R216
Rotary Disc Header

Unloading and Assembly Instructions
214882 Revision C
Original Instruction

The harvesting specialists.
Published May 2019.

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Introduction

This document describes the unloading, setup, and predelivery requirements for the MacDon R216 Rotary Disc Header.

To ensure your customers receive all of the performance and safety benefits from this product, carefully follow the unloading and assembly procedure from the beginning through to completion.

Retain this instruction for future reference.

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

This instruction is currently available in English only.
Summary of Changes

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

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<td>Revision B was never published. Previous publication is revision A.</td>
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<tr>
<td>• 3.1 Removing Shipping Supports, page 9</td>
<td>Edited steps and rearranged between the two topics.</td>
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<td>• 3.4 Removing Shipping Stands, page 21</td>
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<td>3.2 Lowering the Header, page 18</td>
<td>Added note alerting readers to the potential for contact between the lowering chains and hazard light brackets on the header.</td>
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<td>Edited attaching procedure to include steps for positioning header supports for connection, and adjusting forming shield height according to whether a Double Windrow Attachment (DWA) option is included on the machine. Added step to secure header harness.</td>
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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 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.
- 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 engine is running.
- Do **NOT** modify machine. Unauthorized modifications may impair machine function and/or safety. It may also shorten machine’s life.
- To avoid injury or death from unexpected startup of 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 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 is a fire hazard. Do **NOT** allow oil or grease to accumulate on service platforms, ladders, or controls. Clean machines before storage.
- **NEVER** use gasoline, naphtha, or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.
- When storing machinery, cover sharp or extending components to prevent injury from accidental contact.
1.3  Welding Precaution

Welding should never be attempted on the header while it is connected to a windrower.

⚠️ WARNING

Severe damage to sensitive, expensive electronics can result from welding on the header while it is connected to the windrower. It can be impossible to know what effect high current could have with regard to future malfunctions or shorter lifespan. It is very important that welding on the header is not attempted while the header is connected to the windrower.

If you need to do any welding on the header, it should first be disconnected and removed from the windrower. If it is unfeasible to disconnect the header from the windrower before attempting welding, for welding precautions detailing all electrical components that must be disconnected first for safe welding.
1.4 Safety Signs

- Keep safety signs clean and legible at all times.
- Replace safety signs that are missing or illegible.
- If original part on which a safety sign was installed is replaced, be sure the repair part displays the current safety sign.
Chapter 2: Unloading the Header

⚠️ WARNING

To avoid injury to bystanders from being struck by machinery, do NOT allow people to stand in unloading area.

IMPORTANT:

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

NOTE:

Forklifts are normally rated for a load located 610 mm (24 in.) ahead of the back end of the forks. To obtain the forklift capacity at 1220 mm (48 in.), check with your forklift distributor.

Table 2.1 Lifting Vehicle

<table>
<thead>
<tr>
<th></th>
<th>Minimum Capacity</th>
<th>Minimum Fork Length</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Minimum Capacity</strong></td>
<td>3630 kg (8000 lb.)</td>
<td>198 cm (78 in.)</td>
</tr>
</tbody>
</table>

1. Remove the hauler's tie-down straps and chains.

⚠️ WARNING

Be sure forks are secure before moving away from load. Stand clear when lifting.

2. Approach the rotary disc header from its underside and slide the forks under the lifting framework as far as possible.

IMPORTANT:

If the load is two units wide, take care to avoid contacting the other machine.

3. Raise the rotary disc header off the deck.
UNLOADING THE HEADER

4. Back up until the rotary disc header clears the trailer, and slowly lower it to 150 mm (6 in.) from the ground.

5. Take the rotary disc header to the storage or setup area.

6. Set the rotary disc header down on secure, level ground. Do NOT lower the header into working position.

7. Check for shipping damage and missing parts.
Chapter 3: Assembling the Header

Follow each procedure in this chapter in order.

3.1 Removing Shipping Supports

To remove the shipping supports from the cutterbar side of the header, follow these steps:

1. Remove four bolts and nuts (A) from each yellow shipping support (B) and remove the four supports from the disc header.

![Figure 3.1: Shipping Supports]
ASSEMBLING THE HEADER

2. Remove nuts and bolts (A) from the yellow channel and header supports.

3. Remove yellow braces (B) from the header.

4. Remove four nuts and bolts (A) holding yellow channel (B) in place against the plates on both sides of the header.

5. Remove channel (B) from the header.

Figure 3.2: Shipping Stand Brace – Right Side Shown, Left Side Opposite

Figure 3.3: Shipping Channel – Right Side Shown, Left Side Opposite
6. Remove three bolts and washers (A) holding each yellow plate (B) onto the header supports.
7. Remove plates (B) from the header.
8. Each header is shipped with either gauge rollers or skid shoes (but not both). Refer to the relevant installation procedure listed below:
   - 3.1.1 Installing Adjustable Gauge Roller Kit, page 12
   - 3.1.2 Installing Adjustable Skid Shoes Kit, page 15
3.1.1 Installing Adjustable Gauge Roller Kit

Follow these steps and install the Adjustable Gauge Roller kit (MD #B6666) while the header is still set on the ground on its shipping stands:

**NOTE:**

If you are installing the Adjustable Skid Shoe kit (MD #B6667), refer to *3.1.2 Installing Adjustable Skid Shoes Kit, page 15*.

1. Remove the gauge rollers from the shipping crate and remove lynch pin (A) and bar (B) from each gauge roller (C). Retain the bars and lynch pins.

![Figure 3.5: Gauge Rollers](image-url)
2. Remove and retain clevis pins (A) and lynch pins (B) from holes (C) on both ends of gauge roller (D).

3. Align holes (C) with holes (E) in the header’s support bracket (F).

4. Secure gauge roller (A) to support bracket (B) using retained clevis pins (C) and lynch pins (D).

**NOTE:**

Insert clevis pins (C) from outside gauge roller (A) and secure with lynch pins (D) from inside gauge roller (A).
5. Fully insert retained bar (A) into slot (B) from the inboard side of the gauge roller.

6. Secure bar (A) with retained lynch pin (B).

7. Repeat the installation on the opposite side of the disc header.

8. Continue to 3.2 Lowering the Header, page 18.
3.1.2 Installing Adjustable Skid Shoes Kit

Follow these steps and install the Adjustable Skid Shoes kit (MD #B6667) while the disc header is still set on the ground on its shipping stands:

**NOTE:**
If you are installing the Adjustable Gauge Roller kit (MD #B6666), refer to [3.1.1 Installing Adjustable Gauge Roller Kit, page 12](#).

1. Remove the skid shoes from the shipping crate and remove bolts (A), washers (B), spacers (C), and nuts (D). Retain the hardware.

![Figure 3.10: Skid Shoe](image)
2. Secure the back of skid shoe (A) to bracket (B) in two locations with retained bolts (C), washers (D), spacers (E), and nuts (F).

**NOTE:**
Bolt heads should be set outside the skid shoes.

3. Position skid shoe (A) on bracket (B) in fully raised position (as shown) by aligning skid shoe mounting holes (C) with bracket mounting holes (D).
ASSEMBLING THE HEADER

4. Insert clevis pins (A) from outside the skid shoe (B).

5. Secure each clevis pin (A) with a lynch pin (B).

   **NOTE:**
   Lynch pins should be inserted in the clevis pin from inside the skid shoe.

6. Repeat the installation on the opposite side of the disc header.

7. Continue to **3.2 Lowering the Header, page 18.**
3.2 Lowering the Header

Complete the following steps to lower the header into working position after it has been lifted off its shipping trailer and set down on the ground.

⚠️ CAUTION

Ensure spreader bar is secured to the forks so that it cannot slide off the forks or towards the mast as the header is lowered to the ground.

Table 3.1 Lifting Vehicle

<table>
<thead>
<tr>
<th>Chain Type</th>
<th>Overhead lifting quality (1/2 in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Working Load</td>
<td>2270 kg (5000 lb.)</td>
</tr>
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</table>

1. Place wood blocks (A) at a distance of 42 cm (16 1/2 in.) (B) on the outboard side of each shipping stand (C).

**NOTE:**

Wood blocks should be 2 x 4 in. and 1–1.5 m (3–5 ft.) in length.

Figure 3.15: Block Placement
2. Attach spreader bar (A) to forks.

**IMPORTANT:**
Length of spreader bar must be approximately 457 cm (15 ft.).

3. Approach the header from its underside with the forklift.

4. Attach chains with hooks to the spreader bar (A) and hook into shipping brackets (B) on both sides of the disc header.

⚠️ **CAUTION**
Stand clear when lowering the disc header.

**IMPORTANT:**
Chain length must be sufficient to provide a minimum clearance (C) of 1219 mm (48 in.) between the disc header and the spreader bar.

**IMPORTANT:**
Do **NOT** attach chain hooks to the hazard light standards.

5. Raise forks until lift chains are fully tensioned.

6. Back up the forklift **SLOWLY**, and lower the disc header (A) into working position on the wooden blocks (B) placed in Step 1, page 18.

**NOTE:**
Watch out for contact between hazard light brackets and the lowering chains while the header is being lowered. Take care to avoid damaging the lights and brackets.

7. Remove chains from the header.
3.3 Unpacking Hydraulic Hoses and Electrical Harness

Follow these steps to unpack the hydraulic hoses and electrical harness.

1. Remove shipping wire securing hose ends (A) to secured hoses (B) and remove all packing foam from the hose ends.

   **NOTE:**
   Packing foam not shown in illustration at right.

2. Remove packing foam from hose support (C).

   **NOTE:**
   Packing foam not shown in illustration at right.

3. Remove shipping wire cross ties (A) securing hoses (B) to center-link (C) near shipping stands (D), and pull the hoses out from under the center-link.

   **NOTE:**
   Shipping wire cross ties not shown in illustration at right.

4. Remove shipping wire (E) from center-link (C) and move hoses (B) away from the center-link. Rest hoses (B) on top of the header.

5. Remove shipping wire and remove coiled electrical harness (A) from the center-link (B). Place the harness in a safe and clean spot until it’s time to install on an M1240 Windrower.
3.4 Removing Shipping Stands

Complete the following steps to remove the remaining shipping stands from the header.

**NOTE:**
This procedure must be completed on both sides of the header near the forming shields.

1. Remove nut (A) from the outboard side of the right header boot and bolt (B) from the inboard side of the right shipping stand (C). Repeat on the opposite side of the header.

2. Remove four nuts (A) and bolts (B) from top of shipping stands (C) and remove the shipping stands from the header.

---

**Figure 3.21:** Shipping Stand – Right Side Shown, Left Side Opposite

**Figure 3.22:** Shipping Stand
ASSEMBLING THE HEADER

3. Remove and retain bolts (A) and remove shipping plate (B). Discard plate (B) and reinstall bolts (A) on the header. Repeat for the other side of the header.

Figure 3.23: Shipping Plate – Right Side Shown, Left Side Opposite
3.5 Adjusting Rear Baffle Deflectors

Four rear baffle deflector fins are located under the baffle. The baffle and its deflectors require adjustment from shipping configuration to field position.

To adjust the rear baffle and deflector fins, follow these steps:

1. Remove and retain hardware (A) securing deflector (B) to rear baffle (C). Remove and retain deflector (B) from the header. Repeat on the opposite side of the header.

   **NOTE:**
   There are three sets of hardware (A) on the baffle, but only two sets hold deflector (B) in place in shipping position. Ensure all three sets of hardware (A) are removed and retained.

2. Remove pin (A) from baffle handle (B), and adjust the rear baffle by placing handle (B) in center position on baffle bracket (C).

3. Replace pin (A) in baffle handle (B) to secure the handle in fully raised position on baffle bracket (C).
4. Turn over deflector (A) and place on rear baffle (B) and between fixed deflector plate (C) and outer plate (D).

5. Loosely secure deflector (A) in place with retained hardware (E) in three locations. Do **NOT** tighten hardware. Repeat on the opposite side of the header.

6. Adjust the placement of deflector (A) as far inboard as possible so that it contacts fixed deflector plate (C) welded in place on the header. Tighten hardware (E) once deflector is properly placed. Repeat on the opposite side of the header.

**Figure 3.27: Deflector and Rear Baffle**
3.6 Unpacking Curtain

Follow these steps to unpack the cutterbar curtain on the rotary disc header:

1. Loosen 12 nuts (A) under the disc header top shield 2–3 turns to loosen bumper (B).

**IMPORTANT:**

Do **NOT** remove nuts (A) from the disc header; the hardware should be loosened only enough so cable ties (C) can be removed.

2. Cut and remove six cable ties (C) securing cutterbar curtain (D) at the front of the disc header.

3. Ensure bumper (A) aligns with the disc header top shield and tighten all loosened hardware (B) to 39 Nm (28.7 lbf-ft) so bumper (A) and cutterbar curtain (C) are held snugly in place.
ASSEMBLING THE HEADER

⚠️ WARNING

Ensure the cutterbar is completely clear of foreign objects. These objects can be ejected with considerable force when the machine is started and may result in serious injury or machine damage.

4. Check the cutterbar area for debris and foreign objects. Ensure all shipping material is removed.

5. Ensure that the curtain hangs properly and completely encloses the cutterbar area. Minor creases in the curtain will eventually straighten out.
Chapter 4: Attaching Header to M1240 Windrower

4.1 Assembling and Installing Forming Shield

Unpack and assemble the forming shield as follows:

1. Unpack and remove shipping material from deflectors (A) and remove deflectors from cover (B).
2. Locate and open the included hardware bag.

3. Remove cotter pins (A) and deflector hinge rod (B) from the right side bracket (C) and side deflector (D). Retain rod and pins.
4. Lay the cover upside down on an even work surface and install right side bracket (A) on the right side of the forming shield with five 25 mm-long short neck M10 bolts (B) and five nuts (C). Repeat this step and install the left side bracket on the left side of the forming shield.

**NOTE:**
Install bolts (B) from the forming shield’s underside and install nuts (C) on the forming shield’s top side.

5. Secure baffle (A) to side bracket (B) with bolt (C) and nut (D). Repeat on the other side of the header.
6. Install bolt (A) and nut (B) through plate (C) and forming shield angle (D). Repeat this step on the left side of the forming shield.

7. Flip the forming shield over so the forming shield is right side up and set on an even work surface.

8. Slide the angled end of deflector adjustment cover (A) under top sheet support (B) on the top of the forming shield. Repeat on other side of the forming shield.

**NOTE:**
Hardware (C) securing top sheet support (B) may need to be loosened to fit deflector adjustment cover (A) underneath. Retighten any loosened hardware to hold the deflector adjustment covers (A) in place on the forming shield.
9. Flip the forming shield upside down and set on an even work surface.

10. Install side deflector (A) on the right side of the forming shield with one 30 mm-long short neck M10 bolt (B).

11. Secure bolt (B) near the front of the forming shield with washer (C) and two jam nuts (D). Snug nuts (D) against the forming shield, but keep them loose enough to rotate freely.

**NOTE:**
Washer (C) and nuts (D) should be on top of the forming shield when the forming shield is set upright.

12. Use one 25 mm-long square neck M12 bolt (E) near the rear of the forming shield in deflector adjustment cover (F) to secure two washers (G), rubber washer (H), and handle (J). Repeat steps for the left side of the forming shield.

**NOTE:**
Handle (J) should be on top of the forming shield when the forming shield is set upright.

13. At the rear of the forming shield, insert deflector hinge rod (A) through the hinges on installed side deflector (B) and side bracket (C).

14. Secure deflector hinge rod (A) in place with two cotter pins (D), one placed at the top and the bottom of the hinge rod.

15. Repeat steps on the other side of the forming shield.
16. Install handle (A) with two flat washers (B) and one rubber washer (C) using bolt (D) installed through baffle (E) and right side bracket (F). Repeat installation at the left side of the forming shield.

17. Lay cover (A) upside down on a flat surface.

18. Install right deflector (B) on the right side of cover (A) using two bolts and nuts (C). Repeat step to install the left deflector at left side of cover (A).

NOTE:
The narrower deflector end faces the front of cover (A), while the wider end faces the rear.

NOTE:
Deflector removed from illustration for clarity.

19. Flip the forming shield right side up and into installation position.
20. Install shield mount plates (A) on the inside of the windrower legs with two hex head bolts (B) and nuts (C) each.

**NOTE:**
Make sure the top bolt (B) is installed in the foremost setting hole on the shield mounting plate (A). This ensures the forming shield is set at its highest setting.

21. Place the forming shield in position under the windrower.

22. Remove and retain clevis pins (A) from the front corners of the forming shield.
23. Using spacer (A), hex head bolt (B), and nut (C), attach forming shield (D) to shield mount plate (E) installed on the inside of the windrower legs. Repeat on other side of the windrower and forming shield.

24. Install retained clevis pin (A) to hold forming shield in place. Repeat on the other side of the forming shield.

**NOTE:**
Clevis pin (A) should pass under hex head bolt (B) and spacer installed in the previous step, with its lynch pin (C) set towards the interior of the header.
25. Install rubber strap (A) on side bracket (B) using bolt (C), washer (D), and nut (E). Repeat on the left side of the forming shield.

26. Pull rubber strap (A) up towards windrower frame and place onto straight pin (F).

27. Secure rubber strap (A) in place with washer (G) and hair pin (H).

28. Repeat Step 25, page 34 to Step 27, page 34 for the left side of the forming shield.

Figure 4.16: Rubber Strap — Right Side of Forming Shield
4.2 Routing Electrical Harness

A total of seven cable ties (A) will secure the routed header electrical harness (B) in place alongside the windrower main harness and avoid rub/wear points that could damage the harnesses. Keep cable ties (A) loose on harness until the entire harness has been routed on the header.

NOTE:

Windrower main harness is not shown in the illustration at right.

To route the R216 Rotary Disc Header electrical harness on the M1240 Windrower, follow these steps:

1. Move windrower left (cab-forward) platform (A) to the OPEN position. For instructions, refer to the windrower operator’s manual.
2. Retrieve electrical harness (A) and loosely attach it to center-link (B) with two cable ties (C).

**NOTE:**
Cable ties (C) should bundle electrical harness (A) with other hydraulic hoses from the windrower. The other hydraulic hoses are not shown in the illustration at right.

**NOTE:**
Do NOT tighten cable ties (C) on harness at this point.

3. Route electrical harness (A) over the windrower forward cross member and loosely secure it to the windrower main harness (B) with three cable ties (C).

**NOTE:**
Do NOT tighten cable ties (C) on harness at this point.

**NOTE:**
The windrower main harness is only partially illustrated.
4. Route electrical harness (A) over windrower frame (B) towards the multicoupler base.

5. Loosely secure electrical harness (A) to the windrower main harness (C) with one cable tie (D) near the windrower frame.

   **NOTE:**
   Do **NOT** tighten cable tie (D) on harness at this point.

6. Connect header electrical harness (A) to plug (B) set in multicoupler base (C).

7. Secure harness (A) to windrower harness (D) with cable tie (E) to avoid rub/wear points that could damage the harnesses.

   **NOTE:**
   Ensure there is enough slack in harness (A) before securing with cable tie (E) to maintain a minimum bend radius of 50 mm (2 in.) and avoid contact with multicoupler base (C).
4.3 Attaching Disc Header

The M1240 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 disc header. Replace pin (A) to hold center-link in place.

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

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

---

**Figure 4.23: Hydraulic Center-Link**

**Figure 4.24: Disc Header Support**
3. Lift header support (A) and place 2 x 4 in. blocks (B) under the header support. A total of four 2 x 4 in. blocks (B) will be necessary to raise the boot up and into field position. Ensure the boot’s bottom edge (C) is parallel with the ground.

**NOTE:**
Do **NOT** stack blocks (B) crosswise as doing so can make the header unstable when attempting to connect the header and windrower. Stack blocks (B) parallel with each other.

**NOTE:**
To better show placement of blocks (B) under the header supports (A), the illustration at right does not show the two 2 x 4 blocks placed in Step 1, page 18.

4. Repeat Step 3, page 39 on opposite side.

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

5. Start the windrower engine.

⚠️ **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.

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

7. Rotate scroll knob (A) to highlight the HEADER FLOAT symbol (B), and press scroll knob to select. The header float adjust screen displays.
8. 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.

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

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

11. Lift the tractor lift linkage (A) to align with header supports (B).

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

13. Ensure that feet (A) are properly engaged in supports (B).
14. **Self-Aligning Hydraulic Center-Link:**
   
a. Adjust position of the 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 self-locking mechanism.
   
b. If the hook release (C) is open (up), stop the engine and remove the ignition key. Manually push the hook release (C) down after the hook engages the header pin.

15. **Self-Aligning Hydraulic Center-Link:**
   
a. Lower center-link (A) onto the header with REEL DOWN switch on the GSL until the center-link locks into position and the hook release (B) is down.
   
b. Check that the center-link is locked onto the header by pressing the REEL UP switch on the GSL.
   
c. Turn off the windrower engine and remove the key from the ignition.

16. **Self-Aligning Hydraulic Center-Link:** Connect header electrical harness (A) to header.
17. **Hydraulic Center-Link without Self-Alignment:**
   a. Press the HEADER TILT UP or HEADER TILT DOWN cylinder switches on the GSL to extend or retract the center-link cylinder until the hook is aligned with the header attachment pin.
   b. Turn off the windrower engine and remove the key.
   c. Push down on the rod end of link cylinder (B) until the hook engages and locks onto the header pin.
      
      **IMPORTANT:**
      The hook release must be down to enable the self-locking mechanism. If the hook release is open (up), manually push it down after the hook engages the pin.
   d. Check that center-link (A) is locked onto the header by pulling upward on rod end (B) of the cylinder.

18. **Hydraulic Center-Link without Self-Alignment:** Connect header electrical harness (A) to the header.

19. Install clevis pin (A) through the support and windrower lift arm and secure with hairpin (B). Repeat for opposite side.

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

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

20. Start the windrower engine and fully extend the windrower tilt cylinder.

21. Stop the engine and remove the key from the ignition.
22. Pull back on routed header harness (A) to minimize slack in the routing. Ensure the harness is not under tension and tighten all cable ties (B) accordingly.

**NOTE:**
Any excess harness length can be secured under the windrower’s cab with two additional cable ties provided in shipping material. A total of nine cable ties are located in the header’s manual box.

**NOTE:**
Refer to the installation instructions included in the Electric Remote Baffle Control kit (MD #B6664) to connect the electrical harness (A) to the baffle control option. If this option is not installed on the header, tie the loose end of the harness at the header to the main header connector and keep this connector clean and capped for future use.

---

**For headers without the DWA installed:**

23. On both sides of the header, remove and retain bolts (A) and nuts (B) from the forming shield mounting plates (C). Loosen bolts and nuts (D) on the mounting plates (C).

**NOTE:**
Support the forming shield while adjusting the mounting plates. The forming shield is not shown in the illustration to better show the mounting plates and their hardware.

24. Pull the mounting plates so they turn downward and install bolts (A) and nuts (B) through the forming shield frame and the cutout on shield mounting plate (C). Tighten bolts (D). This ensures the forming shield is set at its lowest setting.
ATTACHING HEADER TO M1240 WINDROWER

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

25. Start the windrower engine and raise the header slightly.
26. Turn off the windrower engine and remove the key from the ignition.

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

27. Remove all wooden blocks from beneath the header.

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

28. Start the windrower engine and lower the header fully to the ground.
29. Turn off the windrower engine and remove the key from the ignition.
4.4 Connecting Rotary Disc Header Hydraulics Using Quick Couplers

To connect the R216 Rotary Disc Header hydraulic hoses to the M1240 Windrower using quick couplers, follow these steps:

If your windrower is equipped with hard plumb connections, refer to 4.5 Connecting Disc Header Hydraulics Using Hard Plumbing, page 47 for connection instructions.

1. Route hose bundle (A) from the disc header, under the windrower frame, then insert pin (B) into hole (C) in the windrower frame.

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

   **NOTE:**
   Adding anti-seize to the hose holder pin will make future removal easier.

2. Remove protective plugs (A) from the ends of the hydraulic hoses.

   **Figure 4.39: Hydraulic Hoses**

   **Figure 4.40: Protective Shipping Plugs on R216 Hydraulic Hoses**
3. Use a clean rag to remove dirt and moisture from the couplers on the left side of the windrower frame.

4. Make the following hydraulic and electrical connections to the windrower:
   a. Connect disc pressure hose (A) with coupler (B) and torque to 205–226 Nm (151–167 lbf·ft).
   b. Connect disc return hose (C) with coupler (D) and torque to 205–226 Nm (151–167 lbf·ft).
   c. Connect case drain hose (E) to fitting (F), with relief valve pointing towards the ground. Loosen fitting (F) and retighten as needed to ensure relief valve is pointing straight down as shown.

NOTE:
Parts removed from illustration for clarity.

5. Move left windrower platform (A) to the CLOSED position. For instructions, refer to the windrower operator’s manual.

4.5 Connecting Disc Header Hydraulics Using Hard Plumbing

Hard plumbing helps reduce the potential for leaks at the hydraulic connection sites and helps the header drive run more efficiently. To connect the R216 Rotary Disc Header to the M1240 Windrower with hard plumb fittings, follow these steps:

If your windrower is equipped with quick coupler connections, refer to 4.4 Connecting Rotary Disc Header Hydraulics Using Quick Couplers, page 45 for connection instructions.

1. Use a clean rag to remove dirt and moisture from fittings (B) on the left side of the windrower frame and remove protective caps (A).

   **NOTE:**
   Fittings should be factory-set to 30° to allow hoses to pass by the multicoupler.

   **NOTE:**
   Parts removed from illustration for clarity.

2. Route hose bundle (A) from the disc header, under the windrower frame, then insert pin (B) into hole (C) in the windrower frame.

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

   **NOTE:**
   Adding anti-seize to the hose holder pin will make future removal easier.
3. Remove protective plugs (A) from ends of hydraulic hoses.

4. Make the following hydraulic and electrical connections to the windrower:

   a. Connect disc pressure hose (A) marked with a red cable tie (B) to hard plumb fitting marked with a red cable tie (C) and torque to 205–226 Nm (151–157 lbf·ft)

   b. Connect disc return hose (D) to hard plumb fitting (E) and torque to 205–226 Nm (151–167 lbf·ft)

   c. Connect case drain hose (F) to fitting (G), with relief valve pointing towards the ground. Loosen fitting (G) and retighten as needed to ensure relief valve is pointing straight down as shown.

**NOTE:**
Parts removed from illustration for clarity.
5. Move windrower platform (A) to the CLOSED position. For instructions, refer to the windrower operator’s manual.

Figure 4.47: Windrower with Left Platform in Closed Position
4.6  Restoring Float for Disc Header

Follow these steps to restore the float for an R216 Rotary Disc Header used with an M1240 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.

1. Disengage safety props by turning lever (A) away from the disc header to raise the safety prop until the lever locks into vertical position. Repeat for opposite cylinder.

⚠️ CAUTION

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

2. Start the engine and press HEADER DOWN switch (A) on ground speed lever (GSL) to fully lower the disc header.

Figure 4.48: Safety Props

Figure 4.49: GSL
3. If not prompted by the Harvest Performance Tracker (HPT) display to restore the header float, restore the header float manually by doing the following:
   a. Press rotary scroll knob (A) on HPT to highlight the QuickMenu options.
   b. Rotate scroll knob (A) to highlight HEADER FLOAT symbol (B), and press the scroll knob to select. The screen changes.

4. 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.

5. Stop the engine and remove the key.
4.7 Calibrating Windrower Knife Drive on the Harvest Performance Tracker Display

When the R216 Rotary Disc Header is attached to an M1240 Windrower, the Harvest Performance Tracker (HPT) will recognize the header ID and configure the windrower accordingly. The disc header must be calibrated to ensure that the knife drive pump output is accurate.

**CAUTION**

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

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

1. Start the engine, and engage the header.
2. Press soft key 5 (A) to open the Harvest Performance Tracker (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.

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 KNIFE DRIVE.

Figure 4.52: Opening the Main Menu

Figure 4.53: Windrower Settings Icon and Calibration Submenu Icon
8. Press the PLAY button to begin the calibration process.

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

**NOTE:**
Press the 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.

![Calibration Page](image)

Figure 4.54: Calibration Page
Chapter 5: Installing Options

5.1 Electric Remote Baffle Kit

The Electric Remote Baffle kit (MD #B6664), allows the operator to adjust the disc header baffle electronically from inside the windrower.

This kit includes a linear actuator and support which will need to be installed and adjusted on the disc header. Refer to the instructions included in the kit.
5.2 Crop Dividers Kit

To install the Crop Dividers kit (MD #B6665), follow these steps:

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. Lower the disc header fully.
2. Stop the engine and remove the key from the ignition.
3. Unpack the Crop Dividers kit.
4. Open the cutterbar curtain.

NOTE:
The left crop divider is shown in the following steps. The right side is the opposite.

5. Disconnect hazard light (A) from the header harness.
6. Remove and retain bolt (B) and nut (C) securing hazard light support (D) to the top of the disc header.
7. Remove and retain bolts (E) and nuts (F) from the disc header. Discard the washers between bolts (E) and nuts (F).
8. Remove and retain two bolts (G) from the outboard side of the disc header.

9. Align left crop divider bracket (A) with one crop divider rod (B) and secure in place with two bolts (C) and nuts (D) from the kit.

Figure 5.2: Hazard Light Assembly

Figure 5.3: Installing Crop Divider Hardware
10. Position left crop divider (A) on the front left corner of the disc header.

11. Install using two retained bolts (B) and nuts (C).

12. Reinstall hazard light assembly (A) using retained hardware (B) over the installed crop divider (C). Apply medium-strength threadlocker (Loctite® 242 or equivalent), to retained hardware (B), and torque to 100 Nm (73.75 lbf-ft).

13. Install bolt (D) and nut (E) from the kit, securing hazard light assembly (A) to crop divider (C).

14. Secure the hazard light assembly (A) in place on the disc header with retained bolt (B) and nut (C).

15. Reconnect the hazard light (D), routing the harness through hole (E) in the crop divider (F).

16. Repeat for the right side of the disc header and close the cutterbar curtain.
5.3 Adjustable Gauge Roller Kit

The Adjustable Gauge Roller kit (MD #B6666) allows the R216 Rotary Disc Header to achieve the desired cutting height for optimum cutting performance.

This kit is installed after removing the header shipping supports. To review installation and adjustment instructions, refer to 3.1.1 Installing Adjustable Gauge Roller Kit, page 12.
5.4  **Adjustable Skid Shoes Kit**

The Adjustable Skid Shoes kit (MD #B6667) allows the R216 Rotary Disc Header to achieve the desired cutting height for optimum cutting performance.

This kit is installed after removing the header shipping supports. To review installation and adjustment instructions, refer to *3.1.2 Installing Adjustable Skid Shoes Kit, page 15.*
Chapter 6: Lubricating the Disc Header

⚠ 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.

The disc header has been lubricated at the factory. However, you should lubricate the disc header prior to delivery to offset the effects of weather during outside storage and transport, and to familiarize yourself with the machine. Unless otherwise specified, use high-temperature, extreme-pressure (EP2) performance grease with 1% max molybdenum disulphide (NLGI grade 2) lithium base.

Refer to 6.1 Lubrication Locations, page 62 for a list of grease points on both the right and left side of the header.
6.1 Lubrication Locations

Figure 6.1: Left Side Lubrication Locations

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idler/Tensioner Pivot</td>
<td>Bearing, Roller Conditioner (2 Places)</td>
<td>U-Joint, Conditioner Driveline (2 Places)</td>
</tr>
<tr>
<td>D</td>
<td>E</td>
<td>F</td>
</tr>
<tr>
<td>Slip Joint, Conditioner Driveline</td>
<td>Idler/Tensioner Pivot</td>
<td>Bearing, Feed Roll</td>
</tr>
</tbody>
</table>

1. Use high-temperature, extreme-pressure (EP2) performance grease with 10% max molybdenum disulphide (NLGI grade 2) lithium base.
LUBRICATING THE DISC HEADER

Figure 6.2: Right Side Lubrication Locations

A - Bearing, Roller Conditioner (2 Places)  B - U-Joint, Upper Driveline (2 Places)  C - Slip Joints, Conditioner Drivelines
D - U-Joint, Lower Driveline (2 Places)  E - Idler Pivot

2. Use high-temperature, extreme-pressure (EP2) performance grease with 10% max molybdenum disulphide (NLGI grade 2) lithium base.
Chapter 7: Performing Predelivery Checks

1. Perform final checks and adjustments as listed on the yellow sheet attached at the back of this instruction, to ensure the machine is field-ready. Refer to the referenced pages as indicated on the checklist for detailed instructions.

2. The Operator or the Dealer should retain the completed checklist.

7.1 Conditioner Drive Belt

The conditioner drive belt is located inside the left driveshield and is tensioned with a spring tensioner.

7.1.1 Inspecting Conditioner Drive Belt

The conditioner drive belt tension is set at factory and should not require adjustment. To inspect the conditioner drive belt, follow these steps:

⚠️ WARNING

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

1. Lower the disc header fully.

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

3. Open left driveshield (A).

4. Inspect drive belt (A) and replace if damaged or cracked.

5. Check that jam nut (B) and adjuster nut (C) are tight.
6. Measure the length of belt tensioner spring (A) and ensure spring length (B) is 17 mm (11/16 in.) in accordance with spring tension decal (C). If the spring length requires adjustment, refer to 7.1.2 Adjusting Conditioner Drive Belt, page 66, otherwise close the drive shield and proceed to 7.2 Header Float, page 68.

![Figure 7.3: Belt Tension Spring](image)

7.1.2 Adjusting Conditioner Drive Belt

⚠️ WARNING

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

1. Lower the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Open left drive shield (A).

![Figure 7.4: Left Driveshield](image)
4. Ensure drive belt (A) is in the grooves on drive pulley (B) and driven pulley (C).

**NOTE:**
If necessary, loosen the jam nut and adjuster nut to relieve belt tension while checking.

5. Loosen M16 hex head bolt and lock nuts (A) on pulley mount bracket (B), and adjust position of bracket until the center-to-center distance (C) between drive pulley (D) and driven pulley (E) is 724 mm (28 1/2 in.).

6. Torque hardware to 170 Nm (126 lbf-ft).

7. With hardware fully loosened, slide threaded rod (E) up and backward into the reel speed sensor bracket, then snug hardware to engage the rod pivot point with the bracket.

8. Measure the length of tensioner spring (C). For proper belt tension, dimension (D) should be set to 17 mm (11/16 in.).

9. To adjust spring tension, loosen jam nut (A) by turning it counterclockwise.

10. Turn adjuster nut (B) clockwise to increase tensioner spring/belt tension or turn adjuster nut (B) counterclockwise to decrease tensioner spring/belt tension.

11. Once the correct spring measurement has been achieved, hold adjuster nut (B) in place and tighten jam nut (A) against it by turning the jam nut clockwise.

12. Close the driveshield.
7.2 Header Float

7.2.1 Checking Float

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

1. Start the engine.
2. Use the HEADER TILT switches (A) on the ground speed lever (GSL) to set the center-link to the mid-range position (5.0 on the Harvest Performance Tracker [HPT]).
3. Using the HEADER DOWN switch (B), lower the disc header fully and with the header lift cylinders fully retracted.
   
   **NOTE:**
   Ensure header is level with ground with zero tilt.
4. Turn the engine off, and remove the ignition key.
5. Grasp one end of the header and lift. Lifting force should be 426–471 N (95–105 lbf) and should be the same at both ends.
6. Restart the engine, and adjust float as required. For instructions, refer to 7.2.2 Setting the Float, page 69.

   **NOTE:**
   Increasing the float value on the HPT makes the header feel lighter.
7.2.2 Setting the Float

The optimum float setting lets the disc header follow the contour of the terrain. Proceed as follows:

1. Press rotary scroll knob (A) on the Harvest Performance Tracker (HPT) to display the QuickMenu system.
2. Rotate scroll knob (A) to highlight header float icon (B) and press scroll knob to select.

3. Turn scroll knob (A) to highlight left (B) or right (C) float and press knob (A) to activate selection.
4. Rotate scroll knob (A) to adjust float setting and press knob when finished. Float is now set.

**NOTE:**
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.

5. Use soft key 3 (D) to remove/resume float and deck position to previous setting for the attached header.
PERFORMING PREDELIVERY CHECKS

7.3 Roll Timing

For proper conditioning, the rolls must be properly timed with the bar on one roll centered between two bars on the other roll. The factory setting should be suitable for most crop conditions.

IMPORTANT:
Roll timing is critical when the roll gap is decreased because conditioning is affected and the bars may contact each other.

![Figure 7.11: Properly Timed Rolls](image)

7.3.1 Adjusting Roll Timing

⚠️ 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.

![Figure 7.12: Conditioner Drive](image)
2. On the right side of the header, engage lift release latch (A) and pull handle (B) to open outboard driveshield (C).

3. Lift at handle (D) and open inboard driveshield (E).

4. On the upper roll, loosen four bolts (A) securing yoke plate (B).

   **NOTE:**
   Only three of the four bolts are shown in the illustration.

5. Secure bottom roll (A).

6. Manually rotate upper roll (B) counterclockwise as shown until it stops rotating.

7. Make a mark (C) across yoke (D) and gearbox flange (E).
8. Manually rotate upper roll (A) clockwise it stops rotating. Make a second mark (B) on the yoke flange, and align it with the mark on the gearbox flange.

9. Determine center point (A) between the two marks on the yoke plate, and place a third mark.

10. Rotate upper roll (B) counterclockwise, until the bolt lines up with the third (center) mark.
11. Ensure the threads on four bolts (A) are clean and free of lubricant.

**NOTE:**
Only three of the four bolts are shown in the illustration.

12. Apply medium-strength threadlocker (Loctite® 242 or equivalent) and tighten bolts (A). Torque to 95 Nm (70 lbf-ft).

13. Close the right driveshields.

![Figure 7.17: Conditioner Drive](image)
7.4 Roll Gap

The roll gap controls the degree to which crop is conditioned as it passes through the rolls. Roll gap is factory-set at approximately 6 mm (1/4 in.) for steel rolls.

Steel rolls can be operated over a large range of roll gap settings (intermesh). Using a roll gap of (up to) 25 mm (1 in.), they are suited to a wide range of crops (including alfalfa and thicker-stemmed cane-type crops). However operating with too large of a gap may cause feeding problems.

Grass-type crops may require less gap for proper feeding and conditioning.

IMPORTANT:
If using settings below the factory setting, visually inspect the roll gap to ensure that there is no metal-to-metal contact between the upper and lower rolls.

7.4.1 Adjusting Roll Gap

If the roll gap is not set to factory, follow the procedure below to reset the gap:

⚠️ 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. Lower the disc header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Loosen jam nut (A) on both sides of the conditioner.
4. Turn lower nut (B) counterclockwise until the upper roll rests on the lower roll. Ensure the rolls intermesh.
5. Turn lower nut (B) two and a half turns clockwise to raise the upper roll and achieve a 6 mm (1/4 in.) roll gap.
6. Hold nut (B) and tighten jam nut (A) on both sides of the disc header.

IMPORTANT:
Make sure the roll gap adjustment nuts are adjusted equally on both sides of the disc header to achieve a consistent gap across the rolls.

Figure 7.18: Roll Gap Adjustment
7.5 Roll Tension

Roll tension (the pressure holding the conditioner rolls together) is factory-set to maximum and should rarely require adjustment.

Heavy crops or tough forage can cause the rolls to separate; therefore, maximum roll tension is required to ensure that materials are sufficiently crimped.

7.5.1 Checking Roll Tension

Roll tension is indicated by the exposed thread on the roll tension adjuster bolt.

⚠️ 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. Lower the header to the ground.

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

3. Measure the amount of exposed thread on the roll tension adjuster bolt (A) at both ends of the conditioner. Measurement (B) should be 12–15 mm (1/2–9/16 in.) for steel conditioners.

4. If the tension requires adjustment, refer to 7.5.2 Adjusting Roll Tension, page 76.
7.5.2 Adjusting Roll Tension

To adjust roll tension, follow these steps:

⚠️ **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. Lower the header to the ground.
2. Shut down the engine, and remove the key from the ignition.
3. Loosen jam nut (A) on both sides of the conditioner.
4. Adjust spring drawbolt as follows:
   - Turn spring drawbolt (B) clockwise to tighten spring and **INCREASE** the roll tension.
   - Turn spring drawbolt (B) counterclockwise to loosen spring and **DECREASE** the roll tension.

**IMPORTANT:**
Turn each bolt equally. Roll tension changes by approximately 32 N (7.2 lbf) with each turn of the drawbolt.

5. Measure the amount of exposed thread on spring drawbolt (A) at each end of the conditioner. For steel roll conditioners, measurement (B) should be 12–15 mm (1/2–9/16 in.).
6. Tighten jam nut (C) on both sides of the conditioner.
7.6 Hanging Drums

Hanging drums aid in feeding crop from the ends of the header into the conditioner.

7.6.1 Checking and Adjusting Hanging Drum Drive

The hanging drum drive is set up and tensioned at factory. Ensure the drive belt is properly set and tensioned by following the steps below:

**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 header drashields on the left side of the header.
2. Inspect the hanging drum belt drive and ensure belts (A) are properly seated on pulleys (B).
3. If necessary, adjust the belts as follows:
   a. Loosen tensioner nut (C) to decrease drive belt tension, and adjust belt placement on pulleys (B).
   b. Tighten tensioner nut (C) to increase drive belt tension and hold belts (A) in place.
4. Inspect tensioner spring (A) and ensure it is seated properly in notches (B) on bracket (C) and applies tension to both belts (D).

   **NOTE:**

   Belts (D) are transparent in the illustration at right to better show spring (A) in bracket (C).
5. If necessary, adjust the belts as follows:
   a. Loosen tensioner nut (E) and set the ends of spring (A) in the appropriate notches (B) on bracket (C).
   b. Tighten tensioner nut (E) to hold spring (A) in place with appropriate tension placed on belts (D).
7.7 Feed Roll Drive

7.7.1 Checking and Adjusting Feed Roll Drive

The feed roll drive is set up and tensioned at factory. Ensure the drive belt is properly set and tensioned by following the steps below:

⚠️ 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 header driveshields on the left side of the header.

2. Inspect feed roll belt drive and ensure belts (A) are properly seated on pulleys (B) and pulley (C).

   **NOTE:**
   Driveline is not shown in illustration to better show pulleys and belts.

3. If necessary, adjust the belts as follows:
   a. Insert 1/2 in. ratchet or breaker bar into hole (D) on bracket (E) and rotate bracket (E) and pulley (C) out of the way.
   b. Adjust belt placement on pulleys (B) and pulley (C).
   c. Rotate bracket (E) back into its original position, holding belts (A) in place on pulleys (B) and pulley (C).

4. Inspect tensioner spring (A) and ensure it is seated properly in notch (B) on bracket (C) and applies tension to both belts (D).

   **NOTE:**
   Driveline is not shown in illustration to better show spring (A) in bracket (C).

5. If necessary, adjust the belts as follows:
   a. Loosen tensioner nut (E) and set the ends of spring (A) in the appropriate notches (B) on bracket (C).
   b. Tighten tensioner nut (E) to hold spring (A) in place with appropriate tension placed on belts (D).
7.8 Checking and Adding Conditioner Roll Timing Gearbox Oil

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.

IMPORTANT:

Check the gearbox oil level when the oil is warm. If the oil is cold, idle the machine for approximately 10 minutes prior to checking.

1. Lower the disc header to the ground and adjust the header angle (tilt) so that the cutterbar is level (parallel) with the ground.
2. Shut down the engine, and remove the key from the ignition.
3. On the right side of the header, engage lift release latch (A) and pull handle (B) to open outboard driveshield (C).
4. Lift at handle (D) and open inboard driveshield (E).

5. Clean around oil level sight glass (A) and breather (B) on the inboard side of the gearbox.
6. Ensure that the lubricant is level with the top of the sight glass. If necessary, add lubricant through breather (B). Refer to 8.1 Recommended Lubricants, page 89 for a list of recommended fluids, lubricants, and capacities.

Figure 7.26: Right Driveshields

Figure 7.27: Roll Timing Gearbox
7.9 Checking and Adding Oil in Header Drive Gearbox

IMPORTANT:
Check the gearbox oil level when the oil is warm. If the oil is cold, idle the machine for approximately 10 minutes prior to checking.

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

1. Adjust the header height until the cutterbar is parallel with the ground.
2. Shut down the engine, and remove the key from the ignition.
3. Locate gearbox (A) on the left side of the header.

Figure 7.28: Header Drive Gearbox Location
4. Clean area around check plug (A).
5. Remove check plug (A) with a 13 mm (1/2 in.) socket.
6. Ensure lubricant is even with bottom of check hole (with check plug [A] removed) or slightly runs out of the check hole.
7. If necessary, remove fill plug (B) and add lubricant to gearbox through the fill hole until lubricant runs out of check hole (with check plug [A] removed). Refer to 8.1 Recommended Lubricants, page 89 for a list of recommended fluids, lubricants, and quantities for the machine.
8. Reinstall the plug(s) and tighten.
9. Close the left driveshield and lower the header.
7.10 Checking and Adding Lubricant in Cutterbar

**WARNING**

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

**WARNING**

Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

1. Park the machine on level ground.
2. Lower the header onto 25 cm (10 in.) blocks under both ends of the cutterbar.
3. Shut down the engine, and remove the key from the ignition.
4. Open cutterbar curtain (A).

5. Use a spirit (bubble) level (A) to ensure the cutterbar is level in both directions. Adjust the header accordingly.
6. Clean the area around plug (A). Place a 5 liter (5.2 US qts) capacity container under plug (A).

7. Use a 17 mm socket to remove plug (A) and gasket (B) from cutterbar. Oil level must be up to the inspection plug hole. If additional lubricant is required, continue following this procedure and refer to the next step. If additional lubricant is NOT required, proceed to Step 22, page 84.

8. Reinstall the inspection plug.

![Figure 7.32: Cutterbar Oil Inspection Plug](image)

**CAUTION**

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

9. Start the engine, and raise the header slightly.

10. Lower the header onto blocks, so the right end is slightly higher than left end.

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

12. Remove plug (A) at the right end of the header.

   **IMPORTANT:**
   
   Do NOT remove bolts (B).

13. Add lubricant to the required level.

   **IMPORTANT:**
   
   Do NOT overfill the cutterbar. Overfilling can cause overheating, damage, or cutterbar component failure.

   **NOTE:**
   
   For lubrication specifications, refer to 8.1 Recommended Lubricants, page 89.

14. Replace plug (A) and torque to 30 Nm (22 lbf-ft).

![Figure 7.33: Cutterbar Oil Plug](image)

**CAUTION**

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

15. Start the engine and raise the header fully.

16. Shut down the engine, and remove the key from the ignition. Engage the windrower lift cylinder safety props.

17. Remove the block from under the header.

18. Disengage the windrower lift cylinder safety props.
CAUTION

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

19. Start the engine and lower the header to a level position on the ground.
20. Shut down the engine, and remove the key from the ignition.
21. Recheck the oil level.
22. Check gasket (B) for breaks or cracks, and replace if necessary.
23. Install plug (A) and gasket (B). Tighten securely.

7.11 Checking Lights

1. Check light brackets (A) and make sure they’re securely installed and undamaged.

2. Check operation of hazard lights (B) during machine run-up.
7.12 Checking Manuals

The following manuals should be stored in the manual storage case (A) on the left fixed deflector:

- R216 Rotary Disc Header Operator’s Manual
- R216 Rotary Disc Header Parts Catalog
7.13 Running up the Header

⚠️ WARNING
- Keep everyone several hundred feet away from your operation. Ensure bystanders are never in line with the front or rear of the machine. Stones and other foreign objects can be ejected from either end with force.
- Take extreme care to avoid injury from thrown objects. Do NOT, under any circumstances, operate the header when other people are nearby.
- Check cutterbar area carefully for loose parts and hardware on the cutterbar. These objects can be ejected with considerable force when the machine is started, and may result in serious injury or machine damage.
- The cutterbar curtain reduces the potential for thrown objects. Always keep the curtain down when operating the header. Replace the curtains if it becomes worn or damaged.

⚠️ WARNING
Before investigating an unusual sound or attempting to correct a problem, shut off engine, engage parking brake, and remove key.

⚠️ CAUTION
Never start or move the machine until you are sure all bystanders have cleared the area.

NOTE:
Higher engine rpm may be required to engage the disc header. Do NOT exceed 1800 rpm.

1. Start the windrower.
2. Set the disc header 152–305 mm (6–12 in.) above the ground and adjust the center-link to mid-position.
3. Run the machine slowly for 5 minutes, and watch and listen FROM THE OPERATOR’S SEAT for binding or interfering parts.
4. Run the machine at operating speed for 15 minutes. Listen for any unusual sounds or abnormal vibration.
5. Perform the run-up check as listed on the Predelivery Checklist (the yellow sheet inside the back cover of this instruction) to ensure the machine is field-ready.
6. Retain the Checklist and retain this instruction for future reference.
Chapter 8: Reference

8.1 Recommended Lubricants

Keep your machine operating at top efficiency by using only clean lubricants and by ensuring the following:

- Use clean containers to handle all lubricants.
- Store lubricants in an area protected from dust, moisture, and other contaminants.

**IMPORTANT:**

Do **NOT** overfill the cutterbar when adding lubricant. Overfilling could result in overheating and failure of cutterbar components.

Table 8.1 Recommended Lubricants

<table>
<thead>
<tr>
<th>Specification</th>
<th>Description</th>
<th>Use</th>
<th>Capacities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lubricant:</strong> Grease</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAE Multipurpose</td>
<td>High temperature extreme pressure (EP) performance with 1% max. Molybdenum Disulphide (NLGI Grade 2) lithium base</td>
<td>As required unless otherwise specified</td>
<td>—</td>
</tr>
<tr>
<td>SAE Multipurpose</td>
<td>High temperature extreme pressure (EP) performance with 10% max. Molybdenum Disulphide (NLGI Grade 2) lithium base</td>
<td>Driveline slip-joints</td>
<td>—</td>
</tr>
<tr>
<td><strong>Lubricant:</strong> Gear Lubricant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAE 80W-90</td>
<td>High thermal and oxidation stability API service class GL-5</td>
<td>4.9 m (16 ft.) cutterbar</td>
<td>10 liters (10.5 qts [US])</td>
</tr>
<tr>
<td>SAE 85W-140</td>
<td>Gear lubricant API service class GL-5</td>
<td>Conditioner roll timing gearbox</td>
<td>0.7 liters (0.75 qts [US])</td>
</tr>
<tr>
<td>SAE 80W-140</td>
<td>Fully Synthetic Oil API GL-5 Minimum, SAE J2360 Preferred</td>
<td>Header drive 90 degree gearbox</td>
<td>1.65 liters (1.74 qts [US])</td>
</tr>
</tbody>
</table>
8.2 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).

8.2.1 Metric Bolt Specifications

Table 8.2 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 8.1: Bolt Grades
### Table 8.3 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>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>
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<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 8.4 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>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>
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<tr>
<td>8-1.25</td>
<td>38</td>
<td>42</td>
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<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 8.5 Metric Class 10.9 Bolts and Class 10 Distorted Thread Nut

<table>
<thead>
<tr>
<th>Nominal Size (A)</th>
<th>Torque (Nm) Min.</th>
<th>Torque (Nm) Max.</th>
<th>Torque (lbf·ft) * Min.</th>
<th>Torque (lbf·ft) * Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-0.5</td>
<td>1.3</td>
<td>1.5</td>
<td>*12</td>
<td>*13</td>
</tr>
<tr>
<td>3.5-0.6</td>
<td>2.1</td>
<td>2.3</td>
<td>*19</td>
<td>*21</td>
</tr>
<tr>
<td>4-0.7</td>
<td>3.1</td>
<td>3.4</td>
<td>*28</td>
<td>*31</td>
</tr>
<tr>
<td>5-0.8</td>
<td>6.3</td>
<td>7</td>
<td>*56</td>
<td>*62</td>
</tr>
<tr>
<td>6-1.0</td>
<td>10.7</td>
<td>11.8</td>
<td>*95</td>
<td>*105</td>
</tr>
<tr>
<td>8-1.25</td>
<td>26</td>
<td>29</td>
<td>19</td>
<td>21</td>
</tr>
<tr>
<td>10-1.5</td>
<td>51</td>
<td>57</td>
<td>38</td>
<td>42</td>
</tr>
<tr>
<td>12-1.75</td>
<td>90</td>
<td>99</td>
<td>66</td>
<td>73</td>
</tr>
<tr>
<td>14-2.0</td>
<td>143</td>
<td>158</td>
<td>106</td>
<td>117</td>
</tr>
<tr>
<td>16-2.0</td>
<td>222</td>
<td>246</td>
<td>165</td>
<td>182</td>
</tr>
<tr>
<td>20-2.5</td>
<td>434</td>
<td>480</td>
<td>322</td>
<td>356</td>
</tr>
<tr>
<td>24-3.0</td>
<td>750</td>
<td>829</td>
<td>556</td>
<td>614</td>
</tr>
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</table>

### 8.2.2 Metric Bolt Specifications Bolting into Cast Aluminum

### Table 8.6 Metric Bolt Bolting into Cast Aluminum

<table>
<thead>
<tr>
<th>Nominal Size (A)</th>
<th>Bolt Torque 8.8 (Cast Aluminum)</th>
<th>Bolt Torque 10.9 (Cast Aluminum)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nm</td>
<td>lbf·ft</td>
</tr>
<tr>
<td>M3</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>M4</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>M5</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>M6</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>M8</td>
<td>20</td>
<td>14</td>
</tr>
<tr>
<td>M10</td>
<td>40</td>
<td>28</td>
</tr>
<tr>
<td>M12</td>
<td>70</td>
<td>52</td>
</tr>
<tr>
<td>M14</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>M16</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>
8.2.3 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 8.7 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;3&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>

---

3. Torque values shown are based on lubricated connections as in reassembly.
8.2.4 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 8.8, page 95.
6. Check final condition of fitting.

Table 8.8 O-Ring Boss (ORB) Hydraulic Fittings – Non-Adjustable

<table>
<thead>
<tr>
<th>SAE Dash Size</th>
<th>Thread Size (in.)</th>
<th>Torque Value(^4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Nm</td>
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<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>
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<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>

---

4. Torque values shown are based on lubricated connections as in reassembly.
8.2.5 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 8.9, page 96.

   **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 8.9 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 (^5)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nm</td>
</tr>
<tr>
<td>-3</td>
<td>Note^6</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^6</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^6</td>
<td>7/8</td>
<td>–</td>
</tr>
</tbody>
</table>

---

^5. Torque values and angles shown are based on lubricated connection as in reassembly.

^6. O-ring face seal type end not defined for this tube size.
Table 8.9  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&lt;sup&gt;7&lt;/sup&gt;</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>

8.2.6  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 8.10, page 97. Make sure that tube end of a shaped connector (typically 45 degree or 90 degree) 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 8.10 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>

---

<sup>7</sup> Torque values and angles shown are based on lubricated connection as in reassembly.
### 8.3 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>Unit Name</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>
### 8.4 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>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>Export header</td>
<td>Header configuration typical outside North America</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>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>hp</td>
<td>Horsepower</td>
</tr>
<tr>
<td>HPT display</td>
<td>Harvest Performance Tracker display module on a windrower</td>
</tr>
<tr>
<td>JIC</td>
<td>Joint Industrial Council: A standards body that developed standard sizing and shape for original 37° flared fitting</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>North American header</td>
<td>Header configuration typical in North America</td>
</tr>
<tr>
<td>NPT</td>
<td>National Pipe Thread: A style of fitting used for low-pressure port openings. Threads on NPT fittings are uniquely tapered for an interference fit</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 manifolds, pumps, and motors</td>
</tr>
<tr>
<td>ORFS</td>
<td>O-ring face seal: A style of fitting commonly used for connecting hoses and tubes. This style of fitting is also commonly called ORS, which stands for O-ring seal</td>
</tr>
<tr>
<td>PARK</td>
<td>The slot opposite the NEUTRAL position on operator’s console of M1 Series windrowers</td>
</tr>
<tr>
<td>R2 SP Series</td>
<td>MacDon R216 Rotary Disc Headers for windrowers</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>Screw</td>
<td>A headed and externally threaded fastener that threads into preformed threads or forms its own thread into a mating part</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>--------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Soft joint</td>
<td>A joint made with use of a fastener where joining materials are compressible or experience relaxation over a period of time</td>
</tr>
<tr>
<td>SP rotary disc header</td>
<td>Rotary disc header that connects to a self-propelled machine (windrower, etc.)</td>
</tr>
<tr>
<td>Tension</td>
<td>Axial load placed on a bolt or screw, usually measured in Newtons (N) or pounds (lb.)</td>
</tr>
<tr>
<td>TFFFT</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 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 (finger tight) and then nut is turned farther a number of degrees to achieve its final position</td>
</tr>
<tr>
<td>Torque-tension</td>
<td>The relationship between assembly torque applied to a piece of hardware and axial load it induces in bolt or screw</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>
</tbody>
</table>
Predelivery Checklist

Perform these checks and adjustments before delivering the machine to your Customer. If adjustments are required, refer to the appropriate page number in this manual. The completed Checklist should be retained by either the Operator or the Dealer.

⚠️ WARNING
Do NOT operate the machine with the driveshields open. High speed rotating components may throw debris and could result in death or serious injury.

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

Date Checked: Checked by:

<table>
<thead>
<tr>
<th>✓ Item</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check that skid shoes or gauge rollers are evenly set on both sides of the header.</td>
<td>• 3.1.1 Installing Adjustable Gauge Roller Kit, page 12</td>
</tr>
<tr>
<td>• 3.1.2 Installing Adjustable Skid Shoes Kit, page 15</td>
<td></td>
</tr>
<tr>
<td>Ensure all shipping stands are removed from the header, the cable ties are removed from the cutterbar curtain, and the cutterbar curtain hangs properly.</td>
<td>• 3.1 Removing Shipping Supports, page 9</td>
</tr>
<tr>
<td>• 3.4 Removing Shipping Stands, page 21</td>
<td>• 3.6 Unpacking Curtain, page 25</td>
</tr>
<tr>
<td>Check that side forming shields are evenly set.</td>
<td>4.1 Assembling and Installing Forming Shield, page 27</td>
</tr>
<tr>
<td>Check that deflectors are set in field position and the rear baffle is in the correct position: fully up for headers with the Double Windrow Attachment (DWA) option, and down for headers without the DWA option.</td>
<td>3.5 Adjusting Rear Baffle Deflectors, page 23</td>
</tr>
<tr>
<td>Grease all bearings and drivelines.</td>
<td>6 Lubricating the Disc Header, page 61</td>
</tr>
<tr>
<td>Check main drive belt tension.</td>
<td>7.1.1 Inspecting Conditioner Drive Belt, page 65</td>
</tr>
<tr>
<td>Check conditioner roll tension (roll conditioner).</td>
<td>7.5.1 Checking Roll Tension, page 75</td>
</tr>
<tr>
<td>Check hanging drum drive belts are properly tensioned.</td>
<td>7.6.1 Checking and Adjusting Hanging Drum Drive, page 77</td>
</tr>
<tr>
<td>Check feed roll drive belts are properly tensioned.</td>
<td>7.7.1 Checking and Adjusting Feed Roll Drive, page 78</td>
</tr>
<tr>
<td>Check conditioner roll timing gearbox lubricant.</td>
<td>7.8 Checking and Adding Conditioner Roll Timing Gearbox Oil, page 79</td>
</tr>
<tr>
<td>Check drive gearbox lubricant.</td>
<td>7.9 Checking and Adding Oil in Header Drive Gearbox, page 80</td>
</tr>
<tr>
<td>Check for shipping damage or missing parts. Be sure all shipping dunnage is removed.</td>
<td>_</td>
</tr>
<tr>
<td>Check cutterbar lubricant.</td>
<td>7.10 Checking and Adding Lubricant in Cutterbar, page 82</td>
</tr>
<tr>
<td>Check for loose hardware. Tighten to required torque if applicable.</td>
<td>8.2 Torque Specifications, page 90</td>
</tr>
</tbody>
</table>
Check cutterbar area carefully for loose parts and hardware on the cutterbar.

**WARNING**
These objects can be ejected with considerable force when the machine is started, and may result in serious injury or machine damage.

<table>
<thead>
<tr>
<th>Item</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check cutterbar area carefully for loose parts and hardware on the cutterbar.</td>
<td>—</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Run-Up Procedure</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check hydraulic hose and wiring harness routing to ensure adequate clearance when raising or lowering header.</td>
<td>—</td>
</tr>
<tr>
<td>Ensure the hazard lights are functional.</td>
<td>7.11 Checking Lights, page 85</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Post Run-Up Check – Stop Engine</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check for hydraulic leaks.</td>
<td>—</td>
</tr>
<tr>
<td>Check belt drive for proper idler alignment and overheating bearings.</td>
<td>7.1 Conditioner Drive Belt, page 65</td>
</tr>
<tr>
<td>Ensure the header manuals are in storage compartment.</td>
<td>7.12 Checking Manuals, page 86</td>
</tr>
</tbody>
</table>