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

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Introduction

This manual contains unloading, assembly, and predelivery information for the MacDon M1170 Windrower, which when coupled with one of MacDon’s A40DX, R1 SP Series, D1X Series, or D1XL Series Headers provides a package designed to cut and lay a variety of grain, hay, and specialty crops in windrows.

The M1170 Windrower is Dual Direction®. The windrower can be driven in cab-forward or engine-forward mode.

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

The ignition keys were shipped with the shipping documents and are used to lock the cab doors and tool box compartment.

NOTE:

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

This document is currently available in English only.
## Summary of Changes

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

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Chapter 1: Safety

1.1 Signal Words

Three signal words, DANGER, WARNING, and CAUTION, are used to alert you to hazardous situations. Two signal words, IMPORTANT and NOTE, identify non-safety related information. Signal words are selected using the following guidelines:

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

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

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

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

NOTE:
Provides additional information or advice.
1.2 General Safety

⚠️ CAUTION

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

Protect yourself when assembling, operating, and servicing machinery, wear all protective clothing and personal safety devices that could be necessary for the job at hand. Do NOT take chances. You may need the following:

- Hard hat
- Protective footwear with slip-resistant soles
- Protective glasses or goggles
- Heavy gloves
- Wet weather gear
- Respirator or filter mask
- Be aware that exposure to loud noises can cause hearing impairment or loss. Wear suitable hearing protection devices such as earmuffs or earplugs to help protect against loud noises.

- Provide a first aid kit in case of emergencies.
- Keep a properly maintained fire extinguisher on the machine. 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. Take time to consider safest way. NEVER ignore warning signs of fatigue.

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Figure 1.1: Safety Equipment

Figure 1.2: Safety Equipment

Figure 1.3: Safety Equipment
• Wear close-fitting clothing and cover long hair. **NEVER** wear dangling items such as scarves or bracelets.

• Keep all shields in place. **NEVER** alter or remove safety equipment. Make sure driveline guards can rotate independently of shaft and can telescope freely.

• Use only service and repair parts made or approved by equipment manufacturer. Substituted parts may not meet strength, design, or safety requirements.

• Keep hands, feet, clothing, and hair away from moving parts. **NEVER** attempt to clear obstructions or objects from a machine while the engine is running.

• Do **NOT** modify the machine. Unauthorized modifications may impair machine function and/or safety. It may also shorten the machine’s life.

• To avoid injury or death from unexpected startup of the machine, **ALWAYS** stop the engine and remove the key from the ignition before leaving the operator’s seat for any reason.

• Keep service area clean and dry. Wet and/or oily floors are slippery. Wet spots can be dangerous when working with electrical equipment. Be sure all electrical outlets and tools are properly grounded.

• Keep work area well lit.

• Keep machinery clean. Straw and chaff on a hot engine are fire hazards. 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.
1.3 Tire Safety

Service tires safely.

⚠️ WARNING

- A tire can explode during inflation, which could cause serious injury or death.
- Follow proper procedures when mounting a tire on a wheel or rim. Failure to do so can produce an explosion that may result in serious injury or death.

⚠️ WARNING

- Do NOT remove, install, or repair a tire on a rim unless you have proper equipment and experience to perform job. Take the tire and rim to a qualified tire repair shop.
- Make sure the tire is correctly seated before inflating to operating pressure. If the tire is not correctly positioned on the rim or is overinflated, the tire bead can loosen on one side causing air to escape at high speed and with great force. An air leak of this nature can thrust the tire in any direction, endangering anyone in area.
- Do NOT stand over tire when inflating. Use a clip-on chuck and extension hose.
- Do NOT exceed maximum inflation pressure indicated on tire label.
- Never use force on an inflated or partially inflated tire.
- Make sure all air is removed from the tire before removing the tire from the rim.
- Never weld a wheel rim.
- Replace tires that have defects and replace wheel rims that are cracked, worn, or severely rusted.
1.4 Battery Safety

**WARNING**
- Keep all sparks and flames away from batteries; an explosive gas is given off by electrolyte.
- Ventilate when charging in enclosed space.

**WARNING**
- Wear safety glasses when working near batteries.
- To avoid an electrolyte loss, do NOT tip batteries more than 45°.
- Battery electrolyte causes severe burns. Avoid contact with skin, eyes, or clothing.
- Electrolyte splashed into eyes is extremely dangerous. Should this occur, force eye open, and flood with cool, clean water for 5 minutes. Call a doctor immediately.
- If electrolyte is spilled or splashed on clothing or body, neutralize it immediately with a solution of baking soda and water, then rinse with clear water.

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

IMPORTANT:
It is very important that correct procedures be followed when welding anything connected to the windrower. If procedures are not followed, it could result in severe damage to sensitive, expensive electronics. Even if complete failure of a module doesn’t happen immediately, it is impossible to know what effect high current could have with regard to future malfunctions or shorter lifespan.

Due to the number of connectors, components to be welded should be removed from the windrower whenever possible rather than welded in place. When work needs to be completed on a header, disconnect the header completely from the windrower before welding. These same guidelines apply to plasma cutting, or any other high current electrical operation performed on the machine.

The following items need to be disconnected:

- Negative battery terminals (A) (two connections)
  
  IMPORTANT:
  Always disconnect the battery terminals first, and reconnect them last.

- Master controller (A)
  Four connectors: P231, P232, P233, and P234
  Location: Behind cab, near header lift/fan manifold
  To disconnect the connectors, press the two outer tabs, and pull the connector away from master controller.

  IMPORTANT:
  When reconnecting these connectors, double-check that the connectors are fully seated into the master controller, and that the two locking tabs on each end of all four connectors have popped outward. If the tabs are not popped outward, the connector is not fully seated.

  IMPORTANT:
  Do NOT power up or operate the windrower until these connectors are locked into place.
• Firewall extension module (A)
  Two connectors: P235 and P236
  Location: Behind cab, near header lift/fan manifold.
  To disconnect, use a small 3–6 mm (1/8–1/4 in.) blade screwdriver to insert into the connector’s locking tab. Gently pry upward (no more than 6 mm [1/4 in.]) to unlock the connector tab, and then pull the connector away from the module.

• Chassis extension module (A)
  Two connectors: P247 and P248
  Location: Under cab, inside left frame rail
  To disconnect, use a small 3–6 mm (1/8–1/4 in.) blade screwdriver to insert into the connector’s locking tab. Gently pry upward (no more than 6 mm [1/4 in.]) to unlock the connector tab, and then pull the connector away from the module.

• Engine Control Module (ECM)
  Two connectors for Cummins: P100 (A) and J1 Cummins Proprietary ECM Connector (B)
  Location: On engine
  To disconnect, pull the rubber boot off the cover, unlock the latch, and undo the main over-center latch. Remove strain relief bolts (C) so the connectors can be pulled away from the ECM.
  IMPORTANT:
  Be sure to disconnect both connectors. Note connector locations.
  IMPORTANT:
  Be sure to reconnect connectors in the proper locations. Do NOT cross connect.
NOTE:
To disconnect the remaining circular Deutsch connectors, rotate the outer collar counterclockwise.

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

- Roof connectors (A)
  Four connectors: C10, C12, C13, and C14
  Location: Under cab at base of left cab post

- Chassis relay module (A)
  Three connectors: P240, P241, and P242
  Location: Outside left frame rail near batteries
• Engine harness (A)
  Two round connectors: C30 and C31
  Location: Inside left frame rail, at rear of windrower

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

• Wheel motor connectors (A)
  Two round connectors: C25 and C26
  Location: Under center of frame, just behind front cross member

IMPORTANT:
To connect circular Deutsch connectors without bending the pins, align the plug with the receptacle before attempting to connect.

To align the connectors:
1. Observe the channel cuts and mating channel protrusions on the inner part of the circular walls of the connectors.
2. Face the mating connectors towards each other, and rotate connectors so that channels are aligned.
3. Press connectors together while turning the outer connector clockwise until collar locks.
1.6 Engine Safety

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

CAUTION
• On initial start-up of a new, serviced, or repaired engine, always be ready to stop the engine to prevent an overspeed. Do this by shutting off the air and/or fuel supply to the engine.
• Do NOT bypass or disable automatic shutoff circuits. The circuits help prevent personal injury, and prevent engine damage. For instructions, refer to the technical manual.
• Inspect the engine for potential hazards.
• Before starting the engine, ensure no one is on, underneath, or close to the engine. Ensure that people clear the area.
• All protective guards and covers must be installed if the engine must be started to perform service procedures.
• To help prevent an accident, work around rotating parts carefully.
• If a warning tag is attached to the engine start switch or controls, do NOT start engine or move controls. Consult whoever attached the warning tag before starting the engine.
• Start the engine from the operator’s station. Follow the procedure in the Starting Engine section of the operator’s manual. Following the correct procedure will help prevent major damage to engine components and prevent personal injury.
• To ensure that the jacket water heater (if equipped) and/or lubricant oil heater (if equipped) is working correctly, check the water temperature gauge and/or oil temperature gauge during heater operation.
• Engine exhaust contains products of combustion, which can be harmful to your health. Always start and operate the engine in a well-ventilated area. If the engine is started in an enclosed area, vent exhaust to the outside.
• Engine exhaust gases become very hot during operation and can burn people and common materials. Stay clear of the rear of machine and avoid exhaust gases when engine is running.

NOTE:
If the engine will be operated in very cold conditions, then an additional cold-starting aid may be required.

1.6.1 High-Pressure Rail

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

1.6.2 Engine Electronics

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

Electrical Shock Hazard. The electronic unit injectors use DC voltage. The engine control module (ECM) sends this voltage to the electronic unit injectors. Do NOT come in contact with the harness connector for the electronic unit injectors while engine is operating. Failure to follow this instruction could result in personal injury or death.

This engine has a comprehensive, programmable engine monitoring system. The ECM has the ability to monitor engine operating conditions. If conditions exceed the allowable range, the ECM will initiate immediate action.

The engine monitoring system can initiate the following actions:

- Warning
- Derate
- Shut down

Abnormalities in the following monitored conditions can limit engine speed and/or engine power:

- Engine coolant temperature
- Engine oil pressure
- Engine speed
- Intake manifold air temperature
- Diesel exhaust fluid (DEF) system performance
- Aftertreatment system performance
1.7 Safety Signs

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

Figure 1.23: Operator’s Manual Decal
Chapter 2: Unloading the Windrower

2.1 Using One Forklift to Unload Windrower

⚠️ CAUTION

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

Table 2.1 Lifting Vehicle Requirements

<table>
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<th>Minimum Capacity</th>
<th>7037 kg (15,500 lb.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Fork Length</td>
<td>198.1 cm (78 in.)</td>
</tr>
</tbody>
</table>

IMPORTANT:

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

1. Move the trailer onto level ground and block the trailer wheels.
2. Set forks to the widest possible setting.

⚠️ CAUTION

Ensure forks do NOT contact or lift on fuel tank (A) or engine oil pan (B) (not shown).

3. Position forklift from opposite side of fuel tank, and position forks (C) under windrower frame with the fuel tank (A) between the forks.

NOTE:

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

⚠️ WARNING

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

4. Lift until the windrower is clear of the trailer deck.
5. Back forklift slowly away from the trailer until the windrower is clear of the trailer deck.
6. Lower unit slowly to the ground. If the ground is soft, place wooden blocks under the front shipping stands.
7. Carefully back forklift away from the windrower.
8. Check windrower for shipping damage, and check shipment for missing parts.
9. In case of shipping damage or missing parts, confirm that the serial number matches the shipping manifest, then contact MacDon immediately with any damage or shortage claims.

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1. At 122.2 cm (48 in.) from back end of forks.
Chapter 3: Assembling the Windrower

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

3.1 Lowering Steps

Lowering the steps allows safe and easy access to the cab where some assembly hardware was stored for shipping purposes.

Lower steps from shipping position to working position as follows:

**NOTE:**
Left side shown, right side opposite.

1. Remove stop bolt (A) and discard.
2. Loosen pivot bolts (B) at both sides of step (C).

3. Lower step (A) to working position.
4. Ensure clips (B) are engaged in step.
5. Tighten pivot bolts (C) to 90–100 Nm (66–73 lbf·ft).
6. Retrieve bag containing drive wheel nuts from the storage compartment (A) behind the training seat.
3.2 Installing Caster Wheels

Some shipping configurations come with caster wheels removed. Follow this procedure to install caster wheels if required.

1. Retrieve toolbox (A) from the storage compartment, and remove banding.
   
   **NOTE:**
   Use ignition key to unlock storage compartment.

2. Retrieve hardware from toolbox (A).

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

4. Retrieve caster wheel assemblies from shipment.

5. Using a forklift, approach windrower from the front and slide forks under frame.

   **CAUTION**
   Ensure forks do NOT contact fuel tank (A) and that forks lift on windrower frame.

6. Raise windrower approximately 152 cm (60 in.) off the ground. Place suitable stands under the drive wheel legs and rear frame, and lower windrower onto stands to partially unload the forks.
ASSEMBLING THE WINDROWER

7. Attach sling (B) to caster assembly (A).

8. Retrieve two washers (C) from the toolbox and place them on caster wheel spindle (D).

9. If the caster assembly (A) is on a pallet, remove banding and shipping material securing assembly to the pallet.

10. Attach sling (A) on caster assembly (B) to a suitable lifting device.

11. Tilt walking beam (C) and maneuver caster assembly (B) so that spindle (D) can be installed onto walking beam (C).

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

13. Install key (B) and arm (C) onto the spindle, ensuring that the arm is positioned so there is no clearance at the top and bottom of the walking beam extension.


15. Tighten nut (E) and torque to 190–200 Nm (140–147 lbf·ft).

16. Remove sling from caster assembly.

17. Repeat Steps 7, page 18 to 16, page 18 for second caster assembly.
3.3 Installing Drive Wheels

**CAUTION**

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

**IMPORTANT:**

The windrower must be supported off the ground with stands.

1. Using a forklift, lift cab end of windrower to approximately 130 cm (51 in.) (B) off the ground, enough to position the drive wheel assembly (A). Place a stand (C) under the windrower frame.

2. Clean mounting surface on wheel drive and rim.

3. Position a suitable lifting device (A) under the tire and raise slightly.

4. Position the wheel against wheel drive hub so air valve (B) is on the outside and tread (C) points forward (cab-forward orientation).

**NOTE:**

For turf tires (diamond tread pattern), be sure the arrow on the sidewall points in forward rotation (cab-forward).
5. Align the rim with studs on the hub and push the wheel onto the hub.

6. Install wheel nuts (A).

**IMPORTANT:**
To avoid damage to wheel rims and studs, do **NOT** use an impact wrench. Threads must be clean and dry. Do **NOT** apply lubricant or anti-seize compound. Do **NOT** overtighten wheel nuts.

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

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

8. Repeat the tightening sequence two additional times, ensuring the specified torque is achieved each time.

9. Repeat Steps 2, page 19 to 8, page 20 for the other drive wheel.

10. Raise the windrower, remove the stand, and lower windrower to the ground.

11. Repeat the torque procedure every hour of operation until two consecutive checks confirm that there is no movement of the nuts.
3.4 Repositioning Right Leg

The right (cab-forward) leg requires repositioning from shipping to field configuration.

**IMPORTANT:**
Do **NOT** open the right cab-forward door when the right leg is in shipping configuration. If the glass door contacts the leg, it may result in broken glass and/or a damaged door seal.

1. Using a forklift, lift the front of the windrower. Place a stand (A) (or equivalent) to support front of the windrower and to keep right wheel (B) off the ground.

2. Slowly lower the windrower onto a stand (A).

3. Place a pallet jack (C) (or equivalent) under right wheel (B), and raise pallet jack enough to take the weight off the right wheel.

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

5. Remove two bolts (A), washers, and nuts from frame.
6. Adjust lift height until pin (A) is loose. Extract the pin from the front of the frame with a slide hammer (B) (MD #209816) (tool required due to limited space in front of the fuel tank). Instructions are included with the tool.

**NOTE:**
Removing the pins will be difficult if weight is still on the leg.

7. Repeat for second pin.

8. Move leg outwards to expose one hole (A) in the frame.

9. Align holes at pin locations and use slide hammer (B) to reinstall pins (A). If necessary, adjust the jack to prevent damage to the outer edges of the pins.
10. Secure pins with bolts (A), washers, and nuts. Torque nuts to 136 Nm (100 lbf·ft).

11. Lower the pallet jack and move it from the work area.

12. Support the windrower with a forklift, remove stand, and lower windrower to the ground.

Figure 3.20: Right Leg
3.5 Repositioning Caster Wheels

A narrow caster tread width is better suited for smaller headers because it allows more space for the uncut crop and provides more maneuverability around poles, irrigation inlets, and other obstacles. A wider caster tread width reduces runover in heavy crops that produce large windrows.

1. Lift windrower with forklift to take most of the weight off casters.

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

3. Retain hardware and support brackets (B) and (C) for installation later.

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

4. If not done yet, remove banding and blocking (A) securing walking beam to frame.
5. Rotate the caster so wheel (A) is parallel to the walking beam to assist with moving the extensions. Pull walking beam extension (B) out to desired position and line up bolt holes.

**NOTE:**
The walking beam extension (B) can be adjusted into three working positions.

6. Install two M24 x 60 bolts and washers (C) on the bottom of beam. Do **NOT** tighten.

7. Install two M24 x 60 bolts coated with anti-seize compound and M24 flat washers (A) from the toolbox in the outboard side of the walking beam. Do **NOT** fully tighten.

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

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

**IMPORTANT:**
Ensure support bracket plate (B) is parallel or is installed straight.

9. Tighten bolts as follows:
   a. Snug bottom bolts (A), then snug back bolts (B).
   b. Torque back bolts (B) to 745–770 Nm (550–570 lbf·ft).
   c. Torque bottom bolts (A) to 745–770 Nm (550–570 lbf·ft).

**IMPORTANT:**
Torque bolts after first 5 hours of operation, and then again after 10 hours.
10. Repeat Steps 2, page 24 to 9, page 25 at opposite end of walking beam, ensuring that casters are spaced equally from center of windrower.

11. Lower windrower to ground.
3.6 Installing Caster Anti-Shimmy Dampeners

1. Retrieve anti-shimmy dampeners and hardware from bag in toolbox.

2. If unit was shipped with casters installed, then complete the following procedure. Otherwise, proceed to step 3, page 27.
   a. Remove retaining ring (A).
   b. Remove and discard yellow spacer (B).
   c. Retrieve key and arm from the toolbox.
   d. Install key and arm (D), and secure with retaining ring (E) on the caster shaft as shown.
   e. Tighten nut (C), and torque to 190–200 Nm (140–147 lbf-ft).

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

4. Attach barrel end of second anti-shimmy dampener (A) to support (B) at aft hole location with one M16 x 90 flange head bolt and M16 tech loc nut (C). Install bolt from under support. Do NOT fully tighten.

5. Rotate caster so that arm (D) is aligned with walking beam.
6. Attach rod ends of anti-shimmy dampeners to arm with M16 x 90 flange head bolt (A) and three hardened washers (B).

**NOTE:**
These washers (B) are stamped with L9 for identification.

7. Torque bolt (A) to 244 Nm (180 lbf-ft).

8. Install jam nut (C) and torque to 136–140 Nm (100–103 lbf-ft).

9. Tighten bolts (D) at barrel end of anti-shimmy dampeners, and torque to 136–140 Nm (100–103 lbf-ft).

**IMPORTANT:**
Maintain arm parallel to walking beam while tightening. Do NOT overtighten.

10. Repeat Steps 2, page 27 to 9, page 28 for opposite end of walking beam.

**IMPORTANT:**
Torque bolts after first 5 hours of operation, and then again after 10 hours.
3.7 Installing Windshield Access Step

The windshield access step is secured on the railing of the right side platform (cab-forward).

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

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

   **NOTE:**
   Use the ignition key to unlock the toolbox compartment.

3. Position step (A) on right leg at forward end of platform as shown.

4. Install two M10 x 20 hex head screws (B) through top of step, but do **NOT** tighten.

5. Install one M10 x 20 hex head screw (C) through step support.

6. Tighten and torque screws to 54–61 Nm (40–45 lbf·ft).

Figure 3.32: Step in Shipping Position

Figure 3.33: Windshield Access Step
3.8 Positioning Mirror Arms

The mirror/light support arms require repositioning from shipping position to working position.

1. Loosen retaining nut (A) and pivot nut (B) on support arm (C).
2. Swivel support arm (C) forward 90° from shipping position to working position.

**IMPORTANT:**
Avoid pinching the wire harness when rotating the mirror arms.

3. Tighten retaining nut (A) to 37–41 Nm (28–30 lbf·ft).
4. Tighten pivot nut (B) to 24–27 Nm (18–20 lbf·ft).

5. To prevent pinching wires when adjusting mirror assemblies, ensure roof harness (A) and power mirror harness (B) (if installed) are secured as follows:
   - Roof harness (A) to supports with cable ties (C)
   - Mirror harness (B) (if installed) to roof harness (A) with cable tie (D)
   - Mirror harness (B) (if installed) to mirror arm tube with cable tie (E)

6. Repeat above steps for opposite mirror.
3.9 Installing Slow Moving Vehicle Signs

To install the slow moving vehicle (SMV) sign onto the mirror/light support and walking beam, proceed as follows:

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

   **NOTE:**
   Use ignition key to unlock cab door and toolbox compartment.

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

   **IMPORTANT:**
   Ensure SMV sign does **NOT** cover brake light.

3. Locate support (A) on left cab-forward side of walking beam.

4. Position sign (B) on support (A) as shown, and secure with two M6 x 20 hex head bolts (C) and M6 lock nuts.
3.10 Replacing Speed Identification Symbol Decal – US Only

This topic applies to windrows used in the United States only.

1. Locate the existing speed identification symbol (SIS) decal bracket on the left mirror/lighting arm.
2. Wipe the existing decal with a clean cloth to remove dirt and grease.
3. Apply the 30 mile/h SIS decal (A) (MD #208900) over the existing 45 km/h decal.

Figure 3.39: SIS Decal – US Only
### 3.11 Installing Rear Ballast Package

When operating the windrower with a heavy header, ballast needs to be added to the aft end. Use the following table to determine the amount of ballast required.

Refer to **4.1.10 Checking Tire Pressures, page 47** for proper tire pressures when operating with the applicable header.

#### Table 3.1 Ballast Specifications

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

#### NOTE:
- Each kit weighs 163 kg (360 lb.). A kit contains eight 20.4 kg (45 lb.) weights.
- Ballast not required for A Series Auger Headers and R1 Series Disc Headers.
Installing rear ballast

**WARNING**

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

1. Refer to Table 3.1, page 33 to determine ballast to add to the windrower.

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

3. Move latch (A) towards the right cab-forward side of the windrower.

4. Grasp louver (B), and lift hood to open.

5. Remove eight hex flange bolts (A).

6. Slightly pull light bezel assembly (B), and disconnect plugs P215 (C) and P210 (D) from the back of red tail/brake lights inside the bezel.

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

NOTE:
- Retain center portion (A) of light bezel assembly for reinstallation when ballast is removed.
- Install six hex screws (B) on side bezels for safekeeping. These hex screws will be used when reinstalling center portion of light bezel.

CAUTION
To avoid injury, keep fingers clear of weight bracket when installing weights.

9. Install weights (A) from outboard side and slide to the middle of the bracket on the walking beam.

10. Install retaining bracket (B) on each side of the weight bundle.
    IMPORTANT:
    Ensure retaining bracket (B) engages slot (C) in the bracket.

11. Install rod (D) through retaining bracket and weights with spacers (E) as required.

12. Secure with nuts (F) and tighten.
    IMPORTANT:
    Ensure nuts (F) are flush with the rod.
NOTE:
When installing the three set, 489 kg (1080 lb.) configuration, no spacers are required.
13. Move latch (A) towards the right cab-forward side of the windrower.

14. Grasp louver (B), and lift hood to open.

15. Bring left side bezel (A) close to the frame and connect plug P215 to the back of red tail/brake light (E).

16. Loosely attach left side bezel (A) to frame with four hex flange bolts (B).

17. Repeat Steps 15, page 37 and 16, page 37, attaching plug P210 at right side bezel (C).

18. Turn the IGNITION key to the RUN position, and ensure that rear swath lights (D) and red tail/brake lights (E) are working.

19. If the lights are working, tighten hex flange bolts (B) to secure the left and right light bezels.

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

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

   NOTE:
   Check that the latch lever is not tilted to ensure the hood is latched.
3.12 Lubrication

For grease specification, refer to 5.1 Lubricants, Fluids, and System Capacities, page 109.

3.12.1 Lubrication Procedure

⚠️ WARNING

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

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

3.12.2 Lubrication Points

Figure 3.51: Lubrication Points

A - Top Link (Two Places) (Both Sides)
B - Caster Pivot (Both Sides)
C - Forked Caster Wheel Bearing (Two Places) (Both Wheels)
3.13 Connecting Batteries

1. Move latch (A) towards the right cab-forward side of the windrower.

2. Grasp louver (B), and lift the hood to open.

3. Lift up on the cab-end of cover (A) to disengage it from retaining tab (B), and swing the cover away from the frame.

4. If installing a new battery, remove plastic caps from battery posts.

**IMPORTANT:**

**Batteries are 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.

**NOTE:**

Before connecting harness to batteries, ensure that positive terminal is positioned on the right side of battery when installed on battery support.

5. Attach red positive (+) cable terminals to positive posts (B) on batteries and tighten clamps. Reposition plastic covers onto clamps.

6. Attach black negative (−) cable terminals to negative posts (A) on batteries and tighten clamps. Reposition plastic covers onto clamps.
7. Swing cover (A) towards the windrower frame. Lift up on the cab end of the cover until it is secured by retaining tab (B) on the frame.

8. Grasp hood by louver (C) and lower until hood engages the latch.

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

Figure 3.55: Battery Cover
Chapter 4: Performing Predelivery Checks

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

IMPORTANT:
The machine should not require further adjustments; however, perform the following checks and complete the yellow predelivery checklist at the end of this book to ensure your machine operates at maximum performance. Make adjustments only if absolutely necessary and in accordance with the instructions in this manual.

4.1 Completing Predelivery Checklist

Perform the final checks and adjustments listed on the following pages and the Predelivery Checklist, page 125 (yellow sheet attached to this instruction) to ensure the machine is field-ready.

IMPORTANT:
Ensure the Operator or the Dealer retains the completed Predelivery Checklist.

4.1.1 Recording Serial Numbers

1. Record the windrower and engine serial numbers on the Predelivery Checklist, page 125, and confirm the serial number with the manifest or work order.

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

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

1. Check all engine air intake ducting (A) and joints for looseness. Tighten hose clamps as required.
2. Check that end cap (B) is secure and locked.

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

4.1.3 Checking and Adding Engine Oil

**NOTE:**
Oil can be checked without opening the hood.

1. Remove dipstick (A) by turning it counterclockwise to unlock.
2. Wipe dipstick clean and reinsert it into engine.
3. Remove dipstick again and check oil level. Oil level should be between LOW (L) and HIGH (H). If below the LOW mark, add oil.

**NOTE:**
Adding 1.9 liters (2 U.S. quarts) will raise the level from LOW to HIGH.

4. Replace dipstick and turn it clockwise to lock.

If oil level is too low, follow these steps to add oil:

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

3. Clean around filler cap (A) and remove by turning it counterclockwise.
4. Carefully add oil to achieve the desired level. A funnel is recommended to avoid spillage. For oil specifications, refer to 5.1 Lubricants, Fluids, and System Capacities, page 109.

**CAUTION**
Do NOT fill above the HIGH mark.

5. Replace oil filler cap (A) and turn it clockwise until snug.

### 4.1.4 Checking and Adding Hydraulic Oil

**WARNING**
Avoid high-pressure fluids. Escaping fluid can penetrate the skin causing serious injury.
1. Locate sight glass (A) on the right side of the tank. It indicates the oil level and any signs of contamination.

**NOTE:**

No oil in the sight glass indicates that the oil level is below the add mark on the dipstick. The sight glass is viewable with hood open or closed.

2. Ensure the hydraulic oil level is between the low and full indicator marks.

3. If the oil level is too low, refer to 5.1 Lubricants, Fluids, and System Capacities, page 109 for oil specifications and add oil as follows:
   a. Turn plug handle (B) counterclockwise until loose and remove the plug by pulling straight out.
   b. To improve oil fill rate, open breather cap (A).

   **IMPORTANT:**

   Clean area to prevent debris from entering tank.

   c. Reinstall breather cap (A) and plug (B) and turn the plug handle clockwise until secure.

   **NOTE:**

   After running up a header, check oil level again.

### 4.1.5 Checking Fuel Separator

1. Place a container under filter drain valve (A).

2. Turn drain valve (A) by hand 1 1/2 to 2 turns counterclockwise until fuel begins draining.

3. Drain the filter sump of water and sediment until clear fuel is visible. Clean as necessary.

4. Turn drain valve (A) by hand 1 1/2 to 2 turns clockwise until tight.

5. Dispose of fluid in a safe manner.
4.1.6 Checking Engine Coolant Level

1. Locate the coolant tank.

2. The tank has a MAX and MIN COLD line marker. Check to make sure the coolant level is at the MAX COLD line (A). If it is too low, add coolant.

**NOTE:**
When checking coolant level, use the MAX COLD line on the side of tank that faces cab for an accurate measurement.

**NOTE:**
For specifications, refer to 5.1 Lubricants, Fluids, and System Capacities, page 109.

4.1.7 Checking Engine Gearbox Lubricant Level and Adding Lubricant

1. Remove dipstick (A) and check lubricant level.

4.1.8 Checking Air Conditioning Compressor Belts

1. Ensure air conditioning (A/C) compressor belts (A) are tensioned so that a force of 35–55 N (8–12 lbf) deflects each belt 5 mm (3/16 in.) at midspan.
4.1.9 Checking Operating Safety System

Perform the following checks to ensure the windrower operating safety systems are functioning properly:

⚠️ **WARNING**

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

⚠️ **CAUTION**

Check to be sure all bystanders have cleared the area.

1. With the engine running and the seat base in engine-forward mode, engage the HEADER ENGAGE switch. Confirm the header drive does **NOT** engage and the Harvest Performance Tracker (HPT) displays LOCK SEAT BASE IN CAB-FORWARD.

2. With the engine running and the seat base in cab-forward mode, stand up and engage the HEADER DRIVE switch. The header drive should **NOT** engage and the HPT should display OPERATOR MUST BE SEATED.

3. With the engine running and the seat base unlocked, move the ground speed lever (GSL) out of PARK. Confirm the engine immediately shuts down and the HPT displays LOCK SEAT BASE and sounds a tone.

4. Shut down the engine and engage HEADER ENGAGE switch. Try starting the engine and confirm the HPT displays DISENGAGE HEADER. If the engine turns over, the safety system requires adjustment. Refer to the technical manual for adjustment procedures.

5. Shut down the engine and open the cooler box door. Try starting the engine and confirm the HPT displays CLOSE COOLER BOX DOOR. If the engine turns over, the safety system requires adjustment. Refer to the technical manual for adjustment procedures.

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

![Figure 4.15: Pintle Arms](image)
7. Center the steering wheel. Place the GSL in NEUTRAL but not in PARK. Try starting the engine and confirm the HPT displays MOVE GSL INTO PARK. The engine should NOT turn over. If the engine turns over, the safety system requires adjustment. Refer to the technical manual for adjustment procedures.

8. With the engine off, center the steering wheel. Place the GSL in PARK and ensure the operator’s station is NOT locked. Try starting the engine and confirm that the engine does NOT crank, and the HPT displays LOCK SEAT BASE. If the engine starts, the safety system requires adjustment. Refer to the technical manual for adjustment procedures.

### 4.1.10 Checking Tire Pressures

Check tire pressures with a gauge.

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

**Drive Wheel Tires:** For optimal performance, drive wheel (A) tire pressures are determined by tire type, header size, and additional options. Refer to the following table:

![Windrower Tires](image)

#### Table 4.1 Drive Tire Inflation Specifications

<table>
<thead>
<tr>
<th>Header Type</th>
<th>Description</th>
<th>Installed Options</th>
<th>Weight Kit</th>
<th>Tire Type</th>
<th>Pressure kPa (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Draper Header</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D115X single reel</td>
<td>4.6 m (15 ft.), double knife, timed</td>
<td>—</td>
<td>—</td>
<td>Bar</td>
<td>138 (20)</td>
</tr>
<tr>
<td>D115X single reel</td>
<td>4.6 m (15 ft.), double knife, timed</td>
<td>—</td>
<td>—</td>
<td>Turf</td>
<td>138 (20)</td>
</tr>
<tr>
<td>D120X single reel</td>
<td>6.1 m (20 ft.), double knife, timed</td>
<td>—</td>
<td>—</td>
<td>Bar</td>
<td>138 (20)</td>
</tr>
<tr>
<td>D120X single reel</td>
<td>6.1 m (20 ft.), double knife, timed</td>
<td>—</td>
<td>—</td>
<td>Turf</td>
<td>138 (20)</td>
</tr>
<tr>
<td>D125X single reel</td>
<td>7.6 m (25 ft.), double knife, timed</td>
<td>—</td>
<td>—</td>
<td>Bar</td>
<td>159 (23)</td>
</tr>
<tr>
<td>D125X single reel</td>
<td>7.6 m (25 ft.), double knife, timed</td>
<td>—</td>
<td>—</td>
<td>Turf</td>
<td>159 (23)</td>
</tr>
<tr>
<td>D130XL single reel</td>
<td>9.1 m (30 ft.), double knife, timed</td>
<td>Transport 1</td>
<td></td>
<td>Bar</td>
<td>200 (29)</td>
</tr>
<tr>
<td>D130XL single reel</td>
<td>9.1 m (30 ft.), double knife, timed</td>
<td>Transport 1</td>
<td></td>
<td>Turf</td>
<td>241 (35)</td>
</tr>
<tr>
<td>D130XL single reel</td>
<td>9.1 m (30 ft.), double knife, timed</td>
<td>Transport + upper cross auger + vertical knives 1</td>
<td></td>
<td>Bar</td>
<td>241 (35)</td>
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## Table 4.1 Drive Tire Inflation Specifications (continued)

<table>
<thead>
<tr>
<th>Header Type</th>
<th>Description</th>
<th>Installed Options</th>
<th>Weight Kit</th>
<th>Tire Type</th>
<th>Pressure kPa (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D130XL</td>
<td>single reel 9.1 m (30 ft.), double knife, timed</td>
<td>Transport + upper cross auger + vertical knives</td>
<td>1</td>
<td>Turf</td>
<td>241 (35)</td>
</tr>
<tr>
<td>D135XL</td>
<td>single reel 10.7 m (35 ft.), double knife, untimed</td>
<td>Base</td>
<td>2</td>
<td>Bar</td>
<td>200 (29)</td>
</tr>
<tr>
<td>D135XL</td>
<td>single reel 10.7 m (35 ft.), double knife, untimed</td>
<td>Base</td>
<td>2</td>
<td>Turf</td>
<td>241 (35)</td>
</tr>
<tr>
<td>D135XL</td>
<td>single reel 10.7 m (35 ft.), double knife, untimed</td>
<td>Transport</td>
<td>2</td>
<td>Bar</td>
<td>241 (35)</td>
</tr>
<tr>
<td>D135XL</td>
<td>single reel 10.7 m (35 ft.), double knife, untimed</td>
<td>Transport</td>
<td>2</td>
<td>Turf</td>
<td>241 (35)</td>
</tr>
<tr>
<td>D135XL</td>
<td>double reel 10.7 m (35 ft.), double knife, untimed</td>
<td>Base</td>
<td>2</td>
<td>Bar</td>
<td>221 (32)</td>
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<td>Base</td>
<td>2</td>
<td>Turf</td>
<td>241 (35)</td>
</tr>
<tr>
<td>D135XL</td>
<td>double reel 10.7 m (35 ft.), double knife, untimed</td>
<td>Transport</td>
<td>2</td>
<td>Bar</td>
<td>241 (35)</td>
</tr>
<tr>
<td>D135XL</td>
<td>double reel 10.7 m (35 ft.), double knife, untimed</td>
<td>Transport</td>
<td>2</td>
<td>Turf</td>
<td>241 (35)</td>
</tr>
<tr>
<td>D135XL</td>
<td>double reel 10.7 m (35 ft.), double knife, untimed</td>
<td>Transport + upper cross auger + vertical knives</td>
<td>3</td>
<td>Bar</td>
<td>283 (41)</td>
</tr>
<tr>
<td>D140XL</td>
<td>double reel 10.7 m (35 ft.), double knife, untimed</td>
<td>Transport + upper cross auger + vertical knives</td>
<td>3</td>
<td>Turf</td>
<td>241 (35)</td>
</tr>
<tr>
<td>D140XL</td>
<td>double reel 12.2 m (40 ft.), double knife, untimed</td>
<td>Base</td>
<td>2</td>
<td>Bar</td>
<td>241 (35)</td>
</tr>
<tr>
<td>D140XL</td>
<td>double reel 12.2 m (40 ft.), double knife, untimed</td>
<td>Base</td>
<td>2</td>
<td>Turf</td>
<td>241 (35)</td>
</tr>
<tr>
<td>D140XL</td>
<td>double reel 12.2 m (40 ft.), double knife, untimed</td>
<td>Transport</td>
<td>2</td>
<td>Bar</td>
<td>241 (35)</td>
</tr>
<tr>
<td>D140XL</td>
<td>double reel 12.2 m (40 ft.), double knife, untimed</td>
<td>Transport</td>
<td>2</td>
<td>Turf</td>
<td>241 (35)</td>
</tr>
<tr>
<td>D140XL</td>
<td>double reel 12.2 m (40 ft.), double knife, untimed</td>
<td>Transport + upper cross auger + vertical knives</td>
<td>3</td>
<td>Bar</td>
<td>283 (41)</td>
</tr>
<tr>
<td>D140XL</td>
<td>double reel 12.2 m (40 ft.), double knife, untimed</td>
<td>Transport + upper cross auger + vertical knives</td>
<td>3</td>
<td>Turf</td>
<td>241 (35)</td>
</tr>
<tr>
<td>D145XL</td>
<td>double reel 13.7 m (45 ft.), double knife, untimed</td>
<td>Base</td>
<td>2</td>
<td>Bar</td>
<td>241 (35)</td>
</tr>
<tr>
<td>D145XL</td>
<td>double reel 13.7 m (45 ft.), double knife, untimed</td>
<td>Base</td>
<td>2</td>
<td>Turf</td>
<td>241 (35)</td>
</tr>
</tbody>
</table>
Table 4.1 Drive Tire Inflation Specifications (continued)

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

4.1.11 Starting the Engine

⚠ DANGER

- Avoid possible injury or death from a runaway machine.
- This machine has safety devices which allow the engine to start only when the ground speed lever (GSL) is in PARK, the steering wheel is locked in the PARK position, and the HEADER ENGAGE switch is in the OFF position. Under NO circumstances are these devices to be deliberately rewired or misadjusted so that the engine can be started with controls out of NEUTRAL.
- Do NOT start the engine by shorting across the starter or starter relay terminals. If normal starting circuitry is bypassed, the machine will start with the drive engaged and move.
- Start the engine only from operator’s seat with controls in PARK. NEVER start the engine while standing on ground. NEVER try to start the engine with someone under or near the machine.
- Before starting the engine, be sure there is plenty of ventilation to avoid asphyxiation.
PERFORMING PREDELIVERY CHECKS

IMPORTANT:
Before starting the windrower, check fluid level of the following, and add fluid if necessary:
- Engine oil – Refer to the operator’s manual
- Hydraulic oil – Refer to the operator’s manual
- Gearbox oil – Refer to the operator’s manual

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

NOTE:
Before taking the GSL out of PARK, let the hydraulic oil warm up to 32°C (90°F). You can view the hydraulic oil temperature on Run Screen 4 on the Harvest Performance Tracker (HPT) display.

NOTE:
When the console receives a wake-up signal, the console awakens from sleep mode and closes the battery disconnect relay. The Harvest Performance Tracker (HPT) goes into a boot-up sequence that takes approximately 40 seconds. The following items trigger a wake-up signal for the console:
- Key switch ignition or accessory positions
- Cab door switch
- Horn button
- Hazards button
- Field lights button
- Clearance lights button
- Road lights button
- High beam button

1. Before starting the engine, ensure engine exhaust pipe (A) is not covered or obstructed.

Figure 4.17: Engine Exhaust
2. Ensure the cab-forward or engine-forward directional lock (A) is engaged at the base of the steering column.

3. Move GSL (A) into PARK (C).

4. Turn the steering wheel until it locks. It may be possible to move the steering wheel slightly in the locked position.

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

5. Fasten seat belt.

6. Push HEADER ENGAGE switch (B) to ensure it is in the OFF position.
7. Turn IGNITION switch (A) to the ON position; the Harvest Performance Tracker (HPT) display (B) will illuminate. If the HPT is still booting up, wait for WAIT TO START (WTS) symbol (C) to disappear before trying to start engine.

8. Check that red PARK symbol light (D) is ON and that there are no error messages on screen.

9. Press HORN button (E) three times prior to starting the engine.

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

**NOTE:**
When the engine starts and the header is not engaged, the HPT will display the header disengaged page (B).

**IMPORTANT:**
- Do **NOT** operate the starter for longer than 15 seconds at a time.
- If the engine does not start, wait at least 2 minutes before trying again.
- If you crank the engine for more than 30 seconds within a 2-minute period, the engine will lock the starter circuit to prevent overheating, and a flashing WTS symbol will appear on the display. Wait for the WTS symbol to stop flashing before attempting to crank engine again.
- If the engine still does not start, refer to the operator’s manual.
NOTE:
When the engine temperature is below 5°C (40°F), the engine will cycle through a period where it appears to labor until it warms up. Do **NOT** operate the engine above 1500 rpm until the HPT engine temperature gauge is above the blue range (A).

![Figure 4.22: HPT No Header Screen](image)

*Engine Start Troubleshooting Tips*

If the windrower will not start normally, refer to the following troubleshooting table:

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

**Table 4.2 Engine Start Troubleshooting**

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controls not in NEUTRAL</td>
<td>• Move GSL to NEUTRAL&lt;br&gt;• Move steering wheel to locked (centered) position&lt;br&gt;• Disengage HEADER switch</td>
</tr>
<tr>
<td>Operator’s station not locked</td>
<td>• Adjust position of operator’s station&lt;br&gt;• Ensure lock is engaged</td>
</tr>
<tr>
<td>Neutral interlock misadjusted</td>
<td>• Refer to the windrower technical manual</td>
</tr>
<tr>
<td>No fuel to engine</td>
<td>• Fill empty fuel tank&lt;br&gt;• Replace clogged filter&lt;br&gt;• Check for blocked or damaged fuel lines</td>
</tr>
<tr>
<td>Old fuel in tank</td>
<td>• Drain tank&lt;br&gt;• Refill with fresh fuel</td>
</tr>
<tr>
<td>Water, dirt, or air in fuel system</td>
<td>• Drain, flush, fill, and prime system</td>
</tr>
<tr>
<td>Improper type of fuel</td>
<td>• Drain tank&lt;br&gt;• Refill with correct fuel</td>
</tr>
<tr>
<td>Crankcase oil too heavy</td>
<td>• Replace with recommended oil</td>
</tr>
<tr>
<td>Low battery output</td>
<td>• Test the battery&lt;br&gt;• Check battery electrolyte level</td>
</tr>
</tbody>
</table>
Table 4.2  Engine Start Troubleshooting (continued)

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor battery connection</td>
<td>• Clean and tighten loose connections</td>
</tr>
<tr>
<td>Faulty starter</td>
<td>• Refer to the windrower technical manual</td>
</tr>
<tr>
<td>Wiring shorted, circuit breaker open</td>
<td>• Check continuity of wiring and breaker (manually reset)</td>
</tr>
<tr>
<td>Faulty injectors</td>
<td>• Refer to the windrower technical manual</td>
</tr>
</tbody>
</table>

4.1.12  Checking and Adding Wheel Drive Lubricant

The following procedure is for 10-bolt drive wheels. If the windrower is equipped with the optional high torque power wheels (12–bolt), refer to 4.1.13 Checking Wheel Drive Lubricant Level – 12 Bolt (Optional), page 54.

⚠️ WARNING

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

⚠️ CAUTION

Park on a flat, level surface with the header on the ground, the ground speed lever (GSL) in PARK position, and the steering wheel in locked position (centered). Wait for the HPT to beep and display a red P symbol to confirm the park brakes have engaged.

1. Park the windrower on level ground.
2. Position windrower so plugs (A) and (B) are horizontally aligned with the center (C) of the hub.
3. Shut down the engine, and remove the key from the ignition.
4. Remove plug (A) or (B). The lubricant should be visible through the port or running out slightly.
5. If necessary, add lubricant until lubricant runs out from the open port (A) or (B). For lubricant specifications, refer to 5.1 Lubricants, Fluids, and System Capacities, page 109.

NOTE:

The type of lubricant used after the first wheel drive lubricant change is NOT the same type of lubricant used in the factory. Refer to the manual’s inside back cover for the recommended wheel drive lubricant.

6. Reinstall plugs and tighten.

4.1.13  Checking Wheel Drive Lubricant Level – 12 Bolt (Optional)

Check the wheel drive lubricant level every 250 hours or annually.

⚠️ WARNING

To avoid bodily injury or death from unexpected startup of the machine, always stop the engine and remove the key from the ignition before leaving the operator’s seat for any reason.
1. Park the windrower on level ground.
2. Rotate the wheel drive until fill/drain plug (A) is vertically centered with the hub, and check plug (B) is horizontally aligned with the center of the hub.
3. Shut down the engine, and remove the key from the ignition.

⚠️ WARNING

Use caution when removing plug as there may be pressure in the drive.

4. Remove check plug (B). The lubricant should be visible through the port or running out slightly.
5. Reinstall check plug (B) and torque to 7.5 Nm (6 lbf·ft).
6. Reinstall fill/drain plug (A) and torque to 22 Nm (18 lbf·ft).

Figure 4.24: Wheel Drive – 12 Bolt
4.2 Performing Operational Checks

1. Perform the final checks and adjustments listed on the following pages and the Predelivery Checklist, page 125 (yellow sheet attached to this instruction) to ensure the machine is field-ready.

2. Ensure the Operator or the Dealer retains the completed Predelivery Checklist.

4.2.1 Checking Auto Lights

⚠️ WARNING

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

1. Open the cab door, turn the IGNITION switch to ON and confirm that the Harvest Performance Tracker (HPT) display is booting up by displaying MACDON.

2. Start the engine. For instructions, refer to 4.1.11 Starting the Engine, page 49.

3. If a header is attached, confirm that the HPT default shows the header disengaged screen.
4. If a header is not attached, confirm that the HPT shows the no header screen.

5. Press LIGHT switch (A) to turn on the headlights.

6. Shut down the engine and leave the cab without switching off the lights. Confirm that the HPT display, headlights, and egress light shut off within 3 minutes.

### 4.2.2 Checking Harvest Performance Tracker Display

1. If not already running, start the engine. For instructions, refer to [4.1.11 Starting the Engine, page 49](#).

2. If a header is not attached, check that the no header screen is displayed.
3. If a header is attached, check that header screen (A) is displayed.
4. Check red park symbol (B) is on.
5. Check engine rpm (C) is displayed.
6. Check fuel gauge (D), DEF gauge (E) and temperature gauge (F) in display screen.

**Figure 4.30: HPT Display – Header Attached**

**Navigating the Harvest Performance Tracker**

Turning scroll knob (A) on the Harvest Performance Tracker (HPT) highlights the available options within a menu and increases/decreases the available settings. Pushing the scroll knob selects functions or menu items. Scroll and select functions are duplicated on the ground speed lever (GSL) controls. Unless otherwise specified, these two buttons will always perform the same function and when Select is referred to in this document, either one of these buttons can be used.

1. Turn rotary scroll knob (A) clockwise to move selections down the screen, to the right, clockwise, or to increase settings. Push scroll knob to activate selection.
2. Turn rotary scroll knob (A) counterclockwise to move selections up the screen, to the left, counterclockwise, or to decrease settings. Push scroll knob to activate selection.

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

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

**Figure 4.31: HPT Scroll Knob**

**Figure 4.32: Main Menu**
6. Press BACK button (A) on the HPT to return to previous level within menu structure.

7. Press HOME button (B) on the HPT to return to last selected run screen (or header disengaged screen).

Setting Language and Units of Measurement

To set the language and units of measurement displayed, follow these steps:

1. Navigate to the SETTINGS menu with soft key 5 and the Harvest Performance Tracker (HPT) scroll knob. For instructions, refer to Navigating the Harvest Performance Tracker, page 58.

2. Scroll to SCREEN icon (A) and select it.

3. Scroll to LANGUAGE AND UNITS icon (B), and select it to open the adjustment window.

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

   LANGUAGE
   • ENGLISH (default)
   • SPANISH

   UNITS
   • METRIC
   • USA (default)

Refer to 5.4 Conversion Chart, page 120 for a comprehensive list of U.S. and metric units.
Setting Time and Date

Whenever the Harvest Performance Tracker (HPT) boots up, the time and date will display according to your selected configuration.

1. Navigate to the SETTINGS Menu with soft key 5 and the HPT scroll knob. For instructions, refer to Navigating the Harvest Performance Tracker, page 58.
2. Scroll to the SCREEN option (A) and select it.
3. Scroll to the TIME AND DATE option (B), and select it to open the adjustment window.
4. Scroll through the available options on the HPT display, select the desired option, and scroll to adjust.
Setting Windrower Tire Size

The Harvest Performance Tracker (HPT) is factory-set for 600/65R28 bar tires. If the windrower has a different tire type, you need to change this setting. Setting the proper tire size is important for accurate tracking of ground speed, acres, and productivity data.

1. Navigate to the SETTINGS menu with soft key 5 and the HPT scroll knob. For instructions, refer to Navigating the Harvest Performance Tracker, page 58.
2. Scroll to the WINDROWER SETTINGS icon (A) and select it.
3. Scroll to the TIRES icon (B), and select it to display the adjustment window.

**NOTE:**
The F3 shortcut button on the operator’s console will also display the WINDROWER SETTINGS menu.

4. Scroll to highlight the appropriate tire size (A) and select it. The new selection will be displayed with a shaded green radio button.

4.2.3 Checking Engine Speed

1. Move the throttle to idle position.
2. Check engine speed (A) on the Harvest Performance Tracker (HPT) display and compare to value in table below.
3. Move the throttle to maximum rpm position.
4. Check engine speed (A) on the HPT and compare to value in table below.

**Table 4.3 Engine Speed**

<table>
<thead>
<tr>
<th></th>
<th>Maximum (No Load)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idle</td>
<td>1000 rpm</td>
</tr>
<tr>
<td></td>
<td>2500 rpm</td>
</tr>
</tbody>
</table>
4.2.4 Checking Selective Catalytic Regeneration Conditioning Mode

To prevent loss of engine power due to inhibiting exhaust system cleaning for a prolonged period, ensure that the selective catalytic regeneration (SCR) conditioning inhibit mode is off—indicator (A) on the Harvest Performance Tracker (HPT) display is NOT highlighted—before delivery to the customer.

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

1. Press the soft key 5/menu button (A) on the HPT.

2. Press soft key 5/menu button (A) next to the EXHAUST AFTERTREATMENT icon (B).

3. To turn off SCR conditioning inhibit mode, press soft key 5/ menu button (A) next to the INHIBIT SCR CONDITIONING icon (B), and hold for 3 seconds. The highlighted SCR CONDITIONING INHIBIT icon (C) will turn off.
4.2.5 Checking Exterior Lights

1. *For models with LED lighting:* Remove plastic film from LED lighting.
2. Rotate operator’s seat to cab-forward mode.
3. Press FIELD LIGHT switch (A).
4. Check that front field lights (B), rear field lights (C), and rear swath lights (D) are functioning.

---

**Figure 4.43: Field Lights**
5. Press ROAD LIGHT switch (A), and check that front road lights (B) and rear red tail/brake lights (C) are functioning.
6. Press HIGH/LOW switch (D), and check lights (B).
7. Press TURN SIGNAL switches (E) on console, and check amber lights (F).
8. Press HAZARD LIGHT switch (G), and check flashing hazard lights (F).
9. Press switches to shut off lights.
10. Rotate operator’s seat to engine-forward mode.

11. Press ROAD LIGHT switch (A), and check that front road lights (B) and rear red tail/brake lights (C) are functioning.

12. Press HIGH/LOW switch (D) and check lights (B).

13. Press TURN SIGNAL switches (E) switches on console and check amber lights (F).

14. Press HAZARD LIGHT switch (G) and check flashing hazard lights (F).

15. Press switches to shut off lights.

Figure 4.45: Road Lights – Engine-Forward
16. Push BEACON SWITCH (A), and check that amber beacons (B) are functioning.

17. Press switch to shut off beacons.

4.2.6 Checking Horn

1. Push HORN button (A) and listen for horn.
4.2.7 Checking Interior Lights

1. Open the cab door and check that interior light (A) illuminates.

2. Enter the cab and the close door; the light should go off.

3. Turn the IGNITION key to the RUN position.

4. Push OVERHEAD DOME LIGHT switch (A) to the ON position (B) and check that the light illuminates.

5. Push the LIGHT switch to the DOOR position (C) and check that the light is off.

6. Open the door and check that the light illuminates. Leave the door open.

7. Push switch (A) to OFF position (D) and check that the light is off.

4.2.8 Checking Climate Controls

1. Start the engine and allow it to reach operating temperature.

2. If starting a machine that has been stored for more than 1 week, distribute the oil throughout the A/C system as follows:
   
b. Press + (A) on the FAN SPEED switch to start the fan, adjust temperature control (B) to maximum heating, and press A/C switch (C) if necessary so that the LED light is NOT lit.

b. Press A/C switch (C) to ON (LED light is lit) for one second, then OFF for 5 to 10 seconds. Repeat this step ten times.
3. Press AUTO FAN switch (A) (LED light shows orange) and then press RED TEMPERATURE CONTROL switch (B) until warm air flows through cab vents.

4. Press BLUE TEMPERATURE CONTROL switch (C) until cool air enters the cab.

5. Press FAN SPEED switch (D) (+ or –) and note change in air flow. The AUTO FAN light should be off.

6. Press RECIRCULATING AIR switch (E) and check air flow in cab.

7. Press WINDSHIELD DEFOG/DEFROST switch (F) and check air flow on windshield.

**Figure 4.51: Climate Controls**

### 4.2.9 Checking the Radio and Activating the Bluetooth® Feature

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

**Figure 4.52: Radio and Speakers**

1. To check the radio, follow this procedure:
   a. Turn the IGNITION key to RUN position.
   b. Press POWER button (A) to turn the radio on. Hold the POWER button to turn it off.
     
     **NOTE:**
     The button will illuminate red when OFF and blue when ON.
   c. Press BAND/BACK button (B) to change radio bands.
   d. Rotate Volume/Select knob (C) to change the volume level.
   e. Insert a CD into disc slot (D), or connect a USB storage device to the unit. The radio will automatically switch mode and begin playback after media is successfully loaded.

**Figure 4.53: Radio**
2. To activate the Bluetooth® feature, follow this procedure:
   a. Press POWER button (A) to turn radio on.
   b. Press and hold VOL/SEL knob (B) for two seconds. MENU is displayed on screen (C).
   c. Rotate VOL/SEL (B) to highlight BT SET menu and press VOL/SEL to select. BLUETOOTH ON/OFF is displayed (C).
   d. Press VOL/SEL to select BLUETOOTH.
   e. Rotate the VOL/SEL knob to display ON and press VOL/SEL to select.
   f. Rotate the VOL/SEL knob and select DISCOVER.
   g. Rotate the VOL/SEL knob to display ON and press VOL/SEL to select.
4.3 Checking Manuals

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

1. Ensure the following manuals are included with the windrower:
   - Operator’s Manual
   - Parts Catalog
   - Quick Card
   - Engine Manual
4.4 Performing Final Steps

1. After the predelivery checks are complete, remove the plastic covering from the Harvest Performance Tracker (HPT) and the seats.

2. If the optional GPS kit is included, locate GPS mount parts bag inside the cab, and install it according to the instructions included with the EZ Pilot® or Autopilot™ bundle. If not installing kit, place GPS mount parts bag in toolbox for future installation.

3. Remove the Keep This Door Closed sign from the right door AFTER the right leg is repositioned to field configuration.

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

Figure 4.57: Windshield Decal
4.5 Attaching a Header to an M1 Series Windrower

4.5.1 A40DX Auger Header

*Attaching an A40DX Auger Header*

The windrower may have an optional self-aligning hydraulic center-link that allows vertical position control of the center-link from the cab.

**WARNING**

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

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

**CAUTION**

Check to be sure all bystanders have cleared the area.

2. Start the engine. For instructions, refer to 4.1.11 Starting the Engine, page 49.

**IMPORTANT:**

When lowering the header lift legs without a header or weight box attached to the windrower, ensure the float springs tension is fully released to prevent damage to the header lift linkages.

**NOTE:**

If not prompted by the Harvest Performance Tracker (HPT) display to remove float, remove float manually by doing the following:
3. Press HPT scroll knob (A) to highlight QuickMenu options.

4. Rotate HPT scroll knob (A) to highlight the HEADER FLOAT symbol (B) and press the scroll knob to select.

5. On FLOAT ADJUST PAGE, press soft key 3 (A) to remove float.

6. Press the HEADER DOWN switch (A) on the ground speed lever (GSL) to fully retract header lift cylinders.

7. For hydraulic center-link with self-alignment, press the REEL UP switch (B) on the GSL to raise the center-link until the hook is above the attachment pin on the header.

**IMPORTANT:**
If the center-link is too low, it may contact the header as the windrower approaches the header for hookup.
8. If the hydraulic center-link self-alignment kit is not installed, relocate pin (A) in frame linkage as required to raise the center-link (B) until the hook is above the attachment pin on the header.

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

9. Drive the windrower slowly forward so feet (A) on the windrower enter supports (B) on the header. Continue to drive slowly forward until the feet engage the supports, and the header nudges forward.

10. If the hydraulic center-link self-alignment kit is installed, adjust position of the center-link cylinder (A) with switches on the GSL until the hook (B) is above the header attachment pin.

11. For hydraulic center-link without self-alignment, push down on the rod end of link cylinder (C) until the hook engages and locks onto the header pin.

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

12. For hydraulic center-link with self-alignment, lower center-link (A) onto the header with REEL DOWN switch on the GSL until it locks into position (hook release [D] is down).

13. For hydraulic center-link with self-alignment, check that center-link is locked onto header by pressing the REEL UP switch on the GSL.
CAUTION

Check to be sure all bystanders have cleared the area.

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

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

NOTE:
This procedure may have to be repeated if there is air in the system.

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

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

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

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

IMPORTANT:
Ensure clevis pin (A) is fully inserted and the hairpin is installed behind bracket.
19. Remove the lynch pin from clevis pin (A) in stand (B).
20. Hold stand (B) and remove pin (A).
21. Move the stand to storage position by inverting and relocating onto bracket as shown. Reinsert clevis pin (A) and secure with the lynch pin.

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

**NOTE:**
If the safety prop will **NOT** disengage, raise the header to release the prop.
   a. Turn lever (A) away from the header to raise the safety prop until the lever locks into the vertical position.
   b. Repeat for the opposite cylinder.
23. Repeat for the opposite side.

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

24. Start the engine and press HEADER DOWN switch (A) on GSL to fully lower the header.
25. Press rotary scroll knob (A) on the HPT to highlight the QuickMenu options.

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

27. Turn scroll knob (A) to highlight left (B) or right (C) float and press knob (A) to activate selection.

28. Rotate scroll knob (A) to adjust the float setting and press the knob when finished.

**IMPORTANT:**
Float adjustments of 1.0 (out of 10) change the header weight at the cutterbar by approximately 91 kg (200 lb.). Adjust the float in increments of 0.05 to optimize field performance.

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

30. Grasp one end of the auger header and lift. Lifting force should be 335–380 N (75–85 lbf) at both ends.

**Connecting A40DX Auger Hydraulics**

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

1. Approach platform/stair unit (A) on the left cab-forward side of the windrower and ensure the cab door is closed.

2. Push latch (B), and pull platform (A) toward the walking beam until it stops and the latch engages.
3. Retrieve hydraulic multicouplers (A) and electrical harness (B) from the header.

4. Route the hose/harness bundle toward the windrower through support (C).

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

6. Clean the multicouplers and receptacles to prevent contamination.

7. Push button (A) on the rear multicoupler receptacle and rotate handle (B) away from the windrower.

8. Open cover (C) and position multicoupler (D) onto the receptacle. Align the pins in the coupler with slots in handle (B), and rotate the handle toward the windrower so that the coupler is locked onto the receptacle and button (A) snaps out.

9. Push button (E) on the front multicoupler receptacle and rotate handle (F) away from the windrower.

10. Open cover (G) and position multicoupler (H) onto the receptacle. Align the pins in the coupler with slots in the handle, and rotate the handle toward the windrower so that the coupler is locked onto the receptacle and button (E) snaps out.
PERFORMING PREDELIVERY CHECKS

*M1170 configured with R1 Hydraulic Drive Bundle (B6621):*

11. If switching from a rotary header to an auger header, remove hose (A) from storage location (B) and connect to knife pressure receptacle (C) on the frame.

12. Remove cover from receptacle (A), and connect the electrical harness from the header.

Figure 4.78: Knife Pressure Hose Positions
1 - Hose in Storage Position (Rotary Configuration)
2 - Hose to Knife Pressure Receptacle (Auger/Draper Configuration)

Figure 4.79: Electrical Connectors
13. Push latch (A) to unlock platform (B).

14. Pull platform (A) towards the cab until it stops and latch engages.

4.5.2 D1X or D1XL Series Draper Header

*Attaching Draper Header Supports*

Draper header supports are required to attach a D1X or D1XL Series Draper Header to the windrower.

⚠️ **WARNING**

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

If not installed, attach the draper header support (supplied with the header) to the windrower lift linkage as follows:
1. Remove the hairpin and clevis pin (B) from draper header support (A).

2. Position draper header support (B) on lift linkage (A), and reinstall clevis pin (C).

**NOTE:**
To avoid the pin snagging the windrow, install the clevis pin on the outboard side of the draper header support.

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

4. Repeat for the opposite lift linkage.

*Attaching a D1X or D1XL Series Draper Header*

The windrower may have an optional self-aligning hydraulic center-link that allows vertical position control of the center-link from the cab.

**NOTE:**
Draper header supports must be installed onto the windrower lift linkage before starting this procedure. For instructions, refer to [Attaching Draper Header Supports, page 80](#).

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

1. Shut down the engine, and remove the key from the ignition.
2. **For windrowers without the self-aligning center-link kit:**
   Relocate pin (A) in the frame linkage as required to raise the center-link (B) until the hook is above the attachment pin on the header.

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

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

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

4. Start the engine. For instructions, refer to 4.1.11 Starting the Engine, page 49.

   ! **CAUTION**
   When lowering header lift legs without a header or weight box attached to the windrower, ensure the float springs tension is fully released to prevent damage to the header lift linkages.

   **NOTE:**
   If not prompted by the Harvest Performance Tracker (HPT) display to remove float, remove float manually as follows:
5. Press scroll knob (A) on the HPT to display the QuickMenu system.

6. Rotate scroll knob (A) to highlight HEADER FLOAT symbol (B), and press the scroll knob to select.

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

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

**IMPORTANT:**
If the center-link is too low, it may contact the header as the windrower approaches the header for hookup.
9. Drive the windrower slowly forward until draper header supports (A) enter header legs (B). Continue driving slowly forward until lift linkages contact the support plates in the header legs and the header nudges forward.

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

11. **Self-Aligning Hydraulic Center-Link:**

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

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

   b. If hook release (C) is open (up), shut down the engine, and remove the key from the ignition. Manually push hook release (C) down after the hook engages the header pin.

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

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

12. **Hydraulic Center-Link without Self-Alignment:**

   a. Press HEADER TILT UP or HEADER TILT DOWN cylinder switches on the GSL to extend or retract center-link cylinder until the hook is aligned with the header attachment pin.

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

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

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

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

Check to be sure all bystanders have cleared the area.

e. Start the engine.

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

NOTE:

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

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

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

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

15. Engage the safety props on both lift cylinders as follows:

a. Pull lever (A) toward you to release, and then rotate toward header to lower the safety prop onto the cylinder.

b. Repeat for the opposite lift cylinder.

IMPORTANT:

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

16. Install pin (B) through the header leg (engaging U-bracket in draper header support) on both sides and secure with a hairpin (A).

17. Raise header stand (D) to storage position by pulling spring pin (C) and lifting stand into uppermost position. Release spring pin.
18. Disengage the safety props on both lift cylinders as follows:

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

a. Turn lever (A) away from the header to raise the safety prop until the lever locks into the vertical position.

b. Repeat for the opposite cylinder.

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

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

20. Press rotary scroll knob (A) on Harvest Performance Tracker (HPT) to highlight QuickMenu options.

21. Rotate scroll knob (A) to highlight HEADER FLOAT symbol (B), and press scroll knob to select.
22. Turn scroll knob (A) to highlight left (B) or right (C) float and press knob (A) to activate selection.

23. Rotate scroll knob (A) to adjust float setting and press knob when finished.

**IMPORTANT:**
Float adjustments of 1.0 (out of 10) change the header weight at the cutterbar by approximately 91 kg (200 lb.). Adjust float in increments of 0.05 to optimize field performance.

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

25. Grasp one end of the draper header and lift. Lifting force should be 335–380 N (75–85 lbf) and should be the same at both ends.

26. Proceed to *Connecting D1X or D1XL Series Draper Header Hydraulics, page 87.*

*Connecting D1X or D1XL Series Draper Header Hydraulics*

**IMPORTANT:**
To prevent contamination of the hydraulic system, use a clean rag to remove dirt and moisture from all (fixed and movable) hydraulic couplers.

1. Push link on latch (C) and pull handle (A) on hose management system (B) rearward to disengage arm from the latch.

2. Move hose management system (B) toward the left cab-forward side of the windrower.
3. Ensure the cab door is closed on the left cab-forward side of the windrower.

4. Push latch (B), and pull platform (A) toward the walking beam until the platform stops and the latch engages.

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

6. Open the platform.
M1170 configured with R1 Hydraulic Drive kit (MD B6621):

7. If switching from a rotary header to a draper header, remove hose (A) from storage location (B) and connect to knife pressure receptacle (C) on the frame.

8. Retrieve draper drive and reel control multicoupler (A) from the hose management system.

9. Push knob (B) on hydraulic receptacle and pull handle (C) fully away from the windrower.

10. Open cover (D) and position coupler onto the receptacle. Align the pins in the coupler with slots in handle (C) and push the handle toward the windrower so that the coupler locks onto the receptacle and knob (B) snaps out.

11. Remove hose quick-disconnect (F) from the storage location and connect to receptacle on the frame.

NOTE:
Hose quick-disconnect (F) is only present on M1240 machines configured for draper headers, and on M1170 machines with the R1 Series Hydraulic Drive kit (MD B6621) installed.

12. Remove the cover from electrical connector (E), push the electrical connector onto the receptacle, and secure it by turning the collar on the electrical connector clockwise.
13. Retrieve knife and reel drive multicoupler (A) from the hose management system.

14. Push knob (B) on the hydraulic receptacle and pull handle (C) fully away from the windrower.

15. Open cover (D) and position the coupler onto the receptacle. Align the pins in the coupler with the slots in handle (C), and push the handle toward the windrower so that the coupler locks onto the receptacle and knob (B) snaps out.

16. Close the platform.

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

18. Push the platform towards the cab until it stops and the latch engages.

19. Ensure hydraulic hose routing is as straight as possible and avoids potential rub/wear points.
4.5.3 R1 Series Rotary Disc Header

Attaching R1 Series Rotary Disc Header

The windrower may have an optional self-aligning hydraulic center-link that allows vertical position control of the center-link from the cab.

⚠️ WARNING

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

1. Hydraulic Center-Link without Self-Alignment: Remove pin (A) and raise center-link (B) until hook is above the attachment pin on header. Replace pin (A) to hold center-link in place.

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

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

3. Start the engine. For instructions, refer to 4.1.11 Starting the Engine, page 49.

⚠️ CAUTION

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

When lowering header lift legs without a header or weight box attached to the windrower, ensure the float springs tension is fully released to prevent damage to the header lift linkages.

---

1. Press rotary scroll knob (A) on Harvest Performance Tracker (HPT) display to highlight QuickMenu options.
2. Rotate scroll knob (A) to highlight the HEADER FLOAT symbol (B), and press scroll knob to select. The header float adjust screen displays.

---

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

**NOTE:**

If the header float is active, the icon at soft key 3 will display REMOVE FLOAT; if header float has been removed, the icon will display RESUME FLOAT.
7. Press HEADER DOWN switch (E) on ground speed lever (GSL) to fully retract header lift cylinders.

8. **Self-Aligning Hydraulic Center-Link**: Press REEL UP switch (B) on the GSL to raise the center-link until the hook is above the attachment pin on the header.

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

9. Drive the windrower slowly forward until feet (A) enter supports (B). Continue to drive slowly forward until feet engage the supports and header nudges forward.

10. Ensure feet (A) are properly engaged in supports (B).

11. **Self-Aligning Hydraulic Center-Link**:

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

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

    b. If hook release (C) is open (up), shut down the engine, and remove the key from the ignition. Manually push hook release (C) down after the hook engages the header pin.

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

    d. Check that center-link is locked onto header by pressing the REEL UP switch on the GSL.
12. **Hydraulic Center-Link without Self-Alignment:**
   a. Press HEADER TILT UP or HEADER TILT DOWN cylinder switches on the GSL to extend or retract center-link cylinder until the hook is aligned with the header attachment pin.
   b. Shut down the engine, and remove the key from the ignition.
   c. Push down on rod end of link cylinder (B) until hook engages and locks onto header pin.
   **IMPORTANT:**
   Hook release must be down to enable self-locking mechanism. If the hook release is open (up), manually push it down after hook engages pin.
   d. Check that center-link (A) is locked onto header by pulling upward on rod end (B) of cylinder.
   
   ![Figure 4.116: Hydraulic Center-Link](image)

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

   e. Start the engine.

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

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

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

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

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

![Figure 4.117: GSL](image)

![Figure 4.118: Safety Prop Lever](image)
16. Install clevis pin (A) through support and windrower lift arm and secure with hairpin (B). Repeat for the opposite side of the header.

**IMPORTANT:**
Ensure clevis pin (A) is fully inserted, and hairpin is installed behind bracket.

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

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

a. Turn lever (A) away from the header to raise the safety prop until the lever locks into the vertical position.

b. Repeat for the opposite cylinder.

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

19. Shut down the engine, and remove the key from the ignition.
20. If not prompted by the HPT display to restore header float, restore header float manually by doing the following:
   a. Press rotary scroll knob (A) on Harvest Performance Tracker (HPT) to highlight QuickMenu options.
   b. Rotate scroll knob (A) to highlight HEADER FLOAT symbol (B), and press scroll knob to select. Screen changes.

21. Press soft key 3 (A) to restore the header float.
   **NOTE:**
   If the header float is active, the icon at soft key 3 will display REMOVE FLOAT; if header float has been removed, the icon will display RESUME FLOAT.

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

---

**Connecting R1 Series Rotary Disc Header Hydraulics to an M1170**

**IMPORTANT:**
To prevent contamination of the hydraulic system, use a clean rag to remove dirt and moisture from all (fixed and movable) hydraulic couplers.

1. Approach platform/stair unit (A) on the left cab-forward side of the windrower and ensure the cab door is closed.
2. Push latch (B), and pull platform (A) toward the walking beam until it stops and the latch engages.
3. Open the platform.
4. Retrieve the hydraulic hoses from the header.
5. Attach hose support (A) to the frame near the windrower left cab-forward leg, and route hoses under frame.

**NOTE:**
Route hydraulic hoses as straight as possible, and avoid rub/wear points that could cause damage.

6. Disconnect male coupler (A) from pressure hose.

7. Disconnect female coupler and fitting (B) from return hose.

8. Remove coupling and cap (A) and plug (B) from fittings on windrower.
9. Install male coupler onto pressure fitting (A), and female coupler onto return fitting (B) on windrower.

10. Tighten couplers onto fittings.
11. Retrieve the parts shown in Figure 4.129, page 98 from the bag located inside left header support.

12. Connect female coupler (B) to hose (A).

13. Disconnect steel line (A) from elbow (B) and tee (C) (inside frame) and remove line. Discard line.

14. Install cap (A) on tee.

15. Reposition elbow (B) as shown.
16. Remove two existing nuts (A) securing multicoupler to bracket (B).
17. Position new bracket (C) onto existing bolts and secure with existing nuts (A).
18. Install rubber coupler holder (D) into bracket (C).

19. Connect fitting (A) on knife pressure hose to elbow fitting (B).
20. Place female coupler (C) on knife pressure hose into holder (D).
If switching from an auger/draper header to a rotary header:

21. Disconnect hose (A) from knife pressure receptacle (C) on frame, and move to storage location (B).

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

IMPORTANT:
The hydraulic hoses should have enough slack to pass by multicoupler (E) without coming into contact with it. This will protect the hoses from rubbing against the multicoupler and becoming damaged. You can increase slack in the hoses by loosening and adjusting the hose holder on the front windrower leg, and pulling the hoses backward toward the windrower.
23. Push latch (B) to unlock platform (A).

24. Pull platform (A) towards the cab until it stops and latch engages.

25. Close the platform.
4.6 Adjusting Header Settings on the Harvest Performance Tracker

Before operating the header, ensure the Harvest Performance Tracker (HPT) settings are appropriate for your header.

1. Navigate to SETTINGS menu with soft key 5 and HPT scroll knob. For instructions, refer to Navigating the Harvest Performance Tracker, page 58 if required.

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

   **NOTE:**
   Settings vary depending on the header type.

3. Scroll to highlight appropriate option and press the scroll knob to select it.
   - For example, if a draper header is attached, and ATTACHMENTS (B) is selected, the available choice is DOUBLE DRAPER DRIVE.

4. After completing the SETTINGS, proceed to 4.7 Calibrating the Header Systems, page 104, and 4.8 Calibrating Knife Drive on Harvest Performance Tracker, page 107.

Figure 4.139: Header Settings
4.7 Calibrating the Header Systems

When a header is attached to the windrower, the Harvest Performance Tracker (HPT) will recognize the header ID and determine the appropriate systems to calibrate. The following sensors may require calibration depending on header type:

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

Recalibration is required if the HPT is replaced, a position sensor is replaced, sensor readouts are erratic, or a new header type or attachment is connected to the windrower.

**NOTE:**
To calibrate the knife drive, the header must be attached and engaged. If the header is disengaged when calibration is selected, the message ENGAGE HEADER will appear on the screen.

**NOTE:**
Calibrations **MUST** be performed with the engine running. Some calibrations will **NOT** be available with engine off.

**CAUTION**
Before starting the machine, check to be sure all bystanders have cleared the area.

1. Start the engine, and engage the header.
2. Press soft key 5 (A) to open the HPT main menu.
3. Use HPT scroll knob (B) or the ground speed lever (GSL) scroll wheel to scroll to settings icon (C).
4. Press HPT scroll knob (B) or the GSL SELECT button (not shown) to activate the settings menu options.

![Figure 4.140: Opening the Main Menu](image-url)
5. Scroll to WINDROWER SETTINGS icon (A) and press SELECT.

6. Scroll to CALIBRATION icon (B), and press SELECT to open the adjustment page.

**NOTE:**
The F3 shortcut button on the operator’s console will also open the WINDROWER SETTINGS menu.

7. Select POSITION SENSORS (A).

8. Select CALIBRATION WITH HEADER ENGAGED to display the calibration page as shown at right.

9. Press the PLAY button on the screen to begin the calibration process.

**NOTE:**
If the engine speed is less than 1500 rpm when you press the PLAY button, the calibration system will accelerate the engine to 1500 rpm.
10. When Stage 1 of the calibration is complete, press the PLAY button (A) on the screen to continue with Stage 2 of the calibration process.

11. When Stage 2 of the calibration is complete, press the RESUME button (A) on the screen to set HEADER FLOAT, or press the HOME or BACK button (not shown) to exit without setting the float.

**NOTE:**
Press the X button (A) on the screen (or press the HOME, BACK, or any GSL button [buttons not shown]) at any time during the calibration process to EXIT calibration without saving. The engine speed will return to the original rpm prior to starting the calibration process.

**NOTE:**
If a sensor goes out of its normal operating range during the calibration process, calibration will stop, and a message will appear on the screen indicating that the sensor is out of range. A flashing amber question mark will appear on the calibration icon in the menu system. If a sensor is out of range, adjust the sensor and restart the calibration process.
4.8 Calibrating Knife Drive on Harvest Performance Tracker

**NOTE:**
Calibration of the knife drive must be completed with the header attached; the header must be engaged to perform the calibration procedure. If the header is disengaged when calibration is selected, the message ENGAGE HEADER will appear on the screen.

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

1. Start the windrower and engage the header.
2. Press soft key 5 (A) to open the main menu.
3. Use HPT scroll knob (B) or the ground speed lever (GSL) scroll wheel (not shown) to highlight SETTINGS icon (C).
4. Press HPT scroll knob (B) or the GSL SELECT button (not shown) to activate the settings menu options.

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

**NOTE:**
The F3 shortcut button on the operator’s console will also open the WINDROWER’S SETTINGS menu.

7. Select KNIFE DRIVE.
8. Press the PLAY button on the screen to begin the calibration process.

NOTE:
During the calibration sequence, the engine rpm and header speed will increase and decrease multiple times.

NOTE:
Press X button (A) on the screen or use the Header Disengage Switch at any time during the calibration process to EXIT calibration without saving. The engine speed will return to the original rpm prior to starting the calibration process.

Figure 4.149: Calibration Page
# Chapter 5: Reference

## 5.1 Lubricants, Fluids, and System Capacities

**WARNING**

To avoid injury or death, do not allow ANY machine fluids to enter the body.

### Table 5.1 System Capacities

<table>
<thead>
<tr>
<th>Lubricant/Fluid</th>
<th>Location</th>
<th>Description</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diesel exhaust fluid (DEF)</td>
<td>Diesel exhaust fluid tank</td>
<td>Must meet ISO 22241 requirements.</td>
<td>28 liters (7.5 U.S. gallons)</td>
</tr>
<tr>
<td>Grease</td>
<td>As required unless otherwise specified</td>
<td>SAE multi-purpose high temperature extreme pressure (EP2) performance with 1% max molybdenum disulphide (NLGI Grade 2) lithium base</td>
<td>As required unless otherwise specified</td>
</tr>
<tr>
<td>Diesel fuel</td>
<td>Fuel tank</td>
<td>Ultra low sulphur diesel (ULSD) Grade No. 2, or ULSD Grade No. 1 and 2 mix; refer to 5.2 Fuel Specifications, page 111 for more information</td>
<td>518 liters (137 U.S. gallons)</td>
</tr>
<tr>
<td>Hydraulic oil</td>
<td>Hydraulic reservoir</td>
<td>Single grade transmission/hydraulic fluid (THF)</td>
<td>60 liters (15.8 U.S. gallons)³</td>
</tr>
<tr>
<td>Gear lubricant</td>
<td>Gearbox</td>
<td>SAE 75W-140 or 80W-140, API service class GL-5 fully synthetic gear lubricant (SAE J2360 preferred)</td>
<td>2.3 liters (2.4 U.S. quarts)</td>
</tr>
<tr>
<td>Gear lubricant</td>
<td>Standard Wheel drive</td>
<td>SAE 75W-140 or 80W-140, API service class GL-5 fully synthetic gear lubricant (SAE J2360 preferred)</td>
<td>1.4 liters (1.5 U.S. quarts)</td>
</tr>
<tr>
<td>Gear lubricant</td>
<td>High Torque Wheel drive</td>
<td>SAE 85W-140, API service class GL-5 fully synthetic gear lubricant</td>
<td>4.5 liters (4.8 U.S. quarts)</td>
</tr>
<tr>
<td>Antifreeze M1170</td>
<td>Engine cooling system</td>
<td>ASTM D-6210 and Fleetguard ES Compleat®</td>
<td>31 liters (8.2 U.S. gallons)</td>
</tr>
<tr>
<td>Engine oil M1170</td>
<td>Engine oil pan</td>
<td>SAE 15W-40 compliant with SAE specs for API Class SJ and CJ-4 engine oil</td>
<td>11 liters (11.6 U.S. quarts)</td>
</tr>
<tr>
<td>Air conditioning refrigerant</td>
<td>Air conditioning system</td>
<td>R134A</td>
<td>2.38 kg (5.25 lb.)</td>
</tr>
</tbody>
</table>

2. Optional when operating temperature is below 0°C (32°F).
Table 5.1  System Capacities (continued)

<table>
<thead>
<tr>
<th>Lubricant/Fluid</th>
<th>Location</th>
<th>Description</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air conditioning refrigerant oil</td>
<td>Air conditioning system total capacity</td>
<td>PAG SP-15</td>
<td>240 cc (8.1 fl. oz.)</td>
</tr>
<tr>
<td>Windshield washer fluid</td>
<td>Windshield washer fluid tank</td>
<td>SAE J942 compliant</td>
<td>4 liters (1 U.S. gallon)</td>
</tr>
</tbody>
</table>

If Fleetguard ES Compleat® is unavailable, use a coolant concentrate or prediluted coolant intended for use with heavy duty diesel engines and with a minimum of the following chemical and physical properties:

- Provides cylinder cavitation protection according to fleet study run at or above 60% load capacity.
- Protects the cooling system metals (cast iron, aluminum alloys, and copper alloys such as brass) from corrosion.

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

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

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

**IMPORTANT:**

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

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

Table 5.2 Fuel Specifications

<table>
<thead>
<tr>
<th>Fuel</th>
<th>Specification</th>
<th>Sulphur (by weight)</th>
<th>Water and Sediment (by volume)</th>
<th>Cetane No. °C (°F)</th>
<th>Lubricity</th>
</tr>
</thead>
<tbody>
<tr>
<td>ULSD Grade No. 2</td>
<td>ASTM D975</td>
<td>0.5% maximum</td>
<td>0.05% maximum</td>
<td>40 (104) minimum</td>
<td>520 Microns</td>
</tr>
<tr>
<td>ULSD Grade No. 1 and 2 mix&lt;sup&gt;4&lt;/sup&gt;</td>
<td>n/a</td>
<td>1% maximum</td>
<td>0.1% maximum</td>
<td>45–55 (113–130) cold weather / high altitude</td>
<td>460 Microns</td>
</tr>
</tbody>
</table>

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

- A cetane improver additive can be used with low cetane fuels.
- A wax crystal modifier can help with fuels with high cold filter plugging points (CFPP).
- An anti-icer can help prevent ice formation in wet fuel during cold weather.
- An antioxidant or storage stability additive can help with fuel system deposits and poor storage stability.
- Diesel fuel conditioner can be used to increase the lubricity of fuels so that they meet the requirements given in Table 5.2, page 111.

---

<sup>4</sup> Optional when operating temperature is below 0°C (32°F).
5.3 Torque Specifications

The following tables provide correct torque values for various bolts, cap screws, and hydraulic fittings.

- Tighten all bolts to torque values specified in charts (unless otherwise noted throughout this manual).
- Replace hardware with same strength and grade of bolt.
- Use torque value tables as a guide and periodically check tightness of bolts.
- Understand torque categories for bolts and cap screws by using their identifying head markings.

**Jam nuts**

When applying torque to finished jam nuts, multiply the torque applied to regular nuts by \( f=0.65 \).

**Self-tapping screws**

Standard torque is to be used (**NOT** to be used on critical or structurally important joints).

### 5.3.1 Metric Bolt Specifications

**Table 5.3 Metric Class 8.8 Bolts and Class 9 Free Spinning Nut**

<table>
<thead>
<tr>
<th>Nominal Size (A)</th>
<th>Torque (Nm)</th>
<th>Torque (lbf-ft) (*lbf-in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-0.5</td>
<td>1.4</td>
<td>1.6</td>
</tr>
<tr>
<td>3.5-0.6</td>
<td>2.2</td>
<td>2.5</td>
</tr>
<tr>
<td>4-0.7</td>
<td>3.3</td>
<td>3.7</td>
</tr>
<tr>
<td>5-0.8</td>
<td>6.7</td>
<td>7.4</td>
</tr>
<tr>
<td>6-1.0</td>
<td>11.4</td>
<td>12.6</td>
</tr>
<tr>
<td>8-1.25</td>
<td>28</td>
<td>30</td>
</tr>
<tr>
<td>10-1.5</td>
<td>55</td>
<td>60</td>
</tr>
<tr>
<td>12-1.75</td>
<td>95</td>
<td>105</td>
</tr>
<tr>
<td>14-2.0</td>
<td>152</td>
<td>168</td>
</tr>
<tr>
<td>16-2.0</td>
<td>236</td>
<td>261</td>
</tr>
<tr>
<td>20-2.5</td>
<td>460</td>
<td>509</td>
</tr>
<tr>
<td>24-3.0</td>
<td>796</td>
<td>879</td>
</tr>
</tbody>
</table>

---

**Figure 5.1: Bolt Grades**
Table 5.4 Metric Class 8.8 Bolts and Class 9 Distorted Thread Nut

<table>
<thead>
<tr>
<th>Nominal Size (A)</th>
<th>Torque (Nm)</th>
<th>Torque (lbf-ft) (*lbf-in)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Min.</td>
<td>Max.</td>
</tr>
<tr>
<td>3-0.5</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td>3.5-0.6</td>
<td>1.5</td>
<td>1.7</td>
</tr>
<tr>
<td>4-0.7</td>
<td>2.3</td>
<td>2.5</td>
</tr>
<tr>
<td>5-0.8</td>
<td>4.5</td>
<td>5</td>
</tr>
<tr>
<td>6-1.0</td>
<td>7.7</td>
<td>8.6</td>
</tr>
<tr>
<td>8-1.25</td>
<td>18.8</td>
<td>20.8</td>
</tr>
<tr>
<td>10-1.5</td>
<td>37</td>
<td>41</td>
</tr>
<tr>
<td>12-1.75</td>
<td>65</td>
<td>72</td>
</tr>
<tr>
<td>14-2.0</td>
<td>104</td>
<td>115</td>
</tr>
<tr>
<td>16-2.0</td>
<td>161</td>
<td>178</td>
</tr>
<tr>
<td>20-2.5</td>
<td>314</td>
<td>347</td>
</tr>
<tr>
<td>24-3.0</td>
<td>543</td>
<td>600</td>
</tr>
</tbody>
</table>

Table 5.5 Metric Class 10.9 Bolts and Class 10 Free Spinning Nut

<table>
<thead>
<tr>
<th>Nominal Size (A)</th>
<th>Torque (Nm)</th>
<th>Torque (lbf-ft) (*lbf-in)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Min.</td>
<td>Max.</td>
</tr>
<tr>
<td>3-0.5</td>
<td>1.8</td>
<td>2</td>
</tr>
<tr>
<td>3.5-0.6</td>
<td>2.8</td>
<td>3.1</td>
</tr>
<tr>
<td>4-0.7</td>
<td>4.2</td>
<td>4.6</td>
</tr>
<tr>
<td>5-0.8</td>
<td>8.4</td>
<td>9.3</td>
</tr>
<tr>
<td>6-1.0</td>
<td>14.3</td>
<td>15.8</td>
</tr>
<tr>
<td>8-1.25</td>
<td>38</td>
<td>42</td>
</tr>
<tr>
<td>10-1.5</td>
<td>75</td>
<td>83</td>
</tr>
<tr>
<td>12-1.75</td>
<td>132</td>
<td>145</td>
</tr>
<tr>
<td>14-2.0</td>
<td>210</td>
<td>232</td>
</tr>
<tr>
<td>16-2.0</td>
<td>326</td>
<td>360</td>
</tr>
<tr>
<td>20-2.5</td>
<td>637</td>
<td>704</td>
</tr>
<tr>
<td>24-3.0</td>
<td>1101</td>
<td>1217</td>
</tr>
</tbody>
</table>
### Table 5.6 Metric Class 10.9 Bolts and Class 10 Distorted Thread Nut

<table>
<thead>
<tr>
<th>Nominal Size (A)</th>
<th>Torque (Nm)</th>
<th>Torque (lbf·ft) (*lbf·in)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Min.</td>
<td>Max.</td>
</tr>
<tr>
<td>3-0.5</td>
<td>1.3</td>
<td>1.5</td>
</tr>
<tr>
<td>3.5-0.6</td>
<td>2.1</td>
<td>2.3</td>
</tr>
<tr>
<td>4-0.7</td>
<td>3.1</td>
<td>3.4</td>
</tr>
<tr>
<td>5-0.8</td>
<td>6.3</td>
<td>7</td>
</tr>
<tr>
<td>6-1.0</td>
<td>10.7</td>
<td>11.8</td>
</tr>
<tr>
<td>8-1.25</td>
<td>26</td>
<td>29</td>
</tr>
<tr>
<td>10-1.5</td>
<td>51</td>
<td>57</td>
</tr>
<tr>
<td>12-1.75</td>
<td>90</td>
<td>99</td>
</tr>
<tr>
<td>14-2.0</td>
<td>143</td>
<td>158</td>
</tr>
<tr>
<td>16-2.0</td>
<td>222</td>
<td>246</td>
</tr>
<tr>
<td>20-2.5</td>
<td>434</td>
<td>480</td>
</tr>
<tr>
<td>24-3.0</td>
<td>750</td>
<td>829</td>
</tr>
</tbody>
</table>

### 5.3.2 Metric Bolt Specifications Bolting into Cast Aluminum

#### Table 5.7 Metric Bolt Bolting into Cast Aluminum

<table>
<thead>
<tr>
<th>Nominal Size (A)</th>
<th>Bolt Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8.8 (Cast Aluminum)</td>
</tr>
<tr>
<td></td>
<td>Nm</td>
</tr>
<tr>
<td>M3</td>
<td>–</td>
</tr>
<tr>
<td>M4</td>
<td>–</td>
</tr>
<tr>
<td>M5</td>
<td>–</td>
</tr>
<tr>
<td>M6</td>
<td>9</td>
</tr>
<tr>
<td>M8</td>
<td>20</td>
</tr>
<tr>
<td>M10</td>
<td>40</td>
</tr>
<tr>
<td>M12</td>
<td>70</td>
</tr>
<tr>
<td>M14</td>
<td>–</td>
</tr>
<tr>
<td>M16</td>
<td>–</td>
</tr>
</tbody>
</table>
5.3.3 O-Ring Boss Hydraulic Fittings – Adjustable

1. Inspect O-ring (A) and seat (B) for dirt or obvious defects.

2. Back off lock nut (C) as far as possible. Ensure that washer (D) is loose and is pushed toward lock nut (C) as far as possible.

3. Check that O-ring (A) is NOT on threads and adjust if necessary.

4. Apply hydraulic system oil to O-ring (A).

5. Install fitting (B) into port until backup washer (D) and O-ring (A) contact part face (E).

6. Position angle fittings by unscrewing no more than one turn.

7. Turn lock nut (C) down to washer (D) and tighten to torque shown. Use two wrenches, one on fitting (B) and other on lock nut (C).

8. Check final condition of fitting.
### Table 5.8 O-Ring Boss (ORB) Hydraulic Fittings – Adjustable

<table>
<thead>
<tr>
<th>SAE Dash Size</th>
<th>Thread Size (in.)</th>
<th>Torque Value&lt;sup&gt;5&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Nm</td>
</tr>
<tr>
<td>-2</td>
<td>5/16–24</td>
<td>6–7</td>
</tr>
<tr>
<td>-3</td>
<td>3/8–24</td>
<td>12–13</td>
</tr>
<tr>
<td>-4</td>
<td>7/16–20</td>
<td>19–21</td>
</tr>
<tr>
<td>-5</td>
<td>1/2–20</td>
<td>21–33</td>
</tr>
<tr>
<td>-6</td>
<td>9/16–18</td>
<td>26–29</td>
</tr>
<tr>
<td>-8</td>
<td>3/4–16</td>
<td>46–50</td>
</tr>
<tr>
<td>-10</td>
<td>7/8–14</td>
<td>75–82</td>
</tr>
<tr>
<td>-12</td>
<td>1 1/16–12</td>
<td>120–132</td>
</tr>
<tr>
<td>-14</td>
<td>1 3/8–12</td>
<td>153–168</td>
</tr>
<tr>
<td>-16</td>
<td>1 5/16–12</td>
<td>176–193</td>
</tr>
<tr>
<td>-20</td>
<td>1 5/8–12</td>
<td>221–243</td>
</tr>
<tr>
<td>-24</td>
<td>1 7/8–12</td>
<td>270–298</td>
</tr>
<tr>
<td>-32</td>
<td>2 1/2–12</td>
<td>332–365</td>
</tr>
</tbody>
</table>

5. Torque values shown are based on lubricated connections as in reassembly.
5.3.4 O-Ring Boss Hydraulic Fittings – Non-Adjustable

1. Inspect O-ring (A) and seat (B) for dirt or obvious defects.
2. Check that O-ring (A) is **NOT** on threads and adjust if necessary.
3. Apply hydraulic system oil to O-ring.
4. Install fitting (C) into port until fitting is hand-tight.
5. Torque fitting (C) according to values in Table 5.9, page 117.
6. Check final condition of fitting.

![Figure 5.8: Hydraulic Fitting](image)

Table 5.9 O-Ring Boss (ORB) Hydraulic Fittings – Non-Adjustable

<table>
<thead>
<tr>
<th>SAE Dash Size</th>
<th>Thread Size (in.)</th>
<th>Torque Value*&lt;sup&gt;6&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Nm</td>
</tr>
<tr>
<td>-2</td>
<td>5/16–24</td>
<td>6–7</td>
</tr>
<tr>
<td>-3</td>
<td>3/8–24</td>
<td>12–13</td>
</tr>
<tr>
<td>-4</td>
<td>7/16–20</td>
<td>19–21</td>
</tr>
<tr>
<td>-5</td>
<td>1/2–20</td>
<td>21–33</td>
</tr>
<tr>
<td>-6</td>
<td>9/16–18</td>
<td>26–29</td>
</tr>
<tr>
<td>-8</td>
<td>3/4–16</td>
<td>46–50</td>
</tr>
<tr>
<td>-10</td>
<td>7/8–14</td>
<td>75–82</td>
</tr>
<tr>
<td>-12</td>
<td>1 1/16–12</td>
<td>120–132</td>
</tr>
<tr>
<td>-14</td>
<td>1 3/8–12</td>
<td>153–168</td>
</tr>
<tr>
<td>-16</td>
<td>1 5/16–12</td>
<td>176–193</td>
</tr>
<tr>
<td>-20</td>
<td>1 5/8–12</td>
<td>221–243</td>
</tr>
<tr>
<td>-24</td>
<td>1 7/8–12</td>
<td>270–298</td>
</tr>
<tr>
<td>-32</td>
<td>2 1/2–12</td>
<td>332–365</td>
</tr>
</tbody>
</table>

---

6. Torque values shown are based on lubricated connections as in reassembly.
5.3.5 O-Ring Face Seal Hydraulic Fittings

1. Check components to ensure that sealing surfaces and fitting threads are free of burrs, nicks, scratches, or any foreign material.

2. Apply hydraulic system oil to O-ring (B).

3. Align tube or hose assembly so that flat face of sleeve (A) or (C) comes in full contact with O-ring (B).

4. Thread tube or hose nut (D) until hand-tight. The nut should turn freely until it is bottomed out.

5. Torque fittings according to values in Table 5.10, page 118.

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

6. Use three wrenches when assembling unions or joining two hoses together.

7. Check final condition of fitting.

### Table 5.10 O-Ring Face Seal (ORFS) Hydraulic Fittings

<table>
<thead>
<tr>
<th>SAE Dash Size</th>
<th>Thread Size (in.)</th>
<th>Tube O.D. (in.)</th>
<th>Torque Value$^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nm</td>
</tr>
<tr>
<td>-3</td>
<td>Note$^8$</td>
<td>3/16</td>
<td>–</td>
</tr>
<tr>
<td>-4</td>
<td>9/16</td>
<td>1/4</td>
<td>25–28</td>
</tr>
<tr>
<td>-5</td>
<td>Note$^8$</td>
<td>5/16</td>
<td>–</td>
</tr>
<tr>
<td>-6</td>
<td>11/16</td>
<td>3/8</td>
<td>40–44</td>
</tr>
<tr>
<td>-8</td>
<td>13/16</td>
<td>1/2</td>
<td>55–61</td>
</tr>
<tr>
<td>-10</td>
<td>1</td>
<td>5/8</td>
<td>80–88</td>
</tr>
<tr>
<td>-12</td>
<td>1 3/16</td>
<td>3/4</td>
<td>115–127</td>
</tr>
<tr>
<td>-14</td>
<td>Note$^8$</td>
<td>7/8</td>
<td>–</td>
</tr>
</tbody>
</table>

7. Torque values and angles shown are based on lubricated connection as in reassembly.
8. O-ring face seal type end not defined for this tube size.
### Table 5.10 O-Ring Face Seal (ORFS) Hydraulic Fittings (continued)

<table>
<thead>
<tr>
<th>SAE Dash Size</th>
<th>Thread Size (in.)</th>
<th>Tube O.D. (in.)</th>
<th>Torque Value(^{9})</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nm</td>
</tr>
<tr>
<td>-16</td>
<td>1 7/16</td>
<td>1</td>
<td>150–165</td>
</tr>
<tr>
<td>-20</td>
<td>1 11/16</td>
<td>1 1/4</td>
<td>205–226</td>
</tr>
<tr>
<td>-24</td>
<td>1–2</td>
<td>1 1/2</td>
<td>315–347</td>
</tr>
<tr>
<td>-32</td>
<td>2 1/2</td>
<td>2</td>
<td>510–561</td>
</tr>
</tbody>
</table>

### 5.3.6 Tapered Pipe Thread Fittings

Assemble pipe fittings as follows:

1. Check components to ensure that fitting and port threads are free of burrs, nicks, scratches, or any form of contamination.

2. Apply pipe thread sealant (paste type) to external pipe threads.

3. Thread fitting into port until hand-tight.

4. Torque connector to appropriate torque angle. The turns from finger tight (TFFT) and flats from finger tight (FFFT) values are shown in Table 5.11, page 119. Make sure that tube end of a shaped connector (typically 45° or 90°) is aligned to receive incoming tube or hose assembly. Always finish alignment of fitting in tightening direction. Never back off (loosen) pipe threaded connectors to achieve alignment.

5. Clean all residue and any excess thread conditioner with appropriate cleaner.

6. Assess final condition of fitting. Pay special attention to possibility of cracks to port opening.

7. Mark final position of fitting. If a fitting leaks, disassemble fitting and check for damage.

**NOTE:**
Overtorque failure of fittings may not be evident until fittings are disassembled.

### Table 5.11 Hydraulic Fitting Pipe Thread

<table>
<thead>
<tr>
<th>Tapered Pipe Thread Size</th>
<th>Recommended TFFT</th>
<th>Recommended FFFT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8–27</td>
<td>2–3</td>
<td>12–18</td>
</tr>
<tr>
<td>1/4–18</td>
<td>2–3</td>
<td>12–18</td>
</tr>
<tr>
<td>3/8–18</td>
<td>2–3</td>
<td>12–18</td>
</tr>
<tr>
<td>1/2–14</td>
<td>2–3</td>
<td>12–18</td>
</tr>
<tr>
<td>3/4–14</td>
<td>1.5–2.5</td>
<td>12–18</td>
</tr>
<tr>
<td>1–11 1/2</td>
<td>1.5–2.5</td>
<td>9–15</td>
</tr>
<tr>
<td>1 1/4–11 1/2</td>
<td>1.5–2.5</td>
<td>9–15</td>
</tr>
<tr>
<td>1 1/2–11 1/2</td>
<td>1.5–2.5</td>
<td>9–15</td>
</tr>
<tr>
<td>2–11 1/2</td>
<td>1.5–2.5</td>
<td>9–15</td>
</tr>
</tbody>
</table>

---

9. Torque values and angles shown are based on lubricated connection as in reassembly.
### 5.4 Conversion Chart

#### Table 5.12 Conversion Chart

<table>
<thead>
<tr>
<th>Quantity</th>
<th>SI Units (Metric)</th>
<th>Factor</th>
<th>US Customary Units (Standard)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unit Name</td>
<td>Abbreviation</td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td>hectare</td>
<td>ha</td>
<td>x 2.4710 = acre</td>
</tr>
<tr>
<td>Flow</td>
<td>liters per minute</td>
<td>L/min</td>
<td>x 0.2642 = US gallons per minute</td>
</tr>
<tr>
<td>Force</td>
<td>Newton</td>
<td>N</td>
<td>x 0.2248 = pound force</td>
</tr>
<tr>
<td>Length</td>
<td>millimeter</td>
<td>mm</td>
<td>x 0.0394 = inch</td>
</tr>
<tr>
<td>Length</td>
<td>meter</td>
<td>m</td>
<td>x 3.2808 = foot</td>
</tr>
<tr>
<td>Power</td>
<td>kilowatt</td>
<td>kW</td>
<td>x 1.341 = horsepower</td>
</tr>
<tr>
<td>Pressure</td>
<td>kilopascal</td>
<td>kPa</td>
<td>x 0.145 = pounds per square inch</td>
</tr>
<tr>
<td>Pressure</td>
<td>megapascal</td>
<td>MPa</td>
<td>x 145.038 = pounds per square inch</td>
</tr>
<tr>
<td>Pressure</td>
<td>bar (Non-SI)</td>
<td>bar</td>
<td>x 14.5038 = pounds per square inch</td>
</tr>
<tr>
<td>Torque</td>
<td>Newton meter</td>
<td>Nm</td>
<td>x 0.7376 = pound feet or foot pounds</td>
</tr>
<tr>
<td>Torque</td>
<td>Newton meter</td>
<td>Nm</td>
<td>x 8.8507 = pound inches or inch pounds</td>
</tr>
<tr>
<td>Temperature</td>
<td>degrees Celsius</td>
<td>°C</td>
<td>(°C x 1.8) + 32 = degrees Fahrenheit</td>
</tr>
<tr>
<td>Velocity</td>
<td>meters per minute</td>
<td>m/min</td>
<td>x 3.2808 = feet per minute</td>
</tr>
<tr>
<td>Velocity</td>
<td>meters per second</td>
<td>m/s</td>
<td>x 3.2808 = feet per second</td>
</tr>
<tr>
<td>Velocity</td>
<td>kilometers per hour</td>
<td>km/h</td>
<td>x 0.6214 = miles per hour</td>
</tr>
<tr>
<td>Volume</td>
<td>liter</td>
<td>L</td>
<td>x 0.2642 = US gallon</td>
</tr>
<tr>
<td>Volume</td>
<td>milliliter</td>
<td>mL</td>
<td>x 0.0338 = ounce</td>
</tr>
<tr>
<td>Volume</td>
<td>cubic centimeter</td>
<td>cm³ or cc</td>
<td>x 0.061 = cubic inch</td>
</tr>
<tr>
<td>Weight</td>
<td>kilogram</td>
<td>kg</td>
<td>x 2.2046 = pound</td>
</tr>
</tbody>
</table>
### 5.5 Definitions

The following terms and acronyms may be used in this instruction:

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Series header</td>
<td>MacDon A40D, A40DX, and Grass Seed auger headers</td>
</tr>
<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>Bolt</td>
<td>A headed and externally threaded fastener that is designed to be paired with a nut</td>
</tr>
<tr>
<td>Cab-forward</td>
<td>Windrower operation with Operator and cab facing in direction of travel</td>
</tr>
<tr>
<td>Center-link</td>
<td>A hydraulic cylinder link between header and machine used to change header angle</td>
</tr>
<tr>
<td>CGVW</td>
<td>Combined gross vehicle weight</td>
</tr>
<tr>
<td>D1X Series Header</td>
<td>MacDon D115X, D120X, and D125X rigid draper headers for M1 Series Windrowers</td>
</tr>
<tr>
<td>D1XL Series Header</td>
<td>MacDon D130XL, D135XL, D140XL, and D145XL rigid draper headers for M1 Series Windrowers</td>
</tr>
<tr>
<td>DDD</td>
<td>Double-draper drive</td>
</tr>
<tr>
<td>DEF</td>
<td>Diesel exhaust fluid; also called AdBlue in Europe, and AUS 32 in Australia</td>
</tr>
<tr>
<td>DEF Supply Module</td>
<td>Pump that supplies diesel exhaust fluid through system</td>
</tr>
<tr>
<td>DM</td>
<td>Dosing module</td>
</tr>
<tr>
<td>DK</td>
<td>Double knife</td>
</tr>
<tr>
<td>DKD</td>
<td>Double-knife drive</td>
</tr>
<tr>
<td>DOC</td>
<td>Diesel oxidation catalyst</td>
</tr>
<tr>
<td>DRT</td>
<td>Aftertreatment decomposition tube</td>
</tr>
<tr>
<td>DWA</td>
<td>Double Windrow Attachment</td>
</tr>
<tr>
<td>ECM</td>
<td>Engine control module</td>
</tr>
<tr>
<td>EEC</td>
<td>Eco engine control</td>
</tr>
<tr>
<td>Engine-forward</td>
<td>Windrower operation with Operator and engine facing in direction of travel</td>
</tr>
<tr>
<td>FFFT</td>
<td>Flats from finger tight</td>
</tr>
<tr>
<td>Finger tight</td>
<td>Finger tight is a reference position where sealing surfaces or components are making contact with each other, and fitting has been tightened to a point where fitting is no longer loose</td>
</tr>
<tr>
<td>GSL</td>
<td>Ground speed lever</td>
</tr>
<tr>
<td>GSS</td>
<td>Grass Seed</td>
</tr>
<tr>
<td>GVW</td>
<td>Gross vehicle weight</td>
</tr>
<tr>
<td>Hard joint</td>
<td>A joint made with use of a fastener where joining materials are highly incompressible</td>
</tr>
<tr>
<td>Header</td>
<td>A machine that cuts and lays crop into a windrow and is attached to a windrower</td>
</tr>
<tr>
<td>Hex key</td>
<td>A tool of hexagonal cross-section used to drive bolts and screws that have a hexagonal socket in head (internal-wrenching hexagon drive); also known as an Allen key and various other synonyms</td>
</tr>
<tr>
<td>HDS</td>
<td>Hydraulic deck shift</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>hp</td>
<td>Horsepower</td>
</tr>
<tr>
<td>HPT display</td>
<td>Harvest Performance Tracker display module on an M1 Series Windrower</td>
</tr>
<tr>
<td>JIC</td>
<td>Joint Industrial Council: A standards body that developed standard sizing</td>
</tr>
<tr>
<td></td>
<td>and shape for original 37° flared fitting</td>
</tr>
<tr>
<td>Knife</td>
<td>A cutting device which uses a reciprocating cutter (also called a sickle)</td>
</tr>
<tr>
<td>MDS</td>
<td>Mechanical deck shift</td>
</tr>
<tr>
<td>M1 Series</td>
<td>MacDon M1170 and M1240 Windrowers</td>
</tr>
<tr>
<td>n/a</td>
<td>Not applicable</td>
</tr>
<tr>
<td>NPT</td>
<td>National Pipe Thread: A style of fitting used for low-pressure port</td>
</tr>
<tr>
<td></td>
<td>openings. Threads on NPT fittings are uniquely tapered for an interference</td>
</tr>
<tr>
<td>Nut</td>
<td>An internally threaded fastener that is designed to be paired with a bolt</td>
</tr>
<tr>
<td>ORB</td>
<td>O-ring boss: A style of fitting commonly used in port openings on</td>
</tr>
<tr>
<td></td>
<td>manifolds, pumps, and motors</td>
</tr>
<tr>
<td>ORFS</td>
<td>O-ring face seal: A style of fitting commonly used for connecting hoses</td>
</tr>
<tr>
<td></td>
<td>and tubes. This style of fitting is also commonly called ORS, which stands</td>
</tr>
<tr>
<td></td>
<td>for O-ring seal</td>
</tr>
<tr>
<td>PARK</td>
<td>The slot opposite the NEUTRAL position on operator’s console of M1 Series</td>
</tr>
<tr>
<td>R1 SP Series</td>
<td>MacDon R113 and R116 Rotary Disc Headers for windrowers</td>
</tr>
<tr>
<td>RoHS (Reduction of Hazardous</td>
<td>A directive by the European Union to restrict use of certain hazardous</td>
</tr>
<tr>
<td>Substances)</td>
<td>substances (such as hexavalent chromium used in some yellow zinc platings)</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>SCR</td>
<td>Selective catalytic reduction</td>
</tr>
<tr>
<td>Screw</td>
<td>A headed and externally threaded fastener that threads into preformed</td>
</tr>
<tr>
<td></td>
<td>threads or forms its own thread into a mating part</td>
</tr>
<tr>
<td>SDD</td>
<td>Single-draper drive</td>
</tr>
<tr>
<td>SK</td>
<td>Single knife</td>
</tr>
<tr>
<td>SKD</td>
<td>Single-knife drive</td>
</tr>
<tr>
<td>Soft joint</td>
<td>A joint made with use of a fastener where joining materials are</td>
</tr>
<tr>
<td></td>
<td>compressible or experience relaxation over a period of time</td>
</tr>
<tr>
<td>spm</td>
<td>Strokes per minute</td>
</tr>
<tr>
<td>Tension</td>
<td>Axial load placed on a bolt or screw, usually measured in Newtons (N) or</td>
</tr>
<tr>
<td></td>
<td>pounds (lb.)</td>
</tr>
<tr>
<td>TFFT</td>
<td>Turns from finger tight</td>
</tr>
<tr>
<td>Torque</td>
<td>The product of a force X lever arm length, usually measured in</td>
</tr>
<tr>
<td></td>
<td>Newton-meters (Nm) or foot-pounds (lbf-ft)</td>
</tr>
<tr>
<td>Torque angle</td>
<td>A tightening procedure where fitting is assembled to a precondition</td>
</tr>
<tr>
<td></td>
<td>(finger tight) and then nut is turned farther a number of degrees to</td>
</tr>
<tr>
<td></td>
<td>achieve its final position</td>
</tr>
<tr>
<td>Torque-tension</td>
<td>The relationship between assembly torque applied to a piece of hardware</td>
</tr>
<tr>
<td></td>
<td>and axial load it induces in bolt or screw</td>
</tr>
<tr>
<td>ULSD</td>
<td>Ultra-low sulphur diesel</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>----------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Washer</td>
<td>A thin cylinder with a hole or slot located in the center that is to be used as a spacer, load distribution element, or locking mechanism</td>
</tr>
<tr>
<td>Windrower</td>
<td>Power unit for a header</td>
</tr>
<tr>
<td>WOT</td>
<td>Wide open throttle</td>
</tr>
</tbody>
</table>
# Predelivery Checklist

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

⚠️ **CAUTION**

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

| Windrower Serial Number: | Engine Serial Number: |

## M1170 Windrower Predelivery Checklist

<table>
<thead>
<tr>
<th>Item</th>
<th>Reference</th>
</tr>
</thead>
</table>
| Check for shipping damage or missing parts. Be sure all shipping dunnage is removed. | ![Image](image)
| Check for loose hardware. Tighten to required torque. | 5 Reference, page 109 |
| Check tire air pressures and adjust as required. | 4.1.10 Checking Tire Pressures, page 47 |
| Check wheel drive hub lubricant level. | 4.1.12 Checking and Adding Wheel Drive Lubricant, page 54 |
| Check engine coolant level and strength at pressurized coolant tank. | 4.1.6 Checking Engine Coolant Level, page 45 |
| Check air cleaner and clamps. | 4.1.2 Checking Engine Air Intake, page 42 |
| Check engine oil level and check for leaks. | 4.1.3 Checking and Adding Engine Oil, page 42 |
| Check hydraulic oil level and check for leaks along lines. | 4.1.4 Checking and Adding Hydraulic Oil, page 43 |
| Check fuel separator for water and foreign material, drain and clean as necessary, and add fuel. | 4.1.5 Checking Fuel Separator, page 44 |
| Check gearbox lubricant level. | 4.1.7 Checking Engine Gearbox Lubricant Level and Adding Lubricant, page 45 |
| Check tension of A/C compressor belt. | 4.1.8 Checking Air Conditioning Compressor Belts, page 45 |
| Check that machine is completely lubricated. | 3.12.2 Lubrication Points, page 38 |
| Check Operator’s Presence System | 4.1.9 Checking Operating Safety System, page 46 |
| Check horn operation. | 4.2.6 Checking Horn, page 66 |
| **Start engine and run to operating temperature.** | 4.1.11 Starting the Engine, page 49 |
| Check HPT, fuel, and diesel exhaust fluid (DEF) gauges for operation. | 4.2.2 Checking Harvest Performance Tracker Display, page 57 |
| Check engine speed on HPT. | 4.2.3 Checking Engine Speed, page 61 |
| Ensure selective catalytic reduction (SCR) conditioning inhibit is off. | 4.2.4 Checking Selective Catalytic Regeneration Conditioning Mode, page 62 |
| Check that air conditioning and heater are functioning properly. | 4.2.8 Checking Climate Controls, page 67 |
| Check that interior lights are functioning properly. | 4.2.7 Checking Interior Lights, page 67 |
Check that exterior lights are functioning properly. | 4.2.5 Checking Exterior Lights, page 63
---|---
Check that hazard and signal lights are functioning properly. | 4.2.5 Checking Exterior Lights, page 63
Check that beacons are functioning properly (if installed). | 4.2.5 Checking Exterior Lights, page 63
Complete the header’s Predelivery Checklist (if applicable). | —
Check that manuals are in the windrower manual case. | 4.3 Checking Manuals, page 70
Remove plastic coverings and windshield decal from cab interior. | 4.4 Performing Final Steps, page 71

Date Checked: | Checked by: