Introduction

This instruction manual describes the unloading, setup, and predelivery requirements for the MacDon D1 Series Combine Draper Header with FM100 Float Module.

To ensure the best performance of this product and the safety of your customers, carefully follow the unload and assembly procedure from the beginning through to completion.

Some sections/steps do not apply to all header configurations and sizes. Refer to the instructions for your specific header.

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

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 header faces the crop.
- Unless otherwise noted, use the standard torque values provided in this manual.

NOTE:

Keep your MacDon publications up-to-date. The latest version can be downloaded from our Dealer portal (https://portal.macdon.com) (login required).

This document 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 Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inside front cover</td>
<td>Added copyright and disclaimer.</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>Throughout</td>
<td>Made sure the following statements are now a <strong>WARNING</strong> for consistency:</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td></td>
<td>• Check to be sure all bystanders have cleared the area.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Never start or move the machine until you are sure all bystanders have cleared the area.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Equipment used for loading and unloading must meet or exceed the minimum specified requirements. Using inadequate equipment may result in vehicle tipping, machinery damage, or chain breakage.</td>
<td></td>
</tr>
<tr>
<td>Throughout</td>
<td>Made sure the following statements are now a <strong>DANGER</strong> for consistency:</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td></td>
<td>• To avoid bodily injury or death from unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator’s seat, and always engage safety props before going under the machine for any reason.</td>
<td></td>
</tr>
<tr>
<td>Introduction, page i</td>
<td>Added conventions.</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>2.2 Separating Headers, page 7</td>
<td>Added <strong>NOTE:</strong></td>
<td>Tech Pubs</td>
</tr>
<tr>
<td></td>
<td>• Unless otherwise specified, discard stands, shipping material, and hardware. Removable stands and supports are painted yellow or unpainted.</td>
<td></td>
</tr>
<tr>
<td>2.2 Separating Headers, page 7</td>
<td>Added header size to picture caption for clarity.</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>• Step 6, page 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2 Separating Headers, page 7</td>
<td>Added “double reel only” to step.</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>• Step 9, page 9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.3.1 Forklift Method, page 12</td>
<td>Changed the following <strong>IMPORTANT</strong> to a <strong>WARNING</strong> for consistency:</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td></td>
<td>• Equipment used for loading and unloading must meet or exceed the minimum specified requirements. Using inadequate equipment may result in vehicle tipping, machinery damage, or chain breakage.</td>
<td></td>
</tr>
<tr>
<td>Lifting Single Header, page 13</td>
<td>Changed the following <strong>IMPORTANT</strong> to a <strong>WARNING</strong> for consistency:</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td></td>
<td>• Equipment used for loading and unloading must meet or exceed the minimum specified requirements. Using</td>
<td></td>
</tr>
<tr>
<td>Section</td>
<td>Summary of Change</td>
<td>Internal Use Only</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------------------</td>
</tr>
</tbody>
</table>
| Lifting Two Headers, page 15                 | Changed the following IMPORTANT to a WARNING for consistency:  
• Equipment used for loading and unloading must meet or exceed the minimum specified requirements. Using inadequate equipment may result in vehicle tipping, machine damage, or chain breakage. | Tech Pubs         |
| 2.4 Lowering Header, page 16                 | Added pictures to identify the center-link anchor on single and double-reel headers.                                                                                                                               | Product Support   |
| Step 6, page 19                              |                                                                                                                                                                                                                   |                   |
| 3.1.4 Attaching Center Support – Double Reel, page 35 | Added the following to the step:  
• Retain for reinstallation.                                                                                                                                   | Tech Pubs         |
| Step 1, page 35                              |                                                                                                                                                                                                                   |                   |
| 3.1.6 Attaching Cam Arms, page 37            | Changed the picture to make the step generic to five, six, and nine-bat reels.                                                                                                                                     | Tech Pubs         |
| Step 5, page 38                              |                                                                                                                                                                                                                   |                   |
| 3.1.6 Attaching Cam Arms, page 37            | Added the IMPORTANT to emphasize the correct installation of the shim.                                                                                                                                           | Product Support   |
| Step 6, page 38                              |                                                                                                                                                                                                                   |                   |
| 3.1.6 Attaching Cam Arms, page 37            | Added picture of nine-bat reel for additional reference.                                                                                                                                                           | Tech Pubs         |
| Figure 3.47, page 39                        |                                                                                                                                                                                                                   |                   |
| 3.2.6 Assembling Draper, page 54             | Removed the following WARNING ONLY because the header is considered to be inoperative and not fully assembled at this point in the manual:  
• To avoid bodily injury or death from unexpected start-up or fall of raised machine, always stop engine, remove key, and engage safety props before going under machine for any reason. | Tech Pubs         |
| Step                                         |                                                                                                                                                                                                                   |                   |
| 3.2.6 Assembling Draper, page 54             | Corrected reference to next step in manual.                                                                                                                                                                       | Tech Pubs         |
| Step 18, page 85                             |                                                                                                                                                                                                                   |                   |
| 3.3.5 Installing Deck, page 97              | Reworded step as follows to be consistent with 12, page 53.  
• Adjust deck height to obtain clearance (A) of 7–11 mm (1/8–7/16 in.) between top of deck and inside cutterbar (i.e., the thickness of the draper plus 3 mm). | Tech Pubs         |
| Step 14, page 100                            |                                                                                                                                                                                                                   |                   |
| 3.2.6 Assembling Draper, page 54             | Removed the following WARNING ONLY because the header is considered to be inoperative and not fully assembled at this point in the manual:  
• Equipment used for loading and unloading must meet or exceed the minimum specified requirements. Using inadequate equipment may result in vehicle tipping, machine damage, or chain breakage. | Tech Pubs         |
<p>| Step                                         |                                                                                                                                                                                                                   |                   |</p>
<table>
<thead>
<tr>
<th>Section</th>
<th>Summary of Change</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3.4 Attaching Reel Height Sensor, page 133</strong></td>
<td>• To avoid bodily injury or death from unexpected start-up or fall of raised machine, always stop engine, remove key, and engage safety props before going under machine for any reason.</td>
</tr>
</tbody>
</table>
| • Figure 3.285, page 134 | • ECN 58283: Added AGCO IDEAL™ to picture legend.  
• Added arrows to the picture. |
| **3.4 Attaching Reel Height Sensor, page 133** | Added the following to the NOTE:  
• For configuration (A), pointer (D) points to the FRONT of the header.  
• For configuration (B), pointer (D) points to the REAR of the header. |
| **5.5 Unloading with a Combine, page 162** | Added reference to combine manual. |
| • Step 10, page 162 | **6.1 Installing Filler Cap, page 175** | Updated picture to show change to hydraulic tank filler neck. |
| **6.1 Installing Filler Cap, page 175** | Updated picture to show change to hydraulic tank filler neck. |
| • Step 2, page 175 | Removed step:  
• “Apply hydraulic pipe controlled strength pipe thread sealant (Loctite® 565 or equivalent) to screws.” |
| • Step 3, page 176 | **6.2 FM100 Feed Auger Configurations, page 178** | Narrow configuration as the standard configuration: Added AGCO IDEAL™ Series |
| • Step 4, page 176 | **6.2 FM100 Feed Auger Configurations, page 178** | Narrow configuration: Added information about the quantity of flightings and fingers. |
| **6.2 FM100 Feed Auger Configurations, page 178** | Medium configuration as the standard configuration: Added the following combines:  
• Case IH 2300/2500 Series  
• Case IH 5/6/7150, 7/8/9250  
• CLAAS 7000/8000  
• John Deere 576/77/78/790  
• New Holland CR 10.80/10.90  
• Rostselmash Torum 760/780 |
| **6.2 FM100 Feed Auger Configurations, page 178** | Medium configuration as the standard configuration: |

ECN 58283  
Tech Pubs  
Product Support  
Tech Pubs  
ECN 57856  
ECN 59259  
ECN 57856  
ECN 59301  
Tech Pubs  
Engineering  
Tech Pubs
<table>
<thead>
<tr>
<th>Section</th>
<th>Summary of Change</th>
<th>Internal Use Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.2 FM100 Feed Auger Configurations, page 178</td>
<td>Only Removed &quot;Elevation&quot; from the description of New Holland CX Series.</td>
<td></td>
</tr>
<tr>
<td>6.2 FM100 Feed Auger Configurations, page 178</td>
<td>Medium configuration as an optional configuration: Added AGCO IDEAL™ Series.</td>
<td>Engineering</td>
</tr>
<tr>
<td>6.2 FM100 Feed Auger Configurations, page 178</td>
<td>Medium configuration: Added information about the quantity of flightings and fingers.</td>
<td>Tech Pubs</td>
</tr>
</tbody>
</table>
| 6.2 FM100 Feed Auger Configurations, page 178 | Wide configuration:  
  • Added information about the quantity of flightings and fingers.  
  • Removed NOTE referring to "Optional Modification to Wide Configuration." | Tech Pubs |
| 6.2 FM100 Feed Auger Configurations, page 178 | Ultra narrow configuration:  
  • Added information about the quantity of flightings and fingers.  
  • Added NOTE about drilling holes. | Tech Pubs Product Support |
| 6.2 FM100 Feed Auger Configurations, page 178 | Ultra wide configuration: Added this configuration. | Tech Pubs |
| 6.2.1 Converting from Ultra Narrow Configuration or Narrow Configuration to Medium Configuration, page 181 |  
  Removed footnote:  
  • MD #287031 contains wear-resistant flightings, and is available only through MacDon Parts. | Tech Pubs |
| 6.2.1 Converting from Ultra Narrow Configuration or Narrow Configuration to Medium Configuration, page 181 |  
  • Added NOTE.  
  • Removed NOTE: Flightings are NOT included in this kit. Order flighting kits (MD #287031) separately. | Tech Pubs |
| 6.2.1 Converting from Ultra Narrow Configuration or Narrow Configuration to Medium Configuration, page 181 |  
  • Step 5, page 182  
  • Step 7, page 182  
  • Added to step:  
  • Removing the long flightings left empty flighting slots in the auger that were not needed to install the new shorter flightings. | Tech Pubs |
| 6.2.2 Converting from Wide Configuration to Medium Configuration, page 183 |  
  Removed footnote:  
  • MD #287031 contains wear-resistant flightings, and is available only through MacDon Parts. | Tech Pubs |
| 6.2.2 Converting from Wide Configuration to Medium Configuration, page 183 |  
  • Step 4, page 184  
  • Step 6, page 184  
  • Added NOTE. | Tech Pubs |
<table>
<thead>
<tr>
<th>Section</th>
<th>Summary of Change</th>
<th>Internal Use Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.2.3 Converting from Medium Configuration or Wide Configuration to Narrow Configuration, page 185</td>
<td>Reworded introductory NOTE as follows:</td>
<td>Product Support</td>
</tr>
<tr>
<td></td>
<td>• Flighting performs best when no gaps are present. If desired, use silicone sealant to fill the gaps.</td>
<td></td>
</tr>
<tr>
<td>6.2.3 Converting from Medium Configuration or Wide Configuration to Narrow Configuration, page 185</td>
<td>Added NOTE.</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td></td>
<td>• Step 10, page 186</td>
<td></td>
</tr>
<tr>
<td>6.2.6 Converting from Ultra Narrow or Narrow Configuration to Wide or Ultra Wide Configuration, page 190</td>
<td>Removed footnote:</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td></td>
<td>• MD #287031 contains wear-resistant flightings, and is available only through MacDon Parts.</td>
<td></td>
</tr>
<tr>
<td>6.2.6 Converting from Ultra Narrow or Narrow Configuration to Wide or Ultra Wide Configuration, page 190</td>
<td>Removed NOTE:</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td></td>
<td>• Flightings are NOT included in this kit. Order flighting kit MD #287031 separately.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Step 6, page 191</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Step 8, page 191</td>
<td></td>
</tr>
<tr>
<td>6.2.7 Converting from Wide Configuration to Ultra Wide Configuration, page 192</td>
<td>Changed topic title. Was previously titled “Optional Modification to Wide Configuration.”</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>6.2.8 Converting from Medium Configuration or Wide Configuration to Ultra Narrow Configuration, page 192</td>
<td>Simplified NOTE:</td>
<td>Product Support</td>
</tr>
<tr>
<td></td>
<td>• Flighting performs best when no gaps are present. If desired, use silicone sealant to fill the gaps.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Step 30, page 195</td>
<td></td>
</tr>
<tr>
<td>6.2.8 Converting from Medium Configuration or Wide Configuration to Ultra Narrow Configuration, page 192</td>
<td>Changed torque from 8.5 Nm (75 lbf-in) to 9 Nm (80 lbf-in).</td>
<td>Engineering</td>
</tr>
<tr>
<td></td>
<td>• Step 32, page 195</td>
<td></td>
</tr>
<tr>
<td>6.2.9 Converting from Narrow Configuration to Ultra Narrow Configuration, page 196</td>
<td>Simplified NOTE:</td>
<td>Product Support</td>
</tr>
<tr>
<td></td>
<td>• Flighting performs best when no gaps are present. If desired, use silicone sealant to fill the gaps.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Step 18, page 198</td>
<td></td>
</tr>
<tr>
<td>6.2.9 Converting from Narrow Configuration to Ultra Narrow Configuration, page 196</td>
<td>Changed torque from 8.5 Nm (75 lbf-in) to 9 Nm (80 lbf-in).</td>
<td>Engineering</td>
</tr>
<tr>
<td></td>
<td>• Step 20, page 198</td>
<td></td>
</tr>
<tr>
<td>6.2.10 Installing Feed Auger Fingers, page 198</td>
<td>Removed the following DANGER only because this procedure is for the initial setup of the float module (the float module is not operational at this point):</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>Section</td>
<td>Summary of Change</td>
<td>Internal Use Only</td>
</tr>
<tr>
<td>---------</td>
<td>------------------</td>
<td>------------------</td>
</tr>
<tr>
<td><strong>6.2.10 Installing Feed Auger Fingers, page 198</strong></td>
<td>Changed torque from 8.5 Nm (75 lbf-in) to 9 Nm (80 lbf-in).</td>
<td>Engineering</td>
</tr>
<tr>
<td>• Step 3, page 199</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Step 6, page 200</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>6.2.11 Removing Feed Auger Fingers, page 200</strong></td>
<td>Removed the following DANGER only because this procedure is for the initial setup of the float module (the float module is not operational at this point):</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>• To avoid bodily injury or death from unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator’s seat, and always engage safety props before going under the machine for any reason.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>6.2.11 Removing Feed Auger Fingers, page 200</strong></td>
<td>Changed torque from 8.5 Nm (75 lbf-in) to 9 Nm (80 lbf-in).</td>
<td>Engineering</td>
</tr>
<tr>
<td>• Step 4, page 201</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Step 5, page 201</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>6.3.2 CR Feeder Deflectors, page 202</strong></td>
<td>Added introductory statement:</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>• This section is for New Holland CR combines only. If operating a New Holland CX combine, remove feed deflectors.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>6.3.3 Replacing CR Feeder Deflectors, page 203</strong></td>
<td>Changed the following WARNING to DANGER for consistency:</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>• To avoid bodily injury or death from unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator’s seat, and always engage safety props before going under the machine for any reason.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>7 Attaching Header to Combine, page 205</strong></td>
<td>Added AGCO IDEAL™.</td>
<td>ECN 57194</td>
</tr>
<tr>
<td>• Table 7.1, page 205</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>7.1.1 Attaching Header to an AGCO (Challenger, Gleaner, or Massey Ferguson) Combine, page 205</strong></td>
<td>Added safety step:</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>• Shut down the engine, and remove the key from the ignition.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>7.1.2 Installing Reel Fore-Aft / Header Tilt Selector Switch and Harness, page 209</strong></td>
<td>Revised step to mean tilting the feeder house, not the header, all the way forward.</td>
<td>Product Support</td>
</tr>
<tr>
<td>• Step 1, page 205</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>7.1.2 Installing Reel Fore-Aft / Header Tilt Selector Switch and Harness, page 209</strong></td>
<td>Revised the IMPORTANT as follows for consistency with similar procedures:</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Section</td>
<td>Summary of Change</td>
<td>Internal Use Only</td>
</tr>
<tr>
<td>---------</td>
<td>------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>• Step 3, page 209</td>
<td>If you do not disconnect the battery before connecting the cab draper control harness to the combine’s auxiliary power connectors, electrical components may be damaged.</td>
<td></td>
</tr>
<tr>
<td>7.1.1 Attaching Header to an AGCO (Challenger, Gleaner, or Massey Ferguson) Combine, page 205</td>
<td>Added “AGCO” to the kit number column.</td>
<td></td>
</tr>
<tr>
<td>• Table 7.2, page 207</td>
<td>Added AGCO IDEAL™ topics</td>
<td>ECN 57194</td>
</tr>
<tr>
<td>7.2 AGCO IDEAL™ Series Combines, page 213 7.2.1 Attaching Header to an AGCO IDEAL™ Series Combine, page 213 7.2.2 Installing Reel Fore-Aft / Header Tilt Selector Switch, page 216</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 7.3.1 Attaching Header to Case IH Combine, page 218 | Added safety step:  
• Shut down the engine, and remove the key from the ignition. | Tech Pubs |
| • Step 1, page 218 |  |  |
| 7.4.1 Attaching Header to CLAAS Combine, page 224 | Added safety step:  
• Shut down the engine, and remove the key from the ignition. | Tech Pubs |
| • Step 1, page 224 |  |  |
| 7.5.1 Attaching Header to John Deere Combine, page 229 | Added safety step:  
• Shut down the engine, and remove the key from the ignition. | Tech Pubs |
| • Step 1, page 229 |  |  |
| 7.5.2 Installing Reel Fore-Aft / Header Tilt Switch – S and T Series Combines, page 232 | Replaced the DANGER with the following WARNING to be consistent with similar procedures:  
• 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. | Tech Pubs |
| • Step 1, page 232 | Revised step to mean tilting the feeder house, not the header, all the way forward. | Product Support |
| 7.5.2 Installing Reel Fore-Aft / Header Tilt Switch – 60 and 70 Series Combines, page 239 | Replaced the DANGER with the following WARNING to be consistent with similar procedures:  
• 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. | Tech Pubs |
| 7.5.3 Installing Reel Fore-Aft / Header Tilt Switch – 60 and 70 Series Combines, page 239 | Added safety steps and revised IMPORTANT to be consistent with similar procedures.  
• Procedure now says to disconnect the battery negative cable, not the positive cable. | Tech Pubs |
<table>
<thead>
<tr>
<th>Section</th>
<th>Summary of Change</th>
<th>Internal Use Only</th>
</tr>
</thead>
</table>
| 7.6.1 Attaching Header to New Holland CR/CX Combine, page 244 | Added safety step:  
  - Shut down the engine, and remove the key from the ignition. | Tech Pubs |
| 7.7.1 Positioning Transport Lights, page 249 | Updated picture to show additional nut used to mount transport light assembly. | ECN 58057 |
| 7.7.1 Positioning Transport Lights, page 249 |  
  - Updated picture to show an additional nut used to mount transport light assembly.  
  - Revised picture to show the accurate shipping position of the transport light assembly. | ECN 58057 Engineering |
| 7.7.1 Positioning Transport Lights, page 249 | Updated picture to show an additional nut used to mount transport light assembly. | ECN 58057 |
| 8 Performing Predelivery Checks, page 257 | Added safety step:  
  - Shut down the engine, and remove the key from the ignition. | Tech Pubs |
| 8.2 Checking Wheel Bolt Torque – Transport and Stabilizer Wheels, page 258 | Added “Transport and Stabilizer Wheels” to the topic title. | Tech Pubs |
| 8.3 Checking Knife Drive Box, page 259 | Added safety step:  
  - Shut down the engine, and remove the key from the ignition. | Tech Pubs |
| 8.6.1 Checking and Tensioning Single and Untimed Double-Knife Drive Belts, page 263 | Added safety step:  
  - Shut down the engine, and remove the key from the ignition. | Tech Pubs |
| 8.8 Centering the Reel, page 268 | Added NOTE and associated picture for clarity. | Product Support |
| 8.10 Checking and Adjusting Skid Shoe Settings, page 276 | Changed the following WARNING to a DANGER:  
  - To avoid bodily injury or death from unexpected start-up or fall of raised machine, always stop engine, remove key, and engage safety props before going under machine for any reason.  
  - Removed the following redundant DANGER:  
    - Engage header safety props and reel props before working under header or reel. | Tech Pubs |
<table>
<thead>
<tr>
<th>Section</th>
<th>Summary of Change</th>
<th>Internal Use Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.10 Checking and Adjusting Skid</td>
<td>Added safety steps.</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>Shoe Settings, page 276</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Step 1, page 276 to Step 3, page 276</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Step 6, page 276 to Step 8, page 276</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.11.2 Adjusting Reel Clearance, page 279</td>
<td>Added safety steps.</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>• Step 1, page 279</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Step 2, page 279</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.11.2 Adjusting Reel Clearance, page 279</td>
<td>Added NOTE.</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>• Step 5, page 280</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.11.2 Adjusting Reel Clearance, page 279</td>
<td>Added safety step.</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>• Step 10, page 280</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.13 Adjusting Draper Tension, page 284</td>
<td>Changed the following WARNING to a DANGER:</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td></td>
<td>• To avoid bodily injury or death from unexpected start-up or fall of raised machine, always stop engine, remove key, and engage safety props before going under machine for any reason.</td>
<td></td>
</tr>
<tr>
<td>8.15 Checking and Adjusting Draper Seal,</td>
<td>Revised the IMPORTANT to clarify that the gap (deck seal) on new drapers needs to be set to 1–3 mm (1/16–1/8 in.). Removed information about the break-in period because this does not apply to an unloading and assembly manual.</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>page 287</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Step 1, page 287</td>
<td>Revised associated picture to identify gap dimension.</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>8.15 Checking and Adjusting Draper Seal,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>page 287</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Step 5, page 288</td>
<td>Added step.</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>8.15 Checking and Adjusting Draper Seal,</td>
<td></td>
<td>Product Support</td>
</tr>
<tr>
<td>page 287</td>
<td>Added information regarding header width and the quantity of deck supports to the NOTE.</td>
<td></td>
</tr>
<tr>
<td>• Step 6, page 288</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.15 Checking and Adjusting Draper Seal,</td>
<td></td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>page 287</td>
<td>Added steps and associated pictures.</td>
<td></td>
</tr>
<tr>
<td>• Step 8, page 288</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Step 9, page 288</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Step 11, page 288</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Step 13, page 289</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Section</td>
<td>Summary of Change</td>
<td>Internal Use Only</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td><strong>8.17.1 Greasing Procedure, page 292</strong></td>
<td>Added safety step:</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>• Step 1, page 292</td>
<td>• Shut down the engine, and remove the key from the ignition.</td>
<td></td>
</tr>
<tr>
<td><strong>8.18 Checking and Adjusting Endshields, page 299</strong></td>
<td>Removed the following redundant step:</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>• Step appeared before Step 4, page 300</td>
<td>• Close endshield.</td>
<td></td>
</tr>
<tr>
<td><strong>9.1 Auto Header Height Control, page 305</strong></td>
<td>Added the following statement to the introduction:</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td><strong>9.1.2 Troubleshooting Auto Header Height / Float Indicator, page 306</strong></td>
<td>Added topic.</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td><strong>9.1.3 Sensor Output Voltage Range – Combine Requirements, page 307</strong></td>
<td>Added “AGCO IDEAL™ Series” to table.</td>
<td>ECN 58283</td>
</tr>
<tr>
<td>• Table 9.1, page 307</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Figure 9.10, page 311</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Adjusting Voltage Limits – Two-Sensor System, page 316</strong></td>
<td>Removed legend below picture.</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>• Step 1, page 316</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Step</td>
<td>Added safety step:</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>• Shut down the engine, and remove the key from the ignition.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>9.1.4 AGCO IDEAL™ Series Combines, page 318</strong></td>
<td>Added AGCO IDEAL™ Series topics.</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td><strong>9.1.6 Case IH 130 and 140 Series Mid-Range Combines, page 333</strong></td>
<td>Removed topic titled “Replacing Float Indicator Cable.”</td>
<td>Product Support</td>
</tr>
<tr>
<td><strong>Calibrating Auto Header Height Control – Case IH 5130/6130/7130, 5140/6140/7140, page 338</strong></td>
<td>Added WARNING:</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>• Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>9.1.7 Case IH 7010/8010, 120, 230, 240, and 250 Series Combines, page 342</strong></td>
<td>Added “250 Series” to the topic.</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td><strong>Checking Voltage Range from the Combine Cab – Case IH 7010/</strong></td>
<td>Added “250 Series” to the topic.</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>Section</td>
<td>Summary of Change</td>
<td>Internal Use Only</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>8010, 120, 230, 240, and 250 Series Combines, page 345</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calibrating the Auto Header Height Control – Case IH 7010/8010,120, 230, 240, and 250 Series Combines, page 347</td>
<td>Added “250 Series” to the topic title.</td>
<td>Product Support</td>
</tr>
<tr>
<td>Calibrating the Auto Header Height Control – Case IH 7010/8010,120, 230, 240, and 250 Series Combines, page 347</td>
<td>Added WARNING:</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td></td>
<td>• Clear the area of other persons, pets etc. Keep children away from machinery.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Walk around the machine to be sure no one is under, on, or close to it.</td>
<td></td>
</tr>
<tr>
<td>Calibrating the Auto Header Height Control – Case IH 7010/8010,120, 230, 240, and 250 Series Combines, page 347</td>
<td>Added NOTE.</td>
<td>Product Support</td>
</tr>
<tr>
<td></td>
<td>Step 6, page 348</td>
<td></td>
</tr>
<tr>
<td>Calibrating the Auto Header Height Control – Case IH 7010/8010,120, 230, 240, and 250 Series Combines, page 347</td>
<td>Added callouts to steps and associated picture for clarity.</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td></td>
<td>Step 12, page 350</td>
<td></td>
</tr>
<tr>
<td>Calibrating the Auto Header Height Control – Case IH Combines with Version 28.00 or Higher Software, page 351</td>
<td>Added WARNING:</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td></td>
<td>• Clear the area of other persons, pets etc. Keep children away from machinery.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Walk around the machine to be sure no one is under, on, or close to it.</td>
<td></td>
</tr>
<tr>
<td>Checking Reel Height Sensor Voltages – Case IH Combines, page 355</td>
<td>Added WARNING:</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td></td>
<td>• Clear the area of other persons, pets etc. Keep children away from machinery.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Walk around the machine to be sure no one is under, on, or close to it.</td>
<td></td>
</tr>
<tr>
<td>Setting Preset Cutting Height – Case IH 7010/8010, 120, 230, 240, and 250 Series Combines, page 357</td>
<td>Added “250 Series” to the topic.</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td>Setting Preset Cutting Height – Case IH 7010/8010, 120, 230, 240, and 250 Series Combines, page 357</td>
<td>Added WARNING:</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td></td>
<td>• Clear the area of other persons, pets etc. Keep children away from machinery.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Walk around the machine to be sure no one is under, on, or close to it.</td>
<td></td>
</tr>
<tr>
<td>Setting Preset Cutting Height – Case IH 7010/8010, 120, 230, 240, and 250 Series Combines, page 357</td>
<td>Corrected callout reference for HEADER RESUME switch.</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td></td>
<td>Step 11, page 358</td>
<td></td>
</tr>
<tr>
<td>Checking Voltage Range from the Combine Cab – Challenger and Massey Ferguson, page 358</td>
<td>Added WARNING:</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Section</td>
<td>Summary of Change</td>
<td>Internal Use Only</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td><strong>Calibrating the Auto Header Height Control – Challenger and Massey Ferguson, page 360</strong></td>
<td>Added WARNING: Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td><strong>Adjusting the Header Height – Challenger and Massey Ferguson, page 363</strong></td>
<td>Added WARNING: Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td><strong>Setting the Sensitivity of the Auto Header Height Control – Challenger and Massey Ferguson, page 365</strong></td>
<td>Added WARNING: Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td><strong>Setting the Sensitivity of the Auto Header Height Control – CLAAS 500 Series, page 370</strong></td>
<td>Cleaned picture.</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td><strong>Calibrating Reel Height Sensor – CLAAS 600 and 700 Series, page 380</strong></td>
<td>Added IMPORTANT: Do NOT turn off the engine. The combine has to be at full idle for the sensors to calibrate properly.</td>
<td>Engineering</td>
</tr>
<tr>
<td><strong>9.1.11 CLAAS 8000/7000 Series Combines, page 383</strong></td>
<td>Added CLAAS 8000/7000 Series topics.</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td><strong>Calibrating Reel Height Sensor – John Deere S and T Series, page 447</strong></td>
<td>Added IMPORTANT: Do NOT turn off the engine. The combine has to be at full idle for the sensors to calibrate properly.</td>
<td>Engineering</td>
</tr>
<tr>
<td><strong>Calibrating Header – John Deere S7 Series, page 459</strong></td>
<td>Added WARNING: Never start or move the machine until you are sure all bystanders have cleared the area.</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td><strong>Calibrating Header – John Deere S7 Series, page 459</strong></td>
<td>Reworded introduction to specify that the center-link should be set to “D” instead of the “steepest angle.”</td>
<td>Tech Pubs</td>
</tr>
<tr>
<td><strong>Setting Preset Cutting Height – New Holland CR/CK Series, page 471</strong></td>
<td>Added steps.</td>
<td>Tech Pubs</td>
</tr>
</tbody>
</table>

**Figure 9.147, page 371**

**Step 1, page 447**

**Step 5, page 471**
<table>
<thead>
<tr>
<th>Section</th>
<th>Summary of Change</th>
<th>Internal Use Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Step 6, page 471</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| **10 Checking and Adjusting Reel Height Sensor, page 487** | Replaced the WARNING with the following DANGER:  
• To avoid bodily injury or death from unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator’s seat, and always engage safety props before going under the machine for any reason. | Tech Pubs |
| • Figure 10.1, page 487 | Added AGCO IDEAL™ to picture legend. | ECN 58283 |
| **10 Checking and Adjusting Reel Height Sensor, page 487** | Reworded the NOTE as follows:  
• For configuration (A), pointer (D) points to the **FRONT** of the header.  
• For configuration (B), pointer (D) points to the **REAR** of the header. | Tech Pubs |
| • See NOTE below Figure 10.1, page 487 | Added safety step:  
• Shut down the engine, and remove the key from the ignition. | Tech Pubs |
| **10 Checking and Adjusting Reel Height Sensor, page 487** | Added AGCO IDEAL™ to table. | ECN 58283 |
| • Table 10.1, page 488 | | |
| **10 Checking and Adjusting Reel Height Sensor, page 487** | Added safety step:  
• Engage the reel safety props. | Tech Pubs |
| • Step 10, page 489 | | |
| **10 Checking and Adjusting Reel Height Sensor, page 487** | Added safety step:  
• Disengage the reel safety props. | Tech Pubs |
| • Step 17, page 489 | | |
| **11 Running up Header, page 491** | Removed the following redundant step:  
• Lower plastic pan under float module and check for shipping materials/debris that may have fallen under float module draper. | Tech Pubs |
TABLE OF CONTENTS

Introduction .................................................................i
Summary of Changes ..................................................ii

Chapter 1: Safety ............................................................................ 1
  1.1 Signal Words .........................................................................1
  1.2 General Safety .....................................................................2
  1.3 Safety Signs .........................................................................4

Chapter 2: Unloading the Header ............................................. 5
  2.1 Unloading Headers from Container ....................................5
  2.2 Separating Headers ............................................................7
  2.3 Moving to Assembly Area ................................................12
    2.3.1 Forklift Method ..............................................................12
    2.3.2 Crane Method ..............................................................13
      Lifting Single Header ..........................................................13
      Lifting Two Headers ..........................................................15
  2.4 Lowering Header ..............................................................16

Chapter 3: Assembling the Header and Float Module ........... 21
  3.1 Assembling 6.1–10.7 m (20–35 ft.) Headers ..................... 21
    3.1.1 Removing Endshields from Shipping Position .......... 21
    3.1.2 Removing Shipping Stands and Supports ............... 23
    3.1.3 Attaching Reel Lift Cylinders ............................... 30
    3.1.4 Attaching Center Support ...................................... 30
    3.1.5 Installing Tine Tubes: Six-Bat Reels .................... 36
    3.1.6 Attaching Cam Arms .................................................37
  3.2 Assembling 12.2 m (40 ft) Header (Split Frame) ............... 40
    3.2.1 Unpacking Header .......................................................40
    3.2.2 Removing Shipping Stands and Supports ............... 41
    3.2.3 Removing Extension .................................................47
    3.2.4 Attaching Extension .................................................47
    3.2.5 Installing Deck .........................................................50
    3.2.6 Assembling Draper .....................................................54
    3.2.7 Setting Deck Position .............................................. 55
    3.2.8 Installing Right End Knife ..................................... 56
    3.2.9 Moving Reel Arm ......................................................57
    3.2.10 Installing Right Outboard Skid Shoe .................... 63
    3.2.11 Assembling Right Reel ............................................ 64
      Installing Discs ...............................................................64
      Aligning Solid Disc .......................................................65
      Installing Tine Tubes .................................................... 70
      Tightening Fasteners .................................................... 74
      Attaching Cam Arms .................................................... 75
      Checking Cam Track Alignment ................................... 77
      Installing Reel Lift Cylinders: Left Reel .................... 78
      Setting up Left Reel ......................................................81
Chapter 4: Loading Header for Transport to Dealership ................................................................. 143
4.1 Loading with One Forklift: Upright Position ................................................................. 143
4.2 Loading with One Forklift: Lowered Position ........................................................... 147
4.3 Loading with Two Forklifts ....................................................................................... 149
4.4 Loading with a Crane ............................................................................................... 152

Chapter 5: Unloading Header at Dealer ...................................................................................... 153
5.1 Unloading with One Forklift: Upright Position ............................................................ 153
5.2 Unloading with One Forklift: Lowered Position ........................................................... 157
5.3 Unloading with Two Forklifts ..................................................................................... 159
5.4 Unloading with a Crane ............................................................................................ 161
5.5 Unloading with a Combine ....................................................................................... 162
5.6 Removing the Remaining Shipping Supports ............................................................. 163
5.7 Repositioning Gearbox ............................................................................................ 170
5.8 Installing Driveline .................................................................................................... 172
Chapter 6: Float Module Setup at Dealer

6.1 Installing Filler Cap ........................................................................................................................................ 175
6.2 FM100 Feed Auger Configurations ........................................................................................................... 178
   6.2.1 Converting from Ultra Narrow Configuration or Narrow Configuration to Medium Configuration ... 181
   6.2.2 Converting from Wide Configuration to Medium Configuration .................................................... 183
   6.2.3 Converting from Medium Configuration or Wide Configuration to Narrow Configuration .......... 185
   6.2.4 Converting from Ultra Narrow Configuration to Narrow Configuration ......................................... 187
   6.2.5 Converting from Medium Configuration to Wide Configuration or Ultra Wide Configuration ....... 188
   6.2.6 Converting from Ultra Narrow or Narrow Configuration to Wide or Ultra Wide Configuration .... 190
   6.2.7 Converting from Wide Configuration to Ultra Wide Configuration ................................................. 192
   6.2.8 Converting from Medium Configuration or Wide Configuration to Ultra Narrow Configuration ... 192
   6.2.9 Converting from Narrow Configuration to Ultra Narrow Configuration ........................................... 196
   6.2.10 Installing Feed Auger Fingers .............................................................................................................. 198
   6.2.11 Removing Feed Auger Fingers ............................................................................................................. 200
6.3 FM100 Stripper Bars and Feed Deflectors ............................................................................................... 202
   6.3.1 Removing Stripper Bars .......................................................................................................................... 202
   6.3.2 CR Feeder Deflectors ......................................................................................................................... 202
   6.3.3 Replacing CR Feeder Deflectors ........................................................................................................... 203

Chapter 7: Attaching Header to Combine ........................................................................................................ 205

7.1 AGCO (Challenger, Gleaner, and Massey Ferguson) Combines .............................................................. 205
   7.1.1 Attaching Header to an AGCO (Challenger, Gleaner, or Massey Ferguson) Combine ...................... 205
   7.1.2 Installing Reel Fore-Aft / Header Tilt Selector Switch and Harness ................................................... 209
7.2 AGCO IDEAL™ Series Combines ............................................................................................................... 213
   7.2.1 Attaching Header to an AGCO IDEAL™ Series Combine .................................................................. 213
   7.2.2 Installing Reel Fore-Aft / Header Tilt Selector Switch ....................................................................... 216
7.3 Case IH Combines ..................................................................................................................................... 218
   7.3.1 Attaching Header to Case IH Combine ............................................................................................. 218
7.4 CLAAS Combines ..................................................................................................................................... 224
   7.4.1 Attaching Header to CLAAS Combine ............................................................................................ 224
7.5 John Deere Combines ................................................................................................................................. 229
   7.5.1 Attaching Header to John Deere Combine ......................................................................................... 229
   7.5.2 Installing Reel Fore-Aft / Header Tilt Switch – S and T Series Combines ........................................... 232
   7.5.3 Installing Reel Fore-Aft / Header Tilt Switch – 60 and 70 Series Combines ....................................... 239
7.6 New Holland Combines ............................................................................................................................ 244
   7.6.1 Attaching Header to New Holland CR/CX Combine ........................................................................ 244
7.7 Completing Header Assembly .................................................................................................................... 249
   7.7.1 Positioning Transport Lights ................................................................................................................ 249
   7.7.2 Crop Dividers ...................................................................................................................................... 250
      Removing Crop Dividers from Storage .................................................................................................... 250
      Installing Crop Divider without Latch Option .......................................................................................... 250
      Installing Crop Divider with Latch Option .............................................................................................. 252
      Installing Crop Divider Rods ................................................................................................................. 253
   7.7.3 Installing Left Endshield – Split-Frame Headers .............................................................................. 254
# TABLE OF CONTENTS

### Chapter 8: Performing Predelivery Checks ........................................................................................................ 257

8.1 Checking Tire Pressure – Transport and Stabilizer Wheels ................................................................................. 257
8.2 Checking Wheel Bolt Torque – Transport and Stabilizer Wheels ........................................................................... 258
8.3 Checking Knife Drive Box ........................................................................................................................................ 259
8.4 Checking Oil Level in Header Drive Gearbox ........................................................................................................ 261
8.5 Checking Oil Level in Hydraulic Reservoir ........................................................................................................ 262
8.6 Checking Knife Drive Belt Tension ....................................................................................................................... 263
8.6.1 Checking and Tensioning Single and Untimed Double-Knife Drive Belts ......................................................... 263
8.6.2 Checking and Tensioning Timed Double-Knife Drive Belts ............................................................................. 264
8.7 Checking Knife Hold-Downs .................................................................................................................................. 266
8.7.1 Adjusting Hold-Downs with Pointed Guards ................................................................................................. 266
8.7.2 Adjusting Hold-Down with Stub Guards .......................................................................................................... 267
8.8 Centering the Reel .................................................................................................................................................... 268
8.9 Checking and Adjusting Header Float .................................................................................................................. 271
8.10 Checking and Adjusting Skid Shoe Settings ........................................................................................................ 276
8.11 Reel Clearance to Cutterbar .................................................................................................................................... 277
8.11.1 Measuring Reel Clearance .......................................................................................................................... 278
8.11.2 Adjusting Reel Clearance ............................................................................................................................ 279
8.12 Adjusting Auger to Pan Clearance ......................................................................................................................... 281
8.13 Adjusting Draper Tension ....................................................................................................................................... 284
8.14 Checking and Adjusting Feed Draper Tension ...................................................................................................... 286
8.15 Checking and Adjusting Draper Seal ..................................................................................................................... 287
8.16 Repositioning Right Draper Deflector Angle ........................................................................................................ 290
8.17 Lubricating Header .................................................................................................................................................. 292
8.17.1 Greasing Procedure ........................................................................................................................................ 292
8.17.2 Lubrication Points ............................................................................................................................................ 294
8.18 Checking and Adjusting Endshields ....................................................................................................................... 299
8.19 Checking Manuals .................................................................................................................................................. 303

### Chapter 9: Setting up Auto Header Height Control ................................................................................................. 305

9.1 Auto Header Height Control ....................................................................................................................................... 305
9.1.1 Sensor Operation ................................................................................................................................................... 306
9.1.2 Troubleshooting Auto Header Height / Float Indicator .................................................................................... 306
9.1.3 Sensor Output Voltage Range – Combine Requirements .............................................................................. 307
  10 Volt Adapter (MD #B6421) – New Holland Combines Only ........................................................................... 308
  Manually Checking Voltage Range – One-Sensor System ....................................................................................... 308
  Manually Checking Voltage Range – Two-Sensor System ...................................................................................... 311
  Adjusting Voltage Limits – One-Sensor System ....................................................................................................... 314
  Adjusting Voltage Limits – Two-Sensor System ....................................................................................................... 316
9.1.4 AGCO IDEAL™ Series Combines .................................................................................................................. 318
  Setting up the Header – AGCO IDEAL™ Series .................................................................................................. 318
### Table of Contents

- **Setting Minimum Reel Speed and Calibrating Reel** — AGCO IDEAL™ Series ........................................ 323
- **Setting up Automatic Header Controls** — AGCO IDEAL™ Series ......................................................... 324
- **Calibrating the Header** — AGCO IDEAL™ Series .................................................................................. 326
- **Operating the Header** — AGCO IDEAL™ Series ..................................................................................... 328
- **Reviewing Header In-Field Settings** — AGCO IDEAL™ Series ................................................................. 329

9.1.5 Case IH 5088/6088/7088 Combines ..................................................................................................... 331

- **Calibrating the Auto Header Height Control** — Case IH 5088/6088/7088 ............................................. 331
- **Setting the Sensitivity of the Auto Header Height** — Case IH 5088/6088/7088 ............................. 332

9.1.6 Case IH 130 and 140 Series Mid-Range Combines ............................................................................. 333

- **Setting up the Header on the Combine Display** — Case IH 5130/6130/7130; 5140/6140/7140 .... 333
- **Checking Voltage Range from Combine Cab** — Case IH 5130/6130/7130; 5140/6140/7140 ........ 335
- **Calibrating Auto Header Height Control** — Case IH 5130/6130/7130, 5140/6140/7140 ................. 338
- **Setting Preset Cutting Height** — Case IH 5130/6130/7130, 5140/6140/7140 ................................. 339

9.1.7 Case IH 7010/8010, 120, 230, 240, and 250 Series Combines ................................................................. 342

- **Checking Voltage Range from the Combine Cab** — Case IH 8010 .................................................. 342
- **Setting Header Controls** — Case IH 8010 .............................................................................................. 344
- **Checking Voltage Range from the Combine Cab** — Case IH 7010/8010, 120, 230, 240, and 250 Series Combines ................................................................. 345
- **Calibrating the Auto Header Height Control** — Case IH 7010/8010,120, 230, 240, and 250 Series Combines ................................................................. 347
- **Calibrating the Auto Header Height Control** — Case IH Combines with Version 28.00 or Higher Software ................................................................. 351
- **Checking Reel Height Sensor Voltages** — Case IH Combines ............................................................ 355
- **Setting Preset Cutting Height** — Case IH 7010/8010, 120, 230, 240, and 250 Series Combines .......... 357

9.1.8 Challenger and Massey Ferguson 6 and 7 Series Combines ................................................................ 358

- **Checking Voltage Range from the Combine Cab** — Challenger and Massey Ferguson ................. 358
- **Engaging the Auto Header Height Control** — Challenger and Massey Ferguson .............................. 360
- **Calibrating the Auto Header Height Control** — Challenger and Massey Ferguson .......................... 360
- **Adjusting the Header Height** — Challenger and Massey Ferguson .................................................. 363
- **Adjusting the Header Raise/Lower Rate** — Challenger and Massey Ferguson ................................ 363
- **Setting the Sensitivity of the Auto Header Height Control** — Challenger and Massey Ferguson ........ 365

9.1.9 CLAAS 500 Series Combines ................................................................................................................. 366

- **Calibrating the Auto Header Height Control** — CLAAS 500 Series ...................................................... 366
- **Setting Cutting Height** — CLAAS 500 Series ......................................................................................... 368
- **Setting the Sensitivity of the Auto Header Height Control** — CLAAS 500 Series ............................... 370
- **Adjusting Auto Reel Speed** — CLAAS 500 Series .................................................................................. 372

9.1.10 CLAAS 600 and 700 Series Combines ................................................................................................ 374

- **Calibrating the Auto Header Height Control** — CLAAS 600 and 700 Series ........................................ 374
- **Setting Cutting Height** — CLAAS 600 and 700 Series ........................................................................ 377
- **Setting the Sensitivity of the Auto Header Height Control** — CLAAS 600 and 700 Series ............... 377
- **Adjusting Auto Reel Speed** — CLAAS 600 and 700 Series .................................................................. 379
- **Calibrating Reel Height Sensor** — CLAAS 600 and 700 Series ............................................................ 380
- **Adjusting Auto Reel Height** — CLAAS 600 and 700 Series ................................................................. 382

9.1.11 CLAAS 8000/7000 Series Combines .................................................................................................. 383

- **Setting up the Header** — CLAAS 8000/7000 Series ................................................................. 383
- **Calibrating the Auto Header Height Control** — CLAAS 8000/7000 Series ......................................... 385
- **Setting Cut and Reel Height Preset** — CLAAS 8000/7000 Series ......................................................... 387
- **Setting the Sensitivity of the Auto Header Height Control** — CLAAS 8000/7000 Series ................. 388
- **Adjusting Auto Reel Speed** — CLAAS 8000/7000 Series ................................................................. 389
- **Calibrating Reel Height Sensor** — CLAAS 8000/7000 Series ............................................................. 391

9.1.12 Gleaner R65/R66/R75/R76 and S Series Combines ............................................................................. 392

- **Checking Voltage Range from the Combine Cab** — Gleaner R65/R66/R75/R76 and Pre-2016 S Series ........................................................................ 392
TABLE OF CONTENTS

Engaging the Auto Header Height Control – Gleaner R65/R66/R75/R76 and Pre-2016 S Series .................. 394
Calibrating the Auto Header Height Control – Gleaner R65/R66/R75/R76 and Pre-2016 S Series .......... 396
Turning off the Accumulator – Gleaner R65/R66/R75/R76 and Pre-2016 S Series ........................................ 397
Adjusting the Header Raise/Lower Rate – Gleaner R65/R66/R75/R76 and Pre-2016 S Series ................. 398
Adjusting Ground Pressure – Gleaner R65/R66/R75/R76 and Pre-2016 S Series ........................................ 398
Adjusting the Sensitivity of the Auto Header Height Control – Gleaner R65/R66/R75/R76 and Pre-2016 S Series ................................................................. 399
Troubleshooting Alarms and Diagnostic Faults – Gleaner R65/R66/R75/R76 and Pre-2016 S Series .................. 400

9.1.13 Gleaner S9 Series Combines ........................................................................................................... 402

9.1.14 John Deere 60 Series Combines ......................................................................................................... 416

9.1.15 John Deere 70 Series Combines ......................................................................................................... 424

9.1.16 John Deere S and T Series Combines ................................................................................................. 431

9.1.17 John Deere S7 Series Combines .......................................................................................................... 450


Chapter 10: Checking and Adjusting Reel Height Sensor ................................................................. 487

Chapter 11: Running up Header ........................................................................................................ 491
  11.1 Performing Post Run-Up Adjustments .................................................................................... 495
    11.1.1 Adjusting Draper Tracking ............................................................................................... 496
    11.1.2 Adjusting Knife ................................................................................................................. 498

Chapter 12: Reference ........................................................................................................................ 499
  12.1 Parts List ................................................................................................................................ 499
  12.2 Torque Specifications .............................................................................................................. 506
    12.2.1 Metric Bolt Specifications ................................................................................................. 506
    12.2.2 Metric Bolt Specifications Bolting into Cast Aluminum .................................................. 508
    12.2.3 Flare-Type Hydraulic Fittings ............................................................................................ 509
    12.2.4 O-Ring Boss Hydraulic Fittings – Adjustable ................................................................. 510
    12.2.5 O-Ring Boss Hydraulic Fittings – Non-Adjustable .......................................................... 512
    12.2.6 O-Ring Face Seal Hydraulic Fittings .................................................................................. 513
    12.2.7 Tapered Pipe Thread Fittings ......................................................................................... 514
  12.3 Lifting Equipment Requirements ............................................................................................. 515
  12.4 Conversion Chart ..................................................................................................................... 516
  12.5 Definitions ............................................................................................................................... 517

Predelivery Checklist ....................................................................................................................... 519
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 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

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

2.1 Unloading Headers from Container

The following topic describes the equipment requirements and the procedure for removing headers from a shipping container.

⚠️ WARNING

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

⚠️ WARNING

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

**NOTE:**

When a header and float module are ordered together, they are shipped with the float module already installed in the header.

**IMPORTANT:**

Forklifts are normally rated for a load center 610 mm (24 in.) ahead of back end of the forks. To obtain the forklift capacity for a load center (A) at 1220 mm (48 in.) (B), check with your forklift distributor. The minimum fork length (C) is 1981 mm (78 in.).

![Figure 2.1: Minimum Lifting Capacity](image)

**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.)

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

<table>
<thead>
<tr>
<th>Table 2.2 Lifting Chain Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
</tr>
<tr>
<td>Minimum Load</td>
</tr>
</tbody>
</table>
1. Move trailer into position and block wheels.
2. Lower trailer storage stands.
3. Open the container doors and remove the materials that brace the load.
4. Check the container floor. Remove nails and other obstructions if necessary.
5. Position lifting platform (A) at container opening with lifting vehicle.
6. Attach chain from pull strap (B) on the header to forks on a second vehicle.
   **NOTE:**
   If pull strap is not attached, attach chain to outboard shipping supports.
7. Pull headers from container onto platform.
8. Lift platform slightly to take weight off container.
9. Drive the truck and container forward slowly until the container is clear from the headers. Watch all clearances and reposition the headers as required.
10. When the container is clear of headers, lower platform and headers to ground.

![Figure 2.2: Pull Strap Location](image)
2.2 Separating Headers

Follow these instructions to separate the headers. Headers can also be moved to an assembly area before separating.

- Refer to 2.3 Moving to Assembly Area, page 12 for proper lifting procedures.
- Refer to 12.3 Lifting Equipment Requirements, page 515 for equipment requirements.

NOTE:

Unless otherwise specified, discard stands, shipping material, and hardware. Removable stands and supports are painted yellow or unpainted.

Remove shipping material and hardware as instructed in the following steps:

1. Remove two bolts (A) securing guard (B) and shipping support (C) to the cutterbar, and remove guard.
2. Lift support bar (C) clear of cutterbar, turn support bar 90°, and remove bar from support bracket on opposite header.

NOTE:

Due to inaccessibility, the support bracket on the other header’s cutterbar should be removed after headers are separated.

3. Remove four bolts (A) to remove shipping pull strap assembly (B).
4. Remove four bolts (A), and remove guides (B) from shipping legs at two places.

5. Remove two bolts (A), and remove wall guides (B) at two places on cutterbar (for headers without skid shoes).

6. Remove two bolts (A), and remove bumper(s) (B).

**NOTE:**
When headers of equal length are attached for shipping, each header has a bumper. When headers of unequal length are attached, only the longest header has a bumper.
7. Loosen lower bolt (A), remove upper bolt (B), and remove guide (C) from reel arm.

8. Repeat for the opposite reel arm.

9. **Double reel only**: Remove four bolts (A) and remove center arm wall guide (B).
10. **For staggered connection**: Remove four bolts (A), and remove leg shipping connectors (B) at two places.

![Figure 2.10: Leg Shipping Connector – Staggered Connection](image)

11. **For in-line connection**: Remove eight bolts (A), and remove leg shipping connectors (B) at two places.

![Figure 2.11: Leg Shipping Connector – In-Line Connection](image)

12. Remove two bolts (A) and remove wall guide (B).

![Figure 2.12: Wall Guide Support](image)
13. Remove eight bolts (A) total at four places, and remove two internal support channels (B), one on each side of stand.

14. When headers are separated, repeat Steps 1, page 7 and 2, page 7 for the second header.
2.3 Moving to Assembly Area

To move headers to the assembly area using a forklift or a crane, follow one of these procedures:

2.3.1 Forklift Method

⚠️ WARNING

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

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

For minimum lifting equipment requirements, refer to 12.3 Lifting Equipment Requirements, page 515.

IMPORTANT:
Ensure that forks extend beyond cutterbar prior to lifting header. If forks do not lift at cutterbar, damage to header may occur.

1. Approach header and line up forks (A) with fork slider channels (B).

   NOTE:
   When possible, approach from the underside to minimize potential for scratching the unit.

2. Slide forks (A) as far as possible without contacting the shipping supports of the opposite header.

3. Raise header off platform and set it down securely on level ground. Ensure ground is flat and free of rocks and debris that could damage the header.
 IMPORTANT:
Avoid damage to gearbox (A) when unloading and
grounding unit.

4. Lift second header off platform using the above procedure.
5. Check for shipping damage and missing parts.

2.3.2 Crane Method

*Lifting Single Header*

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

For minimum lifting equipment requirements, refer to *12.3 Lifting Equipment Requirements, page 515.*

1. Attach chains to crane hook.

   **IMPORTANT:**
   Refer to Figure 2.19, page 14 for chain length recommendations.

2. Attach chains to header at attachment points (A).
3. Remove hauler’s tie-down straps and chains.
4. Lift the header off the truck and set it on the ground. If ground is too soft, use blocks under the stands.
5. Unhook chains.
UNLOADING THE HEADER

Figure 2.18: Split-Frame Header

Figure 2.19: Double-Reel Header
A - Attachment Points
B - 1100 mm (43 in.)
C - 1500 mm (59 in.)
**Lifting Two Headers**

⚠️ **WARNING**

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

For minimum lifting equipment requirements, refer to *12.3 Lifting Equipment Requirements, page 515*.

**IMPORTANT:**

For single-reel headers, the recommended length of each chain (A) is 2000 mm (79 in.).

1. Attach chains to crane hook (B).
2. Attach chains to header at locations (A) as shown.
3. Remove hauler’s tie-down straps and chains.
4. Lift header off truck and set it on the ground. If ground is too soft, use blocks under the stands.
5. Unhook chains.

---

**Figure 2.20: Single-Reel Header 6.1–7.6 m (20–25 ft.)**

**Figure 2.21: Double-Reel Header 9.1–13.7 m (30–45 ft.)**
2.4 Lowering Header

Reposition header in preparation for assembly and setup as follows:

1. Choose an area with level ground.
2. Drive lifting vehicle to approach header from its underside.
   **IMPORTANT:**
   Do **NOT** attempt to lift at cutterbar when unloading from trailer. This procedure is **ONLY** for laying the machine over into working position.

3. Attach chain to shipping support (A).

⚠️ **CAUTION**

Stand clear of header when lowering. Machine may swing.
4. Back up SLOWLY while lowering forks until header rests on the ground.
UNLOADING THE HEADER

5. Place 150 mm (6 in.) blocks (A) under each end and center of cutterbar, and lower header onto the blocks.

Figure 2.26: Blocks at Each End of Cutterbar
6. Remove chain and reattach chain to center-link anchor (A) on frame tube. Raise rear of header slightly.

Figure 2.27: Center-link Anchor – Single Reel

Figure 2.28: Center-Link Anchor – Double Reel
7. Lower header stand by pulling pin (A), lowering stand (B), and releasing pin to secure stand in place.

8. Lower header onto stand.

**NOTE:**
If ground is soft, place a block under the stand.

9. Remove chain.

Figure 2.29: Raised Header Stand
Chapter 3: Assembling the Header and Float Module

Proceed to the section that matches your header size and complete each step before moving on to the next section:

- **3.1 Assembling 6.1–10.7 m (20–35 ft.) Headers, page 21**
- **3.2 Assembling 12.2 m (40 ft) Header (Split Frame), page 40**
- **3.3 Assembling 13.7 m (45 ft.) Header (Split Frame), page 86**

### 3.1 Assembling 6.1–10.7 m (20–35 ft.) Headers

#### 3.1.1 Removing Endshields from Shipping Position

1. Loosen nuts (A) and remove screws (B). Use slots in shipping channel to access nuts.
2. Remove channel (C).
3. Remove bolt (D) at front of endshield.
4. Swivel endshield towards rear of header.
5. Engage lock (A) to prevent endshield movement.
6. Remove self-tapping screw (B).
7. Slide endshield upwards and remove from hinge arm.

**NOTE:**
The inboard holes (position 2) on the endshield bracket are used for shipping position.
8. Remove fasteners securing shipping brackets (A) to endshields and remove brackets. Discard fasteners and brackets.

9. Guide endshield onto hinge arm, using outboard holes (position 1) on bracket (C). Slowly slide the endshield downwards.

10. Install self-tapping screw (B).

11. Disengage lock (A) to allow endshield movement.

12. Insert front of endshield behind hinge tab (A).

13. Swing endshield in direction (B) into closed position. Engage lock with a firm push.

14. Verify that endshield is locked.
15. Repeat procedure for opposite endshield.

**NOTE:**
- For **single-reel headers**, right endshield shipping support is attached to header at inboard hole (A) with right endshield in outboard position.
- For **double-reel headers**, right endshield shipping support is attached to header at outboard hole (B) with right endshield in inboard position.

### 3.1.2 Removing Shipping Stands and Supports

Unless otherwise specified, discard stands, shipping material, and hardware. The removable stands are painted yellow or unpainted.

**IMPORTANT:**
If the header is being shipped to a Dealer after assembly, do **NOT** remove the shipping stands and supports at this time. Proceed to Step 13, page 26.

**Removing shipping stands from the float module**

1. Remove two bolts (A) securing right fork channel (B) to shipping stand (C).

   **NOTE:**
   To access the bolts at the lower stand support, the header must be supported with 150 mm (6 in.) blocks.

2. Remove two bolts (D) securing right fork channel (B) to lower brace (E).

3. Repeat the steps above for the left side.
4. Remove lower brace (A).

5. From the upper brace, remove two bolts (A). Repeat for the opposite side.
6. Remove right and left fork channels (A).

7. Remove upper brace (B).

8. Remove four bolts (A) and remove shipping stands (B) from the bottom of the float module.

9. Remove two bolts (A) securing the bottom of coupler cover (B) to the float module.

**IMPORTANT:**
Do NOT remove bolts (C) because they hold multicoupler components in place. Loosen bolts (C) only enough so that coupler cover can be removed, and then make sure you retighten the bolts.

10. Loosen two bolts (C), slide coupler cover to the left until cutouts are aligned with bolts, and then remove coupler cover.

**IMPORTANT:**
Do NOT remove bolts (C) at this time; they hold multicoupler components in place. Loosen bolts (C) only enough so that coupler cover (B) can be removed, and then make sure you retighten the bolts.

11. Tighten two bolts (C).
12. **9.1 m–10.7 m (30–35 ft.) only:** Remove four bolts (A) and two bolts (B) from the shipping stands at both outboard header legs. Remove the shipping stands.

**Removing additional shipping supports and guards**

13. Remove reel anti-rotation strap (A) between the reel and endsheet.

14. **Single reel:** Cut banding (A) securing the reel to the cutterbar and backtube.

**NOTE:**
Do **NOT** remove brackets (B) on cutterbar.
ASSEMBLING THE HEADER AND FLOAT MODULE

15. **Single reel**: Remove bolts (A) securing the center shipping beam to the backtube.

16. **Single reel**: Remove bolts (B) securing the center shipping beam to the cutterbar.

17. **Single reel**: Rotate the shipping beam and remove it from the reel side of the header.

18. **Single reel**: Remove lifting brackets (A) from the shipping beam.
19. **Double reel only**: Remove cotter pins from center-link pin (A). Do **NOT** remove center-link pin or straps between header and float module.

20. Attach brackets (A) to center-link pin (B) and reinstall cotter pins.
21. Reinstall bolt and nut (A) in lifting brackets (B), and tighten bolt.

22. Loosen two bolts (A) on cutterbar shipping bracket (B), and remove bracket.
3.1.3 Attaching Reel Lift Cylinders

**CAUTION**

Tagged bolts (A) on reel arms keep the reel from sliding forward. Ensure fore-aft cylinders are attached BEFORE removing bolts.

**NOTE:**

Reel, draper, and cutterbar parts removed from illustration for clarity.
1. **Standard reel arms:** Remove two top bolts (A) on outboard reel arm support. Repeat for opposite side.

![Figure 3.26: Reel Arm Shipping Support – Standard Reel Arms](image)

**Short reel arms:** Remove bolts (A) on left reel arm support (B). Repeat for opposite side.

**NOTE:**
Reel parts removed from illustration for clarity.

![Figure 3.27: Reel Arm Shipping Support – Short Reel Arms](image)

2. Position sling (A) around reel tube (B) close to the outboard end of reel and attach sling to a forklift (or equivalent).

3. Remove shipping wire/banding from the reel lift cylinder that is secured to the reel right arm.

![Figure 3.28: Reel Right End](image)
4. Lift reel and remove pins from the endsheet and the reel arm.

5. Align the reel lift cylinder mounting bolts with the lug on the endsheet and the hole in the reel arm.

6. Secure cylinder to endsheet and reel arm with clevis pins (A) and (B) as shown.
   - Insert cotter pin into clevis pin (A) on **OUTBOARD** side of reel arm.
   - Insert cotter pin into clevis pin (B) on **INBOARD** side of endsheet.

7. **Double reel**: Position sling (A) around the reel tube near the reel center support arm. Raise lifting device to relieve load on shipping supports (B).
8. **Double reel**: Remove six bolts (A) and two support channels (B) on center reel arm to allow the center reel arm to move. Retain bolts and support channels for use in 3.1.4 Attaching Center Support – Double Reel, page 35.

9. **Double reel**: Lift reel to gain access to the center lift cylinder.

10. **Double reel**: Remove shipping wire and banding from center reel lift cylinder. Remove socket head bolt and nut from cylinder rod.

11. **Double reel**: Lift reel so that hole in center lift cylinder rod lines up with mounting hole in reel arm.

12. **Double reel**: Attach rod end of cylinder to reel arm with socket head bolt and nut (A). Access hardware through holes in reel arm braces (C).

13. **Double reel**: Torque bolt and nut (A) to 54–61 Nm (40–45 lbf·ft).

14. **Double reel**: Remove pin at barrel end of cylinder.

15. **Double reel**: Adjust reel height so pin (B) can be installed at barrel end of cylinder and mounting structure.

16. Reposition sling (A) around the reel tube near the opposite outboard reel arm.

17. Remove shipping wire and banding from the reel lift cylinder.
18. Lift reel and remove pins from the endsheet and the reel arm.

19. Align the reel lift cylinder mounting holes until they line up with the lug on the endsheet and the hole in the reel arm.

20. Secure cylinder to endsheet and reel arm with pins as shown.
   - Insert cotter pin into clevis pin (A) on OUTBOARD side of reel arm.
   - Insert cotter pin into clevis pin (B) on INBOARD side of endsheet.

21. Remove bolts (A) from reel arm support (B) at endsheet and remove support. Repeat at other side.

22. Proceed to the next step for your equipment:
   - For double reel, proceed to 3.1.4 Attaching Center Support – Double Reel, page 35.
   - For single reel, proceed to 3.1.5 Installing Tine Tubes: Six-Bat Reels, page 36.
3.1.4 Attaching Center Support – Double Reel

This procedure applies to headers that are partially assembled at one location and then shipped to a MacDon Dealer location for final assembly.

1. Remove two bolts (A) at end of reel center arm. Retain for reinstallation.

2. Loosen two bolts (B) in support at end of reel center arm.

3. Rotate bracket (C) to align upper holes with holes in arm.

4. Reinstall two bolts (A) at end of reel center arm and tighten.

5. Tighten two bolts (B) in support at end of reel center arm.

6. Reinstall two support channels (A) on cutterbar support (B) and center reel arm support (C) using 1/2 in. x 4-1/5 in. long bolts (D) removed in 3.1.3 Attaching Reel Lift Cylinders, page 30. Adjust height of center reel arm if necessary.

   ![Figure 3.36: Reel Center Arm](image)

   ![Figure 3.37: Reel Center Arm](image)

   ![Figure 3.38: Reel Center Arm Shipping Supports](image)

   IMPORTANCE:

   To prevent damage to the reel and components, supports must be reinstalled for shipping.

7. Tighten all bolts.
3.1.5 Installing Tine Tubes: Six-Bat Reels

NOTE:
This procedure applies ONLY to six-bat reels. If you are assembling a header with a five-bat reel, proceed to 3.1.6 Attaching Cam Arms, page 37.

1. Rotate the reel manually until the tine tubes that are wired to the reel are accessible.
2. Remove shipping wire securing tine tubes to reel, and remove tine tubes.
3. Rotate the reel manually until location (A) without tine tube is accessible.

4. Place tine tube onto reel discs and position the supports on discs as shown. Refer to adjacent supports and tine tubes for correct orientation. Temporarily secure tine tube to discs.
5. Retrieve hardware bag that is wired to tine tube.
6. Assemble tine tube supports to discs using bolts (B) and (C) with lock nuts as shown. Do NOT tighten hardware until all bolts have been installed.
7. Tighten bolts to 95–108 Nm (70–80 lbf-ft).

Figure 3.39: Location without Tine Tube

Figure 3.40: Cam End of Six-Bat Reel (Drive Not Shown for Clarity)
A - Stud
B - Bolts: 1/2 in. x 1.0 in. Torx®
C - Bolts: 1/2 in. x 1.0 in. Torx® (Not Required with Plastic Tines)
3.1.6 Attaching Cam Arms

1. Rotate the reel manually until the tine bars with disconnected cam links are accessible.
2. If not already removed, remove shipping wire (A).
3. Obtain parts from hardware bag D and bag E.
4. Install cam arm (A) with preinstalled stud (B) into disc. Secure with 1/2 in. smooth-face lock nut (C), and torque to 75 Nm (55 lbf·ft).

5. Rotate tine bar crank (A) and position link (B) so attachment holes in bar crank are aligned with hole in link.

6. Install bolt (C) in link and position shim (D) on bolt so that shim is **between** link (B) and tine bar crank (A).

   **IMPORTANT:**
   Make sure shim (D) is installed in the correct location to avoid damage to the bar crank.

   **NOTE:**
   Bolts are precoated with Loctite®, so no further locking method is required.

7. Repeat for remaining tine bars, and then torque bolts (C) to 165 Nm (120 lbf·ft).
NOTE:
Pictures to the right are provided for additional reference.
Proceed to 3.4 Attaching Reel Height Sensor, page 133.

Figure 3.46: Cam Link to Tine Tube on Six-Bat Reel
A - Tine Bar Crank  B - Link
C - Bolt  D - Shim (not visible)
E - Cam Arm  F - Preinstalled Stud

Figure 3.47: Cam Link to Tine Tube on Nine-Bat Reel
A - Tine Bar Crank  B - Link
C - Bolt  D - Shim (not visible)
E - Cam Arm  F - Preinstalled Stud
3.2  Assembling 12.2 m (40 ft) Header (Split Frame)

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

Continued from 2.4 Lowering Header, page 16.

3.2.1  Unpacking Header

1. Remove shipping wire securing left endshield (A) to frame.
2. Remove left endshield and brackets (B) from cutterbar.

3. Remove hardware securing the shipping brackets (A) to the inside of left endshield and discard brackets.

4. Remove shipping wire securing hardware bags to cutterbar guards (A) and remove bags. Remove clips from bags and discard clips.

   NOTE:
   Do NOT install hardware or parts from bags until instructed to do so. Refer to 12.1 Parts List, page 499 for bag contents.

5. Remove shipping wire or strapping from draper bag (B), and set aside for installation.
6. Remove right outboard skid shoe (C) and set aside for installation.
7. Remove reel endshields (D) from deck and set aside for installation.
8. Remove shipping wire, and lift right outboard deck (A) off header. Set aside outboard deck for installation.

9. Remove the reel components and knife that are secured to the existing reel (A).

10. Remove reel disc sectors (A) from the reel arm.

### 3.2.2 Removing Shipping Stands and Supports

Unless otherwise specified, discard stands, shipping material, and hardware. The removable stands are painted yellow.

**IMPORTANT:**

If the header is being shipped to a Dealer after assembly, do **NOT** remove the shipping stands and supports at this time. Proceed to Step 12, page 45.
Removing shipping stands from the float module

1. Remove two bolts (A) securing right fork channel (B) to shipping stand (C).

   **NOTE:**
   To access the bolts at the lower stand support, the header must be supported with 150 mm (6 in.) blocks, as directed in Step 5, page 18.

2. Remove two bolts (D) securing right fork channel (B) to lower brace (E).

3. Repeat the steps above for the left side.

4. Remove lower brace (A).
5. From the upper brace, remove two bolts (A). Repeat for the opposite side.

6. Remove right and left fork channels (A).

7. Remove upper brace (B).
8. Remove four bolts (A) and remove shipping stands (B) from the bottom of the float module.

9. Remove two bolts (A) and loosen two bolts (B) securing coupler cover (C) to the float module.

10. Remove the coupler cover.
Removing the outboard leg supports

11. Remove four bolts (A) and two bolts (B) from the shipping stands at both outboard header legs. Remove stands.

Removing additional shipping supports and guards

12. Remove reel anti-rotation strap (A) between reel and endshield.

13. Loosen existing bolt (A) and disassemble lifting brackets (B).

14. Remove lifting brackets from the center reel support.
15. Remove cotter pins from center-link pin (A). Do **NOT** remove center-link pin or strap between header and float module.

16. Attach brackets (A) to center-link pin (B) and reinstall cotter pins.

17. Reinstall bolt and nut (A) in lifting brackets (B). Tighten bolt.
18. Loosen two bolts (A) in right endshield guard (B) and remove the guard. Hardware can be removed when header endshield is opened.

3.2.3 Removing Extension
1. Support split section of header (A) with slings and a forklift (or equivalent). Position slings on split section to prevent it from shifting when the shipping supports are removed.
2. Remove shipping supports (B) securing split section to the header. Retain hardware for reinstallation.

3.2.4 Attaching Extension
1. Move extension up to header backtube.
2. Locate two fore-aft hoses, one lift hose, two 3/4 in. hoses (A) (double-knife headers), and electrical harness in backtube, and pull out.
3. Align end of split section with end of header.
4. Route the hoses and harness through tube of split section.
5. Attach backtube of split frame to backtube of header with retained 5/8 x 1-3/4 in. long hex bolts and lock nuts (A).

6. Retrieve all parts from the hardware bag labelled A.

7. Position connector (A) onto cutterbar lugs (B) as shown and install with retained 5/8 x 1-1/4 in. carriage bolts and lock nuts. Do **NOT** fully tighten.

8. Use alignment marks (A) to align the end frame prior to fully tightening bolts. Torque flange bolts to 271 Nm (200 lbf-ft).

**IMPORTANT:**
If Grade 5 bolts are used, torque them to 203 Nm (150 lbf-ft). Refer to **12.2 Torque Specifications, page 506** for bolt identification.
ASSEMBLING THE HEADER AND FLOAT MODULE

9. Install guard (A) and cutterbar wearplate at split with two 7/16 x 2-1/2 in. special carriage bolts and lock nuts (B) (existing hardware). Torque bolts to 81–95 Nm (60–70 lbf-ft).

10. Install cutterbar wearplate (A), guard (B), and clip (C) with two 7/16 x 1-1/2 in. long special carriage bolts (D) and nuts at location shown. Tighten nuts to 68 Nm (50 lbf-ft). Adjuster bolt should not require adjusting.

11. Install cutterbar wearplate (E) and guard (F) with two 7/16 x 1-1/2 in. long special carriage bolts (G) and nuts at location shown. Tighten nuts to 68 Nm (50 lbf-ft).
3.2.5 Installing Deck

⚠️ CAUTION
Draper supports in deck are slippery due to graphite coating.

1. Remove three bolts and nuts (A) from deck extension backsheet. Retain for reinstallation.
2. Remove deck support assembly (B) from deck extension backsheet. Retain for reinstallation.
3. Remove deck support casting (C) at front of extension deck. Retain for reinstallation.

4. Remove four nuts (A) at inboard deck front support and remove bar (B). Do NOT remove casting (C). Retain for reinstallation.
5. Install deck support assembly (A) removed in Step 2, page 50. Slide it on from the outboard end of track on backtube.

6. Position deck support casting (A), removed in Step 3, page 50, inside cutterbar from the backside. Slide onto support angle at the outboard location shown.

7. Position deck extension in header. Use wooden blocks to support deck.

8. Attach backsheet (A) to support assembly (B) on the backtube with existing hardware (C).
ASSEMBLING THE HEADER AND FLOAT MODULE

9. Attach deck extension (A) to the existing deck at front cutterbar support (B) with bar (C) and four existing nuts and bolts (D).

![Figure 3.79: View from below Deck](image)

10. Attach support casting (A) removed in Step 3, page 50 to the deck with existing hardware. Do **NOT** fully tighten.

![Figure 3.80: Deck Underside](image)
11. Attach deck extension backsheet (A) to the existing backsheet with existing hardware (B) retained from Step 1, page 50. Ensure Belleville washers (C) are installed as shown.

12. Adjust deck height to obtain clearance (A) of 7–11 mm (1/8–7/16 in.) between top of deck and inside cutterbar (i.e., the thickness of the draper plus 3 mm).

13. Tighten all hardware.
3.2.6 Assembling Draper

1. Retrieve drapers from bag.

2. Insert draper into deck at outboard end under the rollers. Pull draper into deck while feeding it at the end.

3. Feed in the draper until it can be wrapped around the drive roller.

4. Insert opposite end of draper into deck over the rollers. Pull draper fully into the deck.

5. Attach the ends of the draper with connector (A) (provided) using the row of holes closest to the end of the draper. Install screw heads (B) so they lead in the same direction as the crop flow.

6. Check that draper guide (rubber track on underside of draper) is properly engaged in groove of drive roller (A).
7. Ensure idler roller (A) is between draper guides (B).

Figure 3.86: Idler Roller

NOTE:
Draper tension should be just enough to prevent slipping and keep draper from sagging below cutterbar.

8. Ensure white bar (A) is about halfway in the window. If the side draper tension requires adjustment, refer to 8.13 Adjusting Draper Tension, page 284.

Figure 3.87: Tension Adjuster – Left Shown, Right Opposite

3.2.7 Setting Deck Position

1. Adjust deck position (A) 1920 mm (75 1/2 in.) from existing deck.

Figure 3.88: Deck Position
2. Tighten clamp bolt (A) at the upper outboard end of backsheet to secure deck.

![Figure 3.89: Clamp Bolt](image1)

### 3.2.8 Installing Right End Knife

1. Remove knife from shipping position (if not already removed).

2. At right side of header, remove grease fitting (A) from pin (D) in pitman arm (B).

3. Remove nut and bolt (C).

![Figure 3.90: Pitman Arm](image2)

4. Slightly pry apart split (A) in pitman arm so that pin (B) can be tapped upward.

![Figure 3.91: Pitman Arm](image3)
5. Remove the protective covering from knifehead (A) and slide the knife into place. Align knifehead with pitman arm (B).

6. Tap knifehead pin (C) down into the knifehead (A), ensuring pin is bottomed out in the knifehead.

7. Tap the underside of knifehead (A) until the pin is flush with upper face (D) of pitman arm and it just contacts pitman arm with a gap (E) of 0.25 mm (0.010 in.).

8. Reinstall bolt and nut (A).

9. Tighten nut to 220 Nm (160 lbf-ft).

10. Reinstall grease fitting (B) in pin.

11. Grease the bearing.

**NOTE:**
To prevent binding and/or excessive wear caused by knife pressing on guards, do **NOT** overgrease. If more than 6 to 8 pumps of the grease gun are required to fill the cavity, replace the seal in the knifehead.

### 3.2.9 Moving Reel Arm

1. Attach reel arm to a forklift (or equivalent) with slings. Position slings to prevent shifting when the last bolt is removed.

2. Remove hardware (A) securing the forward end of the reel arm to shipping support (B).
3. Move reel arm forward, and position as shown.

4. Reinstall hardware (A) (bolt, two washers, and nut) to attach right reel arm to header frame. Do NOT tighten at this time.

5. Raise reel arm so that lift cylinder lines up with bracket (B) on endsheet.

6. Remove pin from cylinder rod end and use it to attach cylinder to endsheet. Ensure clevis pin (C) is installed in reel arm as shown.

7. Secure clevis pin with cotter pin.

   NOTE:
   - Insert cotter pin OUTBOARD at reel arm.
   - Insert cotter pin INBOARD at endsheet.

8. Route the 1/4 in. reel lift hydraulic hose (A) on the right reel arm into the backtube access hole.

   NOTE:
   Fore-aft hoses not shown in illustration to improve clarity.

9. Remove bolt (A) and remove reel arm safety prop (B) from inboard side of reel arm. Set aside for reinstallation.
10. Install reel arm safety prop (A) inside reel and secure with existing hardware.

**NOTE:**
Tighten reel arm safety prop just enough so it can still be moved by hand.

![Figure 3.98: Reel Arm Safety Prop](image)

11. Route two fore-aft hoses (A) from the right reel arm into the backtube access hole.

**NOTE:**
Ensure there is enough slack in the hoses for reel to slide all the way forward.

![Figure 3.99: Reel Fore-Aft Hoses](image)

12. Locate two 3/4 in. hoses (A) inside the backtube on the right side of the header and route them out through backtube hole (B) towards the hydraulic motor.

![Figure 3.100: Hydraulic Hoses inside Backtube](image)
13. Remove caps and plugs from reel lift and fore-aft hoses and from hose connections inside backtube.

14. Match the colored cable ties and connect one reel lift hose (B) and two fore-aft hoses (A) inside backtube.

15. Remove two caps from motor (A) and two plugs from hoses (B), and connect hoses to motor—matching the colored cable ties.

**NOTE:**
Cutaway view shown. Hoses are routed out through the backtube hole from inside.

16. Tighten hose fittings onto motor.

17. Remove shipping wire (A) from reel lift/fore-aft hoses attached to the right reel arm.
18. Route reel lift/fore-aft hoses (A) to outboard hose connections (B) on the deck extension backsheat.

19. Match color cable ties at the end of the hoses, remove the caps and plugs, and make the hose connections as shown.

20. Match the color cable ties at inboard hose connections (A) on the deck extension backsheat to the outboard hose connections on the existing backsheat.

21. Remove the caps and plugs, and make the hose connections as shown.

22. Route wiring harness (A) from the right side of the backsheat to the reel arm and to the light on the reel arm.

Figure 3.104: Hose Connections on Backsheet

Figure 3.105: Hose Connections on Backsheet

Figure 3.106: Light Wiring Harness on Backsheet
23. Attach transport wiring harness (A) to the right endsheet with clamp (B) (unless transport option is installed).

![Figure 3.107: Transport Wiring Harness](image)

24. Install cinch straps (A) to secure harness and reel lift/fore-aft hoses.

![Figure 3.108: Cinch Straps](image)

25. Install reel arm safety prop (A) inside reel, and secure with existing hardware.

**NOTE:**
Tighten reel arm safety prop just enough so it can still be moved by hand.

![Figure 3.109: Reel Arm Safety Prop](image)
3.2.10 Installing Right Outboard Skid Shoe

1. Remove right endshield.

2. Mount outer skid shoe support to endsheet using hardware (A) provided. Do NOT tighten.

![Figure 3.110: Skid Shoe at Endsheet](image1)

**NOTE:**
Ensure skid shoe (A) is tucked up behind cutterbar (B).

![Figure 3.111: Skid Shoe behind Cutterbar](image2)

3. Attach shoe to frame bracket using two Belleville coned washers (A) and one hex nut (B), as follows:
   a. Position coned washers so the coned surfaces are away from each other as shown at (A).
   b. Tighten until nut touches top washer and bolt head touches bottom of frame bracket.
   c. Ensure there is at least one thread showing at end of bolt.

![Figure 3.112: Skid Shoe Hardware](image3)
4. Check that pin (B) can be removed by hand, and that shoe can be adjusted to all three height settings. If not, adjust bolt tightness (refer to Step 3, page 63).

5. Tighten hardware (A).

6. Set height as desired.

**NOTE:**
Setting should be the same at both ends of header.

7. Replace endshield.

### 3.2.11 Assembling Right Reel

**Installing Discs**

1. Support reel tube on stands (A) provided with each support. Support the reel approximately 914 mm (36 in.) from the ends.

2. Retrieve reel discs that were previously unpacked.

3. Install solid disc segment at the end of the reel tube without a stub shaft using 1/2 x 1.0 in. long Torx® bolts and nuts (A) and 1/2 x 3/4 in. long Torx® bolts and nuts (B) (provided in the hardware bag labelled B). Longer bolts (A) are installed at the reel center tube flange locations. Flanges on disc sections must face inboard.

4. Hand-tighten hardware.

**IMPORTANT:**
Do NOT install hardware in peripheral holes at this time.
5. Position 16-gauge sections (number [A] stamped on each disc section) at the end of the reel tube with the stub shaft.

6. Install 16-gauge discs with 1/2 x 1.0 in. long Torx® bolts and nuts (A) and 1/2 x 3/4 in. long Torx® bolts and nuts (B) (provided in the hardware bag labelled B). Longer bolts (A) are installed at the reel center tube flange locations. Line up seams with previously installed disc and ensure flanges on disc sections face inboard.


8. Install the 18-gauge discs at the center location with 1/2 x 1.0 in. long Torx® bolts and nuts and 1/2 x 3/4 in. long Torx® bolts and nuts (provided in the hardware bag labelled B). The longer bolts are installed at the reel center tube flange locations. Ensure flanges on discs face the same direction as flanges on the outer disc.


Aligning Solid Disc

IMPORTANT:
A jig is required to ensure solid discs are aligned properly and assembled straightly. The jig is included with the first shipment of headers to each setup location.
1. Adjust four bolts (A) at center flange on jig so they protrude past the plate by 5.5 mm (7/32 in.).

2. Position jig (A) on reel tube by inserting shaft on the jig into hole in the tube end. Position lift hook (B) in jig at approximately the 12 o’clock position.
ASSEMBLING THE HEADER AND FLOAT MODULE

3. Rotate the reel so the row of disc seam bolts that line up with tapped hole (A) in reel tube point to the 12 o’clock position.

NOTE:
Only one row (A) of disc seam bolts will line up with a tapped hole (B) in the center mounting plate.

4. Secure jig (A) to reel tube with four bolts (B) in center flange.
5. Close six clamps (A) around the jig.

6. Tighten three bolts (A) at the indented locations on reel tube flange.
7. Tighten three bolts at each seam using sequence shown (1, 2, 3).

8. Check that all bolts are tight. Do NOT tighten the other two discs at this time.


**NOTE:**
Jig can remain attached to reel tube until straightness checks and adjustments are complete.

10. Using a verified straight edge (A), check the contour of the disc at three locations. The disc must NOT exceed the dimensions shown in Figure 3.128, page 70.
11. If necessary, adjust contour as follows:
   a. **Condition 1**: Increase protrusion of adjusting screws. Refer to Step 1, page 66.
   b. **Condition 2**: Decrease protrusion of adjusting screws. Refer to Step 1, page 66.
   c. Loosen all bolts on disc and repeat Step 5, page 68 to Step 10, page 69.

12. Remove four bolts (B) securing jig (A) to reel tube.

13. Remove jig. Use jacking bolt if necessary to remove the jig from the disc.

*Installing Tine Tubes*

**NOTE:**
A template is required to attach tine tubes to reel discs. The template is included with first shipment of headers to each setup location.
1. Rotate reel so seam (A) that lines up with a tapped hole (B) is in the upright position.

2. Position template on cam track ensuring the row of four holes (A) is lined up with the row of bolts on the disc.

3. Transfer the five hex hole locations from the template onto the disc to identify cam arm attachment points (A).
4. Place disc reinforcement channels (from hardware bag B) on the inside face of cam end disc. Position each channel so that center joggle (A) is located over a seam.

5. Loosely install 1/2 x 3/4 in. long Torx® bolts and nuts (found in hardware bag B) at four round hole locations (A) on template.

Cam End Disc – View from Cam End

6. Position tine tubes on discs using the template on the cam track as a guide.
   a. Position brackets (B) on near side.
   b. Loosely install ten 1/2 x 1.0 in. Torx® bolts (A) (found in the hardware bag labelled B).
   c. Install center bolts (C) later with endshield supports.
Center Disc – View from Cam End

7. Position tine tubes on discs using the template on the cam track as a guide.
   a. Position brackets (B) on far side.
   b. Loosely install eleven 1/2 x 3/4 in. Torx® bolts (A) (found in the hardware bag labelled B) into the middle hole (C).

Tail End Disc – View from Cam End

8. Position tine tubes on discs using the template on the cam track as a guide.
   a. Position brackets (B) on far side.
   b. Loosely install eleven 1/2 x 3/4 in. Torx® bolts (A) (found in the hardware bag labelled B).
**Tightening Fasteners**

Use the following sequence for tightening fasteners:

1. Tighten 10 bolts securing tine tubes to cam end disc and torque to 95–108 Nm (70–80 lbf·ft).
2. Tighten 11 bolts securing tine tubes to center disc and torque to 95–108 Nm (70–80 lbf·ft).
3. Tighten 11 bolts securing tine tubes to tail end disc and torque to 95–108 Nm (70–80 lbf·ft).
4. Tighten three center disc bolts (A) at the indented locations on the reel tube flange to 95–108 Nm (70–80 lbf·ft).
5. Tighten three center disc bolts along seams to 95–108 Nm (70–80 lbf·ft) in the order shown (1, 2, 3).
6. Tighten all remaining bolts.
7. Repeat Step 4, page 74 and Step 5, page 74 at inboard disc.
Attaching Cam Arms

1. Manually rotate reel until the tine bars with the disconnected cam links are accessible.
2. Remove shipping wire (A) if not already removed.

NOTE:
Five hex hole locations (A) from the template were previously marked onto the disc (refer to Step 3, page 71) to identify the cam arm attachment points.

3. Obtain reel linkage arms from the hardware bags labelled D and F.

4. Install cam arm (A) with preinstalled stud (B) and washer (C) into previously marked hole on disc. Secure with a 1/2 in. smooth face lock nut (D) and torque to 75 Nm (55 lbf·ft).
5. Attach link (A) to tine bar crank (D) with shoulder bolt (B) and shim (C). Place shim between link and tine bar crank. Torque bolt to 165 Nm (120 lbf-ft).

Figure 3.144: Link
Checking Cam Track Alignment

IMPORTANT:
Proper cam track alignment minimizes the possibility of interference between the cam arms and cam track.

The cam track has been aligned at the factory, but may have moved slightly during shipping and handling; therefore, it is important to perform the following check:

1. Measure the distance between hub mating face (A) and outer cam track (B) at C, D, E, and F (approximately 90° to each other) using the holes in the cam face as a guide.

2. Determine cam tilt using formulas in the Variation column of Table 3.1, page 77.

Table 3.1 Cam Tilt

<table>
<thead>
<tr>
<th>Variation</th>
<th>If Equal to or Greater Than mm (in.)</th>
<th>Add Shim at Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>E – C</td>
<td>5.0 (6/32)</td>
<td>1</td>
</tr>
<tr>
<td>F – D</td>
<td>4.5 (6/32)</td>
<td>2</td>
</tr>
<tr>
<td>C – E</td>
<td>3.5 (1/8)</td>
<td>3</td>
</tr>
<tr>
<td>D – F</td>
<td>3.0 (1/8)</td>
<td>4</td>
</tr>
</tbody>
</table>
3. If variation is equal to or greater than the values in Table 3.1, page 77, add a shim (A) between cam face (B) and reel hub (G) at the locations specified in the Add Shim at Location column as follows:

   a. Loosen two nuts at the location where shim is to be added.
   b. Insert shim (A) from the hardware bag labelled B and retighten nuts. Torque to 102 Nm (75 lbf·ft).

   **NOTE:**
   If variation is less than the values in Table 3.1, page 77, do **NOT** add shims.

### Installing Reel Lift Cylinders: Left Reel

1. Position sling (A) around the reel tube—close to the outboard end of reel—and attach sling to a forklift (or equivalent).
2. **Standard reel arms**: Remove top bolts (A) on reel arm support (B) and anti-rotation brace at left end of reel.

**Short reel arms**: Remove bolts (A) on reel arm support (B), and anti-rotation brace at left end of reel.

**NOTE:**
Reel removed from the illustration to improve clarity.
3. Raise end of reel with a forklift or crane so the reel lift cylinder can be attached.
4. Retrieve the cylinder wired to reel support arm.
5. Remove pins from lug on endsheet and reel arm.
6. Lift reel so reel lift cylinder mounting holes line up with hole in reel arm (A) and lug on endsheet (B).
7. Secure cylinder to endsheet and reel arm with pins as shown.
   - Insert cotter pin OUTBOARD at reel arm (A).
   - Insert cotter pin INBOARD at endsheet (B).
8. Remove sling (A) and position it around reel tube near reel center support arm.
9. Lift reel to access the center lift cylinder.
10. Remove shipping wire securing lift cylinder to center reel arm. Remove packing.
11. Remove socket head bolt and nut from cylinder rod end.

12. Attach the rod end of the cylinder to the reel arm with socket head bolt and nut (A). Access hardware through holes in reel arm braces.

13. Torque bolt and nut (A) to 54–61 Nm (40–45 lbf·ft).

14. Remove pin (B) at the barrel end of the cylinder.

15. Adjust reel height so pin can be installed at barrel end of cylinder and mounting structure.

16. Make sure cylinder hose is properly routed.

**IMPORTANT:**
To avoid damaging hoses, ensure hoses are routed in front of the reel prop pin.

### Setting up Left Reel

1. If not already removed, remove reel anti-rotation strap (A).

2. Rotate reel manually until tine bars with disconnected cam links are accessible.

3. Install bolt (C) in link, and position shim (D) on bolt so shim is between link (B) and tine bar crank (A).

**NOTE:**
Bolts are pre-coated with Loctite®; no further locking method is required.

4. Realign link (B) and tine bar crank (A), and thread in the bolt (C).

5. Torque bolt to 165 Nm (120 lbf·ft).
Installing Right Reel

1. Remove reel driveshield (A) at center of header.

2. Check distance (X) between cam track (A) and hub face (B) at right side of header. If distance is less than 59.0 mm (2.32 in.), add shims provided in the hardware bag labelled B until distance is achieved.

**NOTE:**
Shims are 1.0–1.2 mm (0.040–0.047 in.) thick.

**EXAMPLE:**
If distance (X) is 57.0 mm (2.24 in.), calculate the number of shims required as follows:

\[
59.0 \text{ (2.32)} - 57.0 \text{ (2.24)} = 2.0 \text{ (0.08)} / 1.0 \text{ (0.04)} = 2
\]

Two shims are required.

3. Remove protective coating from shafts at both ends of reel tube.

---

Figure 3.155: Reel Driveshield at Center of Header

Figure 3.156: Distance between Cam Track and Hub Face
4. Position sling around right reel tube at approximately the center disc and attach to a forklift (or equivalent).

5. Ensure bolt (A) at right reel arm pivot is loose.

6. Carefully position reel in header. At right arm, line up shaft on reel arm with hole in reel tube until it engages reel tube slightly.

7. Insert shims (A) (as determined in Step 2, page 82) at cam end of the right reel, and fully engage reel tube onto shaft. Shims are supplied in hardware bag B.
8. Secure reel at right arm with four 1/2 x 1-1/4 in. long hex bolts (A) and lock washers from hardware bag B. Apply medium-strength threadlocker (Loctite® 243 or equivalent) onto bolt before assembly. Torque bolts to 108 Nm (80 lbf·ft).

9. Position the tail end of right reel (A) against the U-joint flange of left reel (B).

10. Engage reel stub shaft (C) into U-joint flange hole (D).

11. Rotate reel so tine tubes are either aligned or staggered relative to the existing reel. Align holes (E) in U-joint flange with holes in center tube at either position.

   **NOTE:**
   Staggering tine tubes balances the load on reel and reel drive, especially in heavy crops.

12. Install four 1/2 x 1-1/4 in. long hex bolts with lock washers (A) (from the hardware bag labelled B) to connect reel to the U-joint. Apply medium-strength threadlocker (Loctite® 243 or equivalent) to bolt before assembly. Torque bolts to 108 Nm (80 lbf·ft).

13. Remove sling from reel.
14. Reinstall reel drive cover (A) at the center of header.

15. Tighten nut (A) at right reel arm pivot until threads run out, or when nut contacts reel arm.

16. Manually rotate reel one revolution to check clearance of control linkages to cam edge. The gap between the cam edge (A) and the linkage (B) should be 5 mm (1/4 in.) nominal with a minimum gap of 0.25 mm (0.010 in.).

   **IMPORTANT:**
   If reel locks up at a certain position, the cam linkage may have been attached to the reel disc at the wrong location. Refer to Step 3, *page 81* for proper linkage attachment points on disc.

17. If linkages bind on cam, realign the cam track. Refer to *Checking Cam Track Alignment, page 77*.

18. Proceed to *3.4 Attaching Reel Height Sensor, page 133*.
3.3 Assembling 13.7 m (45 ft.) Header (Split Frame)

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

(Continued from 2.4 Lowering Header, page 16.)

Unless otherwise specified, discard all shipping material and hardware.

3.3.1 Unpacking Header

1. Remove shipping wire securing left endshield (A) to frame.
2. Remove left endshield and brackets (B) from cutterbar.

3. Remove hardware securing shipping brackets (A) to the inside of left endshield and discard brackets.

Figure 3.166: Left Endshield Shipping Position

Figure 3.167: Left Endshield Shipping Brackets
4. Remove shipping wire securing hardware bags to cutterbar guards (A) and remove the bags. Remove clips from bags and discard clips.

**IMPORTANT:**
Do **NOT** install hardware or parts from bags until instructed to do so. Refer to 12.1 Parts List, page 499 for bag contents.

5. Remove shipping wire or strapping from the draper bag and remove bag (B) from header. Set bag aside.

6. Remove right skid shoe (C).

7. Remove reel endshields (D) from the deck. Set aside for installation.

8. Remove shipping wire and lift right outboard deck (A) from header.

9. Remove the reel components and knife secured to existing reel (A).
10. Remove reel disc sectors (A) from right end reel support arm.

![Figure 3.171: Reel Disc Sectors](image)

### 3.3.2 Removing Shipping Stands and Supports

Unless otherwise specified, discard stands, shipping material, and hardware. The removable stands are painted yellow.

**IMPORTANT:**

If the header is being shipped to a Dealer after assembly, do **NOT** remove the shipping stands, guards, and fork slider channels at this time. Proceed to Step 12, *page 92*.

**Removing shipping stands from the float module**

1. Remove two bolts (A) securing right fork channel (B) to shipping stand (C).

   **NOTE:**

   To access the bolts at the lower stand support, the header must be supported with 150 mm (6 in.) blocks, as directed in Step 5, *page 18*.

2. Remove two bolts (D) securing right fork channel (B) to lower brace (E).

3. Repeat the steps above for the left side.

![Figure 3.172: Shipping Stands and Lower Brace](image)
4. Remove lower brace (A).

5. From the upper brace, remove two bolts (A). Repeat for the opposite side.
6. Remove right and left fork channels (A).
7. Remove upper brace (B).

8. Remove four bolts (A) and remove shipping stands (B) from the bottom of the float module.
9. Remove two bolts (A) and loosen two bolts (B) securing coupler cover (C) to the float module.

10. Remove the coupler cover.

Removing the outboard header legs

11. Remove four bolts (A) and two bolts (B) from the shipping stands at both outboard header legs. Remove stands.
12. Remove anti-rotation strap (A) between reel and endsheet.

13. Loosen existing bolt (A) and disassemble lifting brackets (B).

14. Remove lifting brackets from the center reel support.

15. Remove cotter pins from center-link pin (A). Do NOT remove center-link pin or strap between header and float module.
16. Attach brackets (A) to center-link pin (B) and reinstall cotter pins.

17. Reinstall bolt and nut (A) in lifting brackets (B). Tighten bolt.

18. Loosen two bolts (A) in right endshield guard (B) and remove guard. Hardware can be removed when header endshield is opened.
### 3.3.3 Removing Extension

1. Support split section of header with slings and a forklift (or equivalent). Position slings on split section to prevent it from shifting when the shipping supports are removed.

2. Remove four shipping supports (A) securing split section to the header. Retain hardware in backtube for reinstallation.

3. Remove bolt (B) securing reel arm to the backtube flange. Retain hardware for reinstallation.

4. Separate split section from main header.

![Figure 3.185: Shipping Supports and Hardware](image)

### 3.3.4 Attaching Extension

1. Move extension up to header backtube.

2. Locate two fore-aft hoses, one lift hose, two 3/4 in. hoses (A) (double-knife headers), and electrical harness in backtube, and pull out.

3. Align end of split section with end of header.

4. Route the hoses and harness through tube of split section.

5. Attach backtube of split frame to backtube of header with 5/8 x 1-3/4 in. long hex bolts and lock nuts (A) previously removed in 3.3.3 Removing Extension, page 94.

![Figure 3.186: Hoses and Harness in Backtube](image)

![Figure 3.187: Backtube of Split Frame and Backtube of Header](image)
6. Retrieve all parts from the hardware bag labelled A.

7. Position connector (A) onto cutterbar lugs (B) as shown, and install with 5/8 x 1-1/4 in. carriage bolts and lock nuts (C) removed in 3.3.3 Removing Extension, page 94. Do NOT fully tighten.

8. Use alignment marks (A) on flanges for proper alignment of end frame prior to fully tightening bolts. Torque flange bolts to 271 Nm (200 lbf·ft).

   NOTE:
   If Grade 5 bolts are used, torque them to 203 Nm (150 lbf·ft). Refer to 12.2 Torque Specifications, page 506 for bolt identification.

9. Install guard (A) and cutterbar wearplate at split with two 7/16 x 2-1/2 in. special carriage bolts and lock nuts (B) removed in 3.3.3 Removing Extension, page 94. Torque bolts to 81–95 Nm (60–70 lbf·ft).
10. Install cutterbar wearplate (A), guard (B), and clip (C) with two 7/16 x 1-1/2 in. long special carriage bolts (D) and nuts at location shown. Tighten nuts to 68 Nm (50 lbf-ft). Adjuster bolt should not require adjusting.

11. Install cutterbar wearplate (A) and guard (E) with two 7/16 x 1-1/2 in. long special carriage bolts (F) and nuts at location shown. Tighten nuts to 68 Nm (50 lbf-ft).

Figure 3.191: Wearplates and Guard
3.3.5 Installing Deck

**CAUTION**

Draper supports in deck are slippery due to graphite coating.

1. Remove shipping wires securing draper track to header.
2. Remove two bolts and nuts in draper track.
3. Relocate draper track (A) towards endsheet until holes (B) line up with holes in header legs. Ensure flat flange (C) is toward rear of header.
4. Reinstall bolts (B) with heads on top.

5. Remove bolts and nuts (A) from side and top of deck extension backsheet. Retain for reinstallation.

6. Remove two support castings (B) at front of extension deck. Retain hardware for reinstallation.
7. Position two castings (A) inside cutterbar from backside and slide onto support angle at the outboard location as shown.

8. Remove four nuts (A) from the inboard deck front support casting (B) and remove bar (C). Do NOT remove casting (B). Retain parts for reinstallation.

10. Attach backsheet to backtube at two locations (A) with four existing bolts and nuts.

11. Attach deck extension (A) to the existing deck at front support casting (B) with bar (C) and existing hardware (D).

12. Attach two support castings (A) removed in Step 6, page 97 onto deck with existing hardware. Do NOT fully tighten.
13. Attach deck extension backsheet (A) to existing backsheet with existing hardware (B). Position Belleville washers (C) as shown.

14. Adjust deck height to obtain clearance (A) of 7–11 mm (1/8–7/16 in.) between top of deck and inside cutterbar (i.e., the thickness of the draper plus 3 mm).

15. Tighten all hardware except support casting hardware.
3.3.6 Assembling Draper

1. Retrieve drapers from bag.

2. Insert draper into deck at outboard end under the rollers. Pull draper into deck while feeding it at the end.

3. Feed in the draper until it can be wrapped around the drive roller.

4. Insert opposite end of draper into deck over the rollers. Pull draper fully into the deck.

5. Attach the ends of the draper with connector (A) (provided) using the row of holes closest to the end of the draper. Install screw heads (B) so they lead in the same direction as the crop flow.

6. Check that draper guide (rubber track on underside of draper) is properly engaged in groove of drive roller (A).
7. Ensure idler roller (A) is between draper guides (B).

**NOTE:**
Draper tension should be just enough to prevent slipping and keep draper from sagging below cutterbar.

8. Ensure white bar (A) is about halfway in the window. If the side draper tension requires adjustment, refer to **8.13 Adjusting Draper Tension, page 284**.

### 3.3.7 Setting Deck Position

1. Adjust deck position (A) 1920 mm (75 1/2 in.) from existing deck.
2. Tighten clamp bolt (A) at the upper outboard end of backsheet to secure deck.

3.3.8 Installing Right End Knife

1. Remove knife from shipping position (if not already removed).

2. At right side of header, remove grease fitting (A) from pin (D) in pitman arm (B).

3. Remove nut and bolt (C).

4. Slightly pry apart split (A) in pitman arm so that pin (B) can be tapped upward.
5. Remove the protective covering from knifehead (A) and slide the knife into place. Align knifehead with pitman arm (B).

6. Tap knifehead pin (C) down into the knifehead (A), ensuring pin is bottomed out in the knifehead.

7. Tap the underside of knifehead (A) until the pin is flush with upper face (D) of pitman arm and it just contacts pitman arm with a gap (E) of 0.25 mm (0.010 in.).

8. Reinstall bolt and nut (A).

9. Tighten nut to 220 Nm (160 lbf-ft).

10. Reinstall grease fitting (B) in pin.

11. Grease the bearing.

NOTE:
To prevent binding and/or excessive wear caused by knife pressing on guards, do NOT overgrease. If more than 6 to 8 pumps of the grease gun are required to fill the cavity, replace the seal in the knifehead.

### 3.3.9 Moving Reel Arm

1. Attach reel arm to a forklift (or equivalent) with slings. Position slings to prevent shifting when the last bolt is removed.

2. Remove hardware (A) securing the forward end of the reel arm to shipping support (B).
3. Move reel arm forward, and position as shown.

4. Reinstall hardware (A) (bolt, two washers, and nut) to attach right reel arm to header frame. Do **NOT** tighten at this time.

5. Raise reel arm so that lift cylinder lines up with bracket (B) on endsheet.

6. Remove pin from cylinder rod end and use it to attach cylinder to endsheet. Ensure clevis pin (C) is installed in reel arm as shown.

7. Secure clevis pin with cotter pin.

   **NOTE:**
   - Insert cotter pin **OUTBOARD** at reel arm.
   - Insert cotter pin **INBOARD** at endsheet.

8. Route the 1/4 in. reel lift hydraulic hose (A) on the right reel arm into the backtube access hole.

   **NOTE:**
   Fore-aft hoses not shown in illustration to improve clarity.

9. Remove bolt (A) and remove reel arm safety prop (B) from inboard side of reel arm. Set aside for reinstallation.
ASSEMBLING THE HEADER AND FLOAT MODULE

10. Install reel arm safety prop (A) inside reel and secure with existing hardware.

   **NOTE:**
   Tighten reel arm safety prop just enough so it can still be moved by hand.

11. Route two fore-aft hoses (A) from the right reel arm into the backtube access hole.

   **NOTE:**
   Ensure there is enough slack in the hoses for reel to slide all the way forward.

12. Locate two 3/4 in. hoses (A) inside the backtube on the right side of the header and route them out through backtube hole (B) towards the hydraulic motor.
13. Remove caps and plugs from reel lift and fore-aft hoses and from hose connections inside backtube.

14. Match the colored cable ties and connect one reel lift hose (B) and two fore-aft hoses (A) inside backtube.

15. Remove two caps from motor (A) and two plugs from hoses (B), and connect hoses to motor—matching the colored cable ties.

   **NOTE:**
   Cutaway view shown. Hoses are routed out through the backtube hole from inside.

16. Tighten hose fittings onto motor.

17. Remove shipping wire (A) from reel lift/fore-aft hoses attached to the right reel arm.
18. Route reel lift/fore-aft hoses (A) to outboard hose connections (B) on the deck extension backsheet.

19. Match color cable ties at the end of the hoses, remove the caps and plugs, and make the hose connections as shown.

20. Match the color cable ties at inboard hose connections (A) on the deck extension backsheet to the outboard hose connections on the existing backsheet.

21. Remove the caps and plugs, and make the hose connections as shown.

22. Route wiring harness (A) from the right side of the backsheet to the reel arm and to the light on the reel arm.
23. Attach transport wiring harness (A) to the right endsheet with clamp (B) (unless transport option is installed).

![Figure 3.225: Transport Wiring Harness](image)

24. Install cinch straps (A) to secure harness and reel lift/fore-aft hoses.

![Figure 3.226: Cinch Straps](image)

25. Install reel arm safety prop (A) inside reel, and secure with existing hardware.

**NOTE:**
Tighten reel arm safety prop just enough so it can still be moved by hand.

![Figure 3.227: Reel Arm Safety Prop](image)
3.3.10 Installing Right Outboard Skid Shoe

1. Remove right endshield.

2. Mount outer skid shoe support to endsheet using hardware (A) provided. Do **NOT** tighten.

![Figure 3.228: Skid Shoe at Endsheat](image1)

**NOTE:**
Ensure skid shoe (A) is tucked up behind cutterbar (B).

3. Attach shoe to frame bracket using two Belleville coned washers (A) and one hex nut (B), as follows:

   a. Position coned washers so the coned surfaces are away from each other as shown at (A).

   b. Tighten until nut touches top washer and bolt head touches bottom of frame bracket.

   c. Ensure there is at least one thread showing at end of bolt.

![Figure 3.229: Skid Shoe behind Cutterbar](image2)

![Figure 3.230: Skid Shoe Hardware](image3)
ASSEMBLING THE HEADER AND FLOAT MODULE

4. Check that pin (B) can be removed by hand, and that shoe can be adjusted to all three height settings. If not, adjust bolt tightness (refer to Step 3, page 110).

5. Tighten hardware (A).

6. Set height as desired.

   **NOTE:**
   Setting should be the same at both ends of header.

7. Replace endshield.

---

3.3.11 Assembling Right Reel

**Installing Discs**

1. Support reel tube on stands (A) provided with each support. Support the reel approximately 914 mm (36 in.) from the ends.

2. Retrieve reel discs that were previously unpacked.

3. Install solid disc segment at the end of the reel tube without a stub shaft using 1/2 x 1.0 in. long Torx® bolts and nuts (A) and 1/2 x 3/4 in. long Torx® bolts and nuts (B) (provided in the hardware bag labelled B). Longer bolts (A) are installed at the reel center tube flange locations. Flanges on disc sections must face inboard.

4. Hand-tighten hardware.

   **IMPORTANT:**
   Do **NOT** install hardware in peripheral holes at this time.
5. Position 16-gauge sections (number [A] stamped on each disc section) at the end of the reel tube with the stub shaft.

6. Install 16-gauge discs with 1/2 x 1.0 in. long Torx® bolts and nuts (A) and 1/2 x 3/4 in. long Torx® bolts and nuts (B) (provided in the hardware bag labelled B). Longer bolts (A) are installed at the reel center tube flange locations. Line up seams with previously installed disc and ensure flanges on disc sections face inboard.


8. Install the 18-gauge discs at the center location with 1/2 x 1.0 in. long Torx® bolts and nuts and 1/2 x 3/4 in. long Torx® bolts and nuts (provided in the hardware bag labelled B). The longer bolts are installed at the reel center tube flange locations. Ensure flanges on discs face the same direction as flanges on the outer disc.


**Aligning Solid Disc**

**IMPORTANT:**
A jig is required to ensure solid discs are aligned properly and assembled straightly. The jig is included with the first shipment of headers to each setup location.
ASSEMBLING THE HEADER AND FLOAT MODULE

1. Adjust four bolts (A) at center flange on jig so they protrude past the plate by 5.5 mm (7/32 in.).

2. Position jig (A) on reel tube by inserting shaft on the jig into hole in the tube end. Position lift hook (B) in jig at approximately the 12 o’clock position.
ASSEMBLING THE HEADER AND FLOAT MODULE

3. Rotate the reel so the row of disc seam bolts that line up with tapped hole (A) in reel tube point to the 12 o’clock position.

![Figure 3.239: Jig and Reel Tube](image)

**NOTE:**
Only one row (A) of disc seam bolts will line up with a tapped hole (B) in the center mounting plate.

![Figure 3.240: Reel Position](image)

4. Secure jig (A) to reel tube with four bolts (B) in center flange.

![Figure 3.241: Jig and Reel Tube](image)
5. Close six clamps (A) around the jig.

6. Tighten three bolts (A) at the indented locations on reel tube flange.
7. Tighten three bolts at each seam using sequence shown (1, 2, 3).

8. Check that all bolts are tight. Do NOT tighten the other two discs at this time.


**NOTE:**
Jig can remain attached to reel tube until straightness checks and adjustments are complete.

10. Using a verified straight edge (A), check the contour of the disc at three locations. The disc must **NOT** exceed the dimensions shown in Figure 3.246, page 117.
11. If necessary, adjust contour as follows:
   a. **Condition 1**: Increase protrusion of adjusting screws. Refer to Step 1, page 113.
   b. **Condition 2**: Decrease protrusion of adjusting screws. Refer to Step 1, page 113.
   c. Loosen all bolts on disc and repeat Step 5, page 115 to Step 10, page 116.

12. Remove four bolts (B) securing jig (A) to reel tube.
13. Remove jig. Use jacking bolt if necessary to remove the jig from the disc.

*Installing Tine Tubes*

**NOTE:**
A template is required to attach tine tubes to reel discs. The template is included with first shipment of headers to each setup location.
1. Rotate reel so seam (A) that lines up with a tapped hole (B) is in the upright position.

![Figure 3.249: Reel Position](image1)

2. Position template on cam track ensuring the row of four holes (A) is lined up with the row of bolts on the disc.

![Figure 3.250: Template on Disc](image2)

3. Transfer the five hex hole locations from the template onto the disc to identify cam arm attachment points (A).

![Figure 3.251: Five Hex Hole Locations](image3)
ASSEMBLING THE HEADER AND FLOAT MODULE

4. Place disc reinforcement channels (from hardware bag B) on the inside face of cam end disc. Position each channel so that center joggle (A) is located over a seam.

5. Loosely install 1/2 x 3/4 in. long Torx® bolts and nuts (found in hardware bag B) at four round hole locations (A) on template.

Cam End Disc – View from Cam End

6. Position tine tubes on discs using the template on the cam track as a guide.
   a. Position brackets (B) on near side.
   b. Loosely install ten 1/2 x 1.0 in. Torx® bolts (A) (found in the hardware bag labelled B).
   c. Install center bolts (C) later with endshield supports.
Center Disc – View from Cam End

7. Position tine tubes on discs using the template on the cam track as a guide.
   a. Position brackets (B) on far side.
   b. Loosely install eleven 1/2 x 3/4 in. Torx® bolts (A) (found in the hardware bag labelled B) into the middle hole (C).

尾端凸轮盘 – 观察从凸轮端

8. Position tine tubes on discs using the template on the cam track as a guide.
   a. Position brackets (B) on far side.
   b. Loosely install eleven 1/2 x 3/4 in. Torx® bolts (A) (found in the hardware bag labelled B).
**Tightening Fasteners**

Use the following sequence for tightening fasteners:

1. Tighten 10 bolts securing tine tubes to cam end disc and torque to 95–108 Nm (70–80 lbf·ft).
2. Tighten 11 bolts securing tine tubes to center disc and torque to 95–108 Nm (70–80 lbf·ft).
3. Tighten 11 bolts securing tine tubes to tail end disc and torque to 95–108 Nm (70–80 lbf·ft).
4. Tighten three center disc bolts (A) at the indented locations on the reel tube flange to 95–108 Nm (70–80 lbf·ft).

5. Tighten three center disc bolts along seams to 95–108 Nm (70–80 lbf·ft) in the order shown (1, 2, 3).
6. Tighten all remaining bolts.
7. Repeat Step 4, page 121 and Step 5, page 121 at inboard disc.
**Attaching Cam Arms**

1. Manually rotate reel until the tine bars with the disconnected cam links are accessible.
2. Remove shipping wire (A) if not already removed.

**NOTE:**

Five hex hole locations (A) from the template were previously marked onto the disc (refer to Step 3, page 118) to identify the cam arm attachment points.

3. Obtain reel linkage arms from the hardware bags labelled D and F.
4. Install cam arm (A) with preinstalled stud (B) and washer (C) into previously marked hole on disc. Secure with a 1/2 in. smooth face lock nut (D) and torque to 75 Nm (55 lbf·ft).
5. Attach link (A) to tine bar crank (D) with shoulder bolt (B) and shim (C). Place shim between link and tine bar crank. Torque bolt to 165 Nm (120 lbf-ft).
Checking Cam Track Alignment

IMPORTANT:
Proper cam track alignment minimizes the possibility of interference between the cam arms and cam track.

The cam track has been aligned at the factory, but may have moved slightly during shipping and handling; therefore, it is important to perform the following check:

1. Measure the distance between hub mating face (A) and outer cam track (B) at C, D, E, and F (approximately 90° to each other) using the holes in the cam face as a guide.

2. Determine cam tilt using formulas in the Variation column of Table 3.2, page 124.

<table>
<thead>
<tr>
<th>Variation</th>
<th>If Equal to or Greater Than mm (in.)</th>
<th>Add Shim at Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>E – C</td>
<td>5.0 (6/32)</td>
<td>1</td>
</tr>
<tr>
<td>F – D</td>
<td>4.5 (6/32)</td>
<td>2</td>
</tr>
<tr>
<td>C – E</td>
<td>3.5 (1/8)</td>
<td>3</td>
</tr>
<tr>
<td>D – F</td>
<td>3.0 (1/8)</td>
<td>4</td>
</tr>
</tbody>
</table>

Refer to Figure 3.264, page 125.
3. If variation is equal to or greater than the values in Table 3.2, page 124, add a shim (A) between cam face (B) and reel hub (G) at the locations specified in the Add Shim at Location column as follows:

   a. Loosen two nuts at the location where shim is to be added.

   b. Insert shim (A) from the hardware bag labelled B and retighten nuts. Torque to 102 Nm (75 lbf·ft).

   **NOTE:**

   If variation is less than the values in Table 3.2, page 124, do **NOT** add shims.

---

**Installing Reel Lift Cylinders: Left Reel**

1. Position sling (A) around the reel tube—close to the outboard end of reel—and attach sling to a forklift (or equivalent).
2. **Standard reel arms**: Remove top bolts (A) on reel arm support (B) and anti-rotation brace at left end of reel.

**Short reel arms**: Remove bolts (A) on reel arm support (B), and anti-rotation brace at left end of reel.

**NOTE:**
Reel removed from the illustration to improve clarity.
3. Raise end of reel with a forklift or crane so the reel lift cylinder can be attached.
4. Retrieve the cylinder wired to reel support arm.
5. Remove pins from lug on endsheet and reel arm.
6. Lift reel so reel lift cylinder mounting holes line up with hole in reel arm (A) and lug on endsheet (B).
7. Secure cylinder to endsheet and reel arm with pins as shown.
   - Insert cotter pin **OUTBOARD** at reel arm (A).
   - Insert cotter pin **INBOARD** at endsheet (B).

8. Remove sling (A) and position it around reel tube near reel center support arm.
9. Lift reel to access the center lift cylinder.
10. Remove shipping wire securing lift cylinder to center reel arm. Remove packing.
11. Remove socket head bolt and nut from cylinder rod end.

12. Attach the rod end of the cylinder to the reel arm with socket head bolt and nut (A). Access hardware through holes in reel arm braces.

13. Torque bolt and nut (A) to 54–61 Nm (40–45 lbf·ft).

14. Remove pin (B) at the barrel end of the cylinder.

15. Adjust reel height so pin can be installed at barrel end of cylinder and mounting structure.

16. Make sure cylinder hose is properly routed.

**IMPORTANT:**

To avoid damaging hoses, ensure hoses are routed in front of the reel prop pin.

*Setting up Left Reel*

1. If not already removed, remove reel anti-rotation strap (A).

2. Rotate reel manually until tine bars with disconnected cam links are accessible.

3. Install bolt (C) in link, and position shim (D) on bolt so shim is between link (B) and tine bar crank (A).

**NOTE:**

Bolts are pre-coated with Loctite®; no further locking method is required.

4. Realign link (B) and tine bar crank (A), and thread in the bolt (C).

5. Torque bolt to 165 Nm (120 lbf·ft).
Installing Right Reel

1. Remove reel driveshield (A) at center of header.

2. Check distance (X) between cam track (A) and hub face (B) at right side of header. If distance is less than 59.0 mm (2.32 in.), add shims provided in the hardware bag labelled B until distance is achieved.

**NOTE:**
Shims are 1.0–1.2 mm (0.040–0.047 in.) thick.

**EXAMPLE:**
If distance (X) is 57.0 mm (2.24 in.), calculate the number of shims required as follows:

\[
59.0 \text{ (2.32)} - 57.0 \text{ (2.24)} = 2.0 \text{ (0.08)} / 1.0 \text{ (0.04)} = 2
\]

Two shims are required.

3. Remove protective coating from shafts at both ends of reel tube.
4. Position sling around right reel tube at approximately the center disc and attach to a forklift (or equivalent).

5. Ensure bolt (A) at right reel arm pivot is loose.

6. Carefully position reel in header. At right arm, line up shaft on reel arm with hole in reel tube until it engages reel tube slightly.

7. Insert shims (A) (as determined in Step 2, page 129) at cam end of the right reel, and fully engage reel tube onto shaft. Shims are supplied in hardware bag B.
8. Secure reel at right arm with four 1/2 x 1-1/4 in. long hex bolts (A) and lock washers from hardware bag B. Apply medium-strength threadlocker (Loctite® 243 or equivalent) onto bolt before assembly. Torque bolts to 108 Nm (80 lbf-ft).

9. Position the tail end of right reel (A) against the U-joint flange of left reel (B).

10. Engage reel stub shaft (C) into U-joint flange hole (D).

11. Rotate reel so tine tubes are either aligned or staggered relative to the existing reel. Align holes (E) in U-joint flange with holes in center tube at either position.

**NOTE:**
Staggering tine tubes balances the load on reel and reel drive, especially in heavy crops.

12. Install four 1/2 x 1-1/4 in. long hex bolts with lock washers (A) (from the hardware bag labelled B) to connect reel to the U-joint. Apply medium-strength threadlocker (Loctite® 243 or equivalent) to bolt before assembly. Torque bolts to 108 Nm (80 lbf-ft).

13. Remove sling from reel.
14. Reinstall reel drive cover (A) at the center of header.

15. Tighten nut (A) at right reel arm pivot until threads run out, or when nut contacts reel arm.

16. Manually rotate reel one revolution to check clearance of control linkages to cam edge. The gap between the cam edge (A) and the linkage (B) should be 5 mm (1/4 in.) nominal with a minimum gap of 0.25 mm (0.010 in.).

**IMPORTANT:**
If reel locks up at a certain position, the cam linkage may have been attached to the reel disc at the wrong location. Refer to Step 3, page 128 for proper linkage attachment points on disc.

17. If linkages bind on cam, realign the cam track. Refer to Checking Cam Track Alignment, page 124.

18. Proceed to 3.4 Attaching Reel Height Sensor, page 133.
3.4 Attaching Reel Height Sensor

The reel height sensor linkage (located toward the back of the right reel arm) is disconnected to prevent shipping damage. Reconnect the sensor using the following procedure:

1. Remove the shipping wire from sensor (A).

Figure 3.284: Reel Height Sensor – Disconnected
Figure 3.285: Sensor Arm/Pointer Configurations

A - Case/New Holland Configuration  
B - John Deere/CLAAS/AGCO IDEAL™ Configuration  
C - Sensor Arm (Shown Semitransparent)  
D - Sensor Pointer (Shown Under Sensor Arm)

NOTE:

- For configuration (A), pointer (D) points to the **FRONT** of the header.
- For configuration (B), pointer (D) points to the **REAR** of the header.
- Sensor arm made semitransparent to show sensor pointer behind it.

2. Check that sensor arm (C) and pointer (D) are configured properly for your combine. For instructions, refer to Figure 3.285, page 134.
3. Attach reel height sensor plate (A) to reel arm with existing bolts and nuts (B). Torque to 8.2 Nm (6 lbf·ft).

4. Proceed to 3.5 Installing Reel Endshields, page 136.
3.5 Installing Reel Endshields

Endshields are installed at the reel outboard disc locations on single- and double-reel headers.

1. Retrieve hardware bag E previously removed from cutterbar.

2. **For non-split-frame headers**: retrieve endshield segments that are strapped to reel tube.

3. **For split-frame headers**: retrieve endshield segments that are strapped to center draper track.

**NOTE:**

The endshields are preassembled, except for one segment, to allow installation onto the outboard end disc.

4. Engage endshield support tabs (A) into slots (B) on first segment, and secure with 3/8 x 3/4 in. long Torx® bolt (C) and smooth face lock nut (D). Do **NOT** tighten.

5. Engage tabs of second endshield support into slots at opposite end of first segment.

6. Position second segment in front of first segment, engage endshield support tabs through both segments, and secure with 3/8 x 3/4 in. long Torx® bolt and smooth face lock nut. Do **NOT** tighten.
7. Repeat Step 5, page 136 and Step 6, page 136 for remaining segments leaving last segment uninstalled.

8. Position partially assembled endshield onto reel.

9. Remove two 3/8 x 3/4 in. long Torx® bolts (A) and retain for reinstallation.

10. Position last segment over segment (A) and under first segment (B).

   **NOTE:**
   If necessary, loosen hardware and use a pry tool to secure last segment in place.

11. Engage endshield support tabs through segments, and reinstall two 3/8 x 3/4 in. long Torx® bolts (C) removed in Step 9, page 137.
12. Rotate reel manually to access endshield support installation locations (A).

**NOTE:**
Reel endshields are not shown for clarity.


**NOTE:**
Not all tine tubes shown in illustration.
14. Ensure that clearance (A) between tine tubes and endshield supports is maintained.

**NOTE:**
Reel endshields not shown in illustration for clarity.

15. Install endshield supports onto reel disc using existing 1/2 x 1.0 in. long Torx® head screws (A) and lock nuts. Do NOT tighten.

**NOTE:**
If necessary, remove existing bolts and reinstall with endshield supports.

16. Recheck clearance between tine tubes (A) and endshield supports (B), and adjust if necessary.

17. Tighten all hardware.

**IMPORTANT:**
Use locking jam nuts or use medium-strength threadlocker (Loctite® 243 or equivalent).

18. Torque to 27 Nm (20 lbf-ft).

19. Retighten endshield support bolts if necessary.
3.6 Installing Guards – Single Reel

**Double-Reel Headers:** Proceed to *4 Loading Header for Transport to Dealership, page 143.*

**Single-Reel Headers:** Choose between the following procedures for installing cutterbar components at the center shipping beam location, depending on whether the header has formed hold-downs (A) or forged hold-downs (B).

![Figure 3.299: Knife Hold-Downs](image)

3.6.1 Installing Formed Hold-Down Clips

1. If equipped, position cutterbar wearplate (A) on the cutterbar and install with two 7/16 in. x 1-1/2 in. long carriage bolts (B).

![Figure 3.300: Cutterbar Wearplate](image)
2. Place hold-down clip (A) on cutterbar as shown and secure with existing nuts (B). Adjuster bolt (C) should **NOT** require adjusting.

**NOTE:**
Cutterbar wearplates should be installed with special bolts (D) as shown.

3. Repeat the previous steps for the second (adjacent) location.

4. Torque nuts (B) to 88 Nm (65 lbf-ft).

5. Check and adjust the clearance between the hold-down clips and the knife. For instructions, refer to *8.7 Checking Knife Hold-Downs, page 266*.

If the header is to be assembled at one location and then transported to a MacDon dealership, proceed to *4 Loading Header for Transport to Dealership, page 143*.

If the header is being assembled at the MacDon dealership, proceed to *5.6 Removing the Remaining Shipping Supports, page 163*. 
3.6.2 Forged Hold-Down – Stub Guard Only

1. If equipped, position cutterbar wearplate (A) on the cutterbar and install with two 7/16 in. x 1-1/2 in. long carriage bolts (B).

2. Place adjuster plate (D) and hold-down (A) on cutterbar as shown and secure with 7/16 in. hex nuts (B). Adjuster bolt (C) should NOT require adjusting.

3. Repeat the previous steps for the second (adjacent) location.

4. Torque nuts to 72 Nm (53 lbf-ft).

If the header is to be assembled at one location and then transported to a MacDon dealership, proceed to 4 Loading Header for Transport to Dealership, page 143.

If the header is being assembled at the MacDon dealership, proceed to 5.6 Removing the Remaining Shipping Supports, page 163.
Chapter 4:  Loading Header for Transport to Dealership

The following procedures are recommended for loading the header onto a flat deck, transporting it to a MacDon Dealership, and unloading it for final setup and predelivery inspection.

- 4.1 Loading with One Forklift: Upright Position, page 143
- 4.2 Loading with One Forklift: Lowered Position, page 147
- 4.3 Loading with Two Forklifts, page 149
- 4.4 Loading with a Crane, page 152

4.1 Loading with One Forklift: Upright Position

Use this procedure to place a header in the upright position and load it onto a flat deck trailer.

⚠️ CAUTION

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

For minimum lifting equipment requirements, refer to 12.3 Lifting Equipment Requirements, page 515.

Raising the header to upright position

1. Attach chain to shipping support (A) at the center reel arm.

Figure 4.1: Center Support
2. Drive lifting vehicle forward **SLOWLY** while lifting the forks to raise header to the upright position.

![Figure 4.2: Raising the Header](image)
3. Approach header and line up forks (A) with fork slider channels (B).

**NOTE:**
When possible, approach header from the underside to minimize potential for damage to the unit.

4. Slide forks (A) in as far as possible.

**IMPORTANT:**
Avoid damage to gearbox (A) when setting the unit down.

5. Approach the trailer slowly, and raise the forklift until the header clears the trailer deck by 102–204 mm (4–8 in.).

6. Lower the header onto the trailer deck, and back the forklift away slowly.
7. Secure the header with hauler’s tie-down straps (A) and chains (B).

**NOTE:**
To avoid severe damage to the header, route the tie-down straps under the reel tube. Ensure straps clear the reel tine tubes.

Figure 4.6: Header on Flat Deck Trailer
4.2 Loading with One Forklift: Lowered Position

**WARNING**

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

For minimum lifting equipment requirements, refer to 12.3 Lifting Equipment Requirements, page 515.

**IMPORTANT:**

To improve forklift load stability and prevent damage to the header/float module, lift the header in the upright position using the fork slider channels (refer to 4.1 Loading with One Forklift: Upright Position, page 143). If you must lift the header from the lowered position, proceed cautiously to avoid damaging or scratching the header/float module.

1. Move trailer into position, block trailer wheels, and lower trailer storage stands.
2. Approach header from the back and slide forks underneath float module lower beam structure (A) as far as possible.
3. Slowly raise forklift to about 150 mm (6 in.) off the ground.
4. Raise header stand (B) by pulling pin (A), raising stand, and releasing pin to secure stand in place.

**NOTE:**

The header stand is used to support the header off the ground and should be in the raised position when transporting the header on a flat deck.
5. Maintain adequate clearance between the header and the flat deck when lifting header onto, or off of, the flat deck.
6. Approach trailer slowly and raise forklift until header clears trailer deck by 102–204 mm (4–8 in.).
7. Load header onto trailer. Place wooden blocks under cutterbar and float module frame as required to stabilize header.

8. Back up slowly and move forklift away from flat deck.

9. Secure with hauler’s tie-down straps and chains.

   **IMPORTANT:**
   Route tie-down straps (A) under the reel tube to avoid severely damaging reel tube. Ensure strap clears reel tine tubes.
4.3 Loading with Two Forklifts

⚠️ WARNING

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

For minimum lifting equipment requirements, refer to 12.3 Lifting Equipment Requirements, page 515.

**IMPORTANT:**

To improve forklift load stability and prevent damage to the header/float module, lift the header in the upright position using the fork slider channels (refer to 4.1 Loading with One Forklift: Upright Position, page 143). If you must lift the header from the lowered position, proceed cautiously to avoid damaging or scratching the header/float module.

1. Position forklifts at front (A) and back (B) of the header.

2. With one forklift, position forklift forks (A) underneath the lower beam structure.
3. With the second forklift, position forks underneath cutterbar (A).
4. Slowly raise header about 150 mm (6 in.) off the ground.

5. Raise header stand (B) by pulling pin (A), raising stand, and releasing pin to secure stand in place.

**NOTE:**
The header stand is used to support the header off the ground and should be in the raised position when transporting the header on a flat deck.

6. Slowly raise both forklifts until header clears trailer deck by 102–204 mm (4–8 in.).
7. Slowly back truck deck under header.
8. Place wooden blocks under cutterbar and float module frame as required to stabilize header.
10. Slowly back forklifts away from deck.
11. Secure with hauler’s tie-down straps (A) and chains.

**IMPORTANT:**
Route tie-down straps under the reel tube to avoid severely damaging reel tube. Ensure strap clears reel tine tubes.

Figure 4.16: Header on Flat Deck
4.4 Loading with a Crane

⚠️ WARNING

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

For minimum lifting equipment requirements, refer to 12.3 Lifting Equipment Requirements, page 515.

1. Attach a chain to hook at header center-link (A).
   **IMPORTANT:**
   Recommended length of each chain is 1 m (39 in.).

2. Attach another chain through lifting bracket (B) at front of header.

3. Attach loop end of each chain to crane hook.

4. Lift header and load onto flat deck truck.

5. Place wooden blocks under cutterbar and float module frame as required to stabilize header.

6. Secure with hauler’s tie-down straps (A) and chains.
   **IMPORTANT:**
   Route tie-down straps under the reel tube to avoid severely damaging reel tube. Ensure strap clears reel tine tubes.

---

**Figure 4.17: Lifting Chain Locations**

**Figure 4.18: Header on Flat Deck**
Chapter 5: Unloading Header at Dealer

The following procedures are recommended for unloading the header from a flat-deck trailer and preparing it for final setup and predelivery inspection.

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

- 5.1 Unloading with One Forklift: Upright Position, page 153
- 5.2 Unloading with One Forklift: Lowered Position, page 157
- 5.3 Unloading with Two Forklifts, page 159
- 5.4 Unloading with a Crane, page 161
- 5.5 Unloading with a Combine, page 162

5.1 Unloading with One Forklift: Upright Position

Use this procedure to unload a header in the upright position from a flat deck trailer.

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

For minimum lifting equipment requirements, refer to 12.3 Lifting Equipment Requirements, page 515.

1. Approach header and line up forks (A) with the fork slider channels (B).
   
   IMPORTANT:
   When possible, approach header from the underside to minimize potential for damage to the unit.

2. Slide forks (A) in as far as possible.
3. Remove hauler’s tie-down straps (A) and chains (B).
4. Slowly raise the header off the trailer.
5. Back up until the unit clears trailer and slowly lower to 150 mm (6 in.) from the ground.

6. Move the header to the storage or setup area. Ensure the ground is flat and free of rocks or debris that could damage the header.

   IMPORTANT:
   Avoid damage to gearbox (A) when setting the unit down.

7. Approach header from the underside with the lifting vehicle.
8. Attach chain to the shipping support (A) at the center reel arm.

   CAUTION
   Stand clear of machine when lowering. The machine may swing or shift suddenly.
9. Drive lifting vehicle backwards **SLOWLY** while lowering the forks, until the header is on the ground.

**Figure 5.5: Lowering the Header**
10. Place 150 mm (6 in.) blocks (A) under each end and at the center of cutterbar, then lower header onto blocks.

11. Proceed to 5.6 Removing the Remaining Shipping Supports, page 163.
5.2 Unloading with One Forklift: Lowered Position

Use this procedure to unload a header in the lowered (working) position from a flat deck trailer.

⚠️ CAUTION

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

For minimum lifting equipment requirements, refer to 12.3 Lifting Equipment Requirements, page 515.

1. Move trailer into position, block trailer wheels, and lower trailer storage stands.

2. Approach the header from the back, and slide forks underneath the float module lower beam structure (A) as far as possible.

3. Remove the hauler’s tie-down straps and chains.

   IMPORTANT:
   Ensure that forks extend beyond the cutterbar prior to lifting the header. If the forks do NOT lift at the cutterbar, damage to the header may occur.

⚠️ WARNING

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

4. Raise header off deck.

5. Back up until the unit clears the trailer and slowly lower to 150 mm (6 in.) above ground.

6. Take the machine to the storage or setup area.
7. Lower header stand (B) by pulling pin (A), lowering stand, and releasing pin to secure stand in place.

8. Place 150 mm (6 in.) blocks under each end of cutterbar.

   **NOTE:**
   If ground is soft, place a block under the stand.

9. Lower header onto blocks.

10. Check for shipping damage and missing parts.

11. Proceed to 5.6 Removing the Remaining Shipping Supports, page 163.
5.3 Unloading with Two Forklifts

**WARNING**

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

For minimum lifting equipment requirements, refer to [12.3 Lifting Equipment Requirements, page 515](#).

1. Position trailer to provide access by forklifts on both sides.
2. Approach header from both sides.

3. With one forklift, position forks underneath float module’s lower beam structure (A).

4. With the second forklift, position forks under cutterbar (A).
5. Remove hauler’s tie-down straps and chains.

6. Slowly raise both forklifts until header clears the trailer deck by 102–204 mm (4–8 in.).

7. Slowly drive truck forward until trailer is clear of header.

8. Place 150 mm (6 in.) blocks under each end of cutterbar.

9. Lower header onto blocks.

10. Slowly back forklifts away from header.

11. Check for shipping damage and missing parts.

12. Lower header stand (B) by pulling pin (A), lowering the stand, and releasing the pin to secure the stand in place.

13. Place 150 mm (6 in.) blocks under each end of cutterbar.

14. Lower header onto blocks and header stand.

**NOTE:**
If ground is soft, place a block under the stand.

15. Slowly back forklifts away from header.

16. Check for shipping damage and missing parts.

17. Proceed to 5.6 Removing the Remaining Shipping Supports, page 163.
5.4 Unloading with a Crane

Use this procedure for unloading a header shipped in the lowered position.

⚠️ CAUTION

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

For minimum lifting equipment requirements, refer to 12.3 Lifting Equipment Requirements, page 515.

Refer to 4.4 Loading with a Crane, page 152 for procedures to attach header to a crane, then proceed as follows:

1. Remove hauler’s tie-down straps and chains.
2. Slowly raise crane until header clears trailer deck by 102–204 mm (4–8 in.).
3. Place 150 mm (6 in.) blocks under each end of cutterbar.
4. Lower header onto blocks.
5. Unhook lifting chains at locations (A) and (B) from header.
6. Check for shipping damage and missing parts.
5.5 Unloading with a Combine

Use this procedure to unload a header, shipped in the lowered position, with a combine.

This method assumes that the header was shipped with a fully-assembled float module and the shipping stands and materials have been removed. For instructions, refer to 3 Assembling the Header and Float Module, page 21.

Ensure the correct combine float module configuration is installed and the appropriate combine is used to pick up the header.

NOTE:
A maximum difference of 914 mm (36 in.) (dimension [X] in illustration below) in elevation between a standard or drop-deck truck flatbed and the combine is required for the combine to lift the header off the truck (i.e., using a loading ramp). This may vary with combine make and model.

1. Park truck next to, and at 90° to, the ramp, and with rear of header on the ramp side. Align header pickup points with center of ramp.
2. Lower trailer storage stands.
3. Remove hauler’s tie-down straps and chains.
4. Drive combine onto ramp and approach header.
   NOTE:
   If a suitable ramp is not available, a ditch or other ground contour can provide the required difference in elevation.
5. Pick up header. For instructions, refer to 7 Attaching Header to Combine, page 205.
   NOTE:
   The hydraulic, electrical, and driveline connections are not required to unload the header.
6. Raise header off the flat deck and back combine away.
7. Take machine to storage or setup area.
8. Place 150 mm (6 in.) blocks under each end of cutterbar.
9. Lower header onto blocks.
10. Detach header from combine. For instructions, refer to the combine operator’s manual.
11. Check for shipping damage and missing parts.
12. Proceed to 5.6 Removing the Remaining Shipping Supports, page 163.
5.6 Removing the Remaining Shipping Supports

If the header was transported to a Dealer after assembly, follow this procedure from the beginning and remove the fork slider channels, shipping guards, and stands. If these shipping materials were already removed, proceed to Step 13, page 166.

1. Remove two bolts (A) securing right fork channel (B) to shipping stand (C).

   **NOTE:**
   To access the bolts at the lower stand support, the header must be supported on 150 mm (6 in.) blocks, as directed in Step 5, page 18.

2. Remove two bolts (D) securing fork channel (B) to lower brace (E).

3. Repeat the steps above for the left side.

4. Remove lower brace (A).
5. From the upper brace, remove two bolts (A). Repeat for the opposite side.

6. Remove right and left fork channels (A).

7. Remove upper brace (B).
8. Remove four bolts (A) and remove shipping stands (B) from the bottom of the float module.

9. Remove two bolts (A) securing bottom of coupler cover (B) to the float module.

**IMPORTANT:**
Do **NOT** remove bolts (C) because they hold multicoupler components in place. Loosen bolts (C) only enough so that coupler cover (B) can be removed, and then make sure you retighten the bolts.

10. Loosen two bolts (C), slide coupler cover to the left until cutouts are aligned with bolts, and then remove coupler cover.

11. Tighten two bolts (C).

12. Remove four bolts (A) and two bolts (B) from the shipping stands at both outboard header legs. Remove stands.
13. Remove two bolts (A) at the base of center reel arm shipping support (B) so that plate drops free.

14. Remove bolt (C) at the top of support and slide lower support off cutterbar. Do **NOT** remove brace on reel arm.

15. Support float module with forklift.
16. Remove two braces (A) securing float module to header.
17. Remove bolt and nut (B) securing brace to backtube.
18. Remove cotter pins from pin (C) attaching center-link and shipping braces to header. Do NOT remove pin.
19. Loosen bolt (D) in lifting bracket (E) and remove it.
20. Slip lifting bracket off pin.
21. Slip brace (F) off pin. Reinstall cotter pins.
22. Remove nuts at lifting angle locations and remove angles (A).

23. Retrieve hold-down parts and hardware from bag attached to cutterbar and proceed to the appropriate step for your equipment:
   - For double-reel headers with formed hold-downs, refer to Step 24, page 168.
   - For double-reel headers with forged hold-downs, refer to Step 25, page 168.

**Double-reel headers**

24. Install formed hold-downs as follows:
   a. Position cutterbar wearplates on cutterbar and install with 7/16 x 2-1/2 in. long carriage bolts (not shown).
   b. Place hold-down (A) on cutterbar as shown and secure with existing nuts (B). Adjuster bolt (C) should **NOT** require adjusting.
   c. Torque nuts to 72 Nm (53 lbf·ft).

**Double-reel headers**

25. Install forged hold-downs (stub guard only) as follows:
   a. Position cutterbar wearplates on cutterbar and install with 7/16 in. x 2-1/2 in. long carriage bolts (not shown).
   b. Place adjuster plate (D) and hold-down (A) on cutterbar as shown and secure with 7/16 in. hex nuts (B). Adjuster bolt (C) should **NOT** require adjusting.
   c. Torque nuts to 72 Nm (53 lbf·ft).
**CAUTION**

The reel fore-aft hydraulic cylinders must be connected to the reel prior to removing the fore-aft supports and shipping bolts (A). Failure to do so may result in the reel sliding fully forward when the supports are removed.
5.7 Repositioning Gearbox

1. Remove shipping wire and wrapping on brace (A) and swing the brace clear of gearbox.

2. Loosen nut (A) and move bolt out of shipping position slot.

3. Rotate gearbox and insert bolt into working position slot (A). Tighten nut.

4. Tighten suction hose clamp (B) to 6.4–7.0 Nm (57–62 lbf-in).

   **NOTE:**
   Hose clamps should be readjusted after running with hot oil.

5. Remove bolt and nut from bracket on gearbox.
6. Position brace (A) inside bracket (B). Reinstall bolt and nut (C).

Figure 5.35: Brace Position
5.8 Installing Driveline

⚠️ CAUTION

To prevent injury to the installer and damage to the driveline, hold the driveline so that it doesn’t fall to the floor or ground.

NOTE:

Case New Holland drivelines are stored in a lower position on the float module. If installing a Case New Holland driveline, proceed to Step 2, page 172.

1. Position driveline storage support (A) onto the left frame of the float module. Secure in place with two M10 carriage bolts and hex flange nuts (B).

![Figure 5.36: Driveline Support](image)

2. **Case New Holland only:** Position driveline storage support (A) onto left side of bracket (B) as shown. Secure in place with two M12 hex head bolts (C) and hex flange nuts.

   **NOTE:**
   
   The support for 21-tooth spline drivelines is shown in the illustration at right. The support for 6-tooth spline drivelines is similar.

![Figure 5.37: Driveline Support – Case New Holland](image)
3. At gearbox end, remove driveline shield (A) by loosening nuts (B).

4. Position the driveline quick disconnect onto the float module gearbox shaft, pull back the collar, and slide onto the shaft until the yoke locks on to the shaft. Release the collar.

   **NOTE:**
   The arrow on the driveline sticker should point toward the combine.

5. Position shield (A) on the gearbox and secure with bolts (B).

6. Attach driveline chain (C) to existing chain on shield (A).

7. Position the combine end of driveline (A) onto storage support (B), pull back the collar, and slide onto the shaft until the yoke locks on to the shaft. Release the collar.

8. Secure loose end of driveline chain (C) to driveline storage support (B).
Chapter 6:  Float Module Setup at Dealer

Complete the following procedures in the order in which they are listed:

- 6.1 Installing Filler Cap, page 175
- 6.2 FM100 Feed Auger Configurations, page 178
- 6.3 FM100 Stripper Bars and Feed Deflectors, page 202

6.1 Installing Filler Cap

1. Remove filler cap from bag (A).

⚠️ CAUTION

Fluid may be under pressure. Allow pressure to equalize by loosening screws and lifting the shipping cover slightly.

2. Remove yellow shipping cover (A) from the float module frame. Discard cover. Keep screws if screws are not supplied with filler cap.
3. Remove top gasket (A) for use in the next step.

**NOTE:**
There are two gaskets—one on each side of the filler strainer flange.

4. Place gasket (A) (removed from the top of the filler strainer) onto filler cap neck (B) and align holes.

5. Install #10-32 screws (if supplied with cap, otherwise use existing screws) into filler cap neck (B) and push screws through gasket (A).

6. Place filler cap neck (A) (complete with screws) over opening and ensure the machine screws are aligned with the threaded holes.

7. Carefully thread in the machine screws using a cross pattern (as shown) in order to prevent cross threading of tapped holes.

8. Repeat pattern to gradually tighten screws to 3.5 Nm (31 lbf-in).
9. Install filler cap (A).

Figure 6.6: Filler Cap
6.2 FM100 Feed Auger Configurations

The FM100 feed auger can be configured to suit various crop conditions; there are five configurations available.

**NOTE:**

Dimensions (A) and (B) are the same for both ends of the auger. They should be within 15 mm (9/16 in.) of the numbers given.

**Narrow configuration** is a standard configuration for the following combines:

- AGCO IDEAL™ Series
- Gleaner R6/75, R6/76, S6/77, S6/7/88, S96/7/8
- New Holland CR 920/940/960, 9020/40/60/65, 6090/7090, 8060/8070/8080

Narrow configuration uses 4 long bolt-on flightings (2 on the left and 2 on the right) and 18 feed auger fingers are recommended.

To convert to Narrow configuration from Medium or Wide configuration, refer to 6.2.3 Converting from Medium Configuration or Wide Configuration to Narrow Configuration, page 185.

To convert to Narrow configuration from Ultra Narrow configuration, refer to 6.2.4 Converting from Ultra Narrow Configuration to Narrow Configuration, page 187.

**NOTE:**

Dimensions (A) and (B) are the same for both ends of the auger. They should be within 15 mm (9/16 in.) of the numbers given.

**Medium configuration** is a standard configuration for the following combines:

- Case IH 2300/2500 Series
- John Deere 95/96/97/9860, 95/96/97/9870, 565/66/67/68/690, T670, 576/76/77/78/790
- Massey Ferguson 96/97/9895, 9520/40/60, 9545/65, 9380
- New Holland CR 970/980, 9070/9080, 8090/9090, X.90, X.80, 10.80/10.90
- New Holland CX 8X0, 80X0, 8.X0, 8080/8090
- Rostselmash Torum 760/780
- Versatile RT490

**Medium configuration** is an optional configuration for AGCO IDEAL™ Series.

Medium configuration uses 4 short bolt-on flightings (2 on the left and 2 on the right) and 22 feed auger fingers are recommended.
To convert to Medium configuration from Narrow or Ultra Narrow configuration, refer to 6.2.1 Converting from Ultra Narrow Configuration or Narrow Configuration to Medium Configuration, page 181.

To convert to Medium configuration from Wide configuration, refer to 6.2.2 Converting from Wide Configuration to Medium Configuration, page 183.

NOTE:
Dimensions (A) and (B) are the same for both ends of the auger. They should be within 15 mm (9/16 in.) of the numbers given.

Wide configuration is an optional configuration for the following combines:

- Challenger 670B/680B, 540C/560C, 540E/560E
- CLAAS 590R/595R, 660/670, 760/770/780, 8000
- John Deere T670
- Massey Ferguson 9895, 9540, 9560, 9545, 9565, 9380
- New Holland CX 8X0, 80X0, 8.X0

Wide configuration uses 2 short bolt-on flightings (1 on the left and 1 on the right) and 30 feed auger fingers are recommended.

NOTE:
This configuration may increase combine capacity on wide feeder house combines in certain crop conditions.

To convert to Wide configuration from Medium configuration, refer to 6.2.5 Converting from Medium Configuration to Wide Configuration or Ultra Wide Configuration, page 188.

To convert to Wide configuration from Ultra Narrow or Narrow configuration, refer to 6.2.6 Converting from Ultra Narrow or Narrow Configuration to Wide or Ultra Wide Configuration, page 190.

NOTE:
Dimensions (A) and (B) are the same for both ends of the auger. They should be within 15 mm (9/16 in.) of the numbers given.

Ultra Narrow configuration is an optional configuration that may improve feeding performance on combines with narrow feeder houses. It may also be helpful when harvesting rice.

Ultra Narrow configuration uses 8 long bolt-on flightings (4 on the left and 4 on the right) and 18 auger fingers are recommended.

NOTE:
You will need to drill holes in the flighting and in the drum to install the extra flighting.

To convert to Ultra Narrow configuration from Medium or Wide configuration, refer to 6.2.8 Converting from Medium Configuration or Wide Configuration to Ultra Narrow Configuration, page 192.

To convert to Ultra Narrow configuration from Narrow configuration, refer to 6.2.9 Converting from Narrow Configuration to Ultra Narrow Configuration, page 196.
**Ultra Wide configuration** is an optional configuration for the following combines:

- CLAAS 590R/595R, 660/670, 760/770/780/7000/8000

The Ultra Wide configuration uses no bolt on flighting; only the factory-welded flighting (A) is responsible for conveying the crop.

**NOTE:**
This configuration may improve feeding for wide feeder house combines.

A total of 30 auger fingers are recommended for this configuration.

![Figure 6.11: Ultra Wide Configuration – Rear View](image)

To convert to **Ultra Wide configuration from Medium configuration**, refer to [6.2.5 Converting from Medium Configuration to Wide Configuration or Ultra Wide Configuration, page 188](#).

To convert to **Ultra Wide configuration from Ultra Narrow or Narrow configuration**, refer to [6.2.6 Converting from Ultra Narrow or Narrow Configuration to Wide or Ultra Wide Configuration, page 190](#).

To convert to **Ultra Wide configuration from Wide configuration**, refer to [6.2.7 Converting from Wide Configuration to Ultra Wide Configuration, page 192](#).
6.2.1 Converting from Ultra Narrow Configuration or Narrow Configuration to Medium Configuration

Two flighting kits (MD #287031) are required to convert to this configuration.

Ultra Narrow, Narrow, and Medium auger configurations are shown at right. When converting from Ultra Narrow configuration or Narrow configuration to Medium configuration, you will need to replace long flightings (A) with short flightings (B).

NOTE:
Some parts have been removed from the illustrations for clarity.

1. To improve access and ease installation, remove the float module from the combine. For instructions, refer to the header operator’s manual or technical manual.

2. Remove bolts (A) and access cover (B) from each side of the auger. Retain for reassembly.

   NOTE:
   If necessary, remove multiple access covers.

3. Remove hardware (C) and bolt-on flighting (D). Repeat for all the remaining hardware and bolt-on flightings on the auger. Retain hardware to attach new flightings.
4. On both sides of the auger, remove M6 bolt (A), tee nut (not illustrated), and flighting slot plug (B) from inside the feed auger. Retain parts for installation.

5. Install two bolt-on flightings (A) on the right side of the auger as shown, and secure each flighting with six retained carriage head bolts and nuts at locations (B).

**IMPORTANT:**
Flighting bolt heads must be installed on the inside of the auger to prevent damaging internal components.

**NOTE:**
Flighting performs best when no gaps are present. If desired, use silicone sealant to fill the gaps.

6. Torque all nuts and bolts to 47 Nm (35 lbf·ft) to eliminate deflection on flighting, then torque them to 58–64 Nm (43–47 lbf·ft).

7. Install two bolt-on flightings (A) on the left side of the auger as shown, and secure each flighting with six retained carriage head bolts and nuts at locations (B).

**IMPORTANT:**
Flighting bolt heads must be installed on the inside of the auger to prevent damaging internal components.

**NOTE:**
Flighting performs best when no gaps are present. If desired, use silicone sealant to fill the gaps.

8. Torque all nuts and bolts to 47 Nm (35 lbf·ft) to eliminate deflection on flighting, then torque them to 58–64 Nm (43–47 lbf·ft).
9. Removing the long flightings left empty flighting slots in the auger that were not needed to install the new shorter flightings. Use access hole (A) to position a flighting slot plug (B) from inside the feed auger in each empty slot and secure with a 20 mm long M6 hex head bolt (C) and tee nut. Use plugs and hardware retained from a previous step.

10. Install additional auger fingers. A total of 22 auger fingers is recommended for this configuration. For instructions, refer to 6.2.10 Installing Feed Auger Fingers, page 198.

### 6.2.2 Converting from Wide Configuration to Medium Configuration

One flighting kit (MD #287031) is required to convert the feed auger from Wide configuration to Medium configuration.

Wide and Medium auger configurations are shown at right. When converting from Wide configuration to Medium configuration, you will need to install new flightings (A).

1. Improve access and ease installation by removing the float module from the combine. For instructions, refer to the header operator’s manual or technical manual.
2. Remove bolts (A) and remove access cover (B) from the right side of the auger. Retain for reassembly.

   **NOTE:**
   If necessary, remove multiple access covers.

3. Remove and discard two flighting slot plugs (C) from the right side of the auger.

4. Install bolt-on flighting (A) on the right side of the auger as shown, and secure with six carriage head bolts and six nuts at locations (B).

   **IMPORTANT:**
   Bolt heads must be installed on the inside of the auger to prevent damaging internal components.

   **NOTE:**
   Flighting performs best when no gaps are present. If desired, use silicone sealant to fill the gaps.

5. Torque all nuts and bolts to 47 Nm (35 lbf-ft) to eliminate deflection on flighting, then torque them to 58–64 Nm (43–47 lbf-ft).

6. Repeat Step 2, page 184 and Step 3, page 184 at the left side of auger.

7. Install bolt-on flighting (A) on the left side of the auger as shown, and secure with six carriage head bolts and six nuts at locations (B).

   **IMPORTANT:**
   Bolt heads must be installed on the inside of the auger to prevent damaging internal components.

   **NOTE:**
   Flighting performs best when no gaps are present. If desired, use silicone sealant to fill the gaps.

8. Torque all nuts and bolts (B) to 47 Nm (35 lbf-ft) to eliminate deflection on flighting, then torque them to 58–64 Nm (43–47 lbf-ft).

9. Remove extra auger fingers. A total of 22 fingers are recommended for this configuration. For instructions, refer to 6.2.11 Removing Feed Auger Fingers, page 200.
6.2.3 Converting from Medium Configuration or Wide Configuration to Narrow Configuration

Two flighting kits (MD #287032 or B6400) are required to convert to this configuration. Extra hardware is included in these kits. Be sure to use the correct hardware in the correct location to prevent damage and to maximize performance.

Medium, Wide, and Narrow auger configurations are shown at right. When converting from Medium or Wide configuration to Narrow configuration, you will need to replace existing flightings (A) with flightings (B).

NOTE:
Flighting performs best when no gaps are present. If desired, use silicone sealant to fill the gaps.

NOTE:
All illustrations show the feed auger separated from the float module for clarity. The procedure can be performed with the feed auger installed in the float module.

1. To improve access and ease installation, remove float module from combine. For instructions, refer to the header operator’s manual or technical manual.

2. Remove bolts (A) and access cover (B) from the right side of the auger. Retain for reassembly.

3. Remove hardware (C) and bolt-on flighting (D) from the auger.

4. Remove and discard flighting slot plug (E) located close to the end of flighting (D).

5. Converting from Medium configuration: Repeat above steps for the other flighting on the right side.

Figure 6.22: Auger Configurations – Rear View

1 - Medium Configuration 2 - Wide Configuration 3 - Narrow Configuration

Figure 6.23: Wide Configuration – Right Side

---

1. MD #287032 is available only through MacDon Parts. B6400 is available only through Whole Goods. Both kits contain wear-resistant flightings.
6. **Converting from Wide configuration:** Remove bolts (A), access cover (B), and two flighting slot plugs (C) from the right side of the auger.

7. Repeat Steps 2, page 185 to 6, page 186 at the left side of the feed auger.

8. Install two bolt-on flightings (A) on the right side as shown, and secure each flighting with six carriage head bolts (MD #136178) and nuts (MD #135799) at locations (B).

   **IMPORTANT:**
   Bolt heads must be installed on the inside of the auger to prevent damaging internal components.

9. Torque all nuts and bolts to 47 Nm (35 lbf·ft) to eliminate deflection on flighting, then torque them to 58–64 Nm (43–47 lbf·ft).

10. Install flighting slot plug (MD #213084) at location (C) from inside the auger and secure with an M6 hex head bolt (MD #252703) and tee nut (MD #197263). Repeat for the other flighting mounting locations.

11. Install two bolt-on flightings (A) on the left side as shown, and secure each flighting with six carriage head bolts (MD #136178) and nuts (MD #135799) at locations (B).

   **IMPORTANT:**
   Bolt heads must be installed on the inside of the auger to prevent damaging internal components.

12. Torque all nuts and bolts to 47 Nm (35 lbf·ft) to eliminate deflection on flighting, then torque them to 58–64 Nm (43–47 lbf·ft).

13. Install flighting slot plug (C) (MD #213084) from inside the auger and secure with an M6 hex head bolt (MD #252703) and tee nut (MD #197263). Repeat for the other flighting mounting location used to mount the previous flighting in Step 3, page 185.

14. Remove extra auger fingers. A total of 18 fingers is recommended for this configuration. For instructions, refer to **6.2.11 Removing Feed Auger Fingers, page 200.**
6.2.4 Converting from Ultra Narrow Configuration to Narrow Configuration

The Ultra Narrow and Narrow auger configurations are shown at right. Existing flightings (A) are removed from the auger when converting to the Narrow configuration.

1. Improve access and ease installation by removing the float module from the combine. For instructions, refer to the header operator’s manual or technical manual.

2. Remove bolts (A) and access cover (B). Retain for reassembly.

3. Remove hardware from locations (C), and remove bolt-on flighting (D) from feed auger.

4. Repeat procedure for the remaining three inboard flightings.

5. Install additional auger fingers. A total of 18 fingers is recommended for this configuration. For instructions, refer to 6.2.10 Installing Feed Auger Fingers, page 198.
6.2.5 Converting from Medium Configuration to Wide Configuration or Ultra Wide Configuration

When converting from Medium configuration to Wide configuration, you will need to remove existing flightings (A) from the auger and add auger fingers. When converting from Medium configuration to Ultra Wide configuration, you will need to remove all existing bolt-on flightings (A) from the auger and add auger fingers.

Four flighting plugs (MD #213084), M6 hex head bolts (MD #252703), and M6 tee nuts (MD #197263) are needed to cover exposed flighting mounting holes after the flightings are removed. These parts can be ordered from a MacDon Dealer.

1. Improve access and ease installation by removing the float module from the combine. For instructions, refer to the header operator’s manual or technical manual.

**NOTE:**

Some parts have been removed from the illustrations for clarity.

**To convert from Medium configuration to Wide configuration, follow these steps:**

2. Remove bolts (A) and access cover (B). Retain for reassembly.

3. Remove hardware from locations (C), and remove bolt-on flighting (D) from the feed auger.
4. Install flighting slot plug (A) (MD #213084) in the flighting slot from inside the auger. Secure with M6 hex head bolts (B) (MD #252703) and tee nuts (MD #197263).

5. Repeat above steps at the left side of the auger.

6. Install additional fingers. A total of 30 fingers are recommended for the Wide configuration. For instructions, refer to 6.2.10 Installing Feed Auger Fingers, page 198.

**To convert from Medium configuration to Ultra Wide configuration, follow these steps:**

7. Remove bolts (A) and access cover (B). Retain for reassembly.

8. Remove hardware from locations (C), and remove all bolt-on flightings (D) from the feed auger.

**NOTE:**
Hardware on opposite side of auger indicated, but not shown in illustration.

9. Install flighting slot plug (A) (MD #213084) in the flighting slot from inside the auger. Secure with M6 hex head bolts (B) (MD #252703) and tee nuts (MD #197263).

10. Repeat above steps at the left side of the auger.

11. Install additional fingers. A total of 30 fingers are recommended for the Ultra Wide configuration. For instructions, refer to 6.2.10 Installing Feed Auger Fingers, page 198.
6.2.6 Converting from Ultra Narrow or Narrow Configuration to Wide or Ultra Wide Configuration

One flighting kit (MD #287031) is required to convert to this configuration. Two flighting plugs (MD #213084), two M6 hex head bolts (MD #252703), and two M6 tee nuts (MD #197263) are recommended to close the flighting mounting locations. These parts can be ordered from a MacDon Dealer.

The Narrow, Ultra Narrow, Wide, and Ultra Wide auger configurations are shown at right. When converting from Narrow or Ultra Narrow configuration to Wide configuration, you will need to replace existing bolt-on flightings (A). When converting from Narrow or Ultra Narrow configuration to Ultra Wide configuration, you will be removing all bolt-on flighting.

**NOTE:**
Some parts have been removed from the illustrations for clarity.

1. Improve access and ease installation by removing the float module from the combine. For instructions, refer to the header operator’s manual or technical manual.
2. Remove bolts (A) and access cover (B) from the right side of the auger. Retain for reassembly.
3. Remove hardware (C) and bolt-on flighting (D) from the right side of the auger. If converting to the Wide configuration, discard the removed flighting, but retain hardware to attach the new flighting. If converting to the Ultra Wide configuration, the hardware may be discarded as well.
   
   **NOTE:**
   If converting to Ultra Wide configuration, hardware may be discarded as well.
4. Repeat Step 2, page 190 and Step 3, page 190 for the remaining bolt-on flighting(s) according to whether you are converting to Wide or Ultra Wide configuration.
5. Remove flighting slot plug (A), bolt, and tee nut if converting your auger to the Wide configuration. Retain for reinstallation, and continue to Step 6, page 191. Otherwise, leave plug (A), bolt, and tee nut in place on the auger and continue to Step 10, page 191 to complete the Ultra Wide conversion.

**NOTE:**
Only two flighting slot plugs (A) should be removed—one from each outboard side of the auger.

6. Install new bolt-on flighting (A) using six carriage head bolts and nuts (B) on the right side of the auger.

**IMPORTANT:**
Bolt heads must be installed on the inside of the auger to prevent damaging internal components.

7. Reinstall flighting slot plug (C) previously removed in Step 5, page 191.

8. Install new bolt-on flighting (A) on the left side of the auger using six carriage head bolts and nuts (B).

**IMPORTANT:**
Bolt heads must be installed on the inside of the auger to prevent damaging internal components.

9. Reinstall flighting slot plug (C) previously removed in Step 5, page 191.

10. Install the remaining flighting slot plugs (MD #213084) using the M6 hex head bolts (MD #252703) and tee nuts (MD #197263) in locations previously used to mount removed flighting in Step 3, page 190 and Step 4, page 190.

11. Install additional auger fingers. There should be a total of 30 fingers in this configuration. Auger fingers and all required parts are included in kit. For instructions, refer to 6.2.10 Installing Feed Auger Fingers, page 198.
6.2.7 Converting from Wide Configuration to Ultra Wide Configuration

1. Improve access and ease installation by removing the float module from the combine. For instructions, refer to the header operator’s manual or technical manual.

2. Remove two bolts and access cover (A).

3. Remove hardware (B) and bolt-on flighting (C).

4. Install flighting slot plugs (MD #213084) in the flighting mounting locations (D) and secure with M6 bolts (MD #252703) and tee nuts (MD #197263).

5. Repeat all steps on the left side of the auger.

6. Install additional auger fingers. A total of 30 fingers are recommended for this configuration. For instructions, refer to 6.2.10 Installing Feed Auger Fingers, page 198.

6.2.8 Converting from Medium Configuration or Wide Configuration to Ultra Narrow Configuration

Four flighting kits (MD #287032 or B64002) and some hole-drilling are required to convert to Ultra Narrow configuration. Extra hardware is included in these kits. Be sure to use the correct hardware in the correct location to prevent damage and to maximize performance.

1. Improve access and ease installation by removing the float module from the combine. For instructions, refer to the header operator’s manual or technical manual.

2. Remove bolts (A) and access cover (B) from the right side of the auger. Retain for reassembly.

3. Remove hardware (C) and bolt-on flighting (D) from the auger.

4. Remove flighting slot plug (E) located close to the end of flighting (D).

5. Converting from Medium configuration: Repeat the previous steps for the other bolt-on flighting on the same side.

---

2. MD #287032 is available only through MacDon Parts. B6400 is available only through Whole Goods.
6. **Converting from Wide configuration:** Remove bolts (A), access cover (B), and two flighting slot plugs (C) from the right side of the auger.

7. Repeat Steps 2, page 192 to 6, page 193 at the left side of the auger.

8. Position two bolt-on flightings (A) on the right side, as shown. Temporarily secure flightings with two carriage head bolts and nuts at each location (B).

9. Position another bolt-on flighting (A) outboard of the temporarily installed bolt-on flighting (B). Mark hole locations (C) of the bolt-on flighting onto the temporarily installed bolt-on flighting (B).

10. Remove temporarily installed bolt-on flighting (B) from the auger and drill two 11 mm (7/16 in.) holes at the marked locations.

11. Install bolt-on flighting (B) with newly drilled holes using six carriage head bolts and nuts.

**IMPORTANT:**
Carriage bolt heads must be installed on the inside of the auger to prevent damaging internal components.

12. Repeat Step 9, page 193 to Step 11, page 193 to the remaining bolt-on flighting on the right side of the auger.
13. Position two bolt-on flightings (A) on the left side of the auger as shown. Temporarily secure flightings with two carriage head bolts and nuts at each location (B).

14. Position another bolt-on flighting (A) outboard of the temporarily installed flighting (B). Mark hole locations (C) of the bolt-on flighting onto the temporarily installed bolt-on flighting.

15. Remove temporarily installed bolt-on flighting (B) from the auger and drill two 11 mm (7/16 in.) holes at the marked locations.

16. Install bolt-on flighting (B) with newly drilled holes using six carriage head bolts and nuts.

   IMPORTANT:
   Carriage bolt heads must be installed on the inside of the auger to prevent damaging internal components.

17. Repeat Steps 14, page 194 to 16, page 194 with the remaining bolt-on flighting on the left side of the auger.

18. Place bolt-on flighting (A) outboard of other flighting (B) on the left side of the auger, as shown.

19. Temporarily secure bolt-on flighting (A) with two button head bolts and nuts at location (C).
20. Stretch flighting (A) to fit auger tube as shown. Use slotted holes on flighting to get the best fit around the auger tube.

21. With flighting in the desired position, mark hole locations (A) on auger tube.

22. Remove flighting (B) from auger, and drill 11 mm (7/16 in.) holes at marked locations (A) on auger tube.

23. Remove nearest access cover(s). Retain for reinstallation.

24. Install bolt-on flighting (B) using two button head bolts and nuts at location (C), and four flange head bolts and nuts at locations (A).

**IMPORTANT:**
Ensure bolt heads at location (C) are on the inboard (crop side) and nuts are on the outboard side of the flighting.

25. Repeat Steps 18, page 194 to 24, page 195 for the remaining flighting on the left side of the auger.

26. Place bolt-on flighting (A) outboard of other flighting (B) on the right side of the auger as shown.

27. Temporarily secure bolt-on flighting (A) with two button head bolts and nuts at location (C).

28. Repeat Step 20, page 195 to Step 24, page 195 for both pieces of flighting on the right side of the auger.

29. Install flighting slot plugs (MD #213084) in the flighting mounting locations and secure with M6 bolts and tee nuts.

30. Torque all nuts and bolts to 47 Nm (35 lbf-ft) to eliminate deflection on flighting, then retorque them to 58–64 Nm (43–47 lbf-ft).

**NOTE:**
Flighting performs best when no gaps are present. If desired, use silicone sealant to fill the gaps.

31. Add or remove auger fingers to optimize feeding for your combine and crop conditions. For instructions, refer to 6.2.10 Installing Feed Auger Fingers, page 198 or 6.2.11 Removing Feed Auger Fingers, page 200.

32. If not adding or removing auger fingers, reinstall all access covers and secure with bolts. Coat bolts with medium-strength threadlocker (Loctite® 243 or equivalent) and torque to 9 Nm (80 lbf-in).
6.2.9 Converting from Narrow Configuration to Ultra Narrow Configuration

Two flighting kits (MD #287032 or B6400) and some hole-drilling are required to convert to this configuration. Extra hardware is included in these kits. Be sure to use the correct hardware at the correct location to prevent damage and to maximize performance.

**NOTE:**
Additional holes on the auger are needed before these flightings (A) can be installed.

**NOTE:**
Some parts have been removed from the illustrations for clarity.

---

1. Improve access and ease installation by removing the float module from the combine. For instructions, refer to the header operator’s manual or technical manual.

2. Place new bolt-on flighting (A) outboard of existing flighting (B) on the left side of the auger, as shown.

3. Mark hole locations (C) of new bolt-on flighting (A) onto existing bolt-on flighting (B).

4. Remove nearest access cover to existing bolt-on flighting (B). Retain hardware for reassembly.

5. Remove existing bolt-on flighting (B) from the auger. Retain hardware for reassembly.

6. Drill two 11 mm (7/16 in.) holes at the marked locations of existing bolt-on flighting (B).

7. Reinstall existing bolt-on flighting (B) on the auger.

**NOTE:**
Ensure carriage bolt heads are on the inside of the auger to prevent damage to internal components.

---

3. MD #287032 is available only through MacDon Parts. B6400 is available only through Whole Goods.
8. Place new bolt-on flighting (A) outboard of existing flighting (B) on the left side of the auger, as shown.

9. Secure with two button head bolts (MD #135723) and nuts (MD #135799) at locations (C).

**IMPORTANT:**
Ensure bolt heads are on the inboard (crop side) and nuts are on the outboard side of the flighting.

10. Stretch flighting (A) to fit auger tube as shown. Use slotted holes on flighting to get the best fit around the auger tube.

11. With flighting in desired position, mark hole locations (A) and drill 11 mm (7/16 in.) holes in auger tube.

12. Remove nearest access cover(s). Retain for reinstallation.

13. Secure bolt-on flighting on newly drilled holes (A) using four flange head bolts and nuts.

14. Repeat Step 2, page 196 to Step 13, page 197 for the other flighting on the left side of the auger.
15. Place flighting (A) outboard of existing flighting (B) on the right side of the auger, as shown.

16. Repeat Step 3, page 196 to Step 13, page 197 for both flightings on the right side of the auger.

17. On both sides of the auger, install flighting slot plugs (MD #213084) in the flighting mounting locations and secure with M6 bolts (MD #252703) and tee nuts (MD #197263).

18. Torque all nuts and bolts to 47 Nm (35 lbf·ft) to eliminate deflection on flighting, then torque nuts and bolts again to 58–64 Nm (43–47 lbf·ft).

**NOTE:**
Flighting performs best when no gaps are present. If desired, use silicone sealant to fill the gaps.

19. Add or remove auger fingers as necessary to optimize feeding for your combine and crop conditions. For instructions, refer to 6.2.10 Installing Feed Auger Fingers, page 198 or 6.2.11 Removing Feed Auger Fingers, page 200.

20. If not adding or removing auger fingers, reinstall all access covers and secure with bolts. Coat bolts with medium-strength threadlocker (Loctite® 243 or equivalent) and torque to 9 Nm (80 lbf-in).

### 6.2.10 Installing Feed Auger Fingers

**NOTE:**
Not all parts needed for this procedure are included in this kit and, depending on the original configuration of the feed auger, additional parts may need to be ordered. Refer to 6.2 FM100 Feed Auger Configurations, page 178 to see which parts are available.

1. Remove bolts (A) and access cover (B) closest to the finger that needs to be installed or replaced.
2. Remove two bolts (B), tee nuts, and plug (A).

3. Coat bolts (A) with medium-strength threadlocker (Loctite® 243 or equivalent), and then insert plastic finger guide (B) from inside the auger and secure it with bolts and tee nuts. Torque bolts to 9 Nm (80 lbf-in).

**NOTE:**
When installing additional fingers, ensure you install an equal number on each side of the auger.

4. From inside the auger, insert new auger finger (B) through plastic guide (D).

5. Insert finger (B) into finger holder (C) and secure with hairpin (A).

**NOTE:**
Note orientation of hairpin (A). The round part should face the direction of auger rotation; the formed side (that is, the S-shaped side) must face the chain drive side of the auger.
6. Coat bolts (A) with medium-strength threadlocker (Loctite® 243 or equivalent), then reinstall access cover (B) and secure with bolts. Torque to 9 Nm (80 lbf-in).

6.2.11 Removing Feed Auger Fingers

1. Remove bolts (A) and access cover (B) closest to the finger you are removing. Retain parts for reinstallation.

2. Remove hairpin (A) and pull finger (B) out of finger holder (C) from inside the auger. Remove the finger from the auger by pulling it out through plastic guide (D).
3. Remove bolts (A) and tee nuts securing plastic guide (B) to the auger, and remove the guide from inside the auger.

4. Coat bolts (B) with medium-strength threadlocker (Loctite® 243 or equivalent), and then position plug (A) into the hole from inside the auger. Secure with two M6 hex head bolts (B) and tee nuts. Torque to 9 Nm (80 lbf-in).

5. Coat bolts (A) with medium-strength threadlocker (Loctite® 243 or equivalent) and reinstall access cover (B). Secure the access cover in place with bolts (A). Torque bolts to 9 Nm (80 lbf-in).
6.3 FM100 Stripper Bars and Feed Deflectors

6.3.1 Removing Stripper Bars

Stripper bar kits may have been supplied with your header to improve feeding in certain crops such as rice. They are NOT recommended for cereal crops.

**NOTE:**
The following procedure does NOT apply to New Holland CR960, 9060, 970, 9070, and 9080 combines. For these combines, refer to 6.3.3 Replacing CR Feeder Deflectors, page 203. For New Holland CR combines only:

If necessary, remove auger stripper bars as follows:

1. Remove four bolts (A) and nuts securing bars (B) to float module frame. Remove bars.
2. Repeat for opposite set of stripper bars.

![Figure 6.66: Auger Stripper Bar](image)

6.3.2 CR Feeder Deflectors

This section is for New Holland CR combines only. If operating a New Holland CX combine, remove feed deflectors.

**For New Holland CR combines only:** Short feeder deflectors have been factory-installed on the float module to improve feeding into the feeder house. Remove the feeder deflectors if necessary. For instructions, refer to 6.3.3 Replacing CR Feeder Deflectors, page 203.

Long feeder kits are provided for narrow feeder house combines and can be installed to replace the short feeder deflectors.

**Table 6.1 FM100 Feeder Kits for CR Model Combines**

<table>
<thead>
<tr>
<th>Feeder House Size</th>
<th>Feeder Kit Size</th>
<th>MacDon Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1250–1350 mm (49–65 in.)</td>
<td>Short: 200 mm (7 7/8 in.)</td>
<td>MD #213613, 213614</td>
</tr>
<tr>
<td>1100 mm (43-1/2 in.) and below</td>
<td>Long: 325 mm (12 13/16 in.)</td>
<td>MD #213592, 213593</td>
</tr>
</tbody>
</table>
6.3.3 Replacing CR Feeder Deflectors

If the header is configured for a New Holland CR 960, 9070, or 9080 combine, the float module has a factory-installed feeder deflector kit to improve feeding into the feeder house. The kit can be replaced if necessary.

⚠ DANGER

To avoid bodily injury or death from unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator’s seat, and always engage safety props before going under the machine for any reason.

IMPORTANT:

This information applies to CR model combines only. For CX model combines, kits must be removed.

The D1 Series/FM100 combine completion package for New Holland models includes both a short feeder kit (installed at the factory) and a long feeder kit for narrow feeder house combines. For specifications, refer to Table 6.2, page 203.

Table 6.2 FM100 Feeder Kits for CR Model Combines

<table>
<thead>
<tr>
<th>Combine Model</th>
<th>Feeder House Size</th>
<th>Feeder Kit Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR970, 9070, 9080</td>
<td>Medium</td>
<td>Short: 200 mm (7–7/8 in.)</td>
</tr>
<tr>
<td>CR960, 9060, 940, 9040</td>
<td>Narrow</td>
<td>Long: 325 mm (12–3/4 in.)</td>
</tr>
</tbody>
</table>

If required, replace the feeder deflectors as follows:

1. Determine the position of existing deflector (A) by measuring gap (X) between the deflector’s forward edge and the pan. Record this measurement.

2. Remove two bolts and nuts (B) securing deflector (A) to the float module frame and remove deflector.

3. Position the replacement deflector and reinstall bolts and nuts (B). Do NOT tighten bolts.
4. Set gap (X) to the dimension recorded in Step 1, page 203 and tighten the nuts.

5. Repeat for the opposite deflector.

**WARNING**

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

6. Attach the header to a combine and fully extend center-link.

7. Turn off the combine and remove the key from the ignition.

8. Recheck gap (X) between deflector (A) and the pan.

**NOTE:**

The minimum gap, when attached to the combine, should be 19–25 mm (3/4–1 in.).

9. If necessary, detach header from the combine and adjust the deflector to achieve the minimum gap.
Chapter 7: Attaching Header to Combine

The procedures for attaching the header to a combine vary depending on the combine model. Refer to the following table for the appropriate procedure:

Table 7.1 Combine Model Header Attachment Procedures

<table>
<thead>
<tr>
<th>Combine</th>
<th>Refer to</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGCO Gleaner R and S Series; Challenger 660, 670, 680B, 540C, and 560C; Massey Ferguson 9690, 9790, 9895, 9520, 9540, and 9560</td>
<td>7.1 AGCO (Challenger, Gleaner, and Massey Ferguson) Combines, page 205</td>
</tr>
<tr>
<td>AGCO IDEAL™</td>
<td>7.2 AGCO IDEAL™ Series Combines, page 213</td>
</tr>
<tr>
<td>Case IH 7010, 8010, 7120, 8120, 9120, 5088, 6088, 7088, 5130, 6130, 7130, 7230, 8230, and 9230</td>
<td>7.3 Case IH Combines, page 218</td>
</tr>
<tr>
<td>CLAAS 500, 600, and 700 (R Series)</td>
<td>7.4 CLAAS Combines, page 224</td>
</tr>
<tr>
<td>John Deere 60, 70, S, and T Series</td>
<td>7.5 John Deere Combines, page 229</td>
</tr>
<tr>
<td>New Holland CR and CX</td>
<td>7.6 New Holland Combines, page 244</td>
</tr>
</tbody>
</table>

IMPORTANT:
Ensure applicable functions (automatic header height control [AHHC], Draper Header Option, Hydraulic Center-Link Option, Hydraulic Reel Drive, etc.) are enabled on the combine and in the combine computer. Failure to do so may result in improper header operation.

7.1 AGCO (Challenger, Gleaner, and Massey Ferguson) Combines

7.1.1 Attaching Header to an AGCO (Challenger, Gleaner, or Massey Ferguson) Combine

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

2. Use lock handle (B) to retract lugs (A) at the base of the feeder house.

![Figure 7.1: AGCO Group Feeder House](image)
ATTACHING HEADER TO COMBINE

**WARNING**

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

3. Start the engine and slowly approach the header until the feeder house is directly under float module top cross member (A) and alignment pins (C) (refer to Figure 7.3, page 206) on the feeder house are aligned with holes (B) in the float module frame.

**NOTE:**

Your combine feeder house may not be exactly as shown.

4. Raise the feeder house slightly to lift the header, ensuring feeder house saddle (A) is properly engaged in the float module frame.

5. Shut down the engine, and remove the key from the ignition.
6. Use lock handle (B) to engage lugs (A) with the float module.

**WARNING**

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

7. Start the engine. For instructions, refer to the combine operator’s manual.

8. Lower the header fully.

**NOTE:**

The float module is equipped with a multicoupler that connects to the combine. If your combine is equipped with individual connectors, a multicoupler kit (single-point connector) must be installed. Refer to Table 7.2, page 207 for a list of kits and installation instructions that are available through your combine Dealer.

<table>
<thead>
<tr>
<th>Combine</th>
<th>AGCO Kit Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Challenger</td>
<td>71530662</td>
</tr>
<tr>
<td>Gleaner R/S Series</td>
<td>71414706</td>
</tr>
<tr>
<td>Massey Ferguson</td>
<td>71411594</td>
</tr>
</tbody>
</table>

9. Raise handle (A) to release multicoupler (B) from float module.

Figure 7.5: AGCO Group Feeder House

Figure 7.6: Float Module Multicoupler
10. Push handle (A) on the combine to the fully-open position.

11. Clean the mating surfaces of multicoupler (B) and receptacle if necessary.

12. Position multicoupler (A) onto the combine receptacle, and pull handle (B) to fully engage the multicoupler into the receptacle.

13. Connect reel fore-aft/header tilt selector harness (C) to combine harness (D).

14. Detach safety chain (C) from support bracket (B).

15. Pull collar (D) back to release driveline (A) from support bracket. Remove the driveline from support bracket.
16. Pull back collar (A) on the end of the driveline, and push the driveline onto combine output shaft (B) until the collar locks.

17. Proceed to 7.7 Completing Header Assembly, page 249.

### 7.1.2 Installing Reel Fore-Aft / Header Tilt Selector Switch and Harness

Gleaner combines prior to model year 2014 are not equipped to accommodate hydraulic reel fore-aft and header tilt options. The following additional items are required and not supplied by MacDon:

- Valve (A) (AGCO #71389745)
- Hoses
- Electrical components
- Couplers

**NOTE:**
Model year 2014 and later Gleaner combines will have the above parts factory-installed.

To enable the reel fore-aft and header tilt options, install the switch and harness as follows:

⚠️ **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. Lower and tilt the combine feeder house all the way forward if equipped. This will ensure that the electrical harnesses will be installed with sufficient slack.
2. Shut down the engine, and remove the key from the ignition.
3. Disconnect the negative cable from the combine battery. For instructions, refer to the combine manual.

**IMPORTANT:**

If you do not disconnect the battery before connecting the cab draper control harness to the combine’s auxiliary power connectors, electrical components may be damaged.
4. At the multicoupler, connect the cab draper extension harness (MD #304211) to the float module as follows:
   - **Connector C3A** – If the In-Cab Side Draper Speed Control kit has been installed, plug connector C3B on the valve drive harness into connector C3A. If the In-Cab Side Draper Speed Control kit has not been installed, leave C3A unconnected.
   - **Connector C5B** – Plug connector C5B (A) into connector C5A on the completion harness.

**NOTE:**
Connectors C3A and C5B are shipped with caps. The caps need to be removed in order to connect these connectors.

5. Route cab draper extension harness (A) along the side of the combine feeder house to the underside of the combine cab.

6. Use cable ties (MD #16661) to fasten cab draper extension harness (A) to the main harness on the left side of the feeder house and under the cab floor at locations (B).
7. Use cable ties (MD #16661) to fasten cab draper extension harness (A) to the main harness under the cab floor at location (B).

8. Route cab draper extension harness (A) under the cab, through the cab floor, and into console at foam seal (B).
9. Inside the cab, remove console cover as shown.

10. Connect the cab draper extension harness to the cab draper control harness (MD #304210) as follows:
   - Plug C4B into C4A.
   - Plug C6B into C6A.

11. Connect the cab draper control harness to the power supply inside the console at location (A).
   - The red wire from the inline fuse goes to switched power supply (A).
   - The double black wire goes to the ground.

**IMPORTANT:**
Connecting the draper control harness to an unswitched power supply or cigarette lighter (using harness MD #220570, provided in the kit) will supply constant power to the header tilt side of the solenoid valve and drain the combine battery during extended shutdown periods.

12. Route the draper control harness through grommet (B), and then replace cover.

13. Insert rocker switch (MD #109064) into rocker switch support (MD #158377). Ensure the lugs on the underside of the support have secured the switch.

14. Mount rocker switch support onto console (A) in a comfortable position.

15. Connect harness to switch with red wire to center terminal (B), and white wire to either outer terminal (C).

16. If the In-Cab Side Draper Speed Control kit has been installed, connect connector P551 to the speed control rheostat. If the In-Cab Side Draper Speed Control kit has not been installed, leave connector P551 unconnected.

17. Reconnect the battery cable.

18. Operate the switch to select either REEL FORE-AFT or HEADER TILT function.
ATTACHING HEADER TO COMBINE

7.2 AGCO IDEAL™ Series Combines

7.2.1 Attaching Header to an AGCO IDEAL™ Series Combine

⚠️ WARNING

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

1. Pull lever (A) up to retract pins (B) at the bottom left and right sides of the feeder house.

2. Drive the combine slowly up to the header until the feeder house is directly under top beam (A), and pins (B) are under hooks (C) on the transition frame.

Figure 7.19: Feeder House

Figure 7.20: Feeder House
3. Raise feeder house until transition frame top beam (A) is fully resting on the feeder house. Raise the header slightly off the ground.

**IMPORTANT:**
The full weight of the header must be on the feeder house, **NOT** on pins (B).

4. Position bottom of feeder house so that locking pins (A) align with the holes in mount (C).

5. Push lever (B) down to extend locking pins (A) so they engage in mount (C).

6. Rotate lock disc (A) upward and remove driveline (B) from the support.
7. Pull back collar (A) on end of driveline and push onto combine output shaft (B) until collar locks.

8. Lower handle (A) to release multicoupler (B) from header.

9. Open cover (C) on the combine receptacle.

10. Push handle (D) to fully open position.

11. Clean mating surfaces of coupler and receptacle if necessary.

12. Position coupler (A) onto combine receptacle, and pull handle (B) to fully engage multicoupler into receptacle.
7.2.2 Installing Reel Fore-Aft / Header Tilt Selector Switch

If the combine has previously been used with a MacDon header, the reel fore-aft / header tilt selector switch may already have been installed in the combine cab. If it has, you can skip this procedure. If it has not, follow these steps to install the switch provided in the completion package.

⚠️ WARNING

To avoid bodily injury or death from the 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 and tilt the combine feeder house all the way forward if equipped. This will ensure that the electrical harnesses will be installed with sufficient slack.
2. Shut down the engine, and remove the key from the ignition.
3. Disconnect the negative cable from the combine battery. For instructions, refer to the combine manual.

**IMPORTANT:**

If you do not disconnect the battery before connecting the cab draper control harness to the combine’s auxiliary power connectors, electrical components may be damaged.

4. Plug connector C5B on the cab draper extension harness (MD #304211) into the small connector, C5A (A), on the coupler support.

**NOTE:**

If the In-Cab Side Draper Speed Control kit is installed, plug connector C3B on the valve drive harness into connector C3A; otherwise, leave C3A capped and unconnected.

5. Route the cab draper extension harness into the combine cab. Secure with cable ties (MD #16661).

6. Inside the cab, connect the cab draper extension harness to the cab draper control harness (MD #304210) as follows:
   - Plug C4B into C4A.
   - Plug C6B into C6A.

7. Install rocker switch (A) (MD #109064) into rocker switch support (B) (MD #158377) from the top. Ensure the lugs on the underside of the support have secured the switch.
8. One branch of the cab draper control harness (B) ends in two terminals: T242 and T243. Connect one terminal to the center terminal on rocker switch (A) and the other to either outer terminal. The color of the wire does not matter. Refer to the harness illustration below.

**Figure 7.29: Cab Draper Control Harness (MD #304210)**

9. Install rocker switch support in cab.

10. Connect terminals T241 and T251 on the cab draper control harness to the auxiliary power harness (A) (MD #220570), and then plug harness (A) into a switched accessory power port.

**IMPORTANT:**
Ensure the power port on the combine is switched, otherwise the switch could drain the combine battery during extended shutdown periods.

11. Use cable ties (MD #16661) to secure cab harness in place.

12. Turn on battery disconnect. For instructions, refer to the combine manual.

**Figure 7.30: Auxiliary Power Harness (MD #220570)**
7.3 Case IH Combines

7.3.1 Attaching Header to Case IH Combine

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

2. On the upper left side of the combine float module, remove nut (A), washer, spring, and lever (B).

3. Position lever (A) onto stud (B).
4. Place spring arm (C) into hook on lever (B) to preload it, and tighten nut (A) with washer onto the float module.

5. On the combine, ensure lock handle (A) is positioned so hooks (B) can engage the float module.

**WARNING**

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

6. Start the engine and slowly drive the combine up to the header until feeder house saddle (A) is directly under float module top cross member (B).

7. Raise the feeder house slightly to lift the header, ensuring the feeder saddle is properly engaged in the float module frame.

8. Shut down the engine, and remove the key from the ignition.
9. On the left side of the feeder house, lift lever (A) on the float module and push handle (B) on the combine to engage locks (C) on both sides of the feeder house.

10. Push down on lever (A) so the slot in the lever engages the handle and locks the handle in place.

11. If lock (C) does not fully engage the pin on the float module, loosen bolts (D) and adjust lock. Retighten bolts.

12. Open the cover on receptacle (A) located on the left side of the float module.

13. Press lock button (B) and pull handle (C) to the fully-open position.

14. Clean the receptacle mating surfaces.

15. Remove hydraulic quick coupler (A) from the combine, and clean the mating surfaces.
16. Position the coupler onto coupler receptacle (A) and push handle (B) (not shown) to engage the multicoupler pins into the receptacle.

17. Push handle (B) to the closed position until lock button (C) snaps out.

18. Remove the cover from electrical receptacle (A). Ensure the receptacle is clean and has no signs of damage.

19. Remove electrical connector (A) from the storage cup on the combine and route it to the float module receptacle.
20. Align the lugs on connector (A) with the slots in receptacle (B), push the connector onto the receptacle, and turn the collar on the connector to lock it in place.

21. Detach safety chain (C) from support bracket (B).

22. Pull collar (D) back to release driveline (A) from support bracket. Remove the driveline from support bracket.

23. Pull back collar (A) on the end of the driveline, and push the driveline onto combine output shaft (B) until the collar locks.
24. Disengage the float locks by pulling each float lock handle (A) away from the float module and setting it in unlocked position (B).

**NOTE:**
Illustration at right shows the right side of the header. Float lock on left side of header opposite.

25. Proceed to 7.7 Completing Header Assembly, page 249.
7.4 CLAAS Combines

The D1 Series Draper Header is compatible with CLAAS 500, 600, and 700 Series combines.

7.4.1 Attaching Header to CLAAS Combine

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

2. Move handle (A) on the float module into the raised position, and ensure pins (B) at the bottom corners of the float module are retracted.

⚠️ WARNING

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

3. Start the engine and slowly drive the combine up to the header until feeder house saddle (A) is directly under float module top cross member (B).

4. Raise the feeder house slightly to lift the header, ensuring the feeder saddle is properly engaged in the float module frame.

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

---

Figure 7.46: Pins Retracted

Figure 7.47: Header on Combine
6. Remove locking pin (B) from float module pin (A).

7. Lower handle (A) to engage float module pins (B) into the feeder house. Reinsert locking pin (C) and secure with the hairpin.

8. Remove the blocks from under the cutterbar.

⚠️ WARNING

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

9. Start the engine. For instructions, refer to the combine operator’s manual.

10. Lower the header fully.

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

12. Unscrew knob (A) on combine coupler (B) to release the coupler from the receptacle.

13. Clean coupler (B) and receptacle.
14. Remove float module receptacle cover (A).

15. Place float module receptacle cover (A) onto the combine receptacle.

16. Clean mating surface of coupler (A) and position onto float module receptacle (C).

17. Turn knob (B) to secure the coupler to the receptacle.
18. Detach safety chain (C) from support bracket (B).

19. Pull collar (D) back to release driveline (A) from support bracket. Remove the driveline from the support bracket.

20. Attach driveline (A) to the combine output shaft.
21. Disengage both header float locks by pulling each float lock handle (A) away from the float module and setting it in unlocked position (B).

**NOTE:**
Illustration at right shows the right side of the header. Float lock on left side of header opposite.

22. Proceed to 7.7 Completing Header Assembly, page 249.
7.5 John Deere Combines

The D1 Series Draper Header is compatible with John Deere 60, 70, S, and T Series combines.

7.5.1 Attaching Header to John Deere Combine

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

2. Push handle (A) on the combine multicoupler receptacle towards the feeder house to retract pins (B) at the bottom corners of the feeder house. Clean the receptacle.

⚠️ WARNING

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

3. Start the engine and slowly drive the combine up to the header until feeder house saddle (C) is directly under float module top cross member (D).

4. Raise the feeder house slightly to lift the header ensuring the feeder house saddle is properly engaged in the float module frame.

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

6. Pull handle (A) on the float module to release multicoupler (B) from the storage position. Remove the multicoupler, and push the handle back into the float module to store.

---

**Figure 7.57: Combine and Float Module**

**Figure 7.58: Multicoupler Storage**
7. Position multicoupler (A) onto the receptacle, and pull handle (B) to engage the lugs on the multicoupler into the handle.

8. Pull handle (B) to a horizontal position and ensure multicoupler (A) is fully engaged into the receptacle.

9. Ensure that both feeder house pins (A) are fully engaged into the float module brackets.

   **NOTE:**
   If pins (A) do not fully engage the float module brackets, loosen bolts (B) and adjust the bracket as required.

10. Tighten bolts (B).

11. Slide latch (A) to lock handle (B) in position and secure with lynch pin (C).

12. If the float module is equipped with the reel fore-aft/header tilt selector, connect harness (D) to combine connector (E).
13. Detach safety chain (C) from support bracket (B).

14. Pull collar (D) back to release driveline (A) from support bracket. Remove the driveline from the support bracket.

15. Pull back collar (A) on the end of the driveline, and push the driveline onto combine output shaft (B) until the collar locks.
16. Disengage the float locks by pulling each float lock handle (A) away from the float module, and setting it in unlocked position (B).

**NOTE:**
Illustration at right shows the right side of the header. Float lock on left side of header opposite.

7.5.2 Installing Reel Fore-Aft / Header Tilt Switch – S and T Series Combines

The reel fore-aft/header tilt switch allows the combine Operator to select either reel FORE-AFT or HEADER TILT mode.

**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.

This procedure is applicable to John Deere S and T Series combines. For John Deere 60 or 70 Series combines, refer to 7.5.3 Installing Reel Fore-Aft / Header Tilt Switch – 60 and 70 Series Combines, page 239.

Prepare the combine cab for switch and harness installation as follows:

1. Lower and tilt the combine feeder house all the way forward if equipped. This will ensure that the electrical harnesses will be installed with sufficient slack.
2. Shut down the engine, and remove the key from the ignition.
3. Disconnect the negative cable from the combine battery. For instructions, refer to the combine manual.

**IMPORTANT:**
If you do not disconnect the battery before connecting the cab draper control harness to the combine’s auxiliary power connectors, electrical components may be damaged.
4. At the multicoupler, connect the cab draper extension harness (MD #304211) to the float module as follows:
   - **Connector C3A** – If the In-Cab Side Draper Speed Control kit has been installed, plug connector C3B on the valve drive harness into connector C3A. If the In-Cab Side Draper Speed Control kit has not been installed, leave C3A unconnected.
   - **Connector C5B** – Plug connector C5B (A) into connector C5A on the JD completion harness.

**NOTE:**
Connectors C3A and C5B are shipped with caps. The caps need to be removed in order to connect these connectors.

5. Route cab draper extension harness (A) along the left side of the combine feeder house, under shield (B), to the underside of the combine cab (along the existing hoses).

**NOTE:**
The illustration shows an S6, S7, T6, or T7 Series combine. Earlier models may look different.

6. Secure cab draper extension harness (A) to the hoses with cable ties (MD #16661) as required.

7. Inside the cab, lift floor mat (A) at the front right corner to access knockout (B).

**NOTE:**
The illustration shows an S6, S7, T6, or T7 Series combine. Earlier models may look different.

8. Remove knockout (B).
9. Pull the ends of cab draper extension harness (A) up into the cab through hole (B).

**NOTE:**
The illustration shows an S6, S7, T6, or T7 Series combine. Earlier models may look different.

10. Connect cab draper extension harness (A) to cab draper control harness (C) (MD #304210) as follows:
   - Plug C4B into C4A.
   - Plug C6B into C6A.

11. Reinstall floor mat.

**NOTE:**
Any extra wire can be placed between the floor mat and the right console at the cup holder.

12. For S6 Series, T6 Series, and earlier combines: In the combine cab, open the storage compartment on the console.

13. For S6 Series, T6 Series, and earlier combines: Remove two screws (A) attaching compartment cover (B) to the console and then remove the cover.

14. For S6 Series, T6 Series, and earlier combines: Two rocker switch supports are provided: MD #158377 (A) and MD #220734 (B). Select the one you need to use:
   - MD #158377 – Used on John Deere 60 and 70 Series combines
   - MD #220734 – Used on John Deere S and T Series combines
15. **For S7 and T7 Series combines only**: Secure rocker switch support (A) (MD #220734) to tilt/draper speed support (B) (MD #304111) with two M6 hex socket head screws (C) (MD #136886) and two M6 hex flange lock nuts (MD #152668).

16. Install rocker switch (A) (MD #109064) into rocker switch support (C) from the top. Ensure the lugs on the underside of the support have secured the switch.

**NOTE:**
The tilt/draper speed support needed for S7 and T7 Series combines is not shown in the illustration.

17. One branch of cab draper control harness (B) ends in two terminals: T242 and T243. Connect one terminal to the center terminal on rocker switch (A) and the other to either outer terminal. The color of the wires does not matter.

For more information, refer to Figure 7.73, page 236.
Figure 7.73: Cab Draper Control Harness (MD #304210)

18. If the In-Cab Side Draper Speed Control kit has been installed, connect connector P551 to the speed control rheostat. If the In-Cab Side Draper Speed Control kit has not been installed, leave connector P551 unconnected.

19. **S6 and T6 Series combines only**: Position rocker switch support (C) onto console and align the holes in the support with the holes in the console.

20. **S6 and T6 Series combines only**: Reinstall cover (B) and secure in place with existing screws (A).
21. **S6 and T6 Series combines only**: Close cover and ensure that rocker switch (A) and rocker switch support (B) are secure.

22. Remove two M6 countersunk head screws (C) securing track (B) to the side of the seat, then remove the track. Install tilt/draper speed support (A) between track (B) and the side of the seat using the M6 screws (C).

**NOTE:**
If other options are not being installed on the track, refer to the alternative installation location instructions below. The preferred installation location provides better access to the cup holders.

**NOTE:**
The rocker switch is not shown in the illustration at right.
23. **S7 and T7 Series combines only – alternative installation location:** Secure tilt/draper speed support (A) to track (B) with two M8 carriage head bolts (C) (MD #197171) and two M8 hex flange lock nuts (MD #135337).

**NOTE:**
The rocker switch is not shown in the illustration at right.
24. Connect the feed end of the cab draper control harness (B in Figure 7.73, page 236) to the auxiliary power outlet strip as follows:

**NOTE:**
The auxiliary power strip is on the right side of the cab floor on S6, S7, T6, and T7 Series combines, and near the window on earlier models.
- Terminals T240 and T241 are for power. Connect them to switched power supply (C).
- Terminals T250 and T251 are for ground. Connect them to ground (B).

**NOTE:**
Each circuit has a male and female terminal pair so that they can be connected in line with an existing circuit on the combine. They can also be connected to a spare circuit in the combine (at location [A]), which would only use one terminal out of each pair. Insulate any unused terminals with electrical tape.

**NOTE:**
The illustration shows an S6, S7, T6, or T7 Series combine. Earlier models may look different.

25. Tape any unused terminals to the harness.

26. Reconnect the battery.

### 7.5.3 Installing Reel Fore-Aft / Header Tilt Switch – 60 and 70 Series Combines

The reel fore-aft/header tilt switch allows the combine Operator to select either reel FORE-AFT or HEADER TILT mode.

**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.

This procedure applies to John Deere 60 and 70 Series combines. For John Deere S and T Series combines, refer to 7.5.2 Installing Reel Fore-Aft / Header Tilt Switch – S and T Series Combines, page 232.

1. Lower and tilt the combine feeder house all the way forward if equipped. This will ensure that the electrical harnesses will be installed with sufficient slack.
2. Shut down the engine, and remove the key from the ignition.
3. Disconnect the negative cable from the combine battery. For instructions, refer to the combine manual.

**IMPORTANT:**
If you do not disconnect the battery before connecting the cab draper control harness to the combine’s auxiliary power connectors, electrical components may be damaged.

4. To ensure the switch harness will attach to selector valve wiring harness (with header tilted forward) and that the feeder house can be fully lowered with adequate slack in the harness, lay the switch harness along the route from the front of the feeder house to the auxiliary power supply in the cab.
5. Route switch harness (A) through existing grommet (B) on the combine’s electrical plate (located at the rear of the right side window).

   **NOTE:**
   To simplify feeding the harness through the grommet, wrap the switch and power plugs with electrical tape.

6. Retrieve switch (A) and support (C) provided with kit.

7. Install switch (A) into support (C) from the top. Ensure lugs on underside of support have secured the switch.

   **NOTE:**
   Image at right shows switch (A) connected to harness (B).

8. Mount switch plate (A) between the armrest cover hinge and the armrest using existing screws (B).
9. Connect the switch end of harness (A) to switch (B) with one of the wires to center terminal and the other wire to either outer terminal.

**NOTE:**
The color of the wires does not matter; ensure one wire terminates at the center terminal.

10. Connect the switch harness to auxiliary power supply (D). Connect the wire with the in-line fuse to switched power supply (C) and the second wire to ground (B).

**IMPORTANT:**
Connecting the draper control harness to an unswitched power supply or cigarette lighter (using harness MD #220570, provided in the kit) will supply constant power to the header tilt side of the solenoid valve and drain the combine battery during extended shutdown periods.

11. Tape the unused wire jumpers to the harness.
12. Route switch harness (A) across the underside of the cab, alongside an existing harness, to the left side of the feeder house.

**IMPORTANT:**
To prevent damage to harness, ensure adequate slack by lowering the feeder house fully before securing harness with cable ties.

![Figure 7.86: Switch Harness Routing](image)

13. Secure switch harness (A) at the rear of the feeder house with cable tie.

![Figure 7.87: Switch Harness Routing](image)

14. Route switch harness (A) through the welded hose guide on feeder house.

![Figure 7.88: 60/70 Series Harness Routing](image)
15. Secure switch harness (A) at multicoupler with a cable tie. Leave 100 cm (40 in.) extending past location (B).

Figure 7.89: Switch Harness Routing
7.6 New Holland Combines

The D1 Series Draper Header is compatible with the following New Holland combines:

Table 7.3 Header and Combine Compatibility

<table>
<thead>
<tr>
<th>Series</th>
<th>Combine Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR</td>
<td>920, 940, 960, 970, 980</td>
</tr>
<tr>
<td></td>
<td>9020, 9040, 9060, 9070, 9080</td>
</tr>
<tr>
<td></td>
<td>6090, 7090, 8080, 8090, 9090</td>
</tr>
<tr>
<td></td>
<td>6.80, 6.90, 7.90, 8.90, 9.90, 10.90</td>
</tr>
<tr>
<td>CX</td>
<td>840, 860, 870, 880</td>
</tr>
<tr>
<td></td>
<td>8070, 8080, 8090</td>
</tr>
<tr>
<td></td>
<td>8080 Elevation, 8090 Elevation</td>
</tr>
</tbody>
</table>

7.6.1 Attaching Header to New Holland CR/CX Combine

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

2. On the upper left side of the combine float module, remove nut (A), washer, spring, and lever (B).
3. Position lever (A) onto stud (B).

4. Place spring arm (C) into hook on lever (B) to preload it, and tighten nut (A) with washer onto the combine float module.

5. Ensure handle (A) is positioned so hooks (B) can engage the float module.
WARNING

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

6. Start the engine and slowly drive the combine up to the float module until feeder house saddle (A) is directly under float module top cross member (B).

7. Raise the feeder house slightly to lift the header, ensuring the feeder saddle is properly engaged in the float module frame.

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

9. Lift lever (A) on the float module on the left side of the feeder house, and push handle (B) on the combine to engage locks (C) on both sides of the feeder house.

10. Push down on lever (A) so the slot in the lever engages the handle and locks the handle in place.

11. If the lock does not fully engage pin (D) on the float module when lever (A) and handle (B) are engaged, loosen bolts (E) and adjust lock (C). Retighten bolts.

12. Open the cover on receptacle (A) located on the left side of the float module.

13. Push in lock button (B) and pull handle (C) to the fully open position.

14. Clean the receptacle mating surfaces.
15. Remove hydraulic quick coupler (A) from the storage plate on the combine, and clean the mating surface of the coupler.

16. Position coupler (A) onto the float module receptacle, and push handle (B) to engage the pins into the receptacle.

17. Push handle (B) to closed position until lock button (C) snaps out.

18. Remove the cover on the float module electrical receptacle.

19. Remove connector (D) from the combine.

20. Align lugs on connector (D) with the slots in the float module receptacle, and push the connector onto the receptacle. Turn the collar on the connector to lock it in place.

21. Detach safety chain (C) from support bracket (B).

22. Pull collar (D) back to release driveline (A) from support bracket. Remove the driveline from support bracket.
23. Pull back the collar on the end of the driveline, and push the driveline onto combine output shaft (A) until the collar locks.

24. Disengage the float locks by pulling each float lock handle (A) away from the float module and setting it in unlocked position (B).

**NOTE:**
Illustration at right shows the right side of the header. Float lock on left side of header opposite.

25. Proceed to 7.7 Completing Header Assembly, page 249.
7.7 Completing Header Assembly

7.7.1 Positioning Transport Lights

Transport lights are located on each outboard reel arm. They are shipped in an inverted position on the inboard sides of the reel arms.

1. Remove lock nuts (B) holding right light assembly (A) to the reel arm and remove the light assembly. Retain the lock nuts.

2. Position right light assembly (A) perpendicular to the right reel arm and attach it using retained lock nuts (B).

   **NOTE:**
   The light assembly should rotate with normal hand force yet maintain its position.

3. Remove lock nuts (A) holding left light assembly (B) to the reel arm and remove the light assembly. Retain lock nuts.
4. Position left light assembly (B) perpendicular to the left reel arm and attach it using retained lock nuts (A).

**NOTE:**
The light assembly should rotate with normal hand force yet maintain its position.

---

### 7.7.2 Crop Dividers

Crop dividers are used to help divide the crop when harvesting. They are removable to allow installation of vertical knives and to decrease transport width.

**Removing Crop Dividers from Storage**

Crop dividers are shipped attached to the inboard side of the endsheets. To remove the crop dividers from storage position, follow these steps:

1. Support the crop divider and remove the shipping wire at front end (A).
2. Remove bolt (B).
3. Remove bolt and washer (C) and retain for installation.

**Installing Crop Divider without Latch Option**

**NOTE:**
If the crop divider latch option was ordered with the header, proceed to *Installing Crop Divider with Latch Option, page 252*. Otherwise, complete the following procedure:
ATTACHING HEADER TO COMBINE

1. Position crop divider as shown by inserting lugs (A) into holes (B) in endsheet.

2. Lift the forward end of the crop divider and install bolt (B) and special stepped washer (A) (step towards divider). Tighten bolt.

3. Check that divider does NOT move laterally. Adjust bolts (A) as required to tighten divider, and remove lateral play when pulling at divider tip.
Installing Crop Divider with Latch Option

1. Position the crop divider as shown by inserting lugs (A) into holes in the endsheet.
2. Lift the forward end of the divider until pin (B) engages and closes latch (C).
3. Push safety lever (D) down to lock the pin in latch.

4. Adjust bolts (A) to tighten divider and remove lateral play when pulling at divider tip.
**Installing Crop Divider Rods**

1. Remove shipping wire (A) securing divider rods (B) to header endsheet, and remove divider rods from shipping location.

2. Position crop divider rod (B) on tip of crop divider as shown and tighten bolt (A).

3. Repeat procedure at opposite end of header.
7.7.3 Installing Left Endshield – Split-Frame Headers

NOTE:
On 12.2 and 13.7 m (40 and 45 ft.) split-frame headers, only the left endshield requires installation; the right endshield was installed prior to shipping.

1. Remove and retain self-tapping screw (A) from hinge arm (B).

2. Rotate hinge arm towards the rear of the header and engage lock (A).

3. Guide endshield onto hinge arm, using outboard holes (position 1) on bracket (C). Slowly slide the endshield downwards.

4. Install self-tapping screw (B).

5. Disengage lock (A) to allow endshield movement.

6. Insert front of endshield behind hinge tab (A).

7. Swing endshield in direction (B) into closed position. Engage lock with a firm push.

8. Verify that endshield is locked.

NOTE:
Plastic endshields may expand or contract when subjected to large temperature changes; the endshields are checked and adjusted later in this book.
7.7.4 Installing Options

1. Retrieve the kits supplied as options with the header, and install them according to the instructions supplied with each kit.

2. Proceed to Chapter 8 Performing Predelivery Checks, page 257.
Chapter 8: Performing Predelivery Checks

This machine has been set at the factory and should not require further adjustments; however, the following checks will ensure your machine provides maximum performance. If adjustments are necessary, follow the procedures in this chapter.

⚠️ WARNING
To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before adjusting machine.

IMPORTANT:
To avoid machine damage, check that no shipping material has fallen into the machine.

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

2. Perform the final checks as listed on the Predelivery Checklist (yellow sheet attached to this instruction – Predelivery Checklist, page 519) to ensure the machine is field-ready. Refer to the following pages for detailed instructions as indicated on the Checklist. The completed Checklist should be retained by either the Operator or the Dealer.

8.1 Checking Tire Pressure – Transport and Stabilizer Wheels

Check tire inflation pressure. If necessary, inflate tires according to the following table:

<table>
<thead>
<tr>
<th>Size</th>
<th>Load Range</th>
<th>Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST205/75 R15</td>
<td>D</td>
<td>448 kPa (65 psi)</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>552 kPa (80 psi)</td>
</tr>
</tbody>
</table>

IMPORTANT:
Do NOT exceed maximum pressure specified on tire sidewall.
8.2 Checking Wheel Bolt Torque – Transport and Stabilizer Wheels

Perform the following procedure to ensure that transport and stabilizer wheel bolts are correctly torqued:

1. Check that wheel bolt torque is 110–120 Nm (80–90 lbf·ft).
2. If necessary, adjust torque. Refer to bolt tightening sequence illustration at right.

Figure 8.1: Sequence for Tightening Bolts
8.3 Checking Knife Drive Box

Single-knife headers have one knife drive box and double-knife headers have two knife drive boxes. To access the knife drive box(es), the endshield(s) must be fully opened.

⚠️ DANGER

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before making adjustments to the machine.

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

2. Press down on latch (A) in the opening on the inboard side of the endsheet.

3. Pull endshield open using handle depression (B).

4. Swivel the endshield toward the back of the header and use safety latch (B) to secure endshield support tube (A) to the endsheet.
**PERFORMING PREDELIVERY CHECKS**

**IMPORTANT:**
The knife drive box breather is shipped in position (A) (forward) to prevent oil loss during transport. The breather MUST be repositioned to location (B) to prevent oil loss during normal operation. Failure to do so can result in damage to the knife drive box.

5. Check position of plug (A) and breather (B) at knife drive box. Position MUST be as shown.

6. Remove breather (B) and check oil level. The oil level should be between bottom edge (C) of lower hole (D) and bottom (E) of the breather.

**NOTE:**
Check oil level with top of knife drive box horizontal and with breather (B) screwed in.

7. Reinstall breather and tighten.

Figure 8.4: Knife Drive Box
8.4 Checking Oil Level in Header Drive Gearbox

**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. Lower the header to the ground and ensure the gearbox is in working position.
2. Shut down the engine, and remove the key from the ignition.
3. Remove oil level plug (A) and check that the oil level is up to the bottom of the hole.
4. Reinstall oil level plug (A).

Figure 8.5: Header Drive Gearbox
8.5 Checking Oil Level in Hydraulic Reservoir

1. Check the oil level using lower sight (A) and upper sight (B) with the cutterbar just touching the ground and with the center-link retracted.

   **NOTE:**
   Check the level when the oil is cold.

   **NOTE:**
   For extremely hilly terrain, a hillside extension kit can be installed.

2. Ensure the oil is at the appropriate level for the terrain as follows:
   - **Hilly terrain:** Maintain level so lower sight (A) is full, and upper sight (B) is up to one-half filled.
   - **Normal terrain:** Maintain level so lower sight (A) is one-half full, and upper sight (B) is empty.

Figure 8.6: Oil Level Sight Glass
8.6 Checking Knife Drive Belt Tension

8.6.1 Checking and Tensioning Single and Untimed Double-Knife Drive Belts

⚠️ DANGER

To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before making adjustments to the machine.

**IMPORTANT:**

To prolong the belt and drive life, do NOT overtighten the belt.

1. Shut down the engine, and remove the key from the ignition.
2. Open the left endshield.
3. Loosen two bolts (A) securing the motor assembly to the header endsheet.

   **NOTE:**
   The belt guide has been removed from the illustrations for clarity.

4. Check drive belt tension. A properly tensioned drive belt (C) should deflect 24–28 mm (15/16–1 1/8 in.) when 133 N (30 lbf) of force is applied at the midspan.

5. If the belt needs to be tensioned, turn adjuster bolt (B) clockwise to move the drive motor until proper tension is set.

6. Ensure clearance between belt (A) and belt guide (B) is 1 mm (1/16 in.).

7. Loosen three bolts (C), and adjust the position of guide (B) as required.

8. Tighten three bolts (C).

9. Close the endshield.

10. **Double-knife headers only:** Repeat procedure on the other side of the header.
8.6.2 Checking and Tensioning Timed Double-Knife Drive Belts

The procedure for tensioning timed knife drive belts is the same for both sides of the header. The illustrations show the left side of the header.

⚠️ DANGER
To avoid bodily injury or death from unexpected startup of machine, always stop the engine and remove the key before making adjustments to the machine.

IMPORTANT:
To prolong belt and drive life, do NOT overtighten belt.

IMPORTANT:
Do NOT use the adjuster bolt at the drive pulley to adjust timing belt tension.

1. Shut down the engine, and remove the key from the ignition.
2. Open the endshield.
3. Check drive belt tension. A properly tensioned belt (A) should deflect 13 mm (1/2 in.) at the midpoint of the upper span when a force of 27 N (6 lbf) is applied.

4. If the belt needs to be tensioned, loosen two nuts (A) on knife drive belt idler bracket (B).
5. Position pry bar (C) under the idler bracket, and push the bracket upwards until a force of 27 N (6 lbf) deflects the belt 13 mm (1/2 in.) at the midpoint of the upper span.

IMPORTANT:
Protect the machine’s paint by placing a piece of wood (D) under pry bar (C).
6. After achieving the proper belt tension, tighten nuts (C) to 73–80 Nm (54–59 lbf·ft).

7. Remove pry bar (A) and piece of wood (B).

8. Readjust the tension of a new belt after a short run-in period (about 5 hours).

9. Ensure clearance (A) between belt (B) and guide (C) is 0.5–1.5 mm (1/32–1/16 in.).

10. Loosen bolts (D) and adjust the guide if necessary. Tighten bolts.

11. Close the endshield.

12. Repeat procedure for the opposite side of the header.
8.7 Checking Knife Hold-Downs

Perform daily inspections to ensure the knife hold-downs are preventing the knife sections from lifting off the guards while permitting the knife to slide without binding. Use a feeler gauge to measure the clearance between the hold-downs and knife sections, and refer to the following for adjustment procedures:

- **8.7.1 Adjusting Hold-Downs with Pointed Guards, page 266**
- **8.7.2 Adjusting Hold-Down with Stub Guards, page 267**

### 8.7.1 Adjusting Hold-Downs with Pointed Guards

**WARNING**

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before adjusting machine.

1. Shut down the engine, and remove the key from the ignition.
2. Use a feeler gauge to measure the clearance between the standard guard hold-down (A) and the knife section. Ensure the clearance is 0.1–0.6 mm (0.004–0.024 in.).
3. To lower the front of the hold-down and decrease clearance, turn bolt (B) clockwise; to raise the front of the hold-down and increase clearance, turn bolt (B) counterclockwise.

**NOTE:**

For larger adjustments, it may be necessary to loosen nuts (C), turn adjuster bolt (B), and then retighten nuts.

4. Use a feeler gauge to measure the clearance between the center guard hold-down (A) and the knife section. Ensure the clearance is between the following measurements:
   - **At hold-down tip (B):** 0.1–0.4 mm (0.004–0.016 in.)
   - **At rear of hold-down (C):** 0.1–1.0 mm (0.004–0.040 in.)
5. Adjust the clearance as follows:
   a. Tighten nuts (D) until finger tight.
   b. Turn three adjuster bolts (E) clockwise to raise the front of the hold-down and increase clearance, or counterclockwise to lower the front of the hold-down and decrease clearance.
   c. When all the adjustments are complete and the specified clearances are achieved, torque nuts (D) to 88 Nm (65 lbf-ft).

**WARNING**

Check to be sure all bystanders have cleared the area.
6. Complete the hold-down adjustments, run the header at low engine speed, and listen for noise caused by insufficient clearance.

**IMPORTANT:**
Insufficient hold-down clearance will result in overheating of the knife and guards—readjust as necessary.

### 8.7.2 Adjusting Hold-Down with Stub Guards

**WARNING**
To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before adjusting machine.

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

2. Use a feeler gauge to measure the clearance between the stub guard hold-down (A) and the knife section. Ensure the clearance is between the following measurements:
   - **At hold-down tip (B):** 0.1–0.4 mm (0.004–0.016 in.)
   - **At rear of hold-down (C):** 0.1–1.0 mm (0.004–0.040 in.)

3. Adjust the clearance as follows:
   a. Tighten nuts (D) until they are finger tight.
   b. To lower the front of the hold-down and decrease clearance, turn three adjuster bolts (E) clockwise; to raise the front of the hold-down and increase clearance, turn adjuster bolts (E) counterclockwise.
   c. Torque nuts (D) to 88 Nm (65 lbf-ft) after all the adjustments are complete and the specified clearances are achieved.

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

4. Complete the hold-down adjustments, run the header at low engine speed, and listen for noise caused by insufficient clearance.

**IMPORTANT:**
Insufficient hold-down clearance will result in overheating of the knife and guards—readjust as necessary.
8.8 Centering the Reel

To check and center the reel, follow these steps:

**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.

**WARNING**

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

1. Start combine and lower reel and header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Measure clearance at locations (A) between reel and both endsheets. The clearances should be the same if the reel is centered. To see locations (A) in greater detail, refer to Figure 8.16, page 268.

![Figure 8.16: Double-Reel Measurement Locations](image-url)
NOTE:
The picture to the right shows reel endshield (A) and header endsheet (B). Measure the clearance between reel endshield (A) and header endsheet (B) at both ends of the header. The clearances should be the same if the reel is centered.

4. **Double Reel Only**: If the reel is not centered, follow these steps:
   a. Loosen bolt (A) on each brace (B).
   b. Move the forward end of center support arm (C) laterally as required to center both reels.
   c. Tighten bolts (A) and torque to 359 Nm (265 lbf·ft.).
5. **Single Reel Only**: If the reel is not centered, follow these steps:
   
a. Loosen bolt (A) on brace (B) at both ends of the reel.
   
b. Move the forward end of reel support arm (C) laterally as required to center the reel.
   
c. Tighten bolts (A), and torque to 359 Nm (265 lbf·ft.).

![Figure 8.19: Support Arm and Brace – Single Reel Only, Right End Shown, Left End Opposite](image-url)
8.9 Checking and Adjusting Header Float

The header is equipped with a suspension system that floats the header over the ground to compensate for ridges, trenches, and other variations in ground contour. If the header float is not set properly, it may cause the cutterbar to push into the ground or leave uncut crop. This procedure describes how to check header float and adjust to the factory-recommended settings.

**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.

Use the following guidelines when adjusting float:

- Turn each adjustment bolt pair equally. Repeat torque wrench reading procedure on both sides of header.
- Set the header float as light as possible without causing excessive bouncing to prevent knife component breakage, soil scooping, and soil build-up at the cutterbar in wet conditions.
- To avoid excessive bouncing and leaving a ragged cut, use a slower ground speed with a light float setting, if necessary.
- When cutting off the ground, use the stabilizer wheels in conjunction with header float to minimize bouncing at the header ends and to control cut height.

**NOTE:**
If adequate header float cannot be achieved using all of the available adjustments, an optional heavy-duty spring is available.

To check and adjust header float, follow these steps:

1. Park the combine on a level surface.
2. Level the header and float module. If the header and float module are not level, perform the following checks before adjusting the float:

   **IMPORTANT:**
   Do **NOT** use the float module springs to level the header.
   - Check that the combine feeder house is level.
   - Check that the top of the float module is level with the combine axle.
   - Ensure the combine tires are inflated equally.
3. Adjust header so that the cutterbar is 150–254 mm (6–10 in.) off the ground.
4. Extend the header angle hydraulic cylinder to between B and C on indicator (A).
5. Adjust the reel fore-aft position to between 5 and 6 on position indicator decal (A) located on the reel right arm.

6. Lower the reel fully.

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

8. Disengage both header float locks by pulling float lock handle (A) away from the float module and pushing the float lock handle down and into position (B) (UNLOCK).
9. Place stabilizer wheels and slow speed transport wheels (if equipped) in storage position as follows:
   a. Support the wheel weight by lifting slightly with one hand, and pull up on handle (A) to release the lock.
   b. Lift the wheels to the desired height, and engage the support channel into slot (B) in the upper support.
   c. Push down on handle (A) to lock.

10. Remove supplied torque wrench (A) from its storage position at the right side of the float module frame. Pull in the direction shown to disengage the wrench from the hook.

11. Place torque wrench (A) onto float lock (B). Note the position of the wrench for checking left or right side.

12. Push down on wrench to rotate bell crank (C) forward.
13. Push down on the wrench until indicator (A) reaches a maximum reading and then begins to decrease. Note the maximum reading. Repeat at opposite side.

14. Use the following table as a guide for float settings:
   - If reading on the wrench is high, the header is heavy
   - If reading on the wrench is low, the header is light

Table 8.2 Float Settings

<table>
<thead>
<tr>
<th>Header Size</th>
<th>Indicator Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cutting on the Ground</td>
</tr>
<tr>
<td>D120, D125, D130, and D135</td>
<td>1 1/2 to 2</td>
</tr>
<tr>
<td>D140 and D145</td>
<td>2 to 2 1/2</td>
</tr>
</tbody>
</table>
15. To access float spring adjustment bolts (A), loosen bolts (C) and rotate spring locks (B).

16. To increase float (decrease header weight), turn both adjustment bolts (A) on the left side clockwise. Repeat adjustment at opposite side.

To decrease float (increase header weight), turn left side adjustment bolts (A) counterclockwise. Repeat at opposite side.

**NOTE:**
Turn each bolt pair equally.

17. Adjust the float so the wrench readings are equal on both sides of the header.

18. Lock adjustment bolts (A) with spring locks (B). Ensure bolt heads (A) are engaged in the spring lock cutouts. Tighten bolts (C) to secure spring locks in place.

![Figure 8.28: Float Adjustment – Left Side](image-url)
8.10 Checking and Adjusting Skid Shoe Settings

To check and adjust skid shoes, follow these steps:

**DANGER**

To avoid bodily injury or death from unexpected start-up or fall of raised machine, always stop engine, remove key, and engage safety props before going under machine for any reason.

1. Raise the header fully.
2. Engage the header safety props.
3. Shut down the engine, and remove the key from the ignition.
4. Check the adjustment hole positions on lugs (A) on each skid shoe. They should be the same.
5. If necessary, adjust skid shoe as follows:
   a. Remove lynch pin (B).
   b. Hold shoe and remove pin (C) by disengaging frame and then pulling away from shoe.
   c. Raise or lower skid shoe to desired position using holes in support as a guide.
   d. Reinsert pin (C), engage in frame, and secure with lynch pin (B).
   e. Check that all skid shoes are adjusted to the same position.
6. Disengage the header safety props.
7. Lower the header fully.
8. Shut down the engine, and remove the key from the ignition.

Figure 8.29: Inner Skid Shoe

Figure 8.30: Outer Skid Shoe
8.11 Reel Clearance to Cutterbar

The minimum clearance between the reel fingers and the cutterbar ensures that the reel fingers do not contact the cutterbar during operation. The clearance is set at the factory, but some adjustment may be necessary before operation.

The finger to guard/cutterbar clearances with reels fully lowered are shown in the table below.

Table 8.3 Finger to Guard/Cutterbar Clearance

<table>
<thead>
<tr>
<th>Header Width</th>
<th>(X) 3 mm (+/- 1/8 in.) at Reel Ends</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Single Reel</td>
</tr>
<tr>
<td>6.1 m (20 ft.)</td>
<td>20 mm (3/4 in.)</td>
</tr>
<tr>
<td>7.6 m (25 ft.)</td>
<td>25 mm (1 in.)</td>
</tr>
<tr>
<td>9.1 m (30 ft.)</td>
<td>45 mm (1 3/4 in.)</td>
</tr>
<tr>
<td>10.7 m (35 ft.)</td>
<td>60 mm (2 3/8 in.)</td>
</tr>
<tr>
<td>12.2 m (40 ft.)</td>
<td>—</td>
</tr>
<tr>
<td>13.7 m (45 ft.)</td>
<td>—</td>
</tr>
</tbody>
</table>
8.11.1 Measuring Reel Clearance

**DANGER**
To avoid bodily injury or death from unexpected start-up or fall of raised machine, always stop engine, remove key, and engage safety props before going under header for any reason.

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

1. Start the engine.
2. Lower the header fully on level ground.
3. Set the fore-aft position to the middle position (5) on fore-aft position decal (A).
4. Lower the reel fully.
5. Shut down the engine, and remove the key from the ignition.

6. Measure clearance (X) between points (A) and (B) at certain measurement locations. For clearance specifications, refer to 8.11 Reel Clearance to Cutterbar, page 277.

For the measurement locations, refer to:
- Figure 8.34, page 279 – single reel
- Figure 8.35, page 279 – double reel

**NOTE:**
The reel is factory-set to provide more clearance at the center of the reel than at the ends (frown) to compensate for reel flexing.

**NOTE:**
When measuring reel clearance at the center of a double-reel header, measure the lowest reel.
Measurement location (A): Outer ends of the reel (two places).

![Figure 8.34: Single-Reel Measurement Locations](image)

Measurement location (A): Both ends of both reels (four places).

![Figure 8.35: Double-Reel Measurement Locations](image)

7. Adjust the reel clearance, if required. For instructions, refer to 8.11.2 Adjusting Reel Clearance, page 279.

### 8.11.2 Adjusting Reel Clearance

⚠️ **DANGER**

To avoid bodily injury or death from unexpected start-up or fall of raised machine, always stop engine, remove key, and engage safety props before going under header for any reason.

1. Raise the reel fully.
2. Engage the header safety props.
3. Shut down the engine, and remove the key from the ignition.
4. Adjust the outboard reel arm lift cylinders to set the clearance at the outboard ends of the reel as follows:
   a. Loosen bolt (A).
   b. Turn cylinder rod (B) out of clevis to raise reel and increase clearance to cutterbar, or turn cylinder rod into clevis to lower reel and decrease clearance.
   c. Tighten bolt (A).
   d. Repeat at opposite side.

5. For double reel: Adjust center arm lift cylinder stop (A) to change clearance at inboard ends of reels as follows:
   a. Loosen nut (B).
      NOTE: To make adjustment easier, lower reel onto the safety props after loosening nut (B).
   b. Turn nut (C) counterclockwise to raise reel and increase clearance to cutterbar, or clockwise to lower reel and decrease clearance.
   c. Tighten nut (B).

6. Check measurements and, if necessary, repeat adjustment procedures.
7. Move the reel back to ensure the steel end fingers do NOT contact the deflector shields.
8. If contact occurs, adjust the reel upward to maintain the clearance at all reel fore-aft positions. If contact cannot be avoided after adjusting the reel, trim the steel end fingers to obtain proper clearance.
9. Periodically check for evidence of contact during operation, and adjust clearance as required.
10. Shut down the engine, and remove the key from the ignition.
8.12 Adjusting Auger to Pan Clearance

**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.

**IMPORTANT:**

Maintain an appropriate distance between the auger and the auger pan. Too little clearance may result in the fingers or flighting contacting and damaging the feed draper or pan when operating the header at certain angles. Look for evidence of contact when greasing the float module.

1. Extend the center-link to the steepest header angle, and position the header 150–254 mm (6–10 in.) off the ground.
2. Shut down the engine, and remove the key from the ignition.
3. Ensure the float lock linkage is on the down stops (washer [A] cannot be moved) at both locations.

![Figure 8.38: Float Lock](image)

Figure 8.38: Float Lock
4. Before adjusting the auger to pan clearance, check the auger float position to determine how much clearance is required:

- If bolt head (A) is closest to floating symbol (B), the auger is in the floating position.

**IMPORTANT:**
Make sure bolts (A) are set at the same location on both ends of the header to prevent damaging the machine during operation.

- If bolt head (A) is closest to fixed symbol (B), the auger is in the fixed position.

**IMPORTANT:**
Make sure bolts (A) are set at the same location on both ends of the header to prevent damaging the machine during operation.
5. Loosen two nuts (B) and rotate the auger to position the flighting over the feed pan.

6. Turn bolt (A) clockwise to increase clearance (C); turn bolt (A) counterclockwise to decrease clearance (C).
   - If the feed auger is in the fixed position, set clearance to 22–26 mm (7/8–1.0 in.).
   - If the feed auger is in the floating position, set clearance to 11–15 mm (7/16–5/8 in.).

   **NOTE:**
   The clearance increases between 25–40 mm (1–1 1/2 in.) when the center-link is fully retracted.

7. Repeat Steps 5, page 283 and 6, page 283 for the opposite end of the auger.

   **IMPORTANT:**
   Adjusting one side of the auger can affect the other side. Always double-check both sides of the auger after making final adjustments.

8. Tighten nuts (B) on both ends of the feed auger. Torque the nuts to 93–99 Nm (68–73 lbf·ft).

9. Rotate the drum and double-check clearances.
8.13 Adjusting Draper Tension

The drapers are tensioned at the factory and rarely need adjustment. If adjustment is required, tension the drapers just enough to prevent slipping and to keep the draper from sagging below the cutterbar. Adjust drapers on both sides of the header.

⚠️ DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine, always stop engine, remove key, and engage safety props before going under machine for any reason.

1. Ensure white indicator bar (A) is at the halfway point in the window.

⚠️ WARNING

Check to be sure all bystanders have cleared the area.

2. Start the engine and fully raise the header.
3. Shut down the engine, and remove the key from the ignition.
4. Engage the header safety props.

5. Ensure the draper guide (the rubber track on the underside of the draper) is properly engaged in groove (A) on the drive roller.

Figure 8.42: Left Tension Adjuster Shown – Right Opposite

Figure 8.43: Drive Roller
6. Ensure idler roller (A) is between draper guides (B).

**IMPORTANT:**
Do **NOT** adjust nut (C). This nut is used for draper alignment only.

7. To loosen draper tension:
   • Turn adjuster bolt (A) counterclockwise. White indicator bar (B) will move outboard in the direction of arrow (D) to indicate that the draper is loosening. Loosen until the white indicator bar is at the halfway point in the window.

8. To tighten draper tension:
   • Turn adjuster bolt (A) clockwise. White indicator bar (B) will move inboard in direction of arrow (E) to indicate that the draper is tightening. Tighten until the white indicator bar is at the halfway point in the window.

**IMPORTANT:**
To avoid premature failure of the draper, draper rollers, and/or tightener components, do **NOT** operate if the white bar is not visible.

**IMPORTANT:**
To prevent scooping dirt, ensure the draper is tight enough that it does not sag below the point where the cutterbar contacts the ground.
8.14 Checking and Adjusting Feed Draper Tension

⚠️ DANGER

To avoid bodily injury or death from unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator’s seat, and always engage safety props before going under the machine for any reason.

1. Raise the header fully.
2. Shut down the engine, and remove the key from the ignition.
3. Engage the header safety props.

Checking draper tension:

4. Ensure the draper guide (the rubber track on the underside of the draper) is properly engaged in the groove on the drive roller, and the idler roller is between the guides.

NOTE:
Illustrations show the left side of the float module. The right side is opposite.

NOTE:
The default position of spring retainer (A) (white indicator) is centered (B) in the spring box window; however, the position of the spring retainer varies with draper tracking adjustment at the factory.

5. Check the position of white indicator (A). If the feed draper tracks properly and the spring retainers on both sides of the draper are correctly positioned, then no adjustment is necessary.

6. If adjustment is necessary, proceed to Step 7, page 286.

Adjusting draper tension:

7. Adjust the draper tension by loosening jam nut (A) and turning bolt (B) clockwise to increase draper tension or turning bolt (B) counterclockwise to decrease draper tension. Draper tension can be adjusted as follows:
   - Loosened to 3 mm (1/8 in.) (D) (aft of center in indicator window [E])
   - Tightened to 6 mm (1/4 in.) (C) (forward of center in indicator window [E])

IMPORTANT:
For small tension adjustments, you may need to only adjust one side of the draper. For larger tension adjustments and to avoid uneven draper tracking, you may need to adjust both sides of the draper an equal amount.

8. Tighten jam nut (A).
8.15 Checking and Adjusting Draper Seal

Maintain the deck height such that the draper runs just below the cutterbar.

IMPORTANT:
New factory-installed drapers are pressure and heat checked at the factory. The gap (deck seal) between draper and cutterbar is set to 0–3 mm (0.03–0.12 in.) at the factory to prevent material from entering into the side drapers and stalling them. When installing new drapers, however, it is NEVER acceptable for the gap to be less than 1 mm (0.04 in.) because new drapers are very tacky and there can be a buildup of powder coat on the underside of the cutterbar that can cause excessive drag and extremely high running pressure. A gap of 1–3 mm (0.04–0.12 in.) is acceptable. Follow this procedure to check the gap and adjust if required.

1. With the header in working position, check that clearance (A) between draper (B) and cutterbar (C) is 1–3 mm (0.04–0.12 in.).
   - If the deck height is acceptable, skip the remaining steps and proceed to 8.17 Lubricating Header, page 292.
   - If the deck height is NOT acceptable, adjust the seal as described in the following steps:

2. Take measurement at deck supports (A) with the header in working position. Depending on the header size, there are between two and eight supports per deck.

3. Loosen the draper tension. For instructions, refer to 8.13 Adjusting Draper Tension, page 284.
4. Lift front edge of draper (A) past cutterbar (B) to expose the deck support.

5. Measure and note the thickness of the draper belt.

6. Loosen two lock nuts (A) on deck support (B) one half-turn ONLY.

**NOTE:**
The deck is shown with the draper removed. The number of deck supports (B) is determined by the header width as follows:
- 6.1 m (20 ft.): Four supports
- 7.6–9.1 m (25–30 ft.): Six supports
- 10.7–12.2 m (35–40 ft.): Eight supports
- 13.7 m (45 ft.): Ten supports

7. Tap deck (C) with a hammer to lower the deck relative to the deck supports. Tap deck support (B) using a punch to raise the deck relative to the deck supports.

8. Locate a gauge that is the same thickness as the draper belt, plus 1 mm (0.04 in.). Slide the thickness gauge along deck (A) under the cutterbar in order to properly set the gap.

9. To create a seal, adjust deck (A) so that clearance (B) between cutterbar (C) and deck is the same thickness as the draper belt plus 1 mm (0.04 in.).

**NOTE:**
When checking clearance at either roller, measure from the roller tube, NOT the deck.

10. Tighten deck support hardware (D).

11. Recheck gap (B) with thickness gauge. For instructions, refer to Step 8, page 288.

12. Tension the draper. For instructions, refer to 8.13 Adjusting Draper Tension, page 284.
13. If required, adjust backsheet deflector (A) by loosening nut (D) and moving the deflector until there is a 1–7 mm (0.04–0.28 in.) gap (C) between draper (B) and the deflector.

Figure 8.53: Backsheet Deflector
8.16 Repositioning Right Draper Deflector Angle

The right draper deflector angle is shipped inside the header right endsheet. Install the deflector as follows:

1. Stop engine, and remove key from ignition.
2. Open right endshield (A).
3. Remove two screws (A) and deflector angle (B) from inside the endshield compartment. Retain deflector angle and screws for reinstallation.
   **NOTE:**
   Some parts removed from illustrations for clarity.

5. At inboard side of right endsheet, remove screws (A).
   Retain for reuse later in the procedure.
6. At lower end of deflector (B), remove bolts and nuts (C).
   Retain for reuse later in the procedure.
7. Position deflector angle (A) against the inward side of the endsheet and deflector (B). The end of the deflector angle furthest from cutterbar (C) fits under deflector (B).

8. Adjust deflector angle (A) downward to eliminate gaps between deflector angle (A) and cutterbar (C) at corner (D).

9. Corner (E) should contact the cutterbar first. If necessary, reduce bend angle of deflector angle.

10. Adjust deflector angle height as needed to eliminate gaps at cutterbar.

11. Attach deflector angle (A) to endsheet with screws (B) (retained from Step 3, page 290) and (C) (retained from Step 5, page 290).

12. Attach deflector angle to deflector (D) using bolts and nuts (E) (retained from Step 6, page 290).
8.17 Lubricating Header

Table 8.4 Recommended Lubricant

<table>
<thead>
<tr>
<th>Specification</th>
<th>Description</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAE multipurpose</td>
<td>High temperature, extreme pressure (EP2) performance with 1% max molybdenum disulphide (NLGI Grade 2) lithium base</td>
<td>As required unless otherwise specified</td>
</tr>
<tr>
<td>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>
</tr>
</tbody>
</table>

8.17.1 Greasing Procedure

Greasing points are identified on the machine by decals showing a grease gun and grease interval in hours of operation. Grease point layout decals are located on the header and on the right side of the float module.

⚠️ 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. Shut down the engine, and remove the key from the ignition.
2. Wipe grease fitting with a clean cloth before greasing to avoid injecting dirt and grit.

**IMPORTANT:**
Use clean, high-temperature, extreme-pressure grease only.

3. Inject grease through fitting with grease gun until grease overflows fitting (except where noted).

4. Leave excess grease on fitting to keep out dirt.

5. Replace any loose or broken fittings immediately.

6. Remove and thoroughly clean any fitting that will not take grease. Also clean lubricant passageway. Replace fitting if necessary.
8.17.2 Lubrication Points

Knifehead

IMPORTANT:
Overgreasing can cause the knife to bend and make contact with the guards closest to the knifehead. Check for signs of excessive heating on first few guards after greasing. If required, relieve some pressure by removing the grease fitting.

- To prevent binding and/or excessive wear caused by knife pressing on guards, do NOT overgrease knifehead (A).
- Apply only 1–2 pumps of grease with a grease gun, or just until the knifehead starts to move away from the arm. Do NOT use an electric grease gun.
- If more than 6–8 pumps of the grease gun are required to fill the cavity, replace the seal in the knifehead.
- Check for signs of excessive heating on first few guards after greasing. If required, relieve pressure by pressing check-ball in grease fitting.

NOTE:
Use high temperature extreme pressure (EP2) performance with 1% max molybdenum disulphide (NLGI Grade 2) lithium base grease unless otherwise specified.

Figure 8.62: Knifehead
Single Knife – One Place
Double Knife – Two Places

Figure 8.63: Knife Drive Bearing and Driveshaft – Double-Knife Timed Drive Only

A - Knife Drive Bearing - Double-Knife Drive - (Both Sides)  B - Knife Driveshaft - Double-Knife Timed Drive (Both Sides) (15 Pumps Minimum)
PERFORMING PREDELIVERY CHECKS

Figure 8.64: Drive Roller Bearing, Idler Roller, Slip Joint, and Driveline Universal

4. 10% moly grease is recommended for the driveline slip joint.
IMPORTANT:

Reel U-joint (C) has an extended lubrication cross and bearing kit. Stop greasing when greasing becomes difficult or if U-joint stops taking grease. **OVERGREASING WILL DAMAGE U-JOINT.** Six to eight pumps is sufficient at first grease (factory). As U-joint wears and requires more than six pumps, grease the joint more often.

Figure 8.66: Reel Shaft Bearings

A - Reel Shaft Right Bearing (One Place)
B - Reel Center Bearing (One Place)
C - Reel U-joint (One Place)
D - Reel Shaft left Bearing (One Place)
PERFORMING PREDELIVERY CHECKS

Figure 8.67: Rear Wheel Axle, Wheel Bearings, Frame/Wheel Pivot, and Front Wheel Pivot

A - Wheel Bearings (Four Places)  B - Front Wheel Pivot (One Place)  C - Frame/Wheel Pivot (One Place) Both Sides
8.18 Checking and Adjusting Endshields

Endshields are subject to expansion or contraction caused by large temperature variations. The position of the top pin and lower latch can be adjusted to compensate for dimensional changes.

**Checking the endshield:**

1. Check gap (X) between the front end of the shields and the header frame and compare to the values in Table 8.5, page 299.

**Table 8.5 Endshield Gap at Various Temperatures**

<table>
<thead>
<tr>
<th>Temperature in °C (°F)</th>
<th>Gap (X) mm (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 (45)</td>
<td>13–18 (1/2–23/32)</td>
</tr>
<tr>
<td>18 (65)</td>
<td>10–15 (3/8–19/32)</td>
</tr>
<tr>
<td>29 (85)</td>
<td>7–12 (9/32–15/32)</td>
</tr>
<tr>
<td>41 (105)</td>
<td>4–9 (5/32–11/32)</td>
</tr>
</tbody>
</table>

2. If the endshield gap is correct, proceed to the next procedure. If adjustment is required, proceed to Step 1, page 299.

**Opening the endshield:**

1. To unlock the shield, push release lever (A) located on the backside of the endshield.

2. Pull endshield open using handle depression (B).
3. Pull endshield at handle depression (A). Endshield is retained by hinge tab (B) and will open in direction (C).

4. Pull the endshield free of hinge tab (A) if additional clearance is required, and swing shield towards the rear of the header.

5. Engage safety catch (B) on hinge arm to secure the shield in fully-open position.

Adjusting the endshield gap:

1. Loosen four bolts (A) on support tube bracket (B).
2. Loosen three bolts (A) on latch assembly (B).

3. Adjust latch assembly (B) to achieve the desired gap between the front end of the shield and the header frame. Refer to Table 8.5, page 299 for the recommended endshield gap at various temperatures.

4. Tighten three bolts (A) on the latch assembly to 27 Nm (20 lbf-ft).

5. Tighten four bolts (A) on support tube bracket (B) to 31 Nm (23 lbf-ft).

**Closing the endshield:**

1. Disengage lock (B) to allow endshield to move.

2. Insert front of endshield behind hinge tab (A) and into divider cone.
PERFORMING PREDELIVERY CHECKS

3. Swing endshield in direction (A) into closed position. Engage lock with a firm push.
4. Verify that endshield is locked.

Figure 8.76: Left Endshield
8.19 Checking Manuals

Check the manual case contents. The manual case is located inside the left endshield.

1. Open the left endshield. Remove the cable tie on manual case (A).

3. Confirm that the case contains the following manuals:
   - D1 Series Draper Header for Combines Operator’s Manual
   - D1 Series Draper Header with FM100 Float Module Parts Catalog

4. Close case and endshield.
Chapter 9: Setting up Auto Header Height Control

9.1 Auto Header Height Control

MacDon’s auto header height control (AHHC) feature works in conjunction with the AHHC option available on certain combine models.

A sensor is installed in float indicator box (A) on the FM100 Float Module. This sensor sends a signal to the combine allowing it to maintain a consistent cutting height and an optimum float as the header follows ground contours. A lateral tilt two-sensor system is also available as an optional kit.

FM100 Float Modules are factory-equipped for AHHC; however, before using the AHHC feature, you must do the following:

1. Ensure that the AHHC sensor’s output voltage range is appropriate for the combine. For more information, refer to 9.1.3 Sensor Output Voltage Range — Combine Requirements, page 307.

2. Prepare the combine to use the AHHC feature (applies only to some combine models—refer to the following instructions for your combine).

3. Calibrate the AHHC system so that the combine can correctly interpret data from the height sensor on the float module (refer to the following instructions for your combine).

NOTE:

Once calibration is complete, you are ready to use the AHHC feature in the field. Individual combine settings can improve AHHC performance (refer to your combine instruction manual).
Refer to the following instructions for your specific combine model:

- **9.1.4 AGCO IDEAL™ Series Combines, page 318**
- **9.1.5 Case IH 5088/6088/7088 Combines, page 331**
- **9.1.7 Case IH 7010/8010, 120, 230, 240, and 250 Series Combines, page 342**
- **9.1.8 Challenger and Massey Ferguson 6 and 7 Series Combines, page 358**
- **9.1.9 CLAAS 500 Series Combines, page 366**
- **9.1.10 CLAAS 600 and 700 Series Combines, page 374**
- **9.1.11 CLAAS 8000/7000 Series Combines, page 383**
- **9.1.12 Gleaner R65/R66/R75/R76 and S Series Combines, page 392**
- **9.1.13 Gleaner S9 Series Combines, page 402**
- **9.1.14 John Deere 60 Series Combines, page 416**
- **9.1.15 John Deere 70 Series Combines, page 424**
- **9.1.16 John Deere S and T Series Combines, page 431**

### 9.1.1 Sensor Operation

The position sensors supplied with the auto header height control (AHHC) system are hall-effect sensors. Normal operating signal voltages for the sensors fall between 10% (0.5 VDC) and 90% (4.5 VDC). An increase in sensor voltage correlates to a decrease in ground pressure, or if you are cutting off the ground on gauge wheels, an increase in the header cut height.

Sensor errors result in a 0 V signal, indicating a faulty sensor, incorrect supply voltage, or a damaged wiring harness.

### 9.1.2 Troubleshooting Auto Header Height / Float Indicator

Use the following tables to determine the recommended repair procedure:

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
<th>Refer to</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Symptom: Float indicator not moving</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cable (A) is frayed</td>
<td>Replace cable.</td>
<td></td>
</tr>
<tr>
<td>Excessive material built up inside float indicator / auto header height frame</td>
<td>Clean out material.</td>
<td>—</td>
</tr>
<tr>
<td>Cable (A) fell off of pulleys (B)</td>
<td>Check pulleys and replace them if necessary.</td>
<td>—</td>
</tr>
<tr>
<td>Rubber sheath (C) came off of cable (A) and gets caught on the pulley</td>
<td>Install cable ties around the rubber sheath and cable to secure it.</td>
<td>—</td>
</tr>
<tr>
<td>Spring (D) seized from corrosion</td>
<td>Replace spring.</td>
<td>—</td>
</tr>
<tr>
<td>Cotter pin (E) breaks and pin spins</td>
<td>Check for seized pin in bore, clean if necessary, and then replace cotter pin.</td>
<td>—</td>
</tr>
<tr>
<td>Voltage range too low or high</td>
<td>Adjust voltage range.</td>
<td><a href="#">9.1.3 Sensor Output Voltage Range – Combine Requirements, page 307</a></td>
</tr>
<tr>
<td>Faulty sensor (F)</td>
<td>Replace sensor.</td>
<td>See your MacDon Dealer</td>
</tr>
</tbody>
</table>

215184 306 Revision A
9.1.3 Sensor Output Voltage Range – Combine Requirements

The auto header height control (AHHC) sensor output must be within a specific voltage range for each combine, or the AHHC feature will not work properly.

Table 9.1 Combine Voltage Limits

<table>
<thead>
<tr>
<th>Combine</th>
<th>Low Voltage Limit</th>
<th>High Voltage Limit</th>
<th>Range (Difference between High and Low Limits)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGCO IDEAL™ Series</td>
<td>0.5 V</td>
<td>4.5 V</td>
<td>2.5 V</td>
</tr>
<tr>
<td>Case IH 5088/6088/7088, 5130/6130/7130, 7010/8010, 7120/8120/9120, 7230/8230/9230, and 7240/8240/9240</td>
<td>0.5 V</td>
<td>4.5 V</td>
<td>2.5 V</td>
</tr>
<tr>
<td>Case IH 2588/2577</td>
<td>2.8 V</td>
<td>7.2 V</td>
<td>4.0 V</td>
</tr>
<tr>
<td>Challenger, Gleaner A, and Massey Ferguson</td>
<td>0.5 V</td>
<td>4.5 V</td>
<td>2.5 V</td>
</tr>
<tr>
<td>CLAAS 500/600/700 Series</td>
<td>0.5 V</td>
<td>4.5 V</td>
<td>2.5 V</td>
</tr>
<tr>
<td>Gleaner R and S Series</td>
<td>0.5 V</td>
<td>4.5 V</td>
<td>2.5 V</td>
</tr>
<tr>
<td>John Deere 60, 70, S, and T Series</td>
<td>0.5 V</td>
<td>4.5 V</td>
<td>2.5 V</td>
</tr>
<tr>
<td>New Holland CR/CX - 5 V system</td>
<td>0.7 V</td>
<td>4.3 V</td>
<td>2.5 V</td>
</tr>
<tr>
<td>New Holland CR/CX - 10 V system</td>
<td>2.8 V</td>
<td>7.2 V</td>
<td>4.1–4.4 V</td>
</tr>
</tbody>
</table>
Table 9.1 Combine Voltage Limits (continued)

**NOTE:**
Some combine models do not support checking sensor output voltage from the cab (early Case 23/2588 series, CLAAS 500/600/700 Series). For these models, check output voltage manually. Refer to *Manually Checking Voltage Range – One-Sensor System, page 308* or *Manually Checking Voltage Range – Two-Sensor System, page 311*.

---

**10 Volt Adapter (MD #B6421) – New Holland Combines Only**

New Holland combines with a 10 V system require the 10 V adapter (A) (MD #B6421) for proper calibration of the auto header height control (AHHC) feature.

If a 10 V New Holland combine does not have the adapter installed, the AHHC output will always read 0 V, regardless of sensor position.

**NOTE:**
A 10 V adapter is not available for the optional two-sensor system.

![10 V Adapter (MD #B6421)](image1)

Use a voltmeter to measure the voltage between Pin 1 (power) and Pin 2 (ground) wires at the AHHC sensor (A). This will determine whether the combine has a 5 V system or a 10 V system.

**NOTE:**
The combine key must be in the ON position, but the engine does not need to be running.

The three possible voltage readings are as follows:

- 0 V – combine key is in OFF position, or there is a faulty harness/bad connection
- 5 V – standard combine reading
- 10 V – 10 V combine reading; adapter (MD #B6421) is required

**Manually Checking Voltage Range – One-Sensor System**

The one-sensor system is standard for the FM100 Float Module. If equipped with the optional two-sensor system, refer to *Manually Checking Voltage Range – Two-Sensor System, page 311*.

The output voltage range of the auto header height control (AHHC) sensors in some combines can be checked from the cab. For instructions, refer to your combine operator’s manual or the AHHC instructions later in this document.

To manually check the sensor’s output voltage range, follow these steps:

1. Extend guard angle fully; the header angle indicator should be at D.
2. Position the header 150 mm (6 in.) above the ground, and unlock the float.

![Float Indicator Box](image2)
3. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

**NOTE:**
If the header is **NOT** on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system.

4. Locate linkage assembly (A). Verify that dimension (B) is set to 55 mm (2 3/16 in.). If it is not, adjust linkage (A).
5. Adjust cable take-up bracket (B) (if necessary) until float indicator pointer (A) is on 0.

6. Use a voltmeter (A) to measure the voltage between the ground (Pin 2) and signal (Pin 3) wires at the AHHC sensor in the float indicator box. Ensure it is at the high voltage limit for the combine. For voltage limit chart, refer to Table 9.1, page 307.

   **NOTE:**
   The wiring harness connector must be attached to the sensor. Do **NOT** disconnect it.

7. Fully lower the combine feeder house, and float the header up off the down stops (float indicator should be at 4, and the float module should be fully separated from the header).

   **NOTE:**
   You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

8. Use a voltmeter (A) to measure the voltage between the ground and signal wires at the AHHC sensor in the float indicator box. It should be at the low voltage limit for the combine. For voltage limit chart, refer to Table 9.1, page 307.

   **NOTE:**
   The wiring harness connector must be attached to the sensor. Do **NOT** disconnect it.

9. If the sensor voltage is not within the low and high limits, or if the range between the low and high limits is insufficient, adjust the voltage limits. Refer to *Adjusting Voltage Limits – One-Sensor System, page 314.*
**Manually Checking Voltage Range – Two-Sensor System**

FM100 Float Modules equipped with the optional two-sensor system have a left and right sensor located on the back frame of the float module.

⚠️ **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.

Figure 9.10: Sensor Orientation

1. Before adjusting the sensors, verify the sensor arms are properly installed on the sensors.
   - Left Sensor (A): The **point** on the arm of the sensor should face **away** from the header. The point on the float sensor arm (C) should be installed in the same direction, facing away from the header.
   - Right Sensor (B): The **point** on the arm of the sensor should face **away** from the header. The point on the float sensor arm (D) should be installed in the same direction, facing away from the header.

*To manually check the sensor’s output voltage range, follow these steps:*

2. Extend guard angle fully; the header angle indicator should be at **D**.
3. Position the header 150 mm (6 in.) above the ground, and unlock the float.
4. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

**NOTE:**
If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system.

5. Locate linkage assembly (A). Verify that dimension (B) is set to 55 mm (2 3/16 in.). If it is not, adjust linkage (A).
6. Adjust cable take-up bracket (B) (if necessary) until pointer (A) on the float indicator is on 0.

7. Use a voltmeter to measure the voltage between the ground (Pin 2) and signal (Pin 3) wires of AHHC sensor (A) at the back of the float module side frame. Ensure it is at the high voltage limit for the combine. For voltage limit chart, refer to Table 9.1, page 307.

   **NOTE:**
   The wiring harness connector must be attached to the sensor. Do **NOT** disconnect it.

8. Repeat at the opposite side.

9. Fully lower the combine feeder house, and float the header up off the down stops (float indicator [A] should be at 4, and the float module should be fully separated from the header).

   **NOTE:**
   You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.
10. Using a voltmeter, measure the voltage between the ground (Pin 2) and signal (Pin 3) wires of AHHC sensor (A) at the back of the side frame. Ensure it is at the low voltage limit for the combine. For voltage limit chart, refer to Table 9.1, page 307.

**NOTE:**
The wiring harness connector must be attached to the sensor. Do **NOT** disconnect it.

11. If the sensor voltage is not within the low and high limits, or if the range between the low and high limits is insufficient, adjust the voltage limits. For instructions, refer to *Adjusting Voltage Limits – Two-Sensor System, page 316.*

12. Repeat at the opposite side.

**Adjusting Voltage Limits – One-Sensor System**

Follow this procedure if you have checked the voltage range (either manually or from the cab) and found that the sensor voltage is not within the low and high limits, or that the range between the low and high limits is insufficient.

**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. Follow these steps to adjust the high voltage limit:
   a. Extend guard angle fully; the header angle indicator should be at D.
   b. Position header 152–254 mm (6–10 in.) above the ground; the float indicator should be at 0.
   c. Check the high voltage limit using the combine display or a voltmeter. For voltage limit chart, refer to Table 9.1, page 307.
   d. Loosen sensor-mounting nuts (A).
   e. Slide sensor support (B) to the right to increase high voltage limit or to the left to decrease it.
   f. Tighten sensor-mounting nuts (A).
2. Follow these steps to adjust the low voltage limit:
   a. Extend guard angle fully; the header angle indicator should be at D.
   b. Fully lower header on the ground; the float indicator should be at 4.
   c. Check the low voltage limit using the combine display or voltmeter. For voltage limit chart, refer to Table 9.1, page 307.
   d. Loosen sensor-mounting nuts (A).
   e. Rotate sensor (B) clockwise to increase low voltage limit or counterclockwise to decrease it.
   f. Tighten sensor-mounting nuts (A).
3. After making adjustments, recheck both the upper and lower voltage limits to make sure they are within the required range according to Table 9.1, page 307.
Adjusting Voltage Limits – Two-Sensor System

**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.

Figure 9.19: Sensor Orientation

1. Before adjusting the sensors, verify the sensor arms are properly installed on the sensors.
   - Left Sensor (A): The **point** on the arm of the sensor should face **away** from the header. The point on the float sensor arm (C) should be installed in the same direction, facing away from the header.
   - Right Sensor (B): The **point** on the arm of the sensor should face **away** from the header. The point on the float sensor arm (D) should be installed in the same direction, facing away from the header.

*Follow these steps to adjust the left sensor voltage:*

2. Extend guard angle fully; the header angle indicator should be at **D**.

3. Position header 150–254 mm (6–10 in.) above the ground; the float indicator should be at **0**.
4. Loosen sensor-mounting nuts (A).

5. Check that the left sensor is at the correct high voltage limit according to Table 9.1, page 307.

6. Rotate sensor (B) counterclockwise to lower the voltage. Rotate sensor clockwise to raise the voltage.

7. Tighten sensor-mounting nuts (A).

Figure 9.20: Optional Two-Sensor Kit – Left Sensor

*Follow these steps to adjust the right sensor voltage:*

8. Extend guard angle fully; the header angle indicator should be at D.

9. Position header 150–254 mm (6–10 in.) above the ground; the float indicator should be at 0.
10. Loosen sensor mounting nuts (A).

11. Rotate sensor (B) clockwise to lower the voltage. Rotate sensor counterclockwise to raise the voltage.

12. Check that the right sensor is at the correct high voltage limit according to Table 9.1, page 307.

13. Tighten sensor mounting nuts (A).

14. Fully lower the header; float indicator (A) should be at 4.

15. Check that both sensors are at the correct low voltage limit according to Table 9.1, page 307.

9.1.4 AGCO IDEAL™ Series Combines

Setting up the Header – AGCO IDEAL™ Series

NOTE:
Up-to-date images of the AGCO IDEAL™ Series combine display were not available at time of publishing. For instructions, refer to the combine operator’s manual for updates.
SETTING UP AUTO HEADER HEIGHT CONTROL

AGCO Tyton terminal (A) is used to set up and manage a MacDon header on an IDEAL™ combine. Use the touch screen display to select the desired item on the screen.

Figure 9.23: AGCO IDEAL™ Operator Station
A - Tyton Terminal  B - Control Handle
C - Throttle         D - Header Control Cluster

1. On the top right of the home screen, touch COMBINE icon (A). The COMBINE MAIN MENU opens.

2. On the COMBINE MAIN MENU, touch HEADER SETTINGS (A). The HEADER SETTINGS page opens.
3. Touch HEADER CONFIGURATION field (A). A dialog box showing predefined headers opens.

- If your MacDon header is already set up, it appears on the header list. Touch the MacDon header title (B) to highlight the selection in blue, and then touch green check mark (E) to continue.

- If only default header (D) is shown, touch ABC button (C), and use the on-screen keyboard to enter the MacDon header information. When complete, select one of the following options to return to the HEADER SETTINGS page:
  - Green check mark (E) saves the settings
  - Garbage can icon (F) deletes the highlighted header from the list
  - Red X (G) cancels the change(s)

![Figure 9.26: Header Configuration Menu on Header Settings Page](image-url)
4. To specify the type of header installed on the machine, touch HEADER TYPE field (A).

5. A list of predefined header types appears.
   - For MacDon D1 Series Draper and FD1 Series FlexDraper® headers, touch POWER FLOW (A)
   - Touch green check mark (B) to save the selection and continue

6. Make sure that REEL check box (A) is checked.
7. Touch REEL DIAMETER field (A) and a numeric keypad displays. Enter 102 for a MacDon reel.

8. Touch REEL PPR (Pulses Per Revolution) field (B) and enter 88 as the value for your MacDon header.

**NOTE:**
PPR is determined by the number of teeth on the reel speed sprocket.

9. Touch green check mark (B) at the bottom of numeric keypad (A) when complete, or the red X to cancel.

10. When complete, touch green check mark (A) at the bottom of the HEADER SETTINGS page.
Setting Minimum Reel Speed and Calibrating Reel – AGCO IDEAL™ Series

⚠️ WARNING
Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

NOTE:
Up-to-date images of the IDEAL™ combine display were not available at time of publishing. For instructions, refer to the combine operator’s manual for updates.

1. From the COMBINE MAIN MENU, touch REEL SETTINGS (A) to open the REEL SETTINGS page.

2. To set minimum reel speed, touch SPEED MINIMUM FIELD (B). The on-screen keyboard displays. Enter the desired value. Touch the green check mark to accept the new value, or the red X to cancel. The reel speed is shown in miles per hour (mph) and rotations per minute (rpm).

   NOTE:
   At the bottom of the REEL SETTINGS page, the reel diameter and reel pulses per revolution (PPR) are displayed. These values have already been set in the HEADER SETTINGS page.

3. Reel speed is calibrated on the REEL SETTINGS page by touching CALIBRATE button (A) in the top right of the page.

   NOTE:
The CALIBRATION WIZARD opens and displays a hazard warning.
4. Make sure to meet all the conditions listed in the CALIBRATION WIZARD warning. Press the green check mark to accept and start reel calibration. Pressing the red X will cancel the calibration procedure.

Figure 9.35: Calibration Wizard

5. A message appears in the CALIBRATION WIZARD stating that reel calibration has started. The reel will begin turning slowly and increase to high speed. A progress bar is provided. If necessary, touch the red X (not shown) to cancel. Otherwise, wait for the message that reel calibration has completed successfully. Touch the green check mark to save the calibrated settings.

Figure 9.36: Calibration Progress

Setting up Automatic Header Controls – AGCO IDEAL™ Series

Automatic header functions are configured on the HEADER SETTINGS page.

NOTE:
Up-to-date images of the IDEAL™ Series combine display were not available at time of publishing. For instructions, refer to the combine operator’s manual for updates.
1. **Automatic Control Functions**: There are toggle (OFF/ON) switches on the HEADER SETTINGS page for the automatic control functions. For MacDon headers, ensure the following two functions are enabled as shown:
   - RTC (return to cut) (A)
   - AHHC (automatic header height control) (B)
   All other switches are disabled (not highlighted).

2. **Sensitivity** setting (C) controls how responsive a control (RTC or AHHC) is to a given change in sensor feedback. The setting fields are located directly below the toggle switches. To enter a new sensitivity setting, touch the setting field below the specific toggle switch, and enter the new value in the on-screen keyboard.
   - Increase sensitivity if the combine does not change the feeder position quickly enough when in Auto Mode.
   - Decrease sensitivity if the combine hunts for a position in Auto Mode.

**NOTE:**
Recommended sensitivity starting points for MacDon headers are:
   - 50 for RTC (A)
   - 60 for AHHC (B)

3. **Header Speed**: HEADER CONTROL SPEED area (A) on the HEADER SETTINGS page is used to adjust the following speeds:
   - Tilt left and right is the lateral tilt of the combine faceplate
   - Header up and down (slow and fast speeds) is a two-stage button with slow speed on the first detent and fast on the second

**NOTE:**
Recommended header control speed starting points
   - Slow: Up 45/Down 40
   - Fast: Up 100/Down 100
4. **Header Offsets (A):** Offset distances are important for yield mapping. There are two adjustable dimensions on the HEADER SETTINGS page:

- Header Lateral Offset: the distance between the centerline of the header and the centerline of the machine. This should be set at 0 for a MacDon header.
- Feeder House to Cutter: the distance from the machine interface to the cutterbar. This should be set at 68 for a MacDon header.

![Figure 9.39: Header Offset Settings](image)

*Calibrating the Header – AGCO IDEAL™ Series*

The auto header control functions are configured on the HEADER SETTINGS page.

⚠️ **WARNING**

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

**NOTE:**

Up-to-date images of the IDEAL™ combine display were not available at time of publishing. For instructions, refer to the combine operator’s manual for updates.

1. On the COMBINE MAIN MENU, touch HEADER SETTINGS (A).

![Figure 9.40: Combine Main Menu](image)
2. Touch HEADER CALIBRATE (A) at the right side of the HEADER SETTINGS CONFIG page.

3. The hazard warning for HEADER CALIBRATION appears. Make sure that all conditions are met.

4. Touch the green check mark at the bottom of the page to start the calibration and follow the on-screen commands.

A progress bar is provided and the calibration can be stopped by touching the red X. The header moves automatically and erratically during this process.
5. When the calibration is complete:
   - Review summary information (A)
   - Review green check marks confirming calibrated functions (B)
   - Touch check mark (C) to save

**NOTE:**
Touch CALIBRATIONS icon (A) on MAIN MENU page to display the CALIBRATION MENU where you can choose from a variety of calibrations including header and reel calibration.

---

**Operating the Header – AGCO IDEAL™ Series**

**NOTE:**
Up-to-date images of the IDEAL™ combine display were not available at time of publishing. For instructions, refer to the combine operator’s manual for updates.

The following controls are used to operate the auto header height control (AHHC) functions:

- Tyton terminal (A)
- Control handle (B)
- Throttle (C)
- Header control cluster (D)

For instructions, refer to the combine operator’s manual to familiarize yourself with the controls.
1. With the header running, set lateral tilt to MANUAL by pressing switch (A) so the light above switch is off.

2. Engage the AHHC by pressing switch (B) so light above switch is on.

3. Press AHHC control switch (A) on the control handle to engage the AHHC. The header moves to the current setpoint position.

4. Use HEADER HEIGHT SETPOINT control dial (A) as necessary to fine-tune the position.

**Reviewing Header In-Field Settings – AGCO IDEAL™ Series**

**NOTE:**
Up-to-date images of the IDEAL™ combine display were not available at time of publishing. For instructions, refer to the combine operator’s manual for updates.
1. To view header group settings, touch HEADER icon (A) on the right side of the home page.

2. The following information is displayed:
   - CURRENT POSITION of header (B).
   - SETPOINT cut-off position (C) (indicated by red line)
   - HEADER symbol (D) – touch to adjust the setpoint cut-off position using the adjustment wheel on the right side of the Tyton terminal.
   - CUT HEIGHT for AHHC (E) – fine-tune with the header height setpoint control dial on the header control cluster.
   - HEADER WORKING WIDTH (F)
   - HEADER PITCH (G)

3. Touching a field opens the on-screen keyboard so that values can be adjusted. Enter the new value and touch the green check mark when complete.

NOTE:
Adjustment wheel (A) is located on the right of the Tyton terminal.

NOTE:
HEADER HEIGHT SETPOINT control dial (A) is on the header control cluster.
9.1.5 Case IH 5088/6088/7088 Combines

Calibrating the Auto Header Height Control – Case IH 5088/6088/7088

For best performance of the auto header height control (AHHC) system, perform ground calibration with center-link set to D. When calibration is complete, adjust the center-link back to desired header angle. For instructions, refer to the header operator’s manual.

NOTE:
Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator’s manual for updates.

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

NOTE:
If header float is set too light, it can prevent calibration of AHHC. You may need to set the float heavier for calibration procedure so header doesn’t separate from the float module.

1. Ensure center-link is set to D.
2. Set the float. For instructions, refer to operator’s manual for instructions.
4. Start the combine engine, but do NOT engage separator or feeder house.
5. Locate HEADER CONTROL switch (A) on the right console, and set to HT (this is AHHC mode).

6. Press HEADER LOWER switch (A) on the control handle until the float module and header are fully lowered. You may need to hold the switch for several seconds.

7. Press HEADER RAISE switch (A) on the control handle. The header should stop at about the halfway point. Continue holding the HEADER RAISE switch, and the header will rise until the feeder house reaches its upper limit. The AHHC system is now calibrated.

NOTE:
If float was set heavier to complete the AHHC calibration procedure, adjust to recommended operating float after the calibration is complete.

Figure 9.53: Right Console

Figure 9.54: Control Handle – Case IH 2300/2500
Setting the Sensitivity of the Auto Header Height – Case IH 5088/6088/7088

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small changes in ground height are needed to cause the feeder house to raise or lower. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the feeder house to raise or lower.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

1. Use HEADER SETTINGS key (A) to display the HEADER SENSITIVITY CHANGE page as shown in Figure 9.57, page 333.

2. Use the UP key (B) or DOWN key (C) to adjust the highlighted item. The height sensitivity setting range is 0 (least sensitive) to 250 (most sensitive) in increments of 10.

   NOTE:
   Adjustments take effect immediately. Use the CANCEL key to return to the original settings.

3. Use HEADER SETTINGS key (A) to highlight the next changeable item.

4. Use ENTER key (D) to save changes and return to the monitor screen. If there are no changes, the screen will return to the monitor screen after 5 seconds.
9.1.6 Case IH 130 and 140 Series Mid-Range Combines

Setting up the Header on the Combine Display – Case IH 5130/6130/7130; 5140/6140/7140

1. On the main page of the combine display, select TOOLBOX (A).
2. Select HEAD 1 tab (A). The HEADER SETUP page displays.

**NOTE:**
To locate the HEAD 1 tab, you may need to scroll to the right using side arrows (C).

3. From CUTTING TYPE menu (B), select PLATFORM.


5. From HEADER PRESSURE FLOAT menu (B), select NOT INSTALLED.

6. If you are operating a D1 Series Draper Header, from DRAPER GRAIN HEADER STYLE menu (C), select RIGID 2000 SERIES.

   If you are operating an FD1 Series FlexDraper® Header, from DRAPER GRAIN HEADER STYLE menu (C), select FLEX 2000 SERIES.

7. Locate HHC HEIGHT SENSITIVITY field (A), and set as follows:
   - **If using a two-sensor system:** Set HHC HEIGHT SENSITIVITY to 250.
   - **If using a single-sensor system:** Set HHC HEIGHT SENSITIVITY to 180.

**NOTE:**
If hunting occurs during operation, decrease this setting by 20 points at a time until hunting no longer occurs.

8. Set HHC TILT SENSITIVITY (B) to 150. Increase or decrease as desired.
9. From REEL DRIVE TYPE menu (A), select one of the following:
   - 4 if you are using a standard 19-tooth drive sprocket.
   - 5 if you are using an optional high-torque 14-tooth drive sprocket.
   - 6 if you are using an optional high-torque 10-tooth drive sprocket.

10. From REEL HEIGHT SENSOR menu (A), select YES.

11. Locate AUTOTILT field (A).
   - **If using a two-sensor system**: Select YES in the AUTOTILT field.
   - **If using a single-sensor system**: Select NO in the AUTOTILT field.

---

**Checking Voltage Range from Combine Cab – Case IH 5130/6130/7130; 5140/6140/7140**

**NOTE:**
Changes may have been made to combine controls or display since this document was published. For instructions, refer to the combine operator’s manual for updates.
WARNING

Check to be sure all bystanders have cleared the area.

1. Position the header 150 mm (6 in.) above the ground, and unlock the float.

2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

   NOTE:
   If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the auto header height control (AHHC) system.

3. Adjust cable take-up bracket (B) (if necessary) until pointer (A) on float indicator is on 0.

4. Ensure header float is unlocked.
5. On the main page of the combine display, select DIAGNOSTICS (A). The DIAGNOSTICS page opens.


7. From the GROUP menu, select HEADER (B).

8. From the PARAMETER menu, select LEFT HEIGHT/TILT SENSOR (A).
9. The SETTINGS page updates to display the voltage in VALUE/STATUS field (A). Lower the feeder house fully, and then raise it 305 mm (12 in.) off the ground to view the full range of voltage readings.

10. If the sensor voltage is not within the low and high limits, or if the range between the low and high limits is insufficient, adjust the voltage limits. For instructions, refer to *Adjusting Voltage Limits – One-Sensor System, page 314.*

**Figure 9.70: Case IH Combine Display**

**Calibrating Auto Header Height Control – Case IH 5130/6130/7130, 5140/6140/7140**

For best performance of the auto header height control (AHHC), perform these procedures with center-link set to D. When setup and calibration are complete, adjust center-link back to desired header angle. For instructions, refer to Header Angle in header operator’s manual for instructions.

⚠️ **WARNING**

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

**NOTE:**

This procedure applies to combines with a software version below 28.00. For instructions on calibrating the AHHC for combines with software version 28.00 or above, refer to *Calibrating the Auto Header Height Control – Case IH Combines with Version 28.00 or Higher Software, page 351.*

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. For instructions, refer to the combine operator’s manual for updates.

**NOTE:**

If header float is set too light, it can prevent calibration of AHHC. You may need to set the float heavier for calibration procedure so header doesn’t separate from the float module.

1. Ensure center-link is set to D.
2. Ensure all header and float module electrical and hydraulic connections are made.
3. Start the combine engine, but do **NOT** engage separator or feeder house.
4. Locate HEADER CONTROL switch (A) on the right console, and set to HT (this is AHHC mode).

5. Hold the DOWN button for 10 seconds, or until the combine feeder house has been lowered all the way down (the feeder house will stop moving).

6. Push the RAISE button and hold it until the feeder house travels all the way up. It will stop 61 cm (2 ft.) above ground for 5 seconds, then it will resume lift. This is an indication that calibration is successful.

**NOTE:**
If float was set heavier to complete the AHHC calibration procedure, adjust to recommended operating float after the calibration is complete.

---

**Setting Preset Cutting Height – Case 5130/6130/7130, 5140/6140/7140**

To set preset cutting height, follow these steps:

**NOTE:**
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

![Figure 9.71: Right Console](image1)

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

**NOTE:**
Indicator (A) should be at position 0 (B) with the header 152 mm (6 in.) off the ground. If not, the float sensor output voltage should be checked. For instructions, refer to Step 5, page 310. When the header is on the ground, the indicator should be at position 1 (C) for low ground pressure, and at position 4 (D) for high ground pressure. Crop and soil conditions determine the amount of float to use. The ideal setting is as light as possible without header bouncing or missing crop. Operating with heavy settings prematurely wears the cutterbar wearplates.

![Figure 9.72: Float Indicator Box](image2)
1. Engage separator and header.

2. Manually raise or lower the header to the desired cutting height.

3. Press 1 on button (A). A yellow light next to the button will illuminate.

   **NOTE:**
   When setting presets, always set header position before setting reel position. If header and reel are set at the same time, the reel setting will not be saved.

4. Manually raise or lower the reel to the desired working position.

5. Press 1 on button (A). A yellow light next to the button will illuminate.

6. Manually raise or lower the header to a second desired cutting height.

7. Press 2 on button (A). A yellow light next to the button will illuminate.

8. Manually raise or lower the reel to the desired working position.

9. Press 2 on button (A). A yellow light next to the button will illuminate.

   Up and down arrows should now appear in MANUAL HEIGHT box (A) on the RUN 1 page on the combine display. This indicates that the auto header height control (AHHC) is functioning.

---

**Figure 9.73: Case Combine Console**

**Figure 9.74: Case Combine Console**

**Figure 9.75: Case Combine Display – Run 1 Page**
10. To enable the presets, activate AHHC button (A) to place the header on the ground. To enable the first preset, tap the button once. To enable the second preset, tap the button twice.

To lift the header to maximum working height, hold the SHIFT button on the back of the control handle while tapping AHHC button (A).

11. The maximum working height can be adjusted on the HEADER SETUP page on the combine display. Enter the desired height in MAXIMUM WORKING HEIGHT field (A).

12. If you need to change the position of one of the presets, you can fine-tune this setting with button (A) on the combine console.
9.1.7  Case IH 7010/8010, 120, 230, 240, and 250 Series Combines

Checking Voltage Range from the Combine Cab – Case IH 8010

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

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

1. Position the header 150 mm (6 in.) above the ground, and unlock the float.

2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

   NOTE:
   If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system.

3. Adjust cable take-up bracket (B) (if necessary) until pointer (A) on float indicator is on 0.
4. Ensure header float is unlocked.

5. Select DIAG (A) on the Universal display MAIN screen. The DIAG screen displays.


7. Select HDR HEIGHT/TILT (A). The SENSOR screen displays.
8. Select LEFT SEN (A). The exact voltage is displayed. Raise and lower the header to see the full range of voltage readings.

9. If the sensor voltage is not within the low and high limits, or if the range between the low and high limits is insufficient, adjust the voltage limits. For instructions, refer to Adjusting Voltage Limits – One-Sensor System, page 314.

**Setting Header Controls – Case IH 8010**

The following procedure applies to Case IH 8010 combines without a shift button on the control handle.

The REEL FORE-AFT switches (A) also control header fore-aft tilt if header is equipped with the fore-aft tilt option. The switches can be configured to allow the Operator to swap between reel fore-aft and header fore-aft tilt.

To set the header controls, follow these steps:
1. To swap between reel fore-aft controls and header fore-aft tilt controls, go to the LAYOUT tab, select FORE/AFT CONTROL (A) from the legend, and place it on one of the operator-configurable screens (HARV1, HARV2, HARV3) or ADJUST under the RUN menu.

**NOTE:**
H F/A (B) is displayed on the status bar on the right of the screen when HEADER is selected with the FORE/AFT CONTROL.

2. If HEADER is selected with the FORE/AFT CONTROL, press the reel aft button on the control handle to tilt the header rearward, or press the reel fore button on the control handle to tilt the header forward.

### Checking Voltage Range from the Combine Cab – Case IH 7010/8010, 120, 230, 240, and 250 Series Combines

**NOTE:**
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

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

1. Position the header 150 mm (6 in.) above the ground, and unlock the float.

2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

**NOTE:**
If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the auto header height control (AHHC) system.
3. Adjust cable take-up bracket (B) (if necessary) until pointer (A) on float indicator is on 0.

4. Ensure header float is unlocked.

5. Select DIAGNOSTICS (A) on the MAIN page. The DIAGNOSTICS page opens.

6. Select SETTINGS. The SETTINGs page opens.

7. Select GROUP arrow (A). The GROUP dialog box opens.

9. Select LEFT HEADER HEIGHT SEN (A), and then select the GRAPH button (B). The exact voltage is displayed at top of page. Raise and lower the header to see the full range of voltage readings.

10. If the sensor voltage is not within the low and high limits, or if the range between the low and high limits is insufficient, adjust the voltage limits. For instructions, refer to Adjusting Voltage Limits – One-Sensor System, page 314.

Calibrating the Auto Header Height Control – Case IH 7010/8010, 120, 230, 240, and 250 Series Combines

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. For instructions, refer to the header operator’s manual.

⚠️ WARNING

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

NOTE:
This procedure applies to combines with a software version below 28.00. For instructions on calibrating the AHHC for combines with software version 28.00 or above, refer to Calibrating the Auto Header Height Control – Case IH Combines with Version 28.00 or Higher Software, page 351.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.
NOTE:
If header float is set too light, it can prevent calibration of AHHC. You may need to set the float heavier for calibration procedure so header doesn’t separate from the float module.

1. Ensure center-link is set to D.
2. Ensure all header and float module electrical and hydraulic connections are made.
3. Select TOOLBOX (A) on the MAIN page.

4. Select HEADER tab (A).

   **NOTE:**
   To locate the HEADER tab, you may need to scroll to the right using side arrows (C).

5. Set appropriate HEADER STYLE (B).

6. Set AUTO REEL SPEED SLOPE.

   **NOTE:**
   The AUTO REEL SPEED SLOPE value is the percentage of the reel speed compared to the ground speed. For example, if the value is set to 100, then the reel speed will be the same as the ground speed. Normally you want the reel going slightly faster than the ground speed. However, adjust the value according to crop conditions.

7. Set HEADER PRESSURE FLOAT to NO if equipped, and ensure REEL DRIVE is HYDRAULIC.
8. Install REEL FORE-BACK to YES (if applicable).

9. Locate HHC HEIGHT SENSITIVITY field (A), and set as follows:
   - If using a two-sensor system: Set HHC HEIGHT SENSITIVITY to 250.
   - If using a single-sensor system: Set HHC HEIGHT SENSITIVITY to 180.

   **NOTE:**
   If hunting occurs during operation, decrease this setting by 20 points at a time until hunting no longer occurs.

10. Set HHC TILT SENSITIVITY (B) to 150. Increase or decrease as desired.

11. Install FORE/AFT CONTROL and HDR FORE/AFT TILT (if applicable).
12. Press HEAD2 (A) at bottom of page.
13. Ensure HEADER TYPE (B) is DRAPER.
   NOTE: If recognition resistor is plugged in to header harness, you
   will not be able to change this.
14. Set CUTTING TYPE (C) to PLATFORM.
15. Set appropriate HEADER WIDTH (D) and HEADER USAGE (E).

16. From the REEL HEIGHT SENSOR menu, select YES (A).

17. Locate AUTOTILT field (A).
   - **If using a two-sensor system:** Select YES in the AUTOTILT field.
   - **If using a single-sensor system:** Select NO in the AUTOTILT field.
   NOTE: If float was set heavier to complete the AHHC calibration
   procedure, adjust to recommended operating float after the calibration is complete.
Calibrating the Auto Header Height Control – Case IH Combines with Version 28.00 or Higher Software

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. For instructions, refer to the header operator’s manual.

⚠️ WARNING ⚠️
Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

NOTE:
If header float is set too light, it can prevent calibration of AHHC. You may need to set the float heavier for calibration procedure so header doesn’t separate from the float module.

1. Ensure header center-link is set to D.
2. Raise header on down stops and unlock float.
3. Select TOOLBOX (A) on the MAIN page.

4. Select HEAD 1 tab (A).

   NOTE:
   To locate the HEAD 1 tab, you may need to scroll to the right using side arrows (B).
5. Locate the HEADER SUB TYPE field.

7. Select HEAD 2 tab (A).
8. In HEADER SENSORS field (B), select ENABLE.
9. In HEADER PRESSURE FLOAT field (C), select NO.
10. In HEIGHT/TILT RESPONSE field (D), select FAST.
11. In AUTO HEIGHT OVERRIDE field (E), select YES.
12. Press down arrow (F) to go to the next page.

13. Locate HHC HEIGHT SENSITIVITY field (A), and set as follows:
   • If using a single-sensor system: Set HHC HEIGHT SENSITIVITY to 180.
   • If using a two-sensor system: Set HHC HEIGHT SENSITIVITY to 250.

   NOTE:
   If hunting occurs during operation, decrease this setting by 20 points at a time until hunting no longer occurs.

14. Set HHC TILT SENSITIVITY (B) to 150. Increase or decrease as desired.
15. From the REEL HEIGHT SENSOR menu, select YES (A).

16. Locate AUTOTILT field (A).
   - If using a two-sensor system: Select YES in the AUTOTILT field.
   - If using a single-sensor system: Select NO in the AUTOTILT field.

**NOTE:**
Icons (A) and (B) appear on the monitor only after engaging the separator and header, and then pressing HEADER RESUME button on the control panel.

17. Ensure AUTO HEIGHT icon (A) appears on the monitor and is displayed as shown at location (B). When the header is set for cutting on the ground, this verifies that the combine is correctly using the sensor on the header to sense ground pressure.

**NOTE:**
AUTO HEIGHT field (B) may appear on any of the RUN tabs and not necessarily on the RUN 1 tab.
18. Select CALIBRATION on the combine display, and press the right arrow navigation key to enter the information box.

19. Select HEADER (A), and press ENTER. The CALIBRATION dialog box opens.

**NOTE:**
You can use the up and down navigation keys to move between options.

20. Follow the calibration steps in the order in which they appear in the dialog box. As you proceed through the calibration process, the display will automatically update to show the next step.

**NOTE:**
Pressing the ESC key during any of the steps or letting the system sit idle for more than 3 minutes will cause the calibration procedure to stop.

**NOTE:**
Refer to your combine operator’s manual for an explanation of any error codes.

21. When all steps have been completed, CALIBRATION SUCCESSFUL message is displayed on the page. Exit the CALIBRATION menu by pressing the ENTER or ESC key.

**NOTE:**
If float was set heavier to complete the AHHC calibration procedure, adjust to recommended operating float after the calibration is complete.

---

**Figure 9.111: Case IH Combine Display**

**Figure 9.112: Case IH Combine Display**
Checking Reel Height Sensor Voltages – Case IH Combines

⚠️ WARNING

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

1. On the main page of the combine display, select DIAGNOSTICS (A). The DIAGNOSTICS page opens.

2. Select SETTINGS tab (A). The SETTINGS page opens.

3. From the GROUP menu, select HEADER (B).

4. From the PARAMETER menu, select REEL VERTICAL POSITION (C).
5. Select GRAPH tab (A). The REEL VERTICAL POSITION graph displays.

6. Lower the reel to view high voltage (B). The voltage should be 4.1–4.5 V.

7. Raise the reel to view low voltage (C). The voltage should be 0.5–0.9 V.

8. If either voltage is out of range, refer to 10 Checking and Adjusting Reel Height Sensor, page 487.

Figure 9.115: Case IH Combine Display
Setting Preset Cutting Height – Case IH 7010/8010, 120, 230, 240, and 250 Series Combines

To set the preset cutting height, follow these steps:

**WARNING**

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

**NOTE:**
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

**NOTE:**
Indicator (A) should be at position 0 (B) with the header 152 mm (6 in.) off the ground. If not, the float sensor output voltage should be checked. For instructions, refer to Step 5, page 310. When the header is on the ground, the indicator should be at position 1 (C) for low ground pressure, and at position 4 (D) for high ground pressure. Crop and soil conditions determine the amount of float to use. The ideal setting is as light as possible without header bouncing or missing crop. Operating with heavy settings prematurely wears the cutterbar wearplates.

1. Engage separator and header.
2. Manually raise or lower header to a desired cutting height.
3. Press SET #1 switch (A). Light (C) beside switch (A) will illuminate.
   
   **NOTE:**
   Use switch (E) for fine adjustments.

   **NOTE:**
   When setting presets, always set header position before setting reel position. If header and reel are set at the same time, the reel setting will not save.

4. Manually raise or lower the reel to the desired position.
5. Press SET #1 switch (A). Light (C) beside switch (A) will illuminate.
6. Manually raise or lower the header to a second desired cutting height.
7. Press SET #2 switch (B). Light (D) beside switch (B) will illuminate.
8. Manually raise or lower the reel to a second desired working position.
9. Press SET #2 switch (B). Light (D) beside switch (B) will illuminate.

**Figure 9.116: Float Indicator Box**

**Figure 9.117: Case Combine Controls**
10. To swap between set points, press HEADER RESUME (A).

11. To raise header at headlands, press and hold SHIFT button (B) at the back of the control handle and press HEADER RESUME switch (A). To lower header, press HEADER RESUME switch (A) once to return to header preset height.

**NOTE:**
Pressing HEADER RAISE/LOWER switches (C) and (D) disengages AUTO HEIGHT mode. Press HEADER RESUME (A) to re-engage.

---

**Figure 9.118: Case Combine Controls**

---

### 9.1.8 Challenger and Massey Ferguson 6 and 7 Series Combines

**Checking Voltage Range from the Combine Cab – Challenger and Massey Ferguson**

**WARNING**
Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

**NOTE:**
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

1. Position the header 150 mm (6 in.) above the ground, and unlock the float.

2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

**NOTE:**
If the header is not on down stops during the next two steps, the voltage may go out of range during operation, causing a malfunction of the auto header height control (AHHC) system.

---

**Figure 9.119: Float Lock**
3. Adjust cable take-up bracket (B) (if necessary) until float indicator pointer (A) is on 0.

4. Go to the FIELD page on the combine monitor, and then press the diagnostics icon. The MISCELLANEOUS page displays.

5. Press VMM DIAGNOSTIC button (A). The VMM DIAGNOSTIC page displays.

6. Go to ANALOG IN tab (A), and then select VMM MODULE 3 by pressing the text box below the four tabs. The voltage from the AHHC sensor is now displayed on page as HEADER HEIGHT RIGHT POT and HEADER HEIGHT LEFT POT. The readings may be slightly different.
7. Fully lower the combine feeder house (float module should be fully separated from the header).

**NOTE:**
You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

8. Read voltage.

9. Raise header so cutterbar is 150 mm (6 in.) off the ground.

10. Read voltage.

11. If the sensor voltage is not within the low and high limits, or if the range between the low and high limits is insufficient, adjust the voltage limits. For instructions, refer to *Adjusting Voltage Limits – One-Sensor System, page 314* or *Adjusting Voltage Limits – Two-Sensor System, page 316*.

**Engaging the Auto Header Height Control – Challenger and Massey Ferguson**

**NOTE:**
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

The following system components are required in order for the auto header height control (AHHC) to work:

- Main module (PCB board) and header driver module (PCB board) mounted in card box in fuse panel module (FP)
- Multifunction control handle operator inputs
- Operator inputs mounted in the control console module (CC) panel

**NOTE:**
In addition to the above components, the electrohydraulic header lift control valve is an integral part of the system.

Engage the AHHC as follows:

1. Scroll through the header control options on the combine display using the header control switch until AHHC icon (A) is displayed in the first message box. The AHHC will adjust the header height in relation to the ground according to the height setting and sensitivity setting.

**Calibrating the Auto Header Height Control – Challenger and Massey Ferguson**

⚠️ **WARNING**
Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.
NOTE:
For best performance of the auto header height control (AHHC) system, perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. For instructions, refer to Header Angle in the header operator’s manual.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

NOTE:
If the header float is set too light, it can prevent AHHC calibration. You may need to set the float heavier for the calibration procedure so the header doesn’t separate from the float module.

1. Ensure center-link is set to D.

5. Read the warning message, and then press the green check mark button.

6. Follow the on-screen prompts to complete calibration.

   **NOTE:**
   The calibration procedure can be canceled at any time by pressing the cancel button in the bottom right corner of the screen. While the header calibration is running, the calibration can also be canceled by using the UP, DOWN, TILT RIGHT, or TILT LEFT buttons on the control handle.

   **NOTE:**
   If the combine does not have HEADER TILT installed or if it is inoperable, you may receive warnings during calibration. Press the green check mark if these warnings appear. This will not affect the AHHC calibration.

   **NOTE:**
   If the float was set heavier to complete the AHHC calibration procedure, adjust to the recommended operating float after the calibration is complete.
Adjusting the Header Height – Challenger and Massey Ferguson

Once the auto header height control (AHHC) is activated, press and release the HEADER LOWER button on the control handle. The AHHC will automatically lower the header to the selected height setting.

⚠️ WARNING

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

You can adjust the selected AHHC height using HEIGHT ADJUSTMENT knob (A) on the control console. Turning the knob clockwise increases the selected height, and turning the knob counterclockwise decreases the selected height.

Adjusting the Header Raise/Lower Rate – Challenger and Massey Ferguson

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

1. Press Header icon (A) on the FIELD screen. The HEADER screen displays.

3. Go to the TABLE SETTINGs tab.

4. Press up arrow on MAX UP PWM to increase percentage number and increase raise speed. Press down arrow on MAX UP PWM to decrease percentage number and decrease raise speed.

5. Press up arrow on MAX DOWN PWM to increase percentage number and increase lower speed. Press down arrow on MAX DOWN PWM to decrease percentage number and decrease lower speed.
Setting the Sensitivity of the Auto Header Height Control – Challenger and Massey Ferguson

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small changes in ground height are needed to cause the feeder house to raise or lower. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the feeder house to raise or lower.

WARNING

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

1. Press the HEADER icon on the FIELD screen. The HEADER screen appears.

2. Press HEADER CONTROL button (A). The HEADER CONTROL screen appears. You can adjust sensitivity on this screen using the up and down arrows.

3. Adjust the sensitivity to the maximum setting.

4. Activate the AHHC, and press the HEADER LOWER button on the control handle.

5. Decrease the sensitivity until the feeder house remains steady and does not bounce up and down.

NOTE:
This is the maximum sensitivity and is only an initial setting. The final setting must be made in the field, as the system reaction will vary with changing surfaces and operating conditions.

NOTE:
If maximum sensitivity is not needed, a less sensitive setting will reduce the frequency of header height corrections and component wear. Partially opening the accumulator valve will cushion the action of the header lift cylinders and reduce header hunting.
9.1.9 CLAAS 500 Series Combines

Calibrating the Auto Header Height Control – CLAAS 500 Series

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. For instructions, refer to Header Angle in the header operator’s manual for instructions.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

NOTE:
If header float is set too light, it can prevent calibration of AHHC. You may need to set the float heavier for calibration procedure so header doesn’t separate from the float module.

1. Ensure center-link is set to D.

2. Use < key (A) or > key (B) to select AUTO HEADER, and press OK key (C). The E5 screen displays whether the automatic header height is on or off.

3. Use – key (A) or + key (B) to turn the AHHC on, and press OK key (C).

4. Engage the threshing mechanism and the header.
5. Use the < or > key to select CUTT. HEIGHT LIMITS, and press the combine controls OK key.

6. Follow the procedure displayed on the screen to program the upper and lower limits of the header into the CEBIS.

7. Use the < or > key to select SENSITIVITY CAC, and press the combine controls OK key.

   **NOTE:**
   Setting the sensitivity of the AHHC system affects the reaction speed of the AHHC on the header.

8. Use the – key or the + key to change the setting of the reaction speed, and press the combine controls OK key.

9. Use line (A) or value (B) to determine the sensitivity setting.

   **NOTE:**
   The setting can be adjusted from 0–100%. When sensitivity is adjusted to 0%, the signals from the sensing bands have no effect on the automatic cutting height adjustment. When sensitivity is adjusted to 100%, the signals from the sensing bands have maximum effect on the automatic cutting height adjustment. The recommended starting point is 50%.

   **NOTE:**
   If float was set heavier to complete the AHHC calibration procedure, adjust to recommended operating float after the calibration is complete.
Setting Cutting Height – CLAAS 500 Series

Cutting heights can be programmed into the preset cutting height and auto contour systems. Use the preset cutting height system for cutting heights above 150 mm (6 in.), and use the auto contour system for cutting heights below 150 mm (6 in.).

Setting Preset Cutting Height – CLAAS 500 Series

**WARNING**

Check to be sure all bystanders have cleared the area.

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

1. Start the engine.
2. Activate the machine enable switch.
3. Engage the threshing mechanism.
4. Engage the header.
5. Briefly press button (A) in order to activate the auto contour system, or briefly press button (B) in order to activate the preset cutting height system.

**NOTE:**

Button (A) is used only with auto header height control (AHHC) function. Button (B) is used only with the return to cut function.

6. Use < key (C) or > key (D) to select the CUTTING HEIGHT screen, and press OK key (E).
7. Use – key (A) or + key (B) to set the desired cutting height. An arrow indicates the selected cutting height on the scale.
8. Briefly press button (A) or button (B) in order to select the set point.

9. Repeat Step 7, page 368 for the set point.

Setting Cutting Height Manually – CLAAS 500 Series

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

**NOTE:**
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

1. Use button (A) to raise the header, or button (B) to lower the header to the desired cutting height.

2. Press and hold button (C) for 3 seconds to store the cutting height into the CEBIS (an alarm will sound when the new setting has been stored).

3. Program a second set point, if desired, by using button (A) to raise the header, or button (B) to lower the header to the desired cutting height, and briefly press button (C) to store the second set point into the CEBIS (an alarm will sound when the new setting has been stored).

**NOTE:**
For above-the-ground cutting, repeat Step 1, page 369, and use button (D) instead of button (C) while repeating Step 2, page 369.
Setting the Sensitivity of the Auto Header Height Control – CLAAS 500 Series

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small changes in ground height are needed to cause the feeder house to raise or lower. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the feeder house to raise or lower.

NOTE:
The upper and lower limits of the header must be programmed into the CEBIS before adjusting the sensitivity of the AHHC system. The setting can be adjusted from 0–100%. When sensitivity is adjusted to 0%, the signals from the sensing bands have no effect on the automatic cutting height adjustment. When sensitivity is adjusted to 100%, the signals from the sensing bands have maximum effect on the automatic cutting height adjustment. The recommended starting point is 50%.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

1. Use < key (C) or > key (D) to select SENSITIVITY CAC, and press OK key (E).
2. Use – key (A) or + (B) key to change the reaction speed setting, and press OK key (E).
3. Use line (A) or value (B) to determine the sensitivity setting.
Figure 9.147: Flow Chart for Setting the Sensitivity of the Float Optimizer
Adjusting Auto Reel Speed – CLAAS 500 Series

The preset reel speed can be set when the automatic header functions are activated.

**NOTE:**
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

1. Use the < or > key to select REEL WINDOW. Window E15 will display the current advance or retard speed of the reel in relation to the ground speed.

2. Press OK key (C) to open the REEL SPEED window.

3. Use – key (A) or + key (B) to set the reel speed in relation to the current ground speed. Window E15 will display the selected reel speed.

4. Manually adjust the reel speed by rotating the rotary switch to reel position (A), and then use the – or + key to set the reel speed.
5. Press and hold button (A) or button (B) for 3 seconds to store the setting into the CEBIS (an alarm will sound when the new setting has been stored).

**NOTE:**
Whenever button (A) or button (B) is pressed for 3 seconds, the current positions for reel speed and cutting height are stored.

6. Use the < or > key to select the REEL WINDOW. Window E15 will display the current advance or retard speed of the reel in relation to the ground speed.
7. Press OK key (E), and use < key (C) or > key (D) to select the REEL FORE AND AFT window.
8. Use – key (A) or + key (B) to set the reel fore-aft position.

**NOTE:**
Control handle button (A) or button (B) (as shown in Figure 9.155, page 374) can also be used to set the reel fore-aft position.

9. Press and hold button (A) or button (B) for 3 seconds to store the setting into the CEBIS (an alarm will sound when the new setting has been stored).

**NOTE:**
Whenever button (A) or button (B) is pressed for 3 seconds, the current positions for reel speed and cutting height are stored.

### 9.1.10 CLAAS 600 and 700 Series Combines

**Calibrating the Auto Header Height Control – CLAAS 600 and 700 Series**

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. For instructions, refer to Header Angle in the header operator’s manual for instructions.

**NOTE:**
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

**NOTE:**
If header float is set too light, it can prevent AHHC calibration. You may need to set the float heavier for calibration procedure so header doesn’t separate from the float module.

1. Ensure center-link is set to D.
2. Ensure that the header float is unlocked.
3. Use control knob (A) to highlight AUTO CONTOUR icon (B) and press control knob (A) to select it.

4. Use control knob (A) to highlight the icon that resembles a header with up and down arrows (not shown), and press control knob (A) to select it. Highlighted header icon (B) will be displayed on the screen.

5. Use control knob (A) to highlight the icon that resembles a header with up and down arrows (B), and press control knob (A) to select it.
6. Use control knob (A) to highlight the icon that resembles a screwdriver (B).

7. Engage the combine separator and feeder house.

8. Press control knob (A) and a progress bar will appear.

9. Fully raise the feeder house. Progress bar (A) will advance to 25%.

10. Fully lower the feeder house. Progress bar (A) will advance to 50%.

11. Fully raise the feeder house. Progress bar (A) will advance to 75%.

12. Fully lower the feeder house. Progress bar (A) will advance to 100%.

13. Ensure progress bar (A) displays 100%. The calibration procedure is now complete.

**NOTE:**
If the voltage is not within the range of 0.5–4.5 V at any time throughout the calibration process, the monitor will indicate learning procedure not concluded.

**NOTE:**
If float was set heavier to complete ground calibration procedure, adjust to recommended operating float after the calibration is complete.
Setting Cutting Height – CLAAS 600 and 700 Series

**WARNING**

Check to be sure all bystanders have cleared the area.

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

1. Lower the header to desired cutting height or ground pressure setting. The float indicator box should be set to 1.5.
2. Hold the left side of header raise and lower switch (A) until you hear a ping.

**NOTE:**

You can set two different cutting heights.

Setting the Sensitivity of the Auto Header Height Control – CLAAS 600 and 700 Series

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small changes in ground height are needed to cause the feeder house to raise or lower. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the feeder house to raise or lower.

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

1. Use control knob (A) to highlight HEADER/REEL icon (B), and press control knob (A) to select it. The HEADER/REEL dialog box opens.
2. Select HEADER icon.

4. Select SENSITIVITY CAC (B) from the list.

5. Select SENSITIVITY CAC icon (A).

NOTE:
To set the sensitivity, you will have to change CUTTING HEIGHT ADJUSTMENT (B) from the 0 default. The settings from 1–50 provide a faster response, whereas the settings from -1 to -50 provide a slower response. For best results, make adjustments in increments of 5.

6. Increase the CUTTING HEIGHT ADJUSTMENT setting if the reaction time between the header and the float module is too slow while cutting on the ground, and decrease the CUTTING HEIGHT ADJUSTMENT setting if the reaction time between the header and the float module is too fast.

7. Increase the sensitivity if the header is lowered too slowly, and decrease the sensitivity if the header hits the ground too hard or is lowered too quickly.
Adjusting Auto Reel Speed – CLAAS 600 and 700 Series

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

1. Use control knob (A) to highlight HEADER/REEL icon (B), and press control knob (A) to select it. The HEADER/REEL dialog box opens.

Figure 9.166: CLAAS Combine Display, Console, and Control Handle

2. Use control knob (A) to select REEL SPEED (B), and adjust the reel speed (if you are NOT using Auto Reel Speed). A graph displays in the dialog box.

Figure 9.167: CLAAS Combine Display, Console, and Control Handle

3. Select ACTUAL VALUE (A) from the AUTO REEL SPEED dialog box (if you are using Auto Reel Speed). The ACTUAL VALUE dialog box indicates the auto reel speed.

Figure 9.168: CLAAS Combine Display, Console, and Control Handle
4. Use control knob (A) to raise or lower the reel speed.

   NOTE:
   This option is only available at full throttle.

   Figure 9.169: CLAAS Combine Display, Console, and Control Handle

Calibrating Reel Height Sensor – CLAAS 600 and 700 Series

   NOTE:
   Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

To calibrate reel height, follow these steps:

1. Place header off the ground 15–25 cm (6–10 in.).

   IMPORTANT:
   Do NOT turn off the engine. The combine has to be at full idle for the sensors to calibrate properly.

2. Use control knob (A) to highlight FRONT ATTACHMENT icon (B) and press control knob (A) to select it.

   Figure 9.170: CLAAS Combine Display, Console, and Control Handle
SETTING UP AUTO HEADER HEIGHT CONTROL

3. Use control knob (A) to highlight REEL icon (B), and press control knob (A) to select it.

4. Highlight REEL HEIGHT icon (A), and press control knob to select it.

5. Select LEARNING END STOPS (B) from the list.

6. Use control knob (A) to highlight screwdriver icon (B).
7. Press control knob and a progress bar chart (A) will appear.
8. Follow the prompts on the screen to raise the reel.
9. Follow the prompts on the screen to lower the reel.

10. Ensure progress bar chart displays 100% (A). The calibration procedure is now complete.

Adjusting Auto Reel Height – CLAAS 600 and 700 Series

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

To adjust the auto reel height, follow these steps:
1. Use HOTKEY rotary dial (A) to select REEL icon (B).

2. Use control knob (A) to select AUTO REEL HEIGHT icon (B) at the top of the page.

   **NOTE:**
   AUTO REEL HEIGHT icon (C) at the center of the page should be highlighted black. If it is not black, either the end stops have not been set or the AHHC is not active. For instructions, refer to *Calibrating Reel Height Sensor – CLAAS 600 and 700 Series, page 380*.

3. Adjust the auto reel height position for the current AHHC position using outer scroll knob (A). To lower the preset reel position, turn the scroll knob counterclockwise; to raise the preset reel position, turn the scroll knob clockwise. The display will update current setting (B).

   **NOTE:**
   If the AUTO REEL HEIGHT icon in the center of the page is not black, an AHHC position is not currently active.

### 9.1.11 CLAAS 8000/7000 Series Combines

*Setting up the Header – CLAAS 8000/7000 Series*

Follow these steps to setup a MacDon header:
SETTING UP AUTO HEADER HEIGHT CONTROL

WARNING
Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

1. From the main page, select FRONT ATTACHMENT (A).

2. From the drop down list, select FRONT ATTACHMENT PARAMETERS (A).
3. From the Front Attachment Parameters page, select FRONT ATTACHMENT TYPE (A).

4. From the drop down list, select FLEX CUTTERBAR PRODUCT BY OTHER MANUFACTURER (B).

5. From the Front Attachment Parameters page, select WORKING WIDTH (A).

6. Set header width by sliding adjuster arrow (B) up or down.

7. Select check mark (C) to save settings.

---

**Calibrating the Auto Header Height Control – CLAAS 8000/7000 Series**

⚠️ **WARNING**

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.
1. From the main page, select FRONT ATTACHMENT (A).

2. Select LEARNING PROCEDURES (A) from the menu.

3. SELECT FRONT ATTACHMENT HEIGHT (B).

4. Follow the prompts that appear in Description and Notes fields (A).
5. When prompted, select OK button (A) to start the learning procedure.

6. When prompted, raise front attachment with button (A) on the multifunction lever.

7. When prompted, lower front attachment with button (B) on multifunction lever.

8. Repeat as prompted until calibration is complete.

---

**Setting Cut and Reel Height Preset – CLAAS 8000/7000 Series**

⚠️ **WARNING**

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.
1. Set desired cutting height with feederhouse raise/lower buttons (A) on the multifunction lever.
2. Set desired reel position with buttons (B).
3. Press and hold AUTO HEIGHT PRESET button (C) to store settings.

A triangle (A) appears on the header height gauge indicating the preset level.

Setting the Sensitivity of the Auto Header Height Control – CLAAS 8000/7000 Series

⚠️ WARNING
Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.
1. From the main page, select FRONT ATTACHMENT (A).

2. From the drop down list, select FRONT ATTACHMENT PARAMETERS (A).

3. Scroll through the list and select DROP RATE WITH AUTO CONTOUR icon (A).

4. Adjust the drop rate by sliding adjuster arrow (B) up or down.

5. Select check mark (C) to confirm settings.

Adjusting Auto Reel Speed – CLAAS 8000/7000 Series

⚠️ WARNING
Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.
NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

1. From the main page, select FRONT ATTACHMENT (A).

2. From the list, select SETTINGS ON FRONT ATTACHMENT (A).

3. Select REEL TARGET VALUES (B).

4. Select REEL SPEED ADJUST icon (C).

5. Adjust the reel speed target value by sliding adjuster arrow (A) up or down.

6. Select check mark (B) to save setting.
**Calibrating Reel Height Sensor – CLAAS 8000/7000 Series**

**WARNING**
Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

**NOTE:**
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

1. Place header off the ground 15–25 cm (6–10 in.).

**IMPORTANT:**
Do **NOT** turn off the engine. The combine has to be at full idle for the sensors to calibrate properly.

2. From the main page, select FRONT ATTACHMENT (A).

3. Select LEARNING PROCEDURES FOR FRONT ATTACHMENT (A).

4. Select LEARNING REEL HEIGHT (B).

![Figure 9.196: CEBIS Main Page](image1)

![Figure 9.197: Front Attachment Page](image2)
5. Follow the prompts that appear in Description and Notes fields (A).

6. When prompted, select OK button (A) to start the learning procedure.

### 9.1.12 Gleaner R65/R66/R75/R76 and S Series Combines

**Checking Voltage Range from the Combine Cab – Gleaner R65/R66/R75/R76 and Pre-2016 S Series**

**NOTE:**
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

1. Position the header 150 mm (6 in.) above the ground, and unlock the float.
2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

**NOTE:**
If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system.

3. Ensure pointer (A) on the float indicator box is on 0. If necessary, adjust cable take-up bracket (B) until pointer is on 0.
4. Ensure header float is unlocked.

5. Press and hold button (A) on the heads-up display for 3 seconds to enter diagnostic mode.

6. Scroll down using button (B) until LEFT is displayed on the LCD screen.

7. Press OK button (C). The number indicated on the LCD screen is the voltage reading from the sensor of the AHHC. Raise and lower the header to see the full range of voltage readings.

Engaging the Auto Header Height Control – Gleaner R65/R66/R75/R76 and Pre-2016 S Series

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

The following system components are required in order for the auto header height control (AHHC) to work:

- Main module and header driver module mounted in card box in fuse panel (FP) module.
- Multifunction control handle operator inputs.
- Operator inputs mounted in the control console (CC) module panel.

NOTE:
In addition to the above components, the electrohydraulic header lift control valve is an integral part of the system.
SETTING UP AUTO HEADER HEIGHT CONTROL

Figure 9.203: Combine Auto Header Height Controls

1. Press AUTO MODE button (A) until AHHC LED light (B) begins flashing. If the RTC light is flashing, press AUTO MODE button (A) again until it switches to AHHC.

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

2. Briefly press button (A) on the control handle. The AHHC light should change from flashing to solid. The header also should drop toward the ground. The AHHC is now engaged and can be adjusted for height and sensitivity.

3. Use controls to adjust height and sensitivity to changing ground conditions such as shallow gullies and field drainage trenches.

Figure 9.204: Control Handle
Calibrating the Auto Header Height Control – Gleaner R65/R66/R75/R76 and Pre-2016 S Series

Calibration should be done on flat, level ground without the header clutches engaged. Header height and header tilt must not be in auto or standby modes. The engine rpm must be above 2000 rpm. The header tilt option on 2004 and earlier model combines does not work with MacDon headers. This system will have to be removed and disabled in order to calibrate the auto header height control (AHHC). For instructions, refer to the combine operator’s manual.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

NOTE:
If header float is set too light, it can prevent calibration of AHHC. You may need to set the float heavier for calibration procedure so header doesn’t separate from the float module.

Figure 9.205: Combine Auto Header Height Controls

1. Ensure center-link is set to D.
2. Press AUTO MODE button (A) until AHHC light (B) is illuminated.
3. Press and hold CAL1 button (C) until you see the following lights flash: raise header (D), lower header (E), tilt auto mode (F), and AHHC (B).
4. Fully lower the header, and continue to hold the HEADER LOWER button for 5–8 seconds to ensure float module has separated from header.
5. Press CAL2 button (G) until lower header light (E) stops flashing, and release it when raise header light (D) begins flashing.

6. Raise header to its maximum height (ensure the header is resting on the down-stop pads).

7. Press CAL2 button (G) until raise header light (D) turns off.

**NOTE:** The following steps are applicable only to 2005 and newer combines with the Smartrac feeder house.

8. Wait for the HEADER TILT LEFT light (not shown) to start flashing, and then tilt header to the maximum left position.

9. Press CAL2 button (G) until the HEADER TILT LEFT light (not shown) stops flashing, and release button when the HEADER TILT RIGHT light (not shown) begins flashing.

10. Tilt the header to the maximum right position.

11. Press CAL2 button (G) until all of the following lights flash: raise header (D), lower header (E), height auto mode (A), right header and left header (not shown), and tilt auto mode (F).

12. Center the header.

13. Press CAL1 button (C) to exit calibration and save all values to the memory. All lights should stop flashing.

**NOTE:**
If float was set heavier to complete the AHHC calibration procedure, adjust to recommended operating float after the calibration is complete.

**Turning off the Accumulator – Gleaner R65/R66/R75/R76 and Pre-2016 S Series**

The accumulator will affect the combine’s reaction time and greatly inhibit the auto header height control’s performance.

Refer to the combine operator’s manual for proper procedure when turning accumulator off and on. For best performance, turn the feeder house accumulator off.

**NOTE:**
The accumulator is located in front of the front left axle beam.
Adjusting the Header Raise/Lower Rate – Gleaner R65/R66/R75/R76 and Pre-2016 S Series

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

The auto header height control (AHHC) system’s stability is affected by hydraulic flow rates. Ensure that header raise (A) and header lower (B) adjustable restrictors in the hydraulic manifold are adjusted so that it takes approximately 6 seconds to raise the header from ground level to maximum height (hydraulic cylinders fully extended), and approximately 6 seconds to lower the header from maximum height to ground level.

If there is too much header movement (for example, hunting) when the header is on the ground, adjust the lower rate to a slower rate of drop: 7 or 8 seconds.

NOTE:
Make this adjustment with the hydraulic system at normal operating temperature (54.4°C [130°F]) and the engine running at full throttle.

Adjusting Ground Pressure – Gleaner R65/R66/R75/R76 and Pre-2016 S Series

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

NOTE:
Indicator (A) should be at position 0 (B) with the header 152 mm (6 in.) off the ground. If not, the float sensor output voltage should be checked. Refer to Step 5, page 310. When the header is on the ground, the indicator should be at position 1 (C) for low ground pressure, and at position 4 (D) for high ground pressure. Crop and soil conditions determine the amount of float to use. The ideal setting is as light as possible without header bouncing or missing crop. Operating with heavy settings prematurely wears the cutterbar wearplates.
1. Ensure the header is in auto header height control (AHHC) mode. This is indicated by AUTO MODE LED light (A) displaying a continuous, solid light.

2. The header will lower to the height (ground pressure) corresponding to the position selected with height control knob (B). Turn the knob counterclockwise for minimum ground pressure, and clockwise for maximum ground pressure.

Adjusting the Sensitivity of the Auto Header Height Control – Gleaner R65/R66/R75/R76 and Pre-2016 S Series

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

SENSITIVITY ADJUSTMENT dial (A) controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house.

When SENSITIVITY ADJUSTMENT dial (A) is set to maximum (turned completely clockwise), only small changes in ground height are needed to cause the feeder house to raise or lower. In this position, the cutterbar moves up and down approximately 19 mm (3/4 in.) before the control module signals the hydraulic control valve to raise or lower the header frame.
When SENSITIVITY ADJUSTMENT dial (A) is set to minimum (turned completely counterclockwise), large changes in ground height are needed to cause the feeder house to raise or lower. In this position, the cutterbar moves up and down approximately 51 mm (2 in.) before the control module signals the hydraulic control valve to raise or lower the header frame.

The HEADER SENSE LINE input also changes the range of the sensitivity. When connected to a draper, the counterclockwise position (least sensitive) allows for approximately 102 mm (4 in.) of vertical travel before correction is made.

Troubleshooting Alarms and Diagnostic Faults – Gleaner R65/R66/R75/R76 and Pre-2016 S Series

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

Display type:
Displayed on tachometer (A) as XX or XXX.

Figure 9.211: Tachometer
Figure 9.212: Combine Heads-Up Display

NOTE:
Displayed on LCD (A) as XX in. or XXX cm.

Alarm conditions:
If an error message is received from the fuse panel, an audible alarm sounds. The alarm buzzer sounds five times every 10 seconds. The LCD on the electronic instrument panel (EIP) indicates the header system in error as HDR CTRL followed by HGT ERR for height, and HDR CTRL followed by TILT ERR for tilt. The header height LED flashes yellow two times every second.

When an alarm condition occurs, a green LED flashes on and off (green, yellow, or red depending on the input). In addition, a message is displayed on the LCD to identify the nature of the alarm. For example, HYD TEMP, OPEN, SHRT will be flashed alternately.

Diagnostic fault failures:
Refer to Figure 9.212, page 401.

Pressing header height switch (B) for a minimum of 5 seconds will put the EIP in header diagnostic mode. The LCD (shown on previous screen) will display the message HDR DIAG when the EIP has entered header diagnostic mode.

In this mode, after 3 seconds, header fault parameter labels are displayed on the EIP LCD. All the information displayed is read-only.

OK (C) and CLEAR (D) buttons allow you to scroll through the list of parameters. If there are no active fault codes, the EIP LCD will display NO CODE.

When a parameter is displayed, its label is displayed for 3 seconds, after which its value is automatically displayed.

Pressing OK button (C) while the value is displayed will advance to the next parameter and display its label.

When a parameter label is displayed and OK button (C) is pressed before 3 seconds, the parameter’s value will be displayed.
Pressing AREA (E) will cycle through the options. When LEFT is displayed on the LCD, press OK button (C), and the auto header height control (AHHC) voltage will be shown on the display.

Press DIST button (F) to cycle back through the table.

Press CLEAR button (D) to exit header diagnostics and return to normal mode.

Refer to .

### 9.1.13 Gleaner S9 Series Combines

*Setting up the Header — Gleaner S9 Series*

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

AGCO Tyton terminal (A) is used to set up and manage a MacDon draper header on a Gleaner S9 Series combine. Use the touch screen display to select the desired item on the screen.

1. On the top right quadrant of the home screen, touch COMBINE icon (A). The COMBINE MAIN MENU opens.

---

**Figure 9.213: Gleaner S9**

A - Tyton Terminal  B - Control Handle  C - Throttle  D - Header Control Cluster

**Figure 9.214: Combine Icon on Home Page**
2. On the COMBINE MAIN MENU, touch HEADER SETTINGS (A). The HEADER SETTINGS page opens.

Figure 9.215: Header Settings in Combine Main Menu
3. Touch HEADER CONFIGURATION field (A). A dialog box showing predefined headers opens.

- If your MacDon header is already set up, it appears on the header list. Touch MacDon header title (B) to highlight the selection in blue, and then touch green check mark (E) to continue.

- If only default header (D) is shown, touch ABC button (C), and use the on-screen keyboard to enter the MacDon header information. When complete, select one of the following options to return to the HEADER SETTINGS page:
  - Green check mark (E) saves the settings
  - Garbage can icon (F) deletes the highlighted header from the list
  - Red X (G) cancels the change(s)
4. To specify the type of header installed on the machine, touch HEADER TYPE field (A).

5. A list of predefined header types appears.
   - For MacDon D1 Series Draper and FD1 Series FlexDraper® headers, touch POWER FLOW (A)
   - Touch green check mark (B) to save the selection and continue

6. Make sure that HEADER HAS REEL ATTACHED check box (A) is checked.
7. Touch REEL DIAMETER field (A) and a numeric keypad displays. Enter 40 for a MacDon reel.

8. Touch REEL PPR (Pulses Per Revolution) field (B) and enter 30 as the value for your MacDon header.

NOTE:
PPR is determined by the number of teeth on the reel speed sprocket.

9. Touch green check mark (B) at the bottom of numeric keypad (A) when complete, or the red X to cancel.

10. When complete, touch green check mark (A) at the bottom of the HEADER SETTINGS page.
**WARNING**

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

1. From the COMBINE MAIN MENU, touch REEL SETTINGS (A) to open the REEL SETTINGS page.

2. To set minimum reel speed, touch SPEED MINIMUM FIELD (B). The on-screen keyboard displays. Enter the desired value. Touch the green check mark to accept the new value, or the red X to cancel. The reel speed is shown in mph and rpm.

**NOTE:**

At the bottom of the REEL SETTINGS page, the reel diameter and reel pulses per revolution (PPR) are displayed. These values have already been set in the HEADER SETTINGS page.

3. Reel speed is calibrated on the REEL SETTINGS page by touching CALIBRATE button (A) in the top right of the page.

---

*Figure 9.223: Reel Settings on Combine Main Menu*

*Figure 9.224: Reel Settings Calibration*
The CALIBRATION WIZARD opens and displays a hazard warning.

4. Make sure to meet all the conditions listed in the CALIBRATION WIZARD warning. Press green check mark (A) to accept and start reel calibration. Pressing red X (B) will cancel the calibration procedure.

5. A message appears in the CALIBRATION WIZARD stating that reel calibration has started. The reel will begin turning slowly and increase to high speed. A progress bar is provided. If necessary, touch the red X to cancel. Otherwise, wait for the message that reel calibration has completed successfully. Touch the green check mark to save the calibrated settings.
Setting up Automatic Header Controls – Gleaner S9 Series

Automatic header functions are configured on the HEADER SETTINGS page.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

1. **Automatic Control Functions:** There are toggle (OFF/ON) switches on the HEADER SETTINGS page for the automatic control functions. For MacDon headers, ensure the following two functions are enabled as shown:
   - RTC (return to cut) (A)
   - AHHC (automatic header height control) (B)
   All other switches are disabled (not highlighted).

2. **Sensitivity** setting (C) controls how responsive a control (RTC or AHHC) is to a given change in sensor feedback. The setting fields are located directly below the toggle switches. To enter a new sensitivity setting, touch the setting field below the specific toggle switch, and enter the new value in the on-screen keyboard.
   - Increase sensitivity if the combine does not change the feeder position quickly enough when in Auto Mode.
   - Decrease sensitivity if the combine hunts for a position in Auto Mode.

   NOTE:
   Recommended sensitivity starting points for MacDon headers are:
   - 50 for RTC (A)
   - 60 for AHHC (B)

3. **Header Speed:** HEADER CONTROL SPEED area (A) on the HEADER SETTINGS page is used to adjust the following speeds:
   - Tilt left and right is the lateral tilt of the combine faceplate
   - Header up and down (slow and fast speeds) is a two-stage button with slow speed on the first detent and fast on the second

   NOTE:
   Recommended header control speed starting points
   - Slow: 45 up / 40 down
   - Fast: 100 up / 100 down
4. **Header Offsets (A):** Offset distances are important for yield mapping. There are two adjustable dimensions on the HEADER SETTINGS page:

- **Header Lateral Offset:** the distance between the centerline of the header and the centerline of the machine. This should be set at 0 for a MacDon header.
- **Feeder House to Cutter:** the distance from the machine interface to the cutterbar. This should be set at 68 for a MacDon header.

![Figure 9.230: Header Offset Settings](image)

**Figure 9.231: MacDon Header Settings Inputs**
Calibrating the Header – Gleaner S9 Series

The auto header control functions are configured on the HEADER SETTINGS page.

⚠️ WARNING

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

NOTE:

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

1. On the COMBINE MAIN MENU, touch HEADER SETTINGS (A).

2. Touch CALIBRATE (A) at the bottom right of the page. The HEADER CALIBRATION page displays.

Figure 9.232: Combine Main Menu

Figure 9.233: Header Settings Page
The right side of the page shows Header Calibration information (A). Results are shown for a variety of sensors (B):

- Left and right header sensor (voltage) (values will be the same with MacDon headers)
- Header height sensor (mA)
- Tilt position sensor (mA)

The following valid modes are shown with check marks (C) below sensor values (B):

- Return to cut
- Automatic header height control

⚠️ WARNING

Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on, or close to it.

3. On the control handle, touch HEADER DOWN button (A). Sensor values start changing on the HEADER CALIBRATION page as the header lowers.

**NOTE:**

The header needs to be lowered all the way, and then raised off the ground. The range should be between 0.5 and 4.5 V. If the value is not in that range, the sensor needs to be adjusted. For instructions, refer to *Adjusting Voltage Limits – One-Sensor System, page 314* or *Adjusting Voltage Limits – Two-Sensor System, page 316*.

4. When the sensor values are stable, touch CALIBRATE icon (A).
5. The hazard warning for HEADER CALIBRATION appears. Make sure that all conditions are met.

6. Touch the green check mark at the bottom of the page to start the CALIBRATION WIZARD.

A progress bar is provided and the calibration can be stopped at any time by touching the red X. The header moves automatically and erratically during this process.

7. When the calibration is complete, a message displays, and summary information (A) is shown. Green check marks confirm the functions have been calibrated (B). Touch bottom green check mark (C) to save.
NOTE:
Touch CALIBRATION icon (A) on the COMBINE MAIN MENU page to display the CALIBRATION MENU where you can choose from a variety of calibrations including header and reel calibration.

Operating the Header – Gleaner S9 Series

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

The following controls are used to operate the auto header height control (AHHC) functions:

- Tyton terminal (A)
- Control handle (B)
- Throttle (C)
- Header control cluster (D)

Use the combine operator’s manual to familiarize yourself with the controls.

1. With the header running, set lateral tilt switch (A) to MANUAL.
2. Engage the AHHC by pressing switch (B) upward to the I position.
3. Press AHHC control switch (A) on the control handle to engage the AHHC. The header moves to the current setpoint position.

4. Use HEADER HEIGHT SETPOINT control dial (A) as necessary to fine-tune the position.

**Reviewing Header In-Field Settings – Gleaner S9 Series**

**NOTE:**
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

1. To view header group settings, touch HEADER icon (A) on the right side of the home page.

2. The following information is displayed:
   - CURRENT POSITION of header (B).
   - SETPOINT cut-off position (C) (indicated by red line)
   - HEADER symbol (D) – touch to adjust the setpoint cut-off position using the scroll wheel on the right side of the Tyton terminal.
   - CUT HEIGHT for AHHC (E) – fine-tune with the header height setpoint control dial on the header control cluster.
   - HEADER WORKING WIDTH (F)
   - HEADER PITCH (G)
3. Touching a field opens the on-screen keyboard so that values can be adjusted. Enter the new value and touch the green check mark when complete.

**NOTE:**
Scroll wheel (A) is located on the right side of the Tyton terminal.

**NOTE:**
HEADER HEIGHT SETPOINT control dial (A) is on the header control cluster.

### 9.1.14 John Deere 60 Series Combines

*Checking Voltage Range from the Combine Cab – John Deere 60 Series*

**NOTE:**
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

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

1. Position the header 150 mm (6 in.) above the ground, and unlock the float.
2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

**NOTE:**
If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system.

3. Adjust cable take-up bracket (B) (if necessary) until float indicator pointer (A) is on 0.
4. Press DIAGNOSTIC button (D) on the monitor—DIA appears on the monitor.

5. Press UP button (A) until EO1 appears on the monitor—this is the header adjustments.

6. Press ENTER button (C).

7. Press the UP (A) or DOWN button (B) until 24 is displayed on the top portion of the monitor—this is the voltage reading for the sensor.

8. Ensure header float is unlocked.

9. Start the combine, and fully lower feeder house to the ground.

**NOTE:**
You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

10. Check the sensor reading on the monitor. The reading should be above 0.5 V.

11. Raise the header so it is just off the ground. The reading on the monitor should read below 4.5 V.

12. If the sensor voltage is not within the low and high limits or if the range between the low and high limits is insufficient, refer to *Adjusting Voltage Limits – One-Sensor System, page 314.*
**Calibrating the Auto Header Height Control – John Deere 60 Series**

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. For instructions, refer to the header operator’s manual.

**NOTE:**
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

⚠️ **WARNING**

Check to be sure all bystanders have cleared the area.

**NOTE:**
If header float is set too light, it can prevent calibration of AHHC. You may need to set the float heavier for calibration procedure so header doesn’t separate from the float module.

1. Ensure center-link is set to D.
2. Rest header on down stops, and unlock float.
3. Start the combine.
4. Press the DIAGNOSTIC button (A) on the monitor. DIA appears on the monitor.
5. Press the CAL button (B). DIA-CAL appears on the monitor.

![Figure 9.251: John Deere Combine Display](image-url)
6. Press the UP or DOWN buttons until HDR appears on the monitor.

7. Press the ENTER button. HDR H-DN appears on the monitor.

8. Fully lower feeder house to the ground.

   **NOTE:**
   You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

9. Press the CAL button (A) to save the calibration of the header. HDR H-UP appears on the monitor.

10. Raise the header 1 m (3 ft.) off the ground and press the CAL button (A). EOC appears on the monitor.

11. Press the ENTER button (B) to save the calibration of the header. Your AHHC is now calibrated.

   **NOTE:**
   If an error code appears during calibration, the sensor is out of voltage range and will require adjustment. For instructions, refer to *Checking Voltage Range from the Combine Cab – John Deere 60 Series, page 416.*

   **NOTE:**
   After the calibration is complete, adjust combine operation settings to ensure proper field operation.

   **NOTE:**
   If float was set heavier to complete the AHHC calibration procedure, adjust to recommended operating float after the calibration is complete.
**Turning the Accumulator Off – John Deere 60 Series**

The accumulator is a hydraulic device that cushions the shock of hydraulic fluid when installing a heavy header onto the combine.

**NOTE:**
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

1. Press DIAGNOSTIC button (A) on the monitor. DIA appears on the monitor.
2. Press the UP button (B) until EO1 appears on the monitor, and press ENTER (D). This is the header adjustment.
3. Press the UP (B) or DOWN (C) button until 132 is displayed on the top portion of the monitor. This is the reading for the accumulator.
4. Press ENTER (D) to select 132 as the accumulator reading (this will allow you to change the display to a three-digit number so it has a 0 in it, for example, x0x).
5. Press the UP (B) or DOWN (C) button until the desired number is displayed, and press the CAL button (E).
6. Press ENTER (D) to save the changes. The accumulator is now deactivated.
Setting the Sensing Grain Header Height to 50 – John Deere 60 Series

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

To set the sensing grain header height, follow these steps:

1. Press DIAGNOSTIC button (A) on the monitor. DIA appears on the monitor.
2. Press the UP button (B) until EO1 appears on the monitor, and press ENTER (D). This is the header adjustment.
3. Press the UP (B) or DOWN (C) button until 128 is displayed on the top portion of the monitor. This is the reading for the sensor.
4. Press ENTER (D) to select 128 as the sensor reading (this will allow you to change the display to a three-digit number so it has a 50 in it).
5. Press the UP (B) or DOWN (C) button until the desired number is displayed, and press the CAL button (E).
6. Press ENTER (D) to save the changes. The height is now set.

NOTE:
Do NOT use the active header float function (A) in combination with the MacDon auto header height control (AHHC)—the two systems will counteract one another. The header symbol (B) on the display should NOT have a wavy line under it and should appear exactly as shown on the Active Header Control Display in Figure 9.256, page 422.
**Setting the Sensitivity of the Auto Header Height Control – John Deere 60 Series**

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small changes in ground height are needed to cause the feeder house to raise or lower. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the feeder house to raise or lower.

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

1. Press the DIAGNOSTIC button (A) on the monitor. DIA appears on the monitor.
2. Press the UP button (B) until EO1 appears on the monitor, and press ENTER (D). This is the header adjustment.
3. Press the UP (B) or DOWN (C) button until 112 is displayed on the monitor. This is your sensitivity setting.

**NOTE:**

The lower the reading, the higher the sensitivity. Ideal operating range is typically between 50 and 80.

4. Press ENTER (D) to select 112 as the sensitivity setting (this will allow you to change the first digit of the number sequence).
5. Press UP (B) or DOWN (C) until the desired number is displayed, then press the CAL button (E). This will bring you to the second digit. Repeat this procedure until the desired setting is achieved.
6. Press ENTER (D) to save changes.

**NOTE:**

The numbers shown on the displays in these illustrations are for reference purposes only; they are not intended to represent the specific settings for your equipment.
Adjusting the Threshold for the Drop Rate Valve – John Deere 60 Series

This procedure explains how to adjust the point at which the restrictor valve opens allowing full flow to the lift cylinders.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

NOTE:
The numbers shown on the displays in these illustrations are for reference purposes only; they are not intended to represent the specific settings for your equipment.

1. Press DIAGNOSTIC button (A) on the monitor. DIA appears on the monitor.
2. Press the UP button (B) until EO1 appears on the monitor and press ENTER (C). This is the header adjustment.
3. Press the UP (B) or DOWN button until 114 is displayed on the top portion of the monitor. This is the setting that adjusts when the fast drop rate starts with respect to the dead band.

NOTE:
The default setting is 100. Ideal operating range is typically between 60 and 85.

4. Press ENTER (C) to select 114 as the fast drop rate (this will allow you to change the first digit of the number sequence).
5. Press UP (A) or DOWN (B) until the desired number is displayed, then press the CAL button (C). This will bring you to the second digit. Repeat this procedure until the desired setting is achieved.
6. Press ENTER (D) to save changes.

9.1.15 John Deere 70 Series Combines

Checking Voltage Range from the Combine Cab – John Deere 70 Series

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

WARNING
Check to be sure all bystanders have cleared the area.
1. Position the header 150 mm (6 in.) above the ground, and unlock the float.

2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

   **NOTE:**
   If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system.

3. Adjust cable take-up bracket (B) (if necessary) until pointer (A) on the float indicator is on 0.
4. Press HOME PAGE button (A) on the main screen of the monitor.

5. Ensure three icons (A) shown in the illustration at right appear on the monitor.

6. Use scroll knob (A) to highlight the middle icon (the green i) and press check mark button (B) to select it. This will bring up the Message Center.
7. Use the scroll knob to highlight DIAGNOSTIC ADDRESSES (A) from the right column and select it by pressing the check mark button.

8. Use the scroll knob to highlight drop-down box (B) and press the check mark button to select it.

9. Use the scroll knob to highlight LC 1.001 VEHICLE (A) and press the check mark button to select it.

10. Use the scroll knob to highlight down arrow (A) and press the check mark button to scroll through the list until 029 DATA (B) is displayed and voltage reading (C) appears on the monitor.

11. Ensure header float is unlocked.

12. Start the combine and fully lower feeder house to the ground.

**NOTE:**
You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

13. Check the sensor reading on the monitor.
14. Raise the header so it is just off the ground and recheck the sensor reading.

15. If the sensor voltage is not within the low and high limits or if the range between the low and high limits is insufficient, refer to Adjusting Voltage Limits – One-Sensor System, page 314.

Calibrating Feeder House Speed – John Deere 70 Series

The feeder house speed must be calibrated before you calibrate the auto header height control (AHHC) system. For instructions, refer to the combine operator’s manual.

Calibrating the Auto Header Height Control – John Deere 70 Series

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. For instructions, refer to Header Angle in the header operator’s manual for instructions.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

⚠️ WARNING

Check to be sure all bystanders have cleared the area.

NOTE:
If header float is set too light, it can prevent calibration of AHHC. You may need to set the float heavier for calibration procedure so header doesn’t separate from the float module.

1. Ensure center-link is set to D.

2. Rest header on down stops and unlock float.

3. Start the combine.

4. Press the button located fourth from the left along the top of monitor (A) to select the icon that resembles an open book with a wrench on it (B).

5. Press top button (A) a second time to enter diagnostics and calibration mode.

![Figure 9.268: John Deere Combine Display](image)
6. Select HEADER in box (A) by scrolling down to the box using the scroll knob, and then pressing the check mark button (knob and button are shown in Figure 9.270, page 429).

7. Scroll down to the lower right icon that resembles an arrow in a diamond (B) and press the check mark button to select it.

8. Follow the steps listed on the monitor to perform the calibration.

**NOTE:**
If an error code appears on screen, the sensor is not in the correct working range. For instructions, refer to Checking Voltage Range from the Combine Cab – John Deere S and T Series, page 431 to check and adjust the range.

**NOTE:**
If float was set heavier to complete the AHHC calibration procedure, adjust to recommended operating float after the calibration is complete.
Setting the Sensitivity of the Auto Header Height Control – John Deere 70 Series

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small changes in ground height are needed to cause the feeder house to raise or lower. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the feeder house to raise or lower.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

1. Press button (A) twice and the current sensitivity setting will appear on the monitor (the lower the reading, the lower the sensitivity).

2. Use scroll knob (B) to adjust the sensitivity setting. The adjustment will be saved automatically.

NOTE:
If the screen remains idle for a short period of time, it will automatically return to the previous screen. Pressing check mark button (C) also will return the monitor to the previous screen.

NOTE:
The numbers shown on the displays in these illustrations are for reference purposes only; they are not intended to represent the specific settings for your equipment.
Adjusting the Manual Header Raise/Lower Rate – John Deere 70 Series

The weight of the header will dictate the rate at which the header can be raised or lowered during operation.

To manually adjust the header raise/lower rate, do the following steps:

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

1. Press button (A) and the current raise/lower rate setting will appear on the monitor (the lower the reading, the slower the rate).
2. Use scroll knob (B) to adjust the rate. The adjustment will be saved automatically.

NOTE:
If the screen remains idle for a short period of time, it will automatically return to the previous screen. Pressing check mark button (C) will also return the monitor to the previous screen.

NOTE:
The numbers shown on the displays in these illustrations are for reference purposes only; they are not intended to represent the specific settings for your equipment.

9.1.16 John Deere S and T Series Combines

Checking Voltage Range from the Combine Cab – John Deere S and T Series

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

⚠️ WARNING
Check to be sure all bystanders have cleared the area.
1. Position the header 150 mm (6 in.) above the ground, and unlock the float.

2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

   **NOTE:**
   If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system.

3. Adjust cable take-up bracket (B) (if necessary) until pointer (A) on the float indicator is on 0.
4. Press CALIBRATION icon (A) on the main screen of the monitor. The CALIBRATION screen appears.

5. Press DIAGNOSTIC READINGS icon (A) on the CALIBRATION screen. The DIAGNOSTIC READINGS screen appears. This screen provides access to calibrations, header options, and diagnostic information.

6. Select AHHC RESUME (A) and a list of calibration options appears.
7. Select the AHHC SENSING option.
8. Press icon (A) displayed on screen. The AHHC SENSING menu appears and five screens of information are displayed.

9. Press icon (A) until it reads Page 5 near the top of the screen and the following sensor readings appear:
   - LEFT HEADER HEIGHT
   - CENTER HEADER HEIGHT
   - RIGHT HEADER HEIGHT

   A reading is displayed for both left and right sensors. On the MacDon header, there may be one sensor located in the float indicator box (standard) or two sensors located at the back of the float module side frame (optional).

10. Ensure header float is unlocked.
11. Start the combine and fully lower feeder house to the ground.

   **NOTE:**
   You may need to hold the HEADER DOWN switch for a few seconds to ensure the feeder house is fully lowered.

12. Check the sensor reading on the monitor.
13. If the sensor voltage is not within the low and high limits or if the range between the low and high limits is insufficient, refer to *Adjusting Voltage Limits – One-Sensor System, page 314.*
Calibrating the Auto Header Height Control – John Deere S and T Series

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. For instructions, refer to Header Angle in the header operator’s manual.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

NOTE:
If header float is set too light, it can prevent calibration of AHHC. You may need to set the float heavier for calibration procedure so header doesn’t separate from the float module.

1. Ensure center-link is set to D.
2. Rest header on down stops and unlock float.
3. Press DIAGNOSTIC icon (A) on the main screen of the monitor. The CALIBRATION screen appears.

4. Select THRESHING CLEARANCE (A) and a list of calibration options appears.
5. Select FEEDER HOUSE SPEED (A) from the list of calibration options.

**NOTE:**
Feeder house speed calibration must be done before header calibration.


7. Press icon (A) and instructions will appear on screen to guide you through the remaining calibration steps.
8. Select HEADER (A) from the list of calibration options.


10. Press icon (A) and instructions will appear on screen to guide you through the remaining calibration steps.

    NOTE:
    If an error code appears during calibration, the sensor is out of voltage range and will require adjustment. For instructions, refer to Checking Voltage Range from the Combine Cab – John Deere S and T Series, page 431.

    NOTE:
    If float was set heavier to complete the AHHC calibration procedure, adjust to recommended operating float after the calibration is complete.
Setting the Sensitivity of the Auto Header Height Control – John Deere S and T Series

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small changes in ground height are needed to cause the feeder house to raise or lower. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the feeder house to raise or lower.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

1. Press button (A) twice and the current sensitivity setting will appear on the monitor.

2. Press – or + icons (A) to adjust rates.

   NOTE:
   The numbers shown on the combine display in this illustration are for reference purposes only; they are not intended to represent the specific settings for your equipment.
Adjusting the Manual Header Raise/Lower Rate – John Deere S and T Series

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

NOTE:
Indicator (A) should be at position 0 (B) with the header 152 mm (6 in.) off the ground. If not, the float sensor output voltage should be checked; refer to Step 5, page 310. When the header is on the ground, the indicator should be at position 1 (C) for low ground pressure, and at position 4 (D) for high ground pressure. Crop and soil conditions determine the amount of float to use. The ideal setting is as light as possible without header bouncing or missing crop. Operating with heavy settings prematurely wears the cutterbar wearplates.

1. Press button (A) and the current sensitivity setting will appear on the monitor.

2. Press – or + icons (A) to adjust rates.

NOTE:
The numbers shown on the combine display in this illustration are for reference purposes only; they are not intended to represent the specific settings for your equipment.
Setting Preset Cutting Height – John Deere S and T Series

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

NOTE:
Indicator (A) should be at position 0 (B) with the header (152 mm [6 in.]) off the ground. If not, the float sensor output voltage should be checked. Refer to Step 5, page 310. When the header is on the ground, the indicator should be at position 1 (C) for low ground pressure, and at position 4 (D) for high ground pressure. Crop and soil conditions determine the amount of float to use. The ideal setting is as light as possible without header bouncing or missing crop. Operating with heavy settings prematurely wears the cutterbar wearplates.

1. Press COMBINE – HEADER SETUP icon (A) on the main screen. The COMBINE – HEADER SETUP screen appears. This screen is used to set various header settings such as reel speed, header width, and height of feeder house for acre counter engagement.

3. Select AUTO HEIGHT SENSING (A), RETURN TO CUT (B), and REEL POSITION (C) icons.

**NOTE:**
If REEL POSITION icon (C) cannot be selected (no check mark), the reel height sensor requires calibration. For instructions, refer to *Calibrating Reel Height Sensor – John Deere S and T Series, page 447.*

4. Engage the header.

5. Move the header to the desired position and use knob (A) to fine tune the position.

6. Move the reel to the desired position.

7. Press and hold preset switch 2 (B) until 1 reel height icon flashes on monitor.

8. Repeat previous three steps for preset switch 3 (C).

9. Select an appropriate ground pressure setting. Use preset button 2 (B) on the control handle for a low ground pressure setting in muddy or soft soil conditions, and preset 3 (C) for a high ground pressure setting in firm soil conditions and a higher ground speed.

**NOTE:**
Preset button 1 (A) is reserved for header lift on the headland and is not used for cutting on ground.
NOTE:
When the AHHC is engaged, AHHC icon (A) appears on the monitor and the number indicating which button was pressed (B) is displayed on the screen.

Figure 9.301: Combine Display

Calibrating Feeder House Fore-Aft Tilt Range – John Deere S and T Series

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D.

When setup and calibration are complete, adjust the center-link back to desired header angle. For instructions, refer to the header operator’s manual.

This procedure applies only to model year 2015 and later John Deere S and T Series combines.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

The feeder house fore/aft tilt is controlled by buttons (C) and (D) at the back of the control handle.

Figure 9.302: John Deere Control Handle
NOTE:
The feeder house fore/aft tilt controls can be changed to work with buttons E and F by pressing control handle icon (A) and then selecting FEEDER HOUSE FORE/AFT TILT from drop-down menu (B).

To calibrate the feeder house fore-aft tilt range, follow these steps:

1. Ensure center-link is set to D.
2. Rest header on down stops and unlock float.
3. Press DIAGNOSTIC icon (A) on the main screen of the monitor. The CALIBRATION screen displays.

4. Select CALIBRATIONS drop-down menu (A) to view the list of calibration options.
5. Press arrow (A) to cycle up through the calibration options and select FEEDER HOUSE FORE/AFT TILT RANGE.


7. Follow the instructions that appear on the screen. As you proceed through the calibration process, the display will automatically update to show the next step.

**NOTE:**
If an error code appears during calibration, the sensor is out of voltage range and will require adjustment. For instructions, refer to *Checking Voltage Range from the Combine Cab – John Deere S and T Series*, page 431.
Checking Reel Height Sensor Voltages – John Deere S and T Series

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

1. Press CALIBRATION icon (A) on the main screen of the monitor. The CALIBRATION screen appears.

2. Press DIAGNOSTIC READINGS icon (A) on the CALIBRATION screen. The DIAGNOSTIC READINGS screen appears. This screen provides access to calibrations, header options, and diagnostic information.

3. Select drop-down menu (A) to view the list of calibration options.
4. Scroll down and select REEL RESUME (A).  


6. Press NEXT PAGE icon (A) to cycle to page 3.  

7. Lower the reel to view low voltage (B). The voltage should be 0.5–0.9 V.
8. Raise the reel to view high voltage (A). The voltage should be 4.1–4.5 V.

9. If either voltage is not within the correct range, refer to \textit{Checking and Adjusting Reel Height Sensor, page 487}.

\textit{Calibrating Reel Height Sensor – John Deere S and T Series}

This procedure applies only to model year 2015 and later John Deere S and T Series combines.

\textbf{NOTE:}
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

To calibrate reel height, follow these steps:

1. Place header off the ground 15–25 cm (6–10 in.).

\textbf{IMPORTANT:}
Do \textbf{NOT} turn off the engine. The combine has to be at full idle for the sensors to calibrate properly.

2. Press DIAGNOSTIC icon (A) on the main screen of the monitor. The CALIBRATION screen displays.
3. Select CALIBRATIONS drop-down menu (A) to view the list of calibration options.
4. Scroll through the list of options and select REEL POSITION.
5. Press ENTER icon (B).

6. Follow the instructions that appear on the screen. As you proceed through the calibration process, the display will automatically update to show the next step. This calibration requires you to use reel raise (A) and reel lower (B) switches on the control handle.

7. Press and hold REEL LOWER switch until reel is fully lowered. Continue holding REEL LOWER switch until prompted by the display.
8. Press and hold REEL RAISE switch until reel is fully raised. Continue holding REEL RAISE switch until prompted by the display.

9. When all steps have been completed, CALIBRATION COMPLETE message is displayed on the screen. Exit the CALIBRATION menu by pressing ENTER icon (A).

**NOTE:**
If an error code appears during calibration, the sensor is out of voltage range and will require adjustment. For instructions, refer to *Checking Reel Height Sensor Voltages – John Deere S and T Series, page 445.*
9.1.17  John Deere S7 Series Combines

Setting up Header – John Deere S7 Series

NOTE:
Changes may have been made to combine controls or display since this document was published. Refer to combine operator’s manual for updates.

1. Press header button (A) on the panel below the display. The HEADER page opens.

2. Select HEADER TYPE field (A). The HEADER DETAILS window opens.

3. Verify correct header width is displayed under WIDTH.

4. To change header width, select field (A). The WIDTH window opens.
5. Use the on-screen keypad to enter the correct header width, and then press OK.

6. Press window close button (A) in top right corner of the window to return to the HEADER page.

7. Raise/lower speed (A), tilt speed (B), height sensitivity (C), and tilt sensitivity (D) can all be adjusted from this page. Select the option you would like to adjust. The following example shows the raise/lower speed adjustment.
8. Use + and – buttons (A) to adjust the setting.

9. Press window close button in top right corner of the window to return to the HEADER page.

10. Select AUTO CONTROL icons (A). The AUTO HEADER CONTROLS page opens.

11. If the header has not been calibrated yet, an error icon will appear on HEIGHT SENSING button (A). Select button (A) to view error message.
12. Read error message and then press OK.


Figure 9.331: John Deere S7 Display – Height Sensing Error Message

Checking Voltage Range from the Combine Cab – John Deere S7 Series

The auto header height sensor output must be within a specific range, or the feature will not work properly.

Table 9.2 Voltage Range

<table>
<thead>
<tr>
<th>Combine</th>
<th>Low Voltage Limit</th>
<th>High Voltage Limit</th>
<th>Minimum Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>John Deere S7 Series</td>
<td>0.5 V</td>
<td>4.5 V</td>
<td>3.0 V</td>
</tr>
</tbody>
</table>

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

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

1. Position header 150 mm (6 in.) above ground, and unlock float.
2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

**NOTE:**
If header is not on down stops during next two steps, voltage may go out of range during operation causing a malfunction of auto header height control (AHHC) system.

3. Adjust cable take-up bracket (B) (if necessary) until pointer (A) on float indicator is on 0.
4. On the HARVESTING page, select MENU icon (A) in the bottom right corner of the screen.


6. Select DIAGNOSTICS CENTER icon (B). The DIAGNOSTICS CENTER page opens.

7. Select AHC - SENSING (A). The AHC - SENSING\ DIAGNOSTICS page displays.
8. Select SENSOR tab (A) to view sensor voltages. Center header height sensor voltage (B) must be between 0.5 and 4.5 V, with at least 3 V of variation between 0 and 4 on the float indicator box.

**NOTE:**
If the optional Auto Lateral Tilt AHHC kit is installed, the left and right header height sensors must also be in the same 0.5–4.5 V range.

9. If sensor voltage adjustment is required, refer to *Adjusting Voltage Limits – One-Sensor System, page 314.*

---

**Calibrating Feeder House – John Deere S7 Series**

Feeder house calibration must be done before header calibration.

For best performance of auto header height control (AHHC), perform these procedures with center-link set to D. When setup and calibration are complete, adjust center-link back to desired header angle. For instructions, refer to the header operator’s manual.

**NOTE:**
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

1. Ensure center-link is set to D.
2. Rest header on down stops and unlock float.
3. On the HARVESTING page, select MENU icon (A) in the bottom right corner of screen. The MENU opens.

---
4. Select MACHINE SETTINGS tab (A).

5. Select CALIBRATIONS & PROCEDURES icon (B). The CALIBRATIONS & PROCEDURES page displays.


7. Select FEEDER HOUSE RAISE SPEED CALIBRATION (B). The FH RAISE SPEED CALIBRATION page displays.

8. Select CALIBRATE (A) at the bottom of the page. A calibration overview displays.
9. Read the calibration overview, and then press START.

10. Follow the instructions on the screen. As you proceed through the calibration process, the display will automatically update to show next step.

11. When calibration is complete, select SAVE to confirm calibration.
**Calibrating Header – John Deere S7 Series**

**WARNING**

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

Feeder house calibration must be done before header calibration. If feeder house has not yet been calibrated, refer to *Calibrating Feeder House – John Deere S7 Series, page 456*.

For best performance of auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust center-link back to desired header angle. For instructions, refer to Header Angle in the header operator’s manual.

**NOTE:**

Changes may have been made to combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

1. Ensure center-link is set to D.
2. Rest header on down stops and unlock float.
3. On the HARVESTING page, select MENU icon (A) in the bottom right corner of screen. The MENU opens.
4. Select MACHINE SETTINGS tab (A).
5. Select CALIBRATIONS & PROCEDURES icon (B). The CALIBRATIONS & PROCEDURES page displays.

7. Select HEADER CALIBRATION (B). The HEADER CALIBRATION page displays.

8. Select CALIBRATE (A) at bottom of page. The calibration overview window opens.

9. Press button (A) on console to set engine to high idle.
10. Select START on calibration overview page.

11. Follow instructions that appear on combine display. As you proceed through calibration process, display will automatically update to show next step.

**NOTE:**
If an error code appears during calibration, sensor is out of voltage range and will require adjustment. For instructions, refer to Adjusting Voltage Limits – One-Sensor System, page 314.

12. When calibration is complete, select SAVE to confirm calibration.


Checking Voltage Range from the Combine Cab – New Holland CR/CX Series

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

NOTE:

⚠️ WARNING

Check to be sure all bystanders have cleared the area.

1. Position the header 150 mm (6 in.) above the ground, and unlock the float.

2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

NOTE:
If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the AHHC system.
3. Adjust cable take-up bracket (B) (if necessary) until float indicator pointer (A) is on 0.

4. Ensure header float is unlocked.

5. Select DIAGNOSTICS (A) on the main screen. The DIAGNOSTICS screen displays.

6. Select SETTINGS. The SETTINGS screen displays.

7. Select GROUP drop-down arrow (A). The GROUP dialog box displays.

9. Select LEFT HEADER HEIGHT SEN (A), and then select GRAPH button (B). The exact voltage is displayed at the top of the screen.

10. Raise and lower the header to see the full range of voltage readings.

11. If the sensor voltage is not within the low and high limits, or if the range between the low and high limits is insufficient, adjust the voltage limits. For instructions, refer to Adjusting Voltage Limits – One-Sensor System, page 314.
Setting up Auto Header Height Control – New Holland CR/CX Series

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

NOTE:

1. Select HEADER LATERAL FLOAT on the combine display, and press ENTER.

2. Use the up and down navigation keys to move between options, and select INSTALLED.

3. Select HEADER AUTOFLOAT, and press ENTER.

4. Use the up and down navigation keys to move between options, and select INSTALLED.
Calibrating the Auto Header Height Control – New Holland CR/CX Series

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. For instructions, refer to the header operator’s manual.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

NOTE:

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

NOTE:
If header float is set too light, it can prevent calibration of AHHC. You may need to set the float heavier for calibration procedure so header doesn’t separate from the float module.

Check the following conditions before starting the header calibration procedure:
- The header is attached to the combine.
- The combine is on level ground, with the header level to the ground.
- The header is on down stops, and the center-link is set to D.
- The engine is running.
- The combine is not moving.
- No faults have been received from the Header Height Controller (HHC) module.
- Header/feeder is disengaged.
- Lateral float buttons are NOT pressed.
- ESC key is NOT pressed.

To calibrate the AHHC, follow these steps:

1. Select CALIBRATION on the combine display, and press the RIGHT ARROW navigation key to enter the information box.
2. Select HEADER (A), and press ENTER. The CALIBRATION dialog box opens.

   NOTE:
   You can use the up and down navigation keys to move between options.
3. Follow the calibration steps in the order in which they appear in the dialog box. As you proceed through the calibration process, the display will automatically update to show the next step.

**NOTE:**
Pressing the ESC key during any of the steps or letting the system sit idle for more than 3 minutes will cause the calibration procedure to stop.

**NOTE:**
Refer to your combine operator’s manual for an explanation of any error codes.

4. When all steps have been completed, CALIBRATION SUCCESSFUL message is displayed on the screen. Exit the CALIBRATION menu by pressing the ENTER or ESC key.

**NOTE:**
If float was set heavier to complete AHHC calibration procedure, adjust to recommended operating float after the calibration is complete.

5. If the unit does not function properly, conduct the maximum stubble height calibration.

_Calibrating Maximum Stubble Height – New Holland CR/CX Series_

This procedure describes how to calibrate the area counter to stop or start counting at the correct height. Program the header to a height that will never be reached while cutting. The area counter will stop counting when the header is above the programmed height, and will begin counting when the header is below the programmed height.

Select the height of the header that corresponds to the description above.

**IMPORTANT:**
- If the value is set too low, area may **NOT** be counted since the header is sometimes raised above this threshold although the combine is still cutting.
- If the value is set too high, the area counter will keep counting even when the header is raised (but below this threshold) and the combine is no longer cutting crop.

**WARNING**
Check to be sure all bystanders have cleared the area.
1. Select the MAXIMUM STUBBLE HEIGHT calibration dialog box. As you proceed through the calibration process, the display will automatically update to show the next step.

2. Move header to the correct position using the header up or down control switch on the multifunction handle.

3. Press ENTER to continue. As you proceed through the calibration process, the display will automatically update to show the next step.

4. Press ENTER or ESC to close the calibration screen. The calibration is now complete.
Adjusting Header Raise Rate – New Holland CR/CX Series

If necessary, the header raise rate (the first speed on the HEADER HEIGHT rocker switch of the multifunctional handle) can be adjusted.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

NOTE:

1. Select HEADER RAISE RATE on the combine display.
2. Use the + or – buttons to change the setting.
3. Press ENTER to save the new setting.

NOTE:
The raise rate can be changed from 32–236 in steps of 34. The factory setting is 100.

Figure 9.364: New Holland Combine Display

Setting the Header Lower Rate – New Holland CR/CX Series

If necessary, the header lower rate (the automatic header height control button or second speed on the header height rocker switch of the multifunctional handle) can be adjusted.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

NOTE:
SETTING UP AUTO HEADER HEIGHT CONTROL

1. Select HEADER LOWER RATE on the combine display.
2. Use the + or – buttons to change the setting to 50.
3. Press ENTER to save the new setting.

   **NOTE:**
   The header lower rate can be changed from 2–247 in increments of 7. It is factory-set to 100.

---

### Setting the Sensitivity of the Auto Header Height Control – New Holland CR/CX Series

The sensitivity adjustment controls the distance the cutterbar must travel up or down before the auto header height control (AHHC) reacts and raises or lowers the feeder house. When the sensitivity is set to maximum, only small changes in ground height are needed to cause the feeder house to raise or lower. When the sensitivity is set to minimum, large changes in the ground height are needed to cause the feeder house to raise or lower.

   **NOTE:**
   Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

   **NOTE:**

---

**WARNING**

Check to be sure all bystanders have cleared the area.

1. Engage threshing and feeder house.
2. Select HEIGHT SENSITIVITY on the combine display screen.
3. Use the + or – buttons to change the setting to 200.
4. Press ENTER to save the new setting.

   **NOTE:**
   The sensitivity can be changed from 10–250 in increments of 10. It is factory-set to 100.
Setting Preset Cutting Height – New Holland CR/CX Series

To set the preset cutting height, follow these steps:

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

NOTE:

NOTE:
Indicator (A) should be at position 0 (B) with the header (152 mm [6 in.]) off the ground. If not, the float sensor output voltage should be checked. Refer to Step 5, page 310. When the header is on the ground, the indicator should be at position 1 (C) for low ground pressure, and at position 4 (D) for high ground pressure. Crop and soil conditions determine the amount of float to use. The ideal setting is as light as possible without header bouncing or missing crop. Operating with heavy settings prematurely wears the cutterbar wearplates.

1. Engage the threshing mechanism and the feeder with switches (A) and (B).
2. Set HEADER MEMORY rocker switch (D) in STUBBLE HEIGHT/AUTOFLOAT mode position (A) or (B).
3. Raise or lower the header to the desired cutting height using HEADER HEIGHT and HEADER LATERAL FLOAT momentary switch (C).
4. Lightly press AUTOMATIC HEADER HEIGHT CONTROL button (E) for a minimum of 2 seconds to store the height position. A beep will confirm the setting.

NOTE:
It is possible to store two different header height values by using HEADER MEMORY rocker switch (D) in STUBBLE HEIGHT/AUTOFLOAT mode position (A) or (B).

5. Raise or lower the reel to the desired working height using REEL HEIGHT momentary switch (E).
6. Lightly press AUTOMATIC HEADER HEIGHT CONTROL button (E) for a minimum of 2 seconds to store the height position. A beep will confirm the setting.
7. To change one of the memorized header height set points while the combine is in use, use HEADER HEIGHT AND HEADER LATERAL FLOAT rocker switch (A) (slow up/down) to raise or lower header to the desired value. Lightly press AUTOMATIC HEADER HEIGHT CONTROL button (B) for a minimum of 2 seconds to store the new height position. A beep will confirm setting.

**NOTE:**
Fully pressing AUTOMATIC HEADER HEIGHT CONTROL button (B) will disengage float mode.

**NOTE:**
It is not necessary to press rocker switch (C) again after changing header height set point.

---


This section applies only to 2015 and later CR models (6.80, 6.90, 7.90, 8.90, 9.90, and 10.90). For other pre-2015 New Holland combine models, refer to 9.1.18 New Holland Combines – CR/CX Series – 2014 and Prior, page 462.

#### Checking Voltage Range from the Combine Cab – New Holland CR Series

**NOTE:**
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

**NOTE:**
This section applies only to 2015 and later CR models (6.80, 6.90, 7.90, 8.90, 9.90, and 10.90). For other pre-2015 New Holland combine models, refer to 9.1.18 New Holland Combines – CR/CX Series – 2014 and Prior, page 462.

⚠️ **WARNING**

Check to be sure all bystanders have cleared the area.

1. Position the header 150 mm (6 in.) above the ground, and unlock the float.
2. Check that float lock linkage is on down stops (washer [A] cannot be moved) at both locations.

**NOTE:**
If the header is not on down stops during the next two steps, the voltage may go out of range during operation causing a malfunction of the auto header height control (AHHC) system.

3. Adjust cable take-up bracket (B) (if necessary) until float indicator pointer (A) is on 0.

4. Ensure header float is unlocked.
5. Select DIAGNOSTICS (A) on the main screen. The DIAGNOSTICS screen displays.


7. Select HEADER HEIGHT/TILT (A) from the GROUP drop-down menu.

8. Select HEADER HEIGHT SENS. L (B) from the PARAMETER drop-down menu.
9. Select GRAPH (A). The exact voltage (B) is displayed at the top of the screen.

10. Raise and lower the header to see the full range of voltage readings.

11. If the sensor voltage is not within the low and high limits, or if the range between the low and high limits is insufficient, adjust the voltage limits. For instructions, refer to Adjusting Voltage Limits – One-Sensor System, page 314.

Setting up Auto Header Height Control – New Holland CR Series

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

NOTE:
This section applies only to 2015 and later CR models (6.80, 6.90, 7.90, 8.90, 9.90, and 10.90). For other pre-2015 New Holland combine models, refer to 9.1.18 New Holland Combines – CR/CX Series – 2014 and Prior, page 462.

1. Ensure center-link is set to D.

2. Select TOOLBOX (A) on the main screen. The TOOLBOX screen displays.
3. Simultaneously press UNLOAD (A) and RESUME (B) buttons on the control handle.

**NOTE:**
Software in some New Holland combines may not allow you to change the header from FLEX to PLATFORM or the header type from DEFAULT to 80/90 at the main menu. This is now a dealer setting, and requires you to access the DEALER SETTING screen by pressing and holding both the UNLOAD and RESUME buttons on the control handle for approximately 10 seconds. The DEALER SETTING screen should appear and will allow you to change the header and header type settings.

4. Select HEAD 1 (A). The HEADER SETUP 1 screen displays.

5. Select CUTTING TYPE drop-down arrow (B) and change the CUTTING TYPE to PLATFORM (C).

7. Set HEADER SUB TYPE to 80/90 (A) for a New Holland combine.


9. Select the AUTOFLOAT drop-down arrow and set AUTOFLOAT to INSTALLED (A).

10. Select the AUTO HEADER LIFT drop-down arrow and set AUTO HEADER LIFT to INSTALLED (B).

   **NOTE:**
   With AUTO HEADER LIFT installed and AHHC engaged, the header will lift up automatically when you pull back on the control handle.

11. Set the values for MANUAL HHC RAISE RATE (C) and MANUAL HHC LOWER RATE (D) for best performance according to ground conditions.
12. Set the values for HHC HEIGHT SENSITIVITY (A) and HHC TILT SENSITIVITY (B) for best performance according to ground conditions.

13. From REEL HEIGHT SENSOR menu (A), select YES.

Calibrating the Auto Header Height Control – New Holland CR Series

For best performance of the auto header height control (AHHC), perform these procedures with the center-link set to D. When setup and calibration are complete, adjust the center-link back to desired header angle. For instructions, refer to the header operator’s manual.

NOTE:
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

NOTE:
This section applies only to 2015 and later CR models (6.80, 6.90, 7.90, 8.90, 9.90, and 10.90). For other pre-2015 New Holland combine models, refer to 9.1.18 New Holland Combines – CR/CX Series – 2014 and Prior, page 462.

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

NOTE:
If header float is set too light, it can prevent calibration of AHHC. You may need to set the float heavier for calibration procedure so header doesn’t separate from the float module.

Check the following conditions before starting the header calibration procedure:
setting up auto header height control

- The header is attached to the combine.
- The combine is on level ground, with the header level to the ground.
- The header is on down stops, and the center-link is set to D.
- The engine is running.
- The combine is not moving.
- No faults have been received from the header height controller (HHC) module.
- Header/feeder is disengaged.
- Lateral float buttons are NOT pressed.
- ESC key is NOT pressed.

To calibrate the AHHC, follow these steps:

1. Select CALIBRATIONS (A) on the main screen. The CALIBRATION screen displays.

2. Select CALIBRATION drop-down arrow (A).

Figure 9.385: New Holland Combine Display

Figure 9.386: New Holland Combine Display
3. Select HEADER (A) from the list of calibration options.

4. Follow the calibration steps in the order in which they appear on the screen. As you proceed through the calibration process, the display will automatically update to show the next step.

   **NOTE:**
   Pressing the ESC key during any of the steps or letting the system sit idle for more than 3 minutes will cause the calibration procedure to stop.

   **NOTE:**
   Refer to your combine operator’s manual for an explanation of any error codes.

5. When all steps have been completed, CALIBRATION COMPLETED message is displayed on the screen.

   **NOTE:**
   If float was set heavier to complete AHHC calibration procedure, adjust to recommended operating float after the calibration is complete.

---

**Checking Reel Height Sensor Voltages – New Holland CR Series**

**NOTE:**
Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.
1. On the main page of the combine display, select DIAGNOSTICS (A). The DIAGNOSTICS page opens.

Figure 9.390: New Holland Combine Display

2. Select SETTINGS tab (A). The SETTINGS page opens.

3. From GROUP menu (B), select HEADER.

4. From PARAMETER menu (C), select REEL VERTICAL POSITION.

Figure 9.391: New Holland Combine Display

5. Select GRAPH tab (A). The REEL VERTICAL POSITION graph displays.

6. Lower the reel to view high voltage (B). The voltage should be 4.1–4.5 V.

7. Raise the reel to view low voltage (C). The voltage should be 0.5–0.9 V.

8. If either voltage is out of range, refer to 10 Checking and Adjusting Reel Height Sensor, page 487.

Figure 9.392: New Holland Combine Display
Setting Preset Cutting Height – New Holland CR Series

NOTE:
This section applies only to 2015 and later CR models (6.80, 6.90, 7.90, 8.90, 9.90, and 10.90). For other pre-2015 New Holland combine models, refer to 9.1.18 New Holland Combines – CR/CX Series – 2014 and Prior, page 462.

The console has two buttons used for auto height presets. The toggle switch that was present on previous models is now configured as shown at right. MacDon headers only require first two buttons (A) and (B). Third button (C) is not configured.

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

To set preset cutting height, follow these steps:

1. Engage separator and header.
2. Select preset button 1 (A). A yellow light on the button will illuminate.
3. Raise or lower the header to the desired cutting height.

4. Hold RESUME button (C) on the multifunction handle to set the preset.

   NOTE:
   When setting presets, always set header position before setting reel position. If header and reel are set at the same time, the reel setting will not save.

5. Raise or lower the reel to the desired working position.
6. Hold RESUME button (C) on multifunction handle to set the preset.
7. Repeat Step 2, page 482 to Step 6, page 482, using preset button 2.
8. Lower header to the ground.
9. Select RUN SCREENS (A) on the main screen.

10. Select the RUN tab that shows MANUAL HEIGHT.

NOTE:
The MANUAL HEIGHT field may appear on any of the RUN tabs. When an auto height preset button is pressed, the display will change to AUTO HEIGHT (A).

11. Press one of the auto height preset buttons to select a preset cutting height.
Setting Maximum Work Height – New Holland CR Series

NOTE:
This section applies only to 2015 and later CR models (6.80, 6.90, 7.90, 8.90, 9.90, and 10.90). For other pre-2015 New Holland combine models, refer to 9.1.18 New Holland Combines – CR/CX Series – 2014 and Prior, page 462.

1. Select TOOLBOX (A) on the main screen. The TOOLBOX screen displays.

2. Select FEEDER (A). The FEEDER SETUP screen displays.

3. Select MAXIMUM WORK HEIGHT field (B).

4. Set MAXIMUM WORK HEIGHT to desired value.

5. Press SET and then press ENTER.
Configuring Reel Fore-Aft, Header Tilt, and Header Type – New Holland CR Series

This procedure applies only to 2016 New Holland CR models 6.90, 7.90, 8.90, and 9.90.

**NOTE:**

Changes may have been made to the combine controls or display since this document was published. Refer to the combine operator’s manual for updates.

1. Simultaneously press UNLOAD (A) and RESUME (B) buttons on the control handle.

2. On the HEAD 1 screen, change the CUTTING TYPE from FLEX to PLATFORM as shown at location (A).

3. On the HEAD 2 screen, change HEADER SUB TYPE from DEFAULT to 80/90 as shown at location (A).

---

**Figure 9.401: New Holland Combine Controls**

**Figure 9.402: New Holland Combine Display**

**Figure 9.403: New Holland Combine Display**
There are now two different buttons for ON GROUND presets. The toggle switch that was present on previous models is now configured as shown at right. MacDon headers only require first two buttons (A) and (B). Third button down (C) is not configured.

Figure 9.404: New Holland Combine Controls
Chapter 10: Checking and Adjusting Reel Height Sensor

The output voltage range of the auto reel height sensor can be checked from inside the combine or manually at the sensor. For in-cab instructions, refer to the combine operator’s manual.

⚠️ DANGER

To avoid bodily injury or death from unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator’s seat, and always engage safety props before going under the machine for any reason.

⚠️ WARNING

Check to be sure all bystanders have cleared the area.

IMPORTANT:

Ensure minimum reel height is properly set before adjusting reel height sensor. For instructions, refer to 8.11 Reel Clearance to Cutterbar, page 277. 8.11.1 Measuring Reel Clearance, page 278.

Figure 10.1: Sensor Arm/Pointer Configurations

A - Case/New Holland Configuration
B - John Deere/CLAAS/AGCO IDEAL™ Configuration
C - Sensor Arm (Shown Semitransparent)
D - Sensor Pointer (Shown Under Sensor Arm)

NOTE:

- For configuration (A), pointer (D) points to the FRONT of the header.
- For configuration (B), pointer (D) points to the REAR of the header.
- Sensor arm made semitransparent to show sensor pointer behind it.

1. Shut down the engine, and remove the key from the ignition.
2. Check that sensor arm (C) and pointer (D) are configured properly for your machine. Refer to Figure 10.1, page 487.
CHECKING AND ADJUSTING REEL HEIGHT SENSOR

IMPORTANT:
To measure the output voltage of the reel height sensor, the combine engine needs to be running and supplying power to the sensor. Always engage the combine parking brake and stay away from the reel.

Table 10.1 Reel Height Sensor Voltage Limits

<table>
<thead>
<tr>
<th>Combine Type</th>
<th>Voltage Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X Voltage</td>
</tr>
<tr>
<td>AGCO IDEAL™ Series</td>
<td>4.1–4.5 V</td>
</tr>
<tr>
<td>Case/New Holland</td>
<td>0.5–0.9 V</td>
</tr>
<tr>
<td>CLAAS</td>
<td>4.1–4.5 V</td>
</tr>
<tr>
<td>John Deere</td>
<td>4.1–4.5 V</td>
</tr>
</tbody>
</table>

NOTE:
For CLAAS combines: To avoid a collision of the reel with the cab, the machine is equipped with an automatic reel height limitation. Some CLAAS combines have an automatic shutoff feature that engages when the automatic reel height limitation is reached. When raising the header by more than 80 percent, the reel is automatically lowered. The automatic lowering of the reel can be manually overridden, and a warning will appear on the CEBIS terminal.

To check the voltage range manually, follow these steps:

1. Engage the combine parking brake.
2. Start the engine and fully lower the reel.
3. Use the combine display or a voltmeter (if measuring the sensor manually) to measure voltage range Y. Refer to Table 10.1, page 488 for range requirements.
4. If using a voltmeter, measure the voltage between the ground wire (pin 2) and the signal wire (pin 3) at the reel height sensor (B).
5. Shut down the engine, and remove the key from the ignition.
6. Adjust length of threaded rod (A) to modify voltage range Y.

NOTE:
Dimension (C) is factory set to 41.7 mm (1.6 in).

7. Repeat checking and adjusting until voltage range Y is within the range specified.
8. Start the engine.
9. Raise the reel fully.
10. Engage the reel safety props.
11. Use the combine display or a voltmeter (if measuring the sensor manually) to measure voltage range X. Refer to Table 10.1, page 488 for range requirements.
12. If using a voltmeter, measure the voltage between the ground (Pin 2 wire) and the signal (Pin 3 wire) at the reel height sensor (A).
13. Shut down the engine, and remove the key from the ignition.
14. Loosen two M5 hex nuts (B) and rotate sensor (A) to achieve voltage range X.
15. Repeat checking and adjusting until voltage range X is within the range specified.
16. Start the engine. For instructions, refer to the combine operator’s manual.
17. Disengage the reel safety props.
18. Lower the reel fully.
19. Recheck voltage range Y and ensure it is still within the range specified. Adjust if required.
Chapter 11: Running up Header

To run up the header, follow these steps:

⚠️ DANGER

To avoid bodily injury or death from unexpected start-up or fall of a raised machine, always stop engine and remove key before leaving the operator’s seat, and always engage safety props before going under the machine for any reason.

⚠️ WARNING

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

1. Start combine and raise header fully.
2. Engage the safety props.
3. Shut down the engine, and remove the key from the ignition.
4. Rotate latches (A) to unlock handles (B).
5. Hold pan (C) and rotate handles (B) to release pan. Lower pan to expose draper.

6. Check and remove debris from pan (A) and draper.

![Figure 11.1: Float Module Plastic Pan](image1)

![Figure 11.2: Float Module Plastic Pan](image2)
7. Raise pan and rotate handle (A) so that rod engages clips (B) on pan.

8. Push handle (A) into slot and secure it with latches (B).

9. Open left endshield.
10. Ensure flow control (A) is set to position 6.

11. Ensure feeder house variable speed is set to MINIMUM.

**WARNING**

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

12. Start combine and run the machine slowly for 5 minutes while watching and listening **FROM THE OPERATOR’S SEAT** for binding or interfering parts.

**NOTE:**
Reel and side drapers will not operate until oil flow fills the lines.

13. Run header for an additional 10 minutes at operating speed while watching and listening **FROM THE OPERATOR’S SEAT** for binding or interfering parts.

14. Check the rpm of knife drive box pulley (A) using a handheld tachometer.
15. Check rotation direction of knife drive pulley(s).
16. Shut down the combine.

17. Compare actual pulley rpm with values in the following chart:

### Table 11.1 Recommended Knife Drive Speed (rpm)

<table>
<thead>
<tr>
<th>Header Size</th>
<th>Recommended Knife Drive Speed Range: Single Knife</th>
<th>Recommended Knife Drive Speed Range: Double Knife</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1 m (20 ft.)</td>
<td>N/A</td>
<td>700–850 rpm</td>
</tr>
<tr>
<td>7.6 m (25 ft.)</td>
<td>600–725 rpm</td>
<td></td>
</tr>
<tr>
<td>9.1 m (30 ft.)</td>
<td>600–700 rpm</td>
<td>600–750 rpm</td>
</tr>
<tr>
<td>10.7 m (35 ft.)</td>
<td>550–650 rpm</td>
<td></td>
</tr>
<tr>
<td>12.2 m (40 ft.)</td>
<td>525–600 rpm</td>
<td>550–700 rpm</td>
</tr>
<tr>
<td>13.7 m (45 ft.)</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

18. If adjustment to the knife drive box pulley rpm is necessary, refer to your combine operator’s manual.

19. Perform the run-up check as listed on the Predelivery Checklist (yellow sheet attached to this instruction — Predelivery Checklist, page 519).

### 11.1 Performing Post Run-Up Adjustments

Stop engine and perform post run-up check as listed on the Predelivery Checklist (yellow sheet attached to this instruction Predelivery Checklist, page 519) to ensure machine is field-ready.

⚠️ **WARNING**

To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before adjusting machine.

Some adjustments may be necessary after the run-up. Refer to the following:

- 11.1.1 Adjusting Draper Tracking, page 496
- 11.1.2 Adjusting Knife, page 498
11.1.1 Adjusting Draper Tracking

If necessary, adjust tracking as follows:

<table>
<thead>
<tr>
<th>Tracking</th>
<th>Adjustment</th>
<th>At Location</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backward</td>
<td>Increase X</td>
<td>Drive Roller</td>
<td>Tighten Nut C</td>
</tr>
<tr>
<td>Forward</td>
<td>Decrease X</td>
<td></td>
<td>Loosen Nut C</td>
</tr>
<tr>
<td>Backward</td>
<td>Increase Y</td>
<td>Idler Roller</td>
<td>Tighten Nut F</td>
</tr>
<tr>
<td>Forward</td>
<td>Decrease Y</td>
<td></td>
<td>Loosen Nut F</td>
</tr>
</tbody>
</table>

**Example:** If draper is tracking towards back of deck, increase (X) or (Y) to move draper forward.

![Figure 11.9: Adjustment Locations](image)

**Figure 11.9: Adjustment Locations**

X - Drive Roller       Y - Idler Roller

![Figure 11.10: Drive and Idler Roller Adjustment Locations](image)

**Figure 11.10: Drive and Idler Roller Adjustment Locations**

X - Drive Rollers Adjustment
A - Nut
B - Jam Nut on Adjuster Rod
C - Adjusting Nut

Y - Idler Rollers Adjustment
D - Nut
E - Jam Nut on Adjuster Rod
F - Adjusting Nut
1. Adjust the drive rollers (X) by loosening nut (A) and jam nut (B) on adjuster rod, then turning the adjusting nut (C) (left drive roller shown—right opposite).

2. Adjust the idler rollers (Y) by loosening nut (D) and jam nut (E) on adjuster rod, then turning adjusting nut (F) (left idler roller shown—right opposite).

3. If the draper does not track at the idler roller end, the drive roller is likely not square to the deck. Adjust drive roller, then readjust idler.

Figure 11.11: Adjustment Locations
X - Drive Roller     Y - Idler Roller
11.1.2 Adjusting Knife

**WARNING**
To avoid bodily injury or death from unexpected startup of machine, always stop engine and remove key before adjusting machine.

1. Stop engine and remove the key.
2. Check guards for signs of heating during run-up due to insufficient clearance between guard and knife.
3. Check gap between knifehead (A) and pitman arm (B). A business card should slide easily through the gap. If not, adjust gap by loosening bolt (C), and tapping knifehead (A) with a hammer. Retighten bolt.

**IMPORTANT:**
Overgreasing can cause the knife to bend and make contact with the guards closest to the knifehead. Check for signs of excessive heating on first few guards after greasing. If required, relieve some pressure by pressing the check-ball in grease fitting.

4. Adjust guard alignment as necessary using guard straightening tool (MD #140135). Adjust guard tips upwards by positioning tool as shown, and pulling up.

5. Adjust guard tips downward by positioning tool as shown, and pushing down.

![Figure 11.12: Knifehead and Pitman Arm](image1)

![Figure 11.13: Straightening Tool – Upward Adjustment](image2)

![Figure 11.14: Straightening Tool – Downward Adjustment](image3)
Chapter 12: Reference

12.1 Parts List

This list includes parts that are bagged and attached to 12.2 and 13.7 m (40 and 45 ft.) headers. It does **NOT** include all parts in the shipment.

All bags contain parts within a section of this list. For identification, the bags are labeled with a letter and title.

<table>
<thead>
<tr>
<th>Bag A – Cutterbar Components</th>
<th>12.2 m (40 ft.)</th>
<th>13.7 m (45 ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>118344 Sickle Guard</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>118162 Clip – Hold-Down</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>18654 Nut – Hex 7/16 NC GR5 ZP</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>118154 Bolt – HH 3/8 NC X 5/8 TFL GR8 ZP</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>118193 Nut – Flange Hex .375 NC</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>120558 Bolt</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>125418 Support – Split C-Bar Connection</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>253552 Support – Split C-Bar Connection</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>129297 Wearplate – Cutterbar</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>118345 Knife Guard</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Draper</th>
<th>12.2 m (40 ft.)</th>
<th>13.7 m (45 ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>220639 Draper – 40 ft. WCCO</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>172197 Draper – 40 ft. LEGG</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bag B – Disc Assembly Parts</th>
<th>12.2 m (40 ft.)</th>
<th>13.7 m (45 ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAM END (Discs are Secured to Right Cam)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>105136 Screw – Machine</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>105135 Screw – Machine</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>50186 Nut – Flange Lock SM Face DT 0.500-13UNC GR5</td>
<td>32</td>
<td>32</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MID SPAN (Discs are Secured to Right Cam)</th>
<th>12.2 m (40 ft.)</th>
<th>13.7 m (45 ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>105136 Screw – Machine</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>105135 Screw – Machine</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>50186 Nut – Flange Lock SM Face DT 0.500-13UNC GR5</td>
<td>24</td>
<td>24</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TAIL END (Discs Are Secured to Right Cam)</th>
<th>12.2 m (40 ft.)</th>
<th>13.7 m (45 ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>105136 Screw – Machine</td>
<td>11</td>
<td>11</td>
</tr>
</tbody>
</table>
Table 12.1  Bagged Parts List for 12.2 and 13.7 m (40 and 45 Ft) Headers (continued)

<table>
<thead>
<tr>
<th>Part #</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>12.2 m</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(40 ft.)</td>
</tr>
<tr>
<td>105135</td>
<td>Screw – Machine</td>
<td>17</td>
</tr>
<tr>
<td>50186</td>
<td>Nut – Flange Lock SM Face DT 0.500-13UNC GRS</td>
<td>28</td>
</tr>
</tbody>
</table>

**Bag D – Reel Arm and Reel Linkage Parts** (Hardware in Bag B)

<table>
<thead>
<tr>
<th>Part #</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>12.2 m</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(40 ft.)</td>
</tr>
<tr>
<td>137298</td>
<td>Arm – Cam Control Linkage Sub-Assy</td>
<td>5</td>
</tr>
<tr>
<td>137699</td>
<td>USS Hardened Flat Washer – 1/2 NOM. ID</td>
<td>5</td>
</tr>
<tr>
<td>50186</td>
<td>Nut – Flange Lock SM Face DT 0.500-13UNC GRS</td>
<td>5</td>
</tr>
</tbody>
</table>

**Bag E – Reel Endshields**

<table>
<thead>
<tr>
<th>Part #</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>12.2 m</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(40 ft.)</td>
</tr>
<tr>
<td>164958</td>
<td>Support – Endshield Reel5</td>
<td>10</td>
</tr>
<tr>
<td>135157</td>
<td>Screw – Machine</td>
<td>10</td>
</tr>
<tr>
<td>30228</td>
<td>Nut</td>
<td>10</td>
</tr>
<tr>
<td>105136</td>
<td>Screw – Machine</td>
<td>10</td>
</tr>
<tr>
<td>50186</td>
<td>Nut – Flange Lock SM Face DT 0.500-13UNC GRS</td>
<td>10</td>
</tr>
<tr>
<td>137529</td>
<td>Shim – Crank Bearing</td>
<td>10</td>
</tr>
<tr>
<td>105141</td>
<td>Bolt – Locking Shoulder</td>
<td>10</td>
</tr>
<tr>
<td>245001</td>
<td>Label – Dealers Only</td>
<td>1</td>
</tr>
</tbody>
</table>

**Reel Drive To Center Tube Hardware and Reel Drive Alignment Shims** (Parts in Bag B)

<table>
<thead>
<tr>
<th>Part #</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>12.2 m</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(40 ft.)</td>
</tr>
<tr>
<td>18638</td>
<td>Washer – REG Lock 1/2 IN NOM ID ZP</td>
<td>8</td>
</tr>
<tr>
<td>21491</td>
<td>Bolt – HH 1/2 NC X 1.25 LG GR 5 ZP</td>
<td>8</td>
</tr>
<tr>
<td>164061</td>
<td>Shim – Hub to Cam</td>
<td>2</td>
</tr>
<tr>
<td>137753</td>
<td>Shim Ring – 4 Bolt Flange</td>
<td>2</td>
</tr>
<tr>
<td>245199</td>
<td>Shim – Hub to Cam</td>
<td>2</td>
</tr>
</tbody>
</table>

**Right Skid Shoe if Required** (Secured to Header Frame)

<table>
<thead>
<tr>
<th>Part #</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>12.2 m</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(40 ft.)</td>
</tr>
<tr>
<td>172172</td>
<td>Assy – Right, Shoe</td>
<td>1</td>
</tr>
</tbody>
</table>

**Parts for Transport after Assembly at Export Destination** (Loose Parts in Bag B)

<table>
<thead>
<tr>
<th>Part #</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>12.2 m</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(40 ft.)</td>
</tr>
<tr>
<td>172535</td>
<td>Angle – Guard Tip Shipping</td>
<td>3</td>
</tr>
</tbody>
</table>

5. Not included for European-configured 12.2 m (40-foot) headers.
Figure 12.1: Bag A - Cutterbar Components

A - 118344 – Knife Guard
C - 18654 – Nut - Hex 7/16 NC GR5 ZP
E - 118193 – Nut - Flange Hex .375 NC
G - 125418 – Support - Split C-Bar Connection Weldt
J - 118345 – Knife Guard

B - 118162 – Clip - Hold-Down
D - 118154 – Bolt - HH 3/8 NC X 5/8 TFL GR8 ZP
F - 120558 – Bolt
H - 129297 – Wearplate - Cutterbar
Figure 12.2: Bag B - Disc Assembly Parts

A - 105136 – Screw - Machine
B - 105135 – Screw - Machine
C - 50186 – Nut - Flange Lock SM Face DT 0.500-13 UNC GR5
D - 18638 – Washer - REG Lock 1/2 IN NOM ID ZP
E - 21491 – Bolt - HH 1/2 NC X 1.25 LG GR S ZP
F - 164061 – Shim - Hub to Cam
G - 137699 – USS Hardened Flat Washer - 1/2 NOM. ID
H - 137529 – Shim - Crank Bearing
J - 105141 – Bolt - Locking Shoulder
K - 50186 – Nut - Flange Lock SM Face DT 0.500-13 UNC GR5
L - 220025 – Strap Link Pin S-Bat
M - 137753 – Shim Ring - 4 Bolt Flange
N – 245199 – Shim - Hub to Cam
Figure 12.3: Bag B - Transport Parts

A - 172535 – Angle - Guard Tip Shipping

Figure 12.4: Bag C - Draper

A - 220639 – Draper - 12.2 m (40 ft.) WCCO
A - 220640 – Draper - 13.7 m (45 ft.) WCCO
A - 172197 – Draper - 12.2 m (40 ft.) LEGG
A - 172198 – Draper - 13.7 m (45 ft.) LEGG
Figure 12.5: Bag D - Linkage Arms

A - 137298 – Arm - Cam Control Linkage Sub-Assy

Figure 12.6: Bag E - Reel Linkage Bolts

A - 164958 – Support - Endshield Reel
C - 50186 – Nut - Flange Lock SM Face DT 0.500-13 UNC GR5
E - 137529 – Shim - Crank Bearing
G - 50186 – Nut - Flange Lock SM Face DT 0.500-13 UNC GR5

B - 135157 – Screw - Machine
D - 105141 – Bolt - Locking Shoulder
F - 105136 – Screw - Machine
Figure 12.7: Right Skid Shoe Attached to Header Frame (If Required)

A - 172172 – Assy - Right Shoe
12.2 Torque Specifications

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

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

**Jam nuts**

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

**Self-tapping screws**

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

### 12.2.1 Metric Bolt Specifications

Table 12.2 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 12.8: Bolt Grades
### Table 12.3 Metric Class 8.8 Bolts and Class 9 Distorted Thread Nut

<table>
<thead>
<tr>
<th>Nominal Size (A)</th>
<th>Torque (Nm)</th>
<th>Torque (lbf·ft) (*lbf·in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-0.5</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td>3.5-0.6</td>
<td>1.5</td>
<td>1.7</td>
</tr>
<tr>
<td>4-0.7</td>
<td>2.3</td>
<td>2.5</td>
</tr>
<tr>
<td>5-0.8</td>
<td>4.5</td>
<td>5</td>
</tr>
<tr>
<td>6-1.0</td>
<td>7.7</td>
<td>8.6</td>
</tr>
<tr>
<td>8-1.25</td>
<td>18.8</td>
<td>20.8</td>
</tr>
<tr>
<td>10-1.5</td>
<td>37</td>
<td>41</td>
</tr>
<tr>
<td>12-1.75</td>
<td>65</td>
<td>72</td>
</tr>
<tr>
<td>14-2.0</td>
<td>104</td>
<td>115</td>
</tr>
<tr>
<td>16-2.0</td>
<td>161</td>
<td>178</td>
</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 12.4 Metric Class 10.9 Bolts and Class 10 Free Spinning Nut

<table>
<thead>
<tr>
<th>Nominal Size (A)</th>
<th>Torque (Nm)</th>
<th>Torque (lbf·ft) (*lbf·in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-0.5</td>
<td>1.8</td>
<td>2</td>
</tr>
<tr>
<td>3.5-0.6</td>
<td>2.8</td>
<td>3.1</td>
</tr>
<tr>
<td>4-0.7</td>
<td>4.2</td>
<td>4.6</td>
</tr>
<tr>
<td>5-0.8</td>
<td>8.4</td>
<td>9.3</td>
</tr>
<tr>
<td>6-1.0</td>
<td>14.3</td>
<td>15.8</td>
</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 12.5 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>

12.2.2 Metric Bolt Specifications Bolting into Cast Aluminum

Table 12.6 Metric Bolt Bolting into Cast Aluminum

<table>
<thead>
<tr>
<th>Nominal Size (A)</th>
<th>8.8 (Cast Aluminum)</th>
<th>10.9 (Cast Aluminum)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nm</td>
<td>lbf-ft</td>
</tr>
<tr>
<td>M3</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>M4</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>M5</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>M6</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>M8</td>
<td>20</td>
<td>14</td>
</tr>
<tr>
<td>M10</td>
<td>40</td>
<td>28</td>
</tr>
<tr>
<td>M12</td>
<td>70</td>
<td>52</td>
</tr>
<tr>
<td>M14</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>M16</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>
12.2.3 Flare-Type Hydraulic Fittings

1. Check flare (A) and flare seat (B) for defects that might cause leakage.

2. Align tube (C) with fitting (D) and thread nut (E) onto fitting without lubrication until contact has been made between flared surfaces.

3. Torque fitting nut (E) to specified number of flats from finger tight (FFFT) or to a given torque value in Table 12.7, page 509.

4. Use two wrenches to prevent fitting (D) from rotating. Place one wrench on fitting body (D), and tighten nut (E) with other wrench to torque shown.

5. Assess final condition of connection.

Table 12.7 Flare-Type Hydraulic Tube Fittings

<table>
<thead>
<tr>
<th>SAE Dash Size</th>
<th>Thread Size (in.)</th>
<th>Torque Value⑥</th>
<th>Flats from Finger Tight (FFFT)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Nm</td>
<td>lb·ft</td>
</tr>
<tr>
<td>-2</td>
<td>5/16–24</td>
<td>4–5</td>
<td>3–4</td>
</tr>
<tr>
<td>-3</td>
<td>3/8–24</td>
<td>7–8</td>
<td>5–6</td>
</tr>
<tr>
<td>-4</td>
<td>7/16–20</td>
<td>18–19</td>
<td>13–14</td>
</tr>
<tr>
<td>-5</td>
<td>1/2–20</td>
<td>19–21</td>
<td>14–15</td>
</tr>
<tr>
<td>-6</td>
<td>9/16–18</td>
<td>30–33</td>
<td>22–24</td>
</tr>
<tr>
<td>-8</td>
<td>3/4–16</td>
<td>57–63</td>
<td>42–46</td>
</tr>
<tr>
<td>-10</td>
<td>7/8–14</td>
<td>81–89</td>
<td>60–66</td>
</tr>
<tr>
<td>-12</td>
<td>1 1/16–1/12</td>
<td>113–124</td>
<td>83–91</td>
</tr>
<tr>
<td>-14</td>
<td>1 3/16–1/12</td>
<td>136–149</td>
<td>100–110</td>
</tr>
<tr>
<td>-16</td>
<td>1 5/16–1/12</td>
<td>160–176</td>
<td>118–130</td>
</tr>
<tr>
<td>-20</td>
<td>1 5/8–12</td>
<td>228–250</td>
<td>168–184</td>
</tr>
<tr>
<td>-24</td>
<td>1 7/8–12</td>
<td>264–291</td>
<td>195–215</td>
</tr>
<tr>
<td>-32</td>
<td>2 1/2–12</td>
<td>359–395</td>
<td>265–291</td>
</tr>
<tr>
<td>-40</td>
<td>3–12</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

⑥ Torque values shown are based on lubricated connections as in reassembly.
12.2.4 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 12.8 O-Ring Boss (ORB) Hydraulic Fittings – Adjustable

<table>
<thead>
<tr>
<th>SAE Dash Size</th>
<th>Thread Size (in.)</th>
<th>Torque Value</th>
<th>Nm</th>
<th>lbf·ft (*lbf·in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-2</td>
<td>5/16–24</td>
<td>6–7</td>
<td>*53–62</td>
<td></td>
</tr>
<tr>
<td>-3</td>
<td>3/8–24</td>
<td>12–13</td>
<td>*106–115</td>
<td></td>
</tr>
<tr>
<td>-4</td>
<td>7/16–20</td>
<td>19–21</td>
<td>14–15</td>
<td></td>
</tr>
<tr>
<td>-5</td>
<td>1/2–20</td>
<td>21–33</td>
<td>15–24</td>
<td></td>
</tr>
<tr>
<td>-6</td>
<td>9/16–18</td>
<td>26–29</td>
<td>19–21</td>
<td></td>
</tr>
<tr>
<td>-8</td>
<td>3/4–16</td>
<td>46–50</td>
<td>34–37</td>
<td></td>
</tr>
<tr>
<td>-10</td>
<td>7/8–14</td>
<td>75–82</td>
<td>55–60</td>
<td></td>
</tr>
<tr>
<td>-12</td>
<td>1 1/16–12</td>
<td>120–132</td>
<td>88–97</td>
<td></td>
</tr>
<tr>
<td>-14</td>
<td>1 3/8–12</td>
<td>153–168</td>
<td>113–124</td>
<td></td>
</tr>
<tr>
<td>-16</td>
<td>1 5/16–12</td>
<td>176–193</td>
<td>130–142</td>
<td></td>
</tr>
<tr>
<td>-20</td>
<td>1 5/8–12</td>
<td>221–243</td>
<td>163–179</td>
<td></td>
</tr>
<tr>
<td>-24</td>
<td>1 7/8–12</td>
<td>270–298</td>
<td>199–220</td>
<td></td>
</tr>
<tr>
<td>-32</td>
<td>2 1/2–12</td>
<td>332–365</td>
<td>245–269</td>
<td></td>
</tr>
</tbody>
</table>

7. Torque values shown are based on lubricated connections as in reassembly.
12.2.5 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 12.9, page 512.
6. Check final condition of fitting.

![Figure 12.16: Hydraulic Fitting](image)

**Table 12.9 O-Ring Boss (ORB) Hydraulic Fittings – Non-Adjustable**

<table>
<thead>
<tr>
<th>SAE Dash Size</th>
<th>Thread Size (in.)</th>
<th>Torque Value[^8]</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>

[^8]: Torque values shown are based on lubricated connections as in reassembly.
12.2.6 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 12.10, page 513.

   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 12.10 O-Ring Face Seal (ORFS) Hydraulic Fittings

<table>
<thead>
<tr>
<th>SAE Dash Size</th>
<th>Thread Size (in.)</th>
<th>Tube O.D. (in.)</th>
<th>Torque Value(^9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>Note(^{10})</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(^{10})</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>
</tbody>
</table>

\(^{9}\) Torque values and angles shown are based on lubricated connection as in reassembly.

\(^{10}\) O-ring face seal type end not defined for this tube size.
### Table 12.10  O-Ring Face Seal (ORFS) Hydraulic Fittings (continued)

<table>
<thead>
<tr>
<th>SAE Dash Size</th>
<th>Thread Size (in.)</th>
<th>Tube O.D. (in.)</th>
<th>Torque Value(^{11})</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nm</td>
</tr>
<tr>
<td>-14</td>
<td>Note(^{10})</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>
<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>

### 12.2.7  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 12.11, page 514. 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 12.11 Hydraulic Fitting Pipe Thread

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

\(^{11}\) Torque values and angles shown are based on lubricated connection as in reassembly.
12.3 Lifting Equipment Requirements

The following topic describes the minimum equipment requirements for lifting headers.

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

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

NOTE:
When a header and float module are ordered together, they are shipped with the float module already installed in the header.

IMPORTANT:
Forklifts are normally rated for a load center 610 mm (24 in.) ahead of back end of the forks. To obtain the forklift capacity for a load center (A) at 1220 mm (48 in.) (B), check with your forklift distributor. The minimum fork length (C) is 1981 mm (78 in.).

![Figure 12.19: Minimum Lifting Capacity](image)

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

<table>
<thead>
<tr>
<th>Table 12.12 Lifting Vehicle Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lifting Vehicle</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Minimum Capacity</td>
</tr>
<tr>
<td>Minimum Fork Length</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 12.13 Lifting Chain Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
</tr>
<tr>
<td>Minimum Load</td>
</tr>
</tbody>
</table>
# 12.4 Conversion Chart

## Table 12.14 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>
## 12.5 Definitions

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

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHHC</td>
<td>Automatic Header Height Control</td>
</tr>
<tr>
<td>API</td>
<td>American Petroleum Institute</td>
</tr>
<tr>
<td>ASTM</td>
<td>American Society of Testing and Materials</td>
</tr>
<tr>
<td>Bolt</td>
<td>A headed and externally threaded fastener that is designed to be paired with a nut</td>
</tr>
<tr>
<td>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>D1 Series Header</td>
<td>MacDon D120, D125, D130, D135, D140, and D145 combine draper header</td>
</tr>
<tr>
<td>DDD</td>
<td>Double-draper drive</td>
</tr>
<tr>
<td>DK</td>
<td>Double knife</td>
</tr>
<tr>
<td>DKD</td>
<td>Double-knife drive</td>
</tr>
<tr>
<td>DR</td>
<td>Double reel</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>FM100</td>
<td>Float module used with a D1 or FD1 Series header for combining</td>
</tr>
<tr>
<td>GSL</td>
<td>Ground speed lever</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 crop and feeds it into an attached combine</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>JIC</td>
<td>Joint Industrial Council: A standards body that developed standard sizing and shape for original 37° flared fitting</td>
</tr>
<tr>
<td>Knife</td>
<td>A cutting device which uses a reciprocating cutter (also called a sickle)</td>
</tr>
<tr>
<td>n/a</td>
<td>Not applicable</td>
</tr>
<tr>
<td>NPT</td>
<td>National Pipe Thread: A style of fitting used for low-pressure port 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>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>RoHS (Reduction of Hazardous Substances)</td>
<td>A directive by the European Union to restrict use of certain hazardous substances (such as hexavalent chromium used in some yellow zinc plateings)</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>SDD</td>
<td>Single-draper drive</td>
</tr>
<tr>
<td>SK</td>
<td>Single knife</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>spm</td>
<td>Strokes per minute</td>
</tr>
<tr>
<td>SR</td>
<td>Single reel</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>Timed knife drive</td>
<td>Synchronized motion applied at cutterbar to two separately driven knives from a single hydraulic motor</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>Truck</td>
<td>A four-wheel highway/road vehicle weighing no less than 3400 kg (7500 lb.)</td>
</tr>
<tr>
<td>UCA</td>
<td>Upper cross auger</td>
</tr>
<tr>
<td>Untimed knife drive</td>
<td>Unsynchronized motion applied at cutterbar to two separately driven knives from a single hydraulic motor or two hydraulic motors</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>
</tbody>
</table>
# Predelivery Checklist

Perform these checks and adjustments prior to delivery to your Customer. **Adjustments are normally not required as the machine is factory-assembled and adjusted.** If adjustments are required, refer to the appropriate page number in this manual. Ensure that the completed Checklist is retained by either the Operator or the Dealer.

⚠️ **CAUTION**

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

<table>
<thead>
<tr>
<th>✓</th>
<th>Item</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Check for shipping damage or missing parts. Be sure all shipping dunnage is removed.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Check for loose hardware. Tighten to required torque.</td>
<td><a href="#">12.2 Torque Specifications, page 506</a></td>
</tr>
<tr>
<td></td>
<td>Check tire pressure (Transport/Stabilizer Option).</td>
<td><a href="#">8.1 Checking Tire Pressure – Transport and Stabilizer Wheels, page 257</a></td>
</tr>
<tr>
<td></td>
<td>Check wheel bolt torque (Transport/Stabilizer Option).</td>
<td><a href="#">8.2 Checking Wheel Bolt Torque – Transport and Stabilizer Wheels, page 258</a></td>
</tr>
<tr>
<td></td>
<td>Check knife drive box breather position.</td>
<td><a href="#">8.3 Checking Knife Drive Box, page 259</a></td>
</tr>
<tr>
<td></td>
<td>Check knife drive box oil level.</td>
<td><a href="#">8.3 Checking Knife Drive Box, page 259</a></td>
</tr>
<tr>
<td></td>
<td>Check float module gearbox oil level.</td>
<td><a href="#">8.4 Checking Oil Level in Header Drive Gearbox, page 261</a></td>
</tr>
<tr>
<td></td>
<td>Check hydraulic reservoir oil level before and after run-up.</td>
<td><a href="#">8.5 Checking Oil Level in Hydraulic Reservoir, page 262</a></td>
</tr>
<tr>
<td></td>
<td>Check knife drive belt(s) tension.</td>
<td><a href="#">8.6 Checking Knife Drive Belt Tension, page 263</a></td>
</tr>
<tr>
<td></td>
<td>Check reel centered between header endsheets.</td>
<td><a href="#">8.8 Centering the Reel, page 268</a></td>
</tr>
<tr>
<td></td>
<td>Grease all bearings and drivelines.</td>
<td><a href="#">8.17 Lubricating Header, page 292</a></td>
</tr>
<tr>
<td></td>
<td>Check side draper tension.</td>
<td><a href="#">8.13 Adjusting Draper Tension, page 284</a></td>
</tr>
<tr>
<td></td>
<td>Check draper seal.</td>
<td><a href="#">8.15 Checking and Adjusting Draper Seal, page 287</a></td>
</tr>
<tr>
<td></td>
<td>Check header float.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Check reel tine to cutterbar clearance.</td>
<td><a href="#">8.11.1 Measuring Reel Clearance, page 278</a></td>
</tr>
<tr>
<td></td>
<td>Check auger flighting to feed pan clearance.</td>
<td><a href="#">8.12 Adjusting Auger to Pan Clearance, page 281</a></td>
</tr>
<tr>
<td></td>
<td>Check the knife hold-down adjustment.</td>
<td><a href="#">8.7 Checking Knife Hold-Downs, page 266</a></td>
</tr>
<tr>
<td></td>
<td>Check skid shoes are evenly adjusted at a setting appropriate for first crop.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ensure feeder house variable speed is set to minimum.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ensure auto header height is calibrated and functioning correctly.</td>
<td><a href="#">9 Setting up Auto Header Height Control, page 305</a></td>
</tr>
<tr>
<td><strong>Run-up procedure</strong></td>
<td></td>
<td><a href="#">11 Running up Header, page 491</a></td>
</tr>
<tr>
<td>Item</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>-----------</td>
<td></td>
</tr>
<tr>
<td>Check reel rotating in correct direction.</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Check knife drive pulley(s) is rotating in proper direction. Clockwise on left side; Counterclockwise on right side (double knife only).</td>
<td>Step 15, page 494</td>
<td></td>
</tr>
<tr>
<td>Check knife speed.</td>
<td>Step 17, page 495</td>
<td></td>
</tr>
<tr>
<td>Check draper tracking.</td>
<td>11.1.1 Adjusting Draper Tracking, page 496</td>
<td></td>
</tr>
<tr>
<td>Check deck shift. Draper should stop turning during deck movement, and start again in the opposite direction after shift is complete.</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Check lights are functional.</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Check reel lift cylinders extend fully.</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Check reel moves fully fore and aft.</td>
<td>—</td>
<td></td>
</tr>
</tbody>
</table>

**Post run-up check**

<table>
<thead>
<tr>
<th>Item</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check knife and reel drives for heated bearings.</td>
<td>—</td>
</tr>
<tr>
<td>Check knife sections for discoloration caused by misalignment of components.</td>
<td>11.1.2 Adjusting Knife, page 498</td>
</tr>
<tr>
<td>Check for hot spots on the cutterbar above the draper seal. Adjust deck height as required.</td>
<td>—</td>
</tr>
<tr>
<td>Check for hydraulic leaks.</td>
<td>—</td>
</tr>
<tr>
<td>Check that manual storage case contains operator’s manual and parts catalogs.</td>
<td>8.19 Checking Manuals, page 303</td>
</tr>
</tbody>
</table>

**Date Checked:**

**Checked by:**