This Manual contains instructions for “SAFETY”, “OPERATION”, and “MAINTENANCE/SERVICE” for your new MacDon Model M100 Self-Propelled Windrower.

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.
1 INTRODUCTION

This manual contains information on the MacDon Model M100 Self-Propelled Windrower that 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, or draper headers, provides a package which incorporates many features and improvements in design. This manual must be used in conjunction with your Header Operator's Manual.

CAREFULLY READ ALL THE MATERIAL PROVIDED BEFORE ATTEMPTING TO UNLOAD, ASSEMBLE, OR USE THE MACHINE.

Use this manual as your first source of information about the machine. If you follow the instructions given in this manual, your M100 Windrower will work well for many years. If you require more detailed service information, check with your dealer.

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.

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. A manual storage case is provided in the cab.

NOTE: Right-Hand and Left-Hand designations are determined by the operator’s position, facing the direction of travel.

RECORD THE SERIAL NUMBERS IN THE SPACES BELOW.

Windrower ______________________ M100 Diesel Engine ______________________

Serial Number plate is located on the left side of the main frame, near the rear corner.

Serial Number plate is located on the right side of the engine block.
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HYDRAULIC AND ELECTRICAL SCHEMATICS
2 SAFETY

2.1 SAFETY ALERT SYMBOL

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

This symbol means:

ATTENTION!
BECOME ALERT!
YOUR SAFETY IS INVOLVED!

Carefully read and follow the safety message accompanying this symbol.

WHY IS SAFETY IMPORTANT TO YOU?

ACCIDENTS DISABLE AND KILL
ACCIDENTS COST
ACCIDENTS CAN BE AVOIDED

2.2 SIGNAL WORDS

Note the use of the signal words DANGER, WARNING, and CAUTION with safety messages. The appropriate signal word for each message 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 is also used to alert against unsafe practices.

CAUTION
Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It is also used as a reminder of good safety practices.

2.3 SAFETY SIGNS

2.3.1 Safety Sign Installation

Refer to the illustration on this and following pages and proceed as follows:

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

2.3.2 Safety Sign Locations

The safety signs (decals) appear on the windrower at the locations approximately as shown.

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

Safety Sign Locations (continued)

#32744 IN CAB
#32744 BELOW DOOR HANDLE
#44944 OIL RESERVOIR UNDER HOOD
#134070 FRONT OF PLATFORM
#160400 BEHIND DOOR
#109843 BEHIND DOOR
#163561 LIFT LINKAGES

WARNING

DO NOT GO NEAR LEAKS
- High pressure oil leaks can cause burns, even after the leak stops.
- If not detected, an emergency medical team may need to perform emergency surgery to remove an oil 
  burn. 
- Do not use fingers or automated equipment to check for leaks.
- Lower food or release hydraulic pressure before moving the lift.

CAUTION

To avoid injury or death from improper or unsafe machine operation:
1. Read the Operator’s Manual, and follow all safety instructions.
2. Do not allow untrained persons to operate the machine.
3. Review safety instructions with all operators annually.
4. Ensure that all safety signs are installed and legible.
5. Make sure everyone is in the machine before starting the engine and are wearing the proper personal protective equipment.
6. Do not let others ride on the machine.
7. Keep all shields in place, and stay clear of moving parts.
8. Disengage header drive, put transmission in neutral and wait for all movement to stop before leaving operator’s position.
9. Shut off engine and remove key from ignition before servicing, adjusting, lubricating, cleaning, or unloading the machine.
10. Engage brakes to prevent movement of the machine or trailer before servicing in the raised position.
11. Use slow-moving vehicle warning and flashing warning lights when operating on roadways unless prohibited by law.
SAFETY

Safety Sign Locations (continued)

**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 for PASSENGER SEAT or USE BY CHILDREN.

USE THE SEAT BELT whenever operating the machine or riding as a PASSANGER.

KEEP ALL OTHER RIDERS OFF THE MACHINE.

- #109868 IN CAB
- #32744 IN CAB
- #160350 IN CAB

**WARNING**

1. Machine will move if steering wheel is turned while engine is running.
2. Steering response is opposite to what is normally expected when backing up. Turn bottom of steering wheel in direction you want to go.
3. Always move ground speed lever to slow end of range before shifting high-low speed control.

For complete operating instructions refer to Operator's Manual.

**STARTING:** Disengage header drive. Move ground speed lever to N. Lock steering wheel. Turn key.

**STOPPING:** Move ground speed lever to N. Lock steering wheel. Disengage header drive and stop engine.

**TOWING:** Disengage wheel drives by reversing disc at center of wheel.

- #109844 IN CAB
- #110989 ON FRAME

**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.
- CORROSIVE AND POISONOUS BATTERY ACID: Acid can severely burn your body and clothing.

- #110989 ON FRAME
- #160426 IN CAB

**WARNING**

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

When driving windrower on public roadways:
1. Obey all highway traffic regulations in your area. Use pilot vehicles front and rear of windrower if required by law.
2. Use slow moving vehicle emblem and flashing warning lights unless prohibited by law.
3. If width of attached header impedes other vehicle traffic, remove header and install a MacDon approved weight box. Refer to Operator’s Manual for safe procedure to tow header.

- #160426 IN CAB
SAFETY

Safety Sign Locations (continued)

To prevent machine runaway:
- 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.

CAUTION
Coolant is under pressure and may be hot. Never remove radiator cap when engine is hot.

WARNING

#42130 ON FRAME

#134068 ON FAN SHROUD

#110986 ON FRAME
SAFETY

Safety Sign Locations (continued)

To avoid serious injury or death from loss of control:
1. Do not make abrupt changes in steering direction.
2. Anticipate turns by slowing down well in advance.
3. Do not rapidly accelerate or decelerate while turning.
4. When stopping:
   a. Reduce speed and lower header.
   b. Move header speed lever to slow area or range.
   c. Shift high-low speed control to low range.
5. With header removed, steering control is reduced if weight is not added to drive wheels. If you must drive the tractor without header or on level weight system:
   a. Operate in low speed range.
   b. Avoid slopes.

If control of machine is lost, immediately pull ground speed lever to neutral.

#110986 ON FRAME

#160351 RH HEADLINER PANEL

#163562 ON LIFT LINKAGE

#32743 INSIDE FRAME
2.4 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.

- You may need:
  - a hard hat.
  - protective shoes with slip resistant soles.
  - protective glasses or goggles.
  - heavy gloves.
  - wet weather gear.
  - respirator or filter mask.
  - hearing protection. Be aware that prolonged exposure to loud noise can cause impairment or loss of hearing. Wearing a suitable hearing protective device such as ear muffs (A) or ear plugs (B) protects against objectionable or loud noises.

- Provide a first-aid kit for use in case of emergencies.
- Keep a fire extinguisher on the machine. Be sure the extinguisher is properly maintained and be familiar with its proper use.
- Keep young children away from machinery at all times.
- Be aware that accidents often happen when the operator is tired or in a hurry to get finished. Take the time to consider the safest way. Never ignore warning signs of fatigue.
- Wear close-fitting clothing and cover long hair. Never wear dangling items such as scarves or bracelets.
- 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.
SAFETY

- 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.

- Do not modify the machine. Unauthorized modifications may impair the function and/or safety and affect machine life.

- 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.

- 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.

- Use adequate light for the job at hand.

- 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.
## ACRONYMS AND ABBREVIATIONS

<table>
<thead>
<tr>
<th>TERM</th>
<th>DEFINITION</th>
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<tr>
<td>API</td>
<td>American Petroleum Institute</td>
</tr>
<tr>
<td>ASTM</td>
<td>American Society Of Testing And Materials</td>
</tr>
<tr>
<td>cc</td>
<td>cubic centimeters</td>
</tr>
<tr>
<td>C</td>
<td>Celsius</td>
</tr>
<tr>
<td>CDM</td>
<td>Cab Display Module</td>
</tr>
<tr>
<td>F</td>
<td>Fahrenheit</td>
</tr>
<tr>
<td>ft/min</td>
<td>feet per minute</td>
</tr>
<tr>
<td>ft/s</td>
<td>feet per second</td>
</tr>
<tr>
<td>gpm</td>
<td>U.S. gallons per minute</td>
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<tr>
<td>GSL</td>
<td>Ground Speed Lever</td>
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<tr>
<td>hp</td>
<td>horsepower</td>
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<tr>
<td>in.</td>
<td>inches</td>
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<tr>
<td>in³</td>
<td>cubic inches</td>
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<tr>
<td>kg</td>
<td>kilograms</td>
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<tr>
<td>kPa</td>
<td>kilopascals</td>
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<tr>
<td>lbf.</td>
<td>pounds force</td>
</tr>
<tr>
<td>lbf.ft or ft-lbf</td>
<td>pound feet or foot pounds</td>
</tr>
<tr>
<td>lbf.in or in-lbf</td>
<td>pound inches or inch pounds</td>
</tr>
<tr>
<td>L/min</td>
<td>liters per minute</td>
</tr>
<tr>
<td>mm</td>
<td>millimeters</td>
</tr>
<tr>
<td>mph</td>
<td>miles per hour</td>
</tr>
<tr>
<td>N</td>
<td>Newtons</td>
</tr>
<tr>
<td>N·m</td>
<td>newton meters</td>
</tr>
<tr>
<td>N-DETENT</td>
<td>The slot opposite the neutral position on operator’s console.</td>
</tr>
<tr>
<td>oz.</td>
<td>ounces</td>
</tr>
<tr>
<td>psi</td>
<td>pounds per square inch</td>
</tr>
<tr>
<td>rpm</td>
<td>Revolutions Per Minute</td>
</tr>
<tr>
<td>SAE</td>
<td>Society Of Automotive Engineers</td>
</tr>
<tr>
<td>SCA</td>
<td>Supplemental Coolant Additives</td>
</tr>
<tr>
<td>WCM</td>
<td>Windrower Control Module</td>
</tr>
</tbody>
</table>

Also See Section 7.3.3 Conversion Chart.
## 4 SPECIFICATIONS

### 4.1 WINDROWER DIMENSIONS

<table>
<thead>
<tr>
<th>WHEEL POSITION</th>
<th>TREAD Inch (mm)</th>
<th>HUBS Inch (mm)</th>
<th>CASTERS Inch (mm)</th>
<th>TIRES Inch (mm)</th>
<th>SHIPPING Inch (mm)</th>
<th>WHEEL BASE Inch (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DRIVE TIRE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inner/Outer</td>
<td>-</td>
<td>138.7 (3522)</td>
<td>-</td>
<td>-</td>
<td>142.9 (3630)</td>
<td>158.3 (4021)</td>
</tr>
<tr>
<td>Outer/Outer</td>
<td>134.2 (3410)</td>
<td>146.1 (3712)</td>
<td>-</td>
<td>157.1 (3990)</td>
<td></td>
<td>120.7 (3066)</td>
</tr>
<tr>
<td>Inner/Inner</td>
<td>120.1 (3050)</td>
<td>131.6 (3342)</td>
<td>-</td>
<td>150.0 (3810)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CASTER TIRE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum</td>
<td>93.2 (2367)</td>
<td>-</td>
<td>115.4 (2932)</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>135.8 (3448)</td>
<td>-</td>
<td>158.0 (4013)</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Above dimensions are with 18.4 - 26 drive tires and forked casters.
4.2 SPECIFICATIONS

<table>
<thead>
<tr>
<th>ENGINE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Cummins QSB-3.3 4 Cyl. Turbo</td>
</tr>
<tr>
<td>Displacement</td>
<td>200 cu. in. (3.3 liters)</td>
</tr>
<tr>
<td>Power</td>
<td></td>
</tr>
<tr>
<td>Rated</td>
<td>99 hp (74 kW) @ 2600 rpm</td>
</tr>
<tr>
<td>Peak</td>
<td>99 hp (74 kW) @ 2000 rpm</td>
</tr>
<tr>
<td>Maximum RPM (no load)</td>
<td>2630-2650</td>
</tr>
<tr>
<td>Idle RPM</td>
<td>1100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ELECTRICAL SYSTEM</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended Battery</td>
<td>Group Rating 31A. Max Dim – 13L.x6.81W.x9.43H. in. (330x173x240 mm). 12 Volt, Min. 950CCA. Heavy Duty/Off Road/Vibration Resistant.</td>
</tr>
<tr>
<td>Alternator</td>
<td>120 amp</td>
</tr>
<tr>
<td>Starter</td>
<td>Dry Type</td>
</tr>
<tr>
<td>Working Lights</td>
<td>11</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TRACTION DRIVE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Hydrostatic, 2 Speed Electric Shift</td>
</tr>
<tr>
<td>Speed</td>
<td></td>
</tr>
<tr>
<td>Field</td>
<td>Lo Range 0-11 mph (17.7 km/h)</td>
</tr>
<tr>
<td>Reverse</td>
<td>6 mph (9.6 km/h)</td>
</tr>
<tr>
<td>Transport</td>
<td>High Range 0-16 mph (25.6 km/h)</td>
</tr>
<tr>
<td>Transmission</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>2 Piston Pumps – 1 per Drive Wheel.</td>
</tr>
<tr>
<td>Displacement</td>
<td>3.0 cu.in. (49 cc)</td>
</tr>
<tr>
<td>Flow</td>
<td>33 U.S. gpm (129 L/min)</td>
</tr>
<tr>
<td>Final Drive</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Planetary Gearbox</td>
</tr>
<tr>
<td>Ratio</td>
<td>41.42 : 1</td>
</tr>
<tr>
<td>Wheel Motor Displ.</td>
<td></td>
</tr>
<tr>
<td>Lo Range</td>
<td>2.8 cu.in. (46 cc)</td>
</tr>
<tr>
<td>Hi Range</td>
<td>1.7 cu.in. (27 cc)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SYSTEM CAPACITIES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel Tank</td>
<td>97 U.S. Gallons (378 liters)</td>
</tr>
<tr>
<td>Cooling</td>
<td>51 U.S. Gallons (20 liters)</td>
</tr>
<tr>
<td>Hydraulic Reservoir</td>
<td>11.5 U.S. Gallons (45 liters)</td>
</tr>
<tr>
<td>Crankcase</td>
<td>1.9 U.S. Gallons (7 liters)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HEADER DRIVE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Displacement</td>
</tr>
<tr>
<td>Knife Drive – Pump A (Mechanically Adjustable)</td>
<td>Piston</td>
</tr>
<tr>
<td>Reel Drive – Pump B</td>
<td>Gear</td>
</tr>
</tbody>
</table>

(continued next page)
**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>HEADER LIFT/TILT</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td>Hydraulic</td>
</tr>
<tr>
<td><strong>Gear Pump</strong></td>
<td></td>
</tr>
<tr>
<td>Displacement</td>
<td>1.02 cu.in. (16.7 cc)</td>
</tr>
<tr>
<td>Flow</td>
<td>11.5 U.S. gpm (46.5 L/min)</td>
</tr>
<tr>
<td><strong>System Pressure (Relief/Max)</strong></td>
<td>2500 psi (17.24 MPa)</td>
</tr>
<tr>
<td><strong>Header Tilt</strong></td>
<td>Mechanically Adjustable Link (Optional Hydraulic Cylinder Adjustable From Cab)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HEADER FLOTATION</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Adjustable Springs</strong></td>
<td>Manual, External, Draw-Bolt With Springs (1 per side)</td>
</tr>
</tbody>
</table>

| CAB |  |
| 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 liters) |
| **Seat** | Driver Mechanical Suspension, Seat Belt |
| | Training (Optional) Folding, Cab Mounted, Seat Belt |
| **Windshield Wiper** | Front 31.5 in. (800 mm) Blade |
| **Heater** | 24,000 Btu/h (7038 W) |
| **Air Conditioning** | 28,280 Btu/h (8288 W) |
| **Electrical Outlets** | One Live, One On Ignition, One Live/Keyed. |
| **Mirrors** | Two Outside |
| **Radio** | Two Speakers and Antenna Factory Installed. Dealer Installed Radio |

| SYSTEM MONITORING |  |
| **Speeds** | Ground (mph or km/h), Engine (rpm), Knife (rpm) Optional, Reel (rpm) Optional, Conveyor (Ref. No.) |
| **Header** | Height, Angle (Optional) |

| TIRE OPTIONS |  |
| Size | Drive 18.4 - 26 Bar, 18.4 - 26 Turf, 600-65 R28 Bar, 23.1 - 26 Turf, 580-70 R26 Turf |
| | Rear 7.5 – 16SL Single Rib Formed Caster, 10 x 16 Formed/Forked Caster |
| | 16.5L – 16.1 Rib Implement Flotation, Forked Caster |
| **Pressure** | Drive Bar – 32 psi (221 kPa), Turf – 20 psi (138 kPa) |
| | Rear 10 psi (69 kPa) |

| FRAME AND STRUCTURE |  |
| Dimensions | Refer to Section 4.1, Windrower Dimensions |
| **Frame to Ground (Crop Clearance)** | 45.7 in. (1160 mm) |
| **Weight** | Approx. 9900 lb (4491 kg) |
| **NG Header Compatibility** | SK A30S Auger, D50 & D60S Harvest Header (35’ Max.) |
| | DK A30D, A40D Auger, D60D Harvest Header (35’ Max.) |

**NOTES:** 1. Specifications and design are subject to change without notice or obligation to revise previously sold units. 2. Weights do not include options.
5 OPERATOR’S STATION

The operator’s station is designed for operating the windrower in a cab forward mode.

5.1 OPERATOR CONSOLE

The console contains controls to operate the windrower as well as amenities for the operator.

5.2 SEAT ADJUSTMENTS

The operator’s seat has several adjustments. Refer to the following illustration for the location and description of each adjustment.
5.3 TRAINING SEAT (Optional)

A wall mounted fold-up training seat complete with seat belt is provided for use as described below. To lower seat, lift latch (A) and lower seat (B). For storage, lift seat (B) and secure with latch (A).

**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.

5.4 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 insure 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.

a. To fasten seat belt, pull belt completely across your body. Push the metal eye into the buckle until it locks. Adjust the position of the belt as low on your body as possible.

b. To release, push the red button in the end of the buckle and separate the buckle and metal eye.

5.5 STEERING COLUMN ADJUSTMENT

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

a. Hold onto steering wheel, step on lever (C), and move steering wheel up or down to desired position.

b. Release lever (C) to lock steering wheel position.
5.6 OPERATOR PRESENCE

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

- Header Drive
- Transmission
- Engine

5.6.1 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 5 seconds after the operator leaves the seat, and then the header shuts down.
- If the seat switch is open for more than 5 seconds and the seat switch is closed again, it requires the operator to move the header engage switch to "OFF" position and back to the "ON" position again to restart the header.

5.6.2 Transmission
- If the operator leaves the seat and the transmission is not locked in neutral, after 2 seconds the lower display will flash "NOT IN NEUTRAL" accompanied by an alarm.

5.6.3 Engine
- The engine will not be allowed to start when the header drive switch is engaged.
- The engine will not be allowed to start when the transmission is not locked in neutral.
- The engine will shutdown when the windrower is moving at 5 mph (8 km/h) or less and the operator leaves the seat.
5.7 LIGHTS

The field and transport light switches are located on a panel in the cab headliner. Refer to illustrations on following pages for location of lights.

5.7.1 Field Lighting

- **Hi/Lo Lights**
  Controls Hi/Lo Beam For Road Lights On Cab Roof

- **Lights Switch**
  Controls Field and Transport Lights
  - Field
  - Off
  - Road

- **Beacon**
  Controls Beacons On Cab.
  Standard for Export. Optional for N.A.
  On – Off

- **Front**
  - Field Lights

- **Rear**
  - Swath Lights
5.7.2 Road Lighting

5.7.3 Beacon Lighting – Export

The beacon lights are functional when the ignition and the beacon switches are on. The beacons must be used when driving on the road.
5.8 WINDSHIELD WIPERS

The windshield wiper control is located in the cab headliner.

5.9 REAR VIEW MIRRORS

Two adjustable outside mounted mirrors provide rear view vision.
5.10 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.

5.10.1 Controls

Refer to the following illustrations for an explanation of the controls and operating procedures.

**IMPORTANT**
To distribute the oil throughout the system, perform the following steps whenever the machine is first started after storage for more than one week:

a. Ensure heater shut-off valve at engine is open. See 5.10.3 Heater Shut-off Valve.

b. Turn blower switch to the first position, turn temperature control switch to maximum heating, and A/C control to “OFF”.

c. Start engine and operate at low idle until engine is warm.

d. Click A/C switch from "OFF" to "ON" for one second, then back to "OFF" for 5 to 10 seconds. Repeat this step ten times.

5.10.2 Air Distribution

Cab air distribution is controlled through adjustable air vents. They are located in the cab posts to provide window and operator ventilation as shown in illustration.

5.10.3 Heater Shut-Off Valve

A shut-off valve 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.
5.10.4 A/C Compressor Protection

The compressor is protected from excessively low and high pressures by two switches that shut down the compressor to prevent damage to the system.

- The LOW pressure switch opens when the pressure falls to 5.1-10.9 psi (35-75 kPa) and shuts down the compressor. When the pressure rises to 17.6-26.4 psi (121-182 kPa), the switch closes and allows the compressor to run.
- The HIGH pressure switch opens and stops the compressor when the pressure rises to 315-335 psi (2172-2310 kPa). When the pressure falls to 220-280 psi (1517-1930 kPa), the switch closes and allows the compressor to run.
- The Windrower Control Module (WCM) gives a warning when it senses rapid pressure changes that cause the compressor to rapidly engage and disengage.

If the air conditioning system is shut down by either switch, locate the source of the problem and correct it before operating the system.

5.11 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, and functions only when the road/field light switch is on. 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.

5.12 OPERATOR AMENITIES
5.13 RADIOS

5.13.1 AM/FM Radio

A radio (A) is available as optional equipment from your dealer and a space is provided in the cab headliner to accommodate the installation. Two pre-wired speakers (B) have been factory installed in the headliner. Refer to M100 Self-Propelled Windrower Unloading and Assembly Instruction for radio installation procedures. Operating instructions are supplied with the radio.

5.13.2 Antenna Mounting

A roof mounted antenna base for installing a magnetic antenna is available as an option from your dealer. Order part #160288, or see illustration for part dimensions for a “homemade” version. It accommodates most CB, 2-way radio and satellite radio antennas. Refer to M100 Self-Propelled Windrower Unloading and Assembly Instruction for installation procedures.

5.14 HORN

The horn is activated by pushing the button located beside the ignition key. The ignition switch must be on. Sound the horn three times prior to starting the engine.
5.15 ENGINE CONTROLS/GAUGES

All engine controls are conveniently located on the operator's console. Refer to the following illustration for the location and a description of each.

**IGNITION SWITCH**
- **ACC** – Fully Counter-Clockwise
- **OFF** – All Electrical Systems Off
- **RUN** – Clockwise
- **START** – Fully Clockwise To Crank Engine
  - Release and Switch Returns to RUN

**THROTTLE**
- Controls Engine RPM.
  - **FULL** – Push Lever Forward
  - **OPERATING** – See Section 6.3.5
  - **IDLE** – Pull Lever Back

REMOVE KEY WHEN WINDROWER NOT IN USE.
KEY ALSO LOCKS DOORS.
5.16 WINDROWER CONTROLS

HAZARD WARNING LIGHTS
Activates Signals On Windrower and Header
Push On – Push Off

TURN SIGNALS
Activates Turn Signals On Windrower and Header
Push On – Push Off

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

FAST
SLOW
N-DETENT
REVERSE
5.17 HEADER CONTROLS

All header controls are conveniently located on the operator's console and on the GSL handle.

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

5.17.1 Header Engage Switch

Engages and disengages header drive.

IMPORTANT
Always move throttle lever back to idle before engaging header drive. Do not engage header with engine at full RPM.

5.17.2 GSL Header Switches

The GSL (A) contains switches for the following header functions that are most often adjusted while in operation to suit changing crop conditions. All are momentary type switches. A decal that identifies the switch functions is located on the cab post above the operator's console.

- Display Selector
- Reel Position
- Header Position
- Reel Speed
OPERATOR’S STATION

5.17.2.1 Display Selector Switch

Selects and displays the settings in the CDM (B) top line read-out for each of the header controls.
- Press switch to scroll through settings.

5.17.2.2 Reel Position Switches

Press and hold switch at location shown to move reel.
Release switch at desired position.

5.17.2.3 Header Position Switches

Press and hold switch at location shown to move header.
Release switch at desired position.

5.17.2.4 Reel Speed Switches

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

NOTE
Reel position switches work only on draper headers.

NOTE
Auger speed adjusts proportionately when reel speed is changed. See Section 6 for further details.
5.17.3 Console Header Switches

The operator’s console contains switches for the following header functions that are most often used while the windrower is stationary.

5.17.3.1 Deck Shift

*Draper Header with Deck Shift Option* - Controls deck shifting for double windrowing options with a draper header.
5.18 CAB DISPLAY MODULE (CDM)

5.18.1 Engine and Windrower Functions

- **GROUND SPEED**: mph or kph
- **DISPLAY**: Engine/Windrower Functions
- **HAZARD WARNING LIGHTS SWITCH**: Activates Hazard Warning Lights
  Cancels Turn Signal
- **TURN SIGNAL SWITCHES**: Activates Turn Signals On Windrower and Header
  Push-On/Push-Off
- **ENGINE WARNING LIGHTS**: Engine Pre-Heat/Water In Fuel/Do not Operate/Stop Engine
- **SELECT SWITCH**: Allows Operator To Select Display Item
  On Lower Line.
  See Table
  Push To Select
- **IGNITION SWITCH POSITIONS**: Accessory/Stop/Run/Start

5.18.2 Header Functions

- **DISPLAY**: Header Functions
- **SELECT SWITCH**: Allows Operator To Select Display Item
  Bottom Line - See Table
  Push To Select
- **RETURN TO CUT HEIGHT SWITCH**: Allows Cutting Height Pre-Set
  Push-On/Push-Off
  Illuminates In On Position
- **NOTE**: HEADER MUST BE ENGAGED.
- **HEADER INDEX SWITCH - OPTION**: Links Reel and Conveyor Speed to Ground Speed
  Push-On/Push-Off
  Illuminates In On Position
- **REEL/AUGER SPEED CONTROLS - AUGER HEADER**: Controls Auger And Reel Speed.
  See Section 6.6 For Detailed Procedures.
- **DRAPER SPEED CONTROL - DRAPER HEADER**: Controls Draper Speed
  Push Upper Switch to Increase
  Push Lower Switch to Decrease
  With Optional Module
  Controls Draper Speed INDEX with INDEX SWITCH on.
  Controls Draper SPEED with INDEX SWITCH off.
5.18.3 Operating Screens

The M100 windrower 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:

### IGNITION ON/ENGINE NOT RUNNING

<table>
<thead>
<tr>
<th>DISPLAY (Upper Line)(2-3 Seconds)</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEADER DISENGAGED</td>
<td>Indicates Header Engage Switch Is Off.</td>
</tr>
<tr>
<td>IN PARK</td>
<td>Indicates GSL In Neutral Detent.</td>
</tr>
</tbody>
</table>

### ENGINE RUNNING/HEADER DISENGAGED

(Scroll Through Display with CDM Switch or GSL Switch)

<table>
<thead>
<tr>
<th>DISPLAY (Lower or Upper Line)</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>#######.# ENGINE HRS</td>
<td>Total Engine Operating Time.</td>
</tr>
<tr>
<td>#######.# HEADER HRS</td>
<td>Total Header Operating Time.</td>
</tr>
<tr>
<td>###.# SUB ACRES</td>
<td>Area Cut Since Last Reset. To Reset, Display SUB ACRES On Lower Line And Hold Down Program Switch Until Display Resets (5-7 Seconds).</td>
</tr>
<tr>
<td>###.# SUB HECTARES (If Metric)</td>
<td></td>
</tr>
<tr>
<td>####### TOTAL ACRES</td>
<td>Total Area Cut By Machine.</td>
</tr>
<tr>
<td>####### TOTAL HECT (If Metric).</td>
<td></td>
</tr>
<tr>
<td>###.# HEADER HEIGHT</td>
<td>Distance Setting (00.0-10.0) Between Cutterbar &amp; Ground.</td>
</tr>
<tr>
<td>###.# HEADER ANGLE (Optional)</td>
<td>Angle Setting (00.0-10.0) Header Relative to Ground.</td>
</tr>
<tr>
<td>FUEL LEVEL [■■■■]</td>
<td>Level of Fuel In Tank.</td>
</tr>
<tr>
<td>ENGINE TEMP ### ° F</td>
<td>Engine Coolant Temperature.</td>
</tr>
<tr>
<td>ENGINE TEMP ### ° C (If Metric)</td>
<td></td>
</tr>
<tr>
<td>###.# VOLTS</td>
<td>Engine Electrical System Operating Voltage.</td>
</tr>
<tr>
<td>SCROLL (Lower Line)</td>
<td>Ground Speed Range Switch In High Range.</td>
</tr>
<tr>
<td>ROAD GEAR (Upper Line)</td>
<td></td>
</tr>
</tbody>
</table>
## OPERATOR'S STATION

### ENGINE RUNNING/HEADER ENGAGED

#### AUGER HEADER

(Scroll Through Display with CDM Switch or GSL Switch)

<table>
<thead>
<tr>
<th>DISPLAY (Lower or Upper Line)</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>#######.### ENGINE HRS</td>
<td>Total Engine Operating Time.</td>
</tr>
<tr>
<td>#######.### HEADER HRS</td>
<td>Total Header Operating Time.</td>
</tr>
<tr>
<td>###.### ACRES/HOUR</td>
<td>Actual Cutting Rate In Acres (Hectares)/Hour.</td>
</tr>
<tr>
<td>###.### HECTARES/HOUR (If Metric)</td>
<td></td>
</tr>
<tr>
<td>######.### SUB ACRES</td>
<td>Area Cut Since Last Reset.</td>
</tr>
<tr>
<td>######.### SUB HECTARES (If Metric)</td>
<td></td>
</tr>
<tr>
<td>########## TOTAL ACRES</td>
<td>Total Area Cut By Machine.</td>
</tr>
<tr>
<td>########## TOTAL HECT (If Metric)</td>
<td></td>
</tr>
<tr>
<td>###.### REEL RPM (Optional)</td>
<td>Reel Rotational Speed.</td>
</tr>
<tr>
<td>###.### REEL SENSOR (If Sensor Disabled)</td>
<td></td>
</tr>
<tr>
<td>###.### AUGER SPEED</td>
<td>Auger Rotational Speed (0.0-10.0).</td>
</tr>
<tr>
<td>####### KNIFE SPEED (Optional)</td>
<td></td>
</tr>
<tr>
<td>####### KNIFE SENSOR (If Sensor Disabled)</td>
<td></td>
</tr>
<tr>
<td>###.### HEADER HEIGHT</td>
<td>Distance Setting (00.0-10.0) Between Cutterbar &amp; Ground.</td>
</tr>
<tr>
<td>###.### HEADER SENSOR (If Sensor Disabled)</td>
<td></td>
</tr>
<tr>
<td>FUEL LEVEL</td>
<td>■■■■</td>
</tr>
<tr>
<td>ENGINE TEMP ### ° F</td>
<td>Engine Coolant Temperature.</td>
</tr>
<tr>
<td>ENGINE TEMP ### ° C (If Metric)</td>
<td></td>
</tr>
<tr>
<td>###.### VOLTS</td>
<td>Engine Electrical System Operating Voltage.</td>
</tr>
<tr>
<td>SCROLL</td>
<td>Displays Sub-Menu After 2-3 Seconds. Press SELECT to cancel. Scroll Through Sub-Menu Display with CDM Switch</td>
</tr>
</tbody>
</table>

  SUB-MENU (Lower Line Only)
  
  ####### KNIFE SPEED (Optional)
  
  ####### AUGER SPEED
  
  ###.### REEL RPM (Optional)
  
  ###.### HEADER HEIGHT
  
  FUEL LEVEL |■■■■|■■■■|
  
  ENGINE TEMP ### ° F
  
  ENGINE TEMP ### ° C (If Metric)
## OPERATOR’S STATION

ENGINE RUNNING/HEADER ENGAGED
DRAPER HEADER/INDEX SWITCH OFF

(Scroll Through Display with CDM Switch or GSL Switch)

<table>
<thead>
<tr>
<th>DISPLAY (Lower or Upper Line)</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>#######.# ENGINE HRS</td>
<td>Total Engine Operating Time.</td>
</tr>
<tr>
<td>#######.# HEADER HRS</td>
<td>Total Header Operating Time.</td>
</tr>
<tr>
<td>####.# ACRES/HOUR</td>
<td>Actual Cutting Rate In Acres (Hectares)/Hour.</td>
</tr>
<tr>
<td>####.# HECTARES/HOUR (If Metric)</td>
<td></td>
</tr>
<tr>
<td>####.# SUB ACRES</td>
<td>Area Cut Since Last Reset.</td>
</tr>
<tr>
<td>####.# SUB HECTARES (If Metric)</td>
<td></td>
</tr>
<tr>
<td>###### TOTAL ACRES</td>
<td>Total Area Cut By Machine.</td>
</tr>
<tr>
<td>###### TOTAL HECT (If Metric)</td>
<td></td>
</tr>
<tr>
<td>####.# REEL MPH or RPM (Optional)</td>
<td>Reel Peripheral Speed in miles per hour. Reel Speed in rpm.</td>
</tr>
<tr>
<td>####.# REEL KPH (If Metric)</td>
<td></td>
</tr>
<tr>
<td>####.# REEL SENSOR (If Sensor Disabled)</td>
<td></td>
</tr>
<tr>
<td>####.# DRAPER SPEED</td>
<td>Draper Speed (0.0-10.0).</td>
</tr>
<tr>
<td>####.# KNIFE SPEED (Optional)</td>
<td>Knife Speed In Strokes Per Minute.</td>
</tr>
<tr>
<td>####.# KNIFE SENSOR (If Sensor Disabled)</td>
<td></td>
</tr>
<tr>
<td>####.# HEADER HEIGHT</td>
<td>Distance Setting (00.0-10.0) Between Cutterbar &amp; Ground.</td>
</tr>
<tr>
<td>####.# HEADER SENSOR (If Sensor Disabled)</td>
<td></td>
</tr>
<tr>
<td>####.# HEADER ANGLE (Optional)</td>
<td>Angle Setting (00.0-10.0) Header Relative To Ground.</td>
</tr>
<tr>
<td>####.# HEADER SENSOR (If Sensor Disabled)</td>
<td></td>
</tr>
<tr>
<td>FUEL LEVEL</td>
<td>Level of Fuel In Tank.</td>
</tr>
<tr>
<td>ENGINE TEMP #.# °F</td>
<td>Engine Coolant Temperature.</td>
</tr>
<tr>
<td>ENGINE TEMP #.# °C (If Metric)</td>
<td></td>
</tr>
<tr>
<td>#.# VOLTS</td>
<td>Engine Electrical System Operating Voltage.</td>
</tr>
<tr>
<td>SCROLL</td>
<td>Displays Sub-Menu After 2-3 Seconds. Press SELECT to cancel.</td>
</tr>
<tr>
<td>SUB-MENU (Lower Line Only)</td>
<td>Scroll Through Sub-Menu Display with CDM Switch</td>
</tr>
<tr>
<td>####.# KNIFE SPEED (Optional)</td>
<td></td>
</tr>
<tr>
<td>####.# REEL RPM</td>
<td></td>
</tr>
<tr>
<td>####.# DRAPER SPEED</td>
<td></td>
</tr>
<tr>
<td>FUEL LEVEL</td>
<td>Level of Fuel In Tank.</td>
</tr>
<tr>
<td>ENGINE TEMP #.# °F</td>
<td>Engine Coolant Temperature.</td>
</tr>
<tr>
<td>ENGINE TEMP #.# °C (If Metric)</td>
<td></td>
</tr>
<tr>
<td>####.# HEADER HEIGHT</td>
<td>Angle Setting (00.0-10.0) Header Relative To Ground.</td>
</tr>
<tr>
<td>KNIFE SPD OVERLOAD (Lower Line)</td>
<td>Knife Speed Is Less Than Programmed Set-Point.</td>
</tr>
</tbody>
</table>
### OPERATOR’S STATION

#### ENGINE RUNNING/HEADER ENGAGED
#### DRAPER HEADER/INDEX SWITCH ON

(Scroll Through Display with CDM Switch or GSL Switch)

<table>
<thead>
<tr>
<th>DISPLAY (Lower or Upper Line)</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>#######.# ENGINE HRS</td>
<td>Total Engine Operating Time.</td>
</tr>
<tr>
<td>#######.# HEADER HRS</td>
<td>Total Header Operating Time.</td>
</tr>
<tr>
<td>###.# ACRES/HOUR</td>
<td>Actual Cutting Rate In Acres (Hectares)/Hour.</td>
</tr>
<tr>
<td>###.# HECTARES/HOUR</td>
<td>If Metric</td>
</tr>
<tr>
<td>####.# SUB ACRES</td>
<td>Area Cut Since Last Reset.</td>
</tr>
<tr>
<td>####.# HECTARES</td>
<td>If Metric</td>
</tr>
<tr>
<td>######### TOTAL ACRES</td>
<td>Total Area Cut By Machine.</td>
</tr>
<tr>
<td>######### TOTAL HECT</td>
<td>If Metric</td>
</tr>
<tr>
<td>###.### #.## REEL IND</td>
<td>Reel Peripheral Speed Along With Ground Speed In MPH Or KPH.</td>
</tr>
<tr>
<td>###.### REEL SENSOR</td>
<td>If Sensor Disabled</td>
</tr>
<tr>
<td>###.### #.## DRAP INDX</td>
<td>Draper Speed Along With Ground Speed In MPH Or KPH.</td>
</tr>
<tr>
<td>####.## KNIFE SPEED</td>
<td>Knife Speed In Strokes Per Minute.</td>
</tr>
<tr>
<td>####.## KNIFE SENSOR</td>
<td>If Sensor Disabled</td>
</tr>
<tr>
<td>###.## HEADER HEIGHT</td>
<td>Distance Setting (00.0-10.0) Between Cutterbar &amp; Ground.</td>
</tr>
<tr>
<td>###.## HEADER SENSOR</td>
<td>If Sensor Disabled</td>
</tr>
<tr>
<td>###.## HEADER ANGLE</td>
<td>Angle Setting (00.0-10.0) Header Relative To Ground.</td>
</tr>
<tr>
<td>###.## HEADER SENSOR</td>
<td>If Sensor Disabled</td>
</tr>
<tr>
<td>FUEL LEVEL</td>
<td>■■■■</td>
</tr>
<tr>
<td>ENGINE TEMP ### ° F</td>
<td>Engine Coolant Temperature.</td>
</tr>
<tr>
<td>ENGINE TEMP ### ° C (If Metric)</td>
<td>Engine Electrical System Operating Voltage.</td>
</tr>
</tbody>
</table>

#### SCROLL

<table>
<thead>
<tr>
<th>SUB-MENU (Lower Line Only)</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUB-MENU (Lower Line Only)</td>
<td>Displays Sub-Menu After 2-3 Seconds. Press SELECT to cancel.</td>
</tr>
<tr>
<td>###.## KNIFE SPEED</td>
<td>Scroll Through Sub-Menu Display with CDM Switch</td>
</tr>
<tr>
<td>###.## HEADER HEIGHT</td>
<td></td>
</tr>
<tr>
<td>###.## REEL INDRPM</td>
<td></td>
</tr>
<tr>
<td>###.## DRAP INDX</td>
<td></td>
</tr>
<tr>
<td>FUEL LEVEL</td>
<td>■■■■</td>
</tr>
<tr>
<td>ENGINE TEMP ### ° F</td>
<td></td>
</tr>
<tr>
<td>ENGINE TEMP ### ° C (If Metric)</td>
<td></td>
</tr>
<tr>
<td>###.## REEL MIN RPM</td>
<td>Reel Speed Is Less Than Programmed Set-Point.</td>
</tr>
<tr>
<td>MINIMUM (Lower Line)</td>
<td></td>
</tr>
<tr>
<td>(Optional)</td>
<td></td>
</tr>
</tbody>
</table>

---

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### MISCELLANEOUS OPERATIONAL INFORMATION

<table>
<thead>
<tr>
<th>DISPLAY (Upper Line)</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; LEFT TURN ■</td>
<td>Indicates Left Turn When ← Is Pressed On CDM.</td>
</tr>
<tr>
<td>■ RIGHT TURN &gt;</td>
<td>Indicates Left Turn When → Is Pressed On CDM.</td>
</tr>
<tr>
<td>■ HAZARD ■</td>
<td>Indicates Hazard Warning Lights Are On When △ Is Pressed On CDM.</td>
</tr>
<tr>
<td>ROAD GEAR</td>
<td>With Hi Range Selected On Console Switch.</td>
</tr>
<tr>
<td>HEADER ENGAGED</td>
<td>Header Drive Engaged.</td>
</tr>
</tbody>
</table>
5.18.4 Cab Display Module (CDM)  
Warnings/Alarms

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

5.18.4.1 Engine Warning Lights
## DISPLAY WARNINGS

Informs Operator of Abnormal Windrower Conditions
See Table Below

### DISPLAY WARNINGS AND ALARMS – ENGINE/TRANSMISSION

<table>
<thead>
<tr>
<th>DISPLAY</th>
<th>FLASHING</th>
<th>ALARM TONE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGINE OIL PRESSURE</td>
<td>✓</td>
<td>Continuous Loud Tone Until Oil Pressure Is Regained.</td>
<td>Low Engine Oil Pressure. Accompanied By Warning Lights.</td>
</tr>
<tr>
<td>##.# LOW VOLTS</td>
<td>✓</td>
<td>Single Loud Tone For 10 Seconds.</td>
<td>Voltage Below 11.5.</td>
</tr>
<tr>
<td>##.# HIGH VOLTS</td>
<td>✓</td>
<td>Single Loud Tone For 10 Seconds.</td>
<td>Voltage Above 16.</td>
</tr>
<tr>
<td>IN PARK</td>
<td>✓</td>
<td>One Short Beep</td>
<td>Steering Wheel Centered, And Brakes Are Engaged.</td>
</tr>
<tr>
<td>PLACE GSL INTO “N”</td>
<td></td>
<td>Beeps At 2 Per Second Until Corrected.</td>
<td>Interlock Switch Not Closed With Key On/Engine Off.</td>
</tr>
<tr>
<td>TRANS OIL PRESS</td>
<td>✓</td>
<td>Continuous Loud Tone Until Oil Pressure Is Regained.</td>
<td>Low Transmission Charge Oil Pressure.</td>
</tr>
<tr>
<td>TRANS OIL TEMP</td>
<td>✓</td>
<td>Ongoing Intermittent Moderate Tone Until Temperature Is Below Acceptable Level.</td>
<td>Transmission Oil Temperature Above 221°F (105°C).</td>
</tr>
</tbody>
</table>
### DISPLAY WARNINGS AND ALARMS - WINDROWER

<table>
<thead>
<tr>
<th>DISPLAY</th>
<th>FLASHING</th>
<th>ALARM TONE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRAKE OFF</td>
<td></td>
<td></td>
<td>Engine Running, Brake Solenoid Not Activated.</td>
</tr>
<tr>
<td>BRAKE SW FAILURE</td>
<td></td>
<td></td>
<td>Ignition On/Engine Not Running, Brake Switch And Relay Closed.</td>
</tr>
<tr>
<td>CENTER STEERING</td>
<td></td>
<td>Beeps At 2 Per Second</td>
<td>Interlock Switch Not Closed With Key On/Engine Off.</td>
</tr>
<tr>
<td>DISENGAGE HEADER</td>
<td>✓</td>
<td>None</td>
<td>Header Switch Is In On Position When Ignition Switch Turned On.</td>
</tr>
<tr>
<td>HEADER DISENGAGED</td>
<td></td>
<td>None</td>
<td>Normal</td>
</tr>
<tr>
<td>HEADER OIL PRESS</td>
<td>✓</td>
<td>Continuous Loud Tone Until Oil Pressure Is Regained.</td>
<td></td>
</tr>
<tr>
<td>HYDRAULIC FILTER</td>
<td>✓</td>
<td>Single Loud Tone For 10 Seconds. Repeats Every 15 Minutes Until Condition Is Corrected.</td>
<td>Excessive Pressure Drop Across Hydraulic Oil Filter.</td>
</tr>
<tr>
<td>LOW HYDRAULIC OIL</td>
<td>✓</td>
<td>Continuous Loud Tone For 5 Seconds. If Condition Not Rectified, Single Loud Tone Every 5 Minutes</td>
<td>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.</td>
</tr>
<tr>
<td>NO HEADER</td>
<td></td>
<td>None</td>
<td>Header Is Not Detected.</td>
</tr>
<tr>
<td>NO OPERATOR</td>
<td></td>
<td>Continuous Tone.</td>
<td>Operator Not Detected In Seat With Header Engaged Or Out Of Neutral Detent. Engine Shutdown After 5 Seconds</td>
</tr>
<tr>
<td>NOT IN PARK</td>
<td>✓</td>
<td>Short Beep With Each Flash</td>
<td>Interlock Switch Not Closed With Key On/Engine Off.</td>
</tr>
</tbody>
</table>
5.18.5 Cab Display Module (CDM) Programming

The monitoring system requires programming for each header and the header must be attached to the windrower. Programming the system may be accomplished with or without the engine running. If the engine is running, the transmission must be in neutral. If the engine is not running, the ignition must be on. Exit programming mode at any time by pressing the PROGRAM switch or by turning off the ignition.

The system only needs to be programmed once for each header. The operator may make changes later on to a particular setting to suit windrowing conditions or modifications to the machine. Most functions have been pre-programmed at the factory but can be changed by the operator if required.

Proceed as follows to program the CDM:

**IMPORTANT**

Header must be attached to the windrower. See paragraph 6.5, & 6.6.

a. Turn ignition key to RUN, or start the engine. Refer to paragraph 6.3.5 Engine Operation.
b. Press PROGRAM and SELECT on CDM to enter programming mode.
c. Press SELECT. TRACTOR SETUP? is displayed on upper line.
d. Press → and then SELECT.
e. HEADER TYPE? is displayed. DRAPER is flashing on lower line.
f. Press ← or → to change value on lower line.
g. Press SELECT.
h. TILT CYL INSTALLED? is displayed.
i. Press ← or → to change value on lower line.
j. Press SELECT to advance to the next L1 item and press arrow keys to change values.
k. Press PROGRAM to exit programming mode when finished entering desired values.

Refer to Detailed Programming Instructions on following pages.

**NOTE**

Contact your 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.

* Fast scroll applies only when changing OVERLOAD PRESSURE, and TIRE SIZE.
DETALIED PROGRAMMING INSTRUCTIONS

(Key On / Engine Running or Not / Header Disengaged).
(Press PROGRAM and SELECT on CDM to enter programming mode).

NOTE: ENGINE MUST BE RUNNING TO CALIBRATE SENSORS.

<table>
<thead>
<tr>
<th>Programming Menu Flow Chart</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1 C x x</td>
</tr>
<tr>
<td>L1 C x x</td>
</tr>
<tr>
<td>L1 C x x</td>
</tr>
<tr>
<td>L1 C x x</td>
</tr>
<tr>
<td>L1 C x x</td>
</tr>
<tr>
<td>L2 M x x</td>
</tr>
<tr>
<td>L2 M x x</td>
</tr>
<tr>
<td>L2 M x x</td>
</tr>
<tr>
<td>L2 M x x</td>
</tr>
<tr>
<td>L2 M x x</td>
</tr>
<tr>
<td>L2 M x x</td>
</tr>
<tr>
<td>L2 M x x</td>
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<tr>
<td>L2 M x x</td>
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<tr>
<td>L2 M x x</td>
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<td>L2 M x x</td>
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<td>L2 M x x</td>
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<td>L2 M x x</td>
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<td>L2 M x x</td>
</tr>
<tr>
<td>L2 M x x</td>
</tr>
<tr>
<td>L2 M x x</td>
</tr>
<tr>
<td>L2 M x x</td>
</tr>
<tr>
<td>L1 C x x</td>
</tr>
<tr>
<td>L1 C x x</td>
</tr>
<tr>
<td>L1 C x x</td>
</tr>
<tr>
<td>L2 M x x</td>
</tr>
<tr>
<td>L2 M x x</td>
</tr>
<tr>
<td>L1 C x x</td>
</tr>
</tbody>
</table>

DATA IS ACCURATE TO DATE OF PRINT AND SUBJECT TO CHANGE WITHOUT NOTICE.

(continued next page)
OPERATOR’S STATION

<table>
<thead>
<tr>
<th>L1</th>
<th>Cxxx</th>
<th>VIEW CONTROL LOCKS?</th>
<th>NO/YES</th>
<th>If &quot;NO&quot; then jump to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>L2</td>
<td>Mxxx</td>
<td></td>
<td></td>
<td>EXIT TRACTOR SETUP?</td>
</tr>
</tbody>
</table>

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.

Using the "arrow" keys allows the operator to select the various functions. Pressing "SELECT" will go to the EXIT VIEW LOCKOUTS? menu selection.

<table>
<thead>
<tr>
<th>L1</th>
<th>Cxxx</th>
<th>AUGER SPEED</th>
<th>575.1 HRS ENABLED</th>
</tr>
</thead>
<tbody>
<tr>
<td>L2</td>
<td>Mxxx</td>
<td></td>
<td>648.6 HRS LOCKED</td>
</tr>
</tbody>
</table>

If any of the HDR ANGLE / KNIFE SPEED or REEL SPEED sensors are not "installed" (no expansion module or A30 Auger header selected, they should be suppressed.

The operator can select any of the two items requiring calibration or to STOP & EXIT the menu.

When a function is activated, the display will indicate the function being calibrated. HOLD will flash until the system has completed reading in the signal with the header fully raised.

DONE will flash and prompt the operator to COMPLETE the sensor calibration by lowering the header.

If "NO" then jump to:

(continued next page)
The menu will display the last item selected when the calibration routine is completed.

If the HEADER TILT option in the TRACTOR SETUP is set to NO then only HEIGHT should be available as a menu selection for calibration.

The last 10 distinct error codes are stored along with the code #, Exxx, engine hours and number of occurrences. The "arrow" keys are used to cycle between codes.

If "NO" then jump to:

If no expansion module or an A30 auger header is selected, the corresponding menu items should be suppressed.

The operator can select each sensor and selectively enable or disable the sensor in the event of a sensor malfunction.

If no expansion module or an A30 auger header is selected, the corresponding menu items should be suppressed.

When "SELECT" is pressed the program goes to the EXIT SENSOR SETUP? selection.

Or to the first sensor "installed"
OPERATOR’S STATION

For diagnostic purposes each sensors input signal can be read.

If no expansion module or an A30 auger header is selected, the corresponding menu items should be suppressed.

When "SELECT" is pressed the program goes to the EXIT READ SENSORS? menu selection.

Adds a selection to be able to read in the wheel speed frequency.

If a sensor has been disabled "SENSOR" will be flashing in the area where the input reading would have been.

If no expansion module or an A30 auger header is selected, the corresponding menu items should be suppressed.

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.

If the HEADER TILT cylinder or the REEL FORE/AFT valve is not installed under the TRACTOR SETUP menu then the ACTIVATE FUNCTIONS menu selection for these items should be suppressed.

If no expansion module or an A30 auger header is selected, the corresponding menu items should be suppressed.

For diagnostic purposes each sensors input signal can be read.

If no expansion module or an A30 auger header is selected, the corresponding menu items should be suppressed.

When "SELECT" is pressed the program goes to the EXIT READ SENSORS? menu selection.

If a sensor has been disabled "SENSOR" will be flashing in the area where the input reading would have been.

If no expansion module or an A30 auger header is selected, the corresponding menu items should be suppressed.

For diagnostic purposes each sensors input signal can be read.

If no expansion module or an A30 auger header is selected, the corresponding menu items should be suppressed.

When "SELECT" is pressed the program goes to the EXIT READ SENSORS? menu selection.

If a sensor has been disabled "SENSOR" will be flashing in the area where the input reading would have been.

If no expansion module or an A30 auger header is selected, the corresponding menu items should be suppressed.

For diagnostic purposes each sensors input signal can be read.

If no expansion module or an A30 auger header is selected, the corresponding menu items should be suppressed.

When "SELECT" is pressed the program goes to the EXIT READ SENSORS? menu selection.

If a sensor has been disabled "SENSOR" will be flashing in the area where the input reading would have been.

If no expansion module or an A30 auger header is selected, the corresponding menu items should be suppressed.

For diagnostic purposes each sensors input signal can be read.
5.18.6 Engine Error Codes

The 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 the Appendix for the “Error Codes”.

5.18.7 CDM & 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 the Appendix for the “Fault Codes”.

6 OPERATION

6.1 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.

6.2 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.

---

**6.2.1 Engine Functions**

- Electrical Power
- Accessories
- Engine Stop
- Engine Coolant Temperature
- Engine Throttle
- Engine Glide Plugs
- Engine Urgent Stop
- Engine Malfunction
- Fast
- Engine Rpm
- Slow
- Engine Run
- Water In Fuel
- Engine Start

**6.2.2 Windrower Operating Symbols**

- Turn Signals
- Windshield Wiper
- Hazard Warning Lights
- Seat Height Up
- Forward
- Seat Height Down
- Neutral
- Seat Fore And Aft
- Reverse
- Beacon
- Headlights Low Beam/Road Lights
- Seat Back Fore And Aft
- Headlights High Beam/Road Lights
- Cab Temperature Control
- Work Light
- Lighter
6.2.3 Header Functions

- **Program**
- **Header Index**
- **Return To Cut**
- **Conveyor Speed**
- **Reel Speed**
- **Reel Down**
- **Reel Forward**
- **Reel Up**
- **Reel Rearward**
- **Display Select**
6.3 WINDROWER OPERATION

6.3.1 Operational Safety

Follow these safety precautions:

**CAUTION**

- 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

- 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 windrower and/or combine 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.
- Stop engine and remove key before adjusting or removing plugged material from the machine. A child or even a pet could engage the drive.
- 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 Section 6.3.5.3 Shutdown Procedure.
- Operate only in daylight or good artificial light.

6.3.2 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.

6.3.2.1 Engine

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

b. Avoid unnecessary idling. If engine will be idling for longer than 5 minutes after reaching operating temperature, turn key OFF to stop engine.

c. Check engine oil level frequently. Watch for any signs of leakage. If oil must be added, refer to Section 7.8.2 Oil Level.

<table>
<thead>
<tr>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>During the break-in period, a higher than usual oil consumption should be considered normal.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
</tr>
</tbody>
</table>

d. Watch 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 Section 7.8.7.1 Cooling System. If overheating problems occur, check for coolant leaks.
6.3.2.2 Windrower

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

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

Perform the checks and service specified in Section 7.13.1 Break-In Inspection.

6.3.3 Pre-Season Check
a. Perform the following safety checks at the beginning of each operating season:

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.

b. Perform the following checks:
1. Drain off excess hydraulic oil added for storage. Refer to Section 7.11.2 Changing Hydraulic Oil.
2. Remove plastic bags and/or tape from all sealed openings (air cleaner intake, exhaust pipe, fuel tank).
3. Charge battery and install. Be sure terminals are clean and cables are connected securely.
4. Adjust tension on A/C compressor belt. See Section 7.8.8.3 Tension.
5. Cycle A/C switch to distribute A/C refrigerant oil.

c. Perform annual maintenance. See Section 7.13 Maintenance Schedule.

6.3.4 Daily Check
a. 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 Section 7.11.7 Hoses and Lines.

b. 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 hand-holds on the cab front corners and stand on the header anti-slip strips to wash the front window.

c. Clean all lights and reflective surfaces to maintain visibility to others.

d. Perform Daily maintenance. Refer to Section 7.13.2 Interval Maintenance.
6.3.5 **Engine Operation**

6.3.5.1 **Starting**

---

**DANGER**

- Avoid possible injury or death from a runaway machine.
- Do not start engine by shorting across starter terminals. Machine will start in gear and move if normal starting circuitry is bypassed.
- This machine has safety devices which prevent the engine from starting. 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 circuits to be deliberately rewired or misadjusted so that the engine can be started with controls out of neutral.
- Never start engine by shorting across starter terminals. Machine will start with drive engaged and move if normal starting circuitry is bypassed.
- Never try to start engine with someone under or near machine.
- Start engine only from operator's seat with controls in neutral. NEVER start engine while standing on ground. Machine will start in gear and move if normal starting circuitry is bypassed.
- 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 insure your safety if it is used and maintained.

---

a. Move GSL (A) into **N-DETENT**.
b. Turn steering wheel until it locks.
c. Fasten seat belt.
d. Push header drive switch (B) to off.
e. Normal Start - engine temperature above 60°F (16°C):
   1. Set throttle (C) 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 Section 5.15, Engine Controls/Gauges.

   2. Turn ignition key (D) to **RUN** position.

   **CAUTION**

   Be sure the area is clear of other persons, pets etc. before proceeding.

   3. Single loud tone sounds, engine warning lights illuminate and CDM displays HDR DISENGAGED or HEADER ENGAGED and IN PARK.

   4. Turn ignition key to **START** position until engine starts and then release key. Tone ceases and warning lights go out. CDM displays programmed header data for 5 seconds if attached and then returns to previous display.
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 Trouble Shooting section.

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.

NOTE
Throttle is non-responsive during this time as engine is in “WARM UP” mode. This mode will last from 30 seconds to 3 minutes depending on temperature. After engine has stabilized and idling normally, throttle becomes active.

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

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 Section 8 Trouble Shooting.

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

6.3.5.2 Engine Warm-Up

f. Cold Start - engine temperature below 40°F (5°C).
1. Set throttle (C) to start position – fully back (low idle).
2. Turn key (D) to RUN.
3. Grid heater light (E) on CDM will cycle on/off/on after 2 seconds for a pre-set length of time. The operating period for the glow plug light will change depending on engine temperature.
4. When grid heater light goes out, turn key to START and crank engine until it starts. Leave throttle at IDLE.
5. If engine fails to start, repeat steps 1 to 4.
6. Engine will cycle through a period where it appears to labour.

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

**CAUTION**

Be sure windrower is safely parked on a flat, level surface, header on the ground and the neutral lock/brakes are engaged.

**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).

a. Turn key counter-clockwise to OFF position.

6.3.5.4 Fueling

**WARNING**

To avoid personal injury or death from explosion or fire, do not smoke or allow flame or sparks near fuel tank when refuelling.

Never refuel the windrower when the engine is hot or running.

a. Stop the windrower and remove key.

b. Stand on platform to access the fuel tank filler pipe.

c. Clean the area around the filler cap (A).

d. Turn cap handle (B) counterclockwise until loose and remove cap.

e. Fill tank with approved fuel as per table.

f. Replace fuel tank cap (A) and turn cap handle (B) clockwise until snug.

**NOTE**

Fill fuel tank **daily**, preferably at the end of the day’s operation to help prevent condensation in the tank. Tank Capacity is 97 U.S. Gallons (378 liters).

**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.

**IMPORTANT**

Do not allow tank to empty. Running out of fuel can cause air locks and/or contamination of the fuel system. Refer to Section 7.8.5 Fuel System for priming procedures.

6.3.5.5 Engine Temperature

The normal engine operating temperature range is 180°-225°F (82°-107°C), and is indicated on the CDM display. If the temperature exceeds 230°F (110°C), an ongoing intermittent tone will be heard and the 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).

---

FUEL SPEC SULPHUR (by weight) WATER & SEDIMENT (by weight) CETANE NO. LUBRICITY

<table>
<thead>
<tr>
<th>Diesel Grade</th>
<th>ASTM</th>
<th>Spec</th>
<th>Spec</th>
<th>Spec</th>
<th>Spec</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 2</td>
<td>D-975</td>
<td>As Per</td>
<td>As Per</td>
<td>As Per</td>
<td>As Per</td>
</tr>
<tr>
<td>No. 1 &amp; 2 mix</td>
<td>n/a</td>
<td>1% Max.</td>
<td>0.5% Max.</td>
<td>0.1% Max.</td>
<td>45-55 Cold Weather/ High Alt.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Preferred</td>
<td></td>
<td></td>
<td>460 HFRR</td>
</tr>
</tbody>
</table>

---

**ENGINE TEMP XXX ° F**
6.3.5.6 Engine Oil Pressure

There is no gauge or display for 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 7.5 psi (52 kPa), a continuous loud tone will sound and the CDM display will flash “ENGINE OIL PRESS”. Shutdown the engine immediately if warning occurs while operating or if it continues for more than a few seconds after engine startup.

6.3.5.7 Electrical

The electrical system voltage is displayed on the CDM when selected with the select button on the GSL handle or the select switch on the CDM. The display indicates the condition of the battery and alternator. Refer to table.

<table>
<thead>
<tr>
<th>IGNITION</th>
<th>ENGINE READING</th>
<th>INDICATED CONDITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>On</td>
<td>13.8-15.0</td>
<td>Normal</td>
</tr>
<tr>
<td>&gt; 16.0</td>
<td>Running</td>
<td>Regulator Out of Adjustment.</td>
</tr>
<tr>
<td>&lt;12.5</td>
<td>See Note</td>
<td>Alternator Not Working or</td>
</tr>
<tr>
<td></td>
<td>&lt;12.5</td>
<td>Regulator Out of Adjustment.</td>
</tr>
<tr>
<td>Shutdown</td>
<td>12.0</td>
<td>Battery Normal.</td>
</tr>
</tbody>
</table>

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

6.3.5.8 Engine Integrated Speed Control (ISC)

The engine operating speed can be programmed to enable the windrower to operate at 2400 rpm (200 below maximum) without significantly affecting the ground or header speeds. This is useful in where operating loads are reduced such as in light crop conditions which do not require the maximum engine rpm. Reduced engine speed lowers fuel consumption, noise levels, and exhaust emissions in addition to reducing engine wear.

Programming instructions are given in Section 5.18.5 Cab Display Monitor (CDM) Programming. The programmed engine speed is activated when the header is engaged.

6.3.5.9 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.

- **INTAKE AIR PREHEAT**: Illuminates Yellow Wait To Start Engine
- **WATER IN FUEL**: Illuminates Yellow Service Recommended
- **STOP**: Illuminates Red Stop Engine Immediately Refer to Display Code
- **CAUTION**: Illuminates Yellow Do Not Operate Engine Refer to Display Code

DISPLAY Displays Malfunction Code Refer to Error Codes at End of this Manual
6.3.6 Driving the Windrower

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

**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 Section 6.3.8.2 Towing Header with Windrower. 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 the cab structure will not withstand a roll-over.

**CAUTION**

**HYDROSTATIC STEERING**
The machine is steered hydrostatically, that is, 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 than conventional steering mechanisms.

**IMPORTANT**
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 GSL is in N-DETENT and the steering wheel is centered and locked.

**DANGER**
- Never move ground speed lever or steering wheel until you are sure all bystanders have cleared the area.
- Be sure area is clear before making turns, ends of header travel in a large arc.
- Check the operation of all controls in a safe, clear area before starting work. Be sure you know the capacity and operating characteristics of this machine.
- Do not allow riders in or on the machine.
- Operate only while seated in the operator's position.
- Never attempt to get on or off a moving windrower.
- Avoid sudden starts and stops.

(continued next page)
OPERATOR’S STATION

- Avoid inclines, ditches and fences.
- Do not rapidly accelerate or decelerate when turning.
- Reduce 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.

6.3.6.1 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 wiper.
  - 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.)

a. A swing away platform and stair (A) are provided on the LH side of the windrower to accommodate access to the operator’s station as well as several maintenance tasks.
b. A door (B) is provided for cab entry and exit.
c. The RH window has an overcenter swing-out latch (C) that “unpins” for emergency exit.
6.3.6.2 Operation

a. Place GSL (A) in **N-DETENT**. Engine can be running.
b. Fasten seat belt.
c. Start engine. Refer to Section 6.3.5.1 Starting.
d. Set ground speed range switch (B) to either 2 for road speed (0-16 mph (0-25.7 km/h)), or 1 for field speed (0-11 mph (17.7 km/h)). CDM will display an engine status at (C).
e. Slowly push throttle (D) to full forward (operating speed). CDM should display 2600-2650 RPM at (E).

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

f. Slowly move the GSL (A) forward to desired speed which will be displayed at (F).

**CAUTION**
Operate both steering wheel and ground speed lever slowly for familiarization. Avoid the common tendency of new operators to over-steer.

**NOTE**
The windrower can be equipped with an automatic steering system for use in the field. The Auto-Steer is available as an option and can be installed by an Auto-Steer dealer. The GSL has been pre-wired at the factory with a switch. Also see Section 9.14 AUTO-STEER.

6.3.6.2.1 Reverse

**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 of the machine to travel.

a. Set ground speed-range switch (B) to 1.
b. Move throttle lever (D) to a mid-range position.

d. Move the GSL (A) rearward to desired speed.

d. Steer as shown.

**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.

c. Move the GSL (A) rearward to desired speed.
d. Steer as shown.
OPERATOR’S STATION

6.3.6.2.2 Spin Turn

Hydrostatic steering gives the operator significantly more manoeuvrability than mechanical steering. To make a spin turn, refer to illustration and proceed as follows:

**CAUTION**

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

a. Move the GSL (A) out of N-DETENT towards the seat and hold.
b. Slowly turn the steering wheel in the desired direction of turn. The windrower will pivot between the drive wheels.
c. To stop the turn, slowly turn the steering wheel back to its centered position.
d. To increase the turn radius, slowly move the GSL away from neutral. Remember that this will increase ground speed as well.
e. To stop the turn, move GSL back to neutral, and return the steering wheel to center.

6.3.6.2.3 Stopping

**WARNING**

Do not move ground speed lever rapidly back to neutral. Operator may be thrown forward by sudden stop. Always wear seat belt when operating windrower.

a. SLOWLY return the GSL (A) to neutral and into N-DETENT.
b. Turn steering wheel until it locks.
c. Move throttle lever (D) to low idle position.

**NOTE**

Avoid unnecessary idling. Stop engine if it will be idling for longer than 5 minutes.
d. Brakes are automatically engaged when steering wheel is locked in neutral position.

**CAUTION**

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

**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).

e. Turn key counter-clockwise to OFF position.
6.3.7 Adjustable Caster Tread Width
(Optional)

As an option, 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 maneuverability around poles, irrigation inlets, or other obstacles. A wider tread width is useful in heavy crops that produce large windrows so that run-over is reduced.

To adjust the caster tread width, refer to the following illustrations and proceed as follows:

CAUTION
Park on a flat, level surface, header on the ground and the ground speed lever in N-DETENT 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.

a. 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 where shown.

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

b. Remove bolts and washers (A) and (B) from left and right sides of the walking beam.

c. Slide walking beam extensions (C) inboard or outboard equal amounts and align holes at desired position.

d. Position bracket (D) and install bolts (A) and (B). The two shorter bolts are installed at the back inboard locations. Torque as follows:
   1. Snug bottom bolts (B).
   2. Tighten back bolts (A) to 330 ft·lbf (447 N·m).
   3. Tighten bottom bolts (B) to 330 ft·lbf (447 N·m).

e. Lower windrower and remove lifting device.
f. Retorque bolts at 5 and 10 hours of operation.

IMPORTANT
Center of tread width must be aligned with center of windrower.
6.3.8 Transportsing

6.3.8.1 Driving On Road

**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 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.

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

**WARNING**
Do not drive windrower on a road or highway at night, or in conditions which 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.

---

a. Ensure HEADER DRIVE switch is pushed to off position.

b. Before driving windrower on a roadway:
   1. Clean flashing amber lamps, red tail lamp and head lamps and check that they work properly.
   2. Clean all reflective surfaces and slow moving vehicle emblems.
   3. Adjust interior rear view mirror and clean windows.

c. Push LIGHT switch to ROAD position to activate lamps.

**WARNING**
Always use these lamps on roads to provide warning to other vehicles. Do not use field lamps on roads, other drivers may be confused by them.

d. Push BEACON switch to on to activate beacons (North America optional).

(continued next page)
WINDROWER OPERATION

- Press switch (A) on CDM to activate hazard lights (Export optional).
- Push ground speed range switch (B) for road speed. CDM will display ROAD GEAR at (C), and LED over 2 will light up.
- Slowly push throttle (D) to full forward (operating rpm). CDM should display 2600-2650 at (E).
- Slowly move the GSL (F) forward to desired ground speed which will be displayed also at (F).
- If towing a header, refer to Section 6.3.8.2 Towing Header with Windrower.

**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 closer to neutral to reduce speed.
  - Lower header.
  - Move GROUND SPEED RANGE switch to low range.
- 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 to neutral.
6.3.8.2 Towing D-Series Header with Windrower

The M100 windrower can be used to tow a MacDon Harvest Header with the Slow Speed Transport option installed, provided the Transport Drawbar and the Weight Box options are installed on the windrower. See your MacDon dealer for further information if these options are not installed on your M100 windrower.

**WARNING**

Harvest Header with Transport Option

The windrower without the header must not be used to tow headers due to reduced traction and possible loss of control unless the Weight Box option is installed on the windrower.

**CAUTION**

- To tow a header for transporting with an M100 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 connect any towed implement except for:
  - 30-35’ D-Series headers equipped with slow-speed transport package or
  - Header transport trailers for 20-25’ D-Series headers.
- Tongue weight must not exceed 500 lbs.
- Do not exceed the specified Combined Gross Vehicle Weight (CGVW).

<table>
<thead>
<tr>
<th></th>
<th>LB</th>
<th>KG</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAX GVW (includes mounted implements)</td>
<td>17,750</td>
<td>8,050</td>
</tr>
<tr>
<td>MAX CGVW (includes towed and mounted implements)</td>
<td>20,200</td>
<td>9,160</td>
</tr>
<tr>
<td>WEIGHT “A” ON BOTH DRIVE WHEELS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAX</td>
<td>16,300</td>
<td>7,390</td>
</tr>
<tr>
<td>MIN</td>
<td>9,150</td>
<td>4,150</td>
</tr>
<tr>
<td>MAX WEIGHT “B” ON BOTH CASTER TIRES</td>
<td>3,550</td>
<td>1,610</td>
</tr>
</tbody>
</table>
6.3.8.2.1 From Field to Transport Mode

6.3.8.2.1.1 Detach Header from Windrower
a. Set header on the ground (field 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.

b. Disconnect hydraulic and electrical connections:

c. 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.

**DANGER**

To avoid bodily injury from fall of raised header, always engage header lift cylinder stops when working on or around raised header.

d. Raise header to full height, stop engine, and engage safety locks on lift cylinders.


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

g. Remove pins (D) from lower end of lift linkages.

**NOTE**

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

h. Disconnect the center link as follows:

**HYDRAULIC LINK – OPTION**

1. Pull up on latch (E) and locate latch into notch (F) on top of hook.

(continued next page)
OPERATOR’S STATION

2. Release the safety lock on the header lift cylinders.
3. Lower header down onto the transport wheels.
4. Disengage the top link from the header. Use the header tilt switch to release load on the cylinder if necessary.

MECHANICAL LINK – M150

1. Loosen nut (G) and rotate barrel (H) to relieve load on link.
2. Remove cotter pin on pin (J), and remove pin to disconnect from windrower. Re-install pin in header.

a. Drive windrower so that windrower lift arms are positioned into the weight box pockets.

b. Raise lift arms slightly.
c. Stop engine and remove key.
d. Install locking pins (D) into pockets and thru windrower header lift linkages. Secure with hairpin.

e. At rear of windrower, lower the drawbar bracket from field position as follows:

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

6.3.8.2.1.2 Attach Weight Box To Windrower.

D60 SHOWN

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 (C), and not installed at hole location (B).

1. Hold drawbar support (K) and remove the two pins (L) at the forward end.
2. Lower support to position shown and re-install the two pins in uppermost pair of holes in support.
3. Alternate drawbar (M) can be removed if desired.
f. Attach Tow-Bar To Windrower

The M100 Transport drawbar provides approximately 12 in. (300 mm) of fore/aft movement to ease the attachment of a towed implement.

a. Back the windrower up to the tow-bar (A) so that drawbar hole (B) is within 6 in. (150 mm) of the tow-bar clevis pin.
b. Stop engine and remove key.
c. If the tow-bar (A) is too far from the drawbar (B), remove pin (C), lift the drawbar support (D) until the tow-bar clevis aligns and then install the drawbar pin (E).
d. Start engine and gently reverse the windrower until the drawbar support pivots down into transport position.
e. Stop engine and remove key.
f. Reinstall pin (C) to secure drawbar support, and proceed to step k.

**IMPORTANT**

Ensure lynch pins are secure in all three pins and that the drawbar pin is also secured by a locking pin.

g. If the tow-bar (A) is too close to the windrower, remove pin (F), lower the drawbar support (D) until the tow-bar clevis aligns and then install the drawbar pin (E).
h. Start engine and gently drive the windrower forward until the drawbar support pivots up into transport position.
i. Stop engine and remove key.
j. Reinstall pin (F).

(continued next page)
k. Connect safety chain (G) through the slot (H) in drawbar support and securely attach the hook (J) to the chain. Leave enough slack to allow the hitch to pivot.

l. At the drawbar, connect the tow-bar harness plug (K) to the receptacle on the windrower.

m. At the LH float spring tower, attach connector (L) on windrower harness to towing harness receptacle (M).

n. Confirm that the flashing amber and signal lights on header function properly.

o. Before moving the machine: double check that all pins are secure, the drawbar and hitching components are not showing signs of damage, and that all safety equipment is installed and fully functional.
6.3.8.2.2 From Transport Mode To Field Operation

a. Shutdown windrower and remove key.

b. Disconnect windrower harness (A) from towing harness receptacle (B) in LH float spring tower.

c. Disconnect electrical harness (C) from windrower and store harness on tow-bar.

d. Undo lock (D) and remove safety chain (E) from drawbar and remove clevis pin (F).

e. Move tow-bar off drawbar.

f. At rear of windrower, remove pins (G), lift drawbar support (H) to horizontal position, and re-install pins as shown.

g. Alternate drawbar (J) is used for attaching tow behind swath roller.

IMPORTANT
Do not use alternate drawbar for any other purpose.


(continued next page)
i. Remove pins (M) securing lift linkages to weight box, and retain pins for attaching header to windrower.

j. Lower weight box onto blocks and back away.

k. Attach header to windrower. Refer to Section 6.5.1 Header Attachment.


m. Start engine and lower header to ground. Continue to retract lift cylinders so that member (N) lifts off link (O).

n. Remove temporary lift pins (P) from lift arms and install pins into storage holes in weight box.

o. Before operating the machine, double check that all pins are secure, and that all safety equipment is installed and fully functional.

p. Proceed with operation of header.
6.3.8.3 Towing the Windrower

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 GSL is in N-DETENT before detaching from towing vehicle.

**IMPORTANT**

Failure to disengage final drives before towing will result in serious transmission damage.

**IMPORTANT**

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 destroying the unit.
6.3.8.4 Final Drives

Disengage and engage final drives as follows:

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

d. Bring to full charge and store in a cool, dry place not subject to freezing.

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.

e. 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.
f. If no cover is available; seal air cleaner intake and exhaust pipe with plastic bags and/or waterproof tape.
g. 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.
h. Repaint all worn or chipped painted surfaces to prevent rust.
i. 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.

NOTE

For short term storage (3-4 weeks), it is recommended to shut off the battery disconnect switch to reduce/minimize battery drain. See 7.10.1.5 Battery Disconnect Switch.

At the end of each operating season:

a. Clean the windrower thoroughly.

WARNING

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

b. Store windrower in a dry protected place.

CAUTION

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

c. Remove the battery. Refer to Section 7.10.1.5.
6.4 HEADER OPERATION

The M100 Windrower is designed to use the MacDon A Series auger header with hay conditioner, and D Series Rigid Draper headers with or without hay conditioners. This section describes the attachment and detachment procedures and operating instructions for these header types.

6.4.1 Header Lift Cylinder Stops

Cylinder stops are located on both header lift cylinders on the windrower. To avoid bodily injury or death from fall of raised header, always engage cylinder stops before going under header for any reason. Engage cylinder stops as follows:

a. Press HEADER UP switch to raise header to maximum height.

b. Pull lever (A) and rotate toward header to release and lower cylinder stop (B) onto cylinder. Repeat for both lift cylinders.

c. To store, turn lever (A) away from header to raise stop until lever locks into vertical position.

NOTE

_If one end of the header does not raise fully, the lift cylinders require re-phasing. Proceed as follows:_

1. Hold the up switch until both cylinders stop moving.
2. Press HEADER DOWN switch to lower the header all the way down, and continue to hold the switch for 3-4 seconds.
3. Raise the header again to full height.
6.4.2 Header Flotation

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 sickle 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.

IMPORTANT
The stabilizer wheels are designed to minimize bouncing at the header ends and not “float” the header. Refer to the D60 Harvest Header / FD70 FlexDraper Operator’s Manual for adjustment details.

6.4.2.1 Float Operating Guidelines

When working with the cutterbar on the ground;
- Set center link to mid-range position. Refer to Section 6.4.4 Header Angle.
- In rocky fields, adjust skid shoes down to raise guards when operating at flattest header angle to minimize scooping rocks.
- Adjust header height or adjust header angle to minimize pushing soil.

6.4.2.2 Float Adjustment

The float adjustment uses drawbolts to change the tension on the springs in the lift linkages.

a. Check header float as follows:

![Image of header float adjustment]

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

1. Start the engine.

2. If hydraulic center link is installed, use the HEADER TILT SWITCHES to set center link to mid-range position (05.0 on CDM) (A).


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.

4. Shut down engine and remove key.

5. 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.

(continued next page)
b. If necessary, adjust the float with the drawbolts as follows:

![Diagram of header operation]

**CAUTION**

Check to be sure all bystanders have cleared the area.

1. Start engine.

2. Using HEADER UP switch on GSL, Raise the header fully, shut down the engine, and remove the key.

3. Turn drawbolt (D) clockwise to increase float (makes header lighter) or counterclockwise to decrease float (makes header heavier).

4. Recheck the float as described on previous page.
6.4.2.3 Leveling

The windrower linkages are factory set to provide the proper level for the header and should not normally require adjustment. If the header is not level, perform the following checks prior to adjusting the leveling linkages. The float springs are not used to level the header.

a. Raise header to full height and keep HEADER UP switch depressed to ensure lift cylinders are phased.
b. Check drive wheel tire pressures.
c. Check and set float adjustment. Refer to previous sections.
d. If header is not level after the above checks, adjust as follows:

1. Place float pins in locked out location (A).
2. Park windrower on level ground.
3. Set header approximately 6 inches (150 mm) off ground and check that member (B) is on link (C) as shown. Note high and low end of header.
4. Place wooden blocks under header cutterbar and legs.
5. Lower header onto blocks so that members (B) lift off links (C). Stop engine.

**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.

6. On high side, remove nut, washer and bolt (D) that attaches shims (E) to link.
7. Remove one or both shims (E) and reinstall the hardware (D).

**CAUTION**

Check to be sure all bystanders have cleared the area.

e. Start engine and raise header slightly. Check level of header.

(continued next page)
f. If additional levelling is required, install the removed shim on the opposite linkage.

NOTE
If required, additional shims are available from your dealer

g. Once header is level, return float pins to their engaged position (F).

NOTE
Float does not require adjustment after levelling header.

6.4.3 Header Drive

The headers are hydraulically driven and controlled from the windrower with no mechanical drive shafts. One hydraulic piston pump on the windrower provide fluid power to the knife, and three gear pumps power the drapers or auger, reel, lift and positioning systems and optional attachments.

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

Engage the header as follows:

a. Move throttle to adjust engine speed to idle.

b. Engage header by pushing down on the yellow knob and pulling up on the black ring at the base of the switch.

C. A slight delay between switch on and operating speed is normal.

d. Push yellow knob to disengage header drive.
6.4.4 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 operator’s manual for range of adjustment and recommended settings for your particular header.

**IMPORTANT**
Changing header angle will affect flotation slightly because it has the effect of making the header lighter or heavier.

**IMPORTANT**
To prevent excessive guard breakage when cutting on the ground and 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.

Change header angle as follows:

**HYDRAULIC CENTER LINK (Optional)**

a. To decrease (flatten) header angle, operate HEADER TILT UP switch on GSL handle so that cylinder (A) retracts. The CDM display will show a reading on the lower line (B) of decreasing value between 00.0 and 10.0.

b. To increase (steepen) header angle, operate HEADER TILT DOWN switch on GSL handle so that cylinder (A) extends. The CDM display will show a reading on the lower line of increasing value between 00.0 and 10.0.

c. The header tilt switch can be deactivated to prevent inadvertent header angle changes when pressing the header height control switches.

1. To deactivate, press and hold PROGRAM switch and momentarily press either HEADER TILT UP or HEADER TILT DOWN.

**NOTE**
If either of the header tilt switches are pressed while deactivated, the lower display line will indicate “TILT DISABLED” for five seconds along with a tone.

2. To reactivate, repeat above procedure.

**MECHANICAL CENTER LINK**

a. Loosen plate nut (C).

b. To increase (steepen) angle, rotate barrel (D) to lengthen center link.

c. To decrease (flatten) angle, rotate barrel (D) to shorten center link.

d. Tighten plate nut (C) with a slight tap of a hammer.

---

a. To decrease (flatten) header angle, operate HEADER TILT UP switch on GSL handle so that cylinder (A) retracts. The CDM display will show a reading on the lower line (B) of decreasing value between 00.0 and 10.0.
6.4.5 Cutting Height

The header is raised or lowered with the HEADER UP or HEADER DOWN switches on the GSL. See illustration. The CDM indicates the header height by a reading on the DISPLAY lower line between 00.0 and 10.0, with 00.0 being on the ground. Use DISPLAY SELECTOR switch to display the current setting.

6.4.5.1 Return To Cut (Optional)

The monitoring system assists the operator in maintaining the desired cutting height with the RETURN TO CUT feature that can be turned off or on with a switch on the CDM.

The RETURN TO CUT feature enables the operator to have the header return to a pre-selected cutting height and angle. If desired, the CDM can be programmed so that only the cutting height feature is active. The unit is pre-programmed to activate both cutting height and header angle.

a. Program the RETURN TO CUT feature as follows:

**IMPORTANT**
The windrower must be running with the header engaged.

1. RETURN TO CUT switch must be off (indicator light is off).
2. Adjust the header to the desired height with the HEADER UP or HEADER DOWN switches on the GSL. CDM displays between 00.0 and 10.0.
3. Adjust the header angle with the HEADER TILT UP or HEADER TILT DOWN switches on the GSL. CDM displays between 0.0 and 10.0. This step is not required if height only has been pre-selected.
4. Press the RETURN TO CUT switch on the CDM. The indicator light will illuminate and the settings are now programmed into the WCM.

b. Use the RETURN TO CUT feature as follows:

**IMPORTANT**
Ensure the header is engaged and the RETURN TO CUT switch is illuminated.

**NOTE**
The header can be raised or lowered at any time by depressing and holding the HEADER UP or HEADER DOWN switches on the GSL.

1. If header is above the pre-set height, momentarily press HEADER DOWN switch and header will return to pre-set height.

(continued next page)
2. If the header is below the pre-set height, **press and hold** the HEADER UP switch to raise the header. Release switch to stop header. Alarm will sound when header rises past the pre-set height.

3. If the header angle is changed, double click (two clicks within 0.5 seconds) the HEADER TILT UP or HEADER TILT DOWN switch and the header will return to the pre-set angle.

**NOTE**
*If the header cannot return to the pre-set 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 to reactivate.*

6.4.5.2 Auto-Raise Height

**a.** Program the AUTO RAISE HEIGHT feature as follows:

1. RETURN TO CUT switch can be off or on.
2. PROGRAM and SELECT on CDM to enter programming mode.
3. Press SELECT. TRACTOR SETUP? is displayed on upper line.
4. Press , then SELECT. SET KNIFE SPEED? is displayed.
5. Press SELECT until AUTO RAISE HEIGHT is displayed.
6. Press or to change value on lower line. Range is 0.0 to 10.0 where 10.0 is fully raised.
7. Press PROGRAM to exit programming mode when finished entering desired values.

**b.** Use the AUTO RAISE HEIGHT feature as follows:

**IMPORTANT**
The windrower must be running with the header engaged at the cutting height and the RETURN TO CUT switch activated.

1. Double click HEADER UP switch on the GSL to raise the header to the AUTO RAISE HEIGHT set point.

**NOTE**
*If HEADER UP is pressed while header is being raised, AUTO RAISE HEIGHT is temporarily disabled and header will maintain current height.*

2. Momentarily press the HEADER DOWN switch on the GSL to return the header to the pre-set cutting height.
6.5 D SERIES HEADER OPERATION

6.5.1 Header Attachments

**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 (A), and not installed at hole location (B).

a. If not installed, attach draper header boots (supplied with header) to windrower lift linkage as follows:

1. Remove hairpin and remove pin (C) from boot (D).

b. Remove hairpin on pins (F) and remove pins from header legs.

**CAUTION**
Check to be sure all bystanders have cleared the area.

(continued next page)
c. Start the engine and activate header down button on the GSL to fully retract header lift cylinders.

d. Slowly drive windrower forward so that boots (D) enter header legs (G). Continue to drive slowly forward until lift linkages contact support plates in the header legs, and header nudges forward.

e. Check that linkages are properly engaged in header legs, contacting support plates.

Connect center link as follows:

**MECHANICAL LINK – M150**

1. Loosen nut (H) and rotate barrel (J) to adjust length so that link lines up with header bracket.

2. Install pin (K) and secure with cotter pin.

3. Adjust link to required length for proper header angle by rotating barrel (J). Tighten nut (H) against barrel. A slight tap with a hammer is sufficient.

4. Proceed to step g.

**HYDRAULIC LINK - OPTION**

1. Re-locate the pin at the frame linkage as required to position the hook over the header pin.

2. Activate header tilt cylinder switches on GSL to extend or retract center link cylinder so that the hook lines up with the header attachment pin.

(continued next page)
3. Push down on rod end of link cylinder (K) until hook engages pin on header and is locked.

4. Check that center link is locked onto header by pulling upward on rod end of cylinder.

5. Raise the header fully with the header up switch on the GSL. Stop engine and remove key.

**DANGER**

To avoid bodily injury from fall of raised header, always engage header lift cylinder stops when working on or around raised header.

6. Engage lift cylinder stops on both lift cylinders. Refer to Section 6.4.1 Header Lift Cylinder Stops.

7. Install pin (F) through header leg, (engaging U-bracket in lift linkage) on both sides and secure with hairpin.

**NOTE**

*Install hairpin with open end facing aft.*

8. Raise header stand (L) to storage position by pulling pin (M) and lifting stand into uppermost position. Release pin (M).

9. Remove pin from storage position (N) in linkage and insert in hole (O) to engage float springs. Secure with hairpin.

10. Disengage lift cylinder stops. Refer to Section 6.4.1 Header Lift Cylinder Stops.

11. Start engine and activate header lift cylinders (switch on GSL) to lower header fully.

12. Stop engine and remove key.

13. Connect header drive hoses (P) and electrical harness (Q) to header. Refer to the Draper Header Operator’s Manual.

*(continued next page)*

6.5.2 Header Detachment

a. Raise the header fully with the header up switch on the GSL. Stop engine and remove key.

DANGER

To avoid bodily injury from fall of raised header, always engage header lift cylinder stops when working on or around raised header.

b. Engage lift cylinder stops on both lift cylinders. Refer to Section 6.4.1 Header Lift Cylinder Stops.

c. Remove pin (A) from header leg on both sides.

d. Lower header stand (B) by pulling spring loaded pin (C). Release pin to lock stand.

(continued next page)
e. Remove pin from location (D) to disengage float springs, and insert in storage hole (E). Secure with lynch pin.

**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 (E), and **not** installed at hole location (D).

f. Disengage lift cylinder stops.
g. Start engine, choose a level area and lower header to the ground. Stop engine and remove key.

h. Disconnect header drive hydraulics (F) and electrical harness (G) from header. Refer to the Draper Header Operator’s Manual.

i. Disconnect reel hydraulics (H) and store on bracket at windrower LH side.
j. Disconnect center link as follows:

**MECHANICAL LINK – M150**

1. Loosen nut (J) and rotate barrel (K) to relieve load on link.
2. Remove cotter pin on pin (L), and remove pin to disconnect from windrower. Re-install pin in header.
3. Tighten nut (J) against barrel. A slight tap with a hammer is sufficient.

(continued next page)
HYDRAULIC LINK – OPTION

1. Start engine and activate header tilt cylinder switch on GSL to release load on center link cylinder.

2. Disconnect center link by lifting release (M) and lift hook (N) off header.

k. Slowly back windrower away from header.

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

l. Reinstall pin (A) into header leg and secure with hairpin.

6.5.3 Header Position Adjustments
Refer to Section 6.4 HEADER OPERATION for procedures for controlling header height, header tilt, and float.

6.5.4 Reel Fore-Aft Position (Optional)

Press and hold the switch for the desired fore or aft movement of the reel.

6.5.5 Reel Height

Press and hold the switch for the desired up or down movement of the reel.
6.5.6 Reel Speed

Reel speed is controlled with switches on the CDM 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.

6.5.6.1 Reel to Ground Speed – Index (Option)

Setting the speed of the reel relative to ground speed using the Header Index function allows the operator to maintain a preset reel to ground speed, while operating at varying ground speeds. This feature requires that an “expansion module” has been installed, either at the factory or at your dealer. To use this feature, set the Minimum Reel Speed, and set the Reel Index as follows:

a. Set Reel Minimum Speed

**IMPORTANT**

Windrower can be moving but must be less than minimum reel speed.

**CAUTION**

Check to be sure all bystanders have cleared the area.

b. Set Reel Index while driving windrower at normal operating speed and greater than minimum reel speed.

### Diagram

![Diagram of Header Operation](header_operation_d_series.png)

**NOTE**

DISPLAY will flash ###.## MIN REEL (MPH or KPH) 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.

See example on following page.

(continued next page)
Example:

Windrower is operating at 8 mph with Header Index on and set at 5.5. Display shows:

13.5 5.5 REEL IND

where 13.5 (8+5.5) is the reel speed in mph, and 5.5 is the header index setting.

Windrower speed drops to 7.5 mph at same Header Index setting. Display shows;

13.0 5.5 REEL IND

where 13.0 (7.5+5.5) is the reel speed in mph, and 5.5 is the header index setting.

Windrower is operating at 8 mph with Header Index on and set at 1.0. Display shows:

9.0 1.0 REEL IND

where 9.0 (8+1.0) is the reel speed in mph, and 1.0 is the header index setting.

6.5.6.2 Reel Only Speed

Set the reel speed independently of ground speed as follows:

**CAUTION**

Check to be sure all bystanders have cleared the area.

**NOTE**

This procedure can also be used to change the draper speed “on the go”. These changes become the new set-points.

![Flowchart Diagram]
6.5.7 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 CDM relative to the ground speed of the windrower with the Header Index function, or can run independently. This feature requires that an “expansion module” has been installed, either at the factory or at your dealer.

CAUTION

Check to be sure all bystanders have cleared the area.

6.5.7.1 Draper To Ground Speed – Index (Optional)

To use this feature, set the Draper Minimum Speed, and set the Draper Index.

NOTE

Reducing engine speed saves fuel and reduces noise in the cab. Ground/cutting speed can be maintained using this feature.

a. Set Draper Minimum Speed:

IMPORTANT

Windrower can be moving but must be less than minimum reel speed.

b. Set Draper Index while driving windrower at normal operating speed and greater than minimum draper speed.

See example on following page.

(continued next page)
Example:
Windrower is operating at 8 mph with Header Index on and set at 1.5. Display shows:

**9.5 1.5 DRAP INDEX**
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 INDEX**
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 INDEX**
where **8.9** (8+0.9) is the draper speed in mph, and **0.9** is the header index setting.

### 6.5.7.2 Draper Speed Independent of Ground Speed

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.

![Diagram showing header operation process]

1. **HEADER ENGAGED**
2. **HEADER INDEX SWITCH - OFF**
3. **PRESS DISPLAY SELECTOR FOR DRAPER SP**
4. **HEADER**
5. **DISPLAY SHOWS ### DRAPER SPEED**
6. **##.# = MPH or KPH**
7. **ON CDM PRESS FAST OR SLOW**
8. **DISPLAY SHOWS ### DRAPER SPEED**
9. **SPEED O.K.?**
   - **NO**
   - **YES**
10. **DONE**
6.5.8 **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.

The knife speed is manually set by making adjustments to the knife drive pump and has been pre-set at the factory. For optimum performance, adjust the knife speed according to the header being used. See the following table.

If the machine is equipped with the appropriate sensor and optional module, the CDM will notify the operator when the knife speed reaches an overload pre-set (usually 75% of knife speed). The pre-set can be changed on the CDM. Refer to Section 5.18.5 CDM Programming.

**NOTE**

_The knife speed should stay within the range specified for each header._

<table>
<thead>
<tr>
<th>HEADER DESCRIPTION</th>
<th>KNIFE SPEED</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE</td>
<td>SIZE</td>
</tr>
<tr>
<td>Draper DK</td>
<td>15</td>
</tr>
<tr>
<td>Draper DK</td>
<td>20 &amp; 25</td>
</tr>
<tr>
<td>Draper DK</td>
<td>30</td>
</tr>
<tr>
<td>Draper DK</td>
<td>35</td>
</tr>
<tr>
<td>Draper SK</td>
<td>20 &amp; 25</td>
</tr>
<tr>
<td>Draper SK</td>
<td>30</td>
</tr>
</tbody>
</table>

RPM = speed of wobble box pulley.

SPM = strokes per minute of knife (RPM x 2).

The table shows the minimum and maximum knife speeds for different types of headers. The speeds are specified in RPM and SPM.

a. Determine the knife speed as follows if the machine is _not_ equipped with the optional module:

**CAUTION**

Check to be sure all bystanders have cleared the area.

1. Run engine at 2600 rpm with the header drive engaged and with ISC off.

b. Determine the knife speed as follows if the machine _is_ equipped with the optional module:

1. Run engine at 2600 rpm with the header drive engaged and ISC off.
2. Press SELECTOR button on the GSL until the CDM displays the knife speed in SPM.

c. If required, adjust knife speed 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. Shutdown engine.

(continued next page)
2. Loosen jam-nut (A).
3. Turn adjuster screw (B) clockwise (screw in) to decrease knife speed, and counter-clockwise (screw out) to increase the knife speed.

**NOTE**
One turn of the adjuster screw will change the knife speed by approximately 116 strokes per minute, or the wobble box pulley speed by 58 revolutions per minute.

4. Once adjustment has been made re-torque jam nut (A) as shown.

**d.** Start engine and recheck knife speed.

---

### 6.5.9 Deck Shift (Optional)

The hydraulic deck shift option allows the operator 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. Shift decks as follows:

**CAUTION**
Check to be sure all bystanders have cleared the area.

---

a. Engage header by pushing down on the yellow knob and pulling up on the black ring at the base of the switch (A).

b. Push rocker switch (B) to desired delivery position. Deck(s) will move, and direction of drapers will change accordingly.

c. Operate windrower.
6.6 A SERIES HEADER OPERATION

6.6.1 Header Attachment – A Series

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

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 (C), and not installed at hole location (D).

b. Start the engine and activate HEADER DOWN button on the GSL to fully retract header lift cylinders.

c. Slowly drive windrower forward so that feet (E) on windrower enter boots (B) on the header. Continue to drive slowly forward until feet engage the boots, and header nudges forward.

(continued next page)
d. Connect center link as follows:

**MECHANICAL LINK – M150**

1. Loosen nut (F) and rotate barrel (G) to adjust length so that other end lines up with header bracket.
2. Install pin (H) and secure with cotter pins.
3. Adjust link to required length for proper header angle by rotating barrel (G). Tighten nut (F) against barrel. A slight tap with a hammer is sufficient.
4. Proceed to step e.

**HYDRAULIC LINK - OPTION**

1. Re-locate the pin at the frame linkage as required to position the hook over the header pin.
2. Activate HEADER TILT cylinder switches on GSL to extend or retract center link cylinder so that the hook lines up with the header attachment pin.
3. Push down on rod end of link cylinder until hook engages pin on header and is locked.
4. Check that center link is locked onto header by pulling upward on rod end of cylinder.

**DANGER**

To avoid bodily injury from fall of raised header, always engage header lift cylinder stops when working on or around raised header.

f. Engage lift cylinder stops on both lift cylinders. Refer to Section 6.4.1 Header Lift Cylinder Stops.

(continued next page)
g. Install pin (A) through each boot and foot and secure with hairpin.

**IMPORTANT**

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

h. Remove lynch pin from pin (J) in stand (K).

i. Hold stand and remove pin (J).

j. Reposition stand to storage position by inverting stand and re-locating on bracket as shown. Reinsert pin (J) and secure with lynch pin.

k. Remove pin (L) from storage position in linkage and insert in hole (M) to engage float springs. Secure with lynch pin.

l. Disengage lift cylinder stops.

m. Start engine, and activate header lift cylinder switch on GSL to lower header fully. Stop engine and remove key.

n. Connect header drive hydraulics (N) and electrical harness (O) to header. Refer to Auger Header Operator’s Manual.
6.6.2 Header Detachment

a. Raise the header fully with the header up switch on the GSL. Stop engine and remove key.

DANGER

To avoid bodily injury from fall of raised header, always engage header lift cylinder stops when working on or around raised header.

b. Engage lift cylinder stops on both lift cylinders. Refer to Section 6.4.1 Header Lift Cylinder Stops.

c. Remove hairpin from pin (A), and remove pin from left and right header boots on header.

d. Lower stand (C) by pulling pin (D), inverting stand and re-locating on bracket. Reinsert pin (D) and secure with hairpin.

e. Remove pin from linkage (E) to disengage float springs, and insert in storage hole (F). Secure with lynch pin. Repeat for opposite linkage.

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 (F), and not installed at hole location (E).

f. Disengage lift cylinder stops.

g. Start engine, choose a level area and lower header to the ground.

(continued next page)
h. Disconnect center link as follows:

**MECHANICAL LINK – M150**

1. Loosen nut (G) and rotate barrel (H) to relieve load on link.
2. Remove cotter pin on pin (J), and remove pin to disconnect from header. Re-install pin in header.
3. Proceed to step i.

**HYDRAULIC LINK – OPTION**

1. Activate header tilt cylinder switch on GSL to release load on center link cylinder (K).
2. Lift hook release (L) and lift hook (M) off header pin.

i. Disconnect header drive hydraulics (N) and electrical harness (O). Refer to the Auger Header Operator's Manual.

j. Slowly back windrower away from header.
k. Re-install pins (A) in header boots.
6.6.3 Auger Speed

**CAUTION**
Check to be sure all bystanders have cleared the area.

### 6.6.3.1 A40-D Headers
On A40-D double knife headers, the auger speed can be changed independently from the reel speed with a switch on the CDM. Change auger speed as follows:

![Diagram of header operation](image)

1. **ENGAGE HEADER**
2. **HEADER INDEX SWITCH - OFF**
3. **PRESS DISPLAY SELECTOR FOR ##.# AUGER SPEED**
4. **ON CDM PRESS FAST OR SLOW**
5. **DISPLAY SHOWS ##.# AUGER SPEED**
   - **NO**
   - **SPEED O.K.?**
5.1 **##.# = 4.7 – 9.9**
   - **4.7 = 150 rpm**
   - **9.9 = 320 rpm**
5.2 **YES**
   - **DONE**

* Auger Speed Not To Exceed 320 rpm.

### 6.6.3.2 A30-S and A30-D Headers
On A30 Series auger headers, the auger speed is fixed to the knife speed.

**NOTE**
The auger speed can be independently changed from the knife speed by changing the drive sprocket. Refer to A30-S, A30-D & A40-D Self Propelled Windrower Headers OPERATOR’S MANUAL.
6.6.4 **Reel Speed**

6.6.4.1 **A30-S and A30-D Headers**

The reel speed is fixed to the auger speed and to the knife speed. Both can be changed by installing alternate drive sprockets. Refer to your Auger Header Operator's Manual.

6.6.4.2 **A40-D Header**

The A40-D auger header features a hydraulic direct drive reel with operating speed range of 51 to 76 rpm and is controlled with switches on the CDM, and on the GSL at the operator's station. The hydraulic flows for the reel and auger are interconnected so that the auger and reel speeds are controlled using a combination of the CDM switches and the GSL switches.

*Auger Speed Not To Exceed 320 rpm.*
6.6.5 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 knife speed is manually set by making adjustments to the knife drive pump and has been pre-set at the factory. For optimum performance, adjust the knife speed according to the header being used. See the following table.

If the machine is equipped with the appropriate sensor and optional module, the CDM will notify the operator when the knife speed reaches an overload pre-set (usually 75% of knife speed). The pre-set can be changed on the CDM. Refer to Section 5.18.5 CDM Programming

**NOTE**
The knife speed should stay within the range specified for each header.

<table>
<thead>
<tr>
<th>HEADER DESCRIPTION</th>
<th>KNIFE SPEED</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE</td>
<td>SIZE</td>
</tr>
<tr>
<td></td>
<td>RPM</td>
</tr>
<tr>
<td>Auger</td>
<td>A40D</td>
</tr>
<tr>
<td>Auger</td>
<td>A30D</td>
</tr>
<tr>
<td>Auger</td>
<td>A30S</td>
</tr>
</tbody>
</table>

RPM = speed of wobble box pulley.
SPM = strokes per minute of knife (RPM x 2).

a. Determine the knife speed as follows if the machine is not equipped with the optional module:

**CAUTION**
Check to be sure all bystanders have cleared the area.

1. Run engine at 2600 rpm with the header drive engaged and with ISC off.

b. Determine the knife speed as follows if the machine is equipped with the optional module:

1. Run engine at 2600 rpm with the header drive engaged and ISC off.

2. Check wobble box pulley speed with a hand-held tachometer.

3. Multiply the rpm reading by two for the knife speed in strokes per minute.

c. If required, adjust knife speed 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. Shutdown engine.

(continued next page)
2. Loosen jam-nut (A).
3. Turn adjuster screw (B) clockwise (screw in) to decrease knife speed, and counter-clockwise (screw out) to increase the knife speed.

**NOTE**

One turn of the adjuster screw will change the knife speed by approximately 116 strokes per minute, or the wobble box pulley speed by 58 revolutions per minute.

4. Once adjustment has been made re-torque jam nut (A) as shown.

d. Start engine and recheck knife speed.
7 MAINTENANCE/SERVICE

The following instructions are provided to assist the operator in the use of the M100 Windrower. Detailed maintenance, service, and parts information are contained in the Service Instruction Manual and Parts Catalog that are available from your dealer.

7.1 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 cylinder stops.
- Disengage drives.
- Stop engine and remove key.
- Wait for all moving parts to stop.

7.1.1 Welding Precautions

IMPORTANT

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. These electronic modules include:

- Engine Control Module (ECM)
- Cab Display Module (CDM)

7.2 RECOMMENDED SAFETY PROCEDURES

- Wear close-fitting clothing and cover long hair. Never wear dangling items such as scarves or bracelets.
- Wear protective shoes with slip-resistant soles, a hard hat, protective glasses or goggles and heavy gloves.
- 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 sickle) to move. Stay clear of driven components at all times.
- Be prepared if an accident should occur. Know where the first aid kit and fire extinguishers are located and how to use them.
- Keep the service area 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.
- Use adequate light for the job at hand.
- Replace all shields removed or opened for service.
- Park on a level surface when possible. Block wheels securely.
- Use only service and repair parts made or approved by the equipment manufacturer. Substituted parts may not meet strength, design or safety requirements.
- Keep the machine clean. Never use gasoline, naphtha or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.
7.3 MAINTENANCE SPECIFICATIONS

7.3.1 Recommended Fluids, Fuel, and Lubricants

7.3.1.1 Fuel

<table>
<thead>
<tr>
<th>FUEL</th>
<th>SPEC/DESCRIPTION</th>
<th>USE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diesel Grade No.2</td>
<td>ASTM D-975</td>
<td>As Per Spec</td>
</tr>
<tr>
<td></td>
<td>SULPHUR (by weight)</td>
<td>As Per Spec</td>
</tr>
<tr>
<td></td>
<td>WATER &amp; SEDIMENT (by weight)</td>
<td>As Per Spec</td>
</tr>
<tr>
<td></td>
<td>CETANE NO.</td>
<td>As Per Spec</td>
</tr>
<tr>
<td></td>
<td>LUBRICITY</td>
<td>As Per Spec</td>
</tr>
</tbody>
</table>

| Diesel Grade No.1 & 2 mix * | 1% Max. 0.5% Max. Preferred | 0.1% Max. 45-55 Cold Weather/High Alt. 460 HFRR |

* Optional when operating temp below 0°C. (32°F.).

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 prior to use of fuel additives. Among the situations where additives can prove useful are the following:

- 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.

7.3.1.2 Fluids

<table>
<thead>
<tr>
<th>FLUID</th>
<th>SPEC/DESCRIPTION</th>
<th>USE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti-Freeze</td>
<td>ASTM D-4985</td>
<td>Ethylene Glycol</td>
</tr>
<tr>
<td></td>
<td>SULPHUR (by weight)</td>
<td>With SCA</td>
</tr>
<tr>
<td></td>
<td>WATER &amp; SEDIMENT (by weight)</td>
<td>Cab Air Conditioning System.</td>
</tr>
<tr>
<td></td>
<td>CETANE NO.</td>
<td>As Per Spec</td>
</tr>
<tr>
<td></td>
<td>LUBRICITY</td>
<td>As Per Spec</td>
</tr>
</tbody>
</table>

| Air Conditioning Refrigerant | R134A | Refrigerant | Cab Air Conditioning System. |
| Compressor Oil              | SP-15  | Compressor Oil | Cab Air Conditioning Compressor Lubricant |

* Mix with equal parts of high quality, soft, de-ionized, or distilled water.

7.3.1.3 Lubricants

<table>
<thead>
<tr>
<th>LUBRICANT</th>
<th>SPEC/DESCRIPTION</th>
<th>USE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine Oil</td>
<td>SAE 15W40 Compliant With SAE Specs For API Class SJ And CH-4 Engine Oil.</td>
<td>Engine Crankcase</td>
</tr>
<tr>
<td>Hydraulic Oil</td>
<td>SAE 15W40 Compliant With SAE Specs For API Class SJ And CH-4 Engine Oil</td>
<td>Windrower Drive, Header Drive.</td>
</tr>
<tr>
<td>Gear Lubricant</td>
<td>SAE 5W-140 API Service Class GL-5. Extreme Pressure Gear Lubricant</td>
<td>Drive Wheel Gears Before Initial Change.</td>
</tr>
<tr>
<td></td>
<td>SAE 75W-90 API Service Class GL-5. Fully Synthetic Gear Lubricant (SAE J2360 Preferred)</td>
<td>Drive Wheel Gears After Initial Change.</td>
</tr>
</tbody>
</table>

7.3.1.4 Capacities

<table>
<thead>
<tr>
<th>ITEM</th>
<th>CAPACITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel Tank</td>
<td>97 U.S. Gallons (378 liters)</td>
</tr>
<tr>
<td>Hydraulic Reservoir</td>
<td>11.5 U.S. Gallons (45 liters)</td>
</tr>
<tr>
<td>Drive Wheel</td>
<td>1.5 U.S. Quarts (1.4 liters)</td>
</tr>
<tr>
<td>Engine Cooling System</td>
<td>5.3 U.S. Gallons (20 liters)</td>
</tr>
<tr>
<td>Engine Crankcase</td>
<td>7.6 U.S. Quarts (7 liters)</td>
</tr>
<tr>
<td>Air Cond. Refrigerant</td>
<td>3.6 lb (1.63 kg)</td>
</tr>
<tr>
<td>Air Cond. Compressor</td>
<td>8.1 fl. oz. (240 cc)</td>
</tr>
</tbody>
</table>

7.3.1.5 Storage

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.
7.3.2 **Recommended Torques**

- Tighten all bolts to the torques specified in chart unless otherwise noted throughout this manual.
- Check tightness of bolts periodically, using bolt torque chart as a guide.
- Replace hardware with the same strength bolt.
- Torque figures are valid for non-greased or non-oiled threads and heads unless otherwise specified. Do not grease or oil bolts or capscrews unless specified in this manual. When using locking elements, increase torque values by 5%.

### 7.3.2.1 SAE Bolts

<table>
<thead>
<tr>
<th>BOLT DIA. &quot;A&quot;</th>
<th>NC BOLT TORQUE*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SAE 5</td>
</tr>
<tr>
<td></td>
<td>lbf-ft</td>
</tr>
<tr>
<td>8 1/4</td>
<td>9</td>
</tr>
<tr>
<td>13 5/1</td>
<td>14</td>
</tr>
<tr>
<td>18 3/8</td>
<td>19</td>
</tr>
<tr>
<td>23 7/1</td>
<td>24</td>
</tr>
<tr>
<td>28 1/2</td>
<td>29</td>
</tr>
<tr>
<td>33 9/1</td>
<td>34</td>
</tr>
<tr>
<td>38 5/8</td>
<td>39</td>
</tr>
<tr>
<td>43 3/4</td>
<td>44</td>
</tr>
<tr>
<td>48 7/8</td>
<td>49</td>
</tr>
<tr>
<td>53 1</td>
<td>54</td>
</tr>
</tbody>
</table>

* Torque categories for bolts and capscrews are identified by their head markings.

### 57.1.1.1 Metric Bolts

<table>
<thead>
<tr>
<th>BOLT DIA. &quot;A&quot;</th>
<th>NC BOLT TORQUE*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8.8</td>
</tr>
<tr>
<td></td>
<td>lbf-ft</td>
</tr>
<tr>
<td>M3</td>
<td>0.4</td>
</tr>
<tr>
<td>M4</td>
<td>2.2</td>
</tr>
<tr>
<td>M5</td>
<td>4</td>
</tr>
<tr>
<td>M6</td>
<td>7</td>
</tr>
<tr>
<td>M8</td>
<td>18</td>
</tr>
<tr>
<td>M10</td>
<td>37</td>
</tr>
<tr>
<td>M12</td>
<td>66</td>
</tr>
<tr>
<td>M14</td>
<td>103</td>
</tr>
<tr>
<td>M16</td>
<td>166</td>
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<td>321</td>
</tr>
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<td>M24</td>
<td>553</td>
</tr>
<tr>
<td>M30</td>
<td>1103</td>
</tr>
<tr>
<td>M36</td>
<td>1917</td>
</tr>
</tbody>
</table>

* Torque categories for bolts and capscrews are identified by their head markings.
57.1.1.2 Flare Type Hydraulic Fittings

a. Check flare and flare seat for defects that might cause leakage.
b. Align tube with fitting before tightening.
c. Lubricate connection and hand tighten swivel nut until snug.
d. To prevent twisting the tube(s), use two wrenches. Place one wrench on the connector body and with the second tighten the swivel nut to the torque shown.

<table>
<thead>
<tr>
<th>SAE NO.</th>
<th>TUBE SIZE O.D. (in.)</th>
<th>THD SIZE (in.)</th>
<th>NUT SIZE ACROSS FLATS (in.)</th>
<th>TORQUE VALUE*</th>
<th>RECOMMENDED TURNS TO TIGHTEN (AFTER FINGER TIGHTENING)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ft-lbf</td>
<td>N·m</td>
</tr>
<tr>
<td>3</td>
<td>3/16</td>
<td>3/8</td>
<td>7/16</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>1/4</td>
<td>7/16</td>
<td>9/16</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>5/16</td>
<td>1/2</td>
<td>5/8</td>
<td>12</td>
<td>16</td>
</tr>
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<td>6</td>
<td>3/8</td>
<td>9/16</td>
<td>11/16</td>
<td>18</td>
<td>24</td>
</tr>
<tr>
<td>8</td>
<td>1/2</td>
<td>3/4</td>
<td>7/8</td>
<td>34</td>
<td>46</td>
</tr>
<tr>
<td>10</td>
<td>5/8</td>
<td>7/8</td>
<td>1</td>
<td>46</td>
<td>62</td>
</tr>
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<td>3/4</td>
<td>1-1/16</td>
<td>1-1/4</td>
<td>75</td>
<td>102</td>
</tr>
<tr>
<td>14</td>
<td>7/8</td>
<td>1-3/8</td>
<td>1-3/8</td>
<td>90</td>
<td>122</td>
</tr>
</tbody>
</table>

* The torque values shown are based on lubricated connections as in reassembly.

57.1.1.3 O-ring Type Hydraulic Fittings

a. Inspect O-ring and seat for dirt or obvious defects.
b. On angle fittings, back off the lock nut until washer (A) bottoms out at top of groove (B) in fitting.
c. Hand tighten fitting until back up washer (A) or washer face (if straight fitting) bottoms on part face (C) and O-ring is seated.
d. Position angle fittings by unscrewing no more than one turn.
e. Tighten straight fittings to torque shown.
f. Tighten angle fittings to torque shown in the following table while holding body of fitting with a wrench.

<table>
<thead>
<tr>
<th>SAE NO.</th>
<th>THD SIZE (in.)</th>
<th>NUT SIZE ACROSS FLATS (in.)</th>
<th>TORQUE VALUE*</th>
<th>RECOMMENDED TURNS TO TIGHTEN (AFTER FINGER TIGHTENING)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ft-lbf</td>
<td>N·m</td>
</tr>
<tr>
<td>3</td>
<td>3/8</td>
<td>1/2</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>7/16</td>
<td>9/16</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>1/2</td>
<td>5/8</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>6</td>
<td>9/16</td>
<td>11/16</td>
<td>18</td>
<td>24</td>
</tr>
<tr>
<td>8</td>
<td>3/4</td>
<td>7/8</td>
<td>34</td>
<td>46</td>
</tr>
<tr>
<td>10</td>
<td>7/8</td>
<td>1</td>
<td>46</td>
<td>62</td>
</tr>
<tr>
<td>12</td>
<td>1-1/16</td>
<td>1-1/4</td>
<td>75</td>
<td>102</td>
</tr>
<tr>
<td>14</td>
<td>1-3/16</td>
<td>1-3/8</td>
<td>90</td>
<td>122</td>
</tr>
<tr>
<td>16</td>
<td>1-5/16</td>
<td>1-1/2</td>
<td>105</td>
<td>142</td>
</tr>
<tr>
<td>20</td>
<td>1-5/8</td>
<td>1-7/8</td>
<td>140</td>
<td>190</td>
</tr>
<tr>
<td>24</td>
<td>1-7/8</td>
<td>2-1/8</td>
<td>160</td>
<td>217</td>
</tr>
</tbody>
</table>

* The torque values shown are based on lubricated connections as in reassembly.
### 57.1.2 Conversion Chart

<table>
<thead>
<tr>
<th>QUANTITY</th>
<th>INCH-POUND UNITS</th>
<th>FACTOR</th>
<th>SI UNITS (METRIC)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UNIT NAME</td>
<td>ABBR.</td>
<td>UNIT NAME</td>
</tr>
<tr>
<td>Area</td>
<td>acres</td>
<td>acres</td>
<td>x 0.4047 =</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow</td>
<td>US gallons per minute</td>
<td>(gpm)</td>
<td>x 3.7854 =</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Force</td>
<td>pounds force</td>
<td>lbf</td>
<td>x 4.4482 =</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>inch</td>
<td>in.</td>
<td>x 25.4 =</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>foot</td>
<td>ft</td>
<td>x 0.305 =</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power</td>
<td>horsepower</td>
<td>hp</td>
<td>x 0.7457 =</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure</td>
<td>pounds per square inch</td>
<td>psi</td>
<td>x 6.8948 =</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>x .00689 =</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Torque</td>
<td>pound feet or foot pounds</td>
<td>lbf·ft or ft·lbf</td>
<td>x 1.3558 =</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>pound inches or inch pounds</td>
<td>lbf·in. or in·lbf</td>
<td>x 0.1129 =</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>degrees Fahrenheit</td>
<td>°F</td>
<td>(°F - 32) x 0.56 =</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Velocity</td>
<td>feet per minute</td>
<td>ft/min</td>
<td>x 0.3048 =</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>feet per second</td>
<td>ft/s</td>
<td>x 0.3048 =</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>miles per hour</td>
<td>mph</td>
<td>x 1.6093 =</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volume</td>
<td>US gallons</td>
<td>US gal.</td>
<td>x 3.7854 =</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ounces</td>
<td>oz.</td>
<td>x 29.5735 =</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>cubic inches</td>
<td>in. ³</td>
<td>x 16.3871 =</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>pounds</td>
<td>lb</td>
<td>x 0.4536 =</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
57.2 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.

a. Open the hood at the lowest position as follows:

1. Locate latch (A) behind grill and lift to release hood.
2. Raise hood until strap (B), which should be looped under hooks (C) and (D), stops it at approximately a 40 degree angle.

b. To close hood:
1. Pull down on strap (B), grasp the hood when within reach and lower until hood engages latch (A).

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

b. To close hood:
1. Pull down on strap (B), grasp the hood when within reach and lower until hood engages latch (A).

2. Remove strap from hooks (C) and (D) and allow hood to raise fully to approximately 65 degrees.

d. To close hood:
1. Grasp the strap at (B) and loop under upper hook (C).
2. Pull down on strap and loop under lower hook (D).

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).
57.3 MAINTENANCE PLATFORM

A swing away platform/stair unit is provided on the left side of the windrower for access to the operator's station and engine bay maintenance.

57.3.1 Opening/Closing Platform

- Push latch (A) down and pull platform (B) toward walking beam until it stops and latch re-engages in open position.
- To move platform back to closed position, release latch (A) and move platform forward until it stops and latch re-engages.

57.3.2 Opening/Closing Platform for Major Servicing

To improve access to the hydraulics plumbing, the platform can be swung away from the windrower.

To Open:

- Open engine compartment hood to lowest position.

**IMPORTANT**

Failure to open hood will result in damage to the hood when the platform is repositioned.

- Unlock latch (A) and move platform (B) toward open position.
- Remove nut and bolt (C) and swing link (D) clear of valve block.

(continued next page)
d. At the same time pull front end of platform away from frame while moving it towards the walking beam. Aft corner (E) 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.

e. Swing link (D) under platform.

To Close:

a. Swing link (D) out from under platform all the way forward.
b. Move platform front end inboard while moving it away from the walking beam.
c. Position link (D) on bracket and install bolt and nut (C). Do not fully tighten.
d. Move platform to closed position, ensuring it is locked.
e. Close engine compartment hood.

57.4 LUBRICATING THE WINDROWER

WARNING

To avoid personal injury, before servicing windrower or opening drive covers, follow procedures in Section 7.1, Preparation for Servicing.

Recommend Lubricant

<table>
<thead>
<tr>
<th>LUBRICANT</th>
<th>SPEC DESCRIPTION</th>
<th>USE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grease</td>
<td>SAE Multi-Purpose.</td>
<td>As Required Unless Otherwise Specified.</td>
</tr>
<tr>
<td></td>
<td>High Temp. Extreme Pressure (EP2) Performance With 1% Max Molybdenum Disulphide (NLGI Grade 2). Lithium Base</td>
<td></td>
</tr>
</tbody>
</table>

The greasing points are marked on the machine by decals showing a grease gun and grease interval in hours of operation. See illustration below.

Log hours of operation and use the "Maintenance Checklist" provided to keep a record of scheduled maintenance. Refer to Section 7.13, Maintenance Schedule.

57.4.1 Procedure

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.

a. Wipe grease fitting with a clean cloth before greasing, to avoid injecting dirt and grit.
b. Inject grease through fitting with grease gun until grease overflows fitting, except where noted.
c. Leave excess grease on fitting to keep out dirt.
d. Replace any loose or broken fittings immediately.
e. If fitting will not take grease, remove and clean thoroughly. Also clean lubricant passageway. Replace fitting if necessary.
57.4.2 Lubrication Points

Refer to the illustrations on the following page for identifying the various locations that require lubrication.

- High Temp. Extreme Pressure (EP2) Performance With 1% Max Molybdenum Disulphide (NLGI Grade 2), Lithium Base
- TOP LINK – TWO FITTINGS (BOTH SIDES)
- CASTER PIVOT (BOTH SIDES)
- FORMED CASTER WHEEL BEARING 1 PLACE (BOTH WHEELS)
- FORKED CASTER SPINDLE BEARINGS TWO PLACES (BOTH WHEELS)

WALKING BEAM PIVOT
57.5 OPERATOR’S STATION

57.5.1 Seat Belts
Keep the operator and trainer seat belts in good condition as follows:

a. Keep sharp edges and items that can cause damage away from the belts.
b. From time to time, check belts, buckles, retractors, tethers, slack take-up system and mounting bolts for damage.
c. Replace all parts that have damage or wear.
d. Replace belts that have cuts that can weaken the belt.
e. Check that bolts are tight on the seat bracket or mounting.
f. 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.

57.5.2 Safety Systems
Perform the following checks on the operator’s presence and engine lock-out systems annually or every 500 hours whichever occurs first.

57.5.2.1 Operator’s Presence System

a. With the windrower engine running, place the GSL in Neutral and turn the steering wheel until it locks.
b. With everyone clear of the machine, engage header drive switch;
   1. After header drives are running, stand up out of the seat. In approximately 5 seconds the header should shut off.
   2. If not, the operator presence system requires adjustment. See your MacDon dealer.

   NOTE
   To restart the header, the operator must move the header engage switch to “OFF” position and back to the “ON” position again.

c. With the windrower engine running, place the GSL in Neutral but out of N-DETENT;
   1. Stand up. After 2 seconds, the lower display will flash “NOT IN NEUTRAL” accompanied by a continuous loud tone. Move the GSL into N-DETENT to cancel the alarm.
   2. If there is no warning, the operator presence system requires adjustment. See your MacDon dealer.

d. With the windrower in forward motion at approximately 2-3 mph;
   1. Stand up out of the seat.
   2. The CDM will flash “NO OPERATOR” on the upper line, and “ENGINE SHUTS DOWN 5…4…3…2…1…0” accompanied by a steady tone.
   3. If not, the operator presence system requires adjustment. See your MacDon dealer.

57.5.2.2 Engine Interlock

a. 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.
b. With the engine shut down, steering wheel not centered, and the GSL in neutral but not in N-DETENT, try to start the engine. The 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).
57.5.3 Traction Drive Adjustments

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.

57.5.3.1 GSL Fore-Aft Movement

The GSL should remain as positioned by the operator and yet can be moved without excessive force. The spring is set at the factory to 2.50 in. (64 mm) shown on the illustration. If necessary, adjust as follows:

a. Hold nut (A) from turning and loosen jam-nut (B).

b. To increase the pivot resistance, turn the nut (A) clockwise to compress the spring.

c. To decrease the resistance, turn the nut (A) counterclockwise to release the spring tension.

d. Hold nut (A) from turning and tighten jam-nut (B).

57.5.3.2 Neutral Interlock Checks

A properly functioning system should operate as follows:

- 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).

Any problem with the neutral lock and steering controls could be caused by loose, worn, or improperly adjusted parts. Perform the following checks if the neutral interlock system is not functioning as described above. See Table next page.

IMPORTANT

When servicing this area, it is important to perform all of the checks to avoid missing the problem and providing only a temporary fix.
<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>CHECK</th>
<th>ITEM NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steering wheel will not lock in neutral.</td>
<td>GSL Position</td>
<td>7.7.3.3</td>
</tr>
<tr>
<td></td>
<td>Cable Tension</td>
<td>7.7.3.4</td>
</tr>
<tr>
<td></td>
<td>Neutral Lock</td>
<td>7.7.3.5</td>
</tr>
<tr>
<td></td>
<td>Neutral Start Switch</td>
<td>7.7.3.6</td>
</tr>
<tr>
<td>Ground speed lever will not go into reverse or forward.</td>
<td>Cable Tension</td>
<td>7.7.3.4</td>
</tr>
<tr>
<td>Ground speed lever rattles in neutral</td>
<td>Cable Tension</td>
<td>7.7.3.4</td>
</tr>
<tr>
<td></td>
<td>Neutral Lock</td>
<td>7.7.3.5</td>
</tr>
<tr>
<td>Ground speed lever not spring loaded towards the center of forward travel slot</td>
<td>Cable Tension</td>
<td>7.7.3.4</td>
</tr>
<tr>
<td></td>
<td>Neutral Lock</td>
<td>7.7.3.5</td>
</tr>
<tr>
<td>Steering wheel locks in neutral, but neutral start switch does not compress</td>
<td>Neutral Start Switch</td>
<td>7.7.3.6</td>
</tr>
<tr>
<td></td>
<td>Neutral Lock Adjust Bolts</td>
<td>7.7.3.7</td>
</tr>
<tr>
<td></td>
<td>Cable Tension</td>
<td>7.7.3.4</td>
</tr>
<tr>
<td></td>
<td>GSL Position</td>
<td>7.7.3.3</td>
</tr>
<tr>
<td></td>
<td>Neutral Lock</td>
<td>7.7.3.5</td>
</tr>
<tr>
<td></td>
<td>Perform Neutral Set-up Procedure.</td>
<td>7.7.4</td>
</tr>
<tr>
<td>Machine &quot;growls&quot; severely or moves after engine start-up.</td>
<td>Neutral Start Switch</td>
<td>7.7.3.6</td>
</tr>
<tr>
<td></td>
<td>Neutral Lock Adjust Bolts</td>
<td>7.7.3.7</td>
</tr>
<tr>
<td></td>
<td>Cable Tension</td>
<td>7.7.3.4</td>
</tr>
<tr>
<td></td>
<td>GSL Fore-Aft Movement</td>
<td>7.7.3.1</td>
</tr>
<tr>
<td></td>
<td>GSL Position</td>
<td>7.7.3.3</td>
</tr>
<tr>
<td></td>
<td>Neutral Lock</td>
<td>7.7.3.5</td>
</tr>
<tr>
<td></td>
<td>Loose Hardware</td>
<td>7.7.3.8</td>
</tr>
<tr>
<td></td>
<td>Perform Neutral Set-up Procedure.</td>
<td>7.7.4</td>
</tr>
<tr>
<td>Steering wheel locks in neutral only after several left to right rotations of wheel</td>
<td>Neutral Lock Adjust Bolts</td>
<td>7.7.3.7</td>
</tr>
<tr>
<td></td>
<td>Cable Tension</td>
<td>7.7.3.4</td>
</tr>
<tr>
<td></td>
<td>GSL Position</td>
<td>7.7.3.3</td>
</tr>
<tr>
<td></td>
<td>Neutral Lock</td>
<td>7.7.3.5</td>
</tr>
<tr>
<td></td>
<td>Perform Neutral Set-up Procedure.</td>
<td>7.7.4</td>
</tr>
</tbody>
</table>
57.5.3.3  GSL Position

The GSL should be centered fore-aft (A) in the N-Detent slot when the steering wheel is centered and locked.
If necessary, adjust as follows:

1. Lock pintle arms.
2. Loosen nuts (B).
3. Hold GSL in center of N-Detent slot to locate support (C).
4. Tighten nuts (B) and torque to 80-90 ft·lbf (108-122 Nm).

IMPORTANT
Neutral Interlock must be properly adjusted before adjusting GSL position.

57.5.3.4  Cable Tension

The GSL (D) should easily move into the N-DETENT (E) by itself, and the cable (F) should be tight when the GSL is at the right hand side of the neutral detent on side console. The neutral start switch should also be fully compressed. If the cable is too tight, it will prevent the neutral start switch from fully compressing and prevent proper engagement of adjustment bolts on pintle arm.

Adjust the cable tension as follows:

1. Hold nut (G) from turning and loosen jam-nut (H).
2. To increase the tension, turn the nut (G) clockwise.
3. To decrease the cable tension, turn the nut (G) counterclockwise.
4. Hold nut (G) from turning and tighten jam-nut (H).
57.5.3.5 Neutral Lock Structure

a. Check for proper movement of interlock support structure as follows:

1. Disconnect spring (A) to unload pivots.
2. Check that support (B) rotates freely and that there is no fore-aft movement of structure.
3. If no adjustment is required, reconnect spring (A).

b. If necessary, adjust as follows:

1. Loosen outer nut (C).
2. Turn inner nut (D) until washer just contacts the plastic bushing. This pivot must allow free rotation of the support structure.
3. Hold inner nut (D) with a wrench and tighten outer nut (C) against nut (D).
4. Loosen outer nut (E).
5. Turn inner nut (F) until washer contacts the front support. Check again for free rotation of the structure with no fore-aft movement.
6. Hold inner nut (F) with a wrench and tighten outer nut (E) against inner nut (F).
7. Torque outer nuts (C) & (E) to 60-70 ft-lbf (80-90 Nm).
8. Reconnect spring (A).

57.5.3.6 Neutral Start Switch

The neutral start switch (G) must be closed before the engine can be started. The switch is closed when the neutral interlock on the pump is activated by positioning the GSL into N-DETENT and locking the steering wheel in centre position. When the switch closes, and machine starts and runs, the brakes continue to be applied to the drive wheels as park brake solenoid 3 is energized preventing brake release. The neutral switch is located on the frame adjacent to the hydrostatic transmission.

a. Check that electrical connections are good at neutral start switch (G).

b. Check that the plunger of switch is fully compressed when the steering is locked and the GSL is fully in N-DETENT. Adjust switch support if required as follows:

1. Loosen nut (H) and adjust support (J) as required.
2. Tighten nut (H).

**IMPORTANT**
Do not over-adjust switch support, as this will prevent pintle arms from locking.
57.5.3.7 Neutral Lock Adjustment Bolts

The neutral lock adjustment bolts must fully engage the pintle arms. Check and adjust as follows:

a. Ensure GSL is in N-DETENT position and the steering wheel is locked in the centre position.
b. Shut down the engine.

c. Using a feeler gauge, gap between pivot channel (A) and rear pintle arm (B) should be 0.04-0.20 inch (1-5 mm).
d. If required, adjust the interlock release cable (C) as follows:

1. Loosen jam nut (D) and turn nut (E) counterclockwise to increase the gap and clockwise to decrease.
2. Tighten jam nut (D) against nut (E).
3. Check neutral start switch plunger is fully depressed.

57.5.3.8 Loose Hardware

Check all hardware (not included in the previous checks) is properly tightened to torque specifications on ground speed controls, control rods, pump pintle arms and neutral start mechanisms.
57.5.4 Neutral Set-Up Procedure

This procedure should be performed only after the preceding checks and adjustments have failed to solve the neutral lock/steering problem. This procedure will eliminate machine movement in neutral and will improve neutral locking ability.

⚠️ CAUTION

Use jack-stands with a minimum capacity of 3 tons (2720 kg) to provide adequate support for machine.

⚠️ DANGER

Never attempt neutral set-up procedure without raising front wheels off the ground so they are free to turn. Failure to raise front wheels will result in machine runaway, causing severe personal injury or death.

a. Detach header and remove hay conditioner forming shields from under windrower.

b. Raise front of machine high enough to allow both wheels to turn freely and support with jack-stands. See "Jacking Procedure" under Wheel & Tire Maintenance in this section.

c. Open maintenance platform.

d. Disconnect electrical connector V3 (wire 2-2002) (A) at brake solenoid 3.

e. Ensure GSL is fully in N-DETENT and that neutral lock mechanism (B) has engaged pintle arms (C).

f. Start engine and run at 1100 rpm.

g. Adjust REAR pintle interlock as follows:

1. Loosen jam-nuts (D) and back off adjusting bolts (E) in rear pintle arm.

(continued next page)
2. Move pintle arm a small amount forward and hold so that LH wheel rotates forward for 2 or 3 seconds.

3. Move pintle arm a small amount rearward and hold so that LH wheel rotates backward for 2 or 3 seconds.

4. Position pintle arm so that the LH wheel remains stationary and the pump is the quietest to obtain the exact neutral position.

5. Turn the forward adjusting bolt (E) by hand until it contacts the pintle arm.

6. Move the pintle arm firmly against the adjusting bolt to check the setting – it’s acceptable for the LH wheel to just begin to creep forward. Hand tighten the jam-nut (D) at the forward adjusting bolt.

7. Return pintle arm to the neutral position.

8. Turn the rear adjusting bolt (E) by hand until it contacts the pintle arm.

9. Move the pintle arm firmly against the rear adjusting bolt to check the setting – it’s acceptable for the LH wheel to just begin to creep backward. Hand tighten the jam-nut (D) at the rear adjusting bolt.

10. Verify the adjusting bolt setting by again moving the pintle arm forward, then rearward to check that the LH wheel just begins to creep in both cases.

11. Fully tighten jam-nuts on both adjusting bolts. Ensure that the bolts do not rotate as the jam-nuts are tightened.

12. Check that the rear interlock engages and disengages freely onto the pintle arm in the neutral position.

h. Adjust FRONT pintle interlock (actuates RH wheel) using same procedure for the REAR pintle:

i. Apply a small amount of grease to the head of the adjusting bolts.

j. Shut-off engine.

k. Check GSL position in N-DETENT and adjust as necessary. See 7.7.3.3.

l. Reconnect connector V3 at brake solenoid 3.

m. Close maintenance platform.

n. Lower machine to ground.
57.5.5 HVAC System

57.5.5.1 Fresh Air Intake Filter

The fresh air filter is located under the cab roof behind the rear window and should be serviced daily. Service the filter as follows:

![Diagram of filter location]

**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.

a. Loosen knob (A) and slide retainer out to release filter (B) from rear of cab roof.

b. Tap filter gently on a flat surface, dirty side down. Do not tap on a tire, treads may damage filter pleats.

c. Direct compressed air (100 psi [700 kPa] maximum) through filter in opposite direction of air flow arrows.

d. Wash filter as required:
   1. Soak 15 minutes in warm water (not over 100°F [40°C]) with Filter Element Cleaner, (Donaldson D 1400 or equivalent).
   2. Rinse thoroughly with clean water, (maximum pressure 40 psi [275 kPa]).
   3. Shake excessive water from filter and allow element to dry. Do not use compressed air to dry filter; it may rupture the wet element. Protect element from freezing until dry.

e. Inspect filter before installing as follows:
   1. Hold a bright light on one side element and check carefully for holes. Discard any element which shows the slightest hole.
   2. Be sure outer screen is not dented. Vibration would quickly wear a hole in the filter.
   3. Be sure filter gasket is in good condition. If gasket is damaged or missing, replace element

f. If element is coated with oil or soot, replace the element.

g. Reinstall filter, making sure air flow arrows point towards cab.
57.5.5.2 Return Air Cleaner

The return air filter is located behind the operator’s seat on the cab wall and should be serviced every 100 hours 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.

a. Unscrew the two knobs (A) attaching cover and filter to cab wall, and pull off the cover and filter assembly.

b. Separate the filter (B) from the cover (C).

c. Clean the filter as follows:
   1. Mix a solution of warm water and detergent in a suitable container so that the filter can soak for a few minutes.
   2. Agitate to flush out the dirt.
   3. Rinse with clean water and dry with compressed air.
   4. Inspect filter for damage, separation, and holes. Replace if damaged.

d. Assemble the filter (B) and cover (C) and position on cab wall over opening.

e. Secure to cab wall with knobs (A).

57.5.5.3 A/C Condenser

The air conditioning condenser should be cleaned daily with compressed air and 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 Section 7.9.2 Cooling Box Maintenance.

57.5.5.4 A/C 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. To clean the evaporator, proceed 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.

a. Loosen the clamps (D) on the two drain hoses and pull the hoses off the air conditioning drain tubes.

(continued next page)
b. Remove the ten screws (H) that attach the cover (J) and remove the cover.

**WARNING**

*To avoid cuts from evaporator fins, do not use bare hands to brush away clogs.*

c. Use a vacuum or compressed air to remove dirt from inside the unit.

d. Blow compressed air through the evaporator fins from the blower side first as shown. Direct the air straight into the evaporator to prevent fin damage. A nozzle extension would make this procedure easier.

e. Repeat the previous step from the side opposite the blowers.

f. If dirt is still present, soak evaporator in water to loosen dirt, and then blow out with compressed air.

g. Straighten any bent fins.

h. Reposition cover (J) and attach with eight screws (H).

i. Reattach drain hoses to drain tubes and secure with hose clamps (G).

---

57.5.5.5 A/C Compressor Protection

The compressor is protected from excessively low and high 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 dealer.

57.5.5.6 Refrigerant and Oil

**IMPORTANT**

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

a. Ensure heater shut-off valve at engine is open. See 5.10.3 Heater Shut-off Valve.

b. Turn blower switch to first position, turn temperature control switch to maximum heating, and A/C control to “OFF”.

c. Start engine and operate at low idle until engine is warm.

d. Click A/C switch from "OFF" to "ON" for one second, then back to "OFF" for 5 to 10 seconds. Repeat this step ten times.
57.6 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.

57.6.1 General Engine Inspection

Have the overhead valve lash checked and adjusted every 5000 hours or 4 years by your Windrower dealer.

A general engine inspection, including the fuel injection pump and nozzle inspection, is recommended every 2000 hours. See your dealer.

57.6.2 Oil Level

Check engine oil level frequently and watch for any signs of leakage.

**NOTE**

_During the break-in period, a higher than usual oil consumption should be considered normal._

a. Stop the engine and remove the key. Wait about 5 minutes.

b. Open engine compartment hood to lowest position.

c. Remove dipstick by turning it counterclockwise to unlock and remove.

d. Wipe clean, reinsert in engine and remove.

e. Oil level should be between LOW and HIGH marks.

f. Replace dipstick.

g. Add oil as follows if level is below the LOW mark. One U.S. qt. (1 liter) will raise the level from LOW to HIGH:

**CAUTION**

_Do not fill above the HIGH mark._

1. Move platform to aft position.

2. Remove filler cap on top of engine.

3. Carefully pour the oil. Use SAE 15W40 Compliant With SAE Specs for API Class SJ and CH-4 Engine Oil. A funnel is recommended to avoid spillage.

4. Replace oil filler cap.

h. Close engine compartment hood.
57.6.3 Changing Oil and Oil Filter

NOTE
The engine should be warm prior to changing the oil.

a. Stop the engine and remove the key.
b. Place a drain pan of about 5 U.S. gallons (20 liters) under the engine oil drain.
c. Remove oil pan drain plug and allow the oil to completely finish draining.
d. Check the condition of the used oil. If either of the following is evident, have your dealer correct the problem before starting the engine:
   1. Thin black oil indicates fuel dilution.
   2. Milky discoloration indicates coolant dilution.
e. Open engine compartment hood to lowest position.
f. Clean around the filter head.
g. Remove filter.
h. Clean gasket mating surface.
i. Apply a thin film of clean oil to the gasket on the new filter.
j. Screw the new filter onto the filter mount until the gasket contacts the filter head.
k. Tighten the filter an additional ½ to ¾ turn by hand.

IMPORTANT
Do not use a filter wrench to install the oil filter. Over-tightening can damage the gasket and filter.
l. Install the oil pan drain plug.
m. Remove oil filler pipe cap and add engine oil. The engine requires 7.6 U.S. quarts (7 liters) of SAE 15W40 Compliant with SAE Specs for API Class SJ and CH-4 Engine Oil. Replace filler pipe cap.
n. Operate the engine at low idle and check for leaks at the filter and drain plug.
o. Stop the engine, wait 5 minutes and check the oil level. Add or remove oil to bring oil to HIGH level mark on dipstick.
p. Close engine compartment hood.
q. Properly dispose of used oil and filter.
57.6.4 Air Intake System

**IMPORTANT**
Do not run engine with air cleaner disconnected or disassembled.

Engine intake air (A) is drawn through a duct (B) from the cooling box that pre cleans the air, then through a dual element filter (C) to the turbocharger intake (D). The charged air then passes through a cooler and into the engine. The air cleaner canister is equipped with a vacuator valve (E) that removes dust continuously from the air cleaner housing.

57.6.4.1 Restriction Gauge

The air cleaner is also equipped with a mechanical sensor (F) which indicates red when the primary filter element requires servicing.

a. Check restriction gauge daily.
b. After servicing, re-set restriction gauge by pushing button (G) on top of gauge.

e. Pull out the primary filter element (J) and inspect as follows:

**NOTE**
Only service filter element when restriction gauge indicates red. Over servicing the filter element increases the risk of dirt being ingested by the engine, and severely damaging the engine.

57.6.4.2 Air Filter Servicing

**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.

a. Open engine compartment hood to highest position.
b. Slide yellow locking tab (H) to release canister end cap and rotate end cap counterclockwise until it stops.
c. Pull off end cap.
d. Check the vacuator valve (E) daily for obstructions or damage. Clean or replace if necessary.

(continued next page)
MAINTENANCE/SERVICE

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:

1. Hold a bright light inside element and check carefully for holes. Discard any element which shows the slightest hole.
2. Be sure outer screen is not dented. Vibration would quickly wear a hole in the filter.
3. Be sure filter gasket is in good condition. If gasket is damaged or missing, replace element.
4. If element is coated with oil or soot, replace the element.
5. Inspect the air intake piping for damage, cracked hoses, loose clamps, etc. Repair or replace damaged parts and tighten loose clamps.

IMPORTANT
Do not remove the secondary filter element (K) unless it needs replacing. Do not attempt to clean the secondary (inner) element.

f. Inspect the air intake piping for damage, cracked hoses, loose clamps, etc. Repair or replace damaged parts and tighten loose clamps.

IMPORTANT
The secondary (inner) element should be replaced every third time the primary element is changed.

h. Clean inside of canister and cover with a damp cloth.

IMPORTANT
Leave secondary element in place to prevent ingress of dirt into engine intake.

i. Pat sides of primary element gently to loosen dirt. Do not tap element against a hard surface.

j. Using a Dry Element Cleaner Gun, clean element with compressed air.

k. Hold nozzle next to inner surface, and move up and down pleats.

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.

l. Repeat steps h. and i. to remove additional dirt.
m. Repeat inspection before installing.
n. To remove the secondary element (K), pull it out of the canister.
o. Insert secondary filter element into canister, seal first, and push until seal is seated inside canister.

IMPORTANT
When replacing secondary filter, reinsert new filter as soon as possible to prevent dirt entering engine intake.

p. Insert primary filter element (J) into canister over secondary element and push into place, ensuring that element is firmly seated in canister.

g. Check the secondary element (K) for cleanliness. If there is visible dirt on the secondary element, replace both primary and secondary elements.

IMPORTANT
The air cleaner's primary (outer) filter element should be replaced after three cleanings or at the specified interval. Refer to Section 7.13 MAINTENANCE SCHEDULE.
q. Position end cap onto filter housing with vacuumator valve pointing approximately down.
r. Rotate end cap clockwise until it stops.
s. Slide yellow locking tab (H) to lock end cap in place.
t. Close engine compartment hood.

57.6.4.3 Charge Air Cooling

After the intake air passes through the air filter, it passes through the turbocharger which boosts the pressure. This process heats the air so it is passed through a cooler before entering the engine intake. The cooler is located in the cooling box behind the radiator and should be cleaned daily with compressed air. Refer to Section 7.9.2, Cooling Box Maintenance.
57.6.5 Fuel System

57.6.5.1 Fuel Tank Venting

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.

a. Open engine compartment hood to highest position.

b. Locate filter (A) on vent line against hydraulic oil reservoir.

c. Release hose tension clamps (B) and slide away from filter. Pull hoses off filter.

d. Position new filter through hole in frame and attach top hose onto filter. “IN” marking should face down.

e. Attach lower hose to filter and secure both hoses with tension clamps (B).

**NOTE**

If filter has an arrow instead of an IN marking, arrow should point up.
57.6.5.2 Fuel Filters

The M100 windrower fuel system is equipped with primary (C) and secondary (D) filters. Both filters are screw-on cartridge type but the primary (C) filter is equipped with a separator that separates sediment and water from the fuel. Change both filters as follows every 500 hours of operation:

a. Open engine compartment hood to highest position.

b. Close fuel supply valve (E) under fuel tank.

c. Change primary filter (C) as follows:

1. Clean around the filter head (F).
2. Disconnect Water in Fuel (WIF) sensor (G) from bottom of filter.
3. Remove filter (C) with a filter wrench.
4. Clean gasket mating surface.
5. Fill new filter with clean fuel and apply a thin film of clean oil to the gasket on the new filter.
6. Screw the new filter (C) onto the filter mount until the gasket contacts the filter head.
7. Reconnect WIF sensor (G).
8. Tighten the filter an additional ½ to ¾ turn by hand.

IMPORTANT
Do not use a filter wrench to install the filter. Over-tightening can damage the gasket and filter.

(continued next page)
d. Change secondary filter (D) as follows:

1. Clean around the filter head (H).
2. Remove filter (D) with a filter wrench.
3. Clean gasket mating surface.
4. Apply a thin film of clean oil to the gasket on the new filter.
5. Screw the new filter onto the filter mount until the gasket contacts the filter head.
6. Tighten the filter an additional ½ to ¾ turn by hand.

**IMPORTANT**
Do not use a filter wrench to install the filter. Over-tightening can damage the gasket and filter.

e. Open fuel valve (E) under fuel tank.
f. Use priming pump on primary filter to fill new filter.
g. Close engine compartment hood.
g. Remove plug (L) to ensure tank is completely drained after fuel has stopped flowing from hose.

h. Add some clean fuel to tank to flush out any remaining contaminants.

i. Replace drain plug and reattach hose (J) to fitting. Install clamp (K) and tighten.

j. Refill tank.

57.6.5.4 Separator

A fuel water separator is incorporated into the primary fuel filter. The separator is equipped with a sensor (G) that detects water in the fuel and alerts the operator on the CDM. Drain the water and sediment as follows from the separator daily or at any time the CDM Water in Fuel (WIF) light illuminates.

a. Stop engine and remove key.

b. Turn drain valve (M) by hand 1½ to 2 turns counterclockwise until draining occurs.

c. Drain the filter sump of water and sediment until clear fuel is visible.

d. Turn the valve clockwise to close the drain.
57.6.5.5 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.

⚠️ 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.

**IMPORTANT**

Bleeding the fuel system is not recommended nor required.

a. Manual priming may be required if:
   - The fuel filter is not filled prior to installation.
   - Injection pump is replaced.
   - High-pressure fuel lines are replaced.
   - Engine is run until fuel tank is empty.

b. Prime the fuel system as follows:
   1. Stop the engine and remove the key.
   2. Open engine compartment hood to lowest position.
   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.
57.6.6 Engine Cooling System

The engine cooling system is designed to maintain the engine operating temperature within the specified operating range.

**NOTE**
Anti-freeze is essential in any climate. It broadens the operating temperature range by lowering the coolant freezing point and by raising its boiling point. Anti-freeze also contains rust inhibitors and other additives to prolong engine life.

**IMPORTANT**
If anti-freeze 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.

To service the cooling system, perform the following:

**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.

a. Stop engine and remove key.
b. Move the maintenance platform to the open position for access to the coolant tank and radiator. Ensure the platform latch is engaged in open position.
c. Raise engine compartment hood to lowest position.

57.6.6.1 Coolant Level and Concentration

a. Check daily the coolant level in the coolant recovery tank (A). Tank should be at least half full.
b. If less, then remove cap (B) and add coolant. Use Ethylene Glycol with SCA and equal parts of high quality, soft, de-ionized, or distilled water as recommended by the supplier to protect the engine to temperatures of -30°F (-34°C).

**NOTE**
Do not add coolant to radiator except when changing coolant.

c. Replace cap (B).
57.6.6.2 Radiator Cap

**CAUTION**
To avoid personal injury from hot coolant, do not turn radiator cap until engine has cooled.

![Radiator Cap Image]

a. Remove the radiator cap (C) and check as follows:

1. The radiator cap must fit tightly.

   **NOTE**
   Cap gasket must be in good condition to maintain the 14-18 psi (97-124 kPa) pressure in the cooling system. To check the cap, proceed as follows:

2. Turn the cap counterclockwise to the first notch to relieve pressure before removing cap completely.
3. Turn the cap again and remove.
4. Check the gasket for cracks or deterioration and replace the cap if necessary.
5. Check that the spring in the cap moves freely.
6. Check the anti-freeze in the radiator with a tester annually, preferably before off-season storage. Tester should indicate protection to temperatures of -30°F (-34°C).

b. Replace the cap if spring is stuck.

c. Close engine compartment hood and move maintenance platform to working position.

57.6.6.3 Changing Coolant

Coolant should be drained, and the system flushed and filled with new coolant every 2000 hours or 2 years. Change coolant, and flush the system as follows:

**CAUTION**
To avoid personal injury from hot coolant, do not turn radiator cap until engine cools.

**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.

a. Stop engine and let it cool.
b. Move the maintenance platform toward the rear of the windrower. Ensure the lock is engaged.
c. Raise engine compartment hood to lowest position.

d. Turn the radiator cap (C) to the first notch to relieve pressure before removing cap completely.
e. Place a drain pan (about 8 U.S. gallons (30 liters)) under the engine and radiator.
f. Remove the radiator cap and open radiator drain valve (D) on the engine side of the radiator lower tank. Use a deflector or a hose to prevent coolant running onto frame.

(continued next page)
g. Loosen drain plug in engine block so that coolant drains.
h. When system is drained, replace drain plug in block and close radiator drain valve (D).
i. Fill system with clean water through the radiator and replace radiator cap.

j. Open heater shut-off valve (E).
k. Start engine and turn temperature control knob to high. Run engine until normal operating temperature is reached.
l. Stop engine and drain water out before rust or sediment settles. See steps d. to g.
m. Close drain valves and fill system with a solution of clean water and a heavy duty radiator cleaner. Follow instructions provided with cleaner.
n. After using cleaner solution, again flush system with clean water. Inspect radiator, hoses and fittings for leaks.
o. Close drain valves and fill system through radiator with an equal part mix of anti-freeze and clean, soft water. Use Ethylene Glycol with SCA and equal parts of high quality, soft, de-ionized, or distilled water as recommended by the supplier to protect the engine to temperatures of -30°F (-34°C). System capacity is 5.3 U.S. Gallons (20 liters).
p. Close radiator cap tightly.

q. Remove cap (B) from recovery tank (A) and add coolant until half full.
r. Move maintenance platform to working position and close engine compartment hood.
57.6.7 Exhaust System

CAUTION

To avoid burns, do not touch muffler when engine is running or before allowing sufficient cooling time after shut-down

The exhaust system requires no regular maintenance but it should be inspected periodically as follows:

a. Open engine compartment hood to highest position.

b. 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.

c. 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.

d. The exhaust system should be secured to eliminate vibration. The brackets (B) should fit securely to the muffler (C) and to the engine.

e. Do not change muffler type, piping sizes or exhaust configuration; these have all been selected for some very specific, technical reasons by the engineer. See your dealer for proper replacement parts.
57.6.8 Belts

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.

57.6.8.1 Fan Belt Tension
a. Shutdown engine and open engine compartment access hood to lowest position.

b. Loosen alternator mounting hardware (A).

c. Pry alternator away from engine so that a force of 22 lbf (100 N) deflects belt (B) 5/16 to 1/2 inch (8 to 12 mm) at mid-span between fan pulley and alternator.

CAUTION
Overtightening the belt will result in alternator damage.

d. Tighten alternator mounting hardware (A).

e. Recheck tension and re-adjust as required.

57.6.8.2 Fan Belt Replacement

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.

a. Shutdown the engine and open engine compartment access hood to highest position.

b. Loosen compressor mounting hardware (C) and push compressor towards engine to release belt (D) tension.

c. Remove belt (D).

d. Loosen alternator mounting hardware (A) and push alternator towards engine to release belt (B) tension.

e. Remove belt (B).

f. Install new belt (B) on pulleys.

g. Pry alternator away from engine so that a force of 22 lbf (100 N) deflects belt (B) 5/16 to 1/2 inch (8 to 12 mm) at mid-span between fan pulley and compressor.

h. Tighten alternator mounting hardware (A).

i. Recheck tension and re-adjust as required.

j. Install A/C compressor belt (D) on pulleys.

k. Pry compressor away from engine so that a force of 8 to 12 lbf (35-55 N) deflects the belt (D) 3/16 inch (5 mm) at mid-span.

l. Tighten compressor mounting hardware (C).
m. Recheck tension and re-adjust as required.

n. Close engine compartment hood.
57.6.8.3 A/C Compressor Belt Tension

a. Shutdown engine and open engine compartment access hood to lowest position.

b. Loosen compressor mounting hardware (A).

c. Pry compressor away from engine so that a force of 8 to 12 lbf (35-55 N) deflects the belt (B) 3/16 inch (5 mm) at mid-span.

d. Tighten compressor mounting hardware (A).

e. Recheck tension and re-adjust as required.

f. Close engine compartment hood.

57.6.8.4 A/C Compressor Belt Replacement

a. Shutdown the engine and open engine compartment access hood to lowest level.

b. Loosen compressor mounting hardware (A) and push compressor towards engine to release tension.

c. Remove belt (B).

d. Install new belt (B) on pulleys.

e. Pry compressor away from engine so that a force of 8 to 12 lbf (35-55 N) deflects the belt (B) 3/16 inch (5 mm) at mid-span.

f. Tighten compressor mounting hardware (A).

g. Recheck tension and re-adjust as required.

h. Re-adjust tension of a new belt after a short run-in period (about 5 hours).

57.6.9 Engine Speed

The maximum and idle engine speeds are determined by the ECM software, and factory set. See Section 4 Specifications. If specified speeds cannot be maintained, see your Windrower dealer.

57.6.9.1 Intermediate Engine Speeds

The engine operating speed can be programmed to enable the windrower to operate at reduced engine rpm without significantly affecting the ground or header speeds. Intermediate Speed Control (ISC) is useful in where operating loads are reduced such as in light crop conditions which do not require the maximum engine rpm. Reduced engine speed lowers fuel consumption, noise levels, and exhaust emissions in addition to reducing engine wear.

ISC Off (Normal) – 2600 rpm.

ISC On (Intermediate) – 2400 rpm.

Programming instructions are given in Section 5.18.5 Cab Display Monitor (CDM) Programming. The programmed engine speed is activated when the header is engaged.

57.6.9.2 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 possibly requires adjustment. See your Windrower dealer.
57.7 COOLING BOX

57.7.1 Cooling Box Screen Cleaners

The cooling box screen is equipped with an automatic cleaning device which "vacuums" the screen by means of two rotors. They only operate when the key is on. 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. Service rotors and screen as follows:

a. Stop engine and remove key.
b. Raise engine compartment hood fully.
c. If rotors (A) are plugged, clean as follows:
   1. Remove nut (B).
   2. Pivot rotor assembly (C) away from screen.
   3. Blow out debris from rotors (A) with compressed air.
   4. Push latch (D) and open screen assembly access door (E). Secure with rod (F) stored inside screen door.
   5. If duct (G) is plugged, blow out debris with compressed air.
   6. Clean screen with compressed air.
   7. Reposition rotor assembly (C) secure with bolt and nut (B).
   8. Check clearance between trailing edge of cleaner ducts (A). It should be .04-.32 inches (1-8 mm) at all locations when rotating.

**NOTE**

*Cleaner duct may touch screen as long as duct continues to rotate.*

(continued next page)
i. If necessary, adjust clearance as follows:

1. Loosen nut (B) on motor support (C).
2. Move support in or out until duct is 0.08-0.24 in. (2-6 mm) from screen near the center.
3. Re-tighten nut (B).
4. Loosen the two motor mount bolts (H).
5. Move motor/duct assembly (J) to obtain 0.04-0.32 in. (1-8 mm) gap to screen at full rotation of the duct.
6. Re-tighten nuts (H) on motor mount.

j. Close screen access door (E) and engage latch (D).

k. Lower engine compartment hood.
57.7.2 Cooling Box Maintenance

The radiator and oil cooler should be cleaned daily with compressed air and 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, refer to illustrations below and proceed 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.

a. Stop engine and remove key.
b. Raise engine compartment hood fully.
c. Push latch (A) and open screen assembly access door (B). Secure with rod (C) stored inside the screen door.
d. Rotate retainer (D), pull open condenser (E), and secure with support rod at (F).
e. Lift lever (G) and pull open access door (J).
f. Slide out the oil cooler assembly (K) with handle. If movement is restricted by hose (L), lift up on hose so that it moves away from frame.
g. Lift latch (M) and open access door (N) on the cooling box.

**IMPORTANT**

Fins on coolers can be very easily bent which may interfere with its function. Exercise caution when cleaning.

(continued next page)
h. Clean radiator (O), oil cooler (K), charge air cooler (P), air conditioning condenser (E) and cooling box (Q) with compressed air.

i. Slide oil cooler (K) back into cooling box.

j. Close side access door (J) and lock with lever (G).

k. Close side door (N) and secure with latch (M).

l. Remove support rod at (F), swing condenser (E) back into position and secure with retainer (D).

m. Unhook support rod (C) in screen door and store at base of cooling box.

n. Close door until latch engages pin (A).

o. Lower hood and hood latch will lock hood.
57.8 ELECTRICAL SYSTEM

Electrical schematics are attached at the back of this manual.

57.8.1 Battery

**WARNING**

- Gas given off by battery electrolyte is explosive. Keep all smoking materials, sparks and flames away from batteries.
- Follow proper charging and boosting procedures given in this section.
- Ventilate when charging in enclosed space.
- Always wear protective eye-wear 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.
- Keep batteries out of reach of children.
- 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 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.
- To avoid shocks, burns or damage to electrical system, disconnect battery ground cable before working in an area where you might accidentally contact electrical components.
- 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.

57.8.1.1 Maintenance

**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.

a. Check battery charge **once a year**, more often if operating in cold weather. Hydrometer readings should be 1.260 to 1.300. Readings below 1.250 indicate charging is required. See Section 7.10.1.2 Charging. Add electrolyte if necessary. See Section 7.10.1.4 Adding Electrolyte.

b. Keep battery clean by wiping it with a damp cloth.

c. 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.

d. 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.

e. Do not stack batteries on top of each other.
57.8.1.2 Charging

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. 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).
- Follow all instructions and precautions furnished by the battery charger manufacturer. Charge at recommended rates and times.

57.8.1.3 Boosting

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 a 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.

a. Open engine compartment hood.

b. Remove red rubber cover (if attached) from windrower battery positive terminal.

(continued next page)
57.8.1.4 Adding Electrolyte

**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.

**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.

a. If battery is installed in windrower, shutdown the engine and remove the key.
b. Open engine compartment hood to highest position.

c. Add electrolyte in accordance with the battery manufacturer’s instructions.
57.8.1.5 Replacing 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.

**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.

a. Stop engine and remove key.

b. Open engine compartment hood.

c. Switch the battery disconnect switch to OFF.

d. Remove red plastic cover (if attached) from positive cable clamp (A). Loosen the clamp and remove cable from battery.

e. Loosen clamp (B) on negative terminal and remove cable from battery.

f. Remove bolt (C) securing strap (D) to frame, and remove strap.

g. Lift battery off holder.

h. Position new battery on holder.

i. Install strap (D) with bolt (C).

**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.

j. Attach negative (black) cable clamp (B) to negative post on battery and tighten clamp.

k. Attach positive (red) cable clamp (A) to positive post on battery and tighten. Reposition plastic covers onto clamps.

l. Switch battery disconnect switch to ON.

m. Close hood.
57.8.1.6 Preventing Electrical System Damage

a. Carefully observe polarity when attaching booster battery.
b. Do not short across battery or alternator terminals, or allow battery positive (+) cable or alternator wire to become grounded.
c. Be sure alternator connections are correct before cables are connected to battery. Refer to illustration below.
d. When welding on any part of the machine, disconnect battery cables and alternator wire.
e. Always disconnect battery ground cable when working with the alternator or regulator.
f. Never attempt to polarize alternator or regulator.
g. If wires are disconnected from the alternator, use the illustration below to ensure proper reconnection.

h. Never ground the alternator field terminal or field circuit.
i. Never connect or disconnect alternator or regulator wires with battery connected or alternator operating.
j. Always disconnect cables from the battery when using a charger to charge battery in windrower.
k. Ensure all cables are securely connected before operating engine.
57.8.2 Headlights

57.8.2.1 Adjustment

Adjust for maximum illumination while ensuring oncoming traffic cannot be blinded by the lights. The recommended setting is:

- Light beams laterally centered on the "direction of travel" line from the headlights (i.e. not skewed left or right).
- Upper limit of the beam not higher than 105 inches (266 cm) above ground at a distance of 25 ft. (7.5 m) from the headlight.

a. Hold onto the hand-holds (A) on the cab front corners and stand on the header anti-slip strips.
b. Adjust the lights with screws (B).

57.8.2.2 Bulb Replacement

a. Remove the two screws (C) and remove light assembly.
b. Pull wiring harness connector off the headlight assembly and remove rubber insulator boot (D).
c. Pinch the wire retainer (E) and lift away from hooks.
d. Remove bulb (F) 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.

(continued next page)
57.8.3 **Flood Lights - Forward**

The forward floodlights are not adjustable. Replace bulbs as follows:

a. Shutdown engine and remove the key. Turn off the lights.

b. Hold onto the hand-holds (H) on the cab front corners and stand on the header anti-slip strips when removing the forward field lights.

c. Remove the two screws (J) and remove light bezel (K).

d. Remove light from receptacle.

e. Pinch the wire retainer (L) and lift away from hooks.

f. Remove bulb (M) from body and pull wire from connector (N).

(continued next page)
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.

57.8.4 Flood Lights - Rear

57.8.4.1 Adjustment

The rear floodlights are best adjusted with the machine in the field or the equivalent to suit operator preference.

a. Shutdown engine and remove the key. Turn on lights.

b. Loosen bolts (A) and (B).

c. Position light to desired position.

d. Tighten bolts (A) and (B).

57.8.4.2 Bulb Replacement

a. Shutdown engine and remove the key. Turn off the lights.

b. Remove the two screws (C) and remove light bezel (D).

c. Remove light from receptacle.

(continued next page)
d. Pinch the wire retainer (E) and lift away from hooks.

e. Remove bulb (F) from body and pull wire from connector (G).

**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.

f. Match slots on new bulb (F) with lugs (H) in optical unit and insert bulb into unit.

g. Secure bulb with wire retainer (E).

h. Push wire into connector (G).

i. Position light into light receptacle, ensuring top is up, and secure with bezel (D) and screws (C).

---

**57.8.5 Swath 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.

The swath lights are not adjustable. Replace bulbs as follows:

---

a. Remove the two screws (A) and remove light bezel (B).

b. Remove light from receptacle.

*(continued next page)*
c. Pinch the wire retainer (J) and lift away from hooks.
d. Remove bulb (K) from body and pull wire from connector (L).

**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.

e. Match slots on new bulb (K) with lugs (O) in optical unit and insert bulb into unit.
f. Secure bulb with wire retainer (J).
g. Push wire into connector (L).

**IMPORTANT**
For proper lighting pattern, be sure lights are installed right side up.

h. Position light into light receptacle, ensuring top is up, and secure with bezel (B) and screws (A).

57.8.5.1 Red Tail Lights
a. Shutdown engine and remove the key. Turn off the lights.

b. Remove two screws (C) from light (D) and remove light.
c. Remove connector from light.
d. Connect wiring harness to new light and install light with screws (C).
MAINTENANCE/SERVICE

57.8.5.2 Amber Lights
a. Shutdown engine and remove the key. Turn off the lights.

NOTE
Hold onto the hand-holds (A) on the cab front corners and stand on the header anti-slip strips or stand on the maintenance platform when accessing the amber lights.

b. Remove two screws (B) from lens and remove lens.
c. Push and twist light bulb to remove from socket.
d. Install new bulb ensuring that bulb base is properly engaged in socket. Use Bulb Trade #1156.
e. Reinstall lens with screws (B).

57.8.5.3 Dome Light
a. Shutdown engine.
b. Remove two screws (C) from plastic lens and remove lens.
c. Replace bulb.
d. Reinstall plastic lens with screws (C).

57.8.6 Ambient Light
a. Shutdown engine.
b. Push against tabs (D) with a screwdriver and pull ambient light fixture out of cab roof.
c. Remove connectors (E).
d. Connect wires to new light fixture.
e. Push into place in cab roof until tabs hold fixture in place.

57.8.7 Turn Signal Indicators
If the turn signal indicators on the CDM do not function, contact your Windrower dealer.


**57.8.8 Circuit Breakers and Fuses**

**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 and fuses are located inside the fuse box that is mounted on the frame on the right side of the windrower. The circuit breakers automatically reset and the fuses are the plastic blade type.

Access the breakers and fuses as follows:

a. Stop engine and remove key.

b. Remove wing nut (A) and remove fuse box cover (B).

c. Refer to decal on inside of cover for identification of fuses and circuit breakers. See illustration next page. SEE BG

**57.8.8.1 Checking/Replacing Fuses**

a. To check fuse, pull fuse (C) out of receptacle and visually examine.

b. To replace fuse, insert new fuse into receptacle.

**IMPORTANT**

Replacement fuses should match rating on decal shown on following page.

**57.8.8.2 Replacing Circuit Breakers**

a. To replace circuit breaker (D), pull breaker out of receptacle, and install new circuit breaker.

b. To replace relay (E), pull relay out of receptacle, and install new relay.

c. Reinstall cover and secure with wing nut.
57.8.8.3 Fuse Box Decal
57.8.8.4 Main Fuses - 125 Amp

The 125 amp main fuse holders are located inside the frame beside the battery and are accessed from underneath the windrower.

a. Stop engine and remove key.

b. To check condition of fuse, pull tab (A) and open cover (B).

c. Visually examine fuse (C) for indications of melting.

d. To remove fuse (C), remove two nuts (D) and pull fuse free from holder. Existing wiring may need to be pulled off the stud first.

e. Install new fuse on studs and any existing wiring that was removed.

f. Secure with nuts (D).

g. Close cover (B) and secure with tab (A).
57.9 HYDRAULIC SYSTEM

The M100 Windrower hydraulic system provides oil for the windrower drive system, and header lift and drive systems. Hydraulic schematics are placed at the back of this manual.

**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. 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.

**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.

**IMPORTANT**

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 Windrower Dealer for all other service.

57.9.1 Oil Level

Check hydraulic oil level when oil is cold for most accurate reading:

![DANGER](image)

**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**

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 (A), and not installed at hole location (B).

a. Park windrower on level ground and lower header and reel so that lift cylinders are fully retracted.

b. Stop engine and remove key.

c. Stand on platform to access the filler pipe.

d. Turn filler cap counterclockwise to loosen bung, and remove dipstick.

(continued next page)
e. Maintain level between LOW and FULL marks. If necessary, add SAE 15W40 Compliant with SAE Specs for API Class SJ and CH-4 Engine Oil.

**NOTE**

*LOW to FULL capacity is approximately 1 U.S. gallon (4 liters).*

f. Reinstall filler cap and turn clockwise to tighten bung.
57.9.2 Changing Hydraulic Oil

**NOTE**

Change hydraulic oil every 2000 hours.

a. Stop engine and remove key.
b. Open engine compartment hood to highest position.
c. Place a suitable container (at least 20 gal. US (75 liters)) under drain to collect oil.
d. Remove drain plug from bottom of hydraulic oil reservoir and allow oil to drain.
e. Clean off any metal debris that may have accumulated on magnetic drain plug. Replace and tighten drain plug.
f. Add oil to the tank to the required level through the filler pipe. Refer to previous section.

57.9.3 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 Section 7.9.2 Cooling Box Maintenance.

57.9.4 Hydraulic Oil Filters

**NOTE**

Change hydraulic oil filters after the first 50 hours of operation and every 500 hours thereafter. Filter (A) part #112420 and filter (B) part #151975 can be obtained from your dealer.

The hydraulic system contains two filters. Change hydraulic oil filters 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.

a. Stop engine and remove key.
b. Clean around heads of the filters (A) and (B).
c. Unscrew the filters with a filter wrench.
d. Clean the gasket surface of the filter heads.
e. Fill new filters with clean oil and apply a thin film of clean oil to the filter gaskets.
f. Screw the new filters onto the mount until the gasket contacts the filter head.
g. Tighten filters an additional ½ turn by hand.

**IMPORTANT**

Do not use a filter wrench to install oil filter. Over-tightening can damage gasket and filter.
57.9.5 Header and Reel Hydraulics

57.9.5.1 Pressure Compensator Valve

The pressure compensator valve is pre-set to be sufficient for all header sizes and options. See table below.

When the knife drive pressure approaches the compensator valve setting, a warning tone sounds on the CDM, indicating a potential overload on the header drive. If operation continues, and the pressure reaches the setting, the compensator valve is activated. The header drive will begin to slow down. To avoid overheating the drive pumps, reduce the ground speed to maintain the correct system load and knife drive operation.

NOTE
The warning tone is normal when the operating pressure is very close to the compensator valve pressure setting.

If lift and reel or draper drive capacity problems develop, the pressure compensator valve may require adjusting. Contact your Windrower Dealer or refer to the Technical Service Manual for your Windrower.

<table>
<thead>
<tr>
<th>HEADER MODEL</th>
<th>APPLICATION/SYSTEM</th>
<th>SUGGESTED OVERLOAD WARNING SETTING psi (kPa)</th>
<th>WINDROWER PRESSURE COMP SETTING psi (kPa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D60 &amp; A40D</td>
<td>Reel/Draper Pressure</td>
<td>3000 (20684)</td>
<td>3200 (22063)</td>
</tr>
<tr>
<td>D60 &amp; A40D</td>
<td>Knife/Conditioner Pressure</td>
<td>4000 (27579)</td>
<td>4200 (28958)</td>
</tr>
</tbody>
</table>

57.9.5.2 Reel/Conveyor Flow Control Block

Two hydraulic valve blocks control the reel and conveyor functions, and are controlled by the Windrower Control Module (WCM) according to the inputs from the operator. The valve blocks are located behind the maintenance 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 Windrower Dealer or refer to the Technical Service Manual for your Windrower.

57.9.5.3 Knife Drive Valve Block

The ON/OFF valve on the valve block regulates the knife speed, and is mounted on top of the
knife drive pump. The flow to the knife drive is mechanically set on the pump itself.
57.9.5.4 Header Drop Rate

The header should lower gradually when the lower header switch is pressed. From full height to ground should take approximately 3.5 seconds.

Adjust 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.

a. Lower header to ground, stop engine, and remove key.

b. Move maintenance platform rearward.

c. Loosen jam-nut (A) on needle valve and turn screw (B) clockwise to decrease the drop rate and counter-clockwise to increase the drop rate.

d. Tighten jam-nut (A).

e. Close platform and engine compartment hood.

f. Check drop rate and re-adjust as required.
57.9.6 Traction Drive Hydraulics

57.9.6.1 Transmission Oil Pressure

The windrower transmission consists of two variable displacement axial piston hydraulic pumps, one for each drive wheel. The pumps are direct driven through a coupling to 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 150 psi (1035 kPa), the CDM sounds a tone and displays a flashing warning. Refer to Section 5.17.4 Warnings and Alarms.

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, shutdown the engine and proceed as follows:

a. Check the hydraulic fluid level in the tank. Refer to Section 7.11.1 Oil Level.

b. Check the hoses and lines for leakage.

c. Check the charge pressure relief valve. Refer to following section.

d. If charge pressure still cannot be maintained, do not operate the windrower. Contact your windrower dealer.

57.9.6.2 Charge Pump Pressure

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 and adjust charge pump pressure 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.

a. Open engine compartment hood fully.

b. Remove cap (A) at fitting.

c. 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. Attach hose to the fitting.

d. Start engine and leave at idle. Pressure should be 200 to 250 psi (1379 to 1724 kPa) with the hydraulic oil at 100°F. (40°C) minimum.

e. If pressure is not within this range, adjust relief pressure as follows:
   1. Shut off engine and remove key.
   2. Remove cap (C) from relief valve (B) for access to adjustment screw.

(continued next page)
3. Hold screw (D) with Allen wrench (E) and loosen jam-nut (F).

4. Adjust screw as required.
5. Repeat checking and adjustment until relief pressure is correct, then tighten jam-nut (E) while holding screw (D). Replace cap (C).

f. If relief pressure does not increase after adjusting two or three times, check relief valve as follows:

1. Remove relief valve (B) from manifold.
2. Check that no contaminant is preventing the spring-loaded poppet from properly seating against the valve body.
3. Clean as required with a solvent type cleaner and compressed air, and reinstall valve.
4. Check all seals for integrity.
5. Reset adjustment screw to original position before checking relief pressure.

To install:
g. Remove pressure gauge hose and reinstall cap (A) to fitting.

---

**57.9.7 Hoses and Lines**

Check hydraulic hoses and lines daily for signs of leaks.

**WARNING**

Avoid high-pressure fluids. Escaping fluid can penetrate the skin causing serious injury. Relieve 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.
57.10 WHEELS AND TIRES

57.10.1 Drive Wheels

57.10.1.1 Tire Inflation

a. Visually check daily that tires have not lost pressure. Under-inflation of drive tires can cause side wall cracks.

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.

b. Measure tire pressure annually with a gauge. Maintain the pressure as follows:
   Bar – 32 psi (221 kPa)
   Turf – 20 psi (138 kPa)

DANGER

- 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.
- 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.
- Do not exceed manufacturer’s recommended inflation pressure.

57.10.1.2 Wheel Nut Torque

At first use, or when a wheel is removed, check drive wheel nut 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.

- Use a safety cage if available.
- Do not stand over tire. Use a clip-on chuck and extension hose.

a. Tighten nuts (C) to 220 ft·lbf (300 N·m) using the tightening sequence as shown.

NOTE

To avoid damage to wheel disks, do not over-tighten wheel nuts.

b. Repeat sequence three times.
57.10.1.3 Lubricant

The drive wheel gearbox lubricant should be changed after the first 50 hours. Check the level every 200 hours or annually and change every 1000 hours. The windrower should be on level ground when checking lubricant level.

a. Check the lubricant as follows:
   1. Rotate wheel so that plug (A) is located at the top as shown.
   2. Remove plug (B). The lubricant should be visible through the hole or slightly running out.

   **NOTE**
   Type of lubricant used after first lubricant change is different from factory supplied lubricant.

b. If lubricant needs to be added, remove plug (A), and add lubricant until lubricant runs out at (B). Prior to first change, use SAE 85W-140, API Service, Class GL-5, Extreme Pressure Gear Lubricant. After first change, use SAE 75W-90, API Service, Class GL-5, Fully Synthetic Transmission Lubricant (SAE J2360 preferred).

c. Replace plugs and tighten.

---

d. Change the lubricant as follows:

1. Rotate the wheel so that plug (A) is located at the bottom.
2. Place a large enough container (about 2 quarts U.S. (2 liters) under the drain plug (A).
3. Remove plugs (A) and (B) and drain lubricant. Ideally, the lubricant should be at operating temperature for good draining.
4. When lubricant has drained, rotate wheel so that plug (A) is at the top.

   **NOTE**
   Type of lubricant used after first lubricant change is different from factory supplied lubricant.

5. Add lubricant through (A) until lubricant runs out of hole at (B). Use SAE 75W-90, API Service, Class GL-5, Fully Synthetic Transmission Lubricant (SAE J2360 preferred). Drive wheel gearbox capacity is 1.5 qts. U.S. (1.4 liters).
6. Replace both plugs and tighten.
57.10.1.4 Drive Wheel Removal/Installation

**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.

- Remove header.
- Park windrower on level ground and block all wheels.
- Place GSL in N-DETENT, shutdown engine and remove key.
- Position a 5000 lb (2270 kg) jack under leg jack point and raise windrower wheel slightly off ground.
- Undo wheel nuts (C) and remove wheel.
- To install new tire, ensure that air valves are on outside and tire tread point forward. For "Turf" tires (diamond tread), be sure arrow on sidewall points in forward rotation.
- Position wheel on hub and install wheel nuts (C).
- Tighten nuts (C) to 220 ft·lbf (300 N·m) using the tightening sequence as shown.

**NOTE**

To avoid damage to wheel disks, do not over-tighten wheel nuts.

- Repeat sequence three times.
- Lower windrower and remove jack.
57.10.2  Caster Wheels

57.10.2.1 Tire Inflation

a. Visually check daily that tires have not lost pressure. Under-inflation of drive tires can cause side wall cracks.

⚠️ **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.

b. Measure tire pressure annually with a gauge. Maintain the pressure at 10 psi (69 kPa).

**NOTE**

If caster wheels shimmy a possible cause is over-inflation:

⚠️ **DANGER**

- 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.
- 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.

- Use a safety cage if available.
- Do not stand over tire. Use a clip-on chuck and extension hose.
57.10.2.2 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 machine varies with different attachments, windrower options, terrain and 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 and always add an equal amount of fluid on both sides.

<table>
<thead>
<tr>
<th>TIRE SIZE</th>
<th>FLUID PER TIRE AT 75% FILL</th>
<th>TOTAL WEIGHT OF BOTH TIRES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>U.S. Gal. (Liters)</td>
<td>lb (kg) *</td>
</tr>
<tr>
<td>7.5X16</td>
<td>10 (38)</td>
<td>200 (91)</td>
</tr>
<tr>
<td>10X16</td>
<td>18 (69)</td>
<td>380 (170)</td>
</tr>
<tr>
<td>16.5X16.1</td>
<td>41 (158)</td>
<td>830 (377)</td>
</tr>
</tbody>
</table>

* Weights are given for typical calcium chloride and water mixtures. Weight is reduced by 20% if only water is used (for areas that do not require anti-freeze protection).

---

<table>
<thead>
<tr>
<th>HEADER DESCRIPTION</th>
<th>RECOMMENDED BALLAST</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LEVEL GROUND</td>
</tr>
<tr>
<td>TYPE</td>
<td>SIZE</td>
</tr>
<tr>
<td></td>
<td>U.S. Gal.</td>
</tr>
<tr>
<td></td>
<td>(Liters)</td>
</tr>
<tr>
<td>A &amp; D Series All Options</td>
<td>25’ and Down</td>
</tr>
<tr>
<td>D Series</td>
<td>30’ Single Or Split Reel W/O Conditioner.</td>
</tr>
<tr>
<td></td>
<td>35’ Single Reel</td>
</tr>
<tr>
<td></td>
<td>30’ Split Reel. Steel Fingers &amp; Conditioner.</td>
</tr>
</tbody>
</table>

* If only water is used, increase volume of water by 20% (up to maximum allowable fill per tire) to compensate.
57.10.2.3 Wheel Nut Torque

At first use, or when a wheel is removed, check caster wheel bolt torque as follows after 5 hours and then at 200 hour intervals:

**Forked Casters**

![Image of forked caster torque sequence]

1. Tighten nuts (A) to 120 ft·lbf (163 N·m) using the tightening sequence as shown.

**NOTE**
*To avoid damage to wheel disks, do not over-tighten wheel nuts.*

2. Repeat sequence three times.

**Formed Casters**

![Image of formed caster torque sequence]

1. Tighten bolts (B) to 120 ft·lbf (163 N·m) using the tightening sequence as shown.

**NOTE**
*To avoid damage to wheel disks, do not over-tighten wheel bolts.*

2. Repeat sequence three times.

57.10.2.4 Forked Caster Wheel Removal/Installation

**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.

a. Remove the caster wheel as follows:

1. Park windrower on level ground and block all wheels.
2. Place GSL in N-DETENT, shutdown engine and remove key.
3. Raise end of walking beam using a 2000 lb (908 kg) capacity jack or other suitable lifting device until the wheel is slightly off the ground.
4. Remove the eight bolts (C) attaching axle to forked caster and remove wheel assembly from caster.
5. Undo the eight wheel nuts (D) and remove wheel from axle.

b. Install the caster wheel as follows:

1. Position wheel on axle and install wheel nuts (D).
2. Torque nuts (D) as specified in previous section.
3. Position wheel assembly in forked caster and install with bolts (C). Torque bolts to 75-79 ft·lbf (97-107 N·m).
4. Lower windrower and remove jack.
**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.

a. Remove the caster wheel as follows:
   1. Park windrower on level ground and block all wheels.
   2. Place GSL in N-DETENT, shutdown engine and remove key.
   3. Raise end of walking beam using a 2000 lb (908 kg) capacity jack or other suitable lifting device until the wheel is slightly off the ground.
   4. Undo the six wheel bolts (E) and remove wheel from hub.

b. Install the caster wheel as follows:
   1. Position wheel on hub and install wheel bolts (E).
   2. Torque bolts (E) to 120 ft·lbf (163 N·m) using the tightening sequence as shown on previous page.
   3. Lower windrower and remove jack.

---

57.10.2.6 Caster Wheels Anti-Shimmy Dampeners - Optional

Each caster is equipped with a fluid filled anti-shimmy dampener (F). The mounting bolts (G) need to be checked periodically for security. Refer to Section 7.13, Maintenance Schedule. Inboard bolt should be tightened to 100 ft·lbf (135 N·m). Outboard bolt should be tightened to 85 ft·lbf (115 N·m).
57.11 MAINTENANCE SCHEDULE

The maintenance schedule (see next page) 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 Sections 7.6 to 7.12. Use the fluids and lubricants specified in Section 7.3.1, Recommended Fuel, Fluids and Lubricants.

Service Intervals: The recommended service intervals are in hours of operation. Where a service interval is given in more than one time frame, e.g. "100 hours or Annually", service the machine at whichever interval is reached first.

57.11.1 Break-In Inspection

<table>
<thead>
<tr>
<th>HRS</th>
<th>ITEM</th>
<th>CHECK</th>
<th>REF.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Every .25 Road or 1 in Field</td>
<td>Drive Wheel Nuts</td>
<td>Torque – 220 ft·lbf (300 N·m)</td>
<td>7.12.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Repeat Checks Until Torque Stabilizes.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>A/C Belt</td>
<td>Tension</td>
<td>7.8.8.3</td>
</tr>
<tr>
<td></td>
<td>Caster Wheel Nuts</td>
<td>Torque – 120 ft·lbf (163 N·m)</td>
<td>7.12.2</td>
</tr>
<tr>
<td></td>
<td>Caster Wheel Anti-Shimmy Dampener Bolts (Optional)</td>
<td>Inboard Bolt Torque – 100 ft·lbf (135 N·m)</td>
<td>7.12.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Outboard Bolt Torque – 85 ft·lbf (115 N·m)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Walking Beam Width Adjustment Bolts (Optional)</td>
<td>Torque – 330 ft·lbf (448 N·m)</td>
<td>6.3.7</td>
</tr>
<tr>
<td>10</td>
<td>Walking Beam Width Adjustment Bolts (Optional)</td>
<td>Torque – 330 ft·lbf (448 N·m)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Drive Wheel Nuts</td>
<td>Torque – 220 ft·lbf (300 N·m)</td>
<td>7.12.1</td>
</tr>
<tr>
<td></td>
<td>Neutral</td>
<td>Dealer Adjust</td>
<td>-</td>
</tr>
</tbody>
</table>
| 50        | Hose Clamps – Air Intake/Radiator/Heater/Exhaust/Hydraulic | Hand Tighten Unless Otherwise Noted. | 7.8.4,  
|           |                                           |                                    | 7.8.6,    |
|           |                                           |                                    | 7.8.7 &    |
|           |                                           |                                    | 7.3        |
|           | Walking Beam Width Adjustment Bolts (Optional) | Torque – 330 ft·lbf (448 N·m) | 6.3.7     |
|           | Caster Wheel Anti-Shimmy Dampener Bolts (Optional) | Inboard Bolt Torque – 100 ft·lbf (135 N·m) | 7.12.2 |
|           |                                           | Outboard Bolt Torque – 85 ft·lbf (115 N·m) |           |
|           | Drive Wheel Nuts                          | Torque 220 ft·lbf (300 N·m)        | 7.12.1     |
|           | Drive Wheel Lubricant                     | Change                             | 7.12.1.3   |
|           | Hydraulic Oil Filters                     | Change                             | 7.11.4     |
## 57.11.2 Interval Maintenance

<table>
<thead>
<tr>
<th>INTERVAL</th>
<th>SERVICE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FIRST USE</strong></td>
<td>Refer To Break-In Inspection On Previous Page.</td>
</tr>
<tr>
<td></td>
<td>2. Check Battery Fluid Level.</td>
</tr>
<tr>
<td></td>
<td>3. Check Battery Charge.</td>
</tr>
<tr>
<td></td>
<td>4. Check Anti-Freeze Concentration.</td>
</tr>
<tr>
<td></td>
<td>5. Cycle A/C Blower Switch To Distribute Refrigerant Oil.</td>
</tr>
<tr>
<td></td>
<td>6. Check Safety Systems (or 500 hours whichever occurs first).</td>
</tr>
<tr>
<td><strong>END OF SEASON</strong></td>
<td>Refer To Section 6.3.9 Storage.</td>
</tr>
<tr>
<td><strong>10 HOURS OR DAILY</strong></td>
<td>1. Check Tire Inflation.</td>
</tr>
<tr>
<td></td>
<td>2. Check Engine Oil Level.</td>
</tr>
<tr>
<td></td>
<td>3. Check Engine Coolant Level At Reserve Tank.</td>
</tr>
<tr>
<td></td>
<td>4. Clean Radiator, Hydraulic Oil Cooler, Charge Air Cooler, And A/C Condenser.</td>
</tr>
<tr>
<td></td>
<td>5. Check Hydraulic Oil Level.</td>
</tr>
<tr>
<td></td>
<td>7. Fill Fuel Tank.</td>
</tr>
<tr>
<td></td>
<td>8. Check Hydraulic Hoses And Lines For Leaks.</td>
</tr>
<tr>
<td><strong>50 HOURS</strong></td>
<td>1. Grease Caster Pivots.</td>
</tr>
<tr>
<td></td>
<td>2. Grease Walking Beam Center Pivot.</td>
</tr>
<tr>
<td></td>
<td>4. Grease Forked Caster Spindle Bearings.</td>
</tr>
<tr>
<td></td>
<td>5. Clean Cab Fresh Air Intake Filter.</td>
</tr>
<tr>
<td>**100 HOURS OR ANNUALLY ***</td>
<td>1. Clean Cab Air Return Filter.</td>
</tr>
<tr>
<td>**200 HOURS OR ANNUALLY ***</td>
<td>1. Check Drive Wheel Lubricant Level.</td>
</tr>
<tr>
<td></td>
<td>2. Grease Formed Caster Wheel Hub Bearings.</td>
</tr>
<tr>
<td></td>
<td>3. Check Wheel Nut Torque.</td>
</tr>
<tr>
<td><strong>250 HOURS OR 3 MONTHS</strong></td>
<td>1. Change Engine Oil And Filter.</td>
</tr>
<tr>
<td></td>
<td>2. Change Engine Air Cleaner Primary Filter Element (CDM displays ENGINE AIR FILTER).</td>
</tr>
<tr>
<td><strong>500 HOURS</strong></td>
<td>1. Change Fuel Filters.</td>
</tr>
<tr>
<td></td>
<td>2. Change Hydraulic Oil Filters.</td>
</tr>
<tr>
<td></td>
<td>3. Check Engine Valve Tappet Clearance.</td>
</tr>
<tr>
<td><strong>1000 HOURS</strong></td>
<td>1. Change Drive Wheel Lubricant.</td>
</tr>
<tr>
<td></td>
<td>2. Check Engine Valve Tappet Clearance.</td>
</tr>
<tr>
<td><strong>2000 HOURS</strong></td>
<td>1. Change Hydraulic Oil.</td>
</tr>
<tr>
<td></td>
<td>2. Perform General Engine Inspection.</td>
</tr>
</tbody>
</table>

* IT IS RECOMMENDED THAT ANNUAL MAINTENANCE BE DONE PRIOR TO START OF OPERATING SEASON.
# MAINTENANCE/SERVICE

WINDROWER Serial No.________________

Combine this record with the record in the Header Operator’s Manual.
Refer to Section 7, Maintenance/Service for details on each maintenance procedure.
Copy this page to continue record.

<table>
<thead>
<tr>
<th>ACTION:</th>
<th>- Check</th>
<th>- Lubricate</th>
<th>- Change</th>
<th>- Clean</th>
<th>- Add</th>
</tr>
</thead>
</table>

### MAINTENANCE RECORD

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hour Meter Reading</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serviced By</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### FIRST USE

Refer to Section 7.13.1 Break-In Inspection

**10 HOURS OR DAILY**

- A/C Condenser
- Charge Air Cooler
- Engine Oil Level
- Engine Coolant Level
- Fuel Tank
- Fuel Filter Water Trap
- Hydraulic Hoses And Lines
- Hydraulic Oil Cooler
- Hydraulic Oil Level
- Radiator
- Tire Inflation

**ANNUALLY**

- A/C Blower
- Anti-Freeze Concentration
- Battery Charge
- Battery Fluid Level
- Fuel Tank Vent Line Filter
- Safety Systems (or 500 hours)

**50 HOURS**

- Cab Fresh Air Intake Filter
- Caster Pivots
- Forked Caster Spindle Bearings
- Top Lift Link Pivots
- Walking Beam Center Pivot

**100 HOURS OR ANNUALLY**

- Cab Air Return Filter

**200 HOURS OR ANNUALLY**

- Formed Caster Wheel Hub Bearings
- Drive Wheel Lubricant
- Wheel Nut Torque

Note: A record of daily maintenance is not normally required but is at the owner/operator’s discretion.

Continued Next Page
## MAINTENANCE/SERVICE

### MAINTENANCE RECORD

<table>
<thead>
<tr>
<th>ACTION:</th>
<th>✔ - Check</th>
<th>✰ - Lubricate</th>
<th>▲ - Change</th>
<th>✴ - Clean</th>
<th>+ - Add</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hour Meter Reading</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serviced By</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### 250 HOURS OR 3 MONTHS

- ▲ Engine Oil And Filter
- ▲ Engine Air Cleaner Primary Filter Element

#### 500 HOURS

- ▲ Fuel Filters
- ✔ Engine Valve Tappet Clearance (1st)
- ▲ Crankcase Breather
- ▲ Hydraulic Oil Filters

#### 1000 HOURS

- ▲ Drive Wheel Lubricant
- ✔ Engine Valve Tappet Clearance

#### 2000 HOURS

- ▲ Engine Coolant
- ✔ General Inspection
- ▲ Hydraulic Oil
## TROUBLESHOOTING

### 58 TROUBLESHOOTING

#### 58.1 ENGINE

<table>
<thead>
<tr>
<th>SYMPTOM</th>
<th>PROBLEM</th>
<th>SOLUTION</th>
<th>SECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine Hard To Start Or Will Not Start.</td>
<td>Controls not in neutral. Neutral interlock misadjusted. No fuel to engine. Old fuel in tank. Water, dirt or air in fuel system. Improper type of fuel. Crankcase oil too heavy. Low battery output. Poor battery connection. Faulty starter. Wiring shorted, circuit breaker open. Loose connection at fuel pump. ECM fuse (1 of 2) blown. ECM Ignition relay faulty. Neutral Logic relay faulty. Faulty injectors.</td>
<td>Move GSL to neutral. Move steering wheel to locked position. Disengage header clutch. Contact MacDon dealer. Fill empty fuel tank, replace clogged filter. Drain tank, refill with fresh fuel. Drain, flush, fill and prime system. Use proper fuel for operating conditions. Use recommended oil. Have battery tested. Check battery electrolyte level. Clean and tighten loose connections. Contact MacDon dealer. Check continuity of wiring and breaker (manual reset). Ensure connector at pump is fully pushed in. Replace.</td>
<td>6.3.5.1 5.16.1 7.8.5.2 7.8.5.3 7.3.1 7.10.1.4 7.10.1.4 6.3.5.1 7.8.5.2 7.8.5.3 7.8.5.3 7.3.1 7.10.8.1 7.10.8.2</td>
</tr>
<tr>
<td>Engine Knocks.</td>
<td>Insufficient oil. Engine out of time. Low or high coolant temperature. Improper fuel.</td>
<td>Add oil. Contact MacDon dealer. Remove and check thermostat. Use proper fuel.</td>
<td>7.8.2 7.8.5.2 7.3.1</td>
</tr>
<tr>
<td>Low Oil Pressure.</td>
<td>Low oil level. Improper type of oil. Worn components.</td>
<td>Add oil. Drain, fill crankcase with proper oil. Contact MacDon dealer.</td>
<td>7.8.2 7.8.3 7.10.8.1</td>
</tr>
<tr>
<td>High Oil Consumption.</td>
<td>Crankcase oil too light. Oil leaks. Internal parts worn.</td>
<td>Use recommended oil. Check for leaks around gaskets, seals, and drain plugs. Contact MacDon dealer.</td>
<td>7.3.1 7.8.3 7.10.8.1</td>
</tr>
<tr>
<td>Engine Runs Irregularly Or Stalls Frequently.</td>
<td>Unsteady fuel supply. Water or dirt in fuel system. Air in fuel system. Low coolant temperature. Dirty or faulty injectors.</td>
<td>Change filter on fuel tank vent line. Replace clogged fuel filter. Drain, flush, and fill system. Contact MacDon dealer. Remove and check thermostat. Contact MacDon dealer.</td>
<td>7.8.5.1 7.8.5.2 7.8.5.3 7.10.8.1</td>
</tr>
</tbody>
</table>

* See your MacDon dealer
** Refer to Windrower Technical Manual

(continued next page)
## TROUBLESHOOTING

<table>
<thead>
<tr>
<th>SYMPTOM</th>
<th>PROBLEM</th>
<th>SOLUTION</th>
<th>SECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack Of Power.</td>
<td>Incorrect timing.</td>
<td>Contact MacDon dealer.</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Engine oil viscosity too high.</td>
<td>Use recommended oil.</td>
<td>7.3.3</td>
</tr>
<tr>
<td></td>
<td>Intake air restriction.</td>
<td>Service air cleaner.</td>
<td>7.8.4.1</td>
</tr>
<tr>
<td></td>
<td>Clogged fuel filter.</td>
<td>Replace primary fuel filter and if necessary, replace secondary fuel filter.</td>
<td>7.8.5.2</td>
</tr>
<tr>
<td></td>
<td>High back pressure.</td>
<td>Clean out muffler.</td>
<td>7.8.7</td>
</tr>
<tr>
<td></td>
<td>Improper type of fuel.</td>
<td>Use proper fuel.</td>
<td>7.3.1</td>
</tr>
<tr>
<td></td>
<td>High or low engine temperature.</td>
<td>Remove and check thermostat. **</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Improper valve clearance.</td>
<td>See &quot;Engine Overheats&quot;.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Faulty injectors.</td>
<td>Contact MacDon dealer.</td>
<td>*</td>
</tr>
<tr>
<td>Engine Temperature Below Normal.</td>
<td>Defective thermostat.</td>
<td>Remove and check thermostat. **</td>
<td></td>
</tr>
<tr>
<td>Warning Alarm Sounds.</td>
<td>Engine overheated.</td>
<td>Check coolant level.</td>
<td>7.8.6.1</td>
</tr>
<tr>
<td></td>
<td>Low engine oil pressure.</td>
<td>Check thermostat.</td>
<td>**</td>
</tr>
<tr>
<td></td>
<td>Low transmission oil pressure.</td>
<td>Check oil level.</td>
<td>7.8.2</td>
</tr>
<tr>
<td>Engine Overheats.</td>
<td>Low coolant level.</td>
<td>Fill reserve tank to proper level.</td>
<td>7.8.6.1</td>
</tr>
<tr>
<td></td>
<td>Engine overloaded.</td>
<td>Check system for leaks.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Defective radiator cap.</td>
<td>Reduce ground speed.</td>
<td>6.3.6.2</td>
</tr>
<tr>
<td></td>
<td>Defective fan belt.</td>
<td>Replace cap.</td>
<td>7.8.6.2</td>
</tr>
<tr>
<td></td>
<td>Dirty radiator screen:</td>
<td>Replace belt.</td>
<td>7.8.8.3</td>
</tr>
<tr>
<td></td>
<td>• Rotors turning</td>
<td>Check for obstructions in ducting from screen to fan shroud.</td>
<td>7.10.1</td>
</tr>
<tr>
<td></td>
<td>• Rotors not turning</td>
<td>Check connections to rotor electric motor.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dirty radiator core.</td>
<td>Clean radiator.</td>
<td>7.10.2</td>
</tr>
<tr>
<td></td>
<td>Cooling system dirty.</td>
<td>Flush cooling system.</td>
<td>7.8.6.3</td>
</tr>
<tr>
<td></td>
<td>Defective thermostat.</td>
<td>Remove and check thermostat. **</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Defective temperature gauge or sender.</td>
<td>Check coolant temperature with thermometer, replace if necessary.</td>
<td>7.8.6.2</td>
</tr>
<tr>
<td></td>
<td>Defective water pump.</td>
<td>Contact MacDon dealer.</td>
<td>*</td>
</tr>
<tr>
<td>Engine RPM Cannot Exceed 2400.</td>
<td>ISC engaged.</td>
<td>Disengage ISC</td>
<td>5.18.5</td>
</tr>
<tr>
<td>High Fuel Consumption.</td>
<td>Improper type of fuel.</td>
<td>Use proper fuel.</td>
<td>7.3.1</td>
</tr>
<tr>
<td></td>
<td>Clogged or dirty air cleaner.</td>
<td>Service air cleaner.</td>
<td>7.8.4.1</td>
</tr>
<tr>
<td></td>
<td>Engine overloaded.</td>
<td>Reduce ground speed.</td>
<td>6.3.6.2</td>
</tr>
<tr>
<td></td>
<td>Improper valve clearance.</td>
<td>Reset valves.</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Engine out of time.</td>
<td>Contact MacDon dealer.</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Low engine temperature.</td>
<td>Check thermostat.</td>
<td>**</td>
</tr>
<tr>
<td></td>
<td>Injection nozzles dirty.</td>
<td>Contact MacDon dealer.</td>
<td>*</td>
</tr>
</tbody>
</table>

* See your MacDon dealer
** Refer to Windrower Technical Manual

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## Troubleshooting

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Engine Emits Black Or Grey Exhaust.</strong></td>
<td>Improper type of fuel.</td>
<td>Consult your fuel supplier and use proper type fuel for conditions.</td>
<td>7.3.1</td>
</tr>
<tr>
<td></td>
<td>Engine overloaded.</td>
<td>Reduce ground speed.</td>
<td>6.3.6.2</td>
</tr>
<tr>
<td></td>
<td>Clogged or dirty air cleaner.</td>
<td>Service air cleaner.</td>
<td>7.8.4.1</td>
</tr>
<tr>
<td></td>
<td>Defective muffler.</td>
<td>Check muffler for possible damage which might create back pressure.</td>
<td>7.8.7</td>
</tr>
<tr>
<td></td>
<td>Dirty or faulty injectors.</td>
<td>Contact MacDon dealer.</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Engine out of time.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Air in fuel system.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Engine Emits White Exhaust.</strong></td>
<td>Improper type of fuel.</td>
<td>Consult your fuel supplier and use proper type fuel for conditions.</td>
<td>7.3.1</td>
</tr>
<tr>
<td></td>
<td>Cool engine.</td>
<td>Warm engine up to normal operating temperature.</td>
<td>6.3.5.2</td>
</tr>
<tr>
<td></td>
<td>Defective thermostat.</td>
<td>Remove and check thermostat.</td>
<td>**</td>
</tr>
<tr>
<td></td>
<td>Engine out of time.</td>
<td>Contact MacDon dealer.</td>
<td>*</td>
</tr>
<tr>
<td><strong>Starter Cranks Slowly Or Will Not Operate.</strong></td>
<td>Low battery output.</td>
<td>Check battery charge.</td>
<td>7.10.1.1</td>
</tr>
<tr>
<td></td>
<td>Controls not in neutral.</td>
<td>Move GSL to neutral.</td>
<td>6.3.6</td>
</tr>
<tr>
<td></td>
<td>Move steering wheel to center position.</td>
<td>Disengage header clutch.</td>
<td>6.3.5.1</td>
</tr>
<tr>
<td></td>
<td>Relay not functioning.</td>
<td>Check relay and wire connections.</td>
<td>7.10.8.1</td>
</tr>
<tr>
<td></td>
<td>Loose or corroded battery connections.</td>
<td>Clean and tighten loose connections.</td>
<td>7.10.1.4</td>
</tr>
<tr>
<td></td>
<td>Key switch worn or terminals loose.</td>
<td>Contact MacDon dealer.</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Crankcase oil too high viscosity.</td>
<td>Use recommended oil.</td>
<td>7.3.3</td>
</tr>
<tr>
<td></td>
<td>Main fuse defective/blown.</td>
<td>Replace main fuse.</td>
<td>7.10.8</td>
</tr>
<tr>
<td></td>
<td>Key power fuse blown.</td>
<td>Replace.</td>
<td>7.10.8</td>
</tr>
<tr>
<td></td>
<td>Switch at interlock not closed or defective.</td>
<td>Adjust switch or replace.</td>
<td>*</td>
</tr>
<tr>
<td><strong>Air Filters Require Frequent Cleaning.</strong></td>
<td>Vacuator plugged.</td>
<td>Clean out vacuator.</td>
<td>7.8.4.1</td>
</tr>
<tr>
<td></td>
<td>Pre-cleaner rotor not turning freely.</td>
<td>Repair/replace.</td>
<td>7.10.1</td>
</tr>
</tbody>
</table>

### 58.2 Electrical

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Problem</th>
<th>Solution</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low Voltage And/Or Battery Will Not Charge.</strong></td>
<td>Defective battery.</td>
<td>Have battery tested.</td>
<td>7.10.1.4</td>
</tr>
<tr>
<td></td>
<td>Defective alternator belt.</td>
<td>Replace worn belt.</td>
<td>7.8.8.2</td>
</tr>
<tr>
<td></td>
<td>Loose or corroded connections.</td>
<td>Clean and tighten battery connections.</td>
<td>7.10.1.4</td>
</tr>
<tr>
<td></td>
<td>Dirty or defective alternator, defective voltage regulator, or high resistance in circuit.</td>
<td>Contact MacDon dealer.</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Alternator or voltage regulator not connected properly.</td>
<td>Connect properly.</td>
<td>7.10.1.6</td>
</tr>
</tbody>
</table>

* See your MacDon dealer

** Refer to Windrower Technical Manual
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<table>
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<tr>
<th>Symptom</th>
<th>Problem</th>
<th>Solution</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lights Dim.</strong></td>
<td>High resistance in circuit or poor ground on lights.</td>
<td>Check the wiring circuit for a break in a wire or a poor ground.</td>
<td>***</td>
</tr>
<tr>
<td></td>
<td>Defective light switch.</td>
<td>Contact MacDon dealer.</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>** Refer to Windrower Technical Manual**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>** Refer to Windrower Technical Manual**</td>
<td>** Refer to Windrower Technical Manual**</td>
<td></td>
</tr>
<tr>
<td><strong>Lights Do Not Light.</strong></td>
<td>Burnt out light bulb.</td>
<td>Replace light bulb.</td>
<td>7.10.2 to 7.10.9</td>
</tr>
<tr>
<td></td>
<td>Defective light switch.</td>
<td>Contact MacDon dealer.</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Broken wiring.</td>
<td>Check wiring for broken wire or shorts.</td>
<td>***</td>
</tr>
<tr>
<td></td>
<td>Open or defective circuit breaker.</td>
<td>Check circuit breaker.</td>
<td>7.10.8.1</td>
</tr>
<tr>
<td></td>
<td>Defective relay.</td>
<td>Replace relay.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Poor ground on lights.</td>
<td>Clean and tighten ground wires.</td>
<td>***</td>
</tr>
<tr>
<td><strong>Turn Signals Or Indicators Showing Wrong Direction.</strong></td>
<td>Reversed wires.</td>
<td>Contact MacDon dealer.</td>
<td>*</td>
</tr>
<tr>
<td><strong>No Current To Cab.</strong></td>
<td>Circuit breaker tripped.</td>
<td>Breaker automatically resets.</td>
<td>***</td>
</tr>
<tr>
<td></td>
<td>Broken or disconnected wire.</td>
<td>Contact MacDon dealer.</td>
<td>*</td>
</tr>
<tr>
<td><strong>58.3 Hydraulics</strong></td>
<td></td>
<td>** Refer to Windrower Technical Manual**</td>
<td></td>
</tr>
<tr>
<td><strong>Header Or Reel Not Lifting.</strong></td>
<td>Contaminant in relief valve.</td>
<td>Clean relief valve at cylinder control valve.</td>
<td>**</td>
</tr>
<tr>
<td></td>
<td>Appropriate solenoids not being energized by activating switch.</td>
<td>Contact MacDon dealer.</td>
<td>*</td>
</tr>
<tr>
<td><strong>Header Or Reel Lifts But Lacks Power.</strong></td>
<td>Relief pressure too low or contaminant in relief valve.</td>
<td>Check/adjust/clean relief valve at cylinder control valve.</td>
<td>**</td>
</tr>
<tr>
<td><strong>Reel And/Or Conveyor Not Turning.</strong></td>
<td>Header drive switch not engaged.</td>
<td>Engage switch.</td>
<td>5.16.1</td>
</tr>
<tr>
<td></td>
<td>Flow controls adjusted too low.</td>
<td>Toggle speed controls on CDM to increase flow.</td>
<td>6.5.3, 6.5.4, 6.6.4</td>
</tr>
<tr>
<td></td>
<td>Appropriate solenoid on flow control block not being energized.</td>
<td>Contact MacDon dealer.</td>
<td>*</td>
</tr>
<tr>
<td><strong>Reel And/Or Conveyor Turns But Lacks Power.</strong></td>
<td>Relief pressure too low.</td>
<td>Check/adjust/clean compensator pump.</td>
<td>**</td>
</tr>
<tr>
<td><strong>58.4 Header Drive</strong></td>
<td></td>
<td>** Refer to Windrower Technical Manual**</td>
<td></td>
</tr>
<tr>
<td><strong>Sickle Drive Not Engaging.</strong></td>
<td>Header drive switch in cab not engaged.</td>
<td>Engage switch.</td>
<td>5.16.1</td>
</tr>
<tr>
<td></td>
<td>Appropriate solenoid not being energized by activating switch.</td>
<td>Contact MacDon dealer.</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Operator presence switch not closed or faulty.</td>
<td>Occupy operator’s seat or replace switch.</td>
<td>*</td>
</tr>
<tr>
<td><strong>Sickle Drive Lacks Power</strong></td>
<td>Header drive overload.</td>
<td>Reduce ground speed.</td>
<td>6.3.6.2</td>
</tr>
<tr>
<td></td>
<td>Pressure too low or contaminant in pump compensator valve.</td>
<td>Check/adjust/clean compensator valve on knife drive pump.</td>
<td>*</td>
</tr>
<tr>
<td><strong>Warning Alarm Sounds</strong></td>
<td>Header drive overload.</td>
<td>Reduce ground speed.</td>
<td>6.3.6.2</td>
</tr>
<tr>
<td></td>
<td>Compensator valve setting too low.</td>
<td>Adjust compensator valve on knife drive pump.</td>
<td>*</td>
</tr>
</tbody>
</table>

* See your MacDon dealer

** Refer to Windrower Technical Manual
## 58.5 TRACTION DRIVE

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<th>SYMPTOM</th>
<th>PROBLEM</th>
<th>SOLUTION</th>
<th>SECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warning Alarm Sounds And Transmission Oil Light Is On.</td>
<td>Low hydraulic oil level.</td>
<td>Stop engine and add oil to hydraulic system.</td>
<td>7.12.1</td>
</tr>
<tr>
<td></td>
<td>Low hydraulic pressure.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Foreign material shorting sender.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Short in alarm wiring.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Faulty sender.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>** Refer to Windrower Technical Manual</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheels Lack Pulling Ability On A Grade Or Pulling Out Of A Ditch.</td>
<td>Insufficient torque at drive wheels.</td>
<td>Move speed-range control to field position and reduce ground speed.</td>
<td>6.3.6</td>
</tr>
<tr>
<td></td>
<td>Loose or worn controls.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Air in system.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brakes binding or not releasing fully.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Internal pump or motor damage.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Relief valve in tandem pump dirty or damaged.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Both Wheels Will Not Pull In Forward Or Reverse.</td>
<td>Low oil level.</td>
<td>Check oil reservoir level.</td>
<td>7.11.1</td>
</tr>
<tr>
<td></td>
<td>Power hubs disengaged.</td>
<td>Engage power hubs.</td>
<td>6.3.8.4</td>
</tr>
<tr>
<td></td>
<td>Damaged hydraulic lines preventing proper oil flow.</td>
<td>Replace damaged lines.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Steering controls worn or defective.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Speed-range control not working.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pump arms have broken shaft or loose hardware.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brakes binding or not releasing fully.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Charge pressure relief valve misadjusted or damaged.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Failed pump or motor.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>One Wheel Does Not Pull In Forward Or Reverse.</td>
<td>One final drive disengaged.</td>
<td>Engage final drive.</td>
<td>6.3.8.3</td>
</tr>
<tr>
<td></td>
<td>Pump arm or shaft are broken.</td>
<td>Contact MacDon dealer.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Steering controls worn or defective.</td>
<td>Check GSL and steering for loose, worn or damaged ball joints and connecting rods.</td>
<td>7.7.3 &amp; 7.7.4</td>
</tr>
<tr>
<td></td>
<td>Damaged hydraulic lines preventing proper oil flow.</td>
<td>Contact MacDon dealer.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brakes binding or not releasing fully.</td>
<td>Repair or tighten.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Speed-range control not working.</td>
<td>Check pressure (min. 200 psi (1379 kPa)) on brake release valve.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check the valve adjustment.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check valve parts and seat.</td>
<td>7.11.6.2</td>
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* See your MacDon dealer
** Refer to Windrower Technical Manual
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<th>SOLUTION</th>
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</thead>
<tbody>
<tr>
<td>One Wheel Does Not Pull In Forward Or Reverse (Continued).</td>
<td>High pressure relief valve stuck open, damaged seat.</td>
<td>Check valve and clean or replace.</td>
<td>**</td>
</tr>
<tr>
<td></td>
<td>Failed pump, motor or power hub.</td>
<td>Contact MacDon dealer.</td>
<td>*</td>
</tr>
<tr>
<td>With Steering Wheel Centered, One Wheel Pulls More Than The Other.</td>
<td>Leakage at pump or motor.</td>
<td>Contact MacDon dealer.</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Wheels not in same speed range.</td>
<td>Repair or replace valve.</td>
<td>7.11.6.2</td>
</tr>
<tr>
<td></td>
<td>Faulty relief valve.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excessive Noise From Drive System.</td>
<td>Hydraulic line clamps loose.</td>
<td>Tighten clamps.</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>Mechanical interference in steering or ground speed linkage.</td>
<td>Adjust, repair, replace.</td>
<td>7.7.3 &amp;</td>
</tr>
<tr>
<td></td>
<td>Brakes binding or not releasing fully.</td>
<td></td>
<td>7.7.4</td>
</tr>
<tr>
<td></td>
<td>Faulty pump or motor.</td>
<td>Check pressure (min. 200 psi on brake release valve.</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Air in system.</td>
<td>Contact MacDon dealer.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Check lines for leakage.</td>
<td>---</td>
</tr>
<tr>
<td>Hydraulic Oil Filter Leaks At Seal.</td>
<td>Not properly tightened.</td>
<td>Tighten filter element.</td>
<td>7.11.4</td>
</tr>
<tr>
<td></td>
<td>Damaged seal or threads.</td>
<td>Replace filter or filter head.</td>
<td>7.11.4</td>
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### 58.6 STEERING AND GROUND SPEED CONTROL

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<th>SOLUTION</th>
<th>SECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine Will Not Steer Straight.</td>
<td>Linkage worn or loose.</td>
<td>Adjust steering chain tension.</td>
<td>7.7.4.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Replace worn parts, adjust linkage.</td>
<td>7.7.4.1</td>
</tr>
<tr>
<td>Machine Moves On Flat Ground With Controls In Neutral.</td>
<td>Neutral interlock misadjusted.</td>
<td>Contact MacDon dealer.</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Parking brake not functioning.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insufficient Road Speed.</td>
<td>Speed-range control in field position.</td>
<td>Move to road position.</td>
<td>6.3.8.1</td>
</tr>
<tr>
<td>Steering Wheel Will Not Lock With GSL In N-DETENT.</td>
<td>Transmission interlock misadjusted.</td>
<td>Contact MacDon dealer.</td>
<td>*</td>
</tr>
</tbody>
</table>

* See your MacDon dealer
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#### 58.7 CAB AIR

<table>
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<tr>
<th>SYMPTOM</th>
<th>PROBLEM</th>
<th>SOLUTION</th>
<th>SECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Blower Fan Will Not Run.</strong></td>
<td>Burned out motor. Burned out switch. Motor shaft tight or bearings worn. Faulty wiring - loose or broken. Blower rotors in contact with housing.</td>
<td>Contact MacDon dealer.</td>
<td>*</td>
</tr>
<tr>
<td><strong>Blower Fan Operating But No Air Coming Into Cab.</strong></td>
<td>Dirty fresh air filter. Dirty recirculating air. Evaporator clogged. Air flow passage blocked.</td>
<td>Clean filter. Clean filter. Clean evaporator. Remove blockage.</td>
<td>7.7.5.1 &amp; 7.7.5.2</td>
</tr>
<tr>
<td><strong>Heater Not Heating.</strong></td>
<td>Heater shut-off valve at engine closed. Defective thermostat in engine water outlet manifold. Heater temperature control defective. No thermostat in engine water outlet manifold.</td>
<td>Open valve. Replace thermostat. Replace control. Install thermostat.</td>
<td>5.10.1.1</td>
</tr>
<tr>
<td><strong>Odour From Air Louvers.</strong></td>
<td>Plugged drainage hose. Dirty filters.</td>
<td>Blow out hose with compressed air. Clean filters.</td>
<td>--- 7.7.5.1 &amp; 7.7.5.2</td>
</tr>
<tr>
<td><strong>Air Conditioning Not Cooling.</strong></td>
<td>Low refrigerant level. Switch contacts in thermostat burned excessively, or sensing element defective. Clutch coil burned out or disconnected. Condenser fins plugged. Blower motor disconnected or burned out. Loose or broken drive belt. Compressor partially or completely seized. Dirty filters. Broken or disconnected electrical wire. Broken or disconnected ground wire. Expansion valve stuck in open or closed position. Broken refrigerant line. Leak in system.</td>
<td>Add refrigerant Replace thermostat. Contact MacDon dealer. Clean condenser. Contact MacDon dealer. Replace drive belt and/ or tighten to specs. Remove compressor for service or replacement. Clean fresh air and re-circulation filters. Check all terminals for loose connections; check wiring for hidden breaks. Check ground wire to see if loose, broken, or disconnected. Contact MacDon dealer.</td>
<td>* ** 7.8.8.4 7.7.5.1 &amp; 7.7.5.2 ---</td>
</tr>
</tbody>
</table>

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<td>Air Conditioning Not Cooling. (Continued)</td>
<td>Compressor shaft seal leaking.</td>
<td>Contact MacDon dealer.</td>
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<td>Clogged screen in receiver-drier; plugged hose or coil.</td>
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<td>Compressor clutch slipping.</td>
<td>Remove clutch assembly for service or replacement.</td>
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<td>Clogged air filters.</td>
<td>Remove air filters and clean or replace as necessary.</td>
<td>7.7.5.2 &amp; 7.7.5.1</td>
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<td></td>
<td>Heater circuit is open.</td>
<td>Close heater valves (1 in cab, 1 at engine).</td>
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<td>Too little air circulation over condenser coil; fins clogged with dirt</td>
<td>Clean condenser.</td>
<td>7.9.7.3</td>
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<td></td>
<td>or insects.</td>
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<td>Evaporator fins clogged.</td>
<td>Clean evaporator fins (under cab floor).</td>
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<td>Too little refrigerant in system.</td>
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<td>Clogged expansion valve.</td>
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<td></td>
<td>Clogged receiver-drier.</td>
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<td>Excessive moisture in system.</td>
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<td>Air in system.</td>
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<td>Thermostat defective or improperly adjusted.</td>
<td>Replace thermostat.</td>
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<td>Blower motor sluggish in operation.</td>
<td>Contact MacDon dealer.</td>
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<td>Air Conditioning System Too Noisy.</td>
<td>Defective winding or improper connection in compressor clutch coil or</td>
<td>Contact MacDon dealer.</td>
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<td>Loose or excessively worn drive belt.</td>
<td>Tighten or replace as required.</td>
<td>7.8.8.4</td>
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<td></td>
<td>Noisy clutch.</td>
<td>Remove clutch for service or replacement as required.</td>
<td>**</td>
</tr>
<tr>
<td></td>
<td>Noisy compressor.</td>
<td>Check mountings and repair.</td>
<td>**</td>
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<td></td>
<td>Compressor oil level low.</td>
<td>Remove compressor for service or replacement.</td>
<td>**</td>
</tr>
<tr>
<td></td>
<td>Blower fan noisy due to excessive wear.</td>
<td>Add SP-15 PAG refrigerant oil.</td>
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<tr>
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<td>Excessive charge in system.</td>
<td>Remove blower motor for service or replacement as necessary.</td>
<td>**</td>
</tr>
<tr>
<td></td>
<td>Low charge in system.</td>
<td>Contact MacDon dealer.</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>Excessive moisture in system.</td>
<td>Contact MacDon dealer.</td>
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* See your MacDon dealer
** Refer to Windrower Technical Manual
## TROUBLESHOOTING

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<td><strong>Air Conditioning Cools Intermittently.</strong></td>
<td>Compressor clutch slipping. Unit icing up due to:</td>
<td>Contact MacDon dealer.</td>
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<td>- Thermostat adjusted too low.</td>
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<td></td>
<td>- Excessive moisture in system.</td>
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<td></td>
<td>- Incorrect super-heat adjustment in expansion valve.</td>
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<td></td>
<td>Thermostat defective.</td>
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<td></td>
<td>Defective blower switch or blower motor.</td>
<td></td>
<td></td>
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<td></td>
<td>Partially open, improper ground or loose connection in compressor clutch coil.</td>
<td></td>
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<tr>
<td><strong>Windows Fog Up.</strong></td>
<td>High humidity.</td>
<td>Run A/C to dehumidify air and heater to control temperature.</td>
<td>5.10.1.1</td>
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### 58.8 OPERATOR’S STATION

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<td><strong>Rough Ride.</strong></td>
<td>Seat suspension not adjusted for operator's weight.</td>
<td>Adjust seat suspension.</td>
<td>5.3</td>
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<td></td>
<td>High air pressure in tires.</td>
<td>Deflate to proper pressure.</td>
<td>7.12.1 &amp; 7.12.2</td>
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59 OPTIONS

59.1 REEL DRIVE & LIFT PLUMBING
Reel drive and lift plumbing for draper headers on windrowers that are shipped from the factory in auger header configuration. Installation instructions are included.

59.2 WINDROWER HYDRAULIC COMPLETION FOR DRAPER HEADER REEL FORE/AFT
Allows reel fore/aft hydraulic adjustment for draper headers on windrowers that are shipped from the factory in auger header configuration. Kit includes valve for selection of reel fore/aft or double windrow attachment functions. Installation instructions are included.

59.3 BOOSTER SPRING KIT
Available for headers over 6000 lb (2724 kg). Installation instructions are included.

59.4 INTERNAL BOOSTER SPRING KIT
Internal spring for right side lift linkage to improve float capacity. Standard equipment on left side. Installation instructions are included.

59.5 LIGHT HEADER FLOTATION KIT
Available for headers that do not require as much spring tension for float. Installation instructions are included.

59.6 AM-FM RADIO
Available for installation into pre-wired cab. Speakers are factory installed. Refer to M100 Self-Propelled Windrower Unloading and Assembly Instructions supplied with your windrower for installation details.

59.7 HYDRAULIC CENTER LINK
The hydraulic center link allows the operator to adjust the header angle from the cab. Installation instructions are included.

59.8 FAN AIR BAFFLE KIT
Provides a baffle to reduce windrow disturbance by air exiting the engine cooling fan.

59.9 TRAINING SEAT
A wall mounted fold-up training seat complete with seat belt is available to assist in training a new operator. Installation instructions are included.

59.10 KNIFE SPEED, REEL SPEED INDEX, AND TILT SENSOR MODULE
To allow the electronic monitoring of header knife speed, reel speed and header angle. Also enables the indexing of reel speed to ground speed. Installation instructions are included.

59.11 ANTI-SHIMMY KIT FOR CASTERS
Prevents caster wheel shimmy when traveling at road speed.

59.12 SWATH ROLLER
If a swath roller is desired for canola or other similar crops, an axle mounted design is recommended. Windrower can be fitted with hydraulic lift version of swath rollers featuring in console controls.

59.13 WARNING BEACONS
Two roof mounted rotating warning beacons are available for installation into pre-wired cab. The beacons are standard equipment for export windrowers and optional for North America. Installation instructions are included.

59.14 AUTO-STEER
A MacDon approved auto-steer system is available for your windrower. Contact your dealer for further information. Cabs have been prepared with “access routing knock outs” to enable easy wiring harness installation and display mounting. The GSL has been pre-wired with an auto-steer engage switch.

59.15 ENGINE BLOCK HEATER
Contact your nearest Cummins Engine Distributor and provide your engine model and serial numbers to ensure the proper heater is supplied.

(continued next page)
OPTIONS

59.16 TRANSPORT DRAWBAR
Allows an M100 Windrower to tow MacDon headers equipped with a Slow Speed Transport system. Includes drawbar, related parts, and installation instructions.
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### CDM/WCM FAULT CODES

#### CDM / WCM FAULT CODES

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Description</th>
<th>Operations/Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1</td>
<td>RTCH NOT ALLOWED</td>
<td>Return To Cut activated with the header off.</td>
</tr>
<tr>
<td>E2</td>
<td>TEMP GAUGE SHORT</td>
<td>Wiring / connection problem.</td>
</tr>
<tr>
<td>E3</td>
<td>SPEED STICK SHORT</td>
<td>Wiring / connection problem.</td>
</tr>
<tr>
<td>E4</td>
<td>HEADER ENABLE SHORT</td>
<td>Wiring / connection problem.</td>
</tr>
<tr>
<td>E5</td>
<td>CDM INTERNAL ERROR</td>
<td>Internal hardware or software problem.</td>
</tr>
<tr>
<td>E6</td>
<td>CDM POWER UP</td>
<td>CDM Module did not power up correctly.</td>
</tr>
<tr>
<td>E7</td>
<td>FUEL SOLENOID</td>
<td>WCM Fuel solenoid output fault detected.</td>
</tr>
<tr>
<td>E8</td>
<td>KINFE DRIVE PWM V8+</td>
<td>Knife drive - PWM solenoid drive fault detected.</td>
</tr>
<tr>
<td>E9</td>
<td>DRAPER DRV PWM V9A</td>
<td>Draper Drive - PWM solenoid drive fault detected.</td>
</tr>
<tr>
<td>E10</td>
<td>REEL DRIVE PWM V9B</td>
<td>Reel Drive - PWM solenoid drive fault detected.</td>
</tr>
<tr>
<td>E11</td>
<td>TILT RETRACT V2B</td>
<td>Tilt retract solenoid V2B fault detected.</td>
</tr>
<tr>
<td>E12</td>
<td>TILT EXTEND V2A</td>
<td>Tilt extend solenoid V2A fault detected.</td>
</tr>
<tr>
<td>E13</td>
<td>4 WAY VALVE V6</td>
<td>4 Way valve V6 fault detected.</td>
</tr>
<tr>
<td>E14</td>
<td>BYPASS VALVE V1</td>
<td>Bypass valve V1 fault detected.</td>
</tr>
<tr>
<td>E15</td>
<td>SCREEN CLEANERS</td>
<td>Screen cleaner output fault detected (shorted or open).</td>
</tr>
<tr>
<td>E16</td>
<td>RIGHT STOP LAMP</td>
<td>Right stop lamp output fault detected (shorted or open).</td>
</tr>
<tr>
<td>E17</td>
<td>LEFT STOP LAMP</td>
<td>Left stop lamp output fault detected (shorted or open).</td>
</tr>
<tr>
<td>E18</td>
<td>RIGHT TURN LAMP</td>
<td>Right turn lamp output fault detected (shorted or open).</td>
</tr>
<tr>
<td>E19</td>
<td>LEFT TURN LAMP</td>
<td>Left turn lamp output fault detected (shorted or open).</td>
</tr>
<tr>
<td>E20</td>
<td>MAIN DRIVE V10</td>
<td>Main header drive solenoid V10 fault detected.</td>
</tr>
<tr>
<td>E21</td>
<td>HIGH RANGE V5A</td>
<td>High range solenoid V5A fault detected.</td>
</tr>
<tr>
<td>E22</td>
<td>REEL AFT V2B</td>
<td>Reel aft solenoid V2B fault detected.</td>
</tr>
<tr>
<td>E23</td>
<td>REEL FORE V4D</td>
<td>Reel fore solenoid V4D fault detected.</td>
</tr>
<tr>
<td>E24</td>
<td>REEL UP/DOWN V4B</td>
<td>Reel up / down solenoid V4B fault detected.</td>
</tr>
<tr>
<td>E25</td>
<td>SENSOR VOLTS HIGH</td>
<td>Sensor voltage output high.</td>
</tr>
<tr>
<td>E26</td>
<td>SENSOR VOLTS LOW</td>
<td>Sensor voltage output low.</td>
</tr>
<tr>
<td>E27</td>
<td>BATT+ OUT OF RANGE</td>
<td>System voltage above 16.5 VDC.</td>
</tr>
</tbody>
</table>

#### Error codes E52 to E63 not allocated

#### Error codes E73 to E100 not allocated

<table>
<thead>
<tr>
<th>Error Code</th>
<th>Description</th>
<th>Operations/Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>E101</td>
<td>SPI ERROR</td>
<td>J1939 Can error</td>
</tr>
<tr>
<td>E102</td>
<td>CAN ERROR</td>
<td>J1939 Can error</td>
</tr>
<tr>
<td>E103</td>
<td>EEPROM READ ERROR</td>
<td>Internal error</td>
</tr>
<tr>
<td>E104</td>
<td>EEPROM WRITE ERROR</td>
<td>Internal error</td>
</tr>
<tr>
<td>E105</td>
<td>TEMP SENSOR ERROR</td>
<td>Internal temperature sensor error.</td>
</tr>
</tbody>
</table>

#### MISC INFORMATION / ERROR CODES

<table>
<thead>
<tr>
<th>Description</th>
<th>Operations/Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGINE OIL PRESSURE</td>
<td>Engine oil pressure warning.</td>
</tr>
<tr>
<td>ENGINE TEMPERATURE</td>
<td>Engine coolant temperature warning.</td>
</tr>
<tr>
<td>CANBUS ERROR</td>
<td>Operator not detected in seat (~3 second delay before message)</td>
</tr>
<tr>
<td>NO OPERATOR</td>
<td>No header detected - not hooked up or wiring error.</td>
</tr>
<tr>
<td>NO HEADER</td>
<td>Header engage switch on when ignition turned on.</td>
</tr>
<tr>
<td>DISENGAGE HEADER</td>
<td>Engine code configuration (Canbus)</td>
</tr>
<tr>
<td>S F C</td>
<td>GSL or Pintal switches not closed with the key on / engine off.</td>
</tr>
<tr>
<td>CENTER STEERING NOT IN PARK</td>
<td>GSL or Pintal switches not closed with the key on / engine off.</td>
</tr>
</tbody>
</table>
### ENGINE ERROR CODES

**Example:** CDM displays the Error Code **110S 16F 28C**

**STEP 1.** **110S** – S is SPN column, then locate code 110 in that column.

**STEP 2.** **16F** – F is the FMI column, then locate code 16 in that column.

**STEP 3.** **28C** – C is occurrences, 28 is the quantity.

**STEP 4.** **DESCRIPTION** - Coolant Temperature High - Data Valid but above Normal Operational Range - Moderately Severe Level Engine Coolant Temp.

**STEP 5.** Refer to **LAMP COLOR** and specific **CUMMINS ENGINE CODES** as required.

<table>
<thead>
<tr>
<th>J1939 SPN Description</th>
<th>J1939 SPN</th>
<th>J1939 FMI</th>
<th>Lamp Color</th>
<th>Cummins Engine Code</th>
<th>Cat Engine Code</th>
<th>Cummins / Caterpillar Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crankcase Pressure</td>
<td>22</td>
<td>3</td>
<td>Amber</td>
<td>719</td>
<td></td>
<td>Extended Crankcase Blow-by Pressure Circuit - Voltage Above Normal, or Shorted to High Source</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>Amber</td>
<td>729</td>
<td></td>
<td>Extended Crankcase Blow-by Pressure Circuit - Voltage Below Normal, or Shorted to Low Source</td>
</tr>
<tr>
<td>Coolant Temperature</td>
<td>32</td>
<td>3</td>
<td>Amber</td>
<td>2111</td>
<td></td>
<td>Coolant Temperature 2 Sensor Circuit - Voltage Above Normal, or Shorted to High Source</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>Red</td>
<td>2114</td>
<td></td>
<td>Coolant Temperature 2 - Data Valid but Above Normal Operational Range - Most Severe Level</td>
</tr>
<tr>
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<td></td>
<td>4</td>
<td>Amber</td>
<td>2112</td>
<td></td>
<td>Coolant Temperature 2 Sensor Circuit - Voltage Below Normal, or Shorted to Low Source</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16</td>
<td>Amber</td>
<td>2113</td>
<td></td>
<td>Coolant Temperature 2 - Data Valid but Above Normal Operational Range - Moderately Severe Level</td>
</tr>
<tr>
<td>Accelerator Pedal Position</td>
<td>91</td>
<td>0</td>
<td>Red</td>
<td>148</td>
<td></td>
<td>Accelerator Pedal or Lever Position Sensor Circuit – Abnormal Frequency, Pulse Width, or Period</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>Red</td>
<td>147</td>
<td></td>
<td>Accelerator Pedal or Lever Position Sensor Circuit – Abnormal Frequency, Pulse Width, or Period</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>Red</td>
<td>1242</td>
<td>91</td>
<td>Accelerator Pedal or Lever Position Sensor 1 and 2 - Data Erratic, Intermittent, or Incorrect</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>Red</td>
<td>131</td>
<td>91</td>
<td>Accelerator Pedal or Lever Position Sensor Circuit - Voltage Above Normal, or Shorted to High Source</td>
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<tr>
<td></td>
<td></td>
<td>4</td>
<td>Red</td>
<td>132</td>
<td>91</td>
<td>Accelerator Pedal or Lever Position Sensor Circuit - Voltage Below Normal, or Shorted to Low Source</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8</td>
<td>154</td>
<td>91</td>
<td></td>
<td>Abnormal frequency, pulse width, or period</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12</td>
<td>154</td>
<td>91</td>
<td></td>
<td>Bad Device or component</td>
</tr>
<tr>
<td>Fuel Delivery Pressure</td>
<td>94</td>
<td>1</td>
<td>Amber</td>
<td>2216</td>
<td></td>
<td>Fuel Pump Delivery Pressure - Data Valid but Above Normal Operational Range – Moderately Severe Level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>Amber</td>
<td>268</td>
<td></td>
<td>Fuel Pressure Sensor Circuit - Data Erratic, Intermittent, or Incorrect</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>Amber</td>
<td>546</td>
<td></td>
<td>Fuel Delivery Pressure Sensor Circuit - Voltage Above Normal or Shorted to High Source</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>Amber</td>
<td>547</td>
<td></td>
<td>Fuel Delivery Pressure Sensor Circuit - Voltage Below Normal or Shorted to Low Source</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15</td>
<td>Maint</td>
<td>2261</td>
<td></td>
<td>Fuel Pump Delivery Pressure – Data Valid but Above Normal Operational Range - Least Severe Level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>17</td>
<td>Maint</td>
<td>2262</td>
<td></td>
<td>Fuel Pump Delivery Pressure – Data Valid but Below Normal Operational Range - Least Severe Level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>18</td>
<td>Amber</td>
<td>2215</td>
<td></td>
<td>Fuel Pump Delivery Pressure - Data Valid but Below Normal Operational Range - Moderately Severe Level</td>
</tr>
<tr>
<td>Engine Fuel Filter Differential Pressure</td>
<td>95</td>
<td>16</td>
<td>Amber</td>
<td>2372</td>
<td></td>
<td>Engine Fuel Filter Differential Pressure - Data Valid but Above Normal Operational Range - Moderately Severe Level</td>
</tr>
<tr>
<td>Water in Fuel Indicator</td>
<td>97</td>
<td>3</td>
<td>Amber</td>
<td>428</td>
<td></td>
<td>Water in Fuel Sensor Circuit - Voltage Above Normal, or Shorted to High Source</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>Amber</td>
<td>429</td>
<td></td>
<td>Water in Fuel Sensor Circuit - Voltage Below Normal, or Shorted to Low Source</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15</td>
<td>Maint</td>
<td>418</td>
<td></td>
<td>Water in Fuel Indicator High - Data Valid but Above Normal Operational Range – Least Severe Level</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16</td>
<td>Amber</td>
<td>1852</td>
<td></td>
<td>Water in Fuel Indicator - Data Valid but Above Normal Operational Range - Moderately Severe Level</td>
</tr>
</tbody>
</table>

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## ENGINE ERROR CODES

<table>
<thead>
<tr>
<th>J1939 SPN Description</th>
<th>J1939 SPN</th>
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<th>Lamp Color</th>
<th>Cummins Engine Code</th>
<th>Cat Engine Code</th>
<th>Cummins / Caterpillar Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Engine Oil Pressure</strong></td>
<td>100</td>
<td>1 red</td>
<td>415</td>
<td>360</td>
<td></td>
<td>Oil Pressure Low – Data Valid but Below Normal Operational Range - Most Severe Level</td>
</tr>
<tr>
<td>2</td>
<td>Amber</td>
<td>435</td>
<td></td>
<td></td>
<td></td>
<td>Oil Pressure Sensor Circuit - Data Erratic, Intermittent, or Incorrect</td>
</tr>
<tr>
<td>3</td>
<td>Amber</td>
<td>135</td>
<td>100</td>
<td></td>
<td></td>
<td>Oil Pressure Sensor Circuit - Voltage Above Normal, or Shorted to High Source</td>
</tr>
<tr>
<td>4</td>
<td>Amber</td>
<td>141</td>
<td>100</td>
<td></td>
<td></td>
<td>Oil Pressure Sensor Circuit - Voltage Below Normal, or Shorted to Low Source</td>
</tr>
<tr>
<td>10</td>
<td>157</td>
<td>N/A</td>
<td>360</td>
<td></td>
<td></td>
<td>Engine oil pressure sensor 5V supply connection open circuit</td>
</tr>
<tr>
<td>17</td>
<td>N/A</td>
<td>143</td>
<td>360</td>
<td></td>
<td></td>
<td>Low oil pressure - WARNING</td>
</tr>
<tr>
<td>18</td>
<td>Amber</td>
<td>143</td>
<td>360</td>
<td></td>
<td></td>
<td>Oil Pressure Low – Data Valid but Below Normal Operational Range - Moderately Severe Level</td>
</tr>
<tr>
<td><strong>Boost Pressure</strong></td>
<td>102</td>
<td>2 amber</td>
<td>433</td>
<td></td>
<td></td>
<td>Intake Manifold Pressure Sensor Circuit - Data Erratic, Intermittent, or Incorrect</td>
</tr>
<tr>
<td>3</td>
<td>Amber</td>
<td>122</td>
<td></td>
<td></td>
<td></td>
<td>Intake Manifold Pressure Sensor Circuit – Voltage Above Normal, or Shorted to High Source</td>
</tr>
<tr>
<td>4</td>
<td>Amber</td>
<td>123</td>
<td></td>
<td></td>
<td></td>
<td>Intake Manifold Pressure Sensor Circuit – Voltage Below Normal, or Shorted to Low Source</td>
</tr>
<tr>
<td>16</td>
<td>Amber</td>
<td>124</td>
<td></td>
<td></td>
<td></td>
<td>Intake Manifold 1 Pressure Data Valid but Above Normal – Operational Range - Moderately Severe Level</td>
</tr>
<tr>
<td><strong>Turbocharger 1 Speed</strong></td>
<td>103</td>
<td>10 amber</td>
<td>2345</td>
<td></td>
<td></td>
<td>Turbocharger speed invalid rate of change detected - Abnormal Rate of Change</td>
</tr>
<tr>
<td>16</td>
<td>Amber</td>
<td>595</td>
<td></td>
<td></td>
<td></td>
<td>Turbocharger #1 Speed High - Data Valid but Above Normal Operational Range – Moderately Severe Level</td>
</tr>
<tr>
<td>18</td>
<td>Amber</td>
<td>687</td>
<td></td>
<td></td>
<td></td>
<td>Turbocharger #1 Speed Low - Data Valid but Below Normal Operational Range – Moderately Severe Level</td>
</tr>
<tr>
<td><strong>Intake Manifold #1 Temp</strong></td>
<td>105</td>
<td>0 red</td>
<td>155</td>
<td></td>
<td></td>
<td>Intake Manifold Air Temperature High – Data Valid but Above Normal Operational Range - Most Severe Level</td>
</tr>
<tr>
<td>3</td>
<td>Amber</td>
<td>153</td>
<td>172</td>
<td></td>
<td></td>
<td>Intake Manifold Air Temperature Sensor Circuit - Voltage Above Normal, or Shorted to High Source</td>
</tr>
<tr>
<td>4</td>
<td>Amber</td>
<td>154</td>
<td>172</td>
<td></td>
<td></td>
<td>Intake Manifold Air Temperature Sensor Circuit - Voltage Below Normal, or Shorted to Low Source</td>
</tr>
<tr>
<td>15</td>
<td>None</td>
<td>2964</td>
<td>539</td>
<td></td>
<td></td>
<td>Intake Manifold 1 Temperature - Data Valid but Above Normal Operational Range - Least Severe Level</td>
</tr>
<tr>
<td>16</td>
<td>Amber</td>
<td>488</td>
<td>539</td>
<td></td>
<td></td>
<td>Intake Manifold 1 Temperature - Data Valid but Above Normal Operational Range - Moderately Severe Level</td>
</tr>
<tr>
<td><strong>Inlet Manifold Pressure Sensor</strong></td>
<td>106</td>
<td>3 135</td>
<td>1785</td>
<td></td>
<td></td>
<td>Voltage above normal or shorted high</td>
</tr>
<tr>
<td>4</td>
<td>135</td>
<td>1785</td>
<td></td>
<td></td>
<td></td>
<td>Voltage below normal or shorted low</td>
</tr>
<tr>
<td>10</td>
<td>135</td>
<td>1785</td>
<td></td>
<td></td>
<td></td>
<td>Inlet Manifold Pressure Sensor 5V supply connection open circuit</td>
</tr>
<tr>
<td><strong>Barometric Pressure</strong></td>
<td>108</td>
<td>2 amber</td>
<td>295</td>
<td></td>
<td></td>
<td>Barometric Pressure Sensor Circuit - Data Erratic, Intermittent, or Incorrect</td>
</tr>
<tr>
<td>3</td>
<td>Amber</td>
<td>221</td>
<td></td>
<td></td>
<td></td>
<td>Barometric Pressure Sensor Circuit – Voltage Above Normal, or Shorted to High Source</td>
</tr>
<tr>
<td>4</td>
<td>Amber</td>
<td>222</td>
<td></td>
<td></td>
<td></td>
<td>Barometric Pressure Sensor Circuit – Voltage Below Normal, or Shorted to Low Source</td>
</tr>
<tr>
<td><strong>Coolant Pressure</strong></td>
<td>109</td>
<td>3 amber</td>
<td>231</td>
<td></td>
<td></td>
<td>Coolant Pressure Sensor Circuit - Voltage Above Normal, or Shorted to High Source</td>
</tr>
<tr>
<td>4</td>
<td>Amber</td>
<td>232</td>
<td></td>
<td></td>
<td></td>
<td>Coolant Pressure Sensor Circuit - Voltage Below Normal, or Shorted to Low Source</td>
</tr>
<tr>
<td>18</td>
<td>Amber</td>
<td>233</td>
<td></td>
<td></td>
<td></td>
<td>Coolant Pressure - Data Valid but Below Normal Operational Range - Moderately Severe Level</td>
</tr>
<tr>
<td><strong>Engine Coolant Temperature</strong></td>
<td>110</td>
<td>0 red</td>
<td>151</td>
<td>361</td>
<td></td>
<td>Coolant Temperature Low - Data Valid but Above Normal Operational Range - Most Severe Level</td>
</tr>
<tr>
<td>2</td>
<td>Amber</td>
<td>334</td>
<td></td>
<td></td>
<td></td>
<td>Coolant Temperature Sensor Circuit – Data Erratic, Intermittent, or Incorrect</td>
</tr>
<tr>
<td>3</td>
<td>Amber</td>
<td>144</td>
<td>110</td>
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<td>Coolant Temperature Sensor Circuit – Voltage Above Normal, or Shorted to High Source</td>
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<td>Coolant Temperature Sensor Circuit – Voltage Below Normal, or Shorted to Low Source</td>
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<td>Engine Coolant Temperature High - Data Valid but Above Normal Operational Range - Least Severe Level</td>
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<td>Coolant Temperature High - Data Valid but Above Normal Operational Range - Moderately Severe Level</td>
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<td>J1939 SPN Description</td>
<td>J1939 SPN</td>
<td>J1939 FMI</td>
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<td>Cat Engine Code</td>
<td>Cummins / Caterpillar Description</td>
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<td>Injector Metering Rail 1 Pressure</td>
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<td>Fuel Pressure High - Data Valid but Above Normal Operational Range – Moderately Severe Level</td>
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<td>554</td>
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<td>Fuel Pressure Sensor Error - Data Erratic, Intermittent, or Incorrect</td>
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<td>Injector Metering Rail #1 Pressure Sensor Circuit - Voltage Above Normal, or Shorted to High Source</td>
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<td>Injector Metering Rail #1 Pressure Low – Data Valid but Below Normal Operational Range - Moderately Severe Level</td>
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<td>Key Switch</td>
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<td>Cylinder Power</td>
<td>166</td>
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<td>Cylinder Power Imbalance Between Cylinders - Data Erratic, Intermittent, or Incorrect</td>
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<td>Alternator Potential (voltage)</td>
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<td>Electrical Charging System Voltage Low – Data Valid but Below Normal Operational Range - Most Severe Level</td>
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<td>Electrical Charging System Voltage Low – Data Valid but Below Normal Operational Range - Moderately Severe Level</td>
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<td>Excessive battery power</td>
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<td>441</td>
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<td>Battery #1 Voltage Low - Data Valid but Below Normal Operational Range – Moderately Severe Level</td>
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<td>Ambient Air Temperature</td>
<td>171</td>
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<td>Ambient Air Temperature Sensor Circuit - Voltage Above Normal, or Shorted to High Source</td>
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<td>Fuel Temperature</td>
<td>174</td>
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<td>Engine Fuel Temperature Sensor 1 Circuit - Voltage Above Normal, or Shorted to High Source</td>
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<td>Oil Temperature</td>
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<td>Engine Oil Temperature - Data Valid but Above Normal Operational Range - Most Severe Level</td>
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<td>Engine Speed High - Data Valid but Above Normal Operational Range - Most Severe Level</td>
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<td>Real Time Clock Power</td>
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<td>Maint</td>
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<td>Real Time Clock Power Interrupt - Data Erratic, Intermittent, or Incorrect</td>
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<td>Exhaust Gas Recirculation Temperature</td>
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<td>Exhaust Gas Recirculation Temperature Sensor Circuit - Voltage Above Normal, or Shorted to High Source</td>
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<td>OEM Temperature #1</td>
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<td>Auxiliary Temperature Sensor Input # 1 Circuit - Voltage Above Normal, or Shorted to High Source</td>
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<td>Auxiliary Temperature Sensor Input # 1 Circuit - Voltage Below Normal, or Shorted to Low Source</td>
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<td>J1939 SPN Description</td>
<td>J1939 SPN</td>
<td>J1939 FMI</td>
<td>Lamp Color</td>
<td>Cummins Engine Code</td>
<td>Cat Engine Code</td>
<td>Cummins / Caterpillar Description</td>
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<td>Accelerator Pedal Low Idle Switch</td>
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<td>Auxiliary Temperature Sensor Input # 1 Circuit - Special Instructions</td>
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<td>Accelerator Pedal or Lever Idle Validation Circuit - Data Erratic, Intermittent, or Incorrect</td>
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<td>Accelerator Pedal or Lever Idle Validation Circuit - Out of Calibration</td>
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<td>System Diagnostic code # 1</td>
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<td>2185</td>
<td>Sensor Supply Voltage #4 Circuit – Voltage Above Normal, or Shorted to High Source</td>
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<td>Sensor Supply Voltage #3 Circuit – Voltage Below Normal, or Shorted to Low Source</td>
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<td>Fuel Inlet Meter Device</td>
<td>612</td>
<td>16</td>
<td>Amber</td>
<td>2292</td>
<td>Fuel Inlet Meter Device - Data Valid but Above Normal Operational Range - Moderately Severe Level</td>
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<td>18</td>
<td>Amber</td>
<td>2293</td>
<td>Fuel Inlet Meter Device flow demand lower than expected - Data Valid but Below Normal Operational Range - Moderately Severe Level</td>
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<td>Electronic Control Module</td>
<td>629</td>
<td>31</td>
<td>Amber</td>
<td>757</td>
<td>Electronic Control Module data lost - Condition Exists</td>
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<td>System Diagnostic Code # 2</td>
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<td>Engine Speed / Position Sensor Circuit lost both of two signals from the magnetic pickup sensor - Data Erratic, Intermittent, or incorrect</td>
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<td>Red Stop Lamp</td>
<td>631</td>
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<td>Amber</td>
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<td>Red Stop lamp Driver Circuit - Voltage Below Normal, or Shorted to Low Source</td>
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<td>Power Supply</td>
<td>632</td>
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<td>Power Lost without Ignition Off - Data Erratic, Intermittent, or Incorrect</td>
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<td>Controller #1</td>
<td>633</td>
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<td>111</td>
<td>Engine Control Module Critical internal failure - Bad intelligent Device or Component</td>
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<td>Calibration Memory</td>
<td>634</td>
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<td>341</td>
<td>Engine Control Module data lost - Data Erratic, Intermittent, or Incorrect</td>
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<td>Electronic Calibration Code Incompatibility - Out of Calibration</td>
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<td>ECM Program Memory (RAM) Corruption - Condition Exists</td>
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<td>Fuel Control Valve #1</td>
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<td>Fueling Actuator #1 Circuit Error – Condition Exists</td>
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<td>Primary to secondary speed signal</td>
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<td>SAE J1939 Datalink</td>
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<td>SAE J1939 Multiplexing PGN Timeout Error - Abnormal Update Rate</td>
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<td>SAE J1939 Multiplexing Configuration Error – Out of Calibration</td>
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<td>Variable Geometry Turbocharger</td>
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<td>VGT Actuator Driver Circuit - Voltage Above Normal, or Shorted to High Source</td>
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<td>2384</td>
<td>VGT Actuator Driver Circuit - Voltage Below Normal, or Shorted to Low Source</td>
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<td>Turbo Wastegate</td>
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<td>Solenoid Current Low</td>
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<td>Amber</td>
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<td>Solenoid Current High</td>
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<td>Injector Solenoid Cylinder #1 Circuit – Current Below Normal, or Open Circuit</td>
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<td>1139</td>
<td>Injector Cylinder #1 - Mechanical System Not Responding Properly or Out of Adjustment</td>
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<td>Injector Cylinder #02</td>
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<td>Injector Solenoid Cylinder #2 Circuit – Current Below Normal, or Open Circuit</td>
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<td>J1939 SPN Description</td>
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<td>Lamp Color</td>
<td>Cummins Engine Code</td>
<td>Cat Engine Code</td>
<td>Cummins / Caterpillar Description</td>
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<td>ECM 8V DC supply – voltage normal or shorted high</td>
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<td>Intake Air Heater #1</td>
<td>729</td>
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<td>Intake Air Heater #1 Circuit – Voltage Above Normal, or Shorted to High Source</td>
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<td>Internal Sensor Voltage Supply</td>
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<td>Accelerator Pedal or Lever Position Sensor Supply Voltage Circuit - Voltage Above Normal, or Shorted to High Source</td>
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<td>Electric Lift Pump for Engine Fuel</td>
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<td>Amber</td>
<td>2265</td>
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<td>Fuel Priming Pump Control Signal Circuit – Voltage Above Normal, or Shorted to High Source</td>
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<td>5 Volts DC Supply</td>
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<td>Amber</td>
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<td>Sensor Supply Voltage #1 Circuit – Voltage Above Normal, or Shorted to High Source</td>
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<td>5 Volts DC Supply</td>
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<td>Sensor Supply Voltage #2 Circuit – Voltage Above Normal, or Shorted to High Source</td>
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<td>Sensor Circuit - Voltage</td>
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<td>ECM Internal Temperature Sensor Circuit - Voltage Above Normal, or Shorted to High Source</td>
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<td>Turbocharger #1 Compressor Inlet Temperature</td>
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<td>691</td>
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<td>Turbocharger #1 Compressor Inlet Temperature Sensor Circuit – Voltage Above Normal, or Shorted to High Source</td>
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<td>Turbo Wastegate</td>
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<td>Amber</td>
<td>177</td>
<td>526</td>
<td>Turbo Wastegate not responding</td>
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<tr>
<td>J1939 SPN Description</td>
<td>J1939 SPN</td>
<td>J1939 FMI</td>
<td>Lamp Color</td>
<td>Cummins Engine Code</td>
<td>Cat Engine Code</td>
<td>Cummins / Caterpillar Description</td>
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<td>Exhaust Gas Pressure</td>
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<td>2373</td>
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<td>Exhaust Gas Pressure Sensor Circuit - Voltage Above Normal, or Shorted to High Source</td>
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<td>Exhaust Gas Pressure Sensor Circuit - Voltage Below Normal, or Shorted to Low Source</td>
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<td>Fuel Pump Pressurizing</td>
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<td>272</td>
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<td>High Fuel Pressure Solenoid Valve Circuit – Voltage Above Normal, or Shorted to High Source</td>
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<td>Assembly #1</td>
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<td>High Fuel Pressure Solenoid Valve Circuit – Voltage Below Normal, or Shorted to Low Source</td>
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<td>281</td>
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<td>High Fuel Pressure Solenoid Valve #1 – Mechanical System Not Responding Properly or Out of Adjustment</td>
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<td>Engine Oil Change Interval</td>
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<td>Change Lubricating Oil and Filter – Condition Exists</td>
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<td>Auxiliary Pressure</td>
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<td>Auxiliary Pressure Sensor Input # 2 Circuit - Voltage Above Normal, or Shorted to High Source</td>
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<td>Turbocharger Compressor Outlet Temperature (Calculated) - Data Valid but Above Normal Operational Range – Least Severe Level</td>
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<td>Turbocharger Turbine Inlet Temperature (Calculated) - Data Valid but Above Normal Operational Range – Least Severe Level</td>
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<td>Coolant Pressure</td>
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