Published September 2019.

© 2019 MacDon Industries, Ltd.

The information in this publication is based on the information available and in effect at the time of printing. MacDon Industries, Ltd. makes no representation or warranty of any kind, whether expressed or implied, with respect to the information in this publication. MacDon Industries, Ltd. reserves the right to make changes at any time without notice.
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.

Conventions

The following conventions are used in this document:

- Right and left are determined from the operator’s position. The front of the rotary disc header faces the crop.
- Unless otherwise noted, use the standard torque values provided in this manual.

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

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

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.

<table>
<thead>
<tr>
<th>Section</th>
<th>Summary of Change</th>
<th>Internal Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Throughout</td>
<td>Changed hanging drum to suspended drum</td>
<td>Tech Only</td>
</tr>
<tr>
<td></td>
<td>Removed Adjustable Gauge roller kit instructions</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td></td>
<td>Removed Adjustable Skid Shoes kit instructions</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>3.1 Removing Shipping Supports, page 9</td>
<td>Updated images and procedure, added torque value</td>
<td>E58869</td>
</tr>
<tr>
<td>3.4 Removing Shipping Stands, page 14</td>
<td>Added missing steps</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>4.1.1 Assembling and Installing Forming Shield, page 19</td>
<td>Updated images and procedure</td>
<td>Product Support</td>
</tr>
<tr>
<td>4.1.2 Routing Electrical Harness, page 26</td>
<td>Updated images and procedure</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>4.1.4 Connecting Rotary Disc Header Hydraulics Using Quick Couplers – M1240 Windrowers, page 34</td>
<td>Added note</td>
<td>Product Support</td>
</tr>
<tr>
<td>4.1.5 Connecting Rotary Disc Header Hydraulics Using Hard Plumbing, page 36</td>
<td>Added note</td>
<td>Product Support</td>
</tr>
<tr>
<td>4.1.4 Connecting Rotary Disc Header Hydraulics Using Quick Couplers – M1240 Windrowers, page 34</td>
<td>Updated the procedure</td>
<td>ECN 58681</td>
</tr>
<tr>
<td>4.1.8 Unpacking the Curtain, page 41</td>
<td>Update images and procedure</td>
<td>E58886</td>
</tr>
<tr>
<td>6.1 Lubrication Locations, page 46</td>
<td>Updated driveline positions</td>
<td>ECN 58852</td>
</tr>
<tr>
<td>7.3.1 Checking Suspended Drum Drive, page 54</td>
<td>Updated images</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>7.4.1 Checking Feed Roll Drive, page 55</td>
<td>Updated images and text</td>
<td>ECN 31050</td>
</tr>
<tr>
<td>8.1 Starting the Engine, page 65</td>
<td>Added reference topic</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>8.2 Engaging and Disengaging Header Safety Props, page 69</td>
<td>Added reference topic</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>8.3 Leveling the Header, page 71</td>
<td>Added reference topic</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>8.4 Closing Driveshields, page 74</td>
<td>Added reference topic</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>8.5 Opening Driveshields, page 75</td>
<td>Added reference topic</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>8.6 Closing Cutterbar Curtain, page 77</td>
<td>Added reference topic</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>8.7 Opening Cutterbar Curtain, page 78</td>
<td>Added reference topic</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>8.8 Recommended Lubricants, page 79</td>
<td>Updated oil quantity</td>
<td>Tech Pubs</td>
</tr>
</tbody>
</table>
Introduction ............................................................................................................................................... i
Summary of Changes.................................................................................................................................. ii

Chapter 1: Safety ......................................................................................................................................... 1
  1.1 Signal Words ...................................................................................................................................... 1
  1.2 General Safety .................................................................................................................................... 2
  1.3 Welding Precaution ............................................................................................................................ 4
  1.4 Safety Signs ...................................................................................................................................... 5

Chapter 2: Unloading the Header from a Trailer ..................................................................................... 7

Chapter 3: Assembling the Header ......................................................................................................... 9
  3.1 Removing Shipping Supports ............................................................................................................. 9
  3.2 Lowering the Header ......................................................................................................................... 11
  3.3 Unpacking Hydraulic Hoses and Electrical Harness – M1240......................................................... 13
  3.4 Removing Shipping Stands ............................................................................................................... 14
  3.5 Installing Manual Rear Deflectors ................................................................................................... 17

Chapter 4: Attaching Rotary Disc Header to M1240 Windrower ............................................................... 19
  4.1 Attaching Header to M1240 .............................................................................................................. 19
    4.1.1 Assembling and Installing Forming Shield .................................................................................... 19
    4.1.2 Routing Electrical Harness ........................................................................................................ 26
    4.1.3 Attaching Rotary Disc Header .................................................................................................... 29
    4.1.4 Connecting Rotary Disc Header Hydraulics Using Quick Couplers – M1240 Windrowers .......... 34
    4.1.5 Connecting Rotary Disc Header Hydraulics Using Hard Plumbing .............................................. 36
    4.1.6 Restoring Float for Rotary Disc Header ...................................................................................... 38
    4.1.7 Calibrating Windrower Knife Drive on the Harvest Performance Tracker Display .................... 40
    4.1.8 Unpacking the Curtain ................................................................................................................. 41

Chapter 5: Installing Options .................................................................................................................... 43

Chapter 6: Lubricating the Rotary Disc Header .......................................................................................... 45
  6.1 Lubrication Locations ....................................................................................................................... 46

Chapter 7: Performing Predelivery Checks ............................................................................................ 49
  7.1 Conditioner Drive Belt ..................................................................................................................... 49
    7.1.1 Inspecting Conditioner Drive Belt ................................................................................................ 49
    7.1.2 Adjusting Conditioner Drive Belt ............................................................................................... 50
  7.2 Header Float .................................................................................................................................... 52
    7.2.1 Checking Float ............................................................................................................................ 52
    7.2.2 Setting the Float ......................................................................................................................... 52
  7.3 Suspended Drum Drive .................................................................................................................... 54
    7.3.1 Checking Suspended Drum Drive ............................................................................................... 54
  7.4 Feed Roll Drive ............................................................................................................................... 55
7.4.1 Checking Feed Roll Drive ............................................................................................................... 55
7.5 Checking and Adding Conditioner Roll Timing Gearbox Oil ............................................................... 56
7.6 Checking and Adding Oil in Header Drive Gearbox ........................................................................... 57
7.7 Checking and Adding Lubricant in Cutterbar ...................................................................................... 59
7.8 Checking Lights ................................................................................................................................... 62
7.9 Checking Manuals ................................................................................................................................. 63
7.10 Running up the Header ........................................................................................................................ 64

Chapter 8: Reference ................................................................................................................................ 65
8.1 Starting the Engine ............................................................................................................................... 65
8.2 Engaging and Disengaging Header Safety Props ......................................................................................... 69
8.3 Leveling the Header .............................................................................................................................. 71
8.4 Closing Driveshields ............................................................................................................................... 74
8.5 Opening Driveshields ............................................................................................................................. 75
8.6 Closing Cutterbar Curtain ....................................................................................................................... 77
8.7 Opening Cutterbar Curtain ..................................................................................................................... 78
8.8 Recommended Lubricants ...................................................................................................................... 79
8.9 Torque Specifications .............................................................................................................................. 80
  8.9.1 Metric Bolt Specifications .............................................................................................................. 80
  8.9.2 Metric Bolt Specifications Bolting into Cast Aluminum ......................................................................... 82
  8.9.3 O-Ring Boss Hydraulic Fittings – Adjustable .................................................................................. 83
  8.9.4 O-Ring Boss Hydraulic Fittings – Non-Adjustable ........................................................................... 85
  8.9.5 O-Ring Face Seal Hydraulic Fittings ............................................................................................... 86
  8.9.6 Tapered Pipe Thread Fittings ......................................................................................................... 87
8.10 Conversion Chart ................................................................................................................................. 88
8.11 Definitions .......................................................................................................................................... 89

Predelivery Checklist ................................................................................................................................ 91
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.
• 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 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, refer to the windrower’s technical manual 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 the original part on which a safety sign was installed is replaced, be sure the repair part displays the current safety sign.

Figure 1.7: Operator’s Manual Decal
Chapter 2: Unloading the Header from a Trailer

⚠️ 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>
<thead>
<tr>
<th>Table 2.1 Lifting Vehicle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Capacity</td>
</tr>
<tr>
<td>Minimum Fork Length</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.

Figure 2.1: Minimum Lifting Capacity
A - Load Center of Gravity
B - Load Center 1220 mm (48 in.) from Back of Forks
C - Minimum Fork Length 1981 mm (78 in.)

Figure 2.2: Lifting Rotary Disc Header off Trailer
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).
2. Remove two supports (B)

Figure 3.1: Shipping Supports
ASSEMBLING THE HEADER

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

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

5. Remove three bolts and washers (A) holding support channel (B) onto the header supports.

6. Remove channel (B) from the header.

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

Figure 3.3: Plates
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>
</tbody>
</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 3.4: Block Placement](image)
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 rotary 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 rotary disc header (A) into working position on the wooden blocks (B) placed in Step 1, page 11.

**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 – M1240

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.

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 the 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.

1. Remove two nuts (A) and bolts and discard. Repeat on the opposite side.

2. Remove two bolts (A) and nuts from the top of the header and discard. Repeat on the opposite side of the header.

3. Remove nut (B) and bolt and discard.
4. 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.

5. Remove four nuts (A) and bolts (B) from top of shipping stands (C) and remove the shipping stands from the header.
6. Remove and retain bolts (A) and remove shipping plate (B). Discard plate (B), and repeat for the other side of the header.

7. Apply medium-strength threadlocker (Loctite® 243 or equivalent) to bolt threads (A) and reinstall them onto the header. Torque hardware to 91 Nm (67 lbf·ft). Repeat for the other side of the header.

Figure 3.14: Shipping Plate – Right Side Shown, Left Side Opposite
3.5  Installing Manual Rear Deflectors

There are four fins and two deflectors located under the baffle. The fins and deflectors require no adjustment from shipping configuration to field position.

Install the rear deflectors as follows:

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).
ASSEMBLING THE HEADER

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.

7. Check that the baffle is adjustable across all working positions without binding.

**NOTE:**
Some contact is acceptable.

Figure 3.18: Deflector and Rear Baffle
Chapter 4: Attaching Rotary Disc Header to M1240 Windrower

4.1 Attaching Header to M1240

4.1.1 Assembling and Installing Forming Shield

Unpack and assemble the forming shield as follows:

1. Locate and open the included hardware bag.

For headers without the DWA installed:

2. Install shield mount plates (C) on the inside of the windrower legs.

3. Install two hex head M12 X 1.75 X 140-8.8 bolts (A), washers (D), and nuts (C) in the rear holes on the shield mounting plates. This ensures the forming shield is set at its lowest setting. The lowest setting is used when there is no double windrow attachment (DWA).

![Figure 4.1: Setting Forming Shield for Header without DWA Option](image)
For headers with the DWA installed:

4. Install two hex head M12 X 1.75 X 140-8.8 bolts (A), washers (D), and nuts (C) in the front holes on the shield mounting plates. This ensures the forming shield is set at its highest setting.

5. Unpack and remove shipping material from deflectors (A) and (B).

6. Remove right deflector (A) and left deflector (B) from shipping position and place them on an even work surface.

7. Remove cover (C) from shipping position and place the cover on an even work surface.
8. Remove right deflector (B) and left deflector (C) from shipping position. Retain for installation later.

9. Remove right hinge pin (A).

10. Remove right bracket (D).

11. Remove the two outer existing bolts (B). Retain the bolts and discard the nuts.

12. Install right side bracket (A) on the underside of the forming shield cover.

13. Install three 25 mm-long short neck M10 bolts (B) and three Nyloc nuts (C).

14. Install support plate (D) on the top of the cover.

15. Install two 35 mm-long short neck M10 bolts (E) and two nuts (F).

16. Install one 25 mm-long short neck M10 bolt (A) and nut (B) through plate (C) and forming shield angle (D). Repeat this step on the left side of the forming shield.

17. Repeat Step 9, page 21 to Step 15, page 21 on the opposite side of the forming shield.

18. Place the forming shield in position under the windrower.
19. Using spacer (A), hex head M12 X 130 mm bolt (B), and nyloc 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.

20. Install 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.
21. Pull rubber strap (A) up towards windrower frame. Align the first hole in rubber strap (A) with straight pin (B).

22. Secure rubber strap (A) in place with washer (C) and hair pin (D).


24. Retrieve baffle (A) from shipping position.

25. Secure baffle (A) to side bracket (D) with one 25 mm M12 bolt (B) and nut (C). Snug nut (C) to allow baffle (A) to rotate freely. Repeat on the other side of the forming shield.
26. Install handle (A) with two flat washers (B) and one rubber washer (C), using one 40 mm-long square neck M12 bolt (D) installed through baffle (E) and right side bracket (F). Repeat on the other side of the forming shield.

![Figure 4.11: Baffle Handle](image1)

27. 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.

![Figure 4.12: Deflector Cover](image2)

28. Install side deflector (A) on the right side of the forming shield.

29. Install pin (B) to secure the side deflector.

30. Install one 40 mm-long M10 bolt (C) and nut (D).

31. Install one 35 mm-long short neck M10 bolt (H) near the front of the forming shield with washer (F) and two jam nuts (G). Snug lower nut (G) against the forming shield, but keep it loose enough to rotate freely. Then jam upper nut (G) against the lower nut.

32. Install one 20 mm-long short neck M10 bolt (J) and nut (E). Repeat on the other side of the forming shield.

**NOTE:**
Bolt is installed with button head facing towards the leg to increase clearance.

![Figure 4.13: Right Side Bracket](image3)
33. Use one 40 mm-long square neck M12 bolt (A) to secure the forming shield cover (F), deflector adjustment cover (B), two washers (C), rubber washer (D), and handle (E) together. Repeat on the other side of the forming shield.

34. Repeat Step 28, page 24 to Step 33, page 25 on the other side of the forming shield.

35. Remove existing bolts and nuts (E). Retain the bolts and discard the nuts.

36. Install right deflector (A) on the right side of the forming shield using two 25 mm-short neck M10 bolt (C) and nuts (D). Repeat on the other side of the forming shield.

**NOTE:**
The narrower deflector end faces the front of forming shield, while the wider end faces the rear.
4.1.2 Routing Electrical Harness

A total of seven cable ties (A) will secure the routed header electrical harness (B) in place alongside the windrower chassis 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:**
Cable ties are located in the manual storage box.

**NOTE:**
Windrower chassis 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. 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 header adapter harness (A) and adjustable strap (D). Loosely attach the harness to center-link (B) with two cable ties (C).

**NOTE:**
Cable ties (C) should bundle header adapter 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.

4. Install velcro strap (D) around the center link cylinder.

5. Route header adapter harness (A) over the windrower forward cross member and loosely secure it to windrower chassis harness (B) with three cable ties (C).

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

**NOTE:**
The windrower chassis harness is only partially illustrated.

6. Route header adapter harness (A) over windrower frame (B) towards the multicoupler base.

7. Loosely secure header adapter harness (A) to the windrower chassis harness (C) with one cable tie (D) near the windrower frame.

**NOTE:**
Do **NOT** tighten cable tie (D) on harness at this point.
8. Connect header adapter harness (A) to plug (B) set in multicoupler base (C).

9. Secure header adapter 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).

10. Extend center link (A) fully. Check that there is some slack in the harness (B).

11. Retract center link (A) fully. Check that there is not excessive amount of harness (B) hanging down.

12. Adjust harness (B) positioning as required.

13. Tighten all the cables along the harness.

14. When disconnected from the header, gather the portion of adapter harness (A) that connects to the header and secure it to the center link using adjustable strap (B).
4.1.3 Attaching Rotary 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 rotary disc header. Replace pin (A) to hold center-link in place.

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

2. Remove hairpin (A) from clevis pin (B), and remove pin from rotary disc header support (C) on both sides of rotary disc header.
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 11.

4. Repeat Step 3, page 30 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 engine.

21. Raise the header slightly.

22. Shut down the 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.
23. Remove all wooden blocks from beneath the header.

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

24. Start the engine.

25. Lower the header fully.

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

### 4.1.4 Connecting Rotary Disc Header Hydraulics Using Quick Couplers – M1240 Windrowers

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 [4.1.5 Connecting Rotary Disc Header Hydraulics Using Hard Plumbing, page 36](#) for connection instructions.

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

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

   **NOTE:**
   Leave hose support loose at this time.

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

---

**Figure 4.38: Hydraulic Hoses**

**Figure 4.39: Protective Shipping Plugs on R216 SP 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.

   **NOTE:**
   If required, loosen fitting (F) and retighten as needed to ensure relief valve is pointing straight down as shown.

5. Position the front plate on hose support (G), approximately 140 mm (5.5 in.) away from the windrower frame.

6. Route hoses (A), (B), and (C) as straight as possible and avoid rub/wear points that could damage the hydraulic hoses.

7. Route case drain hose (A) through clip (D), and leave it loose.

8. Slide hoses (B) and (C), back and forth until they relax into position.

9. Tighten clip (D).

10. Tighten nuts (E).

11. Close the platform.

12. Start the engine.

13. Raise the header fully.

14. Watch the hoses for any excessive stretching, or binding. Adjust the hose position in the hose support as required.

15. Lower the header fully.

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

17. Proceed to 4.1.6 Restoring Float for Rotary Disc Header, page 38.
4.1.5 Connecting Rotary 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 4.1.4 Connecting Rotary Disc Header Hydraulics Using Quick Couplers – M1240 Windrowers, page 34 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 rotary 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.

   **NOTE:**
   Retain protective plugs for use when header is detached.

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 (151–167 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.

   **NOTE:**
   If required, 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.

### 4.1.6 Restoring Float for Rotary 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 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**

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 rotary disc header.

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.
4.1.7 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 rotary 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 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 4.51: Opening the Main Menu

Figure 4.52: 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.

![Figure 4.53: Calibration Page](image_url)

### 4.1.8 Unpacking the Curtain

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

⚠️ **WARNING**

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

1. Raise the header fully.

2. Engage the header safety props. For instructions, refer to
   8.2 Engaging and Disengaging Header Safety Props, page 69.

3. Cut five straps (C) securing the cutterbar curtain to the header.

4. Loosen 12 nuts (A) under the rotary 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.

5. Remove the five straps and discard.

![Figure 4.54: Cutterbar Curtain](image_url)
6. Ensure bumper (A) aligns with the rotary 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.

**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.

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

8. Ensure that the curtain hangs properly and completely encloses the cutterbar area. Minor creases in the curtain will eventually straighten out.

Figure 4.55: Cutterbar Curtain
Chapter 5: Installing Options

Install options (if supplied with shipment) according to the instructions supplied with each kit.
Chapter 6: Lubricating the Rotary 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 rotary disc header has been lubricated at the factory. However, you should lubricate the rotary 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.
LUBRICATING THE ROTARY DISC HEADER

6.1 Lubrication Locations

A - Idler/Tensioner Pivot
B - Bearing, Roller Conditioner (Two Places)
D - Slip Joint, Conditioner Driveline
E - Idler/Tensioner Pivot
F - Bearing, Feed Roll
G - Tensioner Arm

Figure 6.1: Left Side Lubrication Locations

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

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 Predelivery Checklist for detailed instructions. The Operator or the Dealer should retain the completed Predelivery 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 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 rotary 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 50, otherwise close the drive shield and proceed to 7.2 Header Float, page 52.

7.1.2 Adjusting Conditioner Drive Belt

⚠️ 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 fully.
2. Shut down the engine, and remove the key from the ignition.
3. Open left driveshield (A).
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 723 mm (28 7/16 in.).

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

7. With hardware fully loosened, slide threaded rod (E) up and backward into the disc 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 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 HEADER DOWN switch (B), lower the rotary disc header fully and with the header lift cylinders fully retracted.

   **NOTE:**
   Ensure the header is level with the 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 52.

   **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 rotary 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.

![Figure 7.10: HPT Left and Right Float Settings](image)
7.3 Suspended Drum Drive

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

7.3.1 Checking Suspended Drum Drive

The suspended 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 driveshields on the left side of the header. For instructions, refer to 8.5 Opening Driveshields, page 75.

2. 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).

3. Inspect the suspended drum belt drive and ensure belts (B) are properly seated on pulleys (A).

4. If necessary, adjust the belts as follows:
   a. Release belt tension using a 1/2 in. drive ratchet at location (C) to turn the tensioner arm clockwise.
   b. Install belt (B). Release tensioner arm to tension belt.
7.4 Feed Roll Drive

7.4.1 Checking 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 idler pulley (C).

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

3. If necessary, adjust belt alignment 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 idler 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 belts (D).

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

---

Figure 7.13: Feed Roll Belt Drive

Figure 7.14: Tensioner Spring
7.5 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 rotary 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 8.8 Recommended Lubricants, page 79 for a list of recommended fluids, lubricants, and capacity.
7.6 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 the machine, always stop the engine and remove the key from the ignition before leaving the operator’s seat for any reason.

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

Figure 7.17: Header Drive Gearbox Location
6. Clean area around check plug (A).
7. Remove check plug (A) with a 13 mm (1/2 in.) socket.
8. Ensure lubricant is even with bottom of check hole (with check plug [A] removed) or slightly runs out of the check hole.
9. 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 8.8 Recommended Lubricants, page 79 for a list of recommended fluids, lubricants, and capacity for the machine.
10. Reinstall the plug(s) and torque to 23 Nm (17 lbf-ft).
11. Close the left driveshield.
12. Lower the header fully.

Figure 7.18: Header Drive Gearbox
7.7 Checking and Adding Lubricant in Cutterbar

**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.

**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 61.

8. Reinstall the inspection plug.

⚠️ 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 8.8 Recommended Lubricants, page 79.

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

⚠️ 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.

7.8 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.

Figure 7.25: Lights
7.9 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
- R216 Rotary Disc Header Quick Card

Figure 7.26: Manual Case
7.10 Running up the Header

**WARNING**

- Keep everyone 100 m (330 ft.) 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 rotary disc header. Do **NOT** exceed 1800 rpm.

1. Clear all bystanders from the area.

2. Start the windrower.

3. Set the rotary disc header 152–305 mm (6–12 in.) above the ground and adjust the center-link to mid-position.

4. Run the machine slowly for 5 minutes, and watch and listen **FROM THE OPERATOR’S SEAT** for binding or interfering parts.

5. Run the machine at operating speed for 15 minutes. Listen for any unusual sounds or abnormal vibration.

6. 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.

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

8. Retain the Predelivery Checklist and this instruction for future reference.
Chapter 8: Reference

8.1 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.

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.

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 8.6: HPT No Header Screen
8.2 Engaging and Disengaging Header Safety Props

Safety props are located on both header lift cylinders on the windrower. Follow these steps to engage or disengage the header safety props:

⚠️ 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.

1. Start the engine. Press the HEADER UP (A) switch 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 the HEADER UP switch (A) until both cylinders stop moving.
   b. Continue to hold the switch for 3–4 seconds. Cylinders are now phased.

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

3. 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.
4. 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.

**Figure 8.9: Safety Prop**
8.3 Leveling the Header

The windrower lift linkages are factory-set to provide the proper header level, and should not normally require adjustment. If leveling is required, 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. Press rotary scroll knob (A) on Harvest Performance Tracker (HPT) to display the QuickMenu system.
2. Rotate scroll knob (A) to highlight the header float symbol (B) and press scroll knob to select. The SET-UP FLOAT page displays.
3. Press soft key 3 (A) to remove float.
4. Park the windrower on level ground.

5. Press the header raise button (A) on the ground speed lever (GSL). When the header reaches maximum height, continue to hold the header raise button momentarily to allow the lift cylinders to rephase.

6. Lower the header to approximately 150 mm (6 in.) off the ground.

7. Ensure that channel (A) is against link (B).

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

9. Measure the distance to the ground at both ends of the header to determine if the header is level.

**CAUTION**

Check to be sure all bystanders have cleared the area.

10. If adjustment is necessary, start engine and resume float. Lower the header onto the ground until channel (A) lifts away from the link (B) on both sides.

11. Shut down the engine, and remove the key from the ignition.
12. On the side that is higher, remove nut, washer, and bolt (A) that attaches shims (B) to the linkage.

13. Remove one or both of the shims (B) and reinstall the hardware (A).

⚠️ CAUTION

Check to be sure all bystanders have cleared the area.

14. Repeat Step 5, page 72 to Step 9, page 72 to rephase the cylinders and check the header level.

15. If additional adjustment is required, repeat Step 10, page 72 to Step 13, page 73, and install one of the removed shims on the opposite linkage.

16. Reset the header float. For instructions, refer to 7.2.2 Setting the Float, page 52.
8.4 Closing Driveshields

⚠️ CAUTION

To reduce the risk of personal injury, do NOT operate the machine without the driveshields in place and secured.

NOTE:
Images shown in this procedure are for the left driveshield—the right driveshield is similar.

1. Lift lock latch (A) to disengage driveshield lock.

2. Move inboard half of driveshield (A) back to closed position.

3. Move outboard half of driveshield (A) back to closed position.
8.5 Opening Driveshields

⚠️ CAUTION

To reduce the risk of personal injury, do NOT operate the machine without the driveshields in place and secured.

NOTE:
Images shown in this procedure are for the left driveshield—the right driveshield is similar.

1. Push down on release lever (A) to disengage the release latch and pull handle (B).

2. Lift the outboard driveshield panel toward the outboard end of the header.
3. Grab handle (A) and lift the other half of endshield (B) to the inboard side of the header.

Figure 8.22: Driveshield – Inboard Side
8.6 Closing Cutterbar Curtain

⚠️ CAUTION

To avoid injury, keep hands and fingers away from corners of doors when closing.

1. Pull curtain outward from retaining clips and lower curtain.

Figure 8.23: Cutterbar Curtain
8.7 Opening Cutterbar Curtain

⚠️ 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. Push curtain (A) inward and up.

2. Secure curtain in place at locations (A) using three clips provided.

**NOTE:**

Cutterbar curtain (A) is held in place between the tines of retaining clips (B).
8.8 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>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>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 80W-90</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 85W-140</td>
<td>Fully Synthetic Oil API GL-5 Minimum, SAE J2360 Preferred</td>
<td>Header drive 90 degree gearbox</td>
<td>1.8 liters (1.9 qts [US])</td>
</tr>
</tbody>
</table>
8.9 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).

### 8.9.1 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 8.27: 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></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 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></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 8.5 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>

8.9.2 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</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>
8.9.3 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[^3]</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.
8.9.4 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 85.
6. Check final condition of fitting.

![Hydraulic Fitting](image)

**Figure 8.34: Hydraulic 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[^1]</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>

[^1]: Torque values shown are based on lubricated connections as in reassembly.
8.9.5 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 86.

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&lt;sup&gt;5&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>Note</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</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</td>
<td>7/8</td>
<td>–</td>
</tr>
<tr>
<td>-16</td>
<td>1 7/16</td>
<td>1</td>
<td>150–165</td>
</tr>
</tbody>
</table>

<sup>5.</sup> Torque values and angles shown are based on lubricated connection as in reassembly.
### 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 $^6$</th>
</tr>
</thead>
<tbody>
<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>

#### 8.9.6 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 87. 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 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>

---

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

**Table 8.11 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>
# 8.11 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>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 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.

### Header Serial Number:

<table>
<thead>
<tr>
<th>✓</th>
<th>Item</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Check that the header is level.</td>
<td>8.3 Leveling the Header, page 71</td>
</tr>
<tr>
<td></td>
<td>Check that skid shoes or gauge rollers are evenly set on both sides of the header.</td>
<td>—</td>
</tr>
</tbody>
</table>
|   | Ensure all shipping stands are removed from the header, the cable ties are removed from the cutterbar curtain, and the cutterbar curtain hangs properly. | • 3.1 Removing Shipping Supports, page 9  
• 3.4 Removing Shipping Stands, page 14  
• 4.1.8 Unpacking the Curtain, page 41 |
<p>|   | Check that side forming shields are evenly set.                       | 4.1.1 Assembling and Installing Forming Shield, page 19 |
|   | Check that baffle 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. | 3.5 Installing Manual Rear Deflectors, page 17 |
|   | Grease all bearings and drivelines.                                   | 6 Lubricating the Rotary Disc Header, page 45          |
|   | Check main drive belt tension.                                        | 7.1.1 Inspecting Conditioner Drive Belt, page 49       |
|   | Check suspended drum drive belts are tensioned.                       | 7.3.1 Checking Suspended Drum Drive, page 54           |
|   | Check feed roll drive belts are tensioned.                            | 7.4.1 Checking Feed Roll Drive, page 55                |
|   | Check conditioner roll timing gearbox lubricant.                      | 7.5 Checking and Adding Conditioner Roll Timing Gearbox Oil, page 56 |
|   | Check drive gearbox lubricant.                                        | 7.6 Checking and Adding Oil in Header Drive Gearbox, page 57 |
|   | Check for shipping damage or missing parts. Be sure all shipping dunnage is removed. | —                                                      |
|   | Check cutterbar lubricant.                                            | 7.7 Checking and Adding Lubricant in Cutterbar, page 59 |
|   | Check for loose hardware. Tighten to required torque if applicable.   | 8.9 Torque Specifications, page 80                      |
|   | Check cutterbar area carefully for loose parts and hardware on the cutterbar. | —                                                      |</p>
<table>
<thead>
<tr>
<th>Item</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>![WARNING] These objects can be ejected with considerable force when the machine is started, and may result in serious injury or machine damage.</td>
<td></td>
</tr>
<tr>
<td>Run-Up Procedure</td>
<td>7.10 Running up the Header, page 64</td>
</tr>
<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>7.8 Checking Lights, page 62</td>
</tr>
<tr>
<td>Post Run-Up Check – Stop Engine</td>
<td></td>
</tr>
<tr>
<td>Check for hydraulic leaks.</td>
<td>—</td>
</tr>
<tr>
<td>Check belt drive for proper idler alignment and overheated bearings.</td>
<td>7.1 Conditioner Drive Belt, page 49</td>
</tr>
<tr>
<td>Ensure the header manuals are in storage compartment.</td>
<td>7.9 Checking Manuals, page 63</td>
</tr>
</tbody>
</table>

Date Checked: Checked by: