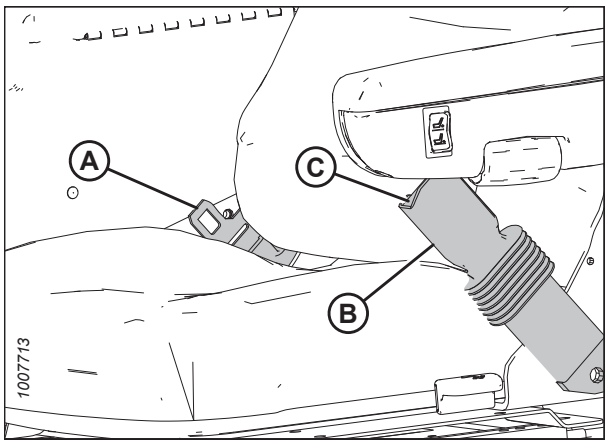


Figure 3.13: Seat Belt

3.4 Using Training Seat

A wall-mounted, fold-up training seat complete with seat belt is provided solely for the purpose of training new Operators.

WARNING

- **The training seat is provided for use by an experienced machine Operator, so that they can train a new Operator on the use of the machine.**
- **Never use the training seat when operating the windrower in engine-forward mode.**
- **The training seat is NOT intended as a passenger seat or for use by children. Use the seat belt whenever you are operating the machine or when you are riding as a Trainer.**
- **Keep all other riders off of the machine.**

To store the training seat, lift seat (B) and secure it with latch (A).

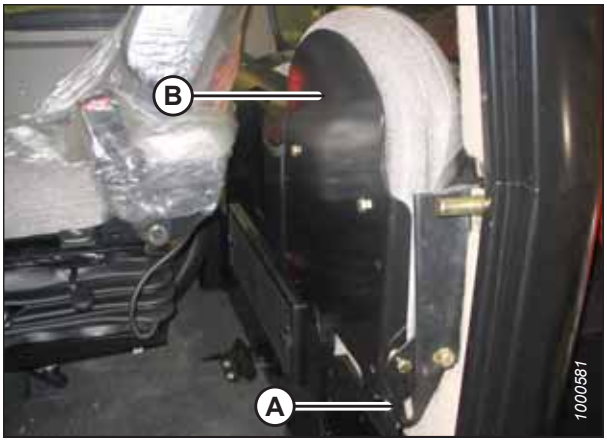


Figure 3.14: Training Seat in Storage Position

To lower the seat, lift latch (A) and lower seat (B).

Figure 3.15: Training Seat

3.5 Adjusting Steering Column

The position of the steering column can be adjusted to suit each Operator and to make it easier to get in and out of the seat.

1. Hold onto the steering wheel, lift handle (A), and move the steering wheel up or down to the desired position.
2. Release handle (A) to lock the position of the steering wheel.

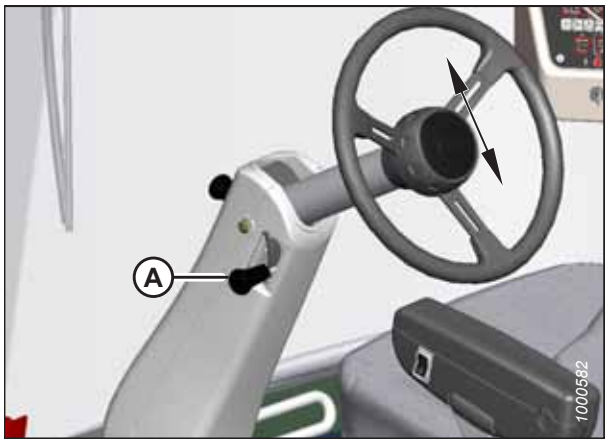


Figure 3.16: Steering Column

3.6 Exterior Lighting

The exterior lighting system consists of the field, road, and beacon and/or clearance lights. These lights can be controlled from a panel in the cab's headliner.

Field/road (A), high/low beam (B), and beacon light (C) switches are located on a panel in the cab headliner. The hazard/turn signal switch is located on the cab display module (CDM).

The position of the operator's station (cab-forward mode or engine-forward mode) automatically determines which lighting systems are activated.

An auto-road light feature is available and is activated when certain conditions are met. For more information, refer to *3.6.6 Auto Road Light, page 56*.

IMPORTANT:

Red and amber reflector tape is positioned so as to be visible in both the engine-forward and cab-forward modes.

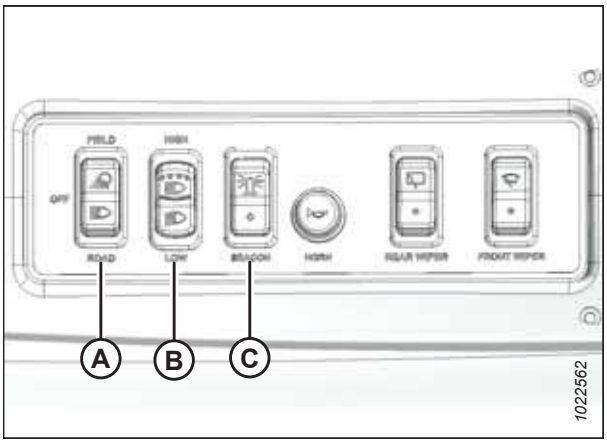


Figure 3.17: Headliner Console – All Countries Except Russia

A - FIELD / OFF / ROAD
B - HIGH / LOW
C - BEACONS / OFF

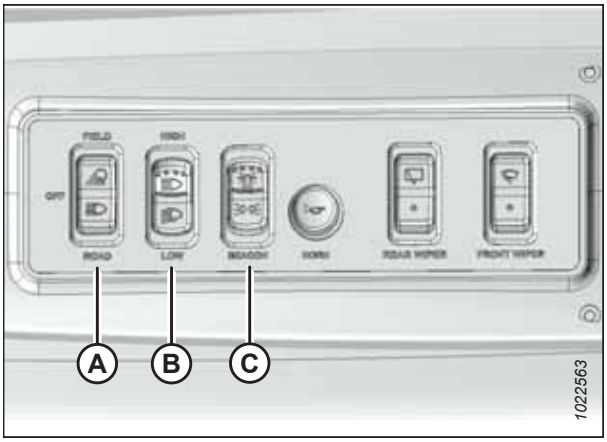


Figure 3.18: Headliner Console – Russia Only

A - FIELD / OFF / ROAD
B - LOW / HIGH
C - BEACON & CLEARANCE / OFF / CLEARANCE

3.6.1 Field Lights – Cab-Forward

The position of the operator's station determines which lights are active when the field/road light switch is set to the FIELD position.

The following lights are ON when the light switch is in the FIELD position when the windrower is in cab-forward mode:

- Field lights in the cab roof (front and rear)
- Swath lights in the hood
- HID lights (if they are installed) on the mirror supports

NOTE:

If the auto-road light feature is activated (that is, the windrower is in engine- or cab-forward mode, out of park, in the high range switch position, and the header is off), only the two front corner field lights will turn on; the remaining field lights will be off.

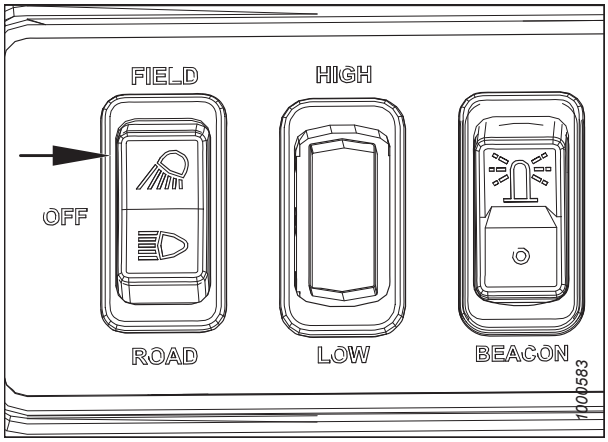


Figure 3.19: Field Light Switch

The two innermost lights in field light group (A) at the front of the cab are adjustable. For instructions, refer to *Adjusting Field Lights, page 414*.

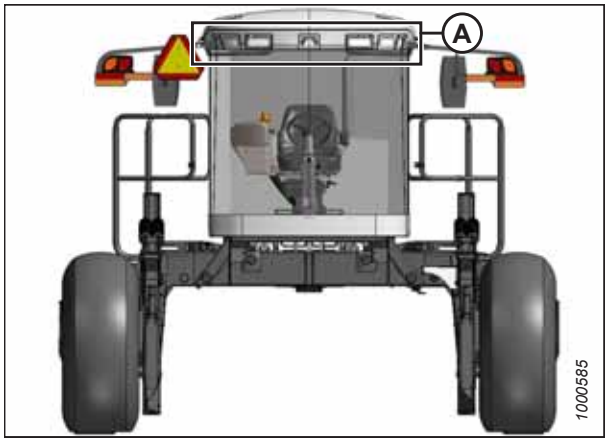


Figure 3.20: Cab-Forward – Front View

Two field lights (A) at the rear of the cab are adjustable. For instructions, refer to *Adjusting Rear Floodlights, page 421*.

NOTE:

When the engine is shut down, rear field lights (A) activate for 60 seconds to illuminate the platform and the stairs, then deactivate.

Two swath lights (B) in the hood are adjustable, but because they are used as road lights in engine-forward mode and are therefore adjusted for that purpose, they should **NOT** be adjusted for field operation.

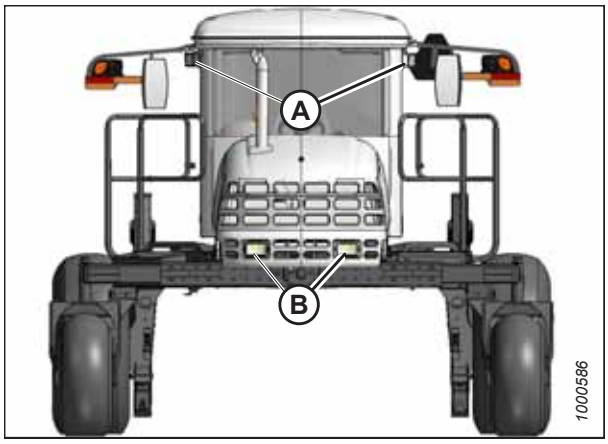


Figure 3.21: Cab-Forward – Rear View

3.6.2 Road Light – Engine-Forward

The position of the operator's station determines which lights are active when the field/road light switch is set to the ROAD position.

The following lights are ON when road light switch (A) is in the ROAD position with the windrower in engine-forward mode:

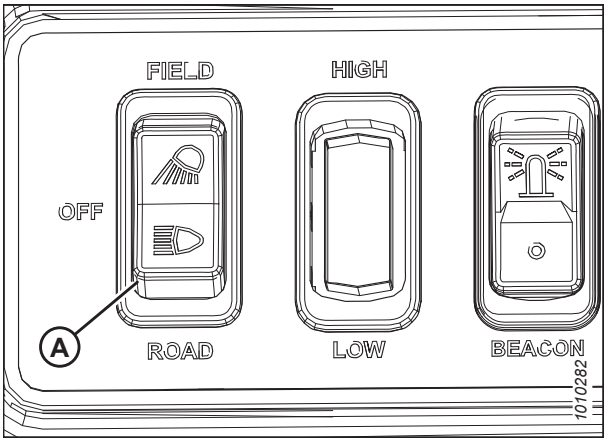


Figure 3.22: Road Light Switch

- Red taillights (A) on the mirror supports
- Amber turn signals and hazard lights (B) on the mirror supports
- Beacon lights (C) on the mirror supports

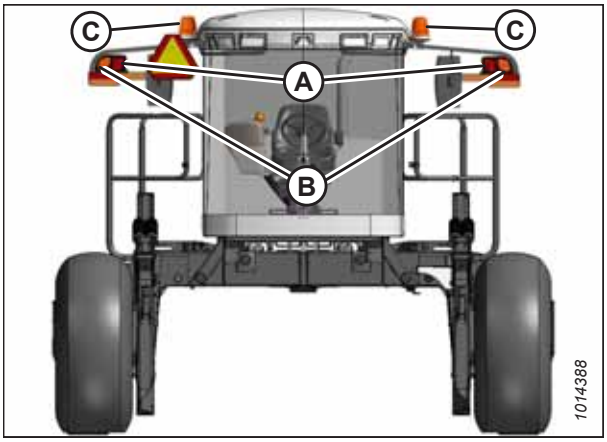


Figure 3.23: Engine-Forward – Rear View

- Amber turn signals and hazard lights (A) on the mirror supports
- Headlights (B) in the hood
- Beacon lights (C) on the mirror supports

The alignment of the two headlights in the hood is adjustable. For instructions, refer to *Aligning Headlights, page 409*.

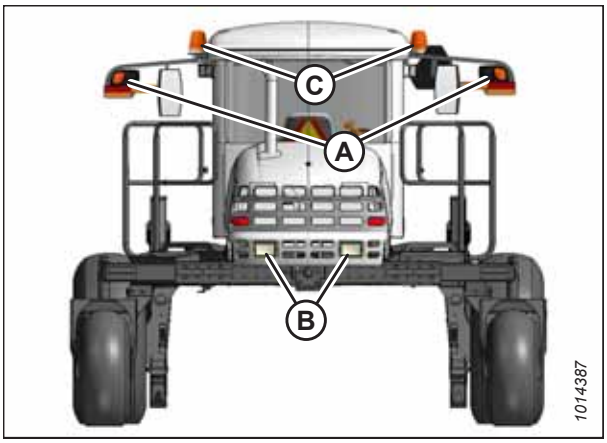


Figure 3.24: Engine-Forward – Front View

3.6.3 Road Light – Cab-Forward

The position of the operator's station determines which lights are active when the field/road light switch is set to the ROAD position.

If equipped, the following lights are functional when switch (A) is in the ROAD position:

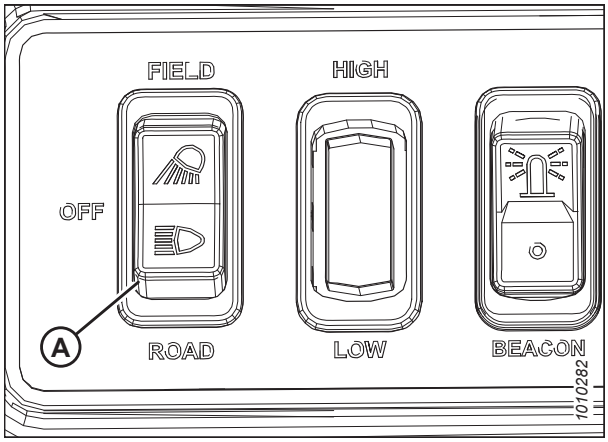


Figure 3.25: Road Light Switch

- Four lights (A) on the cab roof
- Amber turn signals and hazard lights (B) on the mirror supports
- Beacon lights (C) on each side of the cab roof

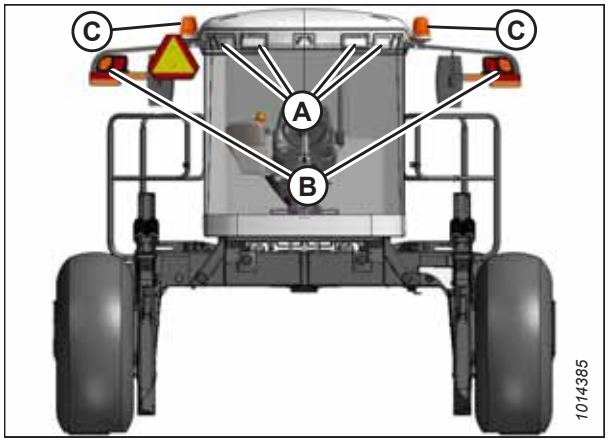


Figure 3.26: Cab-Forward – Front View

- Red lights (A) in the hood
- Beacon lights (B) on the mirror supports

IMPORTANT:

An optional red tail lighting and marking kit must be installed so that the windrower is in compliance with regulations when traveling on the road in cab-forward mode. For more information, refer to *6.4.1 Lighting and Marking for Cab-Forward Road Travel, page 472* or see your MacDon Dealer.

NOTE:

If the red tail lighting kit is not installed, travelling in cab-forward mode and activating the turn indicator will trigger a stop lamp error (E134 or E135).

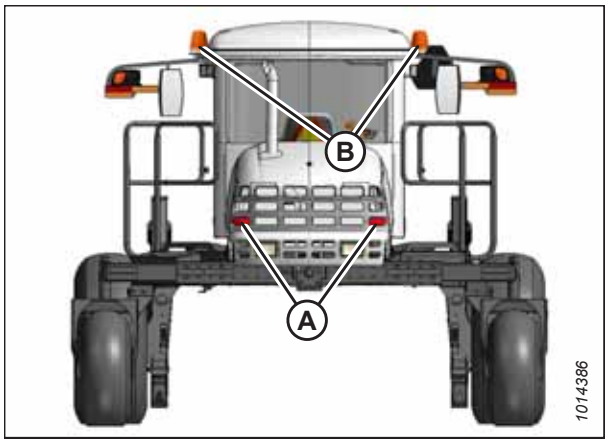


Figure 3.27: Cab Forward – Rear View

IMPORTANT:

If the red tail lighting kit is installed and stop lamp errors still occur, contact your MacDon Dealer.

3.6.4 Turn Signal / Hazard Light

The hazard lights on the mirror supports can be activated manually or can be set to activate automatically under certain conditions.

The hazard lights can be switched on or off by pressing HAZARD switch (A) on the cab display module (CDM).

The hazard lights will also turn on automatically when the auto-road light feature is activated (that is, when the engine is running, the header is off, and the transmission is in either the mid or the high range), and can only be turned off by engaging the header drive.

The turn signal can be switched on or off by pressing LEFT or RIGHT switch (B) on the cab display module (CDM).

Figure 3.28: Turn Signal and Hazard Light Buttons on Cab Display Module

3.6.5 Beacon Light

The beacon lights on top of the windrower cab can be activated manually or set to turn on automatically under certain conditions.

Beacon lights (A) light up when the engine is running and beacon switch (B) is set to ON.

The beacons will also turn on automatically when the auto road light feature is activated (that is, when the engine is running, the header is off, and the transmission is in either the mid or the high range), and can only be turned off by engaging the header drive.

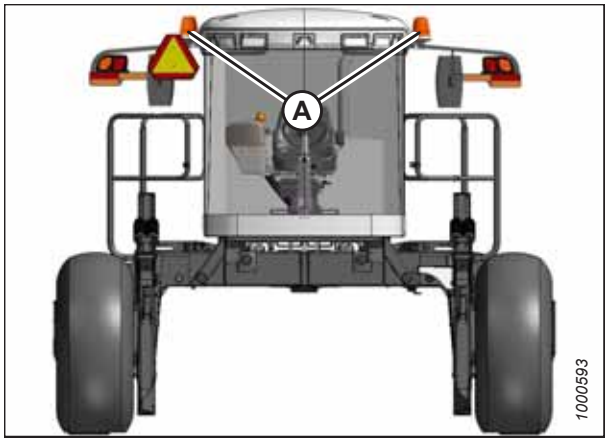


Figure 3.29: Cab-Forward – Front View

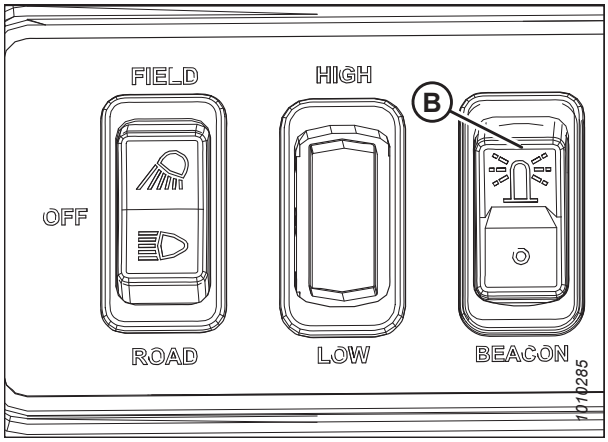


Figure 3.30: Beacon Light Switch

3.6.6 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

3.7 Windshield Wipers

The windrower has two windshield wipers: one in the front, and one in the rear. They can be controlled independently.

The windshield wiper controls are located in the cab headliner. The illustration shows the controls when the windrower is in cab-forward mode.

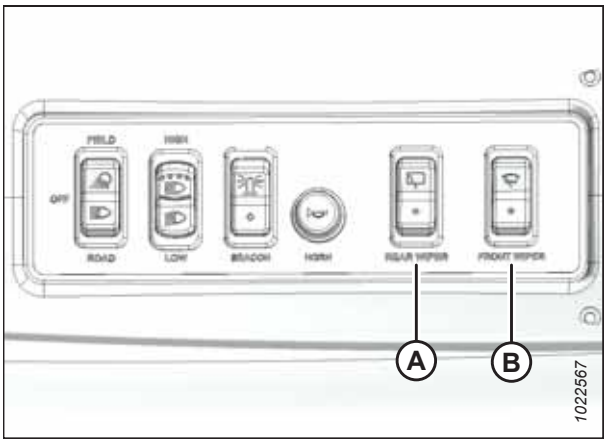


Figure 3.31: Wiper Controls

A - Rear Wiper **B - Front Wiper**

3.8 Rearview Mirrors

The type of rearview mirror available to the Operator depends on whether the windrower is being operated in cab-forward or engine-forward mode.

Two outside-mounted, adjustable mirrors (A) provide a rear view when the windrower is in cab-forward mode.

A single interior-mounted mirror (B) provides a rear view when the windrower is in engine-forward mode.

Mirror/light assembly (A) is designed to fold back if it is struck. A detent-type lock keeps it in place.

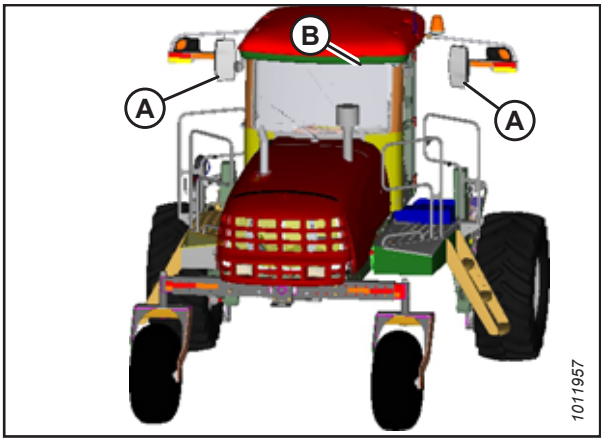


Figure 3.32: Mirrors

3.9 Cab Temperature

The temperature in the windrower cab is regulated by a climate control system which can provide filtered cool or warm air. The heater shut-off valve must be open for the heater to work properly.

The heater/evaporator/blower assembly is located under the cab floor and is accessible from beneath the windrower.

3.9.1 Heater Shut-Off

A coolant shut-off valve near the engine allows the cab heater to be isolated from the engine's cooling system.

Shut-off valve (A) must be OPEN to provide heat to the cab, but can be CLOSED in warm weather so that the cab cooling system can operate at maximum efficiency.

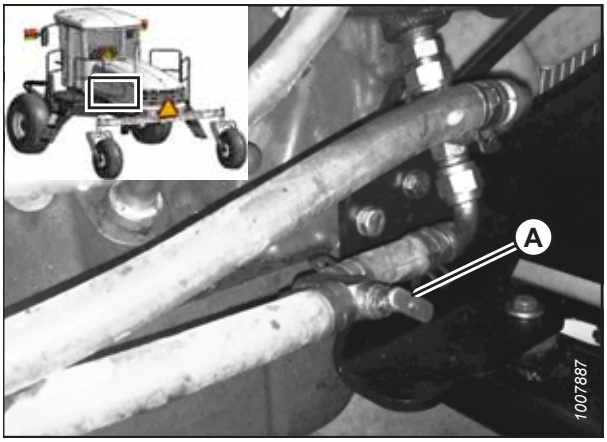


Figure 3.33: Heater Shut-Off Valve

3.9.2 Air Distribution

Air distribution in the cab is controlled through adjustable air vents.

Air vents (A) can be opened or closed, and the direction in which they blow can be changed to suit each Operator.

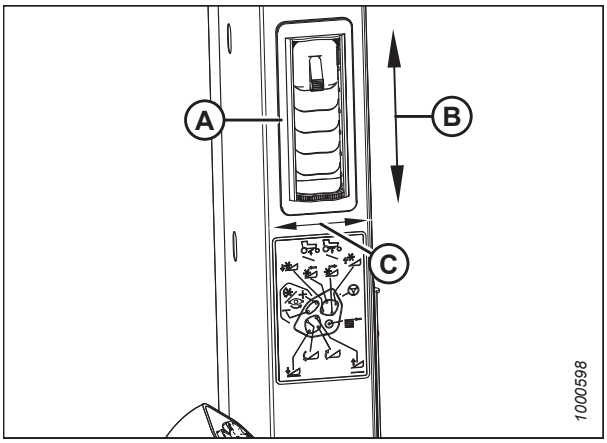


Figure 3.34: Adjustable Air Vents

A - Vent **B - Open/Close** **C - Direction**

3.9.3 Climate Controls

The climate controls in the cab's headliner allow the Operator to control the blower fan speed, to turn the air conditioning (A/C) on and off, to change the air supply source, and to control the temperature of the blown air.

Blower switch (A) – controls the blower fan speed

- OFF / LOW / MEDIUM / HIGH

Air conditioning (A/C) switch (B) – controls the A/C system

- OFF: A/C is not active
- ON: A/C is active when the blower switch is set to a non-OFF setting (that is, low, medium, or high)

Outside air switch (C) – controls the air source for the blower

- FRESH AIR: Starts the booster fan, so that filtered outside air is drawn into the cab
- RECIRCULATE: Stops the booster fan, so that no fresh air is drawn into the cab

Temperature control dial (D) – controls the temperature of the blown air

- Turning the dial clockwise increases the temperature of the blown air
- Turning the dial counterclockwise decreases the temperature of the blown air

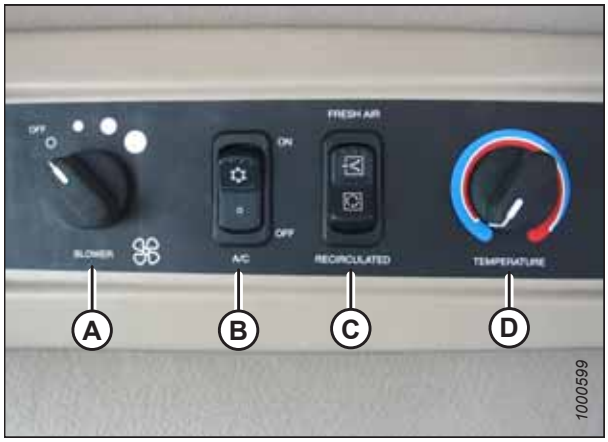


Figure 3.35: Climate Controls

IMPORTANT:

When starting the windrower after it has been stored for a week or more, the refrigerant must be distributed through the A/C system for it to work properly. For instructions, refer to *Cycling Air Conditioning Compressor Coolant, page 169*.

3.10 Interior Lights

Two interior lights are provided in the cab for the convenience of the Operator.

Low intensity LED light (A) is located directly overhead. It functions only when the windrower's key is in the RUN position. An ON/OFF switch is located on the light.

Interior light (B) is located on the headliner switch panel. The light can turned on or off by pressing on the housing. This light can be activated at any time.

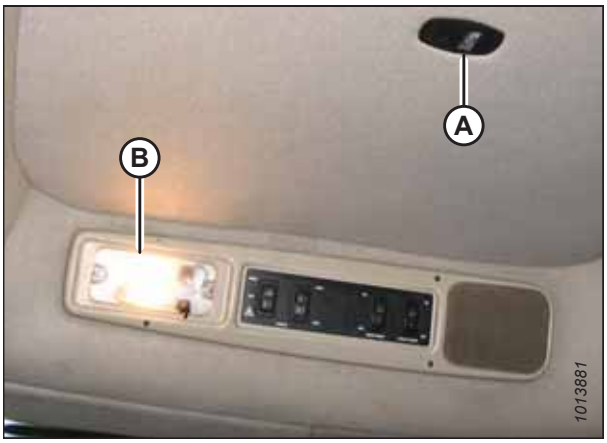


Figure 3.36: Interior Lights

3.11 Emergency Exit

An emergency exit is provided to allow the Operator to exit the windrower in case the door is no longer usable.

The emergency exit window (indicated by emergency exit decal [A]) is located beside the operator's station.

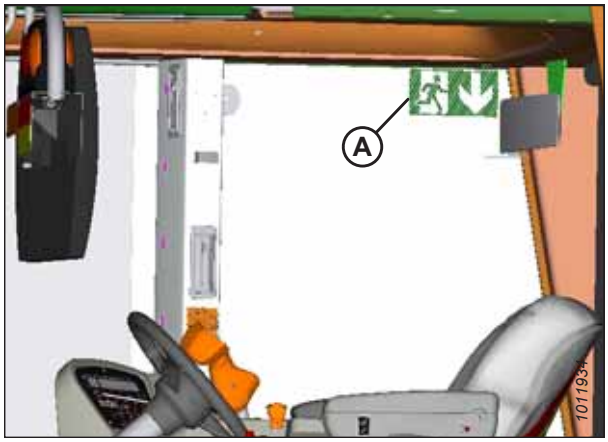


Figure 3.37: Emergency Exit Sign

To open the emergency exit window:

1. Release window latch (A).
2. Remove latch pin (B).
3. Push window (C) open.

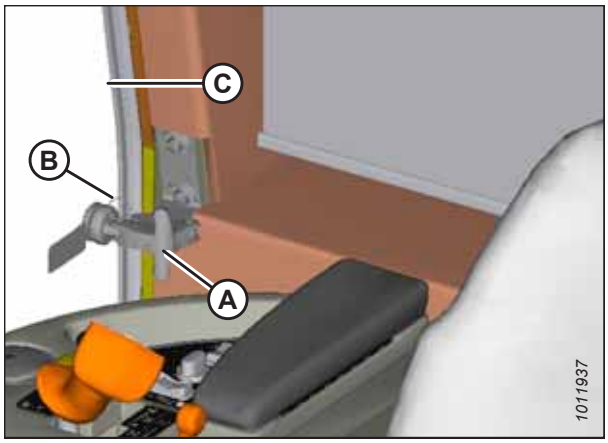


Figure 3.38: Emergency Exit Window

3.12 Operator Amenities

The operator's station includes a number of features which make operating the windrower more convenient, such as an auxiliary power outlet and a cup holder.

Operator's console

A - Auxiliary power outlet
B - Utility tray (under armrest)
C - Cigarette lighter
D - Ashtray/cup holder
E - Utility tray

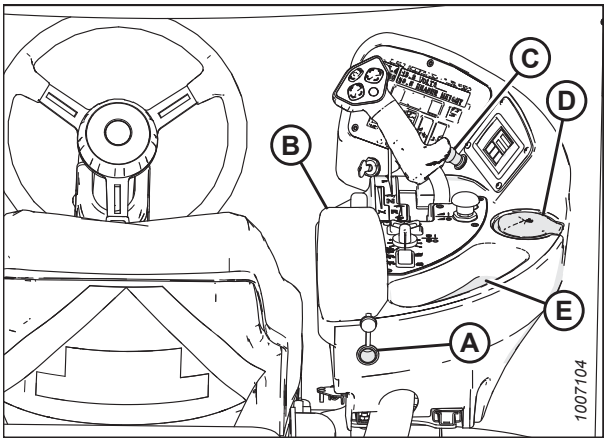


Figure 3.39: Console

Windshield shades (optional)

Retractable window shades (A) can be installed for the front and rear windows. Refer to *6.1.4 Windshield Shades, page 467* for ordering information.

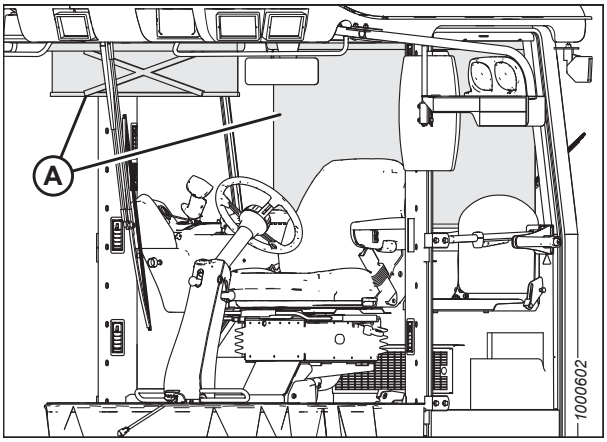


Figure 3.40: Windshield Shades

Auxiliary outlets

Two auxiliary power outlets are located on either side of the wiper motor cover/storage tray behind the Operator (when the operator's station is in cab-forward mode).

A - Auxiliary power outlet
B - Auxiliary power outlet
C - Battery terminal
D - Ground terminal
E - Switched terminal

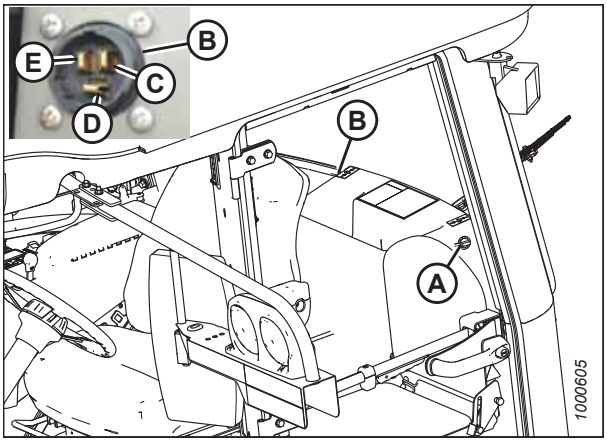


Figure 3.41: Auxiliary Power Outlets

Manual storage

Manual storage case (A) is located under the training seat.

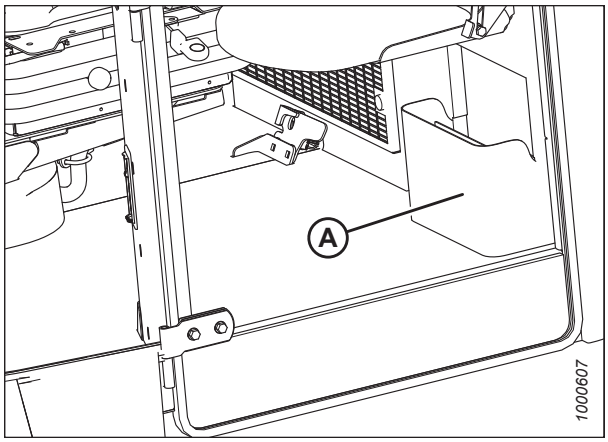


Figure 3.42: Operator's Manual Storage

Coat hook

Coat hook (A) is located above the training seat, left of the Operator.

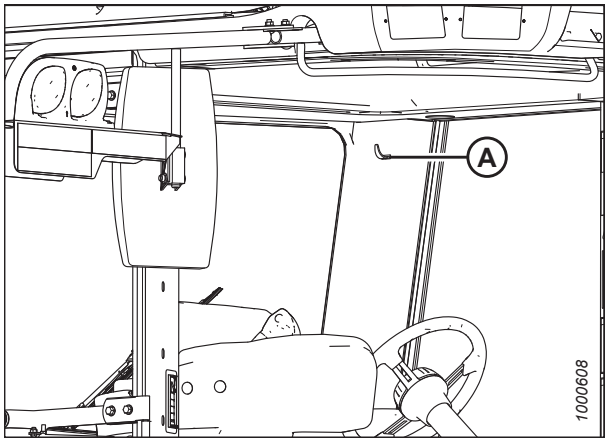


Figure 3.43: Coat Hook

3.13 Radio

A radio is available as optional equipment from your Dealer.

3.13.1 AM/FM Radio

A space is provided in the cab headliner to accommodate the installation of an AM/FM radio. In order to retain the radio settings and the preset memory when the battery disconnect is turned off, a radio which features non-volatile settings memory will need to be installed.

Two pre-wired speakers (A) have been factory-installed in the headliner.

Operating instructions are supplied with the radio.

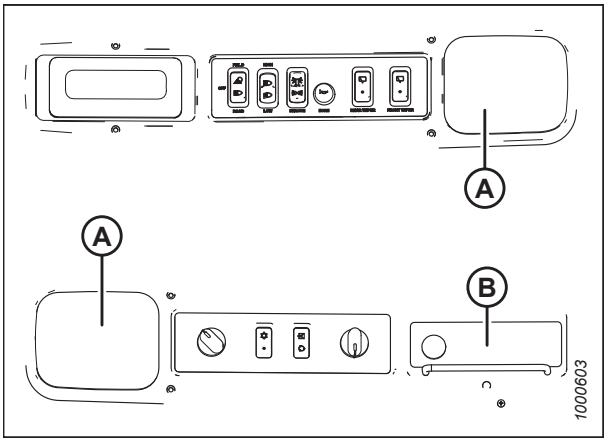


Figure 3.44: Speakers in Headliner

A - Speakers **B - Radio Mounting Location**

3.13.2 Mounting Antenna

An optional base for a magnetic, roof-mounted antenna is available from your Dealer.

IMPORTANT:

The antenna base can be installed only on the left cab-forward and right rear cab roof bolts.

Order the magnetic antenna mount (MD #160288 [B]) from your Dealer. Alternately, refer to *3.47, page 66* for information on making an improvised version. Knockout (C) for the antenna lead is provided on the cab post.

Mounting antenna

1. Remove bolt (A).
2. Position antenna mount (B) as shown. Secure it with bolt (A).

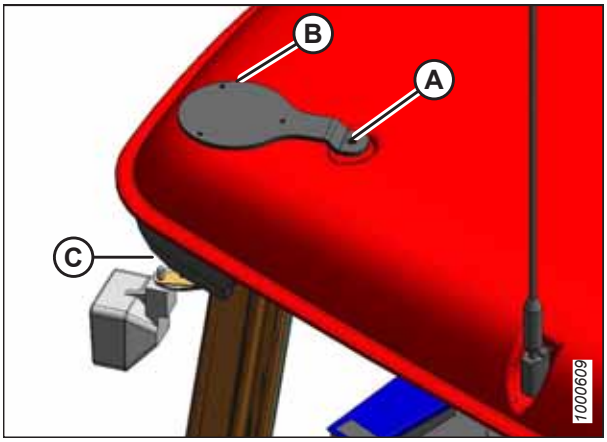


Figure 3.45: Antenna Mount

Knockout (A) is located on the exterior right cab-forward rear corner post of the cab, under the roof, between the horn and the light.

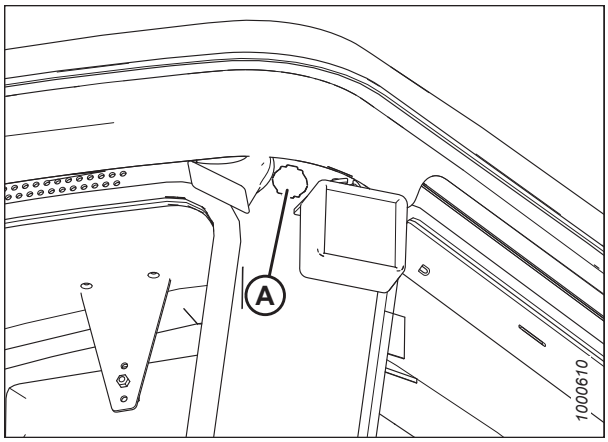


Figure 3.46: Knockout Location in Cab

Custom antenna mount dimensions

To make your own mount, refer to the dimensions template provided. Use 11 gauge or 3.0 mm-thick steel sheeting.

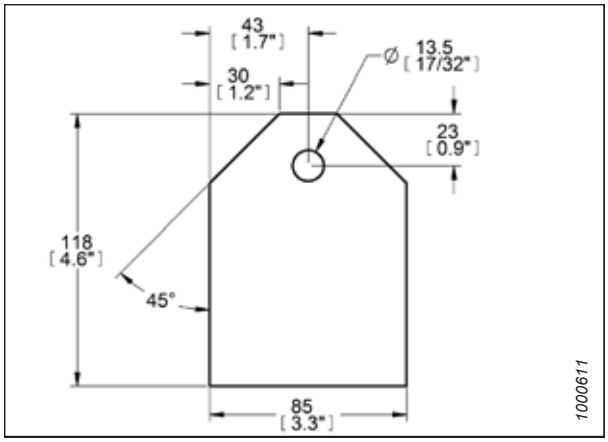


Figure 3.47: Template for Antenna Mount

3.14 Horn

The horn allows the Operator to alert bystanders and other vehicle operators.

The horn is activated by pushing button (A) on the headliner console.

Sound the horn three times prior to starting the engine.

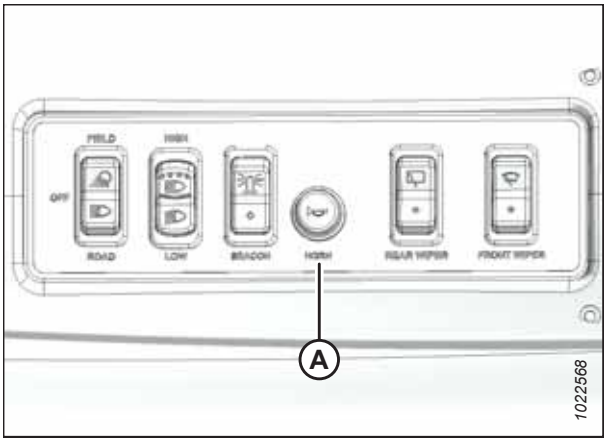


Figure 3.48: Horn Button Location

Horn (A) is located outside the cab on the rear right cab-forward corner of the cab, under the roof.

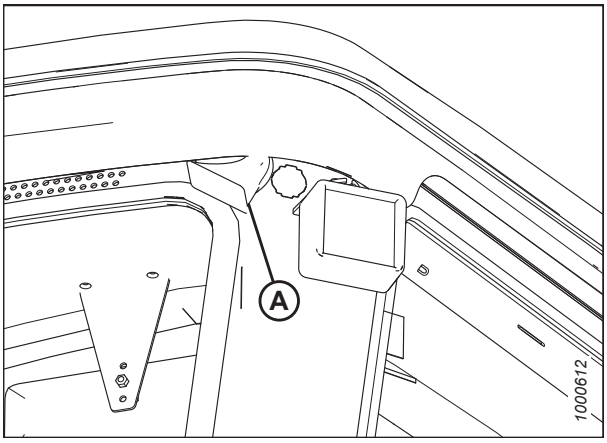


Figure 3.49: Horn Location

3.15 Engine Controls and Display Module

The ignition, fuel and diesel exhaust fluid (DEF) display module, and throttle are located on the operator's console.

IGNITION switch (A)

The features of the windrower that are active depend on the position of the ignition key:

- ACC (accessory): Features such as exterior lighting will be available in this mode. Turn the ignition key fully counterclockwise to activate this mode.
- OFF: One position clockwise of ACC. The engine and all accessories will be off when the key is in this position.
- RUN: The key will remain in this position after the engine has been started.
- START: Turn the ignition key fully clockwise to crank the engine. Once the engine has started, the key will sit in the RUN position.

  NOTE:

  Remove the key when the windrower is not in use; the key also locks the windrower's cab doors.

Fuel and diesel exhaust fluid (DEF) display module (B)

This module provides the following information:

- Diesel fuel level
- DEF level
- High Exhaust System Temperature (HEST) status
- Selective Catalytic Reduction (SCR) system status

Throttle (C) controls the speed of the engine. It has several positions:

- Full: Push the throttle lever fully forward to run the engine at its maximum speed
- Operating: Refer to *Driving Forward in Cab-Forward Mode, page 179* to learn the appropriate engine speed for various tasks.
- Closed: Pull the throttle lever all the way back

Figure 3.50: Engine Controls and DEF Display Module

3.15.1 Fuel and Diesel Exhaust Fluid Display Module

The fuel and diesel exhaust fluid (DEF) levels can be monitored from the display module on the operator's station. The high exhaust system temperature (HEST) indicator and selective catalytic reduction (SCR) controls can also be found here.

Figure 3.51: Fuel and Diesel Exhaust Fluid (DEF) Display Module

A - Fuel and DEF Level
B - High Exhaust System Temperature (HEST)
C - Inhibit Selective Catalytic Reduction (SCR) System Cleaning
D - Force SCR System Cleaning

Fuel and DEF levels

- The gauges will be green when fluid levels are between full and 1/8th full, and red when the levels are between 1/8th full and empty.
- When the levels are in the green range, the switches (icons) will be white. When the levels are in the red range, the switches (icons) will be black and will be backlit with an amber light. The amber lights blink when a fluid level falls below 1/16th of capacity.

IMPORTANT:

If the DEF tank is empty while there is still diesel in the fuel tank, the engine can be run, but the windrower's computer will begin to derate the engine's performance. Eventually, the engine will be limited to idling.

WARNING

Do NOT park the vehicle indoors when the HEST lamp is on.

- When the HEST warning is active, the switch (icon) turns black and a warning lamp is backlit with amber light at location (A)
- The HEST lamp appears when the engine enters an SCR system cleaning. The activation of this process will not hinder normal vehicle operation.
- When the HEST warning is inactive, the switch (icon) is not visible and will appear entirely black (A).

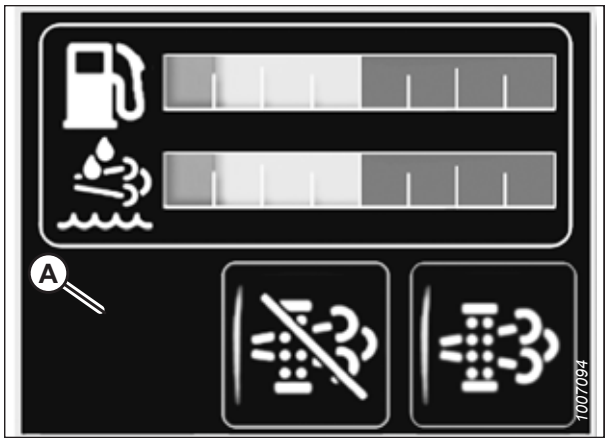


Figure 3.52: Inactive HEST Icon

NOTE:

A forced system cleaning can only be initiated if the Operator is prompted by a flashing icon. A forced system cleaning cannot be initiated at any other time.

Passive and forced SCR cleaning

SCR system cleaning is a high-temperature clean-out cycle designed to keep the after-treatment system free of crystallized DEF particles.

A *passive* system cleaning may be triggered depending on how long and at what speeds the engine has been operating. The cleaning cycle takes approximately 15–30 minutes. When SCR is active, the engine will continue to operate normally. Under certain conditions, a *forced* SCR system cleaning may be needed (for example, if the SCR inhibit switch has been left ON for a long period of time). The windrower's computer will begin to derate the performance of the engine if the Operator continues to operate the machine without performing an SCR system cleaning.

- Switches (icons) (A) and (B) function as both indicator lamps and as switches.
- The switches (icons) turn gray when their respective function is inactive. When their function is active, the switches (icons) turn black and are backlit with an amber light.
- To activate a switch's function, place the ground speed lever (GSL) in N-DETENT, set the throttle to idle, and press and hold the switch for 3 seconds. During the 3-second interval, the fuel icon and gauge will be replaced with the following red text at location (C): HOLD 3 SECONDS, and the red border will turn white. The fuel gauge will then reappear and the white border will begin blinking. The border will revert to solid red when the switch (icon) is released.
- Switch (icon) (A) allows the Operator to inhibit SCR system cleaning. That is, the SCR cycle will never begin until the inhibition state is deactivated.
- Switch (icon) (B) will force the SCR system cleaning cycle to begin.

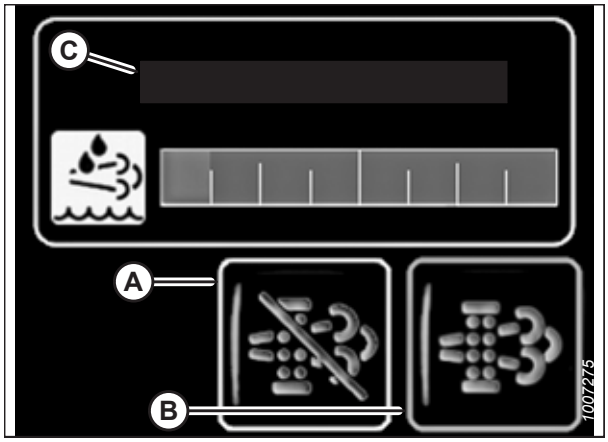


Figure 3.53: SCR System Cleaning Icons

IMPORTANT:

- SCR System Cleaning inhibit (A) should be used only when in an environment where allowing the SCR cycle to run could produce dangerously hot exhaust gases, such as when the windrower is inside a building.
- SCR System Cleaning Forced (B) will rarely require activation by the Operator. If a forced cleaning is deemed to be necessary, the switch (icon) will flash amber. If the SCR System Cleaning Forced switch (icon) begins to flash, park the windrower outside in an area in which high-temperature exhaust gases can be safely discharged.

Tools Menu

The fuel and diesel exhaust fluid (DEF) display module's language and brightness settings can be changed in the Tools menu.

To display the tools and brightness symbols, press and hold fuel gauge display (A) for two seconds.

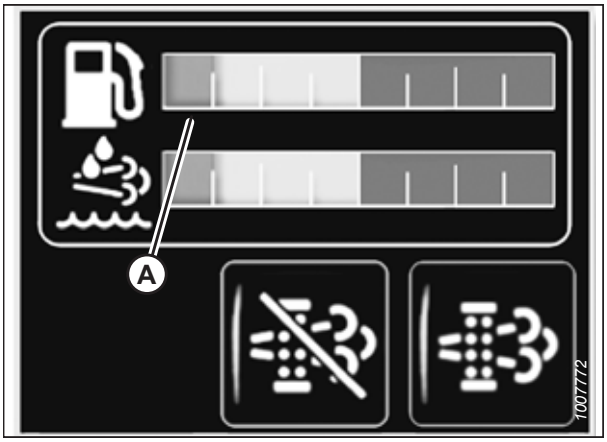


Figure 3.54: Fuel and Diesel Exhaust Fluid (DEF) Display Module

The fuel gauge display will be replaced by a screen displaying tools icon (A) and brightness icon (B).

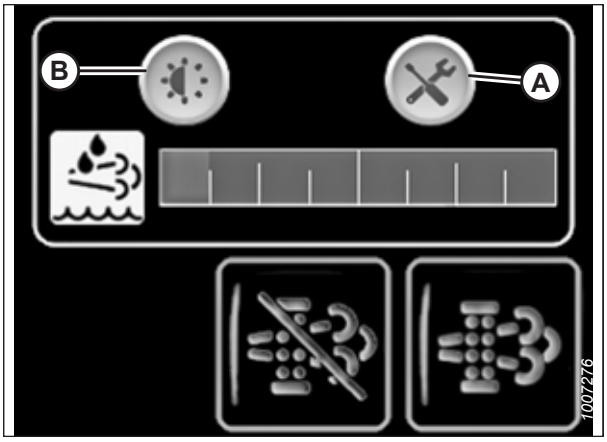


Figure 3.55: Tools and Brightness Symbols on Display

Press the brightness symbol, and backlighting control function (A) will appear.

The display will revert to the fuel gauge display if the backlighting control function is not pressed for five seconds or if the DEF gauge display is pressed.

Press (–) to decrease the degree of backlighting and (+) to increase the degree of backlighting.

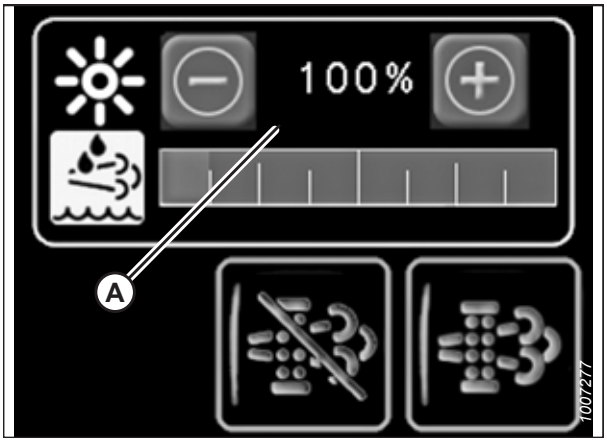


Figure 3.56: Backlighting Control Display

Press the tools symbol to display languages menu (A).

The active language will be indicated by white square (B) around the flag symbol and text corresponding to flag (C). Software version (D) is at the bottom of the languages menu screen.

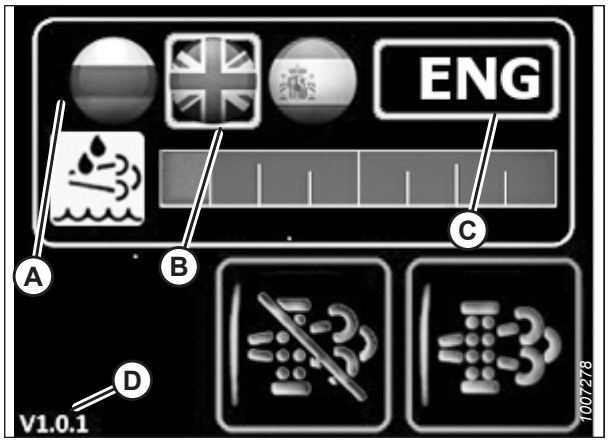


Figure 3.57: Language Display

NOTE:

The languages available are: Russian (A), English (B), and Spanish (C).

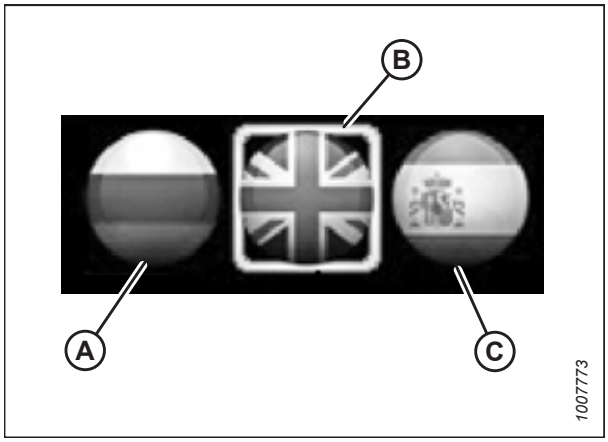


Figure 3.58: Language Icons on Display

Audible Alarm

An audible alarm from the fuel and diesel exhaust fluid (DEF) display module indicates a problem with the fuel system which requires the Operator's attention.

Alarm Tone	Condition	Duration
Ongoing intermittent moderate tone	When the DEF or the fuel level amber light first starts to blink (the fuel or DEF level is at 1/16th tank or lower)	5 seconds
	When the selective catalytic reduction (SCR) system cleaning system is inhibited and the windrower's computer is calling for a passive SCR system cleaning	5 seconds; repeats every 30 minutes
Single moderate tone	At the end of the delay when a switch (icon) is activated	—
	At the end of the delay for entering the brightness/tools menu	—

3.16 Windrower Controls

The windrower controls on the operator's console allow the Operator to control the speed and direction of the windrower, as well as the turn signals and hazard lights.

Console controls

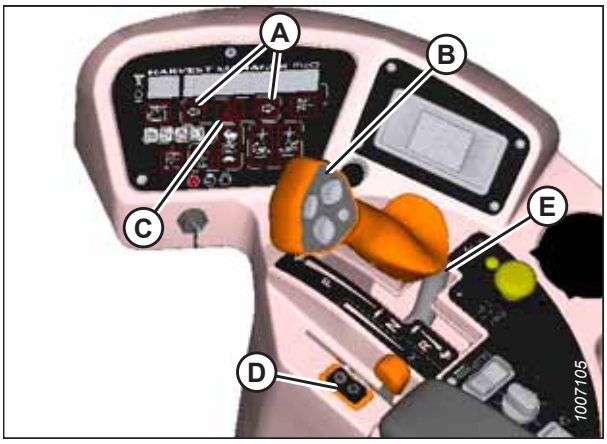


Figure 3.59: Console Controls

Turn signals (A): the turn signal switches activate the turning indicator lights on the windrower and the header. Each switch can be pushed to activate it, and pushed again to deactivate it.

Ground speed lever (GSL) (B): the GSL controls the windrower's speed and whether the windrower is moving forward or in reverse. The positions on the GSL lever are:

- F: Forward
- N: Neutral
- N-detent: Engages the neutral interlock and applies the parking brake when the steering wheel is center-locked
- R: Reverse

Hazard warning lights (C): this switch allows the Operator to activate all of the hazard warning lights on the windrower and the header. It can be pushed to activate the hazard lights, and pushed again to deactivate them.

GROUND SPEED RANGE switch (D): this switch allows the Operator to change the transmission's speed range. The ranges which can be set are:

- High range: 0–37 km/h (23 mph) (ENGINE-FORWARD MODE ONLY)
- Mid range: 0–25.7 km/h (16 mph) (CAB-FORWARD MODE ONLY)
- Low range: 0–17.7 km/h (11 mph)

N-detent (E): When the GSL is in this position, the neutral interlock is engaged, and when the steering wheel is centered and locked, the parking brake will be applied

Autosteer control

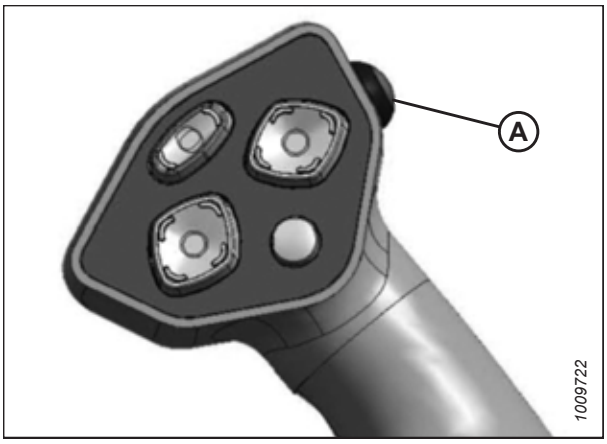


Figure 3.60: GSL

Autosteer engagement switch (A): This switch engages or disengages the automated steering system (if a compatible system is installed on the windrower). Press the switch to engage the autosteer system, and press it again or turn the steering wheel to disengage the autosteer system.

The autosteer engagement switch harness has two connectors:

GSL SW1 (A) is located in the cab, beneath the floor mat at the engine-end seat position switch.

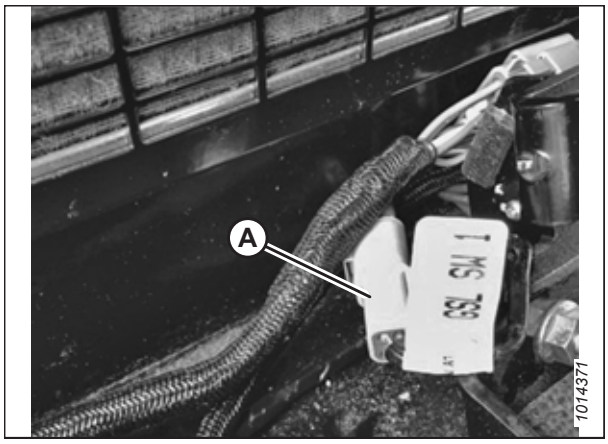


Figure 3.61: Autosteer Harness SW1

GSL SW2 (A) is located beneath the cab, between the fuel tank and the evaporator box.

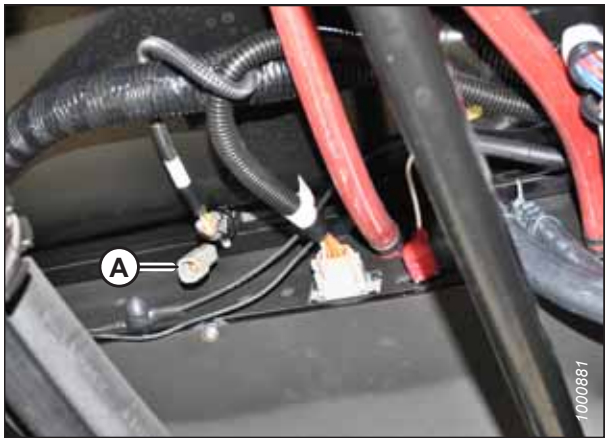


Figure 3.62: Autosteer Harness SW2

3.17 Header Controls

The Operator can control the header attached to the windrower by using the operator's console and the switches on the ground speed lever (GSL) handle.

NOTE:

Some features are only available when certain optional equipment is installed. Some controls may be installed but will be nonfunctional for certain header models.

Refer to *4 Operation, page 163* for instructions on operating specific header models.

3.17.1 Header Drive Switch

The header drive switch engages and disengages the header drive.

To engage the header drive, pull up on collar (B) and push down on switch (A).

To disengage the header drive, push the switch down.

IMPORTANT:

Always move the throttle lever back to the IDLE position before engaging the header drive. Do **NOT** engage the header when the engine is operating at any speed above idle.

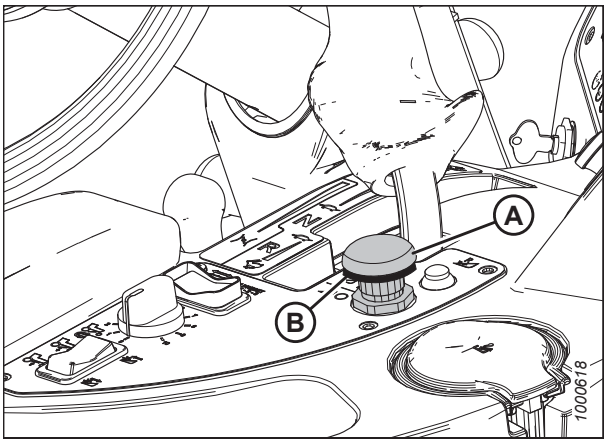


Figure 3.63: Header Drive Switch

3.17.2 Header Drive Reverse Button

The header drive reverse button allows the Operator to run the header in reverse. Typically, this is done to clear obstructions which prevent the header from operating properly.

NOTE:

Reversing an auger header or a draper header equipped with a conditioner requires the installation of a hydraulic reversing kit on the windrower. Rotary disc headers are factory-equipped with the ability to reverse. Contact your MacDon Dealer for more information.

- To engage the header and run it in reverse, push and hold REVERSER button (B), and engage the header by pushing switch (A).
- To disengage the header: Release REVERSER button (B)

  NOTE:

  To engage the header so that it runs in the forward direction, push switch (A) down and then up again.

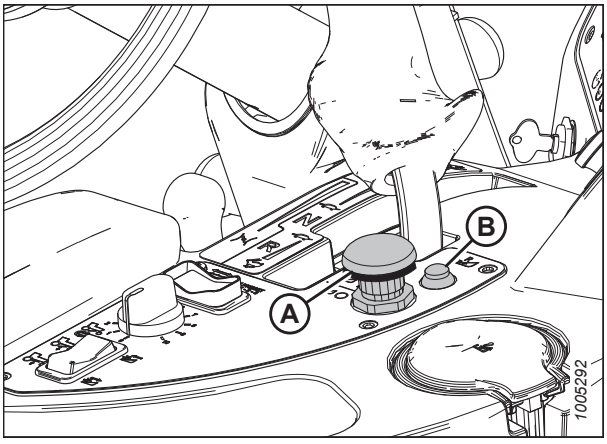


Figure 3.64: Header Drive Switches

3.17.3 Ground Speed Lever Header Switches

Header functions such as the display selection, reel position, header height, and the speed of the reel or discs can be controlled from the switches on the ground speed lever (GSL).

The switches on GSL (A) control the most common header functions.

NOTE:

Decal (B) identifies the functions of the switches on the GSL. Decal (B) can be found on the cab post above the operator's console.

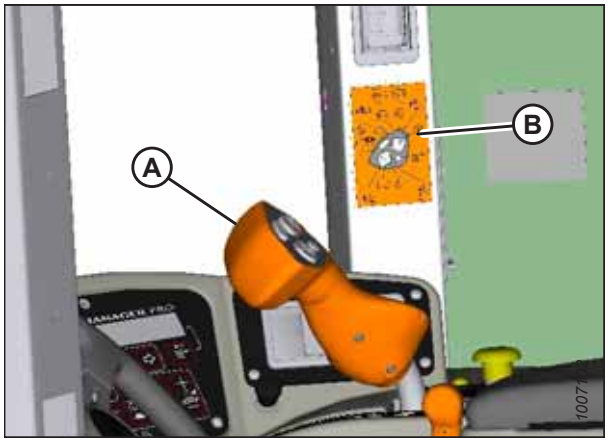


Figure 3.65: Decal on Cab Post

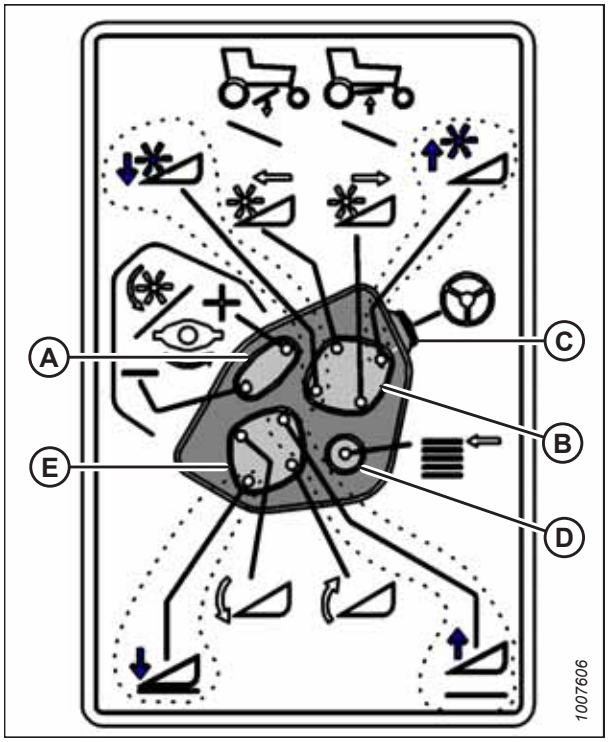


Figure 3.66: GSL Function Groups

A - Reel Speed
B - Reel Position
C - Autosteer Engagement
D - Display Selector
E - Header Position

Display Selector Switch

The display selector switch allows the Operator to choose what information is displayed on the cab display module's (CDM) top line read-out.

Press switch (A) to scroll through the settings.

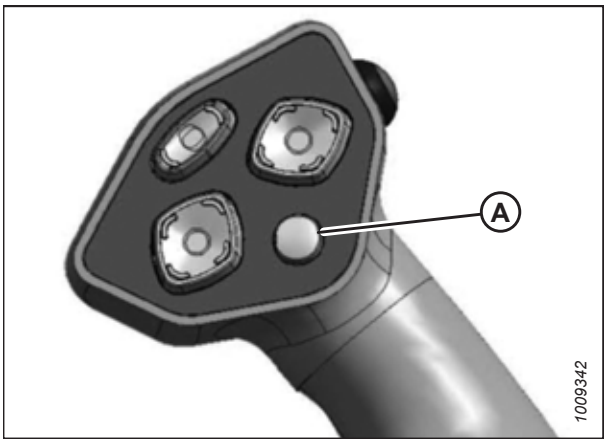


Figure 3.67: Ground Speed Lever

Reel Position Switches

The reel position switches perform different functions depending on how the cab display module (CDM) is programmed, and on what type of header is attached to the windrower.

- The reel position switch is used to control the position of the Double Windrow Attachment (DWA) when this is attached to the windrower. For more information. refer to *4.4.7 Double Windrow Attachment, page 222*
- The reel position switch is used to control the reel fore-aft and height positions when a draper header is attached to the windrower. For more information, refer to *4.6.3 Adjusting Reel Fore-Aft Position, page 293*
- The reel position switch can also be used to control the center-link cylinder, if the relevant kit is installed on the windrower. For more information, refer to *4.5.2 Attaching D or D1 Series Draper Header, page 227* or *4.5.4 Attaching A Series Auger Header, page 242*.

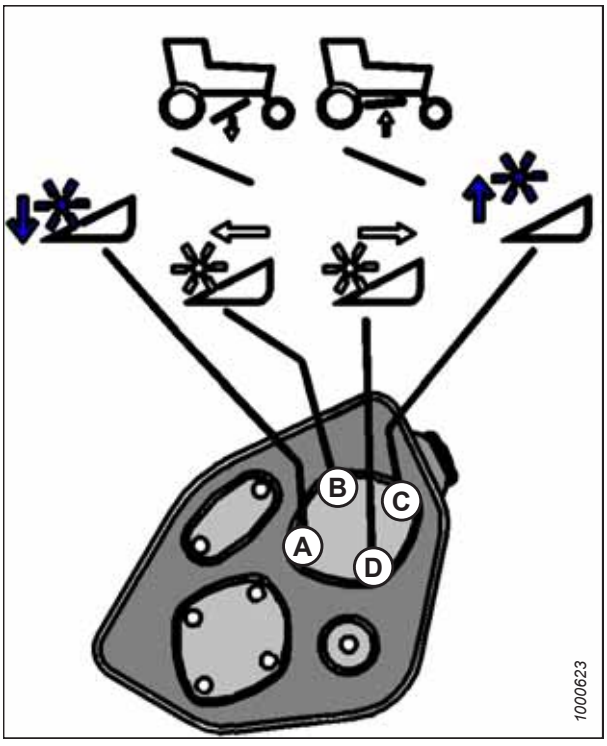


Figure 3.68: Ground Speed Lever

A - Reel Down
B - Reel Forward
C - Reel Up
D - Reel Aft

Header Position Switches

The header position switches on the ground speed lever (GSL) are used to adjust the height and angle of the header.

- To lower the header, press switch (A)
- To tilt the header down, press switch (B)
- To raise the header, press switch (C)
- To tilt the header up, press switch (D)

Release the switch when the header is at the desired position.

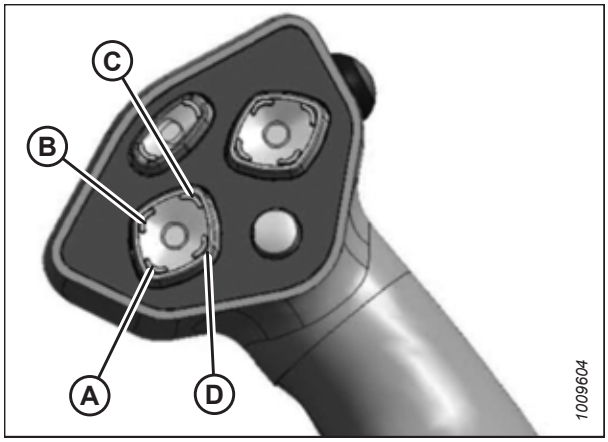


Figure 3.69: Ground Speed Lever

Reel and Disc Speed Switches

The reel speed switches are used to control the speed of the reel when a draper header is attached to the windrower. When other types of headers are attached to the windrower, the reel speed switches control different header functions.

Press and hold switch (A) to increase the reel or the disc speed. Press and hold switch (B) to decrease the reel or the disc speed. Release the switch when the feature is operating at the desired speed.

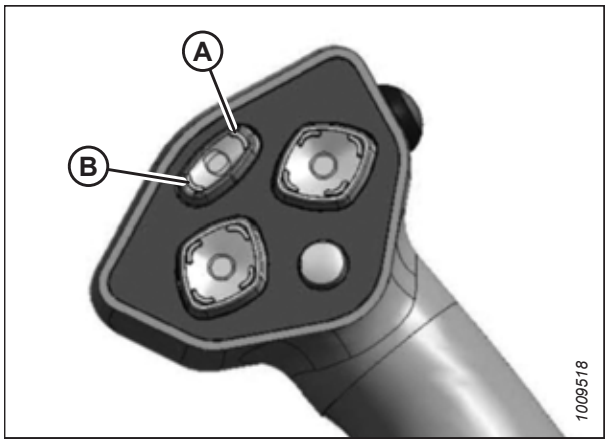


Figure 3.70: Ground Speed Lever

Reel speed switch functions by header type

Auger headers

- A30D Auger Header: the reel speed switches are not applicable in this application
- A40D Auger Header: the speed of the auger changes automatically when the speed of the reel is changed

  IMPORTANT:

  The reel speed on an auger header **MUST NOT EXCEED** 85 rpm. The auger speed **MUST NOT EXCEED** 320 rpm.

Draper headers

- The speed of the reel is controlled by the header index speed setting

Rotary disc headers

- The speed of the conditioner is automatically adjusted when the disc speed is changed

3.17.4 Console Header Switches

The operator's console allows the Operator to control the deck shift and float functions of the header. It is also used to control the Double Windrow Attachment (DWA) and the swath compressor, if these options have been installed on the windrower.

Deck Shift / Float Preset Switch

Depending on the particular configuration of your windrower, this part of the operator's console controls either the deck shift and float presets, or controls the float presets alone.

Draper header with the deck shift option installed

When a draper header with the deck shift option installed is attached to the windrower, this switch controls the deck shift and float settings for double windrowing options with a draper header.

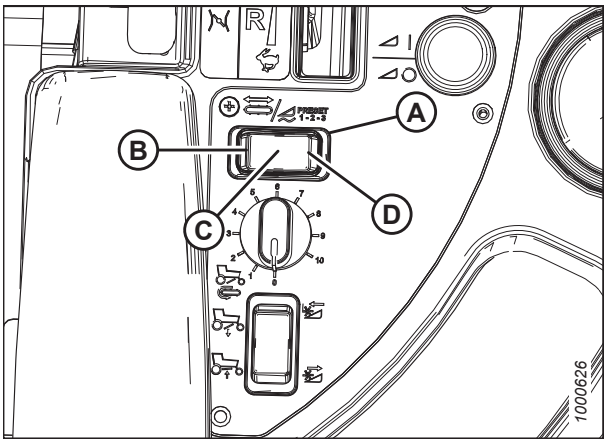


Figure 3.71: Header Switches

A - Deck Shift / Float Preset Switch
B - Left-Side Delivery
C - Center Delivery
D - Right-Side Delivery

Draper header with fixed decks / auger header / rotary disc header

When a fixed-deck draper header, auger header, or rotary disc header is attached to the windrower, this switch is used to select one of the preprogrammed header float settings. Refer to *Float Options, page 207* to learn how to configure these presets.

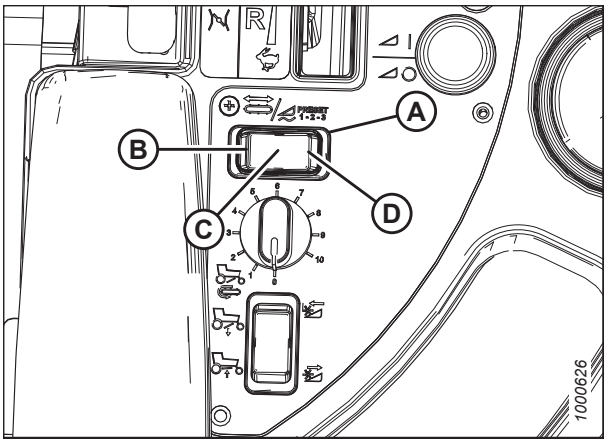


Figure 3.72: Header Switches

A - Deck Shift / Float Preset Switch
B - Float Preset 1
C - Float Preset 2
D - Float Preset 3

Double Windrow Attachment / Swath Compressor Switch – Option

The Double Windrow Attachment (DWA)/swath compressor switch can be used to control the position of the DWA or the swath compressor, depending on which option is installed on the windrower. These functions must be programmed into the cab display module (CDM) before the switch can be used.

If the windrower is equipped with a DWA:

- The DWA deck is raised when switch (A) is in position (C)
- The DWA deck is lowered when switch (A) is in position (B)

The CDM must be programmed for this configuration. For instructions, refer to *Configuring Double Windrow Attachment Controls, page 109*.

Switch (A) may be used instead of the DWA switches on the ground speed lever (GSL). If using switch (A) is not desired, the controls can be swapped to the reel fore/aft buttons on the GSL.

Rotary switch (D) on the operator's console controls the speed of the DWA.

For more information on using the DWA attachment and its controls, refer to *4.4.7 Double Windrow Attachment, page 222*.

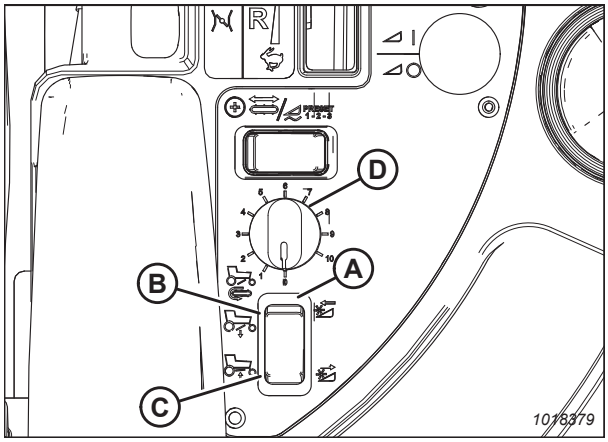


Figure 3.73: Console Switches

If the windrower is equipped with a swath compressor attachment:

- The swath compressor is raised by pressing switch (A) to position (C)
- The swath compressor is lowered by pressing switch (A) to position (B)

NOTE:

When using the DWA, the Operator can choose to use either the rocker switch on the operator's console or the switches on the GSL handle. This option can be set in the CDM. For more information, refer to *3.18.6 Cab Display Module – Configuration Functions, page 95*.

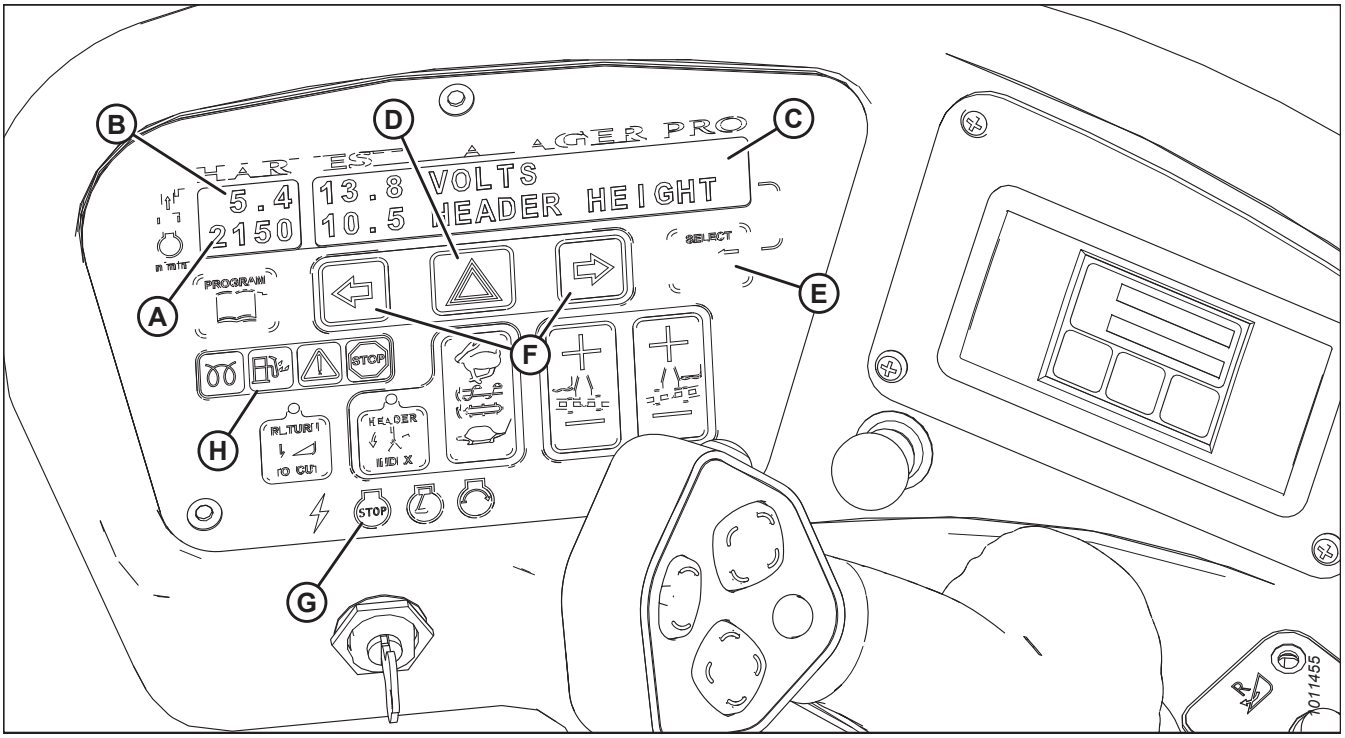
3.18 Cab Display Module

The cab display module (CDM) is a computer located on the windrower operator's console. It is used to configure and operate the windrower and its attachments. It also supplies the Operator with information about the windrower's performance and alerts them to any problems encountered during operation.

3.18.1 Engine and Windrower Functions

The cab display module (CDM) is used to control and report on several windrower functions, such as whether or not the hazard lights are on, and to report engine performance data such as engine speed to the Operator.

Figure 3.74: Cab Display Module (CDM) Engine and Windrower Functions

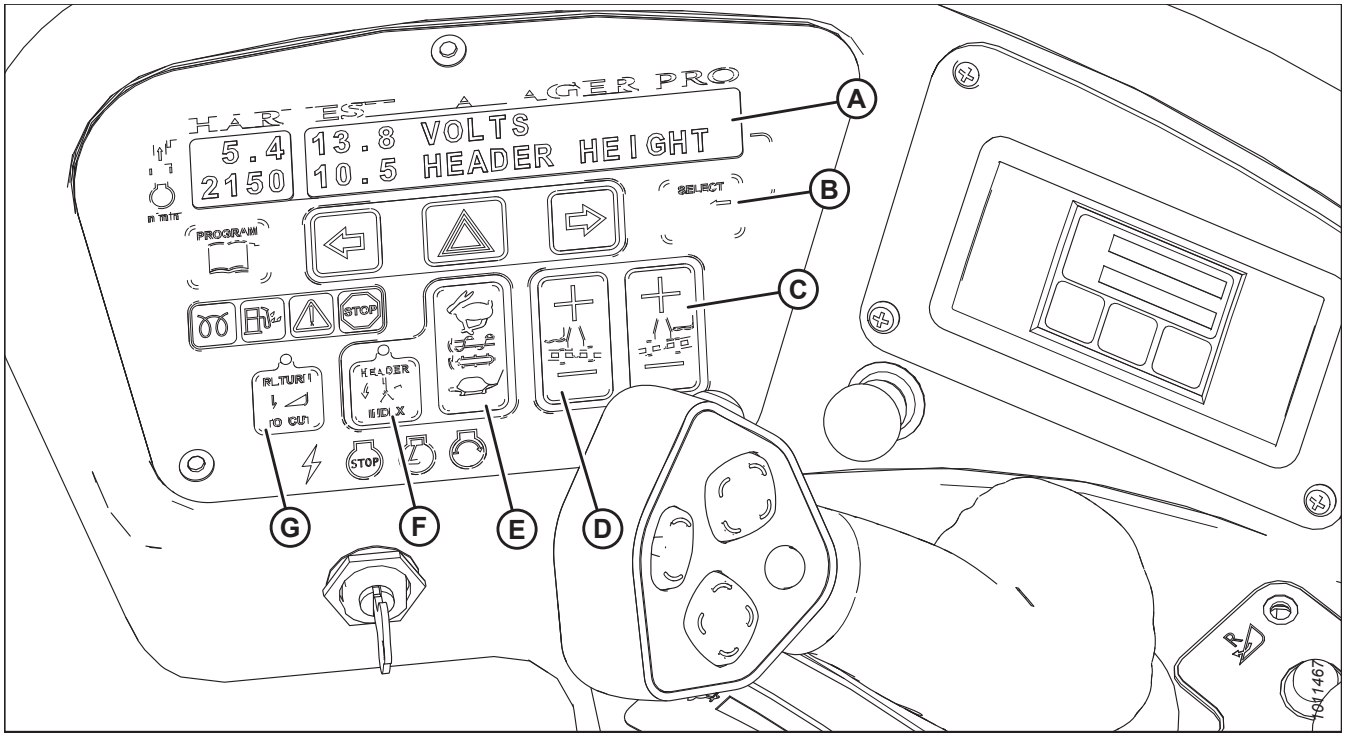


- ENGINE RPM (A)
- GROUND SPEED (B) – km/h or mph
- DISPLAY (C) – Reports windrower performance data
- HAZARD LIGHTS SWITCH (D) – Activates the hazard warning lights; can also be used to cancel an active turn signal
- SELECT SWITCH (E) – Allows the Operator to select a display item on the lower line. Push the switch to SELECT a highlighted option
- TURN SIGNAL SWITCHES (F) – Activates the turn signals on the windrower and on the header. Push the switch to turn the turn signal ON, and push it again to turn it OFF
- IGNITION SWITCH POSITIONS (G) – Depending on the position of the ignition key in the ignition cylinder, the relevant icon will be highlighted: Accessory / Stop / Run / Start
- ENGINE WARNING LIGHTS (H) – These lights report on the state of the engine, or offer warnings about its performance: Engine Pre-Heat / Water In Fuel / CAUTION / Stop Engine

3.18.2 Header Functions

Several header functions such as the header float and the speed of the auger or draper (depending on the type of header attached to the windrower) are controlled from the cab display module (CDM).

Figure 3.75: Cab Display Module (CDM)



- DISPLAY (A) – Reports header performance information.
- SELECT SWITCH (B) – Allows the Operator to select a display item on the lower line. Push the switch to select a highlighted option.
- FLOAT SWITCH (C) – Header right side: changes the header's right float setting. If the deck shift option is installed on the attached header, individual float settings can be configured for each deck shift delivery position. Push + to increase the float ; push – to decrease it.
- FLOAT SWITCH (D) – Header left side: changes the header's left float setting. If the deck shift option is installed on the attached header, individual float settings can be configured for each deck shift delivery position. Push + to increase the float; push – to decrease it.

  NOTE:

  Refer to *Setting Float Options with Deck Shift, page 304* for more information on configuring the deck shift float presets.

- AUGER/DRAPER SPEED ADJUST (E): changes the auger or draper speed index when index switch (F) is set to ON. When index switch (F) is set to OFF, this switch is used to change the auger or draper speed. Push the upper switch to increase this setting; push the lower switch to decrease it.
- HEADER INDEX SWITCH (F): this switch is used to link the speed of the reel and the conveyor to the windrower's ground speed ("speed indexing"). Push the switch to turn speed indexing on; push it again to turn speed indexing off.

  NOTE:

  Header index switch (F) will light up when speed indexing is enabled.

- RETURN-TO-CUT HEIGHT SWITCH (G): this switch allows the Operator to make use of the cutting height preset. Push the switch to enable this feature; push it again to disable it.

  NOTE:

  Return-to-cut height switch (G) will light up when this feature is enabled.

3.18.3 Operating Screens

The display screen on the cab display module (CDM) reports performance information about the windrower and its attached header. Information on the meaning of the messages seen on the upper and lower lines of the display is provided. The message categories in this section are organized according to the state of the windrower (for example, whether or not the engine is running) and the state of the header (for example, whether or not the header is engaged).

Figure 3.76: CDM Operating Screen

A - Display Selector for Upper Line
B - Display
C - CDM Upper Line
D - CDM Lower Line
E - Display Selector for Lower Line

Ignition ON, Engine Not Running

These are the messages which can appear in the cab display module (CDM) when the ignition key is in the RUN position, but the engine has not been started.

Display (Upper Line) (2–3 Seconds)	Description
HEADER DISENGAGED	Indicates that the HEADER DRIVE switch is OFF
IN PARK	Indicates that the ground speed lever (GSL) is in the N-DETENT position

Engine-Forward, Engine Running

These are the messages which can appear in the cab display module (CDM) when the windrower is in engine-forward mode and the engine is running.

Display	Description
ROAD GEAR (upper line)	Indicates that the windrower's transmission is in the HIGH range
#####.# ENGINE HRS (upper or lower line)	Displays the total engine operating time
#####.# UNIT HRS (upper or lower line)	Displays the total windrower operating time
#####.# HEADER HRS (upper or lower line)	Displays the total header operating time
###### TOTAL ACRES (upper or lower line) ###### TOTAL HECT (if metric)	Displays the total area cut by the machine
##.# HEADER HEIGHT (upper or lower line)	Displays the distance setting (00.0–10.0) between the cutterbar and the ground
##.# HEADER ANGLE (upper or lower line)	Displays the angle setting (00.0–10.0) of the header relative to the ground
### °C or F HYD OIL TEMP	Displays the temperature of the windrower's hydraulic oil
##.# VOLTS (upper or lower line)	Displays the engine electrical system's operating voltage
##.# SWATH COMPR HT	Displays the height setting of the swath compressor (00.0–10.0); fully raised is 0
SCROLL (lower line)	Causes the performance messages to display one after the other for two to three seconds at a time; press SELECT to cancel scroll mode

Cab-Forward, Engine Running, Header Disengaged

These are the messages which can appear in the cab display module (CDM) when the windrower is in cab-forward mod, the engine is running, and the header is disengaged.

Display (Lower or Upper Line)	Description
#####.# ENGINE HRS	Displays the total engine operating time
#####.# UNIT HRS	Displays the windrower's total operating time
#####.# HEADER HRS	Displays the header's total operating time
###.# SUB ACRES ###.# SUB HECTARES (if metric)	Displays the total area cut since the last reset was performed. To reset this value: set the CDM to display SUB ACRES on the lower line, then hold down the PROGRAM switch for five to seven seconds until the display resets
###### TOTAL ACRES ###### TOTAL HECT (if metric)	Displays the total area cut by the machine
##.# HEADER HEIGHT	Displays the distance setting (00.0–10.0) between the cutterbar and the ground
##.# HEADER ANGLE	Displays the angle setting (00.0–10.0) of the header relative to the ground.
##.# L FLOAT R ##.#	Displays the float setting (0.0–10.0)
### °C or F HYD OIL TEMP	Displays the temperature of the hydraulic oil
##.# VOLTS	Displays the engine electrical system's operating voltage
##.# SWATH COMPR HT	Displays the height of the swath compressor (00.0–10.0); fully raised is 0
SCROLL (lower line)	Causes the performance messages to display one after the other for two to three seconds at a time; press SELECT to cancel scroll mode

Cab-Forward, Engine Running, Header Engaged, Auger Header Attached, Index Switch OFF

These are the messages which can appear in the cab display module (CDM) when the windrower is in cab-forward mode, the engine is running, the attached auger header is engaged, and the header index switch is set to the OFF state.

Display (Lower or Upper Line)	Description
#####.# ENGINE HRS	Displays the total engine operating time
#####.# UNIT HRS	Displays the windrower's total operating time
#####.# HEADER HRS	Displays the header's total operating time
##.# ACRES/HOUR ##.# HECTARES/HOUR (if Metric)	Displays the actual cutting rate in acres or hectares per hour
###.# SUB ACRES ###.# SUB HECTARES (if Metric)	Displays the total area cut since the last reset was performed. To reset this value: set the CDM to display SUB ACRES on the lower line, then hold down the PROGRAM switch for five to seven seconds until the display resets
###### TOTAL ACRES ###### TOTAL HECT (if Metric)	Displays the total area cut by the machine
##.## REEL RPM ##.## REEL SENSOR	Displays the reel's rotational speed in rpm This message appears if the reel speed sensor is disabled. The messages RPM and SENSOR appear alternately at one-second intervals
##.# AUGER SPEED	Displays the auger's rotational speed (4.7–9.9)
#### KNIFE SPEED #### KNIFE SENSOR	Displays the knife speed in strokes per minute This message appears if the knife speed sensor is disabled. The messages SPEED and SENSOR appear alternately at one-second intervals
##.# HEADER HEIGHT ##.# HEADER SENSOR	Displays the distance setting (00.0–10.0) between the cutterbar and the ground This message appears if the header height sensor is disabled. The messages HEIGHT and SENSOR appear alternately at one-second intervals
##.# HEADER ANGLE ##.# HEADER SENSOR	Displays the angle setting (00.0–10.0) of the header relative to the ground This message appears if the header angle sensor is disabled. The messages ANGLE and SENSOR appear alternately at one-second intervals
##.# L FLOAT R ##.# FLOAT SENS DISABLED	Displays the left and right float settings (0.0–10.0) This message appears if the float sensor is disabled
LOAD|■■■■| | ####	This bar graph represents the hydraulic operating pressure of the circuit in which the hydraulic pressure sensor is installed. The bars will appear to be full if the preprogrammed overload pressure (17,237–34,474 kPa [2500–5000 psi]). is reached. If the hydraulic pressure sensor is disabled, this message will not appear[5]
### °C or F HYD OIL TEMP ### °C or F HYD TEMP	Displays the temperature of the hydraulic oil This message appears if the temperature sensor is disabled. The messages TEMP and SENSOR appear alternately at one-second intervals
##.# VOLTS	Displays the engine electrical system's operating voltage

5. A sensor which can monitor the knife/conditioner circuit pressure can be installed as an optional kit. To monitor the hydraulic pressure of the reel/auger circuit, relocate the sensor per kit instruction MD #169031; this instruction is available from your MacDon Dealer.

Display (Lower or Upper Line)	Description
##.# SWATH COMPR HT SWATH CO SENSOR	Displays the swath compressor's height setting(00.0–10.0); fully raised is 0 This message appears if the swath compressor height sensor is disabled
SCROLL SUB-MENU (lower line only) #### KNIFE SPEED ##.# HEADER HEIGHT LOAD|■■■■|■■■■| ####	Displays the sub-menu after two to three seconds. Press SELECT to exit the sub-menu. Use the CDM switch to scroll through the sub-menu options

Cab-Forward, Engine Running, Header Engaged, Auger Header Attached, Index Switch ON

These are the messages which can appear in the cab display module (CDM) when the windrower is in cab-forward mode, the engine is running, the attached auger header is engaged, and the header index switch is set to the ON state.

Display (Lower or Upper Line)	Description
#####.# ENGINE HRS	Displays the total engine operating time
#####.# UNIT HRS	Displays the windrower's total operating time
#####.# HEADER HRS	Displays the header's total operating time
##.# ACRES/HOUR ##.# HECTARES/HOUR (if metric)	Displays the actual cutting rate in acres or hectares per hour
###.# SUB ACRES ###.# SUB HECTARES (if metric)	Displays the total area cut since the last reset was performed. To reset this value: set the CDM to display SUB ACRES on the lower line, then hold down the PROGRAM switch for five to seven seconds until the display resets
###### TOTAL ACRES ###### TOTAL HECT (if metric)	Displays the total area cut by the machine
##.## ##.# REEL IND. ##.## REEL SENSOR	Displays the reel's indexed speed in rpm and the windrower's ground speed in mph or km/h This message appears if the reel sensor is disabled. The messages IND and SENSOR appear alternately at one-second intervals
##.# AUGER SPEED ##.# AUGER SENSOR	Displays the auger's rotational speed (4.7–9.9) This message appears if the auger speed sensor is disabled. The messages SPEED and SENSOR appear alternately at one-second intervals
#### KNIFE SPEED #### KNIFE SENSOR	Displays the knife speed in strokes per minute This message appears if the knife speed sensor is disabled. The messages SPEED and SENSOR appear alternately at one-second intervals
##.# HEADER HEIGHT ##.# HEADER SENSOR	Displays the distance setting (00.0–10.0) between the cutterbar and the ground This message appears if the header height sensor is disabled. The messages HEIGHT and SENSOR appear alternately at one-second intervals
##.# HEADER ANGLE ##.# TILT SENSOR	Displays the angle setting (00.0–10.0) of the header relative to the ground This message appears if the header angle sensor is disabled. The messages TILT and SENSOR appear alternately at one-second intervals
##.# L FLOAT R ##.# FLOAT SENS DISABLED	Displays the left and right float settings (0.0–10.0) This message appears if the float sensor is disabled

Display (Lower or Upper Line)	Description
LOAD|■■■■| | ####	This bar graph represents the hydraulic operating pressure of the circuit in which the hydraulic pressure sensor is installed. The bars will appear to be full if the preprogrammed overload pressure (17,237–34,474 kPa [2500–5000 psi]) is reached. If the hydraulic pressure sensor is disabled, this message will not appear[6]
### °C or F HYD OIL TEMP ### °C or F HYD TEMP	Displays the temperature of the hydraulic oil This message appears if the temperature sensor is disabled. The messages TEMP and SENSOR appear alternately at one-second intervals
##.# VOLTS	Displays the engine electrical system's operating voltage
##.# SWATH COMPR HT SWATH CO SENSOR	Displays the swath compressor's height setting(00.0–10.0); fully raised is 0 This message appears if the swath compressor height sensor is disabled
SCROLL SUB-MENU (lower line only) #### KNIFE SPEED ##.# HEADER HEIGHT LOAD|■■■■|■■■■| ####	Displays the sub-menu after two to three seconds. Press SELECT to exit the sub-menu. Use the CDM switch to scroll through the sub-menu options

Cab-Forward, Engine Running, Header Engaged, Draper Header Attached, Index Switch OFF

These are the messages which can appear in the cab display module (CDM) when the windrower is in cab-forward mode, the engine is running, the attached draper header is engaged, and the header index switch is set to the OFF state.

Display (Lower or Upper Line)	Description
#####.# ENGINE HRS	Displays the total engine operating time
#####.# UNIT HRS	Displays the windrower's total operating time
#####.# HEADER HRS	Displays the header's total operating time
##.# ACRES/HOUR ##.# HECTARES/HOUR (if metric)	Displays the actual cutting rate in acres or hectares per hour
###.# SUB ACRES ###.# SUB HECTARES (if metric)	Displays the total area cut since the last reset was performed. To reset this value: set the CDM to display SUB ACRES on the lower line, then hold down the PROGRAM switch for five to seven seconds until the display resets
###### TOTAL ACRES ###### TOTAL HECT (if metric)	Displays the total area cut by the machine
##.## REEL MPH ##.## REEL KPH (if metric) ##.## REEL SENSOR (flashing)	Displays the reel's peripheral speed in miles per hour or kilometers per hour. This message appears if the reel sensor is disabled. The messages MPH / KPH and SENSOR appear alternately at one-second intervals
##.# DRAPER SPEED	Displays the speed of the draper (0.0–11.0)
#### KNIFE SPEED #### KNIFE SENSOR	Displays the knife speed in strokes per minute This message appears if the knife speed sensor is disabled. The messages SPEED and SENSOR appear alternately at one-second intervals
##.# HEADER HEIGHT ##.# HEADER SENSOR	Displays the distance setting (00.0–10.0) between the cutterbar and the ground This message appears if the header height sensor is disabled. The messages HEIGHT and SENSOR appear alternately at one-second intervals

6. A sensor which can monitor the knife/conditioner circuit pressure can be installed as an optional kit. To monitor the hydraulic pressure of the reel/auger circuit, relocate the sensor per kit instruction MD #169031; this instruction is available from your MacDon Deale

Display (Lower or Upper Line)	Description
##.# HEADER ANGLE ##.# HEADER SENSOR	Displays the angle setting (00.0–10.0) of the header relative to the ground This message appears if the header angle sensor is disabled. The messages ANGLE and SENSOR appear alternately at one-second intervals
##.# L FLOAT R ##.# FLOAT SENS DISABLED	Displays the left and right float settings (0.0–10.0) This message appears if the float sensor is disabled
### °C or F HYD OIL TEMP ### °C or F HYD SENSOR	Displays the temperature of the hydraulic oil This message appears if the temperature sensor is disabled. The messages TEMP and SENSOR appear alternately at one-second intervals
LOAD|■■■■| | ####	This bar graph represents the hydraulic operating pressure of the circuit in which the hydraulic pressure sensor is installed. The bars will appear to be full if the preprogrammed overload pressure (17,237–34,474 kPa [2500–5000 psi]) is reached. If the hydraulic pressure sensor is disabled, this message will not appear[7]
##.# VOLTS	Displays the engine electrical system's operating voltage
##.# SWATH COMPR HT SWATH CO SENSOR	Displays the swath compressor's height setting(00.0–10.0); fully raised is 0 This message appears if the swath compressor height sensor is disabled
SCROLL SUB-MENU (lower line only) #### KNIFE SPEED ##.# HEADER HEIGHT LOAD|■■■■|■■■■| #### ##.## REEL MPH ##.# DRAPER SPEED	Displays the sub-menu after two to three seconds. Press SELECT to exit the sub-menu. Use the CDM switch to scroll through the sub-menu options
KNIFE SPD OVERLOAD	This message appears if the knife speed drops below its programmed threshold value

Cab-Forward, Engine Running, Header Engaged, Draper Header Attached, Index Switch ON

These are the messages which can appear in the cab display module (CDM) when the windrower is in cab-forward mode, the engine is running, the attached draper header is engaged, and the header index switch is set to the ON state.

Display (Lower or Upper Line)	Description
#####.# ENGINE HRS	Displays the total engine operating time
#####.# UNIT HRS	Displays the windrower's total operating time
#####.# HEADER HRS	Displays the header's total operating time
##.# ACRES/HOUR ##.# HECTARES/HOUR (if metric)	Displays the actual cutting rate in acres or hectares per hour
###.# SUB ACRES ###.# SUB HECTARES (if metric)	Displays the total area cut since the last reset was performed. To reset this value: set the CDM to display SUB ACRES on the lower line, then hold down the PROGRAM switch for five to seven seconds until the display resets
###### TOTAL ACRES ###### TOTAL HECT (if metric)	Displays the total area cut by the machine
##.## ##.# REEL IND REEL.SENSOR	Displays the reel's indexed speed in rpm and the windrower's ground speed in mph or km/h This message appears if the reel sensor is disabled. The messages IND and SENSOR appear alternately at one-second intervals

7. A sensor which can monitor the knife/conditioner circuit pressure can be installed as an optional kit. To monitor the hydraulic pressure of the reel/auger circuit, relocate the sensor per kit instruction MD #169031; this instruction is available from your MacDon Dealer.

Display (Lower or Upper Line)	Description
##.# ##.# DRAP INDX	Displays the indexed speed of the draper in rpm and the windrower's ground speed in mph or km/h
#### KNIFE SPEED #### KNIFE SENSOR	Displays the knife speed in strokes per minute This message appears if the knife speed sensor is disabled. The messages SPEED and SENSOR appear alternately at one-second intervals
##.# HEADER HEIGHT ##.# HEADER SENSOR	Displays the distance setting (00.0–10.0) between the cutterbar and the ground This message appears if the header height sensor is disabled. The messages HEIGHT and SENSOR appear alternately at one-second intervals
##.# HEADER ANGLE ##.# HEADER SENSOR	Displays the angle setting (00.0–10.0) of the header relative to the ground This message appears if the header angle sensor is disabled. The messages ANGLE and SENSOR appear alternately at one-second intervals
##.# L FLOAT R ##.# FLOAT SENS DISABLED	Displays the left and right float settings (0.0–10.0) This message appears if the float sensor is disabled
LOAD|■■■■| | ####	This bar graph represents the hydraulic operating pressure of the circuit in which the hydraulic pressure sensor is installed. The bars will appear to be full if the preprogrammed overload pressure (17,237–34,474 kPa [2500–5000 psi]) is reached. If the hydraulic pressure sensor is disabled, this message will not appear[8]
##.# VOLTS	Displays the engine electrical system's operating voltage
##.# SWATH COMPR HT SWATH CO SENSOR	Displays the swath compressor's height setting(00.0–10.0); fully raised is 0 This message appears if the swath compressor height sensor is disabled
SCROLL SUB-MENU (lower line only) #### KNIFE SPEED ##.# HEADER HEIGHT LOAD|■■■■|■■■■| ##.## ##.# REEL IND ##.# ##.# DRAP INDX	Displays the sub-menu after two to three seconds. Press SELECT to exit the sub-menu. Use the CDM switch to scroll through the sub-menu options
##.## REEL MIN RPM (lower line)	This message appears if the reel speed drops below its programmed threshold value
MINIMUM (lower line)	Displays the reel speed when the windrower is stationary

Cab-Forward, Engine Running, Header Engaged, Rotary Disc Header Attached

These are the messages which can appear in the cab display module (CDM) when the windrower is in cab-forward mode, the engine is running, and the attached rotary header is engaged.

Display (Lower or Upper Line)	Description
#####.# ENGINE HRS	Displays the total engine operating time
#####.# UNIT HRS	Displays the windrower's total operating time
#####.# HEADER HRS	Displays the header's total operating time
##.# ACRES/HOUR ##.# HECTARES/HOUR (if metric)	Displays the actual cutting rate in acres or hectares per hour

8. A sensor which can monitor the knife/conditioner circuit pressure can be installed as an optional kit. To monitor the hydraulic pressure of the reel/auger circuit, relocate the sensor per kit instruction MD #169031; this instruction is available from your MacDon Dealer.

Display (Lower or Upper Line)	Description
###.# SUB ACRES ###.# SUB HECTARES (if metric)	Displays the total area cut since the last reset was performed. To reset this value: set the CDM to display SUB ACRES on the lower line, then hold down the PROGRAM switch for five to seven seconds until the display resets
###### TOTAL ACRES ###### TOTAL HECT (if metric)	Displays the total area cut by the machine
#### DISC RPM ##.## DISC SENSOR	Displays the rotational speed of the disc This message appears if the disc speed sensor is disabled. The messages RPM and SENSOR appear alternately at one-second intervals
##.# HEADER HEIGHT ##.# HEIGHT SENSOR	Displays the distance setting (00.0–10.0) between the cutterbar and the ground This message appears if the header height sensor is disabled. The messages HEIGHT and SENSOR appear alternately at one-second intervals
##.# HEADER ANGLE ##.# HEADER SENSOR	Displays the angle setting (00.0–10.0) of the header relative to the ground This message appears if the header angle sensor is disabled. The messages ANGLE and SENSOR appear alternately at one-second intervals
##.# L FLOAT R ##.# FLOAT SENS DISABLED	Displays the left and right float settings (0.0–10.0) This message appears if the float sensor is disabled
LOAD|■■■■| | ####	This bar graph represents the hydraulic operating pressure of the circuit in which the hydraulic pressure sensor is installed. The bars will appear to be full if the preprogrammed overload pressure (17,237–34,474 kPa [2500–5000 psi]) is reached. If the hydraulic pressure sensor is disabled, this message will not appear[9]
### °C or F HYD OIL TEMP ### °C or F HYD TEMP	Displays the left and right float settings (0.0–10.0) This message appears if the temperature sensor is disabled. The messages TEMP and SENSOR appear alternately at one-second intervals
##.# VOLTS	Displays the engine electrical system's operating voltage
##.# SWATH COMPR HT SWATH CO SENSOR	Displays the swath compressor's height setting(00.0–10.0); fully raised is 0 This message appears if the swath compressor height sensor is disabled
SCROLL SUB-MENU (lower line only) #### DISC RPM ##.# HEADER HEIGHT LOAD|■■■■|■■■■| ####	Displays the sub-menu after two to three seconds. Press SELECT to exit the sub-menu. Use the CDM switch to scroll through the sub-menu options

Miscellaneous Operational Information

These messages can appear on the cab display module's (CDM) display screen when the windrower is in various operational states.

Display (Upper Line)	Description
HEADER DISENGAGED	Indicates that the header drive is disengaged
##.# FOOT DISK	Indicates the size of the header attached to the windrower. AUGER or DRAPER will appear in place of DISK, depending on type of header attached
IN PARK	Indicates that the GSL is in the N-DETENT position

9. A sensor which can monitor the knife/conditioner circuit pressure can be installed as an optional kit. To monitor the hydraulic pressure of the reel/auger circuit, relocate the sensor per kit instruction MD #169031; this instruction is available from your MacDon Dealer.

Display (Upper Line)	Description
< LEFT TURN ■	Indicates that the left turn indicator system is active. This message appears when the left turn arrow on the CDM is pressed when the windrower is in engine-forward mode.[10])
■ RIGHT TURN >	Indicates that the right turn indicator system is active. This message appears when the right turn arrow on the CDM is pressed when the windrower is in engine-forward mode.[11])
■ HAZARD ■	Indicates that the hazard light system is active
HEADER REVERSE	Indicates that the header drive is running in reverse
HEADER ENGAGED	Indicates that the header drive is engaged
ROAD GEAR	This message appears when HIGH RANGE is selected on the console switch

3.18.4 Cab Display Module Warning and Alarms

The cab display module (CDM) displays warnings and sounds alarms to notify the Operator of abnormal operating states.

Engine Warning Lights

The engine warning lights on the cab display module (CDM) allow the Operator to determine the operating state of the engine at a glance.

Figure 3.77: CDM Engine Warning Lights

A - Engine Preheat
B - Water in Fuel
C - Caution
D - Stop
E - Display

10. If the windrower's road light kit is not installed, the CDM will display the error message E135 LEFT STOP LAMP when the windrower is in cab-forward mode.
11. If the windrower's road light kit is not installed, the CDM will display the error message E134 RIGHT STOP LAMP when the windrower is in cab-forward mode.

- **ENGINE PRE-HEAT**: Yellow light. Indicates that the engine's glow plugs are warming the cylinders. The Operator should wait until this light darkens to start the engine.
- **WATER IN FUEL**: Yellow light. Indicates that the windrower's fuel system should be serviced.
- **CAUTION**: Yellow light. Indicates that the engine requires prompt attention. Refer to the error code displayed on the CDM for more information.
- **STOP**: Red light. Indicates that the Operator should stop the engine **IMMEDIATELY**. Refer to the error code displayed on the CDM for more information.
- **DISPLAY**: Displays error codes. To learn the precise meaning of an error code, refer to *8.4 Engine Error Codes, page 504* or contact your MacDon Dealer.

Display Warnings and Alarms

Refer to this table to learn the precise meaning of the alarms, lights, and error messages produced by the cab display module (CDM).

Figure 3.78: CDM Display Warnings and Alarms

Display (A)	Flashing	Alarm Tone	Description
BRAKE OFF	X	Short beep accompanies each flash	Engine is running, GSL is in the N-DETENT position. Indicates a brake pressure switch or brake switch relay fault
BRAKE ON	X	Short beep accompanies each flash	Ground speed lever (GSL) out of the N-DETENT position, but the interlock switch remains closed when the brake is applied
BRAKE SW FAILURE	X	Short beep accompanies each flash	Ignition is in the ON position, the engine is not running, and the brake switch and relay are closed

Display (A)	Flashing	Alarm Tone	Description
CAB-FORWARD SW ON/ ENG-FORWARD SW ON	X	Messages flash alternately	Both seat switches activated
CENTER STEERING		Two beeps per second	GSL or interlock switches are not closed when the key is in the ON position while the engine is OFF.
DISENGAGE HEADER RE-ENGAGE <1800 RPM>	X	None	R80/R85 - Engine rpm above 1800 rpm when attempting to engage the header
ENGINE AIR FILTER	X	Single loud tone for ten seconds; tone repeats every 30 minutes until the condition is corrected	Engine air filter requires servicing
ENGINE TEMPERATURE	X	Ongoing intermittent moderate tone until temperature is below 102°C (215°F)	Engine coolant temperature is greater than 104°C (220°F)
HEADER DISENGAGED		None	Normal operating condition
DISENGAGE HEADER	X	None	Header switch is in the ON position when the Operator is attempting to start the engine
HEADER OIL PRESS	X	Continuous loud tone until oil pressure is regained	Low header charge oil pressure causes the header to shut down. The header's ON switch must be moved to the OFF position and then again to the ON position to restart the header
HYDRAULIC FILTER	X	Single loud tone for ten seconds, Repeats every 15 minutes until the condition is corrected	Excessive pressure increase across the hydraulic oil filter
### °C or F HYD OIL COLD	X	Tone sounds with each flash for 5 seconds and then stops for 1 minute, flashing continues if oil still cold after 1 minute, tone sounds again	Hydraulic oil temperature is less than 10°C (50°F)
### °C or F HYD OIL HOT	X	Tone accompanies each flash for five seconds at 104°C (220°F) then tone stops for 1 minute while flashing continues. If oil still hot after one minute, the tone will sound again. At temperatures of 110°C (230°F) and higher, the light will continue to flash accompanied by a steady tone	Hydraulic oil temperature is more than 104°C (220°F) but less than 110°C (230°F)
IN PARK	X	One short beep	GSL in N-DETENT, steering wheel centered, and brakes are engaged
KNIFE SPEED OVERLOAD	X	Short beep accompanies each flash until the condition is corrected	Machine overload: the knife or disc speed has dropped below its programmed threshold value
LOCK SEAT BASE	X	None	Seat base not detected in cab or engine-forward position

Display (A)	Flashing	Alarm Tone	Description
LOW HYDRAULIC OIL	X	Continuous loud tone for five seconds. If the condition is not corrected, a single loud tone will continue to sound every five minutes	Low hydraulic oil level. The header will shut down automatically if it is engaged. The header ON switch must be moved to the OFF position and then again to the ON position to restart the header
NO HEADER		None	Attached header is not detected
NO OPERATOR		Continuous tone	Operator not detected in seat when the header is engaged, or when the GSL is out of the N-DETENT position. The engine will shut down after five seconds
NO OPERATOR ENGINE SHUT DOWN		Continuous tone	Operator not detected in seat when the machine's ground speed is less than 8 km/h (5 mph). The engine will shut down.
NOT IN PARK	X	Short beep with each flash	GSL or interlock switches not closed when the ignition key is in the ON position while the engine is OFF
PLACE GSL INTO N		Two beeps per second	GSL or interlock switches not closed when the ignition key is in the ON position while the engine is OFF
SLOW DOWN	X	Short beep with each flash	Ground speed is greater than or equal to 40 km/h (25 mph). The Operator should reduce the windrower's ground speed
TRANS OIL PRESS	X	Continuous loud tone until oil pressure is regained	Low transmission charge oil pressure
##.# LOW VOLTS	X	Single loud tone for 10 seconds	Voltage below 11.5
##.# HIGH VOLTS	X	Single loud tone for 10 seconds	Voltage above 15.5

3.18.5 Cab Display Module – Configuration Guidelines

To ensure accurate monitoring, every header attached to the windrower must be configured in the cab display module (CDM).

Use the following guidelines when configuring the CDM:

- The header **MUST** be attached to the windrower for the CDM to recognize the type of header.
- The transmission **MUST** be in neutral (that is, the GSL must be in the N-DETENT position) in order for the Operator to be able to configure the system while the engine is running.
- The ignition switch **MUST** be in the RUN position in order for the Operator to be able to configure the system when the engine is not running.
- A given header only needs to be configured once in the CDM. Most operation parameters are set at the factory, but the Operator can make changes to suit local conditions or to take account of modifications made to the header.
- Windrower input values are provided in this manual. Header function values can be found in the header operator's manual.
- The CDM **MUST** be set to programming mode to view the programming menus. Press PROGRAM and SELECT simultaneously on the CDM to enter programming mode. Exit programming mode at any time by pressing PROGRAM or by turning the ignition key to the OFF position.

- Refer to *3.18.6 Cab Display Module – Configuration Functions, page 95* for a detailed list of programming menu items.

NOTE:

Contact your MacDon Dealer for information about software updates to the electronic modules. Your Dealer will have access to the latest software upgrades and the necessary interface tools to install the software.

3.18.6 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 3.79: 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:

Contact your MacDon Dealer for information about software updates to the electronic modules. Your Dealer will have access to the latest software upgrades and the necessary interface tools to install the software.

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.

3.18.7 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.

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 3.80: 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 3.81: 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 3.82: Language Display

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 3.83: 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 3.84: 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 3.85: Display Units

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 3.86: 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 3.87: 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 3.88: Buzzer Volume

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 3.89: 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 3.90: 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 3.91: Display Backlighting Setting

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 3.92: 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 3.93: 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 3.94: Display Contrast Setting

3.18.8 Configuring Windrower

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

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 selects the header profile based on the type of attached header. For more information, refer to *4.5 Attaching and Detaching Headers, page 226*.

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 3.95: 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 3.96: Knife Speed Setting

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. For more information, refer to *4.5 Attaching and Detaching Headers, page 226*.
- 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 3.97: 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 3.98: Knife Overload Speed

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. For more information, refer to *4.5 Attaching and Detaching Headers, page 226*.
- 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 3.99: 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 3.100: Disc Overload Speed

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.
- To enable the hydraulic pressure sensor, refer to *Enabling or Disabling Header Sensors, page 141*.

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 3.101: 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 3.102: Hydraulic Overload Pressure

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.

For more information on the Header Index feature, refer to *4.6.5 Reel Speed, page 295* and *4.6.6 Draper Speed, page 298*.

NOTE:

The header **MUST** be attached to the windrower to perform this procedure. The CDM automatically selects the header profile based on the type of attached header. For more information, refer to *4.5 Attaching and Detaching Headers, page 226*.

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 3.103: 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 3.104: Header Index Mode

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 CDM automatically selects the header profile based on the type of attached header. For more information, refer to *4.5 Attaching and Detaching Headers, page 226*.

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 3.105: 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 3.106: Return to Cut Mode

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.

For more information on the Auto Raise Height feature, refer to *Auto Raise Height, page 220*.

NOTE:

The header **MUST** be attached to the windrower to perform this procedure. The CDM automatically selects the header profile based on the type of attached 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 3.107: 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 3.108: Auto Raise Height

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 3.109: 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 3.110: 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 3.111: 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 3.112: DWA Auto Up/Down

Activating Hydraulic Center-Link

Once the hydraulic center-link has been installed on the windrower, it must be activated in the cab display module's (CDM) WINDROWER SETUP menu.

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 3.113: 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 3.114: Hydraulic Center-Link

Activating Rotary Disc Header Drive Hydraulics

To operate a rotary disc header with the windrower, the header drive hydraulics option on the windrower's cab display module (CDM) must be activated.

NOTE:

This procedure is provided on the assumption that the Disc Drive kit (MD #B4657) has been installed. For more information, refer to *6.3.8 R80 and R85 Rotary Header Drive Hydraulics, page 470*.

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 3.115: 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 3.116: Rotary Disc Hydraulics

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 CDM automatically selects the header profile based on the type of attached header. For more information, refer to *4.5 Attaching and Detaching Headers, page 226*.
- The header cut width setting corresponds to the actual cutting width of the header, not the total width of the header.

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 3.117: 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 3.118: Header Cut Width

Activating Swath Compressor

An optional swath compressor is available through your MacDon Dealer. 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.

To activate the swath compressor, do the following:

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 3.119: 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.
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.

Figure 3.120: M155 Swath Compressor Controls Shown – M155*E4* Similar

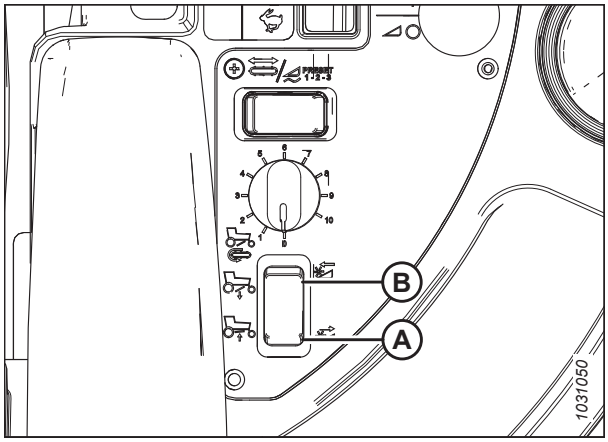


Figure 3.121: Swath Compressor Switch

11. Press PROGRAM (A) to exit programming mode or press SELECT (B) to proceed to the next windrower setup option.

Figure 3.122: M155 CDM Programming Buttons Shown – M155*E4* Similar

Activating Hay Conditioner

To use the hay conditioner, it must be activated in the windrower's cab display module (CDM). 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 *4.5 Attaching and Detaching Headers, page 226*.

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 3.123: M155*E4* Cab Display Module

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 3.124: M155*E4* Cab Display Module

Setting Reel Speed Display Units

The preferred unit for header reel speed can be displayed 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 CDM automatically selects the header profile based on the type of attached header. For more information, refer to *4.5 Attaching and Detaching Headers, page 226*.

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 3.125: 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 3.126: Reel Speed Display

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 3.127: 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).

Figure 3.128: Tire Size

6. Press PROGRAM (A) to exit programming mode or press SELECT (D) to proceed to the next WINDROWER SETUP option.

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 programmed engine speed is activated when the header is engaged. For more information, refer to *Engine Intermediate Speed Control, page 173*.

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 3.129: 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.

Figure 3.130: Engine ISC RPM

Table 3.1 ISC Settings

ISC and rpm		
Off[12]	1	2
High Idle	2050	1900

NOTE:

The previously selected ISC setting will flash.

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

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 3.131: ISC RPM

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 3.132: Cab Display Module (CDM)

3.18.9 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.

Activating Header Tilt Control Lockout

Activating 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 CDM automatically selects the header profile based on the type of attached header. For more information, refer to *4.5 Attaching and Detaching Headers, page 226*.

To activate the header tilt 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 3.133: 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 3.134: 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.

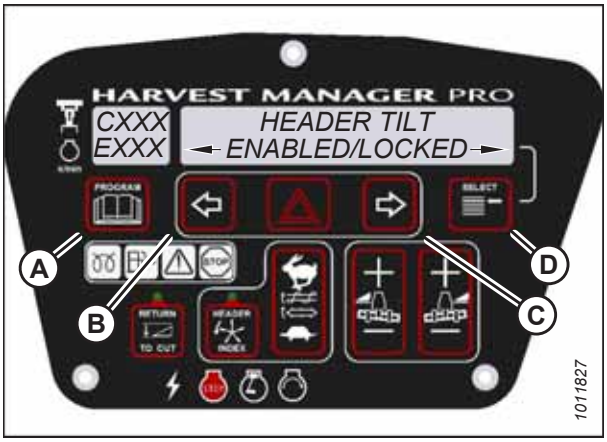


Figure 3.135: Header Tilt Control Lock

Activating Header Float Control Lockout

Activating 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 CDM automatically selects the header profile based on the type of attached header.

For more information, refer to *4.5 Attaching and Detaching Headers, page 226*.

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 3.136: 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 3.137: 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.

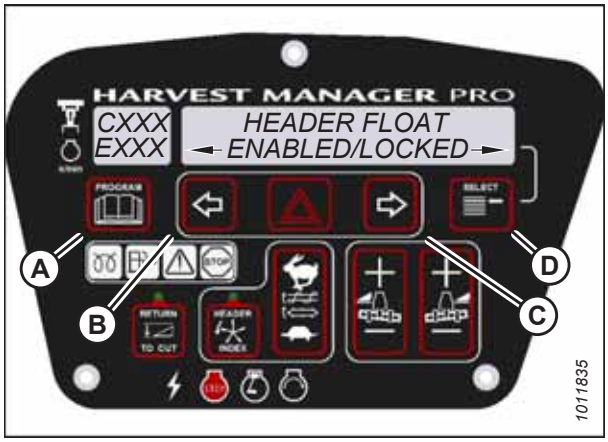


Figure 3.138: Header Float Control Lock

Activating Reel Fore-Aft Control Lockout

Activating 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 CDM automatically selects the header profile based on the type of attached header. For more information, refer to *4.5 Attaching and Detaching Headers, page 226*.

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 3.139: 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 3.140: 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.

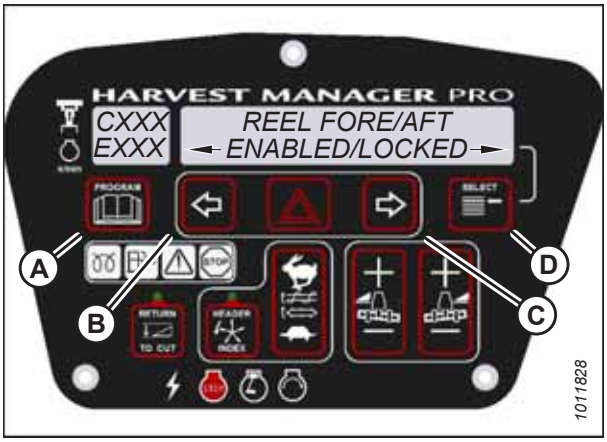


Figure 3.141: Reel Fore-Aft Control Lock

Activating Draper Speed Control Lockout

Activating 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 CDM automatically selects the header profile based on the type of attached header. For more information, refer to *4.5 Attaching and Detaching Headers, page 226*.

To activate the draper 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 3.142: 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 3.143: 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.

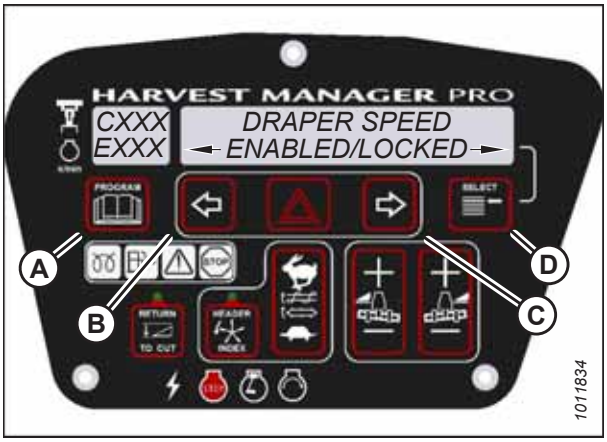


Figure 3.144: Draper Control Lock

Activating Auger Speed Control Lockout

Activating 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 CDM automatically selects the header profile based on the type of attached header. For more information, refer to *4.5 Attaching and Detaching Headers, page 226*.

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 3.145: 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 3.146: 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.

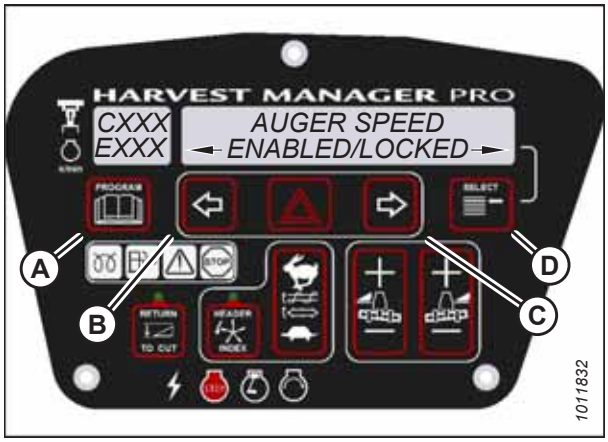


Figure 3.147: Auger Control Lock

Activating Knife Speed Control Lockout

Activating 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 CDM automatically selects the header profile based on the type of attached header. For more information, refer to *4.5 Attaching and Detaching Headers, page 226*.

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 3.148: 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 3.149: 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.

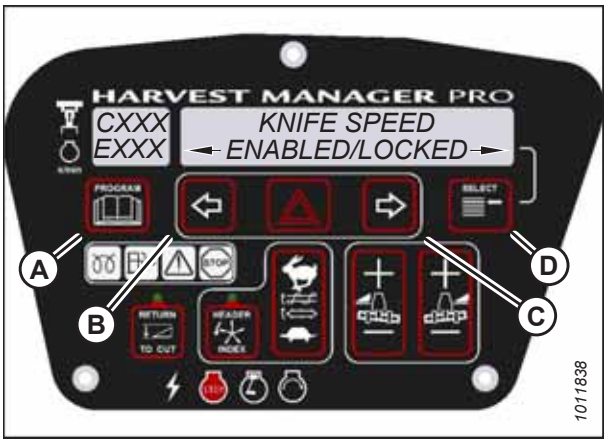


Figure 3.150: Knife Speed Control Lock

Activating Rotary Disc Speed Control Lockout

Activating 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 disc 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 CDM automatically selects the header profile based on the type of attached header. For more information, refer to *4.5 Attaching and Detaching Headers, page 226*.

To activate the rotary disc speed 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 3.151: 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 3.152: 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.

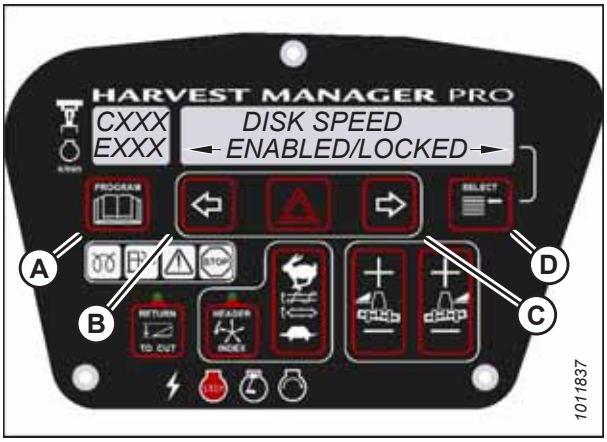


Figure 3.153: Disc Speed Control Lock

Activating Reel Speed Control Lockout

Activating 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 disc 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 CDM automatically selects the header profile based on the type of attached header. For more information, refer to *4.5 Attaching and Detaching Headers, page 226*.

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 3.154: 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 3.155: 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.

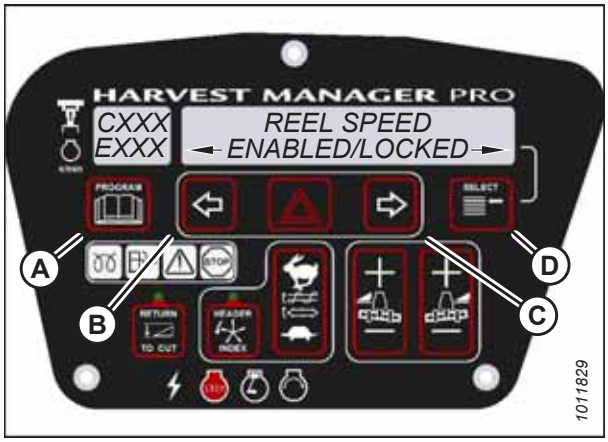


Figure 3.156: Reel Speed Control Lock

3.18.10 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 3.157: 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 3.158: 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 3.159: 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 3.160: Control Locks

3.18.11 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).

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 CDM automatically selects the header profile based on the type of attached header. For more information, refer to *4.5 Attaching and Detaching Headers, page 226*.
- 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 3.161: 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 3.162: 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.

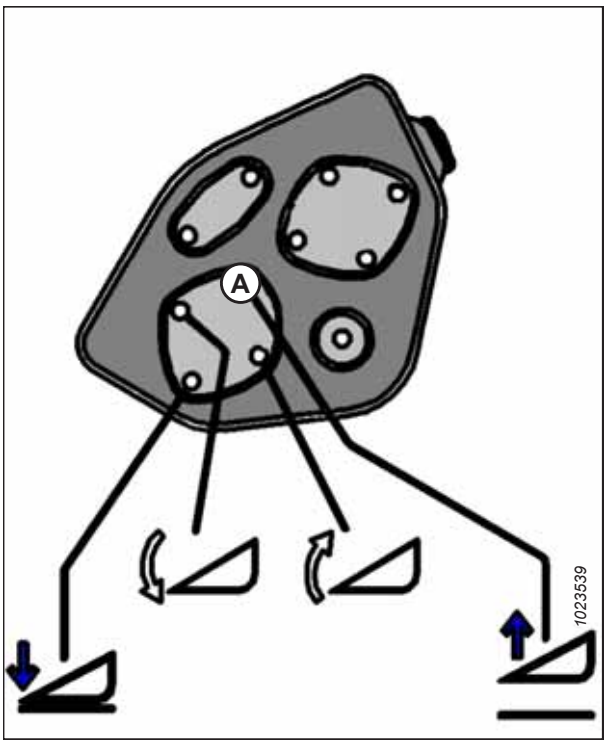


Figure 3.163: Header Height Controls on GSL

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.

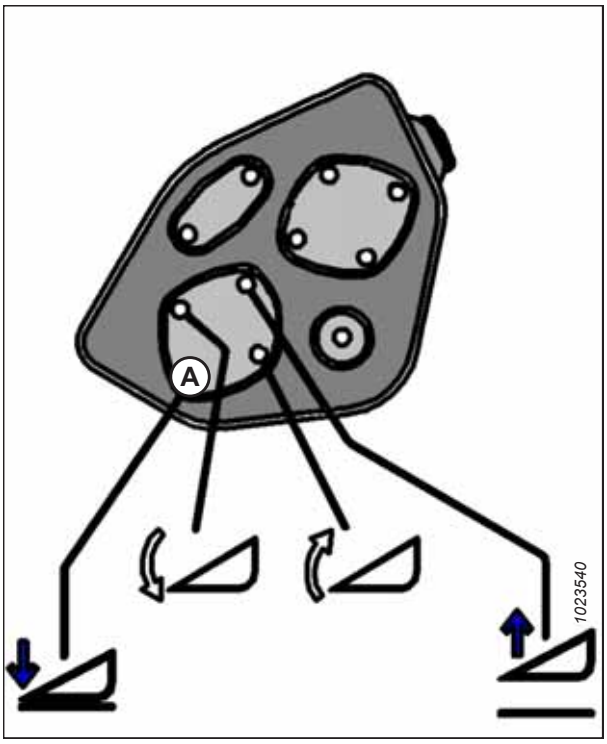


Figure 3.164: Header Height Controls on GSL

10. Press the right arrow to select the next header sensor calibration or select STOP & EXIT. Press SELECT.

    For instructions on calibrating the header tilt sensor, refer to *Calibrating Header Tilt Sensor, page 134*. For instructions on calibrating the header float sensor, refer to *Calibrating Header Float Sensors, page 136*.

11. Press PROGRAM to exit programming mode.

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 report the angle of the header correctly.

NOTE:

- The header must be attached to the windrower to perform this procedure. The CDM automatically selects the header profile based on the type of attached header. For more information, refer to *4.5 Attaching and Detaching Headers, page 226*.
- The engine must be running to perform this procedure.

WARNING

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.
3. Press SELECT (B) until CALIBRATE SENSORS? appears on the upper line.
   - NO/YES will appear on the lower line.

Figure 3.165: 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 3.166: 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.

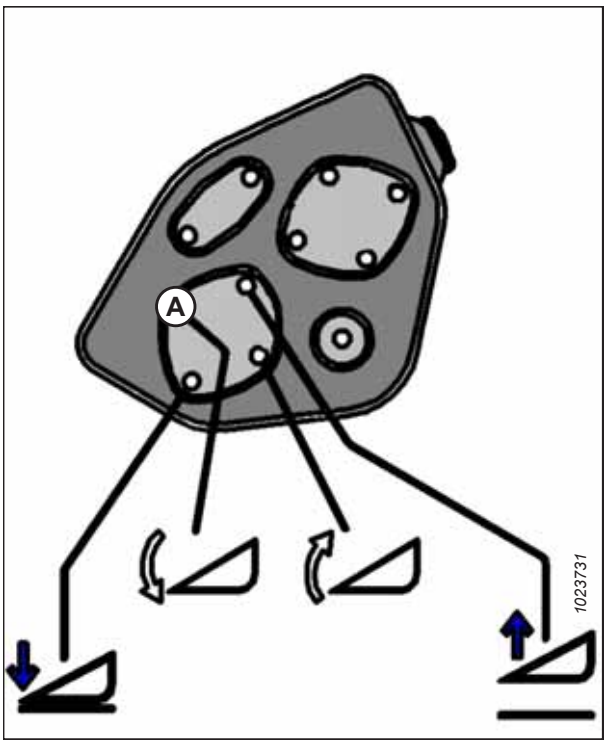


Figure 3.167: Header Tilt Controls on GSL

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.

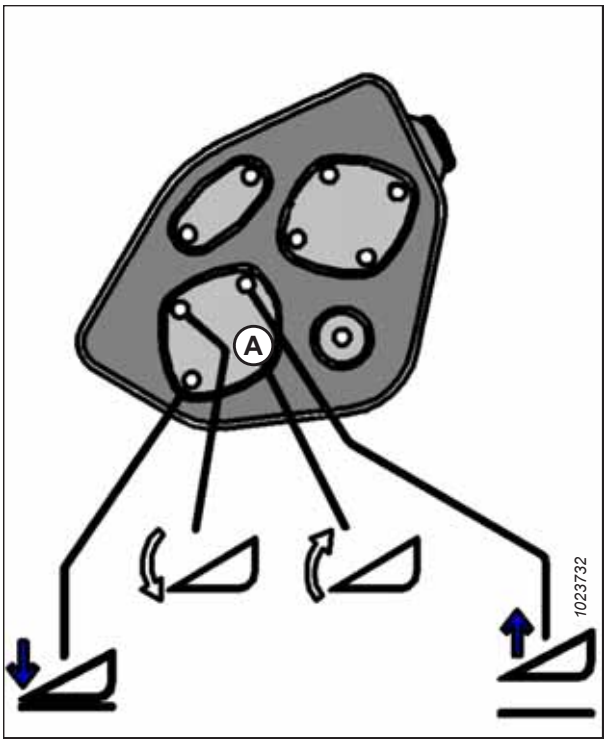


Figure 3.168: Header Tilt Controls on GSL

10. Press the right arrow to select the next header sensor calibration or select STOP & EXIT. Press SELECT.

    For instructions, refer to *Calibrating Header Height Sensor, page 132* or *Calibrating Header Float Sensors, page 136*.

11. Press PROGRAM to exit programming mode.

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 CDM automatically selects the header profile based on the type of attached header. For more information, refer to *4.5 Attaching and Detaching Headers, page 226*.
- Use the left or right FLOAT buttons on the CDM to perform this procedure.

WARNING

Ensure that all bystanders have cleared the area.

IMPORTANT:

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

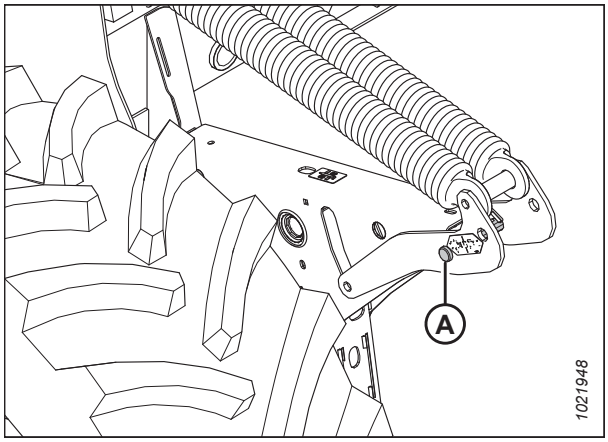


Figure 3.169: Float Pin – Right Side

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 3.170: 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 3.171: 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 3.172: 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 3.173: Negative Header Float Display

10. Press the right arrow to select the next header sensor calibration or select STOP & EXIT. Press SELECT. For instructions, refer to *Calibrating Header Height Sensor, page 132* or *Calibrating Header Tilt Sensor, page 134*.
11. Press PROGRAM to exit programming mode.

3.18.12 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 3.174: 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 3.175: 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.

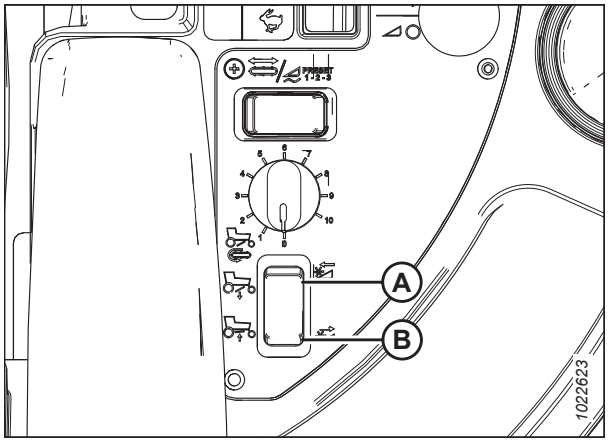


Figure 3.176: Swath Compressor Controls

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 3.177: 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.

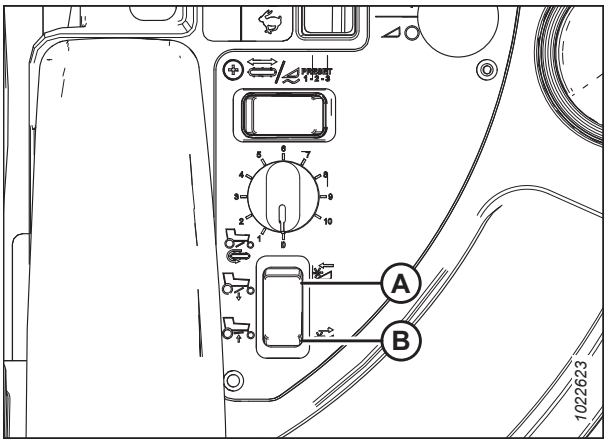


Figure 3.178: Swath Compressor Controls

A - Lower Swath Compressor
B - Raise Swath Compressor

3.18.13 Troubleshooting Windrower Problems

The cab display module (CDM) can be used as a troubleshooting tool, since it can provide information about the status of various sensors and display error codes.

Displaying Windrower and Engine Error Codes

The cab display module (CDM) stores any error codes that occur during operation.

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 3.179: 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 3.180: Diagnostic Functions

7. Press right arrow (A) to select YES. Press SELECT (C).
   - The most recent error code will appear.
   - Refer to *8.7.1 Cab Display Module Error Codes, page 532*.
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 3.181: 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.
    - Refer to *8.4 Engine Error Codes, page 504*.
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.

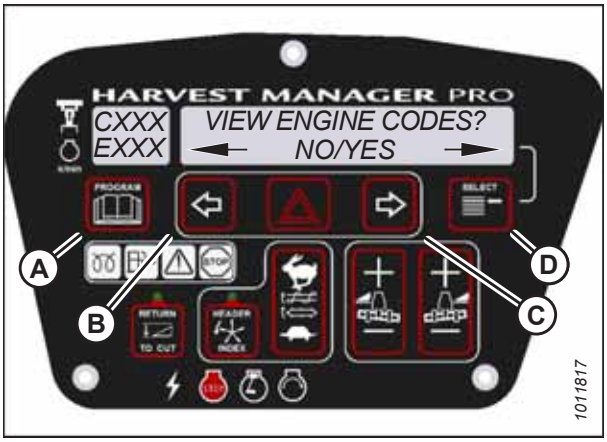


Figure 3.182: Engine Codes

Enabling or Disabling Header Sensors

Each header sensor can be enabled or disabled using the windrower's cab display module (CDM).

NOTE:

- The header must be attached to the windrower to perform this procedure. The CDM automatically selects the header profile based on the type of attached header. For more information, refer to *4.5 Attaching and Detaching Headers, page 226*.
- Disabled sensors generate the flashing message SENSOR on the CDM when the header is operating. This message indicates that the output from this sensor has been disabled.

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 3.183: 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 3.184: 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[13]
   - 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 3.185: Header Sensors

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 selects the header profile based on the type of attached header. For more information, refer to *4.5 Attaching and Detaching Headers, page 226*.

13. 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 3.186: 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 3.187: 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 3.188: Header Sensors

Forcing Header Identification

The windrower's cab display module (CDM) must recognize the header model 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.

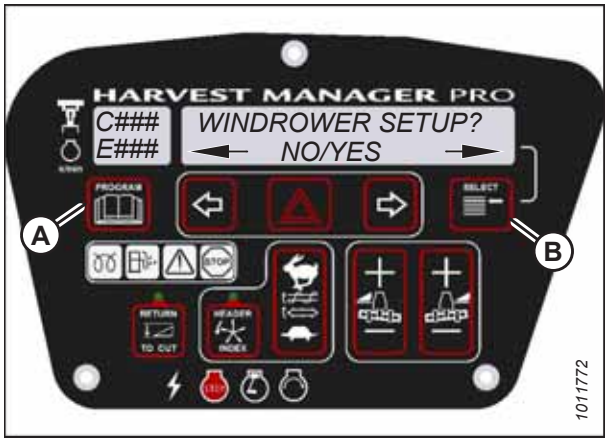


Figure 3.189: CDM Programming Buttons

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 3.190: 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 3.191: 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 3.192: Header Type

3.18.14 Troubleshooting Header Problems

A guide for resolving difficulties encountered while configuring header features in the cab display module (CDM) is provided.

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). This procedure is used to test the functionality of this feature.

NOTE:

- The header must be attached to the windrower to perform this procedure. The CDM automatically selects the header profile based on the type of attached header. For more information, refer to *4.5 Attaching and Detaching Headers, page 226*.
- 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 3.193: 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 3.194: 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 3.195: 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.

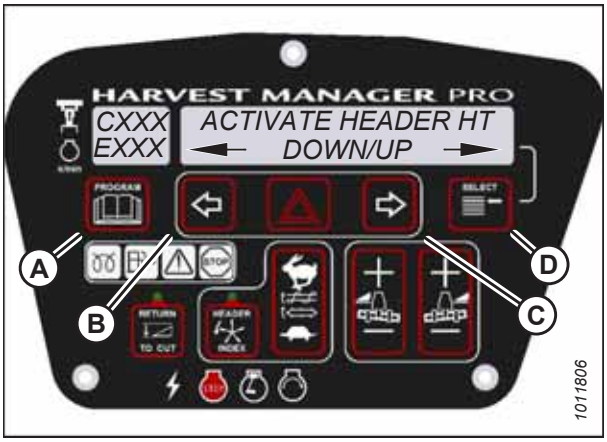


Figure 3.196: Header Height

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). This procedure is used to test the functionality of this feature.

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 3.197: 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 3.198: 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 3.199: Functions

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

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.

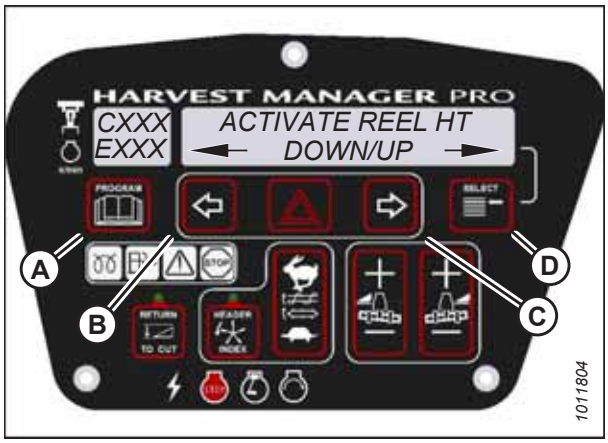


Figure 3.200: Reel Height

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). This procedure is used to test the functionality of this feature.

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 *4.5 Attaching and Detaching Headers, page 226*.
- 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 3.201: 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 3.202: 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 3.203: 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.

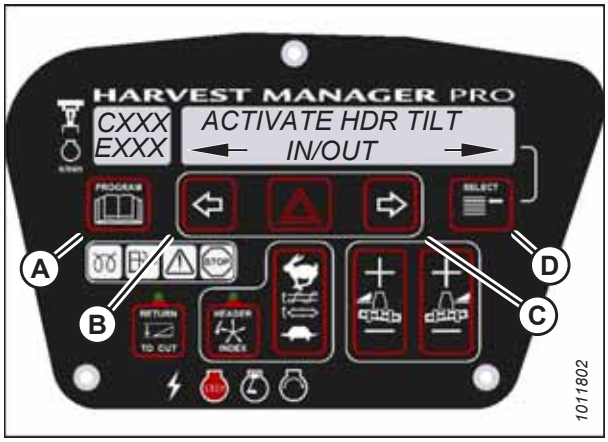


Figure 3.204: Header Tilt Angle

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 follow this procedure. For more information, refer to *4.5 Attaching and Detaching Headers, page 226*.
- 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. Press SELECT (B).
   - WINDROWER SETUP? will appear on the upper line.

Figure 3.205: 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 3.206: 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 3.207: 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 3.208: Knife Drive

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. For more information, refer to *4.5 Attaching and Detaching Headers, page 226*.
- 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 3.209: 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 3.210: 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 3.211: 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 3.212: Draper Drive

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 *4.5 Attaching and Detaching Headers, page 226*.
- 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 3.213: 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 3.214: 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 3.215: 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 3.216: Reel Drive

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 3.217: 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 3.218: 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 3.219: 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 3.220: Disc Drive

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 *Configuring Double Windrow Attachment Controls, page 109*.
- 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 3.221: 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 3.222: 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 3.223: 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.

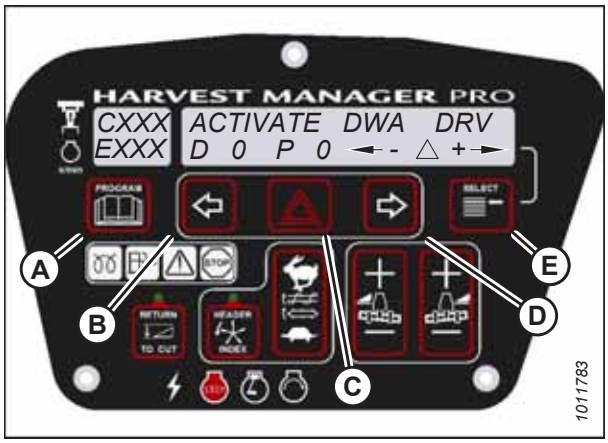


Figure 3.224: DWA Drive

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 *4.5 Attaching and Detaching Headers, page 226*.
- 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 3.225: 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 3.226: 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 3.227: 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 3.228: Reel Fore-Aft

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 3.229: 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 3.230: 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 3.231: 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 3.232: 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 3.233: Hydraulic Purge Cycle

3.18.15 Engine Error Codes

To assist the Operator or Technician in diagnosing engine problems, the cab display module (CDM) displays error codes when there is a fault with one or more of the sensors which monitor engine operation parameters.

For an explanation of an engine error code, refer to *8.4 Engine Error Codes, page 504*.

3.18.16 Cab Display Module and Windrower Control Module Fault Codes

To assist the Operator or Technician in locating a specific problem with the windrower, the cab display module (CDM) displays fault codes when there is a fault with one of the sensors which monitor windrower performance parameters.

For an explanation of a fault code, refer to *8.7.1 Cab Display Module Error Codes, page 532*.

Chapter 4: Operation

Safely operating your machine requires familiarizing yourself with its capabilities.

4.1 Owner/Operator Responsibilities

Owning and operating heavy equipment comes with certain duties.

CAUTION

- **It is your responsibility to read and understand this manual completely before operating the windrower. Contact your Dealer if an instruction is not clear to you.**
- **Follow all safety messages in this manual and on the safety signs on the windrower.**
- **Remember that YOU are the key to safety. Good safety practices protect you and the people around you.**
- **Before allowing anyone to operate the windrower, for however short a time or distance, ensure that they have been instructed in its safe and proper use.**
- **Review this manual and all other relevant safety information with all the windrower's Operators every year.**
- **Be alert for other Operators not using recommended procedures or not following safety precautions. Correct these mistakes immediately, before an accident occurs.**
- **Do NOT modify the windrower. Unauthorized modifications may impair the functionality or the safety of the machine, and may reduce the windrower's service life.**
- **The safety information provided in this manual does NOT replace the safety codes, insurance requirements, or laws applicable to the region in which you will be operating the windrower. Ensure that your machine complies with all relevant regulations.**

4.2 Symbol Definitions

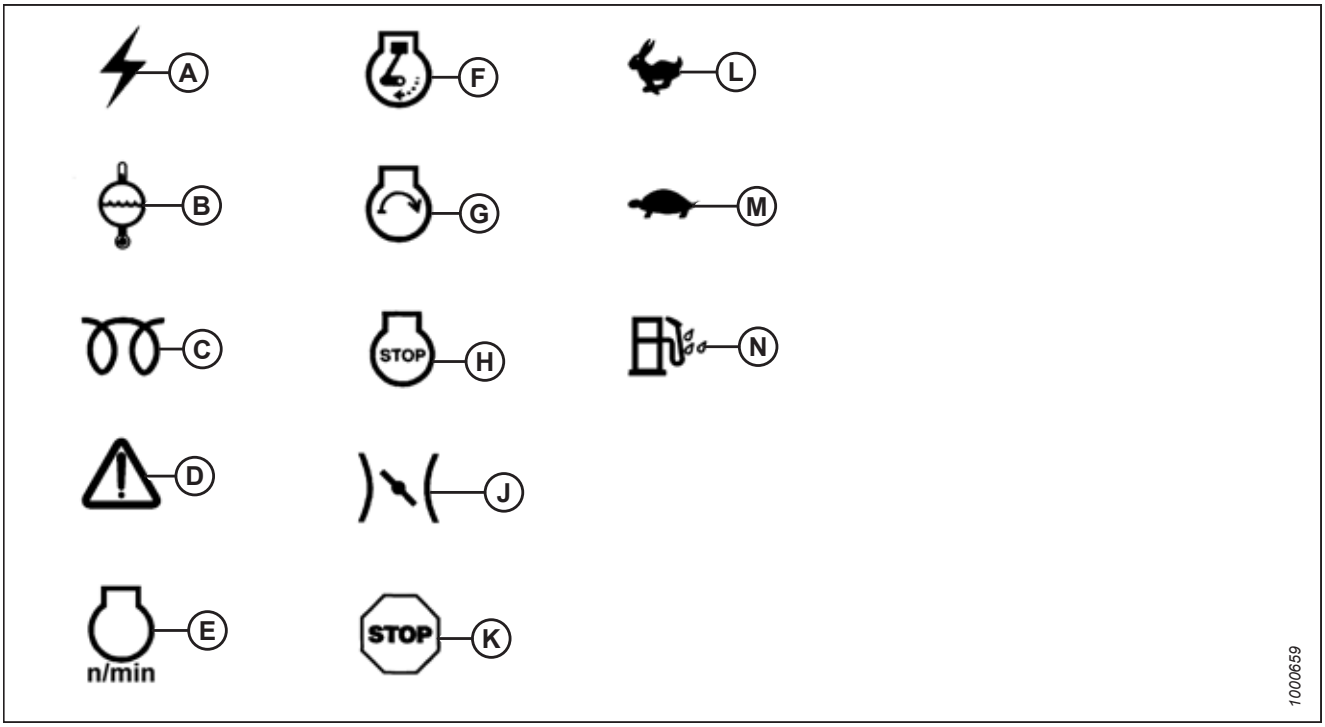
The symbols presented in this topic provide at-a-glance information on critical windrower performance parameters.

Ensure that you are familiar with the meaning of these symbols before operating the windrower.

4.2.1 Engine Functions

These symbols, found on the console, indicate that the button or indicator on which the symbol is found pertains to a particular windrower engine function.

Figure 4.1: Engine Function Symbols

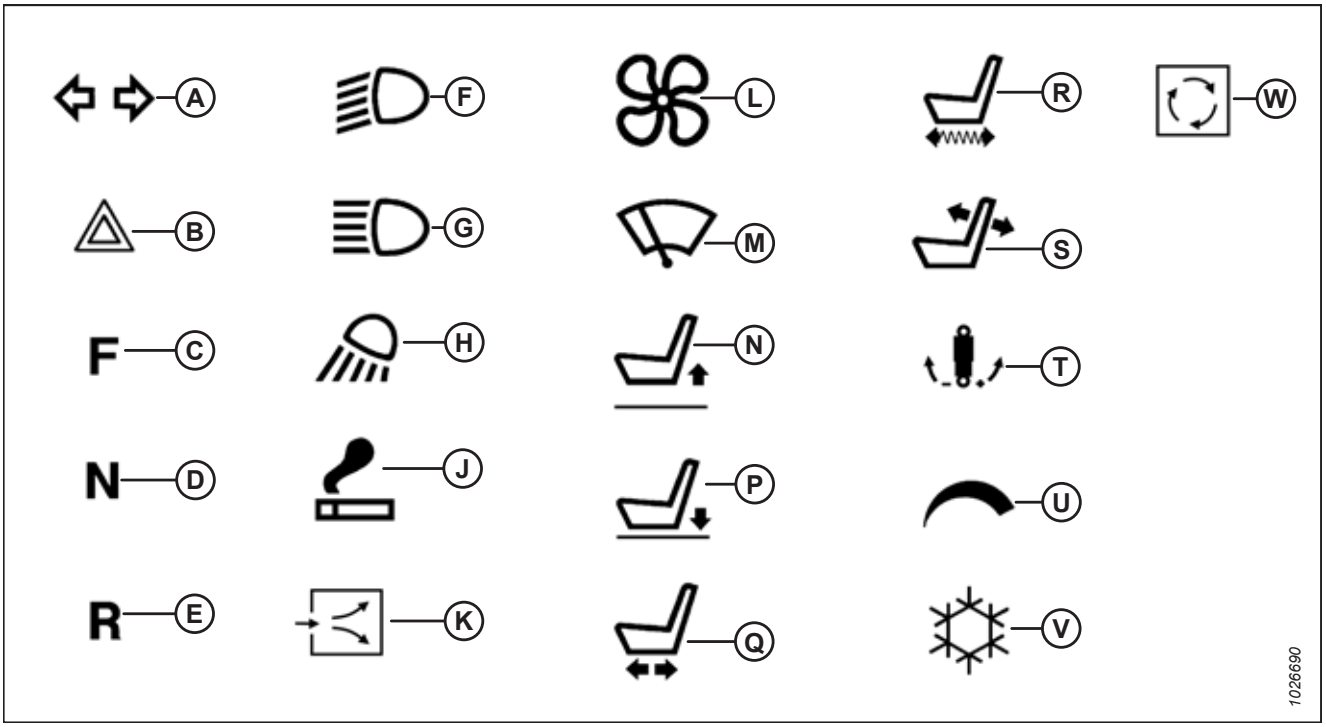


A - Electrical Power – Accessories
B - Engine Coolant Temperature
C - Engine Glow Plugs
D - Engine Malfunction
E - Engine rpm
F - Engine Run
G - Engine Start
H - Engine Stop
J - Engine Throttle
K - Engine Urgent Stop
L - Fast
M - Slow
N - Water in Fuel

4.2.2 Windrower Operating Symbols

These symbols, found on the console, indicate that the button or indicator on which the symbol is found pertains to a particular windrower function.

Figure 4.2: Windrower Operating Symbols



A - Turn Signals
B - Hazard Warning Lights
C - Forward
D - Neutral
E - Reverse
F - Headlights Low Beam
G - Headlights High Beam
H - Work Light
J - Lighter
K - Fresh Air
L - Blower
M - Windshield Wiper
N - Seat Height Up
P - Seat Height Down
Q - Seat Fore and Aft
R - Seat Fore Aft Isolator
S - Seat Back Fore and Aft
T - Seat Ride Damping
U - Cab Temperature Control
V - Air Conditioning
W - Recirculate

4.2.3 Header Functions

These symbols, found on the console, indicate that the button or indicator on which the symbol is found pertains to a particular header function.

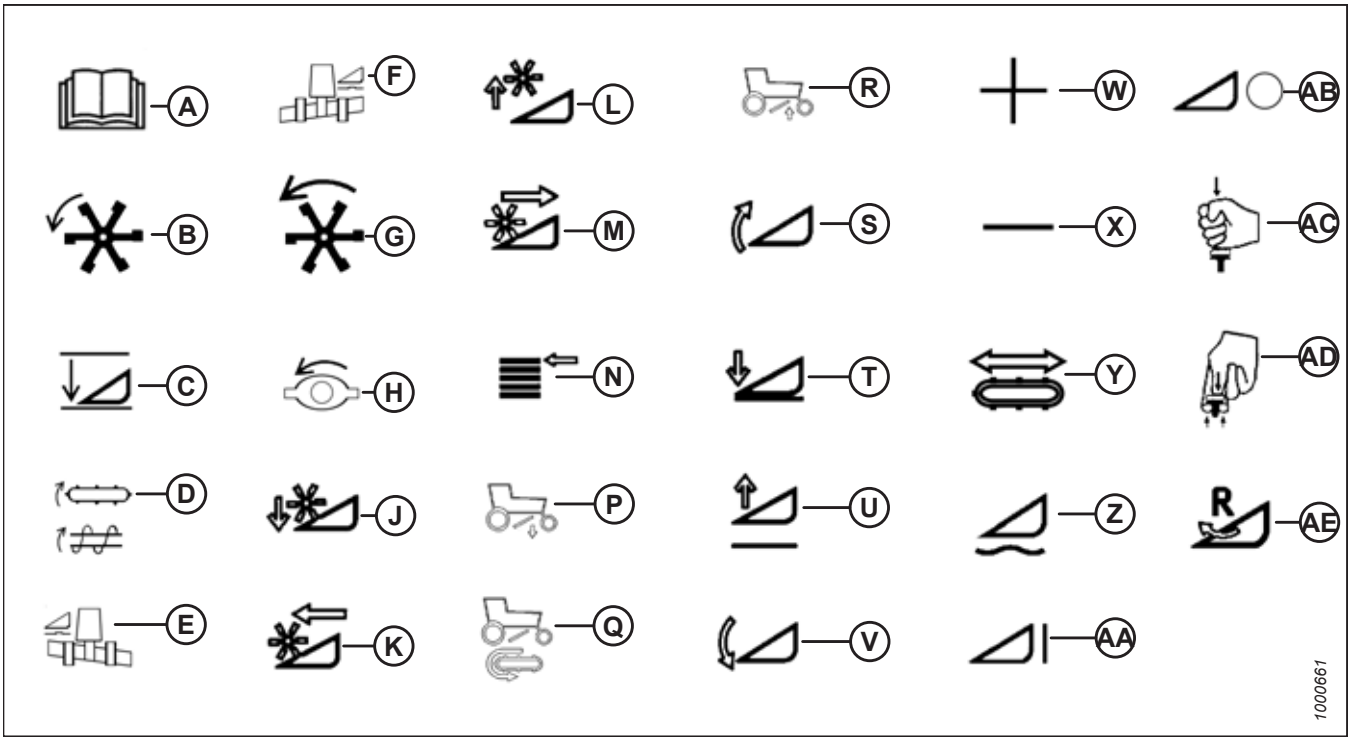


Figure 4.3: Header Function Symbols

A - Program
B - Header Index
C - Return to Cut
D - Conveyor/Auger Speed
E - Float Left
F - Float Right
G - Reel Speed
H - Disc Speed
J - Reel Down
K - Reel Forward
L - Reel Up
M - Reel Rearward
N - Display Select
P - DWA Down
Q - DWA Draper Speed
R - DWA Up
S - Header Tilt Up
T - Header Down
U - Header Up
V - Header Tilt Down
W - Increase
X - Decrease
Y - Deck Shift
Z - Float
AA - Header Engage
AB - Header Disengage
AC - Push Down Header Disengage
AD - Pull Up Header Engage
AE - Header Reverse

4.3 Operating Windrower

Safely operating your machine requires familiarizing yourself with its capabilities.

4.3.1 Operational Safety

There are several safety considerations for the Operator to take into account before operating the windrower.

CAUTION

Follow these safety precautions:

- **Wear close-fitting clothing and protective shoes with slip resistant soles.**
- **Remove any foreign objects from the machine and from the surrounding area.**
- **Carry with you any protective clothing and personal safety devices that may be necessary through the day, such as a hard hat, protective glasses, goggles, heavy gloves, a respirator, and a dust mask. Don't take chances.**

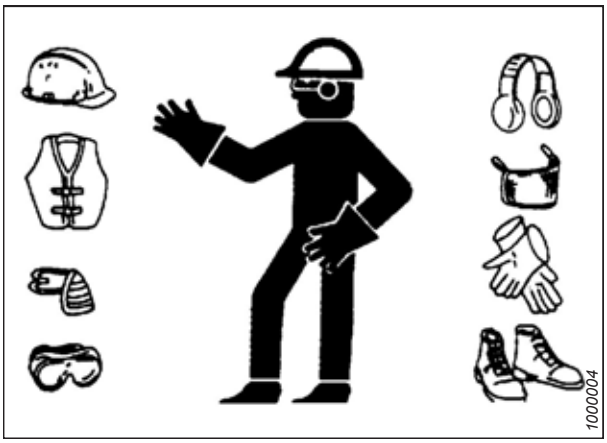


Figure 4.4: Safety Equipment

- **Protect yourself against noise. Wear a suitable hearing protective device such as earmuffs or ear plugs to protect against objectionable or uncomfortable loud noises.**
- **Follow all safety and operational instructions provided in the operator's manuals. If you do not have a manual, get one from your Dealer and read it thoroughly.**
- **Never attempt to start the engine or operate the machine except from the operator's seat.**
- **Check the operation of all controls in a safe clear area before starting work.**
- **Check for excessive vibration and unusual noises. If there is any indication of trouble, shut down and inspect the machine. Follow proper shutdown procedure. Refer to *Stopping Engine, page 173*.**

Figure 4.5: Safety Equipment

- **Operate the machine only in daylight or good artificial light.**

4.3.2 Break-In Period

During the first 150 hours of windrower operation, certain windrower systems will require extra attention.

DANGER

Before investigating an unusual sound or attempting to correct a problem, place the ground speed lever (GSL) in the N-DETENT position, shut off the engine, and remove the key from the ignition.

- Operate the engine at moderate load and avoid extremely heavy or light loading for longer than 5 minutes.

- Avoid unnecessary idling. If the engine will be idling longer than 5 minutes after reaching operating temperature, shut off the engine.
- Check the engine oil level frequently. Watch for any signs of oil leakage. If you need to add oil to the windrower's engine, refer to *5.8.3 Checking Engine Oil Level, page 352*.

  NOTE:

  During the break-in period, a higher-than-usual oil consumption should be expected.

  NOTE:

  If the windrower must be driven in cold weather (that is, when the ambient temperature is below freezing), let the engine idle for three minutes after starting the engine, and then operate the engine at moderate speed until the oil has warmed up.
- Monitor the coolant gauge in the cab to see if the engine coolant temperature rises beyond the normal operating range.
- Verify that the coolant level in the reserve tank (mounted next to radiator) stays between the HOT and COLD marks on the tank.

For more information about the cooling system, refer to *5.8.9 Engine Cooling System, page 379*.

In addition to the above items, carry out regular maintenance procedures, as detailed in *5.2 Maintenance Schedule, page 318*:

IMPORTANT:

Until you become familiar with the sound and feel of your new windrower, be extra alert and attentive.

NOTE:

Before taking the ground speed lever (GSL) out of the PARK position, let the hydraulic oil warm up to 32°C (90°F).

4.3.3 Preseason Checks / Annual Service

These checks should be performed at the beginning of every harvest season, or annually, whichever comes first.

CAUTION

- **Review this operator's manual annually to refresh your memory on safety and operating recommendations.**
- **Review all safety signs and other decals on the windrower and note any potential hazard areas.**
- **Ensure that all shields and guards are properly installed and secured. Never alter or remove safety equipment.**
- **Ensure that you understand and have practiced safe use of all the windrower's controls. Know the capacity and operating characteristics of the machine.**
- **Keep a properly stocked first aid kit and a charged fire extinguisher on the windrower.**

To prepare the windrower for field work after storing it, do the following:

1. Perform the following tasks:
   a. Drain off any excess hydraulic oil added for storage purposes. Refer to *5.11.3 Changing Hydraulic Oil, page 440*.
   b. Remove the plastic bags and/or tape from all sealed openings (for example: the air cleaner intake, the exhaust pipe, or the fuel tank).
   c. Charge the windrower's battery and install it. Ensure that the terminals are clean and that the cables are connected securely.
   d. If the diesel exhaust fluid (DEF) tank was drained for storage, ensure that the DEF tank drain plug is tight. Fill the DEF tank as needed.
   e. Adjust the tension on the air conditioning (A/C) compressor belt. For instructions, refer to *Tensioning Air Conditioner Compressor Belt, page 392*.
   f. Distribute the A/C refrigerant by cycling the A/C switch. For instructions, refer to *Cycling Air Conditioning Compressor Coolant, page 169*.
   g. Check the entire A/C system for leaks.
2. Perform the annual maintenance procedures. For instructions, refer to *5.2 Maintenance Schedule, page 318*.

Cycling Air Conditioning Compressor Coolant

If the windrower has been stored for more than week, the coolant in the air conditioning (A/C) compressor will need to be cycled before the cabin A/C system can be used.

1. Turn blower switch (A) to the first position, temperature control switch (D) to the maximum heating position, and air conditioning (A/C) control switch (B) to the OFF position.

WARNING

Ensure that all bystanders have cleared the area.

2. Start the engine. Allow the engine to operate at low idle until it is warm.
3. Move A/C switch (B) from the OFF position to the ON position for 1 second, then back to the OFF position for 5–10 seconds. Repeat this step ten times.

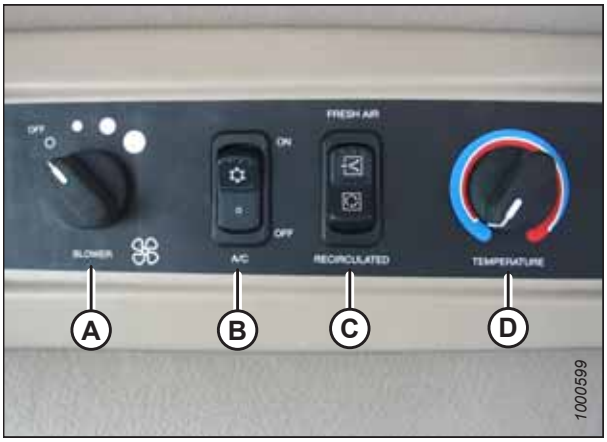


Figure 4.6: Climate Control

A - Blower Switch
B - Air Conditioning Switch
C - Outside Air Switch
D - Temperature Control

4.3.4 Daily Checks and Maintenance

Some quick checks and maintenance tasks will need to be performed daily on the windrower.

1. Check the machine for fluid leaks.

   NOTE:

   Use the proper procedure when searching for pressurized fluid leaks. For instructions, refer to *5.11.7 Hoses and Lines, page 449*.

2. Check for any missing or broken parts.

3. Clean the windrower's windows and mirrors to ensure good visibility in all directions. Stand on the platform to access the rear window. Hold onto the handholds on the cab front corners and stand on the header's anti-slip strips to get access to the front window.
4. Clean all lights and reflective surfaces.
5. Perform the specified daily maintenance procedures. For instructions, refer to *5.2 Maintenance Schedule, page 318*.

4.3.5 Engine Operation

To ensure the length of the windrower's service life, its engine needs to be started, operated, and shut down according to the provided procedures.

Starting Engine

To ensure its service life, the windrower's engine must be started by following the provided procedure.

DANGER

- **This machine has safety devices which allow the engine to start only when the ground speed lever is in the N-DETENT position, the steering wheel is locked in the NEUTRAL position, and the header drive switch is in the OFF position. Under no circumstances are these devices to be deliberately rewired or misadjusted so that the engine can be started with the controls out of the NEUTRAL position.**
- **Do NOT start the engine by shorting across the starter or starter relay terminals. The windrower will start and might be able to move if the drive is engaged.**
- **Start the engine only from the operator's seat with the controls in the NEUTRAL position. NEVER start the engine while standing on the ground. Never try to start the engine with someone under or near the windrower.**
- **Before starting the engine, ensure that there is plenty of ventilation; the exhaust from the engine is dangerous to bystanders when emitted in an unventilated environment.**

WARNING

If the starter is able to engage when the steering wheel is unlocked, or when the ground speed lever is out of the NEUTRAL position, or when the header clutch is engaged, DO NOT ATTEMPT TO OPERATE THE WINDROWER. Contact your Dealer immediately for more information.

IMPORTANT:

Do **NOT** tow the machine to start the engine; damage to the hydrostatic drives will result.

1. Main battery disconnect switch (A) is located on the right frame rail, behind the maintenance platform, and can be accessed by moving the platform. Ensure that the switch is in the POWER ON position.

WARNING

Before starting the engine, fasten your seat belt and ensure that the trainer's seat belt is used if the seat is occupied.

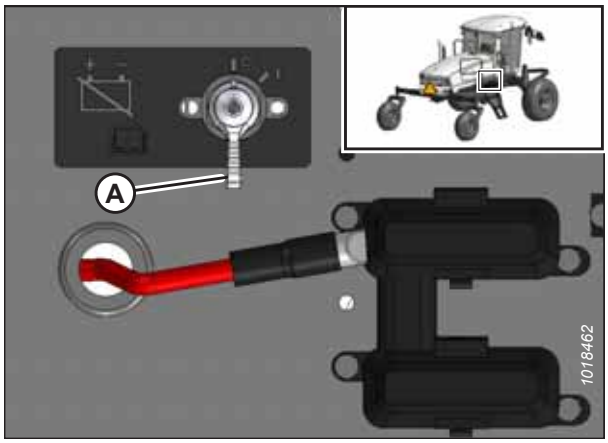


Figure 4.7: Battery Disconnect Switch

2. Ensure that lock (A) at the base of the steering column is engaged in either the cab-forward or the engine-forward position.
3. Move ground speed lever (GSL) (B) into the N-DETENT position.
4. Turn the steering wheel until it locks.

   NOTE:

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

   IMPORTANT:

   Do **NOT** attempt to force the wheel out of the locked position; damage to the traction system may occur.
5. Fasten the seat belt.
6. Push HEADER DRIVE switch (C) to ensure it is OFF.

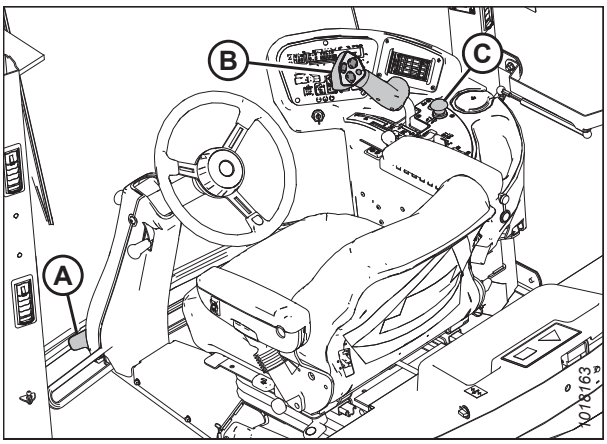


Figure 4.8: Operator Controls

DANGER

Ensure that all bystanders have cleared the area.

7. Set throttle (A) to the START position (fully back).
8. Sound the horn three times.
9. Turn ignition key (B) to the RUN position. A single loud tone will sound, the engine warning lights will light up as the ignition self-test is performed, and the cab display module (CDM) will display the messages HEADER DISENGAGED and IN PARK.
10. Turn ignition key (B) to the START position until the engine starts, then release the key. The CDM will display programmed header data for five seconds (if a header is attached to the windrower), and then will resume displaying whatever was previously displayed.

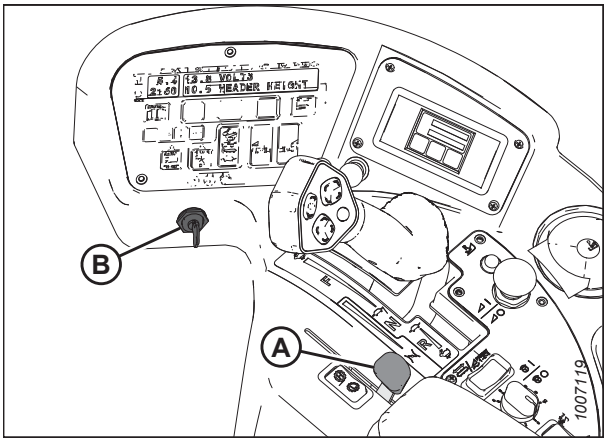


Figure 4.9: Operator Console

IMPORTANT:

The cab display module (CDM) provides important information about the windrower's operating status. Familiarize yourself with the CDM's display screen. For more information, refer to *3.18 Cab Display Module, page 81*.

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 trying to start the engine again.
- After the third unsuccessful attempt to start the engine, allow the solenoid to cool for 10 minutes before trying again. If the engine still does not start, refer to *7.1 Engine Troubleshooting, page 473*.
- Do **NOT** operate the engine above 1500 rpm until the engine temperature gauge indicates that the engine coolant temperature is above 40°C (100°F).

NOTE:

Before taking the GSL out of the PARK position, let the hydraulic oil warm up to 32°C (90°F).

Starting Engine – Cold Temperature

When attempting to start the windrower's engine when the ambient temperature is below 5°C (40°F), follow this modified procedure.

WARNING

If the starter is able to engage when the steering wheel is unlocked, or when the ground speed lever (GSL) is out of the NEUTRAL position, or when the header clutch is engaged, DO NOT START the ENGINE. Contact your MacDon Dealer for more information.

1. Set throttle (A) to the START position (fully back).
2. Turn ignition key (B) to the RUN position.

   Grid heater light (C) on the CDM will cycle ON–OFF–ON after two seconds for a preset length of time. The operating period for the glow plug light will change depending on the engine temperature.
3. Sound the horn three times.
4. When grid heater light (C) goes out, turn the ignition key to the START position, and crank the engine until it starts. Leave throttle (A) at the IDLE position.
5. If the engine fails to start, repeat this procedure, beginning with Step *2, page 172*.

   NOTE:

   When the ambient temperature is below 5°C (40°F), the engine will cycle through a period when it sounds as though it is struggling to stay running. This is normal.

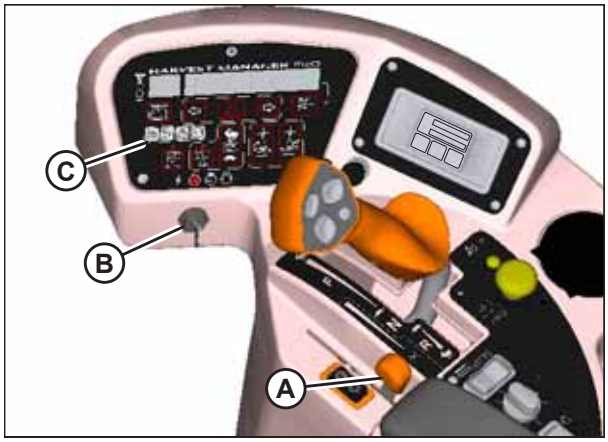


Figure 4.10: Operator Controls

IMPORTANT:

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

Engine Warm-Up

The windrower's engine must be allowed to reach operating temperature before you begin doing field work.

Allow the engine to run with throttle lever (A) at or near the low-idle position until the reported temperature reaches approximately 40°C (100°F). Before taking the ground speed lever (GSL) out of PARK, let the hydraulic oil warm up to 32°C (90°F).

NOTE:

You can view the engine temperature reading in the cab display module (CDM). For more information, refer to *Engine Temperature, page 174*.

Figure 4.11: Operator Console

Engine Intermediate Speed Control

The windrower's engine can be set so that it operates at a particular speed. This feature is useful when cutting a light crop, where maximum engine output is not needed; this allows for reduced fuel consumption, noise levels, and emissions, while also reducing wear on the engine.

The engine operating speed can be set to enable the windrower to operate at reduced rpm: 1900, 2050, or 2200 rpm. This can be done without significantly affecting the ground or header speeds. The default setting is 2200 rpm or the last selected speed setting.

The programmed engine speed is activated when the header is engaged.

For instructions on using engine intermediate speed control, refer to *Setting Engine Intermediate Speed Control, page 118*.

Stopping Engine

Before turning the ignition key to the OFF position, ensure that the windrower has been idled for a sufficient amount of time.

CAUTION

Park on a flat, level surface with the header on the ground, the ground speed lever (GSL) in the N-DETENT position, and the steering wheel in the locked position (centered). To confirm that the parking brake is engaged, wait for the cab display module (CDM) to beep and display the message IN PARK.

IMPORTANT:

Before stopping the engine, allow the engine to run at low idle for approximately 5 minutes. This will allow heated engine parts to cool down, and will allow the turbocharger to slow down while engine oil pressure is available.

1. If there is a header attached to the windrower, then lower the header.
2. Place GSL (B) into the N-DETENT position.
3. Lock the steering wheel.
4. Turn ignition key (A) counterclockwise to the OFF position. The engine will stop.

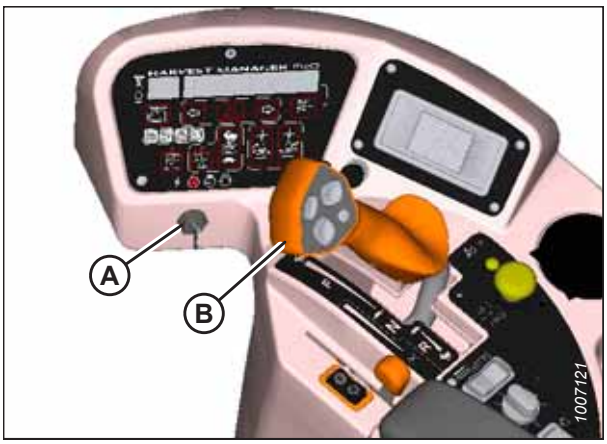


Figure 4.12: Operator Console

Engine Temperature

The reported engine temperature tells the Operator how hot the coolant that circulates around the engine is. The windrower's engine is designed to work optimally at a specific coolant temperature, so the coolant temperature should be checked periodically during operation.

The engine temperature will be displayed on cab display module (CDM) (A) when this option has been selected using SELECT button (B) on the ground speed lever (GSL) handle, or SELECT switch (C) on the CDM.

The normal engine operating temperature range is 82–104°C (180–220°F).

If the reported engine coolant temperature exceeds 104°C (220°F), the CDM will begin to emit a tone intermittently, and the flashing message ENGINE TEMP will appear on the display. Stop the engine **IMMEDIATELY** and determine the cause of the overheating condition before attempting to operate the windrower again. When the engine coolant temperature drops below 102°C (215°F), the CDM will stop emitting the tone and the ENGINE TEMP message will not appear on the display any longer.

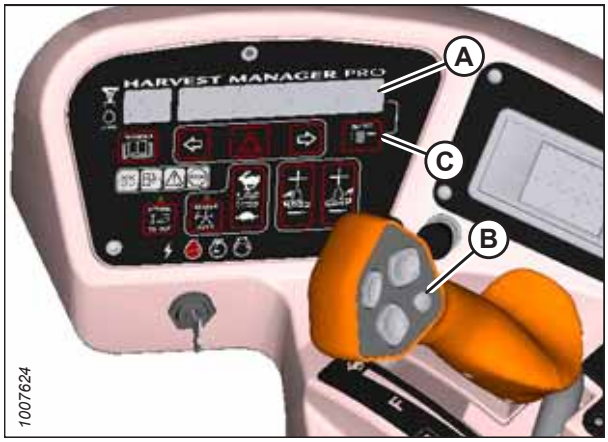


Figure 4.13: Operator Console

NOTE:

Before taking the ground speed lever (GSL) out of the PARK position, let the hydraulic oil warm up to 32°C (90°F).

Engine Oil Pressure

Oil pressure is a critical parameter of engine operation, since the quality of lubrication directly determines the efficiency and lifespan of the windrower's engine. If oil pressure is too low or too high, the engine's performance and longevity can be adversely affected. Oil pressure warnings may trigger the lighting up of the symbols on the operator's console and messages on the cab display module (CDM).

The nominal engine oil pressure is 69 kPa (10 psi) at low idle and 380 kPa (55.1 psi) at maximum rated speed.

If the oil pressure drops below 52 kPa (7.5 psi), an error code and error message will appear on the CDM.

If the STOP ENGINE symbol lights up, stop the engine **IMMEDIATELY** and investigate.

IMPORTANT:

Attempting to operate the engine when the STOP ENGINE symbol is lit can result in permanent damage to the engine.

If the yellow CAUTION symbol lights up, the windrower can continue to be operated safely. However, it is **STRONGLY** recommended that the Operator continue to monitor the engine carefully.

Cab Display Module Voltage Display

The electrical system's voltage is displayed on the cab display module (CDM) when this option is selected with the SELECT button on the ground speed lever (GSL) handle or the SELECT switch on the CDM.

Refer to the table below for information on what the various voltage readings might indicate about the status of the electrical system.

Table 4.1 Windrower Electrical System Voltage Readings and their Interpretations

Ignition State	Engine State	Reading (V)	Indicated Condition
ON	Running	13.8–15.0	The electrical system is working as expected
		> 16.0[14]	The regulator is out of adjustment
		< 12.5[14]	The alternator is not working, or the regulator is out of adjustment
	Shut down	12.0	The electrical system is working as expected

Engine Warning Lights

The engine warning light symbols on the operator's console are used to alert the Operator to abnormal engine operating states. Operators should familiarize themselves with the meanings of these symbols, as operating the engine when a symbol is active can lead to irreversible engine damage.

There are four engine warning lights on the operator's console. Any of these symbols may light up if the windrower's computer detects abnormalities while the engine is running. The engine warning lights should **NOT** be lit when the windrower is operating normally. For more information, refer to *Engine Warning Lights, page 91*.

4.3.6 Exhaust System Cleaning

The exhaust aftertreatment system uses diesel exhaust fluid (DEF) and selective catalyst reduction (SCR) technology to reduce the emission of nitrogen oxides (NOx). The process involves injecting DEF (a nitrogenous compound which decomposes into ammonia) into the exhaust over a catalyst. The ammonia reacts with NOx, producing harmless nitrogen and water. However, prolonged use of DEF can lead to the buildup of crystallized DEF in the emission system. SCR technology is used to heat the exhaust system to remove crystallized DEF.

Automatic exhaust system cleaning events maintain the performance of the aftertreatment system by increasing exhaust temperatures in order to remove the buildup of crystallized DEF. Automatic cleaning occurs any time during machine operation as long as the INHIBIT SCR CONDITIONING switch is OFF. Turn on the INHIBIT SCR CONDITIONING switch if the environment is not suitable for high exhaust temperatures (for example, when the windrower is inside a building). The INHIBIT SCR CONDITIONING switch is intended as a temporary measure; if the INHIBIT switch is left on for an extended period, the windrower's computer will derate the engine's performance until manual SCR conditioning is performed.

Activate the MANUAL SCR CONDITIONING exhaust system cleaning if the automatic exhaust system cleaning was deactivated during normal operation. Engine speed may vary between 1000 and 1400 rpm during manual exhaust system cleaning.

For more information on interacting with the exhaust system cleaning system, refer to *3.15.1 Fuel and Diesel Exhaust Fluid Display Module, page 69*.

14. When the reading is above 16.0 volts, the voltage message on the CDM will begin flashing, and the CDM will emit a single loud tone. The CDM will emit another tone every 30 minutes, until the voltage reading drops below 16.0 volts.

4.3.7 Driving Windrower

Driving the windrower presents several safety risks, which can be mitigated or avoided by following the provided safety instructions.

DANGER

- **NEVER move the ground speed lever (GSL) or the steering wheel until you are sure all bystanders have cleared the area.**
- **Ensure that the area is clear of bystanders and obstacles before making turns; the ends of an attached header travel in a wide arc.**
- **Check the operation of all controls in a safe area before starting work.**
- **Understand the capabilities and the operating characteristics of your machine.**
- **Do NOT allow riders in or on the machine.**
- **Do NOT operate the machine unless you are seated in the operator's position.**
- **Do NOT attempt to get on or off of a moving windrower.**
- **AVOID sudden starts and stops.**
- **AVOID inclines, ditches, and fences.**
- **Do NOT rapidly accelerate or decelerate when turning.**
- **REDUCE your speed before turning, crossing slopes, or travelling over rough ground.**
- **Do NOT allow anyone to stand behind the machine while it is operating, as objects may be forcibly ejected by the header and could injure bystanders.**

WARNING

Seat belts can help ensure your safety when they are properly used and maintained.

- **Before starting the engine, fasten your seat belt, and ensure that the training seat occupant's seat belt is securely fastened.**
- **Never wear a seat belt loosely or leave any slack in the belt system. Never wear the belt in a twisted condition or pinched between the seat structural members.**

WARNING

Avoid driving the machine with the header removed. Removing the header decreases the weight on the drive wheels, reducing steering control. If you must drive the machine with the header removed and without a MacDon weight system:

- **Use the windrower's low-speed range.**
- **Do NOT allow the engine to exceed 1500 rpm.**
- **Avoid loose gravel and slopes.**
- **Never use the windrower as a towing vehicle when the header is removed, except as instructed in *Towing Header with Windrower, page 190*. There is insufficient weight on the drive wheels to provide steering control.**
- **If control of the machine is lost, immediately pull the ground speed lever (GSL) to the NEUTRAL position.**
- **Be aware that the cab is NOT designed to withstand a rollover. Because of the windrower's operating characteristics, a reinforced cab capable of withstanding a rollover is not required.**

WARNING

When operating the windrower on an incline:

- **Lower the header.**
- **Reduce the windrower's ground speed.**
- **Move the GROUND SPEED RANGE switch to L (low range).**
- **If the windrower's ground speed is greater than or equal to 40 km/h (25 mph), the CDM will display a warning message (SLOW DOWN) and will emit a tone. Move the GSL closer to NEUTRAL to reduce the windrower's ground speed.**

CAUTION

Hydrostatic steering control differs from mechanical steering in these respects:

- **Hydrostatic steering is more sensitive than mechanical steering. Do NOT make abrupt changes in steering direction.**
- **When operating the windrower in reverse, take account of the fact that steering wheel will produce the opposite results, compared to operating in the forward direction.**
- **When the engine is running, moving the ground speed lever out of the N-DETENT position will unlock the steering wheel. Any movement of the steering wheel will then cause the machine to move, even if the ground speed lever is still in the NEUTRAL position.**
- **The parking brake is only applied when the GSL is in the N-DETENT position and the steering wheel is centered and locked.**

Entering and Exiting Windrower

Safely exiting or entering the windrower's cab requires that you follow the proper procedure.

CAUTION

To prevent slipping and possible injury, ALWAYS face the windrower and use the hand rail when dismounting or mounting. NEVER attempt to get on or off a moving windrower. Before leaving the operator's seat for any reason:

- **Park the windrower on a flat, level surface. Put the ground speed lever into the N-DETENT position and center the steering wheel in the locked position. Wait for the cab display module (CDM) to emit a tone and display an "In Park" message to confirm that the parking brake is engaged.**
- **Fully lower the header and the reel (if applicable).**
- **Disengage the header drives.**
- **To prevent bodily injury or death from the unexpected startup of the machine, always stop the engine and remove the key from the ignition.**
- **Turn off the lights, unless their being on is required for inspection purposes.**
- **Release the seat belt.**
- **Turn off the wipers.**
- **Raise the armrest and steering wheel for easier exit and re-entry.**
- **Lock the cab door if you are leaving the windrower unattended.**

Swing-away platforms and stairs (A) are provided on both sides of the windrower to accommodate cab-forward and engine-forward access to the operator's station, as well as several maintenance tasks.

The left cab-forward side platform is shown in the rearward (cab-forward) position.

Two doors (B) are provided for cab entry and exit in either cab-forward mode or engine-forward mode. Enter the cab using whichever door is opposite the operator's console.

NOTE:

When the engine is shut down, the rear field lights will activate for 60 seconds. The rear field lights will illuminate the platform and the stairs, allowing for safe egress from the windrower.

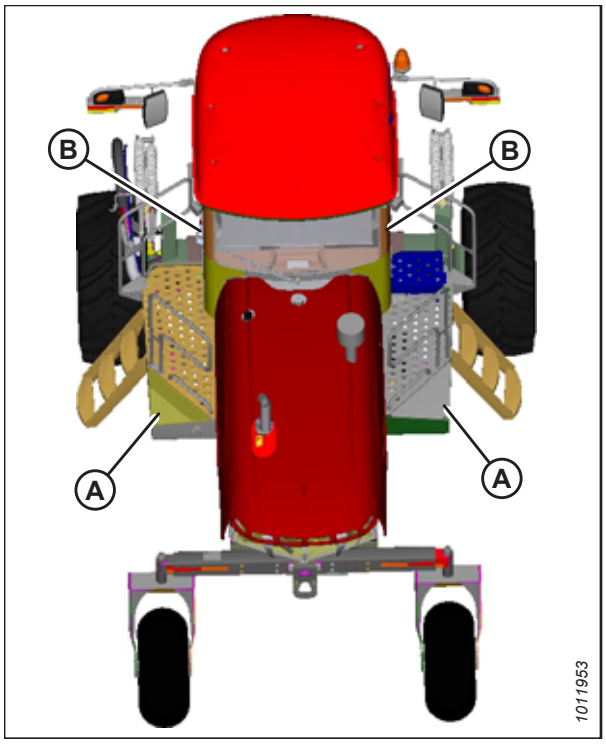


Figure 4.14: Platforms and Doors

Driving Forward in Cab-Forward Mode

The windrower can be operated in cab-forward mode when you want to attach the windrower to and operate a header. Be aware that the windrower will steer from the rear when in this mode; the windrower should be operated gently until you are comfortable with this mode.

CAUTION

Operate both the steering wheel and the ground speed lever (GSL) slowly until you are familiar with them. Avoid the common tendency of new Operators to oversteer (that is, to turn more sharply than necessary).

WARNING

Do NOT drive the windrower on the road when it is in cab-forward mode, unless it is equipped with the proper lighting and markings for cab-forward road travel.

In cab-forward mode, the operator's station is facing away from the engine. If necessary, swivel the operator's seat to the cab-forward position as follows:

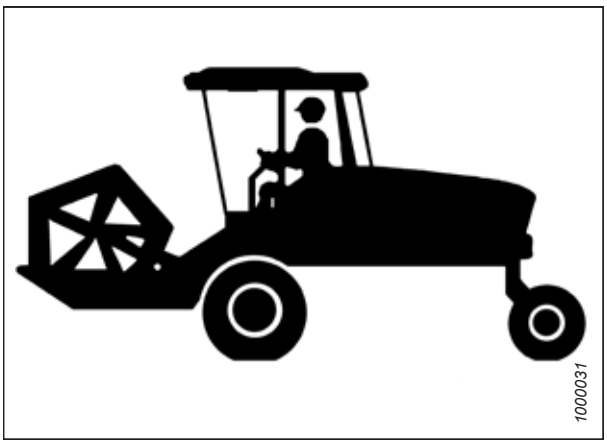


Figure 4.15: Cab-Forward Mode

1. Move GSL (A) to the N-DETENT position. The engine can be running.

   IMPORTANT:

   If the GSL is **NOT** in the N-DETENT position, the GSL cable may be damaged when you swivel the operator's station.

2. Pull up and hold knob (B) to release latch (C) at the base of the steering column.

3. Turn the steering wheel counterclockwise to pivot the operator's station clockwise 180°. When the operator's station has turned fully, the pin will engage the latch, securing the operator's station in its position.

4. Ensure that the Operator's seat belt is fastened.

5. If it is not already running, start the engine. For instructions, refer to *Starting Engine, page 170*.

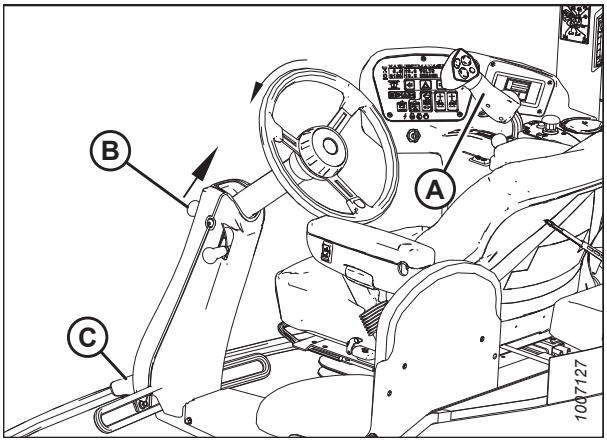


Figure 4.16: Operator's Station Position Change Latch

6. Raise the header just enough to clear common obstacles. Do not raise the header higher than is necessary, as this will upset the windrower's center of gravity. Ensure that the Operator has good visibility out of the cab and that motorists are able to see the header's lights.

7. There are two cab-forward speed ranges. Set GROUND SPEED RANGE switch (A) to either **H** (0–25.7 km/h [16 mph]), or **L** (0–17.7 km/h [11 mph]).

8. Slowly push throttle (B) to the fully forward position (that is, the operating speed position). The cab display module (CDM) should display 2320–2350 rpm on screen (C).

CAUTION

Check again to be sure that all bystanders have cleared the area.

9. Slowly move GSL (E) out of the N-DETENT position to the desired speed setting. The selected speed setting will appear on screen (D).

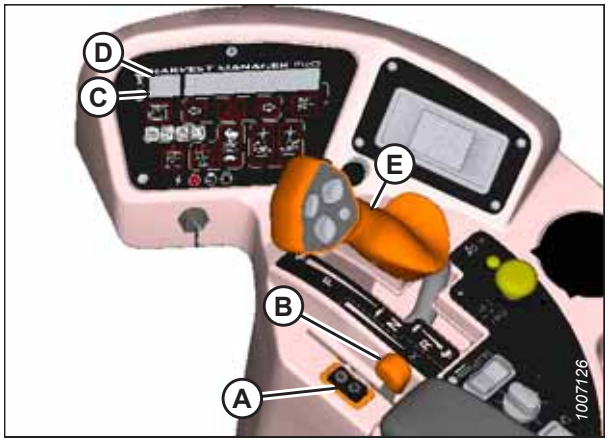


Figure 4.17: Operator Console

Driving in Reverse in Cab-Forward Mode

The windrower's GROUND SPEED RANGE switch will need to be in the low position before the windrower can be operated in reverse. When reversing, the steering wheel will produce the opposite response in the direction of the windrower from that produced when it is operating in the forward direction.

WARNING

Back up slowly. Hold the steering wheel at the bottom and turn the wheel in the direction you want the rear (cab-forward) of the machine to travel.

1. Move GROUND SPEED RANGE switch (A) to **L** (the low-range position).

2. Move throttle lever (B) to a mid-range position.

   NOTE:

   Steering will be less sensitive when the windrower is operating in the low-speed range, and the engine speed will be reduced.

CAUTION

Ensure that all bystanders have cleared the area.

3. Move the ground speed lever (GSL) rearward to the desired speed setting.

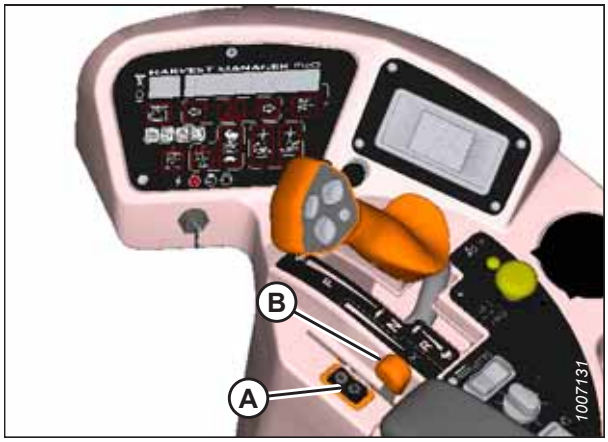


Figure 4.18: Operator's Console

4. Steer the windrower as shown.

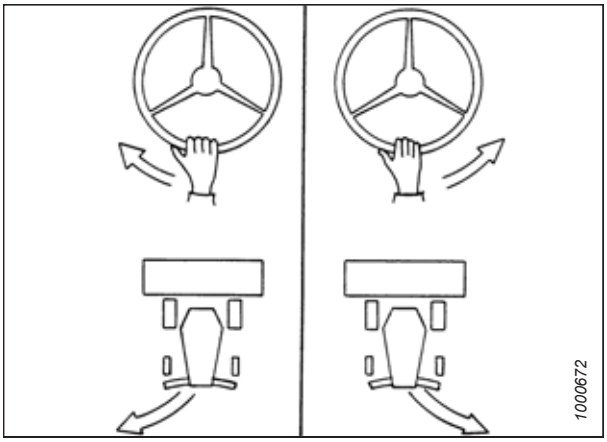


Figure 4.19: Operating in Reverse when the Windrower is in Cab-Forward Mode

Driving Forward in Engine-Forward Mode

In engine-forward mode, the operator's station will face the engine, and the header will be behind the Operator. Generally, this mode is used when operating the windrower on a roadway.

If necessary, swivel the operator's station to the engine-forward position:

Figure 4.20: Engine-Forward – Seat Faces Engine

1. Place ground speed lever (GSL) (A) in the N-DETENT position and lock the steering wheel. The engine can be running.

   IMPORTANT:

   If the GSL is **NOT** in the N-DETENT position, the GSL cable may be damaged when you swivel the operator's station.

2. Pull up on and hold knob (B) to release latch (C) at the base of the steering column.

3. Turn the steering wheel counterclockwise to pivot the operator's station clockwise 180°. When the operator's station has turned fully, the pin will engage the latch, securing the operator's station in its position.

4. If it is not already running, start the engine. For instructions, refer to *Starting Engine, page 170*.

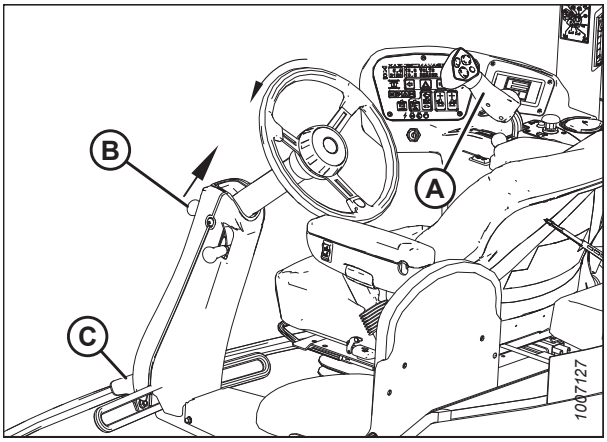


Figure 4.21: Engine-Forward – Seat Faces Engine

5. Set GROUND SPEED RANGE switch (A) to the **H** position for road speed (0–37 km/h [23 mph]). The cab display module (CDM) will display ROAD GEAR at location (F) and will emit a tone.

6. Slowly push throttle (B) to the fully forward position (operating speed). The CDM will display 2320–2350 rpm at location (C).

DANGER

Ensure that all bystanders have cleared the area.

7. Slowly move GSL (E) forward to the desired speed. The reported ground speed will appear at location (D).

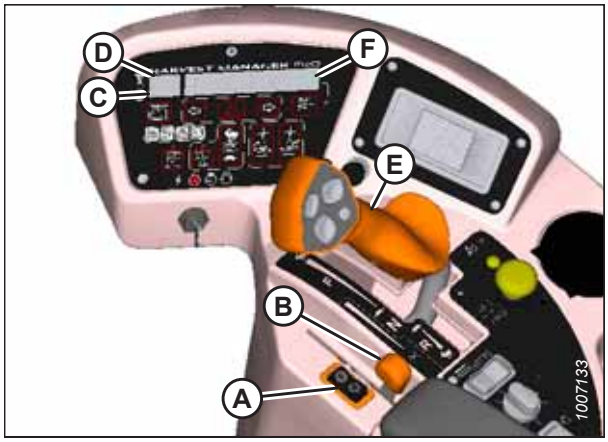


Figure 4.22: Operator Console

CAUTION

Operate both the steering wheel and ground speed lever slowly while becoming familiar with the machine. Remember that the steering is more sensitive when the speed-range control is in high road speed position. Avoid the common tendency of new Operators to oversteer.

8. If more tractive power is required (for example, when driving up a ramp, up a hill, or out of a ditch):
   a. Move GSL (E) closer to NEUTRAL.
   b. Switch speed-range control (A) to the **L** (low range) position.
9. Once the windrower is on flat ground:
   a. Set GSL (E) to **NOT MORE THAN HALF** of the maximum forward speed.
   b. Move speed-range switch (A) to **H** (high range).

   NOTE:

   The steering is more sensitive in this speed range.

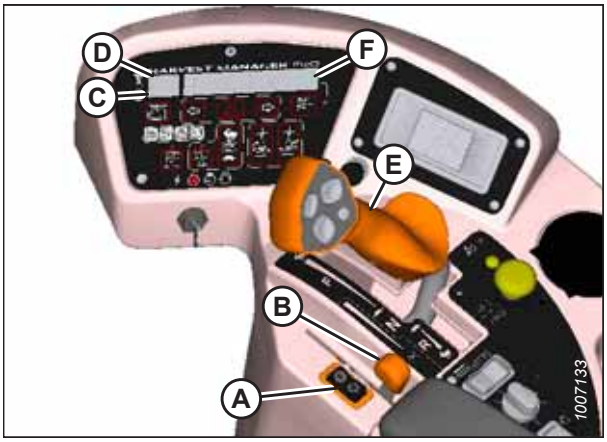


Figure 4.23: Operator Console

Driving in Reverse in Engine-Forward Mode

Ensure that the windrower's GROUND SPEED RANGE switch is in the low position before attempting to operate in reverse. Be aware that the steering wheel will produce the opposite response in the direction of the windrower from that produced when it is operating in the forward direction.

WARNING

Back up slowly. Hold the steering wheel at the bottom and turn the wheel in the direction you want the rear (cab-forward) of the machine to travel.

1. Move speed-range switch (A) to the **L** (low-range) position.
2. Move throttle lever (B) to a mid-range position.

   NOTE:

   Reversing in the low-speed range and at a reduced engine speed is recommended, since steering will be less sensitive than at higher speed settings.

DANGER

Ensure that all bystanders have cleared the area.

3. Move ground speed lever (GSL) (C) rearward to the desired speed.

Figure 4.24: Operator Console

4. Steer the windrower as shown.

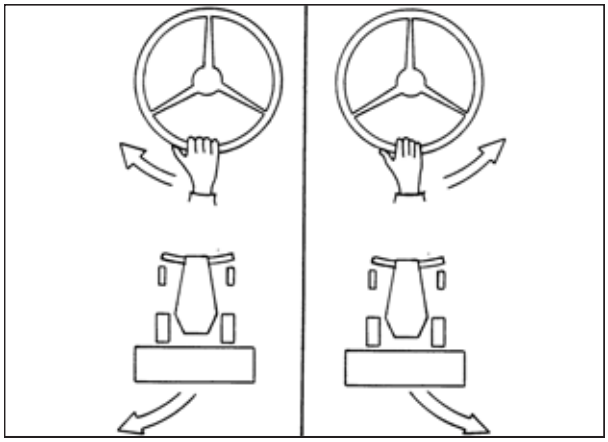


Figure 4.25: Operating in Reverse when Windrower is in Cab-Forward Mode

Spin Turning

The caster wheels on the windrower allow for turns with a very small radius. The faster the windrower is going, the larger the radius of the turn will be.

CAUTION

Be sure the area is clear before making turns. Although the windrower pivots on the spot, the ends of the header travel faster and in a large arc.

1. Move ground speed lever (GSL) (A) out of the N-DETENT position to a moderate setting.
2. Slowly turn the steering wheel in the direction in which you would like the windrower to turn. The windrower will pivot between the drive wheels.
3. To increase the radius of the turn, slowly move the GSL away from NEUTRAL.

   NOTE:

   The higher the ground speed, the wider the turn will be.
4. To stop the turn, slowly turn the steering wheel back to its centered position.

Figure 4.26: Operator Console

Stopping

Moving the ground speed lever to the N-DETENT position applies the windrower's wheel brakes. After the windrower has stopped, the engine will need to be allowed to idle for a sufficient amount of time before it can be shut off.

WARNING

Do NOT move the ground speed lever (GSL) rapidly back to NEUTRAL. You may be thrown forward by a sudden stop and the wheels may skid, reducing steering control. Always wear a seat belt when operating the windrower.

CAUTION

Park on a flat, level surface with the GSL in the N-DETENT position and the steering wheel centered in the locked position. Wait for the CDM to beep and display an "In Park" message to confirm the parking brake is active.

1. **SLOWLY** return GSL (A) to the NEUTRAL position and into the N-DETENT position.
2. Turn the steering wheel until it locks.
3. Move throttle lever (B) to the low idle position.

   NOTE:

   Avoid idling the engine unnecessarily. Stop the engine if it will be idling for longer than five minutes.

   NOTE:

   The brakes are automatically engaged when the steering wheel is locked in the NEUTRAL position.

   IMPORTANT:

   Before stopping the engine, allow the engine to run at low idle for approximately five minutes to allow hot engine parts to cool, and to allow the turbocharger fan to slow down while engine oil pressure is still available.
4. Turn the ignition key counterclockwise to the OFF position.

Figure 4.27: Operator Console

4.3.8 Adjusting Caster Tread Width

The windrower's rear casters can be moved closer together. This allows the windrower to be loaded onto a trailer and shipped without having to remove the casters entirely. A narrower tread width also suits windrowers paired with smaller headers, by allowing more space for the uncut crop. A narrower setting also makes it easier to maneuver around obstacles such as poles and irrigation inlets. Wider settings are more suitable for heavy crops, which can produce large windrows.

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 flat, level surface with the header on the ground, the ground speed lever (GSL) in the N-DETENT position, and the steering wheel in the locked position (centered). To confirm that the parking brake is engaged, wait for the cab display module (CDM) to beep and display the message IN PARK.

1. Park the windrower on level ground, shut down the engine and remove the key from the ignition.

2. Position a jack or other lifting device under the frame at location (A). Raise the rear of the windrower slightly so that most of the weight is off of the casters.

   NOTE:

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

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

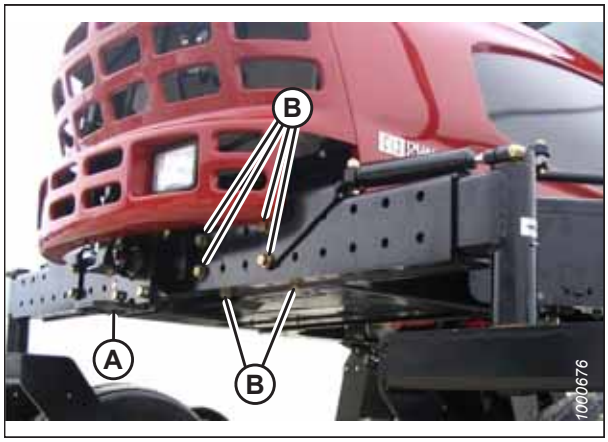


Figure 4.28: Caster Wheel Extensions

4. Slide the extensions inboard or outboard equally and align the holes at the desired locations.

   NOTE:

   Use the caster wheels to assist in moving the extensions: rotate the casters until the wheels are parallel to the walking beam.

Figure 4.29: Caster Wheel Extensions

IMPORTANT:

The caster wheels must be an equal distance (as indicated by [A]) from the center of the windrower.

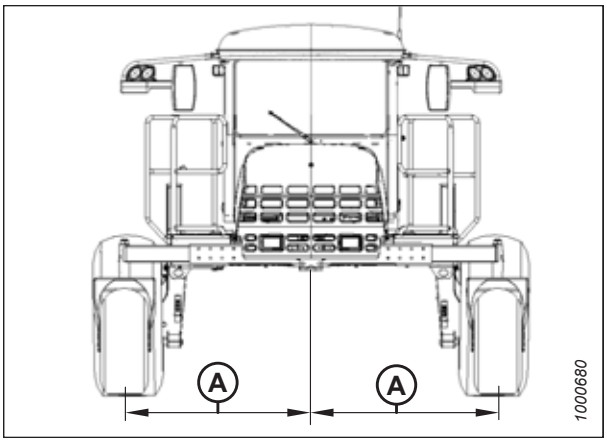


Figure 4.30: Adjustable Caster Wheels

5. Line up the holes in the walking beam. Install shorter bottom bolts (B).
6. Position bracket (A) and install back bolts (C).
7. Tighten the bolts as follows:
   a. Snug bottom bolts (B), then snug back bolts (C).
   b. Tighten and torque back bolts (C) to 447 Nm (330 lbf·ft).
   c. Tighten and torque bottom bolts (B) to 447 Nm (330 lbf·ft).
8. Lower the windrower to the ground.

   IMPORTANT:

   Torque the bolts again after the first 5 and 10 hours of operation after changing the position of the casters.

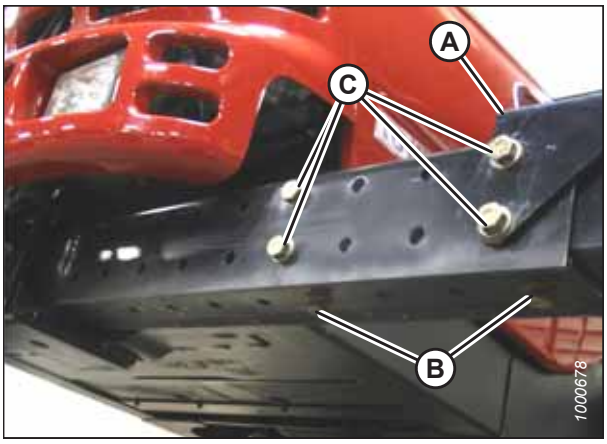


Figure 4.31: Caster Wheel Extensions

4.3.9 Transporting

The windrower can be driven from one location to another. If correctly equipped, the windrower can also tow a header. The windrower should generally **NOT** be towed, however, as this can result in damage to the hydrostatic drives, though a procedure for emergency towing is provided.

Driving on Road

The windrower is designed to be driven on the road with the engine facing forward to provide better visibility for the Operator and improved stability for the machine. The windrower can also be driven on the road in cab-forward mode, but at a reduced speed and under restricted conditions.

WARNING

A collision between the windrower and other vehicles may result in injury or death.

WARNING

When driving the windrower on public roadways:

- **Obey all highway traffic regulations in your area. Arrange to have pilot vehicles in the front and the rear of the windrower, if doing so is required by law.**
- **Display a slow-moving vehicle emblem and flashing warning lights, unless these actions are prohibited by law.**
- **If the width of the attached header impedes other vehicle traffic, remove the header and install a MacDon-approved weight box on the windrower. This will allow the windrower to be driven safely on roadways without an attached header.**

WARNING

- **Do NOT drive the windrower on the road when it is in cab-forward mode, unless the optional lighting and marking kit is installed; the marking and lighting on the windrower when it is in this mode are not compliant with most road regulations. For more information, refer to *6.4.1 Lighting and Marking for Cab-Forward Road Travel, page 472*.**
- **Do NOT drive the windrower on a road or a highway at night or in conditions that reduce visibility, such as fog or rain. The width of the windrower may not be apparent to other drivers in these conditions.**

CAUTION

Operate both the steering wheel and ground speed lever slowly while becoming familiar with the machine. Remember that the steering is more sensitive when the speed-range control is in high road speed position. Avoid the common tendency of new Operators to oversteer.

CAUTION

Familiarize yourself with the width regulations and lighting and marking requirements in your region before attempting to drive the windrower on a public road.

Before driving the windrower on a public roadway:

1. Ensure that HEADER DRIVE switch (A) is in the OFF position (down).
2. Clean the flashing amber lamps, red tail lamps, and head lamps, and ensure that they work properly.
3. Clean all reflective surfaces and slow moving vehicle emblems.
4. Clean the windows.
5. Adjust the interior rear view mirror so that you can see behind you.

Figure 4.32: Header Drive Switch

6. Push the LIGHT switch to ROAD position (A) to activate the lamps. Always use these lamps when operating the windrower on public roads. For more information, refer to *3.6 Exterior Lighting, page 51*.

   NOTE:

   If the auto-road light feature is activated (that is, when the windrower is in the engine- or cab-forward mode, is out of park, is in high range switch position, and has the header disengaged), only the two front corner field lights will turn on; the other field lights will be inactive.

7. Use HIGH/LOW LIGHTS (B) as needed to see farther. Turn the high beams off when other vehicles are approaching; refer to your local regulations to learn the legally required minimum distance at which the high beams must be turned off.

8. Push BEACON switch (C) to the ON position to activate the beacons.

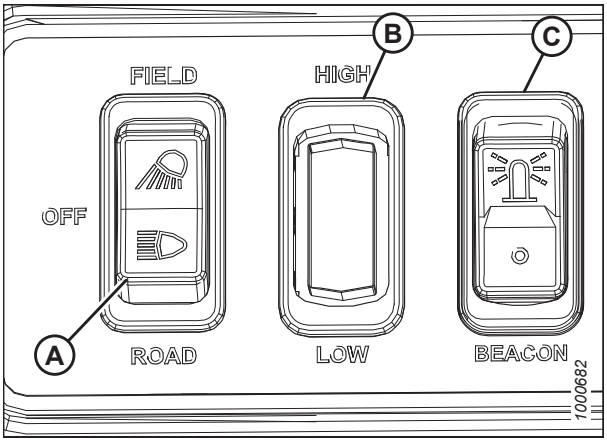


Figure 4.33: Light Switches

9. Press switch (A) on the cab display module (CDM) to activate the hazard lights.

   IMPORTANT:

   Switch ON the beacon and hazard lights when travelling on the road with the transmission in the low range.

Figure 4.34: CDM

10. Set GROUND SPEED RANGE switch (A), the ROAD speed setting. The CDM will display ROAD GEAR at location (F) if the windrower is in engine-forward mode.

    NOTE:

    The GROUND SPEED RANGE switch can be moved to this position while the windrower is moving, but the windrower's ground speed must be less than 8 km/h (5 mph) for the road gear to successfully engage.

11. Slowly push throttle (B) to the fully forward position (operating speed). The CDM should display 2320–2350 rpm (C).

12. Slowly move ground speed lever (GSL) (E) forward to the desired speed. The reported ground speed will be displayed at location (F).

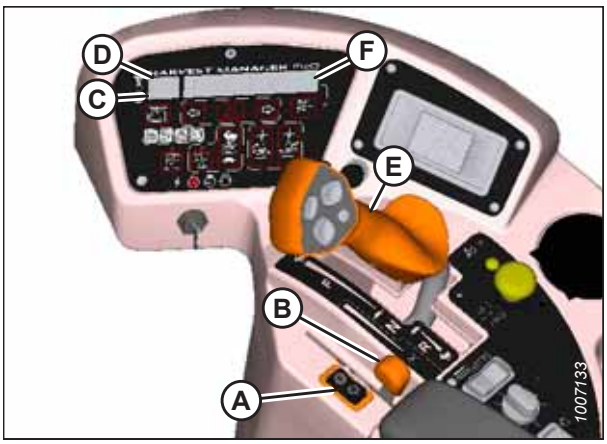


Figure 4.35: Operator Console

13. If you intend to drive on a public roadway while towing a header, refer to *Towing Header with Windrower, page 190* for more information.

Towing Header with Windrower

The windrower can be used to tow a MacDon draper header that has the Slow Speed Transport option installed. Ensure that the optional weight box or an approved header transporter is installed on the windrower to transfer the windrower's weight to the lift arms.

WARNING

- **A windrower without a header or weight box must NOT be used to tow a header, because the windrower will be unbalanced, which can cause the Operator to lose control of the machine.**
- **When towing equipment which lacks its own electric brakes, do NOT allow the windrower's ground speed to exceed 32 km/h (20 mph).**

Figure 4.36: Towing a Header

CAUTION

- **To tow a header with an M155*E4* Self-Propelled Windrower, the header must be equipped with the appropriate equipment to comply with local regulations.**
- **Before towing, conduct a pretrip inspection to verify that the relevant signal lighting and safety equipment is installed and functioning properly.**
- **Do NOT exceed the Combined Gross Vehicle Weight (CGVW) specified in Table *4.2, page 190*.**
- **To prevent equipment damage or injury, ensure that the windrower and its attached equipment are within the following weight limits:**

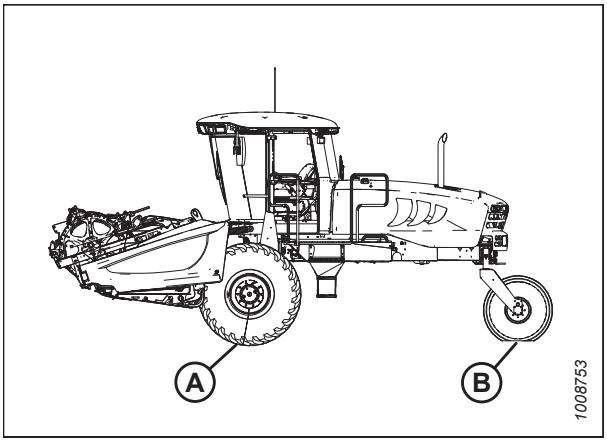


Figure 4.37: M Series Windrower

Table 4.2 Maximum Weight

		kg	lb.
Maximum GVW (includes mounted implements)		9750	21,500
Maximum CGVW (includes towed and mounted implements)		10,480	23,100
Weight on both drive wheels (A)	**Maximum**	8500	18,750
	Minimum	4570	10,070
Maximum weight on both caster tires (B)		2750	6050

Converting Windrower from Field to Transport Mode

To tow a header equipped with the Slow Speed Transport option, the windrower must be converted from field to transport mode. A weight box will be needed to ensure that the windrower remains balanced.

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

To prevent bodily injury from the fall of a raised header, always engage the safety props when working on or around a raised header, and before going under the header for any reason.

1. Lower the header.
2. Disconnect the following hydraulic and electrical connections:
   a. **Left side:** Arrange the hydraulic hoses and electrical cable into the storage position. For instructions, refer to the header operator's manual.
   b. **Right side:** Release the multi-link and place it into the storage position on the windrower. For instructions, refer to the header operator's manual.
3. Retrieve the temporary lift pin from its storage location on the weight box and install it into rear hole (A) at the top of the lift arms. This provides additional lift height so that the transport wheels can easily be deployed.

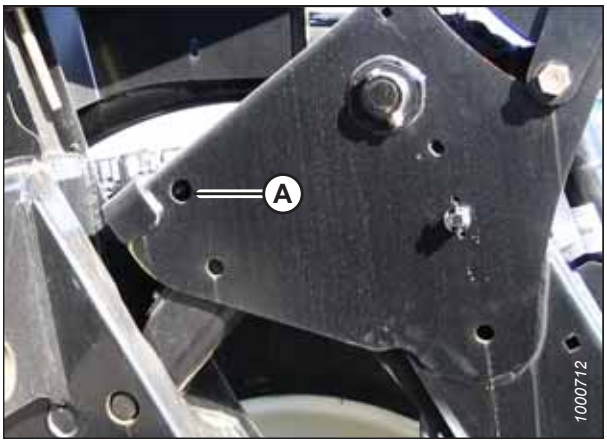


Figure 4.38: Lift Arms

DANGER

Ensure that all bystanders have cleared the area.

4. Start the engine.
5. Raise the header to its maximum height.
6. Stop the engine, and remove the key from the ignition.
7. Engage the safety props on the windrower's lift cylinders. Refer to *4.4.1 Engaging and Disengaging Header Safety Props, page 203* for instructions.
8. Deploy the header's Slow Speed Transport system. For instructions, refer to the header operator's manual.

Figure 4.39: Header in Transport Mode

9. Remove the float pin from engaged position (A) and insert it in storage location (B). Secure the pin with a lynch pin.

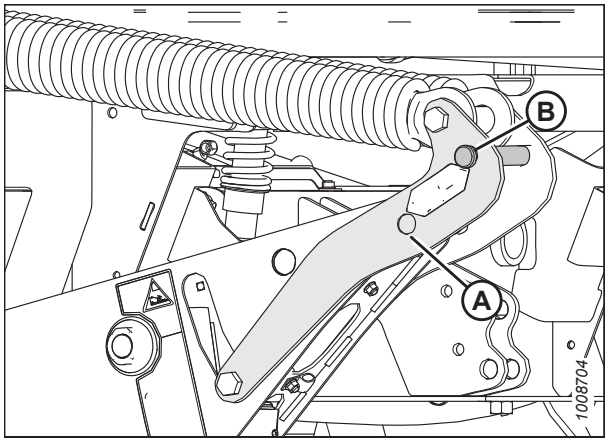


Figure 4.40: Lift Arms

10. Remove pins (A) from the lower end of the lift linkages.

    NOTE:

    Pins (A) are also used to secure the weight box to the windrower linkage.

11. Release the safety props on the header lift cylinders. For instructions, refer to *4.4.1 Engaging and Disengaging Header Safety Props, page 203*.

12. Start the engine.

13. Lower the header until the weight is resting on the transport wheels.

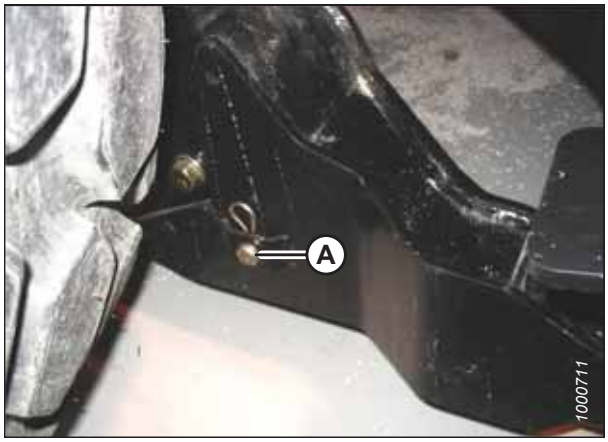


Figure 4.41: Lift Arms

14. Use the HEADER TILT switches to release the load on the center-link, if necessary.

15. Shut down the engine and remove the key from the ignition.

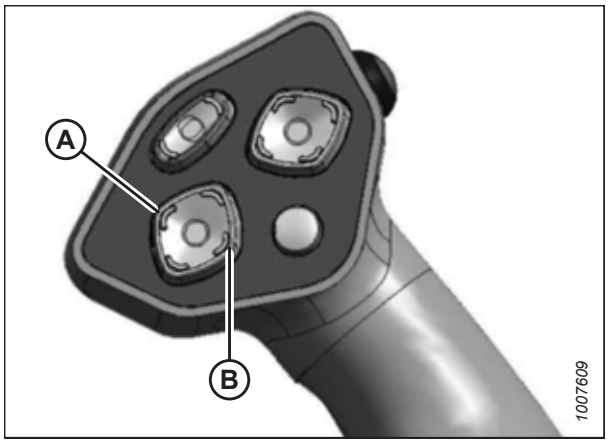


Figure 4.42: Ground Speed Lever (GSL)

A - Header Tilt Down **B - Header Tilt Up**

16. If the windrower is equipped with a hydraulic center-link, disconnect the center-link:

    a. Pull up on latch (A), and position the latch into notch (B) on the top of the hook.

    b. Release the safety props on the header lift cylinders. For instructions, refer to *4.4.1 Engaging and Disengaging Header Safety Props, page 203*.

    c. Disengage the top-link from the header. If necessary, use the HEADER TILT switch to release load on the cylinder.

17. To unlock the center-link, pull up on latch (A) and position the latch into notch (B) on the top of the hook.

18. Lift the center-link off of the header pin.

    NOTE:

    If the center-link self-alignment kit is installed, start the engine and raise the center-link using the REEL UP switch on the ground speed lever (GSL).

19. Slowly back the windrower away from the header.

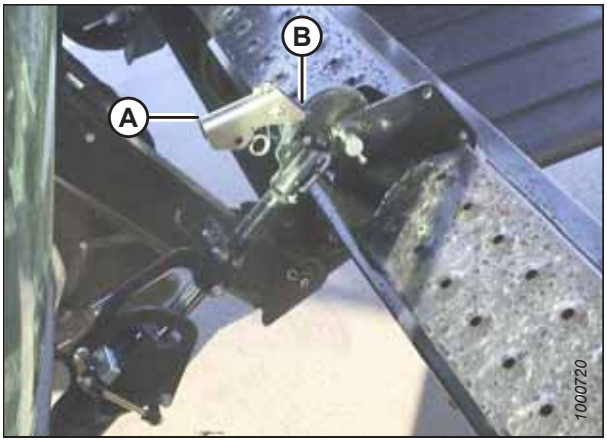


Figure 4.43: Hydraulic Link

Attaching Header in Transport Mode to Windrower

Once the windrower has been converted from the field position to the transport position, the weight box can be attached to the windrower, and the header's tow-bar can be attached to the weight box.

To attach the transport hitch to the header:

1. Position end (A) of the aft section onto front wheel hook (B).

2. Push down until latch (C) captures end (A).

3. Secure latch (C) with clevis pin (D).

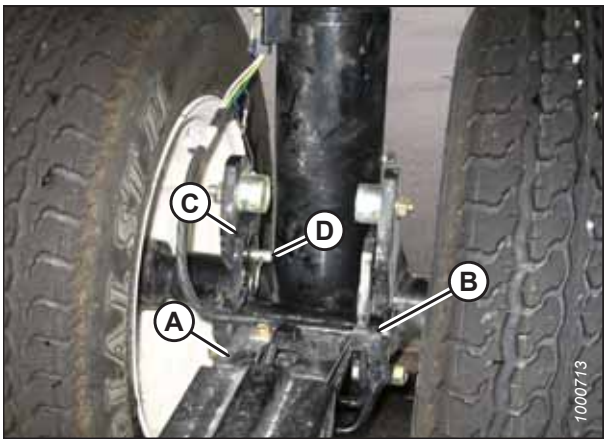


Figure 4.44: Transport Hitch

4. Remove the L-pin from end (A) of the aft section (if installed).

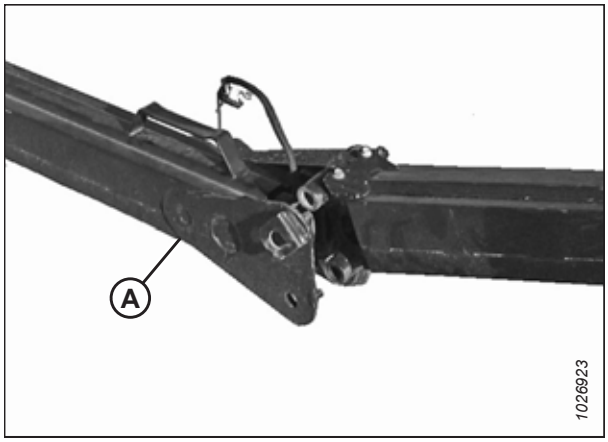


Figure 4.45: Transport Hitch

5. Position end (B) of the forward section into end (A) of the aft section. Lower the forward section into the aft section.

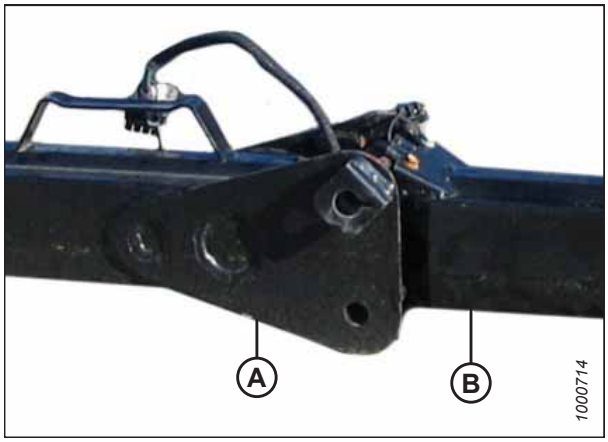


Figure 4.46: Transport Hitch

6. Fully insert L-pin (A) in the upper hole and turn the pin to lock it. Secure the pin with lynch pin (B).

7. Complete the electrical connection at joint (C).

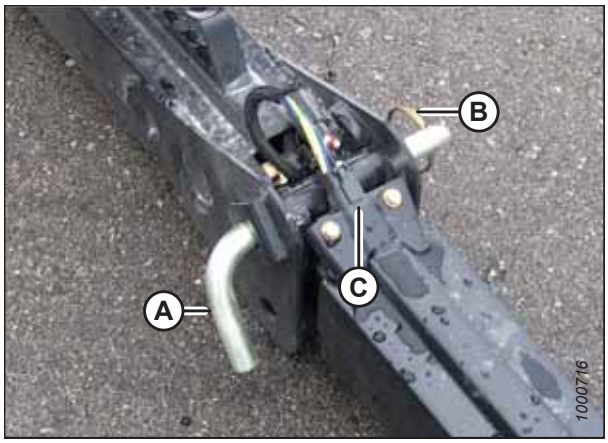


Figure 4.47: Transport Hitch

8. Complete the electrical connection at header wheel (A).

Figure 4.48: Header Transport Wheel

IMPORTANT:

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

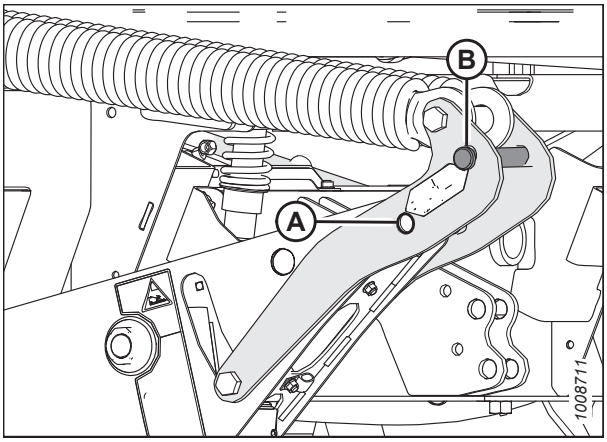


Figure 4.49: Lift Linkage

9. Drive the windrower forward so that the windrower's lift arms enter into the weight box's lift pockets.

10. Raise the lift arms slightly. Install locking pins (A) into the pockets through the windrower's lift linkages. Secure the locking pins with hairpins.

NOTE:

Pins (A) were previously removed from the header lift linkage's lower ends.

Figure 4.50: Windrower Lift Linkage

11. Route weight box harness (A) to the electrical connector on the left lift linkage. Connect the harness to connector (B) on the windrower.
12. Raise the lift arms fully.
13. Shut down the engine, and remove the key from the ignition.

Figure 4.51: Weight Box

14. Move the float pins from storage location (A) to engaged position (B).

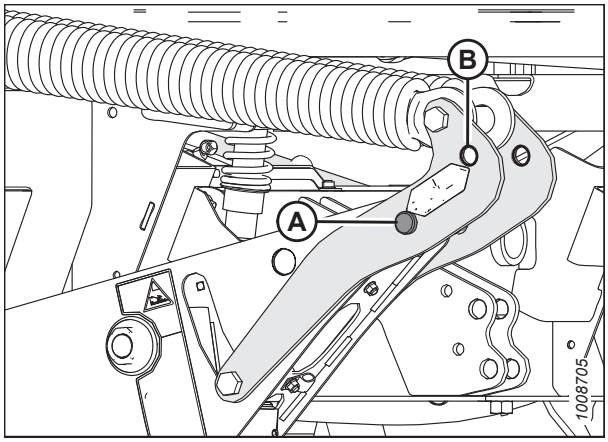


Figure 4.52: Lift Linkage

DANGER

Ensure that all bystanders have cleared the area.

15. Start the engine.
16. Press HEADER DOWN switch (A) on the ground speed lever (GSL) to lower the lift arms until the rear of the arms lift away from the linkage.

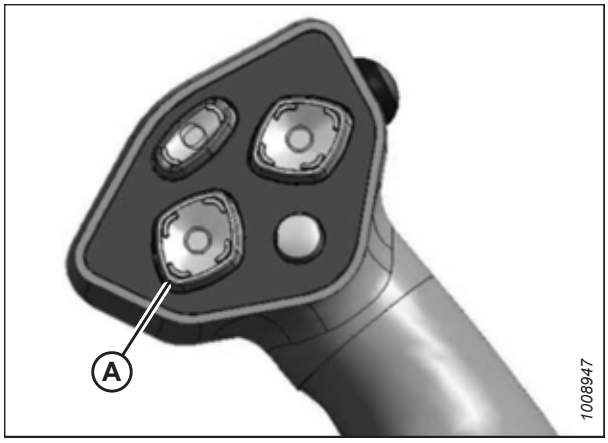


Figure 4.53: GSL

17. Attach the Slow Speed Transport hitch to the weight box tongue using the drawbar pin. Secure the hitch using lynch pin (A). Attach safety chain (B).

18. Connect hitch harness (C) to the electrical socket at the front of the weight box.

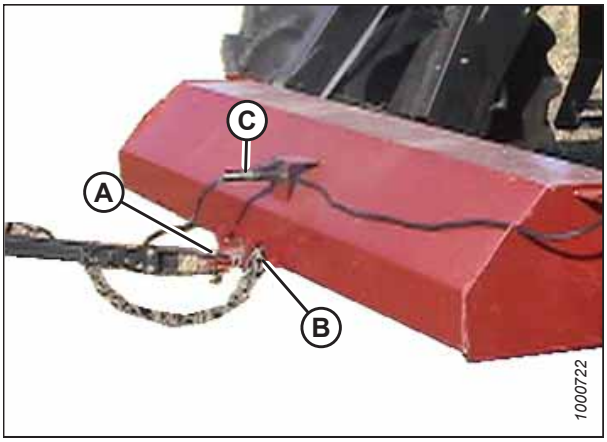


Figure 4.54: Weight Box

19. Remove temporary lift pins (A) (these should be sitting loose in the lift arms) and place them into the storage holes on the weight box.

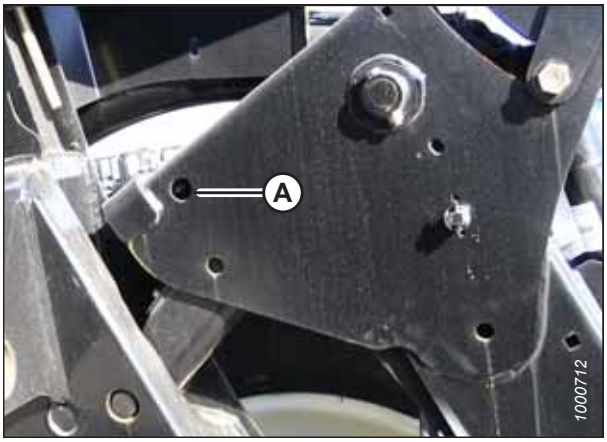


Figure 4.55: Lift Arms

Converting from Transport Mode to Field Mode

Once the windrower and towed header have been moved to their new location, the windrower and header must be converted back to field mode before they can be used for field work.

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. Stop the engine, and remove the key from the ignition.
2. Disconnect the electrical harness at connector (B) from the windrower. Store harness (A) on the weight box.

Figure 4.56: Electrical Harness

3. Disconnect wiring connector (A) at the front wheel.

Figure 4.57: Header Transport Wheel

4. Remove clevis pin (D).
5. Push latch (C) and lift tow-bar (A) from the hook. Release the latch and replace the clevis pin.
6. Unhook the tow-bar from the weight box.

Figure 4.58: Header Transport Wheel

DANGER

Ensure that all bystanders have cleared the area.

7. Start the engine.
8. Lower the lift arms until the rear of the lift arms floats up and away from the lift arm mechanism.
9. Stop the engine, and remove the key from the ignition.
10. Remove temporary lift pins (A) from the weight box. Install the pins into the holes at the rear of the lift arms.
11. Start the engine.
12. Raise the lift arms to their maximum height.
13. Stop the engine, and remove the key from the ignition.
14. Engage the lift cylinder safety props. For instructions, refer to *4.4.1 Engaging and Disengaging Header Safety Props, page 203*.
15. Disengage the float. Store the pins at storage hole location (B). Move the float pins from working hole location (A).

    IMPORTANT:

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

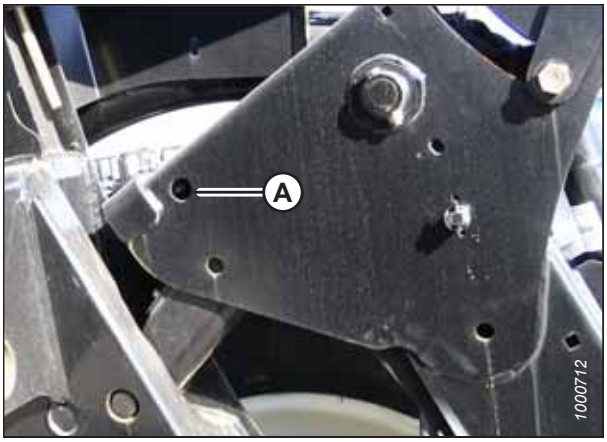


Figure 4.59: Lift Arms

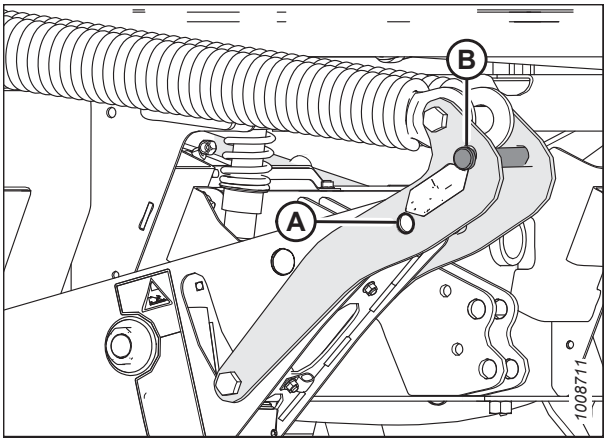


Figure 4.60: Float Pins

16. Remove pins (A) securing the lift linkages to the weight box. Retain the pins so they can be used to attach the header to the windrower.
17. Disengage the lift cylinder safety props. For instructions, refer to *4.4.1 Engaging and Disengaging Header Safety Props, page 203*.
18. Start the engine.
19. Lower the weight box onto blocks, and back the windrower away.
20. Attach the header to the windrower. For instructions, refer to *4.5 Attaching and Detaching Headers, page 226*.
21. Convert the header to field position. Refer to the header operator's manual for instructions.

Figure 4.61: Weight Box

Towing Windrower – Emergency

Towing the windrower is generally **NOT** recommended; however, it is important to be prepared for emergency situations if the windrower gets stuck, or must be hauled onto a truck or trailer.

IMPORTANT:

- **NEVER** attempt to start the windrower by towing it; damage to the wheel drives may occur.
- Failure to disengage the wheel drives before attempting to tow the header will result in transmission damage.
- Tow the windrower only for short distances, on level ground, and at slow speed.

DANGER

When the windrower's wheel drives are disengaged (turned inward), the windrower's brakes and steering will be nonfunctional, and the windrower will be able to roll away. After towing the windrower, place blocks under the front and rear wheels to prevent uncontrolled movement.

1. Disengage the wheel drives. For instructions, refer to *Engaging and Disengaging Wheel Drives, page 200*.
2. Use attachment point (A) to tow the windrower if it gets stuck, or if it must be hauled onto a trailer for transport.
3. Place the blocks under the front and rear wheels to prevent uncontrolled movement.
4. Engage the windrower's wheel drives. For instructions, refer to *Engaging and Disengaging Wheel Drives, page 200*.

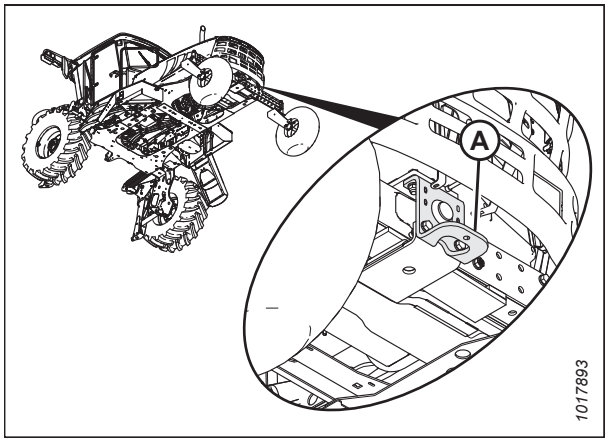


Figure 4.62: Emergency Towing

Engaging and Disengaging Wheel Drives

The wheel drives, along with the wheel drive motors, provide the motive force needed to turn the windrower's drive wheels. They may need to be disengaged for certain maintenance operations, or to tow the header.

WARNING

Park the windrower on a flat, level surface. Chock the wheels when disengaging the wheel drive to prevent the windrower from rolling away.

1. Park the windrower on a level surface.

2. Remove two bolts (A) at the center of the drive wheel.
3. Remove cap (B) and flip it over so that the convex side faces in.

   NOTE:

   The cap depresses a pin which disengages the wheel drive.
4. Reinstall bolts (A) to secure cap (B).
5. Repeat Step *2, page 201* to Step *4, page 201* on the other drive wheel.
6. **To engage the wheel drives:** reverse cap (B). Ensure that the pin at the center of the wheel pops out to engage the wheel drive.

   NOTE:

   Engaging the wheel drives may require rocking the wheels slightly.

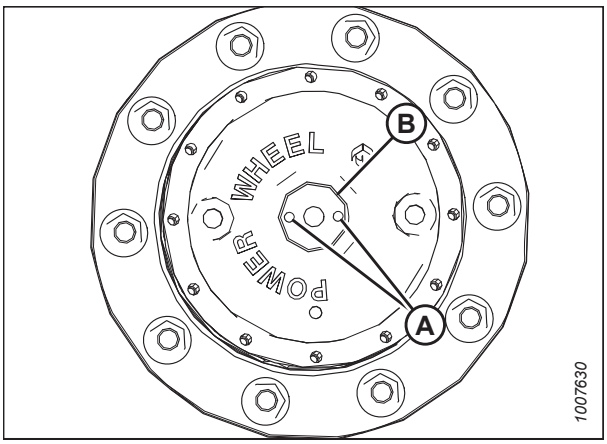


Figure 4.63: Wheel Drives – 10 Bolt

4.3.10 Storing Windrower

Several tasks must be performed before the windrower can be stored at the end of the season.

WARNING

Never use gasoline, naphtha, or any volatile material for cleaning purposes. These materials are toxic and can be flammable.

CAUTION

Never operate the engine in an unventilated building. Proper ventilation is required to prevent exhaust gas hazards from occurring.

CAUTION

All of the exposed metal parts on a battery are electrically conductive. Never lay a metal object across the battery terminals; this will cause a short-circuit.

1. Clean the windrower thoroughly.
2. Store the windrower in a dry, protected place.
3. Remove and properly store the windrower's batteries. For instructions, refer to *Removing Batteries, page 405*.
4. Charge the windrower's batteries and store them in a cool, dry area in an upright position. Do **NOT** stack one battery on top of another unless the batteries are both in cartons.
5. If the windrower is to be stored outside, cover the windrower with a waterproof tarpaulin or other protective material.
6. If no cover is available, seal the air cleaner intake and exhaust pipe with plastic bags and/or waterproof tape.
7. If possible, store the windrower on blocks to take the weight off of the tires. If blocking up the machine is not possible, increase the tire pressure by 25% over the recommended level. Be sure to adjust the tire pressure to the recommended operating value before the windrower is operated again.
8. Repaint all worn or chipped painted surfaces to prevent rust.

9. Lubricate the windrower thoroughly, leaving excess grease on the grease fittings. Apply grease to the exposed threads and the sliding surfaces of components.

10. Inspect the windrower for any worn or damaged components and repair them as needed. Tighten loose hardware. For the hardware torque values, refer to *8.2 Recommended Torque Values, page 493*.

11. Check for any broken components and order replacements from your Dealer. Attending to these items right away will save time and effort at the beginning of the next season.

12. To protect the cylinder rods from rust and corrosion, retract the header lift cylinders, float cylinders, and header tilt cylinders.

13. Add an approved rust inhibitor to the engine oil in accordance with the manufacturer's instructions. Run the engine to operating temperature to mix the inhibitor with the oil, unless the product directs you to do otherwise.

14. To prevent condensation, fill the hydraulic oil reservoir to the top of the filler neck with an approved hydraulic system oil. For instructions, refer to *5.11.1 Checking and Filling Hydraulic Oil, page 439*.

15. Test the engine coolant antifreeze concentration to ensure it is sufficient to protect the engine against the lowest expected ambient emperature.

16. In climates where the ambient temperature regularly falls below 0°C (32°F), ensure that the diesel exhaust fluid (DEF) tank is less than 75% full.

17. If the machine is to be stored for longer than six months, drain the DEF tank.

4.4 Operating with Header

Operating the windrower with a header refers to the procedures needed to attach the header to and detach it from the windrower, and to use the header in the field.

This windrower is designed to operate with a MacDon A Series Auger Header, R or R1 Series Rotary Disc Header, or D or D1 Series Draper Header with or without an attached Hay Conditioner. For the procedures for attaching the header to and detaching it from the windrower, refer to *4.5 Attaching and Detaching Headers, page 226*.

4.4.1 Engaging and Disengaging Header Safety Props

Safety props are located on both header lift cylinders on the windrower. Engage the props any time you are going to work on or around the header when it is raised. When engaged, the safety props prevent a header from dropping suddenly if the lift system hydraulics lose pressure.

DANGER

To prevent bodily injury from the fall of a raised header, always engage the safety props when working on or around a raised header, and before going under the header for any reason.

1. Start the engine.
2. Press HEADER UP switch (A) on the ground speed lever (GSL) to raise the header to its maximum height.

   NOTE:

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

   a. Press and hold HEADER UP switch (A) until both cylinders stop moving.

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

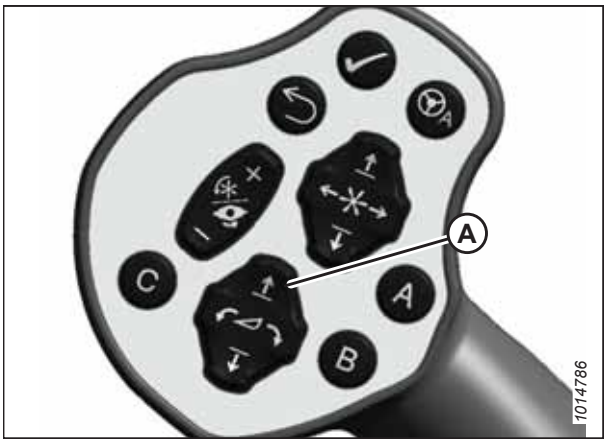


Figure 4.64: Ground Speed Lever

3. To engage the safety props on the lift cylinders:
   a. Pull lever (A) and rotate it toward the header to lower safety prop (B) onto the cylinder.
   b. Repeat the previous step for the opposite lift cylinder.

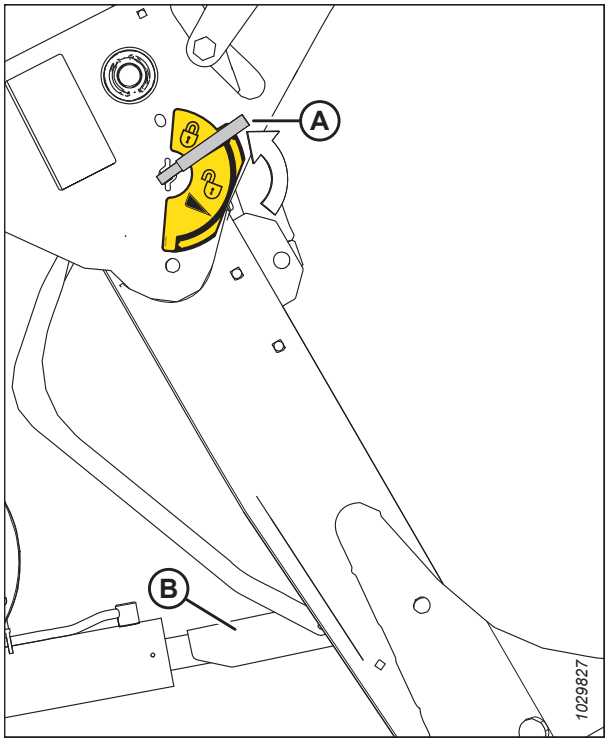


Figure 4.65: Safety Prop

DANGER

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

4. To disengage the safety props on the lift cylinders:
   a. Turn lever (A) away from the header to raise the safety prop until the lever locks into the vertical position.
   b. Repeat the previous step for the opposite cylinder.

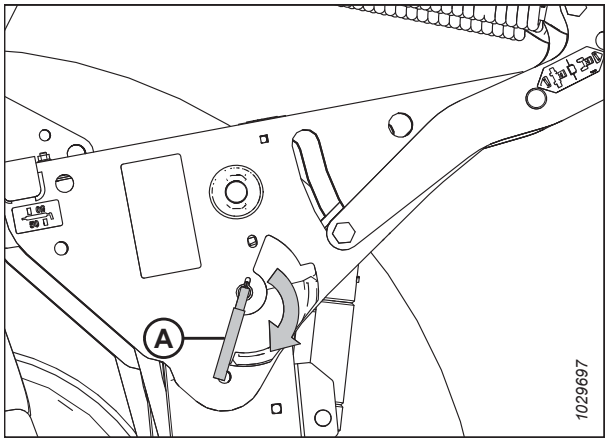


Figure 4.66: Safety Prop

WARNING

Ensure that all bystanders have cleared the area.

5. Start the engine.
6. Lower the header fully.
7. Shut down the engine, and remove the key from the ignition.

4.4.2 Header Float

The header float feature allows the header to follow the contours of the ground closely as the windrower moves forward. The header is able to respond to sudden changes in elevation or obstacles quickly. The float setting is ideal when the cutterbar rides along the ground with minimal bouncing, and without scooping or pushing soil.

IMPORTANT:

- Configure the header float setting to be as light as possible, while limiting the amount of bouncing produced by the header. Doing so will reduce the amount of wear placed on knife components, and will prevent the header from scooping soil.
- Prevent the header from bouncing excessively by operating at a slower ground speed when the float setting is light. A bouncing header results in raggedly cut crop.
- Before setting the header float, install all of the header kits (for example: upper cross auger; skid shoes; slow speed transport kit). If the slow speed transport (SST) tow-bar will be stored on the header during operation, set the float with the tow bar in place.
- Adjust the float when adding or removing optional attachments which change the weight of the header.

Float Operating Guidelines

Follow these instructions to get the best performance out of the header float system.

When working with the cutterbar on the ground:

- Set the center-link to the mid-range position (5.0 on cab display module [CDM]). For instructions, refer to *4.4.5 Adjusting Header Angle, page 214*.
- When the header is level with the ground, minimize the scooping of rocks by adjusting the header skid shoes downward to raise the guards.
- To prevent the header from pushing soil, adjust the height or the angle of the header.

When cutting with a draper header's cutterbar off the ground:

- Set the center-link to the mid-range position (5.0 on CDM). For instructions, refer to *4.4.5 Adjusting Header Angle, page 214*.
- Balance the amount of header weight carried by the float and by the stabilizer wheels. For instructions, refer to your draper header operator's manual.
- Use the CDM's controls to automatically maintain the proper cutting height. For instructions, refer to *4.4.6 Controlling Cutting Height, page 217*.

Checking Float

The windrower is equipped with primary (coarse) and secondary (fine) float adjustment systems. The primary adjustment allows the Operator to move the system's drawbolts to change the tension on the springs in the lift linkages. The secondary adjustment allows the Operator to use hydraulic cylinders to change the spring tension.

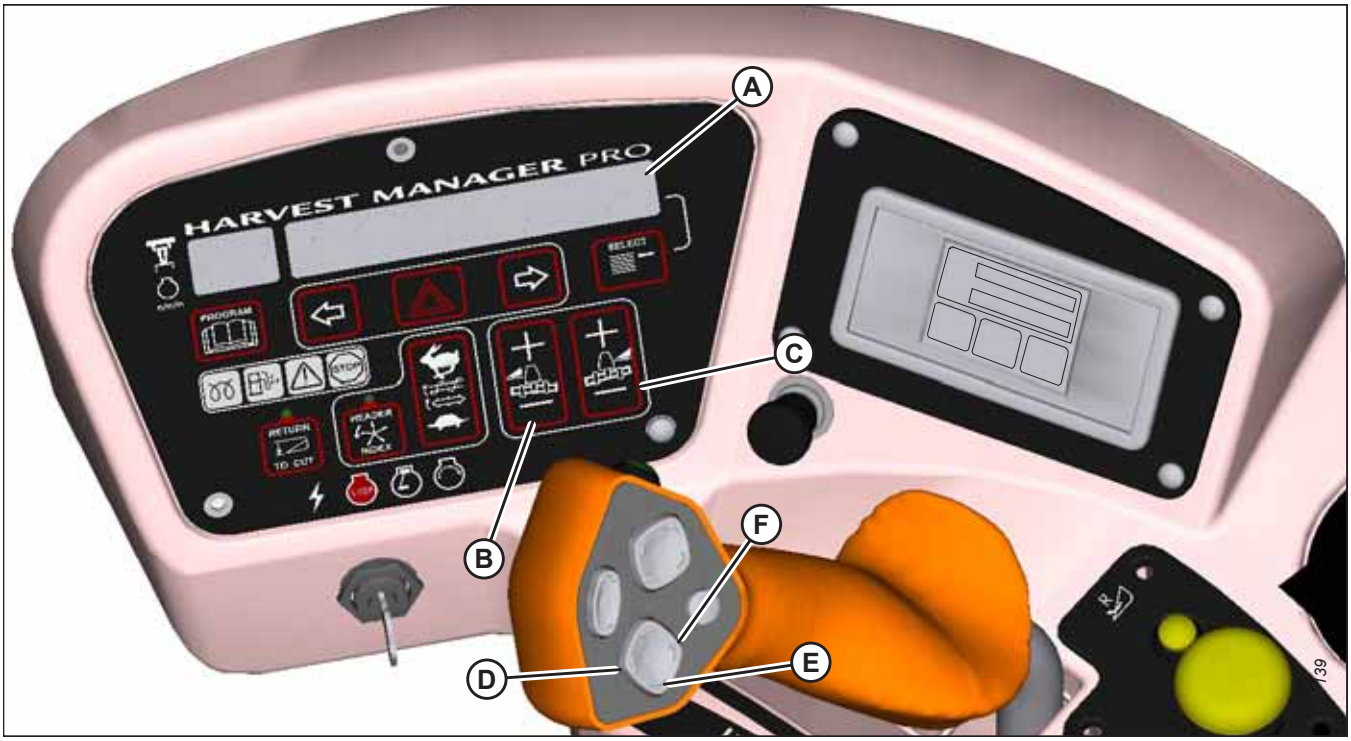


Figure 4.67: Cab Display Module (CDM)

A - CDM Display
B - Left Float Adjustment
C - Right Float Adjustment
D - Header Tilt Down
E - Header Lower
F - Header Tilt Up

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. Set the left and right float fine adjustments on the CDM to approximately 5.0:
   a. Using FLOAT SELECTOR switch (B), push **+** to increase the float or **–** to decrease the float on the left side of the header. CDM display (A) will show the selected float setting for the left side (for example: 5.0 L FLOAT R XX.X).
   b. Repeat the previous step for the right side of the header float using switch (C). The display will show the float setting for both sides, (for example, 5.0 L FLOAT R 5.0).
2. Shut down the engine, and remove the key from the ignition.
3. Grasp each end of the header in turn and lift it. Use the amount of lifting force specified in the following table:

Header	Force Required to Lift Header at the Ends with Lift Cylinder Fully Retracted
Auger	335–380 N (75–85 lbf)
Rotary disc	426–471 N (95–105 lbf)
Draper	335–380 N (75–85 lbf) with stabilizer/transport wheels raised (if equipped)

Adjusting Float Using Drawbolts

Coarse float adjustment is done using the drawbolts located on both sides of 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.

DANGER

Ensure that all bystanders have cleared the area.

1. Start the engine.
2. Using HEADER UP switch (A) on the ground speed lever (GSL), raise the header fully.
3. Shut down the engine, and remove the key from the ignition.

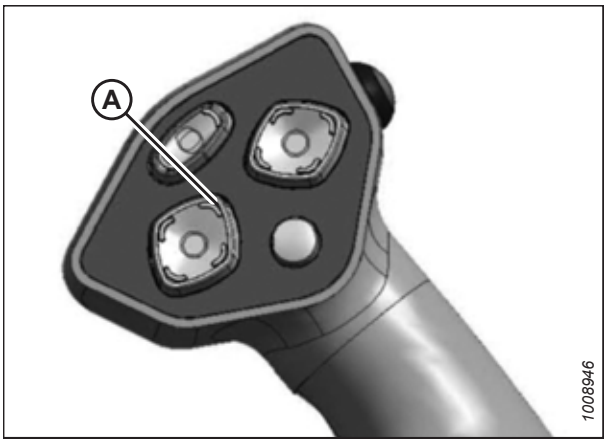


Figure 4.68: GSL

4. Turn drawbolt (A) clockwise to increase the float, or counterclockwise to decrease the float.
5. Check the header float again. Refer to *Checking Float, page 206* for instructions.

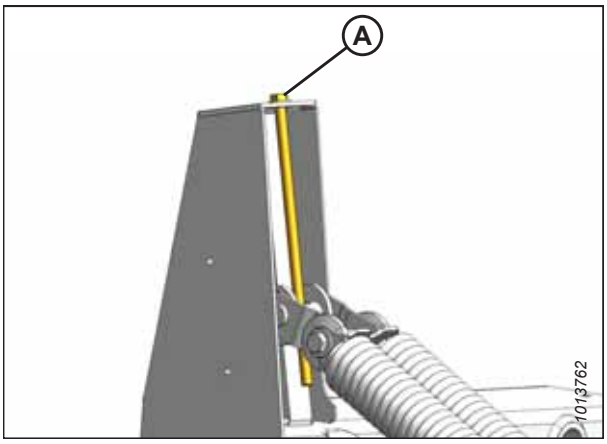


Figure 4.69: Header Float Adjustment

Float Options

The float system can be programmed for three types of windrowing conditions when using an attached draper header (without the deck shift option), an auger header, or a rotary disc header.

The Operator may wish to have three different float settings available to them for different harvest conditions. For example:

- Position 1: Border conditions
- Position 2: Normal conditions
- Position 3: Rocky conditions

To configure the float presets:

1. Engage the header.
2. Move FLOAT PRESET SWITCH (A) to position 1 (B).

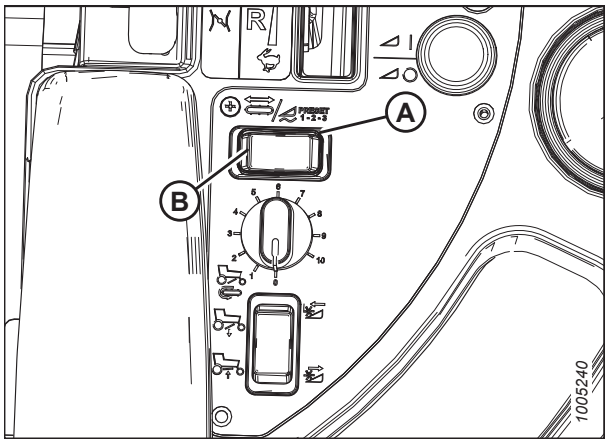


Figure 4.70: Float Preset Switch

Figure 4.71: Cab Display Module (CDM) Float Adjustment

A - CDM Display
B - Left Float Adjustment
C - Right Float Adjustment
D - Header Tilt Down
E - Header Lower
F - Header Tilt Up

3. Using HEADER DOWN switch (E), lower the header fully, so that the lift cylinders are fully retracted.
4. Set the left and right float fine adjustments on the CDM to approximately 5.0:
   a. Using FLOAT SELECTOR switch (B), push **+** to increase the float or **–** to decrease the float on the left side of the header. CDM display (A) will show the selected float setting for the left side (for example: 5.0 L FLOAT R XX.X).
   b. Repeat the previous step for the right side of the header float using switch (C). The display will show the float setting for both sides, (for example, 5.0 L FLOAT R 5.0).

5. Select a second preset with FLOAT PRESET 2 SWITCH (C).
6. Repeat Step *1, page 208* and Step *2, page 208* to configure the float preset.
7. Select a third preset with FLOAT PRESET 3 SWITCH (D).
8. Repeat Step *1, page 208* and Step *2, page 208* to configure the float preset.

   NOTE:

   For draper headers with the deck shift option, the float can be programmed to compensate for the change in weight distribution when the decks are shifted. Refer to *Setting Float Options with Deck Shift, page 304*.

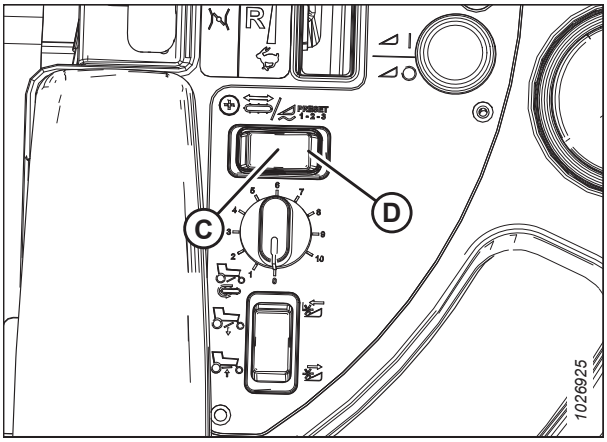


Figure 4.72: Float Preset Switch

4.4.3 Leveling Header

The windrower linkages are factory-set to provide the proper level for the header and should not normally require adjustment.

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.

If the header is not level, check the pressure of the windrower's tires before adjusting the leveling linkages.

NOTE:

The float springs are **NOT** used to level the header.

To level the header:

1. Place the float pins in locked-out location (A).

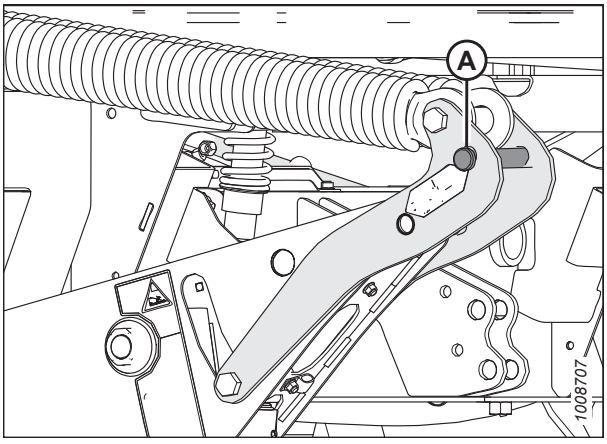


Figure 4.73: Float Pins – Disengaged

2. Park the windrower on level ground.

3. Raise the header fully using HEADER UP button (A). Hold the button momentarily to allow the lift cylinders to rephase.

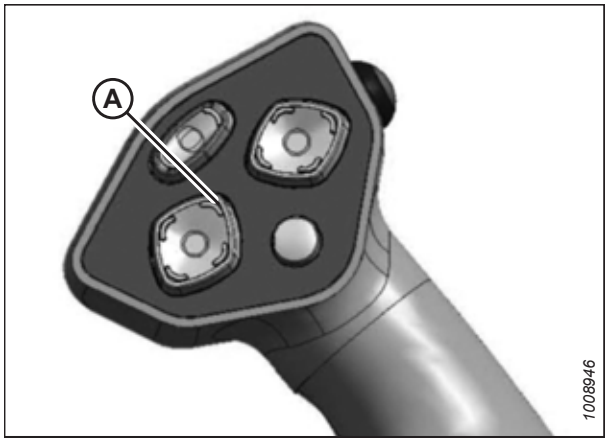


Figure 4.74: Ground Speed Lever (GSL)

4. Adjust the height of the header until it sits approximately 150 mm (6 in.) off of the ground. Ensure that member (A) rests against link (B).

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

6. Measure the distance to the ground at both ends of the header. If the values are the same, then no float adjustment is necessary. If they are different, then the side with the greater distance between the ground and the bottom of the header will need to be adjusted.

7. If adjustment is necessary, start the engine and raise the header fully. Stop the engine, and remove the key from the ignition.

8. Move the float pins to engaged position (A).

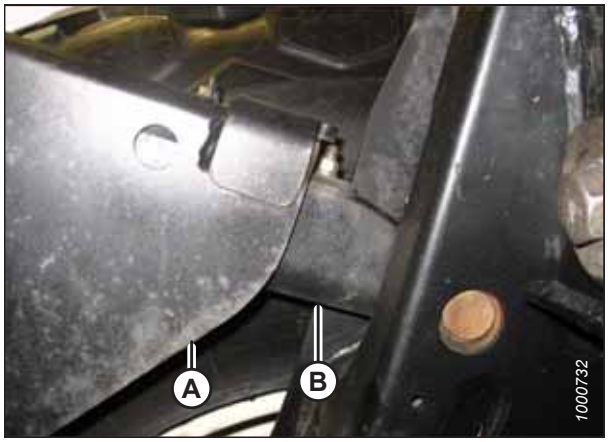


Figure 4.75: Lift Linkage

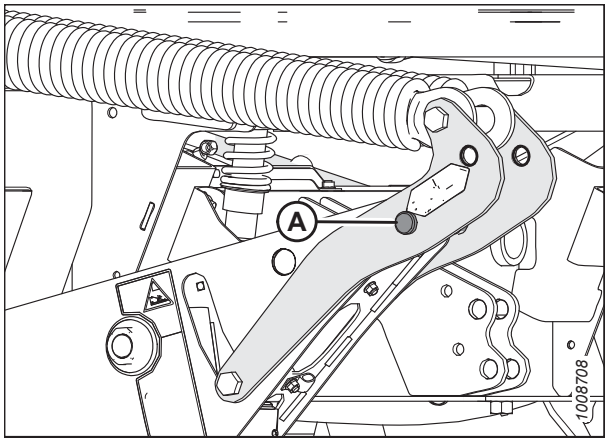


Figure 4.76: Float Pins – Engaged

9. Start the engine, and lower the header onto the ground until member (A) lifts off of link (B) on both sides of the header.
10. Stop the engine, and remove the key from the ignition.

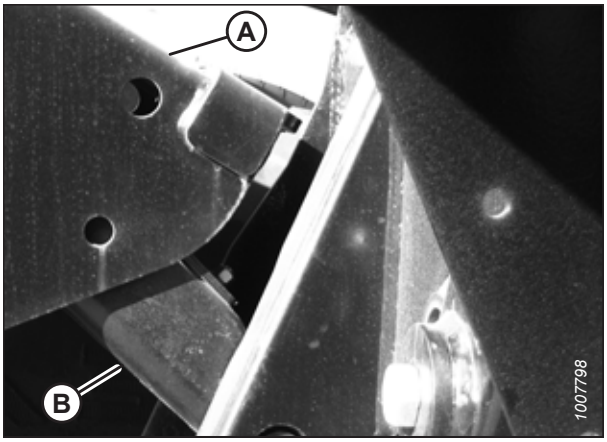


Figure 4.77: Lift Linkage

11. On the high side of the linkage, remove nut, washer, and bolt (A) which attach shims (B) to the link.
12. Remove one or both shims (B), and reinstall hardware (A).

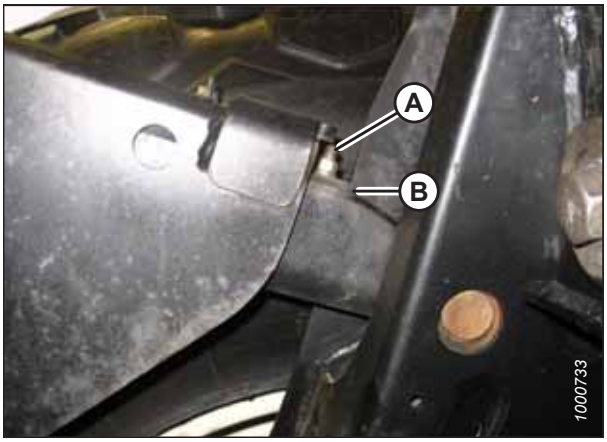


Figure 4.78: Lift Linkage

13. Start the engine and raise the header fully.
14. Stop the engine and remove the key from the ignition.
15. Move the float pins to the disengaged position.
16. Start the engine, and adjust the height of the header so that it sits approximately 150 mm (6 in.) off of the ground.
17. Check that member (A) is resting against link (B).
18. Shut down the engine, and remove the key from the ignition.
19. Measure the distance to the ground at both ends of the header. If the values are the same, then no float adjustment is necessary. If they are different, then the side with the greater distance between the ground and the bottom of the header will need to be adjusted.

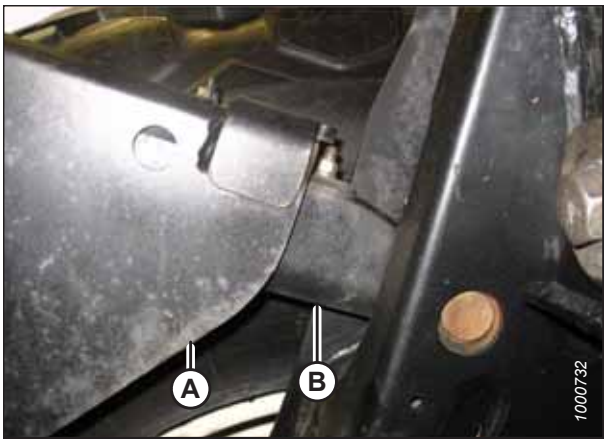


Figure 4.79: Lift Linkage

20. If additional leveling is needed, repeat Steps *7, page 210* to *10, page 211* and install the removed shim on the opposite linkage.

    NOTE:

    Additional shims are available from your Dealer.

21. Once the header is level, return the float pins to engaged position (A).

    NOTE:

    The float does **NOT** require adjustment after leveling the header.

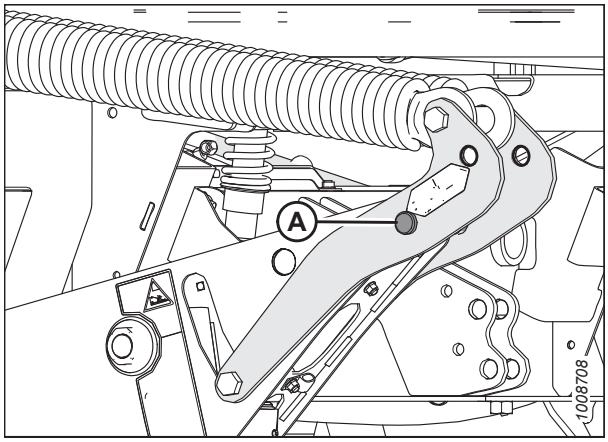


Figure 4.80: Float Pins – Engaged

4.4.4 Header Drive Controls

The header can be engaged, disengaged, and reversed using the controls on the operator's console.

NOTE:

Some controls described in this section are optional equipment and may not be installed on your unit. Some controls may be installed, but will be nonfunctional for certain header models.

Engaging and Disengaging Header

The header can be engaged and disengaged using a single switch on the operator's console. Ensure that the throttle is set to idle before engaging the header.

IMPORTANT:

Always move the throttle lever back to idle before engaging the header drive. Do **NOT** engage the header with the engine running at full throttle.

DANGER

Ensure that all bystanders have cleared the area.

1. To engage the header:
   a. Set throttle (A) to idle.
   b. Push down on the center of HEADER DRIVE switch (B). Pull the switch up to engage the header drive. A slight delay between the switch being activated and the header beginning operation is normal.
2. To disengage the header, push HEADER DRIVE switch (B) down.

Figure 4.81: Operator Console

Reversing Header

The header can be reversed using a switch on the operator's console. You may wish to reverse the header to help clear an obstruction.

1. Push down and hold HEADER DRIVE REVERSE button (A) and pull up on HEADER DRIVE switch (B). The cab display module (CDM) will display the message HEADER REVERSE.
2. Release REVERSE button (A) to stop the header.
3. Push down HEADER DRIVE switch (B) to the OFF position. This will allow you to restart the header.

   NOTE:

   To engage the header drive, first push down, and then pull up on the HEADER DRIVE knob.

Figure 4.82: Operator Console

4.4.5 Adjusting Header Angle

Header angle is the term used to describe the position of the cutterbar relative to the ground. The angle of the header can be changed as needed to suit different harvesting conditions.

Refer to the header operator's manual for the recommended header angle settings for your particular header.

The header angle can be adjusted from the cab without shutting down the windrower when the windrower is equipped with the hydraulic center-link. The windrower's cab display module (CDM) allows you to establish preset header angle settings for a variety of crop conditions.

IMPORTANT:

- Changing the header angle will affect the float slightly, due to the changes in weight distribution. If the float setting is changed, the header angle setting may also need to be adjusted.
- To prevent damage to the knife guards when conditions are not suited to operating with a heavier float setting (for example, when harvesting in a rocky or a wet field), do **NOT** use the windrower's TILT CONTROL function. Instead, use the HEADER HEIGHT switch.

Figure 4.83: Operator Console

A - Program Button
B - Display
C - Header Tilt Down
D - Header Tilt Up
E - Display Selector

- To decrease the header angle, press HEADER TILT UP switch (D) on the ground speed lever (GSL) handle. The CDM will display a reading on the lower line, which should be a decreasing value ranging between 00.0 and 10.0.
- To increase the header angle, operate HEADER TILT DOWN switch (C) on the GSL handle. The CDM will display a reading on the lower line, which should be an increasing value ranging between 00.0 and 10.0.

NOTE:

The HEADER TILT switch can be locked out to prevent inadvertent changes to the header angle. For instructions, refer to *Activating Header Tilt Control Lockout, page 120*.

Checking Self-Locking Center-Link Hook

The self-locking hook on the windrower's center-link will need to be inspected periodically to ensure it is in good working order.

1. If the header is attached to the windrower, disconnect the center-link hook from the header by pulling up on handle (A) to release the locking device and then lifting the hook off of the header pin.

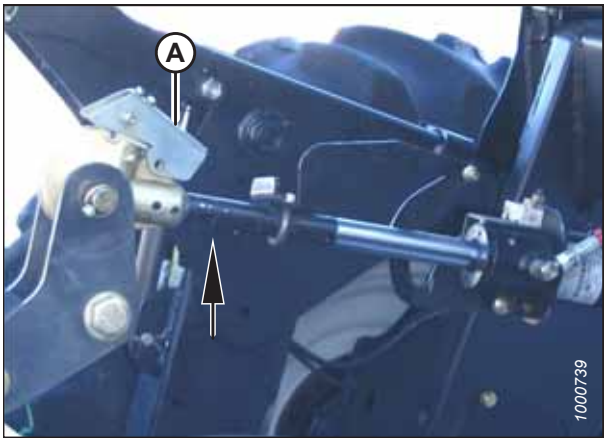


Figure 4.84: Center-Link

2. Lower handle (A) into the locked position.

3. Push up on lock pin (B). The handle should catch on the casting and the pin should **NOT** lift.

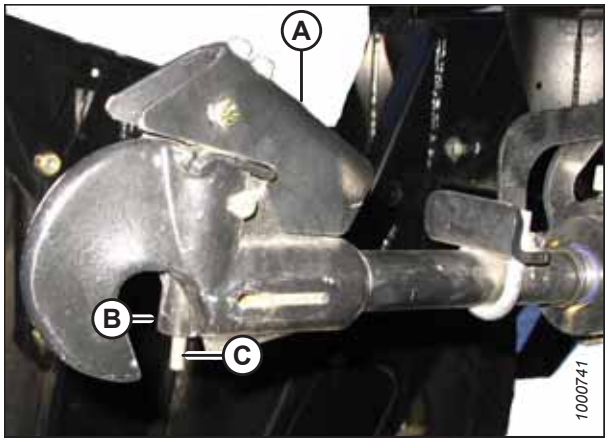


Figure 4.85: Center-Link Hook

A - Handle **B - Lock Pin** **C - Actuator Rod**

4. Ensure that the lock pin lifts with the handle by pushing up on the actuator rod as shown.

Figure 4.86: Center-Link Hook

4.4.6 Controlling Cutting Height

Cutting height can be adjusted by raising or lowering the header using the HEADER UP or HEADER DOWN switches on the ground speed lever (GSL).

Figure 4.87: Operator Console

The cab display module (CDM) displays the current header height setting on the lower line of DISPLAY (A). The reading will range between 00.0 and 10.0, with 00.0 representing the header sitting flush with the ground, and 10.0 indicating that the header is at its maximum height. Use HEADER UP button (B) and HEADER UP button (C) to change the height of the header.

Use DISPLAY SELECTOR switch (D) to display the current header height setting.

Return to Cut

The return to cut (RTC) feature provides preset cutting height and tilt angle settings for the header. This feature can be turned OFF or ON with a switch on the cab display module (CDM).

If desired, the CDM can be programmed so that only the cutting height feature is active.

The AUTO RAISE HEIGHT feature allows you to raise the header to a preselected height while in RETURN TO CUT mode. Refer to *Configuring Auto Raise Height Feature, page 220* for instructions.

Configuring Return to Cut Feature

The return to cut (RTC) feature provides preset cutting height and tilt angle settings for the header. This feature can be configured on the operator's console.

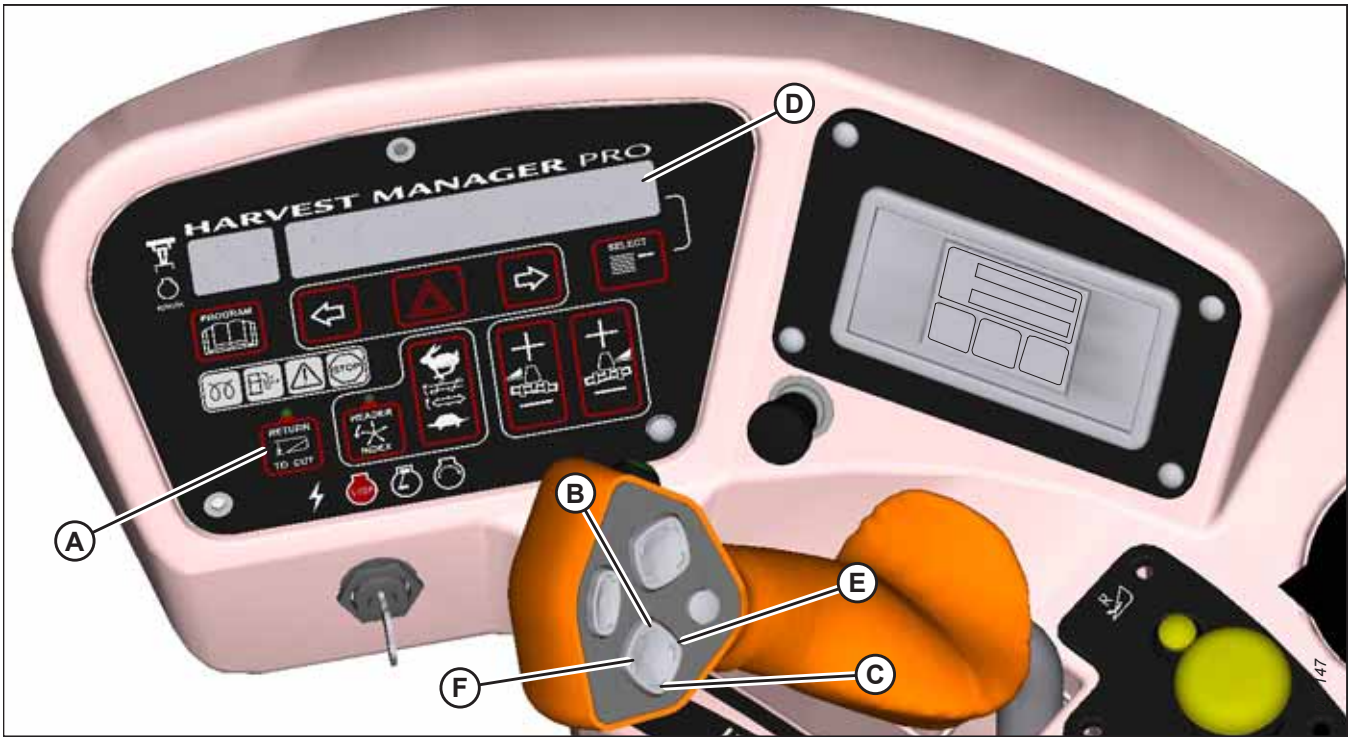


Figure 4.88: Operator Console

DANGER

Ensure that all bystanders have cleared the area.

1. Start the windrower.
2. Engage the header.
3. Set RETURN TO CUT switch (A) to the OFF position. The indicator light will be dark.
4. Adjust the header to the desired cutting height using HEADER UP switch (B) and/or HEADER DOWN switch (C) on the ground speed lever (GSL). The cab display module (CDM) will display the header height setting at location (D), which will be a value ranging between 00.0 and 10.0.
5. Adjust the header angle with HEADER TILT UP switch (E) and/or HEADER TILT DOWN switch (F) on the GSL. The CDM will display the header angle as a value between 00.0 and 10.0.

   NOTE:

   Performing this step is not necessary when you want to configure the RETURN TO CUT switch to change only the header height.

6. Press RETURN TO CUT switch (A) on the CDM. Your settings will be stored in the windrower control module (WCM).

Using Return to Cut Feature

The return to cut (RTC) feature provides preset cutting height and tilt angle settings for the header. When return to cut mode is enabled, the HEADER UP and HEADER DOWN switches will change the height and angle of the header according to the stored RTC settings.

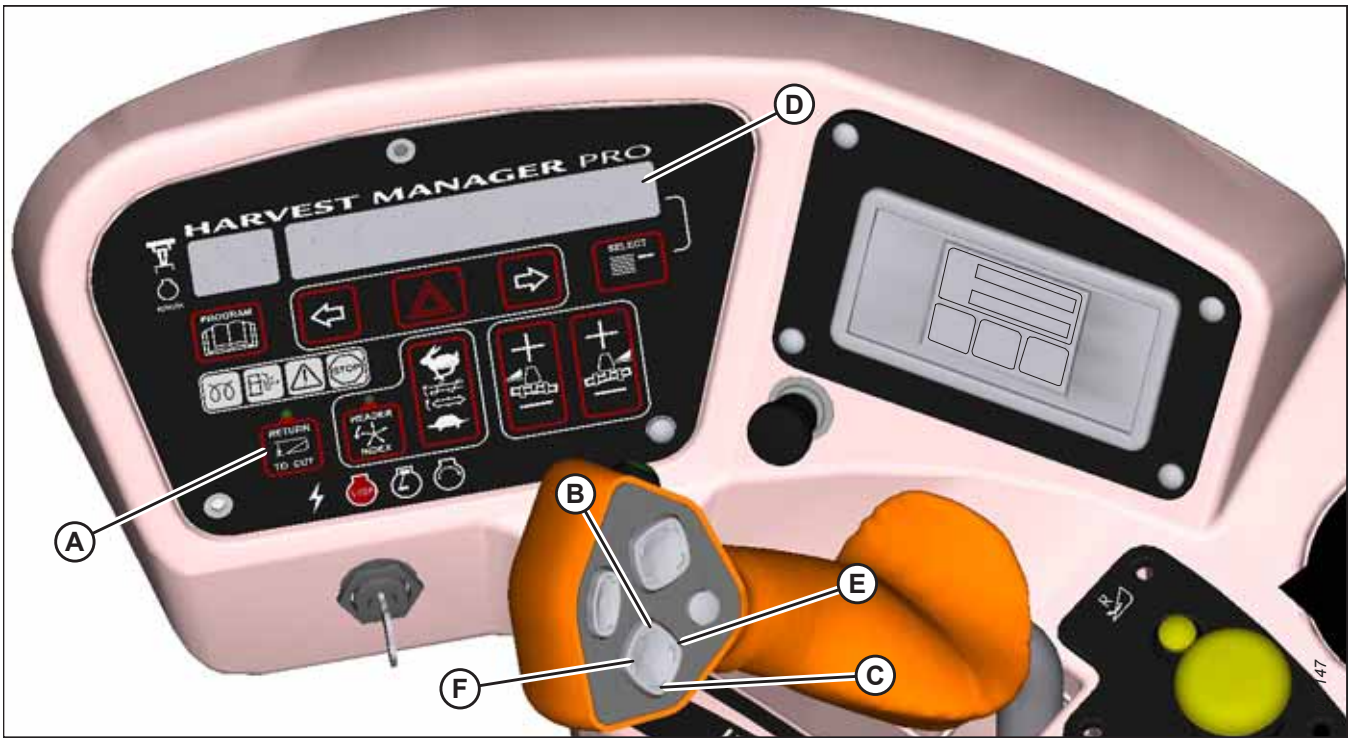


Figure 4.89: Operator Console

A - Return to Cut
B - Header Up
C - Header Down
D - Display
E - Header Tilt Up
F - Header Tilt Down

IMPORTANT:

Ensure that the header is engaged and that RETURN TO CUT switch (A) is lit up.

NOTE:

The header can be raised or lowered by pressing and holding HEADER UP switch (B) or HEADER DOWN switch (C) on the ground speed lever (GSL).

1. If the header is above the preset cutting height, momentarily press HEADER DOWN switch (C) to cause the header to return to the preset height.

2. If the header is below the preset height, press and hold HEADER UP switch (B) to raise the header. Release the switch when the header is at the desired height. The CDM will emit a tone when the header rises past the preset height setting.

3. If the header angle changes, double-press (two button presses occurring within 0.5 seconds) HEADER TILT UP switch (E) or HEADER TILT DOWN switch (F), and the header will return to the preset angle.

   NOTE:

   If the header cannot return to the preset height or angle within 30 seconds, the return to cut feature will deactivate to prevent the hydraulic oil from overheating. Push RETURN TO CUT switch (A) to reactivate RTC mode.

Auto Raise Height

The header can be raised to a preset height by enabling the auto raise height feature in the cab display module (CDM).

Refer to the following topics to learn how to use the auto raise height feature:

- *Configuring Auto Raise Height Feature, page 220*
- *Using Auto Raise Height Feature, page 221*

Configuring Auto Raise Height Feature

The header can be raised to a preset height by enabling the auto raise height feature in the cab display module (CDM). Auto raise height can be configured by accessing the CDM's WINDROWER SETUP menu.

Figure 4.90: Operator Console

A - Return to Cut **B - Program** **C - Select** **D - Right Arrow**
E - Left Arrow **F - Header Up** **G - Header Down**

NOTE:

RETURN TO CUT switch (A) can be OFF or ON.

1. Turn the ignition key to the ON position, or start the engine.
2. Press PROGRAM (B) and SELECT (C) simultaneously on the CDM to enter programming mode.
3. Press SELECT (C). WINDROWER SETUP? will appear on the upper line.
4. Press right arrow (D), then SELECT (C). SET KNIFE SPEED? will appear.
5. Press SELECT (C) until AUTO RAISE HEIGHT appears.
6. Press left arrow (E) or right arrow (D) to change the auto raise height value on the lower line. The acceptable auto raise height values range between 4.0 to 9.5. At 10.0, the feature is disabled and OFF will be displayed.
7. Press PROGRAM (B) to exit programming mode.

Using Auto Raise Height Feature

The header can be raised to a preset height by enabling the auto raise height feature in the cab display module (CDM). Once this feature has been configured, the header can be raised to the preset height by rapidly double-pressing the HEADER UP switch.

IMPORTANT:

To use the auto raise height feature, the windrower's engine must be running, the header must be engaged and sitting at the preset cutting height, and the return to cut feature must be active.

1. To raise the header to the auto raise height set-point, double-press (press the button twice within 0.5 seconds) HEADER UP switch (B) on the ground speed lever (GSL).

   NOTE:

   When the AUTO RAISE HEIGHT switch is set to ON, the ACRE counter will be disabled when the header is raised higher than the preset cutting height.

2. If desired, press the HEADER UP switch while the header is being raised to disable auto raise height. The header will maintain its current height.

   NOTE:

   When the AUTO RAISE HEIGHT switch is set to OFF, the ACRE counter will be disabled when the header height value is greater than 9.5. OFF will be displayed on the cab display module (CDM).

3. To return the header to the preset cutting height, momentarily press HEADER DOWN switch (C).

Figure 4.91: Operator's Station

Header Drop Rate

The header should fall gradually when the HEADER DOWN switch is pressed. The header should be able to drop from the fully raised to the fully lowered position in 3–4 seconds.

If the drop rate requires adjustment, refer to *Adjusting Header Drop Rate, page 445*.

4.4.7 Double Windrow Attachment

The double windrow attachment (DWA) allows the windrower to deposit two windrows of cut material close together into a single large windrow. Using the DWA halves the number of passes needed to collect the crop once it has dried.

The DWA system is compatible with windrowers paired with an A Series Auger Header, an R Series Rotary Disc Header, or with a D65 Draper Header with the HC10 Hay Conditioner installed.

Raising the side delivery system shuts off the draper and allows the crop to be deposited between the windrower wheels as it would be without the DWA installed.

Refer to the MacDon M Series Windrower Double Windrow Attachment Manual for the operating and maintenance instructions.

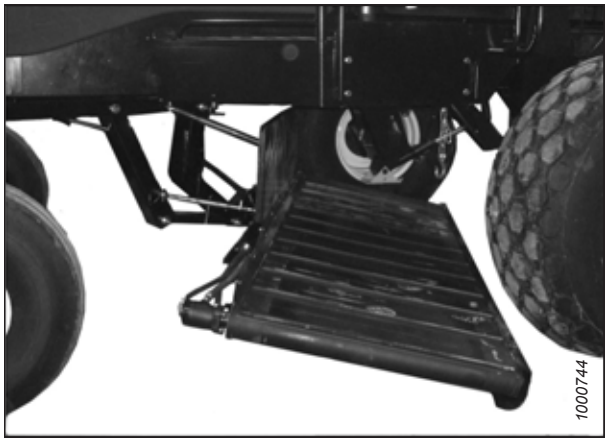


Figure 4.92: DWA Installed on Windrower

When the DWA is active, cut crop will be deposited onto the side delivery system draper and delivered to the side of the windrower, as shown. To feed into the same windrow, the second cutting pass must be made in the opposite direction of the first.

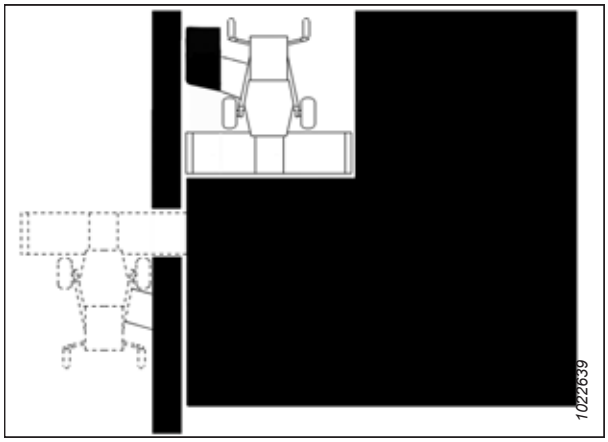


Figure 4.93: Double Windrowing Diagram

Engaging and Disengaging Double Windrow Attachment

The double windrow attachment (DWA) system can be engaged or disengaged using the DWA controls on the ground speed lever (GSL) or the DWA rocker switch on the operator's console.

The DWA is disengaged when it is fully raised, and engaged when it is fully lowered. You can raise or lower the DWA deck by pressing DWA DOWN button (B) or DWA UP button (A) on the ground speed lever (GSL) or by using the rocker switch on the operator's console. The DWA should have been configured to work with one or the other of these controls when it was installed, but the configuration can be changed at any time. Refer to *Configuring Double Windrow Attachment Controls, page 109* for instructions on how to change the DWA control configuration.

NOTE:

The same controls are used for raising and lowering the swath compressor, if it is installed.

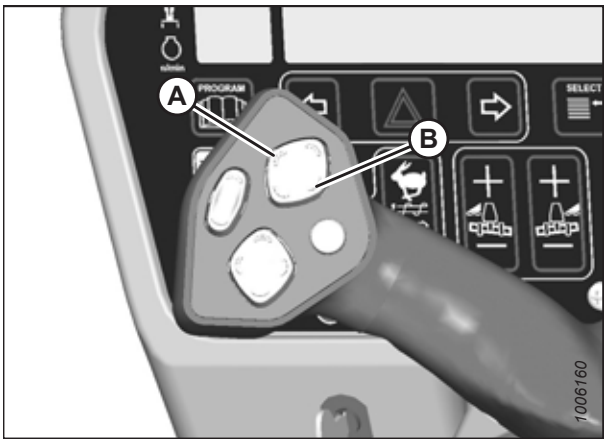


Figure 4.94: Ground Speed Lever (GSL)

The DWA can also be raised or lowered using the rocker switch on the operator's console, which should have been installed when the DWA was installed on the windrower. The DWA can be lowered by pressing rocker (A), and raised by pressing rocker (B).

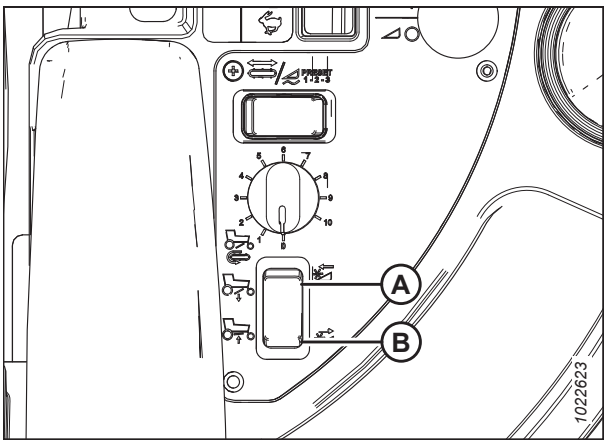


Figure 4.95: Operator's Console

Adjusting Double Windrow Attachment Draper Speed

The double windrow attachment's (DWA) draper speed can be changed by using the rotary switch on the operator's console. This switch should have been installed when the DWA was installed on the windrower.

The DWA's draper speed can be controlled using rotary switch (A) on the operator's console.

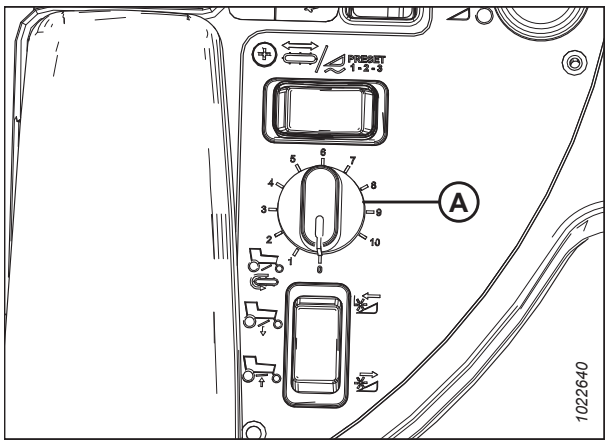


Figure 4.96: DWA Draper Speed Rotary Switch on Operator's Console

4.4.8 Engaging and Disengaging Swath Roller / Swath Compressor

Engage or disengage the swath roller/swath compressor using the double windrow attachment (DWA) controls on the operator's console or ground speed lever (GSL).

The swath roller/swath compressor can be raised or lowered using DWA UP switch (A) or DWA DOWN switch (B) on the GSL, or by using rocker switch (C) on the operator's console. The controls should have been configured in the cab display module (CDM) when the swath roller/swath compressor was installed on the windrower. However, the controls can be reconfigured at any time.

For instructions on changing the configuration of the controls, refer to *Configuring Double Windrow Attachment Controls, page 109*.

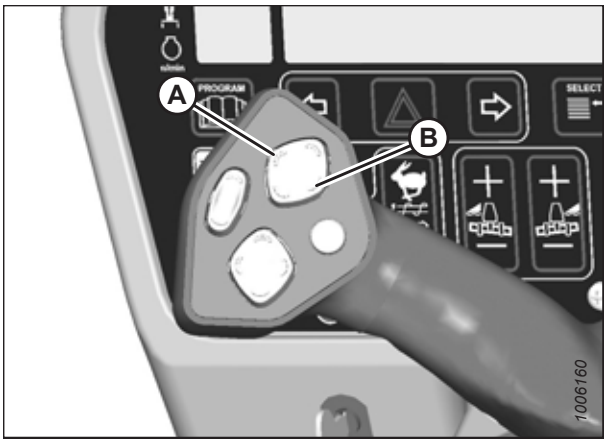


Figure 4.97: GSL

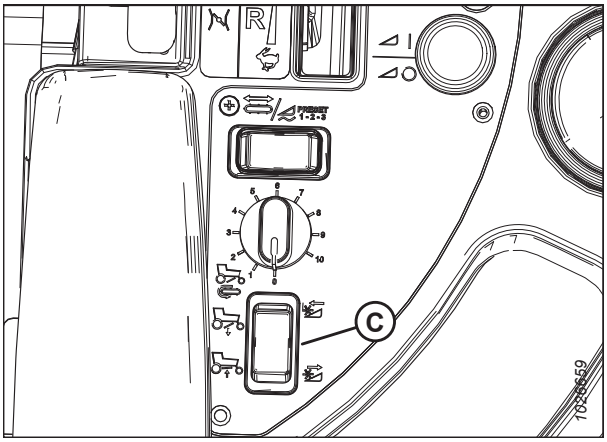


Figure 4.98: Rocker Switch

4.5 Attaching and Detaching Headers

There are specific procedures for safely attaching and detaching each model of header to and from the windrower.

4.5.1 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).

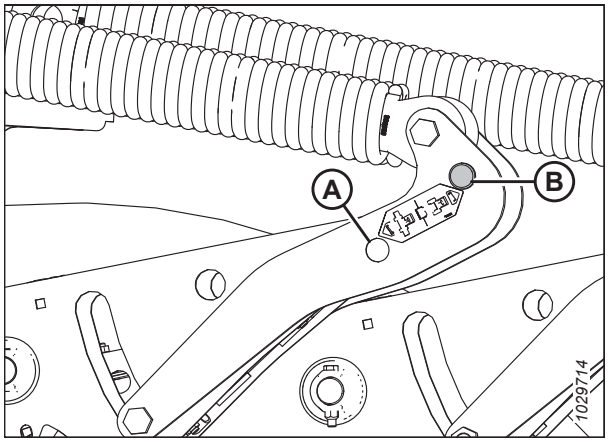


Figure 4.99: Header Float Linkage

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

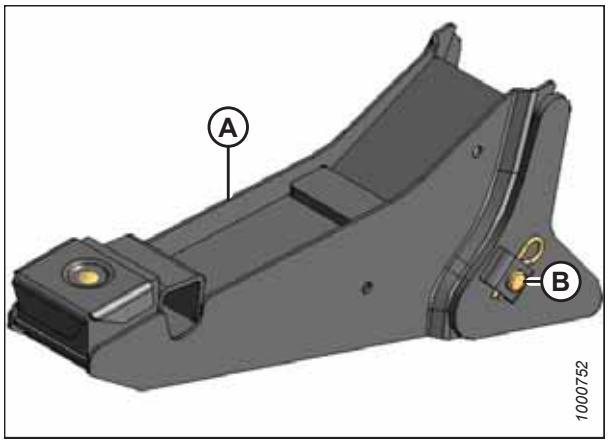


Figure 4.100: Header Boot

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 226* to Step *3, page 226* to install the boot on the opposite side of the windrower.

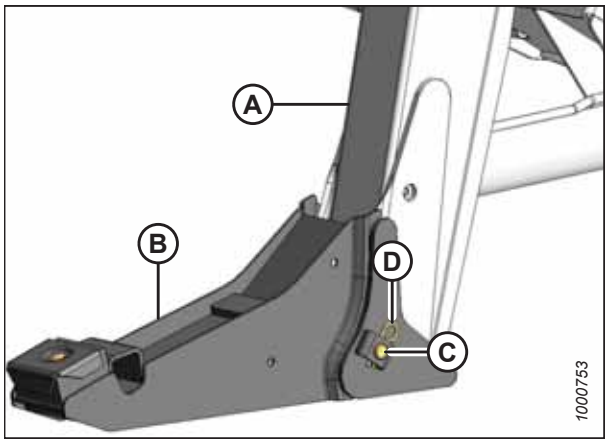


Figure 4.101: Header Boot

4.5.2 Attaching D or D1 Series Draper Header

Attaching a header to the windrower involves physically connecting the header to the header and completing the hydraulic and electrical connections.

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:

- *Attaching D or D1 Series Draper Header – Hydraulic Center-Link with Self-Alignment, page 227*
- *Attaching D or D1 Series Draper Header – Hydraulic Center-Link without Self-Alignment, page 232*

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

The header will need to be physically attached to the windrower, and the hydraulic and electrical connections completed. 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 *4.5.1 Attaching Header Boots, page 226*.

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 pin (B), and remove the pin from the header leg. Repeat this step on the other side of the header.

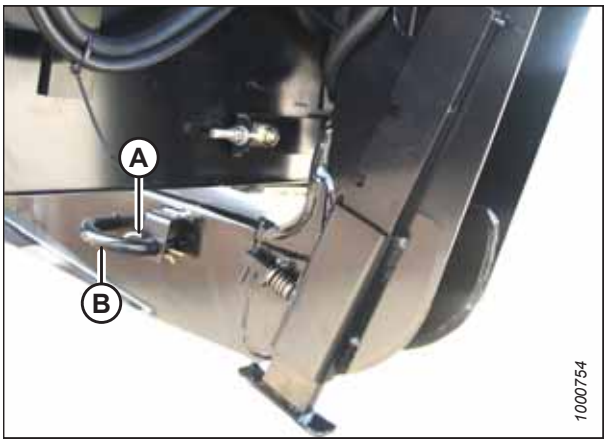


Figure 4.102: Header Leg

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.

   IMPORTANT:

   Before starting the engine for the first time the windrower is operated in a season, remove the protective cover from the exhaust stack.

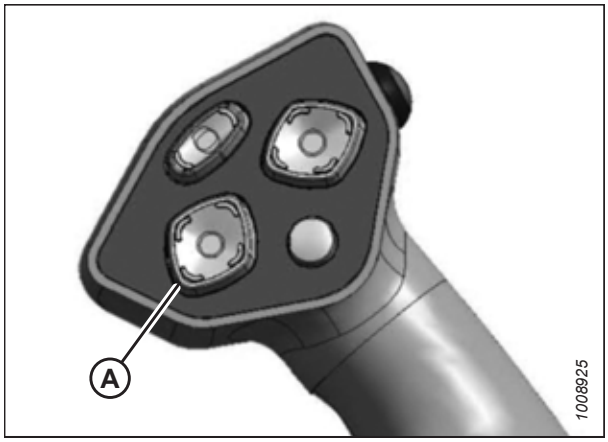


Figure 4.103: Ground Speed Lever

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.

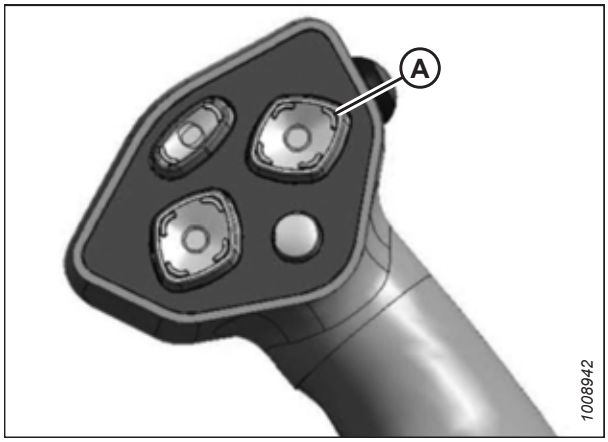


Figure 4.104: Ground Speed Lever

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.

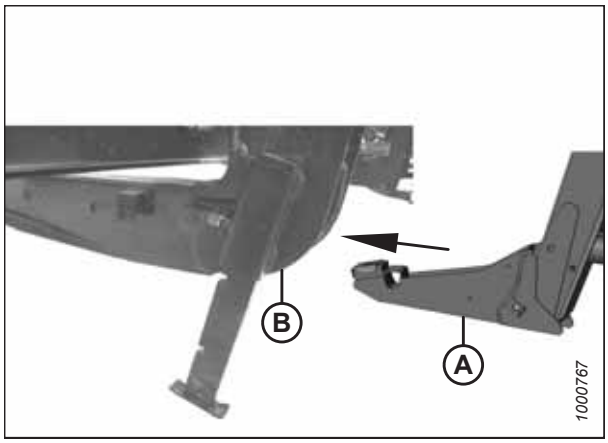


Figure 4.105: Header Leg and Boot

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.

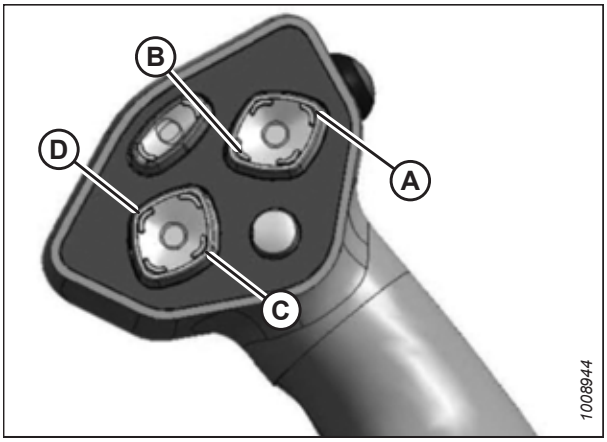


Figure 4.106: Ground Speed Lever

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.

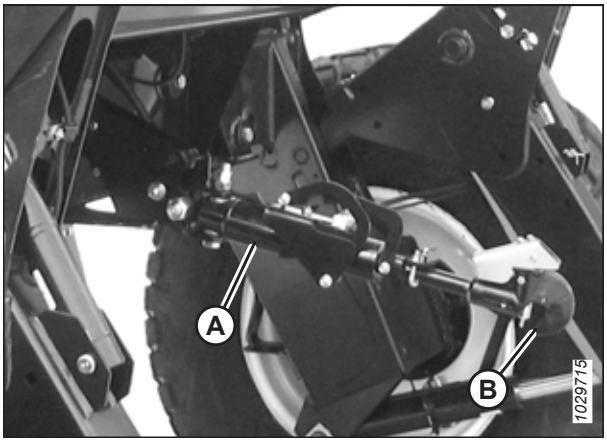


Figure 4.107: Hydraulic Center-Link

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 to fully phase the cylinders.

    NOTE:

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

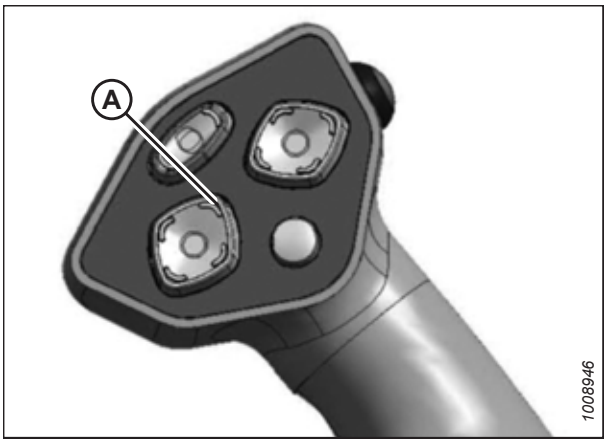


Figure 4.108: Ground Speed Lever

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.

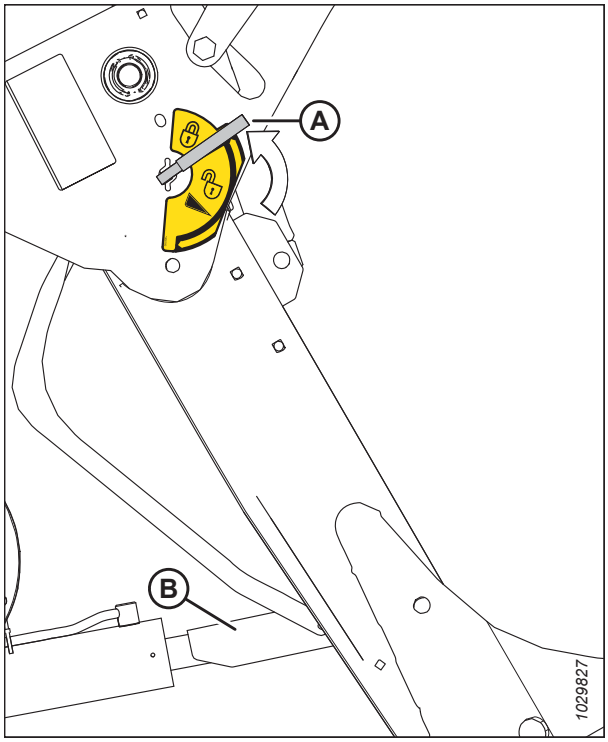


Figure 4.109: Safety Prop

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.

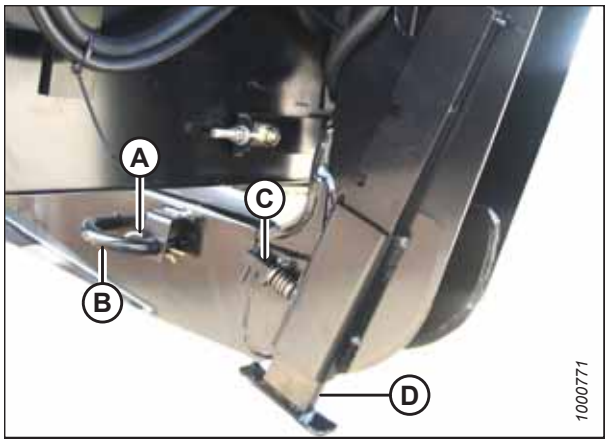


Figure 4.110: Header Leg

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.

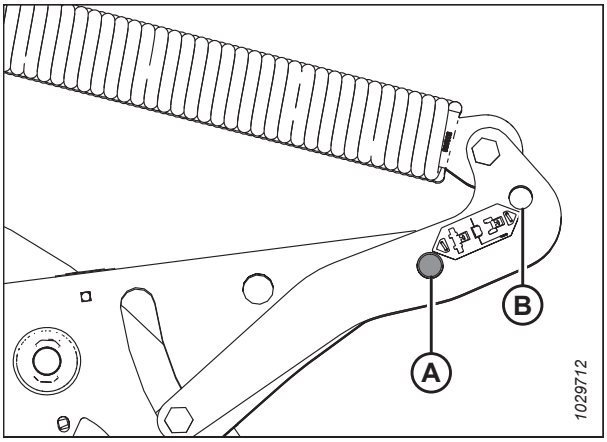


Figure 4.111: Header Float Linkage

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

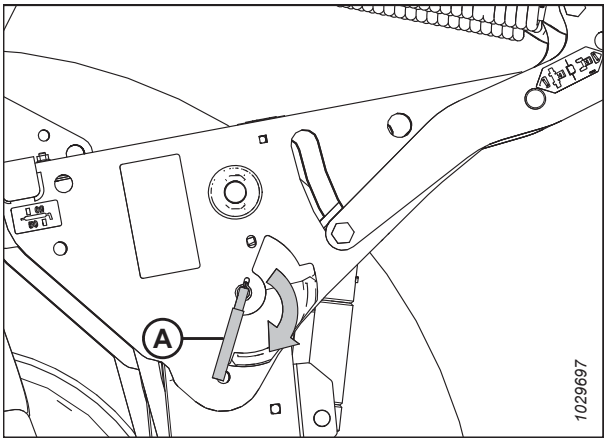


Figure 4.112: Safety Prop Lever

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.

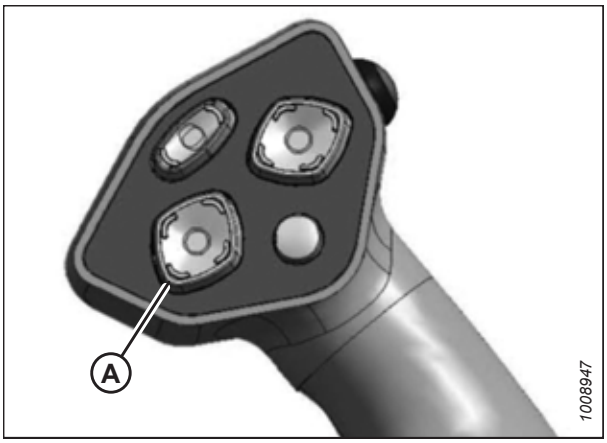


Figure 4.113: Ground Speed Lever

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

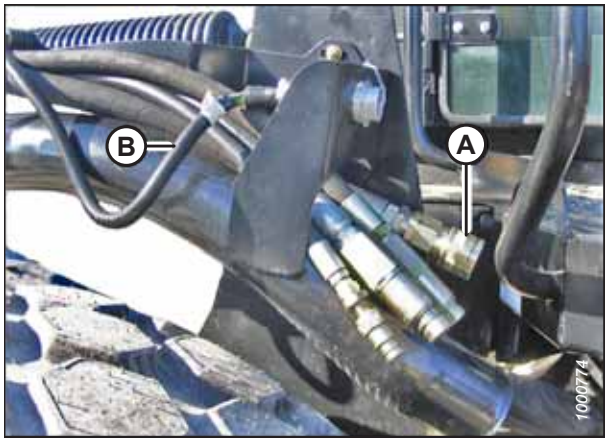


Figure 4.114: Header Drive Hoses and Harness

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

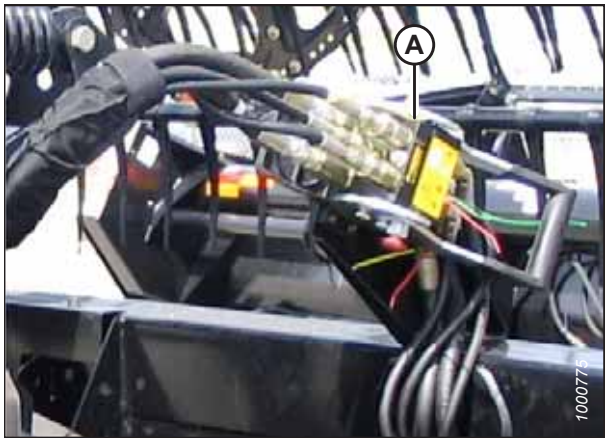


Figure 4.115: Reel Hydraulics

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

The header will need to be physically attached to the windrower, and the hydraulic and electrical connections completed. 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 *4.5.1 Attaching Header Boots, page 226*.

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 pin (B), and remove the pin from the header leg. Repeat this step on the other side of the header.

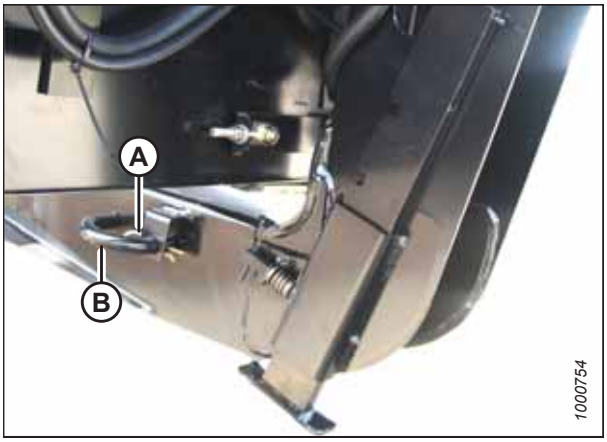


Figure 4.116: Header Leg

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.

   IMPORTANT:

   Before starting the engine for the first time the windrower is operated in a season, remove the protective cover from the exhaust stack.

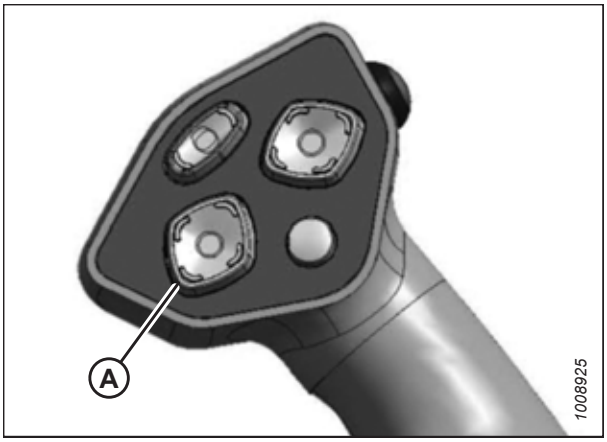


Figure 4.117: Ground Speed Lever

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.

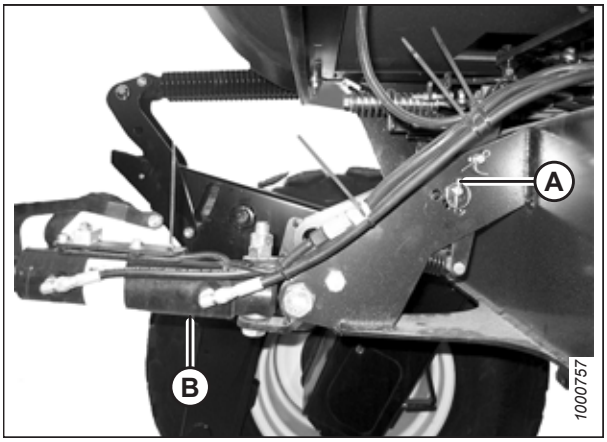


Figure 4.118: Hydraulic Center-Link without Self-Alignment Kit

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.

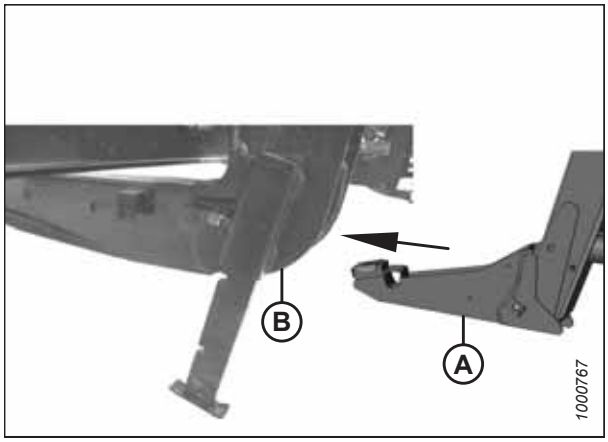


Figure 4.119: Header Leg and Boot

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.

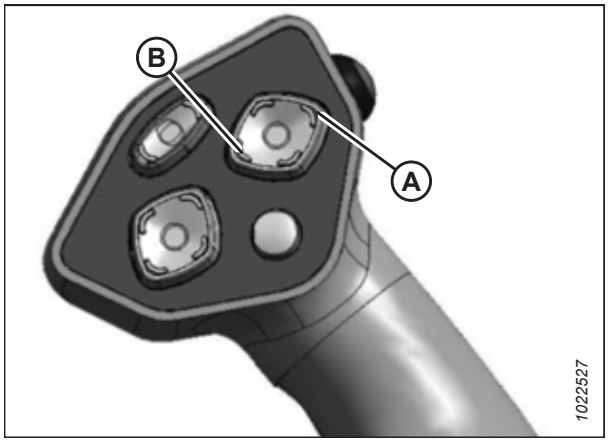


Figure 4.120: Ground Speed Lever

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.

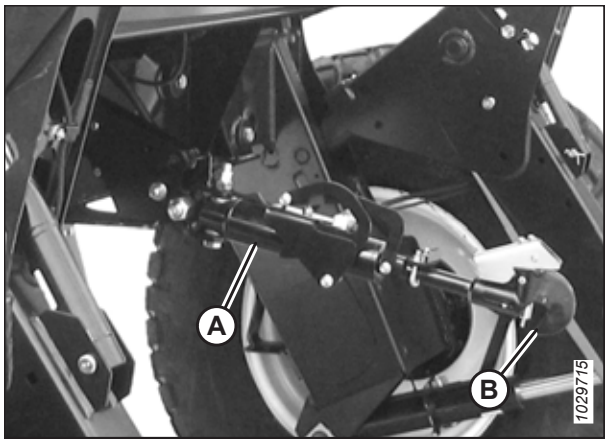


Figure 4.121: Hydraulic Center-Link

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.

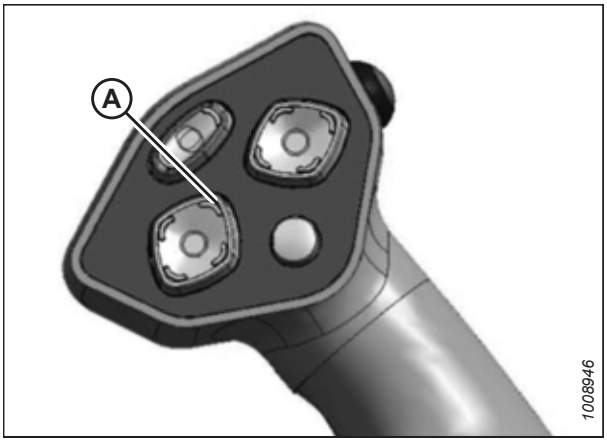


Figure 4.122: Ground Speed Lever

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.

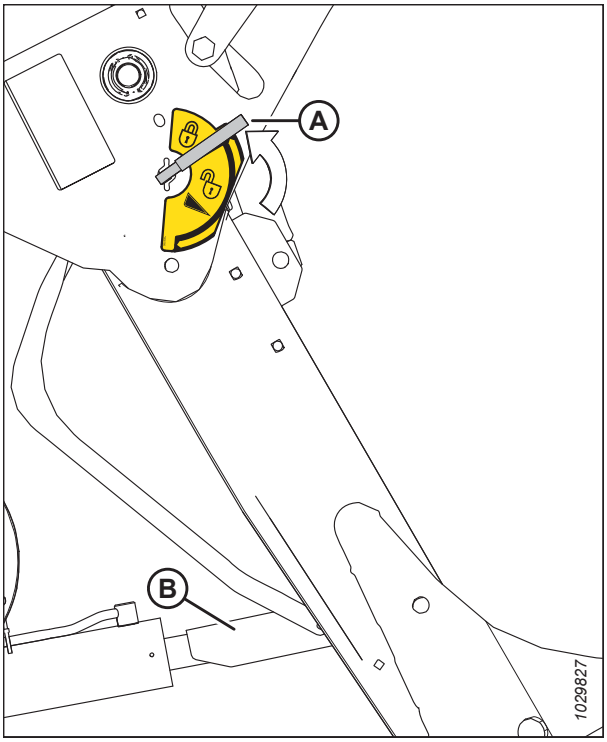


Figure 4.123: Safety Prop

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

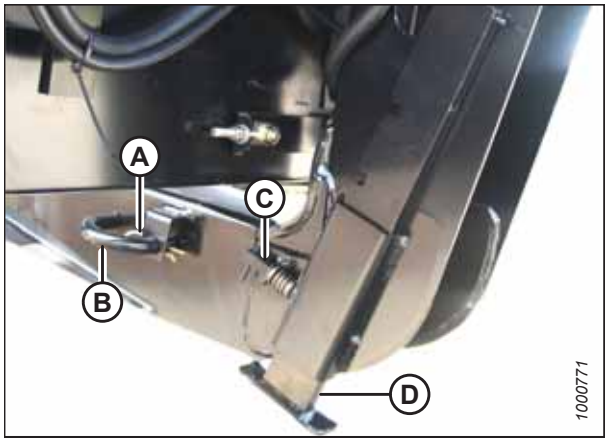


Figure 4.124: Header Leg

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.

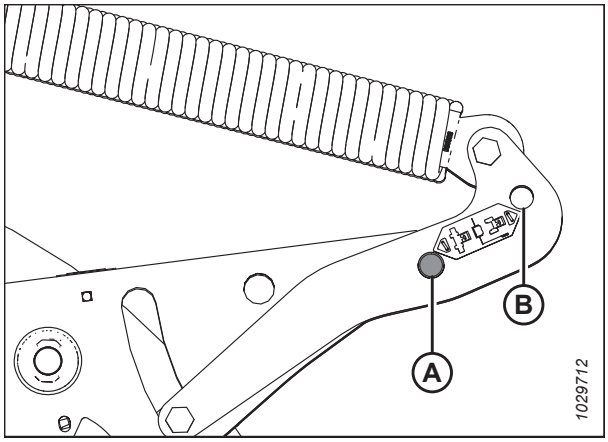


Figure 4.125: Header Float Linkage

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

18. Repeat the previous step to disengage the other safety prop.

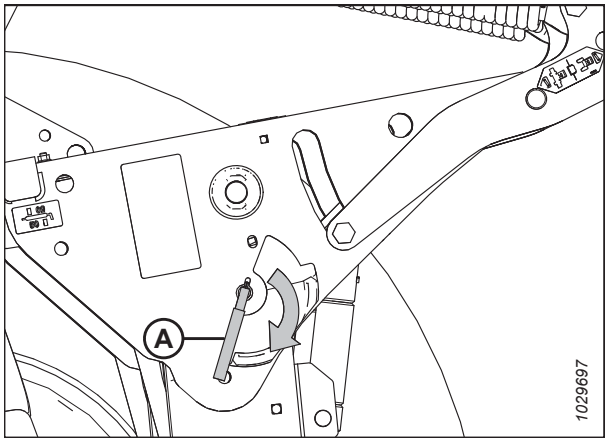


Figure 4.126: Safety Prop Lever

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

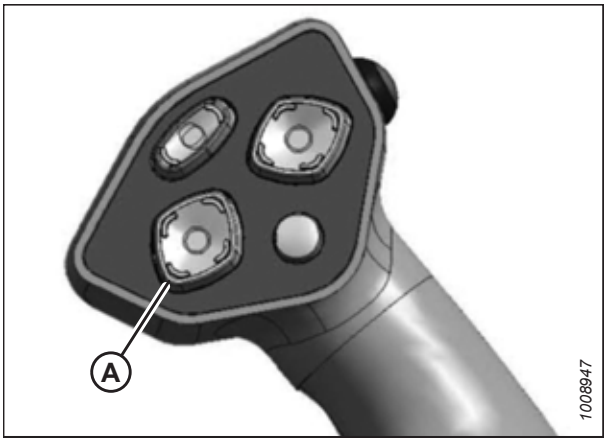


Figure 4.127: Ground Speed Lever

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

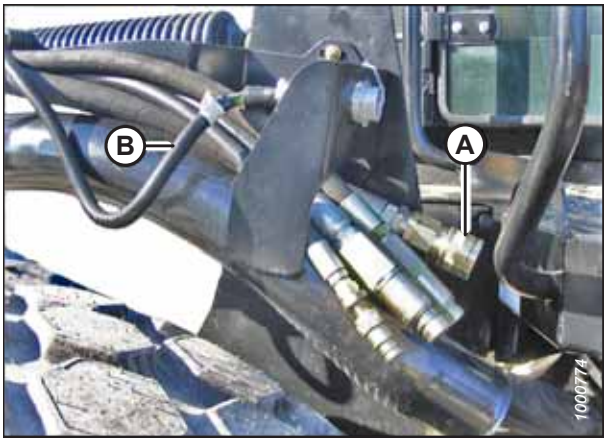


Figure 4.128: Header Drive Hoses and Harness

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

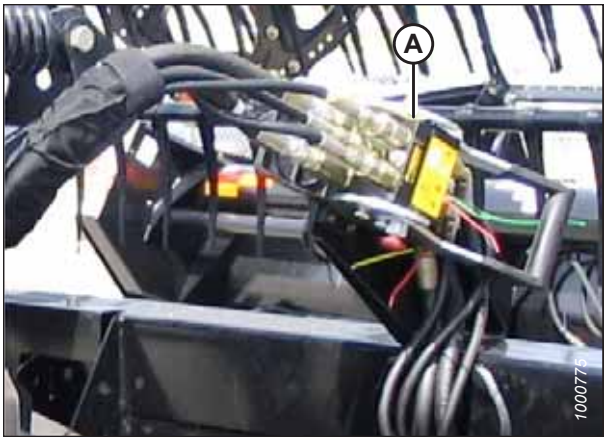


Figure 4.129: Reel Hydraulics

4.5.3 Detaching D or D1 Series Draper Header

Detaching a header from the windrower involves removing the header's mechanical connection to the windrower and disconnecting the hydraulic and electrical connections.

Detaching D or D1 Series Draper Header – Hydraulic Center-Link

Detaching a header from the windrower requires lowering the header stand, removing the leg pins, disengaging the float springs, and disconnecting the electrical and hydraulic connectors.

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. Press HEADER UP switch (A) to raise the header to its maximum height.
3. Rephase the cylinders if one end of the header does not rise fully:
   a. Press and hold HEADER UP switch (A) until both cylinders stop moving.
   b. Continue to hold the switch for 3–4 seconds. The cylinders are now phased.
4. Shut down the engine, and remove the key from the ignition.

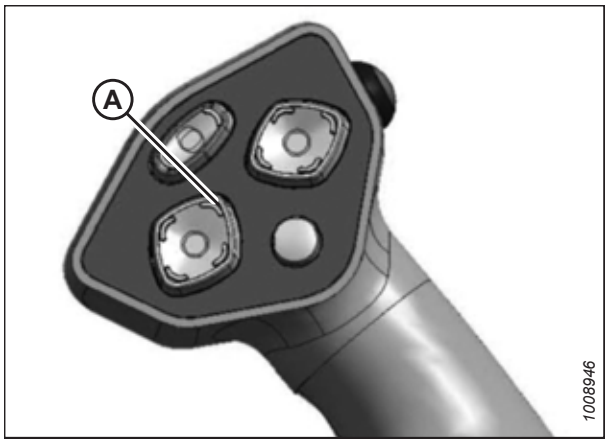


Figure 4.130: Ground Speed Lever (GSL)

5. To engage the safety props on the lift cylinders:

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

   b. Repeat the previous step for the opposite lift cylinder.

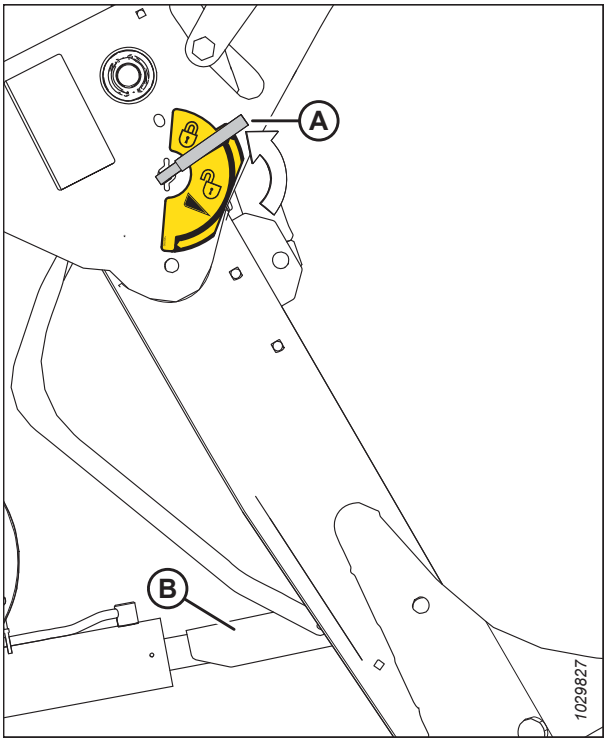


Figure 4.131: Safety Prop

6. Remove pin (B) by removing hairpin (A) from the header leg.

7. Repeat the previous step on the other side of the header.

8. Lower header stand (D) by pulling spring loaded pin (C). Release the spring pin to lock the stand.

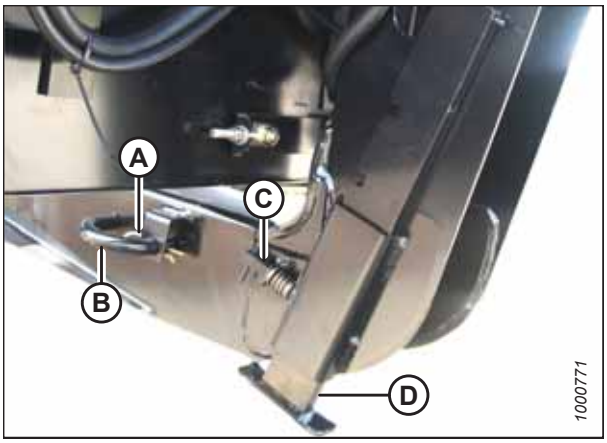


Figure 4.132: Header Stand

9. Remove the clevis pin from location (A) to disengage the float springs. Insert the pin in storage hole (B). Secure it 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 position (B) and **NOT** in engagement position (A).

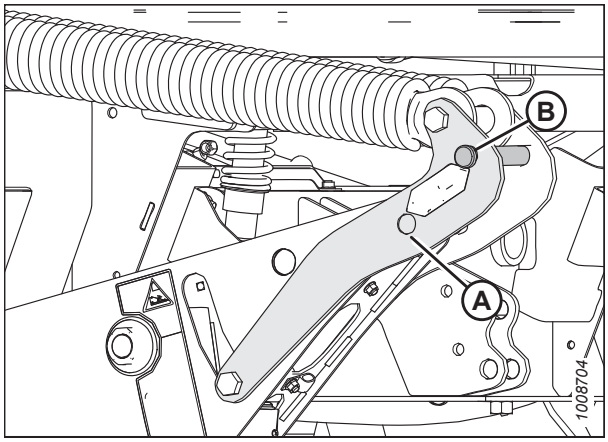


Figure 4.133: Header Float Linkage

10. To disengage the safety props on the lift cylinders:

    a. Turn lever (A) away from the header to raise the safety prop until the lever locks into the vertical position.

    b. Repeat the previous step for the opposite cylinder.

11. Start the engine.

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

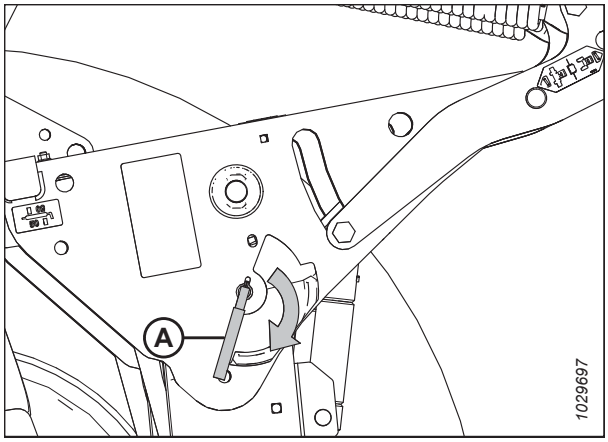


Figure 4.134: Safety Prop

13. Disconnect header drive hydraulics (A) and electrical harness (B) from the header and store them in the support on the windrower's left cab-forward side. Refer to the draper header operator's manual for further information.

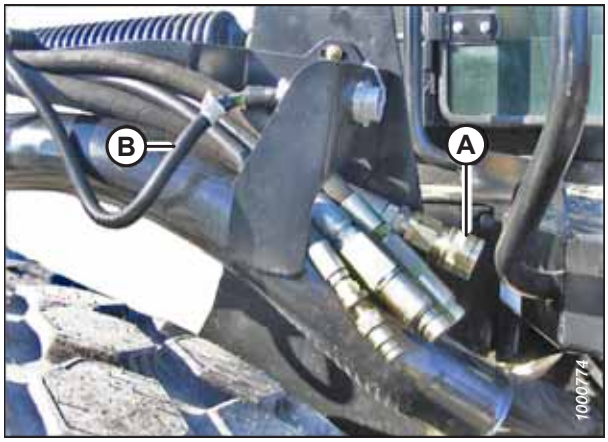


Figure 4.135: Header Drive Hydraulics

14. Disconnect reel hydraulics (A) from the header and store the connector on the bracket on the windrower's left cab-forward side. Refer to the draper header operator's manual for further information.

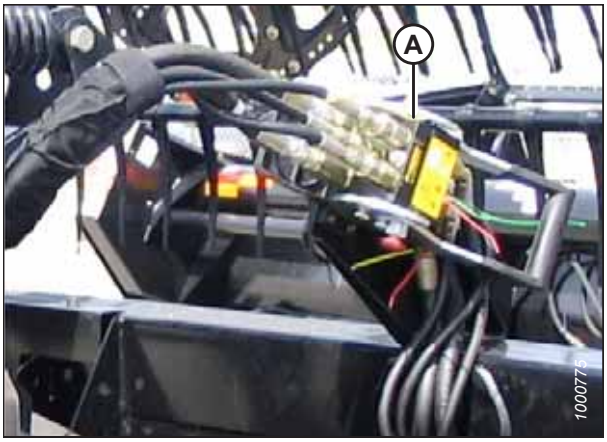


Figure 4.136: Reel Hydraulics

15. Start the engine.

16. Activate HEADER TILT UP switch (A) or HEADER TILT DOWN switch (B) on the ground speed lever (GSL) to relieve the load on the center-link cylinder.

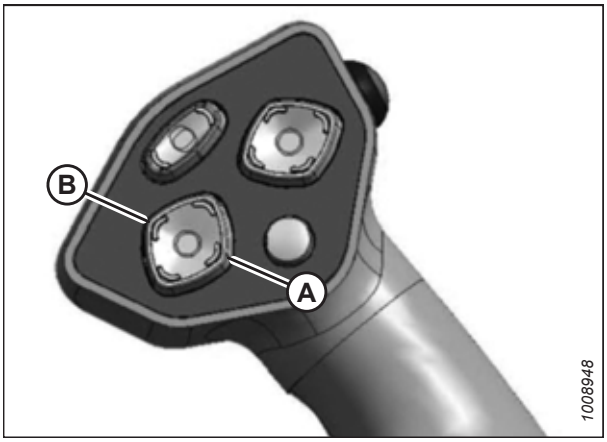


Figure 4.137: Ground Speed Lever

17. Disconnect the center-link by lifting release (B) and hook (A) off of the header.

    NOTE:

    If the optional center-link self-alignment kit is installed, lift release (B) and then operate the link lift cylinder using the REEL UP switch on the GSL to disengage the center-link from the header.

    NOTE:

    If a hay conditioner is installed, ensure that it clears the windrower legs when the windrower is reversed.

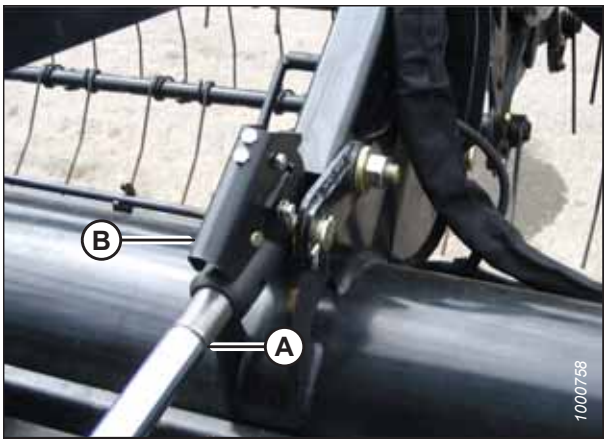


Figure 4.138: Hydraulic Center-Link

18. Back the windrower away from the header.
19. Reinstall pin (A) into the header leg. Secure the pin with hairpin (B).

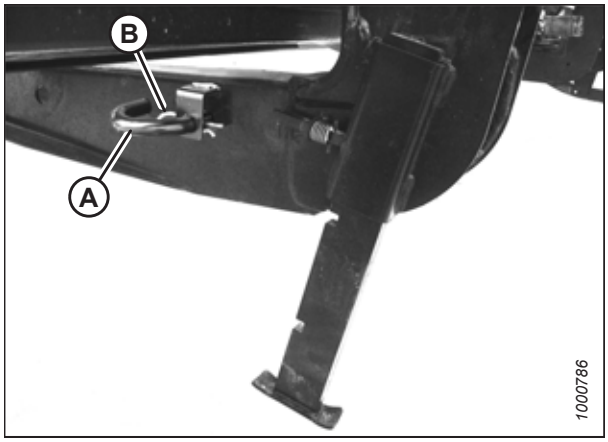


Figure 4.139: Header Stand

4.5.4 Attaching A Series Auger Header

Attaching a header to the windrower involves physically connecting the header to the header and completing the hydraulic and electrical connections.

The procedure for detaching an A Series Auger Header from the windrower differs slightly depending on the configuration of the windrower. Proceed to the relevant topic:

- *Attaching A Series Auger Header – Hydraulic Center-Link with Self-Alignment, page 242*
- *Attaching A Series Auger Header – Hydraulic Center-Link without Self-Alignment, page 248*

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

The header will need to be physically attached to the windrower, and the hydraulic and electrical connections completed. 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.

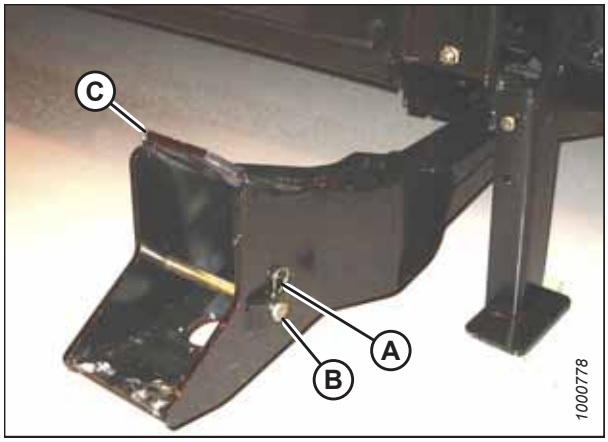


Figure 4.140: Header Boot

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).

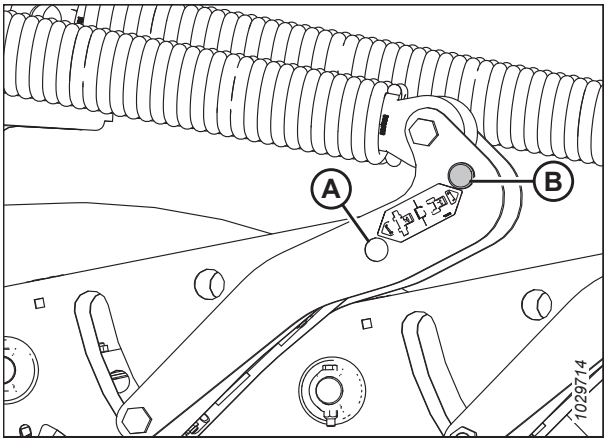


Figure 4.141: Header Float Linkage

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.

   IMPORTANT:

   Before starting the engine for the first time the windrower is operated in a season, remove the protective cover from the exhaust stack.

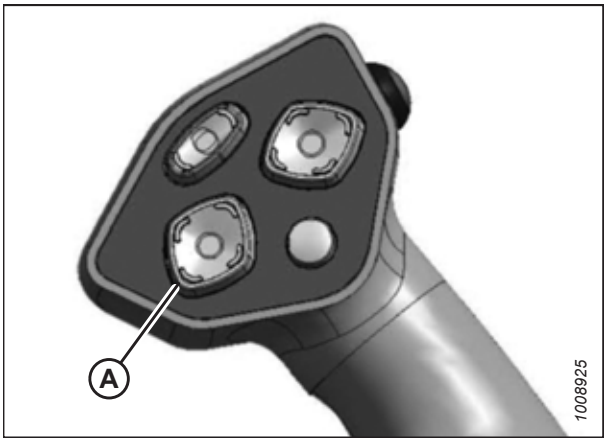


Figure 4.142: Ground Speed Lever

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.

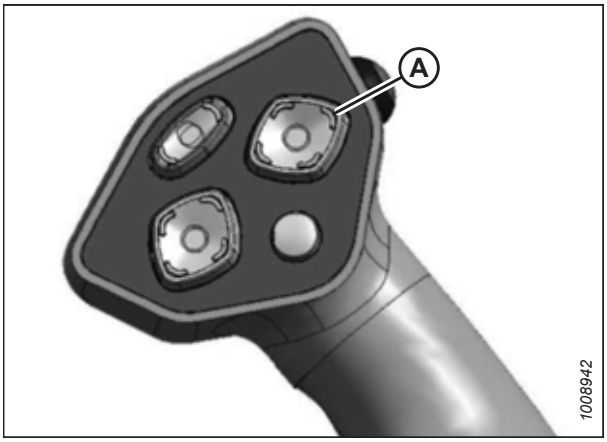


Figure 4.143: Ground Speed Lever

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.

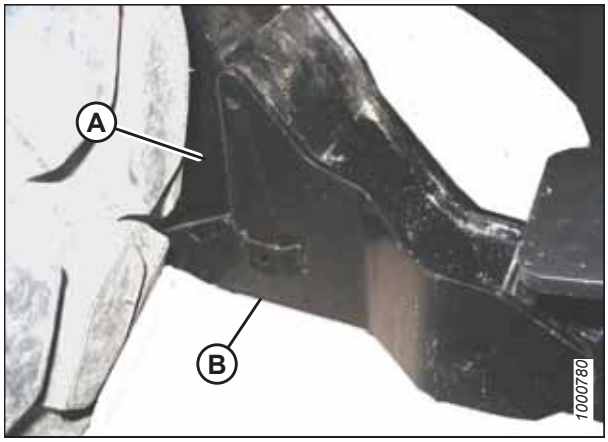


Figure 4.144: Header Support

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.

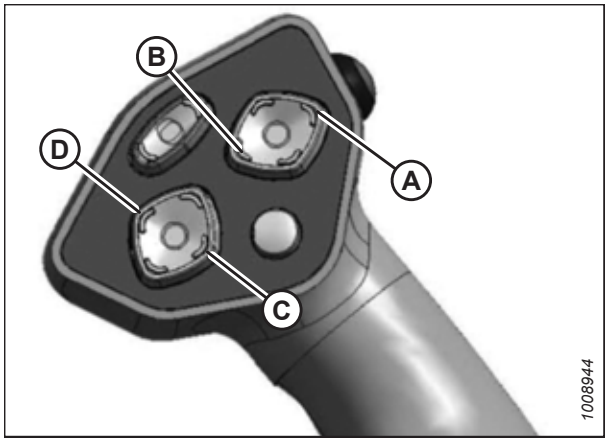


Figure 4.145: Ground Speed Lever

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.

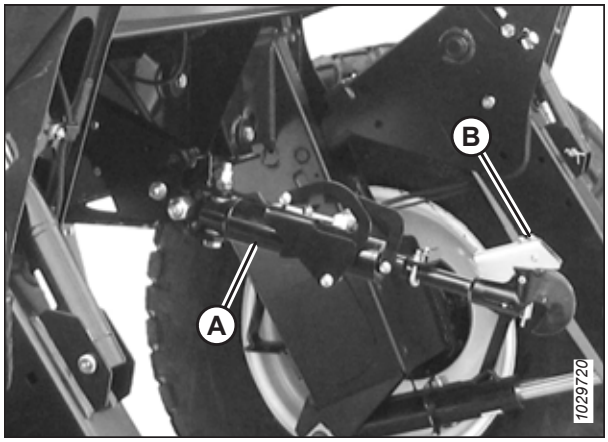


Figure 4.146: Hydraulic Center-Link

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 to fully phase the cylinders.

    NOTE:

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

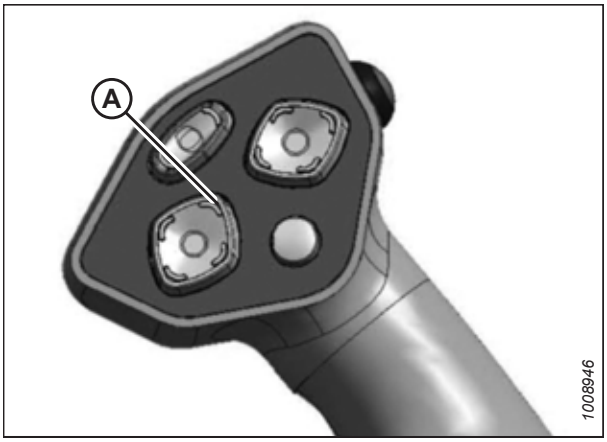


Figure 4.147: Ground Speed Lever

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.

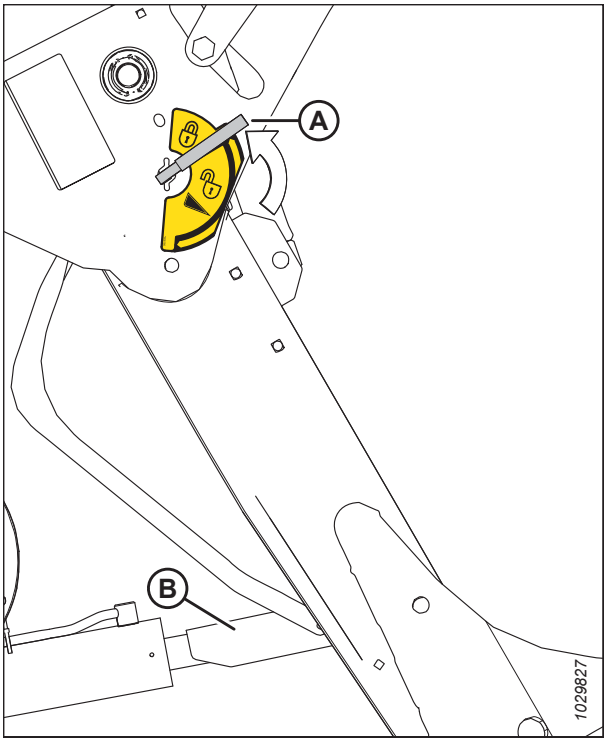


Figure 4.148: Safety Prop

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.

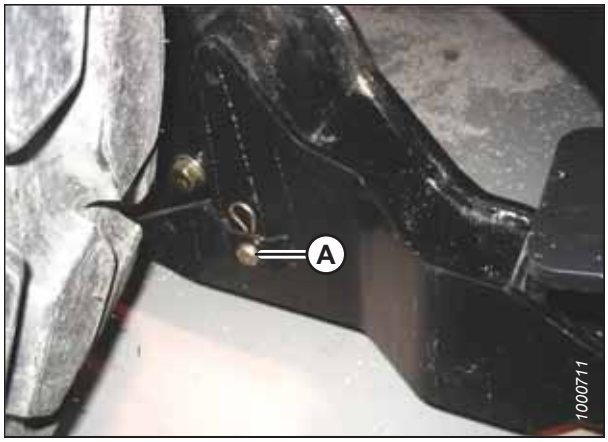


Figure 4.149: Header Support

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.

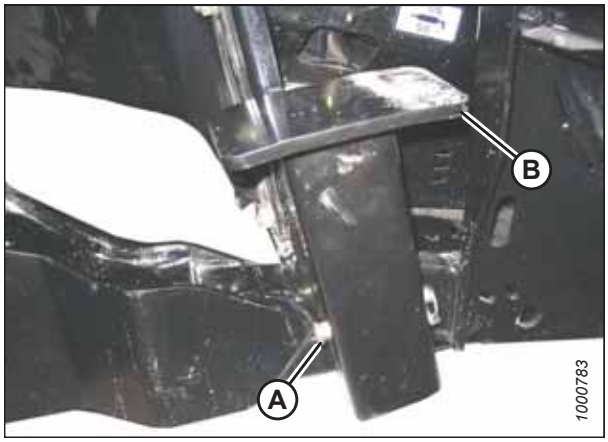


Figure 4.150: Header Stand

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.

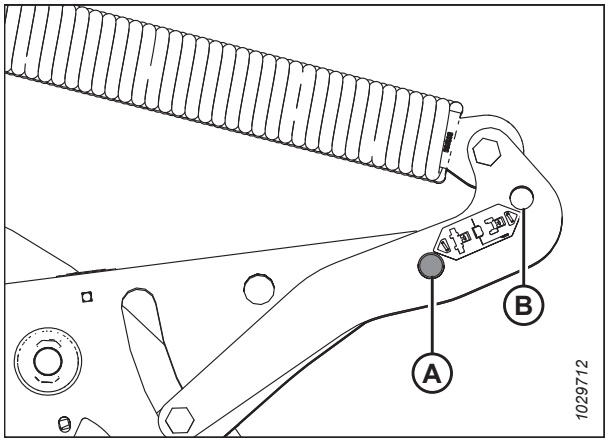


Figure 4.151: Header Float Linkage

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

21. Repeat the previous step to disengage the other safety prop.

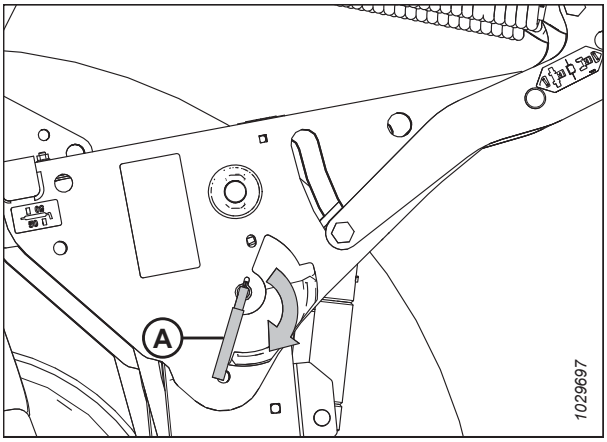


Figure 4.152: Safety Prop Lever

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.

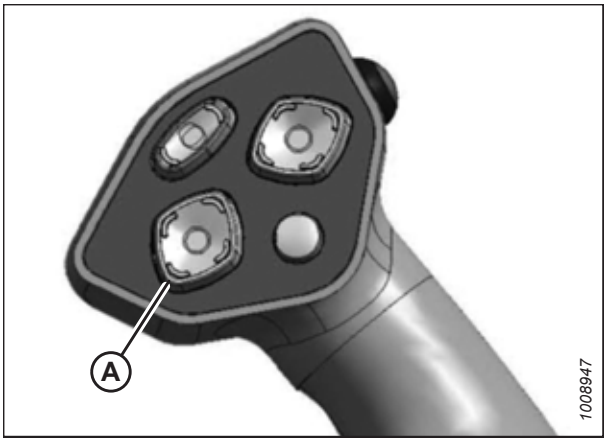


Figure 4.153: Ground Speed Lever

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

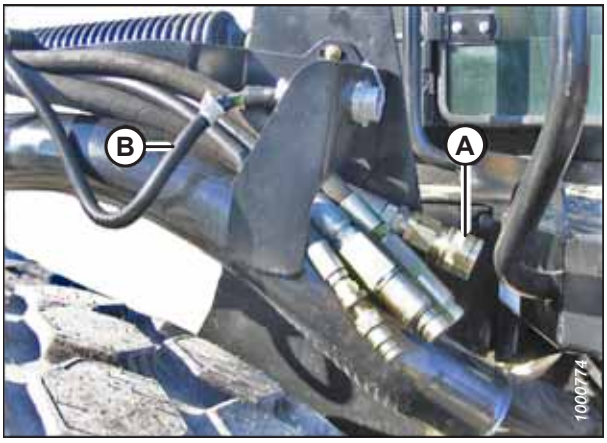


Figure 4.154: Header Drive Hoses and Harness

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

The header will need to be physically attached to the windrower, and the hydraulic and electrical connections completed. 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.

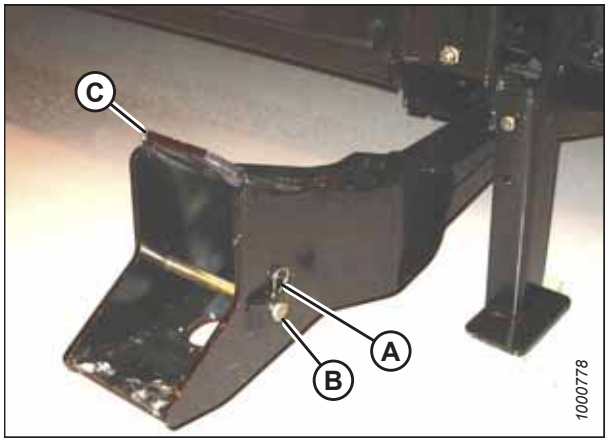


Figure 4.155: Header Boot

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).

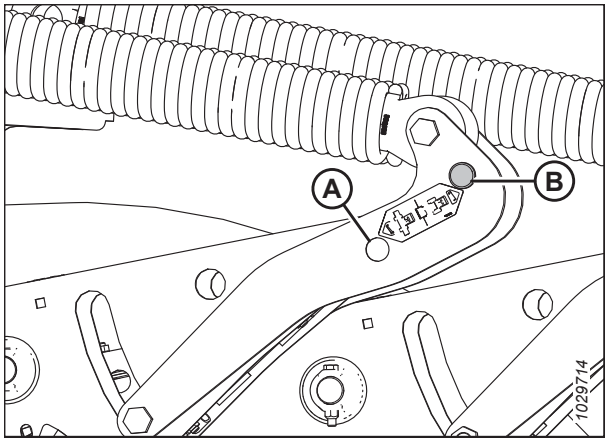


Figure 4.156: Header Float Linkage

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.

   IMPORTANT:

   Before starting the engine for the first time the windrower is operated in a season, remove the protective cover from the exhaust stack.

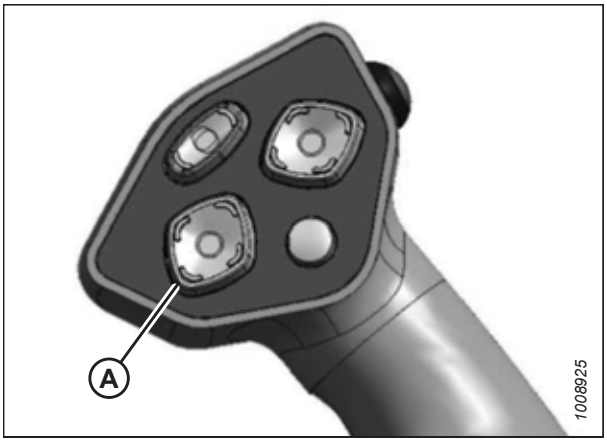


Figure 4.157: Ground Speed Lever

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.

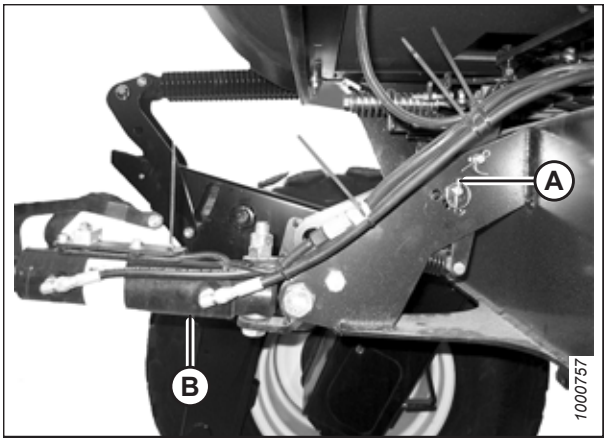


Figure 4.158: Hydraulic Center-Link without Self-Alignment Kit

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.

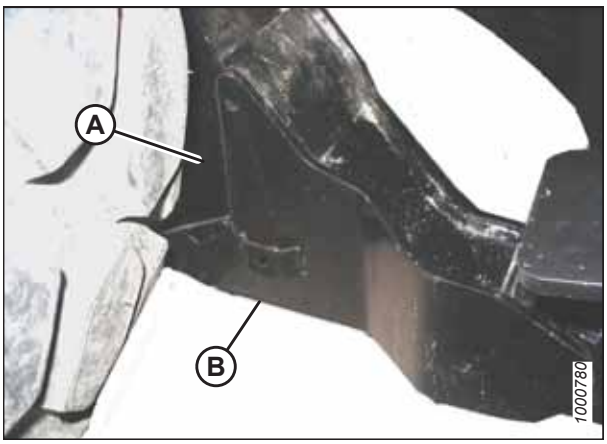


Figure 4.159: Header Support

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.

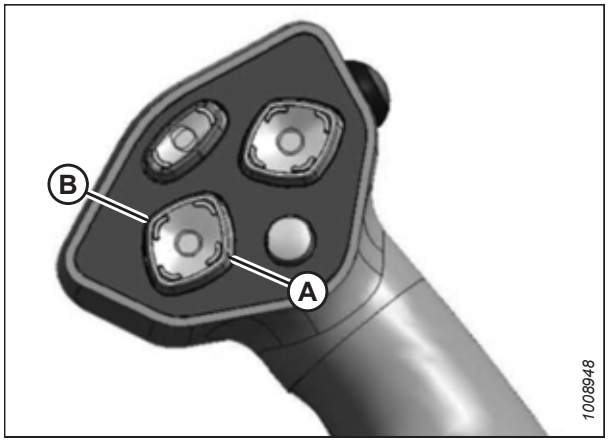


Figure 4.160: Ground Speed Lever

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.

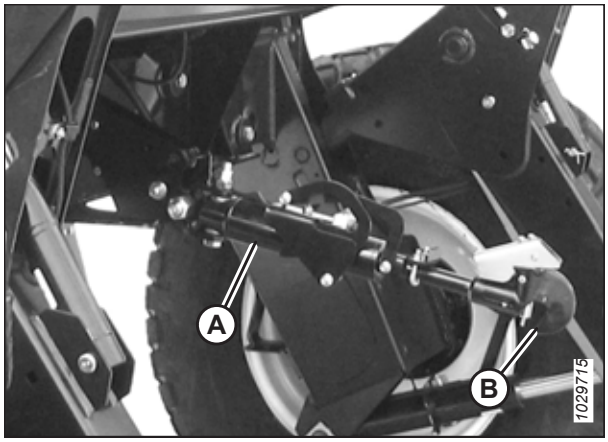


Figure 4.161: Hydraulic Center-Link

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.

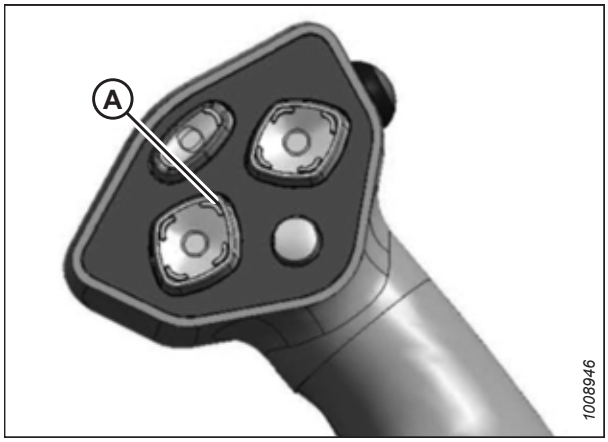


Figure 4.162: Ground Speed Lever

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.

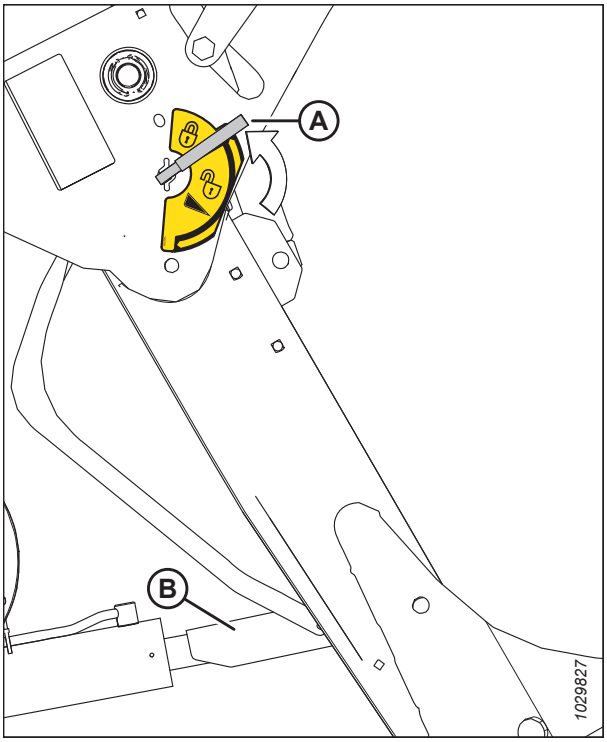


Figure 4.163: Safety Prop

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.

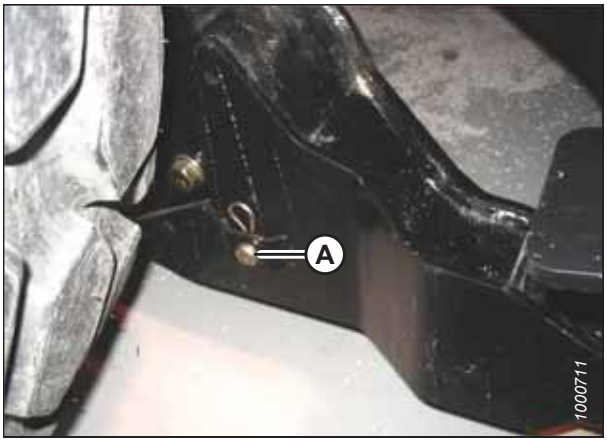


Figure 4.164: Header Support

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.

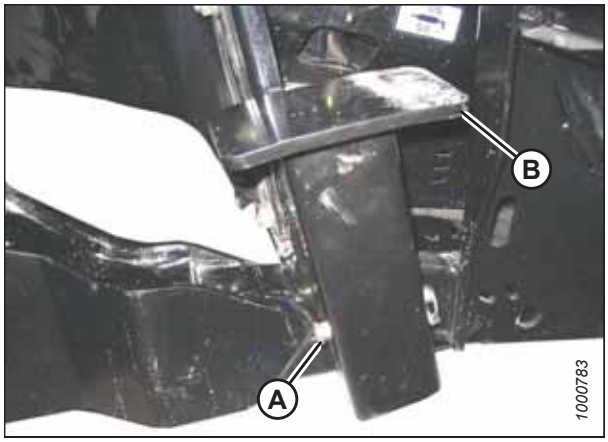


Figure 4.165: Header Stand

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.

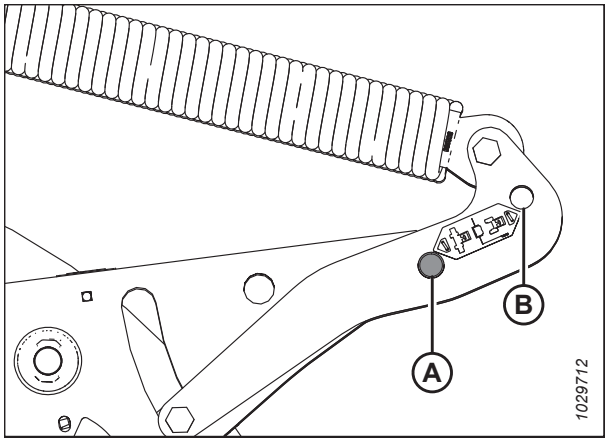


Figure 4.166: Header Float Linkage

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

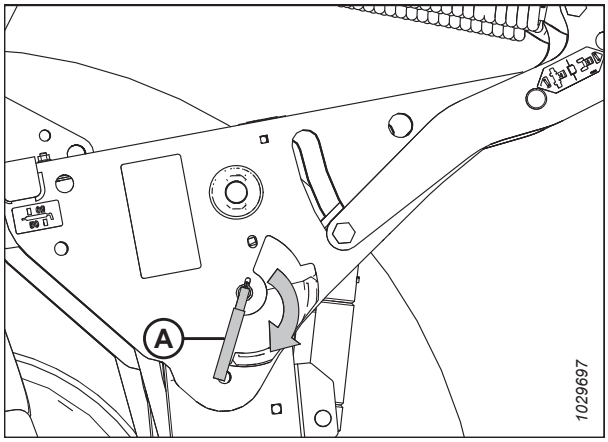


Figure 4.167: Safety Prop Lever

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.

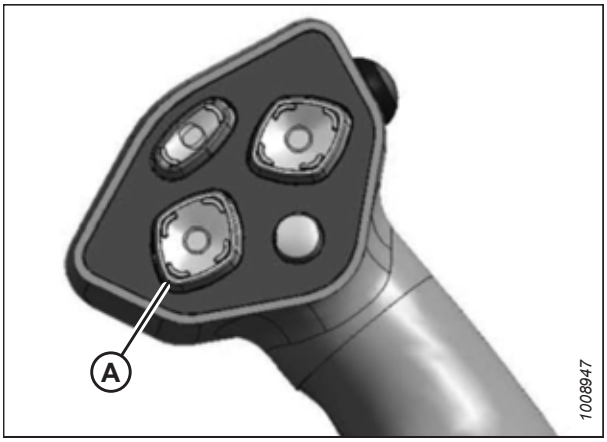


Figure 4.168: Ground Speed Lever

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

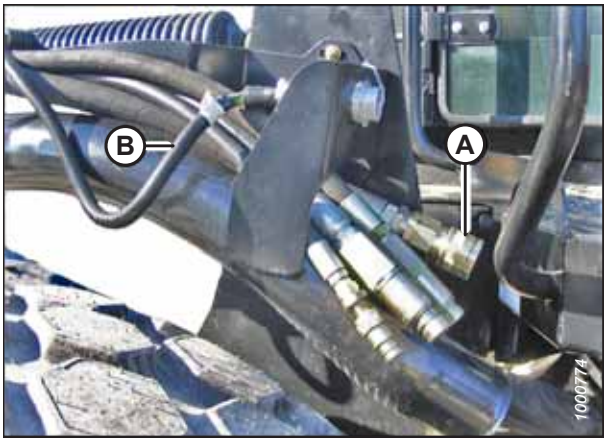


Figure 4.169: Header Drive Hoses and Harness

4.5.5 Detaching A Series Auger Header

Detaching a header from the windrower involves removing the header's mechanical connection to the windrower and disconnecting the hydraulic and electrical connections.

Detaching A Series Auger Header – Hydraulic Center-Link

Detaching an A Series Auger Header from the windrower requires lowering the header stand, removing the leg pins, disengaging the float springs, and disconnecting the electrical and hydraulic connectors.

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. Press HEADER UP switch (A) on the ground speed lever (GSL) to raise the header to its maximum height.
3. Rephase the cylinders if one end of the header does not rise fully:
   a. Press and hold HEADER UP switch (A) until both cylinders stop moving.
   b. Continue to hold the switch for 3–4 seconds. The cylinders are now phased.
4. Shut down the engine, and remove the key from the ignition.

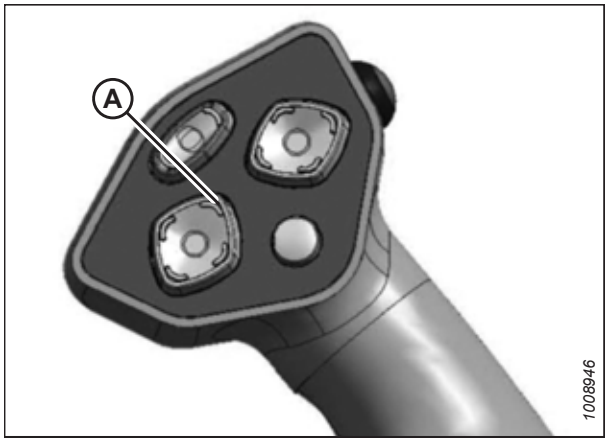


Figure 4.170: Ground Speed Lever

DANGER

To prevent bodily injury from the fall of a raised header, always engage the safety props when working on or around a raised header, and before going under the header for any reason.

5. To engage the safety props on the lift cylinders:
   a. Pull lever (A) and rotate it toward the header to lower safety prop (B) onto the cylinder.
   b. Repeat the previous step for the opposite lift cylinder.

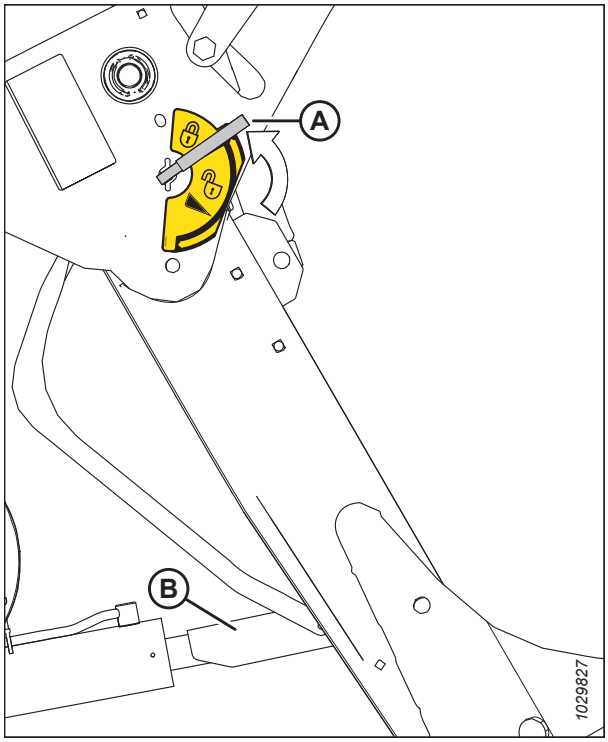


Figure 4.171: Safety Prop

6. Remove the hairpin from clevis pin (A), and remove the clevis pin from header boots (B).

7. Repeat the previous step on the other side of the header.

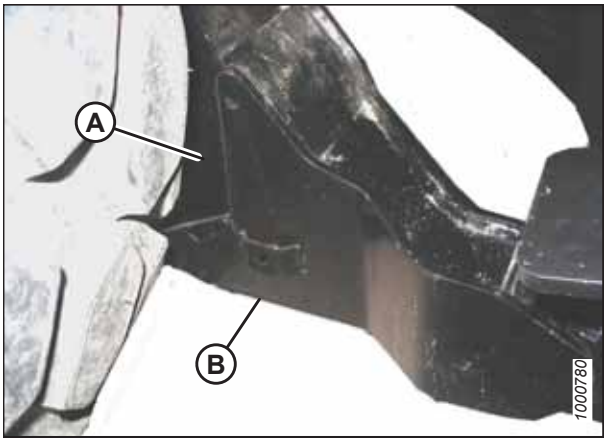


Figure 4.172: Header Boot

8. Lower stand (A) by pulling clevis pin (B), inverting the stand, and positioning the stand on the bracket. Reinsert pin (B) and secure it with a hairpin.

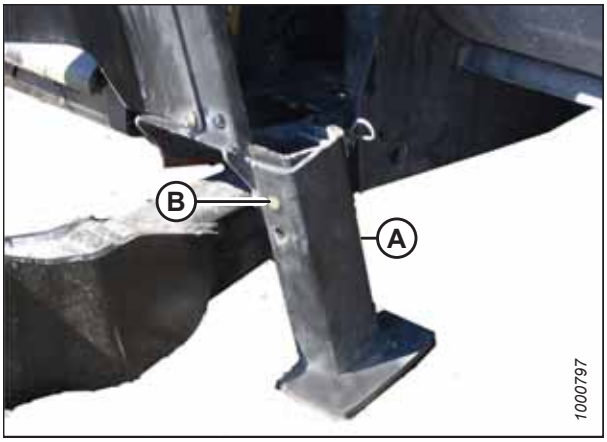


Figure 4.173: Header Stand

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

   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 the engaged position.

   Remove the lynch pin from the clevis pin, and remove the clevis pin from engaged position (A) in the linkage to disengage the float springs.

10. Insert the clevis pin into storage hole (B). Secure it with a lynch pin.

11. Repeat the previous step on the other side of the header.

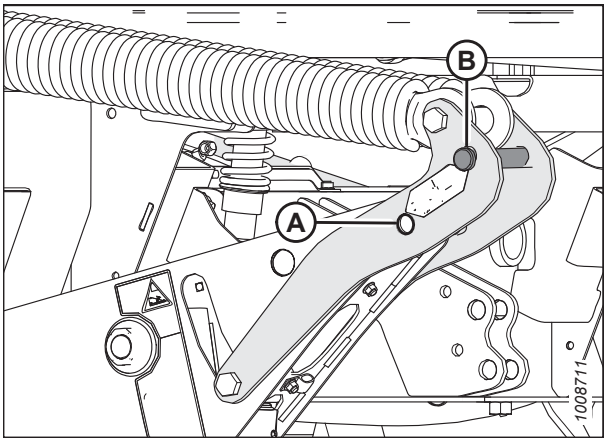


Figure 4.174: Header Float Linkage

12. Disengage the safety props by turning lever (A) away from the header to raise the safety prop until the lever locks into the vertical position.

13. Repeat the previous step to release the safety prop on the opposite cylinder.

14. Start the engine, choose a level area, and lower the header to the ground.

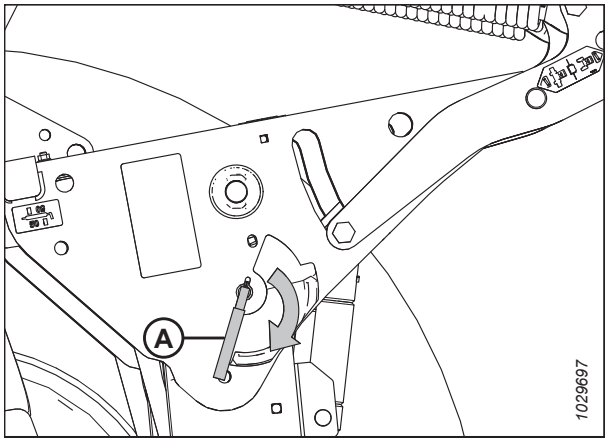


Figure 4.175: Safety Props

15. Press HEADER TILT UP switch (A) or HEADER TILT DOWN switch (B) on the GSL to relieve the load on the center-link cylinder.

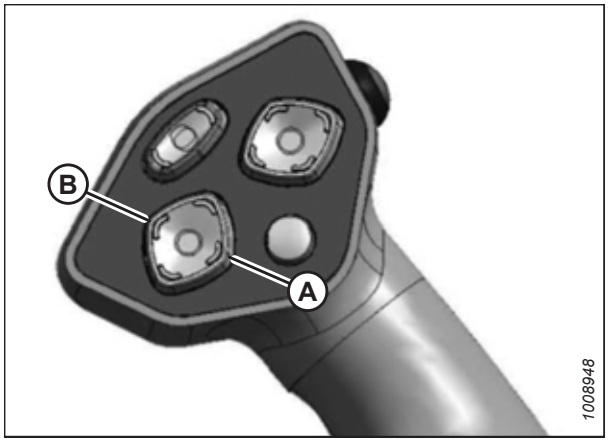


Figure 4.176: Ground Speed Lever

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

17. Lift hook release (C) and lift hook (B) off of the header pin.

    NOTE:

    If the optional center-link self-alignment kit is installed, lift release (C) and then operate link lift cylinder (A) using the REEL UP switch on the GSL to disengage the center-link from the header.

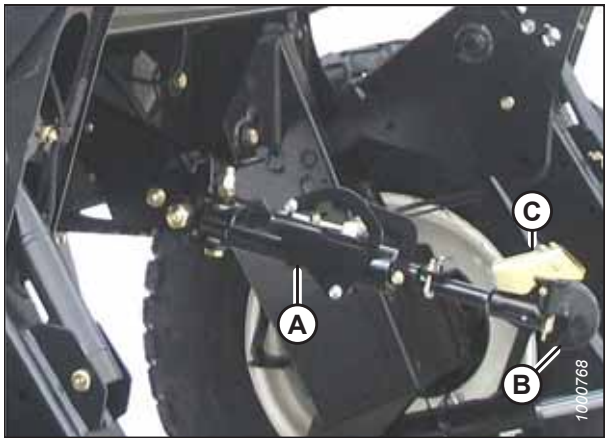


Figure 4.177: Hydraulic Center-Link

18. Disconnect header drive hydraulics (A) and electrical harness (B). Refer to the auger header operator's manual.
19. Back the windrower slowly away from the header.

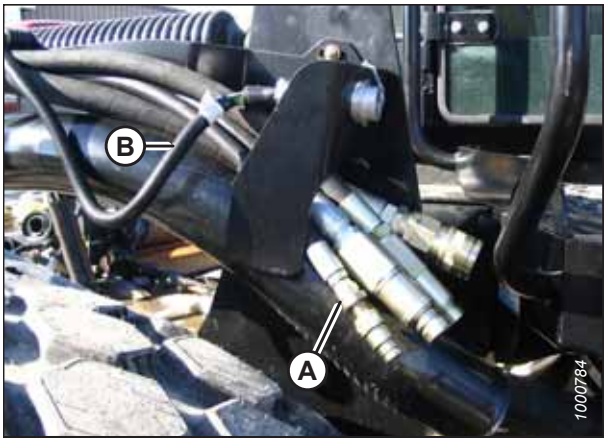


Figure 4.178: Header Drive Hydraulics

20. Reinstall clevis pin (B) into header boot (C) and secure it with hairpin (A).
21. Repeat the previous step on the opposite side of the header.

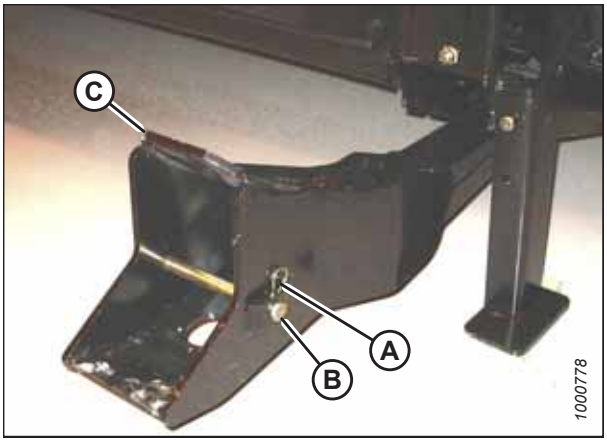


Figure 4.179: Header Boots

4.5.6 Attaching R Series or R1 Series Rotary Disc Header

Attaching a header to the windrower involves physically connecting the header to the header and completing the hydraulic and electrical connections.

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 procedure for attaching an R or R1 Series Rotary Disc Header to the windrower differs slightly depending on the configuration of the windrower. Proceed to the relevant topic:

- *Attaching R or R1 Series Rotary Disc Header – Hydraulic Center-Link with Self-Alignment, page 258*
- *Attaching R or R1 Series Rotary Disc Header – Hydraulic Center-Link without Self-Alignment, page 263*

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

The header will need to be physically attached to the windrower, and the hydraulic and electrical connections completed. 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.

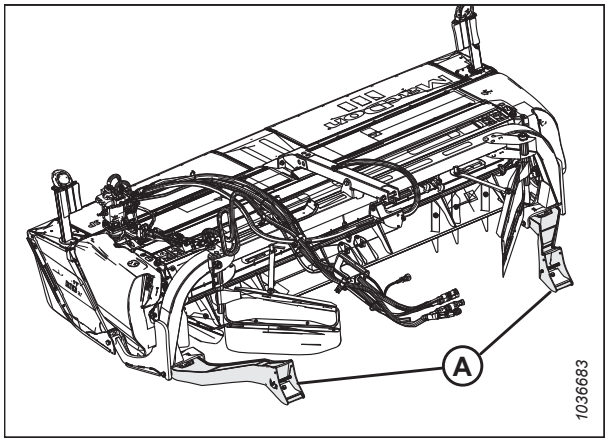


Figure 4.180: Header Supports – R113 SP

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

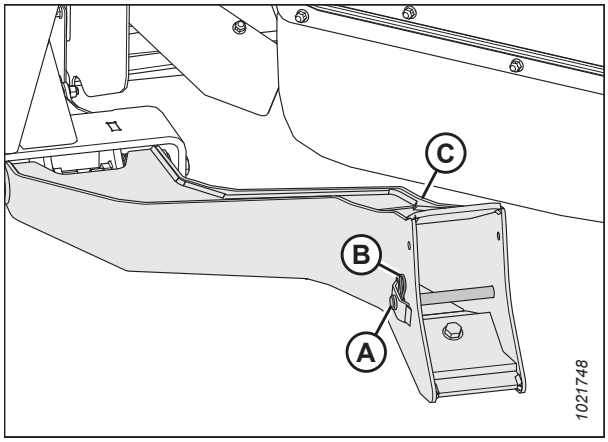


Figure 4.181: Header Support

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).

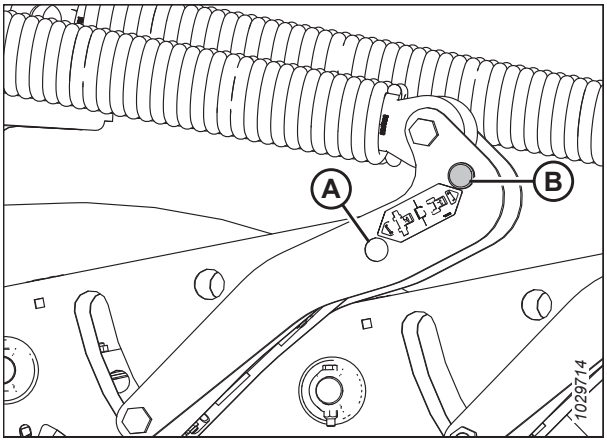


Figure 4.182: Float Linkage

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.

   IMPORTANT:

   Before starting the engine for the first time the windrower is operated in a season, remove the protective cover from the exhaust stack.

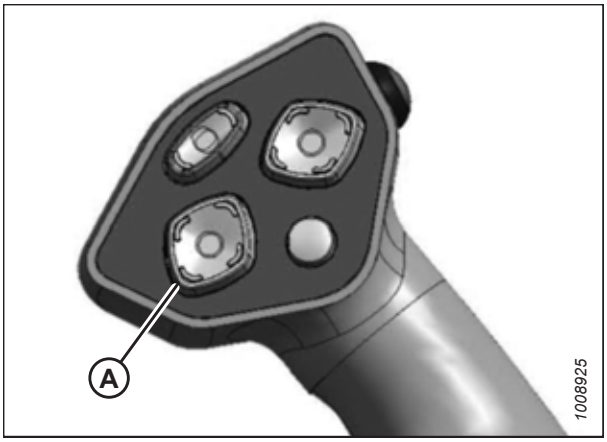


Figure 4.183: Ground Speed Lever

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.

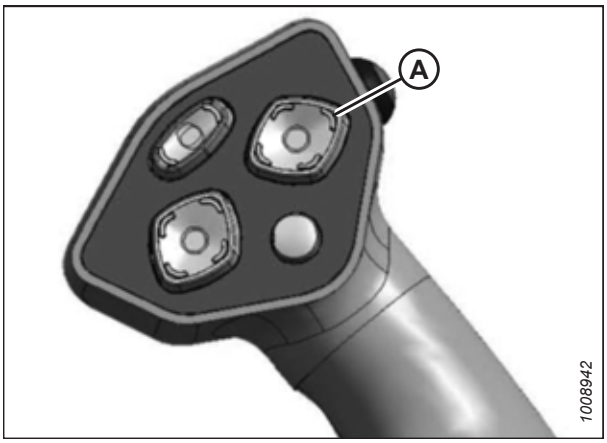


Figure 4.184: Ground Speed Lever

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.

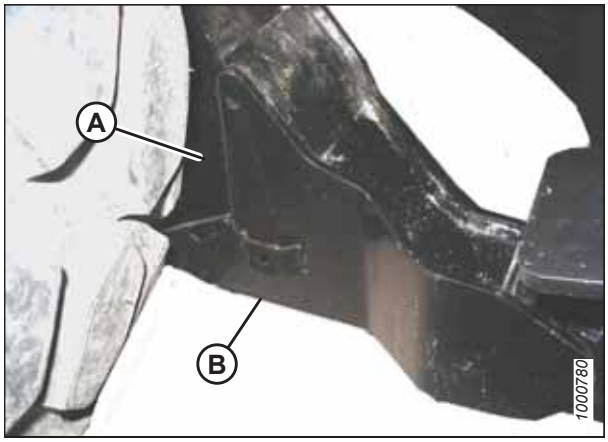


Figure 4.185: Header Support

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.

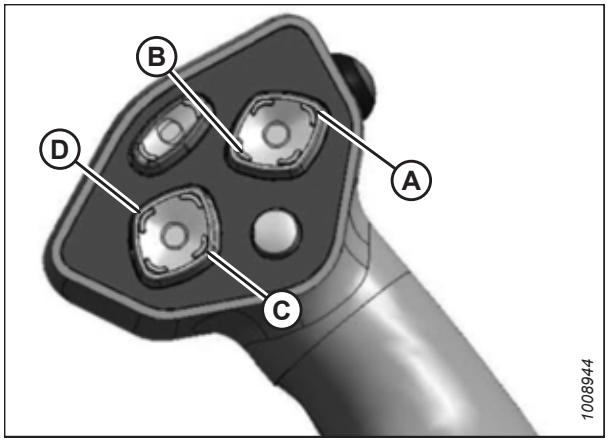


Figure 4.186: Ground Speed Lever

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.

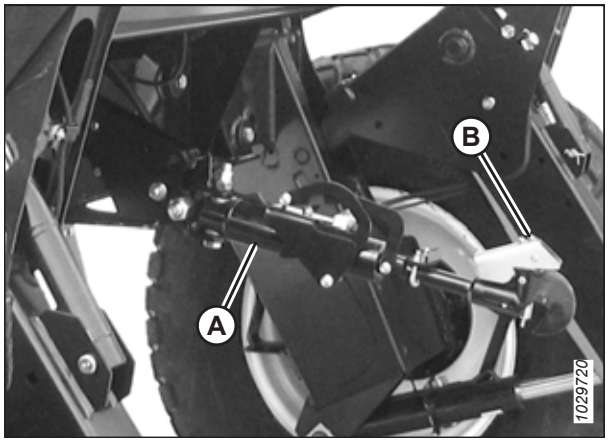


Figure 4.187: Hydraulic Center-Link

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 to fully phase the cylinders.

    NOTE:

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

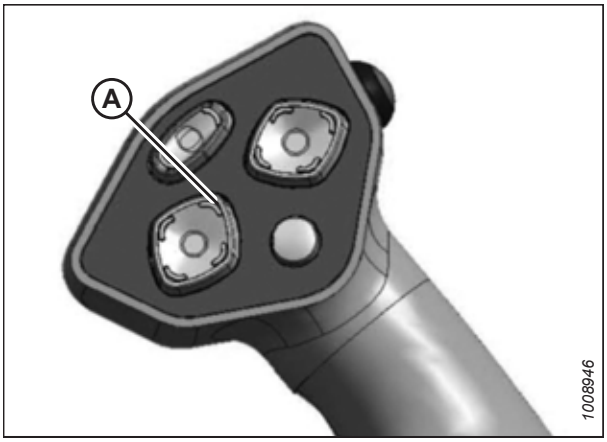


Figure 4.188: Ground Speed Lever

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.

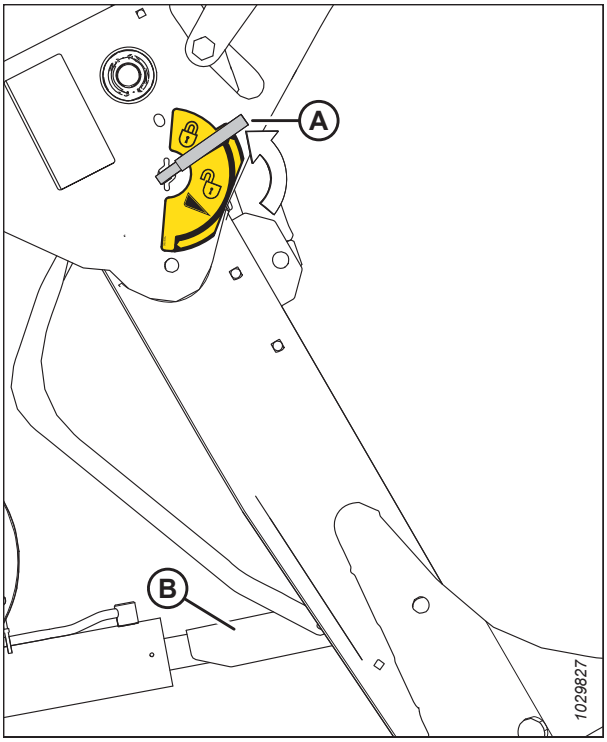


Figure 4.189: Safety Prop

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.

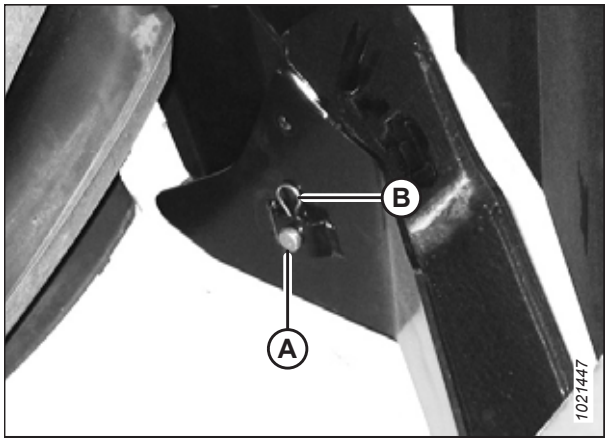


Figure 4.190: Header Support

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.

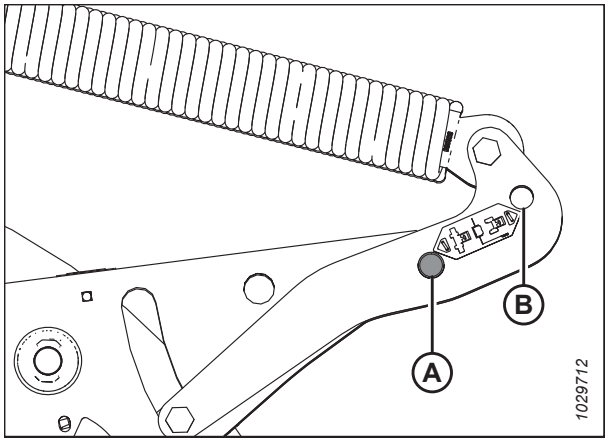


Figure 4.191: Header Float Linkage

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

18. Repeat the previous step to disengage the other safety prop.

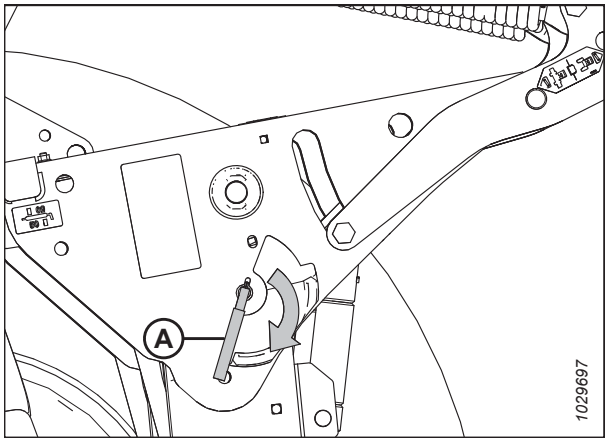


Figure 4.192: Safety Prop Lever

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.

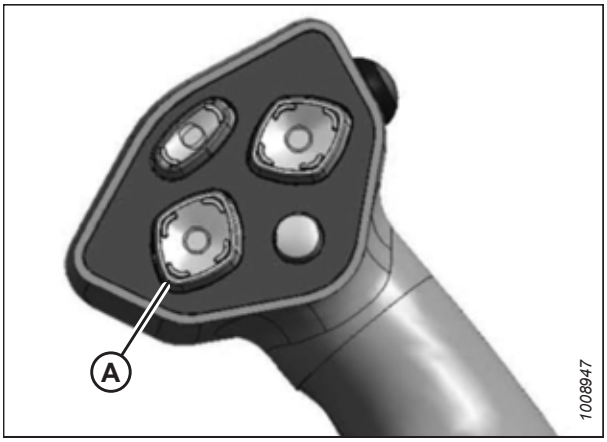


Figure 4.193: Ground Speed Lever

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

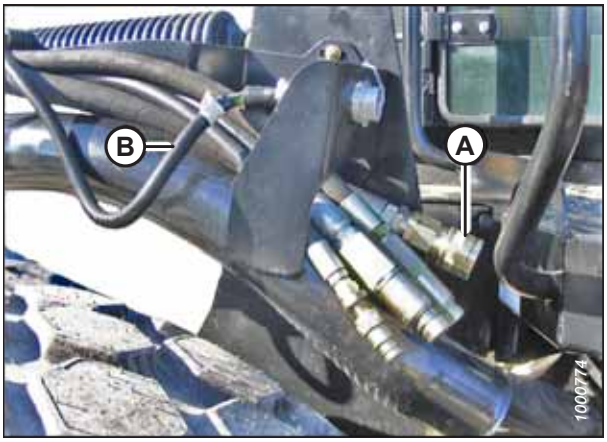


Figure 4.194: Header Drive Hoses and Harness

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

The header will need to be physically attached to the windrower, and the hydraulic and electrical connections completed. 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.

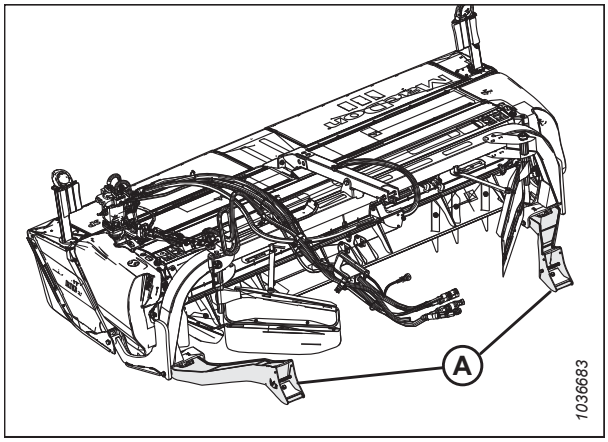


Figure 4.195: Header Supports – R113 SP

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

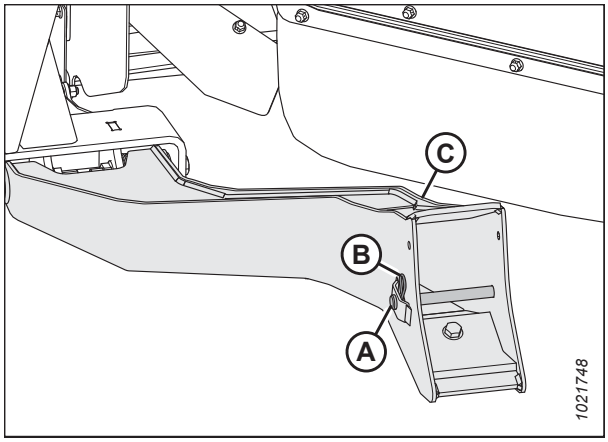


Figure 4.196: Header Support

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).

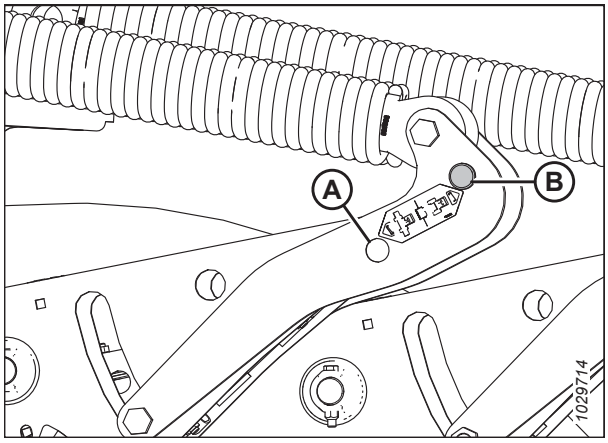


Figure 4.197: Header Float Linkage

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.

   IMPORTANT:

   Before starting the engine for the first time the windrower is operated in a season, remove the protective cover from the exhaust stack.

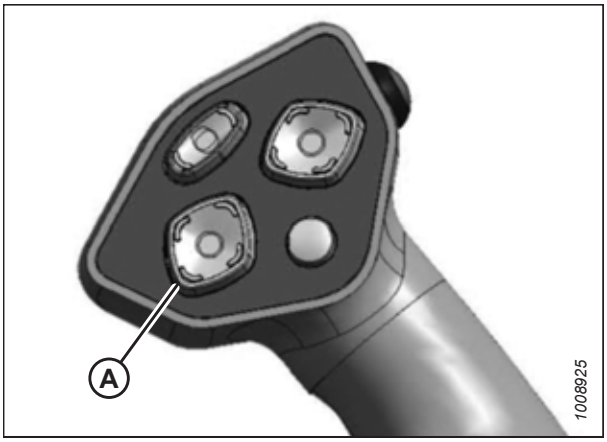


Figure 4.198: Ground Speed Lever

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.

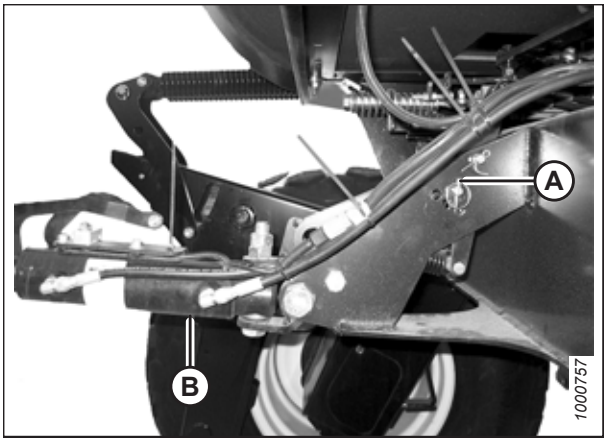


Figure 4.199: Hydraulic Center-Link without Self-Alignment Kit

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.

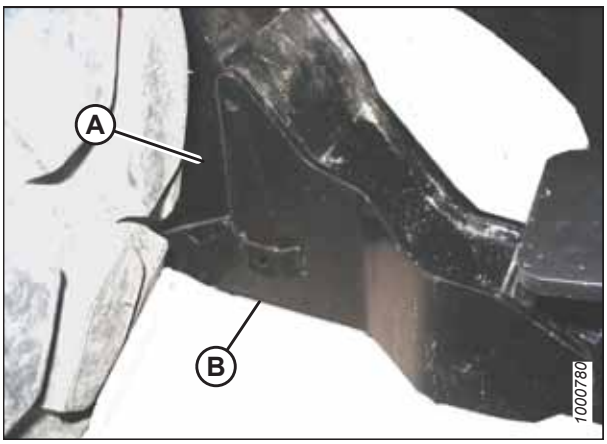


Figure 4.200: Header Support

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.

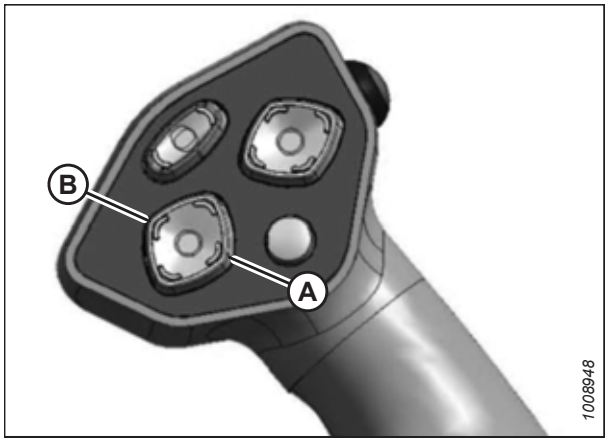


Figure 4.201: Ground Speed Lever

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.

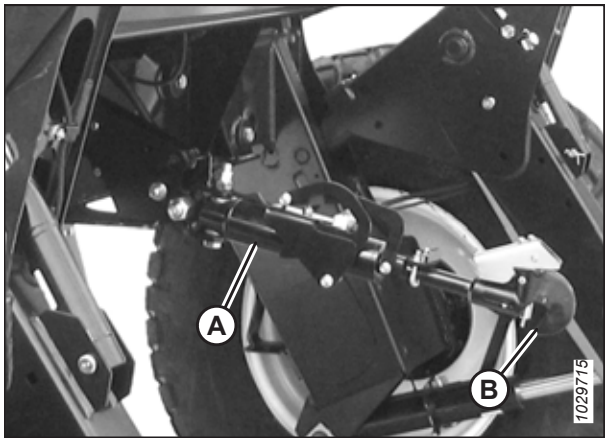


Figure 4.202: Hydraulic Center-Link

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.

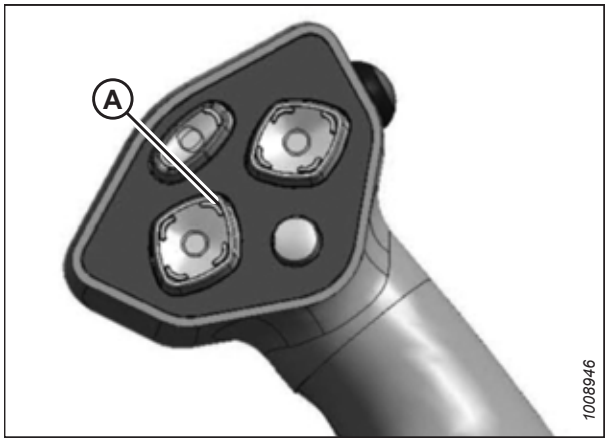


Figure 4.203: Ground Speed Lever

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.

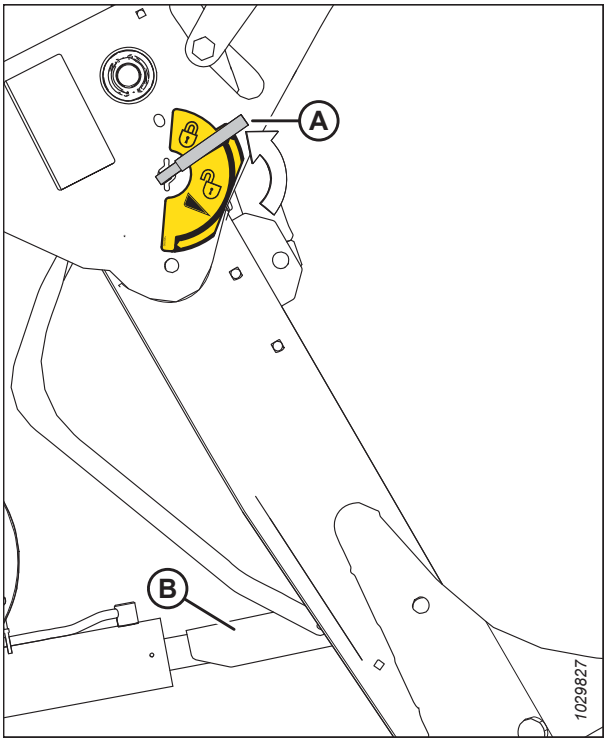


Figure 4.204: Safety Prop

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.

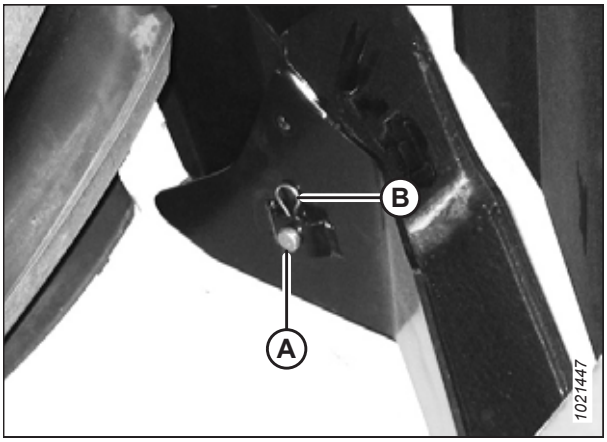


Figure 4.205: Header Support

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.

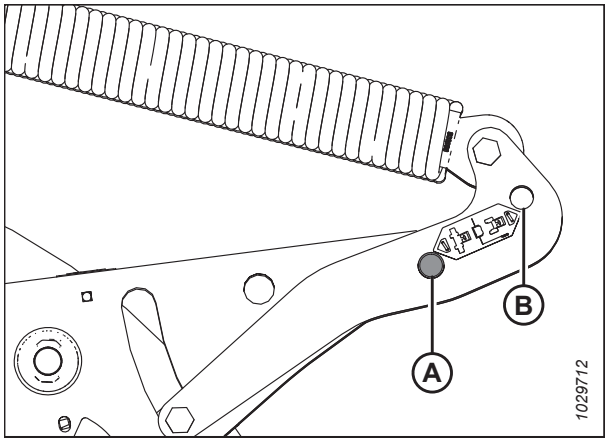


Figure 4.206: Header Float Linkage

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

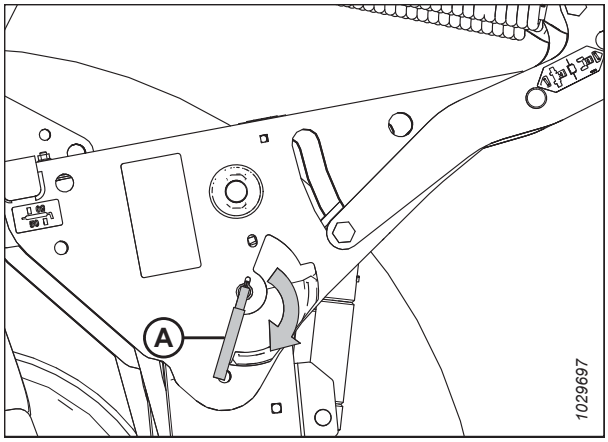


Figure 4.207: Safety Prop Lever

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.

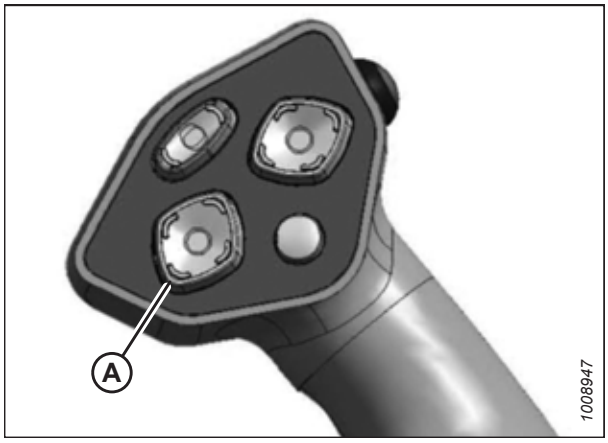


Figure 4.208: Ground Speed Lever

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

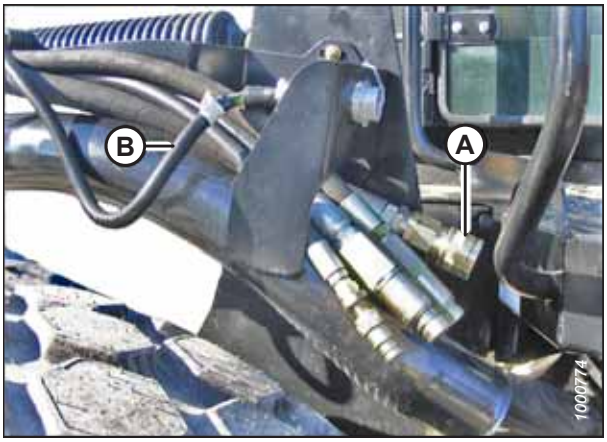


Figure 4.209: Header Drive Hoses and Harness

4.5.7 Detaching R or R1 Series Rotary Disc Header

Detaching a header from the windrower involves removing the header's mechanical connection to the windrower and disconnecting the hydraulic and electrical connections.

Detaching R or R1 Series Rotary Disc Header — Hydraulic Center-Link

Detaching an R or R1 Series Rotary Disc Header from the windrower requires lowering the header stand, removing the leg pins, disengaging the float springs, and disconnecting the electrical and hydraulic connectors.

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. Start the engine and press HEADER UP switch (A) to raise the header to its maximum height.
2. Rephase the cylinders if one end of the header does not rise fully:
   a. Press and hold HEADER UP switch (A) until both cylinders stop moving.
   b. Continue to hold the switch for 3–4 seconds. The cylinders are now phased.

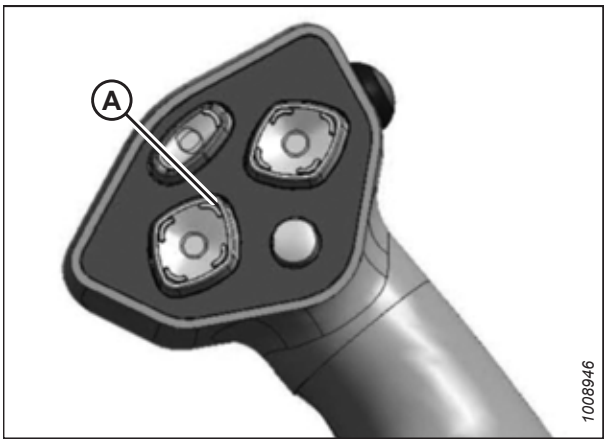


Figure 4.210: Ground Speed Lever (GSL)

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

4. To engage the safety props on the lift cylinders:

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

   b. Repeat the previous step for the opposite lift cylinder.

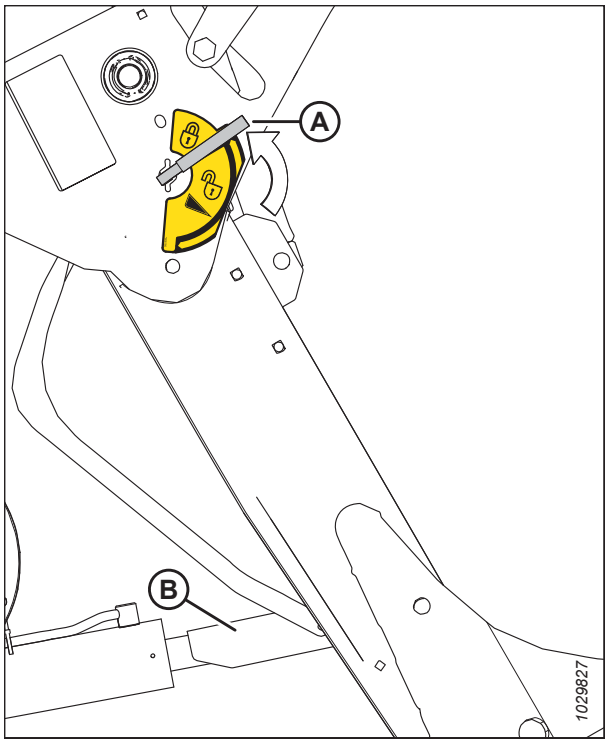


Figure 4.211: Safety Prop

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

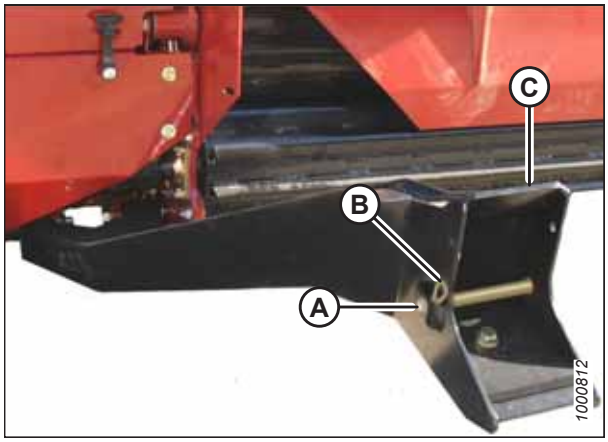


Figure 4.212: Header Boots

6. Remove the hairpin and the clevis pin from location (A) to disengage the float springs. Insert the clevis pin into storage hole (B). Secure it with the hairpin.

   IMPORTANT:

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

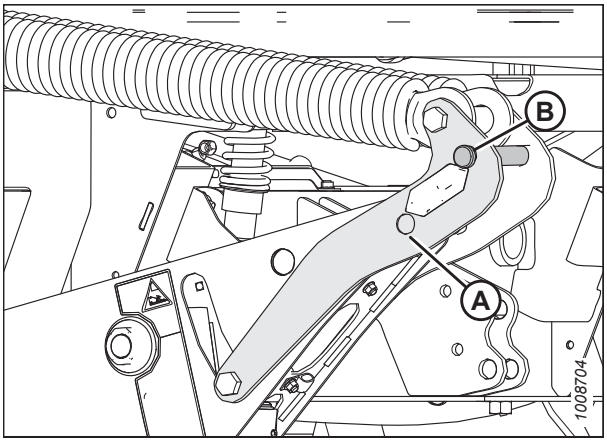


Figure 4.213: Header Float Linkage

DANGER

Ensure that all bystanders have cleared the area.

7. Disengage the safety props by turning lever (A) away from the header to raise the safety prop until the lever locks into vertical position. Repeat this step to secure the opposite cylinder.

8. Start the engine, choose a level area, and lower the header to the ground.

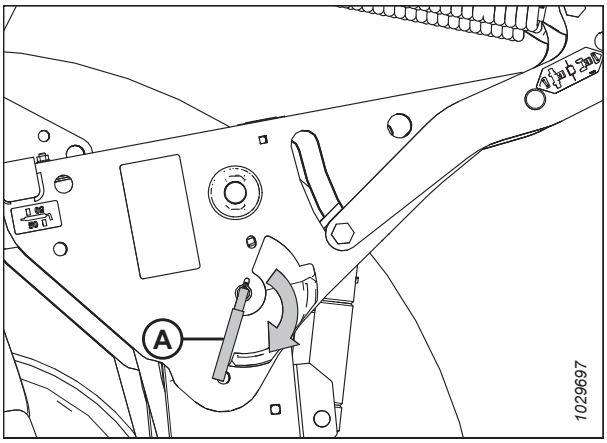


Figure 4.214: Safety Props

9. Press HEADER TILT UP (A) and HEADER TILT DOWN (B) cylinder switches on the GSL to release the load on the center-link cylinder.

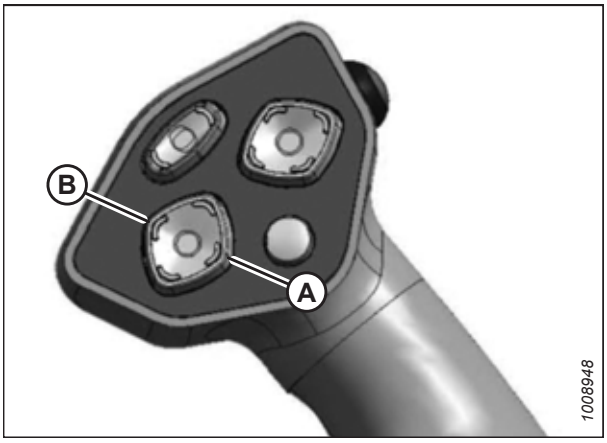


Figure 4.215: Ground Speed Lever

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

11. Lift hook release (C) and lift hook (B) off the header pin.

    NOTE:

    If the optional center-link lift cylinder is installed, lift release (C) and then operate the link lift cylinder from the cab to disengage center-link (A) from the header.

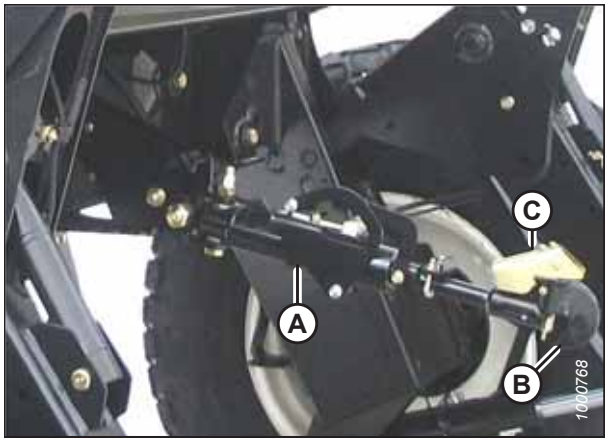


Figure 4.216: Hydraulic Center-Link

12. Disconnect header drive hydraulics (A) and electrical harness (B). Refer to the header operator's manual.

13. Back the windrower slowly away from the header.

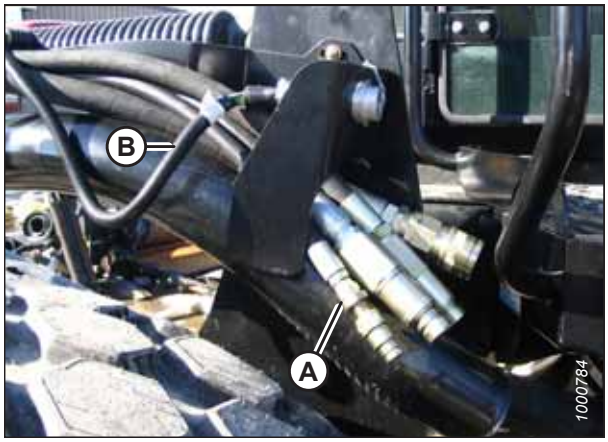


Figure 4.217: Header Drive Hydraulics

14. Reinstall clevis pin (A) through boot (C) and secure it with hairpin (B). Repeat this step on the opposite side of the header.

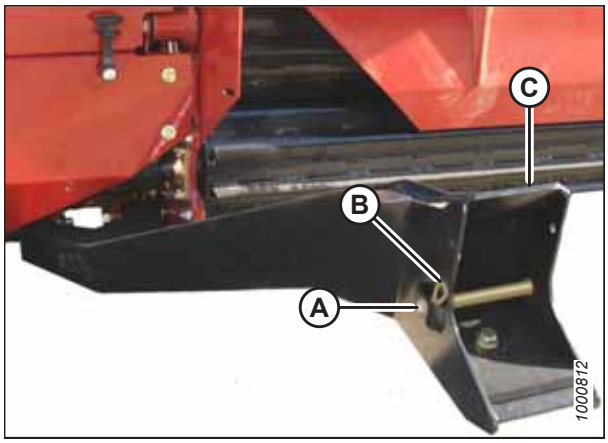


Figure 4.218: Header Boot

4.5.8 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 *Attaching R2 Series Rotary Disc Header – Hydraulic Center-Link with Self-Alignment, page 273*.
- To connect the header to an M155*E4* Self-Propelled Windrower equipped with a non-self-aligning hydraulic center-link, proceed to *Attaching R2 Series Rotary Disc Header – Hydraulic Center-Link without Self-Alignment, page 279*.

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.

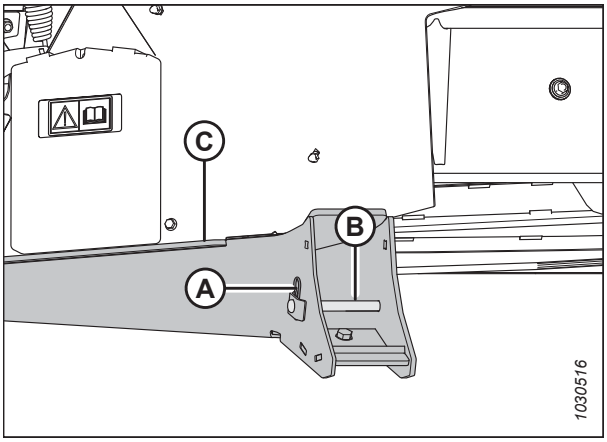


Figure 4.219: Header Support

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.

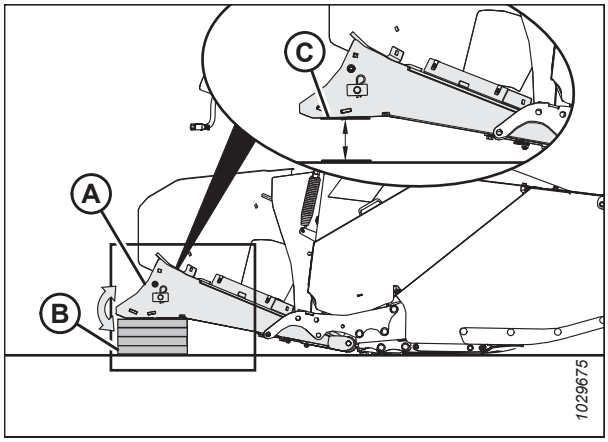


Figure 4.220: Header Support

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.

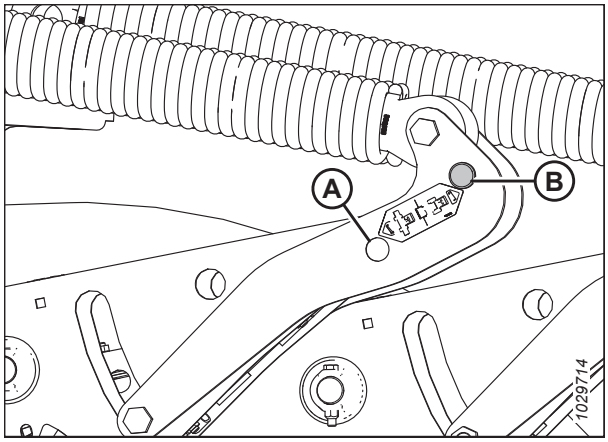


Figure 4.221: Float Linkage

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.

   IMPORTANT:

   Before starting the engine for the first time the windrower is operated in a season, remove the protective cover from the exhaust stack.

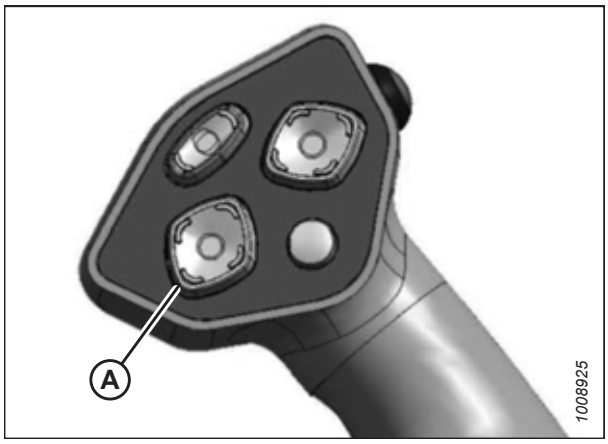


Figure 4.222: Ground Speed Lever

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.

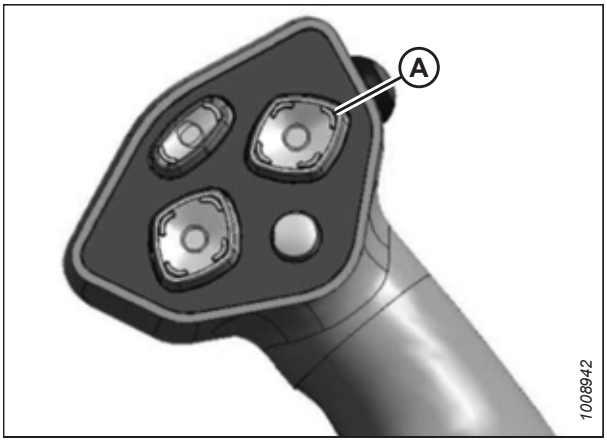


Figure 4.223: Ground Speed Lever

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.

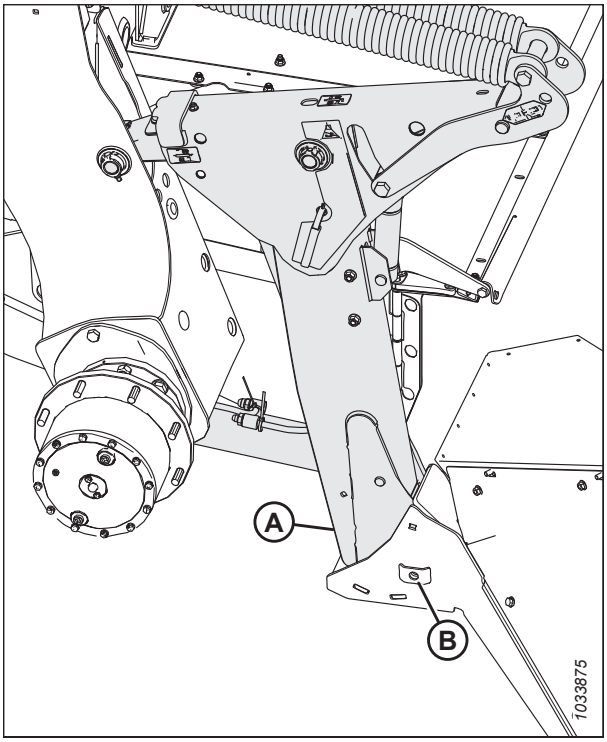


Figure 4.224: Header Support

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.

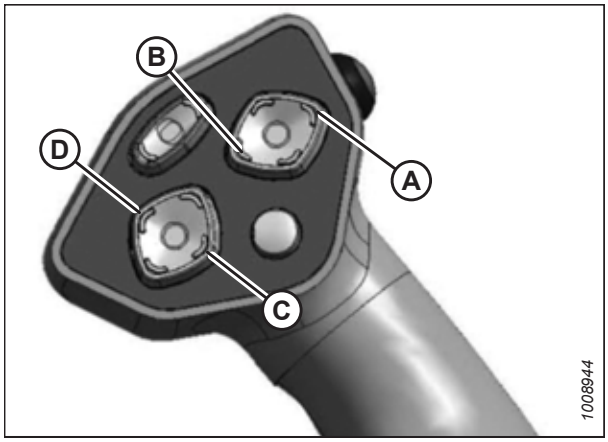


Figure 4.225: Ground Speed Lever

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.

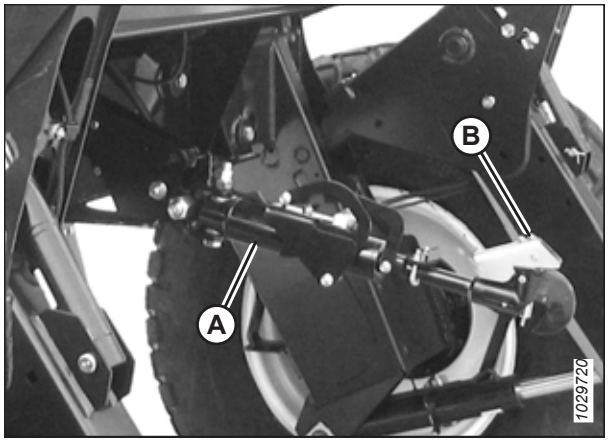


Figure 4.226: Hydraulic Center-Link

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 to fully phase the cylinders.

    NOTE:

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

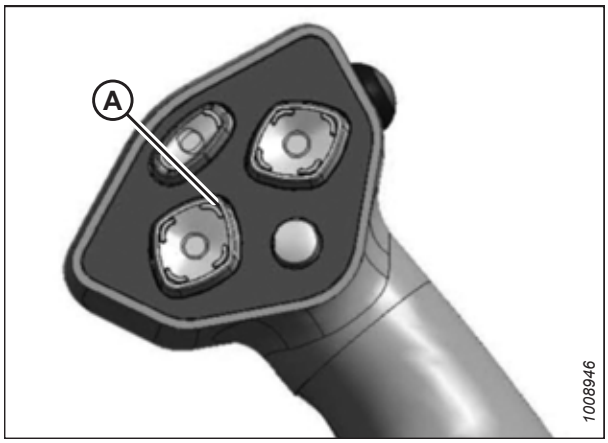


Figure 4.227: Ground Speed Lever

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.

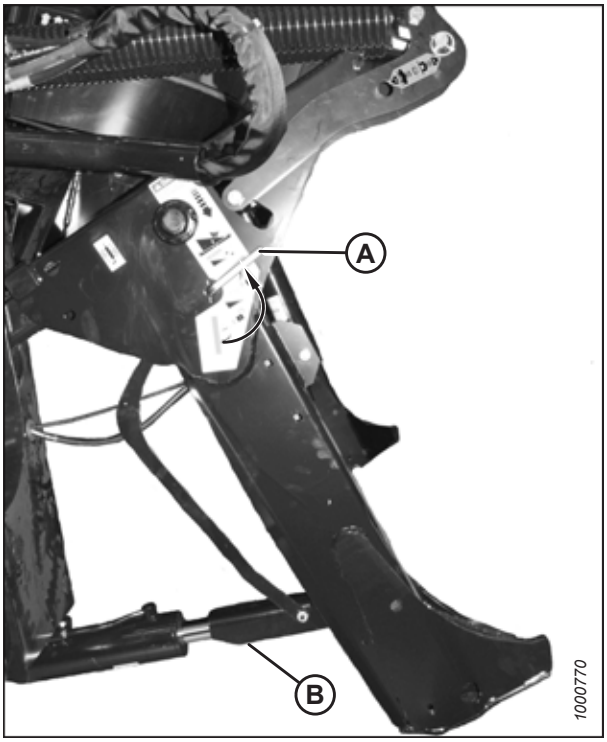


Figure 4.228: Safety Prop

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.

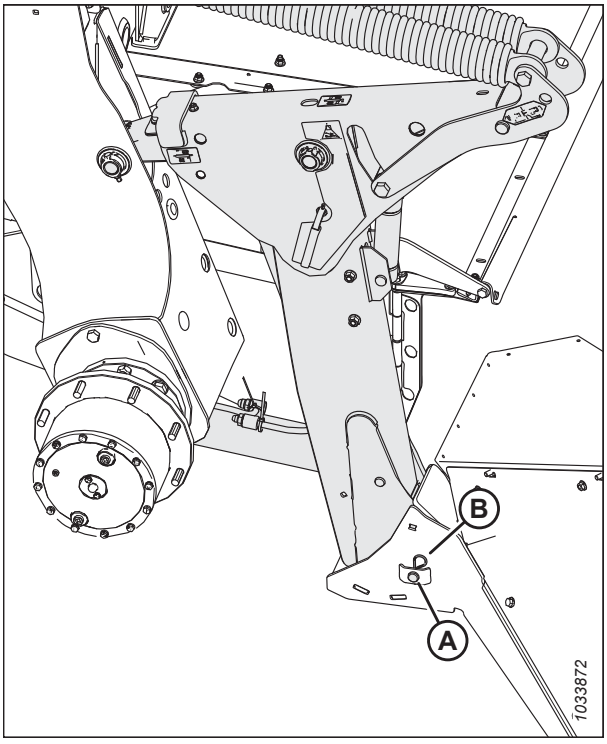


Figure 4.229: Header Support

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.

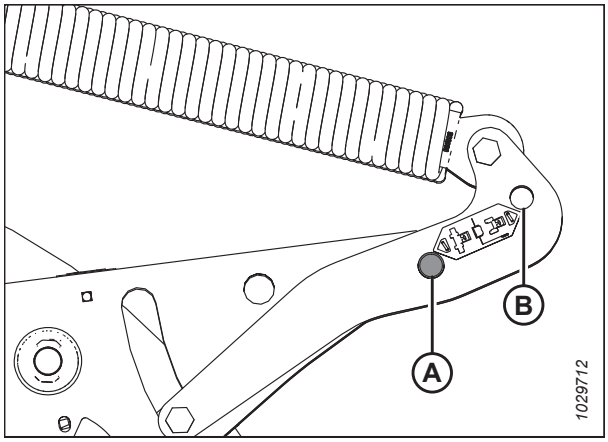


Figure 4.230: Header Float Linkage

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

22. Repeat the previous step to disengage the other safety prop.

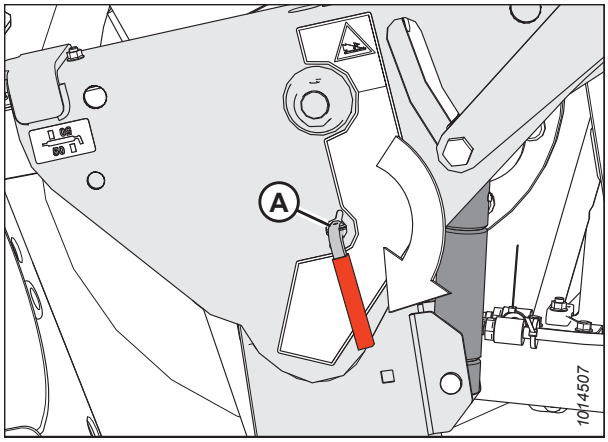


Figure 4.231: Safety Prop

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 *Completing Hydraulic and Electrical Connections, page 285*.

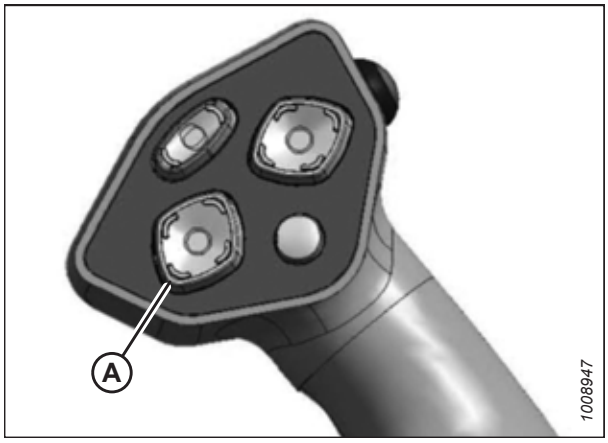


Figure 4.232: Ground Speed Lever

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.

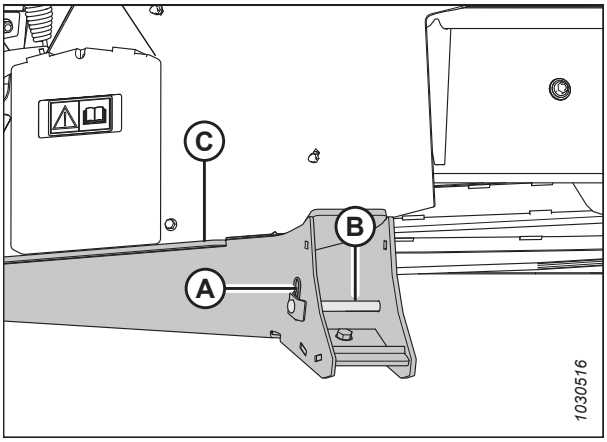


Figure 4.233: Header Support

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.

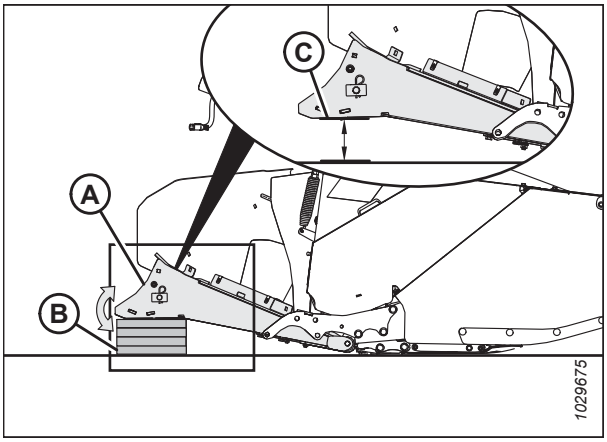


Figure 4.234: Header Support

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.

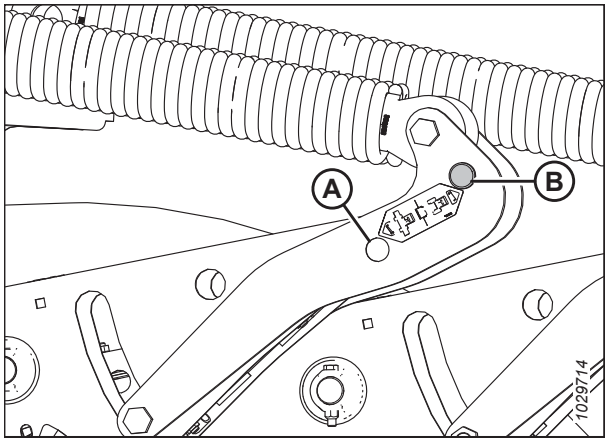


Figure 4.235: Float Linkage

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.

   IMPORTANT:

   Before starting the engine for the first time the windrower is operated in a season, remove the protective cover from the exhaust stack.

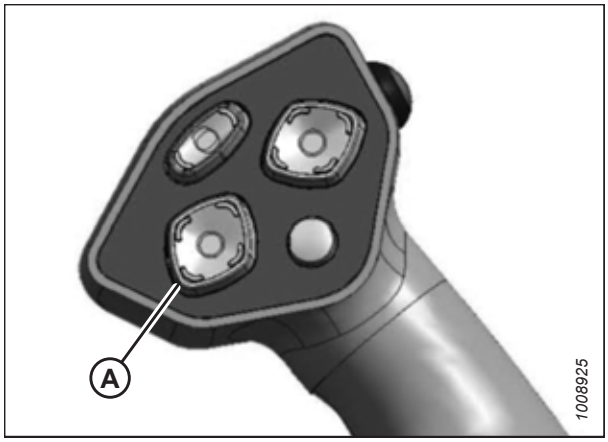


Figure 4.236: Ground Speed Lever

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.

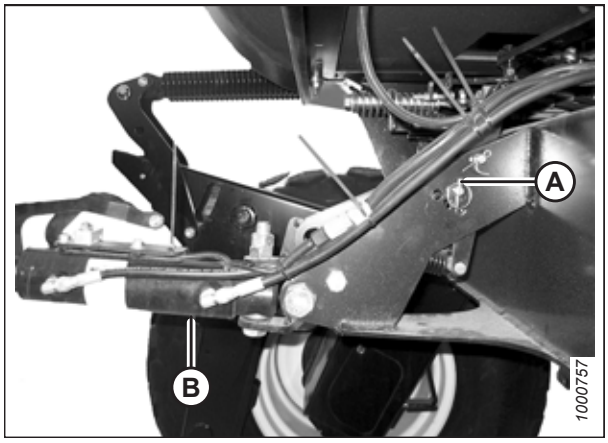


Figure 4.237: Hydraulic Center-Link without Self-Alignment Kit

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.

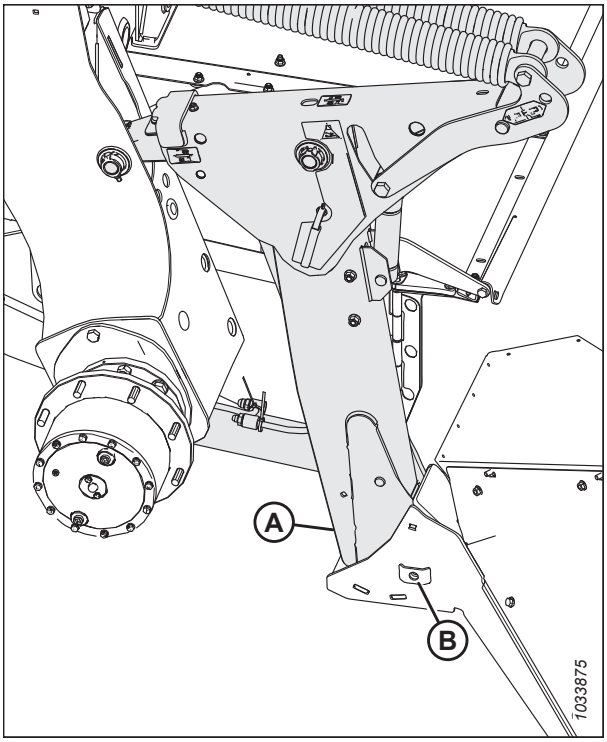


Figure 4.238: Header Support

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.

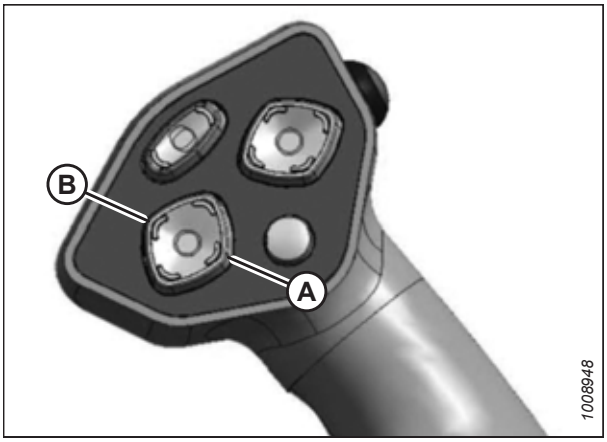


Figure 4.239: Ground Speed Lever

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.

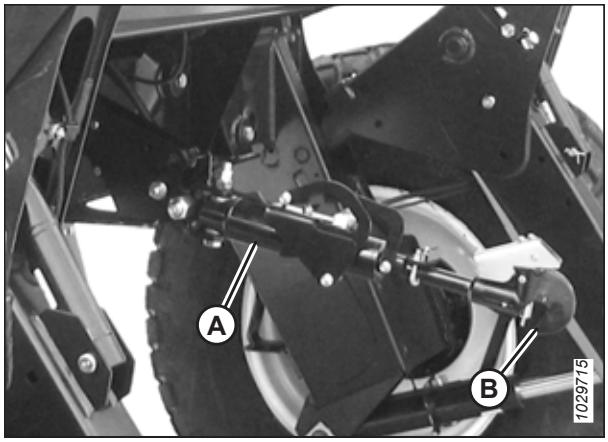


Figure 4.240: Hydraulic Center-Link

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 to fully phase the cylinders.

    NOTE:

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

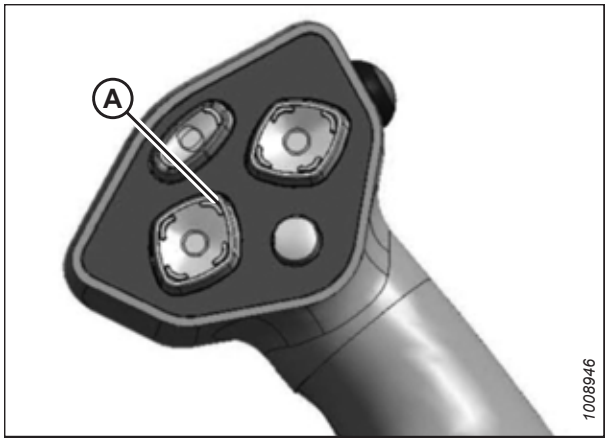


Figure 4.241: Ground Speed Lever

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.

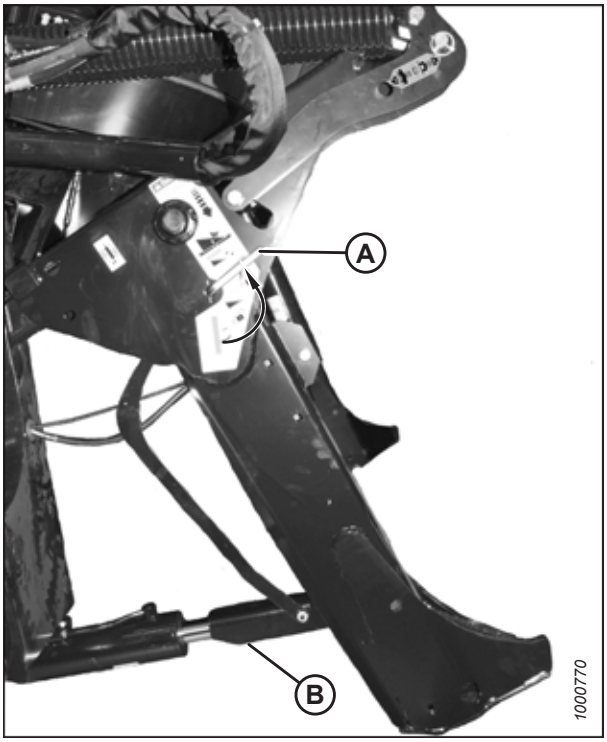


Figure 4.242: Safety Prop

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.

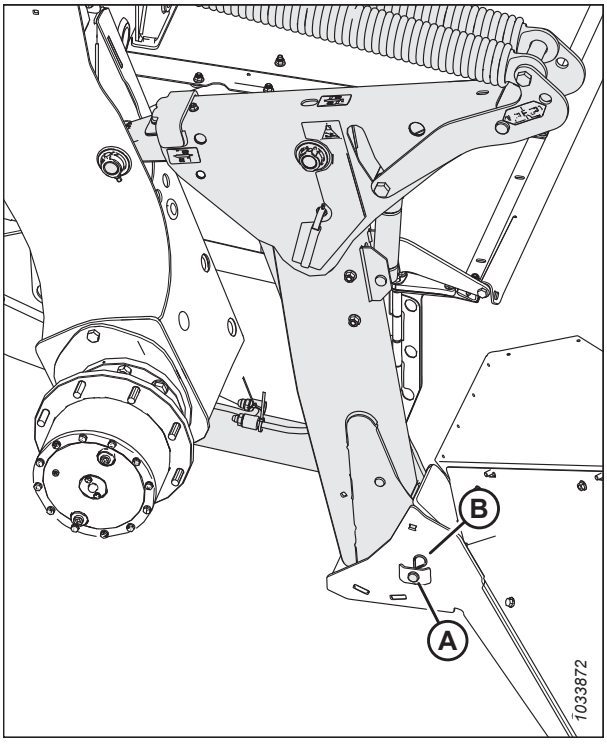


Figure 4.243: Header Support

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.

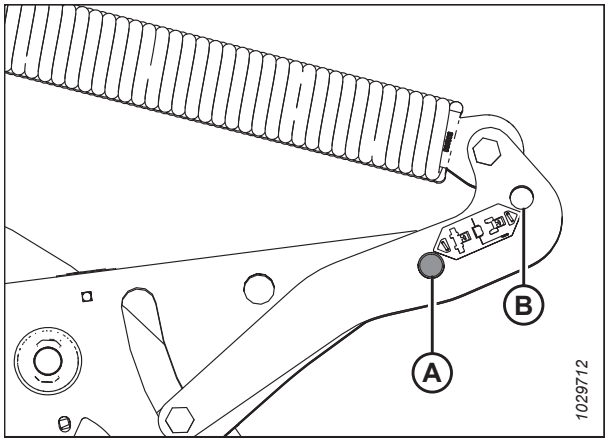


Figure 4.244: Header Float Linkage

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

23. Repeat the previous step to disengage the other safety prop.

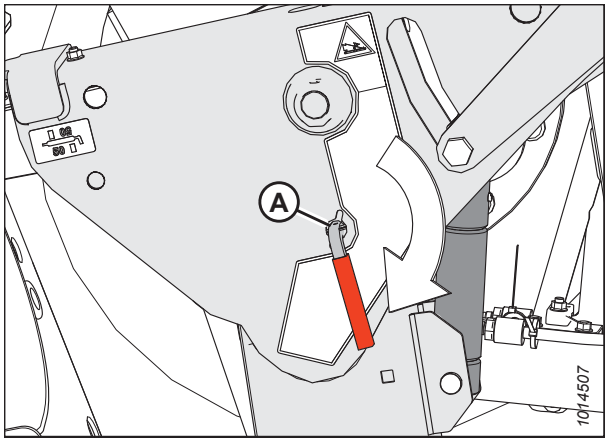


Figure 4.245: Safety Prop

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.

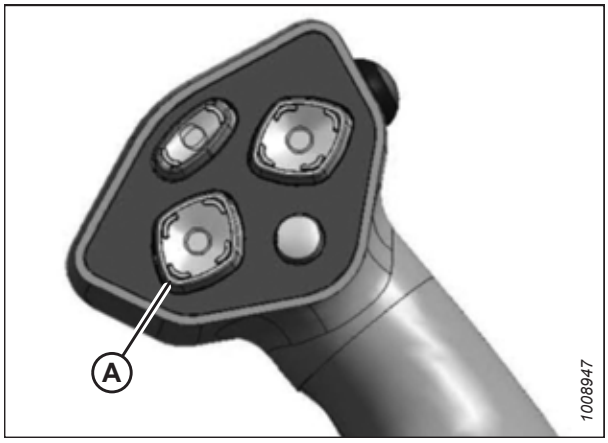


Figure 4.246: Ground Speed Lever

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

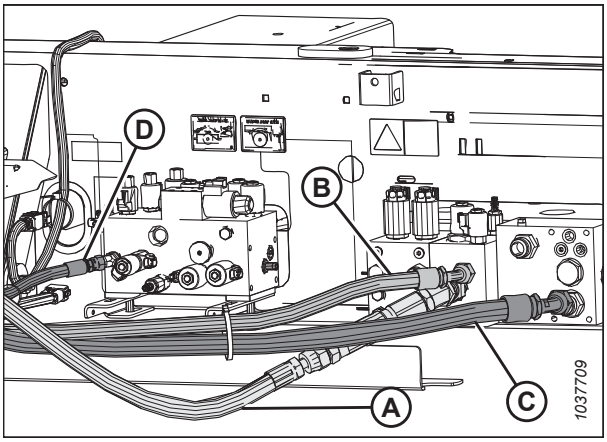


Figure 4.247: Windrower Hydraulic Hoses Connected to Hydraulic Block

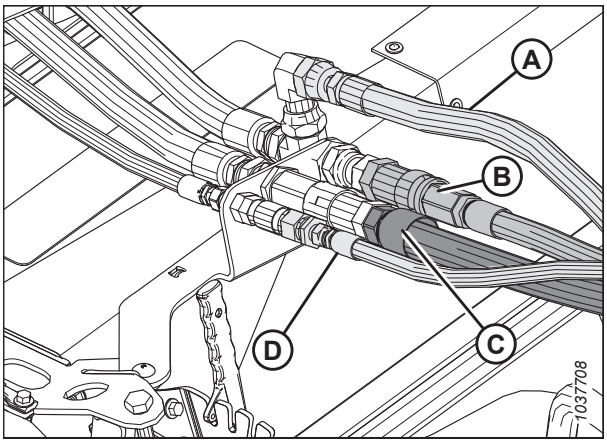


Figure 4.248: Windrower Hydraulic Hoses Connected to Header – View from Rear of Header

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).

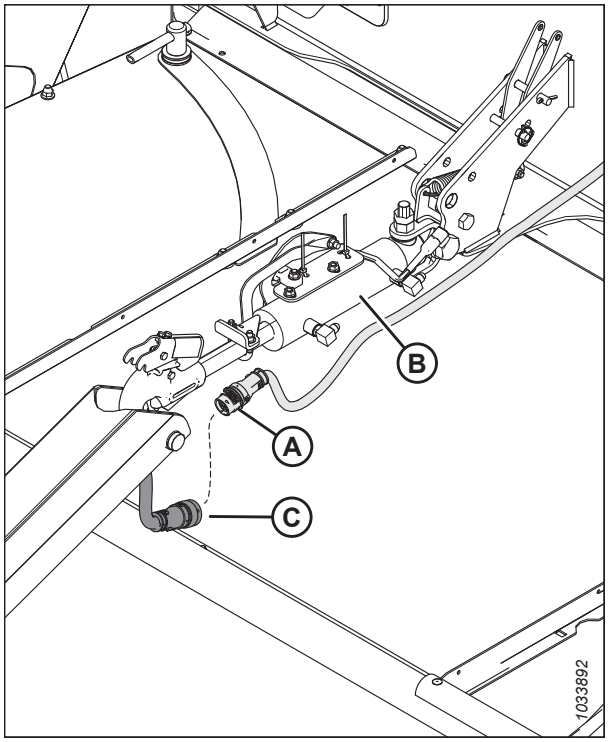


Figure 4.249: Windrower Adapter Harness

NOTE:

When the harness is not in use, secure harness (A) to the center-link tilt cylinder using strap (B).

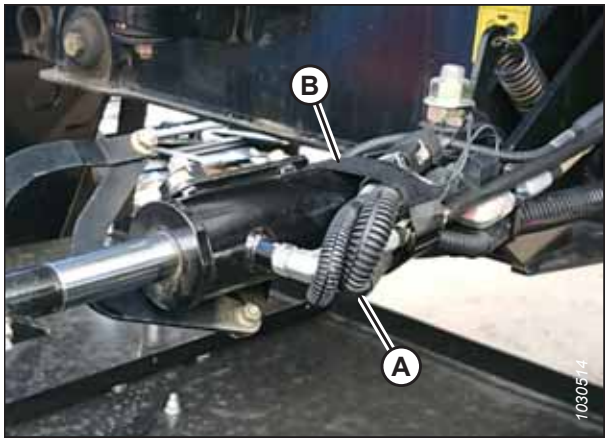


Figure 4.250: Adapter Harness Secured to Center-Link

4.5.9 Detaching R2 Series Rotary Disc Header

Detaching a header from the windrower involves removing the header's mechanical connection to the windrower and disconnecting the hydraulic and electrical connections. The procedure differs slightly depending on whether or not the windrower is equipped with a self-adjusting hydraulic center-link.

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. Start the engine and press HEADER UP switch (A) to raise the header to its maximum height.
2. Rephase the cylinders if one end of the header does not rise fully:
   a. Press and hold HEADER UP switch (A) until both cylinders stop moving.
   b. Continue to hold the switch for 3–4 seconds. The cylinders are now phased.

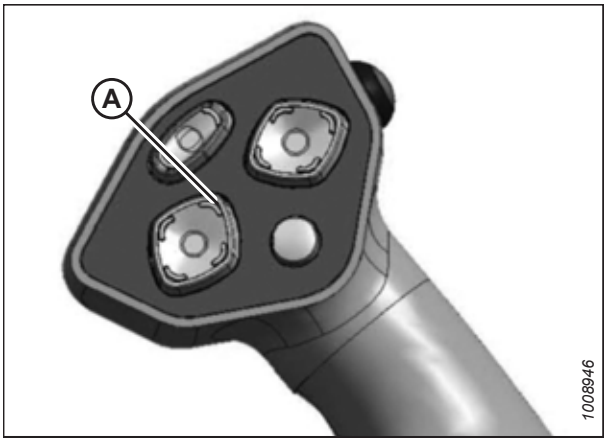


Figure 4.251: Ground Speed Lever (GSL)

3. Shut down the engine, and remove the key from the ignition.
4. To engage the safety props on the lift cylinders:
   a. Pull lever (A) and rotate it toward the header to lower safety prop (B) onto the cylinder.
   b. Repeat the previous step for the opposite lift cylinder.

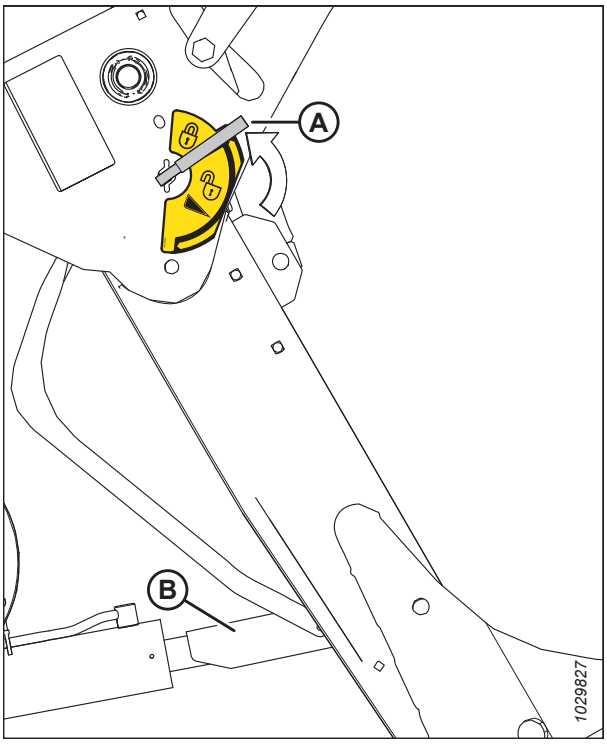


Figure 4.252: Safety Prop

5. Remove the hairpin from the float spring clevis pin. Remove the clevis pin from hole (B) and insert it into storage hole (A) to disengage the float springs. Secure the clevis pin with the hairpin.

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

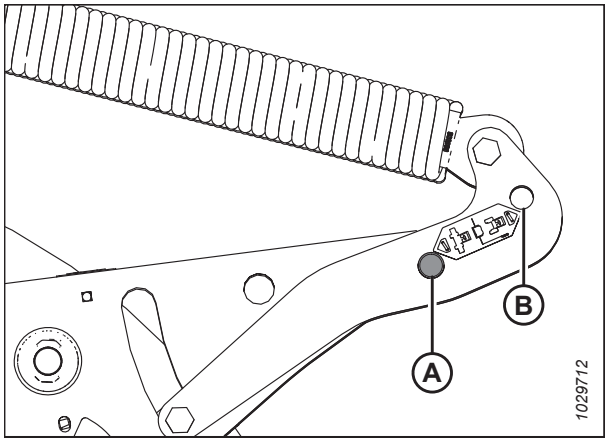


Figure 4.253: Header Float Linkage

7. Remove hairpin (B) from clevis pin (A). Remove clevis pin (B). Retain the pins.

8. Repeat the previous step on the other side of the header.

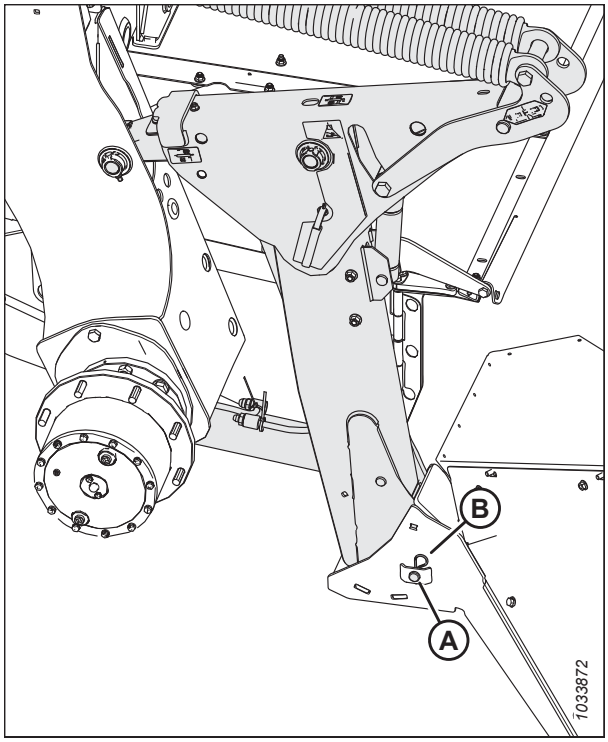


Figure 4.254: Header Support

9. Disengage the safety props by turning lever (A) away from the header to raise the safety prop until the lever locks into vertical position. Repeat for the opposite cylinder.

10. Start the engine, choose a level area, and lower the header to the ground.

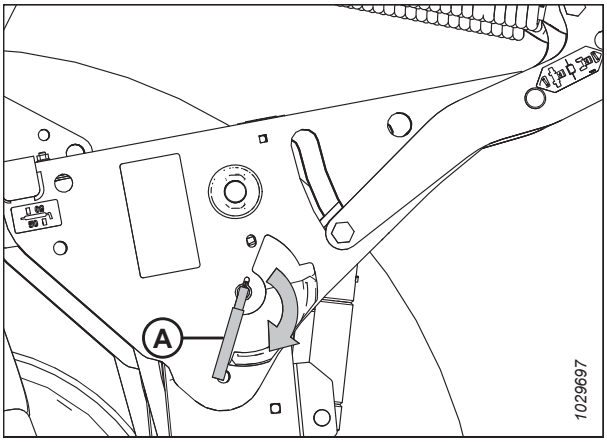


Figure 4.255: Safety Props

11. Press HEADER TILT UP (A) and HEADER TILT DOWN (B) cylinder switches on the GSL to release the load on the center-link cylinder.

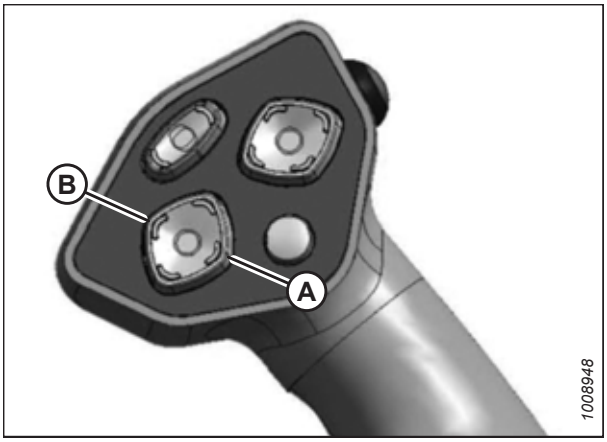


Figure 4.256: Ground Speed Lever

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

13. Lift hook release (C) and lift hook (B) off of the header pin.

    NOTE:

    If the optional center-link lift cylinder is installed, lift release (C) and then operate the link lift cylinder from the cab to disengage center-link (A) from the header.

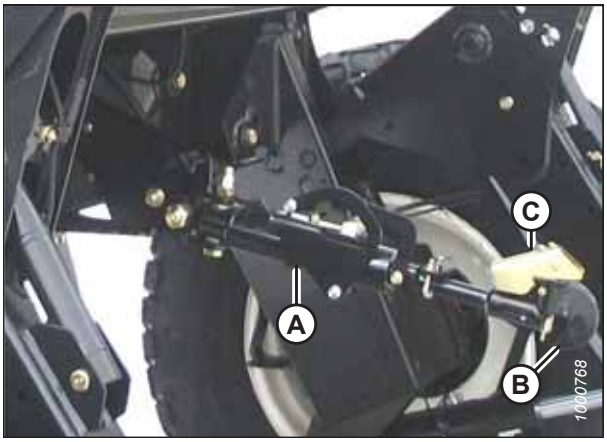


Figure 4.257: Hydraulic Center-Link

14. Disconnect upper pressure hose (A), lower pressure hose (B), return hose (C), and case drain hose (D) from the header.

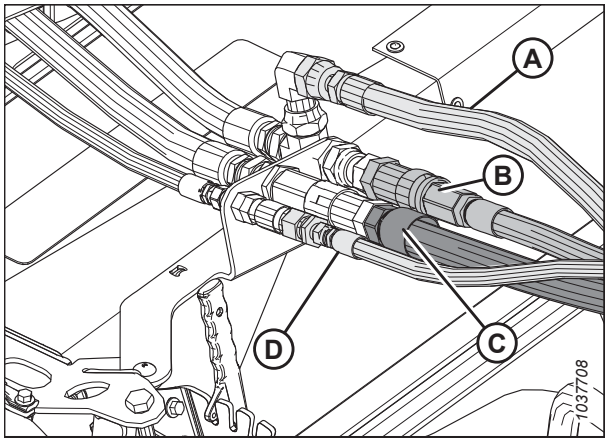


Figure 4.258: Windrower Hydraulic Hoses Connected to Header — View from Rear of Header

15. Pull hydraulic hose bundle (A) and the upper hydraulic pressure hose through the hose guide.
16. Open latch (B).
17. Fold hose bundle (A) and the upper hydraulic pressure hose (not shown) back as shown and secure them with latch (B).

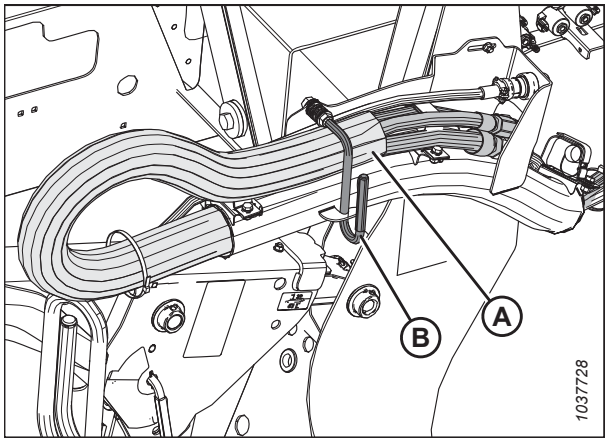


Figure 4.259: Hydraulic Hoses in Storage Position

18. Disconnect windrower harness (A) from header harness (C). Install the protective caps on each connector.
19. Store harness (A) on center-link (B) with the attached straps (not shown).
20. Slowly back the windrower away from the header.

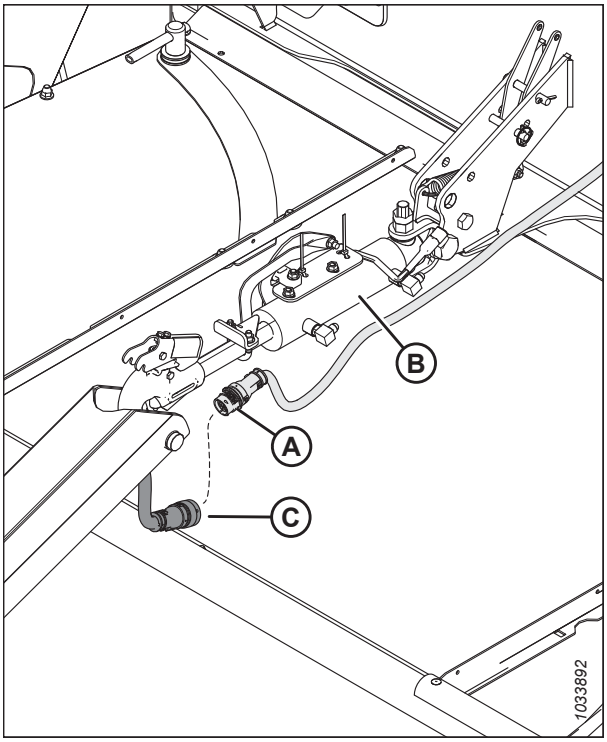


Figure 4.260: Windrower Harness

21. Insert clevis pin (B) into boot (C) as shown. Secure the clevis pin with hairpin (A).
22. Repeat the previous step on the other side of the header.

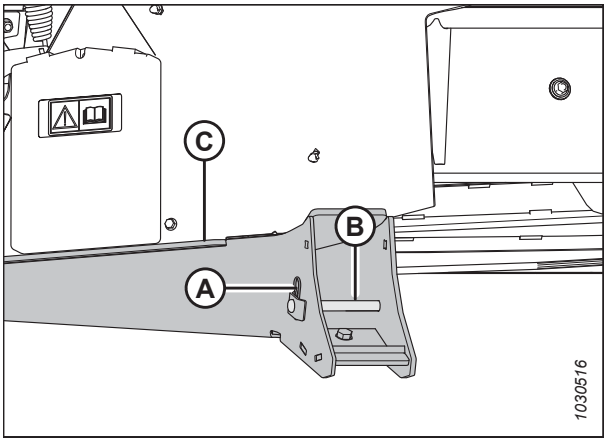


Figure 4.261: Header Boot

4.6 Operating with D or D1 Series Draper Header

Instructions for configuring the hydraulics, changing the reel settings, operating the draper and knives, and using the optional deck shift controls on a D or D1 Series Draper Header are provided.

The M155*E4* Self-Propelled Windrower is factory-equipped to run a D or D1 Series Draper Header.

If a HC10 Hay Conditioner is to be installed on the header, installing a Header Drive Reverser kit on the windrower is recommended. Order the kit from your MacDon Dealer and install it according to the instructions supplied with the kit. For more information on the kit, refer to *6.3.3 Header Drive Reverser, page 469*.

The procedure for attaching a D Series or D1 Series Draper Header to the windrower varies depending on the type of center-link installed on the windrower. Refer to the relevant procedure:

- *Attaching D or D1 Series Draper Header – Hydraulic Center-Link with Self-Alignment, page 227*
- *Attaching D or D1 Series Draper Header – Hydraulic Center-Link without Self-Alignment, page 232*

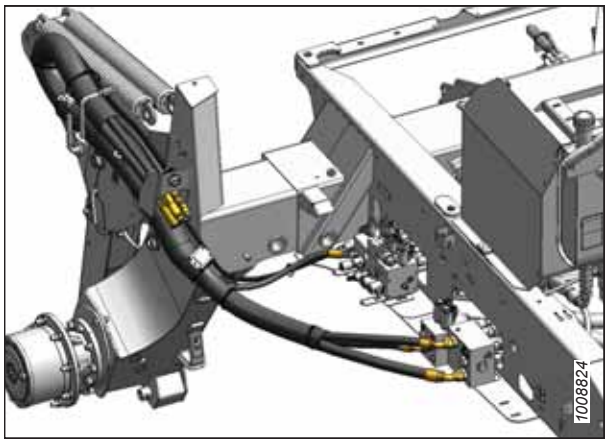


Figure 4.262: Draper Header Hydraulics

4.6.1 Configuring Hydraulics

The windrower must be fitted with a basic draper drive hydraulic kit to operate a D or D1 Series Draper Header.

Windrowers equipped with D or D1 Series hydraulics have four header drive hoses on the left cab-forward side.

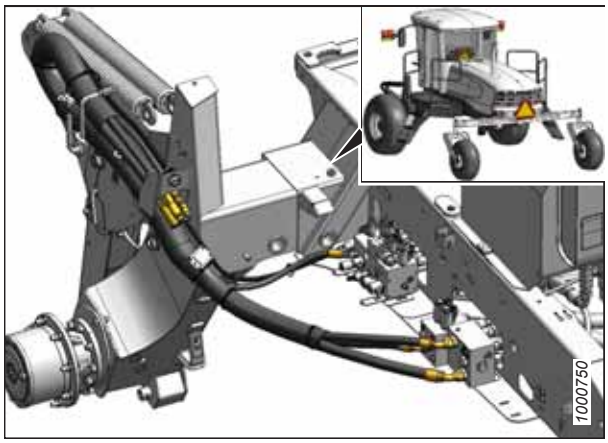


Figure 4.263: Draper Header Drive Hydraulics

There are also up to five reel drive hoses on the right cab-forward side.

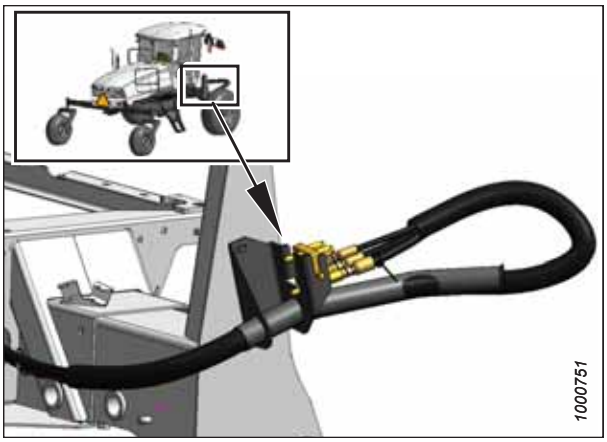


Figure 4.264: Draper Header Reel Hydraulics

4.6.2 Reel Settings

The header reel's fore-aft position, height, and speed can be changed using the controls on the ground speed lever (GSL).

4.6.3 Adjusting Reel Fore-Aft Position

The reel fore-aft position can be changed using the controls on the ground speed lever (GSL).

Press FORWARD switch (A) or AFT switch (B) to move the reel in that direction.

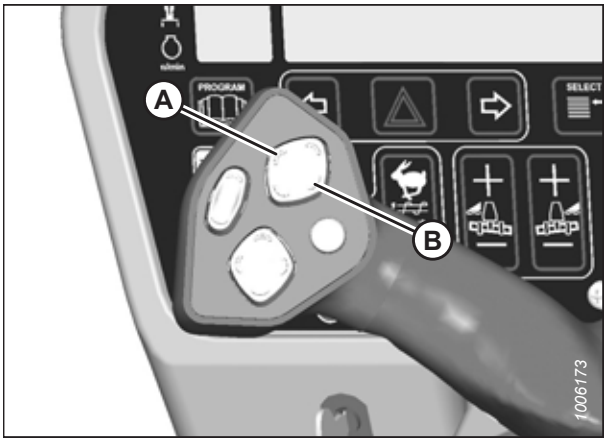


Figure 4.265: Ground Speed Lever

4.6.4 Adjusting Reel Height

The reel fore-aft position can be changed using the controls on the ground speed lever (GSL).

Press and hold REEL UP switch (A) or REEL DOWN switch (B) to move the reel in the desired direction.

IMPORTANT:

Under certain conditions, when the reel is raised to its full height, the reel tines may contact the cab roof. Exercise care to avoid damage to the windrower or the reel.

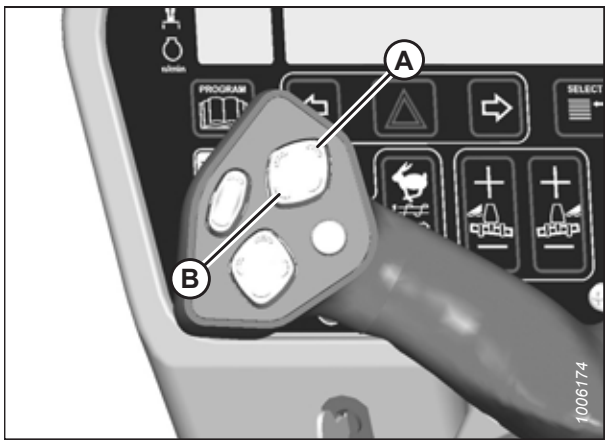


Figure 4.266: Ground Speed Lever (GSL)

4.6.5 Reel Speed

Reel speed can be controlled using the switches on the ground speed lever (GSL), or can be indexed to the ground speed of the header.

On D and D1 Series draper headers, the reel speed can be set independently, or can be set relative to the ground speed of the windrower. This can be done using the windrower's header index feature. Refer to *Setting Header Index Mode, page 106* for instructions on enabling header index mode. Refer to your header operator's manual for specific windrowing guidelines and recommended speeds.

Indexing Reel Speed to Ground Speed

The Operator can choose to link the speed of the reel to the ground speed of the windrower, rather than controlling it manually, by taking advantage of the windrower's header indexing feature.

Setting the speed of the reel relative to the windrower's ground speed using the header index function allows you to run the engine at a lower speed while maintaining the desired header performance.

Indexing the reel speed to the windrower's ground speed requires setting the minimum reel speed and the reel index speed:

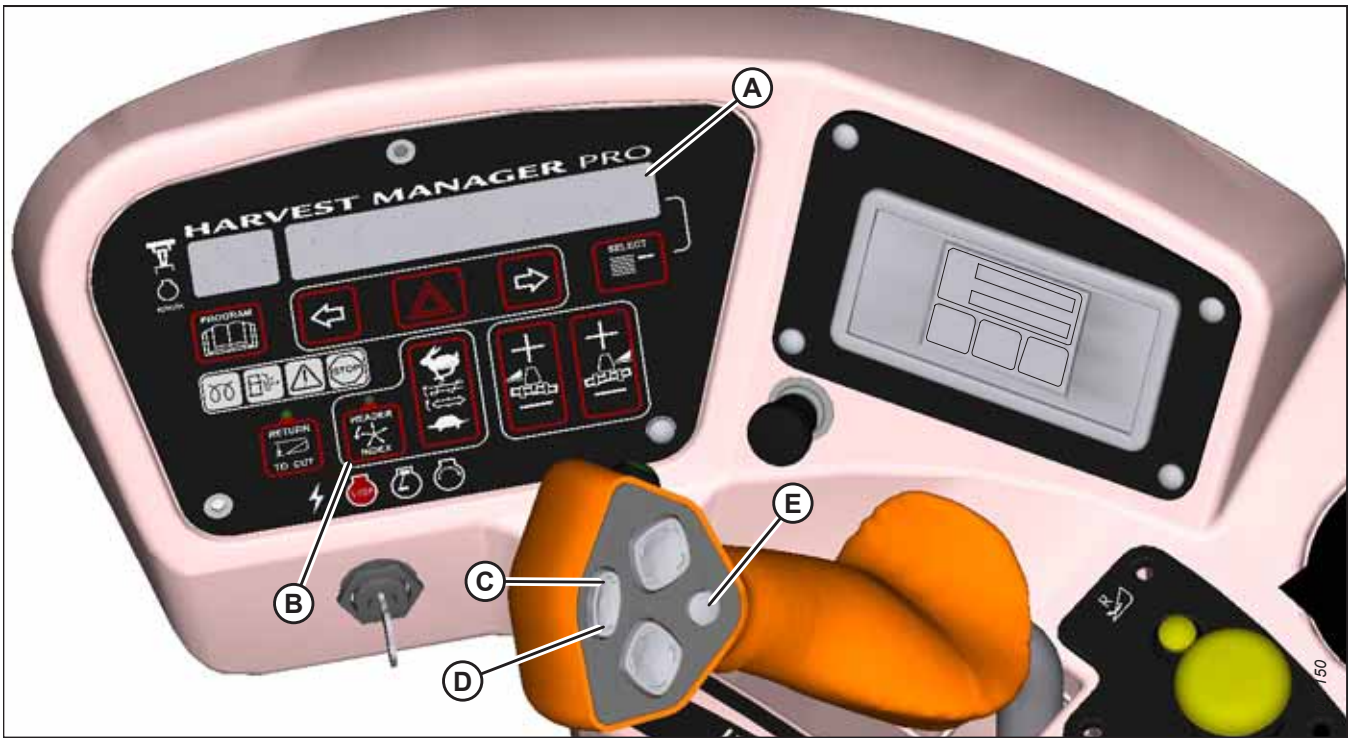


Figure 4.267: Operator Console

A - Display
B - Header Index
C - Fast Button
D - Slow Button
E - Display Selector

DANGER

Ensure that all bystanders have cleared the area.

1. Set the minimum reel speed as follows:

   IMPORTANT:

   Set the minimum reel speed while the windrower is stationary (that is, with the ground speed lever [GSL] in the N-DETENT position).

   a. Start the engine.

   b. Engage the header.

   c. Set HEADER INDEX switch (B) to ON.

   d. Press DISPLAY SELECTOR button (E) on the GSL or press FAST button (C) or SLOW button (D) to display the message ##.## MIN REEL at location (A). The displayed value represents the minimum reel speed in terms of rpm or mph or km/h, depending on how the cab display module (CDM) is configured.

   e. Press FAST switch (C) or SLOW switch (D) until the desired minimum reel speed is achieved.

2. Set the reel index as follows:

   IMPORTANT:

   The reel index setting can only be adjusted while operating at a ground speed faster than the configured minimum reel speed plus the configured header index value.

   a. Set HEADER INDEX switch (B) to ON.

   b. Press DISPLAY SELECTOR button (E) on the GSL or press FAST button (C) or SLOW button (D). The CDM will display the message ##.## ##.# REEL IND.[15]

      - The first term displayed on the CDM, ##.##, represents the reel speed in terms of rpm or mph or km/h, depending on how the CDM is configured.)
      - The second term displayed on the CDM, #.##, represents the reel index setting.

   c. Press FAST button (C) or SLOW button (D) until the desired reel index setting is achieved.

   NOTE:

   The reel will continue operating at the minimum reel speed setting when the ground speed drops below the set value.

   CDM screen (A) may display the message ##.## MIN REEL (RPM or MPH or KPH). This message indicates that the Operator should change the minimum reel speed or should increase the windrower's ground speed. This message will appear if the sum of the ground speed and the index value is less than the minimum reel speed set-point.

15. The message REEL IND will only be displayed when the windrower is operating at a ground speed faster than minimum reel speed plus the header index speed.

Adjusting Reel Speed without Indexing

The Operator can set their preferred reel speed without using the windrower's indexing system by using the reel speed controls on the ground speed lever (GSL).

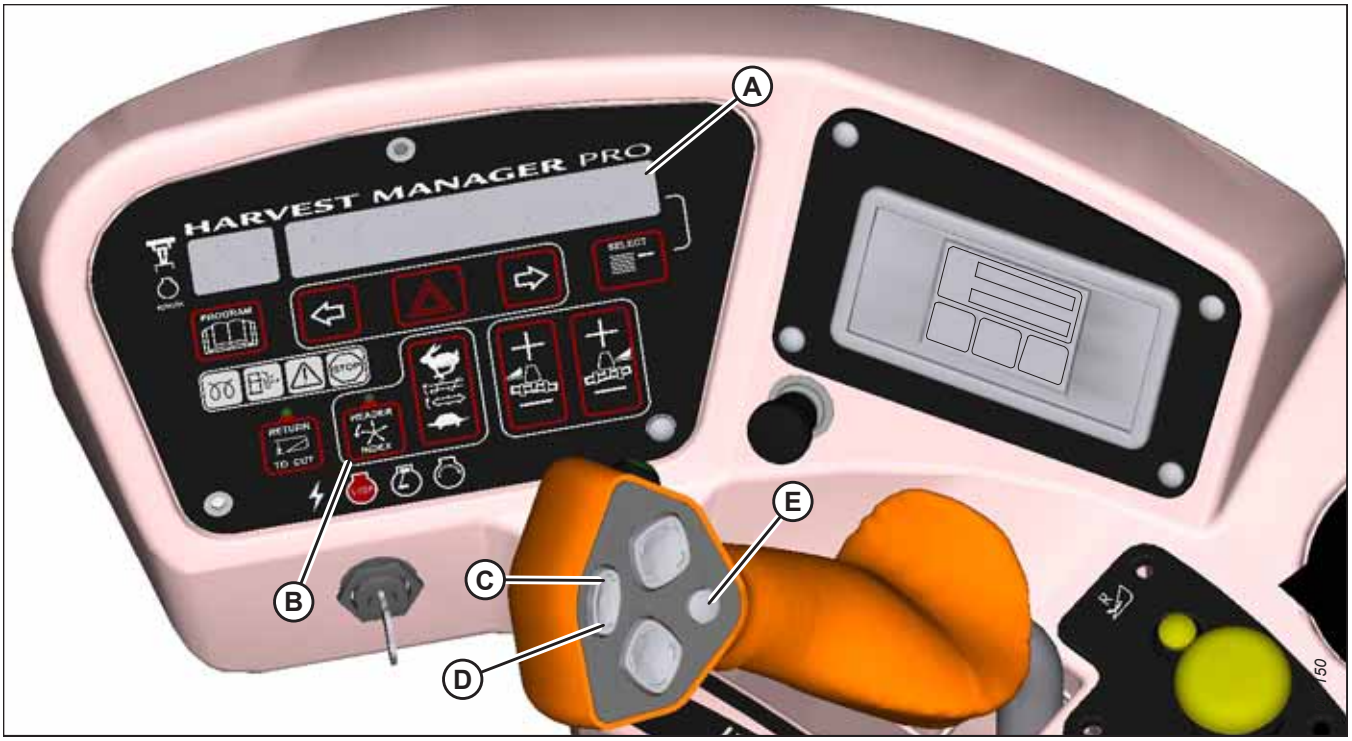


Figure 4.268: Operator Console

A - Display
B - Header Index
C - Reel Fast
D - Reel Slow
E - Display Selector

DANGER

Ensure that all bystanders have cleared the area.

1. Set HEADER INDEX (B) to OFF.
2. Press REEL FAST button (C) or REEL SLOW button (D) on the ground speed lever (GSL) until CDM (A) displays the message ##.## REEL MPH. Adjust the reel speed value until your preferred setting appears.[16]

16. The reel speed can also be displayed in km/h or rpm, depending on the CDM's display settings.

4.6.6 Draper Speed

The speed at which the header's draper belts turn can be controlled from the windrower's cab. The draper speed can be set to run independently, or relative to the ground speed of the windrower by taking advantage of the windrower's header indexing function.

For information on the recommended draper speed settings, refer to your header operator's manual.

Indexing Draper Speed to Ground Speed

Linking the draper speed to the windrower's ground speed using the header index function allows the Operator to operate the engine at a lower speed while maintaining the desired ground and draper speeds. Reducing engine speed saves fuel and reduces the noise level in the cab.

Indexing the draper speed to the ground speed requires setting both the minimum draper speed and the draper index value in the windrower's cab display module (CDM).

Setting Minimum Draper Speed

In order to index the speed of the draper to the windrower's ground speed, the minimum draper speed setting must be set in the cab display module (CDM).

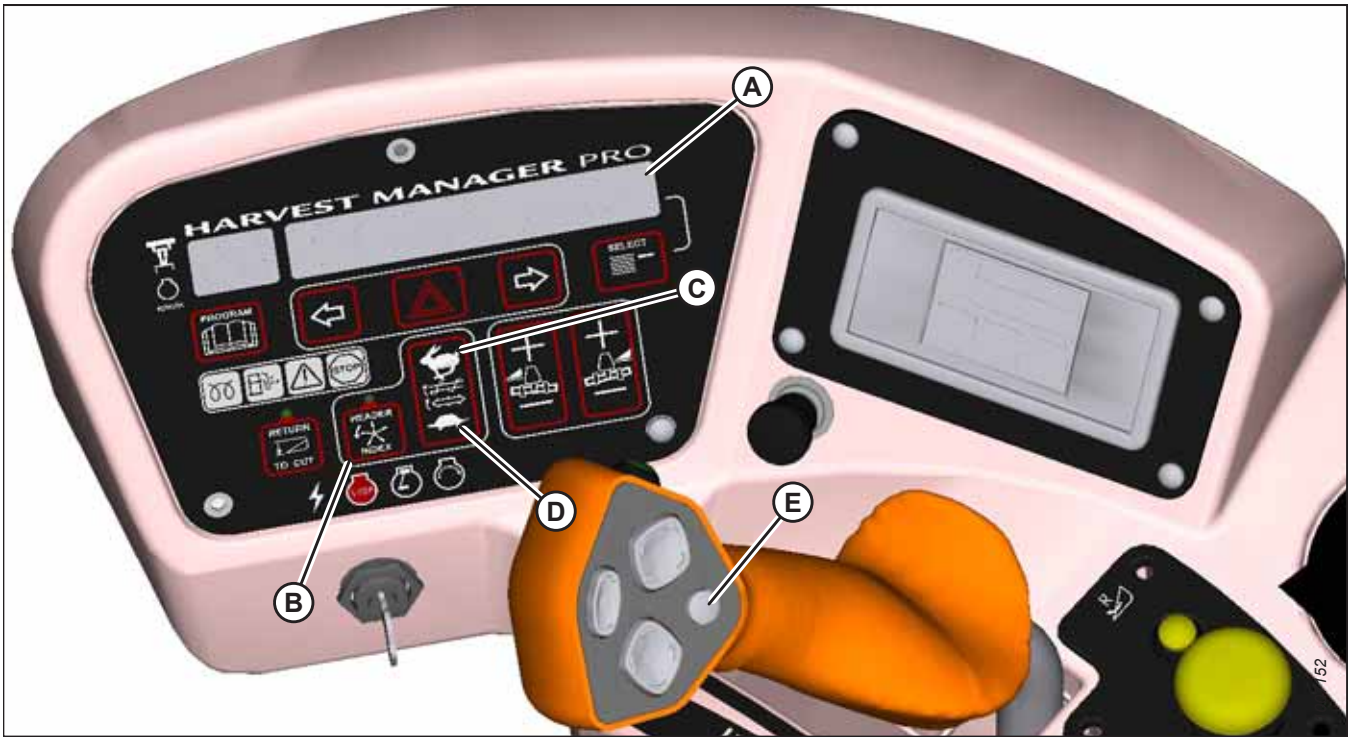


Figure 4.269: Operator Console

A - Display
B - Header Index
C - Draper Fast
D - Draper Slow
E - Display Selector

DANGER

Ensure that all bystanders have cleared the area.

IMPORTANT:

Set the minimum draper speed while the windrower is stationary (that is, while the ground speed lever [GSL] is in the N-DETENT position).

1. Start the engine.
2. Engage the header.
3. Set HEADER INDEX switch (B) to ON.
4. Press DISPLAY SELECTOR button (E) until CDM (A) displays the message ##.## DRAPER MIN.[17]
5. Use FAST button (C) or SLOW button (D) to set the desired minimum draper speed.

Setting Draper Index

In order to index the speed of the draper to the windrower's ground speed, the draper index setting must be configured in the cab display module (CDM).

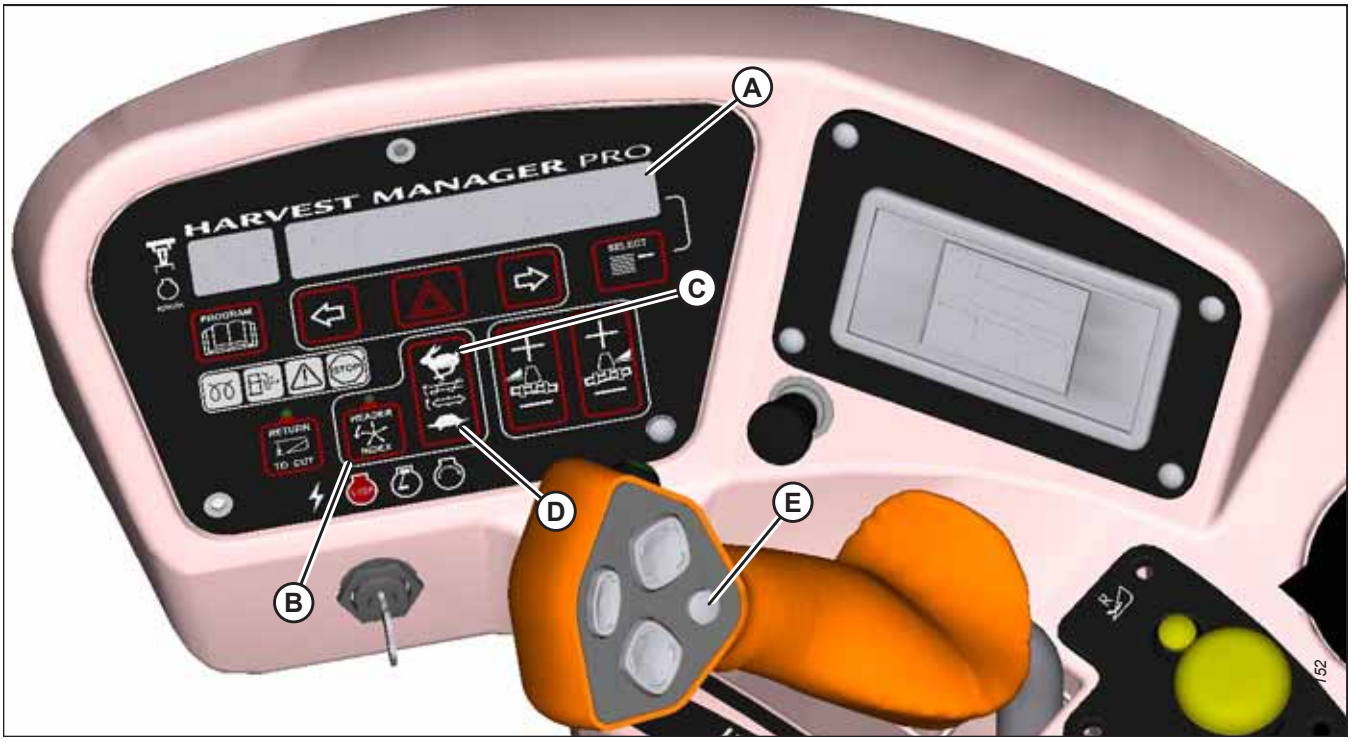


Figure 4.270: Operator Console

DANGER

Ensure that all bystanders have cleared the area.

IMPORTANT:

The draper index can only be adjusted while the windrower is traveling at a ground speed greater than the sum of the minimum draper speed and the draper index value.

1. Start the engine.
2. Engage the header.
3. Set HEADER INDEX switch (B) to ON.

17. The reel speed can also be displayed in km/h or rpm, depending on the CDM's display settings.

4. Press DISPLAY SELECTOR (E) on the ground speed lever (GSL). The message DRAPER INDX will appear[18] at location (A) on the cab display module (CDM).

5. Press DRAPER FAST (C) or SLOW (D) on the CDM until CDM (A) shows the message ##.## ##.# DRAP IND. Adjust the value as needed.

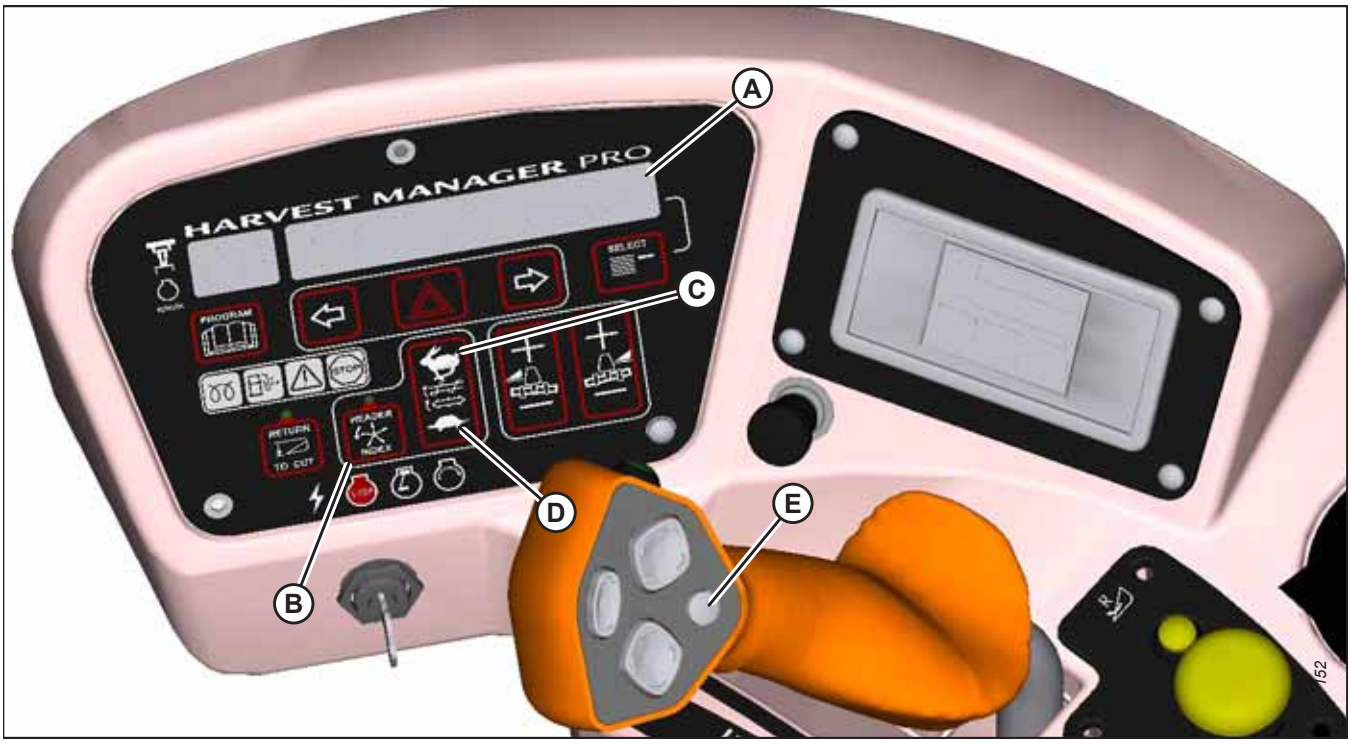
   - The first term displayed on the CDM, ##.##, represents the draper speed in terms of rpm or mph or km/h, depending on how the CDM is configured.)
   - The second term displayed on the CDM, #.##, represents the draper index value.

Examples:

- The windrower is traveling at 13 km/h (8 mph) with the HEADER INDEX switch set to ON and the draper index value set at 1.5.
  The CDM will display: 9.5 1.5 DRAP INDX, where 9.5 (8 + 1.5) is the draper speed in mph and 1.5 is the header index setting.
- The windrower's speed drops to 12 km/h (7.5 mph), while the header index value remains the same.
  The CDM will display: 9.0 1.5 DRAP INDX, where 9.0 (7.5 + 1.5) is the draper speed in mph and 1.5 is the header index setting.
- The windrower is traveling at 13 km/h (8 mph) with the HEADER INDEX switch set to ON and the draper index value set at 0.9.
  The CDM will display: 8.9 0.9 DRAP INDX, where 8.9 (8 + 0.9) is the draper speed in mph and 0.9 is the header index setting.

Adjusting Draper Speed without Indexing

The Operator can set their preferred draper speed without using the windrower's indexing system by using the draper speed controls on the cab display module (CDM).



18. DRAPER INDX will only appear when the windrower is traveling at a ground speed greater than the sum of the minimum draper speed and the draper index value.

Figure 4.271: Operator Console

NOTE:

This procedure can also be followed to change the draper speed while the windrower is in motion.

CAUTION

Ensure that all bystanders have cleared the area.

1. Start the engine.
2. Engage the header.
3. Set HEADER INDEX switch (B) to OFF.
4. Press DISPLAY SELECTOR button (E) until the message ##.# DRAPER SPEED appears on cab display module (CDM) (A).[19]
5. Press FAST button (C) or SLOW button (D) on the CDM until the desired draper speed appears at location (A).

4.6.7 Knife Speeds

The windrower's knife speed should be set so that the crop is cut cleanly. The Operator should choose a knife speed which suits the type of crop being cut and the operating conditions.

When the header is first attached to the windrower, the windrower control module (WCM) receives a code from the header that determines the knife speed range and the minimum speed.

However, the Operator can configure their own speed setting in the cab display module (CDM). This setting will be stored in the WCM's memory, so that the knife will operate at the new setting each time the header is detached and reattached to the windrower.

If no header code is detected, the CDM displays NO HEADER and the knife speed reverts to the operator's selection, which will be a value which can range from 800 to 1000 strokes per minute.

Refer to the header operator's manual for the suggested knife speed for different crops and cutting conditions.

NOTE:

The knife speed cannot be programmed outside the range specified for each model of header.

NOTE:

The knife speed can be adjusted without shutting down the windrower; however, the windrower should be stopped before adjusting CDM settings.

Refer to the following table for the minimum and maximum knife speed settings on various types of draper header.

Table 4.3 Draper Header Knife Speed Ranges for M Series Self-Propelled Windrowers

Header		Knife Speed			
Type	Width	Minimum Speed		Maximum Speed	
		rpm[20]	spm[21]	rpm[20]	spm[21]
Draper with double knife	4.6 m (15 ft.)	750	1500	950	1900
Draper with double knife	6.1 and 7.6 m (20 and 25 ft.)	700	1400	850	1700

19. The reel speed can also be displayed in km/h or rpm, depending on the CDM's display settings.
20. The values specified in this column refer to the speed of the knife drive box's pulley.
21. Knife strokes per minute (rpm x 2)

Table 4.3 Draper Header Knife Speed Ranges for M Series Self-Propelled Windrowers (continued)

Header		Knife Speed			
Type	Width	Minimum Speed		Maximum Speed	
		rpm[22]	spm[23]	rpm[22]	spm[23]
Draper with double knife	9.1 m (30 ft.)	600	1200	800	1600
Draper with double knife	10.6 m (35 ft.)	600	1200	700	1400
Draper with double knife	12.2 m (40 ft.)	550	1100	700	1400
Draper with single knife	6.1 and 7.6 m (20 and 25 ft.)	600	1200	750	1500
Draper with single knife	9.1 m (30 ft.)	600	1200	700	1400
Draper with single knife	10.6 m (35 ft.)	550	1100	700	1400
Draper with single knife	12.2 m (40 ft.)	525	1050	600	1200

To adjust the knife speed, refer to *Setting Header Knife Speed, page 102*.

Adjusting Knife Speed

The knife speed can be adjusted using the cab display module (CDM).

Figure 4.272: Operator Console

22. The values specified in this column refer to the speed of the knife drive box's pulley.
23. Knife strokes per minute (rpm x 2)

DANGER

Ensure that all bystanders have cleared the area.

1. Start the engine.
2. Engage the header.
3. Press PROGRAM (D) and SELECT (E) on the cab display module (CDM) until the message **#### KNIFE SPM** appears at location (A). This value indicates the speed of the knife in strokes per minute (spm).
4. Press LEFT ARROW (B) or RIGHT ARROW (C) until the desired knife speed is achieved.

4.6.8 Deck Shift Control

On windrowers with an attached draper header equipped with the deck shift option, the Operator can choose to deliver crop to the left or right side of the header, in addition to being able to deliver the crop between the legs of the windrower.

Engaging Deck Shift

Engaging the deck shift option allows the Operator to choose to deliver crop to the left or right side of the header, in addition to being able to deliver the crop between the legs of the windrower. The deck shift controls can be found on the operator's console.

DANGER

Ensure that all bystanders have cleared the area.

1. Start the engine.
2. Engage the header by pushing down on HEADER DRIVE button (A) while pulling up on black ring (B) at the base of the switch.

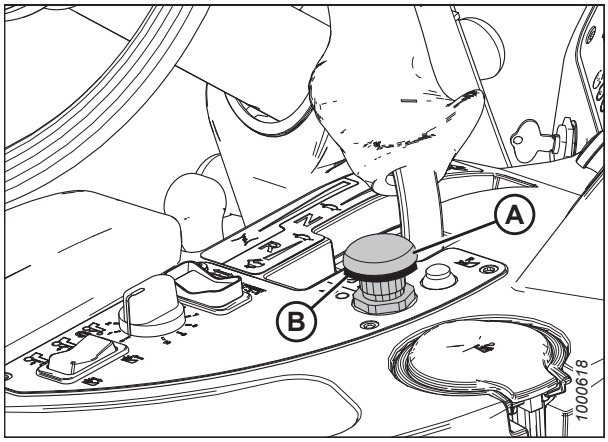


Figure 4.273: Header Drive Button

3. Move switch (A) to the desired delivery position. The draper deck(s) will move and the direction of drapers will change accordingly.

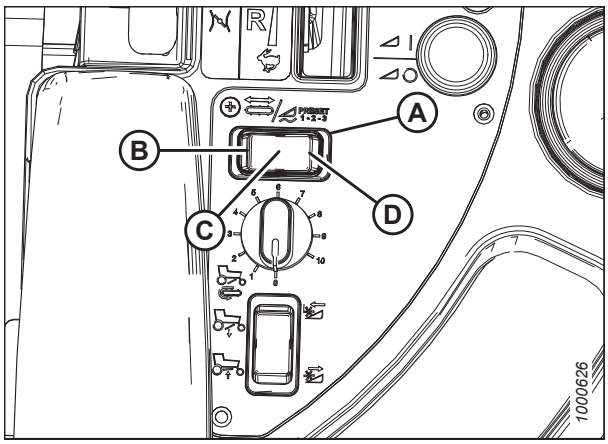


Figure 4.274: Deck Shift Switch

A - Deck Shift Switch
B - Left-Side Delivery
C - Center Delivery
D - Right-Side Delivery

Setting Float Options with Deck Shift

For draper headers equipped with the deck shift option, the header float can be set for each deck position. The float setting is maintained when the deck shift is engaged.

DANGER

Ensure that all bystanders have cleared the area.

1. Start the engine.
2. Engage the header.
3. Using HEADER TILT SWITCHES (A) and (B) on the ground speed lever (GSL), set the center-link to the mid-range position (05.0 on display [E]).

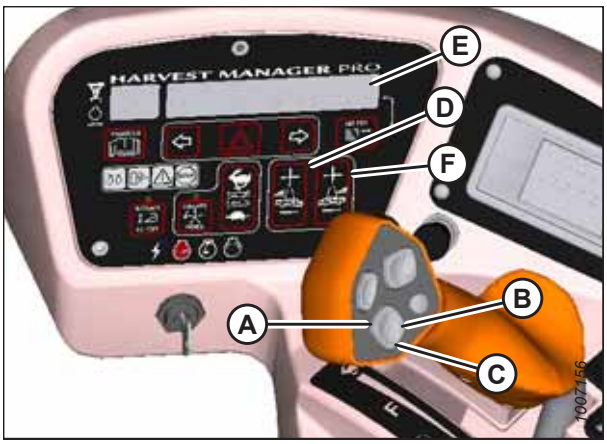


Figure 4.275: Operator Console

A - Header Tilt Down
B - Header Tilt Up
C - Header Down
D - Left Float
E - Display
F - Right Float

4. Select a deck position using DECK SHIFT switch (A) from one of the following delivery options:
   - B - Left-side delivery
   - C - Center delivery
   - D - Right-side delivery

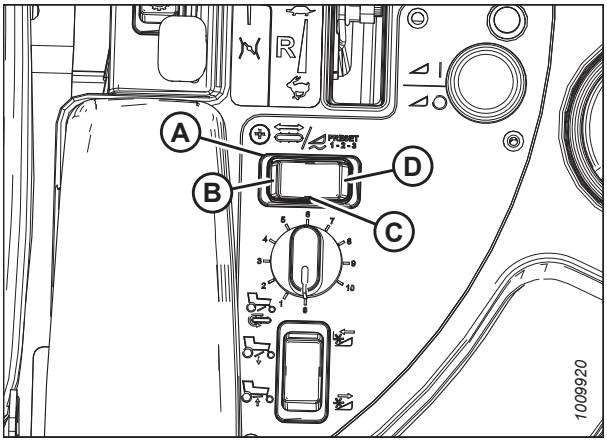


Figure 4.276: Deck Shift Switch

5. Using HEADER DOWN switch (A) on the GSL, lower the header fully until the lift cylinders are fully retracted.
6. Using LEFT FLOAT SWITCH (B), push **+** to increase the float or **–** to decrease the float on the left side of the header. Screen (D) will display the selected float value for the left side. For example: 8.0 L FLOAT R ##.#
7. Repeat this procedure to set the float on the right side of the header by using RIGHT switch (C). Screen (D) will display the selected float value for both sides. For example: 8.0 L FLOAT R 3.0

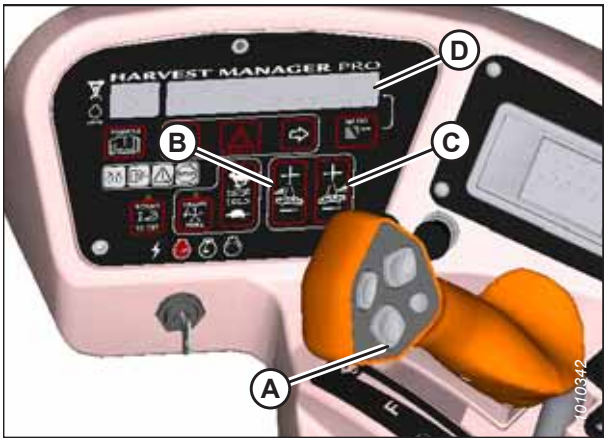


Figure 4.277: Operator Console

8. Select a second deck position using DECK SHIFT switch (A).
9. Repeat Step *6, page 305* and Step *7, page 305* to set the float for the second deck position.
10. Select a third deck position with DECK SHIFT switch (A).
11. Repeat Step *6, page 305* and Step *7, page 305* to set the float for the third deck position.

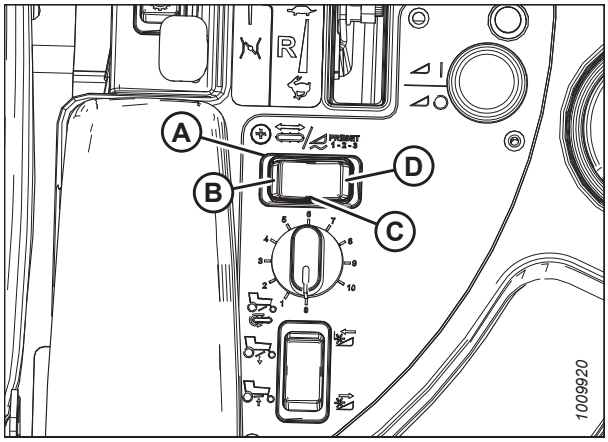


Figure 4.278: Deck Shift Switch

A - Deck Shift Switch
B - Left-Side Delivery
C - Center Delivery
D - Right-Side Delivery

4.7 Operating with A Series Auger Header

Instructions for setting the knife speed and the reel speed on A Series Auger Headers are provided.

4.7.1 Auger Speed

The options for setting the header's auger speed differ depending on the model of the header.

Setting Auger Speed on A30D Auger Headers

On A30D Auger Headers, the auger speed is fixed to the knife speed. The cab display module (CDM) cannot display the auger speed.

Setting Auger Speed on A40D Auger Headers

The speed of the auger on A40D Auger Headers is directly related to the speed of the reel. However, the auger speed can be controlled independently of the reel.

Figure 4.279: Operator Console

DANGER

Ensure that all bystanders have cleared the area.

1. Start the engine.
2. Engage the header.
3. Set HEADER INDEX switch (B) to OFF.
4. Set the REEL SPEED setting to the minimum possible value. For instructions, refer to *Reel and Disc Speed Switches, page 78*.

5. Press DISPLAY SELECTOR switch (E) on the ground speed lever (GSL) or press FAST button (C) or SLOW button (D) on the cab display module (CDM) until the message ##.# AUGER SPEED appears at location (A). The displayed value represents the speed of the auger.

   NOTE:

   Changes to the reel speed will directly affect the speed of the auger. However, when the reel speed is adjusted, the auger speed value displayed on the CDM will not change.

6. Press FAST button (C) or SLOW button (D) on the CDM until the desired auger speed is achieved.

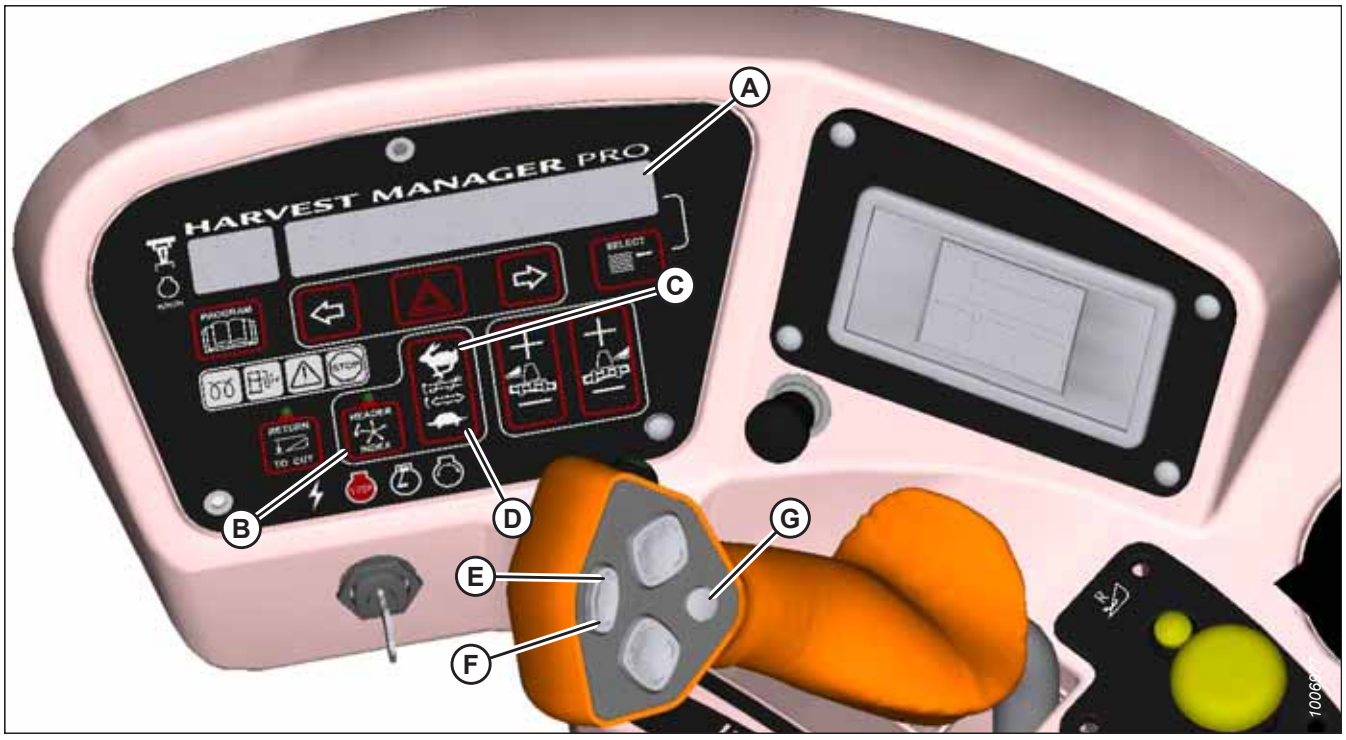
4.7.2 Reel Speed

The ability to control or monitor the header's reel speed differs depending on the particular model of auger header attached to the windrower.

Displaying Reel Speed – A30S and A30D Auger Headers

On A30 Series Auger Headers, the speed of the auger and the speed of the reel are directly related to the speed of the main header drive. The relationship between the drive speed and the speed of the reel and the auger can only be changed by installing a different size auger and reel drive sprockets.

Figure 4.280: Operator Console



A - Display **B - Header Index** **C - Auger Fast** **D - Auger Slow**
E - Fast **F - Slow** **G - Display Selector**

1. Start the engine.
2. Engage the header.
3. Set HEADER INDEX switch (B) to the **OFF** state.
4. On the ground speed lever (GSL), press DISPLAY SELECTOR (G) or the SELECT SWITCH on the cab display module (CDM) until the message **##.## REEL RPM** appears at location (A). The value ##.## will range between 15.00 and 85.00 rpm.

Reel Speed – A40D Auger Headers

The A40D Auger Header features a hydraulic direct drive reel with an operating speed range of 15–85 rpm. The Operator can control the reel speed using the cab display module (CDM) and the ground speed lever (GSL).

NOTE:

Adjusting the reel speed will result in a change to the auger speed unless the auger speed has been preset.

Adjusting Reel Speed

The A40D Auger Header's reel is hydraulically driven. Adjusting the reel speed also changes the auger speed, unless the auger speed is initially set to a predetermined value. Follow this procedure to set the auger speed so that subsequent reel speed adjustments will only affect the reel.

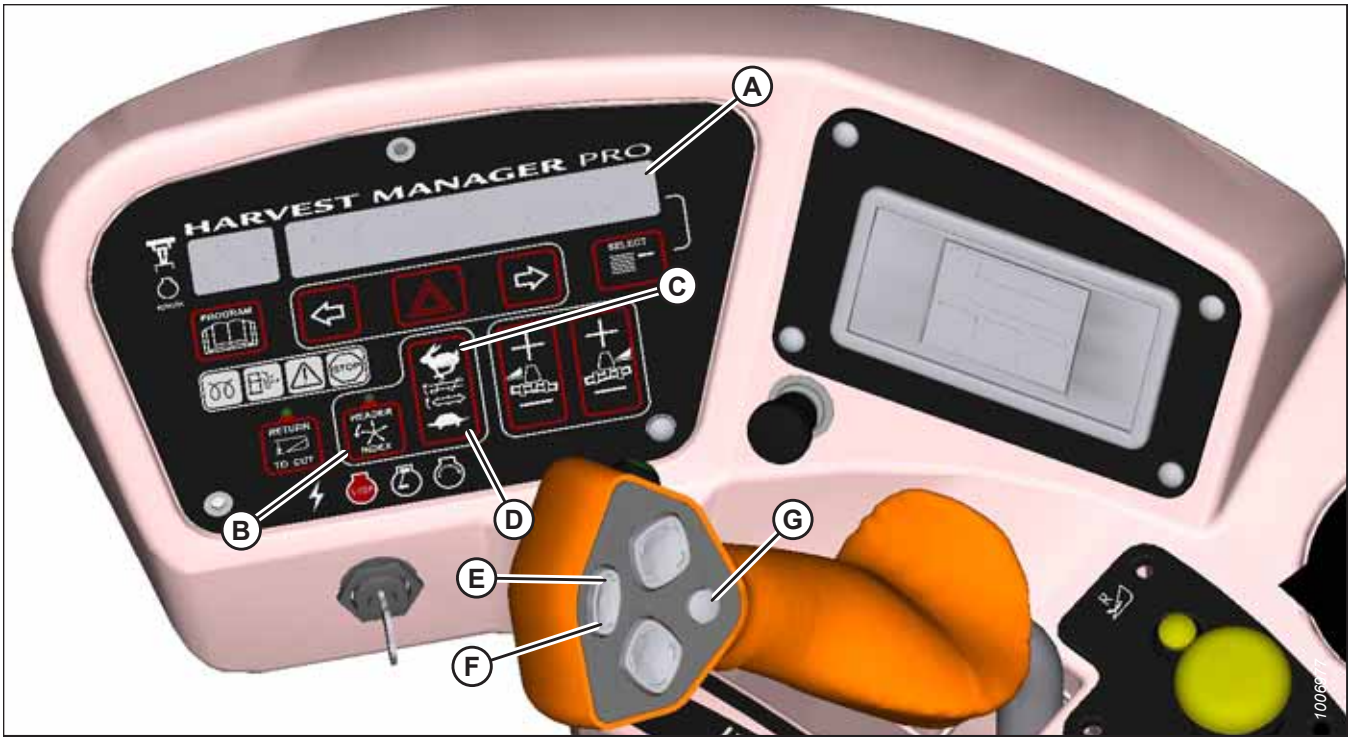


Figure 4.281: Operator Console

A - Display
B - Header Index
C - Auger Fast
D - Auger Slow
E - Fast
F - Slow
G - Display Selector

NOTE:

Once the reel speed has been configured, subsequent adjustments to the reel speed will **NOT** affect the auger speed.

1. Start the engine.
2. Engage the header.
3. Set HEADER INDEX SWITCH (B) to OFF.
4. On the ground speed lever (GSL), press REEL SLOW switch (F) until a beep is heard. The message ##.## REEL RPM will appear at location (A).
5. Press AUGER SLOW button (D) or FAST button (C) to set the desired auger speed. The message ##.# AUGER SPEED will appear at location (A).

6. On the GSL, press REEL SLOW button (F) or FAST button (E) to set the desired reel speed. The message ##.## REEL RPM. will appear at location (A).

Adjusting Reel Speed while Windrower is in Motion

The reel speed on an A40D Auger Header can be adjusted by using the reel speed controls on the ground speed lever (GSL). The reel speed can range from 15 to 85 rpm.

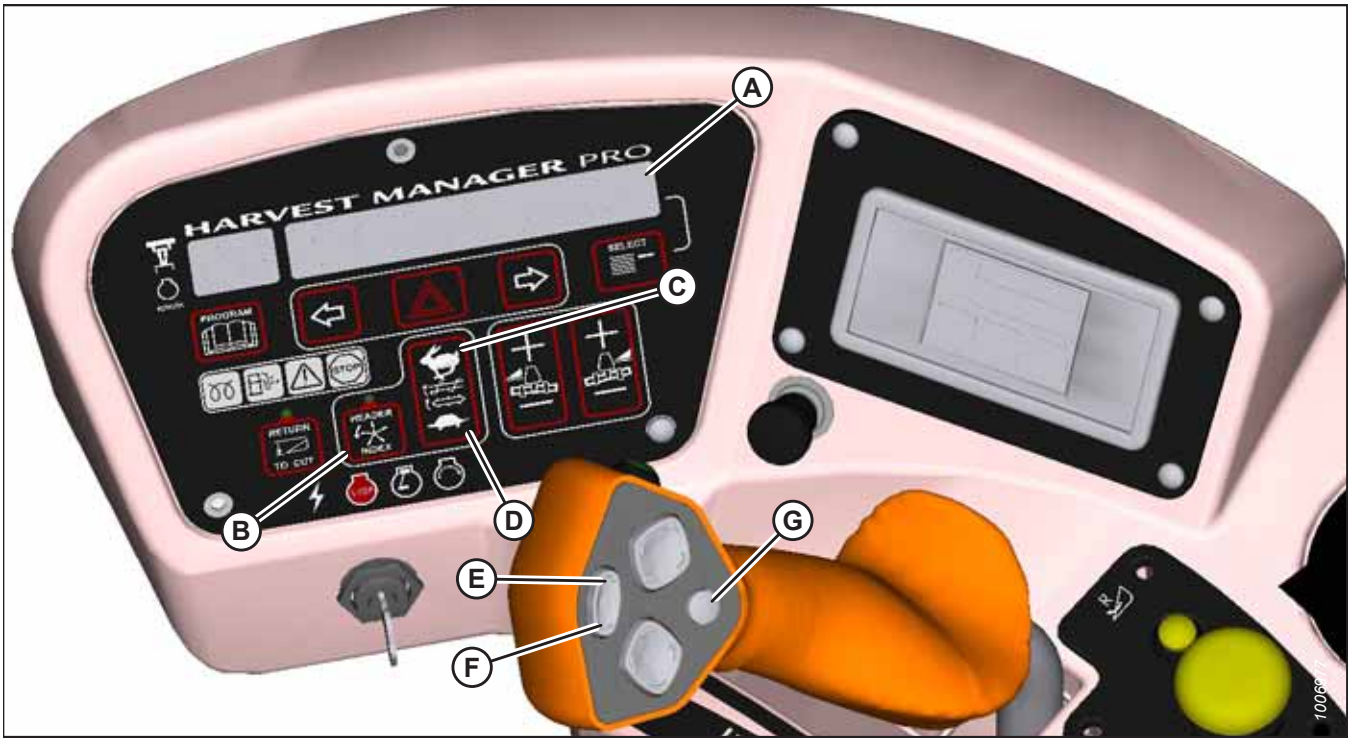


Figure 4.282: Operator's Console

A - Display **B - Header Index** **C - Auger Fast** **D - Auger Slow**
E - Reel Fast **F - Reel Slow** **G - Display Selector**

1. Set HEADER INDEX switch (B) to OFF.

2. Press REEL SLOW button (F) or REEL FAST button (E) on the ground speed lever (GSL) until the message ##.## REEL RPM appears at location (A). The displayed value (##.##) represents the reel speed in terms of rpm, mph, or km/h, depending on how the cab display module (CDM) has been configured.

   NOTE:

   Adjusting the reel speed will directly affect the auger speed, unless the auger speed has been preset.

Indexing Reel Speed to Ground Speed

The reel speed on an A40D Auger Header can be configured so that it varies directly with the speed of the auger using the header index function. Indexing the reel speed to the ground speed requires setting the minimum reel speed and configuring the reel index setting.

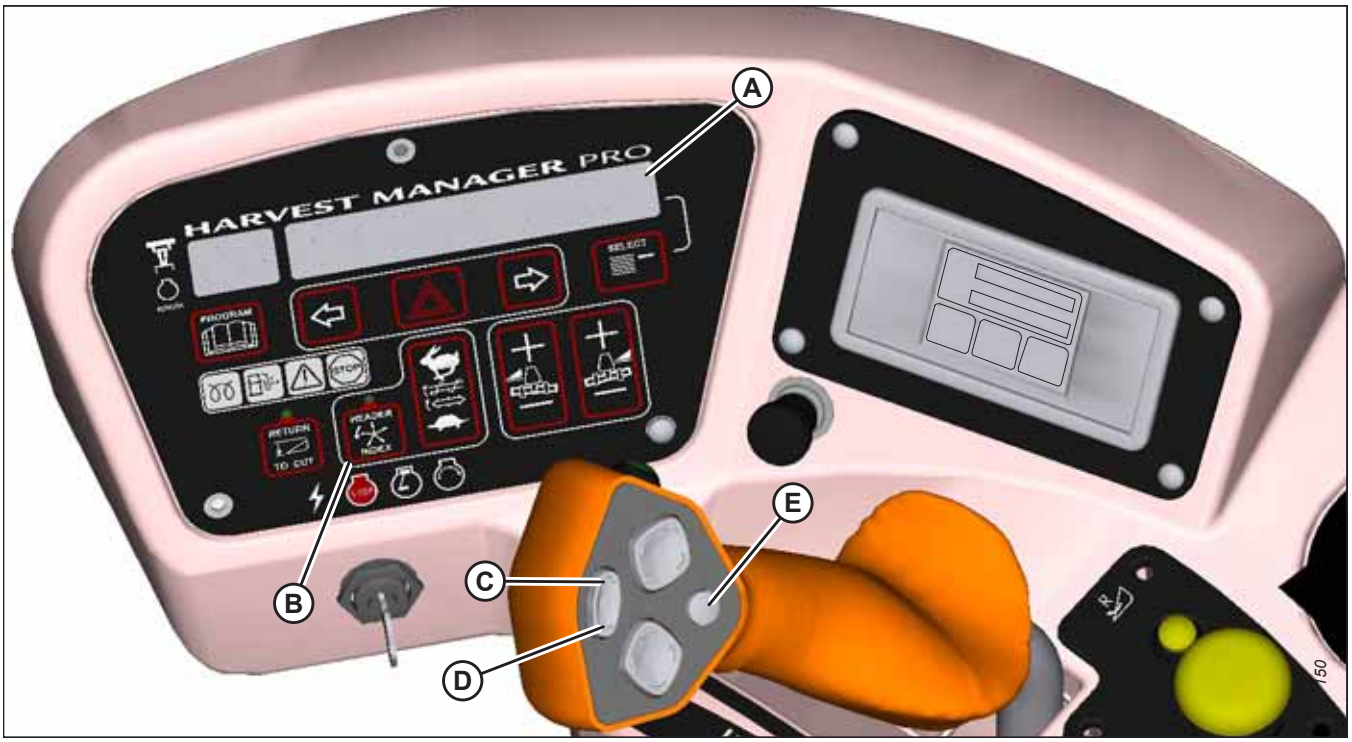


Figure 4.283: Operator Console

DANGER

Ensure that all bystanders have cleared the area.

1. First, set the minimum reel speed as follows:

   IMPORTANT:

   Set the minimum reel speed while the windrower is stationary (that is, while the ground speed lever [GSL] is in the N-DETENT position).

   a. Start the engine.

   b. Engage the header.

   c. Set HEADER INDEX switch (B) to ON.

   d. Press DISPLAY SELECTOR button (E) on the GSL, or press the FAST button (C) or SLOW button (D). The message ##.## MIN REEL will appear at location (A). The displayed value (##.##) represents the reel speed in rpm, mph, or km/h, depending on how the cab display module (CDM) has been configured.

   e. Press FAST button (C) or SLOW button (D) until the desired minimum reel speed is achieved.

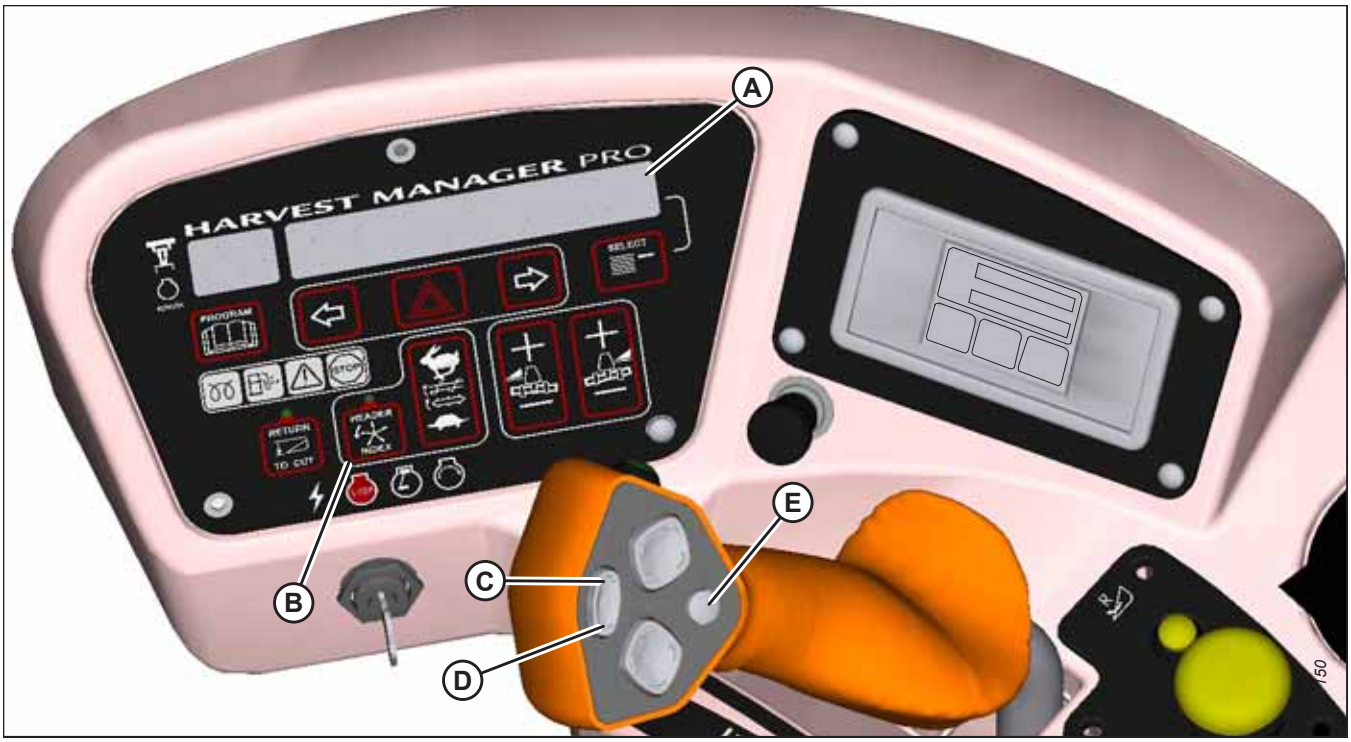


Figure 4.284: Operator Console

2. Next, configure the reel index setting as follows:

   IMPORTANT:

   The reel index setting can only be adjusted while the windrower is traveling at a ground speed greater than the sum of the minimum reel speed and the header index value.

   NOTE:

   The reel will continue operating at the minimum reel speed setting when the windrower's ground speed drops below the set value. If this occurs, the message ##.## MIN REEL will appear at location (A). To prevent this message from appearing, raise the minimum reel speed, or increase the windrower's ground speed.

   a. Set HEADER INDEX switch (B) to ON.

   b. Press DISPLAY SELECTOR button (E) on the GSL or press FAST button (C) or SLOW button (D). The message ##.## ##.# REEL IND will appear at location (A). The first term, ##.##, represents the reel speed in rpm, mph, or km/h, depending on how the cab display module (CDM) is configured. The second term, ##.#, represents the reel index setting.

   c. Press FAST button (C) or SLOW button (D) until the desired reel index value is achieved.

Examples:

- The windrower is traveling at 8 mph with the HEADER INDEX switch set to the ON state, and the header index value set to -1.0.
  The CDM will display the message 7.0 -1.0 REEL IND, where 7.0 (8.0-1.0) is the reel speed in mph and -1.0 is the header index setting.
- The windrower speed drops to 7.5 mph, while the header index value remains the same.
  The CDM will display the message 6.5 -1.0 REEL IND, where 6.5 (7.5-1.0) is the reel speed in mph and -1.0 is the header index setting.
- The windrower is traveling at 8 mph, and the header index value is set to 2.0.
  The CDM will display the message 10.0 2.0 REEL IND, where 10.0 (8+2.0) is the reel speed in mph and 2.0 is the header index setting.

4.7.3 Knife Speed

The header's knife speed should be configured so that a clean cut is achieved. The type of crop being cut and the cutting conditions are important factors to consider when setting the knife speed.

When the header is first attached to the windrower, the windrower control module (WCM) receives a code from the header that determines the knife speed range and the minimum speed. The desired speed can be programmed on the cab display module (CDM) and stored in the WCM memory so the knife will operate at the original set-point after the header is detached and reattached to the windrower. If no header code is detected, the CDM displays NO HEADER and the knife speed reverts to the operator's selection from a range of 800–1000 strokes per minute. Refer to the header operator's manual for the suggested knife speed for a variety of crops and conditions.

NOTE:

The knife speed cannot be programmed outside the range specified for each header.

NOTE:

The knife speed can be adjusted without shutting down the machine; however, the windrower should be stopped before adjusting CDM settings.

To adjust the knife speed, refer to *Setting Header Knife Speed, page 102*.

Adjusting Knife Speed

The knife speed on an A Series Auger Header can be adjusted using the cab display module (CDM).

Figure 4.285: Operator Console

DANGER

Ensure that all bystanders have cleared the area.

1. Start the engine.
2. Engage the header.
3. Press PROGRAM (D) and SELECT (E) simultaneously on the cab display module (CDM). The message **#### KNIFE SPM** will appear at location (A). The displayed value (####) represents the speed of the knife in strokes per minute (spm).
4. Press LEFT ARROW (B) or RIGHT ARROW (C) until the desired knife speed is displayed at location (A).

4.8 Operating with R, R1, or R2 Series Rotary Disc Header

Refer to this section to learn how to operate an attached R, R1, or R2 Series Rotary Disc Header.

R80 and R85 4.0 m (13 ft.) Rotary Disc Headers are shipped without the hydraulic motor or hydraulic hoses installed. These must be installed before the header can be operated.

If necessary, obtain the Hydraulic Motor kit (MD #B5510) from your MacDon Dealer and install it according to the instructions supplied with the kit.

R1 Series Rotary Disc Headers come from the Dealer with the required Hydraulic Completion package (MD #B6272) already installed. A Disc Drive kit (MD #B4657) is also required in order for the windrower to engage with the header.

R2 Series Rotary Disc Headers require the installation of the Disc Drive kit (MD #B4657) and the M155*E4* Hydraulic Drive kit (MD #B7310) in order for the windrower to engage with the header.

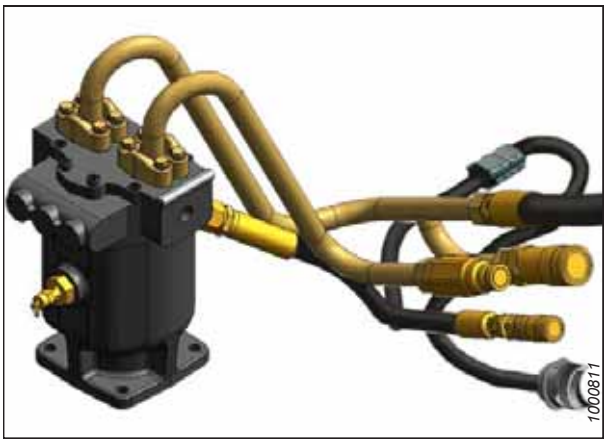


Figure 4.286: Kit MD #B5510

NOTE:

A Hydraulic Coupler kit (MD #B5497) is also available. This kit allows for the quick attachment and removal of multiple header models.

4.8.1 Disc Speed

The disc speed should be set according to the crop type and the cutting conditions.

Refer to the header operator's manual for information on setting the disc speed.

Setting Disc Speed

The disc speed can be set by using the controls on the ground speed lever (GSL).

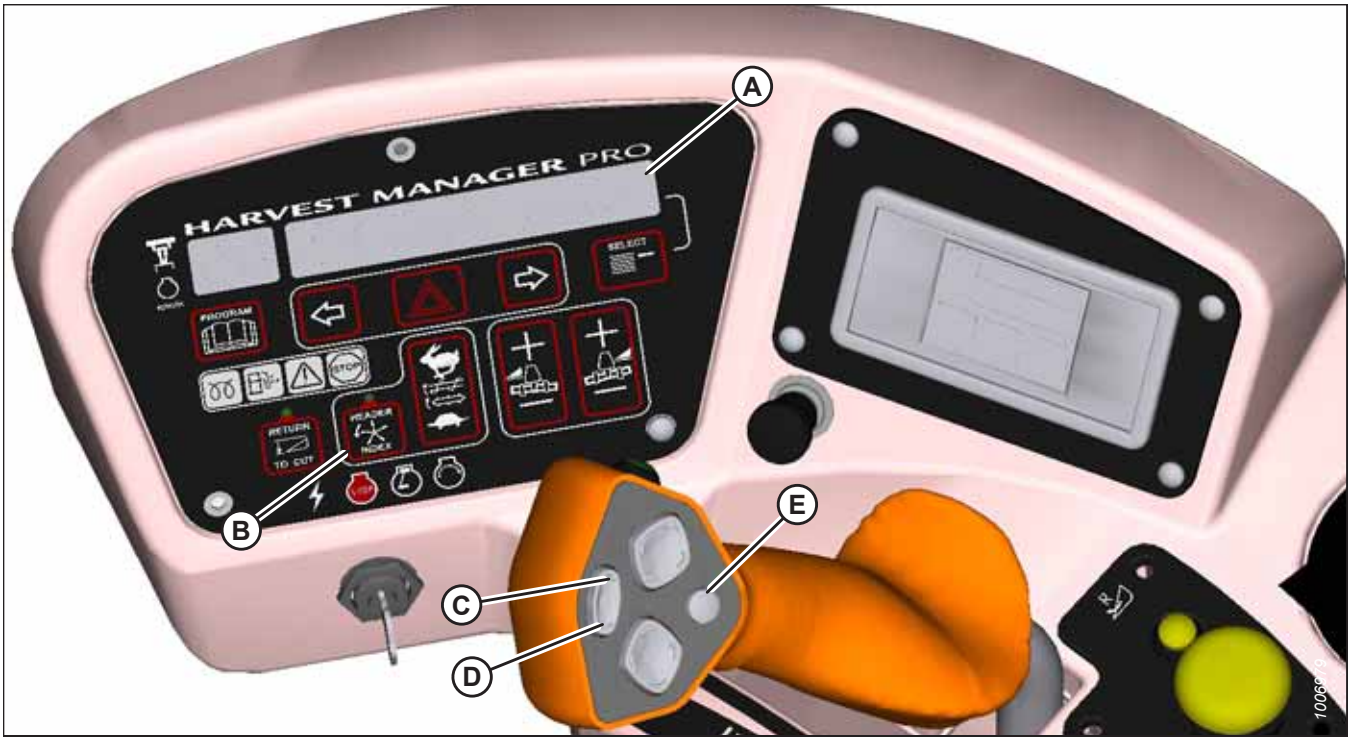


Figure 4.287: Operator Console

A - Display
B - Header Index
C - Fast
D - Slow
E - Display Selector

DANGER

Ensure that all bystanders have cleared the area.

1. Start the engine.
2. Engage the header.
3. Set HEADER INDEX switch (B) to OFF.
4. Press FAST button (C) or SLOW button (D) on the ground speed lever (GSL). The message #### DISC RPM will appear. The displayed value (####) represents the disc speed in rpm.
5. Press FAST button (C) or SLOW button (D) until the desired disc speed is achieved.

Chapter 5: Maintenance and Servicing

This chapter contains the information necessary to perform routine maintenance and occasional servicing tasks on your machine. The word “maintenance” refers to scheduled tasks that help your machine operate safely and effectively; “service” refers to tasks that must be performed when a part needs to be repaired or replaced. For advanced service procedures, contact your Dealer.

5.1 Preparing for Servicing

Several preliminary tasks must be performed before the windrower can be safely maintained or serviced.

WARNING

To prevent injury, before servicing the windrower or opening the drive covers:

- **Fully lower the header. If you intend to service the windrower with the header in the raised position, engage the header lift cylinder safety props.**
- **Disengage the header drive.**
- **Stop the engine, and remove the key from the ignition.**
- **Wait for all moving parts to come to rest.**

5.2 Maintenance Schedule

The maintenance schedule specifies the maintenance procedures needed to keep the windrower in excellent operating conditions, and the operating hours at which those procedures should be performed.

Regular maintenance is the best insurance against early wear and untimely breakdowns. Follow the provided maintenance schedule to maximize the service life of the windrower.

Record the windrower's serial number here for future copies of this record:

Windrower Serial Number: _____

Combine this record with the record in the header operator's manual. Make copies of this page to continue the record.

For detailed instructions, refer to the various procedures in this chapter. Use the fluids and lubricants specified in *8.1 Recommended Fuel, Fluids, and Lubricants, page 489*.

Service intervals: The recommended service intervals are specified in terms of the windrower's hours of operation or as a period of elapsed time; service the windrower at whichever interval occurs first.

IMPORTANT:

The recommended intervals are based on typical operating conditions. Service the machine more often if it is being operated under adverse conditions (for example: severe dust, or handling extra-heavy loads).

CAUTION

When performing maintenance procedures, follow all of the safety instructions provided in *1 Safety, page 1*.

✎	Hour meter reading												
✎	Service date												
✎	Serviced by												
First use	Preseason or Annual. For instructions, refer to *4.3.3 Preseason Checks / Annual Service, page 168*.												
Action	✓ Check	♦ Lubricate				▲ Change				✹ Clean			
First Hour[24]													
✓	Check drive wheel nuts torque. For instructions, refer to *Tightening Drive Wheel Nuts, page 451*.												
First 5 Hours[24]													
✓	Check A/C compressor belt tension. For instructions, refer to *Tensioning Air Conditioner Compressor Belt, page 392*.												
✓	Check caster wheel nuts torque. For instructions, refer to *Tightening Caster Wheel Hardware, page 459*.												
✓	Check caster wheel anti-shimmy dampener bolts torque. For instructions, refer to *Tightening Caster Wheel Anti-Shimmy Dampeners, page 464*.												
✓	Check walking beam width adjustment bolts torque. For instructions, refer to *4.3.8 Adjusting Caster Tread Width, page 186*.												
First 10 Hours[24]													
✓	Check walking beam width adjustment bolts torque. For instructions, refer to *4.3.8 Adjusting Caster Tread Width, page 186*.												
✓	Check neutral adjustment[25].												

24. Begins from the first use of the machine.
25. Dealer-adjusted.

Every 10 Hours or Daily[24]													
✹	Clean A/C condenser[26]. For instructions, refer to *5.9.3 Cleaning Cooler Box Components, page 396*.												
✹	Clean charge air cooler. For instructions, refer to *5.9.3 Cleaning Cooler Box Components, page 396*.												
✓	Check engine oil level[26] . For instructions, refer to *5.8.3 Checking Engine Oil Level, page 352*.												
✓	Check engine coolant level. For instructions, refer to [26] *Checking Coolant Level, page 380*.												
✓	Add fuel to fuel tank[26] . For instructions, refer to *Filling Fuel Tank, page 369*.												
✓	Check fuel filter water trap[26] . For instructions, refer to *Removing Water from Fuel System, page 370*.												
✹	Clean hydraulic oil cooler[26] . For instructions, refer to *5.11.2 Hydraulic Oil Cooler, page 440*.												
✓	Check hydraulic oil level[26] . For instructions, refer to *5.11.1 Checking and Filling Hydraulic Oil, page 439*.												
✹	Clean radiator[26] . For instructions, refer to *5.9 Maintaining Engine Cooling Box, page 394*.												
✓	Check tire inflation pressure[26] . For instructions, refer to *Inflating Drive Wheel Tire, page 450*.												
✓	Check diesel exhaust fluid (DEF) level[26] . For instructions, refer to *3.15.1 Fuel and Diesel Exhaust Fluid Display Module, page 69*.												

26. Records of daily maintenance are not required for warranty purposes. However, these records can be maintained, if desired.

First 50 Hours[27]													
✓	Inspect hose clamps: intake/radiator/heater/hydraulic[28]. Refer to specific hose clamp section for instructions.												
✓	Check walking beam, with adjustment bolts. For instructions, refer to *4.3.8 Adjusting Caster Tread Width, page 186*.												
✓	Check caster wheel anti-shimmy dampener bolts (if installed). For instructions, refer to *Tightening Caster Wheel Anti-Shimmy Dampeners, page 464*.												
▲	Change main gearbox oil. For instructions, refer to *Changing Lubricant, page 388*.												
▲	Change wheel drive lubricant. For instructions, refer to *Changing Wheel Drive Lubricant, page 457*.												
▲	Change charge system oil filter. For instructions, refer to *Charge Oil Filter, page 442*.												
▲	Change return oil filter. For instructions, refer to *Return Oil Filter, page 443*.												
Every 50 Hours													
✹	Clean cab fresh air intake filter. For instructions, refer to *Inspecting and Cleaning Fresh Air Intake Filter Element, page 343*.												
●	Lubricate caster pivots. For instructions, refer to *5.5.2 Lubrication Points, page 334*.												
●	Lubricate forked caster spindle bearings. For instructions, refer to *5.5.2 Lubrication Points, page 334*.												
✓	Check gearbox oil level. For instructions, refer to *Checking Lubricant Level and Adding Lubricant, page 387*.												
●	Lubricate top lift link pivots. For instructions, refer to *5.5.2 Lubrication Points, page 334*.												

27. Begins from first use of machine.
28. Hand-tighten these clamps unless otherwise noted.

Annually[29] [30]													
✓	Check A/C blower. For instructions, refer to *Cycling Air Conditioning Compressor Coolant, page 169*.												
✓	Check antifreeze concentration. For instructions, refer to *Checking Engine Coolant Strength, page 380*.												
✓	Check battery charge. For instructions, refer to *Maintaining Batteries, page 401*.												
✓	Check battery fluid level. For instructions, refer to *Charging Batteries, page 402*.												
▲	Change fuel tank vent line filter. For instructions, refer to *Replacing Fuel Tank Vent Filter, page 362*.												
✓	Check steering linkages. For instructions, refer to *Checking Steering Link Pivots, page 339*.												
Every 100 Hours or Annually[30]													
✹	Clean cab air return filter. For instructions, refer to *Cleaning Return Air Cleaner/Filter, page 345*.												
✓	Check cab suspension limit straps. For instructions, refer to *5.6.5 Cab Suspension Limit Straps, page 341*.												
Every 250 Hours or Annually [30]													
▲	Change engine oil and filter. For instructions, refer to *5.8.4 Changing Engine Oil, page 354*.												
▲	Change engine air cleaner primary filter element. For instructions, refer to *Removing Primary Air Filter, page 357* and *Installing Primary Air Filter, page 359*.												
●	Lubricate formed caster wheel hub bearings. For instructions, refer to *5.5.2 Lubrication Points, page 334*.												
✓	Check drive wheel lubricant. For instructions, refer to *Checking Wheel Drive Lubricant Level, page 455*.												
✓	Check exhaust system. For instructions, refer to *5.8.11 Inspecting Exhaust System, page 389*.												

29. Begins from the first use of the machine.
30. It is recommended that annual maintenance be done prior to the start of the operating season.

Every 500 Hours or Annually[31] [32]													
▲	Change fuel filters. For instructions, refer to *Maintaining Fuel Filters, page 363*.												
▲	Change gearbox lubricant. For instructions, refer to *Changing Lubricant, page 388*.												
▲	Change charge system and return oil filters. For instructions, refer to *5.11.4 Changing Hydraulic Oil Filters, page 441*.												
✓	Inspect safety systems. For instructions, refer to *5.6.2 Safety Systems, page 335*.												
Every 1000 Hours													
▲	Change wheel drive lubricant. For instructions, refer to *Changing Wheel Drive Lubricant, page 457*.												
✹	Clean diesel exhaust fluid (DEF) supply module filter. For instructions, refer to *Cleaning and Inspecting Supply Module Filter, page 378*.												
2000 hours[31]													
▲	Change coolant. For instructions, refer to *Changing Coolant, page 382*.												
▲	Change diesel exhaust fluid (DEF) vent hose filter. For instructions, refer to *Replacing Diesel Exhaust Fluid Vent Hose Filter, page 374*.												
▲	Change engine crank case filter. For instructions, refer to *Replacing Engine Oil Filter, page 355*.												
4500 hours or every 3 years[31]													
▲	Change diesel exhaust fluid (DEF) supply module filter. For instructions, refer to *Diesel Exhaust Fluid Supply Module Filter, page 376*.												
5000 hours or every two years[31]													
✓	Check engine valve tappet clearance.												

31. Begins from the first use of the machine.
32. It is recommended that annual maintenance be done prior to start of operating season.

5.3 Engine Compartment Hood

The engine compartment hood has two open positions. The lowest is for general maintenance such as checking and adding fluid and servicing the cooling box. The highest position provides full access to the engine compartment.

5.3.1 Opening Hood – Lower Position

Moving the windrower's hood to the lower open position allows you to perform general maintenance tasks.

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. 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.

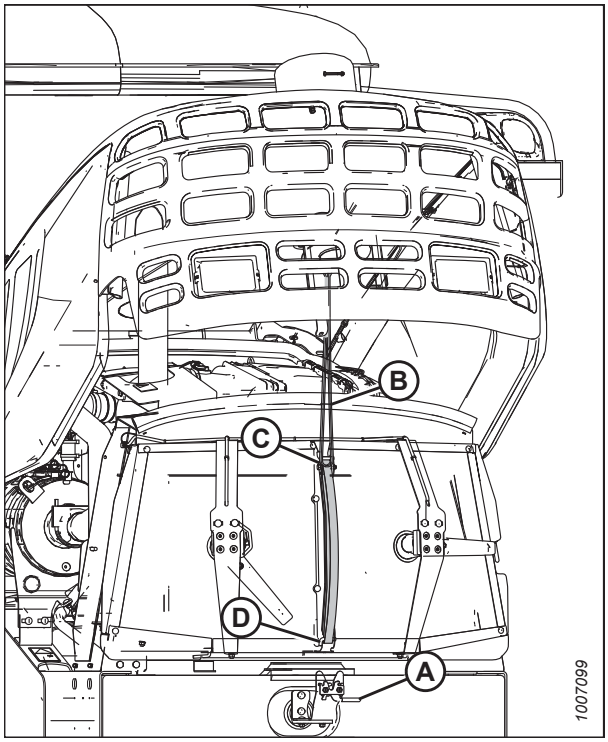


Figure 5.1: Hood Open – Lower Position

5.3.2 Closing Hood – Lower Position

Once your maintenance tasks are complete, close the hood again before operating the windrower.

1. Grasp the strap at location (B). Loop the strap under upper hook (C).

   IMPORTANT:

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

2. Pull down on the strap, grasp the hood when it comes within reach, and then lower it until the hood engages latch (A).

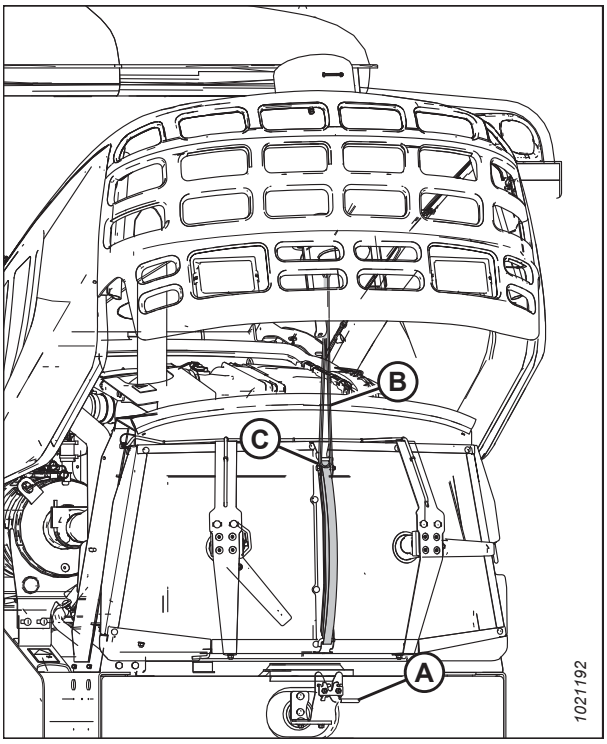


Figure 5.2: Hood Open (Lower Position)

5.3.3 Opening Hood – Highest Position

To perform extended maintenance or service procedures, the hood should be at its highest position.

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.
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.

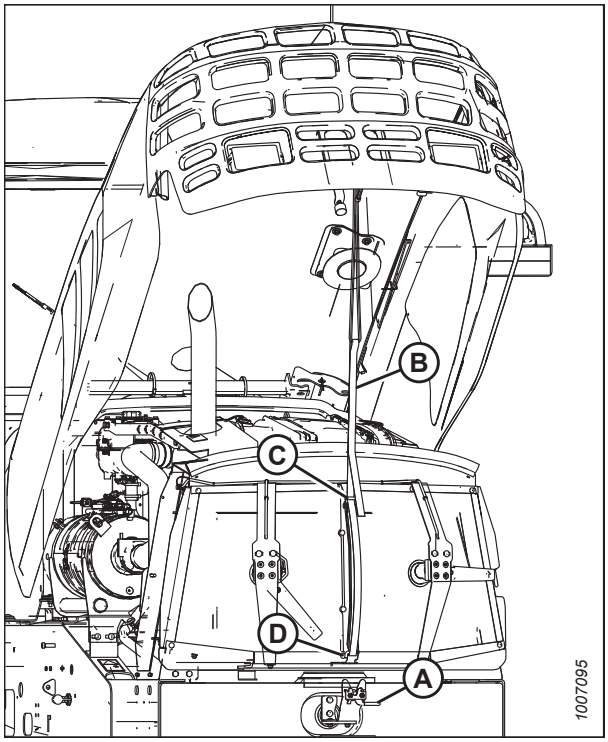


Figure 5.3: Hood Open – Highest Position

5.3.4 Closing Hood – Highest Position

Once your maintenance or service tasks are complete, close the hood again before operating the windrower.

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).

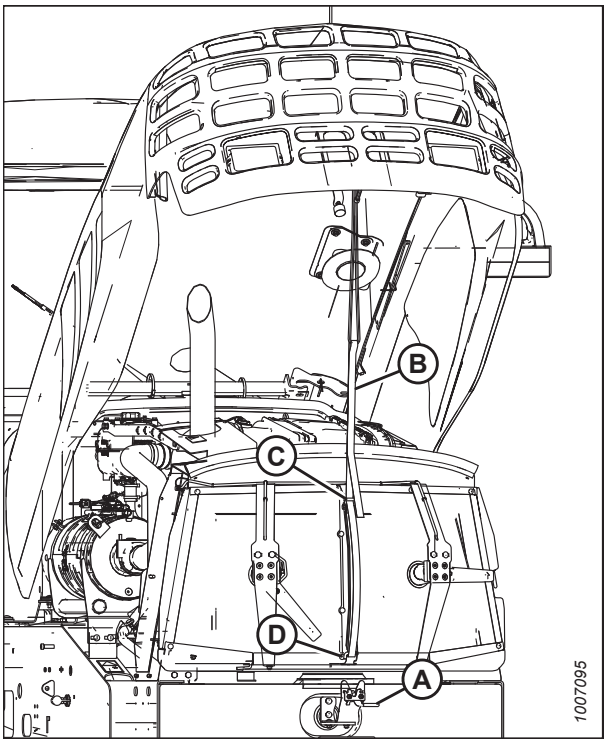


Figure 5.4: Hood Open – Highest Position

5.4 Maintenance Platforms

Swing-away platforms and stairs are provided on both sides of the windrower. These allow access to the operator's station and the engine bay. The platforms can be swung away from the windrower to allow access to the hydraulic system and the batteries.

The maintenance platforms have three positions:

- Closed position
- Open – standard position
- Open – major servicing position

5.4.1 Opening Platforms – Standard Position

The windrower platforms can be opened to access windrower components such as batteries and hydraulic components. This procedure describes how to open the cab-forward left platform to the standard position. Follow the same procedure to open the right platform.

The platforms can also be opened to a wider, major service position. For instructions on opening the platform to the major service position, refer to *5.4.3 Opening Platforms – Major Service Position, page 330*.

CAUTION

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

- Left cab-forward platform (A)
- Right cab-forward platform (B)

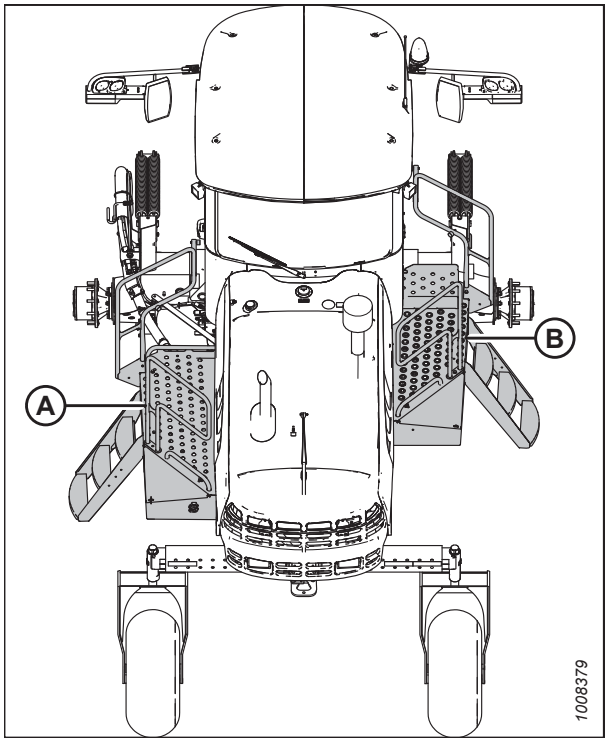


Figure 5.5: Platforms

1. Push latch (A) and pull platform (B) toward the walking beam until it stops and the latch is engaged in the open position.

   NOTE:

   Ensure that the platform is latched before standing on it.

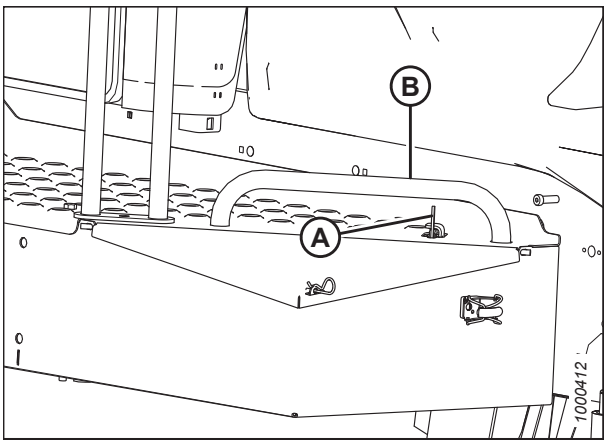


Figure 5.6: Platform Latch

5.4.2 Closing Platforms – Standard Position

Once your maintenance or service tasks are complete, the windrower's platform will need to be closed.

CAUTION

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

- Left cab-forward platform (A)
- Right cab-forward platform (B)

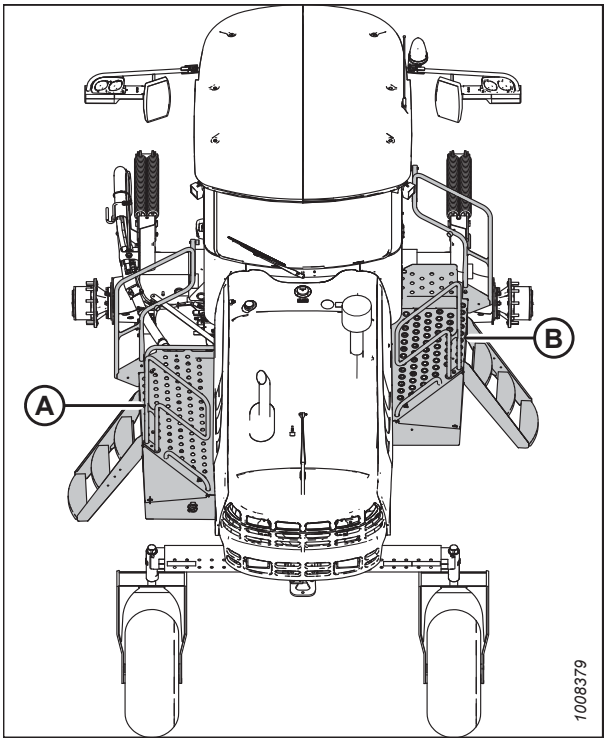


Figure 5.7: Platforms

1. If the platform is latched in the open position, push latch (A) to unlock it.
2. Grasp handle (B) on the platform and push it forward until it stops and latch (A) is engaged.

   NOTE:

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

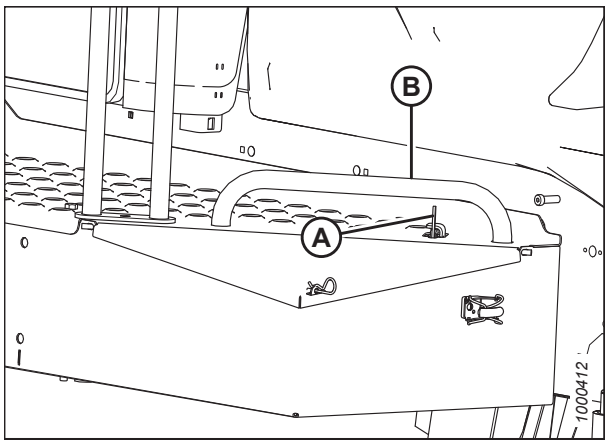


Figure 5.8: Platform Latch

5.4.3 Opening Platforms – Major Service Position

To improve access to the hydraulic system and the battery, the platforms can be swung away from the windrower into the major service position. This procedure applies to both platforms.

CAUTION

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

- Left cab-forward platform (A)
- Right cab-forward platform (B)

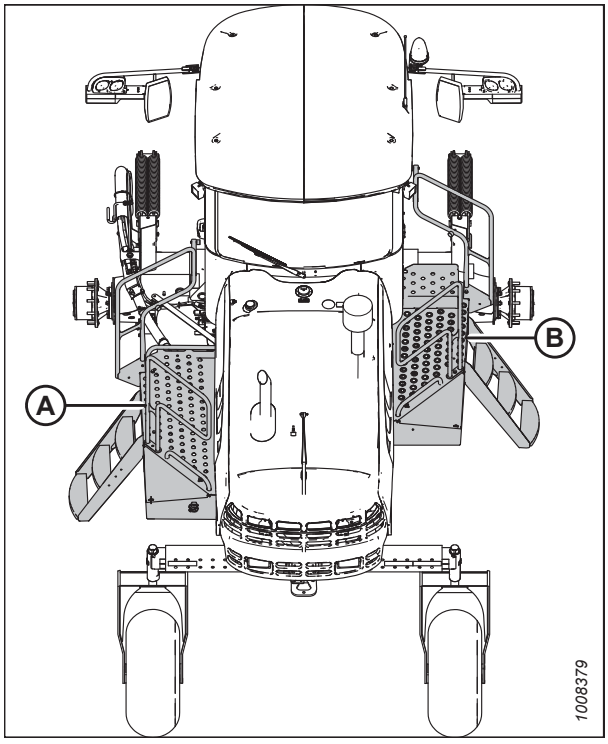


Figure 5.9: Platforms

1. Open the hood. For instructions, refer to *5.3.1 Opening Hood – Lower Position, page 324*.

   IMPORTANT:

   If you do not open the hood, it will be damaged when the platform is moved.

2. Unlock latch (A) and move platform (B) toward the open position. Do **NOT** lock the platform in the fully aft position.

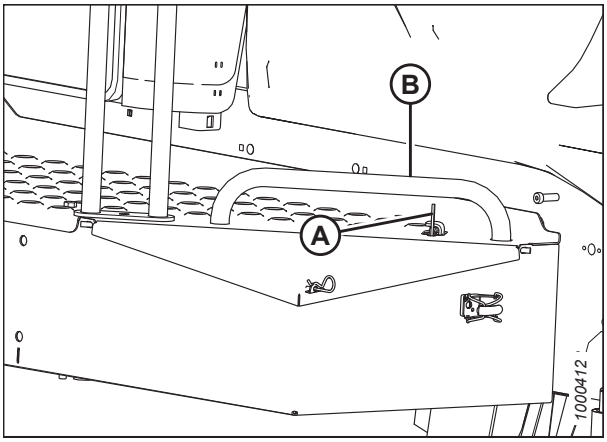


Figure 5.10: Platform Latch

3. Remove the nut and bolt securing link (A) to the frame. Swing link (A) out of the way.

4. Pull the front cab-forward end of the platform away from the frame while moving it toward the walking beam. The aft corner of platform (B) should project slightly into the engine bay when the platform is in place.

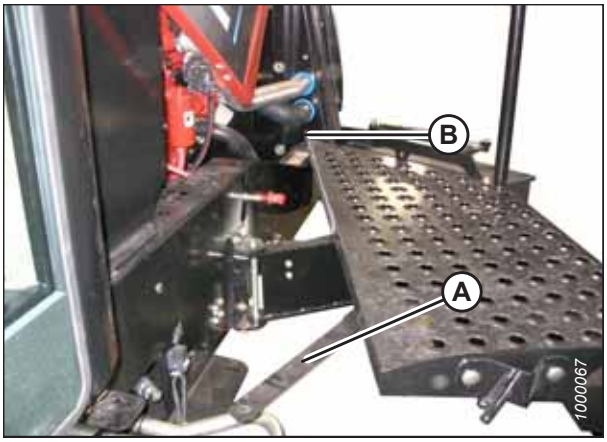


Figure 5.11: Platform

5.4.4 Closing Platforms – Major Service Position

Once your maintenance or service tasks are complete, the windrower's platform will need to be closed.

CAUTION

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

1. Swing link (A) all the way forward.

2. Push front cab-forward end (B) of the platform towards the frame while moving the platform forward.

3. Position link (A) on the bracket and install the bolt and nut. Tighten the hardware just enough, while still allowing the link to swivel on the bracket.

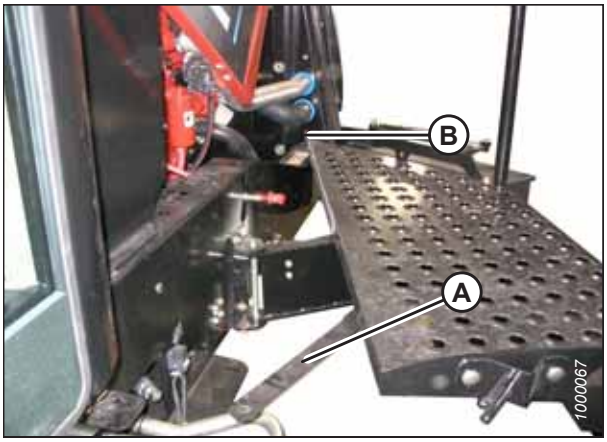


Figure 5.12: Platform

4. Move platform (B) cab-forward until it stops and engages latch (A).

5. Close the hood. For instructions, refer to *5.3.2 Closing Hood – Lower Position, page 325*.

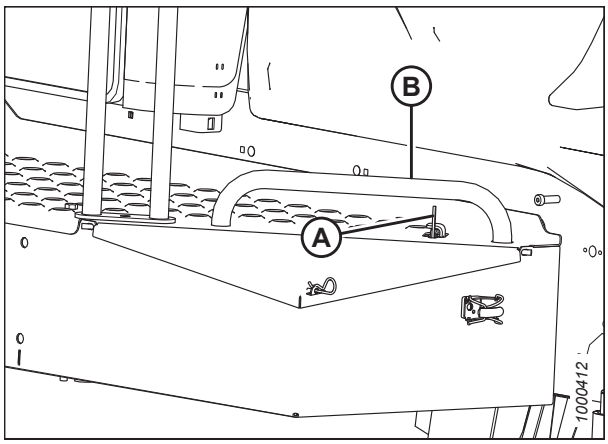


Figure 5.13: Platform Latch

5.5 Windrower Lubrication

Grease point decals can be recognized by the presence of a grease gun silhouette and a number. The numbers indicate how frequently in terms of windrower operating hours the grease points should receive lubrication.

WARNING

Before servicing the windrower or opening the drive covers, familiarize yourself with the procedures provided in *1 Safety, page 1*.

Log the windrower's hours of operation and use the Maintenance Checklist provided in this manual to keep a record of performed maintenance. Refer to *5.2 Maintenance Schedule, page 318* for more information.

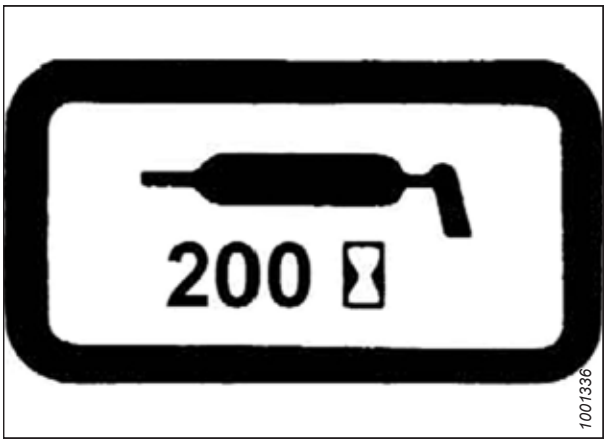


Figure 5.14: Lubrication Interval Decal

5.5.1 Lubricating Windrower

Whenever windrower components receive grease, this procedure should be followed.

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. To learn what type of grease to inject into a fitting, refer to *8.1.3 Lubricants, Fluids, and System Capacities, page 491*.
2. To avoid injecting dirt and grit, wipe the grease fitting with a clean cloth before injecting grease.
3. Inject grease through the fitting using a grease gun until grease overflows the fitting, except where advised to do otherwise.
4. Leave a blob of excess grease on the fitting. This will help keep contamination from entering the fitting.
5. Replace any loose or broken fittings immediately.
6. If a grease fitting will **NOT** take grease, remove the fitting and clean it thoroughly. Replace the fitting if necessary.

5.5.2 Lubrication Points

These are the points on the windrower which will need to receive regular lubrication. Refer to the Maintenance Schedule to learn how often to apply grease to these areas.

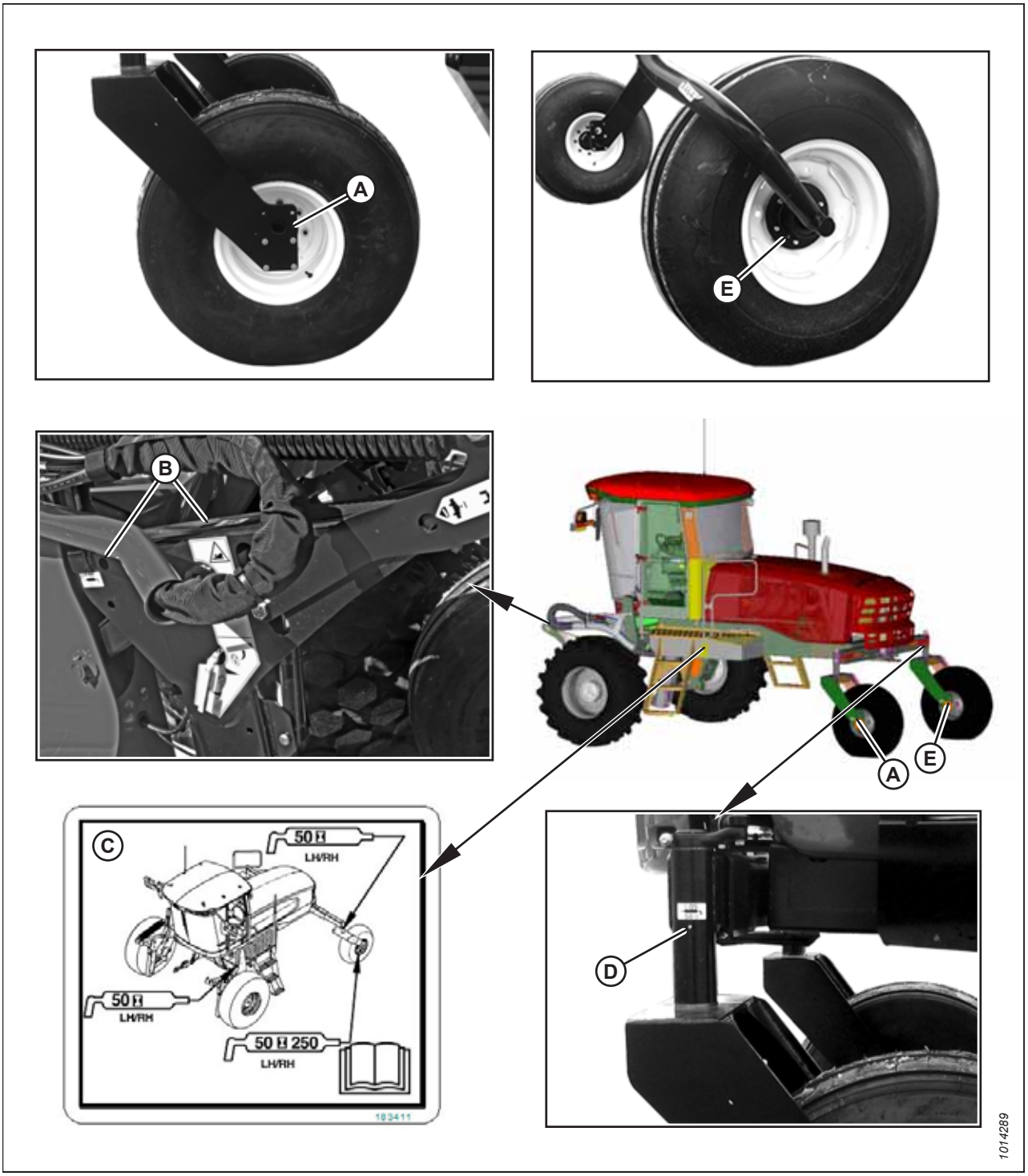


Figure 5.15: Lubrication Points

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)

5.6 Operator's Station

Several of the safety features in the windrower operator's station require maintenance from time to time.

5.6.1 Seat Belts

Seat belts are an important component of the windrower's operator safety system. Follow this procedure to ensure that the seat belts are functioning properly.

- Keep sharp objects and other potential sources of damage away from the safety belts.
- Regularly inspect the belts, buckles, retractors, tethers, slack take-up system, and mounting bolts for damage.
- Ensure that the bolts on the seat bracket and mounting plate are secure.
- Replace any damaged or worn part immediately.
- If the belt has a cut, replace it – a damaged belt may not be able to safely restrain the operator.
- Keep the seat belts clean and dry. Clean the belts with a solution of soap and warm water only. Do **NOT** use bleach or dye on the belts, as these may weaken the material.

5.6.2 Safety Systems

Perform these checks on the operator presence and engine lock-out systems according to the interval specified in the maintenance schedule.

Checking Operator Presence System

The operator presence system is a safety feature designed to deactivate or alert selected windrower systems when the Operator is not seated at the operator's station. Perform these checks to ensure that the operator presence system is functioning correctly. Repairs to this system must be performed by a MacDon Dealer.

DANGER

Ensure that all bystanders have cleared the area.

CAUTION

Park the windrower on a flat, level surface. Lower the header to the ground, put the ground speed lever into the N-DETENT position, and center the steering wheel in the locked 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. While the windrower engine is running, place the ground speed lever (GSL) in the NEUTRAL position and turn the steering wheel until it locks.
2. Engage the header drive.
3. Stand up. After approximately 5 seconds, the header should shut down. If the header does **NOT** shut down, the operator presence system requires adjustment. Contact your MacDon Dealer for more information.
4. To restart the header, move the HEADER DRIVE switch to the OFF position and then back to the ON position.
5. While the engine is running, put the GSL into the N-DETENT position. For instructions, refer to *3.16 Windrower Controls, page 73*.
6. Swivel the operator's station, but do **NOT** lock it into position.
7. Move the GSL out of the N-DETENT position. The engine should shut down and the message LOCK SEAT BASE → CENTER STEERING WHEEL → NOT IN NEUTRAL will appear on the cab display module (CDM).

8. Swivel the operator's station and lock it in place. The CDM display should return to normal. If the engine does **NOT** shut down, the seat position switches require adjustment. Contact your MacDon Dealer for more information.

9. While the windrower is traveling at a speed less than 8 km/h (5 mph), stand up. The CDM will display the message NO OPERATOR on the upper line and ENGINE SHUT DOWN 5…4…3…2…1…0 on the lower line, and will emit a steady tone. When the count reaches 0, the engine should shut down. If the engine does **NOT** shut down, the operator presence system requires adjustment. Contact your MacDon Dealer for more information.

10. While the windrower is traveling at a speed greater than 8 km/h (5 mph), stand up. The CDM should beep once and display the message NO OPERATOR on the lower line. If this does **NOT** occur, the operator presence system requires adjustment. Contact your MacDon Dealer for more information.

Checking Engine Interlock

The windrower's engine interlock ensures that the engine cannot be started while the header drive is engaged. Follow these steps to ensure that the engine interlock is working correctly.

DANGER

Ensure that all bystanders have cleared the area.

1. With the engine shut down and the header drive switch in the ON position, try to start the engine. If the engine turns over, the system requires adjustment. Contact your MacDon Dealer for more information.

2. With the engine shut down, the steering wheel **NOT** locked in the center position, and the ground speed lever (GSL) in the NEUTRAL position, but **NOT** in the N-DETENT position, try to start the engine. The cab display module (CDM) will display the message NOT IN NEUTRAL on the upper line and the message CENTER STEERING WHEEL on the lower line, and will emit a repeating beep; the engine should **NOT** start. If the engine starts, the system requires adjustment. Contact your MacDon Dealer for more information.

A properly functioning system should operate as follows:

- The engine should start **ONLY** when the GSL is in the N-DETENT position, the steering wheel is centered in the locked position, the seat base is latched in either the engine-forward or the cab-forward direction, and the header drive switch is in the OFF position. The parking brake should remain engaged and the machine should **NOT** move after the engine starts.
- When the engine is running and the GSL is out of the N-DETENT position, the steering wheel should **NOT** lock.
- If the engine is running and the steering wheel is centered, the windrower should **NOT** move when the GSL is pulled straight out of the N-DETENT position, either in forward or reverse.

5.6.3 Ground Speed Lever Adjustments

The windrower's ground speed lever (GSL) may require adjustments from time to time to ensure that the force required to move it into various positions is acceptable.

Adjusting Ground Speed Lever Lateral Movement

It should require little force to move the ground speed lever (GSL) into the N-DETENT position. If this is not the case, follow this procedure to adjust the GSL.

DANGER

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

In the cab, adjust the lateral pivot resistance as follows:

1. Remove five screws (A) securing control panel (B) to the console. Remove the control panel.

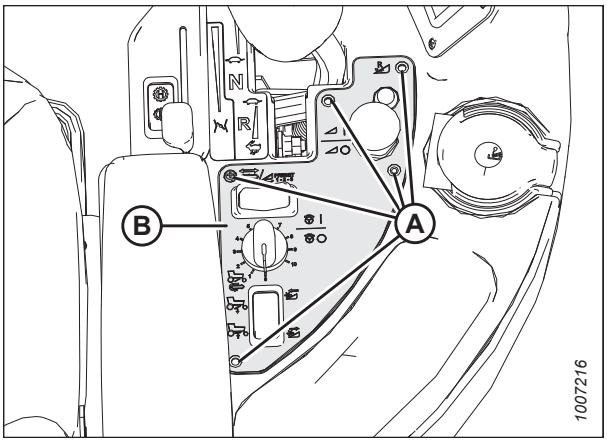


Figure 5.16: Control Panel

2. Loosen jam nut (A).
3. Turn nut (B) to either tighten or loosen the pivot. The nut should be tightened until snug and then loosened by half a turn.
4. Tighten jam nut (A).
5. Test the movement of the GSL. Repeat this procedure as needed.

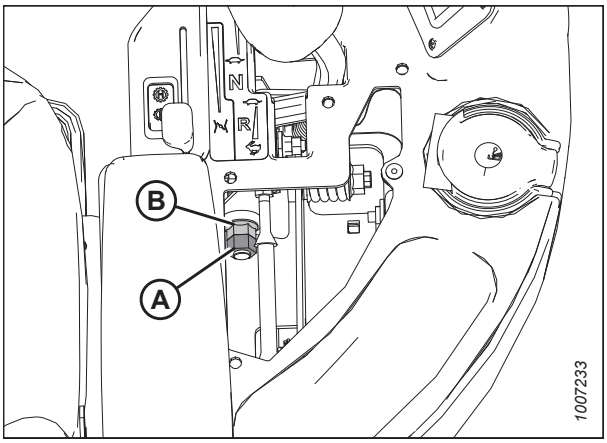


Figure 5.17: Control Panel Removed

6. Reinstall control panel (B) and secure it with five screws (A).

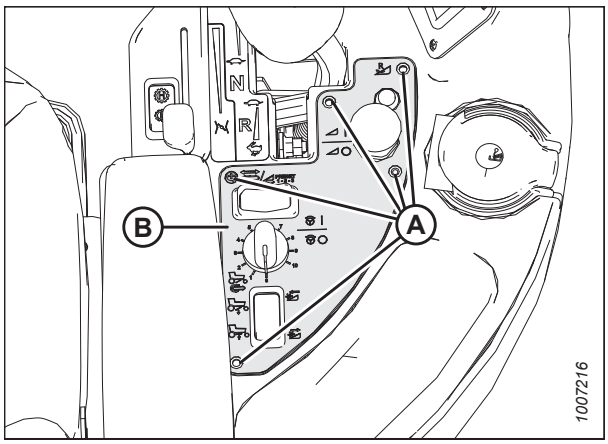


Figure 5.18: Control Panel

Adjusting Ground Speed Lever Fore-Aft Movement

The ground speed lever (GSL) should remain as positioned by the Operator yet be movable without excessive force.

1. Pull handle (A) toward the operator's seat and move the console fully forward to gain access to the underside of the console.

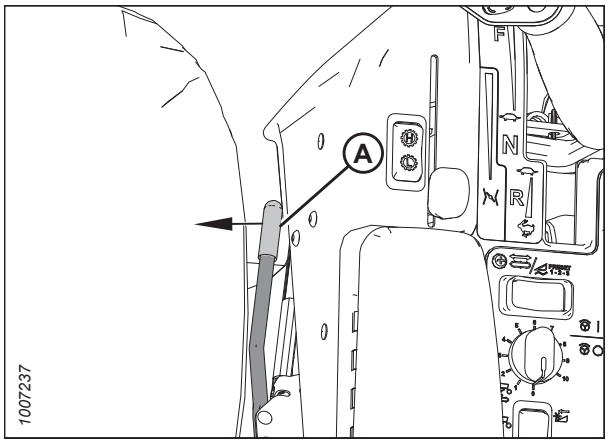


Figure 5.19: Seat Adjustment Handle

2. Set spring dimension (B) to 32 mm (1 1/4 in.).
3. To increase the pivot resistance, turn nut (A) clockwise to compress the spring.
4. To decrease the resistance, turn nut (A) counterclockwise to release the spring tension.

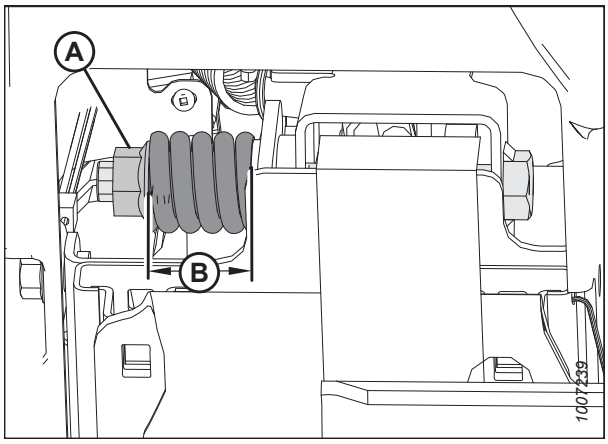


Figure 5.20: GSL Adjustment Spring

5.6.4 Steering Adjustments

The windrower's steering link pivots and steering chain tension may need adjustment from time to time.

Checking Steering Link Pivots

If the windrower's steering feels vague or sloppy, the steering link pivots may need tightening, or the ball joints may need replacement. Perform these checks annually.

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. Place ground speed lever (GSL) (A) in the N-DETENT position.
2. Shut down the engine, and remove the key from the ignition.

Figure 5.21: Operator's Console

3. Check steering rod bolts (A) for looseness and ball joints (B) for any perceptible movement.

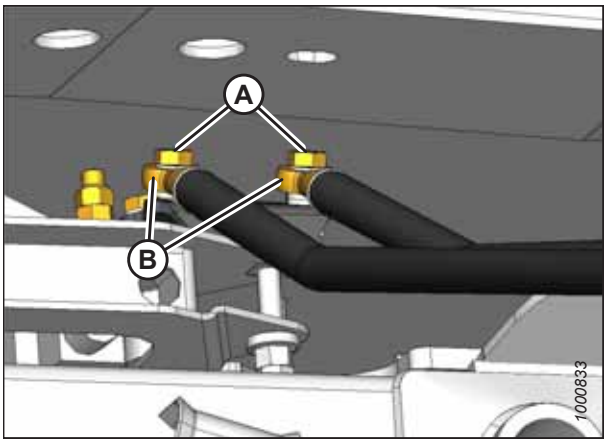


Figure 5.22: Steering Rods

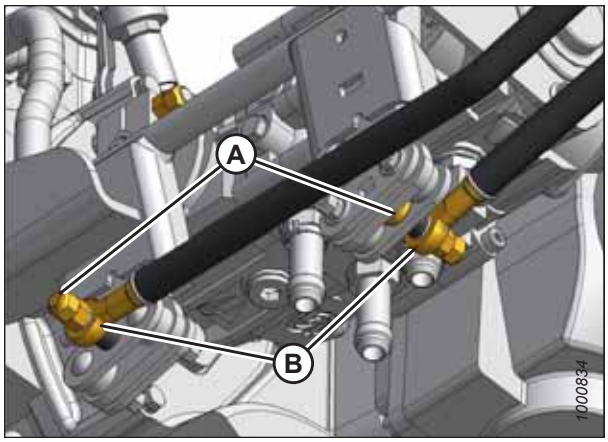


Figure 5.23: Steering Rods – Pump End

4. Check steering link bolts (A) for looseness and ball joints (B) for any perceptible movement.

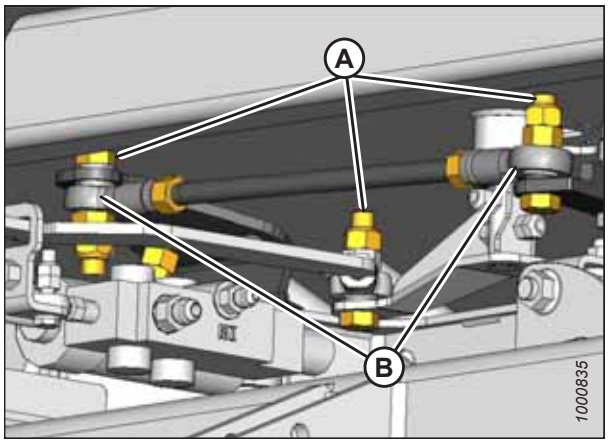


Figure 5.24: Steering Link

5. If the bolts are loose:
   a. Loosen jam nut (A).
   b. Tighten inside nut (B) to 95–108 Nm (70–80 lbf·ft).
   c. Hold inside nut (B) and tighten jam nut (A) to 81–95 Nm (60–70 lbf·ft).

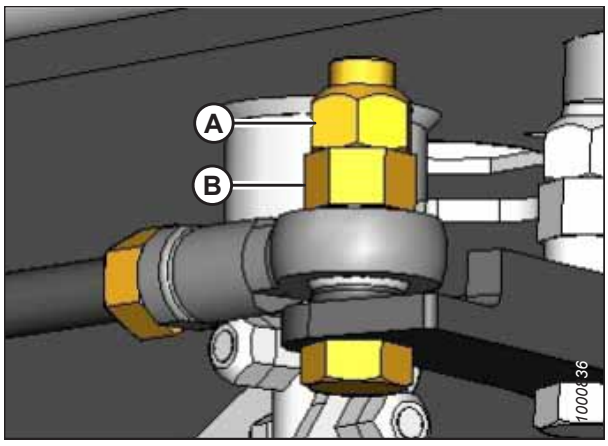


Figure 5.25: Steering Link

6. To replace loose steering link ball joints or steering rod ball joints, contact your MacDon Dealer.
7. After replacing parts or making adjustments, ensure that the steering lock and neutral interlock are functioning correctly. For instructions, refer to *5.6.2 Safety Systems, page 335*.

Checking and Adjusting Steering Chain Tension

If the windrower's steering feels vague or sloppy, the steering chain tension may require adjustment.

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. Check the steering for binding or excessive play, which may be the result of the steering chain being too tight or too loose. If the steering is satisfactory, then this procedure does not need to be performed.
2. If the chain tension requires adjustment, swivel the operator's station to position the steering column close to the door.
3. At the base of the steering column, measure the spring length (dimension [C]). It should be 16 mm (5/8 in.).
4. If the spring length requires adjustment:
   a. Loosen nut (A) and turn nut (B) until the spring length is 16 mm (5/8 in.).
   b. Tighten nut (A) against nut (B).
   c. Verify that the steering chain is taut and that the steering shaft is free to rotate.

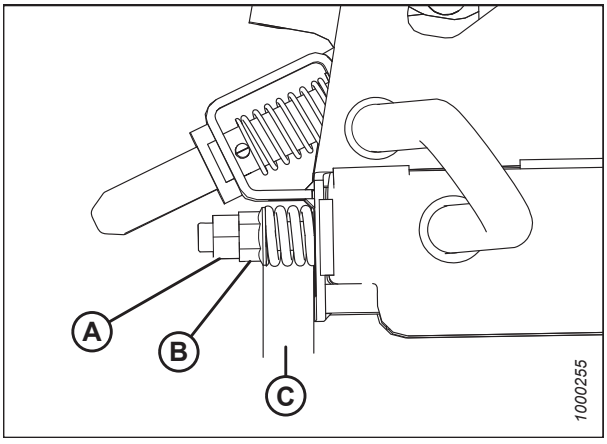


Figure 5.26: Steering Tension Adjuster

5.6.5 Cab Suspension Limit Straps

The cab suspension limit straps are located next to the front suspension on both sides of the cab. These straps protect the cab suspension components by preventing the cab shocks from fully extending. The straps do not require regular maintenance, but they should be inspected every 100 hours.

1. Inspect the material on straps (A) for evidence of fraying or tearing.
2. If material is torn or frayed, contact your MacDon Dealer for replacement straps.

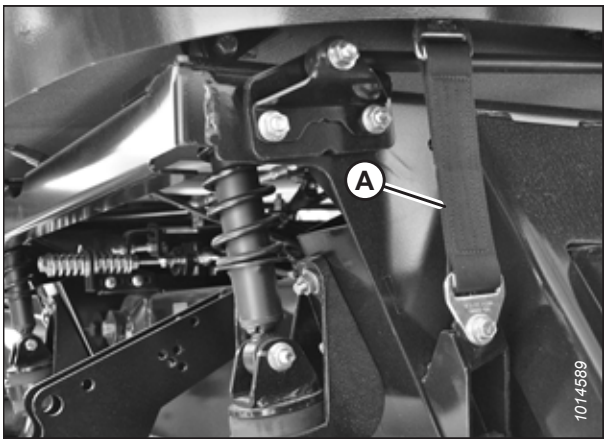


Figure 5.27: Cab Suspension

5.7 Heating, Ventilating, and Air Conditioning System

The windrower's heating, ventilating, and air conditioning (HVAC) system should be inspected from time to time. The cabin air filter, air conditioning condenser, and air conditioning evaporator core will need periodic attention.

5.7.1 Fresh Air Intake Filter

The fresh air filter is located outside the right rear of the cab and should be serviced according to the interval specified in the maintenance schedule.

Removing Fresh Air Intake Filter

The windrower's fresh air intake filter should be replaced according to the interval specified in the windrower's maintenance schedule.

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. From outside the cab, locate filter tray (B) at the lower-back corner of the right side of the cab.
2. Rotate latch (A) and slide filter tray (B) out of the housing.

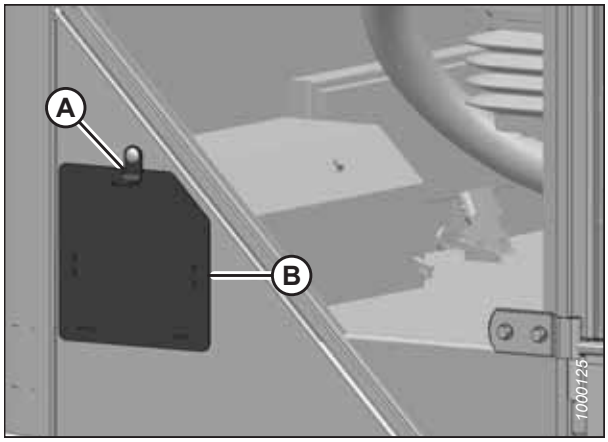


Figure 5.28: Filter Tray

3. Remove filter (A) from tray (B).

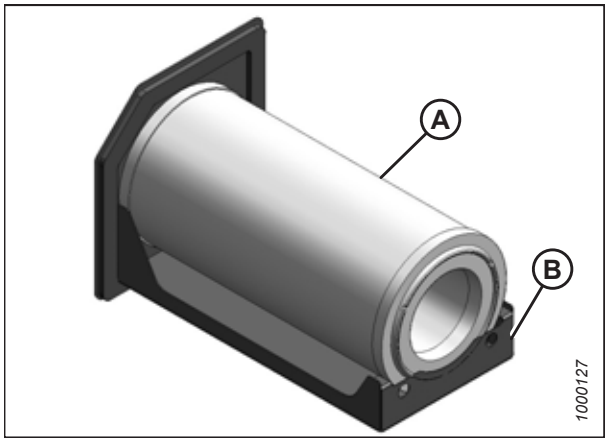


Figure 5.29: Fresh Air Filter

Inspecting and Cleaning Fresh Air Intake Filter Element

Once the filter element has been removed, it can be cleaned with compressed air and inspected for damage. Replace damaged filter elements.

1. Tap the sides of filter element (A) gently to loosen the accumulated debris. Do **NOT** tap the element against a hard surface.
2. Using a dry element cleaner gun, clean the element with compressed air.

   IMPORTANT:

   The air pressure used to clean the filter must **NOT** exceed 414 kPa (60 psi). Do **NOT** direct air against the outside of the element, as dirt might be forced through the filter to the inside.
3. Hold the air nozzle next to the filter element's inner surface and move the nozzle up and down the pleats.
4. Repeat Step *1, page 343* to Step *3, page 343* as needed.
5. Hold a bright light inside the element and check carefully for holes. Discard any element that shows even a small hole.
6. Check the outer screen for dents.
7. Check the filter gasket for cracks, tears, or other signs of damage. If the gasket is damaged or is missing, replace the element.

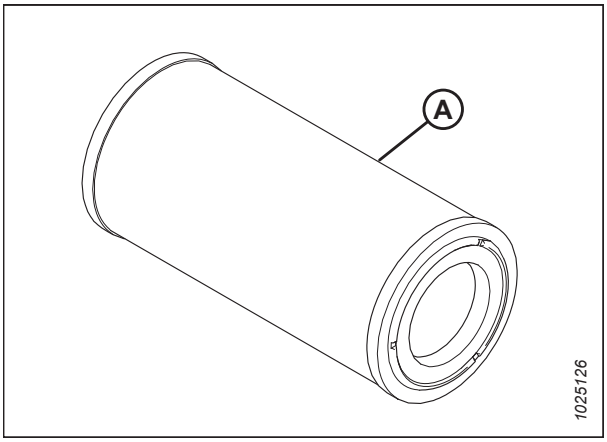


Figure 5.30: Fresh Air Filter Element

Installing Fresh Air Intake Filter

Once the filter has been cleaned, or if a new filter is to be installed, it can be placed onto the element tray and installed in the windrower.

Refer to *8.1.4 Filter Part Numbers, page 492* for the appropriate part number.

1. Clean tray (B) and the interior of the filter housing.
2. Place filter (A) onto tray (B).

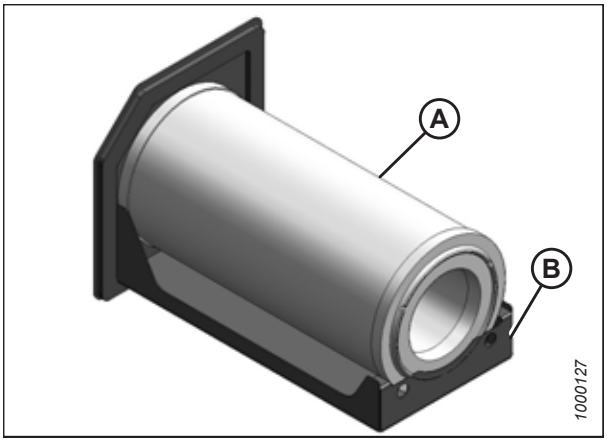


Figure 5.31: Fresh Air Filter

3. Slide filter tray (B) into the housing.

   NOTE:

   If necessary, move the Global Positioning System (GPS) wiring harnesses to the left engine-forward side of the housing before inserting the filter tray.

4. Close and latch housing door (A).

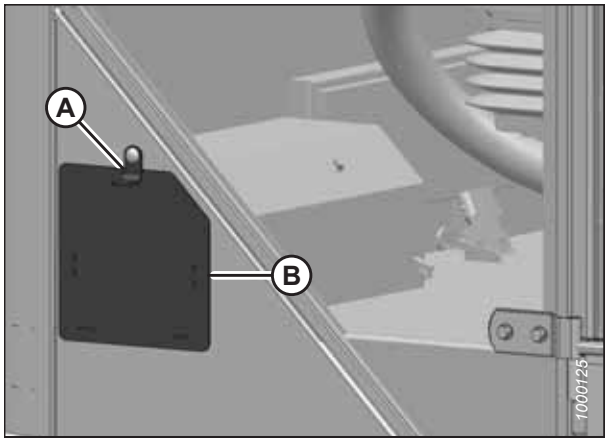


Figure 5.32: Cab Fresh Air Filter Access

5.7.2 Cleaning Return Air Filter

The return air filter is located behind the operator's seat on the cab wall and should be serviced according to the interval specified in the maintenance schedule.

Servicing Return Air Cleaner/Filter

Before the return air filter can be cleaned and inspected, it must be removed from the windrower's 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.

If you intend to replace the return air filter, refer to *8.1.4 Filter Part Numbers, page 492* for the appropriate part number.

1. Unscrew two knobs (A) attaching the cover and the filter to the cab wall. Remove the cover and remove filter assembly (B).

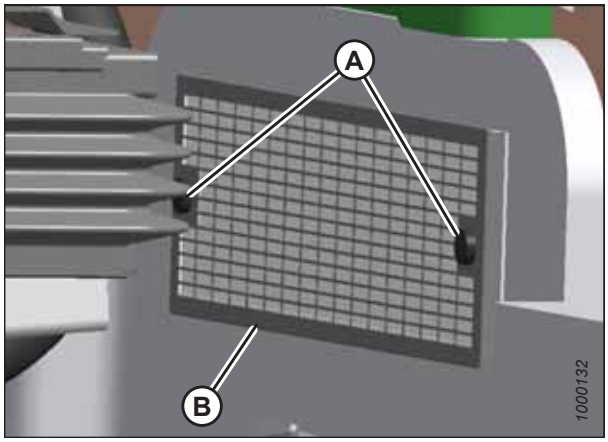


Figure 5.33: Return Air Filter

2. Separate filter (B) from cover (A).
3. Clean or replace the filter. If you intend to clean the filter, refer to *Cleaning Return Air Cleaner/Filter, page 345*.
4. Assemble filter (B) and cover (A). Position the assembly over the air return opening on the wall of the cab.

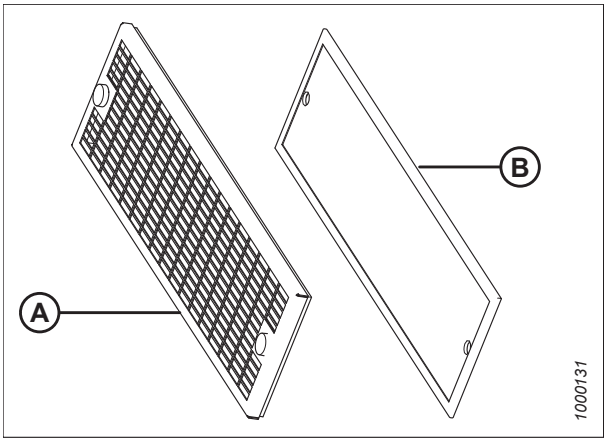


Figure 5.34: Return Air Filter

5. Secure filter assembly (B) to the cab wall with knobs (A).

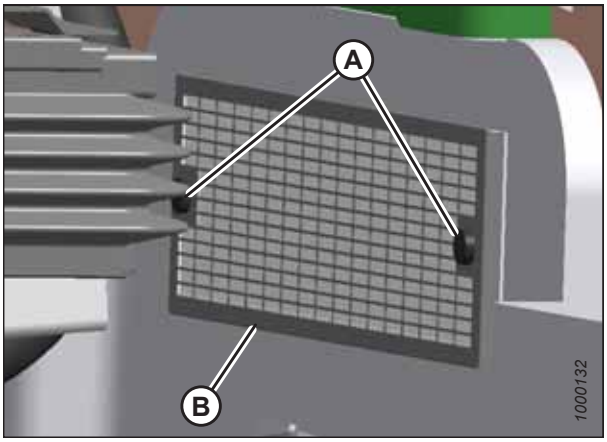


Figure 5.35: Return Air Filter

Cleaning Return Air Cleaner/Filter

If the filter is in good condition, it may be cleaned instead of replaced.

1. Mix a solution of warm water and detergent in a suitable container. Soak filter (A) in the solution for a few minutes.
2. Agitate the solution to flush dirt out of the filter.
3. Rinse filter (A) with clean water. Dry the filter using compressed air.
4. Inspect filter (A) for damage, separation, or holes. Replace the filter if it is damaged.

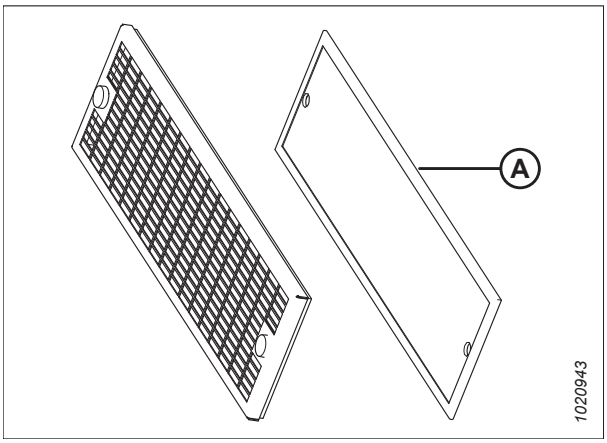


Figure 5.36: Return Air Filter

5.7.3 Air Conditioning Condenser

Clean the air conditioning condenser daily with compressed air. More frequent cleaning may be necessary in severe conditions.

Cleaning the condenser can be done at the same time as the radiator, oil cooler, and charge air cooler. For instructions, refer to *5.9 Maintaining Engine Cooling Box, page 394*.

5.7.4 Air Conditioning Evaporator Core

Check the air conditioning (A/C) evaporator annually for cleanliness. If the A/C system produces insufficient cooling, a possible cause is clogged evaporator fins. The fins may become clogged with dirt on the side opposite the blowers. The evaporator is located inside the heating air conditioning unit under the windrower's cab.

Removing Air Conditioner Cover

To access the air conditioning evaporator core, the air conditioner (A/C) cover must be removed.

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. Loosen clamps (A) on the two drain hoses connected to the A/C drain tubes, and pull the hoses off of the A/C drain tubes.

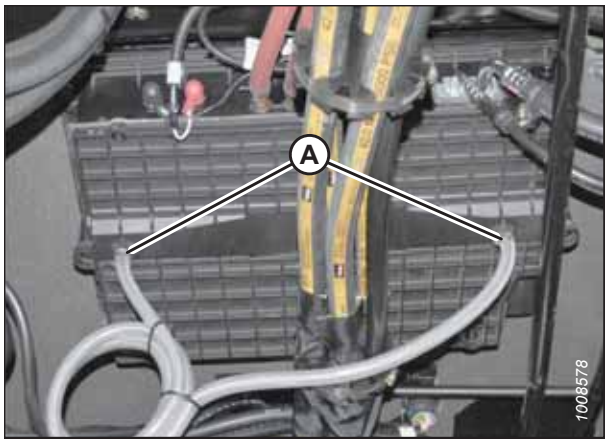


Figure 5.37: HVAC System

3. Remove eight screws (A) securing cover (B) to the housing, and remove the cover.

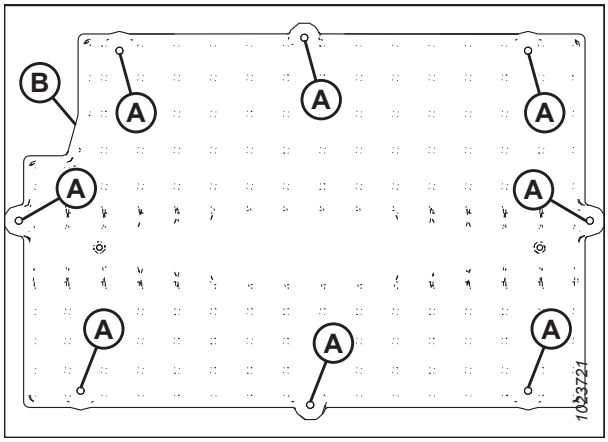


Figure 5.38: A/C Cover

Cleaning Air Conditioning Evaporator Core

Once the air conditioning cover has been removed, the evaporator core can be accessed. The core must be cleaned sufficiently so that blown air is able to penetrate through the core.

WARNING

To avoid injury, do NOT attempt to clean the evaporator fins with your bare hands; the edges are sharp.

1. Remove the air conditioning cover. For instructions, refer to *Removing Air Conditioner Cover, page 346*.
2. Use a vacuum cleaner or compressed air to remove any dirt inside the A/C unit.
3. Blow compressed air through the evaporator fins from blower side (A) first. Direct the air straight into the evaporator to prevent fin damage. Using a nozzle extension makes this procedure easier.
4. Repeat Step *3, page 347* at side (B) opposite the blowers.

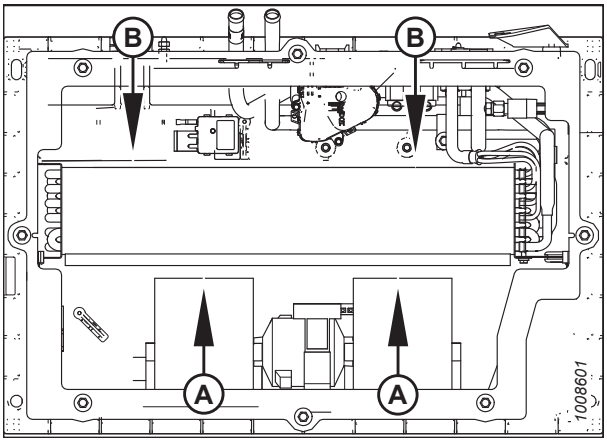


Figure 5.39: HVAC System

5. If you cannot feel the compressed air blowing through the evaporator core, proceed as follows:
   a. Protect blower motor (A) from water.
   b. Soak evaporator core (B) with warm water using a low-pressure hose. Wait for at least 5 minutes before proceeding with the next step.
   c. Blow compressed air through the core from blower side (C).
   d. Repeat the soaking procedure until air blows freely through the evaporator.
6. Reinstall the air conditioning cover. For instructions, refer to *Installing Air Conditioning Cover, page 348*.

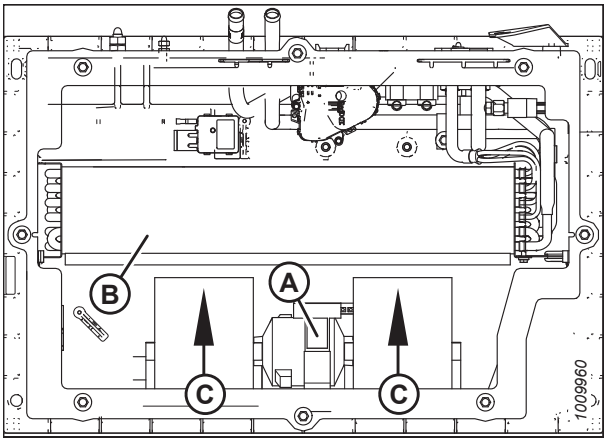


Figure 5.40: HVAC System

Installing Air Conditioning Cover

Once the air conditioning evaporator core has been serviced, the cover can be replaced.

1. Straighten any bent fins.
2. Position cover (B) onto the A/C unit, and secure it with eight screws (A).

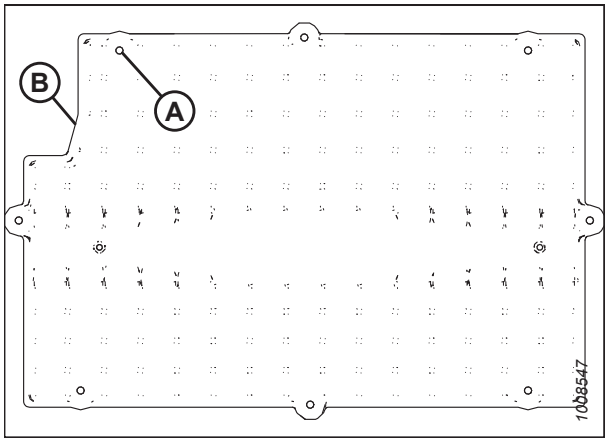


Figure 5.41: A/C Cover

3. Reattach the drain hoses to the drain tubes and secure them with hose clamps (A).

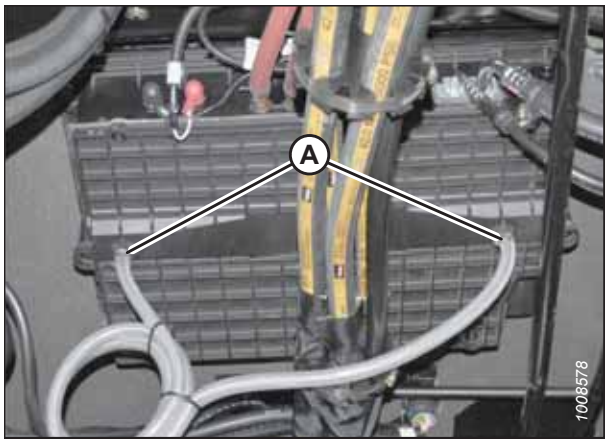


Figure 5.42: A/C Drains

5.7.5 Air Conditioning Compressor

The air conditioning (A/C) compressor is protected from excessively low suction and high discharge pressures by two switches that shut down the compressor to prevent damage to the system. These switches do not require regular maintenance. Contact your MacDon Dealer if you suspect a problem with the switches.

Low-pressure switch

The low-pressure switch is closed when there is sufficient refrigerant in the system and the pressure is above 234 kPa (34 psi). The system remains pressurized at about 414–483 kPa (60–70 psi) with the compressor off.

When the A/C system is turned on, the compressor starts because the system pressure is above 234 kPa (34 psi). As the system gets colder, the suction pressure (low side) drops. At 24–86 kPa (3.5–12.5 psi) (for 2014 and prior: 14–55 kPa [2–8 psi]), the switch opens and shuts down the compressor.

When the pressure rises above 172 kPa (25 psi), the switch closes and the compressor restarts. The low-pressure switch is located at the outlet of the evaporator (under the cab in the A/C box).

High-pressure switch

The high-pressure switch is closed when there is sufficient refrigerant in the system. The system remains pressurized at about 414–483 kPa (60–70 psi) with the compressor off.

If the pressure exceeds 2482–2620 kPa (360–380 psi) during operation, the valve opens. It will close when pressure falls below 1517–1931 kPa (220–280 psi). The high-pressure switch is located on the receiver drier (right cab-forward frame rail, behind the fuse panel).

If the compressor cycles rapidly due to rapid changes in pressure, the cab display module (CDM) will display the message CHECK A/C SYSTEM. Contact your MacDon Dealer for more information.

Servicing Air Conditioning Compressor

Beyond replacing the air conditioner compressor belt, most service procedures will have to be performed by a MacDon Dealership.

To replace the air conditioner compressor's belt, refer to *Replacing Air Conditioner Compressor Belt, page 392*.

5.8 Engine

Refer to this section to learn how to inspect and maintain the engine system, including the fuel, lubrication, air intake, and exhaust systems.

CAUTION

- **NEVER operate the engine in a closed building. Proper ventilation is required to prevent exhaust gas hazards.**
- **Keep the engine clean. Straw and chaff on a hot engine, for example, present a fire hazard.**
- **NEVER use gasoline, naphtha, or any other volatile material for cleaning purposes. These materials are toxic and/or flammable.**

5.8.1 General Engine Inspection

It is recommended that detailed engine inspections be performed by your MacDon Dealer.

Refer to the engine owner's manual for further information.

NOTE:

QSB 4.5 and QSB 6.7 Cummins Engine #4021531 are supplied with your machine.

5.8.2 Turning Engine Manually

To manually turn the engine with the flywheel, an access hole is provided on the left cab-forward side of the engine for a barring tool, which can be obtained from the engine manufacturer.

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. Open the hood to the lower position. For instructions, refer to *5.3.1 Opening Hood – Lower Position, page 324*.
3. Move the platform on the left cab-forward side of the machine to the open position. For instructions, refer to *5.4.1 Opening Platforms – Standard Position, page 328*.

4. Remove positive (red) cables (A) from the battery posts first, then remove negative (black) cables (B) from the remaining battery posts.

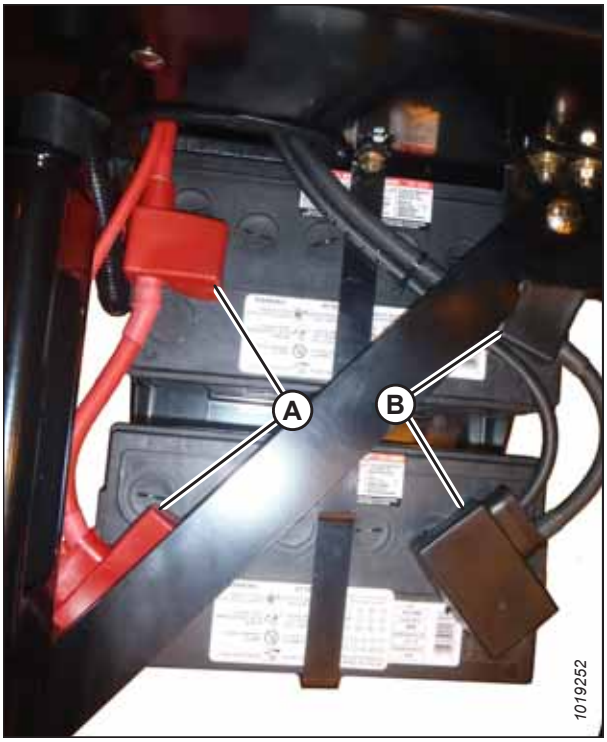


Figure 5.43: Batteries

5. At the left cab-forward side of the engine, clean the area around the plastic cap on access hole (A). Remove the cap.

   IMPORTANT:

   Ensure that nothing falls into the gearbox oil reservoir.

   NOTE:

   The cap is siliconed in place, and may be difficult to remove.

6. Insert barring tool (B) into the flywheel housing until it engages the ring gear.

7. Attach a 1/2 in. square-drive ratchet or breaker bar to the barring tool and turn it.

8. Remove barring tool (B), and then clean the oil from around access hole (A).

9. Clean the plastic cap. Apply silicone sealant to the cap and reinstall it in access hole (A).

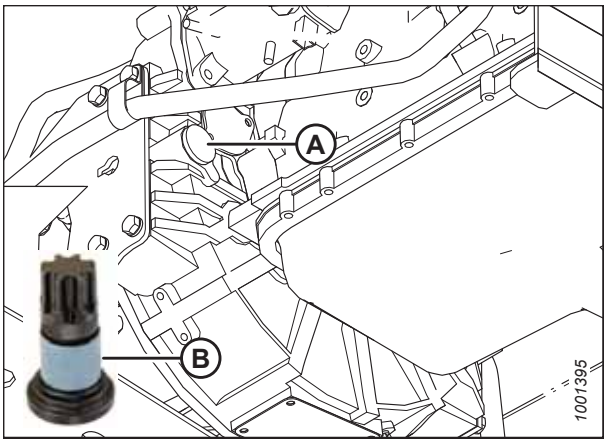


Figure 5.44: Access Hole Location for Barring Tool

IMPORTANT:

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

10. Attach negative (black) cables (B) to the negative posts on the batteries, and tighten the clamps. Then attach positive (red) cables (A) to the positive posts on the batteries and tighten the clamps.
11. Position the plastic covers onto the clamps.
12. Close the hood. For instructions, refer to *5.3.2 Closing Hood – Lower Position, page 325*.
13. Close the platform. For instructions, refer to *5.4.2 Closing Platforms – Standard Position, page 329*.

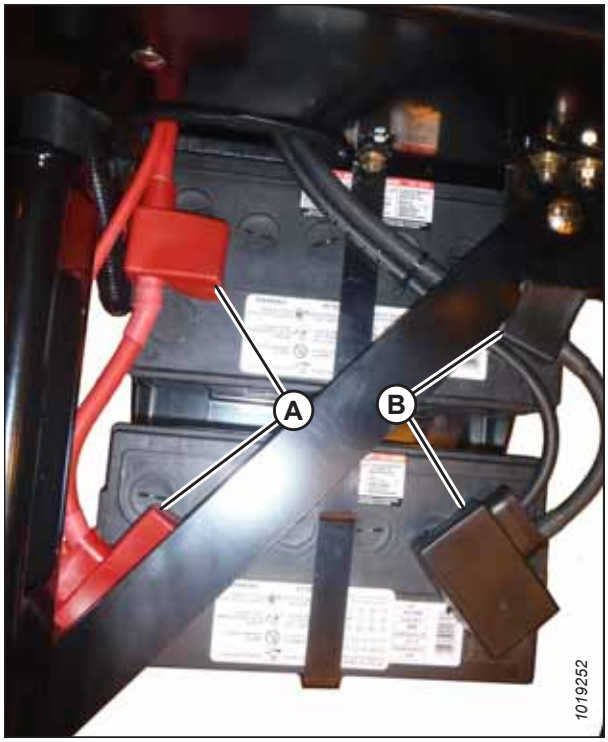


Figure 5.45: Batteries

5.8.3 Checking Engine Oil Level

Check the engine oil level daily (that is, after every 10 hours of operation). Monitor the engine for signs of fluid leakage.

DANGER

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

NOTE:

During the break-in period, a higher than usual oil consumption is normal.

1. Open the hood to the lower position. For instructions, refer to *5.3.1 Opening Hood – Lower Position, page 324*.
2. Operate the engine at low idle and check for leaks at the filter and drain plug.
3. Shut down the engine, and remove the key from the ignition.

4. Remove dipstick (A) by turning it counterclockwise to unlock it.
5. Wipe the dipstick clean and reinsert it into the engine.
6. Remove the dipstick again and check the oil level.

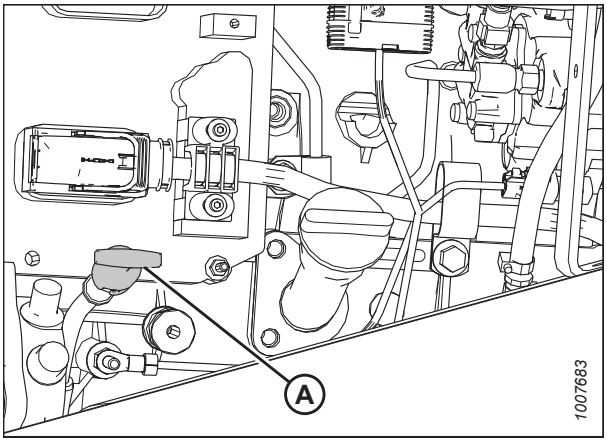


Figure 5.46: Engine Oil Dipstick

7. Add oil if the level is below the low (L) mark. For instructions, refer to *Adding Engine Oil, page 355*.

   IMPORTANT:

   Keep the oil level between the low (L) and high (H) marks on the dipstick.

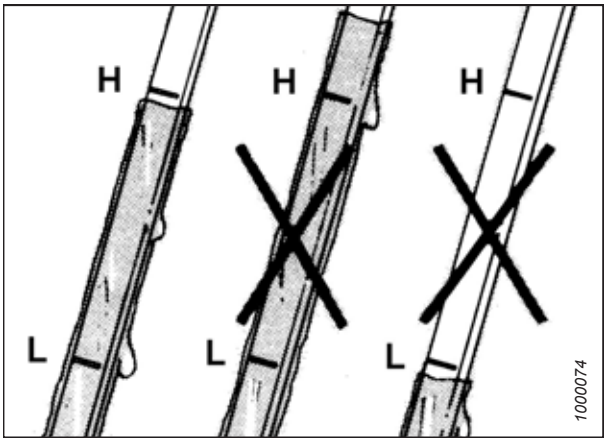


Figure 5.47: Engine Oil Level

8. Replace dipstick (A) and turn it clockwise to lock it.
9. Close the hood. For instructions, refer to *5.3.2 Closing Hood – Lower Position, page 325*.

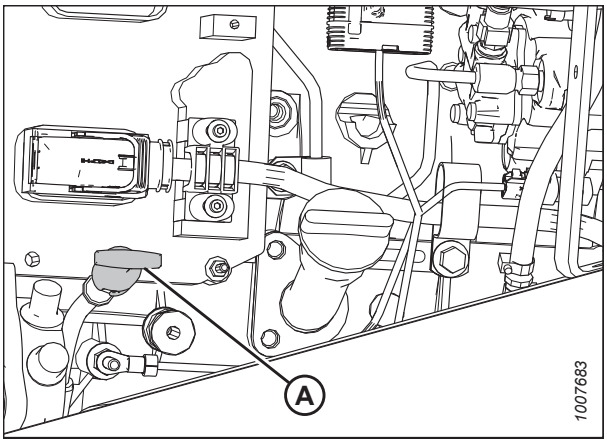


Figure 5.48: Engine Oil Dipstick

5.8.4 Changing Engine Oil

The engine oil should be changed according to the interval specified in the windrower's Maintenance Schedule. The oil filter should be changed whenever the engine oil is changed.

Draining Engine Oil

Before new engine oil can be added to the crankcase, the old oil must be thoroughly drained. Allow sufficient time for the oil to drain before replacing the drain plug.

DANGER

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

NOTE:

The engine should be warm when you change the oil.

1. Shut down the engine, and remove the key from the ignition.
2. Place a drain pan with a capacity of at least 24 liters (6 US gallons) under the engine oil drain.
3. Remove oil drain plug (A) and allow the oil to drain completely.
4. When all of the oil has drained out of the tank, inspect drain plug (A) for contaminants, and clean the drain plug if necessary, before replacing drain plug (A).
5. Check the condition of the used oil. If either of the following is evident, have your Dealer correct the problem before starting the engine:
   - Thin black oil indicates fuel dilution.
   - Milky discoloration indicates coolant dilution.
6. Properly dispose of the used oil.

   IMPORTANT:

   Do **NOT** run the engine without oil in the crankcase, or permanent damage to the engine may result. For instructions, refer to *Adding Engine Oil, page 355*.

   NOTE:

   Replace the oil filter each time the engine oil is changed. For instructions, refer to *Replacing Engine Oil Filter, page 355*.

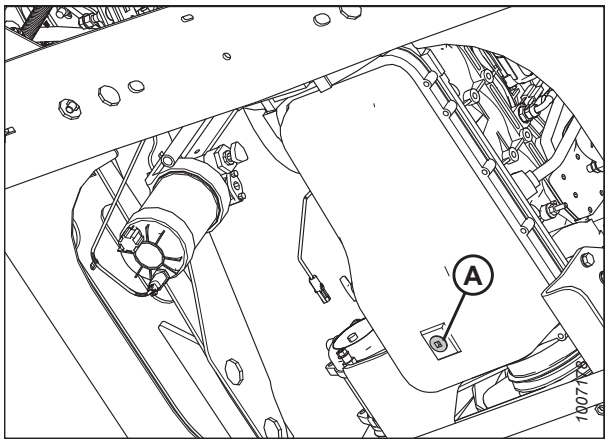


Figure 5.49: Engine Oil Drain Plug

Replacing Engine Oil Filter

Replace the engine oil filter any time the engine oil is replaced. Be sure not to overtighten the filter when installing it.

NOTE:

Replace the oil filter each time the engine oil is changed. Refer to *8.1.4 Filter Part Numbers, page 492* for the recommended oil filter to use.

1. Open the hood. For instructions, refer to *5.3.1 Opening Hood – Lower Position, page 324*.
2. Clean around filter head (A).
3. Remove filter (B).
4. Clean the gasket mating surface.
5. Apply a thin film of clean oil to the gasket on the new filter.
6. Screw the new filter onto the filter mount until the gasket contacts the filter head.
7. Tighten the filter an additional 1/2 to 3/4 turn by hand.

   IMPORTANT:

   Do **NOT** use a filter wrench to install the oil filter. Overtightening can damage the gasket and filter.
8. Properly dispose of the used filter.

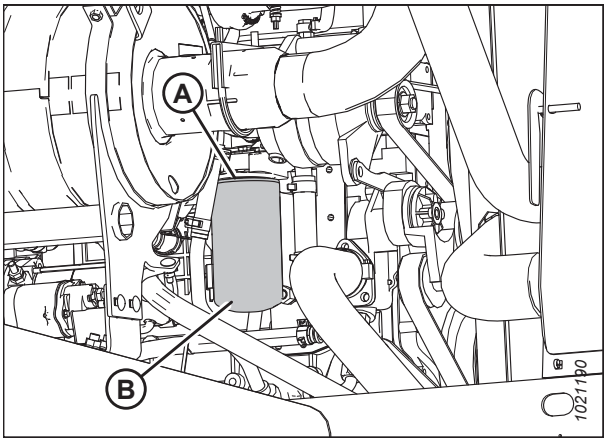


Figure 5.50: Engine Oil Filter

Adding Engine Oil

If the engine oil's dipstick shows that the engine oil level is low, or if the oil has been drained, more oil will need to be added.

Refer to *8.1.3 Lubricants, Fluids, and System Capacities, page 491* for information on the recommended lubricants.

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Open the hood to the lower position. For instructions, refer to *5.3.1 Opening Hood – Lower Position, page 324*.
3. Remove filler cap (A) by turning it counterclockwise.
4. Carefully pour in the new oil. Use a funnel to avoid spillage. Clean any spills immediately.

CAUTION

Do NOT fill above the HIGH mark.

5. Replace oil filler cap (A) and turn it clockwise until it is snug.
6. Check the oil level. For instructions, refer to *5.8.3 Checking Engine Oil Level, page 352*.
7. Close the hood. For instructions, refer to *5.3.2 Closing Hood – Lower Position, page 325*.

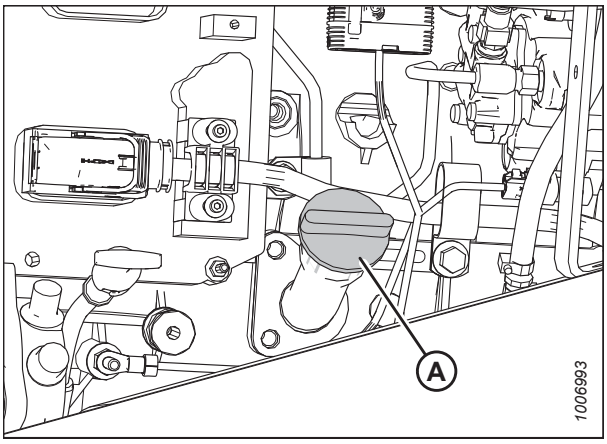


Figure 5.51: Oil Filler Cap

5.8.5 Air Intake System

The engine requires the continuous intake of filtered air for combustion to occur.

IMPORTANT:

Do **NOT** operate the engine while the air cleaner is disconnected or disassembled.

The engine draws in air from the cooling box through duct (A), and then through dual element filter (B).

The air cleaner canister is equipped with aspirator (C), which removes dust continuously from the air cleaner housing.

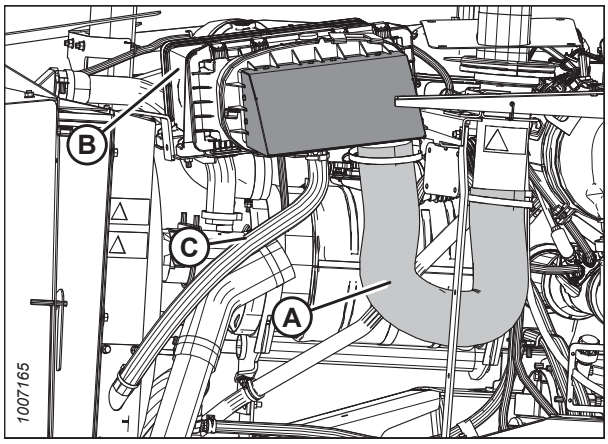


Figure 5.52: Air Intake System

The air cleaner is also equipped with restriction switch (A), which can cause the cab display module (CDM) to display a warning and emit a tone when the engine air filter system requires servicing.

After servicing the filter, the restriction switch must be reset by pushing the button at the end of the switch.

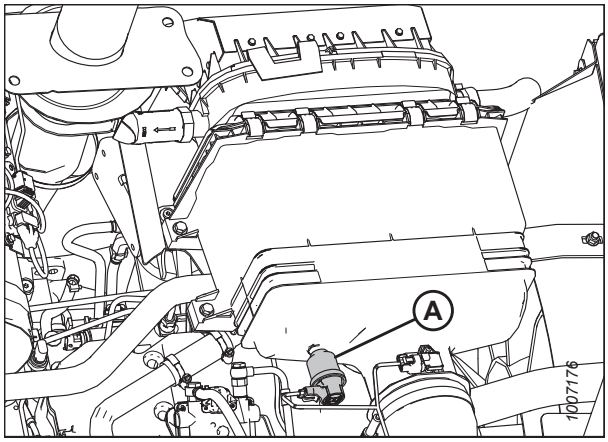


Figure 5.53: Air Restriction Indicator

For the air filter part number, refer to *8.1.4 Filter Part Numbers, page 492*.

IMPORTANT:

- Do **NOT** run the engine while the air cleaner is disconnected or disassembled.
- Over-servicing the filter element increases the risk of the engine sucking in dirt, which can severely damage the engine's internal components.
- Filter servicing should only be performed when the CDM displays the message ENGINE AIR FILTER, or at the interval specified in *5.2 Maintenance Schedule, page 318*.

Removing Primary Air Filter

The windrower's cab display module (CDM) will alert the Operator when the engine air filter requires service. The air filter must first be removed before it can be replaced.

1. Open the hood. For instructions, refer to *5.3.1 Opening Hood – Lower Position, page 324*.
2. Open the maintenance platform on the right cab-forward side. For instructions, refer to *5.4.1 Opening Platforms – Standard Position, page 328*.
3. Unlatch clips (A) that secure cover (B) and plenum (C) to air cleaner housing (D).

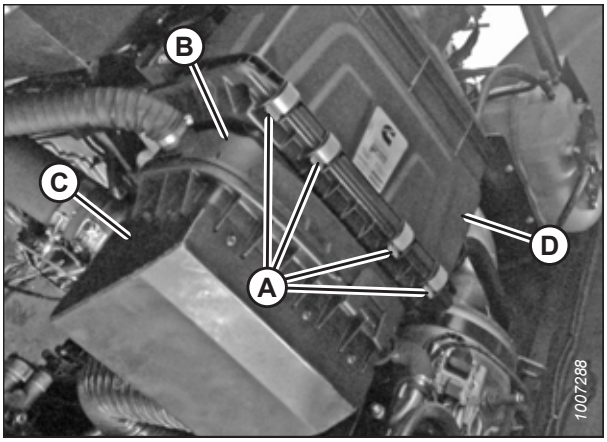


Figure 5.54: Air Cleaner Housing and Cover

4. Carefully move cover (A) to dislodge it from notches (B) at the bottom of air cleaner housing (C).

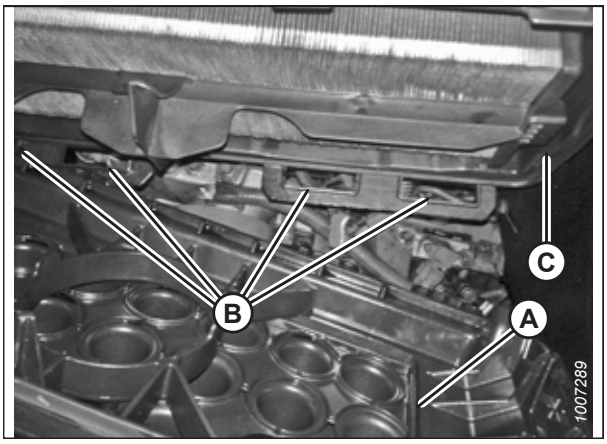


Figure 5.55: Air Cleaner Housing

5. Check aspirator duct opening (A) for obstructions or damage. Clean the duct if necessary.
6. Place cover (B) on the windrower frame.

   NOTE:

   Hoses (C) can be left connected to the cover.

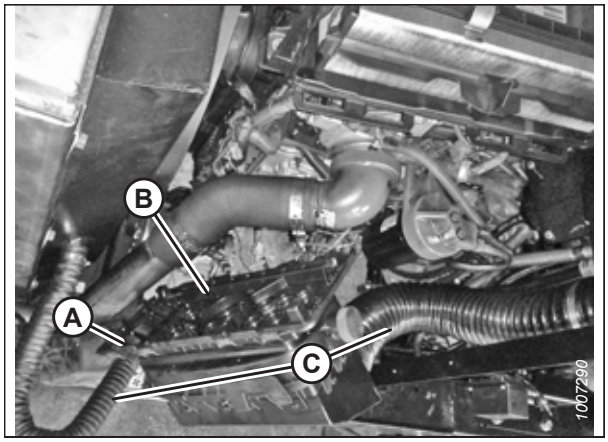


Figure 5.56: Air Cleaner

7. Pull out primary filter (A).
8. If necessary, change the secondary filter. For instructions, refer to *Replacing Secondary Air Filter, page 360*.

   IMPORTANT:

   - Do **NOT** remove the secondary filter unless it needs replacing. Do **NOT** attempt to clean and reuse the secondary filter.
   - Replace the secondary filter annually or after every third primary filter change, even if it looks clean.
   - If the secondary filter looks dirty, further inspection is required. Examine the filter canister for cracks and replace it if necessary. Ensure that the canister's retaining latches are secure.

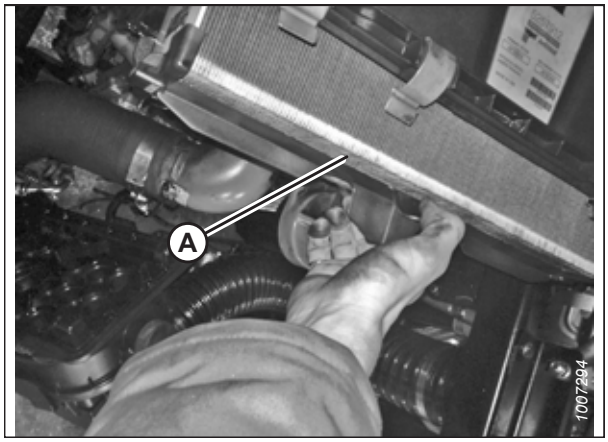


Figure 5.57: Air Cleaner Primary Filer

IMPORTANT:

Clean the inside of the housing and cover carefully. Dirt left in the air cleaner housing can damage the engine.

- Use a clean, water-dampened cloth to wipe every surface clean.
- Inspect the housing to make sure it is clean before putting in a new filter.
- Always clean the gasket sealing surfaces of the housing. An improper gasket seal is one of the most common causes of engine contamination.
- Ensure that all ridges of hardened dirt are completely removed wherever the filter gasket contacts the cleaner housing.
- Check for uneven dirt patterns on your old filter. Your old filter is a valuable clue to potential dust leakage or gasket sealing problems. A pattern on the filter clean side is a sign that the old filter was not firmly sealed or that a dust leak exists.
- Ensure that the cause of any leak is identified and that the leak is corrected before replacing the filter.
- Recheck the sealing surface in the housing to ensure that it is clean.

Installing Primary Air Filter

Once the primary air filter has been removed and inspected, it can be replaced.

NOTE:

For the primary air filter replacement part number, refer to *8.1.4 Filter Part Numbers, page 492*.

1. Insert new primary filter (A) into the canister and push it into place, ensuring that the element is firmly seated in the canister.

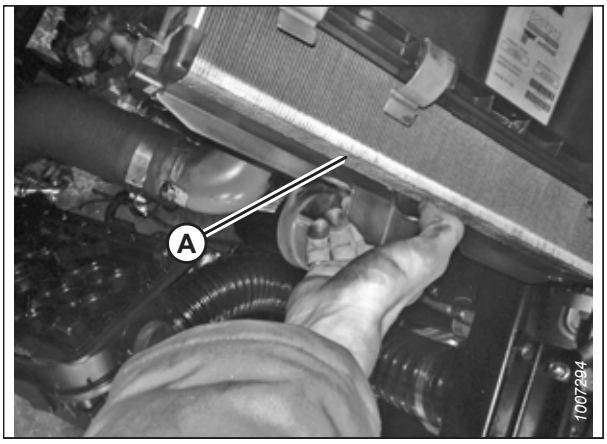


Figure 5.58: Air Cleaner Primary Filter

2. Connect the tabs at the bottom of cover (A) to notches (B) at the bottom of air cleaner housing (C).

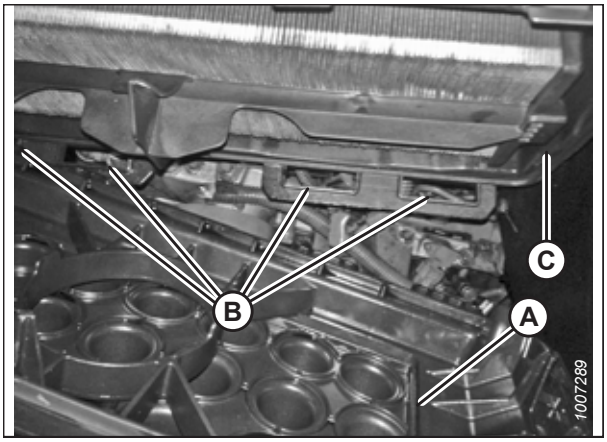


Figure 5.59: Air Cleaner

3. Secure cover (B) and plenum (C) to air cleaner housing (D) using four clips (A).

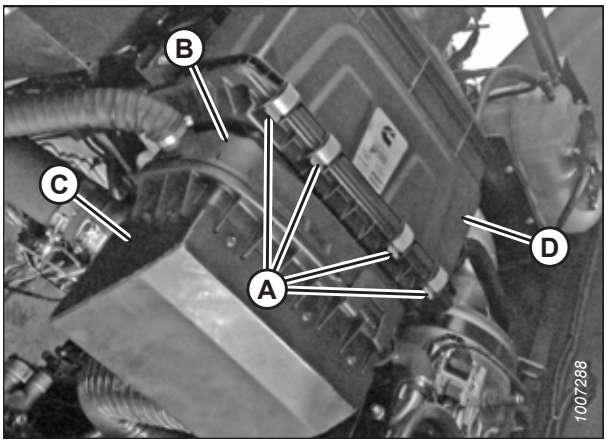


Figure 5.60: Air Cleaner Cover and Housing

4. Reset the restriction switch by pressing the button at the end of switch (A).
5. Close the hood. For instructions, refer to *5.3.2 Closing Hood – Lower Position, page 325*.
6. Close the maintenance platform. For instructions, refer to *5.4.2 Closing Platforms – Standard Position, page 329*.

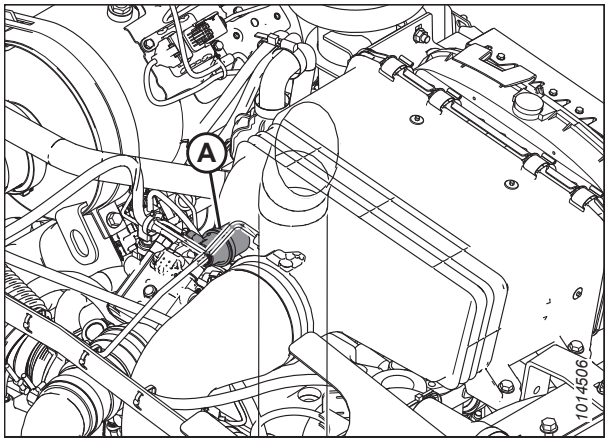


Figure 5.61: Air Cleaner Restriction Switch

Cleaning Engine Air Cleaner Primary Filter

The air cleaner's primary filter should be replaced after three cleanings or at the interval specified in the maintenance schedule. The secondary element should be replaced every third time the primary element is changed.

Refer to for the required replacement interval.

IMPORTANT:

- The secondary filter element should **NEVER** be cleaned, only replaced.
- **Primary air filter element cleaning is NOT recommended due to the possible degradation of the element material.** If any of the conditions described in these steps are found, the filter element **MUST** be replaced.

To clean the air cleaner's primary filter, follow these steps:

1. Use a bright light to inspect the inside of the element, looking carefully for holes in the element's fabric.
2. Inspect the filter gasket for cracks, tears, or other signs of damage.
3. Inspect the element for oil or soot contamination.
4. Inspect the secondary element for cleanliness. If there is visible dirt on the secondary element, replace both the primary and the secondary elements. Do **NOT** attempt to clean and reuse the elements.
5. If the secondary element passes inspection, use compressed air not exceeding 270 kPa (40 psi) and a dry element cleaner gun to clean the primary element. Hold the nozzle next to the inner surface only and move it along the pleats.

   NOTE:

   After three cleanings (or at the specified interval), replace the primary element.
6. Repeat the inspection procedure before installing the primary element.

Replacing Secondary Air Filter

Replace the secondary filter annually or after every third primary filter change, even if it appears clean.

For the secondary filter replacement part number, refer to *8.1.4 Filter Part Numbers, page 492*.

If you are changing the secondary filter because it looks dirty, further inspection is required. Examine the filter canister for cracks and replace it as needed. Ensure that canister retaining latches (B) are secure. Ensure that the filter's sealing surfaces are soft, flexible, and are sealing properly. Poor sealing will allow debris through to the secondary filter.

IMPORTANT:

Secondary filter (A) should never be cleaned, only replaced. Do **NOT** remove the secondary filter unless it needs replacing.

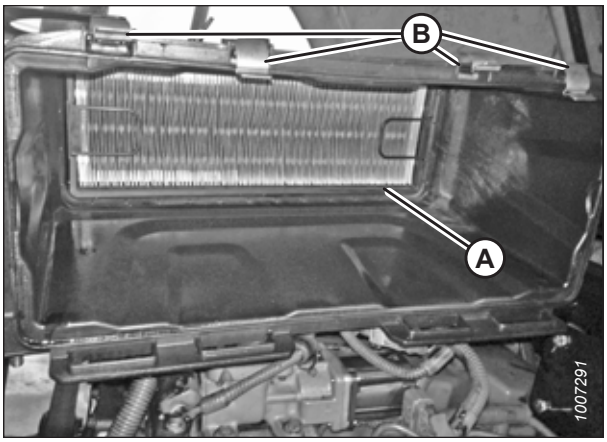


Figure 5.62: Secondary Air Filter

1. Remove the primary filter. For instructions, refer to *Removing Primary Air Filter, page 357*.

   IMPORTANT:

   When replacing the secondary filter, reinsert the new filter as soon as possible to prevent dirt and dust from entering the engine intake.

2. Pull handle (A) on each end of secondary filter (B) until filter (B) is removed from the housing.

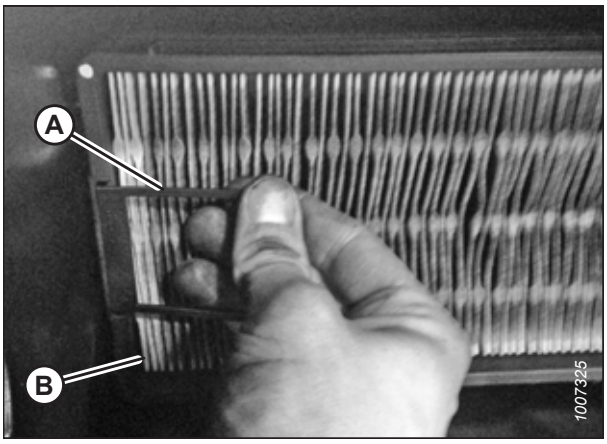


Figure 5.63: Secondary Air Filter

3. Insert new secondary filter (A) into the housing. Push the filter until it is seated inside the housing.
4. Install the primary filter. For instructions, refer to *Installing Primary Air Filter, page 359*.

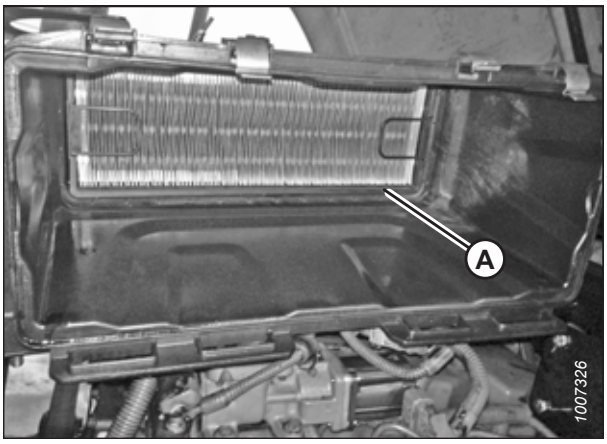


Figure 5.64: Secondary Air Filter

5.8.6 Charge Air Cooling

Charge air is routed through a cooler located in the cooling box, prior to entering the engine intake. The cooler should be cleaned daily using compressed air.

For instructions on cleaning charge air cooler (A) and the rest of the air cooling system, refer to *5.9.2 Cleaning Screens and Coolers, page 394* and *5.9.3 Cleaning Cooler Box Components, page 396*.

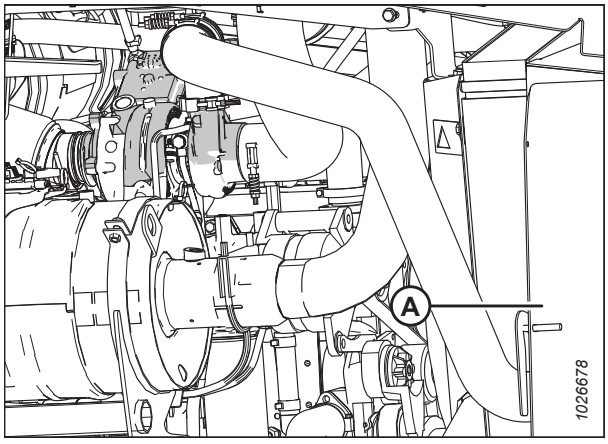


Figure 5.65: Engine Air Intake System

5.8.7 Fuel System

The fuel system feeds the engine a continuous pressurized supply of diesel fuel. A filtering and water separation system ensures the purity of the fuel reaching the engine.

Replacing Fuel Tank Vent Filter

The windrower's fuel tank is vented by a hose connected to the filler tube. The hose is connected to a filter that should be changed according to the interval specified in the maintenance schedule.

For the fuel tank vent filter replacement part number, refer to *8.1.4 Filter Part Numbers, page 492*.

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.

WARNING

To prevent personal injury or death from an explosion or fire, do NOT allow flame or sparks near the windrower when the fuel system is being serviced.

1. Shut down the engine, and remove the key from the ignition.
2. Open the hood to its highest position. For instructions, refer to *5.3.3 Opening Hood – Highest Position, page 325*.
3. Open the left cab-forward side maintenance platform. For instructions, refer to *5.4.1 Opening Platforms – Standard Position, page 328*.

4. Locate filter (A) on the vent line against the hydraulic oil reservoir.
5. Release hose tension clamps (B) and slide them away from the filter. Pull the hoses off of the filter, and discard the filter.
6. Insert the new filter through the hole in the frame and attach the top hose to the filter. The IN marking on the filter should face down.

   NOTE:

   If the filter has an arrow instead of an IN marking, the arrow should point up.
7. Attach the lower hose to the filter and secure both of the hoses using tension clamps (B).

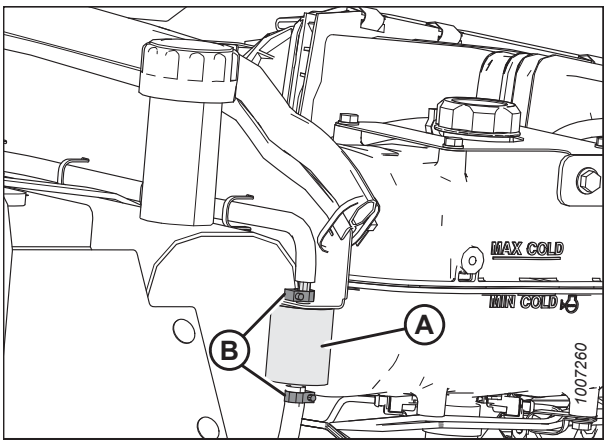


Figure 5.66: Fuel Tank Vent

8. Close the hood. For instructions, refer to *5.3.4 Closing Hood – Highest Position, page 327*.
9. Close the platform. For instructions, refer to *5.4.2 Closing Platforms – Standard Position, page 329*.

Maintaining Fuel Filters

The windrower's fuel system is equipped with two threaded cartridge filters: a primary and a secondary. The primary filter is equipped with a separator that separates sediment and water from the fuel. The primary fuel filter will need to be changed once the filter element is completely covered by fuel.

Primary fuel filter (A)

Secondary fuel filter (B)

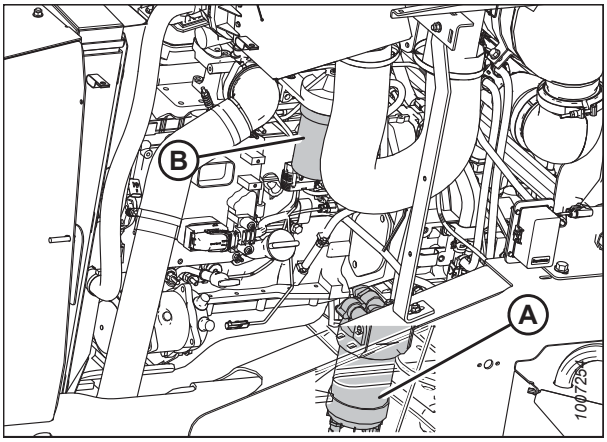


Figure 5.67: Fuel System Filters

To remove or install a fuel filter, refer to the relevant procedure:

- *Removing Primary Fuel Filter, page 364*
- *Installing Primary Fuel Filter, page 365*
- *Removing Secondary Fuel Filter, page 365*
- *Installing Secondary Fuel Filter, page 366*

Removing Primary Fuel Filter

Removing the primary fuel filter requires disconnecting the filter from the water separation system and the fuel system.

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. Open the hood to the highest position. For instructions, refer to *5.3.3 Opening Hood – Highest Position, page 325*.
3. On the bottom of the fuel tank, locate fuel shut-off valve (A) and move it to the closed position.

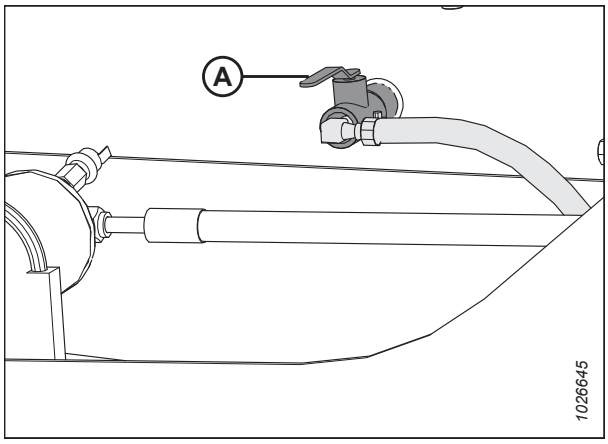


Figure 5.68: Fuel Shut-off Valve

4. Locate primary fuel filter (A) on the right cab-forward side of the windrower.

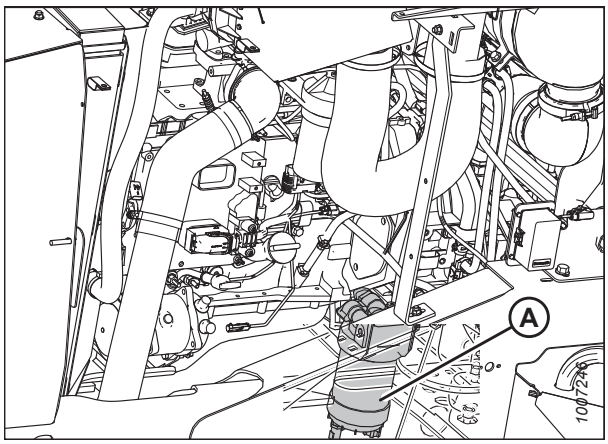


Figure 5.69: Primary Fuel Filter Location

5. Clean around the head of primary filter (A).
6. Disconnect water in fuel (WIF) sensor (B) from the bottom of the filter. Place a container capable of holding 4 L (1.1 US gal) below the filter.
7. Turn valve (C) by hand, counterclockwise, and drain the fuel from the filter into a container. Dispose of the fuel.
8. Remove filter (A). The filter can be turned using a 25.4 mm (1 in.) wrench.
9. Clean the gasket mating surface.

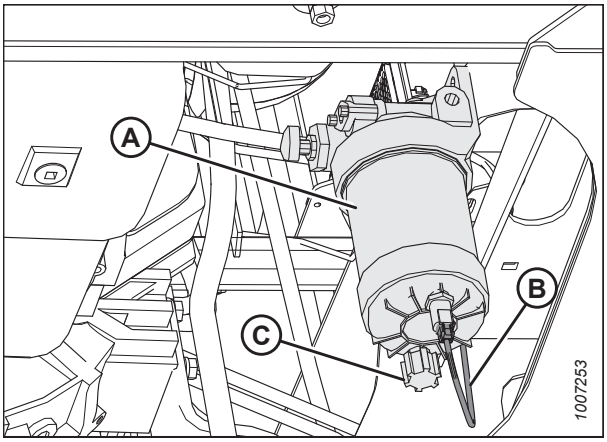


Figure 5.70: Primary Fuel Filter

Installing Primary Fuel Filter

Install the new primary fuel filter after removing the old filter.

For the primary fuel filter replacement part number, refer to *8.1.4 Filter Part Numbers, page 492*.

IMPORTANT:

If possible, prefill new filters with clean fuel prior to assembly. Fill the filter through the clean side block-off plug, which is packed with the filter. To prevent unfiltered fuel from entering the system and damaging fuel system components, do **NOT** pour fuel directly in the center of the filter.

1. Lubricate the fuel filter O-ring with clean oil.
2. Screw new filter (A) onto the filter mount, until the gasket contacts the filter head.
3. Tighten the filter an additional 3/4 turn by hand. Using a 25.4 mm (1 in.) wrench, torque the filter to 38 Nm (28 lbf·ft).
4. Tighten the filter an additional 1/2 to 3/4 turn by hand.

   IMPORTANT:

   Do **NOT** use a filter wrench to install the filter. Overtightening can damage the gasket and filter.
5. Reconnect water in fuel (WIF) sensor (B).

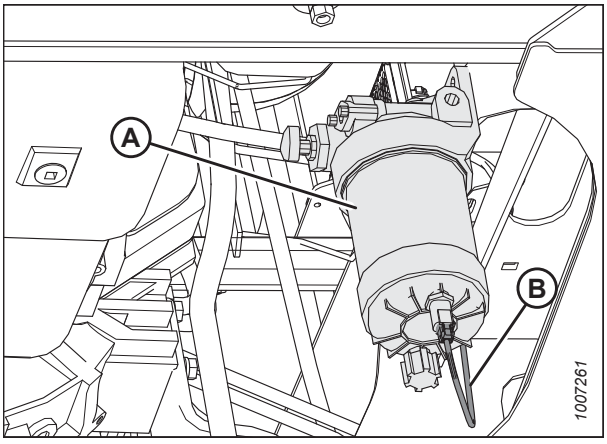


Figure 5.71: Primary Fuel Filter

Removing Secondary Fuel Filter

Removing the secondary fuel filter involves disconnecting it from the fuel system and draining it of fuel. The secondary filter does not have a water separator.

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. Open the hood to the highest position. For instructions, refer to *5.3.3 Opening Hood – Highest Position, page 325*.
3. Clean around secondary filter head (A).
4. Place a container under the filter to catch spilled fluid.
5. Remove filter (B) with a filter wrench.
6. Clean the gasket mating surface.

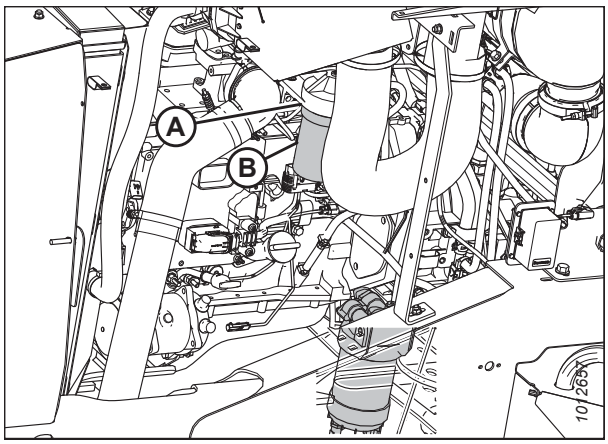


Figure 5.72: Secondary Fuel Filter

Installing Secondary Fuel Filter

The secondary fuel filter does not have a water separator.

For the secondary fuel filter replacement part number, refer to *8.1.4 Filter Part Numbers, page 492*.

IMPORTANT:

If possible, pre-fill new filters with clean fuel prior to assembly, using the clean side block-off plug, which is packed with the filter. Do **NOT** pour fuel directly in the center of the filter, since this will allow unfiltered fuel to enter the system and can cause damage to fuel system components.

1. Screw new secondary filter (A) onto the filter mount until the gasket contacts the filter head.
2. Tighten the filter an additional 1/2 to 3/4 turn by hand.

   IMPORTANT:

   Do **NOT** use a filter wrench to install the filter. Overtightening can damage the gasket and filter.

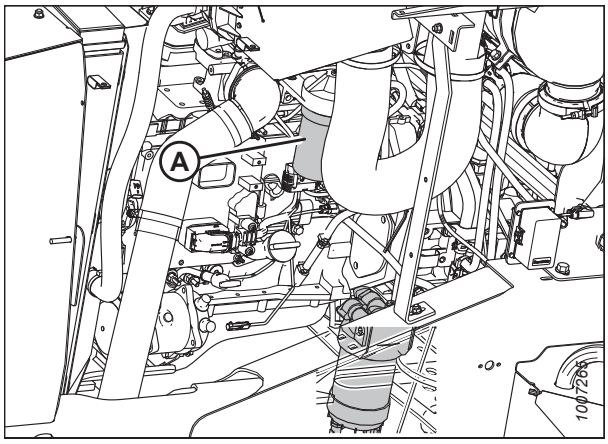


Figure 5.73: Secondary Fuel Filter

3. Open fuel valve (A) under the fuel tank.
4. Prime the fuel system. For instructions, refer to *Priming Fuel System , page 370*.

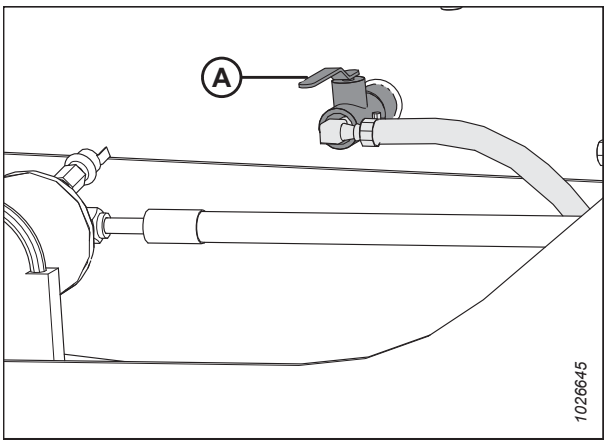


Figure 5.74: Fuel Shut-off Valve

Draining Fuel Tank

Draining the fuel tank is necessary to remove old or contaminated fuel, or if the fuel tank requires service.

DANGER

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

WARNING

- **To prevent personal injury or death from an explosion or fire, do NOT allow open flames or sparks near the windrower when it is being refueled.**
- **Do NOT refuel the windrower when the engine is hot or running.**
- **Ensure that the fuel delivery system is properly bonded and grounded. A bonded fuel delivery system has an electrically conductive and unbroken connection between all components of the fuel delivery system. A wire connection from the fuel delivery system to the machine chassis will equalize the static potential between the two machines, further reducing the chance of a static electric discharge. A properly grounded fuel delivery system has an electrically conductive connection from the fuel delivery system tank to the ground.**

1. Shut down the engine, and remove the key from the ignition.
2. Open the hood to its lowest position. For instructions, refer to *5.3.1 Opening Hood – Lower Position, page 324*.
3. Close fuel shut-off valve (A) located on the bottom of the fuel tank.

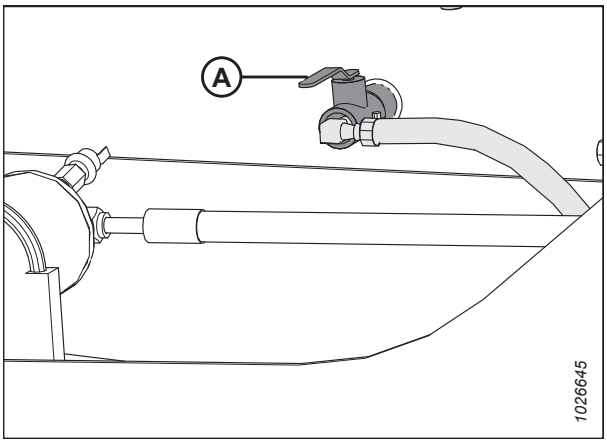


Figure 5.75: Fuel Shut-off Valve

4. Place a 20 liter (5 US gallon) drain pan under fuel supply hose (A) at the primary filter.
5. Loosen clamp (B) and pull fuel supply hose (A) off of its fitting.

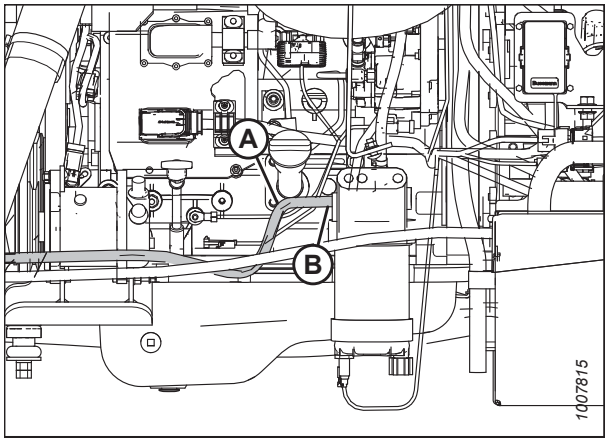


Figure 5.76: Fuel System – View from outside Frame

6. Route the hose to the drain pan, and then open valve (A) to drain the fuel tank.

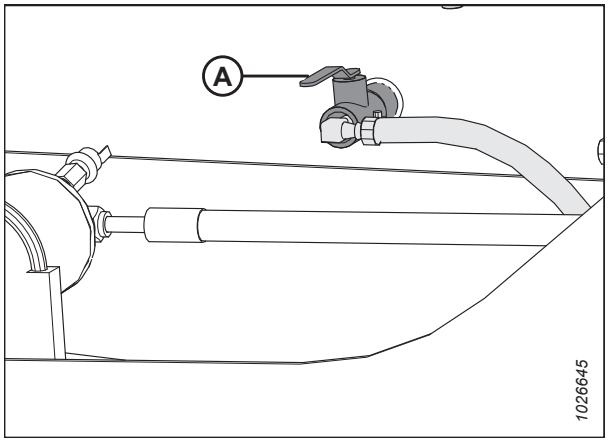


Figure 5.77: Fuel Shut-off Valve

7. Add some clean fuel to the tank to flush out any remaining contaminants.
8. Reattach fuel supply hose (A) to the fitting. Install clamp (B) and tighten it.

   NOTE:

   Do **NOT** refill the fuel tank immediately if you intend to perform additional maintenance on the fuel system. Refill it once your tasks are completed. For instructions, refer to *Filling Fuel Tank, page 369*.

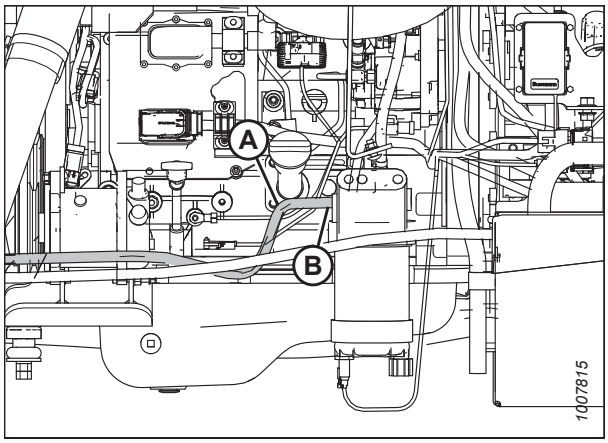


Figure 5.78: Fuel System – View from outside Frame

Filling Fuel Tank

Diesel fuel is added to the windrower's fuel tank via the fuel filler neck.

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.

WARNING

- **To prevent personal injury or death from an explosion or fire, do NOT allow open flames or sparks near the windrower when it is being refueled.**
- **Do NOT refuel the windrower when the engine is hot or running.**
- **Ensure that the fuel delivery system is properly bonded and grounded. A bonded fuel delivery system has an electrically conductive and unbroken connection between all components of the fuel delivery system. A wire connection from the fuel delivery system to the machine chassis will equalize the static potential between the two machines, further reducing the chance of a static electric discharge. A properly grounded fuel delivery system has an electrically conductive connection from the fuel delivery system tank to the ground.**

CAUTION

Do NOT allow the tank to empty. Running out of fuel can cause air locks and/or contamination of the fuel system.

1. Shut down the engine, and remove the key from the ignition.
2. Stand on either platform to access the fuel tank filler pipe.
3. Clean the area around filler cap (A).
4. Turn cap handle (B) counterclockwise until it is loose. Remove the cap.
5. Fill the tank with approved fuel. Refer to the inside back cover of this manual for the recommended fuel.

   IMPORTANT:

   Do **NOT** fill the tank completely—space is required for expansion. A filled tank could overflow if exposed to a rise in temperature, such as direct sunlight.
6. Replace fuel tank cap (A) and turn cap handle (B) clockwise until it is snug.

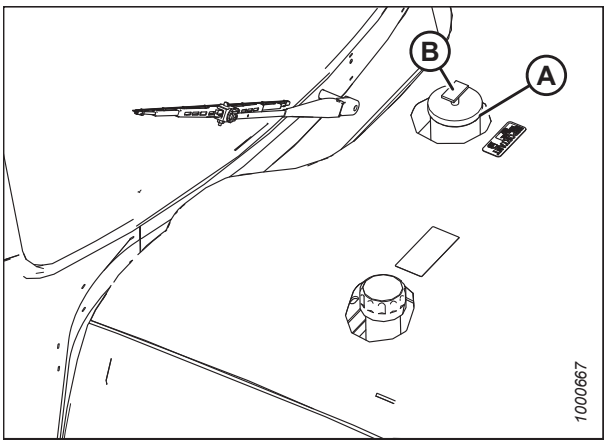


Figure 5.79: Fuel Filler Cap

Fuel/Water Separator

A fuel/water separator is incorporated into the primary fuel filter. The separator is equipped with a drain and a sensor that triggers a warning on the cab display module (CDM) if water is detected in the fuel. Drain the water and sediment from the separator daily and whenever the water in fuel (WIF) light on the CDM is active.

To remove water from the fuel system, refer to *Removing Water from Fuel System, page 370*.

Removing Water from Fuel System

Water in the fuel system can result in damage to the windrower's engine. If water is detected in the fuel system, it must be removed immediately.

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. Open the hood to the lower position. For instructions, refer to *5.3.1 Opening Hood – Lower Position, page 324*.
3. Place a container under filter (A) to catch any spilled fluid.
4. Turn drain valve (B) by hand 1 1/2 to 2 turns counterclockwise until fluid begins flowing out of the filter.
5. Drain the filter sump of water and sediment until a stream of clear fuel is visible.
6. Turn the valve clockwise to close the drain.
7. Dispose of the collected fluid safely.
8. Close the hood. For instructions, refer to *5.3.2 Closing Hood – Lower Position, page 325*.

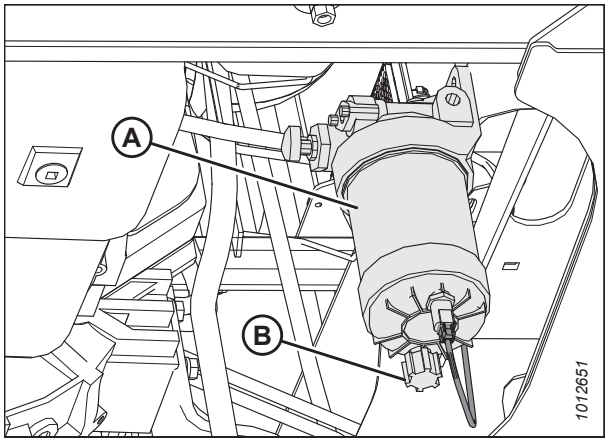


Figure 5.80: Primary Fuel Filter

Priming Fuel System

Controlled venting of air is provided at the injection pump through the fuel drain manifold. Small amounts of air, introduced by changing filters or injection pump supply line, will be vented automatically if the fuel filters are changed according to the intervals specified in the windrower's maintenance schedule. However, service procedures such as changing the fuel filter can result in the loss of the fuel system's prime. Follow this procedure to reprime the fuel system.

IMPORTANT:

Bleeding the fuel system is **NOT** recommended or required at any time. Manual priming will be required if:

- The fuel filter is replaced
- The fuel injection pump is replaced
- The high-pressure fuel lines are replaced
- The engine is run until the fuel tank is empty

Priming Fuel System

Controlled venting of air is provided at the injection pump through the fuel drain manifold. Small amounts of air, introduced by changing filters or injection pump supply line, will be vented automatically if the fuel filters are changed according to the intervals specified in the windrower's maintenance schedule. However, service procedures such as

changing the fuel filter can result in the loss of the fuel system's prime. If the continuous flow of fuel to the fuel injector is interrupted, the fuel system will need to be re-primed manually.

IMPORTANT:

Bleeding the fuel system is **NOT** recommended or required at any time. Manual priming will be required if:

- The fuel filter is replaced
- The fuel injection pump is replaced
- The high-pressure fuel lines are replaced
- The engine is run until the fuel tank is empty

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.

WARNING

The fuel pump high-pressure fuel lines and fuel rail contain extremely high pressure fuel. Never loosen any fittings. Personal injury and property damage can result.

1. Remove the key from the ignition.
2. Open the hood to the lower position. For instructions, refer to *5.3.1 Opening Hood – Lower Position, page 324*.
3. Turn priming knob (A) counterclockwise to unlock the plunger on the primary filter head.
4. Push the plunger approximately 120 times to pressurize the fuel system.
5. Lock the plunger by turning knob (A) clockwise until it is snug.
6. Attempt to start the engine. If the engine does **NOT** start, repeat the priming procedure.
7. Close the hood. For instructions, refer to *5.3.2 Closing Hood – Lower Position, page 325*.

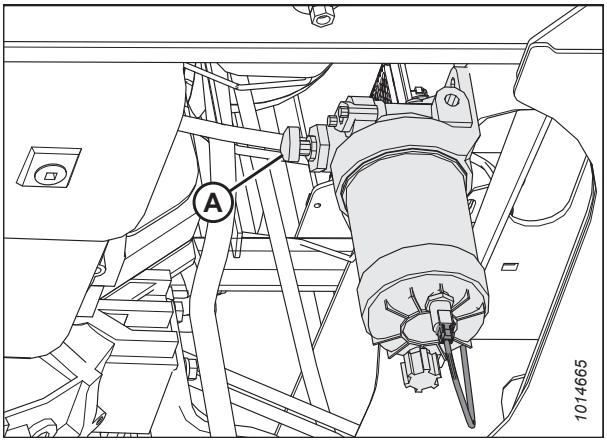


Figure 5.81: Primary Fuel Filter

5.8.8 Diesel Exhaust Fluid System

The diesel exhaust fluid (DEF) system injects DEF into the windrower's engine exhaust system. This fluid reacts with the exhaust gases over a catalyst, thereby reducing the damage that the engine's emissions do to the environment. The Operator may need to drain the DEF tank if the windrower will not be operated for a long period of time. The Operator will also need to ensure that the filters in the DEF system are changed according to the intervals specified in the maintenance schedule.

IMPORTANT:

If the windrower will be in storage for longer than 6 months, the diesel exhaust fluid (DEF) tank should be drained to prevent damage to the tank. For instructions, refer to *Draining Diesel Exhaust Fluid Tank, page 372*.

IMPORTANT:

If the windrower will be operated when the ambient temperature is below 0°C (32°F), do **NOT** fill the DEF tank to more than 75% of its capacity. When the ambient temperature is below freezing, DEF will expand in volume by approximately 7%.

NOTE:

For DEF specifications, refer to this manual's inside back cover.

Draining Diesel Exhaust Fluid Tank

The windrower's diesel exhaust fluid (DEF) tank can be drained so that the tank can be serviced, or if the windrower will be stored for a period longer than 6 months.

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Move the platform on the right cab-forward side of the machine to the open position. For instructions, refer to *5.4.1 Opening Platforms – Standard Position, page 328*.
3. 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.

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.

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

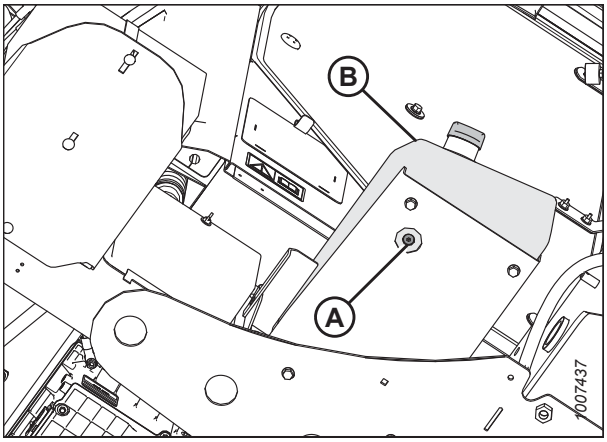


Figure 5.82: View from beneath Tank

8. Refill the DEF tank. For instructions, refer to *Filling Diesel Exhaust Fluid Tank, page 373*.

   IMPORTANT:

   Do NOT start the windrower's engine before filling the DEF tank.

   NOTE:

   If the windrower will be in storage for a period longer than 6 months, do **NOT** refill the DEF tank now. Refill the DEF tank when the windrower resumes operation.

9. Close the maintenance platform. For instructions, refer to *5.4.2 Closing Platforms – Standard Position, page 329*.

Filling Diesel Exhaust Fluid Tank

Diesel exhaust fluid (DEF) is toxic and can damage surfaces it comes into contact with. Follow this procedure to safely refill the DEF tank.

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.

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.

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.

1. Shut down the engine, and remove the key from the ignition.
2. Move the platform on the right cab-forward side of the machine to the open position. For instructions, refer to *5.4.1 Opening Platforms – Standard Position, page 328*.

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 6 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.

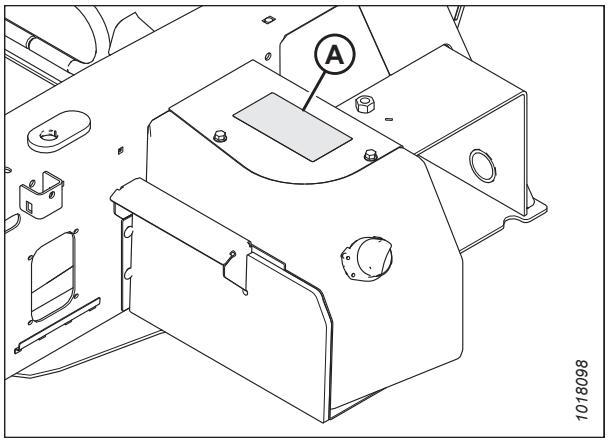


Figure 5.83: DEF Tank

3. Clean around filler cap (A).
4. Turn cap (A) counterclockwise until it is loose. Remove the cap.
5. Fill the tank with an approved DEF. For instructions, refer to *8.1.3 Lubricants, Fluids, and System Capacities, page 491*.

   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.

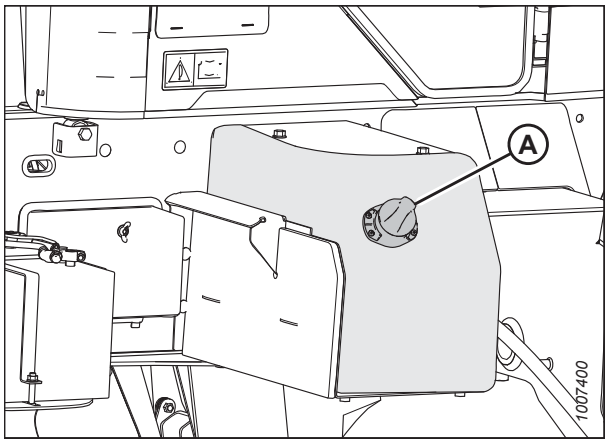


Figure 5.84: DEF Tank

6. Replace filler cap (A) and turn it clockwise until it is tight.
7. Close the maintenance platform. For instructions, refer to *5.4.2 Closing Platforms – Standard Position, page 329*.

Replacing Diesel Exhaust Fluid Vent Hose Filter

The diesel exhaust fluid (DEF) vent hose filter should be replaced according to the interval specified in the maintenance schedule.

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.

Refer to *8.1.4 Filter Part Numbers, page 492* for the part number of the replacement filter.

1. Shut down the engine, and remove the key from the ignition.
2. Under the right side of the windrower, behind DEF tank (B), locate DEF tank vent hose (A).

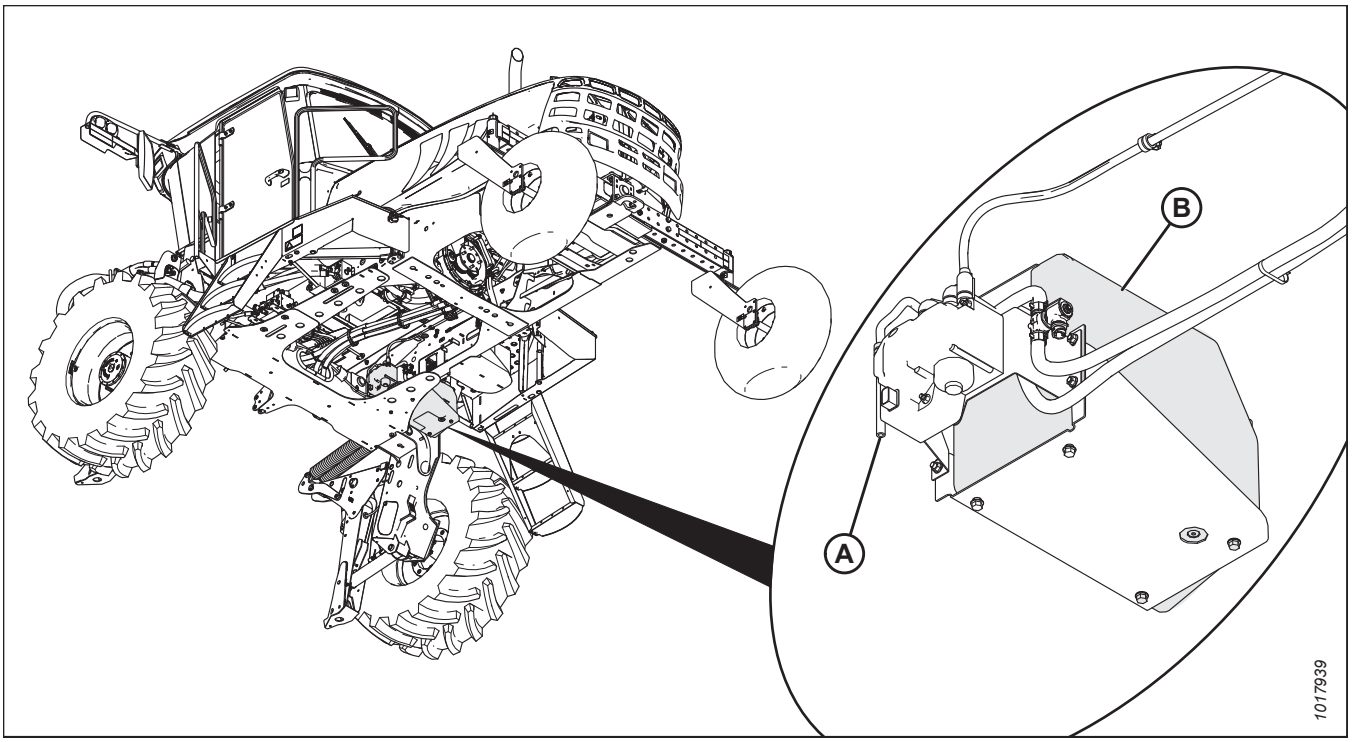


Figure 5.85: DEF Vent Hose Location

3. Remove cable tie (A) securing the vent hose filter to the DEF vent hose.
4. Undo two lined clamps (B) securing the filter to vent hose (C).
5. Remove the filter from vent hose (C).

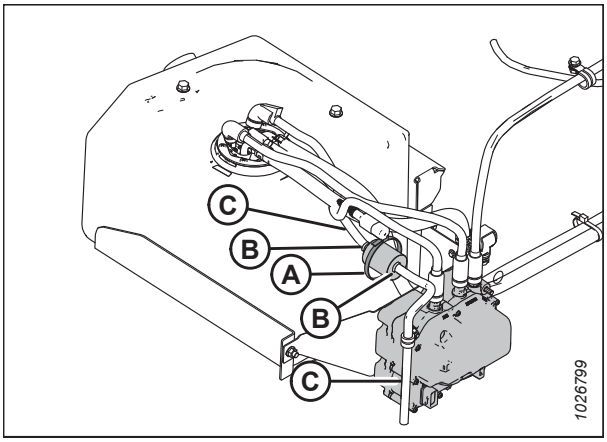


Figure 5.86: Vent Hose Filter – behind DEF Tank

6. Install new vent hose filter (A) onto the end of the DEF head hose. Secure it with clamp (B).

   IMPORTANT:

   Ensure that the arrow on vent hose filter (A) points toward the head of the DEF tank.
7. Secure vent hose (C) to the filter using clamp (B).

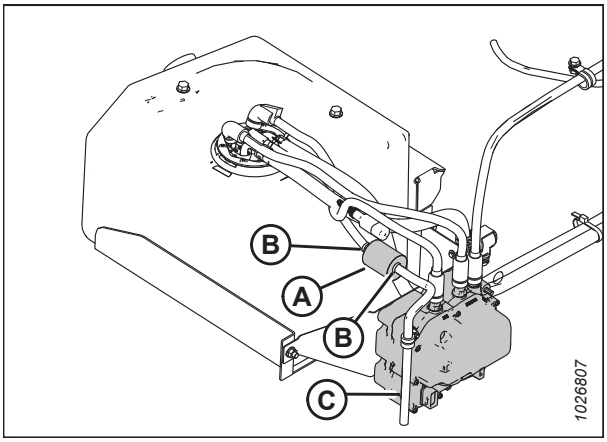


Figure 5.87: Vent Hose Filter

8. Secure vent hose filter (A) to DEF suction hose (B) using cable tie (C).

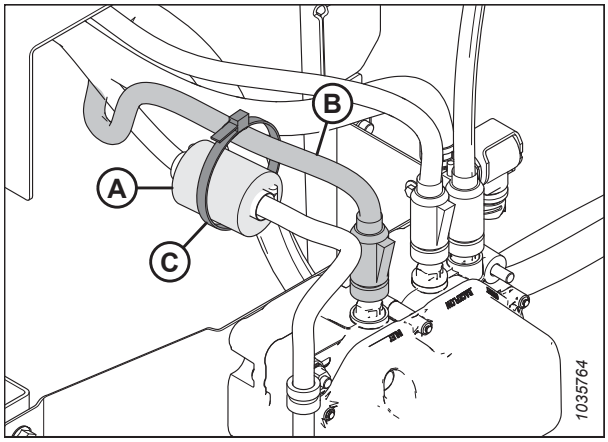


Figure 5.88: Vent Hose Filter

Diesel Exhaust Fluid Supply Module Filter

The supply module filter is designed to prevent debris that may be suspended in the diesel exhaust fluid (DEF) from entering the system. Permanent damage to—and premature failure of—the DEF supply module can result from fluid debris.

Checking Supply Module Filter

If you suspect that the diesel exhaust fluid (DEF) supply module filter is clogged, perform this inspection.

1. Locate aftertreatment diesel exhaust fluid (DEF) supply module (A) behind the DEF tank.

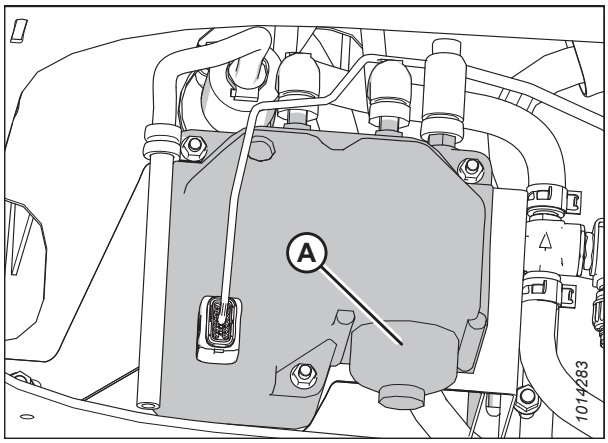


Figure 5.89: DEF Supply Module

2. Inspect the area around the seal and vent of aftertreatment DEF supply module filter cap (A) for signs of leakage.

   NOTE:

   DEF fluid leaves a white residue when it dries. If there is evidence of leaking, remove the supply module filter, clean it and inspect it for signs of residue before replacing it. For instructions, refer to *Cleaning and Inspecting Supply Module Filter, page 378*.

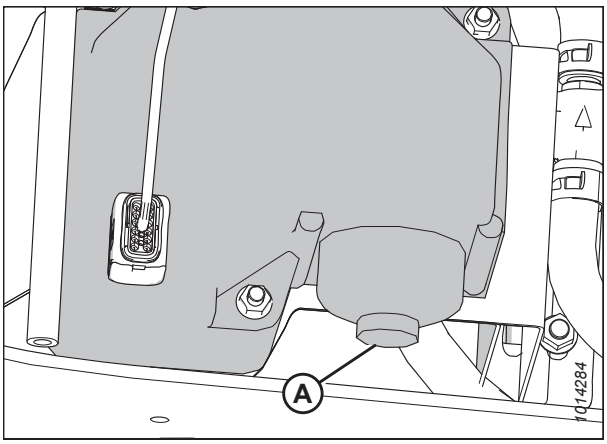


Figure 5.90: DEF Supply Module Filter Cap

Removing Supply Module Filter

The windrower's diesel exhaust fluid (DEF) supply module filter may need to be removed for replacement or inspection.

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.

WARNING

Batteries emit explosive gases. To reduce the possibility of personal injury, always ventilate the compartment before servicing the batteries. To reduce the possibility of electrical arcing, remove the negative (–) battery cable first and attach the negative (–) battery cable last.

WARNING

The DEF line connecting the aftertreatment DEF supply module to the aftertreatment DEF dosing module operates under pressure and should not be disconnected while the engine is running or until the purge process, which occurs after the engine is turned off, has been completed. Disconnecting the DEF line while it is under pressure may result in uncontrolled spraying.

WARNING

Wear appropriate eye and face protection when using compressed air. Flying debris and dirt can cause personal injury.

IMPORTANT:

Do **NOT** disconnect the windrower batteries until the diesel exhaust fluid (DEF) dosing system has completed its purge cycle. Before removing or disconnecting any components of the DEF system, wait at least five minutes after the windrower's ignition switch is turned to the OFF position for the aftertreatment DEF dosing system to purge the DEF from the system. The purge cycle is an automatic process and does not require the Operator's intervention. The aftertreatment DEF supply module emits an audible pumping noise during the purging process.

NOTE:

Do **NOT** power wash or steam clean the supply module. Use compressed air to remove any loose debris.

1. Set the battery main disconnect switch to the OFF position. For instructions, refer to *Battery Main Disconnect Switch, page 401*.

2. Place a catch basin capable of holding at least 29 liters (7.5 US gallons) under the DEF filter cap. This will be used to collect the remaining DEF in the filter housing.

   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.

3. Unscrew filter cap (A).

4. Remove aftertreatment DEF filter equalizing element (B).

5. Remove old aftertreatment DEF supply module filter element (D).

   NOTE:

   Disposable service tool (C) is included with the filter to aid in filter removal. Use the appropriate end of the tool to remove the filter. When the tool has been inserted into the module, a click will be heard, which indicates that the tool is engaged with the filter.

6. Discard and replace the filter and equalizing element, if these are removed from the aftertreatment supply module.

7. Clean and inspect the supply module. For instructions, refer to *Cleaning and Inspecting Supply Module Filter, page 378*.

8. Install the new supply module filter. For instructions, refer to *Installing Supply Module Filter, page 379*.

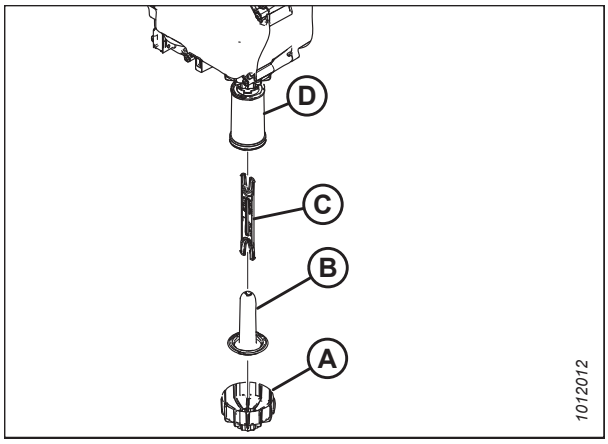


Figure 5.91: DEF Supply Module Filter

Cleaning and Inspecting Supply Module Filter

Once the diesel exhaust fluid (DEF) supply module filter has been removed, it should be cleaned and examined. The module filter may need to be replaced.

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.

1. Check the DEF filter for evidence of contaminated DEF. Take note of the appearance and smell of the filter to determine if contaminated fluid has passed through the dosing system.

2. Inspect the DEF filter for debris.

3. Discard the filter element and the equalizing element.

4. Inspect the aftertreatment DEF supply module filter's cap for cracks or holes.

5. Check the condition of the threads on the aftertreatment DEF supply module's cap.

6. If the threads are damaged, replace the aftertreatment DEF supply module's cap.

7. If the cap threads are damaged, inspect the aftertreatment DEF supply module's threads.

8. If threads of the aftertreatment DEF supply module are damaged, replace the entire aftertreatment DEF supply module.
9. Clean the aftertreatment DEF supply module's cap and the threads on the supply module using warm water and a clean cloth.

Installing Supply Module Filter

Once the diesel exhaust fluid (DEF) supply module filter has been removed, cleaned, and inspected, the cleaned module (or a new replacement) can be installed.

For the replacement supply module filter part numbers, refer to *8.1.4 Filter Part Numbers, page 492*.

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.

1. Slide DEF filter equalizing element (A) into DEF filter cartridge (B).
2. Insert the assembly into aftertreatment DEF supply module (C).
3. Install cap (D) and torque it to 20 Nm (15 lbf·ft).

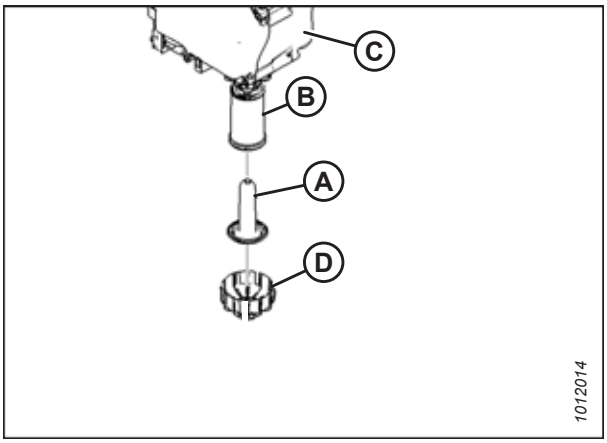


Figure 5.92: DEF Supply Module Filter

WARNING

Batteries can emit explosive gases. To reduce the possibility of personal injury, always ventilate the compartment before servicing the batteries. To reduce the possibility of arcing, remove the negative (-) battery cable first and attach the negative (-) battery cable last.

4. Connect the batteries. For instructions, refer to *Connecting Batteries, page 408*.
5. Start the engine.
6. Check the DEF system for leaks.

   NOTE:

   The aftertreatment DEF dosing system will not prime until the operating Selective Catalytic Reduction (SCR) temperatures are reached. To verify that there are no DEF leaks, test drive the windrower for a minimum of 15 minutes to allow the SCR system to reach its operating temperature.

5.8.9 Engine Cooling System

The engine cooling system is designed to maintain the engine operating temperature within the recommended operating range.

NOTE:

Using coolant with antifreeze is essential in any climate. Antifreeze allows the windrower to be operated in a broader range of ambient temperatures by lowering the coolant's freezing point and by raising its boiling point. Antifreeze also contains rust inhibitors and other additives which extend the service life of the windrower.

IMPORTANT:

If the strength of the antifreeze in the coolant currently in the windrower's cooling system is insufficient, do **NOT** drain the cooling system. The cooling system may not drain completely, and damage from freezing may still result.

Refer to *8.1 Recommended Fuel, Fluids, and Lubricants, page 489* for information on the recommended coolant for the windrower.

Checking Coolant Level

Inspect the the pressurized coolant tank to check the coolant level.

DANGER

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

NOTE:

Ensure that the engine has cooled down prior to checking the coolant level.

1. Shut down the engine, and remove the key from the ignition.
2. Open the hood to the highest position. For instructions, refer to *5.3.3 Opening Hood – Highest Position, page 325*.
3. Move the platform on the left cab-forward side of the machine to the open position. For instructions, refer to *5.4.1 Opening Platforms – Standard Position, page 328*.
4. Locate coolant reservoir (A). The coolant level should be between maximum line (B) and minimum line (C) when the engine is cold. If additional coolant is needed, refer to *Adding Coolant, page 386*.
5. Close the platform. For instructions, refer to *5.4.2 Closing Platforms – Standard Position, page 329*.
6. Close the hood. For instructions, refer to *5.3.4 Closing Hood – Highest Position, page 327*.

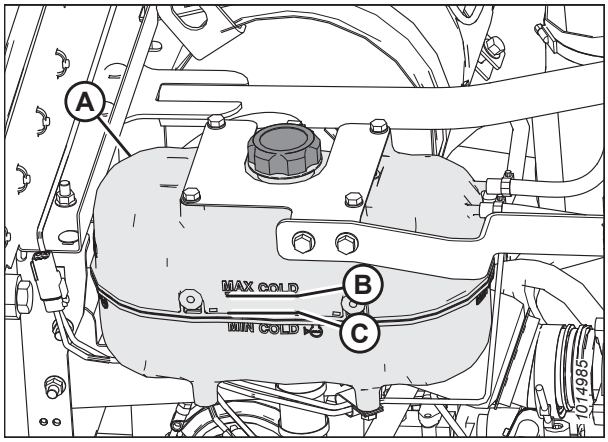


Figure 5.93: Engine Coolant Tank

Checking Engine Coolant Strength

The strength of the antifreeze in the coolant in the pressurized coolant tank will need to be tested according to the interval specified in the maintenance schedule.

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

To avoid personal injury from hot coolant, do NOT attempt to open the pressurized coolant tank cap until the engine cools.

1. Shut down the engine, and remove the key from the ignition.
2. Open the hood to the highest position. For instructions, refer to *5.3.3 Opening Hood – Highest Position, page 325*.
3. Move the platform on the left cab-forward side of the machine to the open position. For instructions, refer to *5.4.1 Opening Platforms – Standard Position, page 328*.
4. Push down and turn pressurized coolant tank cap (A) counterclockwise to the first notch to relieve pressure before removing the cap completely.
5. Push down and turn cap (A) again and remove it.
6. Check the coolant in the pressurized coolant tank using an antifreeze tester. The tester should indicate that the antifreeze in the coolant will protect the engine at temperatures equal to or greater than -34°C (-30°F).

   IMPORTANT:

   Use a tester that is specifically designed for the type of antifreeze used in the windrower. Using an inappropriate antifreeze tester can result in an incorrect antifreeze strength reading.
7. Inspect the pressurized coolant tank cap before reinstalling it. For instructions, refer to *Inspecting Pressurized Coolant Tank Cap, page 381*.
8. Reinstall pressurized coolant tank cap (A).
9. Close the platform. For instructions, refer to *5.4.2 Closing Platforms – Standard Position, page 329*.
10. Close the hood. For instructions, refer to *5.3.4 Closing Hood – Highest Position, page 327*.

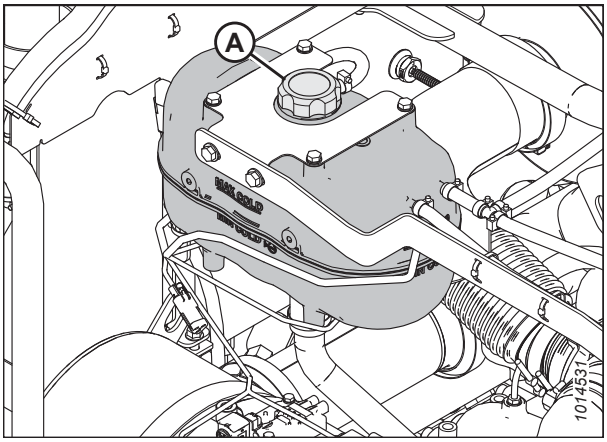


Figure 5.94: Engine Cooling System

Inspecting Pressurized Coolant Tank Cap

The pressurized coolant tank cap must fit tightly and the cap gasket must be in good condition in order to maintain the cooling system's pressure level, which should be 97–124 kPa (14–18 psi). Inspect the cap whenever you measure the engine coolant's antifreeze strength.

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

To avoid personal injury from hot coolant, do NOT attempt to open the pressurized coolant tank cap until the engine cools.

1. Shut down the engine, and remove the key from the ignition.
2. Open the hood to the highest position. For instructions, refer to *5.3.3 Opening Hood – Highest Position, page 325*.
3. Move the platform on the left cab-forward side of the machine to the open position. For instructions, refer to *5.4.1 Opening Platforms – Standard Position, page 328*.

4. Push down and turn cap (A) counterclockwise to the first notch to relieve the pressure in the cooling system before removing the cap completely.
5. Push down and turn cap (A) again and remove it.
6. Check the gasket for cracks or deterioration. Replace the cap if it appears worn.
7. Check that the spring in the cap moves freely.
8. Replace the cap if the spring is stuck.
9. Close the platform. For instructions, refer to *5.4.2 Closing Platforms – Standard Position, page 329*.
10. Close the hood. For instructions, refer to *5.3.4 Closing Hood – Highest Position, page 327*.

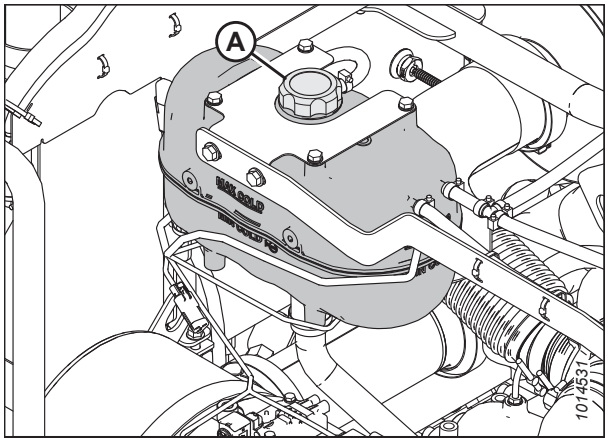


Figure 5.95: Engine Cooling System

Changing Coolant

The windrower's coolant should be drained and the cooling system flushed and filled with new coolant according to the interval specified in the maintenance schedule.

To change the coolant, refer to the following procedures:

- *Draining and Cleaning Cooling System, page 382*
- *Adding Coolant, page 386*

Draining and Cleaning Cooling System

Once the coolant has been drained from the cooling system, the system should be flushed and cleaned before being refilled with coolant.

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

To avoid personal injury from hot coolant, do NOT attempt to open the pressurized coolant tank cap until the engine cools.

1. Shut down the engine, and remove the key from the ignition.
2. Ensure the cooling system is cold.
3. Open the hood to the highest position. For instructions, refer to *5.3.3 Opening Hood – Highest Position, page 325*.
4. Move the platform on the left cab-forward side of the machine to the open position. For instructions, refer to *5.4.1 Opening Platforms – Standard Position, page 328*.

5. Push down and turn pressurized coolant tank cap (A) to the first notch to relieve the pressure in the cooling system. Remove the cap.

   IMPORTANT:

   Place a drain pan of a capacity of at least 30 liters (8 US gallons) under the engine and the radiator. Use a deflector or hose to prevent coolant from running onto the windrower's frame.

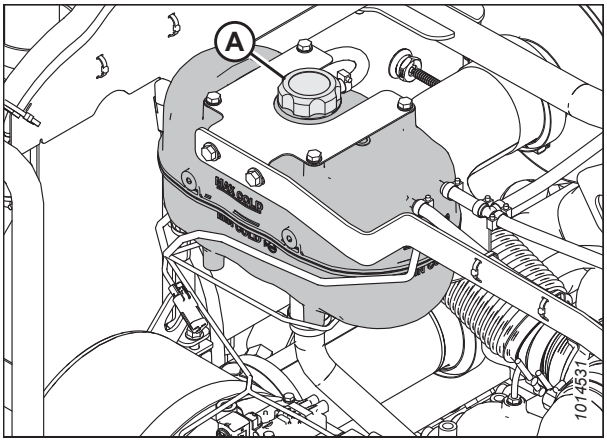


Figure 5.96: Coolant Recovery Tank

6. Locate radiator drain valve (A) at the bottom of the engine side of the radiator lower tank. Open the drain valve.

   NOTE:

   Part of the lower left frame has been made transparent to more clearly show the location of the radiator's drain valve.

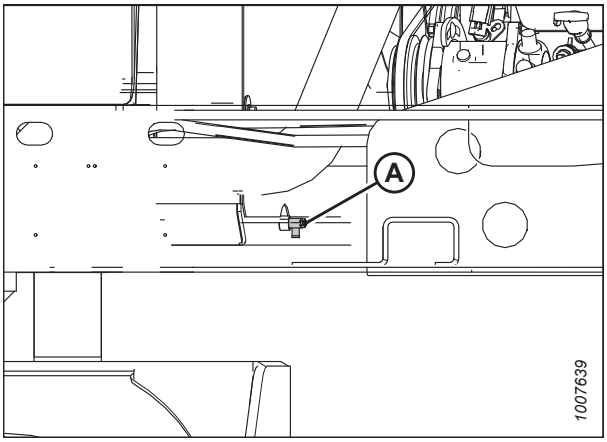


Figure 5.97: Radiator Drain Valve

7. Close heater shut-off valve (A). Disconnect the hose on the heater side of the valve.

   NOTE:

   Be careful when removing the hose as the system will be drained.

8. Open the valve to drain the block.

9. Reattach the hose to valve (A).

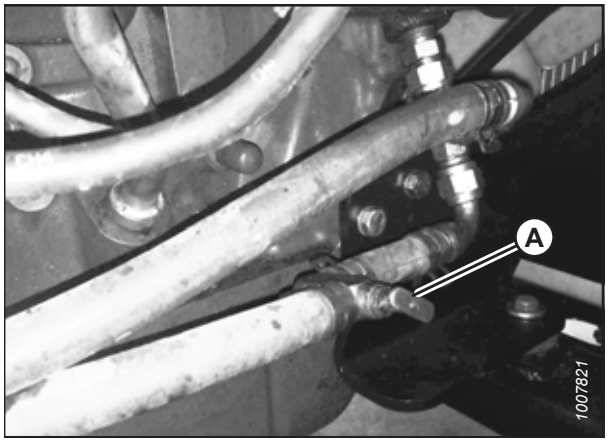


Figure 5.98: Heater Shut-Off Valve – Model Year 2016 and Prior

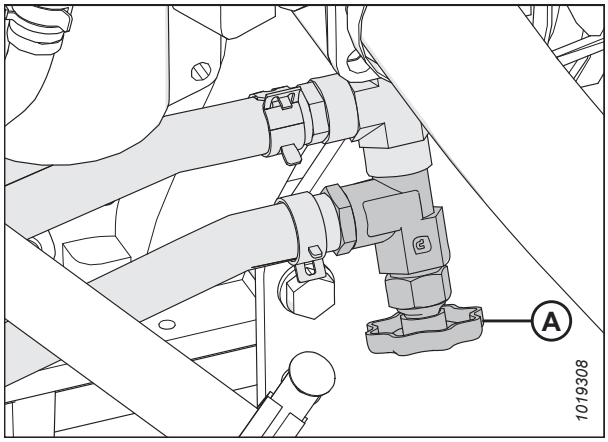


Figure 5.99: Heater Shut-Off Valve – Model Year 2017

10. Close radiator drain valve (A) at the bottom of the radiator's lower tank.

    NOTE:

    Part of the lower left frame has been made transparent to more clearly show the location of the radiator's drain valve.

11. Fill the system with clean water through the pressurized coolant tank and replace the pressurized coolant tank's cap.

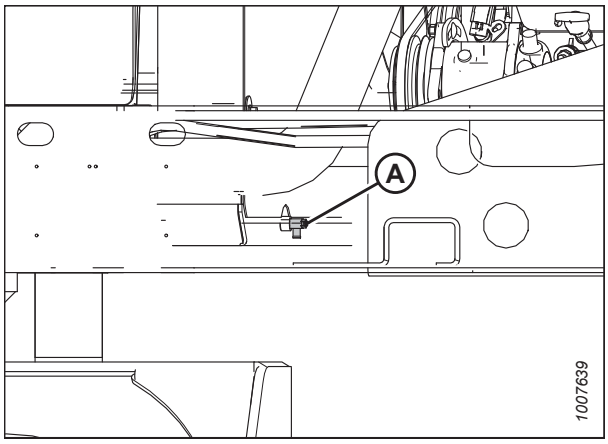


Figure 5.100: Radiator Drain Valve

12. Open heater shut-off valve (A).
13. Start the engine.
14. Turn the temperature control knob to the HIGH position. Allow the engine to run until it reaches operating temperature.
15. Stop the engine, and remove the key from the ignition.

CAUTION

Be careful when draining the water from the cooling system, as the water will be at the engine operating temperature of 82–104°C (180–220°F).

16. Drain the water from the cooling system quickly. This procedure is identical to the coolant removal procedure.

    NOTE:

    Drain the water from the cooling system as quickly as possible after the engine has been turned off to prevent rust flakes or other sediment from settling.

17. Close the drain valves.
18. Fill the cooling system with a solution of clean water and a heavy-duty radiator cleaner. Follow the instructions provided with the cleaner.
19. After using the cleaner solution, flush the system with clean water again. Inspect the radiator, hoses, and fittings for leaks.
20. Close the drain valves.
21. Fill the cooling system with coolant. For instructions, refer to *Adding Coolant, page 386*.
22. Replace cap (B) on coolant recovery tank (A).
23. Close the platform. For instructions, refer to *5.4.2 Closing Platforms – Standard Position, page 329*.
24. Close the hood. For instructions, refer to *5.3.4 Closing Hood – Highest Position, page 327*.

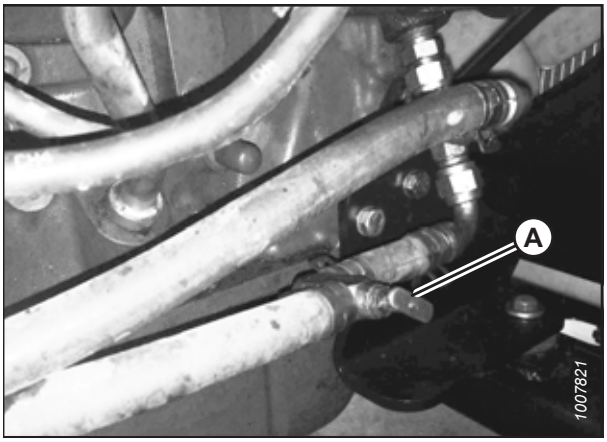


Figure 5.101: Heater Shut-Off Valve – Model Year 2016 and Prior

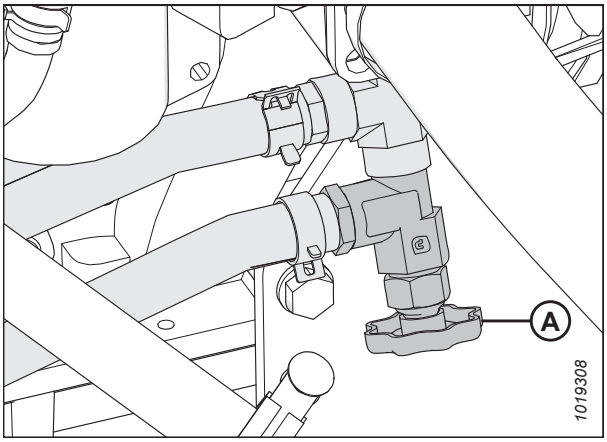


Figure 5.102: Heater Shut-Off Valve – Model Year 2017

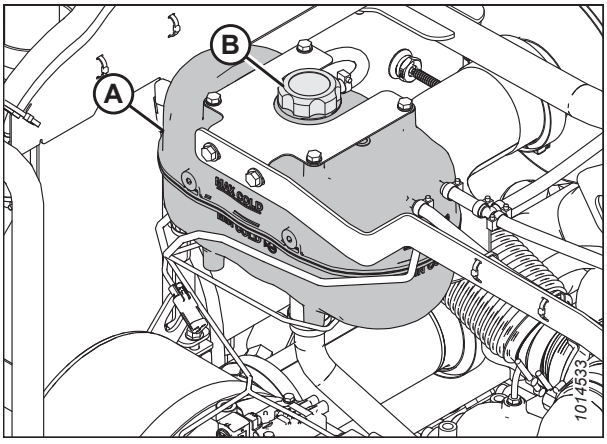


Figure 5.103: Coolant Recovery Tank

Adding Coolant

Check the coolant level in the pressurized coolant tank daily. Add coolant if the level is below the range indicated on the tank decal.

NOTE:

For coolant specifications, refer to the inside back cover.

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

To avoid personal injury from hot coolant, do NOT attempt to open the pressurized coolant tank cap until the engine cools.

1. Shut down the engine, and remove the key from the ignition.
2. Open the hood to the highest position. For instructions, refer to *5.3.3 Opening Hood – Highest Position, page 325*.
3. Move the platform on the left cab-forward side of the machine to the open position. For instructions, refer to *5.4.1 Opening Platforms – Standard Position, page 328*.
4. Remove cap (B) from coolant recovery tank (A).
5. Add coolant at a rate not exceeding 3 gallons per minute until the coolant level is within the range on the decal.

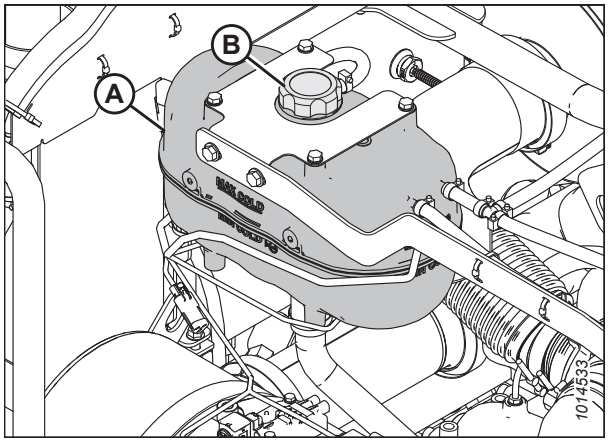


Figure 5.104: Coolant Recovery Tank

DANGER

Ensure that all bystanders have cleared the area.

6. Start the engine. Allow the engine to run at high idle for approximately 20 minutes or until the engine temperature reaches 85°C (185°F).
7. Check the coolant level again. Add coolant until the coolant level is within the range on the decal.
8. Replace cap (B).
9. Close the platform. For instructions, refer to *5.4.2 Closing Platforms – Standard Position, page 329*.
10. Close the hood. For instructions, refer to *5.3.4 Closing Hood – Highest Position, page 327*.

5.8.10 Gearbox

The gearbox's lubricant will need to be inspected and changed from time to time, according to the intervals specified in the maintenance schedule.

Checking Lubricant Level and Adding Lubricant

The gearbox's lubricant level can be inspected through the check plug port. Lubricant can also be added through this port.

CAUTION

Park on a flat, level surface with the header on the ground, the ground speed lever (GSL) in the N-DETENT position, and the steering wheel in the locked position (centered). To confirm that the parking brake is engaged, wait for the cab display module (CDM) to beep and display the message IN PARK.

DANGER

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

1. Park the windrower on level ground.
2. Shut down the engine, and remove the key from the ignition.
3. Remove check plug (A). The lubricant should be visible through the hole.
4. If necessary, add lubricant through check plug hole (A).

   NOTE:

   For information on the lubricant specifications, refer to *8.1.3 Lubricants, Fluids, and System Capacities, page 491*.

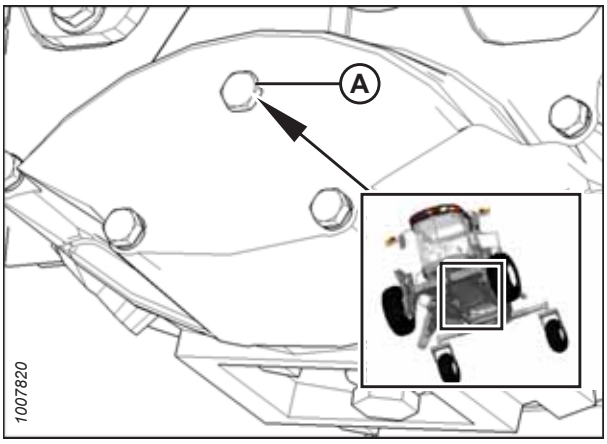


Figure 5.105: Gearbox Lubricant Check Plug

5. To add lubricant:
   a. Remove breather cap (A). Pour lubricant through the filler neck until it runs out of the check port. To refill the gearbox completely, add approximately 2.1 liters (2.2 US quarts) of lubricant.
   b. Replace the check plug and the breather cap and tighten them.
   c. Start the engine.
   d. Allow the engine to operate at low idle while you inspect the gearbox for potential lubricant leaks.
   e. Shut down the engine, and remove the key from the ignition.

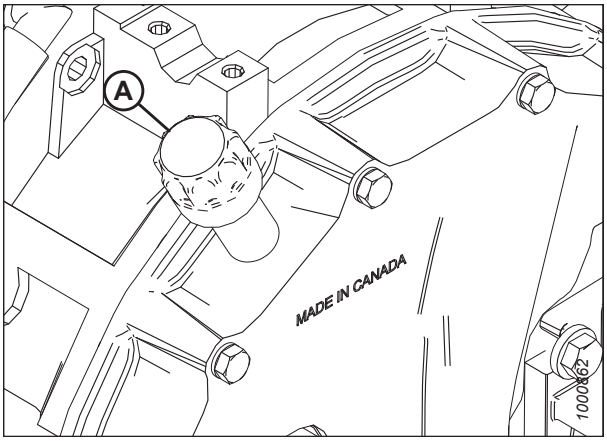


Figure 5.106: Gearbox Breather Cap

Changing Lubricant

The gearbox lubricant will need to be changed according to the interval specified in the maintenance schedule.

CAUTION

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

DANGER

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

NOTE:

The engine should be warm when changing the gearbox lubricant.

1. Shut down the engine, and remove the key from the ignition.
2. Place a drain pan with a capacity of at least 4 liters (1 US gallon) under the gearbox.
3. Remove drain plug (B) and let the oil drain completely.
4. Install drain plug (B) and remove check plug (A).

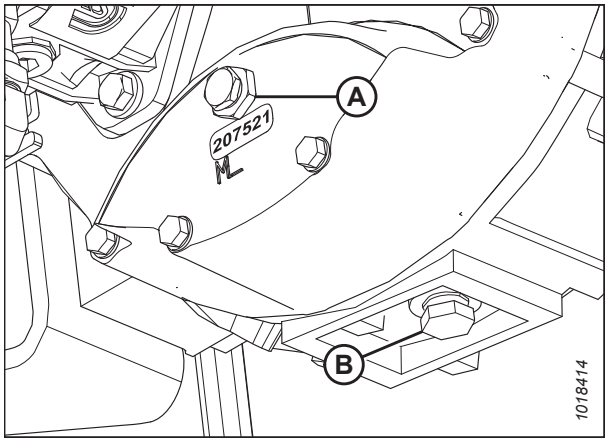


Figure 5.107: Gearbox Lubricant Drain Plug

5. Add lubricant as follows:
   a. Remove breather cap (A) and add lubricant until it runs out the check port. If refilling, add approximately 2.1 liters (2.2 US quarts).
   b. Replace the check plug and the breather cap and tighten them.
   c. Operate the engine at low idle and check for leaks at the check plug and drain plug.

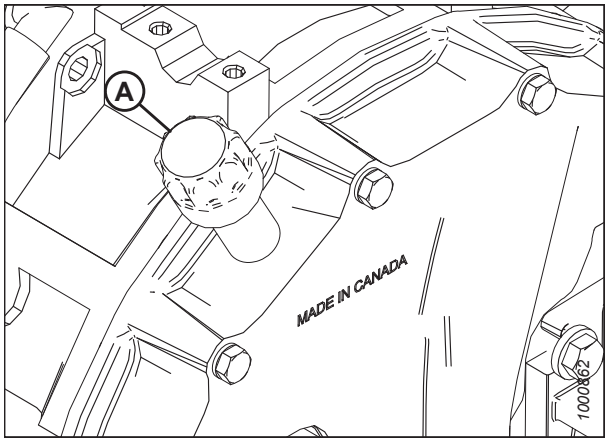


Figure 5.108: Gearbox Breather Cap

5.8.11 Inspecting Exhaust System

The exhaust system includes two exhaust treatment canisters, a bellows tube, and the retaining hardware. In between the two exhaust canisters is a tube with a dosing module (DM) which injects diesel exhaust fluid (DEF) into the exhaust.

CAUTION

The engine exhaust stack may be hot. To avoid burns, do NOT touch the exhaust canister while the engine is running. Allow the exhaust stack to cool before attempting to service it.

The exhaust system requires no regular maintenance, but should be inspected periodically as follows:

1. Open the hood to its highest position. For instructions, refer to *5.3.3 Opening Hood – Highest Position, page 325*.

   IMPORTANT:

   Ensure that the exhaust system is secure. This will reduce the amount of vibration the windrower is subjected to.

2. Inspect the following:

   - Exhaust canisters (A) and bellows tube (B) for dents, cracks, and wear

     NOTE:

     A damaged bellows tube may cause safety issues, and may cause the windrower's computer to derate the engine.

   - Straps (C) for tightness
   - U-bolt (D) and Marman clamps (E) for breakage, cracks, and rust

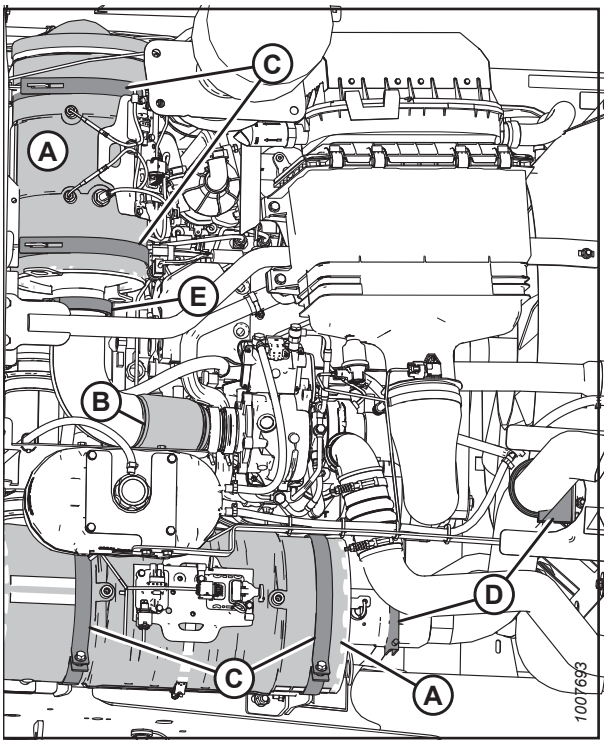


Figure 5.109: Exhaust System

3. Inspect four Marman clamps (A) securing the tubes in between the two exhaust canisters.

   IMPORTANT:

   Do **NOT** modify the exhaust system. See your Dealer for proper replacement parts.

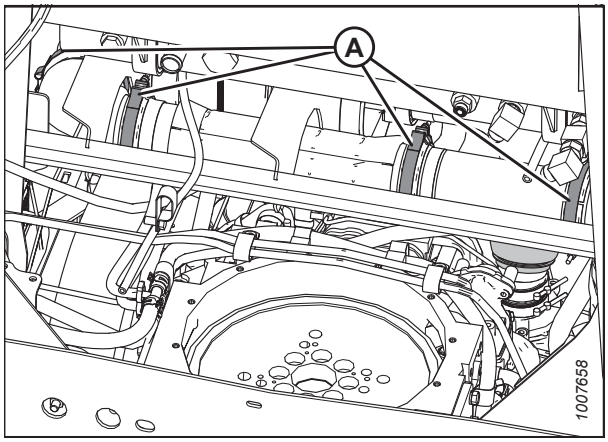


Figure 5.110: Exhaust Canister

4. Inspect the area around clamps (A) for breakage, cracks, and rust-through.

   IMPORTANT:

   If the exhaust is leaking, tighten the clamps to 12–15 Nm (9–11 lbf·ft). If there is an exhaust leak at a Marman connection, replace the seals (refer to the M155*E4* Parts Catalog). Contact your Dealer if the exhaust leak persists.

5. Inspect the exhaust tubing for dents or crushed areas. Damaged tubing creates exhaust flow restriction and increases exhaust back pressure. Even relatively small dents will cause decreased fuel economy and increased wear on the turbocharger. If the dents are large, the higher exhaust temperature will increase the wear on the engine.

5.8.12 Belts

The fan belt and the air conditioner compressor belt will need to be inspected and replaced from time to time.

Tensioning Fan Belt

The engine fan drive belt is automatically tensioned. Manual adjustment is **NOT** required.

Replacing Fan Belt

The fan belt drives the radiator cooling fan. If it is worn or damaged, it should be replaced.

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. Open the left cab-forward platform. For instructions, refer to *5.4.1 Opening Platforms – Standard Position, page 328*.
3. Open the hood. For instructions, refer to *5.3.1 Opening Hood – Lower Position, page 324*.

4. Loosen compressor mounting hardware (B). Push the compressor toward the engine to release the tension on the A/C compressor belt.
5. Remove belt (A) from the compressor.

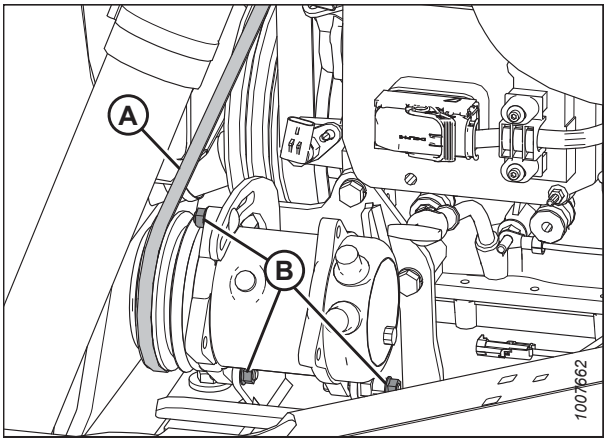


Figure 5.111: A/C Compressor

6. Insert the drive end of a 1/2 in.-drive ratchet wrench into belt tensioner (B).
7. Rotate the tensioner counterclockwise until fan belt (A) can be slipped off of pulley (C). Release the tensioner and remove the wrench.
8. Remove the belt in the order 1–2–3, as shown. Route the fan belt around the fan and remove the belt.
9. Install new belt (A) around the fan and onto the pulleys in the order 3–2–1, as shown.
10. Insert the drive end of a 1/2 in.-drive ratchet wrench into belt tensioner (B).
11. Rotate the tensioner counterclockwise until belt (A) can be slipped onto pulley (C). Release the tensioner and remove the wrench.
12. Ensure that the belt is properly seated in all pulley grooves.
13. Reinstall compressor belt (A).
14. Tension the compressor belt. For instructions, refer to *Tensioning Air Conditioner Compressor Belt, page 392*.
15. Close the hood. For instructions, refer to *5.3.2 Closing Hood – Lower Position, page 325*.
16. Close the platform. For instructions, refer to *5.4.2 Closing Platforms – Standard Position, page 329*.

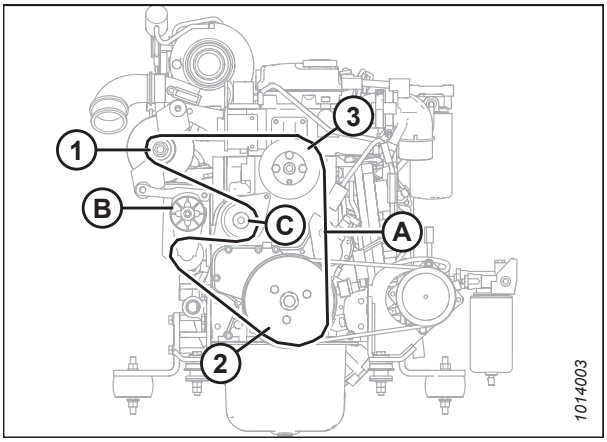


Figure 5.112: Engine Belts

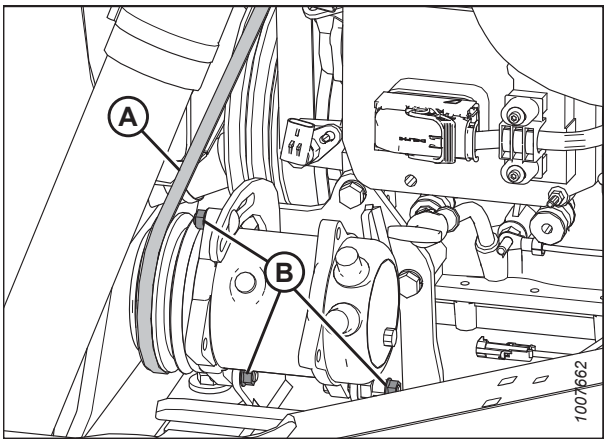


Figure 5.113: A/C Compressor

Replacing Air Conditioner Compressor Belt

If the air conditioner compressor belt shows evidence of wear or damage, it will need to be replaced.

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. Open the hood to the lower position. For instructions, refer to *5.3.1 Opening Hood – Lower Position, page 324*.
3. Loosen compressor mounting hardware (B). Push the compressor toward the engine to release the tension on the A/C compressor belt.
4. Remove belt (A) from the compressor.
5. Install new compressor belt (A).
6. Tension the compressor belt. For instructions, refer to *Tensioning Air Conditioner Compressor Belt, page 392*.
7. Close the hood. For instructions, refer to *5.3.2 Closing Hood – Lower Position, page 325*.

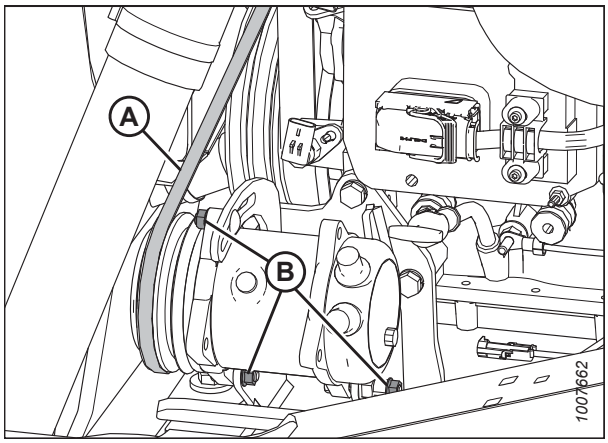


Figure 5.114: A/C Compressor

Tensioning Air Conditioner Compressor Belt

During the first few hours of windrower operation, and after being replaced, the air conditioner compressor belt will need to be tensioned.

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. Open the hood to the lower position. For instructions, refer to *5.3.1 Opening Hood – Lower Position, page 324*.
3. Loosen compressor mounting hardware (B).
4. Pry the compressor away from the engine so that a force of 35–55 N (8–12 lbf) applied to the midspan of belt (A) causes a deflection of 5 mm (3/16 in.).
5. Tighten compressor mounting hardware (B).
6. Recheck the belt tension. Repeat this procedure as needed.
7. Close the hood from the lower position. For instructions, refer to *5.3.2 Closing Hood – Lower Position, page 325*.

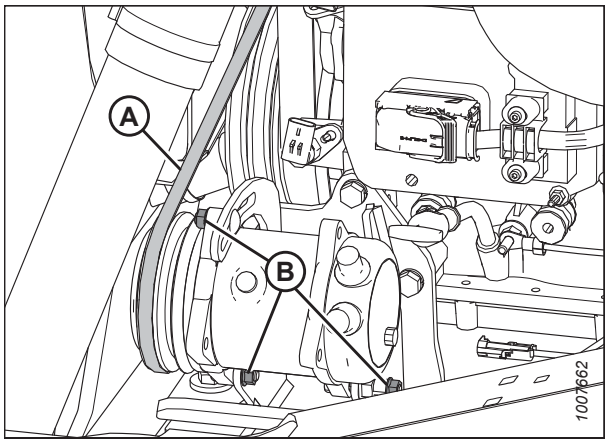


Figure 5.115: A/C Compressor

5.8.13 Engine Speed

The engine's idle and maximum speeds are factory set.

Refer to *2.2 Specifications, page 31* for detailed information on the factory-set engine speeds. If your windrower's engine is unable to maintain the specified speeds, contact your MacDon Dealer.

IMPORTANT:

Do **NOT** remove any seals from the injector pump. Removal of seals will void the engine's warranty.

To configure the engine's intermediate speed control function, refer to *Engine Intermediate Speed Control, page 173*.

Throttle Adjustment

The engine speed is controlled by a throttle lever connected to an electronic sensor inside the console.

The throttle lever in the cab should be able to move the throttle sensor through its full range without contacting the console at any point.

If the throttle lever is contacting the console and interferes with the specified engine speeds, the sensor position may need adjustment. Contact your MacDon Dealer for more information.

5.9 Maintaining Engine Cooling Box

The windrower engine cooling box components should be cleaned daily, and more frequently in severe dust conditions.

Refer to the following list of procedures before attempting to perform maintenance on the engine cooling box components:

5.9.1 Opening Cooler Box Screen

The cooler box screen will need to be opened in for the cooler box to be cleaned.

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. Open the hood. For instructions, refer to *5.3.3 Opening Hood – Highest Position, page 325*.
3. Push latch (A) and open screen assembly access door (B). Secure the access door using the rod, which is stored inside the screen door.

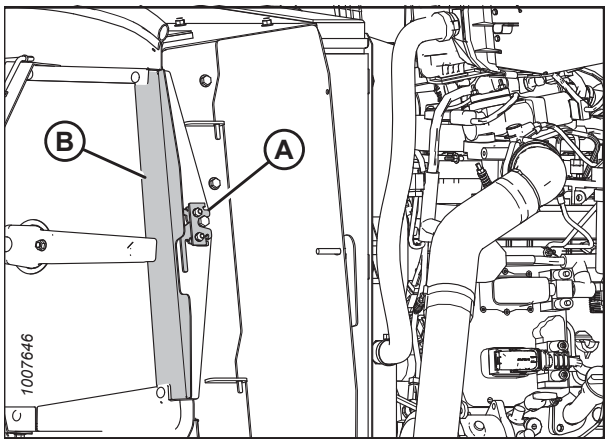


Figure 5.116: Engine Cooling System

5.9.2 Cleaning Screens and Coolers

When the engine is running, two electrically-driven rotors and suction from the engine's cooling fan sweep and vacuum debris away from the cooling box screen. If the screen is not being cleaned, the rotors or ducts may be plugged.

NOTE:

The following procedure demonstrates how to clean the screens on one side of the engine bay. The procedure for cleaning the other side is similar.

1. Open the hood. For instructions, refer to *5.3.3 Opening Hood – Highest Position, page 325*.

2. Remove nuts (B).
3. Pivot screen cleaner assembly (C) away from the screen.
4. Blow debris away from cleaner duct (A) using compressed air.
5. If the duct is plugged, open the cooler box screen. For instructions, refer to *5.9.1 Opening Cooler Box Screen, page 394*.

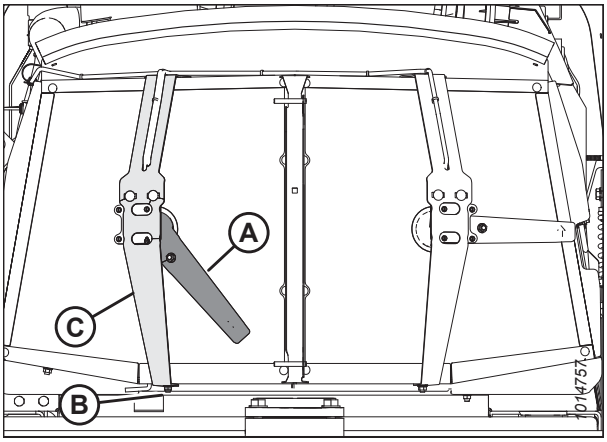


Figure 5.117: Screen Cleaner Assembly

6. Blow debris out of duct (A) using compressed air.
7. Clean the screen using compressed air.

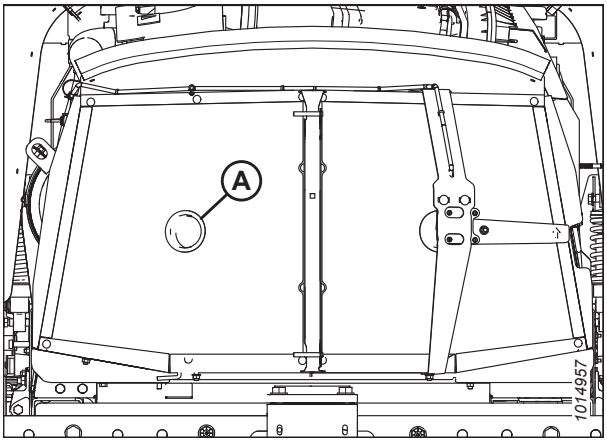


Figure 5.118: Cooler Box Screen

8. Move screen cleaner assembly (C) back into position. Secure it with bolts and nuts (B).
9. Check the clearance between duct (A) and the screen. For instructions, refer to *5.9.4 Adjusting Screen Cleaner Rotor to Screen Clearance, page 398*.
10. Close the cooler box screen. For instructions, refer to *5.9.5 Closing Cooler Box Screen, page 398*.
11. Close the hood. For instructions, refer to *5.3.4 Closing Hood – Highest Position, page 327*.

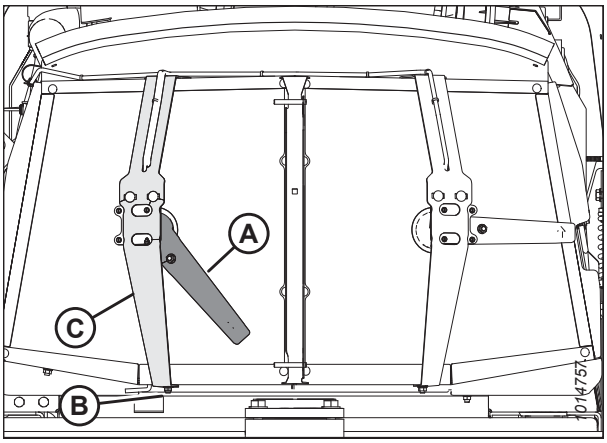


Figure 5.119: Screen Cleaner Assembly

5.9.3 Cleaning Cooler Box Components

The radiator and oil cooler should be cleaned daily with compressed air. More frequent cleaning may be necessary in severe conditions. The charge air cooler and air conditioning (A/C) condenser may also be cleaned at the same time.

1. Open the cooler box screen. For instructions, refer to *5.9.1 Opening Cooler Box Screen, page 394*.
2. Lift latch (A) and open right access door (B).

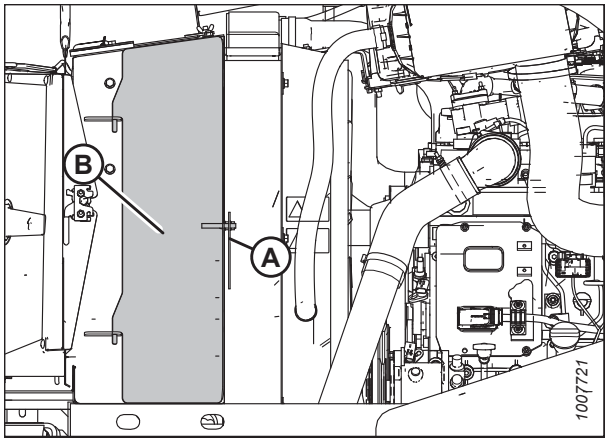


Figure 5.120: Right Cooler Access Door

3. Slide out oil cooler / air conditioning condenser assembly (A).

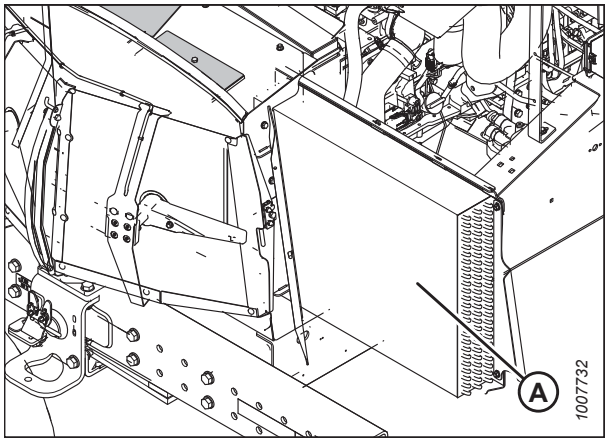


Figure 5.121: A/C Condenser Assembly

4. Lift latch (A) and open left access door (B).

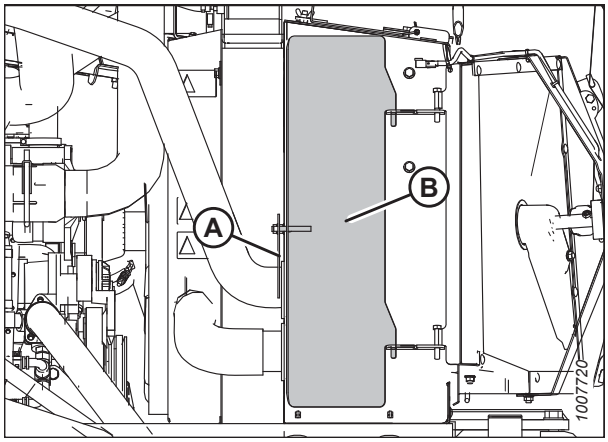


Figure 5.122: Left Cooler Access Door

5. Remove wing nut (A) and open access door (B) on the top of the cooling box.

   IMPORTANT:

   Avoid bending the cooler fins when performing this procedure. Bent fins cool less efficiently.

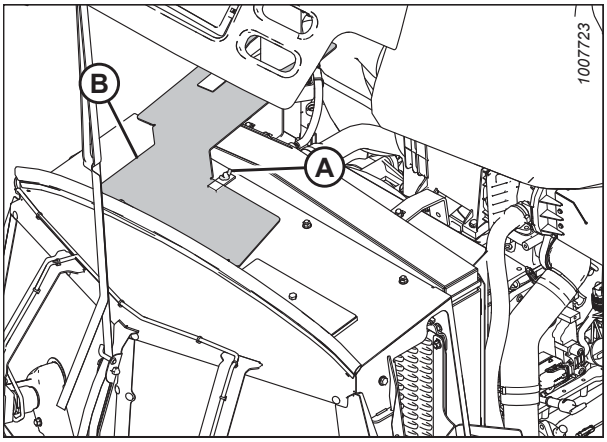


Figure 5.123: Cooling Box Access Door

6. Clean radiator (A) using compressed air. You can access the radiator through the access hole in the cooling box.
7. Clean oil cooler / air conditioning condenser (B), charge air cooler (C), and cooling box (D) using compressed air.
8. Inspect all lines and coolers for evidence of leaks and damage.
9. Slide oil cooler / air conditioning condenser (B) back into cooling box (D).
10. Close the side access door. Lock it with the lever.
11. Close the access door on top of the cooling box. Secure it with the wing nut.
12. Close the cooler box screen. For instructions, refer to *5.9.5 Closing Cooler Box Screen, page 398*.

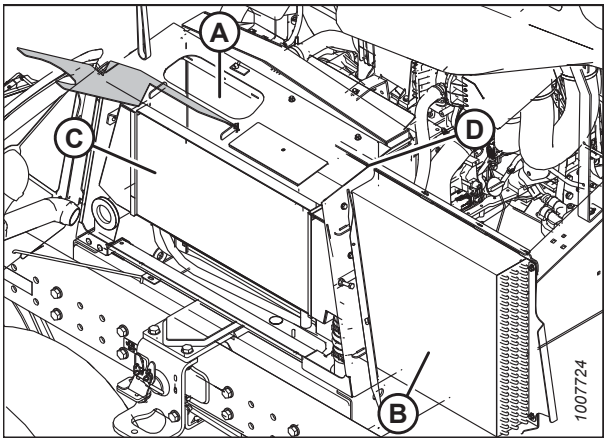


Figure 5.124: Engine Cooling System

5.9.4 Adjusting Screen Cleaner Rotor to Screen Clearance

For the cooler box's screen cleaners to work effectively, the proper clearance between the trailing edge of the screen cleaner rotor and the screen must be maintained.

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. Open the hood to the lower position. For instructions, refer to *5.3.1 Opening Hood – Lower Position, page 324*.

   NOTE:

   The screen cleaner rotors rotate counterclockwise. It is acceptable for the rotors to touch the screen, so long as their rotation is not slowed or obstructed.
3. Loosen nut (B) on motor support (C).
4. Move the support in or out until duct (A) is 2–6 mm (0.079–0.236 in.) from the screen near the center.
5. Tighten nut (B).
6. Loosen two motor mount bolts (D).
7. Move motor/duct assembly (E) until there is a gap of 1–8 mm (0.039–0.314 in.) between the screen and the rotor when it is fully rotated.
8. Tighten nuts (D) on the motor mount.
9. Close the hood. For instructions, refer to *5.3.2 Closing Hood – Lower Position, page 325*.

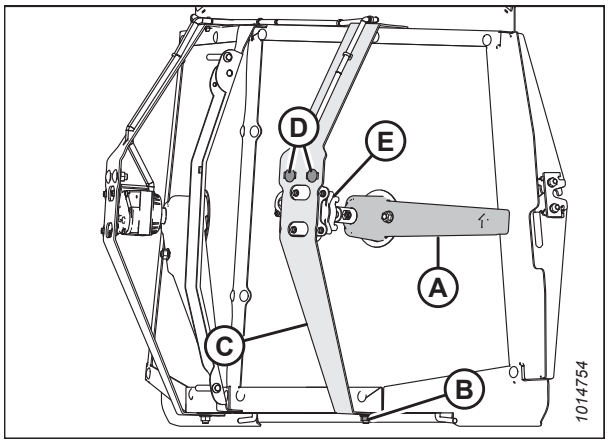


Figure 5.125: Screen Cleaner

5.9.5 Closing Cooler Box Screen

Once you are finished maintaining or servicing the cooler box, close the cooler box screen.

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. Unhook the support rod and store it in the screen door. Close screen access door (B) and engage latch (A).

3. Close the hood. For instructions, refer to *5.3.4 Closing Hood – Highest Position, page 327*.

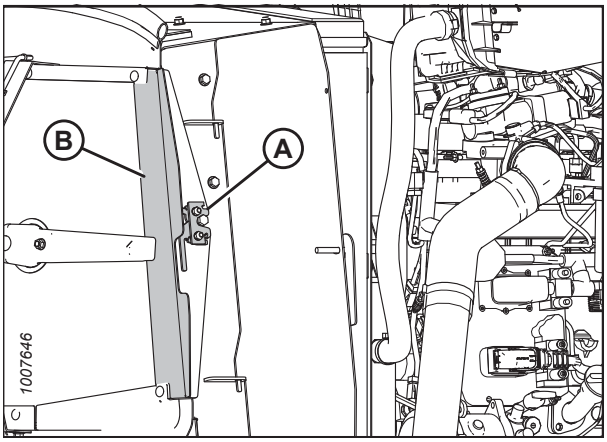


Figure 5.126: Engine Cooling System

5.10 Electrical System

Refer to this section for information on maintaining the windrower's battery, lights, and the circuit breaker and fuses.

5.10.1 Preventing Electrical System Damage

The windrower's electrical system can be damaged if the correct procedures are not followed when the windrower is serviced.

To prevent damage to the electrical system, take the following precautions:

- When connecting a booster battery to the windrower's battery, ensure that the leads are connected to the proper terminals and grounding points.
- Do **NOT** short across the battery or the alternator terminals, or allow the battery's positive (+) cable or alternator wire to become grounded.
- Ensure that the connections from the alternator to the battery are correct before connecting the battery to the windrower.
- When welding on any part of the machine, disconnect the battery cables and alternator wire. For instructions, refer to *1.8 Welding Precautions, page 10*.
- Always disconnect the battery's ground cable when working with the alternator or the regulator.
- Do **NOT** attempt to polarize the alternator or regulator.
- If wires are disconnected from the alternator, ensure that terminals (A) and (B) are reconnected properly.
- Do **NOT** ground the alternator's field terminal or the field.
- Do **NOT** connect or disconnect the alternator or the regulator wires when the battery is connected or when the alternator is operating.
- Always disconnect the battery's connection to the windrower when using a charger to charge the battery.
- Ensure that all cables are securely connected before operating the engine.
- To prevent damage to the windrower's circuitry, disconnect the negative battery terminal when replacing an electronic control module. Additionally, when handling an electronic control module, avoid touching the connector pins directly.

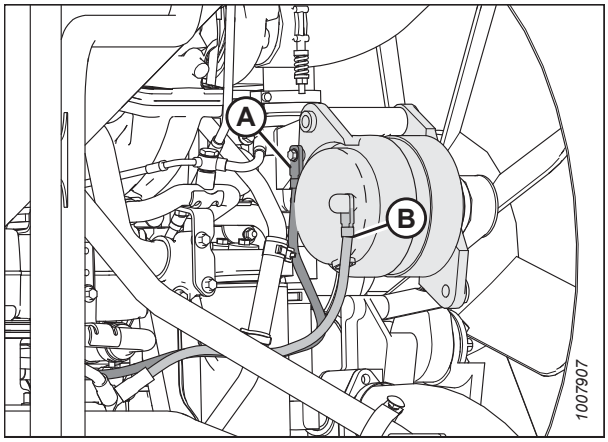


Figure 5.127: Alternator

A - Negative Terminal **B - Positive Terminal**

5.10.2 Battery

The windrower is equipped with a pair of batteries, which are used to start the windrower and to power its electrical system. Follow these recommendations to ensure the service life of the batteries.

Maintaining Batteries

To ensure the service life of the windrower's batteries, follow these recommendations.

CAUTION

Do NOT attempt to service the battery unless you have the proper equipment and the training necessary to perform the task. Contact your MacDon Dealer if the electrical system requires service.

- Measure the battery's charge once a year, or more often if the windrower regularly operates in cold weather. Hydrometer readings should range between 1.260 and 1.300. Readings below 1.250 indicate that charging is required. For instructions, refer to *Charging Batteries, page 402*. The battery may also require additional electrolyte fluid. For instructions, refer to *Adding Electrolyte to Batteries, page 404*.
- Keep the battery case clean. To clean the case, wipe it with a damp cloth.
- Keep all connections to the battery clean. If there is corrosion on the battery terminals, apply a paste of baking soda and water to the terminals and scrub them with a brush. A light coating of grease applied to the terminals after the cables are attached will reduce the future occurrence of corrosion.
- To safely store a battery: store it in an upright position, fully charged, in a dry area, at a temperature between -7° and +26°C (+20° to +80°F).
- Do **NOT** stack batteries on top of each other, unless the batteries are placed in cartons first.
- Test batteries every 4–6 months. Recharge them if necessary.

Battery Main Disconnect Switch

The battery's main disconnect switch is located on the right cab-forward side frame rail, just behind the batteries. It can be accessed by moving the maintenance platform.

Move switch (A) to the POWER OFF position when servicing electrical components. Doing so will help prevent the loss of battery charge when the windrower will not be used for periods longer than 1 week.

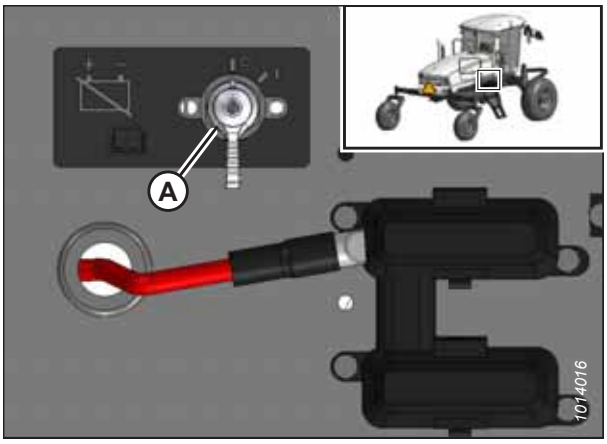


Figure 5.128: Battery Main Disconnect Switch

Charging Batteries

Charging a battery can be dangerous, if the proper procedures are not followed. Familiarize yourself with this information before attempting to charge a battery.

CAUTION

- **Ventilate the area where the batteries will be charged.**
- **Do NOT charge a frozen battery. Warm the battery to 16°C (60°F) before attempting to charge it.**
- **Do NOT connect or disconnect live circuits.**
- **To prevent sparks, turn off the charger before attempting to connect the leads to the battery. Connect the positive cable first.**
- **Wear safety glasses when working with batteries.**
- **If charging the battery in the windrower, disconnect the positive battery cable before connecting the charger cable. Connect the ground cable last.**
- **Stop charging the battery, or reduce the charging rate, if the battery feels hot or is venting electrolyte fluid. The battery's temperature must NOT exceed 52°C (125°F).**
- **The maximum charge rate in amperes should be NO MORE than 1/3 of the battery's reserve capacity rating. If the terminal voltage exceeds 16.0 volts while the battery is being charged, reduce the charging rate. Continue charging the battery. Reduce the charging rate as needed until the voltage does not increase and the current does not decrease in a two-hour period.**

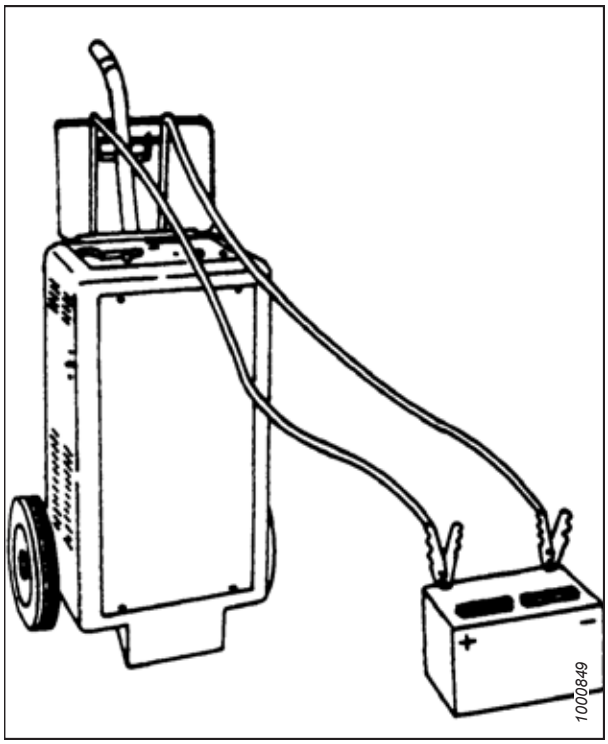


Figure 5.129: Charging a Battery

Table 5.1 Voltage Chart

Voltage	State of Charge (%)	Approximate Battery Charging Time[33] to Full Charge at 27°C/80°F (Minutes)			
Standard Battery		Maximum Rate at (Amps)			
12 Volts		50	30	20	10
12.6	100	— FULL CHARGE —			
12.4	75	20	35	48	90
12.2	50	45	75	95	180
12.0	25	65	115	145	280
11.8	0	85	150	195	370

33. The charging time depends upon the's battery capacity, condition, age, temperature, and on the efficiency of the charger.

WARNING

- **Gel and absorbent glass mat (AGM) batteries require a voltage-limited charger. Charging a gel or AGM battery on a typical shop charger—even one time—may shorten its service life.**
- **If the electrolyte fluid is accessible, verify that the plates are covered before attempting to charge the battery. At the end of the charge, add distilled water as needed. If fluid is added, charge the battery for an additional 30 minutes. If the electrolyte levels are low, but the battery is sealed, discard the battery.**

CAUTION

Follow all instructions and precautions provided by the battery charger's manufacturer, in addition to the following precautions:

- **Charge the battery at the recommended rates and times.**
- **Turn off the charger prior to attaching it to the battery.**
- **Wear safety glasses when working with batteries.**
- **The maximum charge rate in amperes should be NO MORE than 1/3 of the battery's reserve capacity rating. If the terminal voltage exceeds 16.0 volts while the battery is being charged, reduce the charging rate. Continue charging the battery. Reduce the charging rate as needed until the voltage does not increase and the current does not decrease in a two-hour period.**
- **If the battery case gets hot during charging or emits large amount of gasses, stop charging the battery and investigate.**

IMPORTANT:

NEVER overcharge batteries. Excessive charging will shorten battery life.

To charge a battery, follow these steps:

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Move the platform on the right cab-forward side of machine to the open position. For instructions, refer to *5.4.1 Opening Platforms – Standard Position, page 328*.
3. Remove red plastic covers (A) from the positive cable clamps.
4. Remove black plastic covers (B) from the negative terminals.
5. If charging the battery while it is connected to the windrower's electrical system, disconnect **POSITIVE** battery cable (A), then connect the charger cable to the positive post, then connect the charger's ground cable to the engine block.
6. Charge the batteries in accordance with the charger manufacturer's instructions.
7. Close the platform. For instructions, refer to *5.4.2 Closing Platforms – Standard Position, page 329*.

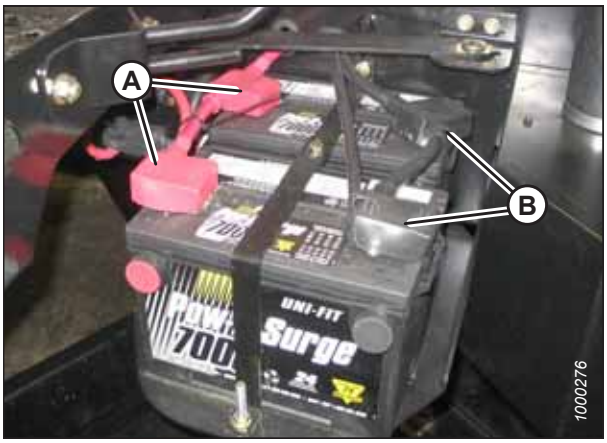


Figure 5.130: Battery Terminal Location

Boosting Battery

Boosting the windrower's batteries involves connecting the batteries to another vehicle's battery system.

CAUTION

- **The gas emitted by batteries is explosive. Keep sparks and flames away from batteries.**
- **Wear protective eyewear when using a booster battery.**
- **Ensure that bystanders are clear of the machine before starting the engine. Start the engine from the operator's station.**

1. Remove the red rubber cover from boost post (A) on the windrower frame.
2. Attach one end of the battery cable to the positive (+) terminal of the booster battery, and the other end to positive boost post (A) on the windrower frame.
3. Attach one end of the second cable to the negative (–) terminal of the booster battery, and the other end to ground post (B) on the windrower frame.
4. Start the engine.
5. After the engine starts, disconnect the cable from windrower ground post (B) first, and then disconnect the other end of the cable from the negative (–) terminal of the booster battery.
6. Disconnect the cable from the positive (+) terminal of the booster battery, and then disconnect the other end of the cable from positive boost post (A) on the windrower frame.
7. Replace the rubber cover on boost post (A).
8. Close the hood. For instructions, refer to *5.3.2 Closing Hood – Lower Position, page 325*.

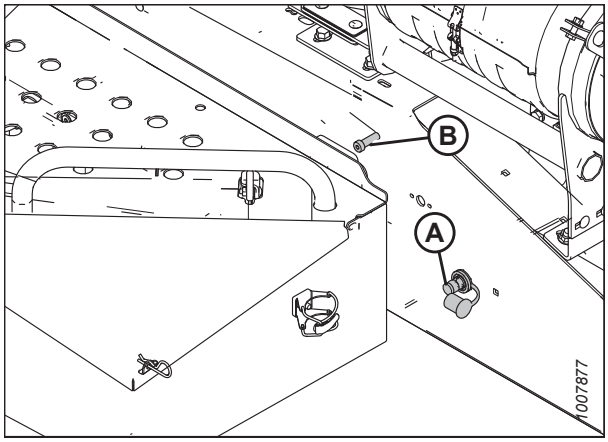


Figure 5.131: Battery Boost Posts

Adding Electrolyte to Batteries

Electrolyte fluid can be added to the battery's cells, if needed.

CAUTION

Do NOT attempt to service a battery unless you have the proper equipment and training for the task. Have the windrower's batteries serviced by a MacDon Dealer.

WARNING

Keep all smoking materials, sparks, and flames away from the electrolyte container and the battery. The gas emitted by a battery represents an explosion hazard.

Figure 5.132: Battery Safety Hazard

WARNING

- **Battery electrolyte causes severe burns. Avoid contact with your skin, eyes, or clothing. Wear protective eyewear and heavy gloves when handling electrolyte fluid.**
- **If electrolyte is spilled or splashed on clothing or on the body, neutralize it immediately with a solution of baking soda and water, then rinse the contaminated area with clean water.**
- **Electrolyte splashed into the eyes is extremely dangerous. Should this occur, force the eye open and flood it with cool, clean water for five minutes. Call a doctor immediately.**

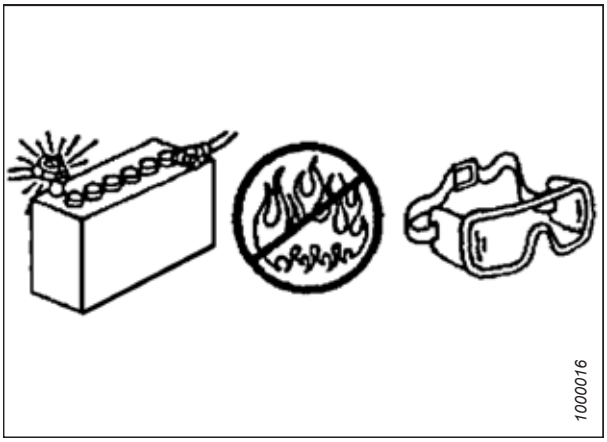


Figure 5.133: Battery Safety

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Move the platform on the left cab-forward side of the machine to the open position. For instructions, refer to *5.4.1 Opening Platforms – Standard Position, page 328*.
3. Add the electrolyte in accordance with the battery manufacturer's instructions.
4. Close the platform. For instructions, refer to *5.4.2 Closing Platforms – Standard Position, page 329*.

Removing Batteries

The windrower's batteries may need to be removed for service, storage, or replacement.

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

Do NOT attempt to service a battery unless you have the proper equipment and training for the task. Have the windrower's batteries serviced by a MacDon Dealer.

1. Shut down the engine, and remove the key from the ignition.
2. Move the platform on the right cab-forward side of the machine to the open position. For instructions, refer to *5.4.1 Opening Platforms – Standard Position, page 328*.
3. Ensure battery main disconnect switch (A) is turned to the POWER OFF position.

   NOTE:

   The battery main disconnect switch is located on the right frame rail beside the batteries.

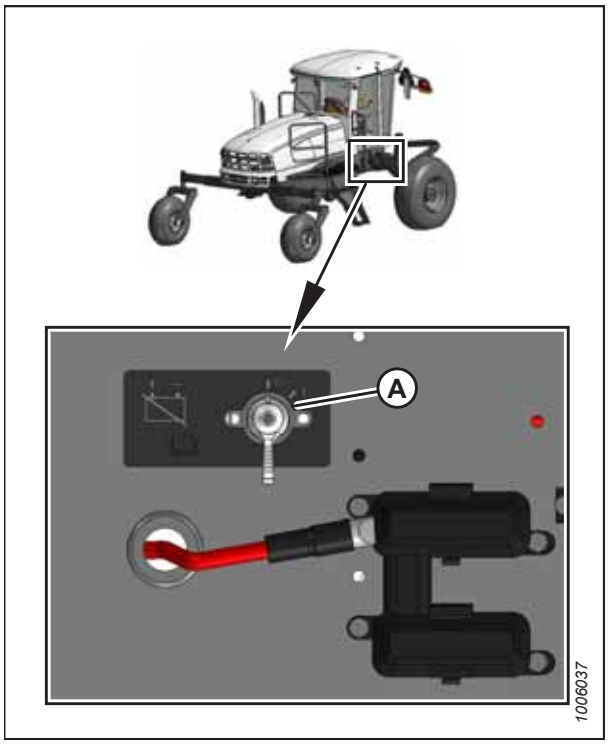


Figure 5.134: Battery Main Disconnect Switch

4. Remove bolt (A) securing the platform arm to the platform. Swing arm (B) out of the way.
5. Remove the black plastic covers from negative cable clamps (D). Loosen the clamps and disconnect the cable from the batteries.
6. Remove the red plastic covers from positive cable clamps (C). Loosen the clamps and disconnect the cable from the batteries.
7. Remove bolts (E) securing strap (F) to the frame, and remove the strap.

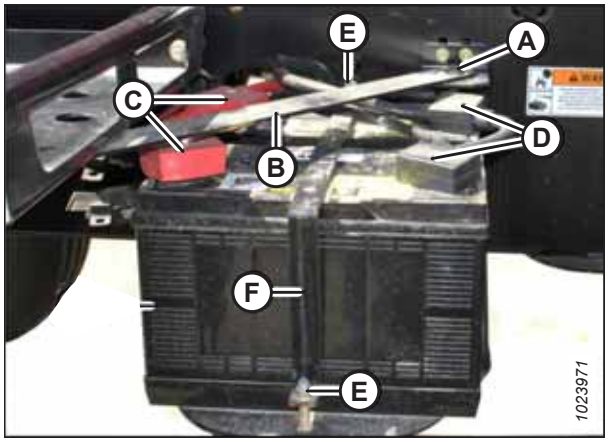


Figure 5.135: Batteries

8. Lift the batteries off of holder (A).

   IMPORTANT:

   - Store the batteries in a cool, dry area in an upright position.
   - Do **NOT** stack batteries on top of each other unless they are in cartons.
   - Test wet batteries every 4–6 months. Recharge them if necessary.

   NOTE:

   The dual battery support can be removed from the frame by simply lifting the support, and pulling it away from the frame.

Figure 5.136: Battery Holder

Installing Batteries

The batteries must be placed in the windrower's dual battery support tray and connected to the windrower's electrical system.

Replacement batteries must meet the specifications shown in the following table:

Table 5.2 Battery Specification

Rating	Group	CCA (min)	Volt	Maximum Dimension
Heavy duty, off-road, vibration resistant	BCI 29H or 31A	650	12	334 x 188 x 232 mm (13.25 x 7.37 x 9.44 in.)

1. Ensure that battery main disconnect switch (A) is turned to the POWER OFF position.

   NOTE:

   The battery main disconnect switch is located on the right frame rail beside the batteries.

2. Open the right cab-forward platform to access the batteries. For instructions, refer to *5.4.1 Opening Platforms – Standard Position, page 328*.

3. Remove the cable ties securing the battery cables to the battery clamp.

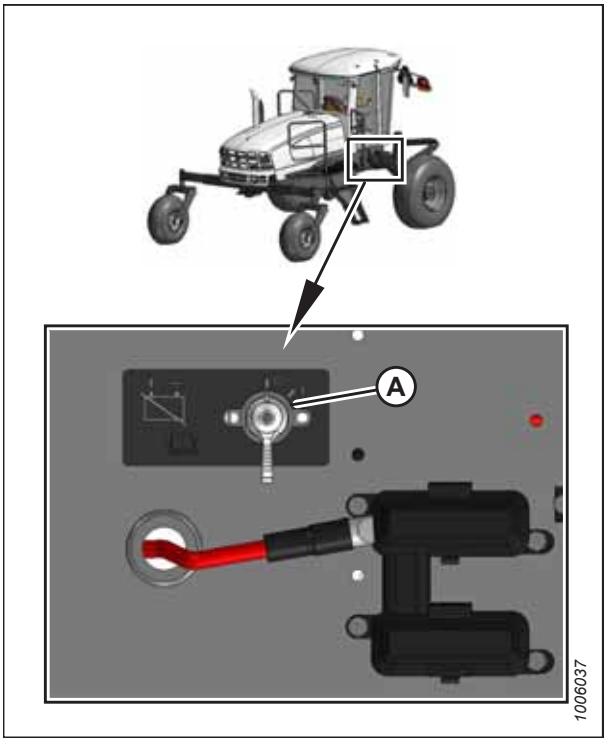


Figure 5.137: Battery Main Disconnect Switch

4. Position new batteries (G) on the dual battery support.

   NOTE:

   Ensure that the batteries are positioned so that positive posts (C) face aft.

5. Secure strap (F) with bolts (E).

6. Rotate platform support bar (B) into position and secure it with bolt (A).

7. Connect the battery cables to positive post (C) and negative post (D). For instructions, refer to *Connecting Batteries, page 408*.

8. Close the platform. For instructions, refer to *5.4.2 Closing Platforms – Standard Position, page 329*.

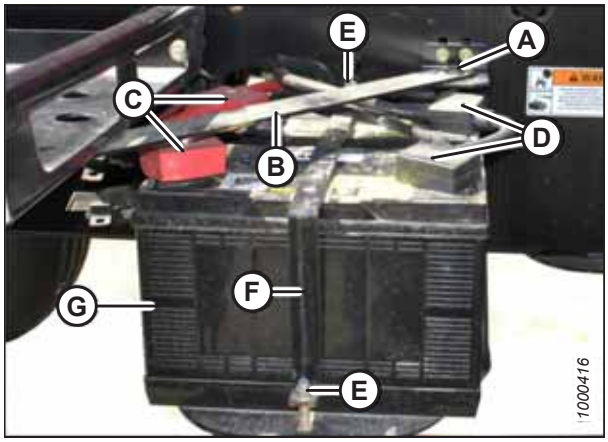


Figure 5.138: Batteries

Connecting Batteries

Once the batteries have been secured in the windrower's dual support tray, they can be connected to the windrower's electrical system.

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. Open the right cab-forward maintenance platform. For instructions, refer to *5.4.1 Opening Platforms (Standard Position), page 328*.

2. Ensure battery main disconnect switch (A) is turned to the POWER OFF position.

   NOTE:

   The battery main disconnect switch is located on the right frame rail beside the batteries.

3. Remove the cable ties securing the battery cables to the battery clamps.

   IMPORTANT:

   The batteries are negative grounded. Always connect the red starter cables to the positive (+) terminals of the batteries and the black ground cables to the negative (–) terminals of the batteries. Reversed polarity in the batteries or alternator may result in permanent damage to the electrical system.

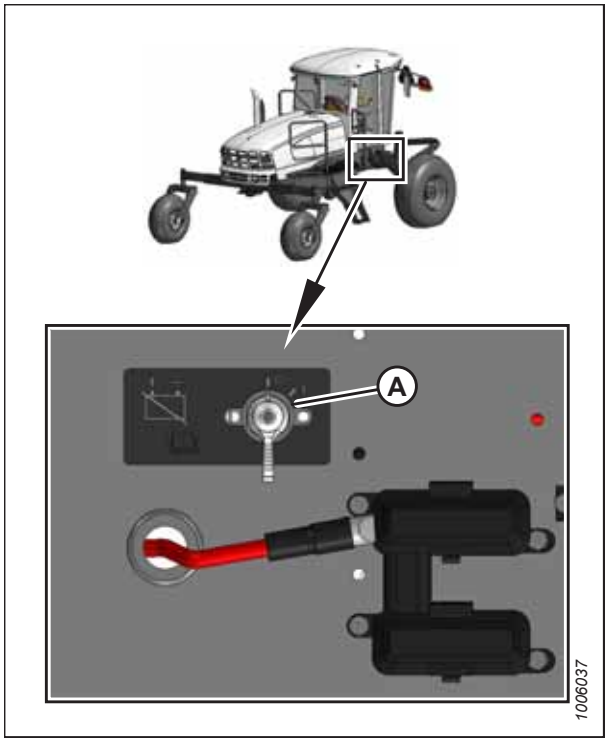


Figure 5.139: Battery Main Disconnect Switch

4. Remove the plastic caps from the battery posts.
5. Attach the red positive (+) cable terminals to positive posts (A) on the batteries and tighten the clamps. Reposition the plastic covers onto the clamps.
6. Attach the black negative (–) cable terminals to negative posts (B) on the batteries and tighten the clamps. Reposition the plastic covers onto the clamps.
7. Turn the battery main disconnect switch to the POWER ON position.
8. Close the platform. For instructions, refer to *5.4.2 Closing Platforms – Standard Position, page 329*.

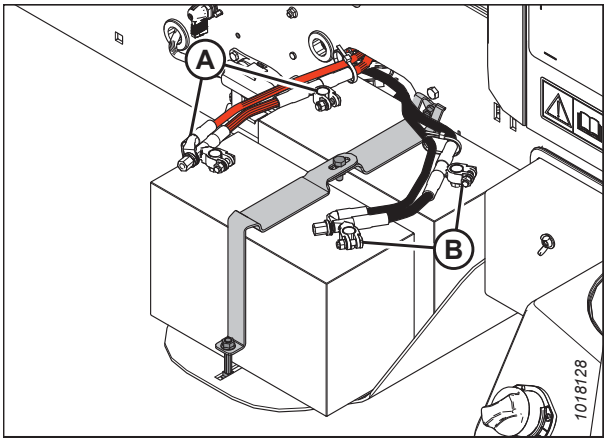


Figure 5.140: Batteries

5.10.3 Headlights – Engine-Forward

These lights sit at the end of the engine compartment. They are used as headlights when the windrower is operating in engine-forward mode.

Aligning Headlights

The headlights should be positioned so that they illuminate the area in front of the windrower without impairing the vision of those facing the headlights.

DANGER

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

NOTE:

When aligning the headlights, a header should be attached to the windrower and raised. This will ensure that the headlights are aligned for operating conditions.

1. Park the windrower on level ground in front of a vertical surface such as a wall, so that the headlights sit 7.5 m (25 ft.) away from the surface.
2. Shut down the engine, and remove the key from the ignition.

3. Turn on ROAD lights (A) and set HIGH-LOW switch (B) to LOW BEAM.

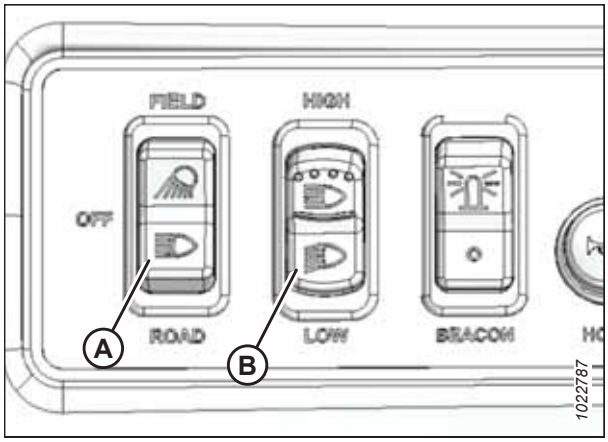


Figure 5.141: Road Light Switch – All Countries Except Russia

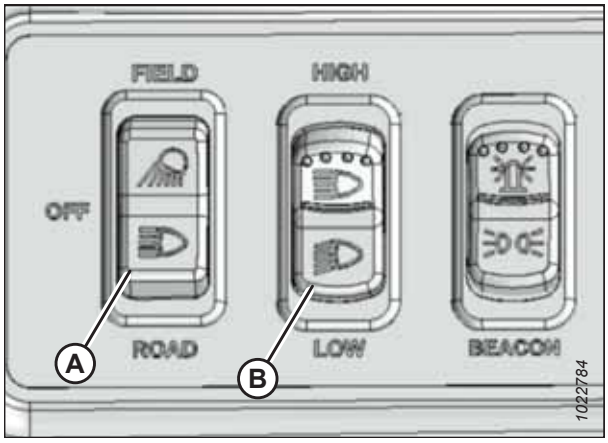


Figure 5.142: Road Light Switch – Russia Only

4. To align the headlights, you will need to tighten or loosen any or all of adjusting screws (A). Ensure that the beam remains centered when making adjustments.

   NOTE:

   The adjustments made apply only to the headlights when they are in low-beam mode.

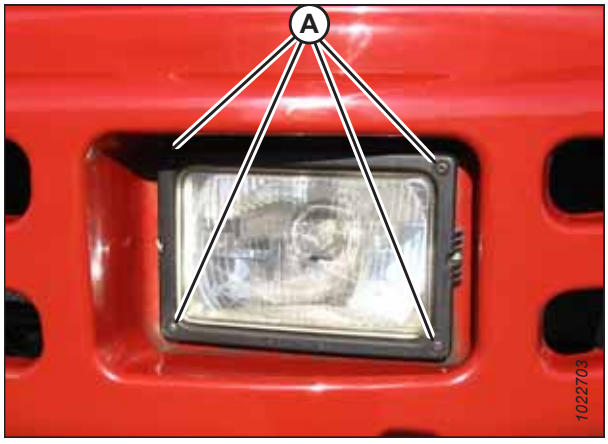


Figure 5.143: Headlights

5. Adjust the headlight so that upper edge (C) of the light beam does not rise higher than 1263 mm (49 3/4 in.) (dimension [A]) above the ground (indicated by [E]). Refer to the illustration for details. Ensure that center line (D) is maintained as shown.

   NOTE:

   This measurement is only applicable while the headlight sits 7.5 m (25 ft.) from a vertical surface such as a wall (dimension [B]).

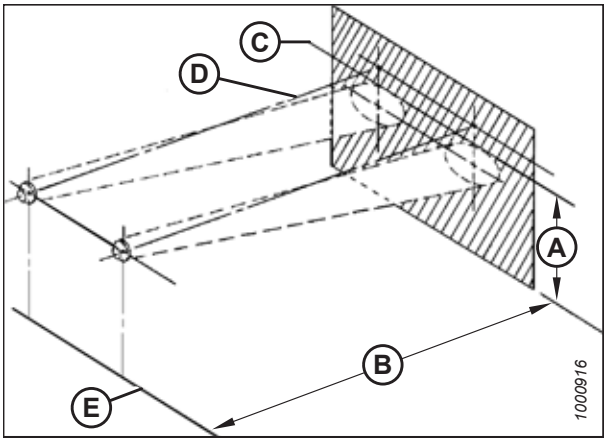


Figure 5.144: Headlight Beam Positioning

A - 1263 mm (49 3/4 in.) – distance between top of light beam and ground
B - 7.5 m (25 ft.) – distance between the headlight and the vertical surface
C - Upper edge of beam
D - Center line, projected outward from headlight
E - Ground

Replacing Headlight Bulb

If a headlight bulb is burnt out or damaged, it will need to be replaced.

Use part MD #110267 to replace burnt out or damaged headlight bulbs.

1. Remove two screws (A). Remove the headlight assembly from the hood.

Figure 5.145: Headlight

2. Detach the wiring harness connector from the headlight assembly. Remove rubber insulator boot (A).

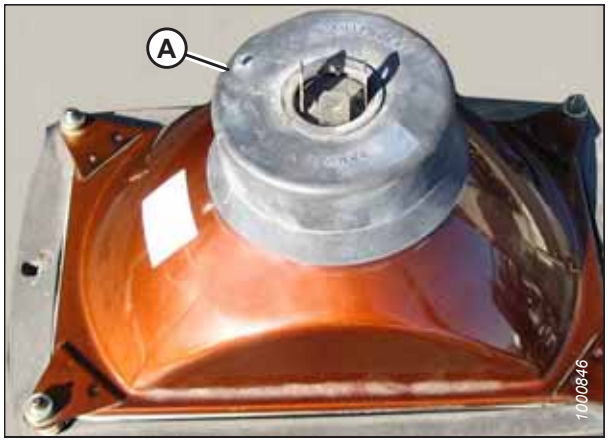


Figure 5.146: Headlight Assembly

3. Pinch wire retainer (A) and lift it away from the hooks.
4. Remove bulb (B) from the headlight body.

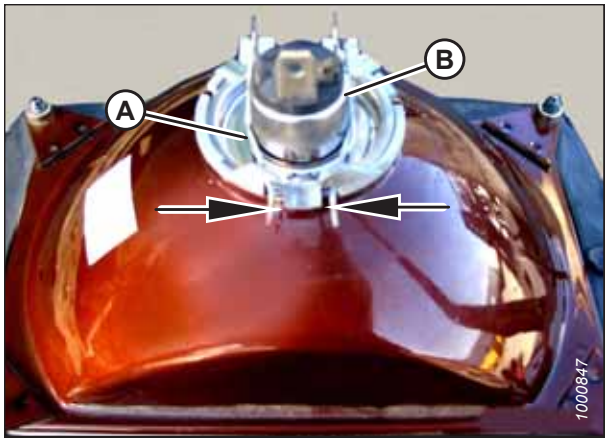


Figure 5.147: Headlight Assembly

5. Retrieve the new headlight. Align lugs (B) on the new bulb with slots (C) in the body, and push the new headlight into place.

   IMPORTANT:

   Do **NOT** touch the glass of the new light bulb when installing it into the headlight body. Contaminants on the surface of the bulb can cause hot spots, which can cause the bulb to fail prematurely. Use a cloth or gloves when installing the new bulb.

6. Secure the bulb with wire retainer (A).

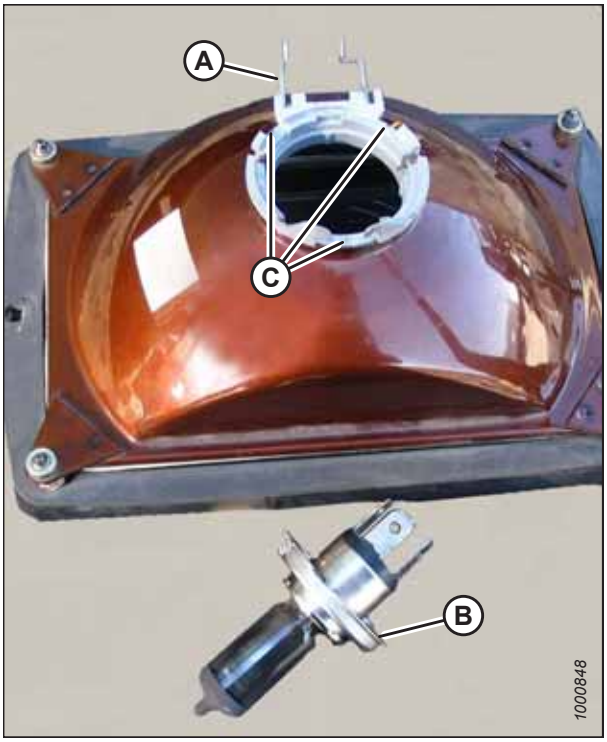


Figure 5.148: Headlight Assembly

7. Replace rubber insulator boot (A).

8. Push the connector onto the light bulb.

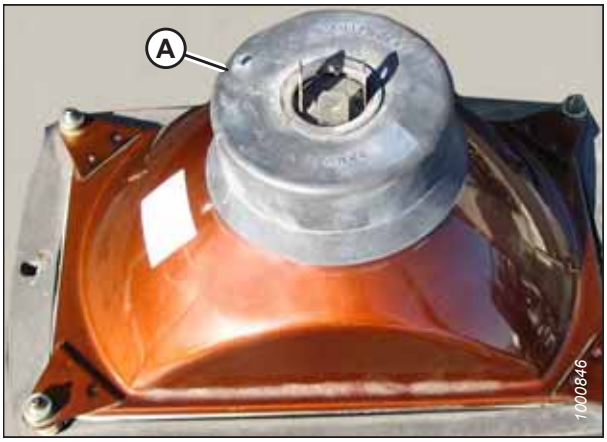


Figure 5.149: Headlight Assembly

9. Position the headlight into the light receptacle, ensuring that the housing is oriented correctly. Secure the housing with screws (A). To align the headlights, refer to *Aligning Headlights, page 409*.

Figure 5.150: Headlight

5.10.4 Field Lights – Cab-Forward

The field lights allow the Operator to see the header and the area immediately around the windrower when the windrower is operating in cab-forward mode.

Adjusting Field Lights

The field lights should be adjusted in conditions which resemble the windrower's real-world operating conditions.

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. Holding onto handholds (A) on the cab's front corners, stand on the header's anti-slip strips.

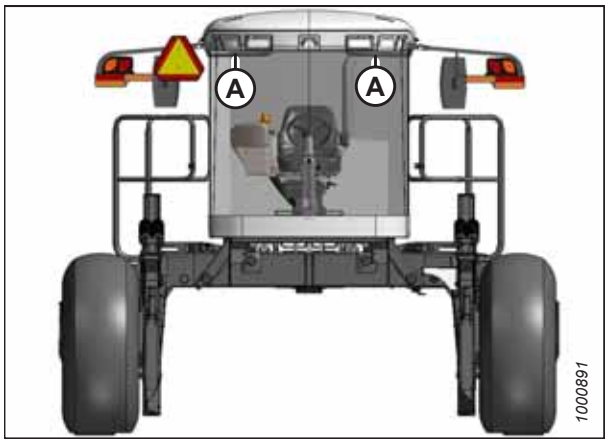


Figure 5.151: Windrower Cab-Forward

2. Adjust the lights by tightening or loosening screws (A), as needed.

Figure 5.152: Field Lights

Replacing Field Light Bulb

If a field bulb is burnt out or damaged, it will need to be replaced.

Use part MD #109113 to replace burnt out or damaged headlight bulbs.

1. Remove two screws (A). Remove the light assembly.
2. Replace the bulb using the procedure described in *Replacing Headlight Bulb, page 411*; the procedure for the field lights is similar.

Figure 5.153: Field Lights

5.10.5 Floodlights – Cab-Forward

The windrower's floodlights illuminate the left and right sides of the windrower's operating area when the windrower is operating in cab-forward mode.

Adjusting Forward Floodlights

The forward floodlights cannot be adjusted.

Replacing Bulb in Cab-Forward Floodlight

If a floodlight bulb is burnt out or damaged, it will need to be replaced.

Use part MD #109113 to replace a burnt out or damaged floodlight bulb.

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. Turn the lights OFF.
2. Shut down the engine, and remove the key from the ignition.
3. Holding onto handholds (A) on the cab's front corners, stand on the header's anti-slip strips.
4. Remove two screws (B).
5. Remove light bezel (C).
6. Remove the floodlight body from its receptacle.

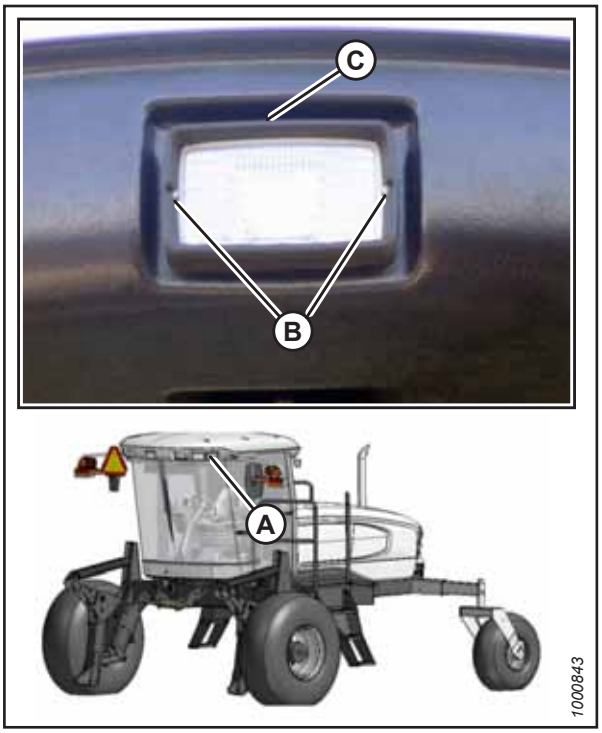


Figure 5.154: Forward Floodlights

7. Pinch wire retainer (A) and lift it away from the hooks.
8. Remove bulb (B) from the floodlight body. Remove the wire from connector (C).

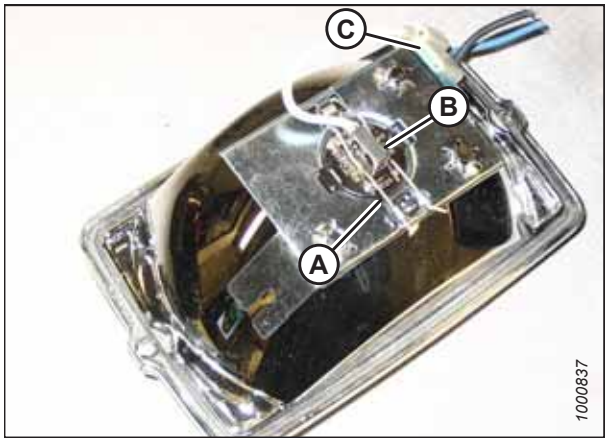


Figure 5.155: Floodlight Assembly

9. Match the slots on new bulb (B) with lugs (D) and insert the new bulb into the receptacle.

   IMPORTANT:

   Do **NOT** touch the glass of the new light bulb when installing it into the headlight body. Contaminants on the surface of the bulb can cause hot spots, which can cause the bulb to fail prematurely. Use a cloth or gloves when installing the new bulb.

10. Secure the bulb with wire retainer (A).

11. Push the wire into connector (C).

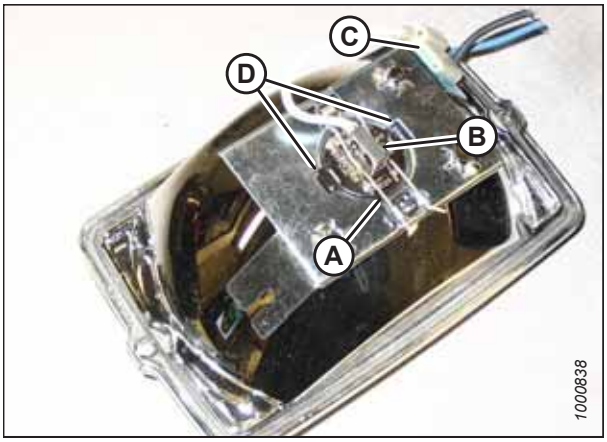


Figure 5.156: Floodlight Assembly

12. Position the floodlight body into its receptacle, ensuring that the body is oriented correctly. Secure the floodlight with bezel (C) and screws (B).

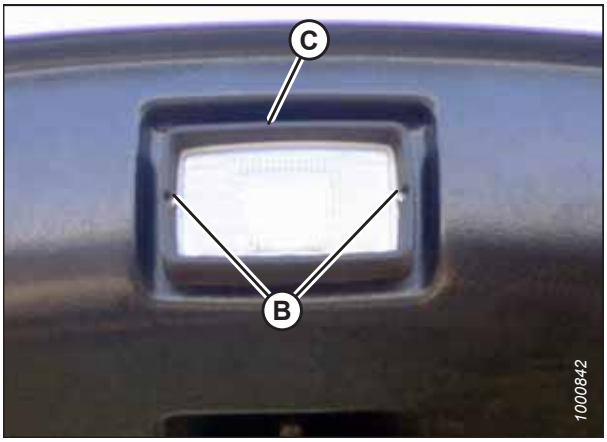


Figure 5.157: Forward Floodlight

5.10.6 High-Intensity Discharge Auxiliary Lighting – Option

Two optional high-intensity discharge (HID) lights installed on the windrower's mirrors provide additional lighting during field operation. They are usable only when the windrower is operating in cab-forward mode.

Replacing High Intensity Discharge Floodlights

Model year 2012 and newer M155*E4* Self-Propelled Windrowers may have a set of high-intensity discharge (HID) lights installed on the mirrors. These lights are wired into the windrower's field/work light circuit. If an HID light is damaged, follow this procedure to replace it.

DANGER

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

NOTE:

The HID lights can be found in kit MD #B5596.

1. Turn the lights OFF.
2. Shut down the engine, and the remove the key from the ignition.
3. Holding onto handholds (A) on the cab's front corners, stand on the header's anti-slip strips, or else stand on the maintenance platform.

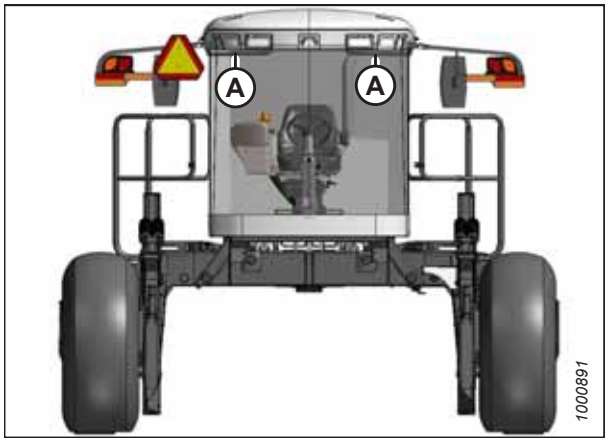


Figure 5.158: Cab-Forward Lights

4. Locate the lamp electrical harness connector on the bottom of the mirror assembly. Disconnect lamp harness connector (A).

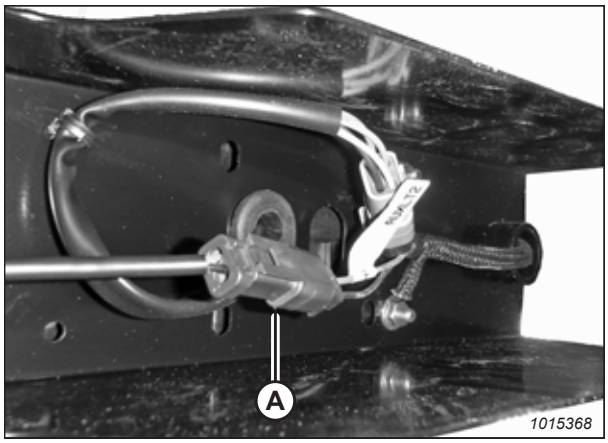


Figure 5.159: Lamp Harness Connector – View from Underside of Mirror

5. Feed the lamp electrical harness through grommet (B).
6. Remove nut (A).
7. Remove the old HID lamp from the mirror assembly and discard it.

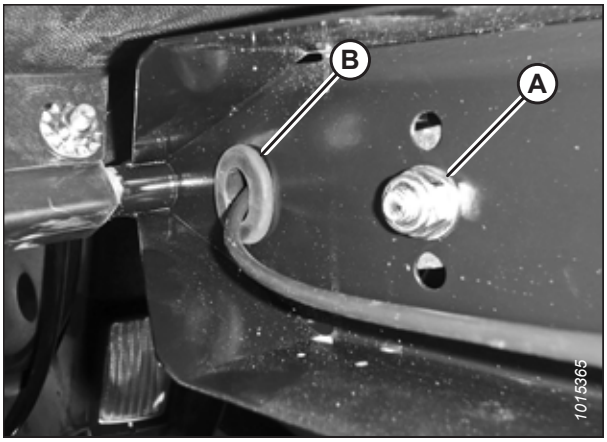


Figure 5.160: Hardware and Light Harness Grommet – View from Underside of Mirror

8. Retrieve new HID lamp (A) and place it on the mirror assembly as shown.

Figure 5.161: New HID Lamp in Place

9. From the underside of the mirror, feed the electrical connector through grommet (B).
10. Secure the HID lamp with retained nut (A).

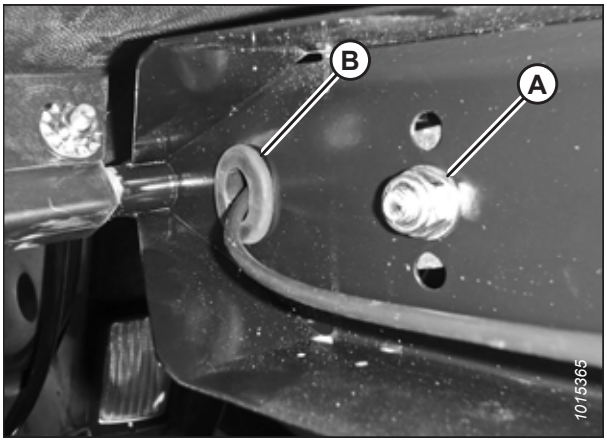


Figure 5.162: Hardware and Light Harness Grommet – View from Underside of Mirror

11. Connect lamp harness connector (A).

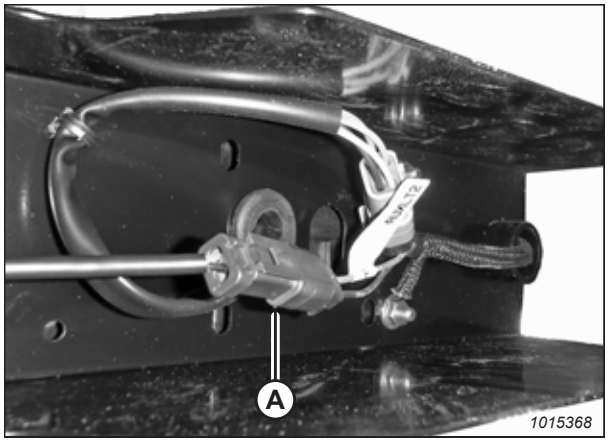


Figure 5.163: Lamp Harness Connector – View from Underside of Mirror

12. Loosen bolt (A) in bracket (C).
13. Adjust lamp (B) to the desired position. Tighten bolt (A).

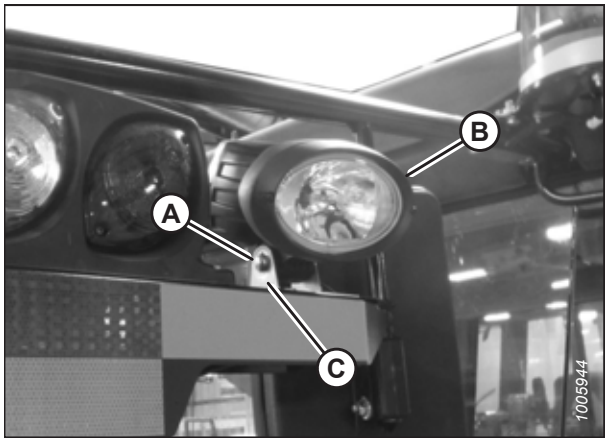


Figure 5.164: HID Lamp Installed

Adjusting High-Intensity Discharge Auxiliary Lights

The optional high-intensity discharge (HID) lights should be adjusted according to actual operating conditions.

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. Turn the lights ON.
3. Loosen bolt (A) and nut (C) inside the light/mirror support.
4. Move light (B) to the desired position.
5. Tighten bolt (A) and nut (C).

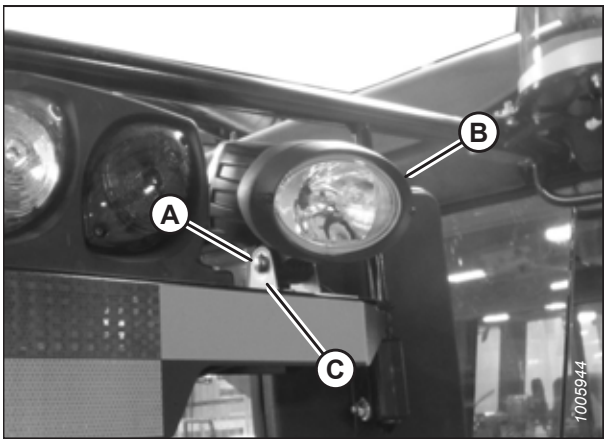


Figure 5.165: HID Auxiliary Lights

5.10.7 Floodlights – Rear

The rear floodlights illuminate the working area behind the windrower.

Adjusting Rear Floodlights

The rear floodlights should be adjusted according to actual operating conditions.

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. Turn the lights ON.

3. Loosen bolts (A) and (B).
4. Move the light to the desired position.
5. Tighten bolts (A) and (B).

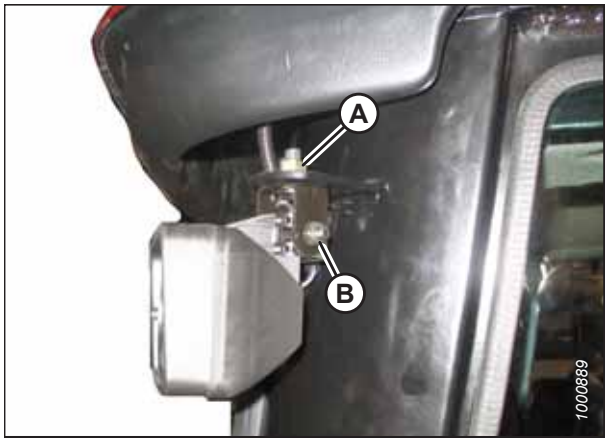


Figure 5.166: Rear Floodlight

Replacing Bulb in Rear Floodlight

If a rear floodlight bulb is burnt out or damaged, it will need to be replaced.

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.

Replace a burnt out or damaged rear floodlight bulb with part MD #109113.

1. Shut down the engine, and remove the key from the ignition.
2. Turn the lights OFF.
3. Remove two screws (A). Remove light bezel (B).
4. Remove the light from its receptacle.

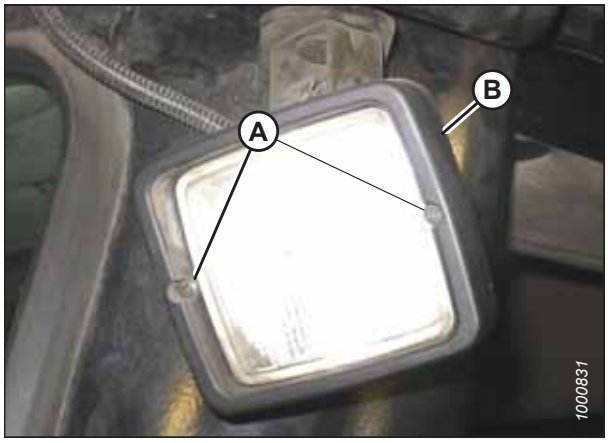


Figure 5.167: Rear Floodlight

5. Pinch wire retainer (A) and lift it away from the hooks.

   IMPORTANT:

   Do **NOT** touch the glass of the halogen bulb as the oils or other chemicals from your skin will cause the bulb to fail prematurely.

6. Remove bulb (B) from the floodlight body. Remove the wire from connector (D).

7. Insert new bulb (B) into the floodlight body, matching the slots on new bulb (B) with lugs (C).

8. Secure the bulb with wire retainer (A).

9. Push the wire into connector (D).

10. Position the floodlight body in its receptacle, ensuring that the body is correctly oriented.

11. Secure the floodlight body with bezel (B) and screws (A).

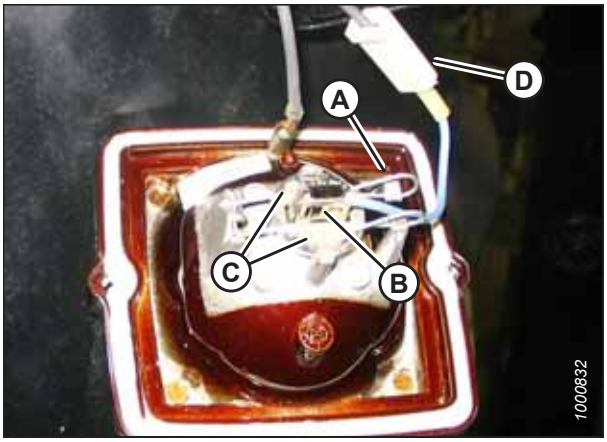


Figure 5.168: Rear Floodlight Assembly

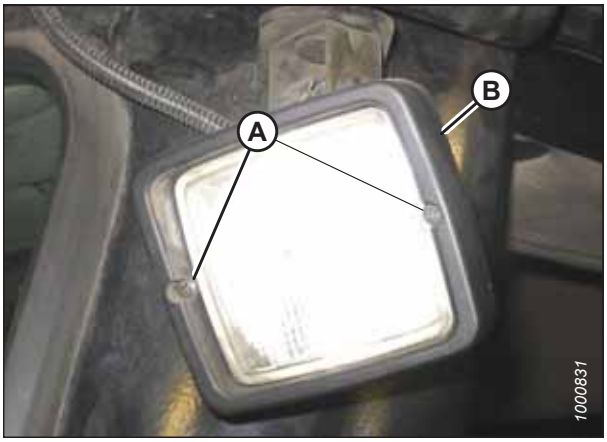


Figure 5.169: Rear Floodlight

5.10.8 Replacing Bulbs in Red and Amber Lights

If a bulb in a red or amber light is damaged or burnt out, it will need to be replaced.

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. Turn the lights OFF.
3. Holding onto handholds (A) on the cab's front corners, stand on the header anti-slip strips, or stand on the maintenance platform.

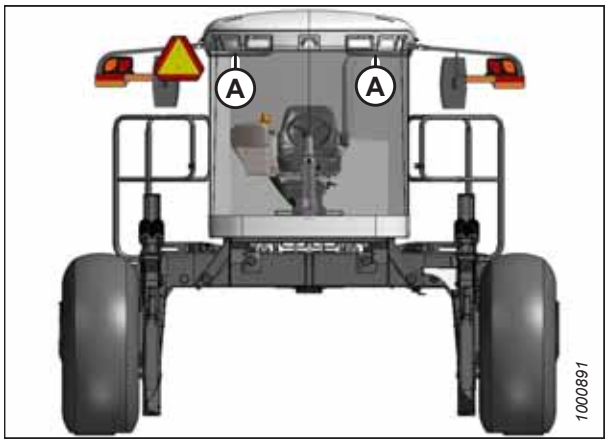


Figure 5.170: Windrower Cab-Forward

4. Remove two screws (A) from the lens. Remove the lens.
5. Push and twist the light bulb to remove it from its socket.
6. Install the new bulb in its socket, ensuring that the base of the bulb is properly engaged in its socket.
   - Replace the bulb in a red light with trade #1157.
   - Replace the bulb in an amber light with trade #1156.
7. Reinstall the lens and secure it with screws (A).

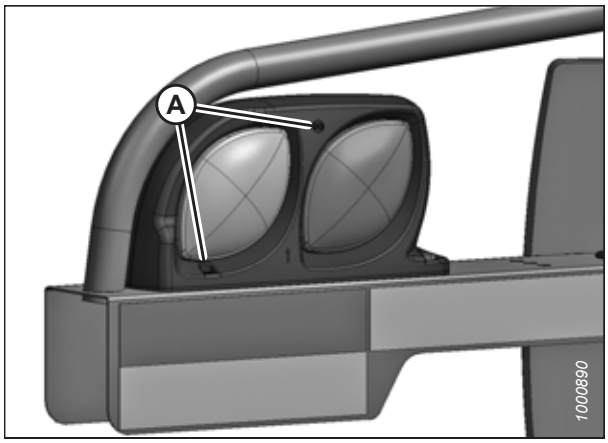


Figure 5.171: Red and Amber Lights

5.10.9 Replacing Red Taillights

If a red taillight is damaged, it will need to be replaced.

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.

Red taillights are included with the lighting and marking for cab-forward road travel kit (MD #B5412).

1. Shut down the engine and remove the key from the ignition.
2. Turn the lights OFF.
3. In the grille of the hood, remove two screws (A) from light (B). Remove the light.
4. Remove the connector from the light.
5. Connect the wiring harness to new light (B). Install the light and secure it with screws (A).

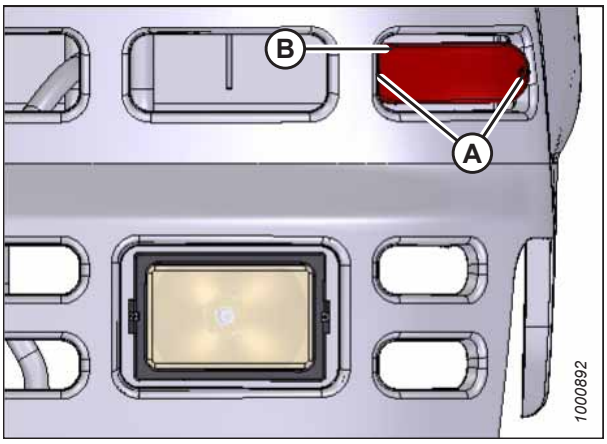


Figure 5.172: Red Taillights

5.10.10 Replacing Bulbs in Beacon Lights

If the bulb in a beacon light is burnt out or damaged, it will need to be replaced.

When replacing a beacon bulb, use part MD #160379.

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. Turn the beacon lights OFF.
3. Holding onto handholds (B) on the cab's front corner, stand on the header's anti-slip strips, or stand on the maintenance platform.

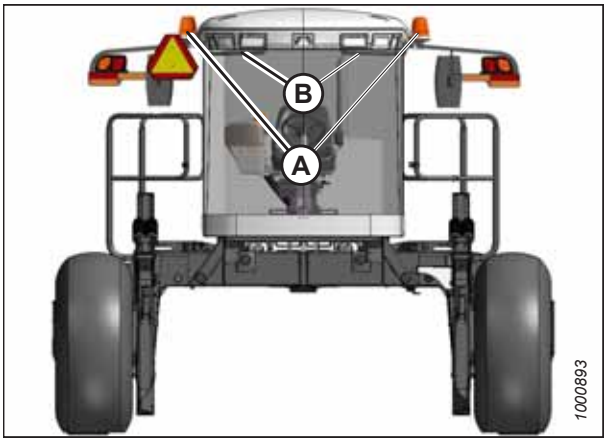


Figure 5.173: Warning Beacons

4. Turn lens (A) counterclockwise to unlock the lens from its base. Remove the lens.

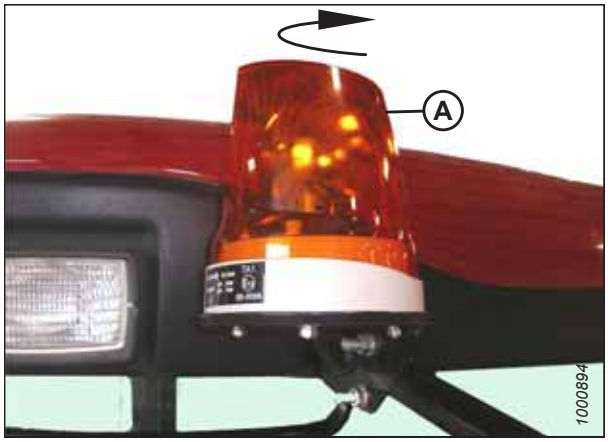


Figure 5.174: Warning Beacon

5. Pinch retainer (A) and remove it from the bulb socket.
6. Pull the bulb out of the socket.

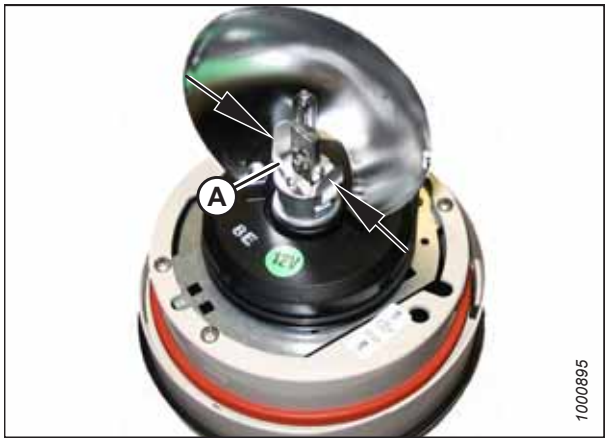


Figure 5.175: Beacon Lamp Assembly

7. Disconnect harness (A) from the bulb.

   IMPORTANT:

   Do **NOT** touch the glass of the new light bulb when installing it into the headlight body. Contaminants on the surface of the bulb can cause hot spots, which can cause the bulb to fail prematurely. Use a cloth or gloves when installing the new bulb.

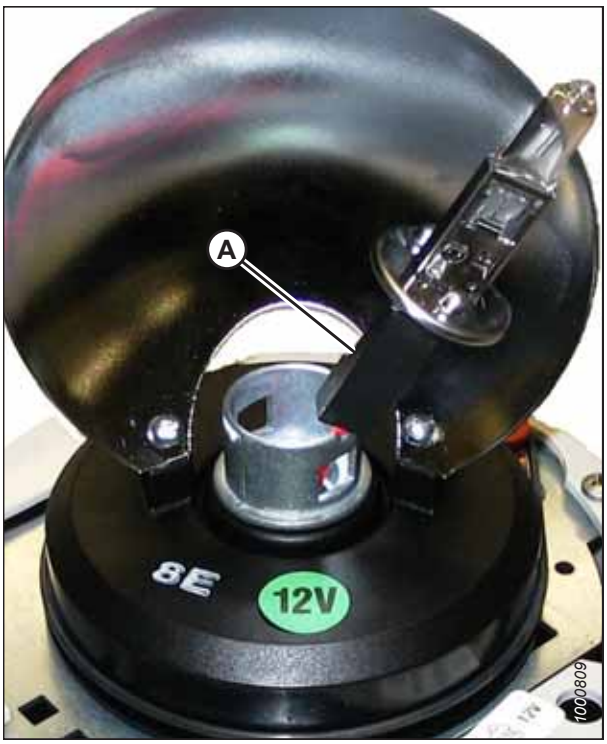


Figure 5.176: Beacon Lamp Assembly

8. Connect the harness to the new bulb. Place the bulb in the socket, lining up the flat side of the bulb with the recess in socket (A).

Figure 5.177: Beacon Lamp Assembly

9. Place retainer (A) over the bulb. Pinch the tabs to secure the retainer to the socket.

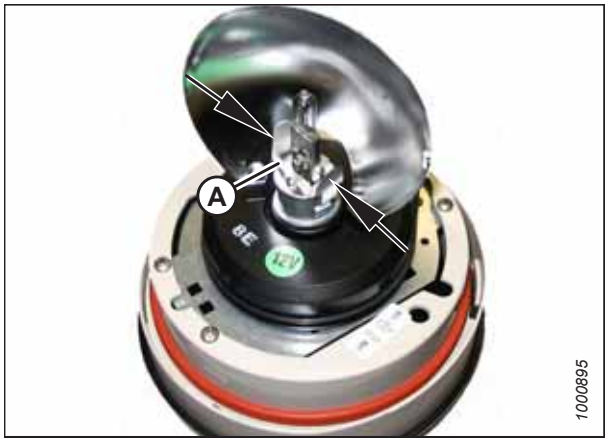


Figure 5.178: Beacon Lamp Assembly

10. Line up the three lugs (one is longer) in the base with the slots in the lens, and seat the lens against the rubber seal.

Figure 5.179: Beacon Lamp Assembly

11. Turn lens (A) clockwise to lock it in place.

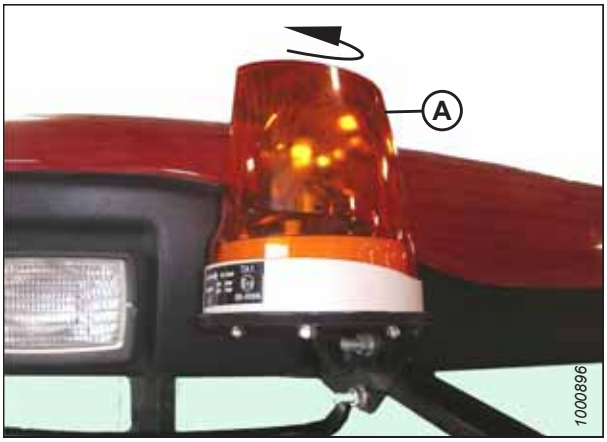


Figure 5.180: Warning Beacon

5.10.11 Replacing Cabin Dome Light

The cabin dome light improves visibility inside the cab. If the dome light is burnt out or damaged, it will need to be replaced.

1. Remove two screws (A) from the dome light assembly. Remove the assembly.
2. Disconnect the old dome light assembly from the wiring harness.
3. Connect the new dome light (MD #183413) to the wiring harness.
4. Install the new dome light assembly and secure it with two screws (A).

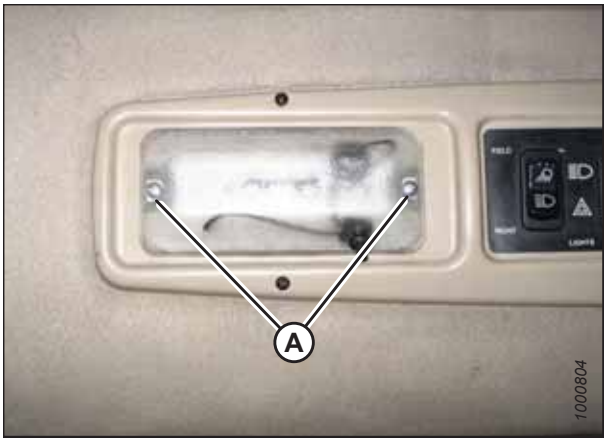


Figure 5.181: Cabin Dome Light

5.10.12 Replacing Ambient Light Fixture

The ambient light fixture improves visibility inside the cab. If the ambient light is burnt out or damaged, it will need to be replaced.

1. Locate ambient light fixture (A) in the roof liner.

Figure 5.182: Ambient Light Fixture

2. Pressing on flexible tabs (A) with a screwdriver, pull the ambient light fixture out of the cab headliner.
3. Remove the wires from connectors (B).
4. Retrieve the new ambient light fixture. Attach the wire connectors to the new light fixture.
5. Push the new light fixture into the slot in the cab roof, until the flexible tabs hold the fixture in place.

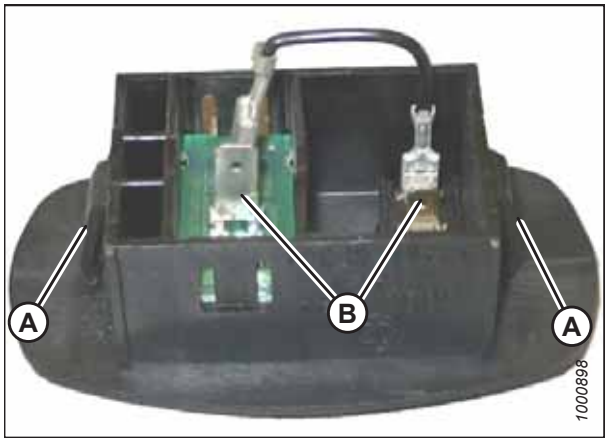


Figure 5.183: Ambient Light Fixture

5.10.13 Turn Signal Indicators

The turn signal indicator lights can be found on the operator's console. If the turn signal indicators are not working correctly, contact your MacDon Dealer for more information.

5.10.14 Accessing Main Fuse Box

The main fuse box can be found on the windrower's frame, under the right cab-forward platform.

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. Stop the engine, and remove the key from the ignition.
2. Move the right (cab-forward) platform aftward. For instructions, refer to *5.4.1 Opening Platforms – Standard Position, page 328*.

3. Remove wing nut (A). Remove fuse box cover (B).

4. A cover may be installed over the circuit breaker. Remove it to access the breaker.

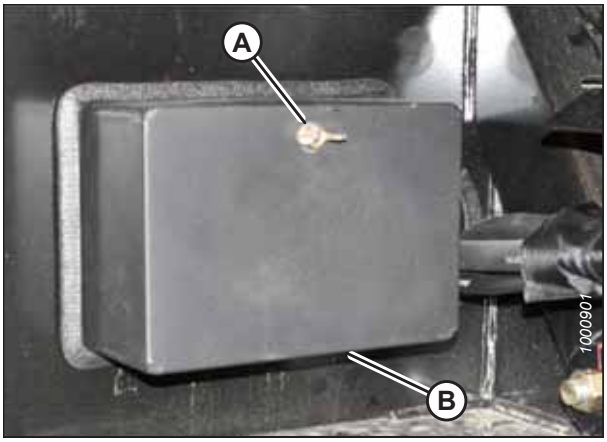


Figure 5.184: Fuse Box

Checking and Replacing Fuses

If you suspect that a fuse needs replacement, you will need to open the fuse box and examine the fuse in question. The decal inside the fuse box aids the Operator in identifying the function of a given fuse.

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

2. Open the right cab-forward platform. For instructions, refer to *5.4.1 Opening Platforms – Standard Position, page 328*.

3. Remove the fuse box cover. For instructions, refer to *5.10.14 Accessing Main Fuse Box, page 430*.

4. Refer to the decal on the inside of the fuse box cover for information on the function of each fuse.

5. To check a fuse: pull the fuse out of its receptacle and hold it up to a light source. If the fuse is damaged, the wire inside will be broken. If you see a broken wire, the fuse must be replaced.

6. If the fuse is damaged, insert a new fuse into the receptacle. If the fuse is undamaged, insert the removed fuse back into its receptacle.

   IMPORTANT:

   Replacement fuses should match the current rating on the decal. Refer to *Fuse Box Decal, page 433* for more information.

7. Reinstall the fuse box cover. Secure it with the wing nut.

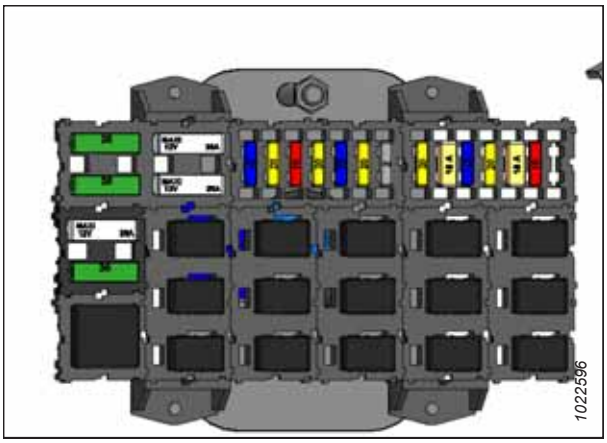


Figure 5.185: Fuses and Circuit Breakers

Replacing Circuit Breakers and Relays

If a circuit breaker or relay in the windrower's main fuse box is nonfunctional, it must be replaced.

Replace breakers and relays as follows:

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. Stop the engine, and remove the key from the ignition.
2. Move the right cab-forward platform rearward.
3. Remove the fuse box cover. For instructions, refer to *5.10.14 Accessing Main Fuse Box, page 430*.
4. To replace circuit breaker (A), pull the breaker out of its receptacle. Replace the removed circuit breaker with the new circuit breaker.
5. To replace relay (B), pull the relay out of its receptacle. Replace the removed relay with the new relay.
6. Reinstall the fuse box cover. Secure it with the wing nut.

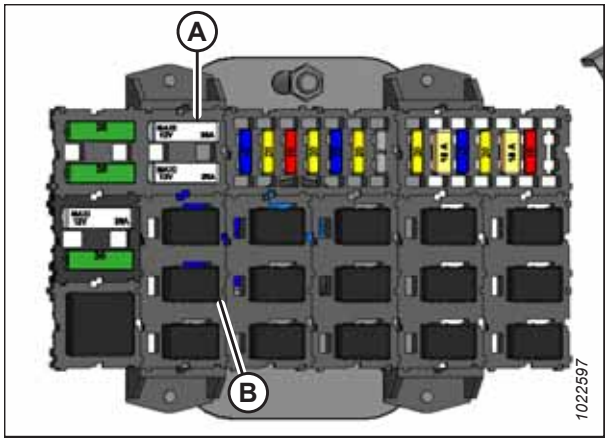


Figure 5.186: Relays and Breakers

Fuse Box Decal

Refer to this diagram to learn the function and specifications for the fuses, circuit breakers, and relays in the windrower's main fuse box.

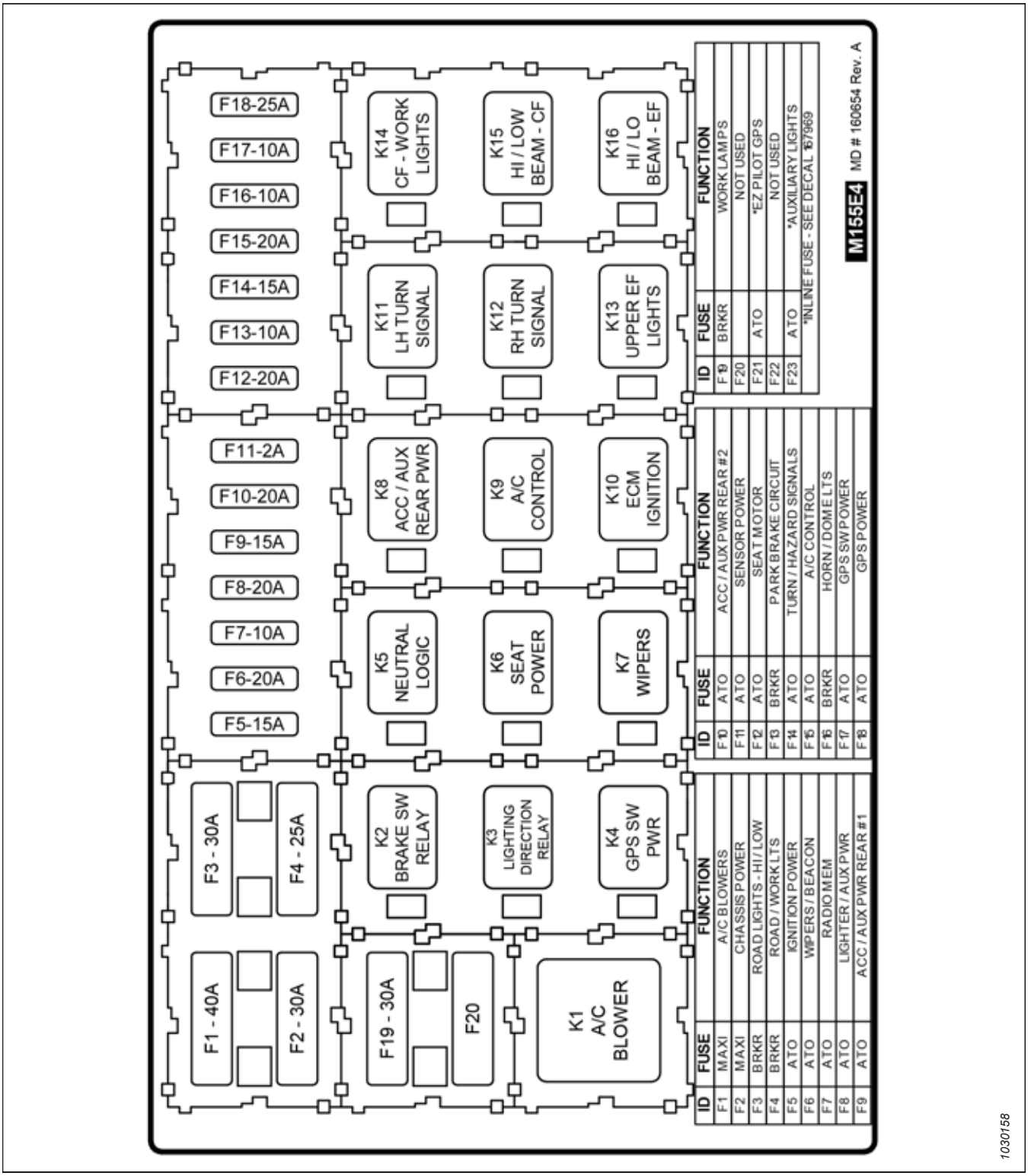


Figure 5.187: Fuse Decal

Accessing T4 Fuses and Electronic Control Unit Fuse

The M155*E4* Self Propelled Windrower is equipped with a separate fuse and breaker box and an electronic control unit (ECU) power fuse dedicated to the diesel exhaust fluid (DEF) system.

Locate fuse box (A) and ECU power fuse (B). They can be found below the exhaust canister on the right cab-forward side of the windrower.

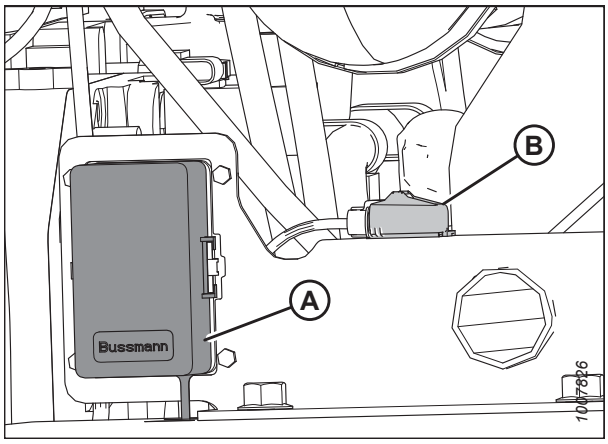


Figure 5.188: Fuse Box and ECU Power Fuse

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. Stop the engine, and remove the key from the ignition.
2. Move the right cab-forward side platform aftward. For instructions, refer to *5.4.3 Opening Platforms – Major Service Position, page 330*.
3. Raise the hood to its highest position. For instructions, refer to *5.3.3 Opening Hood – Highest Position, page 325*.
4. Undo clips (A) on both sides of the fuse box.
5. Remove cover (B).
6. Replace fuses or relays as needed. Refer to the decal on the inside of the fuse box's cover for aid in identifying the function and specifications of the fuses and relays. Refer to *Checking and Replacing T4 Fuses and Relays, page 435* for more information.

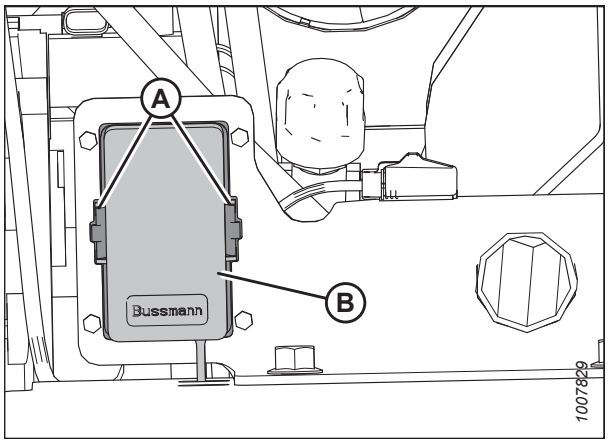


Figure 5.189: Fuse Box

7. Undo clip (A) securing the connector to the ECU power fuse. Pull cover (B) away.

8. Replace the ECU power fuse, if needed. Reconnect the connector and secure it with clip (A).

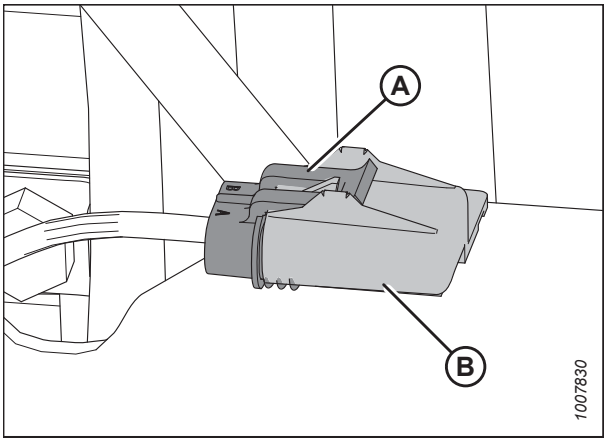


Figure 5.190: ECU Power Fuse

Checking and Replacing T4 Fuses and Relays

If you suspect that a T4 fuse needs replacement, you will need to open the T4 fuse box and examine the fuse in question. The decal inside the T4 fuse box aids the Operator in identifying the function of a given fuse. If you suspect that a relay in the T4 fuse box needs replacement, you will need to pull the suspect relay and perform the appropriate testing procedure on the relay before deciding whether to replace it or not.

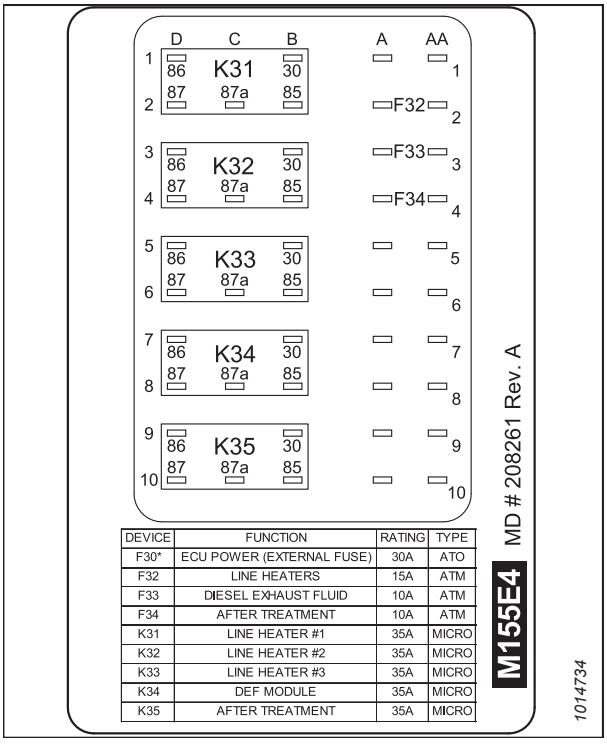
To check and replace a fuse:

1. To check a fuse: pull the fuse out of its receptacle and hold it up to a light source. If the fuse is damaged, the wire inside will be broken. If you see a broken wire, the fuse must be replaced.

2. If the fuse is damaged, insert the new fuse into the receptacle. If the fuse is undamaged, replace the undamaged fuse into receptacle.

   IMPORTANT:

   Replacement fuses should match the current rating on the decal. Refer to *Fuse Box Decal, page 433* for more information.



DEVICE	FUNCTION	RATING	TYPE
F30*	ECU POWER (EXTERNAL FUSE)	30A	ATO
F32	LINE HEATERS	15A	ATM
F33	DIESEL EXHAUST FLUID	10A	ATM
F34	AFTER TREATMENT	10A	ATM
K31	LINE HEATER #1	35A	MICRO
K32	LINE HEATER #2	35A	MICRO
K33	LINE HEATER #3	35A	MICRO
K34	DEF MODULE	35A	MICRO
K35	AFTER TREATMENT	35A	MICRO

Figure 5.191: Fuses and Relays

To replace a relay:

3. Pull the relay out of its receptacle and install the new relay.

Inspecting and Replacing 125A Main Fuses

The 125A main fuse holders are located on the frame under the right cab-forward platform beside the battery.

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. Stop the engine, and remove the key from the ignition.
2. Move the right cab-forward platform aftward.

NOTE:

There are three main fuses: two fuses (A) are secured on the right cab-forward front frame, and the other can be found behind the frame, secured by two bolts and nuts (B).

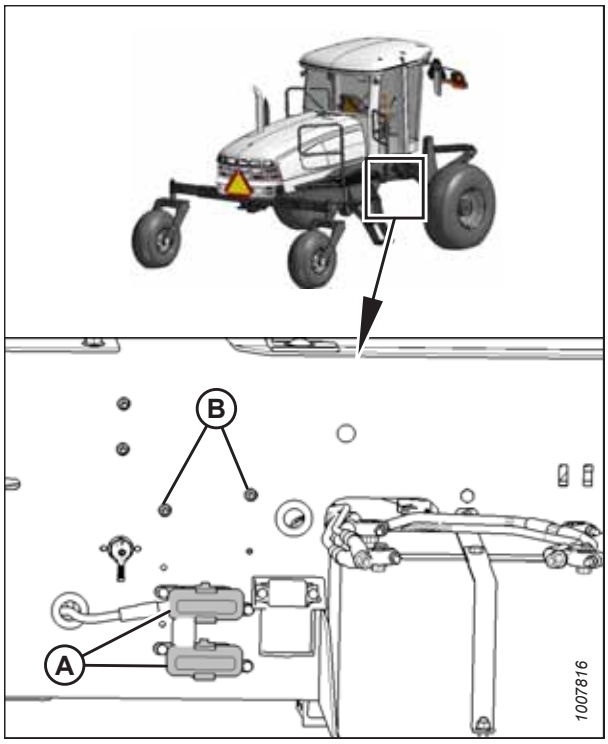


Figure 5.192: 125A Main Fuses

3. To check the condition of a fuse, pull tab (A) and open cover (B).

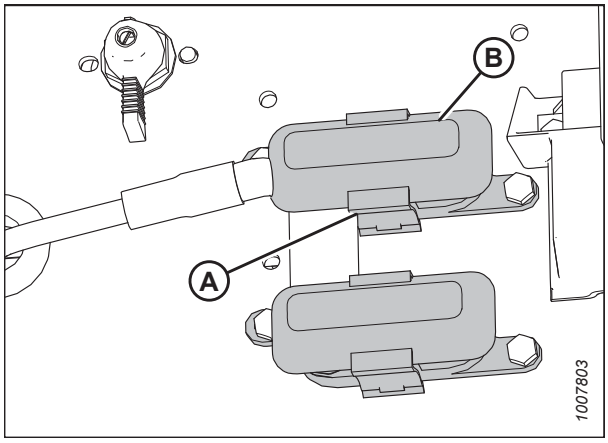


Figure 5.193: 125A Main Fuses

4. Inspect fuse (A) for evidence of damage.
5. If the fuse is damaged, it will need to be removed. To remove fuse (A), remove two nuts (B) and pull the fuse free from its holder.

   NOTE:

   The existing wiring may need to be pulled off of the stud first.

6. Install the new fuse, along with any wiring that was removed to access the fuse.
7. Secure the fuse with nuts (B).

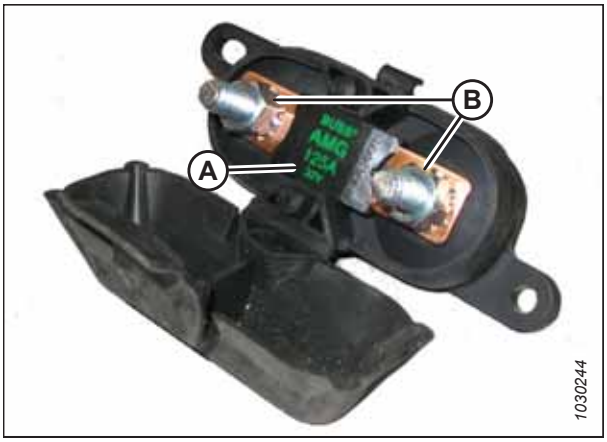


Figure 5.194: 125A Main Fuse

8. Close cover (B) and secure it with tab (A).
9. Return the platform to the operating position. Ensure that the lock is engaged.

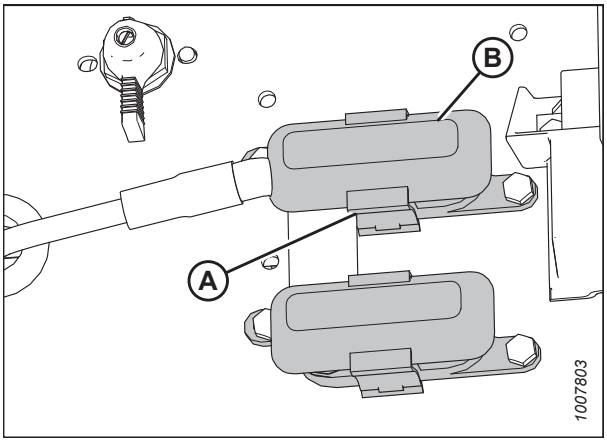


Figure 5.195: 125A Main Fuses

5.11 Hydraulic System

The hydraulic system provides oil pressure for the header lift, windrower drive, and header drive systems.

WARNING

- **Avoid high pressure fluids. Escaping fluid can penetrate the skin, causing serious injury. Relieve the pressure in the hydraulic system before disconnecting any hydraulic fittings.**
- **Tighten all fittings before applying pressure to the hydraulic system.**

Figure 5.196: Hydraulic Pressure Hazard

WARNING

- **Use a piece of cardboard or paper to search for hydraulic leaks. Do NOT use your hand or any other part of your body.**
- **If ANY hydraulic fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type of injury. Otherwise, this injury becoming infected with gangrene.**

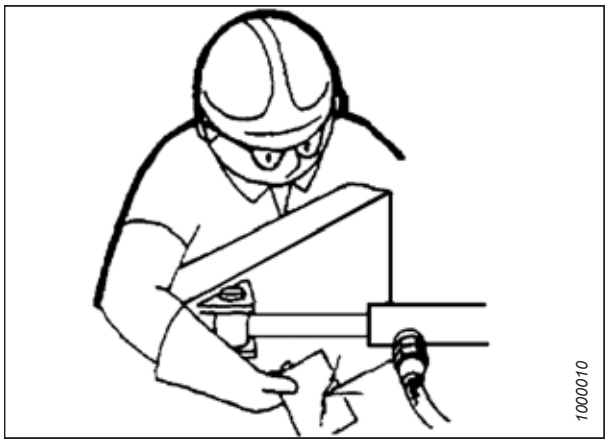


Figure 5.197: Checking Hydraulic Leaks

IMPORTANT:

Contaminants such as dirt, dust, and water are the major cause of damage to the hydraulic system.

- If the hydraulic system's components must be disconnected for service, protect the ends of hoses, tubing, and ports from contamination. Cover openings with properly fitting hydraulic caps and plugs. If such caps and plugs are not available, protect openings with clean, lint-free towels or clean plastic bags.
- Before installing a replacement hydraulic hose, flush the inside of the hose with clean diesel fuel or commercial petroleum cleaning solvent for a minimum of ten seconds. Do **NOT** use water, water soluble cleaners, or compressed air to clean a hydraulic hose.
- The hydraulic system's components are manufactured with a great degree of precision, and have been assembled in sanitary conditions at the factory. Do **NOT** attempt to service these components in the field, except to maintain the proper oil level, change the hydraulic oil and filters, and to adjust the relief pressures as described in this manual.

Contact your MacDon Dealer for all other hydraulic system service needs.

5.11.1 Checking and Filling Hydraulic Oil

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.

DANGER

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

1. Park the windrower on a level surface.
2. Lower the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Open the hood to the lower position. For instructions, refer to *5.3.1 Opening Hood – Lower Position, page 324*.

NOTE:

Sight glass (A) can be found under the hood on the right side of the hydraulic fluid reservoir. It allows the Operator to inspect the hydraulic oil to determine its level. If there is no oil visible in the sight glass, then oil must be added to the hydraulic oil reservoir.

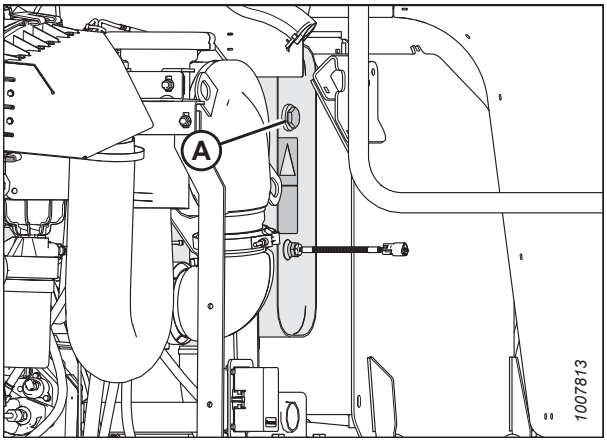


Figure 5.198: Hydraulic Oil Sight Glass

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

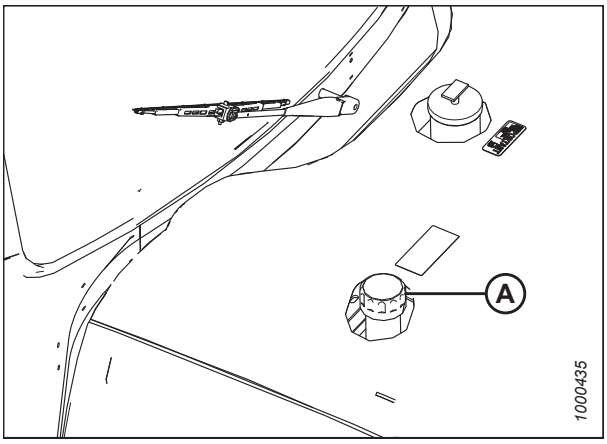


Figure 5.199: Engine Hood

8. If necessary, add hydraulic oil to the reservoir. Refer to the inside back cover of this manual for the hydraulic oil specifications and the capacity of the hydraulic fluid reservoir.

   NOTE:

   When the dipstick is showing low (L), approximately 4 liters (1 US gallon) of oil is required to reach the full (H) mark.

   IMPORTANT:

   - Use new, good quality, prefiltered, clean hydraulic oil
   - Exercise care to prevent debris from falling into the tank

9. Reinstall the dipstick and the filler cap. Turn the cap clockwise until it is secure.

10. Close the hood. For instructions, refer to *5.3.2 Closing Hood – Lower Position, page 325*.

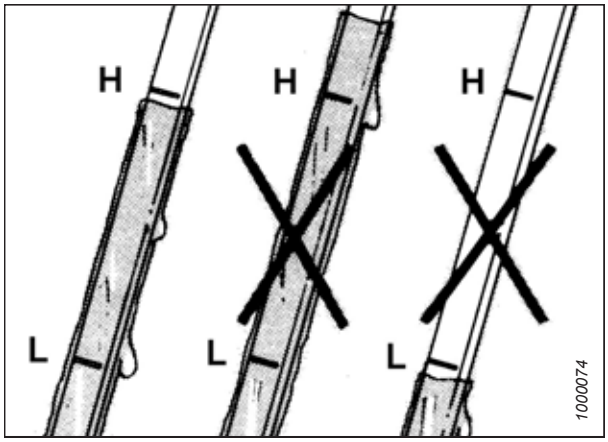


Figure 5.200: Hydraulic Oil Levels

5.11.2 Hydraulic Oil Cooler

The hydraulic oil cooler is located inside the cooling box behind the radiator.

It should be cleaned daily with compressed air. For instructions, refer to *5.9.3 Cleaning Cooler Box Components, page 396*.

5.11.3 Changing Hydraulic Oil

The hydraulic oil should be changed according to the interval specified in the maintenance schedule, which can be found in the windrower operator's manual.

DANGER

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

1. Park the windrower on a level surface.
2. Lower the header fully.
3. Shut down the engine, and remove the key from the ignition.
4. Open the hood to the highest position. For instructions, refer to *5.3.3 Opening Hood – Highest Position, page 325*.
5. Place a clean container (at least 75 liters [20 US gallons]) under the drain at the bottom of the hydraulic oil reservoir.

6. Remove drain plug (A). Allow the oil to drain completely.

   NOTE:

   Some parts have been removed from the illustration for the sake of clarity.

7. Inspect magnetic drain plug (A). Using a clean cloth, remove any metal debris that may have accumulated on the surface of the plug. Check the condition of the O-ring on the drain plug. Look for cracking, breakage, or deformation. Replace the O-ring if it shows any sign of wear or damage.

8. Install drain plug (A), and torque it to 80 Nm (59 lbf·ft).

9. Fill the hydraulic oil reservoir. For instructions, refer to *5.11.1 Checking and Filling Hydraulic Oil, page 439*.

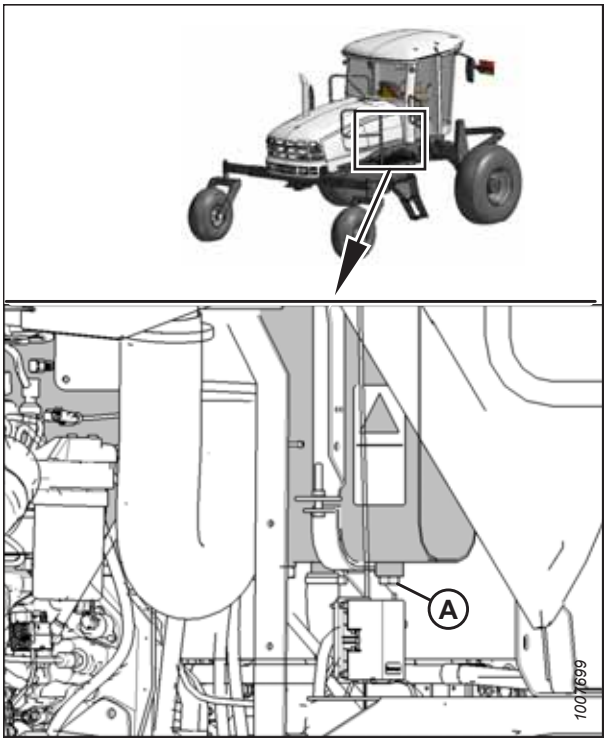


Figure 5.201: Hydraulic Oil Drain Plug

5.11.4 Changing Hydraulic Oil Filters

The charge and return hydraulic oil filters should be replaced at the same time, according to the intervals specified in the machine's maintenance schedule.

Change the hydraulic oil filters after the first 50 hours of operation, and after every 500 hours thereafter. The replacement part for filter (A) (MD #112419) and the service kit for filter (B) (MD #320360) can be obtained from your Dealer.

Charge oil filter (A) and return oil filter (B) are located just inside the frame on the left side of the windrower. They are accessible from underneath the windrower.

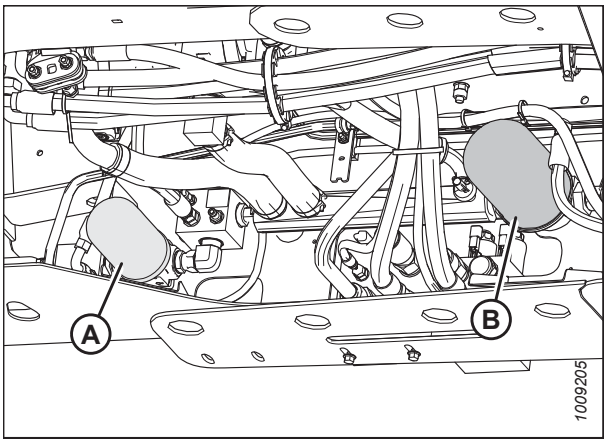


Figure 5.202: Hydraulic Oil Filters

Charge Oil Filter

The charge oil filter cleans the oil in the hydraulic charge circuit. The charge circuit replenishes oil losses that occur normally at the motor and pump case drains and associated circuits.

Removing Charge Oil Filter

The charge oil filter can be removed from the left side of the windrower so that it can be replaced.

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. Clean around head of filter (A).
3. Apply a vacuum to the hydraulic tank filler hole to prevent oil leakage during filter change. Place a 19 L (5 US gal) container beneath the filter to collect any oil that may leak out.
4. Unscrew filter (A) using a filter wrench.
5. Dispose of the used oil and the filter in accordance with local legislation.

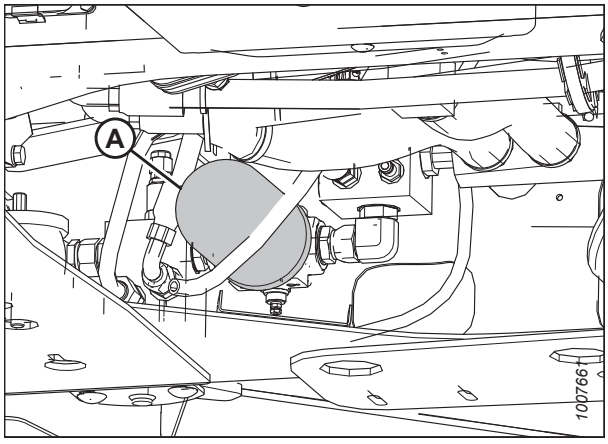


Figure 5.203: Charge Oil Filter

Installing Charge Oil Filter

Once the charge oil filter has been removed from the windrower's left side, a new filter can be installed.

NOTE:

For the charge oil filter replacement part number, refer to *8.1.4 Filter Part Numbers, page 492*.

1. Clean the gasket surface of the filter head.
2. Apply a thin film of clean oil to the filter gasket.
3. Screw new filter (A) onto the mount. Tighten the filter until the gasket contacts the filter head.
4. Tighten the filter an additional 1/2 turn by hand.

   IMPORTANT:

   Do **NOT** use a filter wrench to install the oil filter. Overtightening can damage the gasket and the filter.
5. Check the hydraulic oil level and add oil if needed. For instructions, refer to *5.11.1 Checking and Filling Hydraulic Oil, page 439*.

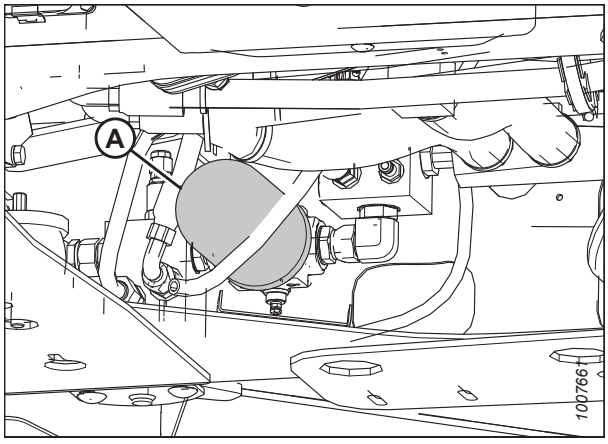


Figure 5.204: Charge Oil Filter

Return Oil Filter

The return oil filter filters the oil in the header drive systems. It should be changed according to the interval specified in the maintenance schedule.

Removing Return Oil Filter

The return oil filter can be removed from the windrower's left side so that it can be replaced.

DANGER

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

1. Shut down the engine, and remove the key from the ignition.
2. Move the platform on the left cab-forward side of the machine to the open position. For instructions, refer to *5.4.1 Opening Platforms – Standard Position, page 328*.
3. Clean around the head of filter (A).
4. Place a 19 L (5 US gal) container beneath filter (A) to collect any oil that may leak out.
5. Unscrew filter (A) using a filter wrench.
6. Dispose of the used oil and the filter in accordance with local legislation.

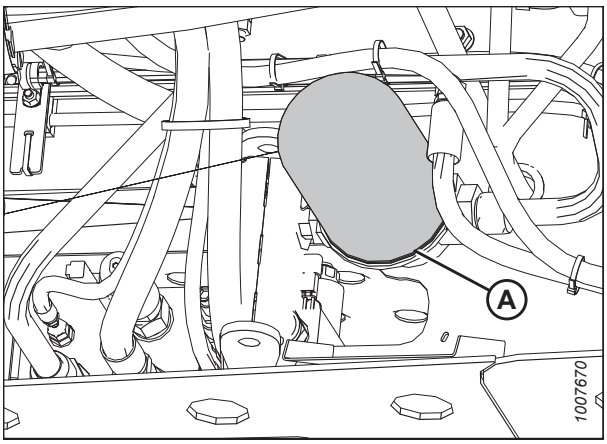


Figure 5.205: Return Oil Filter

7. Remove gasket (C) from groove (B) in filter head (A).

   NOTE:

   The filter head has been removed from the illustration for clarity.

   NOTE:

   Filter (D) is shown for context.

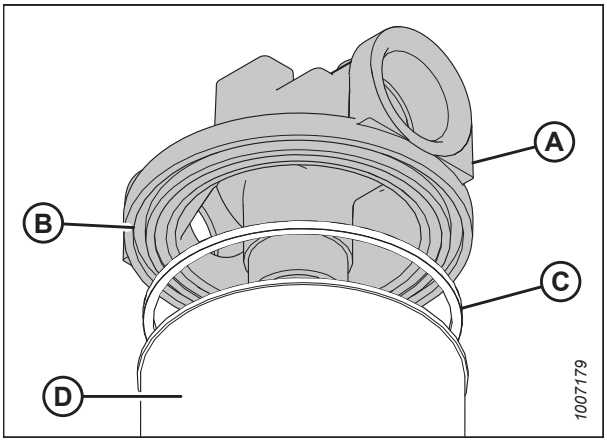


Figure 5.206: Return Oil Filter

Installing Return Oil Filter

Once the windrower's return oil filter has been removed from the windrower's left side, a new filter can be installed.

NOTE:

For the filter specifications, refer to *8.1.4 Filter Part Numbers, page 492*.

1. Clean gasket groove (B) in filter head (A). If an O-ring is installed in the groove, remove and discard it.
2. Apply a thin film of clean oil to filter square cut gasket (C).
3. Install new square cut gasket (C) into groove (B) in filter head (A).
4. Screw new filter (D) onto the filter head until the gasket contacts the filter.

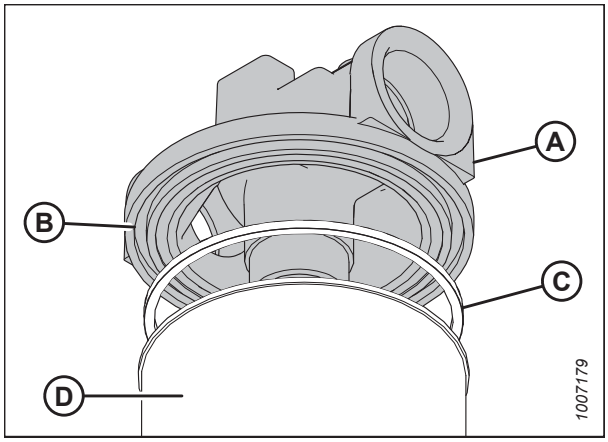


Figure 5.207: Return Oil Filter

5. Tighten filter (A) an additional 1/2 turn by hand.

   IMPORTANT:

   Do **NOT** use a filter wrench to install the oil filter. Overtightening can damage the gasket and the filter.

6. Check the hydraulic oil level. For instructions, refer to *5.11.1 Checking and Filling Hydraulic Oil, page 439*.

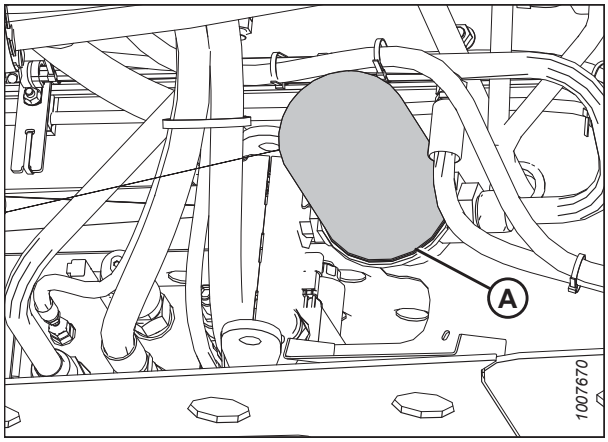


Figure 5.208: Return Oil Filter

5.11.5 Header and Reel Hydraulics

Refer to this section for information on the hydraulic components which affect the operating characteristics of the header and the reel (if the header is equipped with a reel).

Pressure Compensator Valve

The pressure compensator valve protects the header drive pumps from overheating under very heavy loads.

When the operating pressure reaches the absolute pressure limit setting (refer to Table *5.3, page 445* for hydraulic pressure setting) the compensator valve in the pump is activated and the header drive will slow down to avoid overheating the drive pumps. When this occurs, reduce the windrower's ground speed to reduce the hydraulic system pressure.

NOTE:

An optional pressure sensor is available which monitors the knife or reel drive hydraulic pressure. This sensor will cause the cab display module (CDM) to emit a warning tone if it detects that the hydraulic system pressure has reached a preset limit. The system pressure limit can be configured using the CDM. For information on the pressure sensor kit, refer to *6.3.5 Pressure Sensor Kit, page 469*. The warning tone is only heard if the pressure sensor is installed and enabled.

NOTE:

The CDM emitting a warning tone is normal when the operating pressure is close to the compensator valve's pressure setting.

Table 5.3 Header Hydraulic Pressures

Header Model	Application/System	Windrower Absolute Pressure Limit Setting kPa (psi)	Suggested Overload Warning Setting kPa (psi)
R/R1 Series	Disc pressure	28,958 (4200)	27,579 (4000)
D/D1 Series	Reel/draper pressure	22,063 (3200)	20,684 (3000)
A Series	Knife/conditioner pressure	28,958 (4200)	27,579 (4000)

If lift or drive capacity problems occur, the pressure compensator valve may require adjusting. Contact your MacDon Dealer for assistance.

Flow Control Blocks

Two hydraulic valve blocks equipped with multiple cartridges are used for various windrower functions The flow control blocks are regulated by the windrower control module (WCM), according to inputs from the Operator. The valve blocks are located behind the left cab-forward platform.

The valve blocks do not require any scheduled maintenance other than to check for leaking fittings or loose electrical connections. If service is required, contact your MacDon Dealer.

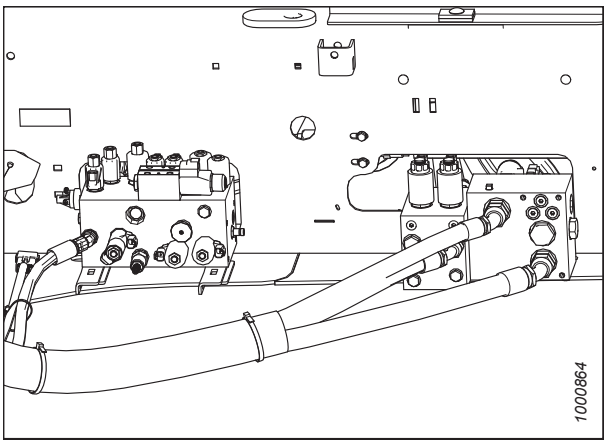


Figure 5.209: Hydraulic Valve Blocks

Adjusting Header Drop Rate

The header should fall gradually when the LOWER HEADER switch is pressed. Lowering the header from the fully raised to the fully lowered position should take 3–4 seconds. If the lowering speed falls outside of these specifications, the header drop rate requires adjustment.

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.

IMPORTANT:

The drop rate should **NOT** be less than 3–4 seconds; damage to the header or windrower may result if the drop rate is higher than this.

NOTE:

If the drop rate is too low (that is, if it requires more than 30 seconds for the header to move from the fully raised to the fully lowered position), the windrower control module (WCM) will disable the return to cut height, tilt, and float presets. This is done to prevent the hydraulic system from overheating.

1. Shut down the engine, and remove the key from the ignition.
2. Move the platform on the left cab-forward side of the machine to the open position. For instructions, refer to *5.4.1 Opening Platforms – Standard Position, page 328*.
3. Loosen inner knob (B) on the needle valve. Adjust the knob as follows:
   - Turn outer knob (A) clockwise to decrease the drop rate
   - Turn outer knob (A) counterclockwise to increase the drop rate
4. Tighten inner knob (B).
5. Check the drop rate. Repeat this procedure as needed.
6. Close the platform. For instructions, refer to *5.4.2 Closing Platforms – Standard Position, page 329*.

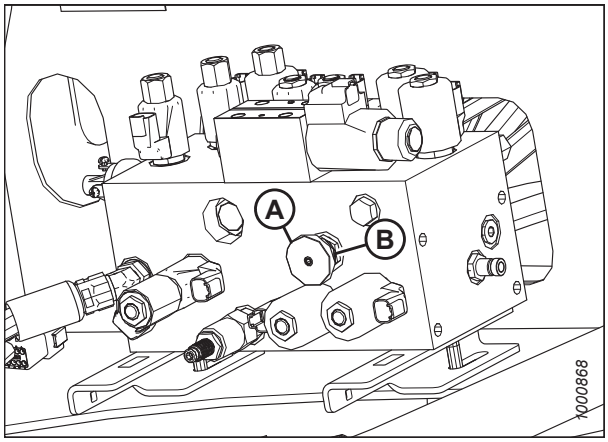


Figure 5.210: Multifunction Control Manifold

Adjusting Reel Drop Rate

When the lower reel switch is pressed, the reel should drop from fully raised to fully lowered in approximately 3–4 seconds. Operators can change the drop rate as needed.

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.

IMPORTANT:

The drop rate should **NOT** be less than 3–4 seconds; damage to the header or windrower may result if the drop rate is higher than this.

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Move the platform on the left cab-forward side of the machine to the open position. For instructions, refer to *5.4.1 Opening Platforms – Standard Position, page 328*.

4. Locate drop rate control valve (A), installed at port D on the manifold.

   NOTE:

   This valve is installed on draper-ready windrowers; it affects draper headers only.

5. Loosen set screw (B). Turn cap (C) as follows:

   - Turn cap (C) clockwise to decrease the reel drop rate.
   - Turn cap (C) counterclockwise to increase the reel drop rate.

6. Check the reel drop rate. Repeat this procedure as needed.

   NOTE:

   To reset the drop rate to factory specifications, fully close the needle valve and then open it four turns counterclockwise.

7. Tighten set screw (B).

   NOTE:

   Reel drop rate decal (A) is provided as a guide when adjusting valve position.

8. Close the platform. For instructions, refer to *5.4.2 Closing Platforms – Standard Position, page 329*.

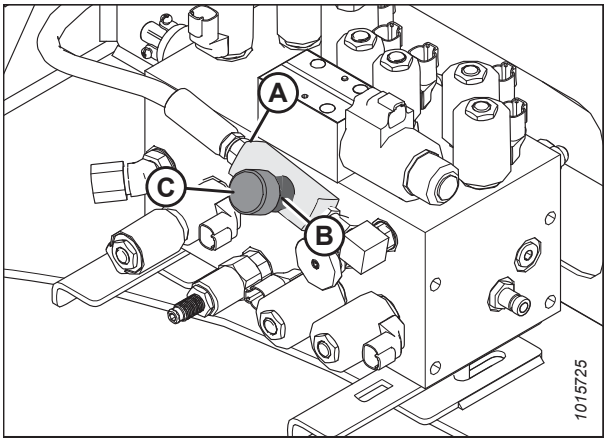


Figure 5.211: Multifunction Control Manifold

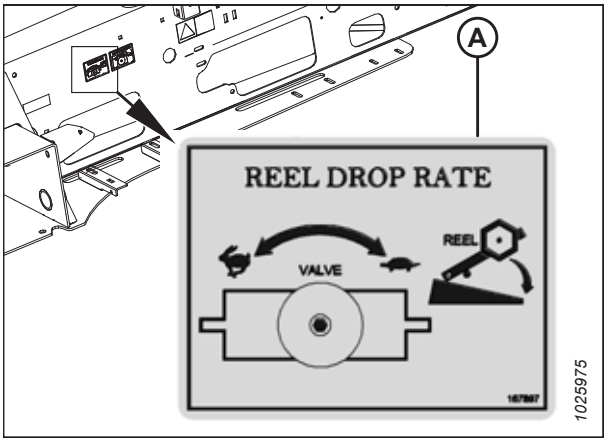


Figure 5.212: Reel Drop Rate Decal

5.11.6 Traction Drive Hydraulics

The windrower transmission consists of two variable-displacement axial-piston hydraulic pumps; each drive wheel has its own dedicated pump.

The pumps are driven through a gearbox from the engine. Each pump requires charge flow in order to:

- Compensate for internal hydraulic fluid leakage
- Maintain positive pressure in the main circuit
- Maintain the temperature of the hydraulic system
- Compensate for leakage losses from the external valving or auxiliary systems

The windrower control module (WCM) monitors the charge pressure. The cab display module (CDM) will emit a tone and display a flashing warning message if the charge pressure drops below 1725 kPa (250 psi). For more information, refer to *Display Warnings and Alarms, page 92*.

Checking Transmission Oil Pressure

The transmission oil pressure must be within the correct range for the drive wheels to function correctly.

IMPORTANT:

The rated charge pressure **MUST** be maintained under all conditions of operation to prevent damage to the transmission.

If the TRANS OIL PRESSURE warning is displayed, shut down the engine, and proceed as follows:

1. Check the hydraulic fluid level in the tank. For instructions, refer to *5.11.1 Checking and Filling Hydraulic Oil, page 439*.
2. Check the hoses and lines for leakage.
3. Check the charge pressure relief valve. For instructions, refer to *Checking Charge Pump Pressure, page 448*.
4. If charge pressure still cannot be maintained, do **NOT** operate the windrower. Contact your MacDon Dealer.

Checking Charge Pump Pressure

The charge pump oil pressure must be within the correct range for the drive wheels to function 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.

The incorrect charge pressure setting may result in the charge pressure pump being unable to build the required system pressure and/or inadequate loop flushing flows.

The correct charge pressure **MUST** be maintained under all conditions, in order to maintain pump control performance and to operate the brake release.

Check the charge pump pressure as follows:

1. Open the hood fully. For instructions, refer to *5.3.3 Opening Hood – Highest Position, page 325*.
2. Attach a 0–4000 kPa (0–600 psi) pressure gauge to a hose long enough to allow the pressure gauge to be read from the operator's seat.
3. Locate test port (A) on the charge filter head. Clean the test port fitting, and then attach the hose to the fitting.
4. Start the engine. Set the throttle to the idle position. The pressure should be 1655–2241 kPa (240–325 psi) when the hydraulic oil reaches a temperature of 40°C (100°F).
5. Record the reading and shut down the engine.
6. If the pressure reading is **NOT** within the appropriate range, contact your MacDon Dealer.
7. If the pressure reading is within the appropriate range, remove the hose from the test port and close the hood. For instructions, refer to *5.3.4 Closing Hood – Highest Position, page 327*.

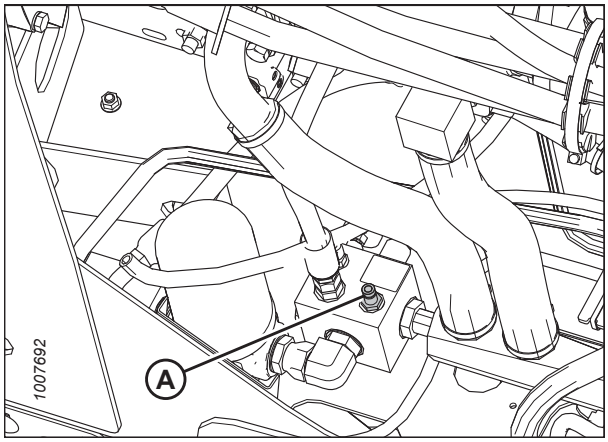


Figure 5.213: Charge Pump Test Port

5.11.7 Hoses and Lines

Check hydraulic hoses and lines daily for signs of leaks.

WARNING

- **Avoid high pressure fluids. Escaping fluid can penetrate the skin, causing serious injury.**
- **Relieve the pressure in the hydraulic system before disconnecting any hydraulic fittings. Tighten all connections before applying pressure.**
- **Keep away from pin-holes and nozzles which can eject high-pressure fluids.**

Figure 5.214: Hydraulic Pressure Hazard

WARNING

- **Use a piece of cardboard or paper to search for hydraulic leaks. Do NOT use your hand or any other part of your body.**
- **If ANY hydraulic fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type of injury. Otherwise, this injury becoming infected with gangrene.**

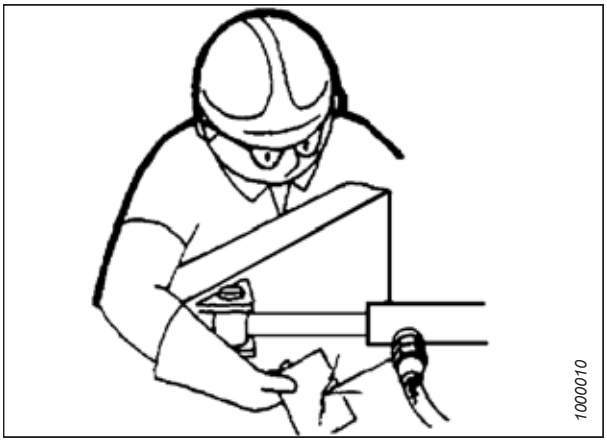


Figure 5.215: Checking Hydraulic Leaks

IMPORTANT:

Contaminants such as dirt, dust, and water are the major cause of damage to the hydraulic system.

- If the hydraulic system's components must be disconnected for service, protect the ends of hoses, tubing, and ports from contamination. Cover openings with clean, lint-free towels, or clean plastic bags.
- Before installing a replacement hydraulic hose, flush the inside of those with clean diesel fuel or commercial petroleum cleaning solvent for a minimum of ten seconds. Do **NOT** use water, water soluble cleaners, or compressed air to clean a hydraulic hose.
- The hydraulic system's components are manufactured with a great degree of precision, and have been assembled in sanitary conditions at the factory. Do **NOT** attempt to service these components in the field, except to maintain the proper oil level, change the hydraulic oil and filters, and to adjust the relief pressures as described in this manual.

Contact your MacDon Dealer for all other hydraulic system service needs.

5.12 Wheels and Tires

Refer to this section for information on maintaining the windrower's drive wheels and caster wheels.

5.12.1 Drive Wheels

The drive wheels are hydraulically driven by the wheel drive motors. The tire pressure, wheel nut torque, and wheel drive lubrication level should be inspected regularly.

Inflating Drive Wheel Tire

The tires on the windrower's drive wheels must be inflated to the correct pressure to ensure the windrower's performance in the field.

DANGER

- **Inflate the tire when the wheel is in a safety cage, if possible.**
- **Do NOT stand over the tire while inflating it. Use a clip-on chuck and extension hose.**
- **NEVER install a tube in a cracked wheel rim.**
- **NEVER weld a wheel rim.**
- **Do NOT exceed the maximum inflation pressure, which can be found on the tire's sidewall.**
- **Ensure that all the air is removed from a tire before attempting to remove the tire from the rim.**

Figure 5.216: Drive Tire Inflation

DANGER

- **NEVER use force on an inflated or partially inflated tire. Ensure that the tire is correctly seated before inflating it to operating pressure.**
- **Do NOT remove, install, or make repairs to a tire on a rim unless you have the proper equipment and experience to perform the job. Take the tire and rim to a qualified tire repair shop.**
- **If the tire is NOT in the correct position on the rim, or if it is overinflated, the tire bead can loosen on one side, causing air to leak 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.**

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.

Perform a daily visual check on the tires to ensure that they have not lost air pressure. Adjust the tire pressure as needed. Underinflated drive tires can cause sidewall cracks.

To inspect a tire's air pressure level, follow these steps:

1. Shut down the engine, and remove the key from the ignition.
2. Determine the type and size of tire installed on the windrower.
3. Refer to the following table to determine the appropriate tire pressure:

Table 5.4 Drive Wheel Tire Options (Ten Bolt)

18.4-26 Bar	600-65 R28 Bar	18.4-26 Turf	23.1-26 Turf
317 kPa (46 psi)	241 kPa (35 psi)	317 kPa (46 psi)	234 kPa (34 psi)

4. Adjust the tire pressure as needed.

IMPORTANT:

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

Tightening Drive Wheel Nuts

The wheel nuts must be tightened in a specific pattern to prevent damage to the drive wheels.

Whenever a wheel is installed, retorque the drive wheel nuts after one hour of operation. Retorque the installed wheel every hour until two consecutive checks demonstrate that the wheel nut torque is unchanged.

IMPORTANT:

- To avoid damage to the wheel rims and studs, tighten the wheel 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.
- Ensure that only the manufacturer-specified wheel nuts are used to secure the drive wheel.

1. Tighten drive wheel nuts (A). Ensure that the nuts and studs are dry. Do **NOT** apply lubricant or anti-seize compound to the threads of the wheel studs. Torque each nut to 510 Nm (375 lbf·ft) using the tightening sequence shown at right.
2. Repeat the tightening sequence twice more.
3. Retorque the installed wheel every hour until two consecutive checks demonstrate that the wheel nut torque is unchanged.

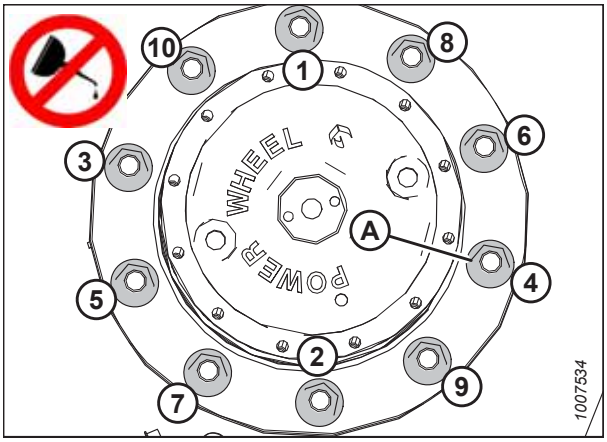


Figure 5.217: Drive Wheel – Nut Tightening Sequence

Servicing Drive Wheels

Refer to this section to learn how to safely remove and install the drive wheels, and to learn how to maintain the wheel drives.

Raising Drive Wheel

The windrower's drive wheel will need to be raised off of the ground to be removed or installed.

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

Detach the header or weight box, if these are attached to the windrower. Use a jack with a minimum lifting capacity of 2268 kg (5000 lb.) to provide adequate support for the windrower.

1. Detach the header from the windrower. For instructions, refer to *4.5 Attaching and Detaching Headers, page 226*.
2. Park the windrower on level ground. Ensure that caster wheels (A) are oriented so that they are parallel to drive wheels (B) as shown.
3. Place blocks or wheel chocks behind both caster wheels.

   NOTE:

   Blocking or chocking the caster wheels ensures that the windrower will not roll backward when the front of the machine is raised up.

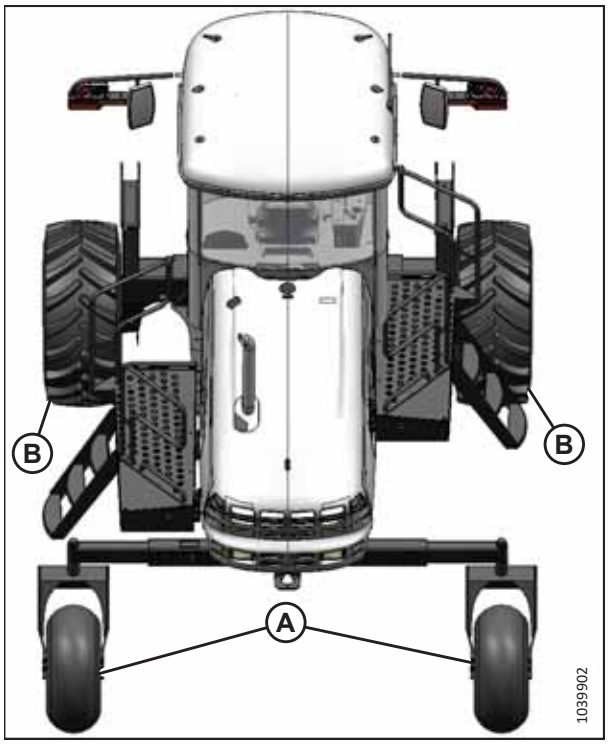


Figure 5.218: Caster Wheels Parallel to Drive Wheels

4. Place ground speed lever (A) in N-DETENT position (B).

CAUTION

The jack stand used to support the windrower must be capable of supporting a minimum of 2268 kg (5000 lb.).

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

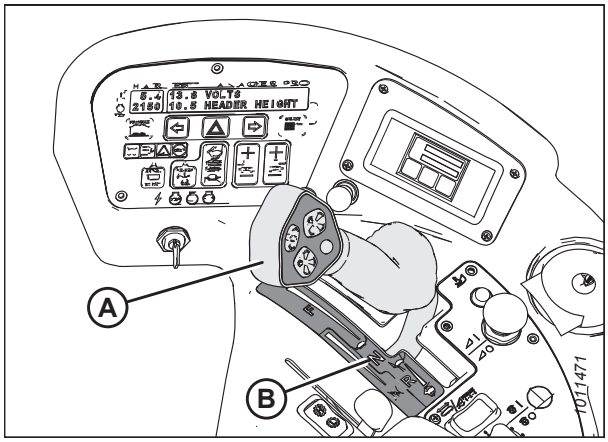


Figure 5.219: Ground Speed Lever

6. Locate jacking point (A) on the back of the drive wheel leg.
7. Place the head of the jacking device within retaining ring (B).

   IMPORTANT:

   The head of the jacking device **MUST** fit within retaining ring (B). To do so, the head will need to be 5 cm (2 in.) in diameter or smaller.
8. Elevate the drive wheel slightly.
9. Place a jack stand under lift cylinder mount (C).
10. Lower the windrower onto the jack stand.

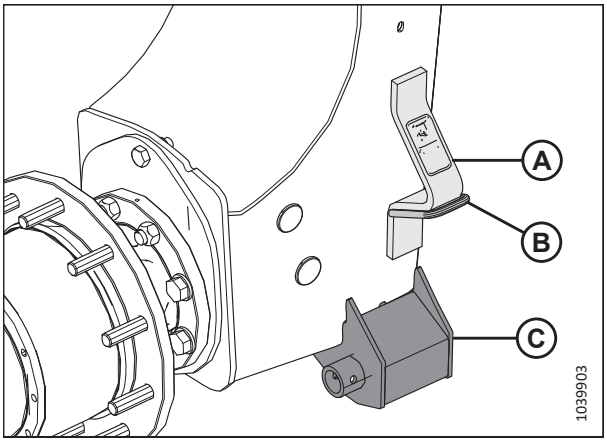


Figure 5.220: Drive Wheel Jacking Point

Removing Drive Wheel

Once the drive wheel has been raised, the wheel nuts can be removed and the wheel can be removed from the windrower.

CAUTION

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

1. Raise windrower drive wheel (A) off of the ground. For instructions, refer to *Raising Drive Wheel, page 451*.
2. Remove wheel nuts (B).
3. Use a suitable lifting device to remove drive wheel (A).

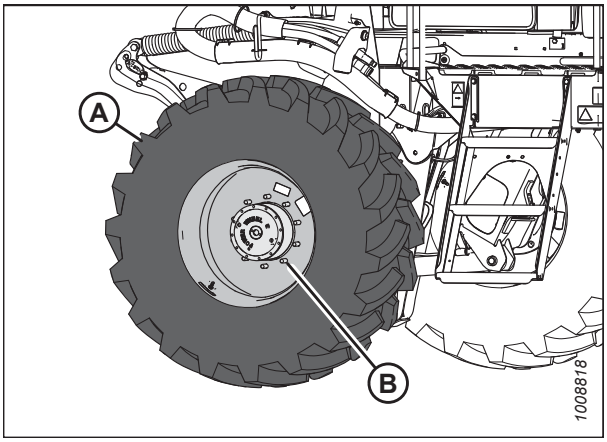


Figure 5.221: Drive Wheel

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. 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 direction of cab-forward rotation.

2. Install the wheel on the hub with the aid of a suitable lifting device.

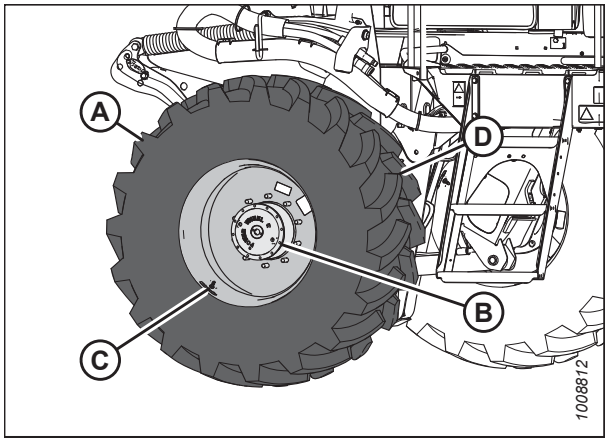


Figure 5.222: Drive Wheel

3. Install and hand-tighten wheel nuts (A).

   IMPORTANT:

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

4. Remove the lifting device.

5. Torque the drive wheel nuts. For instructions, refer to *Tightening Drive Wheel Nuts, page 451*.

6. Raise the windrower. Remove the jack. For instructions, refer to *Lowering Drive Wheel, page 455*.

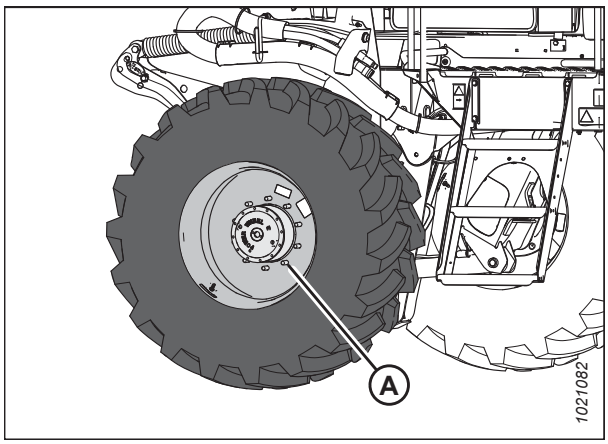


Figure 5.223: Drive Wheel Nuts

Lowering Drive Wheel

Once the drive wheel is secured to the wheel hub, the windrower can be lowered.

CAUTION

Jack stand must be capable of supporting a minimum of 2268 kg (5000 lb.).

1. Place a jack under leg jack point (A), and raise the drive wheel slightly off of the jack stand.
2. Remove the jack stand from under cylinder lift mount (B). Lower the drive wheel to the ground.
3. Remove the jack.

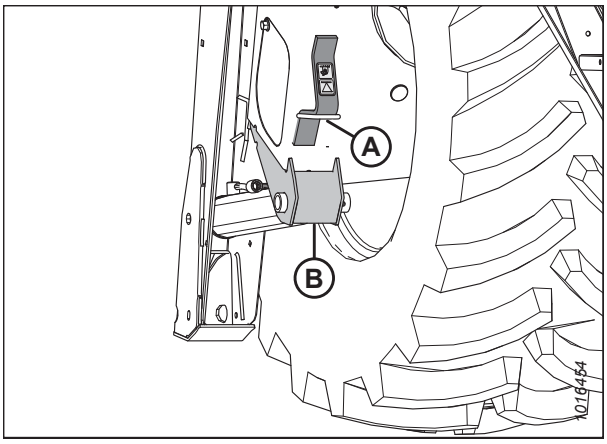


Figure 5.224: Drive Wheel Leg Jack Point

Lubrication

The windrower's hydraulic wheel drives are filled with lubricant. The Operator will need to inspect the level of the wheel lubricant and replace it according to the intervals specified in the maintenance schedule.

Checking Wheel Drive Lubricant Level

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

DANGER

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

CAUTION

Park on a level surface with the ground speed lever (GSL) in the 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. If lubricant needs to be added, refer to *Adding Wheel Drive Lubricant, page 456*.

   NOTE:

   The type of lubricant used after the first wheel drive lubricant change differs from the type of lubricant used at the factory. Refer to the manual's inside back cover for the recommended wheel drive lubricant.
5. Reinstall the plugs and tighten them.

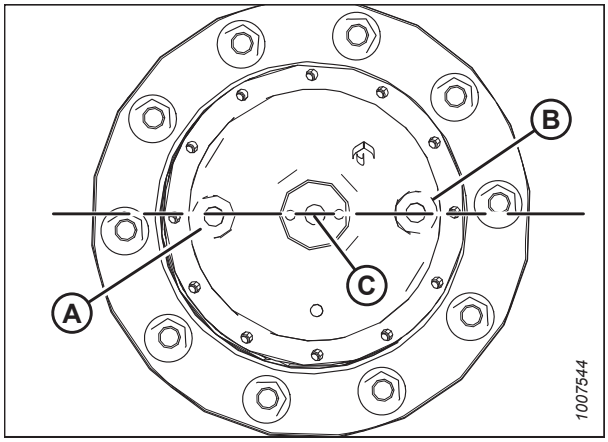


Figure 5.225: Drive Wheel Hub

Adding Wheel Drive Lubricant

If the level of lubricant in the wheel drives is insufficient, or if the lubricant has been drained, more will need to be added.

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 flat, level surface with the header on the ground, the ground speed lever (GSL) in the N-DETENT position, and the steering wheel in the locked position (centered). To confirm that the parking brake is engaged, wait for the cab display module (CDM) to beep and display the message IN PARK.

IMPORTANT:

Do **NOT** mix lubricants of different brands or specifications.

1. 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.
2. Shut down the engine, and remove the key from the ignition.
3. Remove two plugs (A) and (B). The oil should be visible through the hole.
4. If lubricant needs to be added, remove second plug (B), and add lubricant until lubricant runs out at port (A). Refer to the inside back cover for lubricant specifications.

   NOTE:

   The type of lubricant used after the first wheel drive lubricant change is not the same type of lubricant used in the factory. Refer to the manual's inside back cover for the recommended wheel drive lubricant.
5. Reinstall and tighten plugs (A) and (B).

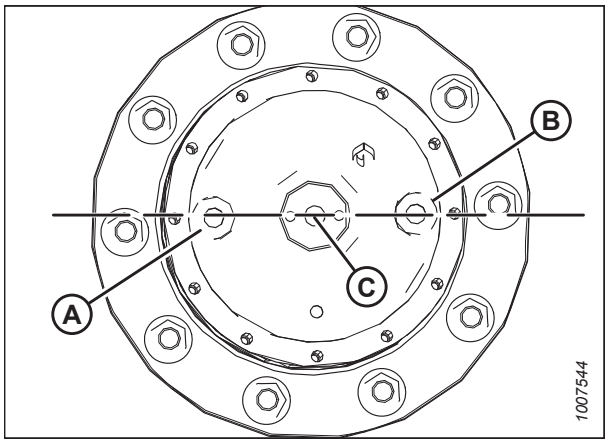


Figure 5.226: Drive Wheel Hub

6. Start the engine. Operate the windrower for a few minutes, then stop and check the oil level. If necessary, add more oil.

Changing Wheel Drive Lubricant

The wheel drive lubricant should be changed according to the interval specified in the maintenance schedule. Change the lubricant when it is warm.

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 flat, level surface with the header on the ground, the ground speed lever (GSL) in the N-DETENT position, and the steering wheel in the locked position (centered). To confirm that the parking brake is engaged, wait for the cab display module (CDM) to beep and display the message IN PARK.

1. Park the windrower on level ground. Position the windrower so that one of drain plugs (A) or (B) is at the lowest point on the drive wheel hub, as shown.
2. Shut down the engine, and remove the key from the ignition.
3. Place a container large enough to hold at least 2 liters (2 quarts) of fluid under lower drain plug (B).
4. Remove both plugs (A) and (B). Allow the lubricant to drain completely into the container.

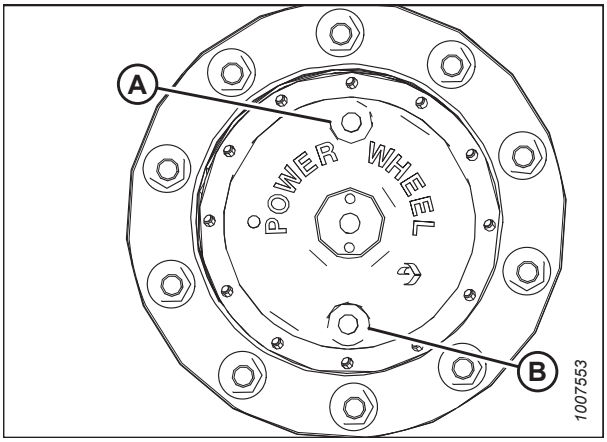


Figure 5.227: Drive Wheel Hub

CAUTION

Dispose of oil in a manner that complies with local rules and regulations.

5. After the lubricant has drained completely, start the windrower and position it so that the imaginary line running through (A) and (B) and center hub (C) is parallel with the ground, as shown.
6. Shut down the engine, and remove the key from the ignition.
7. Add lubricant to the wheel drive. For instructions, refer to *Adding Wheel Drive Lubricant, page 456*.

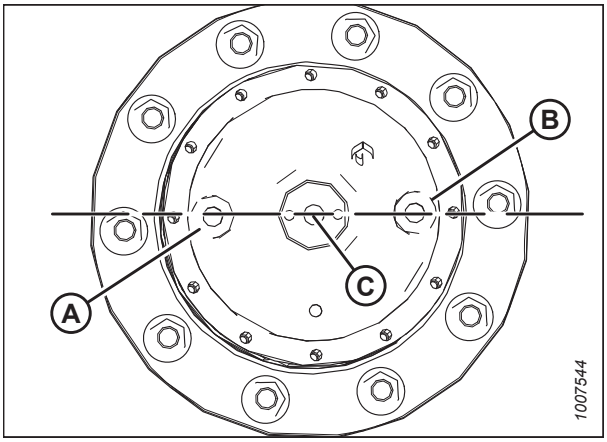


Figure 5.228: Drive Wheel Hub

5.12.2 Caster Wheels

The casters wheels' tire pressure, wheel nut torque, and the anti-shimmy dampeners should be inspected regularly.

Inflating Caster Tire

Follow these procedures to safely inflate the tire on a caster wheel.

DANGER

- **Inflate the tire when the wheel is in a safety cage, if possible.**
- **Do NOT stand over the tire while inflating it. Use a clip-on chuck and extension hose.**
- **NEVER install a tube in a cracked wheel rim.**
- **NEVER weld a wheel rim.**
- **Do NOT exceed the maximum inflation pressure, which can be found on the tire's sidewall.**
- **Ensure that all the air is removed from a tire before attempting to remove the tire from the rim.**

Figure 5.229: Safely Filling a Tire with Air

DANGER

- **NEVER use force on an inflated or partially inflated tire. Ensure that the tire is correctly seated before inflating it to operating pressure.**
- **Do NOT remove, install, or make repairs to a tire on a rim unless you have the proper equipment and experience to perform the job. Take the tire and rim to a qualified tire repair shop.**
- **If the tire is NOT in the correct position on the rim, or if it is overinflated, the tire bead can loosen on one side, causing air to leak 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.**

Check the tire pressure according to the interval specified in the maintenance schedule. Caster tire pressure should be 69 kPa (10 psi).

To maintain pressure, visually check daily that tires have not lost pressure, and adjust the pressure as needed. Underinflation of tires can cause sidewall cracks.

NOTE:

Overinflation may cause the caster wheels to shimmy.

Table 5.5 Caster Tire Options

Formed Caster	Forked Caster
7.5–16SL single rib, 10–16 front steer tire	16.5L–16.1 rib implement flotation, 10–16 front steer tire
69 kPa (10 psi)	69 kPa (10 psi)

Tightening Caster Wheel Hardware

The caster wheel hardware must be tightened in a specific pattern to prevent damage to the caster wheels.

At first use or when a wheel is removed, check the wheel nut torque every 15 minutes when the windrower is operating on the road, or after every hour when it is operating in the field, until the specified torque is maintained across two checks.

Once the specified torque is maintained, check the wheel nut torque after every 10 and 50 hours (field or road operation) and then at 200 hour intervals thereafter.

To tighten the caster wheel hardware on a forked caster:

1. Position the wheel on the axle. Install wheel nuts (A).
2. Tighten wheel nuts (A) to 163 Nm (120 lbf·ft) using the tightening sequence shown. Repeat the tightening sequence three times.

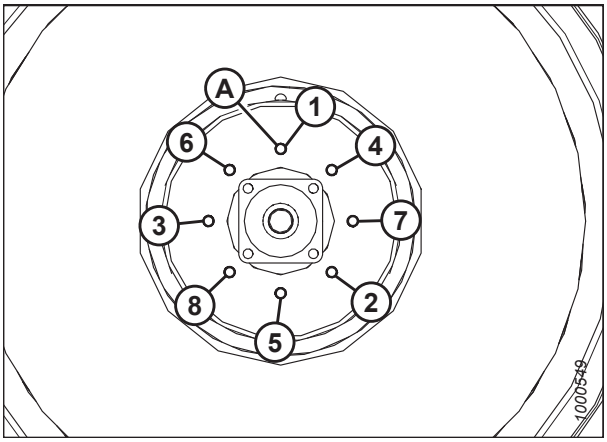


Figure 5.230: Forked Caster Wheel Nut Tightening Sequence

To tighten the caster wheel hardware on a formed caster:

1. Position wheel (B) on the hub. Install wheel bolts (A).
2. Tighten wheel bolts (A) to 163 Nm (120 lbf·ft) using the tightening sequence shown. Repeat the tightening sequence three times.

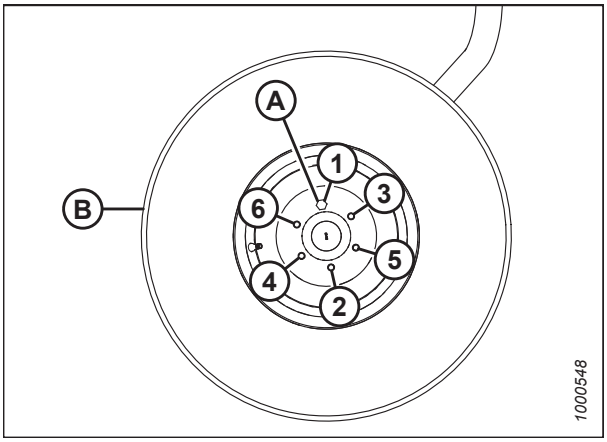


Figure 5.231: Formed Caster Wheel Bolt Tightening Sequence

Servicing Caster Wheels

Refer to this section to learn how to safely remove and install the caster wheels.

Raising Caster Wheel – Formed and Forked

The caster wheel will need to be raised off of the ground to be removed or installed.

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

The jack stand must be capable of supporting a minimum of 2268 kg (5000 lb.).

1. Park the windrower on level ground and block the drive wheels.
2. Place ground speed lever (GSL) (A) in N-DETENT position (B).
3. Shut down the engine, and remove the key from the ignition.

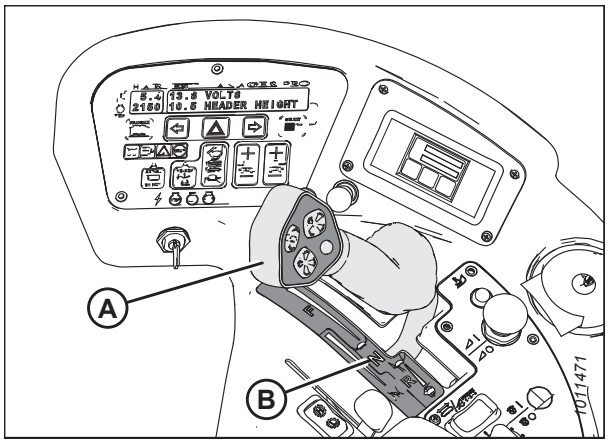


Figure 5.232: GSL Position

4. Raise the end of walking beam (A) until caster wheel assembly (B) is no longer in contact with the ground. Use a suitable lifting device, capable of lifting a minimum of 2268 kg (5000 lb.) to lift the windrower.
5. Place a jack stand beneath the walking beam. Lower the jack until the beam rests on the stand.

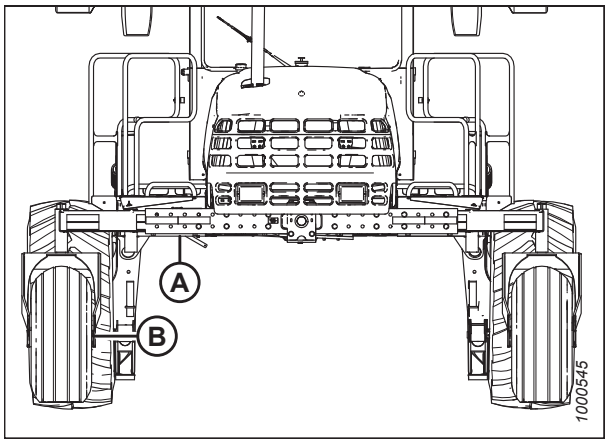


Figure 5.233: Caster Wheels and Walking Beam – Engine-Forward View

Lowering Caster Wheel – Formed and Forked

Once the caster wheel is secured to the caster, the windrower can be lowered.

CAUTION

The jack stand must be capable of supporting a minimum of 2268 kg (5000 lb.).

1. Raise the end of walking beam (A) slightly, using a suitable lifting device capable of lifting a minimum of 2268 kg (5000 lb.).
2. Remove the jack stand and lower the end of the walking beam until the caster wheel assembly (B) is on the ground.

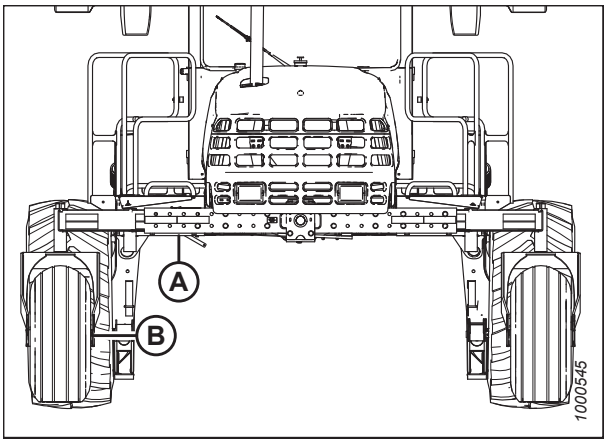


Figure 5.234: Caster Wheels and Walking Beam – Engine-Forward View

Removing Forked Caster Wheel

Once the caster wheel has been raised, the forked caster axle assembly can be removed from the windrower, and the wheel can be removed from the axle assembly.

CAUTION

The wheel assembly is heavy. Support the wheel assembly before removing the axle bolts.

1. Raise the caster wheel. For instructions, refer to *Raising Caster Wheel – Formed and Forked, page 460*.
2. Remove eight bolts (A) (four on each side of the caster) attaching axle (B) and cover (C) to forked caster (E). Remove wheel assembly (D) from caster (E).

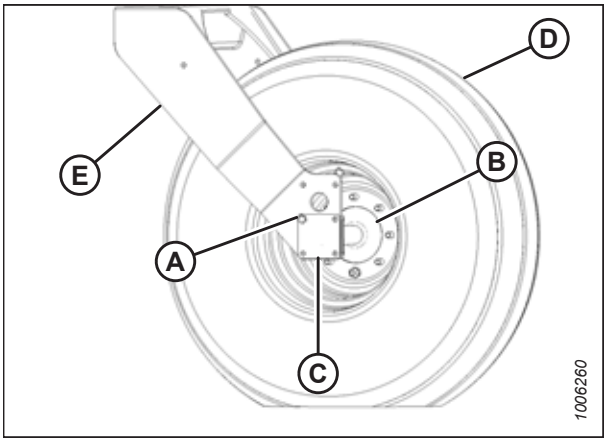


Figure 5.235: Forked Caster Wheel

3. Remove eight wheel nuts (A) securing axle (B) to wheel (C).
4. Separate axle (B) and wheel (C).

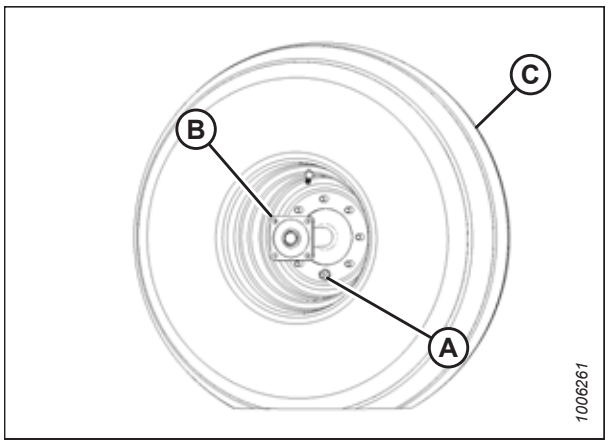


Figure 5.236: Forked Caster Wheel

Installing Forked Caster Wheel

The caster wheel will need to be attached to the axle assembly before it can be installed on the windrower.

CAUTION

The wheel assembly is heavy. Support the wheel assembly before removing the axle bolts.

1. Position wheel assembly (C) on axle assembly (B). Install wheel nuts (A).
2. Torque wheel nuts (A). For instructions, refer to *Tightening Caster Wheel Hardware, page 459*.

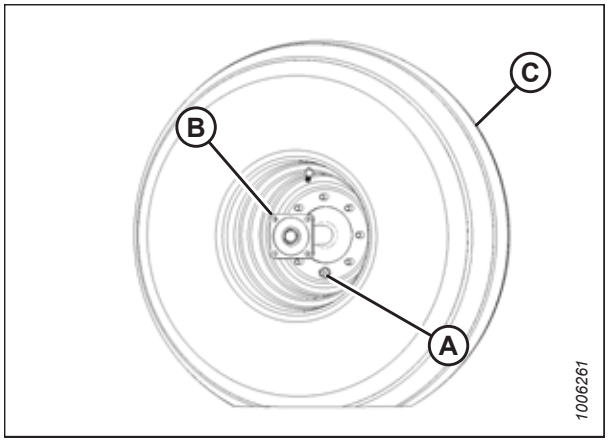


Figure 5.237: Forked Caster Wheel

3. Position wheel assembly (D) in forked caster (E).
4. Position cover plates (C) as shown and install eight bolts (A) (four on each side of caster) to secure axle (B) to caster (E). Torque the bolts to 102 Nm (75 lbf·ft).
5. Lower the caster wheel. For instructions, refer to *Lowering Caster Wheel – Formed and Forked, page 461*.

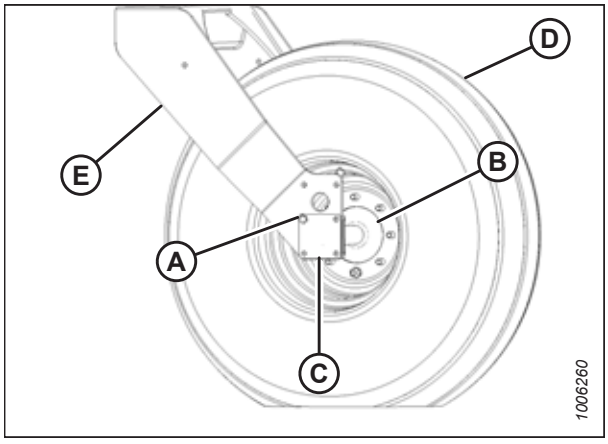


Figure 5.238: Forked Caster Wheel

Removing Formed Caster Wheel

Formed caster wheels are bolted directly to the caster hub. The windrower will need to be elevated to remove the caster wheel.

CAUTION

The wheel assembly is heavy. Support the wheel assembly before removing the axle bolts.

1. Raise the caster wheel. For instructions, refer to *Raising Caster Wheel – Formed and Forked, page 460*.
2. Remove six bolts (A) securing wheel (B) to the hub.
3. Remove wheel (B).

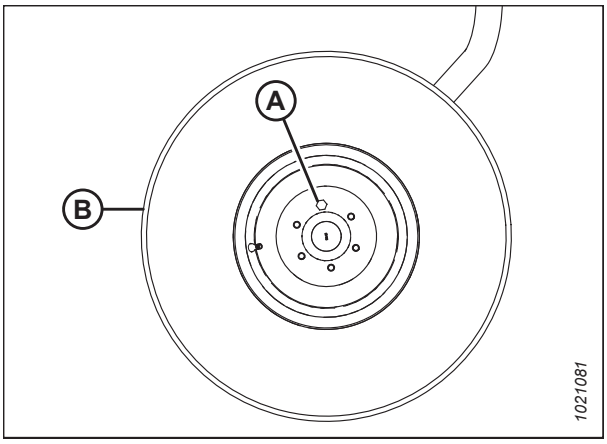


Figure 5.239: Formed Caster Wheel

Installing Formed Caster Wheel

Formed caster wheels are attached directly to the caster wheel hub.

CAUTION

The wheel assembly is heavy. Support the wheel assembly before removing the axle bolts.

1. Position wheel assembly (B) on the caster wheel hub. Secure the wheel with six wheel bolts (A).
2. Referring to the tightening sequence at right, torque bolts (A) to 163 Nm (120 lbf·ft).
3. Lower the caster wheel. For instructions, refer to *Lowering Caster Wheel – Formed and Forked, page 461*.

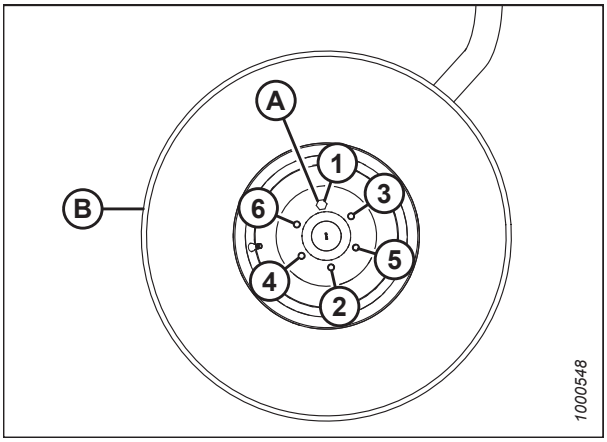


Figure 5.240: Formed Caster Wheel

Tightening Caster Wheel Anti-Shimmy Dampeners

The windrower's anti-shimmy dampeners mitigate the tendency of caster wheels to shake. They may require tightening from time to time.

Each caster is equipped with a fluid-filled anti-shimmy dampener (for example, dampener [A]).

Mounting bolts (B) should be checked periodically to ensure that they are tight. For the inspection interval, refer to *5.2 Maintenance Schedule, page 318*.

- The inboard bolt must be tightened to 135 Nm (100 lbf·ft).
- The outboard bolt must be tightened to 115 Nm (85 lbf·ft).

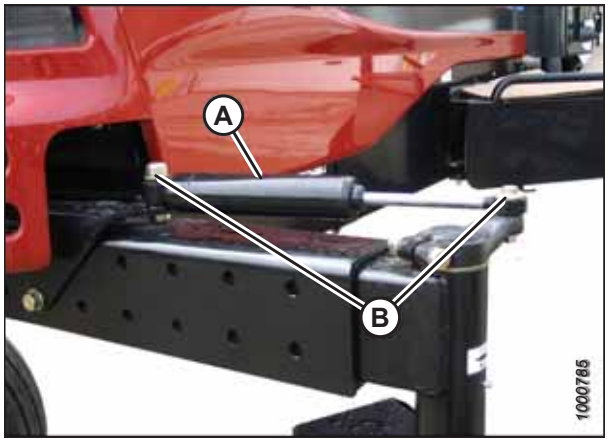


Figure 5.241: Anti-Shimmy Dampener

Ballast Requirements

Adding fluid ballast to the windrower's caster tires will improve the windrower's stability when it is paired with a heavy header. Tire ballast may only be needed for certain header-windrower combinations in certain types of terrain.

With respect to ballast capacity, a tire is considered to be "full" of ballast fluid when 75% of the inner volume of the tire is occupied by ballast fluid, or else when the ballast fluid is level with the wheel's valve stem when the stem is at the 12 o'clock position while the windrower is on level ground. When adding ballast fluid to the caster wheels, always add an identical amount to each wheel. The caster wheels can safely hold any volume of ballast fluid up to and including their maximum capacity, as specified in the table below.

Table 5.6 Recommended Ballast Weight

Header		Recommended Ballast				Recommended Tire Size
		Level Terrain		Sloped Terrain		
Series	Size/Model	Per Tire	Both Tires	Per Tire	Both Tires	
		liters (US gal)	kg (lb.)	liters (US gal)	kg (lb.)	
A Series	All	0				7.5 x 16 10 x 16 16.5 x 16.1
R Series	4.0 m (13 ft.) ONLY	0				7.5 x 16 10 x 16 16.5 x 16.1
D Series	7.6 m (25 ft.) and smaller	0				7.5 x 16 10 x 16 16.5 x 16.1
D Series	9.1 m (30 ft.) single or double reel without conditioner 10.7 m (35-ft.) single reel	0	0	38 (10)	91 (200)	7.5 x 16 10 x 16 16.5 x 16.1
D Series	9.1 m (30 ft.) double reel steel fingers and conditioner 10.7 m (35 ft.) double reel (5 or 6-bat)	69 (18)	170 (380)	115 (30)	288 (630)	Level ground: 10 x 16 Level ground: 16.5 x 16.1 Hills: 16.5 x 16.1
D Series	12.1 m (40 ft.)	115 (30)	288 (630)	158 (41)	377 (830)	16.5 x 16.1

Chapter 6: Options and Attachments

Several optional kits and attachments are available for your windrower, depending on your specific performance needs.

6.1 Cab

Several cab amenities are available which can make using the windrower more convenient for the Operator.

6.1.1 AM/FM Radio

The cab is pre-wired for easy installation of a single DIN audio component such as the optional AM/FM radio, which can be obtained from your MacDon Dealer. The windrower comes from the factory with speakers already installed.

In order to retain the radio settings and preset memory when the battery disconnect switch is turned off, install a radio with non-volatile memory.

For installation details, refer to the unloading and assembly instructions supplied with your windrower.

6.1.2 Automated Steering Systems

A MacDon-approved automated steering system is available from any MacDon Dealer which provides Trimble® global positioning system (GPS) installation and support services.

MacDon windrowers are partially pre-wired for either the Trimble® AutoPilot™ hydraulically integrated steering system or the Trimble® Electric on wheel system (EZ-Pilot®, EZ-Pilot® Pro, or Autopilot™ Motor Drive [APMD]). The windrower's ground speed lever (GSL) has an automated steering (autosteer) engage switch; the Trimble® display mounting kit (MD #183348) is supplied in the cab.

Table 6.1 Autosteer System Bundles

Trimble® Autosteer System	Part Number
Electric on wheel (EZ-Pilot®, EZ-Pilot® Pro, or Autopilot™ Motor Drive [APMD])	MD #B9003[34]
Integrated AutoPilot™	MD #B5589[34]

Other GPS providers may supply vehicle-specific installation packages or make installation kits available through MacDon Dealers.

NOTE:

Additional completion kits may be required dependent upon the type of display being installed.

6.1.3 High Intensity Discharge Auxiliary Lighting

This kit includes two cab-mounted high intensity discharge (HID) lamps that provide additional field lighting.

MD #B5596

Instruction MD #169621 is included in the bundle.

6.1.4 Windshield Shades

This kit includes retractable sun shades for front and rear windows. The necessary attachment hardware is also included in the kit.

MD #B4866

Instruction MD #169218 is included in the bundle.

34. Instructions supplied in the kit.

6.2 Engine

Several optional kits are available for your windrower's engine, depending on your particular performance needs.

6.2.1 Engine Block Heater

A block heater is an electrical resistance heater which warms the engine block, making starting the engine in cold climates much easier. Contact your nearest Cummins Engine Distributor to order an engine block heater. You will need to provide your engine's model and serial number to ensure that the proper heater is supplied.

6.2.2 Engine Fan Air Baffle

The Engine Fan Air Baffle kit prevents the windrow formed by the windrower from being disturbed by the exhaust from the engine cooling fan.

MD #B5440

Instruction MD #169443 is included in the bundle.

6.3 Header Operation

Several kits are available which can augment the capabilities of the header attached to the windrower, or which allow the windrower to be used with different types of headers.

6.3.1 Draper Header Case Drain Kit

The Draper Header Case Drain kit must be installed on the windrower in order to attach a MacDon D50, D60, or D65 Draper Header equipped with an upper cross auger (UCA) without double-draper drive to the windrower. The case drain kit (MD #B5842) is **NOT** required for double-draper drive headers equipped with kits MD #B5606 and MD #B6154.

MD #B5842

6.3.2 Draper Header Reel Drive and Lift Plumbing

This kit must be installed on the windrower in order for it to be able to pair with a draper header. The kit includes the draper header reel drive and lift plumbing (less valve) and the reel fore-aft hydraulic components.

NOTE:

If the last digit of the windrower code is B, this bundle is already installed.

MD #B5577

Instruction MD #169537 is included in the bundle.

6.3.3 Header Drive Reverser

This kit allows the conditioner, knife, auger, and reel on an auger header to operate in reverse. When the windrower is paired with a draper header, this kit allows the conditioner and knife to operate in reverse.

MD #B4656 [35, 36, 37, 38]

Instruction MD #169213 is included with the bundle.

6.3.4 Light Header Flotation

This kit is recommended for headers which do not require a high degree of spring tension for the header float.

MD #B4664

Instruction MD #169033 is included in the bundle.

6.3.5 Pressure Sensor Kit

This kit provides enhanced monitoring of the knife drive (or reel drive) hydraulic pressure, and warns of overload conditions.

MD #B5574

Instruction MD #169031 is included in the bundle.

35. If installed on a windrower equipped with a D Series Draper Header, only the knife circuit will reverse.
36. If installed on a windrower equipped with an A Series Auger Header, the knife, reel, auger, and conditioner will reverse. Grass seed auger headers are not equipped with conditioners.
37. If installed on a windrower equipped with a D Series Draper Header and HC10 Hay Conditioner, knife and conditioner will reverse.
38. R Series Disc Headers cannot use the reversing feature.

6.3.6 R/R1 Disc Drive Kit

This kit includes a valve required to operate an R/R1 Series Rotary Disc Header with an M155*E4* SP Windrower.

MD #B4657

6.3.7 R2 Rotary Disc Header Hydraulic Drive Kit

This kit includes the components necessary to make an M155*E4* Self-Propelled Windrower compatible with an R2 Series Rotary Disc Header. The kit includes a new hydraulic motor, hoses, fittings, and attachment hardware, as well as installation instructions.

MD #7310

Installation instruction MD #215390 is included with the kit.

6.3.8 R80 and R85 Rotary Header Drive Hydraulics

This kit is needed to allow the windrower to operate with a 4.0 m (13 ft.) R80 or R85 Rotary Disc Header. The kit includes the header drive plumbing and installation instructions.

MD #B5510

The installation instructions are included in the bundle.

6.3.9 Self-Aligning Center-Link

This kit allows the Operator to remotely position the center-link cylinder without leaving the operator's station.

Hydraulic center-link (MD #B4650) must be installed.

MD #B4802

Instruction MD #169004 included in the bundle.

6.3.10 Spring with External Booster Spring

This kit increases the float capacity of the windrower. Install this kit on windrowers paired with headers that weigh more than 2724 kg (6000 lb.).

The Spring with External Booster Spring kit (MD #B4659) includes two springs (one for each side) and mounting brackets.

Instruction MD #169032 is included in the bundle.

Table 6.2 External Booster Spring Kit (MD #B4659) Required – Double Knife D and D1 Series SP Draper Headers

Header Size	Options and Attachments Installed on Header						
	HC10 Hay Conditioner	Slow Speed Transport	Upper Cross Auger	Slow Speed Transport and Upper Cross Auger	Slow Speed Transport and HC10 Hay Conditioner	HC10 Hay Conditioner and Upper Cross Auger	Slow Speed Transport, HC10 Hay Conditioner, and Upper Cross Auger
9.1 m (30 ft.)	Yes	Not Available	Factory Installed	Yes	Yes	Yes	Yes
10.8 m (35 ft.)	Not Available	Yes	Yes	Yes	Not Available	Not Available	Not Available
12.2 m (40 ft.)	Not Available	Yes	Yes	Yes	Not Available	Not Available	Not Available

6.3.11 Spring with Internal Booster Spring

MacDon windrowers have two large diameter springs on each side: an outboard spring and an inboard spring. This kit includes parts to replace one of the large-diameter springs with a new inboard spring assembly. The new inboard spring assembly comes with an internal booster spring inside.

The Spring with Internal Booster Spring kit (MD #B5303) includes one spring and castings for one side of the windrower.

Instruction MD #169316 is included in the bundle.

6.3.12 Swath Compressor

The MacDon Swath Compressor is a large, formed polyethylene sheet which is designed to mount to the underside of a MacDon M Series Self-Propelled Windrower. The MacDon Swath Compressor is designed for use with D Series Draper Headers cutting canola.

When lowered, the swath compressor helps prevent wind damage by shaping the windrow and anchoring it into the stubble behind the header. This reduces the occurrence of shelling in the windrow.

The height of the swath compressor can be adjusted using a rocker switch on the operator's console. The current height setting can be monitored on the Cab Display Module (CDM).

MD #C2061

Operator's manual MD #215350 and MD #215953 are included.

6.3.13 Swath Roller

An axle-mounted swath roller increases the windrow's resistance to wind disturbance, especially in canola or similar crops. It can be fitted with a hydraulic lift with in-cab controls.

Contact your MacDon Dealer for information.

6.4 Transport

Several kits are available which facilitate moving the header from field to field.

6.4.1 Lighting and Marking for Cab-Forward Road Travel

This kit makes the windrower compliant with vehicle lighting regulations when the windrower is traveling on public roads while in cab-forward mode. This kit includes red tail lights, slow moving vehicle (SMV) markings, hardware, and installation instructions.

MD #B5412

Instruction MD #169426 is included in the bundle.

6.4.2 Towing Harness

The towing harness is used together with the weight box (refer to *Towing Header with Windrower, page 190*) when towing a D Series Draper Header equipped with the slow speed transport (SST) option behind the windrower.

MD #B5280 – Weight box harness only. Includes hitch pin and wiring for use with slow speed header transport option.

Instruction MD #169278 is included in the bundle.

6.4.3 Weight Box

A weight box installed onto the windrower header lift system is required to transport a header behind the windrower.

MD #B5238 – Weight box without harness

A towing harness is required to use the weight box. Refer to *Towing Header with Windrower, page 190* for more information.

Chapter 7: Troubleshooting

Refer to these topics if you encounter problems while operating the windrower.

7.1 Engine Troubleshooting

Refer to the table provided below if you encounter engine problems while operating the windrower.

Problem	Solution	Section
Symptom: Engine hard to start or will not start		
Controls not in NEUTRAL	Move GSL to NEUTRAL.	*Starting Engine, page 170*
Controls not in NEUTRAL	Move steering wheel to locked position (centered).	*Starting Engine, page 170*
Controls not in NEUTRAL	Disengage header drive switch.	*4.4.4 Header Drive Controls, page 212*
NEUTRAL interlock improperly adjusted	Contact Dealer.	Contact Dealer
Fuel not reaching the engine	Fill empty fuel tank. Replace clogged fuel filter.	*Filling Fuel Tank, page 369* and *Maintaining Fuel Filters, page 363*
Old fuel in fuel tank	Drain tank. Refill the tank with fresh fuel.	*5.8.7 Fuel System, page 362*
Water, dirt, or air in fuel system	Drain, flush, fill, and prime the fuel system.	*5.8.7 Fuel System, page 362*
Improper type of fuel in fuel tank	Use proper fuel for operating conditions.	*8.1.2 Fuel Specifications, page 490*
Oil in crankcase is the wrong type	Use recommended oil.	*8.1.3 Lubricants, Fluids, and System Capacities, page 491*
Low battery output	Have battery tested. Check battery electrolyte level.	*5.10.2 Battery, page 401*
Poor battery connection	Clean and tighten loose connections.	*5.10.2 Battery, page 401*
Faulty starter	Contact Dealer.	Contact Dealer
Loose electrical connection at fuel pump	Ensure that connector at pump is fully pushed in.	Contact Dealer
Wiring shorted or circuit breaker open	Check continuity of wiring and breaker (manual reset).	*Checking and Replacing Fuses, page 431*
ECM fuse (1 of 2) blown	Replace fuse.	*Checking and Replacing Fuses, page 431*
ECM ignition relay faulty	Replace ignition relay.	*Checking and Replacing Fuses, page 431*
NEUTRAL logic relay faulty	Replace logic relay.	*Checking and Replacing Fuses, page 431*
Faulty fuel injectors	Contact Dealer.	Contact Dealer
Symptom: Engine knocks		
Engine timing incorrect	Contact Dealer.	Contact Dealer
Insufficient oil in crankcase	Add oil.	*Adding Engine Oil, page 355*
Coolant temperature too low or too high	Contact Dealer.	Contact Dealer
Fuel in fuel tank is the wrong type	Use proper fuel.	*8.1.2 Fuel Specifications, page 490*

Problem	Solution	Section
Symptom: Low oil pressure		
Low oil level in crankcase	Add oil.	*Adding Engine Oil, page 355*
Improper type of oil in crankcase	Drain and fill crankcase with proper oil.	*8.1.3 Lubricants, Fluids, and System Capacities, page 491*
Worn components	Contact Dealer.	Contact Dealer
Symptom: High oil consumption		
Internal engine parts worn	Contact Dealer.	Contact Dealer
Engine oil viscosity too low	Use recommended oil.	*8.1.3 Lubricants, Fluids, and System Capacities, page 491*
Oil leaks	Check for leaks around gaskets, seals, and drain plugs.	*5.8.3 Checking Engine Oil Level, page 352*
Symptom: Engine runs irregularly or stalls frequently		
Erratic fuel supply	Change filter on fuel tank vent line. Replace clogged fuel filter.	*Replacing Fuel Tank Vent Filter, page 362* and *5.8.7 Fuel System, page 362*
Water or dirt in fuel system	Drain, flush, and fill fuel system.	*8.1.3 Lubricants, Fluids, and System Capacities, page 491*
Low coolant temperature	Remove and check thermostat.	Contact Dealer
Air in fuel system	Contact Dealer.	Contact Dealer
Dirty or faulty fuel injectors	Contact Dealer.	Contact Dealer
Symptom: Lack of power		
Incorrect engine timing	Contact Dealer.	Contact Dealer
Engine oil viscosity too high	Use recommended oil.	*8.1.3 Lubricants, Fluids, and System Capacities, page 491*
Intake air restriction	Service air cleaner.	*5.8.5 Air Intake System, page 356*
Clogged fuel filter	Replace primary fuel filter, and if necessary, replace secondary fuel filter.	*Maintaining Fuel Filters, page 363*
High exhaust back pressure	Clean out or replace exhaust canisters.	*5.8.11 Inspecting Exhaust System, page 389*
Improper type of fuel in fuel tank	Use proper fuel.	*8.1.2 Fuel Specifications, page 490*
High or low engine temperature	Remove and check thermostat.	Contact Dealer
Improper valve clearance	Contact Dealer.	Contact Dealer
Faulty fuel injectors	Contact Dealer.	Contact Dealer
Symptom: Engine temperature below normal		
Defective thermostat	Remove and check thermostat.	Contact Dealer

Problem	Solution	Section
Symptom: Warning alarm sounds		
Engine overheated	Check coolant level.	*Checking Coolant Level, page 380*
Engine overheated	Check thermostat.	Contact Dealer
Low engine oil pressure	Check oil level.	*5.8.3 Checking Engine Oil Level, page 352*
Low transmission oil pressure	Check oil level.	*5.11.1 Checking and Filling Hydraulic Oil, page 439*
Symptom: Engine overheats		
Low coolant level	Fill reserve tank to proper level. Check system for leaks.	*5.8.9 Engine Cooling System, page 379*
Only water in cooling system	Drain cooling system. Fill cooling system with an approved type of coolant.	*5.8.9 Engine Cooling System, page 379*
Engine overloaded	Reduce ground speed.	*Driving Forward in Cab-Forward Mode, page 179*
Defective pressurized coolant tank cap	Replace cap.	*Inspecting Pressurized Coolant Tank Cap, page 381*
Defective fan belt	Replace belt	*Replacing Fan Belt, page 390*
Dirty radiator screen, rotors turning	Check for obstructions in ducting from screen to fan shroud.	*5.9 Maintaining Engine Cooling Box, page 394*
Dirty radiator screen, rotors not turning	Check connections to rotor electric motor.	*5.9 Maintaining Engine Cooling Box, page 394*
Dirty radiator core	Clean radiator.	*5.8.9 Engine Cooling System, page 379*
Cooling system dirty	Flush cooling system.	*5.8.9 Engine Cooling System, page 379*
Defective thermostat	Remove and check thermostat.	Contact Dealer
Defective temperature gauge or sender	Check coolant temperature with thermometer. Replace gauge if necessary.	Contact Dealer
Defective water pump	Contact Dealer.	Contact Dealer
Symptom: High fuel consumption		
Clogged or dirty air cleaner	Service air cleaner.	*5.8.5 Air Intake System, page 356*
Engine overloaded	Reduce ground speed.	*Driving Forward in Cab-Forward Mode, page 179*
Improper valve clearance	Contact Dealer.	Contact Dealer
Engine out of time	Contact Dealer.	Contact Dealer
Dirty fuel injector nozzles	Contact Dealer.	Contact Dealer
Low engine temperature	Check thermostat.	Contact Dealer
Improper type of fuel in fuel tank	Use proper fuel.	*8.1.2 Fuel Specifications, page 490*

Problem	Solution	Section
Symptom: Starter cranks slowly or will not operate		
Low battery output	Check battery charge.	*Maintaining Batteries, page 401*
Loose or corroded battery connections	Clean and tighten loose connections.	*Maintaining Batteries, page 401*
Controls not in NEUTRAL	Move GSL to NEUTRAL.	*Driving Forward in Cab-Forward Mode, page 179*
Controls not in NEUTRAL	Move steering wheel to CENTER position.	*Driving in Reverse in Cab-Forward Mode, page 180*
Controls not in NEUTRAL	Disengage header.	*Engaging and Disengaging Header, page 212*
Relay not functioning	Check relay and wire connections.	*5.10 Electrical System, page 400*
Main fuse defective/blown	Replace main fuse.	*5.10 Electrical System, page 400*
Key power fuse blown	Replace fuse.	*5.10 Electrical System, page 400*
Key switch worn or terminals loose	Contact Dealer.	Contact Dealer
Switch at interlock not closed or defective	Adjust or replace switch . Contact your Dealer.	Contact Dealer
Engine oil viscosity too high	Use recommended oil.	*8.1.3 Lubricants, Fluids, and System Capacities, page 491*
Symptom: Air filters require frequent cleaning		
Aspirator plugged	Clean out aspirator.	*5.8.5 Air Intake System, page 356*

7.2 Diesel Exhaust Fluid System Troubleshooting

Refer to the table provided below if you encounter problems with the diesel exhaust fluid (DEF) system while operating the windrower.

Problem	Solution
Symptom: Engine cranks, but fails to run	
No fuel No power	• Check the fuel level. • Check the fuel supply to the pump inlet. • Ensure that the air intake is clear. • Using a multimeter, ensure that there is a reading of 12 V between ignition pin 5 and the ground when the ignition key is in the ON position.
Symptom: DEF supply module fails to prime or purge	
No DEF supply	• Check the DEF tank level. • Check the connection on the DEF supply module. Detach and inspect connection for contamination or damage. • Inspect the DEF lines running to and from the DEF dosing module for signs of leakage. DEF, when it dries, leaves a white deposit, which can help identify leaky fittings. Replace the DEF supply module if necessary. • Remove and inspect the DEF lines to see if they are clogged. Soak the lines in warm water to dissolve any blockages.
Symptom: Aftertreatment DEF supply module–mechanical system not responding	
Supply module injector clogged	Remove the DEF injector. Remove all crystallized DEF deposits from the injector by cleaning it gently with warm water.
Symptom: Aftertreatment sensor (NOx level, DOC temp, SCR temp)	
Sensor failure	• Ensure that the connector to the sensor in question is plugged in and that the locking tabs are locked. • Contact your MacDon Dealer. • Ensure that the power supply and ground are connected to the sensor in question. • If the continuity check fails, locate the source of the discontinuity and repair or replace the harness(es) as needed (MD #160704 and/or 160705).
Symptom: Several simultaneous aftertreatment codes on the CDM	
CAN communication error Electronics system	Contact your MacDon Dealer.
Symptom: System derate	
DEF tank empty	Fill the tank with an approved DEF. For instructions, refer to *Filling Diesel Exhaust Fluid Tank, page 373*.
DEF tank sensor wiring damage or unplugged	Check the sensor connection on the DEF tank. Inspect the connection for contamination or damage.
Symptom: DEF quality inadequate, causing system derate	

Problem	Solution
DEF contamination DEF too old	Ensure that the DEF in the tank meets ISO 22241-1 / DIN 70070 standards and has not been contaminated.
Symptom: System out NO_X high, causing system derate	
No DEF supply	• Fill the tank with an approved DEF. For instructions, refer to *Filling Diesel Exhaust Fluid Tank, page 373*. • The flow of urea is inadequate. Inspect the tank and the supply module filters, and replace them if necessary. For instructions, refer to *Diesel Exhaust Fluid Supply Module Filter, page 376*. • Inspect the DEF lines for clogging. Soak the lines in warm water to dissolve any crystallized DEF.

7.3 Electrical Troubleshooting

Refer to the table provided below if you encounter problems with the electrical system while operating the windrower.

Problem	Solution	Reference
Symptom: Low voltage and/or battery will not charge		
Defective battery	Have battery tested.	*5.10.2 Battery, page 401*
Loose or corroded connections	Clean and tighten battery connections.	*Maintaining Batteries, page 401*
Defective alternator belt	Replace worn belt.	*Replacing Fan Belt, page 390*
Alternator or voltage regulator not connected properly	Connect properly.	*5.10.2 Battery, page 401*
Dirty or defective alternator, defective voltage regulator, or high resistance in circuit	Contact Dealer.	Contact Dealer
Symptom: Lights dim		
Defective light switch	Contact Dealer.	Contact Dealer
High resistance in circuit or poor ground on lights	Check the wiring circuit for a break in a wire or a poor ground.	—
Symptom: Lights do not light		
Burned out or defective light bulb	Replace light bulb.	*Replacing Headlight Bulb, page 411*
Burned out or defective light bulb	Replace light bulb.	*Replacing Bulb in Cab-Forward Floodlight, page 415*
Burned out or defective light bulb	Replace light bulb.	*Replacing Bulb in Rear Floodlight, page 422*
Broken wiring	Check wiring for broken wire or shorts.	—
Poor ground on lights	Clean and tighten ground wires.	—
Open or defective circuit breaker	Check circuit breaker.	*5.10.14 Accessing Main Fuse Box, page 430*
Defective relay	Replace relay.	*Replacing Circuit Breakers and Relays, page 432*
Defective light switch	Contact Dealer.	Contact Dealer
Symptom: Turn signals or indicators showing wrong direction		
Reversed wires	Contact Dealer.	Contact Dealer
Symptom: No current to cab		
Broken or disconnected wire	Contact Dealer.	Contact Dealer
Circuit breaker tripped	Breaker automatically resets.	—
Battery disconnect switch is OFF	Turn battery disconnect switch ON.	*Battery Main Disconnect Switch, page 401*

7.4 Hydraulics Troubleshooting

Refer to the table provided below if you encounter problems with the hydraulic system while operating the windrower.

Problem	Solution	Reference
Symptom: Header or reel not lifting		
Appropriate solenoids not being energized by activating switch	Contact Dealer.	Contact Dealer
Contaminant in relief valve	Clean relief valve at cylinder control valve.	Contact Dealer
Relief pressure too low or contaminant in relief valve	Check/adjust/clean relief valve at cylinder control valve.	Contact Dealer
Symptom: Reel and/or conveyor not turning		
HEADER DRIVE switch not engaged	Engage HEADER DRIVE switch.	*Engaging and Disengaging Header, page 212*
Flow controls adjusted too low	Toggle speed controls on CDM to increase flow.	D Series and D1 SP Series: *4.6.6 Draper Speed, page 298*, and *4.6.5 Reel Speed, page 295* A Series: *4.7.1 Auger Speed, page 307*
Appropriate solenoid on flow control block not being energized	Contact Dealer.	Contact Dealer
Symptom: Reel and/or conveyor turns but lacks power		
Relief pressure too low	Check/adjust/clean relief valve.	Contact Dealer
Symptom: Hydraulic oil high-temperature alarm		
Hydraulic oil cooling system not working properly	Check/clean cooling box.	*5.9 Maintaining Engine Cooling Box, page 394*
Faulty bypass valve	Clean or replace bypass valve.	Contact Dealer
Symptom: Hydraulic oil low-temperature alarm		
Hydraulic oil too cold	Run engine until hydraulic oil warms up.	—
Symptom: Header or reel lifts unevenly		
Air in system	Fully raise header or reel and hold switch.	*4.4.1 Engaging and Disengaging Header Safety Props, page 203*

7.5 Header Drive Troubleshooting

Refer to the table provided below if you encounter problems with the header drive while operating the windrower.

Problem	Solution	Reference
Symptom: Header drive not engaging		
HEADER DRIVE switch in cab not engaged	Engage HEADER DRIVE switch.	*Engaging and Disengaging Header, page 212*
Operator presence switch not closed or faulty	Occupy operator's seat or replace switch. Contact your Dealer.	Contact Dealer
Appropriate solenoid not being energized by activating switch	Contact Dealer.	Contact Dealer
Symptom: Header drive lacks power		
Relief valve setting too low	Contact Dealer.	Contact Dealer
Hydraulic couplers/unions not properly connected	Ensure hoses are connected correctly and hose couplers/unions are tight.	Refer to the header operator's manual.
Header drive overload	Reduce ground speed.	—
Symptom: Warning alarm sounds		
Header drive overload	Reduce ground speed.	—
Relief valve setting too low	Contact Dealer.	Contact Dealer

7.6 Traction Drive Troubleshooting

Refer to the table provided below if you encounter traction drive problems while operating the windrower.

Problem	Solution	Reference
Symptom: Warning alarm sounds and transmission oil light is on		
Low hydraulic oil level	Stop engine, and add oil to hydraulic system.	*5.11.1 Checking and Filling Hydraulic Oil, page 439*
Low hydraulic pressure	Contact Dealer.	Contact Dealer
Foreign material shorting sender	Contact Dealer.	Contact Dealer
Short in alarm wiring	Contact Dealer.	Contact Dealer
Faulty sender	Contact Dealer.	Contact Dealer
Symptom: Wheels lack pulling ability on a grade or pulling out of a ditch		
Internal pump or motor damage	Contact Dealer.	Contact Dealer
Insufficient torque at drive wheels	Move ground speed range control to field position, and reduce ground speed.	*Driving Forward in Engine-Forward Mode, page 181*
Loose or worn controls	Check controls.	*5.6.3 Ground Speed Lever Adjustments, page 337*
Air in system	Use proper oil.	*8.1.3 Lubricants, Fluids, and System Capacities, page 491*
Air in system	Check oil level and leaks.	*5.11.1 Checking and Filling Hydraulic Oil, page 439*
Air in system	Check hydraulic oil filters.	*5.11 Hydraulic System, page 438*
Brakes binding or not releasing fully	Check pressure on brake release valve (min. 1379 kPa [200 psi]).	Contact Dealer
Relief valve in tandem pump dirty or damaged	Replace relief valve.	Contact Dealer
Symptom: With steering wheel centered, one wheel pulls more than the other		
Leakage at pump or motor	Contact Dealer.	Contact Dealer
Wheels not in same speed range	Contact Dealer.	Contact Dealer
Faulty relief valve	Repair or replace valve. Contact Dealer.	Contact Dealer
Symptom: Both wheels will not pull in forward or reverse		
Pump arms have broken shaft or loose hardware	Repair or tighten parts and hardware.	Contact Dealer
Brakes binding or not releasing fully	Check pressure on brake release valve (min. 1379 kPa [200 psi]).	Contact Dealer
Low oil level	Check oil reservoir level.	*5.11.1 Checking and Filling Hydraulic Oil, page 439*
Power hubs disengaged	Engage final drives.	*Engaging and Disengaging Wheel Drives, page 200*
Damaged hydraulic lines preventing proper oil flow	Replace damaged lines.	Contact Dealer
Ground speed range control not working	Contact Dealer.	Contact Dealer
Steering controls worn or defective	Check GSL and steering for loose, worn, or damaged ball joints and connecting rods.	*5.6.3 Ground Speed Lever Adjustments, page 337* and *5.6.4 Steering Adjustments, page 339*

Problem	Solution	Reference
Charge pressure relief valve misadjusted or damaged	Check the valve adjustment. Check valve parts and seat.	*Checking Charge Pump Pressure, page 448*
Failed pump or motor	Contact Dealer.	Contact Dealer
Symptom: Excessive noise from drive system		
Mechanical interference in steering or ground speed linkage	Adjust, repair, and replace.	*5.6.3 Ground Speed Lever Adjustments, page 337* and *5.6.4 Steering Adjustments, page 339*
Brakes binding or not releasing fully	Check pressure on brake release valve (min. 1379 kPa [200 psi]).	Contact Dealer
Faulty pump or motor	Contact Dealer.	Contact Dealer
Air in system	Check lines for leakage.	—
Hydraulic line clamps loose	Tighten clamps.	—
Symptom: One wheel does not pull in forward or reverse		
Broken pump arm or shaft	Contact Dealer.	Contact Dealer
One final drive disengaged	Engage final drive.	*Engaging and Disengaging Wheel Drives, page 200*
Steering controls worn or defective	Check GSL and steering for loose, worn, or damaged ball joints and connecting rods.	*5.6.3 Ground Speed Lever Adjustments, page 337* and *5.6.4 Steering Adjustments, page 339*
High pressure relief valve stuck open, damaged seat	Check valve, and clean or replace.	Contact Dealer
Brakes binding or not releasing fully	Check pressure on brake release valve (min. 1379 kPa [200 psi]).	Contact Dealer
Damaged hydraulic lines preventing proper oil flow	Contact Dealer.	Contact Dealer
Ground speed range control not working	Contact Dealer.	Contact Dealer
Failed pump, motor, or power hub	Contact Dealer.	Contact Dealer
Symptom: Hydraulic oil filter leaks at seal		
Not properly tightened	Tighten filter element.	*5.11.4 Changing Hydraulic Oil Filters, page 441*
Damaged seal or threads	Replace filter or filter head.	*5.11.4 Changing Hydraulic Oil Filters, page 441*

7.7 Steering and Ground Speed Control Troubleshooting

Refer to the table provided below if you encounter problems with the steering system or with the ground speed lever (GSL) while operating the windrower.

Problem	Solution	Reference
Symptom: Machine will not steer straight		
Linkage worn or loose	Adjust steering chain tension. Replace worn parts. Adjust linkage.	*5.6.4 Steering Adjustments, page 339*
Symptom: Machine moves on flat ground with controls in neutral		
Neutral interlock adjusted incorrectly	Contact Dealer.	Contact Dealer
Parking brake not functioning	Contact Dealer.	Contact Dealer
GSL servo adjusted incorrectly	Contact Dealer.	Contact Dealer
GSL cable adjusted incorrectly	Contact Dealer.	Contact Dealer
Transmission interlock adjusted incorrectly	Contact Dealer.	Contact Dealer
Symptom: Steering wheel will not unlock		
Transmission interlock cylinder not working	Contact Dealer.	Contact Dealer
Symptom: Insufficient road speed		
Ground speed range control in field position	Move to road position.	*Driving on Road, page 187*
Symptom: Steering is too stiff or too loose		
Steering chain tension is out of adjustment	Adjust steering chain tension.	*5.6.4 Steering Adjustments, page 339*

7.8 Cab Air Troubleshooting

Refer to the table provided below if you encounter problems with the cab air system while operating the windrower.

Problem	Solution	Reference
Symptom: Blower fan will not run		
Burned out motor	Contact Dealer.	Contact Dealer
Burned out switch	Contact Dealer.	Contact Dealer
Motor shaft tight or bearings worn	Contact Dealer.	Contact Dealer
Faulty wiring—loose or broken	Contact Dealer.	Contact Dealer
Blower rotors in contact with housing	Contact Dealer.	Contact Dealer
Symptom: Blower fan operating but no air coming into cab		
Dirty fresh air filter	Clean fresh air filter.	*Inspecting and Cleaning Fresh Air Intake Filter Element, page 343*
Dirty recirculating air filter	Clean recirculating filter.	*Cleaning Return Air Cleaner/Filter, page 345*
Evaporator clogged	Clean evaporator.	*Cleaning Air Conditioning Evaporator Core, page 347*
Air flow passage blocked	Remove blockage.	—
Symptom: Heater not heating		
Heater shut-off valve at engine closed	Open valve.	*3.9.1 Heater Shut-Off, page 59*
Defective thermostat in engine water outlet manifold	Replace thermostat.	Contact Dealer
Heater temperature control defective	Replace control.	Contact Dealer
No thermostat in engine water outlet manifold	Install thermostat.	Contact Dealer
Symptom: Odor from air louvers		
Plugged drainage hose	Blow out hose with compressed air.	—
Dirty filters	Clean filters.	*Cleaning Return Air Cleaner/Filter, page 345*
Symptom: Air conditioning cools intermittently		
Unit icing up – thermostat set too low	Adjust thermostat.	Contact Dealer
Unit icing up – excessive moisture in system	Contact Dealer.	Contact Dealer
Unit icing up – incorrect super-heat adjustment in the expansion valve	Contact Dealer.	Contact Dealer
Thermostat defective	Contact Dealer.	Contact Dealer
Defective blower switch or blower motor	Contact Dealer.	Contact Dealer
Partially open connection, improper ground or loose connection in compressor clutch coil	Contact Dealer.	Contact Dealer
Compressor clutch slipping	Contact Dealer.	Contact Dealer
Symptom: Air conditioning not cooling		
Low refrigerant level	Add refrigerant. Contact Dealer.	Contact Dealer
Clutch coil burned out or disconnected	Contact Dealer.	Contact Dealer
Blower motor disconnected or burned out	Contact Dealer.	Contact Dealer

Problem	Solution	Reference
Switch contacts in thermostat burned, or sensing element defective	Replace thermostat.	Contact Dealer
Compressor partially or completely seized	Remove compressor for service or replacement.	Contact Dealer
Condenser fins plugged	Clean condenser.	*5.7.3 Air Conditioning Condenser, page 346*
Loose or broken compressor drive belt	Replace drive belt and/or tighten to specifications.	*Tensioning Air Conditioner Compressor Belt, page 392* and *Replacing Air Conditioner Compressor Belt, page 392*
Dirty filters	Clean fresh air and recirculation filters.	*Cleaning Engine Air Cleaner Primary Filter, page 360* and *Cleaning Return Air Cleaner/Filter, page 345*
Broken or disconnected electrical wire	Check all terminals for loose connections; check wiring for hidden breaks.	—
Broken or disconnected ground wire	Check ground wire to see if the wire is loose, broken, or disconnected.	—
Expansion valve stuck in open or closed position	Contact Dealer.	Contact Dealer
Broken refrigerant line	Contact Dealer.	Contact Dealer
Leak in system	Contact Dealer.	Contact Dealer
Compressor shaft seal leaking	Contact Dealer.	Contact Dealer
Clogged screen in receiver-drier; plugged hose or coil	Contact Dealer.	Contact Dealer
Symptom: Air conditioning not producing sufficient cooling[39]		
Compressor clutch slipping	Remove clutch assembly for service or replacement.	Contact Dealer
Thermostat defective or improperly adjusted	Replace thermostat.	Contact Dealer
Clogged air filters	Remove air filters, and clean or replace as necessary.	*Cleaning Engine Air Cleaner Primary Filter, page 360* and *Cleaning Return Air Cleaner/Filter, page 345*
Heater circuit is open	Close temperature control in cab, and valve on engine.	*3.9.3 Climate Controls, page 60* and *3.9.1 Heater Shut-Off, page 59*
Insufficient air circulation over condenser coil; fins clogged with dirt or insects	Clean condenser.	*5.7.3 Air Conditioning Condenser, page 346*
Evaporator fins clogged	Clean evaporator fins (under cab floor).	*Cleaning Air Conditioning Evaporator Core, page 347*

39. Sufficient cooling defined as when air temperature in cab, measured at louvered vent, can be maintained at 14°C (25°F) below ambient air temperature.

Problem	Solution	Reference
Refrigerant low	Contact Dealer.	Contact Dealer
Clogged expansion valve	Contact Dealer.	Contact Dealer
Clogged receiver-drier	Contact Dealer.	Contact Dealer
Excessive moisture in system	Contact Dealer.	Contact Dealer
Air in system	Contact Dealer.	Contact Dealer
Blower motor sluggish in operation	Contact Dealer.	Contact Dealer
Symptom: Air conditioning system too noisy		
Defective winding or improper connection in compressor clutch coil or relay	Contact Dealer.	Contact Dealer
Excessive charge in system	Contact Dealer.	Contact Dealer
Low charge in system	Contact Dealer.	Contact Dealer
Excessive moisture in system	Contact Dealer.	Contact Dealer
Loose or excessively worn drive belt	Tighten or replace as required.	*Tensioning Air Conditioner Compressor Belt, page 392* and *Replacing Air Conditioner Compressor Belt, page 392*
Noisy clutch	Remove clutch for service or replacement as required.	Contact Dealer
Noisy compressor	Check mountings and repair. Remove compressor for service or replacement.	Contact Dealer
Compressor oil level low	Add SP-15 PAG refrigerant oil.	Contact Dealer
Blower fan noisy due to excessive wear	Remove blower motor for service or replacement as necessary.	Contact Dealer
Symptom: Windows fog up		
High humidity	Run A/C to dehumidify air and heater to control temperature.	*3.9.3 Climate Controls, page 60*

7.9 Operator's Station Troubleshooting

Refer to the table provided below if you encounter problems with the operator's station while operating the windrower.

Problem	Solution	Reference
Symptom: Rough ride		
Seat suspension not adjusted for operator's weight	Adjust seat suspension.	*3.3 Operator's Seat Adjustments, page 44*
High air pressure in tires	Deflate to proper pressure.	*Inflating Drive Wheel Tire, page 450* and *Inflating Caster Tire, page 458*
Cab suspension too stiff	Adjust suspension.	Contact Dealer

Chapter 8: Reference

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

8.1 Recommended Fuel, Fluids, and Lubricants

Use only the fuel, fluids, and lubricants specified in this manual.

8.1.1 Storing Lubricants and Fluids

To safely store lubricant and fluids without risk of degradation or contamination, follow these procedures.

- Buy good quality, clean fuel from a reputable supplier.
- Use clean containers to handle fuel and lubricants.
- Keep containers full to avoid condensation issues.
- Store fluids in an area protected from dust, moisture, and other contaminants.
- Avoid storing fuel over long periods of time. If there is a risk of the fuel remaining in the windrower's fuel tank for a long period of time, add fuel conditioner to avoid condensation problems.
- Store fuel in a convenient place away from buildings.
- Diesel exhaust fluid (DEF) should be stored in a cool, dry, well ventilated area, out of direct sunlight, on a lower shelf or on the floor. The shelf life of DEF depends on its exposure to sunlight and temperature. If the storage area temperature is between -12° and 32°C (10° and 90°F), DEF's shelf life is approximately one year. If the maximum temperature does not exceed 24°C (75°F) for extended periods, DEF's shelf life is two years.
- Diesel exhaust fluid (DEF) should be drained from the DEF tank if you intended to store the windrower for a period exceeding six months.
- The windrower should never be stored with the diesel exhaust fluid (DEF) tank filled to capacity when the ambient temperature is below freezing. Ensure that the level of fluid in the DEF tank is 75% or lower.
- Diesel exhaust fluid (DEF) is corrosive to some metals and should only be stored in polyethylene, polypropylene, or stainless steel containers.
- DEF containers should be sealed to prevent contamination. Improper storage can also result in the evaporation of water from the DEF fluid, which affects the specified water to urea ratio.
- Diesel fuel should never be mixed with diesel exhaust fluid (DEF).

8.1.2 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.

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

Table 8.1 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[40] 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 *8.1, page 490*. Diesel fuel conditioner is available from your Dealer.

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

8.1.3 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 8.2 Windrower System Capacities

Lubricant/Fluid	Location	Description	Capacity
Diesel exhaust fluid (DEF)	Diesel exhaust fluid tank	Must meet ISO 22241 requirements	28.4 L (7.5 U.S. gal)
Grease	As required unless otherwise specified	SAE multi-purpose high temperature extreme pressure (EP2) performance with 1% maximum 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[41]; refer to *8.1.2 Fuel Specifications, page 490* for more information	367 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[42], API service class GL-5 fully synthetic gear lubricant (SAE J2360 preferred)	2.1 L (2.2 U.S. qt.)
Gear lubricant	Wheel drive[43]	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	30 L (7.9 U.S gal)[44]
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[45]	Air conditioning system total capacity	PAG SP-15	240 cc (8.1 fl. oz.)

41. Optional when operating temperature is below 0°C (32°F).
42. SAE 75W-140 may be substituted for SAE 80W-140 if necessary.
43. SAE 85W-140 API Service Class GL-5. Extreme Pressure Gear Lubricant is used before initial change.
44. Equal parts with high quality, soft, deionized or distilled water as recommended by Supplier.
45. New compressor (MD #183515) comes filled.

NOTE:

If Peak Final Charge Global™ or Fleetguard ES Compleat™ OAT are unavailable, use a coolant concentrate or prediluted coolant intended for use with heavy-duty diesel engines. Ensure that the coolant meets the following minimum standards:

- 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.

8.1.4 Filter Part Numbers

Refer to this table before changing an engine, hydraulic system, cabin, or diesel exhaust fluid (DEF) tank filter to learn the correct part to order.

Table 8.3 Filter Part Numbers – M155*E4* Self-Propelled Windrower

Filter	Part Number
Engine oil filter	MD #111974
Charge oil filter	MD #112419
Return oil filter kit	MD #320360
Primary fuel filter element	MD #205028
Secondary fuel filter element	MD #205029
Fuel strainer filter (breather)	MD #207200
Fuel filler filter	MD #163989
Primary element (cab)	MD #111060
Primary air filter element	MD #203621
Secondary air filter element	MD #203622
Return air filter	MD #109797
Diesel exhaust fluid (DEF) – tank suction filter	MD #207478 [46]
Diesel exhaust fluid (DEF) – tank suction filter	MD #291162 [47]
Diesel exhaust fluid (DEF) – vent hose filter	MD #111608
Diesel exhaust fluid (DEF) supply module filter kit	MD #207510

46. For model year 2018 and prior windrowers without DEF Head Service kit (MD #183997) installed.
47. For model year 2019 and later windrowers and 2018 and prior windrowers with DEF Head Service kit (MD #183977) installed. Includes filter and filter housing.

8.2 Recommended Torque Values

Refer to this section to learn the standard torque values for various types of hardware.

8.2.1 Torque Specifications

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

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

Jam nuts

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

Self-tapping screws

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

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 8.4 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

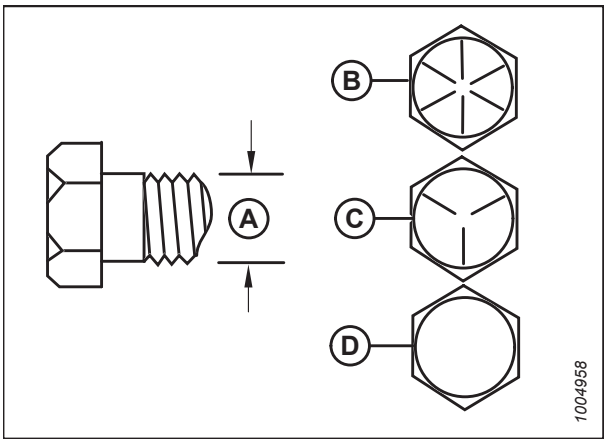


Figure 8.1: Bolt Grades

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

Table 8.5 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

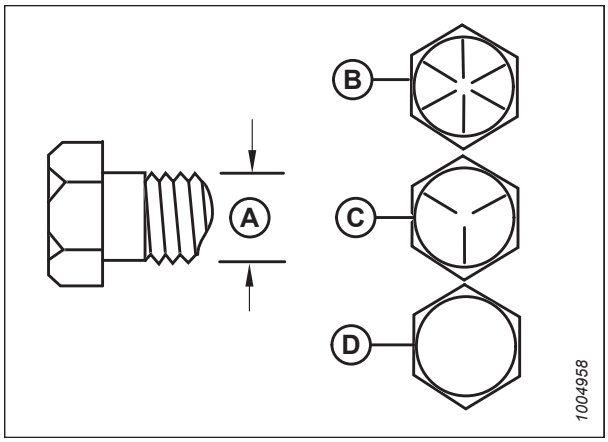


Figure 8.2: Bolt Grades

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

Table 8.6 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

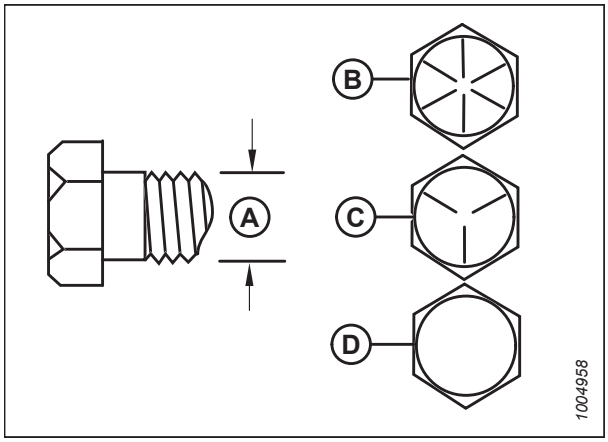


Figure 8.3: Bolt Grades

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

Table 8.7 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

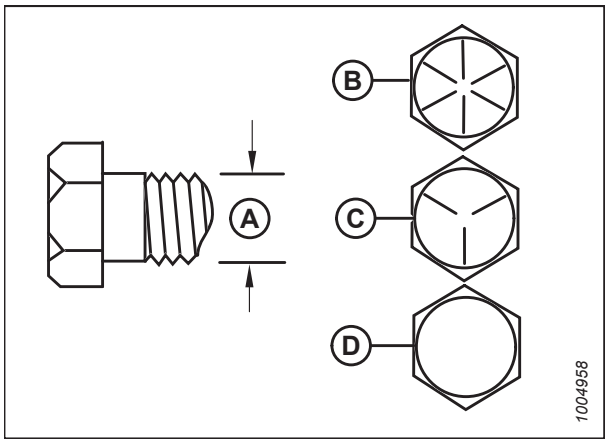


Figure 8.4: Bolt Grades

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

Metric Bolt Specifications

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

NOTE:

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

Table 8.8 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

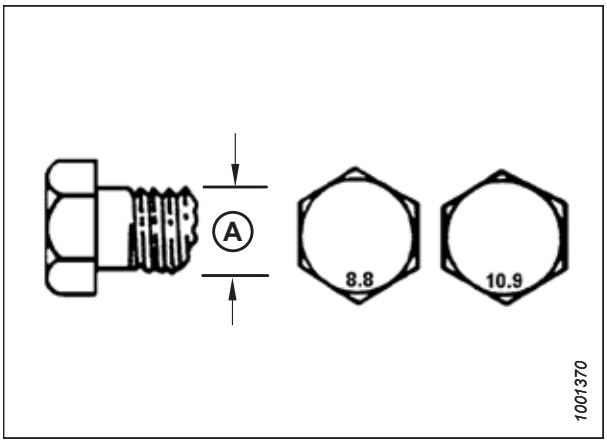


Figure 8.5: Bolt Grades

Table 8.9 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

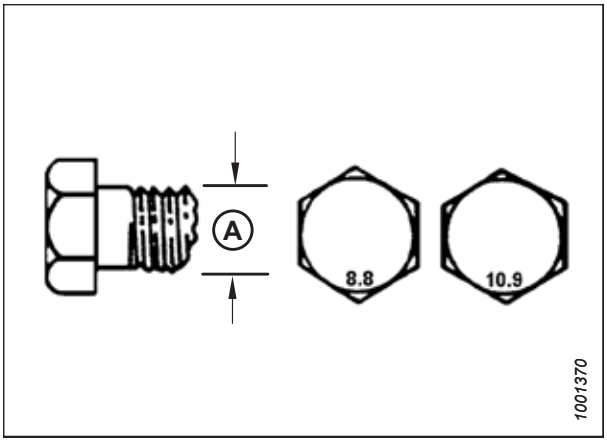


Figure 8.6: Bolt Grades

Table 8.10 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

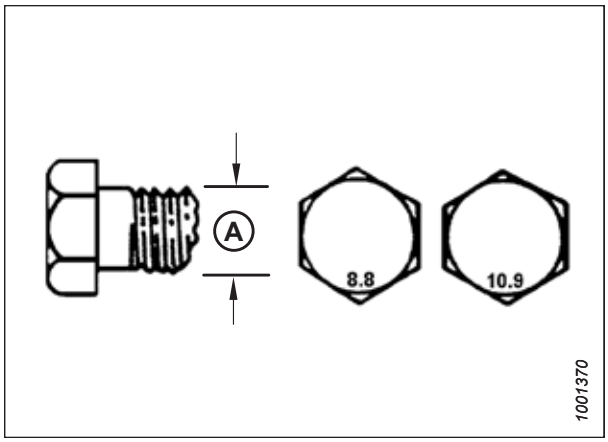


Figure 8.7: Bolt Grades

Table 8.11 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

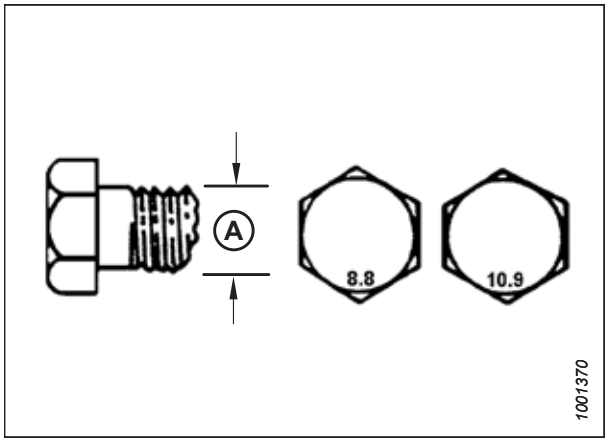


Figure 8.8: Bolt Grades

Metric Bolt Specifications – Cast Aluminum

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

NOTE:

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

Table 8.12 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	–	–	–	–

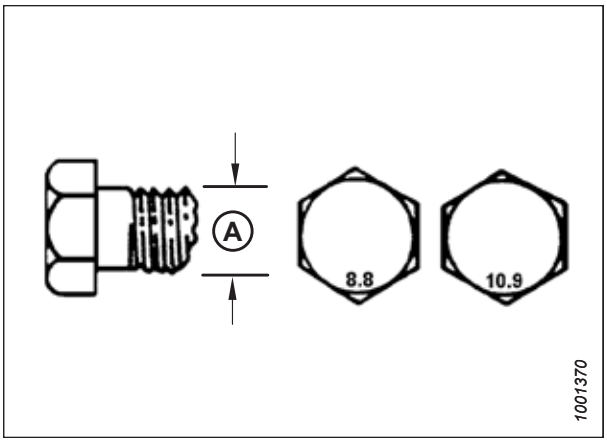


Figure 8.9: Bolt Grades

Flare-Type Hydraulic Fittings

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

1. Inspect 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 *8.13, page 497*.
4. Secure fitting (D) with two wrenches. Place one wrench on fitting body (D), and tighten nut (E) with the other wrench to the torque value shown in Table *8.13, page 497*.
5. Verify the final condition of connection.

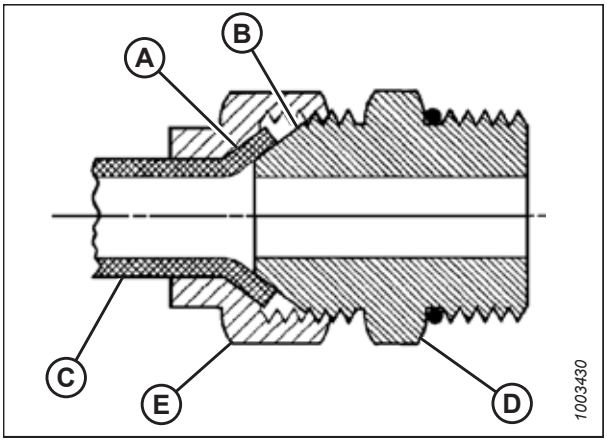


Figure 8.10: Hydraulic Fitting

Table 8.13 Flare-Type Hydraulic Tube Fittings

SAE Dash Size	Thread Size (in.)	Torque Value[48]		Flats from Finger Tight (FFFT)	
		Nm	lbf·ft	Tube	Swivel Nut or Hose
-2	5/16–24	4–5	3–4	—	—
-3	3/8–24	7–8	5–6	—	—
-4	7/16–20	18–19	13–14	2 1/2	2
-5	1/2–20	19–21	14–15	2	2
-6	9/16–18	30–33	22–24	2	1 1/2
-8	3/4–16	57–63	42–46	2	1 1/2
-10	7/8–14	81–89	60–66	1 1/2	1 1/2

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

Table 8.13 Flare-Type Hydraulic Tube Fittings (continued)

SAE Dash Size	Thread Size (in.)	Torque Value[49]		Flats from Finger Tight (FFFT)	
		Nm	lbf·ft	Tube	Swivel Nut or Hose
-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

O-Ring Boss Hydraulic Fittings – Adjustable

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

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

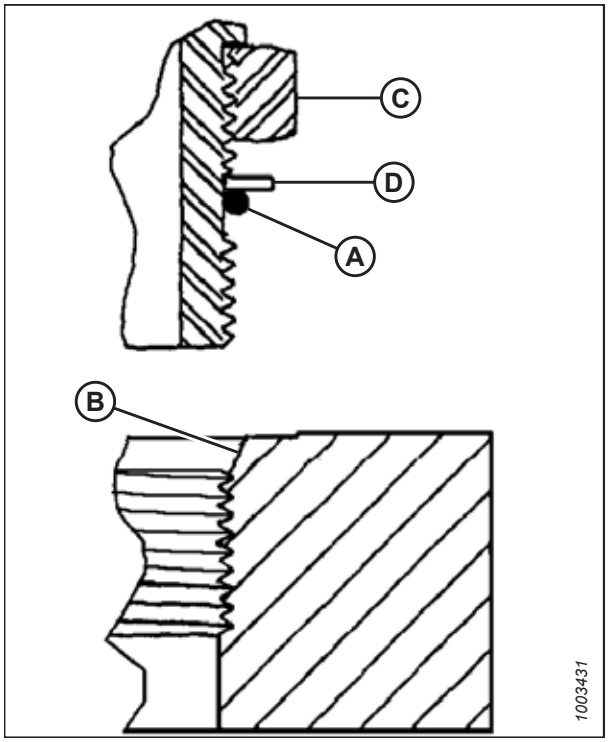


Figure 8.11: Hydraulic Fitting

49. 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. Verify the final condition of the fitting.

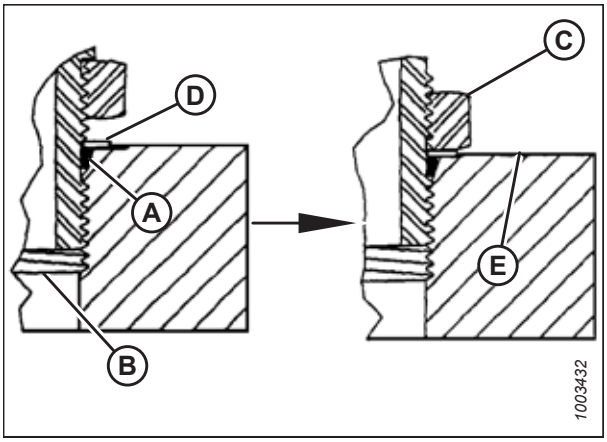


Figure 8.12: Hydraulic Fitting

Table 8.14 O-Ring Boss (ORB) Hydraulic Fittings – Adjustable

SAE Dash Size	Thread Size (in.)	Torque Value[50]	
		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

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

O-Ring Boss Hydraulic Fittings – Non-Adjustable

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

1. Inspect O-ring (A) and seat (B) for dirt or defects.
2. Ensure that O-ring (A) is **NOT** on the threads. Adjust O-ring (A) if necessary.
3. Apply hydraulic system oil to the O-ring.
4. Install fitting (C) into the port until the fitting is hand-tight.
5. Torque fitting (C) according to values in Table *8.15, page 500*.
6. Verify the final condition of the fitting.

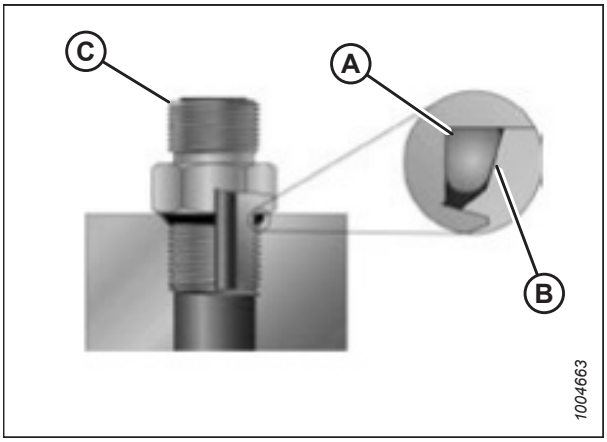


Figure 8.13: Hydraulic Fitting

Table 8.15 O-Ring Boss (ORB) Hydraulic Fittings – Non-Adjustable

SAE Dash Size	Thread Size (in.)	Torque Value[51]	
		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

O-Ring Face Seal Hydraulic Fittings

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

Torque values are shown in the Table *8.16, page 501*.

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

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

Figure 8.14: Hydraulic Fitting

2. Apply hydraulic system oil to O-ring (B).
3. Align the tube or hose assembly so that the flat face of sleeve (A) or (C) comes 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 *8.16, page 501*.

   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. Verify the final condition of the fitting.

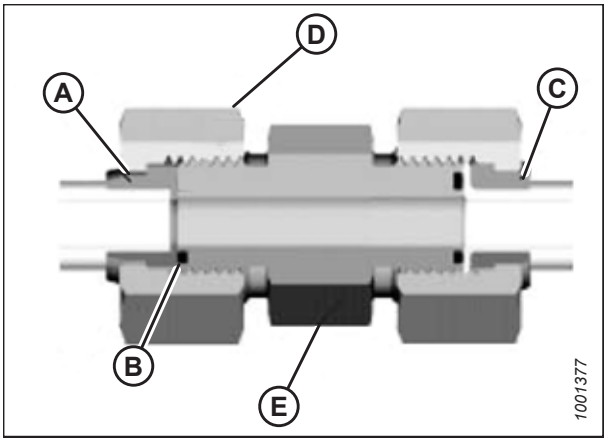


Figure 8.15: Hydraulic Fitting

Table 8.16 O-Ring Face Seal (ORFS) Hydraulic Fittings

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value[52]	
			Nm	lbf·ft
-3	Note[53]	3/16	–	–
-4	9/16	1/4	25–28	18–21
-5	Note[53]	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[53]	7/8	–	–
-16	1 7/16	1	150–165	111–122

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

Table 8.16 O-Ring Face Seal (ORFS) Hydraulic Fittings (continued)

SAE Dash Size	Thread Size (in.)	Tube O.D. (in.)	Torque Value[54]	
			Nm	lbf·ft
-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

Tapered Pipe Thread Fittings

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

Assemble pipe fittings as follows:

1. Ensure that the fitting and the port threads are free of burrs, nicks, scratches, and any other form of contamination.
2. Apply paste-type pipe thread sealant to the external pipe threads.
3. Thread the fitting into the port until it is hand-tight.
4. Torque the connector to the appropriate torque angle. The turns from finger tight (TFFT) and flats from finger tight (FFFT) values are shown in Table *8.17, page 502*. Ensure that the tube end of a shaped connector (typically a 45° or 90° elbow) is aligned to receive the incoming tube or hose assembly. Always finish the alignment of the fitting in the direction of tightening. Never loosen the threaded connectors to achieve alignment.
5. Clean all residue and any excess thread conditioner with an appropriate cleaner.
6. Inspect the final condition of the fitting. Pay special attention to the possibility of cracks in the port opening.
7. Mark the final position of the fitting. If a fitting leaks, disassemble the fitting and check it for damage.

   NOTE:

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

Table 8.17 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

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

8.3 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 8.18 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.

8.4 Engine Error Codes

If an engine error occurs, the cab display module (CDM) will display an engine error code. Refer to the table below to learn the meaning of the code.

The following example explains the segments of an error code:

If the cab display module (CDM) displays the Error Code 629S 12F 28C, this is the meaning of the parts of the code:

629S : S represents the J1939 SPN column. Locate code 629 in that column.

12F : F represents the FMI column. Locate code 12 in that column.

28C : C represents the occurrences (count); 28 is the quantity.

J1939 SPN description : Controller #1. The Cummins description of this is engine control module critical internal failure — Bad intelligent device or component.

The Cummins Dealer will request the fault code that corresponds with the number that you have located in the J1939 SPN column.

Table 8.19 Engine Error Codes

Fault Code	J1939 SPN	J1939 FMI	Lamp	J1939 SPN Description	Cummins Description[55]
2272	27	4	Amber	Engine exhaust gas recirculation 1 valve position	EGR valve position circuit - voltage below normal, or shorted to low source
6497	51	3	None	Engine intake throttle actuator position sensor circuit	Engine intake throttle actuator position sensor circuit - voltage above normal, or shorted to high source
6498	51	4	None	Engine intake throttle actuator position sensor circuit	Engine intake throttle actuator position sensor circuit - voltage above normal, or shorted to low source
241	84	2	Amber	Wheel-based vehicle speed	Wheel-based vehicle speed - data erratic, intermittent or incorrect
148	91	0	Red	Accelerator pedal position 1	Accelerator pedal or lever position sensor 1 - data valid but above normal operational range - most severe level
147	91	1	Red	Accelerator pedal position 1	Accelerator pedal or lever position 1 sensor circuit frequency - data valid but below normal operating range
1242	91	2	Red	Accelerator pedal position 1	Accelerator pedal or lever position sensor 1 - data erratic, intermittent or incorrect
131	91	3	Red	Accelerator pedal position 1	Accelerator pedal or lever position sensor 1 circuit - voltage above normal, or shorted to high source
1358	91	3	Amber	Accelerator pedal position 1	Accelerator pedal or lever position sensor 1 circuit - voltage above normal, or shorted to high source
132	91	4	Red	Accelerator pedal position 1	Accelerator pedal or lever position sensor 1 circuit - voltage below normal, or shorted to low source
1359	91	4	Amber	Accelerator pedal position 1	Accelerator pedal or lever position sensor 1 circuit - voltage below normal, or shorted to low source
3326	91	9	Red	Accelerator pedal position 1	SAE J1939 multiplexed accelerator pedal or lever sensor system - abnormal update rate

55. The descriptions of Cummins J1939 SPN codes are subject to change at their discretion.

Table 8.19 Engine Error Codes (continued)

Fault Code	J1939 SPN	J1939 FMI	Lamp	J1939 SPN Description	Cummins Description[56]
1515	91	19	Red	Accelerator pedal position 1	SAE J1939 multiplexed accelerator pedal or lever sensor system - received network data in error
546	94	3	Amber	Engine fuel delivery pressure	Fuel delivery pressure sensor circuit - voltage above normal, or shorted to high source
547	94	4	Amber	Engine fuel delivery pressure	Fuel delivery pressure sensor circuit - voltage below normal, or shorted to low source
2372	95	16	Amber	Engine fuel filter differential pressure	Fuel filter differential pressure - data valid but above normal operating range - moderately severe level
428	97	3	Amber	Water in fuel indicator	Water in fuel indicator sensor circuit - voltage above normal, or shorted to high source
429	97	4	Amber	Water in fuel indicator	Water in fuel indicator sensor circuit - voltage below normal, or shorted to low source
418	97	15	Amber (Blinking)	Water in fuel indicator	Water in fuel indicator - data valid but above normal operating range - least severe level
1852	97	16	Amber	Water in fuel indicator	Water in fuel indicator - data valid but above normal operating range - moderately severe level
415	100	1	Red	Engine oil pressure	Engine oil rifle pressure - data valid but below normal operational range - most severe level
435	100	2	Amber	Engine oil pressure	Engine oil rifle pressure - data erratic, intermittent or incorrect
135	100	3	Amber	Engine oil pressure	Engine oil rifle pressure 1 sensor circuit - voltage above normal, or shorted to high source
141	100	4	Amber	Engine oil pressure	Engine oil rifle pressure 1 sensor circuit - voltage below normal, or shorted to low source
143	100	18	Amber	Engine oil pressure	Engine oil rifle pressure - data valid but below normal operating range - moderately severe level
556	101	0	Red	Engine crankcase pressure	Crankcase pressure - data valid but above normal operational range - most severe level
1942	101	2	Amber	Engine crankcase pressure	Crankcase pressure - data erratic, intermittent or incorrect
1843	101	3	Amber	Engine crankcase pressure	Crankcase pressure circuit - voltage above normal, or shorted to high source
1844	101	4	Amber	Engine crankcase pressure	Crankcase pressure circuit - voltage below normal, or shorted to low source
1974	101	15	Amber (Blinking)	Engine crankcase pressure	Crankcase pressure - data valid but above normal operating range - least severe level
555	101	16	Amber	Engine crankcase pressure	Crankcase pressure - data valid but above normal operating range - moderately severe level
122	102	3	Amber	Engine intake manifold #1 pressure	Intake manifold 1 pressure sensor circuit - voltage above normal, or shorted to high source
123	102	4	Amber	Engine intake manifold #1 pressure	Intake manifold 1 pressure sensor circuit - voltage below normal, or shorted to low source

56. The descriptions of Cummins J1939 SPN codes are subject to change at their discretion.

Table 8.19 Engine Error Codes (continued)

Fault Code	J1939 SPN	J1939 FMI	Lamp	J1939 SPN Description	Cummins Description[57]
2288	103	15	None	Engine turbocharger 1 speed	Turbocharger 1 speed - data valid but above normal operating range - least severe level
595	103	16	Amber	Engine turbocharger 1 speed	Turbocharger 1 speed - data valid but above normal operating range - moderately severe level
687	103	18	Amber	Engine turbocharger 1 speed	Turbocharger 1 speed - data valid but below normal operating range - moderately severe level
155	105	0	Red	Engine intake manifold 1 temperature	Intake manifold 1 temperature - data valid but above normal operational range - most severe level
153	105	3	Amber	Engine intake manifold 1 temperature	Intake manifold 1 temperature sensor circuit - voltage above normal, or shorted to high source
154	105	4	Amber	Engine intake manifold 1 temperature	Intake manifold 1 temperature sensor circuit - voltage below normal, or shorted to low source
2964	105	15	None	Engine intake manifold 1 temperature	Intake manifold 1 temperature - data valid but above normal operating range - least severe level
488	105	16	Amber	Engine intake manifold temperature	Intake manifold 1 temperature - data valid but above normal operating range - moderately severe level
5576	107	15	Amber	Engine air filter 1 differential pressure	Engine air filter differential pressure - data valid but above normal operating range - least severe level
3341	107	16	Amber	Engine air filter 1 differential pressure	Engine air filter differential pressure - data valid but above normal operating range - moderately severe level
151	110	0	Red	Engine coolant temperature	Engine coolant temperature - data valid but above normal operational range - most severe level
144	110	3	Amber	Engine coolant temperature	Engine coolant temperature 1 sensor circuit - voltage above normal, or shorted to high source
145	110	4	Amber	Engine coolant temperature	Engine coolant temperature 1 sensor circuit - voltage below normal, or shorted to low source
146	110	16	Amber	Engine coolant temperature	Engine coolant temperature - data valid but above normal operating range - moderately severe level
2646	110	31	Amber	Engine coolant temperature	Engine coolant temperature - condition exists
2659	110	31	None	Engine coolant temperature	Engine coolant temperature - condition exists
235	111	1	Red	Engine coolant level	Coolant level - data valid but below normal operational range - most severe level
195	111	3	Amber	Engine coolant level	Coolant level sensor 1 circuit - voltage above normal, or shorted to high source
6522	111	3	None	Engine coolant level	Coolant level sensor 1 circuit - voltage above normal, or shorted to high source

57. The descriptions of Cummins J1939 SPN codes are subject to change at their discretion.

Table 8.19 Engine Error Codes (continued)

Fault Code	J1939 SPN	J1939 FMI	Lamp	J1939 SPN Description	Cummins Description[58]
196	111	4	Amber	Engine coolant level	Coolant level sensor 1 circuit - voltage below normal, or shorted to low source
6523	111	4	None	Engine coolant level	Coolant level sensor 1 circuit - voltage below normal, or shorted to low source
2448	111	17	Amber (Blinking)	Engine coolant level	Coolant level - data valid but below normal operating range - least severe level
197	111	18	Amber	Engine coolant level	Coolant level - data valid but below normal operating range - moderately severe level
449	157	0	Red	Engine injector metering rail 1 pressure	Injector metering rail 1 pressure - data valid but above normal operational range - most severe level
451	157	3	Amber	Engine injector metering rail 1 pressure	Injector metering rail 1 pressure sensor circuit - voltage above normal, or shorted to high source
452	157	4	Amber	Engine injector metering rail 1 pressure	Injector metering rail 1 pressure sensor circuit - voltage below normal, or shorted to low source
553	157	16	Amber	Engine injector metering rail 1 pressure	Injector metering rail 1 pressure - data valid but above normal operating range - moderately severe level
559	157	18	Amber	Engine injector metering rail 1 pressure	Injector metering rail 1 pressure - data valid but below normal operating range - moderately severe level
6256	168	15	None	Battery potential / power input 1	Battery 1 voltage - data valid but above normal operating range - least severe level
442	168	16	Amber	Battery potential / power input 1	Battery 1 voltage - data valid but above normal operating range - moderately severe level
3724	168	17	Amber	Battery potential / power input 1	Battery 1 voltage - data valid but below normal operating range - least severe level
6257	168	17	None	Battery potential / power input 1	Battery 1 voltage - data valid but below normal operating range - moderately severe level
441	168	18	Amber	Battery potential / power input 1	Battery 1 voltage - data valid but below normal operating range - moderately severe level
6524	175	3	None	Engine oil temperature 1	Engine oil temperature sensor 1 circuit - voltage above normal, or shorted to high source
6525	175	4	None	Engine oil temperature 1	Engine oil temperature sensor 1 circuit - voltage below normal, or shorted to low source
234	190	0	Red	Engine speed	Engine crankshaft speed/position - data valid but above normal operational range - most severe level
689	190	2	Amber	Engine speed	Engine crankshaft speed/position - data erratic, intermittent or incorrect
2321	190	2	None	Engine speed	Engine crankshaft speed/position - data erratic, intermittent or incorrect

58. The descriptions of Cummins J1939 SPN codes are subject to change at their discretion.

Table 8.19 Engine Error Codes (continued)

Fault Code	J1939 SPN	J1939 FMI	Lamp	J1939 SPN Description	Cummins Description[59]
2468	190	16	Amber	Engine speed	Engine crankshaft speed/position - data valid but above normal operating range - moderately severe level
4517	237	13	Amber	Vehicle identification number	Vehicle identification number - out of calibration
1866	411	2	Amber	Engine exhaust gas recirculation 1 differential pressure	Exhaust gas recirculation differential pressure - data erratic, intermittent, or incorrect
2273	411	3	Amber	Engine exhaust gas recirculation 1 differential pressure	Exhaust gas recirculation differential pressure sensor circuit - voltage above normal, or shorted to high source
2274	411	4	Amber	Engine exhaust gas recirculation 1 differential pressure	Exhaust gas recirculation differential pressure sensor circuit - voltage below normal, or shorted to low source
2375	412	3	Amber	Engine exhaust gas recirculation 1 temperature	Exhaust gas recirculation temperature sensor circuit - voltage above normal, or shorted to high source
2376	412	4	Amber	Engine exhaust gas recirculation 1 temperature	Exhaust gas recirculation temperature sensor circuit - voltage below normal, or shorted to low source
2961	412	15	None	Engine exhaust gas recirculation 1 temperature	Exhaust gas recirculation temperature - data valid but above normal operating range - least severe level
2962	412	16	Amber	Engine exhaust gas recirculation 1 temperature	Exhaust gas recirculation temperature - data valid but above normal operating range - moderately severe level
293	441	3	Amber	Auxiliary temperature 1	Auxiliary temperature sensor input 1 circuit - voltage above normal, or shorted to high source
294	441	4	Amber	Auxiliary temperature 1	Auxiliary temperature sensor input 1 circuit - voltage below normal, or shorted to low source
292	441	14	Red	Auxiliary temperature 1	Auxiliary temperature sensor input 1 - special instructions
431	558	2	Amber	Accelerator pedal 1 low idle switch	Accelerator pedal or lever idle validation switch - data erratic, intermittent, or incorrect
432	558	13	Red	Accelerator pedal 1 low idle switch	Accelerator pedal or lever idle validation switch circuit - out of calibration
3527	558	19	Red	Accelerator pedal 1 low idle switch	Accelerator pedal or lever idle validation switch - received network data in error
3488	563	9	Amber	Anti-lock braking (ABS) active	Anti-lock braking (ABS) controller - abnormal update rate
4215	563	31	None	Anti-lock braking (ABS) active	Anti-lock braking (ABS) active - condition exists
115	612	2	Red	System diagnostic code #2	Engine magnetic speed/position lost both of two signals - data erratic, intermittent, or incorrect

59. The descriptions of Cummins J1939 SPN codes are subject to change at their discretion.

Table 8.19 Engine Error Codes (continued)

Fault Code	J1939 SPN	J1939 FMI	Lamp	J1939 SPN Description	Cummins Description[60]
291	625	9	Red	Proprietary datalink	Proprietary datalink error (OEM/vehicle datalink) - abnormal update rate
111	629	12	Red	Controller #1	Engine control module critical internal failure - bad intelligent device or component
343	629	12	Amber	Controller #1	Engine control module warning internal hardware failure - bad intelligent device or component
3697	630	12	Red	Engine control module calibration memory	Engine control module calibration memory - bad intelligent device or component
2311	633	31	Amber	Engine fuel actuator 1 control command	Electronic fuel injection control valve circuit - condition exists
285	639	9	Amber	J1939 network #1, primary vehicle network (previously SAE J1939 data link)	SAE J1939 multiplexing PGN timeout error - abnormal update rate
286	639	13	Amber	J1939 network #1, primary vehicle network (previously SAE J1939 data link)	SAE J1939 multiplexing configuration error - out of calibration
2387	641	7	Amber	Engine variable geometry turbocharger actuator #1	VGT actuator driver circuit (motor) - mechanical system not responding or out of adjustment
1894	641	9	Amber	Engine variable geometry turbocharger actuator #1	VGT actuator driver circuit - abnormal update rate
2636	641	9	Red	Engine variable geometry turbocharger actuator #1	VGT actuator driver circuit - abnormal update rate
2198	641	11	Amber	Engine variable geometry turbocharger actuator #1	VGT actuator driver circuit - root cause not known
2634	641	12	Red	Engine variable geometry turbocharger actuator #1	VGT actuator controller - bad intelligent device or component
1898	641	13	Amber	Engine variable geometry turbocharger actuator #1	VGT actuator controller - out of calibration

60. The descriptions of Cummins J1939 SPN codes are subject to change at their discretion.

Table 8.19 Engine Error Codes (continued)

Fault Code	J1939 SPN	J1939 FMI	Lamp	J1939 SPN Description	Cummins Description[61]
2449	641	13	Red	Engine variable geometry turbocharger actuator #1	VGT actuator controller - out of calibration
1962	641	15	Amber	Engine variable geometry turbocharger actuator #1	VGT actuator driver over temperature (calculated) - data valid but above normal operating range - least severe level
1976	641	15	None	Engine variable geometry turbocharger actuator #1	VGT actuator driver over temperature (calculated) - data valid but above normal operating range - least severe level
2635	641	31	Red	Engine variable geometry turbocharger actuator #1	VGT actuator driver circuit - condition exists
237	644	2	Amber	Engine external speed command input	External speed command input (multiple unit synchronization) - data erratic, intermittent, or incorrect
2377	647	3	Amber	Engine fan clutch 1 output device driver	Fan control circuit - voltage above normal, or shorted to high source
6263	647	3	None	Engine fan clutch 1 output device driver	Fan control circuit - voltage above normal, or shorted to high source
245	647	4	Amber	Engine fan clutch 1 output device driver	Fan control circuit - voltage below normal, or shorted to low source
6264	647	4	None	Engine fan clutch 1 output device driver	Fan control circuit - voltage below normal, or shorted to low source
322	651	5	Amber	Engine injector cylinder #01	Injector solenoid driver cylinder 1 circuit - current below normal or open circuit
331	652	5	Amber	Engine injector cylinder #02	Injector solenoid driver cylinder 2 circuit - current below normal or open circuit
1141	652	7	Amber	Engine injector cylinder #02	Injector solenoid driver cylinder 2 - mechanical system not responding or out of adjustment
324	653	5	Amber	Engine injector cylinder #03	Injector solenoid driver cylinder 3 circuit - current below normal or open circuit
1142	653	7	Amber	Engine injector cylinder #03	Injector solenoid driver cylinder 3 - mechanical system not responding or out of adjustment
332	654	5	Amber	Engine injector cylinder #04	Injector solenoid driver cylinder 4 circuit - current below normal or open circuit
1143	654	7	Amber	Engine injector cylinder #04	Injector solenoid driver cylinder 4 - mechanical system not responding or out of adjustment
584	677	3	Amber	Engine starter motor relay	Starter relay driver circuit - voltage above normal, or shorted to high source
585	677	4	Amber	Engine starter motor relay	Starter relay driver circuit - voltage below normal, or shorted to low source

61. The descriptions of Cummins J1939 SPN codes are subject to change at their discretion.

Table 8.19 Engine Error Codes (continued)

Fault Code	J1939 SPN	J1939 FMI	Lamp	J1939 SPN Description	Cummins Description[62]
2557	697	3	Amber	Auxiliary PWM driver #1	Auxiliary PWM driver 1 circuit - voltage above normal, or shorted to high source
2558	697	4	Amber	Auxiliary PWM driver #1	Auxiliary PWM driver 1 circuit - voltage below normal, or shorted to low source
4734	701	14	Red	Auxiliary I/O #01	Auxiliary input/output 1 - special instructions
778	723	2	Amber	Engine speed 2	Engine camshaft speed/position sensor - data erratic, intermittent, or incorrect
2322	723	2	None	Engine speed 2	Engine camshaft speed/position sensor - data erratic, intermittent, or incorrect
731	723	7	Amber	Engine speed 2	Engine speed/position camshaft and crankshaft misalignment - mechanical system not responding or out of adjustment
2555	729	3	Amber	Engine intake air heater driver #1	Engine intake air heater 1 circuit - voltage above normal, or shorted to high source
6556	729	3	None	Engine intake air heater driver #1	Engine intake air heater 1 circuit - voltage above normal, or shorted to high source
2556	729	4	Amber	Engine intake air heater driver #1	Engine intake air heater 1 circuit - voltage below normal, or shorted to low source
6557	729	4	None	Engine intake air heater driver #1	Engine intake air heater 1 circuit - voltage below normal, or shorted to low source
3641	748	9	Amber	Transmission output retarder	Transmission output retarder - abnormal update rate
6336	862	3	None	Crankcase breather heater circuit	Crankcase breather filter heater circuit - voltage above normal, or shorted to high source
6337	862	4	None	Crankcase breather heater circuit	Crankcase breather filter heater circuit - voltage below normal, or shorted to low source
133	974	3	Red	Remote accelerator pedal position	Remote accelerator pedal or lever position sensor 1 circuit - voltage above normal, or shorted to high source
134	974	4	Red	Remote accelerator pedal position	Remote accelerator pedal or lever position sensor 1 circuit - voltage below normal, or shorted to low source
288	974	19	Red	Remote accelerator pedal position	SAE J1939 multiplexing remote accelerator pedal or lever position sensor system - received network data in error
6563	976	2	None	PTO governor state	Auxiliary intermediate (PTO) speed switch validation - data erratic, intermittent, or incorrect
6418	1072	3	None	Engine (compression) brake output #1	Engine brake actuator driver 1 circuit - voltage above normal, or shorted to high source
6419	1072	4	None	Engine (compression) brake output #1	Engine brake actuator driver 1 circuit - voltage below normal, or shorted to low source
6421	1073	3	None	Engine (compression) brake output #2	Engine brake actuator driver output 2 circuit - voltage above normal, or shorted to high source
6422	1073	4	None	Engine (compression) brake output #2	Engine brake actuator driver output 2 circuit - voltage below normal, or shorted to low source

62. The descriptions of Cummins J1939 SPN codes are subject to change at their discretion.

Table 8.19 Engine Error Codes (continued)

Fault Code	J1939 SPN	J1939 FMI	Lamp	J1939 SPN Description	Cummins Description[63]
6258	1075	3	None	Engine electric lift pump for engine fuel supply	Electric lift pump for engine fuel supply circuit - voltage above normal, or shorted to high source
6259	1075	4	None	Engine electric lift pump for engine fuel supply	Electric lift pump for engine fuel supply circuit - voltage below normal, or shorted to low source
3555	1081	9	Amber	Engine wait to start lamp	Engine wait to start lamp - abnormal update rate
691	1172	3	Amber	Engine turbocharger 1 compressor intake temperature	Turbocharger 1 compressor intake temperature circuit - voltage above normal, or shorted to high source
692	1172	4	Amber	Engine turbocharger 1 compressor intake temperature	Turbocharger 1 compressor intake temperature circuit - voltage below normal, or shorted to low source
743	1176	2	Amber	Engine turbocharger 1 compressor intake pressure	Turbocharger 1 compressor intake pressure - data erratic, intermittent or incorrect
741	1176	3	Amber	Engine turbocharger 1 compressor intake pressure	Turbocharger 1 compressor intake pressure circuit - voltage above normal, or shorted to high source
742	1176	4	Amber	Engine turbocharger 1 compressor intake pressure	Turbocharger 1 compressor intake pressure circuit - voltage below normal, or shorted to low source
3298	1194	13	Red	Anti-theft encryption seed present indicator	Anti-theft encryption seed - out of calibration
2554	1209	2	Amber	Engine exhaust gas pressure 1	Exhaust gas pressure 1 - data erratic, intermittent or incorrect
2373	1209	3	Amber	Engine exhaust gas pressure 1	Exhaust gas pressure sensor 1 circuit - voltage above normal, or shorted to high source
2374	1209	4	Amber	Engine exhaust gas pressure 1	Exhaust gas pressure sensor 1 circuit - voltage below normal, or shorted to low source
3329	1231	2	None	J1939 network #2	J1939 network #2 - data erratic, intermittent, or incorrect
3331	1235	2	None	J1939 network #3	J1939 network #3 - data erratic, intermittent, or incorrect
1654	1323	31	Amber	Engine misfire cylinder #1	Engine misfire cylinder 1 - condition exists
1655	1324	31	Amber	Engine misfire cylinder #2	Engine misfire cylinder 2 - condition exists
1656	1325	31	Amber	Engine misfire cylinder #3	Engine misfire cylinder 3 - condition exists
1657	1326	31	Amber	Engine misfire cylinder #4	Engine misfire cylinder 4 - condition exists

63. The descriptions of Cummins J1939 SPN codes are subject to change at their discretion.

Table 8.19 Engine Error Codes (continued)

Fault Code	J1939 SPN	J1939 FMI	Lamp	J1939 SPN Description	Cummins Description[64]
272	1347	3	Amber	Engine fuel pump pressurizing assembly #2	Engine fuel pump pressurizing assembly 1 circuit - voltage above normal, or shorted to high source
271	1347	4	Amber	Engine fuel pump pressurizing assembly #1	Engine fuel pump pressurizing assembly 1 circuit - voltage below normal, or shorted to low source
281	1347	7	Amber	Engine fuel pump pressurizing assembly #3	Engine fuel pump pressurizing assembly 1 - mechanical system not responding or out of adjustment
483	1349	3	Amber	Engine injector metering rail 2 pressure	Injector metering rail 2 pressure sensor circuit - voltage above normal, or shorted to high source
649	1378	31	Amber (Blinking)	Engine oil change interval	Engine oil change interval - condition exists
297	1388	3	Amber	Auxiliary pressure #2	Auxiliary pressure sensor input 2 circuit - voltage above normal, or shorted to high source
298	1388	4	Amber	Auxiliary pressure #2	Auxiliary pressure sensor input 2 circuit - voltage below normal, or shorted to low source
296	1388	14	Red	Auxiliary pressure #2	Auxiliary pressure sensor input 2 - special instructions
3714	1569	31	Amber	Engine protection torque derate	Engine protection torque derate - condition exists
4789	1639	0	Amber	Fan speed	Fan speed - data valid but above normal operational range - most severe level
4791	1639	1	Amber	Fan speed	Fan speed - data valid but below normal operational range - most severe level
6469	1639	2	None	Fan speed	Fan speed – data erratic, intermittent, or incorrect
6467	1639	15	None	Fan speed	Fan speed - data valid but above normal operational range - least severe level
6468	1639	17	None	Fan speed	Fan speed - data valid but below normal operational range - most severe level
4437	1668	2	None	J1939 network #4 - data erratic	J1939 network #4 - data erratic, intermittent or incorrect
3737	1675	31	None	Engine starter mode	Engine starter mode overcrank protection - condition exists
1673	1761	1	Amber	Aftertreatment 1 diesel exhaust fluid tank level	Aftertreatment 1 diesel exhaust fluid tank level - data valid but below normal operational range - most severe level
1669	1761	3	Amber	Aftertreatment 1 diesel exhaust fluid tank level	Aftertreatment 1 diesel exhaust fluid tank level sensor circuit - voltage above normal, or shorted to high source
1668	1761	4	Amber	Aftertreatment 1 diesel exhaust fluid tank level	Aftertreatment 1 diesel exhaust fluid tank level sensor circuit - voltage below normal, or shorted to low source

64. The descriptions of Cummins J1939 SPN codes are subject to change at their discretion.

Table 8.19 Engine Error Codes (continued)

Fault Code	J1939 SPN	J1939 FMI	Lamp	J1939 SPN Description	Cummins Description[65]
4677	1761	9	Amber	Aftertreatment 1 diesel exhaust fluid tank level	Sae J1939 multiplexing PGN timeout error - abnormal update rate
4769	1761	10	Amber	Aftertreatment 1 diesel exhaust fluid tank level	Aftertreatment 1 diesel exhaust fluid tank level sensor - abnormal rate of change
4739	1761	11	Amber	Aftertreatment 1 diesel exhaust fluid tank level	Aftertreatment 1 diesel exhaust fluid tank level sensor - root cause not known
6562	1761	11	None	Aftertreatment 1 diesel exhaust fluid tank level	Aftertreatment 1 diesel exhaust fluid tank level sensor - root cause not known
6526	1761	13	None	Aftertreatment 1 diesel exhaust fluid tank temperature	Aftertreatment 1 diesel exhaust fluid tank level sensor - out of calibration
3497	1761	17	Amber (Blinking)	Aftertreatment 1 diesel exhaust fluid tank level	Aftertreatment 1 diesel exhaust fluid tank level - data valid but below normal operating range - least severe level
3498	1761	18	Amber (Blinking)	Aftertreatment 1 diesel exhaust fluid tank level	Aftertreatment 1 diesel exhaust fluid tank level - data valid but below normal operating range - moderately severe level
1239	2623	3	Amber	Accelerator pedal #1 channel 2	Accelerator pedal or lever position sensor 2 circuit - voltage above normal, or shorted to high source
1241	2623	4	Amber	Accelerator pedal #1 channel 2	Accelerator pedal or lever position sensor 2 circuit - voltage below normal, or shorted to low source
2346	2789	15	None	Engine turbocharger 1 calculated turbine intake temperature	Turbocharger turbine intake temperature - data valid but above normal operating range - least severe
2349	2791	5	Amber	Engine exhaust gas recirculation 1 (EGR1) valve control	EGR valve control circuit - current below normal or open circuit
2353	2791	6	Amber	Engine exhaust gas recirculation 1 (EGR1) valve control	EGR valve control circuit - current above normal or grounded circuit
2357	2791	7	Amber	Engine exhaust gas recirculation 1 (EGR1) valve control	EGR valve control circuit - mechanical system not responding or out of adjustment
6555	2791	7	None	Engine exhaust gas recirculation 1 (EGR1) valve control	EGR valve control circuit - mechanical system not responding or out of adjustment
1896	2791	13	Amber	Engine exhaust gas recirculation 1 (EGR1) valve control	EGR valve controller - out of calibration
1961	2791	15	Amber	Engine exhaust gas recirculation 1 (EGR1) valve control	EGR valve control circuit over temperature - data valid but above normal operating range - least severe level

65. The descriptions of Cummins J1939 SPN codes are subject to change at their discretion.

Table 8.19 Engine Error Codes (continued)

Fault Code	J1939 SPN	J1939 FMI	Lamp	J1939 SPN Description	Cummins Description[66]
1679	3031	2	Amber	Aftertreatment 1 diesel exhaust fluid tank temperature	Aftertreatment 1 diesel exhaust fluid tank temperature - data erratic, intermittent or incorrect
1678	3031	3	Amber	Aftertreatment 1 diesel exhaust fluid tank temperature	Aftertreatment 1 diesel exhaust fluid tank temperature sensor - voltage above normal, or shorted to high source
1677	3031	4	Amber	Aftertreatment 1 diesel exhaust fluid tank temperature	Aftertreatment 1 diesel exhaust fluid tank temperature sensor - voltage below normal, or shorted to low source
6559	3031	4	None	Aftertreatment 1 diesel exhaust fluid tank temperature	Aftertreatment 1 diesel exhaust fluid tank temperature sensor - voltage below normal, or shorted to low source
4572	3031	9	Amber	Aftertreatment 1 diesel exhaust fluid tank temperature	Aftertreatment 1 diesel exhaust fluid tank temperature - abnormal update rate
3228	3216	2	Amber	Aftertreatment 1 intake NOx	Aftertreatment 1 intake NOx sensor - data erratic, intermittent or incorrect
1885	3216	4	Amber	Aftertreatment 1 intake NOx	Aftertreatment 1 intake NOx sensor circuit - voltage below normal, or shorted to low source
3232	3216	9	Amber	Aftertreatment 1 intake NOx	Aftertreatment 1 intake NOx sensor - abnormal update rate
3725	3216	10	Amber	Aftertreatment 1 intake NOx	Aftertreatment 1 intake NOx sensor - abnormal rate of change
6621	3216	10	None	Aftertreatment 1 intake NOx	Aftertreatment 1 intake NOx sensor - abnormal rate of change
3718	3216	13	Amber	Aftertreatment 1 intake NOx	Aftertreatment 1 intake NOx - out of calibration
3748	3216	20	Amber	Aftertreatment 1 intake NOx	Aftertreatment 1 intake NOx sensor - data not rational - drifted high
6458	3216	20	None	Aftertreatment 1 intake NOx	Aftertreatment 1 intake NOx sensor - data not rational - drifted high
6459	3216	21	None	Aftertreatment 1 intake NOx	Aftertreatment 1 intake NOx sensor - data not rational - drifted high
3682	3218	2	Amber	Aftertreatment 1 intake gas sensor power status	Aftertreatment 1 intake NOx sensor power supply - data erratic, intermittent, or incorrect
1694	3226	2	Amber	Aftertreatment 1 outlet NOx	Aftertreatment 1 outlet NOx sensor - data erratic, intermittent or incorrect
6464	3226	2	None	Aftertreatment 1 outlet NOx	Aftertreatment 1 outlet NOx sensor - data erratic, intermittent, or incorrect
1887	3226	4	Amber	Aftertreatment 1 outlet NOx	Aftertreatment 1 outlet NOx sensor circuit - voltage below normal, or shorted to low source
6521	3226	4	None	Aftertreatment outlet NOx sensor circuits	Aftertreatment 1 outlet NOx sensor circuit - voltage below normal, or shorted to low source

66. The descriptions of Cummins J1939 SPN codes are subject to change at their discretion.

Table 8.19 Engine Error Codes (continued)

Fault Code	J1939 SPN	J1939 FMI	Lamp	J1939 SPN Description	Cummins Description[67]
2771	3226	9	Amber	Aftertreatment 1 outlet NOx	Aftertreatment 1 outlet NOx sensor - abnormal update rate
3545	3226	10	Amber	Aftertreatment 1 outlet NOx	Aftertreatment 1 outlet NOx sensor - abnormal rate of change
6565	3226	10	None	Aftertreatment 1 outlet NOx	Aftertreatment 1 outlet NOx sensor - abnormal rate of change
3717	3226	13	Amber	Aftertreatment 1 outlet NOx	Aftertreatment 1 outlet NOx sensor - out of calibration
3749	3226	20	Amber	Aftertreatment 1 outlet NOx	Aftertreatment 1 outlet NOx sensor - data not rational - drifted high
6462	3226	20	None	Aftertreatment 1 outlet NOx	Aftertreatment 1 outlet NOx sensor - data not rational - drifted high
6463	3226	21	None	Aftertreatment 1 outlet NOx	Aftertreatment 1 outlet NOx sensor - data not rational - drifted high
3681	3228	2	Amber	Aftertreatment 1 outlet gas sensor power status	Aftertreatment 1 outlet NOx sensor power supply - data erratic, intermittent, or incorrect
2976	3361	2	Amber	Aftertreatment 1 diesel exhaust fluid dosing unit	Aftertreatment 1 diesel exhaust fluid dosing unit temperature - data erratic, intermittent, or incorrect
3558	3361	3	Amber	Aftertreatment 1 diesel exhaust fluid dosing unit	Aftertreatment 1 diesel exhaust fluid dosing unit - voltage above normal, or shorted to high source
3559	3361	4	Amber	Aftertreatment 1 diesel exhaust fluid dosing unit	Aftertreatment 1 diesel exhaust fluid dosing unit - voltage below normal, or shorted to low source
1682	3362	31	Amber	Aftertreatment 1 diesel exhaust fluid dosing unit input lines	Aftertreatment 1 diesel exhaust fluid dosing unit input lines - condition exists
1683	3363	3	Amber	Aftertreatment 1 diesel exhaust fluid tank 1 heater	Aftertreatment 1 diesel exhaust fluid tank heater - voltage above normal, or shorted to high source
6479	3363	3	None	Aftertreatment 1 diesel exhaust fluid tank 1 heater	Aftertreatment 1 diesel exhaust fluid tank heater - voltage above normal, or shorted to high source
1684	3363	4	Amber	Aftertreatment 1 diesel exhaust fluid tank 1 heater	Aftertreatment 1 diesel exhaust fluid tank heater - voltage below normal, or shorted to low source
6481	3363	4	None	Aftertreatment 1 diesel exhaust fluid tank 1 heater	Aftertreatment 1 diesel exhaust fluid tank heater - voltage below normal, or shorted to low source
3242	3363	7	Amber	Aftertreatment 1 diesel exhaust fluid tank 1 heater	Aftertreatment 1 diesel exhaust fluid tank heater - mechanical system not responding or out of adjustment

67. The descriptions of Cummins J1939 SPN codes are subject to change at their discretion.

Table 8.19 Engine Error Codes (continued)

Fault Code	J1939 SPN	J1939 FMI	Lamp	J1939 SPN Description	Cummins Description[68]
6475	3363	7	None	Aftertreatment 1 diesel exhaust fluid tank 1 heater	Aftertreatment 1 diesel exhaust fluid tank heater - mechanical system not responding or out of adjustment
1713	3363	16	Amber	Aftertreatment 1 diesel exhaust fluid tank 1 heater	Aftertreatment 1 diesel exhaust fluid tank heater - data valid but above normal operating range - moderately severe level
1712	3363	18	Amber	Aftertreatment 1 diesel exhaust fluid tank 1 heater	Aftertreatment 1 diesel exhaust fluid tank heater - data valid but below normal operating range - moderately severe level
6476	3363	18	None	Aftertreatment 1 diesel exhaust fluid tank 1 heater	Aftertreatment 1 diesel exhaust fluid tank heater - data valid but below normal operating range - moderately severe level
3866	3364	1	Amber	Aftertreatment 1 diesel exhaust fluid tank 1 quality	Aftertreatment diesel exhaust fluid quality - data valid but below normal operational range - most severe level
3878	3364	2	Amber	Aftertreatment 1 diesel exhaust fluid tank 1 quality	Aftertreatment diesel exhaust fluid quality - data erratic, intermittent, or incorrect
1686	3364	3	Amber	Aftertreatment 1 diesel exhaust fluid tank 1 quality	Aftertreatment diesel exhaust fluid quality sensor circuit - voltage above normal, or shorted to high source
6493	3364	3	None	Electronic throttle control actuator driver circuit	Electronic throttle control actuator driver circuit -voltage above normal, or shorted to high source
1685	3364	4	Amber	Aftertreatment 1 diesel exhaust fluid tank 1 quality	Aftertreatment diesel exhaust fluid quality sensor circuit - voltage below normal, or shorted to low source
6494	3364	4	None	Electronic throttle control actuator driver circuit	Electronic throttle control actuator driver circuit -voltage above normal, or shorted to low source
6496	3364	5	None	Electronic throttle control actuator driver circuit	Electronic throttle control actuator driver circuit - current below normal or open circuit
3876	3364	7	Amber	Aftertreatment 1 diesel exhaust fluid tank 1 quality	Aftertreatment diesel exhaust fluid quality sensor - mechanical system not responding or out of adjustment
3868	3364	9	Amber	Aftertreatment 1 diesel exhaust fluid tank 1 quality	Aftertreatment diesel exhaust fluid quality - abnormal update rate
4277	3364	10	Amber	Aftertreatment 1 diesel exhaust fluid tank 1 quality	Aftertreatment diesel exhaust fluid quality - abnormal rate of change
1715	3364	11	Amber	Aftertreatment 1 diesel exhaust fluid tank 1 quality	Aftertreatment diesel exhaust fluid quality - root cause not known

68. The descriptions of Cummins J1939 SPN codes are subject to change at their discretion.

Table 8.19 Engine Error Codes (continued)

Fault Code	J1939 SPN	J1939 FMI	Lamp	J1939 SPN Description	Cummins Description[69]
1714	3364	13	Amber	Aftertreatment 1 diesel exhaust fluid tank 1 quality	Aftertreatment diesel exhaust fluid quality - out of calibration
4842	3364	15	None	Aftertreatment diesel exhaust fluid quality	Aftertreatment diesel exhaust fluid quality - data valid but above normal operating range - least severe level
3867	3364	18	Amber	Aftertreatment 1 diesel exhaust fluid tank 1 quality	Aftertreatment diesel exhaust fluid quality - data valid but below normal operating range - moderate severe level
6752	3364	18	None	Aftertreatment 1 diesel exhaust fluid tank 1 quality	Aftertreatment diesel exhaust fluid quality - data valid but below normal operating range - moderate severe level
386	3509	3	Amber	Sensor supply voltage 1	Sensor supply 1 circuit - voltage above normal, or shorted to high source
352	3509	4	Amber	Sensor supply voltage 1	Sensor supply 1 circuit - voltage below normal, or shorted to low source
227	3510	3	Amber	Sensor supply voltage 2	Sensor supply 2 circuit - voltage above normal, or shorted to high source
187	3510	4	Amber	Sensor supply voltage 2	Sensor supply 2 circuit - voltage below normal, or shorted to low source
239	3511	3	Amber	Sensor supply voltage 3	Sensor supply 3 circuit - voltage above normal, or shorted to high source
238	3511	4	Amber	Sensor supply voltage 3	Sensor supply 3 circuit - voltage below normal, or shorted to low source
2185	3512	3	Amber	Sensor supply voltage 4	Sensor supply 4 circuit - voltage above normal, or shorted to high source
2186	3512	4	Amber	Sensor supply voltage 4	Sensor supply 4 circuit - voltage below normal, or shorted to low source
1695	3513	3	Amber	Sensor supply voltage 5	Sensor supply 5 - voltage above normal, or shorted to high source
1696	3513	4	Amber	Sensor supply voltage 5	Sensor supply 5 - voltage below normal, or shorted to low source
515	3514	3	Amber	Sensor supply voltage 6	Sensor supply 6 circuit - voltage above normal, or shorted to high source
516	3514	4	Amber	Sensor supply voltage 6	Sensor supply 6 circuit - voltage below normal, or shorted to low source
4743	3515	5	Amber	Aftertreatment 1 diesel exhaust fluid temperature 2	Aftertreatment 1 diesel exhaust fluid temperature 2 sensor circuit - current below normal or open circuit
4744	3515	6	Amber	Aftertreatment 1 diesel exhaust fluid temperature 2	Aftertreatment 1 diesel exhaust fluid temperature 2 sensor circuit - current above normal or grounded
4243	3515	10	Amber	Aftertreatment 1 diesel exhaust fluid temperature 2	Aftertreatment 1 diesel exhaust fluid temperature 2 - abnormal rate of change

69. The descriptions of Cummins J1939 SPN codes are subject to change at their discretion.

Table 8.19 Engine Error Codes (continued)

Fault Code	J1939 SPN	J1939 FMI	Lamp	J1939 SPN Description	Cummins Description[70]
6619	3515	10	None	Aftertreatment 1 diesel exhaust fluid temperature 2	Aftertreatment 1 diesel exhaust fluid temperature 2 - abnormal rate of change
4745	3515	11	Amber	Aftertreatment 1 diesel exhaust fluid temperature 2	Aftertreatment 1 diesel exhaust fluid temperature 2 - root cause not known
4768	3521	11	Amber	Aftertreatment 1 diesel exhaust fluid property	Aftertreatment 1 diesel exhaust fluid property - root cause not known
1117	3597	2	None	ECU power output supply voltage #1	Power supply lost with ignition on - data erratic, intermittent, or incorrect
351	3597	12	Amber	ECU power output supply voltage #1	Injector power supply - bad intelligent device or component
6499	3597	17	None	ECU power output supply voltage #1	ECU power output supply voltage 1 - data valid but below normal operating range - moderately severe level
1938	3597	18	Amber	ECU power output supply voltage #1	ECU power output supply voltage 1 - data valid but below normal operating range - moderately severe level
4213	3695	2	Amber	Aftertreatment regeneration inhibit switch	Aftertreatment regeneration inhibit switch - data erratic, intermittent, or incorrect
6568	3695	2	None	Aftertreatment regeneration inhibit switch	Aftertreatment regeneration inhibit switch - data erratic, intermittent, or incorrect
5938	3750	14	Amber	Diesel particulate filter 1 conditions not met for active regeneration	Diesel particulate filter 1 conditions not met for active regeneration – condition exists
3547	4096	31	Amber	NOx limits exceeded due to empty diesel exhaust fluid tank	Aftertreatment diesel exhaust fluid tank empty - condition exists
1427	4185	31	Amber	Overspeed shutdown relay driver	Overspeed shutdown relay driver diagnostic has detected an error - condition exists
1428	4186	31	Amber	Low oil pressure shutdown relay driver	Low oil pressure (LOP) shutdown relay driver diagnostic has detected an error - condition exists
1429	4187	31	Amber	High engine temperature shutdown relay driver	High engine temperature (HET) shutdown relay driver diagnostic has detected an error - condition exists
1431	4188	31	Amber	Pre-low oil pressure indicator relay driver	Pre-low oil pressure warning relay driver diagnostic has detected an error - condition exists
1432	4223	31	Amber	Pre-high engine temperature warning relay driver	Pre-high engine temperature warning relay driver diagnostic has detected an error - condition exists

70. The descriptions of Cummins J1939 SPN codes are subject to change at their discretion.

Table 8.19 Engine Error Codes (continued)

Fault Code	J1939 SPN	J1939 FMI	Lamp	J1939 SPN Description	Cummins Description[71]
3596	4334	2	Amber	Aftertreatment 1 diesel exhaust fluid doser absolute pressure	Aftertreatment 1 diesel exhaust fluid pressure sensor - data erratic, intermittent, or incorrect
3571	4334	3	Amber	Aftertreatment 1 diesel exhaust fluid doser absolute pressure	Aftertreatment 1 diesel exhaust fluid pressure sensor - voltage above normal, or shorted to high source
3572	4334	4	Amber	Aftertreatment 1 diesel exhaust fluid doser absolute pressure	Aftertreatment 1 diesel exhaust fluid pressure sensor - voltage below normal, or shorted to low source
3575	4334	16	Amber	Aftertreatment 1 diesel exhaust fluid doser absolute pressure	Aftertreatment 1 diesel exhaust fluid pressure sensor - data valid but above normal operating range
3574	4334	18	Amber	Aftertreatment 1 diesel exhaust fluid doser absolute pressure	Aftertreatment 1 diesel exhaust fluid pressure sensor - data valid but below normal operating range
4249	4337	10	Amber	Aftertreatment 1 diesel exhaust fluid dosing temperature	Aftertreatment 1 diesel exhaust fluid dosing temperature - abnormal rate of change
3237	4340	3	Amber	Aftertreatment 1 diesel exhaust fluid line heater 1 state	Aftertreatment 1 diesel exhaust fluid line heater 1 circuit - voltage above normal, or shorted to high source
6531	4340	3	None	Aftertreatment 1 diesel exhaust fluid line heater 1 state	Aftertreatment 1 diesel exhaust fluid line heater 1 circuit - voltage above normal, or shorted to high source
3238	4340	4	Amber	Aftertreatment 1 diesel exhaust fluid line heater 1 state	Aftertreatment 1 diesel exhaust fluid line heater 1 circuit - voltage below normal, or shorted to low source
6532	4340	4	None	Aftertreatment 1 diesel exhaust fluid line heater 1 state	Aftertreatment 1 diesel exhaust fluid line heater 1 circuit - voltage below normal, or shorted to low source
3258	4340	5	Amber	Aftertreatment 1 diesel exhaust fluid line heater 1 state	Aftertreatment 1 diesel exhaust fluid line heater 1 circuit - current below normal or open circuit
6482	4340	5	None	Aftertreatment 1 diesel exhaust fluid line heater 1 state	Aftertreatment 1 diesel exhaust fluid line heater 1 circuit - current below normal or open circuit
3239	4342	3	Amber	Aftertreatment 1 diesel exhaust fluid line heater 2 state	Aftertreatment 1 diesel exhaust fluid line heater 2 circuit - voltage above normal, or shorted to high source

71. The descriptions of Cummins J1939 SPN codes are subject to change at their discretion.

Table 8.19 Engine Error Codes (continued)

Fault Code	J1939 SPN	J1939 FMI	Lamp	J1939 SPN Description	Cummins Description[72]
6533	4342	3	None	Aftertreatment 1 diesel exhaust fluid line heater 2 state	Aftertreatment 1 diesel exhaust fluid line heater 2 circuit - voltage above normal, or shorted to high source
3241	4342	4	Amber	Aftertreatment 1 diesel exhaust fluid line heater 2 state	Aftertreatment 1 diesel exhaust fluid line heater 2 circuit - voltage below normal, or shorted to low source
6534	4342	4	None	Aftertreatment 1 diesel exhaust fluid line heater 2 state	Aftertreatment 1 diesel exhaust fluid line heater 2 circuit - voltage below normal, or shorted to low source
3261	4342	5	Amber	Aftertreatment 1 diesel exhaust fluid line heater 2 state	Aftertreatment 1 diesel exhaust fluid line heater 2 circuit - current below normal or open circuit
6483	4342	5	None	Aftertreatment 1 diesel exhaust fluid line heater 2 state	Aftertreatment 1 diesel exhaust fluid line heater 2 circuit - current below normal or open circuit
3422	4344	3	Amber	Aftertreatment 1 diesel exhaust fluid line heater 3 state	Aftertreatment diesel exhaust fluid line heater 3 circuit - voltage above normal, or shorted to high source
6535	4344	3	Amber	Aftertreatment 1 diesel exhaust fluid line heater 3 state	Aftertreatment diesel exhaust fluid line heater 3 circuit - voltage above normal, or shorted to high source
3423	4344	4	Amber	Aftertreatment 1 diesel exhaust fluid line heater 3 state	Aftertreatment diesel exhaust fluid line heater 3 circuit - voltage below normal, or shorted to low source
6536	4344	4	Amber	Aftertreatment 1 diesel exhaust fluid line heater 3 state	Aftertreatment diesel exhaust fluid line heater 3 circuit - voltage below normal, or shorted to low source
3425	4344	5	Amber	Aftertreatment 1 diesel exhaust fluid line heater 3 state	Aftertreatment diesel exhaust fluid line heater 3 circuit - current below normal or open circuit
6484	4344	5	None	Aftertreatment 1 diesel exhaust fluid line heater 3 state	Aftertreatment diesel exhaust fluid line heater 3 circuit - current below normal or open circuit
3229	4360	0	Red	Aftertreatment 1 SCR catalyst intake gas temperature	Aftertreatment 1 SCR intake temperature - data valid but above normal operational range - most severe level
3144	4360	2	Amber	Aftertreatment 1 SCR catalyst intake gas temperature	Aftertreatment 1 SCR intake temperature sensor - data erratic, intermittent or incorrect
3142	4360	3	Amber	Aftertreatment 1 SCR catalyst intake gas temperature	Aftertreatment 1 SCR intake temperature sensor circuit - voltage above normal, or shorted to high source
3143	4360	4	Amber	Aftertreatment 1 SCR catalyst intake gas temperature	Aftertreatment 1 SCR intake temperature sensor circuit - voltage below normal, or shorted to low source

72. The descriptions of Cummins J1939 SPN codes are subject to change at their discretion.

Table 8.19 Engine Error Codes (continued)

Fault Code	J1939 SPN	J1939 FMI	Lamp	J1939 SPN Description	Cummins Description[73]
3164	4360	15	None	Aftertreatment 1 SCR catalyst intake gas temperature	Aftertreatment 1 SCR intake temperature - data valid but above normal operating range - least severe
3231	4360	16	Red	Aftertreatment 1 SCR catalyst intake gas temperature	Aftertreatment 1 SCR intake temperature - data valid but above normal operating range - moderately severe level
3165	4363	0	Red	Aftertreatment 1 SCR catalyst outlet gas temperature	Aftertreatment 1 SCR outlet temperature - data valid but above normal operational range - most severe
3148	4363	2	Amber	Aftertreatment 1 SCR catalyst outlet gas temperature	Aftertreatment 1 SCR outlet temperature sensor - data erratic, intermittent, or incorrect
3146	4363	3	Amber	Aftertreatment 1 SCR catalyst outlet gas temperature	Aftertreatment 1 SCR outlet temperature sensor circuit - voltage above normal, or shorted to high source
6569	4363	3	None	Aftertreatment 1 SCR catalyst outlet gas temperature	Aftertreatment 1 SCR outlet temperature sensor circuit - voltage above normal, or shorted to high source
3147	4363	4	Amber	Aftertreatment 1 SCR catalyst outlet gas temperature	Aftertreatment 1 SCR outlet temperature sensor circuit - voltage below normal, or shorted to low source
6571	4363	4	None	Aftertreatment 1 SCR catalyst outlet gas temperature	Aftertreatment 1 SCR outlet temperature sensor circuit - voltage below normal, or shorted to low source
3235	4363	16	Red	Aftertreatment 1 SCR catalyst outlet gas temperature	Aftertreatment 1 SCR outlet temperature - data valid but above normal operating range - moderately severe level
6517	4364	17	None	Aftertreatment 1 SCR conversion efficiency	Aftertreatment SCR catalyst conversion efficiency - data valid but below normal operating range - moderately severe level
3582	4364	18	Amber	Aftertreatment 1 SCR conversion efficiency	Aftertreatment SCR catalyst conversion efficiency - data valid but below normal operating range - moderately severe level
3577	4376	3	Amber	Aftertreatment 1 diesel exhaust fluid return valve	Aftertreatment diesel exhaust fluid return valve - voltage above normal, or shorted to high source
3578	4376	4	Amber	Aftertreatment 1 diesel exhaust fluid return valve	Aftertreatment diesel exhaust fluid return valve - voltage below normal, or shorted to low source
4157	4376	7	Amber	Aftertreatment 1 diesel exhaust fluid return valve	Aftertreatment diesel exhaust fluid return valve - mechanical system not responding or out of adjust
6527	4376	7	None	Aftertreatment 1 diesel exhaust fluid return valve	Aftertreatment diesel exhaust fluid return valve - mechanical system not responding or out of adjust

73. The descriptions of Cummins J1939 SPN codes are subject to change at their discretion.

Table 8.19 Engine Error Codes (continued)

Fault Code	J1939 SPN	J1939 FMI	Lamp	J1939 SPN Description	Cummins Description[74]
3315	4765	2	Amber	Aftertreatment diesel oxidation catalyst intake temperature	Aftertreatment 1 diesel oxidation catalyst intake temperature - data erratic, intermittent, or incorrect
6539	4765	2	None	Aftertreatment diesel oxidation catalyst intake temperature	Aftertreatment 1 diesel oxidation catalyst intake temperature - data erratic, intermittent, or incorrect
3314	4765	3	Amber	Aftertreatment diesel oxidation catalyst intake temperature	Aftertreatment 1 diesel oxidation catalyst intake temperature sensor circuit - voltage above normal, or shorted to high source
3313	4765	4	Amber	Aftertreatment diesel oxidation catalyst intake temperature	Aftertreatment 1 diesel oxidation catalyst intake temperature sensor circuit - voltage below normal, or shorted to low source
3251	4765	16	Red	Aftertreatment diesel oxidation catalyst intake temperature	Aftertreatment 1 diesel oxidation catalyst intake temperature - data valid but above normal operating range
5387	4766	0	Red	Aftertreatment 1 diesel oxidation catalyst outlet gas temperature	Aftertreatment 1 diesel oxidation catalyst outlet gas temperature - data valid but above normal operating range - most severe level
5386	4766	2	Amber	Aftertreatment 1 diesel oxidation catalyst outlet gas temperature	Aftertreatment 1 diesel oxidation catalyst outlet gas temperature - data erratic, intermittent, or incorrect
4533	4766	3	Amber	Aftertreatment 1 diesel oxidation catalyst outlet gas temperature sensor circuit	Aftertreatment 1 diesel oxidation catalyst outlet gas temperature sensor circuit - voltage above normal, or shorted to high source
4534	4766	4	Amber	Aftertreatment 1 diesel oxidation catalyst outlet gas temperature sensor circuit	Aftertreatment 1 diesel oxidation catalyst outlet gas temperature sensor circuit - voltage below normal, or shorted to low source
5389	4766	15	Amber	Aftertreatment 1 diesel oxidation catalyst outlet gas temperature	Aftertreatment 1 diesel oxidation catalyst outlet gas temperature - data valid but above normal operating range - least severe level
5388	4766	16	Red	Aftertreatment 1 diesel oxidation catalyst outlet gas temperature	Aftertreatment 1 diesel oxidation catalyst outlet gas temperature - data valid but above normal operating range - moderately severe level
3751	4792	7	None	Aftertreatment SCR catalyst system	Aftertreatment SCR catalyst system - mechanical system not responding or out of adjustment
4585	4792	14	Red	Aftertreatment SCR catalyst system	Aftertreatment 1 SCR catalyst system - special instructions

74. The descriptions of Cummins J1939 SPN codes are subject to change at their discretion.

Table 8.19 Engine Error Codes (continued)

Fault Code	J1939 SPN	J1939 FMI	Lamp	J1939 SPN Description	Cummins Description[75]
3151	4794	31	Amber	Aftertreatment 1 SCR catalyst system	Aftertreatment 1 SCR catalyst system missing - condition exists
1664	4796	31	Amber	Aftertreatment 1 diesel oxidation catalyst missing	Aftertreatment 1 diesel oxidation catalyst missing - condition exists
6726	4796	31	None	Aftertreatment 1 diesel oxidation catalyst missing	Aftertreatment 1 diesel oxidation catalyst missing - condition exists
2637	5018	11	None	Aftertreatment diesel oxidation catalyst	Aftertreatment 1 diesel oxidation catalyst face plugged - root cause not known
3649	5024	10	Amber	Aftertreatment 1 intake gas NOx sensor heater ratio	Aftertreatment 1 intake NOx sensor heater - abnormal rate of change
3583	5031	10	Amber	Aftertreatment 1 outlet gas NOx sensor heater ratio	Aftertreatment 1 outlet NOx sensor heater - abnormal rate of change
6581	5031	10	None	Aftertreatment 1 outlet gas NOx sensor heater ratio	Aftertreatment 1 outlet NOx sensor heater - abnormal rate of change
3419	5125	3	Amber	Sensor supply voltage 7	Sensor supply 7 circuit - voltage above normal, or shorted to high source
3421	5125	4	Amber	Sensor supply voltage 7	Sensor supply 7 circuit - voltage below normal, or shorted to low source
4863	5245	31	Amber	Aftertreatment selective catalytic reduction operator inducement active	Aftertreatment diesel exhaust fluid tank low level indicator
3712	5246	0	Red	Aftertreatment SCR operator inducement severity	Aftertreatment SCR operator inducement - data valid but above normal operational range - most severe level
2638	5298	17	None –Amber QSF3.8	Aftertreatment 1 diesel oxidation catalyst conversion efficiency	Aftertreatment 1 diesel oxidation catalyst conversion efficiency - data valid but below normal operating range - moderately severe level
1691	5298	18	Amber	Aftertreatment 1 diesel oxidation catalyst conversion efficiency	Aftertreatment 1 diesel oxidation catalyst conversion efficiency - data valid but below normal operating range - moderately severe level
3755	5394	2	None	Aftertreatment diesel exhaust fluid dosing valve	Aftertreatment diesel exhaust fluid dosing valve - data erratic, intermittent, or incorrect
3567	5394	5	Amber	Aftertreatment diesel exhaust fluid dosing valve	Aftertreatment diesel exhaust fluid dosing valve - current below normal or open circuit

75. The descriptions of Cummins J1939 SPN codes are subject to change at their discretion.

Table 8.19 Engine Error Codes (continued)

Fault Code	J1939 SPN	J1939 FMI	Lamp	J1939 SPN Description	Cummins Description[76]
3568	5394	7	Amber	Aftertreatment diesel exhaust fluid dosing valve	Aftertreatment diesel exhaust fluid dosing valve - mechanical system not responding or out of adjustment
3633	5484	3	Amber	Engine fan clutch 2 output device driver	Engine fan clutch 2 control circuit - voltage above normal, or shorted to high source
6456	5484	3	None	Engine fan clutch 2 output device driver	Engine fan clutch 2 control circuit - voltage above normal, or shorted to high source
3634	5484	4	Amber	Engine fan clutch 2 output device driver	Engine fan clutch 2 control circuit - voltage below normal, or shorted to low source
6457	5484	4	None	Engine fan clutch 2 output device driver	Engine fan clutch 2 control circuit - voltage below normal, or shorted to low source
3562	5491	3	Amber	Aftertreatment 1 diesel exhaust fluid line heater relay	Aftertreatment diesel exhaust fluid line heater relay - voltage above normal, or shorted to high source
6477	5491	3	None	Aftertreatment 1 diesel exhaust fluid line heater relay	Aftertreatment diesel exhaust fluid line heater relay - voltage above normal, or shorted to high source
3563	5491	4	Amber	Aftertreatment 1 diesel exhaust fluid line heater relay	Aftertreatment diesel exhaust fluid line heater relay - voltage below normal, or shorted to low source
6478	5491	4	None	Aftertreatment 1 diesel exhaust fluid line heater relay	Aftertreatment diesel exhaust fluid line heater relay - voltage below normal, or shorted to low source
6537	5491	7	None	Aftertreatment 1 diesel exhaust fluid line heater relay	Aftertreatment 1 diesel exhaust fluid line heater relay - mechanical system not responding or out of adjustment
3741	5571	0	Amber	High pressure common rail fuel pressure relief valve	High pressure common rail fuel pressure relief valve - data valid but above normal operational range
3727	5571	7	None	High pressure common rail fuel pressure relief valve	High pressure common rail fuel pressure relief valve - mechanical system not responding or out of adjustment
5585	5571	15	Amber	High pressure common rail fuel pressure relief valve	High pressure common rail fuel pressure relief valve - data valid but above normal operating range - least severe level
4158	5742	12	Amber	Aftertreatment diesel particulate filter temperature sensor module	Aftertreatment diesel particulate filter temperature sensor module - bad intelligent device or component
4164	5743	3	Amber	Aftertreatment selective catalytic reduction temperature sensor module	Aftertreatment selective catalytic reduction temperature sensor module - voltage above normal, or shorted to high source

76. The descriptions of Cummins J1939 SPN codes are subject to change at their discretion.

Table 8.19 Engine Error Codes (continued)

Fault Code	J1939 SPN	J1939 FMI	Lamp	J1939 SPN Description	Cummins Description[77]
4165	5743	4	Amber	Aftertreatment selective catalytic reduction temperature sensor module	Aftertreatment selective catalytic reduction temperature sensor module - voltage below normal, or shorted to low source
4152	5743	9	Amber	Aftertreatment selective catalytic reduction temperature sensor module	Aftertreatment selective catalytic reduction temperature sensor module - abnormal update rate
4261	5743	11	Amber	Aftertreatment selective catalytic reduction temperature sensor module	Aftertreatment selective catalytic reduction temperature sensor module - root cause not known
4159	5743	12	Amber	Aftertreatment selective catalytic reduction temperature sensor module	Aftertreatment selective catalytic reduction temperature sensor module - bad intelligent device or component
4166	5743	16	Amber	Aftertreatment selective catalytic reduction temperature sensor module	Aftertreatment selective catalytic reduction temperature sensor module - data valid but above normal
4168	5745	3	Amber	Aftertreatment 1 diesel exhaust fluid dosing unit heater	Aftertreatment 1 diesel exhaust fluid dosing unit heater - voltage above normal, or shorted to high
4169	5745	4	Amber	Aftertreatment 1 diesel exhaust fluid dosing unit heater	Aftertreatment 1 diesel exhaust fluid dosing unit heater - voltage below normal, or shorted to low source
6513	5745	17	None	Aftertreatment 1 diesel exhaust fluid dosing unit heater	Aftertreatment 1 diesel exhaust fluid dosing unit heater - data valid but below normal operating range
4171	5745	18	Amber	Aftertreatment 1 diesel exhaust fluid dosing unit heater	Aftertreatment 1 diesel exhaust fluid dosing unit heater - data valid but below normal operating range
4155	5746	3	Amber	Aftertreatment 1 diesel exhaust fluid dosing unit heater relay	Aftertreatment 1 diesel exhaust fluid dosing unit heater relay - voltage above normal, or shorted to high source
6529	5746	3	None	Aftertreatment 1 diesel exhaust fluid dosing unit heater relay	Aftertreatment 1 diesel exhaust fluid dosing unit heater relay - voltage above normal, or shorted to high source

77. The descriptions of Cummins J1939 SPN codes are subject to change at their discretion.

Table 8.19 Engine Error Codes (continued)

Fault Code	J1939 SPN	J1939 FMI	Lamp	J1939 SPN Description	Cummins Description[78]
4156	5746	4	Amber	Aftertreatment 1 diesel exhaust fluid dosing unit heater relay	Aftertreatment 1 diesel exhaust fluid dosing unit heater relay - voltage below normal, or shorted to low source
4251	5798	10	Amber	Aftertreatment 1 diesel exhaust fluid dosing unit heater temperature	Aftertreatment 1 diesel exhaust fluid dosing unit heater temperature - abnormal rate of change
6511	6655	3	None	ECU power lamp	Maintain ECU power lamp - voltage above normal, or shorted to high source
6512	6655	4	None	ECU power lamp	Maintain ECU power lamp - voltage below normal, or shorted to low source
6473	6799	2	None	Engine fan blade pitch	Fan blade pitch – data erratic, intermittent, or incorrect
5183	6799	3	Amber	Engine fan blade pitch	Fan blade pitch position sensor circuit - voltage above normal, or shorted to high source
6471	6799	3	None	Engine fan blade pitch	Fan blade pitch position sensor circuit - voltage above normal, or shorted to high source
5184	6799	4	Amber	Engine fan blade pitch	Fan blade pitch position sensor circuit - voltage below normal, or shorted to low source
6472	6799	4	None	Engine fan blade pitch	Fan blade pitch position sensor circuit - voltage below normal, or shorted to low source
5185	6799	7	Amber	Engine fan blade pitch	Fan blade pitch - mechanical system not responding or out of adjustment
5278	6802	31	Amber	Engine fan blade pitch	Aftertreatment 1 diesel exhaust fluid dosing system frozen - condition exists
5653	6881	9	Amber	SCR operator inducement override switch	SCR operator inducement override switch - abnormal update rate
5654	6881	13	Amber	SCR operator inducement override switch	SCR operator inducement override switch - out of calibration
5393	6882	3	Amber	Aftertreatment diesel oxidation catalyst temperature sensor module	Aftertreatment diesel oxidation catalyst temperature sensor module - voltage above normal or shorted to high source
5394	6882	4	Amber	Aftertreatment diesel oxidation catalyst temperature sensor module	Aftertreatment diesel oxidation catalyst temperature sensor module - voltage below normal or shorted to low source
5391	6882	9	Amber	Aftertreatment diesel oxidation catalyst temperature sensor module	Aftertreatment diesel oxidation catalyst temperature sensor module - abnormal update rate

78. The descriptions of Cummins J1939 SPN codes are subject to change at their discretion.

Table 8.19 Engine Error Codes (continued)

Fault Code	J1939 SPN	J1939 FMI	Lamp	J1939 SPN Description	Cummins Description[79]
5395	6882	11	Amber	Aftertreatment diesel oxidation catalyst temperature sensor module	Aftertreatment diesel oxidation catalyst temperature sensor module - root cause not known
5392	6882	12	Amber	Aftertreatment diesel oxidation catalyst temperature sensor module	Aftertreatment diesel oxidation catalyst temperature sensor module - bad intelligent device or component
5396	6882	16	Amber	Aftertreatment diesel oxidation catalyst temperature sensor module	Aftertreatment diesel oxidation catalyst temperature sensor module - data valid but above normal operating range - moderately severe level
5632	6918	31	Maintenance	SCR system cleaning inhibited due to inhibit switch	SCR system cleaning inhibited due to inhibit switch - condition exists
5631	6928	31	None	SCR system cleaning inhibited due to system timeout	SCR system cleaning inhibited due to system timeout - condition exists
6597	6928	31	Amber	SCR system cleaning inhibited due to system timeout	SCR system cleaning inhibited due to system timeout - condition exists
6634	7848	14	Amber	Aftertreatment 1 SCR system conditions not met for active cleaning	Aftertreatment 1 SCR system conditions not met for active cleaning - special instructions
5939	520968	9	Amber	—	Machine constrained operation - abnormal update rate. No communication or an invalid data transfer rate has been detected on the J1939 data link between the ECM and the machine electronic control unit
5941	520968	19	None	—	Machine constrained operation - received network data in error. The received J1939 datalink message was not valid
5617	524286	31	Amber	Aftertreatment 1 diesel oxidation catalyst system	Aftertreatment 1 diesel oxidation catalyst system - special instruction

79. The descriptions of Cummins J1939 SPN codes are subject to change at their discretion.

8.5 Diesel Exhaust Fluid Supply Module Fault Codes

If a diesel exhaust fluid (DEF) supply module error occurs, the cab display module (CDM) will display an error code. Refer to the table below to learn the meaning of the code.

SPN	FMI	Description	
3361	2	DEF dosing unit temperature	Data erratic, intermittent, or incorrect
3361	3	DEF dosing unit	Voltage above normal or shorted to high source
3559	4	DEF dosing unit	Voltage below normal or shorted to low source
4094	31	–	Nox limits exceeded due to insufficient reagent quality—condition exists
4334	3	DEF pressure sensor	Voltage above normal or shorted to high source
4334	4	DEF pressure sensor	Voltage below normal or shorted to low source
4334	16	DEF pressure sensor	Data valid but above normal operating range
4334	18	DEF pressure sensor	Data valid but below normal operating range
4337	3	DEF dosing temperature sensor	Voltage above normal or shorted to high
4337	4	DEF dosing temperature sensor	Voltage below normal or shorted to low
4337	10	DEF dosing temperature	Abnormal rate of change
4376	3	DEF return valve	Voltage above normal or shorted to high source
4376	4	DEF return valve	Voltage below normal or shorted to low source
4376	7	DEF return valve	Mechanical system not responding or out of adjustment
5394	7	DEF dosing valve	Mechanical system not responding or out of adjustment
5745	3	DEF dosing unit heater	Voltage above normal or shorted to high source
5745	4	DEF dosing unit heater	Voltage below normal or shorted to low source
5745	18	DEF dosing unit heater	Data valid but below normal operating range
5746	3	DEF dosing unit heater relay	Voltage above normal or shorted to high source
5746	4	DEF dosing unit heater relay	Voltage below normal or shorted to low source
5798	2	DEF dosing unit heater temperature	Data erratic, intermittent, or incorrect
5798	10	DEF dosing unit heater temperature	Abnormal rate of change

8.6 Diesel Exhaust Fluid Tank and Sensor Associated Fault Codes

If a diesel exhaust fluid (DEF) exhaust fluid tank or sensor error occurs, the cab display module (CDM) will display an error code. Refer to the table below to learn the meaning of the code.

SPN	FMI	Description	
1761	1	DEF tank level	data valid but below normal operating range—most severe level
1761	2	DEF tank level	data erratic, intermittent, or incorrect
1761	3	DEF tank level sensor circuit	voltage above normal or shorted to high source
1761	4	DEF tank level sensor circuit	voltage below normal or shorted to low source
1761	5	DEF tank level sensor circuit	current below normal or open circuit
1761	6	DEF tank level	current above normal or grounded circuit
1761	10	DEF tank level	abnormal rate of change
1761	11	DEF tank level	root cause not known
1761	13	DEF tank level	out of calibration
1761	17	DEF tank level	data valid but below normal operating range—least severe level
1761	18	DEF tank level	data valid but below normal operating range—moderately severe level
3031	2	DEF tank temperature sensor	data erratic, intermittent, or incorrect
3031	3	DEF tank temperature sensor	voltage above normal or shorted to high source
3031	4	DEF tank temperature sensor	voltage below normal or shorted to low source
3031	5	DEF tank temperature sensor	current below normal or open circuit
3031	6	DEF tank temperature sensor	current above normal or grounded circuit
3031	9	DEF tank temperature sensor	abnormal update rate
3031	11	DEF tank temperature	root cause not known
3031	13	DEF tank temperature sensor	out of calibration
3363	3	DEF tank heater	voltage above normal or shorted to high source
3363	4	DEF tank heater	voltage below normal or shorted to low source
3363	7	DEF tank heater	mechanical system not responding or out of adjustment
3363	16	DEF tank heater	data valid but above normal operating range—moderately severe level
3363	18	DEF tank heater	data valid but below normal operating range—moderately severe level
3364	1	DEF tank quality sensor	data valid but below normal operating range—most severe level
3364	2	DEF tank quality sensor	data erratic, intermittent, or incorrect
3364	3	DEF tank quality sensor	voltage above normal or shorted to high source
3364	4	DEF tank quality sensor	voltage below normal or shorted to low source

SPN	FMI	Description	
3364	5	DEF tank quality sensor	current below normal or open circuit
3364	6	DEF tank quality sensor	current above normal or grounded circuit
3364	7	DEF tank quality sensor	mechanical system not responding or out of adjustment
3364	9	DEF tank quality sensor	abnormal update rate
3364	10	DEF tank quality sensor	abnormal rate of change
3364	11	DEF tank quality sensor	root cause not known
3364	12	DEF tank quality sensor	bad intelligent device or component
3364	13	DEF tank quality sensor	out of calibration
3364	18	DEF tank quality sensor	data valid but below normal operating range—moderately severe
4094	31	–	NOx limits exceeded due to insufficient regent quality—condition exists
4096	31	–	DEF tank empty—condition exists

8.7 Cab Display Module / Windrower Control Module Error Codes

The cab display module (CDM) may display an error code if an error in a monitored system occurs while the windrower is operating. The tables supplied in this section will allow you to interpret the meaning of a CDM error code.

8.7.1 Cab Display Module Error Codes

The cab display module (CDM) displays error codes when there is a fault with one of the sensors that monitor and control windrower operation. Use the list of error codes to help identify a specific problem with the windrower.

NOTE:

In the case of dual codes being shown for an item (primarily the solenoid valves), the first code indicates a SHORT CIRCUIT condition, while the second code indicates an OPEN CIRCUIT condition. That is, E41 would be a SHORT in the reel aft solenoids (P55, P59), while E141 would indicate an OPEN circuit.

Codes		CDM Display	Description
E1			
E2		RTCH NOT ALLOWED	Return to cut height activated with the header off.
E3		CDM CANBUS ERROR	CANBUS error with CDM. Check electrical connections.
E4		HDR DRV NOT ALLOWED	Header engage switch activated while in engine-forward.
E5		CHECK HEADER ID	Header ID change has been detected while the header was engaged.
E6		TEMP GAUGE SHORT	Wiring/connection problem.
E7		SPEED STICK SHORT	Wiring/connection problem.
E8		HEADER ENABLE SHORT	Wiring/connection problem.
E9		WCM ENABLE SHORT	Wiring/connection problem.
E10		CDMI NTERNAL ERROR	Internal hardware or software problem.
E11		CDM POWER UP	CDM did not power up correctly.
E12		WCM POWER UP	WCM did not power up correctly.
E13		FUEL SOLENOID	WCM fuel solenoid output fault detected.
E14			
E15		KNIFE DRIVE PWM P68	Knife drive—PWM solenoid P68 drive fault detected.
E16		DRAPER DRV PWM P69	Draper drive—PWM solenoid P69 drive fault detected.
E17		REEL DRIVE PWM P70	Reel drive—PWM solenoid P70 drive fault detected.
E18			
E19	E119	LOAD SENSE P75	Disc block valve—Solenoid P75 drive fault detected—short circuit / open circuit
E20			
E21	E121	REVERSER P106	Reverser solenoid P106 fault detected—short circuit / open circuit
E22			
E23	E123	REVERSER	Reverser solenoids (P65,P66,P67) fault detected—short circuit / open circuit
E24	E124	DECK SHFT RIGHT P95	Right deck shift solenoid P95 fault detected—short circuit / open circuit
E25	E125	DECK SHFT LEFT P96	Left deck shift solenoid P96 fault detected—short circuit / open circuit
E26	E126	DWA UP	DWA raise solenoid P72, P73 fault detected—short circuit / open circuit

Codes		CDM Display	Description
E27	E127	DWA DOWN	DWA lower solenoid P72, P73 fault detected—short circuit / open circuit
E28	E128	TILT RETRACT	Header tilt retract solenoid P54 fault detected—short circuit / open circuit
E29	E129	TILT EXTEND	Header tilt extend solenoid P53, P54 fault detected—short circuit / open circuit
E30	E130	4 WAY VALVE P62	Four-way valve solenoid P62 fault detected—short circuit / open circuit
E31	E131	BYPASS VALVE P52	Bypass valve solenoid P52 fault detected—short circuit / open circuit
E32	E132	HEADER UP/DOWN P57	Header up/down solenoid P57 fault detected—short circuit / open circuit
E33	E133	SCREEN CLEANERS	Screen cleaner output fault detected—short circuit / open circuit
E34	E134	RIGHT STOP LAMP	Right stop lamp output fault detected—short circuit / open circuit
E35	E135	LEFT STOP LAMP	Left stop lamp output fault detected—short circuit / open circuit
E36	E136	RIGHT TURN LAMP	Right turn lamp output fault detected—short circuit / open circuit
E37	E137	LEFT TURN LAMP	Left turn lamp output fault detected—short circuit / open circuit
E38	E138	MAIND RIVE	Main header drive solenoid P71 fault detected—short circuit / open circuit
E39	E139	LOW RANGE P61	Low range solenoid P61 fault detected—short circuit / open circuit
E40	E140	HIGH RANGE P60	High range solenoid P60 fault detected—short circuit / open circuit
E41	E141	REEL AFT	Reel aft solenoid P55, P59 fault detected—short circuit / open circuit
E42	E142	REEL FORE	Reel fore solenoid P55, P59 fault detected—short circuit / open circuit
E43	E143	REEL UP/DOWN P58	Reel up/down solenoid P58 fault detected—short circuit / open circuit
E44	E144	FLOAT RHS P64	Right float solenoid P64 fault detected—short circuit / open circuit
E45	E145	FLOAT LHS P63	Left float solenoid P63 fault detected—short circuit / open circuit
E46		SENSOR VOLTS HIGH	WCM's 9V sensor voltage output high (wire 5)
E47		SENSOR VOLTS LOW	WCM's 9V sensor voltage output low (wire 5)
E48		WCM OVER TEMP	WCM over temp fault.
E49		WCM LOW TEMP	WCM low temp fault.
E50		BATT + OUT OF RANGE	System voltage above 15.5 VDC.
E51	E151	DISK DRIVE PWM P68	Disk header drive solenoid P68 fault detected—short circuit / open circuit
E52			
E53			
E54			
E55		DISK SPD OVERLOAD	Low disk speed detected < setpoint
Error codes E56 to E63 not allocated			
E64		HEADER OIL PRESSURE	Header drive charge pressure low (switch 228 on hydraulic schematic)

Codes		CDM Display	Description
E65		KNIFE OVERLOAD	Low knife speed detected < setpoint
E66		##.# LOW VOLTS	Low system voltage <11.5 VDC
E67		TRANS OIL PRESSURE	Supercharge pressure low (switch 202 on hydraulic schematic)
E68		HYDRAULIC OIL HOT	Oil tank temp >230 deg F / 110 deg C
E69		ENGINE AIR FILTER	Engine air filter plugged
E70		HYDRAULIC FILTER	Hydraulic filture pressure too high (switch 227 on hydraulic schematic)
E71		LOW HYDRAULIC OIL	Low hydraulic oil level sensor tripped (switch 225 on hydraulic schematic)
E72		##.# HIGH VOLTS	System voltage above 15.5 VDC.
Error codes E73 to E100 not allocated			
E101		SPI ERROR	Internal error
E102		CAN ERROR	J1939 Can error
E103		EEPROM READ ERROR	Internal error
E104		EEPROM WRITE ERROR	Internal error
E105		TEMP SENSOR ERROR	Internal temperature sensor error.

8.7.2 Miscellaneous Information / Error Codes

The cab display module (CDM) displays error codes when there is a fault with one of the sensors that monitor and control windrower operation. Use the list of error codes to help identify a specific problem with the windrower.

CDM Display	Description
ENGINE OIL PRESSURE	Engine oil pressure warning
ENGINE TEMPERATURE	Engine coolant temperature warning
CANBUSS ERROR	J1939 Can error
KNIFE SPD OVERLOAD	Low knife speed detected (less than programmed overload speed)
NO OPERATOR	Operator not detected in seat (~3 second delay before message)
NO HEADER	No header ID detected—not hooked up or wiring error
LOCK SEAT BASE	Seat base not detected in either cab- or engine-forward position
DISENGAGE HEADER	Header engage switch ON when ignition turned ON
xxxxS xxF xxC	Engine error code configuration (CANBUS)—refer to *8.4 Engine Error Codes, page 504*
CENTER STEERING	GSL or pintle switches not closed with the key ON / engine OFF
NOT IN PARK	GSL or pintle switches not closed with the key ON / engine OFF
BRAKE ON	Engine running GSL out of PARK brake is still engaged
PLACE GSL INTO "N"	GSL or pintle switches not closed with the key ON / engine OFF
BRAKE SW FAILURE	Ignition on / engine not running—brake switch and relay closed
BRAKE OFF	Engine running, GSL in N-DETENT— brake pressure switch or brake switch relay fault
CHECK SEAT SWITCHES	System detects that both seat switches are active
CAB FORWARD SW ON	If both switches are to be activated than the display
ENG FORWARD SW ON	Will alternate between these messages

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Lubricants, Fluids, and System Capacities

This page acts as a quick reference for the Operator. It provides information on the types of lubricants and fluids used in the windrower

CAUTION

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

Lubricant/Fluid	Location	Description	Capacity
Diesel exhaust fluid (DEF)	Diesel exhaust fluid tank	Must meet ISO 22241 requirements	28.4 liters (7.5 US gallons)
Grease	Various	SAE multi-purpose high temperature extreme pressure (EP2) performance with 1% maximum 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[80]; refer to *8.1.2 Fuel Specifications, page 490* for more information	367 liters (97 US gallons)
Hydraulic oil	Hydraulic reservoir	SAE 15W-40 compliant with SAE specs for API class SJ and CH-4 engine oil.	65 liters (17.2 US gallons)
Gear lubricant	Gearbox	SAE 80W-140[81], API service class GL-5 fully synthetic gear lubricant (SAE J2360 preferred)	2.1 liters (2.2 US quarts)
Gear lubricant	Wheel drive[82]	SAE 75W-90, API service class GL-5 fully synthetic gear lubricant (SAE J2360 preferred)	1.4 liters (1.5 US quarts)
Coolant	Engine cooling system	ASTM D-6210 and CES-14603, Fleetguard® ES Compleat™ OAT, Peak Final Charge Global®. For more information, refer to *8.1.3 Lubricants, Fluids, and System Capacities, page 491*	30 liters (7.9 US gallons)
Engine oil	Engine oil pan	SAE 15W-40 compliant with SAE specs for API class SJ and CJ-4 engine oil	11 liters (11.6 US quarts)
Air conditioning refrigerant	Air conditioning system	R134A	2.27 kg (5 lb.)
Air conditioning refrigerant oil[83]	Air conditioning system total capacity	SP-15 PAG	240 cc (8.1 fl. oz.)

80. Optional when operating temperature is below 0°C (32°F).
81. SAE 75W-140 may be substituted for SAE 80W-140 if necessary.
82. SAE 85W-140 API Service Class GL-5. Extreme Pressure Gear Lubricant is used before initial change.
83. New compressor (MD #183515) comes filled.

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