HOW TO REACH US

<table>
<thead>
<tr>
<th>ADDRESS</th>
<th>HOURS</th>
<th>TELEPHONE &amp; FAX NUMBER</th>
<th>E-MAIL &amp; INTERNET</th>
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</table>
| Crary Industries, Inc.  
237 12th St. NW  
West Fargo, ND 58078 | Monday-Friday  
8 am-5pm (CST) | For Parts and Service:  
Ph: 701.282.5520 •  
800.247.7335  
Fax: 701.282.9522 | Email: service@crary.com •  
sales@crary.com  
Online: www.crary.com |

DISCLAIMER
This document is based on information available at the time of its publication. While efforts have been made to be accurate, the information contained herein does not purport to cover all details or variations, nor to provide for every possible contingency in connection with installation, operation, or maintenance. Features may be described herein which are not present in all systems. Crary Industries assumes no obligation of notice to holders of this document with respect to changes subsequently made.

Crary Industries assumes no responsibility for the accuracy, completeness, sufficiency, or usefulness of the information contained herein.

SPECIFICATIONS AND DESIGN ARE SUBJECT TO CHANGE WITHOUT NOTICE.
Crary Industries is continually making improvements and developing new equipment. In doing so, we reserve the right to make changes or add improvements to our product without obligation for equipment previously sold.

Because modification to this machine may affect the performance, function, and safety of its operation, no modifications are to be made without the written permission of Crary Industries. Part replacements should be with original equipment supplied by Crary Industries.

THE CRARY INDUSTRIES STATEMENT OF PRODUCT SAFETY
As a manufacturer of specialized agricultural equipment, Crary Industries fully recognizes its responsibility of providing its customers products that perform their expected use in a reasonably safe manner. Safety considerations shall be an integral and high priority part of all engineering/design analysis and judgments involving Crary products. It is our stated policy that our products will be manufactured to comply with the safety standards specified by the American Society of Agricultural Engineers, the National Electrical Code, the Society of Automotive Engineers, and/or any other applicable recognized standards at the time manufactured. However, this statement should not be construed to mean that our product will safeguard against a customer’s own carelessness or neglect in violating common safety practices specified in each product’s manual, nor will we be liable for any such act.

SERIAL NUMBER LOCATION
Always give your authorized Crary dealer the serial number of your machine when ordering parts, requesting service, or any other information. The serial number decal is located on the front, left hand end of the air manifold, as shown below.

Please record the serial number in the space provided on the front cover and on the warranty and registration card.
LIMITED WARRANTY

This warranty applies to all AG and Marine Equipment manufactured by Crary Industries.

Crary Industries warrants to the original owner each new Crary Industries product to be free from defects in material and workmanship, under normal use and service. The warranty shall extend as shown below from date of delivery. The product is warranted to the original owner as evidenced by a completed warranty registration on file at Crary Industries.

<table>
<thead>
<tr>
<th>Product</th>
<th>Warranty Length</th>
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<tbody>
<tr>
<td>Finger Air Reel</td>
<td>2 year</td>
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<tr>
<td>Crary Wind System</td>
<td>2 year</td>
</tr>
<tr>
<td>Big Top</td>
<td>1 year</td>
</tr>
<tr>
<td>Top Off Auger</td>
<td>1 year</td>
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<tr>
<td>Cyclone</td>
<td>1 year</td>
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<tr>
<td>Cutting Systems</td>
<td>1 year</td>
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<tr>
<td>WeedRoller</td>
<td>1 year (commercial)</td>
</tr>
<tr>
<td>Replacement Parts</td>
<td>90 days (unless superceded by warranty)</td>
</tr>
<tr>
<td>OEM Fans</td>
<td>1 year</td>
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</table>

THE WARRANTY REGISTRATION MUST BE COMPLETED AND RETURNED TO CRARY INDUSTRIES WITHIN 10 DAYS OF DELIVERY OF THE PRODUCT TO THE ORIGINAL OWNER OR THE WARRANTY WILL BE VOID.

In the event of a failure, return the product, at your cost, along with proof of purchase to the selling Crary Industries dealer. Crary Industries will, at its option, repair or replace any parts found to be defective in material or workmanship. Warranty on any repairs will not extend beyond the product warranty. Repair or attempted repair by anyone other than a Crary Industries dealer as well as subsequent failure or damage that may occur as a result of that work will not be paid under this warranty. Crary Industries does not warrant replacement components not manufactured or sold by Crary Industries.

1. This warranty applies only to parts or components that are defective in material or workmanship.
2. This warranty does not cover normal wear items including but not limited to bearings, belts, pulleys and reel tines.
3. This warranty does not cover normal maintenance, service or adjustments.
4. This warranty does not cover depreciation or damage due to misuse, negligence, accident or improper maintenance.
5. This warranty does not cover damage due to improper setup, installation or adjustment.
6. This warranty does not cover damage due to unauthorized modifications of the product.

Crary Industries is not liable for any property damage, personal injury or death resulting from the unauthorized modification or alteration of a Crary product or from the owner’s failure to assemble, install, maintain or operate the product in accordance with the provisions of the Owner’s manual.

Crary Industries is not liable for indirect, incidental or consequential damages or injuries including but not limited to loss of crops, loss of profits, rental of substitute equipment or other commercial loss.

This warranty gives you specific legal rights. You may have other rights that may vary from area to area.

Crary Industries makes no warranties, representations or promises, expressed or implied as to the performance of its products other than those set forth in this warranty. Neither the dealer nor any other person has any authority to make any representations, warranties or promises on behalf of Crary Industries or to modify the terms or limitations of this warranty in any way. Crary Industries, at its discretion, may periodically offer limited, written enhancements to this warranty.

CRARY INDUSTRIES RESERVES THE RIGHT TO CHANGE THE DESIGN AND/OR SPECIFICATIONS OF ITS PRODUCTS AT ANY TIME WITHOUT OBLIGATION TO PREVIOUS PURCHASERS OF ITS PRODUCTS.

NOTE

The warranty will not cover gearboxes that have been disassembled within the warranty period.
INSPECTION AFTER DELIVERY

After receiving the shipment of your CWS, please ensure that no boxes are missing. The following tables show the number of boxes included in all kits available for a MacDon and Case IH 2062/2162 CWS. Refer to your packing slip to see which kits you should have received. Then, ensure that all boxes were shipped. Contact your dealer immediately if any boxes are missing.

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<thead>
<tr>
<th>GEARBOX MOUNT KIT</th>
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<tr>
<td>KIT NUMBER</td>
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Congratulations on your choice of a new Crary Wind System (CWS) to complement your farming operation. This equipment has been designed and manufactured to meet the needs of a discerning agricultural industry for the efficient harvesting of crops.

Safe, efficient, and trouble free operation of your CWS requires that you and anyone else who will be operating or maintaining the machine, read and understand the Safety, Operation, Maintenance, and Trouble Shooting information contained within the Operator’s Manual. Check each item referred to and acquaint yourself with the adjustments required to obtain efficient operation.

This manual covers all the CWS models manufactured by Crary Industries for MacDon 974, MacDon FD70, MacDon FD75 Case IH 2062 and Case IH 2162 headers. Use the table of contents as a guide to locate required information.

Keep this manual handy for frequent reference and to pass on to new operators or owners. Call your Crary dealer or distributor if you need assistance, information, or additional copies of the manuals.

Many people have worked on the design, production, and delivery of this machine. They have built into it the highest quality of materials and workmanship. The information in this manual is based on the knowledge, study, and experience of these people through years of manufacturing specialized farming machinery.

The performance of the machine depends on proper maintenance and adjustment. Even if you are an experienced operator of this or similar equipment, we ask you to read the operator’s manual before running the machine. Keep the manual handy for future reference. It has been carefully prepared, organized, and illustrated to assist you in finding the information you need. Your Crary dealer will be happy to answer any further questions you may have about the machine.

OPERATOR ORIENTATION - All references to left, right, front and rear of the machine, as mentioned throughout the manual, are determined by standing behind the machine and facing towards the direction of forward travel.
2
Section SAFETY

2.1 SAFETY ALERT SYMBOL

This Safety Alert Symbol means:

ATTENTION! BECOME ALERT!
YOUR SAFETY IS INVOLVED!

The Safety Alert symbol identifies important safety messages on the machine and in the manual. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

Why is SAFETY important to you?

3 Big Reasons

1. Accidents Disable and Kill
2. Accidents Cost
3. Accidents Can Be Avoided

SIGNAL WORDS:

Note the use of the signal words DANGER, WARNING, CAUTION, IMPORTANT and NOTE with the safety messages. The appropriate signal word for each message has been selected using the following guidelines:

DANGER - Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations, typically for machine components that, for functional purposes, cannot be guarded.

WARNING - Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. 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 also be used to alert against unsafe practices.

IMPORTANT - Instructions that must be followed to ensure proper installation/operation of equipment.

NOTE - General statements to assist the reader.
2.2 GENERAL SAFETY

YOU are responsible for the SAFE operation and maintenance of your machine. You must ensure that you and anyone else who is going to operate, maintain or work around the machine are familiar with the operating and maintenance procedures and related safety information contained in this manual. This manual will alert you to all good safety practices that should be adhered to while operating the machine.

Remember, YOU are the key to safety. Good safety practices not only protect you but also the people around you. Make these practices a working part of your safety program. Be certain that EVERYONE operating this equipment is familiar with the recommended operating and maintenance procedures and follows all the safety precautions. Most accidents can be prevented. Do not risk injury or death by ignoring good safety practices.

- Owners must give operating instructions to operators or employees before allowing them to operate the machine, and annually thereafter per OSHA (Occupational Safety and Health Administration) regulation 1928.57.

- The most important safety device on this equipment is a safe operator. It is the operator’s responsibility to read and understand all Safety and Operating instructions in the manual and to follow them. All accidents can be avoided.

- A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death.

- Do not modify the equipment in anyway. Unauthorized modification may impair the function and/or safety and could affect the life of the equipment.

1. Read and understand the Owner’s Manual and all safety decals before operating, maintaining, adjusting or servicing the machine.

2. Only trained persons shall operate the machine. An untrained operator is not qualified to operate the machine.

3. Have a first-aid kit available for use, should the need arise, and know how to use it.

4. Provide a fire extinguisher for use in case of an accident. Store in a highly visible place.

5. Do not allow children, spectators or bystanders within hazard area of machine.

6. Wear appropriate protective gear. This list includes but is not limited to:
   - A hard hat.
   - Protective shoes with slip resistant soles.
   - Protective goggles.
   - Heavy gloves.
   - Hearing protection.
   - Respirator or filter mask.

7. Wear suitable ear protection during prolonged exposure to excessive noise.

8. Place all controls in neutral or off, lower header to the ground, stop combine engine, set parking brake, chock wheels, remove ignition key and wait for all moving parts to stop, before servicing, adjusting, repairing or unplugging.

9. Review safety related items annually with all personnel who will be operating or maintaining the machine.

Think SAFETY! Work SAFELY!
2.3 OPERATING SAFETY

1. Read and understand the Owner’s Manual and all safety decals before servicing, adjusting or repairing.

2. Install and secure all guards and shields before starting or operating.

3. Keep hands, feet, hair and clothing away from all moving and/or rotating parts.

4. Place all controls in neutral or off, lower header to the ground, stop combine engine, set parking brake, chock wheels, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.

5. Clear the area of bystanders, especially small children, before starting.

6. Keep all hydraulic lines, fittings, and couplers tight and free of leaks before and during use.

7. Clean reflectors and lights before transporting.

8. Review safety related items annually with all personnel who will be operating or maintaining the machine.

9. Shut the combine off when connecting the machine hydraulics.

10. Do not exceed fan speed of 5300 RPM. Check the fan speed by multiplying the driveline speed (RPM) by the gear ratio of the gearbox.

11. Do not run the fan without back pressure. Close the butterfly valve on the fan if the flex hose is disconnected.

2.4 MAINTENANCE SAFETY

1. Follow ALL operating, maintenance, and safety information in this manual.

2. Support the machine with blocks or safety stands when working around it.

3. Follow good shop practices:
   - Keep service area clean and dry.
   - Be sure electrical outlets and tools are properly grounded.
   - Use adequate light for the job at hand.

4. Use only tools, jacks and hoists of sufficient capacity for the job.

5. Place all controls in neutral or off, lower header to the ground, stop combine engine, set parking brake, chock wheels, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.

6. When maintenance work is completed, install and secure all guards before resuming work.

7. Relieve pressure from hydraulic circuit before servicing or disconnecting from combine.

8. Keep hands, feet, hair and clothing away from all moving and/or rotating parts.

9. Clear the area of bystanders, especially small children, when carrying out any maintenance and repairs or making any adjustments.

10. Keep safety decals clean. Replace any decal that is damaged or not clearly visible.

11. First-class maintenance is a prerequisite for the safest operation of your machine. Maintenance, including lubrications, should be performed with the machine stopped and locked out.

Think SAFETY! Work SAFELY!
2.5 HYDRAULIC SAFETY

1. Always place all combine hydraulic controls in neutral before disconnecting from combine or working on hydraulic system.

2. Make sure that all components in the hydraulic system are kept in good condition and are clean.

3. Relieve pressure before working on the hydraulic system.

4. Replace any worn, cut, abraded, flattened or crimped hoses.

5. Do not attempt any makeshift repairs to the hydraulic fittings or hoses by using tape, clamps or cements. The hydraulic system operates under extremely high-pressure. Such repairs will fail suddenly and create a hazardous and unsafe condition.

6. Wear proper hand and eye protection when searching for a high-pressure hydraulic leak. Use a piece of wood or cardboard as a backstop instead of hands to isolate and identify a leak.

7. If injured by a concentrated high-pressure stream of hydraulic fluid, seek medical attention immediately. Serious infection or toxic reaction can develop from hydraulic fluid piercing the skin surface.

8. Before applying pressure to the system, make sure all components are tight and that lines, hoses, and couplings are not damaged.

2.6 PTO SAFETY

1. Keep bystanders, especially children, away from drivelines.

2. Be extremely careful when working around PTO shafts, drivelines, or other rotating shafts.

3. Do not remove or modify protective shields or guards.

4. Do not step across a PTO shaft or driveline or use it as a step.

5. Keep guards and shields in place at all times while operating.

6. Replace all damaged or missing parts or shields with the correct original manufacturer’s parts.

7. Grease, clean, and maintain PTO components according to original manufacturer’s specifications and information in this manual.

8. Clothing worn by the operator must be fairly tight. Never wear loose-fitted jackets, shirts, or pants when working around the drivelines. Tie long hair back or put under a cap.

9. Keep hydraulic hoses, electrical cords, chains, and other items from contacting the drivelines.

10. Do not clean, lubricate, or adjust the drivelines when the reel is engaged and the combine is running.

Think SAFETY! Work SAFELY!
2.7 TRANSPORT SAFETY

1. Make sure you are in compliance with all local regulations regarding transporting equipment on public roads and highways.

2. It is the responsibility of the owner to know the lighting and marking requirements of the local highway authorities and to install and maintain the equipment to provide compliance with the regulations. Add extra lights when transporting at night or during periods of limited visibility.

3. See the Owner’s manual that came with your combine and header for proper transportation.

2.8 STORAGE SAFETY

1. Store the unit in an area away from human activity.

2. Do not permit children to play on or around the stored machine.

3. See the Owner’s manual that came with your combine and header for proper storage.

2.9 ASSEMBLY SAFETY

1. Assemble in an area with sufficient space to handle the largest component and access to all sides of the machine

2. Use only lifts, cranes and tools with sufficient capacity for the load.

3. When necessary, have someone assist you.

4. Do not allow spectators in the working area.

2.10 SAFETY DECALS

1. Keep safety decals clean and legible at all times.

2. Replace safety decals that are missing or have become illegible.

3. Replaced parts that displayed a safety decal should also display the current decal.

4. Replacement decals are to be placed back in the original location.

5. Safety decals are available from your authorized dealer or the factory.

HOW TO INSTALL SAFETY DECALS:

1. Be sure that the installation area is clean and dry.

2. Be sure temperature is above 50°F (10°C).

3. Decide on the exact position before you remove the backing paper.

4. Remove the smaller portion of the split backing paper.

5. Align the decal over the specified area and carefully press the small portion with the exposed sticky backing in place.

6. Slowly peel back the remaining paper and carefully smooth the remaining portion of the decal in place.

7. Small air pockets can be pierced with a pin and smoothed out using the piece of decal backing paper.

Think SAFETY! Work SAFELY!
Crary Industries follows the general Safety Standards specified by the American Society of Agricultural Engineers (ASAE) and the Occupational Safety and Health Administration (OSHA). Anyone who will be operating and/or maintaining the equipment must read and clearly understand ALL Safety, Operating and Maintenance information presented in this manual.

Do not operate or allow anyone else to operate this equipment until such information has been reviewed. Annually review this information before the season start-up.

Make these periodic reviews of SAFETY and OPERATION a standard practice for all of your equipment. An untrained operator is unqualified to operate this machine.

A sign-off sheet is provided for your record keeping to show that all personnel who will be working with the equipment have read and understand the information in the owner’s manual and have been instructed in operation of the equipment.

**SIGN - OFF FORM**

<table>
<thead>
<tr>
<th>DATE</th>
<th>EMPLOYEE SIGNATURE</th>
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Good safety requires that you familiarize yourself with the various safety decals, the type of warning and the area, or particular function related to that area, that requires your SAFETY AWARENESS.

Think SAFETY! Work SAFELY!

**WARNING**

EXPOSED DRIVE
Can cause severe injury.

Keep all shields in place while machine is running.

*PN 0732-0598-00 - Decal, Warning*

**DANGER**

SHIELD HAS BEEN REMOVED.
DO NOT OPERATE WITHOUT SHIELD IN PLACE. SERIOUS INJURY OR DEATH MAY OCCUR.

*PN 17423 - Decal, Danger*

**REMEMBER** - If safety decals have been damaged, removed or become illegible or parts have been replaced without safety decals, new decals must be applied. New safety decals are available from the manufacturer or an authorized dealer.
4.1 HEADER PREPARATION

On FD70, FD75 & Case IH 2162 headers, no disassembly is required. For MacDon 974 & Case IH 2062 headers, perform the following steps before installing the drive kit:

1. Expose the LH sickle drive belt.
2. Loosen the tension on the OEM idler pulley (Figure 1).
3. Remove the sickle drive belt from the pulleys.
4. Remove the sickle drive pulley from the OEM drive shaft.
5. Remove the OEM drive shaft from the header.

Figure 1: Header preparation for 974 & CIH 2062 headers
4.2 DRIVELINE ADJUSTMENT

If you determined that your driveline needs to be shortened, use the following steps to modify the shaft length.

If the amount required to be cut off does not include a grease zerk use the steps in section 4.2.1. If a grease zerk is within the cutting area, use the steps in section 4.2.2.

4.2.1 SHORTENING THE DRIVELINE (OPTION A)

1. Pull the driveline into two pieces. Connect one end to the combine and the other end to the drive shaft. Line up the two halves parallel to each other.

2. Measure the distance from the end of one driveline tube to the bottom of the end shield of the other driveline half (dimension A in Figure 2). Measure and mark the driveline tube 1-9/16” inward from dimension A.

3. Cut the shield tube in the marked position.

4. Using the cut piece of shield tube as your measurement, place the cut piece against the end of the shaft. Mark and cut the shaft.

5. Using the cut piece of shield tube as your measurement, mark and cut the tube on the other half of the driveline, and then the shaft.

6. File both shaft ends, and slide the two halves back together.

4.2.2 SHORTENING THE DRIVELINE (OPTION B)

1. Using a Phillips screwdriver, remove the screw at the flexible cone base of the outer shield tube. Then, twist the flexible cone until the cone flare aligns with the bearing tab (Figure 3). Pull the yoke and inner profile out of the tubing.

2. Remove the spring pin.

3. Find a pipe that is large enough to slide the inner profile inside, but is small enough that the end yoke will not pass through. This pipe should extend at least 4 inches past the end of the driveline inner profile.

   A. Insert the inner profile into the pipe.

   B. Place a steel plate on the floor and, with the yoke pointing up, bounce the pipe on the steel plate. After several bounces, the inner profile should drop out of the yoke and onto the floor.

4. Cut the yoke end of both the shaft and shield tube by the length determined.

5. Insert the profile back into the yoke and drill a new spring pin hole.

6. Insert the spring pin.

7. Drill new holes in the shield to accept the shield bearing.

8. Install the driveline shield by reversing the disassembly process from Step 1.

If you determined that your driveline needs to be shortened, use the following steps to modify the shaft length.

If the amount required to be cut off does not include a grease zerk use the steps in section 4.2.1. If a grease zerk is within the cutting area, use the steps in section 4.2.2.

IMPORTANT

The driveline shields must be reinstalled to the original equipment standards of construction and installation.

Figure 2: Shorten the driveline if it is too long

Figure 3: Removing the shield tube
4.3 GEARBOX/FAN MOUNT (974 & CIH 2062 HEADERS)

1. Line up the gearbox mount weldment according to Figure 4. Dimension “A” is variable based on header width. See the following table for correct measurements. Also, when positioning the weldment, make sure it is pushed up as far as possible against the round header tube.

2. Using the gearbox mount weldment as a template, drill three 5/16” holes into the header through the top holes of the weldment. Tap for 3/8” bolts.

3. In the bottom three gearbox mount weldment holes, drill three 13/32” holes through the header panel.

4. Install the gearbox mount plate to the header with six 3/8” x 1” serrated flange bolts and washers. Reach underneath the draper and behind the header panel to install three washers and nuts on the bottom bolts. Torque hardware to 30 ft-lbs.

5. Use a jack or hoist to position the gearbox inside the gearbox mount weldment. Attach the gearbox to the weldment with four 1/2” x 1-1/4” serrated flange bolts. Torque hardware to 75 ft-lbs.

6. Use two existing fan housing bolts to attach the fan support bracket to the fan housing.

7. Use the fan support bracket as a template to drill two 5/16” holes into the top of the header tube. Tap the holes for 3/8” bolts.

8. Attach the fan support bracket to the header tube with two 3/8” x 1” serrated flange bolts. Torque to 30 ft-lbs.

9. Attach a flexible latch to each side of the gearbox mount bracket by using two #10-24 x 3/4” bolts and nuts per latch. Using four #10-24 x 1/2” screws and nuts, install the catch for each latch on the gearbox shield weldments (Figure 5).

10. Using four 1/2” x 1” bolts, install a shield hinge on each side of the gearbox.

11. Attach LH and RH shield weldments to the shield hinges with one 5/16” x 6-1/2” bolts and nylock nut per shield.

12. Check the gearbox and, if necessary, fill the gearbox with lube before use.

Use Mobilube SHC 75W-90 synthetic gear lube or equivalent with the following specifications:
- API Service GL-5/MT.1
- MIL-L-2105D
- MACK GO-J PLUS
- SAE J2360
- Capacity: 40 ounces (1.2 liters)

NOTE
Apply a medium strength thread locking agent to the bolts used to secure the gearbox mount to the header and the gearbox to the mount.

<table>
<thead>
<tr>
<th>Header length</th>
<th>Dimension “A”</th>
</tr>
</thead>
<tbody>
<tr>
<td>30’</td>
<td>58.75”</td>
</tr>
<tr>
<td>36’</td>
<td>95”</td>
</tr>
</tbody>
</table>
4.3 GEARBOX/FAN MOUNT (974 & CIH 2062 HEADERS)

Figure 5: Left hand gearbox/fan mount (974 & CIH 2062 headers)
4.4 GEARBOX/FAN MOUNT (FD70, FD75 & CIH 2162 HEADERS)

1. Attach the gearbox mount weldment to the adapter tube using the mount plate and bolts as shown in Figure 6.

   **NOTE**

   Apply a medium strength thread locking agent to the bolts used to secure the gearbox mount to the header and the gearbox to the mount.

2. Mark the bottom right hole using the gearbox mount weldment as a template. Remove the gearbox mount weldment and hardware and drill a 21/32" hole. (Figure 7) Reinstall gearbox mount weldment using four 5/8" x 7" bolts and nuts and torque to 150 ft. lbs.

3. Install mount support bracket to the gearbox mount using two 3/8 x 1-1/4" bolts, nuts, and washers. Attach the lower support bracket to the mount support bracket and leave the center hardware loose to allow adjustment. (Figure 8)

4. Align the lower support bracket with the square hole on the header adapter and secure with a 1/2" bolt. Drill a 13/32" hole through the OEM mount and secure bracket with a 3/8" bolt. Tighten all hardware.

5. Use a jack or hoist to position the gearbox in place next to the gearbox mount weldment. Attach the gearbox to the weldment with four 1/2" x 1-1/4" serrated flange bolts (Figure 10). Torque hardware to 75 ft-lbs.

6. Check the gearbox and, if necessary, fill the gearbox with lube before use.

   Use Mobilube SHC 75W-90 synthetic gear lube or equivalent with the following specifications:
   - API Service GL-5/MT.1
   - MIL-L-2105D
   - MACK GO-J PLUS
   - SAE J2360
   - Capacity: 40 ounces (1.2 liters)

7. Using the table on the next page measure from the end of the header and drill two 17/64" hole for each bracket and tap for 5/16 bolts. Install the two tube mount weldments using two bolts and washers.
4.4 GEARBOX/FAN MOUNT (FD70, FD75 & CIH 2162 HEADERS)

<table>
<thead>
<tr>
<th>Manifold Length</th>
<th>First Bracket Mount</th>
<th>Second Bracket Mount</th>
</tr>
</thead>
<tbody>
<tr>
<td>30'</td>
<td>21&quot;</td>
<td>41&quot;</td>
</tr>
<tr>
<td>35'</td>
<td>21&quot;</td>
<td>73&quot;</td>
</tr>
<tr>
<td>40'</td>
<td>21&quot;</td>
<td>95&quot;</td>
</tr>
</tbody>
</table>

Figure 10: Right hand gearbox/fan mount (FD70 & CIH 2162 headers)
1. Attach the gearbox mount weldment to the adapter tube using the mount plate and bolts as shown in Figure 11.

2. Mark the bottom right hole using the gearbox mount weldment as a template. Remove the gearbox mount weldment and hardware and drill a 21/32” hole. (Figure 12) Reinstall gearbox mount weldment using four 5/8” x 7” bolts and nuts and torque to 150 ft. lbs.

3. Install the mount support bracket to the gearbox mount using two 3/8 x 1-1/4” bolts, nuts, and washers. Attach the lower support bracket to the mount support bracket and leave the center hardware loose to allow adjustment. (Figure 13)

4. Align the lower support bracket with the square hole on the header adapter and secure with a 1/2” bolt. Drill a 13/32” hole through the OEM mount and secure bracket with a 3/8” bolt. Tighten all hardware.

5. Use a jack or hoist to position the gearbox in place next to the gearbox mount weldment. Attach the gearbox to the weldment with six 1/2” x 1-1/4” serrated flange bolts. Torque hardware to 75 ft-lbs.

6. Using a 1/2” x 2-1/4” bolt washer and nut to attach the top of the gearbox the gearbox mount bracket. (Figure 14)

7. Check the gearbox and, if necessary, fill the gearbox with lube before use.

Use Mobilube SHC 75W-90 synthetic gear lube or equivalent with the following specifications:
- API Service GL-5/MT.1
- MIL-L-2105D
- MACK GO-J PLUS
- SAE J2360
- Capacity: 28 ounces (0.8 liters)
4.5 GEARBOX/FAN MOUNT (FD70, FD75 & CIH 2162 HEADERS) (SERIES II)

Figure 14: Gearbox mount location, Series II

Figure 15: Right hand tube mount location

Figure 16: Right hand gearbox/fan mount (FD70 & CIH 2162 headers) (Series II)
4.6 GEARBOX/FAN MOUNT (FD70 HEADERS ON LEXION COMBINES)

1. Attach the gearbox mount weldment to the adapter tube using the mount plate and bolts as shown in Figure 17.

   --- NOTE ---

   Apply a medium strength thread locking agent to the bolts used to secure the gearbox mount to the header and the gearbox to the mount.

2. Mark the bottom right hole using the gearbox mount weldment as a template. Remove the gearbox mount weldment and hardware and drill a 21/32" hole. (Figure 18) Reinstall gearbox mount weldment using four 5/8" x 7" bolts and nuts and torque to 150 ft. lbs.

3. Install lower support weldment to the gearbox mount using six 3/8 x 1-1/4" bolts and nylock nuts. Attach the lower support bracket to the mount support weldment and leave the center hardware loose to allow adjustment. (Figure 19)

4. Align the lower support bracket with the square hole on the header adapter and secure with a 1/2" bolt. Drill a 13/32" hole through the OEM mount and secure bracket with a 3/8" bolt. Tighten all hardware.

5. Use a jack or hoist to position the gearbox in place next to the gearbox mount weldment. Attach the gearbox to the weldment with four 1/2" x 1-1/4" serrated flange bolts (Figure 19). Torque hardware to 75 ft-lbs.

6. Check the gearbox and, if necessary, fill the gearbox with lube before use.

   Use Mobilube SHC 75W-90 synthetic gear lube or equivalent with the following specifications:
   - API Service GL-5/MT.1
   - MIL-L-2105D
   - MACK GO-J PLUS
   - SAE J2360
   - Capacity: 40 ounces (1.2 liters)
4.6 GEARBOX/FAN MOUNT (FD70 HEADERS ON LEXION COMBINES)

Figure 19: Right hand gearbox/fan mount (FD70 on Lexion Combines)
4.7 LEFT HAND DRIVE KIT (974 & CIH 2062 HEADERS)

1. Using two bushings and 5/16" keys, install the gearbox stub shaft in the gearbox. The 6-spline end of the shaft should point toward the feeder house. Center the shaft in the gearbox and torque all bushing bolts to 17 ft-lbs.

2. Install the bearing mount plate to the LH side of the header with OEM hardware (Figure 20).

3. Install two flangettes, one bearing and the shield mount assembly to the bearing mount plate. Use three 3/8" x 1-1/4" carriage bolts, washers and nylock nuts (Figure 22).

4. Slide the LH drive shaft through the bearing mount plate. When inserting the shaft, install the drive shaft shield between the bearing and header.

5. Reinstall the header sickle drive pulley and belt that were removed in the header preparation section.

6. Tighten the lock collar on the bearing. To do so, insert a punch in the lock collar dimple. Using a hammer, tap the punch in the direction of normal shaft rotation until the collar is tight. Then, tighten the lock collar set screw.

7. Find the OEM hose holder shown in Figure 21. Use the existing bolt to attach the spring mount angle. This will be used to hold a driveline safety chain.

8. Using a 5/16" key, install the OEM PTO driveline on the LH drive shaft.

9. Slide the slip clutch shield over the OEM driveline and attach it to the shield mount assembly. Use three 5/16" x 3/4" bolts.

10. Install the other end of the OEM PTO driveline on the LH end of the gearbox stub shaft.

11. Attach the slip clutch end of the provided driveline to the RH end of the gearbox stub shaft.
4.7 LEFT HAND DRIVE KIT (974 & CIH 2062 HEADERS)

Figure 22: Left hand drive kit assembly (974 & CIH 2062 headers)
### 4.8 RIGHT HAND DRIVE KIT (FD70 & CIH 2162 HEADERS)

1. Using two bushings and 5/16” keys, install the gearbox drive shaft in the gearbox. The splined end of the shaft should point toward the feeder house (Figure 23). The blunt end of the shaft should be installed flush with the right gearbox bushing. Torque all bushing bolts to 17 ft-lbs.

2. Using two 1/2” x 1” serrated flange bolts, install the gearbox shield weldment over the RH gearbox bushing.

3. Install the shield hinge to the gearbox mount using two 1/2” x 1” serrated flange bolts and nuts and attach the PTO shield. Attach the flexible latch using two 10-24 x 3/4” bolts. Install the catch to the PTO shield using 2 10-24 x 1/2” screws.

4. Install the slip clutch end of the provided driveline onto the LH end of the gearbox drive shaft.

5. Install the PTO holder to the gearbox mount weldment with two 3/8” x 1-1/4” bolt and nut.

---

**Figure 23: Right hand drive kit assembly (FD70 & CIH 2162 headers)**
4.9 RIGHT HAND DRIVE KIT (FD70 & FD75 HEADERS)  (SERIES II)

1. Using three 3/8” x 3/4” bolts, install the PTO shield.

2. Attach the PTO holder to the gearbox mount using two 3/8” x 1-1/4” bolts and nuts.

3. Using the table measure from the end of the header and drill two 17/64” hole for each bracket and tap for 5/16 bolts. Install the two tube mount weldments using two bolts and washers.

<table>
<thead>
<tr>
<th>Manifold Length</th>
<th>First Bracket Mount</th>
<th>Second Bracket Mount</th>
</tr>
</thead>
<tbody>
<tr>
<td>30’</td>
<td>21”</td>
<td>41”</td>
</tr>
<tr>
<td>35’</td>
<td>21”</td>
<td>73”</td>
</tr>
<tr>
<td>40’</td>
<td>21”</td>
<td>95”</td>
</tr>
<tr>
<td>45’</td>
<td>36”</td>
<td>110”</td>
</tr>
</tbody>
</table>

**NOTE**

Mount brackets so manifold will align to the fan outlet elbow.

*Figure 24: Right hand drive kit assembly (FD70 & FD75 headers)  (Series II)*
4.10 REEL ARM MOUNT (974 & CIH 2062 HEADERS)

IMPORTANT

Read all instructions to become familiar with the parts and procedure used before starting the actual work. You may refer to the parts catalog for additional aid in assembling the CWS.

4.10.1 LEFT HAND

1. Place the LH reel arm weldment on top of the OEM LH reel arm as shown in Figure 25. Install the LH reel arm weldment to existing holes in the OEM reel arm with the two provided 1/2” x 2-3/4” bolts, washers and nuts.

2. Using a 1/2” x 3-1/2” bolt, washer and nut, attach an arm mount tube and tube mount weldment to the rear hole of the LH reel arm weldment.

3. Insert a reel mount assembly into the arm mount tube (Figure 26).

4. Attach the notched end of the adjustment strap to the arm mount tube and reel mount assembly with a 1/2” x 3-1/2” bolt, washers and nut.

5. Attach the bottom end of the adjustment strap to the front hole of the LH reel arm weldment with a 1/2” x 1-1/4” carriage bolt, washer and nut.

Figure 25: Left hand reel arm weldment (974 & 2062 headers)

Figure 26: LH reel arm mount assembly (974 & CIH 2062 headers)
4.10 REEL ARM MOUNT (974 & CiH 2062 HEADERS)

4.10.2 RIGHT HAND

1. Place the RH reel arm weldment on top of the OEM RH reel arm. Align the bolt holes of the RH reel arm weldment with existing holes in the OEM reel arm.

2. Install the reel arm weldment to the OEM reel arm with two 1/2” x 2-1/4” bolts, washers, nuts and OEM spacers (Figure 27).

3. Using a 1/2” x 3-1/2” bolt, washers and nut, attach an arm mount tube to the rear hole of the RH reel arm weldment.

4. Insert a reel mount assembly into the arm mount tube (Figure 28).

5. Attach the notched end of the adjustment strap to the arm mount tube and reel mount assembly with a 1/2” x 3-1/2” bolt, washers and nut.

6. Attach the bottom end of the adjustment strap to the front hole of the RH reel arm weldment with a 1/2” x 1-1/4” carriage bolt, washer and nut.

---

**Figure 27: Right hand reel arm weldment (974 & 2062 headers)**

**Figure 28: RH reel arm mount assembly (974 & CIH 2062 headers)**
4.10 REEL ARM MOUNT (974 & CIH 2062 HEADERS)

4.10.3 CENTER

1. Place the center reel arm weldment along the left side (when looking from combine cab) of the OEM center reel arm. Position the bolt holes of the center reel arm weldment to line up with existing holes in the OEM reel arm.

2. Attach the center reel arm weldment to the OEM center reel arm with two 1/2" x 2-3/4" bolts, four washers and two nylock nuts (Figure 29).

3. Using a 1/2" x 3-1/2" bolt, washers and nut, attach an arm mount tube to the rear hole of the center reel arm weldment.

4. Insert the center reel mount assembly into the arm mount tube.

5. Attach the notched end of the adjustment strap to the arm mount tube and reel mount assembly with a 1/2" x 3-1/2" bolt, washer and nut.

6. Attach the bottom end of the adjustment strap to the front hole of the center reel arm weldment with a 1/2" x 1-1/4" carriage bolt, washer and nut.

7. Ensure the RH, LH and center reel mount assemblies are at equal height.

Figure 29: Center reel arm mount assembly (974 & CIH 2062 headers)
4.11 REEL ARM MOUNT (FD70 & CIH 2162 HEADERS)

4.11.1 LEFT HAND

1. Assemble the bearings using the spacer, adaptor, bearing and washer. Use a 3/8 x 5" bolt and nylock nut to secure the bearings to the CWS mount weldment. (Figure 30)

CAUTION

Be sure the reel is secure and will not move before beginning installation.

2. Remove the OEM bracket from the reel and save the hardware for later use. (Figure 31)

3. Set a CWS mount weldment on the OEM LH reel arm. Slide it back against the OEM bracket shown in Figure 32.

4. Insert a 1/2” x 1-3/4” carriage bolt through the OEM bracket and the bottom hole of the CWS mount weldment. Use a 1/2” hex nut as a spacer on the bolt between the CWS mount weldment and OEM bracket. Install a 1/2” washer and nylock nut on the end of the bolt. (Figure 32)

5. Use the CWS mount weldment as a template to drill the top two holes through the reel arm bracket for 3/8” bolts.

6. Attach the CWS mount weldment to the OEM bracket with two 3/8” x 1-3/4” bolts through the top holes. Install a spacer on each bolt between the CWS mount weldment and OEM bracket. Install a nylock nut on each bolt and torque to 30 ft-lbs.

7. Using a 1/2” x 3” carriage bolt and locknut, attach an end hole of an arm mount tube to the clevis of the CWS mount weldment (Figure 33).

8. Insert the reel mount assembly into the arm mount tube.

9. Attach the adjustment strap to the arm mount tube and reel mount assembly with a 1/2” x 3-1/4” bolt, nut, and washers. Use two washers as spacers between the strap and tube. (Figure 33)

10. Attach the bottom end of the adjustment strap to the front hole of the CWS mount weldment with a 1/2” x 1-1/4” carriage bolt and nut.

11. Replace reel stop with new bracket using OEM hardware removed in step 2.
4.11 REEL ARM MOUNT (FD70 & CIH 2162 HEADERS)

Figure 33: LH reel arm mount assembly (FD70 & CIH 2162 headers)
4.11 REEL ARM MOUNT (FD70 & CIH 2162 HEADERS)

4.11.2 RIGHT HAND

1. Assemble the bearings using the spacer, adaptor, bearing and washer. Use a 3/8 x 5” bolt and nylock nut to secure the bearings to the CWS mount weldment. (Figure 30)

2. Disconnect the OEM cylinder and remove the mount.

3. Set a CWS mount weldment on the OEM RH reel arm. Slide it back against the OEM bracket shown in Figure 34.

4. Attach the CWS mount weldment to the OEM bracket. To do so, replace two existing bolts with 3/8” x 1-3/4” bolts and washers (Figure 34). Install a spacer on each bolt between the CWS mount weldment and OEM bracket. Use one 1/2” x 1-1/4” carriage bolt, washer and nut to bolt the bottom hole of the CWS mount weldment to the OEM bracket.

5. Using a 1/2” x 3” carriage bolt and locknut, attach an end hole of an arm mount tube to the clevis of the CWS mount weldment (Figure 36).

6. Insert a reel mount assembly into the arm mount tube.

7. Attach the adjustment strap to the arm mount tube and reel mount assembly with a 1/2” x 3-1/4” bolt, nut, and washers. Use two washers as spacers between the strap and tube. (Figure 37)

8. Attach the bottom end of the adjustment strap to the front hole of the CWS mount weldment with a 1/2” x 1-1/4” carriage bolt and nut.

9. Position the tube mount as shown in Figure 35 onto the OEM reel mount. Install a 5/16 x 1” bolt in the upper left corner. Using the bracket as a template to mark and drill the other hole using a 11/32” drill.

10. Bolt tube mount to the OEM reel mount using a spacer between the bracket and the OEM mount. Use a 5/16 x 1-1/4” bolt, nut and washer to secure in place. (Figure 34)

11. Install new cylinder mount as shown in Figure 36 and reconnect the OEM cylinder.
4.11 REEL ARM MOUNT (FD70 & CIH 2162 HEADERS)

Figure 37: RH reel arm mount assembly (FD70 & CIH 2162 headers)
4.11 REEL ARM MOUNT (FD70 & CIH 2162 HEADERS)

4.11.3 CENTER

1. Assemble the bearings using the spacer, adaptor, bearing and washer. Use a 3/8 x 5" bolt and nylock nut to secure the bearings to the CWS mount weldment. (Figure 30)

2. Disconnect the OEM cylinder and remove the mount.

3. Set a CWS mount weldment on the OEM center reel arm. Slide it back against the OEM bracket shown in Figure 38.

4. Attach the CWS mount weldment to the OEM bracket. To do so, replace two existing bolts with 3/8" x 1-3/4" bolts and washers (Figure 38). Install a spacer on each bolt between the CWS mount weldment and OEM bracket. Use one 1/2" x 1-1/4" carriage bolt, washer and nut to bolt the bottom hole of the CWS mount weldment to the OEM bracket.

5. Using a 1/2" x 3" carriage bolt and locknut, attach an end hole of an arm mount tube to the clevis of the CWS mount weldment (Figure 40).

6. Insert the center reel mount assembly into the arm mount tube.

7. Attach the adjustment strap to the arm mount tube and reel mount assembly with a 1/2" x 3-1/4" bolt, nut, and washers. Use two washers as spacers between the strap and tube. (Figure 40)

8. Attach the bottom end of the adjustment strap to the front hole of the CWS mount weldment with a 1/2" x 1-1/4" carriage bolt and nut.

9. Install new cylinder mount as shown in Figure 39 and reconnect the OEM cylinder.

10. Ensure the RH, LH and center reel mount assemblies are at equal height.

CAUTION

Be sure the reel is secure and will not move before beginning installation.
4.11 REEL ARM MOUNT (FD70 & CIH 2162 HEADERS)

Figure 40: Center reel arm mount assembly (FD70 & CIH 2162 headers)
CAUTION

Be sure the reel is secure and will not move before beginning installation.

1. Remove the existing OEM cylinder mount from the front of the reel arm and discard. Remove the OEM hardware from the bottom of the OEM reel mounting bracket and discard hardware except for the spacer which will be reused.

2. Assemble the bearings using the spacer, adaptors, bearings and bushings. Use a 3/8 x 5" bolt and nylock nut to secure the bearings to the RH reel mount. (Figure 44)

3. Slide the RH reel mount to the OEM reel arm. Attach the bottom of the RH reel mount to the OEM reel arm using a 1/2" x 5-1/2" bolt, nut and washers. (Figure 41) Reuse the OEM spacer removed previously. Adjust the spacer so there is 1/16" gap between the spacer and the reel arm.

4. Attach the RH reel arm mount bracket to the of the RH reel mount using a 1/2" x 1-1/4" bolt and nut.

5. Using the mount bracket as a guide mark and drill a 17/32" hole into the OEM reel arm. Be sure to have the bracket straight when marking hole location. Attach the bracket to the OEM reel arm using a 1/2" x 1-1/4" bolt and nut.

6. Attach the arm mount to the RH reel mount using two 1/2" x 4" bolts, spacers and nuts. (Figure 43)

7. Insert a reel mount into the arm mount and secure with a 1/2" x 2-3/4" bolt and nut.

8. Install new cylinder mount using four 1/2" x 1" screws.

9. Attach the cylinder to the cylinder mount with the provided cylinder pin and two hair pins.

10. Attach the tube mount the RH reel mount using two 5/16" x 1" bolts and nuts.

Figure 41: RH reel mount (FD75 headers)

Figure 42: RH reel mount (FD75 headers)
4.12 REEL ARM MOUNT (FD75 HEADERS)

Figure 43: Right reel arm mount assembly (FD75 headers)
4.12 REEL ARM MOUNT (FD75 HEADERS)

4.12.2 LEFT HAND

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
</table>
Be sure the reel is secure and will not move before beginning installation.

1. Remove the existing OEM pin from the fore/aft cylinder, and discard. Remove the reel stop bolt from the end of the reel arm and discard. Remove the OEM hardware from the bottom of the OEM reel mounting bracket and discard hardware except for the spacer which will be reused.

2. Assemble the bearings using the spacer, adaptors, bearings and bushings. Use a 3/8 x 5” bolt and nylock nut to secure the bearings to the LH reel mount. (Figure 44)

3. Slide the LH reel mount to the OEM reel arm. Attach the LH reel mount to the OEM cylinder using a 5/8” x 3-1/4” bolt, nut and four washers as shown in Figure 45.

4. Attach the bottom of the LH reel mount to the OEM reel arm using a 1/2” x 5-1/2” bolt, nut and washers. (Figure 46) Reuse the OEM spacer removed in step one. Adjust the spacer so there is 1/16” gap between the spacer and the reel arm.

5. Attach the arm mount to the LH reel mount using two 1/2” x 4” bolts, spacers and nuts. (Figure 47)

6. Insert a reel mount into the arm mount and secure with a 1/2” x 2-3/4” bolt and nut.

7. Install new cylinder mount using four 1/2” x 1” screws. The top hole will not be used on the LH side.

Figure 44: Bearing assembly (FD75 headers)

Figure 45: LH reel mount (FD75 headers)

Figure 46: LH reel mount (FD75 headers)
4.12 REEL ARM MOUNT (FD75 HEADERS)

Figure 47: Left reel arm mount assembly (FD75 headers)
4.12 REEL ARM MOUNT (FD75 HEADERS)

4.12.3 CENTER

Be sure the reel is secure and will not move before beginning installation.

1. Remove the existing OEM cylinder mount from the front of the reel arm and discard.

2. Assemble the bearings using the spacer, adaptors, bearings and bushings. Use a 3/8 x 4-1/2” bolt and nylock nut to secure the bearings to the center reel mount. (Figure 44)

3. Slide the center reel mount to the OEM reel arm. Attach the bottom of the center reel mount to the OEM reel arm using a 1/2” x 1-1/4” bolt, nut and washer. (Figure 48)

4. Align the center reel arm mount bracket to the holes on the center reel arm and slide the mount so it is secure in place. Attach with two 1/2” x 1-1/4” bolts and washers.

5. Attach the arm mount to the center reel mount. On the slotted pivot use a 1/2” x 4-1/2” bolt, nut and six washers. (Figure 49). On the front pivot use a 1/2” x 4-1/2” bolt, nut and four washers.

6. Insert the center reel mount into the arm mount and secure with a 1/2” x 2-3/4” bolt and nut.

7. Install new cylinder mount using four 1/2” x 1” screws.

8. Attach the cylinder to the cylinder mount with the provided cylinder pin and two hair pins.
4.12 REEL ARM MOUNT (FD75 HEADERS)

Figure 49: Center reel arm mount assembly (FD75 headers)
### 4.13 MANIFOLD (FD75 HEADERS)

#### NOTE

References to left and right of the machine, are determined by standing behind the machine and facing the direction of forward travel.

1. Slide a t-bolt clamp over each end of each single hump hose.
2. Slide the single hump hoses onto each side of the connector manifold. Leave enough room in the middle of the connector manifold to install an air tube. (Figure 50)
3. Slide a manifold pivot over the right side of the manifold with the serial number. Slide a manifold pivot over the left side of the manifold without the serial number. (Figure 51)
4. Slide the LH and RH manifolds into the single hump hoses.
5. Using a hoist lift the manifold into position.
6. Use half clamps to secure the manifold to the left hand, right hand and center reel mount assemblies. Install the half clamps with 3/8” x 1” carriage bolts and 3/8” nylock nuts.
7. Adjust the manifold as necessary to center the manifold between the reel mount.
8. Tighten all t-bolt clamps.

---

(Figure 50: Manifold Assembly)
4.13 MANIFOLD (FD75 HEADERS)

**Figure 51: Center manifold Assembly (FD75 headers)**
4.14 MANIFOLD (SECTIONAL)

1. Slide a brace clamp and pivot clamp onto the 20.5" connector manifold.

2. Connect the left and right CWS manifolds with the connector manifold, two single hump hoses and four 8-11/16" t-bolt clamps (Figure 52). The connector manifold should be installed with the pivot clamp on the right side of the brace clamp (when looking from combine cab). If installing a 36' manifold, the shorter manifold section with the serial number decal must be installed on the left side.

3. Center the manifold on the reel arm mounts.

4. Slide the brace clamp against the left hand side of the center reel mount and tighten.

5. Place the half clamps on top of the manifold at each reel arm mount. Install each half clamp with four 3/8" x 1" carriage bolts, eight washers and four nylock nuts.

6. Slide the pivot clamp against the right hand side of the center half clamp. Tighten the bolts and nuts. Do not over tighten.

7. Slide the tube cap (Figure 53) on the manifold end opposite the gearbox.

8. Fasten the tube cap with an 8-3/8" t-bolt clamp.

Figure 52: Manifold installation

Figure 53: Tube cap (shown on LH end of manifold)
4.15 DROP TUBE ASSEMBLY

When installing the air tubes, start working from the LH side (as looking from the combine cab) of the manifold and work to the right. Install a long air tube first.

- Install a long drop tube in both connector manifold holes.
- Alternate long and short air tubes the length of the manifold.
- 40” reels: Begin with two long air tubes on each end then alternate long and short.

1. Apply the self adhesive foam seals, if not already installed.
   A. Remove and discard the slot and two hole cutouts from the self adhesive foam seal.
   B. Remove the self adhesive foam seal from the backing and apply foam seal to manifold.

2. To connect an air tube, place it on one of the holes in the manifold and point the end towards the direction of the cutterbar.

3. Place a u-bolt around the manifold and through the holes on the air tube weldment.

4. Secure the air tube with two 5/16” flange nuts (Figure 54). Torque to 11 ft-lbs.

5. Repeat procedure for all air tubes, making sure to alternate long and short air tubes. When you reach the connector manifold, install a long drop tube in both of the connector manifold holes.

<table>
<thead>
<tr>
<th>MANIFOLD LENGTH</th>
<th># OF SHORT DROP TUBES</th>
<th># OF LONG DROP TUBES</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 FT (12” SPACING)</td>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td>35 FT (12” SPACING)</td>
<td>16</td>
<td>18</td>
</tr>
<tr>
<td>36 FT (12” SPACING)</td>
<td>17</td>
<td>19</td>
</tr>
<tr>
<td>40 FT (12” SPACING)</td>
<td>2</td>
<td>37</td>
</tr>
<tr>
<td>45 FT (12” SPACING)</td>
<td>2</td>
<td>43</td>
</tr>
</tbody>
</table>

Figure 54: Drop tube assembly
4.16 MOUNTING THE FLEX HOSE (974 & CIH 2062 HEADERS)

**NOTE**

For easy installation of hose parts, you may use a solution of soap and water as lubricant when sliding pieces together.

1. Using two 5/16" x 1" bolts and nuts, attach the tube mount weldment to the LH reel arm mount as shown in Figure 55.

2. Attach the clamp mount bracket to existing holes in the LH reel arm with two 5/8" x 4" bolts, washers and nuts (Figure 56).

3. Set a 56" aluminum manifold in the tube mount weldment and clamp mount bracket. Position the manifold so that the back end is about even with the back panel of the header.

4. Fasten the aluminum tube to the tube mount weldment with a 5/16" u-bolt, washers and nuts (Figure 57). Tighten so that the tube will not slide back and forth within the weldment.

5. Install a half clamp on the clamp mount bracket by using four 3/8" x 1-1/2" carriage bolts, sixteen washers and four nuts. Use the washers as spacers between the half clamp and clamp mount bracket.

6. Slide an 8-11/16" t-bolt clamp over each end of the 90 degree elbow. Then, slide the 90 degree elbow onto the LH end of the front CWS manifold. Point the elbow toward the 56" manifold.

7. Insert an elbow support band from the flex hose into the 90 degree elbow.

8. Determine the length of hose needed to connect the 90 degree elbow to the 56" manifold and cut the hose. Do not leave slack in this portion of the flex hose.

9. Install the flex hose on the front end of the 56" manifold with an 8-3/8" t-bolt clamp.

10. Slide an 8-11/16" t-bolt clamp over each end of the 45 degree elbow. Then, slide the 45 degree elbow onto the rear end of the 56" manifold. Point the elbow toward the fan air outlet.

11. Insert the remaining manifold into the 45 degree elbow.

12. With the remaining piece of flex hose from step 8, insert the elbow support band into the manifold.

13. Determine the amount of flex hose needed to connect the manifold to the fan air outlet and cut the hose if needed. Leave enough slack in the hose to allow complete up/down and fore/aft movement of the reel arm.


15. Tighten all t-bolt clamps.
4.16 MOUNTING THE FLEX HOSE (974 & CIH 2062 HEADERS)

Figure 57: Air hose installation (974 & CIH 2062 headers)
4.17 MOUNTING THE FLEX HOSE (FD70, FD75 & CIH 2162 HEADERS) (30’ - 40’)

NOTE
For easy installation of hose parts, you may use a solution of soap and water as lubricant when sliding hose pieces together.

1. Set the 56” aluminum manifold in the tube mounts. Position the manifold so that the back end is about even with the back panel of the header.

2. Fasten the manifold to the tube mount weldment with two 5/16” u-bolts and four nuts (Figure 60). Tighten so that the manifold will not slide back and forth within the weldment.

3. Slide an 8-11/16” t-bolt clamp over each end of the 90 degree elbow. Then, slide the elbow over the RH end of the front CWS manifold. Point the elbow toward the 56” manifold.

4. Insert an elbow support band into the 90 degree elbow.

5. Determine the length of hose needed to connect the elbow support band to the 56” manifold and cut the hose. Leave enough slack in this portion of flex hose to allow complete up/down and fore/aft movement of the reel.

6. Install the flex hose over the elbow support band and the front end of the 56” manifold with two 8-3/8” t-bolt clamps.

7. Set the aluminum manifold in the tube mounts in the back of the reel.

8. Fasten the manifold to the tube mount weldment with two 5/16” u-bolts and four nuts (Figure 60). Tighten so that the manifold will not slide back and forth within the weldment.

9. **Series I**: Slide an 8-11/16” t-bolt clamp over each end of the 45 degree elbow. Then, slide the elbow onto the fan outlet. Point the elbow toward the manifold.

**Series II**: Slide an 8-11/16” t-bolt clamp over each end of a 90 degree elbow. Then, slide the elbow onto the fan outlet. Point the elbow toward the manifold.

10. Insert an elbow support band into the elbow installed in the previous step.

11. Determine the length of flex hose needed to connect the elbow support band to the manifold and cut the hose. Install the flex hose over the elbow support band and the back end of the manifold with two 8-3/8” t-bolt clamps.

12. Slide an 8-11/16” t-bolt clamp over each end of the 45 degree elbow. Then, slide the elbow onto the RH end rear manifold. Point the elbow toward the 56” manifold on the side of the reel.

13. Insert an elbow support band into the 45 degree elbow.

14. Determine the length of flex hose needed to connect the elbow support band to the 56” manifold. Cut the hose if needed. Leave enough slack in this portion of flex hose to allow complete up/down and fore/aft movement of the reel.

15. Install the flex hose on the elbow support band and the rear end of the 56” manifold with two 8-3/8” t-bolt clamps.

16. Tighten all t-bolt clamps.
4.17 MOUNTING THE FLEX HOSE (FD70, FD75 & CIH 2162 HEADERS) (30’ - 40’)

Figure 58: Fan routing

Figure 59: Fan routing

Figure 60: Air hose installation (30’ FD70 & CIH 2162 headers)
4.18 HOSE ROUTING (FD70, FD75 DUAL FLOW) (40’ & 45’)

NOTE
For easy installation of hose parts, you may use a solution of soap and water as lubricant when sliding hose pieces together.

4.18.1 RIGHT HAND SIDE
CONVERTING A SINGLE FLOW TO A DUAL FLOW
1. On 40’ single flow headers remove the components shown in Figure 61. The flex hose and one clamp will be discarded. All other parts will be re-used on the left hand side hose routing.
2. Slide an 8-11/16” t-bolt clamp over each end of a hump hose. Then, slide the hump hose over the fan air outlet. Slide the t-connection onto the hump hose.
3. Determine the length of hose needed to connect the t-connection and the rear manifold.
4. Slide an 8-11/16” t-bolt clamp over one end of the flex hose. Then slide the hose onto the right hand side of the t-connection. Slide an 8-11/16” t-bolt clamp over the other end of the flex hose. Then slide it onto the rear manifold.
5. Tighten all t-bolt clamps.

INSTALLING RH SIDE OF DUAL FLOW SYSTEM
1. Set the 56” aluminum manifold in the tube mounts. Position the manifold so that the back end is about even with the back panel of the header.
2. Fasten the manifold to the tube mount weldment with two 5/16” u-bolts and four nuts (Figure 62). Tighten so that the manifold will not slide back and forth within the weldments.
3. Slide an 8-11/16” t-bolt clamp over each end of a hump hose. Then, slide the hump hose over the fan air outlet. Slide the t-connection onto the hump hose.
4. Determine the length of hose needed to connect the t-connection and the rear manifold.
5. Slide an 8-11/16” t-bolt clamp over one end of the flex hose. Then slide the hose onto the right hand side of the t-connection. Slide an 8-11/16” t-bolt clamp over the other end of the flex hose. Then slide it onto the rear manifold.
6. Insert an elbow support band into the 90 degree elbow.
7. Set the aluminum manifold in the tube mounts in the back of the header.
8. Fasten the manifold to the tube mount weldments with two 5/16” u-bolts and four nuts (Figure 62). Tighten so that the manifold will not slide back and forth within the weldments.
9. Slide an 8-11/16” t-bolt clamp over each end of a hump hose. Then, slide the hump hose over the fan air outlet. Slide the t-connection onto the hump hose.
10. Determine the length of hose needed to connect the t-connection and the rear manifold.
11. Slide an 8-11/16” t-bolt clamp over one end of the flex hose. Then slide the hose onto the right hand side of the t-connection. Slide an 8-11/16” t-bolt clamp over the other end of the flex hose. Then slide it onto the rear manifold.
12. Slide an 8-11/16” t-bolt clamp over each end of the 45 degree elbow. Then, slide the elbow onto the RH end rear manifold. Point the elbow toward the 56” manifold on the side of the reel.
13. Insert an elbow support band into the 45 degree elbow.
14. Determine the length of flex hose needed to connect the elbow support band to the 56” manifold. Cut the hose if needed. Leave enough slack in this portion of flex hose to allow complete up/down and fore/aft movement of the reel.
15. Install the flex hose on the elbow support band and the rear end of the 56” manifold with two 8-3/8” t-bolt clamps.
16. Tighten all t-bolt clamps.
4.18 HOSE ROUTING (FD70, FD75 DUAL FLOW) (40' & 45')

Figure 62: Air hose installation (Dual Flow)
4.18 HOSE ROUTING (FD70, FD75 DUAL FLOW)

NOTE
For easy installation of hose parts, you may use a solution of soap and water as lubricant when sliding hose pieces together.

4.18.2 REAR HOSE ROUTING

NOTE
Two sets of tube mounts are provided for the center manifold. Use the tube mounts with the slotted hole (reference purposes only) when installing on a FD70. Use the tube mounts without the slotted hole when installing on a FD75. Discard the tube mounts that are not used.

1. Secure the transition tube mount brackets to the fluid reservoir on the back of the header using two 1/2” x 7-1/2’ bolts and nuts. Place the tube mount 18” from the inside left hand edge of the fluid reservoir flange. (Figure 63) The other transition tube mount bracket should have been installed at the same time as the gearbox mount bracket.

2. Refer to Figure 65 dimension A for tube mount location. Using a mount clamp as a template, measure from the left hand inside edge of the header and mark and drill two 17/64” holes and tap for 5/16 bolts. Install the tube mount weldment using two bolts and washers.

3. 45’ headers only: Refer to Figure 65 dimension B or tube mount location. Using a tube mount as a template, measure from the left hand inside edge of the header and mark and drill two 17/64” holes and tap for 5/16 bolts. Install the tube mount weldment using two bolts and washers.

4. Refer to Figure 65 dimension C for tube mount location. Using a tube mount as a template, measure from the left hand inside edge of the header and mark and drill two 17/64” holes and tap for 5/16 bolts. Install the tube mount weldment using two bolts and washers.

5. Set a manifold on the tube mounts over the feeder house and secure each end with a u-bolt and two 5/16” nuts and washers. Align each end with the ends of the fluid reservoir.

6. Determine the length of hose needed to connect the t-connection and the rear manifold. After determining the length of hose needed, cut the hose.

7. Slide an 8-11/16” t-bolt clamp over each end of the flex hose. Then, slide the flex hose on to the t-connection and the rear manifold.

8. Set the left rear manifold on the tube mounts and secure each end with a u-bolt and two 5/16” nuts and washers.

9. Slide an 8-11/16” t-bolt clamp over each end of a 45 degree elbow. Then, slide the elbow onto the RH end left rear manifold. Point the elbow to the center manifold.

10. Insert an elbow support band into the 45 degree elbow.

11. Slide an 8-11/16” t-bolt clamp over each end of a 45 degree elbow. Then, slide the elbow onto the LH end center manifold. Point the elbow toward the left manifold.

12. Insert an elbow support band into the 45 degree elbow.

13. Determine the length of flex hose needed to connect the two 45 degree elbow support bands. Be sure the elbow support bands are in line with each other before the flex hose is installed. Cut the hose if needed.

14. Install the flex hose on the elbow support bands with two 8-3/8” t-bolt clamps.

15. Tighten all t-bolt clamps.

IMPORTANT
DO NOT drill into the fluid reservoir. Tighten bolts on the clamp so that they squeeze the clamp around the reservoir.
### 4.18 HOSE ROUTING (FD70, FD75 DUAL FLOW)

#### Header Length

<table>
<thead>
<tr>
<th>Header Length</th>
<th>Dimension “A”</th>
<th>Dimension “B”</th>
<th>Dimension “C”</th>
</tr>
</thead>
<tbody>
<tr>
<td>40’</td>
<td>27”</td>
<td>N/A</td>
<td>120”</td>
</tr>
<tr>
<td>45’</td>
<td>27”</td>
<td>90”</td>
<td>150”</td>
</tr>
</tbody>
</table>

**Figure 64: Left hand tube clamp locations**

**Figure 65: Left hand tube clamp locations**
4.18 HOSE ROUTING (FD70 & FD75 40' & 45' HEADERS) (DUAL FLOW)

NOTE
For easy installation of hose parts, you may use a solution of soap and water as lubricant when sliding hose pieces together.

4.18.3 LEFT HAND ROUTING

1. On 40' single flow headers remove the end cap and the clamp from the left hand side of the front manifold. Discard these parts as they will not be reused.

2. If you are installing the dual flow system onto a current single flow you will need to drill two holes for the left hand tube mount. Using the tube mount as a template mark and drill two 11/32” holes as shown in Figure 66.

3. Attach the tube mount to the LH reel mount using two 5/16” x 1” bolts and nuts.

4. Set the 56” manifold in the tube mount and secure each with two u-bolt and 5/16” nuts and washers.

NOTE
The parts removed in the “4.18.2 Rear hose Routing” from the single flow system will be reused on 40’ headers in steps 5 and 6.

5. Slide an 8-11/16” t-bolt clamp over each end of the 90 degree elbow. Then, slide the 90 degree elbow over the LH end of the CWS manifold. Point the elbow toward the side manifold.

6. Insert an elbow support band into the 90 degree elbow.

7. Determine the length of hose needed to reach the side manifold. Leave enough slack in the hose to allow the fore/aft hydraulic cylinder to fully extend. After determining the length of hose needed, cut the hose.

8. Install the hose over the support band in the 90 degree elbow and the front end of the side manifold with an 8-3/8” t-bolt clamp.

9. Slide an 8-11/16” t-bolt clamp over each end of the 45 degree elbow. Then, slide the elbow onto the LH end rear manifold. Point the elbow toward the 56” manifold on the side of the reel.

10. Insert an elbow support band into the 45 degree elbow.

11. Determine the length of flex hose needed to connect the 45 degree elbow and the side manifold. After determining the length of hose needed, cut the hose.

12. Install the hose over the support band in the 45 degree elbow and the back end of the side manifold with an 8-3/8” t-bolt clamp.

13. Tighten all t-bolt clamps.
Figure 67: Left hand hose routing (Dual Flow)
4.19 ELECTRICAL WIRING

**WARNING**

Place all controls in neutral or off, stop combine engine, set parking brake, remove ignition key, wait for all moving parts to stop, then properly block machine before servicing, adjusting, repairing, or unplugging.

**NOTE**

Disconnect the intermediate harness connector at the feeder house when the header is disconnected from the combine.

1. Mount the switch plate assembly in a convenient place inside the cab. (Use either velcro or bolts.)
2. Run the red wires with fuse (15 Amp & 6 Amp) to a power source. Use actuator switch harness if provided and combine is equipped with same type of auxiliary power supply.
3. Run the black wires to a suitable ground or to the actuator switch harness ground wires.
4. Route the long harnesses along the combine and header to the actuators (15 Amp Manifold Tilt; 6 Amp Air Volume) and plug in.
5. Mount the intermediate harness connectors to a convenient location on the combine feeder house.

*Figure 68: Electrical schematic*
4.20 ELECTRIC ACTUATOR

4.20.1 ALL OTHER CWS

1. Using the adjustment straps, adjust reel mount assemblies to desired position and torque all 1/2" hardware to 75 ft-lbs.

2. Attach the base end of the electric actuator to the center reel mount assembly with a 1/2" x 2-1/2" bolt and locknut (Figure 69).

3. Adjust the manifold so the air tubes point directly behind the cutterbar. The reel tines should extend past the air tubes. Manually turn the reel to ensure that the tines follow the curve of the air tubes as they rotate downward (Figure 70).

4. Extend the actuator rod 2 inches.

5. Bolt the actuator rod to the clevis on the pivot clamp with a 1/2" x 2-1/2" bolt and locknut.

6. Tighten the pivot clamp hardware.

4.20.2 FD75 CWS

1. Attach a manifold pivot rod to each manifold pivot using two 5/16 x 7/8 carriage bolt and nuts. (Figure 71)

2. Attach the base end of the electric actuator to the center reel mount assembly with a 1/2" x 2" bolt and nylock nut.

3. Adjust the manifold so the air tubes point towards the cutterbar. The reel tines should extend past the air tubes. Manually turn the reel to ensure that the tines follow the curve of the air tubes as they rotate downward (Figure 70).

4. Extend the actuator rod 1/2 the length of full extension (approx. 2 inches).

5. Position the actuator rod between the manifold pivot rods and secure with four 5/16 x 7/8 carriage bolts and nuts.

6. Connect the manifold pivot rod supports together using a 5/16" x 7/8" bolt and nut.

7. Tighten the pivot clamp hardware once the manifold and air tubes are properly positioned.
4.21 OPTIONAL EQUIPMENT

4.21.1 NEUTRAL DRIVE SHAFT

The neutral drive shaft is available for 974 & CIH 2062. The neutral shaft is used to bypass the fan when harvesting conditions do not require air.

1. Use six 3/8” x 1” carriage bolts, flat washers and nylock nuts to install the stub shaft, two bearings and four flangettes to the gearbox mount weldment (Figure 72). The 6-spline end of the shaft should point toward the feeder house. Torque 3/8” hardware to 30 ft-lbs.

2. Make sure the stub shaft is centered in the gearbox mount weldment and tighten the lock collar on both bearings. To do so, insert a punch in the lock collar dimple. Using a hammer, tap the punch in the direction of normal shaft rotation until the collar is tight. Then, tighten the lock collar set screw.

Figure 72: Neutral drive shaft installation
Section OPERATION

The CWS is designed to dramatically improve harvesting efficiency. Be familiar with the machine before starting.

It is the responsibility of the owner or operator to read this manual and to train all other operators before they start working with the machine. Hazard control and accident prevention are dependent upon the awareness of personnel involved in the operation of the CWS.

Follow all safety instructions exactly. Safety is everyone’s business. By following recommended procedures, a safe working environment is provided for the operator, bystanders and the area around the work site. Untrained operators are not qualified to operate the machine.

Many features incorporated into this machine are the result of suggestions made by customers like you. Read this manual carefully to learn how to operate the machine safely and how to set it to provide maximum efficiency. By following the operating instructions in conjunction with a good maintenance program, your CWS will provide many years of trouble-free service.

WARNING

1. Read and understand the Owner’s Manual and all safety signs before servicing, adjusting or repairing.
2. Install and secure all guards and shields before starting or operating.
3. Keep hands, feet, hair and clothing away from all moving and/or rotating parts.
4. Place all controls in neutral or off, lower header to the ground, stop combine engine, set parking brake, chock wheels, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
5. Clear the area of bystanders, especially small children, before starting.
6. Keep all hydraulic lines, fittings, and couplers tight and free of leaks before and during use.
7. Clean reflectors and lights before transporting.
8. Review safety related items annually with all personnel who will be operating or maintaining the machine.
9. Shut the combine off when connecting the machine hydraulics.
10. Do not exceed fan speed of 5300 RPM. Check the fan speed by multiplying the driveline speed (RPM) by the gear ratio of the gearbox.
11. Do not run the fan without back pressure. Close the butterfly valve on the fan if the flex hose is disconnected.
5.1 MACHINE COMPONENTS

The CWS is designed to work with the existing OEM reel to harvest all types of beans, and small grains. Air is used to enhance the performance of your pickup reel by moving the crop off the sickle towards the header auger or belt. Proper adjustment of the air volume and direction will increase the performance of your header while reducing shatter loss. Please take a few minutes to become familiar with the proper setup and operation of your Crary Wind System.
5.2 INITIAL ADJUSTMENTS

5.2.1 MANIFOLD ADJUSTMENT
1. Adjust your header and pickup reel per the manufacturer’s recommendations.
2. Position air manifold to maintain clearance between air tubes and reel bats/tines.
3. Adjust the air tube position to point at the back of the sickle bar. This adjustment refers to the longer air tubes on Crary Wind Systems.
4. Loosen tilt actuator clamp and adjust so the actuator is in middle of stroke (approx. 2” of actuator shaft exposed) with tube nozzles pointed at the back of the sickle bar. Retighten clamp.
5. Make sure air tubes do not hit ground when reel is at its lowest operating position. Adjust as required.

5.2.2 TORQUE LIMITER (SLIP CLUTCH)
The CWS comes equipped with a torque limiter (slip clutch) on the main drive of the CWS. The torque limiter is set in the engaged position from the factory. Before use, the slip clutch must be slipped and adjusted to ensure proper function.

3. If the torque limiter does not slip, repeat the procedure 2 or 3 times. If it still doesn’t slip, check that all the center locknuts are loosened and not placing tension on the pressure plates.
4. After the torque limiter has slipped, refer to the next section for instructions on how to reset the torque limiter.

ADJUSTING THE TORQUE LIMITER
After the torque limiter has slipped, it must be adjusted to the tension required to operate the header. The goal of this procedure is to have the torque limiter slip momentarily upon initial startup and then operate normally. The slip clutch must not slip at full RPM.
1. Slowly engage the PTO with the engine running at idle speed.
2. If the torque limiter does not slip, shut off machine and loosen the center locknuts in 1/4 turn increments until it slips momentarily when the header is engaged. If the torque limiter continues to slip after start-up, tighten the center locknuts in 1/4 turn increments until it slips momentarily when the header is engaged.
3. The torque limiter is ready for use.

NOTE
At the end of the season, or before any long period of non-use, loosen the center locknuts to relieve the pressure on the linings.

ALLOWING THE TORQUE LIMITER TO SLIP
1. Loosen the center locknuts (Figure 74) on the torque limiter so that the pressure is relieved from the pressure plates.
2. With the combine engine at idle speed, engage the PTO for 2-3 seconds to make the torque limiter slip. Do not allow the torque limiter to slip for more than 2-3 seconds at a time to prevent damage to the linings.

WARNING
Place all controls in neutral or off, stop combine engine, set parking brake, remove ignition key, wait for all moving parts to stop, then properly block machine before servicing, adjusting, repairing, or unplugging.

WARNING
To prevent burn-up of slip disks the torque limiter (slip clutch) must be adjusted prior to use.

Figure 74: Adjusting the torque limiter
## 5.3 PRE-OPERATION CHECKLIST

Efficient and safe operation of the CWS requires that each operator reads and understands the operating procedures and all related safety precautions outlined in this section. A pre-operation checklist is provided for the operator. It is important for both personal safety and maintaining the good mechanical condition of the machine that this checklist is followed.

Before operating the machine and each time thereafter, the following areas should be checked off:

1. Service the machine per the schedule outlined in the Service Record.
2. Use only a combine of adequate power and specifications to operate the machine.
3. Check that all guards are installed, secured and functioning as intended. Do not operate with missing or damaged shields.
4. Ensure that the machine is properly attached to the header and that mechanical retainers, such as quick pins, are installed.
5. Check the cutterbar, reel area and drives for entangled material.
6. Check the chains and sprockets for proper tension and alignment. Adjust as required.
7. Visually inspect the hydraulic system for leakage, loose fittings, and damaged hoses. Tighten fittings, replace damaged components and wipe up leaked or excess hydraulic fluid.
8. Check condition of driveline slip clutch friction discs. If installing replacement discs, adjust spring height to original height. Deviation from original setting may be needed depending upon disc wear. Run-in is recommended at the start of the season (see Service and Maintenance Section).

## 5.4 MACHINE BREAK-IN

### 5.4.1 PRE-START INSPECTION

1. Read the Operator’s Manual.
2. Check that the hydraulic lines and electrical harnesses are routed where they will not contact moving parts. Be sure all components are clipped, taped or tied securely in place.
3. Check that all required nuts and bolts are installed and tightened to their specified torque.

### 5.4.2 AFTER OPERATING FOR 2 HOURS

1. Re-torque fasteners and hardware.
2. Check that all safety decals are installed and legible. Apply new decals if required.
3. Check that no hydraulic hoses are being pinched, crimped, or are rubbing. Reroute as required.
4. Check that the wiring harness is not being pinched, crimped, or rubbing. Reroute as required.
5. Check the tension and alignment of all drive chains. Adjust as required.
6. The gearbox will generate heat. The typical operating temperature of the gearbox is 180° F.

### 5.4.3 AFTER OPERATING FOR 10 HOURS:

1. Re-torque fasteners and hardware.
2. Check that all guards are installed, secured and functioning as intended. Do not operate with missing or damaged shields.
3. Check safety decals. Install new ones if required.
4. Check the routing of hydraulic lines and the wiring harness. Reroute as required to prevent pinching, crimping, binding, or rubbing.
5. Refer to the normal servicing and maintenance schedule as defined in the Service Record.

### 5.5 NEUTRAL DRIVE SHAFT (OPTIONAL)

**WARNING**

Place all controls in neutral or off, stop combine engine, set parking brake, remove ignition key, wait for all moving parts to stop, then properly block machine before servicing, adjusting, repairing, or unplugging.

When harvesting in conditions where air flow is unnecessary, you can bypass the fan to improve combine fuel economy. To do so, place all controls in neutral or off, stop combine engine, set parking brake, remove ignition key, and wait for all moving parts to stop. Then, move the driveline ends that are connected to each end of the gearbox stub shaft to the neutral shaft located behind the fan.

To slide a driveline on and off the splined shafts, pull back the spring-loaded collar at the end of the driveline. After moving the driveline to the desired shaft, release the end collar and make sure the driveline locks into place on the shaft.
5.6 CONTROLS

Before starting to work, all operators should familiarize themselves with the location and function of the controls and safety devices. Some machines may vary due to different models of combines and headers. Refer to Figure 75 through Figure 77.

MANIFOLD TILT:
1. Moving the toggle switch to the FORE position extends the shaft of the electric actuator. This directs the air tubes toward the back of the header.
2. Moving the toggle switch to the AFT position retracts the shaft of the electric actuator. This directs the air tubes toward the front of the header.

FAN AIR VOLUME ACTUATOR:
1. Move the toggle to the OPEN position to open the butterfly plate which increases air volume to the air tubes.
2. Move the toggle to the CLOSED position to close the butterfly plate which decreases air volume to the air tubes.

REEL LIFT/FORE AND AFT ADJUSTMENT:
Consult your owner/operator’s manual that came with your header.

---

Figure 75: Manifold tilt and fan air volume toggle switch

Figure 76: Air flow

Figure 77: Fan butterfly actuator
5.7 OPERATING HINTS

The following are recommended adjustments the operator can make based on crop conditions. Any adjustments that involve the operator leaving the combine cab should heed the warning instructions listed below.

1. Increase air to maximum.
2. Move tilt control until air is directed at back of sickle bar with reel feeding properly.
3. Gradually reduce air until crop is no longer flowing smoothly across sickle.
4. Gradually increase air until smooth crop flow across the sickle is achieved.
5. Remember: more air uses more horsepower.
6. Gradually adjust air position fore and aft until optimum crop flow is achieved.
7. Gradually reduce air further until minimum air is used to maintain crop flow.

WARNING

Place all controls in neutral or off, stop combine engine, set parking brake, remove ignition key, wait for all moving parts to stop, then properly block machine before servicing, adjusting, repairing, or unplugging.

DO USE AIR TO FEED CROP ACROSS THE SICKLE.
DO ADJUST AIR TUBE ANGLE TO MAXIMIZE CROP FLOW ACROSS THE SICKLE.
DO USE THE REEL TO BRING THE CROP TO THE HEADER.
DO MAKE ADJUSTMENTS GRADUALLY.
DO VERIFY PROPER AIR POSITION WHENEVER ADJUSTING REEL HEIGHT OR FORE AND AFT POSITION.
DO SHUT OFF AIR IMMEDIATELY IF THE AIR HOSE SHOULD FAIL. FAILURE TO DO SO MAY RESULT IN GEARBOX FAILURE.

DO FOLLOW TROUBLESHOOTING GUIDE ONE STEP AT A TIME.
DO NOT USE MORE AIR THAN NEEDED.
DO NOT OPERATE WITH THE AIR TUBES ON THE GROUND.
DO NOT OPERATE WITH PLUGGED AIR TUBES.
DO NOT OPERATE WITH AIR HOSE DISCONNECTED.

5.8 TRANSPORTING

The CWS is designed to be easily and conveniently moved from location to location. When transporting the machine, review and follow these safety instructions:

1. Make sure you are in compliance with all local regulations regarding transporting equipment on public roads and highways.
2. It is the responsibility to the owner to know the lighting and marking requirements of the local highway authorities and to install and maintain the equipment to provide compliance with the regulations. Add extra lights when transporting at night or during periods of limited visibility.
3. See the owner’s manual that came with your combine and header for proper transportation guidelines.
After the season’s use, the machine should be thoroughly inspected and prepared for storage. Repair or replace any worn or damaged components to prevent any unnecessary down time at the start of next season. To insure a long, trouble free life, this procedure should be followed when preparing the unit for storage.

1. Clear the area of bystanders, especially small children.

2. Thoroughly wash the entire machine using a pressure washer to remove all dirt, mud, debris or residue.

3. Inspect the following components:
   
   A. PTO Driveline Components
      - Check the condition and operation of the friction disc torque limiter (slip clutch).
      - Release slip clutch pressure.
      - Store in a dry place.
   
   B. Electrical System
      - Check the wiring harness and all wiring components for damaged or worn areas.
      - Check for cracked or worn insulation.
      - Replace any components that have come in contact with moving parts and re-route to prevent damage in the future.
   
   C. CWS Components
      - Air Tubes: repair or replace bent or damaged air tubes.
   
   D. Fan Components
      - Visually inspect fan rotor for wear or buildup.
      - Check condition of the rotary screen bearings.

4. Make a list of all parts needed for repairs and order them immediately. Repairs can then be done when time permits and prevent unnecessary down time at the start of next season.

5. Lubricate all grease points to remove any water residue from the washing and prevent rusting during the storage period. Rotate all moving parts to distribute lubricant to all surfaces.

6. Change gearbox oil: Use 40 ounces (1.2 liters) of Mobilube SHC 75W-90 synthetic gear lube or equivalent with the following specifications:
   
   API Service GL-5/MT.1
   MIL-L-2105D
   MACK GO-J PLUS
   SAE J2360

7. Apply a light coat of grease on the shafts.

8. Check the cutterbar, reel area and drives for entangled material.

9. Touch up all paint nicks and scratches to prevent rusting.

10. Move the machine to its storage area.

11. Select an area that is dry, level, and free of debris.

12. If the machine cannot be stored inside, cover with a waterproof tarpaulin and tie securely in place.

13. Store out of the way of human activity.

14. Do not allow children to play on or around stored unit.

**REMOVING FROM STORAGE**

When removing from storage and preparing to use, follow this procedure:

1. Clear the area of bystanders, especially small children.

2. Remove the tarpaulin from the machine if it was covered.

3. Clean off accumulated trash and dirt.

4. Check routing and securing of all hydraulic lines and wiring harness; adjust as required.

5. Rotate all components and systems by hand to see that none are seized. Loosen any seized components with penetrating oil before starting.

6. Retighten any loose bolts to their specified torque.

7. Lubricate all grease points and shaft surfaces.

8. Check for excessive wear on all moving parts.

9. Tighten all hydraulic connections and mounts; replace o-rings, fittings, or connectors subject to leaking.

10. Review and follow all items in the Pre-Operation and Machine Break-In sections before starting (Sections 5.3 & 5.4).

11. Check slip clutch for proper adjustment using run-in method from Section 5.2.2.

12. Install all safety shields and review precautions with operators and other personnel involved in the operation.
### 6.1 MAINTENANCE CHECKLIST

Along with a servicing interval, perform a visual inspection. Maintenance personnel can often detect potential problems from any unusual sounds made by such components as shafts, bearings and drives.

These service recommendations are based on normal operating conditions. Severe or unusual conditions may require more frequent attention. Copy this page to continue record.

<table>
<thead>
<tr>
<th>HOURS</th>
<th>ACTION CODE:</th>
<th>√ = CHECK OR INSPECT</th>
<th>L = LUBRICATE</th>
<th>CL = CLEAN</th>
<th>C = CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVICED BY</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>DAILY</td>
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<tr>
<td>L PTO CROSS JOURNAL ZERKS</td>
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<td></td>
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<tr>
<td>√ GEARBOX OIL LEVEL</td>
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<tr>
<td>16 HOURS</td>
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<tr>
<td>L PTO INNER TUBE</td>
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<td>40 HOURS</td>
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</tr>
<tr>
<td>L PTO SHIELD RETAINING BEARING</td>
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<td></td>
</tr>
<tr>
<td>L PTO DISCONNECT MECHANISM</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>√ FAN HOUSING AND AIRWAY</td>
<td></td>
<td></td>
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<tr>
<td>YEARLY</td>
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<tr>
<td>C GEARBOX OIL</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>√ CONDITION OF FRICTION DISC TORQUE LIMITER (SLIP CLUTCH)</td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>
6.2 FLUIDS AND LUBRICANTS

GREASE: Use an SAE multi-purpose high temperature grease with extreme pressure (EP) performance meeting or exceeding the NLGI #2 rating for all requirements. Also acceptable is an SAE multi-purpose lithium based grease.

GEARBOX LUBE: Use Mobilube SHC 75W-90 synthetic gear lube or equivalent with the following specifications:
- API Service GL-5/MT.1
- MIL-L-2105D
- MACK GO-J PLUS
- SAE J2360
- Capacity: 40 ounces (1.2 liters) (Series I)
- 28 ounces (0.8 liters) (Series II)

STORING LUBRICANTS: Your machine can operate at top efficiency only if clean lubricants are used. Use clean containers to handle all lubricants. Store them in an area protected from dust, moisture and other contaminants.

6.3 GREASING

1. Use the Maintenance Checklist provided to keep a record of all scheduled maintenance.
2. Use a hand-held grease gun for all greasing.
3. Wipe grease fitting with a clean cloth before greasing to avoid injecting dirt and grit.
4. Replace and repair broken fittings immediately.
5. If fittings will not take grease, remove and clean thoroughly. Also clean lubricant passageway. Replace fitting if necessary.

6.4 GEARBOX OIL

CHECKING THE GEARBOX OIL LEVEL

Check the gearbox oil level daily. Check more frequently if leaks exist around any of the plugs or shaft seals.

The oil level in the gearbox should be no higher than the bottom of the driveshaft.

When checking the oil on the Series II gearboxes be sure that the base of the gearbox is level.

WARNING
Always clean the vent plug if any leaks are noticed around shaft seals.

CHANGING THE GEARBOX OIL

See Figure 78 and Figure 79 for the location of oil fill and drain plugs. Every 500 operating hours or annually, whichever comes first, the oil should be replaced. When changing the oil, follow this procedure:
1. Place a container under the gearbox.
2. Remove the drain plug. Allow 10 minutes to drain.
3. Replace the drain plug.
4. Series I: Add 40 ounces (1.2 liters) of Mobilube SHC 75W-90 synthetic gear lube or equivalent with the following specifications:
   - API Service GL-5/MT.1
   - MIL-L-2105D
   - MACK GO-J PLUS
   - SAE J2360
   - Capacity: 40 ounces (1.2 liters)

Series II: Add 28 ounces (0.8 liters) of Mobilube SHC 75W-90 synthetic gear lube or equivalent with the following specifications:
- API Service GL-5/MT.1
- MIL-L-2105D
- MACK GO-J PLUS
- SAE J2360
- Capacity: 28 ounces (0.8 liters)
5. Fill the gearbox oil through the top fill plug.
6. Check that the air passage through the vent plug is open.
7. Dispose of the used oil in an environmentally safe manner.
### 6.5 PTO LUBRICATION

**DAILY**

Lubricate PTO cross journals (Figure 80). Make sure grease purges through all four bearings.

**EVERY 16 HOURS**

Lubricate PTO inner tubes (Figure 80). Telescoping members must have lubrication to operate successfully. Telescoping members without fittings should be pulled apart and grease should be added manually with a brush.

**EVERY 40 HOURS**

Lubricate the PTO shield retaining bearing (Figure 80). Molded nipples on the guard near each guard bearing are intended as grease fittings and should be lubricated every 40 hours of operation.

Lubricate the PTO disconnect mechanism.

### 6.6 FAN HOUSING AND AIR HOSE

Every 40 hours the fan housing and airway (Figure 81) should be checked for wear.

### 6.7 SLIP CLUTCH MAINTENANCE

1. Disconnect the PTO driveline from the implement.
2. Position the driveline on a workbench.
3. Loosen the eight center locknuts.
4. Remove bolts and disassemble all components.
5. Check the condition of all parts, especially the friction discs (Figure 82).
6. If replacement parts are needed, consult your local authorized Crary dealer.
7. Reassemble all components.
8. Tighten nuts following an alternating cross pattern until the clutch slips momentarily upon initial startup and then continues to operate normally.
Section TROUBLESHOOTING

In the following section, we have listed many of the problems, causes and solutions to the problems that you may encounter.

If you encounter a problem that is difficult to solve, even after having read through this trouble shooting section, please call your local Crary dealer. Before you call, please have this manual and the serial number from your machine ready.

BEFORE YOU CALL
Please have the following information available:

Serial # ________________________

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>POSSIBLE CAUSE</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shattering of grain ahead of cutter bar</td>
<td>Reel speed not coordinated with ground speed, causing excessive agitation before crop is cut.</td>
<td>Adjust reel speed to coordinate with ground speed so reel will move crop evenly.</td>
</tr>
<tr>
<td></td>
<td>Reel is positioned too low.</td>
<td>Raise reel.</td>
</tr>
<tr>
<td></td>
<td>Ground speed too fast for conditions of crop.</td>
<td>Slow ground speed.</td>
</tr>
<tr>
<td>Cut crop building up and falling from front of cutter bar or loss of grain heads at cutter bar.</td>
<td>Reel not adjusted low enough for proper delivery of cut crop to auger.</td>
<td>Set reel low enough to sweep material from cutter bar.</td>
</tr>
<tr>
<td></td>
<td>Insufficient ledge for crop travel.</td>
<td>Extend rigid cutter bar.</td>
</tr>
<tr>
<td></td>
<td>Auger clearance too high from platform bottom.</td>
<td>Adjust outer ends of auger to 1/2” (13mm) clearance of platform bottom and check finger clearance.</td>
</tr>
<tr>
<td></td>
<td>Insufficient airflow or misdirection of airflow from manifold to clean off cutter bar.</td>
<td>Adjust manifold so that air flow is directed more at cutter bar to keep it clean.</td>
</tr>
<tr>
<td></td>
<td>Reel speed too slow.</td>
<td>Increase speed of reel.</td>
</tr>
<tr>
<td></td>
<td>Reel is positioned too high.</td>
<td>Move reel back and then down.</td>
</tr>
<tr>
<td></td>
<td>Build up of grain on cutterbar.</td>
<td>Lower height of reel and set fore-and-aft position as close as possible to cutter bar and auger.</td>
</tr>
<tr>
<td>Uneven or bunched feeding of crop to cylinder.</td>
<td>Feeder chain carrying straw back around and disrupting crop flow to the cylinder.</td>
<td>Extend feederhouse stripper down to stop straw from filtering back out.</td>
</tr>
<tr>
<td></td>
<td>Crop “tailing in” to the auger (heads not feeding first).</td>
<td>Rotate manifold so that air flow is directed higher on the crop.</td>
</tr>
<tr>
<td></td>
<td>Cutter bar not at recommended speed.</td>
<td>Check basic speed of combine (see combine owner’s manual).</td>
</tr>
<tr>
<td>Gear box leaking or overheating.</td>
<td>Incorrect oil type or level.</td>
<td>Check level and replace if necessary.</td>
</tr>
<tr>
<td></td>
<td>Breather plugged.</td>
<td>Remove breather, clean and reinstall.</td>
</tr>
<tr>
<td></td>
<td>Seals are leaking.</td>
<td>Install new seal kit.</td>
</tr>
<tr>
<td>Rotary screen plugs.</td>
<td>Debris is pinched between the base and the screen, stopping the rotor.</td>
<td>Adjust air base closer to the screen.</td>
</tr>
<tr>
<td></td>
<td>Screen cleaner not adjusted properly.</td>
<td>Adjust the screen cleaner to revolve close to the screen, but not touching it.</td>
</tr>
<tr>
<td></td>
<td>Needs Rotary Screen Wrap.</td>
<td>Contact Crary Dealer for Rotary Screen Wrap (P/N 25592-12). This wrap will prevent debris from becoming lodged between the base and the rotary screen.</td>
</tr>
</tbody>
</table>
8
Section

SPECIFICATIONS

8.1 FAN PERFORMANCE DATA

4500 RPM
FORWARD CURVE
8" OUTLET FAN

ROTOR SIZE =
16.50" DIA X 3.00" WIDE

<table>
<thead>
<tr>
<th>Horsepower &amp; Efficiency %</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
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</thead>
<tbody>
<tr>
<td>Static Pressure</td>
<td>5</td>
<td>10</td>
<td>15</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Efficiency</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
</tr>
<tr>
<td>Pressure</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
</tr>
</tbody>
</table>

CFM 1000 2000 3000 4000

FORWARD CURVE
8" OUTLET FAN

ROTOR SIZE =
16.50" DIA X 3.00" WIDE

Efficiency
Pressure
Horsepower
# 8.2 Bolt Torque

Checking Bolt Torque:

The table shown below is for reference purposes only and its use by anyone is entirely voluntary, unless otherwise noted. Reliance on its contents for any purpose is at the sole risk of that person. Crary Co. is not responsible for any loss claim or damage arising therefrom. In developing these tables, Crary has made a determined effort to present the contents accurately.

<table>
<thead>
<tr>
<th>SAE Grade and Head Markings</th>
<th>SAE - 2</th>
<th>SAE - 5</th>
<th>SAE - 8</th>
<th>Bolt Diameter</th>
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</thead>
<tbody>
<tr>
<td><strong>ENGLISH</strong></td>
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<td></td>
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</tr>
<tr>
<td><strong>BOLT DIAMETER</strong></td>
<td><strong>SAE 2</strong></td>
<td><strong>SAE 5</strong></td>
<td><strong>SAE 8</strong></td>
<td></td>
</tr>
<tr>
<td>1/4&quot;</td>
<td>7.5</td>
<td>5.5</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>5/16&quot;</td>
<td>15</td>
<td>11</td>
<td>23</td>
<td>17</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>27</td>
<td>20</td>
<td>41</td>
<td>30</td>
</tr>
<tr>
<td>7/16&quot;</td>
<td>41</td>
<td>30</td>
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<td>50</td>
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<tr>
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<td>1&quot;</td>
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<td>220</td>
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<tr>
<td>1-1/8&quot;</td>
<td>407</td>
<td>300</td>
<td>1085</td>
<td>800</td>
</tr>
<tr>
<td>1-1/4&quot;</td>
<td>570</td>
<td>420</td>
<td>2631</td>
<td>1940</td>
</tr>
</tbody>
</table>

| **METRIC**                  |         |         |         |               |
| **BOLT DIAMETER**           | **4.8** | **8.8** | **10.9** | **12.9**     |
| 4.8                         | 0.5     | 0.4     | -       | -             |
| 8.8                         | 3       | 2.2     | -       | -             |
| 10.9                        | 5       | 4       | -       | -             |
| 12.9                        | 6       | 4.5     | 11      | 8.5           |
| 15                          | 15      | 11      | 28      | 20            |
| 5                           | 29      | 21      | 55      | 40            |
| 5.5                         | 60      | 50      | 150     | 110           |
| 6                           | 125     | 92      | 240     | 175           |
| 7                           | 175     | 125     | 330     | 250           |
| 8                           | 240     | 180     | 475     | 350           |
| 9                           | 330     | 250     | 650     | 475           |
| 10                          | 425     | 310     | 825     | 600           |
| 11                          | 625     | 450     | 1200    | 875           |

*Torque figures indicated above are valid for non-greased or non-oiled threads and heads unless otherwise specified. Therefore, do not grease or oil bolts or cap screws unless otherwise specified in this manual. When using locking elements, increase torque values by 5%.

*Torque value for bolts and cap screws are identified by their head markings.