

MacDon

M155 **Self-Propelled Windrower**

Operator's Manual

169883 Revision A

Original Instruction

The harvesting specialists worldwide.

This manual contains instructions for SAFETY, OPERATION, and MAINTENANCE/SERVICE for the MacDon M155 Self-Propelled Windrower. Featuring the Dual Direction® and Ultra Glide® suspension on the M155.




Published June, 2014

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 hands after handling.

Declaration of Conformity

		
EC Declaration of Conformity		
MacDon Industries Ltd 680 Moray Street Winnipeg, Manitoba, Canada R3J 3S3		
<i>The undersigned hereby declares that:</i>		
Machine type:	<i>M Series Windrower</i>	
Model:	<i>M105, M155, M205</i>	
Serial Number(s):	<i>As Per Shipping Document</i>	
<i>fulfills all relevant provisions and essential requirements of the following directives:</i>		
Directive	Number	Certification Method
Machinery Directive	2006/42/EC	Self-Certification
EMC Directive	2004/108/EC	Self-Certification
<i>Name and address of the person in the European Community authorized to compile the technical construction file:</i>		
Johannes Molitor Schwarzwald Strasse 67 66482 Zweibrucken / Germany HRB 31002, Amtgericht Zweibrucken		
Place of Declaration:	Winnipeg, Manitoba, Canada	Name: Ibrahim Saleh
Date of Declaration:	01 July 2013	Title: Director, Product Integrity

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Figure 1

Continued on next page.

Whole Body and Hand-Arm Vibration Levels

The weighted root mean square acceleration to which the whole body is subjected to ranges from 0.57 to 1.06 m/s² as measured on a representative machine during typical operations and analyzed in accordance with ISO 5008.

During the same operations, the weighted root means square hand-arm vibration was less than 1.45 m/s² 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-weight sound pressure levels inside the operator's station ranged from 70.1 to 73.1 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 Self-Propelled Windrower, which is designed to cut and lay in windrows a wide variety of grain, hay, and specialty crops. Windrowing allows starting the harvest earlier, protects the crop from wind damage, and gives you more flexibility in scheduling combine time.

The power unit (referred to in this manual as the “windrower”), when coupled with one of the specially designed auger, rotary, or draper headers, provides a package which incorporates many features and improvements in design.

The M155 Windrower is Dual Direction®, meaning that the windrower can be driven in the cab-forward or the engine-forward modes. Right-hand and left-hand designations are therefore determined by the operator’s position, facing the direction of travel. This manual uses the terms “right cab-forward”, “left cab-forward”, “right engine-forward”, and “left engine-forward” when referencing specific locations on the machine.

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 areas. Study the Table of Contents to familiarize yourself with how the material is organized.

If you follow the instructions given here, your M155 Windrower will work well for many years.

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

A manual storage case is provided in the cab. Keep this manual handy for frequent reference and to pass on to new Operators or Owners. Call your Dealer if you need assistance, information, or additional copies of this manual.

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

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

List of Revisions

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

Summary of Change	Location
Added new safety sign locations.	1.11 Safety Sign Locations, page 13
Updated lift linkage images to include the new decal.	Various locations throughout 4.4.3 Levelling the Header, page 143
Restructured the header attach and detach procedures to improve readability.	4.5 Attaching and Detaching Headers, page 157
Removed reference to the walking beam grease zerk in the Lubrication Points section. No longer required with new design.	5.6.2 Lubrication Points, page 274
Updated air conditioning unit images to show the new unit.	Air Conditioning Evaporator, page 288
Added image showing new battery boost post location.	Boosting the Battery, page 331
Replaced the missing Hydraulic Oil Maintenance instruction.	Checking and Filling Hydraulic Oil, page 360
Added the Adjusting Reel Drop Rate section.	Adjusting Reel Drop Rate, page 367
Added image and instruction for 10-bolt wheel tightening procedure and torque specifications	Various locations throughout Tightening Drive Wheel Nuts, page 371
Updated the replacing cabin dome light procedure.	Dome Light, page 353
Added case drain kit information to the Options and Attachments section.	7.1.5 Case Drain Kit, page 405
Added mechanical center-link to the Option and Attachments section.	7.1.15 Mechanical Center-Link, page 407

Serial Number

Record the model number, model year, and serial number of the windrower and engine on the lines below.

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

WINDROWER MODEL NUMBER _____
YEAR OF MANUFACTURE _____



Figure 2: Machine Serial Number Location

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

ENGINE SERIAL NUMBER _____
DATE OF MANUFACTURE _____



Figure 3: Engine Serial Number Location

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1 Safety

1.1 Safety Alert Symbols

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

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

SAFETY

1.2 Signal Words

Three signal words, DANGER, WARNING, and CAUTION, are used to alert you to hazardous situations. The appropriate signal word for each situation has been selected using the following guidelines:

DANGER

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

WARNING

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

CAUTION

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

1.3 General Safety

CAUTION

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

Protect yourself

- When assembling, operating, and servicing machinery, wear all the protective clothing and personal safety devices that **COULD** be necessary for the job at hand. Don't take chances.

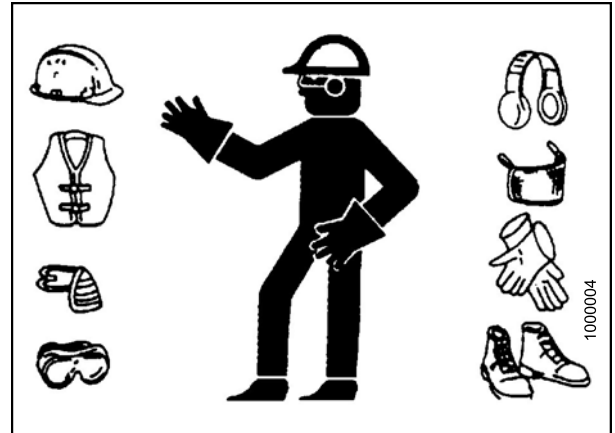


Figure 1.2: Safety Equipment

- You may need:
 - A hard hat
 - Protective footwear with slip resistant soles
 - Protective glasses or goggles
 - Heavy gloves
 - Wet weather gear
 - A respirator or filter mask

- Hearing protection
Be aware that exposure to loud noise can cause impairment or loss of hearing. Wearing suitable hearing protection devices such as ear muffs or ear plugs. These will help protect against objectionable or loud noises.

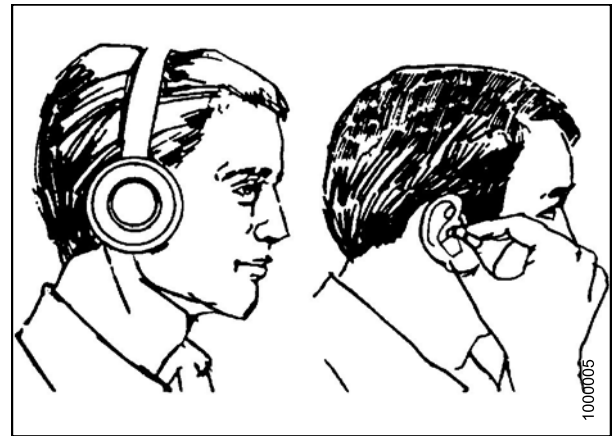


Figure 1.3: Safety Equipment

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

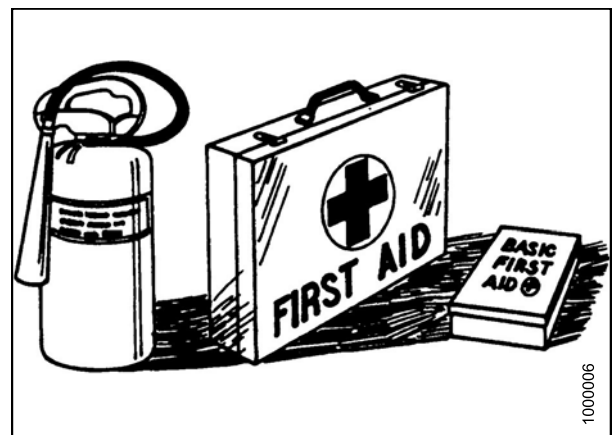


Figure 1.4: Safety Equipment

SAFETY

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



Figure 1.5: Safety around Equipment

- Keep hands, feet, clothing, and hair away from moving parts. Never attempt to clear obstructions or objects, from a machine while the engine is running.
- Do **NOT** modify the machine. Non-authorized modifications may impair machine function and/or safety. It may also shorten the machine's life.
- Stop the engine and remove the key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

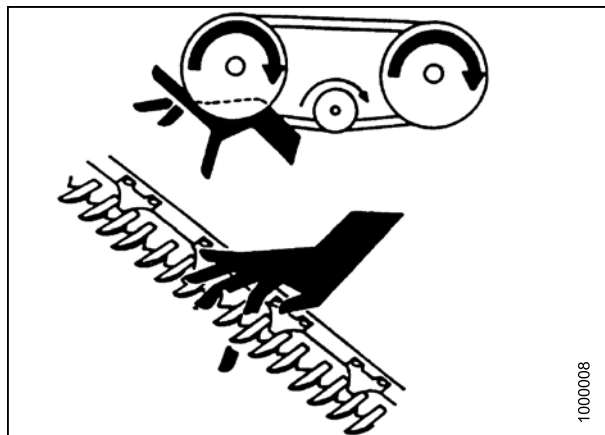


Figure 1.6: Safety around Equipment

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



Figure 1.7: Safety around Equipment

SAFETY

1.4 Maintenance Safety

To ensure your safety while maintaining the machine:

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



Figure 1.8: Safety around Equipment

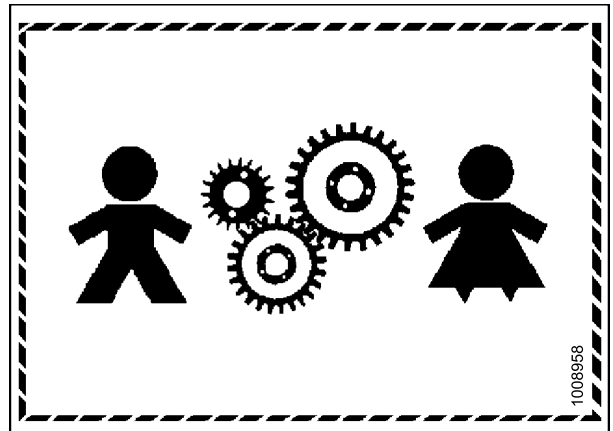


Figure 1.9: Equipment NOT Safe for Children

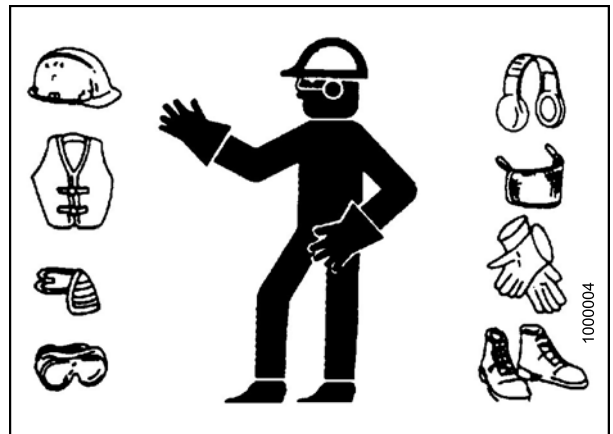


Figure 1.10: Safety Equipment

SAFETY

1.5 Hydraulic Safety

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

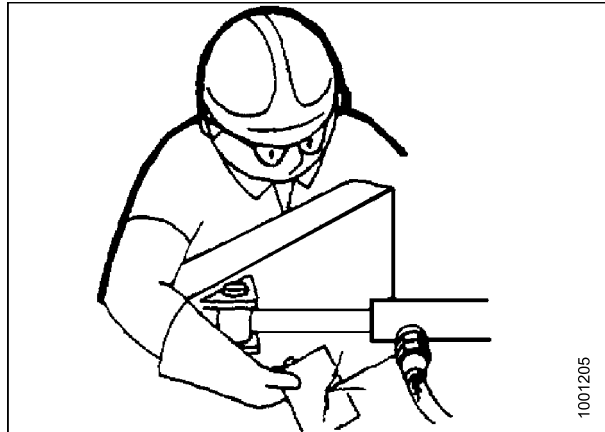


Figure 1.11: Checking Hydraulic Leaks

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



Figure 1.12: Hydraulic Pressure Hazard

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

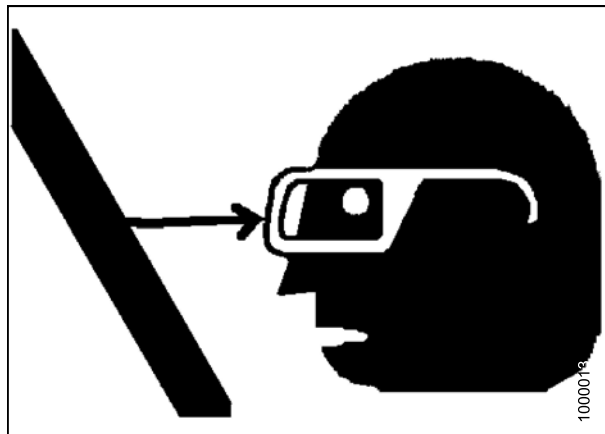


Figure 1.13: Safety Glasses

SAFETY

1.6 Tire Safety

- Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosion that may result in serious injury or death.

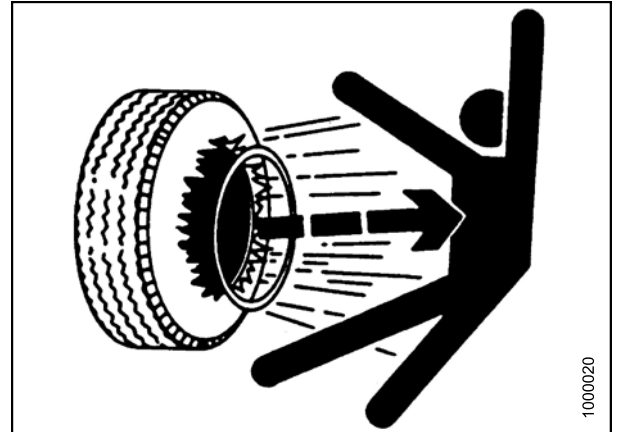


Figure 1.14: Over-Inflated Tire

- Do **NOT** attempt to mount a tire unless you have the proper training and equipment.
- Have a qualified tire dealer or repair service perform required tire maintenance.

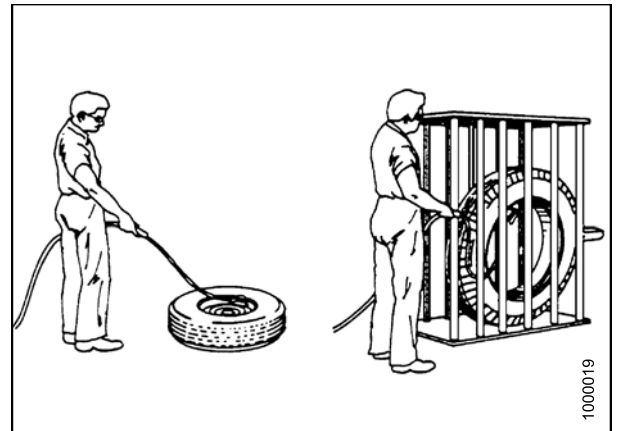


Figure 1.15: Safely Filling a Tire with Air

1.7 Battery Safety

WARNING

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



Figure 1.16: Safety around Equipment

WARNING

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

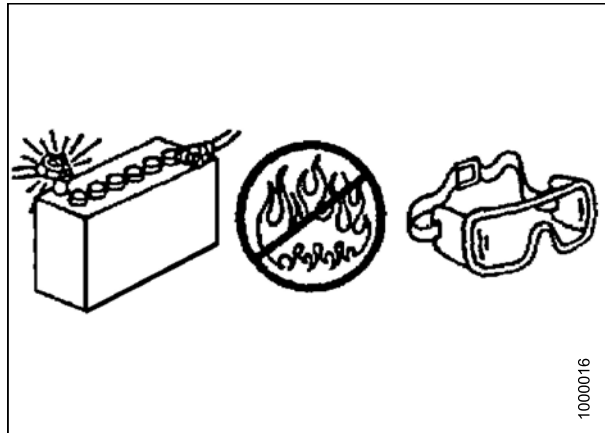


Figure 1.17: Safety around Equipment

WARNING

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

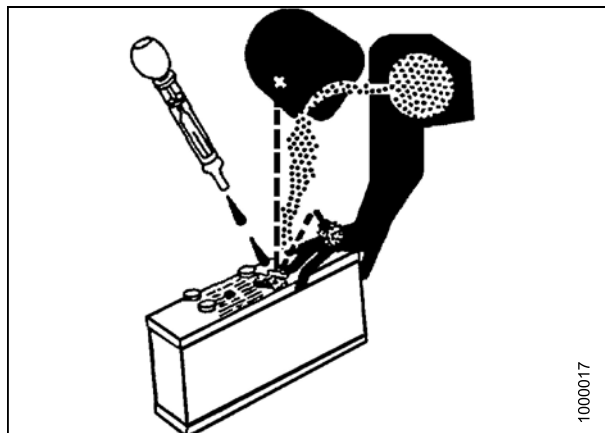


Figure 1.18: Safety around Equipment

SAFETY

1.8 Welding Precaution

High currents and voltage spikes associated with welding can cause damage to electronic components. Before welding on any part of the windrower or an attached header, disconnect all electronic module harness connections as well as the battery cables. Refer to your technical manual or MacDon Dealer for proper procedures.

SAFETY

1.9 Engine Safety

WARNING

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

CAUTION

- In the initial start-up of a new, serviced, or repaired engine always make provision to shut the engine off, in order to stop an over-speed. This may be accomplished by shutting off the air and/or fuel supply to the engine. Over-speed shut down should occur automatically for engines that are controlled electronically.
- Do NOT bypass or disable the automatic shutoff circuits. The circuits are provided in order to help prevent personal injury. The circuits are also provided in order to help prevent engine damage. Refer to the technical manual 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 the area is free of personnel.
- All protective guards and all protective covers must be installed if the engine must be started in order to perform service procedures.
- To help prevent an accident that is caused by parts in rotation, work around the parts carefully.
- If a warning tag is attached to the engine start switch or to the controls, do NOT start the engine or move the controls. Consult with the person who attached the warning tag before the engine is started.
- Start the engine from the operator's compartment. Always start the engine according to the procedure that is described in the Engine Starting section of the operator's manual. Knowing the correct procedure will help to prevent major damage to the engine components and prevent personal injury.
- To ensure that the jacket water heater (if equipped) and/or the lube oil heater (if equipped) is working correctly, check the water temperature gauge and/or the oil temperature gauge during the heater operation. Engine exhaust contains products of combustion which can be harmful to your health. Always start the engine and operate the engine in a well ventilated area. If the engine is started in an enclosed area, vent the engine exhaust to the outside.

NOTE: The engine may be equipped with a device for cold starting. If the engine will be operated in very cold conditions, then an additional cold starting aid may be required. Normally, the engine will be equipped with the correct type of starting aid for your region of operation.

1.9.1 High Pressure Rails

CAUTION

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

SAFETY

1.9.2 Engine Electronics

WARNING

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

WARNING

Electrical Shock Hazard. The electronic unit injectors use DC voltage. The engine control module (ECM) sends this voltage to the electronic unit injectors. Do NOT come in contact with the harness connector for the electronic unit injectors while 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 the engine operating conditions. If any of the engine parameters extend outside an allowable range, the ECM will initiate an immediate action.

The following actions are available for engine monitoring control:

- Warning
- Derate
- Shutdown

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

- Engine Coolant Temperature
- Engine Oil Pressure
- Engine Speed
- Intake Manifold Air Temperature

The engine monitoring package can vary for different engine models and different engine applications. However, the monitoring system and the engine monitoring control will be similar for all engines. Together, the two controls will provide the engine monitoring function for the specific engine application.

SAFETY

1.10 Safety Signs

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

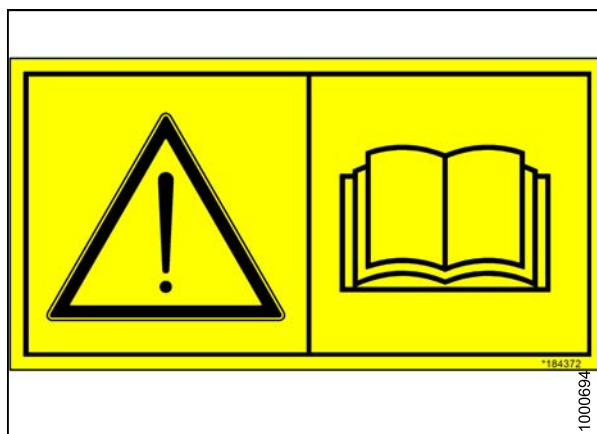


Figure 1.19: Operator's Manual Decal

1.10.1 Installing Safety Decals

To install a safety decal, follow these steps:

1. Be sure the installation area is clean and dry.
2. Decide on the exact location before you remove the decal backing paper.
3. Remove the smaller portion of the split backing paper.
4. Place the sign in position and slowly peel back the remaining paper, smoothing the sign as it is applied.
5. Small air pockets can be smoothed out or pricked with a pin.

SAFETY

1.11 Safety Sign Locations

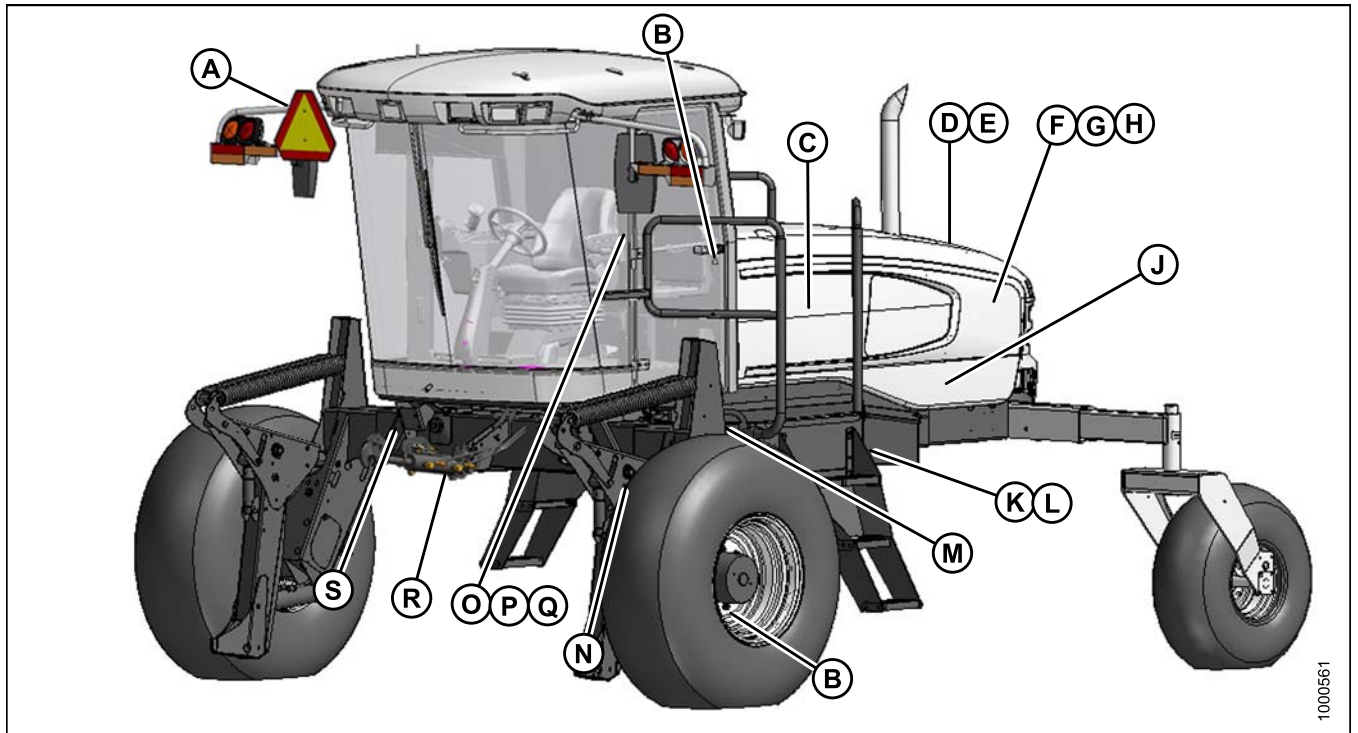


Figure 1.20: Safety Sign Locations (LH Side)

A - Hazard Sign (MD #135378)

D - Exhaust Cover (MD #166450)

G - Fan Shroud (Middle) (MD #166451)

K - Platform (L of Step) (MD #166425)

N - Lift Linkage (MD #166438)

Q - Inner Post (MD #166463)

B - Cab Door and Rim (MD #166454)

E - Close to Radiator Cap (MD #166461)

H - Fan Shroud (Bottom) (MD #166452)

L - Platform (R of Step) (MD #166441)

O - Inner Post (MD #166457)

R - Neutral Interlock (MD #166425)

C - Oil Reservoir under Hood (MD #174436)

F - Fan Shroud (Top) (MD #166450)

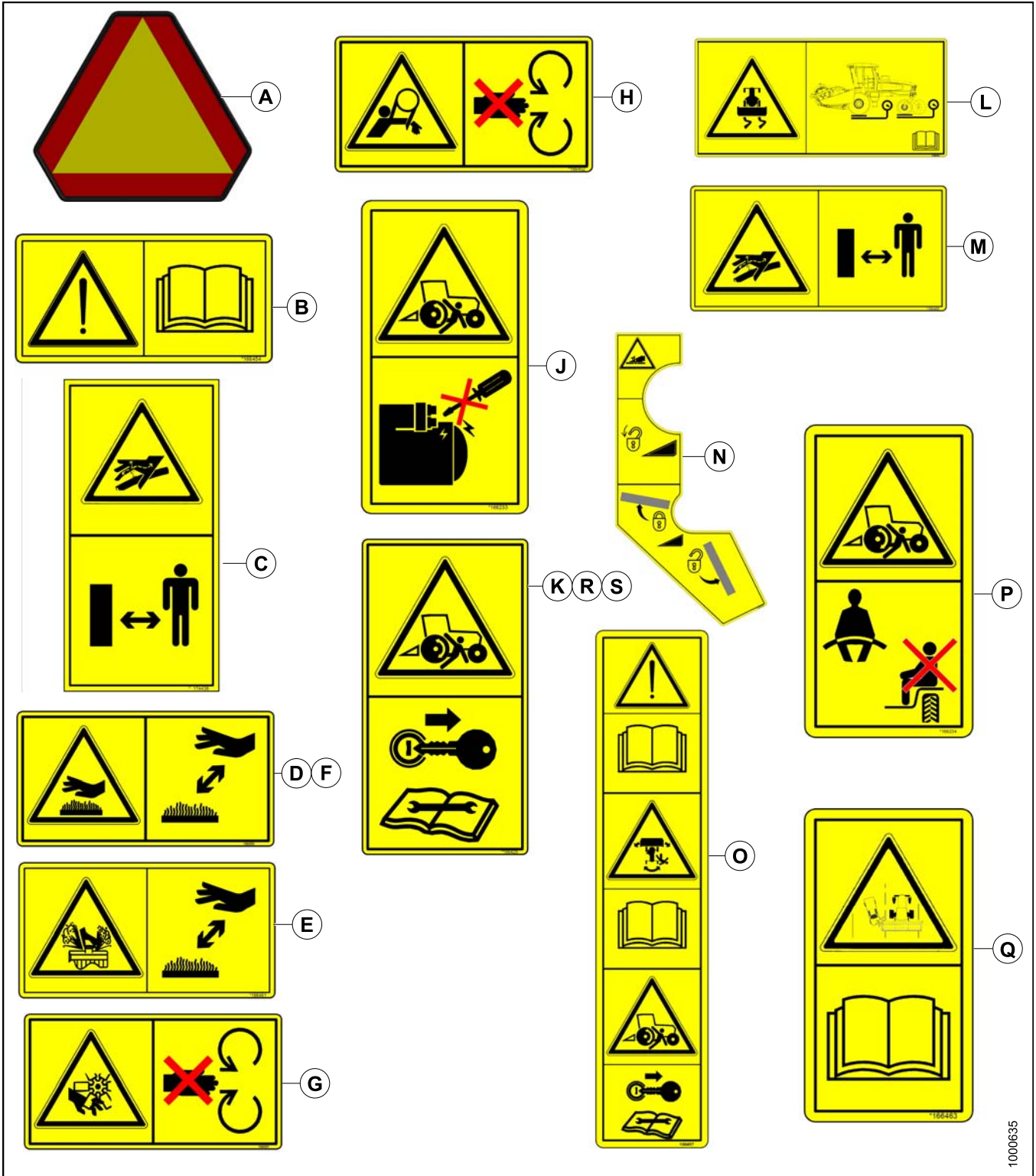
J - Frame Opening (MD #166233)

M - Frame at Valve Block (MD #166466)

P - Inner Post (MD #166234)

S - Frame (MD #166425)

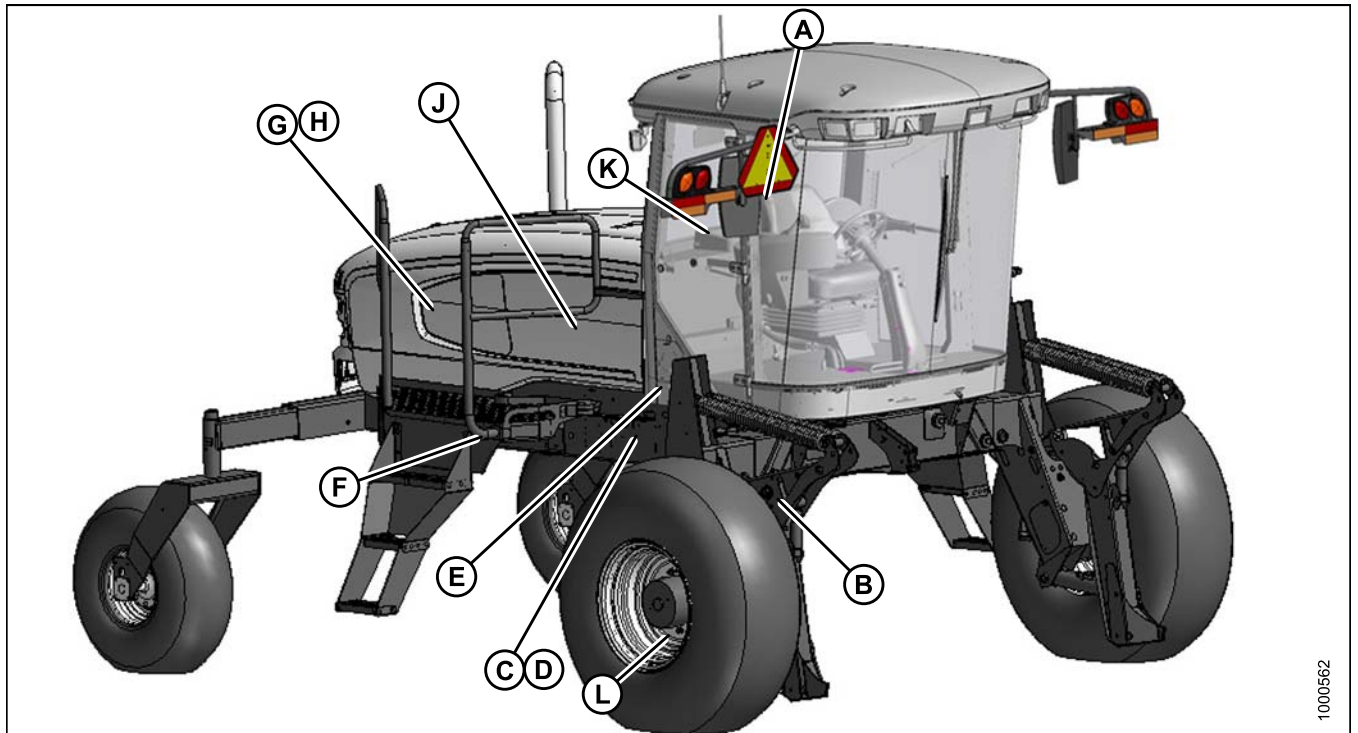
SAFETY



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Figure 1.21: Safety Signs (LH Side)

SAFETY



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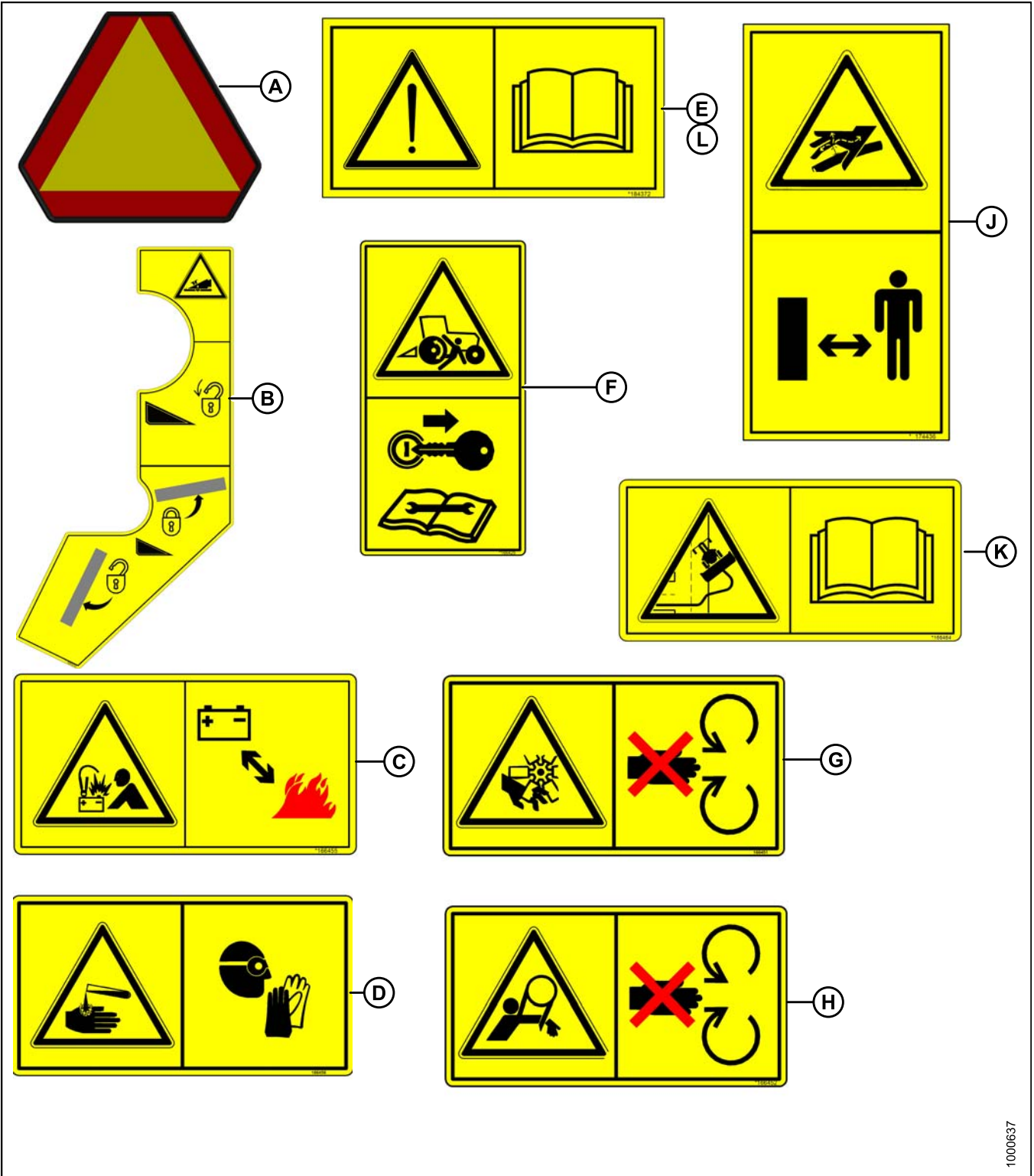
Figure 1.22: Safety Sign Locations (RH Side)

A - Hazard Sign on Seat (MD #115148)
D - Frame (MD #166456)
G - Shroud (MD #166451)
K - Wiper Cover (MD #166465)

B - Lift Linkage (MD #166439)
E - Cab Frame (MD #184372)
H - Shroud (MD #166452)
L - Rim (MD #166454 [similar to [E]])

C - Frame (MD #166455)
F - Platform (MD #166425)
J - Hydraulic Reservoir (MD #174436)

SAFETY



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Figure 1.23: Safety Signs (RH Side)

SAFETY

1.12 Interpreting Safety Signs

In the safety sign explanations below, (a) refers to the top or left position panel, (b) refers to the bottom or right position of the safety decal depending on decal orientation.

NOTE: If there are more than two panels in a decal, the lettering will continue downward or to the right, depending on decal orientation.

1. MD #166233

a. Run-over hazard.

b. **DANGER**

- Do not start engine by shorting across starter or starter relay terminals. Machine will start with drive engaged and move if starting circuitry is bypassed.
- Start engine only from operator's seat. Do not try to start engine with someone under or near machine.



Figure 1.24: MD #166233

2. MD #166234

a. Run-over hazard.

b. **WARNING**

- The training seat is provided for an experienced Operator of the machine when a new Operator is being trained.
- The training seat is not intended as a passenger seat or for use by children.
- Use the seat belt whenever operating the machine or riding as a trainer.
- Keep all other riders off the machine.



Figure 1.25: MD #166234

SAFETY

3. MD #166425

a. Roll-over hazard.

b. **WARNING**

- Stop the engine and remove the key from ignition before servicing, adjusting, lubricating, cleaning, or unplugging the machine.

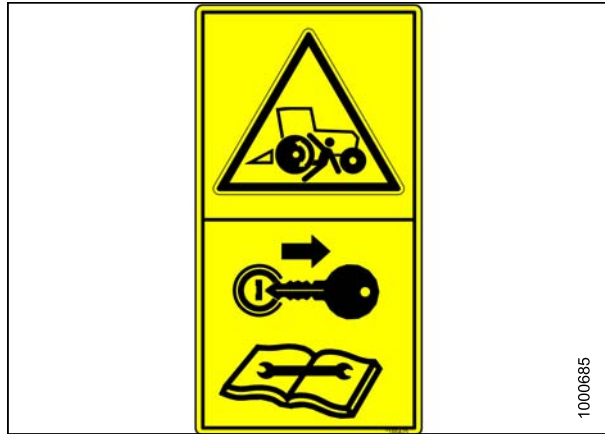


Figure 1.26: MD #166425

4. MD #166438

a. Crushing hazard.

b. **DANGER**

- Rest header on ground or engage safety props before going under unit.

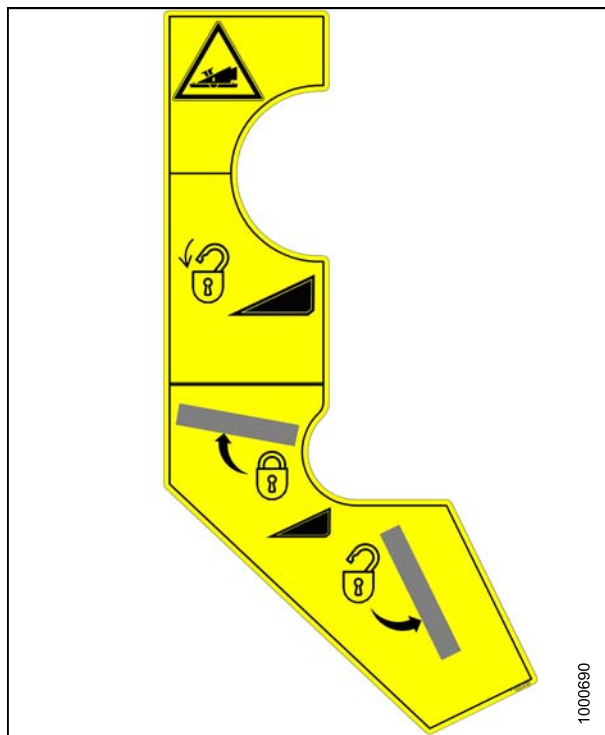


Figure 1.27: MD #166438

SAFETY

5. MD #166439
 - a. Crushing hazard.
 - b. **DANGER**
 - Rest header on ground or engage safety props before going under unit.

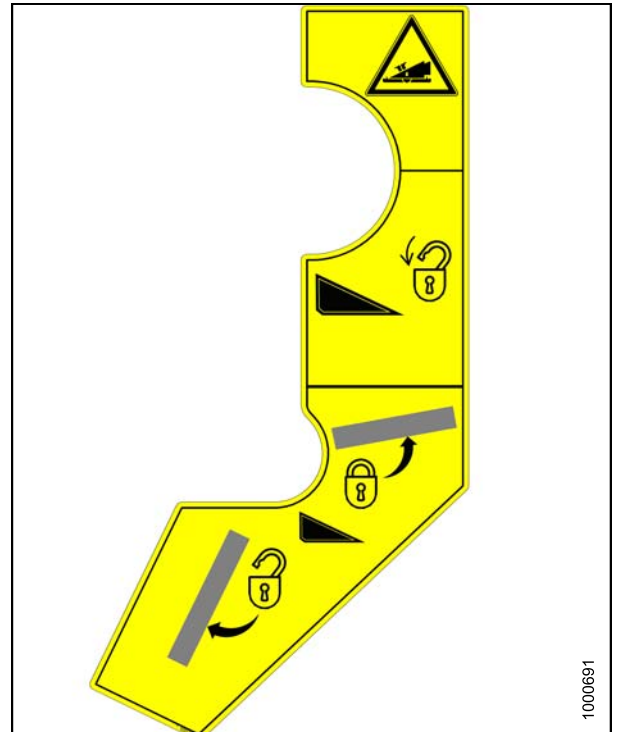


Figure 1.28: MD #166439

6. MD #166441
 - a. Loss of control hazard.
 - b. **CAUTION**
 - To prevent machine damage and/or loss of control, it is essential that the machine be equipped such that weights are within the specified limits.

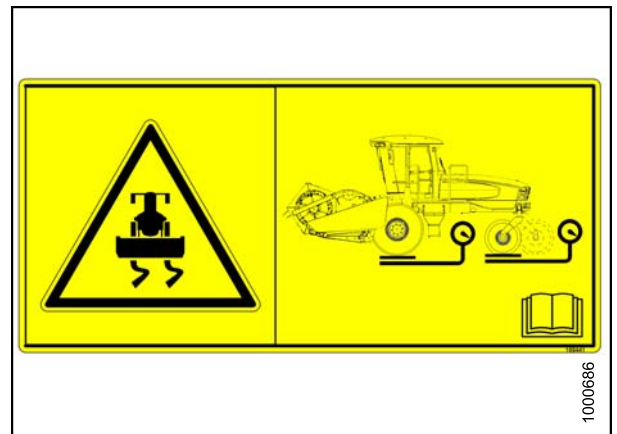


Figure 1.29: MD #166441

SAFETY

7. MD #166450

a. Hot surface hazard.

b. **WARNING**

- To avoid injury, keep a safe distance from hot surface.

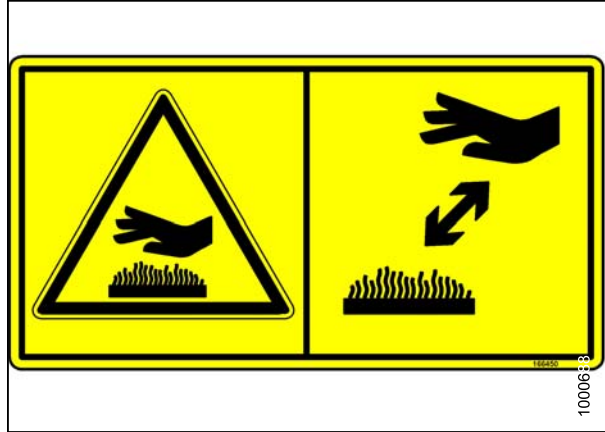


Figure 1.30: MD #166450

8. MD #166451

a. Rotating fan hazard.

b. **WARNING**

- To avoid injury, stop the engine and remove the key before opening engine hood.

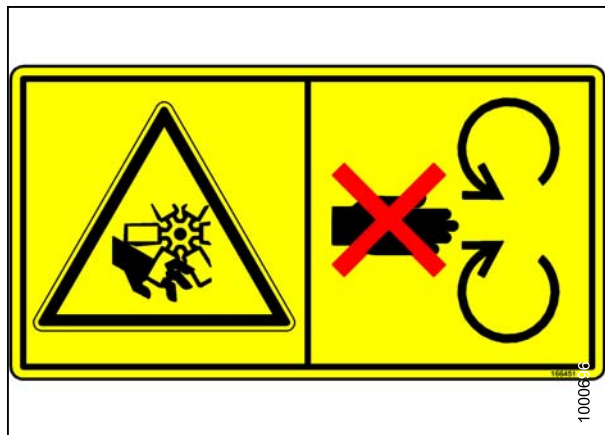


Figure 1.31: MD #166451

SAFETY

9. MD #166454

a. General hazard pertaining to machine operation and servicing.

b. **CAUTION**

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

- i. Read the operator's manual and follow all safety instructions. If you do not have a manual, obtain one from your dealer.
- ii. Do not allow untrained persons to operate the machine.
- iii. Review safety instructions with all Operators annually.
- iv. Ensure that all safety signs are installed and legible.
- v. Make certain everyone is clear of machine before starting engine and during operation.
- vi. Keep riders off the machine.
- vii. Keep all shields in place and stay clear of moving parts.
- viii. Disengage header drive, put transmission in Neutral, and wait for all movement to stop before leaving operator's position.
- ix. Shut off the engine and remove the key from ignition before servicing, adjusting, lubricating, cleaning, or unplugging machine.
- x. Engage locks to prevent lowering of header or reel before servicing in the raised position.
- xi. Use slow moving vehicle emblem and flashing warning lights when operating on roadways unless prohibited by law.

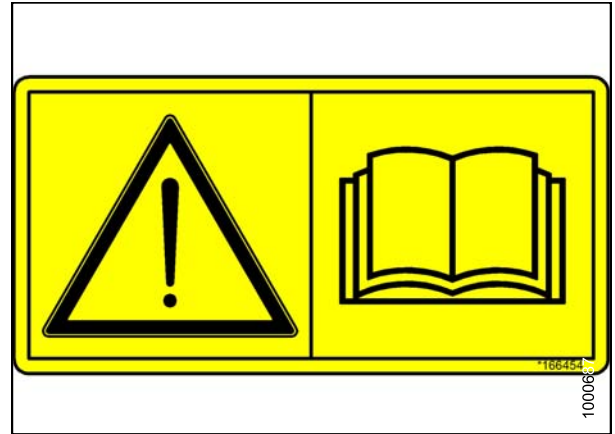


Figure 1.32: MD #166454

10. MD #166455

a. Explosion hazard.

b. **WARNING**

- Prevent serious bodily injury caused by:
- Explosive battery gases. Keep sparks and flames away from the battery. Refer to operator's manual for battery boosting and charging procedures.



Figure 1.33: MD #166455

SAFETY

11. MD #166456

a. Battery acid hazard.

b. **WARNING**

- Corrosive and poisonous battery acid. Acid can severely burn your body and clothing.



Figure 1.34: MD #166456

SAFETY

12. MD #166457

a. General hazard pertaining to machine operation and servicing.

b. **CAUTION**

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

i. Read the operator's manual and follow all safety instructions. If you do not have a manual, obtain one from your Dealer.

ii. Do not allow untrained persons to operate the machine.

iii. Review safety instructions with all Operators annually.

iv. Ensure that all safety signs are installed and legible.

v. Make certain everyone is clear of machine before starting engine and during operation.

vi. Keep riders off the machine.

vii. Keep all shields in place and stay clear of moving parts.

viii. Disengage header drive, put transmission in Neutral and wait for all movement to stop before leaving operator's position.

ix. Shut off the engine and remove the key from ignition before servicing, adjusting, lubricating, cleaning, or unplugging machine.

x. Engage locks to prevent lowering of header or reel before servicing in the raised position.

xi. Use slow moving vehicle emblem and flashing warning lights when operating on roadways unless prohibited by law.

c. Run-over hazard.

d. **WARNING**

- Machine will move if steering wheel is turned while engine is running.

- Steering response is opposite to what is normally expected when backing up. Turn bottom of steering wheel in direction you want to go.

- Always move ground speed lever to slow end of range before shifting high-low speed control.

e. Run-over hazard.

f. Stop the engine and remove the key from ignition before servicing, adjusting, lubricating, cleaning, or unplugging the machine.

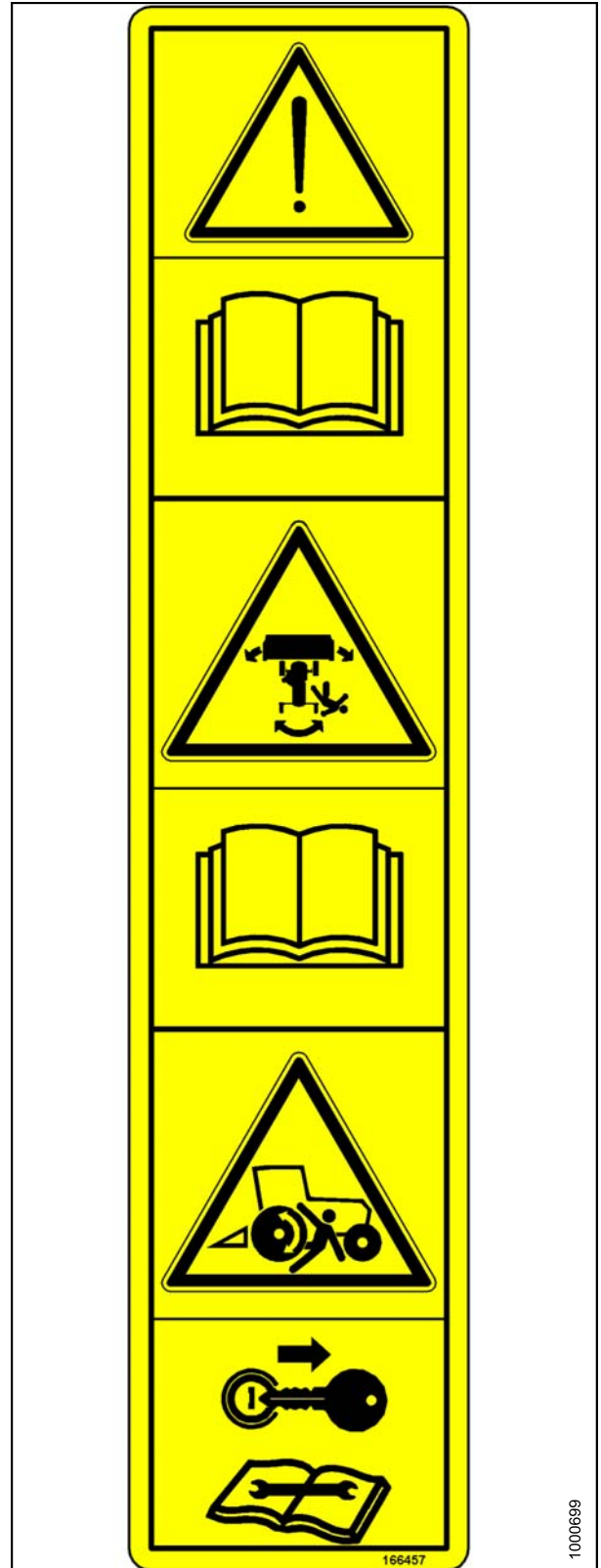


Figure 1.35: MD #166457

SAFETY

13. MD #166461

- a. Hot fluid under pressure hazard.
- b. **CAUTION**
 - Coolant is under pressure and may be hot. Never remove radiator cap when engine is hot.

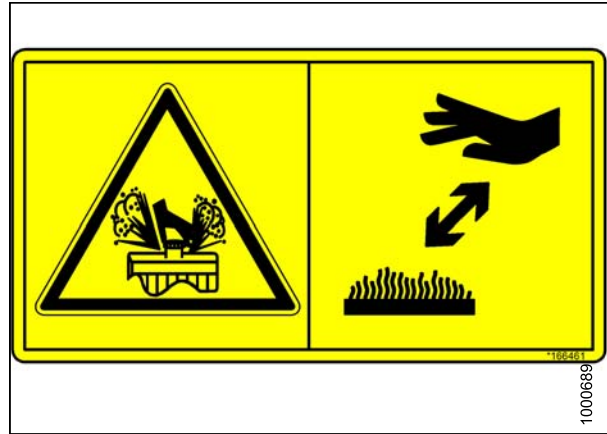


Figure 1.36: MD #166461

14. MD #166463

- a. Collision hazard in transport.
- b. **WARNING**
 - Collision between windrower and other vehicles may result in injury or death.

When driving windrower on public roadways:

- i. Obey all highway traffic regulations in your area. Use pilot vehicles front and rear of windrower if required by law.
- ii. Use slow moving vehicle emblem and flashing warning lights unless prohibited by law.
- iii. If width of attached header impedes other vehicle traffic, remove header and install MacDon approved weight box. Refer to operator's manual for safe procedure to tow header.



Figure 1.37: MD #166463

SAFETY

15. MD #166465

a. Loss of control hazard.

b. **WARNING**

To avoid serious injury or death from loss of control:

- i. Do not make abrupt changes in steering direction.
- ii. Anticipate turns by slowing down well in advance.
- iii. Do not rapidly accelerate or decelerate while turning.
- iv. Limit speed to maximum 20 mph (32 km/h) when towing a header. To ensure steering control refer to operator's manual for adding weight to drive wheels.
- v. When travelling on steep slopes:
 - 1) Reduce speed and lower header.
 - 2) Move ground speed lever to slow end of range.
 - 3) Shift high-low speed control to low range.
- vi. With header removed, steering control is reduced if weight is not added to drive wheels. If you must drive the windrower without header or MacDon weight system:
 - 1) Operate in low speed range.
 - 2) Avoid slopes.
 - 3) Do not tow a header. **IF CONTROL OF MACHINE IS LOST, IMMEDIATELY PULL GROUND SPEED LEVER TO NEUTRAL.**

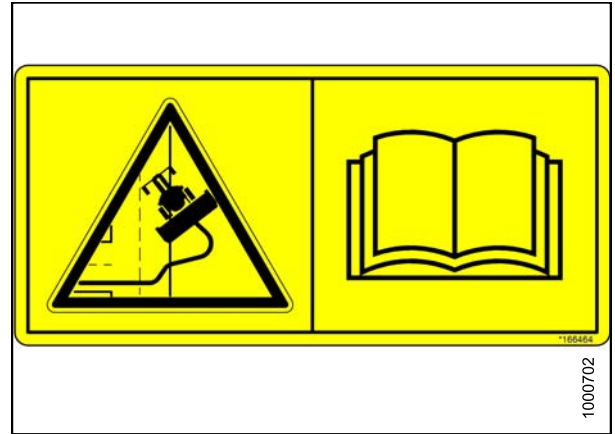


Figure 1.38: MD #166465

16. MD #166466

a. High pressure oil hazard.

b. **WARNING**

Do not go near leaks.

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



Figure 1.39: MD #166466

SAFETY

17. MD #174436

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



Figure 1.40: MD #174436

18. MD #190546

- a. Slippery surface.
- b. **WARNING**
Do not place foot.
 - Do not use this area as a step or platform.
 - Failure to comply could result in serious injury or death.



Figure 1.41: MD #190546

2 Description

2.1 Definitions

The following terms and acronyms may be used in this manual.

Term	Definition
A-Series header	MacDon auger header.
API	American Petroleum Institute.
APT	articulated power turn.
ASTM	American Society of Testing and Materials.
Bolt	A headed and externally threaded fastener that is designed to be paired with a nut.
Cab-forward	Windrower operation with the Operator and cab facing in the direction of travel.
CDM	Cab display module on a self-propelled windrower.
Center-link	A hydraulic cylinder or manually adjustable turnbuckle type link between the header and the machine to which it is attached. It is used to change header angle.
CGVW	Combined vehicle gross weight.
D-Series header	MacDon draper header.
DWA	Double Windrow Attachment.
ECM	Engine control module.
Engine-forward	Windrower operation with the Operator and engine facing in the direction of travel.
Finger tight	Finger tight is a reference position where sealing surfaces or components are making contact with each other and the fitting has been tightened to a point where the fitting is no longer loose.
F.F.F.T	Flats from finger tight.
GSL	Ground speed lever.
GVW	Gross vehicle weight.
Hard joint	A joint made with the use of a fastener where the joining materials are highly incompressible.
Header	A machine that cuts and lays crop into a windrow and is attached to a self-propelled windrower.
Hex key	A hex key or Allen key (also known by various other synonyms) is a tool of hexagonal cross-section used to drive bolts and screws that have a hexagonal socket in the head (internal-wrenching hexagon drive).
hp	Horsepower.
ISC	Intermediate Speed Control.
JIC	Joint Industrial Council: a standards body that developed the standard sizing and shape for original 37° flared fitting.
Knife	A cutting device which uses a reciprocating cutter. Also called a sickle.
n/a	Not applicable.
Nut	An internally threaded fastener that is designed to be paired with a bolt.

DESCRIPTION

Term	Definition
N-DETENT	The slot opposite the NEUTRAL position on operator's console.
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.
ORB	O-ring boss: a style of fitting commonly used in port opening 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.
PTO	Power Take-Off.
rpm	Revolutions per minute.
R-Series header	MacDon rotary disc header.
RoHS (Reduction of Hazardous Substances)	A directive by the European Union to restrict the use of certain hazardous substances (such as hexavalent chromium used in some yellow zinc platings).
SAE	Society Of Automotive Engineers.
Screw	A headed and externally threaded fastener that threads into preformed threads or forms its own thread in one of the mating parts.
Self-Propelled (SP) Windrower	Self-propelled machine consisting of a power unit with a header and/or conditioner.
Soft joint	A joint made with the use of a fastener where the joining materials are compressible or experience relaxation over a period of time.
spm	Strokes per minute.
Tractor	Agricultural type tractor.
Truck	A four-wheel highway/road vehicle weighing no less than 7500 lbs (3400 kg).
Tension	Axial load placed on a bolt or screw, usually measured in pounds (lb) or Newtons (N).
T.F.F.T.	Turns from finger tight.
Torque	The product of a force X lever arm length, usually measured in foot-pounds (ft·lbf) or Newton-meters (N·m).
Torque angle	A tightening procedure where the fitting is assembled to a precondition (finger tight) and then the nut is turned further a number of degrees or a number of flats to achieve its final position.
Torque-tension	The relationship between the assembly torque applied to a piece of hardware and the axial load it induces in the bolt or screw.
UCA	Upper cross auger.
Washer	A thin cylinder with a hole or slot located in the center and is to be used as a spacer, load distribution element, or a locking mechanism.
Windrower	Power unit of a self-propelled header.
WCM	Windrower control module.

DESCRIPTION

2.2 Specifications

ENGINE		
Type	Cummins QSB-4.5L 4 Cylinder Turbo Diesel. B20 Biodiesel Approved.	
Displacement	275 cu. in. (4.5 L)	
Power	Rated	148 hp (110 kW) @ 2300 rpm
	Peak	156 hp (116 kW) @ 2000 rpm
ELECTRICAL SYSTEM		
Recommended Battery (2)	12 Volt, Maximum Dimension: 13.25 x 7.37 x 9.44 in (334 x 188 x 232 mm). 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	130 amp	
Egress Lighting	Standard	
Starter	Wet Type	
Working Lights	11	
TRACTION DRIVE		
Type	Hydrostatic, 3 Speed Electric Shift	
Speed	Field (Cab-Forward)	Low Range: 0–11 mph (18 km/h), Mid Range: 0–16 mph (26 km/h)
	Reverse (Cab-Forward)	6 mph (9.6 km/h)
	Transport (Engine-Forward)	High Range: 0–23 mph (37 km/h)
Transmission	Type	2 Piston Pumps: 1 per Drive Wheel.
	Displacement	2.65 cu. in. (44 cc)
	Flow	40 US gpm (167 L/min)
	Pressure	5500 psi (379 bar)
Final Drive	Type	Planetary Gearbox
	Ratio	30.06 : 1
Wheel Motor Displacement	Low Range	4.15 cu. in. (68 cc)
	Mid Range	3.01 cu. in. (50 cc)
	High Range	1.93 cu. in. (32 cc)
SYSTEM CAPACITIES		
Fuel Tank	97 US Gallons (367 L)	
Hydraulic Reservoir	17.2 US Gallons (65 L)	
HEADER DRIVE (Refer to Table 2.1 M155 Hydraulic Pumps, page 31).		

DESCRIPTION

HEADER LIFT/TILT		
	Type	Hydraulic Double Acting Cylinders. Tilt - Optional Hydraulic Positioning, Optional Hydraulic Center-Link
	Function	Lift / Tilt / Float
HEADER FLOAT		
	Primary Adjustment	Manual, External, Drawbolt With Springs (1 per side). One Inner Booster Spring On Left Side.
	Fine Adjustment	Hydraulic, In-Cab Switch
	Automatic	Hydraulic, 3 Programmable Settings For All Headers (Deck Shift Compensation On Draper Headers)
CAB		
Type		Spring/Shock Suspension
Dimensions	Width	63 in. (1600 mm)
	Depth	68.3 in. (1735 mm) (at top of window)
	Height	64.6 in. (1640 mm)
	Volume	125 cu. ft. (3540 L)
Seat	Driver	Adjustable Air-Ride Suspension, Seat Belt
	Training	Folding, Cab Mounted, Seat Belt
Windshield Wiper	Front	31.5 in. (800 mm) Blade
	Rear	22 in. (560 mm) Blade
Heater		24,000 Btu/h (7038 W)
Air Conditioning		28,280 Btu/h (8288 W)
Electrical Outlets		One Live, Two On Ignition, One Live/Keyed
Mirrors		One Inside (Transport), Two Outside (Field)
Radio		Two Speakers and Antenna Factory Installed. Radio 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
TIRE OPTIONS (Refer to 2.2 Drive Tires, page 33 for options.)		
FRAME AND STRUCTURE		
Dimensions		Refer to 2.3 Windrower Dimensions, page 32
Frame to Ground (Crop Clearance)		45.7 in. (1160 mm)
Weight	Base	9610 lbs (4360 kg) ¹
	Maximum GVW	21,500 lbs (9750 kg) ¹
	Maximum CGVW	23,100 lbs (10,480 kg) ¹

1. Weights do not include options.

DESCRIPTION

HEADER COMPATIBILITY		
Auger Headers	A30-D, A40-D	All Sizes
Draper Headers	D50, D60, and D65 ²	Up to 35 FT.
Draper Headers	D60 and D65 40 FT ²	40 FT.
Rotary Disc	R80 and R85	13 FT. Only ³

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

Table 2.1 M155 Hydraulic Pumps

Pump Type	Specifications	Controller Type	Function
Pump A - Load Sense Pressure Compensated Piston Pump	Variable Displacement: 0–2.75 cu. in. (45 cc) Flow = 0-27 gpm (102 L/min) at 4000 psi (27.56 MPa)	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: 0–2.32 cu. in. (38 cc) Flow = 0-24 gpm (84 L/min) at 3200 psi (22.05 MPa)	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: 0.84 cu. in. (13.8 cc) Flow at Full Throttle 11.5 gpm. (44 L/min) at 2500 psi (17.23 MPa)	Engine rpm	Supercharge flow and pressure for traction drive, brake release, Neutral lock, and DWA draper drive (if installed).
Pump D- Gear Pump	Displacement: 0.84 cu. in. (13.8 cc) Flow at Full Throttle 11.5 gpm. (44 L/min) at 2500 psi (17.23 MPa)	Engine rpm	Supercharge flow and pressure for traction drive, brake release, and Neutral lock.

2. Depending on header options

3. Only 18.4 x 26 tires are compatible with the 13 FT R80 and R85

DESCRIPTION

2.3 Windrower Dimensions

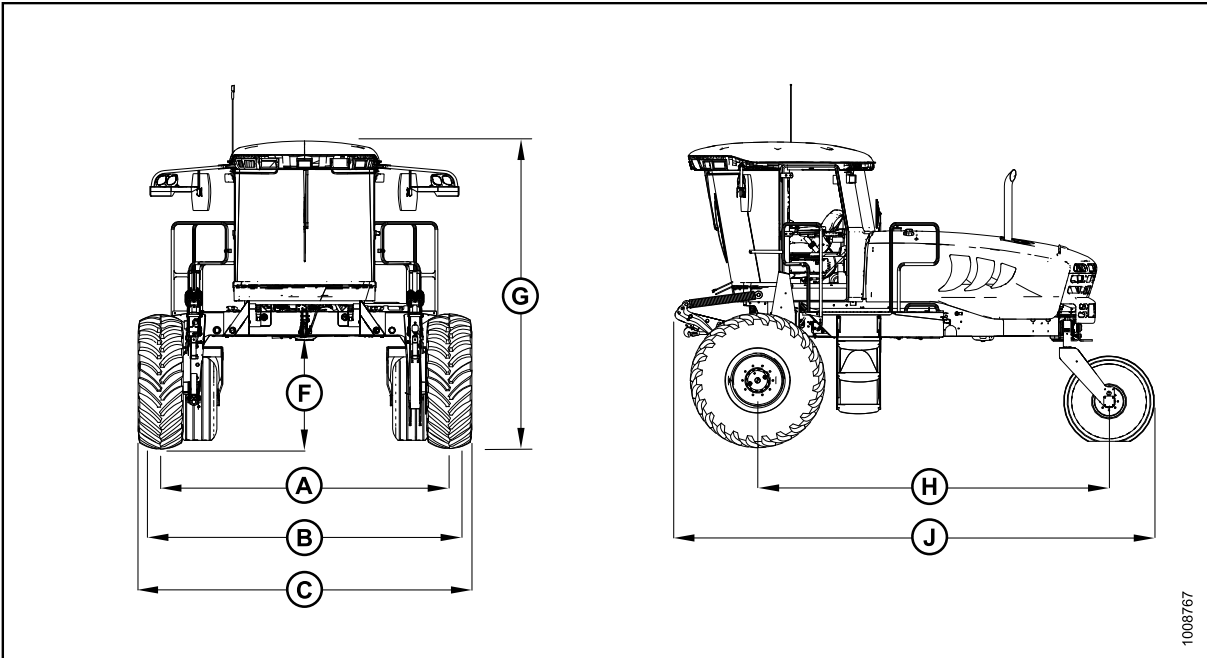


Figure 2.1: Windrower Dimensions – Forward

A - Drive Tire Tread ([2.2 Drive Tires, page 33](#))

B - Drive Tire Hubs ([2.2 Drive Tires, page 33](#))

C - Drive Tires ([2.2 Drive Tires, page 33](#))

F - 45-3/4 in. (1160 mm)

G - 133 in. (3378 mm)

H - 158-5/16 in. (4022 mm)

J - 207-7/8 in. (5280 mm)

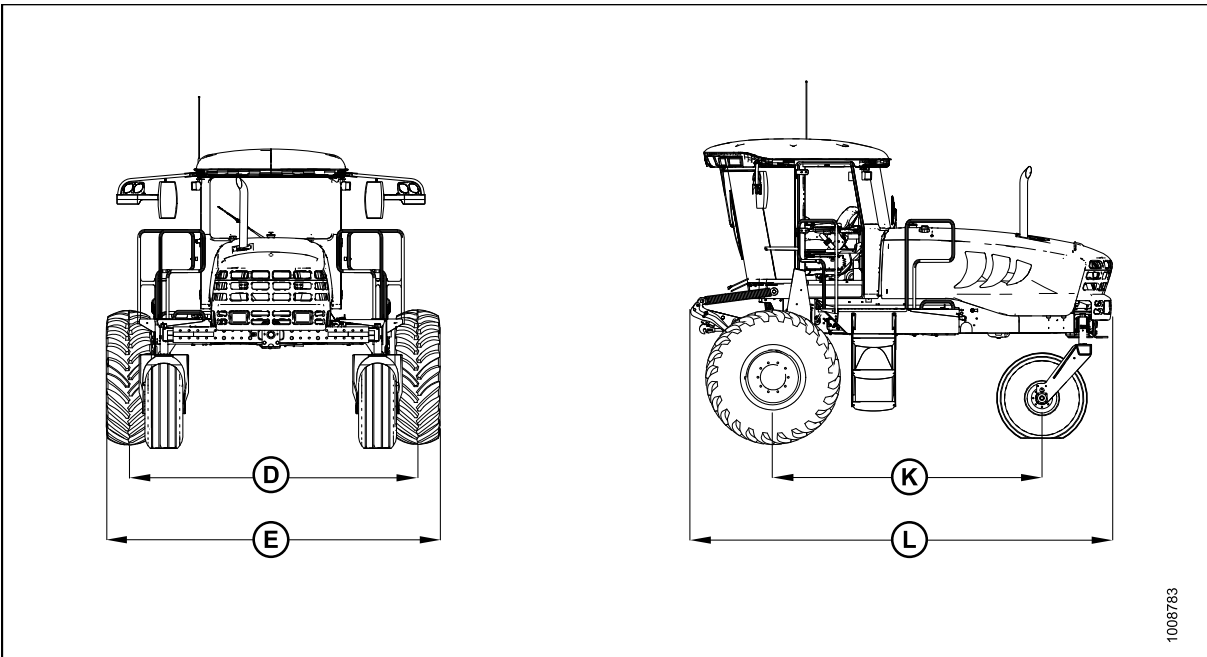


Figure 2.2: Windrower Dimensions – Reverse

D - Caster Tire Tread ([2.3 Caster Tires, page 33](#))

E - Caster Tire Casters ([2.3 Caster Tires, page 33](#))

K - 120-9/16 in. (3064 mm)

L - 186-7/8 in. (4747 mm)

DESCRIPTION

Table 2.2 Drive Tires

Tire Size	Wheel Position	Tread (A) in. (mm)	Hubs (B) in. (mm)	Tires (C) in. (mm)
18.4 x 26 Bar & Turf Narrow Track ⁴	Inner/Outer (Shipping)	123-3/4 (3144)	140-9/16 (3571)	143-7/16 (3644)
	Outer/Outer	130-7/8 (3324)	147-11/16 (3751)	150-5/8 (3824)
	Inner/Inner	116-11/16 (2964)	133-1/2 (3391)	136-3/8 (3464)
18.4 x 26 Bar and Turf Wide Track ⁴	Inner/Outer (Shipping)	130-11/16 (3319)	140-9/16 (3571)	150-3/8 (3819)
	Outer/Outer	137-3/4 (3499)	147-11/16 (3751)	157-7/16 (3999)
	Inner/Inner	123-9/16 (3139)	133-1/2 (3391)	143-1/4 (3639)
600/65R28 Radial Tire	Inner/Outer (Shipping)	123-9/16 (3139)	140-9/16 (3571)	147-15/16 (3758)
	Outer/Outer	130-11/16 (3319)	147-11/16 (3751)	155-1/16 (3938)
	Inner/Inner	116-1/2 (2959)	133-1/2 (3391)	140-7/8 (3578)
23.1-26 and 580/70R26 Turf Tires	Inner/Outer (Shipping)	126-1/8 (3203)	140-9/16 (3571)	149-5/16 (3793)
	Outer/Outer	133-3/16 (3383)	147-11/16 (3751)	156-7/16 (3973)
	Inner/Inner	119 (3023)	133-1/2 (3391)	142-1/4 (3613)

Table 2.3 Caster Tires

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

4. Only 18.4 x 26 tires are compatible with the 13-foot R80 and R85.

DESCRIPTION

2.4 Component Location

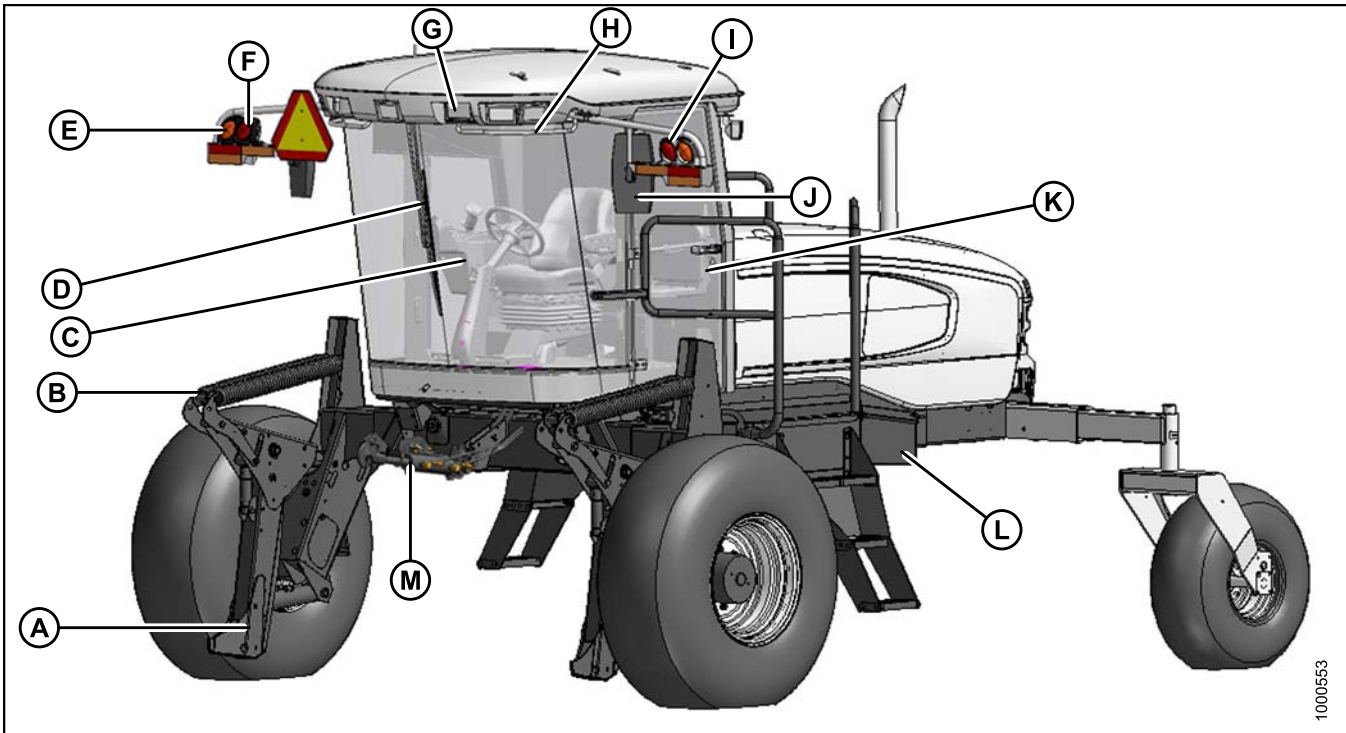


Figure 2.3: Front Cab-Forward View

A - Header Lift Leg
D - Windshield Wiper
G - Field/Road Lights
J - Mirror
M - Center-Link

B - Header Float Springs
E - Turn Signal / Hazard Lights
H - Handholds
K - Door

C - Operator's Station
F - Tail Light Engine-Forward
I - Tail Light Engine-Forward
L - Maintenance Platform

DESCRIPTION

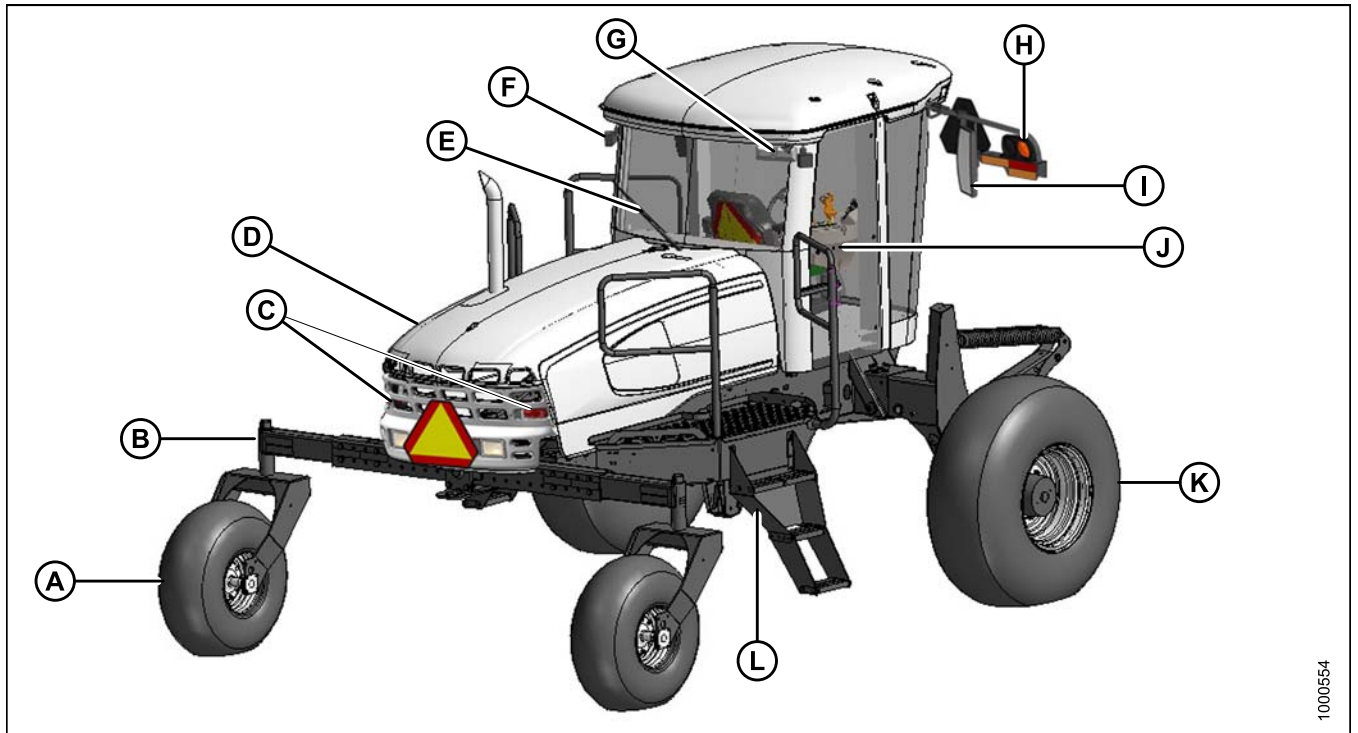


Figure 2.4: Rear Cab-Forward View

A - Caster Wheel
D - Engine Compartment Hood
G - Horn
J - Door

B - Walking Beam
E - Windshield Wiper
H - Turn Signal/Hazard Lights
K - Drive Wheel

C - Tail Lights - Cab-Forward (Option)
F - Field/Road Lights
I - Mirror
L - Maintenance Platform

1000554

3 Operator's Station

The operator's station is designed for operating the windrower in a cab-forward mode (working mode), or in an engine-forward mode (transport mode). The operator's station, which includes the seat, console, and steering column, pivots 180 degrees so that the Operator maintains access to the windrower controls and gauges regardless of the direction of travel.

3.1 Operator Console

The console contains controls to operate the windrower, as well as amenities for the Operator. The console position is adjustable to suit each particular Operator.

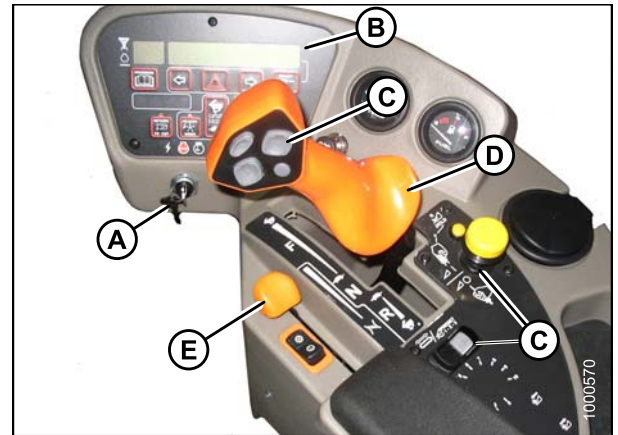


Figure 3.1: Operator Console

1. Adjusting fore-aft and height:
 - a. Pull lever (A) and slide console fore or aft to the desired position.
 - b. Release lever to lock console.

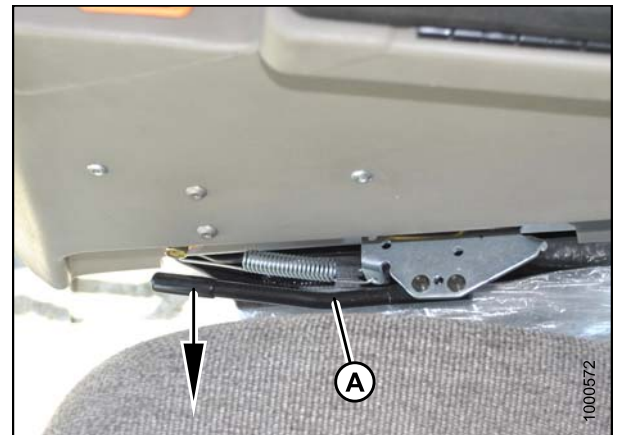


Figure 3.2: Seat Fore-Aft

OPERATOR'S STATION

2. Adjusting only fore-aft:
 - a. Loosen nuts (A) under console.
 - b. Move console as required.
 - c. Tighten nuts (A).

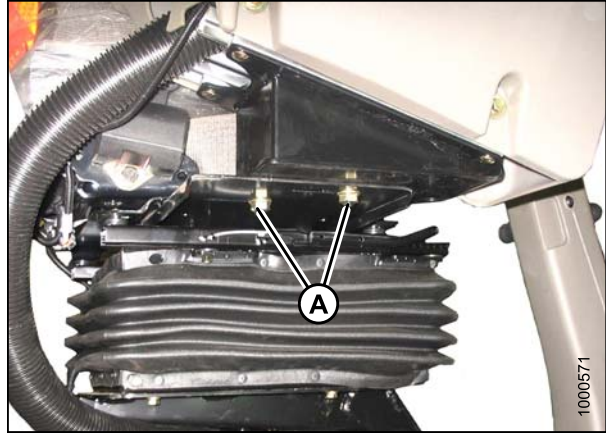


Figure 3.3: Seat Fore-Aft

3.2 Operator Presence System

The Operator Presence System is a safety feature designed to deactivate or alarm selected systems when the Operator is not seated at the operator's station.

These systems include:

- Header Drive
- Engine and Transmission

3.2.1 Header Drive

- Requires the Operator to be seated in the seat in order to engage the header drive.
- Power is maintained to the header drive for five seconds after the Operator leaves the seat, and then the header shuts down.
- After the header has shut down automatically, the HEADER DRIVE switch must be moved to OFF position and back to the ON position again to restart the header.

3.2.2 Engine and Transmission

- The engine will not start when the HEADER DRIVE switch is engaged.
- The engine will shut down when the windrower is moving at 5 mph (8 km/h) or less and the Operator leaves the seat. The CDM will flash "NO OPERATOR" on the upper line and "ENGINE SHUT DOWN 5...4...3...2...1...0" on the lower line accompanied by a steady tone. At "0", the engine shuts down.
- If the Operator leaves the seat and the transmission is not locked in NEUTRAL, after five seconds the lower display will flash "NOT IN NEUTRAL" and an alarm will sound.
- When the seat is in between cab-forward and engine-forward positions, the engine will shut off if the transmission is not locked in the NEUTRAL position. The lower display will flash "LOCK SEAT BASE" until the seat base is locked into position.

OPERATOR'S STATION

3.3 Operator's Seat Adjustments

The operator's seat has several adjustments. Refer to the following for the location and description of each adjustment.

3.3.1 Fore-Aft

Adjusts fore-aft position.

1. Pull lever (A) up to release.
2. Move seat forward or rearward.
3. Release lever (A).



Figure 3.4: Fore-Aft Position

3.3.2 Seat Suspension and Height

Controls suspension stiffness and seat height.

INCREASE: Press upper switch (A).

DECREASE: Press lower switch (B).



Figure 3.5: Seat Suspension and Height

OPERATOR'S STATION

3.3.3 Vertical Dampener

Adjusts suspension dampening.

INCREASE: Turn knob (A) counterclockwise.

DECREASE: Turn knob (A) clockwise.

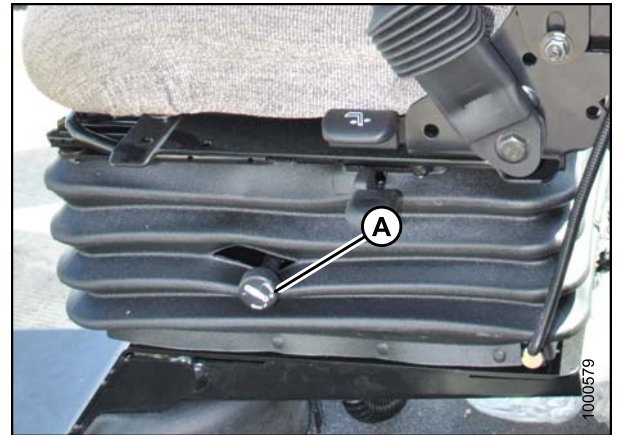


Figure 3.6: Vertical Dampener

3.3.4 Armrest

Raise armrest (A) for easier access to seat.

Lower armrest (A) after seat belt is buckled.



Figure 3.7: Armrest

OPERATOR'S STATION

3.3.5 Fore-Aft Isolator Lock

Locks seat fore-aft isolator.

LOCK: Push lever (A) down.

UNLOCK: Pull lever (A) up.



Figure 3.8: Fore-Aft Isolator Lock

3.3.6 Seat Tilt

To adjust seat tilt:

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



Figure 3.9: Seat Tilt

OPERATOR'S STATION

3.3.7 Armrest Angle

Adjusts angle of armrest.

INCREASE: Rotate knob (A) clockwise.

DECREASE: Rotate knob (A) counterclockwise.

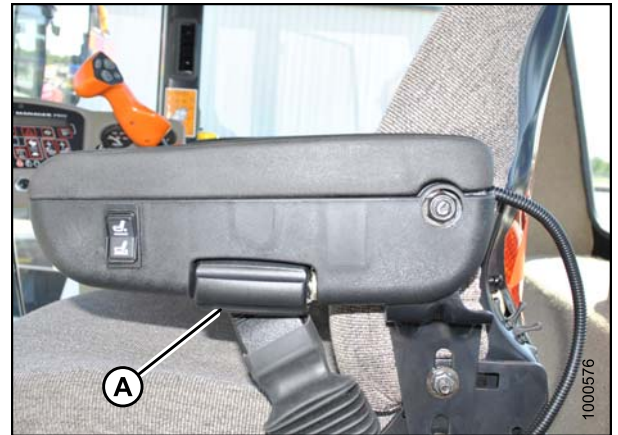


Figure 3.10: Armrest Angle

3.3.8 Lumbar Support

Adjusts stiffness of seat back.

INCREASE: Rotate knob (C) upward.

DECREASE: Rotate knob (C) downward.



Figure 3.11: Lumbar Support

OPERATOR'S STATION

3.4 Training Seat

A wall mounted fold-up training seat complete with seat belt is provided.

WARNING

- The training seat is provided for an experienced Operator of the machine when a new Operator is being trained.
- The training seat is **NOT** intended as a **PASSENGER SEAT** or **FOR USE BY CHILDREN**. **USE THE SEAT BELT** whenever operating the machine or riding as a Trainer.
- **KEEP ALL OTHER RIDERS OFF THE MACHINE.**

For storage, lift seat (B) and secure with latch (A).

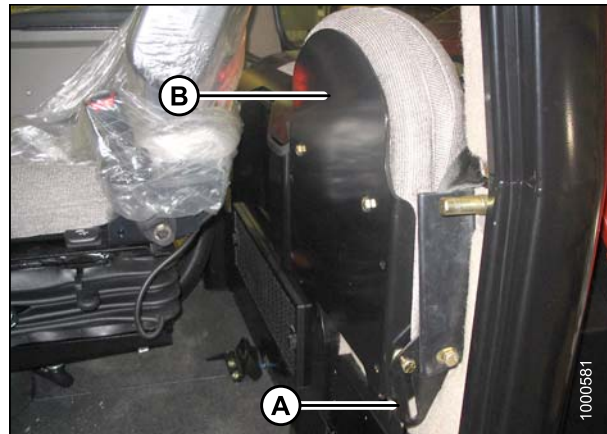


Figure 3.12: Training Seat

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



Figure 3.13: Training Seat

OPERATOR'S STATION

3.5 Seat Belts

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

WARNING

- Before starting engine, securely fasten your seat belt and ensure trainer's seat belt is fastened if occupied.
- The seat belt can help ensure your safety if it is used and maintained.
- Never wear a seat belt loosely or with slack in the belt system. Never wear the belt in a twisted condition or pinched between the seat structural members.

To fasten seat belt (A):

1. Pull belt at right side completely across your body.
2. Push the metal eye (B) into the buckle (C) until it locks.
3. Adjust the position of the belt as low on your body as possible.

To release seat belt (A):

4. Push the red button (D) in the end of the buckle.
5. Separate the buckle (C) and metal eye (B).

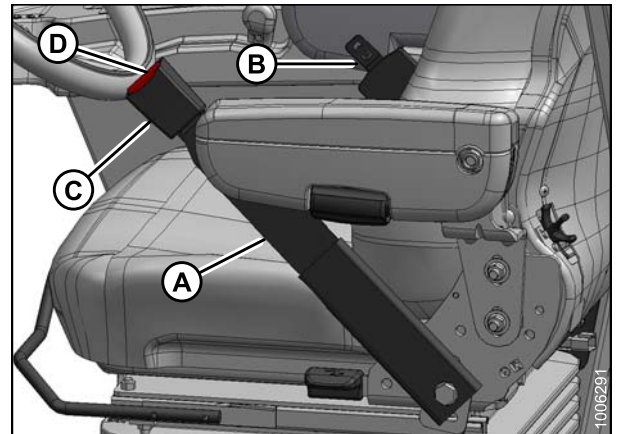


Figure 3.14: Seat Belt

A - Seat Belt B - Metal Eye C - Buckle D - Red Button

OPERATOR'S STATION

3.6 Steering Column Adjustment

The steering column can be adjusted to suit each particular Operator and for easier entry to and exit from the seat.

To adjust the steering column:

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

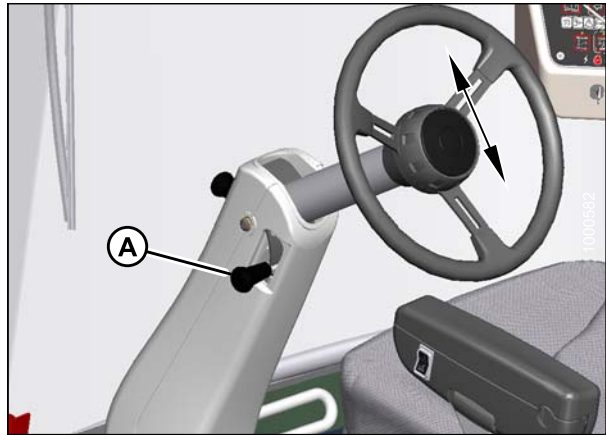


Figure 3.15: Adjust Steering Column

OPERATOR'S STATION

3.7 Lighting

The field and road light switches are located on a panel in the cab headliner.

The lighting is dependent upon the position of the operator's station, that is, cab-forward mode or engine-forward mode. The position of the operator's station automatically determines the lighting.

The hazard lights will be automatically activated when certain conditions are met. The windrower must be cab-forward, medium range, brake off, and header off.

The work lights will not turn on in certain instances. If the windrower is engine-forward or if the windrower is cab-forward, out of park, medium range, and header off.

IMPORTANT:

Red and amber reflector tape is applied to be visible in both engine-forward and cab-forward modes.

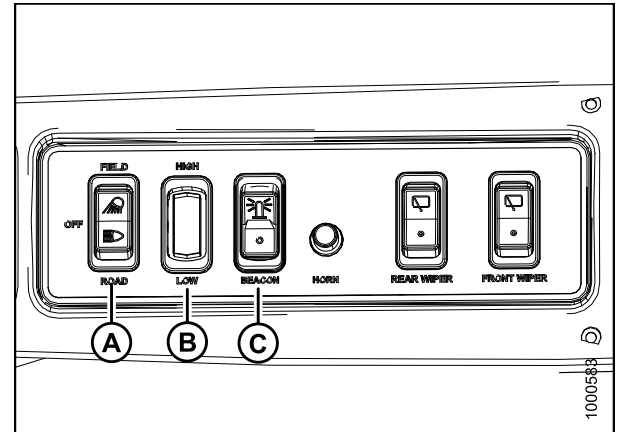


Figure 3.16: Roof Liner Console

A - Field or Road Lights
C - Beacon (If Equipped)

B - Low or High Beams

3.7.1 Cab-Forward Lighting: Field

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

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

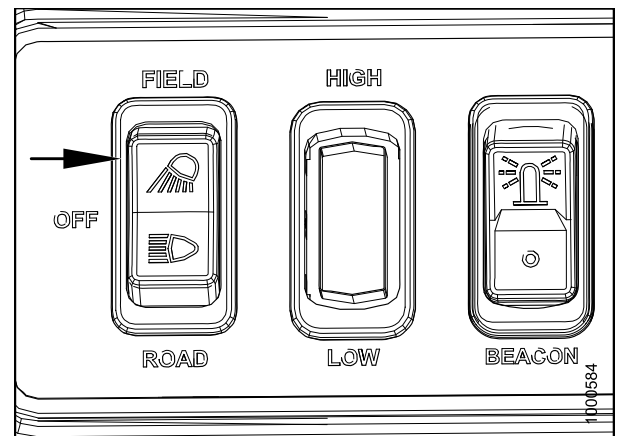


Figure 3.17: Field Light Switch

OPERATOR'S STATION

The two innermost in the field light group (A) at the front of the cab are adjustable. Refer to [Adjusting Field Lights](#), page 339.

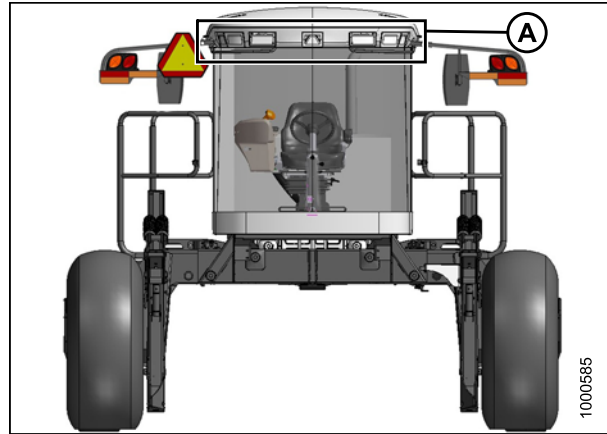


Figure 3.18: Cab-Forward: Front View

The two field lights (A) at the rear of the cab are adjustable. Refer to [Adjusting Rear Flood Lights](#), page 345.

The two swath lights (B) in the hood are adjustable but because they are used as road lights in engine-forward mode and adjusted accordingly, they should **NOT** adjusted for field operation.

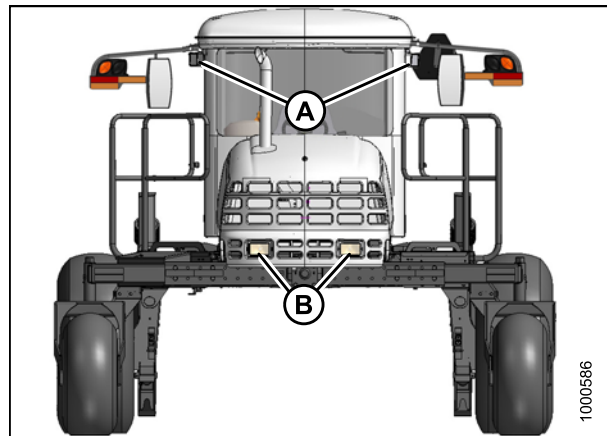


Figure 3.19: Cab-Forward: Rear View

OPERATOR'S STATION

3.7.2 Engine-Forward Lighting: Road

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

- Red tail lights (A) on the mirror supports
- Amber turn signals and hazard lights (B) on mirror supports visible from both front and rear

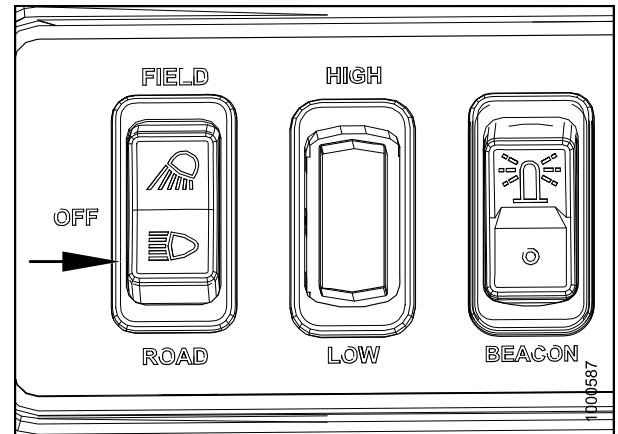


Figure 3.20: Road Light Switch

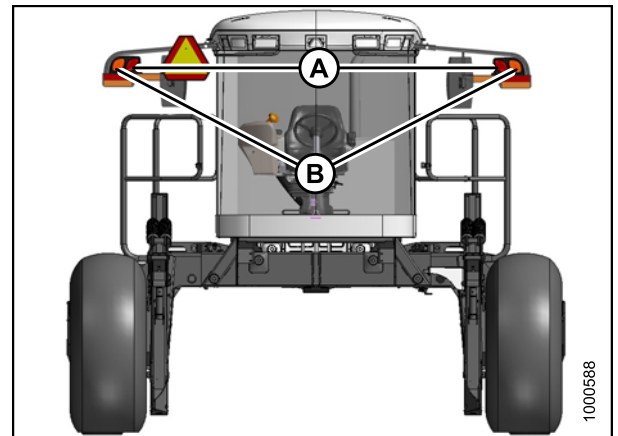


Figure 3.21: Engine-Forward: Rear View

- A - Red Tail Lights
- B - Amber Turn Signal / Hazard Lights

- Headlights (B) in hood with low/high.

The two headlights in the hood are adjustable. Refer to [Aligning Headlights, page 335](#).

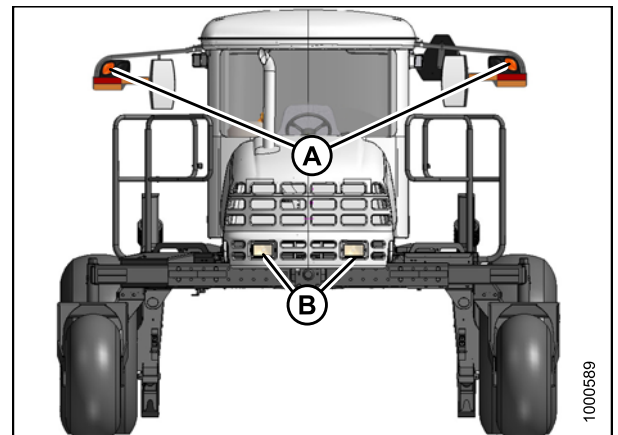


Figure 3.22: Engine-Forward: Front View

- A - Amber Turn Signal / Hazard Lights
- B - Road Lights – Low / High

OPERATOR'S STATION

3.7.3 Cab-Forward Lighting: Road (Optional)

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

- Four lights (A) in cab roof
- Amber turn signals and hazard lights (B) on mirror supports visible from both front and rear
- red lights (C) in hood

The hazard lights will be automatically activated when certain conditions are met. The windrower must be cab-forward, medium range, brake OFF, and header OFF.

IMPORTANT:

Optional red tail lighting and marking kit must be installed so that road travel in the cab-forward mode complies with road travel regulations. See your MacDon Dealer.

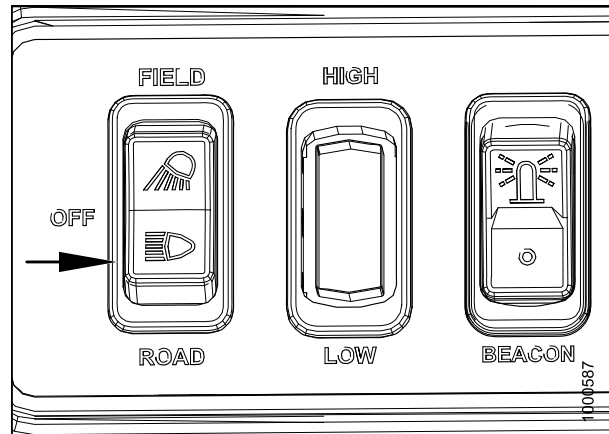


Figure 3.23: Road Light Switch

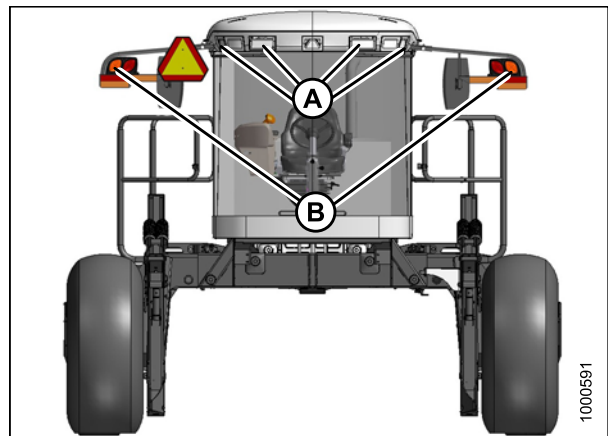


Figure 3.24: Cab Forward: Front View

OPERATOR'S STATION

3.7.4 Beacon Lighting: Export (N.A. Optional)

MD #B5582

The beacon lights (A) are functional when the ignition and the beacon switch are ON.

The beacons **MUST** be used when driving on the road where required by law.

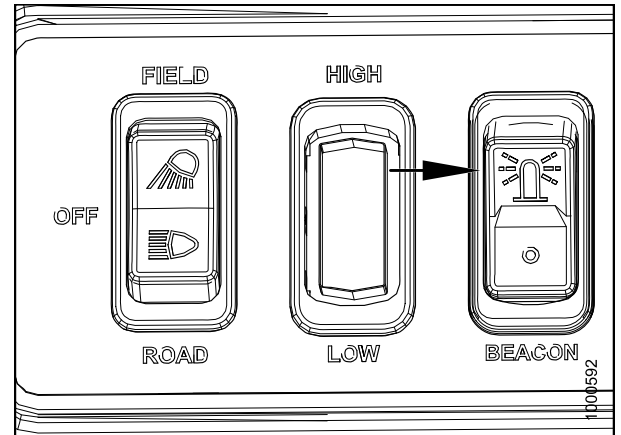


Figure 3.25: Beacon Light Switch

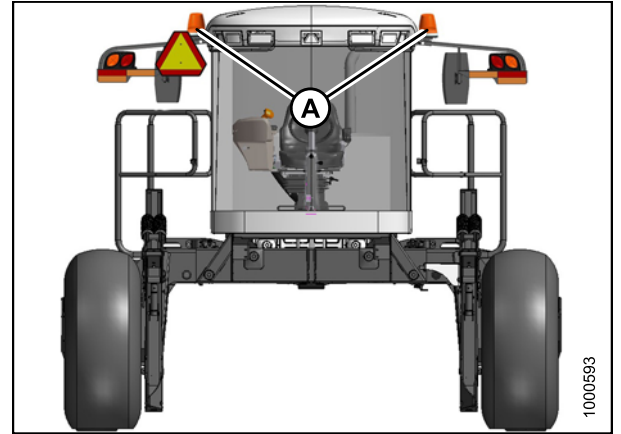


Figure 3.26: Cab-Forward: Front View

3.7.5 Optional HID Auxiliary Lighting (if installed)

Two optional High Intensity Discharge (HID) lights (MD #B5596) provide additional lighting during field operation.

They operate only in cab-forward mode, and if installed, are located on the mirror supports (A).

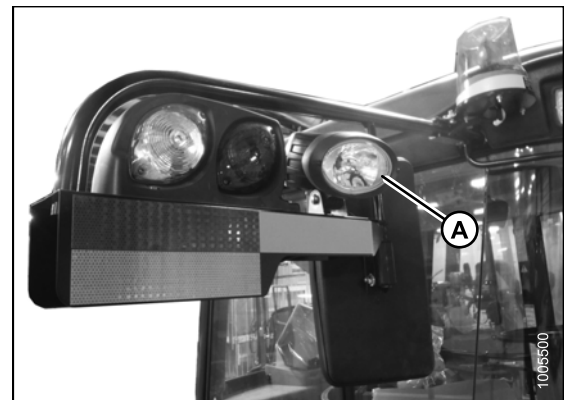


Figure 3.27: HID Auxiliary Lights (Optional)

OPERATOR'S STATION

If installed, they are located on the mirror supports, and are activated with the light switch in the FIELD position.

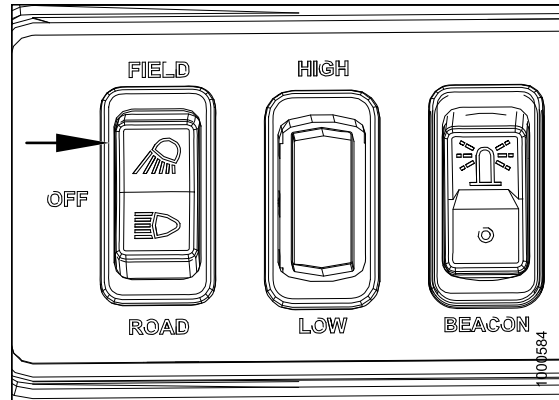


Figure 3.28: Field Light Switch

OPERATOR'S STATION

3.8 Windshield Wipers

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

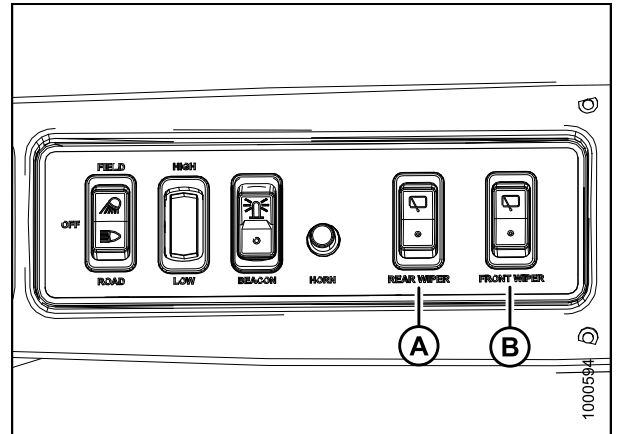


Figure 3.29: Wiper Controls

A - Rear Wiper

B - Front Wiper

OPERATOR'S STATION

3.9 Rear View Mirrors

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

A single interior mounted mirror (B) provides rear view vision in the engine-forward mode.

The mirror/light assembly (A) is designed to fold backwards if accidentally struck either during normal operation or by another machine. A detent-type lock keeps it in place.

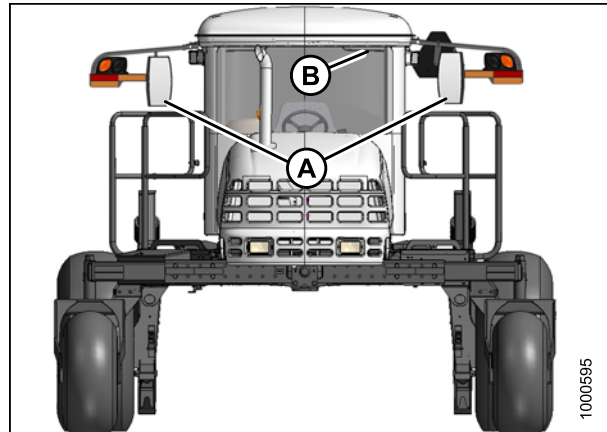


Figure 3.30: Mirrors

OPERATOR'S STATION

3.10 Cab Temperature

The cab environment is controlled by a climate control system that provides clean air-conditioned or heated air for the Operator.

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

3.10.1 Heater Shut-Off

A shut-off valve (A) at the engine allows the cab heater to be isolated from the engine coolant.

The valve must be OPEN to provide heat to the cab, but for maximum cooling, the valve can be CLOSED.

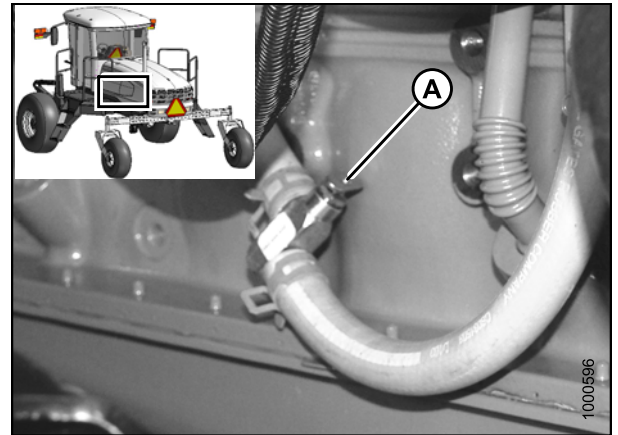


Figure 3.31: Heater Shut-Off Valve

3.10.2 Air Distribution

Cab air distribution is controlled through adjustable air vents (A) located in the cab posts. The vents provide window and Operator ventilation.

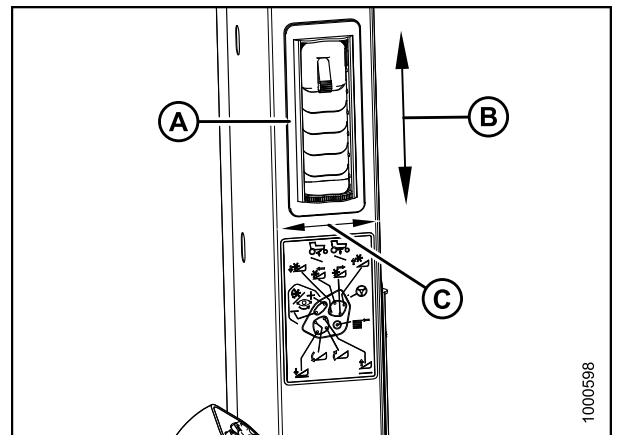


Figure 3.32: Adjustable Air Vents

A - Vent

B - Open/Close

C - Direction

OPERATOR'S STATION

3.10.3 Controls

A – Blower Switch controls the blower speed.

- OFF / LOW / MEDIUM / HIGH

B – Air Conditioning Switch controls A/C system.

- OFF: A/C does not operate.
- ON: A/C operates with blower switch ON.

C – Outside Air Switch controls the air source.

- Fresh Air: Starts booster fan and filtered outside air is drawn into cab.
- Recirculate: Stops booster fan and cab air is recirculated.

D – Temperature Control Dial controls cab temperature.

- Clockwise: Increases temperature.
- Counterclockwise: Decreases temperature.

IMPORTANT:

To distribute the refrigerant oil throughout the A/C system, perform the following steps when starting the windrower after more than one week of storage:

1. Ensure heater shut-off valve at engine is OPEN. Refer to [3.10.1 Heater Shut-Off, page 55](#).
2. Turn blower switch to the first position, turn temperature control switch to MAXIMUM heating, and A/C control to OFF.
3. Start engine and operate at low idle until engine is warm.
4. Click A/C switch from OFF to ON for 1 second, then back to OFF for 5 to 10 seconds. Repeat this step ten times.

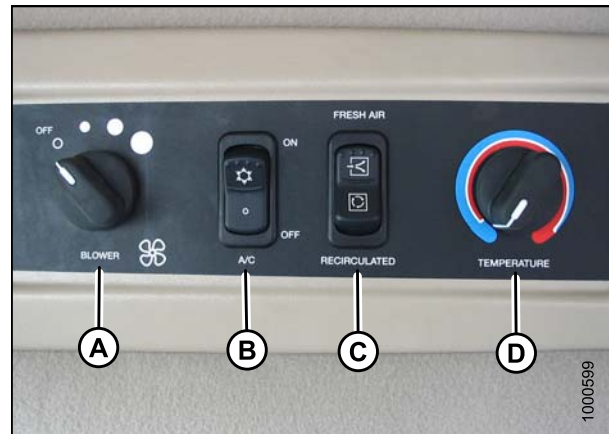


Figure 3.33: Climate Controls

A - Blower Switch

B - Air Conditioning Switch

C - Outside Air Switch

D - Temperature Control Switch

OPERATOR'S STATION

3.11 Interior Lights

Two interior lights are installed in the cab headliner.

A low intensity LED light (A) is located directly overhead to provide ambient lighting if desired. It functions only when the key is in the run position. An ON-OFF switch is located on the light.

The other interior light (B) is located on the headliner switch panel and the push-ON, push-OFF button is located on the light. It functions at any time.

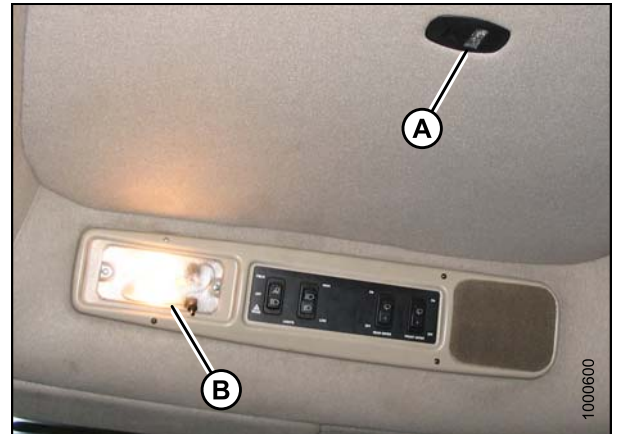


Figure 3.34: Interior Lights

OPERATOR'S STATION

3.12 Operator Amenities

Console

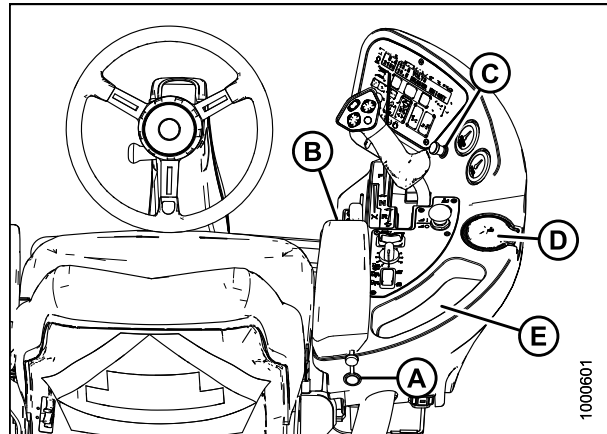


Figure 3.35: Console

- A - Auxiliary Power Outlet
- B - Utility Tray under Arm Rest
- C - Cigarette Lighter
- D - Ashtray / Cup Holder
- E - Utility Tray

Window Shades (optional)

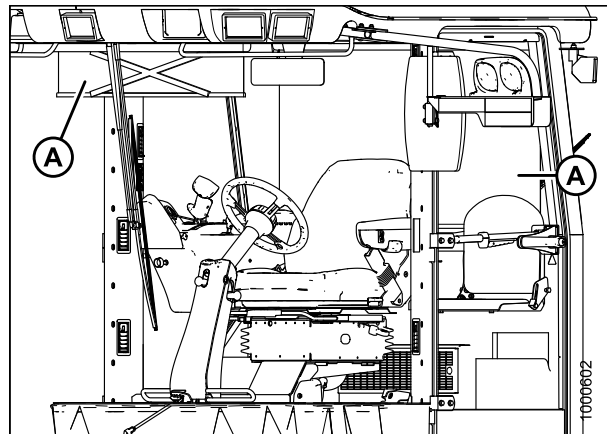


Figure 3.36: Window Shades (Optional)

- A - Window Shades (Optional)

OPERATOR'S STATION

Auxiliary Outlets

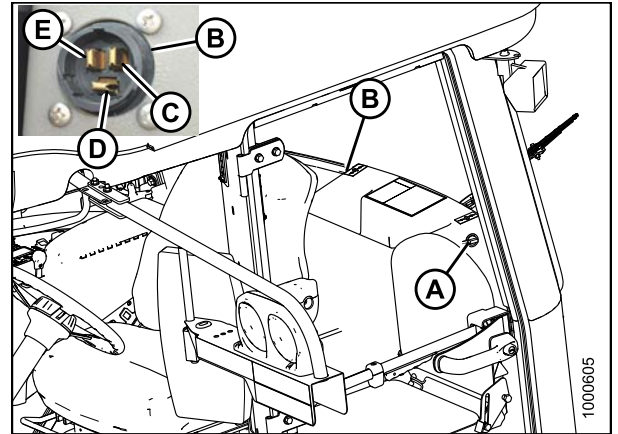


Figure 3.37: Auxiliary Power Outlets

- A - Auxiliary Power Outlet
- B - Auxiliary Power Outlet
- C - Battery Terminal
- D - Ground Terminal
- E - Switched Terminal

Manual Storage

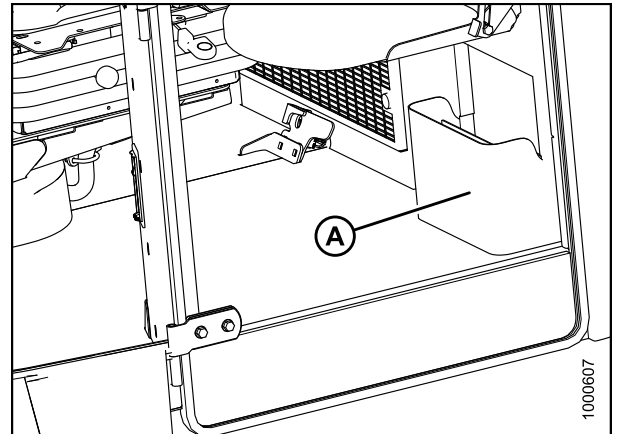


Figure 3.38: Operator's Manual Storage

- A - Manual Storage

Coat Hook

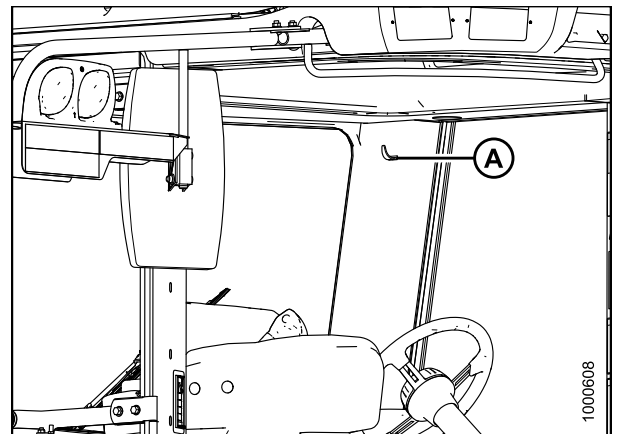


Figure 3.39: Coat Hook

- A - Coat Hook (A)

OPERATOR'S STATION

3.13 Radio

A radio is available as optional equipment from your Dealer.

3.13.1 AM/FM Radio

A space (B) is provided in the cab headliner to accommodate the installation of an AM/FM radio that is available as optional equipment from your Dealer.

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

For radio installation procedures, refer to MD #169885 M155 and M205 Self-Propelled Windrower Unloading and Assembly Instructions for North American Shipments or MD #169886 M-Series Self-Propelled Windrower Unloading and Assembly Instructions for Container Shipments.

Operating instructions are supplied with the radio.

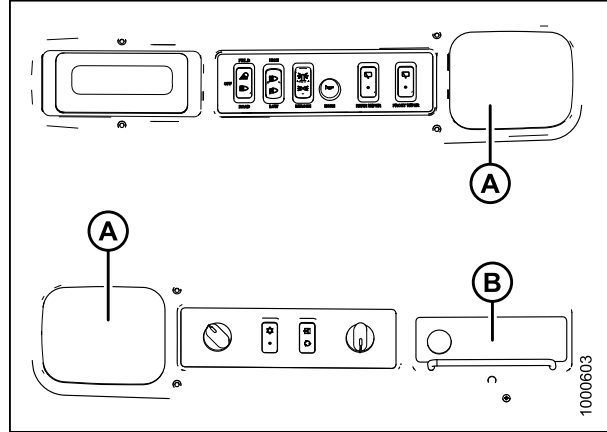


Figure 3.40: Speakers in Roof Liner

A - Speakers

B - Radio Mounting Location

3.13.2 Antenna Mounting

A roof-mounted antenna base for installing a magnetic antenna is available as an option from your Dealer.

Order antenna mount MD #160288 (B) or see illustration for part dimensions for an improvise version. A knockout (C) for the antenna lead is provided on the cab post.

IMPORTANT:

Antenna base can only be installed on the left- and right-hand rear cab roof bolts.

1. Remove existing bolt (A).
2. Install antenna mount (B) and secure with bolt (A).

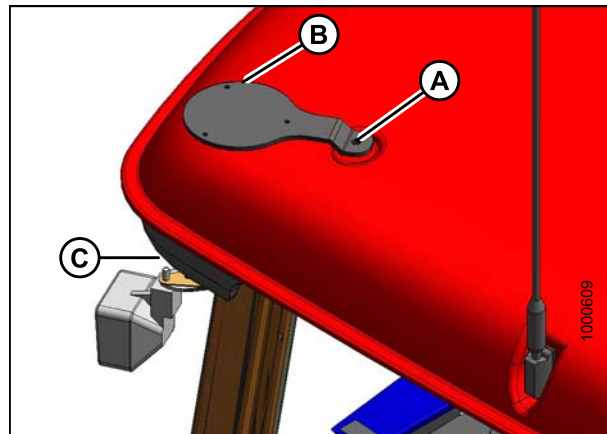


Figure 3.41: Antenna Mount

OPERATOR'S STATION

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

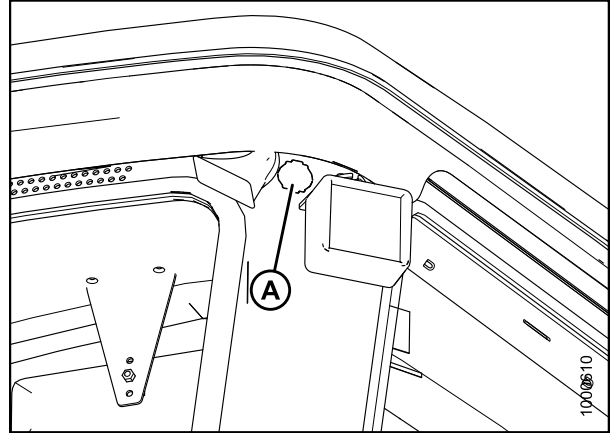


Figure 3.42: Knockout Location in Cab

To make your own mount, see template for mount.
Use 11 GA. or 3.0 mm steel sheet.

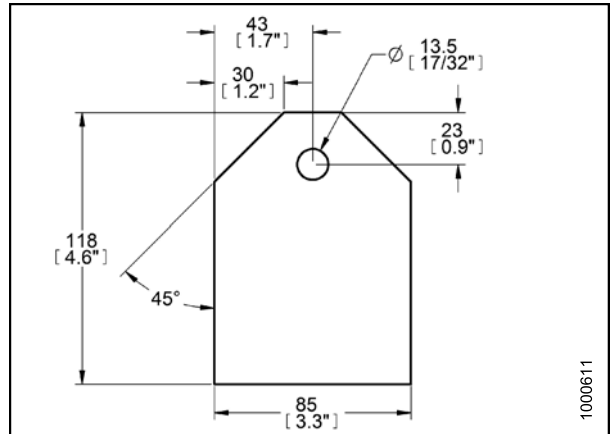


Figure 3.43: Template for Antenna Mount

OPERATOR'S STATION

3.14 Horn

The horn is activated by pushing the button (A) located on the panel in the headliner.

Sound the horn three times prior to starting the engine.

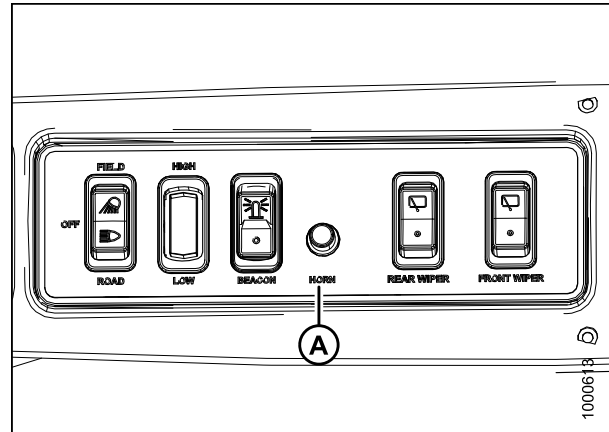


Figure 3.44: Horn Button Location

The horn (A) is located outside the cab on the rear right-hand corner of the cab, under the roof.

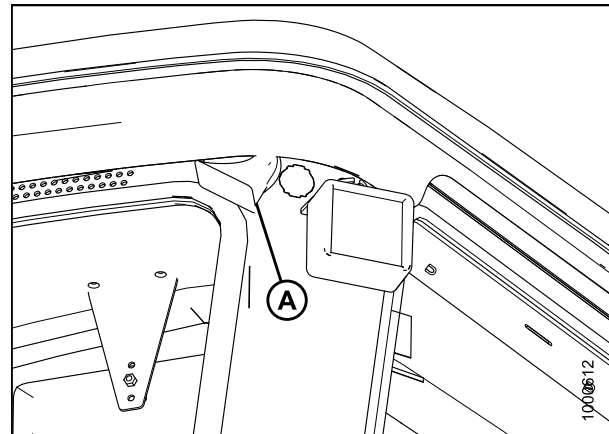


Figure 3.45: Horn Location

OPERATOR'S STATION

3.15 Engine Controls and Gauges

All engine controls and gauges are conveniently located on the operator's console.

Refer to the illustration for the location and the following for a description of each.

A – Ignition Switch

- ACC: Fully counterclockwise
- OFF: All electrical systems OFF
- RUN: Clockwise
- START: Fully clockwise to crank engine. Release and switch returns to RUN
- REMOVE KEY WHEN WINDROWER NOT IN USE. KEY ALSO LOCKS DOORS

B – Engine Temperature Gauge indicates engine coolant temperature.

- Normal Running: 180°–225°F (82°–107°C)
- Warning Tone Over 230°F (110°C)

C – Fuel Gauge indicates fuel level in tank.

- E: Empty
- F: Full

D – Throttle controls engine speed.

- FULL: Push lever forward
- OPERATING: Refer to [4.3.6 Windrower Operation, page 111](#)
- CLOSED: Pull lever back



Figure 3.46: Engine Controls and Gauges

A - Ignition Switch
C - Fuel Gauge

B - Engine Temperature Gauge
D - Throttle

OPERATOR'S STATION

3.16 Windrower Controls

Console Controls:

A – TURN SIGNALS activate turn signals on windrower and header.

- Push-ON / Push-OFF

B – GROUND SPEED LEVER (GSL) controls speed and direction of movement.

- F: Forward
- N: NEUTRAL
- N-DETENT: Engages Neutral Interlock, and applies park brake when steering locked in center
- R: Reverse

C – HAZARD WARNING LIGHTS activate signals on windrower and header.

- Push-ON / Push-OFF

D – GROUND SPEED RANGE SWITCH shifts transmission speed range.

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

E – N-Detent

Autosteer Control:

A – AUTOSTEER ENGAGEMENT SWITCH engages/disengages the automated steering -system (if compatible system is installed).

- ENGAGE: Click to engage
- DISENGAGE: Turn steering wheel or click to disengage

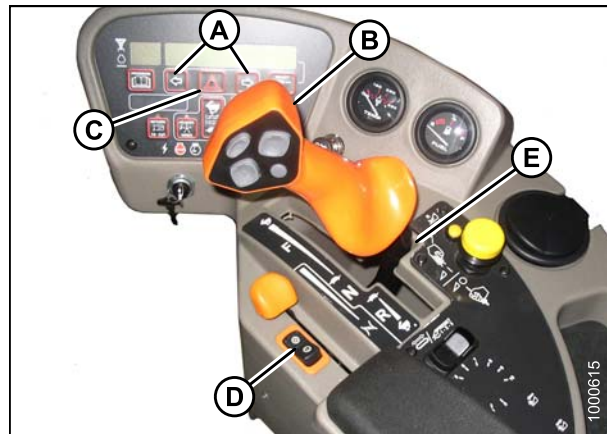


Figure 3.47: Console Controls

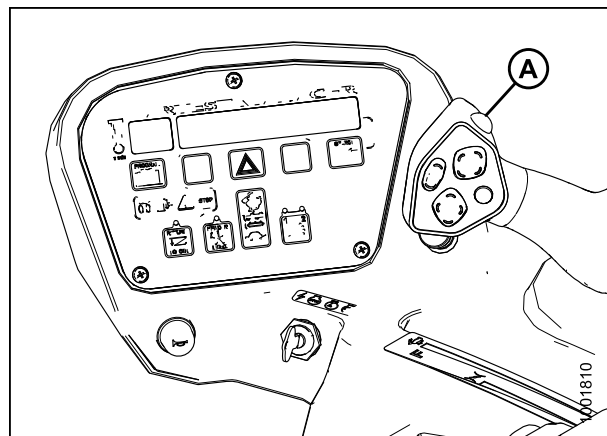


Figure 3.48: AutoSteer

A - Autosteer Engagement Switch

OPERATOR'S STATION

The autosteer engagement switch harness end (A) is beneath the cab between the fuel tank and evaporator box.



Figure 3.49: Autosteer Harness

OPERATOR'S STATION

3.17 Header Controls

All header controls are conveniently located on the operator's console and on the ground speed lever (GSL) handle.

NOTE: Some controls are optional equipment and may not be present in your unit. Some controls may be installed, but will be nonfunctional for certain headers.

Refer to specific header sections in this manual for detailed operating procedures of all header controls.

3.17.1 Header Drive Switch

The header drive switch (A) engages and disengages the header drive.

To engage the header drive, push the switch to center and pull up.

To disengage the header drive, push the switch down.

IMPORTANT:

Always move throttle lever back to IDLE before engaging header drive. Do **NOT** engage header with engine at full rpm.

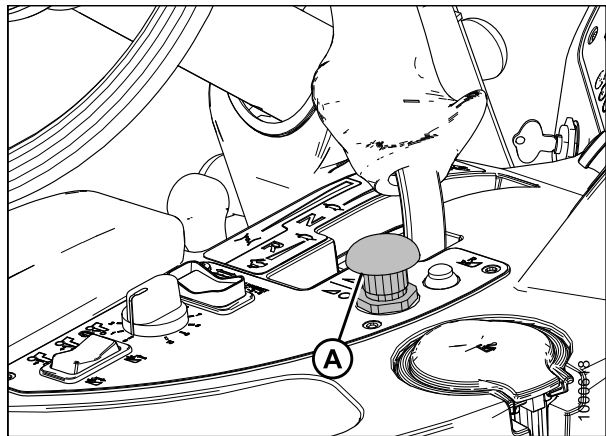


Figure 3.50: Header Drive Switch

3.17.2 Header Drive Reverse Button

NOTE: The optional hydraulic reversing kit must be installed on draper headers with a conditioner and on auger headers. Rotary disc headers are factory-equipped with the reverser.

- ENGAGE: Push and hold REVERSER button (B) and engage header with Switch (A)
- DISENGAGE: Release REVERSER Button (B)

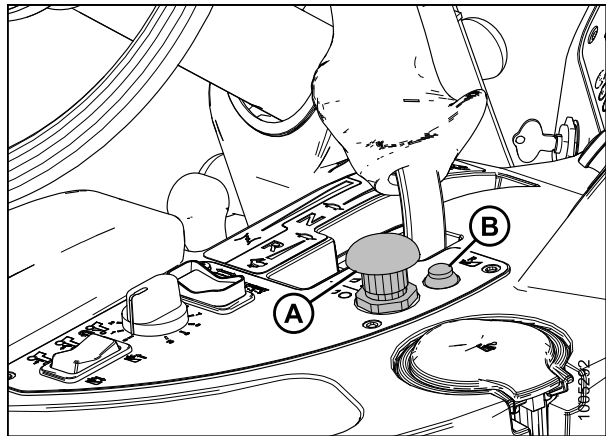


Figure 3.51: Header Drive Switches

OPERATOR'S STATION

3.17.3 Ground Speed Lever (GSL) Header Switches

The GSL (A) contains switches for the header functions that are most often adjusted while in operation to suit changing crop conditions. All are momentary-type switches.

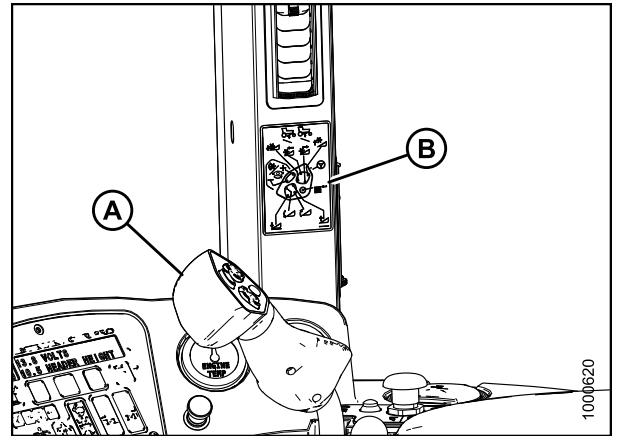


Figure 3.52: GSL

NOTE: A decal (B) identifying switch functions is located on the cab post above the operator's console.

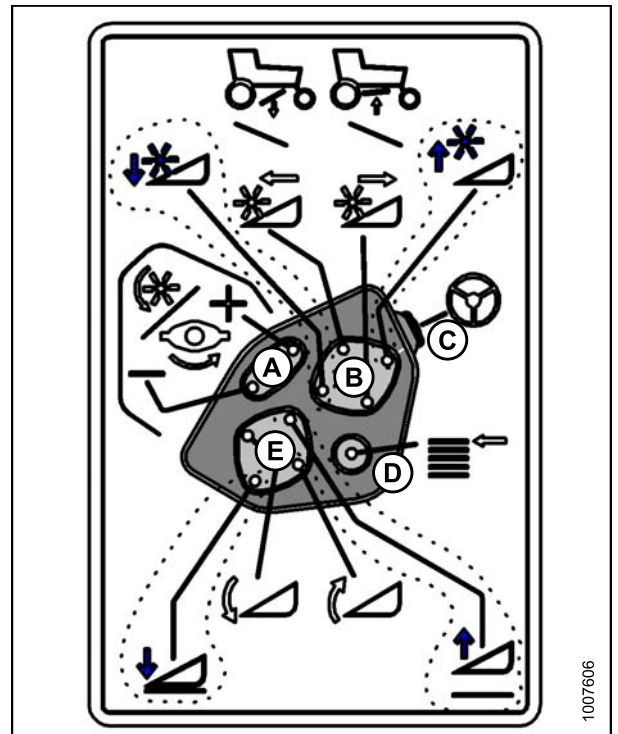


Figure 3.53: GSL Function Groups

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

OPERATOR'S STATION

Display Selector Switch

The display selector switch (A) selects and displays the settings in the cab display module (CDM) top line read-out for each of the header controls.

Press switch (A) to scroll through settings.

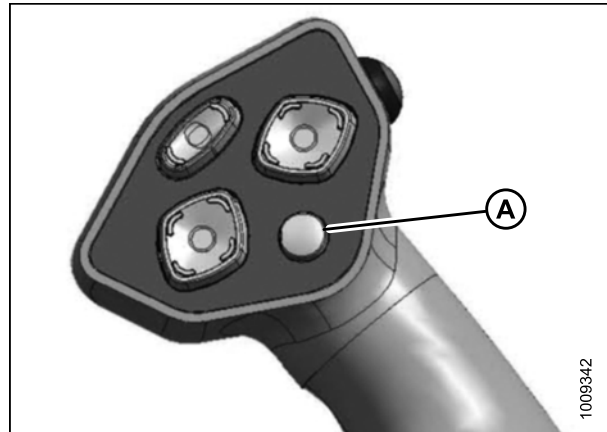


Figure 3.54: GSL

Reel Position Switches

The reel position switches perform different functions depending on cab display module (CDM) programming and on which header is attached. For detailed switch operating modes, refer to one of the following sections that is specific to your header:

- Double Windrow Attachment (DWA) Position. Refer to [4.4.7 Double Windrowing, page 154](#).
- Reel Fore-Aft Position and Height on Draper Headers. Refer to
 - [4.6.4 Reel Fore-Aft Position, page 229](#)
 - [4.6.5 Reel Height, page 229](#)
- Center-Link Assist Cylinder. Refer to
 - [4.5.1 Attaching a D-Series Header, page 157](#)
 - [4.5.3 Attaching an A-Series Header, page 180](#)

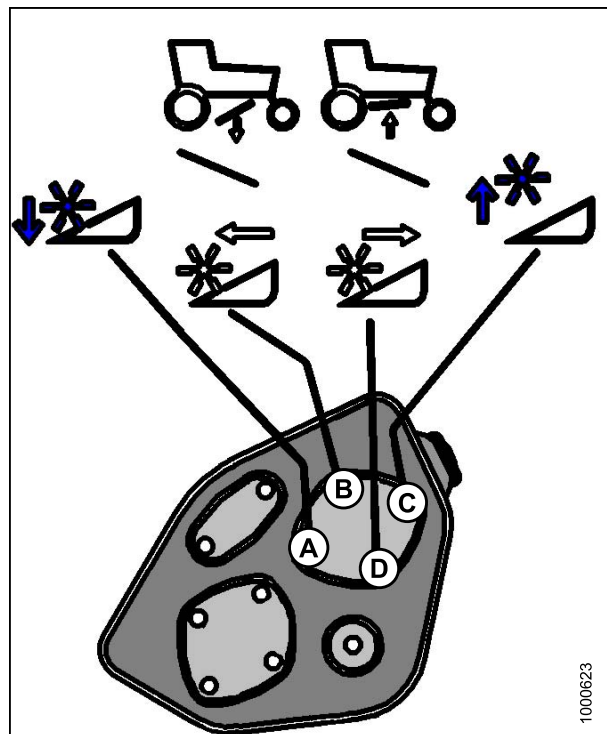


Figure 3.55: Ground Speed Lever

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

OPERATOR'S STATION

Header Position Switches

Press and hold switch at location shown to move header up or down and to change the angle of the header relative to the ground. Release switch at desired position.

NOTE: Refer to the section in this manual that is specific to your header for detailed switch operating modes.

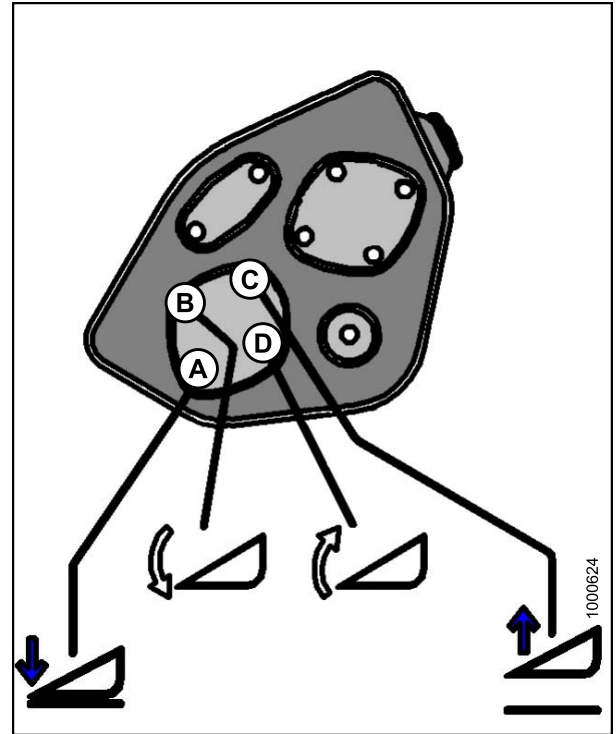


Figure 3.56: Ground Speed Lever

A - Header Down
B - Header Tilt Down
C - Header Up
D - Header Tilt Up

Reel and Disc Speed Switches

Press and hold switch at location shown to change reel or disc speed. Release switch at desired speed.

Auger Header

- A-30 header: Not applicable
- A-40 header: Auger speed is automatically maintained when reel speed is changed

IMPORTANT:

Reel speed on auger header **MUST NOT EXCEED** 85 rpm. Auger speed **MUST NOT EXCEED** 320 rpm.

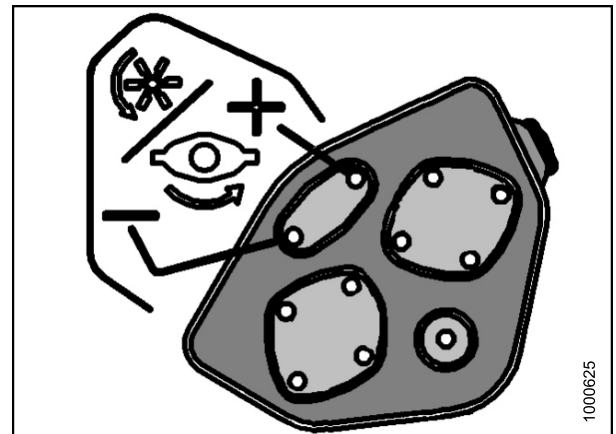


Figure 3.57: Ground Speed Lever

Draper Header

- Reel speed is limited in INDEX HEADER SPEED mode

Rotary Disc Header

- Conditioner speed automatically adjusts when DISC SPEED is changed

OPERATOR'S STATION

3.17.4 Console Header Switches

The operator's console contains switches for the following header functions.

Deck Shift/Float Preset Switch

Draper Header with Deck Shift Option

- Controls deck shifting and float settings for double windrowing options with a draper header.

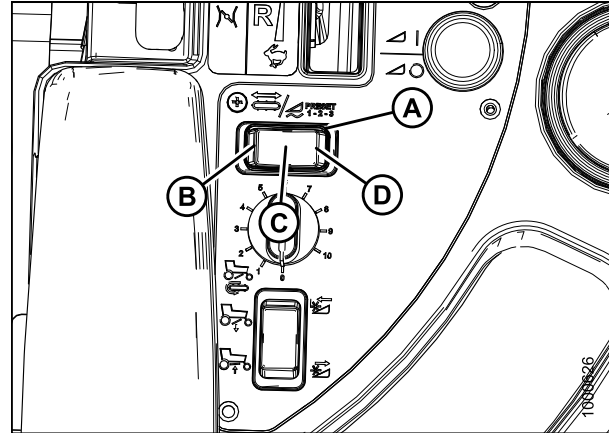


Figure 3.58: Header Switches

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 Header

- Selects preprogrammed header float settings. Refer to [Checking Float, page 139](#) for instructions to preset the float

NOTE: Refer to the section in this manual that is specific to your header for detailed switch operating modes.

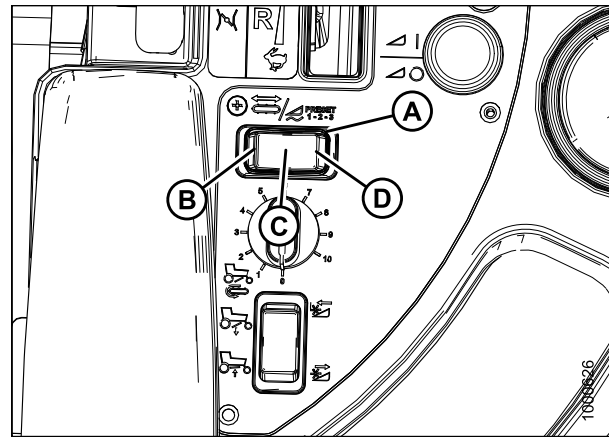


Figure 3.59: Header Switches

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

OPERATOR'S STATION

Double Windrow Attachment (DWA) / Swath Roller Switch (if installed)

Double Windrow Attachment

- The DWA deck is raised (C) or lowered (B) if switch (A) is installed in the console and if the cab display module (CDM) is programmed for this configuration. It may be used in lieu of the DWA switches on the ground speed lever (GSL).

Swath Roller

- Roller is raised (E) or lowered (D) when switch is pressed.

NOTE: You may swap controls to the rocker switch or to the GSL handle, by changing the programming in the CDM. Refer to [Detailed Programming Menu Flow Chart, page 88](#).

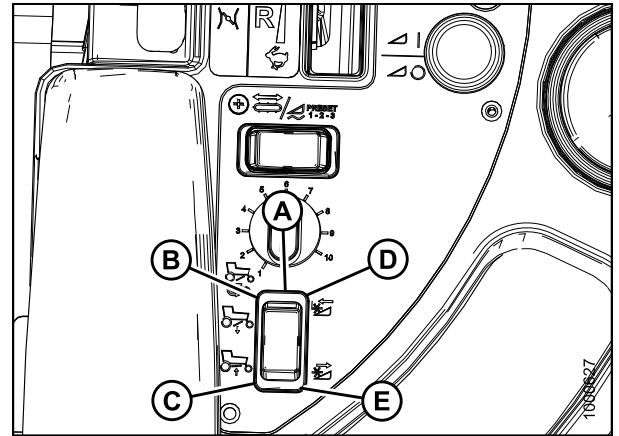


Figure 3.60: Console Switches

OPERATOR'S STATION

3.18 Cab Display Module (CDM)

3.18.1 Engine and Windrower Functions



Figure 3.61: CDM Engine and Windrower Functions

- A** – Engine rpm
- B** – Ground Speed: mph or kph
- C** – DISPLAY: Engine/windrower functions.
- D** – HAZARD WARNING LIGHTS switch: Activates hazard warning lights, cancels turn signal.
- E** – SELECT switch: Allows operator to select display item on lower line. Push to SELECT.
- F** – TURN SIGNAL switches: Activates turn signals on windrower and header Push-ON / Push-OFF.
- G** – IGNITION switch positions: Accessory / Stop / Run / Start.
- H** – Engine warning lights: Engine Pre-Heat / Water In Fuel / CAUTION / Stop Engine.

OPERATOR'S STATION

3.18.2 Header Functions



Figure 3.62: Cab Display Module

A – DISPLAY: Header functions.

B – SELECT SWITCH: Allows Operator to select display item on lower line. Push to SELECT.

C – FLOAT SWITCH – Header Right Side: Changes header float. The system remembers setting with deck shift option if activated with float setting switch. Push + to Increase. Push – to Decrease.

D – FLOAT SWITCH – Header Left Side: Changes header float. The system remembers setting with deck shift option if activated with float setting switch. Push + to Increase. Push – to Decrease.

E – AUGER/DRAPER SPEED ADJUST: Changes auger/drafter speed INDEX with INDEX SWITCH ON. Changes auger/drafter SPEED with INDEX SWITCH OFF. Push upper switch to increase. Push lower switch to decrease.

F – HEADER INDEX SWITCH: Links reel and conveyor speed to ground speed. Push-ON / Push-OFF.

NOTE: Illuminates in ON position.

NOTE: Header must be engaged.

G – RETURN TO CUT HEIGHT SWITCH: Allows cutting height preset. Push-ON/Push-OFF.

NOTE: Illuminates in ON position.

NOTE: Header must be engaged.

OPERATOR'S STATION

3.18.3 Operating Screens

The cab display module (CDM) and the windrower control module (WCM) provide information on several functions for the engine, header, and windrower. The information displayed in various operating modes is described in the following sections.

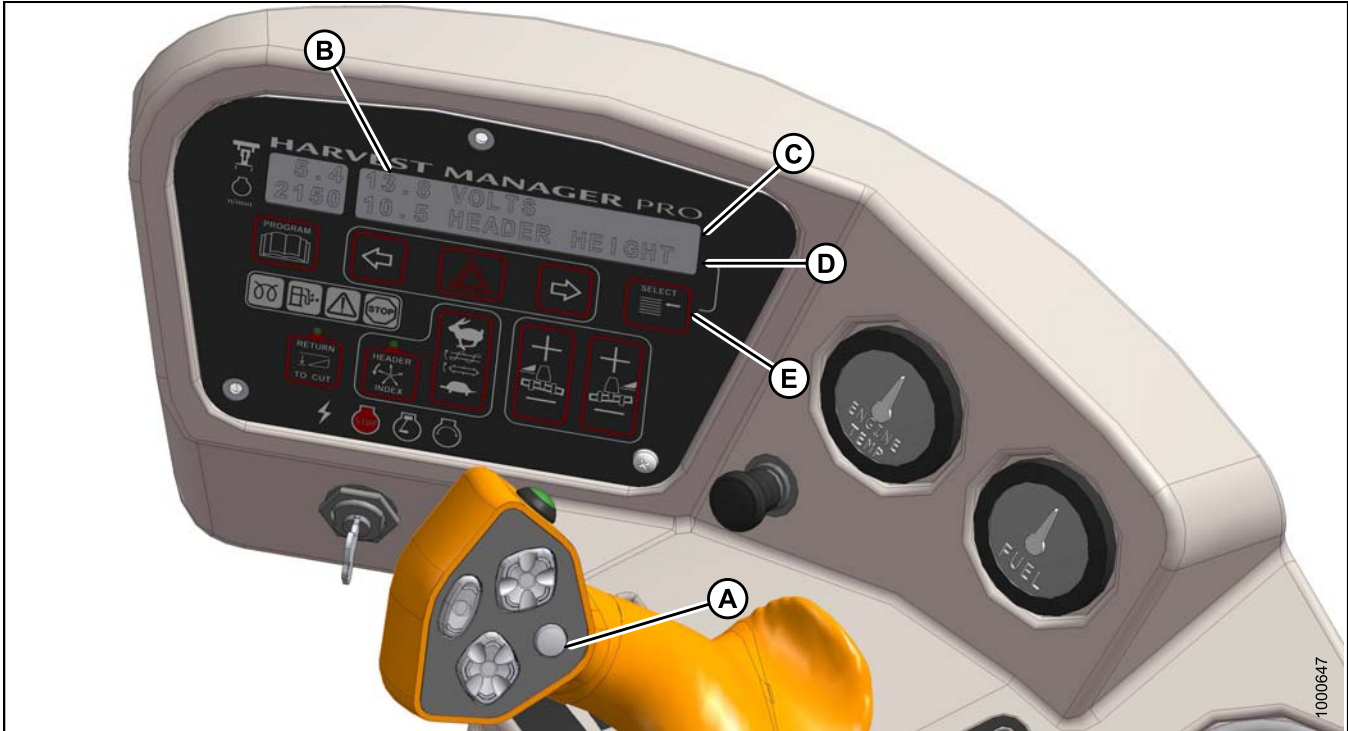


Figure 3.63: CDM Operating Screen

A - Display Selector for Upper Line
D - CDM Lower Line

B - Display
E - Display Selector for Lower Line

C - CDM Upper Line

Ignition ON, Engine Not Running

Display (upper line) (2–3 seconds)	Description
HEADER DISENGAGED	Indicates HEADER DRIVE switch is OFF.
IN PARK	Indicates ground speed lever (GSL) is in N-DETENT.

OPERATOR'S STATION

Engine-Forward, Engine Running

Display	Description
ROAD GEAR (Upper Line)	Ground speed range switch in high range.
#####.# ENGINE HRS (Upper or Lower Line)	Total engine operating time.
#####.# HEADER HRS (Upper or Lower Line)	Total header operating time.
##### TOTAL ACRES (Upper or Lower Line) ##### TOTAL HECT (if Metric)	Total area cut by machine.
##.# HEADER HEIGHT (Upper or Lower Line)	Distance setting (00.0–10.0) between cutterbar and ground.
##.# HEADER ANGLE (Upper or Lower Line)	Angle setting (00.0–10.0) header relative to ground.
### °C or F HYD OIL TEMP	Hydraulic oil temperature.
##.# VOLTS (Upper or Lower Line)	Engine electrical system operating voltage.
SCROLL (Lower Line)	Displays above items after 2–3 seconds; press SELECT to cancel.

Cab-Forward, Engine Running, Header Disengaged

Scroll through display with cab display module (CDM) switch or ground speed lever (GSL) switch.

Display (lower or upper line)	Description
#####.# ENGINE HRS	Total engine operating time.
#####.# HEADER HRS	Total header operating time.
###.# SUB ACRES ###.# SUB HECTARES (if metric)	Area cut since last reset. To reset, display SUB ACRES on lower line, and hold down Program switch until display resets (5–7 seconds).
##### TOTAL ACRES ##### TOTAL HECT (if metric)	Total area cut by machine.
##.# HEADER HEIGHT	Distance setting (00.0–10.0) between cutterbar and ground.
##.# HEADER ANGLE	Angle setting (00.0–10.0) header relative to ground.
##.# L FLOAT R ##.#	Float setting (0.0–10.0).
### °C or F HYD OIL TEMP	Hydraulic oil temperature.
##.# VOLTS	Engine electrical system operating voltage.
SCROLL (Lower Line)	Displays above items after 2–3 seconds; press SELECT to cancel.

OPERATOR'S STATION

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

Scroll through display with cab display module (CDM) switch or ground speed lever (GSL) switch.

Display (lower or upper line)	Description
#####.# ENGINE HRS	Total engine operating time.
#####.# HEADER HRS	Total header operating time.
##.# ACRES/HOUR ##.# HECTARES/HOUR (If Metric)	Actual cutting rate in acres (hectares)/hour.
###.# SUB ACRES ###.# SUB HECTARES (If Metric)	Area cut since last reset. To reset, display SUB ACRES on lower line, and hold down program switch until display resets (5–7 seconds).
##### TOTAL ACRES ##### TOTAL HECT (If Metric)	Total area cut by machine.
##.## REEL RPM ##.## REEL SENSOR	Reel rotational speed. Sensor Disabled. RPM and SENSOR alternate at 1 second intervals.
##.# AUGER SPEED	Auger rotational speed (4.7–9.9).
#### KNIFE SPEED #### KNIFE SENSOR	Knife speed in strokes per minute. Sensor Disabled. SPEED and SENSOR alternate at 1 second intervals.
##.# HEADER HEIGHT ##.# HEADER SENSOR	Distance setting (00.0–10.0) between cutterbar and ground. Sensor Disabled. HEIGHT and SENSOR alternate at 1 second intervals.
##.# HEADER ANGLE ##.# HEADER SENSOR	Angle setting (00.0–10.0) header relative to ground. Sensor Disabled. ANGLE and SENSOR alternate at 1 second intervals.
##.# L FLOAT R ##.# FLOAT SENS DISABLED	Left and right float setting (0.0–10.0). Sensor Disabled.
LOAD ■■■■ ####	Bar graph representing hydraulic operating pressure. Full scale is preprogrammed overload pressure (2500–5000 psi). If sensor disabled, LOAD does not display ⁵ .
### °C or F HYD OIL TEMP ### °C or F HYD TEMP	Hydraulic oil temperature. Sensor Disabled. TEMP and SENSOR alternate at 1 second intervals.
##.# VOLTS	Engine electrical system operating voltage.
SCROLL SUB-MENU (Lower Line Only) #### KNIFE SPEED ##.# HEADER HEIGHT LOAD ■■■■ ■■■■ ####	Displays sub-menu after 2–3 seconds. Press SELECT to cancel. Scroll through sub-menu display with CDM switch.

5. The LOAD sensor to monitor knife/conditioner circuit pressure is optional. To monitor reel/auger circuit pressure, relocate sensor as per Form MD #169031, which is available through your Dealer.

OPERATOR'S STATION

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

Scroll through display with cab display module (CDM) switch or ground speed lever (GSL) switch.

Display (lower or upper line)	Description
#####.# ENGINE HRS	Total engine operating time.
#####.# HEADER HRS	Total Header operating time.
##.# ACRES/HOUR ##.# HECTARES/HOUR (If Metric)	Actual cutting rate in acres (hectares)/hour.
###.# SUB ACRES ###.# SUB HECTARES (If Metric)	Area cut since last reset. To reset, display SUB ACRES on lower line, and hold down program switch until display resets 5–7 seconds).
##### TOTAL ACRES ##### TOTAL HECT (If Metric)	Total area cut by machine.
##.## ##.# REEL IND. ##.## REEL SENSOR	Reel Peripheral speed along with ground speed in mph or kph. Sensor disabled. IND and SENSOR alternate at 1 second intervals.
##.# AUGER SPEED ##.# AUGER SENSOR	Auger rotational speed (4.7–9.9). Sensor disabled. SPEED and SENSOR alternate at 1 second intervals.
#### KNIFE SPEED #### KNIFE SENSOR	Knife speed In strokes per minute. Sensor disabled. SPEED and SENSOR alternate at 1 second intervals.
##.# HEADER HEIGHT ##.# HEADER SENSOR	Distance setting (00.0–10.0) between cutterbar and ground. Sensor disabled. HEIGHT and SENSOR alternate at 1 second intervals.
##.# HEADER ANGLE ##.# TILT SENSOR	Angle setting (00.0–10.0) header relative to ground. Sensor disabled. ANGLE and SENSOR alternate at 1 second intervals.
##.# L FLOAT R ##.# FLOAT SENS DISABLED (If Sensor Disabled)	Left and right float setting (0.0–10.0). Sensor disabled.
LOAD ■■■■ ####	Bar graph representing hydraulic operating pressure. Full scale is preprogrammed overload pressure (2500–5000 psi). If sensor disabled, LOAD does not display ⁶
### °C or F HYD OIL TEMP ### °C or F HYD TEMP	Hydraulic oil temperature. Sensor Disabled. TEMP and SENSOR alternate at 1 second intervals.

6. The LOAD sensor to monitor knife/conditioner circuit pressure is optional. To monitor reel/auger circuit pressure, relocate sensor as per Form MD #169031, which is available through your Dealer.

OPERATOR'S STATION

Display (lower or upper line)	Description
##.# VOLTS	Engine electrical system operating voltage.
SCROLL SUB-MENU (Lower Line Only) #### KNIFE SPEED ##.# HEADER HEIGHT LOAD ■■■■ ■■■■ ####	Displays sub-menu after 2–3 Seconds. Press SELECT to cancel. Scroll through sub-menu display with CDM switch.

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

Scroll through display with cab display module (CDM) switch or ground speed lever (GSL) switch.

Display (lower or upper line)	Description
#####.# ENGINE HRS	Total engine operating time.
#####.# HEADER HRS	Total header operating time.
##.# ACRES/HOUR ##.# HECTARES/HOUR (if metric)	Actual cutting rate in acres (hectares)/hour.
###.# SUB ACRES ###.# SUB HECTARES (if metric)	Area cut since last reset. To reset, display SUB ACRES on lower line, and hold down program switch until display resets (5–7 seconds).
##### TOTAL ACRES ##### TOTAL HECT (if metric)	Total area cut by machine.
###.# REEL MPH ###.# REEL KPH (if metric) ###.# REEL SENSOR (flashing)	Reel peripheral speed. Sensor Disabled. MPH or KPH and SENSOR alternate at 1 second intervals.
##.# DRAPER SPEED	Draper speed (0.0–11.0).
#### KNIFE SPEED #### KNIFE SENSOR	Knife speed In strokes per minute. Sensor Disabled. SPEED and SENSOR alternate at 1 second intervals.
##.# HEADER HEIGHT ##.# HEADER SENSOR	Distance setting (00.0–10.0) between cutterbar and ground. Sensor Disabled. HEIGHT and SENSOR alternate at 1 second intervals.
##.# HEADER ANGLE ##.# HEADER SENSOR	Angle setting (00.0–10.0). Header relative to ground. Sensor Disabled. ANGLE and SENSOR alternate at 1 second intervals.
##.# L FLOAT R ##.# FLOAT SENS DISABLED	Left and right float setting (0.0–10.0). Sensor Disabled.
###.# °C or F HYD OIL TEMP ###.# °C or F HYD SENSOR	Hydraulic oil temperature. Sensor Disabled. TEMP and SENSOR alternate at 1 second intervals.

OPERATOR'S STATION

Display (lower or upper line)	Description
LOAD ■■■■ ■■■■	Bar graph representing hydraulic operating pressure. Full scale is pre-programmed overload pressure (2500–5000 psi). If sensor disabled, LOAD does not display ⁷
### VOLTS	Engine electrical system operating voltage.
SCROLL SUB-MENU (Lower Line Only) ■■■■ KNIFE SPEED ### HEADER HEIGHT LOAD ■■■■ ■■■■ ■■■■ ### REEL MPH ### DRAPER SPEED	Displays sub-menu after 2–3 seconds. Press SELECT to cancel. Scroll through sub-menu display with CDM switch.
KNIFE SPD OVERLOAD	

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

Scroll through display with cab display module (CDM) switch or ground speed lever (GSL) switch.

Display (lower or upper line)	Description
##### ENGINE HRS	Total engine operating time.
##### HEADER HRS	Total header operating time.
### ACRES/HOUR ### HECTARES/HOUR (if metric)	Actual cutting rate in acres (hectares)/hour.
### SUB ACRES ### SUB HECTARES (if metric)	Area cut since last reset. To reset, display SUB ACRES on lower line and hold down program switch until display resets (5–7 Seconds).
##### TOTAL ACRES ##### TOTAL HECT (if metric)	Total area cut by machine.
### ### REEL IND REEL.SENSOR	Reel peripheral speed along with ground speed in mph or kph. Sensor Disabled. IND and SENSOR alternate at 1 second intervals.
### ### DRAP INDX	Draper speed along with ground speed in mph or kph.
#### KNIFE SPEED #### KNIFE SENSOR	Knife speed in strokes per minute. Sensor Disabled. SPEED and SENSOR alternate at 1 second intervals.
### HEADER HEIGHT ### HEADER SENSOR	Distance setting (00.0–10.0) between cutterbar and ground. Sensor Disabled. HEIGHT and SENSOR alternate at 1 second intervals.
### HEADER ANGLE ### HEADER SENSOR	Angle setting (00.0–10.0) header relative to ground. Sensor Disabled. ANGLE and SENSOR alternate at 1 second intervals.

7. The LOAD sensor to monitor knife/conditioner circuit pressure is optional. To monitor reel/auger circuit pressure, relocate sensor as per Form MD #169031, which is available through your Dealer.

OPERATOR'S STATION

Display (lower or upper line)	Description
###.# L FLOAT R ###.# FLOAT SENS DISABLED	Left and right float setting (0.0–10.0). Sensor Disabled.
LOAD ■■■■ ####	Bar graph representing hydraulic operating pressure. Full scale is pre-programmed overload pressure (2500–5000 psi). If sensor disabled, LOAD does not display ⁸
###.# VOLTS	Engine electrical system operating voltage.
SCROLL SUB-MENU (lower line only) #### KNIFE SPEED ###.# HEADER HEIGHT LOAD ■■■■ ■■■■ ###.# ##.# REEL IND ###.# ##.# DRAP INDX	Displays sub-menu after 2–3 seconds. Press SELECT to cancel. Scroll through sub-menu display with CDM switch.
###.# REEL MIN RPM (lower line)	Reel speed drops below programmed set-point.
MINIMUM (lower line)	Reel speed at zero ground speed.

Cab-Forward, Engine Running, Header Engaged, Rotary Header Installed

Scroll through display with cab display module (CDM) switch or ground speed lever (GSL) switch.

Display (lower or upper line)	Description
#####.# ENGINE HRS	Total engine operating time.
#####.# HEADER HRS	Total header operating time.
###.# ACRES/HOUR ###.# HECTARES/HOUR (If Metric)	Actual cutting rate in acres (hectares)/hour.
###.# SUB ACRES ###.# SUB HECTARES (If Metric)	Area cut since last reset. To reset, display SUB ACRES on lower line, and hold down program switch until display resets (5–7 seconds).
##### TOTAL ACRES ##### TOTAL HECT (If Metric)	Total area cut by machine.
#### DISC RPM ###.# DISC SENSOR	Disc rotational speed. Sensor Disabled. RPM and SENSOR alternate at 1 second intervals.
###.# HEADER HEIGHT ###.# HEIGHT SENSOR	Distance setting (00.0–10.0) between cutterbar and ground. Sensor Disabled. HEIGHT and SENSOR alternate at 1 second intervals.
###.# HEADER ANGLE ###.# HEADER SENSOR	Angle setting (00.0–10.0) header relative to ground. Sensor Disabled. ANGLE and SENSOR alternate at 1 second intervals.
###.# L FLOAT R ###.# FLOAT SENS DISABLED	Left and right float setting (0.0–10.0). Sensor Disabled.

8. The LOAD sensor to monitor knife/conditioner circuit pressure is optional. To monitor reel/auger circuit pressure, relocate sensor as per Form MD #169031, which is available through your Dealer.

OPERATOR'S STATION

Display (lower or upper line)	Description
LOAD ■■■■ ■■■■	Bar graph representing hydraulic operating pressure. Full scale is pre-programmed overload pressure (2500–5000 psi). If sensor disabled, LOAD does not display ⁹ .
### °C or F HYD OIL TEMP ### °C or F HYD TEMP	Hydraulic oil temperature. Sensor Disabled. TEMP and SENSOR alternate at 1 second intervals.
##.# VOLTS	Engine electrical system operating voltage.
SCROLL SUB-MENU (Lower Line Only) #### DISC RPM ##.# HEADER HEIGHT LOAD ■■■■ ■■■■ ■■■■	Displays sub-menu after 2–3 seconds. Press SELECT to cancel. Scroll through sub-menu display with CDM switch.

Miscellaneous Operational Information

Scroll through display with cab display module (CDM) switch or ground speed lever (GSL) switch.

Display (upper line)	Description
HEADER DISENGAGED	Header drive is disengaged.
##.# FOOT DISK	AUGER or DRAPER will appear in place of DISK, depending on type of header attached.
IN PARK	GSL in N-DETENT position.
< LEFT TURN ■	Indicates left turn when left arrow is pressed on CDM. Engine-forward mode only ¹⁰ .
■ RIGHT TURN >	Indicates right turn when right arrow is pressed on CDM. Engine forward mode only ¹¹
■ HAZARD ■	Indicates hazard warning lights are on when hazard button is pressed on CDM.
HEADER REVERSE	Header drive running in reverse.
HEADER ENGAGED	Header drive engaged.
ROAD GEAR	With HIGH RANGE selected on Console switch. Engine-forward only ¹¹

9. The LOAD sensor to monitor knife/conditioner circuit pressure is optional-installed. To monitor reel/auger circuit pressure, relocate sensor as per Form MD #169031, which is available through your Dealer.

10. If road light kit is not installed, CDM will display E135 LEFT STOP LAMP as a malfunction in CAB-FORWARD mode.

11. If road light kit is not installed, CDM will display E134 RIGHT STOP LAMP as a malfunction in CAB-FORWARD mode.

OPERATOR'S STATION

3.18.4 Cab Display Module (CDM) Warning/Alarms

The CDM displays warnings and sounds alarms to notify of abnormal windrower status at startup when the ignition is turned ON, and at engine operating speeds above 500 rpm.

Engine Warning Lights



Figure 3.64: CDM Engine Warning Lights

- A** – ENGINE PRE-HEAT: Illuminates yellow. Wait to start engine.
- B** – WATER IN FUEL: Illuminates yellow. Service recommended.
- C** – CAUTION: Illuminates yellow. Prompt attention is required. Refer to display code.
- D** – STOP: Illuminates red. Stop engine immediately. Refer to display code.
- E** – DISPLAY: Displays malfunction code. Refer to [8 Engine Error Codes, page 411](#) or Dealer.

OPERATOR'S STATION

Display Warnings and Alarms

Informs Operator of abnormal windrower conditions.



Figure 3.65: CDM Display Warnings and Alarms

Display (A)	Flashing	Alarm Tone	Description
BRAKE OFF	X	Short Beep with Each Flash.	Engine Running, Brake Solenoid Not Activated.
BRAKE ON	X	Short Beep with Each Flash.	Ground speed lever (GSL) out of N-DETENT, but Interlock Switch Remains Closed to Apply Brake.
BRAKE SW FAILURE	X	Short Beep with Each Flash.	Ignition ON / Engine Not Running, Brake Switch and Relay Closed.
CAB-FORWARD SW ON/ ENG-FORWARD SW ON	X	Messages Flash Alternately.	Both Seat Switches Activated.
CENTER STEERING		Beeps at 2 Per Second.	GSL or Interlock Switches not Closed with Key ON / Engine OFF.
DISENGAGE HEADER RE-ENGAGE <1800RPM>	X	None	R80/R85 - Engine rpm Above 1800 when Engaging Header.
ENGINE AIR FILTER	X	Single Loud Tone for 10 Seconds. Repeats Every 30 Minutes Until Condition Is Corrected.	Engine Air Filter Requires Servicing.

OPERATOR'S STATION

Display (A)	Flashing	Alarm Tone	Description
ENGINE TEMPERATURE	X	Ongoing Intermittent Moderate Tone until Temperature Is Below 215°F (102°C).	Engine Temperature Over 230°F (110°C).
HEADER DISENGAGED		None	Normal
DISENGAGE HEADER	X	None	Header Switch Is in ON Position when Ignition Switch Turned ON.
HEADER OIL PRESS	X	Continuous Loud Tone until Oil Pressure Is Regained.	Low Header Charge Oil Pressure. Header Shuts Down Automatically. Header ON Switch Must be Moved to OFF Position and Then to ON Position to Restart the Header.
HYDRAULIC FILTER	X	Single Loud Tone for 10 Seconds. Repeats Every 15 Minutes until Condition Is Corrected.	Excessive Pressure Increase across 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 Temp <50°F (10°C).
### °C or F HYD OIL HOT	X	Tone with Each Flash at 220°F (105°C) for 5 Seconds and Then Stops for 1 Minute. Flashing Continues. If Oil Still Hot after 1 Minute, Tone Sounds Again. Flashing and Steady Tone at 230°F (110°C) and Higher.	Hydraulic Oil Temp >220°F (105°C) but <230°F (110°C).
IN PARK	X	One Short Beep.	GSL In N-DETENT, Steering Wheel Centered, and Brakes Are Engaged.
KNIFE SPEED OVERLOAD	X	Short Beep With Each Flash Until Condition Is Corrected.	Machine Overload. Knife or Disc Speed Drops Below Programmed Value.
LOCK SEAT BASE	X	None	Seat Base not Detected In Cab or Engine-Forward Position.
LOW HYDRAULIC OIL	X	Continuous Loud Tone for 5 Seconds. If Condition not Rectified, Single Loud Tone Every 5 Minutes.	Low Hydraulic Oil Level. Header Shuts Down Automatically if Engaged. Header ON Switch Must Be Moved to OFF Position and then to ON Position to Restart the Header.
NO HEADER		None	Header Is Not Detected.

OPERATOR'S STATION

Display (A)	Flashing	Alarm Tone	Description
NO OPERATOR		Continuous Tone.	Operator Not Detected in Seat with Header Engaged or out of N-DETENT. Engine Shutdown after 5 Seconds.
NO OPERATOR ENGINE SHUT DOWN		Continuous Tone.	Engine Shutdown When Operator not Detected in Seat with Machine Moving Under 3 mph (4.8 km/h).
NOT IN PARK	X	Short Beep with Each Flash.	GSL or Interlock Switches Not Closed with Key ON / Engine OFF.
PLACE GSL INTO "N"		Beeps at 2 per Second until Corrected.	GSL or Interlock Switches Not Closed with Key ON / Engine OFF.
SLOW DOWN	X	Short Beep with Each Flash.	Ground Speed is Greater Than or Equal to 25 mph (40 km/h). Operator Should Pull Back on the GSL to Reduce Ground Speed.
TRANS OIL PRESS	X	Continuous Loud Tone Until Oil Pressure Is Regained.	Low Transmission Charge Oil Pressure.
TRANS OIL TEMP	X	Ongoing Intermittent Moderate Tone Until Temperature Is Below Acceptable Level.	Transmission Oil Temperature Above 221°F (106°C) .
### 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.

OPERATOR'S STATION

3.18.5 Cab Display Module (CDM) Programming



Figure 3.66: CDM

A - Side Display

D - Menu Item Scroll Forward

B - Main Display

E - Menu Item Scroll Backward

C - Select Switch

F - Program Switch

A – SIDE DISPLAY displays software revision status.

- Upper Line – C### (CDM)
- Lower Line – M### (WCM)

B – MAIN DISPLAY displays menu item and selection.

- Upper Line – Menu Item
- Lower Line – Selection

C – SELECT SWITCH places monitor into Program Mode with PROGRAM switch. Press to accept menu item and advance to next item.

D – MENU ITEM SCROLL FORWARD displays value under menu item.

- Push to scroll forward
- Hold down for fast scroll¹²

E – MENU ITEM SCROLL BACKWARD displays value under menu item.

- Push to scroll backward
- Hold down for fast scroll¹²

F – PROGRAM SWITCH places monitor into program mode. Press while pressing SELECT switch.

12. Fast scroll applies only when changing KNIFE SPEED, OVERLOAD PRESSURE, and TIRE SIZE.

OPERATOR'S STATION

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

IMPORTANT:

Header must be attached to the windrower so that the CDM can detect the type of header (Header ID) and adjust the programming mode accordingly.

Proceed as follows to program the CDM:

NOTE: Pressing PROGRAM at any time will cancel the programming mode/menus and return back to the main operating displays. For detailed programming menu selection, refer to [Detailed Programming Menu Flow Chart, page 88](#).

1. Turn ignition key to RUN or start the engine.
2. On CDM, press PROGRAM and SELECT to enter programming mode.
3. Press SELECT. WINDROWER SETUP? with header width displayed on upper line.
4. Press left or right arrow to change value on lower line.
5. Press SELECT to advance to the next L1 item and press arrow keys to change values.
6. Set the following functions:

NOTE: The following can be set by the Dealer provided that the header is installed and other information needed is available.

- DWA INSTALLED?
- TILT CYL INSTALLED?
- DISC BLK INSTALLED?
- HDR CUT WIDT?
- HAY CONDITIONER?
- SET TIRE SIZE?

7. Press PROGRAM to exit programming mode when finished entering values.

Programming Guidelines

Use the following guidelines when programming the cab display module (CDM):

1. The monitoring system requires programming for each header, and the **HEADER MUST BE ATTACHED TO THE WINDROWER** so that the CDM recognizes the type of header.
2. Programming the system may be accomplished with or without the engine running.
 - If the engine is running, the transmission must be in Neutral (GSL in N-DETENT).
 - If the engine is not running, the ignition must be turned to RUN.
3. The system only needs to be programmed once for each header. Most functions are preset at the factory but the Operator can make changes later on to suit windrowing conditions or modifications to the machine.
4. Input values for the windrower are provided in this manual, and values for the header functions are in the operator's manual for the applicable header.
5. The CDM must be in programming mode to view the program menus. Press PROGRAM and SELECT on the CDM to enter programming mode. Exit programming mode at any time by pressing PROGRAM or by turning ignition to OFF.

OPERATOR'S STATION

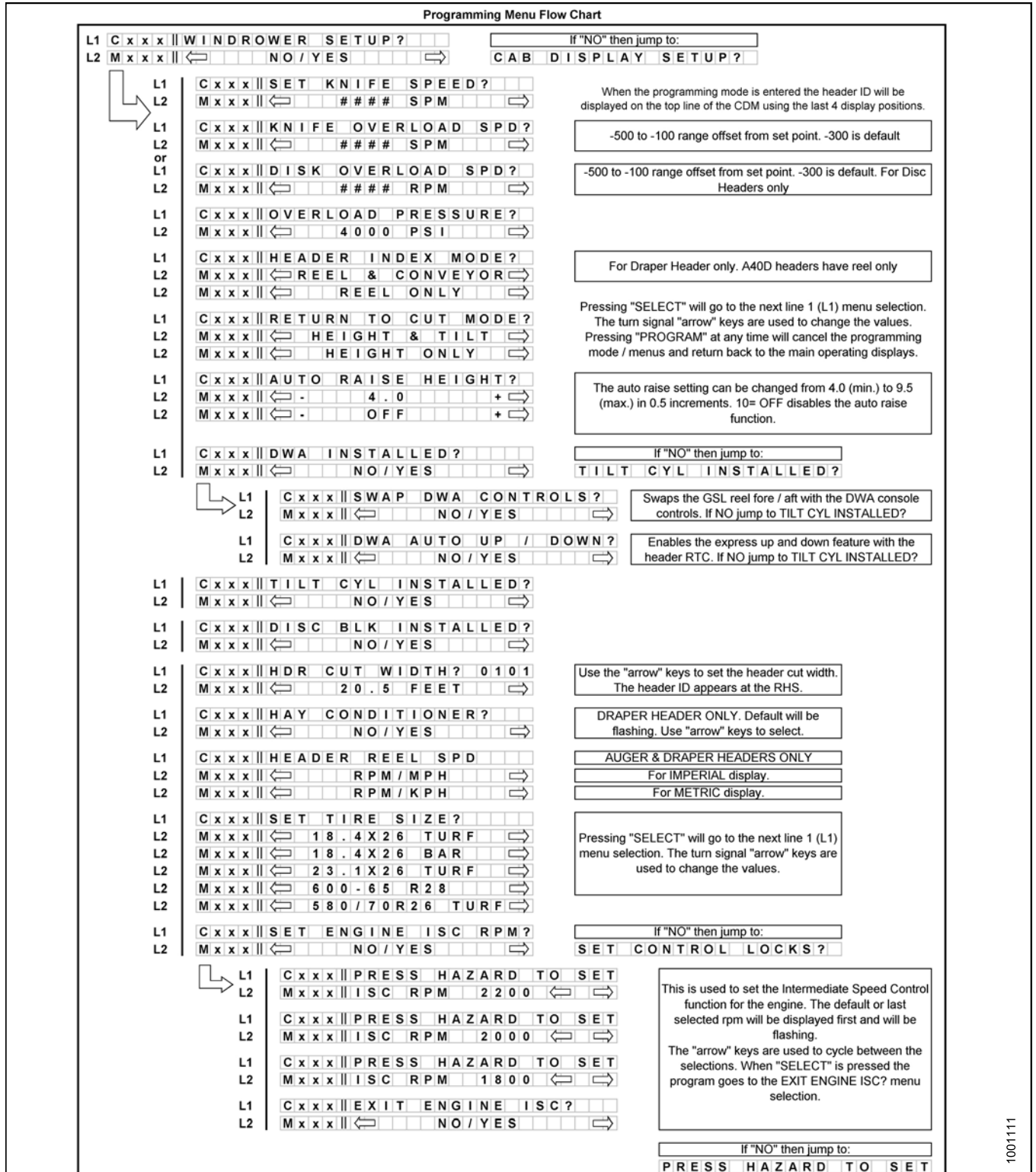
6. Refer to the [Detailed Programming Menu Flow Chart, page 88](#) for a listing of all the menus with user information for each menu item.

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

Detailed Programming Menu Flow Chart

The programming menu flow chart is current for cab display module (CDM) software 315 and windrower control module (WCM) software 214.

OPERATOR'S STATION



OPERATOR'S STATION

L1	C x x x SET CONTROL LOCKS?	If "NO" then jump to:
L2	M x x x ← NO / YES →	VIEW CONTROL LOCKS?
L1	C x x x HEADER TILT	<p>This menu allows the operator to selectively "lock out" the control functions for the various header functions. The default or selected "status" for each item will flash.</p> <p>The "arrow" keys are used to ENABLE or LOCK OUT each function. Pressing "SELECT" will go to the next L1 menu item.</p>
L2	M x x x ← ENABLED / LOCKED →	
L1	C x x x HEADER FLOAT	
L2	M x x x ← ENABLED / LOCKED →	
L1	C x x x REEL FORE / AFT	
L2	M x x x ← ENABLED / LOCKED →	
L1	C x x x DRAPER SPEED	
L2	M x x x ← ENABLED / LOCKED →	
L1	C x x x AUGER SPEED	
L2	M x x x ← ENABLED / LOCKED →	
L1	C x x x KNIFE SPEED	
L2	M x x x ← ENABLED / LOCKED →	
L1	C x x x DISK SPEED	
L2	M x x x ← ENABLED / LOCKED →	
L1	C x x x REEL SPEED	
L2	M x x x ← ENABLED / LOCKED →	
L1	C x x x EXIT CONTROL LOCKS?	If "NO" then jump to:
L2	M x x x ← NO / YES →	HEADER TILT
L1	C x x x VIEW CONTROL LOCKS?	If "NO" then jump to:
L2	M x x x ← NO / YES →	EXIT WINDRWR SETUP?
L1	C x x x HEADER TILT	<p>When the control lock outs are viewed the lower display line (L2) will show the engine hours and either ENABLED or LOCKED to indicate the present status along with the engine hours at which time the function was either ENABLED or LOCKED.</p> <p>Using the "arrow" keys allows the operator to select the various functions. Pressing "SELECT" will go to the EXIT VIEW LOCKOUTS? menu selection.</p>
L2	M x x x 5 7 5 . 1 HRS ENABLED	
L2	M x x x 6 4 8 . 6 HRS LOCKED	
L1	C x x x HEADER FLOAT	
L2	M x x x 5 7 5 . 1 HRS ENABLED	
L2	M x x x 6 4 8 . 6 HRS LOCKED	
L1	C x x x REEL FORE / AFT	
L2	M x x x 5 7 5 . 1 HRS ENABLED	
L2	M x x x 6 4 8 . 6 HRS LOCKED	
L1	C x x x DRAPER SPEED	
L2	M x x x 5 7 5 . 1 HRS ENABLED	
L2	M x x x 6 4 8 . 6 HRS LOCKED	
L1	C x x x AUGER SPEED	
L2	M x x x 5 7 5 . 1 HRS ENABLED	
L2	M x x x 6 4 8 . 6 HRS LOCKED	
L1	C x x x KNIFE SPEED	
L2	M x x x 5 7 5 . 1 HRS ENABLED	
L2	M x x x 6 4 8 . 6 HRS LOCKED	
L1	C x x x DISK SPEED	
L2	M x x x 5 7 5 . 1 HRS ENABLED	
L2	M x x x 6 4 8 . 6 HRS LOCKED	
L1	C x x x REEL SPEED	
L2	M x x x 5 7 5 . 1 HRS ENABLED	
L2	M x x x 6 4 8 . 6 HRS LOCKED	
L1	C x x x EXIT VIEW LOCKOUTS?	If "NO" then jump to:
L2	M x x x ← NO / YES →	HEADER TILT
L1	C x x x EXIT WINDRWR SETUP?	If "NO" then jump to:
L2	M x x x ← NO / YES →	SET KNIFE SPEED?
		or DISC OVERLOAD SPD?

Disc Header Only

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OPERATOR'S STATION

L1	C x x x	ACTIVATE FUNCTIONS?	If "NO" then jump to:
L2	M x x x	← NO / YES →	FORCE HEADER TYPE?
L1	C x x x	ACTIVATE HEADER HT	For diagnostic purposes each header function can be activated by using the "arrow" keys on the CDM. When "SELECT" is pressed the program will go to the next function that can be activated.
L2	M x x x	← DOWN / UP →	
L1	C x x x	ACTIVATE REEL HT	If a disk header is detected then the nomenclature should read: DISC DRIVE instead of KNIFE DRIVE.
L2	M x x x	← DOWN / UP →	
L1	C x x x	ACTIVATE HDR TILT	PWM OPERATION: If the HAZARD switch is pressed instead of the TURN SIGNAL switch the GSL will operate the PWM valve (HAZARD sw must be held) and the PWM value will reset to zero when released.
L2	M x x x	← IN / OUT →	
L1	C x x x	KNIFE DRV SPD XXXX	For Disc Header only
L2	M x x x	D 0 P 0 ← - Δ + →	
L1	C x x x	DRAPER DRV SPD XXXX	The DWA menu selection should only be available if the DWA INSTALLED? is set to YES.
L2	M x x x	D 0 P 0 ← - Δ + →	
L1	C x x x	REEL DRV SPD XXXX	For Disc Header only
L2	M x x x	D 0 P 0 ← - Δ + →	
L1	C x x x	DISC DRV SPD XXXX	ACTIVATE HYD PURGE - This is to allow the operator to purge the air from a new or changed pump system.
L2	M x x x	D 0 P 0 ← - Δ + →	
L1	C x x x	ACTIVATE DWA DRV	Pressing and holding the right hand "arrow" button activates a predetermined timed purge cycle. Releasing pressure on the switch or a completed cycle (timed out) will jump to the PURGE CYCLE ENDED menu selection.
L2	M x x x	D 0 P 0 ← - Δ + →	
L1	C x x x	ACTIVATE REEL F/A	If "NO" then jump to:
L2	M x x x	← FORE / AFT →	
L1	C x x x	ACTIVATE HYD PURGE?	TO ACTIVATE PURGE
L2	M x x x	← NO / YES →	
L1	C x x x	TO ACTIVATE PURGE	If "NO" then jump to:
L2	M x x x	← PRESS AND HOLD →	
L1	C x x x	PURGE CYCLE STARTED	ACTIVATE HEADER HT
L2	M x x x	← PRESS AND HOLD →	
L1	C x x x	PURGE CYCLE ENDED	If "NO" then jump to:
L2	M x x x	← →	
L1	C x x x	PURGE CYCLE ENDED	EXIT DIAGNOSTIC?
L2	M x x x	← NO EXIT YES →	
L1	C x x x	EXIT FUNCTION MENU?	If "NO" then jump to:
L2	M x x x	← NO / YES →	
L1	C x x x	FORCE HEADER TYPE? "NO" then jump to:	This allows the operator to select or "force" a header ID configuration if a "NO HEADER" ID is being read by the control system. The header type will revert back to "NO HEADER" every time the ignition is cycled. When "SELECT" is pressed the program goes to the EXIT HEADER TYPE? menu selection.
L2	M x x x	← NO / YES →	
L1	C x x x	SELECT HEADER TYPE	If "NO" then jump to:
L2	M x x x	← DISK HEADER →	
L2	M x x x	← SK AUGER →	If "NO" then jump to:
L2	M x x x	← DK AUGER →	
L2	M x x x	← GRASS SEED →	VIEW ERROR CODES?
L2	M x x x	← 20 FT SK DRAPER →	
L2	M x x x	← 25 FT SK DRAPER →	If "NO" then jump to:
L2	M x x x	← 30 FT SK DRAPER →	
L2	M x x x	← 35 FT SK DRAPER →	WINDROWER SETUP?
L2	M x x x	← 15 FT DK DRAPER →	
L2	M x x x	← 20 FT DK DRAPER →	If "YES" then jump to:
L2	M x x x	← 25 FT DK DRAPER →	
L2	M x x x	← 30 FT DK DRAPER →	OPERATING SCREENS
L2	M x x x	← 35 FT DK DRAPER →	
L2	M x x x	← 40 FT DK DRAPER →	
L1	C x x x	EXIT FORCE HEADER?	
L2	M x x x	← NO / YES →	
L1	C x x x	EXIT DIAGNOSTIC?	
L2	M x x x	← NO / YES →	
L1	C x x x	EXIT SETUP?	
L2	M x x x	← NO / YES →	

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OPERATOR'S STATION

Operating Information Screens

Cab Display Monitor - Operating Information Screens

Disk Header

L1 or L2	#####.#	ENGINE	HRS
L1 or L2	#####.#	HEADER	HRS
L1 or L2	###.#	ACRES /	HOURL
L1 or L2	#####.#	SUB	ACRES
L1 or L2	#####.#	TOTAL	ACRES
L1 or L2	#####	DISK	RPM
L1 or L2	###.#	HEADER	HEIGHT
L1 or L2	###.#	HEADER	ANGLE
L1 or L2	###.#	L FLOAT	R ###.#
L1 or L2	3 8 ° F	HYD OIL	COLD
L1 or L2	1 4 8 ° F	HYD OIL	TEMP
L1 or L2	2 2 1 ° F	HYD OIL	HOT
L1 or L2	2 3 0 ° F	HYD OIL	HOT

L1 or L2 LOAD I ■■■■■■■■■■■■■■■■■■■■■■

L1 or L2 ###.# VOLTS

L2 SCROLL

L2 DISK SPD OVERLOAD

Metric Equivalents

L1 or L2	###.#	HECTARES /	HOURL
L1 or L2	#####.#	SUB	HECTARES
L1 or L2	#####	TOTAL	HECT

L1 or L2 M155 / M205 - equipped with temp. sensor.
There are 4 different display lines depending on the oil temp.: <10 deg. C - COLD with an intermittent tone, >105 C - HOT intermittent tone and >110 C - HOT with a steady tone.

Scroll Sub-Menu

L2	#####	DISK	RPM
L2	###.#	HEADER	HEIGHT
L2	LOAD I	■■■■■■■■■■	■■■■■■■■■■

Auger Header

L1 or L2	#####.#	ENGINE	HRS
L1 or L2	#####.#	HEADER	HRS
L1 or L2	###.#	ACRES /	HOURL
L1 or L2	#####.#	SUB	ACRES
L1 or L2	#####.#	TOTAL	ACRES
L1 or L2	#####	REEL	RPM
L1 or L2	###.#	AUGER	SPEED
L1 or L2	#####	KNIFE	SPEED
L1 or L2	###.#	HEADER	HEIGHT
L1 or L2	###.#	HEADER	ANGLE
L1 or L2	###.#	L FLOAT	R ###.#
L1 or L2	3 8 ° F	HYD OIL	COLD
L1 or L2	1 4 8 ° F	HYD OIL	TEMP
L1 or L2	2 2 1 ° F	HYD OIL	HOT
L1 or L2	2 3 0 ° F	HYD OIL	HOT

L1 or L2 LOAD I ■■■■■■■■■■■■■■■■■■■■■■

L1 or L2 ###.# VOLTS

L2 SCROLL

L2 KNIFE SPD OVERLOAD

Metric Equivalents

L1 or L2	###.#	HECTARES /	HOURL
L1 or L2	#####.#	SUB	HECTARES
L1 or L2	#####	TOTAL	HECT

L1 or L2 M155 / M205 - equipped with temp. sensor.
There are 4 different display lines depending on the oil temp.: <10 deg. C - COLD with an intermittent tone, >105 C - HOT intermittent tone and >110 C - HOT with a steady tone.

Scroll Sub-Menu

L2	#####	KNIFE	SPEED
L2	###.#	HEADER	HEIGHT
L2	LOAD I	■■■■■■■■■■	■■■■■■■■■■
L2	###.#	REEL	RPM
L2	###.#	AUGER	SPEED

Draper Header

L1 or L2	#####.#	ENGINE	HRS
L1 or L2	#####.#	HEADER	HRS
L1 or L2	###.#	ACRES /	HOURL
L1 or L2	#####.#	SUB	ACRES
L1 or L2	#####.#	TOTAL	ACRES
L1 or L2	#####	REEL	MPH
L1 or L2	###.#	DRAPER	SPEED
L1 or L2	#####	KNIFE	SPEED
L1 or L2	###.#	HEADER	HEIGHT
L1 or L2	###.#	HEADER	ANGLE
L1 or L2	###.#	L FLOAT	R ###.#
L1 or L2	3 8 ° F	HYD OIL	COLD
L1 or L2	1 4 8 ° F	HYD OIL	TEMP
L1 or L2	2 2 1 ° F	HYD OIL	HOT
L1 or L2	2 3 0 ° F	HYD OIL	HOT

L1 or L2 LOAD I ■■■■■■■■■■■■■■■■■■■■■■

L1 or L2 ###.# VOLTS

L2 SCROLL

L2 KNIFE SPD OVERLOAD

Metric Equivalents

L1 or L2	###.#	HECTARES /	HOURL
L1 or L2	#####.#	SUB	HECTARES
L1 or L2	#####	TOTAL	HECT
L1 or L2	###.#	REEL	KPH

L1 or L2 M155 / M205 - equipped with temp. sensor.
There are 4 different display lines depending on the oil temp.: <10 deg. C - COLD with an intermittent tone, >105 C - HOT intermittent tone and >110 C - HOT with a steady tone.

Scroll Sub-Menu

L2	#####	KNIFE	SPEED
L2	###.#	HEADER	HEIGHT
L2	LOAD I	■■■■■■■■■■	■■■■■■■■■■
L2	###.#	REEL	MPH
L2	###.#	DRAPER	SPEED

Header Index "ON"

1001071

169883

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Revision A

OPERATOR'S STATION

L1 or L2	#####. # ENGINE HRS	
L1 or L2	#####. # HEADER HRS	
L1 or L2	###. # ACRES / HOUR	
L1 or L2	#####. # SUB ACRES	
L1 or L2	#####. # TOTAL ACRES	
L1 or L2	###. # #. # REEL IND	
L1 or L2	###. # #. # DRAP INDX	
L1 or L2	#####. # KNIFE SPEED	
L1 or L2	###. # HEADER HEIGHT	
L1 or L2	###. # HEADER ANGLE	
L1 or L2	###. # L FLOAT R #. #	
L1 or L2	3 8 ° F HYD OIL COLD	
L1 or L2	1 4 8 ° F HYD OIL TEMP	
L1 or L2	2 2 1 ° F HYD OIL HOT	
L1 or L2	2 3 0 ° F HYD OIL HOT	
L1 or L2	LOAD ■■■■■■	
L1 or L2	###. # VOLTS	
L2	SCROLL	→
L2	#####. # REEL MIN RPM	
L2	MINIMUM	
L2	#####. # KNIFE SPEED	
L2	###. # HEADER HEIGHT	
L2	LOAD ■■■■■■	
L2	###. # #. # REEL IND	
L2	###. # #. # DRAP INDX	

M155 / M205 - equipped with temp. sensor. There are 4 different display lines depending on the oil temp.: <10 deg. C - COLD with an intermittent tone, >105 C - HOT intermittent tone and >110 C - HOT with a steady tone.

Scroll Sub-Menu

Power Up & Misc. Display Information

L1	HEADER DISENGAGED	
L1	###. # FOOT DISK	
L1	IN PARK	
L1	< LEFT TURN	>
L1	RIGHT TURN	
L1	HAZARDS	
L1	ROAD GEAR	
L1	HEADER REVERSE	
L1	HEADER ENGAGED	

L1	###. # FOOT AUGER	
L1	###. # FOOT DRAPER	
L1	###. # METRE AUGER	
L1	###. # METRE DRAPER	
L1	###. # METRE DISK	

Operating Menus - Sensors Enabled		Operating Menus - Sensors Disabled	
L1 or L2	###. # REEL RPM	L1 or L2	###. # REEL SENSOR
L1 or L2	###. # AUGER SPEED	L1 or L2	###. # AUGER SENSOR
L1 or L2	#####. # KNIFE SPEED	L1 or L2	#####. # KNIFE SENSOR
L1 or L2	###. # HEADER HEIGHT	L1 or L2	###. # HEADER SENSOR
L1 or L2	###. # HEADER ANGLE	L1 or L2	###. # HEADER SENSOR
L1 or L2	###. # L FLOAT R #. #	L1 or L2	FLOAT SENS DISABLED
L1 or L2	1 4 8 ° F HYD OIL TEMP	L1 or L2	1 4 8 ° F HYD SENSOR
L1 or L2	LOAD ■■■■■■	L1 or L2	PRESSURE SENSOR

Operator presses PROGRAM / SELECT in the tractor setup menu or while the header is engaged - SPEED UNLOCKED.

L1	SET KNIFE SPEED?		
L2	← 1 2 0 0 SPM →		

Normal display with knife speed unlocked.

Operator presses PROGRAM / SELECT in the tractor setup menu or while the header is engaged - SPEED LOCKED.

L1	KNIFE SPEED LOCKED		
L2	← 1 2 0 0 SPM →		

Top line of display changes to this if locked. Pressing the arrow keys does not change the speed.

L1 or L2	###. # HEADER ANGLE		
----------	---------------------	--	--

Using the CDM or GSL SELECT button will display the standard information. If the GSL switch for the tilt function is pressed the display will not toggle to the function but display:

HEADER TILT LOCKED

L1 or L2	###. # L FLOAT R #. #		
----------	-----------------------	--	--

The CDM will show the "normal" float display when selected by using the SELECT button (CDM or GSL). If the CDM LHS or RHS FLOAT switches are pressed the display will show:

HEADER FLOAT LOCKED

OPERATOR'S STATION

If the CDM or GSL select switch is pressed the CDM will display the values from the sensors (unless disabled). It is only when the function switch (that would activate a valve) is pressed that the display would show "LOCKED" for that function.

AUGER HEADER

HEADER TILT	H	E	A	D	E	R	T	I	L	T	L	O	C	K	E	D		
HEADER FLT	H	E	A	D	E	R	F	L	O	A	T	L	O	C	K	E	D	
REEL	F	O	R	E	/	A	F	T	L	O	C	K	E	D				
AUGER SPD	A	U	G	E	R	S	P	E	E	D	L	O	C	K	E	D		
KNIFE SPEED	K	N	I	F	E	S	P	E	E	D	L	O	C	K	E	D		
REEL SPEED	R	E	E	L	S	P	E	E	D	L	O	C	K	E	D			

ALTERNATE DISPLAY - LOCKED AT RHS

HEADER TILT	H	E	A	D	E	R	T	I	L	T		L	O	C	K	E	D	
HEADER FLT	H	E	A	D	E	R	F	L	O	A	T		L	O	C	K	E	D
REEL	F	O	R	E	/	A	F	T					L	O	C	K	E	D
AUGER SPD	A	U	G	E	R	S	P	E	E	D			L	O	C	K	E	D
KNIFE SPEED	K	N	I	F	E	S	P	E	E	D			L	O	C	K	E	D
REEL SPEED	R	E	E	L	S	P	E	E	D				L	O	C	K	E	D

DRAPER HEADER

HEADER TILT	H	E	A	D	E	R	T	I	L	T	L	O	C	K	E	D		
HEADER FLT	H	E	A	D	E	R	F	L	O	A	T	L	O	C	K	E	D	
REEL	F	O	R	E	/	A	F	T	L	O	C	K	E	D				
DRAPER SPD	D	R	A	P	E	R	S	P	E	E	D	L	O	C	K	E	D	
KNIFE SPEED	K	N	I	F	E	S	P	E	E	D	L	O	C	K	E	D		
REEL SPEED	R	E	E	L	S	P	E	E	D	L	O	C	K	E	D			

DRAPER HEADER

HEADER TILT	H	E	A	D	E	R	T	I	L	T		L	O	C	K	E	D	
HEADER FLT	H	E	A	D	E	R	F	L	O	A	T		L	O	C	K	E	D
REEL	F	O	R	E	/	A	F	T	L	O	C		L	O	C	K	E	D
DRAPER SPD	D	R	A	P	E	R	S	P	E	E	D		L	O	C	K	E	D
KNIFE SPEED	K	N	I	F	E	S	P	E	E	D			L	O	C	K	E	D
REEL SPEED	R	E	E	L	S	P	E	E	D				L	O	C	K	E	D

DISK HEADER

HEADER TILT	H	E	A	D	E	R	T	I	L	T	L	O	C	K	E	D		
HEADER FLT	H	E	A	D	E	R	F	L	O	A	T	L	O	C	K	E	D	
DRAPER SPD	D	I	S	K	S	P	E	E	D	L	O	C	K	E	D			

DISK HEADER

HEADER TILT	H	E	A	D	E	R	T	I	L	T		L	O	C	K	E	D	
HEADER FLT	H	E	A	D	E	R	F	L	O	A	T		L	O	C	K	E	D
DRAPER SPD	D	I	S	K	S	P	E	E	D				L	O	C	K	E	D

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OPERATOR'S STATION

3.18.6 Engine Error Codes

The cab display module (CDM) displays error codes when there is a fault with one of the several sensors that monitor and control engine operation, to assist the Operator or Technician in locating a specific problem with engine operation. Refer to [8 Engine Error Codes, page 411](#).

3.18.7 Cab Display Module (CDM) and Windrower Control Module (WCM) Fault Codes

The CDM displays fault codes when there is a fault with one of the several sensors that monitor and control windrower operation, to assist the Operator or Technician in locating a specific problem with the windrower. Refer to [9 Cab Display Module \(CDM\) Error Codes, page 429](#).

4 Operation

4.1 Owner/Operator Responsibilities



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 the manual and on safety signs on the machine.
- 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, make sure they have been instructed in its safe and proper use.
- Review the manual and all safety related items with all Operators annually.
- 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 machine. Unauthorized modifications may impair the function and/or safety and affect machine life.
- The safety information given in this manual does NOT replace safety codes, insurance needs, or laws governing your area. Be sure your machine meets the standards set by these regulations.

OPERATION

4.2 Symbol Definitions

The following symbols are used to depict functions or reactions at the various instruments and controls. Learn the meaning of these symbols before operating the windrower.

4.2.1 Engine Functions

These are the symbols that are used on the console.

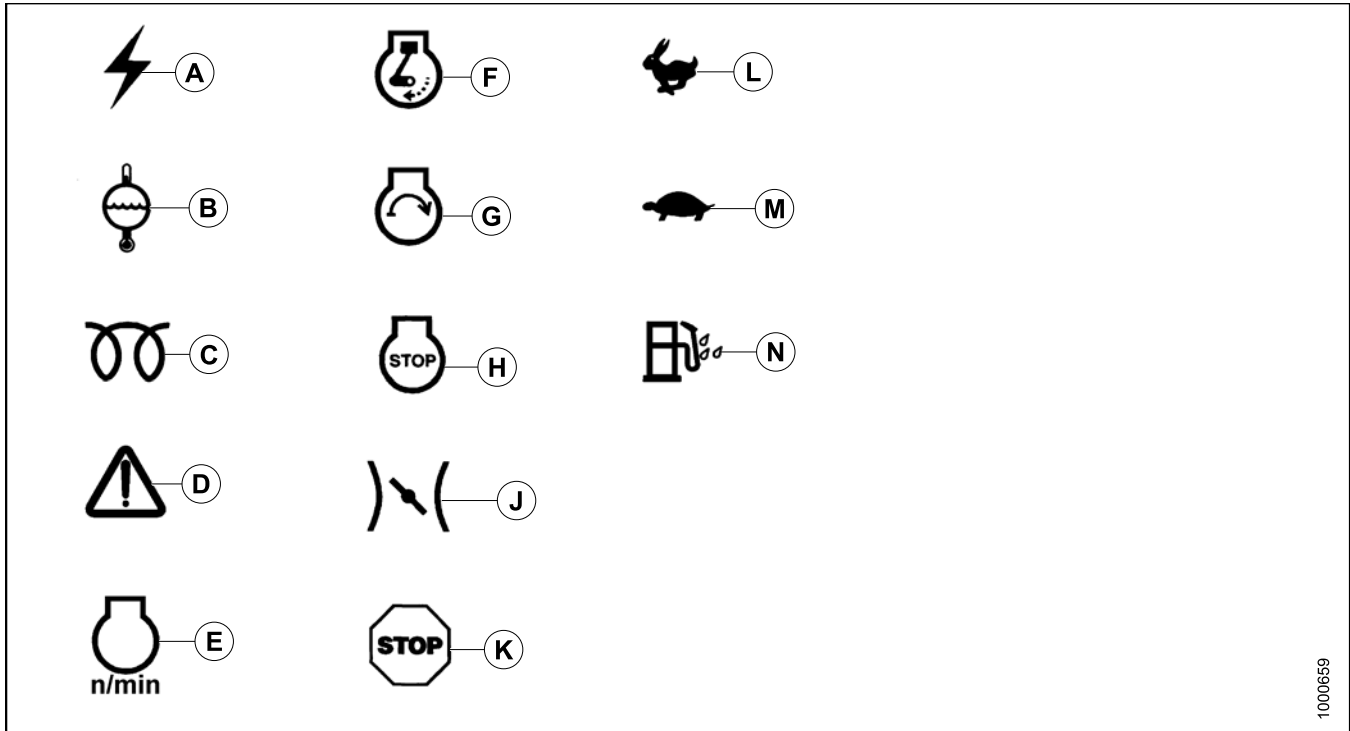


Figure 4.1: Engine Function Symbols

- | | | |
|------------------------------------|--------------------------------|-----------------------|
| 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 | | |

OPERATION

4.2.2 Windrower Operating Symbols

These are the symbols used on the console for windrower operation.

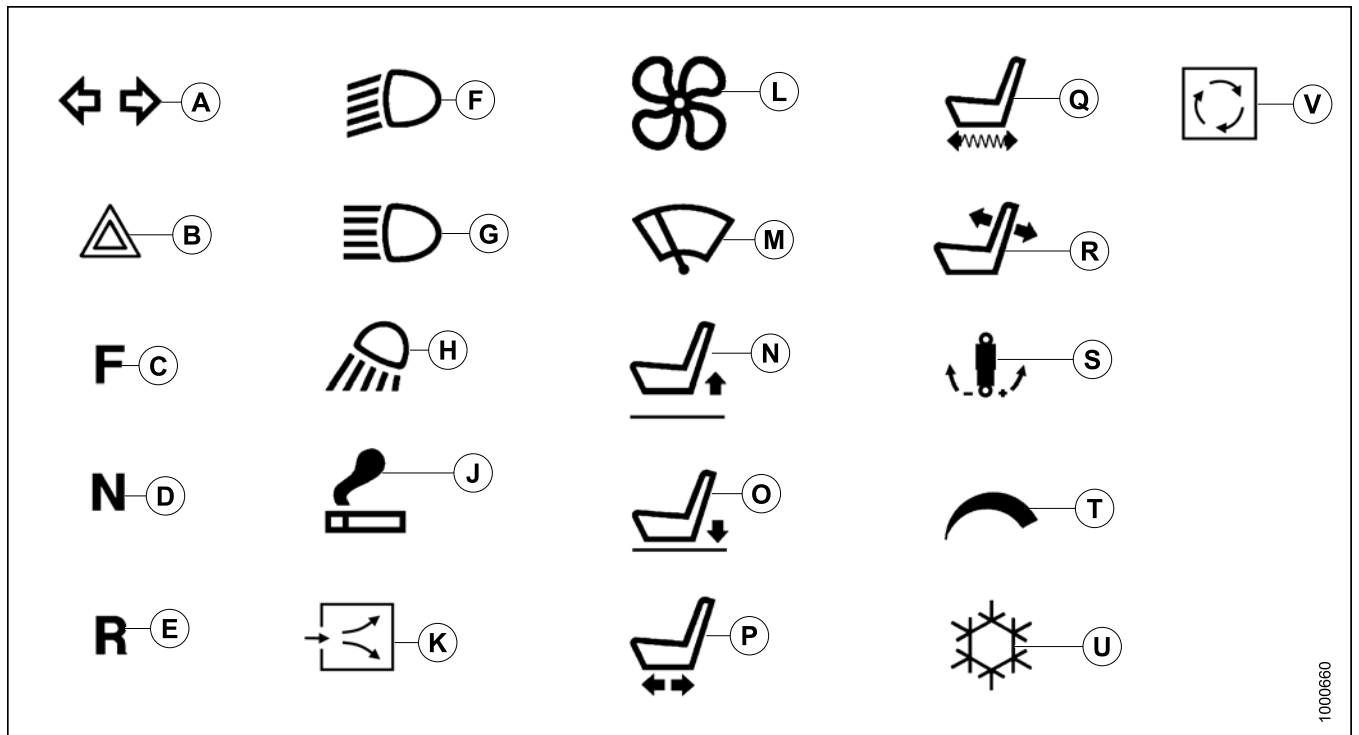


Figure 4.2: Windrower Operating Symbols

A - Turn Signals

C - Forward

E - Reverse

G - Headlights High Beam

J - Lighter

L - Blower

N - Seat Height Up

P - Seat Fore and Aft

R - Seat Back Fore and Aft

T - Cab Temperature Control

V - Recirculate

B - Hazard Warning Lights

D - Neutral

F - Headlights Low Beam

H - Work Light

K - Fresh Air

M - Windshield Wiper

O - Seat Height Down

Q - Seat Fore Aft Isolator

S - Seat Ride Damping

U - Air Conditioning

OPERATION

4.2.3 Header Functions

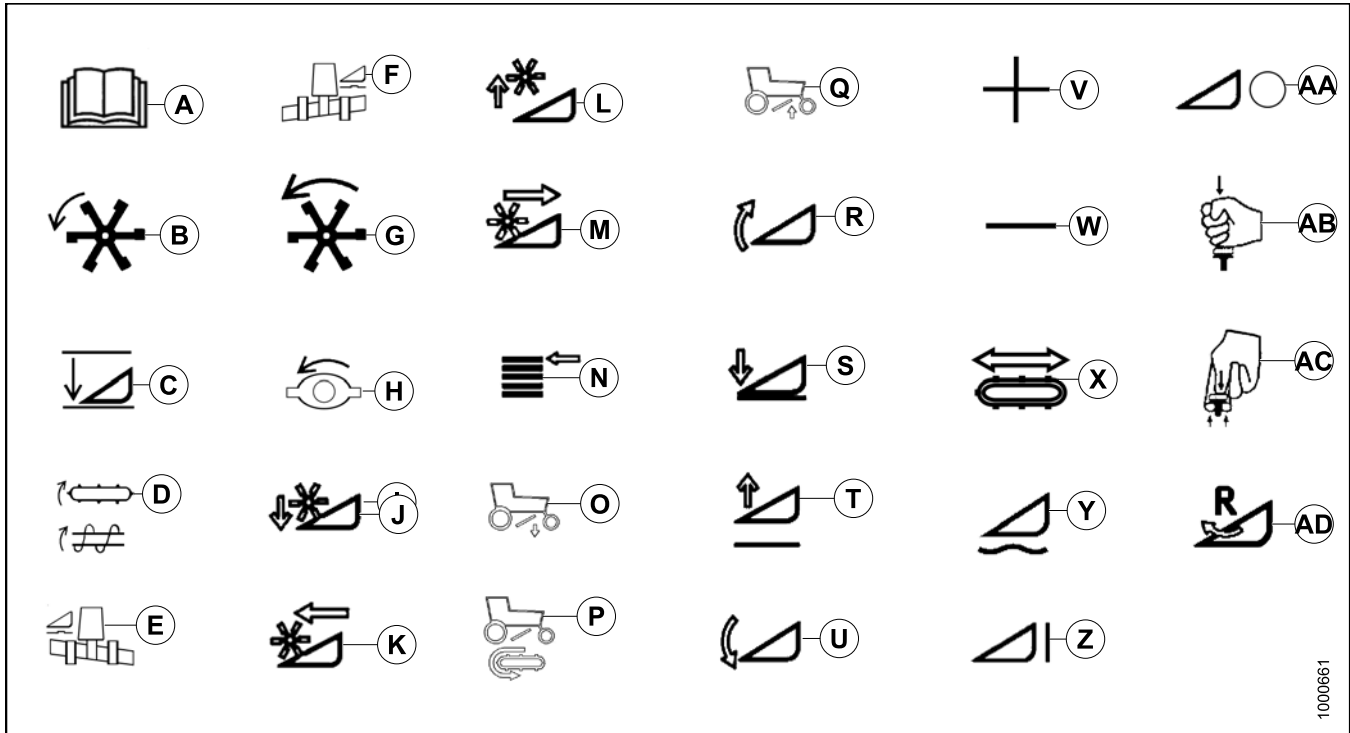


Figure 4.3: Header Function Symbols

- | | | |
|----------------------------|-----------------------|---------------------------------|
| 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 | O - DWA Down | P - DWA Draper Speed |
| Q - DWA Up | R - Header Tilt Up | S - Header Down |
| T - Header Up | U - Header Tilt Down | V - Increase |
| W - Decrease | X - Deck Shift | Y - Float |
| Z - Header Engage | AA - Header Disengage | AB - Push Down Header Disengage |
| AC - Pull Up Header Engage | AD - Header Reverse | |

4.3 Operating the Windrower

4.3.1 Operational Safety

CAUTION

Follow these safety precautions:

- Wear close fitting clothing and protective shoes with slip resistant soles.
- Remove foreign objects from the machine and surrounding area.
- Carry with you any protective clothing and personal safety devices that **COULD** be necessary through the day. Don't take chances.
- You may need:
 - a hard hat
 - protective glasses or goggles
 - heavy gloves
 - respirator or filter mask
 - wet weather gear

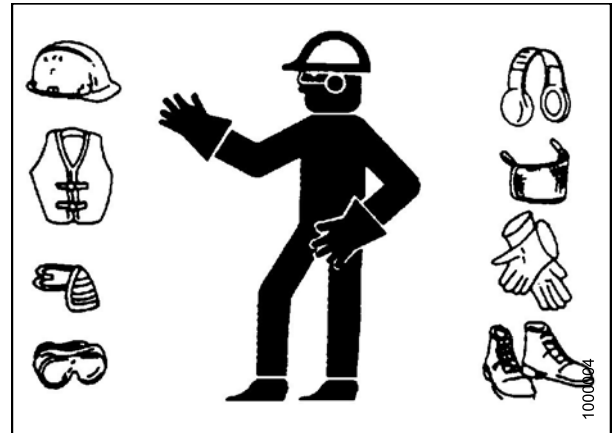


Figure 4.4: Safety Equipment

- Protect against noise. Wear a suitable hearing protective device such as ear muffs or ear plugs to protect against objectionable or uncomfortable loud noises.
- Follow all safety and operational instructions given in your operator's manuals. If you do not have a header 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 [Shutting Down the Engine, page 109](#).
- Operate only in daylight or good artificial light.



Figure 4.5: Safety Equipment

OPERATION

4.3.2 Break-In Period

The windrower is ready for normal operation. However there are several items to check and watch out for during the first 150 hours.

In addition to the following, perform the items specified in [Break-In Inspections, page 383](#).

DANGER

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

IMPORTANT:

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

- Operate engine at moderate load and avoid extremely heavy or light loading for longer than 5 minutes.
- Avoid unnecessary idling. If engine will be idling longer than 5 minutes after reaching operating temperature, turn key OFF to stop engine.
- Check engine oil level frequently. Watch for any signs of leakage. If oil must be added, refer to [Checking Engine Oil Level, page 293](#).

NOTE: During the break-in period, a higher than usual oil consumption should be considered normal.

NOTE: If windrower must be driven in cold weather (below freezing), let engine idle for 3 minutes, and then operate at moderate speed until oil has warmed up.

- Watch coolant gauge in cab for temperature rising beyond normal operating range. Check that coolant level at reserve tank (mounted next to radiator) stays between HOT and COLD marks on tank. Refer to [Engine Cooling System, page 310](#). If over-heating problems occur, check for coolant leaks.

4.3.3 Preseason Checks/Annual Service

CAUTION

- Review the operator's manual to refresh your memory on safety and operating recommendations.
 - Review all safety signs and other decals on the windrower and note hazard areas.
 - Be sure all shields and guards are properly installed and secured. Never alter or remove safety equipment.
 - Be sure you understand and have practiced safe use of all controls. Know the capacity and operating characteristics of the machine.
 - Store a properly stocked first aid kit and charged fire extinguisher on the windrower.
1. Perform the following checks:
 - a. Drain off excess hydraulic oil added for storage. Refer to [Draining Hydraulic Oil, page 362](#).
 - b. Remove plastic bags and/or tape from all sealed openings (air cleaner intake, exhaust pipe, fuel tank).
 - c. Charge battery and install. Be sure terminals are clean and cables are connected securely.
 - d. Adjust tension on A/C compressor belt. Refer to [Tensioning A/C Compressor Belt, page 325](#).
 - e. Distribute A/C refrigerant by cycling A/C switch. Refer to [A/C Compressor Coolant Cycling, page 105](#).

OPERATION

- f. Check the entire air conditioning system for leakage at the beginning of each season.
2. Perform annual maintenance. Refer to [5.7.11 Maintenance Schedule, page 382](#).

A/C Compressor Coolant Cycling

Cycle A/C switch to distribute A/C refrigerant oil as follows:

IMPORTANT:

Perform the following steps whenever the machine is first started after storage for more than one week:

1. Turn blower switch (A) to the first position, turn temperature control switch (D) to maximum heating, and A/C control switch (B) to OFF.
2. Start engine, and operate at low idle until engine is warm.
3. Click A/C switch (B) from OFF to ON for one second, then back to OFF for 5 to 10 seconds. Repeat this step ten times.

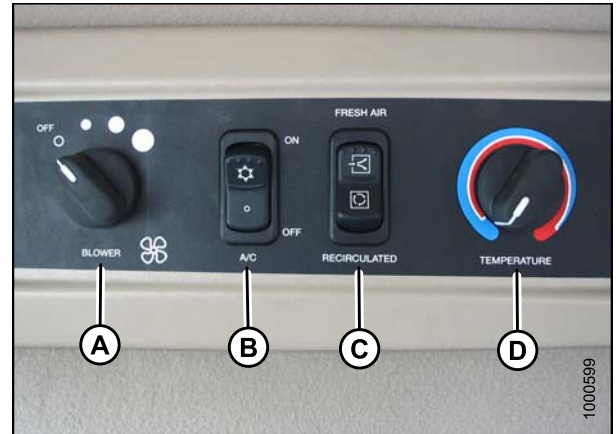


Figure 4.6: Climate Control

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

4.3.4 Daily Check

1. Check the machine for leaks or any parts that are missing, broken, or not working correctly.

NOTE: Use proper procedure when searching for pressurized fluid leaks. Refer to [Hoses and Lines, page 369](#).

2. Clean the windows and mirrors to be sure of 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 anti-slip strips to wash the front window.
3. Clean all lights and reflective surfaces to maintain visibility to others.
4. Perform daily maintenance. Refer to [5.7.11 Maintenance Schedule, page 382](#).

OPERATION

4.3.5 Engine Operation

Starting the Engine

⚠ DANGER

- Avoid possible injury or death from a runaway machine.
- This machine has safety devices which allow the engine to start only when the ground speed lever is in N-DETENT, 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 controls out of NEUTRAL.
- Do NOT start engine by shorting across starter or starter relay terminals. Machine will start with drive engaged and move if normal starting circuitry is bypassed.
- Start engine only from operator's seat with controls in NEUTRAL. NEVER start engine while standing on ground. Never try to start engine with someone under or near machine.
- Before starting engine, be sure there is plenty of ventilation to avoid asphyxiation.

IMPORTANT:

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

⚠ WARNING

Before starting engine, securely fasten your seat belt and ensure trainer's seat belt is fastened if occupied. The seat belt can help ensure your safety if it is used and maintained.

1. The battery main disconnect switch is located on the RH frame rail, behind the maintenance platform, and can be accessed by moving the platform. Ensure switch is switched to POWER ON position.

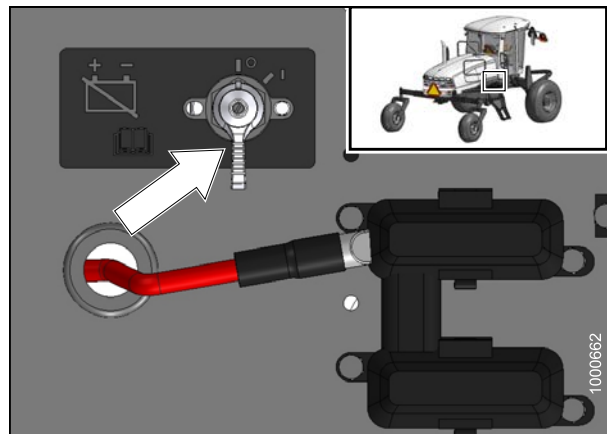


Figure 4.7: Battery Disconnect Switch

OPERATION

2. Ensure lock (A) at the base of the steering column is engaged at cab-forward or engine-forward position.
3. Move ground speed lever (GSL) (B) into N-DETENT.
4. Turn steering wheel until it locks. It may be possible to move the steering wheel slightly in the locked position.

IMPORTANT:

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

5. Fasten seat belt.
6. Push HEADER DRIVE switch (C) to ensure it is OFF.

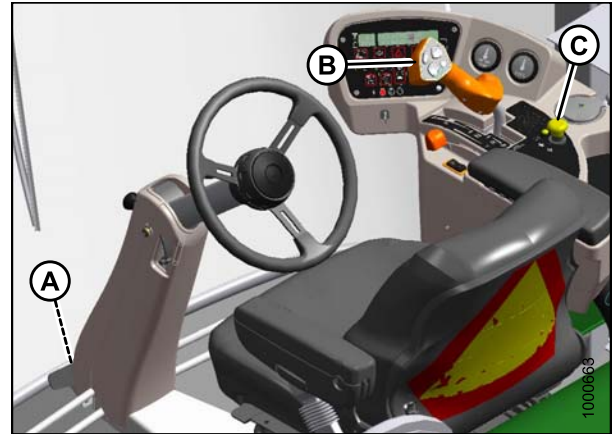


Figure 4.8: Operator Controls

Normal Start

Engine temperature above 60°F (16°C):

WARNING

If starter engages with steering wheel unlocked, ground speed lever out of NEUTRAL, or header clutch engaged, DO NOT START ENGINE. See your Dealer.

1. Set throttle (A) to START position—fully back.

IMPORTANT:

The machine gauges and instruments provide important information about machine operation and condition. Familiarize yourself with the gauges and monitor them carefully during start-up operation. Refer to [3.15 Engine Controls and Gauges, page 63](#).



Figure 4.9: Operator Console

CAUTION

Check to be sure all bystanders have cleared the area.

2. Sound horn three times.
3. Turn ignition key (B) to RUN position. Single loud tone sounds, engine warning lights illuminate as a self-test, and cab display module (CDM) displays “HEADER DISENGAGED” and “IN PARK”.
4. Turn ignition key (B) to START position until engine starts, and then release key. CDM displays programmed header data for 5 seconds if attached, and then returns to previous display.

OPERATION

IMPORTANT:

- Do **NOT** operate starter for longer than 15 seconds at a time.
- If engine does not start, wait at least two minutes before trying again.
- After the third 15 second crank attempt, allow solenoid to cool for 10 minutes before further cranking attempts. If engine still does not start, refer to [6.1 Engine Troubleshooting, page 387](#).

Cold Start

WARNING

If starter engages with steering wheel unlocked, ground speed lever out of NEUTRAL, or header clutch engaged, **DO NOT START ENGINE**. See your Dealer.

IMPORTANT:

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

When the engine temperature is below 40°F (5°C), follow the procedure for a normal start. Refer to [Normal Start, page 107](#). The engine will cycle through a period where it appears to labor until the engine warms up. The throttle is nonresponsive during this time as the engine is in “WARM UP” mode. This mode will last from 30 seconds to 3 minutes depending on the temperature. After the engine has stabilized and is idling normally, the throttle becomes active.

Engine Warm-Up

Allow engine to run with throttle lever (A) at or near low idle position until temperature gauge (B) reaches approximately 100°F (40°C).

NOTE: Scroll through cab display module (CDM) for engine temperature.



Figure 4.10: Operator Console

Engine Intermediate Speed Control (ISC)

The engine operating speed can be programmed to enable the windrower to operate at reduced engine rpm (that is, 1800, 2000, or 2200 rpm) without significantly affecting the ground or header speeds. The default setting is 2200 rpm or the last selected rpm.

NOTE: Previous M-Series windrower models included an OFF (full throttle) option which is **NOT** available on the M155.

OPERATION

Engine ISC is useful when operating loads are reduced such as in light crop conditions that do not require the maximum engine rpm. Reduced engine speed lowers fuel consumption, noise levels, and exhaust emissions in addition to reducing engine wear.

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

Programming instructions are provided in [3.18.5 Cab Display Module \(CDM\) Programming, page 86](#).

Shutting Down the Engine

CAUTION

Park on a flat, level surface, header on the ground, and the ground speed lever in N-DETENT position and steering wheel locked.

IMPORTANT:

Before stopping engine, run at low idle for approximately five minutes to cool hot engine parts (and allow turbocharger to slow down while engine oil pressure is available).

1. Lower header.
2. Place ground speed lever (GSL [B]) into N-DETENT.
3. Lock steering wheel.
4. Turn ignition key (A) counterclockwise to OFF position.



Figure 4.11: Operator Console

Fuelling

Fill fuel tank daily, preferably at the end of the day's operation to help prevent condensation in the tank.

CAUTION

Do NOT allow tank to empty. Running out of fuel can cause air locks and/or contamination of the fuel system. Refer to [System Priming, page 310](#).

WARNING

- **To avoid personal injury or death from explosion or fire, do NOT smoke or allow flame or sparks near fuel tank when refueling.**
 - **NEVER refuel the windrower when the engine is hot or running.**
1. Stop windrower and remove key.
 2. Stand on either platform to access the fuel tank filler pipe.

OPERATION

3. Clean the area around filler cap (A).
4. Turn cap handle (B) counterclockwise until loose and then remove cap.
5. Fill tank with approved fuel. Refer to *Lubricants, Fluids, and System Capacities*, page 263.

IMPORTANT:

Do **NOT** fill 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 snug.

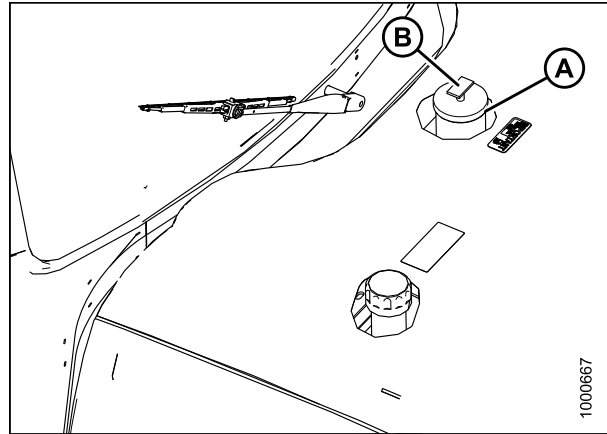


Figure 4.12: Fuel Cap

Engine Temperature

The normal engine operating temperature range is 180–225°F (82–107°C) and is indicated by the temperature gauge (B) on the operator's console.

If the temperature exceeds 230°F (110°C), an ongoing intermittent tone will be heard and the cab display module (CDM) will flash "ENGINE TEMP". Stop the engine **immediately** and determine cause. The tone will stop and the CDM will return to normal when the temperature drops below 225°F (107°C).



Figure 4.13: Operator Console

Engine Oil Pressure

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

If the oil pressure drops below the preset level of 7.5 psi (52 kPa), the cab display module (CDM) flashes an error code and error message.

If the STOP ENGINE light illuminates, stop the engine **IMMEDIATELY** and investigate.

If the yellow CAUTION light illuminates, stopping immediately is optional. You may continue operations and investigate later, but you are **STRONGLY** advised to monitor the situation carefully.

OPERATION

Electrical

The electrical system voltage is displayed on the cab display module (CDM) when selected with the SELECT button on the ground speed lever (GSL) handle or the SELECT switch on the CDM. The display indicates the condition of the battery and alternator.

Ignition	Engine	Reading	Indicated Condition
ON	Running	13.8–15.0	Normal
		> 16.0 ¹³	Regulator out of adjustment
		< 12.5 ¹³	Alternator not working or regulator out of adjustment
	Shut down	12.0	Battery normal

Engine Warning Lights

There are four engine warning lights that illuminate if abnormal conditions occur while the engine is running. The engine warning lights should **NOT** be illuminated under normal operating conditions. For more information, refer to [Engine Warning Lights, page 82](#).

4.3.6 Windrower Operation

WARNING

- Before starting engine, securely fasten your seat belt and ensure trainer's seat belt is fastened if occupied.
- The seat belt can help ensure your safety if it is used and maintained.
- Never wear a seat belt loosely or with 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 header removed. Removing header decreases the weight on drive wheels, reducing steering control.
- If necessary to drive machine with header removed, use transmission field speed range, do NOT exceed 1500 rpm engine speed and avoid loose gravel and slopes.
- Never use windrower as a towing vehicle when header is removed, except as instructed in [Towing Header with Windrower, page 124](#). There is insufficient weight on the drive wheels to provide steering control.
- Because of windrower shape characteristics, a roll-over protected (ROPS) cab is not required. If operating with header removed, be aware that cab structure will NOT withstand a roll-over.

13. Display flashes voltage reading with single loud tone. Repeats every 30 minutes until condition is fixed.

OPERATION

CAUTION

HYDROSTATIC STEERING

- Turning the steering wheel varies the hydraulic flow to one drive wheel relative to the other drive wheel.
- The reaction of this type of steering is different from conventional steering mechanisms.

CAUTION

- With the engine running, moving the ground speed lever out of N-DETENT unlocks steering. Any movement of steering wheel will then cause the machine to move, even if the ground speed lever has not been moved forward or rearward from the NEUTRAL position.
- Hydrostatic steering is more sensitive than mechanical steering.
- Steering is opposite to normal when driving in reverse.
- The brakes are only on when the ground speed lever (GSL) is in N-DETENT and the steering wheel is centered and locked.

DANGER

- NEVER move the ground speed lever or steering wheel until you are sure all bystanders have cleared the area.
- Make sure area is clear before making turns, as the ends of a header travel in a large arc.
- Check the operation of all controls in a safe, clear area before starting work.
- Do know the capacity and operating characteristics of your machine.
- Do NOT allow riders in or on the machine.
- Do NOT operate unless seated in the operator's position.
- Do NOT attempt to get on or off 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 operating. Foreign objects may be forcibly ejected.

OPERATION

Ingress/Egress

CAUTION

To provide more secure hand and foot mobility, preventing 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 on level ground if possible.
- Be sure ground speed lever is in N-DETENT and steering wheel is locked in the straight-ahead position.
- Fully lower header and reel.
- Disengage header drives.
- Stop engine and remove key from ignition. A child or even a pet could engage an idling machine.
- Turn off wipers.
- Turn off lights unless required for inspection purposes.
- Release seat belt.
- Raise armrest and steering wheel for easier exit and re-entry.
- Lock the cab door when leaving the windrower unattended. (When the door is locked, it can still be opened from inside the cab.)

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 right cab-forward side platform is shown above 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 the door opposite the operator's console.

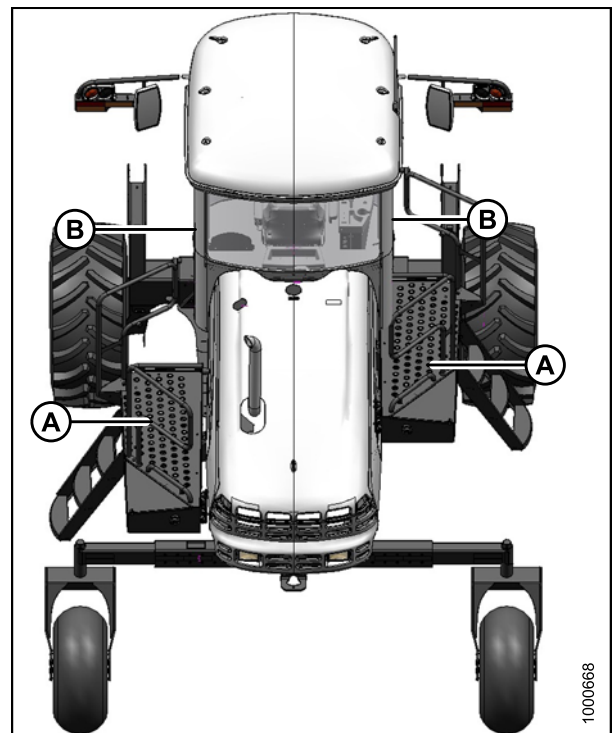


Figure 4.14: Platforms and Doors

OPERATION

Driving Forward in Cab-Forward Mode

WARNING

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

Operator's station must be facing away from the engine. If necessary, swivel operator's seat to cab-forward position as follows:

1. Place ground speed lever (GSL) (A) in N-DETENT. Engine can be running.

IMPORTANT:

If GSL is NOT in N-DETENT, damage to the GSL cable may result when swivelling operator's station.

2. Pull up on knob (B) and hold to release latch (C) at base of steering column.
3. Turn steering wheel counterclockwise to pivot operator's station clockwise 180° until pin engages latch to secure operator's station in new position.
4. Ensure seat belt is fastened.
5. Start engine if not running. Refer to [Starting the Engine, page 106](#).
6. There are two cab-forward speed ranges. Set ground speed range switch (A) to either **H** (0–16 mph [25.7 km/h]), or **L** (0–11 mph [17.7 km/h]).
7. Slowly push throttle (B) to full forward (operating speed). cab display module (CDM) should display 2320–2350 rpm at (C).

CAUTION

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

8. Move the GSL (E) out of N-DETENT and slowly forward to desired speed which will be displayed at (D).

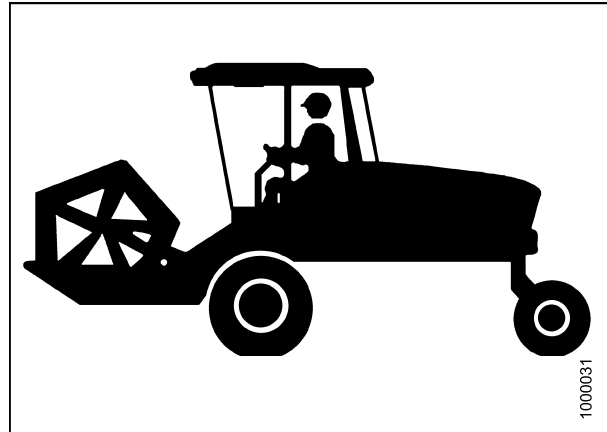


Figure 4.15: Cab-Forward Mode



Figure 4.16: Operator Console



Figure 4.17: Operator Console

OPERATION

CAUTION

Operate both steering wheel and ground speed lever slowly for familiarization. Avoid the common tendency of new Operators to oversteer.

IMPORTANT:

The windrower can be equipped with an automatic steering system for use in the field. An automated steering system is available as an option and can be installed by a MacDon Dealer. The GSL has been pre-wired at the factory with a switch. Also refer to [7.1.2 Automated Steering Systems, page 405](#).

Driving in Reverse in Cab-Forward Mode

WARNING

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

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

NOTE: Reversing in low speed range and at reduced engine speed is recommended since steering will be less sensitive than at higher speed settings.

CAUTION

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

3. Move the ground speed lever (GSL) rearward to desired speed.
4. Steer as shown.



Figure 4.18: Operator's Console

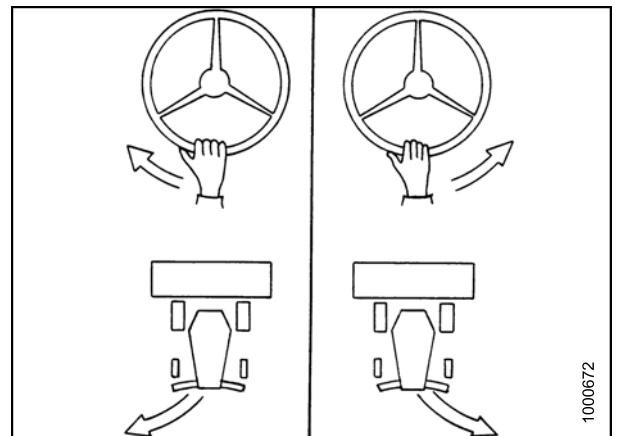


Figure 4.19: Cab-Forward Mode

OPERATION

Driving Forward in Engine-Forward Mode

Operator's station must be facing toward the engine. If necessary, swivel operator's station to engine-forward position as follows:

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

IMPORTANT:

If GSL is **NOT** in N-DETENT, damage to the GSL cable may result when swivelling operator's station.

2. Pull up on knob (B) and hold to release latch (C) at base of steering column.
3. Turn steering wheel clockwise to pivot operator's station counterclockwise 180° until pin engages latch to secure operator's station in new position.
4. Start engine if not running. Refer to [Starting the Engine, page 106](#).
5. Set ground speed range switch (A) to **H** for road speed (0–23 mph [37 km/h]). cab display module (CDM) will display ROAD GEAR at (F) and an alarm will briefly sound.
6. Slowly push throttle (B) to full forward (operating speed). CDM should display 2320–2350 rpm at (C).

⚠ CAUTION

Check to be sure all bystanders have cleared the area.

7. Slowly move the GSL (E) forward to desired speed which will be displayed at (D).

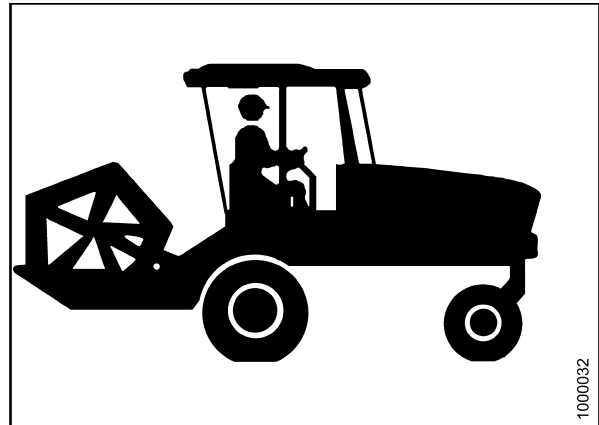


Figure 4.20: Engine-Forward – Seat Faces Engine



Figure 4.21: Engine-Forward – Seat Faces Engine

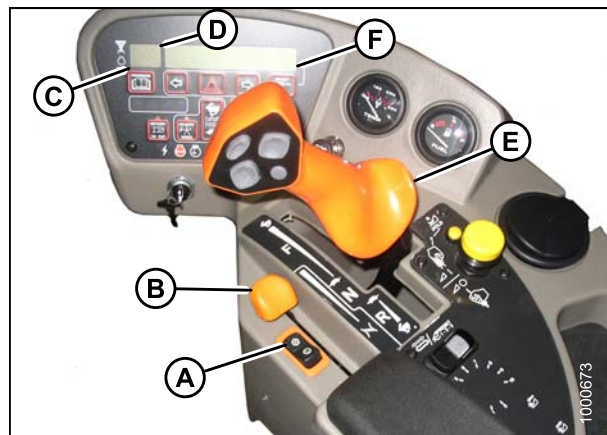


Figure 4.22: Operator Console

OPERATION

CAUTION

Operate both steering wheel and ground speed lever slowly for familiarization. Remember that steering is more sensitive when speed-range control is in road speed position. Avoid the common tendency of new Operators to over-steer.

8. If more tractive (lugging) power is required (for example, when driving up a ramp, up a hill, or up out of a ditch):
 - a. Move the GSL (E) closer to NEUTRAL.
 - b. Switch speed-range control (B) to **L** (low range).
9. Once the lugging condition no longer exists:
 - a. Set GSL (E) to **NOT MORE THAN HALF** maximum forward speed.
 - b. Move speed-range control (B) to **H** (high-range). Steering is more sensitive in this speed range.



Figure 4.23: Operator Console

Driving in Reverse in Engine-Forward Mode

WARNING

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

1. Move speed-range switch (A) to L.
 2. Move throttle lever (B) to a mid-range position
- NOTE:** Reversing in low speed range and at reduced engine speed is recommended since steering will be less sensitive than at higher speed settings.



Figure 4.24: Operator Console

OPERATION

CAUTION

Check to be sure all bystanders have cleared the area.

3. Move the ground speed lever (GSL) (C) rearward to desired speed.
4. Steer as shown.

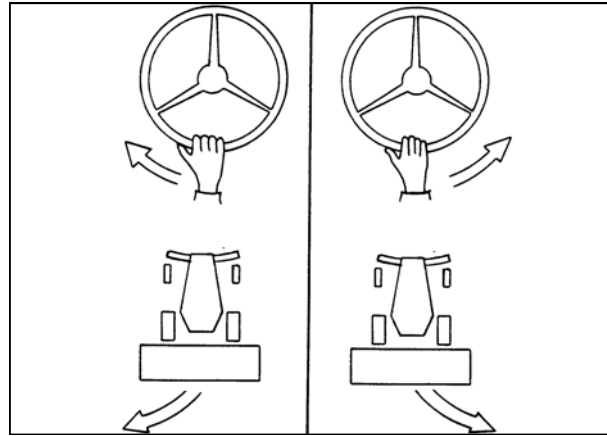


Figure 4.25: Steering the Windrower

Spin Turning

Hydrostatic steering provides significantly more manoeuvrability than mechanical steering.

CAUTION

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

1. Move the ground speed lever (GSL) (A) out of N-DETENT towards the seat and hold.
2. Slowly turn the steering wheel in the desired direction of turn. The windrower will pivot between the drive wheels.
3. To increase the turn radius, slowly move the GSL away from NEUTRAL. Remember that this will increase ground speed as well.
4. To stop the turn, slowly turn the steering wheel back to its centered position.



Figure 4.26: Operator Console

Stopping

WARNING

Do NOT move ground speed lever rapidly back to NEUTRAL. You may be thrown forward by sudden stop. Always wear seat belt when operating windrower.

OPERATION

To stop the windrower:

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

NOTE: Avoid unnecessary idling. Stop engine if it will be idling for longer than 5 minutes.

4. Brakes are automatically engaged when steering wheel is locked in NEUTRAL position.

IMPORTANT:

Before stopping engine, run at low idle for approximately 5 minutes to cool hot engine parts (and allow turbocharger to slow down while engine oil pressure is available).

5. Turn ignition key counterclockwise to OFF position.



Figure 4.27: Operator Console

4.3.7 Adjusting Caster Tread Width

The rear casters can be adjusted to a narrow tread width to allow loading and shipping without having to remove them.

A narrow tread width also suits smaller headers by allowing more space to the uncut crop and provides more manoeuvrability around poles, irrigation inlets, or other obstacles.

A wider tread width is useful in heavy crops that produce large windrows so that runover is reduced.

CAUTION

Park on a flat, level surface, header on the ground, and the ground speed lever in N-DETENT position and steering wheel locked.

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

Adjust the caster tread width as follows:

1. Raise rear of windrower slightly so that most of the weight is off the casters, using a jack or other lifting device under the frame at (B).

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

2. Remove six bolts (A) four on backside, two on underside, and washers from left and right side of walking beam.

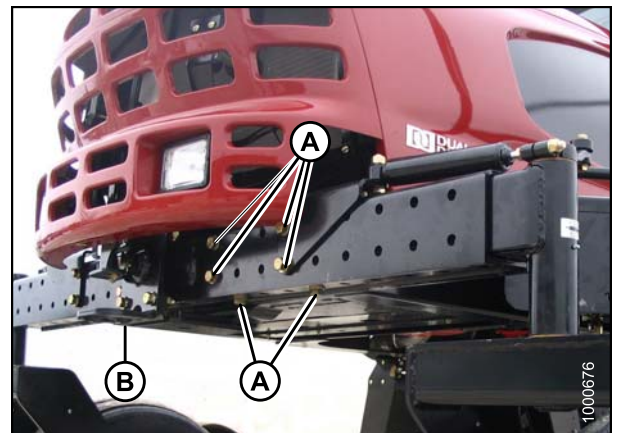


Figure 4.28: Caster Wheel Extensions

OPERATION

- Slide extensions inboard or outboard equal amounts and align holes at desired location.

NOTE: Use the caster wheels to assist in moving the axle by rotating the caster so that wheel is parallel to the axle.



Figure 4.29: Caster Wheel Extensions

IMPORTANT:

Caster wheels must be equidistant from center of windrower.

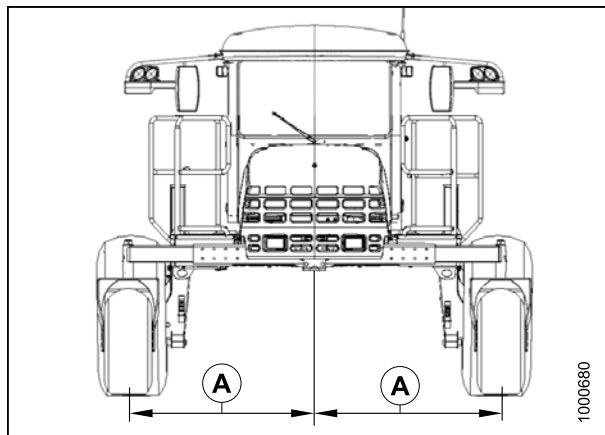


Figure 4.30: Adjustable Caster Wheels

- Line up holes then install shorter bottom bolts (B).
- Position bracket (A) and install back bolts (C).
- Tighten bolts as follows:
 - Snug bottom bolts (B), then snug back bolts (C).
 - Tighten and torque back bolts (C) to 330 ft·lbf (447 N·m).
 - Tighten and torque bottom bolts (B) to 330 ft·lbf (447 N·m).
- Lower windrower to ground.

IMPORTANT:

Torque bolts after first 5 and 10 hours of operation.

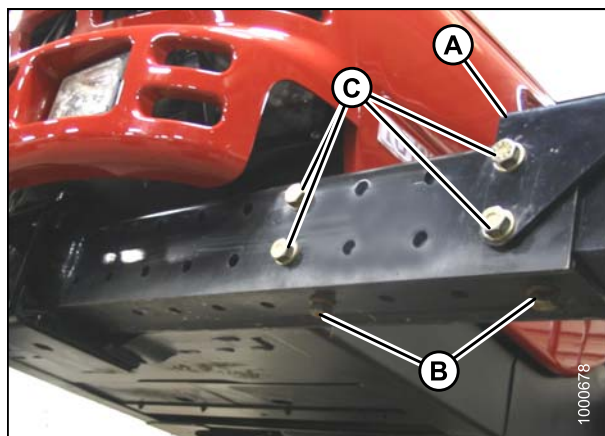


Figure 4.31: Caster Wheel Extensions

OPERATION

4.3.8 Transporting the Windrower

Driving on the Road

The M155 Self-Propelled Windrower is designed to be driven on the road with the engine forward to provide better visibility for the Operator and improved stability for the machine. The windrower is also capable of being driven on the road in cab-forward mode, but at a reduced speed and under restricted conditions.

WARNING

Collision between windrower and other vehicles may result in injury or death.

WARNING

When driving windrower on public roadways:

- Obey all highway traffic regulations in your area. Use pilot vehicles in front and rear of windrower if required by law.
- Use slow moving vehicle emblem and flashing warning lights unless prohibited by law.
- If width of attached header impedes other vehicle traffic, remove header and install a MacDon approved weight box.

WARNING

- Do NOT drive windrower on the road in the cab-forward mode, unless the optional lighting marking kit is installed, as lighting/reflector visibility will not be compliant with road regulations. Refer to [7.1.14 Lighting and Marking for Cab-Forward Road Travel, page 407](#).
- Do NOT drive windrower on a road or highway at night or in conditions that reduce visibility, such as fog or rain. The width of the windrower may not be apparent under these conditions.

CAUTION

Operate both steering wheel and ground speed lever slowly for familiarization. Remember that steering is more sensitive when speed-range control is in road speed position. Avoid the common tendency of new Operators to over-steer.

CAUTION

Check local laws for width regulations and lighting and marking requirements before transporting on roads.

OPERATION

Before driving windrower on a roadway:

1. Ensure HEADER DRIVE switch (A) is pushed to OFF position (down).
2. Clean flashing amber lamps, red tail lamp and head lamps, and check that they work properly.
3. Clean all reflective surfaces and slow moving vehicle emblems.
4. Adjust interior rear view mirror and clean windows.



Figure 4.32: Header Drive Switch

5. Push LIGHT switch (A) to ROAD position to activate lamps. Always use these lamps on roads to provide warning to other vehicles.
 - a. Use HIGH / LOW LIGHTS (B) as required when other vehicles are approaching.
 - b. Do **NOT** use FIELD lamps on roads, other drivers may be confused by them.
6. Push BEACON switch (C) ON to activate beacons .

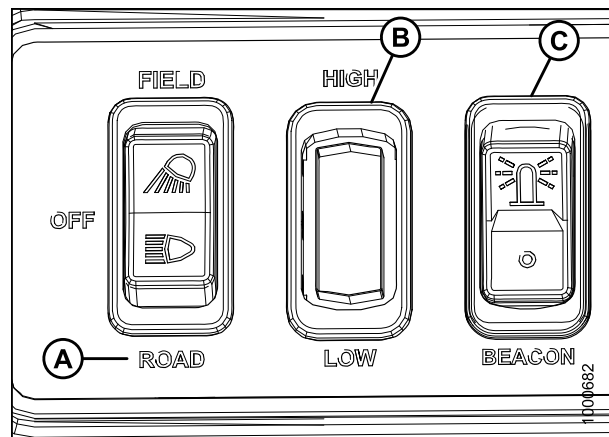


Figure 4.33: Light Switches

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



Figure 4.34: CDM

OPERATION

- Set ground speed range switch (A) for ROAD speed. CDM will display ROAD GEAR at (F) if windrower is in engine-forward mode.

NOTE: Windrower can be moving, but speed must be less than 5 mph (8 km/h) for road gear to engage.

- Slowly push throttle (B) to full forward (operating speed). CDM should display 2320–2350 rpm (C).
- Slowly move the ground speed lever (GSL) (E) forward to desired speed which will be displayed at (F).
- To slow the windrower, pull the GSL (E) rearward to decrease the speed.
- Move the GSL (E) to N-DETENT.
- Lock steering wheel.
- Shut of engine by turning key counterclockwise to OFF position.
- If towing a header, refer to [Towing Header with Windrower, page 124](#).

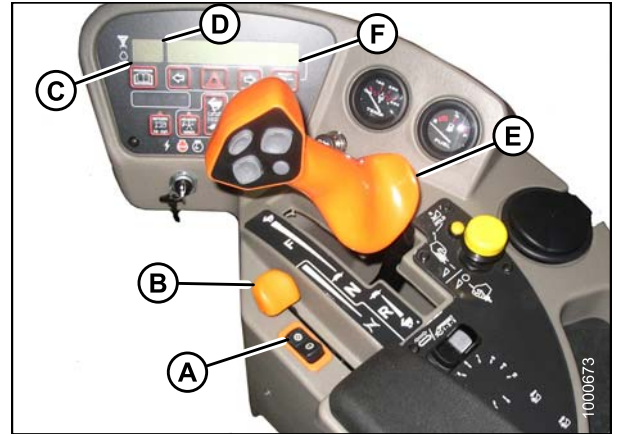


Figure 4.35: Operator Console

WARNING

To avoid serious injury or death from loss of control:

- Do NOT make abrupt changes in steering direction.
- Anticipate turns and steep slopes by slowing down well in advance.
- Do NOT rapidly accelerate or decelerate while turning.

When travelling on steep slopes:

- Move ground speed lever (GSL) closer to NEUTRAL to reduce speed.
- Lower header.
- Move GROUND SPEED RANGE switch to L – low range.
- If the ground speed is greater than or equal to 25 mph (40 km/h), the CDM will display a warning message (SLOW DOWN) with an audible alert. Move GSL closer to NEUTRAL to reduce speed.

With header removed, steering control is reduced if weight is not added to drive wheels. If you must drive the windrower without header or MacDon weight system:

- Operate in low speed range.
- Do NOT exceed 1500 rpm engine speed.
- Avoid loose gravel and slopes.
- Do NOT tow a header.
- If control of machine is lost, immediately pull ground speed lever (GSL) to NEUTRAL.

OPERATION

Towing Header with Windrower

The windrower can be used to tow a MacDon draper header that has the optional slow speed transport option installed, **PROVIDED** the optional weight box is installed on the windrower or an approved header transporter with weight transfer to the lift arms.

WARNING

Draper Header with Transport Option Installed

- The windrower without the header must **NOT** be used to tow headers due to reduced traction and possible loss of control unless a weight box option ([7.1.23 Weight Box, page 409](#)) is installed on the windrower or a header transporter that transfers weight to the lift arms.
- For towed equipment without brakes, do **NOT** exceed 20 mph (32 km/h).



Figure 4.36: Towing a Header

CAUTION

- To tow a header for transporting with an M155 Self-Propelled Windrower, the header must be equipped with the appropriate equipment to comply with all local regulations.
- Before each towing trip, a pre-trip inspection must all be conducted to verify that all signal lighting and safety equipment is installed and functioning properly.
- Do **NOT** exceed the specified Combined Gross Vehicle Weight (CGVW).
- To prevent machine damage and/or loss of control, it is essential that the machine be equipped such that weights are within the following limits:

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

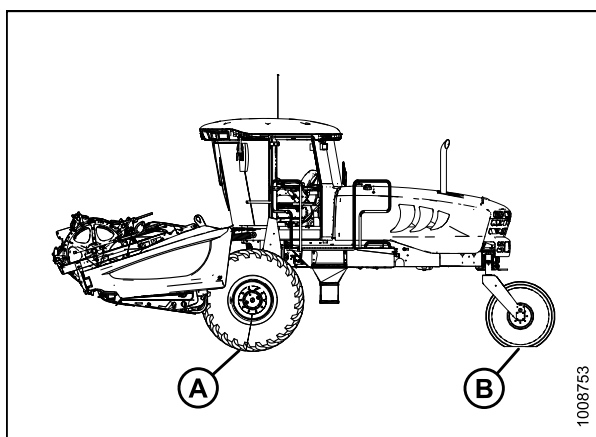


Figure 4.37: Maximum Weight

Converting from Field to Transport Mode

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

OPERATION

1. Set header on the ground (field position).
2. Disconnect hydraulic and electrical connections:
 - a. **Left Side** – Store hydraulic hoses and electrical cable into the storage position. Refer to header operator's manual.
 - b. **Right Side** – Release the multi-link and place into storage on windrower. Refer to header operator's manual.
3. Retrieve temporary lift pin from storage location on weight box and install into **rear hole (A)** at the top of the lift arms for additional lift height for transport wheel deployment.

CAUTION

Check to be sure all bystanders have cleared the area.

DANGER

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

4. Start engine and raise header to full height.
5. Stop engine and engage safety props on lift cylinders.
6. Deploy header slow speed transport system. Refer to header operator's manual.

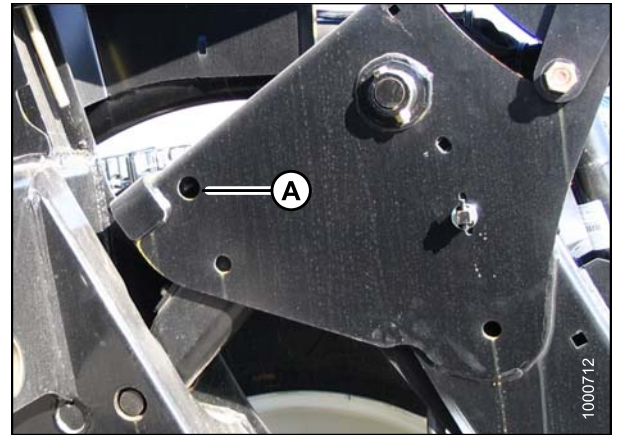


Figure 4.38: Lift Arms



Figure 4.39: Header in Transport Mode

OPERATION

- Remove float pin from engaged position (A) and insert in storage location (B). Secure with lynch pin.

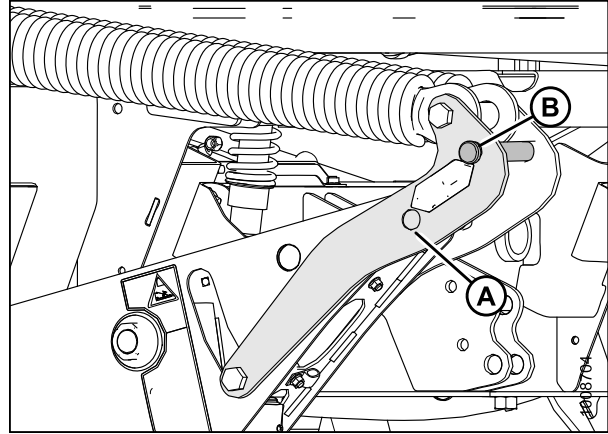


Figure 4.40: Lift Arms

- Remove pins (A) from lower end of lift linkages.
NOTE: Pins (A) are also used to secure weight box to windrower linkage.
- Release the safety props on the header lift cylinders. (Refer to [4.4.1 Header Safety Props, page 137.](#))
- Start engine and lower header down onto the transport wheels.

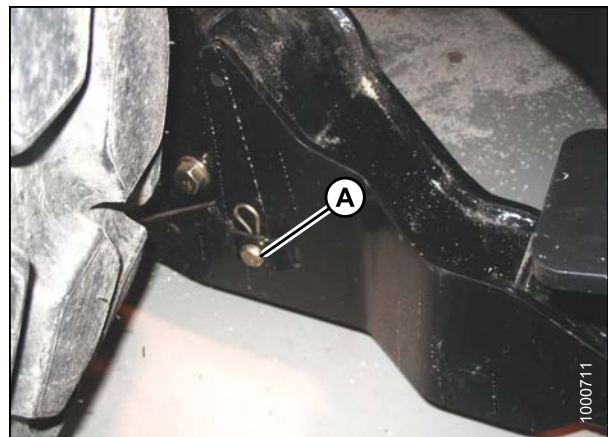


Figure 4.41: Lift Arms

- Use the HEADER TILT switches to release load on the cylinder if necessary.
- Shut down engine and remove key from ignition.

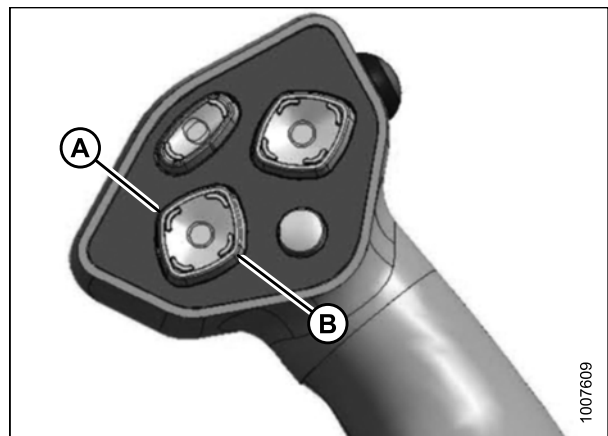


Figure 4.42: Ground Speed Lever (GSL)

A - Header Tilt Down

B - Header Tilt Up

OPERATION

Attach center-link as follows:

13. To unlock the center-link, pull up on latch (A), and position latch into notch (B) on top of hook.
14. Lift center-link off header pin.

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

15. Slowly back windrower away from header, shut engine OFF, and remove key from ignition.

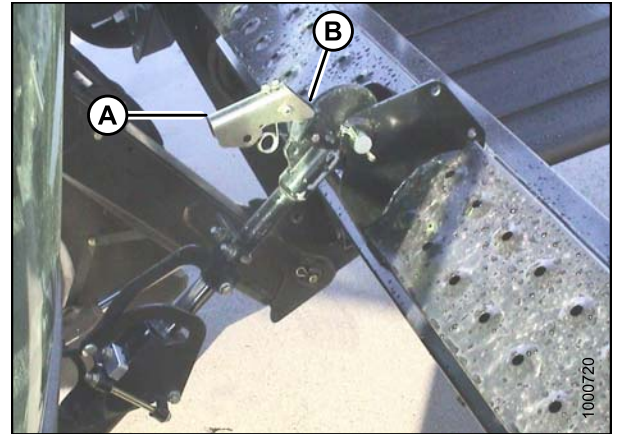


Figure 4.43: Hydraulic Link

Mechanical Link

16. If using a mechanical link, disconnect the center-link as follows:
 - a. Loosen nut (A), and rotate barrel (B) to relieve load on link.
 - b. Remove cotter pin (D) on pin (C), and remove pin to disconnect from windrower. Reinstall pin in header.

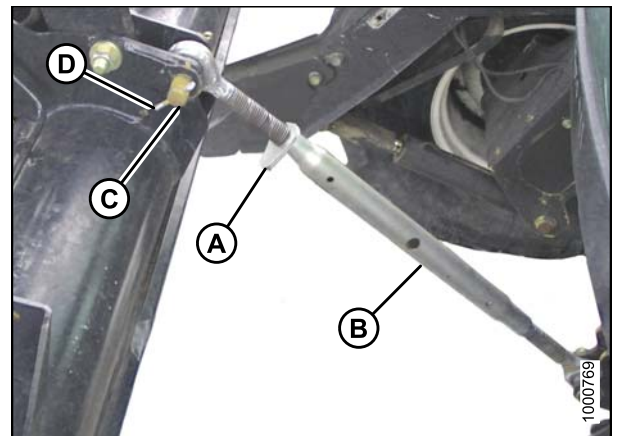


Figure 4.44: Mechanical Link

A - Nut
B - Barrel
C - Pin
D - Cotter Pin

Attaching Header Transport Hitch to Header

Attach header transport hitch to header as follows:

1. Position end (A) of the aft section onto front wheel hook (B).
2. Push down until latch (C) captures the end (A).
3. Secure latch (C) with clevis pin (D).



Figure 4.45: Transport Hitch

OPERATION

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

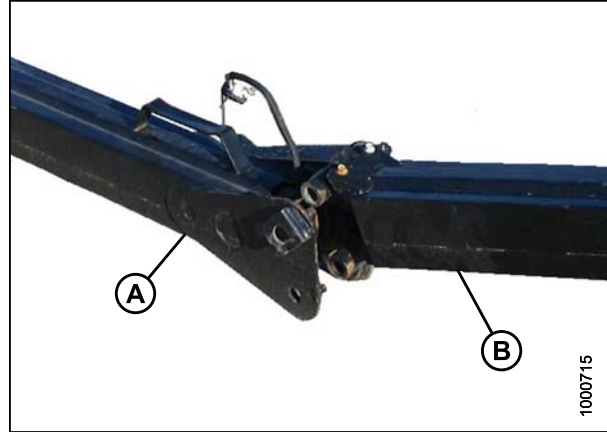


Figure 4.46: Transport Hitch

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

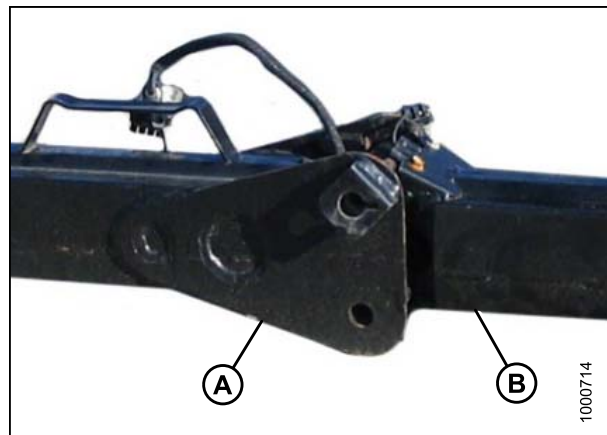


Figure 4.47: Transport Hitch

6. Fully insert L-pin (A) in upper hole and turn pin to lock it. Secure with ring pin (B).
7. Make electrical connection at the joint (C).

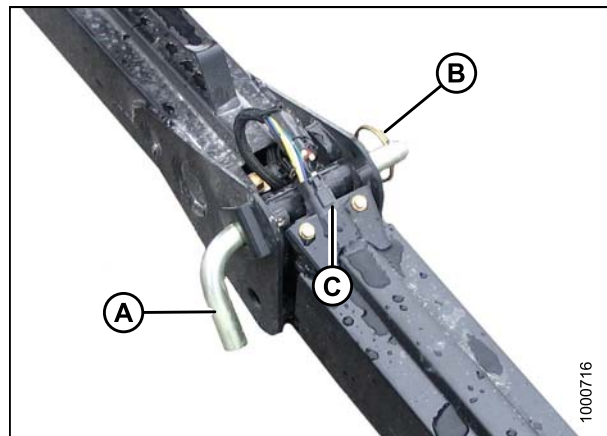


Figure 4.48: Transport Hitch

OPERATION

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



Figure 4.49: Header Transport Wheel

IMPORTANT:

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

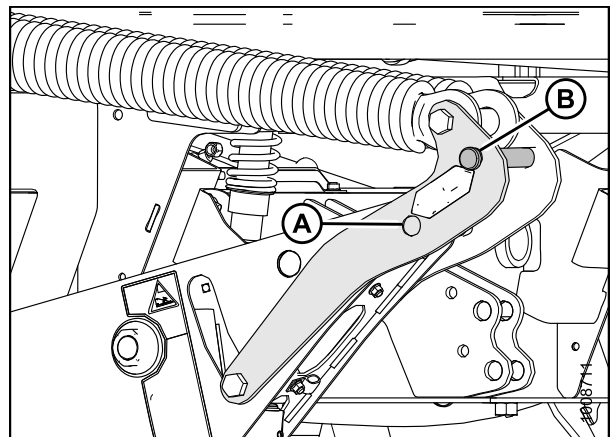


Figure 4.50: Lift Linkage

9. Drive windrower so that windrower lift arms are positioned into the weight box pockets.
10. Raise lift arms slightly, install locking pins (A) into pockets, and through windrower header lift linkages. Secure with hairpin.

NOTE: Pins (A) were previously removed from the header lift linkage lower end.

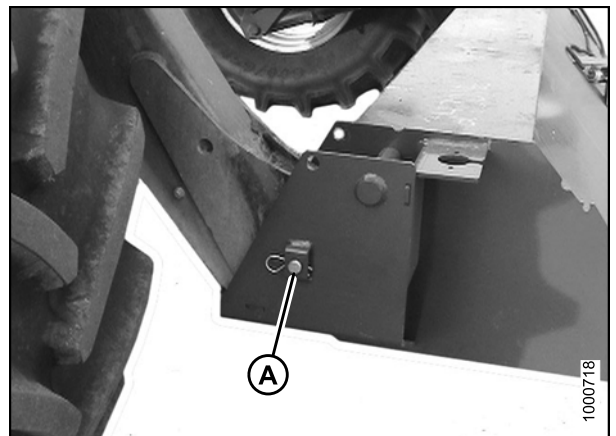


Figure 4.51: Windrower Lift Linkage

OPERATION

11. Route the weight box harness (A) to the electrical connector at the left side lift linkage and connect harness to connector on windrower (B).
12. Raise lift arms fully, shut engine OFF, and remove key from ignition.

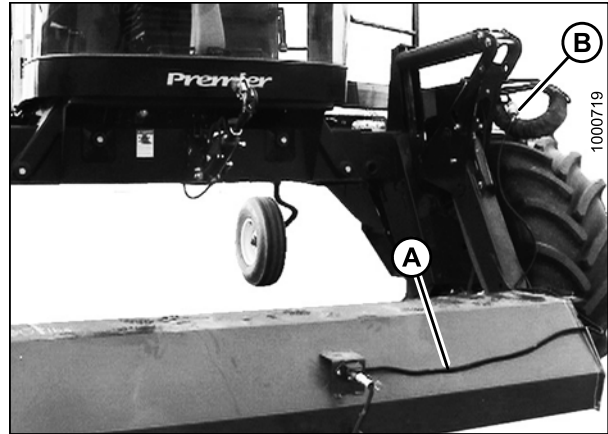


Figure 4.52: Weight Box

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

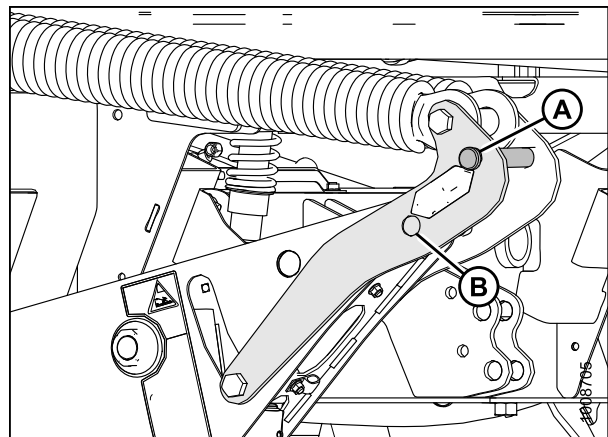


Figure 4.53: Lift Linkage

14. Start engine and press HEADER DOWN switch (A) on ground speed lever (GSL) to lower lift arms until the lift arm lifts away from the linkage at the rear of the lift arm.

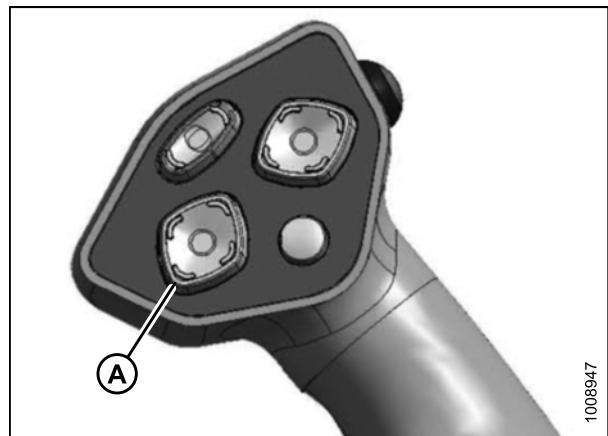


Figure 4.54: GSL

OPERATION

15. Attach slow speed transport hitch to the weight box tongue with drawbar pin. Secure using lynch pin (A). Attach safety chain (B).
16. Connect hitch harness (C) to electrical socket at front of weight box.

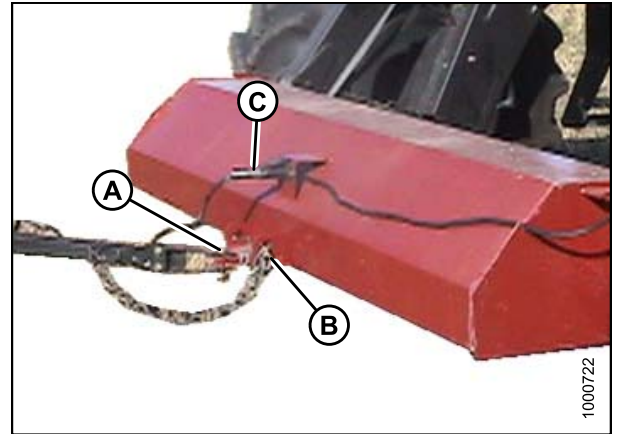


Figure 4.55: Weight Box

17. Remove the temporary lift pins (A) (should be loose in lift arm) and place into storage holes on weight box.

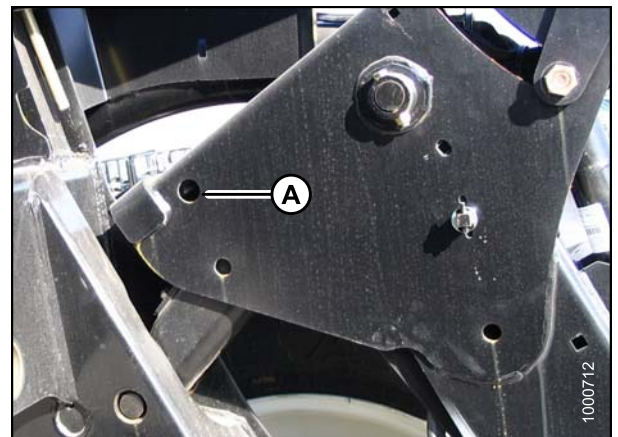


Figure 4.56: Lift Arms

Converting from Transport Mode to Field Operation

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

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

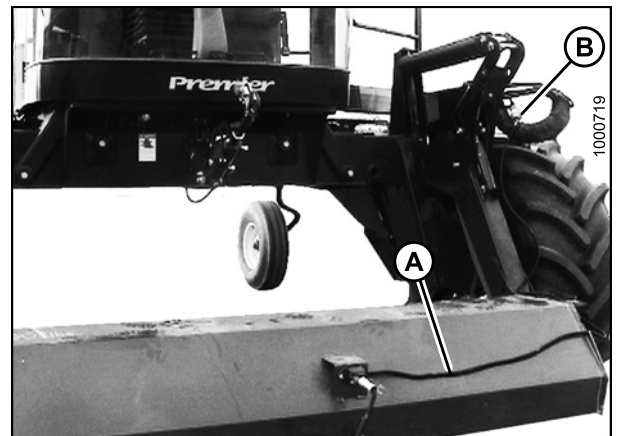


Figure 4.57: Electrical Harness

OPERATION

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



Figure 4.58: Header Transport Wheel

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



Figure 4.59: Header Transport Wheel

CAUTION

Check to be sure all bystanders have cleared the area.

7. Start engine and lower lift arms until rear of lift arms floats up and away from the lift arm mechanism.
8. Stop engine and remove key from ignition.
9. Remove temporary lift pins (A) from weight box and install pins (F) into holes at rear of lift arms.
10. Start engine and fully raise lift arms. Stop engine and remove key from ignition.
11. Engage lift cylinder safety props. (Refer to [4.4.1 Header Safety Props](#), page 137.)

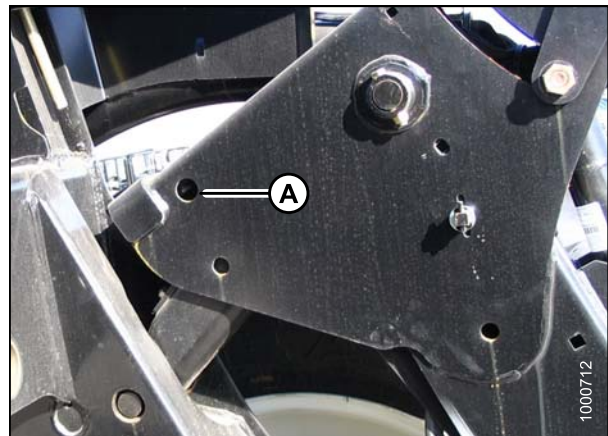


Figure 4.60: Lift Arms

OPERATION

12. Move float pins from working hole location (A) to disengage the float and store pins at storage hole location (B).

IMPORTANT:

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

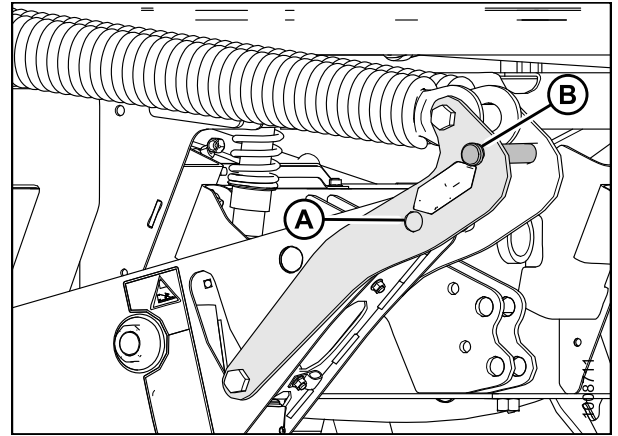


Figure 4.61: Float Pins

13. Remove pins (A) securing lift linkages to weight box and retain pins for attaching header to windrower. Disengage lift cylinder safety props. (Refer to [4.4.1 Header Safety Props](#), page 137).

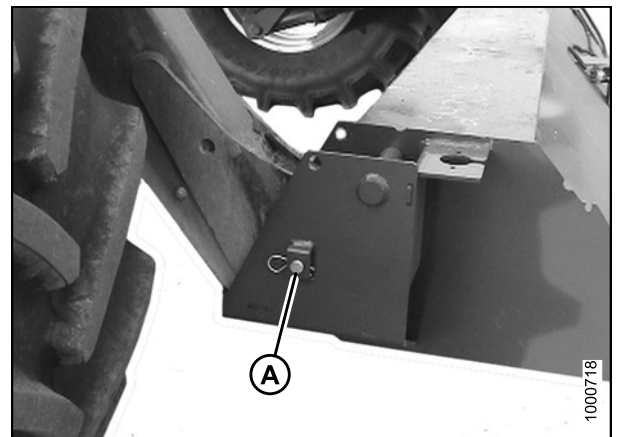


Figure 4.62: Weight Box

14. Start engine, lower weight box onto blocks, and back away.
15. Attach header to windrower. Refer to [4.5 Attaching and Detaching Headers](#), page 157.
16. Convert header into field position. Refer to header operator's manual for procedure.
17. Start engine and lower header to ground. Continue to retract lift cylinders so that member (A) lifts off of link (B).
18. Remove temporary lift pins (C) from lift arms and install pins into storage holes in weight box.
19. Before operating the machine, double check that all pins are secure and that all safety equipment is installed and fully functional.
20. Proceed with operation of header.

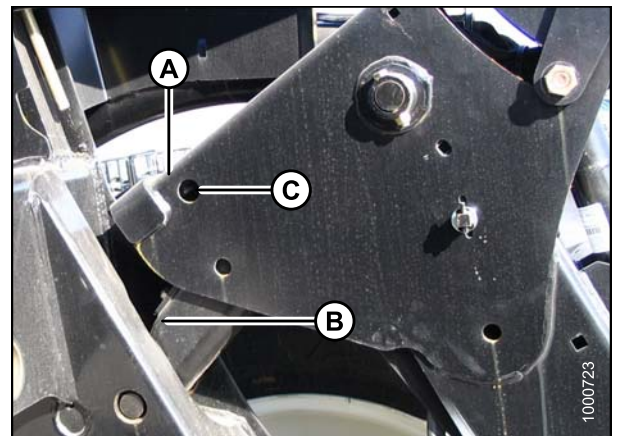


Figure 4.63: Lift Arms

OPERATION

Towing the Windrower (Emergency)

In emergency situations, for example, towing out of a field or into a shop, windrower may be towed without a trailer, providing the following precautions are followed:

WARNING

A proper towing apparatus is critical to safe towing. Use the following guidelines:

- Do **NOT** attach directly from hitch to walking beam. Slope of tow-bar will not provide proper transfer of braking force to windrower, causing loss of control.
- For proper steering, towing apparatus should be attached to **BOTH** left and right hand frame members, and should attach to tow-bar at same height as towing vehicle hitch.
- Towing apparatus should be removed for field operation, to avoid interference with windrow.

WARNING

With final drives disengaged, the windrower may roll on a sloped surface. Before disengaging final drives, attach windrower to towing vehicle. After towing, engage drives and ensure ground speed lever (GSL) is in N-DETENT before detaching from towing vehicle.

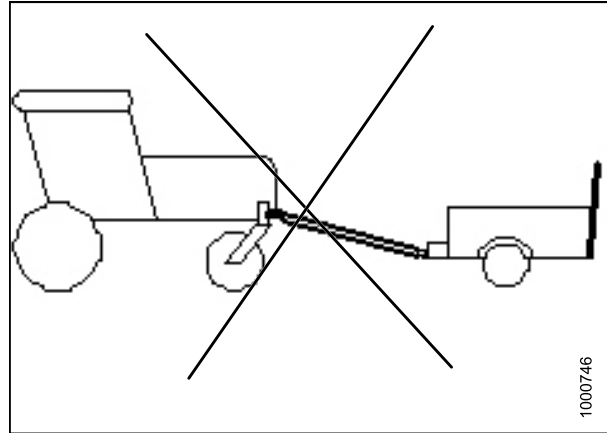


Figure 4.64: Improper Towing Procedure

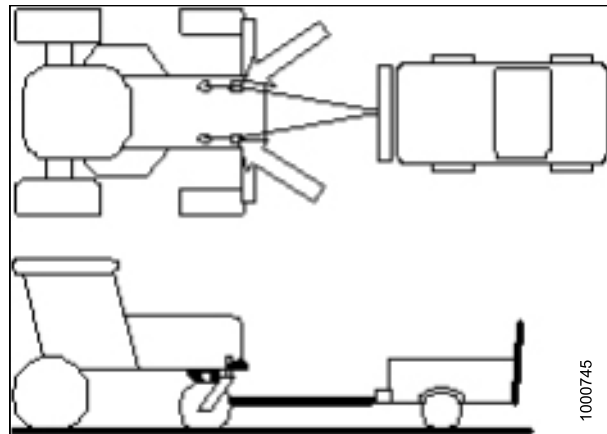


Figure 4.65: Correct Towing Procedure

IMPORTANT:

- Failure to disengage final drives before towing will result in serious transmission damage.
- Do **NOT** exceed 16 mph (26 km/h) when towing windrower.
- Do **NOT** use this towing method for normal transporting of windrower.
- Even with final drives disengaged, rolling speeds of more than 16 mph (26 km/h) will cause final drive gears to run at excessive speeds, possibly severely damaging or causing the unit to fail.

OPERATION

Final Drives

Disengage and engage final drives as follows:

1. Remove the two bolts (A) at the center of drive wheel.
2. Remove cap (B) and flip over so that dished side faces in. The cap depresses a pin that disengages the gearbox.
3. After towing, reverse cover (B) to engage final drives. Be sure plunger at center of wheel pops out to engage drive.

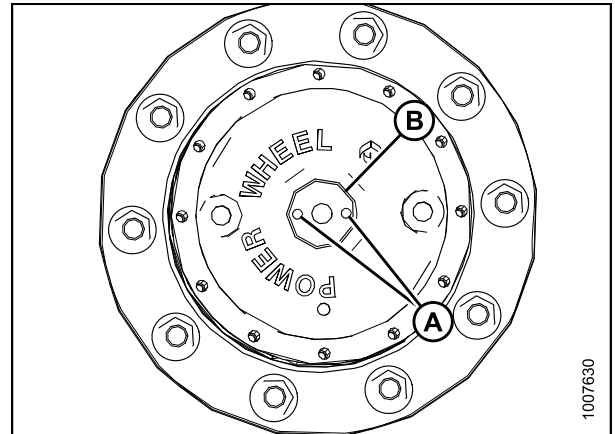


Figure 4.66: Final Drives

4.3.9 Storing the Windrower

At the end of each operating season, you need to store your windrower properly.

WARNING

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

CAUTION

Never operate engine in a closed building. Proper ventilation is required to avoid exhaust gas hazards.

CAUTION

Remember when working around storage batteries that all of the exposed metal parts are live. Never lay a metal object across the terminals because a spark and short circuit will result.

1. Clean the windrower thoroughly.
2. Store windrower in a dry protected place.
3. Remove battery. Refer to [Removing Batteries, page 332](#).
4. Bring to full charge and store in a cool, dry place not subject to freezing.
5. If stored outside, always cover windrower with a waterproof tarpaulin or other protective material. This will protect the switches, instruments, tires, etc. from inclement weather.
6. If no cover is available; seal air cleaner intake and exhaust pipe with plastic bags and/or waterproof tape.
7. If possible, block up windrower to take weight off tires. If it is not possible to block up the machine, increase tire pressure by 25% for storage. Adjust to recommended operating pressure before next use.
8. Repaint all worn or chipped painted surfaces to prevent rust.
9. Lubricate the windrower thoroughly, leaving excess grease on fittings to keep moisture out of bearings. Apply grease to exposed threads and sliding surfaces of components.

OPERATION

10. Check for worn components and repair. Tighten loose hardware and replace any missing hardware. Refer to [5.2 Torque Specifications, page 250](#).
11. Check for broken components and order replacements from your Dealer. Attention to these items right away will save time and effort at beginning of next season.
12. Add approved rust inhibitor to the engine oil in accordance with the manufacturer's instructions. Run engine to operating temperature to mix inhibitor with oil, unless otherwise specified.
13. To prevent condensation, fill hydraulic oil reservoir to filler neck with approved hydraulic system oil. Refer to [Checking and Filling Hydraulic Oil, page 360](#).
14. Test engine coolant antifreeze concentration to ensure it is sufficient to protect engine against lowest expected temperature.

OPERATION

4.4 Operating with a Header

The M155 Self-Propelled Windrower is designed to use the MacDon A-Series Auger Header, R-Series Rotary Header, and D-Series Rigid Draper Header with or without a Hay Conditioner.

This section describes the attachment and detachment procedures and operating instructions for these header types.

4.4.1 Header Safety Props

Safety props are located on both header lift cylinders on the windrower.

DANGER

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

Engage safety props as follows:

1. Start engine and press HEADER UP (A) switch to raise header to maximum height.
2. Rephase cylinders if one end of the header does not raise fully. If rephasing is needed, proceed as follows:
 - a. Press and hold the HEADER UP (A) switch until both cylinders stop moving.
 - b. Continue to hold the switch for 3–4 seconds. Cylinders are phased.

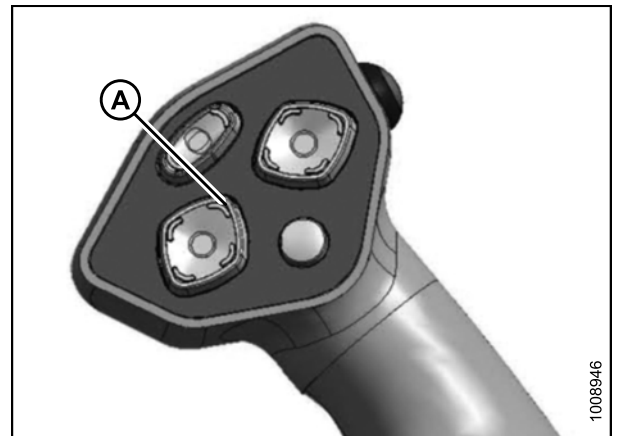


Figure 4.67: Ground Speed Lever (GSL)

OPERATION

3. Pull lever (A) and rotate toward header to lower safety prop (B) onto cylinder. Repeat for opposite cylinder.

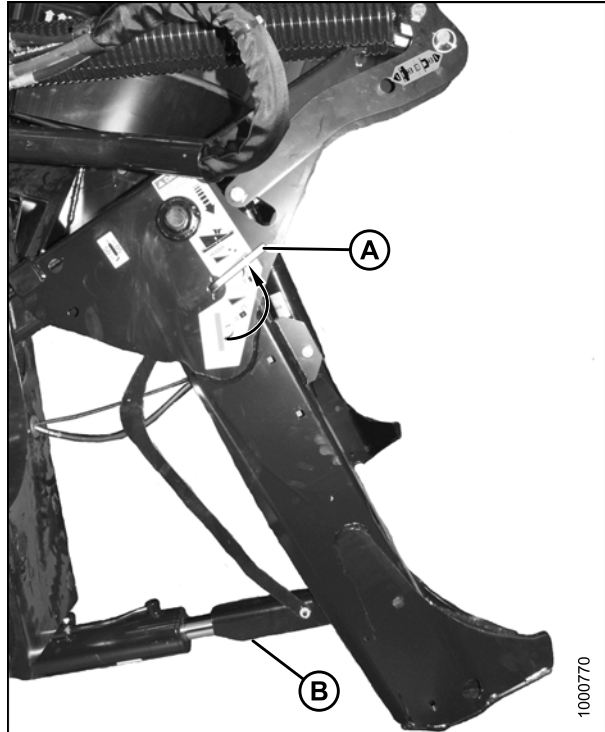


Figure 4.68: Safety Prop

4. To disengage safety props and for storage, turn lever (A) away from header to raise safety prop until lever locks into vertical position. Repeat for opposite cylinder.

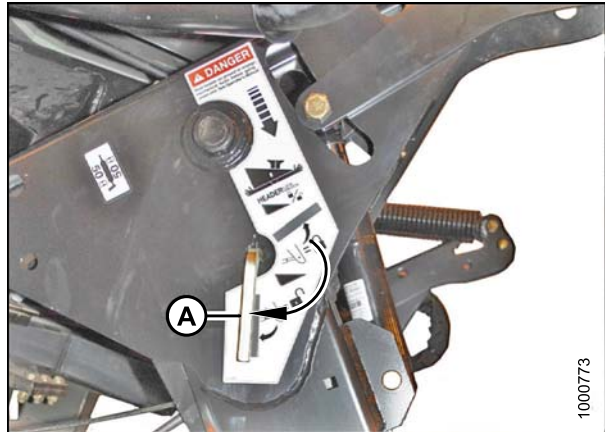


Figure 4.69: Safety Prop

5. Start engine, choose a level area, and lower header to the ground. Stop engine and remove key.

OPERATION

4.4.2 Header Float

Float is intended for cutting crops that require the cutterbar to be in contact with the ground. Optimum float is for the cutterbar to maintain contact with the ground with minimum bouncing and scooping or pushing soil. The machine will perform best with minimum extra weight on the header.

IMPORTANT:

- To avoid frequent breakage of knife components, scooping soil, or soil build-up at cutterbar in wet conditions, header float should be set as light as possible without causing excessive bouncing.
- When float setting is light, it may be necessary to use a slower ground speed to avoid excessive bouncing and leaving a ragged cut.
- The stabilizer wheels are designed to minimize bouncing at the header ends and **NOT** float the header. Refer to your header operator's manual for float setting and adjustment guidelines.

Float Operating Guidelines

When working with the cutterbar on the ground:

1. Set center-link to mid-range position (05.0 on cab display module [CDM]). Refer to [4.4.5 Adjusting Header Angle, page 147](#).
2. In rocky fields, adjust skid shoes down to raise guards when operating at flattest header angle to minimize scooping rocks.
3. Adjust header height or adjust header angle to minimize pushing soil.

When working with the cutterbar off the ground (draper header only):

1. Set center-link to mid-range position (05.0 on CDM). Refer to [4.4.5 Adjusting Header Angle, page 147](#).
2. The proper setting requires balancing the amount of header weight carried by the float and stabilizer wheels. Refer to your draper header operator's manual.
3. Use the CDM controls to automatically maintain cutting height. Refer to [4.4.6 Cutting Height, page 150](#).

Checking Float

M-Series windrowers are equipped with primary (coarse) and secondary (fine) float adjustment systems. The primary or coarse adjustment uses drawbolts to change the tension on the springs in the lift linkages. The secondary or fine adjustment uses hydraulic cylinders to change the spring tension.

OPERATION



Figure 4.70: Cab Display Module (CDM) Float Adjustment

A - CDM Display
D - Header Tilt Down

B - Left Float Adjustment
E - Header Lower

C - Right Float Adjustment
F - Header Tilt Up

Check header float as follows:

⚠ DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

⚠ CAUTION

Check to be sure all bystanders have cleared the area.

1. Start the engine.
2. Using HEADER TILT switches (D, F), set center-link to mid-range position (5.0 on CDM [A]).
3. Using HEADER DOWN switch (E), lower header fully with lift cylinders fully retracted.
4. Set left (B) and right (C) float fine adjustments on CDM to approximately 5.0 as follows:
 - a. Using FLOAT SELECTOR switch (B), push + to increase float or – to decrease float on left side of header. CDM display (A) will indicate selected float for left side, for example (5.0 L FLOAT R XX.X).
 - b. Repeat for right side float with switch (C). Display will indicate float for both sides, for example (5.0 L FLOAT R 5.0).
5. Shut down engine and remove key.
6. Grasp the divider rod and lift. The force to lift should be as noted in the following table and should be approximately the same at both ends.

OPERATION

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

Adjusting Float Using Drawbolts

Coarse float adjustment is done using the drawbolts located on either side of the windrower.

If necessary, coarse adjust the float with the drawbolts as follows:

CAUTION

Check to be sure all bystanders have cleared the area.

1. Start engine.
2. Using HEADER UP (A) switch on ground speed lever (GSL), raise the header fully, shut down engine, and remove key.
3. Turn drawbolt (A) clockwise to increase float (makes header lighter) or counterclockwise to decrease float (makes header heavier).
4. Recheck the header float as described in [Checking Float, page 139](#).



Figure 4.71: GSL

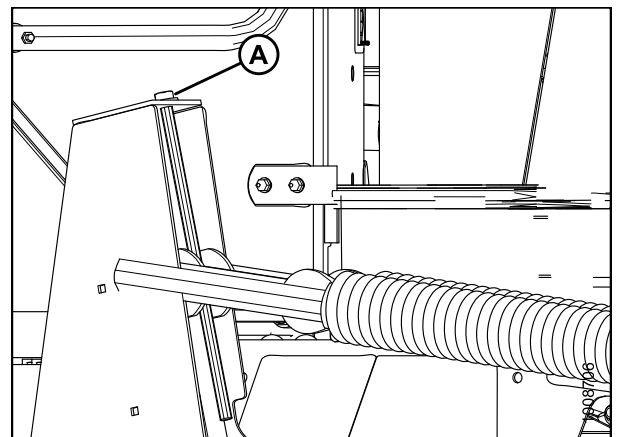


Figure 4.72: Header Float Adjustment

OPERATION

Float Options

For draper headers without the deck shift option, auger headers, and rotary headers, the float can be preprogrammed for three types of windrowing conditions.

Example:

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

Set float presets as follows:

1. Engage header.
2. Push FLOAT PRESET SWITCH (A) to Position 1 (B).

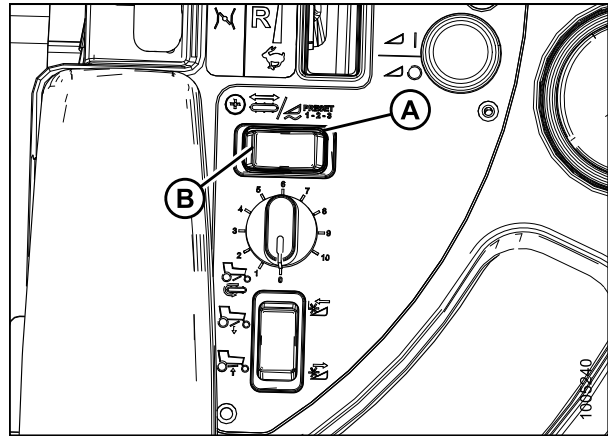


Figure 4.73: Float Preset Switch

3. Using HEADER TILT switches (D, F), set center-link to mid-range position (5.0 on CDM [A]).
4. Using HEADER DOWN switch (E), lower header fully with lift cylinders fully retracted.
5. Set left (B) and right (C) float fine adjustments on CDM to approximately 5.0 as follows:
 - a. Using FLOAT SELECTOR switch (B), push + to increase float or – to decrease float on left side of header. CDM display (A) will indicate selected float for left side, for example (5.0 L FLOAT R XX.X).
 - b. Repeat for right side float with switch (C). Display will indicate float for both sides, for example (5.0 L FLOAT R 5.0).

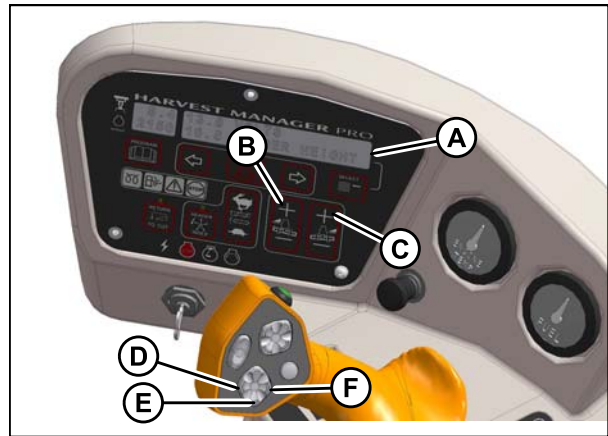


Figure 4.74: Operator Console

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

OPERATION

6. Select a second preset with the FLOAT PRESET 2 SWITCH (C).
7. Repeat Steps 1., *Float Options, page 142* and 2., *Float Options, page 142* to set the float.
8. Select a third preset with the FLOAT PRESET 3 SWITCH (D).
9. Repeat steps 1., *Float Options, page 142* and 2., *Float Options, page 142* to set the float.
10. Operate windrower.

NOTE: For draper headers with the deck shift option, the float can be preprogrammed to compensate for weight distribution when the decks are shifted. Refer to *Setting Float Options with Deck Shift, page 238*.

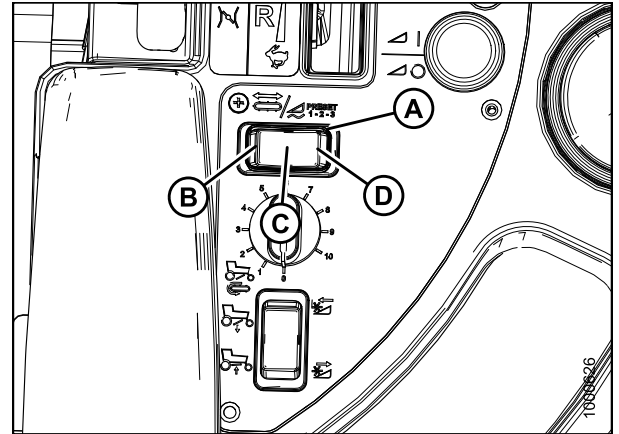


Figure 4.75: Float Preset Switch

4.4.3 Levelling the Header

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

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

If the header is not level, check the windrower tire pressures before adjusting the levelling linkages.

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

To level the header, follow these steps:

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

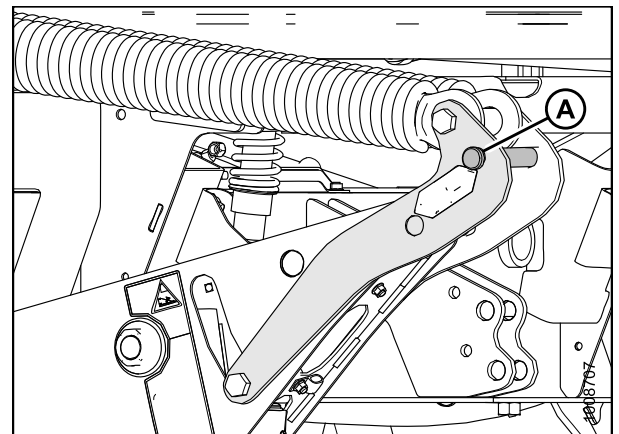


Figure 4.76: Float Pins

OPERATION

2. Park windrower on level ground.
3. Raise header fully and hold momentarily to allow lift cylinders to rephase.

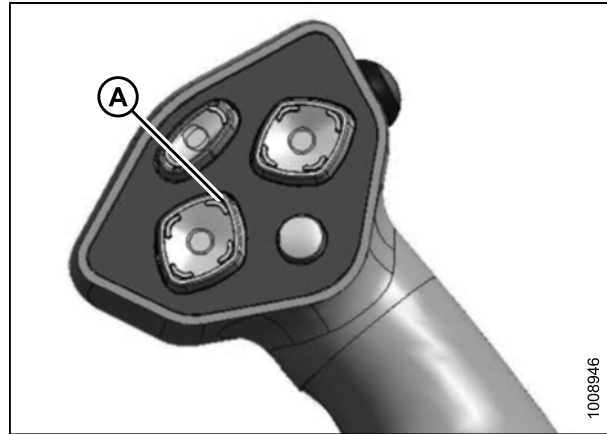


Figure 4.77: Ground Speed Lever (GSL)

4. Set header approximately 6 in. (150 mm) off ground and check that member (A) is against link (B). Note the high and low end of header.
5. Place wooden blocks under header cutterbar and legs.

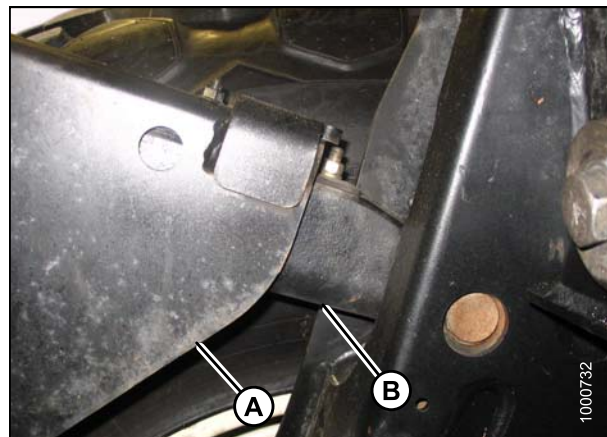


Figure 4.78: Lift Linkage

6. Lower header onto blocks so that member (A) lifts off link (B) on both sides.
7. Stop engine and remove key.

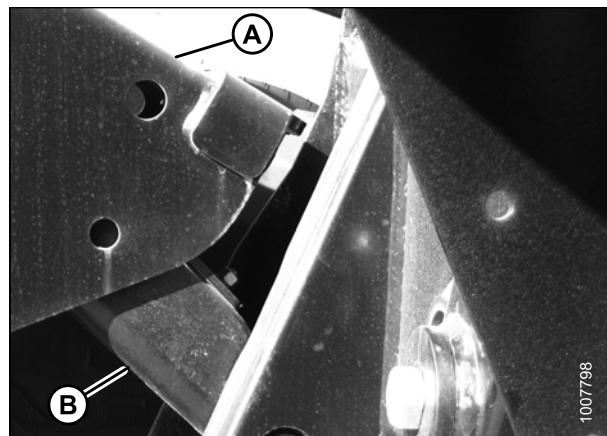


Figure 4.79: Lift Linkage

OPERATION

8. On high side, remove nut, washer, and bolt (A) that attaches shims (B) to link.
9. Remove one or both shims (B) and reinstall the hardware (A).
10. Start engine and raise header slightly. Check level of header.
11. If additional levelling is required, install the removed shim on the opposite linkage.

NOTE: If required, additional shims are available from your Dealer.

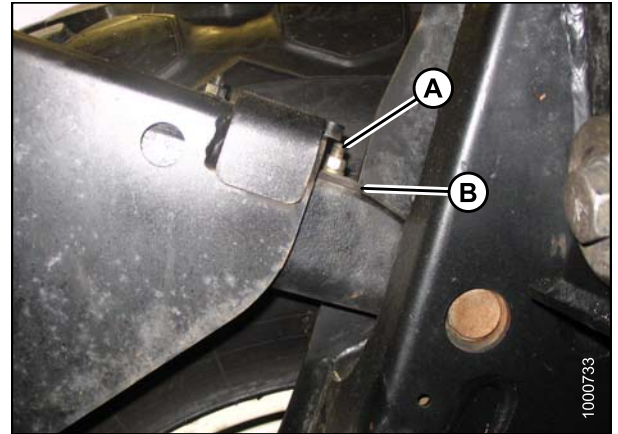


Figure 4.80: Lift linkage

12. Once header is level, return float pins to their engaged position (A).

NOTE: Float does **NOT** require adjustment after levelling header.

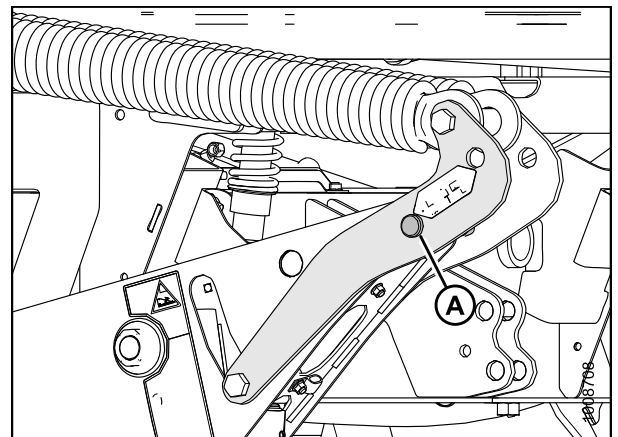


Figure 4.81: Float Pins

4.4.4 Header Drive

All header controls are conveniently located on the operator's console and on the ground speed lever (GSL) handle.

NOTE: Some controls are optional equipment and may not be present in your unit. Some controls may be installed, but will be nonfunctional for certain headers.

Engaging and Disengaging the Header

CAUTION

Check to be sure all bystanders have cleared the area.

IMPORTANT:

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

OPERATION

1. To Engage Header:

- a. Move throttle (A) to adjust engine speed to idle.
- b. Push the center down and pull up the HEADER DRIVE switch (B) to engage header drive. A slight delay between switch ON and operating speed is normal.

2. To Disengage Header:

- a. Push HEADER DRIVE switch (B) down to disengage header drive.



Figure 4.82: Operator Console

OPERATION

Reversing the Header

NOTE: The optional hydraulic reversing kit must be installed.

IMPORTANT:

Hose plumbing to the reverser block is specific to the header type. To prevent damage to the reel on D-Series headers, refer to the reverser kit installation instruction MD# 169213 when switching from an auger header to a draper header on the same windrower.

- Reverses knife and conditioner on D-Series draper headers.
- Reverses reel, auger, knife and conditioner on A-Series auger headers.

Reverse the header as follows:

1. Push down and hold HEADER DRIVE REVERSE button (A) and pull up the HEADER DRIVE switch (B).
2. CDM will display HEADER REVERSE.
3. **RELEASE REVERSE BUTTON (A) TO STOP HEADER.**
4. Push down the HEADER DRIVE switch (B) to OFF, so that it can be restarted.

NOTE: To engage header drive, push down, and pull up HEADER DRIVE knob.



Figure 4.83: Operator Console

4.4.5 Adjusting Header Angle

Header angle is defined as the angle between the ground and the drapers/cutterbar and is adjustable to accommodate crop conditions and/or soil type.

Refer to the appropriate header operator's manual for the range of adjustment and recommended settings for your particular header.

The header angle can be hydraulically adjusted from the cab without shutting down the windrower. A readout on the cab display module (CDM) allows you to establish settings for each crop condition.

IMPORTANT:

- Changing header angle will affect flotation slightly because it has the effect of making the header lighter or heavier.
- To prevent excessive guard breakage when conditions are not suited to heavier float (e.g., rocky or wet), do **NOT** use the TILT CONTROL "on the go". Instead, use the HEADER HEIGHT switch.

OPERATION

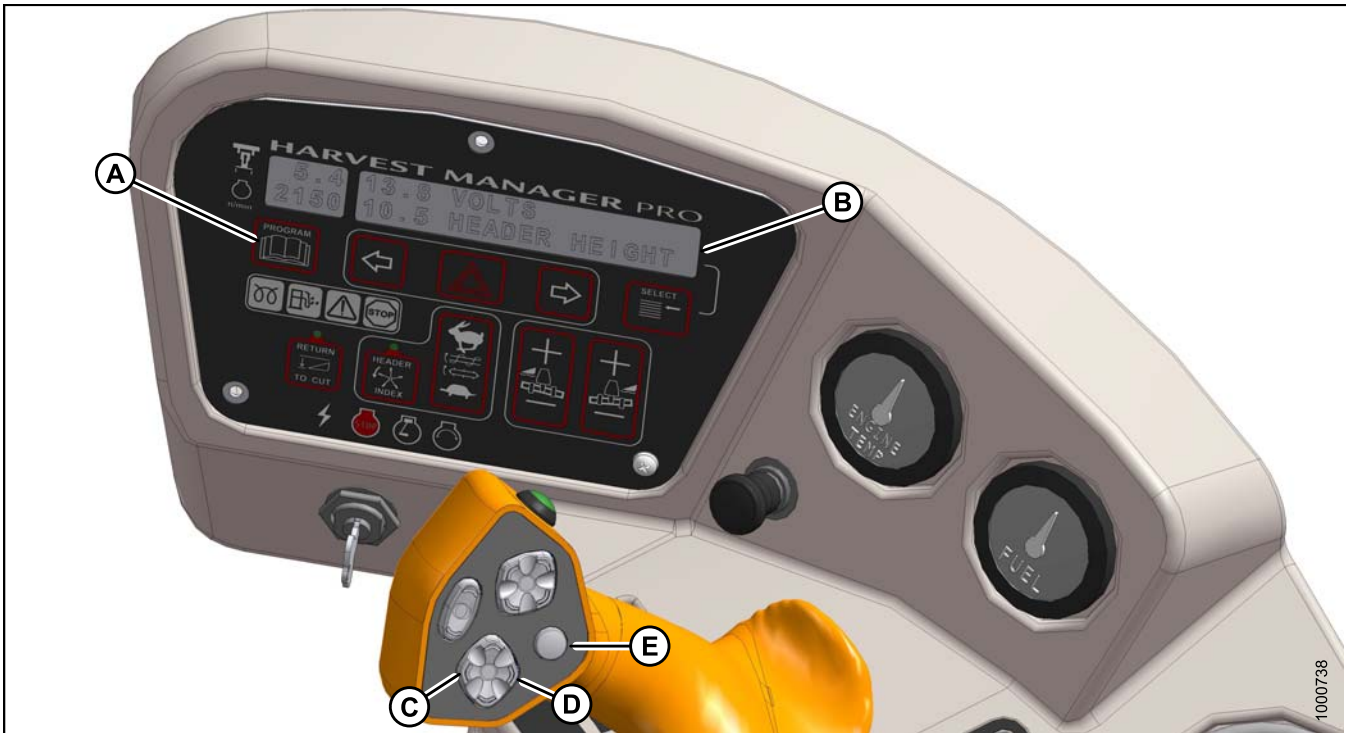


Figure 4.84: Operator Console

A - Program Button
D - Header Tilt Up

B - Display
E - Display Selector

C - Header Tilt Down

Change header angle as follows:

- To decrease (flatten) header angle, operate HEADER TILT UP switch (D) on ground speed lever (GSL) handle so that cylinder retracts. The CDM display will show a reading on the lower line of decreasing value between 00.0 and 10.0.
 - To increase (steepen) header angle, operate HEADER TILT DOWN switch (C) on GSL handle so the cylinder extends. The CDM display will show a reading on the lower line of increasing value between 00.0 and 10.0.
 - The HEADER TILT switch can be deactivated to prevent inadvertent header angle changes when pressing the HEADER HEIGHT control switches. Refer to [3.18.5 Cab Display Module \(CDM\) Programming, page 86](#).
1. Switch to PROGRAM mode on CDM.
 2. Press SELECT until SET CONTROL LOCKS? is displayed.
 3. Press the right arrow to display HEADER TILT.
 4. Press the right arrow to LOCK (deactivate) the control.
 5. Press PROGRAM (A) to exit.

Checking Self-Locking Center-Link Hook

Periodically check the operation of the hook locking mechanism and ensure that it is working properly as follows:

OPERATION

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

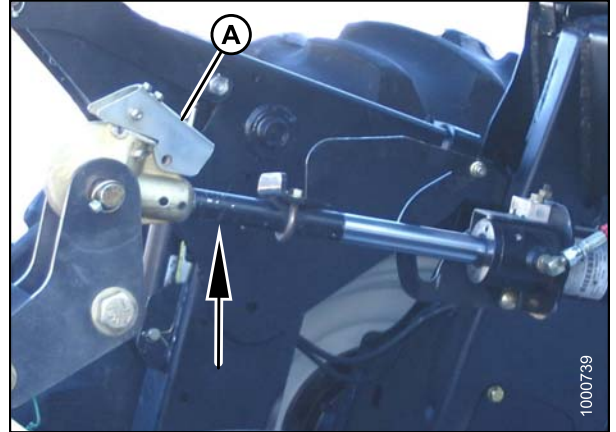


Figure 4.85: Center-link

2. Lower the handle (A) into the **LOCK** position.
3. Push up on lock pin (B) only. Handle should catch on casting and pin should **NOT** lift.

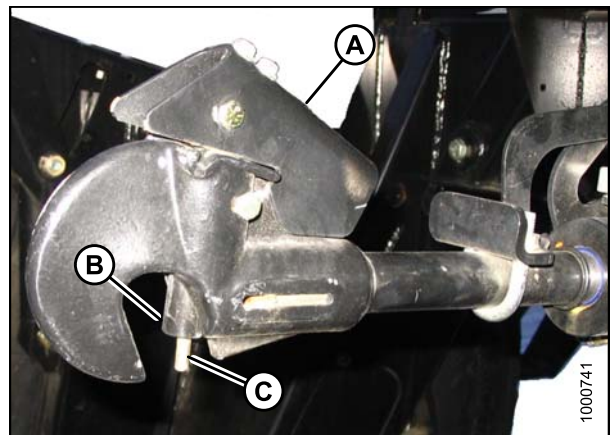


Figure 4.86: Center-link Hook

A - Handle

B - Lock Pin

C - Actuator Rod

4. Push up on actuator rod (C) and lock pin should lift with the handle.



Figure 4.87: Center-link Hook

OPERATION

4.4.6 Cutting Height



Figure 4.88: Operator Console

A - Display

B - Header Up

C - Header Down

D - Display Selector

Cutting height is adjusted by raising or lowering the header with the HEADER UP (B) or HEADER DOWN (C) switches on the ground speed lever (GSL).

The cab display module (CDM) indicates header height with a reading on the DISPLAY (A) lower line between 00.0 and 10.0, with 00.0 being on the ground.

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

Return to Cut

The M-Series monitoring system will assist you in maintaining the desired cutting height with the RETURN TO CUT feature. This feature can be turned OFF or ON with a switch on the cab display module (CDM).

The RETURN TO CUT feature enables you to have the header return to a preselected cutting height and angle.

If desired, the CDM can be programmed so that only the cutting height feature is active. The unit is preprogrammed to activate both cutting height and header angle.

The AUTO RAISE HEIGHT feature allows you to raise the header to a preselected height while in the RETURN TO CUT mode. Refer to [Programming Auto Raise Height Feature, page 153](#).

Refer to the following procedures:

- [Programming Return to Cut Feature, page 151](#)
- [Using Return to Cut Feature, page 152](#)

OPERATION

Programming Return to Cut Feature



Figure 4.89: Operator Console

A - Return to Cut
E - Header Tilt Up

B - Header Up
F - Header Tilt Down

C - Header Down

D - Display

Program the RETURN TO CUT feature as follows:

IMPORTANT:

The windrower must be running with the header engaged.

1. Set RETURN TO CUT switch (A) to OFF (indicator light is OFF).
2. Adjust the header to the desired cutting height with the HEADER UP (B) or HEADER DOWN (C) switches on the ground speed lever (GSL). The cab display module (CDM) displays between **00.0 and 10.0** at (D).
3. Adjust the header angle with the HEADER TILT UP (E) or HEADER TILT DOWN (F) switches on the GSL. CDM displays between **00.0 and 10.0**. This step is not required if height only has been preselected.
4. Press the RETURN TO CUT switch (A) on the CDM. The indicator light will illuminate and the settings are now programmed into the windrower control module (WCM).

OPERATION

Using Return to Cut Feature

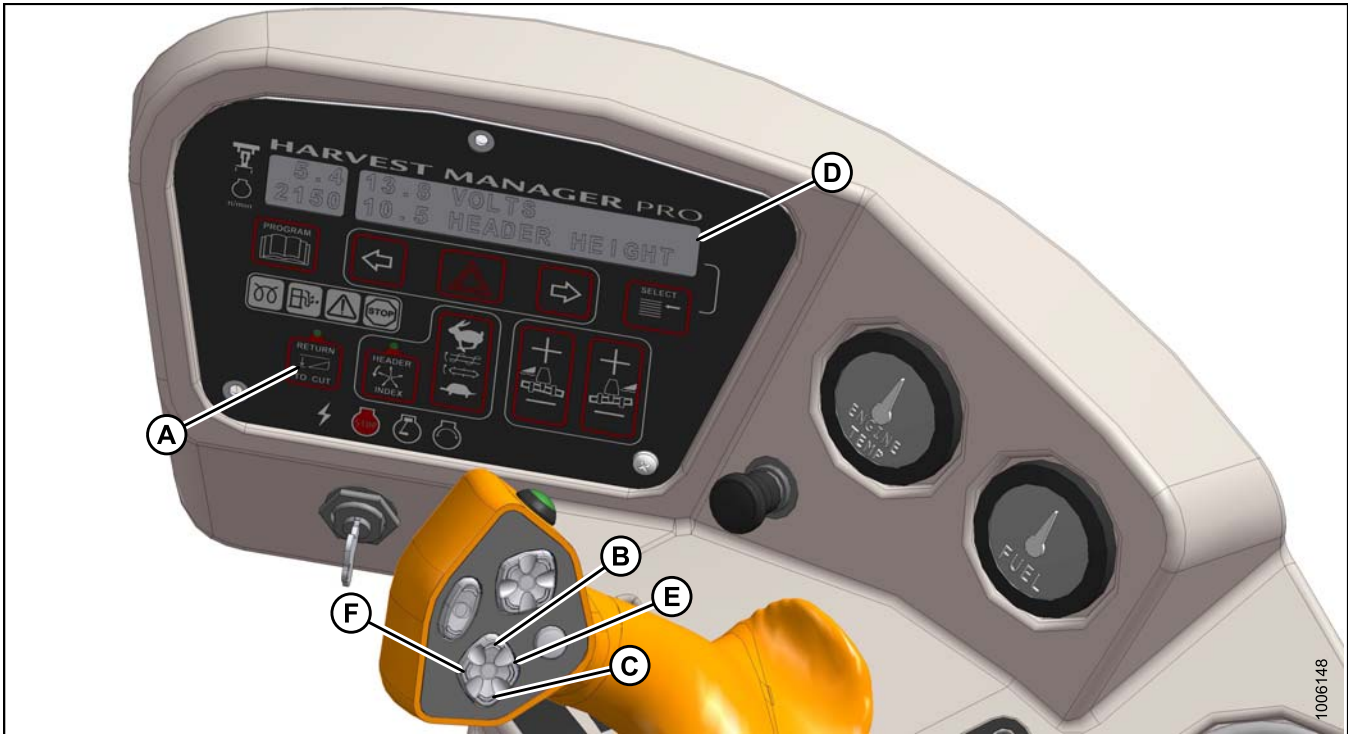


Figure 4.90: Operator Console

A - Return to Cut
D - Display

B - Header Up
E - Header Tilt Up

C - Header Down
F - Header Tilt Down

Use the RETURN TO CUT feature as follows:

IMPORTANT:

Ensure the header is engaged and the RETURN TO CUT switch (A) is illuminated.

NOTE: The header can be raised or lowered at any time by **pressing and holding** the HEADER UP (B) or HEADER DOWN (C) switches on the ground speed lever (GSL).

1. If header is above the preset cutting height, **momentarily press** HEADER DOWN switch (C) and the header will return to preset height.
2. If the header is below the preset height, **press and hold** the HEADER UP (B) switch to raise the header. Release switch to stop header. Alarm will sound when header rises past the preset height.
3. If the header angle is changed, double-click (two clicks within 0.5 seconds) the HEADER TILT UP (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 the RETURN TO CUT switch (A) to reactivate.

OPERATION

Auto Raise Height

The header can be automatically raised if programmed into the cab display module (CDM).

Refer to the following topics:

- [Programming Auto Raise Height Feature, page 153](#)
- [Using Auto Raise Height Feature, page 154](#)

Programming Auto Raise Height Feature

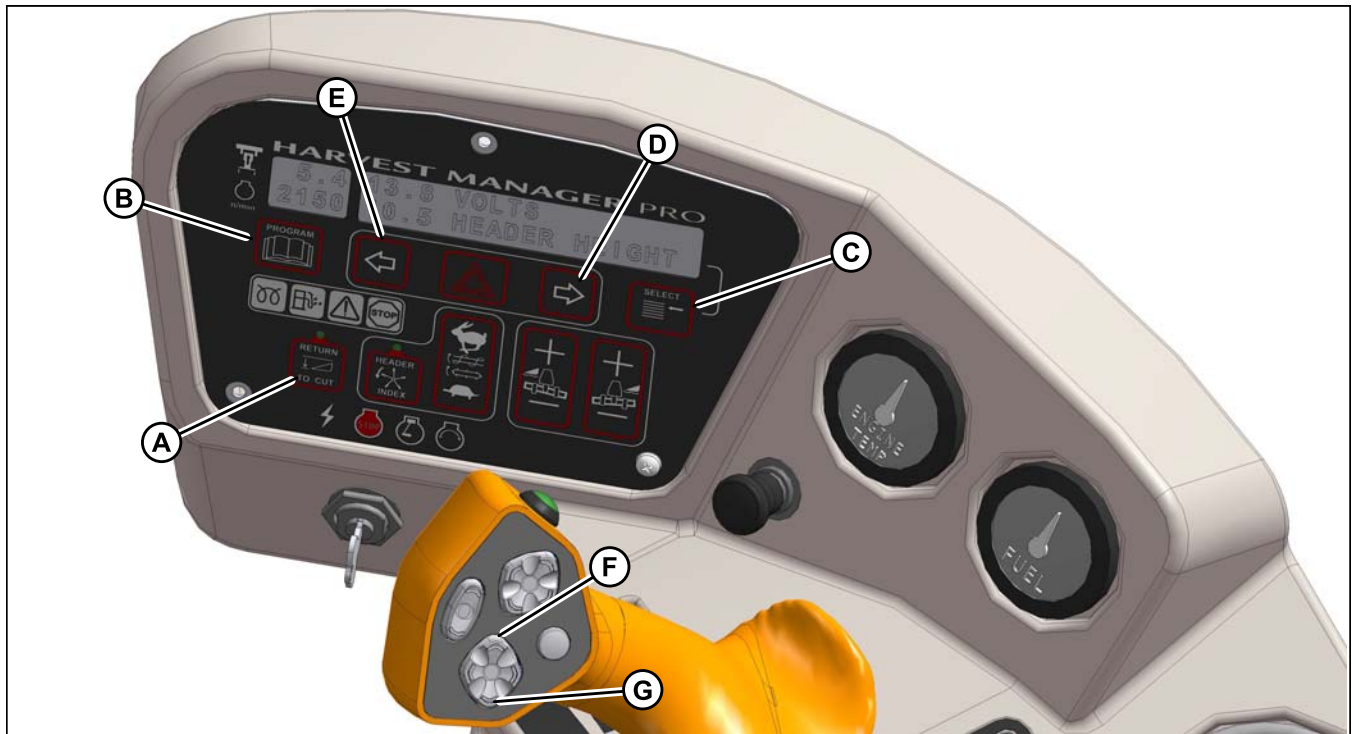


Figure 4.91: Operator Console

A - Return to Cut
E - Left Arrow

B - Program
F - Header Up

C - Select
G - Header Down

D - Right Arrow

Program the AUTO RAISE HEIGHT feature as follows:

NOTE: RETURN TO CUT switch (A) can be OFF or ON.

1. Press PROGRAM (B) and SELECT (C) on cab display module (CDM) to enter programming mode.
2. Press SELECT (C). WINDROWER SETUP? is displayed on upper line (B).
3. Press right arrow (D), then SELECT. SET KNIFE SPEED? is displayed.
4. Press SELECT (C) until AUTO RAISE HEIGHT is displayed.
5. Press left arrow (E) or right arrow (D) to change value on lower line. Working range is 4.0 to 9.5. At 10.0, the feature is disabled and "OFF" is displayed.
6. When finished entering desired values, press PROGRAM to exit programming mode.

OPERATION

Using Auto Raise Height Feature

IMPORTANT:

The windrower must be running with the header engaged at the cutting height and the RETURN TO CUT switch (A) activated.

Use the AUTO RAISE HEIGHT feature as follows:

1. To raise the header to the AUTO RAISE HEIGHT set point, double-click (two clicks within 0.5 seconds) the HEADER UP switch (D) on the ground speed lever (GSL).

NOTE: With AUTO RAISE HEIGHT turned ON, the ACRE counter will be disabled when header height greater than preset cutting height.

2. If desired, press HEADER UP switch while header is being raised to disable AUTO RAISE HEIGHT and maintain current height.

NOTE: With AUTO RAISE HEIGHT turned OFF, the ACRE counter will be disabled when header height value is greater than 9.5. OFF is displayed on the cab display module (CDM).

3. To return the header to the preset cutting height, momentarily press HEADER DOWN switch (E).

Header Drop Rate

The header should lower gradually when the HEADER DOWN switch is pressed. From full height to ground should take approximately 3–4 seconds.

If the drop rate requires adjustment, refer to [Adjusting Header Drop Rate, page 366](#)

4.4.7 Double Windrowing

The double windrow attachment (DWA) deposits two windrows of conditioned material close together to be picked up by a forage chopper.

The system is for use with the A-Series Auger Header, R-Series Rotary Disc Header, and D65 Draper Header with HC10 Hay Conditioner.

The conditioned crop is deposited onto the side delivery system draper and delivered to the side of the windrower when required.

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 side delivery system.

Refer to MacDon M-Series Windrower Double Windrow Attachment Manual (Form MD #169216) for complete operating and maintenance instructions. The manual is shipped with the DWA kit.



Figure 4.92: DWA

OPERATION

Double Windrow Attachment (DWA) Deck Position

The deck is raised and lowered with the DWA UP (A) and DWA DOWN (B) switches on the ground speed lever (GSL) or with the rocker switch on the operator's console, depending on how the windrower cab display module (CDM) is programmed during the installation of the double windrow attachment (DWA).

To swap controls from the console to the GSL, refer to [Detailed Programming Menu Flow Chart, page 88](#).

NOTE: The same switch is used for raising and lowering a swath roller (if installed).

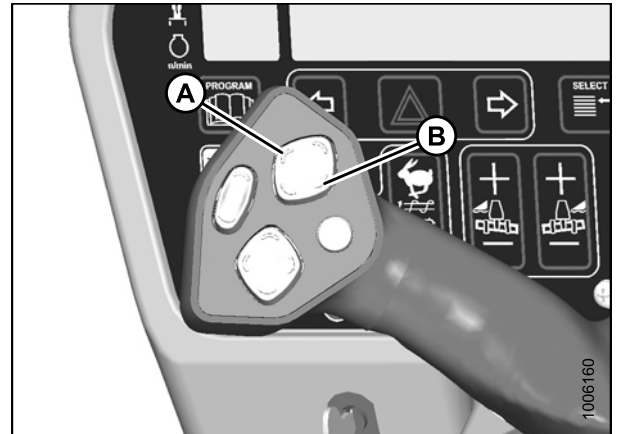


Figure 4.93: Ground Speed Lever (GSL)

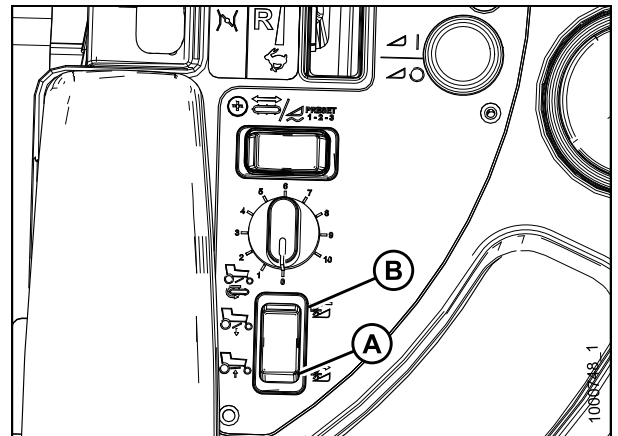


Figure 4.94: Operator's Console

Double Windrow Attachment (DWA) Draper Speed

The draper speed is controlled with the rotary switch (A) next to the rocker switch on the operator's console.

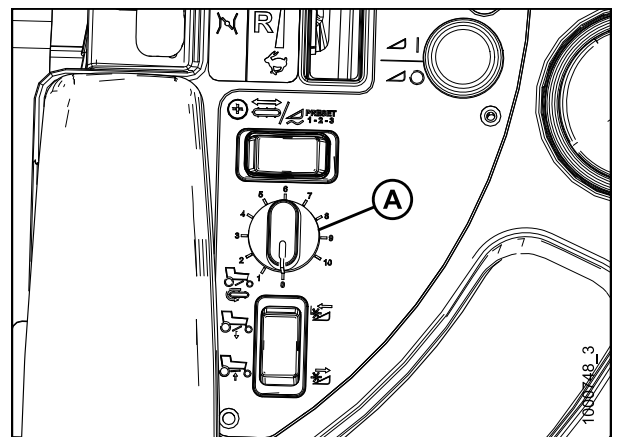


Figure 4.95: Operator's Console

OPERATION

4.4.8 Swath Roller Operation

The swath roller is raised and lowered with the DWA UP (A) and DWA DOWN (B) switches on the ground speed lever (GSL) or with the rocker switch on the operator's console, depending on how the windrower cab display module (CDM) is programmed during the installation of the Swath Roller kit.

To swap controls from the console to the GSL, refer to [Detailed Programming Menu Flow Chart, page 88](#).

Refer to the operating instructions that are provided with an Swath Roller kit. Refer to [7.1.20 Swath Roller, page 408](#) for more information.

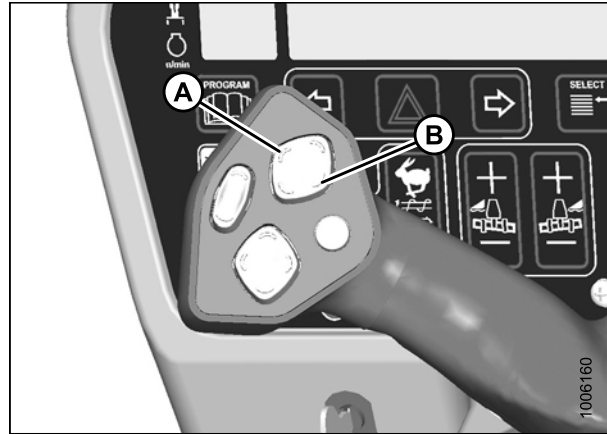


Figure 4.96: GSL

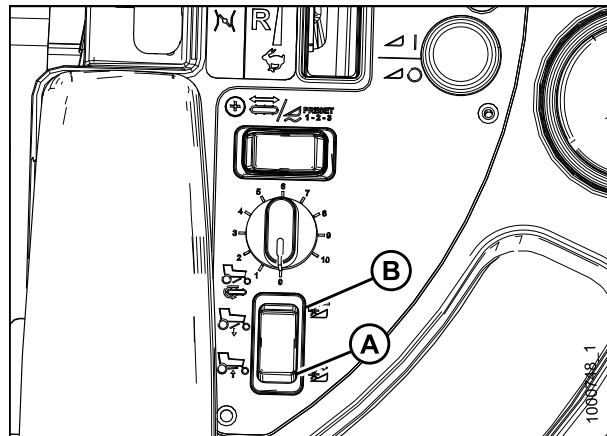


Figure 4.97: Rocker Switch

4.5 Attaching and Detaching Headers

4.5.1 Attaching a D-Series Header

Refer to the procedure that is appropriate for the center-link installed on the windrower:

- [Attaching a D-Series Header: Hydraulic Center-Link with Optional Self-Alignment, page 157](#)
- [Attaching a D-Series Header: Hydraulic Center-Link without Self-Alignment, page 162](#)
- [Attaching a D-Series Header: Mechanical Center-Link, page 168](#)

Attaching a D-Series Header: Hydraulic Center-Link with Optional Self-Alignment

NOTE: This topic assumes that draper header boots have already been attached to the windrower lift linkage. If that is not the case, refer to [4.6.2 Attaching Header Boots, page 228](#).

To attach a D-Series header to a windrower equipped with a hydraulic center-link and optional self-alignment, follow these steps:

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Remove the hairpin (A) from pins (B) and remove the pins from the header legs.

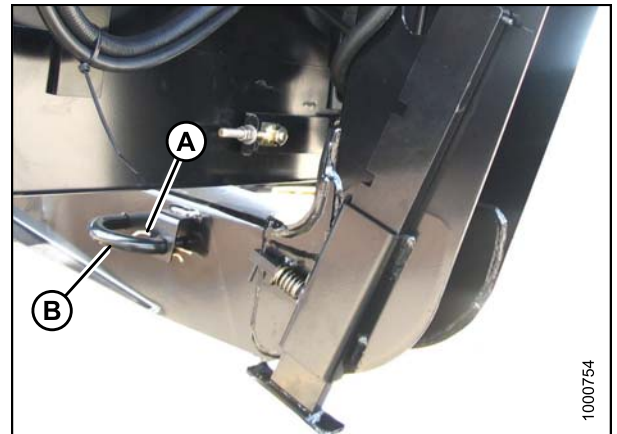


Figure 4.98: Header Leg

CAUTION

Check to be sure all bystanders have cleared the area.

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

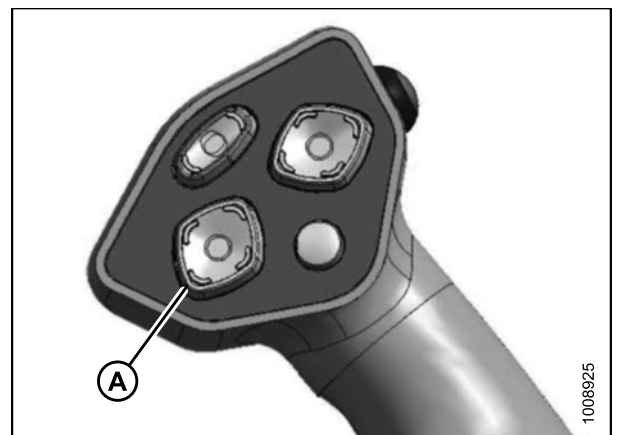


Figure 4.99: GSL

OPERATION

3. If necessary, activate the REEL UP switch (A) on the GSL to raise the center-link, so that 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.

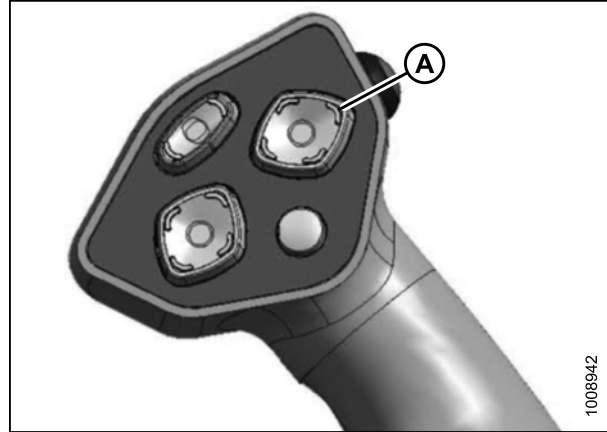


Figure 4.100: GSL

4. Slowly drive the windrower forward so the boots (A) enter the header legs (B). Continue to drive slowly forward until lift linkages contact the support plates in the header legs and the header nudges forward.
5. Ensure that lift linkages are properly engaged in header legs, contacting the support plates.

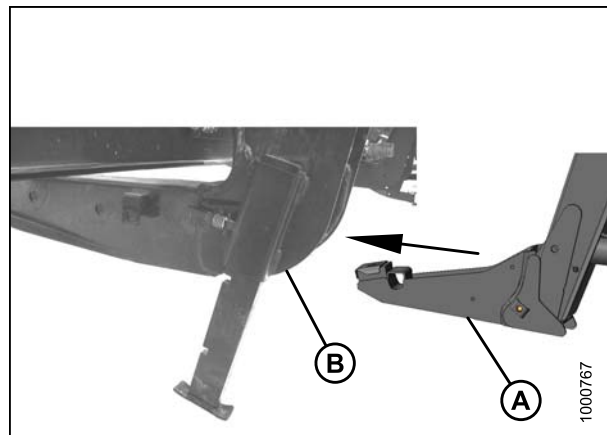


Figure 4.101: Header Leg and Boot

6. 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

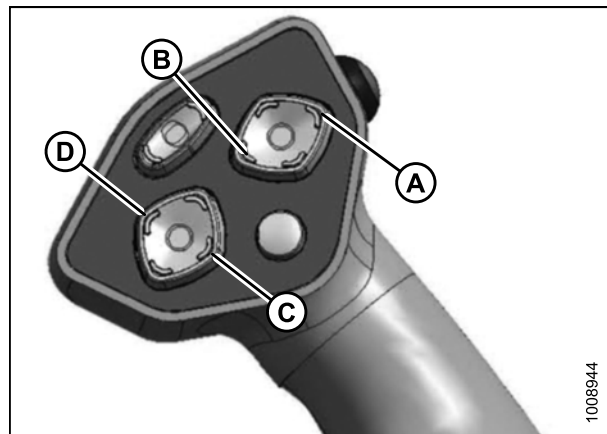


Figure 4.102: GSL

OPERATION

- Adjust position of the center-link cylinder (A) with the REEL UP and REEL DOWN switches, and HEADER TILT switches on the GSL to position the hook above the header attachment pin.

IMPORTANT:

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

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

CAUTION

Check to be sure all bystanders have cleared the area.

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

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

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

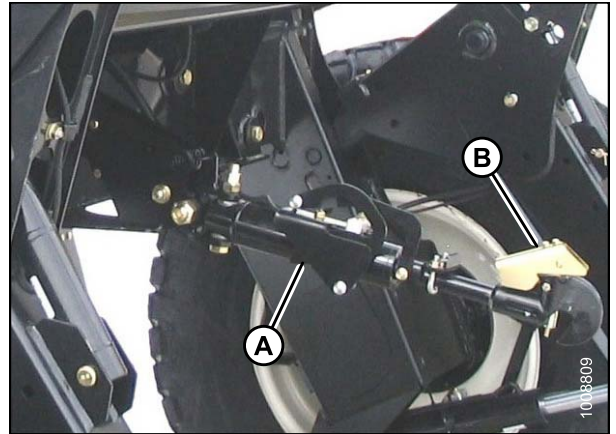


Figure 4.103: Hydraulic Center-Link



Figure 4.104: GSL

OPERATION

11. Engage safety props on both lift cylinders as follows:
 - a. Stop engine and remove key from ignition.
 - b. Pull lever (A) and rotate toward header to release and lower the safety prop (B) onto cylinder.
 - c. Repeat for the opposite lift cylinder.

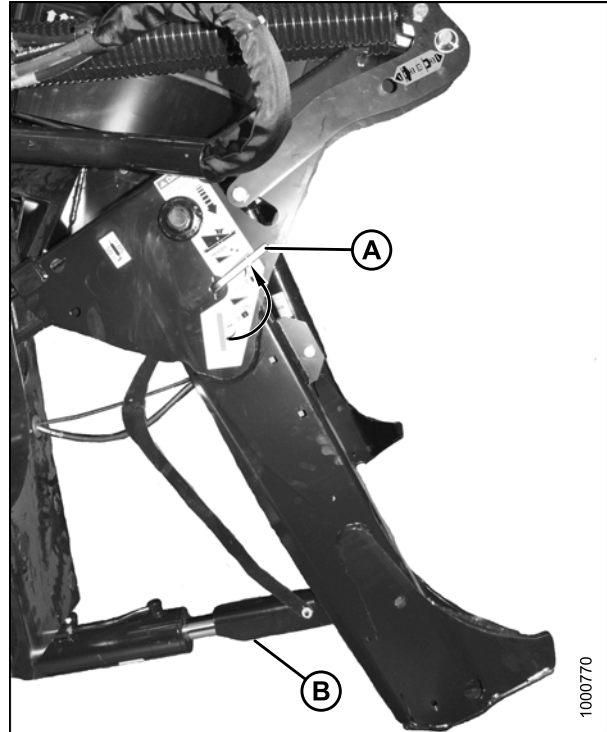


Figure 4.105: Cylinder Stop

12. Install pin (B) through the header leg, (engaging U-bracket in lift linkage) on both sides and secure with a hairpin (A).
13. Raise header stand (D) to storage position by pulling spring pin (C) and lifting stand into uppermost position. Release spring pin (C).

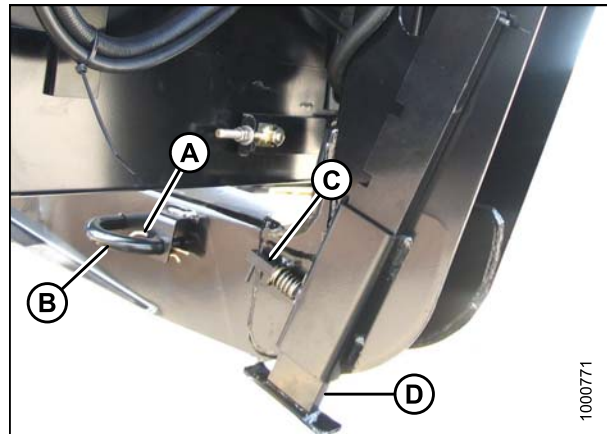


Figure 4.106: Header Leg

OPERATION

14. Remove clevis pin from storage position (B) in linkage and insert in hole (A) to engage float springs. Secure with hairpin.

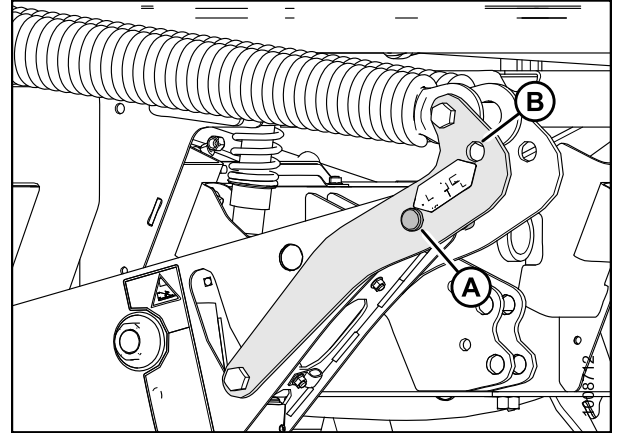


Figure 4.107: Header Lift Linkage

15. Disengage safety prop by turning lever (A) downward to release and lower stop until lever locks into vertical position.
16. Repeat for opposite lift safety prop.

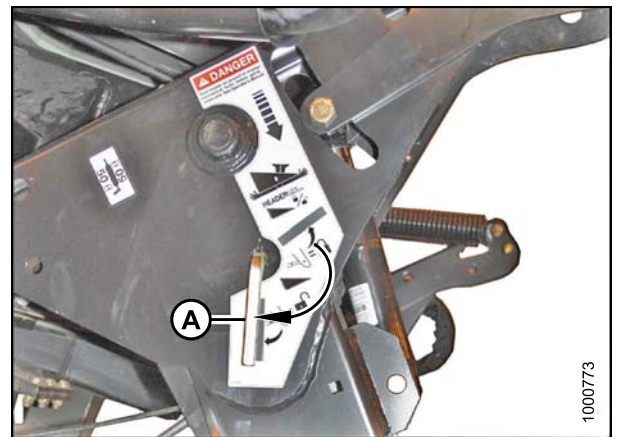


Figure 4.108: Cylinder Stop

CAUTION

Check to be sure all bystanders have cleared the area.

17. Start engine and activate HEADER DOWN switch on GSL to lower header fully.
18. Stop engine and remove key.

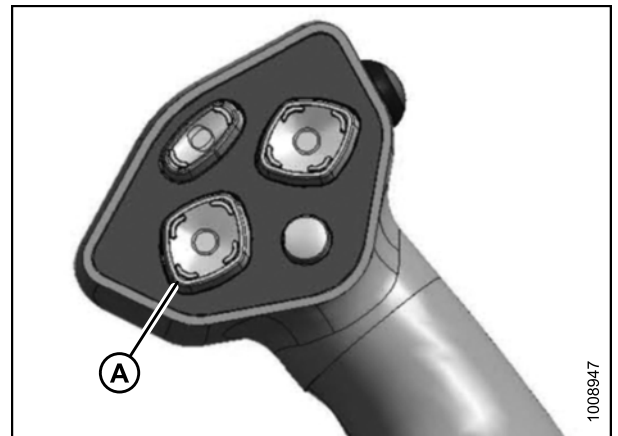


Figure 4.109: GSL

OPERATION

19. Connect header drive hoses (A) and electrical harness (B) to header. Refer to the draper header operator's manual.

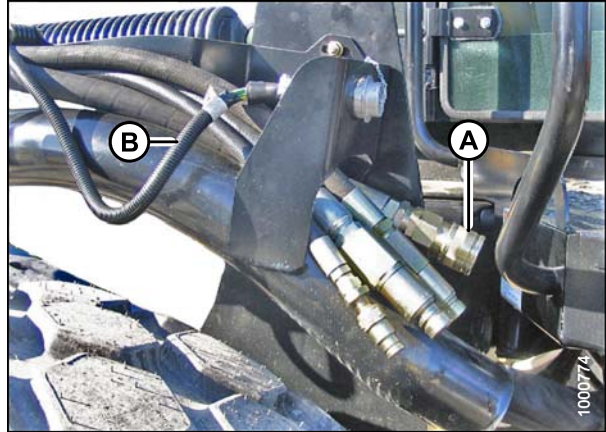


Figure 4.110: Header Drive Hoses and Harness

20. Connect reel hydraulics (A) at right-hand side of windrower. Refer to the draper header operator's manual.

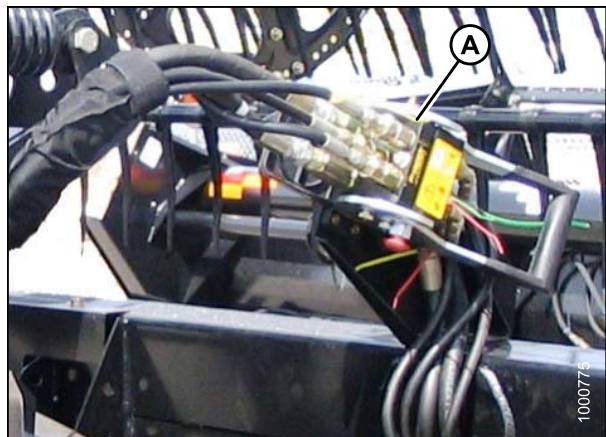


Figure 4.111: Reel Hydraulics

Attaching a D-Series Header: Hydraulic Center-Link without Self-Alignment

NOTE: This topic assumes that draper header boots have already been attached to the windrower lift linkage. If that is not the case, refer to [4.6.2 Attaching Header Boots, page 228](#).

To attach a D-Series header to a windrower equipped with a hydraulic center-link without the self-alignment kit, follow these steps:

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

OPERATION

1. Remove the hairpin (A) from pin (B) and remove the pins from both header legs.

CAUTION

Check to be sure all bystanders have cleared the area.

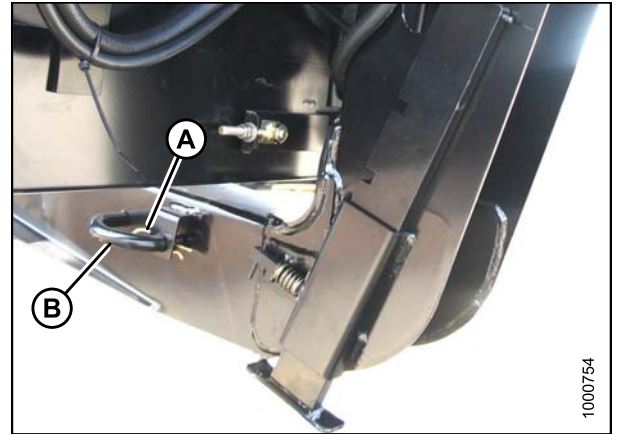


Figure 4.112: Header Leg

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

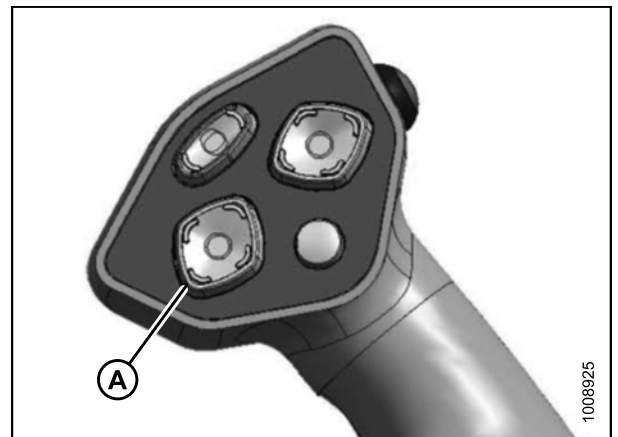


Figure 4.113: GSL

3. If necessary, relocate the pin (A) at the frame linkage as required to raise the center-link (B) so that the hook (B) 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.

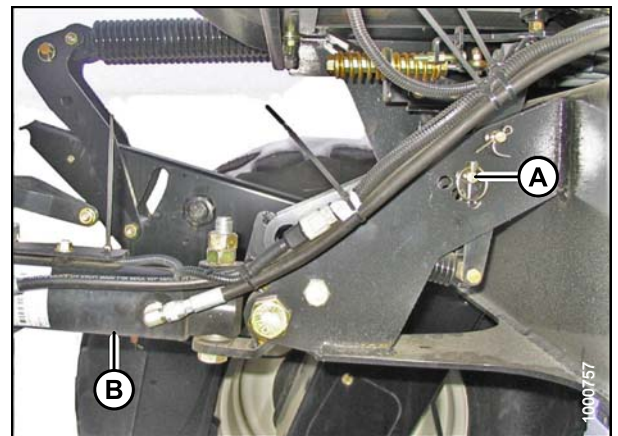


Figure 4.114: Hydraulic Center-Link without Self-Alignment Kit

OPERATION

4. Slowly drive the windrower forward so the boots (A) enter the header legs (B). Continue to drive slowly forward until lift linkages contact the support plates in the header legs and the header nudges forward.
5. Ensure that lift linkages are properly engaged in header legs, contacting the support plates.

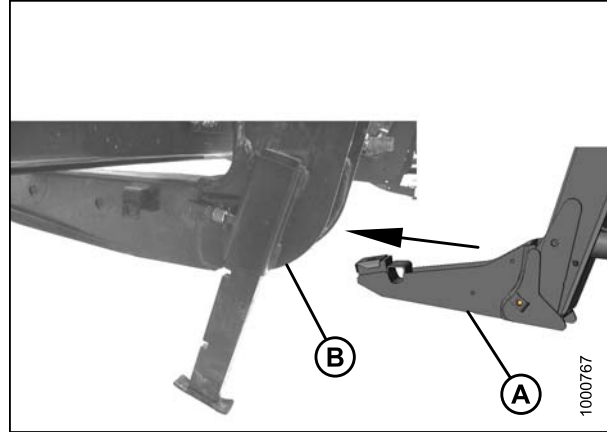


Figure 4.115: Header Leg and Boot

6. Activate HEADER TILT cylinder switches on ground speed lever (GSL) to extend or retract center-link cylinder so that the hook lines up with the header attachment pin.
7. Stop engine and remove key from ignition.

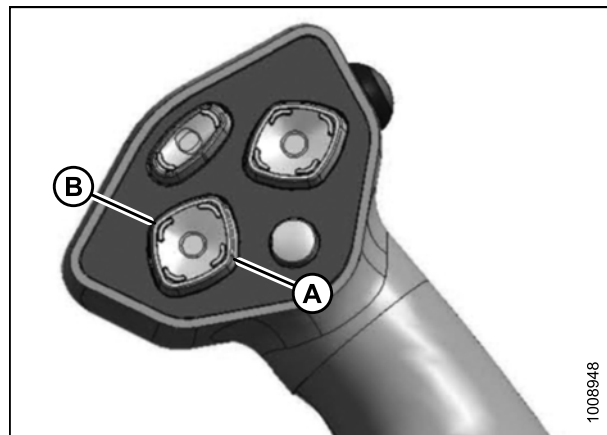


Figure 4.116: GSL

A - Header Tilt Up

B - Header Tilt Down

8. Push down on rod end of link cylinder (B), until hook engages pin on header and is locked.

IMPORTANT:

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

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

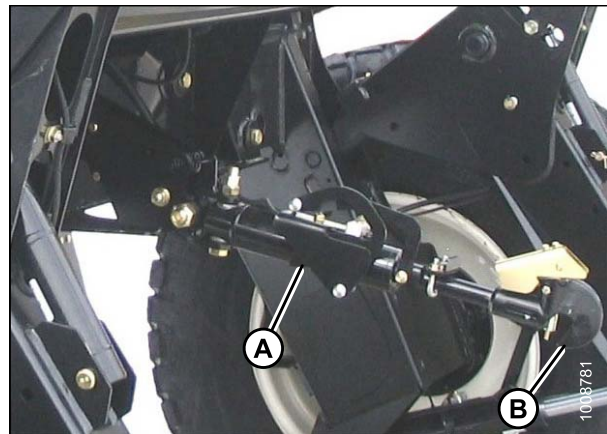


Figure 4.117: Hydraulic Center-Link

OPERATION

CAUTION

Check to be sure all bystanders have cleared the area.

10. Start engine and press the HEADER UP switch (A) to raise header to maximum height.

NOTE: If one end of the header does **NOT** raise fully, rephase the 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. Cylinders are now phased.

11. Engage safety props on both lift cylinders as follows:

- a. Stop engine and remove key from ignition.
- b. Pull lever (A) and rotate toward header to release and lower the cylinder stop (B) onto cylinder.
- c. Repeat for the opposite lift cylinder.

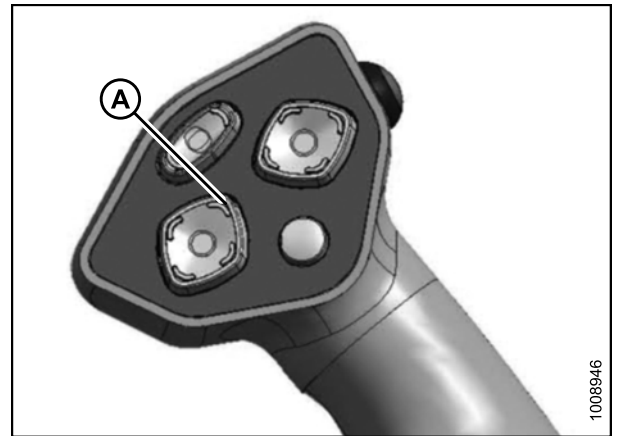


Figure 4.118: GSL

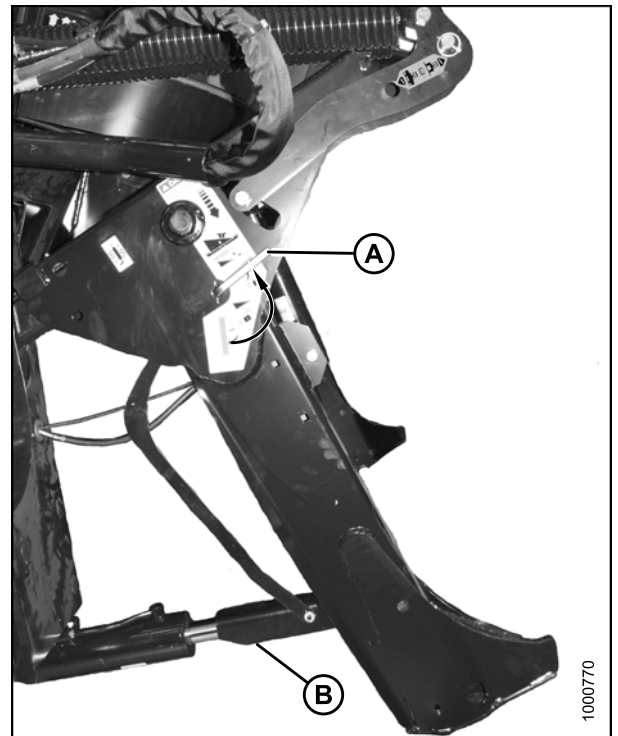


Figure 4.119: Cylinder Stop

OPERATION

12. Install the pin (B) through header leg, (engaging U-bracket in lift linkage) on both sides and secure with hairpin (A).
13. Raise header stand (D) to storage position by pulling spring pin (C) and lifting stand into uppermost position. Release spring pin (C).

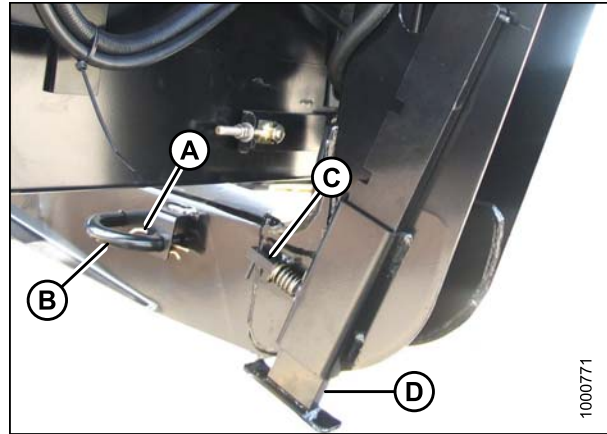


Figure 4.120: Header Leg

14. Remove clevis pin from storage position (B) in linkage and insert in hole (A) to engage float springs. Secure with hairpin.

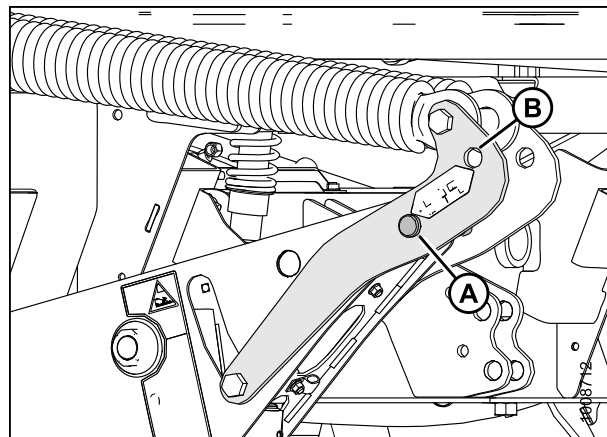


Figure 4.121: Header Lift Linkage

15. Disengage safety prop by turning lever (A) downward to release and lower stop until lever locks into vertical position.
16. Repeat for opposite safety prop.

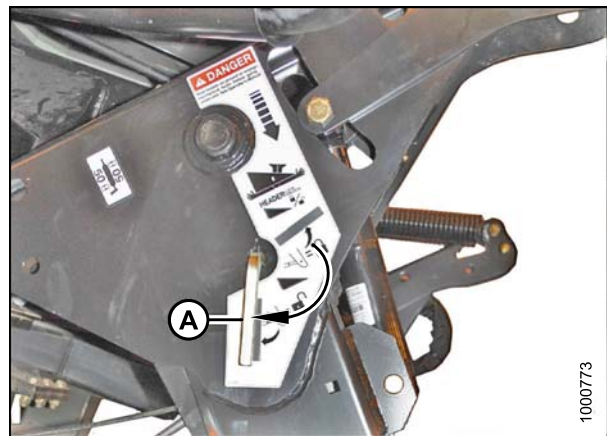


Figure 4.122: Cylinder Stop

OPERATION

CAUTION

Check to be sure all bystanders have cleared the area.

17. Start engine and activate HEADER DOWN switch (A) on GSL to lower header fully.
18. Stop engine and remove key.

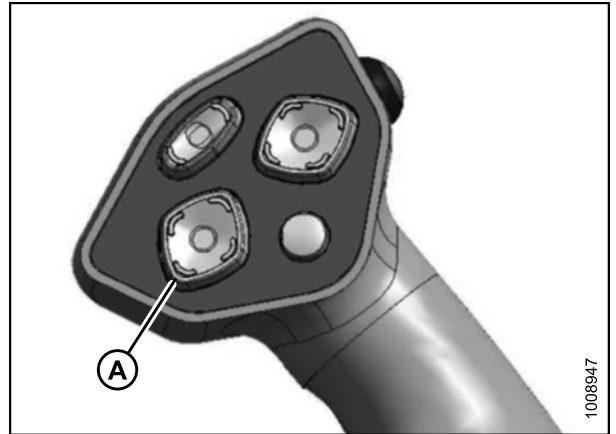


Figure 4.123: GSL

19. Connect header drive hoses (A) and electrical harness (B) to header. Refer to the draper header operator's manual.

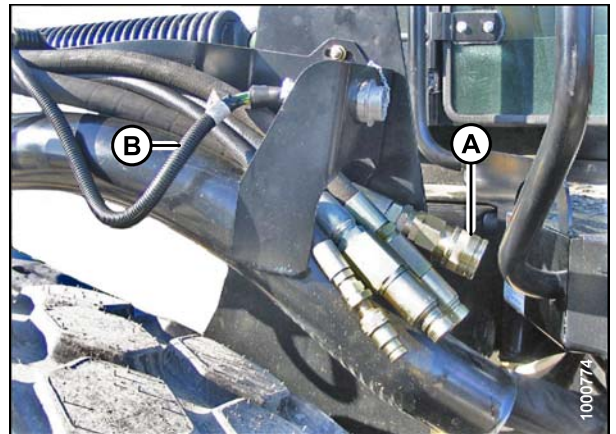


Figure 4.124: Header Drive Hoses and Harness

20. Connect reel hydraulics (A) at right-hand side of windrower. Refer to the draper header operator's manual.

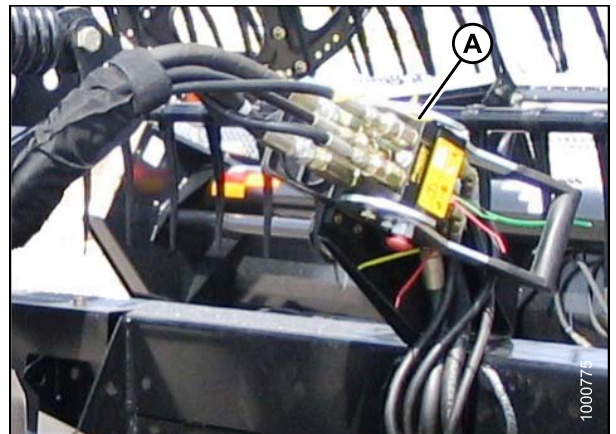


Figure 4.125: Reel Hydraulics

OPERATION

Attaching a D-Series Header: Mechanical Center-Link

NOTE: This topic assumes that draper header boots have already been attached to the windrower lift linkage. If that is not the case, refer to [4.6.2 Attaching Header Boots, page 228](#).

To attach a D-Series header to a windrower equipped with a mechanical center-link, follow these steps:

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Remove the hairpin (A) from pins (B) and remove the pins from header legs.

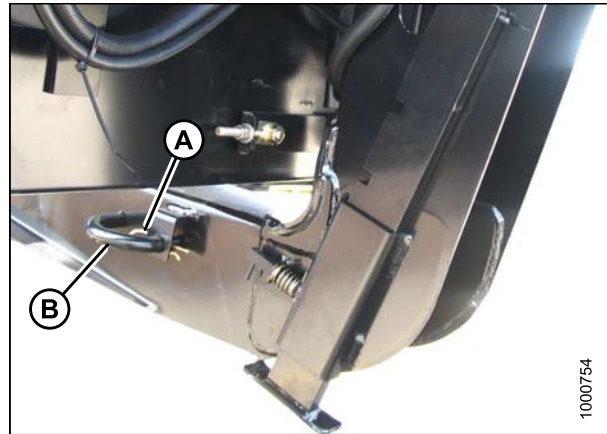


Figure 4.126: Header Leg

CAUTION

Check to be sure all bystanders have cleared the area.

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

IMPORTANT:

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

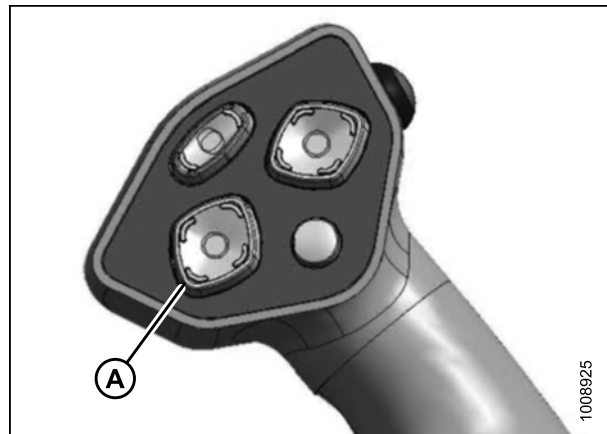


Figure 4.127: GSL

OPERATION

3. Slowly drive the windrower forward so the boots (A) enter the header legs (B). Continue to drive slowly forward until lift linkages contact the support plates in the header legs and the header nudges forward.
4. Ensure that lift linkages are properly engaged in header legs, contacting the support plates.

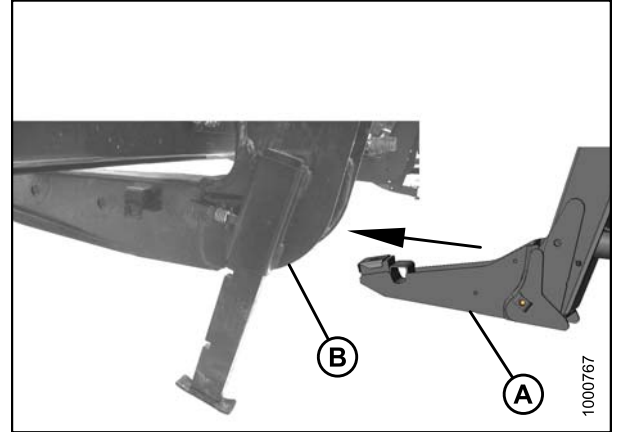


Figure 4.128: Header Leg and Boot

5. Stop engine and remove key from ignition.
6. Loosen nut (A) and rotate barrel (B) to adjust length so that the link lines-up with header bracket.
7. Install clevis pin (C) and secure with cotter pin (D).
8. Adjust link to required length for proper header angle by rotating barrel (B). Tighten nut (A) against barrel. A slight tap with a hammer is sufficient.

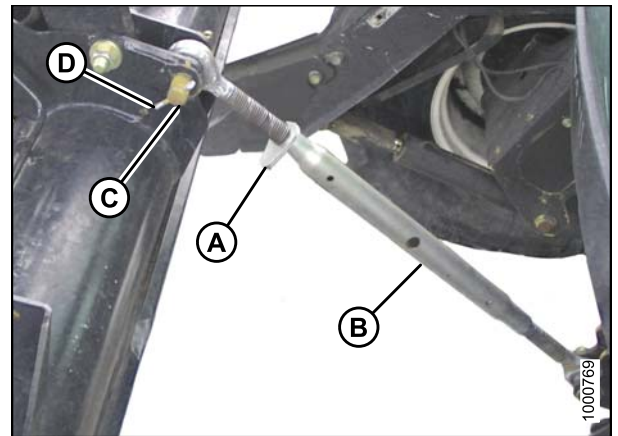


Figure 4.129: Mechanical Center-Link

CAUTION

Check to be sure all bystanders have cleared the area.

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

NOTE: If one end of the header does **NOT** raise fully, rephase the 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. Cylinders are now phased.

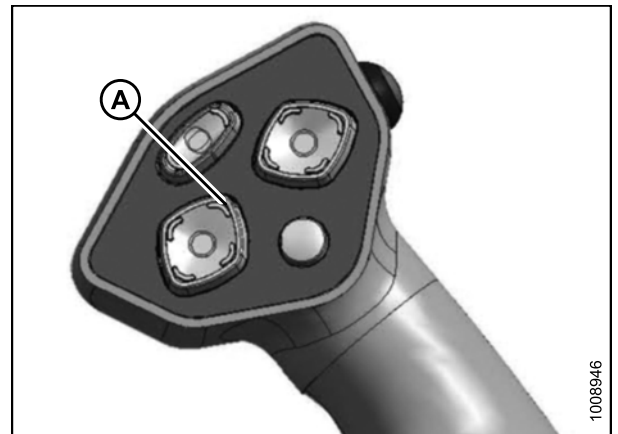


Figure 4.130: GSL

OPERATION

10. Engage safety props on both lift cylinders as follows:
 - a. Stop engine and remove key from ignition.
 - b. Pull lever (A) and rotate toward header to release and lower the safety prop (B) onto cylinder.
 - c. Repeat for the opposite lift cylinder.

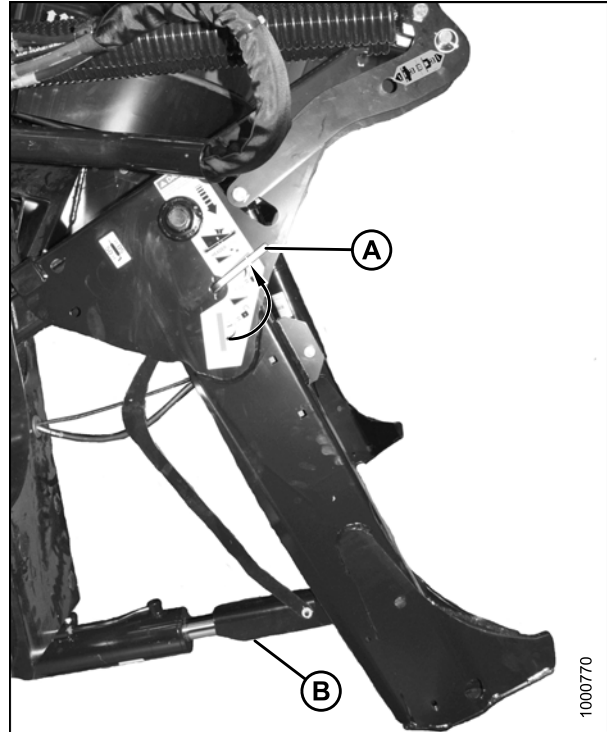


Figure 4.131: Cylinder Stop

11. Install pin (B) through header leg, (engaging U-bracket in lift linkage) on both sides and secure with a hairpin (A).
12. Raise header stand (D) to storage position by pulling spring pin (C) and lifting stand into uppermost position. Release spring pin (C).

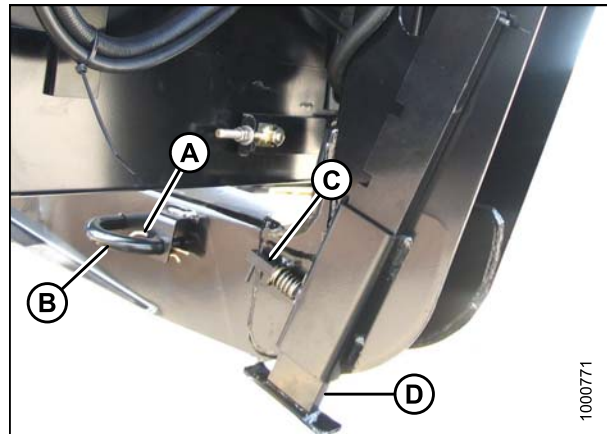


Figure 4.132: Header Leg

OPERATION

13. Remove clevis pin from storage position (B) in linkage and insert in hole (A) to engage float springs. Secure with hairpin.

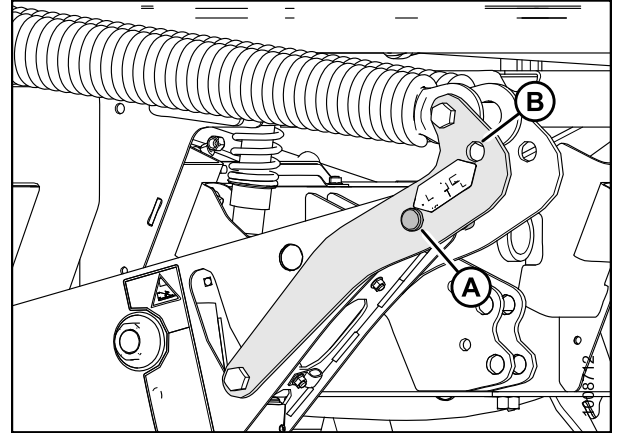


Figure 4.133: Header Lift Linkage

14. Disengage safety prop by turning lever (A) downward to release and lower stop until lever locks into vertical position.
15. Repeat for opposite safety prop.

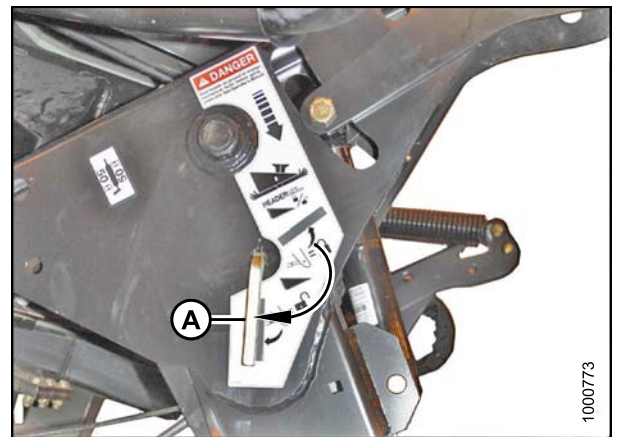


Figure 4.134: Cylinder Stop

CAUTION

Check to be sure all bystanders have cleared the area.

16. Start engine and activate HEADER DOWN switch on GSL (A) to lower header fully.
17. Stop engine and remove key.

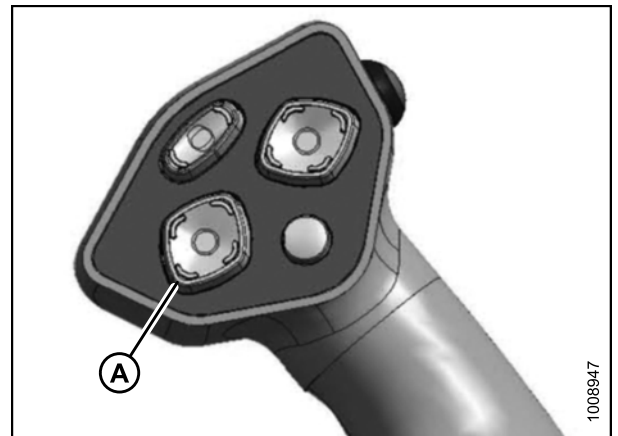


Figure 4.135: GSL

OPERATION

18. Connect header drive hoses (A) and electrical harness (B) to header. Refer to the draper header operator's manual.

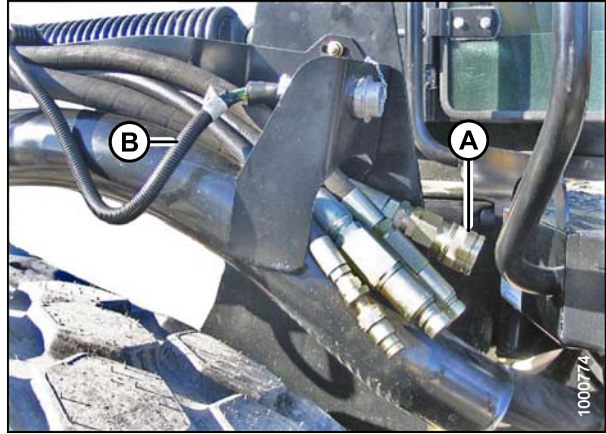


Figure 4.136: Header Drive Hoses and Harness

19. Connect reel hydraulics (A) at right-hand side of windrower. Refer to the draper header operator's manual.

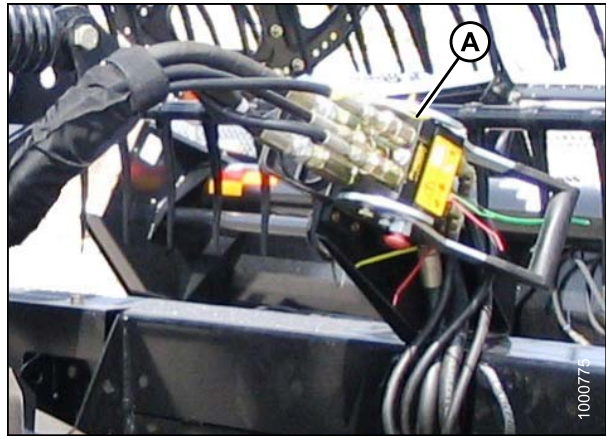


Figure 4.137: Reel Hydraulics

4.5.2 Detaching a D-Series Header

Refer to the procedure that is appropriate for the center-link installed on the windrower:

- [Detaching a D-Series Header: Hydraulic Center-Link, page 173](#)
- [Detaching a D-Series Header: Mechanical Center-Link, page 176](#)

OPERATION

Detaching a D-Series Header: Hydraulic Center-Link

To detach a D-Series header from an M-Series windrower equipped with a hydraulic center-link, follow these steps:

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Start engine and press HEADER UP (A) switch to raise header to maximum height.
2. Rephase cylinders if one end of the header does not raise fully. If rephasing is needed, proceed as follows:
 - a. Press and hold the HEADER UP (A) switch until both cylinders stop moving.
 - b. Continue to hold the switch for 3–4 seconds. Cylinders are phased.
3. Stop engine and remove key.
4. Pull lever (A) and rotate toward header to lower safety prop (B) onto cylinder. Repeat for opposite cylinder.



Figure 4.138: GSL

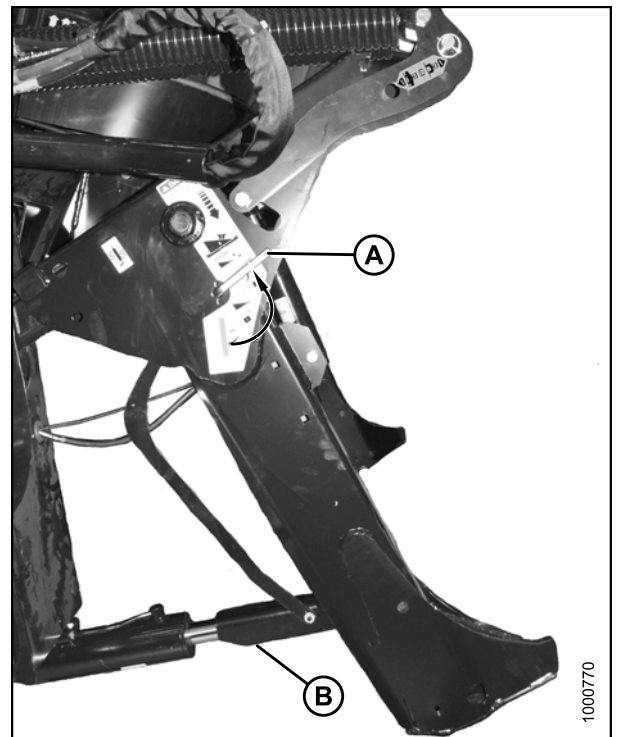


Figure 4.139: Safety Prop

OPERATION

5. Remove the pin (B) by removing the hairpin (A) from header leg on both sides.
6. Lower header stand (D) by pulling spring loaded pin (C). Release spring pin to lock stand.

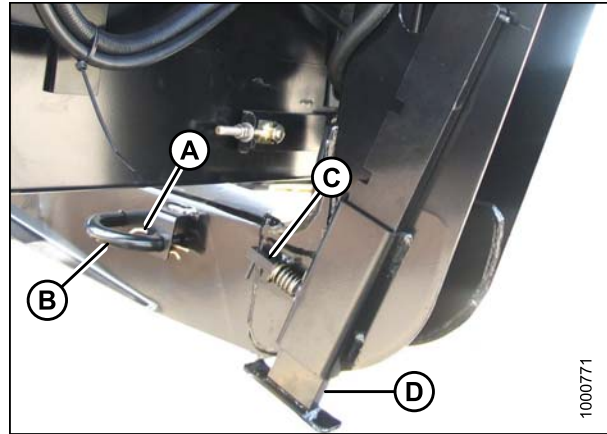


Figure 4.140: Header Stands

7. Remove clevis pin from location (A) to disengage float springs and insert in storage hole (B). Secure with lynch pin.

CAUTION

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

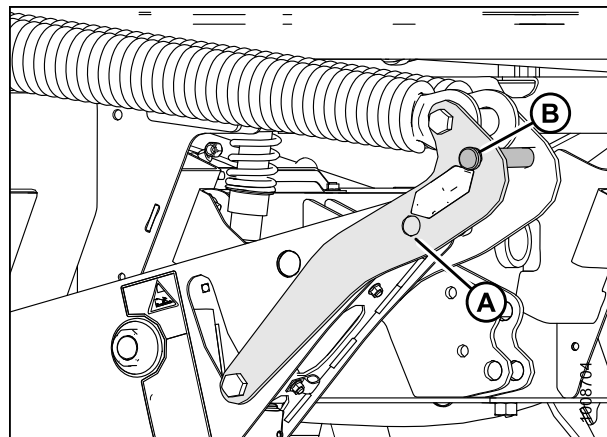


Figure 4.141: Header Lift Linkage

8. To disengage safety props and for storage, turn lever (A) away from header to raise safety prop until lever locks into vertical position. Repeat for opposite cylinder.

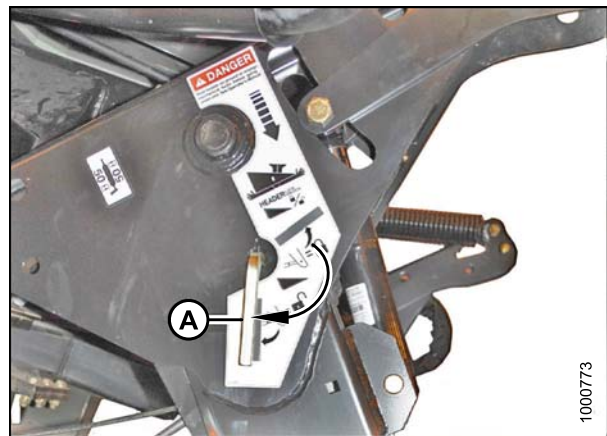


Figure 4.142: Safety Prop

OPERATION

9. Disconnect header drive hydraulics (A) and electrical harness (B) from header and store in support on windrower left cab-forward side. Refer to the draper header operator's manual for further information.

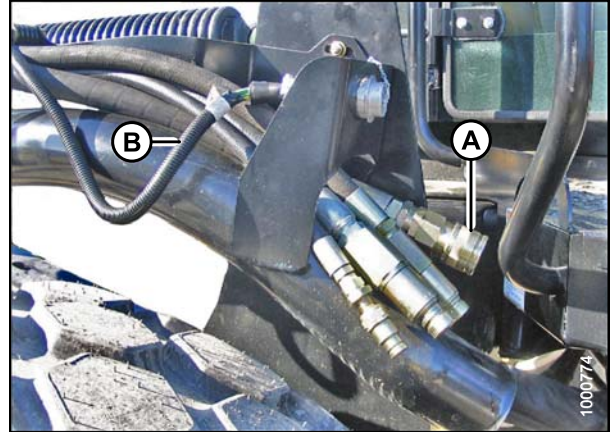


Figure 4.143: Header Drive Hydraulics

10. Disconnect reel hydraulics (A) from header and store on bracket at windrower left cab-forward side. Refer to the draper header operator's manual for further information.

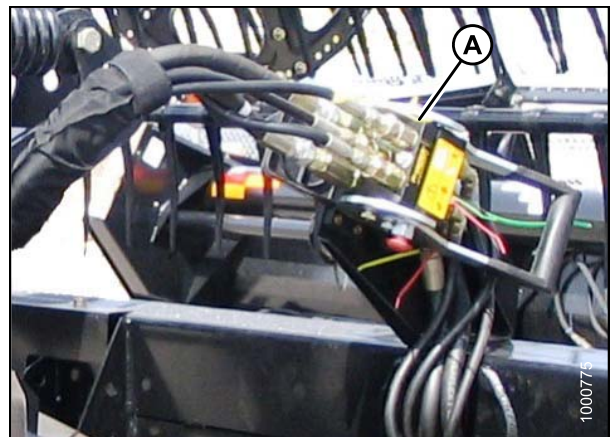


Figure 4.144: Reel Hydraulics

CAUTION

Check to be sure all bystanders have cleared the area.

11. Start engine and activate HEADER TILT cylinder switch on ground speed lever (GSL) to release load on center-link cylinder.

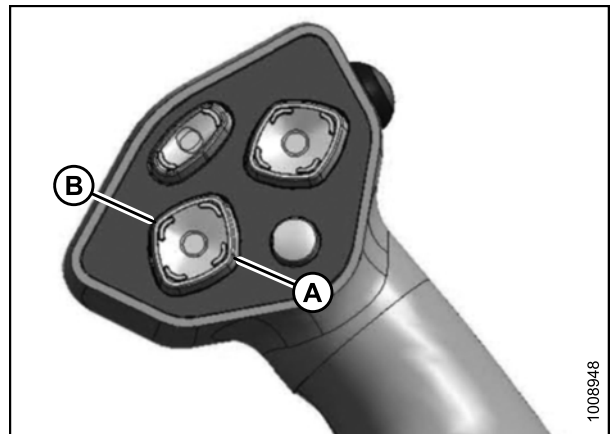


Figure 4.145: GSL

A - Header Tilt Up

B - Header Tilt Down

OPERATION

12. Disconnect center-link by lifting release (B) and lift hook (A) off header.

NOTE: If optional center-link self-alignment kit is installed, lift release (B) and then operate the link lift cylinder with REEL UP switch on GSL to disengage the center-link from the header.

NOTE: If hay conditioner is installed, watch clearances on both sides.

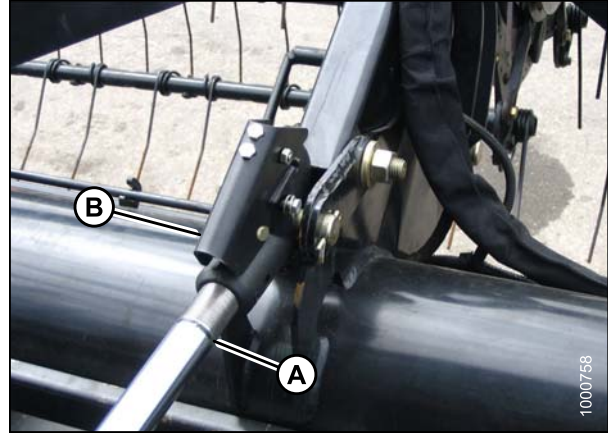


Figure 4.146: Hydraulic Center-Link

13. Reinstall pin (A) into header leg and secure with a hairpin (B).

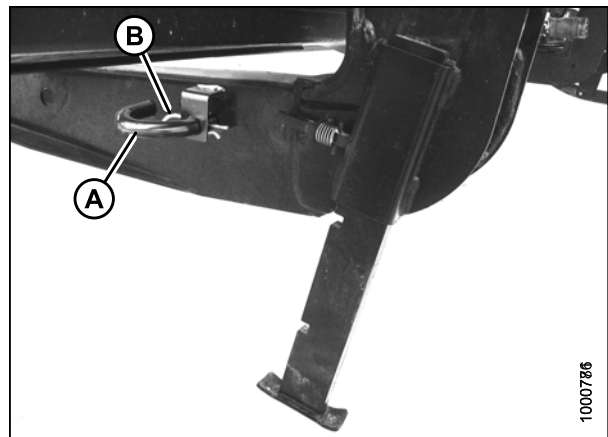


Figure 4.147: Header Stand

Detaching a D-Series Header: Mechanical Center-Link

To detach a D-Series header from an M-Series windrower equipped with mechanical center-link, follow these steps:

⚠ DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Start engine and press HEADER UP (A) switch to raise header to maximum height.
2. If one end of the header does **NOT** raise completely, rephase the cylinders as follows:
 - a. Press and hold the HEADER UP (A) switch on the ground speed lever (GSL) until both cylinders stop moving.
 - b. Continue to hold the switch for 3–4 seconds. Cylinders are phased.
3. Stop engine and remove key.



Figure 4.148: GSL

OPERATION

4. To engage the safety props, pull lever (A) and rotate toward header to lower safety prop (B) onto cylinder. Repeat for the opposite cylinder.

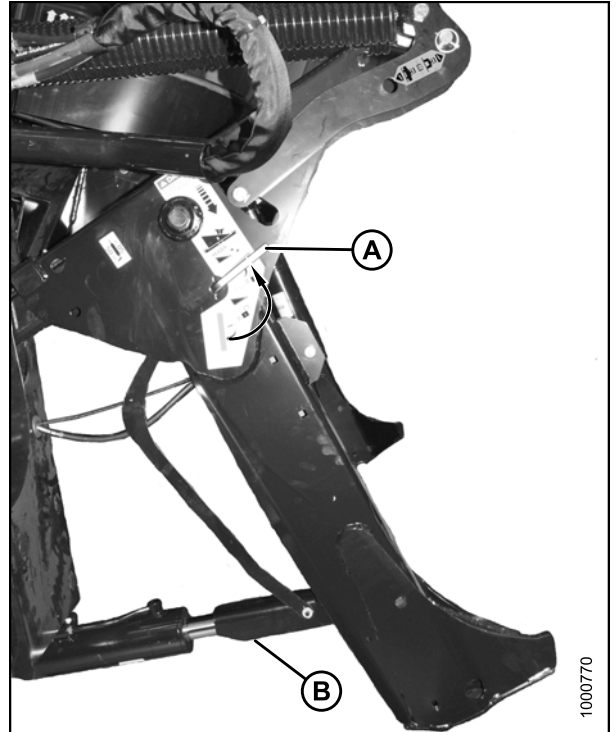


Figure 4.149: Safety Prop

5. Remove the clevis pin (B) by removing hairpin (A) from header leg on both sides.
6. Lower header stand (D) by pulling spring loaded pin (C). Release pin to lock stand.

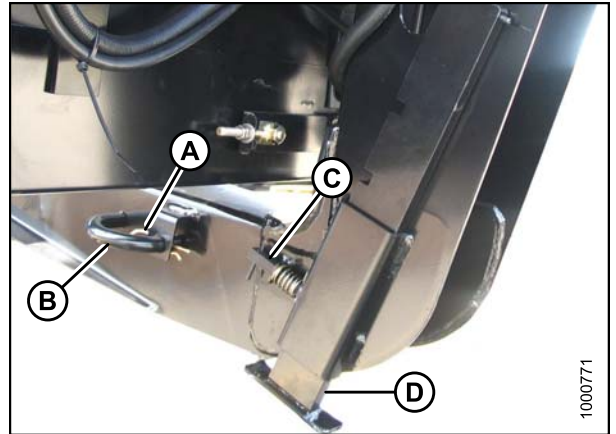


Figure 4.150: Header Stands

OPERATION

7. Remove the clevis pin from location (A) to disengage float springs and insert in storage hole (B). Secure with lynchpin.

CAUTION

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

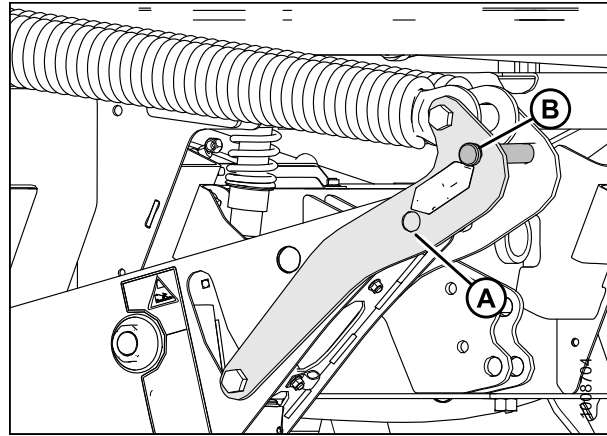


Figure 4.151: Header Lift Linkage

8. To disengage safety props and for storage, turn lever (A) away from header to raise safety prop until lever locks into vertical position. Repeat for opposite cylinder.

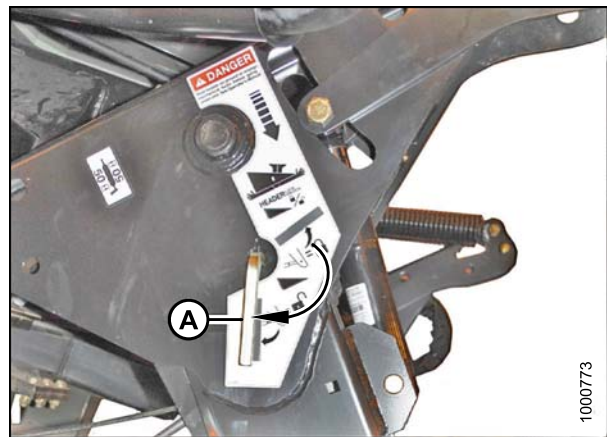


Figure 4.152: Safety Prop

9. Disconnect header drive hydraulics (A) and electrical harness (B) from header and store in support on windrower left cab-forward side. Refer to the draper header operator's manual for further information.

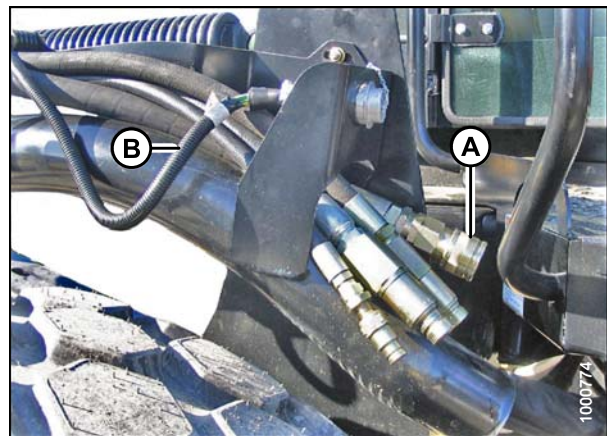


Figure 4.153: Header Drive Hydraulics

OPERATION

10. Disconnect reel hydraulics (A) from header and store on bracket at windrower left cab-forward side. Refer to the draper header operator's manual for further information.

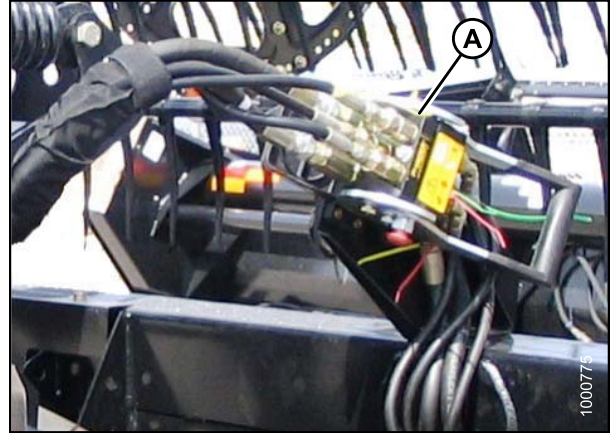


Figure 4.154: Reel Hydraulics

11. Loosen nut (A) and rotate barrel (B) to relieve load on link.
12. Remove cotter pin on clevis pin (D) and remove the pin (C) to disconnect from windrower. Reinstall clevis pin (C) in header.
13. Tighten nut (A) against barrel. A slight tap with a hammer is sufficient.

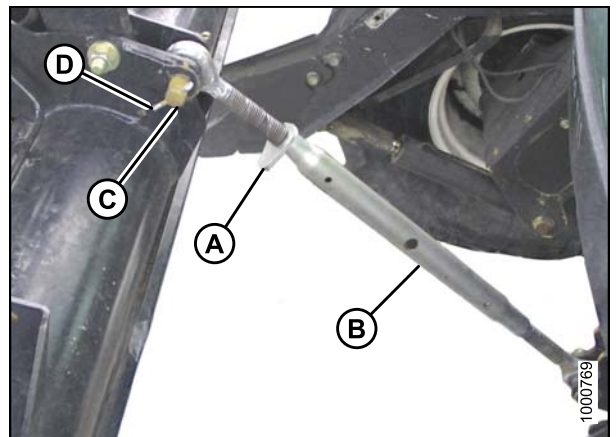


Figure 4.155: Mechanical Center-Link

14. Reinstall pin (A) into header leg and secure with a hairpin (B).

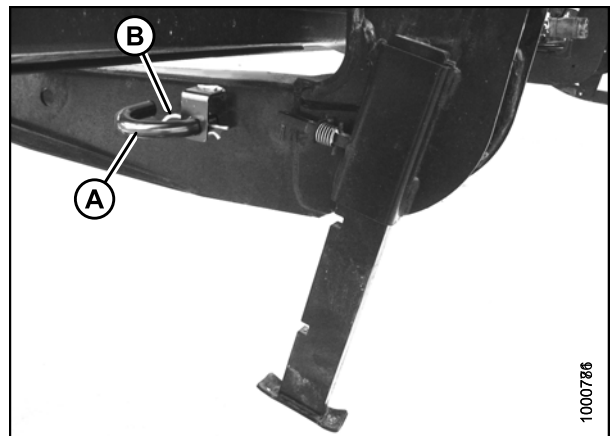


Figure 4.156: Header Leg

OPERATION

4.5.3 Attaching an A-Series Header

Refer to the procedure that is appropriate for the center-link installed on the windrower:

- [Attaching an A-Series Header: Hydraulic Center-Link with Optional Self-Alignment, page 180](#)
- [Attaching an A-Series Header: Hydraulic Center-Link without Self-Alignment, page 185](#)
- [Attaching an A-Series Header: Mechanical Center-Link, page 191](#)

Attaching an A-Series Header: Hydraulic Center-Link with Optional Self-Alignment

To attach an A-Series header to a windrower equipped with a hydraulic center-link and optional self-alignment, follow these steps:

⚠ DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Remove hairpin (A) from pin (B) and remove pin from left and right header boots (C) on header.

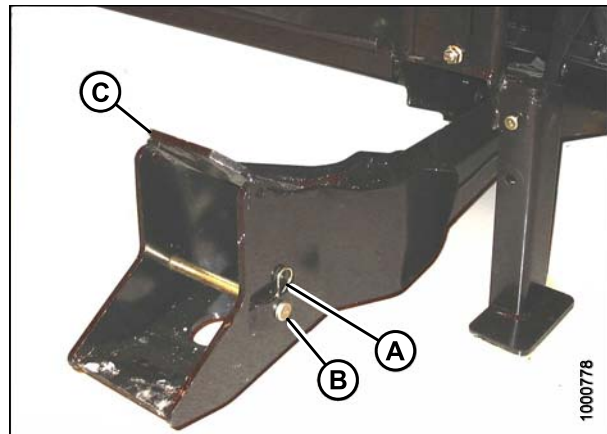


Figure 4.157: Header Boot

⚠ CAUTION

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

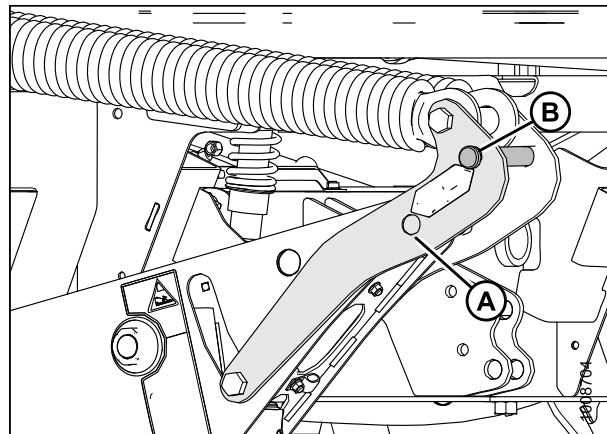


Figure 4.158: Header Lift Linkage

OPERATION

CAUTION

Check to be sure all bystanders have cleared the area.

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

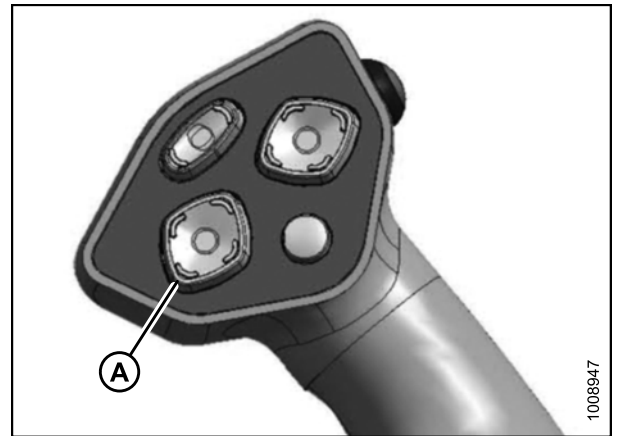


Figure 4.159: GSL

3. If necessary, activate the REEL UP switch (A) on the GSL to raise the center-link, so that 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.

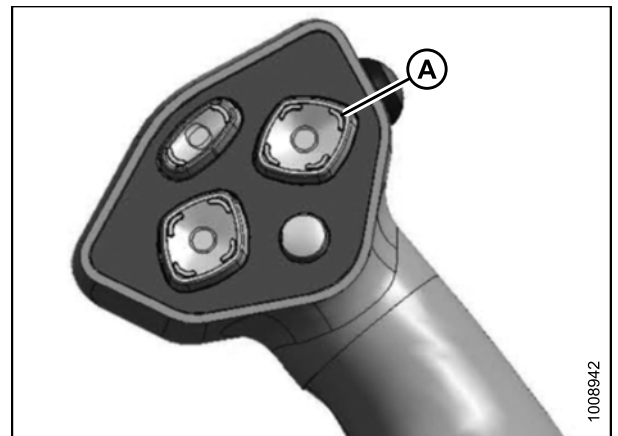


Figure 4.160: GSL

4. Slowly drive the windrower forward so the feet (A) on the windrower enter the boots (B) on the header. Continue to drive slowly forward until the feet engage the boots and the header nudges forward.

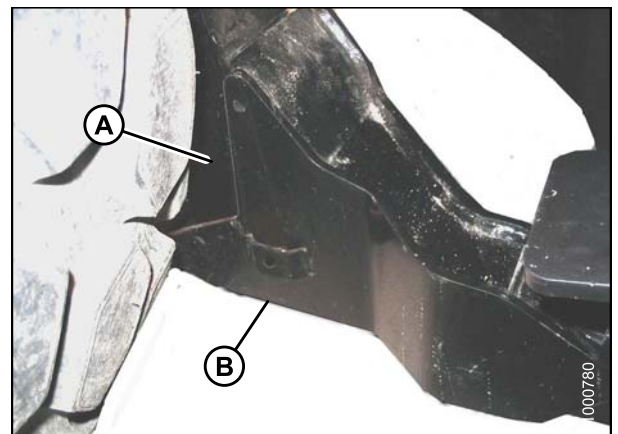


Figure 4.161: Header Boot

OPERATION

5. 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

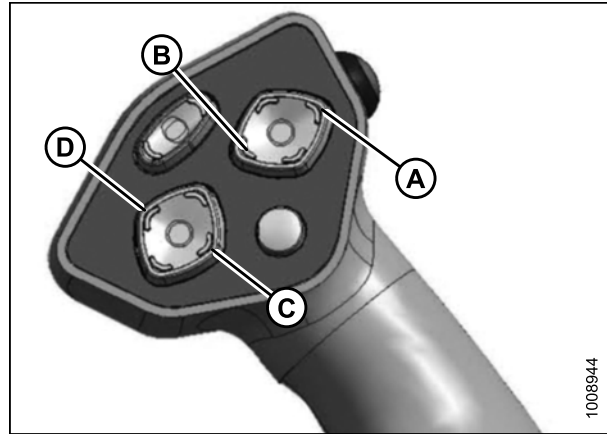


Figure 4.162: GSL

6. Adjust position of the center-link cylinder (A) with the REEL UP and REEL DOWN switches. Position the hook above the header attachment pin using the HEADER TILT switches on the GSL.

IMPORTANT:

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

7. Lower center-link (A) onto the header with REEL DOWN switch until it locks into position (hook release [B] is down).
8. Check that center-link is locked onto header by pressing the REEL UP switch on the GSL.
9. Start engine and press HEADER UP switch (A) to raise header to maximum height.

NOTE: If one end of the header does NOT raise fully, the lift cylinders require re-phasing. If re-phasing is needed, proceed 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. Cylinders are now phased.

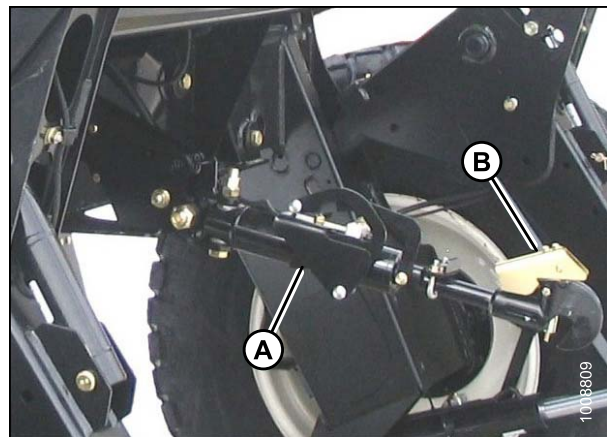


Figure 4.163: Hydraulic Center-Link

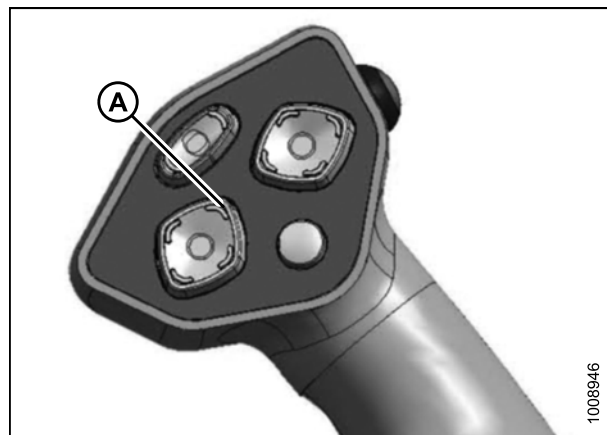


Figure 4.164: GSL

OPERATION

10. Safety props are located on both of the windrower's header lift cylinders. Engage safety props on both lift cylinders as follows:
 - a. Stop engine and remove key from ignition.
 - b. Pull lever (A) and rotate toward header to release and lower the safety prop (B) onto cylinder.
 - c. Repeat for the opposite lift cylinder.

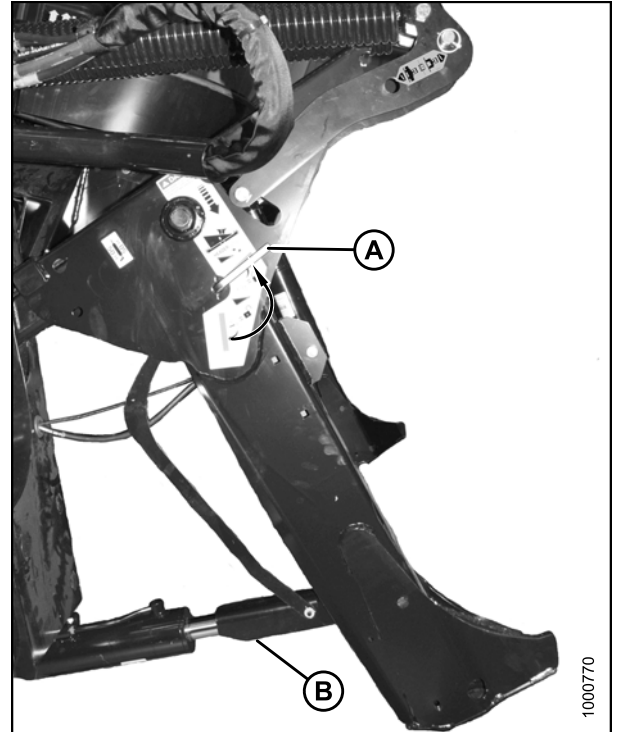


Figure 4.165: Safety Prop

11. Install clevis pin (A) through each boot and foot, and secure with hairpin. Do this to both sides.

IMPORTANT:

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

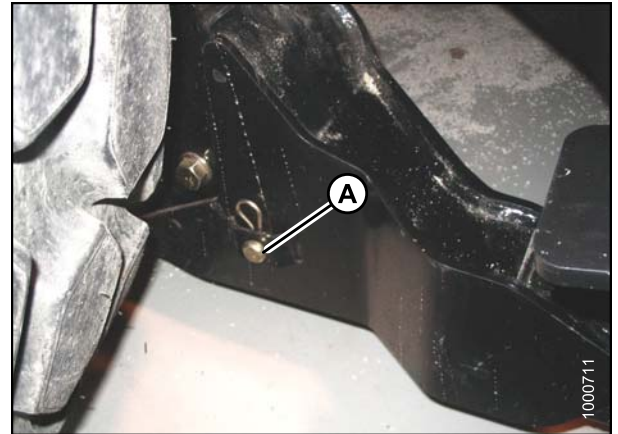


Figure 4.166: Header Boot

OPERATION

12. Remove lynch pin from clevis pin (A) in stand (B).
13. Hold stand (B) and remove pin (A).
14. Position stand to storage position by inverting stand and relocating on bracket as shown. Reinsert clevis pin (A) and secure with lynch pin.

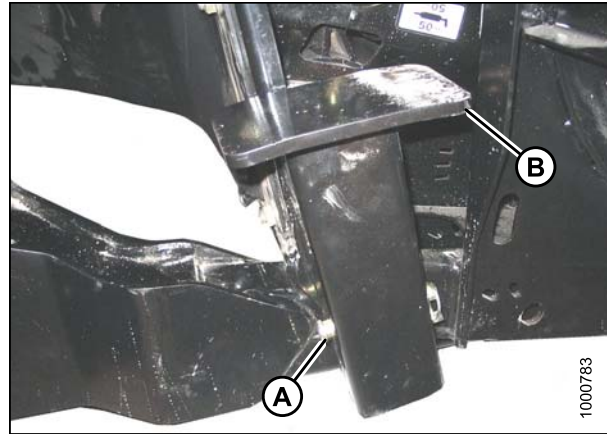


Figure 4.167: Header Stand

15. Remove clevis pin from storage position (B) in linkage, and insert in hole (A) to engage float springs. Secure with hairpin.

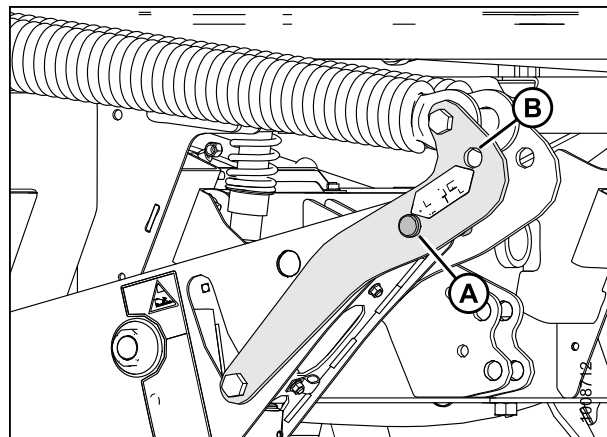


Figure 4.168: Header Lift Linkage

16. Disengage safety prop by turning lever (A) downward to release and lower safety prop until lever locks into vertical position.
17. Repeat for opposite safety prop.

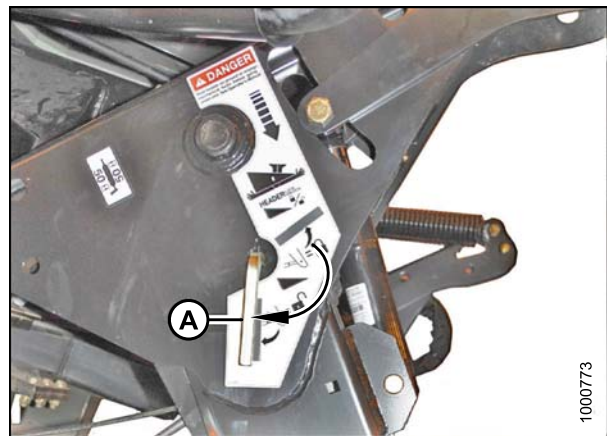


Figure 4.169: Safety Prop

OPERATION

CAUTION

Check to be sure all bystanders have cleared the area.

18. Start engine and activate HEADER DOWN switch (A) on GSL to lower header fully. Stop engine and remove key.

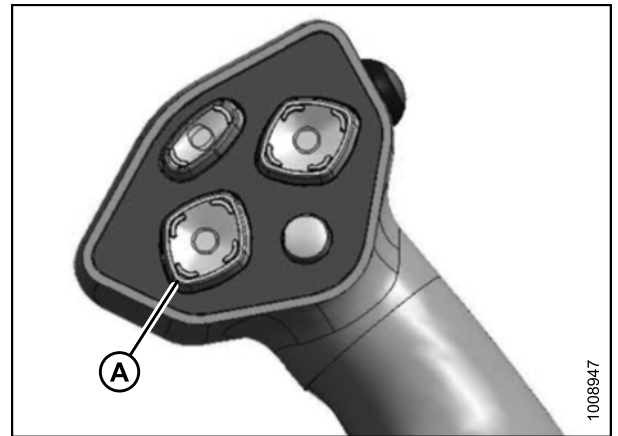


Figure 4.170: GSL

19. Connect header drive hoses (A) and electrical harness (B) to header. Refer to the auger header operator's manual.

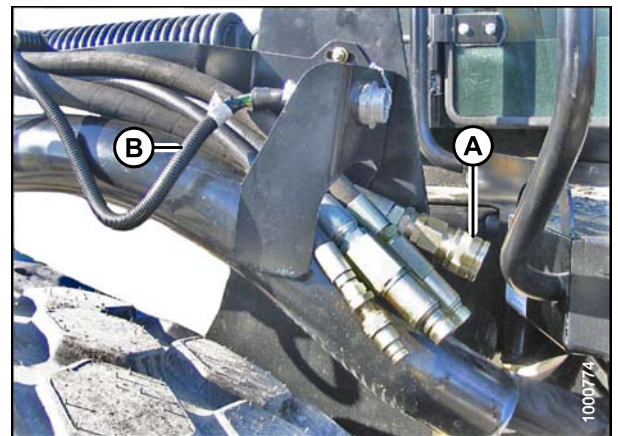


Figure 4.171: Header Drive Hoses and Harness

Attaching an A-Series Header: Hydraulic Center-Link without Self-Alignment

To attach an A-Series header to a windrower equipped with a hydraulic center-link without the self-alignment kit, follow these steps:

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

OPERATION

1. Remove hairpin (A) from clevis pin (B) and remove the clevis pin from left and right header boots (C) on header.

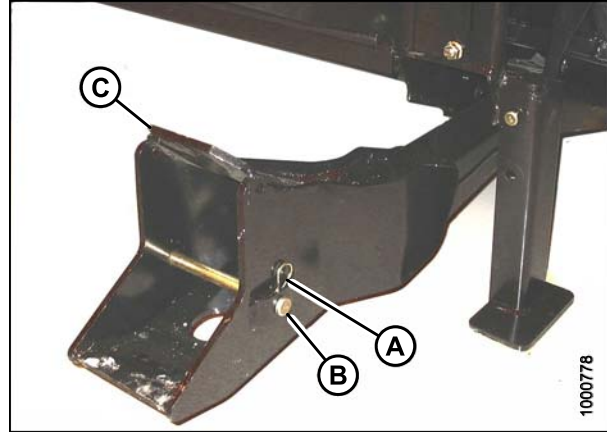


Figure 4.172: Header Boot

CAUTION

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

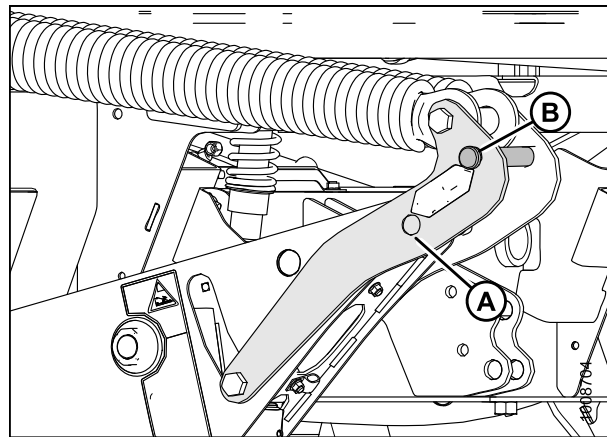


Figure 4.173: Header Lift Linkage

CAUTION

Check to be sure all bystanders have cleared the area.

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

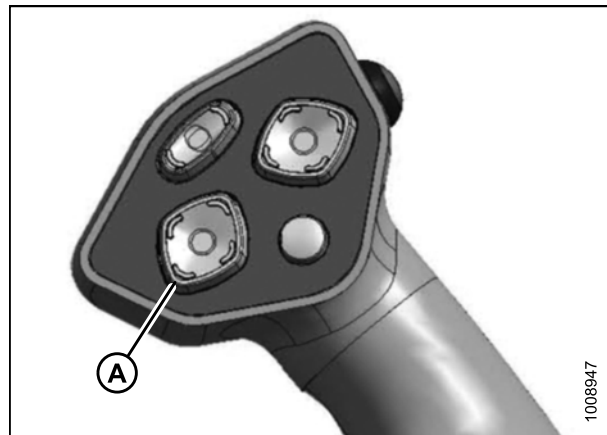


Figure 4.174: GSL

OPERATION

3. If necessary, relocate pin (A) at the frame linkage as required to raise the center-link (B) so that 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.

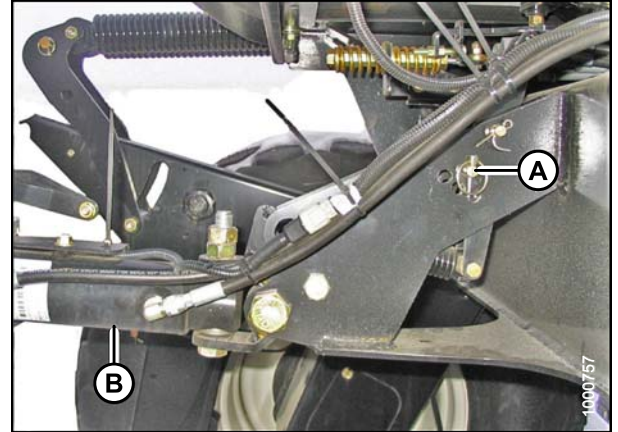


Figure 4.175: Hydraulic Center-Link without Self-Alignment Kit

4. Slowly drive the windrower forward so the feet (A) on the windrower enter the boots (B) on the header. Continue to drive slowly forward until the feet engage the boots and the header nudges forward.

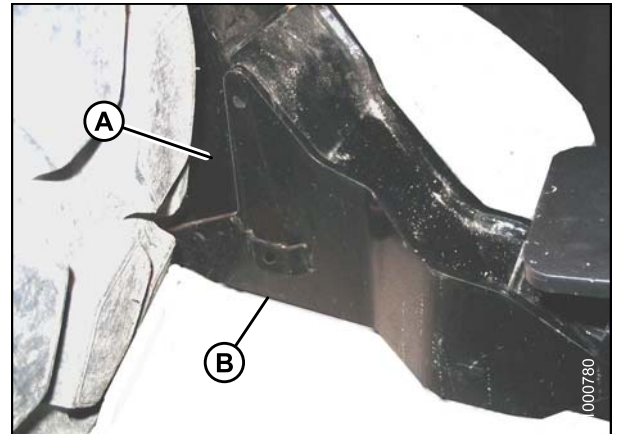


Figure 4.176: Header Boot

5. Activate HEADER TILT cylinder switches on ground speed lever (GSL) to extend or retract center-link cylinder so that the hook lines up with the header attachment pin.
6. Stop engine and remove key from ignition.

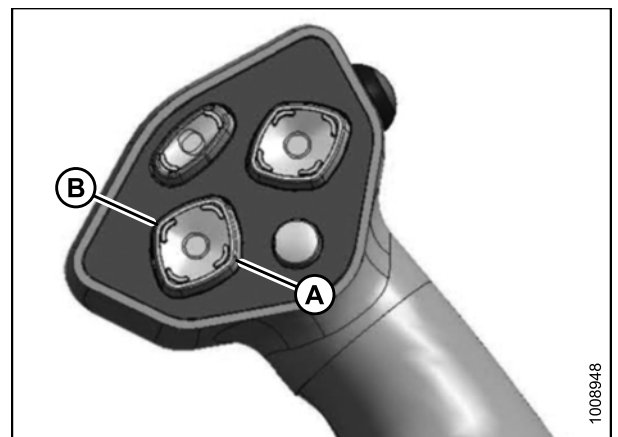


Figure 4.177: GSL

A - Header Tilt Up

B - Header Tilt Down

OPERATION

7. Push down on rod end of link cylinder (B), until hook engages pin on header and is locked.

IMPORTANT:

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

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

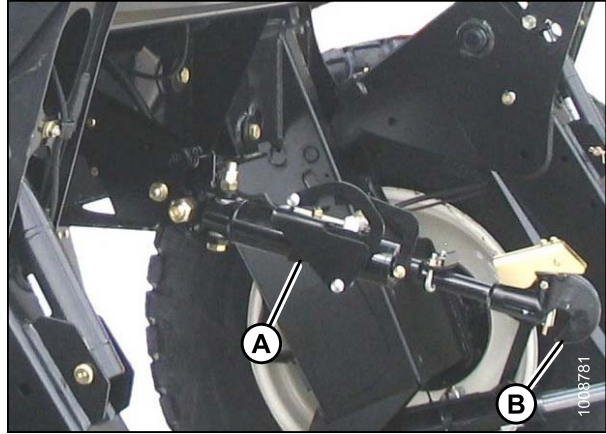


Figure 4.178: Hydraulic Center-Link

CAUTION

Check to be sure all bystanders have cleared the area.

9. Start engine and press the HEADER UP switch (A) to raise header to maximum height.

NOTE: If one end of the header does **NOT** raise fully, the lift cylinders require rephasing. If rephasing is needed, proceed 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. Cylinders are now phased.



Figure 4.179: GSL

OPERATION

10. Engage safety props on both lift cylinders as follows:
 - a. Stop engine and remove key from ignition.
 - b. Pull lever (A) and rotate toward header to release and lower the safety prop (B) onto cylinder.
 - c. Repeat for the opposite lift cylinder.

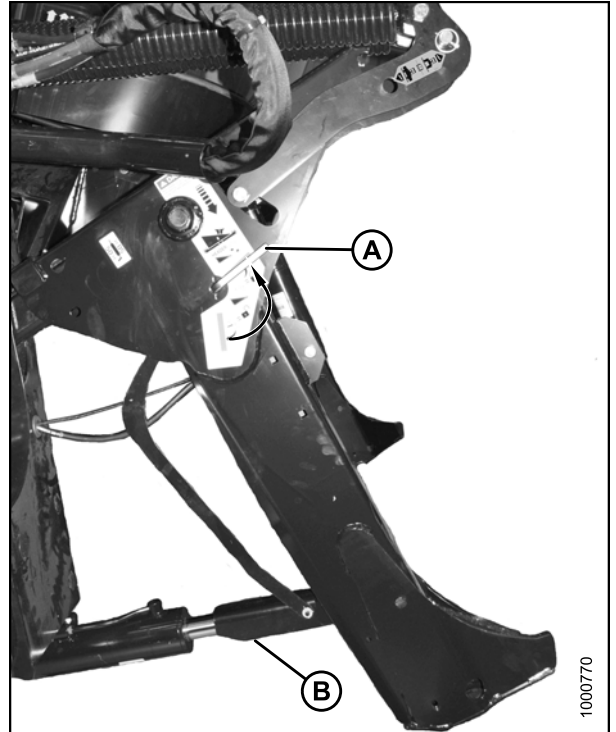


Figure 4.180: Cylinder Stop

11. Install clevis pin (A) through each boot and foot, and secure with hairpin. Do this to both sides.

IMPORTANT:

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

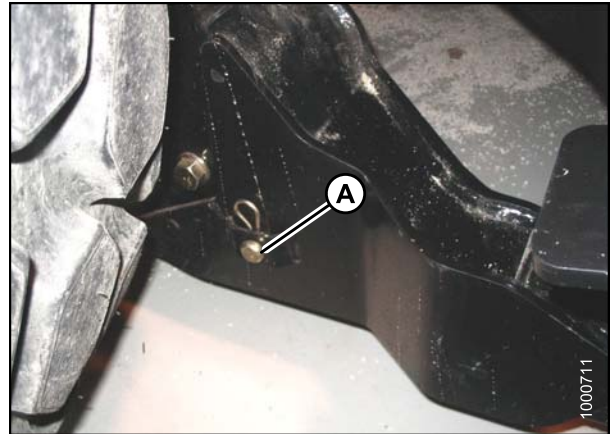


Figure 4.181: Header Boot

OPERATION

12. Remove lynch pin from clevis pin (A) in stand (B).
13. Hold stand (B) and remove pin (A).
14. Position stand to storage position by inverting stand and relocating on bracket as shown. Reinsert clevis pin (A) and secure with lynch pin.

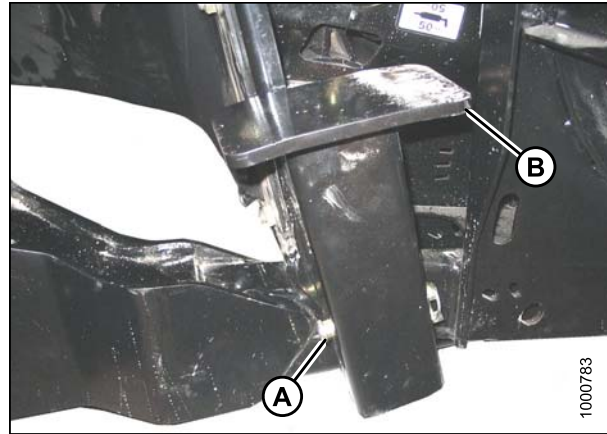


Figure 4.182: Header Stand

15. Remove clevis pin from storage position (B) in linkage, and insert in hole (A) to engage float springs. Secure with hairpin.

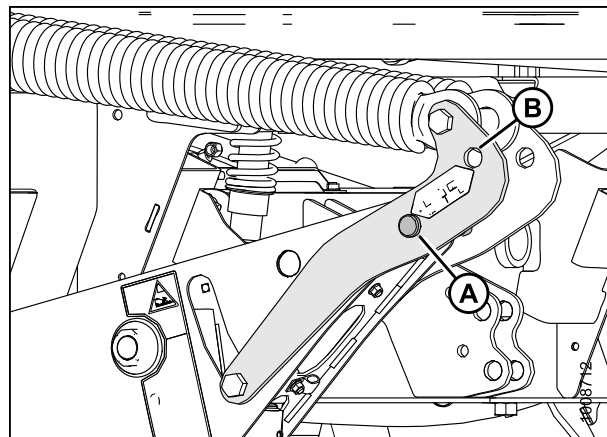


Figure 4.183: Header Lift Linkage

16. Disengage safety prop by turning lever (A) downward to release and lower safety prop until lever locks into vertical position.
17. Repeat for opposite safety prop.

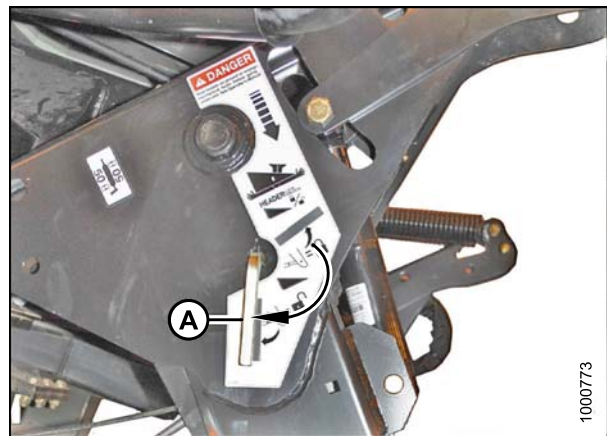


Figure 4.184: Safety Prop

OPERATION

CAUTION

Check to be sure all bystanders have cleared the area.

18. Start engine and activate HEADER DOWN switch (A) on GSL to lower header fully. Stop engine and remove key.

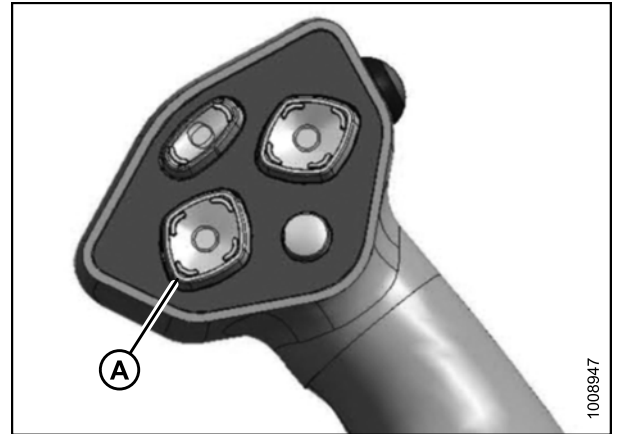


Figure 4.185: GSL

19. Connect header drive hoses (A) and electrical harness (B) to header. Refer to the auger header operator's manual.

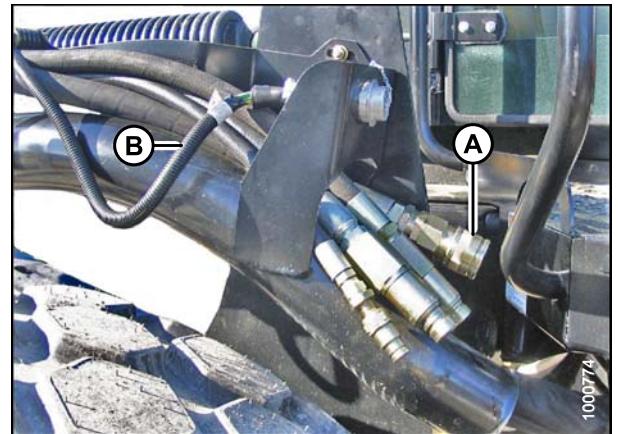


Figure 4.186: Header Drive Hoses and Harness

Attaching an A-Series Header: Mechanical Center-Link

To attach an A-Series header to a windrower equipped with a mechanical center-link, follow these steps:

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

OPERATION

1. Remove hairpin (A) from clevis pin (B) and remove pin from left and right header boots (C) on header.

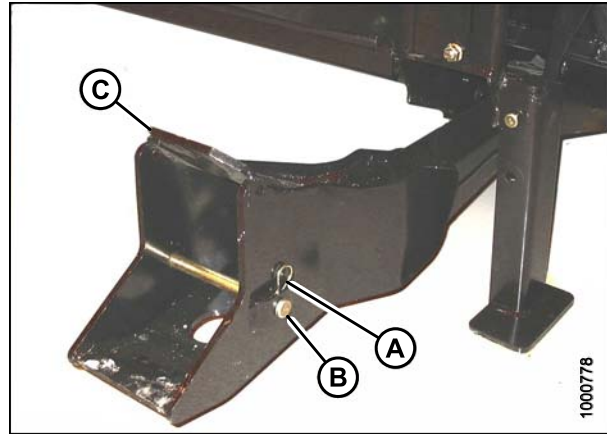


Figure 4.187: Header Boot

CAUTION

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

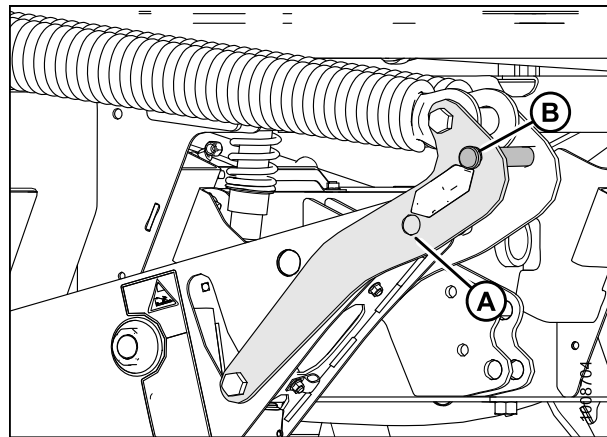


Figure 4.188: Header Lift Linkage

CAUTION

Check to be sure all bystanders have cleared the area.

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

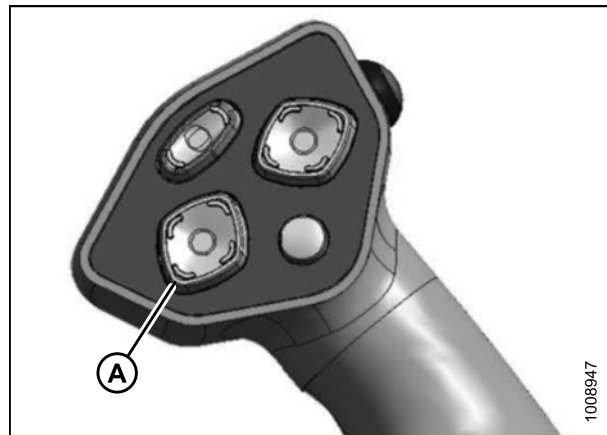


Figure 4.189: GSL

OPERATION

3. Slowly drive the windrower forward so the feet (A) on the windrower enter the boots (B) on the header. Continue to drive slowly forward until the feet engage the boots and the header nudges forward.

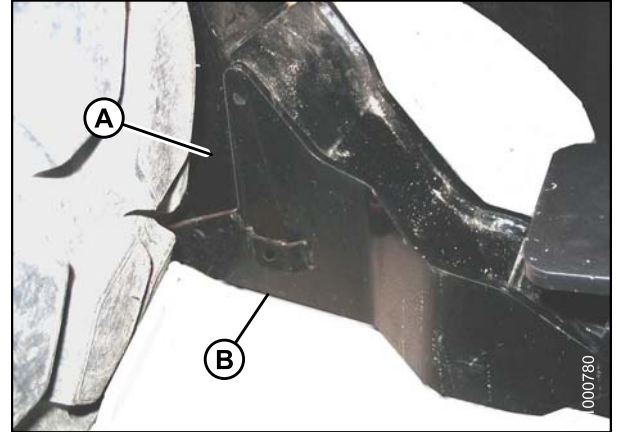


Figure 4.190: Header Boot

4. Stop engine and remove key from ignition.
5. Loosen nut (A) and rotate barrel (B) to adjust length so that the link lines-up with header bracket.
6. Install clevis pin (C) and secure with cotter pin (D).
7. Adjust link to required length for proper header angle by rotating barrel (B). Tighten nut (A) against barrel. A slight tap with a hammer is sufficient.

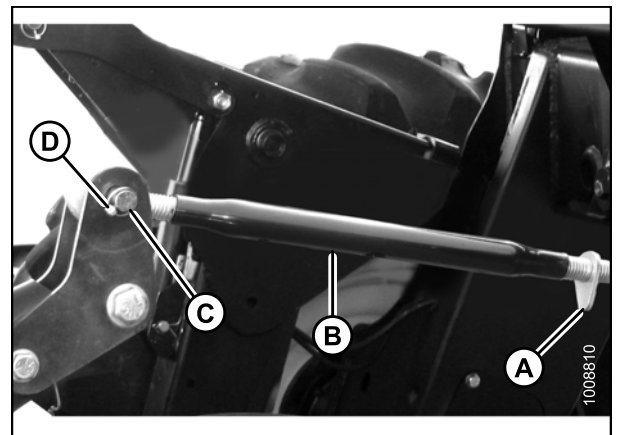


Figure 4.191: Mechanical Center-Link

CAUTION

Check to be sure all bystanders have cleared the area.

8. Start engine and press the HEADER UP switch (A) to raise header to maximum height.

NOTE: If one end of the header does **NOT** raise fully, the lift cylinders require rephasing. If rephasing is needed, proceed 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. Cylinders are now phased.

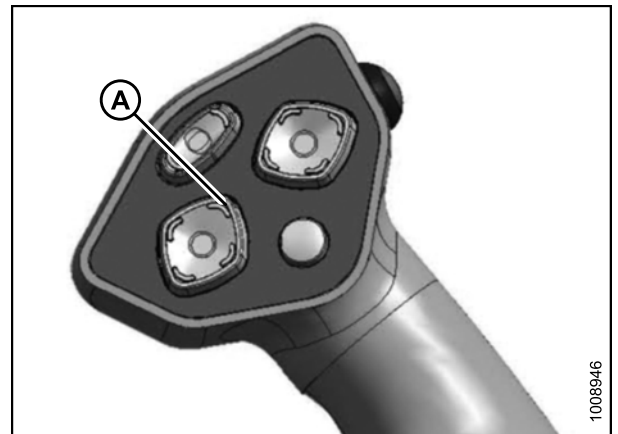


Figure 4.192: GSL

OPERATION

9. Engage safety props on both lift cylinders as follows:
 - a. Stop engine and remove key from ignition.
 - b. Pull lever (A) and rotate toward header to release and lower the safety prop (B) onto cylinder.
 - c. Repeat for the opposite lift cylinder.

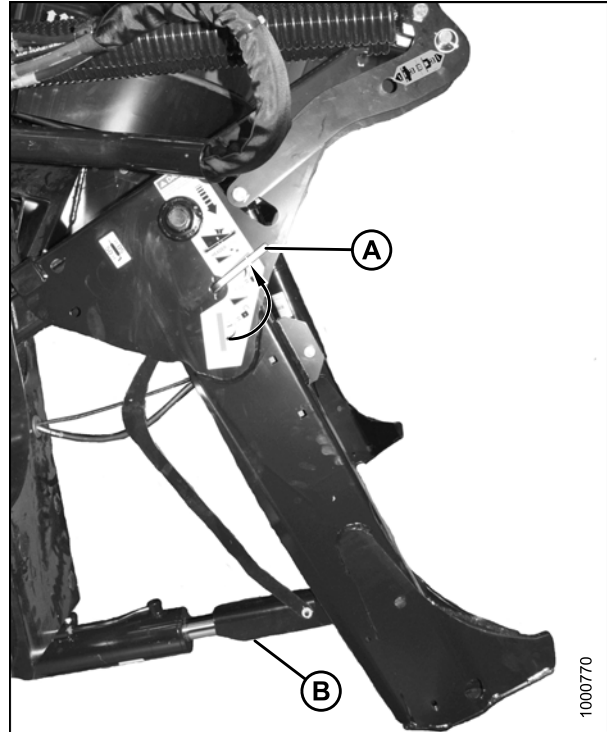


Figure 4.193: Cylinder Stop

10. Install clevis pin (A) through each boot and foot, and secure with hairpin. Do this to both sides.

IMPORTANT:

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

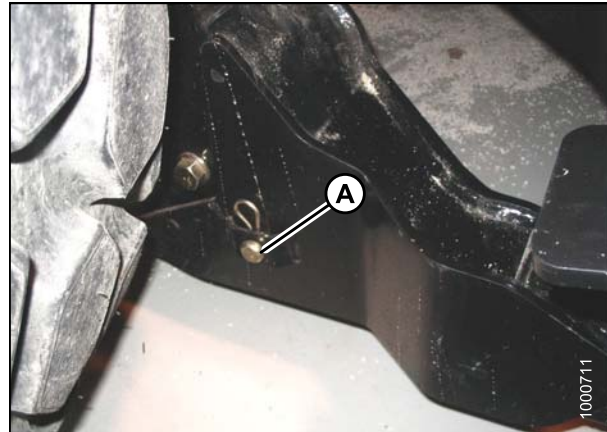


Figure 4.194: Header Boot

OPERATION

11. Remove lynch pin from clevis pin (A) in stand (B).
12. Hold stand (B) and remove pin (A).
13. Position stand to storage position by inverting stand and relocating on bracket as shown. Reinsert clevis pin (A) and secure with lynch pin.

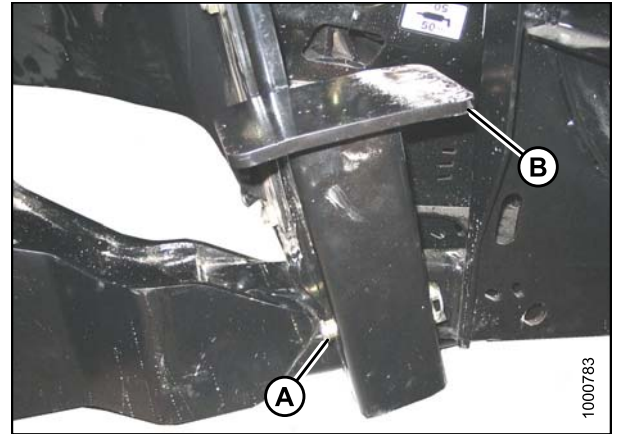


Figure 4.195: Header Stand

14. Remove clevis pin from storage position (B) in linkage, and insert in hole (A) to engage float springs. Secure with hairpin.

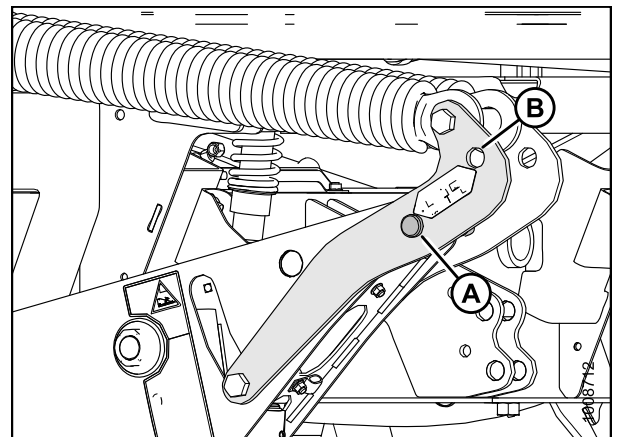


Figure 4.196: Header Lift Linkage

15. Disengage safety prop by turning lever (A) downward to release and lower safety prop until lever locks into vertical position.
16. Repeat for opposite safety prop.

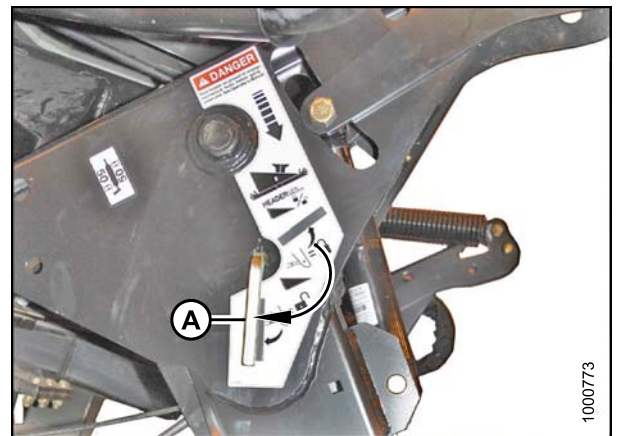


Figure 4.197: Safety Prop

OPERATION

CAUTION

Check to be sure all bystanders have cleared the area.

17. Start engine and activate HEADER DOWN switch (A) on GSL to lower header fully. Stop engine and remove key.

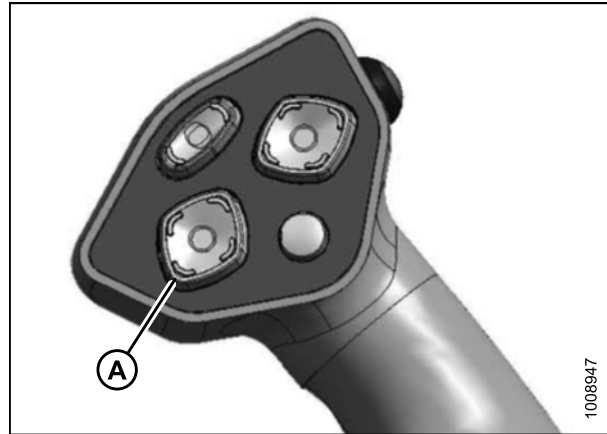


Figure 4.198: GSL

18. Connect header drive hoses (A) and electrical harness (B) to header. Refer to the auger header operator's manual.

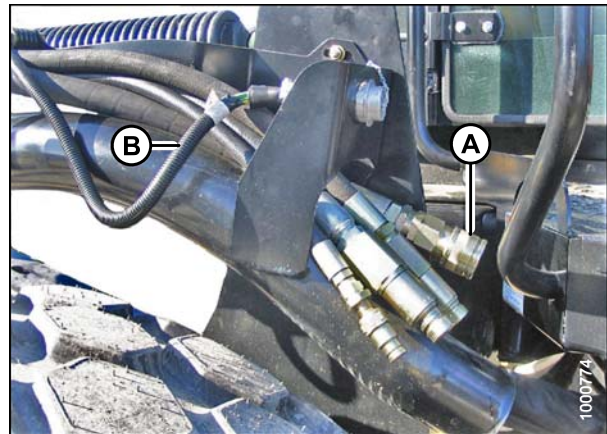


Figure 4.199: Header Drive Hoses and Harness

4.5.4 Detaching an A-Series Header

Refer to the procedure that is appropriate for the center-link installed on the windrower:

- [Detaching an A-Series Header: Hydraulic Center-Link, page 197](#)
- [Detaching an A-Series Header: Mechanical Center-Link, page 200](#)

OPERATION

Detaching an A-Series Header: Hydraulic Center-Link

To detach an A-Series header from a windrower with hydraulic center-link, follow these steps:

WARNING

Stop engine, and remove key before making adjustments to the machine. A child or even a pet could engage the drive.

1. Start engine and press HEADER UP button (A) on ground speed lever (GSL) to raise header to maximum height.
2. If one end of the header does **NOT** raise fully, rephase the cylinders as follows:
 - a. Press and hold the HEADER UP (A) switch until both cylinders stop moving
 - b. Continue to hold the switch for 3–4 seconds. Cylinders are phased.
3. Stop engine and remove key.

DANGER

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

4. Pull lever (A) and rotate toward header to lower safety prop (B) onto cylinder. Repeat for opposite cylinder.



Figure 4.200: GSL

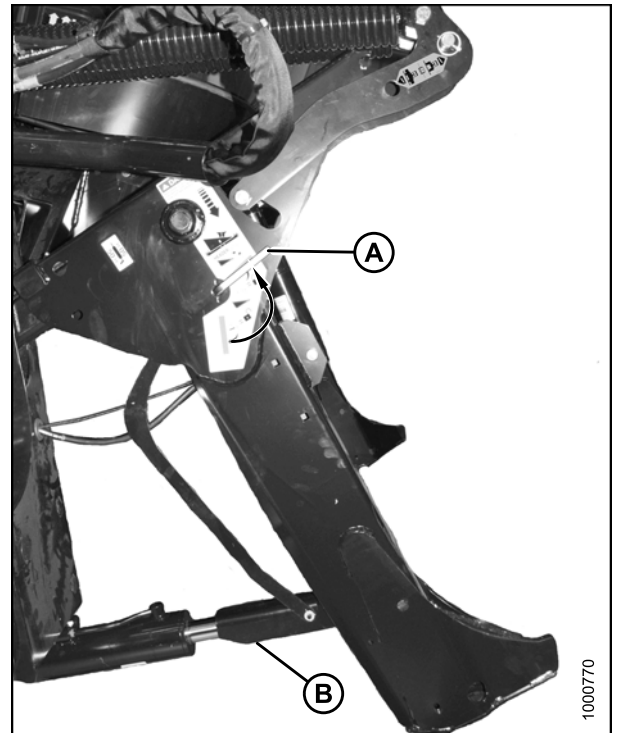


Figure 4.201: Safety Prop

OPERATION

- Remove hairpin from the clevis pin (A) and remove the clevis pin from left and right header boots (B).

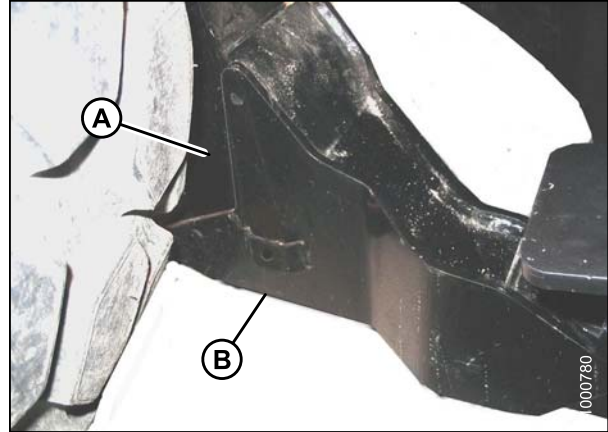


Figure 4.202: Header Boot

- Lower the stand (A) by pulling clevis pin (B), inverting stand, and relocating on bracket. Reinsert pin (B) and secure with hairpin.

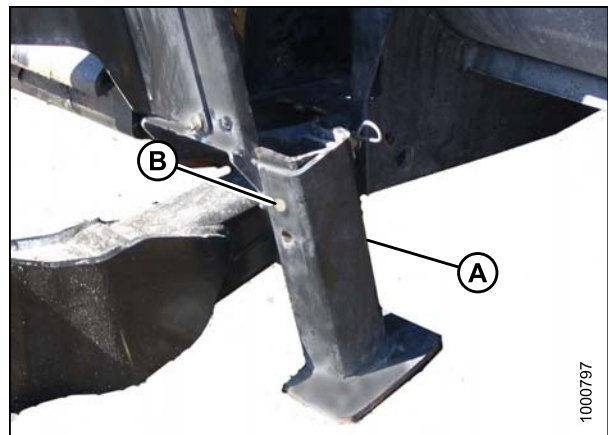


Figure 4.203: Header Stand

- Remove the clevis pin from linkage (A) to disengage float springs and insert in storage hole (B). Secure with lynch pin. Repeat for opposite linkage.

CAUTION

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

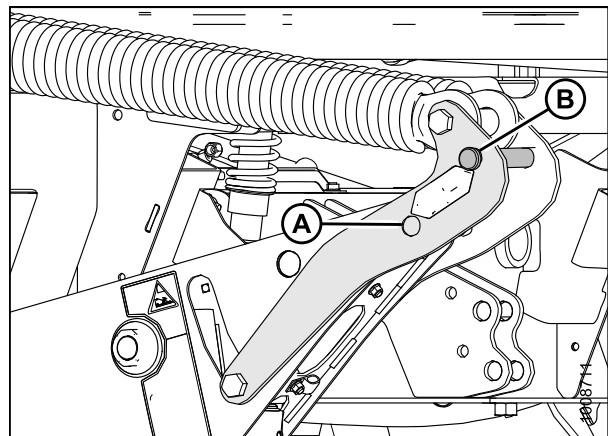


Figure 4.204: Header Lift Linkage

OPERATION

- To disengage safety props and for storage, turn lever (A) away from header to raise safety prop until lever locks into vertical position. Repeat for opposite cylinder.

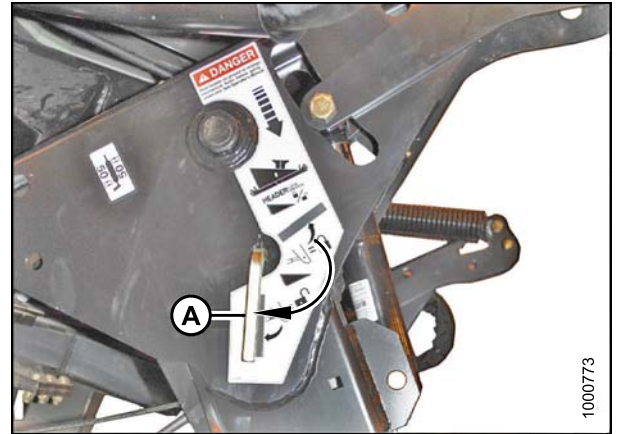


Figure 4.205: Safety Props

CAUTION

Check to be sure all bystanders have cleared the area.

- Start engine, choose a level area, and lower header to the ground.
- Activate HEADER TILT cylinder switch on ground speed lever (GSL) to release load on center-link cylinder.

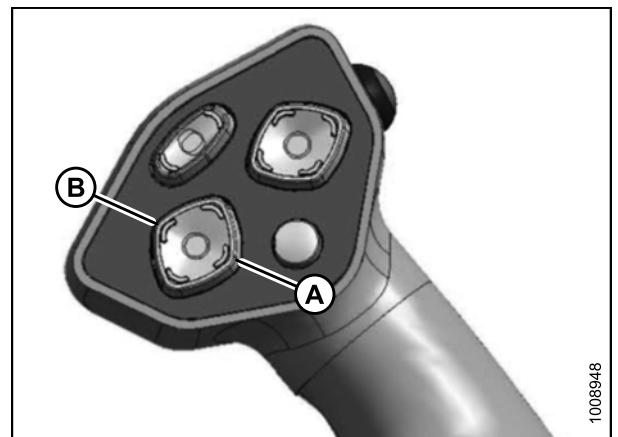


Figure 4.206: GSL

A - Header Tilt Up

B - Header Tilt Down

- Stop engine, and remove key from ignition.
- Lift hook release (C) and lift hook (B) off header pin.

NOTE: If optional center-link self-alignment kit is installed, lift release (C), and then operate the link lift cylinder with REEL UP switch on GSL to disengage the center-link from the header.

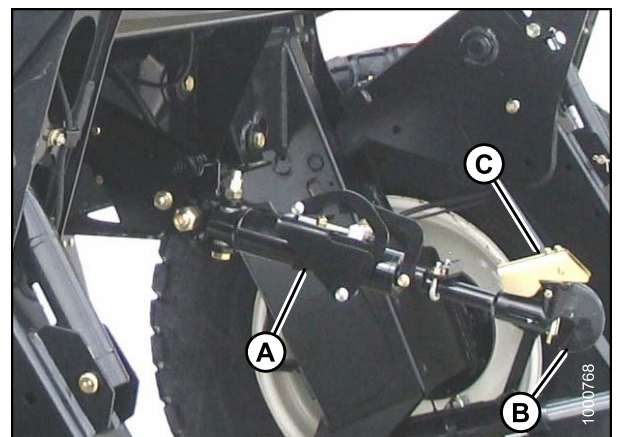


Figure 4.207: Hydraulic Center-Link

OPERATION

13. Disconnect header drive hydraulics (A) and electrical harness (B). Refer to the auger header operator's manual.
14. Slowly back windrower away from header.

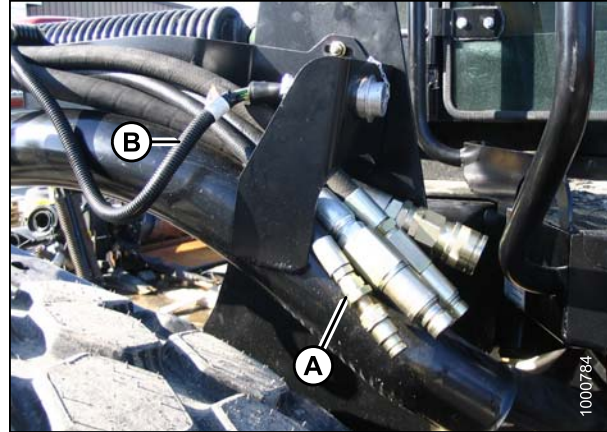


Figure 4.208: Header Drive Hydraulics

15. Reinstall clevis pin (B) and secure with hairpin (A) in header boot (C).
16. Repeat for the opposite side.

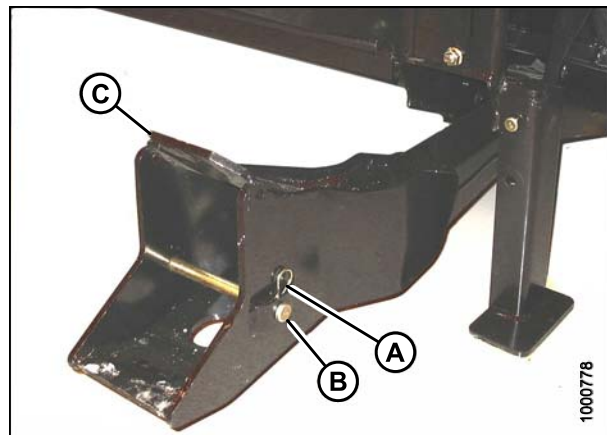


Figure 4.209: Header Boots

Detaching an A-Series Header: Mechanical Center-Link

⚠ WARNING

Stop engine, and remove key before making adjustments to machine. A child or even a pet could engage the drive.

1. Start engine and press HEADER UP button (A) on ground speed lever (GSL) to raise header to maximum height.
2. If one end of the header does **NOT** raise fully follow these steps to rephase the cylinders:
 - a. Press and hold the HEADER UP (A) switch until both cylinders stop moving
 - b. Continue to hold the switch for 3–4 seconds. Cylinders are phased.
3. Stop engine and remove key.



Figure 4.210: GSL

OPERATION

DANGER

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

4. Pull lever (A) and rotate toward header to lower safety prop (B) onto cylinder. Repeat for opposite cylinder.

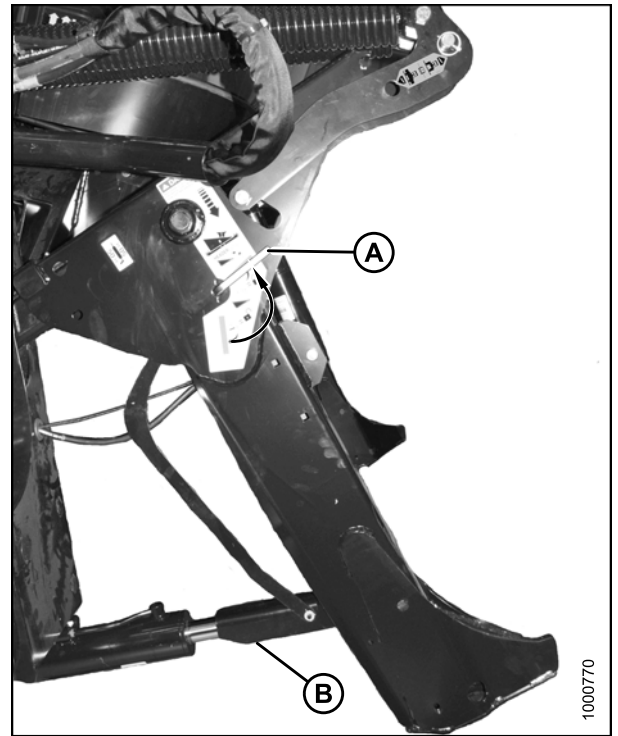


Figure 4.211: Safety Prop

5. Remove hairpin from the clevis pin (A) and remove clevis pin from the left and right header boots (B).

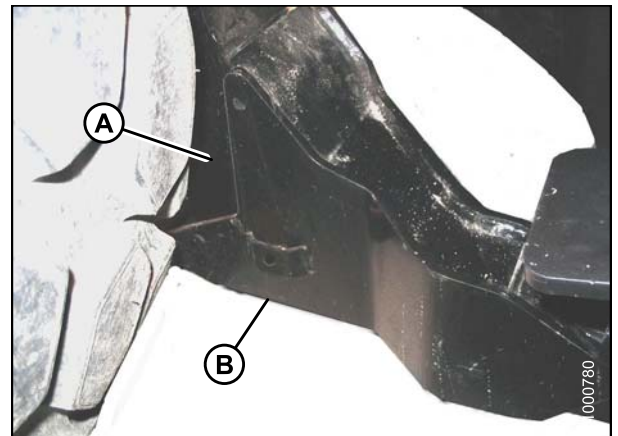


Figure 4.212: Header Boot

OPERATION

- Lower the header stand (A) by pulling clevis pin (B), inverting stand, and relocating on bracket. Reinsert clevis pin (B) and secure with hairpin.

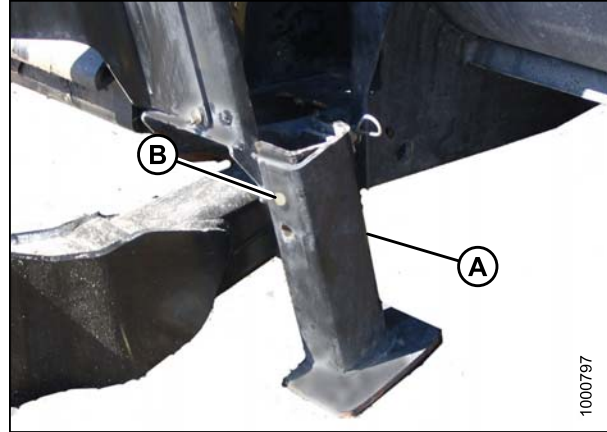


Figure 4.213: Header Stands

- Remove clevis pin from linkage (A) to disengage float springs and insert in storage hole (B). Secure with lynch pin. Repeat for opposite linkage.

CAUTION

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

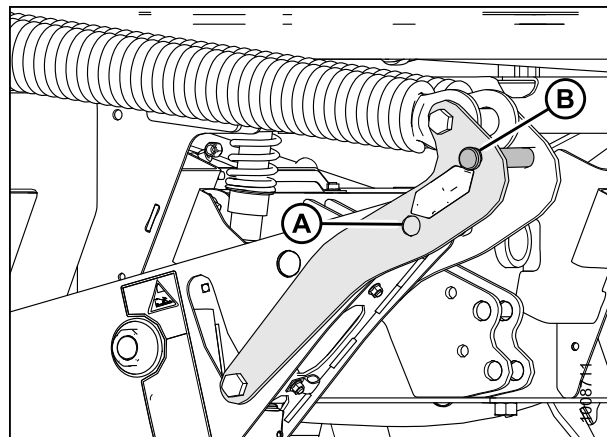


Figure 4.214: Header Lift Linkage

- To disengage safety props and for storage, turn lever (A) away from header to raise safety prop until lever locks into vertical position. Repeat for opposite cylinder.

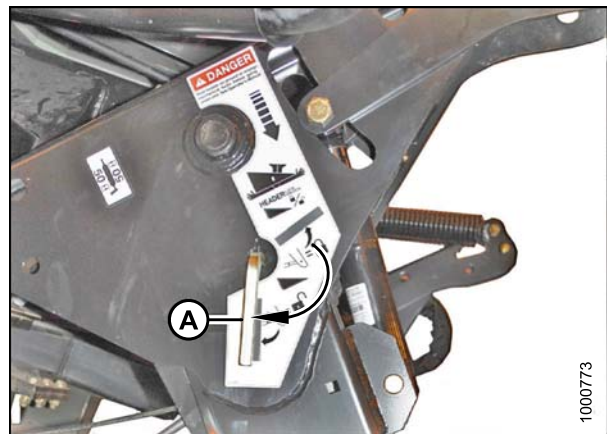


Figure 4.215: Safety Prop

OPERATION

- Loosen nut (A) and rotate barrel (B) to relieve load on link.
- Remove cotter pin (D) on clevis pin (C) and remove pin to disconnect from header.
- Reinstall clevis pin in header.

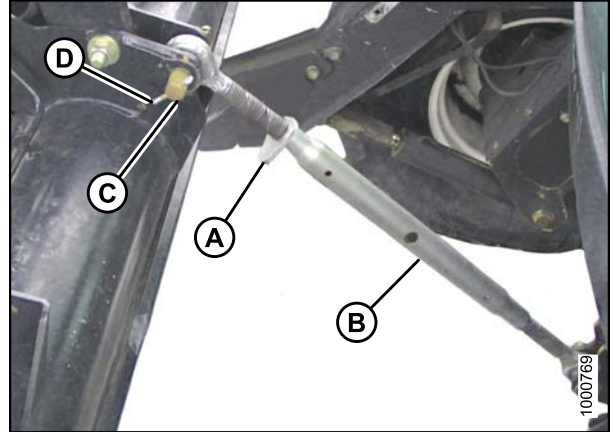


Figure 4.216: Mechanical Center-Link

- Disconnect header drive hydraulics (A) and electrical harness (B). Refer to the auger header operator's manual.
- Slowly back windrower away from header.

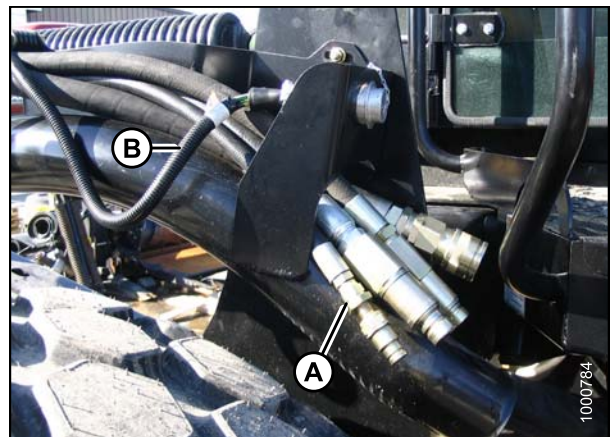


Figure 4.217: Header Drive Hydraulics

- Reinstall clevis pin (B) and secure with hairpin (A) in header boot (C).
- Repeat for the opposite side.

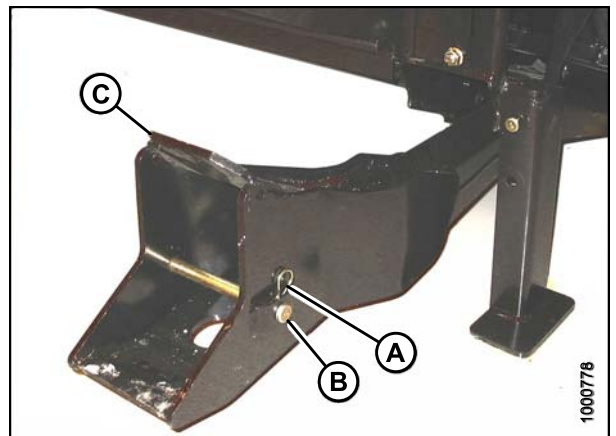


Figure 4.218: Header Boot

OPERATION

4.5.5 Attaching an R-Series Header

M155 Self-Propelled Windrower

The M155 Self-propelled windrower can operate **ONLY** 13-foot R80 and R85 Rotary Disc Headers. These headers are shipped without the motor and hoses installed, and the installation of a separate motor and hose bundle is necessary. A Hydraulic Valve kit is also needed to operate the header.

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

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

Refer to the procedure that is appropriate for the center-link installed on the windrower:

- [Attaching an R-Series Header: Hydraulic Center-Link with Optional Self-Alignment, page 204](#)
- [Attaching an R-Series Header: Hydraulic Center-Link without Self-Alignment, page 210](#)
- [Attaching an R-Series Header: Mechanical Center-Link, page 215](#)

Attaching an R-Series Header: Hydraulic Center-Link with Optional Self-Alignment

To attach an R-Series header to a windrower equipped with a hydraulic center-link and optional self-alignment, follow these steps:

⚠ DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

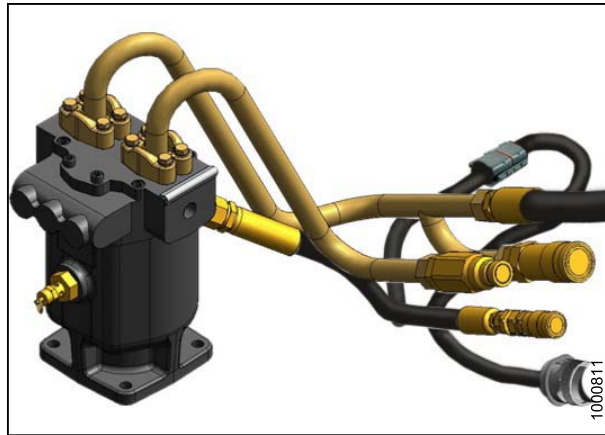


Figure 4.219: M155 Hydraulic Drive Kit (MD #B5510)

OPERATION

1. Remove hairpin (B) from clevis pin (A) and remove pin from on left and right header boots (C) on header.

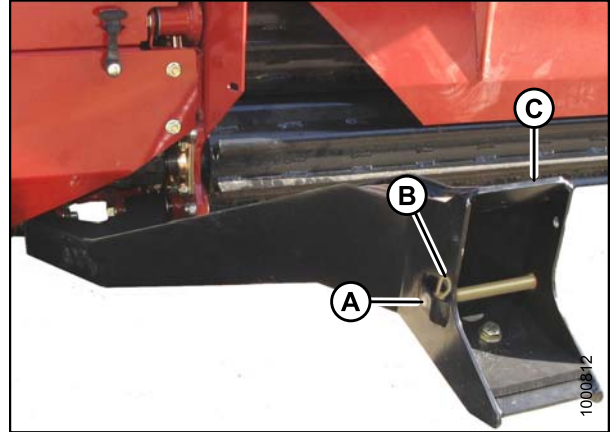


Figure 4.220: Header Boot

CAUTION

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

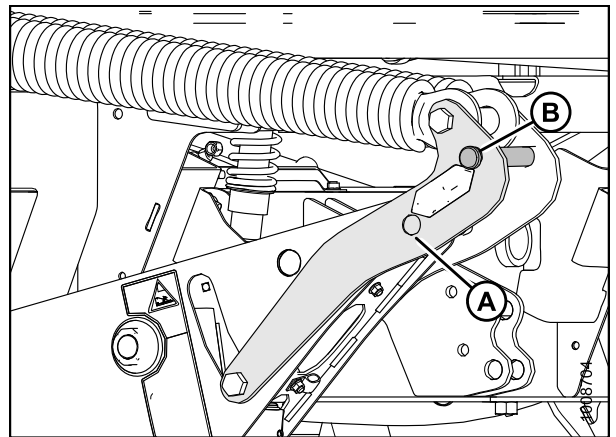


Figure 4.221: Header Lift Linkage

CAUTION

Check to be sure all bystanders have cleared the area.

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

IMPORTANT:

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

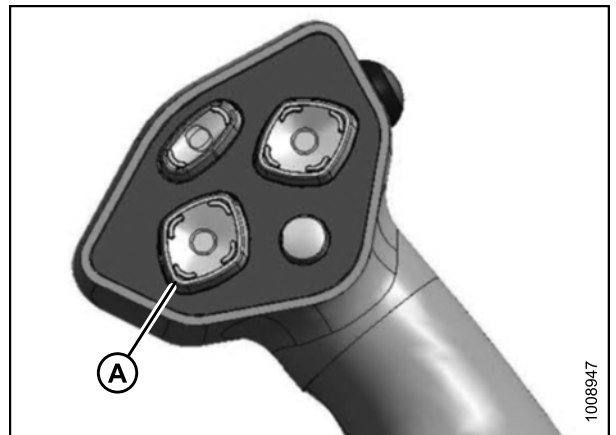


Figure 4.222: GSL

OPERATION

3. If necessary, activate the REEL UP switch (A) on the GSL to raise the center-link so that the hook is above the attachment pin on the header.

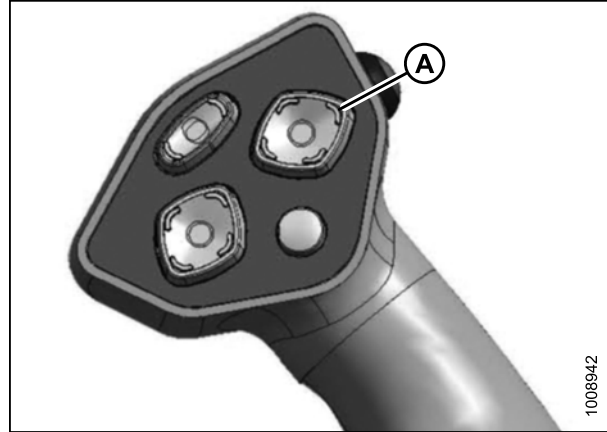


Figure 4.223: GSL

4. Slowly drive windrower forward so that feet (A) on windrower enter boots (B) on the header. Continue to drive slowly forward until feet engage the boots and header nudges forward.

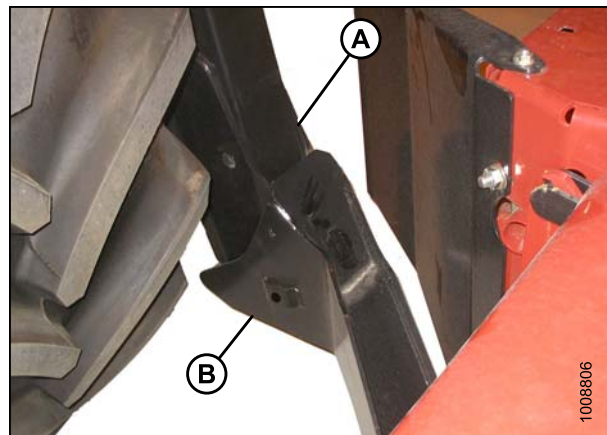


Figure 4.224: Header Boot

5. 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

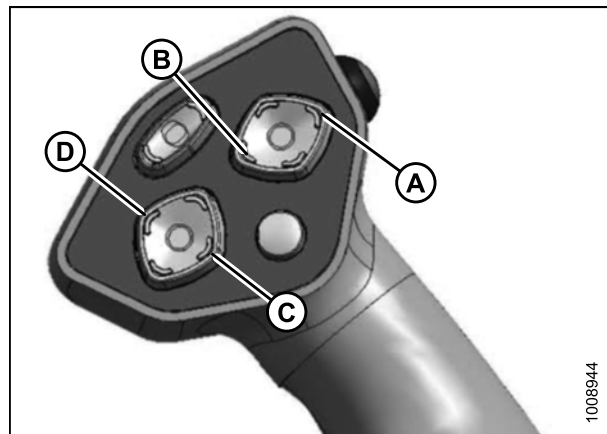


Figure 4.225: GSL

OPERATION

- Adjust position of the center-link cylinder (E) with the REEL UP and REEL DOWN switches. Position the hook above the header attachment pin using HEADER TILT switches on the GSL.
- Lower center-link (A) onto the header with REEL DOWN switch until it locks into position (hook release [B] is down).
- Check that center-link is locked onto header by pressing the REEL UP switch on the GSL.

IMPORTANT:

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

- Start engine and press HEADER UP switch (A) to raise header to maximum height.

NOTE: If one end of the header does NOT raise fully, the lift cylinders require re-phasing. If re-phasing is needed, proceed as follows:

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

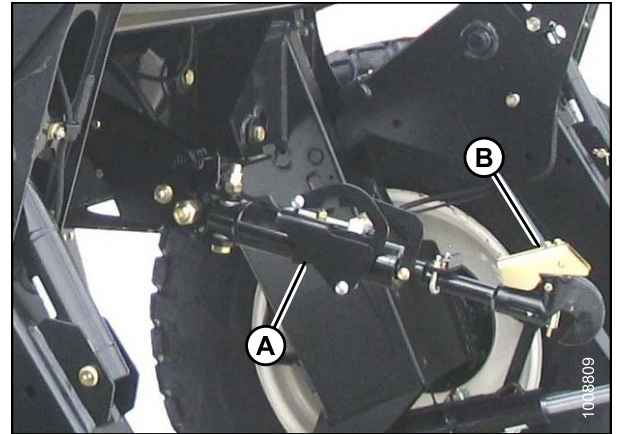


Figure 4.226: Hydraulic Center-Link

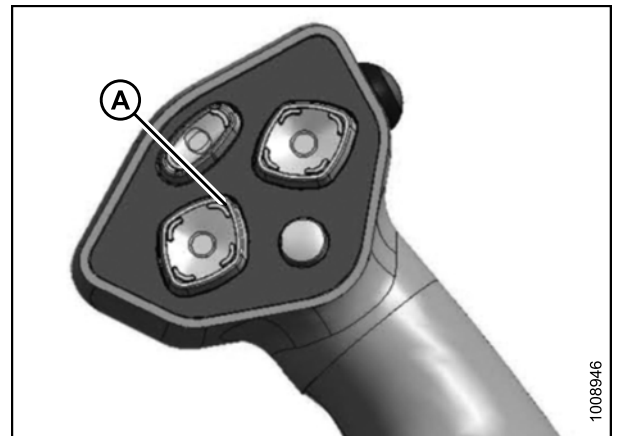


Figure 4.227: GSL

OPERATION

10. Safety props are located on both of the windrower's header lift cylinders. Engage safety props on both lift cylinders as follows:
 - a. Stop engine and remove key from ignition.
 - b. Pull lever (A) and rotate toward header to release and lower the safety prop (B) onto cylinder.
 - c. Repeat for the opposite lift cylinder.

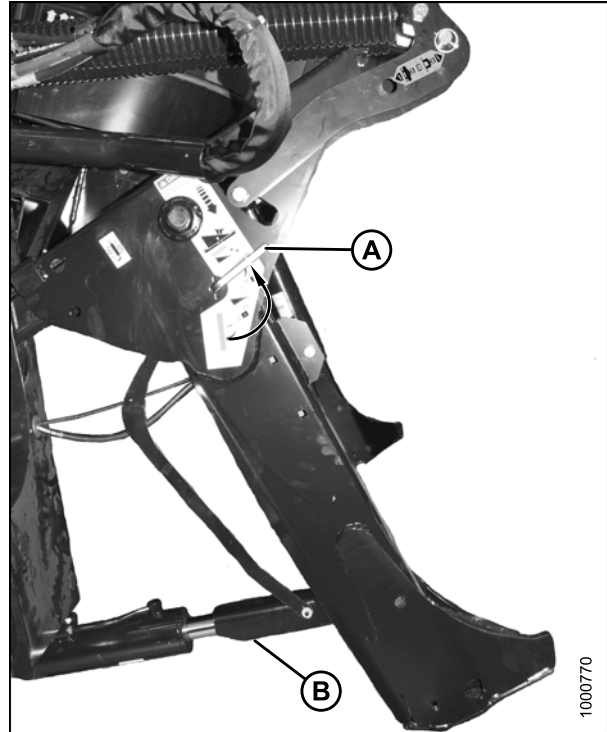


Figure 4.228: Safety Prop

11. Install clevis pin (A) through each boot and foot, and secure with hairpin (B). Do this to both sides.

IMPORTANT:

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

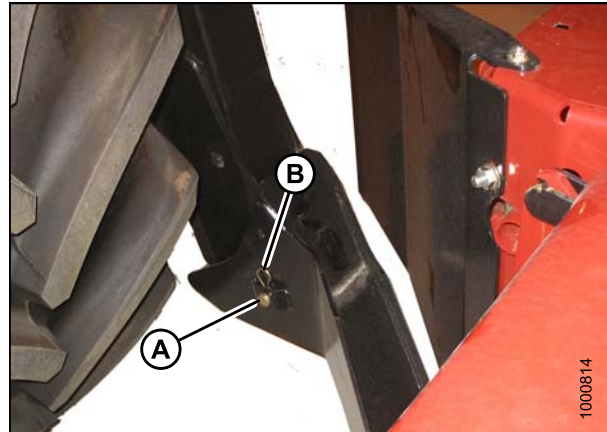


Figure 4.229: Header Boot

OPERATION

12. Remove clevis pin from storage position (B) in linkage, and insert in hole (A) to engage float springs. Secure with hairpin.

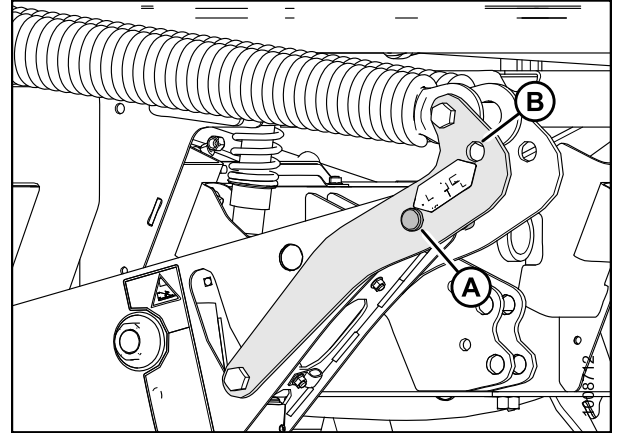


Figure 4.230: Header Lift Linkage

13. Disengage safety prop by turning lever (A) downward to release and lower safety prop until lever locks into vertical position.
14. Repeat for opposite safety prop.

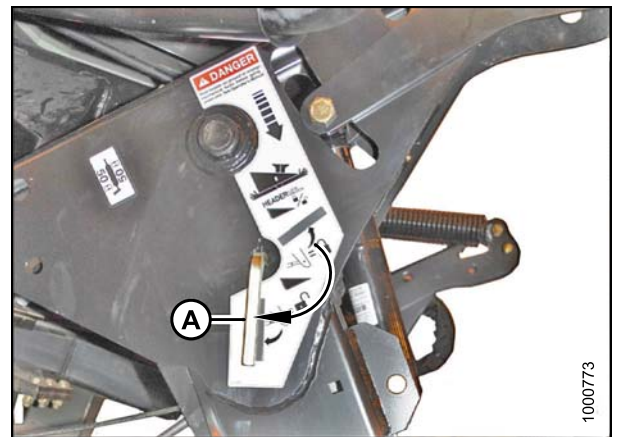


Figure 4.231: Safety Prop

CAUTION

Check to be sure all bystanders have cleared the area.

15. Start engine and activate HEADER DOWN switch (A) on GSL to lower header fully. Stop engine and remove key.

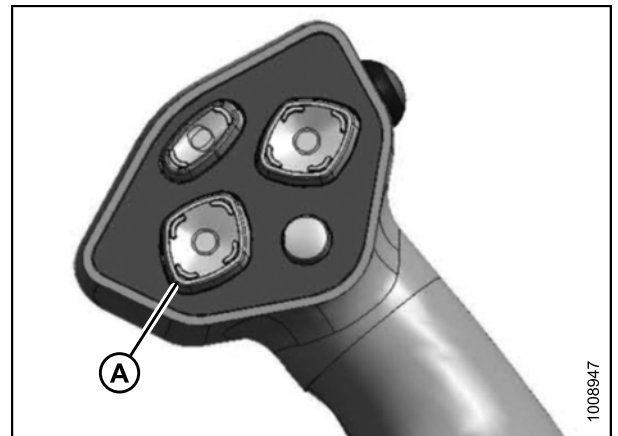


Figure 4.232: GSL

OPERATION

16. Connect header drive hoses (A) and electrical harness (B) to header. Refer to the rotary disc header operator's manual.

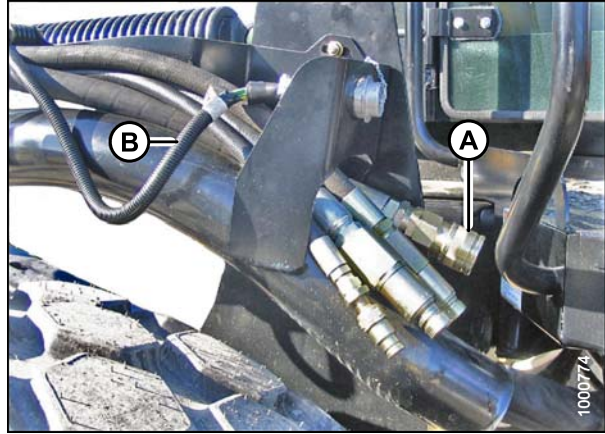


Figure 4.233: Header Drive Hoses and Harness

Attaching an R-Series Header: Hydraulic Center-Link without Self-Alignment

⚠ DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Remove hairpin (B) from clevis pin (A) and remove pin from left and right header boots (C) on header.

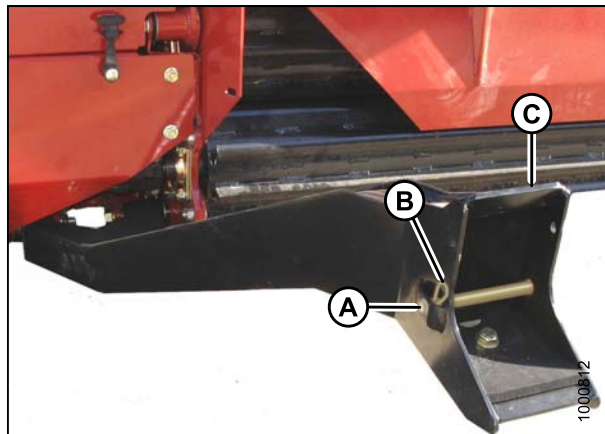


Figure 4.234: Header Boot

⚠ CAUTION

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

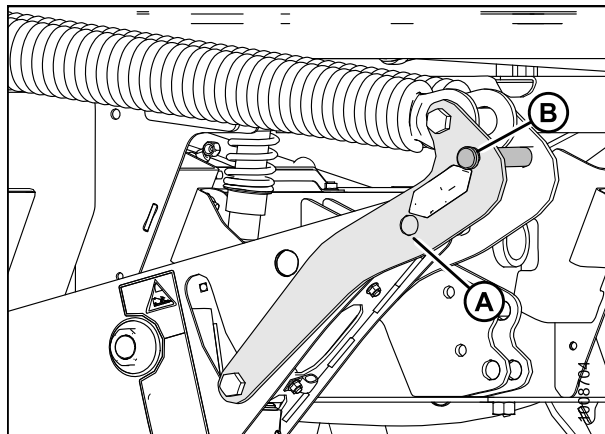


Figure 4.235: Header Lift Linkage

OPERATION

CAUTION

Check to be sure all bystanders have cleared the area.

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

IMPORTANT:

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

3. If necessary, relocate the clevis pin (A) at the frame linkage as required to raise the center-link (B), so that the hook is above the attachment pin on the header.

4. Slowly drive windrower forward so that feet (A) on windrower enter boots (B) on the header. Continue to drive slowly forward until feet engage the boots and header nudges forward.

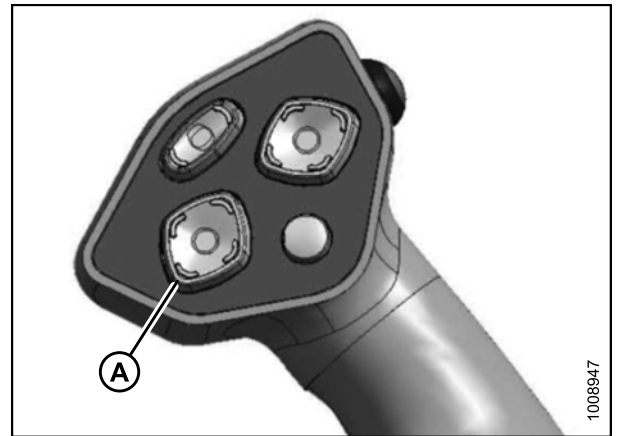


Figure 4.236: GSL

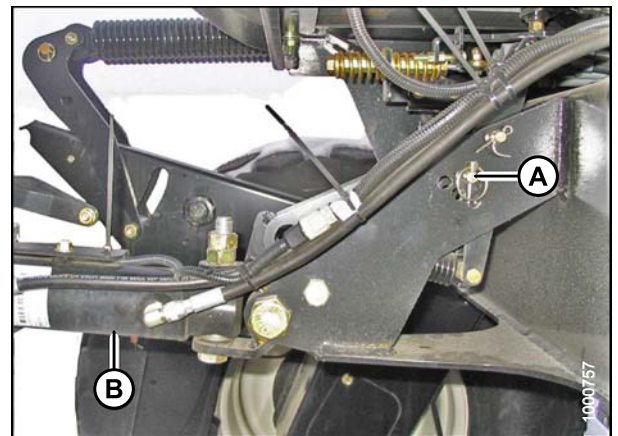


Figure 4.237: Hydraulic Center-Link without Self-Alignment

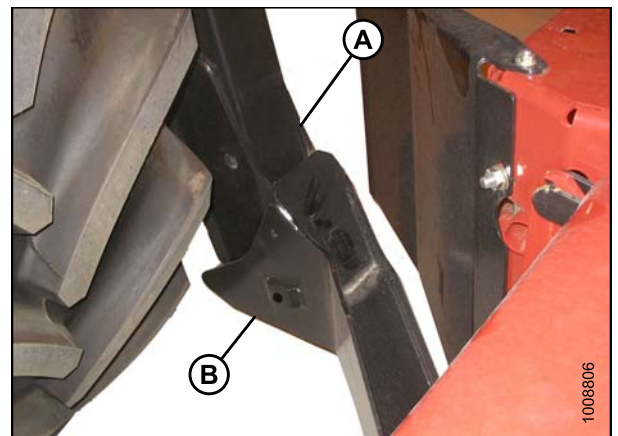


Figure 4.238: Header Boots

OPERATION

5. Activate HEADER TILT cylinder switches on ground speed lever (GSL) to extend or retract center-link cylinder so that the hook lines up with the header attachment pin.
6. Stop engine and remove key from ignition.

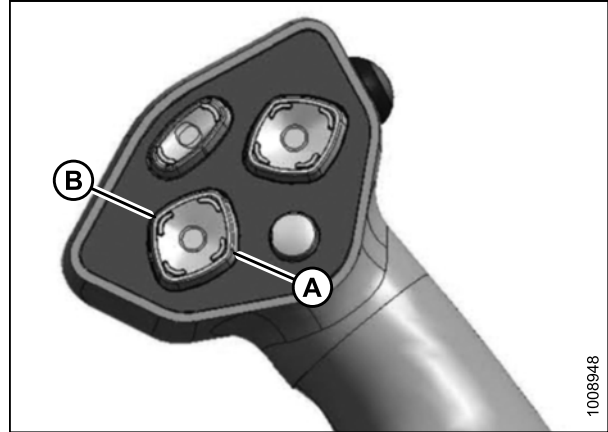


Figure 4.239: GSL

7. Push down on rod end of link cylinder (B), until hook engages header and is locked.

IMPORTANT:

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

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

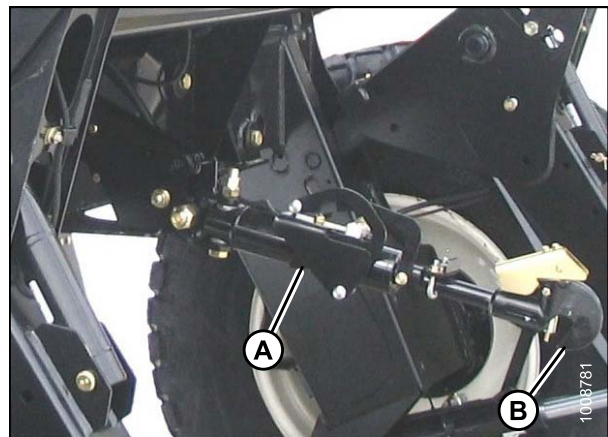


Figure 4.240: Hydraulic Center-Link

9. Start engine and press HEADER UP switch (A) to raise header to maximum height.

NOTE: If one end of the header does NOT raise fully, the lift cylinders require re-phasing. If re-phasing is needed, proceed 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. Cylinders are now phased.



Figure 4.241: GSL

OPERATION

10. Safety props are located on both of the windrower's header lift cylinders. Engage safety props on both lift cylinders as follows:
 - a. Stop engine and remove key from ignition.
 - b. Pull lever (A) and rotate toward header to release and lower the safety prop (B) onto cylinder.
 - c. Repeat for the opposite lift cylinder.

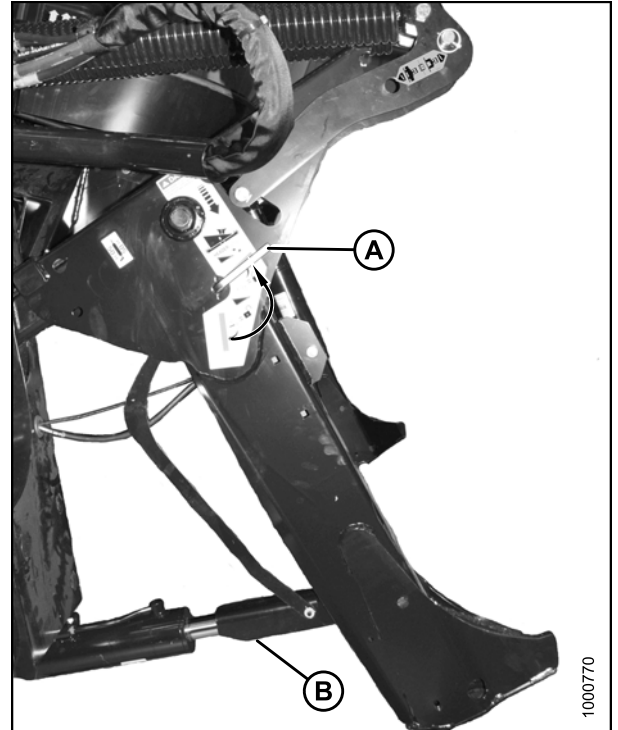


Figure 4.242: Safety Prop

11. Install clevis pin (A) through each boot and foot, and secure with hairpin (B). Do this to both sides.

IMPORTANT:

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

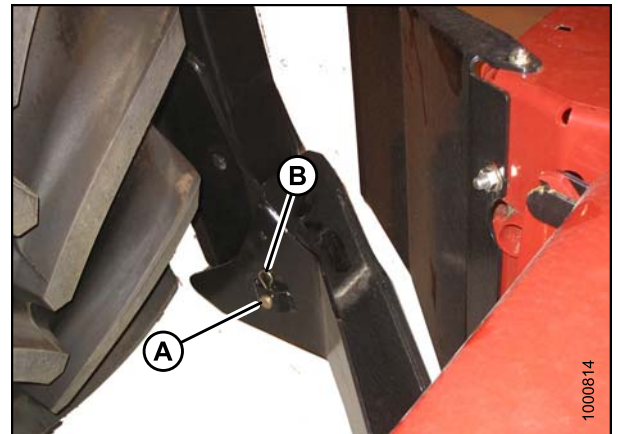


Figure 4.243: Header Boot

OPERATION

12. Remove clevis pin from storage position (B) in linkage, and insert in hole (A) to engage float springs. Secure with hairpin.

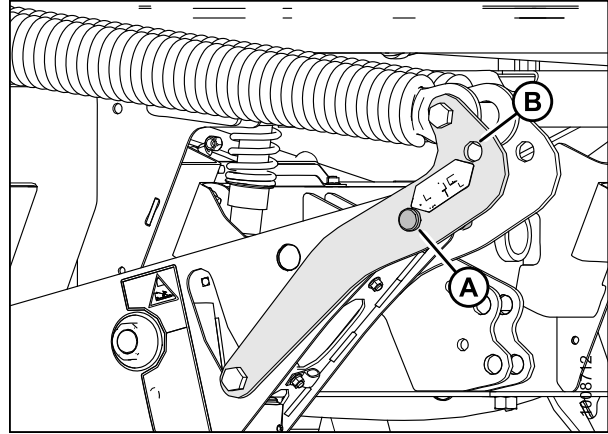


Figure 4.244: Header Lift Linkage

13. Disengage safety prop by turning lever (A) downward to release and lower safety prop until lever locks into vertical position.
14. Repeat for opposite safety prop.

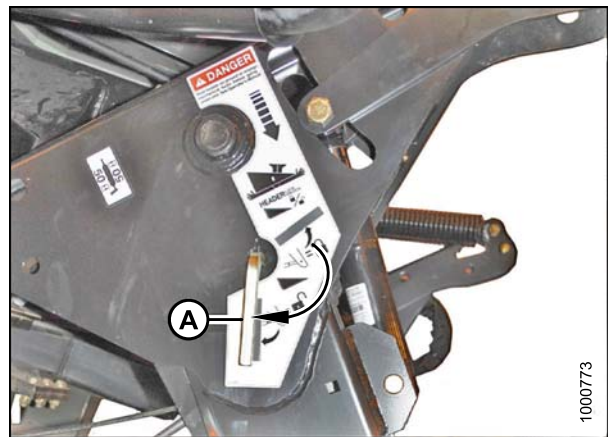


Figure 4.245: Safety Prop

CAUTION

Check to be sure all bystanders have cleared the area.

15. Start engine and activate HEADER DOWN switch (A) on GSL to lower header fully. Stop engine and remove key.

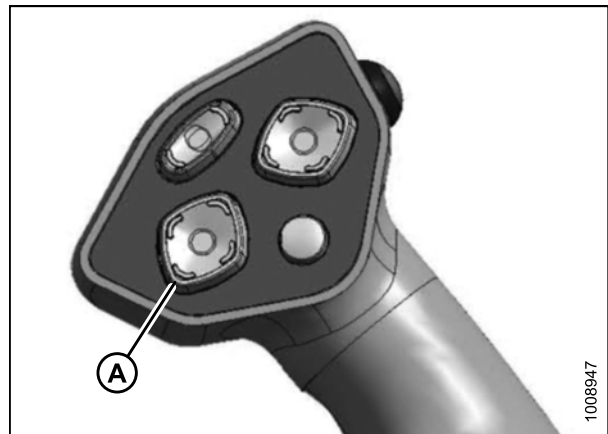


Figure 4.246: GSL

OPERATION

16. Connect header drive hoses (A) and electrical harness (B) to header. Refer to the rotary disc header operator's manual.

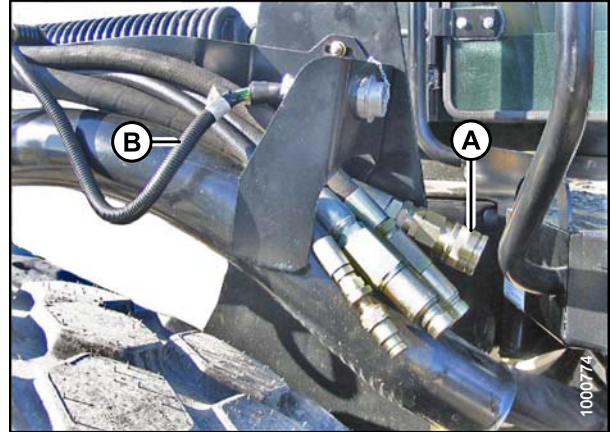


Figure 4.247: Header Drive Hoses and Harness

Attaching an R-Series Header: Mechanical Center-Link

To attach an R-Series header to an M155 Self-propelled Windrower with the mechanical center-link option, follow these steps:

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Remove hairpin (B) from clevis pin (A) and remove pin from on left and right header boots (C) on header.

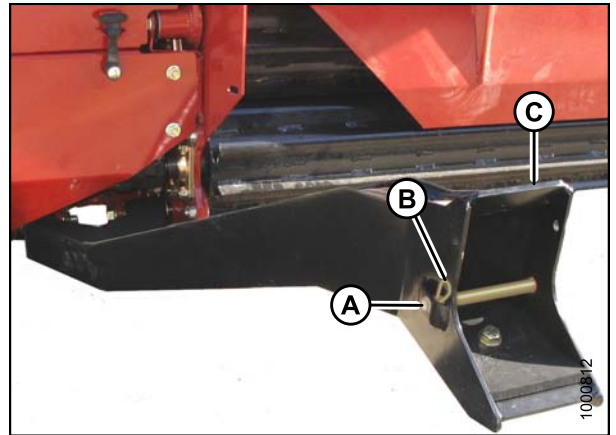


Figure 4.248: Header Boot

OPERATION

CAUTION

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

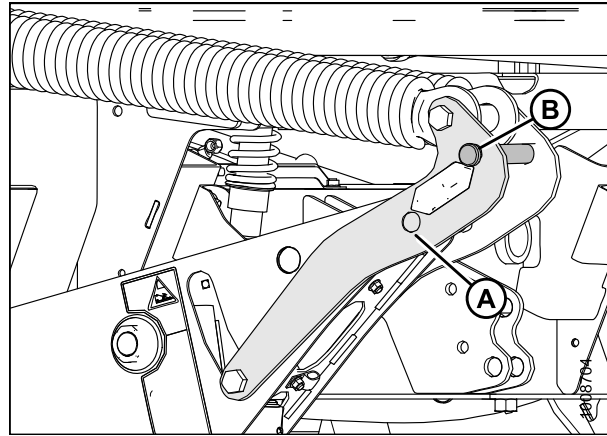


Figure 4.249: Header Lift Linkage

CAUTION

Check to be sure all bystanders have cleared the area.

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

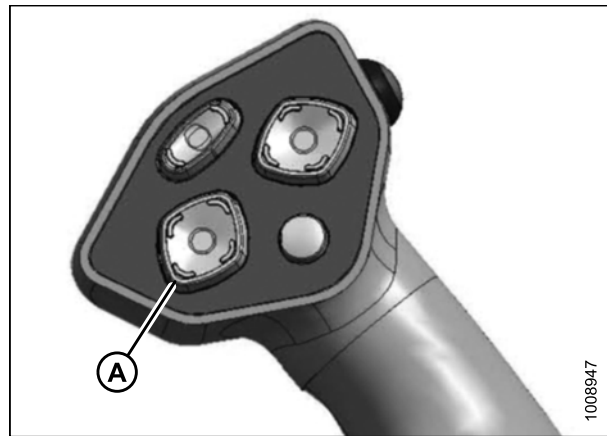


Figure 4.250: GSL

3. Slowly drive windrower forward so that feet (A) on windrower enter boots (B) on the header. Continue to drive slowly forward until feet engage the boots and header nudges forward.

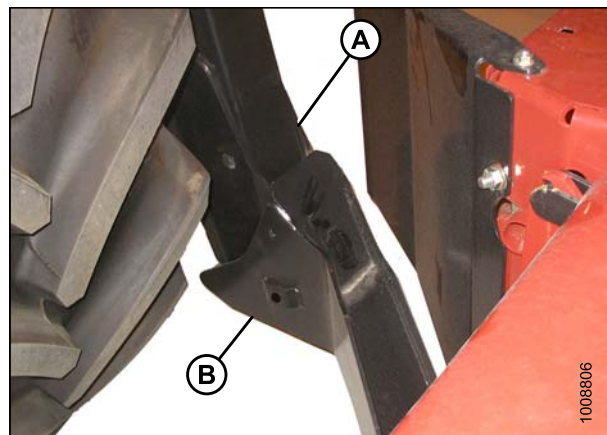


Figure 4.251: Header Boot

OPERATION

4. Stop engine and remove the key.
5. Loosen nut (A) and rotate barrel (B) to adjust length so that the link lines up with header bracket.
6. Install pin (C) and secure with cotter pin (D).
7. Adjust link to required length for proper header angle by rotating barrel (B). Tighten nut (A) against barrel. A slight tap with a hammer is sufficient.

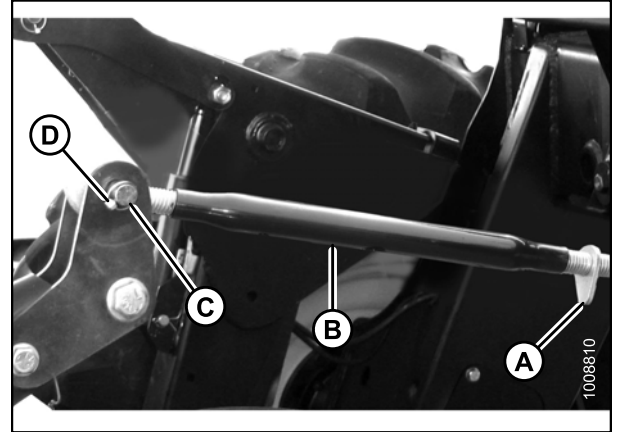


Figure 4.252: Mechanical Center-Link

8. Start engine and press HEADER UP switch (A) to raise header to maximum height.

NOTE: If one end of the header does NOT raise fully, the lift cylinders require re-phasing. If re-phasing is needed, proceed 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. Cylinders are now phased.

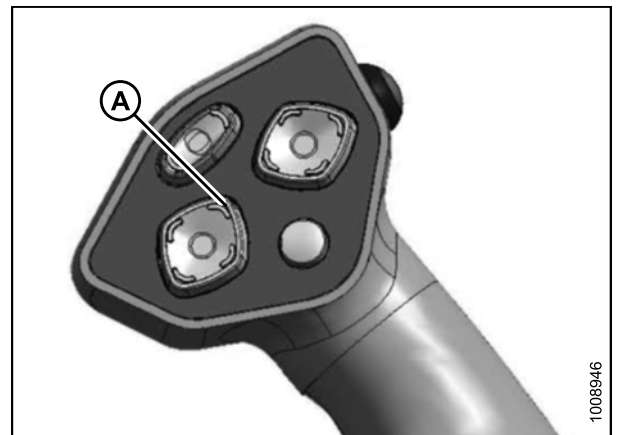


Figure 4.253: GSL

OPERATION

9. Safety props are located on both of the windrower's header lift cylinders. Engage safety props on both lift cylinders as follows:
 - a. Stop engine and remove key from ignition.
 - b. Pull lever (A) and rotate toward header to release and lower the safety prop (B) onto cylinder.
 - c. Repeat for the opposite lift cylinder.

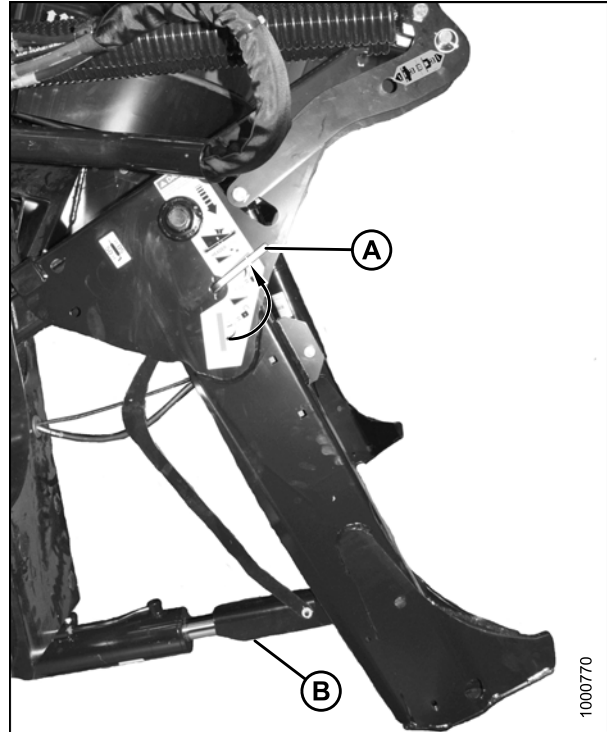


Figure 4.254: Safety Prop

10. Install clevis pin (A) through each boot and foot, and secure with hairpin (B). Do this to both sides.

IMPORTANT:

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

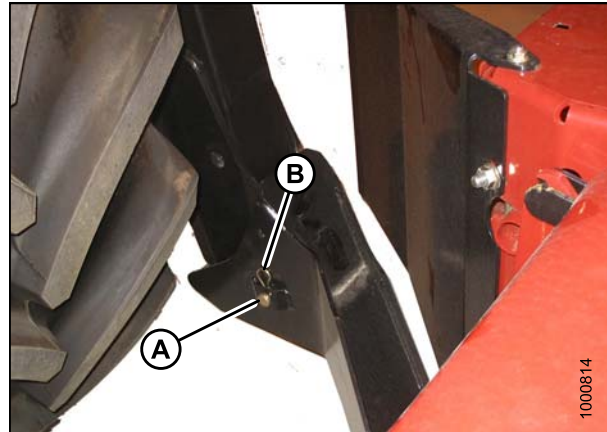


Figure 4.255: Header Boot

OPERATION

11. Remove clevis pin from storage position (B) in linkage, and insert in hole (A) to engage float springs. Secure with hairpin.

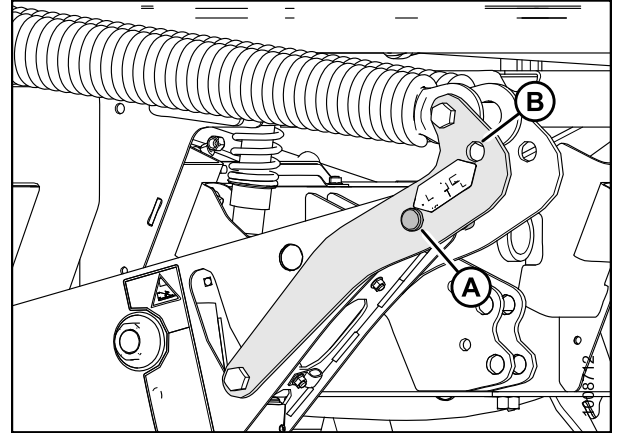


Figure 4.256: Header Lift Linkage

12. Disengage safety prop by turning lever (A) downward to release and lower safety prop until lever locks into vertical position.
13. Repeat for opposite safety prop.

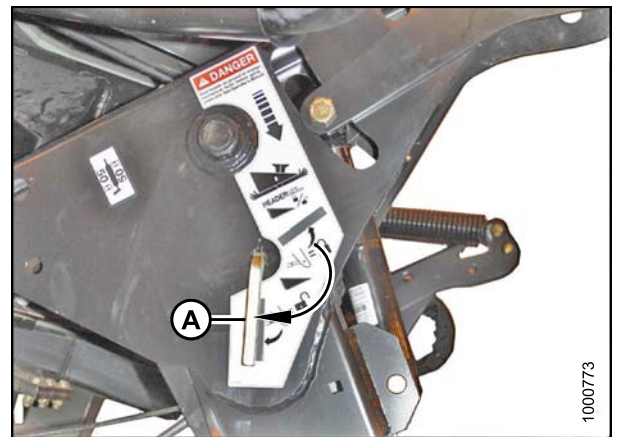


Figure 4.257: Safety Prop

CAUTION

Check to be sure all bystanders have cleared the area.

14. Start engine and activate HEADER DOWN switch (A) on GSL to lower header fully. Stop engine and remove key.

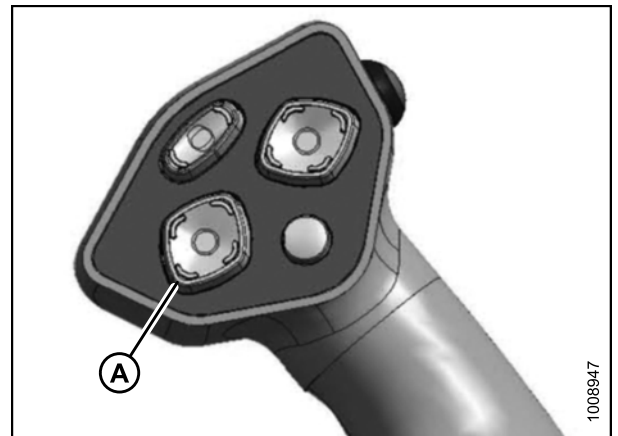


Figure 4.258: GSL

OPERATION

15. Connect header drive hoses (A) and electrical harness (B) to header. Refer to the rotary disc header operator's manual.

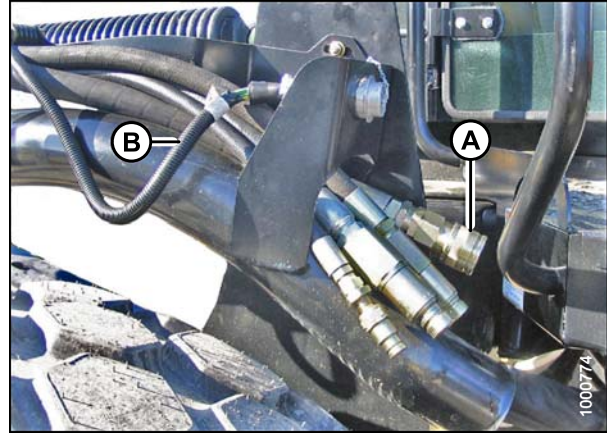


Figure 4.259: Header Drive Hoses and Harness

4.5.6 Detaching an R-Series Header

Refer to the procedure that is appropriate for the center-link installed on the windrower:

- [Detaching an R-Series Header: Hydraulic Center-Link, page 220](#)
- [Detaching an R-Series Header: Mechanical Center-Link, page 223](#)

Detaching an R-Series Header: Hydraulic Center-Link

To detach an R-Series header from an M-Series windrower equipped with a hydraulic center-link, follow these steps:

⚠ DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Start engine and press HEADER UP (A) switch to raise header to maximum height.
2. Rephase cylinders if one end of the header does not raise fully. If rephasing is needed, proceed as follows:
 - a. Press and hold the HEADER UP (A switch until both cylinders stop moving.
 - b. Continue to hold the switch for 3–4 seconds. Cylinders are phased.



Figure 4.260: Ground Speed Lever (GSL)

OPERATION

3. Stop engine and remove key from ignition.
4. Pull lever (A) and rotate toward header to lower safety prop (B) onto cylinder. Repeat for opposite cylinder.

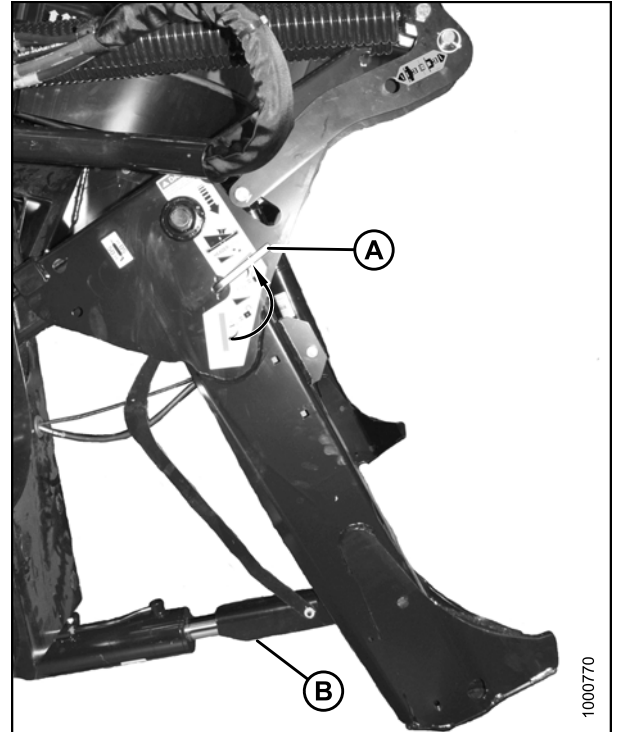


Figure 4.261: Safety Prop

5. Remove hairpin from clevis pin (A) and remove pin from left and right header boots (B) on header.

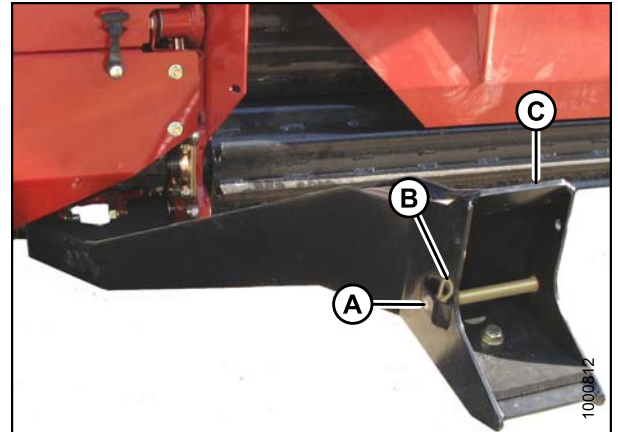


Figure 4.262: Header Boots

OPERATION

- Remove clevis pin from location (A) to disengage float springs and insert in storage hole (B). Secure with hairpin.

CAUTION

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

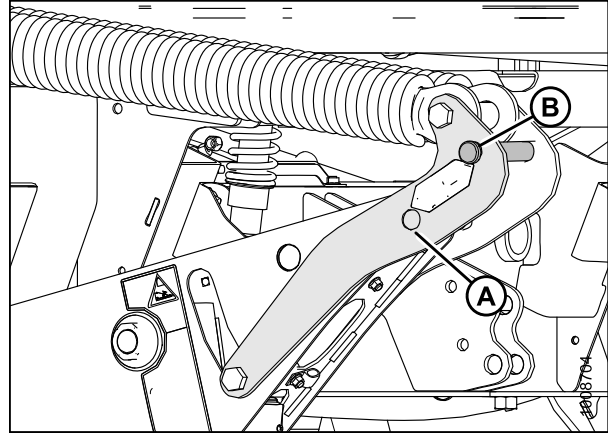


Figure 4.263: Header Lift Linkage

- To disengage safety props and for storage, turn lever (A) away from header to raise safety prop until lever locks into vertical position. Repeat for opposite cylinder.

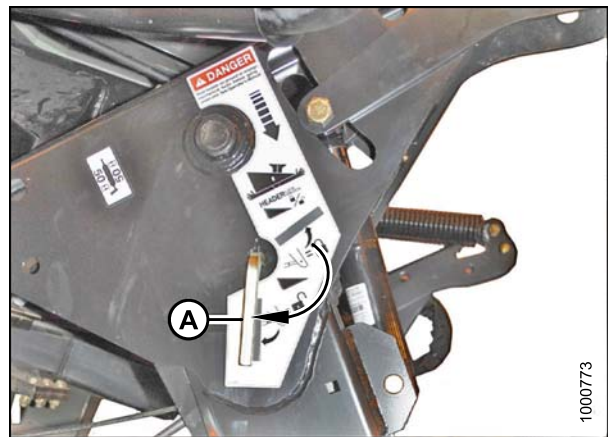


Figure 4.264: Safety Prop

- Start the machine.
- Activate HEADER TILT cylinder switch on GSL to release load on center-link cylinder (A).
- Lift hook release (C) and lift hook (B) off header pin.

NOTE: If optional center-link lift cylinder is installed, lift release (C) and then operate the link lift cylinder from the cab to disengage the center-link from the header.

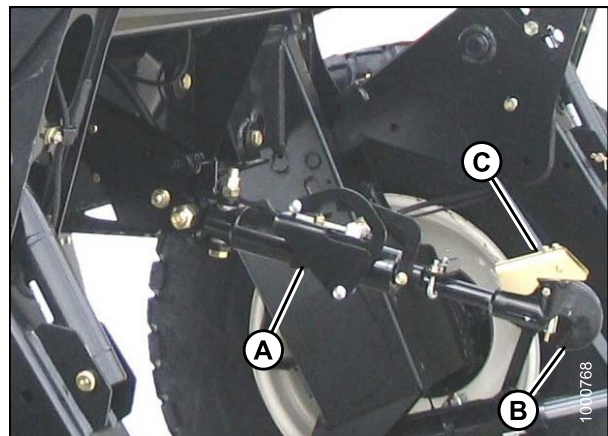


Figure 4.265: Hydraulic Center-Link

OPERATION

11. Disconnect header drive hydraulics (A) and electrical harness (B). Refer to the R-Series Header Operator's Manual.
12. Slowly back windrower away from header.

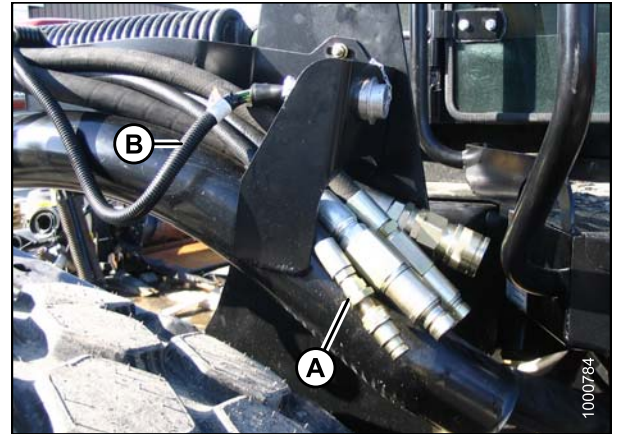


Figure 4.266: Header Drive Hydraulics

13. Reinstall clevis pin (A) through each boot (C) and secure with hairpin (B). Do this to both sides.

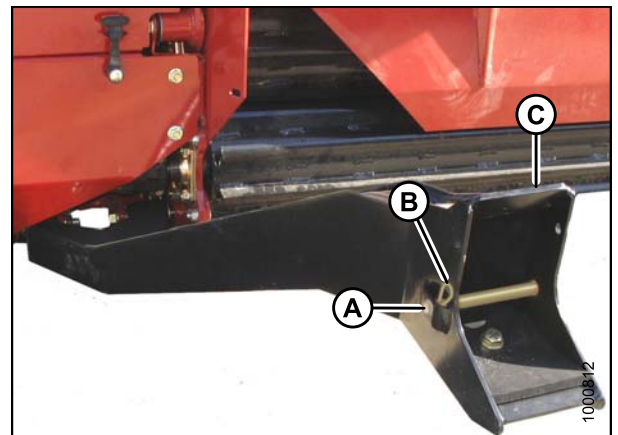


Figure 4.267: Header Boot

Detaching an R-Series Header: Mechanical Center-Link

⚠ DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Start engine and press HEADER UP (A) switch to raise header to maximum height.
2. Rephase cylinders if one end of the header does not raise fully. If rephasing is needed, proceed as follows:
 - a. Press and hold the HEADER UP (A) switch until both cylinders stop moving.
 - b. Continue to hold the switch for 3–4 seconds. Cylinders are phased.

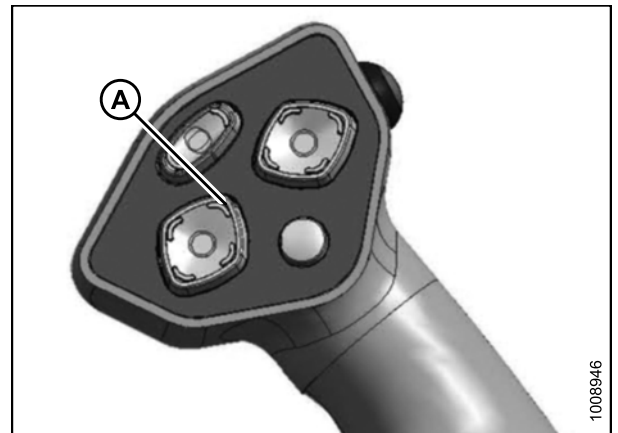


Figure 4.268: Ground Speed Lever (GSL)

OPERATION

3. Stop engine and remove key from ignition.
4. Pull lever (A) and rotate toward header to lower safety prop (B) onto cylinder. Repeat for opposite cylinder.

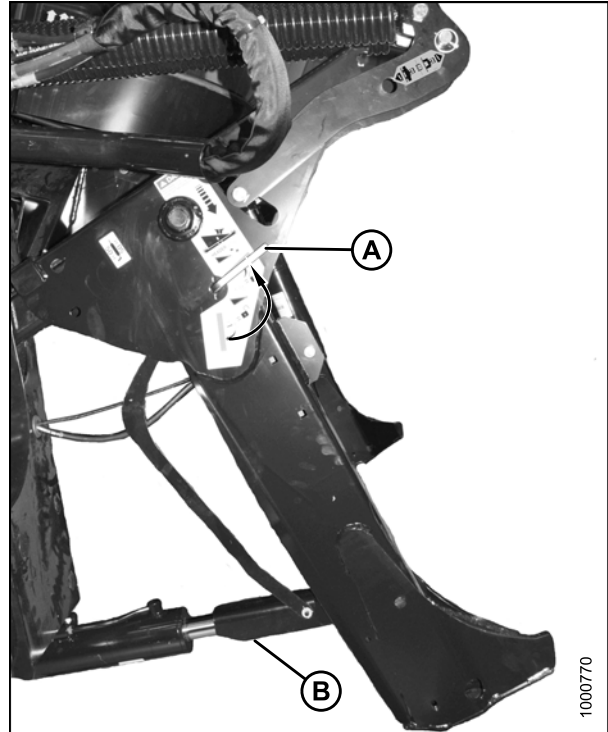


Figure 4.269: Safety Prop

5. Remove hairpin (B) from clevis pin (A) and remove pin from left and right header boots (C) on header.

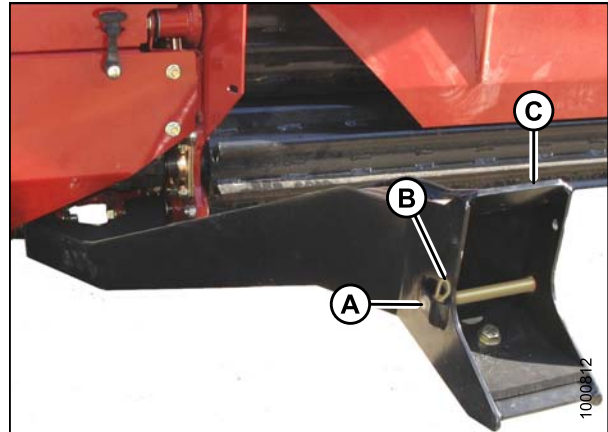


Figure 4.270: Header Boots

OPERATION

6. Remove clevis pin from location (A) to disengage float springs and insert in storage hole (B). Secure with hairpin.

CAUTION

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

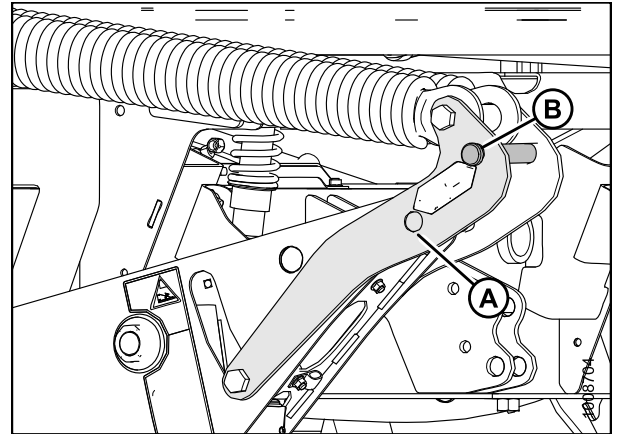


Figure 4.271: Header Lift Linkage

7. To disengage safety props and for storage, turn lever (A) away from header to raise safety prop until lever locks into vertical position. Repeat for opposite cylinder.

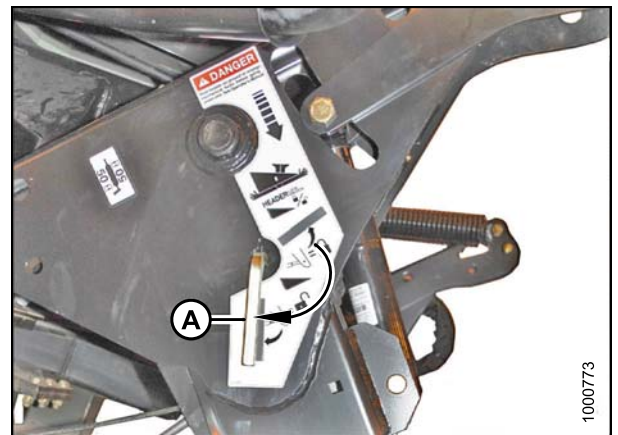


Figure 4.272: Safety Prop

8. Loosen nut (B) and rotate barrel (A) to relieve load on link.

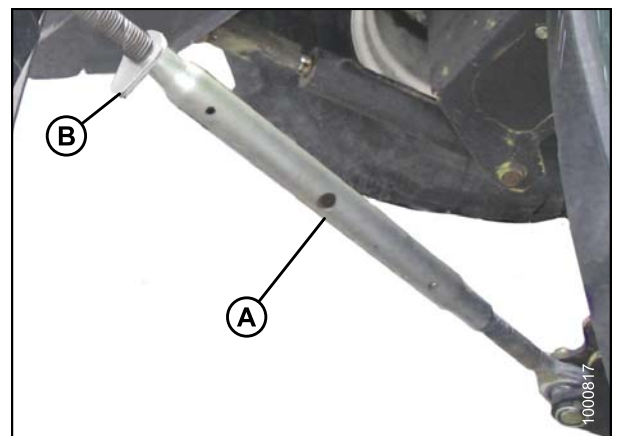


Figure 4.273: Mechanical Center-Link

OPERATION

9. Remove cotter pin on clevis pin (B) and remove pin to disconnect from header. Reinstall clevis pin in header.
10. Tighten nut against barrel (A). A slight tap with a hammer is sufficient.

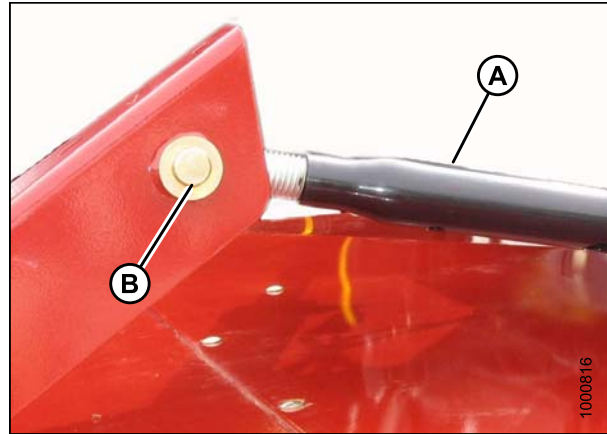


Figure 4.274: Mechanical Center-Link

11. Disconnect header drive hydraulics (A) and electrical harness (B). Refer to the R-Series Header Operator's Manual.
12. Start engine and slowly back windrower away from header.

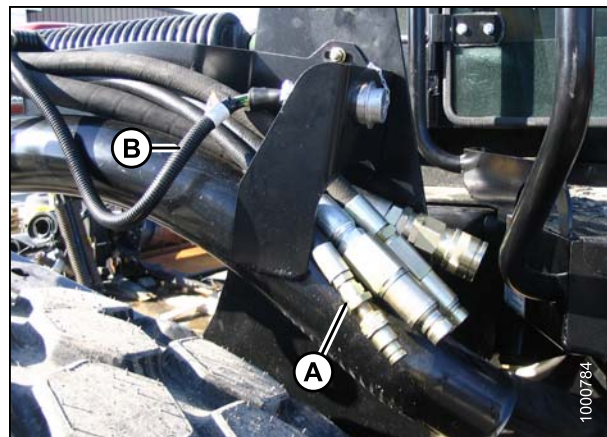


Figure 4.275: Header Drive Hydraulics

13. Stop engine and remove the key.
14. Reinstall the clevis pin (A) through each boot (C) and secure with hairpin (B). Do this to both sides.

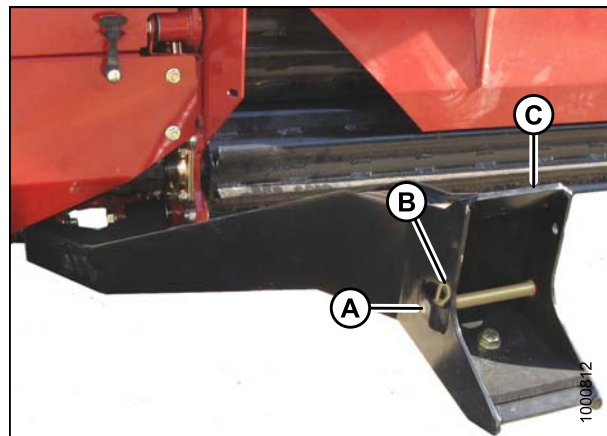


Figure 4.276: Header Boots

OPERATION

4.6 Operating with a D-Series Header

4.6.1 Configuring Hydraulics

The windrower must be fitted with a draper drive basic kit to operate D-Series draper headers.

Windrowers equipped with D-Series hydraulics have four header drive hoses on the LH side.

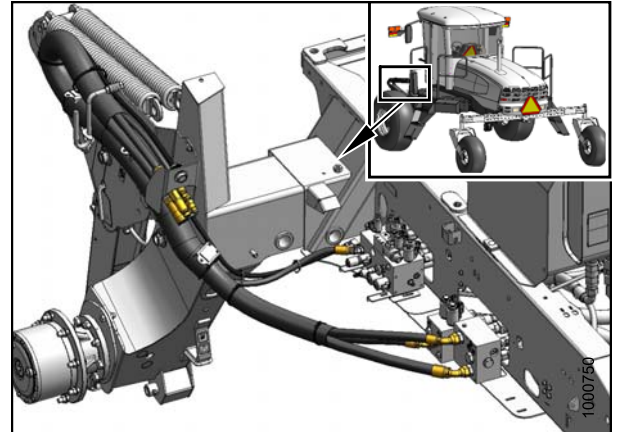


Figure 4.277: Draper Header Drive Hydraulics

There are also up to five reel drive hoses on the RH side.

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

- Base Kit MD #B5577

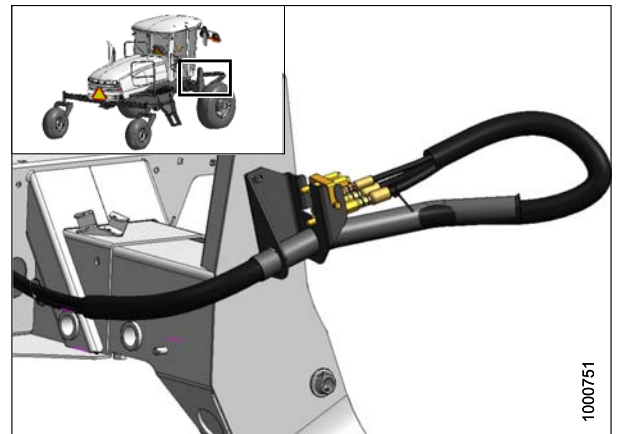


Figure 4.278: Draper Header Reel Hydraulics

OPERATION

4.6.2 Attaching Header Boots

Header boots are required to attach a D-Series Draper Header to the windrower.

CAUTION

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

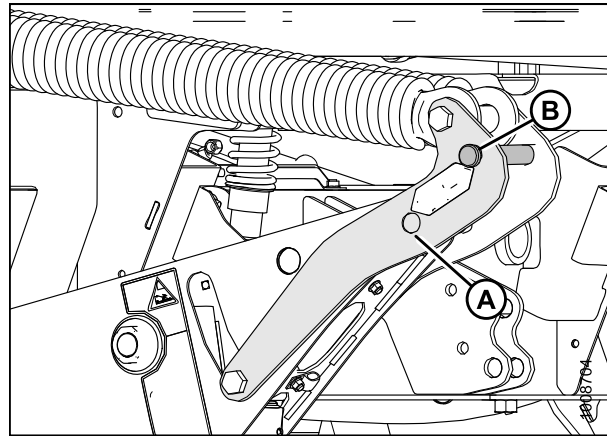


Figure 4.279: Header Lift

If **NOT** installed, attach draper header boots (supplied with header) to windrower lift linkage as follows:

1. Remove pin (B) from boot (A).
2. Position boot (B) on lift linkage (A) and reinstall pin (C). Pin may be installed from either side of boot.
3. Secure pin (C) with hairpin (D).
4. Repeat for opposite side.

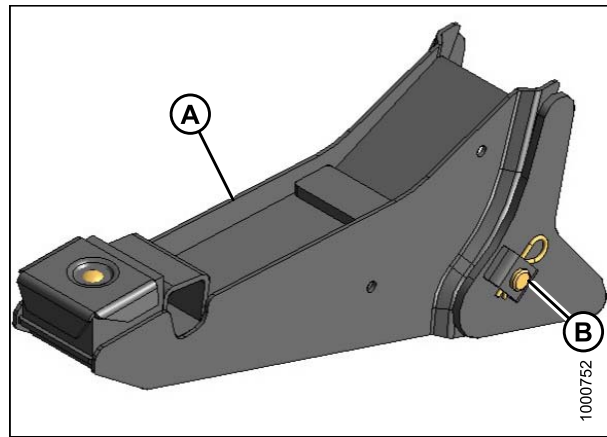


Figure 4.280: Header Boot

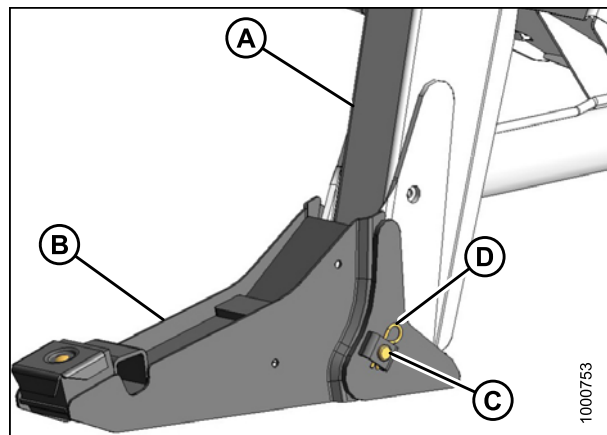


Figure 4.281: Header Boot

4.6.3 Header Position

Refer to [4.4 Operating with a Header, page 137](#) for procedures for controlling header height, header tilt, and float.

OPERATION

4.6.4 Reel Fore-Aft Position

The reel fore-aft position can be hydraulically adjusted with the optional reel position system and is controlled with multi-function switches on the ground speed lever (GSL).

Press and hold the switch for the desired FORWARD (A) or AFT (B) movement of the reel.

NOTE: The switches also control adjustments to the optional double window attachment (DWA) conveyor and can be activated when programming the cab display module (CDM).



Figure 4.282: GSL

4.6.5 Reel Height

Press and hold the switch for the desired movement of the reel REEL UP (A) or REEL DOWN (B).

IMPORTANT:

Under certain conditions, with reel raised to full height, the reel tines may contact the cab roof. Exercise care to avoid damage to the machine.

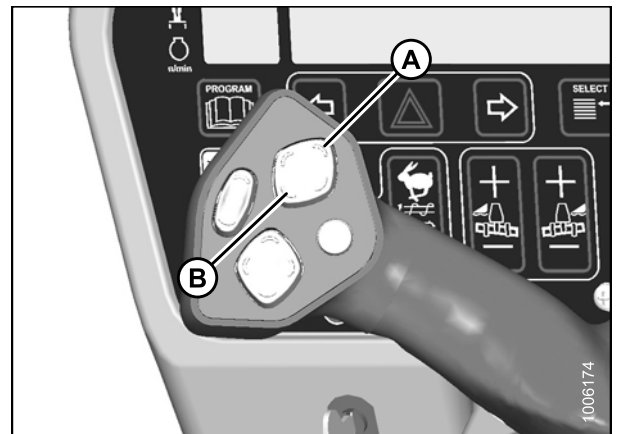


Figure 4.283: Ground Speed Lever (GSL)

4.6.6 Reel Speed

The reel speed is controlled with switches on the Ground Speed Lever (GSL) in the cab. On D-Series draper headers, it can be set relative to the ground speed of the windrower using the HEADER INDEX feature or can run independently. Refer to the operator's manual for your specific header for windrowing guidelines and recommended speeds.

Reel to Ground Speed

Setting the speed of the reel relative to ground speed using the HEADER INDEX function allows you to run the engine at lower rpm while maintaining the desired ground and reel speed. Reducing engine speed saves fuel and reduces noise in the cab.

This mode requires setting the **MINIMUM REEL SPEED** and the **REEL INDEX**.

OPERATION



Figure 4.284: Operator Console

A - Display
D - Slow

B - Header Index
E - Display Selector

C - Fast

IMPORTANT:

Windrower can be moving, but must be less than minimum reel speed.

1. Set the **MINIMUM REEL SPEED** as follows:

- Engage header.
- Set HEADER INDEX switch (B) to **ON**.
- On ground speed lever (GSL), press DISPLAY SELECTOR (E) to display **###.## MIN REEL** or press FAST (C) or SLOW (D) switch.
###.## = RPM or MPH or KPH¹⁴ .
- Press FAST (C) or SLOW (D) until desired minimum reel speed is displayed.

NOTE: The reel will continue operating at the Minimum Reel Speed setting when ground speed drops below this value. DISPLAY (A) will flash **###.## MIN REEL** (RPM or MPH or KPH) to prompt you to change the minimum set-point or increase ground speed if Ground Speed Plus Index is **LESS THAN** the Minimum Reel Speed Set-Point.

2. Set the **REEL INDEX** as follows:

- Set HEADER INDEX (B) switch to **ON**.
- On GSL press DISPLAY SELECTOR (E) to display **###.## ##.# REEL IND** or press FAST (C) or SLOW (D) switch.
###.## = RPM or MPH or KPH¹⁴ , **##.#** = 0.0 to 9.9.
- Press FAST (C) or SLOW (D) until desired reel index is displayed.

14. As per settings in CDM programming

OPERATION

Examples:

3. Windrower is operating at 8 mph with HEADER INDEX ON and set at -1.0.
Display shows **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.
4. Windrower speed drops to 7.5 mph at same HEADER INDEX setting.
Display shows **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.
5. Windrower is operating at 8 mph with HEADER INDEX ON and set at 2.0.
Display shows: **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.

Reel Only Speed

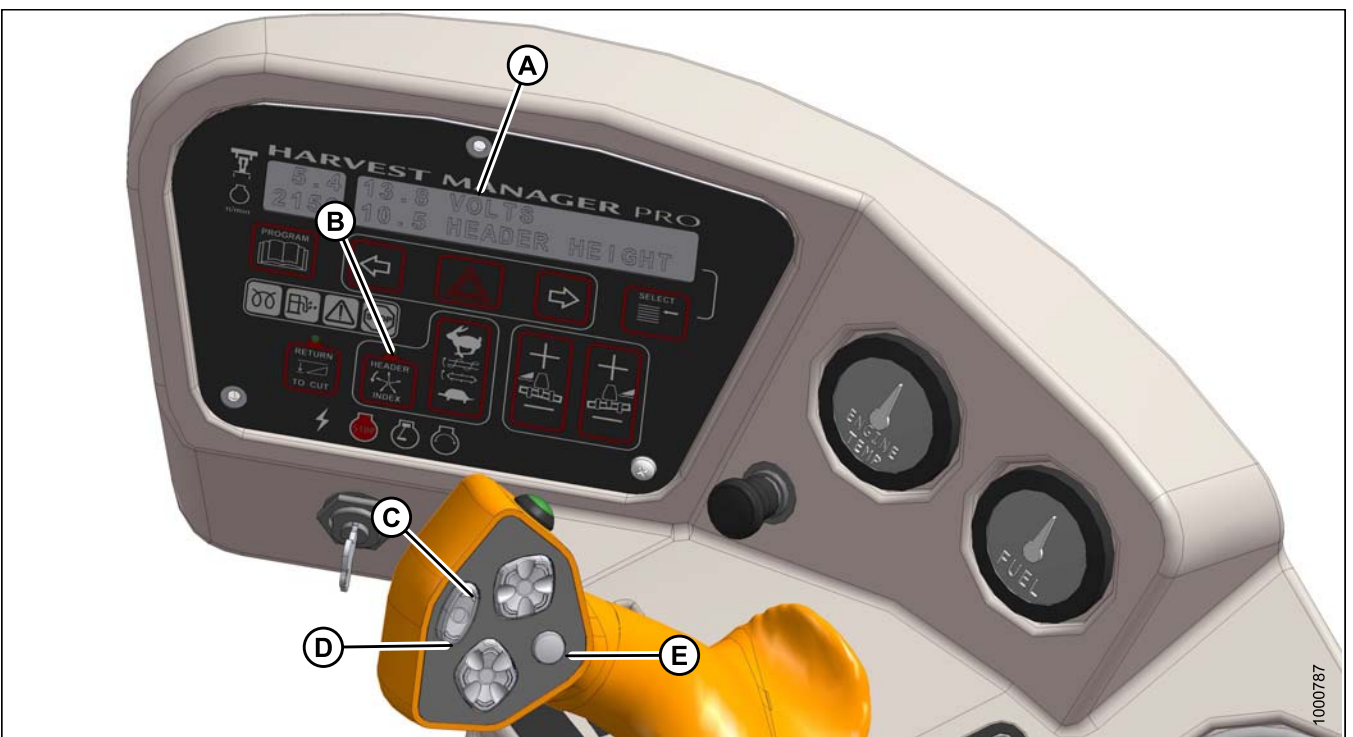


Figure 4.285: Operator Console

A - Display
D - Reel Slow

B - Header Index
E - Display Selector

C - Reel Fast

CAUTION

Check to be sure all bystanders have cleared the area.

Set the speed of the reel independently of ground speed as follows while operating the windrower:

NOTE: This procedure is similar to changing the draper speed “on the go” with the conveyor speed control switch. Refer to [Setting Draper Speed Independent of Ground Speed, page 235](#). These changes become the new set-points.

1. Set HEADER INDEX (B) to **OFF**.

OPERATION

2. On ground speed lever (GSL) press REEL FAST (C) or REEL SLOW (D) until desired reel speed is displayed at (A).
3. DISPLAY (A) shows **##.## REEL MPH**.

4.6.7 Draper Speed

Draper speed affects the orientation of stalks in the windrow. Faster draper speeds tend to form herringbone or dovetail configurations. Refer to your header operator's manual for guidelines on what speed to use.

The draper speed can be set with switches on the cab display module (CDM) relative to the ground speed of the windrower with the HEADER INDEX function or can run independently.

Draper to Ground Speed

Setting the speed of the draper relative to ground speed using the HEADER INDEX function allows you to run the engine at lower rpm while maintaining the desired ground and draper speed. Reducing engine speed saves fuel and reduces noise in the cab.

This mode requires setting the **MINIMUM DRAPER SPEED** and setting the **DRAPER INDEX**.

Refer to the following:

- [Setting Draper Minimum Speed, page 233](#)
- [Setting Draper Index, page 234](#)

OPERATION

Setting Draper Minimum Speed

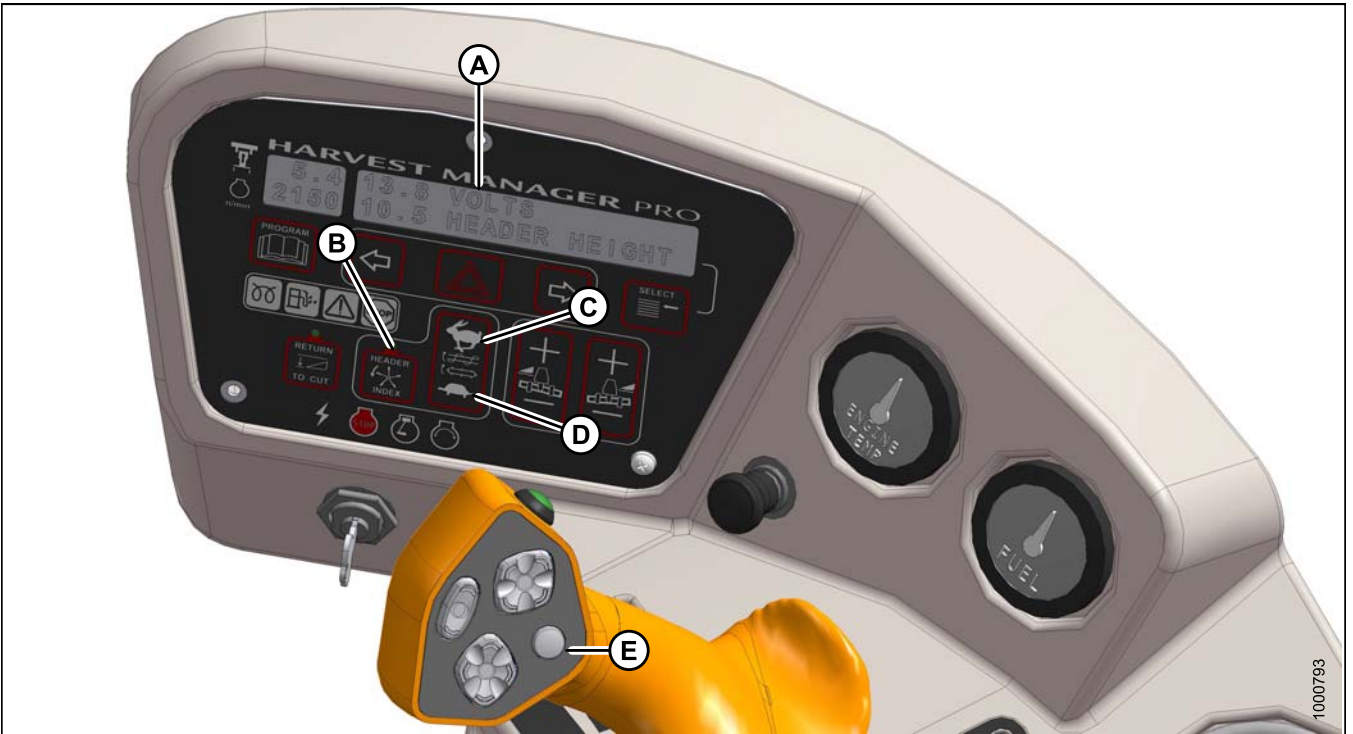


Figure 4.286: Operator Console

A - Display

D - Draper Slow

B - Header Index

E - Display Selector

C - Draper Fast

IMPORTANT:

Windrower can be moving, but must be **LESS THAN** minimum reel speed.

Set **DRAPER MINIMUM SPEED** as follows:

1. Engage header.
2. Set HEADER INDEX (B) switch to **ON**.
3. Press DISPLAY SELECTOR (E) for **DRAPER MIN**.
4. On cab display module (CDM) press SLOW (D) until beep is heard.
5. Display (A) shows **### DRAPER MIN**¹⁵.

15. DISPLAY will flash **### MIN CONV** (MPH or KPH) to prompt you to change the minimum set point, or increase ground speed if Ground Speed Plus Index is **less than** the Minimum Draper Speed Set Point.

OPERATION

Setting Draper Index

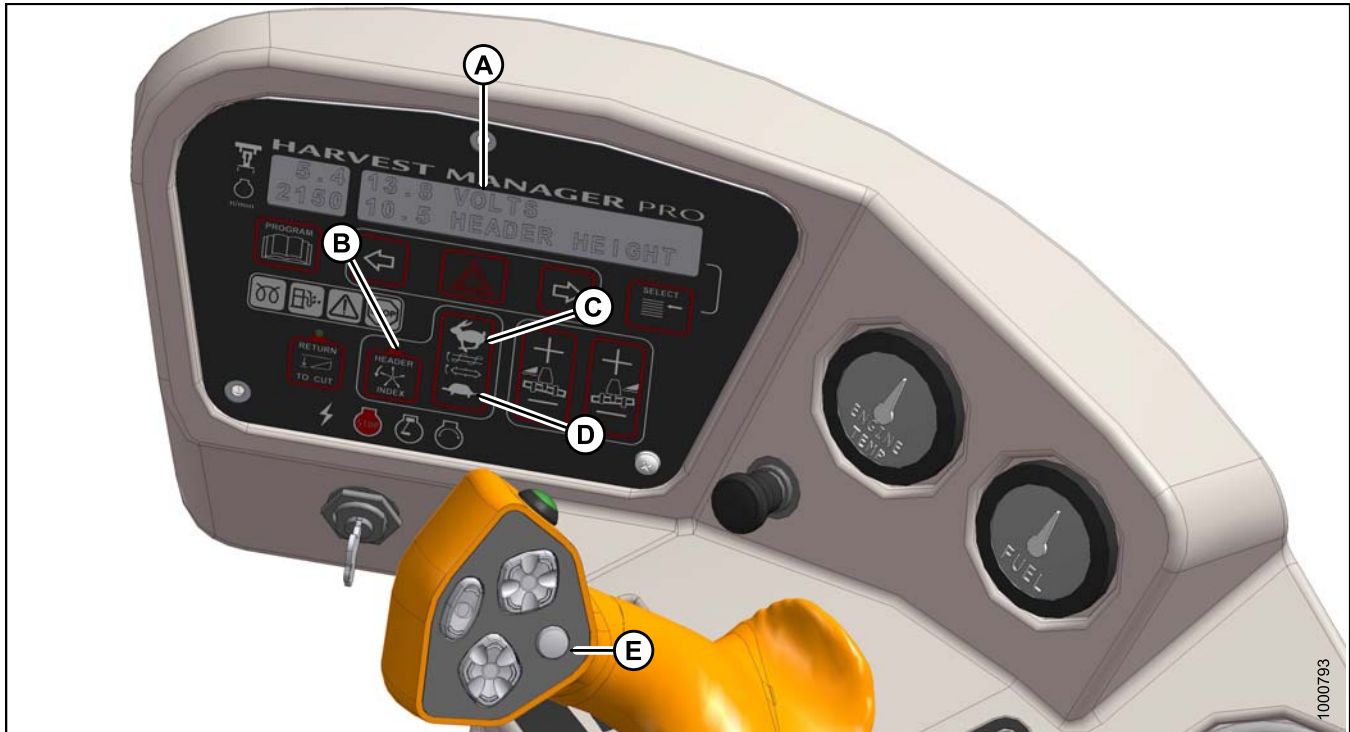


Figure 4.287: Operator Console

A - Display
D - Draper Slow

B - Header Index
E - Display Selector

C - Draper Fast

Set **DRAPER INDEX** as follows:

IMPORTANT:

Windrower can be moving, but must be **GREATER THAN** minimum reel speed.

1. Engage header.
2. Set **HEADER INDEX** switch (B) to **ON**.
3. Press **DISPLAY SELECTOR** (E) so that **DRAPER INDX** is displayed at (A).
4. On cab display module (CDM) press **DRAPER FAST** (C) or **SLOW** (D) until desired index is displayed at (A).
Display shows **###.# ##.# DRAP IND**.
###.# = MPH or KPH
##.# = -1.9 to +3.0

OPERATION

Examples:

- Windrower is operating at 8 mph with HEADER INDEX ON and set at 1.5.

Display shows: **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.

- Windrower speed drops to 7.5 mph at same HEADER INDEX setting.

Display shows: **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.

- Windrower is operating at 8 mph with HEADER INDEX ON and set at 0.9.

Display shows: **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.

Setting Draper Speed Independent of Ground Speed

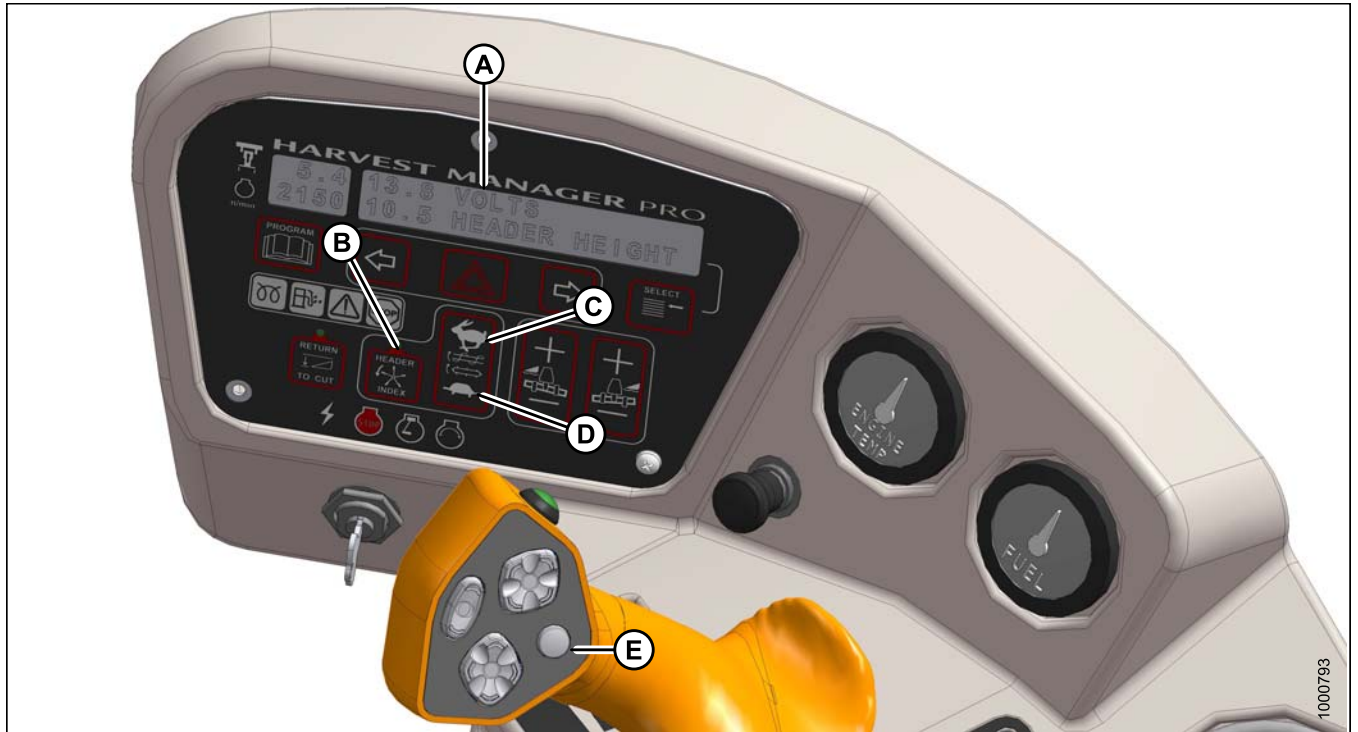


Figure 4.288: Operator Console

A - Display

D - Draper Slow

B - Header Index

E - Display Selector

C - Draper Fast

Set the speed of the draper independently of ground speed as follows:

NOTE: This procedure can also be used to change the draper speed “on the go”.

CAUTION

Check to be sure all bystanders have cleared the area.

1. Engage header.

OPERATION

2. Set HEADER INDEX switch (B) to **OFF**.
3. Press DISPLAY SELECTOR (E) to display at (A) **DRAPER SPEED**.
4. On cab display module (CDM) press **FAST** (C) or **SLOW** (D) until desired draper speed is displayed at (A).
Display shows **### DRAPER SPEED**.
= MPH or KPH

4.6.8 Knife Speed

The ideal cutting speed of the knife should be such that a clean cut is achieved. Crop types and conditions usually influence the knife and forward speeds. Refer to the header operator's manual for more information on knife speeds.

Table 4.1 D-Series Knife Speed

Header Description		Knife Speed			
Type	Size (ft)	Minimum		Maximum	
		rpm ¹⁶	spm ¹⁷	rpm ¹⁶	spm ¹⁷
Draper DK	15	750	1500	950	1900
	20 and 25	700	1400	850	1700
	30	600	1200	800	1600
	35			700	1400
Draper SK	20 and 25	600	1200	750	1500
	30			700	1400
	35	550	1100		

The windrower control module (WCM) reads a code from the header that determines the knife speed range and the minimum speed when the header is first attached to the windrower.

The desired speed can be programmed on the cab display module (CDM) and is stored in the WCM memory so that if the header is detached and then reattached to the windrower, the knife will operate at the original set-point.

If no header code is detected, the CDM displays NO HEADER, the knife speed reverts to a range from 800–1000 strokes per minute and you can then preset the speed.

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.

16. Revolutions per minute - Speed of knife drive box pulley

17. Strokes per minute of knife (rpm x 2)

OPERATION

Setting Knife Speed “On the Go”



Figure 4.289: Operator Console

A - Display
D - Program

B - Slower
E - Select

C - Faster

CAUTION

Check to be sure all bystanders have cleared the area.

Display and set knife speed “on the go” as follows:

1. Engage header.
2. On cab display module (CDM) press PROGRAM (D) and SELECT (E).
DISPLAY (A) shows **#### KNIFE SPM.**
= strokes per minute.
3. Press SLOWER (B) or FASTER (C) until desired knife speed is displayed at (A).

OPERATION

4.6.9 Deck Shift (Optional)

The hydraulic deck shift option allows you to control deck position and draper rotation from the operator's station. It enables crop delivery from left side, center, or right side of the header.

Deck Shift

CAUTION

Check to be sure all bystanders have cleared the area.

Shift decks as follows:

1. Engage header by pushing down on the yellow HEADER DRIVE knob, and pulling up on the black ring at the base of the switch (C).
2. Push the switch (A) to desired delivery position. Deck(s) will move and direction of drapers will change accordingly.
3. Operate windrower.

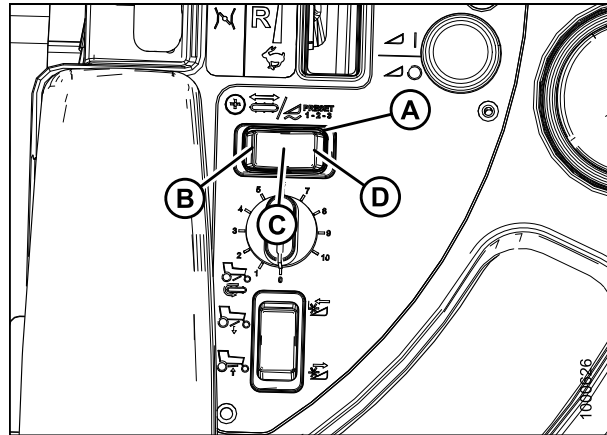


Figure 4.290: Deck Shift Switch

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 position of the decks. The float is then maintained when the decks are shifted.

CAUTION

Check to be sure all bystanders have cleared the area.

Program the float as follows:

1. Engage header.

OPERATION

2. Using HEADER TILT SWITCHES (A) and (B) on the GSL, set center-link to mid-range position (05.0 on DISPLAY [E]).
3. Push DECK SHIFT switch (G) on the console to desired delivery position.
4. Using HEADER DOWN switch (C) on the GSL, lower header fully with lift cylinders fully retracted.
5. Using LEFT FLOAT SWITCH (D), push + to increase float or – to decrease float on left side of header. DISPLAY (E) will indicate selected float for left side, for example (8.0 L FLOAT R ##.#).
6. Repeat for right side float with RIGHT switch (F). DISPLAY (E) will indicate float for both sides, for example (8.0 L FLOAT R 3.0).
7. Select a second deck position with the DECK SHIFT switch (G).
8. Repeat steps 5. and 6. above to set the float.
9. Select a third position if desired with the DECK SHIFT switch (G) and repeat steps 5. and 6. above to set the float.

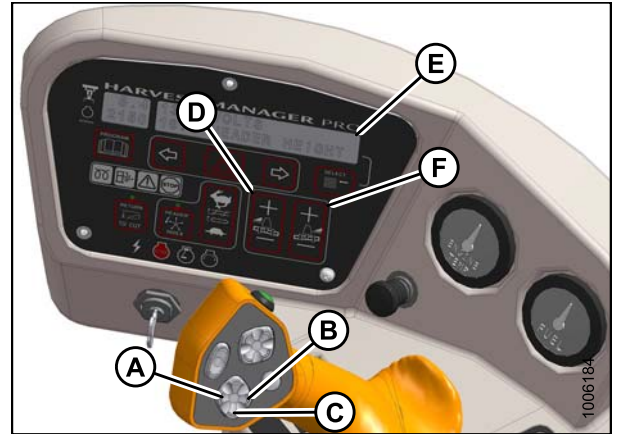


Figure 4.291: Operator Console

- | | |
|----------------------|--------------------|
| A - Header Tilt Down | B - Header Tilt Up |
| C - Header Down | D - Left Float |
| E - Display | F - Right Float |

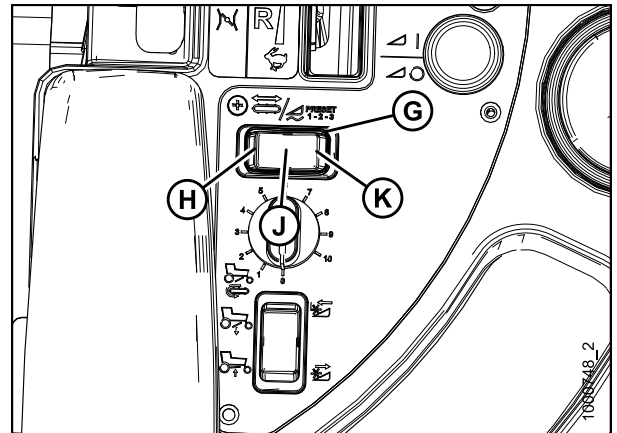


Figure 4.292: Deck Shift Switch

- | | |
|-----------------------|-------------------------|
| A - Deck Shift Switch | B - Left Side Delivery |
| C - Center Delivery | D - Right Side Delivery |

OPERATION

4.7 Operating with an A-Series Header

The M155 is factory-equipped to run an A-Series Auger Header.

4.7.1 Auger Speed

Auger Speed on A30-D Headers

On A30–D Auger Headers, the auger speed is fixed to the knife speed. The auger speed is **NOT** monitored and cannot be displayed.

Auger Speed on A40-D Headers

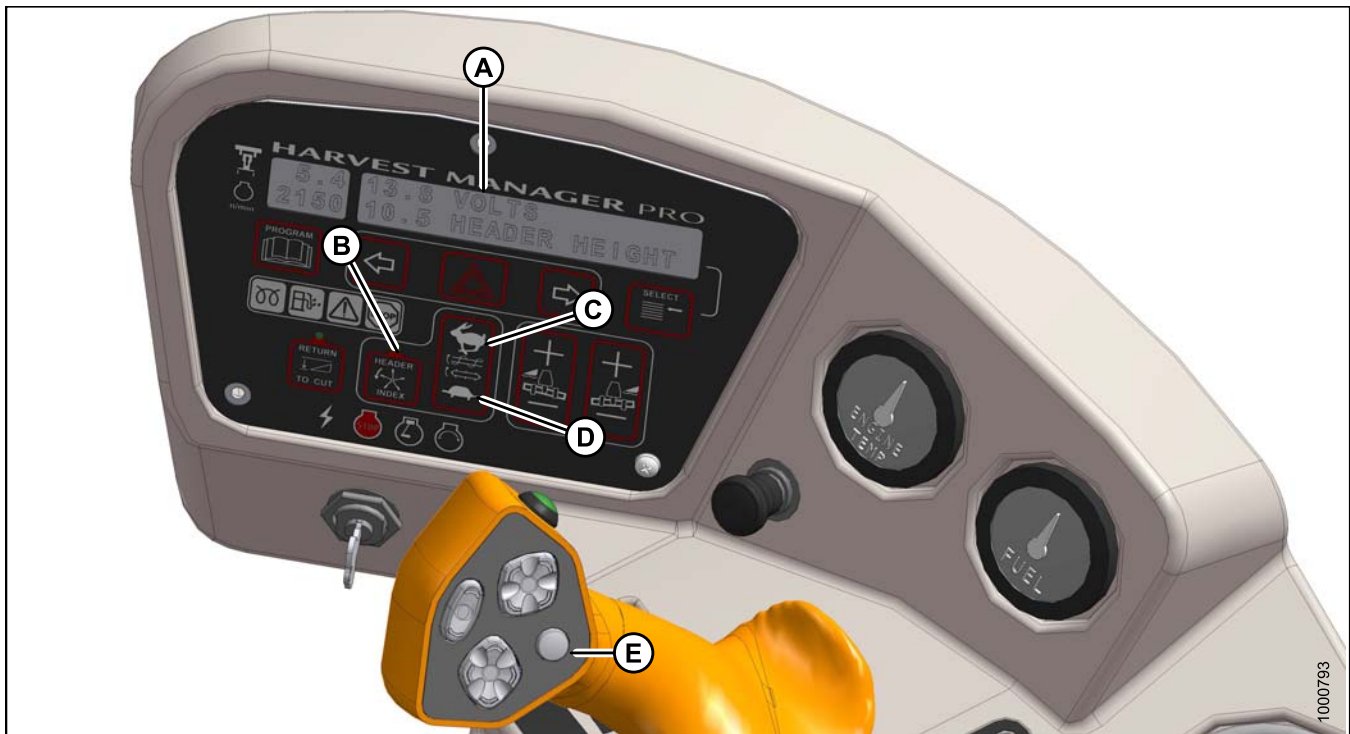


Figure 4.293: Operator Console

A - Display
D - Auger Slow

B - Header Index Switch
E - Display Selector

C - Auger Fast
D - Auger Slow

CAUTION

Check to be sure all bystanders have cleared the area.

Change auger speed as follows:

1. Engage header.
2. Set HEADER INDEX switch (B) to **OFF**

OPERATION

3. On ground speed lever (GSL), press DISPLAY SELECTOR switch (E) until **### AUGER SPEED** is displayed at (A) or on cab display module (CDM), press FAST (C) or SLOW (D). Display (A) shows **### AUGER SPEED**¹⁸.

= 4.7 to 9.9

4. Press FAST (C) or SLOW (D) on CDM until desired auger speed is displayed at (A).

NOTE: Changing the auger speed does not affect the reel speed.

4.7.2 Reel Speed

Refer to your header operator's manual for recommended reel speed settings for your particular crop.

Reel Speed on A30-D Headers

The reel is driven by the auger, and both are dependent on the main header drive speed. The auger speed and hence the reel speed can be changed by installing a different size auger drive sprocket, or by varying the windrower engine rpm. These headers do **NOT** have a reel speed sensor, therefore no read out is available for the display.

Reel Speed on A40-D Headers

The A40-D Auger Header features a hydraulic direct drive reel with an operating speed range of 15–50 rpm that is controlled with switches on the cab display module (CDM) and on the ground speed lever (GSL) at the operator's station.

The reel drive motor and the auger drive motor are connected in series but a separate line to the auger allows the reel speed to change independently from the auger speed. Switches on the GSL are used to adjust the reel speed which is displayed on the CDM display. The reel speed can be set by three methods;

- Reel Only (only reel speed changes)
- Reel On-the-Go (reel and auger speeds change)
- Reel to Ground (indexed)

NOTE: Adjusting the reel speed will result in a change to auger speed unless the auger speed has been preset.

18. Auger speed not to exceed 320 rpm.

OPERATION

Adjusting Reel Only Speed

The A40 reel drive is hydraulically driven. Adjusting reel speed also changes auger speed, unless the auger speed is initially set at a predetermined value. The following procedure sets the auger speed so that subsequent reel speed adjustments will only affect the reel.

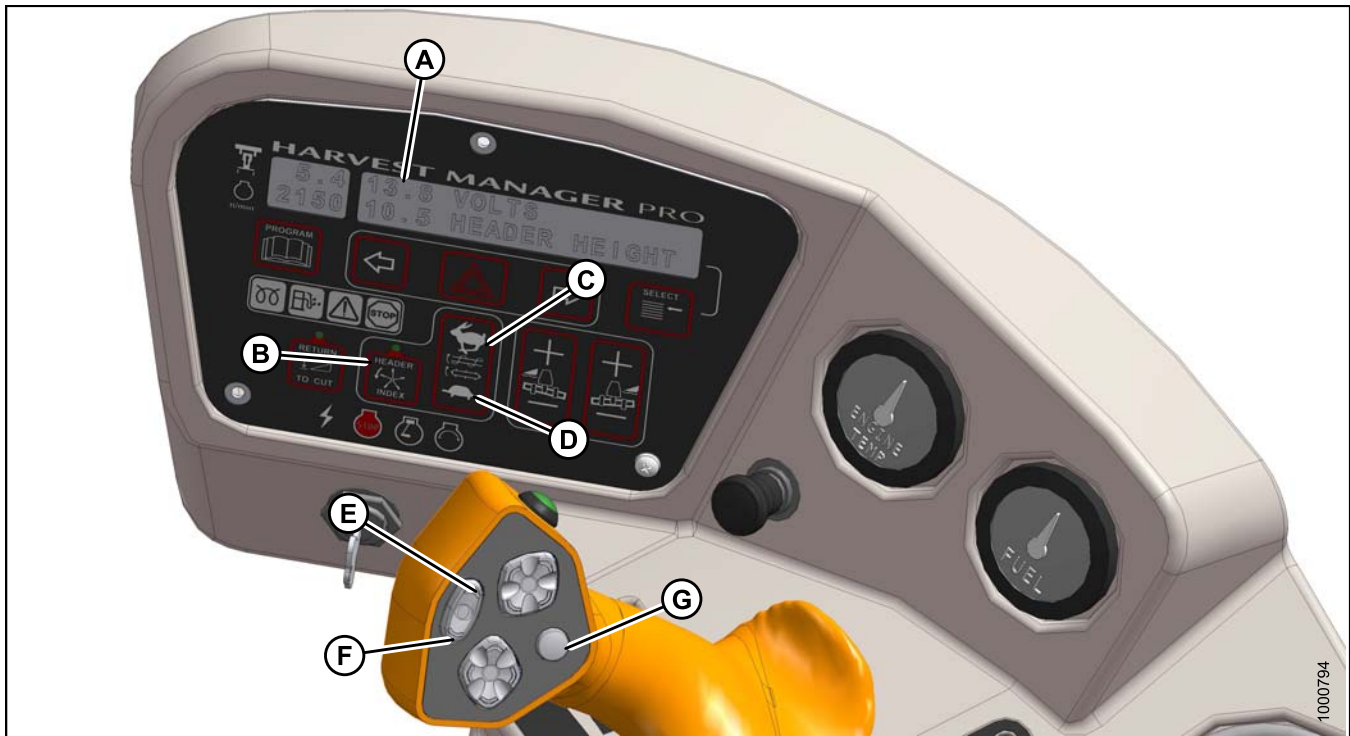


Figure 4.294: Operator Console

A - Display
D - Auger Slow
G - Display Selector

B - Header Index
E - Fast

C - Auger Fast
F - Slow

IMPORTANT:

To prevent over-speeding the auger, initially set the speed of the reel and auger as follows:
Subsequent adjustments to reel speed do **NOT** affect auger speed.

1. Engage header.
2. Set HEADER INDEX SWITCH (B) to **OFF**.
3. On ground speed lever (GSL) press REEL SLOW switch (F) until a beep is heard.
4. DISPLAY (A) shows **### REEL RPM**.
5. On cab display module (CDM) press AUGER SLOW (D) or FAST (C) switch to set desired auger speed.
6. DISPLAY (A) shows **### AUGER SPEED**.
7. On GSL press REEL SLOW (F) or FAST (E) switch to set desired reel speed.
8. DISPLAY (A) shows **### REEL RPM**.

NOTE: The auger speed will **NOT** change if the reel speed is adjusted.

OPERATION

Adjusting Reel Speed “On The Go”

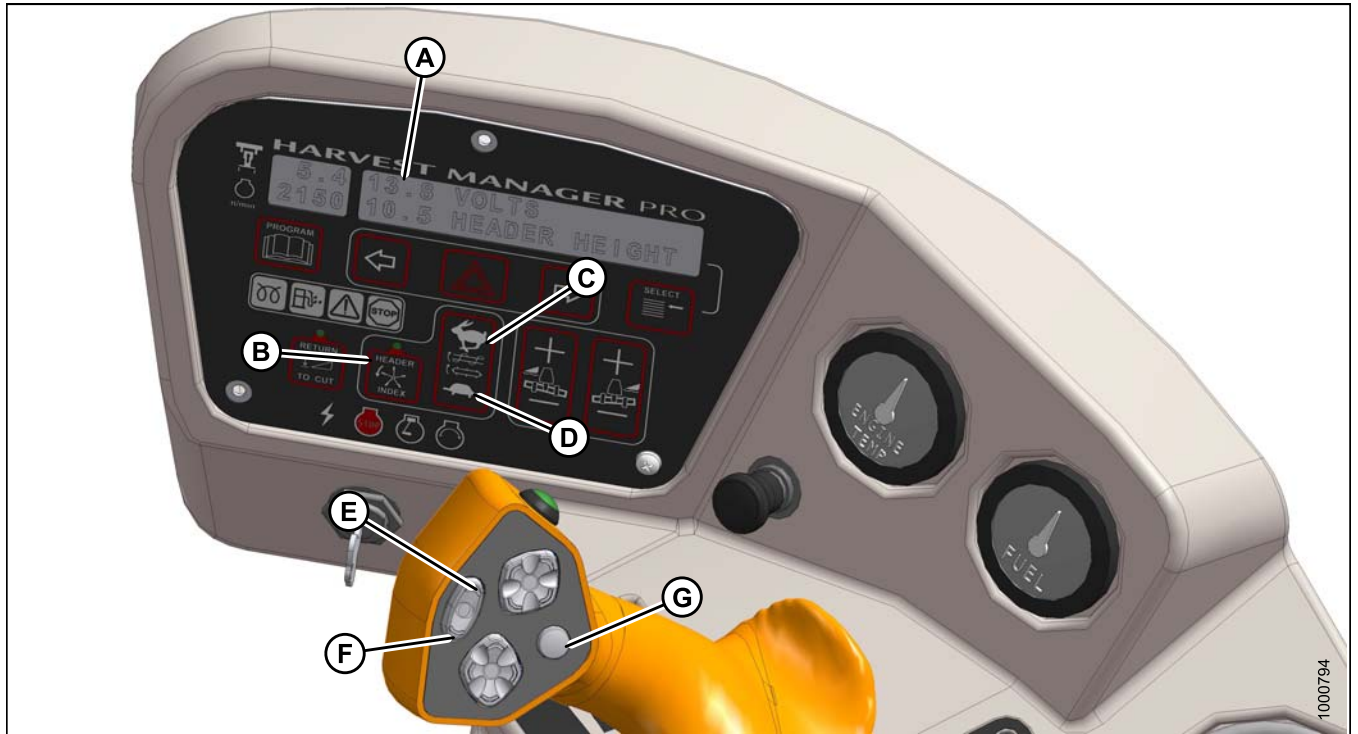


Figure 4.295: Operator Console

A - Display
E - Reel Fast

B - Header Index
F - Reel Slow

C - Auger Fast
G - Display Selector

D - Auger Slow

The reel speed adjustment range is from 15 to 85 rpm. Adjust the reel speed while the machine is in operation as follows:

1. Set HEADER INDEX switch (B) to **OFF**.
2. On ground speed lever (GSL), press REEL SLOW (F) or REEL FAST (E) until desired speed is reached. DISPLAY (A) shows **###.## REEL RPM**.

NOTE: Adjusting the reel speed will result in a change to auger speed unless the auger speed has been preset.

Setting Reel to Ground Speed

Setting the speed of the reel relative to ground speed using the HEADER INDEX function automatically adjusts the reel speed with changes in ground speed. Operator fatigue is reduced and more consistent crop flow into the auger is achieved.

NOTE: Any change to the reel speed will result in a change to the auger speed unless the auger speed has been preset. Refer to [Adjusting Reel Only Speed, page 242](#).

This mode requires setting the **Minimum Reel Speed** and the **Reel Index**.

OPERATION



Figure 4.296: Operator Console

A - Display
D - Slow

B - Header Index
E - Display Selector

C - Fast

IMPORTANT:

Windrower can be moving, but must be less than minimum reel speed.

1. Set the Minimum Reel Speed as follows:
 - a. Engage header.
 - b. Set HEADER INDEX switch (B) to **ON**.
 - c. On ground speed lever (GSL) press DISPLAY SELECTOR (E) to display **###.## MIN REEL**, or press FAST (C) or SLOW (D) switch.
###.## = RPM or MPH or KPH¹⁹
 - d. Press SLOW (D) until beep is heard.
 - e. Display (A) shows **###.## REEL MIN RPM**.

NOTE: The reel will continue operating at the Minimum Reel Speed setting when ground speed drops below this value. DISPLAY (A) will flash **###.## MIN REEL** (RPM or MPH or KPH¹⁹) to prompt the operator to change the minimum set-point, or increase ground speed if Ground Speed Plus Index is **LESS THAN** the Minimum Reel Speed Set-Point.

2. Set the Reel Index as follows:

IMPORTANT:

Windrower can be moving, but must be greater than minimum reel speed.

- a. Set HEADER INDEX switch (B) to **ON**.

19. As per settings in cab display module (CDM) programming.

OPERATION

- b. On GSL press DISPLAY SELECTOR (E) to display **###.### ###.# REEL IND**, or press FAST (C) or SLOW (D) switch.
###.### = RPM or MPH or KPH¹⁹, **###.#** = 0.0 to 9.9.
- c. Press FAST (C) or SLOW (D) until desired reel index is displayed.

Examples:

- Windrower is operating at 8 mph with HEADER INDEX ON, and set at -1.0.

Display shows: **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.

- Windrower speed drops to 7.5 mph at same HEADER INDEX setting.

Display shows: **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.

- Windrower is operating at 8 mph with HEADER INDEX ON, and set at 2.0.

Display shows: **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 ideal cutting speed of the knife should be such that a clean cut is achieved. Crop types and conditions usually influence the knife and forward speeds.

The windrower control module (WCM) reads a code from the header that determines the knife speed range and the minimum speed when the header is first attached to the windrower.

The desired speed can be programmed on the cab display module (CDM) and is stored in the WCM memory so that if the header is detached and then reattached to the windrower, the knife will operate at the original set-point.

If no header code is detected, the CDM displays NO HEADER, and the knife speed reverts to a range from 0–1400 strokes per minute. You can then adjust the speed setting.

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 speed can be adjusted without shutting down the machine, although it is recommended that the windrower be stopped to enable you to reprogram the WCM.

OPERATION

Setting Knife Speed “On the Go”



Figure 4.297: Operator Console

A - Display
D - Program

B - Slower (Left Arrow)
E - Select

C - Faster (Right Arrow)

CAUTION

Check to be sure all bystanders have cleared the area.

Display and set knife speed “on the go” as follows:

1. Engage header.
2. Press PROGRAM (D) and SELECT (E).
3. DISPLAY (A) shows **#### KNIFE SPM.**
4. To adjust knife speed, press ARROW (B) or ARROW (C).
Display (A) shows new knife speed **#### KNIFE SPM.**

OPERATION

4.8 Operating with an R-Series Header

The R85 13-foot header and the R80 13- and 16-foot headers are shipped without the motor and hoses installed and the installation of a separate motor and hose bundle is necessary.

If required, obtain kit MD #B5510 from your MacDon Dealer, and install it in accordance with the instructions supplied with the Kit.

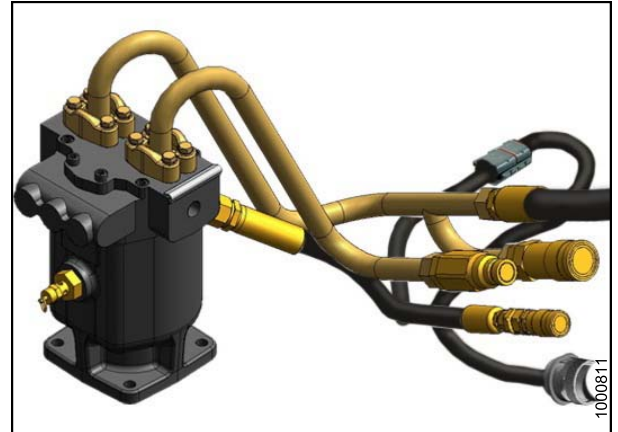


Figure 4.298: Kit MD #B5510

OPERATION

4.9 Disc Speed

Disc speed is ideal when a clean cut is achieved. Crop types and conditions usually influence the disc and forward speeds.

When the windrower is first attached to the header, the windrower control module (WCM) reads a code from the header determining the speed range and minimum speed.

The desired speed is programmed on the cab display module (CDM) and stored in the WCM memory so the discs 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 disc speed reverts to a preset range that can be changed by the Operator.

Refer to the header operator's manual for the suggested disc speed for a variety of crops and conditions.

4.9.1 Setting Disc Speed



Figure 4.299: Operator Console

A - Display
D - Slow

B - Header Index
E - Display Selector

C - Fast

CAUTION

Check to be sure all bystanders have cleared the area.

Display and set the desired disc speed as follows:

1. Engage header.
2. Set HEADER INDEX switch (B) to **OFF**.
3. On ground speed lever (GSL) press FAST (C) or SLOW (D) until desired disc speed is displayed at (A). Display (A) shows **#### DISC RPM**.

= RPM

5 Maintenance and Servicing

The following instructions are provided to assist the Operator in the use of the windrower.

Detailed maintenance, service, and parts information are contained in the technical manual and parts catalog that are available from your MacDon Dealer.

5.1 Preparation For Servicing

WARNING

To avoid personal injury, before servicing adapter/header or opening drive covers:

- **Fully lower the header. If necessary to service in the raised position, always engage lift safety props.**
- **Disengage drives.**
- **Stop engine, and remove key.**
- **Wait for all moving parts to stop.**

MAINTENANCE AND SERVICING

5.2 Torque Specifications

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

- Tighten all bolts to the torques specified in chart (unless otherwise noted throughout this manual).
- Replace hardware with the same strength and grade bolt.
- Check tightness of bolts periodically, using the tables below as a guide.
- Torque categories for bolts and cap screws are identified by their head markings.

5.2.1 SAE Bolt Torque Specifications

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

Table 5.1 SAE Grade 5 Bolt and Grade 5 Free Spinning Nut

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

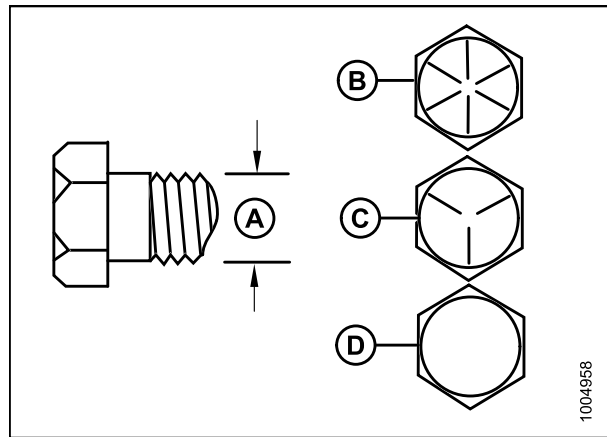


Figure 5.1: Bolt Grades

A - Nominal Size
C - SAE-5

B - SAE-8
D - SAE-2

MAINTENANCE AND SERVICING

Table 5.2 SAE Grade 5 Bolt and Grade 5 Distorted Thread Nut

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

Table 5.3 SAE Grade 8 Bolt and Grade 8 Distorted Thread Nut

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

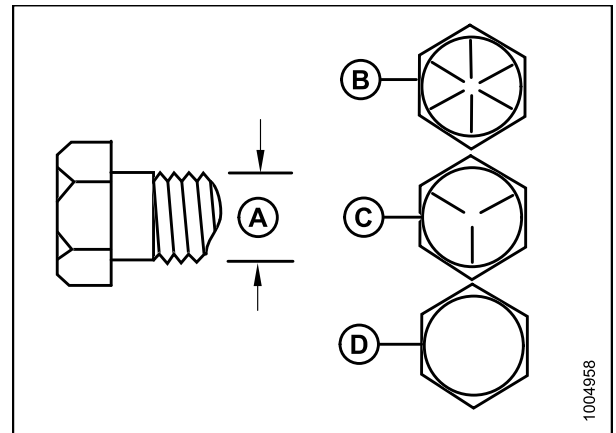


Figure 5.2: Bolt Grades

A - Nominal Size
C - SAE-5

B - SAE-8
D - SAE-2

MAINTENANCE AND SERVICING

Table 5.4 SAE Grade 8 Bolt and Grade 8 Free Spinning Nut

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

5.2.2 Metric Bolt Specifications

Table 5.5 Metric Class 8.8 Bolts and Class 9 Free Spinning Nut

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

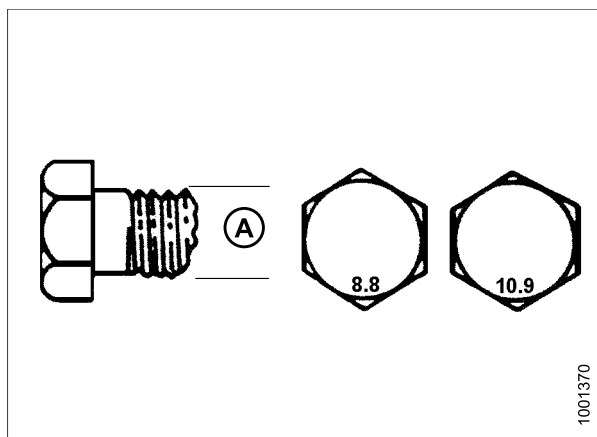


Figure 5.3: Bolt Grades

A - Nominal Size

MAINTENANCE AND SERVICING

Table 5.6 Metric Class 8.8 Bolts and Class 9 Distorted Thread Nut

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

Table 5.7 Metric Class 10.9 Bolts and Class 10 Free Spinning Nut

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

MAINTENANCE AND SERVICING

Table 5.8 Metric Class 10.9 Bolts and Class 10 Distorted Thread Nut

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

5.2.3 Metric Bolt Specifications Bolting into Cast Aluminum

Table 5.9 Metric Bolt Bolting into Cast Aluminum

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

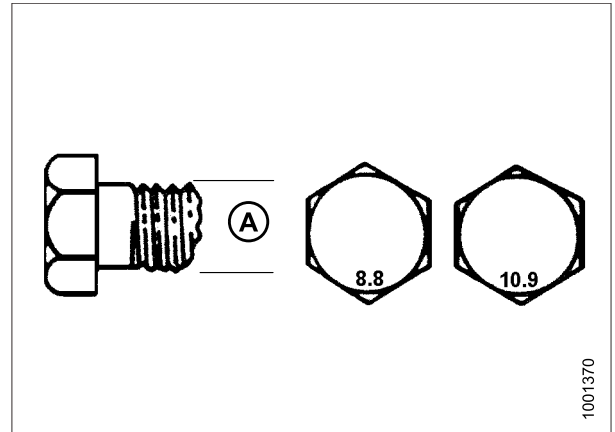


Figure 5.4: Bolt Grades

A - Nominal Size

5.2.4 Flare-Type Hydraulic Fittings

1. Check flare (A) and flare seat (B) for defects that might cause leakage.
2. Align tube (C) with fitting (D) and thread nut (E) onto fitting without lubrication until contact has been made between the flared surfaces.
3. Torque the fitting nut (E) to the specified number of FFFT or to a given torque value shown in the following table.
4. To prevent the fitting (D) from rotating, use two wrenches. Place one wrench on the fitting body (D) and tighten the nut (E) with the other wrench to the torque shown.
5. Assess the final condition of the connection.

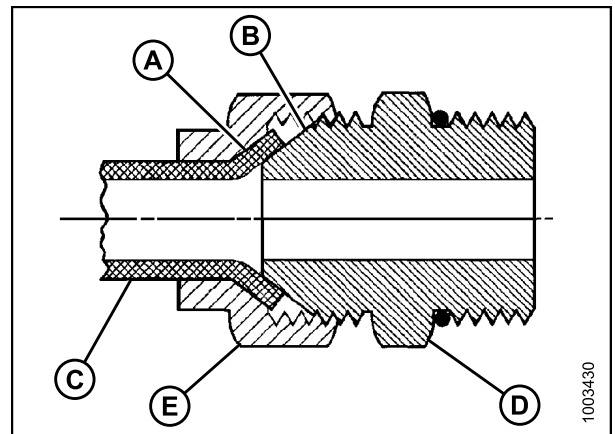


Figure 5.5: Hydraulic Fitting

A - Flare
 B - Flare Seat
 C - Tube
 D - Body
 E - Nut

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Table 5.10 Flare-Type Hydraulic Tube Fittings

SAE No.	Tube Size O.D. (in.)	Thread Size (in.)	Nut Size across Flats (in.)	Torque Value ²⁰		Flats from Finger Tight (FFFT)	
				ft-lbf	N-m	Flats	Turns
3	3/16	3/8	7/16	6	8	1	1/6
4	1/4	7/16	9/16	9	12	1	1/6
5	5/16	1/2	5/8	12	16	1	1/6
6	3/8	9/16	11/16	18	24	1	1/6
8	1/2	3/4	7/8	34	46	1	1/6
10	5/8	7/8	1	46	62	1	1/6
12	3/4	1-1/16	1-1/4	75	102	3/4	1/8
14	7/8	1-3/8	1-3/8	90	122	3/4	1/8
16	1	1-5/16	1-1/2	105	142	3/4	1/8

²⁰. Torque values shown are based on lubricated connections as in reassembly.

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5.2.5 O-Ring Boss (ORB) Hydraulic Fittings (Adjustable)

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

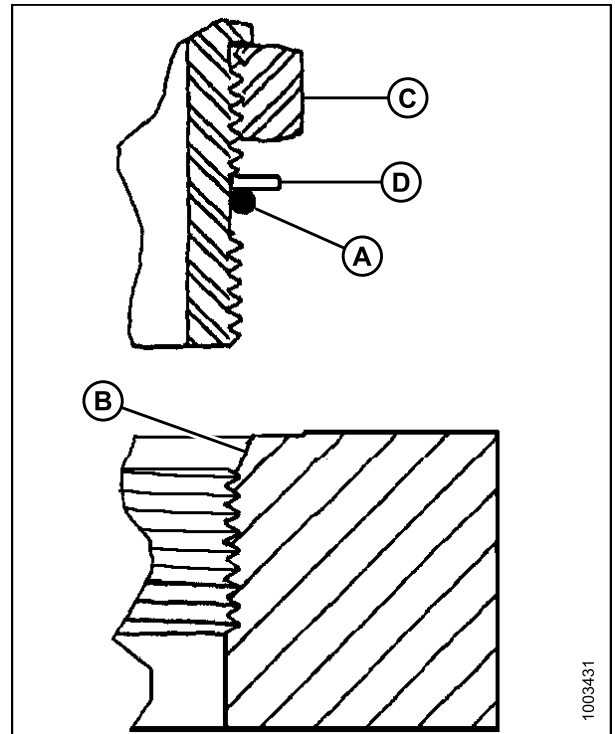


Figure 5.6: Hydraulic Fitting

A - O-Ring B - Seat C - Nut
D - Washer

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

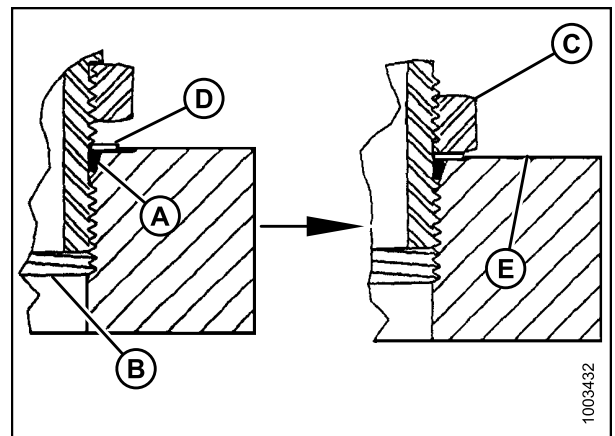


Figure 5.7: Hydraulic Fitting

A - O-Ring B - Fitting C - Nut
D - Washer E - Part Face

MAINTENANCE AND SERVICING

Table 5.11 O-Ring Boss (ORB) Hydraulic Fittings (Adjustable)

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

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

MAINTENANCE AND SERVICING

5.2.6 O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable)

1. Inspect O-ring (A) and seat (B) for dirt or obvious defects.
2. Check that O-ring (A) is **NOT** on the threads, adjust if necessary.
3. Apply hydraulic system oil to the O-ring.
4. Install fitting (C) into port until fitting is hand tight.
5. Torque fitting (C) per value in chart. Refer to Table 5.12 *O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable)*, page 259.
6. Check the final condition of the fitting.

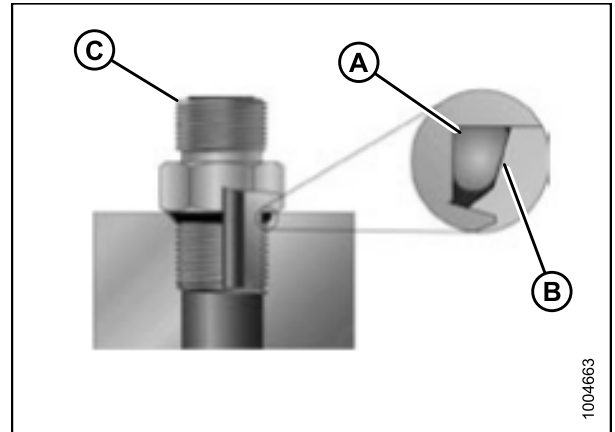


Figure 5.8: Hydraulic Fitting

Table 5.12 O-Ring Boss (ORB) Hydraulic Fittings (Non-Adjustable)

SAE Dash Size	Thread Size (in.)	Torque Value ²²	
		ft-lbf (*in-lbf)	N·m
-3	3/8-24	*106–115	12–13
-4	7/16–20	14–15	19–21
-5	1/2–20	15–24	21–33
-6	9/16–18	19–21	26–29
-8	3/4–16	34–37	46–50
-10	7/8–14	55–60	75–82
-12	1-1/16-12	88–97	120–132
-14	1-3/8-12	113–124	153–168
-16	1-5/16-12	130–142	176–193
-20	1-5/8-12	163–179	221–243
-24	1-7/8-12	199–220	270–298

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

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5.2.7 O-Ring Face Seal (ORFS) Hydraulic Fittings

To tighten O-ring face seal (ORFS) hydraulic fittings, follow these steps:

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



Figure 5.9: Hydraulic Fitting

2. Apply hydraulic system oil to the O-ring (B).
3. Align the tube or hose assembly so that the flat face of the sleeve (A) or (C) comes in full contact with O-ring (B).
4. Thread tube or hose nut (D) until hand-tight. The nut should turn freely until it is bottomed out.
5. Torque fitting further to the torque value in the table shown in the opposite column.

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

6. When assembling unions or two hoses together, three wrenches will be required.
7. Check the final condition of the fitting.

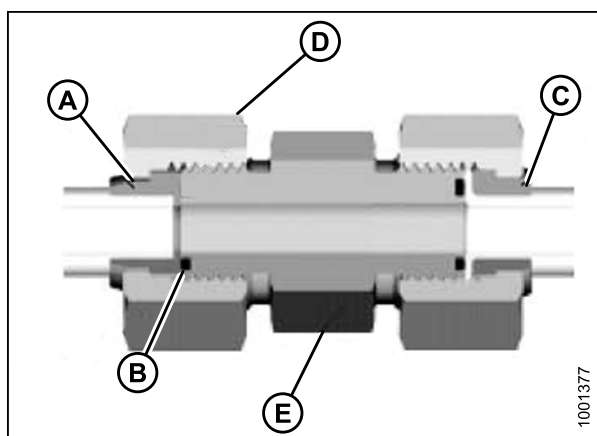


Figure 5.10: Hydraulic Fitting

A - Brazed Sleeve
B - O-Ring
C - Two Piece Sleeve
D - Nut
E - Fitting Body

MAINTENANCE AND SERVICING

Table 5.13 O-Ring Face Seal (ORFS) Hydraulic Fittings

SAE Dash Size	Thread Size (in.)	Torque Value ²³	
		ft·lbf (*in·lbf)	N·m
-3	Note ²⁴	–	–
-4	9/16–18	18–21	25–28
-5	Note ²⁴	–	–
-6	11/16-16	29–32	40–44
-8	13/16-16	41–45	55–61
-10	1–14	59–65	80–88
-12	1-3/16-12	85–94	115–127
-14	Note ²⁴	–	–
-16	1-7/16-12	111–122	150–165
-20	1-11/16-12	151–167	205–226
-24	2–12	232–256	315–347
-32	2-1/2-12	376–414	510–561

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

24. O-ring face seal type end not defined for this tube size

MAINTENANCE AND SERVICING

5.3 Maintenance Specifications

5.3.1 Recommended Fuel, Fluids, and Lubricants

Storing Lubricants and Fluids

Your machine can operate at top efficiency only if clean fuel and lubricants are used.

- Use clean containers to handle all fuels and lubricants.
- Store in an area protected from dust, moisture, and other contaminants.
- Buy good quality, clean fuel from a reputable dealer.
- Avoid storing fuel over long periods of time. If you have a slow turnover of fuel in windrower tank or supply tank, add fuel conditioner to avoid condensation problems.
- Store fuel in a convenient place away from buildings.

Fuel Specifications

Use good quality diesel fuel from a reputable supplier. For most year-round service, No. 2 diesel fuel meeting ASTM specification D975 Grade S15 will provide good performance.

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

Table 5.14 Fuel Specification

Fuel	Specification	Sulphur (by weight)	Water and Sediment (by volume)	Cetane no. °C	Lubricity
Grade No. 2	ASTM D975	0.5% Maximum	0.05% Maximum	40° Minimum	520 Microns
Grade No.1 and 2 mix ²⁵	n/a	1% Maximum 0.5% Maximum Preferred	0.1% Maximum	45–55° Cold Weather / High Altitude	460 Microns

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

- A cetane improver additive can be used with low cetane fuels.
- A wax crystal modifier can help with fuels with high cold filter plugging points (CFPP).
- An anti-icer can help prevent ice formation in wet fuel during cold weather.
- An anti-oxidant 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 the table on the previous page. Diesel fuel conditioner is available from your Dealer.

25. Optional when operating temp below 0°C (32°F).

MAINTENANCE AND SERVICING

Lubricants, Fluids, and System Capacities

Table 5.15 System Capacities

Lubricant/Fluid	Location	Description	Capacity
Grease	As required unless otherwise specified	SAE multi-purpose.High temperature extreme pressure (EP2) performance with 1% max molybdenum disulphide (NLGI Grade 2) lithium base.	
Diesel fuel	Fuel tank	Diesel Grade No.2, or Diesel Grade No.1 and 2 mix ²⁶ ; refer to Fuel Specifications, page 262 for more information.	97 U.S. gallons (378 liters)
Hydraulic oil	Hydraulic reservoir	SAE 15W-40 compliant with SAE specs for API Class CJ-4 engine oil which meets or exceeds CES20081 and API performance classification CJ-4.	17.2 U.S. gallons (66 liters)
Gear lubricant	Gear box	SAE 75W-90, API service class GL-5.Fully synthetic gear lubricant, (SAE J2360 preferred).	2.2 U.S. quarts (2.1 liters)
	Wheel drive ²⁷		1.5 U.S. quarts (1.4 liters)
Antifreeze	Engine cooling system	ASTM D-6210 and Fleetguard ES Compleat [®] . See below.	6.6 U.S. gallons (25 liters) ²⁸
Engine oil	Engine oil pan	SAE 15W-40 compliant with SAE specs for API Class SJ and CH-4 engine oil.	11.6 U.S. quarts (11 liters)
Air conditioning refrigerant	Air conditioning system	R134A	5 lbs (2.27 kg)
Air conditioning refrigerant oil ²⁹	Air conditioning system total capacity	PAG SP-15	8.1 fl. oz. (240 cc)

26. Optional when operating temp below 0°C. (32°F).

27. SAE 85W-140 API Service Class GL-5. Extreme pressure gear lubricant is used before initial change.

28. Equal parts with water, high quality, soft, de-ionized or distilled water as recommended by Supplier.

29. New compressor (**MD #203013**) comes filled. If installing on 2014 and prior, see Service Bulletin 1254.

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If Fleetguard ES Compleat® is unavailable, use a coolant concentrate or prediluted coolant intended for use with heavy duty diesel engines and with a minimum of the following chemical and physical properties:

- Is formulated with a quality nitrite free additive package.
- 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.

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

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

Water quality is important 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. Do **NOT** mix ethylene glycol and propylene glycol base coolants. Do **NOT** use coolants that contain nitrites.

Filter Part Numbers

Table 5.16 M155 Filter Part Numbers

Filter	Part Number
Engine Oil Filter	MD #111974
Charge Oil Filter	MD #112419
Return Oil Filter	MD #151975
Primary Fuel Filter Element	MD #111972
Fuel Strainer Filter	MD #111608
Secondary Fuel Filter Element	MD #166312
Fuel Filler Filter	MD #163989
Primary Element (CAB)	MD #111060
Primary Air Filter Element	MD #111954
Safety Air Filter Element	MD #111955

5.3.2 Conversion Chart

Quantity	Inch-Pound Units		Factor	SI Units (Metric)	
	Unit Name	Abbreviation		Unit Name	Abbreviation
Area	acres	acres	x 0.4047 =	hectares	ha
Flow	US gallons per minute	gpm	x 3.7854 =	liters per minute	L/min
Force	pounds force	lbf	x 4.4482 =	Newtons	N

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Quantity	Inch-Pound Units		Factor	SI Units (Metric)	
	Unit Name	Abbreviation		Unit Name	Abbreviation
Length	inch	in.	$\times 25.4 =$	millimeters	mm
	foot	ft.	$\times 0.305 =$	meters	m
Power	horsepower	hp	$\times 0.7457 =$	kilowatts	kW
Pressure	pounds per square inch	psi	$\times 6.8948 =$	kilopascals	kPa
			$\times .00689 =$	megapascals	MPa
			$\div 14.5038 =$	bar (non-SI)	bar
Torque	pound feet or foot pounds	ft·lbf	$\times 1.3558 =$	newton meters	N·m
	pound inches or inch pounds	in·lbf	$\times 0.1129 =$	newton meters	N·m
Temperature	degrees fahrenheit	°F	$(^{\circ}\text{F}-32) \times 0.56 =$	Celsius	°C
Velocity	feet per minute	ft/min	$\times 0.3048 =$	meters per minute	m/min
	feet per second	ft/s	$\times 0.3048 =$	meters per second	m/s
	miles per hour	mph	$\times 1.6063 =$	kilometres per hour	km/h
Volume	US gallons	US gal	$\times 3.7854 =$	liters	L
	ounces	oz.	$\times 29.5735 =$	milliliters	ml
	cubic inches	in. ³	$\times 16.3871 =$	cubic centimetres	cm ³ or cc
Weight	pounds	lbs	$\times 0.4536 =$	kilograms	kg

5.4 Engine Compartment Hood

The engine hood has two open positions. The lowest is for general maintenance such as checking and adding fluid, servicing the cooling box, etc. The highest position accommodates full access to the engine bay.

5.4.1 Opening Hood (Lower Position)

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Stop the engine and remove the key.
2. Locate latch (A) behind grill and lift to release hood.
3. Raise hood until strap (B), which should be looped under hooks (C) and (D), stops it at approximately a 40° angle.
4. Remove strap from hook (C) and allow hood to raise slightly further.

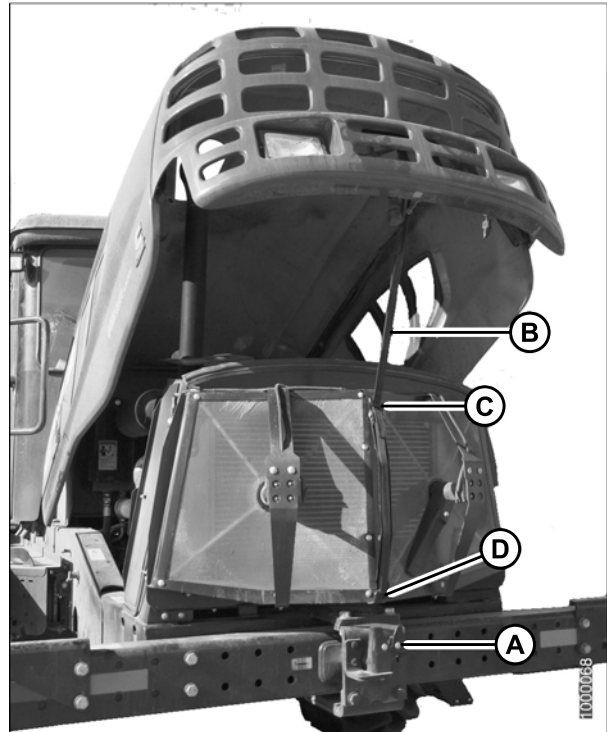


Figure 5.11: Accessing Engine Compartment

MAINTENANCE AND SERVICING

5.4.2 Closing Hood (Lower Position)

1. Grasp the strap at (B) and loop under upper hook (C).

IMPORTANT:

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

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

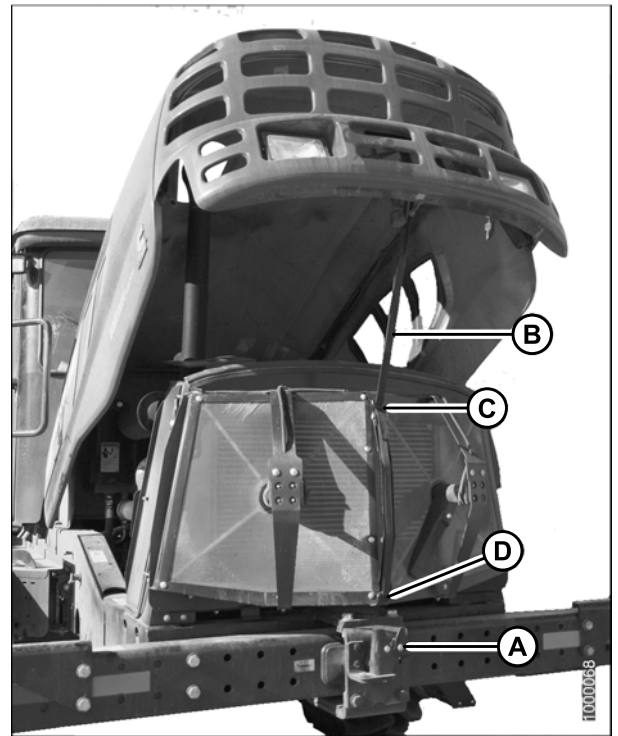


Figure 5.12: Accessing Engine Compartment

5.4.3 Opening Hood (Highest Position)

⚠ DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Stop the engine and remove the key.

MAINTENANCE AND SERVICING

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

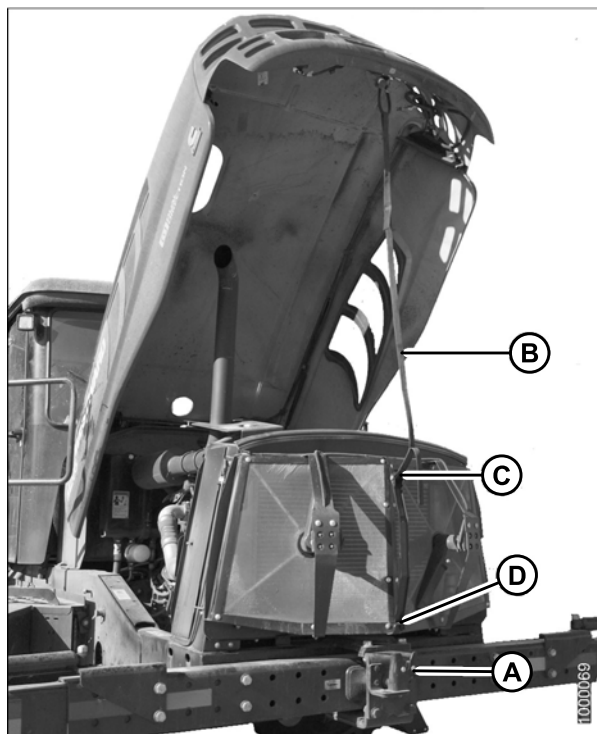


Figure 5.13: Accessing Engine Compartment

5.4.4 Closing Hood (Highest Position)

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

IMPORTANT:

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

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

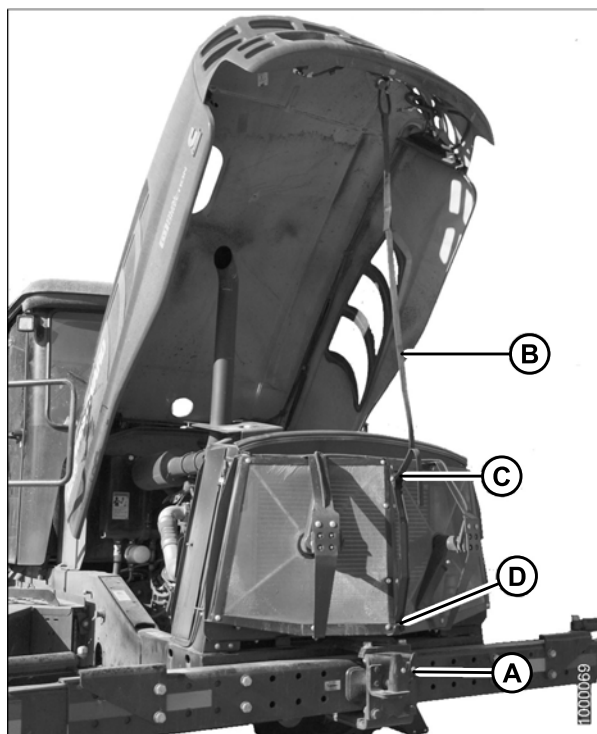


Figure 5.14: Accessing Engine Compartment

5.5 Maintenance Platforms

Swingaway platform/stair units are provided on both sides of the windrower for access to the operator's station and engine bay maintenance.

To improve access to the hydraulics plumbing or battery, the platforms can be swung away from the windrower.

When open, the maintenance platforms have two positions:

- Standard Position
- Major Servicing Position

5.5.1 Opening Platforms (Standard Position)

1. Approach the platform/stair unit (A) or (B) that you want to move.

NOTE: This procedure describes how to open the cab-forward left platform (A). The same procedure is used to for the right platform (B).

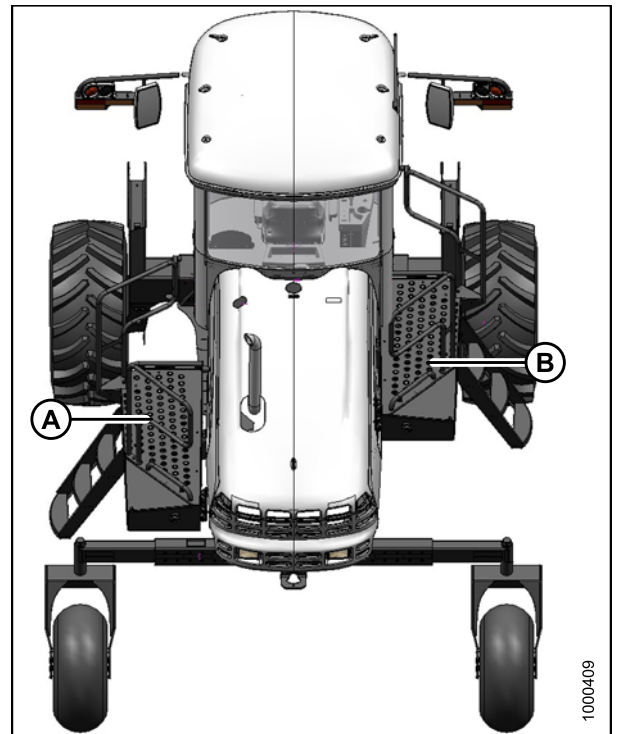


Figure 5.15: Platforms

2. Push latch (A) and pull platform (B) toward walking beam until it stops and latch engages in open position.

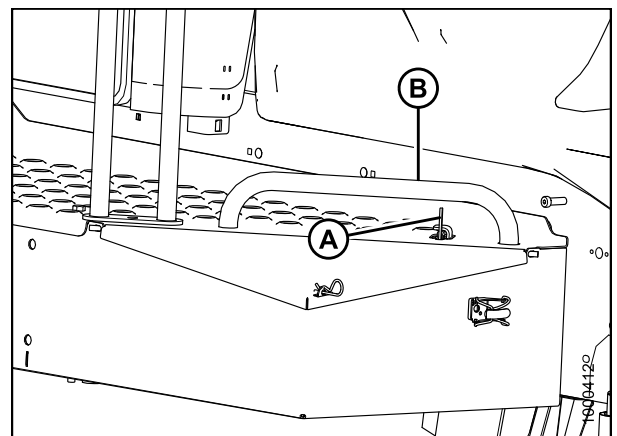


Figure 5.16: Platform Latch

MAINTENANCE AND SERVICING

5.5.2 Closing Platforms (Standard Position)

This procedure describes how to close the cab-forward left platform (A). The same procedure is used to close the right platform (B).

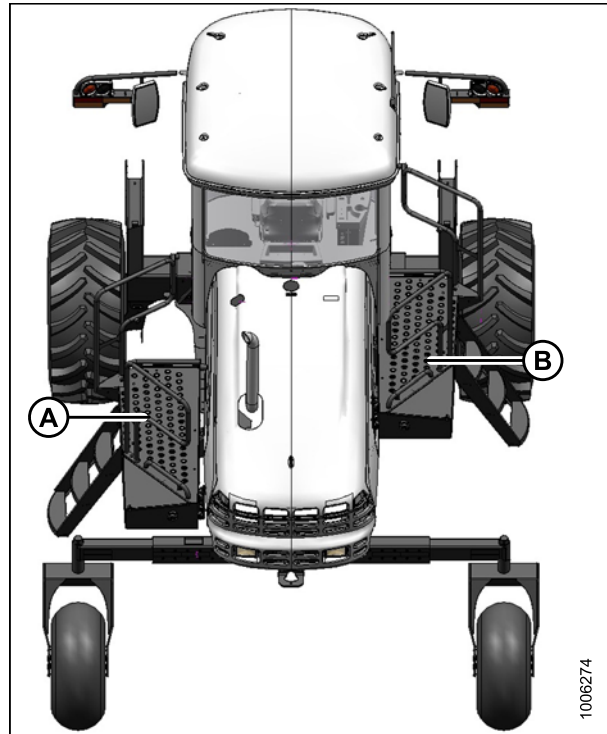


Figure 5.17: Platforms

1. If platform is latched in the open position, push latch (A) to unlock it.
2. Grasp handle (B) on platform and push forward until it stops and latch (A) engages.

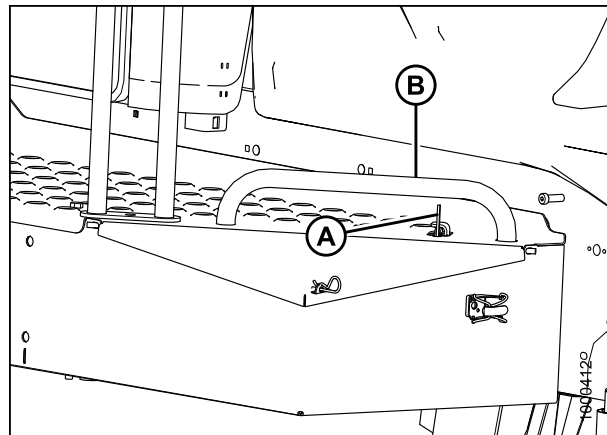


Figure 5.18: Platform Latch

5.5.3 Opening Platforms (Major Service Position)

To improve access to the hydraulics plumbing or battery, the platforms can be swung away from the windrower.

1. Open the hood. Refer to [5.4.1 Opening Hood \(Lower Position\)](#), page 266.

IMPORTANT:

Failure to open hood will result in damage to the hood when the platform is moved.

MAINTENANCE AND SERVICING

- 2. Approach the platform/stair unit (A) or (B) that you want to move.

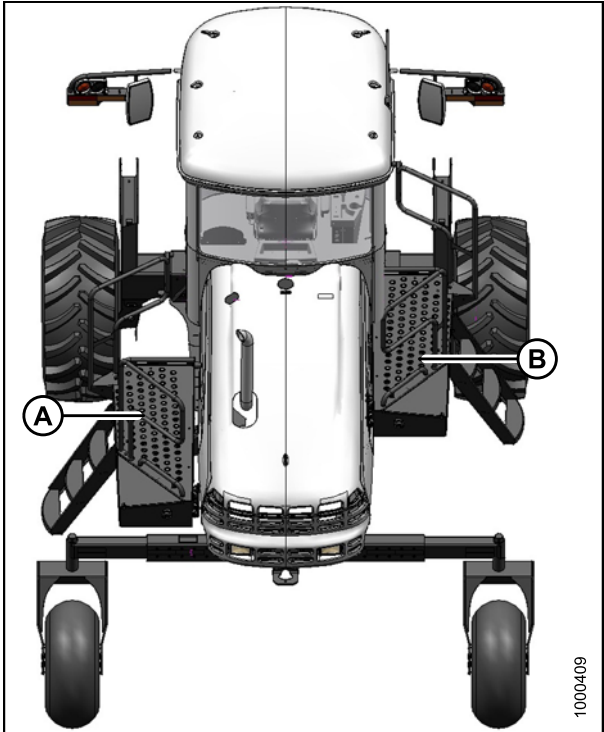


Figure 5.19: Platforms

- 3. Unlock latch (A) and move platform (B) toward open position. Do **NOT** lock in full aft position.

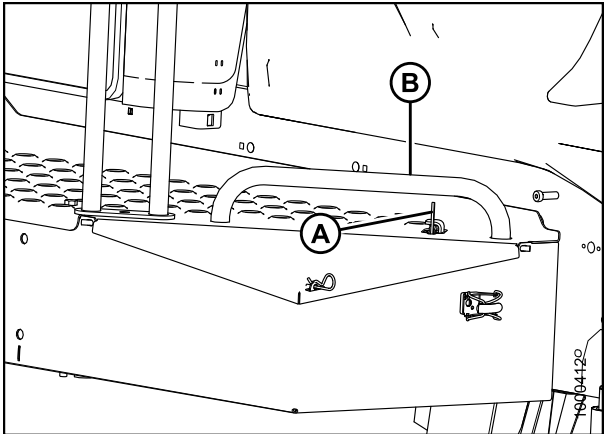


Figure 5.20: Platform Latch

MAINTENANCE AND SERVICING

4. Remove the nut and bolt that secures the link (A) to the frame. Swing link (A) out of the way.
5. Pull the front (cab-forward) end of platform away from frame while moving it towards the walking beam. Aft corner (B) of platform should project slightly into engine bay when optimum opening is reached.

CAUTION

Do NOT stand on the platform in the unlocked position. It is unstable and may result in a fall.

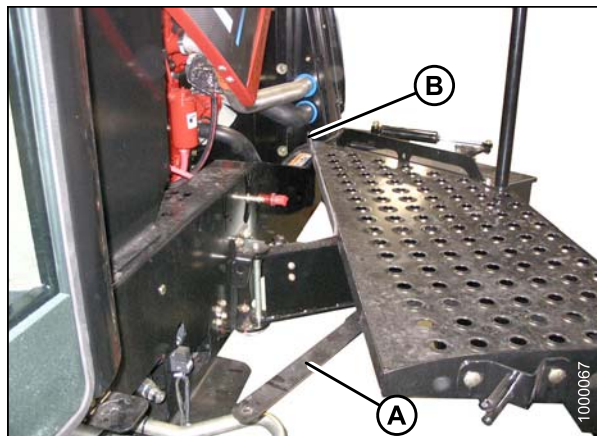


Figure 5.21: Platforms

5.5.4 Closing Platforms (Major Service Position)

CAUTION

Do NOT stand on the platform in the unlocked position. It is unstable and may result in a fall.

CAUTION

Do NOT stand on the platform in the unlocked position. It is unstable and may result in a fall.

1. Swing link (A) all the way forward.
2. Push the front (cab-forward) end of platform towards the frame while moving the platform forward (cab-forward).
3. Position link (A) on bracket and install bolt and nut. Tighten enough so that link can still swivel on bracket.
4. Move platform (B) forward (cab-forward) until it stops and latch (A) engages.
5. Close the hood. Refer to [5.4.2 Closing Hood \(Lower Position\)](#), page 267.

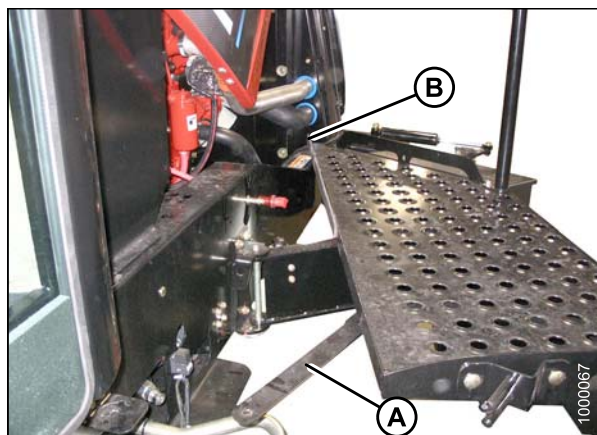


Figure 5.22: Platforms

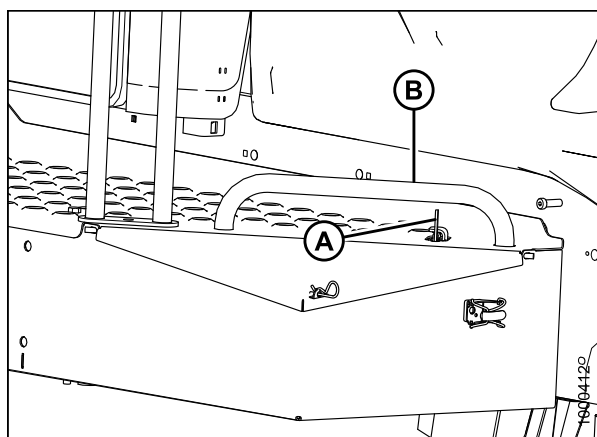


Figure 5.23: Platform Latch

5.6 Windrower Lubrication

WARNING

To avoid personal injury, before servicing windrower or opening drive covers, follow procedures in the SAFETY section.

The greasing points are marked on the machine by decals showing a grease gun and grease interval in hours of operation.

Log hours of operation and use the Maintenance Checklist provided to keep a record of scheduled maintenance. Refer to *Maintenance Schedule/Record, page 384*.

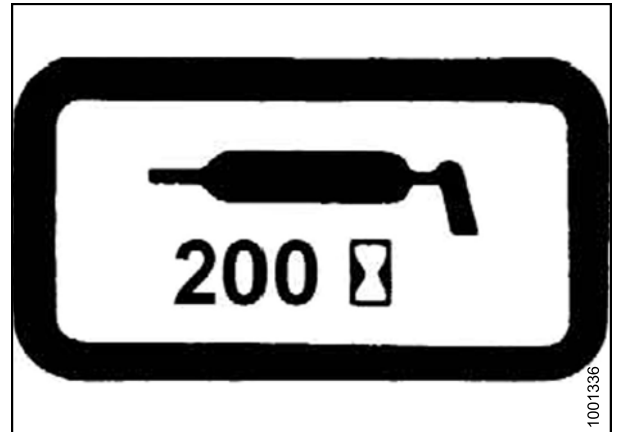


Figure 5.24: Lubrication Interval Decal

5.6.1 Lubricating the Windrower

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. To avoid injecting dirt and grit, wipe grease fitting with a clean cloth before greasing.
2. Inject grease through fitting with grease gun until grease overflows fitting, except where noted. Refer to *Lubricants, Fluids, and System Capacities, page 263*.
3. Leave excess grease on fitting to keep out dirt.
4. Replace any loose or broken fittings immediately.
5. If fitting will **NOT** take grease, remove and clean thoroughly. Also clean lubricant passageway. Replace fitting if necessary.

MAINTENANCE AND SERVICING

5.6.2 Lubrication Points

Refer to the following illustrations to identify various locations that require lubrication.

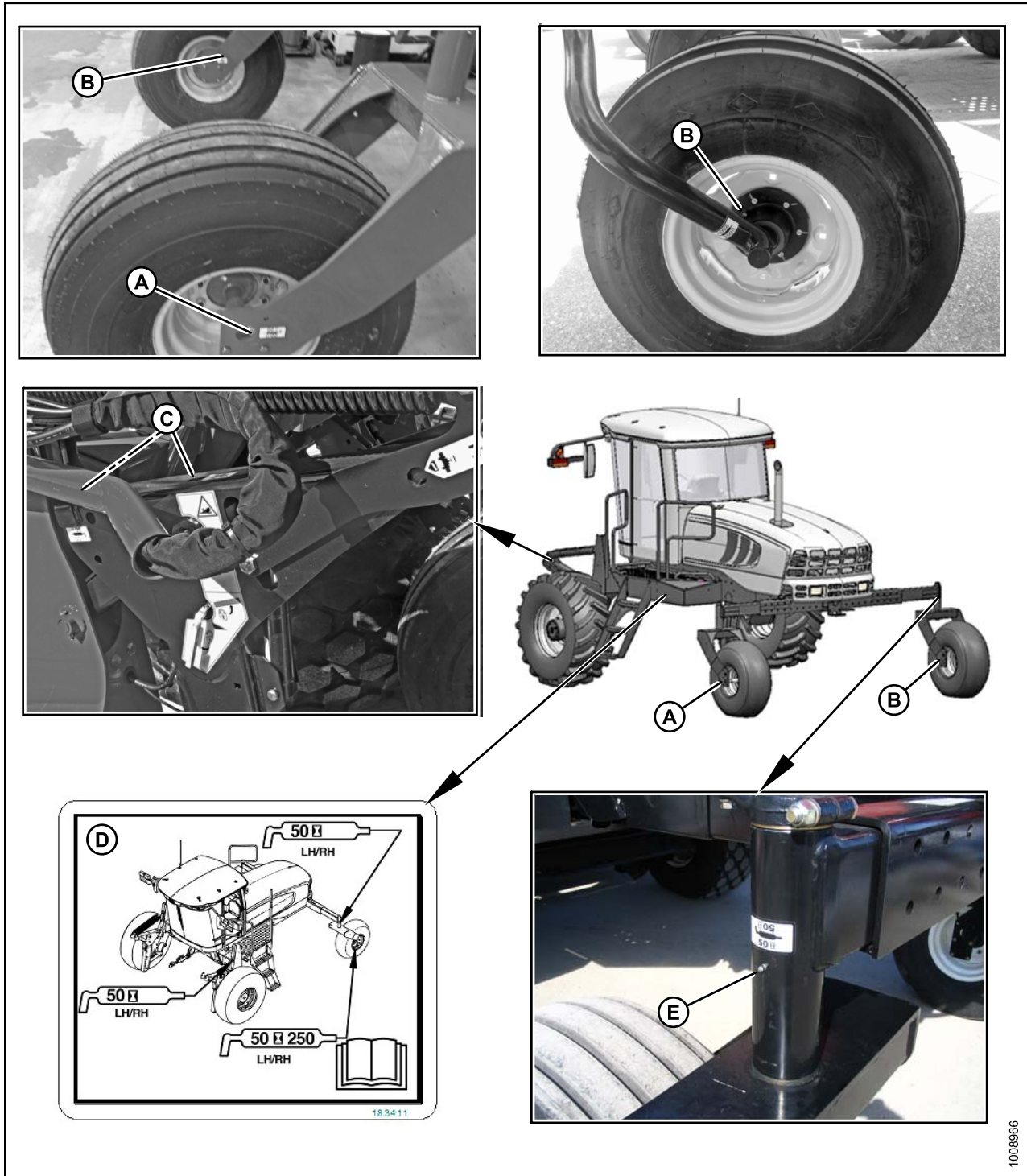


Figure 5.25: Lubrication Points

A - Forked Caster Wheel Bearing (2 Places) (Outer—Both Wheels)
C - Top Link (2 Places) (Both Sides)
D - Lubrication Decal (MD #183411)

B - Forked/Formed Caster Wheel Bearing (2 Places)
(Inner—Both Wheels) (50 Hrs/250 Hrs)
E - Caster Pivot (Both Sides)

5.7 Operator's Station

5.7.1 Seat Belts

- Keep sharp edges and items that can cause damage away from the belts.
- From time to time, check belts, buckles, retractors, tethers, slack take-up system and mounting bolts for damage.
- Replace all parts that have damage or wear.
- Replace belts that have cuts that can weaken the belt.
- Check that bolts are tight on the seat bracket or mounting.
- Keep seat belts clean and dry. Clean only with a soap solution and warm water. Do **NOT** use bleach or dye on the belts, as this may weaken the material.

5.7.2 Safety Systems

Perform the following checks on the operator's presence and engine lock-out systems annually or every 500 hours—whichever occurs first.

Checking Operator Presence System

1. While the windrower engine running, place the ground speed lever (GSL) in NEUTRAL and turn the steering wheel until it locks.
2. With everyone clear of the machine, engage header drive switch:
 - a. After header drives are running, stand up out of the seat. In approximately 5 seconds, the header should shut off.
 - b. If **NOT**, the Operator Presence System requires adjustment. See your MacDon Dealer.

NOTE: To restart the header, move the HEADER DRIVE switch to OFF position and back to the ON position again.

3. With the engine running, position the GSL in NEUTRAL and in N-DETENT:
 - a. Swivel the operator's station, but do **NOT** lock into position.
 - b. Move GSL out of N-DETENT. The engine should shut down and the lower display will flash "LOCK SEAT BASE → CENTER STEERING WHEEL → NOT IN NEUTRAL".
 - c. Swivel and lock the operator's station and the display should return to normal.
 - d. If the engine does **NOT** shut down, the seat position switches require adjustment. See your MacDon Dealer.
4. With the windrower moving at less than 5 mph (8 km/h):
 - a. Stand up out of the seat.
 - b. The cab display module (CDM) will flash "NO OPERATOR" on the upper line and "ENGINE SHUT DOWN 5...4...3...2...1...0" on the lower line accompanied by a steady tone. At "0", the engine shuts down.
 - c. If the engine does **NOT** shut down, the Operator Presence System requires adjustment. See your MacDon Dealer.
5. With the windrower moving at more than 5 mph (8 km/h):
 - a. Stand up out of the seat.
 - b. The CDM should beep once and display "NO OPERATOR" on the lower line.

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- c. If **NOT**, the Operator Presence System requires adjustment. See your MacDon Dealer.

Checking Engine Interlock

1. With the engine shut down and the header drive switch engaged, try to start the engine. If the engine turns over, the system requires adjustment. See your MacDon Dealer.
2. With the engine shut down, steering wheel **NOT** centered, and the ground speed lever (GSL) in NEUTRAL, but **NOT** in N-DETENT, try to start the engine. The cab display module (CDM) will flash “NOT IN NEUTRAL” on the display upper line and “CENTER STEERING WHEEL” on the lower line, accompanied by a short beep with each flash and the engine should **NOT** turn over. If the engine turns over, the system requires adjustment. See your MacDon Dealer.

A properly functioning system should operate as follows. If not, see your MacDon Dealer.

- The starter should engage **ONLY** when the GSL is in N-DETENT, steering wheel locked in the CENTER position and the header drive switch is in the OFF position.
- Under the above conditions, the brake should engage and the machine should **NOT** move after engine start-up.
- The steering wheel should **NOT** lock with the engine running and the GSL is out of the N-DETENT.
- The machine should **NOT** move with the engine running and with the steering wheel still centered, when the GSL is pulled straight out of N-DETENT (**NOT** in forward or reverse).

5.7.3 Ground Speed Lever (GSL) Adjustments

Adjusting Ground Speed Lever (GSL) Lateral Movement

The ground speed lever (GSL) should easily move into the N-DETENT by itself.

Adjust the lateral pivot resistance as follows:

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Remove the five screws (A) securing control panel (B) to console, remove panel, and store in the tray.

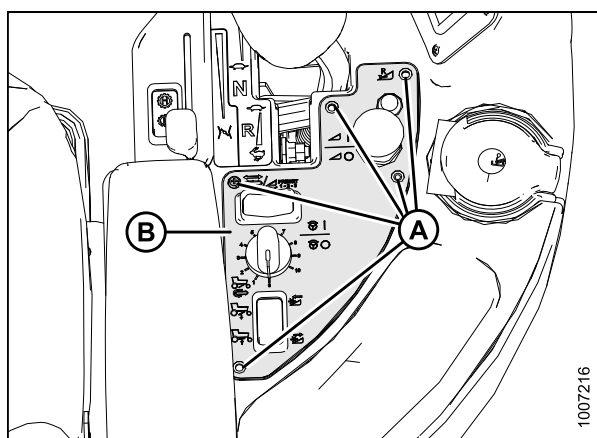


Figure 5.26: Header Control Panel

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2. Back off the jam nut (A) and turn nut (B) to either tighten or loosen the pivot. The nut should be tightened to snug and then backed off 1/2 turn.
3. Tighten jam nut (A).
4. Check movement of GSL.

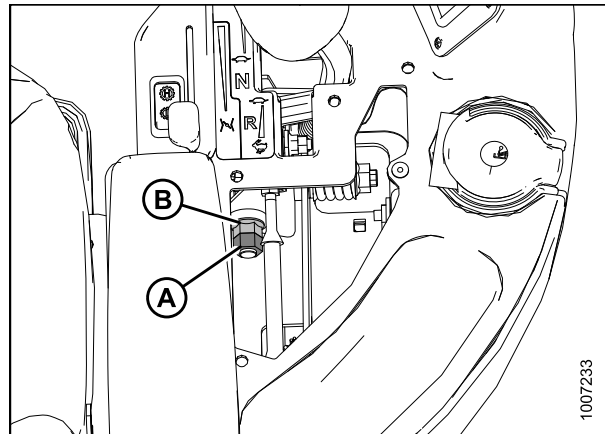


Figure 5.27: Header Control Panel

5. Reinstall the control panel (B) with the five screws (A).

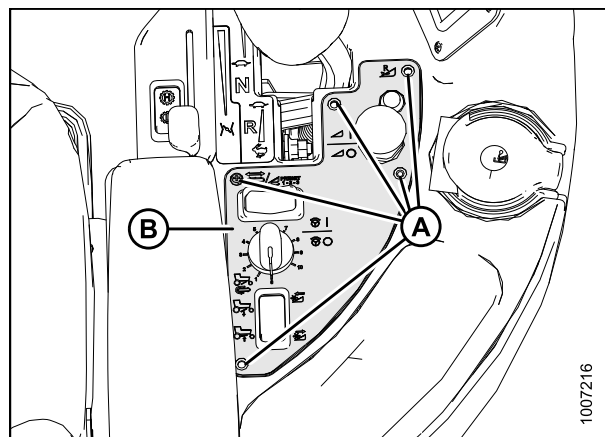


Figure 5.28: Header Control Panel

Adjusting Ground Speed Lever (GSL) Fore-Aft Movement

The GSL should remain as positioned by the Operator yet be movable without excessive force.

Adjust as follows:

1. Pull handle (A) toward the operator's seat and move the console fully forward to ease accessibility from the underside of the console.

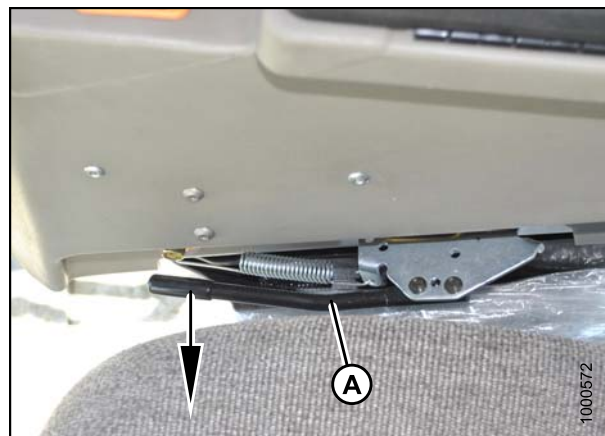


Figure 5.29: Seat Adjustment Handle

MAINTENANCE AND SERVICING

2. Set spring dimension (B) to 1-1/4 in. (32 mm).
3. To increase the pivot resistance, turn the nut (A) clockwise to compress the spring.
4. To decrease the resistance, turn the nut (A) counterclockwise to release the spring tension.

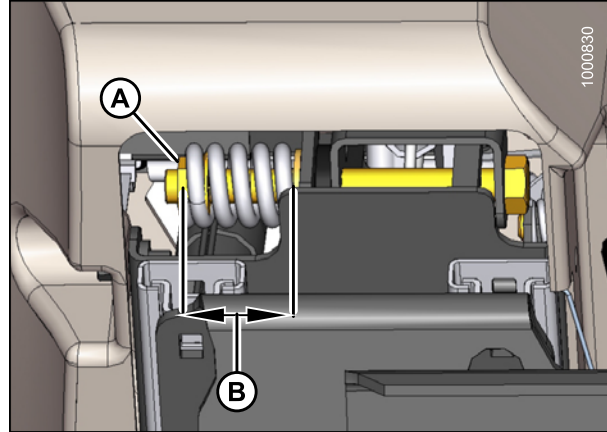


Figure 5.30: GSL Adjustment Spring

B - Spring Dimension 1-1/4 in. (32 mm)

5.7.4 Steering Adjustments

Checking Steering Link Pivots

The following checks should be performed annually:

⚠ DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Place ground speed lever (GSL) (A) in N-DETENT, shut down engine, and remove key.



Figure 5.31: Operator Console

MAINTENANCE AND SERVICING

- 2. Check steering rod bolts (A) for looseness and ball joints (B) for any perceptible play or movement.

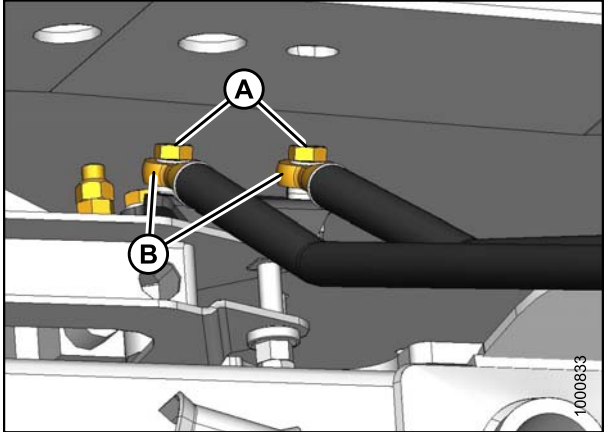


Figure 5.32: Steering Rods

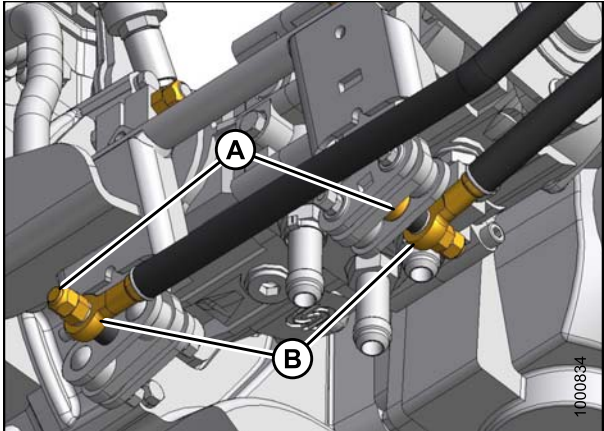


Figure 5.33: Steering Rods (Pump End)

- 3. Check steering link bolts (A) for looseness and ball joints (B) for any perceptible play or movement.

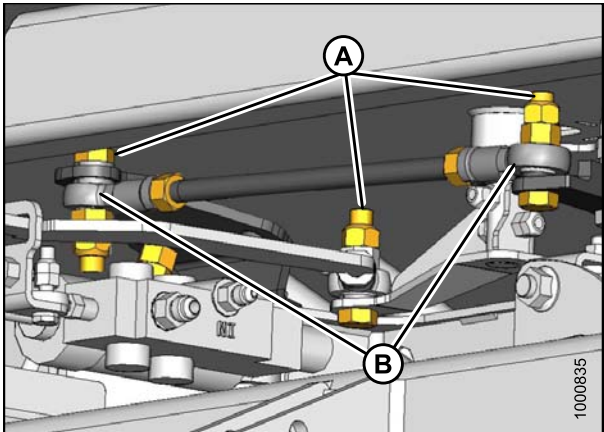


Figure 5.34: Steering Link

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4. If bolts are loose:
 - a. Back off jam nut (A).
 - b. Tighten inside nut (B) to 70–80 ft·lbf (95–108 N·m).
 - c. Hold inside nut (B) and tighten jam nut (A) to 60–70 ft·lbf (81–95 N·m).

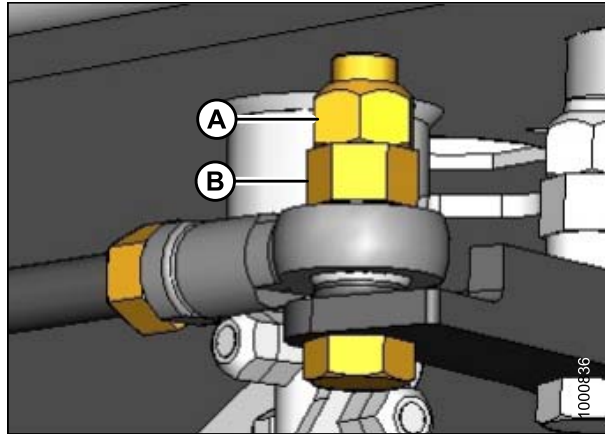


Figure 5.35: Steering Link

5. If steering link ball joints or steering rod ball joints are loose, they should be replaced. See your MacDon Dealer.

6. After replacing parts or making adjustments, perform checks for Neutral Interlock and steering lock. Refer to Section [5.7.2 Safety Systems, page 275](#).

Checking Steering Chain Tension

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Check steering for binding or excessive play which may be the result of the steering chain being too tight or too loose. If the steering chain does **NOT** require adjustment, skip the following steps.
2. If the chain tension requires adjustment, swivel the operator's station to position steering column close to the door.

MAINTENANCE AND SERVICING

3. At the base of the steering column, check dimension (C) at spring. It should be 5/8 in. (16 mm). Adjust dimension as follows:
 - a. Loosen nut (A) and turn nut (B) to achieve 5/8 in. (16 mm) dimension (C).
 - b. Tighten nut (A) against nut (B) to secure position.
 - c. Check that steering chain is taut and steering shaft is free to rotate.

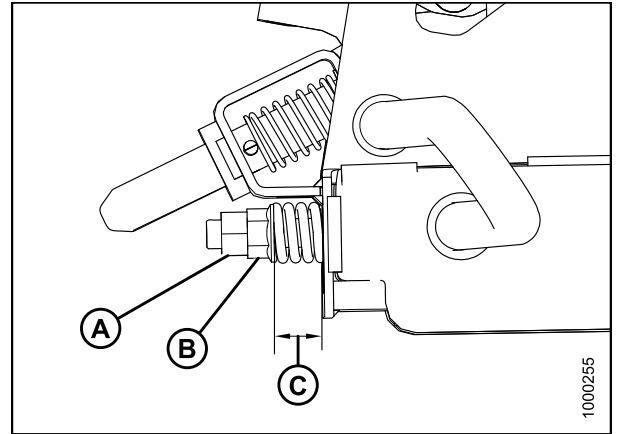


Figure 5.36: Steering Tension Adjuster

A - Nut

B - Nut

C - Dimension

5.7.5 Park Brake

The brake is applied when the interlock is fully engaged. To engage the interlock and the brake, the ground speed lever (GSL) must be in the N-DETENT position and the steering wheel centered.

Adjusting and Replacing Interlock Switch

The ground speed lever (GSL) switch is located inside the console, but can easily be removed for adjustment or replacement. Check that GSL contacts switch lever and pushes plunger.

⚠ DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

Adjust or replace switch as follows:

1. Place GSL (A) in N-DETENT, shut down engine, and remove key.



Figure 5.37: GSL

MAINTENANCE AND SERVICING

2. Remove the five screws (A) securing control panel (B) to console, remove panel, and store in the tray.

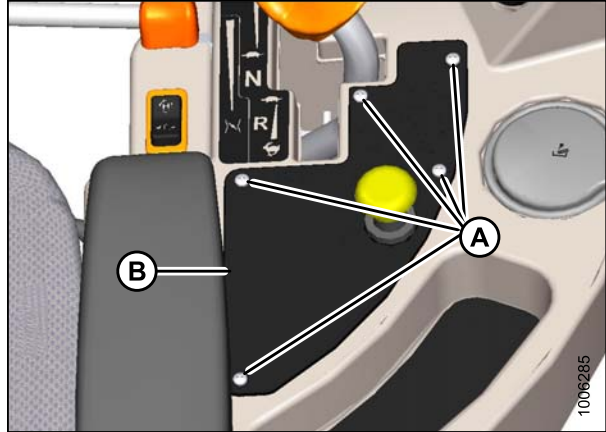


Figure 5.38: Header Control Panel

3. Remove three rubber nuts (A) securing switch support plate (B) to the console.

NOTE: For clarity, console in the image was made transparent to show the switch support plate (B).

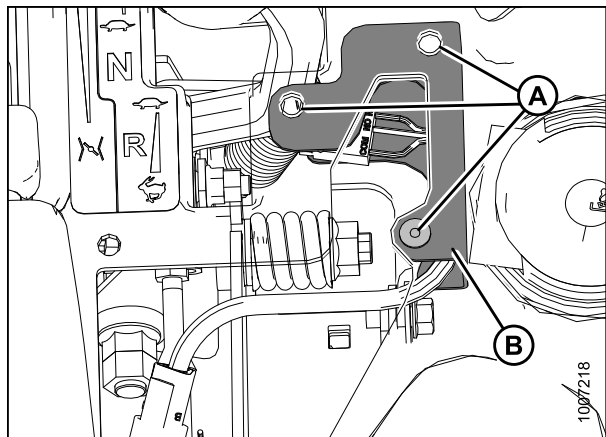


Figure 5.39: Console (Transparent)

4. Move the switch support plate (A) on top of the console (B).

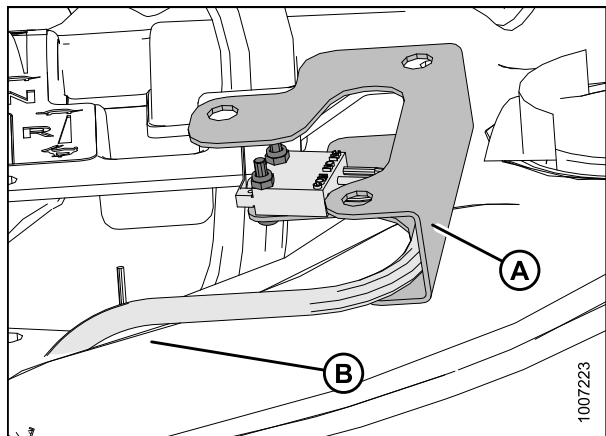


Figure 5.40: Switch Support Plate

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5. Adjust switch (A) as follows:
 - a. Loosen nuts (B) and rotate switch on support sufficiently so that GSL will contact switch lever (C) and push in the plunger (D).
 - b. Tighten nuts (B).

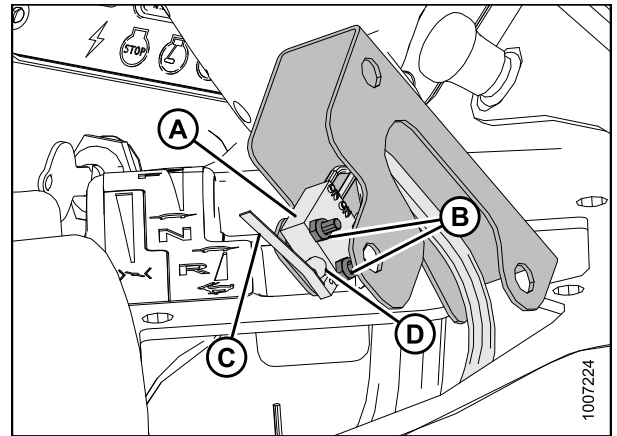


Figure 5.41: Switch Lever

6. If necessary, replace switch as follows
 - a. Disconnect wiring harness (A) at connector.
 - b. Remove nuts and screws (B) and remove switch (C).
 - c. Install new switch (C) on support and secure with nuts and screws (B).
 - d. Connect harness (A) to console wiring.

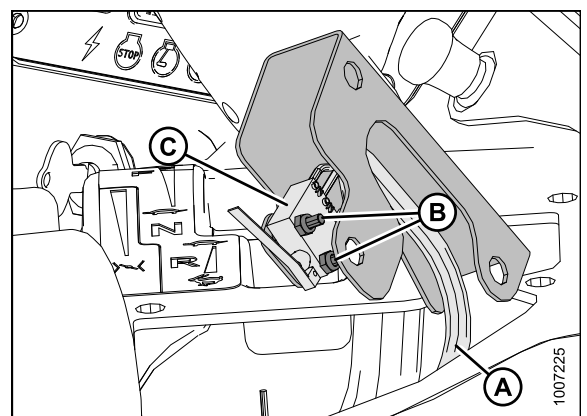


Figure 5.42: GSL Switch Lever

7. Position switch support plate (B) inside console and secure with rubber nuts (A).

NOTE: For clarity, console in the image was made transparent to show the switch support plate (B).

8. Check operation of switch.

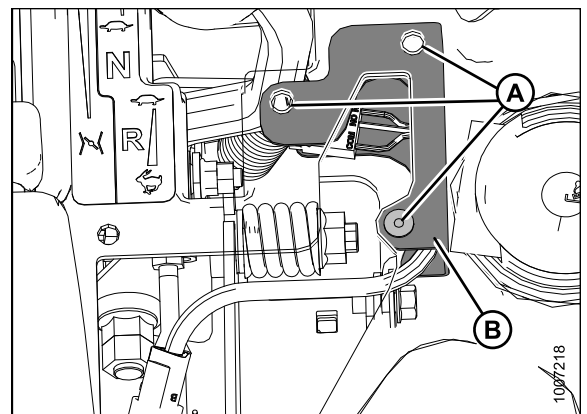


Figure 5.43: Console (Transparent)

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9. Reinstall control panel (B) with five screws (A).

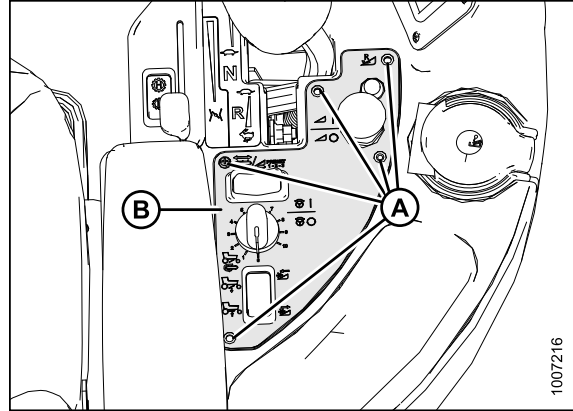


Figure 5.44: Header Control Panel

5.7.6 Heating, Ventilating, and Air Conditioning (HVAC) System

Fresh Air Intake Filter

The fresh air filter is located outside the right rear of the cab and should be serviced every 50 hours under normal conditions and more frequently in severe conditions.

Removing Fresh Air Filter

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Open the right-hand platform. Refer to [5.5.1 Opening Platforms \(Standard Position\)](#), page 269.
2. Rotate latch (A) and slide filter tray (B) out of the housing.

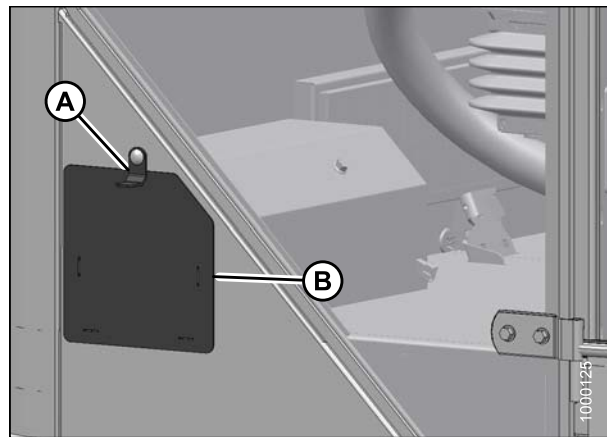


Figure 5.45: Filter Tray

MAINTENANCE AND SERVICING

3. Remove filter (A) from tray (B).

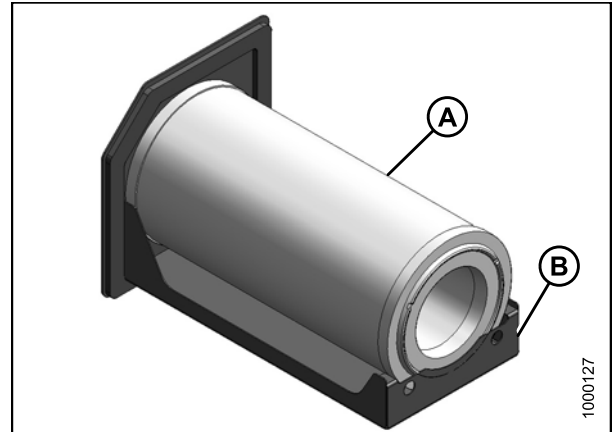


Figure 5.46: Fresh Air Filter

Inspecting And Cleaning Fresh Air Filter Element

1. Pat sides of element gently to loosen dirt. Do **NOT** tap element against a hard surface.
2. Using a Dry Element Cleaner Gun, clean element with compressed air.
3. Hold nozzle next to inner surface and move up and down pleats.
4. Repeat previous steps to remove additional dirt as required.
5. Hold a bright light inside element and check carefully for holes. Discard any element that shows the slightest hole.
6. Check outer screen for dents. Vibration would quickly wear a hole in the filter.
7. Check filter gasket for cracks, tears, or other signs of damage. If gasket is damaged or missing, replace element.

IMPORTANT:

Air pressure must **NOT** exceed 60 psi (414 kPa). Do **NOT** direct air against outside of element, as dirt might be forced through to inside.

Installing Fresh Air Filter

1. Clean tray (B) and interior of filter housing.
2. Place filter (A) onto tray (B).

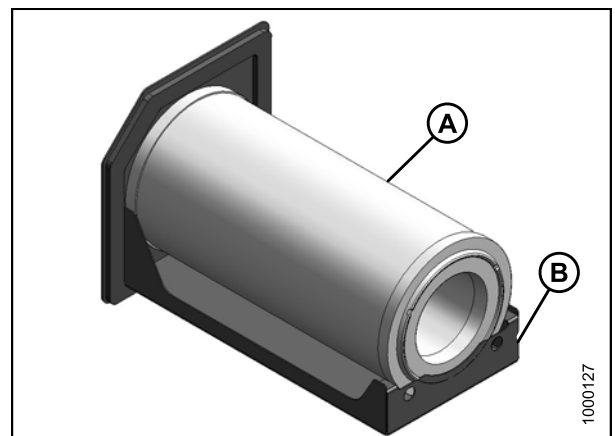


Figure 5.47: Fresh Air Filter

MAINTENANCE AND SERVICING

3. Slide filter tray (B) into housing.
4. Close and latch housing door (A).

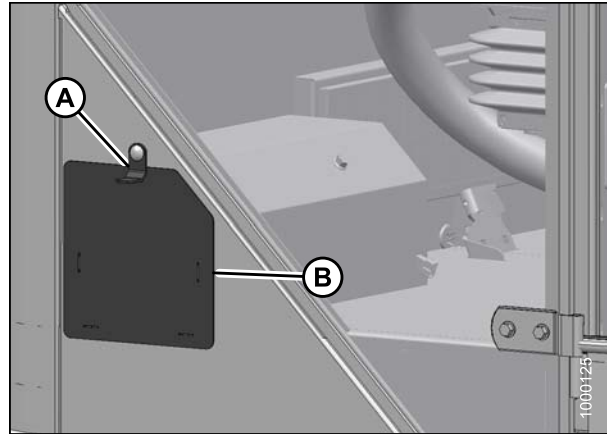


Figure 5.48: Filter Tray

Return Air Cleaner/Filter

The return air cleaner/filter is located behind the operator's seat on the cab wall and should be serviced every 100 hours.

Removing and Installing Return Air Filter/Cleaner

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Unscrew the two knobs (A) attaching cover and filter to cab wall, and remove the cover and filter assembly (B).

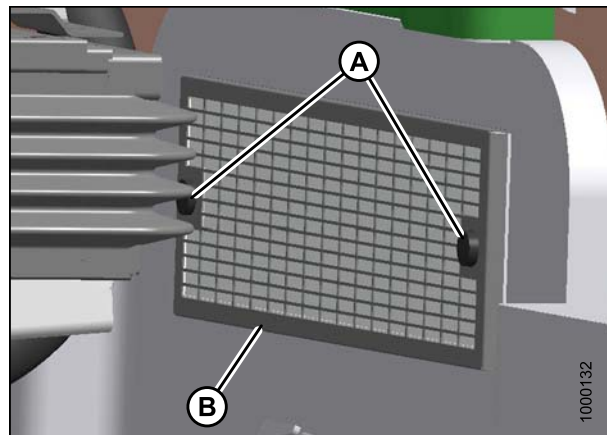


Figure 5.49: Return Air Filter

MAINTENANCE AND SERVICING

2. Separate the filter (B) from the cover (A).
3. Clean or replace filter. If cleaning filter, see [Cleaning Return Air Cleaner, page 287](#).
4. Assemble the cleaner (B) and cover (A), and position on cab wall over opening.

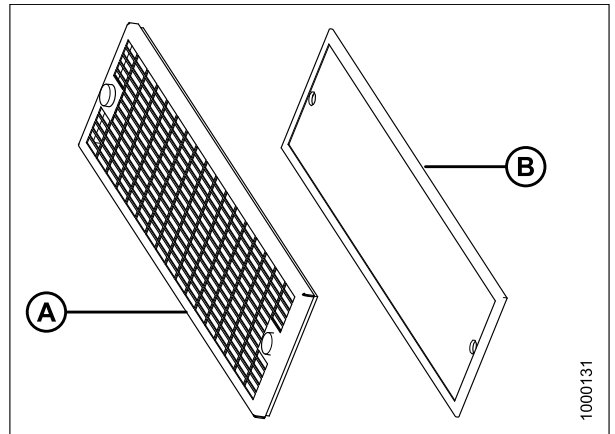


Figure 5.50: Return Air Filter

5. Secure filter assembly (B) to cab wall with knobs (A).

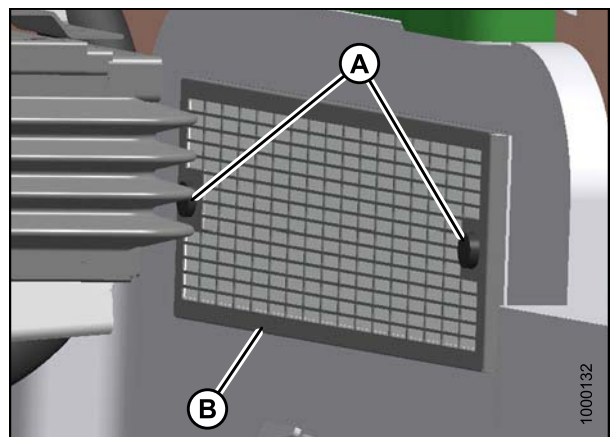


Figure 5.51: Return Air Filter

Cleaning Return Air Cleaner

Clean the electrostatic filter as follows:

1. Mix a solution of warm water and detergent in a suitable container so that the filter (B) can soak for a few minutes.
2. Agitate to flush out the dirt.
3. Rinse with clean water, and then dry with compressed air.
4. Inspect filter for damage, separation, and holes. Replace if damaged.

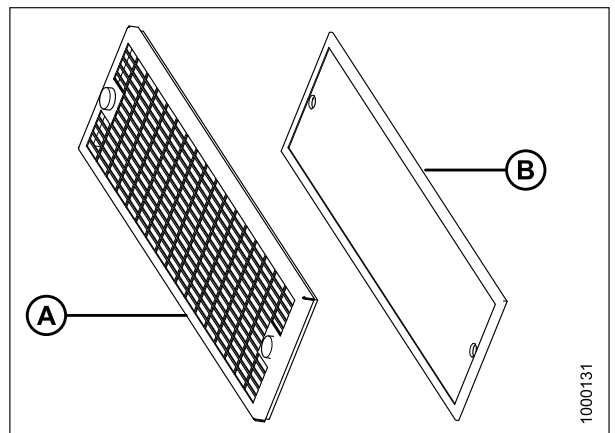


Figure 5.52: Return Air Filter

MAINTENANCE AND SERVICING

Air Conditioning Condenser

The air conditioning condenser should be cleaned 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. Refer to [Maintaining Engine Cooling Box, page 315](#).

Air Conditioning Evaporator

The air conditioning evaporator should be checked annually for cleanliness. If the air conditioning system produces insufficient cooling, a possible cause is clogged evaporator fins. Fins will clog up from the side opposite the blowers. The evaporator is located inside the heating air conditioning unit under the cab. It is accessed by removing the cover from the unit.

Removing Air Conditioning Cover

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Loosen the clamps (A) on the two drain hoses and pull the hoses off the air conditioning drain tubes.

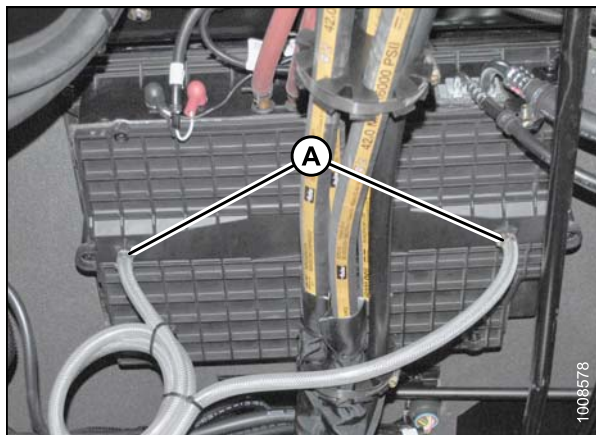


Figure 5.53: Red Dot HVAC System

2. Remove the eight screws (A) that attach the cover (B) and remove the cover.

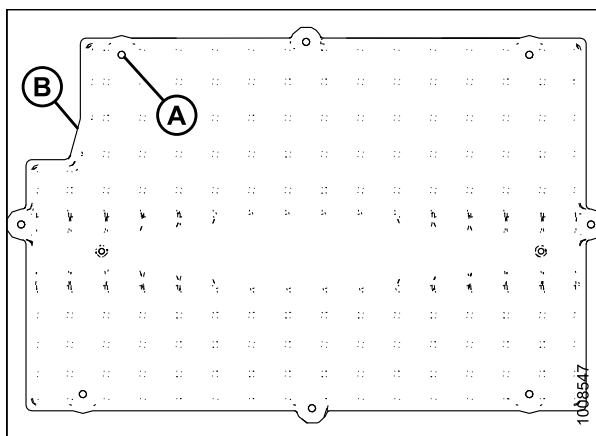


Figure 5.54: Red Dot HVAC System

MAINTENANCE AND SERVICING

Cleaning Air Conditioning Evaporator Core

WARNING

To avoid cuts from evaporator fins, do NOT use bare hands to brush away clogs.

1. Use a vacuum or compressed air to remove dirt from inside the unit.
2. Blow compressed air through the evaporator fins from the blower side (A) first as shown. Direct the air straight into the evaporator to prevent fin damage. A nozzle extension would make this procedure easier.
3. Repeat the previous step from the side opposite the blowers (B).
4. If dirt is still present, soak evaporator in water to loosen dirt and then blow out with compressed air.

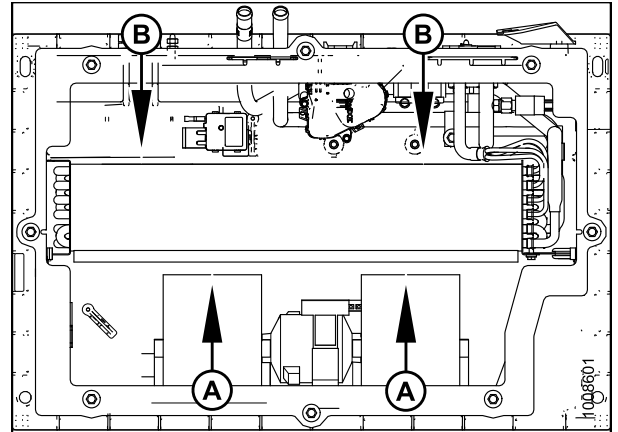


Figure 5.55: Red Dot HVAC System

Installing Air Conditioning Cover

1. Straighten any bent fins.
2. Position cover (B) and attach with eight screws (A).

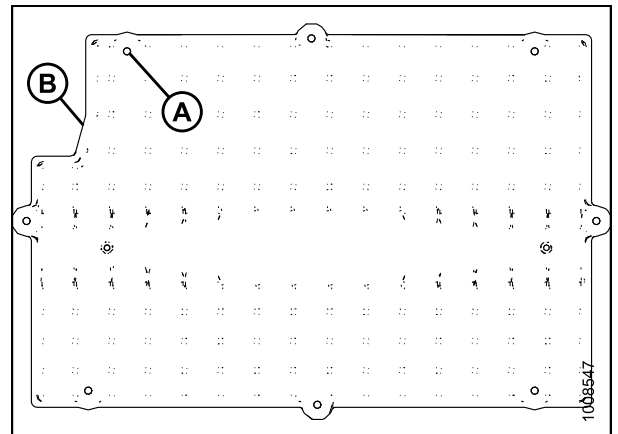


Figure 5.56: Red Dot HVAC System

MAINTENANCE AND SERVICING

3. Reattach drain hoses to drain tubes and secure with hose clamps (A).

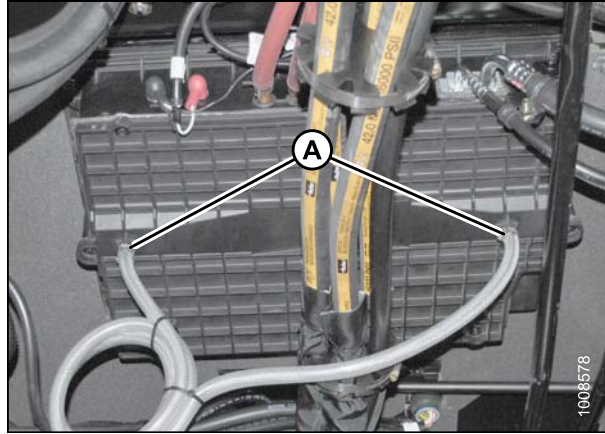


Figure 5.57: Red Dot HVAC System

Air Conditioning Compressor

The 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 any regular servicing or maintenance, so if problems occur and the switches are suspect, contact your MacDon Dealer.

- The low pressure switch is normally closed with an A/C charge in the system. It is located at the outlet of the evaporator (under cab in A/C box). It will open when the pressure falls to 2–8 psi (14–55 kPa) and close when pressure rises above 15–25 psi (103–172 kPa).
- The high pressure switch is normally closed with an A/C charge in the system and is located on the receiver drier (right-hand frame rail, behind back of fuse panel). It opens if pressure exceeds 360–380 psi (2482–2620 kPa) on rising pressure. It will close when pressure falls below 220–280 psi (1517–1931 kPa) on falling pressure.

If the compressor cycles rapidly due to rapid pressure changes, the cab display module (CDM) displays a warning “CHECK A/C SYSTEM”. Contact your Dealer.

MAINTENANCE AND SERVICING

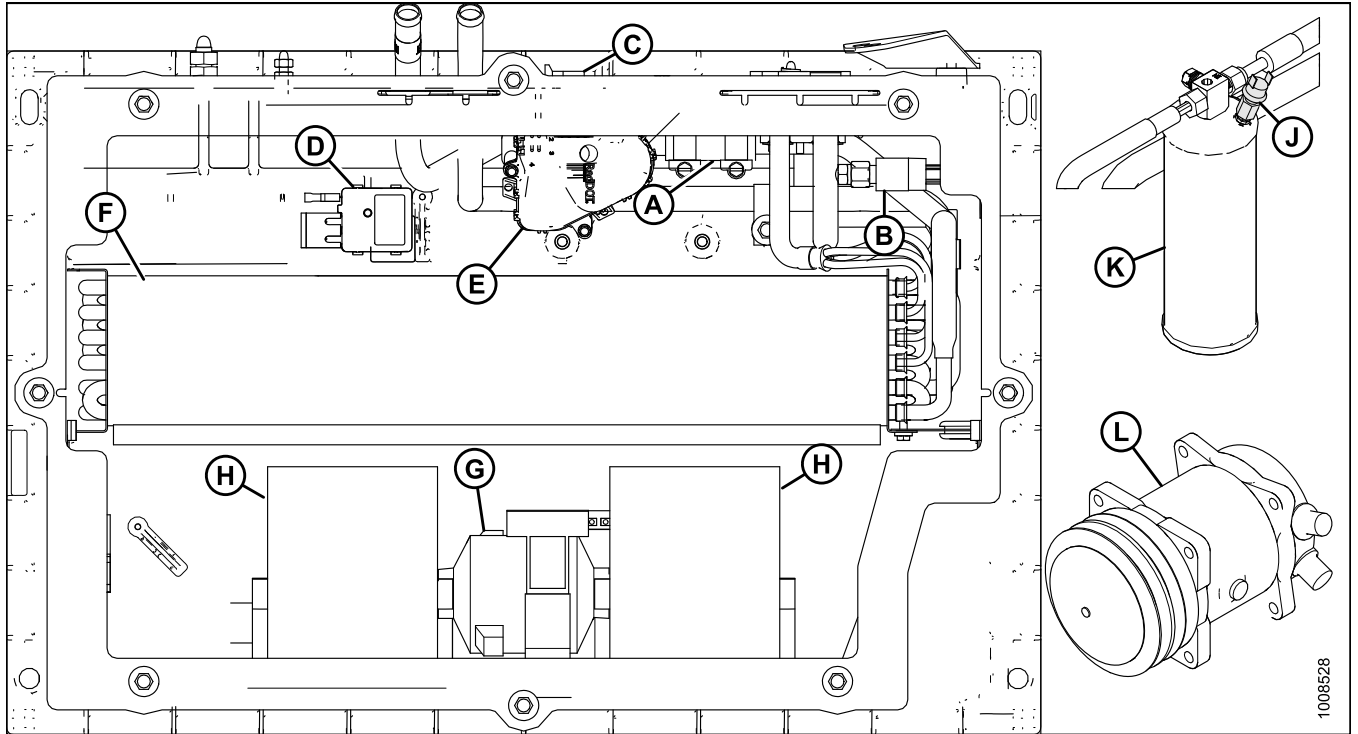


Figure 5.58: Red Dot HVAC System MD #202957

A - Expansion Valve	B - Low Pressure Switch	C - Electrical Connector	D - Thermostat
E - Heater Valve	F - Evaporator Core	G - Blower Motor	H - Blower Fans
J - High Pressure Switch	K - Receiver Dryer	L - Compressor	

Servicing the Air Conditioning Compressor

Refer to [Replacing A/C Compressor Belt, page 325](#) for belt replacement procedure.

See your MacDon Dealer for all other servicing procedures.

5.7.7 Engine

CAUTION

- NEVER operate engine in a closed building. Proper ventilation is required to avoid exhaust gas hazards.
- Keep the engine clean. Straw and chaff on a hot engine are a fire hazard.
- NEVER use gasoline, naphtha, or any other volatile material for cleaning purposes. These materials are toxic and/or flammable.

General Engine Inspection

Engine inspection should be performed by your MacDon Dealer.

Refer to your engine manual for further information. (Owner's Manual QSB 4.5 and QSB 6.7 Engine Cummins #4021531 are supplied with your machine).

MAINTENANCE AND SERVICING

Turning Engine Manually

To manually turn the engine with the flywheel, an access hole is provided on the left cab-forward side for a barring tool that is available from Cummins.

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

IMPORTANT:

Ensure nothing falls into gearbox oil reservoir.

1. Stop engine and remove ignition key.
2. Open the hood to the lowest position. Refer to [5.4.1 Opening Hood \(Lower Position\)](#), page 266.
3. Open left cab-forward side platform. Refer to [5.5.1 Opening Platforms \(Standard Position\)](#), page 269.
4. Remove positive (red) cables (A and C) from battery posts first, then remove negative (black) cables (B and D) from both battery posts.

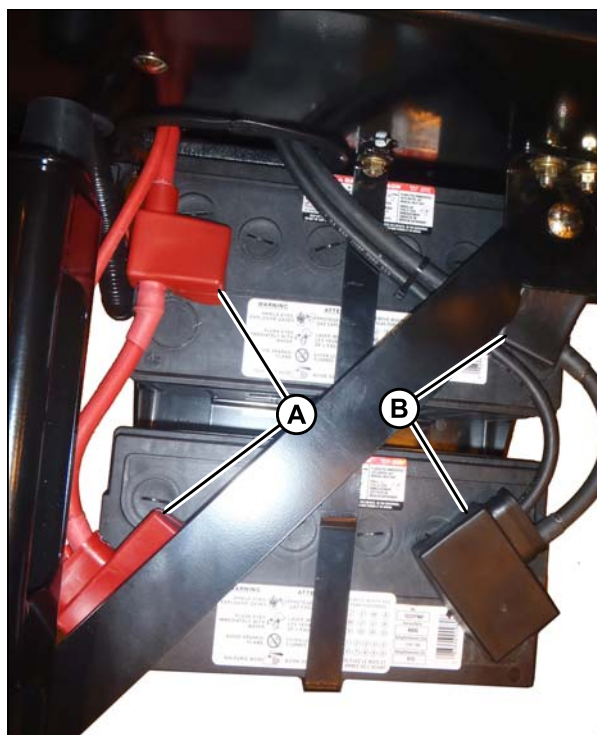


Figure 5.59: Battery Terminal Location

5. Clean area around the plastic cap on access hole (A). Remove the cap.
6. Insert the 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, and turn.
8. Remove barring tool (B) and clean oil from around access hole.
9. Clean plastic cap and reinstall in hole (A) with silicone sealant.

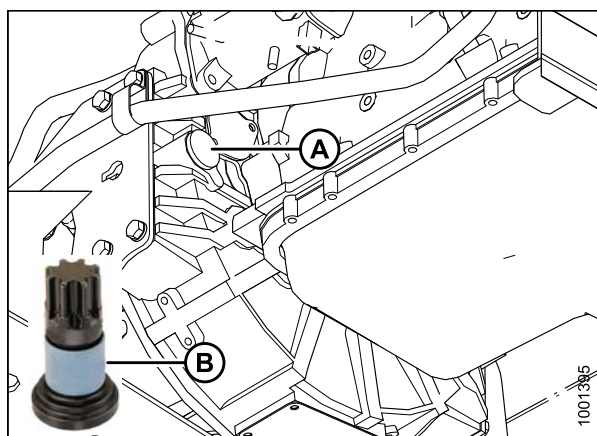


Figure 5.60: Access Hole Location for Barring Tool

A - Access Hole

B - Cummins Barring Tool

MAINTENANCE AND SERVICING

IMPORTANT:

BATTERY IS NEGATIVE GROUNDED. Always connect starter cable to the positive (+) terminal of battery and battery ground cable to negative (-) terminal of battery. Reversed polarity in battery or alternator may result in permanent damage to electrical system.

10. Attach negative (black) cables (B) to negative posts on batteries, and tighten clamps. Then attach positive (red) cables (A) to positive post on batteries and tighten clamps.
11. Position plastic covers onto clamps.
12. Close the hood. Refer to [5.4.2 Closing Hood \(Lower Position\)](#), page 267.
13. Close platform. Refer to [5.5.2 Closing Platforms \(Standard Position\)](#), page 270.

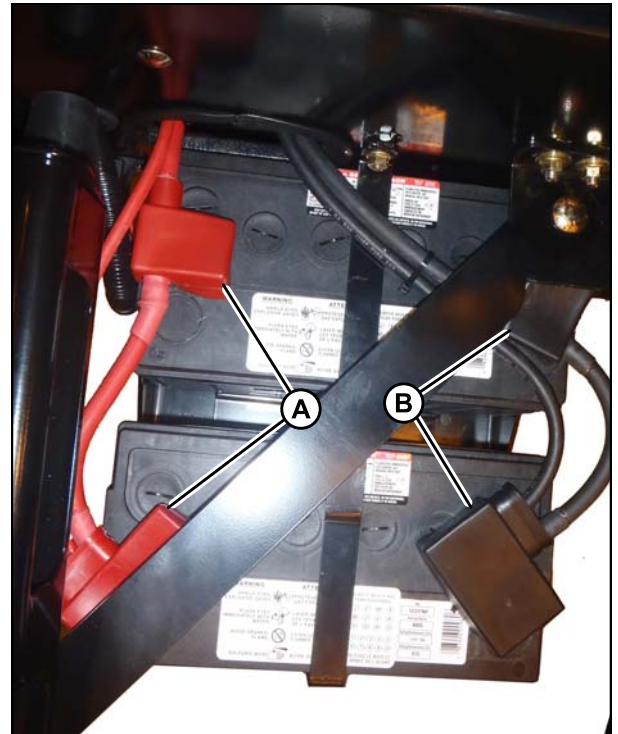


Figure 5.61: Battery Terminal Location

Engine Oil

Checking Engine Oil Level

Check engine oil level frequently and watch for any signs of leakage.

To check the engine oil level, follow these steps:

NOTE: During the break-in period, a higher than usual oil consumption should be considered normal.

1. Open the hood to the lowest position. Refer to [5.4.1 Opening Hood \(Lower Position\)](#), page 266.
2. Operate the engine at low idle, and check for leaks at the filter and drain plug.
3. Stop the engine and remove the key. Wait about 5 minutes.

MAINTENANCE AND SERVICING

- Remove dipstick (B) by turning it counterclockwise to unlock.
- Wipe clean, reinsert in engine, and then remove.

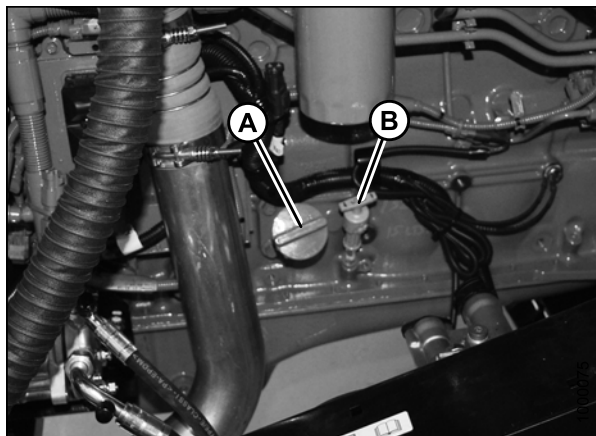


Figure 5.62: Engine Oil Level

- Oil level should be between LOW and HIGH. If level is below LOW mark, 2 US quarts (1.9 liters) will raise the level from LOW to HIGH.

NOTE: If you need to add oil, refer to [Adding Engine Oil, page 295](#).

- Replace dipstick and turn it clockwise to lock.
- Close the hood. Refer to [5.4.4 Closing Hood \(Highest Position\), page 268](#).

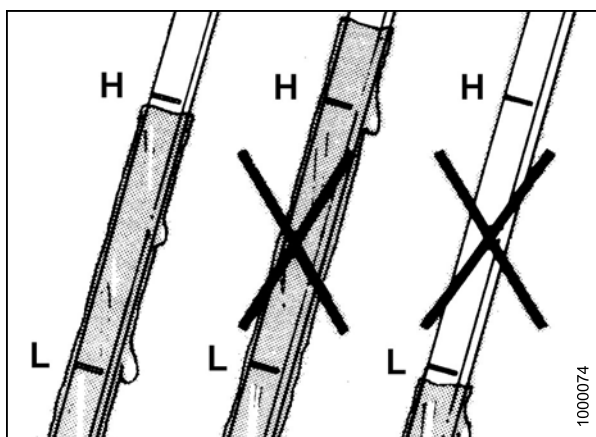


Figure 5.63: Engine Oil Level

Changing Engine Oil

Refer to the following procedures:

- [Checking Engine Oil Level, page 293](#)
- [Draining Engine Oil, page 294](#)
- [Replacing Engine Oil Filter, page 295](#)
- [Adding Engine Oil, page 295](#)

Draining Engine Oil

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

NOTE: The engine should be warm prior to changing the oil.

- Stop the engine and remove the key.
- Place a drain pan with a capacity of about 6 US gallons (24 liters) under the engine oil drain.

MAINTENANCE AND SERVICING

3. Remove oil drain plug (A) and allow the oil to completely finish draining.
4. Replace 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 used oil.

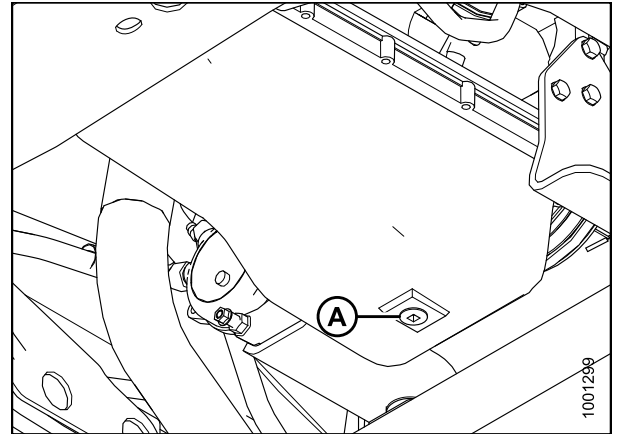


Figure 5.64: Engine Oil Drain Plug

Replacing Engine Oil Filter

NOTE: Replace oil filter each time engine oil is changed.

1. Open the hood. Refer to [5.4.1 Opening Hood \(Lower Position\)](#), page 266.
2. Clean around the filter head (A).
3. Remove filter.
4. Clean gasket mating surface.
5. Apply a thin film of clean oil to the gasket on the new filter. Refer to [Filter Part Numbers](#), page 264 for recommended oil filter to use.
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 used oil filter.

Adding Engine Oil

1. Stop the engine and remove the key. Wait about 5 minutes.
2. Open the hood. Refer to [5.4.1 Opening Hood \(Lower Position\)](#), page 266.

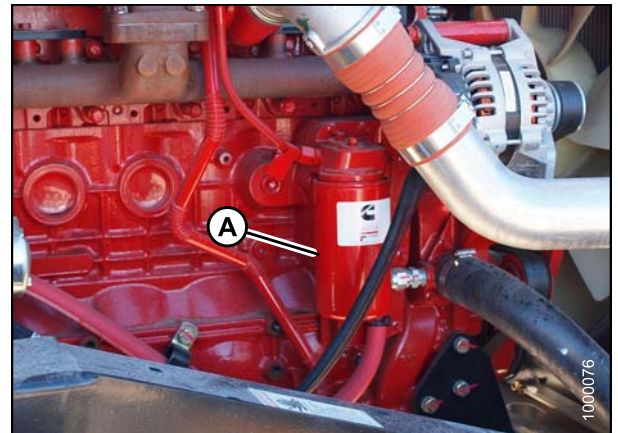


Figure 5.65: Engine Oil Filter

MAINTENANCE AND SERVICING

3. Remove filler cap (A) by turning it counterclockwise.
4. Carefully pour the oil. A funnel is recommended to avoid spillage. Refer to [Lubricants, Fluids, and System Capacities, page 263](#) for oil specifications.

CAUTION

Do **NOT** fill above the **HIGH** mark.

5. Replace oil filler cap (A) and turn it clockwise until snug.
6. Check the oil level. Refer to [Checking Engine Oil Level, page 293](#).
7. Close the hood. Refer to [5.4.2 Closing Hood \(Lower Position\), page 267](#).

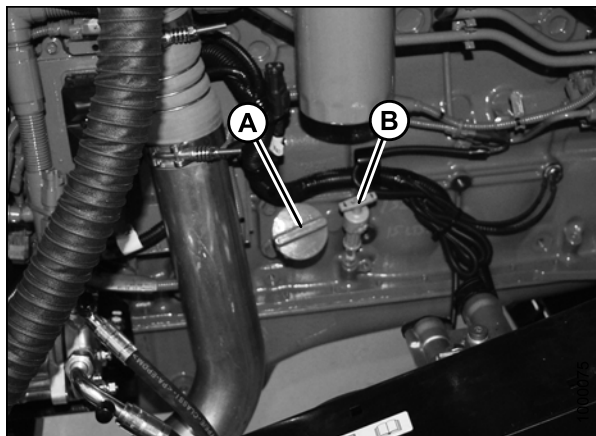


Figure 5.66: Oil Filler Cap

Air Intake System

IMPORTANT:

Do **NOT** run engine with air cleaner disconnected or disassembled.

Engine intake air is drawn through a duct (A) from the cooling box that precleans the air and then through a dual element filter (B).

The air cleaner canister is equipped with an aspirator (C) that removes dust continuously from the air cleaner housing.

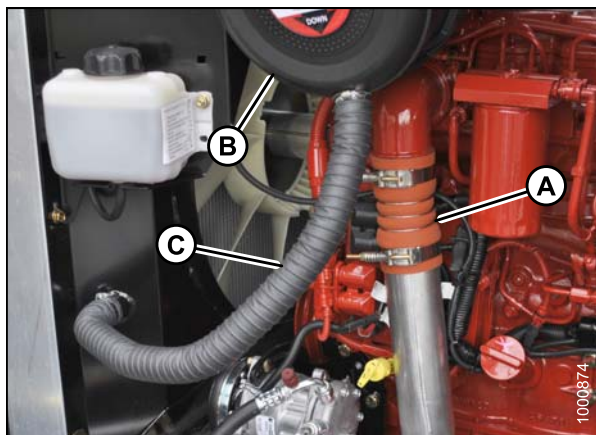


Figure 5.67: Air Intake System

MAINTENANCE AND SERVICING

The air cleaner is also equipped with a restriction switch (A) that activates a warning display and tone on the cab display module (CDM) when the filter system requires servicing.

After servicing the filter, the restriction switch must be reset by pushing the button at the end of the switch. Refer to [Air Filter Restriction Indicator, page 297](#)

IMPORTANT:

- Do **NOT** run engine with air cleaner disconnected or disassembled.
- Over-servicing the filter element increases the risk of dirt being ingested by the engine and severely damaging the engine.
- Filter servicing should only be performed when the CDM indicates “ENGINE AIR FILTER” or at the specified interval. Refer to [Maintenance Schedule/Record, page 384](#).

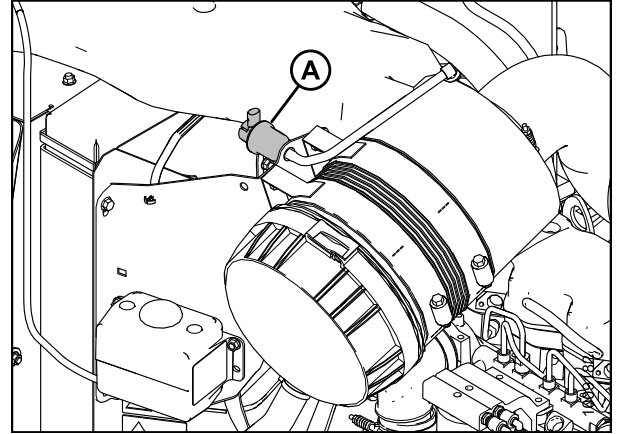


Figure 5.68: Air Restriction Indicator

Air Filter Restriction Indicator

During engine operation, the indicator shows the vacuum in inches of H₂O and kPa. As the filter accumulates dirt, the restriction increases.

When the indicator gauge reaches the CHANGE FILTER mark (A), 25 inches of H₂O [6.20 kPa], a warning tone will sound and the cab display module (CDM) will indicate the filter requires servicing.

IMPORTANT:

Over-servicing the filter element increases the risk of dirt being ingested by the engine, causing severe damage.

Service air filter **ONLY IF** indicator reaches the CHANGE FILTER mark (A) or 2.5 inches H₂O [6.20 kPa].

IMPORTANT:

After servicing filters, press the RESET button on the end of the indicator (B).

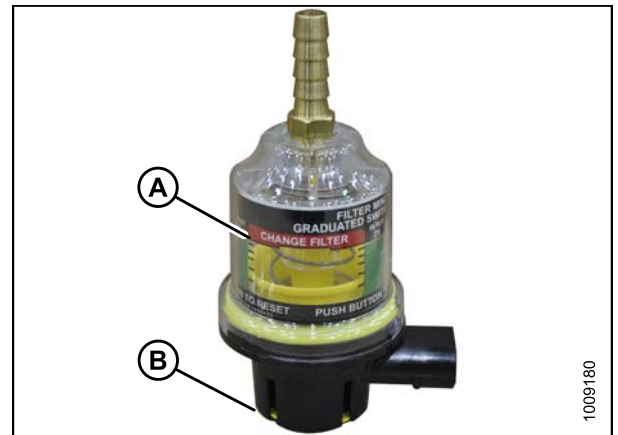


Figure 5.69: Air Filter Restriction Indicator

MAINTENANCE AND SERVICING

Removing Primary Air Filter

1. Open the hood. Refer to [5.4.1 Opening Hood \(Lower Position\)](#), page 266.
2. Open the maintenance platform on right cab-forward side. Refer to [5.5.1 Opening Platforms \(Standard Position\)](#), page 269.
3. Slightly lift catch (A) at side of end cap (B) and rotate end cap counterclockwise until it stops.

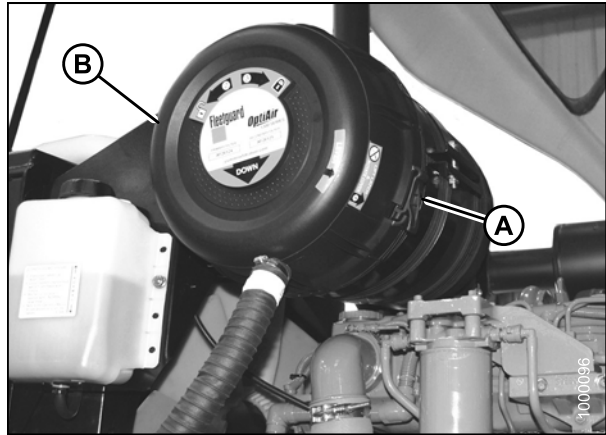


Figure 5.70: Engine Air Cleaner

4. Make sure arrow (A) lines up with UNLOCK symbol on end cap.
5. Pull off the end cap.

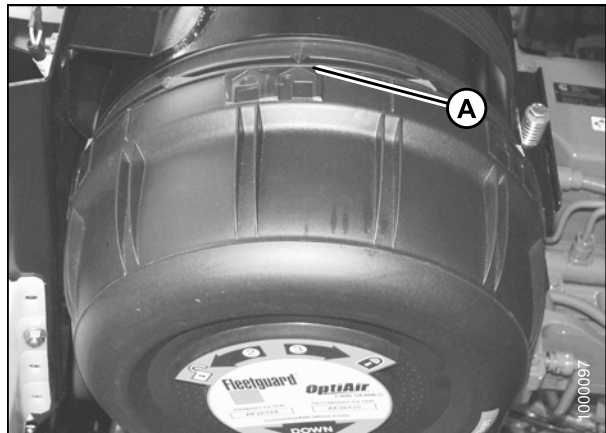


Figure 5.71: Engine Air Cleaner

6. Check the aspirator duct opening (A) for obstructions or damage. Clean if necessary.

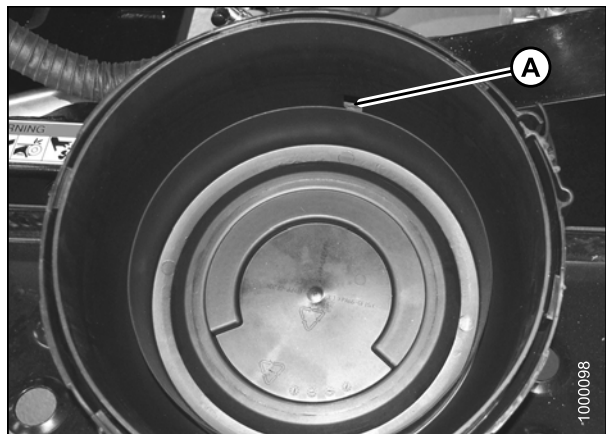


Figure 5.72: Engine Air Cleaner

MAINTENANCE AND SERVICING

7. Pull out the primary filter element (A).

IMPORTANT:

Be extremely careful with the dirty element, until you get it completely out of the housing. Accidentally bumping it while still inside means dropped dirt and dust may contaminate the clean side of your filter housing, before the new filter element has a chance to do its job.

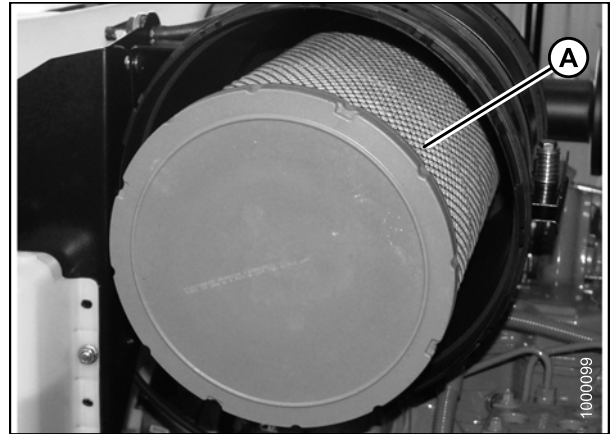


Figure 5.73: Engine Air Cleaner

IMPORTANT:

- Do **NOT** remove the secondary (inner) filter element (A) unless it needs replacing. It must **NEVER** be cleaned.
- Replace secondary filter element annually or after every third primary filter change, even if it looks clean.
- If the secondary element looks dirty, a further inspection will be required.
- Examine filter canister for cracks and replace as necessary.
- Ensure canister retaining latches are secure.
- Ensure filter sealing surfaces are soft, flexible and sealing, not hard, and allowing debris through to safety filter.

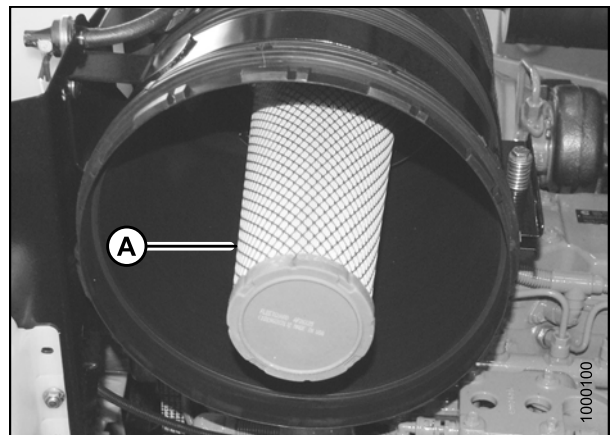


Figure 5.74: Engine Air Cleaner

8. Clean the inside of the canister housing and end cap carefully. Dirt left in the air cleaner housing may be harmful to your engine.
 - Use a clean, water-dampened cloth to wipe every surface clean.
 - Check it visually to make sure it is clean before putting in a new element.
 - Always clean the gasket sealing surfaces of the housing. An improper gasket seal is one of the most common causes of engine contamination.
 - Make sure that all hardened dirt ridges are completely removed wherever filter gaskets contact the cleaner housing.

MAINTENANCE AND SERVICING

9. Check for uneven dirt patterns on your old element. Your old element is a valuable clue to potential dust leakage or gasket sealing problems.
 - A pattern on the element clean side is a sign that the old element was **NOT** firmly sealed or that a dust leak exists.
 - Make certain the cause of that leak is identified and rectified before replacing the element.
 - Press fresh gasket to see if it springs back.
 - On a radial seal element the gasket surface is the inside diameter of the open end cap.
 - Make sure the gasket is seating evenly, if you don't feel the gasket is seating evenly for a perfect seal, you may **NOT** have protection.
 - Recheck to see if the sealing surface in the housing is clean, or if the element is the correct model number. It may be too short for the housing.
10. If required, also change the secondary filter. Refer to [Removing and Installing Secondary Air Filter, page 302](#).

Installing Primary Air Filter

NOTE: If replacing air filter, see [Filter Part Numbers, page 264](#).

1. Insert new primary filter element (A) into canister over secondary element, and push into place, ensuring that element is firmly seated in canister.

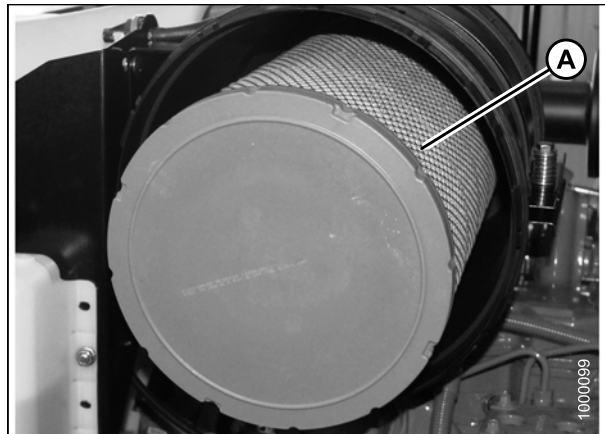


Figure 5.75: Engine Air Cleaner

MAINTENANCE AND SERVICING

2. Align arrow (A) to UNLOCK position on end cap, and push end cap fully onto housing.
3. Rotate end cap clockwise until catch (A) engages housing to prevent end cap from turning.



Figure 5.76: Engine Air Cleaner

4. Position end cap (B) onto filter housing with aspirator pointing approximately down.

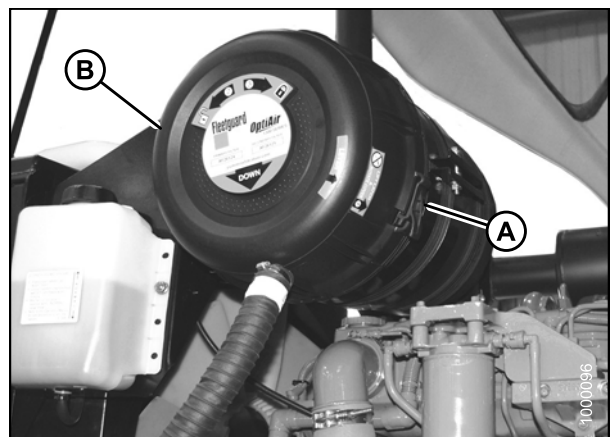


Figure 5.77: Engine Air Cleaner

5. After servicing the filter, you must reset the restriction switch (A) by pushing the button on the end of it to reset it.
6. Close the hood. Refer to [5.4.2 Closing Hood \(Lower Position\)](#), page 267.
7. Close the maintenance platform. Refer to [5.5.1 Opening Platforms \(Standard Position\)](#), page 269.

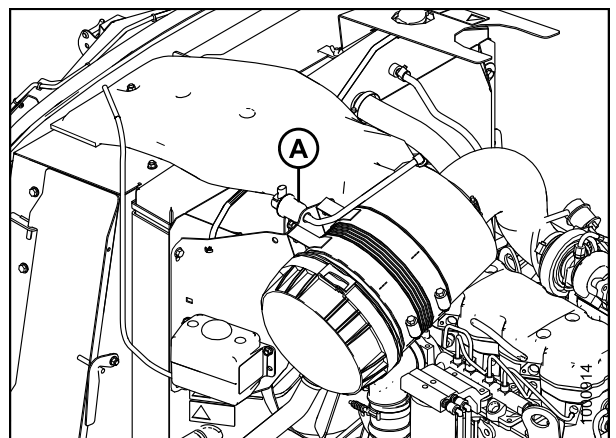


Figure 5.78: Engine Air Cleaner

Cleaning Engine Air Filter Primary Element

IMPORTANT:

The secondary (inner) element should NEVER be cleaned, only replaced.

MAINTENANCE AND SERVICING

IMPORTANT:

Air filter element cleaning is NOT recommended due to the possible degradation of the element material. If cleaning is performed, there are several risks involved and the following procedures should be followed. If any of the following conditions are found, the filter element **MUST** be replaced.

1. Hold a bright light inside element, and check carefully for holes.
2. Check outer screen for dents. Vibration would quickly wear a hole in the filter.
3. Check filter gasket for cracks, tears, or other signs of damage.
4. Check element for oil or soot contamination.
5. Check the secondary element for cleanliness. If there is visible dirt on the secondary element, replace both primary and secondary elements. Do **NOT** clean.

IMPORTANT:

The air cleaner's primary (outer) filter element should be replaced after three cleanings or at the specified interval. The secondary (inner) element should be replaced every third time the primary element is changed. Refer to Section [5.7.11 Maintenance Schedule, page 382](#) for the required interval.

6. If secondary element passes inspection, clean primary element as follows:
 - a. Use compressed air **NOT** exceeding 60 psi (400 kPa), and a Dry Element Cleaner Gun.
 - b. Hold nozzle next to inner surface only, and move up and down on pleats.
 - c. After three cleaning's (or at the specified interval), replace the primary element.
7. Repeat inspection before installing.

Removing and Installing Secondary Air Filter

NOTE:

- The secondary element (A) should **NEVER** be cleaned — only replaced.
- Do **NOT** remove the secondary filter element unless it needs replacing.
- Replace safety element annually or after every third primary filter change, even if it appears clean.
- If you are changing secondary element because it looked dirty, a further inspection will be required.
- Examine filter canister for cracks and replace as necessary.
- Ensure canister retaining latches are secure. Ensure filter sealing surfaces are soft, flexible and sealing, not hard and allowing debris through to secondary filter.

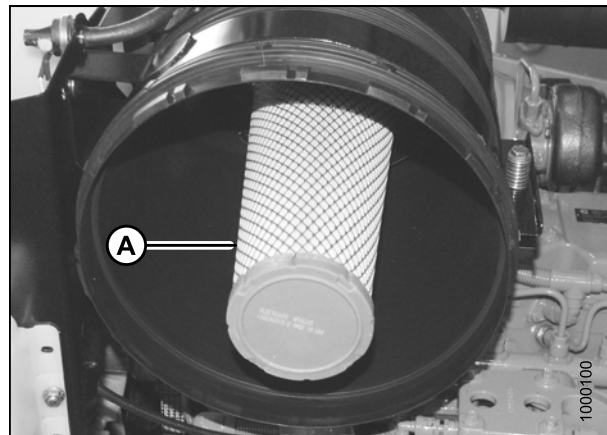


Figure 5.79: Engine Air Cleaner

MAINTENANCE AND SERVICING

1. Remove the primary filter, refer to [Removing Primary Air Filter, page 298](#).

IMPORTANT:

When replacing secondary filter, reinsert new filter as soon as possible to prevent dirt from entering engine intake.

2. Remove the secondary element (A), and pull it out of the canister.

NOTE: If replacing filter, refer to [Filter Part Numbers, page 264](#).

3. Insert new secondary filter element (A) into canister, seal first, and push until seal is seated inside canister.
4. Reinstall the primary filter, refer to [Installing Primary Air Filter, page 300](#).

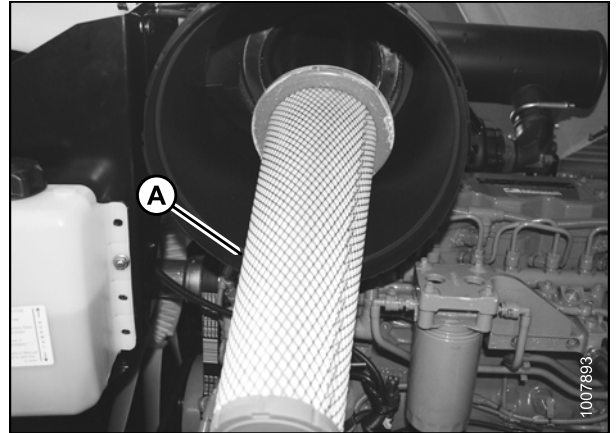


Figure 5.80: Engine Air Cleaner

Fuel System

Removing and Installing Fuel Tank Vent Filter

The fuel tank is vented by a hose that is connected to the filler tube. The hose is connected to a filter that should be changed annually.

Change the filter as follows:

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

WARNING

To avoid personal injury or death from explosion or fire, do NOT smoke or allow flame or sparks near windrower when servicing.

1. Stop the engine and remove the key.
2. Open the hood. Refer to [5.4.3 Opening Hood \(Highest Position\), page 267](#).
3. Open the right cab-forward side maintenance platform. Refer to [5.5.1 Opening Platforms \(Standard Position\), page 269](#).

MAINTENANCE AND SERVICING

4. Locate filter (A) on vent line against hydraulic oil reservoir.
5. Release hose tension clamps (B) and slide away from filter. Pull hoses off filter.
6. Position new filter through hole in frame and attach top hose onto filter. *IN* marking should face down.

NOTE: If filter has an arrow instead of an *IN* marking, arrow should point up.

7. Attach lower hose to filter and secure both hoses with tension clamps (B).
8. Close hood. Refer to [5.4.4 Closing Hood \(Highest Position\)](#), page 268.
9. Close the maintenance platform. Refer to [5.5.2 Closing Platforms \(Standard Position\)](#), page 270

Maintaining Fuel Filters

The windrower fuel system is equipped with primary (A) and secondary (B) screw-on cartridge type filters. The primary filter (A) is equipped with a separator that separates sediment and water from the fuel.

NOTE: Bottom part of image was made transparent to show the primary filter (A).

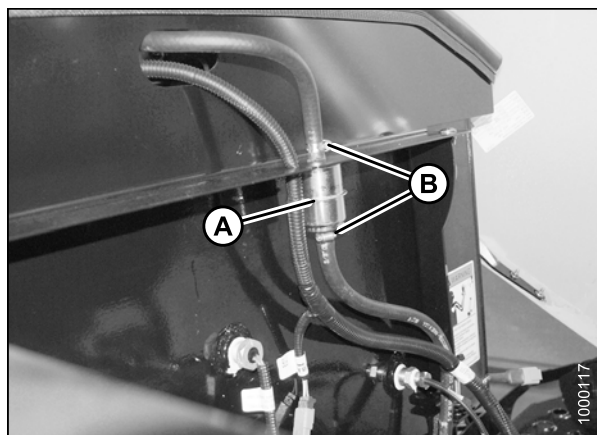


Figure 5.81: Fuel System

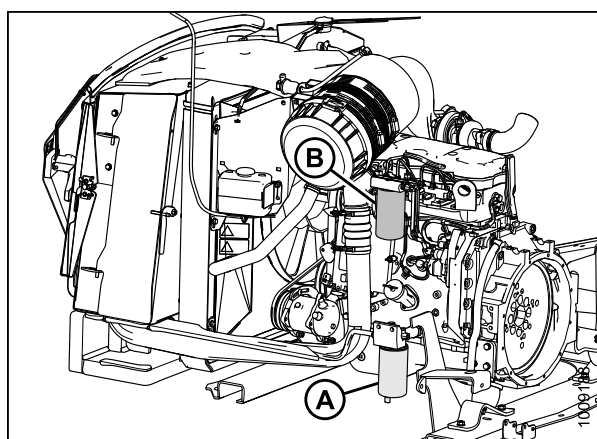


Figure 5.82: Fuel System Filters

Refer to the following procedures:

- [Removing Primary Fuel Filter](#), page 304
- [Installing Primary Fuel Filter](#), page 305
- [Removing Secondary Fuel Filter](#), page 306
- [Installing Secondary Fuel Filter](#), page 306

Removing Primary Fuel Filter

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Stop the engine and remove the key.
2. Open the hood. Refer to [5.4.3 Opening Hood \(Highest Position\)](#), page 267.

MAINTENANCE AND SERVICING

3. On the bottom of the fuel tank, locate the fuel supply valve (A) and move it to the closed position.

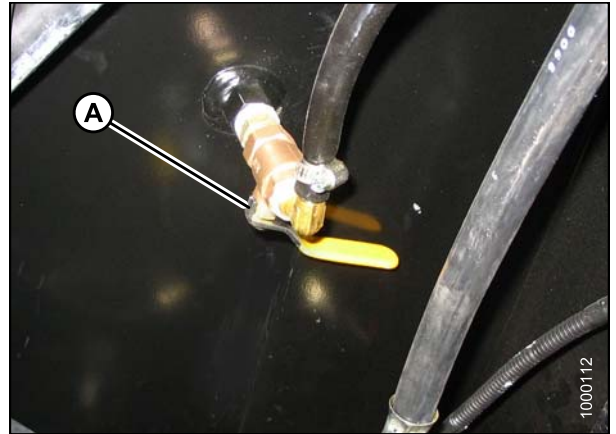


Figure 5.83: Fuel System

4. Locate the primary fuel filter (A) on the right cab-forward side of the windrower.

NOTE: Bottom part of the image made transparent to show location of the primary filter.

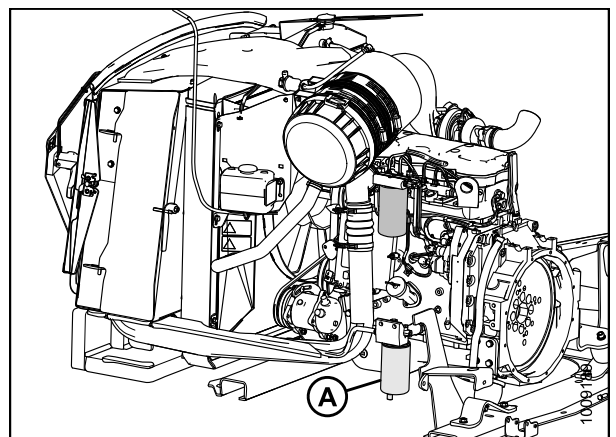


Figure 5.84: Fuel Filter Locations

5. Clean around the primary filter (A) head.
6. Disconnect the water in fuel (WIF) sensor (B) from bottom of filter.
7. Turn drain valve (C) by hand counterclockwise until draining occurs, and drain filter into a container.
8. Remove filter (A) with a filter wrench.
9. Clean gasket mating surface.

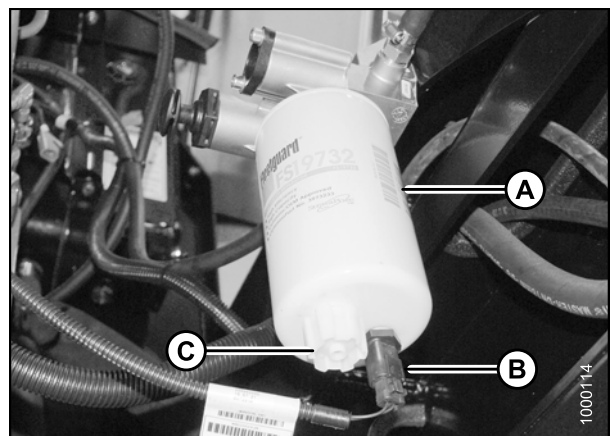


Figure 5.85: Fuel System

Installing Primary Fuel Filter

IMPORTANT:

Do **NOT** prefill filter with fuel. Prefilling can contaminate the fuel system.

NOTE: If replacing filter, refer to [Filter Part Numbers, page 264](#).

MAINTENANCE AND SERVICING

1. Screw the new filter (A) onto the filter mount until the gasket contacts the filter head.
2. Reconnect water in fuel (WIF) sensor (B).
3. 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.

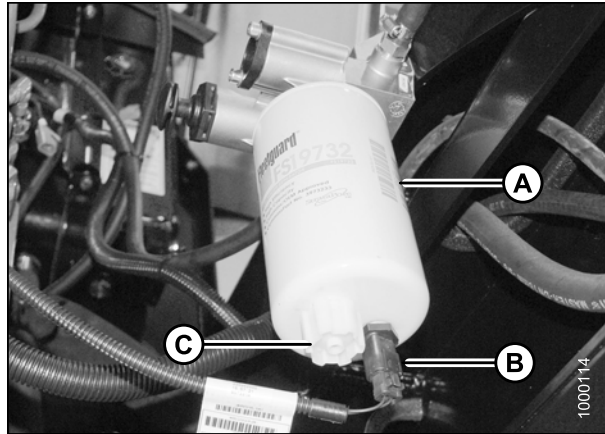


Figure 5.86: Fuel System

Removing Secondary Fuel Filter

1. Clean around the secondary filter head (A).
2. Place a container under the filter to catch spilled fluid.
3. Remove filter (B) with a filter wrench.
4. Clean gasket mating surface.

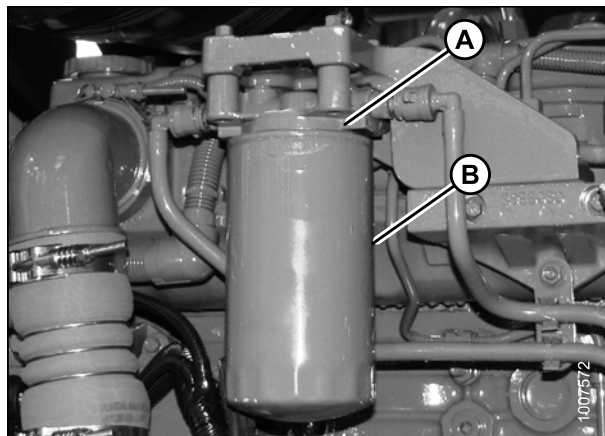


Figure 5.87: Fuel System

Installing Secondary Fuel Filter

IMPORTANT:

Do **NOT** prefill filter with fuel. Prefilling can contaminate the fuel system.

NOTE: If replacing filter, refer to [Filter Part Numbers, page 264](#).

MAINTENANCE AND SERVICING

1. Screw the 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.

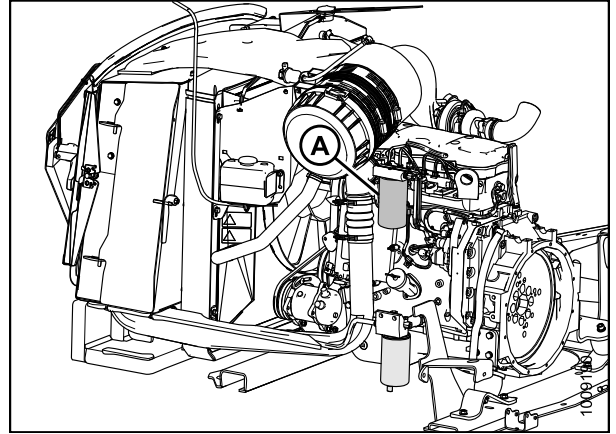


Figure 5.88: Fuel System

3. Open fuel valve (A) under fuel tank.
4. Prime the fuel system, refer to [Priming Fuel System, page 310](#).

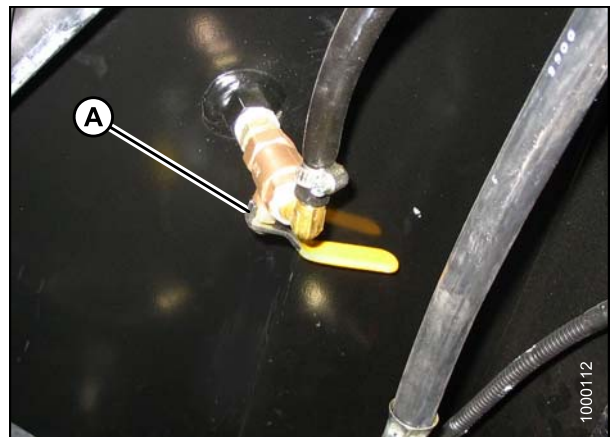


Figure 5.89: Bottom of Fuel Tank

Draining Fuel Tank

Draining the fuel tank is necessary to remove old or contaminated fuel.

WARNING

- To avoid personal injury or death from explosion or fire, do **NOT** smoke or allow flame or sparks near fuel tank when refueling.
- **NEVER** refuel the windrower when the engine is hot or running.

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Stop the engine and remove the key.
2. Open the hood. Refer to [5.4.1 Opening Hood \(Lower Position\), page 266](#).

MAINTENANCE AND SERVICING

3. Close fuel supply valve (A). Located on the bottom of the fuel tank.

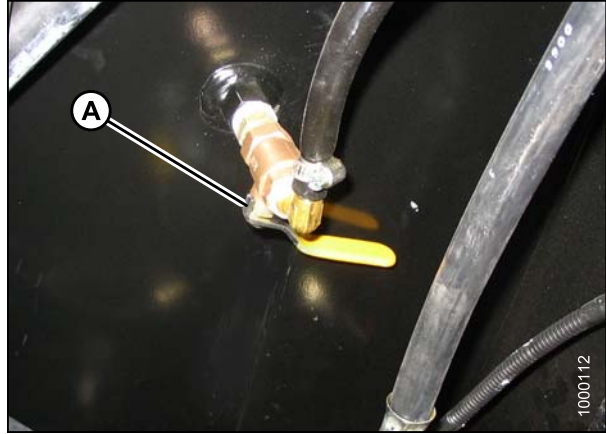


Figure 5.90: Bottom of Fuel Tank

4. Place a 5 U.S. gallon (20 liter) drain pan under the fuel supply hose (A) at primary filter.
5. Loosen clamp (B) and pull fuel supply hose (A) off fitting.

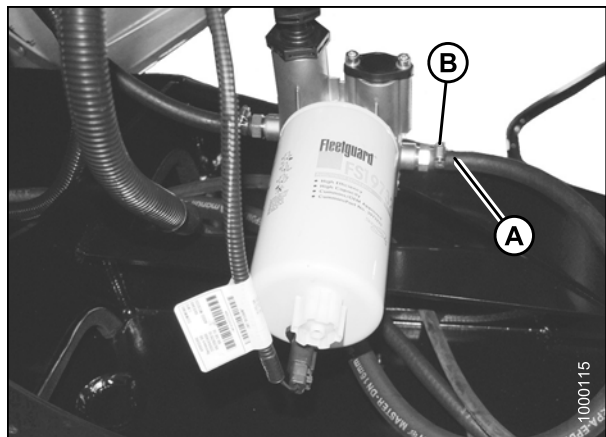


Figure 5.91: Fuel System

6. Route hose to drain pan and open valve (A) to drain tank.

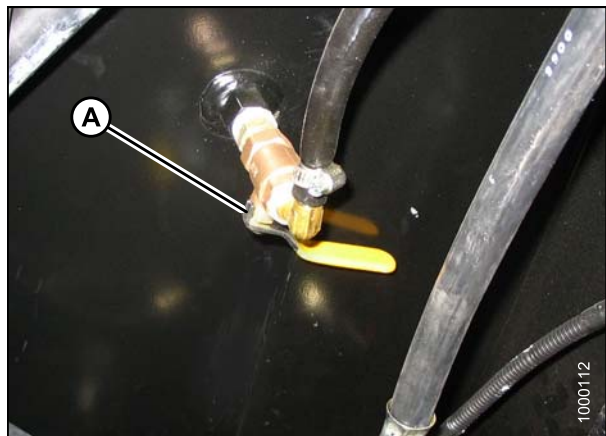


Figure 5.92: Fuel System

MAINTENANCE AND SERVICING

7. Add some clean fuel to tank to flush out any remaining contaminants.
8. Reattach fuel supply hose (A) to fitting. Install clamp (B) and tighten.

NOTE: Do **NOT** refill the fuel tank if you need to work on the system. Refill it once work is completed. Refer to *Fuelling*, page 109.

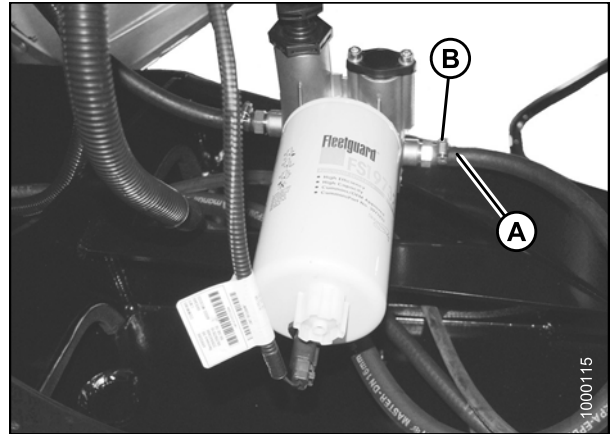


Figure 5.93: Fuel System

Filling Fuel Tank

Fuel/Water Separator

A fuel water separator is incorporated into the primary fuel filter. The separator is equipped with a drain and with a sensor that detects water in the fuel and alerts the Operator on the cab display module (CDM).

Refer to the following procedure to remove water from the fuel system:

- *Removing Water from Fuel System*, page 309

Removing Water from Fuel System

Drain the water and sediment as follows from the separator daily, or at any time the cab display module (CDM) water in fuel (WIF) light illuminates.

1. Stop the engine and remove the key.
2. Open the hood. Refer to *5.4.1 Opening Hood (Lower Position)*, page 266.
3. Place a container under the filter (A) to catch spilled fluid.
4. Turn drain valve (C) by hand 1-1/2 to 2 turns counterclockwise until draining occurs.
5. Drain the filter sump of water and sediment until clear fuel is visible.
6. Turn the valve clockwise to close the drain.
7. Dispose of fluid safely.
8. Close the hood. Refer to *5.4.2 Closing Hood (Lower Position)*, page 267.

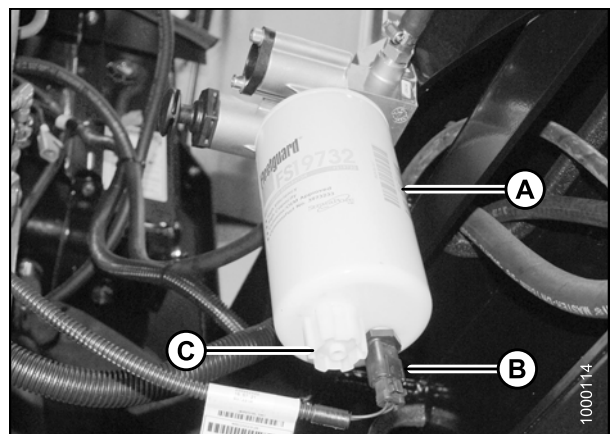


Figure 5.94: Fuel System

MAINTENANCE AND SERVICING

System Priming

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 in accordance with instructions.

IMPORTANT:

Bleeding the fuel system is **NOT** recommended or required. Manual priming will be required if:

- Fuel filter is replaced.
- Injection pump is replaced.
- High-pressure fuel lines are replaced.
- Engine is run until fuel tank is empty.

Priming Fuel System

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. Stop the engine and remove the key.
2. Open the hood to lowest position. Refer to [5.4.1 Opening Hood \(Lower Position\)](#), page 266.
3. Turn the priming knob (A) counterclockwise to unlock the plunger on the primary filter head.
4. Pump approximately 120 times to pressurize the fuel system.
5. Lock the plunger by turning knob (A) clockwise until snug.
6. Try starting engine. If engine does **NOT** start, repeat priming.
7. Close hood. Refer to [5.4.2 Closing Hood \(Lower Position\)](#), page 267.

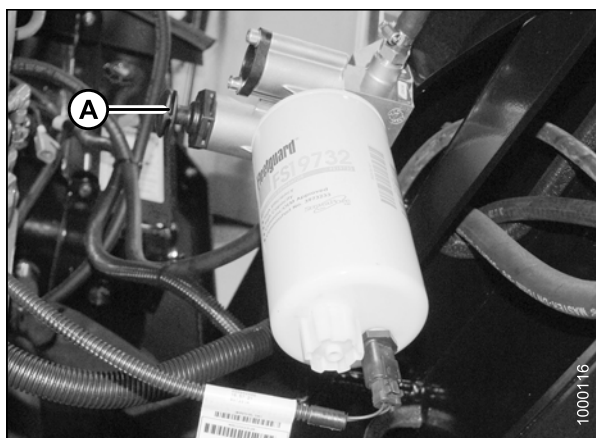


Figure 5.95: Fuel System

Engine Cooling System

The engine cooling system is designed to maintain the engine operating temperature within the specified operating range.

NOTE: Antifreeze is essential in any climate. It broadens the operating temperature range by lowering the coolant freezing point, **AND** by raising its boiling point. Antifreeze also contains rust inhibitors and other additives to prolong engine life.

IMPORTANT:

If antifreeze strength is not adequate, do **NOT** drain cooling system to protect against freezing. System may not drain completely and damage from freezing could still result.

Refer to [Lubricants, Fluids, and System Capacities](#), page 263 for detailed information.

MAINTENANCE AND SERVICING

Inspecting Radiator Cap

The radiator cap must fit tightly and the cap gasket must be in good condition to maintain the 14–18 psi (97–124 kPa) pressure in the cooling system.

CAUTION

- To avoid personal injury from hot coolant, do NOT turn radiator cap until engine cools.
 - Engine exhaust stack may be hot.
1. Open the hood. Refer to [5.4.3 Opening Hood \(Highest Position\)](#), page 267.
 2. Open the platform. Refer to [5.5.1 Opening Platforms \(Standard Position\)](#), page 269.
 3. Turn the cap (A) counterclockwise to the first notch to relieve pressure before removing cap completely.
 4. Turn the cap (A) again and remove.
 5. Check the gasket for cracks or deterioration and replace the cap if necessary.
 6. Check that the spring in the cap moves freely.
 7. Replace the cap if spring is stuck.
 8. Close the platform. Refer to [5.5.2 Closing Platforms \(Standard Position\)](#), page 270.
 9. Close the hood. Refer to [5.4.4 Closing Hood \(Highest Position\)](#), page 268.

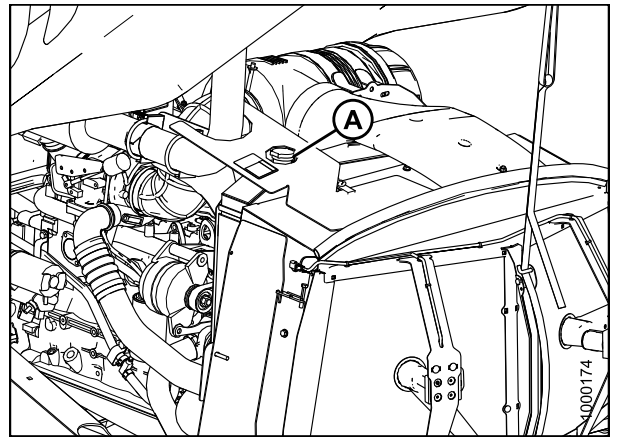


Figure 5.96: Engine Cooling System

Checking Engine Coolant Strength

Check the anti-freeze in the radiator with a tester annually, preferably before off-season storage.

CAUTION

- To avoid personal injury from hot coolant, do NOT turn radiator cap until engine cools.
 - Engine exhaust stack may be hot.
1. Open the hood. Refer to [5.4.3 Opening Hood \(Highest Position\)](#), page 267.
 2. Open the platform. Refer to [5.5.1 Opening Platforms \(Standard Position\)](#), page 269.

MAINTENANCE AND SERVICING

3. Remove the radiator cap (A).

IMPORTANT:

Turn the cap (A) counterclockwise to the first notch to relieve pressure before removing cap completely.

4. Check the coolant in the radiator using an antifreeze tester. Tester should indicate protection to temperatures of -30°F (-34°C).
5. Inspect the radiator cap before reinstalling, refer to [Inspecting Radiator Cap, page 311](#).
6. Replace radiator cap (A).
7. Close the platform. Refer to [5.5.2 Closing Platforms \(Standard Position\), page 270](#).
8. Close the hood. Refer to [5.4.4 Closing Hood \(Highest Position\), page 268](#).

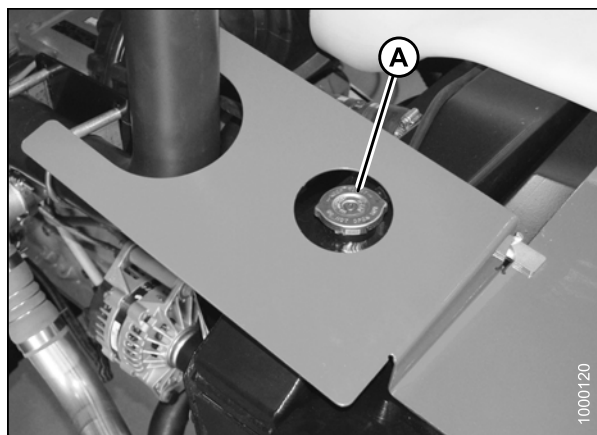


Figure 5.97: Engine Cooling System

Checking Coolant Level

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

Check coolant level in the coolant recovery tank daily.

1. Stop the engine and remove the key.
2. Open the hood. Refer to [5.4.3 Opening Hood \(Highest Position\), page 267](#).
3. Open the platform. Refer to [5.5.1 Opening Platforms \(Standard Position\), page 269](#).

NOTE: To view coolant capacities, refer to [Lubricants, Fluids, and System Capacities, page 263](#).

4. Close the platform. Refer to [5.5.2 Closing Platforms \(Standard Position\), page 270](#).
5. Close the hood. Refer to [5.4.4 Closing Hood \(Highest Position\), page 268](#).

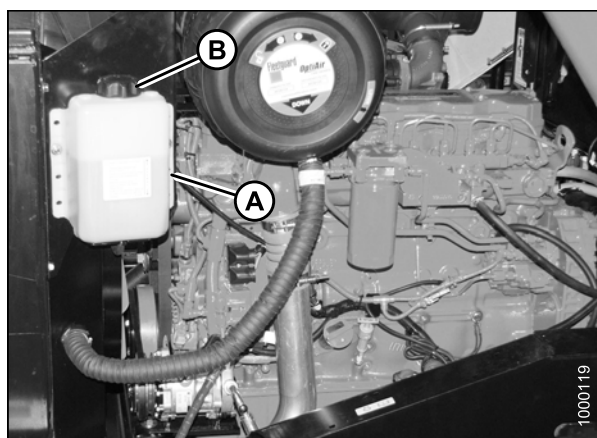


Figure 5.98: Engine Cooling System

MAINTENANCE AND SERVICING

Changing Coolant

Coolant should be drained and the system flushed and filled with new coolant every **2000 hours or 2 years**.

Refer to the following procedures:

- [Draining Coolant, page 313](#)
- [Adding Coolant, page 315](#)

Draining Coolant

WARNING

To avoid personal injury from hot coolant, do NOT turn radiator cap until engine cools. Engine exhaust may be hot.

1. Stop the engine, remove the key. Let the engine cool.
2. Open the hood. Refer to [5.4.3 Opening Hood \(Highest Position\), page 267](#).
3. Open the platform. Refer to [5.5.1 Opening Platforms \(Standard Position\), page 269](#).
4. Turn the radiator cap (A) to the first notch to relieve pressure before removing cap completely.

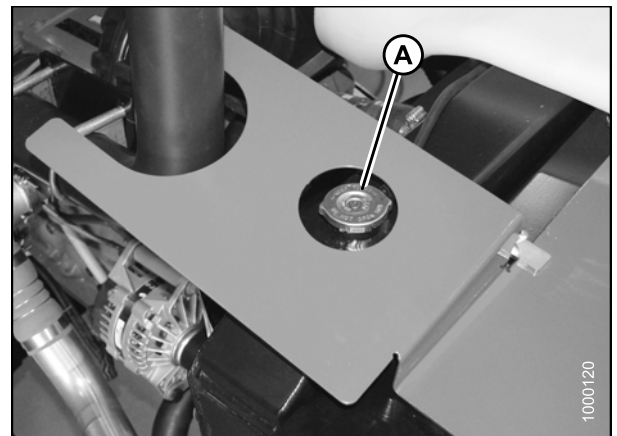


Figure 5.99: Engine Cooling System

5. Remove the radiator cap and open radiator drain valve (A) at the bottom of the engine side of the radiator lower tank. (Frame has been removed from illustration for clarity.)

IMPORTANT:

Place a drain pan (about 8 U.S. gallons [30 liters]) under the engine and radiator and use a deflector or hose to prevent coolant running onto frame.

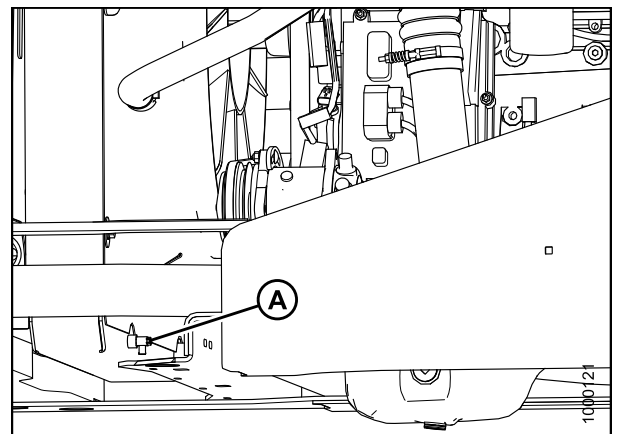


Figure 5.100: Engine Cooling System

MAINTENANCE AND SERVICING

6. Close the heater shut-off valve (A) and disconnect hose on heater side of valve.
7. Open valve to drain the block.
8. When system is drained, reattach hose on valve (A).

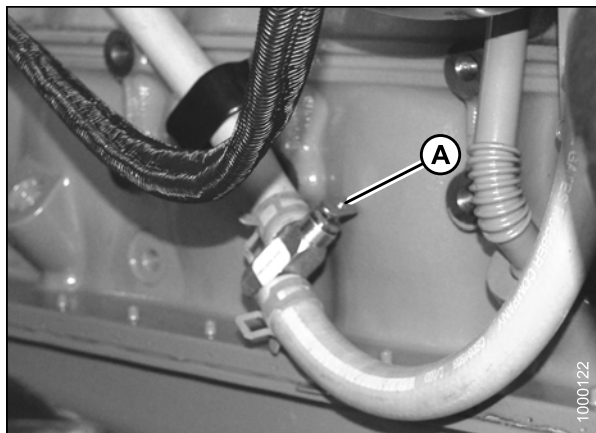


Figure 5.101: Engine Cooling System

9. Close radiator drain valve (A) at the bottom of the engine side of the radiator lower tank. (Frame has been removed from illustration for clarity.)
10. Fill system with clean water through the radiator and replace radiator cap.

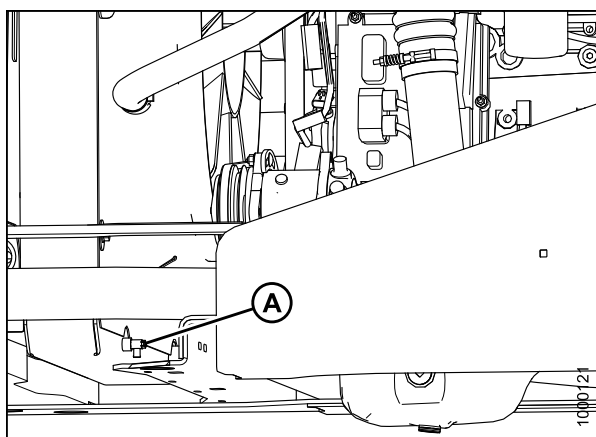


Figure 5.102: Engine Cooling System

11. Open heater shut-off valve (A).
12. Start engine and turn temperature control knob to HIGH. Run engine until normal operating temperature is reached.
13. Stop the engine and drain water out before rust or sediment settles. Repeat coolant removal procedure.
14. Close drain valves and fill system with a solution of clean water and a heavy duty radiator cleaner. Follow instructions provided with cleaner.
15. After using cleaner solution, again flush system with clean water. Inspect radiator, hoses, and fittings for leaks
16. Close drain valves and fill system. Refer to [Adding Coolant, page 315](#).
17. Close the platform. Refer to [5.5.2 Closing Platforms \(Standard Position\), page 270](#).
18. Close the hood. Refer to [5.4.4 Closing Hood \(Highest Position\), page 268](#).

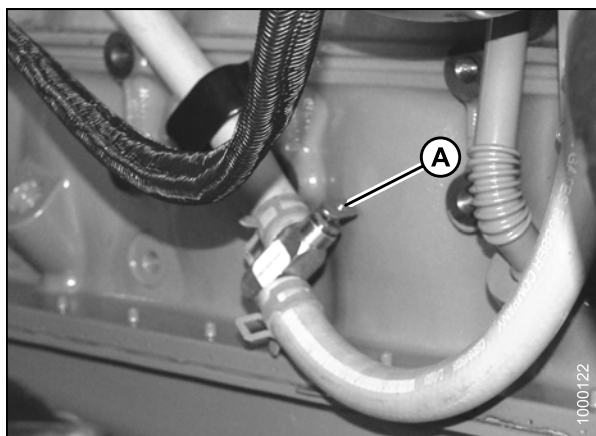


Figure 5.103: Engine Cooling System

MAINTENANCE AND SERVICING

Adding Coolant

Check the coolant level in the coolant recovery tank (A) daily, the tank should be at least one-half full. If less, add coolant.

NOTE: Do **NOT** add coolant to radiator except when changing coolant.

To add coolant to the coolant recovery tank, follow these steps:

1. Open the hood. Refer to [5.4.3 Opening Hood \(Highest Position\)](#), page 267.
2. Open the platform. Refer to [5.5.1 Opening Platforms \(Standard Position\)](#), page 269.
3. Remove cap (B) and add coolant until one-half full.

NOTE: For coolant specifications, refer to [Lubricants, Fluids, and System Capacities](#), page 263.

4. Replace cap (B).
5. Close the platform. Refer to [5.5.2 Closing Platforms \(Standard Position\)](#), page 270.
6. Close the hood. Refer to [5.4.4 Closing Hood \(Highest Position\)](#), page 268.

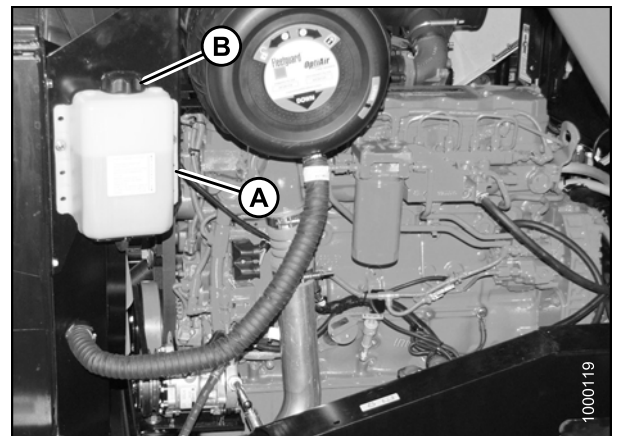


Figure 5.104: Engine Cooling System

Maintaining Engine Cooling Box

Refer to the following procedures:

- [Opening Cooler Box Screen](#), page 316
- [Charge Air Cooling](#), page 316
- [Cleaning Screens and Coolers](#), page 317
- [Cleaning Cooler Box Components](#), page 318
- [Adjusting Screen Cleaner Duct to Screen Clearance](#), page 320
- [Closing Cooler Box Screen](#), page 321

MAINTENANCE AND SERVICING

Opening Cooler Box Screen

1. Open the hood. Refer to [5.4.3 Opening Hood \(Highest Position\)](#), page 267.
2. Push latch (A) and open screen assembly access door (B). Secure with rod stored inside screen door.

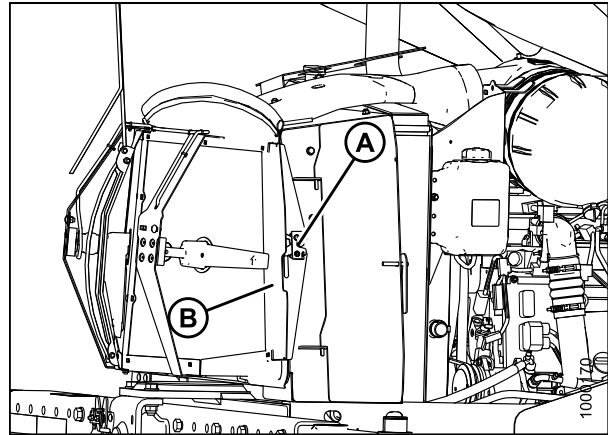


Figure 5.105: Engine Cooling System

Charge Air Cooling

After the intake air passes through the air filter, it passes through the turbocharger (A) that boosts the pressure. This process heats the air so it is passed through pipe (B) to a cooler before entering the engine intake.

The cooler is located in the cooling box (C) behind the radiator and should be cleaned daily with compressed air. Refer to [Maintaining Engine Cooling Box](#), page 315.

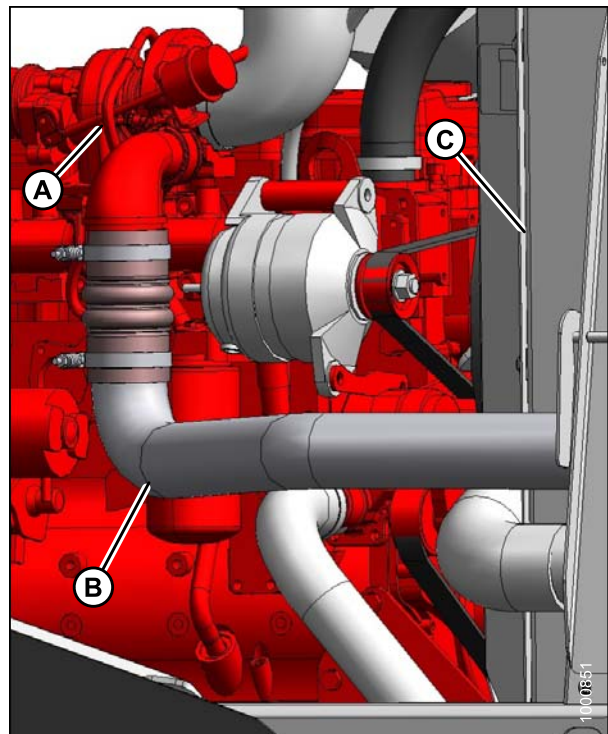


Figure 5.106: Engine Air Intake System

MAINTENANCE AND SERVICING

Cleaning Screens and Coolers

The cooling box screen is equipped with an automatic cleaning device that vacuums the screen by means of two rotors. They only operate when the engine is running. The rotors are electrically driven and the suction is provided by the engine cooling fan. If the screen is not being cleaned by the rotors, they may be plugged.

If rotors are plugged, clean as follows:

1. Open the hood. Refer to [5.4.3 Opening Hood \(Highest Position\)](#), page 267.
2. Remove nuts (B).
3. Pivot screen cleaner assembly (C) away from screen.
4. Blow out debris from ducts (A) with compressed air.
5. If ducts are plugged, open the cooler box screen. Refer to [Opening Cooler Box Screen](#), page 316.

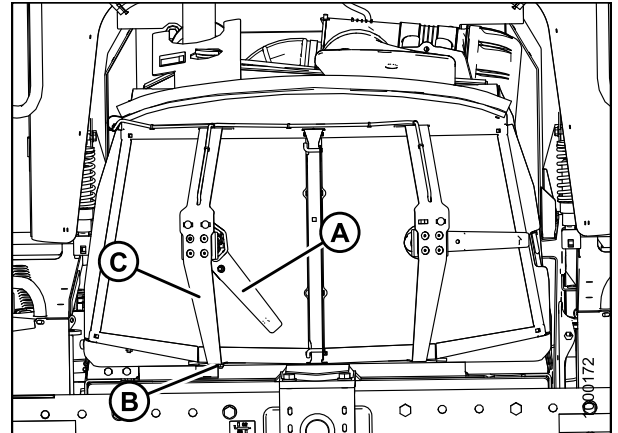


Figure 5.107: Engine Cooling System

6. Blow debris out of ducts (A) with compressed air.
7. Clean screen with compressed air.

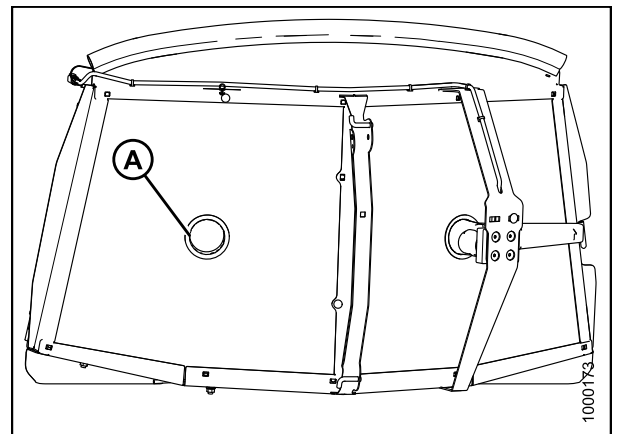


Figure 5.108: Engine Cooling System

MAINTENANCE AND SERVICING

8. Move the screen cleaner assembly (C). Secure with bolts and nuts (B).
9. Close the cooler box screen. Refer to [Closing Cooler Box Screen, page 321](#).
10. Close the hood. Refer to [5.4.4 Closing Hood \(Highest Position\), page 268](#).

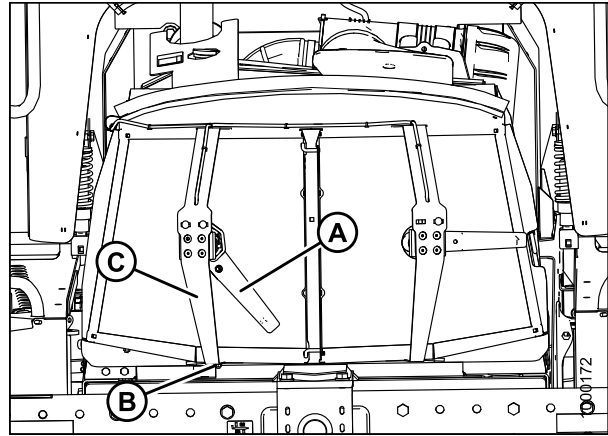


Figure 5.109: Engine Cooling System

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 condenser may also be cleaned at the same time.

To clean these components, proceed as follows:

1. Open cooler box screen. Refer to [Opening Cooler Box Screen, page 316](#).
2. Lift latch (A) and open the right hand access door (B).

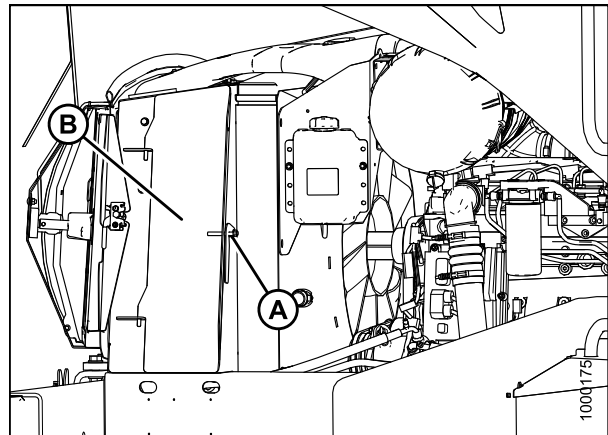


Figure 5.110: Engine Cooling System

MAINTENANCE AND SERVICING

- Slide out the oil cooler / air conditioning condenser assembly (A).

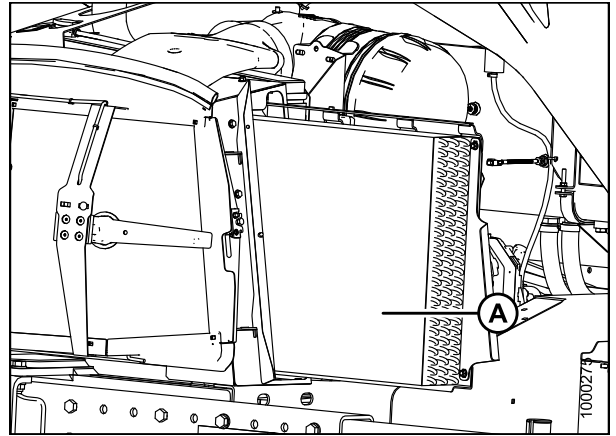


Figure 5.111: Engine Cooling System

- Lift latch (A) and open the left hand access door (B).

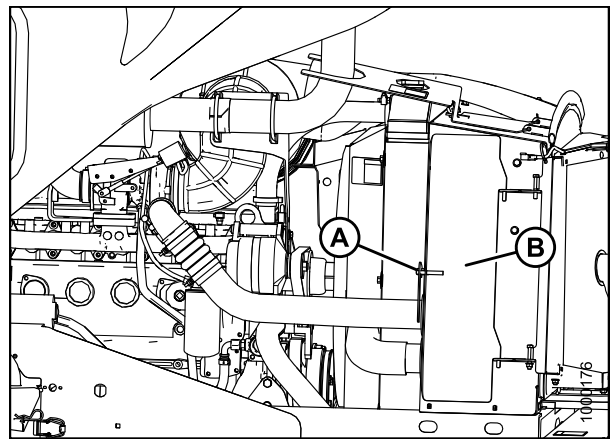


Figure 5.112: Engine Cooling System

- Remove wing nut (A) and open access door (B) at top of cooling box.

NOTE: Fins on coolers can be very easily bent which may interfere with its function. Exercise caution when cleaning.

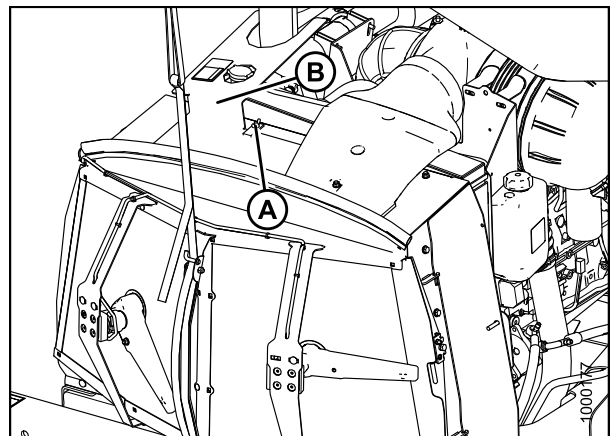


Figure 5.113: Engine Cooling System

MAINTENANCE AND SERVICING

6. Clean radiator (D) through access holes in cooling box with compressed air.
7. Clean oil cooler / air conditioning condenser (A), charge air cooler (E), fuel cooler (B), and cooling box (C) with compressed air.
8. Inspect all lines and coolers for evidence of leaks and damage.
9. Slide oil cooler / air conditioning condenser (A) back into cooling box (C).
10. Close side access door and lock with lever.
11. Close access door on top of the cooling box and secure with wing nut.
12. Close cooler box screen. Refer to [Closing Cooler Box Screen, page 321](#).

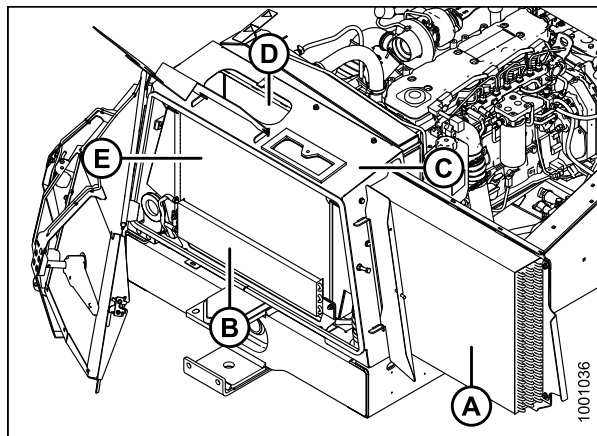


Figure 5.114: Engine Cooling System

A - Oil Cooler/Condenser B - Fuel Cooler
C - Cooling Box D - Radiator
E - Air Cooler

Adjusting Screen Cleaner Duct to Screen Clearance

Check clearance between trailing edge of screen cleaner duct (A) and screen. It should be 3/64–5/16 in. (1–8 mm) at all locations when rotating.

NOTE: Screen cleaner ducts rotate counterclockwise and may touch screen as long as it continues to rotate.

If necessary, adjust clearance as follows:

1. Open the hood. Refer to [5.4.1 Opening Hood \(Lower Position\), page 266](#).
2. Loosen nut (B) on motor support (C).
3. Move support in or out until duct is 3/32–1/4 in. (2–6 mm) from screen near the center.
4. Retighten nut (B).
5. Loosen the two motor mount bolts (D).
6. Move motor/duct assembly (E) to obtain 3/64–5/16 in. (1–8 mm) gap to screen at full rotation of the duct.
7. Retighten nuts (D) on motor mount.
8. Close the hood. Refer to [5.4.2 Closing Hood \(Lower Position\), page 267](#).

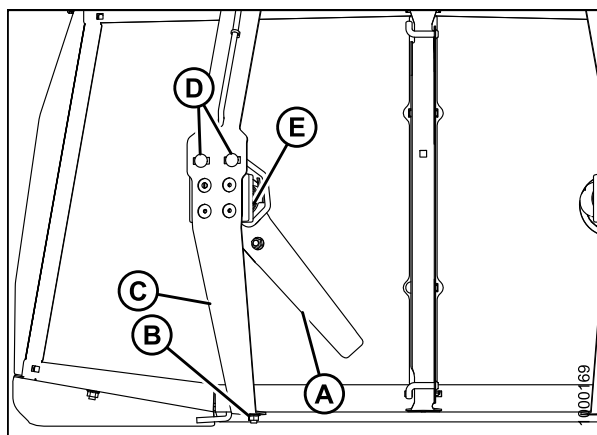


Figure 5.115: Engine Cooling System

MAINTENANCE AND SERVICING

Closing Cooler Box Screen

1. Unhook the support rod and store it in the screen door. Close screen access door (B) and engage latch (A).
2. Close the hood. Refer to [5.4.4 Closing Hood \(Highest Position\)](#), page 268.

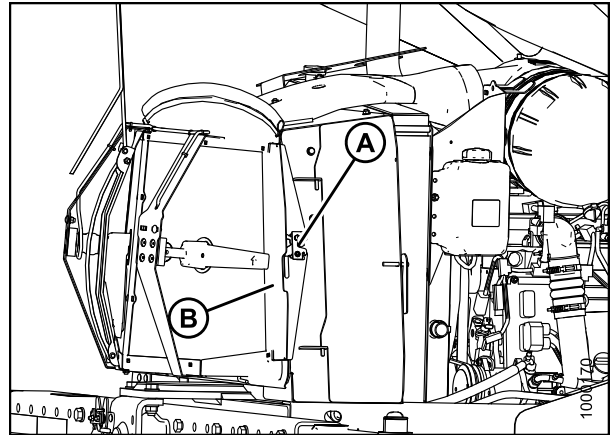


Figure 5.116: Engine Cooling System

Gearbox

Checking Lubricant Level and Adding Lubricant

CAUTION

Park on a flat, level surface, header on the ground, and the ground speed lever in N-DETENT position and steering wheel locked.

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Check the lubricant level every 50 hours as follows:
 - a. Park the windrower on level ground, shut down engine, and remove key.
 - b. Under the windrower, beneath the main pumps, locate and remove check plug (A). The lubricant should be visible through the hole or slightly running out.

NOTE: To view lubricant specifications, refer to [Lubricants, Fluids, and System Capacities](#), page 263.

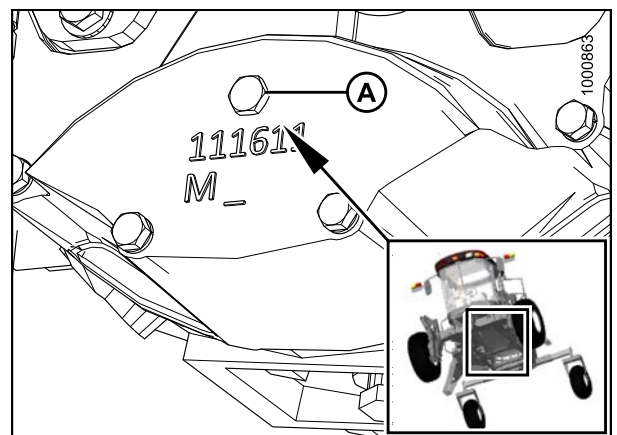


Figure 5.117: Gearbox Lubricant Check Plug

MAINTENANCE AND SERVICING

2. Add lubricant as follows:
 - a. Remove breather cap (A) and add lubricant until it runs out at the check plug.
 - b. Replace check plug and breather cap and tighten.
 - c. Operate the engine at low idle and check for leaks at the check plug and drain plug.

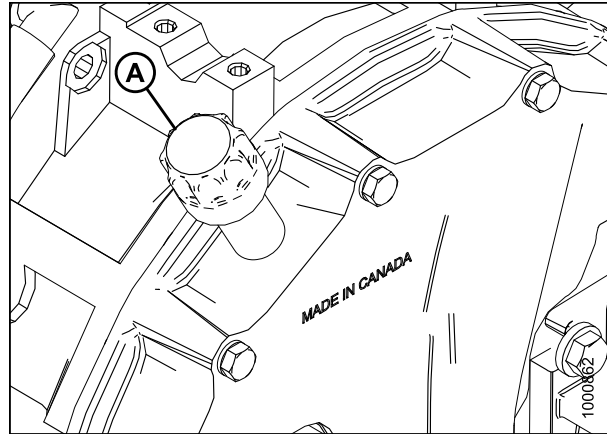


Figure 5.118: Gearbox Breather Cap

Changing Lubricant

Change gearbox lubricant after the first 50 hours, and then at 500 hours as follows:

NOTE: The engine should be warm prior to changing the oil.

1. Stop engine and remove key.
2. Place a 1 US gallon (4 liters) drain pan under the gearbox.
3. Remove drain plug (B) and allow oil to completely finish draining.
4. Install drain plug (B) and remove check plug (A).
5. Add lubricant. Refer to [Checking Lubricant Level and Adding Lubricant, page 321](#).
6. Operate the engine at low idle and check for leaks at the check plug and drain plug.

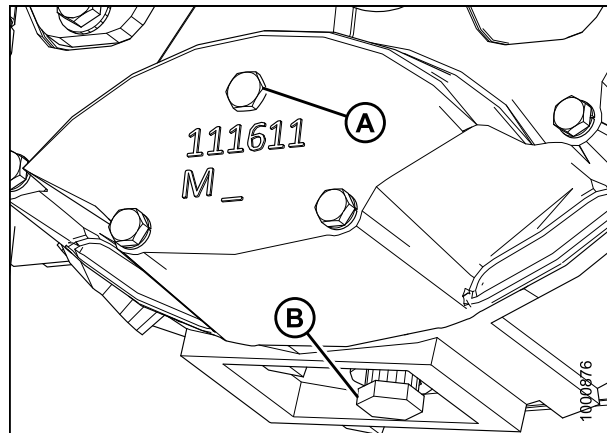


Figure 5.119: Gearbox Lubricant Drain Plug

Exhaust System

CAUTION

To avoid burns, do NOT touch muffler when engine is running. Allow sufficient cooling time after shut-down.

MAINTENANCE AND SERVICING

The exhaust system requires no regular maintenance, but it should be inspected periodically as follows:

1. Open the hood to its highest position. For instructions, refer to [5.4.3 Opening Hood \(Highest Position\)](#), page 267.
2. Inspect the area around clamps (A) for breakage, cracks and rust-through. In addition to excess noise, a leaky exhaust system may allow exhaust gases to escape to the cab.
3. Check tubing for dents or crushed areas. Dents or crushed portions of any tubing create exhaust flow restriction, and increase back pressure significantly. Even relatively small dents will cause decreased fuel economy and increased turbo wear. If dents are relatively large, increased bearing and cylinder wear will occur due to increased exhaust temperature.
4. Make sure the exhaust system is secured to eliminate vibration. The brackets (B) should fit securely to the muffler (C), and to the engine.

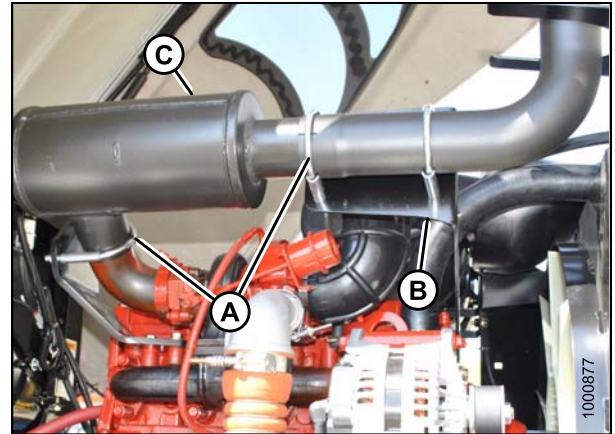


Figure 5.120: Exhaust System

A - Clamps

B - Brackets

C - Muffler

IMPORTANT:

Do **NOT** change muffler type, piping sizes, or exhaust configuration. See your Dealer for proper replacement parts.

Belts

Tensioning Alternator/Fan Belt

The alternator, water pump, and fan belt are automatically tightened; manual adjustment is **NOT** required.

Replacing Fan Belt

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

MAINTENANCE AND SERVICING

1. Shut down the engine and remove the key.
2. Open the LH platform. Refer to [5.5.1 Opening Platforms \(Standard Position\)](#), page 269.
3. Open the hood. Refer to [5.4.1 Opening Hood \(Lower Position\)](#), page 266.
4. Loosen compressor mounting hardware (B) and push compressor towards engine to release tension.
5. Remove belt (A) from compressor.

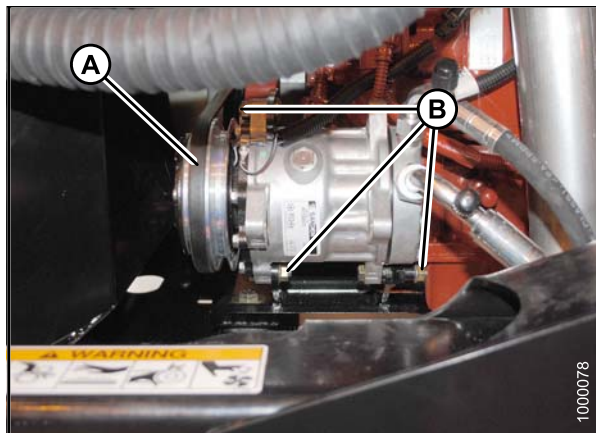


Figure 5.121: A/C Compressor

6. Insert the drive end of a 1/2 in. drive ratchet wrench into the belt tensioner (B).
7. Rotate tensioner counterclockwise until fan belt (C) can be slipped off pulley (D). Release tensioner and remove wrench.
8. Remove belt in order 1–2–3 as shown. Route fan belt around fan and remove belt.
9. Install new belt (C) around fan and onto pulleys in order 3–2–1.
10. Insert the drive end of a 1/2 in. drive ratchet wrench into the belt tensioner (C).

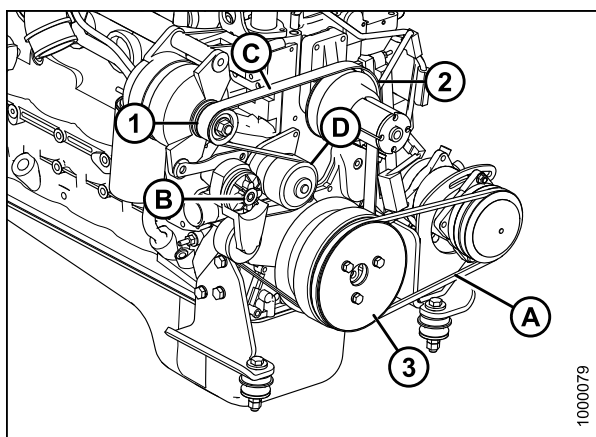


Figure 5.122: Engine Belts

A - A/C Compressor Belt B - Belt Tensioner
C - Fan Belt D - Pulley

11. Rotate tensioner counterclockwise until belt (C) can be slipped onto pulley (D). Release tensioner and remove wrench.
12. Check that belt is properly seated in all pulley grooves.
13. Install new compressor belt (A).
14. Pry compressor away from engine so that a force of 8–12 ft·lbf (35–55 N·m) deflects the belt (A) 3/16 in. (5 mm) at mid-span.
15. Tighten compressor mounting hardware (B).
16. Recheck tension and readjust as required.
17. Close the hood. Refer to [5.4.2 Closing Hood \(Lower Position\)](#), page 267.
18. Close the platform. Refer to [5.5.2 Closing Platforms \(Standard Position\)](#), page 270.

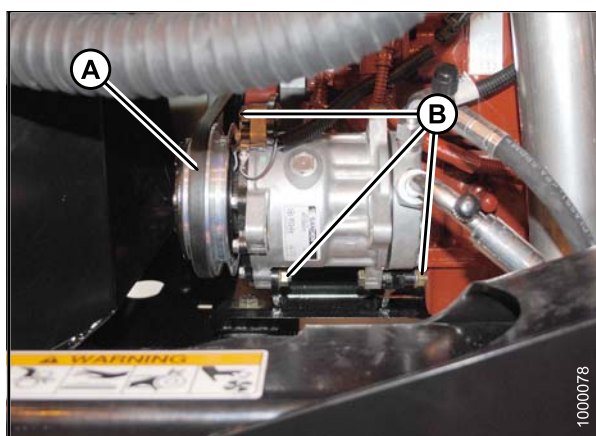


Figure 5.123: A/C Compressor

MAINTENANCE AND SERVICING

Tensioning A/C Compressor Belt

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Shut down the engine and remove the key.
2. Open the hood. Refer to [5.4.1 Opening Hood \(Lower Position\)](#), page 266.
3. Loosen compressor mounting hardware (B).
4. Pry compressor away from engine so that a force of 8–12 ft·lbf (35–55 N·m) deflects the belt (A) 3/16 in. (5 mm) at mid-span.
5. Tighten compressor mounting hardware (B).
6. Recheck tension and readjust as required.
7. Close the hood. Refer to [5.4.2 Closing Hood \(Lower Position\)](#), page 267.

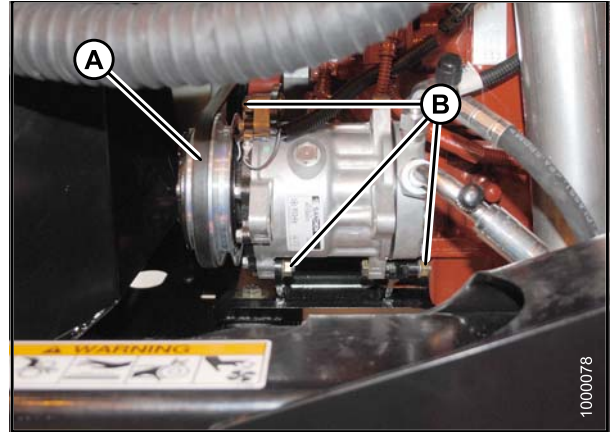


Figure 5.124: A/C Compressor

Replacing A/C Compressor Belt

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Shut down the engine and remove the key.
2. Open the hood. Refer to [5.4.1 Opening Hood \(Lower Position\)](#), page 266.
3. Loosen compressor mounting hardware (B) and push compressor towards engine to release tension.
4. Remove belt (A) from compressor.
5. Install new compressor belt (A).
6. Pry compressor away from engine so that a force of 8–12 ft·lbf (35–55 N·m) deflects the belt (A) 3/16 in. (5 mm) at mid-span.
7. Tighten compressor mounting hardware (B).
8. Recheck tension and readjust as required.
9. Close the hood. Refer to [5.4.2 Closing Hood \(Lower Position\)](#), page 267.

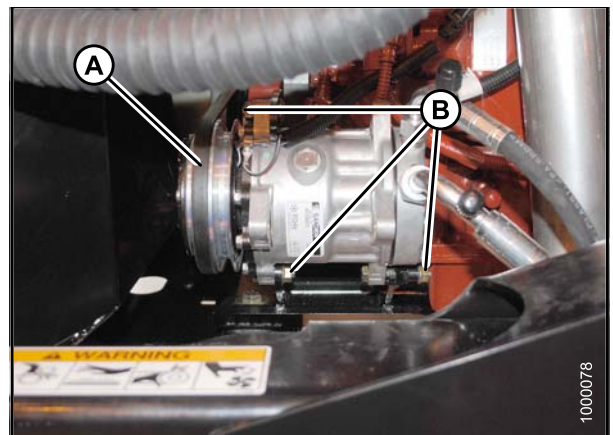


Figure 5.125: A/C Compressor

MAINTENANCE AND SERVICING

Engine Speed

The maximum and idle engine speeds are factory set.

Refer to [2.2 Specifications, page 29](#) for detailed information. If specified speeds cannot be maintained, see your MacDon Dealer.

See also [Engine Intermediate Speed Control \(ISC\), page 108](#).

Throttle Adjustment

The engine speed is controlled with the throttle lever that is connected to an electronic sensor inside the console.

The throttle lever in the cab should move the throttle sensor the full range between slow speed stop and full rpm stop without contacting the console at either position.

If the throttle lever is contacting the console and interferes with specified engine speeds, the sensor position may need adjustment. See your MacDon Dealer.

5.7.8 Electrical System

Battery

MAINTENANCE AND SERVICING

Preventing Electrical System Damage

To prevent electrical system damage, take the following precautions:

- Carefully observe polarity when attaching booster battery.
- Do **NOT** short across battery or alternator terminals, or allow battery positive (+) cable or alternator wire to become grounded.
- Be sure alternator connections are correct before cables are connected to battery.
- When welding on any part of the machine, disconnect battery cables and alternator wire. Refer to [Welding Precaution](#).
- Always disconnect battery ground cable when working with the alternator or regulator.
- Never attempt to polarize alternator or regulator.
- If wires are disconnected from the alternator, use the illustration to ensure proper reconnection.
- Never ground the alternator field terminal or field.
- Never connect or disconnect alternator or regulator wires with battery connected or alternator operating.
- Always disconnect cables from the battery when using a charger to charge battery in windrower.
- Ensure all cables are securely connected before operating engine.

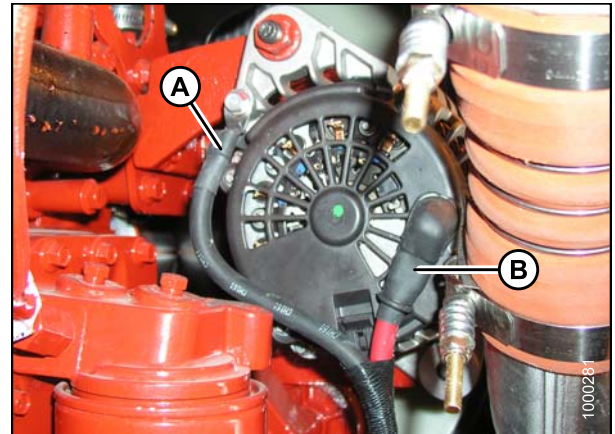


Figure 5.126: Alternator

A - Negative Terminal

B - Positive Terminal

Maintaining the Battery

CAUTION

Do NOT attempt to service battery unless you have the proper equipment and experience to perform the job. Have it done by a qualified Dealer.

- Check battery charge **once a year**, and more often if operating in cold weather. Hydrometer readings should be 1.260 to 1.300. Readings below 1.250 indicate charging is required. Refer to [Charging the Battery, page 329](#). Add electrolyte if necessary. Refer to [Adding Electrolyte to the Battery, page 331](#).
- Keep batteries clean by wiping with a damp cloth.
- Keep all connections clean and tight. Remove any corrosion, and wash terminals with a solution of baking soda and water. A light coating of grease on terminals (after cables are attached) will reduce corrosion.
- To prolong battery life, store batteries fully charged and at +20° to +80°F (-7° to +26°C). Check voltage after storage, and recharge as needed, according to battery and charger manufacturer recommendations.
- Do **NOT** stack storage batteries on top of each other.

MAINTENANCE AND SERVICING

Battery Main Disconnect Switch

A battery main disconnect switch is located on the right cab-forward side frame rail, just behind the batteries, and can be easily accessed by moving the maintenance platform.

Ensure switch is switched to POWER OFF position when performing major servicing to electrical components, or for periods of non-use to prevent inadvertent loss of battery charge.

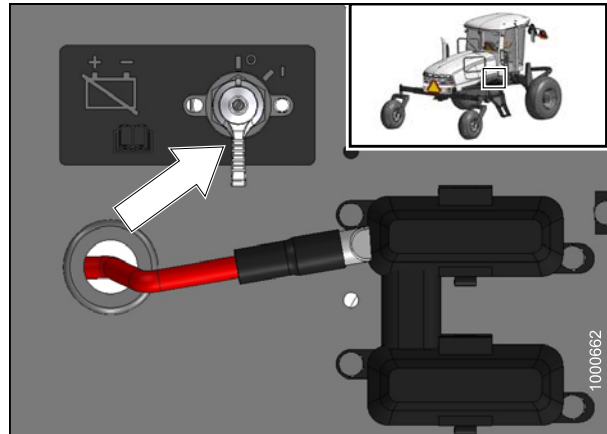


Figure 5.127: Electrical System

MAINTENANCE AND SERVICING

Charging the Battery

CAUTION

- Ventilate the area where batteries are being charged.
- Do NOT charge a frozen battery. Warm to 60°F (16°C) before charging.
- Do NOT connect or disconnect live circuits. To prevent sparks, turn off charger and connect positive cable first. PROTECT YOUR EYES.
- If charging battery in windrower, disconnect POSITIVE battery cable before connecting charger cable, then connect ground cable last, away from battery.
- Stop or cut back charging rate if battery feels hot, or is venting electrolyte. Battery temperature must NOT exceed 125°F (52°C).
- The maximum charge rate in amperes should be NO MORE than 1/3 of the battery's reserve capacity minute rating. If the terminal voltage exceeds 16.0 volts while charging, reduce the charge rate.
- Continue charging and reduce the rate as needed until a two hour period results in no increase in voltage or decrease in current.

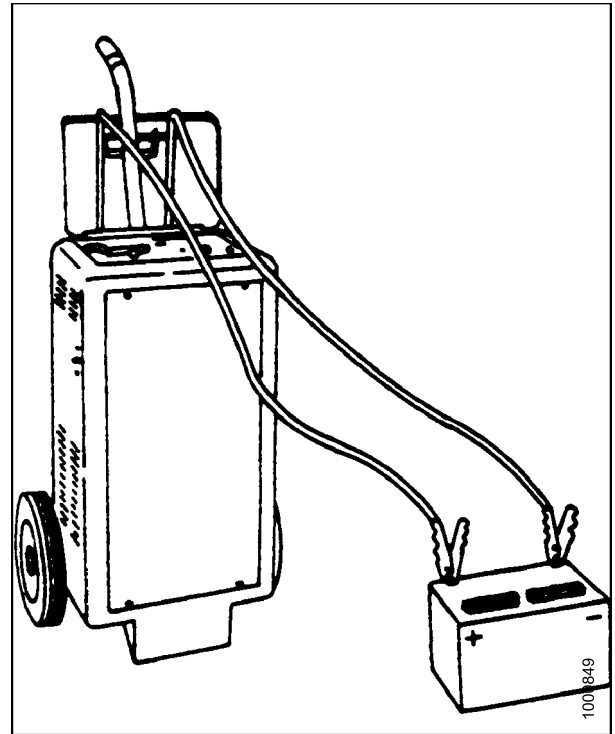


Figure 5.128: Charging Battery

WARNING

- Gel and AGM (Absorbed Glass Mat) batteries require a voltage-limited charger. Charging a Gel or AGM battery on a typical shop charger—even one time—may greatly shorten its life.
- If the electrolyte is accessible, verify that plates are covered before beginning to charge. At the end of charge, add distilled water as needed to bring levels to the proper height. If water is added, charge for an additional 30 minutes to mix. If electrolyte levels are low, but battery is not accessible, remove battery from service.

Table 5.17 Voltage Chart

Voltage	State of Charge (%)	Approximate Battery Charging Time ³⁰ to Full Charge at 80°F/27°C. (Minutes)			
		Maximum Rate at (Amps)			
Standard Battery					
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

30. Charging time depends upon battery capacity, condition, age, temperature, and efficiency of charger.

MAINTENANCE AND SERVICING

CAUTION

Follow all instructions and precautions furnished by the battery charger manufacturer, including the following:

- Charge at recommended rates and times.
- Turn off charger prior to hook up to avoid dangerous sparks. Wear proper eye protection.
- Reduce charge rate if the terminal voltage is higher than 16.0 volts while charging. The maximum charge rate in amperes should NOT exceed 1/3 of the battery's reserve capacity minute rating.
- Continue charging if there is no change in voltage or current for a period of two-hour and reduce the rate as needed.
- If the battery case gets hot during charging or spews large amount of gasses, temporarily stop charging.

IMPORTANT:

NEVER overcharge batteries. Excessive charging will shorten battery life.

To charge battery, follow these steps:

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Stop the engine and remove the key.
2. Move platform on right cab-forward side of machine to open position to allow access to the batteries. Refer to [5.5.1 Opening Platforms \(Standard Position\)](#), page 269.
3. Remove red plastic cover (A) from positive cable clamps.
4. Remove black plastic cover (B) from negative terminals.
5. If charging battery in windrower, disconnect **positive** battery cable (A), then connect charger cable to positive post. Connect charger ground cable to the engine block last, away from battery.
6. Charge batteries in accordance with charger manufacturer's instructions.
7. Close platform. Refer to [5.5.2 Closing Platforms \(Standard Position\)](#), page 270.

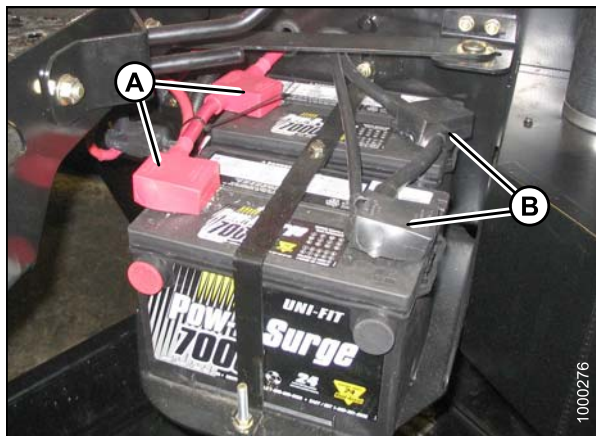


Figure 5.129: Battery Terminal Location

A - Positive Terminals

B - Negative Terminals

MAINTENANCE AND SERVICING

Boosting the Battery

A twelve volt battery can be connected in parallel (+ to +) with the windrower battery. Use heavy-duty battery cables.

CAUTION

- Gas given off by batteries is explosive. Keep sparks and flames away from batteries.
 - Make last connection and first disconnection at the point furthest away from the batteries.
 - Wear protective eye-wear when using a booster battery.
 - Be sure everyone is clear of machine when starting engine. Start engine from operator's station only.
1. Open the hood. Refer to [5.4.1 Opening Hood \(Lower Position\)](#), page 266.
 2. Remove red rubber cover from boost post (A) on windrower frame.
 3. Attach one end of battery cable to positive (+) terminal of booster battery, and other end to positive boost post (A) on windrower frame.
 4. Attach second cable to negative (-) terminal of booster battery, and then to ground post (B) on windrower frame.
 5. Turn ignition switch in cab as with normal start up.
 6. After engine starts, disconnect cable from windrower ground first, and then disconnect the other cables.
 7. Replace rubber cover on boost post (A).
 8. Close the hood. Refer to [5.4.2 Closing Hood \(Lower Position\)](#), page 267.

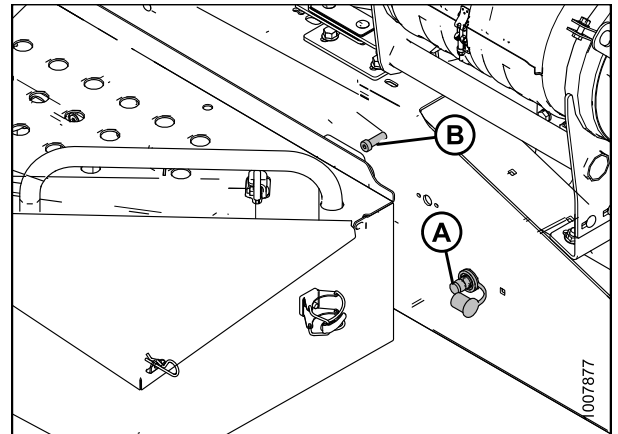


Figure 5.130: Battery Boost Posts

Adding Electrolyte to the Battery

WARNING

- Keep all smoking materials, sparks and flames away from electrolyte container and battery, as gas given off by electrolyte is explosive.
- Battery electrolyte causes severe burns. Avoid contact with skin, eyes or clothing. Wear protective eyewear and heavy gloves.



Figure 5.131: Safety Equipment

MAINTENANCE AND SERVICING

WARNING

- 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 with clean water.
- Electrolyte splashed into the eyes is extremely dangerous. Should this occur, force the eye open, and flood with cool, clean water for five minutes. Call a Doctor immediately.

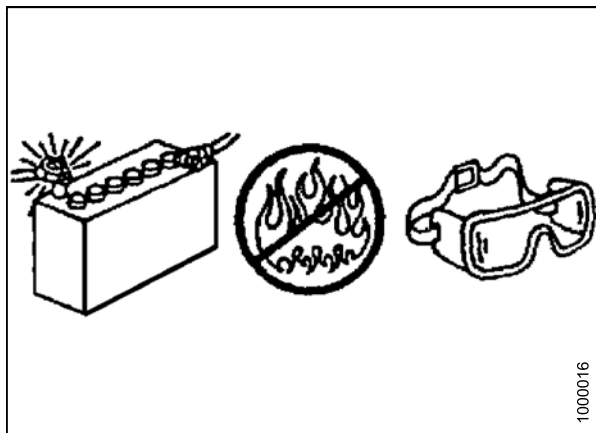


Figure 5.132: Safety Equipment

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. If battery is installed in windrower, stop the engine and remove the key.
2. Open the platform on the right side of the cab. Refer to [5.5.1 Opening Platforms \(Standard Position\)](#), page 269.
3. Add electrolyte in accordance with the battery manufacturer's instructions.
4. Close the platform. Refer to [5.5.2 Closing Platforms \(Standard Position\)](#), page 270.

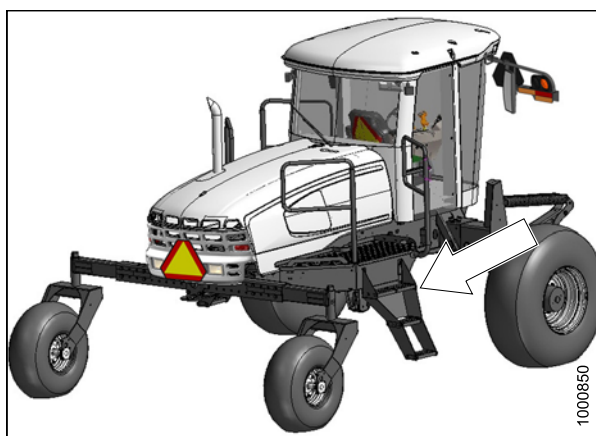


Figure 5.133: Platform Location

Removing Batteries

CAUTION

Do not attempt to service battery unless you have the proper equipment and experience to perform the job. Have it done by a qualified Dealer.

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Stop the engine and remove the key.
2. Open the right cab-forward platform to expose the batteries. Refer to [5.5.1 Opening Platforms \(Standard Position\)](#), page 269.

MAINTENANCE AND SERVICING

3. The battery main disconnect switch (A) is located on the right-hand frame rail beside the batteries. Ensure battery switch (A) is switched to POWER OFF position.

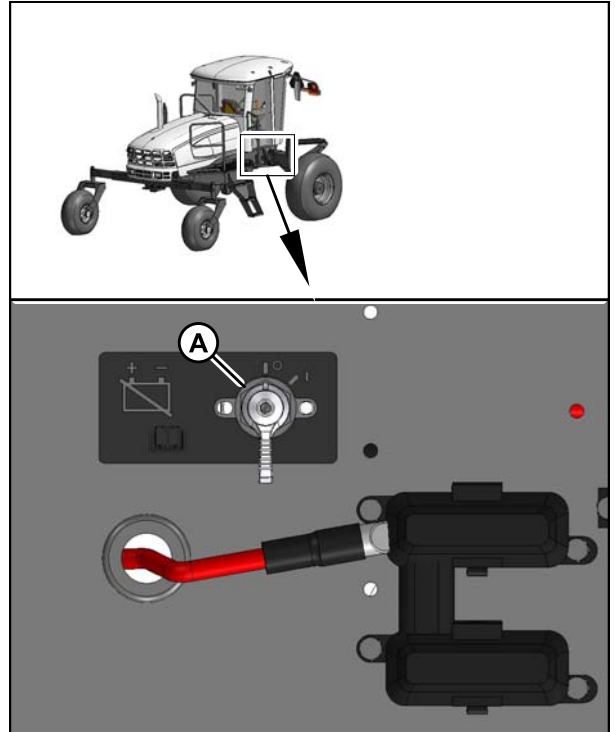


Figure 5.134: Battery Switch

4. Remove the bolt (A) that secures the platform arm to the platform. Swing arm (B) out of the way.
5. Remove the black plastic cover from the negative cable clamps (D). Loosen clamps and remove cable from batteries.
6. Remove the red plastic cover from positive cable clamps (C). Loosen the clamps and remove cable from batteries.
7. Remove bolts (E) securing strap (F) to frame, and remove strap.
8. Lift batteries off holder (G).

NOTE: Dual battery support can be removed from frame by simply lifting support, and pulling it away from frame.

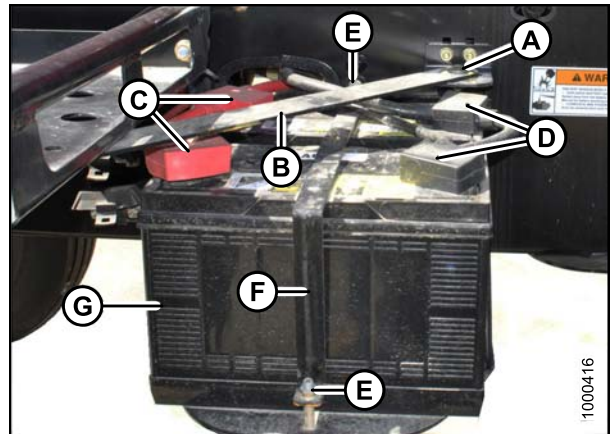


Figure 5.135: Battery Location

Installing Batteries

Table 5.18 Battery Specification

Rating	Group	CCA (min)	Volt	Maximum Dimension
Heavy duty, off-road, vibration resistant	BCI 29H or 31A	650	12	13.25 x 7.37 x 9.44 in. (334 x 188 x 232 mm)

MAINTENANCE AND SERVICING

1. The battery main disconnect switch (A) is located on the right-hand frame rail beside the batteries. Ensure battery switch (A) is switched to POWER OFF position.
2. Open the right cab-forward platform to expose the batteries. Refer to [5.5.1 Opening Platforms \(Standard Position\)](#), [page 269](#).
3. Remove cable ties securing battery cables to battery clamp.

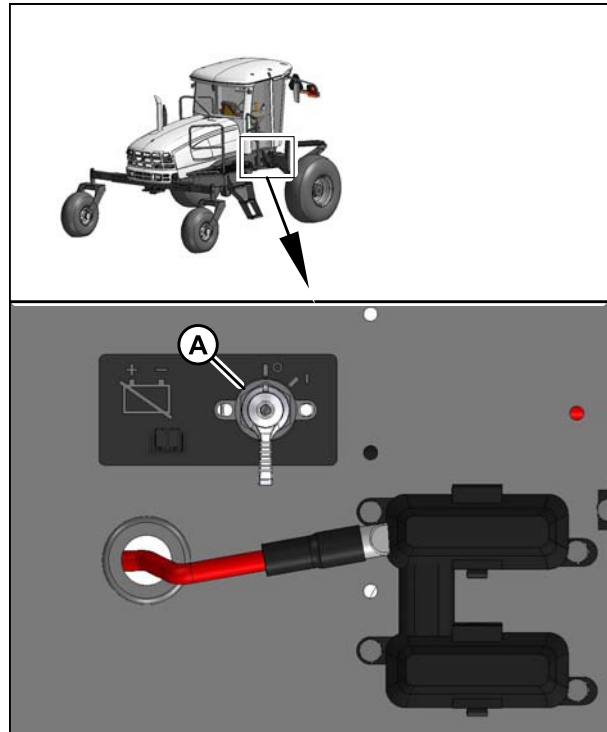


Figure 5.136: Battery Switch

4. Position new batteries (G) on dual battery support.
- NOTE:** Ensure that batteries are positioned so that the positive posts (C) face aft.
5. Install strap (F) with bolts (E).
 6. Rotate bar (B) into position and secure with bolt (A).
 7. Connect battery cables. Refer to [Connecting Batteries](#), [page 335](#).
 8. Close the platform. Refer to [5.5.2 Closing Platforms \(Standard Position\)](#), [page 270](#).

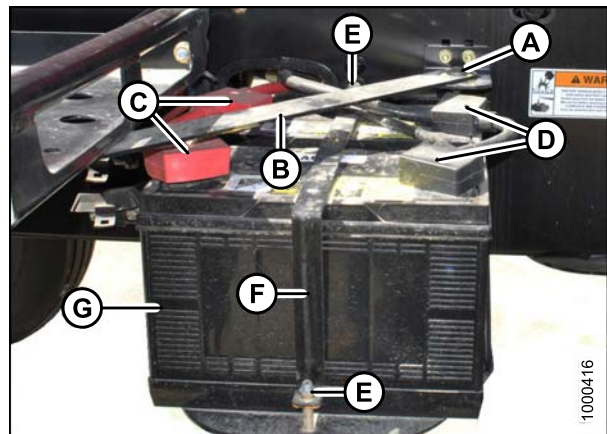


Figure 5.137: Battery Location

MAINTENANCE AND SERVICING

Connecting Batteries

1. Stop the engine and remove the key.
2. Open the right cab-forward platform to expose the batteries. Refer to [5.5.1 Opening Platforms \(Standard Position\)](#), page 269.
3. The battery main disconnect switch (A) is located on the right-hand frame rail beside the batteries. Ensure battery switch (A) is switched to POWER OFF position.
4. Remove cable ties securing battery cables to battery clamp.

IMPORTANT:

BATTERY IS NEGATIVE GROUNDED. Always connect red starter cable to the positive (+) terminal of battery and black ground cable to negative (-) terminal of battery. Reversed polarity in battery or alternator may result in permanent damage to electrical system.

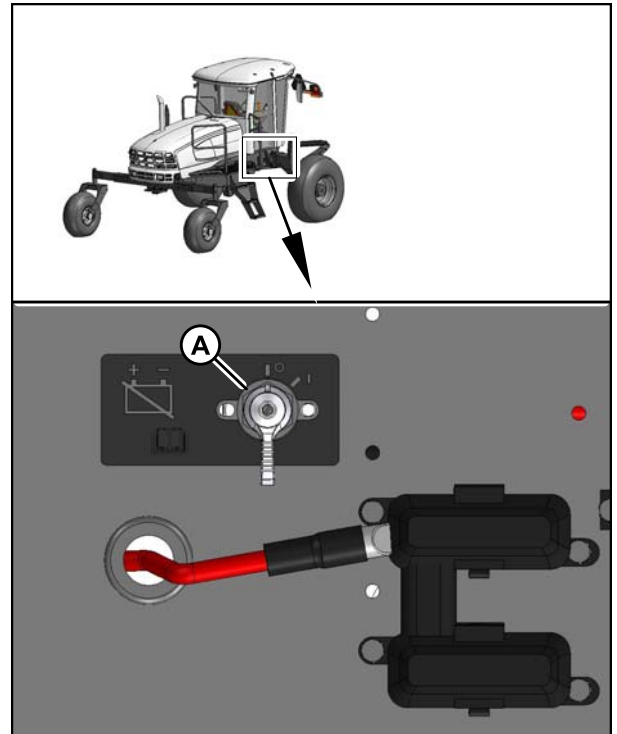


Figure 5.138: Battery Switch

5. Remove plastic caps from battery posts.
6. Attach positive (red) cable terminals to positive post (A) on batteries and tighten. Reposition plastic covers onto clamps.
7. Attach negative (black) cable terminals to negative post (B) on batteries and tighten clamps.
8. Turn battery switch to POWER ON position.
9. Close the platform, refer to [5.5.2 Closing Platforms \(Standard Position\)](#), page 270.

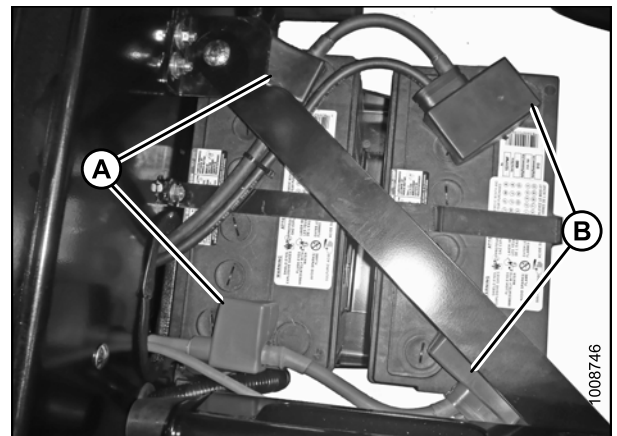


Figure 5.139: Batteries

Headlights: Engine-Forward

Aligning Headlights

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

NOTE: Header should be attached and raised to maintain proper windrower stance.

MAINTENANCE AND SERVICING

1. Position windrower on level ground in front of a vertical surface in accordance with the illustration.
2. Shut down engine and remove key.

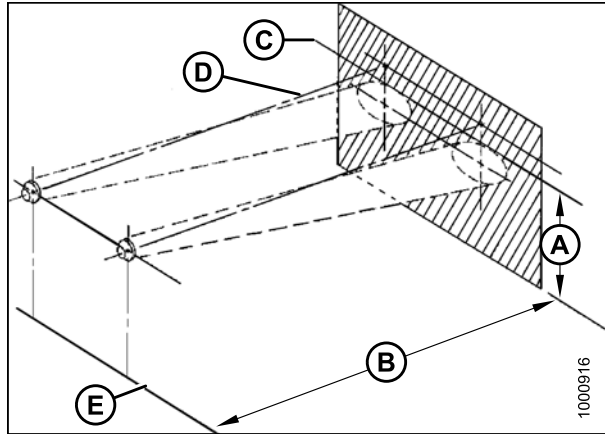


Figure 5.140: Headlight Beam Positioning

A - 49.75 in. (1263 mm) Maximum B - 25 ft (7.5 m)
 C - Top Edge of Beam D - Beam Centered on Direction
 E - Ground of Travel Line

3. Turn on ROAD lights and switch to low-beam.

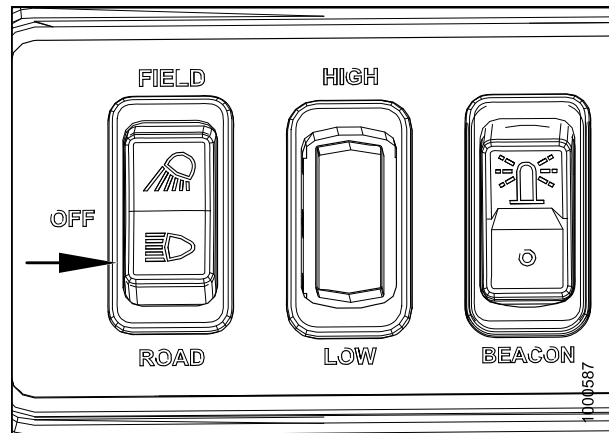


Figure 5.141: Road Light Switch

4. Align the headlights to the following specifications by turning adjusting screws (A).
 - Adjustments are for low-beam.
 - Light beams laterally centered on the direction of travel line from the headlights (that is, **NOT** skewed left or right).
 - Upper limit of the beam **NOT** higher than 49-3/4 in. (1263 mm) above ground at a distance of 25 ft. (7.5 m) from the headlight.



Figure 5.142: Headlights

MAINTENANCE AND SERVICING

3. Pinch the wire retainer (A) and lift away from hooks.
4. Remove bulb (B) from body.

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.

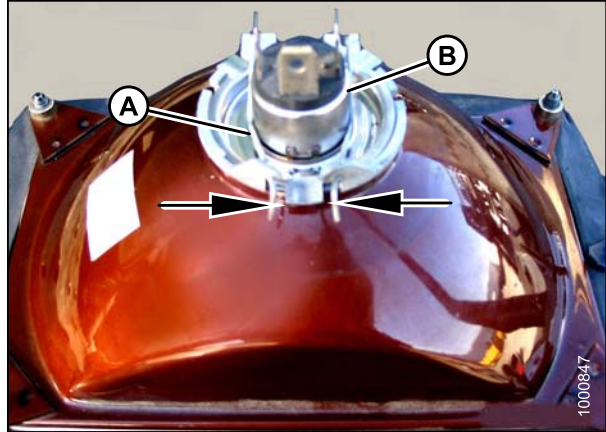


Figure 5.146: Headlight Assembly

5. Align lugs (B) on new bulb with slots (C) in body and push into place.
6. Secure bulb with wire retainer (A).

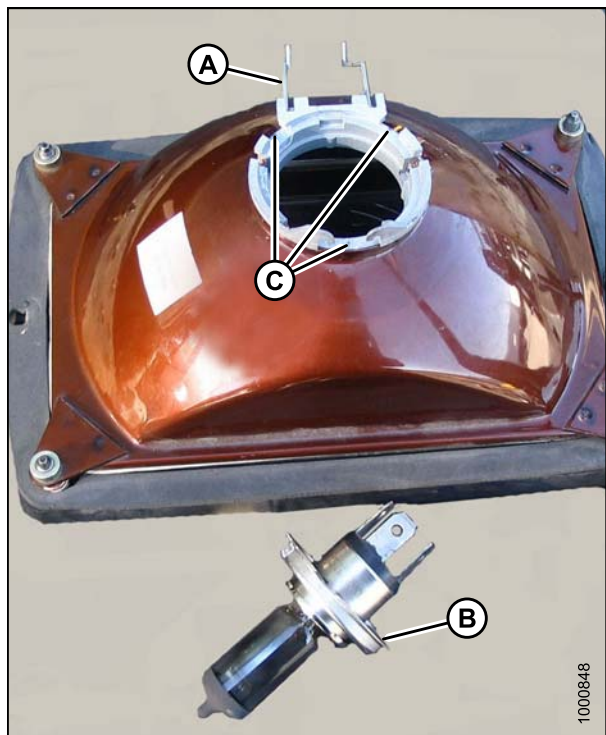


Figure 5.147: Headlight Assembly

MAINTENANCE AND SERVICING

7. Replace rubber insulator boot (A).
8. Push connector onto light bulb.

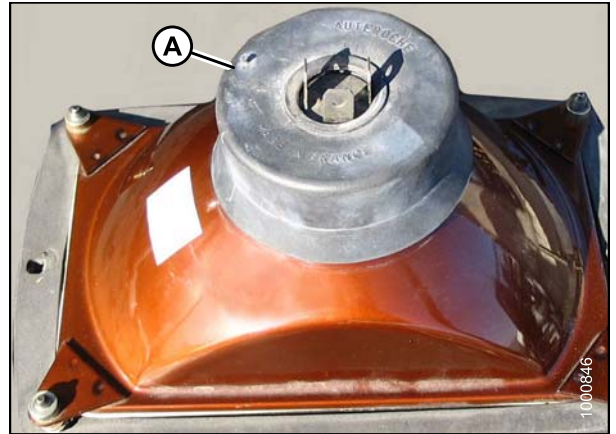


Figure 5.148: Headlight Assembly

9. Position headlight into light receptacle, ensuring top is up, and secure with screws (A).

NOTE: Aligning of light should not be necessary.



Figure 5.149: Headlight Assembly

Field Lights: Cab-Forward

Adjusting Field Lights

The field lights are best adjusted with the machine in the field (or equivalent) to suit Operator preference.

⚠ DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Hold onto handholds (A) on the cab front corners, and stand on header anti-slip strips.

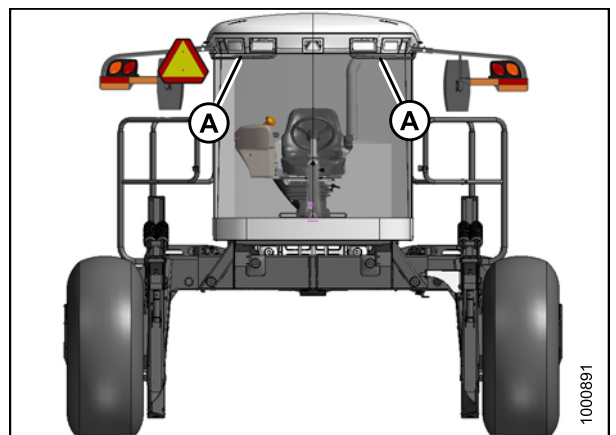


Figure 5.150: Field Lights

MAINTENANCE AND SERVICING

2. Adjust lights with screws (A).

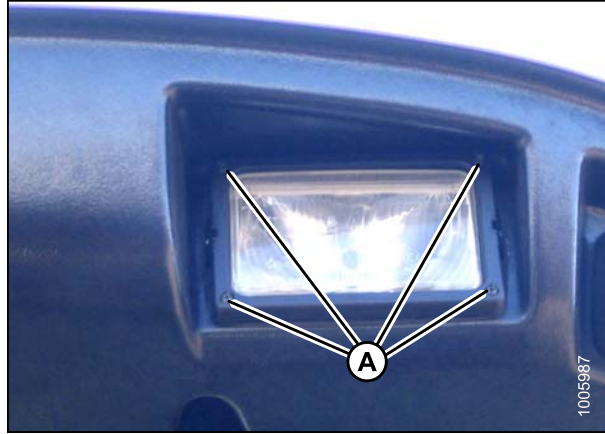


Figure 5.151: Field Lights

Replacing Field Light Bulb

1. Remove two screws (A), and remove light assembly.
2. Replace bulb as described in [Replacing Field Light Bulb, page 340](#).

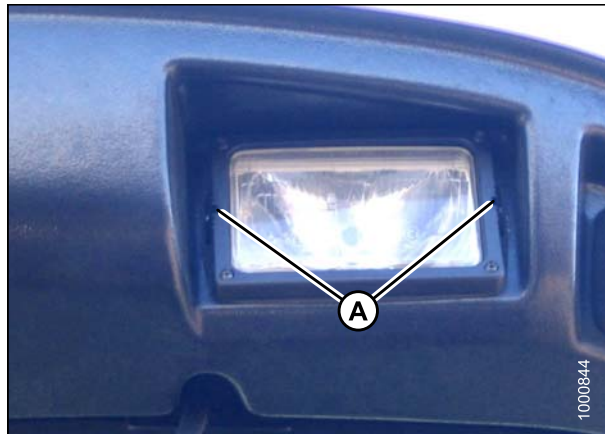


Figure 5.152: Field Lights

Flood Lights: Forward

Adjusting Forward Flood Lights

The forward flood lights are **NOT** adjustable.

Replacing Bulb in Cab-Forward Flood Light

Replace bulbs as follows:

1. Shut down engine and remove key. Turn lights OFF.

MAINTENANCE AND SERVICING

2. Hold onto the handholds (A) on the cab front corners and stand on the header anti-slip strips when removing the forward field lights.
3. Remove two screws (B) and remove light bezel (C).
4. Remove light from receptacle.

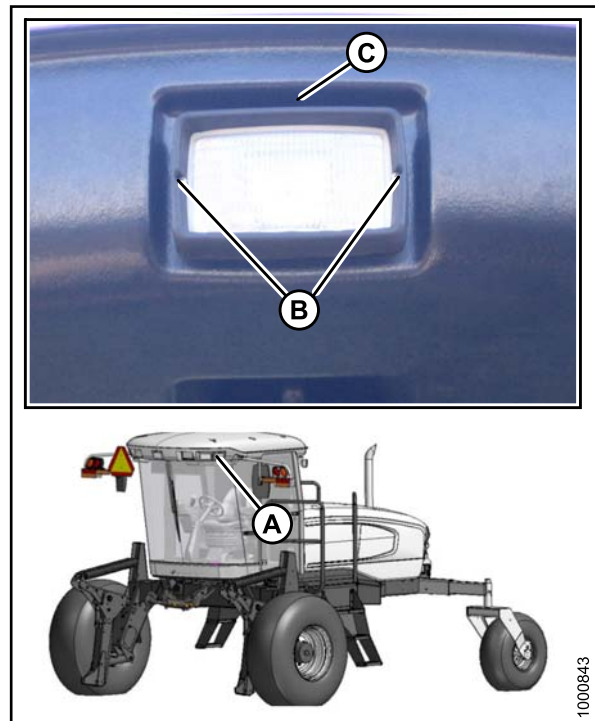


Figure 5.153: Forward Flood Lights

5. Pinch the wire retainer (A) and lift away from hooks.
6. Remove bulb (B) from body and pull wire from connector (C).

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.

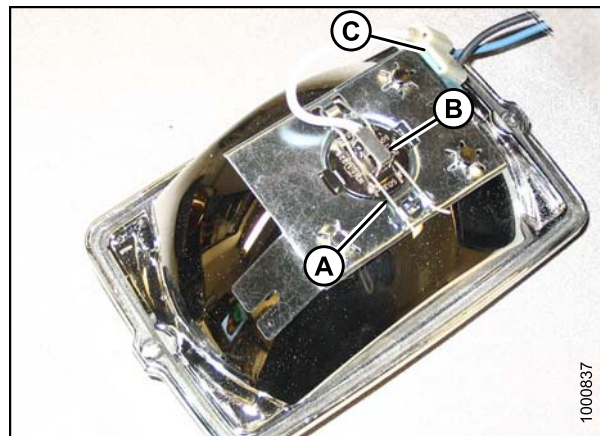


Figure 5.154: Flood Light Assembly

MAINTENANCE AND SERVICING

7. Match slots on new bulb (B) with lugs (D) in optical unit and insert bulb into unit.
8. Secure bulb with wire retainer (A).
9. Push wire into connector (C).

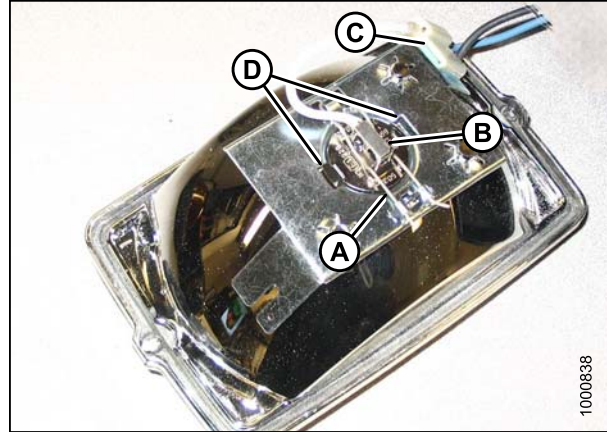


Figure 5.155: Flood Light Assembly

10. Position light into light receptacle, ensuring top is up and secure with bezel (C) and screws (B).

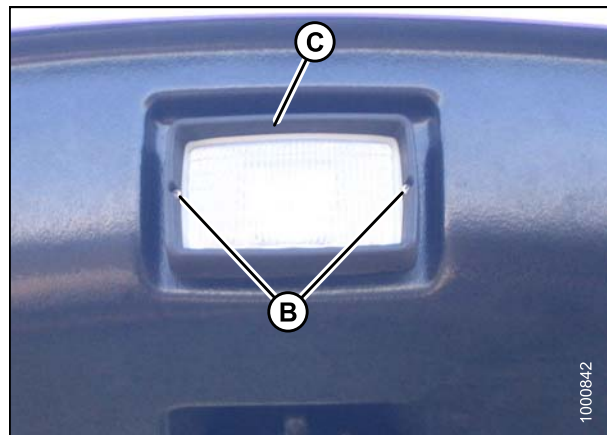


Figure 5.156: Forward Flood Light

HID Auxiliary Lighting (Optional - MD #B5596)

Two optional High Intensity Discharge (HID) lights provide additional lighting during field operation. They operate only in cab-forward mode.

MAINTENANCE AND SERVICING

Adjusting HID Auxiliary Lights (if Installed)

If installed, HID auxiliary lights are best adjusted with the machine in the field (or equivalent) to suit Operator preference.

1. Shut down engine and remove key. Turn lights ON.
2. Loosen bolt (A) and nut (B) (located inside light / mirror support).
3. Position light to desired position.
4. Tighten bolt (A) and nut (B).

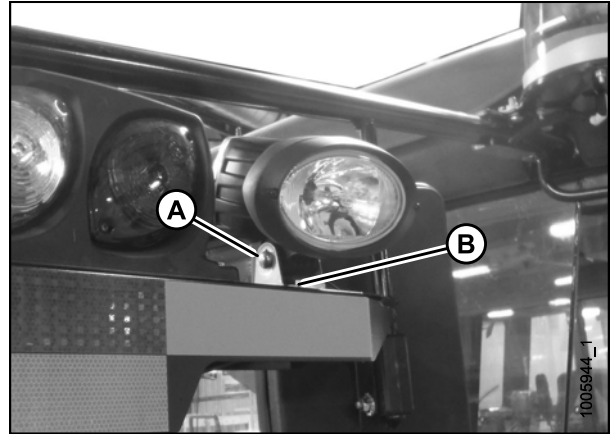


Figure 5.157: HID Auxiliary Lights

Replacing HID Lamp (if Installed)

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Shut down engine and remove key. Turn lights OFF.

NOTE: Hold onto the handholds on the cab front corners and stand on the header anti-slip strips, or stand on the maintenance platform when accessing the HID auxiliary lights.

2. Disconnect lamp connector (A) from electrical harness (B).

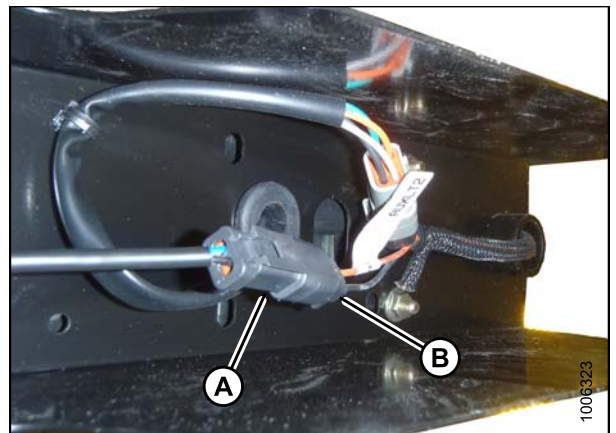


Figure 5.158: HID Auxiliary Light Harness

MAINTENANCE AND SERVICING

3. Remove grommet (A) from light support (B).
4. If replacing lamp and bracket assembly, remove nut (C) and spring washer from inside light support (B) and remove light assembly.

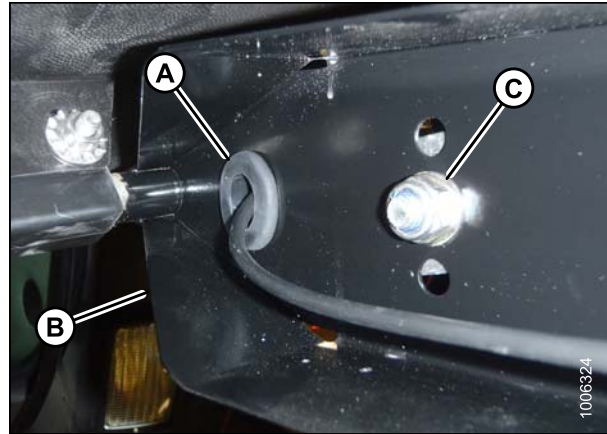


Figure 5.159: HID Light Assembly

5. If replacing the lamp only, remove the nut, spring washer and bolt (A) securing lamp (B) to lamp bracket (C) and remove lamp (B).
6. If installing lamp only, position new lamp (B) in lamp bracket (C) and secure with bolt (A), spring washer and nut. Adjust lamp (B) to desired position and tighten bolt (A).

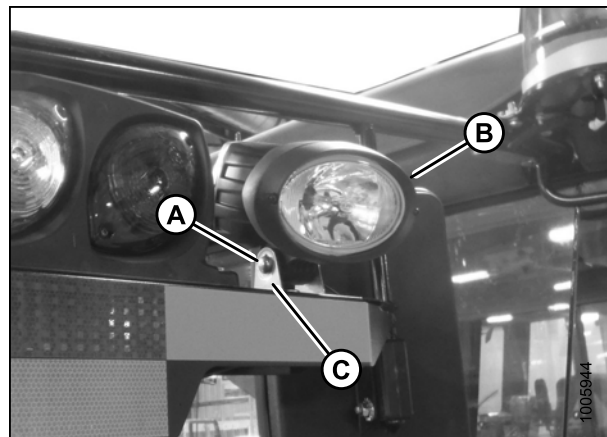


Figure 5.160: HID Auxiliary Lights

7. If installing light/bracket assembly, locate light in center hole in light support (B) and secure with hardware (C) provided with light assembly. Adjust light assembly to desired position and tighten nut (C).
8. Route lamp harness through grommet (A) and slot in light support (B).
9. Reinstall grommet (A) in light support (B).

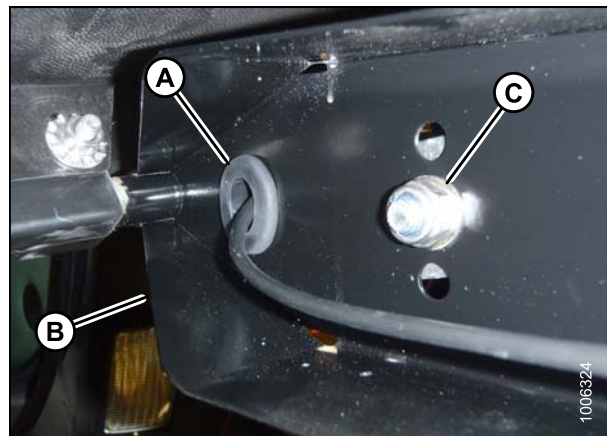


Figure 5.161: HID Light Assembly

MAINTENANCE AND SERVICING

10. Connect lamp plug (A) to main harness connector (B).

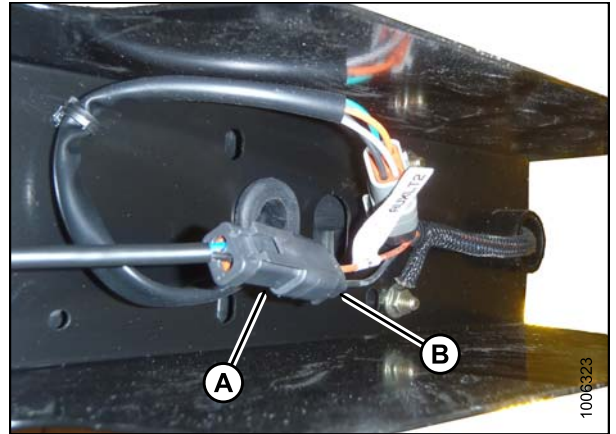


Figure 5.162: HID Auxiliary Light Harness

Flood Lights: Rear

Adjusting Rear Flood Lights

The rear flood lights are best adjusted with the machine in the field (or equivalent) to suit Operator preference.

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Shut down engine, and remove key. Turn lights ON.
2. Loosen bolts (A) and (B).
3. Position light to desired position.
4. Tighten bolts (A) and (B).

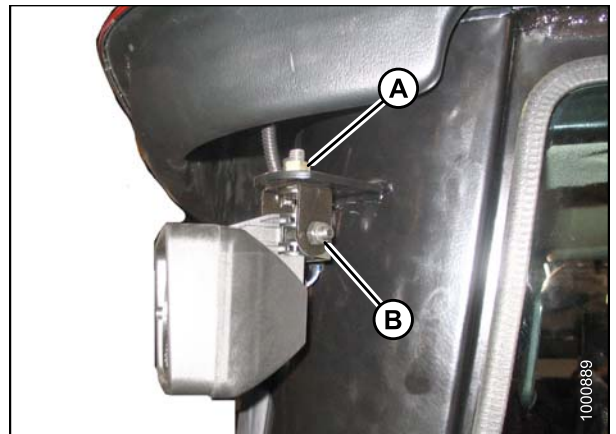


Figure 5.163: Rear Flood Lights

Replacing Bulb in Rear Flood Light

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

MAINTENANCE AND SERVICING

1. Shut down engine, and remove key. Turn lights OFF.
2. Remove two screws (A), and remove light bezel (B).
3. Remove light from receptacle.

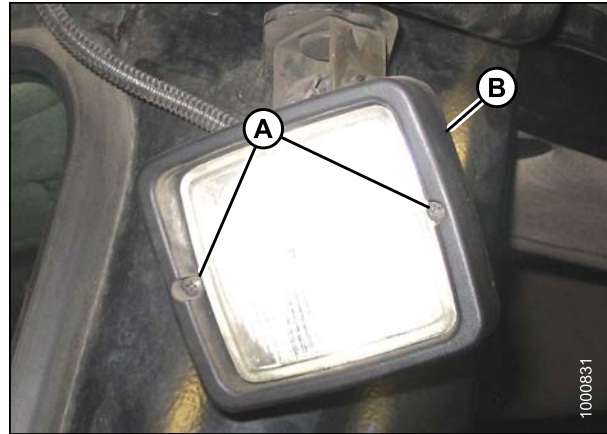


Figure 5.164: Rear Flood Light Assembly

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.

4. Pinch the wire retainer (A), and lift away from hooks.
5. Remove bulb (B) from body, and pull wire from connector (D).
6. Match slots on new bulb (B) with lugs (C) in optical unit and insert bulb into unit.
7. Secure bulb with wire retainer (A).
8. Push wire into connector (D).

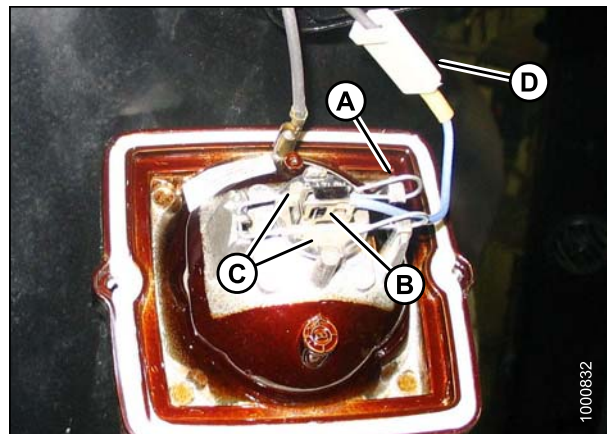


Figure 5.165: Rear Flood Light Assembly

9. Position light into light receptacle, ensuring top is up and secure with bezel (B) and screws (A).

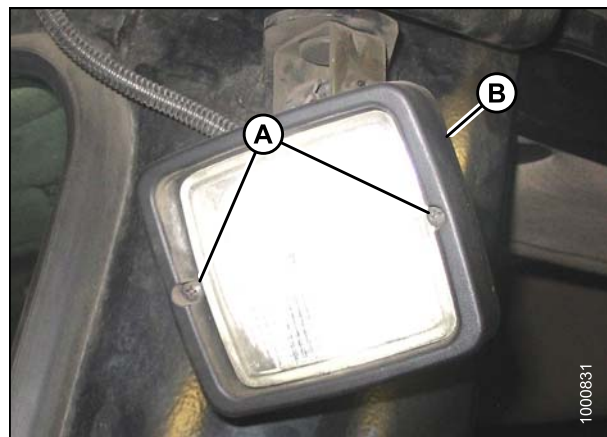


Figure 5.166: Rear Flood Light Assembly

MAINTENANCE AND SERVICING

Red and Amber Lights

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Shut down engine and remove key. Turn lights OFF.

NOTE: Hold onto the handholds (A) on the cab front corners and stand on the header anti-slip strips, or stand on the maintenance platform when accessing the red and amber lights.

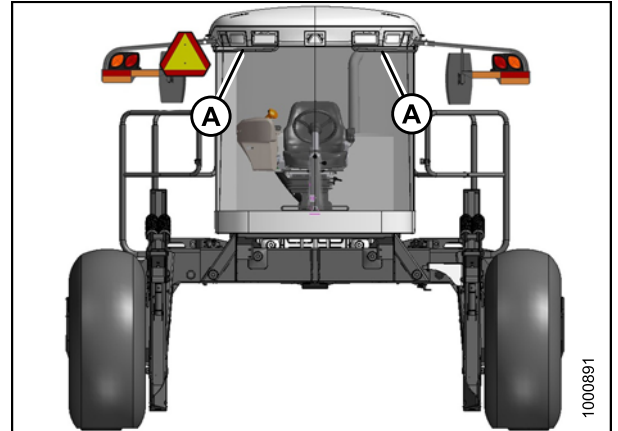


Figure 5.167: Cab Forward Handholds

2. Remove two screws (A) from lens and remove lens.
3. Push and twist light bulb to remove from socket.
4. Install new bulb in socket ensuring that bulb base is properly engaged in socket. Use Bulb Trade #1157 for red tail lights and #1156 for amber lights.
5. Reinstall lens with screws (B).

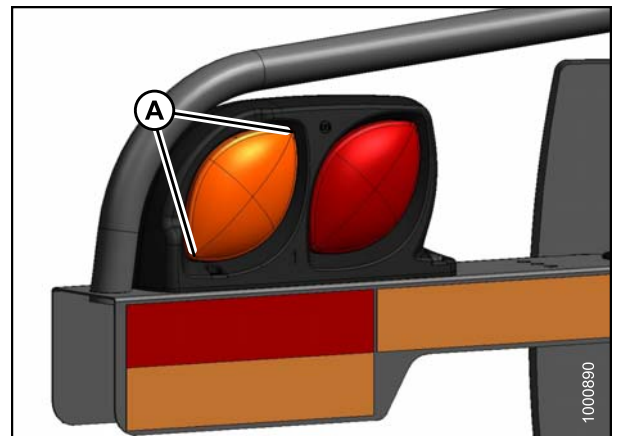


Figure 5.168: Red and Amber Lights

Red Tail Lights (if installed)

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Shut down engine and remove key. Turn lights OFF.

MAINTENANCE AND SERVICING

2. In the grill of the hood, remove two screws (A) from light (B), and remove light.
3. Remove connector from light.
4. Connect wiring harness to new light (B) and install light with screws (A).

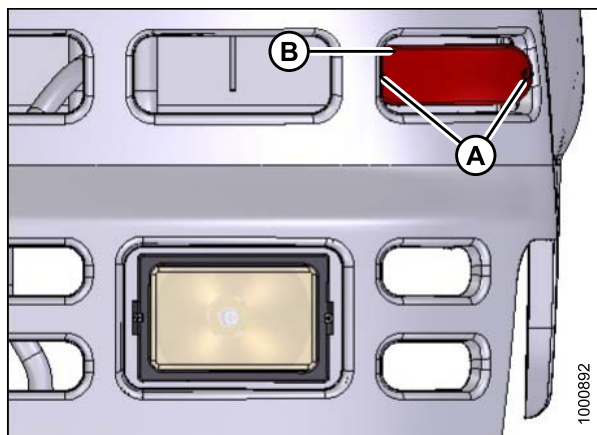


Figure 5.169: Red Tail Lights

Beacons (if installed)

Warning beacons are available as an optional Dealer-installed attachment (MD #B5582).

1. Shut down engine and remove key. Turn beacons OFF.

NOTE: Hold onto the handholds (B) on the cab front corners, and stand on the header anti-slip strips, or stand on the maintenance platform when accessing the beacons (A).

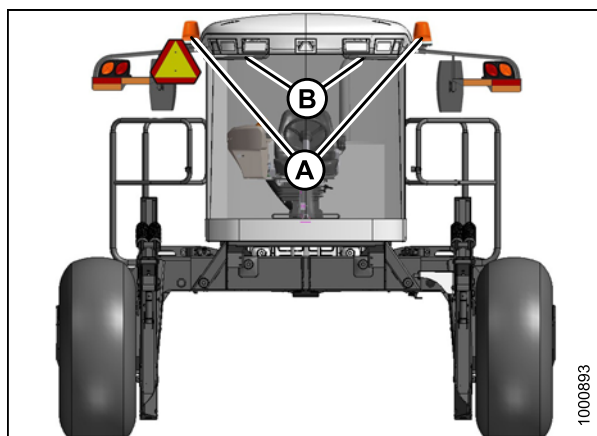


Figure 5.170: Warning Beacons

2. Turn lens (A) counterclockwise to unlock lens from base and remove lens.

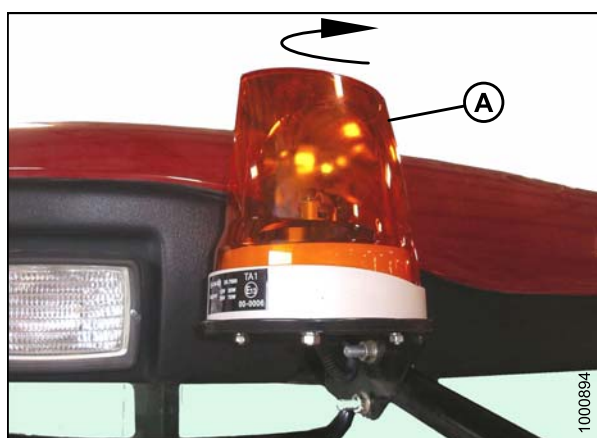


Figure 5.171: Warning Beacons

MAINTENANCE AND SERVICING

3. Pinch retainer (A) and remove it from lamp socket.
4. Pull lamp out of socket.

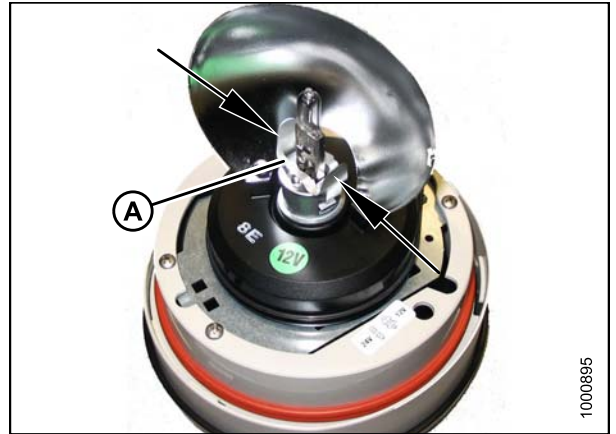


Figure 5.172: Beacon Lamp Assembly

5. Disconnect harness from lamp.

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.



Figure 5.173: Beacon Lamp Assembly

MAINTENANCE AND SERVICING

6. Connect harness to new lamp, place lamp in socket, and line up the flat side on lamp with recess in socket.



Figure 5.174: Beacon Lamp Assembly

7. Place retainer (A) over lamp and pinch tabs to secure retainer to socket.

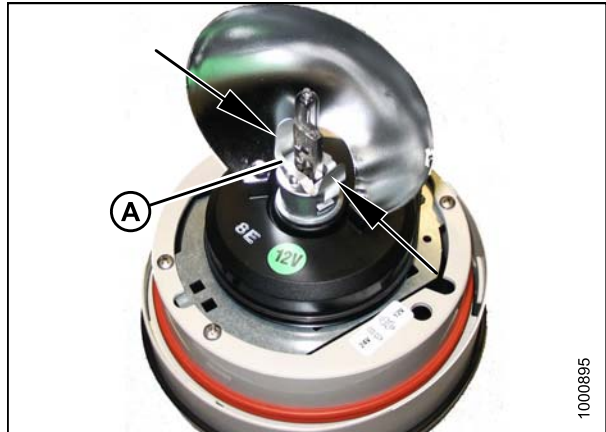


Figure 5.175: Beacon Lamp Assembly

MAINTENANCE AND SERVICING

- 8. Line up the three lugs (one is longer) in the base with slots in lens, and seat the lens against the rubber seal.

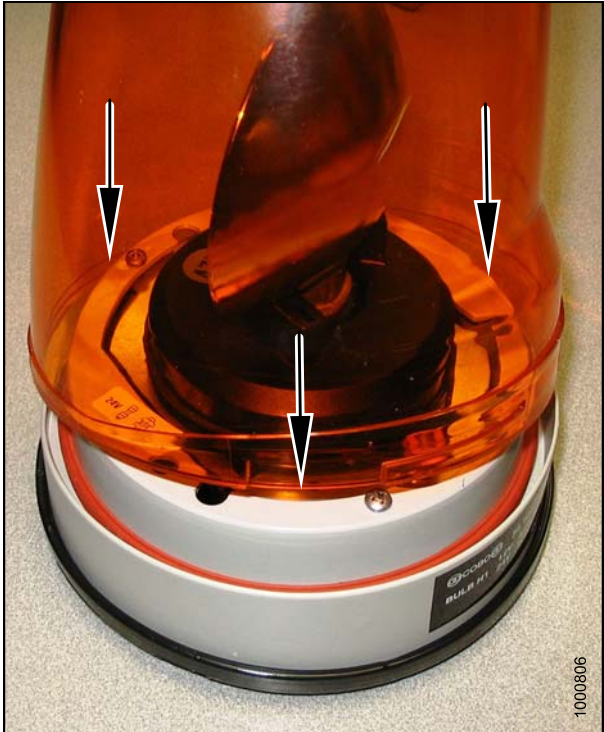


Figure 5.176: Beacon Lamp Assembly

- 9. Turn the lens clockwise to lock it in place.

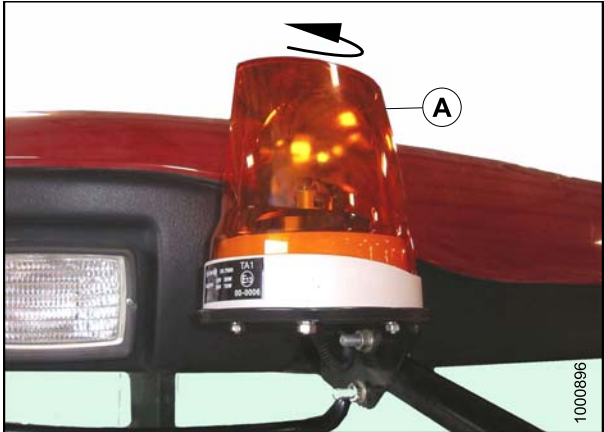


Figure 5.177: Warning Beacons

MAINTENANCE AND SERVICING

Console Gauge Light

To replace a light inside one of the console gauges, follow these steps:

1. Shut down engine and remove key. Turn lights OFF.
2. Remove the appropriate gauge access hole decal (A) behind the operator's console.

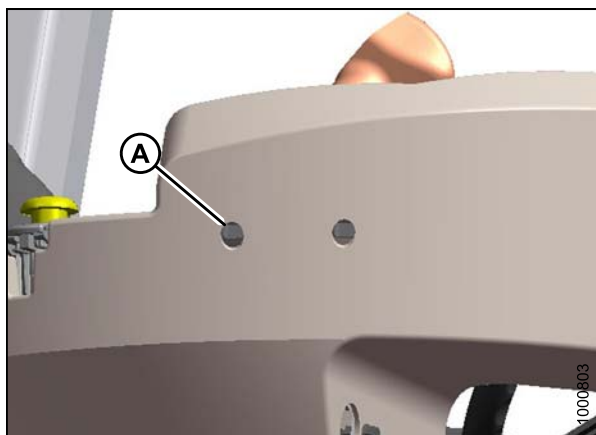


Figure 5.178: Operator Console

3. Remove nut (B) securing mounting bracket (C) to gauge inside the console.
4. Pull gauge out from console. It is **NOT** necessary to disconnect the wiring harness to back of gauge.
5. Twist bulb holder (D) counterclockwise until loose and pull bulb holder from back of gauge.
6. Insert new bulb into gauge and turn clockwise until it locks.
7. Push gauge into console.
8. Locate bracket (C) onto back of gauge and secure with nut (B). Tighten nut.
9. Replace gauge access-hole decal (A).

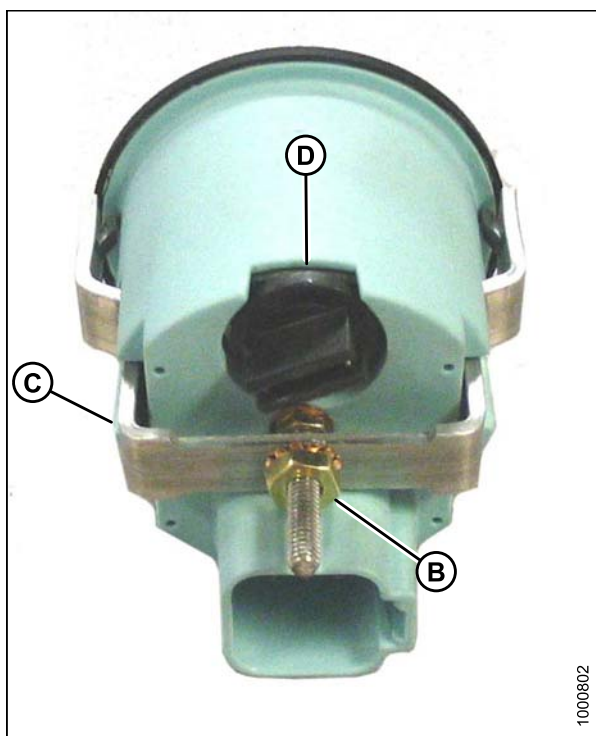


Figure 5.179: Back Of Console Gauge

MAINTENANCE AND SERVICING

Dome Light

To replace a cabin dome light, follow these steps:

1. Shut down engine.
2. Remove two screws (A) from the dome light assembly and remove the assembly.
3. Disconnect the old dome light assembly from the wiring harness.
4. Connect the new dome light MD #183413 to the wiring harness.
5. Install the new dome light with two screws (A).

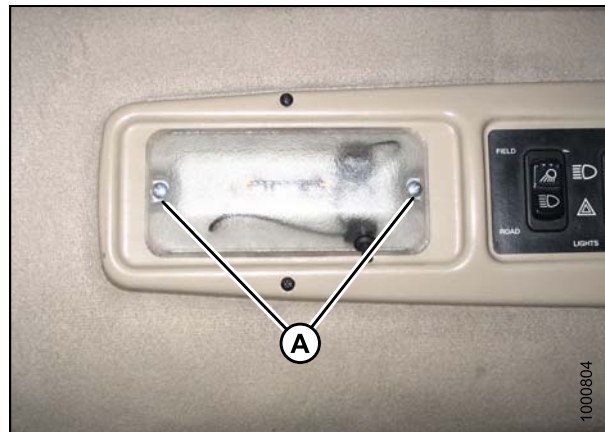


Figure 5.180: Cabin Dome Light

Ambient Light

To replace the ambient light fixture, follow these steps:

1. Shut down engine.
2. Locate the ambient light fixture (A) in the roof liner.

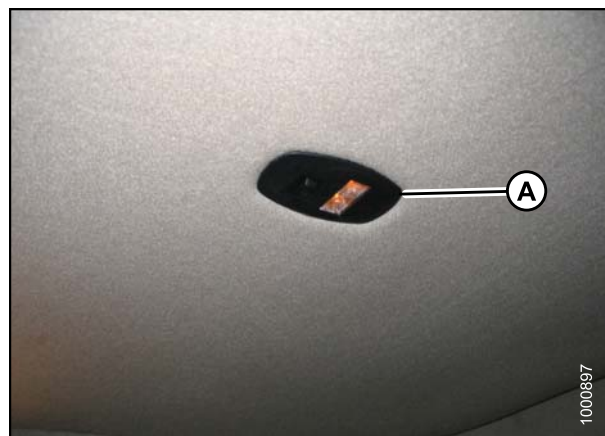


Figure 5.181: Ambient Light Fixture

3. Push against tabs (A) with a screwdriver and pull ambient light fixture out of cab roof.
4. Remove wires from connectors (B).
5. Connect wires to new light fixture.
6. Push into place in cab roof until tabs hold fixture in place.

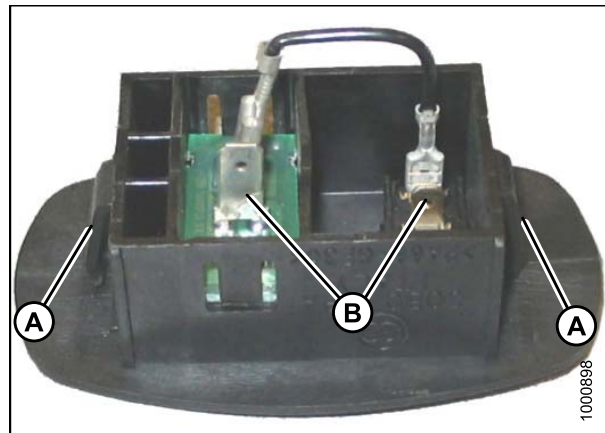


Figure 5.182: Ambient Light Fixture

MAINTENANCE AND SERVICING

Turn Signal Indicators

If the turn signal indicators on the cab display module (CDM) do **NOT** function, contact your MacDon Dealer.

Circuit Breakers and Fuses

The circuit breakers and fuses are located inside the fuse box that is mounted on the frame under the right cab-forward side platform.

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

The circuit breakers automatically reset. Fuses are the plastic blade type.

Access the breakers and fuses as follows:

1. Stop engine and remove key.
2. Move right cab-forward side platform rearward (cab-forward).
3. Remove wing nut (A) and remove fuse box cover (B).
4. Refer to decal on inside of cover for identification of fuses and circuit breakers.
5. A cover may be installed over the circuit breaker. Remove it to access the breaker.

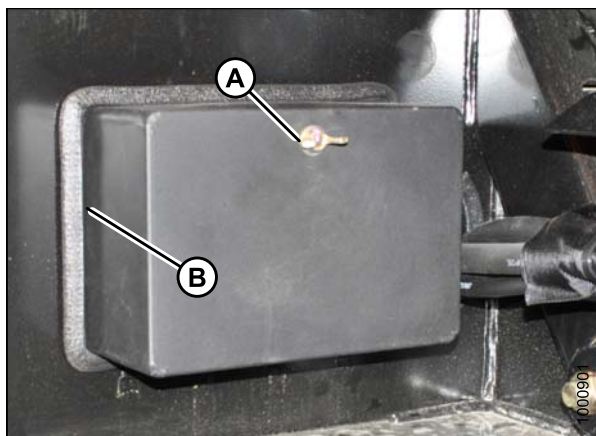


Figure 5.183: Fuse Box

Checking and Replacing Fuses

1. To check fuse, pull fuse (A) out of receptacle and visually examine.
2. To replace fuse, insert new fuse into receptacle.

IMPORTANT:

Replacement fuses should match rating on decal shown on following page.

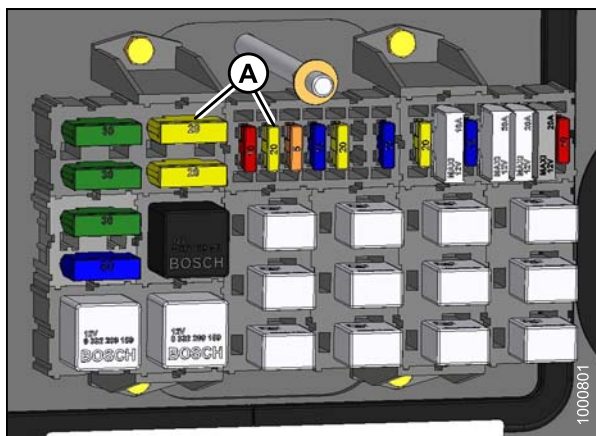


Figure 5.184: Fuses

MAINTENANCE AND SERVICING

Replacing Circuit Breakers and Relays

Access the breakers and relays as follows:

1. Stop engine and remove key.
2. Move right cab-forward side platform rearward (cab-forward).
3. To replace circuit breaker (A), pull breaker out of receptacle and install new circuit breaker.
4. To replace relay (B), pull relay out of receptacle and install new relay.
5. Reinstall cover and secure with wing nut.

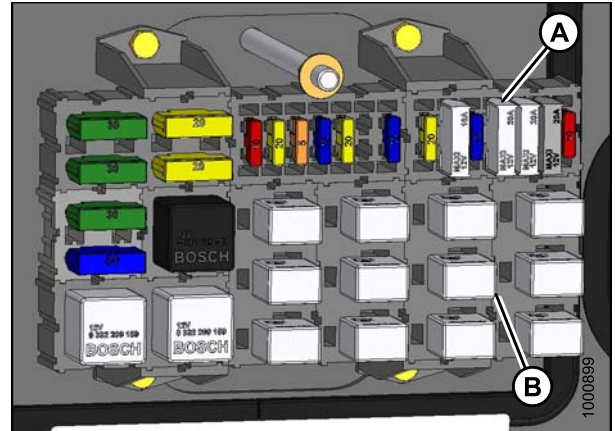


Figure 5.185: Relays and Breakers

MAINTENANCE AND SERVICING

Fuse Box Decal

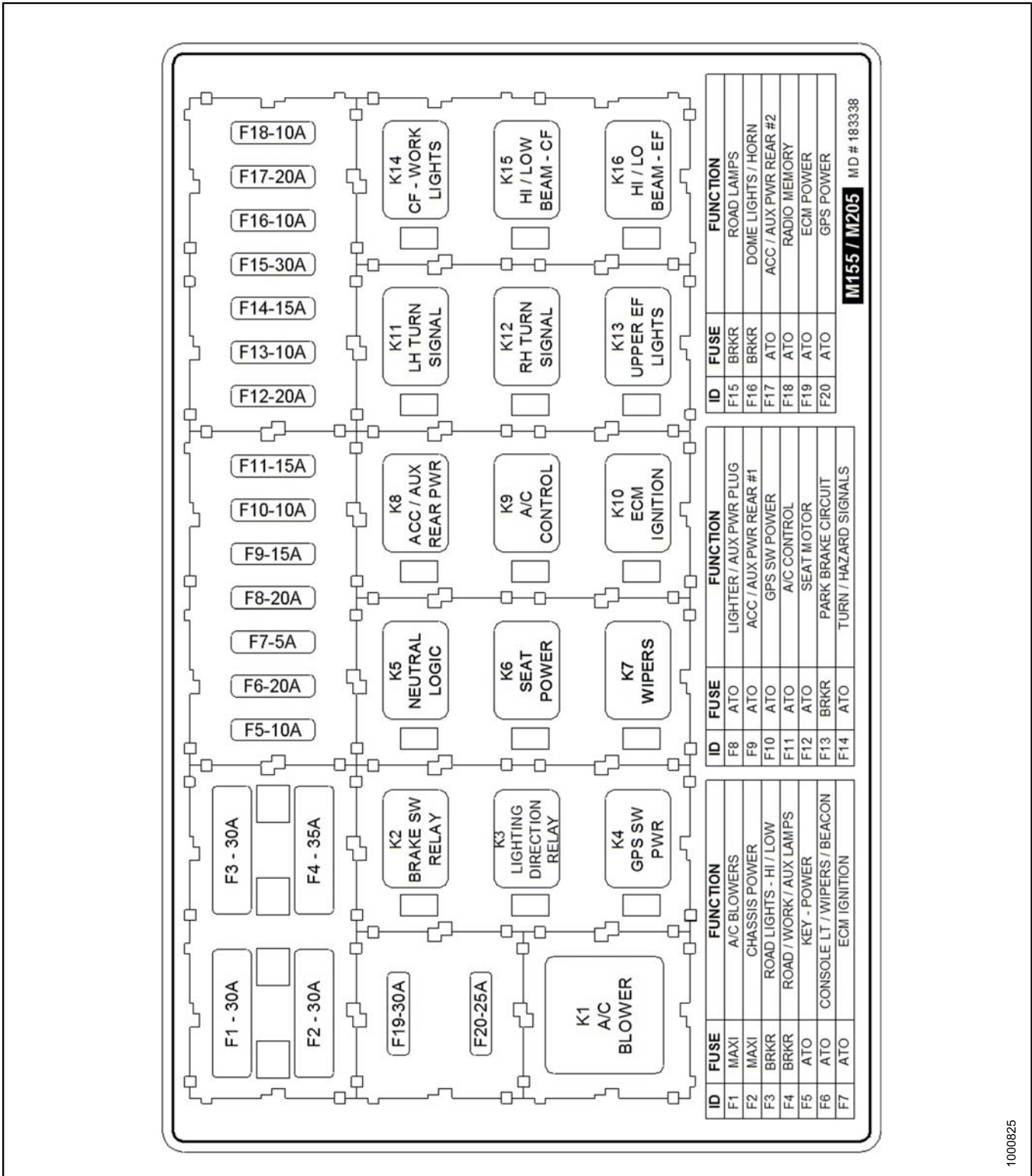


Figure 5.186: Fuse Decal

1000825

MAINTENANCE AND SERVICING

Inspecting and Replacing 125-Amp Main Fuses

The 125-amp main fuse holders are located on the frame under the right cab-forward side platform beside the battery.

Access the 125-amp main fuses as follows:

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Stop engine and remove key.
2. Move right cab-forward side platform rearward (cab-forward).
3. To check condition of fuse (A), pull tab (A) and open cover (B).

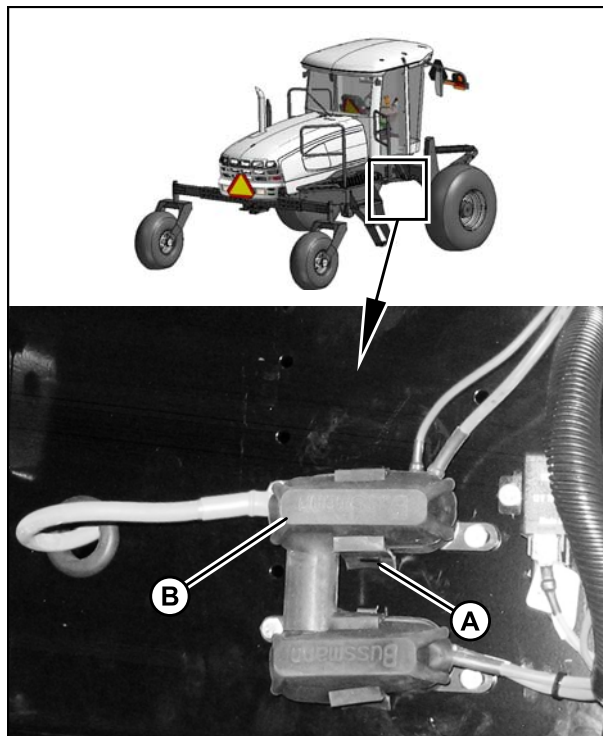


Figure 5.187: 125-Amp Main Fuses

MAINTENANCE AND SERVICING

4. Visually examine fuse (B) for indications of melting.
5. To remove fuse (B), remove two nuts (C) and pull fuse free from holder. Existing wiring may need to be pulled off the stud first.
6. Install new fuse on studs and any existing wiring that was removed.
7. Secure with nuts (C).

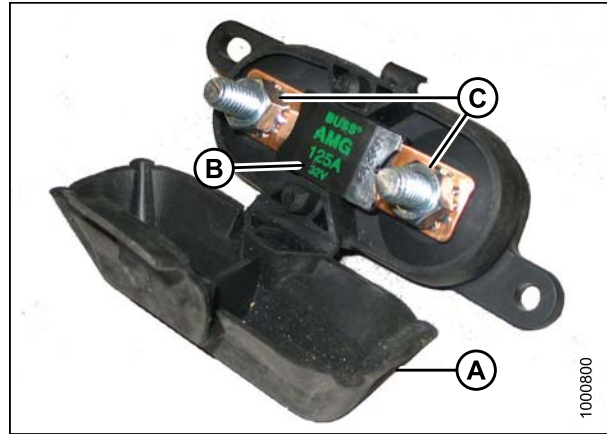


Figure 5.188: 125-Amp Main Fuse

8. Close cover (B) and secure with tab (A).
9. Return platform to operating position. Ensure lock engages.

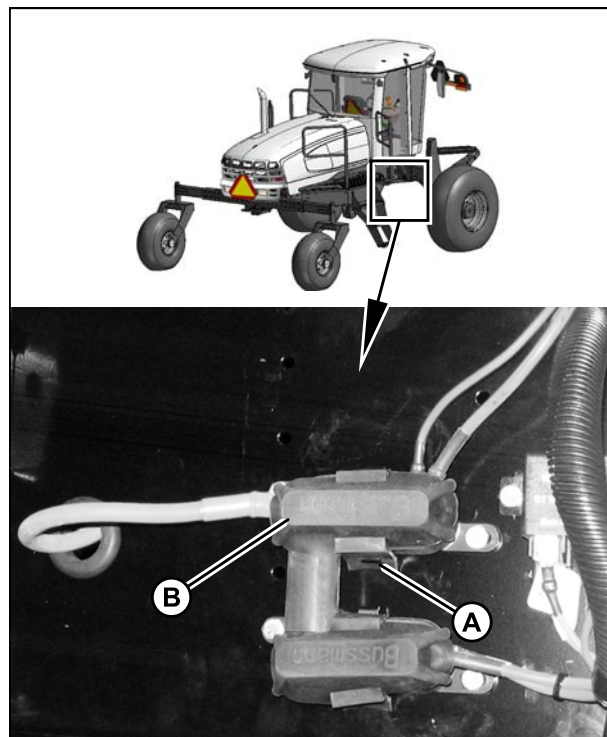


Figure 5.189: 125-Amp Main Fuses

MAINTENANCE AND SERVICING

5.7.9 Hydraulic System

The M155 windrower hydraulic system provides oil pressure for the windrower drive system, the header lift, and drive systems.

WARNING

- Avoid high pressure fluids. Escaping fluid can penetrate the skin causing serious injury. Relieve pressure before disconnecting hydraulic lines.
- Tighten all connections before applying pressure. Keep hands and body away from pin-holes and nozzles which eject fluids under high pressure.



Figure 5.190: Hydraulic Pressure Hazard

WARNING

- Use a piece of cardboard or paper to search for leaks.
- If ANY fluid is injected into the skin, it must be surgically removed within a few hours by a Doctor familiar with this type of injury or gangrene may result.

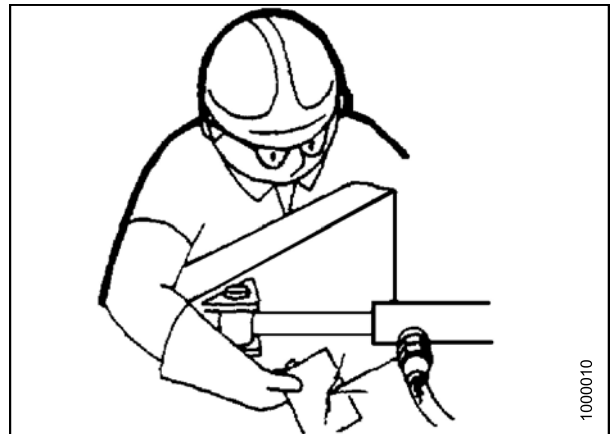


Figure 5.191: Checking Hydraulic Leaks

IMPORTANT:

- Dirt, dust, water, and foreign material are the major causes of trouble developing in the hydraulic system.
- If the hydraulic system should be disconnected for service, protect the ends of hoses, tubing, and ports of components from contamination with clean, lint-free towels, or clean plastic bags.
- Before installing any replacement hose, flush the inside of it with unused diesel fuel or unused commercial petroleum cleaning solvent for ten seconds minimum. Do **NOT** use water, water soluble cleaners, or compressed air.
- The components in this system are built to very close tolerances and have been adjusted at the factory. Do **NOT** attempt to service these components except to maintain proper oil level, change oil and filters, and to adjust relief pressures as described in this manual. See your MacDon Dealer for all other service.

MAINTENANCE AND SERVICING

Checking and Filling Hydraulic Oil

Follow these steps to check and fill the hydraulic oil:

1. Park windrower on level ground and lower header and reel so that lift cylinders are fully retracted.
2. Stop the engine and remove the key.
3. Open the hood. Refer to [5.4.1 Opening Hood \(Lower Position\)](#), page 266.

NOTE: A sight glass is provided under the hood on the right side of the tank. It indicates oil level and signs of contamination. No oil in the sight glass indicates oil level is below the add mark on the dipstick.

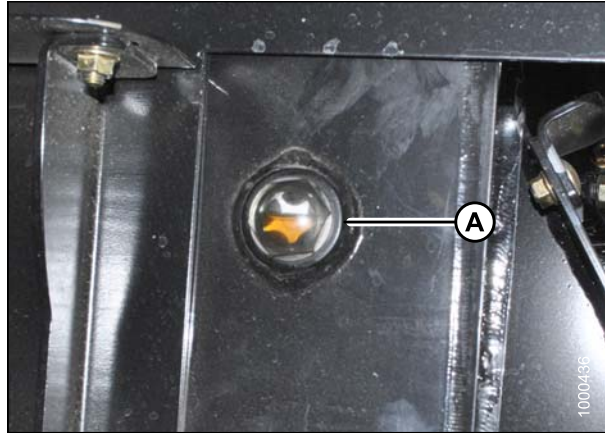


Figure 5.192: Hydraulic Oil Sight Glass

4. Stand on left (cab-forward side) platform to access the filler pipe.
5. Turn filler cap (A) counterclockwise to unlock cap and remove dipstick.

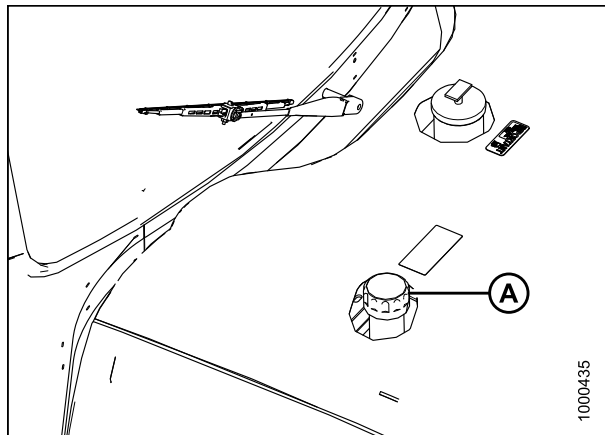


Figure 5.193: Engine Hood

MAINTENANCE AND SERVICING

- If necessary, add oil to maintain a level between the LOW and FULL marks.

Refer to [Lubricants, Fluids, and System Capacities, page 263](#) for hydraulic oil specifications and quantity.

NOTE: When dipstick is showing LOW, approximately 1 US gallon (4 liters) is required to reach the FULL mark.

IMPORTANT:

- Use good quality, prefiltered oil. .
 - Exercise care to prevent debris from falling into tank.
- Reinstall dipstick and filler cap, and turn clockwise to tighten/lock.
 - Close the hood. Refer to [5.4.2 Closing Hood \(Lower Position\), page 267](#).

Hydraulic Oil Cooler

The hydraulic oil cooler is located inside the cooling box behind the radiator.

It should be cleaned daily with compressed air. Refer to [Cleaning Cooler Box Components, page 318](#).

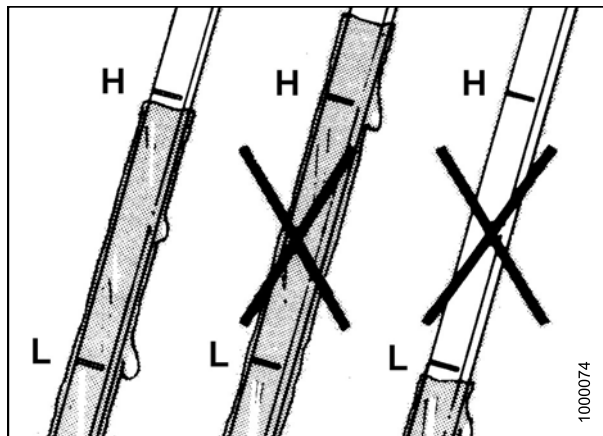


Figure 5.194: Checking Hydraulic Oil

MAINTENANCE AND SERVICING

Draining Hydraulic Oil

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

NOTE: Change hydraulic oil every 1500 hours.

1. Park windrower on level ground and lower header and reel so that lift cylinders are fully retracted.
2. Stop the engine and remove the key.
3. Open the hood. Refer to [5.4.3 Opening Hood \(Highest Position\)](#), page 267.
4. Place a clean container (at least 20 U.S gallons [75 liters]) under drain at the bottom of the hydraulic reservoir to collect the oil.
5. Remove drain plug (A) and allow oil to drain.
6. Clean off any metal debris that may have accumulated on magnetic plug. Wipe plug with a clean cloth. Check O-ring condition. Look for cracking, breakage, or deformation that may impede sealing ability and replace as required.
7. Install drain plug (A).
8. Fill hydraulic oil reservoir. Refer to [Checking and Filling Hydraulic Oil](#), page 360.

Changing Hydraulic Oil Filters

The charge filter (A) and return filter (B) are located just inside the frame on the left side and are accessible from under the windrower. Change as follows:

NOTE: Change hydraulic oil filters after the first 50 hours of operation, and every 500 hours thereafter. Filter (A) MD #112419 and filter (B) MD #151975 can be obtained from your Dealer.

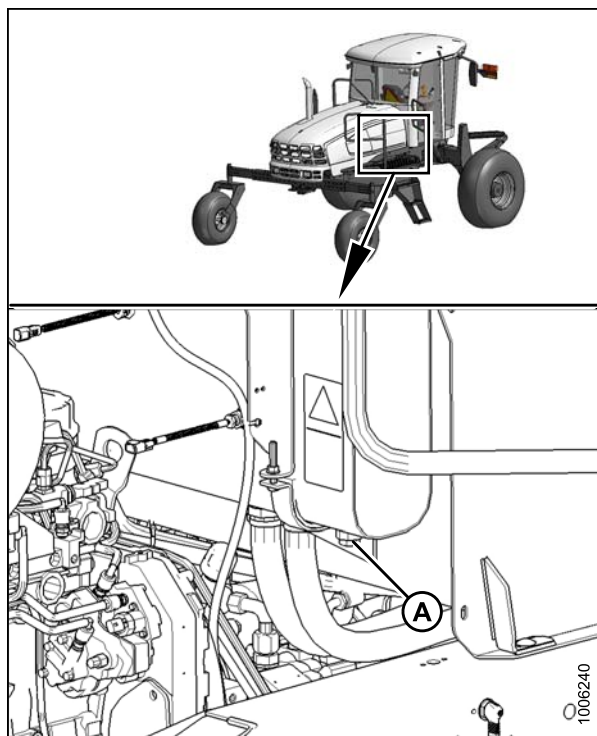


Figure 5.195: Hydraulic Oil Drain Plug

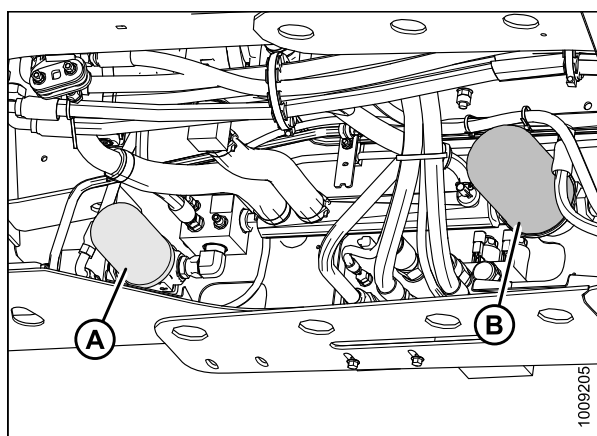


Figure 5.196: Hydraulic Oil Filters

MAINTENANCE AND SERVICING

Charge Filter

The charge filter filters the oil in the windrower hydraulic charge circuit that supplies make up oil for normal losses at motor and pump case drains and associated circuits.

Refer to the following procedures to change the charge filter:

- [Removing Charge Filter, page 363](#)
- [Installing Charge Filter, page 363](#)

Removing Charge Filter

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Stop the engine and remove the key.
2. Clean around head of the filter.
3. Place a container beneath the filter to collect any oil that may leak out.
4. Unscrew filter (A) with a filter wrench.
5. Dispose of used oil and filter in accordance with local environmental legislation.

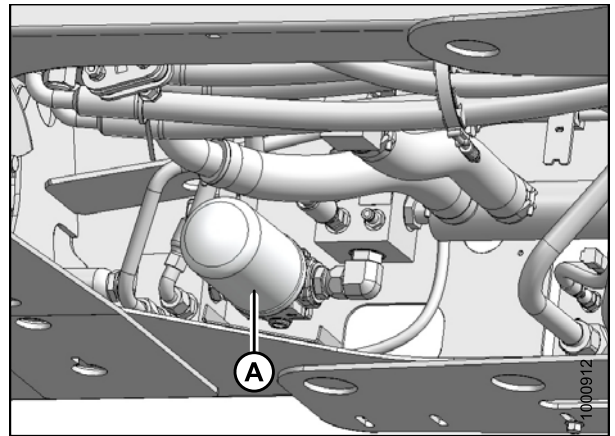


Figure 5.197: Hydraulic System

Installing Charge Filter

NOTE: For charge filter replacement part number, refer to [Filter Part Numbers, page 264](#).

1. Clean the gasket surface of the filter head.
2. Apply a thin film of clean oil to the filter gasket.
3. Screw the new filter (A) onto the mount until the gasket contacts the filter head.
4. Tighten filter an additional 1/2 turn by hand.

IMPORTANT:

Do **NOT** use a filter wrench to install oil filter. Overtightening can damage gasket and filter.

5. Check hydraulic fluid levels, refer to [Checking and Filling Hydraulic Oil, page 360](#). For capacity level, refer to [Lubricants, Fluids, and System Capacities, page 263](#).

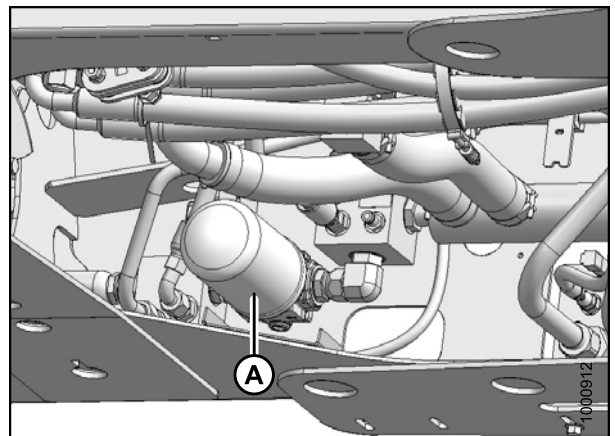


Figure 5.198: Hydraulic System

MAINTENANCE AND SERVICING

Return Filter

The return filter filters the oil in the header drive systems and should be changed after the first 50 hours and then at 500 hour intervals.

To change the return filter, refer to the following procedures:

- [Removing Return Filter, page 364](#)
- [Installing Return Filter, page 364](#)

Removing Return Filter

1. Stop the engine and remove the key.
2. Clean around head of the filter (A).
3. Place a container beneath the filter (A) to collect any oil that may leak out.
4. Unscrew filter (A) with a filter wrench.
5. Dispose of used oil and filter in accordance with local environmental legislation.

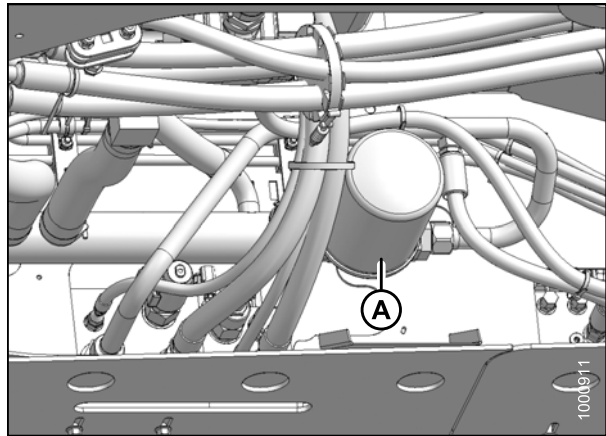


Figure 5.199: Hydraulic System

NOTE: Image showing filter head removed to show component clarity.

6. Remove gasket (C) from groove (B) in filter head (A).

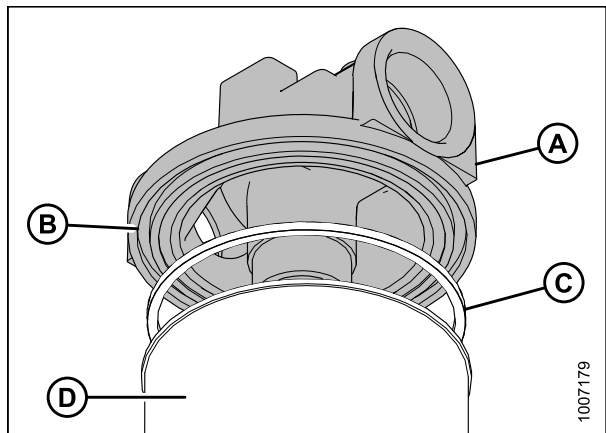


Figure 5.200: Hydraulic System

Installing Return Filter

NOTE: For filter specifications, refer to [Filter Part Numbers, page 264](#).

MAINTENANCE AND SERVICING

NOTE: Image showing filter head removed to show component clarity.

1. Clean the gasket groove (B) in the filter head (A).
2. Apply a thin film of clean oil to the filter gasket (C).
3. Install new gasket into the groove (B) in the filter head (A).
4. Screw the new filter (D) onto the filter head until the gasket contacts the filter.

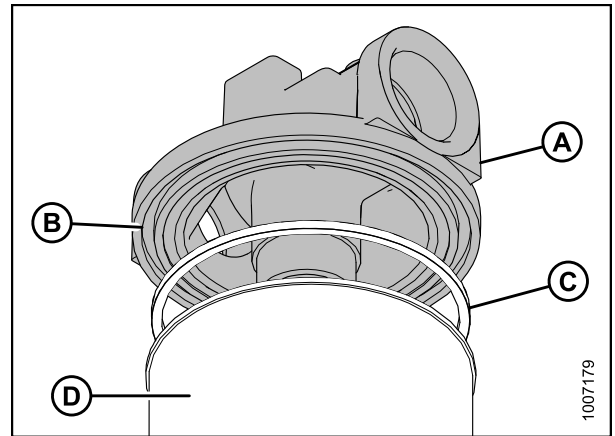


Figure 5.201: Hydraulic System

5. Tighten filter an additional 3/4 turn by hand.

IMPORTANT:

Do **NOT** use a filter wrench to install oil filter. Overtightening can damage gasket and filter.

6. Check hydraulic fluid levels. Refer to [Checking and Filling Hydraulic Oil, page 360](#). For capacity level, refer to [Lubricants, Fluids, and System Capacities, page 263](#).

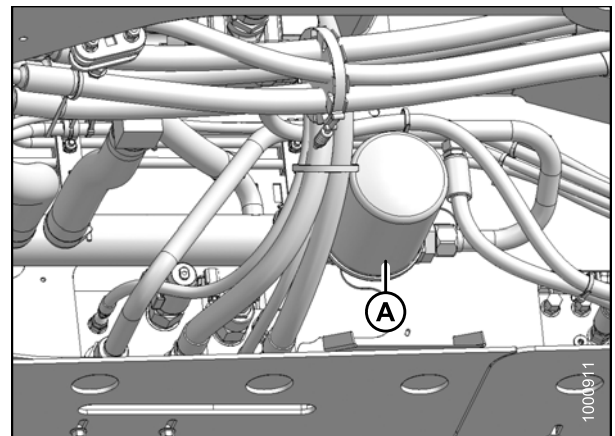


Figure 5.202: Hydraulic System

Header and Reel Hydraulics

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 [5.19 Header Hydraulic Pressures, page 366](#)) the compensator valve in the pump is activated and the header drive will slow down to avoid overheating the drive pumps. At this point, reduce the ground speed to maintain the correct system load and header drive operation.

NOTE: An optional pressure sensor is available to monitor the knife or reel drive hydraulic pressure and provide a warning tone from the cab display module (CDM) if the system pressure approaches a preset limit. The system pressure limit is set during CDM programming. Refer to [7.1.17 Pressure Sensor, page 407](#).

NOTE: The warning tone is only heard if the pressure sensor is installed and enabled.

NOTE: A warning tone is normal when the operating pressure is close to the compensator valve's pressure setting.

MAINTENANCE AND SERVICING

Table 5.19 Header Hydraulic Pressures

Header Model	Application/System	Windrower Absolute Pressure Limit Setting psi (kPa)	Suggested Overload Warning Setting psi (kPa)
R-Series	Disc Pressure	4200 (28,958)	4000 (27,579)
D-Series	Reel/Draper Pressure	3200 (22,063)	3000 (20,684)
A-Series	Knife/Conditioner Pressure	4200 (28,958)	4000 (27,579)

If lift and drive capacity problems develop, the pressure compensator valve may require adjusting. Contact your MacDon Dealer or refer to the technical service manual for your windrower.

Flow Control Blocks

Two hydraulic valve blocks with multiple cartridges are used for the various windrower functions and are controlled by the windrower control module (WCM) according to the inputs from the Operator. The valve blocks are located behind the left cab-forward side 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.

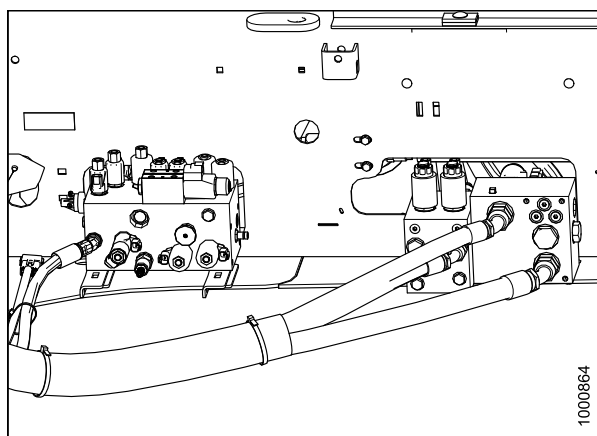


Figure 5.203: Hydraulic Valve Blocks

Adjusting Header Drop Rate

The header should lower gradually when the lower header switch is pressed. From full height to ground should take approximately 3–4 seconds.

If drop rate is too slow, return to cut height or tilt or float presets may time out. This is to keep the hydraulics from being pressurized.

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Lower header to ground, stop the engine, and remove the key.
2. Move left cab-forward side platform rearward. Refer to [5.5.1 Opening Platforms \(Standard Position\), page 269](#).

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- Loosen inner knob (A) on needle valve and then turn outer knob (B),
 - Clockwise to decrease the drop rate,
 - Counterclockwise to increase the drop rate.
- Tighten inner knob (A).
- Check drop rate and readjust as required.
- Close the platform. Refer to [5.5.2 Closing Platforms \(Standard Position\)](#), page 270.

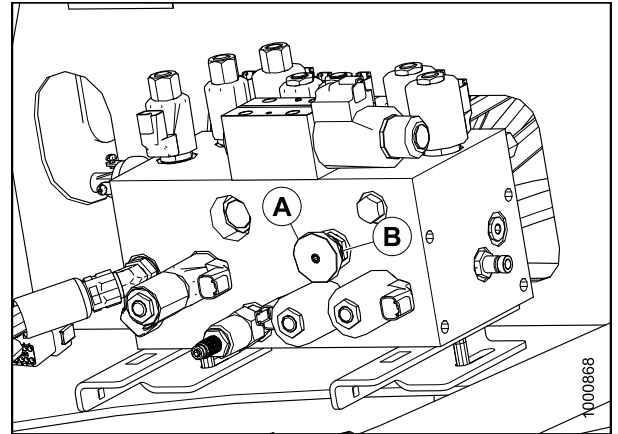


Figure 5.204: Hydraulic Valve Block

Adjusting Reel Drop Rate

The reel should lower gradually when the lower reel switch is pressed. From fully raised to fully lowered should take approximately 3–4 seconds. Drop rate is a customer preference and will vary based on crop type and cutting condition.

NOTE: Drop speed should **NOT** be less than 3 to 4 seconds from all the way up to all the way down as structural damage may result.

NOTE: If drop rate is too slow, return to cut height or tilt or float presets may time out. This is to keep the hydraulics from being pressurized.

- Lower header to ground, stop the engine, and remove the key.
- Open the left cab-forward side maintenance platform. Refer to [5.5.1 Opening Platforms \(Standard Position\)](#), page 269.
- Locate valve (A) installed at port D, it controls the reel drop rate.

NOTE: This valve is only installed with a draper header.

- Loosen setscrew (B) and turn cap (C),
 - Clockwise to decrease the drop rate
 - Counterclockwise to increase the drop rate
- Check drop rate and adjust as required
- Tighten setscrew (B).

NOTE: To reset to factory specifications, fully close the needle valve and open it four turns counterclockwise.

- Close the platform. Refer to [5.5.2 Closing Platforms \(Standard Position\)](#), page 270.

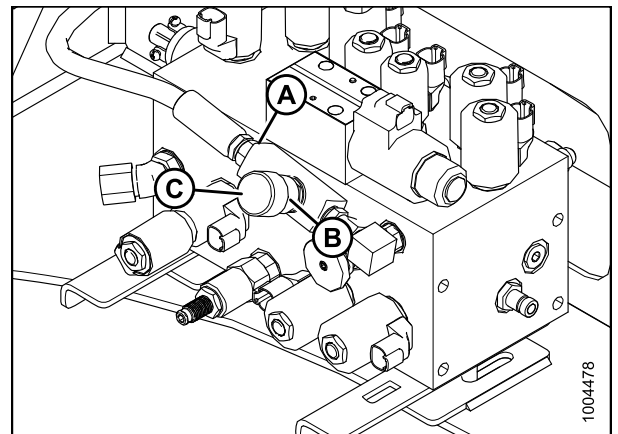


Figure 5.205: Hydraulic Valve Block

MAINTENANCE AND SERVICING

Traction Drive Hydraulics

Transmission Oil Pressure

The windrower transmission consists of two variable displacement axial piston hydraulic pumps, one for each drive wheel.

The pumps are driven through a gearbox from the engine. Each pump requires charge flow to make up for internal leakage, maintain positive pressure in the main circuit, provide flow for cooling, and replace any leakage losses from external valving or auxiliary systems.

The charge pressure is monitored, and if it drops below 250 psi (1725 kPa), the cab display module (CDM) sounds a tone, and displays a flashing warning. Refer to [3.18.4 Cab Display Module \(CDM\) Warning/Alarms, page 82](#).

IMPORTANT:

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 engine, and proceed as follows:

1. Check the hydraulic fluid level in the tank. Refer to [Checking and Filling Hydraulic Oil, page 360](#).
2. Check the hoses and lines for leakage.
3. Check the charge pressure relief valve. Refer to [Checking Charge Pump Pressure, page 368](#).
4. If charge pressure still cannot be maintained, do **NOT** operate the windrower. Contact your MacDon Dealer.

Checking Charge Pump Pressure

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

Incorrect charge pressure settings may result in the inability to build required system pressure and/or inadequate loop flushing flows.

Correct charge pressure **MUST** be maintained under all conditions to maintain pump control performance and to operate the brake release.

Check charge pump pressure as follows:

1. Open hood fully. Refer to [5.4.3 Opening Hood \(Highest Position\), page 267](#).
2. Attach a 0–600 psi (4000 kPa) pressure gauge to a hose that is long enough to allow pressure gauge to be read from the operator's seat.

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3. Locate the test port (A) which is located on the charge filter head. Clean test port fitting and attach hose to the fitting.
4. Start engine and leave at idle. Pressure should be 240–325 psi (1655–2241) kPa) with the hydraulic oil at 100°F (40°C) minimum.
5. Note reading and shut down windrower.
6. If pressure is **NOT** within this range, contact your MacDon Dealer.
7. Otherwise, remove hose from test port and close the hood. Refer to [5.4.4 Closing Hood \(Highest Position\)](#), page 268.

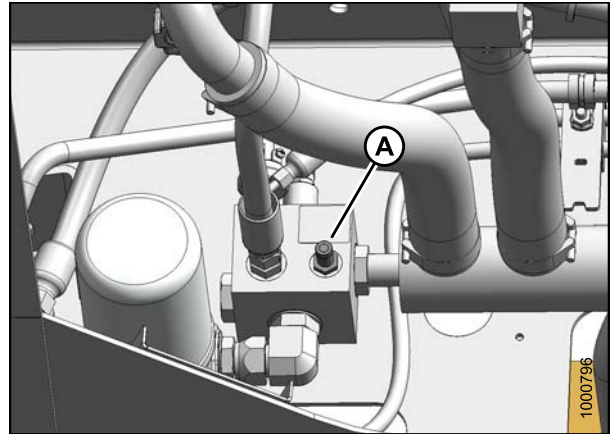


Figure 5.206: Charge Pump Test Port

A - Charge Pump Test Port

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 pressure before disconnecting hydraulic lines. Tighten all connections before applying pressure.
- Keep hands and body away from pin-holes and nozzles which eject fluids under high pressure.
- If ANY fluid is injected into the skin, it must be surgically removed within a few hours by a Doctor familiar with this type of injury or gangrene may result.
- Use a piece of cardboard or paper to search for leaks.

IMPORTANT:

- Keep hydraulic coupler tips and connectors clean. Dust, dirt, water, and foreign material are the major causes of hydraulic system damage.
- DO **NOT** attempt to service hydraulic system in the field. Precision fits require WHITE ROOM CARE during overhaul.



Figure 5.207: Hydraulic Pressure Hazard

MAINTENANCE AND SERVICING

5.7.10 Wheels and Tires

Drive Wheel

Inflating Drive Wheel Tire

DANGER

- Use a safety cage if available.
- Do NOT stand over tire. 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 maximum inflation pressure as per label on tire.
- Make sure all the air is removed from a tire before removing the tire from the rim.



Figure 5.208: Drive Tire Inflation

DANGER

- NEVER use force on an inflated or partially inflated tire. Make sure the tire is correctly seated before inflating 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 correct position on the rim, or if too full of air, 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

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

Visually check daily that tires have not lost pressure. Adjust pressure as required. Under-inflation of drive tires can cause side wall cracks.

Measure tire pressure annually with a gauge. Maintain tire pressure as follows:

1. Determine the type and size of tire that is installed on your machine.
2. Refer to the Drive Wheel Tire Pressure table for the appropriate tire pressure.

Table 5.20 Drive Wheel Tire Options

Drive Wheel Tire Options				
18.4-26 Bar	600 / 65 R28 Bar	18.4-26 Turf	23.1-26 Turf	580 / 70 R26 Turf
32 psi (221 kPa)	26 psi (179 kPa)	35 psi (241 kPa)	20 psi (138 kPa)	24 psi (165 kPa)

3. Adjust tire pressure as required.

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Tightening Drive Wheel Nuts

At first use, or when a wheel is removed, torque drive wheel nuts after one hour of operation.

Continue with torque procedure every hour until two consecutive checks produce no movement of the nuts.

IMPORTANT:

- To avoid damage to wheel rims and studs, tighten nuts by hand, do **NOT** use an impact gun, do **NOT** use lubricant or Never-Seez® compound, and do **NOT** overtighten wheel nuts.
- Ensure only the manufacture's specified nuts are used.

1. Tighten drive wheel nuts (A). Ensure nuts and studs are dry with no lubricant or Never-Seez® compound. Torque each to 375 ft·lbf (510 N·m) using the tightening sequence as shown.
2. Repeat sequence three times.

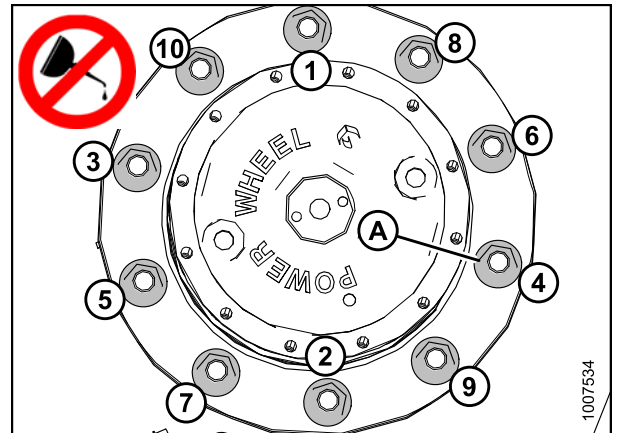


Figure 5.209: Wheel Drive Assembly

Lubricating Wheel Drive

Refer to these procedures to lubricate the wheel drive.

- [Checking Wheel Drive Lubricant Level, page 372](#)
- [Adding Wheel Drive Lubricant, page 372](#)
- [Changing Wheel Drive Lubricant, page 373](#)

MAINTENANCE AND SERVICING

Checking Wheel Drive Lubricant Level

Check the wheel drive lubricant level every 200 hours or annually.

NOTE: The windrower should be on level ground when checking lubricant level.

NOTE: The type of lubricant used after the first lubricant change is different from the factory supplied lubricant.

1. Position windrower so that plugs (A) and (B) are horizontally aligned with the center (C) of the hub.
2. Remove plug (A) or (B). The lubricant should be visible through the port or running out slightly. If lubricant needs to be added, Refer to [Adding Wheel Drive Lubricant, page 372](#).
3. Reinstall plugs and tighten.

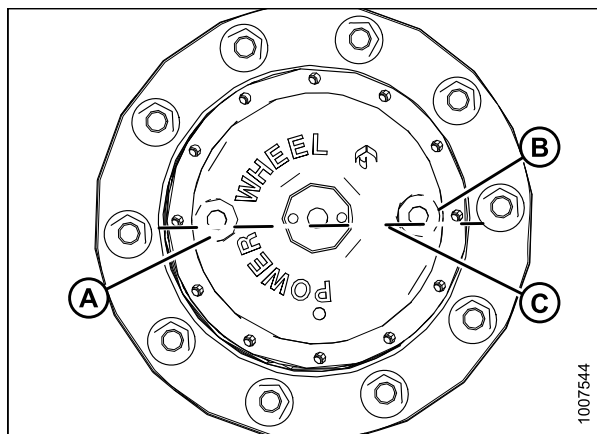


Figure 5.210: Wheel Drive Assembly

Adding Wheel Drive Lubricant

NOTE: Do **NOT** mix lubricants of different brands or characteristics.

NOTE: For lubricant specifications, Refer to [Lubricants, Fluids, and System Capacities, page 263](#).

1. Rotate the wheel drive so plugs (A) and (B) are horizontal (C).
2. Stop windrower and remove key from ignition.
3. Remove the two plugs (A) and (B).

NOTE: PRIOR TO FIRST CHANGE: use SAE 85W-140, API Service, Class GL-5, Extreme Pressure Gear Lubricant.

NOTE: AFTER FIRST CHANGE: use SAE 75W-90, API Service, Class GL-5, Fully Synthetic Transmission Lubricant (SAE J2360 preferred).

4. Add lubricant through one of the ports until the lubricant flows out of the other port.
5. Reinstall and tighten plugs (A) and (B).
6. Start up and operate the windrower for a few minutes, then stop and check the oil level. Refer to [Checking Wheel Drive Lubricant Level, page 372](#). If necessary, add more oil.

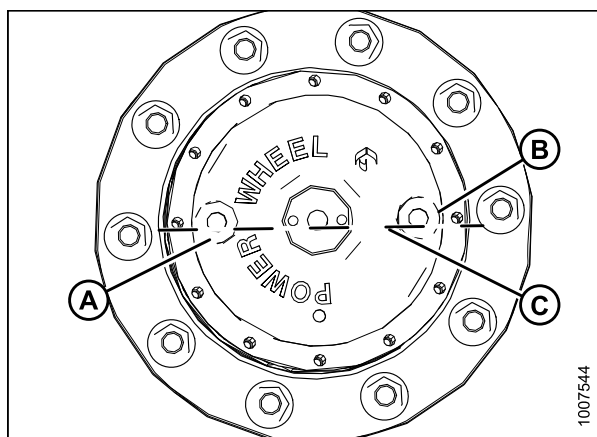


Figure 5.211: Wheel Drive

MAINTENANCE AND SERVICING

Changing Wheel Drive Lubricant

The wheel drive lubricant should be changed after the first 50 hours and then in accordance with the maintenance schedule. Change the lubricant when it is warm.

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Park windrower on level ground and position windrower so drain plug (B) is at the lowest point.
2. Shut down the windrower and remove key from ignition.
3. Place a large enough container (about 2 quarts [2 liters]) under the lower drain plug (B).
4. Remove plugs (A) and (B), and drain lubricant into container.
5. After the lubricant has drained completely, position the windrower so that ports (A) and (B) on wheel are level with the center of the hub (C) as shown.
6. Add lubricant. Refer to [Adding Wheel Drive Lubricant, page 372](#).

CAUTION

Dispose oil in a manner that is in compliance with the local rules and regulations.

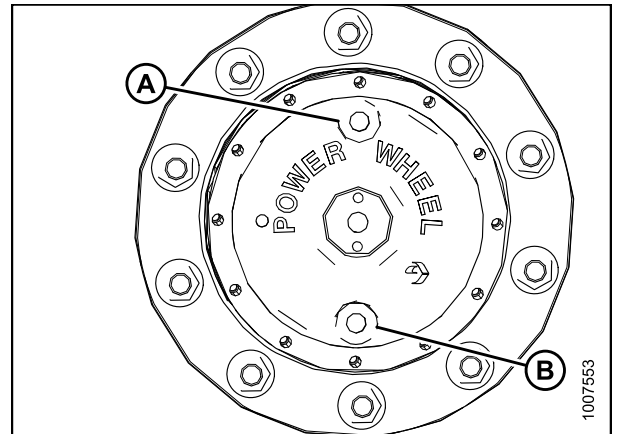


Figure 5.212: Wheel Drive

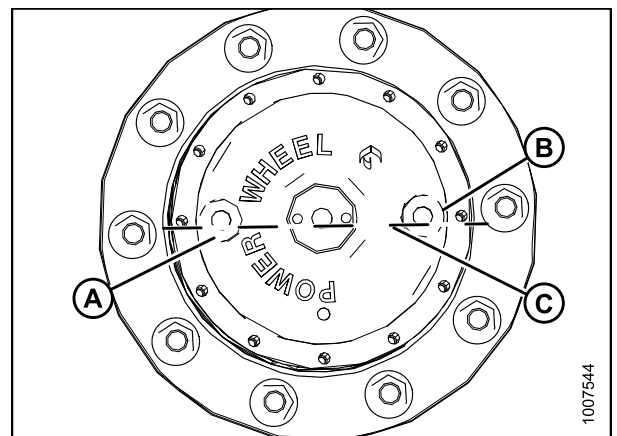


Figure 5.213: Wheel Drive

Servicing Drive Wheel

To service a drive wheel, refer to the following procedures:

- [Raising Drive Wheel, page 374](#)
- [Removing Drive Wheel, page 375](#)
- [Installing Drive Wheel, page 375](#)
- [Lowering Drive Wheel, page 376](#)

MAINTENANCE AND SERVICING

Raising Drive Wheel

This procedure can be used on both drive wheels.

DANGER

To avoid severe personal injury or death caused by machine runaway, shut off engine and remove key before performing any of the following checks and/or adjustments.

CAUTION

Header **MUST** be removed and **NO** weight box installed. Use a hydraulic jack with minimum lifting capacity of 5000 lb (2268 kg) to provide adequate support for the machine.

1. Remove the header.
2. Park windrower on level ground and block all wheels.
3. Place ground speed lever (GSL) in N-DETENT (A), shut down engine, and remove key.



Figure 5.214: Ground Speed Lever

CAUTION

Jack stand must be capable of supporting a minimum of 5000 lb (2268 kg).

4. Place a jack under the leg jack point (A) and raise the drive wheel until it is slightly off ground. Place a jack stand beneath the lift cylinder mount (B).

NOTE: Do **NOT** place jack stand under the cylinder. Use a small metal plate on top of the jack stand.

5. Lower the windrower onto the jack stand.

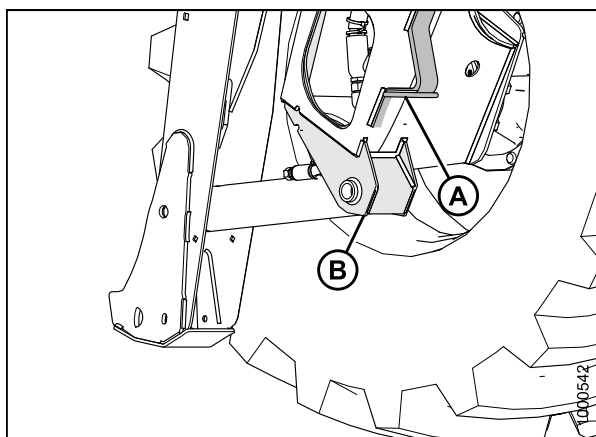


Figure 5.215: Drive Wheel Jack Point

MAINTENANCE AND SERVICING

Removing Drive Wheel

CAUTION

Use a suitable lifting device capable of supporting a minimum of 2000 lbs (907 kg) to lift the wheel assembly away from the windrower.

1. Raise the windrower drive wheel (A) off the ground. Refer to [Raising Drive Wheel, page 374](#).
2. Remove the wheel nuts (B).
3. Remove the drive wheel (A).

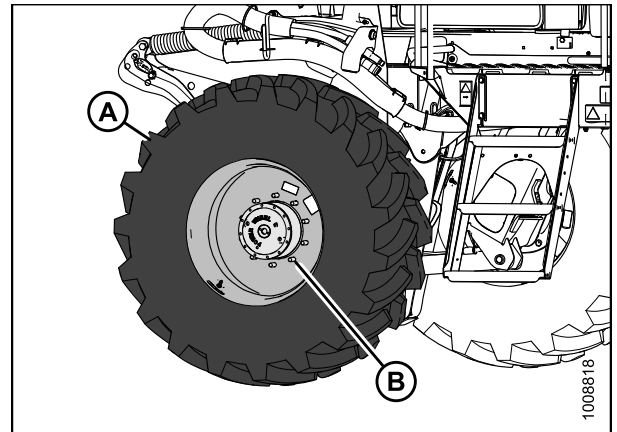


Figure 5.216: Drive Wheel Assembly

Installing Drive Wheel

NOTE: Windrower must be supported off the ground with stands. Refer to [Raising Drive Wheel, page 374](#).

1. Position drive wheel (A) against wheel drive hub (B), so that air valve (C) are on the outside and tire tread (D) points forward, when windrower is in cab forward. For Turf tires (diamond tread), be sure arrow on sidewall points in forward rotation, when windrower in cab forward.
2. Lift wheel on hub with lifting device. Lower lifting device.

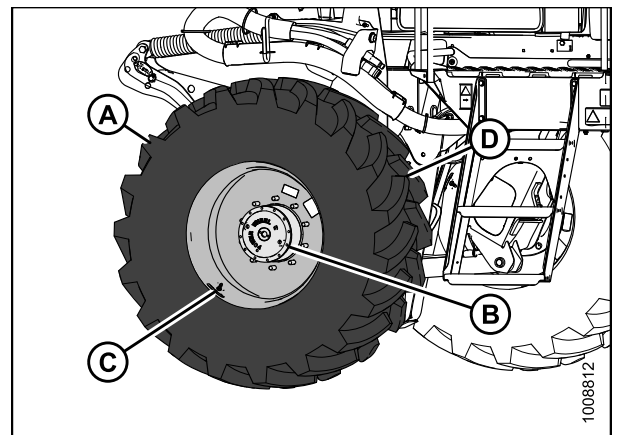


Figure 5.217: Drive Wheel Assembly

3. Line up the holes in the rim with the studs on the wheel drive hub and install wheel nuts (A).

NOTE: To avoid damage to wheel rims and studs, tighten nuts by hand, do **NOT** use an impact gun, do **NOT** use lubricant or Never-Seez® compound, and do **NOT** overtighten wheel nuts.

4. Torque drive wheel nuts. Refer to [Tightening Drive Wheel Nuts, page 371](#).
5. Lower the windrower, and remove jack. Refer to [Lowering Drive Wheel, page 376](#).
6. After one hour of operation, retorque the wheel nuts. Then check every hour until two consecutive checks produce no movement of the nuts.

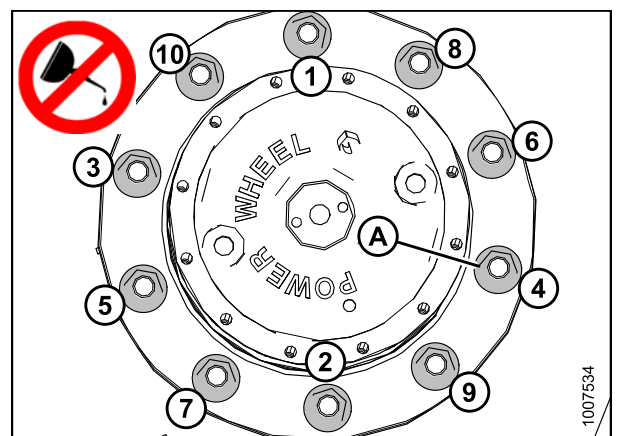


Figure 5.218: Drive Wheel Nuts

MAINTENANCE AND SERVICING

Lowering Drive Wheel

This procedure can be used on both drive wheels.

CAUTION

Jack stand must be capable of supporting a minimum of 5000 lb (2268 kg).

1. Place a jack under the leg jack point (A) and raise the drive wheel slightly off the jack stand.
2. Remove the jack stand from under the cylinder lift mount (B) and lower the drive wheel to the ground.
3. Remove the jack.

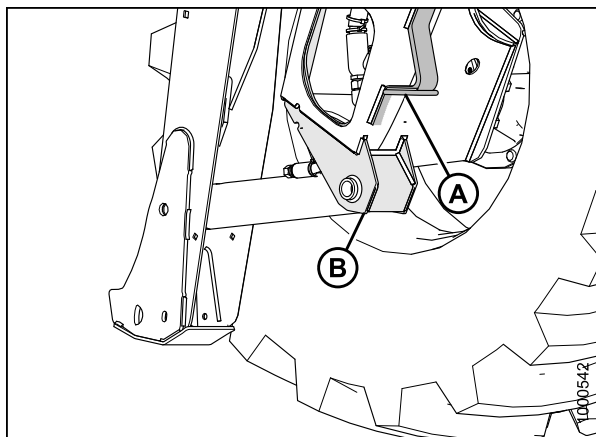


Figure 5.219: Drive Wheel Leg Jacking Point

Caster Wheel

Inflating Caster Tire

DANGER

- Do NOT exceed maximum inflation pressure as per label on tire.
- Use a safety cage if available.
- Do NOT stand over tire. Use a clip-on chuck and extension hose.
- NEVER install a tube in a cracked wheel rim.
- NEVER weld a wheel rim.
- Make sure all the air is removed from a tire before removing the tire from the rim.

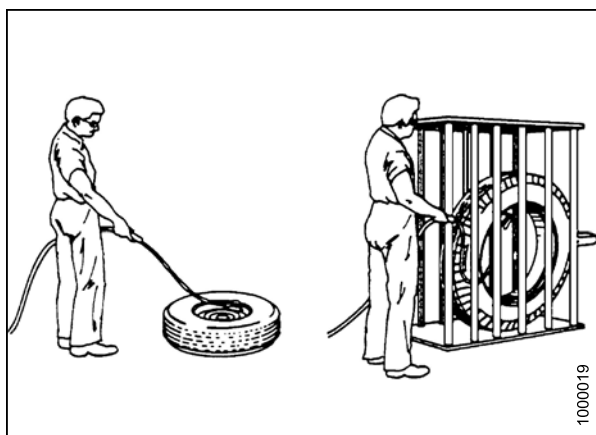


Figure 5.220: Safely Filling a Tire with Air

DANGER

- NEVER use force on an inflated or partially inflated tire. Make sure the tire is correctly seated before inflating 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 correct position on the rim or if too full of air, 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.
- To avoid severe personal injury or death caused by machine runaway, shut off engine and remove key before performing any of the following checks and/or adjustments.

MAINTENANCE AND SERVICING

Measure tire pressure annually with a gauge. Caster tire pressure should be 10 psi (69 kPa).

To maintain pressure, visually check daily that tires have not lost pressure, and adjust pressure as needed. Under-inflation of tires can cause side wall cracks.

NOTE: If caster wheels shimmy, a possible cause is over-inflation.

Table 5.21 Caster Tire Options

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
10 psi (69 kPa)	10 psi (69 kPa)

Caster Wheel Nut Torque

At first use or when a wheel is removed, check wheel nut/bolt torque every 15 minutes on the road or 1 hour in the field until the specified torque is maintained.

Continue with a checking schedule of 10 and 50 hours (field or road operation) and then every 200 hour intervals thereafter.

Forked Caster:

1. Torque wheel nuts (A) to 120 ft·lbf (163 N·m) using the tightening sequence shown.

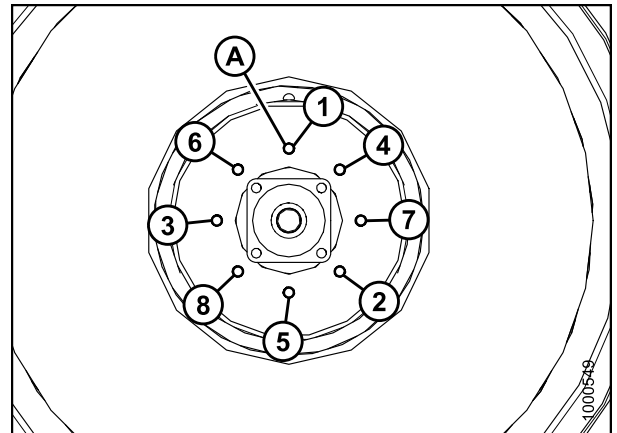


Figure 5.221: Caster Wheel Nuts

Formed Caster:

2. Position wheel assembly (B) on hub and install wheel bolts (A).
3. Torque bolts (A) to 120 ft·lbf (163 N·m)..

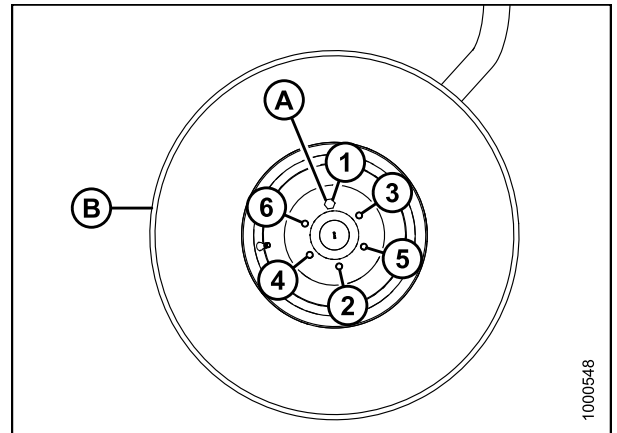


Figure 5.222: Caster Wheel Nuts

MAINTENANCE AND SERVICING

Servicing Caster Wheels

Refer to the following procedures:

- [Raising Caster Wheel \(Formed and Forked\)](#) , page 378
- [Lowering Caster Wheel \(Formed and Forked\)](#), page 379
- [Removing Forked Caster Wheel](#), page 379
- [Installing Forked Caster Wheel](#), page 380
- [Removing Formed Caster Wheel](#), page 380 [Installing Formed Caster Wheel](#), page 381

Raising Caster Wheel (Formed and Forked)

This procedure is the same for forked and formed caster wheels.

DANGER

Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.

1. Park windrower on level ground and block the drive wheels.
2. Place the ground speed lever (GSL) in N-DETENT (A), stop the engine and remove the key.



Figure 5.223: GSL Position

3. Raise end of walking beam (A) using a suitable lifting device capable of lifting 5000 lb (2268 kg) minimum until the caster wheel assembly (B) is slightly off the ground.
4. Place a jack stand beneath the walking beam and lower the beam until resting on the stand.

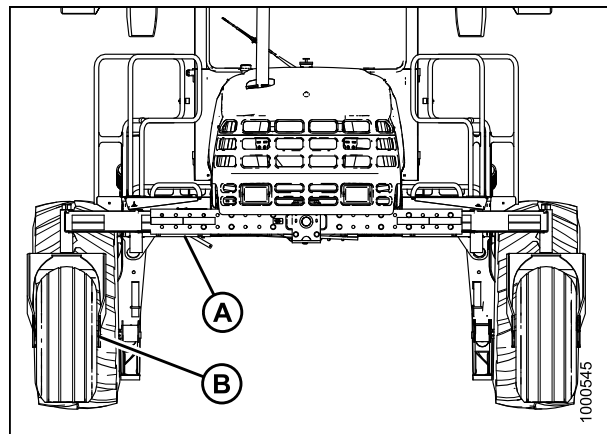


Figure 5.224: Caster Wheel Assembly

MAINTENANCE AND SERVICING

Lowering Caster Wheel (Formed and Forked)

This procedure is the same for forked and formed caster wheels.

1. Raise the end of walking beam (A) slightly, using a suitable lifting device capable of lifting minimum 5000 lb (2268 kg).
2. Remove the jack stand and lower the end of the walking beam until the caster wheel assembly (B) is on the ground.
3. Remove blocks from the drive tires.

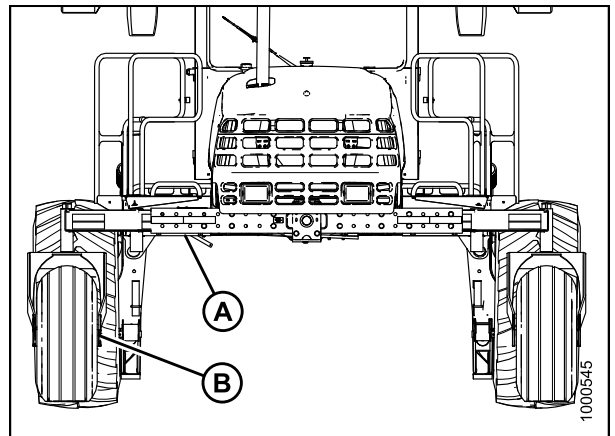


Figure 5.225: Caster Wheel Assembly

Removing Forked Caster Wheel

CAUTION

Wheel assemblies are heavy. Support wheel assembly before removing axle bolts.

1. Raise caster wheel. Refer to [Raising Caster Wheel \(Formed and Forked\)](#), page 378.
2. Remove the eight bolts (A) (four on each side of caster) attaching axle (B) and cover (C) to forked caster (E), and remove wheel assembly (D) from caster (E).
3. Remove the eight wheel nuts (A) that secure the axle (B) to the wheel (C).
4. Separate axle (B) and wheel (C).

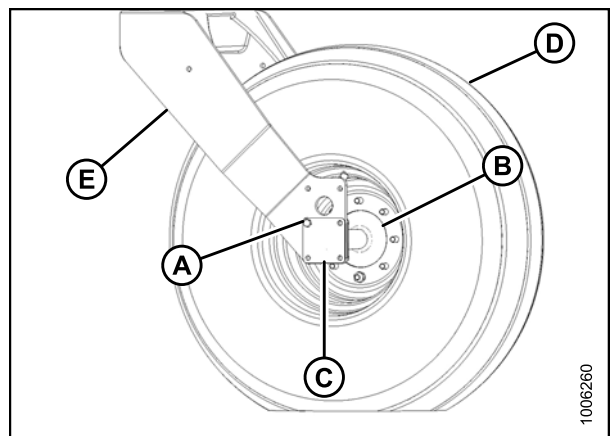


Figure 5.226: Caster Wheel Assembly

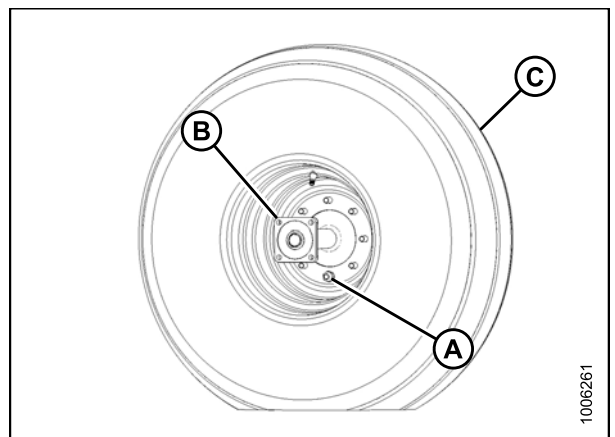


Figure 5.227: Caster Wheel Assembly

MAINTENANCE AND SERVICING

Installing Forked Caster Wheel

1. Position wheel assembly (C) on axle assembly (B) and install wheel nuts (A).
2. Torque wheel nuts (A). Refer to [Caster Wheel Nut Torque](#), page 377.

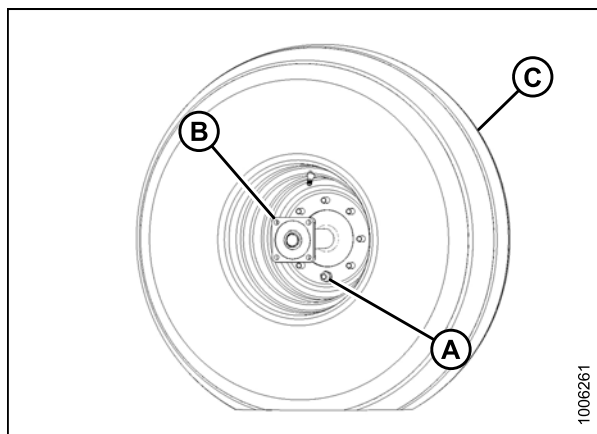


Figure 5.228: Caster Wheel Assembly

3. Position wheel assembly (D) in forked caster (E).
4. Position cover plates (C) and install eight bolts (A) (four on each side of caster) to secure axle (B) to caster (E). Torque bolts to 75–79 ft·lbf (97–107 N·m).
5. Lower caster wheel. Refer to [Lowering Caster Wheel \(Formed and Forked\)](#), page 379.

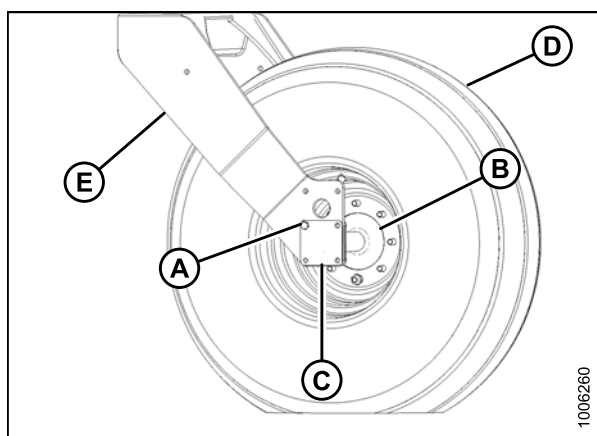


Figure 5.229: Caster Wheel Assembly

Removing Formed Caster Wheel

1. Raise caster wheel. Refer to [Raising Caster Wheel \(Formed and Forked\)](#), page 378.
2. Remove the six bolts (A) that secure the wheel (B) to the hub.
3. Remove wheel (B).

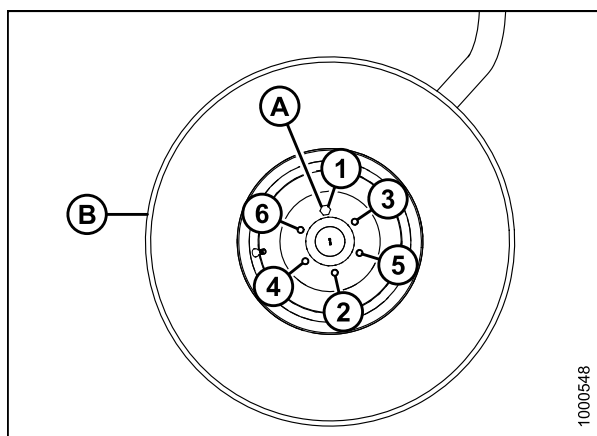


Figure 5.230: Caster Wheel Assembly

MAINTENANCE AND SERVICING

Installing Formed Caster Wheel

1. Position wheel assembly (B) on hub, and install the six wheel bolts (A).
2. Torque bolts (A). Refer to [Caster Wheel Nut Torque, page 377](#).
3. Lower caster wheel. Refer to [Lowering Caster Wheel \(Formed and Forked\), page 379](#).

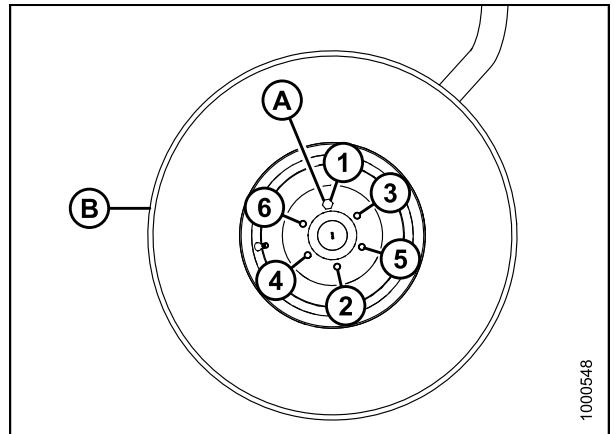


Figure 5.231: Caster Wheel Assembly

Caster Wheels Anti-Shimmy Dampeners

Each caster is equipped with a fluid-filled anti-shimmy dampener (A).

The mounting bolts (B) need to be checked periodically for security. Refer to [5.7.11 Maintenance Schedule, page 382](#).

- Inboard bolt should be tightened to 100 ft·lbf (135 N·m).
- Outboard bolt should be tightened to 85 ft·lbf (115 N·m).

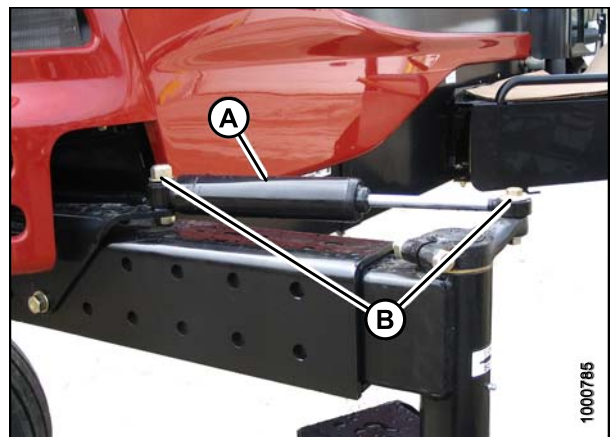


Figure 5.232: Anti-Shimmy Dampener

MAINTENANCE AND SERVICING

Ballast Requirements

Fluid ballasting of rear caster tires is recommended to provide adequate machine stability when using large headers on the windrower. Also, the stability of the machine varies with different attachments, windrower options, terrain, and the operator's driving technique.

Ballast capability per tire is at a maximum fill of 75%, or when fluid is level with valve stem when the stem is positioned at 12 o'clock. Fluid can be added to any level up to maximum fill. Always add an equal amount of fluid on both sides.

Header Description		Recommended Ballast				Recommended Tire Size
		Level Ground		Hills		
Type	Size	Per Tire	Both Tires	Per Tire	Both Tires	
		US Gal (liters)	lb (kg)	US Gal (liters)	lb (kg)	
A-Series	All options	0				7.5 X 16 10 X 16 16.5 X 16.1
R-Series	13 ft. ONLY					
D-Series	25-ft. and down	0				
	30-ft. Single or Double Reel without Conditioner. 35-ft. Single Reel					0
	30-ft. Double Reel Steel Fingers and Conditioner. 35-ft. Double Reel (5 or 6-Bat)	18 (69)	380 (170)	30 (115)	630 (288)	Level Ground: 10 X 16 Level Ground: 16.5 X 16.1 Hills: 16.5 X 16.1
	40-ft	30 (115)	630 (288)	41 (158)	830 (377)	16.5 X 16.1

5.7.11 Maintenance Schedule

The Maintenance Schedule specifies the periodic maintenance procedures and service intervals.

Regular maintenance is the best insurance against early wear and untimely breakdowns. Following this schedule will increase machine life.

For detailed instructions, refer to the various procedures in this chapter. Use the fluids and lubricants specified in [5.3.1 Recommended Fuel, Fluids, and Lubricants, page 262](#).

Service Intervals: The recommended service intervals are in hours of operation. Where a service interval is given in more than one time frame, for example, 100 hours or annually, service the machine at whichever interval is reached first.

IMPORTANT:

Recommended intervals are for average conditions. Service the machine more often if operated under adverse conditions (severe dust, extra heavy loads, etc.).

MAINTENANCE AND SERVICING

CAUTION

Carefully follow safety messages given in [1 Safety, page 1](#).

Break-In Inspections

Break-in Inspections		
Hours	Item	Check
1	Drive wheel nuts	Torque: 375 ft·lbf (510 N·m) dry Repeat checks at one hour intervals until torque stabilizes at two consecutive checks
5	A/C compressor belt	Tension.
	Caster wheel nuts	Torque: 120 ft·lbf (163 N·m)
	Caster wheel anti-shimmy dampener bolts	Inboard bolt torque: 100 ft·lbf (135 N·m) Outboard bolt torque: 85 ft·lbf (115 N·m)
	Walking beam width adjustment bolts	Torque: 330 ft·lbf (448 N·m)
10	Walking beam width adjustment bolts	Torque: 330 ft·lbf (448 N·m)
	Neutral	Dealer adjusted
50	Hose clamps: air intake / radiator / heater / hydraulic	Hand-tighten unless otherwise noted
	Walking beam width adjustment bolts	Torque: 330 ft·lbf (448 N·m)
	Caster wheel anti-shimmy dampener bolts	Inboard bolt torque: 100 ft·lbf (135 N·m) Outboard bolt torque: 85 ft·lbf (115 N·m)
	Drive wheel lubricant	Change
	Main gearbox oil	
	Charge system oil filter	
	Manifold oil filter	

MAINTENANCE AND SERVICING

Maintenance Schedule/Record

WINDROWER SERIAL NUMBER: _____

Combine this record with the record in the header operator's manual. Copy this page to continue record.

Refer to [5 Maintenance and Servicing, page 249](#) for details on each maintenance procedure.

Maintenance Record	Action:	✓ - Check	⬇ - Lubricate	▲ - Change	✳ - Clean	+ - Add									
Hour meter reading															
Date															
Serviced by															
FIRST USE, Refer to Break-In Inspections, page 383															
10 HOURS OR DAILY³¹															
✳ A/C Condenser ³²															
✳ Charge Air Cooler ³²															
✓ Engine Oil Level ³²															
✓ Engine Coolant Level ³²															
✓ Fuel Tank ³²															
✓ Fuel Filter Water Trap ³²															
✓ Hydraulic Hoses and Lines ³²															
✳ Hydraulic Oil Cooler ³²															
✓ Hydraulic Oil Level ³²															
✳ Radiator ³²															
✓ Tire Inflation ³²															
ANNUALLY³³															
✓ A/C Blower															
✓ Antifreeze Concentration															
✓ Battery Charge															
✓ Battery Fluid Level															
▲ Fuel Tank Vent Line Filter															
✓ Steering Linkages															
50 HOURS															
✳ Cab Fresh Air Intake Filter															
⬇ Caster Pivots															

31. Whichever occurs first.

32. A record of daily maintenance is not normally required but is at the Owner/Operator's discretion.

33. It is recommended that annual maintenance be done prior to start of operating season.

MAINTENANCE AND SERVICING

Maintenance Record	Action:	✓ - Check	☼ - Lubricate	▲ - Change	✱ - Clean	+ - Add											
☼ Forked Caster Spindle Bearings																	
✓ Gearbox Oil Level																	
☼ Top Lift Link Pivots																	
100 HOURS OR ANNUALLY^{31, 33}																	
✱ Cab Air Return Filter																	
250 HOURS OR ANNUALLY^{31, 33}																	
▲ Engine Oil and Filter																	
▲ Engine Air Cleaner Primary Filter Element																	
☼ Formed Caster Wheel Hub Bearings																	
✓ Drive Wheel Lubricant																	
500 HOURS OR ONCE A YEAR^{31, 33}																	
▲ Fuel Filters																	
▲ Gearbox Lubricant																	
▲ Charge System and Return Oil Filters																	
✓ Safety Systems																	
1000 HOURS																	
▲ Drive Wheel Lubricant																	
1500 HOURS OR EVERY TWO YEARS³¹																	
▲ Hydraulic Oil																	
2000 HOURS OR EVERY TWO YEARS³¹																	
▲ Engine Coolant																	
✓ General Inspection																	
5000 HOURS OR EVERY TWO YEARS³¹																	
✓ Engine Valve Tappet Clearance																	

6 Troubleshooting

6.1 Engine Troubleshooting

Symptom	Problem	Solution	Section
Engine hard to start or will not start	Controls not in NEUTRAL	Move GSL to NEUTRAL.	Starting the Engine, page 106
		Move steering wheel to locked position.	
		Disengage header drive switch.	4.4.4 Header Drive, page 145
	NEUTRAL Interlock misadjusted	Contact Dealer.	Contact Dealer.
	No fuel to engine	Fill empty fuel tank. Replace clogged filter.	Fuelling, page 109 and Maintaining Fuel Filters, page 304
	Old fuel in tank	Drain tank. Refill with fresh fuel.	Fuel System, page 303
	Water, dirt, or air in fuel system	Drain, flush, fill, and prime system.	
	Improper type of fuel	Use proper fuel for operating conditions.	Fuel Specifications, page 262
	Crankcase oil too heavy	Use recommended oil.	Lubricants, Fluids, and System Capacities, page 263
	Low battery output	Have battery tested. Check battery electrolyte level.	Battery, page 326
	Poor battery connection	Clean and tighten loose connections.	
	Faulty starter	Contact Dealer.	Contact Dealer.
	Loose electrical connection at fuel pump	Ensure connector at pump is fully pushed in.	Contact Dealer.
	Wiring shorted, circuit breaker open	Check continuity of wiring and breaker (manual reset).	Checking and Replacing Fuses, page 354
	ECM fuse (1 of 2) blown	Replace.	
	ECM Ignition relay faulty		
	NEUTRAL Logic relay faulty		
Faulty injectors	Contact Dealer.	Contact Dealer.	

TROUBLESHOOTING

Symptom	Problem	Solution	Section
Engine knocks	Engine out of time	Contact Dealer.	Contact Dealer.
	Insufficient oil	Add oil.	Adding Engine Oil, page 295
	Low or high coolant temperature	Contact Dealer.	Contact Dealer.
	Improper fuel	Use proper fuel.	Fuel Specifications, page 262
Low oil pressure	Low oil level	Add oil.	Adding Engine Oil, page 295
	Improper type of oil	Drain and fill crankcase with proper oil.	Lubricants, Fluids, and System Capacities, page 263
	Worn components	Contact Dealer.	Contact Dealer.
Internal parts worn			
High oil consumption	Crankcase oil too light	Use recommended oil.	Lubricants, Fluids, and System Capacities, page 263
	Oil leaks	Check for leaks around gaskets, seals, and drain plugs.	Checking Engine Oil Level, page 293
	Unsteady fuel supply	Change filter on fuel tank vent line. Replace clogged fuel filter.	Removing and Installing Fuel Tank Vent Filter, page 303 and Fuel System, page 303
Engine runs irregularly or stalls frequently	Water or dirt in fuel system	Drain, flush, and fill fuel system.	Lubricants, Fluids, and System Capacities, page 263
	Low coolant temperature	Remove and check thermostat.	Contact Dealer.
	Air in fuel system	Contact Dealer.	
	Dirty or faulty injectors		

TROUBLESHOOTING

Symptom	Problem	Solution	Section
Lack of power	Incorrect timing	Contact Dealer.	Contact Dealer.
	Engine oil viscosity too high	Use recommended oil.	<i>Lubricants, Fluids, and System Capacities, page 263</i>
	Intake air restriction	Service air cleaner.	<i>Air Intake System, page 296</i>
	Clogged fuel filter	Replace primary fuel filter, and if necessary, replace secondary fuel filter.	<i>Maintaining Fuel Filters, page 304</i>
	High back pressure	Clean out or replace muffler.	<i>Exhaust System, page 322</i>
	Improper type of fuel	Use proper fuel.	<i>Fuel Specifications, page 262</i>
	High or low engine temperature	Remove and check thermostat.	Contact Dealer.
	Improper valve clearance	Contact Dealer.	
Faulty injectors			
Engine temperature below normal	Defective thermostat	Remove and check thermostat.	
Warning alarm sounds	Engine overheated	Check coolant level.	<i>Checking Coolant Level, page 312</i>
		Check thermostat.	Contact Dealer.
	Low engine oil pressure	Check oil level.	<i>Checking Engine Oil Level, page 293</i>
	Low transmission oil pressure		<i>Checking and Filling Hydraulic Oil, page 360</i>

TROUBLESHOOTING

Symptom	Problem	Solution	Section
Engine overheats	Low coolant level	Fill reserve tank to proper level. Check system for leaks.	Engine Cooling System, page 310
	Water only for coolant	Replace with antifreeze.	
	Engine overloaded	Reduce ground speed.	4.3.6 Windrower Operation, page 111
	Defective radiator cap	Replace cap.	Inspecting Radiator Cap, page 311
	Defective fan belt	Replace belt.	Replacing Fan Belt, page 323
	Dirty radiator screen, rotors turning	Check for obstructions in ducting from screen to fan shroud.	Maintaining Engine Cooling Box, page 315
	Dirty radiator screen, rotors not turning	Check connections to rotor electric motor.	
	Dirty radiator core	Clean radiator.	Engine Cooling System, page 310
	Cooling system dirty	Flush cooling system.	
	Defective thermostat	Remove and check thermostat.	Contact Dealer.
	Defective temperature gauge or sender	Check coolant temperature with thermometer. Replace gauge if necessary.	
Defective water pump	Contact Dealer.		
High fuel consumption	Clogged or dirty air cleaner	Service air cleaner.	Air Intake System, page 296
	Engine overloaded	Reduce ground speed.	4.3.6 Windrower Operation, page 111
	Improper valve clearance	Contact Dealer.	Contact Dealer.
	Engine out of time		
	Dirty injector nozzles		
	Low engine temperature	Check thermostat.	
Improper type of fuel	Use proper fuel.	Fuel Specifications, page 262	

TROUBLESHOOTING

Symptom	Problem	Solution	Section
Engine emits black or grey exhaust	Improper type of fuel	Consult your fuel supplier, and use proper type fuel for conditions.	Fuel Specifications, page 262
	Engine overloaded	Reduce ground speed.	4.3.6 Windrower Operation, page 111
	Clogged or dirty air cleaner	Service air cleaner.	Air Intake System, page 296
	Defective muffler	Check muffler for possible damage that might create back pressure.	Exhaust System, page 322
	Dirty or faulty injectors	Contact Dealer.	Contact Dealer.
	Engine out of time		
	Air in fuel system		
Engine emits white exhaust	Engine out of time	Contact Dealer.	Contact Dealer.
	Improper type of fuel	Consult your fuel supplier, and use proper type fuel for conditions.	Fuel Specifications, page 262
	Cool engine	Warm engine up to normal operating temperature.	Engine Warm-Up, page 108
	Defective thermostat	Remove and check thermostat.	Contact Dealer.
Starter cranks slowly or will not operate	Low battery output	Check battery charge.	Maintaining the Battery, page 327
	Loose or corroded battery connections	Clean and tighten loose connections.	
	Controls not in NEUTRAL	Move GSL to NEUTRAL.	4.3.6 Windrower Operation, page 111
		Move steering wheel to CENTER position.	Driving in Reverse in Cab-Forward Mode, page 115
		Disengage header.	Engaging and Disengaging the Header, page 145
	Relay not functioning	Check relay and wire connections.	5.7.8 Electrical System, page 326
	Main fuse defective/blown	Replace main fuse.	
	Key power fuse blown	Replace.	
	Key switch worn or terminals loose	Contact Dealer.	Contact Dealer.
	Switch at Interlock not closed or defective	Adjust switch or replace. Contact your Dealer.	
	Crankcase oil too high viscosity	Use recommended oil.	Lubricants, Fluids, and System Capacities, page 263

TROUBLESHOOTING

Symptom	Problem	Solution	Section
Air filters require frequent cleaning	Aspirator plugged	Clean out aspirator.	<i>Air Intake System, page 296</i>
	Pre-cleaner rotor not turning freely	Repair/replace.	<i>Maintaining Engine Cooling Box, page 315</i>

TROUBLESHOOTING

6.2 Electrical Troubleshooting

Symptom	Problem	Solution	Section
Low voltage and/or battery will not charge	Defective battery	Have battery tested.	Battery, page 326
	Loose or corroded connections	Clean and tighten battery connections.	Maintaining the Battery, page 327
	Defective alternator belt	Replace worn belt.	Replacing Fan Belt, page 323
	Alternator or voltage regulator not connected properly	Connect properly.	Battery, page 326
	Dirty or defective alternator, defective voltage regulator, or high resistance in circuit	Contact Dealer.	Contact Dealer.
Lights dim	Defective light switch		
	High resistance in circuit or poor ground on lights	Check the wiring circuit for a break in a wire or a poor ground.	—
Lights do not light	Burned out or defective light bulb	Replace light bulb.	Replacing Headlight Bulb, page 337
			Replacing Bulb in Cab-Forward Flood Light, page 340
			Replacing Bulb in Rear Flood Light, page 345
	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	Circuit Breakers and Fuses, page 354
	Defective relay	Replace relay	Replacing Circuit Breakers and Relays, page 355
Defective light switch	Contact Dealer	Contact Dealer.	
Turn signals or indicators showing wrong direction	Reversed wires	Contact Dealer	Contact Dealer.
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 328

TROUBLESHOOTING

6.3 Hydraulics Troubleshooting

Symptom	Problem	Solution	Section
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.
Header or reel lifts but lacks power	Relief pressure too low or contaminant in relief valve	Check/adjust/clean relief valve at cylinder control valve.	Contact Dealer.
Reel and/or conveyor not turning	HEADER DRIVE switch not engaged	Engage HEADER DRIVE switch.	<i>Engaging and Disengaging the Header, page 145</i>
	Flow controls adjusted too low	Toggle speed controls on CDM to increase flow.	D-Series: 4.6.7 Draper Speed, page 232 , and 4.6.6 Reel Speed, page 229 A-Series: 4.7.1 Auger Speed, page 240 R-Series: 4.9 Disc Speed, page 248
	Appropriate solenoid on flow control block not being energized	Contact Dealer.	Contact Dealer.
Reel and/or conveyor turns but lacks power	Relief pressure too low	Check/adjust/clean relief valve.	Contact Dealer.
Hydraulic oil high-temperature alarm	Hydraulic oil cooling system not working properly	Check/clean cooling box.	<i>Maintaining Engine Cooling Box, page 315</i>
	Faulty bypass valve	Clean or replace.	Contact Dealer.
Hydraulic oil low-temperature alarm	Hydraulic oil too cold	Run engine until hydraulic oil warms up.	—

TROUBLESHOOTING

6.4 Header Drive Troubleshooting

Symptom	Problem	Solution	Section
Header drive not engaging	Header DRIVE switch in cab not engaged	Engage HEADER DRIVE switch.	<i>Engaging and Disengaging the Header, page 145</i>
	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.	
Header drive lacks power	Relief valve setting too low		
Warning alarm sounds	Header drive overload	Reduce ground speed.	<i>Driving Forward in Engine-Forward Mode, page 116</i>
	Relief valve setting too low	Contact Dealer.	Contact Dealer.

TROUBLESHOOTING

6.5 Traction Drive Troubleshooting

Symptom	Problem	Solution	Section
Warning alarm sounds and transmission oil light is on	Low hydraulic oil level	Stop engine, and add oil to hydraulic system.	Checking and Filling Hydraulic Oil, page 360
	Low hydraulic pressure	Contact Dealer.	Contact Dealer.
	Foreign material shorting sender		
	Short in alarm wiring		
	Faulty sender		
Wheels lack pulling ability on a grade or pulling out of a ditch.	Internal pump or motor damage		
	Insufficient torque at drive wheels	Move ground speed range control to field position, and reduce ground speed.	Driving Forward in Engine-Forward Mode, page 116
	Loose or worn controls	Check controls.	5.7.3 Ground Speed Lever (GSL) Adjustments, page 276
	Air in system	Use proper oil.	Lubricants, Fluids, and System Capacities, page 263
		Check oil level and leaks.	Checking and Filling Hydraulic Oil, page 360
		Check hydraulic oil filters.	5.7.9 Hydraulic System, page 359
	Brakes binding or not releasing fully	Check pressure on brake release valve (min. 200 psi [1379 kPa]).	Contact Dealer.
Relief valve in tandem pump dirty or damaged	Replace relief valve.		
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		
	Faulty relief valve	Repair or replace valve. Contact Dealer.	

TROUBLESHOOTING

Symptom	Problem	Solution	Section
Both wheels will not pull in forward or reverse	Pump arms have broken shaft or loose hardware	Repair or tighten.	Contact Dealer.
	Brakes binding or not releasing fully	Check pressure on brake release valve (min. 200 psi [1379 kPa]).	
	Low oil level	Check oil reservoir level.	<i>Checking and Filling Hydraulic Oil, page 360</i>
	Power hubs disengaged	Engage final drives.	<i>Final Drives, page 135</i>
	Damaged hydraulic lines preventing proper oil flow	Replace damaged lines.	Contact Dealer.
	Ground speed range control not working	Contact Dealer.	
	Steering controls worn or defective	Check GSL and steering for loose, worn or damaged ball joints and connecting rods.	<i>5.7.3 Ground Speed Lever (GSL) Adjustments, page 276 and 5.7.4 Steering Adjustments, page 278</i>
	Charge pressure relief valve misadjusted or damaged	Check the valve adjustment. Check valve parts and seat.	<i>Checking Charge Pump Pressure, page 368</i>
	Failed pump or motor	Contact Dealer.	Contact Dealer.

TROUBLESHOOTING

Symptom	Problem	Solution	Section
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.	Final Drives, page 135
	Steering controls worn or defective	Check GSL and steering for loose, worn or damaged ball joints and connecting rods.	5.7.3 Ground Speed Lever (GSL) Adjustments, page 276 and 5.7.4 Steering Adjustments, page 278
	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. 200 psi [1379 kPa]).	Contact Dealer.
	Damaged hydraulic lines preventing proper oil flow	Contact Dealer.	
	Ground speed range control not working		
	Failed pump, motor or power hub		
Excessive noise from drive system	Mechanical interference in steering or ground speed linkage	Adjust, repair, replace.	5.7.3 Ground Speed Lever (GSL) Adjustments, page 276 and 5.7.4 Steering Adjustments, page 278
	Brakes binding or not releasing fully	Check pressure on brake release valve) (min. 200 psi [1379 kPa]).	Contact Dealer.
	Faulty pump or motor	Contact Dealer.	
	Air in system	Check lines for leakage.	—
	Hydraulic line clamps loose	Tighten clamps.	
Hydraulic oil filter leaks at seal	Not properly tightened	Tighten filter element.	
	Damaged seal or threads	Replace filter or filter head.	

TROUBLESHOOTING

6.6 Steering and Ground Speed Control Troubleshooting

Symptom	Problem	Solution	Section
Machine will not steer straight	Linkage worn or loose	Adjust steering chain tension. Replace worn parts. Adjust linkage.	5.7.4 Steering Adjustments, page 278
Machine moves on flat ground with controls in neutral	Neutral interlock misadjusted	Contact Dealer.	Contact Dealer.
	Parking brake not functioning		
	GSL servo misadjusted		
	GSL cable misadjusted		
Steering wheel will not lock with gsl in n-detent	Transmission interlock misadjusted		
Steering wheel will not unlock	Transmission interlock cylinder not working		
Insufficient road speed	Ground speed range control in field position	Move to road position.	Driving on the Road, page 121
Steering is too stiff or too loose	Steering chain tension is out of adjustment	Adjust steering chain tension.	5.7.4 Steering Adjustments, page 278

TROUBLESHOOTING

6.7 Cab Air Troubleshooting

Symptom	Problem	Solution	Section
Blower fan will not run	Burned out motor	Contact Dealer.	Contact Dealer.
	Burned out switch		
	Motor shaft tight or bearings worn		
	Faulty wiring—loose or broken		
	Blower rotors in contact with housing		
Blower fan operating but no air coming into cab	Dirty fresh air filter	Clean fresh air filter.	Cleaning Engine Air Filter Primary Element, page 301
	Dirty recirculating air filter	Clean recirculating filter.	Cleaning Return Air Cleaner, page 287
	Evaporator clogged	Clean evaporator.	Cleaning Air Conditioning Evaporator Core, page 289
	Air flow passage blocked	Remove blockage.	—
Heater not heating	Heater shut-off valve at engine closed	Open valve.	3.10.1 Heater Shut-Off, page 55
	Defective thermostat in engine water outlet manifold	Replace thermostat.	Contact Dealer.
	Heater temperature control defective	Replace control.	
	No thermostat in engine water outlet manifold	Install thermostat.	
Odor from air louvers	Plugged drainage hose	Blow out hose with compressed air.	—
	Dirty filters	Clean filters.	Cleaning Engine Air Filter Primary Element, page 301 and Cleaning Return Air Cleaner, page 287

TROUBLESHOOTING

Symptom	Problem	Solution	Section
Air conditioning not cooling	Low refrigerant level	Add refrigerant. Contact Dealer.	Contact Dealer.
	Clutch coil burned out or disconnected	Contact Dealer.	
	Blower motor disconnected or burned out		
	Switch contacts in thermostat burned excessively, or sensing element defective	Replace thermostat.	
	Compressor partially or completely seized	Remove compressor for service or replacement.	
	Condenser fins plugged	Clean condenser.	<i>Air Conditioning Condenser, page 288</i>
	Loose or broken compressor drive belt	Replace drive belt and/ or tighten to specifications.	<i>Tensioning A/C Compressor Belt, page 325 and Replacing A/C Compressor Belt, page 325</i>
	Dirty filters	Clean fresh air and recirculation filters.	<i>Cleaning Engine Air Filter Primary Element, page 301 and Cleaning Return Air Cleaner, page 287</i>
	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 loose, broken, or disconnected.	
	Expansion valve stuck in open or closed position	Contact Dealer.	Contact Dealer.
	Broken refrigerant line		
	Leak in system		
	Compressor shaft seal leaking		
Clogged screen in receiver-drier; plugged hose or coil			

TROUBLESHOOTING

Symptom	Problem	Solution	Section
Air conditioning not producing sufficient cooling. (sufficient cooling defined as when air temperature in cab, measured at louvered vent, can be maintained at 25°F (14°C) below ambient air temperature.)	Compressor clutch slipping	Remove clutch assembly for service or replacement.	Contact Dealer.
	Thermostat defective or improperly adjusted	Replace thermostat.	
	Clogged air filters	Remove air filters, and clean or replace as necessary.	Cleaning Engine Air Filter Primary Element, page 301 and Cleaning Return Air Cleaner, page 287
	Heater circuit is open	Close temperature control in cab, and valve on engine).	3.10.3 Controls, page 56 and 3.10.1 Heater Shut-Off, page 55
	Insufficient air circulation over condenser coil; fins clogged with dirt or insects	Clean condenser.	Air Conditioning Condenser, page 288
	Evaporator fins clogged	Clean evaporator fins (under cab floor).	Air Conditioning Evaporator, page 288
	Refrigerant low	Contact Dealer.	Contact Dealer.
	Clogged expansion valve		
	Clogged receiver-drier		
	Excessive moisture in system		
	Air in system		
Blower motor sluggish in operation			
Air Conditioning Cools Intermittently	Unit icing up due to thermostat adjusted too low	Adjust thermostat.	Contact Dealer.
	Unit icing up due to excessive moisture in system	Contact Dealer.	
	Unit icing up due to incorrect super-heat adjustment in the expansion valve		
	Thermostat defective		
	Defective blower switch or blower motor		
	Partially open, improper ground or loose connection in compressor clutch coil		
	Compressor clutch slipping		

TROUBLESHOOTING

Air Conditioning System Too Noisy	Defective winding or improper connection in compressor clutch coil or relay	Contact Dealer.	Contact Dealer.
	Excessive charge in system		
	Low charge in system		
	Excessive moisture in system		
	Loose or excessively worn drive belt	Tighten or replace as required.	<i>Tensioning A/C Compressor Belt, page 325 and Replacing A/C Compressor Belt, page 325</i>
	Noisy clutch	Remove clutch for service or replacement as required.	Contact Dealer.
	Noisy compressor	Check mountings and repair. Remove compressor for service or replacement.	
	Compressor oil level low	Add SP-15 PAG refrigerant oil.	
Blower fan noisy due to excessive wear	Remove blower motor for service or replacement as necessary.		
Windows Fog Up	High humidity	Run A/C to dehumidify air and heater to control temperature.	<i>3.10.3 Controls, page 56</i>

TROUBLESHOOTING

6.8 Operator's Station Troubleshooting

Symptom	Problem	Solution	Section
Rough ride	Seat suspension not adjusted for operator's weight	Adjust seat suspension.	<i>3.3 Operator's Seat Adjustments, page 40</i>
Rough ride	High air pressure in tires	Deflate to proper pressure.	<i>Inflating Drive Wheel Tire, page 370 and Inflating Caster Tire, page 376</i>
Rough ride	Cab suspension too stiff	Adjust suspension.	Contact Dealer.

7 Options and Attachments

7.1 Options and Attachments

The following options and attachments are available through your MacDon Dealer. The Dealer will require the part number (MD #) to determine pricing and availability.

7.1.1 AM/FM Radio

The cab is pre-wired for easy installation of a DIN “E”-style audio component available from your MacDon dealer. Speakers are factory-installed.

For installation details, refer to the unloading and assembly instructions supplied with your windrower.

7.1.2 Automated Steering Systems

A MacDon-approved automated steering system is available from MacDon Dealers that provide installation and support services.

MacDon windrowers are prewired for either the Trimble® AutoPilot™ hydraulically integrated steering system or the Trimble EZ-Pilot™ wheel/column based assisted steering system. The windrower’s ground speed lever (GSL) has an automated steering (autosteer) engage switch and the Trimble® display mounting kit MD #183348 is supplied in the cab.

The Trimble® AutoPilot™ system requires the MacDon automated steering hydraulic interface kit MD #B5589. Installation instruction MD #169539 is included with the kit.

Other GPS providers may supply parts in their vehicle specific installation packages or make installation kits available through MacDon Dealers.

7.1.3 Booster Spring Kit (External)

Available for headers over 6000 lb (2724 kg) to increase the float capacity.

MD #B4659 – Booster Spring Kit (external) includes two springs (one for each side) and mounting bracket.

Instruction MD #169032 is included with the bundle.

7.1.4 Booster Spring Kit (Internal)

An additional spring that is installed inside the header lift spring for increased float capacity.

MD #B5303 - includes one spring and castings for one side of the windrower.

Instruction MD #169316 is included with the bundle.

7.1.5 Case Drain Kit

The Draper Header Case Drain Kit must be installed when attaching a MacDon D50, D60, or D65 draper header with an upper cross auger (UCA) but without double draper drive. Case Drain Kit MD #B5842 is **NOT** required for double draper drive headers equipped with kits MD #B5606 and MD #B5653.

MD #B5842

OPTIONS AND ATTACHMENTS

7.1.6 Double Windrow Attachment (DWA)

Allows auger header windrower to lay a double windrow. The kit includes a draper deck, linkage assembly, hydraulics, and installation instructions.

MD #C1987 consists of:

- MD #B4655 Deck
- MD #B5270 Linkage assembly
- MD #B5301 Hydraulic kit
- MD #169216 Double Windrow Attachment (DWA) Manual

7.1.7 Draper Header Reel Drive and Lift Plumbing

Base kit required to run draper header. Includes draper header reel drive and lift plumbing (less valve) and reel fore-aft hydraulics.

NOTE: If the last digit of windrower code is B, this bundle is already installed.

MD #B5577

Includes Instruction MD #169537.

7.1.8 Engine Block Heater

Contact your nearest Cummins Engine Distributor, and provide your engine model and serial numbers to ensure the proper heater is supplied.

7.1.9 Engine Fan Air Baffle

Prevents the windrow from being disturbed by engine cooling fan air blast.

MD #B5440

Instruction MD #169443 is included with the bundle

7.1.10 Header Drive Reverser

Allows the conditioner, knife, auger, and reel to reverse on the auger header, and the conditioner and knife to reverse on the draper header.

MD #B4656

Instruction MD #169213 is included with the kit.

7.1.11 HID Auxiliary Lighting

Provides additional field lighting. The kit includes two cab-mounted high intensity discharge (HID) lamps and installation instructions.

MD #B5596

Instruction MD #169621 is included with the bundle

OPTIONS AND ATTACHMENTS

7.1.12 Hydraulic Center-Link

Allows remote adjustment of the header angle using a hydraulic cylinder between the header and the windrower.

MD #B4650 (hydraulic center-link)

Instruction MD #169236 is included with the bundle.

7.1.13 Light Header Flotation

Available for headers that do not require as much spring tension for header float.

MD #B4664

Instruction MD #169033 is included with the bundle.

7.1.14 Lighting and Marking for Cab-Forward Road Travel

Allows the windrower to be compliant with vehicle lighting regulations when travelling in the cab-forward mode on public roads. The kit includes red tail lights, slow moving vehicle (SMV) markings, hardware, and installation instructions.

MD #B5412

Instruction MD #169426 is included with the bundle.

7.1.15 Mechanical Center-Link

The mechanical center-link provides a manually adjustable connection between the windrower and the header/mower conditioner.

MD #B4665

7.1.16 Pre-Cleaner and Radiator/Charge Air Cooler Sweeps

Increases engine air filter service interval in dusty conditions by relocating the air intake above the engine hood. Radiator/charge air cooler sweeps reduce debris build-up on cooler core services

MD #B5806

7.1.17 Pressure Sensor

Monitors knife drive (or reel drive) hydraulic pressure, and warns of overload conditions.

MD #B5574

Instruction MD #169031 is included with the kit.

7.1.18 Rotary Header Drive Hydraulics (13-foot)

Used to allow operation of a 13-foot rotary header. The kit includes header drive plumbing and installation instructions.

MD #B5510

OPTIONS AND ATTACHMENTS

7.1.19 Self-Aligning Center-Link

Allows the center-link cylinder to be hydraulically positioned and connected to the header without leaving the operator's station.

For hands-free connecting, hydraulic center-link (MD #B4650) must be installed.

Instruction MD #B4802 is included with the kit.

7.1.20 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: Free Form Plastic Products

Box 159

502 F.P. Bourgault Drive

St. Brieux, SK S0K 3V0

(306) 275-2155

<http://www.freeformplastics.com>

7.1.21 Towing Harness

The towing harness is used together with the weight box when towing a D-Series draper header equipped with slow speed transport 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 with the bundle.

7.1.22 Warning Beacons

Two rotating warning beacons that are designed for installation onto the pre-wired cab. The kit includes the beacons, a switch, mounting hardware, and instructions. The beacons are standard equipment for exported windrowers, and are optional for North America. Fits 2009 and newer machines.

MD #B5582

Instruction MD #169538 is included with the bundle.

OPTIONS AND ATTACHMENTS

7.1.23 Weight Box

To move the windrower without an attached header, attach the weight box to the header lift system. The weight box allows transporting a header behind the windrower by providing additional weight on the drive wheels.

MD #B5238 – Weight box without harness³⁴

MD #B5240 – Weight box without harness and concrete.³⁴

Instruction MD #169280 is included with the bundle.

MD #B5280 – Wiring harness for weight box. Includes hitch pin and wiring for use with slow speed transport. Use with MD #B5238 and MD #B5240. Required when towing header with SP windrower.

Instruction MD #169278 is included with the bundle.

7.1.24 Windshield Shades

Retractable sun shades for front and rear windows. Attachment hardware is included.

MD #B4866

Instruction MD #169218 is included with the bundle.

34. Wiring harness MD #B5280 is also required to tow a header. Refer to [7.1.21 Towing Harness, page 408](#)

8 Engine Error Codes

Example: cab display module (CDM) displays the Error Code 110S 16F 28C

1. 110S - S represents the SPN column. Locate code 110 in that column.
2. 16F - F represents the FMI column. Locate code 16 in that column.
3. 28C - C is occurrences, 28 is the quantity.
4. DESCRIPTION - Coolant Temperature High – Data Valid but Above Normal Operational Range - Moderately Severe Level Engine Coolant Temp.
5. Refer to LAMP COLOR and specific ENGINE CODES as required.

J1939 SPN	J1939 FMI	Lamp Color	Cummins Code	J1939 SPN	Cummins Description	Category	CDM Error Message
22	3	Amber	719		Crankcase Pressure	Extended crankcase blow-by pressure circuit - Voltage above normal, or shorted to high source	Crankcase Pressure
	4	Amber	729			Extended crankcase blow-by pressure circuit - Voltage below normal, or shorted to low source	
32	3	Amber	2111		Coolant Temperature	Coolant temperature 2 sensor circuit - Voltage above normal, or shorted to high source	Coolant Temperature
52	0	Red	2114			Coolant temperature 2 - Data valid but above normal operational range - Most severe level	
	4	Amber	2112			Coolant temperature 2 sensor circuit - Voltage below normal, or shorted to low source	
	16	Amber	2113			Coolant temperature 2 - Data valid but above normal operational range - Moderately severe level	

ENGINE ERROR CODES

J1939 SPN	J1939 FMI	Lamp Color	Cummins Code	J1939 SPN	Cummins Description	Category	CDM Error Message
91	0	Red	148		Accelerator Pedal Position	Accelerator pedal or lever position sensor circuit - Abnormal frequency, pulse width, or period	Accelerator Pedal Position
	1	Red	147			Accelerator pedal or lever position sensor circuit - Abnormal frequency, pulse width, or period	
	2	Red	1242	154		Accelerator pedal or lever position sensor 1 and 2 - Data erratic, intermittent, or incorrect	
	3	Red	131	154		Accelerator pedal or lever position sensor circuit - Voltage above normal, or shorted to high source	
	4	Red	132	154		Accelerator pedal or lever position sensor circuit - Voltage below normal, or shorted to low source	
	8	154		154	Throttle Position Sensor	Abnormal frequency, pulse width, or period	
	12	154		154		Bad device or component	
	19	Red	287		Accelerator Pedal Position	SAE J1939 multiplexing accelerator pedal or lever sensor system error - Received network data in error	
94	1	Amber	2216		Fuel Delivery Pressure	Fuel pump delivery pressure - Data valid but above normal operational range - Moderately severe level	Fuel Delivery Pressure
	2	Amber	268			Fuel pressure sensor circuit - Data erratic, intermittent, or incorrect	
	18	Amber	2215			Fuel pump delivery pressure - Data valid but below normal operational range - Moderately severe level	

ENGINE ERROR CODES

J1939 SPN	J1939 FMI	Lamp Color	Cummins Code	J1939 SPN	Cummins Description	Category	CDM Error Message
97	3	Amber	428		Water in Fuel Indicator	Water in fuel sensor circuit - Voltage above normal, or shorted to high source	Water in Fuel Indicator
	4	Amber	429			Water in fuel sensor circuit - Voltage below normal, or shorted to low source	
	15	Maint	418			Water in fuel indicator high - Data valid but above normal operational range - Least severe level	
100	1	Red	415	157	Engine Oil Pressure	Oil pressure low - Data valid but below normal operational range - Most severe level	Engine Oil Pressure
	2	Amber	435			Oil pressure sensor circuit - Data erratic, intermittent, or incorrect	
	3	Amber	135	157		Oil pressure sensor circuit - Voltage above normal, or shorted to high source	
	4	Amber	141	157		Oil pressure sensor circuit - Voltage below normal, or shorted to low source	
	10	157		157		Engine oil pressure sensor 5v supply connection open circuit	
	17	N/A		157		Low oil pressure - warning	
	18	Amber	143	360		Oil pressure low - Data valid but below normal operational range - Moderately severe level	

ENGINE ERROR CODES

J1939 SPN	J1939 FMI	Lamp Color	Cummins Code	J1939 SPN	Cummins Description	Category	CDM Error Message
102	2	Amber	433		Boost Pressure	Intake manifold pressure sensor circuit - Data erratic, intermittent, or incorrect	Boost Pressure
	3	Amber	122	197		Intake manifold pressure sensor circuit - Voltage above normal, or shorted to high source	
	4	Amber	123	197		Intake manifold pressure sensor circuit - Voltage below normal, or shorted to low source	
	10	Amber		197		Intake manifold pressure sensor circuit - Abnormal rate of change	
103	10	Amber	2345		Turbocharger 1 Speed	Turbocharger speed invalid rate of change detected - Abnormal rate of change	Turbocharger 1 Speed
	16	Amber	595			Turbocharger #1 speed high - Data valid but above normal operational range – Moderately severe level	
	18	Amber	687			Turbocharger #1 speed low - Data valid but below normal operational range - Moderately severe level	

ENGINE ERROR CODES

J1939 SPN	J1939 FMI	Lamp Color	Cummins Code	J1939 SPN	Cummins Description	Category	CDM Error Message
105	0	Red	155		Intake Manifold #1 Temp	Intake manifold air temperature high - Data valid but above normal operational range - Most severe level	Intake Manifold #1 Temperature
	3	Amber	153	133		Intake manifold air temperature sensor circuit - Voltage above normal, or shorted to high source	
	4	Amber	154	133		Intake manifold air temperature sensor circuit - Voltage below normal, or shorted to low source	
	15	None	2964	133		Intake manifold temperature high - Data valid but above normal operational range - Least severe level	
	16	Amber	488	133	Intake Manifold	Intake manifold 1 temperature - Data valid but above normal operational range - Moderately severe level	
106	3	135		1785	Inlet Manifold Pressure Sensor	Voltage above normal or shorted high	Inlet Manifold Pressure Sensor
	4	135		1785		Voltage below normal or shorted low	
	10	135		1785		Inlet manifold pressure sensor 5v supply connection open circuit	
107	15	Amber		151	Air Filter Restriction	High air filter restriction	Air Filter
108	2	Amber	295		Barometric Pressure	Barometric pressure sensor circuit - Data erratic, intermittent, or incorrect	Barometric Pressure
	3	Amber	221			Barometric pressure sensor circuit - Voltage above normal, or shorted to high source	
	4	Amber	222			Barometric pressure sensor circuit - Voltage below normal, or shorted to low source	

ENGINE ERROR CODES

J1939 SPN	J1939 FMI	Lamp Color	Cummins Code	J1939 SPN	Cummins Description	Category	CDM Error Message
109	3	Amber	231		Coolant Pressure	Coolant pressure sensor circuit - Voltage above normal, or shorted to high source	Coolant Pressure
	4	Amber	232			Coolant pressure sensor circuit - Voltage below normal, or shorted to low source	
	18	Amber	233			Coolant pressure - Data valid but below normal operational range - Moderately severe level	
110	0	Red	151	168	Engine Coolant Temperature	Coolant temperature low - Data valid but above normal operational range - Most severe level	Engine Coolant Temperature
	2	Amber	334			Coolant temperature sensor circuit - Data erratic, intermittent, or incorrect	
	3	Amber	144	168		Coolant temperature sensor circuit - Voltage above normal, or shorted to high source	
	4	Amber	145	168		Coolant temperature sensor circuit - Voltage below normal, or shorted to low source	
	15	None	2963	168		Engine coolant temperature high - Data valid but above normal operational range - Least severe level	
	16	Amber	146	168		Coolant temperature high - Data valid but above normal operational range - Moderately severe level	

ENGINE ERROR CODES

J1939 SPN	J1939 FMI	Lamp Color	Cummins Code	J1939 SPN	Cummins Description	Category	CDM Error Message
157	0	Red	449	159	Injector Metering Rail 1 Pressure	Fuel pressure high - Data valid but above normal operational range - Moderately severe level	Injector Metering Rail 1 Pressure
	1	Amber	2249	159		Injector metering rail 1 pressure - Data valid but below normal operational range - Most severe level	
	2	Amber	554			Fuel pressure sensor error - Data erratic, intermittent, or incorrect	
	3	Amber	451	159		Injector metering rail #1 pressure sensor circuit - Voltage above normal, or shorted to high source	
	4	Amber	452	159		Injector metering rail #1 pressure sensor circuit - Voltage below normal, or shorted to low source	
	16	Amber	553			Injector metering rail #1 pressure high - Data valid but above normal operational range - Moderately severe level	
	18	Amber	559			Injector metering rail #1 pressure low - Data valid but below normal operational range - Moderately severe level	
158	2	439		439	Keyswitch	Data erratic, intermittent, or incorrect	Keyswitch
166	2	None	951		Cylinder Power	Cylinder power imbalance between cylinders - Data erratic, intermittent, or incorrect	Cylinder Power

ENGINE ERROR CODES

J1939 SPN	J1939 FMI	Lamp Color	Cummins Code	J1939 SPN	Cummins Description	Category	CDM Error Message
167	1	Red	598		Alternate Potential (Voltage)	Electrical charging system voltage low - Data valid but below normal operational range - Most severe level	Alternator Potential (Voltage)
	16	Amber	596			Electrical charging system voltage high - Data valid but above normal operational range - Moderately severe level	
	18	Amber	597			Electrical charging system voltage low - Data valid but below normal operational range - Moderately severe level	
168	0	422		422	ECM Battery Power	Excessive battery power	ECM Battery Power
	1					Low battery power	
	2					Intermittent	
	16	Amber	442		Electrical Potential (Voltage)	Battery #1 voltage high - Data valid but above normal operational range - Moderately severe level	
	18	Amber	441		Electrical Potential (Voltage)	Battery #1 voltage low - Data valid but below normal operational range - Moderately severe level	
171	3	Amber	249		Ambient Air Temperature	Ambient air temperature sensor circuit - Voltage above normal, or shorted to high source	Ambient Air Temperature
	4	Amber	256			Ambient air temperature sensor circuit - Voltage below normal, or shorted to low source	
173	15	Amber		185	High Exhaust Temperature	High exhaust temperature	Exhaust Temp

ENGINE ERROR CODES

J1939 SPN	J1939 FMI	Lamp Color	Cummins Code	J1939 SPN	Cummins Description	Category	CDM Error Message
174	3	Amber	263		Fuel Temperature	Engine fuel temperature sensor 1 circuit - Voltage above normal, or shorted to high source	Fuel Temperature
	4	Amber	265			Engine fuel temperature sensor 1 circuit - Voltage below normal, or shorted to low source	
	16	Amber	261			Engine fuel temperature - Data valid but above normal operational range - Moderately severe level	
175	0	Red	214		Oil Temperature	Engine oil temperature - Data valid but above normal operational range - Most severe level	Oil Temperature
	2	Amber	425			Engine oil temperature - Data erratic, intermittent, or incorrect	
	3	Amber	212			Engine oil temperature sensor 1 circuit - Voltage above normal, or shorted to high source	
	4	Amber	213			Engine oil temperature sensor 1 circuit - Voltage below normal, or shorted to low source	
190	0	Red	234		Engine Speed	Engine speed high - Data valid but above normal operational range - Most severe level	Engine Speed
	2	Amber	689			Primary engine speed sensor error - Data erratic, intermittent, or incorrect	
	8	141		141	Speed/Timing Sensor	Abnormal signal frequency	
	15	N/A		141	Engine Speed	Engine overspeed - Warning	
251	2	Maint	319		Real Time Clock Power	Real time clock power interrupt - Data erratic, intermittent, or incorrect	Real Time Clock Power

ENGINE ERROR CODES

J1939 SPN	J1939 FMI	Lamp Color	Cummins Code	J1939 SPN	Cummins Description	Category	CDM Error Message
558	2	Amber	431	91	Accelerator Pedal Low Idle Switch	Accelerator pedal or lever idle validation circuit - Data erratic, intermittent, or incorrect	Accelerator Pedal Low Idle Switch
	2	155		774	Secondary Throttle Position Sensor	Data erratic, intermittent, or incorrect	
	4	Amber	55		Accelerator Pedal Low Idle Switch	Accelerator pedal or lever idle validation circuit - Voltage below normal, or shorted to low source	
	13	Red	432		Accelerator Pedal Low Idle Switch	Accelerator pedal or lever idle validation circuit - Out of calibration	
611	3	Amber	2185		System Diagnostic Code #1	Sensor supply voltage #4 circuit - Voltage above normal, or shorted to high source	Accelerator Pedal Low Idle Switch
	4	Amber	238		System Diagnostic Code #1	Sensor supply voltage #3 circuit - Voltage below normal, or shorted to low source	
	16	Amber	2292		Fuel Inlet Meter Device	Fuel inlet meter device - Data valid but above normal operational range - Moderately severe level	
	18	Amber	2293		Fuel Inlet Meter Device	Fuel inlet meter device flow demand lower than expected - Data valid but below normal operational range - Moderately severe level	
	31	Amber	757		Electronic Control Module	Electronic control module data lost - Condition exists	Electronic Control Module
612	2	Red	115		System Diagnostic Code # 2	Engine speed / position sensor circuit lost both of two signals from the magnetic pickup sensor - Data erratic, intermittent, or incorrect	System Diagnostic Code # 2
627	2	Amber	434		Power Supply	Power lost without ignition off - Data erratic, intermittent, or incorrect	Power Supply

ENGINE ERROR CODES

J1939 SPN	J1939 FMI	Lamp Color	Cummins Code	J1939 SPN	Cummins Description	Category	CDM Error Message
629	12	Red	111		Controller #1	Engine control module critical internal failure - bad intelligent device or component	Controller #1
630	2	Amber	341	527	Calibration Memory	Engine control module data lost - Data erratic, intermittent, or incorrect	Calibration Memory
	13	Red	342			Electronic calibration code incompatibility - Out of calibration	
	31	Amber	2217			ECM program memory (RAM) corruption - Condition exists	
631	2	415		415	Engine Software	Data incorrect	Engine software
633	31	Amber	2311		Fuel Control Valve #1	Fueling actuator #1 circuit error - Condition exists	Fuel Control Valve #1
637	11	143		143	Primary To Secondary Speed Signal	Calibration fault	Primary to secondary speed signal
639	9	Amber	285	247	SAE J1939 Datalink	SAE J1939 multiplexing PGN timeout error - Abnormal update rate	SAE J1939 Datalink
	13	Amber	286			SAE J1939 multiplexing configuration error - Out of calibration	
1484	31	None	211		J1939 Error	Additional auxiliary diagnostic codes logged - Condition exists	J1939 Error
641	3	Amber	2385		Variable Geometry Turbocharger	VGT actuator driver circuit - Voltage above normal, or shorted to high source	Variable Geometry Turbocharger
	4	Amber	2384			VGT actuator driver circuit - Voltage below normal, or shorted to low source	
646	5	177		526	Turbo Wastegate	Solenoid current low	Turbo Wastegate
	6	177		526		Solenoid current high	

ENGINE ERROR CODES

J1939 SPN	J1939 FMI	Lamp Color	Cummins Code	J1939 SPN	Cummins Description	Category	CDM Error Message
651	2			111	Cylinder #1 Injector	Cylinder #1 injector erratic, intermittent or incorrect	Injector Cylinder #01
	5	Amber	322	1		Injector solenoid cylinder #1 circuit - Current below normal, or open circuit	
	6	N/A		1		Injector current high	
	7	Amber	1139	1		Injector cylinder #1 - Mechanical system not responding properly or out of adjustment	
652	2			112	Cylinder #2 Injector	Cylinder # 2 injector erratic, intermittent or incorrect	Injector Cylinder #02
	5	Amber	331	2		Injector solenoid cylinder #2 circuit - Current below normal, or open circuit	
	6	N/A		2		Injector current high	
	7	Amber	1141	2		Injector cylinder #2 - Mechanical system not responding properly or out of adjustment	
653	2			113	Cylinder #3 Injector	Cylinder # 3 injector erratic, intermittent or incorrect	Injector Cylinder #03
	5	Amber	324	3		Injector solenoid cylinder #3 circuit - Current below normal, or open circuit	
	6	N/A		3		Injector current high	
	7	Amber	1142	3		Injector cylinder #3 - Mechanical system not responding properly or out of adjustment	
654	2			114	Cylinder #4 Injector	Cylinder # 4 injector erratic, intermittent or incorrect	Injector Cylinder #04
	5	Amber	332	4		Injector solenoid cylinder #4 circuit - Current below normal, or open circuit	
	6	N/A		4		Injector current high	
	7	Amber	1143	4		Injector cylinder #4 - Mechanical system not responding properly or out of adjustment	

ENGINE ERROR CODES

J1939 SPN	J1939 FMI	Lamp Color	Cummins Code	J1939 SPN	Cummins Description	Category	CDM Error Message
655	2			115	Cylinder #5 Injector	Cylinder # 5 injector erratic, intermittent or incorrect	Injector Cylinder #05
	5	Amber	323	5		Injector solenoid cylinder #5 circuit - Current below normal, or open circuit	
	6	N/A		5		Injector current high	
	7	Amber	1144	5		Injector cylinder #5 - Mechanical system not responding properly or out of adjustment	
656	2			116	Cylinder #6 Injector	Cylinder # 6 injector erratic, intermittent or incorrect	Injector Cylinder #06
	5	Amber	325	6		Injector solenoid cylinder #6 circuit - Current below normal, or open circuit	
	6	N/A		6		Injector current high	
	7	Amber	1145	6		Injector cylinder #6 - Mechanical system not responding properly or out of adjustment	
676	5	199		199	Glow Plug Start Aid Relay	Current low	Glow Plug Start Aid relay
	6	199				Current high	
677	3	Amber	584		Starter Solenoid Lockout Relay Driver Circuit	Starter relay circuit - Voltage above normal, or shorted to high source	Starter Solenoid Lockout Relay Driver Circuit
	4	Amber	585			Starter relay circuit - Voltage below normal, or shorted to low source	
678	3	517		517	8V DC Supply	ECM 8V DC supply - Voltage above normal or shorted high	8V DC supply
	4	517				ECM 8V DC supply - Voltage below normal or shorted low	

ENGINE ERROR CODES

J1939 SPN	J1939 FMI	Lamp Color	Cummins Code	J1939 SPN	Cummins Description	Category	CDM Error Message
723	2	Amber	753			Engine speed/position #2 camshaft sync error - Data erratic, intermittent, or incorrect	Engine Speed Sensor #2
	7	Amber	731		Engine Speed Sensor #2	Engine speed/position #2 Mechanical misalignment between camshaft and crankshaft sensors - Mechanical system not responding properly or out of adjustment	
	8	142		142	Secondary Engine Speed Sensor	Abnormal signal frequency	
729	3	Amber	2426		Inlet Air Heater Driver #1	Intake air heater #1 circuit - Voltage above normal, or shorted to high source	Grid Heater
	4		2427			Intake air heater #1 circuit - Voltage above normal, or shorted to high source	
1043	3	Amber	387		Internal Sensor Voltage Supply	Accelerator pedal or lever position sensor supply voltage circuit - Voltage above normal, or shorted to high source	Internal Sensor Voltage Supply
	4	Amber	284			Engine speed/position sensor (crankshaft) supply voltage circuit - Voltage below normal, or shorted to low source	
1075	3	Amber	2265		Electric Lift Pump For Engine Fuel	Fuel priming pump control signal circuit - Voltage above normal, or shorted to high source	Electric Lift Pump for Engine Fuel
	4	Amber	2266			Fuel priming pump control signal circuit - Voltage below normal, or shorted to low source	

ENGINE ERROR CODES

J1939 SPN	J1939 FMI	Lamp Color	Cummins Code	J1939 SPN	Cummins Description	Category	CDM Error Message	
1079	3	Amber	386	516	5 Volts DC Supply	Sensor supply voltage #1 circuit - Voltage above normal, or shorted to high source	5 Volts DC Supply	
	4	Amber	352	516		Sensor supply voltage #1 circuit - Voltage below normal, or shorted to low source		
1080	3	Amber	227			Sensor supply voltage #2 circuit - Voltage above normal, or shorted to high source		
	4	Amber	187			Sensor supply voltage #2 circuit - Voltage below normal, or shorted to low source		
1136	3	Amber	697		Sensor Circuit - Voltage	ECM internal temperature sensor circuit - Voltage above normal, or shorted to high source	Sensor Circuit - Voltage	
	4	Amber	698			ECM internal temperature sensor circuit - Voltage below normal, or shorted to low source		
1172	3	Amber	691		Turbocharger #1 Compressor Inlet Temperature	Turbocharger #1 compressor inlet temperature sensor circuit - Voltage above normal, or shorted to high source	Turbocharger #1 Compressor Inlet Temperature	
	4	Amber	692			Turbocharger #1 compressor inlet temperature sensor circuit - Voltage below normal, or shorted to low source		
1188	5	Amber		177	Turbo Wastegate	Turbo wastegate drive current below normal	Turbo Wastegate	
	6					Turbo wastegate drive current above normal		
	7					Turbo wastegate not responding		

ENGINE ERROR CODES

J1939 SPN	J1939 FMI	Lamp Color	Cummins Code	J1939 SPN	Cummins Description	Category	CDM Error Message
1347	3	Amber	272		Fuel Pump Pressurizing Assembly #1	High fuel pressure solenoid valve circuit - Voltage above normal, or shorted to high source	Fuel Rail Pump
	4	Amber	271			High fuel pressure solenoid valve circuit - Voltage below normal, or shorted to low source	
	5	162		162	Fuel Rail Pump	Output current low	
	6	162		162		Output current high	
	7	Amber	281	162	Fuel Pump Pressurizing Assembly #1	High fuel pressure solenoid valve #1 - Mechanical system not responding properly or out of adjustment	
1378	31	Maint	649		Engine Oil Change Interval	Change lubricating oil and filter - Condition exists	Engine Oil Change Interval
1388	3	Amber	297		Auxiliary Pressure	Auxiliary pressure sensor input # 2 circuit - Voltage above normal, or shorted to high source	Auxiliary Pressure
	4	Amber	298			Auxiliary pressure sensor input # 2 circuit - Voltage below normal, or shorted to low source	
	14	Red	296			Auxiliary pressure sensor input 1 - Special instructions	
1563	2	Amber	1256		Control Module Identification Input State	Control module identification input state error - Data erratic, intermittent, or incorrect	Control Module Identification Input State
2623	3	Amber	1239		Accelerator Pedal Position	Accelerator pedal or lever position sensor 2 circuit - Voltage above normal, or shorted to high source	Accelerator Pedal Position
	4	Amber	1241			Accelerator pedal or lever position sensor 2 circuit - Voltage below normal, or shorted to low source	

ENGINE ERROR CODES

J1939 SPN	J1939 FMI	Lamp Color	Cummins Code	J1939 SPN	Cummins Description	Category	CDM Error Message
2629	15	None	2347		System Diagnostic Code #1	Turbocharger compressor outlet temperature (calculated) - Data valid but above normal operational range - Least severe level	System Diagnostic Code #1
2789	15	None	2346		System Diagnostic Code #1	Turbocharger turbine inlet temperature (calculated) - Data valid but above normal operational range - Least severe level	System Diagnostic Code #1
2981	3	Amber	2115		Coolant Pressure	Coolant pressure 2 circuit - Voltage above normal, or shorted to high source	Coolant Pressure
	4	Amber	2116			Coolant pressure 2 circuit - Voltage below normal, or shorted to low source	
	18	Amber	2117			Coolant pressure 2 - Data valid but below normal operational range - Moderately severe level	

9 Cab Display Module (CDM) Error Codes

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. IE. 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 activated with the header off.
E3		CDM CAN BUS 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		CDM INTERNAL ERROR	Internal hardware or software problem.
E11		CDM POWER UP	CDM Module did not power up correctly.
E12		WCM POWER UP	WCM Module 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 DRIVE 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
E20			
E21	E121	REVERSER P106	Reverser Solenoid P106 fault detected
E22			
E23	E123	REVERSER	Reverser – Solenoid (P65, P66, P67) fault detected
E24	E124	DECK SHFT RIGHT P95	Right Deck Shift solenoid P95 fault detected
E25	E125	DECK SHFT LEFT P96	Left Deck Shift solenoid P96 fault detected
E26	E126	DWA UP	DWA Raise solenoid P72, P73 fault detected
E27	E127	DWA DOWN	DWA Lower solenoid P72, P73, fault detected circuit
E28	E128	TILT RETRACT	Header Tilt Retract solenoid P54, fault detected
E29	E129	TILT EXTEND	Header Tilt Extend solenoid P53, P54, fault detected
E30	E130	4 WAY VALVE P62	4 Way valve solenoid P62 fault detected

CAB DISPLAY MODULE (CDM) ERROR CODES

Codes		CDM Display	Description
E31	E131	BYPASS VALVE P52	Bypass valve solenoid P52 fault detected
E32	E132	HEADER UP/DOWN P57	Header up / down solenoid P57, fault detected
E33	E133	SCREEN CLEANERS	Screen cleaner output fault detected
E34	E134	RIGHT STOP LAMP	Right stop lamp output fault detected
E35	E135	LEFT STOP LAMP	Left stop lamp output fault detected
E36	E136	RIGHT TURN LAMP	Right turn lamp output fault detected
E37	E137	LEFT TURN LAMP	Left turn lamp output fault detected
E38	E138	MAIN DRIVE	Main header drive solenoid P71 fault detected
E39	E139	LOW RANGE P61	Low range solenoid P61 fault detected
E40	E140	HIGH RANGE P60	High range solenoid P60 fault detected
E41	E141	REEL AFT	Reel aft solenoid P55, P59, fault detected
E42	E142	REEL FORE	Reel fore solenoid P55, P59, fault detected
E43	E143	REEL UP/DOWN P58	Reel up / down solenoid P58, P52, P62 fault detected
E44	E144	FLOAT RHS P64	RHS float solenoid P64, fault detected
E45	E145	FLOAT LHS P63	LHS float solenoid P63, fault detected
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
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 (MD #112848 on return manifold)
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°F/110°C.
E69		ENGINE AIR FILTER	Engine air filter plugged
E70		HYDRAULIC FILTER	Hydraulic filter pressure too high. (switch 227 on hydraulic schematic)

CAB DISPLAY MODULE (CDM) ERROR CODES

Codes		CDM Display	Description
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	J1939 Can 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.

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