# A30-S & A30-D
# Pull-Type Mower Conditioners

# A30-S, A30-D & A40-D
# Self-Propelled Auger Headers

OPERATOR'S MANUAL

Model Year - 2009

Part #169000 Rev A


**MACDON A40-D SELF-PROPELLED AUGER HEADER**


**MACDON A30-D PULL-TYPE MOWER CONDITIONER**

# 1 INTRODUCTION

This manual describes the operating and maintenance procedures for the Model A30-S, A30-D, and A40-D Auger Headers, including a Grass Seed version. Your new Auger Header is designed to cut, condition, and lay in windrows a wide variety of grasses and hay crops, and the double-knife feature that is available expands the operational envelope, especially in heavier crops.

| MODEL * | DESCRIPTION | CONFIGURATION | KNIFE | SIZE (FT) | FEATURES |
|---|---|---|---|---|---|
| **A30-S** | **A** – Auger Header with Conditioner | **30** - Self-Propelled Or Pull-Type | **S** - Single | 14 and 16 | Hydraulic Drive |
| **A30-D** | **A** – Auger Header with Conditioner | | **D** - Double | 16 and 18 | Hydraulic Drive |
| **A40-D** | **A** – Auger Header with Conditioner | **40** - Self-Propelled | | 14, 16, and 18 | Separate Hydraulic Auger, Knife and Reel Drives, Grass Seed Option. |

* Model availability depends on dealer affiliation.

CAREFULLY READ ALL THE MATERIAL PROVIDED BEFORE ATTEMPTING TO UNLOAD, ASSEMBLE, OR USE THE MACHINE.

Use this manual as your first source of information about the machine. If you follow the instructions given in this manual, your Windrower will work well for many years. A Parts Catalog is also supplied with your new header. If you require more detailed service information, see your dealer for availability of a Service Manual.

Use the Table of Contents and the Index to guide you to specific areas. Study the Table of Contents to familiarize yourself with how the material is organized.

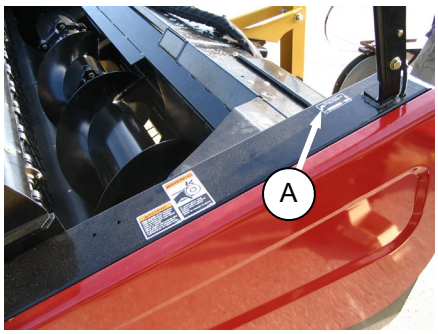
Keep this manual handy for frequent reference and to pass on to new operators or owners. Call your dealer if you need assistance, information, or additional copies of this manual.

RECORD THE SERIAL NUMBERS OF THE HEADER AND ARTICULATING POWER TONGUE (APT) IN THE SPACES BELOW.

**HEADER SERIAL NUMBER**:

_____

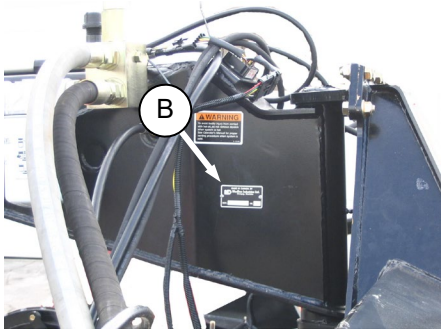
Serial Number plate (A) is located at the top of the left hand end frame.




**APT (PULL-TYPE) SERIAL NUMBER**:

_____

Serial Number plate (B) is located at the top aft end of the APT.




**PTO SPEED**: 540 RPM ☐ 1000 RPM ☐

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# 2 SAFETY

## *2.1 SAFETY ALERT SYMBOL*

This safety alert symbol indicates important safety messages in this manual and on safety signs on the machine.

This symbol means:

**ATTENTION!**
**BECOME ALERT!**
**YOUR SAFETY IS INVOLVED!**

Carefully read and follow the safety message accompanying this symbol.

WHY IS SAFETY IMPORTANT TO YOU?

ACCIDENTS DISABLE AND KILL
ACCIDENTS COST
ACCIDENTS CAN BE AVOIDED

## *2.2 SIGNAL WORDS*

Note the use of the signal words DANGER, WARNING, and CAUTION with 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.**

### WARNING

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

### CAUTION

**Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It is also used as a reminder of good safety practices.**

## *2.3 SAFETY SIGNS*

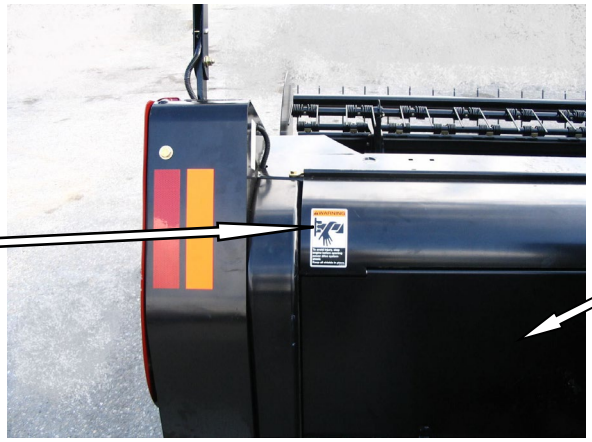
- The safety signs appear on the windrower at the locations shown on pages 4 to 7.
- Keep safety signs clean and legible at all times.
- Replace safety signs that are missing or become illegible.
- If original parts on which a safety sign was installed are replaced, be sure the repair part also bears the current safety sign.
- Safety signs are available from your Dealer Parts Department.

### *2.3.1 Safety Sign Installation*

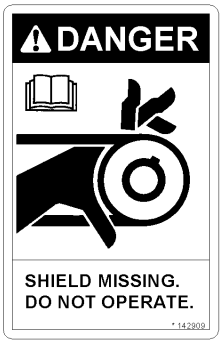
a. Be sure the installation area is clean and dry.
b. Decide on the exact location before you remove the decal backing paper.
c. Remove the smaller portion of the split backing paper.
d. Place the sign in position and slowly peel back the remaining paper, smoothing the sign as it is applied.
e. Small air pockets can be smoothed out or pricked with a pin.

### *2.3.2 Safety Sign Locations Pull-Type*

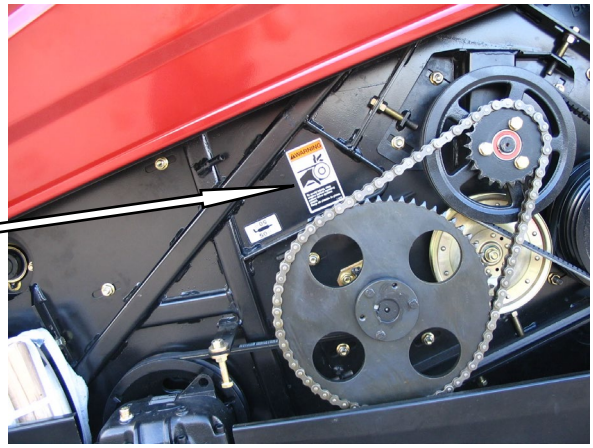

#170281




DRIVE SHAFTS - #38334

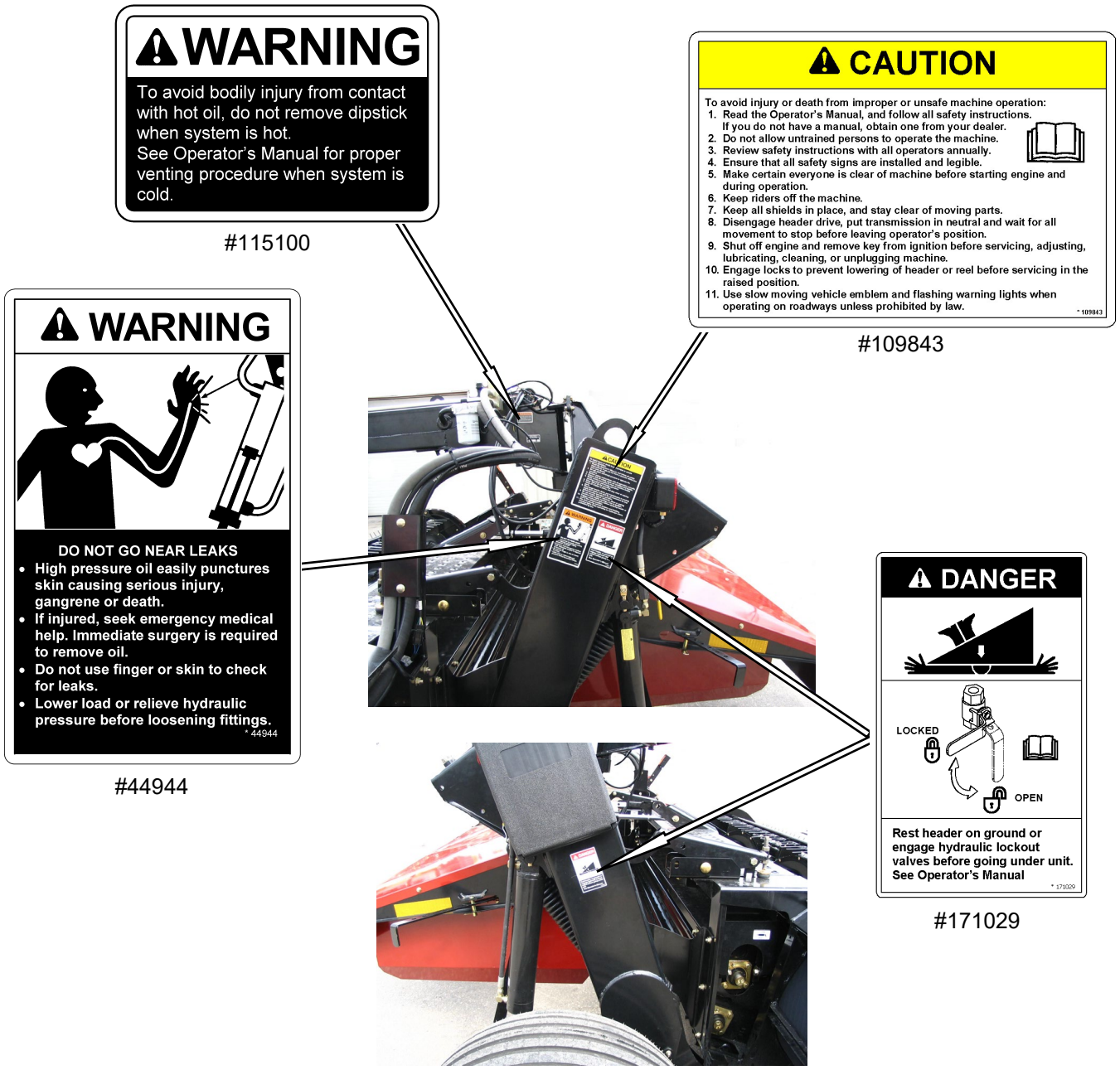



BOTH ENDS -#142909

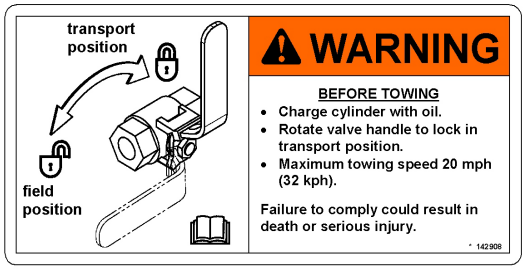



BOTH SIDES - #140311

## Safety Sign Locations Pull-Type (cont'd)

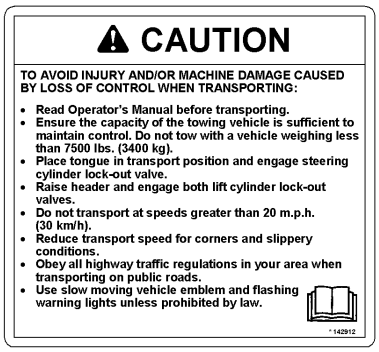


## Safety Sign Locations Pull-Type (cont'd)

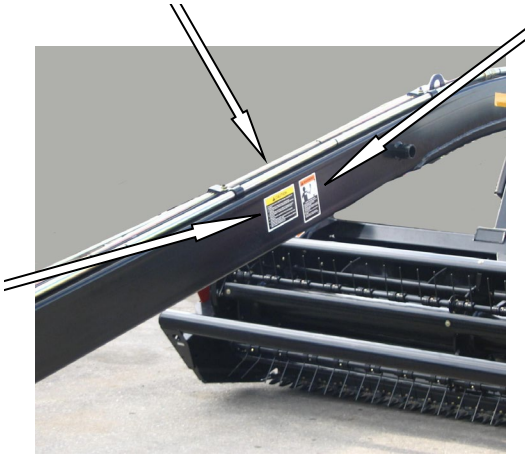



ON APT (BACK-SIDE) - #142908


#44944




#142912




ON END SHEET (BOTH ENDS) - 28403

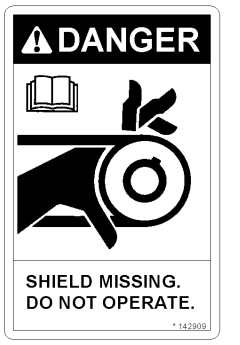
ON BACK FRAME


ON END SHEET (BOTH ENDS) - #32738

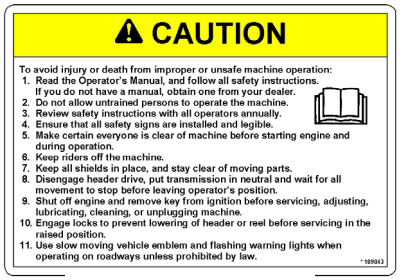
### *2.3.3 Safety Sign Locations Self-Propelled*


#170281

ON DRIVE SHAFTS - #36651



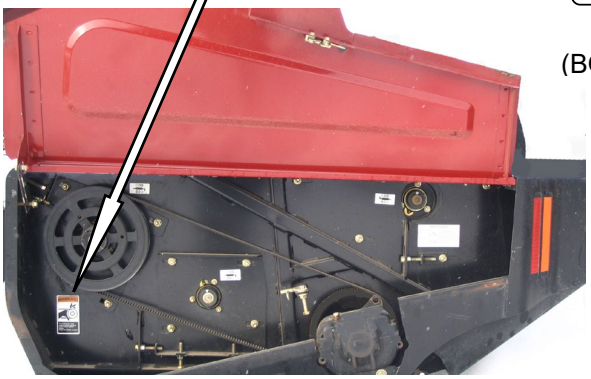

BOTH ENDS - #142909

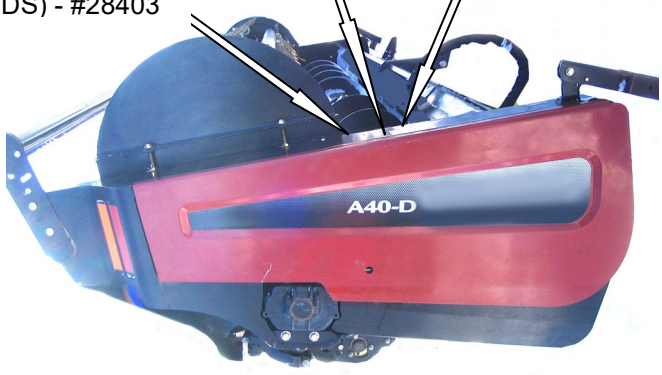



#109843


ON END SHEET (BOTH ENDS) - #28403


ON END SHEET (BOTH ENDS) - #32738

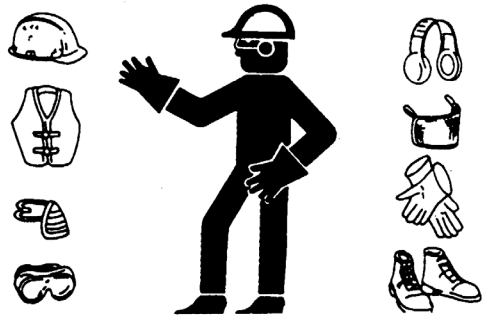




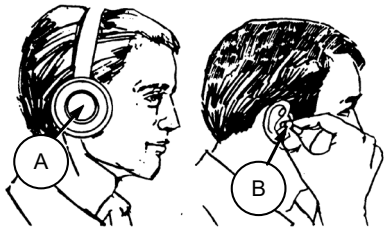
## *2.4 GENERAL SAFETY*

### CAUTION

- **The following are general farm safety precautions that should be part of your operating procedure for all types of machinery.**
- **Protect yourself.**



- **When assembling, operating and servicing machinery, wear all the protective clothing and personal safety devices that COULD be necessary for the job at hand. Don't take chances.**
- **You may need:**
  - **a hard hat.**
  - **protective shoes with slip resistant soles.**
  - **protective glasses or goggles.**
  - **heavy gloves.**
  - **wet weather gear.**
  - **respirator or filter mask.**
  - **hearing protection. Be aware that prolonged exposure to loud noise can cause impairment or loss of hearing. Wearing a suitable hearing protective device such as ear muffs (A) or ear plugs (B) protects against objectionable or loud noises.**

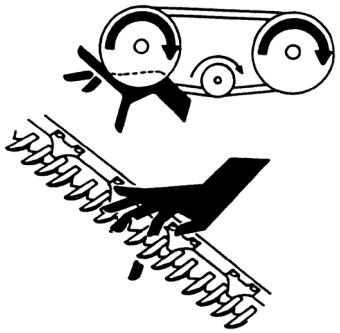



- **Provide a first-aid kit for use in case of emergencies.**
- **Keep a fire extinguisher on the machine. Be sure the extinguisher is properly maintained and be familiar with its proper**


**use.**

- **Keep young children away from machinery at all times.**
- **Be aware that accidents often happen when the operator is tired or in a hurry to get finished. Take the time to consider the safest way. Never ignore warning signs of fatigue.**
- **Wear close-fitting clothing and cover long hair. Never wear dangling items such as scarves or bracelets.**

- **Keep hands, feet, clothing and hair away from moving parts. Never attempt to clear obstructions or objects from a machine while the engine is running.**
- **Keep all shields in place. Never alter or remove safety equipment. Make sure driveline guards can rotate independently of the shaft and can telescope freely.**



**GENERAL SAFETY (Cont'd):**

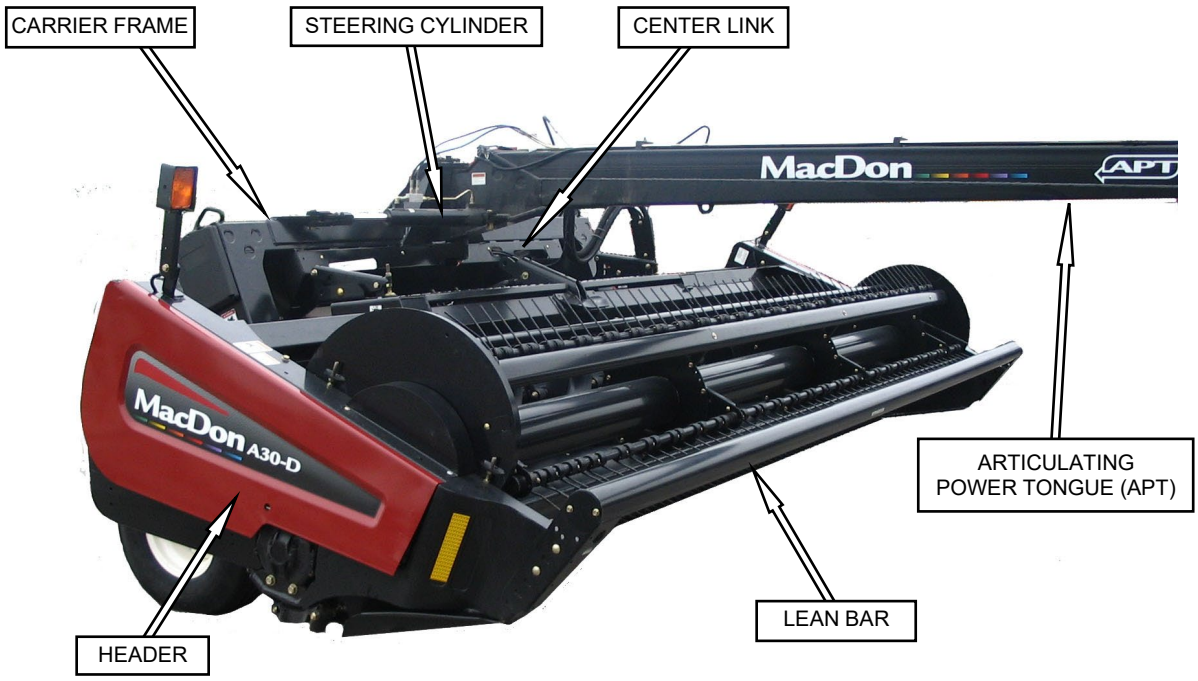
- **Use only service and repair parts made or approved by the equipment manufacturer. Substituted parts may not meet strength, design, or safety requirements.**
- **Do not modify the machine. Unauthorized modifications may impair the function and/or safety and affect machine life.**
- **Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.**
- **Keep the area used for servicing machinery clean and dry. Wet or oily floors are slippery. Wet spots can be dangerous when working with electrical equipment. Be sure all electrical outlets and tools are properly grounded.**

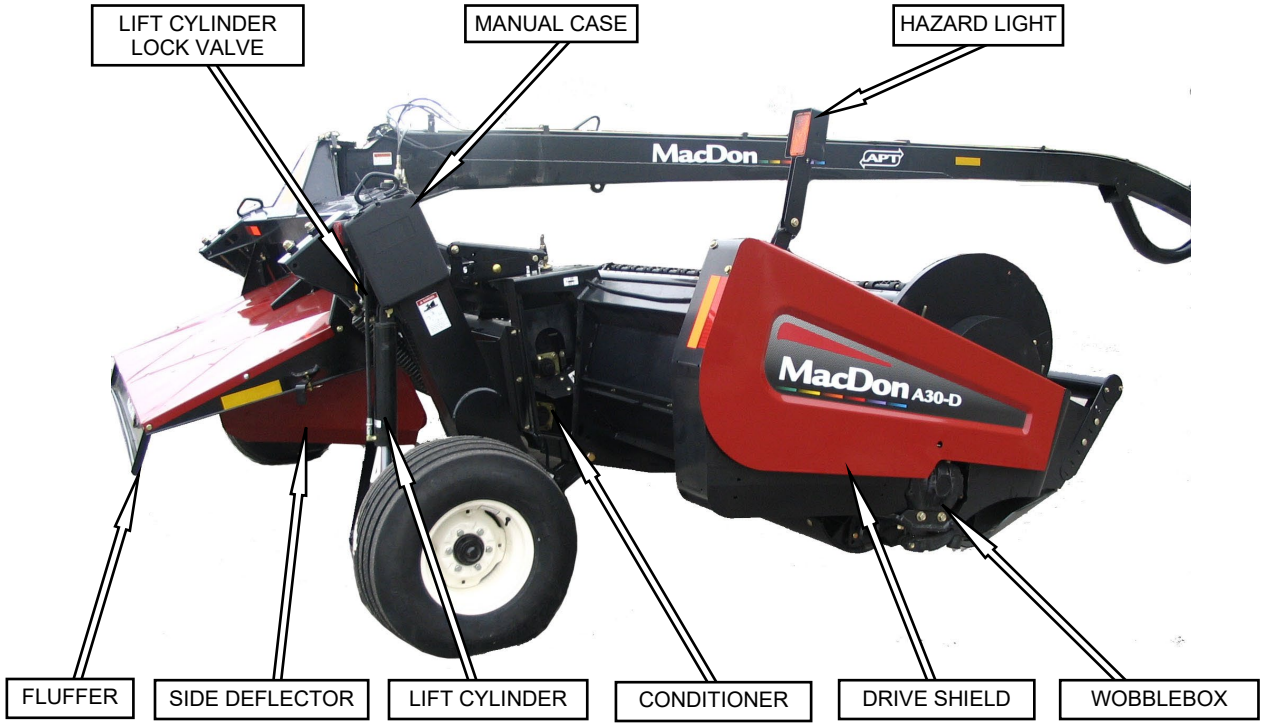
- **Use adequate light for the job at hand.**
- **Keep machinery clean. Do not allow oil or grease to accumulate on service platforms, ladders or controls. Clean machines before storage.**
- **Never use gasoline, naphtha or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.**
- **When storing machinery, cover sharp or extending components to prevent injury from accidental contact.**

# 3 ACRONYMS AND ABBREVIATIONS

| TERM | DEFINITION |
|---|---|
| API | American Petroleum Institute |
| APT | Articulating Power Tongue |
| ASTM | American Society Of Testing And Materials |
| C | Celsius |
| F | Fahrenheit |
| ft/min | feet per minute |
| ft/s | feet per second |
| gpm | U.S. gallons per minute |
| hp | horsepower |
| $in.^3$ | cubic inches |
| kPa | kilopascals |
| lbf | pounds force |
| lbf·ft or ft·lbf | pound feet or foot pounds |
| lbf·in or in·lbf | pound inches or inch pounds |
| MPa | megapascals |
| mph | miles per hour |
| N | newtons |
| N·m | newton meters |
| oz. | ounces |
| psi | pounds per square inch |
| PTO | Power Take-Off |
| rpm | Revolutions Per Minute |
| SAE | Society Of Automotive Engineers |

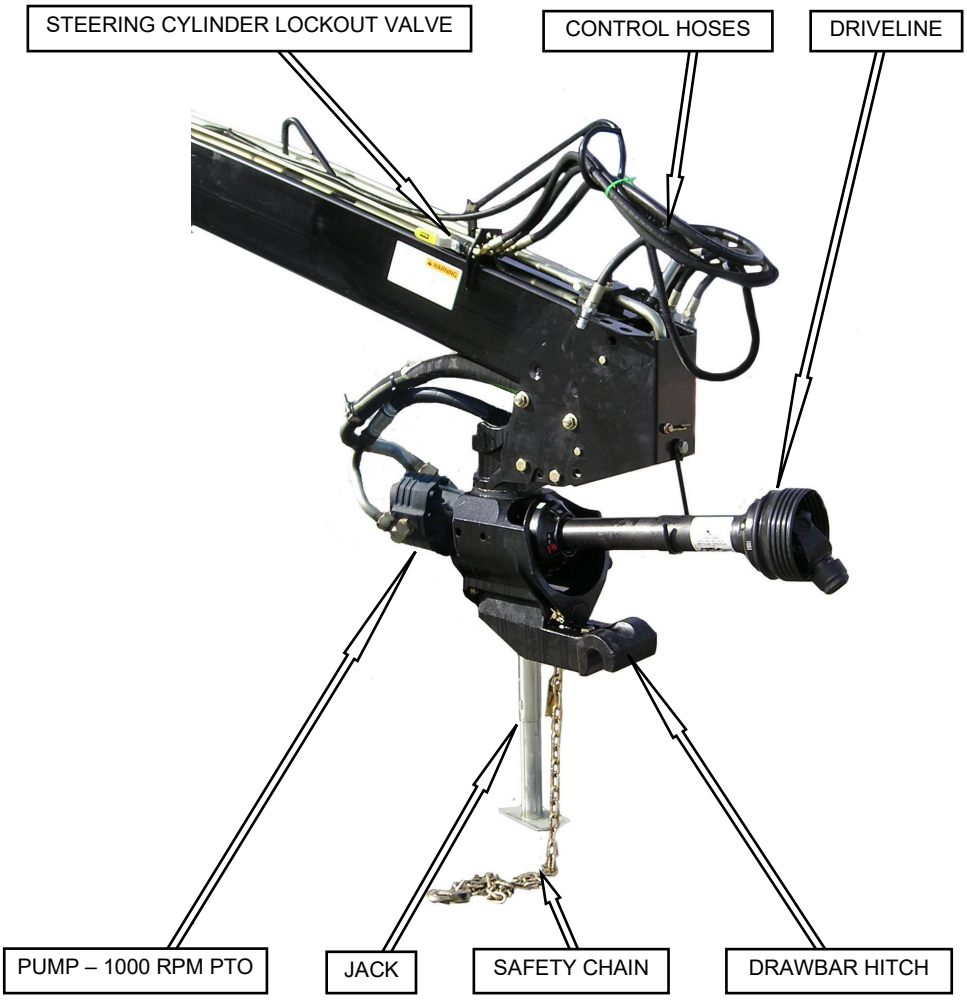
# 4 COMPONENT IDENTIFICATION

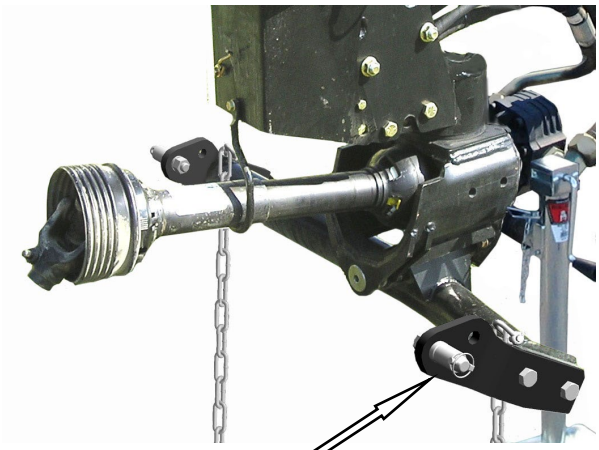


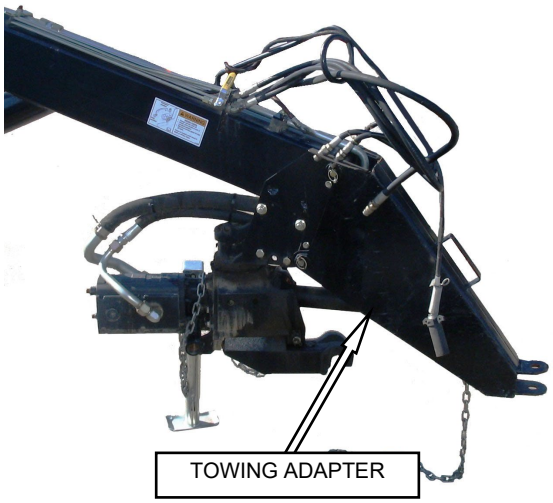




HAZARD LIGHT
HEADER DRIVE
TAIL-LIGHT
FORMING SHIELD
ADJUSTER BOLTS
FLOAT SPRING
DRIVE SHIELD
MacDon
A30-D MacDon

ARTICULATING POWER TONGUE (APT)



# 5 SPECIFICATIONS

## *5.1 PULL-TYPE HEADERS*

| HEADER SIZE | | 14 FT | | 16 FT | | 18 FT |
|---|---|---|---|---|---|---|
| HEADER MODEL | | A30-S | A30-D | A30-S | A30-D | A30-D |
| **FRAME & STRUCTURE** | | | | | | |
| Width | | 16 ft-3 in. (4953 mm) | n/a | 17 ft-9 in. (5410 mm) | | 19 ft-3 in. (5867 mm) |
| Length | Transport | 26 ft-7 in. (8130 mm) | | | | |
| | Field | 26 ft-7 in. (8130 mm) | | | | |
| Height | Transport | 86 in. (2184 mm) | | | | |
| | Field | 86 in. (2184 mm) | | | | |
| Approx. Weight [lb (kg)] | | 7200 (3269) | n/a | 7400 (3360) | 8000 (3632) | 8200 (3723) |
| Carrier | | Pull-Type | | | | |
| Lighting | | Two Amber and Two Red Transport Lights | | | | |
| Spare Knife Storage | | Frame Tube | Lean Bar | Frame Tube | Lean Bar | |
| Reversing Wrench/Guard Straightening Tool | | Stored Inside LH End Sheet | | | | |
| Manual Storage | | Frame Mounted Case | | | | |
| **WHEELS** | | | | | | |
| Tires | | 31 x 13.5 – 15 NHS 8 Ply Terra-Rib | | | | |
| Tread Width | | 150 inches (3810 mm) | | | | |
| Pressure | | 30 psi (207 kPa) | | | | |
| **CUTTERBAR** | | | | | | |
| Effective Cutting Width | | 14 ft-9 in. (4496 mm) | | 16 ft-3 in. (4953 mm) | | 17 ft-9 in. (5410 mm) |
| Cutting Height | | 4 in. (100 mm) Below Ground To 21 in. (533 mm) Above Ground | | | | |
| Guard Angle Adjustment | | 8° – 16° | | | | |
| **MAIN DRIVE** | | | | | | |
| Hydraulic | | Tractor PTO Driven Piston Pump 540 or 1000 rpm | | | | |
| **HEADER DRIVE** | | | | | | |
| Hydraulic | | M44 (44 cc) Motor To Gearbox | | | | |
| **SICKLE** | | | | | | |
| Drive Type | Type | Belt Driven Heavy Duty (MD) Wobble Box (Enclosed Oil Bath) | | | | |
| | Qty | One | Two | One | Two | |
| Sickle Speed (Strokes Per Minute) | No Load | 1970 | 1980 | 1970 | 1980 | |
| | Load | 1510 | 1910 | | | |
| Stroke | | 3 in. (76 mm) | | | | |
| Sections | | Bolted Over-Serrated, 9 Serrations/Inch. | | | | |
| Guards | | Forged And Double Heat-Treated | | | | |

# SPECIFICATIONS

## *PULL-TYPE HEADERS* (Cont'd)

| HEADER SIZE | | | | 14 FT | | 16 FT | | 18 FT |
|---|---|---|---|---|---|---|---|---|
| HEADER MODEL | | | | A30-S | A30-D | A30-S | A30-D | A30-D |
| **AUGER** | | | | | | | | |
| Drive | | | Mechanical | 2 Belts To Chain | | | | |
| Size | | | Tube | 10 in. (254 mm) O.D | | | | |
| | | | Flighting | 20 in. (508 mm) O.D., 0.25 in. (6 mm) thick. | | | | |
| Type | | | | Undershot, Centre Feed. Rubber Finger Feed | | | | |
| Stripper Bars | | | | 3 Per Side | | | | |
| Speed (rpm) | 20T Sprocket | | No Load | 265 | 275 | 265 | 275 | |
| | | | Load | 256 | 265 | 256 | 265 | |
| | 19T Sprocket | | No Load | 252 | 261 | 252 | 261 | |
| | | | Load | 243 | 252 | 243 | 252 | |
| Delivery Opening | | | | 95.7 in. (2430 mm) | | | | |
| **REEL** | | | | | | | | |
| Drive | | | Mechanical | 2 Belts From Auger To Chain Final Drive | | | | |
| Type | | | Bats | 5 Bat (6 Bat Optional) | | | | |
| | | | Tines | Steel - 0.25 in. (6 mm) Dia. | | | | |
| Tine Bar Bearings | | | | Replaceable Polyethylene | | | | |
| Radius (to tine tip) | | | | 22 in. (540 mm) | | | | |
| Speed (rpm) | 20T Sprocket | 20T Auger | No Load | 71 | 74 | 71 | 74 | |
| | | | Load | 69 | 71 | 69 | 71 | |
| | | 19T Auger | No Load | 68 | 70 | 68 | 70 | |
| | | | Load | 65 | 68 | 65 | 68 | |
| | 19T Sprocket | 20T Auger | No Load | 68 | 70 | 68 | 70 | |
| | | | Load | 65 | 68 | 65 | 68 | |
| | | 19T Auger | No Load | 64 | 67 | 64 | 67 | |
| | | | Load | 62 | 64 | 62 | 64 | |
| **CONDITIONER** | | | | | | | | |
| Drive | | | Hydraulic | M44 (44cc) Motor To Enclosed Oil-Bath Gearbox | | | | |
| Roll Type | | | | Intermeshing Steel Bars | | | | |
| Roll Diameter | | | Bars | 9.17 in. (233 mm) O.D. | | | | |
| | | | Tube | 6.63 in. (168 mm) O.D. | | | | |
| Roll Length | | | | 102 in. (2590 mm) | | | | |
| Roll Speed (rpm) | | | | No Load – 824. Load – 795 | | | | |
| Swath Width | | | | 36 in. (915 mm) To 92 in. (2340 mm) | | | | |
| Unplugging Assist | | | | Rolls Open As Header Lifts. Rolls Can Open To 4.25 in. (108 mm) During Operation | | | | |
| Forming Shields | | | | Header Mounted Adjustable Baffle And Side Deflector System For 36 in. (915 mm) To 100 in. (2540 mm) Swath Width. | | | | |
| **OPERATING SPEED** | | | | | | | | |
| Recommended Cutting | | | | 5 mph (8 km/hr) | | | | |
| Recommended Transport | | | | 20 mph (30 km/hr) | | | | |
| **TRACTOR REQUIREMENTS** | | | | | | | | |
| Power (minimum) | | | | 90 HP (68 kW) | | 110 HP (83 kW) | | 130HP (98 kW) |
| Hydraulics | | | | 2000 psi (13,714 kPa) | | | | |

NOTES: 1. Specifications and design are subject to change without notice or obligation to revise previously sold units.

## *5.2 SELF-PROPELLED HEADERS*

| HEADER SIZE | | 14 FT | | | 16 FT | | | 18 FT | |
|---|---|---|---|---|---|---|---|---|---|
| **HEADER MODEL** | | **A30-S** | **A30-D** | **A40-D** | **A30-S** | **A30-D** | **A40-D** | **A30-D** | **A40-D** |
| **FRAME & STRUCTURE** | | | | | | | | | |
| Width | | 16 ft-3 in. (4953 mm) | | | 17 ft-9 in. (5410 mm) | | | 19 ft-3 in. (5867 mm) | |
| Weight [lb (kg)] | | n/a | n/a | 5680 (2579) | n/a | n/a | 5850 (2656) | n/a | 6020 (2733) |
| Carrier | | MacDon M Series Self-Propelled Windrower | | | | | | | |
| Lighting | | Two Amber Transport Lights | | | | | | | |
| Spare Knife Storage | | Frame Tube | Lean Bar | | Frame Tube | Lean Bar | | Lean Bar | |
| Reversing Wrench/Guard Straightening Tool | | Stored Inside LH End Sheet | | | | | | | |
| Manual Storage | | Tractor Cab | | | | | | | |
| **CUTTERBAR** | | | | | | | | | |
| Effective Cutting Width | | 14 ft-9 in. (4496 mm) | | | 16 ft-3 in. (4953 mm) | | | 17 ft-9 in. (5410 mm) | |
| Cutting Height | | 5.9 in. (150 mm) Below Ground To 35.4 in. (900 mm) Above Ground | | | | | | | |
| Guard Angle Adjustment | | 7° – 17.5° | | | | | | | |
| **HEADER DRIVE** | | | | | | | | | |
| Hydraulic | | M44 (44 cc) Motor To Gearbox | | | | | | | |
| **SICKLE** | | | | | | | | | |
| Belt Driven Heavy Duty (MD) Wobble Box (Enclosed Oil Bath) | Belt Type | V | Timing | | V | Timing | | | |
| | Qty | One | Two | | One | Two | | | |
| Sickle Speed (Strokes Per Minute) | | 1540 | 1450-1950 | | 1540 | 1450-1950 | | | |
| Stroke | | 3 in. (76 mm) | | | | | | | |
| Sections | | Bolted Over-Serrated, 14 Serrations/Inch. (9 Serrations/Inch Optional) | | | | | | | |
| Guards | | Forged And Double Heat-Treated | | | | | | | |
| **AUGER** | | | | | | | | | |
| Drive | Hydraulic Direct Mounted Motor | -- | | 15.9 $in^3$ (261 cc) /rev | -- | | 15.9 $in^3$ (261 cc) /rev | -- | 15.9 $in^3$ (261 cc) /rev |
| | Mechanical | 2 Belts To Chain | | -- | 2 Belts To Chain | | -- | 2 Belts To Chain | -- |
| Max Speed (rpm) | 20T Sprocket | 260 | 270 | 230-320* | 260 | 270 | 230-320* | 270 | 230-320* |
| | 19T Sprocket | 250 | 260 | | 250 | 260 | | 260 | |
| Size | Tube | 10 in. (254 mm) O.D | | | | | | | |
| | Flighting | 20 in. (508 mm) O.D., 0.25 in. (6 mm) thick. | | | | | | | |
| Type | | Undershot, Centre Feed. Rubber Finger Feed | | | | | | | |
| Stripper Bars | | 3 Per Side | | | | | | | |
| Delivery Opening | | 95.7 in. (2430 mm) | | | | | | | |

* Max Speed on M100 Tractor

# SPECIFICATIONS

## *SELF-PROPELLED HEADERS* (Cont'd)

| HEADER SIZE | | | 14 FT | | | 16 FT | | | 18 FT | |
|---|---|---|---|---|---|---|---|---|---|---|
| HEADER MODEL | | | A30-S | A30-D | A40-D | A30-S | A30-D | A40-D | A30-D | A40-D |
| **REEL** | | | | | | | | | | |
| Drive | Hydraulic Direct Mounted Motor | | -- | | 14.2 $in^3$ (232 cc) /rev | -- | | 14.2 $in^3$ (232 cc) /rev | -- | 14.2 $in^3$ (232 cc) /rev |
| | Mechanical From Auger | | 2 Belts/Chain Final Drive | | -- | 2 Belts/Chain Final Drive | | -- | 2 Belts/ Chain Final Drive | -- |
| Type | | | 5 Bat (6 Bat Opt) | | 6 Bat (7 Opt) | 5 Bat (6 Opt) | | 6 Bat (7 Opt) | 5 Bat (6 Opt) | 6 Bat (7 Opt) |
| Tines | | | Steel - 0.25 in. (6 mm) Dia. | | | | | | | |
| Tine Bar Bearings | | | Replaceable Polyethylene | | Greasable Ball | Replaceable Polyethylene | | Greasable Ball | Replace-able Poly-ethylene | Greasable Ball |
| Radius (to tine tip) | | | 22 in. (540 mm) | | | | | | | |
| Max Speed (rpm) | 20T Sprocket | 20T Auger | 70 | 73 | 51*-76 | 70 | 73 | 51*-76 | 73 | 51*-76 |
| | | 19T Auger | 67 | 69 | | 67 | 69 | | 69 | |
| | 19T Sprocket | 20T Auger | 67 | 69 | | 67 | 69 | | 69 | |
| | | 19T Auger | 63 | 66 | | 63 | 66 | | 66 | |
| **CONDITIONER** | | | | | | | | | | |
| Drive | | Hydraulic | M44 (44cc) Motor To Enclosed Oil-Bath Gearbox | | | | | | | |
| Roll Type | | | Intermeshing Steel Bars | | | | | | | |
| Roll Diameter | | Bars | 9.17 in. (233 mm) O.D. | | | | | | | |
| | | Tube | 6.63 in. (168 mm) O.D. | | | | | | | |
| Roll Length | | | 102 in. (2590 mm) | | | | | | | |
| Roll Speed (rpm) | | | 810 | | 601-810 | 810 | | 601-810 | 810 | 601-810 |
| Unplugging Assist | | | Reversing Flow To Hydraulic Motors | | | | | | | |
| Forming Shields | | | Tractor Mounted Side Deflector System For 36 in. (915 mm) To 100 in. (2540 mm) Swath Width. | | | | | | | |
| **OPERATING SPEED** | | | | | | | | | | |
| Recommended Cutting | | | 5 mph (8 km/hr) | | | | | | | |

* Minimum reel speed on Grass Seed header is 30 rpm.

# 6 OPERATION

## *6.1 OWNER/OPERATOR RESPONSIBILITIES*

**CAUTION**

- **It is your responsibility to read and understand this manual completely before operating the windrower. Contact your dealer if an instruction is not clear to you.**
- **Follow all safety messages in the manual and on safety signs on the machine.**
- **Remember that YOU are the key to safety. Good safety practices protect you and the people around you.**
- **Before allowing anyone to operate the windrower, for however short a time or distance, make sure they have been instructed in its safe and proper use.**
- **Review the manual and all safety related items with all operators annually.**
- **Be alert for other operators not using recommended procedures or not following safety precautions. Correct these mistakes immediately, before an accident occurs.**
- **Do not modify the machine. Unauthorized modifications may impair the function and/or safety and affect machine life.**
- **The safety information given in this manual does not replace safety codes, insurance needs, or laws governing your area. Be sure your machine meets the standards set by these regulations.**
- **Ensure that the tractor is properly equipped to safely operate the windrower. This may include adding ballast according to Tractor Operator's Manual requirements for attachments of this size and mass.**

## *6.2 OPERATIONAL SAFETY*

Follow these safety precautions:

**CAUTION**

- **Follow all safety and operational instructions given in your tractor Operator's Manual. If you do not have a tractor manual, get one from your dealer and read it thoroughly.**
- **Never attempt to start the tractor engine or operate the windrower except from the tractor seat.**
- **Check the operation of all controls in a safe clear area before starting work.**
- **Do not allow riders on tractor or windrower.**
- **Never start or move the machine until you are sure all bystanders have cleared the area.**
- **Avoid travelling over loose fill, rocks, ditches or holes.**
- **Drive slowly through gates and doorways.**
- **If cutting ditch banks, use extreme caution. If the windrower hits an obstruction, the front of the tractor will usually swerve towards the ditch.**
- **When working on inclines, travel uphill or downhill when possible. Be sure to keep tractor transmission in gear when travelling downhill.**
- **Never attempt to get on or off a moving tractor.**
- **Do not get off the tractor while the windrower is in operation.**
- **Stop tractor engine and remove key before adjusting or removing plugged material from the machine. A child or even a pet could engage the drive.**
- **Check for excessive vibration and unusual noises. If there is any indication of trouble, shut down and inspect the machine. Follow proper shutdown procedure:**
  - **engage tractor brake.**
  - **disengage PTO.**
  - **turn off engine and remove key**
  - **wait for all movement to stop**
  - **dismount and engage cylinder stops before inspecting raised machine. Operate only in daylight or good artificial light.**

## 6.3 TRACTOR SETUP – PULL-TYPE

### 6.3.1 Tractor Requirements

| HEADER WIDTH | MIN POWER HP (kW) | MINIMUM DRAWBAR CAPACITY lbf (N) | MINIMUM HYDRAULICS psi (MPa) |
|---|---|---|---|
| 14 FT | 90 (68) | 1400 (6227) | 2000 (13.7) |
| 16 FT | 110 (83) | 1450 (6449) | |
| 18 FT | 130 (98) | 1500 (6672) | |

**NOTE**

*Tractor must be equipped with a seven terminal outlet to supply power to the windrower's warning lights.*

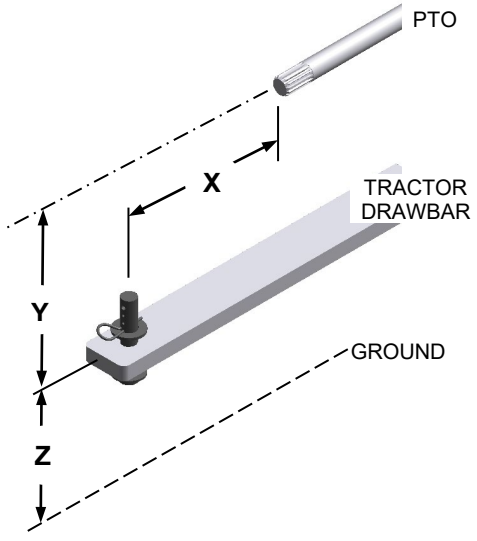
### 6.3.2 Drawbar Adjustment

**CAUTION**

**Shut off tractor, engage parking brake and remove key before working around hitch.**

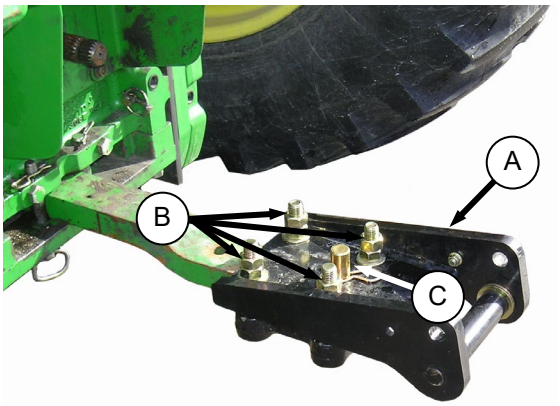
Adjust tractor drawbar to meet ASAE Standard specifications as listed below.

| DIMENSION | 1000 RPM PTO | |
|---|---|---|
| | 1.37 INCH DIA. | 1.75 INCH DIA. |
| X | 16 in. (406 mm) | 20 in. (508 mm) |
| Y | 6-12 in. (152-305 mm)<br>8 in. (203 mm) Recommended | |
| Z | 13-17 in. (330-432 mm)<br>16 in. (406 mm) Recommended | |




### 6.3.3 Drawbar Hitch Set-Up

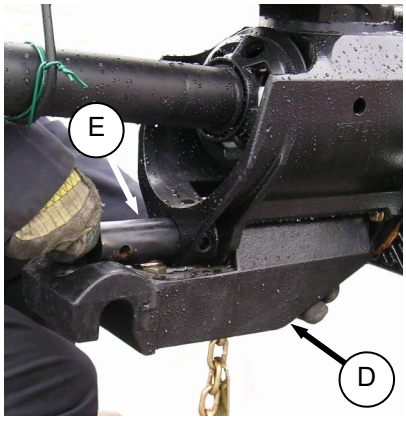
a. Secure the tractor drawbar so the hitch-pin hole is directly below the driveline.



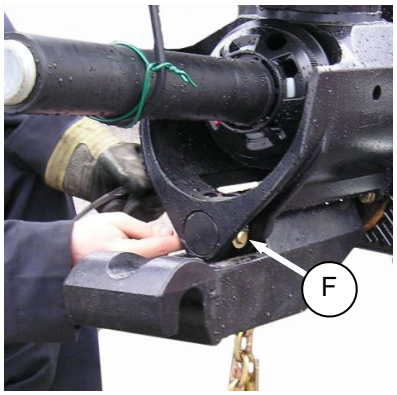

b. Loosen bolts (B) on extension assembly (A) and slide onto drawbar.

c. Install pin (C) through drawbar and extension from underside and secure with hairpin.

d. Gradually tighten the four bolts to 265 ft·lbf (359 N·m).

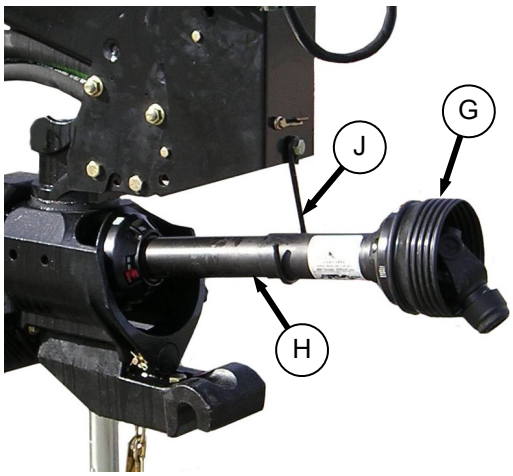



e. Attach the swivel APT member (D) with pin (E) onto the APT.




f. Secure pin with clevis pin (F), washers, and cotter pin.

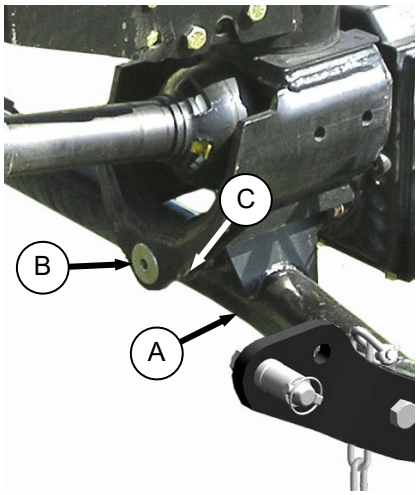
*(continued next page)*




g. Assemble PTO driveline male half (G) onto PTO shaft (H) on APT. Push male half so that PTO shaft is at its fully compressed length.

h. Locate PTO shaft in hook (J).

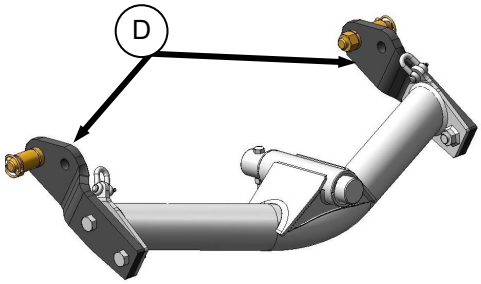
### *6.3.4 3 Point Hitch (Cat. II, III, or IIIN) Set-Up*



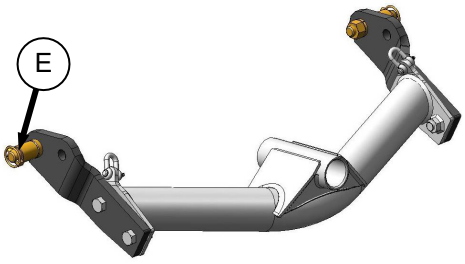

a. Attach the 3 point hitch yoke (A) to the APT with pin (B). The installation is similar to that described in the previous section.

b. Secure pin (B) with clevis pin (C), washers, and cotter pin.

c. The arms (D) on APT yoke can be set up to suit the tractor hitch arms:

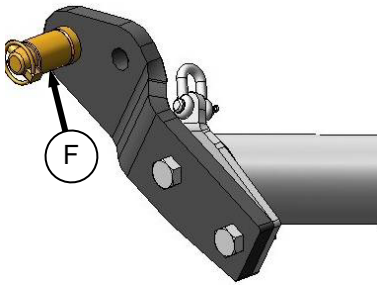



CATEGORY II or IIIN



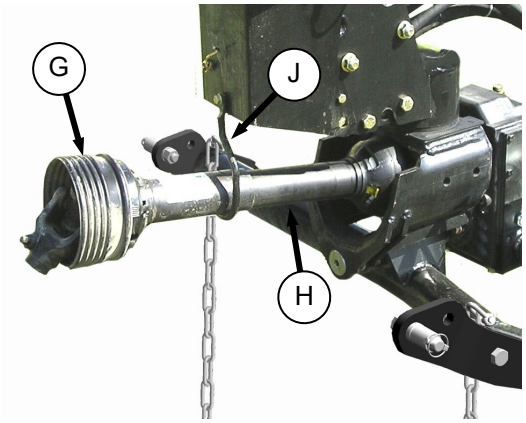

CATEGORY III

1. Remove pins (E) from arms.
2. Remove arms (D) from APT yoke.
3. Re-install arms on opposite ends of yoke as shown.
4. Re-install pins (E) in arms.




**NOTE**

*Bushings (F) on pins can be removed to suit hole size in tractor hitch arms.*




d. Assemble PTO driveline male half (G) onto PTO shaft (H) on APT. Push male half so that PTO shaft is at its fully compressed length.

e. Locate PTO shaft in hook (J).

## 6.4 MOWER CONDITIONER/ TRACTOR HOOKUP – PULL-TYPE

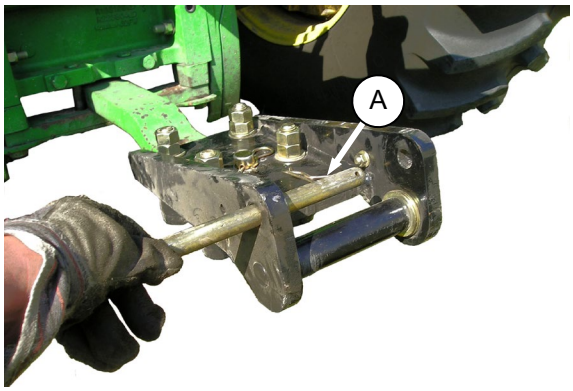
**CAUTION**

**Shut off tractor, engage parking brake and remove key before working around hitch.**

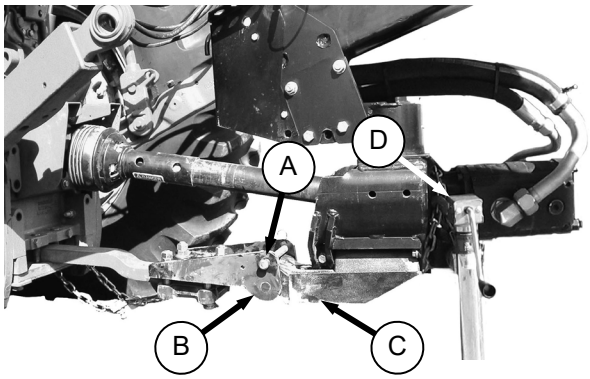
**CAUTION**

**Never attach windrower to tractor rear axle or three-point hitch arms.**

### 6.4.1 Drawbar Hook-Up




a. Remove pin (A).




b. Position tractor to align drawbar extension (B) with arm (C) on mower conditioner.

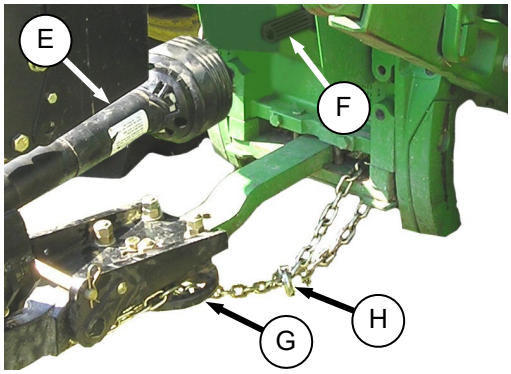
c. Lower jack (D) to engage arm (C) on drawbar extension (B).

d. Install hitch-pin (A) and secure with hairpin.

**IMPORTANT**

If the tractor has a three-point hitch, lower the lower links as low as possible to prevent damage to (APT).

e. Attach driveline (E) to tractor PTO shaft as follows:

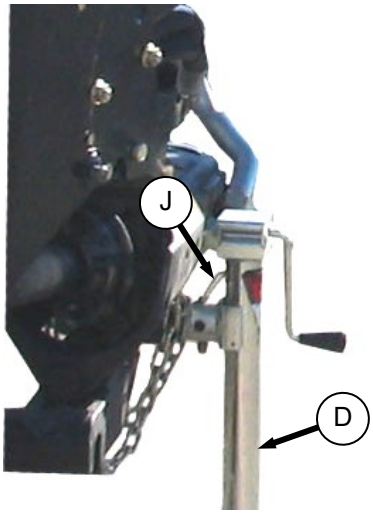



1. Position driveline onto tractor PTO shaft (F).
2. Pull back collar on driveshaft and push driveshaft until it locks. Release collar.

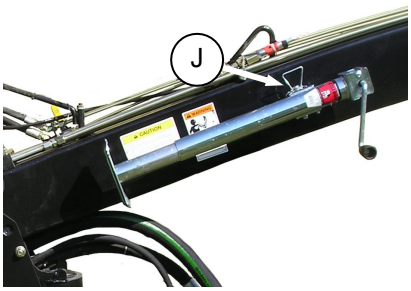
f. Route safety chain from mower conditioner through chain support (G), around drawbar support and lock the hook (H) on chain.

**IMPORTANT**

Adjust chain length to remove all slack except what is needed for turns.




g. Raise jack (D), pull pin (J) and move jack to storage position on side of APT.



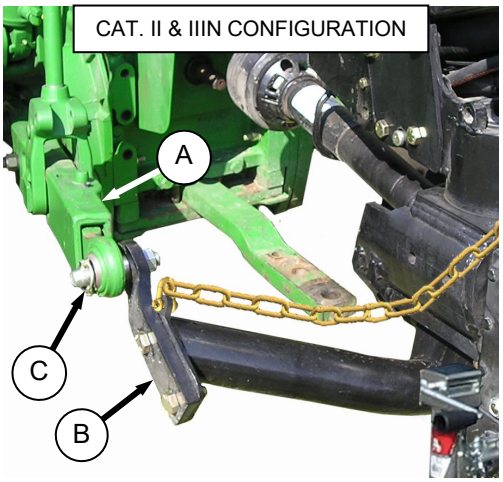

h. Secure jack with pin (J).

i. Proceed to Step 6.4.3 Hydraulic Connections.

### *6.4.2 3 Point Hitch (Cat. II, III, or IIIN) Hook-Up*

**CAUTION**

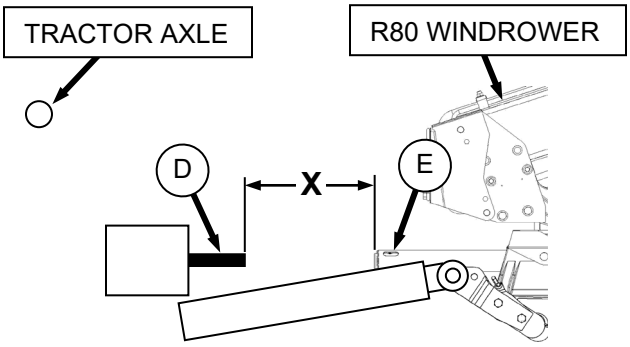
**Shut off tractor, engage parking brake and remove key before working around hitch.**




a. Position tractor and align tractor hitch arms (A) with windrower arms (B). Use the jack to adjust height of windrower.

b. Secure arms with lynch pins (C).

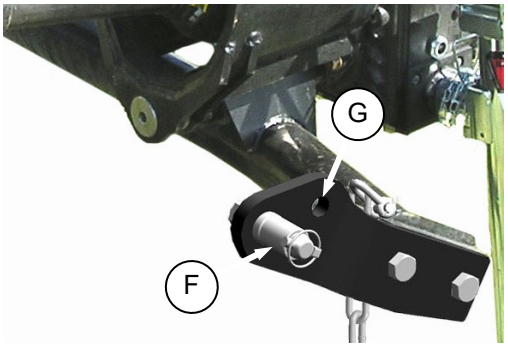
c. Install anti-sway bars on tractor hitch to stabilize lateral movement of hitch arms (A). Refer to your tractor operator's manual.



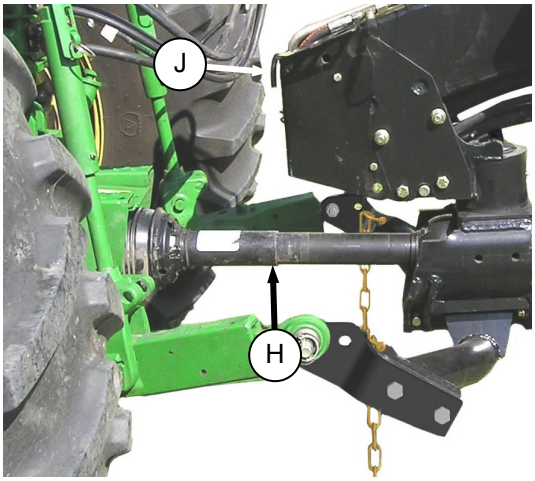

d. Check distance '**X**' between tractor PTO shaft (D) and implement input shaft (E) (without the front half of the driveline attached).

e. The measurement must not exceed the following:

| DRIVELINE SHAFT SIZE | DISTANCE 'X' |
|---|---|
| 1.375 in. (34 mm) | 14 in. (356 mm) |
| 1.75 in. (43 mm) | 17 in. (432 mm) |



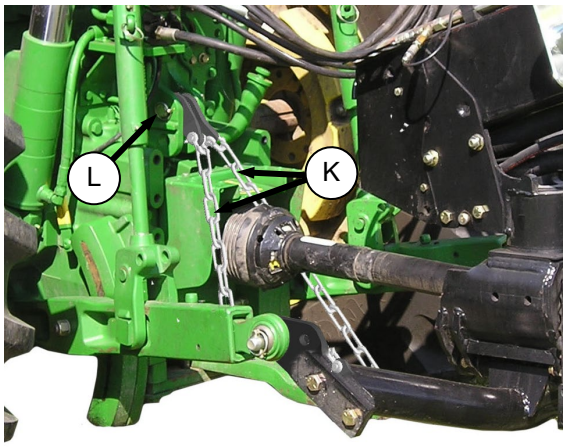

f. Change locations of pins (F) in APT arms to hole (G) to locate implement closer to tractor if necessary.




g. Position driveshaft (H) onto tractor PTO shaft. Driveline should be approximately level.

h. Pull back collar on driveshaft and push driveshaft until it locks. Release collar.

i. Rotate driveline storage hook (J) to upward position.



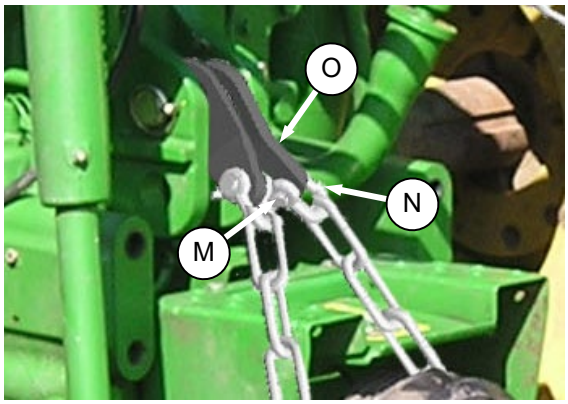

j. Attach down-stop chains (K) to pin (L) on tractor.

*(continued next page)*

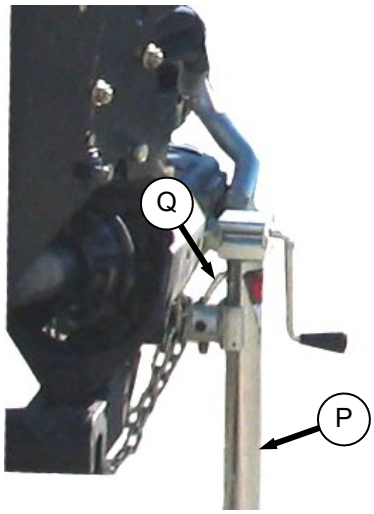
## CAUTION

**The downstop chains limit the downward travel of the 3-point hitch lifting arms to prevent damaging the PTO driveline on the mower-conditioner. Ensure chains are attached when operating the mower-conditioner.**

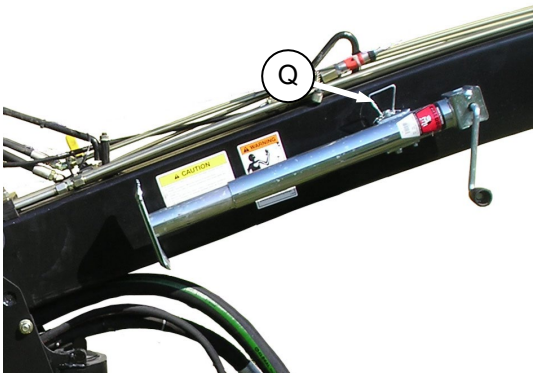
k. Adjust chain length as required by relocating end link at tractor end of chain as follows:




1. Remove cotter pin and clevis pin (M) to disconnect open link (N) and end link (O).
2. Relocate open link (N) to new location on chain and re-attach to end link (O) with clevis pin (M). Chains do not need to be tight.
3. Secure clevis pin with cotter pin.




l. Raise jack (P), pull pin (Q), and move jack to storage position on side of APT.

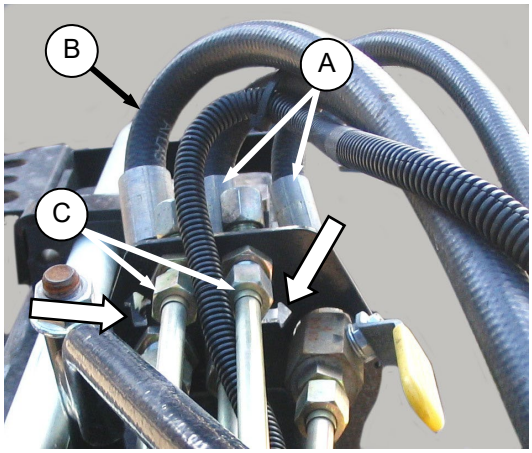



m. Secure jack with pin (Q).

### *6.4.3 Hydraulic Connections*

**WARNING**

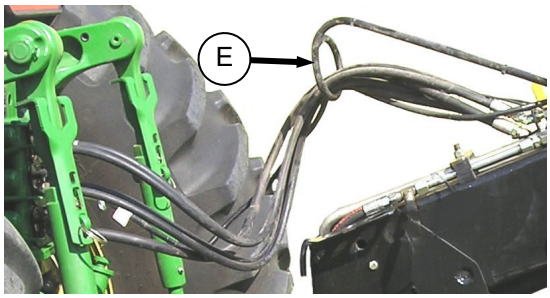
**Do not use remote hydraulic system pressures over 3000 psi (20684 kPa). Check your tractor manual for remote system pressure.**



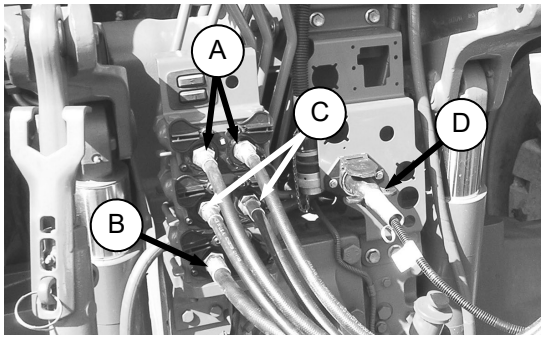

| SYSTEM | HOSE | TRACTOR HYDRAULICS |
|---|---|---|
| **Steering** | A (2 Hoses) | Control 1 |
| **Lift** | B (1 Hose) | Control 2 |
| **Header Tilt** | C (2 Hoses) | Control 3 |

**NOTE**

*Arrows cut into plate indicate system for hoses. LIFT ⇧ STEERING ⇔*




a. Ensure hoses are routed through guide (E) to provide proper hose arc as shown.




b. Connect two **steering** cylinder hoses (A) as follows:

| CONTROL LEVER POSITION | CYLINDER MOVEMENT | MOWER-CONDITIONER DIRECTION |
|---|---|---|
| **Forward** | Extend | Right |
| **Backward** | Retract | Left |

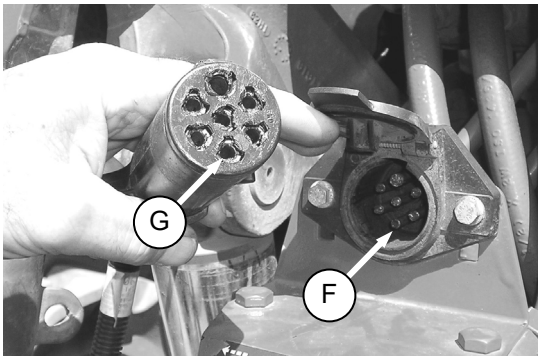
c. Connect one **lift** cylinder hose (B) as follows:

| CONTROL LEVER POSITION | CYLINDER MOVEMENT | HEADER MOVEMENT |
|---|---|---|
| **Forward** | Retract | Lower |
| **Backward** | Extend | Raise |

d. Connect two **header tilt** cylinder hoses (C) as follows: (Not required with mechanical center link).

| CONTROL LEVER POSITION | CYLINDER MOVEMENT | HEADER MOVEMENT |
|---|---|---|
| **Forward** | Retract | Lower |
| **Backward** | Extend | Raise |

e. Connect the mower-conditioner wiring harness connector (D) to tractor. The connector is designed to fit tractors equipped with a round 7-pin receptacle (SAE J560).




**IMPORTANT**

Older model tractors will have Pin #4 (F) energized as an accessory circuit. The R80 mower conditioner uses this pin position (G) for brake lights. Check that Pin #4 in the tractor receptacle is not constantly energized – see tractor's operator's manual and remove the appropriate fuse if required.

## 6.5 MOWER CONDITIONER / TRACTOR UNHOOK – PULL-TYPE

**CAUTION**

**To prevent accidental movement of tractor, shut off engine, engage parking brake, and remove key.**

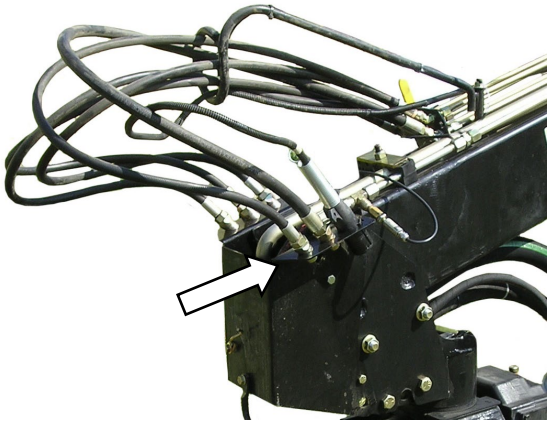
**To maintain stability, always lower the machine completely. Block windrower wheels before detaching from tractor.**

### 6.5.1 Drawbar Hitch Unhook

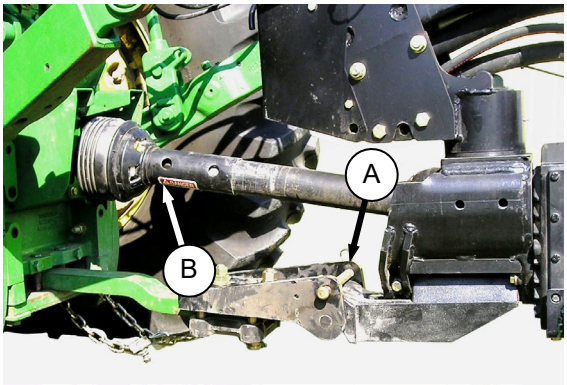
a. Park machine on flat level surface with hitch at an angle to tractor drawbar (to facilitate pump detachment).

b. Lower header onto blocks or leave header raised. Engage lift cylinder lock-out valves if leaving in raised position.

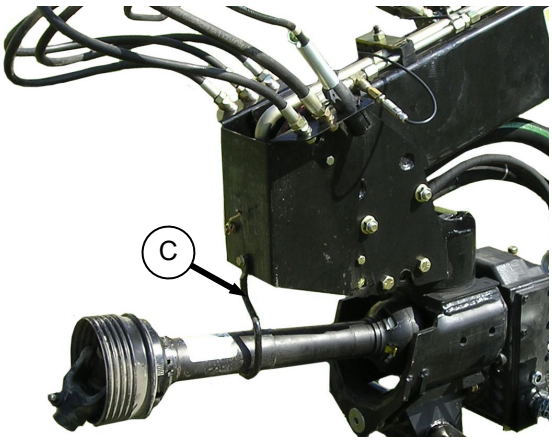
c. Move remote cylinder control valve lever back and forth to relieve stored hydraulic pressure.



d. Disconnect hydraulic hoses and electrical harness. Store hose ends in holes at front of APT as shown.

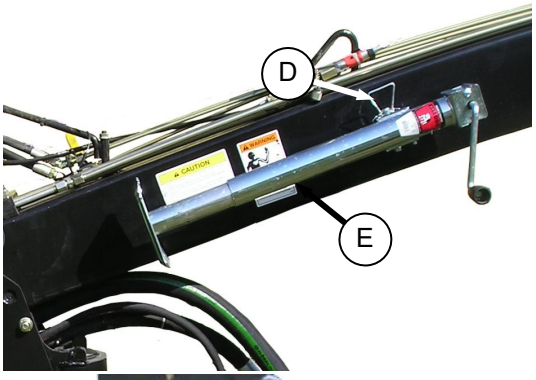


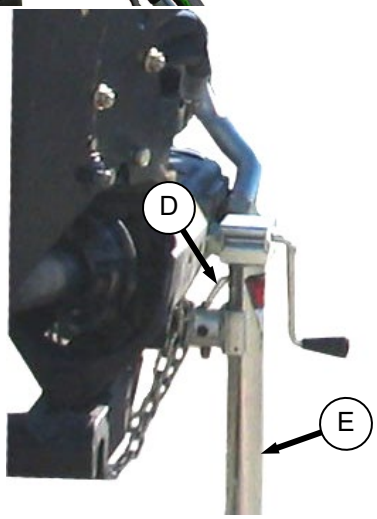

e. Remove pin (A).




f. Rotate hook (C) to lower position.

g. Pull back collar on driveline (B) and slide coupler off tractor PTO shaft and position driveline in hook.

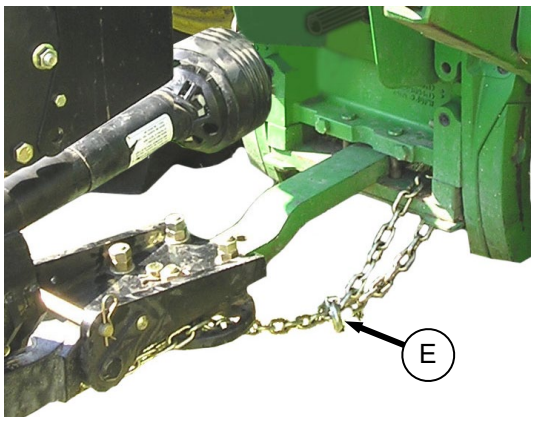



h. Pull pin (D) securing jack (E) and move to working position at front of APT. Secure jack with pin (D).

i. Lower jack to take weight off tractor drawbar.

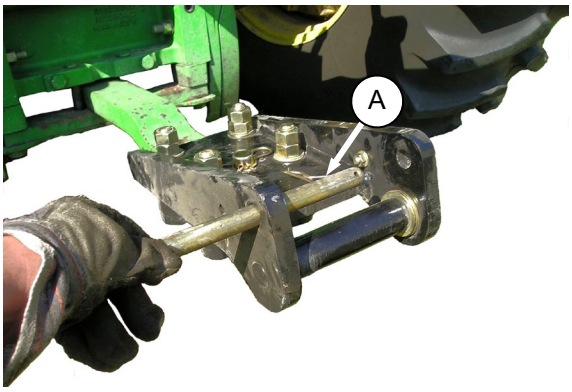
*(continued next page)*




j. Remove chain lock (E) and unhook safety chain from tractor. Wrap chain around APT for storage.

k. Lower jack to raise APT clear of drawbar.

l. Slowly drive tractor away from mower conditioner.




m. Replace hitch pin (A) and secure with hairpin.

### *6.5.2 3-Point Hitch Unhook*

a. Park machine on flat level surface.

b. Lower header onto blocks or leave header raised. Engage lift cylinder lock-out valves if leaving in raised position.

c. If necessary, raise 3-point hitch arms to release tension on downstop chains.

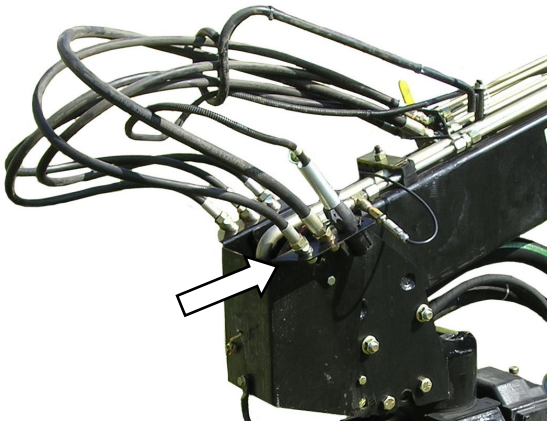
**CAUTION**

**To prevent accidental movement of tractor, shut off engine, engage parking brake, and remove key.**

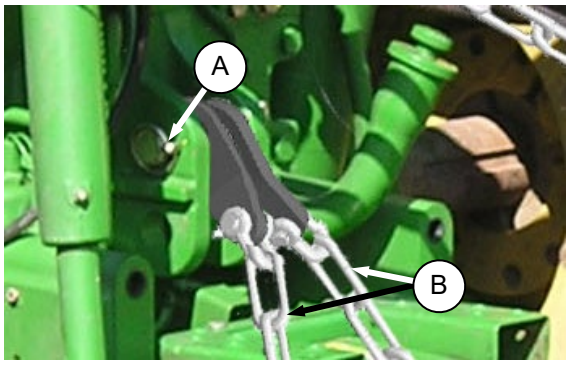
**To maintain stability, always lower the machine completely. Block mower conditioner wheels before detaching from tractor.**

d. Shut off engine and remove key.

e. Move remote cylinder control valve lever back and forth to relieve stored hydraulic pressure.

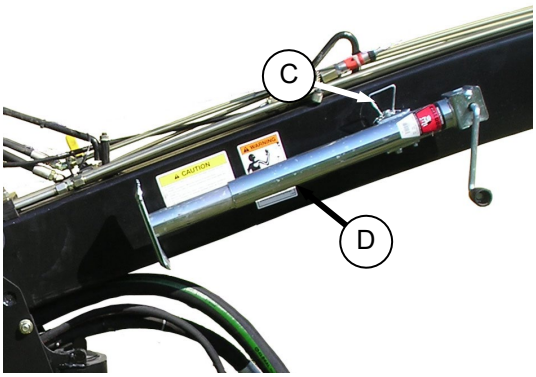


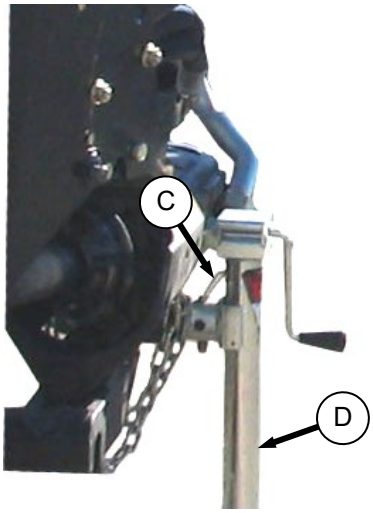
f. Disconnect hydraulic hoses and electrical harness. Store hose ends in holes at front of APT as shown.



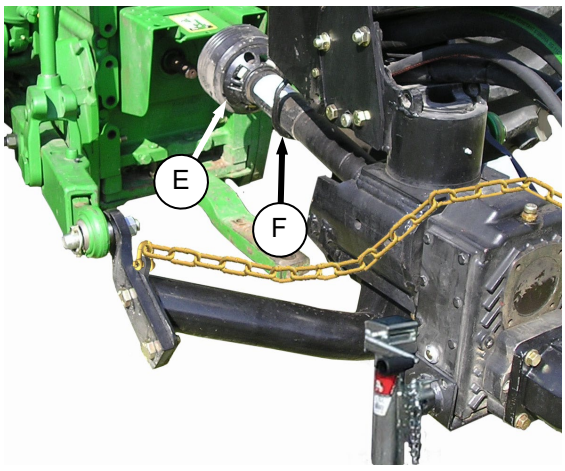

g. Remove pin (A), and remove down-stop chains (B) from tractor and store on APT yoke.

*(continued next page)*



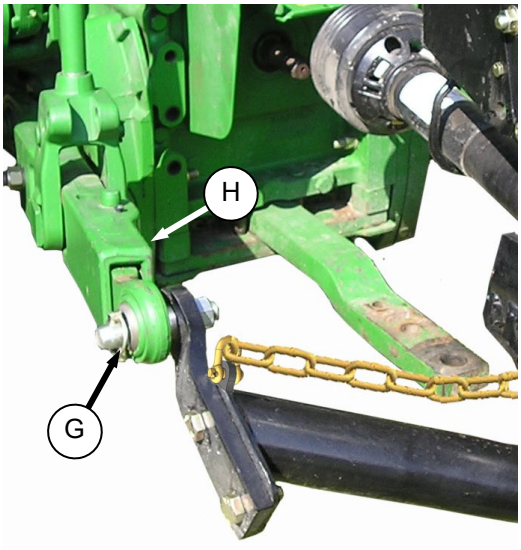

h. Pull pin (C) securing jack (D) to APT and move to working position at front of APT. Secure jack with pin (C).




i. Rotate hook (F) to lower position.

j. Pull back collar on driveline (E) and slide coupler off tractor PTO shaft. Place driveline in hook.

k. Lower jack to raise APT and take weight off hitch arms.




l. Remove lynch pins (G) and swing hitch arms (H) clear of APT.

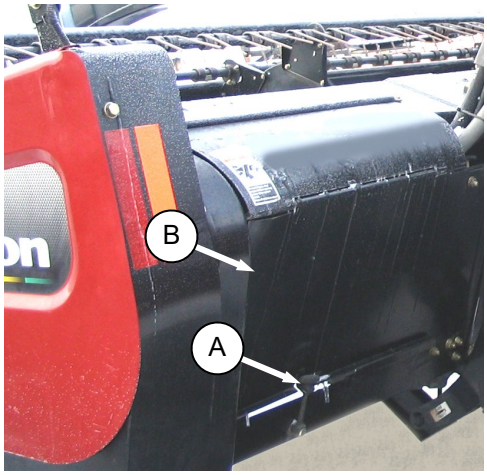
m. Slowly drive tractor away from mower conditioner.

## 6.6 HEADER ATTACHMENT – SELF-PROPELLED

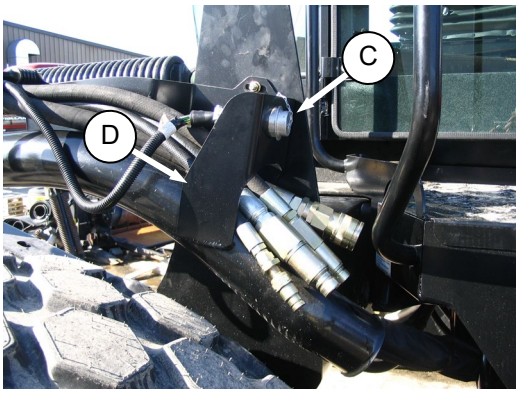
Refer to the M100, or M150 & M200 Self-Propelled Windrower Operator's Manuals for procedures for mechanically attaching the auger header to the self-propelled windrower. Refer to the following procedures for electrical and hydraulic connections. The header drive hydraulic hoses and electrical harness are located on the LH cab-forward side of the tractor.

### CAUTION

**To prevent accidental movement of tractor, shut off engine, engage parking brake, and remove key.**



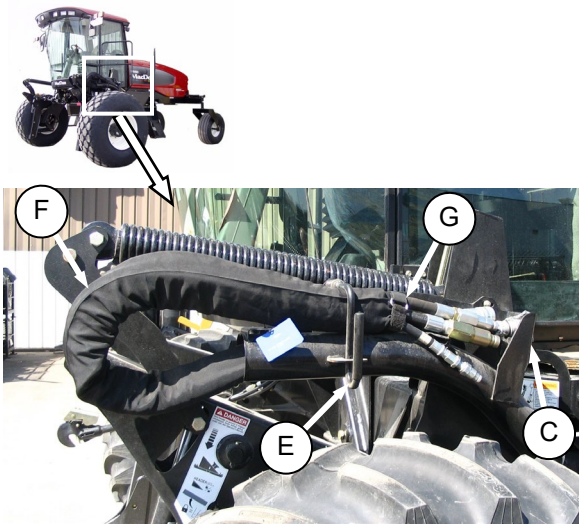

a. Disengage rubber latch (A) and open driveline shield (B).




**NOTE**

*The header drive hydraulics and electrical harness are located on the LH cab-forward side of the tractor.*

b. Remove the cap (C) from electrical connector, and remove connector from support bracket (D).



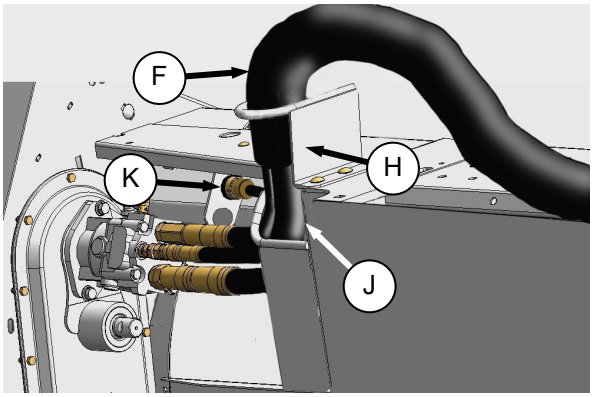

c. Push lever (E) inboard to disengage bracket and rotate counterclockwise to release the hose bundle (F).

d. Move hose bundle (F) to header.

e. Rotate lever (E) clockwise and engage bracket to store.

f. Refer to following sections for your specific header model for hose attachment details.

### 6.6.1 A30-S and A30-D Attachment




a. Pass hoses (F) from tractor through support (H) and access hole (J) in header frame.

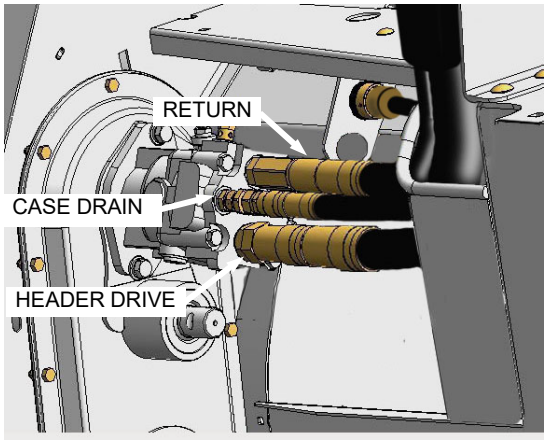
b. Remove cover on header electrical receptacle (K).

c. Push connector onto receptacle and turn collar on connector to lock it in place.

d. Attach cover to mating cover on tractor wiring harness.

e. Remove caps from hydraulic couplers and clean if necessary.

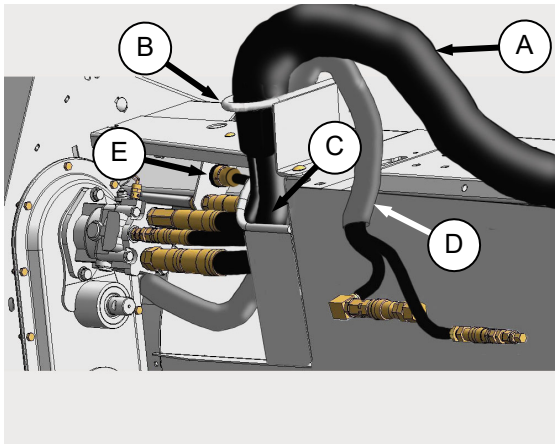
*(continued next page)*




f. Push hose connectors onto mating receptacles as shown until collars on receptacles snap into lock position.

g. Close driveline shield before engaging header.

### *6.6.2 A40-D Attachment*



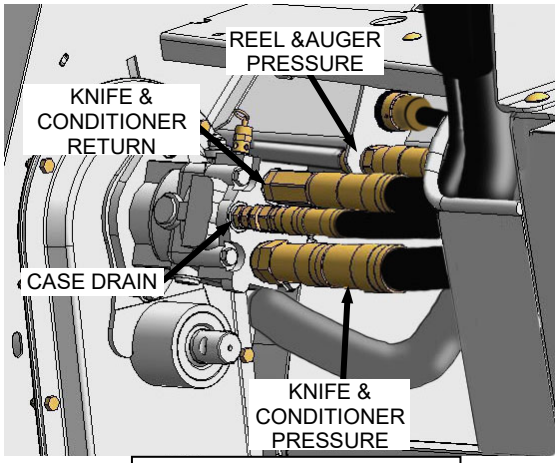

a. Route hoses (A) from tractor through support (B) and access hole (C) in header frame alongside existing hose bundle (D).

b. Remove cover on header electrical receptacle (E).

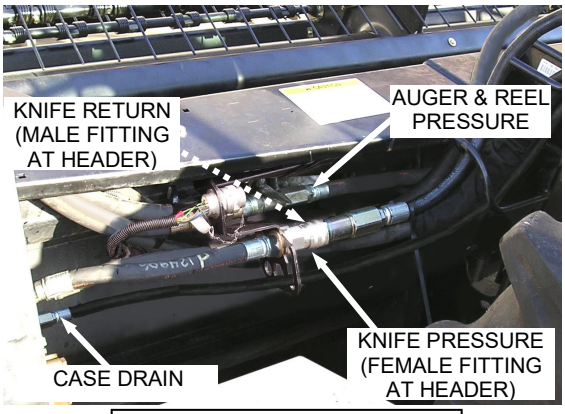
c. Push connector onto receptacle and turn collar on connector to lock it in place.

d. Attach cover to mating cover on tractor wiring harness.

e. Remove caps from hydraulic couplers and clean if necessary.




STANDARD HEADER

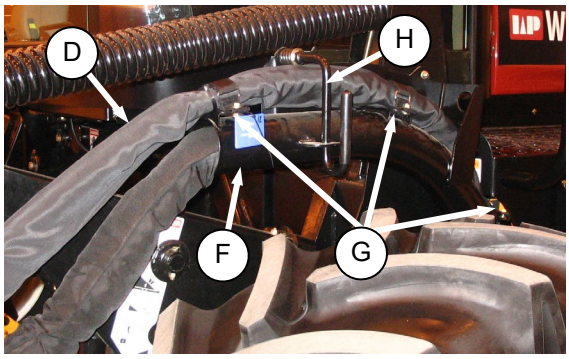



GRASS SEED HEADER

f. Push hose connectors onto mating receptacles as shown until collars on receptacles snap into lock position.

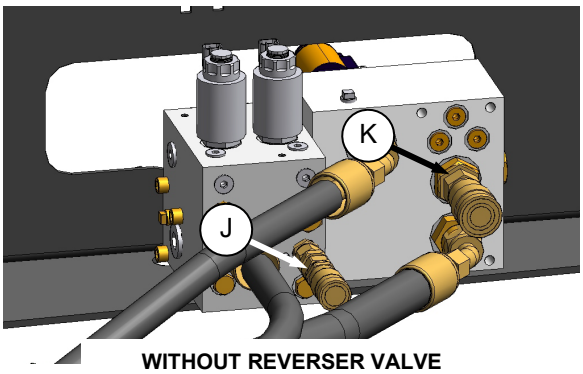
*(continued next page)*

g. Move tractor platform to open position to expose hydraulic valve blocks.

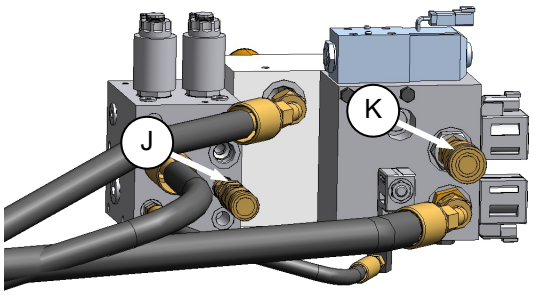



h. Route auger return and reel pressure hose bundle (D) from header to tractor along existing hose support (F) on LH side of tractor to valve blocks.

i. Secure with three straps (G) and lower lever (H).

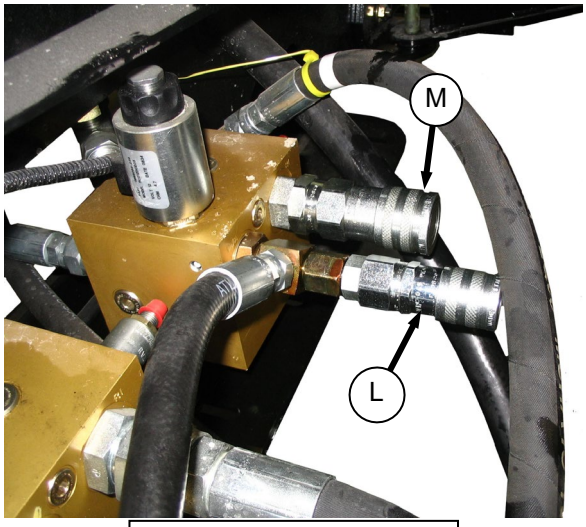



WITHOUT REVERSER VALVE




WITH REVERSER VALVE

M150/M200 TRACTOR




M100 TRACTOR

j. Push hose connectors onto mating receptacles (J) and (K), or (L) and (M), on valve block until collar on receptacle snaps into lock position.

**NOTE**

*Adjacent hoses may require slight repositioning to allow access to header hoses.*

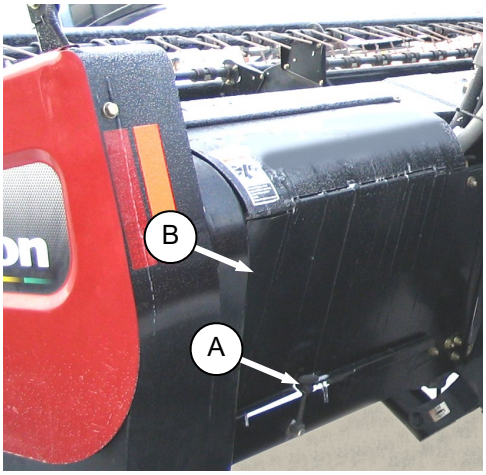
k. Close header driveline shield and move tractor platform to closed position.

## 6.7 HEADER DETACHMENT – SELF-PROPELLED

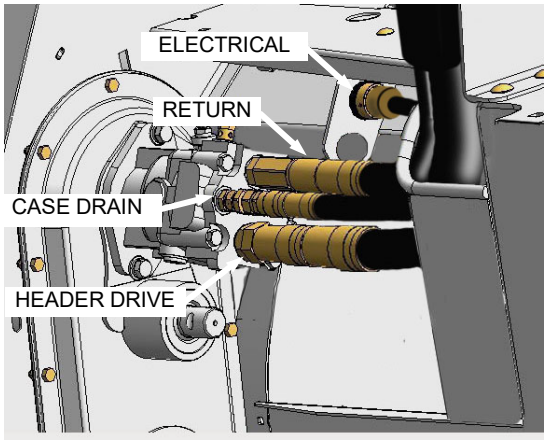
**CAUTION**

**To prevent accidental movement of tractor, shut off engine, engage parking brake, and remove key.**

### 6.7.1 A30-S and A30-D Detachment

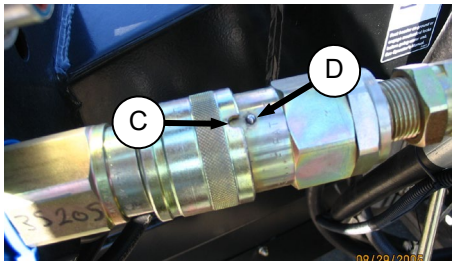



a. Disengage rubber latch (A) and lift driveline shield (B) to open position.

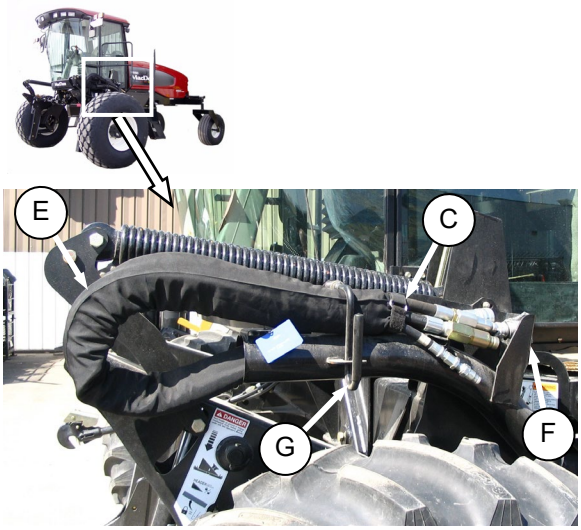



b. Disconnect electrical connector by turning collar counterclockwise and pulling connector to disengage.

c. Disconnect hoses from hydraulic motor as follows:




1. Line up slot (C) in collar with pin (D) on connector.
2. Push collar toward pin and pull connector to disengage.
3. Install caps on connectors and hose ends (if equipped).




d. Move hose bundle (E) from header and locate on tractor LH side with hose ends in support (F) and under lever (G).

e. Rotate lever (G) clockwise and push to engage bracket.

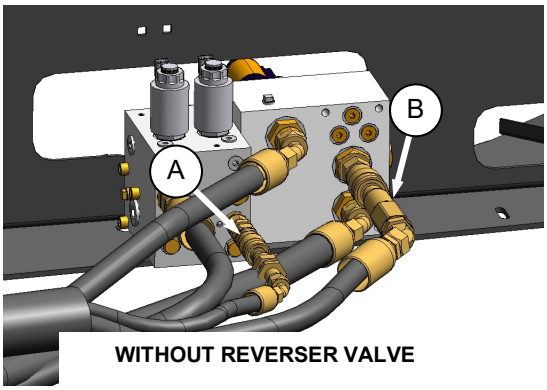
f. Locate electrical harness through support (F) and attach cap to electrical connector.

g. Close header driveline shield and move tractor platform back to closed position.

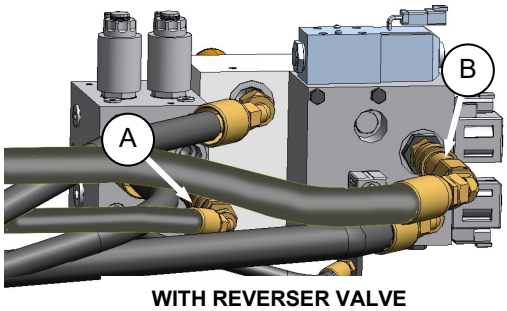
h. Detach header from tractor. Refer to the M100, or M150 & M200 Self-Propelled Windrower Operator's Manuals for procedures for mechanically detaching the header from the self-propelled windrower.

### *6.7.2 A40-D Detachment*

a. Move LH (cab forward M150/M200) platform to rear of tractor.

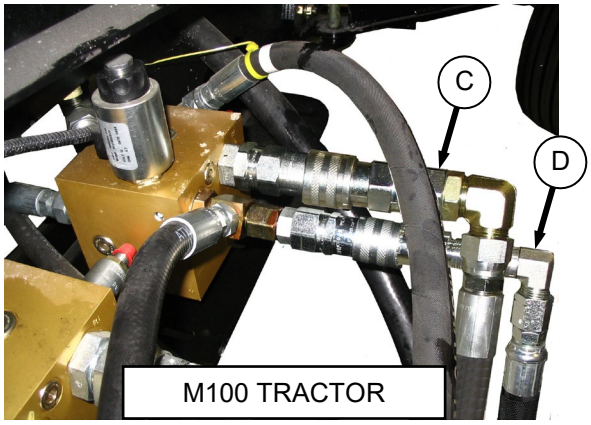



WITHOUT REVERSER VALVE



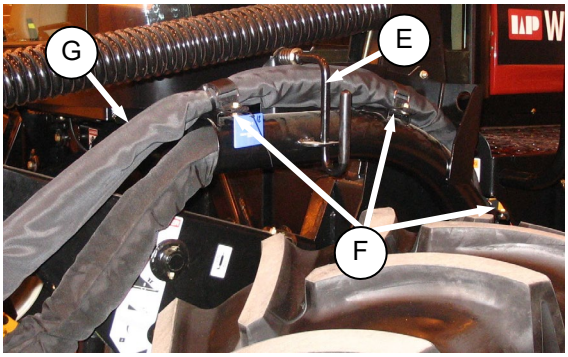

WITH REVERSER VALVE

M150/M200 TRACTOR




M100 TRACTOR

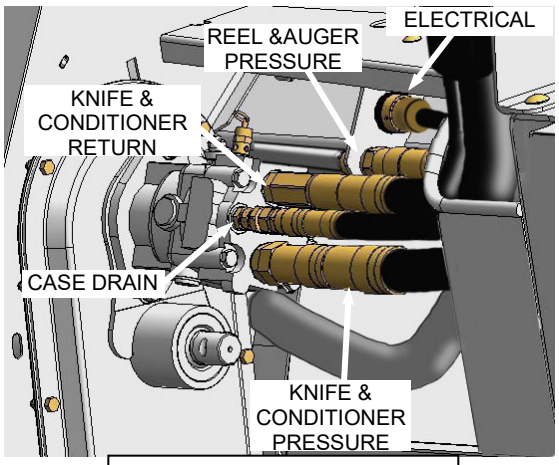
b. Disconnect the two hydraulic hoses (A) and (B) or (C) and (D) from tractor valve(s).



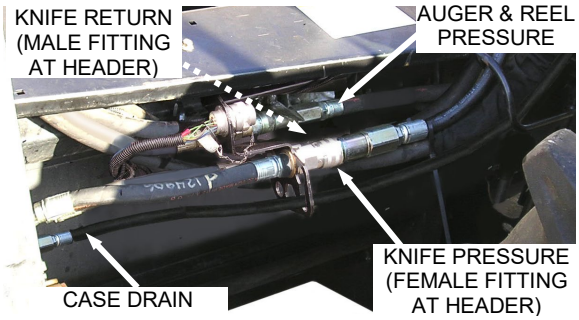

c. Raise lever (E) and undo Velcro straps (F).

d. Move hose bundle (G) to store on header walkway.

e. Install caps on connectors and hose ends if equipped.




STANDARD HEADER

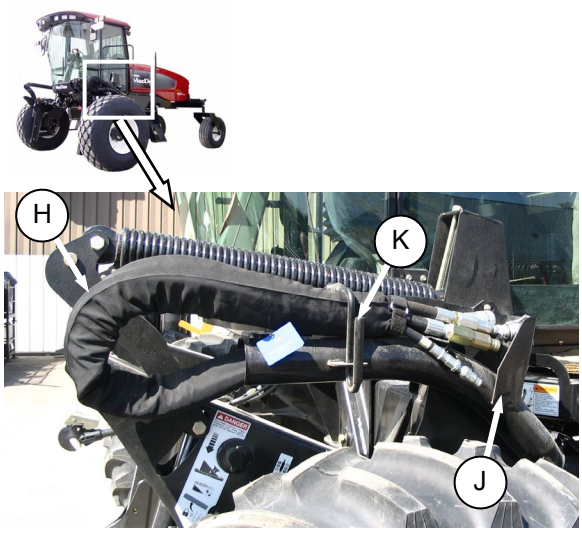



GRASS SEED HEADER

f. At the header, disconnect electrical connector by turning collar counterclockwise and pulling connector to disengage.

g. Disconnect hoses from hydraulic motor, and auger and reel pressure hose.

*(continued next page)*




h. Move hose bundle (H) from header and locate on tractor LH side with hose ends in support (J) and under lever (K).

i. Rotate lever (K) clockwise and push to engage bracket.

j. Locate electrical harness through support (J) and attach cap to electrical connector.

k. Close driveline shield and move tractor platform back to closed position.

l. Detach header from tractor. Refer to the M100, or M150 & M200 Self-Propelled Windrower Operator's Manuals for procedures for mechanically detaching the header from the self-propelled windrower.

## 6.8 TRANSPORTING MOWER CONDITIONER

### 6.8.1 Self-Propelled

Refer to M100, or M150 & M200 Self-Propelled Windrower Operator's Manuals for transporting headers when attached to the M100, M150 and M200 Windrower tractors.

### 6.8.2 Pull-Type - Towing

The A Series Pull-Type Mower Conditioners can be transported on public roads by towing with a tractor or a truck. Proceed to 6.8.2.1 Transporting With A Tractor, or 6.8.2.2 Transporting With A Truck.

**CAUTION**

- **Be aware of roadside obstructions, oncoming traffic and bridges.**
- **Travel speed should be such that complete control and machine stability are maintained at all times. Do not exceed 20 mph (32 km/h). Reduce speed for corners and slippery conditions.**
- **When transporting on roads, use tractor lights and mower conditioner flashing amber and red tail-lights to provide adequate warning to operators of other vehicles.**
- **Do not transport the mower conditioner on a road or highway at night, or in conditions, which reduce visibility, such as fog or rain.**

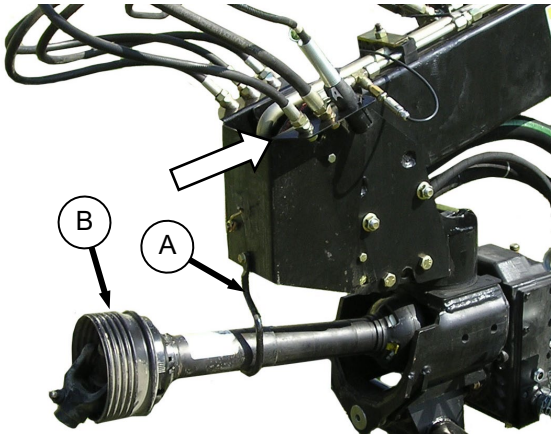
#### 6.8.2.1 Transporting With A Tractor

If the windrower is in transport mode, proceed as follows. Otherwise, see 6.8.2.3 Preparing Windrower for Transport.

a. Hook-up mower conditioner to tractor. See 6.4 Mower Conditioner/Tractor Hook-up, for details on attaching the mower conditioner to the tractor.

**NOTE**

*The hydraulic hoses do not need to be attached to the tractor for towing. Ensure they are securely stored on the APT.*




**NOTE**

*The PTO does not need to be attached for towing purposes. If not attached, lower hook (A), store driveline on hook, and remove forward half (B) of driveline. Store forward half in cab for transport.*

b. Ensure that APT safety chain is properly attached to towing vehicle. Provide only enough slack in chain to permit turning.

c. Check local laws for width regulations and lighting or marking requirements before transporting on roads.

d. Do not exceed 20 mph (32 km/h).

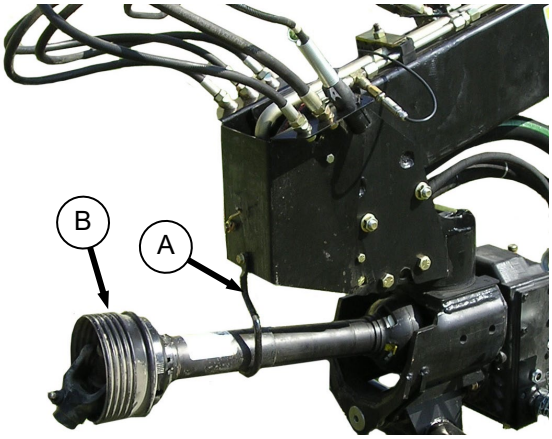
*(continued next page)*

### 6.8.2.2 Transporting With a Truck

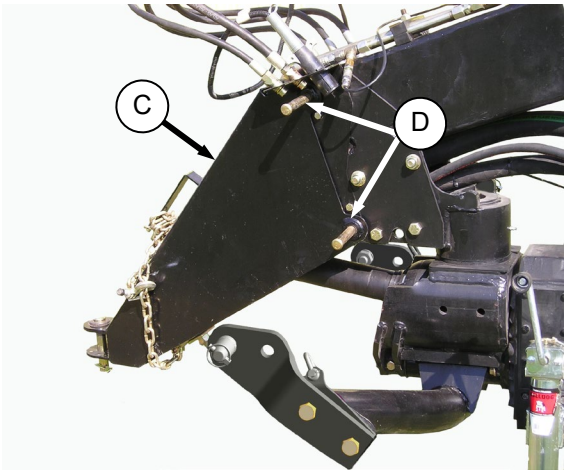
**CAUTION**

**Do not tow with a vehicle weighing less than 7500 lb (3400 kg). Ensure that the capacity of the towing vehicle is sufficient to maintain control.**

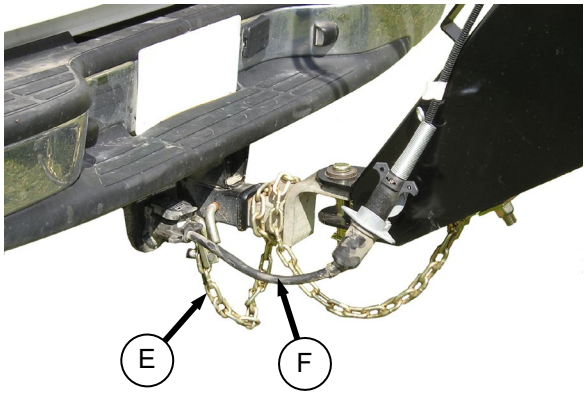
If the windrower is in transport mode, proceed as follows. Otherwise, see 6.8.2.3 Preparing Windrower for Transport.




a. Store hydraulic hoses on the APT as shown opposite.
b. Lower hook (A) and place driveline in hook.
c. Remove the forward half (B) of driveline and store in truck for transport.




d. Position towing adapter (C) on APT and secure with pins (D).
e. Attach mower conditioner to truck.
f. Remove jack from working position and store on APT. Secure with pin.




g. Wrap safety chain around APT and attach to truck frame (E).
h. Connect electrical harness (F).
i. Check local laws for width regulations and lighting or marking requirements before transporting on roads.
j. Do not exceed 20 mph (32 km/h).

### 6.8.2.3 Preparing Windrower for Transport

a. Charge the steering circuit as follows:
   1. Connect the two APT steering cylinder hoses to a tractor hydraulic circuit.
   2. Steer the header completely to the left, then right. Repeat three or four times.

b. Steer the mower conditioner so that it is centered behind the towing vehicle.

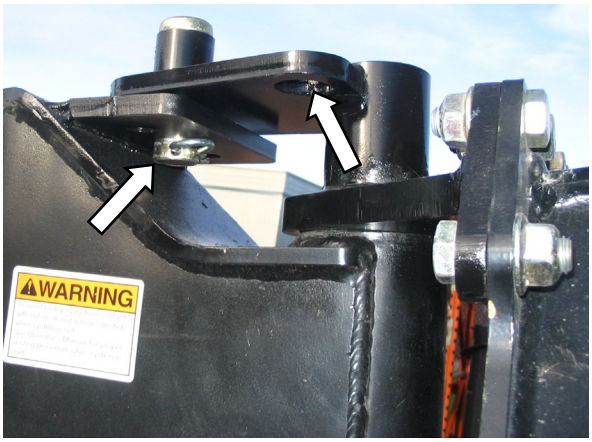

c. Close the lock-out valve on the APT.

d. Raise the header fully and engage both header lift cylinder lock-out valves.

**WARNING**

**Do not tow unless the steering cylinder is fully charged. If steering cylinder is not fully charged loss of control can result in injury or death. Use the temporary transport lock pin if machine must be towed without a fully charged steering cylinder.**

e. If steering cylinder is not fully charged, install temporary transport lock pin as follows: Otherwise, proceed to step f.




   1. Remove pin from storage at aft end of APT.
   2. Line up holes in APT and frame and install transport lock pin as shown.
   3. Secure with lynch pin.


f. Check that jack is properly attached in storage position on APT.

g. Keep SMV sign, reflectors and lights clean and visible at rear of mower conditioner.

h. Ensure tires are properly inflated.

i. Refer to Section 6.8.2.1, or 6.8.2.2 for towing procedures.

### *6.8.3 Pull-Type - Flatbed*

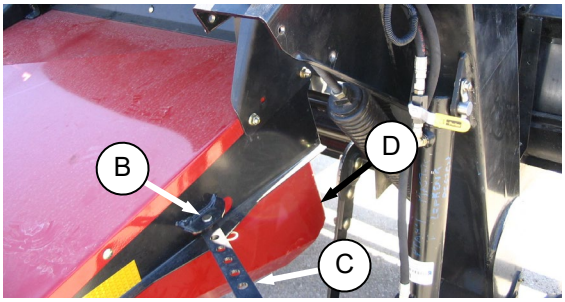
To transport the windrower on a flatbed trailer, proceed as follows:

**CAUTION**

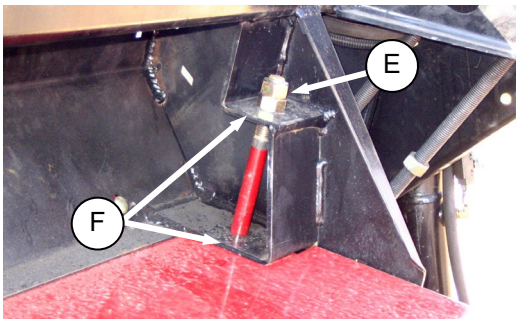
**Use the following procedure when transporting the windrower on a flatbed trailer.**

#### 6.8.3.1 Loading – Pull-Type

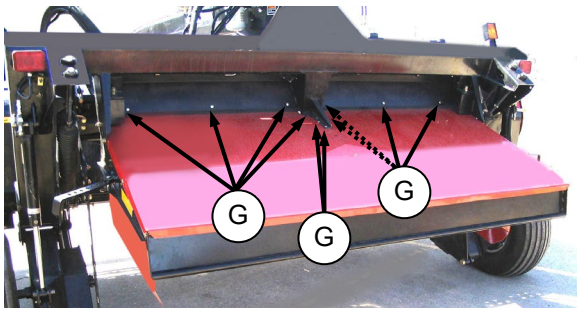
a. Lower the windrower to the ground and move the cylinder lock-out valve handle to the horizontal position at both lift cylinders.
b. Retract header angle control link to minimum.
c. Unhook windrower from tractor. Refer to Section 6.5, Windrower/Tractor Unhook.
d. Tie hoses to APT.
e. Remove tall crop dividers, if equipped.
f. Remove complete forming shield group as follows:



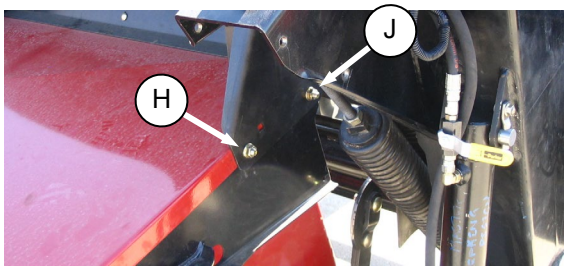

1. Remove pins (B).
2. Disassemble adjuster bars (C) from side deflectors (D). Note orientation of hardware.



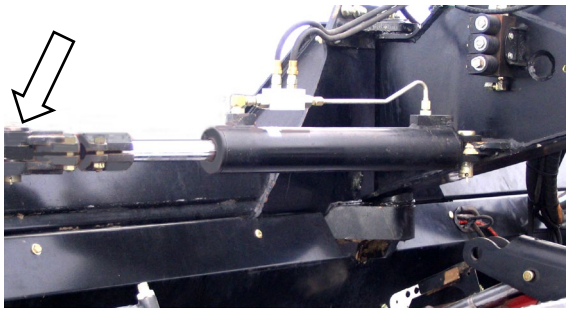

3. Remove nuts (E) and drop side deflectors from frame (F).




4. Remove eight bolts (G) attaching forming shield cover to frame.




5. Remove two bolts (H) and lower rear of forming shield to ground.
6. Remove two bolts (J) and detach forming shield from frame.



g. Remove pin at rod end of APT steering cylinder and move cylinder away from frame. Re-insert pin in clevis.

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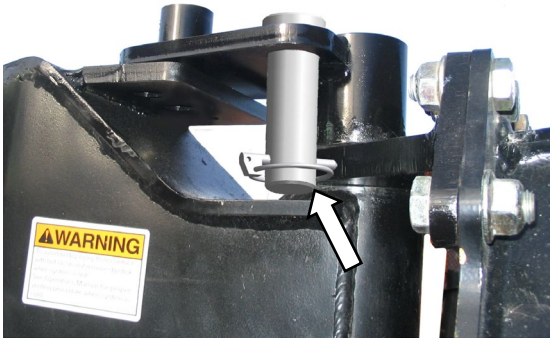



h. Ensure temporary transport lock pin is in storage location.

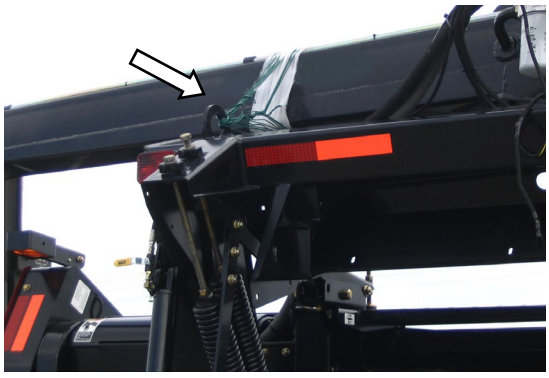
## WARNING

**To avoid tipping over, the header must be resting on the ground prior to swinging the APT.**

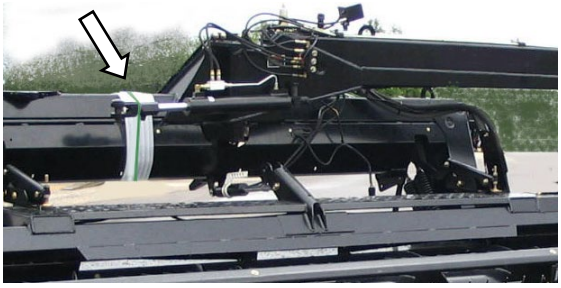
i. Swing APT to the left as far as possible without damaging hydraulic lines.

**IMPORTANT**

*The APT must not widen the shipping package.*



j. Secure APT to frame hook to prevent movement. Use cardboard or suitable material under the tie to protect paint.



k. Secure the steering cylinder to the frame with wire. Wrap tie around clevis and use cardboard or suitable material under the tie to protect paint on the frame.

## CAUTION

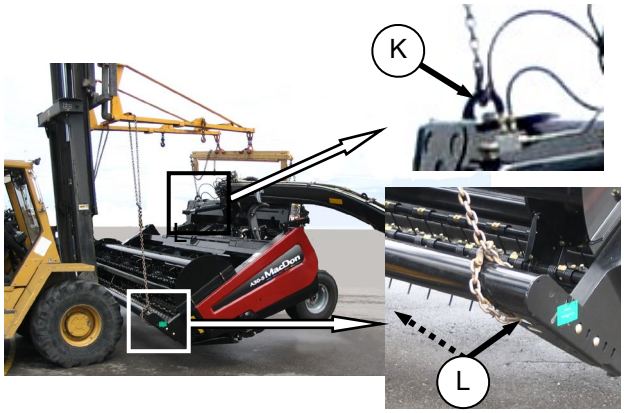
**Equipment used for unloading must meet or exceed the requirements specified below. Using inadequate equipment may result in chain breakage, vehicle tipping or machine damage.**

Lifting Vehicle:

Minimum Lifting Capacity: 8500 lb (3865 kg)
Minimum Lifting Height: 15 ft. (4.5 m)

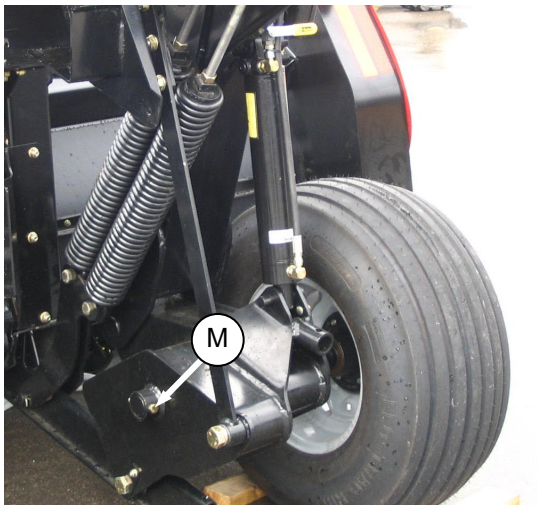
Chain

Type: Overhead Lifting Quality (1/2 inch)
Minimum Working Load: 5000 lb (2270 kg)




l. Attach a chain to each frame hook (K) and a chain to each end of the lean bar at (L). Chain must pass through hole at end of lean bar.

m. Position forklift from either front or back of windrower and lift slightly off the ground.




n. Remove the wheels by removing bolt (M) and pulling wheel/axle assembly from frame.

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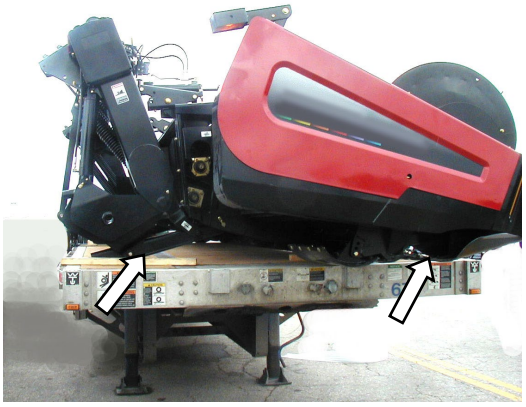
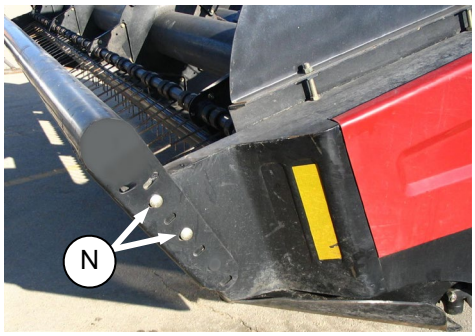


o. Lift windrower and back the flatbed trailer under the unit. The windrower can be positioned with the APT towards the front or rear of the flatbed.

p. Lower windrower onto flatbed so its weight rests on the frame and sloped edge of header end panels as shown.



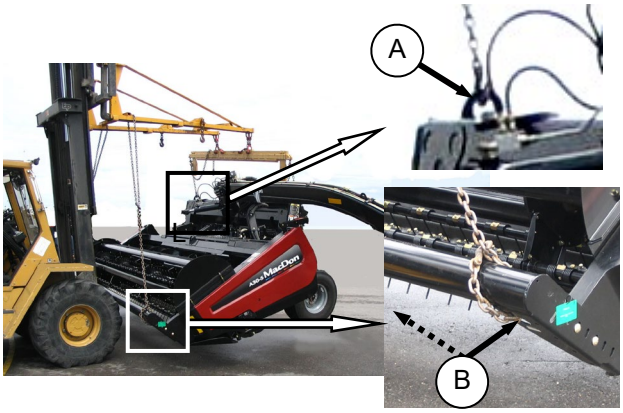

q. Remove four bolts (N) and remove the lean bar to minimize load width. Secure the lean bar to the flatbed.

r. Tie the unit and the end of the APT down securely.

### 6.8.3.2 Unloading – Pull-Type

a. Remove tie downs.

b. Install lean bar onto windrower with four bolts (N).




c. Attach a chain to each frame hook (A) and a chain to each end of the lean bar at (B). Chain must pass through hole at end of lean bar.

## CAUTION

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

Lifting Vehicle:

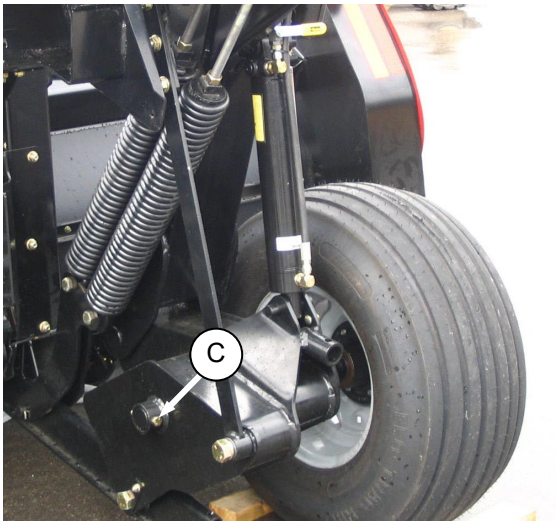
Minimum Lifting Capacity: 8500 lb (3865 kg)
Minimum Lifting Height: 15 ft. (4.5 m)

Chain

Type: Overhead Lifting Quality (1/2 inch)
Minimum Working Load: 5000 lb (2270 kg)

d. Position forklift from either front or back of windrower, lift slightly off the flatbed, and move flatbed from beneath windrower.

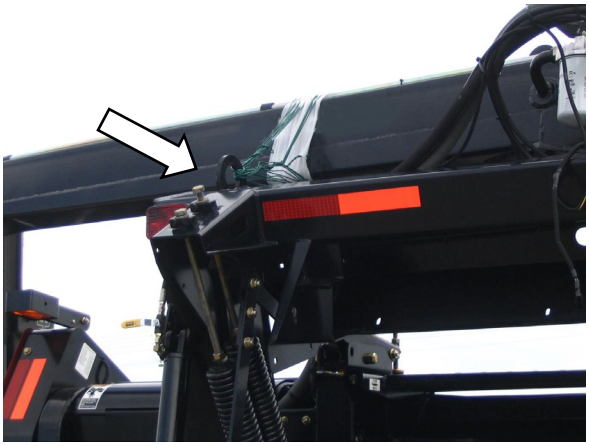
*(continued next page)*



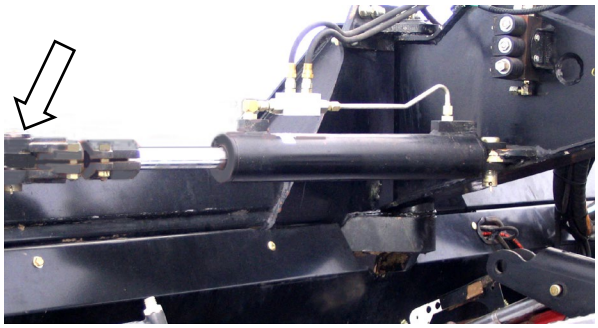

e. Lower windrower and install wheel/axle assemblies onto windrower. Secure axle to frame with bolt (C) and tighten to required torque.

f. Lower windrower to ground and remove lifting chains.

g. Remove tie securing steering cylinder to frame.

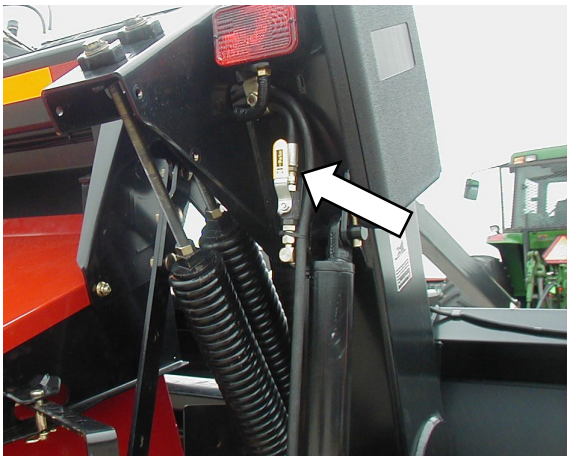


h. Remove tie securing APT to frame and swing APT to working position.



i. Attach steering cylinder rod end to frame.

j. Install rear forming shields using reverse order of step f in Section 6.8.3.1.



k. Move lift cylinder lock out valve handles to vertical position.

## 6.9 BREAK-IN PERIOD

a. After attaching header/windrower to tractor for the first time, operate the machine slowly for 5 minutes, watching and listening FROM THE TRACTOR SEAT for binding or interfering parts.

**NOTE**

*Until you become familiar with the sound and feel of your new windrower, be extra alert and attentive.*

### CAUTION

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

b. Perform the items specified in 7.17.1.1 Break-In Inspection – SP, or 7.17.2.1 Break-In Inspection - PT.

## 6.10 PRE-SEASON CHECK

Perform the following the beginning of each operating season:

### CAUTION

- **Review the Operator's Manual to refresh your memory on safety and operating recommendations.**
- **Review all safety signs and other decals on the mower conditioner and note hazard areas.**
- **Be sure all shields and guards are properly installed and secured. Never alter or remove safety equipment.**
- **Be sure you understand and have practiced safe use of all controls. Know the capacity and operating characteristics of the machine.**
- **Check the first aid kit and fire extinguisher. Know where they are and how to use them.**

a. Adjust tension on drive belts. Refer to Section 7.8, Sickle and Sickle Drive, Section 7.9, Reel and Reel Drive, Section 7.11, Auger and Auger Drive.

b. Lubricate chains and adjust tensions. Refer to Section 7.6.2, Oiling, and Section 7.9.1, Reel Drive Chain, and Section 7.11, Auger and Auger Drive.

c. Check tire pressure and adjust as required. See Section 7.14.4 Tire Inflation.

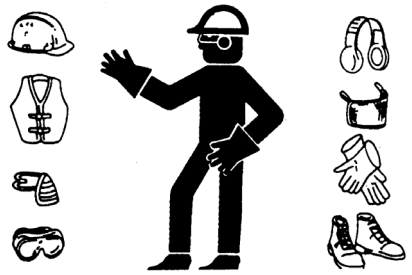
d. Perform all annual maintenance. See Section 7.17, Maintenance Schedule.

## 6.11 DAILY START-UP CHECK

Do the following each day before start-up:

### CAUTION

- **Be sure tractor and windrower are properly attached, all controls are in neutral and tractor brake is engaged.**
- **Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the windrower to be sure no one is under, on or close to it.**
- **Wear close fitting clothing and protective shoes with slip resistant soles.**
- **Remove foreign objects from the machine and surrounding area.**
- **As well, carry with you any protective clothing and personal safety devices that COULD be necessary through the day. Don't take chances.**



- **You may need:**
  - **- a hard hat**
  - **- protective glasses or goggles**
  - **- heavy gloves**
  - **- respirator or filter mask**
  - **- wet weather gear**
- **Protect against noise. Wear a suitable hearing protective device such as ear muffs or ear plugs to protect against objectionable or uncomfortable loud noises.**

a. Check the machine for leaks or any parts that are missing, broken, or not working correctly.

**NOTE:**

*Use proper procedure when searching for pressurized fluid leaks. Refer to Section 7.7.3 Hoses and Lines.*

b. Clean all lights and reflective surfaces on the machine. Check lights for proper operation.

c. Perform all Daily maintenance. Refer to Section 7.17, Maintenance Schedule.

## 6.12 SHUTDOWN PROCEDURE

**CAUTION**

**Before leaving the tractor seat for any reason:**

- **Park on level ground if possible.**
- **Lower the windrower fully.**
- **Place all controls in NEUTRAL or PARK.**
- **Disengage PTO.**
- **Engage the park brake.**
- **Stop engine and remove key from ignition.**
- **Wait for all movement to stop.**
- **Lock tractor anti-vandalism covers and closures when leaving the machine unattended.**

## 6.13 ENGAGING THE PTO – PULL-TYPE

**DANGER**

**Be sure all bystanders are clear of the machine before engaging the PTO. Never leave tractor seat with the PTO engaged.**

a. Engage the PTO slowly, just before the windrower is moved up to the standing crop.

b. Be sure tractor PTO is running at correct rpm before starting to cut. (540 or 1000, as equipped.)

c. Disengage the PTO when not operating the windrower.

## 6.14 LIFT CYLINDER LOCK-OUTS

**WARNING**

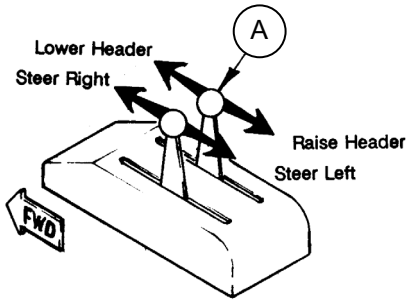
**To avoid bodily injury or death from fall of raised machine, always lock-out lift cylinders before going under windrower for any reason.**

### 6.14.1 Self-Propelled

Refer to M100, or M150 & M200 Self-Propelled Windrower Operator's Manual for details on the lift cylinder locks.

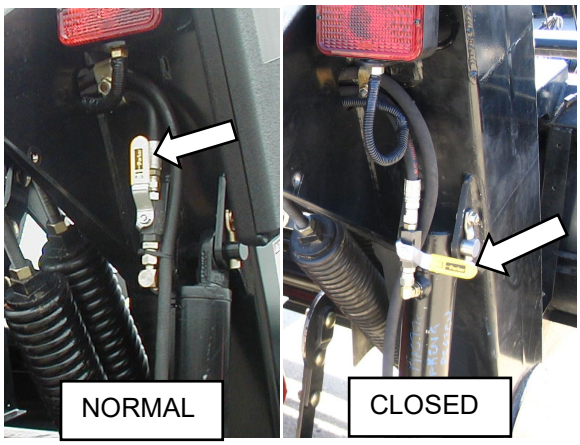
### 6.14.2 Pull-Type

a. Raise machine to maximum height by activating remote cylinder control valve in tractor.




**IMPORTANT**

*Hoses should be connected so that moving control lever (A) backward raises the header.*

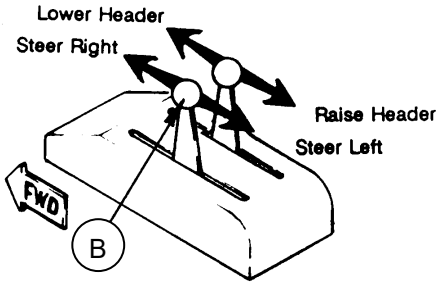



b. Close the lock-out valve on each lift cylinder by turning the handle to the horizontal position.

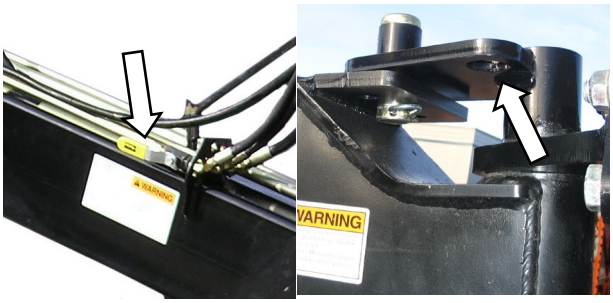
c. To return to normal operation turn the handle on the lock-out valves to the vertical position.

## 6.15 STEERING – PULL-TYPE

Steering the windrower is controlled by the tractor remote hydraulic system. This steering system allows the windrower to follow directly behind the tractor, make a full cut to either side, or any position in between.




**IMPORTANT**




*Hoses should be connected so that moving tractor control lever (B) forward steers the machine to the right and moving the lever (B) backward steers the windrower left.*

**IMPORTANT**

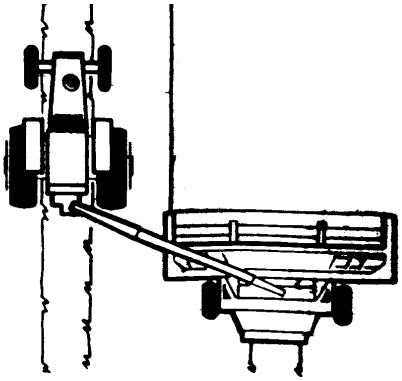
*To allow APT to swing, the valve on the APT must be in the working or open position (handle in line with APT), and the temporary transport lock pin must be in the storage location.*

The centre pivot provides the operator the opportunity to move the windrower into field position easily, allows right angle turns in either direction, steering around objects on both sides and straight line field cutting on either side of the tractor.

The control is operated momentarily for steering and must be returned to OFF or NEUTRAL position as soon as the windrower reaches the desired path of travel.

### 6.15.1 Right Side Operation – Pull-Type

Move steering lever forward to achieve desired position of windrower on right side of tractor.



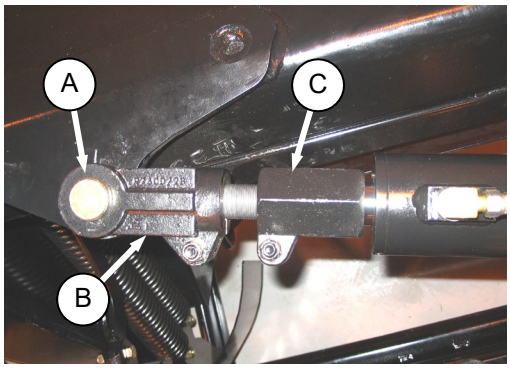
To adjust tracking of windrower during right side operation, the steering cylinder clevis can be repositioned:

| DESIRED TRACK | CYLINDER EXTENSION | CLEVIS POSITION |
|---|---|---|
| Further RIGHT | Increase | Clevis (A) Further From Cylinder |
| Further LEFT | Decrease | Clevis (A) Closer To Cylinder |

**CAUTION**

**Stop engine and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.**

a. Shutdown the tractor and remove the key.



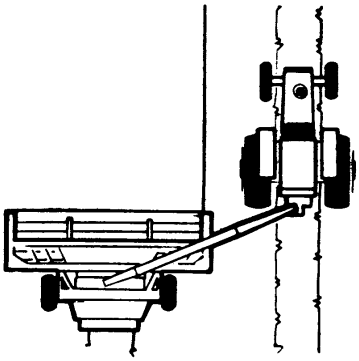

b. Loosen clamping bolt (B) on clevis (A).

c. Using a wrench on the stroke control (C), rotate cylinder rod so that the clevis moves away from or closer to the cylinder. Each turn of the rod changes the tracking by approximately 2 inches.

d. Tighten clamping bolt to 65 ft·lbf (90 N·m).

e. Re-check torque on clamping bolt after 1 hour and every 100 hours thereafter.

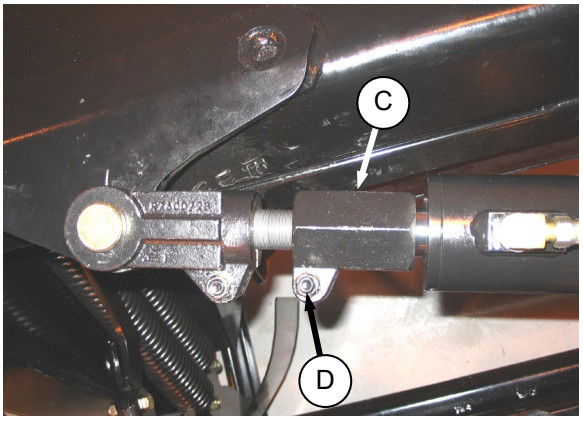
### 6.15.2 LH Side Operation – Pull-Type



Move steering lever backward to achieve desired position of windrower on LH side of tractor.

To adjust tracking of windrower during LH side operation, the steering cylinder stroke control can be repositioned:

| DESIRED TRACK | CYLINDER STROKE | STROKE CONTROL POSITION |
|---|---|---|
| Further LEFT | Decrease | Rotate Stroke Control (C) Away From Clevis. |
| Further RIGHT | Increase | Rotate Stroke Control (C) Towards Clevis. |

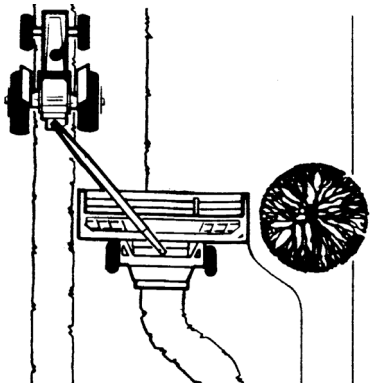



a. Loosen clamping bolt (D) on stroke control (C) and rotate stroke control to desired position. Each turn of the stroke control changes the tracking by approximately 2 inches.
b. Tighten clamping bolt to 65 ft·lbf (90 N·m).
c. Re-check torque on clamping bolt after 1 hour and every 100 hours thereafter.

**IMPORTANT**

*The adjustment for right side operation must be done prior to adjustment for LH side operation.*

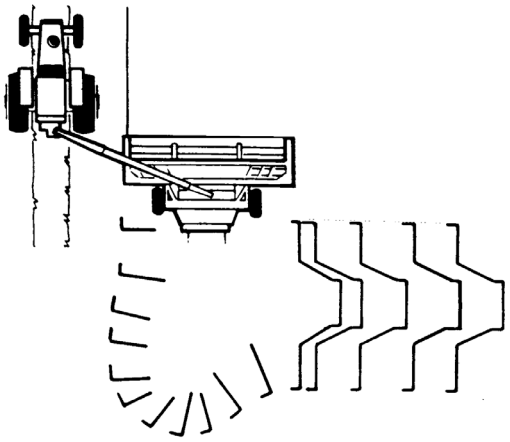
### 6.15.3 Avoiding Obstacles



Move steering lever as required to avoid obstacles.

### 6.15.4 Square Corners

The following procedure is intended only as a guide to developing a turning procedure for the tractor being used. Specific distances are not given due to the variances in tractor manoeuvrability.



a. As the tractor approaches the corner, guide the tractor sharply away from the crop. Steer the windrower to maintain a straight cut ahead as the tractor moves away from the crop.
b. As soon as the sickle cuts past where the new corner will be, raise the header sufficiently for skid shoes to clear the ground, then steer the windrower to the extreme direction away from the uncut crop.
c. As the tractor passes the corner, steer it sharply back towards the uncut crop, taking care that the inside tractor tire does not contact the windrower APT.
d. Guide the tractor to straddle the last cut windrow. As the windrower finishes turning, steer it back towards the uncut crop, align the header with the crop edge and lower header to cutting height.

### *6.15.5 180 Degree Turn*

**NOTE**

*When cutting back and forth on one side of the field, approximately 50 ft. (15 m) is required at each end of the field to make a 180 degree turn-around.*

Refer to illustration and proceed as follows:

a. Beginning at position (A), the tractor is guided away from the uncut crop while the windrower is guided straight ahead until cutting through the end.

b. As soon as the sickle cuts through, raise the header to lift the skid shoes clear of the ground, and steer the windrower to the extreme direction away from the uncut crop.

**NOTE**

*For ease of operation, both levers can be activated with one hand and held until steering cylinder completes its stroke.*

c. At position (B), start turning the tractor back towards the uncut crop.

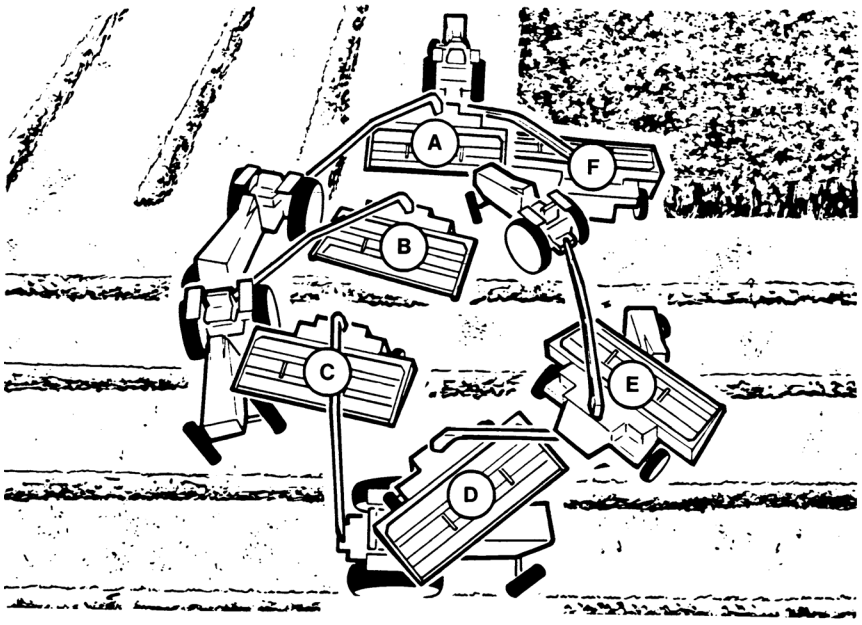
**IMPORTANT**

*When turning, take care that the inside tractor tire does not contact APT of windrower.*

d. In positions (C) and (D), continue turning towards the uncut crop, (with the windrower steered towards the outside of the turning circle), being aware of APT-to-tire clearance.

e. At position (E), the tractor completes the circle and the front wheels are turned to straddle the last cut windrow. At this point, steer the windrower to line up with the edge of the uncut crop.

f. At position (F), lower header to cutting height and begin a new cut through the field.



## 6.16 UNPLUGGING THE WINDROWER

### 6.16.1 Unplugging Conditioner – Pull Type

**WARNING**

**Stop tractor engine and remove key before removing plugged material from windrower. A child or even a pet could engage the drive.**

a. Stop forward movement of the tractor and stop the PTO.

b. Raise the machine and slowly engage the PTO.

**NOTE**

*Raising the windrower automatically raises the top roll to ease plug removal.*

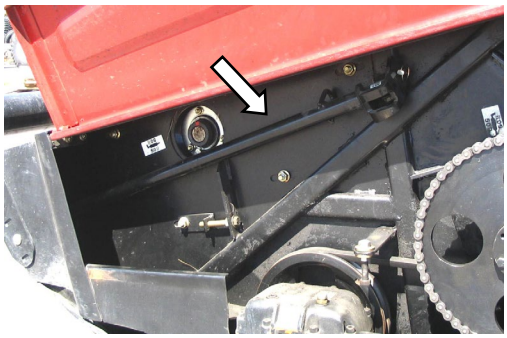
c. If plug does not clear: with machine still raised, shut off engine, remove key and lock tractor brakes.

d. Engage lift cylinder lock-out valves.

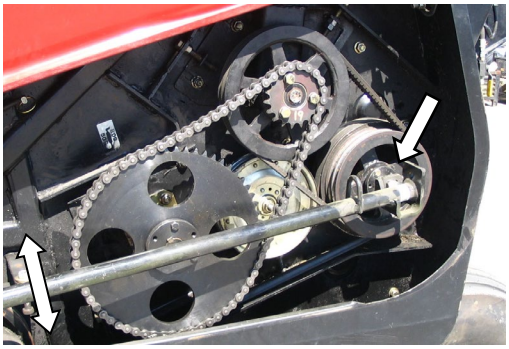
**WARNING**

**Wear heavy gloves when working around sickle.**

e. Clean off cutterbar and area under reel by hand.



f. Retrieve wrench from storage inside the LH drive compartment.



g. Use wrench on LH end of primary drive shaft to turn rolls forward until plug clears.

h. Return wrench to storage location and secure in place with pin.

**WARNING**

**Return unplug wrench to storage location and close LH drive shield before restarting machine.**

**NOTE**

*If plugging persists, see Section 8, Troubleshooting.*

### 6.16.2 Unplugging Conditioner – Self-Propelled A30-S and A30-D.

Reverse the header drive. Refer to M150 & M200 Self-Propelled Windrower Operator's Manual for procedures on reversing the header drive.

### 6.16.3 Unplugging Sickle

a. Stop forward movement of the tractor and shutdown the header.

b. Lift the cutterbar about 12 inches (300 mm).

c. Back up about 3 feet (1 metre) while slowly engaging the header.

d. If the plug does not clear; raise machine, apply tractor brake, shut off engine, and remove key.

**WARNING**

**Stop tractor engine and remove key before removing plugged material from windrower. A child or even a pet could engage the drive.**

e. Engage lift cylinder lock-outs.

**WARNING**

**Wear heavy gloves when working around sickle.**

f. Clean off cutterbar by hand.

**NOTE**

*If sickle plugging persists, see Section 8, Troubleshooting.*

## 6.17 HEADER OPERATION

Satisfactory function of the windrower in all situations requires making proper adjustments to suit various crops and conditions.

Correct operation reduces crop loss and allows cutting of more acres. As well, proper adjustments and timely maintenance will increase the length of service you receive from the machine.

The variables listed below and detailed on the following pages will affect the performance of the windrower. You will quickly become adept at adjusting the machine to give you the desired results.

| VARIABLE | SECTION |
|---|---|
| Lean Bar Position | 6.17.1 |
| Auger Speed | 6.17.2 |
| Reel Speed | 6.17.3 |
| Auger Position | 6.17.4 |
| Reel Position | 6.17.5 |
| Tine Aggressiveness | 6.17.6 |
| Cutting Height | 6.17.7 |
| Header Angle | 6.17.8 |
| Header Flotation | 6.17.9 |
| Feed Pan / Rock Drop Tine Position | 6.17.10 |
| Roll Gap/Timing/Alignment | 6.17.11 |
| Roll Tension | 6.17.12 |
| Forming Shields | 6.17.13 |
| Ground Speed | 6.17.14 |

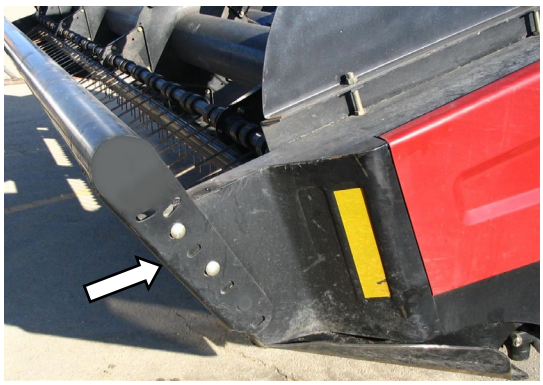
### 6.17.1 Lean Bar Position

**IMPORTANT**

*To prevent structural damage to the header, do not operate with lean bar removed.*

Use the lean bar adjustment to accommodate different crop heights.

The lean bar should strike the upper portion of the crop, leaning it away from the header and exposing the stalks to the sickle.



To extend or retract lean bar, re-position hardware in adjustment holes as required. Refer to illustration.

### 6.17.2 Auger Speed

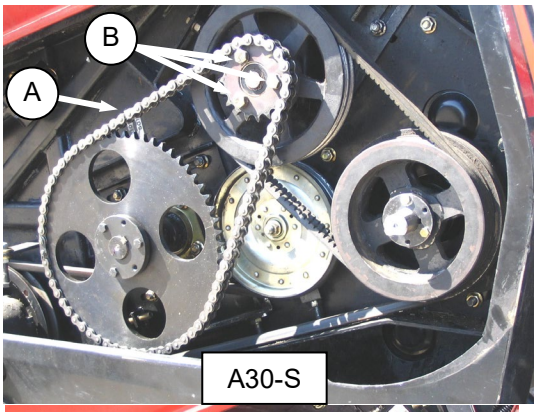
The auger speed must be high enough to carry the crop into the conditioner and yet not throw it out. In light crops, a lower throttle setting on the tractor will slow down the windrower operating speed and help to prevent carryover.

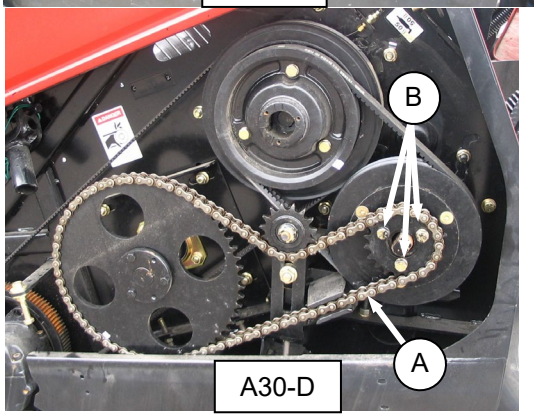
#### 6.17.2.1 Auger Speed, A30-S and A30-D

The A30 auger speed is fixed to the engine rpm and an optional 19 tooth drive sprocket provides lower auger speeds.

Refer to Section 5 SPECIFICATIONS for available auger speeds at rated tractor RPM.

To change auger drive sprockets, proceed as follows:




a. Remove auger drive chain (A). Refer to Section 7.11, Auger and Auger Drive – A30-S & A30-D.
b. Remove the three bolts (B) attaching sprocket to pulley and remove sprocket.
c. Attach applicable sprocket to pulley with three bolts and torque to 75 ft·lbf (102 N·m).
d. Replace auger drive chain (A). Refer to Section 7.11, Auger and Auger Drive – A30-S & A30-D.

#### 6.17.2.2 Auger Speed, A40-D

The A40-D auger header features a hydraulic direct drive auger with operating speed range of 230 to 320 rpm and is controlled from the operator's station on the self-propelled windrower. Refer to the M100 or M150 & M200 Self-Propelled Windrower Operator's Manuals.

### *6.17.3 Reel Speed*

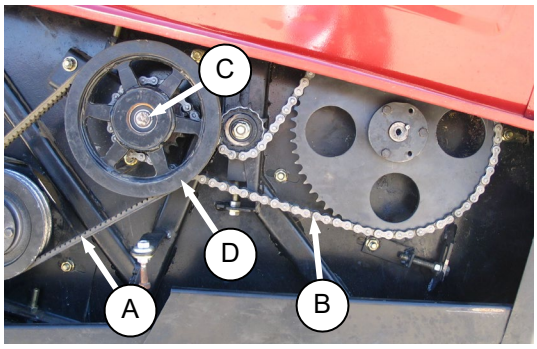
For best feeding of the crop into the windrower, the reel speed must be faster than ground speed. This gently sweeps material across the sickle into the auger. A slower reel speed will reduce crop carry-over, while a faster reel speed will result in a more even stubble height in down and tangled crops.

#### 6.17.3.1 Reel Speed, A30-S and A30-D

The A30 reel speed is fixed to the engine rpm and auger speed. An optional 19 tooth drive sprocket provides lower reel speeds if necessary.

Refer to Section 5 SPECIFICATIONS for available reel speeds at rated tractor RPM.

To change auger drive sprockets, proceed as follows:




a. Remove reel drive belt (A) and reel drive chain (B) from drive sprocket. Refer to Sections 7.9.1, Reel Drive Chain - A30-S and A30-D and 7.9.2, Reel Drive Belts - A30-S and A30-D.
b. Remove snap-ring (C) from pulley (D) and remove pulley.
c. Remove the three bolts attaching sprocket to pulley and remove sprocket.
d. Attach applicable sprocket to pulley with three bolts and torque to 75 ft·lbf (102 N·m).
e. Replace pulley and install snap-ring.
f. Replace reel drive chain and belt. Refer to Sections 7.9.1, Reel Drive Chain and 7.9.2, Reel Drive Belts.

#### 6.17.3.2 Reel Speed, A40-D

The A40-D auger header features a hydraulic direct drive reel with operating speed range of 51 to 76 rpm and is controlled from the operator's station on the self-propelled windrower. Refer to the M100 or M150 & M200 Self-Propelled Windrower Operator's Manuals.

### *6.17.4 Auger Position*

**CAUTION**

**To avoid personal injury, before servicing windrower or opening drive covers, follow procedures in Section 6.1, "Preparation for Servicing".**

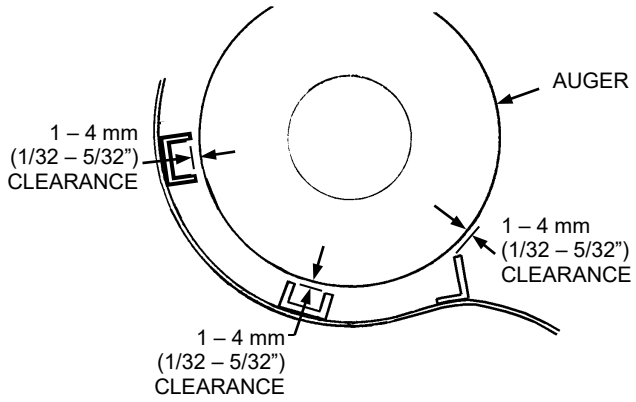
The auger position has been factory set and should not normally require adjustment. For nearly all conditions, the auger performs best when set as close as possible to the stripper bars without rubbing. This is especially important in grass and other crops which have a tendency to wrap. Component wear may cause clearances to become excessive, resulting in feeding problems and uneven windrows.

To make adjustments to auger position, refer to the following paragraphs 6.17.4.1 to 6.17.4.6.

**NOTE**

*In heavier crops it may be necessary to remove the front stripper bar for smoother crop flow across the auger. Refer to Section 7.11.7, Stripper Bars.*

**NOTE**

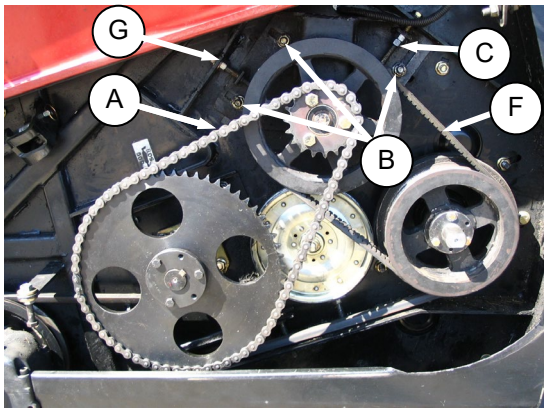



*The auger should clear the stripper bars on the auger pan by approximately 1/32 – 5/32 in. (1 - 4 mm). Shimming the stripper bars may be required. Refer to Section 7.11.7, Stripper Bars.*

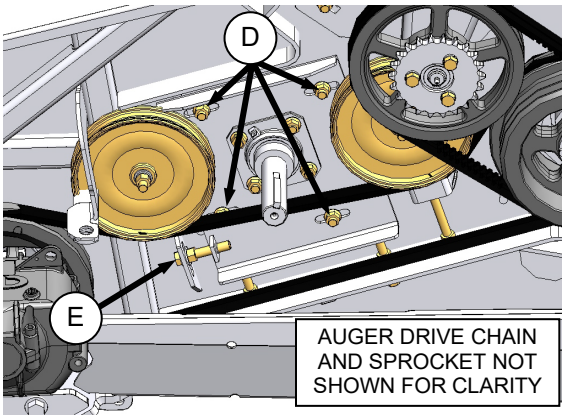
#### 6.17.4.1 Auger Fore-Aft Adjustment – A30-S

a. Open LH end shield.

b. Loosen auger drive chain (A) as follows:




1. Loosen three bolts (B).
2. Loosen jam-nut on adjuster bolt (C).
3. Turn adjuster bolt (C) to loosen chain (A).




c. Loosen the four nuts (D).

d. Loosen jam-nut on adjuster bolt (E) and turn bolt (E) to adjust auger fore-aft position.

e. Tighten jam-nut on bolt (E) and tighten nuts (D).

f. Tighten auger drive chain as follows:

1. Turn adjuster bolt (C) to tighten chain (A). Deflection at (A) should be ¼ inch (6 mm).
2. Tighten jam-nut on bolt (C).

g. Check auger drive V-belt (F) tension. Each belt should deflect 3/16 in. (4 mm) at mid-span when a load of 8-12 lbf (35-40 N) is applied to each belt. If necessary, adjust as follows:

3. Loosen jam-nut on adjuster bolt (G).
4. Turn adjuster bolt (G) to achieve tension as per above.
5. Tighten jam-nut at (G).

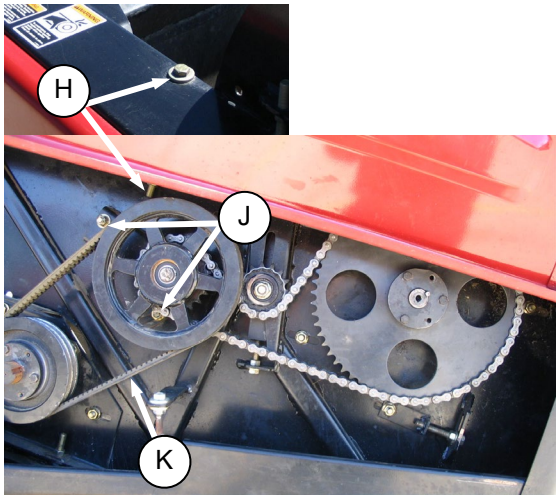
h. Tighten bolts (B).

i. Close shield.

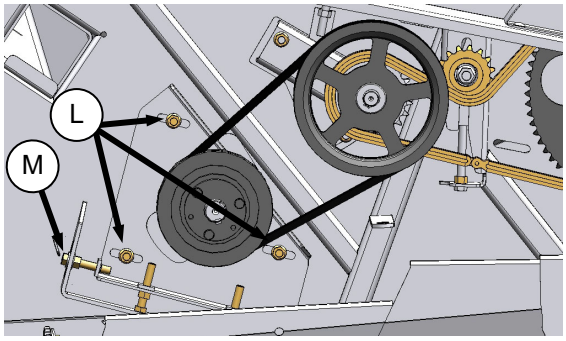
*(continued next page)*

j. Open RH end shield.

k. Loosen reel drive belts as follows:




1. Loosen jam-nut on adjuster bolt (H) and nuts (J).
2. Turn adjuster bolt (H) to loosen reel drive belts (K).



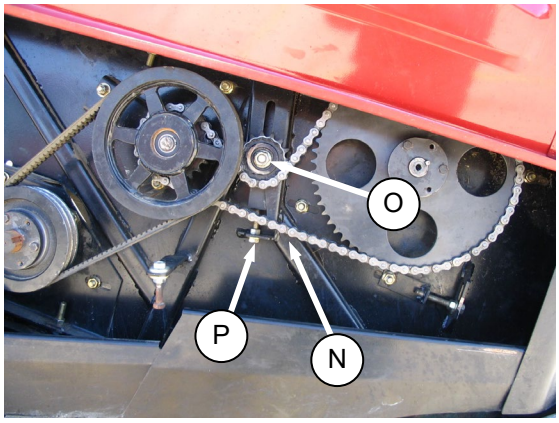

l. Loosen the three bolts (L).

m. Loosen jam-nut on adjuster bolt (M) and turn bolt (M) to adjust auger fore-aft position.

n. Tighten jam-nut and bolts (L).

o. Tighten belts as follows:

1. Turn adjuster bolt (H) to move pulley so that each belt (K) deflects 3/16 in. (4 mm) when a load of 8-12 lbf (35-40 N) is applied to each belt at mid-span.
2. Tighten jam-nut on adjuster bolt (H) and nuts (J).




p. Check reel drive chain tension. Total chain slack at (N) should be 1/4 in. (6 mm). If necessary, adjust as follows:

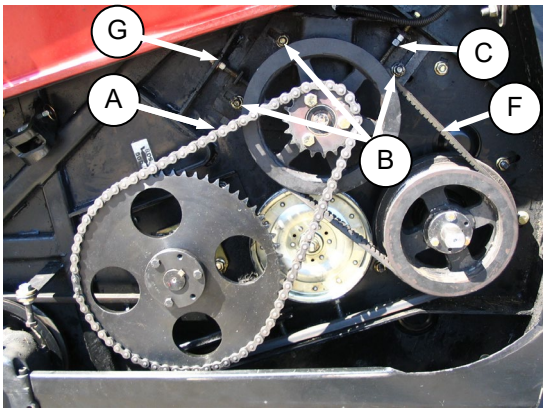
1. Loosen bolt (O) on sprocket and jam-nut on adjuster bolt (P).
2. Turn adjuster bolt (P) to move idler sprocket downward until chain slack is achieved as above.
3. Rotate auger and check chain for slack at tightest point. Re-adjust position of idler sprocket to achieve required slack.
4. Tighten jam-nut at (P) and nut (O) on sprocket. Recheck tension.

q. Close shield before engaging header.

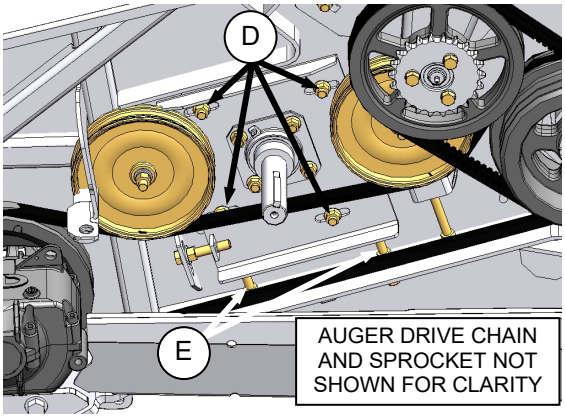
### 6.17.4.2 Auger Vertical Adjustment – A30-S

a. Open LH end shield.

b. Loosen auger drive chain (A) as follows:




1. Loosen three bolts (B).
2. Loosen jam-nut on adjuster bolt (C).
3. Turn adjuster bolt (C) to loosen chain (A).




c. Loosen the four nuts (D).

d. Loosen jam-nuts on adjuster bolts (E) and turn bolts (E) to adjust auger vertical position.

e. Tighten jam-nuts and nuts (D).

f. Tighten auger drive chain (A) as follows:

1. Turn adjuster bolt (C) to tighten chain (A). Deflection at (A) should be ¼ inch (6 mm).
2. Tighten jam-nut on bolt (C).

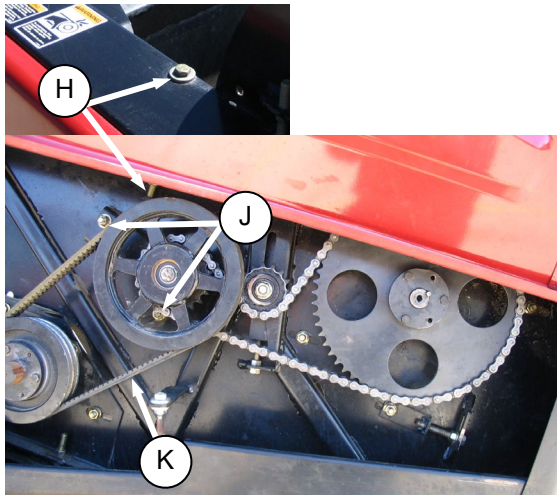
g. Check auger drive V-belt (F) tension. Each belt should deflect 3/16 in. (4 mm) at mid-span when a load of 8-12 lbf (35-40 N) is applied to each belt. If necessary, adjust as follows:

1. Loosen jam-nut on adjuster bolt (G).
2. Turn adjuster bolt (G) to achieve tension as per above.
3. Tighten jam-nut at (G) and tighten bolts (B).

h. Close shield.

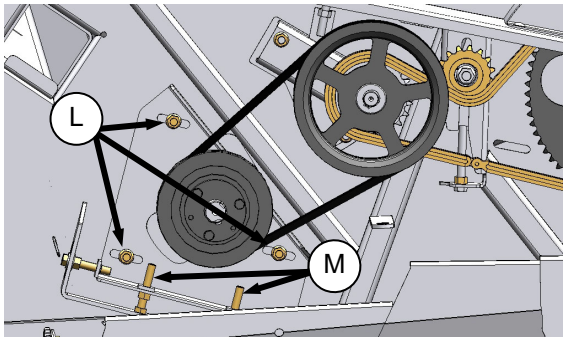
i. Open RH end shield.

j. Loosen reel drive belts (K) as follows:




1. Loosen jam-nut on adjuster bolt (H) and nuts (J).
2. Turn adjuster bolt (H) to loosen reel drive belts (K).

k. Loosen the three nuts (L).




l. Loosen jam-nuts on adjuster bolts (M) and turn bolt (M) to adjust auger vertical position.

m. Tighten jam-nuts and nuts (L).

n. Tighten belts (K) as follows:

1. Turn adjuster bolt (H) to move pulley so that each belt (K) deflects 3/16 in. (4 mm) when a load of 8-12 lbf (35-40 N) is applied to each belt at mid-span.
2. Tighten jam-nut on adjuster bolt (H) and nuts (J).

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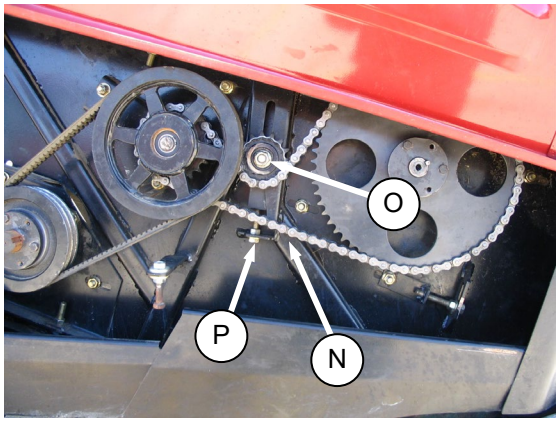


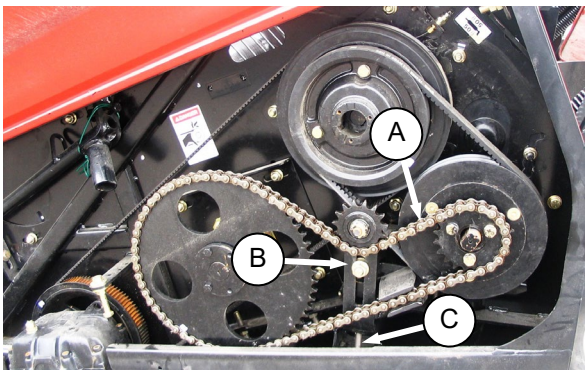

o. Check reel drive chain tension. Total chain slack at (N) should be 1/4 in. (6 mm). If necessary, adjust as follows:
   1. Loosen bolt (O) on sprocket and jam-nut on adjuster bolt (P).
   2. Turn adjuster bolt (P) to move idler sprocket downward until chain slack is achieved as above.
   3. Rotate auger and check chain for slack at tightest point. Re-adjust position of idler sprocket to achieve required slack.
   4. Tighten jam-nut at (P) and nut (O) on sprocket. Recheck tension.

p. Close shield before engaging header.

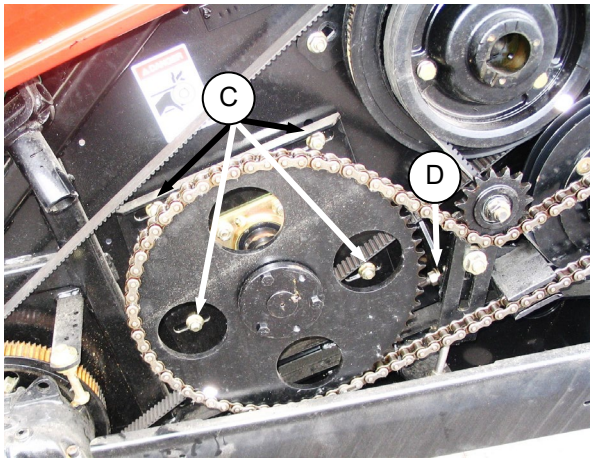
### 6.17.4.3 Auger Fore-Aft Adjustment – A30-D

a. Open LH end shield.

b. Loosen auger drive chain (A) as follows:




1. Loosen nut (B) on idler sprocket support.
2. Turn adjuster bolt (C) to loosen chain (A).




c. Loosen four nuts (C).

d. Loosen jam-nut on adjuster bolt (D) and turn adjuster bolt (D) to adjust auger fore-aft position.

e. Tighten jam-nut and four nuts (C).

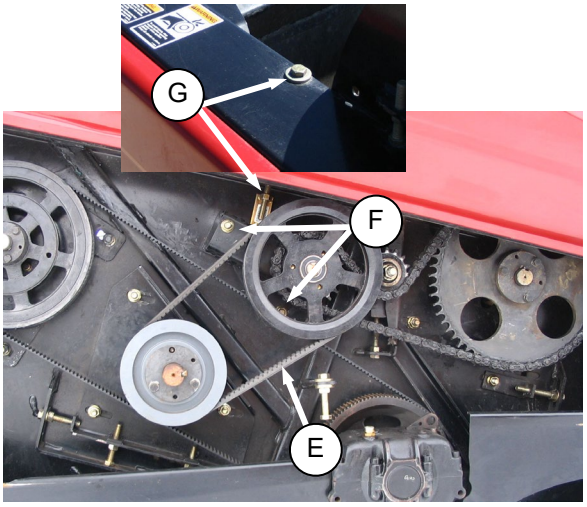
f. Tighten auger drive chain (A) as follows:

1. Turn adjuster bolt (C) to achieve (5 mm) slack at mid-span of chain (A).
2. Tighten nut (B) on idler sprocket support.
3. Rotate auger and check chain for slack at tightest point. Re-adjust position of idler sprocket to achieve required slack.

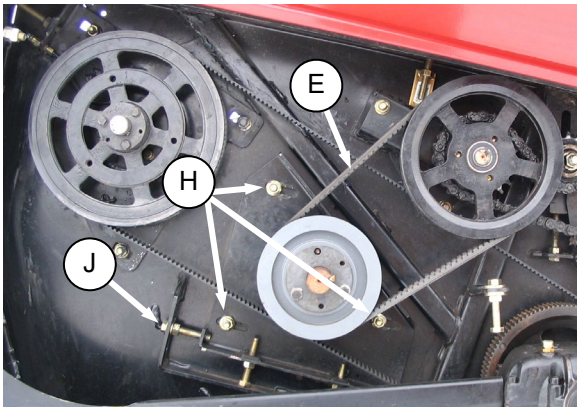
g. Close LH end shield.

h. Open RH end shield.

i. Loosen reel drive belts (E) as follows:




1. Loosen nuts (F).
2. Loosen jam-nut on adjuster bolt (G).
3. Turn adjuster bolt (G) to loosen reel drive belts.



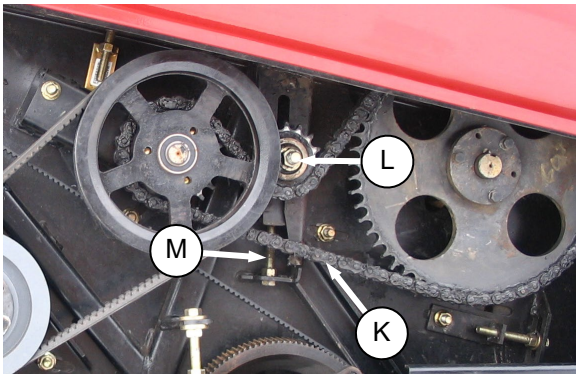

j. Loosen nuts (H).

k. Loosen jam-nut on adjuster bolt (J).

l. Turn adjuster bolts (J) to adjust auger fore-aft position.

m. Tighten nuts (H) and jam-nut.

*(continued next page)*




n. Check reel drive chain tension. Total chain slack at (K) should be 1/4 in. (6 mm). If necessary, adjust as follows:

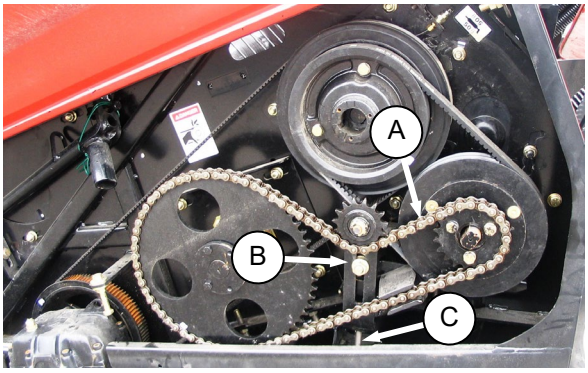
   4. Loosen bolt (L) on sprocket and jam-nut on adjuster bolt (M).
   5. Turn adjuster bolt (M) to move idler sprocket downward until chain slack is achieved as above.
   6. Rotate auger and check chain for slack at tightest point. Re-adjust position of idler sprocket to achieve required slack.
   7. Tighten jam-nut at (M) and nut (L) on sprocket. Recheck tension.

o. Close shield before engaging header.

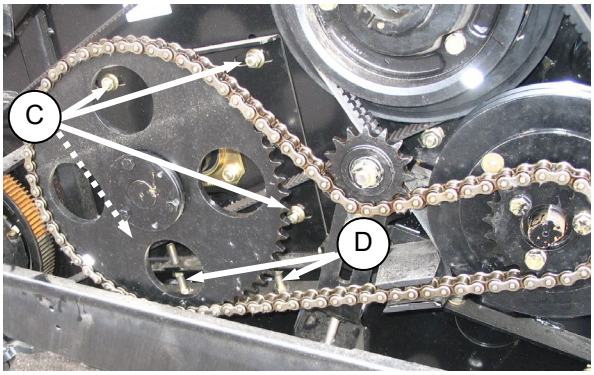
### 6.17.4.4 Auger Vertical Adjustment – A30-D

a. Open LH end shield.

b. Loosen auger drive chain (A) as follows:




1. Loosen nut (B) on idler sprocket support.
2. Turn adjuster bolt (C) to loosen chain (A).




c. Loosen four nuts (C).

d. Loosen jam-nut on adjuster bolt (D) and turn adjuster bolt (D) to adjust auger vertical position.

e. Tighten jam-nut and four nuts (C).

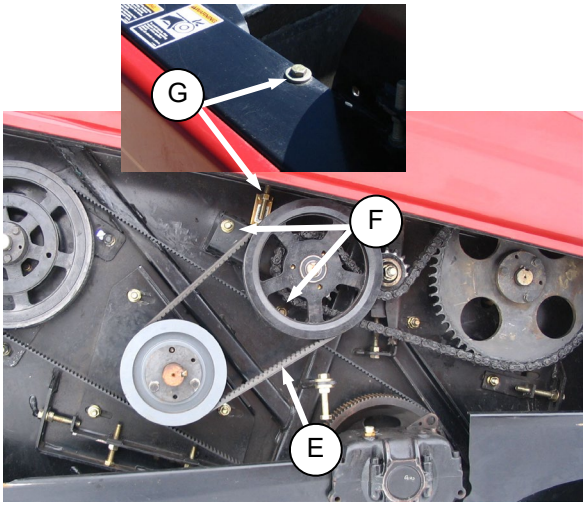
f. Tighten auger drive chain (A) as follows:

1. Turn adjuster bolt (C) to achieve (5 mm) slack at mid-span of chain (A).
2. Tighten nut (B) on idler sprocket support.
3. Rotate auger and check chain for slack at tightest point. Re-adjust position of idler sprocket to achieve required slack.

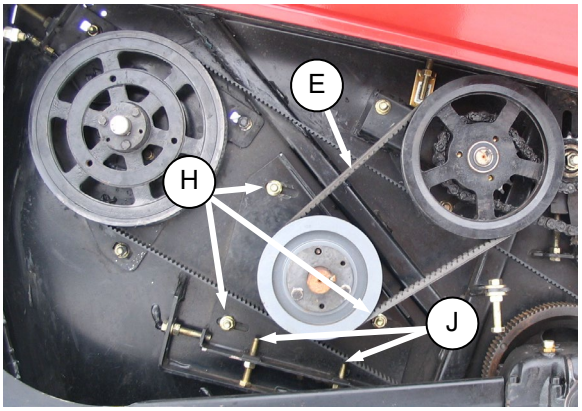
g. Close LH end shield.

h. Open RH end shield.

i. Loosen reel drive belts (E) as follows:




1. Loosen nuts (F).
2. Loosen jam-nut on adjuster bolt (G).
3. Turn adjuster bolt (G) to loosen reel drive belts.



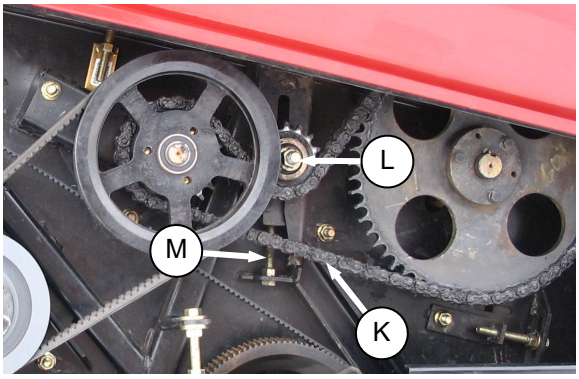

j. Loosen nuts (H).

k. Loosen jam-nuts on adjuster bolts (J).

l. Turn adjuster bolts (J) to adjust auger vertical position.

m. Tighten nuts (H) and jam-nuts.

*(continued next page)*

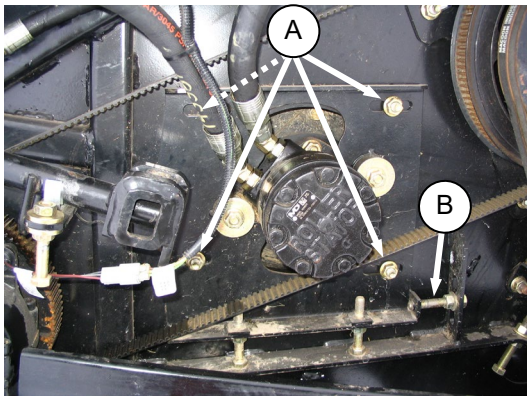



n. Check reel drive chain tension. Total chain slack at (K) should be 1/4 in. (6 mm). If necessary, adjust as follows:
   1. Loosen bolt (L) on sprocket and jam-nut on adjuster bolt (M).
   2. Turn adjuster bolt (M) to move idler sprocket downward until chain slack is achieved as above.
   3. Rotate auger and check chain for slack at tightest point. Re-adjust position of idler sprocket to achieve required slack.
   4. Tighten jam-nut at (M) and nut (L) on sprocket. Recheck tension.

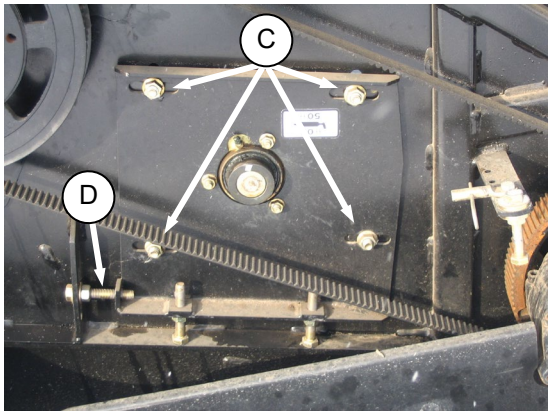
o. Close shield before engaging header.

### 6.17.4.5 Auger Fore-Aft Adjustment – A40-D

a. Open LH end shield.



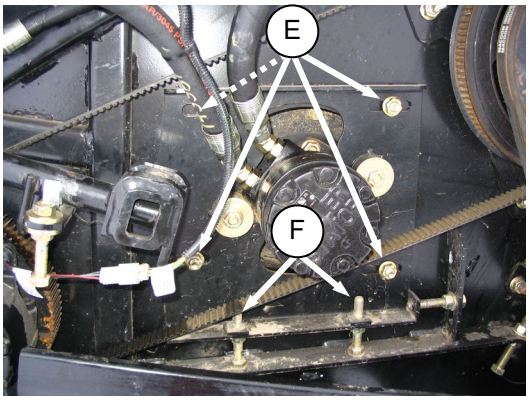

b. Loosen the four nuts (A).
c. Loosen jam-nut on adjuster bolt (B) and turn bolt (B) to adjust auger fore-aft position.
d. Tighten jam-nut.
e. Tighten nuts (A).
f. Close shield before engaging header.
g. Open RH end shield.



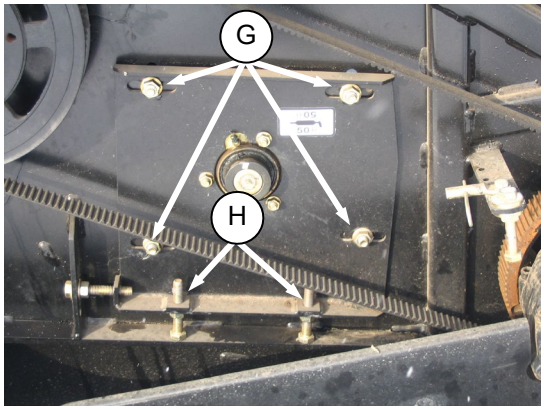

h. Loosen the four nuts (C).
i. Loosen jam-nut on adjuster bolt (D) turn bolt (D) to adjust auger fore-aft position.
j. Tighten jam-nut.
k. Tighten nuts (C).
l. Close shield before engaging header.

### 6.17.4.6 Auger Vertical Adjustment – A40-D

a. Open LH end shield.




b. Loosen the four nuts (E).
c. Loosen jam-nuts on adjuster bolts (F) and turn bolts (B) to adjust auger vertical position.
d. Tighten jam-nuts.
e. Tighten nuts (E).
f. Close shield before engaging header.
g. Open RH end shield.




h. Loosen the four nuts (G).
i. Loosen jam-nuts on adjuster bolts (H) turn bolts (H) to adjust auger vertical position.
j. Tighten jam-nuts.
k. Tighten nuts (G).
l. Close shield before engaging header.

### *6.17.5 Reel Position*

Reel position has been found to be a critical factor in achieving good results in adverse conditions. The reel position is factory set for average straight standing crop. It can be adjusted both vertically and horizontally (fore-aft) for different crop conditions. See the chart below for recommended reel position in unusual crop conditions.

**REEL POSITION CHART**

| CROP CONDITION | REEL POSITION |
|---|---|
| Crop Down Or Lodged | Forward & Down (Also Increase Reel Speed) |
| Wet Or Dead Material Collects On Cutterbar And Plugs Sickle. | Back & Down (Close To Guards) |
| Short Crop | Back |
| Thick Stemmed Or Heavy Standing | Up And Forward |

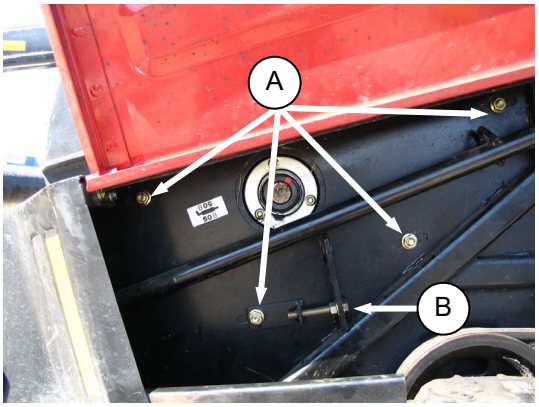
To make adjustments to reel position, refer to the following paragraphs 6.17.5.1 to 6.17.5.4.

#### 6.17.5.1 Reel Fore-Aft Position, A30-S and A30-D

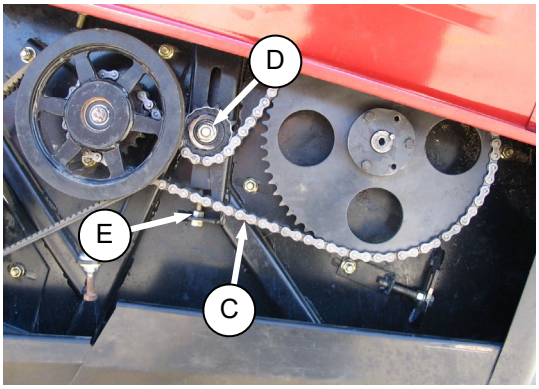
**NOTE**

*The reel must be adjusted equally on both sides.*

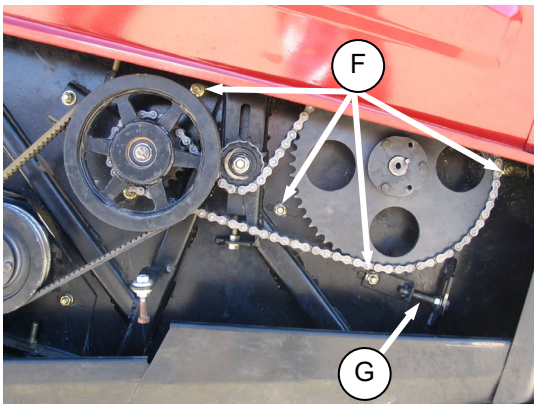
a. Open LH end shield.




b. Loosen the four nuts (A).
c. Loosen jam-nut on adjuster bolt (B) and turn bolt (B) to adjust fore-aft position.
d. Tighten jam-nut and four nuts (A).
e. Close the drive shield before engaging the header.
f. Open RH end shield.
g. Loosen the reel drive chain (C) as follows:




1. Loosen nut (D) on sprocket.
2. Loosen jam-nut on adjuster bolt (E).
3. Turn adjuster bolt (E) to loosen chain.



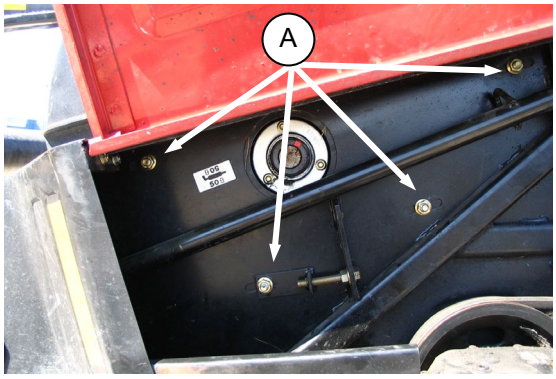

h. Loosen the four nuts (F).
i. Loosen jam-nut on adjuster bolt (G) and turn adjuster bolt to adjust reel fore-aft position.
j. Tighten jam-nut and four nuts (F).
k. Tighten the reel drive chain (C) as follows:
   1. Turn adjuster bolt (E) to tighten chain until total chain slack at (C) is 1/4 in. (6 mm).
   2. Tighten jam-nut at (E) and nut (D) and recheck tension.
l. Close the shield before engaging the header.

### 6.17.5.2 Reel Vertical Position, A30-S and A30-D

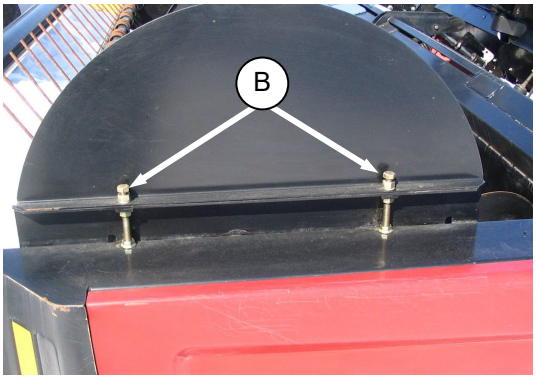
**NOTE**

*Adjustment at forward adjuster bolt should be 0.47 inches (12 mm) lower than at rear adjuster bolt.*

a. Open LH end shield.




b. Loosen the four nuts (A).



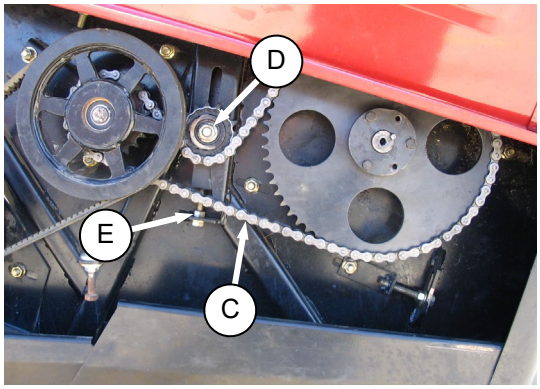

c. Loosen jam-nuts on adjuster bolts (B) and turn bolts (B) to raise or lower reel.

d. Tighten jam-nuts and nuts (A).

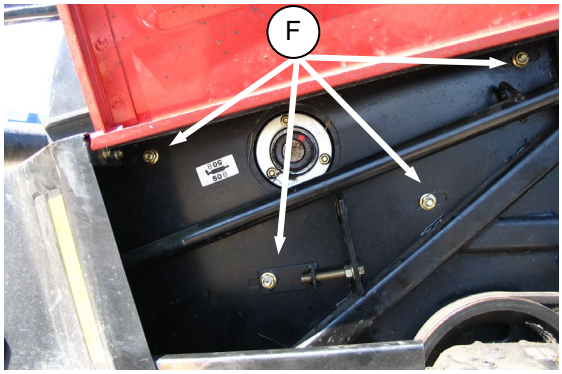
e. Close shield before engaging header.

f. Open RH end shield.

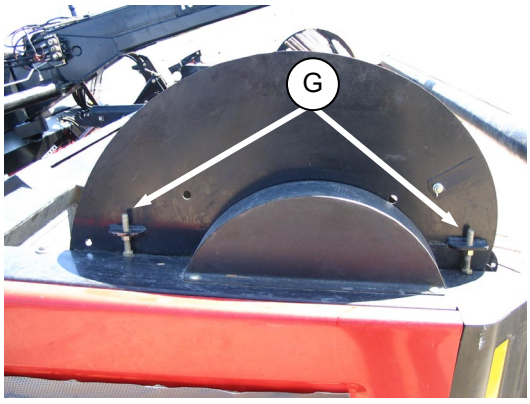
g. Loosen the reel drive chain (C) as follows:




1. Loosen nut (D) on sprocket.
2. Loosen jam-nut on adjuster bolt (E).
3. Turn adjuster bolt (E) to loosen chain.




h. Loosen the four nuts (F).



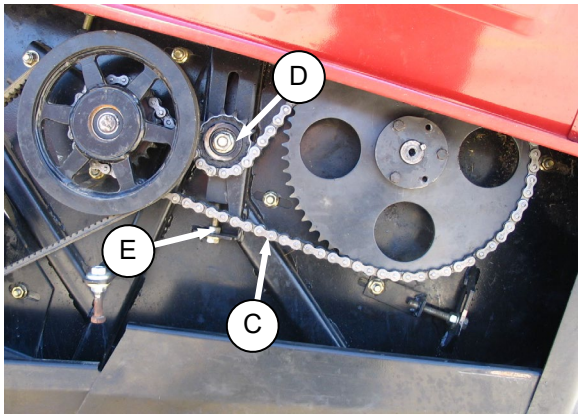

i. Loosen jam-nuts on adjuster bolts (G) and turn adjuster bolts to raise or lower reel.

**NOTE**

*Adjustment at forward adjuster bolt should be 0.47 inches (12 mm) lower than at rear adjuster bolt.*

j. Tighten jam-nuts and four nuts (F.

*(continued next page)*




k. Tighten the reel drive chain (C) as follows:
   4. Turn adjuster bolt (E) to tighten chain until total chain slack at (C) is 1/4 in. (6 mm).
   5. Tighten jam-nut at (E) and nut (D) and recheck tension.

l. Close the shield before engaging the header.

m. Check that the reel rotates freely.

**IMPORTANT**

*Manually rotate reel and ensure that tines do not contact header pan, otherwise damage to pan will result. If necessary, grind off excessive length from tine if tine length varies considerably. Remove any sharp edges or burrs from tine.*

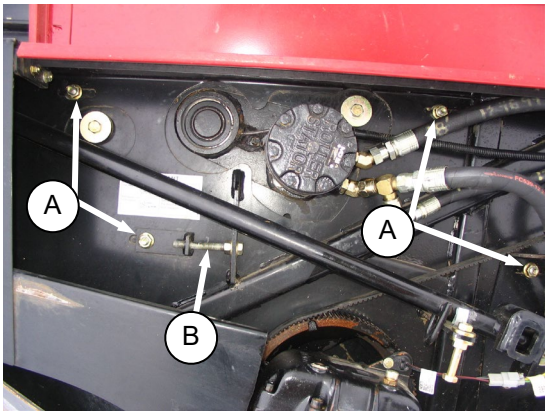
n. Check that the reel is evenly adjusted.

### 6.17.5.3 Reel Fore-Aft Position A40-D

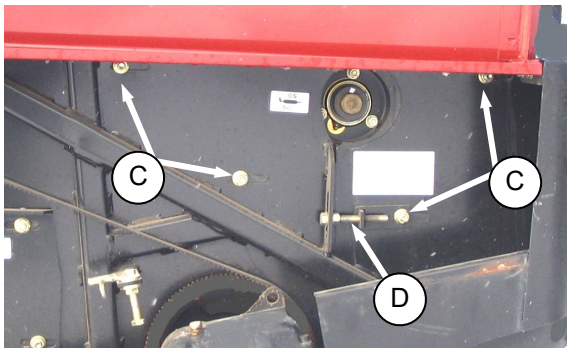
**NOTE**

*The reel must be adjusted equally on both sides.*

a. Open LH end shield.




b. Loosen the four nuts (A).
c. Loosen jam-nut on adjuster bolt (B) and turn bolt (B) to adjust reel fore-aft position.
d. Tighten jam-nut.
e. Tighten nuts (A).
f. Open RH end shield.



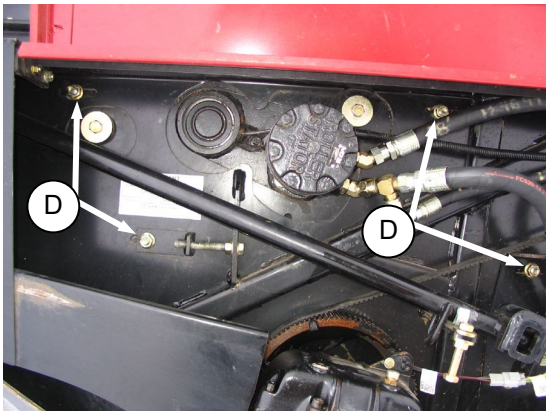

g. Loosen the four nuts (C).
h. Loosen jam-nut on adjuster bolt (D) and turn bolt (D) to adjust reel fore-aft position.
i. Tighten jam-nut.
j. Tighten nuts (C).
k. Close drive shields before engaging header.

### 6.17.5.4 Reel Vertical Position A40-D

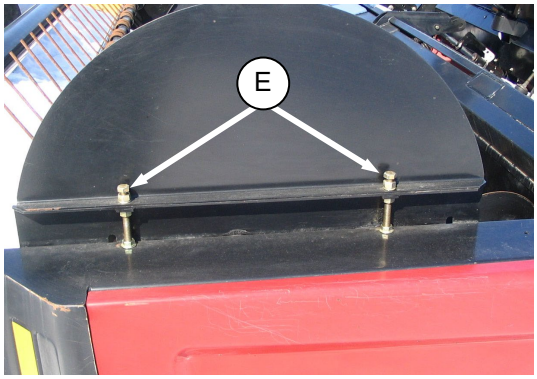
**NOTE**

*Adjustment at forward adjuster bolt should be 0.47 inches (12 mm) lower than at rear adjuster bolt.*

a. Open LH end shield.



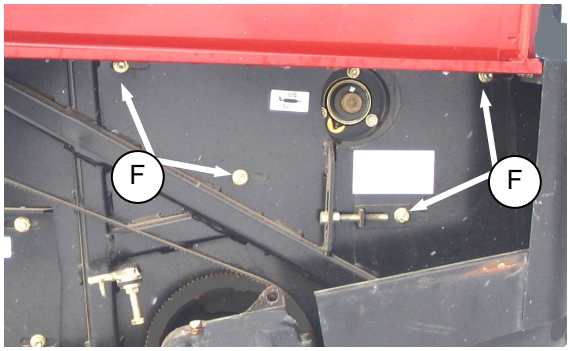

b. Loosen the four nuts (D).



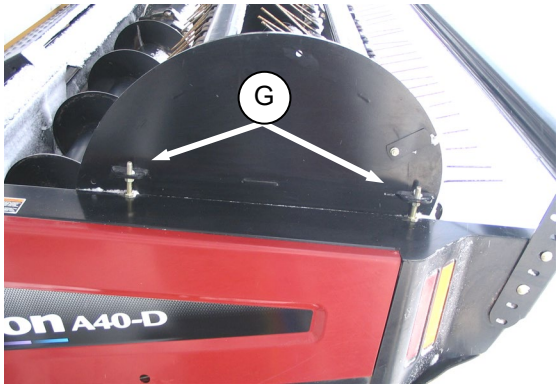

c. Loosen jam-nuts on adjuster bolts (E) turn bolts (E) to raise or lower reel.
d. Tighten jam-nuts.
e. Tighten nuts (D).

*(continued next page)*

f. Open RH end shield.




g. Loosen the four nuts (F).




h. Loosen jam-nuts on adjuster bolts (G) turn bolts (G) to adjust reel vertical position.

i. Tighten jam-nut.

j. Tighten nuts (F).

k. Close shields before engaging header.

l. Check that the reel rotates freely.

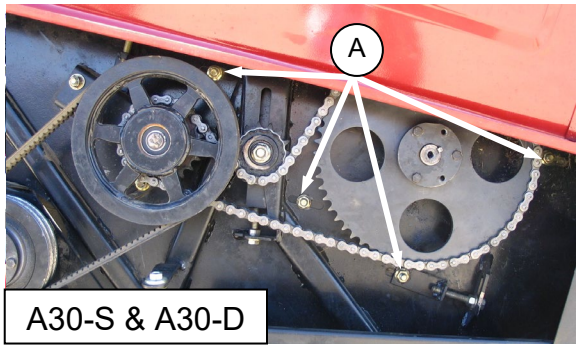
**IMPORTANT**

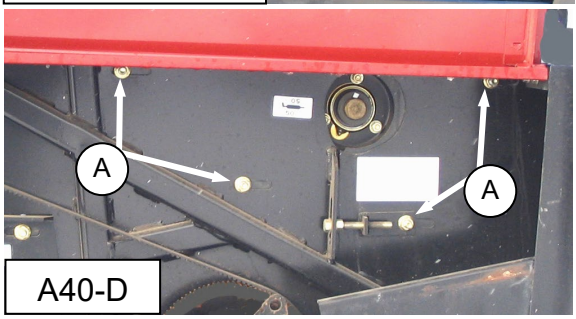
*Manually rotate reel and ensure that tines do not contact header pan, otherwise damage to pan will result. If necessary, grind off excessive length from tine if tine length varies considerably. Remove any sharp edges or burrs from tine.*

m. Check that the reel is evenly adjusted.

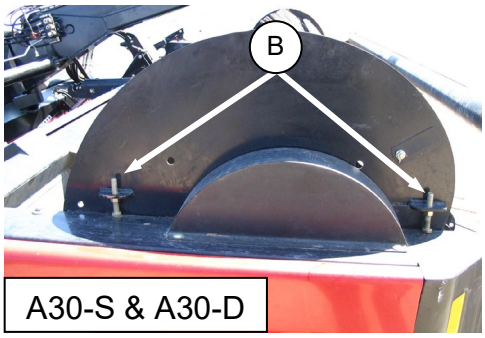
### 6.17.6 Tine Aggressiveness Adjustment

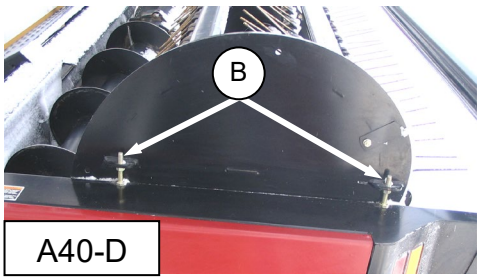
a. Open RH end shield.




b. At right side of reel (cam end) only, loosen four nuts (A).

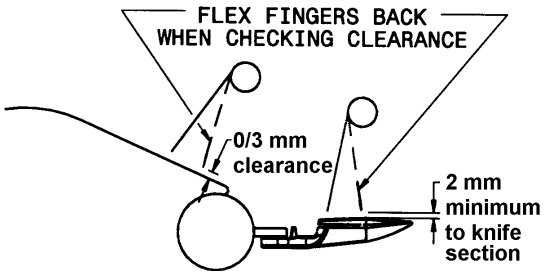



c. Loosen jam-nuts on bolts (B) and turn bolts to rotate cam to desired position. Viewed from right side, rotate cam clockwise to obtain more aggressive tine action.

d. Tighten nuts (A) and jam-nuts on bolts (B).

e. Check that chain and/or belt have not become over tight. Adjust to recommended tension if required. Refer to Sections 7.9.1, Reel Drive Chain and 7.9.2, Reel Drive Belts.




CHECK TINE CLEARANCE

f. Rotate reel slowly by hand and check finger clearance at knife and pan. **Flex fingers to simulate crop-loaded position to ensure fingertip clearances to knife sections and auger pan** are adequate for working conditions.

### 6.17.7 Cutting Height

Cutting height is controlled with a combination of skid shoes or gauge rollers, and header angle adjustment, not with the header lift cylinders. Having the header "ride" on the skid shoes allows the float linkage to float header over obstacles and follow ground contours, rather than supporting the header with the cylinder.

**NOTE**

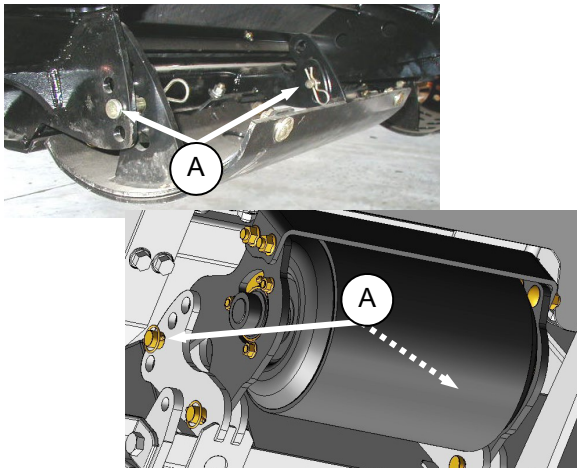
*Lowering the skid shoes or gauge rollers raises the cutting height. This may be desirable in stony conditions, to reduce damage to cutting components. Also, a longer stubble length helps material dry faster.*

**WARNING**

**To avoid bodily injury or death from unexpected start-up or fall of raised machine, stop engine, remove key and engage lift cylinder lockout valves before going under machine to adjust skid shoes or for any reason.**

### 6.17.7.1 Cutting Height Adjustment:

a. Raise header and engage lift cylinder lockouts.




b. Remove pins (A) at each skid shoe or gauge roller.

c. Raise or lower skid shoe or gauge roller to desired position.

d. Replace pins (A).

e. Check that skid shoes or gauge rollers are adjusted to the same position.

f. Check header float and adjust if required. Refer to Section 6.17.9, Header Flotation.

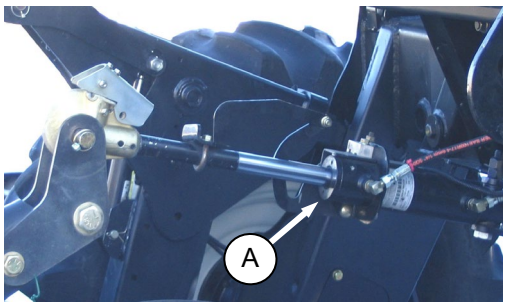
**NOTE**

*LH and RH skid shoes are standard equipment, and two more inner skid shoes may be added if required. A set of two gauge rollers may be installed in place of the outer skid shoes.*

### *6.17.8 Header Angle*

Header (or guard) angle can be varied from 8° to 16° below horizontal. Choose an angle that maximizes performance for your crop and field conditions. A flatter angle provides better clearance in stony conditions while a steeper angle is required in down crops for better lifting action.

#### 6.17.8.1 Header Angle – Self-Propelled

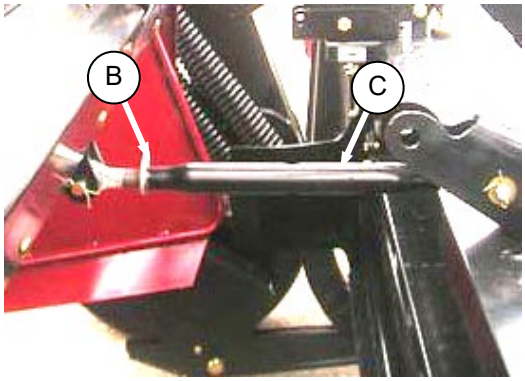



The header angle can be hydraulically adjusted from the cab using hydraulic cylinder (A) without shutting down the windrower. To adjust the angle, refer to the M100, or M150 & M200 Self-Propelled Windrower Operator's Manual.

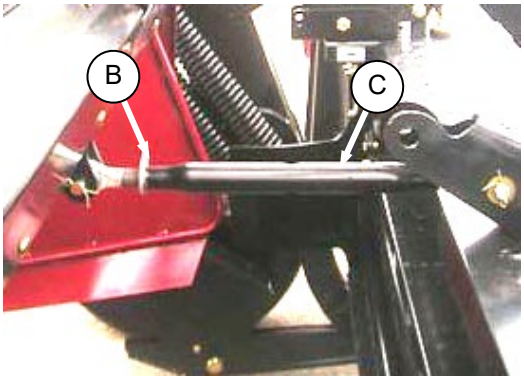
#### 6.17.8.2 Header Angle – Pull-Type

##### *6.17.8.2.1 Mechanical Adjustment (if equipped)*

a. Lower header so that cutter bar is resting on the ground.



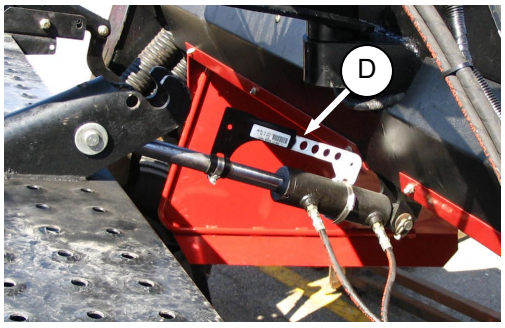

b. Loosen nut (B).
c. To decrease (flatten) header angle, rotate the turnbuckle sleeve (C) so that the turnbuckle decreases in length.
d. To increase (steepen) header angle, rotate the turnbuckle sleeve (C) so that the turnbuckle increases in length.




e. Snug up nut (B) but do not over tighten. A slight tap with a small hammer is sufficient.
f. Check cutting height and adjust if required. Refer to Section 6.17.7, Cutting Height.
g. Check header float and adjust if required. Refer to Section 6.17.9, Header Flotation.

##### *6.17.8.2.2 Hydraulic Adjustment (if equipped)*

The header angle can be adjusted from the tractor without shutting down the windrower.




a. To decrease (flatten) header angle, operate tractor hydraulic control so that cylinder retracts, decreasing the number of holes in the gauge (D) that are exposed.
b. To increase (steepen) header angle, operate tractor hydraulic control so that cylinder extends, increasing the number of holes in the gauge that are exposed.

### *6.17.9 Header Flotation*

Header flotation springs are normally set so 70 lbf force (311 N) is required to lift either end of the header just off the ground. In rough or stony conditions, it may be desirable to change setting to 35-50 lbf (156-222 N) to protect cutting components.

**NOTE**

*When float setting is light, it may be necessary to use a slower ground speed to avoid excessive bouncing and leaving a ragged cut.*

#### 6.17.9.1 Flotation Adjustment – Self-Propelled

The header float can be hydraulically adjusted from the cab without shutting down the windrower. To adjust the float, refer to M150 & M200 Self-Propelled Windrower Operator's Manual.

#### 6.17.9.2 Flotation Adjustment – Pull-Type

**IMPORTANT**

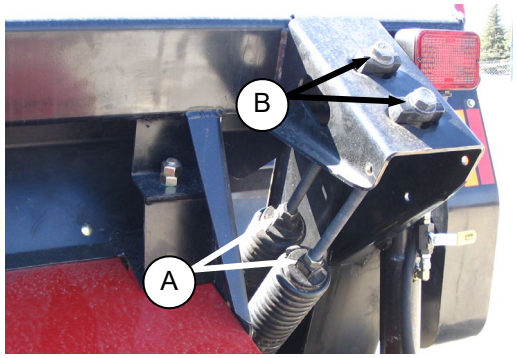
*Float setting (or lifting force) must be equal on both ends of the header. LH and right ends require different spring lengths to achieve equal float at both ends.*

**IMPORTANT**

*Because header weight transfers to outside tire whenever header is swung from one side to the other, tires must be fully inflated (30 psi (207 kPa)) to minimize effects on header float.*

a. Position header directly behind tractor.

b. Raise header fully.




c. Back jam-nuts (A) away from spring.

d. To increase flotation, turn adjuster bolts (B) clockwise (further into spring). To decrease flotation, turn adjuster bolts counterclockwise.

**NOTE**

*Springs must be adjusted in pairs.*

e. Tighten jam-nuts (A) against spring inserts to secure the setting.

f. Lower header and check header flotation at each end.

**NOTE**

*Other operating variable adjustments may affect float setting. Check the float and readjust if necessary after adjusting reel position, cutting height, or header angle. Also, if using a tractor with drawbar height different than 16 inches (406 mm) flotation will be affected. Adjust as required.*

### *6.17.10 Feed Pan / Rock-Drop Tine Position*

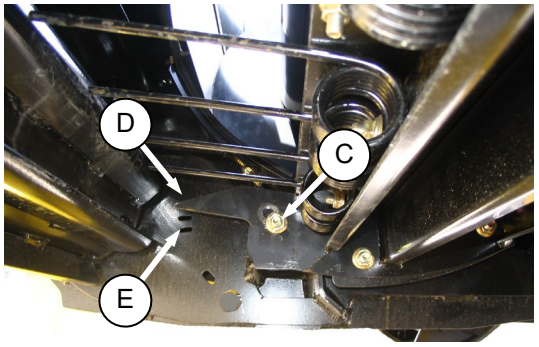
The rear of the feed pan is adjustable up and down to raise or lower the feed pan and rock drop tines.

- Lowering the feed-pan helps prevent plugging in heavy crop.
- Raising the feed-pan helps to form an even windrow in light crop.

**WARNING**

**To avoid bodily injury or death from unexpected start-up or fall of raised machine; stop engine, remove key and engage header lift cylinder stops before going under.**

a. Raise header fully and engage header lift cylinder stops.




b. Loosen nut (C) both sides and align pointer (D) at each side of rock drop tine support with one of the slots (E) to match crop condition.

| CROP | SLOT |
|---|---|
| Light | Upper |
| Normal | Center |
| Heavy | Lower |

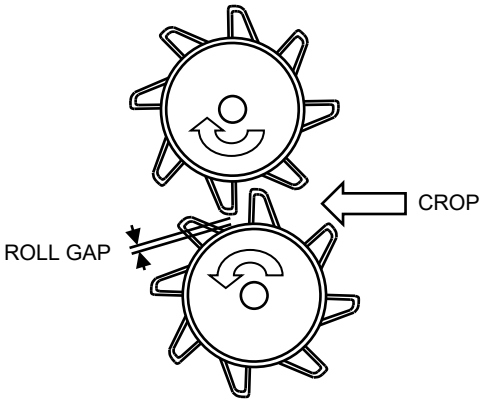
c. Tighten hardware on both sides.

d. Disengage header lift cylinder stops.

### *6.17.11 Hay Conditioner*

Steel rolls "condition" the crop by crimping and crushing the stem in several places. This allows moisture release for quicker drying. The degree to which the crop is conditioned as it passes through the rolls is controlled by roll gap. See illustration. The gap is factory set at 1/4 inch (6 mm).

Correct conditioning of alfalfa, clover and other legumes is usually indicated when 90% of the stems show cracking, but no more than 5% of the leaves are damaged. Use only enough roll gap to achieve this result.

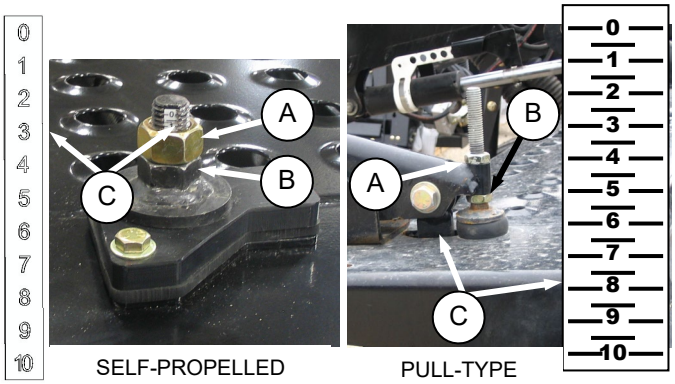



A larger gap (up to 1 inch [25 mm]) may be desirable in thick stemmed cane-type crops; however, too large a gap may cause feeding problems.

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

#### 6.17.11.1 Roll Gap

Adjust the roll gap as follows:




a. Lower header fully.
b. Loosen and back-off upper jam-nut (A), both sides of conditioner.
c. To increase roll gap, turn lower nut (B) to raise link and increase the gauge (C) setting.

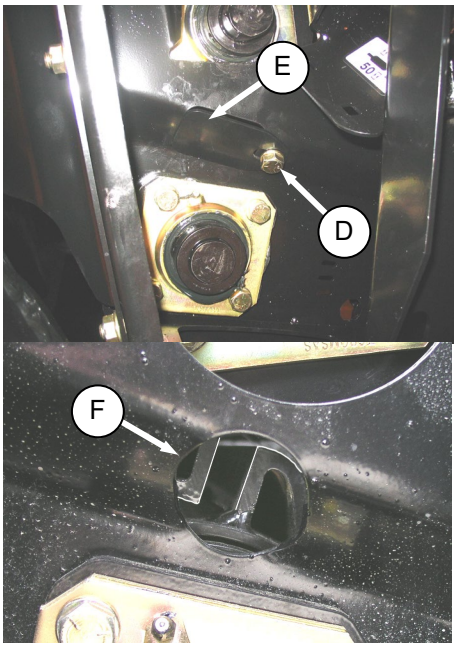
**NOTE**

*Each division on the roll gap decal represents a change of approximately 1/8 inch (3mm) in roll gap. The factory setting of 1/4 inch (6 mm) roll gap is mark 1 on the decal (C).*

**NOTE**

*When adjusting roll gap, be sure that the decal reading is the same on both sides of the conditioner roll to achieve consistent intermesh across the rolls.*

d. To decrease roll gap, turn lower nut (B) to lower link and decrease the gauge (C) setting.
e. Tighten jam-nuts (A), both sides.




f. Loosen bolt (D) and rotate cover (E) to expose access port (F).
g. Inspect space between roll bars at both ends of the rolls at access port (F).

**IMPORTANT**

*Roll timing and alignment are critical when the roll gap is decreased because:*

- conditioning is affected, and
- the bars may contact each other.

h. Check roll timing and alignment when reducing roll gap. Refer to Section 6.17.11.2, Roll Timing and Alignment.
i. Close cover (E) and tighten bolt (D).

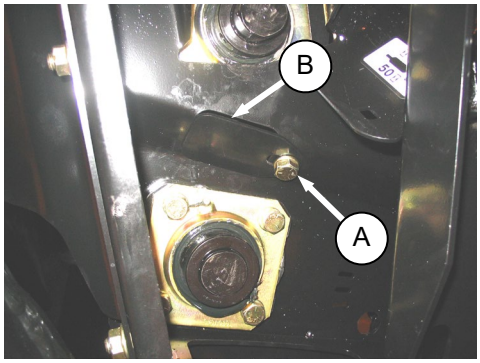
### 6.17.11.2 Roll Timing and Alignment

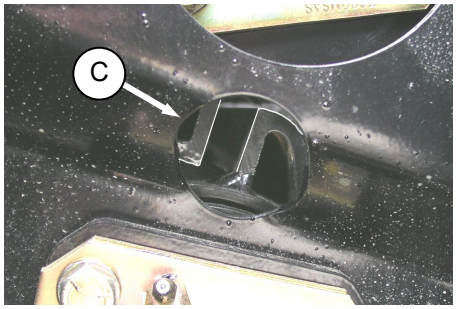
For proper conditioning, the rolls must be properly timed and aligned with each steel bar on one roll centered between two bars of the other roll as shown. The factory setting should be suitable for most crop conditions.

**WARNING**

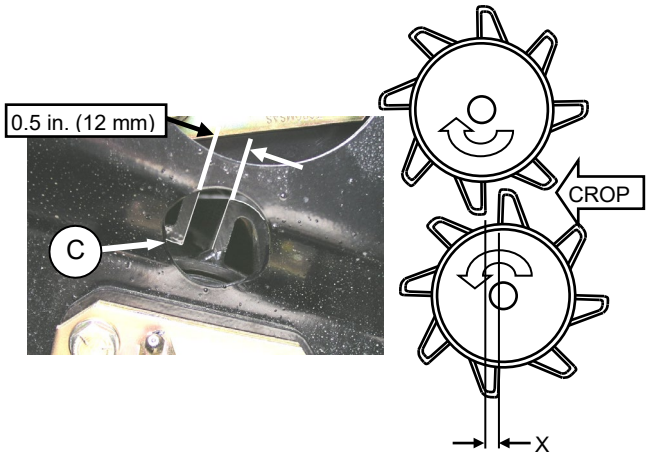
**To avoid bodily injury or death from unexpected start-up or fall of raised machine; stop engine, remove key and engage lift cylinder stops before going under machine to examine roll timing, or for any reason.**

#### *6.17.11.2.1Roll Timing*




a. Loosen bolt (A) and rotate cover (B) to expose access port (C).

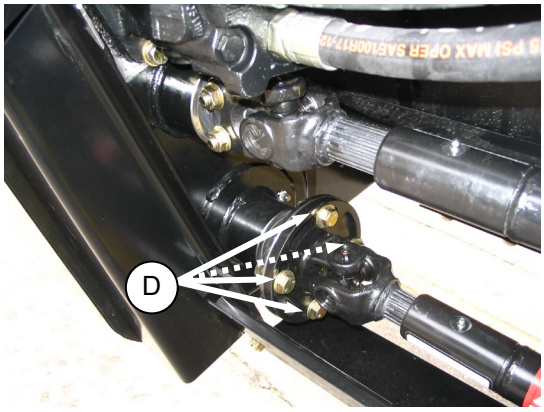



b. Examine roll timing (distance 'X') at each end of the rolls with the header fully lowered. Each steel bar on one roll should be centered between two bars of the other roll so that distance "X" is 0.5 inches (12 mm).

**NOTE**

*If the distance 'X' varies more than 1/16 in (1.6 mm) from one end to the other, the rolls should be re-aligned. Refer to Section 6.17.11.2.2, Roll Alignment.*

c. If required, adjust the roll timing as follows:




1. Loosen four bolts (D) in slots of yoke plate on lower roll universal shaft.
2. Turn rolls to achieve best timing.
3. When roll timing is satisfactory, tighten bolts (D) to secure the position.
4. Recheck the distance between the bars at both ends of the rolls at (C).
5. Close cover (B) and tighten bolt (A).

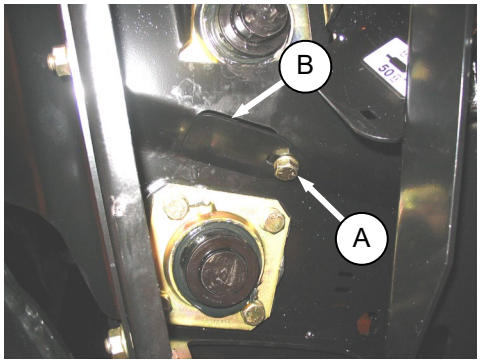
### *6.17.11.2.2Roll Alignment*

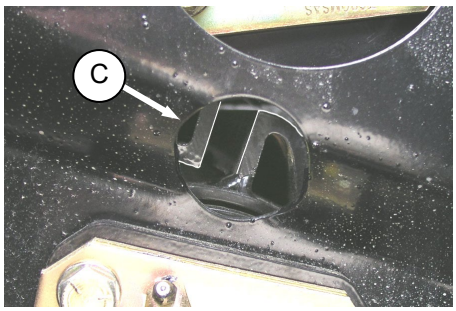
The rolls can be aligned in the fore and aft direction by shimming the pivot assembly link at the RH end of the upper roll. The rolls are aligned at the factory but adjustment is provided in case the rolls become misaligned during operation.

**WARNING**

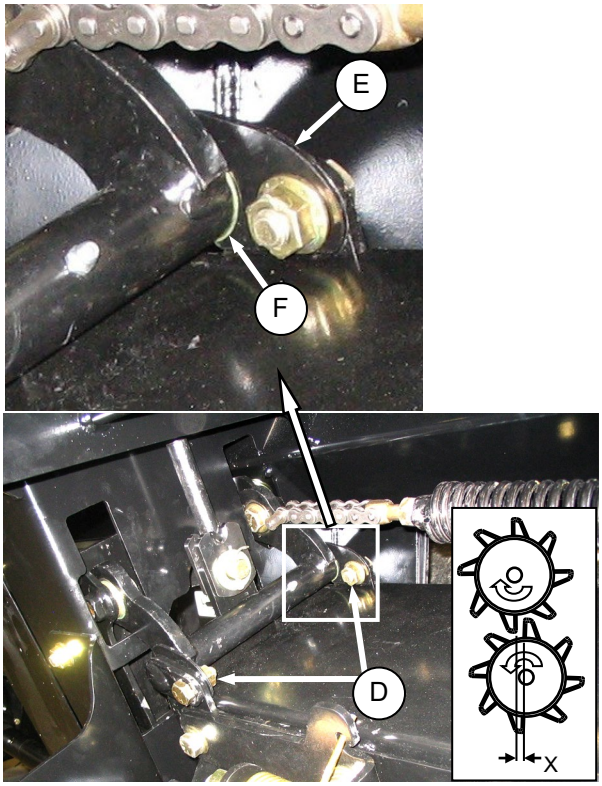
**To avoid bodily injury or death from unexpected start-up of machine; stop engine, remove key before examining roll timing.**

a. Lower header until it rests on the ground.




b. Loosen bolt (A) and rotate cover (B) to expose access port (C).




c. Remove nuts and bolts (D) and remove shims (E). The shims can be lifted off the pivot rod.

d. Move upper roll until dimension ‘X’ at both ends looking through (C) is within 1/16 in (1.6 mm).

e. Reinstall the shims, ensuring hardened washer (F) is against the pivot tube.

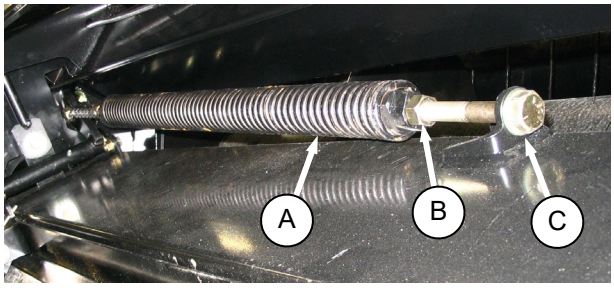
f. Reinstall bolts (D) and nuts.

g. Operate windrower and recheck the alignment.

h. Close cover (B) and tighten bolt (A).

### *6.17.12 Roll Tension*

The roll tension (the force holding the rolls together) is factory set and is adjustable. There is a spring (A) for each end of the roll.




a. To increase the roll tension, loosen jam-nut (B) at spring insert, and turn the spring draw-bolt (C) clockwise to tighten the spring. Tighten jam-nut (B).

b. To decrease the roll tension, loosen jam-nut (B) at spring insert, and turn the spring draw-bolt (C) counterclockwise to loosen the spring. Tighten jam-nut (B).

### *6.17.13 Forming Shields*

## WARNING

**Keep hands and feet away from discharge opening. Keep everyone several hundred feet away from your operation. Never direct the discharge toward anyone. Stones or other foreign objects can be ejected with force.**

The position of the forming shields controls the width and placement of the windrow. The decision on forming shield position (settings between 36 and 92 inches [915 and 2346 mm]) should be based on the following factors:

- weather conditions (rain, sun, humidity, wind)
- type and yield of crop
- drying time available
- method of processing (bales, silage, "green-feed")

A wider windrow will generally dry faster and more evenly, resulting in less protein loss. Fast drying is especially important in areas where the weather allows only a few days to cut and bale. Refer to Section 6.18, Haying Tips, for more information.

Where weather conditions permit or when drying is not critical, for example, when cutting for silage or "green-feed", a narrower windrow may be preferred for ease of pick-up.

#### 6.17.13.1 Side Deflectors

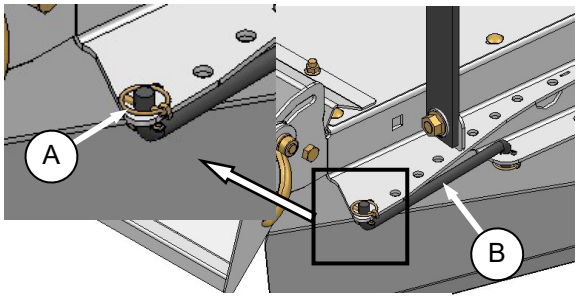
The position of the side forming shields controls the width and placement of the windrow.

## CAUTION

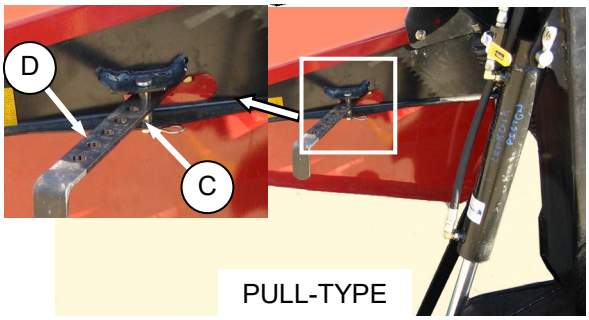
**Before leaving the tractor seat for any reason:**

- **Park on level ground if possible.**
- **Lower the windrower fully.**
- **Place all controls in NEUTRAL or PARK.**
- **Disengage PTO (pull-type).**
- **Engage the park brake.**
- **Stop engine and remove key from ignition.**
- **Wait for all movement to stop.**

To ensure windrow placement is centered with respect to carrier/drive wheels, adjust both side deflectors to the same hole position on the adjuster bar. To achieve this setting, adjuster bars must be in the corresponding hole both sides.



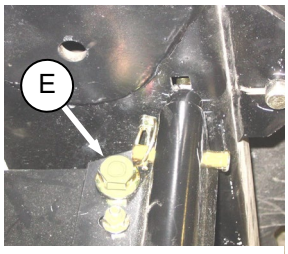

SELF-PROPELLED




PULL-TYPE

a. Set forming shield side deflectors to desired width by repositioning adjuster bars as follows:
   1. For SP machines, remove lynch pin (A), move adjuster bar (B) to another hole and re-install lynch pin (A).
   2. For PT machines, remove hairpin and clevis pin (C). Move adjuster bar (D) to another hole and re-install clevis pin (C) and hairpin.

b. If forming shield attachment is too tight or too loose, adjust as follows:

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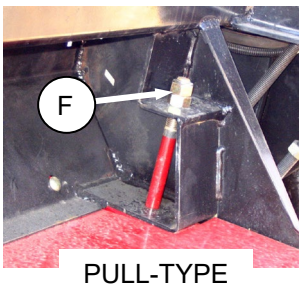



PULL-TYPE

   1. On SP headers, tighten or loosen nut (E) as required.
   2. On PT headers, back off top nut at (F) and adjust lower nut at (F) as required. Then, holding lower nut with a wrench, tighten top nut securely against lower nut.

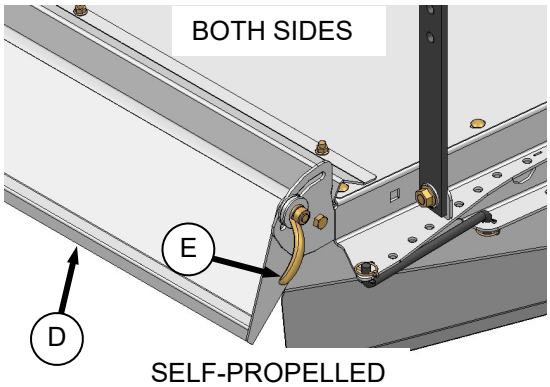
### 6.17.13.2 Rear Deflector (Fluffer Shield)

The rear deflector (D) slows the crop exiting the conditioner rolls, directs the flow downward, and "fluffs" the material.

## CAUTION

**Before leaving the tractor seat for any reason:**

- **Park on level ground if possible.**
- **Lower the windrower fully.**
- **Place all controls in NEUTRAL or PARK.**
- **Disengage PTO (pull-type).**
- **Engage the park brake.**
- **Stop engine and remove key from ignition.**
- **Wait for all movement to stop.**




SELF-PROPELLED


a. For more crop control in light material, lower the deflector by pushing down on one side of the deflector and then on the other side. Locking handles (E) are located at either end of the deflector and may be loosened slightly.

b. For heavier crops, raise the deflector by pulling up on one side and then on the other side.

**NOTE**

*For even windrow formation, be sure the deflector is not twisted.*

### *6.17.14 Ground Speed*

## CAUTION

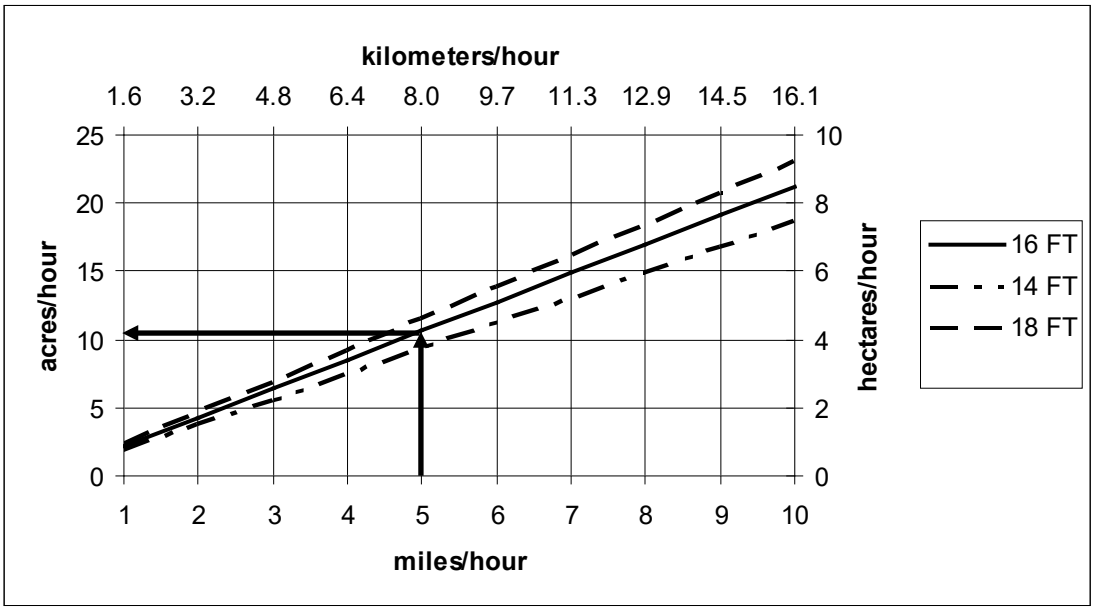
**Reduce speed when turning, crossing slopes, or when travelling over rough ground.**

a. Tractor ground speed should not exceed 8 mph (13 km/h). For most crop conditions a ground speed of 5 mph (8 km/h) has been found satisfactory.

b. Choose a ground speed that allows the sickle to cut the crop smoothly and evenly.

c. The chart below indicates the relationship between ground speed and area cut for two header sizes.

Example: At ground speed of 5 mph (8 km/h) with a 16 ft. windrower, the area cut would be approximately 10 acres (4 hectares) per hour.



### *6.17.15 Grass Seed Windrowing*

The grass seed auger header has several features to adapt it to this special application. These features include:

#### 6.17.15.1 Stub Guards and Hold-downs

The cutterbar is equipped with stub guards for effective cutting in tough grass crops. See Section 7.8.7 Sickle Guards for maintenance of these components.

#### 6.17.15.2 Special Auger Design

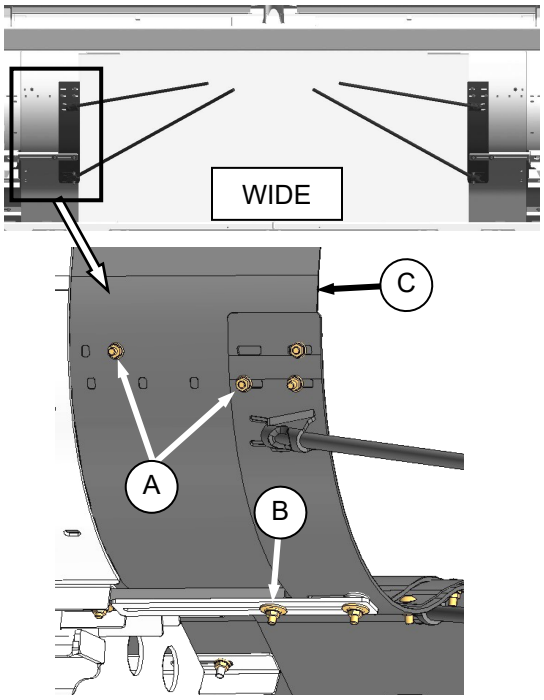
The center beaters and beater supports have been removed to reduce auger wrapping.

#### 6.17.15.3 Seven-Bat Reel

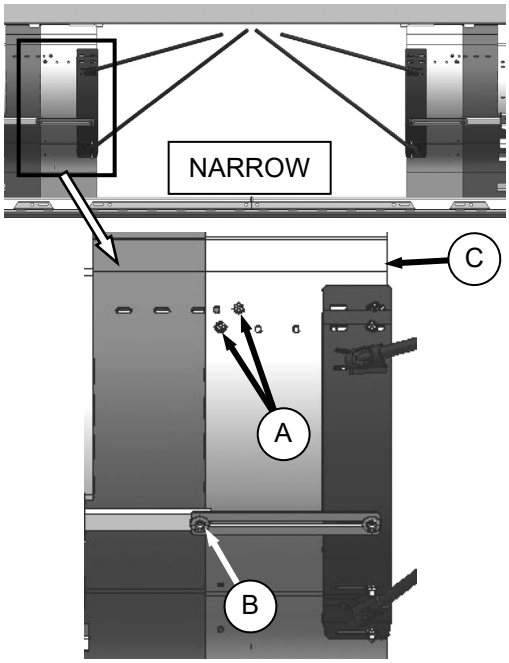
A seventh bat is added to the reel body, for smoother reel action and better crop feed into the header.

#### 6.17.15.4 Auger Pan Extensions

The grass seed header is equipped with adjustable auger pan extensions that allow adjustment of delivery opening to vary the windrow characteristics. Adjust as follows:



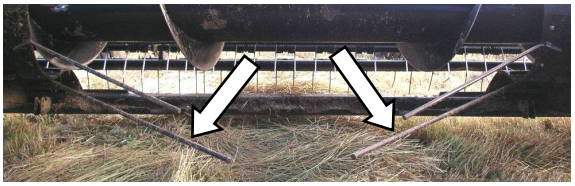

a. Remove two bolts (A), and loosen bolt (B).
b. Slide pan (C) and swath forming rods inboard to desired position and align holes.




c. Re-install two bolts (A) and tighten bolts (A) and (B).
d. Repeat for opposite pan extension.

### 6.17.15.5 Windrow Forming Rods

Forming rods are provided to assist in forming the narrow windrows preferred for this application.



a. Bend the rods to modify the windrow shape. Use the forming rods in conjunction with the auger pan extensions to achieve the width and shape of windrows you desire.

## 6.18 HAYING TIPS

### 6.18.1 Curing

a. A quick cure will maintain top quality because:
   - 5% of the protein is lost for each day hay lies on the ground,
   - The sooner the cut hay is off, the earlier the start for next growth.

b. Leaving the windrow as wide and thin as possible makes for the quickest curing

c. The cured hay should be baled as soon as possible.

### 6.18.2 Topsoil Moisture

a. On wet soil, the general rule of "wide and thin" does not apply. A narrower windrow will dry faster than hay left flat on wet ground.

b. When the ground is wetter than the hay, moisture from the soil is absorbed by the hay above it. Determine topsoil moisture level before cutting. Use a moisture tester or estimate level:

| LEVEL | % MOISTURE | CONDITION |
|---|---|---|
| Wet | Over 45 | Soil is Muddy |
| Damp | 25 – 45 | Shows Footprints |
| Dry | Under 25 | Surface is Dusty |

c. If ground is wet due to irrigation, wait until soil moisture drops below 45%.

d. If ground is wet due to frequent rains, cut when weather allows and let the forage lie on wet ground until it dries to the moisture level of the ground.

e. The cut hay will dry no more until the ground under it dries, so consider moving the windrow to drier ground.

### 6.18.3 Weather and Topography

a. Cut as much hay as possible by midday, when drying conditions are best.

b. Fields sloping south get up to 100% more exposure to the sun's heat than do north sloping fields. If hay is baled and chopped, consider baling the south facing fields and chopping those facing north.

c. When relative humidity is high, the evaporation rate is low and hay dries slower.

d. If there is no wind, saturated air becomes trapped around the windrow. Raking or tedding will expose the hay to fresher, less saturated air.

e. Cut hay perpendicular to the direction of the prevailing winds is also recommended.

### 6.18.4 Windrow Characteristics

It is recommended that a windrow with the following characteristics be produced. Refer to Section 6.17 Operating Variables, for instructions on adjusting the windrower.

| CHARACTERISTIC | ADVANTAGE |
|---|---|
| High And Fluffy | The movement of air through the windrow is more important to the curing process than direct sunlight. |
| Consistent Formation, Not Bunchy | Permits an even flow of material into the baler, chopper etc. |
| Even Distribution of Material Across Windrow | Results in even and consistent bales to minimize handling and stacking problems |
| Properly Conditioned | Prevents excessive leaf damage |

### 6.18.5 Driving On Windrow

Driving on previously cut windrows can lengthen drying time by a full day in hay that will not be raked.

If practical, set forming shields for a narrower windrow that can be straddled.

**NOTE**

*Driving on the windrow in high yielding crops may be unavoidable if a full width windrow is necessary.*

### 6.18.6 Raking and Tedding

Raking or tedding speeds up drying, however the benefits must be weighted against the additional leaf losses which will result. There is little or no advantage to raking or tedding if the ground beneath the windrow is dry.

Large windrows on damp or wet ground should be turned over when they reach 40-50% moisture. Hay should not be raked or tedded at less than 25% moisture, or excessive yield losses will result.

### 6.18.7 Chemical Drying Agents

Hay drying agents work by removing wax from legume surfaces, enabling water to escape and evaporate faster. However, treated hay lying on wet ground will also absorb ground moisture faster.

Before deciding to use a drying agent, costs and benefits relative to your area should be carefully compared.

## *6.19 STORAGE*

Do the following at the end of each operating season:

a. Clean the windrower thoroughly.

**CAUTION**

**Never use gasoline, naphtha or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.**

**CAUTION**

**Cover cutterbar and sickle guards to prevent injury from accidental contact.**

b. Store in a dry, protected place if possible. If stored outside, always cover windrower with a waterproof canvas or other protective material.

c. Raise header and engage lift cylinder lock-outs.

d. If possible, block up the windrower to take weight off tires.

e. Repaint all worn or chipped painted surfaces to prevent rust.

f. Loosen drive belts.

g. Lubricate the windrower thoroughly, leaving excess grease on fittings to keep moisture out of bearings. Apply grease to exposed threads, cylinder rods and sliding surfaces of components. Oil sickle components to prevent rust.

h. Check for worn components and repair.

i. Check for broken components and order replacement from your dealer. Attention to these items right away will save time and effort at beginning of next season.

j. Replace or tighten any missing or loose hardware. Refer to Section 6.5, Recommended Torques.

k. Remove divider rods (if equipped) to reduce space required for inside storage.

# 7 MAINTENANCE/SERVICE

The following instructions are provided to assist the operator in the use of the windrower. Detailed maintenance, service, and parts information are contained in the Service Instruction Manual and Parts Catalog that are available from your dealer.

## *7.1 PREPARATION FOR SERVICING*

### CAUTION

**To avoid personal injury, before servicing windrower or opening drive covers:**

a. Fully lower the windrower. If necessary to service in the raised position, always engage lift cylinder stops.
b. Disengage PTO (pull-type).
c. Stop engine and remove key.
d. Engage park brake.
e. Wait for all moving parts to stop.

## *7.2 RECOMMENDED SAFETY PROCEDURES*

- **Park on level surface when possible. Block wheels securely if windrower is parked on an incline. Follow all recommendations in your Tractor Operator's Manual.**
- **Wear close-fitting clothing and cover long hair. Never wear dangling items such as scarves or bracelets.**
- **Wear protective shoes with slip-resistant soles, a hard hat, protective glasses or goggles and heavy gloves.**
- **If more than one person is servicing the machine at the same time, be aware that rotating a driveline or other mechanically driven component by hand (for example, accessing a lube fitting) will cause drive components in other areas (belts, pulleys, and sickle) to move. Stay clear of driven components at all times.**
- **Be prepared if an accident should occur. Know where the first aid kit and fire extinguishers are located and how to use them.**
- **Keep the service area clean and dry. Wet or oily floors are slippery. Wet spots can be dangerous when working with electrical equipment. Be sure all electrical outlets and tools are properly grounded.**
- **Use adequate light for the job at hand.**
- **Replace all shields removed or opened for service.**
- **Use only service and repair parts made or approved by the equipment manufacturer. Substituted parts may not meet strength, design or safety requirements.**
- **Keep the machine clean. Never use gasoline, naphtha or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.**

## *7.3 MAINTENANCE SPECIFICATIONS*

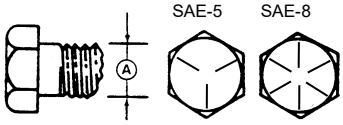
### *7.3.1 Recommended Torques*

- Tighten all bolts to the torques specified in chart unless otherwise noted throughout this manual.
- Check tightness of bolts periodically, using bolt torque chart as a guide.
- Replace hardware with the same strength bolt.
- Torque figures are valid for non-greased or non-oiled threads and heads unless otherwise specified. Do not grease or oil bolts or capscrews unless specified in this manual. When using locking elements, increase torque values by 5%.

#### 7.3.1.1 SAE Bolts

| BOLT DIA. "A" in. | NC BOLT TORQUE* | | | |
|---|---|---|---|---|
| | SAE 5 | | SAE 8 | |
| | lbf·ft | N·m | lbf·ft | N·m |
| 1/4 | 9 | 12 | 11 | 15 |
| 5/16 | 18 | 24 | 25 | 34 |
| 3/8 | 32 | 43 | 41 | 56 |
| 7/16 | 50 | 68 | 70 | 95 |
| 1/2 | 75 | 102 | 105 | 142 |
| 9/16 | 110 | 149 | 149 | 202 |
| 5/8 | 150 | 203 | 200 | 271 |
| 3/4 | 265 | 359 | 365 | 495 |
| 7/8 | 420 | 569 | 600 | 813 |
| 1 | 640 | 867 | 890 | 1205 |

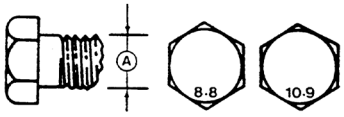
* Torque categories for bolts and capscrews are identified by their head markings.



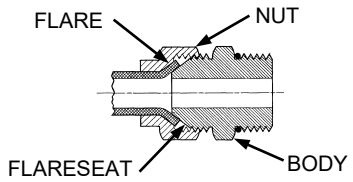

#### 7.3.1.2 Metric Bolts

| BOLT DIA. "A" | NC BOLT TORQUE* | | | |
|---|---|---|---|---|
| | 8.8 | | 10.9 | |
| | lbf·ft | N·m | lbf·ft | N·m |
| M3 | 0.4 | 0.5 | 1.3 | 1.8 |
| M4 | 2.2 | 3 | 3.3 | 4.5 |
| M5 | 4 | 6 | 7 | 9 |
| M6 | 7 | 10 | 11 | 15 |
| M8 | 18 | 25 | 26 | 35 |
| M10 | 37 | 50 | 52 | 70 |
| M12 | 66 | 90 | 92 | 125 |
| M14 | 103 | 140 | 148 | 200 |
| M16 | 166 | 225 | 229 | 310 |
| M20 | 321 | 435 | 450 | 610 |
| M24 | 553 | 750 | 774 | 1050 |
| M30 | 1103 | 1495 | 1550 | 2100 |
| M36 | 1917 | 2600 | 2710 | 3675 |

* Torque categories for bolts and capscrews are identified by their head markings.



### 7.3.1.3 Flare Type Hydraulic Fittings




a. Check flare and flare seat for defects that might cause leakage.

b. Align tube with fitting before tightening.

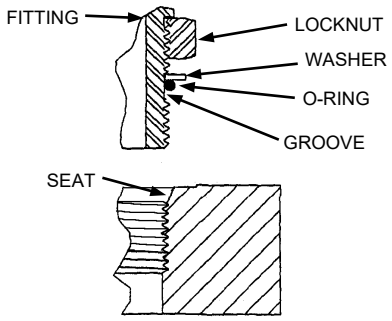
c. Lubricate connection and hand tighten swivel nut until snug.

d. To prevent twisting the tube(s), use two wrenches. Place one wrench on the connector body and with the second tighten the swivel nut to the torque shown.

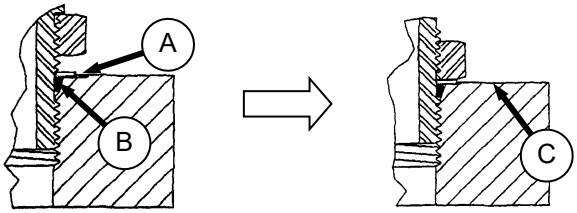
| TUBE SIZE O.D. (in.) | NUT SIZE ACROSS FLATS (in.) | TORQUE VALUE* | | RECOMMENDED TURNS TO TIGHTEN (AFTER FINGER TIGHTENING) | |
|---|---|---|---|---|---|
| | | lbf·ft | N·m | Flats | Turns |
| 3/16 | 7/16 | 6 | 8 | 1 | 1/6 |
| 1/4 | 9/16 | 9 | 12 | 1 | 1/6 |
| 5/16 | 5/8 | 12 | 16 | 1 | 1/6 |
| 3/8 | 11/16 | 18 | 24 | 1 | 1/6 |
| 1/2 | 7/8 | 34 | 46 | 1 | 1/6 |
| 5/8 | 1 | 46 | 62 | 1 | 1/6 |
| 3/4 | 1-1/4 | 75 | 102 | 3/4 | 1/8 |
| 7/8 | 1-3/8 | 90 | 122 | 3/4 | 1/8 |

* The torque values shown are based on lubricated connections as in reassembly.

### 7.3.1.4 O-ring Type Hydraulic Fittings




a. Inspect O-ring and seat for dirt or obvious defects.




b. On angle fittings, back off the lock nut until washer (A) bottoms out at top of groove (B) in fitting.

c. Hand tighten fitting until back up washer (A) or washer face (if straight fitting) bottoms on part face (C) and O-ring is seated.

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

e. Tighten straight fittings to torque shown.

f. Tighten angle fittings to torque shown in the following table while holding body of fitting with a wrench.

| THD SIZE (in.) | NUT SIZE ACROSS FLATS (in.) | TORQUE VALUE* | | RECOMMENDED TURNS TO TIGHTEN (AFTER FINGER TIGHTENING) | |
|---|---|---|---|---|---|
| | | lbf·ft | N·m | Flats | Turns |
| 3/8 | 1/2 | 6 | 8 | 2 | 1/3 |
| 7/16 | 9/16 | 9 | 12 | 2 | 1/3 |
| 1/2 | 5/8 | 12 | 16 | 2 | 1/3 |
| 9/16 | 11/16 | 18 | 24 | 2 | 1/3 |
| 3/4 | 7/8 | 34 | 46 | 2 | 1/3 |
| 7/8 | 1 | 46 | 62 | 1-1/2 | 1/4 |
| 1-1/16 | 1-1/4 | 75 | 102 | 1 | 1/6 |
| 1-3/16 | 1-3/8 | 90 | 122 | 1 | 1/6 |
| 1-5/16 | 1-1/2 | 105 | 142 | 3/4 | 1/8 |
| 1-5/8 | 1-7/8 | 140 | 190 | 3/4 | 1/8 |
| 1-7/8 | 2-1/8 | 160 | 217 | 1/2 | 1/12 |

* The torque values shown are based on lubricated connections as in reassembly.

### *7.3.2 Recommended Fluids and Lubricants*

Your machine can operate at top efficiency only if clean lubricants are used.

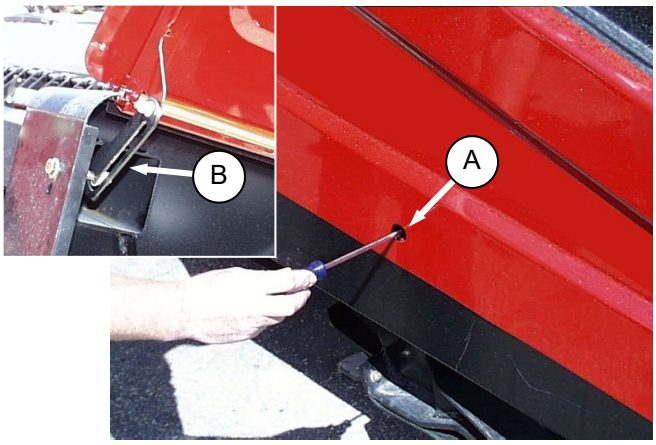
- Use clean containers to handle all lubricants.
- Store in an area protected from dust, moisture, and other contaminants.

| LUBRICANT | SPEC | DESCRIPTION | USE | CAPACITIES |
|---|---|---|---|---|
| Grease | SAE Multi-Purpose | High Temp. Extreme Pressure (EP2) Performance With 1% Max Molybdenum Disulphide (NLGI Grade 2). Lithium Base | As Required Unless Otherwise Specified. | -- |
| | | High Temp. Extreme Pressure (EP) Performance With 10% Max Molybdenum Disulphide (NLGI Grade 2). Lithium Base | Driveline Slip-Joints | -- |
| Gear Lubricant | SAE 85W-140 | API Service Class GL-5 | Wobble Box | 2.3 qts (2.2 liters) |
| | | | Conditioner Drive Gearbox | 1.5 qts (1.4 liters) |
| Hydraulic Oil | SAE 15W40 | Compliant With SAE Specs For API Class SJ And CH-4 Engine Oil. | Steering, Lift, and Header Drive Systems Reservoir | 33 gal. US (126 liters) |

### *7.3.3 Conversion Chart*

| QUANTITY | INCH-POUND UNITS | | FACTOR | SI UNITS (METRIC) | |
|---|---|---|---|---|---|
| | UNIT NAME | ABBR. | | UNIT NAME | ABBR. |
| Area | acres | acres | x 0.4047 = | hectares | ha |
| Flow | US gallons per minute | (gpm) | x 3.7854 = | liters per min | L/min |
| Force | pounds force | lbf | x 4.4482 = | Newtons | N |
| Length | inch | in. | x 25.4 = | millimeters | mm |
| | foot | ft | x 0.305 = | meters | m |
| Power | horsepower | hp | x 0.7457 = | kilowatts | kW |
| Pressure | pounds per square inch | psi | x 6.8948 = | kilopascals | kPa |
| | | | x .00689 = | megapascals | MPa |
| Torque | pound feet or foot pounds | lbf·ft or ft·lbf | x 1.3558 = | newton meters | N·m |
| | pound inches or inch pounds | lbf·in. or in·lbf | x 0.1129 = | newton meters | N·m |
| Temperature | degrees Fahrenheit | ˚F | (F- 32) x 0.56 = | Celsius | ˚C |
| Velocity | feet per minute | ft/min | x 0.3048 = | meters per min | m/min |
| | feet per second | ft/s | x 0.3048 = | meters per sec | m/s |
| | miles per hour | mph | x 1.6063 = | kilometers per hour | km/h |
| Volume | US gallons | US gal. | x 3.7854 = | liters | L |
| | ounces | oz. | x 29.5735 = | milliliters | ml |
| | cubic inches | $in.^3$ | x 16.3871 = | cubic centimeters | $cm^3$ or cc |
| Weight | pounds | lb | x 0.4536 = | kilograms | kg |

## 7.4 DRIVE SHIELDS

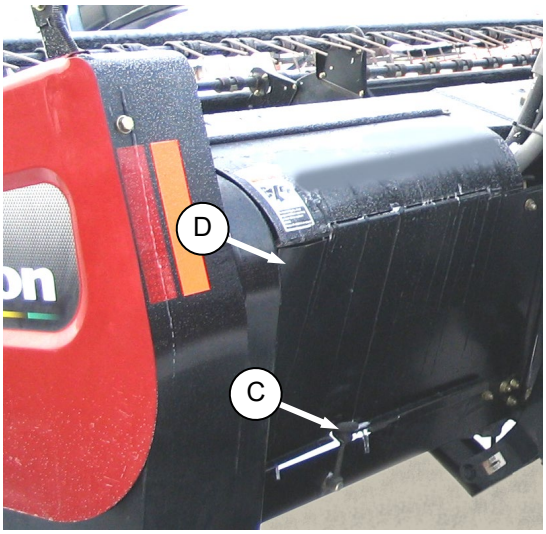



a. To open the LH and right drive shields on the header, press a screwdriver against latch in opening at (A).

**CAUTION**

**Ensure shield lock engages in the open position as shown at (B) before letting go of shield.**

b. To close, push shield slightly farther open and move lock (B) out of engagement slot. Lower shield by hand and release about 12” from fully closed position. Shield will self-latch.




c. To open the driveline shield, disengage rubber latch (C) and open shield (D).

d. To close, lower shield and engage rubber latch.

## 7.5 LIFT CYLINDER LOCK-OUTS

### 7.5.1 Self-Propelled

Refer to M100, or M150 & M200 Self-Propelled Windrower Operator’s Manuals.

### 7.5.2 Pull-Type

**DANGER**

**To avoid bodily injury or death from unexpected start-up or fall of raised machine; stop engine, remove key and engage lift cylinder lock-out valves before going under machine for any reason.**

a. Raise the header fully, shut off engine and remove key.

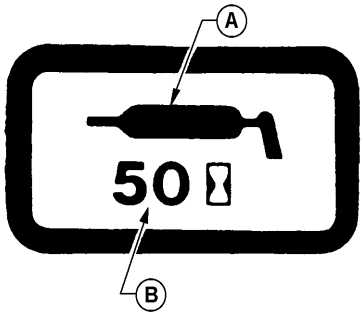
b. Move handle to horizontal position on both header lift cylinder lock-out valves.

## 7.6 LUBRICATION

**CAUTION**

**To avoid personal injury, before servicing windrower or opening drive covers, follow procedures in Section 6.1, Preparation for Servicing.**

Refer to Section 6.4, Recommended Lubricants for recommended greases.




SAMPLE GREASE DECAL

The greasing points are marked on the machine by decals showing a grease gun (A), and grease interval (B) in hours of operation. Log hours of operation and use the "Maintenance Checklist" provided to keep a record of scheduled maintenance. Refer to Section 7.17, Maintenance Schedule.

### 7.6.1 Greasing Procedure

a. Wipe grease fitting with a clean cloth before greasing, to avoid injecting dirt and grit.
b. Inject grease through fitting with grease gun until grease overflows fitting, except where noted.
c. Leave excess grease on fitting to keep out dirt.
d. Replace any loose or broken fittings immediately.
e. If fitting will not take grease, remove and clean thoroughly. Also clean lubricant passageway. Replace fitting if necessary.

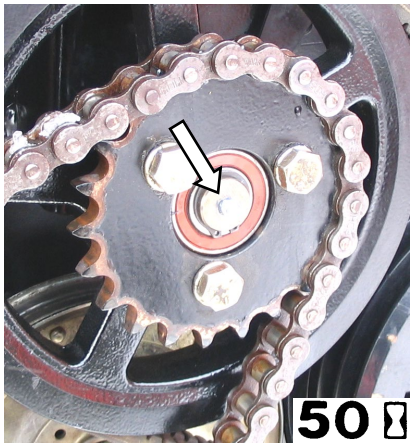
### 7.6.2 Lubrication Points

The lubrication requirements depend on the model of windrower that is being serviced. Refer to the specified pages for identifying lubrication points for your specific model.

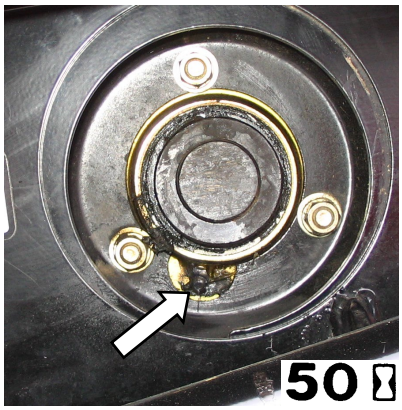
## I. A30-S HEADERS

High Temp. Extreme Pressure (EP2) Performance With 1% Max Molybdenum Disulphide (NLGI Grade 2).Lithium Base

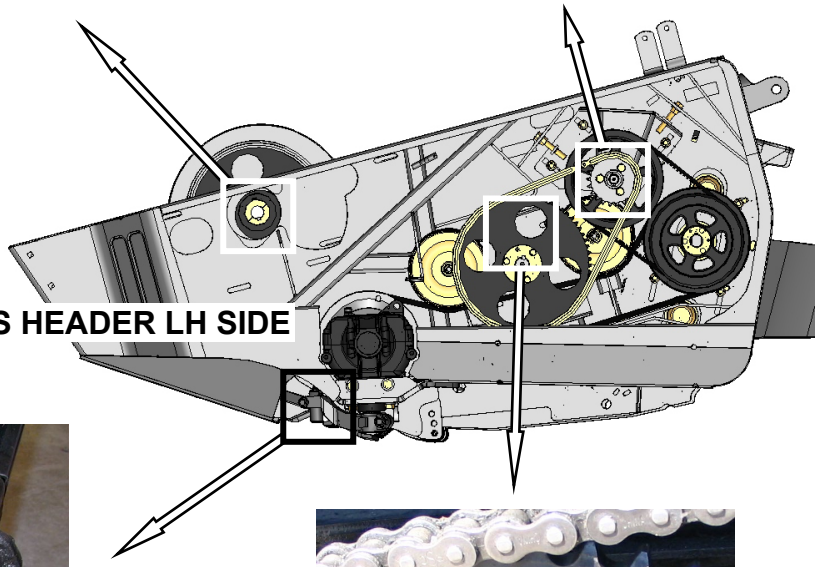




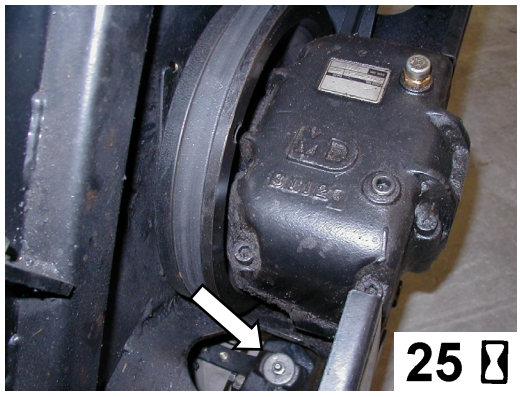

AUGER DRIVE BEARING (1 PLC)




REEL SHAFT BEARING (1 PLC)



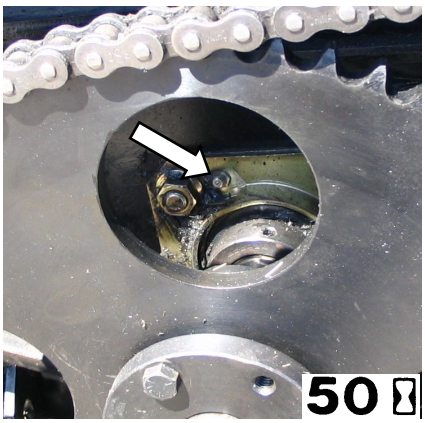
**A30-S HEADER LH SIDE**




SICKLE HEAD BEARING (1 PLC)

**NOTE**

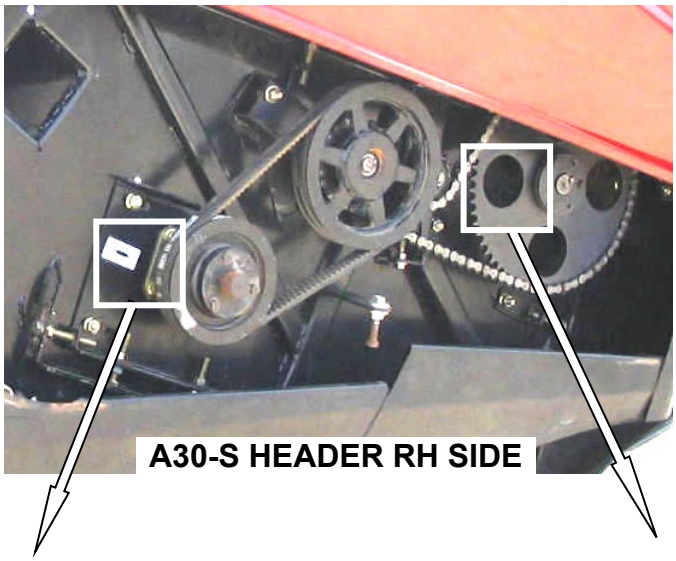
To prevent binding and/or excessive wear caused by sickle pressing on guards, do not over grease. If more than 6 to 8 pumps of the grease gun are required to fill the cavity, replace the seal in the sickle head.

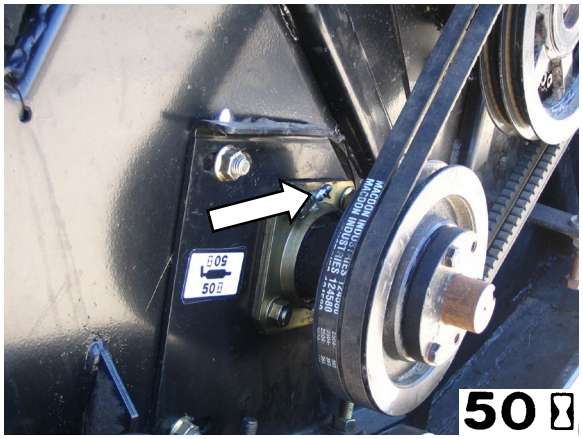



AUGER SHAFT BEARING (1 PLC)

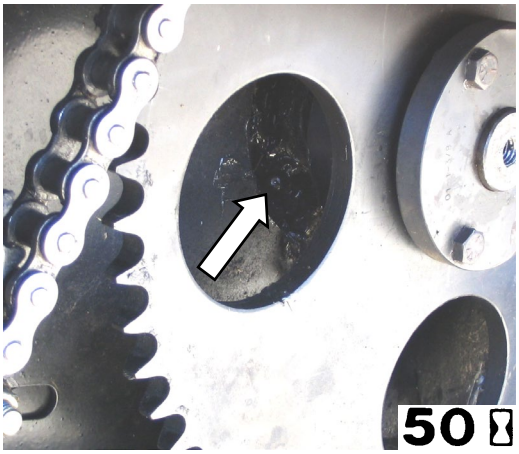
**A30-S HEADERS** (Cont'd)

High Temp. Extreme Pressure (EP2) Performance With 1% Max Molybdenum Disulphide (NLGI Grade 2).Lithium Base



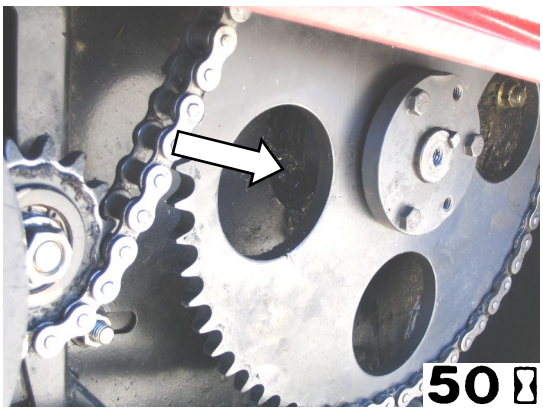

AUGER SHAFT BEARING (1 PLC)



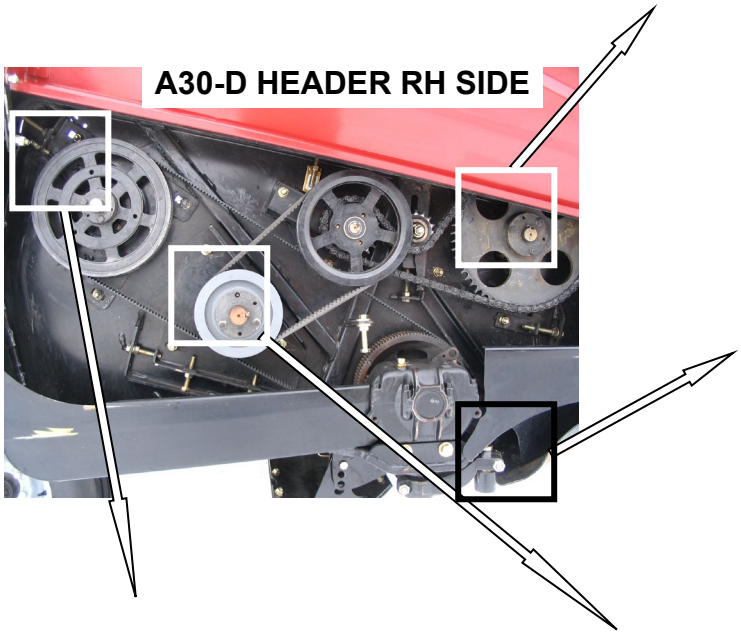

REEL SHAFT BEARING (1 PLC)

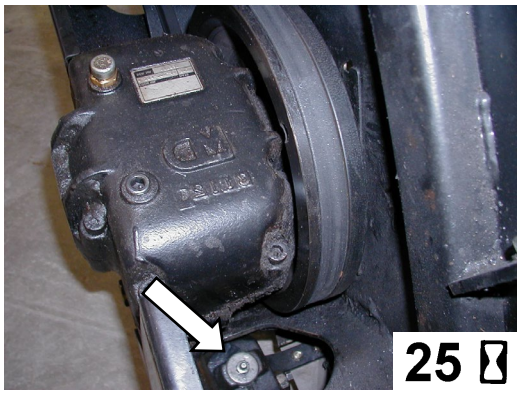
## II. A30-D HEADERS

High Temp. Extreme Pressure (EP2) Performance With 1% Max Molybdenum Disulphide (NLGI Grade 2).Lithium Base




REEL SHAFT BEARING (1 PLC)

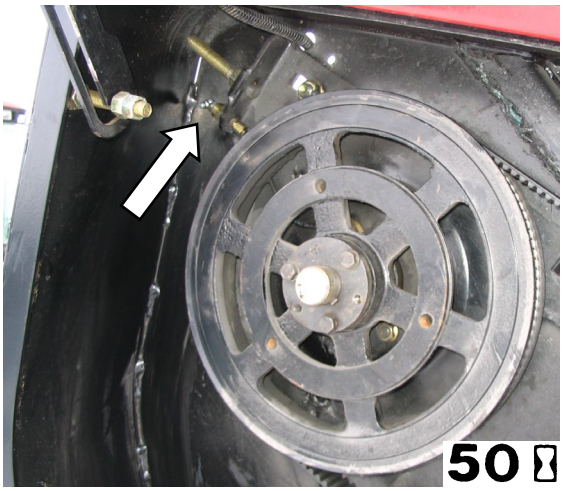


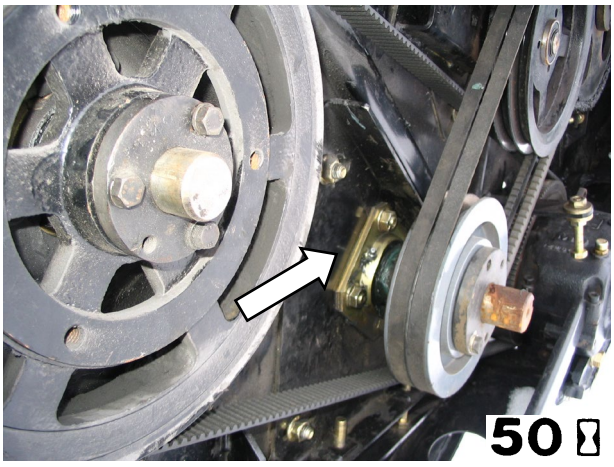

SICKLE HEAD BEARING (1 PLC)

**NOTE**

To prevent binding and/or excessive wear caused by sickle pressing on guards, do not over grease. If more than 6 to 8 pumps of the grease gun are required to fill the cavity, replace the seal in the sickle head.



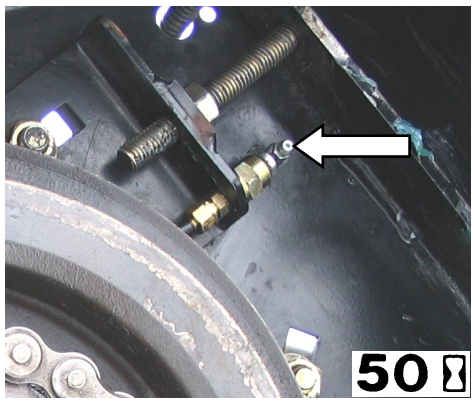

SICKLE DRIVE BEARING (1 PLC)



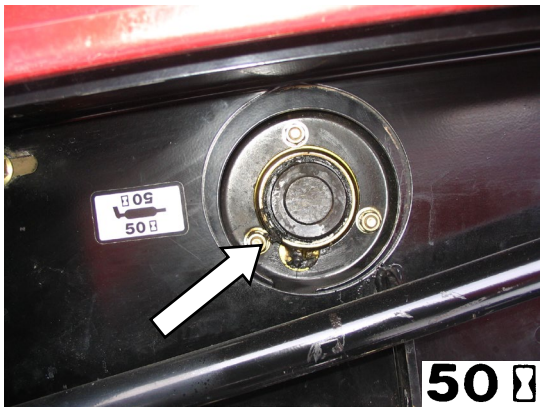

AUGER SHAFT BEARING (1 PLC)

## *A30-D HEADERS (Cont'd)*

High Temp. Extreme Pressure (EP2) Performance With 1% Max Molybdenum Disulphide (NLGI Grade 2).Lithium Base

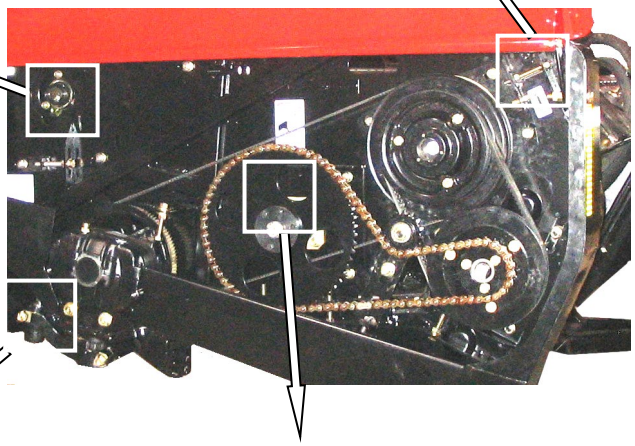


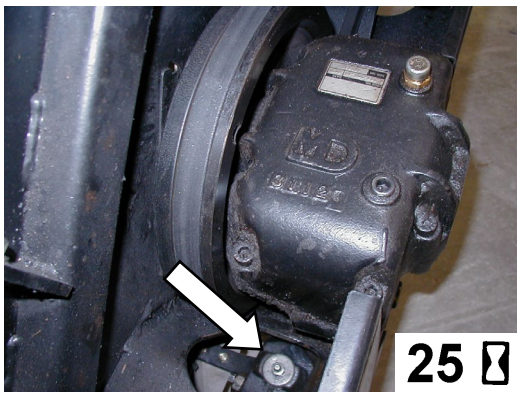

CROSS SHAFT BEARING (1 PLC)




REEL SHAFT BEARING (1 PLC)

**A30-D HEADER LH SIDE**

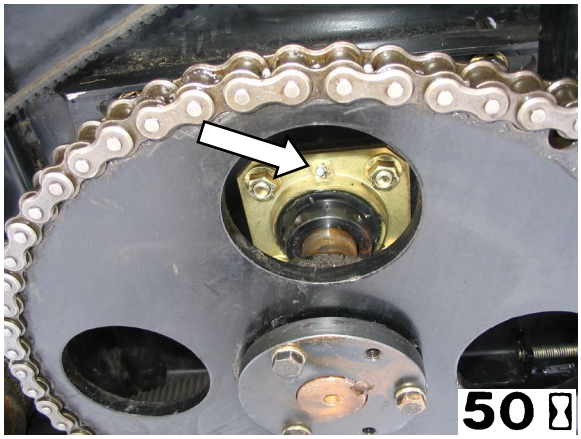





SICKLE HEAD BEARING (1 PLC)

**NOTE**

To prevent binding and/or excessive wear caused by sickle pressing on guards, do not over grease. If more than 6 to 8 pumps of the grease gun are required to fill the cavity, replace the seal in the sickle head.

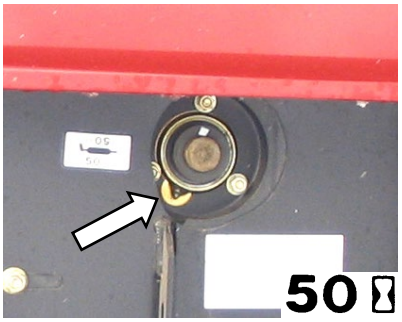



AUGER SHAFT BEARING (1 PLC)

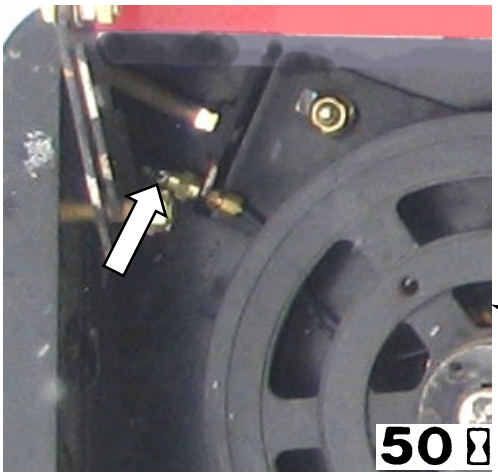
## III. A40-D HEADERS

High Temp. Extreme Pressure (EP2) Performance With 1% Max Molybdenum Disulphide (NLGI Grade 2).Lithium Base

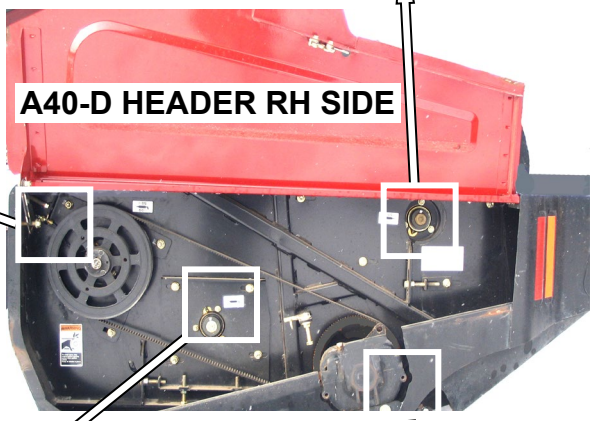


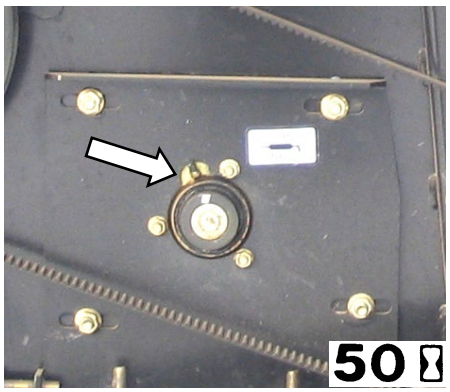



REEL SHAFT BEARING (1 PLC)

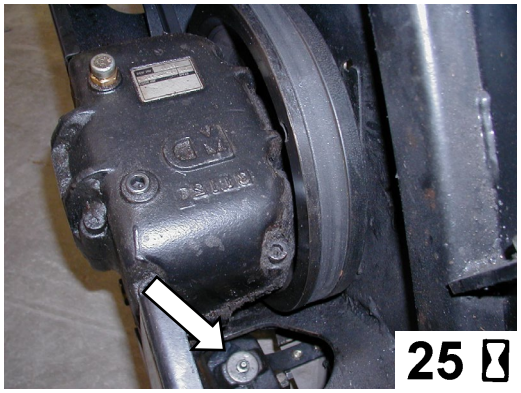



SICKLE DRIVE BEARING (1 PLC)




AUGER SHAFT BEARING (1 PLC)



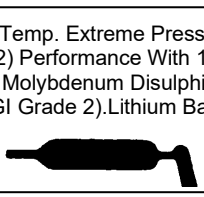

SICKLE HEAD BEARING (1 PLC)

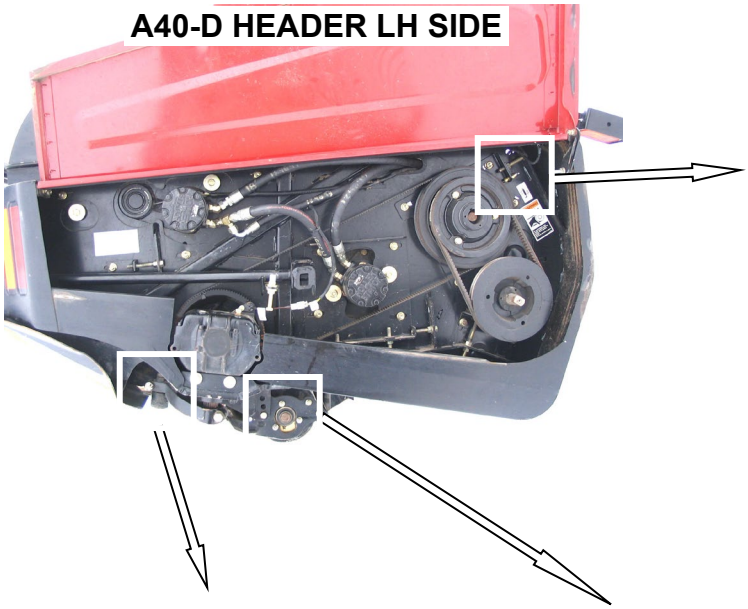
**NOTE**

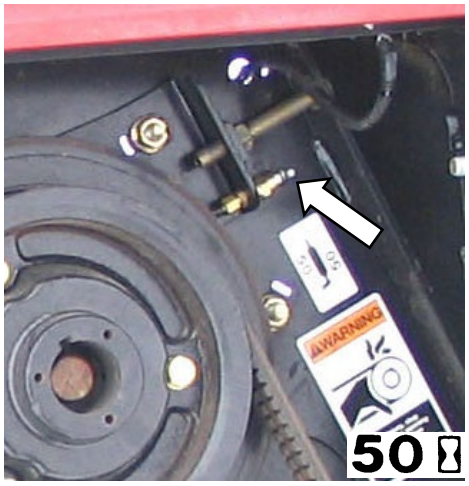
To prevent binding and/or excessive wear caused by sickle pressing on guards, do not over grease. If more than 6 to 8 pumps of the grease gun are required to fill the cavity, replace the seal in the sickle head.

## *A40-D HEADERS (Cont'd)*

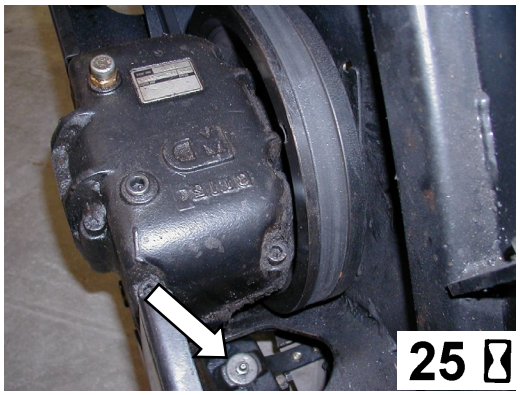
High Temp. Extreme Pressure (EP2) Performance With 1% Max Molybdenum Disulphide (NLGI Grade 2).Lithium Base






SICKLE DRIVE BEARING (1 PLC)




SICKLE HEAD BEARING (1 PLC)

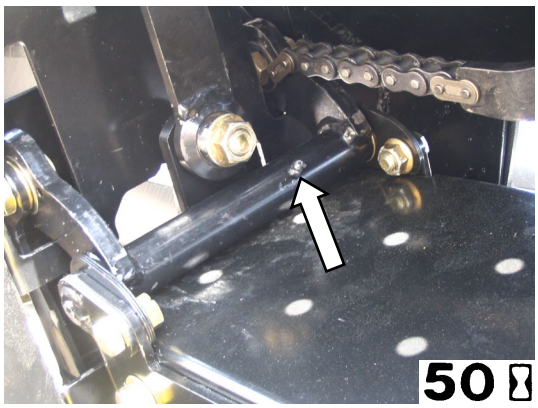

GAUGE ROLLER BEARINGS (2 PLCS)
BOTH SIDES – IF INSTALLED

**NOTE**

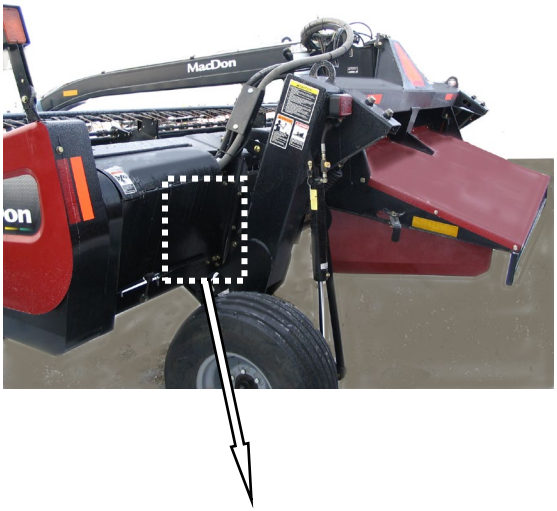
To prevent binding and/or excessive wear caused by sickle pressing on guards, do not over grease. If more than 6 to 8 pumps of the grease gun are required to fill the cavity, replace the seal in the sickle head.

## IV. HAY CONDITIONER

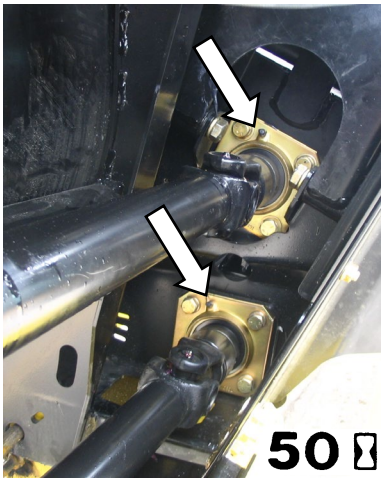
High Temp. Extreme Pressure (EP2) Performance With **1% Max** Molybdenum Disulphide (NLGI Grade 2).Lithium Base



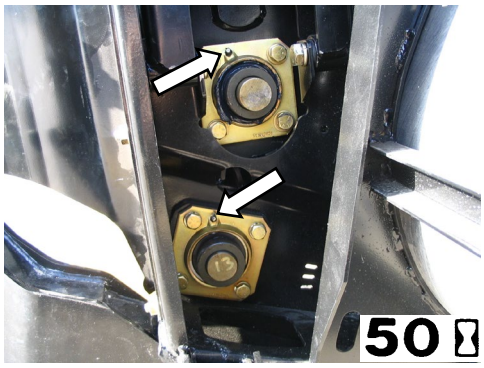

ROLL PIVOT (1 PLC BOTH SIDES)





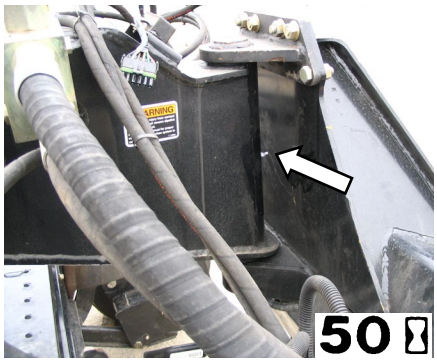



ROLL SHAFT BEARINGS (2 PLCS)

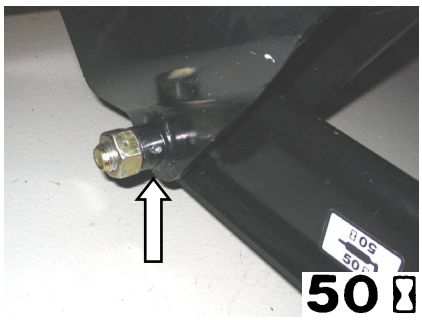


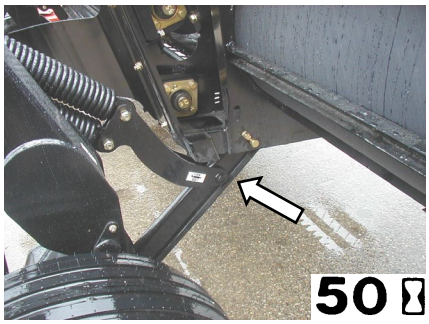

ROLL SHAFT BEARINGS (2 PLCS)

## V. PULL TYPE CARRIER FRAME

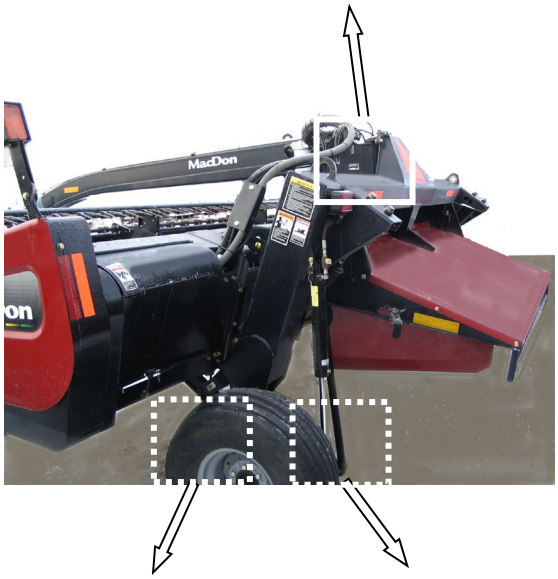



TONGUE PIVOT (1 PLC)

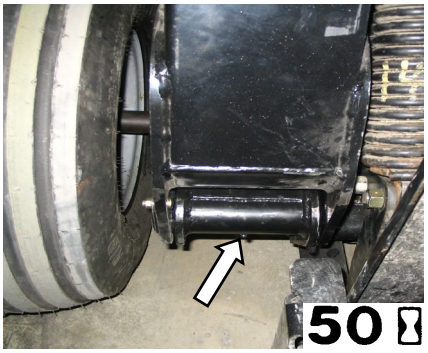


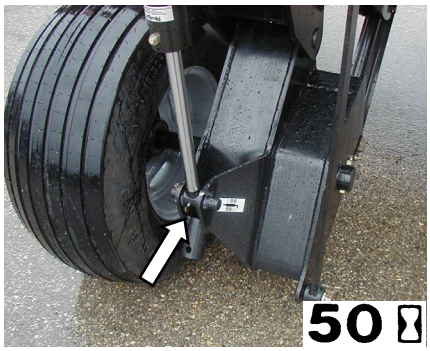

FLOAT LINK (2 PLCS) BOTH SIDES



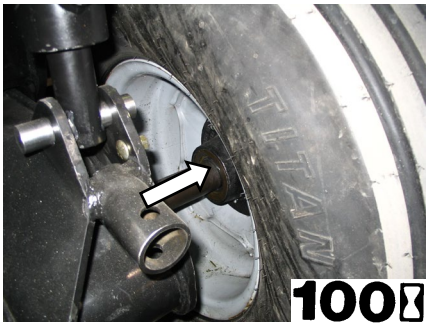





FRAME/HEADER PIVOT
(1 PLC) BOTH SIDES




LIFT CYL ATTACH
(1 PLC LH SIDE)

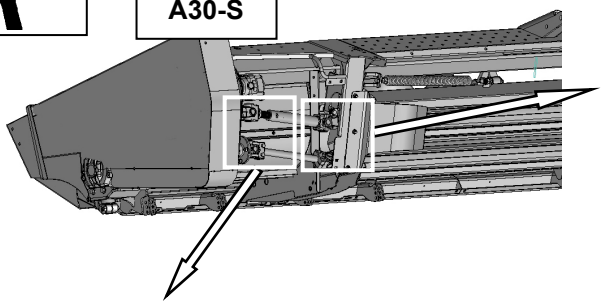


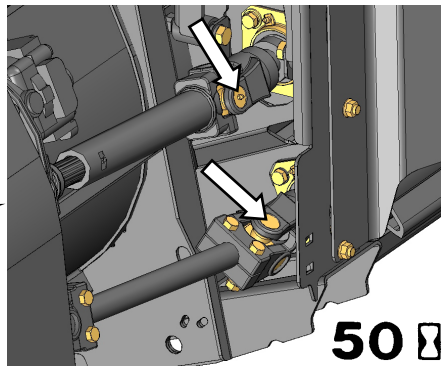

WHEEL BEARINGS
(1 PLC BOTH SIDES)

## VI. DRIVELINES

High Temp. Extreme Pressure (EP2) Performance With 1% Max Molybdenum Disulphide (NLGI Grade 2).Lithium Base

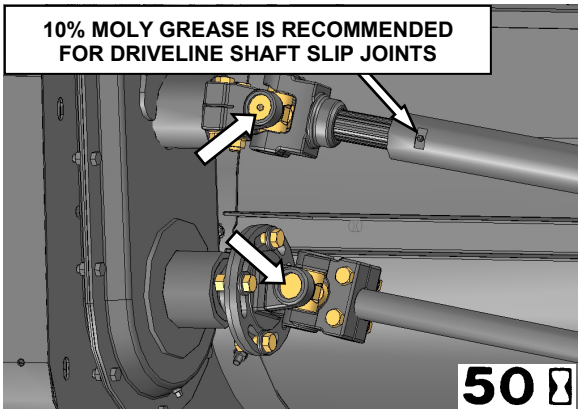
**A30-S**



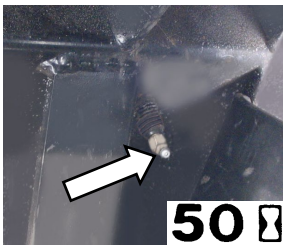



DRIVELINE UNIVERSALS (2 PLCS)

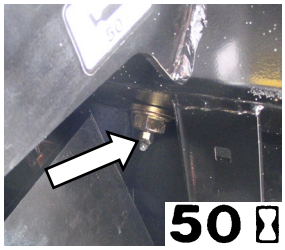
**10% MOLY GREASE IS RECOMMENDED FOR DRIVELINE SHAFT SLIP JOINTS**




DRIVELINE UNIVERSALS (2 PLCS)
DRIVELINE SHAFTS (1 PLC)

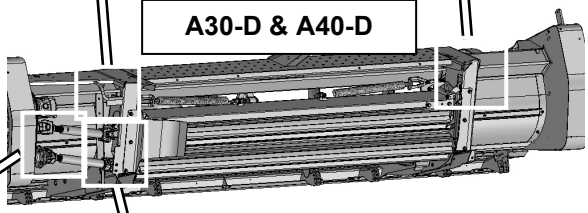



CROSS SHAFT (1 PLC)

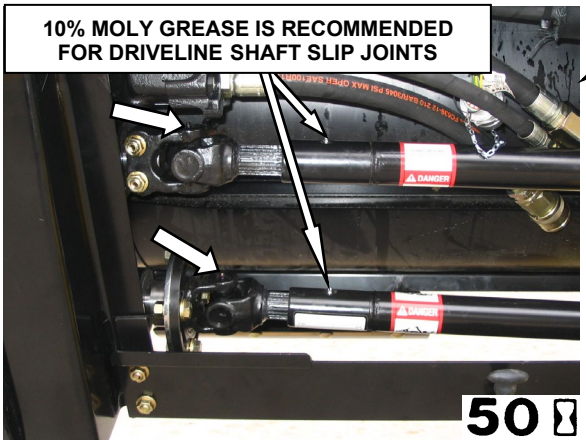



CROSS SHAFT (1 PLC)

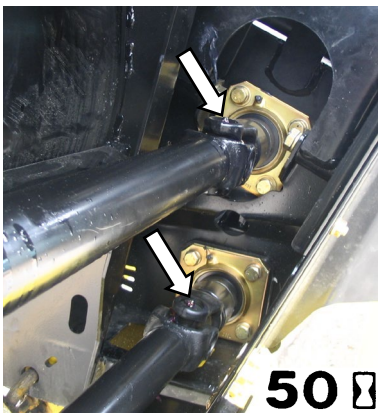
**A30-D & A40-D**



**10% MOLY GREASE IS RECOMMENDED FOR DRIVELINE SHAFT SLIP JOINTS**




DRIVELINE UNIVERSALS (2 PLCS)
DRIVELINE SHAFTS (2 PLCS)

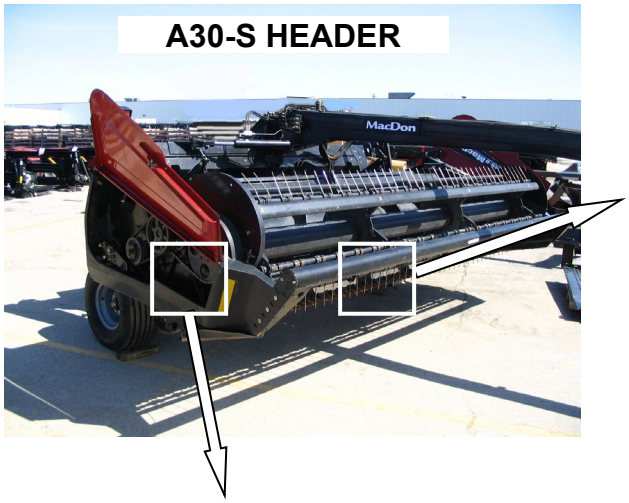


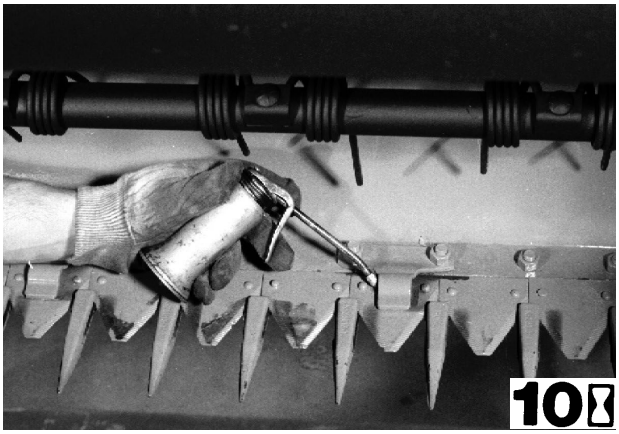

DRIVELINE UNIVERSALS (2 PLCS)

## VII. OILING REQUIREMENTS

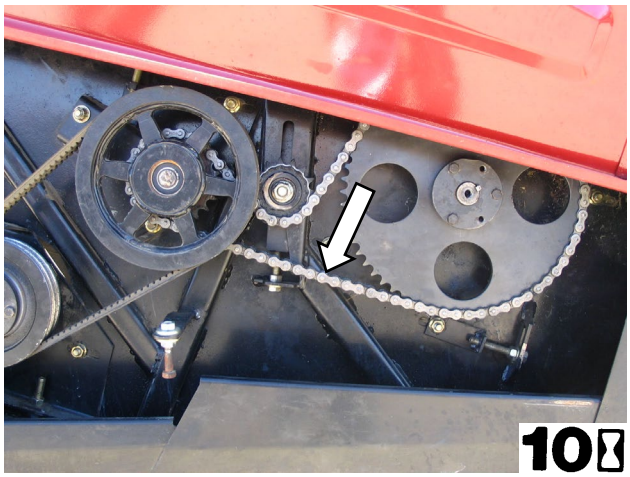
Refer to the following illustration for identifying the various locations that require lubrication. See Section 6.4 Recommended Fluids and Lubricants, for proper oil.

Apply oil to upper edge of lower spans when oiling chains.

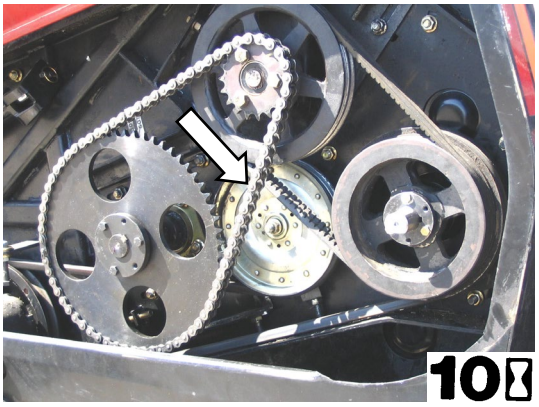



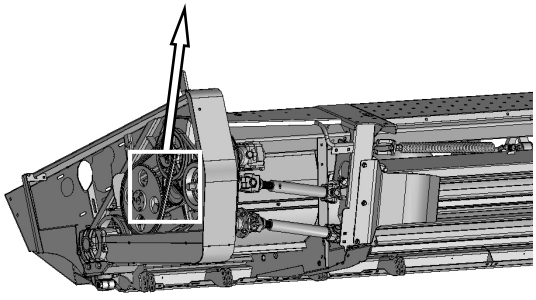

OIL KNIFE DAILY EXCEPT IN SANDY SOIL




REEL DRIVE CHAIN (1 PLC)



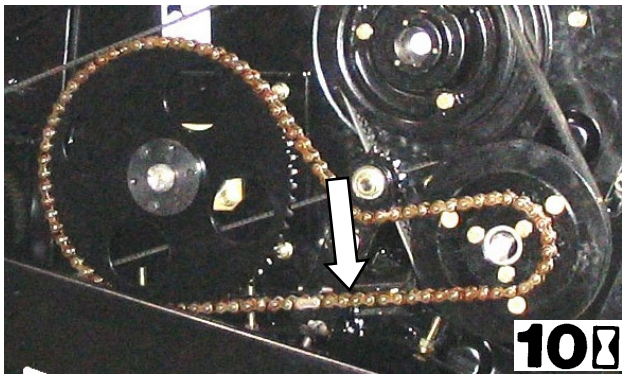

AUGER DRIVE CHAIN (1 PLC)



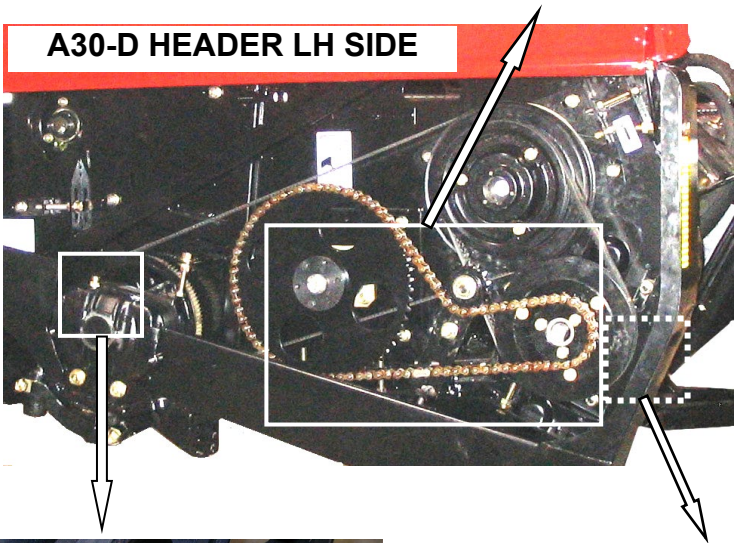
**A30-S HEADER LH SIDE**

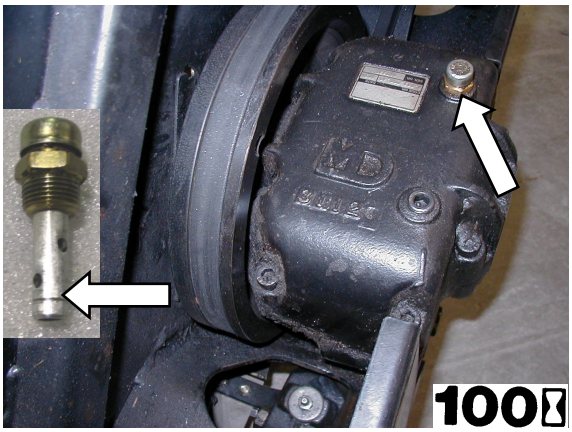
**OILING** (Cont'd)

SAE 30

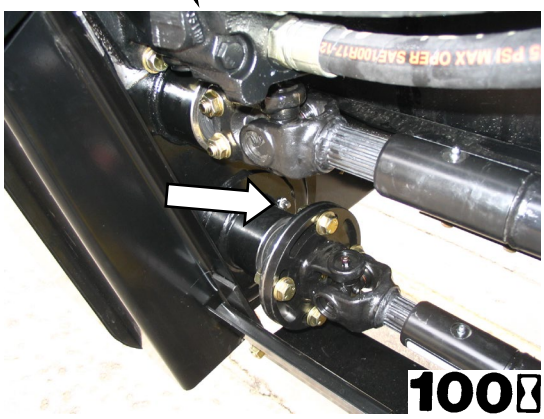



AUGER DRIVE CHAIN (1 PLC)



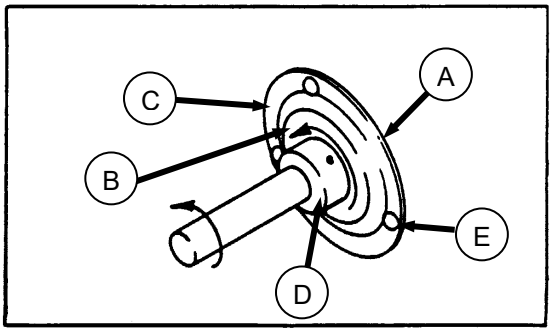

WOBBLE BOX
(A30-S 1 PLC) (A30-D/A40-D 2 PLCS)
(CHECK OIL LEVEL WITH TOP OF
WOBBLE BOX HORIZONTAL)




CHECK ROLL GEARBOX (1 PLC)

### *7.6.3 Sealed Bearing Installation*

a. Clean shaft and coat with rust preventative.




b. Install flangette (A), bearing (B), second flangette (C) and lock collar (D).

**NOTE**

*The locking cam is only on one side of the bearing.*

c. Install (but do not tighten) the flangette bolts (E).

d. When the shaft is correctly located, lock the lock collar with a punch.

**NOTE**

*The collar should be locked in the same direction the shaft rotates. Tighten the set screw in the collar.*

e. Tighten the flangette bolts (E).

f. Loosen the flangette bolts on the mating bearing one turn and re-tighten. This will allow the bearing to line up.

## 7.7 HYDRAULICS

### 7.7.1 Hydraulics – Self-Propelled

Refer to M100, or M150 & M200 Self-Propelled Windrower Operator's Manual for hydraulic system maintenance procedures for self-propelled windrowers.

### 7.7.2 Hydraulics – Pull-Type

The pull-type windrower is hydraulically powered using the following systems:

- A self-contained hydraulic system to operate the header functions.
- The tractor remote system to operate the header lift cylinders and steering.

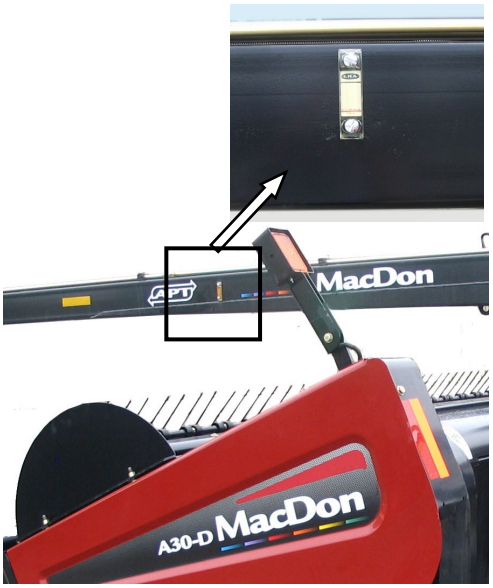
**WARNING**

**Do not use remote hydraulic system pressures over 3000 psi (20684 kPa). Check your tractor manual for remote system pressure.**

#### 7.7.2.1 Reservoir

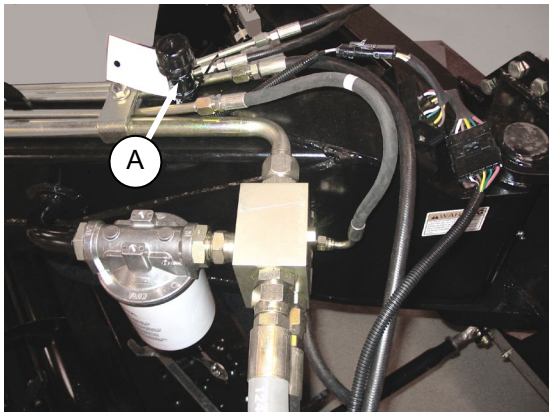
The windrower's self-contained hydraulic system uses the APT of the machine for the hydraulic oil reservoir.

#### 7.7.2.2 Oil Level




Check oil level daily (before start-up) at the sight gauge on the left side of the APT. Oil level should be at or near FULL mark on the gauge when top surface of APT is level and oil is cold.

#### 7.7.2.3 Adding Hydraulic Oil




a. Slowly unscrew filler cap (A) from filler tube.
b. Add SAE 15W40 oil until level is between ADD and FULL marks on sight gauge.
c. Replace filler cap.

#### 7.7.2.4 Changing Hydraulic Oil

**NOTE**

*Change hydraulic oil every 500 hours or 3 years.*

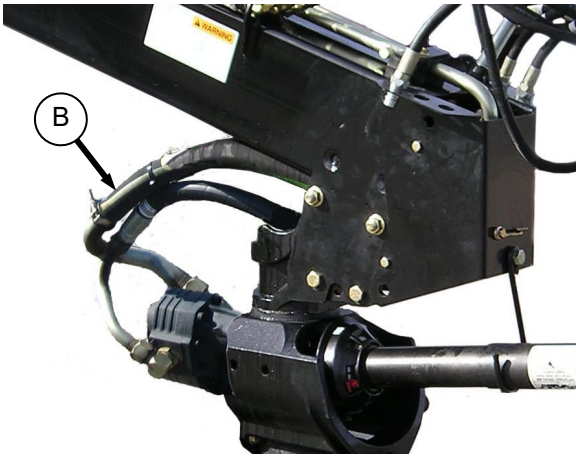
**NOTE**

*A drain pan with a capacity of 130 liters (35 U.S. gallons) will be required.*

**NOTE**

*Windrower must be disconnected from tractor. Refer to Section 5.4, Windrower/Tractor Unhook.*

a. Remove filler cap (A) at aft end of APT.

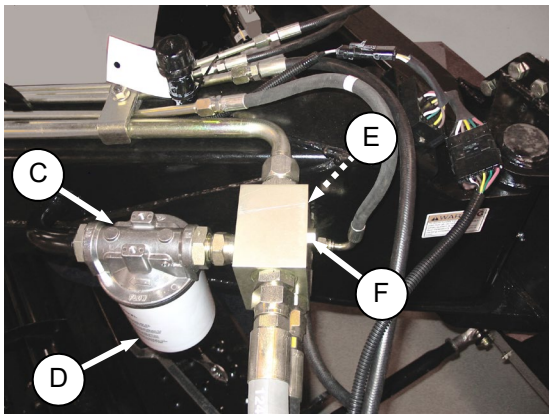



b. Disconnect the pump suction hose (B) from the pump and drain into container.
c. Reconnect pump suction hose to the pump.
d. Fill reservoir to recommended level with SAE 15W30 oil. Capacity is 33 gal. US (126 liters).

#### 7.7.2.5 Changing Hydraulic Oil Filter

**NOTE**

*Change hydraulic oil filter after the first 100 hours operation and every 250 hours thereafter.*




a. Clean around the filter head (C).
b. Remove the filter (D) and clean the gasket surface of the filter head.
c. Apply a thin film of clean oil to the gasket on the new filter.
d. Install new filter. Turn the filter onto the mount until the gasket contacts the filter head. Tighten the filter an additional 1/2 to 3/4 turn by hand.

**IMPORTANT**

*Do not use a filter wrench to install the filter. Over-tightening can damage gasket and filter.*

#### 7.7.2.6 Pressure Relief Valve

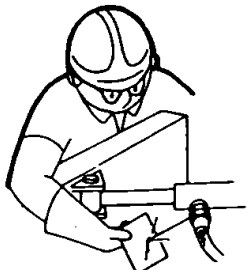
A possible cause of poor cutting performance and/or excessive heating of hydraulic oil is low relief pressure. The relief valve (E) is factory set at 4000 psi (27.6 MPa). See your dealer for adjustment or service. A pressure gauge can be installed at the gauge port (F) as shown.

### *7.7.3 Hoses and Lines*

Check hydraulic hoses and lines daily for signs of leaks.

**WARNING**

**Avoid high-pressure fluids. Escaping fluid can penetrate the skin causing serious injury. Relieve pressure before disconnecting hydraulic lines. Tighten all connections before applying pressure. Keep hands and body away from pin- holes and nozzles which eject fluids under high pressure.**



**If ANY fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type of injury or gangrene may result. Use a piece of cardboard or paper to search for leaks.**

**IMPORTANT**

*Keep hydraulic coupler tips and connectors clean. Dust, dirt, water and foreign material are the major causes of hydraulic system damage. DO NOT attempt to service hydraulic system in the field. Precision fits require WHITE ROOM CARE during overhaul.*

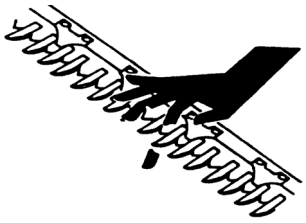
## *7.8 SICKLE AND SICKLE DRIVE*

### CAUTION

**To avoid personal injury, before servicing windrower or opening drive covers, follow procedures in Section 7.1, Preparation for Servicing.**

### WARNING

**Keep hands clear of the area between guards and sickle at all times.**



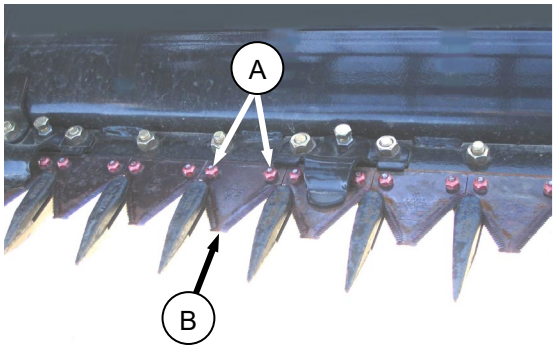
### CAUTION

**Wear heavy gloves when working around or handling sickles.**

### *7.8.1 Sickle Section Replacement*

Check daily that sections are firmly bolted to the sickle back and are not worn or broken. Replace as required. A worn or broken sickle section can be replaced without removing sickle from cutterbar.

a. Stroke sickle as required to expose sickle sections.




b. Remove lock nuts (A) and lift section (B) off of bolts.

**IMPORTANT**

*Do not mix heavy and light sickle sections on same sickle.*

c. Clean any dirt off of sickle back and position new sickle section on bolts.

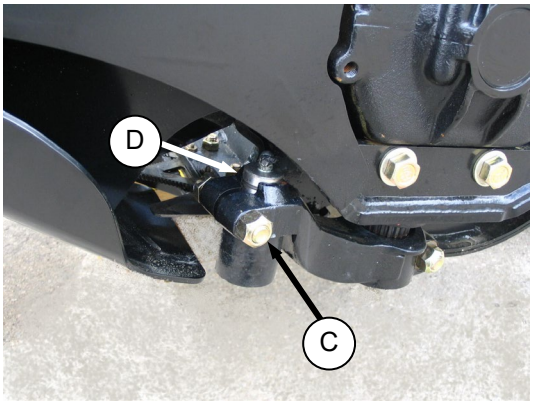
d. Secure with lock-nuts and tighten to required torque.

### *7.8.2 Sickle Removal*

**WARNING:**

**Stand to rear of sickle during removal to reduce risk of injury from cutting edges. Wear heavy gloves when handling sickle.**

a. Stroke sickle to its outer limit.




b. Clean area around sickle head and remove nut and bolt (C).

c. Remove grease zerk from pin (D).

d. Insert screwdriver in groove of pin (D) and pry up on sickle head pin to free sickle. Pin does not have to be removed from arm.

e. Pull sickle out.

f. Cover sickle head to shield bearing from dirt.

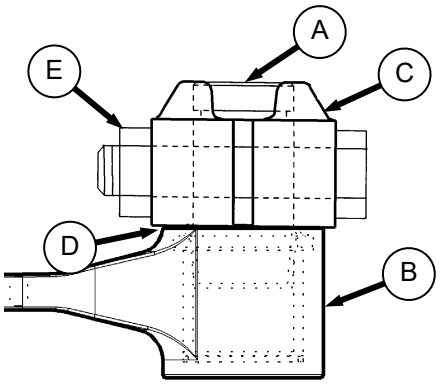
### *7.8.3 Sickle Installation*

**WARNING**

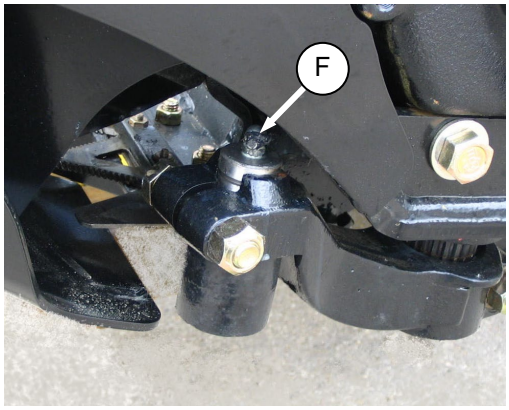
**Stand to rear of sickle during installation to reduce risk of injury from cutting edges. Wear heavy gloves when handling sickle.**

**IMPORTANT**

*Align guards and re-set sickle hold-downs while replacing sickle.*



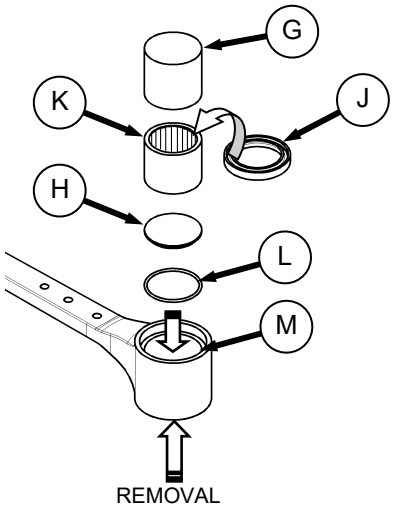

a. If sickle head pin (A) is installed in the sickle head (B), remove the pin.
b. Slide sickle into place and align sickle head (B) with pitman arm.
c. Install sickle head pin (A) in pitman arm (C) and tap it down into the sickle head, ensuring pin is bottomed out in the sickle head.
d. Tap the underside of the sickle head until the pin is flush with the upper face (C) of the pitman arm (C).
e. Carefully adjust to achieve a 0.010 in. (.25 mm) gap at (D) with the knife laying flat on the first few guards.
f. Replace bolt and nut (E).
g. Tighten nut to 160 ft·lbf (220 N·m).




h. Replace grease zerk (F) in pin.
i. Grease bearing if it has been replaced.

### *7.8.4 Sickle Head Bearing Removal*

a. Remove the sickle. See Section 7.8.2.




b. Using a flat-ended tool (G) with approximately the same diameter as the plug (H), tap out the seal (J), bearing (K), and plug (H) from the underside of the head.

**NOTE**

*The seal can be replaced without removing the bearing. When changing seal, check pin and needle bearing for wear. Replace if necessary.*

### *7.8.5 Sickle Head Bearing Installation*

a. Place O-ring (L) and plug (H) in sickle head.

**IMPORTANT**

*Assemble the bearing with the stamped end (the end with identification markings) against the tool.*

b. Using a flat-ended tool (G) with approximately the same diameter as the bearing (K), push the bearing into the sickle head until the top of the bearing is flush with the step (M) in sickle head.
c. Install seal (J) in top of sickle head with lip facing outwards.

**IMPORTANT**

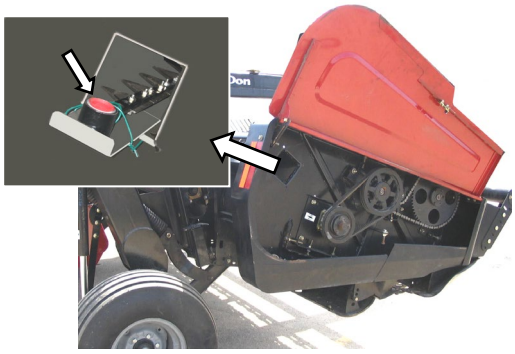
*To avoid premature sickle head or wobble box failure, be sure there is no looseness in:*

- Fit of sickle head pin and needle bearing.
- Fit of sickle head pin and pitman arm.

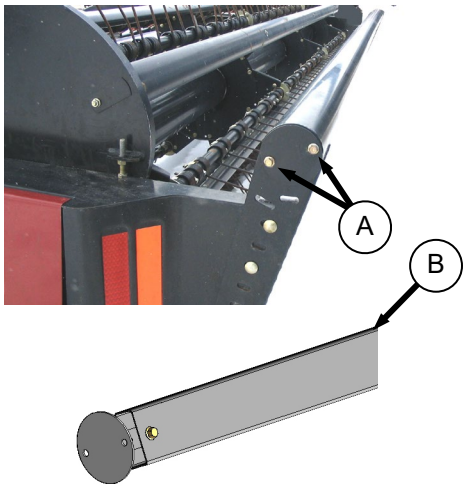
d. Install sickle.

### *7.8.6 Spare Sickle*

a. A spare sickle complete with knife head on single knife headers may be stored in the header frame tube at right end as shown. Ensure sickle is secured in place.



b. Spare knives with the knife head for double knife headers may be stored inside the lean bar. The LH knife is stored at the LH end of the lean bar and the RH knife is stored at the right end of the lean bar. To remove the knife, refer to following illustration and proceed as follows:

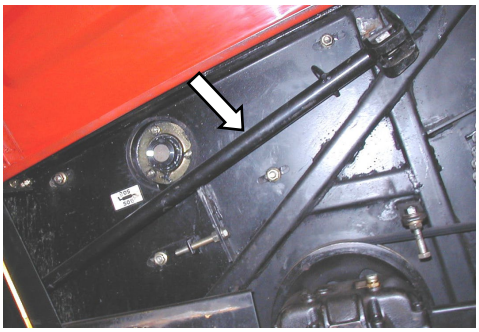



1. Remove bolts (A) from lean bar end cap.
2. Pull out end cap and plastic storage tube assembly (B) with the knife inside.
3. Slide knife from storage tube (B).
4. Replace storage tube inside lean bar.
5. Reinstall bolts (A) and tighten.

### *7.8.7 Sickle Guards*

Check daily that guards are aligned to obtain proper shear cut between sickle section and guard. Sickle sections should contact shear surface of each guard.

#### 7.8.7.1 Guard Alignment



a. Retrieve tool from LH side of header.

b. To adjust guard tips downward, position tool as shown at and push down.

DOWNWARD ADJUSTMENT

c. To adjust tips upward, position tool as shown and pull up.

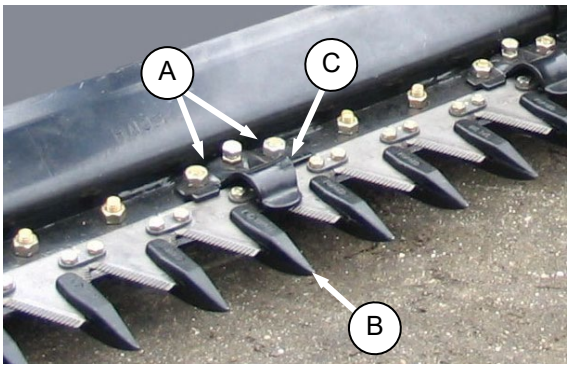
UPWARD ADJUSTMENT

**TIP:** If trouble is encountered cutting tangled, or fine-stemmed material, replace guards with stub guards. If material is tough to cut, install stub guards with top guard and adjuster plate. A stub guard conversion kit for the Windrower is available from your dealer. Refer to Section 9.5, Stub Guard Conversion Kit.

#### 7.8.7.2 Guard Replacement

Check daily that guards are firmly bolted to the cutterbar and are not worn or broken. Replace as required. A worn or broken guard can be replaced without removing sickle from cutterbar Pointed Guard Replacement -Single Knife

a. Stroke the sickle so that the sickle sections are spaced midway between the guards.



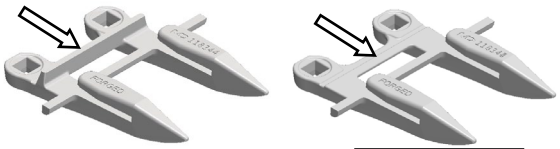

b. Remove the two nuts (A) and bolts that attach guard (B) and hold-down (C) (if applicable) to the cutterbar.

c. Remove the guard and hold-down.

d. Position new guard and on cutterbar and install carriage bolts.

**IMPORTANT**

*The second, third, and fourth outboard guards on drive side of the header do not have a support. Ensure that the proper replacement is installed.*




e. Install hold-down and secure with nuts. Tighten nuts to 50 ft·lbf (68 N·m).

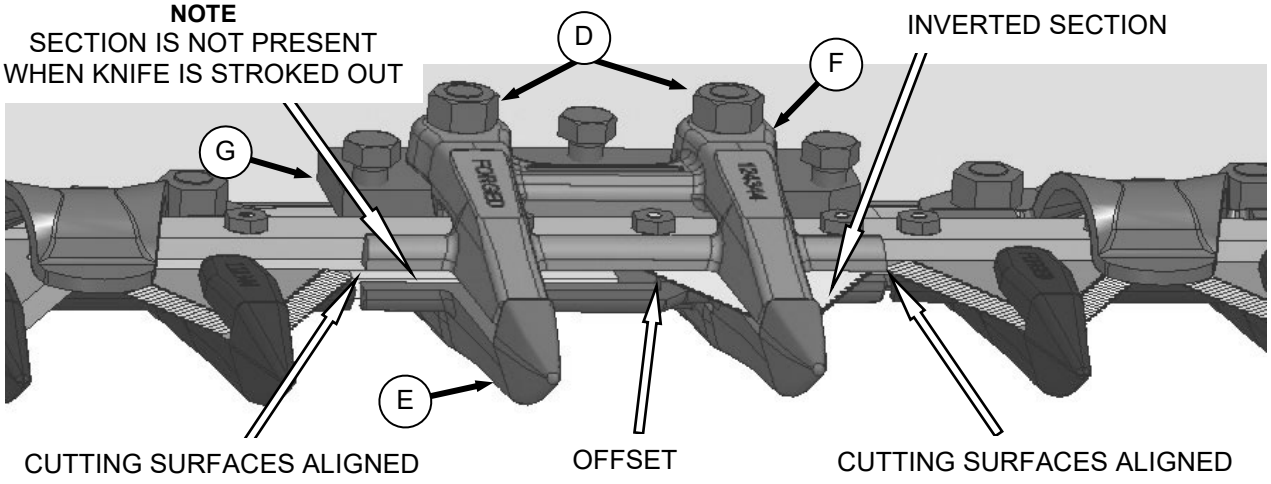
f. Check and adjust clearance between hold-down and sickle. Refer to Section 7.8.8, Sickle Hold-Downs.

#### *7.8.7.2.1 Pointed Guard Replacement -Double Knife*

Refer to previous section for standard guard replacement. The guard near the center of the double knife header, where the two sickles overlap, requires a slightly different replacement procedure.

**IMPORTANT**

*Replace adjacent guards when replacing center guard.*




CENTER POINTED GUARD AND HOLD-DOWN (SICKLES STROKED FULLY

a. Remove the two nuts (D) and bolts that attach center guard (E) and top guide (F) to cutterbar.
b. Remove guard and top guide (F), and adjuster bar (G).

**IMPORTANT**

*Ensure center guard (E) has offset cutting surfaces. See illustrations.*

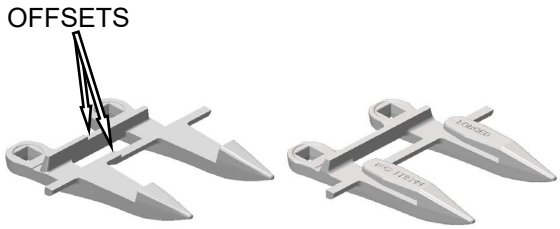
**NOTE**

*Top guide (F) must accommodate the two overlapping knifes at center guard (E) location on double-knife header. Ensure replacement is correct part.*

**IMPORTANT**

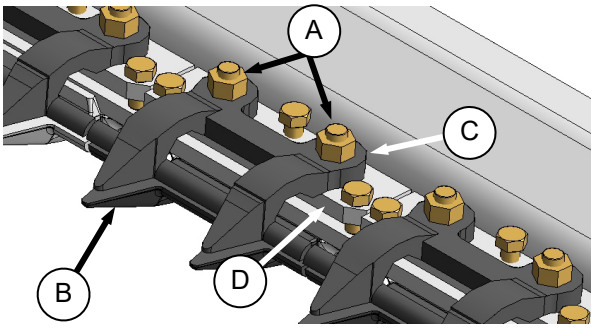
*Ledger surfaces of center and adjacent guards must be vertically aligned to avoid interference with sickle sections.*

c. Position replacement center guard (E), adjuster bar (G), top guide (F), and install bolts but do not tighten fully.
d. Check and adjust clearance between hold-down (F) and sickle. Refer to Section 7.8.8, Sickle Hold-Downs.



### *7.8.7.2.2 Stub Guard Replacement -Single Knife*

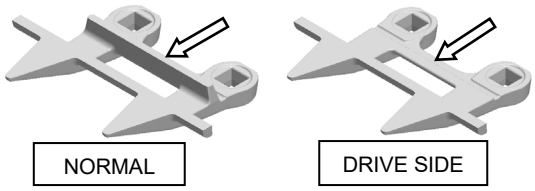
Stub guards, complete with top guides and adjuster plates are designed to cut tough crops.




a. Remove the two nuts (A) and bolts that attach guard (B) and top guide (C) to cutterbar.
b. Remove guard, top guide, and adjuster bar (D).
c. Position replacement guard (B), adjuster bar (D), top guide (C), and install bolts and nuts (A). Do not tighten.

**IMPORTANT**

*Note position of mitre on adjuster bar (D). Bar should be reinstalled in same position. Mitres should not be adjacent to each other.*




**IMPORTANT**

*The second, third, and fourth outboard guards on drive side of the header do not have a support. Ensure that the proper replacement is installed.*

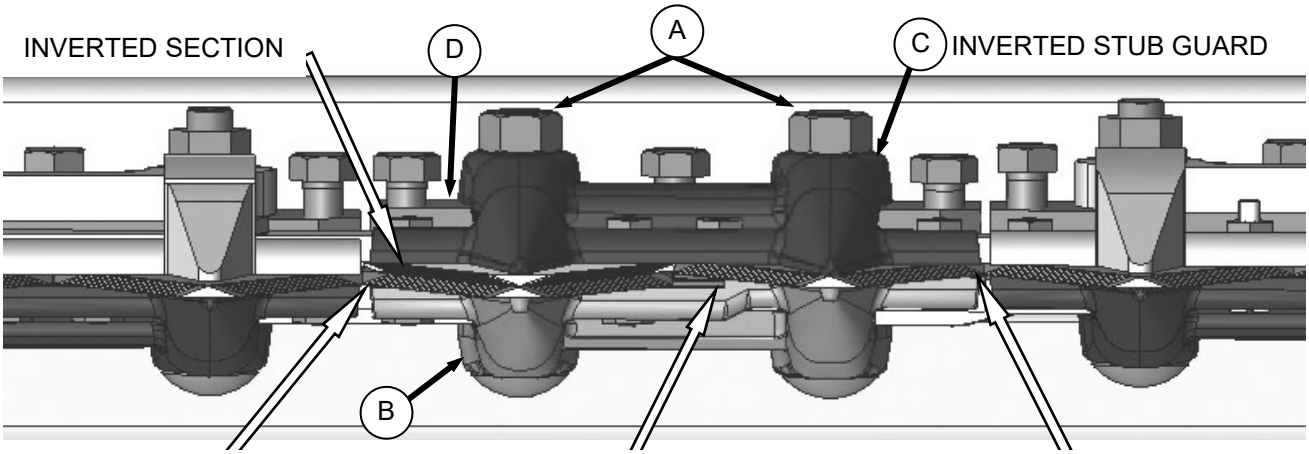
d. Check and adjust clearance between top guide and sickle. Refer to Section 7.8.8, Sickle Hold-Downs.

#### *7.8.7.2.3 Stub Guard Replacement -Double Knife*

Refer to previous section for typical guard replacement. The guard near the center of the double knife header, where the two sickles overlap, requires a slightly different replacement procedure.

**IMPORTANT**

*Replace adjacent guards when replacing center guard.*




CENTER STUB GUARD AND HOLD-DOWN
(SICKLES STROKED FULLY IN)

a. Remove the two nuts (A) and bolts that attach center guard (B) and top guide (C) to cutterbar.

b. Remove guard and top guide, and adjuster bar (D).

**IMPORTANT**

*Ensure center guard (B) has offset cutting surfaces. See illustration.*

**NOTE**

*Top guide (C), which is an inverted stub guard, must accommodate the two overlapping knifes at centre guard location on double-knife header. Ensure replacement is correct part.*

**IMPORTANT**

*Ledger surfaces of center and adjacent guards must be vertically aligned to avoid interference with sickle sections.*

c. Position replacement guard (B), adjuster bar (D), top guide (C), and install bolts and nuts (A) but do not tighten.

d. Check and adjust clearance between hold-down and sickle. Refer to Section 7.8.8, Sickle Hold-Downs.

### *7.8.8 Sickle Hold-Downs*

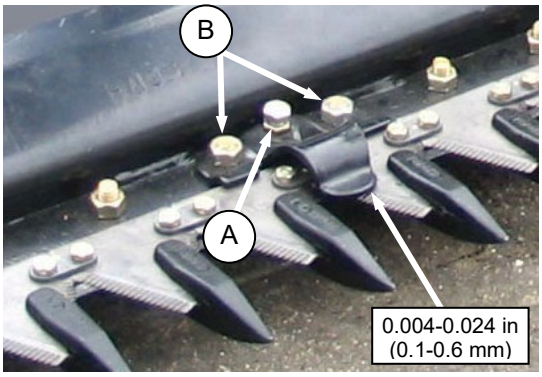
Check daily that sickle hold-downs are set to prevent sickle sections from lifting off guards but still permit sickle to slide without binding.

**NOTE**

*Guards should be aligned prior to adjusting hold-downs.*

#### 7.8.8.1 Sickle Hold-Down Adjustment -Pointed Guards

Single Knife

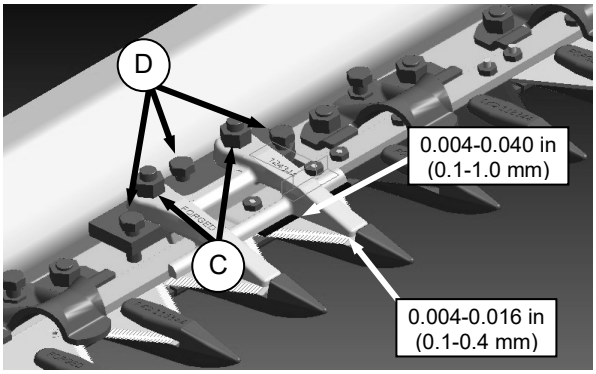



a. Turn the adjuster bolt (A). Using a feeler gauge, clearance from hold-down to sickle section should be 0.004-0.024 in (0.1-0.6 mm).

**NOTE**

*For larger adjustments, it may be necessary to loosen bolts (B), turn adjuster bolt (A), then retighten nuts (B).*

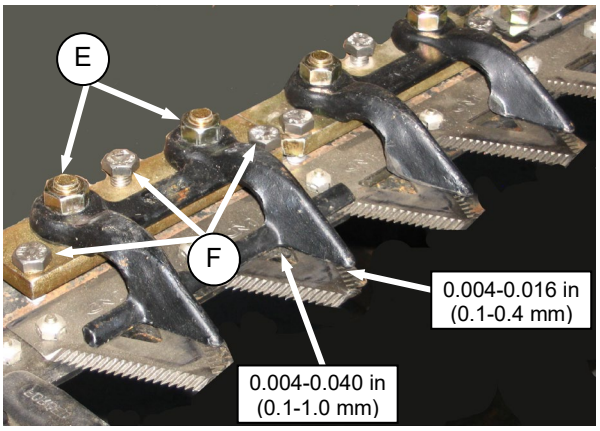
Double Knife




a. Torque nuts (C) to 35 ft·lbf (46 N·m).
b. Turn the adjuster bolts (D). Using a feeler gauge, clearance from hold-down to sickle section should be 0.004-0.016 in (0.1-0.4 mm) at the guide tip, and 0.004-0.040 in (0.1-1.0 mm) at rear of guide.
c. Torque nuts (C) to 53 ft·lbf (72 N·m).
d. After adjusting all hold-downs, run header at a low engine speed and listen for noise due to insufficient clearance. Insufficient clearance will also result in overheating of the sickle and guards.

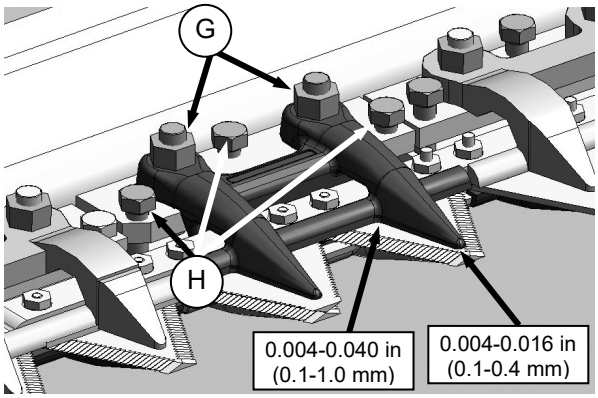
#### 7.8.8.2 Sickle Hold-Down Adjustment -Stub Guards

Single Knife




a. Torque nuts (E) to 35 ft·lbf (46 N·m).
b. Turn the adjuster bolts (F). Using a feeler gauge, clearance from hold-down to sickle section should be 0.004-0.016 in (0.1-0.4 mm) at the guard tip, and 0.004-0.040 in (0.1-1.0 mm) at rear of guide.
c. Torque nuts (E) to 53 ft·lbf (72 N·m).

Double Knife




a. Torque nuts (G) to 35 ft·lbf (46 N·m).
b. Turn the adjuster bolts (H). Using a feeler gauge, clearance from hold-down to sickle section should be 0.004-0.016 in (0.1-0.4 mm) at the guide tip, and 0.004-0.040 in (0.1-1.0 mm) at rear of guide.
c. Torque nuts (G) to 53 ft·lbf (72 N·m).
d. After adjusting all hold-downs, run header at a low engine speed and listen for noise due to insufficient clearance. Insufficient clearance will also result in overheating of the sickle and guards.

## *7.8.9 Sickle Drive Belt – A30-S*

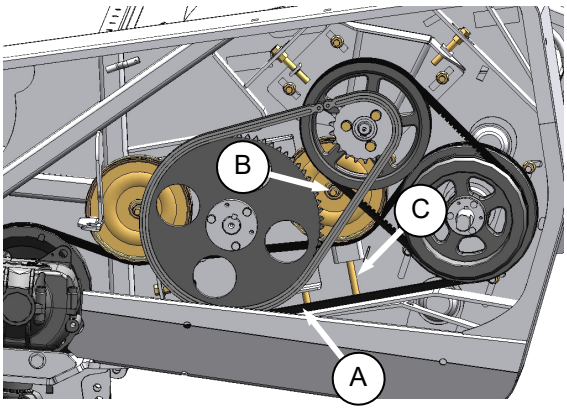
### 7.8.9.1 Tension Adjustment

Adjust tension on sickle drive belt (A) as follows:

**IMPORTANT**

*To prolong belt and drive life, do not over-tighten belts.*

a. Open LH end shield.

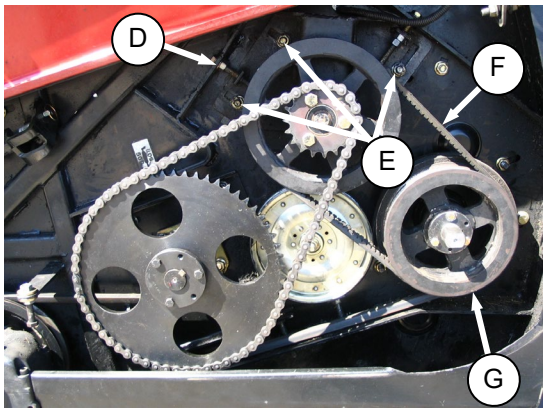



b. Loosen nut (B) securing idler pulley.
c. Loosen jam-nut on adjuster bolt (C).
d. Turn adjuster bolt (C) to move idler until a force of 20 lbf (80 N) deflects belt (A) 1/4 inch (6 mm) at mid-span.
e. Tighten jam-nut at (C) and nut (B) on idler pulley.
f. Close shield.
g. Re-adjust tension of a new belt after a short run-in period, (about 5 hours).

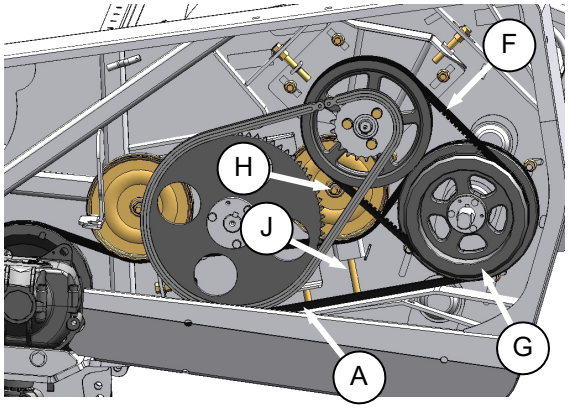
### 7.8.9.2 Removal – A30-S Sickle Drive Belt

Remove sickle drive belt (A) as follows:

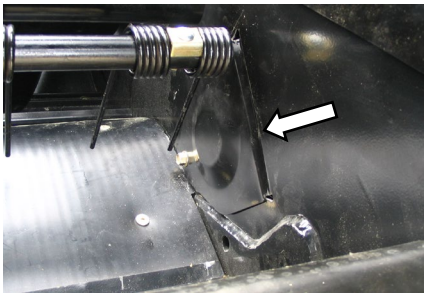
a. Open LH end shield.




b. Loosen jam-nut on adjuster bolt (D).
c. Loosen three bolts (E).
d. Turn adjuster bolt (D) to loosen auger drive belts (F) so they can be slipped off pulley (G).



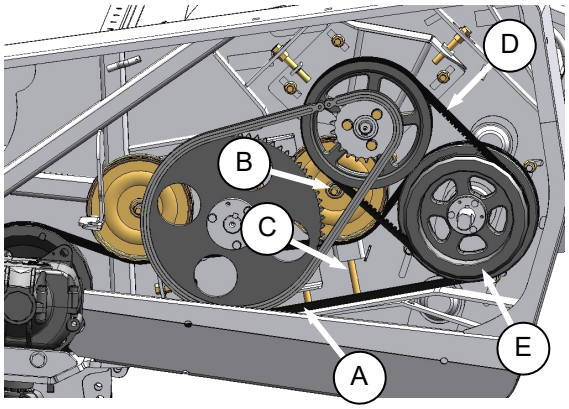

e. Loosen nut (H) securing idler pulley.
f. Loosen jam-nut on adjuster bolt (J).
g. Turn adjuster bolt (J) so that sickle drive belt (A) can be slipped off pulley (G).



h. Remove bolt-in plate in LH end sheet at wobble box.
i. Slip belt off wobble box pulley and route belt through this hole to remove it.

### 7.8.9.3 Installation – A30-S Sickle Drive Belt

Install sickle drive belt (A) as follows:



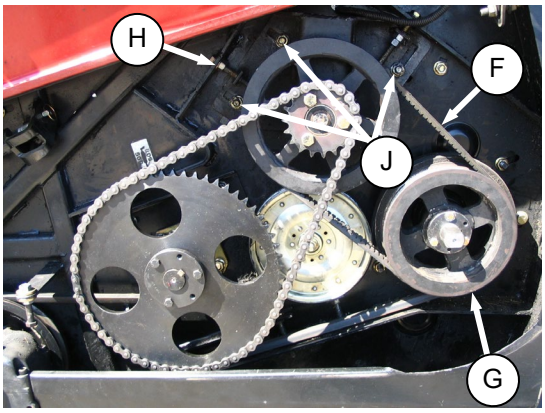

a. Route sickle drive belt (A) through opening in end sheet onto wobble box pulley and sickle drive pulley (E) as shown.

**NOTE**

*When installing new belt, never pry belt over pulley. Be sure idler is fully loosened, then tension belt.*

b. Turn adjuster bolt (C) to move idler until a force of 20 lbf (80 N) deflects belt (A) 1/4 inch (6 mm) at mid-span.

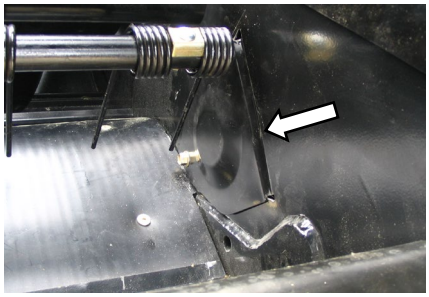
c. Tighten idler bolt (B).




d. Position belts (F) on pulley (G) as shown.

e. Turn adjuster bolt (H) so that each belt deflects 3/16 in. (4 mm) at mid-span when a load of 8-12 lbf (35-40 N) is applied to each belt.

f. Tighten bolts (J) and jam-nut on (H).



g. Install bolt-in plate in LH end sheet at wobble box, and close end shield.

h. Re-adjust tension of a new belt after a short run-in period, (about 5 hours).

## *7.8.10 Sickle Drive Belts – A30-D*

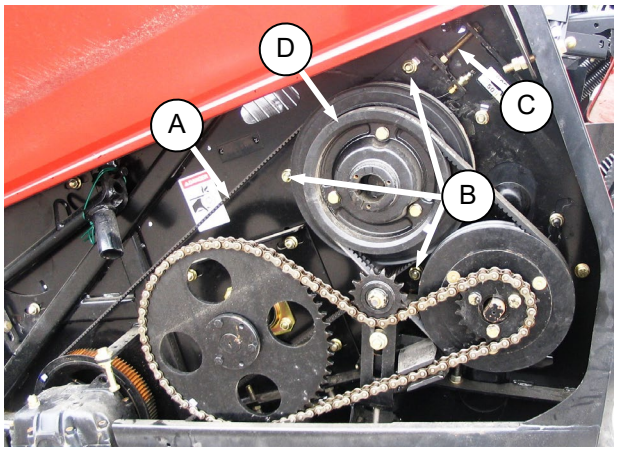
### 7.8.10.1 Tension Adjustment- LH Sickle Drive, A30-D

Adjust tension on sickle drive belt (A) as follows:

**IMPORTANT**

*To prolong belt and drive life, do not over-tighten belts.*

a. Open LH end shield.

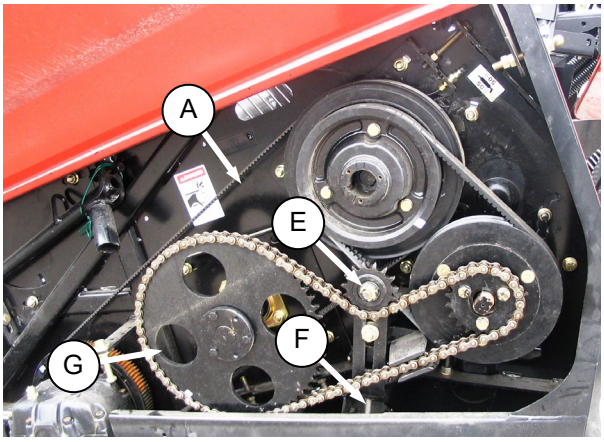



b. Loosen three nuts (B).
c. Loosen jam-nut on adjuster bolt (C).
d. Turn adjuster bolt (C) to move pulley (D) until a force of 5-6.5 lbf (22-30 N) deflects belt (A) 0.55 inch (14 mm) at mid-span.
e. Tighten jam-nut at (C) and three nuts (B).
f. Close end shield.
g. Re-adjust tension of a new belt after a short run-in period, (about 5 hours).

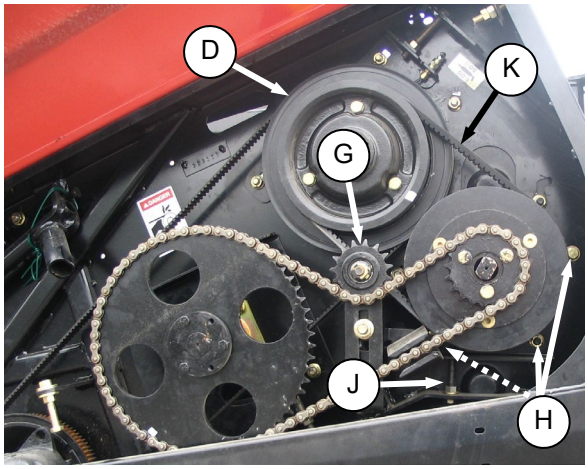
### 7.8.10.2 Removal – LH Sickle Drive Belt, A30-D

Remove sickle drive belt (A) as follows:

a. Open LH end shield.

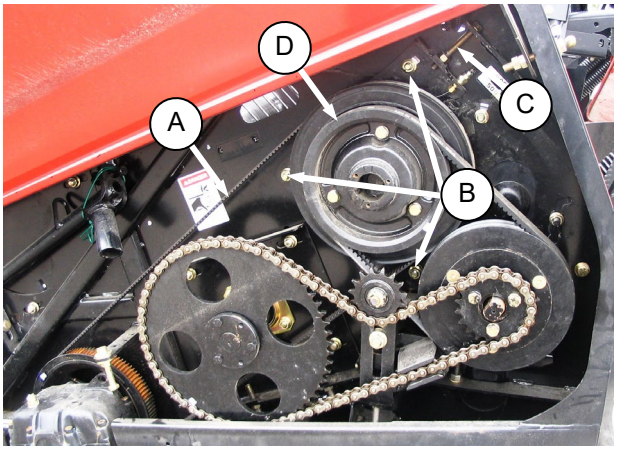



b. Loosen nut (E) on idler sprocket.
c. Turn adjuster bolt (F) to loosen chain so that it can be removed from large sprocket (G).



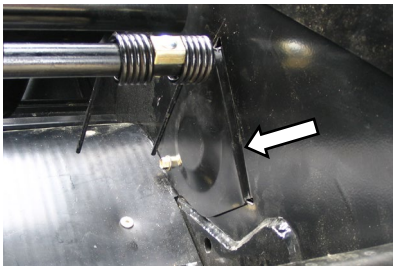

d. Loosen nuts (H) and jam-nut on adjuster bolt (J).
e. Turn adjuster bolt (J) to loosen V-belts (K) so that belts can be slipped off pulley (D).

*(continued next page)*




f. Loosen three nuts (B).

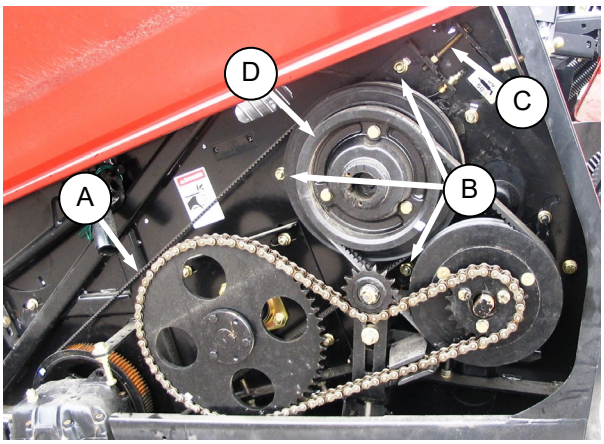
g. Loosen jam-nut on adjuster bolt (C) and turn adjuster bolt (C) so that sickle drive belt (A) can be slipped off pulley (D).



h. Remove bolt-in plate in LH end sheet at wobble box.

i. Slip belt off wobble box pulley and route belt through this hole to remove it.

### 7.8.10.3 Installation – LH Sickle Drive Belt, A30-D




a. Route sickle drive belt (A) through opening in end sheet onto wobble box pulley and sickle drive pulley (D) as shown.

**NOTE**

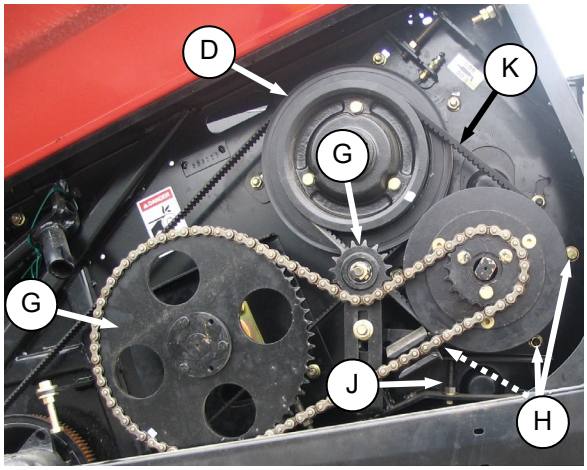
*When installing new belt, never pry belt over pulley. Be sure idler is fully loosened, then tension belt.*

**IMPORTANT**

*To prolong belt and drive life, do not over-tighten belts.*

b. Turn adjuster bolt (C) to move pulley (D) until a force of 5-6.5 lbf (22-30 N) deflects belt (A) 0.55 inch (14 mm) at mid-span.

c. Tighten jam-nut at (C) and three nuts (B).



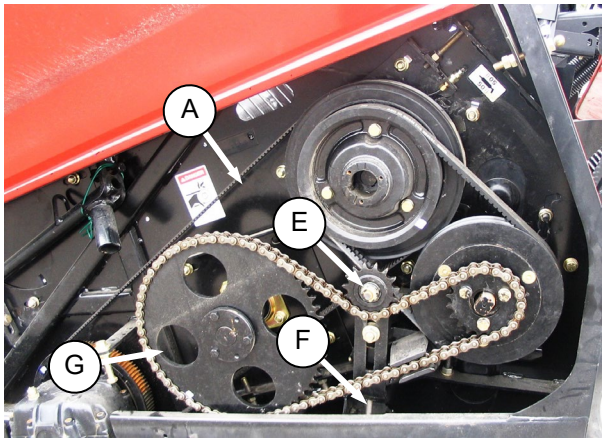

d. Reposition V-belts (K) on pulley (D)

e. Turn adjuster bolt (J) to move drive pulley until a force of 8-12 lbf (35-50 N) applied at mid-span on each belt (K) deflects each belt 0.16 inch (4 mm).

f. Tighten jam-nut at (J) and three nuts (H).

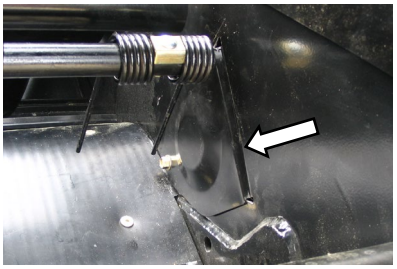
g. Reposition chain on large sprocket (G).

*(continued next page)*




h. Turn adjuster bolt (F) to tighten chain to give (5 mm) slack at mid-span. Tighten nut (E) on idler sprocket.

i. Rotate auger and check chain for slack at tightest point. Re-adjust position of idler sprocket to achieve required slack.



j. Install bolt-in plate in LH end sheet at wobble box and close end shield.

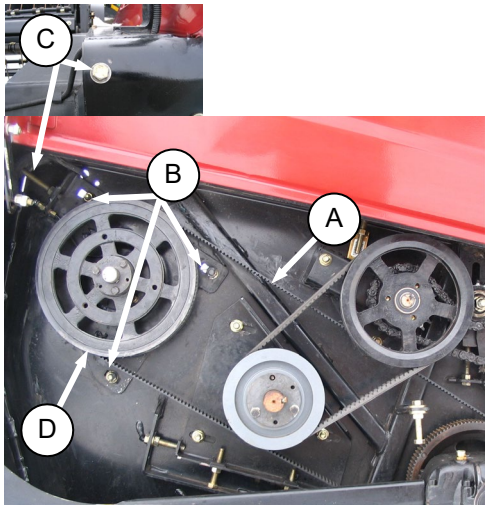
k. Re-adjust tension of a new belt after a short run-in period, (about 5 hours).

### 7.8.10.4 Tension Adjustment - RH Sickle Drive Belt, A30-D

**IMPORTANT**

*To prolong belt and drive life, do not over-tighten belts.*

a. Open RH end shield.




b. Loosen three nuts (B) and jam-nut on adjuster bolt (C).

c. Turn adjuster bolt (C) to move pulley (D) until a force of 5-6.5 lbf (22-30 N) applied at mid-span deflects belt (A) 0.55 inch (14 mm).

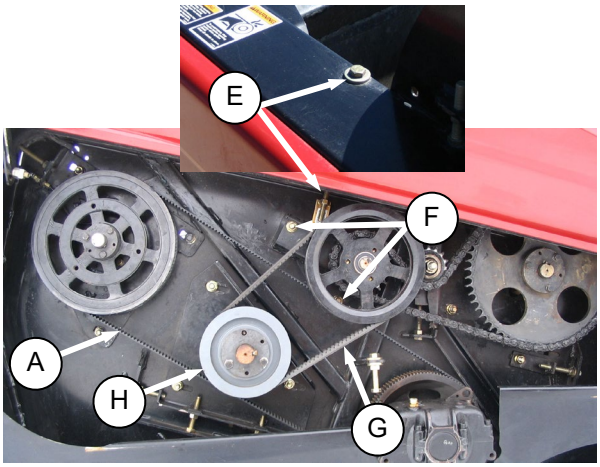
d. Tighten jam-nut at (C) and three nuts (B).

e. Close end shield.

f. Re-adjust tension of a new belt after a short run-in period, (about 5 hours).

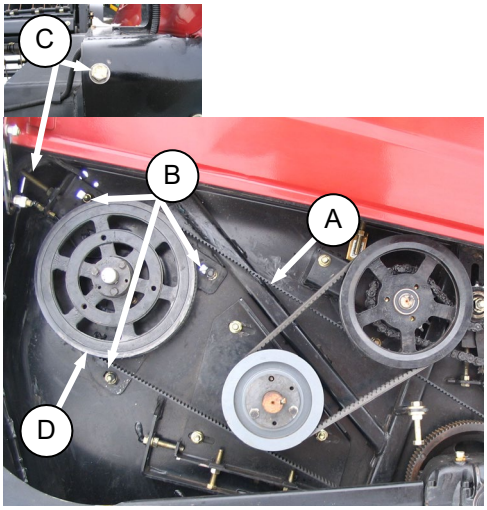
### 7.8.10.5 Removal – RH Sickle Drive Belt, A30-D

a. Open shield on header RH side.



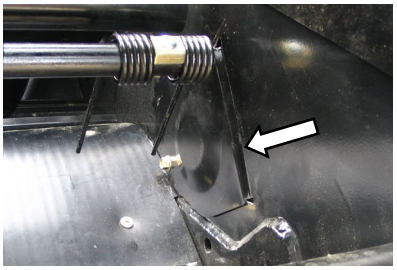

b. Loosen jam-nut on adjuster bolt (E) and nuts (F) at reel drive arm.

c. Turn adjuster bolt (E) to loosen reel drive V-belts (G) and remove belts from pulley (H).




d. Loosen three nuts (B) and jam-nut on adjuster bolt (C).

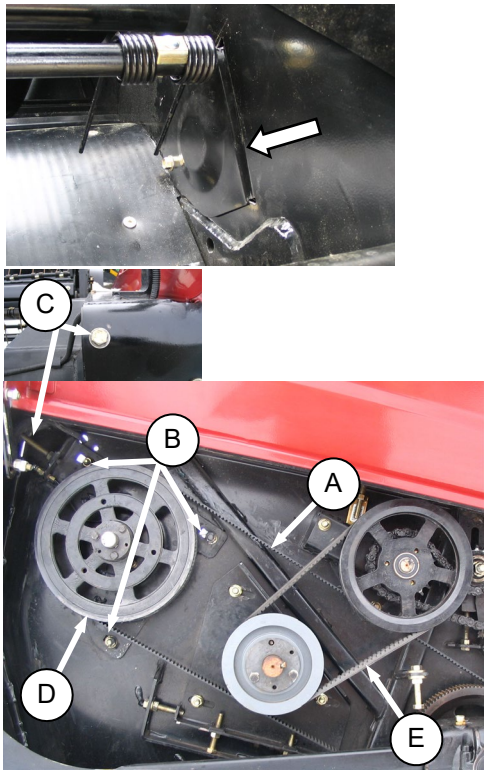
e. Turn adjuster bolt (C) so that sickle drive belt (A) can be slipped off pulley (D).



f. Remove bolt-in plate in LH end sheet at wobble box.

g. Slip belt off wobble box pulley and route belt through this hole to remove it.

### 7.8.10.6 Installation – RH Sickle Drive Belt, A30-D




a. Route sickle drive belt (A) through opening in end sheet onto wobble box pulley and sickle drive pulley (D).

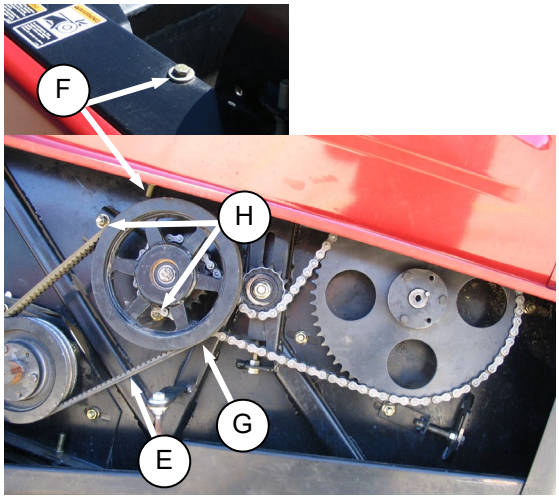
**NOTE**

*When installing new belt, never pry belt over pulley. Be sure adjusting screw is fully loosened, then tension belt.*

b. Turn adjuster bolt (C) to move pulley (D) until a force of 5-6.5 lbf (22-30 N) applied at mid-span deflects belt (A) 0.55 inch (14 mm).

c. Tighten jam-nut at (C) and three nuts (B).

d. Position V-belts (E) on pulleys.




e. Turn adjuster bolt (F) to move pulley (G) so that each belt (E) deflects 3/16 in. (4 mm) when a load of 8-12 lbf (35-40 N) is applied to each belt at mid-span.

f. Tighten jam-nut on adjuster bolt (F) and nuts (H).

g. Install bolt-in plate in RH end sheet at wobble box.

h. Close end shield.

i. Re-adjust tension of a new belt after a short run-in period, (about 5 hours).

## *7.8.11 Sickle Drive Belts – A40-D*

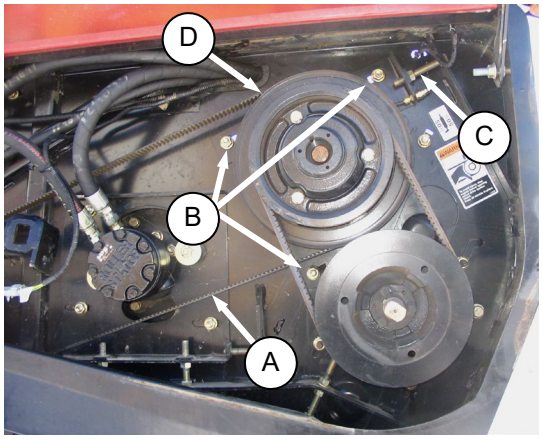
### 7.8.11.1 Tension Adjustment- LH Sickle Drive Belts, A40-D

Timing belt

**IMPORTANT**

*To prolong belt and drive life, do not over-tighten belts.*

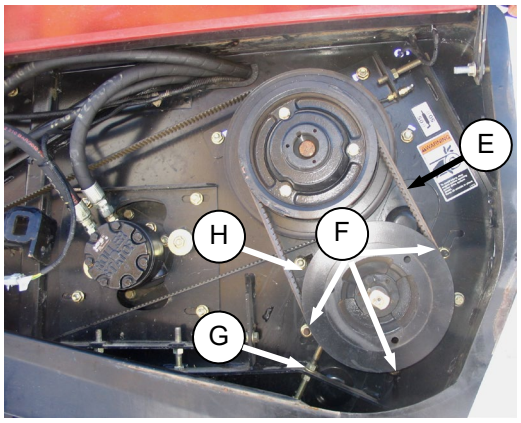
Adjust the LH sickle drive belt (A) tension as follows:




a. Open the shield on the LH side of the header.
b. Loosen three nuts (B) and jam-nut on adjuster bolt (C).
c. Turn adjuster bolt (C) to move pulley (D) until a force of 5-6.5 lbf (22-30 N) applied at mid-span deflects belt (A) 0.55 inch (14 mm).
d. Tighten jam-nut at (C) and three nuts (B).
e. Re-adjust tension of a new belt after a short run-in period, (about 5 hours).

Double V-Belts

Adjust the sickle drive double V-belts (E) tension as follows:




a. Loosen three nuts (F) and jam-nut on adjuster bolt (G).

**IMPORTANT**

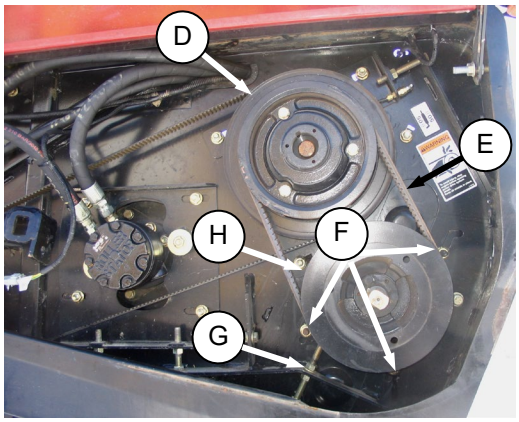
*To prolong belt and drive life, do not over-tighten belts.*

b. Turn adjuster bolt (G) to move pulley (H) until a force of 8-12 lbf (35-50 N) applied to each belt at mid-span deflects each belt (E) 0.16 inch (4 mm).
c. Tighten jam-nut at (G) and three nuts (F).
d. Close end shield.
e. Re-adjust tension of a new belt after a short run-in period, (about 5 hours).

### 7.8.11.2 Removal – LH Sickle Drive Belts, A40-D

Double V-Belts

Remove the sickle drive double V-belts (E) as follows:




a. Open the shield on the LH side of the header.
b. Loosen three nuts (F) and jam-nut on adjuster bolt (G).
c. Turn adjuster bolt (G) so that drive belts (E) can be slipped off pulleys (D) and (H).

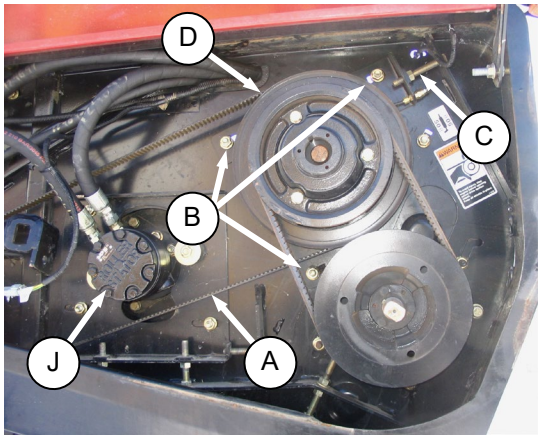
*(continued next page)*

***Removal –LH Sickle Drive Belts, A40-D** (cont'd)*

Timing belt

Remove the LH sickle drive belt (A) as follows:

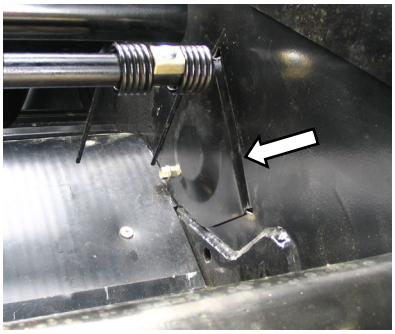
a. Remove double V-belts (E) as per previous page.




b. Disconnect hoses from auger drive motor (J). Protect hose ends and motor ports with clean, lint free cloths or clean plastic bags.

c. Loosen three nuts (B) and jam-nut on adjuster bolt (C).

d. Turn adjuster bolt (C) so that sickle drive belt (A) can be slipped off pulley (D).



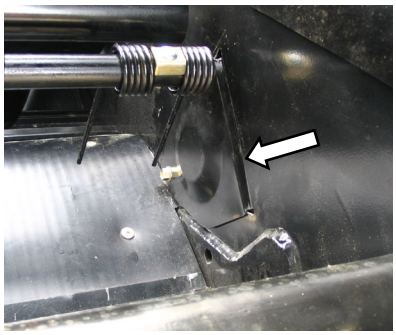
e. Remove bolt-in plate in LH end sheet at wobble box.

f. Slip belt off wobble box pulley and route belt through this hole to remove it.

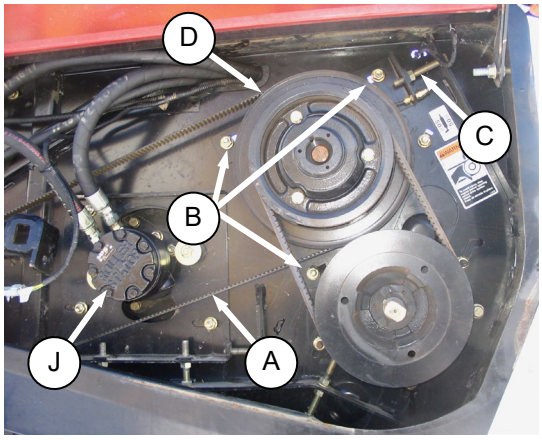
### 7.8.11.3 Installation –LH Sickle Drive Belts, A40-D

Timing belt

Install the LH sickle drive belt (A) as follows:



a. Route sickle drive belt (A) through opening in end sheet onto wobble box pulley and sickle drive pulley (D) as shown.




**NOTE**

*When installing new belt, never pry belt over pulley. Be sure adjusting screw is fully loosened, then tension belt.*

**IMPORTANT**

*To prolong belt and drive life, do not over-tighten belts.*

b. Turn adjuster bolt (C) to move pulley (D) until a force of 5-6.5 lbf (22-30 N) deflects belt (A) 0.55 inch (14 mm) at mid-span.

c. Tighten jam-nut at (C) and three nuts (B).

d. Reconnect hoses onto hydraulic motor (J).

e. Re-adjust tension of a new belt after a short run-in period, (about 5 hours).

*(continued next page)*

**Installation –LH Sickle Drive Belts, A40-D** (cont'd)

Double V-Belts

Install the sickle drive double V-belts (E) as follows:

**IMPORTANT**

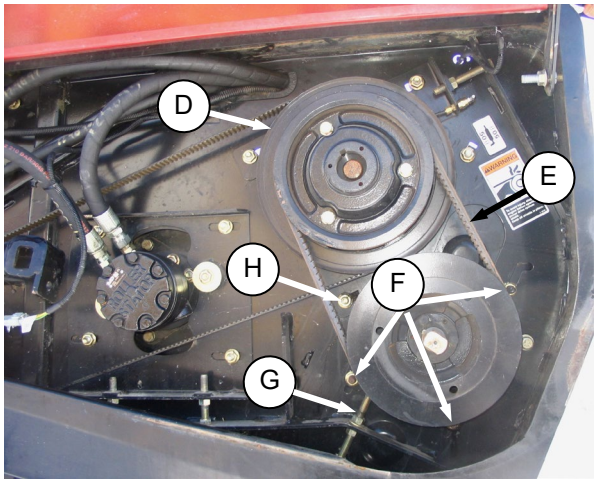
*Belts are a matched set. Replace both drive belts even if only one needs replacing.*

**NOTE**

*When installing new belt, never pry belt over pulley. Be sure adjusting screw is fully loosened, then tension belt.*

**IMPORTANT**

*To prolong belt and drive life, do not over-tighten belts.*



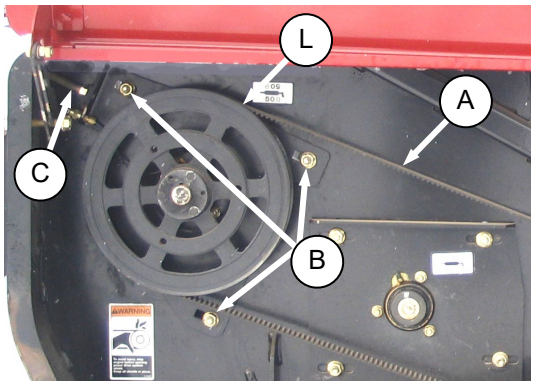

a. Slip belts onto pulleys (H) and (D).
b. Turn adjuster bolt (G) to move pulley (H) until a force of 8-12 lbf (35-50 N) applied at mid-span to each belt deflects each belt (E) 0.16 inch (4 mm).
c. Tighten jam-nut at (G) and three nuts (F).
d. Re-adjust tension of a new belt after a short run-in period, (about 5 hours).

### 7.8.11.4 Tension Adjustment - RH Sickle Drive Belts, A40-D

**IMPORTANT**

*To prolong belt and drive life, do not over-tighten belts.*

Adjust the RH sickle drive belt (A) tension as follows:

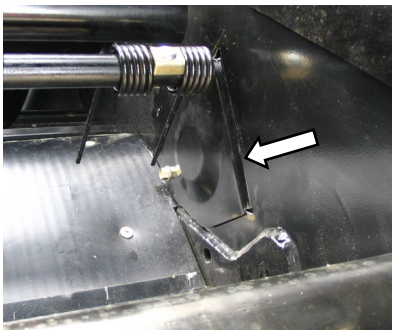



a. Open RH end shield.
b. Loosen three nuts (B) and jam-nut on adjuster bolt (C).
c. Turn adjuster bolt (B) to move pulley (L) until a force of 5-6.5 lbf (22-30 N) deflects belt (A) 0.55 inch (14 mm) at mid-span.
d. Tighten jam-nut at (C) and three nuts (B).
e. Re-adjust tension of a new belt after a short run-in period, (about 5 hours).

### 7.8.11.5 Removal – RH Sickle Drive Belt, A40-D

Remove the RH sickle drive belt (A) as follows:

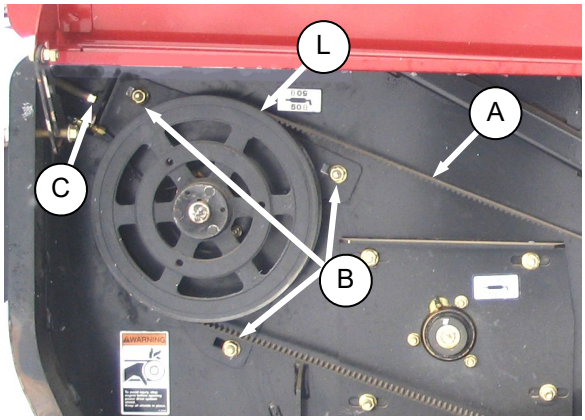
a. Loosen three nuts (B) and jam-nut on adjuster bolt (C).
b. Turn adjuster bolt (C) so that sickle drive belt (A) can be slipped off pulley (L).



c. Remove bolt-in plate in LH end sheet at wobble
d. Slip belt off wobble box pulley and route belt through this hole to remove it.

### 7.8.11.6 Installation –RH Sickle Drive Belt, A40-D

Install the RH sickle drive belt (A) as follows:




a. Route sickle drive belt (A) through opening in end sheet onto wobble box pulley and sickle drive pulley (L) as shown.

**NOTE**

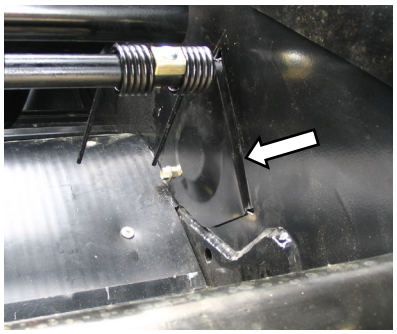
*When installing new belt, never pry belt over pulley. Be sure adjusting screw is fully loosened, then tension belt.*

**IMPORTANT**

*To prolong belt and drive life, do not over-tighten belts.*

b. Turn adjuster bolt (C) to move pulley (K) until a force of 5-6.5 lbf (22-30 N) deflects belt (A) 0.55 inch (14 mm) at mid-span.

c. Tighten jam-nut at (C) and three nuts (B).



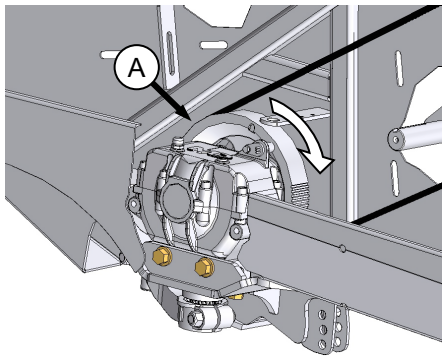
d. Install bolt-in plate in LH end sheet at wobble box and close end shield.

e. Re-adjust tension of a new belt after a short run-in period, (about 5 hours).

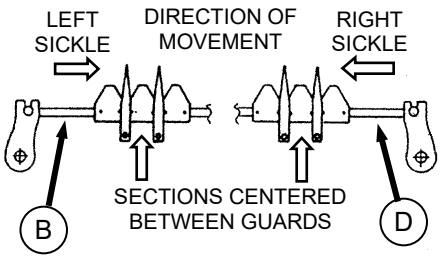
### *7.8.12 Sickle Drive Timing Adjustment*

Double knife A30-D and A40-D Auger Headers require that the sickles are properly timed to move in opposite directions.

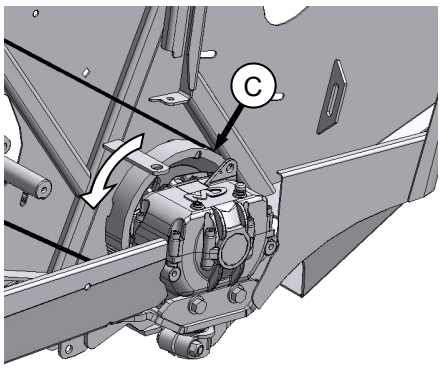
a. Remove the right side sickle drive belt. Refer to Section 7.8.10.5, Removal – RH Sickle Drive Belts, A30-D, or Section 7.8.11.5, Removal – RH Sickle Drive Belt, A40-D.




b. Rotate the LH side wobble box driven pulley (A) clockwise until the LH side sickle (B) is at the centre of the inboard stoke (moving towards centre of header).




**NOTE**




*Centre stroke is when the sickle sections are centered between guard points as shown.*

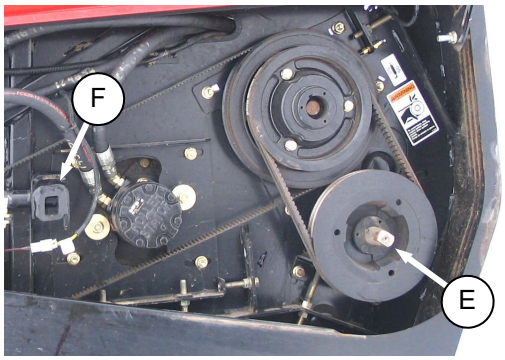
c. Rotate the right side wobble box pulley (C) counterclockwise until the right side sickle (D) is at the centre of the inboard stroke.

d. Install the right side wobble box drive belt and tension. Refer to Section 7.8.10.6, Installation – RH Sickle Drive Belts, A30-D, or Section 7.8.11.6, Installation – RH Sickle Drive Belt, A40-D.

**IMPORTANT**

*To maintain timing, wobble box driver and driven pulleys must not rotate as the belt is tightened.*

e. Check that the timing belts are properly seated in the grooves on both driver and driven pulleys.




f. Check for correct sickle timing by rotating the drive shaft (E) slowly with the unplug wrench (F) and observe sickles where they overlap at the centre of the header.

**IMPORTANT**

*Sickles must move in opposite directions and must begin moving at exactly the same time.*

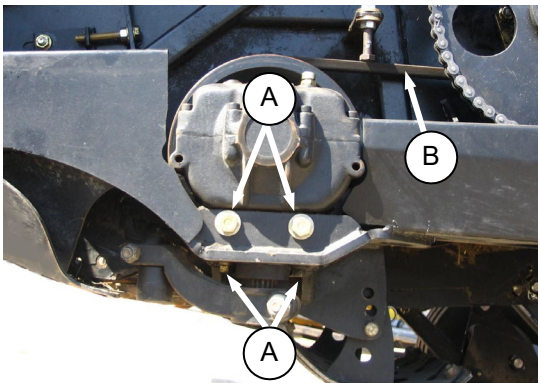
g. If timing is off, proceed as follows:

1. Loosen right side timing belt sufficiently to allow skipping the belt one or more teeth as required. Refer to Section 7.8.10.4, Tension Adjustment – RH Sickle Drive Belts, A30-D, or Section 7.8.11.4, Tension Adjustment – RH Sickle Drive Belt, A40-D.
2. If RIGHT SICKLE “leads” LEFT SICKLE, rotate RIGHT HAND driven pulley (C) clockwise.
3. If RIGHT SICKLE “lags” LEFT SICKLE, rotate RIGHT HAND driven pulley (C) counterclockwise.
4. Tighten right side timing belt. Refer to Section 7.8.10.4, Tension Adjustment – RH Sickle Drive Belts, A30-D, or Section 7.8.11.4, Tension Adjustment – RH Sickle Drive Belt, A40-D.

## *7.8.13 Wobble Box*

### 7.8.13.1 Mounting Bolts

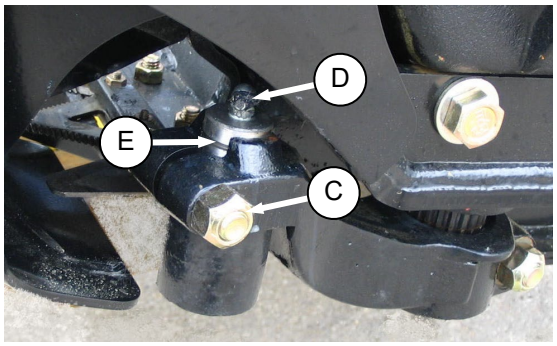
Check four wobble box mounting bolts (A) torque after the first 10 hours operation and every 100 hours thereafter. Torque bolts to 200 ft·lbf (270 N·m). When tightening, start with the side mounting bolts.




### 7.8.13.2 Wobble Box Removal

a. Loosen sickle drive belt (B) and slip off wobble box pulley. Refer to one of the following sections:
   - Section 7.8.9.1, Tension Adjustment -Sickle Drive Belt, A30-S,
   - Section 7.8.10.1, Tension Adjustment –LH Sickle Drive Belt, A30-D,
   - Section 7.8.10.4, Tension Adjustment –RH Sickle Drive Belt, A30-D,
   - Section 7.8.11.1, Tension Adjustment –LH Sickle Drive Belt, A40-D,
   - Section 7.8.11.4, Tension Adjustment –RH Sickle Drive Belt, A40-D.

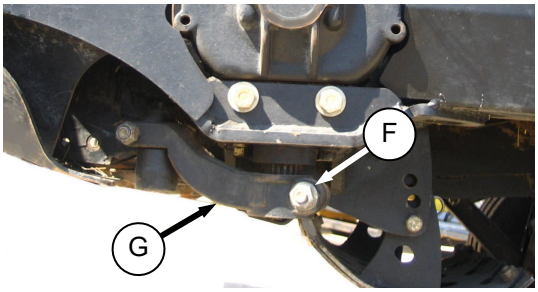
b. Stroke sickle to its outer limit.




c. Clean area around sickle head and remove nut and bolt (C).

d. Remove grease zerk from pin (D).

e. Insert screwdriver in groove (E) of pin and pry up on sickle head pin to free sickle. Pin does not have to be removed from arm.




f. Remove bolt (F) from pitman arm.

g. Remove pitman arm (G) from wobble box shaft.

h. Remove bolts (A) attaching wobble box to frame.

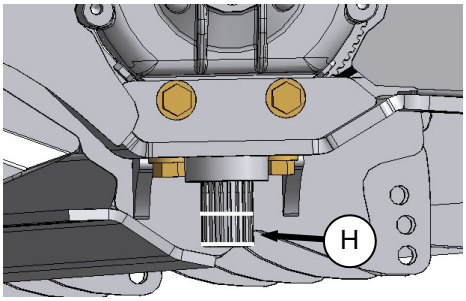
i. Remove wobble box.

### 7.8.13.3 Wobble Box Installation

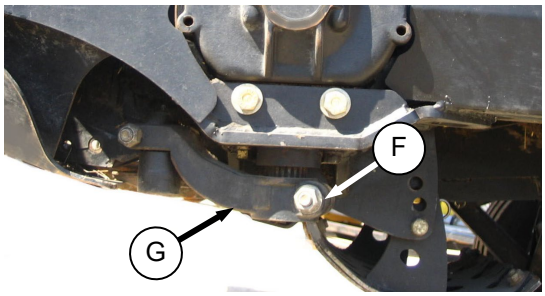
a. Position wobble box as shown and install four bolts (A). Torque side bolts and then bottom bolts to 200 ft·lbf (270 Nm).

**IMPORTANT**

*Use only Grade L9 bolts and flat washers.*




b. Apply Loctite® #243 adhesive (or equivalent) to spline. Apply in two bands (H) around shaft as shown, with one band at end of spline and one band approximately mid-way.

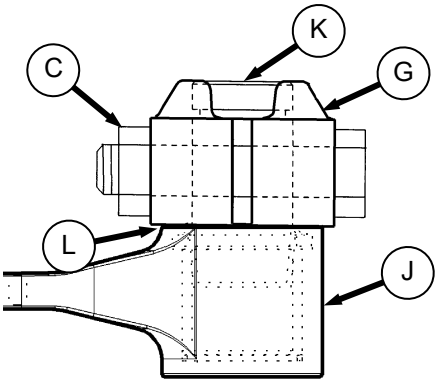



c. Slide pitman arm (G) onto output shaft. Rotate pulley to ensure drive arm just clears frame to ensure proper placement on splines.

d. Position pitman arm at furthest outboard position. Slide arm up or down on shaft until it just contacts knifehead [0.010 in. (0.25 mm)] gap.

e. Install bolt (B) and nut and torque to 160 ft·lbf (217 N·m).

*(continued next page)*




f. Align sickle head (J) with pitman arm (G).

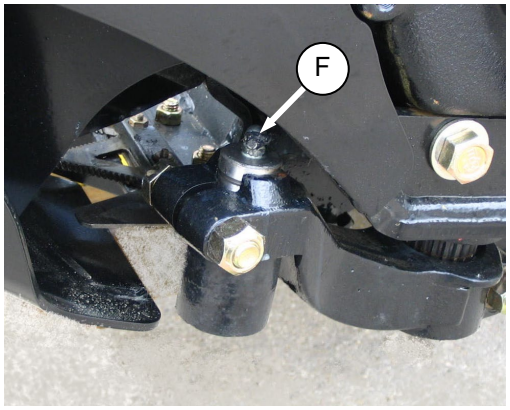
g. Install sickle head pin (K) in pitman arm (G) and tap it down into the sickle head, ensuring pin is bottomed out in the sickle head.

h. Tap the underside of the sickle head until the pin is flush with the upper face of the pitman arm (G).

i. Carefully adjust to achieve a 0.010 in. (.25 mm) gap at (L) with the knife laying flat on the first few guards.

j. Replace bolt and nut (C).

k. Tighten nut to 160 ft·lbf (220 N·m).



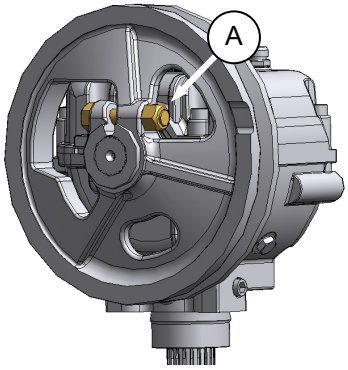

l. Replace grease zerk (F) in pin.

m. Install drive belt onto wobble box pulley and tighten. Refer to one of the following sections:

- Section 7.8.9.1, Tension Adjustment -Sickle Drive Belt, A30-S,
- Section 7.8.10.1, Tension Adjustment –LH Sickle Drive Belt, A30-D,
- Section 7.8.10.4, Tension Adjustment –RH Sickle Drive Belt, A30-D,
- Section 7.8.11.1, Tension Adjustment –LH Sickle Drive Belt, A40-D,
- Section 7.8.11.4, Tension Adjustment –RH Sickle Drive Belt, A40-D.

### 7.8.13.4 Pulley Removal

a. Remove wobble box. See previous page.

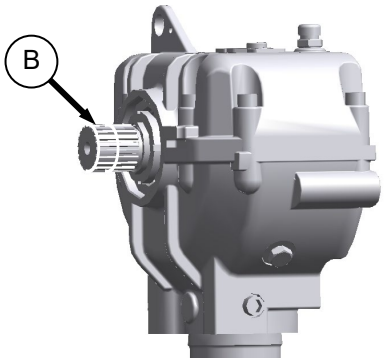



b. Loosen nut and bolt (A) from pulley.

c. Remove pulley using a 3-jaw puller.

### 7.8.13.5 Pulley Installation

a. Remove any rust or paint from inner spline. For replacement parts, remove oil/grease with degreasing agent.




b. Apply Loctite® #243 adhesive (or equivalent) to spline. Apply in two bands (B) around shaft as shown, with one band at end of spline and one band approximately mid-way.

c. Install pulley on shaft until flush with end of shaft and secure with bolt (F) and nut. Torque bolts to 160 ft·lbf (217 N·m).

d. Install wobble box. See previous page.

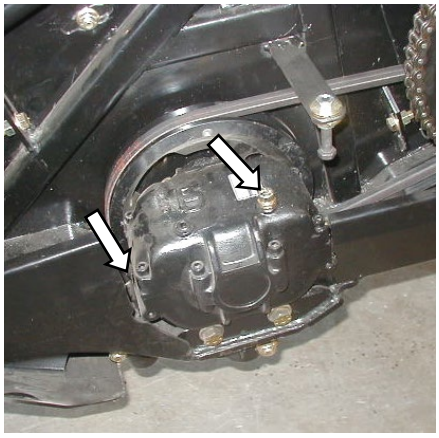
### 7.8.13.6 Changing Wobble Box Oil

**NOTE**

*Change wobble box lubricant after the first 50 hours operation and every 1000 hours (or 3 years) thereafter.*

a. Raise header to allow a suitable container to be placed under wobble box drain to collect oil.

b. Engage header lift cylinder stops.



c. Remove breather/dipstick and drain plug and allow oil to drain.

d. Replace drain plug and add oil to required level. Use Gear Lubricant, SAE 85W-140, API Service Class GL-5, 2.3 qts (2.2 liters).

e. Disengage lift cylinder stops.

## 7.9 REEL AND REEL DRIVE - A30-S AND A30-D.

**CAUTION**

**To avoid personal injury, before servicing windrower or opening drive covers, follow procedures in "Preparation for Servicing", Section 7.1.**

### 7.9.1 Reel Drive Chain, A30-S and A30-D

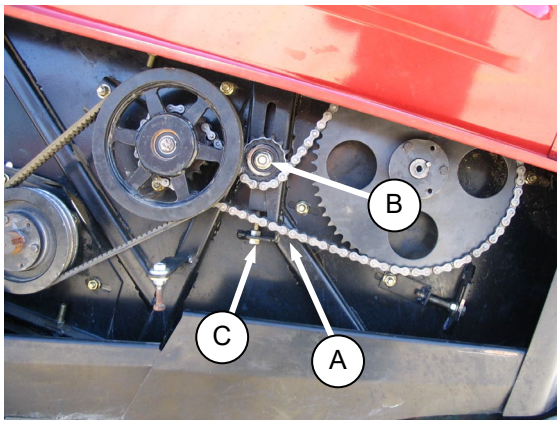
#### 7.9.1.1 Tension

**NOTE**

*For major adjustments, such as after repositioning reel or auger, adjust belt tension before chain tension.*

Adjust reel drive chain (A) tension as follows:

a. Open shield on header RH side.

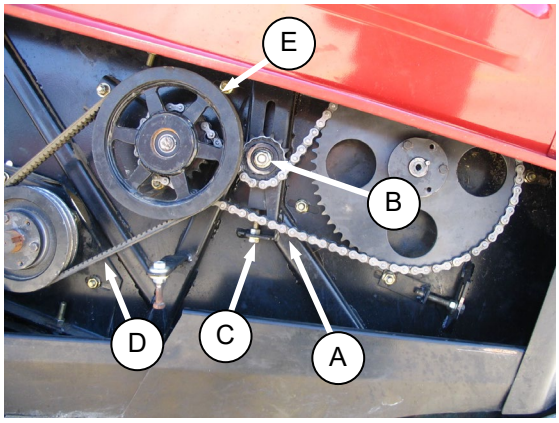



b. Loosen nut (B) on idler sprocket.
c. Loosen jam-nut on adjuster bolt (C) and back off.
d. To increase tension, turn adjustor bolt (C) to move idler sprocket downward until total chain slack at (A) is 1/4 in. (6 mm).
e. Tighten jam-nut at (C) and nut (B) and recheck tension.
f. Close shield before engaging header.

#### 7.9.1.2 Removal

Remove reel drive chain (A) as follows:

a. Open shield on header RH side.




b. Remove reel drive belt (D) from pulley (E). Refer to Section 7.9.2, Reel Drive Belts, A30-S & A30-D.
c. Loosen nut (B) on idler sprocket.
d. Loosen jam-nut on adjuster bolt (C) and back off.
e. Turn adjuster bolt (C) to loosen chain.
f. Remove chain from sprockets.

#### 7.9.1.3 Installation

Install reel drive chain (A) as follows:

a. Position chain (A) around sprockets as shown.
b. Install and tighten reel drive belts (D). Refer to Section 7.9.2 Reel Drive Belts, A30-S & A30-D.
c. Turn adjuster bolt (C) to move idler sprocket downward until total chain slack at (A) is 1/4 in. (6 mm).
d. Rotate auger and check chain for slack at tightest point. Re-adjust position of idler sprocket to achieve required slack.
e. Tighten jam-nut at (C) and nut (B) and recheck tension.
f. Close shield before engaging header.

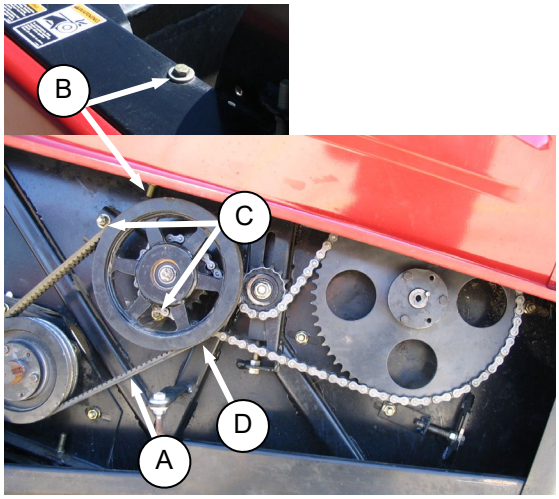
## *7.9.2 Reel Drive Belts, A30-S and A30-D*

### 7.9.2.1 Tension Adjustment

**IMPORTANT**

*To prolong drive life, do not over-tighten belts. Belt slippage is used to protect the reel in an overload situation.*

Adjust reel drive belts (A) tension as follows:




a. Open shield on header RH side.
b. Loosen jam-nut on adjuster bolt (B) and nuts (C).
c. Turn adjuster bolt (B) to move pulley (D) so that each belt (A) deflects 3/16 in. (4 mm) when a load of 8-12 lbf (35-40 N) is applied to each belt at mid-span.
d. Tighten jam-nut on adjuster bolt (B) and nuts (C).

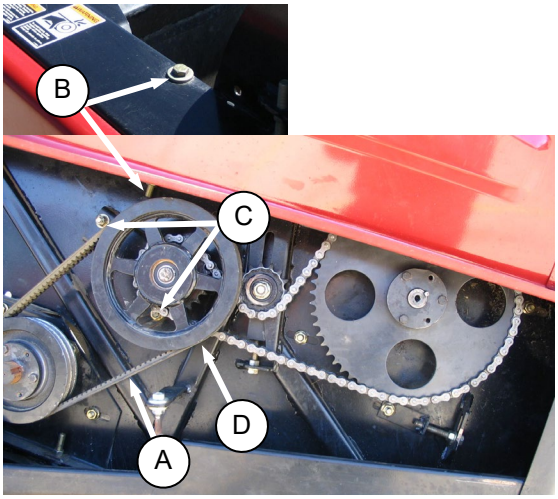
**NOTE**

*Re-adjust tension of new belts after about 5 hours of operation.*

e. Check reel drive chain tension and adjust if necessary. See Section 7.9.1, Reel Drive Chain, A30-S & A30-D.
f. Close shield before engaging header.

### 7.9.2.2 Removal

Remove reel drive belts (A) as follows:




a. Open shield on header RH side.
b. Loosen jam-nut on adjuster bolt (B) and nuts (C) at reel drive arm.
c. Turn adjuster bolt (B) to loosen reel drive belts.
d. Remove drive belts (A).

### 7.9.2.3 Installation

**IMPORTANT**

*Reel drive belts are a matched set. Replace both drive belts even if only one needs replacing.*

Install reel drive belts (A) as follows:

a. Position drive belts (A) on pulleys, ensuring both belts are identical.
b. Turn adjuster bolt (B) to move pulley (D) so that each belt (D) deflects 3/16 in. (4 mm) when a load of 8-12 lbf (35-40 N) is applied to each belt at mid-span.
c. Tighten jam-nut on adjuster bolt (B) and nuts (C).

**NOTE**

*Re-adjust tension of new belts after about 5 hours of operation.*

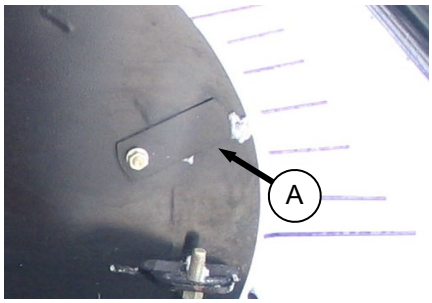
d. Check reel drive chain tension and adjust if necessary. See Section 7.9.1, Reel Drive Chain, A30-S & A30-D.
e. Close shield before engaging header.

### *7.9.3 Reel Tines and Tine Bar Bearings, A30-S and A30-D*

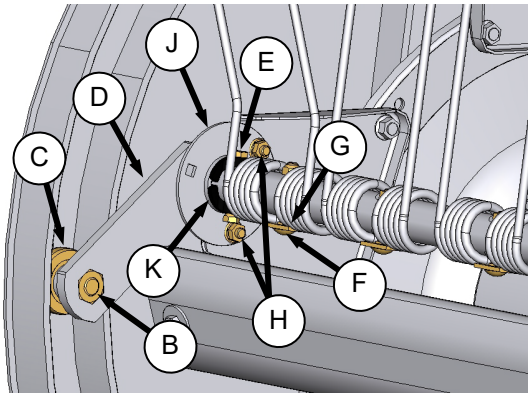
**IMPORTANT**

*Keep reel tines in good condition. Straighten or replace as required.*

#### 7.9.3.1 Removal –Tines and Bearings, Cam End




a. Loosen bolt on cover (A) and slide cover to expose hole in cam disc. Rotate reel and align bearing with hole.




b. Remove cam follower bearing bolt (B), bearing (C), and nut.

c. Disengage the cam arm (D) from the cam track with a pry bar.

d. Remove bolt (E), bolt (F), and keeper (G) that connect cam arm (D) and end tines to tine bar.

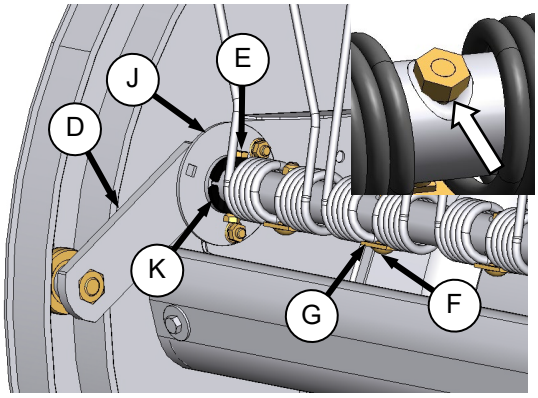
e. Remove bolts (H) securing tine bar bearing support (J) to reel arm.

f. Position end of tine bar clear of cam disc and remove cam arm assembly (D).

g. Slide bearing support (J) off tine bar and remove bearing halves (K).

h. Remove nut, bolt, and keeper on each tine to be removed and slide tine off the bar.

#### 7.9.3.2 Installation –Tines and Bearings, Cam End

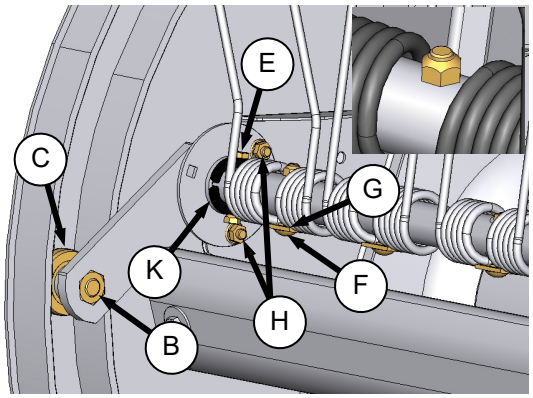



a. Install replacement tines on tine bar and secure with bolt (F) and keeper (G). Install nut with tapered side against tine bar. Do not install bolt in end tine at this time.

b. Slide bearing support (J) onto tine bar.

c. Position end of tine bar clear of cam disc and install cam arm assembly (D), on tine bar.

d. Engage cam arm into cam track as shown.




e. Locate the bearing halves (K) inside the bearing support.

**NOTE**

*Ensure bearings are installed with flanges of bearing facing the centreline of the windrower.*

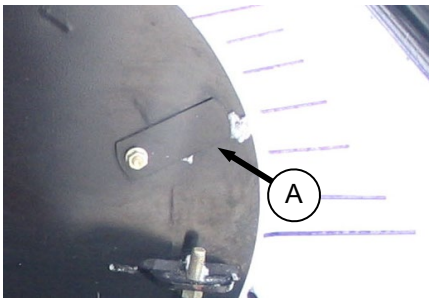
f. Install bolt (E) through the bearings, tine bar and cam arm shaft. Secure with nut and torque to 2-3 ft·lbf (2.5-4 N·m).

g. Attach end tine to tine bar with bolt (F) and keeper (G). Install nut with flat side against tine bar.

h. Attach bearing support to reel arm with bolts and nuts (H). Torque nuts to 21 ft·lbf (29 N·m).

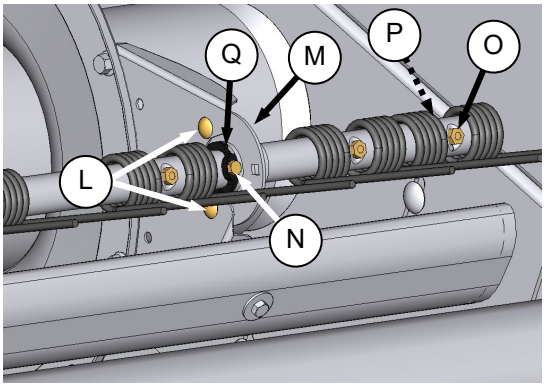
i. Install cam follower bearing (C) with bolt (B) and torque to 125 ft·lbf (170 N·m).

*(continued next page)*



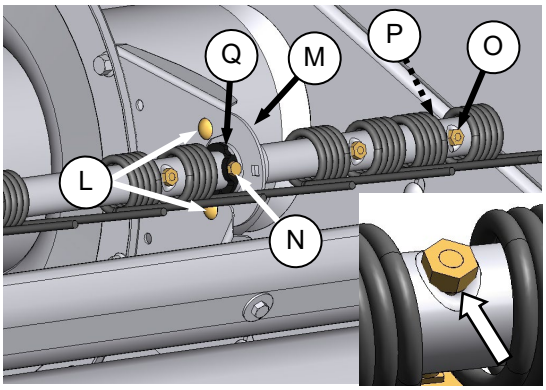

j. Reposition cover (A) on cam and tighten bolt.

#### 7.9.3.3 Removal -Tines and Bearings, Opposite Cam End




a. Remove bolts (L) securing tine bar bearing support (M) to reel arm.
b. Remove bolt (O), and keeper (P) that connect end tines to tine bar.
c. Remove bolt (N) securing bearing halves to tine bar.
d. Position end of tine bar clear of cam disc and slide tines off bar.
e. Slide bearing support (M) off tine bar and remove bearing halves (Q).
f. Remove nut, bolt, and keeper on each tine to be removed and slide tine off the bar.

#### 7.9.3.4 Installation –Tines and Bearings, Opposite Cam End




a. Slide tines and bearing support (M) onto tine bar.
b. Locate the bearing halves (Q) inside the bearing support (M).

**NOTE**

*Ensure bearings are installed with flanges of bearing facing the centreline of the windrower.*

c. Install bolt (N) through the bearings, tine bar and cam arm shaft. Secure with nut and torque to 2-3 ft·lbf (2.5-4 N·m).
d. Attach bearing support to reel arm with bolts and nuts (L). Torque nuts to 21 ft·lbf (29 N·m).
e. Secure tines on tine bar with bolt (O) and keeper (P). Install nut with tapered side against tine bar.

## 7.10 REEL AND REEL DRIVE – A40-D

**CAUTION**

**To avoid personal injury, before servicing windrower or opening drive covers, follow procedures in Section 6.1, Preparation for Servicing.**

### 7.10.1 Reel Drive – A40-D

The reel drive gearbox and hydraulic motor are a factory assembled unit. The gearbox is sealed and requires no scheduled maintenance. If service is required for either the gearbox or motor, see your dealer.

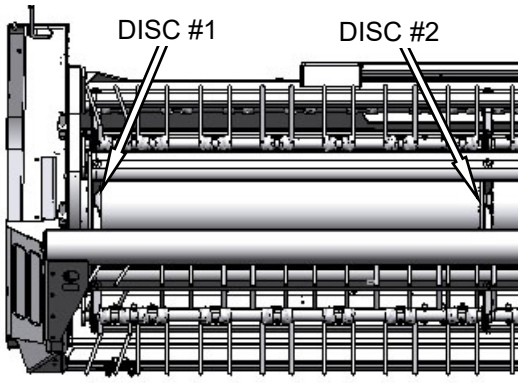
### 7.10.2 Reel Tines and Tine Bar Bearings, A40-D

**IMPORTANT**

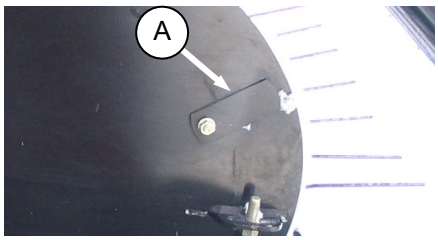
*Keep reel tines in good condition. Straighten or replace as required.*

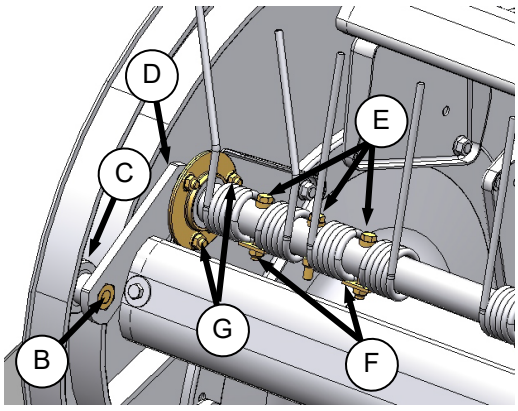
Separate procedures are required to replace reel tines, depending on their location on the reel.

#### 7.10.2.1 Tine and Bearing Replacement, Cam End – Disc #1




a. Loosen bolt on cover (A) and slide cover to expose hole in cam disc. Rotate reel and align bearing with hole.




b. Remove cam follower bearing bolt (B), bearing (C), and nut.

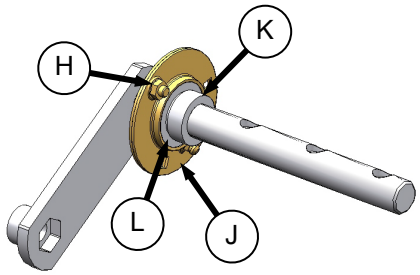
c. Disengage the cam arm (D) from the cam track with a pry bar.

d. Remove three shoulder bolts (E) and keepers (F) that connect cam arm (D) and end tines to tine bar.

e. Remove flangette mounting bolts (G), at discs #1 and #2.

f. Position end of tine bar clear of cam disc and remove cam arm assembly (D), complete with bearing assembly.

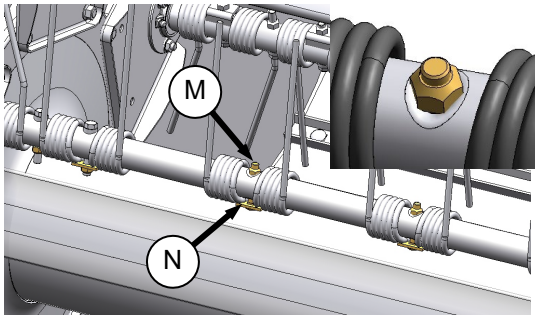
g. Replace bearing as follows:



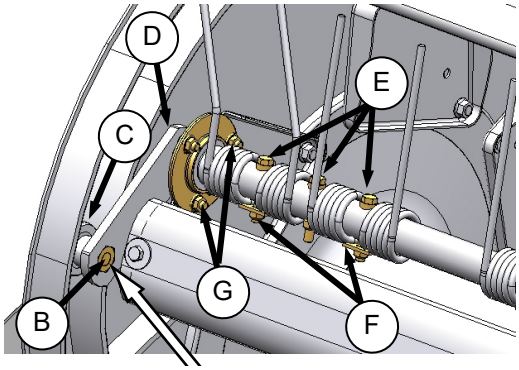

1. Remove bolt (H), separate the flangettes (J), and remove inboard flangette.
2. Loosen set screw in collar (K) and unlock collar with a punch.
3. Slide bearing (L) off shaft, leaving outboard flangette on shaft.
4. Slide replacement bearing onto shaft.
5. Assemble flangettes (J) with bolt (H), but do not tighten.

*(continued next page)*

h. Replace tine as follows:




1. Remove bolt (M) and keeper (N) on tine to be replaced.
2. Remove bolts and keepers on tines as required to facilitate replacement of damaged or worn tine.
3. Slide tines off tine bar.
4. Install replacement tine on tine bar and secure with bolt (M) and keeper (N). Install nut with flat side against tine bar. Do not install bolts in end tines at this time.




**IMPORTANT**
INSTALL NUT WITH DISTORTED THREAD TOWARDS BOLT HEAD.

i. Position end of tine bar clear of cam disc and install cam arm assembly (D), complete with bearing on tine bar.

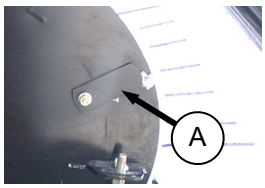
j. Engage cam arm into cam track as shown.

k. Attach bearing flangettes at discs #1 and #2 with bolts (G). Tighten bolts to 23-26 ft·lbf (31-36 N·m).

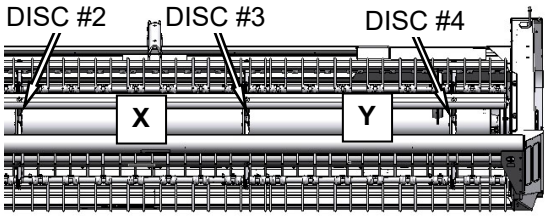
l. Position tines as shown and install shoulder bolts (E) with keepers (F).

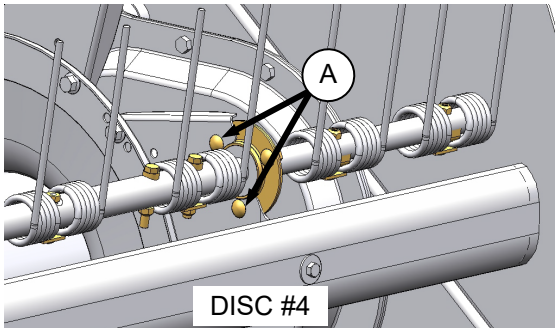
m. Install cam follower bearing (C) with bolt (B) and torque to 125 ft·lbf (170 N·m).

n. Reposition cover (A) on cam and tighten bolt.

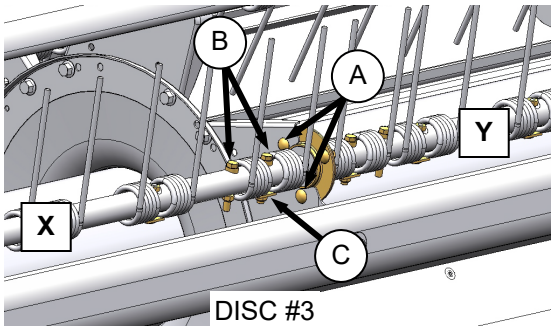


### 7.10.2.2 Tine and Bearing Replacement, Centre Section X




a. Remove flangette mounting bolts (A) at reel discs #3 and #4.

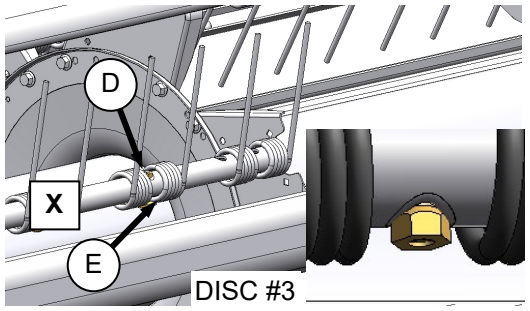



b. Remove shoulder bolts (B) and keeper (C) connecting tine bar sections “X” and “Y” at reel disc #3.

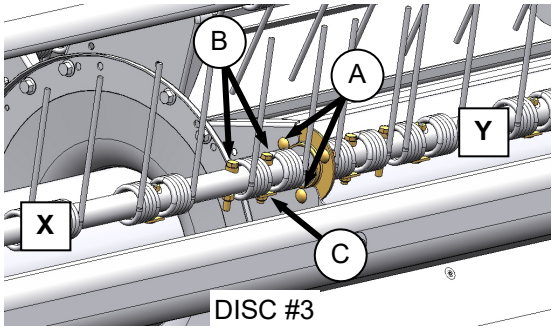
c. Lift tine bar away from reel arms and remove complete tine bar section “Y” (including reel bearings at discs #3 and #4).

d. To replace tine bar bearing, refer to Section 7.6.3, Sealed Bearing Replacement.

e. Replace tine as follows:

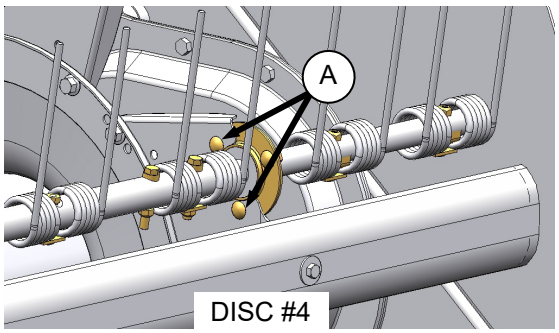



1. Remove bolt (D) and keeper (E) on tine to be replaced.
2. Remove bolts and keepers on tines as required to facilitate replacement of damaged or worn tine.
3. Slide tines off tine bar.
4. Install tines on tine bar and secure with bolts (D) and keepers (E). Install nut with tapered side against tine bar. Do not install bolts in end tines at this time.



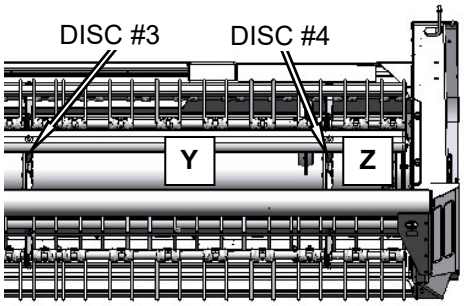

f. Assemble tine bar section “Y” (including reel bearings at discs #3 and #4) to tine bar section “X” at reel disc #3.

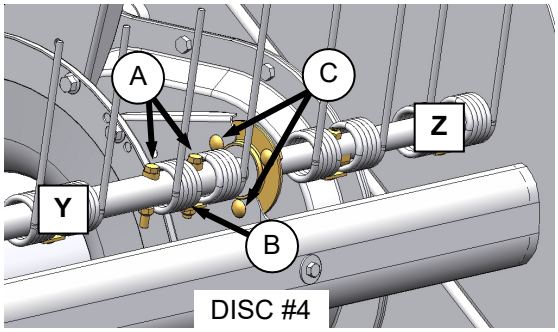
g. Position tines as shown and install shoulder bolts (B) with keeper (C).




h. Attach bearing flangettes to reel arm at discs #3 and #4 with bolts (A). Tighten bolts to 23-26 ft·lbf (31-36 N·m).

### 7.10.2.3 Tine and Bearing Replacement, Opposite Cam – Section Y



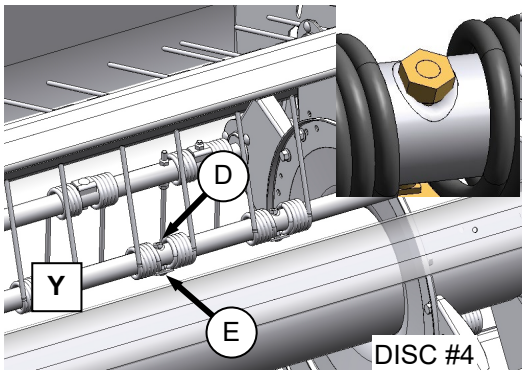

a. Remove shoulder bolts (A) and keeper (B) connecting tine bar extension “Z” to section “Y” at reel disc #4.

b. Remove flangette mounting bolts (C) at reel disc #4.

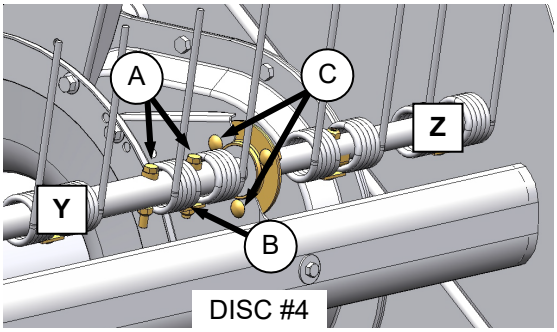
c. Lift tine bar away from reel arm and remove tine bar extension “Z” complete with bearing assembly.

d. To replace tine bar bearing, refer to Section 7.6.3, Sealed Bearing Replacement.

e. Replace tine as follows:




1. Remove bolt (D) and keeper (E) on tine to be replaced.
2. Remove bolts and keepers on tines as required to facilitate replacement of damaged or worn tine.
3. Slide tines off tine bar.



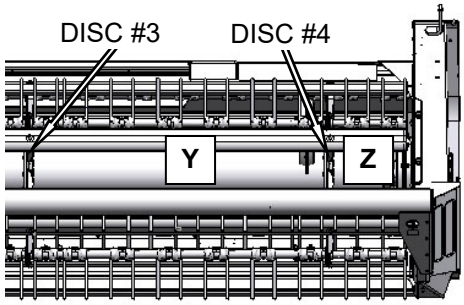

4. Install tines on tine bar and secure with bolts (D and keepers (E). Install nut with tapered side against tine bar. Do not install bolts in end tine at this time.

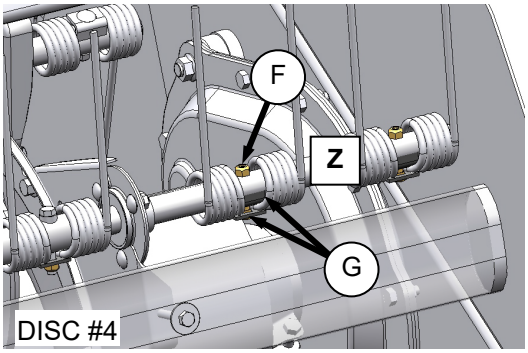
f. Install tine bar extension “Z” including bearing to section “Y” at reel disc #4.

g. Install shoulder bolts (A) and keeper (B) with tine to connect tine bar extension.

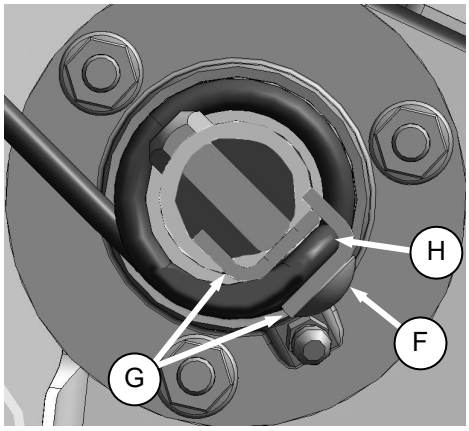
h. Install flangette mounting bolts (C) at reel disc #4. Tighten to 16-20 ft·lbf (21-27 N·m).

### 7.10.2.4 Tine Replacement, Tine Bar Extension – Section Z




a. Remove bolt (F) and keepers (G) on tine to be replaced and slide tines off tine bar.




b. Install tines on tine bar and secure with bolt (F) and two keepers (G). Tine (H) must be clamped between keepers (G).

## *7.11 AUGER AND AUGER DRIVE, A30-S AND A30-D*

**CAUTION**

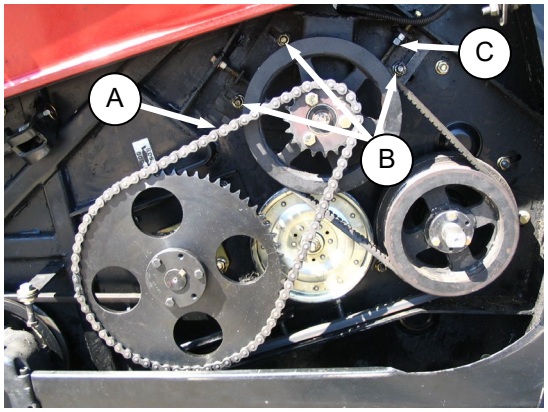
**To avoid personal injury, before servicing windrower or opening drive covers, follow procedures in Section 6.1, Preparation for Servicing.**

### *7.11.1 Auger Drive Chain, A30-S*

#### 7.11.1.1 Tension

Adjust chain (A) tension as follows:

a. Open LH end shield.

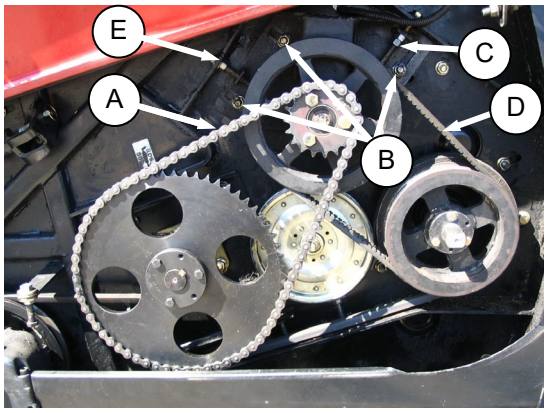



b. Loosen three bolts (B).
c. Loosen jam-nut on adjuster bolt (C).
d. Turn adjuster bolt (C) to adjust chain (A) tension. Deflection at (A) should be ¼ inch (6 mm).
e. Tighten bolts (B).
f. Tighten jam-nut on adjuster bolt (C).
g. Close end shield.

#### 7.11.1.2 Removal

Remove chain (A) as follows:

a. Open LH end shield.




b. Loosen three bolts (B).
c. Loosen jam-nut on adjuster bolt (C).
d. Turn adjuster bolt (C) to loosen chain (A).
e. Remove chain.

#### 7.11.1.3 Installation

Install chain (A) as follows:

a. Position chain (A) on sprockets as shown.
b. Turn adjuster bolt (C) to adjust chain tension. Deflection at (A) should be ¼ inch (6 mm).
c. Tighten jam-nut on adjuster bolt (C).

**NOTE**

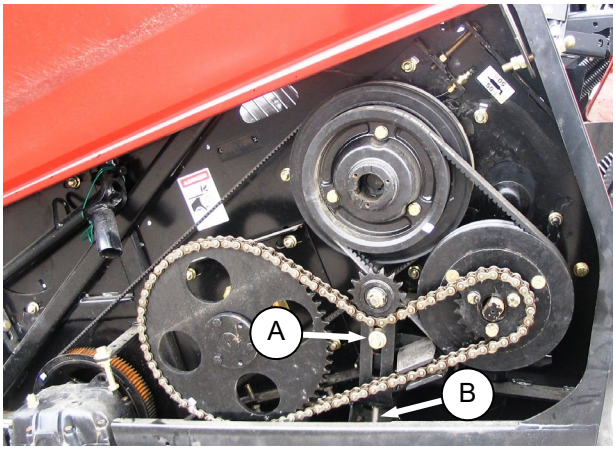
*Minor belt tension adjustments may be made without affecting chain tension. For major adjustments, like after repositioning reel or auger, adjust chain tension before belt tension.*

d. Check auger drive V-belt (D) tension. Each belt should deflect 3/16 in. (4 mm) at mid-span when a load of 8-12 lbf (35-40 N) is applied to each belt. If necessary, adjust as follows:
   1. Loosen jam-nut on adjuster bolt (E).
   2. Turn adjuster bolt (E) to achieve tension as per above.
   3. Tighten bolts (B).
   4. Tighten jam-nut at (E).
e. Close shield before engaging header.

## *7.11.2 Auger Drive Chain, A30-D*

### 7.11.2.1 Tension

a. Open LH end shield.




b. Loosen nut (A) on idler sprocket support.
c. Turn adjuster bolt (B) to give (5 mm) slack at mid-span of chain. Tighten nut (A) on idler sprocket support.
d. Rotate auger and check chain for slack at tightest point. Re-adjust position of idler sprocket to achieve required slack.
e. Close end shield.

### 7.11.2.2 Removal

a. Open LH end shield.
b. Loosen nut (A) on idler sprocket support.
c. Turn adjuster bolt (B) to loosen chain so that it can be removed from small sprocket.
d. Remove chain from large sprocket.

### 7.11.2.3 Installation

a. Position chain around sprockets as shown.
b. Turn adjuster bolt (B) to give (5 mm) slack at mid-span of chain. Tighten nut (A) on idler sprocket support.
c. Rotate auger and check chain for slack at tightest point. Re-adjust position of idler sprocket to achieve required slack.
d. Close end shield before engaging header.

## *7.11.3 Auger Drive Belts, A30-S*

### 7.11.3.1 Tension

**IMPORTANT**

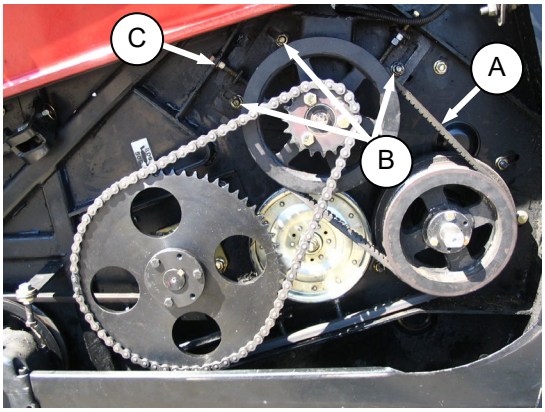
To prolong drive life, do not over-tighten belts. Belt slippage is used to protect the auger in an overload situation.

**NOTE**

*Minor belt tension adjustments may be made without affecting chain tension. For major adjustments, like after repositioning reel or auger, adjust chain tension before belt tension.*

Adjust auger drive belts (A) tension as follows:

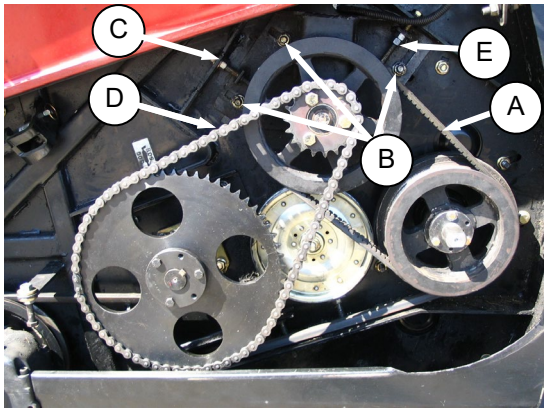
a. Open LH end shield.




b. Loosen three bolts (B).
c. Loosen jam-nut on adjuster bolt (C).
d. Turn adjuster bolt (C) so that each belt deflects 3/16 in. (4 mm) at mid-span when a load of 8-12 lbf (35-40 N) is applied to each belt.
e. Tighten bolts (B).
f. Tighten jam-nut at (C).
g. Close shield before engaging header.

### 7.11.3.2 Removal

a. Open LH end shield.




b. Remove chain (D) from small sprocket as follows:
   1. Loosen three bolts (B).
   2. Loosen jam-nut on adjuster bolt (E).
   3. Turn adjuster bolt (E) to loosen chain (D).
   4. Remove chain from small sprocket.
c. Loosen jam-nut on adjuster bolt (C).
d. Turn adjuster bolt (C) to loosen auger drive belts (A).
e. Remove belts (A).

### 7.11.3.3 Installation

**IMPORTANT**

*Auger drive belts are a matched set. Replace both drive belts even if only one needs replacing.*

a. Position auger drive belts (A) as shown.
b. Install auger drive chain (D) as follows:
   1. Locate chain (D) onto small sprocket.
   2. Turn adjuster bolt (E) to tighten chain. Deflection at (D) should be ¼ inch (6 mm).
   3. Tighten jam-nut on adjuster bolt (E)
c. Turn adjuster bolt (C) so that each belt deflects 3/16 in. (4 mm) at mid-span when a load of 8-12 lbf (35-40 N) is applied to each belt.
d. Tighten jam-nut on adjuster bolt (C) and the three bolts (B).

**NOTE**

*Re-adjust tension of a new belt after about 5 hours of operation.*

e. Close end shield.

## *7.11.4 Auger Drive Belts, A30-D*

### 7.11.4.1 Tension

**IMPORTANT**

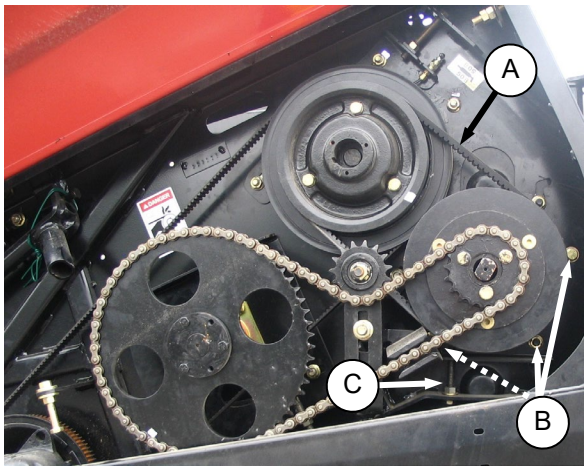
*To prolong drive life, do not over-tighten belt. Belt slippage is used to protect the auger in an overload situation.*

**NOTE**

*Minor belt tension adjustments may be made without affecting chain tension. For major adjustments, like after repositioning reel or auger, adjust chain tension before belt tension.*

Adjust auger drive belts (A) tension as follows:

a. Open LH end shield.




b. Loosen three bolts (B).
c. Loosen jam-nut on adjuster bolt (C).
d. Turn adjuster bolt (C) so that each belt deflects 3/16 in. (4 mm) at mid-span when a load of 8-12 lbf (35-40 N) is applied to each belt.
e. Tighten bolts (B) and jam-nut at (C).

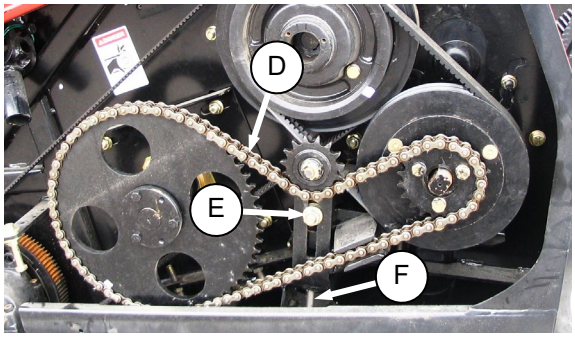
**NOTE**

*Re-adjust tension of new belts after about 5 hours of operation.*

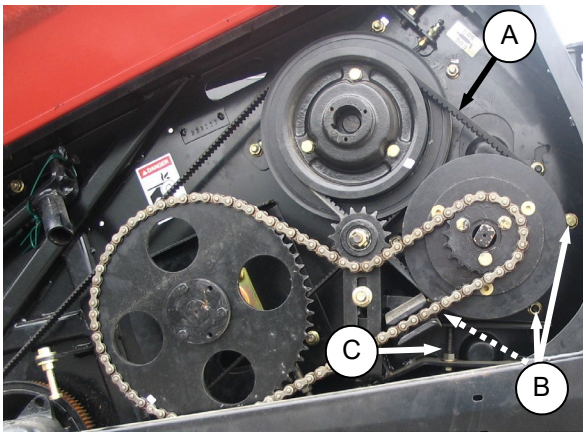
f. Close shield before engaging header.

### 7.11.4.2 Removal

a. Open LH end shield.




b. Remove auger drive chain (D) as follows:
   1. Loosen nut (E) on idler sprocket support.
   2. Turn adjuster bolt (F) to loosen chain (D).
   3. Remove chain from small sprocket.
c. Loosen three bolts (B).



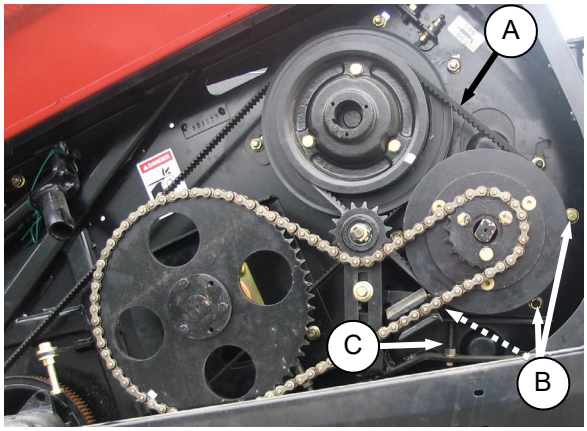

d. Loosen jam-nut on adjuster bolt (C).
e. Turn adjuster bolt (C) to loosen auger drive belts (A).
f. Remove belts (A).

### 7.11.4.3 Installation

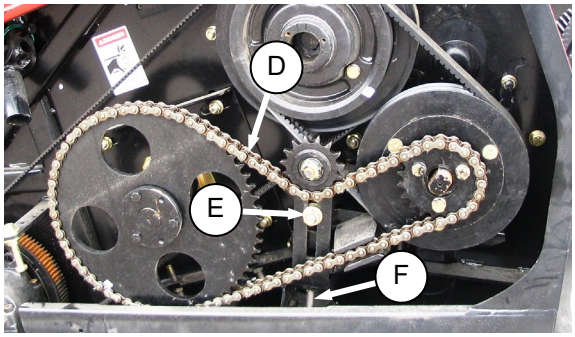
**IMPORTANT**

*Auger drive belts are a matched set. Replace both drive belts even if only one needs replacing.*

Install auger drive belts (A) as follows:




a. Position auger drive belts (A) as shown.
b. Turn adjuster bolt (C) so that belts (A) deflect 3/16 in. (4 mm) at mid-span when a load of 8-12 lbf (35-40 N) is applied to each belt.
c. Tighten bolts (B) and jam-nut at (C).
d. Install auger drive chain (D) as follows:




1. Position chain on small sprocket.
2. Turn adjuster bolt (F) to give (5 mm) slack at mid-span of chain. Tighten nut (E) on idler sprocket support.
3. Rotate auger and check chain for slack at tightest point. Re-adjust position of idler sprocket to achieve required slack.

e. Close end shield.

### *7.11.5 Auger Pans*

The high density polyethylene auger pans are repairable and replaceable. Refer to the Technical Service Manual for details on replacing the pans.

**IMPORTANT**

*To prolong the life of the auger pan, be sure to check that reel tines do not contact the pans when adjusting the reel position or tine pitch.*

Stones and other debris can deform the polyethylene pans. If this occurs, the pans can be straightened as follows:

**CAUTION**

**To avoid personal injury, before servicing windrower or opening drive covers, follow procedures in "Preparation for Servicing", Section 6.1, and Section 5.2, Recommended Safety Procedures.**

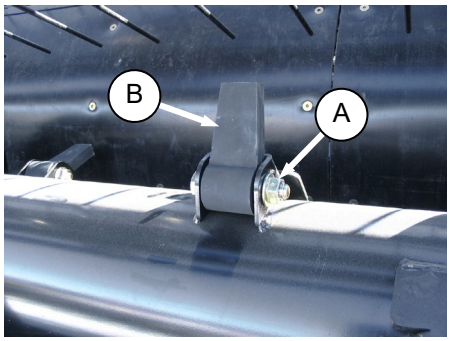
a. Heat the deformed area with a heat gun until the poly is almost sticky.
b. Push out the dent and then apply a cold wet rag. Keep wetting the rag in cold water and applying it the area until cool. This ensures the poly retains it shape.

**NOTE**

*If the dent is too severe and has stretched the poly, it may be necessary to locally remove the poly. Use a plastic welder to rejoin the material. Replacement pans are also available from your dealer.*

### *7.11.6 Rubber Fingers*

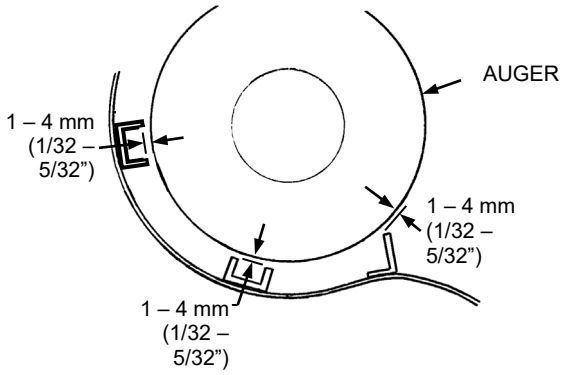
Rubber fingers should be replaced if missing or damaged.




a. Remove nut and bolt (A) and remove finger (B).
b. Position new finger in holder and install bolt and nut. Rubber finger should be free to move after bolt is tightened.

### *7.11.7 Stripper Bars*

To maintain proper clearance between the auger and stripper bars, the bars may need replacing due to wear or damage. Shims may also need to be installed to compensate for local irregularities in the structure.

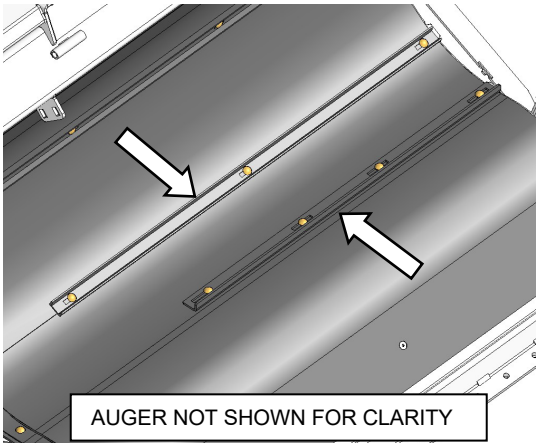



**WARNING**

**To avoid bodily injury or death from unexpected start-up or fall of raised machine, stop engine, remove key and engage lift cylinder stops before going under machine.**

#### 7.11.7.1 Stripper Bar Removal

Heavy crops may cause plugging across the auger due to restricted flow at the stripper bars. Remove the lower stripper bar, and if necessary remove the center stripper bar as follows:

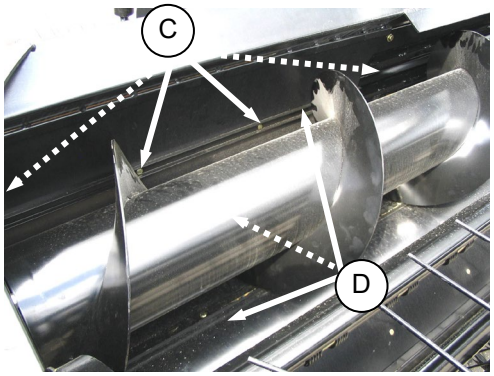



a. Remove bolts attaching stripper bar to pan.
b. Remove stripper bar.
c. Replace bolts in pan.

**NOTE**

*Special countersunk bolts are available from your dealer.*

### 7.11.7.2 Stripper Bar Replacement

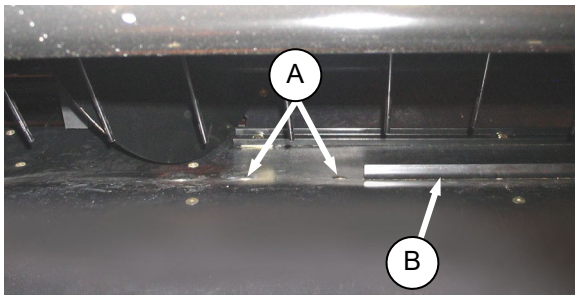



a. Remove the four nuts and bolts (C) that secure each stripper bar (D) (left hand and right hand) to the pan, and remove bars. There are six bars in total.
b. Position new bars (D) on pan as shown with upper flange on front bar facing forward.
c. Install three bolts and nuts (C) in each bar and torque to 150 ft·lbf (203 N·m).
d. Check clearance between auger and stripper bars.
e. Loosen bolts (C) and add shims between stripper bars and pan at bolt locations as required to obtain clearance as shown.
f. Retighten bolts to specified torque.

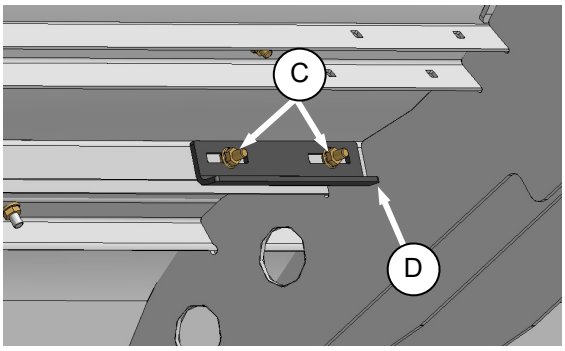
### 7.11.7.3 Stripper Bar Extensions

Extensions for the front stripper bar are provided for installation if required for certain crop conditions that cause the material to bunch up at the ends of the conditioner rolls. The stripper bar extensions will allow the auger to carry the crop more toward the center rather than prematurely feeding it to the conditioner.

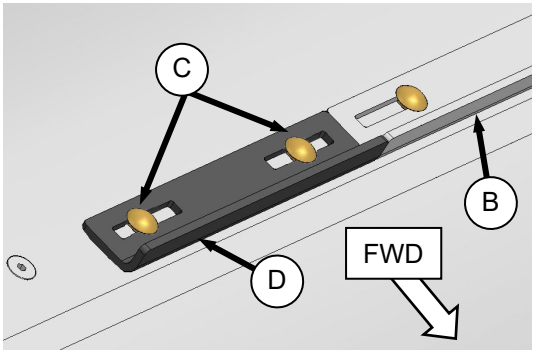
a. Raise header and engage lift cylinder stops.




b. Remove the two existing countersunk bolts (A) in pan adjacent to the two front stripper bars (B). Store for re-installation when the extension is no longer required and removed.




c. Remove two nuts and carriage bolts (C) securing extension (D) to underside of header pan support and retain for reinstallation.




LH SIDE
(AUGER NOT SHOWN FOR CLARITY)

d. Locate extension (D) at inboard end of front stripper bars (B) and install with carriage bolts (C) removed at c.

## *7.12 AUGER AND AUGER DRIVE, A40-D*

The A40-D header auger is driven directly from a hydraulic motor and there are no belts or chains to maintain. For auger and stripper bar maintenance procedures, refer to Section 7.11.5, Auger Pan Repairing, and Section 7.11.6, Rubber Fingers, and Section 7.11.7, Stripper Bars.

## 7.13 CONDITIONER

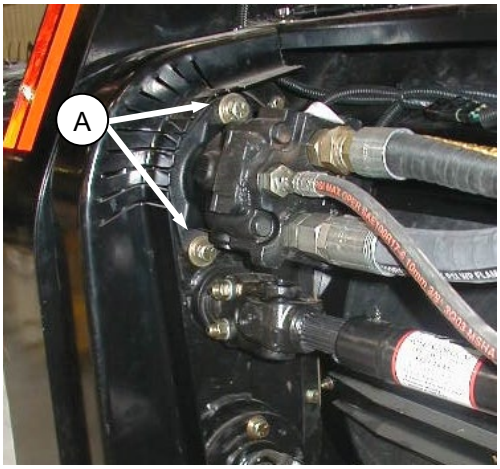
**CAUTION**

**To avoid personal injury, before servicing windrower or opening drive covers, follow procedures in "Preparation for Servicing", Section 6.1.**

### 7.13.1 Hydraulic Drive Motor Removal – All Models

a. Open shield covering conditioner drive.

b. On pull-type machines, disconnect the hydraulic hoses from the motor and install caps on hose ends and motor ports.




c. On self-propelled machines, disconnect hoses at couplers on motor.

d. Remove the two bolts (A) securing motor to gearbox and remove motor.

### 7.13.2 Hydraulic Drive Motor Installation – All Models

Install the hydraulic drive motor onto the gearbox (A) as follows:

a. Clean off excess sealant from motor flange and gearbox face.

b. Apply light coat of silicone to motor flange and position motor on gearbox as shown until mounting holes are aligned and pinion engages gear in gearbox.

c. Install bolts (A) and washers and torque to 75 ft·lbf (102 N·m).

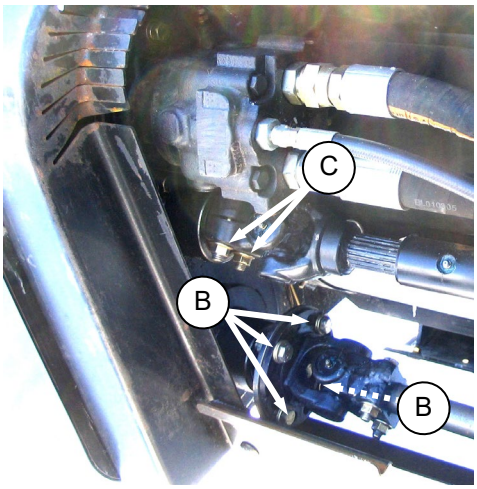
d. Reconnect hoses to motor.

### 7.13.3 Gearbox Removal - A30-S

a. Remove hydraulic drive motor. Refer to Section 7.13.1, Hydraulic Drive Motor Removal.

**NOTE**

*It is not necessary to disconnect the motor hoses for this operation.*

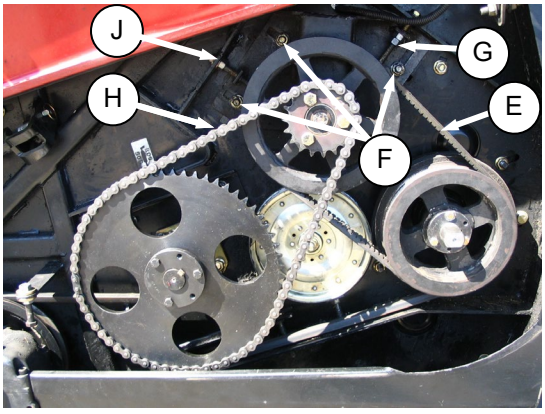



b. Remove the four nuts and bolts (B) from the lower roll drive shaft and swing driveline clear of gearbox.

c. Remove the two nuts and bolts (C) from the upper roll shaft at the gearbox and pull driveline clear of gearbox.

d. Open the end shield on the LH side of the header.

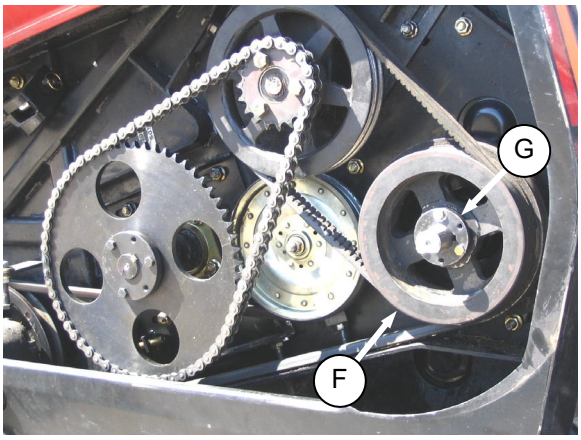
e. Remove the auger drive belts (E) from the drive pulley as follows:



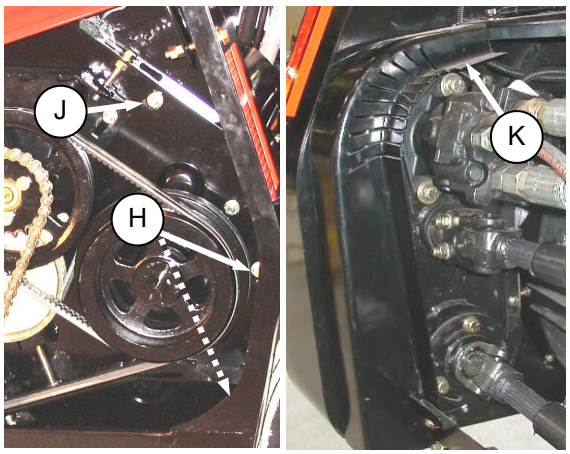

1. Loosen three bolts (F).
2. Loosen jam-nut on adjuster bolt (G).
3. Turn adjuster bolt (G) to loosen chain (H).
4. Loosen jam-nut on adjuster bolt (J).
5. Turn adjuster bolt (J) to loosen auger drive belts (E).
6. Remove belts (E) from drive pulley.

*(continued next page)*

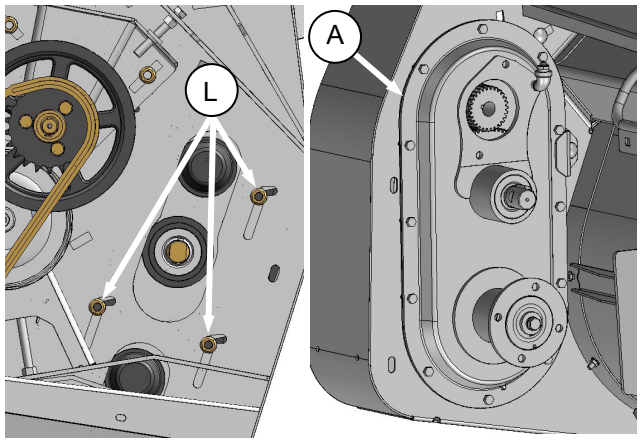
f. Remove the auger drive pulley (F) as follows:




1. Remove the three bolts from the tapered bushing (G) in pulley (F).
2. Install bolts in the two threaded holes in bushing and tighten to release the bushing.
3. Remove the pulley, bushing, and key.

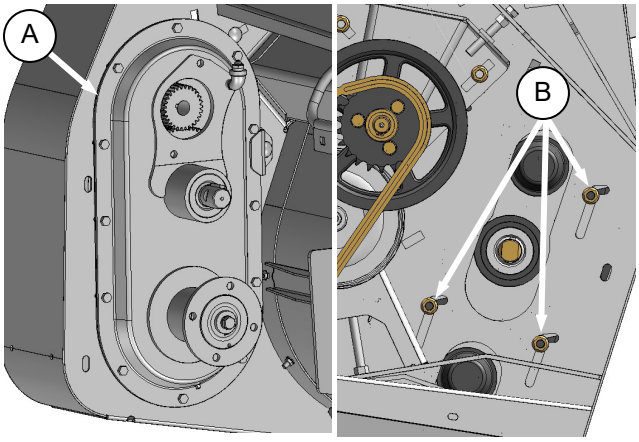



g. Remove the two bolts (H), and nut and bolt (J) attaching channel (K) to end sheet and remove channel (K).



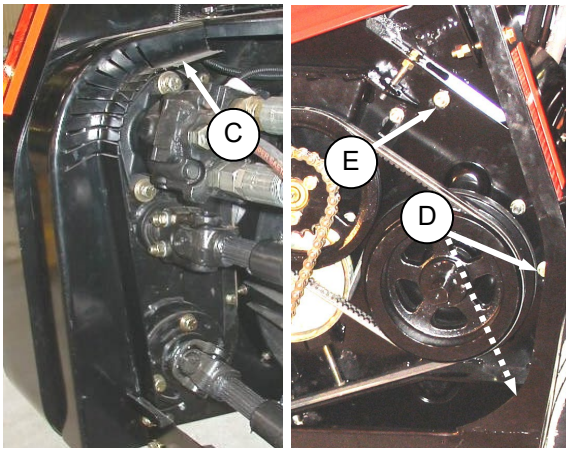

h. Remove the three flanged lock nuts (L) that secure gearbox (A) to header end sheet, and remove gearbox.

### *7.13.4 Gearbox Installation - A30-S*




a. Position gearbox (A) as shown picking up the three holes (B) in the end sheet. See above.

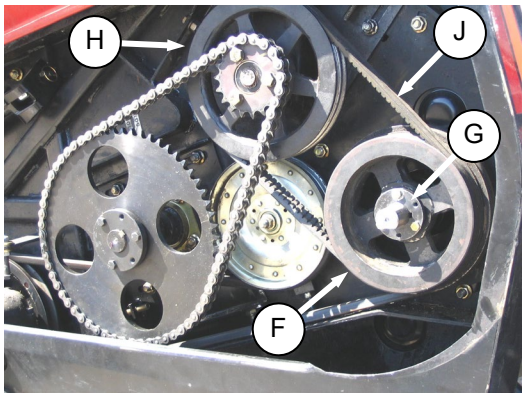
b. Install three flanged locknuts at (B) but do not tighten.




c. Position channel (C) as shown, picking up the three holes in the end sheet.

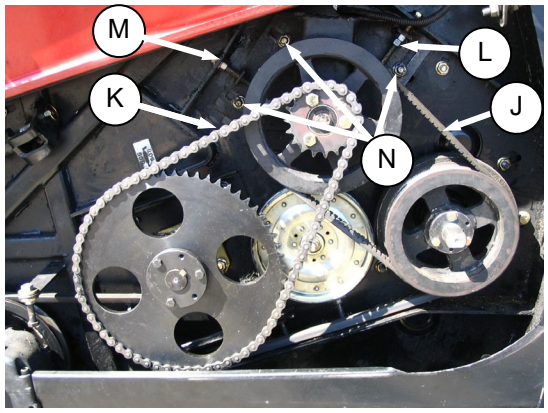
d. Install bolts (D) in the lower two holes and bolt and nut (E) in the upper hole and tighten. Install bolt (E) with head on backside.

e. Install auger drive pulley (F) as follows:



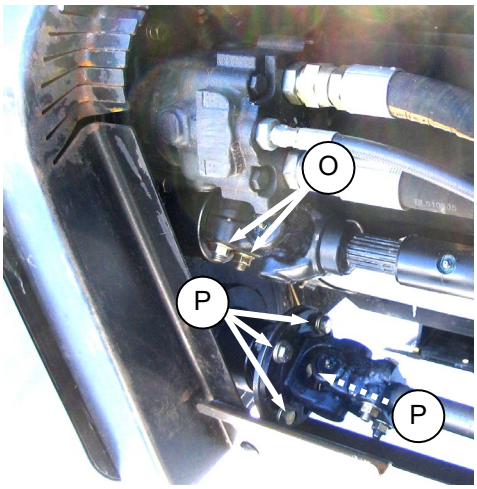

1. Slide pulley (F) onto shaft with key.
2. Install tapered bushing (G) onto shaft, ensuring holes are aligned with holes in pulley.
3. Align pulley (F) and countershaft pulley (H) faces to within .06 in. (1.5 mm).
4. Install three bolts in tapered bushing (G) and tighten to 18 ft·lbf (25 N·m).
5. Tap bushing and re-torque. Repeat until bolts no longer turn at 18 ft·lbf (25 N·m).

f. Install and tighten auger drive belts (J) as follows:




1. Position auger drive belts (J) as shown.
2. Locate chain (K) onto small sprocket.
3. Turn adjuster bolt (L) to tighten chain. Deflection at (K) should be ¼ inch (6 mm).
4. Tighten jam-nut on adjuster bolt (L).
5. Turn adjuster bolt (M) so that each belt deflects 3/16 in. (4 mm) at mid-span when a load of 8-12 lbf (35-40 N) is applied to each belt.
6. Tighten jam-nut on adjuster bolt (M) and the three bolts (N).

*(continued next page)*

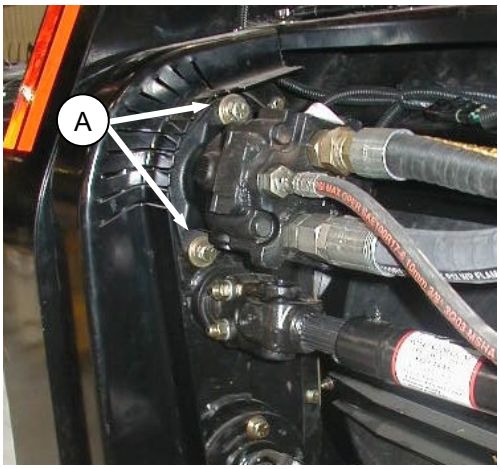



g. Slide upper roll driveline onto gearbox as shown. Install and tighten two bolts and nuts (O). Torque to 75 ft·lbf (102 N·m).

h. Attach lower roll driveline flange onto gearbox flange using four bolts and nuts (P).

i. Adjust roll timing. Refer to Section 6.17.11.2, Roll Timing and Alignment.

j. Clean off excess sealant from motor flange and gearbox face.




k. Apply light coat of silicone to motor flange and position motor on gearbox as shown until mounting holes are aligned and pinion engages gear in gearbox.

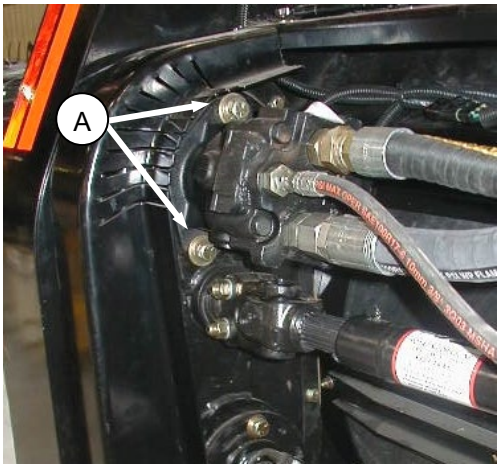
l. Install bolts (A) and washers and torque to 75 ft·lbf (102 N·m).

m. Reconnect hoses to motor.

n. Close all shields before engaging header.

### *7.13.5 Gearbox Removal – A30-D*

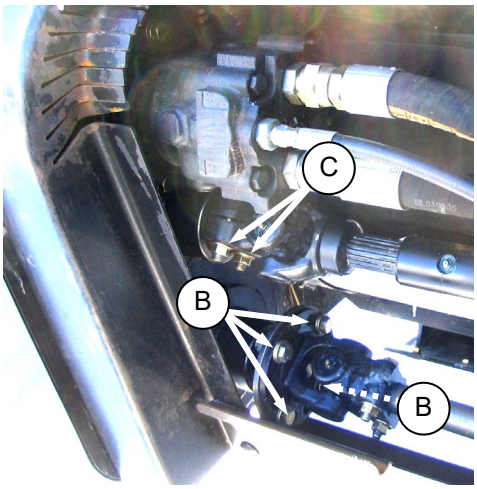
a. Open shield covering conditioner drive.




b. Remove the two bolts (A) securing motor to gearbox and remove motor.

**NOTE**

*It is not necessary to disconnect the motor hoses for this operation.*

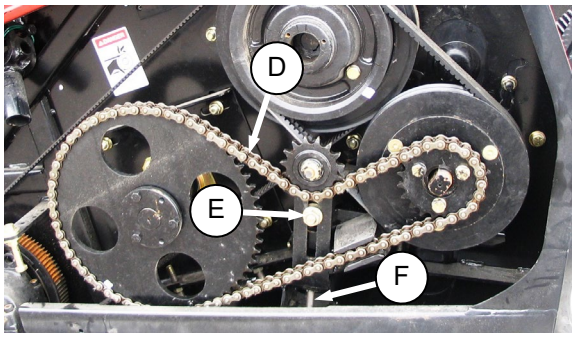



c. Remove the four nuts and bolts (B) from the lower roll drive shaft and swing driveline clear of gearbox.

d. Remove the two nuts and bolts (C) from the upper roll shaft at the gearbox and pull driveline clear of gearbox.

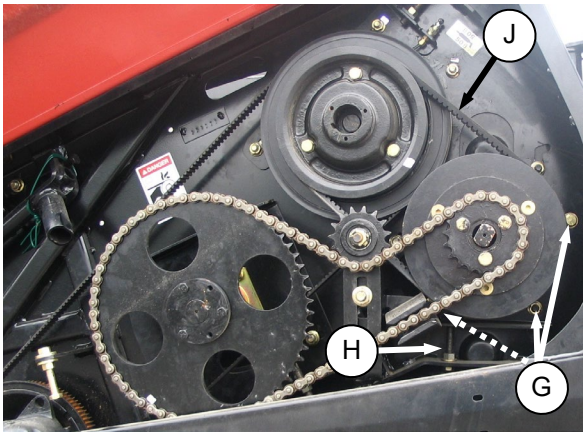
e. Open the LH end shield.

f. Remove auger drive chain (D) from small sprocket as follows:




1. Loosen nut (E) on idler sprocket support.
2. Turn adjuster bolt (F) to loosen chain (D).
3. Remove chain from small sprocket.

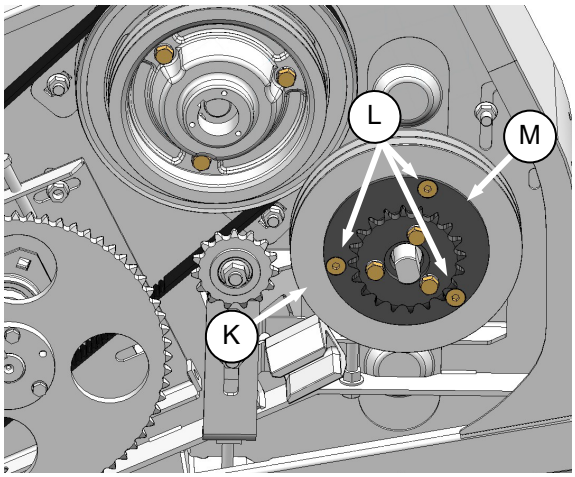
g. Remove V-belts from drive pulley as follows:



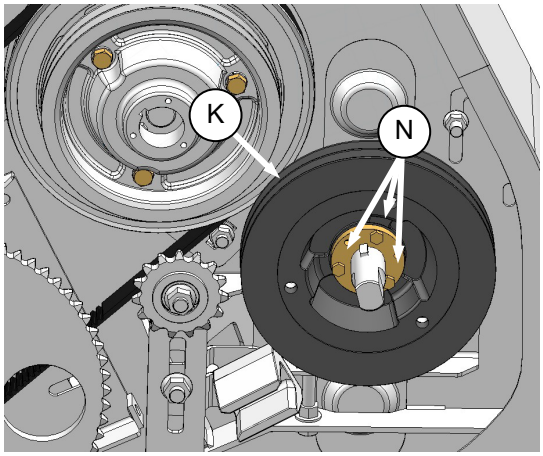

1. Loosen three bolts (G).
2. Loosen jam-nut on adjuster bolt (H).
3. Turn adjuster bolt (H) to loosen auger drive belts (J).
4. Remove belts (J) from drive pulley.

*(continued next page)*

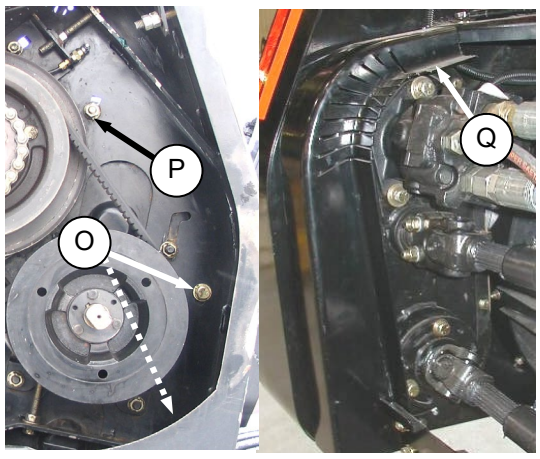
h. Remove the auger drive pulley (K) as follows:



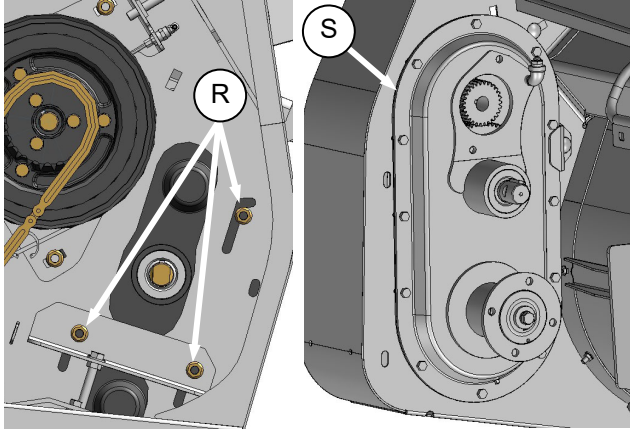

1. Remove the three bolts (L) from hub (M) and remove hub and sprocket.




2. Remove the three bolts (N) from the tapered bushing.
3. Install bolts in the two threaded holes in bushing and tighten to release the bushing.



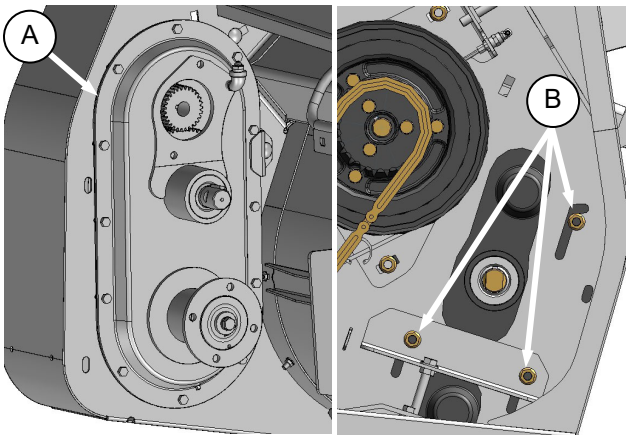

4. Remove the pulley (K), bushing, and key.




i. Remove the two bolts (O), and nut and bolt (P) attaching channel (Q) to end sheet and remove channel (Q).

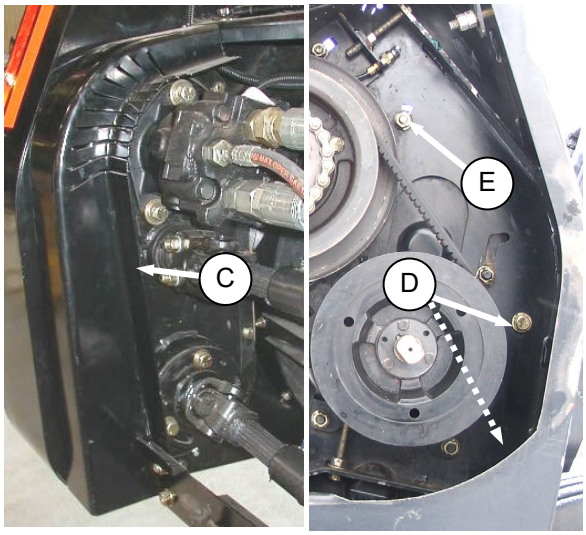
j. Remove the three flanged lock nuts (R) that secure gearbox (S) to header end sheet and remove gearbox.

### *7.13.6 Gearbox Installation – A30-D*




a. Position gearbox (A) as shown, picking up the three holes in the end sheet.

b. Install three flanged locknuts at (B) but do not tighten.

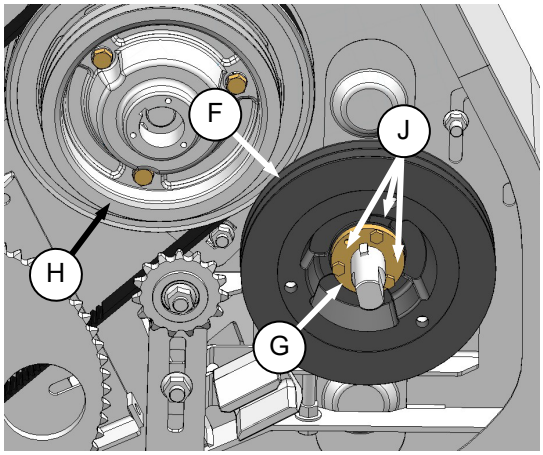



c. Position channel (C) as shown, picking up the three holes in the end sheet.

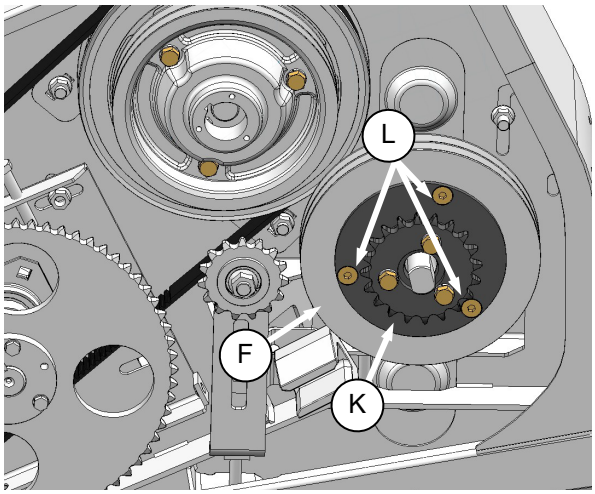
d. Install bolts (D) in the lower two holes and bolt and nut (E) in the upper hole and tighten. Install bolt (E) from backside.

e. Tighten hardware.

f. Install drive pulley (F) as follows:




1. Slide pulley (F) onto shaft with key.
2. Install tapered bushing (G) onto shaft, ensuring holes are aligned with holes in pulley.
3. Align pulley (F) and countershaft pulley (H) faces to within .06 in. (1.5 mm).
4. Install three bolts (J) in tapered bushing (G) and tighten to 18 ft·lbf (25 N·m).
5. Tap bushing and re-torque. Repeat until bolts no longer turn at 18 ft·lbf (25 N·m).




g. Install hub and sprocket (K) with three bolts and nuts (L). Tighten to required torque.

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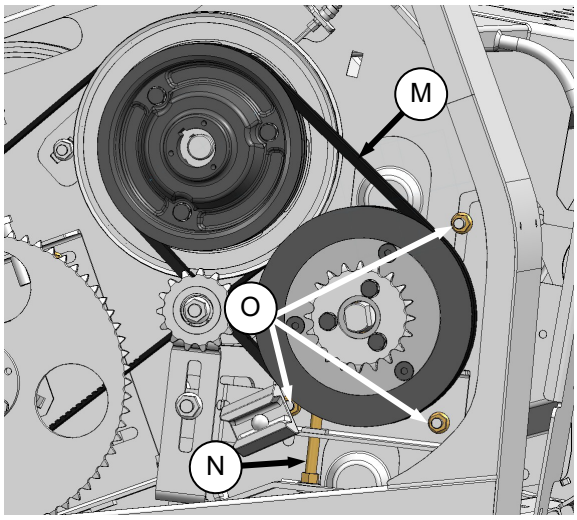
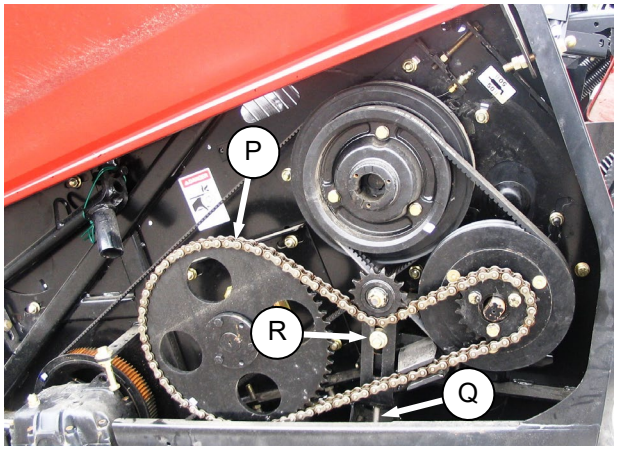



h. Position auger drive belts (M) as shown.

i. Turn adjuster bolt (N) so that belts (M) deflect 3/16 in. (4 mm) at mid-span when a load of 8-12 lbf (35-40 N) is applied to each belt.

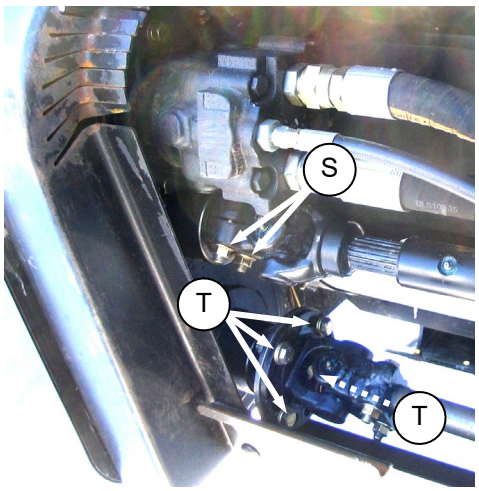
j. Tighten bolts (O) and jam-nut at (N).




k. Install drive chain (P) onto sprockets.

l. Turn adjuster bolt (Q) to give (5 mm) slack at mid-span of chain. Tighten nut (R) on idler sprocket support.

m. Rotate auger and check chain for slack at tightest point. Re-adjust position of idler sprocket to achieve required slack.



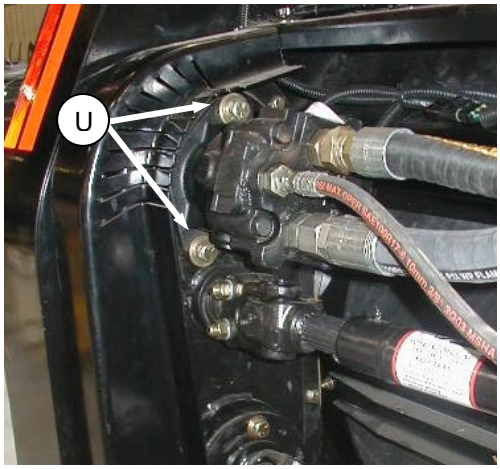

n. Slide upper roll driveline onto gearbox as shown. Install and tighten two bolts and nuts (S). Torque to 75 ft·lbf (102 N·m).

o. Attach lower roll driveline flange onto gearbox flange using four bolts and nuts (T).

p. Adjust roll timing. Refer to Section 6.17.11.2, Roll Timing and Alignment.

q. Clean off excess sealant from motor flange and gearbox face.

r. Apply light coat of silicone to motor flange and position motor on gearbox as shown until mounting holes are aligned and pinion engages gear in gearbox.



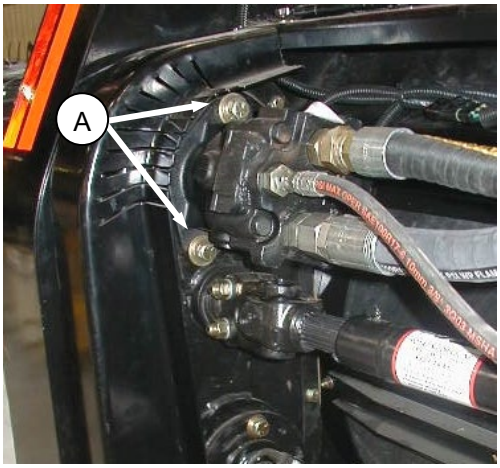

s. Install bolts (U) and washers and torque to 75 ft·lbf (102 N·m).

t. Reconnect hoses to motor.

u. Close all shields before operating machine.

### *7.13.7 Gearbox Removal – A40-D*

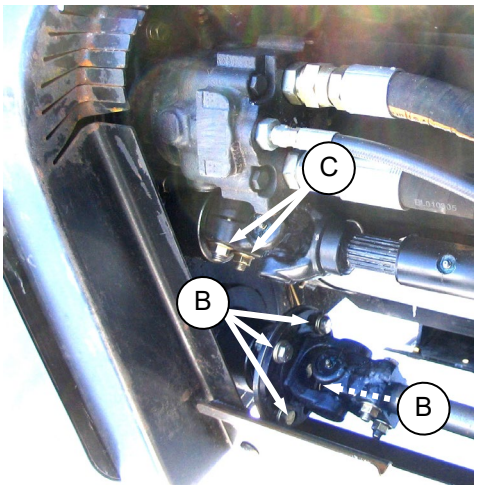
a. Open shield covering conditioner drive.




b. Remove the two bolts (A) securing motor to gearbox and remove motor.

**NOTE**

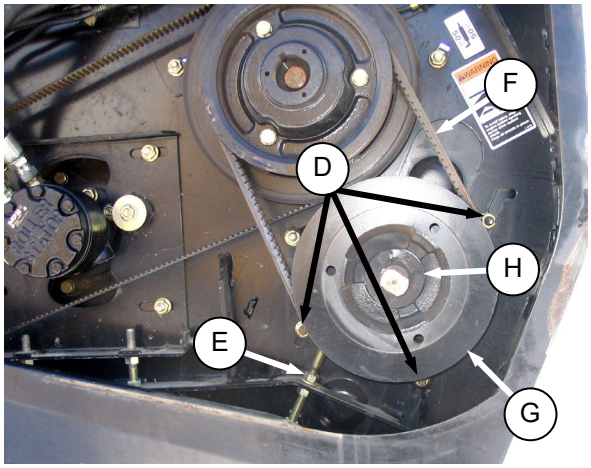
*It is not necessary to disconnect the motor hoses for this operation.*




c. Remove the four nuts and bolts (B) from the lower roll drive shaft and swing driveline clear of gearbox.

d. Remove the two nuts and bolts (C) from the upper roll shaft at the gearbox and pull driveline clear of gearbox.

e. Open the end shield on the LH side of the header.

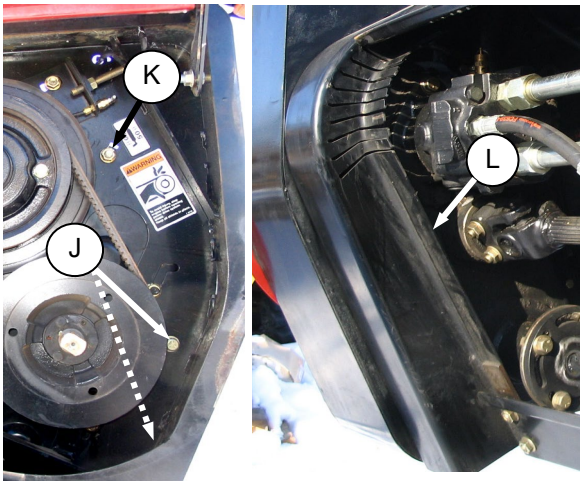



f. Loosen three nuts (D) and jam-nut on adjuster bolt (E).

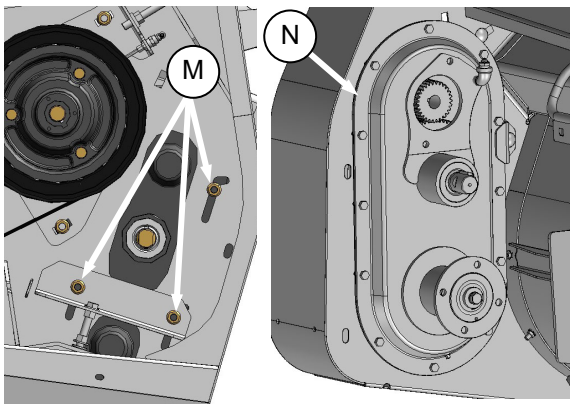
g. Turn adjuster bolt (E) so that drive belts (F) can be slipped off pulley (G).

h. Remove the sickle drive pulley (G) as follows:

1. Remove the three bolts from the tapered bushing (H) in pulley (D).
2. Install bolts in the two threaded holes in bushing and tighten to release the bushing.
3. Remove the pulley, bushing, and key.




i. Remove the two bolts (J), and nut and bolt (K) attaching channel (L) to end sheet and remove channel (L).

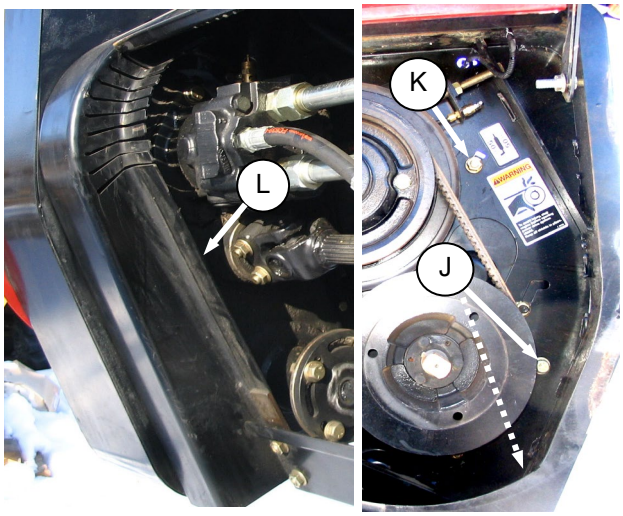



j. Remove the three flanged lock nuts (M) that secure gearbox (N) to header end sheet and remove gearbox.

### *7.13.8 Gearbox Installation – A40-D*

a. Position gearbox (N) as shown picking up the three holes in the end sheet.

b. Install three flanged locknuts (M) but do not tighten.

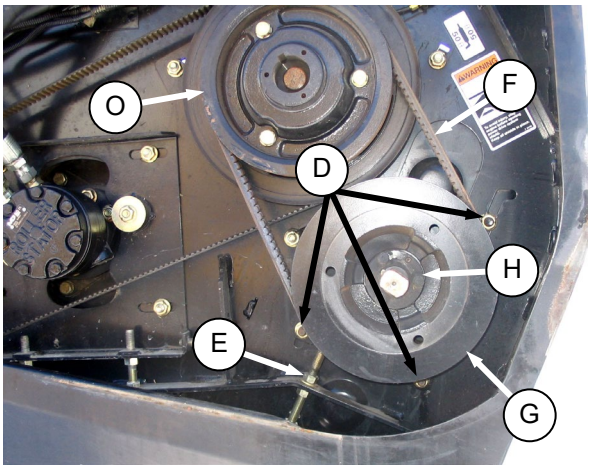



c. Position channel (L), picking up the three holes in the end sheet.

d. Install bolts at (J) in the lower two holes and bolt and nut (K) in the upper hole and tighten.

e. Tighten hardware.

f. Install drive pulley (G) as follows:

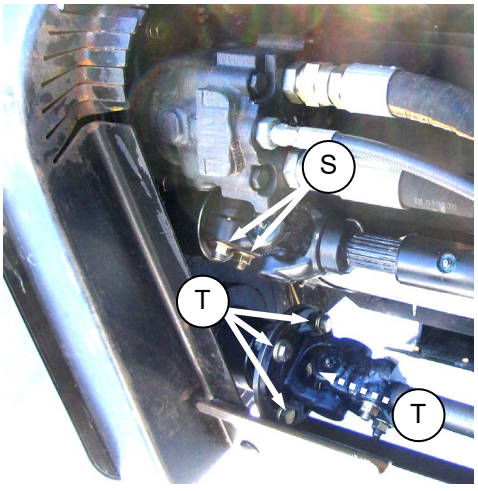



1. Slide pulley (G) onto shaft with key.
2. Install tapered bushing (H) onto shaft, ensuring holes are aligned with holes in pulley.
3. Align pulley (G) and countershaft pulley (O) faces to within .06 in. (1.5 mm).
4. Install three bolts in tapered bushing (H) and tighten to 18 ft·lbf (25 N·m).
5. Tap bushing and re-torque. Repeat until bolts no longer turn at 18 ft·lbf (25 N·m).

g. Position belts (F) on pulleys (G) and (O).

h. Turn adjuster bolt (E) to move pulley (G) until a force of 8-12 lbf (35-50 N) on each belt at mid-span deflects the belt (F) 0.16 inch (4 mm).

i. Tighten jam-nut at (E) and three nuts (D).




j. Slide upper roll driveline onto gearbox as shown. Install and tighten two bolts and nuts (S). Torque to 75 ft·lbf (102 N·m).

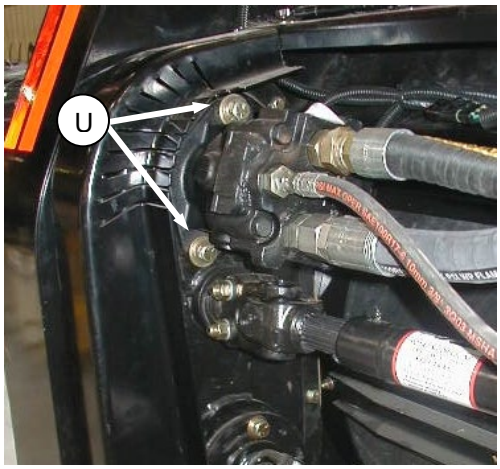
k. Attach lower roll driveline flange onto gearbox flange using four bolts and nuts (T).

*(continued next page)*

l. Adjust roll timing. Refer to Section 6.17.11.2, Roll Timing and Alignment.

m. Clean off excess sealant from motor flange and gearbox face.

n. Apply light coat of silicone to motor flange and position motor on gearbox as shown until mounting holes are aligned and pinion engages gear in gearbox.




o. Install bolts (U) and washers and torque to 75 ft·lbf (102 N·m).

p. Reconnect hoses to motor.

q. Close all shields before operating machine.

### *7.13.9 Changing Gearbox Oil*

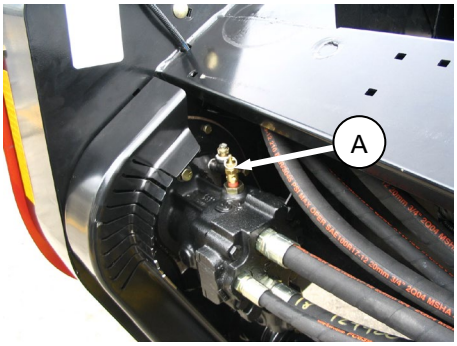
**NOTE**

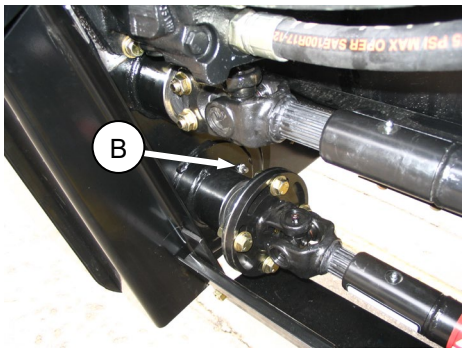
*Change conditioner drive gearbox lubricant after the first 50 hours operation and every 1000 hours (or 3 years) thereafter.*

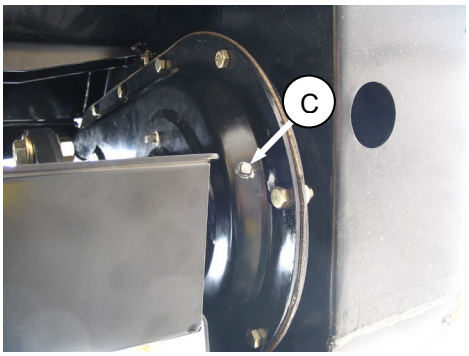
a. Lower header to ground.

b. Open driveline shield.

c. Place a suitable container under gearbox drain to collect oil.




d. Remove breather (A), check plug (B) and drain plug (C).

e. Allow oil to drain.

f. Replace drain plug (C) and add oil at (A) to required level. Use Gear Lubricant, SAE 85W-140, API Service Class GL-5, 1.5 qts (1.4 liters).

g. Oil is at required level when it runs out of check plug (B).

## 7.14 WHEELS, TIRES, AND HITCH – PULL-TYPE

**CAUTION**

**To avoid personal injury, before servicing windrower or opening drive covers, follow procedures in "Preparation for Servicing", Section 6.1.**

### 7.14.1 Wheel Bolts

**IMPORTANT**

*Check and tighten wheel bolts after the first hour of operation and every 100 hours thereafter.*

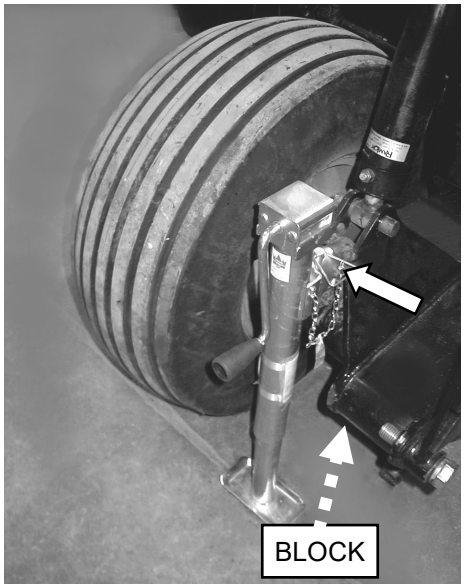
**IMPORTANT**

*Whenever a wheel is removed and re-installed, check torque after one hour of operation. Maintain 120 ft·lbf (160 N·m) torque.*

### 7.14.2 Wheel Removal

a. Lower header to the ground.

b. Retrieve jack (5000 lb capacity) from storage position on APT.




c. Position jack on mount provided on frame leg as shown and raise tire just off the ground. Place block under frame leg.

d. Remove wheel bolts.

e. Remove wheel.

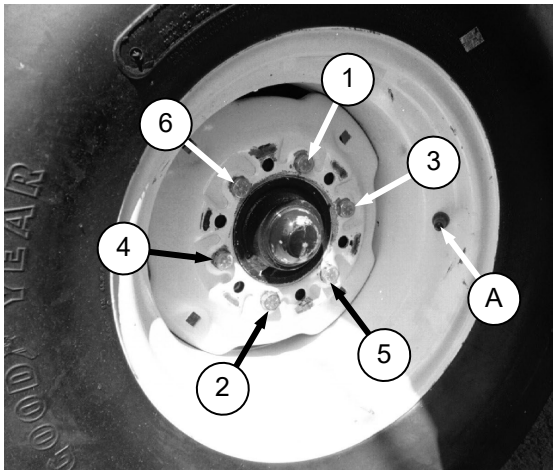
### 7.14.3 Installation

**CAUTION**

**When installing wheel be sure to use the holes that are countersunk to match bolt head profile. The uncountersunk holes do not seat the bolts correctly.**

**IMPORTANT**

*Follow proper bolt tightening sequence shown. Be sure valve stem (A) points away from wheel support.*




a. Position wheel on spindle and install bolts. Partially tighten.

b. Remove blocks and lower jack until tire contacts the ground.

c. Torque bolts to 120 ft·lbf (160 N·m) in accordance with tightening sequence shown.

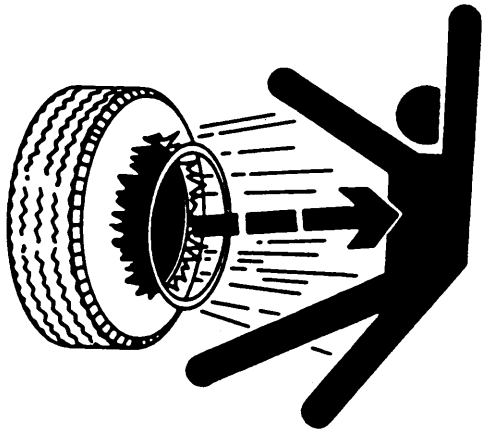
d. Lower jack completely, remove from leg and store on APT.

### *7.14.4 Tire Inflation*

Check tire pressure daily. Maintain 30 psi (207 kPa).

**WARNING**

- **Service tires safely.**

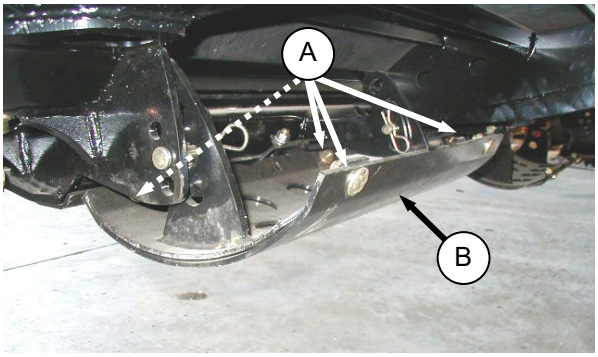


- **A tire can explode during inflation and cause serious injury or death.**
- **Do not stand over tire. Use a clip-on chuck and extension hose.**
- **Never increase air pressure beyond 35 psi (241 kPa) to seat the bead on the rim.**
- **Replace the tire if it has a defect.**
- **Replace a wheel rim, which has cracks, wear or severe rust.**
- **Never weld a wheel rim.**
- **Never use force on an inflated or partially inflated tire.**
- **Make sure the tire is correctly seated before inflating to operating pressure.**
- **If the tire is not in correct position on the rim, or is too full of air, the tire bead can loosen on one side, causing air to leak at high speed and with great force. An air leak of this nature can thrust the tire in any direction, endangering anyone in the area.**
- **Make sure all the air is removed from a tire before removing the tire from a rim.**
- **Do not remove, install or make repairs to a tire on a rim unless you have the proper equipment and experience to perform the job.**
- **Take the tire and rim to a qualified tire repair shop.**

## *7.15 SKID SHOE WEAR PLATE REPLACEMENT*

The skid shoes are equipped with replaceable wear plates that can be reversed for increase service life. It is recommended that the wear plates be replaced when the skid shoe weldment becomes exposed. Replace wear plates as follows:

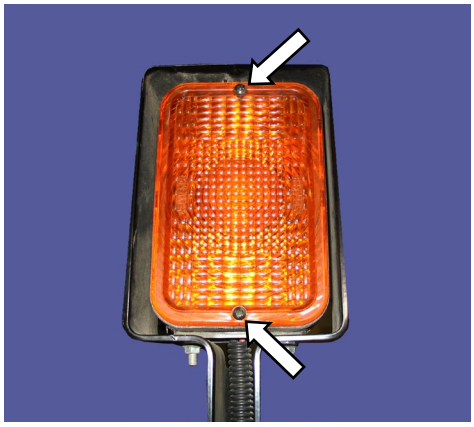
a. Raise header and engage lift cylinder stops.




b. Remove bolts (A) and remove wear plates (B).
c. Position replacement wear plate (B) as shown. (The same wear plate can be reinstalled but in the reverse position).
d. Secure wear plate with bolts and nuts (A).
e. Disengage lift cylinder stops.

## *7.16 ELECTRICAL*

a. Use electrical tape and wire clips as required to prevent wires from dragging or rubbing.
b. Keep lights clean and replace burnt bulbs.
c. To replace light bulbs:
   1. Using a phillips screwdriver, remove screws from fixture and remove plastic lens.



*Bulb Part No. - Trade #1156*

   2. Replace bulb and reinstall plastic lens and screws.

## 7.17 MAINTENANCE SCHEDULE

The following maintenance schedules list periodic maintenance procedures, and are organized by service intervals. Regular maintenance is the best insurance against early wear and untimely breakdowns. Following this schedule will increase machine life. For detailed instructions, refer to the specific headings in Section 6, Maintenance/Service.

Recommended service intervals are in **hours of operation**. Where a service interval is given in more than one time frame, e.g. "100 hours or Annually", service the machine at whichever interval is reached first.

**IMPORTANT**

*Recommended intervals are for average conditions. Service the machine more often if operated under adverse conditions (severe dust, extra heavy loads, etc.).*

**CAUTION**

**Carefully follow safety messages given under Section 7.2, Recommended Safety Procedures.**

### 7.17.1 Self-Propelled

**NOTE**

*The following service schedule is only applicable to the Windrower Header. Refer to your Tractor Operator's Manual #169007 for tractor maintenance.*

#### 7.17.1.1 Break-In Inspection - SP

| HRS. | ITEM | CHECK | REFERENCE |
|---|---|---|---|
| 5 | Hardware | Torque | Sec. 6.5 |
| 5, 25, & 50 | Auger Drive Belt | Tension | Sec. 7.11.3 & 7.11.4 |
| | Reel Drive Belt | Tension | Sec. 7.9.2 |
| | Sickle Drive Belt | Tension | Sec. 7.8.8 & 7.8.9 |
| 10 | Auger Drive Chain | Tension/Lub. | Sec. 7.11.1 & 7.11.2 |
| | Reel Drive Chain | Tension/Lub. | Sec. 7.9.1 |
| | Wobble Box Mounting Bolts | Torque | 200 ft·lbf (270 N·m) Sec.7.8.10. |

#### 7.17.1.2 Interval Maintenance - SP

| INTERVAL | SERVICE | |
|---|---|---|
| FIRST USE | Refer To Section 7.17.1.1 Break-In Inspection. | |
| 100 HOURS OR ANNUALLY * | 1. Check Conditioner Drive Gearbox Lubricant Level.<br>2. Check Wobble Box Lubricant Level. | 3. Check Wobble Box Mounting Bolt Torques. |
| END OF SEASON | Refer To Section 6.19, STORAGE. | |
| 10 HOURS OR DAILY | 1. Check Hydraulic Hoses And Lines For Leaks.<br>2. Oil Sickle (Except In Sandy Conditions.<br>3. Check Sickle Sections, Guards, & Hold-Downs | 4. Oil Reel Drive Chain (except A40-D).<br>5. Oil Auger Drive Chain (except A40-D).<br>6. Check Wobble Box Bolt Torque (First 10 Hours Only, Every 100 Hours Thereafter). |
| 25 HOURS | 1. Grease Sickle Head. | |
| 50 HOURS | 1. Grease Reel Shaft Bearings.<br>2. Grease Auger Shaft Bearings.<br>3. Grease Auger Jack-Shaft Bearings (except A40-D).<br>4. Grease Conditioner Universal Shafts.<br>5. Grease Conditioner Shaft Bearings.<br>6. Grease Roll Pivots Bearing. | 7. Grease Gauge Roller Bearings.<br>8. Change Wobble Box Lubricant. (First 50 Hours Only, Every 1000 Hours Thereafter).<br>9. Change Conditioner Drive Gearbox Lubricant (First 50 Hours Only, Every 1000 Hours Thereafter). |
| 1000 HOURS OR 3 YEARS | 1. Change Wobble Box Lubricant. | 2. Change Conditioner Drive Gearbox Lubricant. |

### 7.17.1.3 Maintenance Record - SP

| Self-Propelled Windrower Header | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **ACTION:** | **✓ - Check** | | | | **♦ - Lubricate** | | | | | | | | | | **▲ - Change** | | | | | | | | |
| MAINTENANCE RECORD | **Hour Meter Reading** | | | | | | | | | | | | | | | | | | | | | | |
| | **Date** | | | | | | | | | | | | | | | | | | | | | | |
| | **Serviced By** | | | | | | | | | | | | | | | | | | | | | | |
| | **BREAK-IN** | Refer To Section 7.17.1.1, Break-In Inspection. | | | | | | | | | | | | | | | | | | | | | |
| | **100 HOURS OR ANNUALLY** | | | | | | | | | | | | | | | | | | | | | | |
| ✓ | Conditioner Drive Gearbox Lube Level | | | | | | | | | | | | | | | | | | | | | | |
| ♦ | Wheel Hub Bearings | | | | | | | | | | | | | | | | | | | | | | |
| ✓ | Wobble Box Bolt Torque | | | | | | | | | | | | | | | | | | | | | | |
| ✓ | Wobble Box Lubricant Level | | | | | | | | | | | | | | | | | | | | | | |
| | **END OF SEASON** | Refer To Section 6.19, STORAGE. | | | | | | | | | | | | | | | | | | | | | |
| | **10 HOURS OR DAILY** | **NOTE: A RECORD OF DAILY MAINTENANCE IS NOT NORMALLY REQUIRED BUT IS AT THE OWNER/OPERATOR'S DISCRETION.** | | | | | | | | | | | | | | | | | | | | | |
| ♦ | Auger Drive Chain (except A40-D) | | | | | | | | | | | | | | | | | | | | | | |
| ✓ | Hydraulic Hoses & Lines | | | | | | | | | | | | | | | | | | | | | | |
| ✓ | Hydraulic Oil Level | | | | | | | | | | | | | | | | | | | | | | |
| ♦ | Reel Drive Chain (except A40-D) | | | | | | | | | | | | | | | | | | | | | | |
| ♦ | Sections, Guards, Hold-downs | | | | | | | | | | | | | | | | | | | | | | |
| ✓ | Sickle Assembly | | | | | | | | | | | | | | | | | | | | | | |
| ✓ | Wobble Box Bolt Torque - First 10 H | | | | | | | | | | | | | | | | | | | | | | |
| | **25 HOURS** | | | | | | | | | | | | | | | | | | | | | | |
| ♦ | Sickle Head | | | | | | | | | | | | | | | | | | | | | | |
| | **50 HOURS** | | | | | | | | | | | | | | | | | | | | | | |
| ♦ | Auger Drive Jackshaft Bearings (except A40-D). | | | | | | | | | | | | | | | | | | | | | | |
| ♦ | Auger Shaft Bearings | | | | | | | | | | | | | | | | | | | | | | |
| ♦ | Gauge Roller Bearings | | | | | | | | | | | | | | | | | | | | | | |
| ♦ | Main Drive Shaft Bearings | | | | | | | | | | | | | | | | | | | | | | |
| ♦ | Reel Shaft Bearings | | | | | | | | | | | | | | | | | | | | | | |
| ▲ | Conditioner Gearbox Oil - First 50 H only | | | | | | | | | | | | | | | | | | | | | | |
| ♦ | Conditioner Universal Shafts | | | | | | | | | | | | | | | | | | | | | | |
| ♦ | Roll Pivots | | | | | | | | | | | | | | | | | | | | | | |
| ♦ | Conditioner Shaft Bearings | | | | | | | | | | | | | | | | | | | | | | |
| ♦ | Sickle Drive Cross-Shaft | | | | | | | | | | | | | | | | | | | | | | |
| ▲ | Wobble Box Oil - First 50 H only | | | | | | | | | | | | | | | | | | | | | | |
| | **1000 HOURS OR 3 YEARS** | | | | | | | | | | | | | | | | | | | | | | |
| ▲ | Conditioner Drive Gearbox Lubricant | | | | | | | | | | | | | | | | | | | | | | |
| ▲ | Wobble Box Lubricant | | | | | | | | | | | | | | | | | | | | | | |

## *7.17.2 Pull-Type Mower Conditioner*

### 7.17.2.1 Break-In Inspection - PT

| *HRS.* | *ITEM* | *CHECK* | *REFERENCE* |
|---|---|---|---|
| **1** | Wheel Bolts | Torque | 120 ft·lbf (160 N·m) Sec. 6.15.1 |
| | Steering Cylinder Clevis & Stroke Control | Torque | 52 ft·lbf (72 N·m) |
| **5, 25, 50** | Auger Drive Belt | Tension | Sec. 7.11.3 & 7.11.4 |
| | Reel Drive Belt | Tension | Sec. 7.9.2 |
| | Sickle Drive Belt | Tension | Sec. 7.8.8 & 7.8.9 |
| **5** | Hardware | Torque | Sec. 6.5 |
| **10** | Auger Drive Chain | Tension/Lub. | Sec. 7.11.1 & 7.11.2 |
| | Reel Drive Chain | Tension/Lub. | Sec. 7.9.1 |
| **10** | Wobble Box Mtg Bolts | Torque | 200 ft·lbf (270 N·m) Sec.7.8.10. |

### 7.17.2.2 Interval Maintenance - PT

| *INTERVAL* | *SERVICE* | |
|---|---|---|
| **FIRST USE** | Refer To Section 7.17.2.1. Break-In Inspection | |
| **100 HOURS OR ANNUALLY *** | 1. Check Conditioner Drive Gearbox Lubricant Level.<br>2. Check Wobble Box Lubricant Level.<br>3. Check Wobble Box Mounting Bolt Torques. | 4. Check Wheel Bolt Torques.<br>5. Grease Wheel Hub Bearings.<br>6. Change Hydraulic Oil Filter (First 100 Hours Only, Every 250 Hours Thereafter). |
| **END OF SEASON** | Refer To Section 6.19, STORAGE. | |
| **10 HOURS OR DAILY** | 1. Check Hydraulic Oil Level.<br>2. Check Hydraulic Hoses And Lines For Leaks.<br>3. Oil Sickle (Except In Sandy Conditions.<br>4. Check Sickle Sections, Guards, & Hold-Downs | 5. Oil Reel Drive Chain.<br>6. Oil Auger Drive Chain.<br>7. Check Tire Pressure.<br>8. Check Wobble Box Bolt Torque (First 10 Hours Only, Every 100 Hours Thereafter). |
| **25 HOURS** | 1. Grease Sickle Head. | |
| **50 HOURS** | 1. Grease APT Pivot.<br>2. Grease Reel Shaft Bearings.<br>3. Grease Auger Shaft Bearings.<br>4. Grease Auger Jack-Shaft Bearings.<br>5. Grease Conditioner Universal Shafts.<br>6. Grease Conditioner Shaft Bearings.<br>7. Grease Roll Pivots Bearing. | 8. Grease Frame-To-Header Pivots.<br>9. Grease Lower Float Link Bushings.<br>10. Grease Gauge Roller Bearings.<br>11. Change Wobble Box Lubricant. (First 50 Hours Only, Every 1000 Hours Thereafter).<br>12. Change Conditioner Drive Gearbox Lubricant (First 50 Hours Only, Every 1000 Hours Thereafter). |
| **250 HOURS** | Change Hydraulic Oil Filter. | |
| **500 HOURS OR 3 YEARS** | Change Hydraulic Oil. | |
| **1000 HOURS OR 3 YEARS** | 1. Change Wobble Box Lubricant. | 2. Change Conditioner Drive Gearbox Lubricant. |

*** IT IS RECOMMENDED THAT ANNUAL MAINTENANCE BE DONE PRIOR TO START OF OPERATING SEASON.**

### 7.17.2.3 Maintenance Record - PT

| | ACTION: | ✓ - Check | | | | | ♦ - Lubricate | | | | | | | ▲ - Change | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MAINTENANCE RECORD | Hour Meter Reading | | | | | | | | | | | | | | | | | | | |
| | Date | | | | | | | | | | | | | | | | | | | |
| | Serviced By | | | | | | | | | | | | | | | | | | | |
| | **FIRST USE** | Refer To Section 7.17.2.1. Break-In Inspection | | | | | | | | | | | | | | | | | | |
| | **100 HOURS OR ANNUALLY** | | | | | | | | | | | | | | | | | | | |
| ▲ | Hydraulic Oil Filter - First 100 H Only | | | | | | | | | | | | | | | | | | | |
| ✓ | Conditioner Drive Gearbox Lube | | | | | | | | | | | | | | | | | | | |
| ✓ | Wheel Bolt Torque | | | | | | | | | | | | | | | | | | | |
| ♦ | Wheel Hub Bearings | | | | | | | | | | | | | | | | | | | |
| ✓ | Wobble Box Bolt Torque | | | | | | | | | | | | | | | | | | | |
| ✓ | Wobble Box Lubricant Level | | | | | | | | | | | | | | | | | | | |
| | **END OF SEASON** | Refer To Section 6.19, STORAGE | | | | | | | | | | | | | | | | | | |
| | **10 HOURS OR DAILY** | **NOTE: A RECORD OF DAILY MAINTENANCE IS NOT NORMALLY REQUIRED BUT IS AT THE OWNER/OPERATOR'S DISCRETION.** | | | | | | | | | | | | | | | | | | |
| ♦ | Auger Drive Chain | | | | | | | | | | | | | | | | | | | |
| ✓ | Hydraulic Hoses & Lines | | | | | | | | | | | | | | | | | | | |
| ✓ | Hydraulic Oil Level | | | | | | | | | | | | | | | | | | | |
| ♦ | Reel Drive Chain | | | | | | | | | | | | | | | | | | | |
| ♦ | Sections, Guards, Hold-downs | | | | | | | | | | | | | | | | | | | |
| ✓ | Sickle Assembly | | | | | | | | | | | | | | | | | | | |
| ✓ | Wobble Box Bolt Torque - First 10 H | | | | | | | | | | | | | | | | | | | |
| | **25 HOURS** | | | | | | | | | | | | | | | | | | | |
| ♦ | Sickle Head | | | | | | | | | | | | | | | | | | | |
| | **50 HOURS** | | | | | | | | | | | | | | | | | | | |
| ♦ | Auger Drive Jackshaft Bearings. | | | | | | | | | | | | | | | | | | | |
| ♦ | Auger Shaft Bearings | | | | | | | | | | | | | | | | | | | |
| ♦ | Frame-to-Header Pivot | | | | | | | | | | | | | | | | | | | |
| ♦ | Gauge Roller Bearings | | | | | | | | | | | | | | | | | | | |
| ♦ | Lower Float Link Bushings | | | | | | | | | | | | | | | | | | | |
| ♦ | Main Drive Shaft Bearings | | | | | | | | | | | | | | | | | | | |
| ♦ | Reel Shaft Bearings | | | | | | | | | | | | | | | | | | | |
| ▲ | Conditioner Gearbox Oil - First 50 H | | | | | | | | | | | | | | | | | | | |
| ♦ | Conditioner Universal Shafts | | | | | | | | | | | | | | | | | | | |
| ♦ | Roll Pivots | | | | | | | | | | | | | | | | | | | |
| ♦ | Conditioner Shaft Bearings | | | | | | | | | | | | | | | | | | | |
| ♦ | Sickle Drive Cross-Shaft | | | | | | | | | | | | | | | | | | | |
| ♦ | Spring Pivots | | | | | | | | | | | | | | | | | | | |
| ✓ | Tire Pressure | | | | | | | | | | | | | | | | | | | |
| ♦ | APT Pivot | | | | | | | | | | | | | | | | | | | |
| ▲ | Wobble Box Oil - First 50 H only | | | | | | | | | | | | | | | | | | | |
| | **250 HOURS** | | | | | | | | | | | | | | | | | | | |
| ▲ | Hydraulic Oil Filter | | | | | | | | | | | | | | | | | | | |
| | **500 HOURS OR 3 YEARS** | | | | | | | | | | | | | | | | | | | |
| ▲ | Hydraulic Oil | | | | | | | | | | | | | | | | | | | |
| | **1000 HOURS OR 3 YEARS** | | | | | | | | | | | | | | | | | | | |
| ▲ | Conditioner Drive Gearbox Lubricant | | | | | | | | | | | | | | | | | | | |
| ▲ | Wobble Box Lubricant | | | | | | | | | | | | | | | | | | | |

# 8 TROUBLESHOOTING

## *8.1 WINDROWER PERFORMANCE*

| SYMPTOM | PROBLEM | SOLUTION | SECTION |
|---|---|---|---|
| **Carryover of Crop On Reel.** | Reel speed too fast. | Reduce reel speed (sprocket size). | 6.17.3 |
| **Material Build-Up On Header Frame.** | Auger speed too fast. | Reduce auger speed (sprocket size). | 6.17.2 |
| | Very light crop. | Reduce tractor rpm. | - |
| **Insufficient Conditioning Of Stems.** | Roll gap too large. | Decrease roll gap. | 6.17.11 |
| **Leaves Damaged, Crushed Or Stripped Off Stems.** | Reel speed too fast. | Reduce reel speed. | 6.17.3 |
| | Roll gap too small. | Increase roll gap. | 6.17.11 |
| | Rolls improperly timed. | Adjust roll timing. | 6.17.11.2 |
| **Leaving Small Strip Of Flattened, Uncut Material.** | Crowding of the uncut material. | Steer tractor slightly away from uncut crop. | - |
| | Reel position incorrect. | Move reel forward and down. | 6.17.5 |
| | Sickle sections or guards are worn or broken. | Replace worn or broken parts. | 7.8.1 & 7.8.7 |
| **Long Stubble In Down Crop.** | Cutting height too high. | Lower cutting height with skid shoes. | 6.17.7 |
| | Ground speed too fast. | Slow down. | |
| | Header angle too flat for guards to pick up down crop. | Increase header angle. | 6.17.8 |
| | Reel position incorrect. | Move reel forward and down. | 6.17.5 |
| | Tine aggressiveness too low | Rotate cam clockwise (viewed from R/H end) for more aggressive tine action. | 6.17.6 |
| **Pulling Material By The Roots Or Tall Material Leaning Into Machine.** | Ground speed too slow. | Increase ground speed. | -- |
| | Reel position incorrect. | Move reel forward and down. | 6.17.5 |
| **Ragged Or Uneven Cutting Of Crop.** | Bent or misaligned guards causing poor shearing action. | Align guards for proper shearing action. | 7.8.7 |
| | Bent sickle causing binding. | Straighten bent sickle. Check alignment and adjust if necessary. | 7.8.2 |
| | Ground speed too fast. | Slow down. Ground speed should not exceed 8 mph (13 km/h). | -- |

| SYMPTOM | PROBLEM | SOLUTION | SECTION |
|---|---|---|---|
| **Ragged Or Uneven Cutting Of Crop.** | Header angle too flat for guards to pick up down crop. | Increase header angle. | 6.17.8 |
| | Header flotation too light, causing bouncing. | Adjust to heavier float setting. | 6.17.9 |
| | PTO speed too slow. | Maintain proper RPM on PTO. Check for proper match of pump & gear-drive at PTO. | -- |
| | Reel drive chain too loose. | Increase chain tension. | 7.9.1 |
| | Reel position incorrect. | Move reel forward and down. | 6.17.5 |
| | Relief valve pressure too low. | Replace valve. | See Dealer |
| | Sickle drive belt too loose. | Increase belt tension. | 7.8.9 to 7.8.11 |
| | Sickle sections or guards are worn or broken. | Replace worn or broken parts. | 7.8.1 & 7.8.7 |
| **Conditioner Plugging.** | Ground speed too fast. | Slow down. | -- |
| | Roll gap too large for proper feeding. | Decrease roll gap. | 6.17.11 |
| | Roll gap too small in thick stemmed cane-type crops. | Increase roll gap. | 6.17.11 |
| | Rolls improperly timed. | Adjust roll timing. | 6.17.11.2 |
| **Sickle Plugging.** | Bent or misaligned guards. | Align guards. | 7.8.7 |
| | Extremely thick or wet undergrowth. | Raise cutting height to clear undergrowth. | 6.17.7 |
| | | Consider use of stub guards. | 8.6 |
| | Header flotation too heavy. | Adjust to lighter float setting. | 6.17.9 |
| | PTO speed too slow. | Maintain proper RPM on PTO. Check for proper match of pump & gear-drive at PTO. | 5.3.1 |
| | Reel position incorrect. | Move reel back and down (close to guards). | 6.17.5 |
| | Sickle drive belt too loose. | Adjust belt tension. | 7.8.9 to 7.8.11 |
| | Sickle hold-downs improperly adjusted. | Adjust hold-downs so sickle works freely. | 6.17.7 |
| | Sickle sections or guards are worn or broken. | Replace worn or broken parts. | 7.8.1 & 7.8.7 |
| | Wet undergrowth. | Cut when undergrowth is dry. | -- |

| SYMPTOM | PROBLEM | SOLUTION | SECTION |
|---|---|---|---|
| **Uneven Formation And Bunching Of Windrow.** | Auger to stripper clearance too wide. | Adjust auger to stripper bars clearance. | 6.17.3 |
| | Rear deflector bypassing or dragging crop. | Adjust rear deflector for proper crop control. | 6.17.12 |
| | Reel not feeding properly in heavy crops. | Decrease ground speed. | -- |
| | Uneven crop flow across auger. | Remove front stripper bar or stripper bar extension. | 7.11.7 |
| | Build up of crop at ends of rolls. | Add stripper bar extension | 7.11.7 |
| **Uneven Windrow Formation In Light Crop.** | Rear of feed pan too low. | Raise rock drop tine bar. | 6.17.9 |
| **Reel Causes Seed Loss (e.g. Grass Seed).** | Reel speed too fast. | Adjust flow control on tractor | 6.17.3 |
| | Header angle too steep, causing tines to contact ground. | Flatten header angle, and check header float. | 6.17.8 |
| | Reel not correctly positioned. | Lower reel speed, move reel rearward, as close as possible to auger, and downward as close as possible to knife and pan. | 6.17.3 & 6.17.5 |
| **Auger Plugging In Heavy Grass Seed.** | Poor crop flow across auger. | Remove lower stripper bar and middle stripper bar if necessary. | 7.11.7 |
| **Plugging At Delivery Opening In Heavy Grass Seed.** | Opening too narrow. | Move pan extensions to widest position. | 6.17.14 |
| **Grass Seed Windrow Too Wide or Too Narrow.** | Pan extensions not adjusted properly. | Adjust pan extensions. | 6.17.14 |

## *8.2 MECHANICAL*

| SYMPTOM | PROBLEM | SOLUTION | SECTION |
|---|---|---|---|
| **Auger And/Or Conditioner Rolls Damaged By Stones.** | Feed pan doesn't allow stones to fall through. | Lower rock-drop tines. | 6.17.9 |
| **Excessive Breakage Of Sickle Sections Or Guards.** | Ground speed too high in stony conditions. | Reduce ground speed. | -- |
| | Cutting height too low in stony conditions. | Raise cutting height with skid shoes. | 6.17.7 |
| | Header angle too steep in stony conditions. | Decrease header angle | 6.17.8 |
| | Header flotation too heavy in stony conditions | Adjust to lighter float setting. | 6.17.9 |
| | Sickle speed too slow. | Maintain proper RPM on PTO. Check for proper match of pump & gear-drive at PTO. | -- |
| | Guards, sickle and hold-downs misaligned. | Straighten guards, align hold-downs. | 7.8.7 & 7.8.8 |
| **Excessive Heating Of Hydraulic Oil.** | Relief pressure too low. | Replace relief valve. | See Dealer |
| **Header Stalling In Extremely Tall, Heavy Crop (6+ Tons Per Acre)** | Insufficient crop clearance at rear of feed pan. | Lower rock drop tines (rear of header pan). | 6.17.9 |
| | | Remove rubber fingers from auger at delivery opening. | 7.11.6 |
| | | Increase roll gap. | 6.17.11 |
| | Feeding aids for shorter, lighter crop impede flow of heavy or thick stemmed crops (cane, sudan grass etc.). | Remove front set of stripper bars. | 7.11.7 |
| **Header Turns While Unloaded But Slows Or Stops When Starting To Cut.** | Low reservoir oil level. | Add oil to reservoir. | 6.7.2.3 |
| | Defective motor | Repair motor. | See Dealer |
| | Defective O-ring inside relief valve. | Replace relief valve. | See Dealer |
| | Defective pump. | Repair pump. | See Dealer |
| | Defective relief valve. | Repair relief valve. | See Dealer |
| | PTO slipping on tractor. | Repair tractor PTO system. | See Dealer |
| | Cold oil in system. | Reduce ground speed until oil reaches operating temperature. | -- |

| SYMPTOM | PROBLEM | SOLUTION | SECTION |
|---|---|---|---|
| **Knocking In Sickle Drive.** | Worn needle bearing in sickle head. | Replace. | 7.8.4 |
| | Worn sickle head pin. | Replace. | 7.8.3 |
| | Incorrect end guards. | Replace with special end guards. | 7.8.6.2 |
| **Sickle Back Breakage.** | Dull sickle. | Replace. | 7.8.4 |
| | Worn sickle head pin. | Replace. | 7.8.3 |
| | Bent or broken guard. | Straighten or replace. | 7.8.7 |
| | Incorrect end guards at sickle head. | Replace with correct number of special guards. | 7.8.7 |
| **Windrower Side Drift.** | Header is dragging on one end and pulling to that side. | Adjust skid shoes to prevent cutterbar dragging. | 6.17.8 |
| | | Adjust header flotation. | 6.17.9 |
| | Low tire pressure on one side. | Check and correct tire pressure (30 psi (207 kPa). | 6.15.3 |
| **Lights Malfunctioning.** | Improper ground. | Check for proper grounding between light base and header. | 6.8 |
| | Burnt out bulb. | Replace bulb. | 6.8 |
| | Poor connection. | Check connector at tractor. | 5.3.1 |

# 9 OPTIONS AND ATTACHMENTS

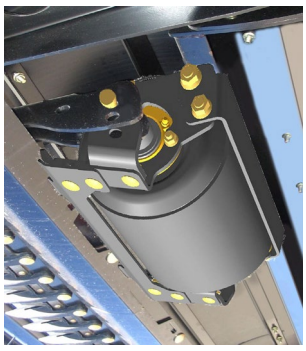
## 9.1 HYDRAULIC HEADER ANGLE KITS-PULL-TYPE

This kit allows the header angle to be adjusted hydraulically with a cylinder replacing the standard mechanical link. A separate hydraulic circuit is required or the existing APT steering cylinder hydraulic circuit can be utilized, depending on the tractor hydraulics. Installation instructions are included with the kits.

## 9.2 ADDITIONAL SKID SHOES

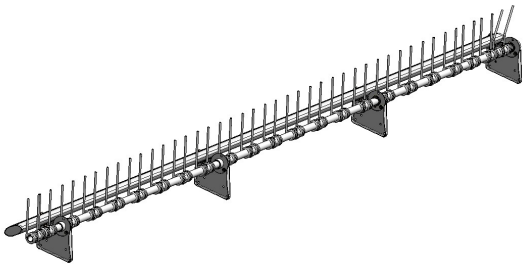
In addition to the standard two outer skid shoes, two inner skid shoes may be added for extra control of cutting height and protection of cutting components.

## 9.3 GAUGE ROLLER KIT



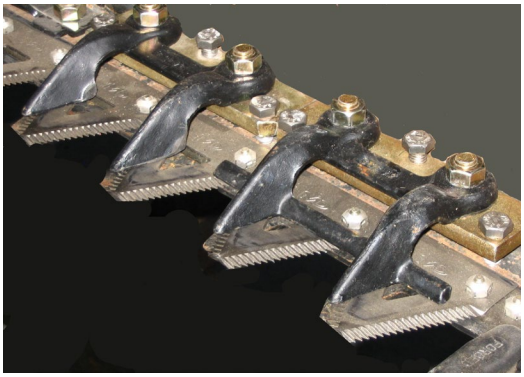
The gauge roller kit replaces the outer skid shoes and consists of rollers in place of skid shoes. They can be adjusted for varying cutting height.

## 9.4 REPLACEMENT REEL BAT KITS- A30-S & A30-D



Consists of one complete bat assembly for ease of replacement.

## 9.5 STUB GUARD CONVERSION KIT



Stub guards, complete with top guides and adjuster plates are designed to cut tough crops.

Installation and adjustment instructions are included with the kit.

## 9.6 TALL CROP DIVIDER KIT

The tall crop dividers attach to the ends of the header for clean crop dividing and reel entry in tall crops. The kit includes left and right dividers, lean bar extensions and attachment hardware.

# 10 UNLOADING AND ASSEMBLY

Refer to header specific instruction for unloading, assembly and set-up procedures that are included with your shipment.

| HEADER DESCRIPTION | USED ON | INSTRUCTION PART NUMBER |
|---|---|---|
| A30-S/A30-D | Pull-Type Mower Conditioner | 169001 |
| A30-S/A30-D/A40-D | Self-Propelled Windrower | 169078 |

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