

# **Model 5020 POWER TONGUE WINDROWER**

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## **OPERATOR'S MANUAL**

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Inside Front Cover  
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## INTRODUCTION

Your new MacDon Model 5020 Power-Tongue Windrower is designed to cut, condition and lay in windrows, a wide variety of grasses and hay crops.

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.

The manual contains instructions for "Safety", "Operation", and "Maintenance/Service". In addition, "Unloading and Assembly" information is given towards the back of this book.

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

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. A manual storage case is provided on the primary drive shield at rear of main frame.

**NOTE:** Right hand (R/H) and left hand (L/H) designations are determined from the operator's position, facing forward.



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## SERIAL NUMBER LOCATIONS

Record the serial number in the space provided.

Windrower:

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Serial number plate (A) is located on the side of the left hand end frame.

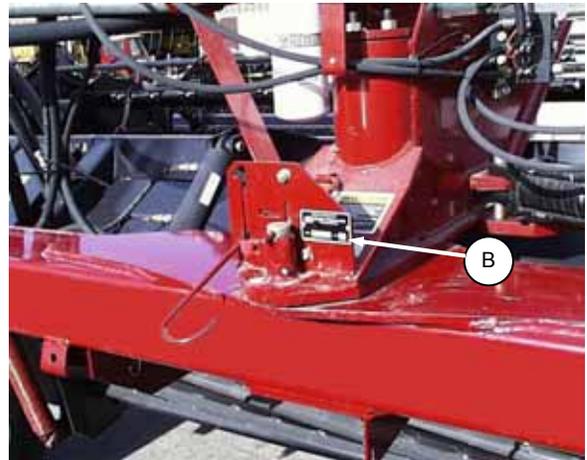


SERIAL PLATE LOCATION: WINDROWER

Tongue:

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Serial number plate (B) is located at rear of tongue.



SERIAL PLATE LOCATION: TONGUE

**NOTE:** When ordering parts and service, be sure to give your dealer the complete and proper serial number.

# SAFETY

## 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?

- 3 BIG REASONS
- ACCIDENTS DISABLE AND KILL
  - ACCIDENTS COST
  - ACCIDENTS CAN BE AVOIDED

## 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.

# SAFETY

## SAFETY SIGNS

- The safety signs reproduced below appear on the windrower at the locations shown on page 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.

### To install safety signs:

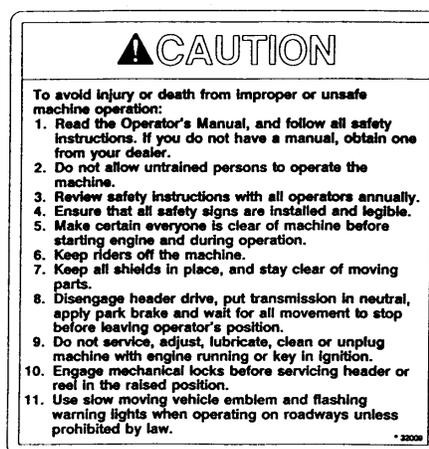
1. Be sure the installation area is clean and dry.
2. Decide on the exact location before you remove the decal backing paper.
3. Remove the smaller portion of the split backing paper.
4. Place the sign in position and slowly peel back the remaining paper, smoothing the sign as it is applied.
5. Small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



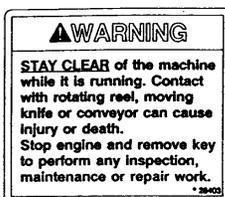
A - # 44611



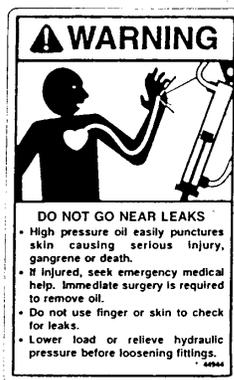
B - # 32738



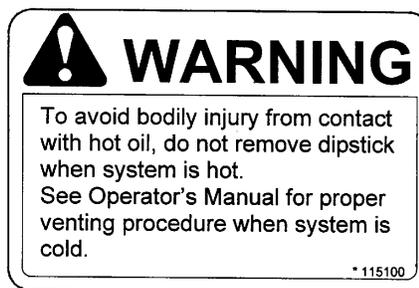
C - # 32009



D - # 28403



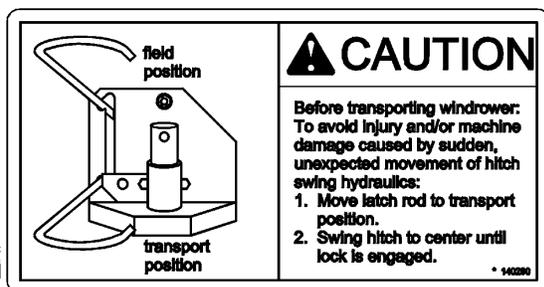
F - # 44944



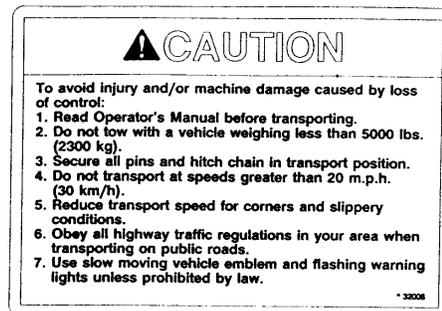
G - # 115100



E - # 140311



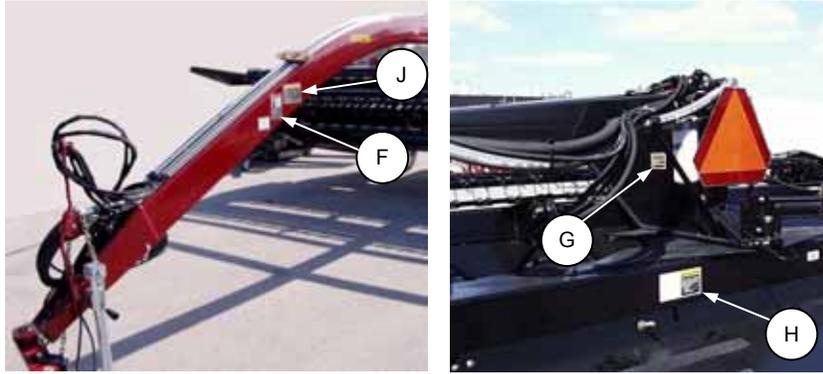
H - # 140290



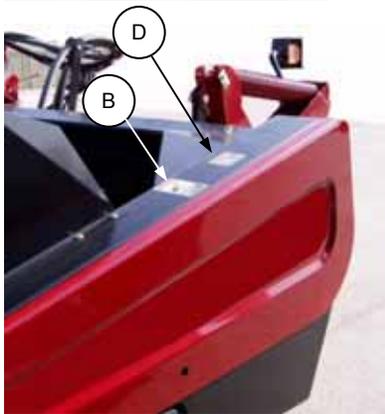
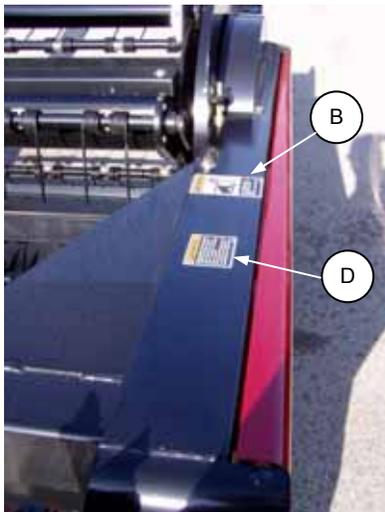
J - # 32008

# SAFETY

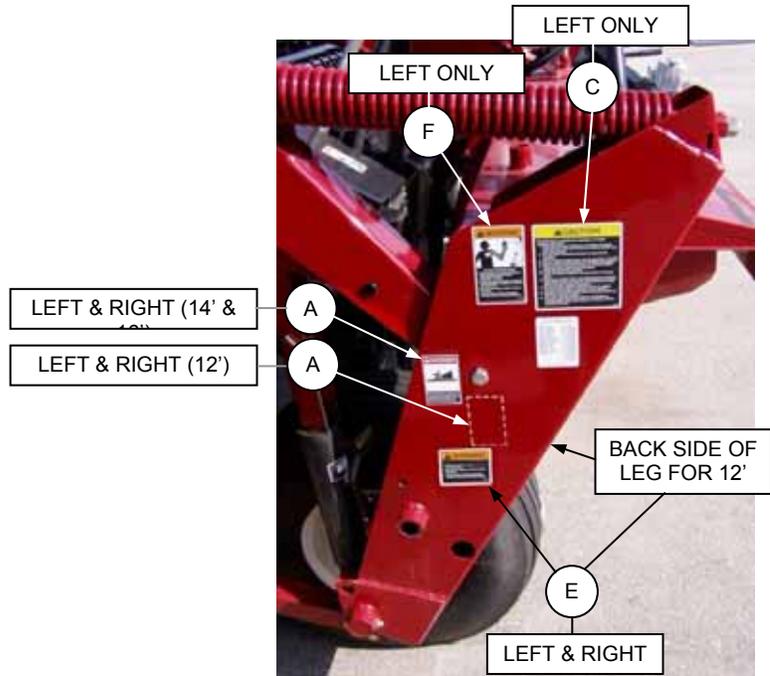
## SAFETY SIGN LOCATIONS



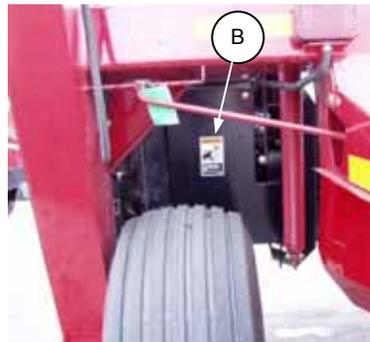
TONGUE & FRAME BACK TUBE



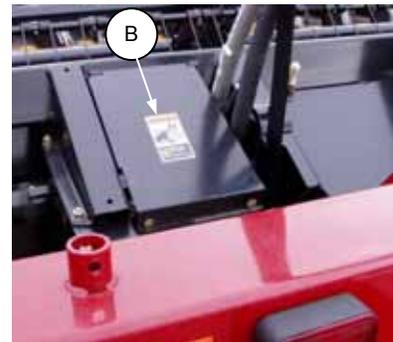
HEADER END FRAMES



MAIN FRAME



12' UNIT



14' & 16' UNITS

PRIMARY DRIVE SHIELD

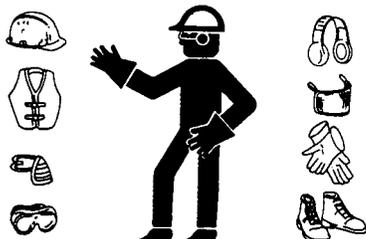
# SAFETY

## GENERAL SAFETY



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

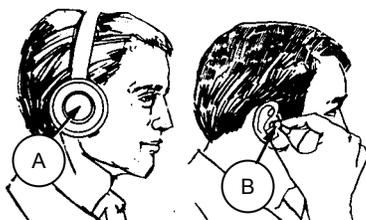
### 1. Protect yourself.



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.



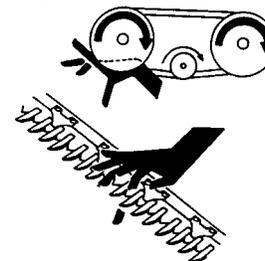
2. Provide a first-aid kit for use in case of emergencies.
3. Keep a fire extinguisher on the machine. Be sure the extinguisher is properly maintained and be familiar with its proper use.
4. Keep young children away from machinery at all times.
5. Be aware that accidents often happen when the operator is tired or in a hurry to get finished. Take the time to consider the safest way. Never ignore warning signs of fatigue.



6. Wear close-fitting clothing and cover long hair. Never wear dangling items such as scarves or bracelets.



7. 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.



8. 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.
9. Use only service and repair parts made or approved by the equipment manufacturer. Substituted parts may not meet strength, design, or safety requirements.
10. Do not modify the machine. Unauthorized modifications may impair the function and/or safety and affect machine life.
11. 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.
12. 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.



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

## SPECIFICATIONS

<u>DIMENSIONS</u>	<u>12 FT.</u>	<u>14 FT.</u>	<u>16 FT.</u>
Overall Width:			
Transport Position	13.5 ft. (4103 mm)	15.5 ft. (4713 mm)	17.5 ft. (5323 mm)
Field Position	18.1 ft. (5531 mm)	21.1 ft. (6446 mm)	24.1 ft. (7360 mm)
Overall Length:			
Transport Position	20.7 ft. (6320 mm)	22.1 ft. (6740 mm)	24.9 ft. (7573 mm)
Field Position	15.8 ft. (4816 mm)	16.3 ft. (4975 mm)	18.2 ft. (5557 mm)
Overall Height			
Transport Position		6.2 ft. (1896 mm)	
Field Position		6.2 ft. (1896 mm)	
Weight	5900 lbs. (2675 kg)	6250 lbs. (2835 kg)	6623 lbs. (3005 kg)

### CUTTERBAR

Cutterbar Width	12.25 ft. (3734 mm)	14.25 ft. (4343 mm)	16.25 ft. (4953 mm)
Cutting Height (on skids) at 8° guard angle		1.5 to 4 in. (38 to 100 mm)	
Guard (Header) Angle (adjustable)		6° to 11.5° below horizontal	
Cutterbar Range at 8° guard angle		2.0 in. below ground to 21 in. above ground (to guard tip) (-50 mm to +533 mm)	

### MAIN DRIVE

Rear Countershaft Speed	540 or 1000 RPM PTO tractor driven pump to hydraulic motor driving primary shaft 1156 RPM *		
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### SICKLE

Drive Type	Belt driven wobble box (enclosed oil bath)		
Speed	1560 strokes or 780 cycles per minute *		
Stroke	3 in. (76 mm)		
Sections	Over-serrated, low shoulder		
Guards	Double heat treated, forged steel		

### REEL

Drive Type	V-belt drive from R/H auger shaft to chain final drive		
Reel Type	5 bats (4 or 6 bats optional), replaceable steel pick-up tines, cam action, polymer tine tube bearings		
Radius	22 in. (1560 mm) to finger tip		
Speed	72 RPM as assembled / 59 RPM with pulley exchange / 66 RPM optional *		

**NOTE:** Specifications listed only under 14 ft. column are common to all sizes.

\* All speeds are in no-load condition at rated tractor RPM.

## SPECIFICATIONS

<u>AUGER</u>	<u>12 FT.</u>	<u>14 FT.</u>	<u>16 FT.</u>
Drive Type		Chain final drive	
Overload Protection		Hydraulic motor	
Auger Type		20 in. (508 mm) diameter variable pitch, center feed	
Auger Speed		245 RPM *	

### CONDITIONER ROLLS

Drive Type	Drivelines from enclosed oil bath chain drive		
Roll Type	Helical intermeshing steel "V" bars		
Roll Diameter	8.75 in. (222 mm)		
Roll Length	93 in. (2360 mm)		
Roll Speed	827 RPM *		

### WHEELS

Tread Width	119 in. (3030 mm)	143 in. (3640 mm)	143 in. (3640 mm)
Tires	31 x 13.5 - 15 NHS 8 ply Terra-Rib		
Tire Pressure	30 psi (207 kPa)		

### MATERIAL DISCHARGE

Minimum Width	30 in. (760 mm)		
Maximum Width	92 in. (2346 mm)		
Rear Fluffing Shield	Adjustable		

### OPERATING SPEED

Recommended Field Speed	5 mph (8 km/h)		
Recommended Transport Speed	20 mph (30 km/h)		

### TRACTOR REQUIREMENTS

Minimum Power	60 hp (45 kw)	75 hp (56 kw)	90 hp (68 kw)
Drawbar Capacity Must Exceed	1300 lbs. (5785 N)	1030 lbs. (4580 N)	1100 lbs. (4895 N)
PTO	540 or 1000 RPM - ASAE standard location		
Hydraulic Capacity	1750 psi (12000 kPa), two hydraulic circuits		

\* All speeds are in no-load condition at rated tractor RPM.

(SPECIFICATIONS AND DESIGN ARE SUBJECT TO CHANGE WITHOUT NOTICE OR OBLIGATION TO REVISE UNITS PREVIOUSLY SOLD.)

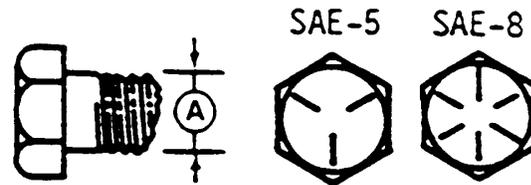
# TORQUE SPECIFICATIONS

## CHECKING BOLT TORQUE

The tables shown below give correct torque values for various bolts and capscrews. 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.

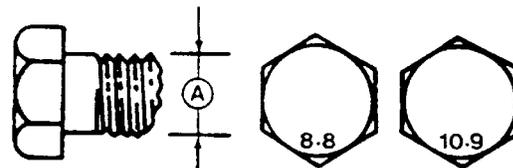
### ENGLISH TORQUE SPECIFICATION

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



### METRIC TORQUE SPECIFICATIONS

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



Torque figures indicated above 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%.

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

## TORQUE SPECIFICATIONS

### TIGHTENING HYDRAULIC O-RING FITTINGS\*

1. Inspect O-ring and seat for dirt or obvious defects.
2. On angle fittings, back the lock nut off until washer bottoms out at top of groove.
3. Hand tighten fitting until back up washer or washer face (if straight fitting) bottoms on face and O-ring is seated.
4. Position angle fittings by unscrewing no more than one turn.
5. Tighten straight fittings to torque shown.
6. Tighten angle fittings to torque shown while holding body of fitting with a wrench.

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

Thread Size (in.)	Nut Size Across Flats (in.)	Torque Value*		Recommended Turns to Tighten (after finger tightening)	
		N-m	[lb-ft]	Flats	Turns
3/8	1/2	8	[6]	2	1/3
7/16	9/16	12	[9]	2	1/3
1/2	5/8	16	[12]	2	1/3
9/16	11/16	24	[18]	2	1/3
3/4	7/8	46	[34]	2	1/3
7/8	1	62	[46]	1-1/2	1/4
1-1/16	1-1/4	102	[75]	1	1/6
1-3/16	1-3/8	122	[90]	1	1/6
1-5/16	1-1/2	142	[105]	3/4	1/8
1-5/8	1-7/8	190	[140]	3/4	1/8
1-7/8	2-1/8	217	[160]	1/2	1/12

### TIGHTENING HYDRAULIC FLARE-TYPE TUBE FITTINGS\*

1. Check flare and flare seat for defects that might cause leakage.
2. Align tube with fitting before tightening.
3. Lubricate connection and hand tighten swivel nut until snug.
4. 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.

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

Tube Size O.D. (in.)	Nut Size Across Flats (in.)	Torque Value*		Recommended Turns to Tighten (after finger tightening)	
		N-m	[lb-ft]	Flats	Turns
3/16	7/16	8	[6]	1	1/6
1/4	9/16	12	[9]	1	1/6
5/16	5/8	16	[12]	1	1/6
3/8	11/16	24	[18]	1	1/6
1/2	7/8	46	[34]	1	1/6
5/8	1	62	[46]	1	1/6
3/4	1-1/4	102	[75]	3/4	1/8
7/8	1-3/8	122	[90]	3/4	1/8

# OPERATION

## YOUR RESPONSIBILITIES AS AN OWNER/OPERATOR

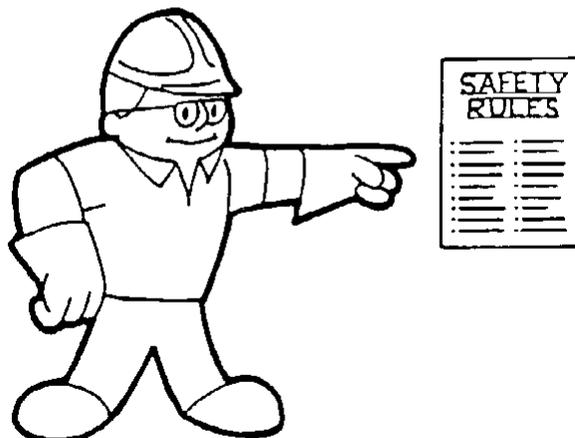


### CAUTION:

1. 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.
2. Follow all safety messages in the manual and on safety signs on the machine.
3. Remember that YOU are the key to safety. Good safety practices protect you and the people around you.
4. 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.
5. Review the manual and all safety related items with all operators annually.
6. Be alert for other operators not using recommended procedures or not following safety precautions. Correct these mistakes immediately, before an accident occurs.
7. Do not modify the machine. Unauthorized modifications may impair the function and/or safety and affect machine life.
8. 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.
9. 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.



READ THE OPERATOR'S MANUAL



FOLLOW SAFETY RULES

## TO THE NEW OPERATOR

It's natural for an operator to be anxious to get started with a new machine. Please take the time to familiarize yourself with the windrower by reading the Operator's Manual and safety signs before attempting operation.

# OPERATION

## PREPARING THE TRACTOR

1. Select proper tractor size. The minimum power required is:
  - 12 ft. - 60 hp (45 kw)
  - 14 ft. - 75 hp (56 kw)
  - 16 ft. - 90 hp (68 kw)Tractor drawbar capacity must exceed:
  - 12 ft. - 1300 lb. (5785 N)
  - 14 ft. - 1030 lb. (4580 N)
  - 16 ft. - 1100 lb. (4895 N)

Also, minimum hydraulics required are 1750 psi (12000 kPa) pressure with double acting, dual remote capability.

2. Adjust tractor drawbar to meet ASAE Standard specifications as listed below. An improperly located drawbar may affect header flotation and guard angle.

(A) 14 in. (356 mm) for 540 rpm.  
16 in. (406 mm) for 1000 rpm.

(B) 6 to 12 in. (152 to 305 mm) with 8 in. (203 mm) recommended.

(C) 13 to 17 in. (330 to 432 mm) from ground with 16 in. (406 mm) recommended.

3. Secure the drawbar so the hitch pinhole is directly below the driveline.

**NOTE:** If the tractor has a three-point hitch, raise the lower links as high as possible to prevent damage.

4. Attach the drawbar extension (D) to the tractor drawbar.

**IMPORTANT:** To prevent damage to the pump and hose assembly, do not operate the machine without the drawbar extension. Use washers (E) as required depending on drawbar thickness.

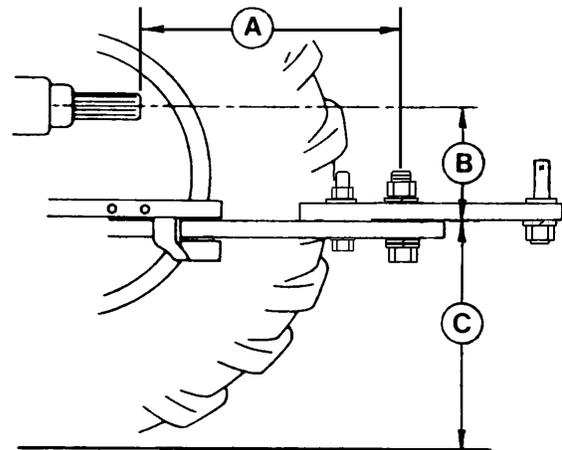
Tighten 5/8 nut (F) to 160 ft.lbs. (215 N-m) torque.

Tighten 1 inch slotted nut (G) to 630 ft.lbs. (850 N-m) torque. Further tighten nut (G) to align slot with hole and install cotter pin.

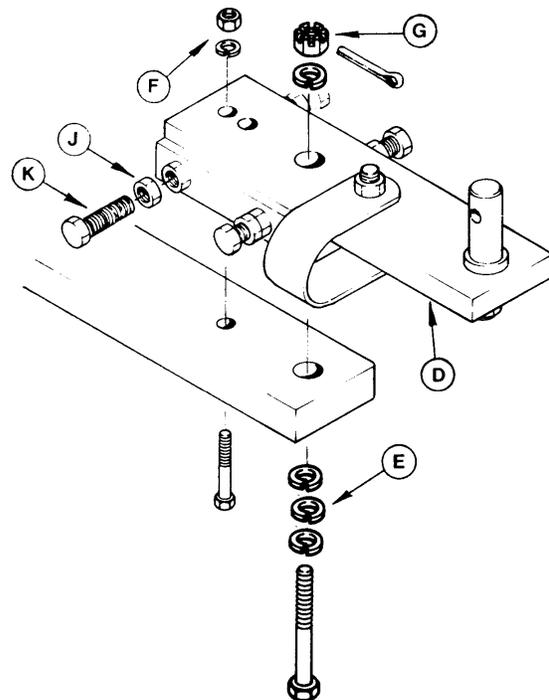
Back off nuts (J) and turn in four bolts (K) until snug against tractor drawbar. Tighten nuts (J) to secure the position.

5. Use proper PTO speed (540 or 1000) depending on windrower options.

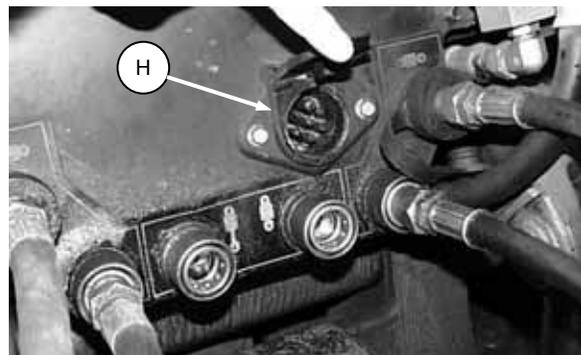
6. Tractor must be equipped with a seven terminal outlet (H) to supply power to the windrower's warning lights.



STANDARD DRAWBAR SPECIFICATIONS



ATTACH DRAWBAR EXTENSION



SEVEN TERMINAL ELECTRICAL OUTLET

# OPERATION

## PREPARING THE WINDROWER

1. Check the tires and inflate if necessary. Recommended pressure is 30 psi (207 kPa).



**CAUTION:** When inflating tires, use a clip-on chuck and extension hose long enough to allow you to stand to one side and not facing the tire.

2. Check for proper assembly and adjustment and make sure all bolts are tightened securely.

STAND TO ONE SIDE WHEN INFLATING TIRES



CHECK REEL DRIVE BELT TENSION

3. Check the tension of the reel drive belt and the sickle drive belt. Adjust if required. See Maintenance/Service section.

4. Lubricate the machine completely and check the oil level of the sickle drive box. See Maintenance/Service section.



CHECK SICKLE DRIVE BELT TENSION,  
AND DRIVE BOX LUBRICANT

5. Check hydraulic oil level at dipstick. Add oil if required. See Maintenance/Service section.

6. Install quick coupler tips (matching the tractor to be used) on the remote hydraulic hoses.



CHECK HYDRAULIC OIL LEVEL

# OPERATION

## ATTACHING WINDROWER TO TRACTOR



**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.

1. Using the jack, raise windrower tongue to clear the hitch pin in drawbar extension. Position tractor to align ball joint on tongue with hitch pin and lower tongue. Secure with lock pin (A).
2. Route hitch chain from windrower through chain support (B), around drawbar support and lock hook (C) on chain.

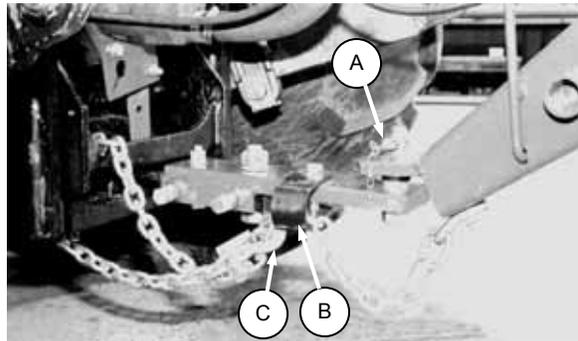
**IMPORTANT:** Adjust chain length to remove all slack except what is needed for turns.

3. Remove weight from jack. Pull pin securing jack and move to storage position (D) on top of frame tube.
4. **NOTE:** Pump attachment is easier if hitch is angled to tractor, not straight on.

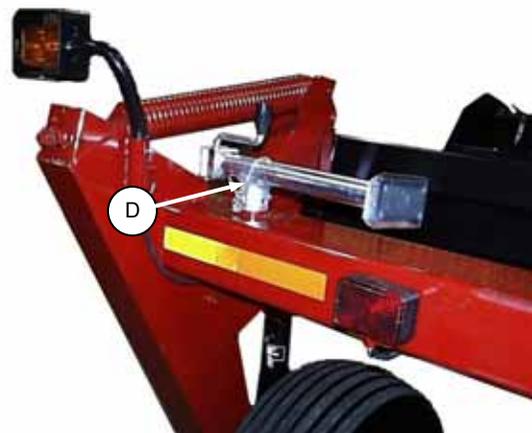
Slide the hydraulic pump assembly onto the PTO shaft of the tractor. Adjust the torque arm (E) so that it rests on the right side of the drawbar.

### **IMPORTANT:**

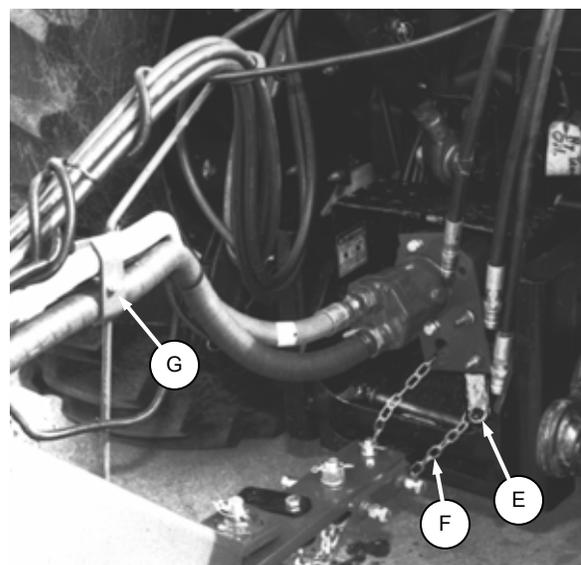
- Pump outlets must remain vertical. Loop the torque arm chain (F) around the drawbar and lock the chain in keyhole slot in torque arm mounting plate.
- To prevent hose damage, route hoses through guide (G) to provide proper hose arc as shown.
- Full engagement of PTO shaft into pump is required to prevent damage to pump spline. Pump should slide 2-1/2" (64 mm) onto shaft.
- The pump must never be keyed or fastened to the PTO shaft. If the drawbar pin should become disengaged, the pump must be free to slip off.



SECURE HITCH PIN AND CHAIN



JACK STORAGE

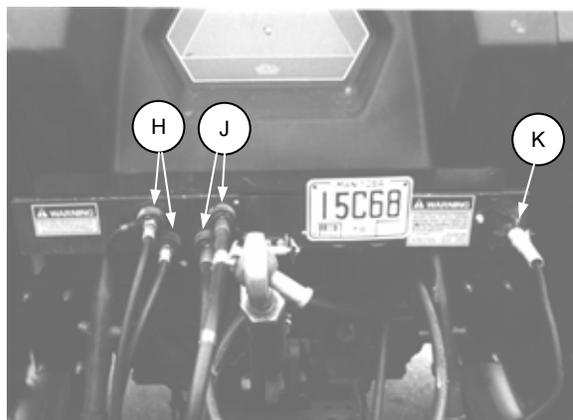


ATTACH PUMP ASSEMBLY

## OPERATION

### ATTACHING WINDROWER TO TRACTOR (cont'd)

5. Connect remote hydraulic hoses as follows:
  - a. Connect the two tongue swing hoses (H) so that when the tractor control is moved forward, the swing cylinder will extend, moving the windrower to the right. When the tractor control handle is moved back, the swing cylinder will retract, moving the windrower to the left.
  - b. Connect the two lift cylinder hoses (J) so that when the tractor control is moved back, the lift cylinder will extend, raising the header. When the tractor control is moved forward, the lift cylinder will retract, lowering the header.
6. Connect the windrower wiring harness plug (K) to outlet on tractor.



CONNECT REMOTE HYDRAULICS  
AND ELECTRICAL

### DETACHING WINDROWER FROM TRACTOR



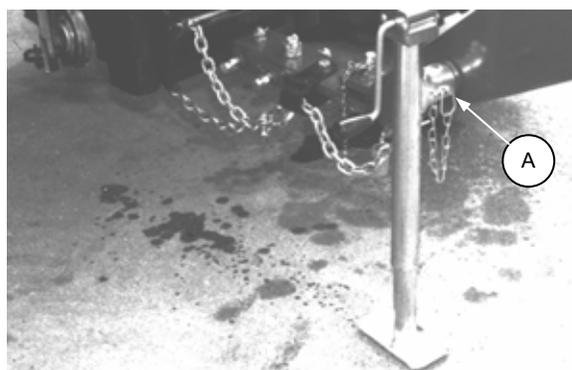
**CAUTION:** To prevent accidental movement of tractor, shut off engine, engage parking brake, and remove key.

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

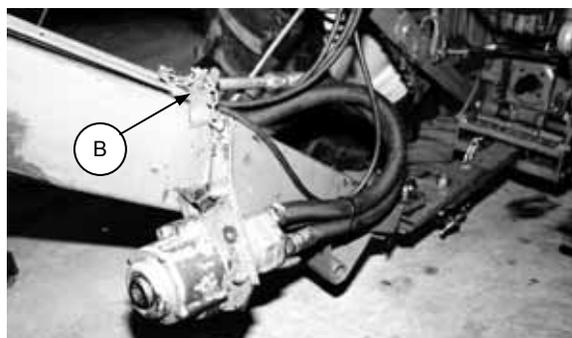
Park machine on flat level surface with hitch at an angle to tractor drawbar (to facilitate pump detachment).

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

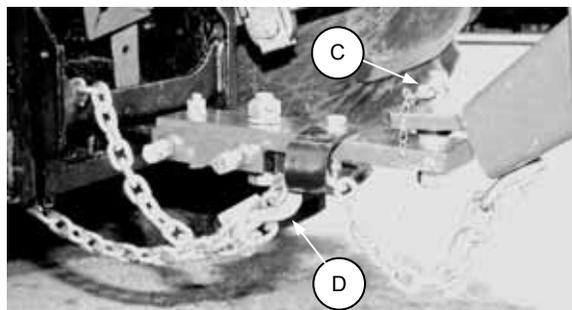
1. Pull pin securing jack and move to working position (A) at front of tongue.
2. Lower jack to take weight off tractor drawbar.
3. Unlock torque arm chain from keyhole slot in torque arm mounting plate. Remove hydraulic pump assembly and store at (B).
4. Disconnect hydraulic hoses and electrical harness. Store with ends off ground.
5. Remove hitch pin lock (C) and unhook chain (D) from tractor. Wrap chain around windrower tongue for storage. Raise windrower tongue with jack to clear hitch pin.
6. Slowly drive tractor away from windrower.



MOVE JACK TO WORKING POSITION



STORE PUMP ASSEMBLY



REMOVE HITCH PIN LOCK AND CHAIN

# OPERATION

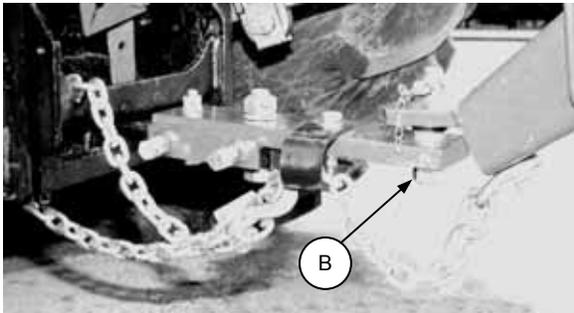
## BREAK-IN PERIOD

1. After attaching 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.



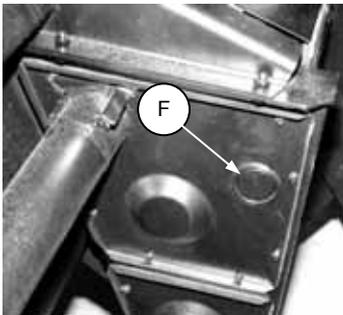
**CAUTION:** Before investigating an unusual sound or attempting to correct a problem, shut off tractor, engage parking brake and remove key.

2. Check wheel bolt torque after 1 hour operation and periodically thereafter (at least every 100 hours). Torque to 120 ft.lbs. (160 N-m).
3. Check sickle drive belt (A), auger primary drive belt (H) and reel drive belt (G) after 5 hours operation for initial stretch. Tighten as necessary. (See Maintenance/Service section). Continue to check the belts periodically for the first 50 hours.
4. Check hitch pin nut (B) after 5 hours operation and every 50 hours thereafter. Torque to 350 ft.lbs. (475 N-m).



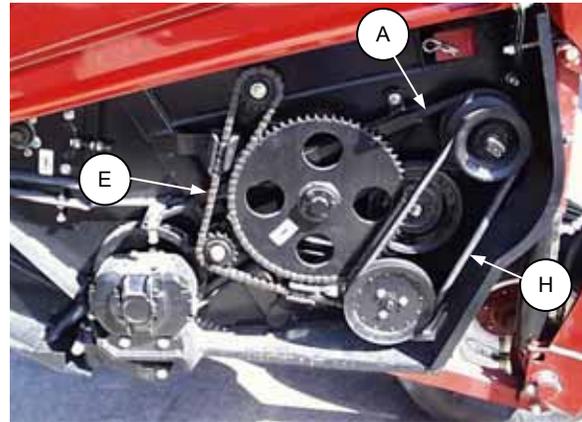
CHECK HITCH PIN LOCK NUT

5. Check hardware after 5 hours operation. Tighten as necessary. See Specifications section for recommended torques.
6. Tighten the four wobble box mounting bolts (C) after 10 hours operation and every 100 hours thereafter. Torque to 200 ft.lbs. (270 N-m), starting with the side mounting bolts.
7. Check reel drive chain (D), auger drive chain (E) and roll drive chain (F) after 10 hours operation for proper tension and lubrication. See Maintenance/Service section.

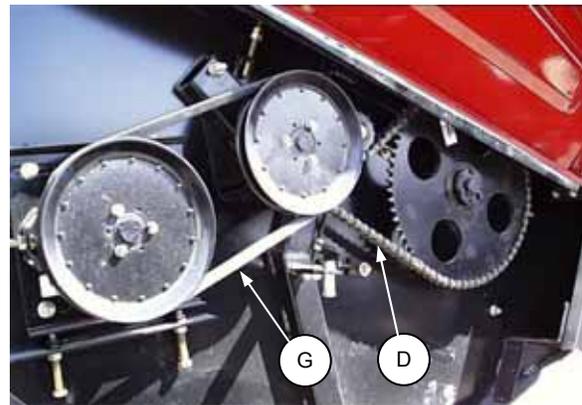


CHECK ROLL DRIVE CHAIN TENSION

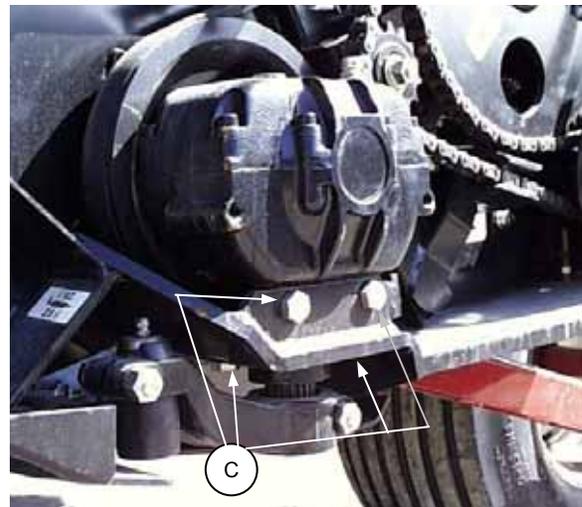
Form # 147008



CHECK SICKLE DRIVE BELT AND AUGER DRIVE BELT & CHAIN TENSION



CHECK REEL DRIVE BELT & CHAIN



CHECK WOBBLE BOX MOUNTING BOLTS

CONTINUED NEXT PAGE.....

# OPERATION

## **BREAK-IN PERIOD (continued)**

8. Change wobble box lubricant after 50 hours operation and every 1000 hours (or 3 years) thereafter. See Maintenance/Service section.
9. Change hydraulic oil filter after 100 hours operation and every 250 hours thereafter. See Hydraulics in Maintenance/Service section.
10. Until you become familiar with the sound and feel of your new windrower, be extra alert and attentive.

## **PRE-STARTING CHECKS**

Do the following at the start of each operating season:



### **CAUTION:**

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

Also:

6. Adjust tension on drive belts. See Maintenance/ Service section.
7. Perform all annual maintenance. See Maintenance/ Service section.

# OPERATION

## PRE-STARTING CHECKS

Do the following each day before start-up:



### CAUTION:

1. 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.
2. Remove foreign objects from the machine and surrounding area.
3. Wear close fitting clothing and protective shoes with slip resistant soles.

As well, carry with you any protective clothing and personal safety devices that **COULD** be necessary through the day. Don't take chances.

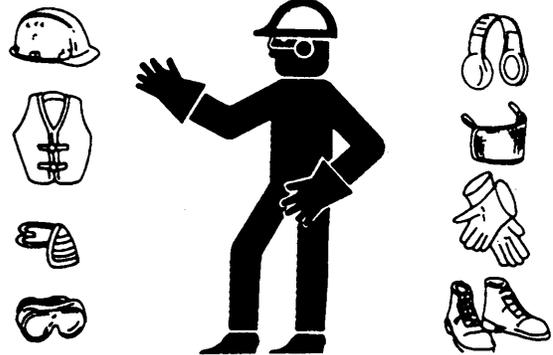
You may need:

- a hard hat
- protective glasses or goggles
- heavy gloves
- respirator or filter mask
- wet weather gear.

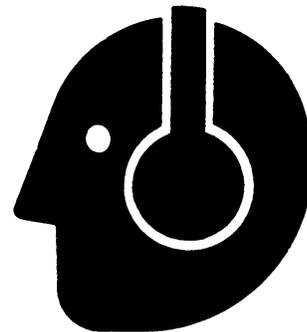
4. Protect against noise. Wear a suitable hearing protective device such as ear muffs or ear plugs to protect against objectionable or uncomfortable loud noises.
5. Check the machine for leaks or any parts that are missing, broken, or not working correctly.

**NOTE:** Use proper procedure when searching for pressurized fluid leaks. See "Hydraulics" in Maintenance/Service section.

6. Be sure tractor and windrower are properly attached, all controls are in neutral and tractor brake is engaged.
7. Clean all lights and reflective surfaces on the machine. Check lights for proper operation.
8. Perform all Daily maintenance. See Maintenance/Service section.



PROTECT YOURSELF



PROTECT AGAINST NOISE

# OPERATION

## OPERATE CORRECTLY



### CAUTION:

1. 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.
  2. Never attempt to start the tractor engine or operate the windrower except from the tractor seat.
  3. Check the operation of all controls in a safe clear area before starting work.
  4. Do not allow riders on tractor or windrower.
  5. Never start or move the machine until you are sure all bystanders have cleared the area.
  6. Avoid travelling over loose fill, rocks, ditches or holes.
  7. Drive slowly through gates and doorways.
  8. If cutting ditch banks, use extreme caution. If the windrower hits an obstruction, the front of the tractor will usually swerve towards the ditch.
  9. When working on inclines, travel uphill or downhill when possible. Be sure to keep tractor transmission in gear when travelling downhill.
  10. Never attempt to get on or off a moving tractor.
  11. Do not get off the tractor while the windrower is in operation.
  12. 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.
  13. 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.
  14. Operate only in daylight or good artificial light.
- 

## ENGAGING THE PTO



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

- Engage the PTO slowly, just before the windrower is moved up to the standing crop.
- Be sure tractor PTO is running at correct rpm before starting to cut. (540 or 1000, as equipped.)
- Disengage the PTO when not operating the windrower.

## OPERATION

### LIFT CYLINDER STOP (RAISING AND LOWERING WINDROWER)



**WARNING:** To avoid bodily injury or death from fall of raised machine, always engage lift cylinder stops before going under windrower for any reason.

#### To engage cylinder stops:

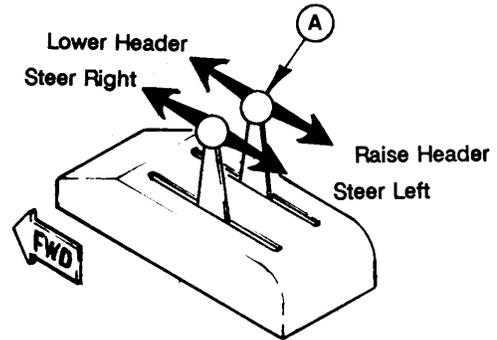
1. Raise machine to maximum height by activating remote cylinder control valve in tractor.

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

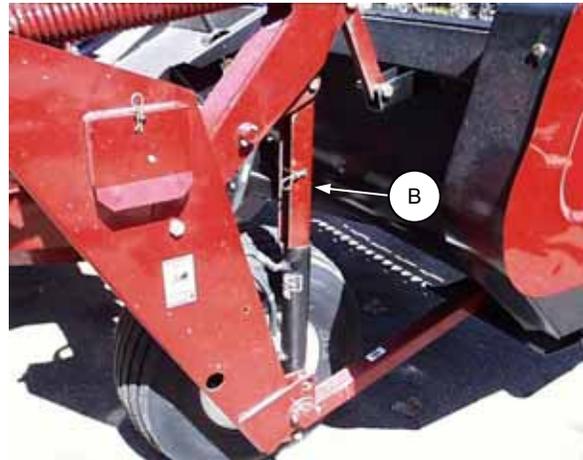
2. Remove cylinder stops from storage position and install in engaged position (B). Secure with clevis pin and hair pin.
3. Lower machine slightly so stops take some weight.

#### To lower windrower:

1. Raise machine to maximum height to take weight off stops.
2. Remove stops from cylinders and store in position (C). Secure with clevis pin and hair pin.
3. Lower machine by activating remote cylinder control valve in tractor.



TRACTOR CONTROL LEVER (TYPICAL)



LIFT CYLINDER STOPS - ENGAGED



LIFT CYLINDER STOPS - STORAGE

# OPERATION

## STEERING

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.

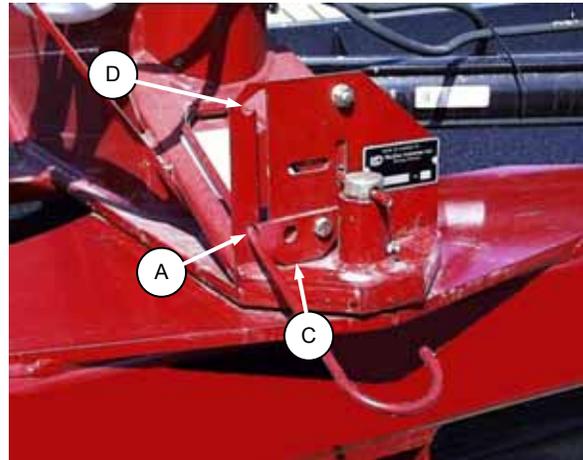
**NOTE:** To allow hitch to swing, latch rod must be in field position (D). If rod is in transport position (A), pivot rod retainer (C) up to allow moving rod from (A) to (D).

**NOTE:** Hoses should be connected so that moving tractor control lever (E) forward steers the machine to the right and moving the lever back steers the windrower left.

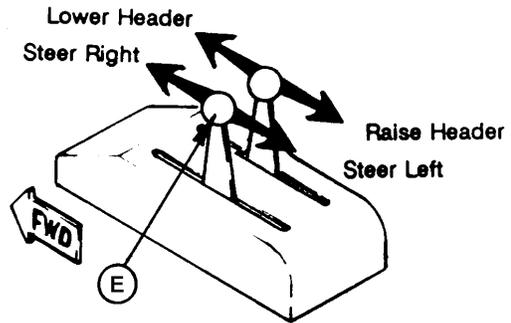
The control is operated momentarily for steering and must be returned to OFF or NEUTRAL position as soon as the windrower reaches the desired path of travel.

The center 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.

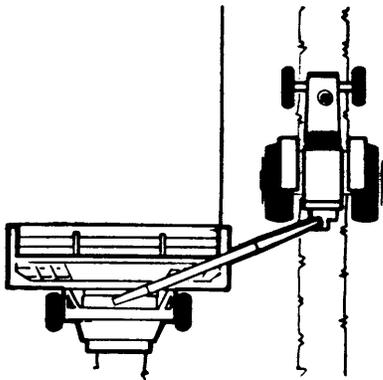
**NOTE:** Before steering the windrower, the header should be raised enough that the skid shoes clear the ground.



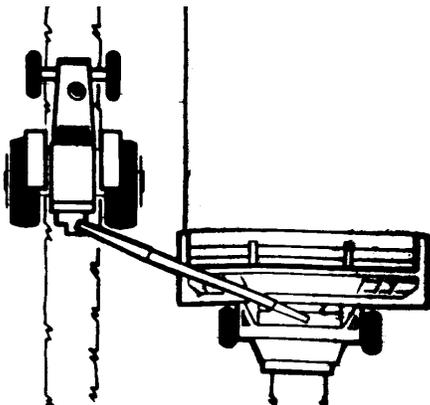
MOVE LATCH ROD TO FIELD POSITION (D)



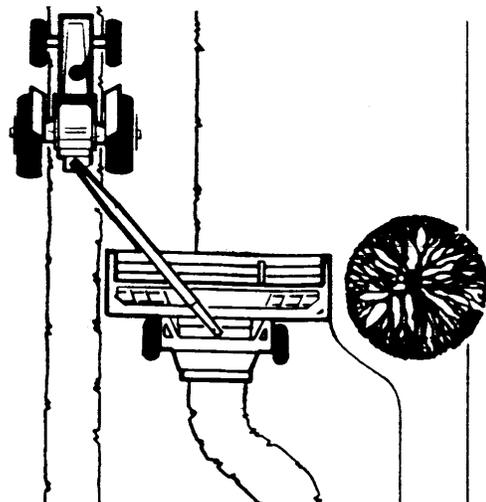
TRACTOR CONTROL LEVER - TYPICAL



OPERATING ON LEFT SIDE



OPERATING ON RIGHT SIDE



STEERING AROUND AN OBSTRUCTION

## OPERATION

### 180° TURN

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° turn-around.

Proceed as follows:

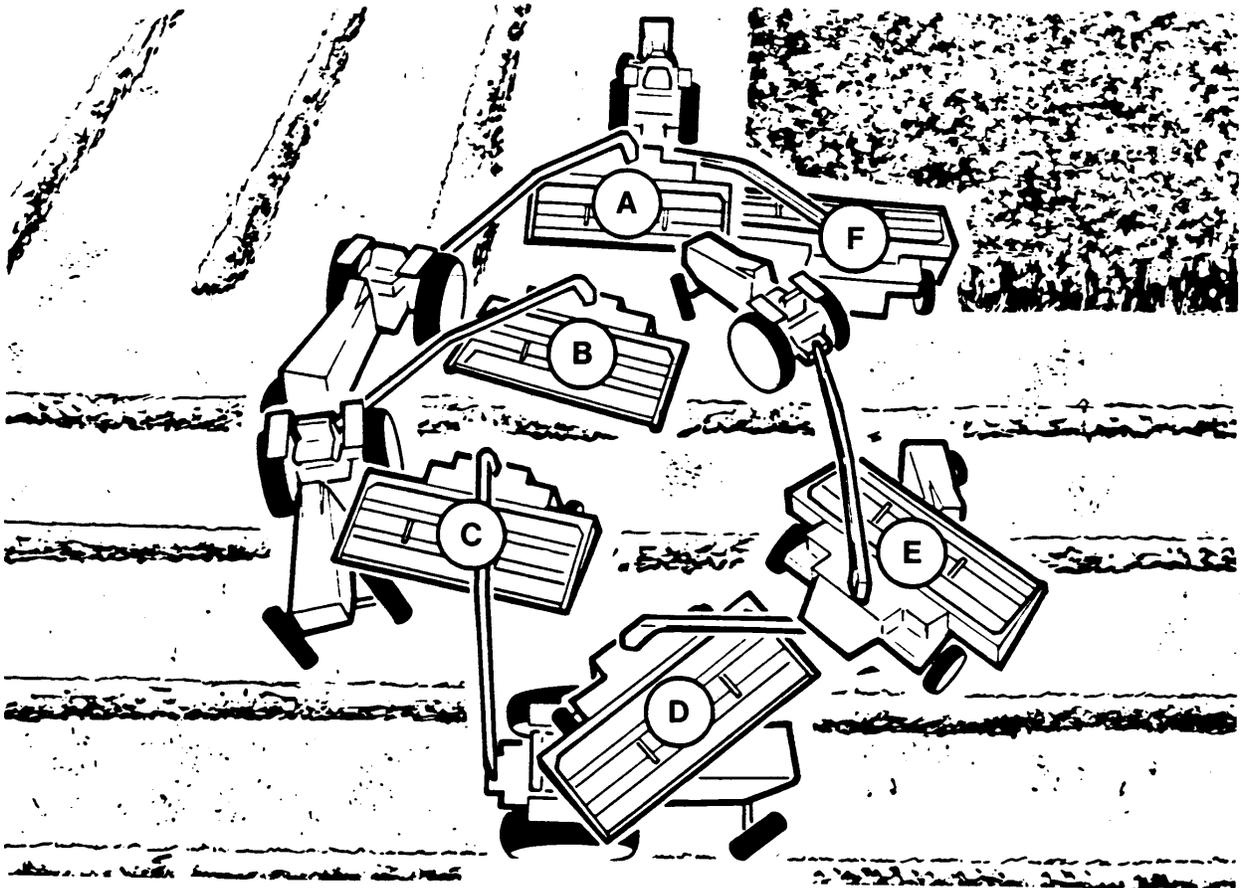
1. Beginning at position (A), the tractor is guided away from the uncut crop while the windrower is guided straight ahead until cutting through the end.
2. As soon as the sickle cuts through, raise the header to lift the skid shoes clear of the ground, and steer the windrower to the extreme direction 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.

3. 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 tongue of windrower.

4. 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 tongue-to-tire clearance.
5. 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.
6. At position (F), lower header to cutting height and begin a new cut through the field.

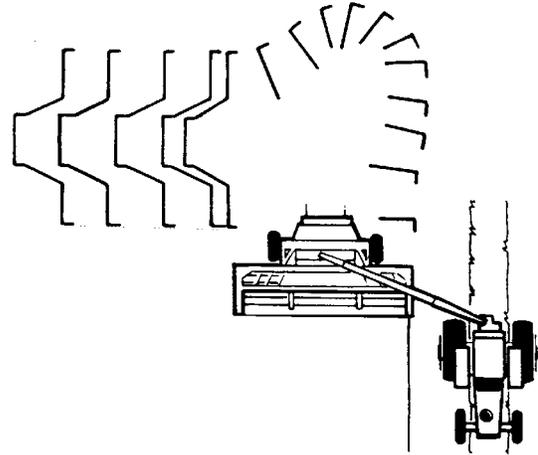


# OPERATION

## TURNING 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 maneuverability.

1. 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.
2. 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.
3. 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 tongue.
4. 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.



TURNING A SQUARE CORNER

## OPERATING VARIABLES

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 ten variables listed here 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.

1. Lean Bar Position
2. Ground Speed
3. Reel Speed
4. Reel Position
5. Cutting Height
6. Header Angle
7. Header Flotation
8. Feed Pan / Rock Drop Tine Position
9. Roll Gap
10. Forming Shields

### OPERATING VARIABLES

# OPERATION

## 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 (A) in adjustment holes as required.



LEAN BAR ADJUSTMENT

## GROUND SPEED

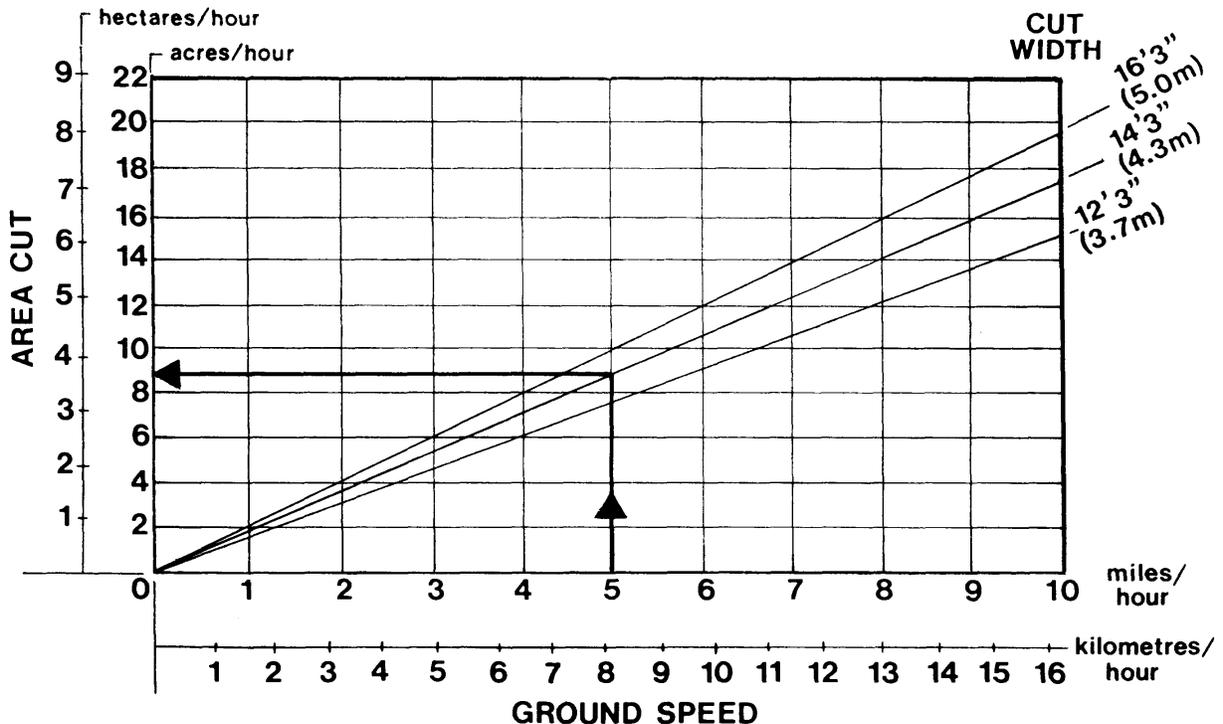


**CAUTION:** Reduce speed when turning, crossing slopes, or when travelling over rough ground.

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.

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

The chart below indicates the relationship between ground speed and area cut for three header sizes. Example: At ground speed of 5 mph (8 km/h) with a 14 ft. windrower, the area cut would be approximately 9 acres (3.7 hectares) per hour.



# OPERATION

## REEL SPEED

For best feeding of the crop into the auger, reel speed should be just faster than ground speed. This gently sweeps material across the sickle into the auger.

The reel speed is factory set at 72 rpm. (No-load at rated tractor RPM.)

With a pulley position exchange, other reel speeds are possible. (See chart.) A slower reel speed will reduce excessive crop carry-over, while a faster reel speed will result in a more even stubble height in down and tangled crops.

9 1/2" OD Pulley Position	10 1/2" OD Pulley Position	Reel Speed
B	A	59 rpm
A	B	72 rpm
none	A & B	66 rpm

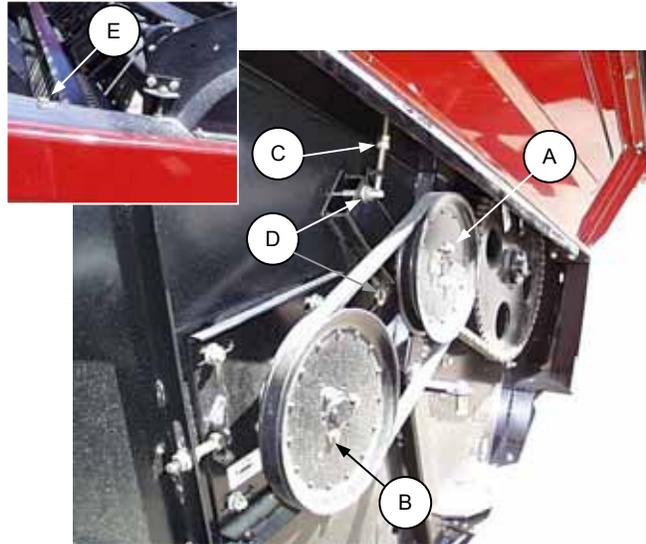
REEL SPEED CHART  
(for positions (A) & (B) see photo below)

### To change reel speed:

- Loosen jam nut (C) on adjuster bolt and two flange nuts (D) at reel drive arm. Loosen adjuster bolt (E) to slacken belt. Remove belt.
- Remove three flange locknuts at position (A).
- Remove three bolts and lockwashers at position (B).
- Position pulleys to achieve desired reel speed, (see chart). Replace pulley hardware.

**NOTE:** For 66 rpm reel speed it will be necessary to purchase an additional 10 1/2 inch O.D. pulley from your Dealer.

- Replace reel drive belt and tighten. Check reel drive chain tension. See Maintenance /Service section for recommended belt and chain tension.



CHANGING REEL SPEED  
66 rpm CONFIGURATION SHOWN

## 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. (Continued next page.)

REEL POSITION CHART	
<u>Unusual Crop Condition</u>	<u>Reel Position</u>
· Crop down or lodged	Forward & down (also increase reel speed)
· Wet or dead material collects on cutterbar, plugging sickle.	Back & down (close to guards)
· Short crop.	Back
· Thick stemmed or heavy standing crop.	Up and forward

# OPERATION

## REEL POSITION (continued)

**NOTE:** The reel must be adjusted equally on both sides, both horizontally and vertically.

### To adjust reel horizontal (fore-aft) position:

- Loosen jam nut (A) on adjuster bolt and two flange nuts (B) at reel drive arm. Loosen adjuster bolt (C) to slacken belt
- Loosen nut (D) and back off nut (E). Turn nut (F) to move idler sprocket upward until reel drive chain is loose.
- Loosen nuts (G), three on left side, four on right side.
- Loosen jam nut on bolt (H), both sides, and turn adjuster nuts to move reel fore or aft to desired position. Tighten jam nut.
- Tighten nuts (G).
- Tighten belt first, then tighten chain. See recommended tensions in Maintenance/Service section.

### To adjust reel vertical position:

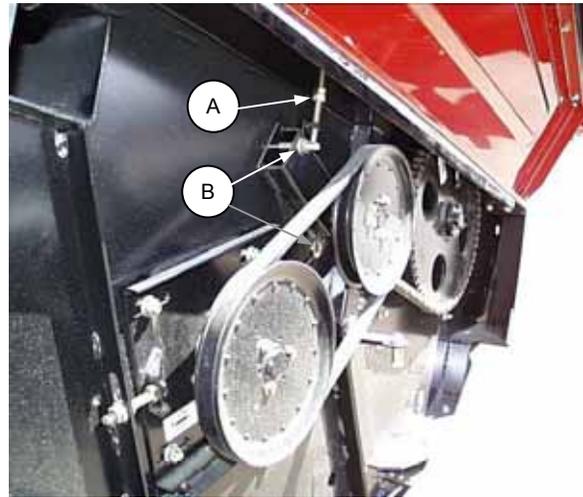
- Loosen jam nut (A) on adjuster bolt and two flange nuts (B) at reel drive arm. Loosen adjuster bolt (C) to slacken belt
- Loosen nut (D) and back off nut (E). Turn nut (F) to move idler sprocket upward until reel drive chain is loose.
- Loosen nuts (G), three on left side, four on right side.
- Loosen jam nuts (J) (left side only), and use push bolts (K), two per side, to move reel up or down to desired position. Tighten nuts (J).
- Tighten nuts (G)
- Tighten belt first, then tighten chain. See recommended tensions in Maintenance/Service section.

### To adjust tine aggressiveness:

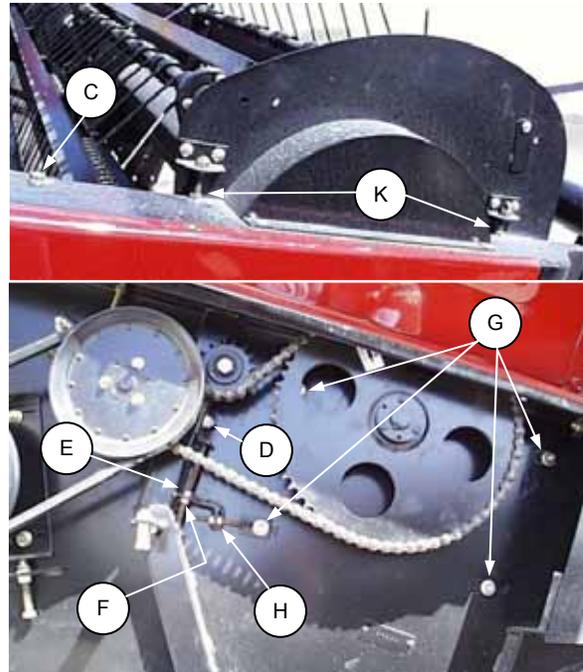
- At right side of reel (cam end) only, loosen four nuts (G).
- Use push bolts (K) to rotate cam to desired position. Viewed from right side, rotate cam clockwise to obtain more aggressive tine action.
- Tighten nuts (G), then check that chain and/or belt have not become over tight. Adjust to recommended tension if required. See Maintenance/Service section.

### After adjusting reel position:

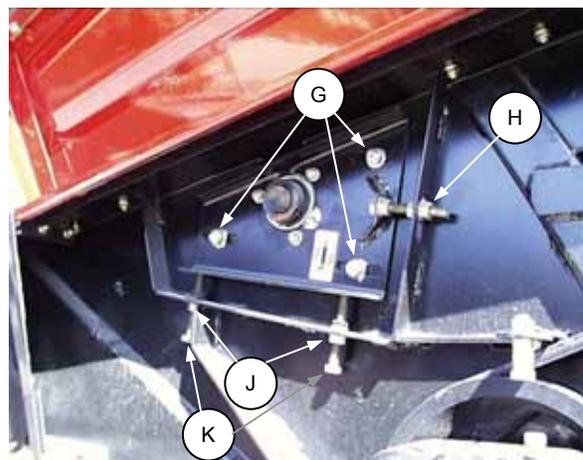
- Check that the reel rotates freely. Tines must not contact auger, guards or ground.
- Check that the reel is adjusted to the same position on both sides. Reel tube should appear parallel to header beam from both side and front.
- Check header float and adjust if required. See "Header Flotation" in this section.



LOOSENING REEL DRIVE BELT – RIGHT SIDE



REEL POSITION ADJUSTMENTS - RIGHT SIDE



REEL POSITION ADJUSTMENTS - LEFT SIDE

# OPERATION

## CUTTING HEIGHT

Control cutting height with skid plates, not with the hydraulic cylinder. Having the header "ride" on the skid plates allows the float linkage to float header over obstacles and follow ground contours, rather than supporting the header with the cylinder.

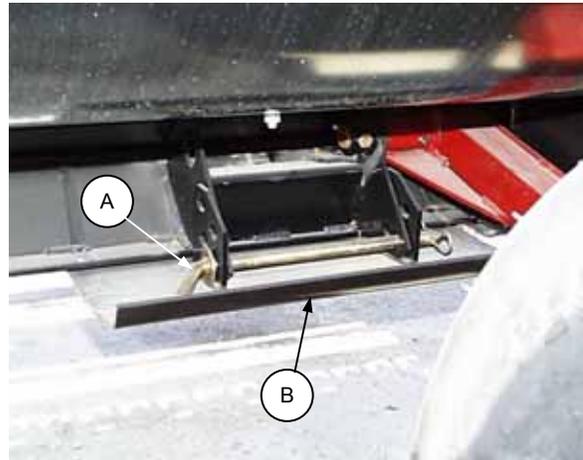
**NOTE:** Lowering the skid plates raises the cutting height. This may be desirable in stony conditions, to reduce damage to cutting components. Also, a longer stubble length helps material dry faster.

### To adjust cutting height:



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

- a. Remove pin (A) at each skid plate.
- b. Raise or lower skid plate (B) to desired position.
- c. Replace pin (A).



CUTTING HEIGHT ADJUSTMENT

### After adjusting cutting height:

- a. Check that skid plates are adjusted to the same position.
- b. Check header float and adjust if required. See "Header Flotation" in this section.

**NOTE:** Left and right skid plates are standard equipment. An additional two inner skid plates may be added if required.



**WARNING:** Stones or other foreign objects carried into the conditioner rolls can be ejected with force in ANY direction. Keep everyone several hundred feet away from your operation and be sure you are adequately protected. See "General Safety" in Safety section for recommended protective wear.

# OPERATION

## HEADER ANGLE

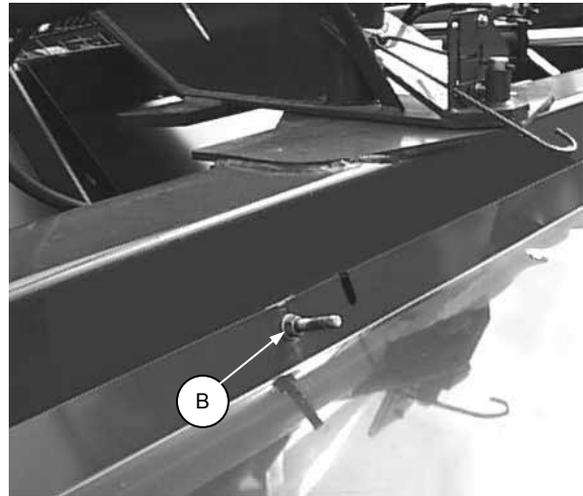
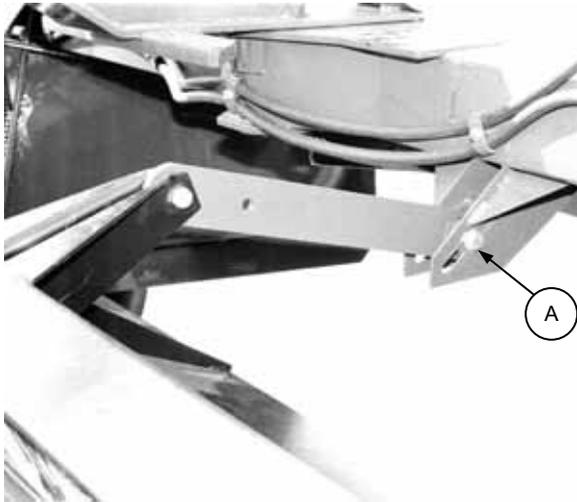
Header (or guard) angle can be varied from 6° to 11.5° below horizontal. Choose an angle that maximises performance for your crop and field conditions. A flatter angle provides better clearance in stony conditions while a steeper angle is required in down crops for better lifting action.

### To adjust header angle:

- a. Loosen nut (A).
- b. To decrease (flatten) header angle, turn nut (B) clockwise.
- c. To increase (steepen) header angle, turn nut (B) counter-clockwise.
- d. Tighten nut (A) to 200 ft.lbs. (270 N.m)

### After adjusting header angle:

- a. Check cutting height and adjust if required. See "Cutting Height" in this section.
- b. Check header float and adjust if required. See "Header Flotation" in this section.



HEADER ANGLE ADJUSTMENT

**NOTE:** Two optional kits are available which allow header angle to be adjusted hydraulically with a cylinder replacing the mechanical link shown above. One kit (B 4257) requires a separate hydraulic circuit from the tractor. The other (B 4256) uses the existing tongue steering cylinder hydraulic circuit, and a remote switch-operated selector valve controls which circuit is currently active. Installation instructions are included with the kits.



OPTIONAL HYDRAULIC HEADER ANGLE KIT

# OPERATION

## **HEADER FLOTATION**

Header flotation springs are normally set so 70 lbs. 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 lbs. (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.

To increase header flotation, which decreases the force required to lift header:

- a. Raise header fully.
- b. Back jam nut (A) away from spring.
- c. Turn adjuster bolt (B) further into spring to increase flotation.
- d. Tighten jam nut (A) against spring insert (C) to secure the setting.
- e. Lower header and check header flotation at each end.

**IMPORTANT:** Float setting (or lifting force) must be equal on both springs. Weight difference between left and right ends requires different spring lengths to achieve equal float at both ends. Note that 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.



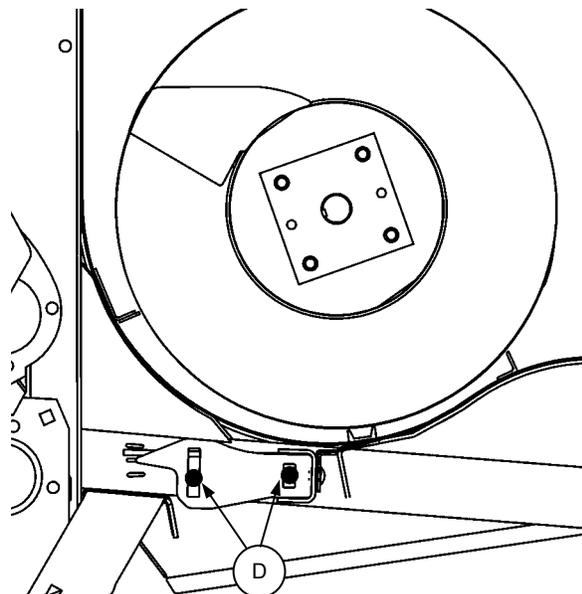
HEADER FLOTATION ADJUSTMENT

## **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.

- Move down in heavy crop to prevent plugging of bulky material.
- Move up in light crop for even windrow formation.
- To adjust, loosen hardware (D) both sides and position rock drop tine support as required.
- Align pointer at each side of rock drop tine support with slot to match crop condition:
  - Light Crop – Upper slot
  - Normal Crop – Center slot
  - Heavy Crop – Lower slot

- NOTE:** Use pointer to align with slot, not tines which are aligned above the pointer as shown.
- Tighten hardware (D) both sides.



ROCK DROP TINE HEIGHT ADJUSTMENT

# OPERATION

## ROLL GAP



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

Steel rolls "condition" the crop by crimping 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 (A), measured from bar to roll tube. The gap is factory set at 3/4 inch (20 mm) for normal operation.

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 slightly 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.

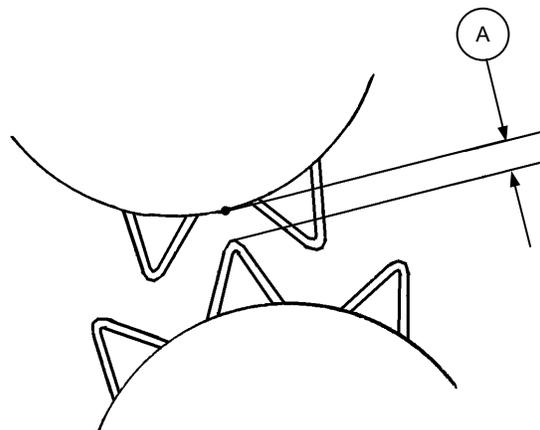
Grass type crops may require less gap for proper feeding and conditioning.

### To adjust roll gap:

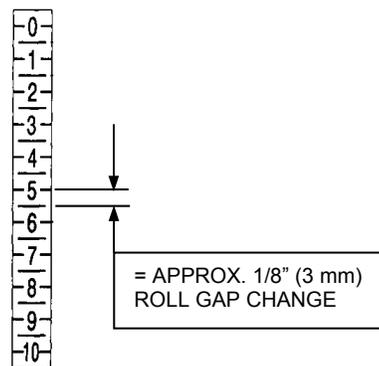
**NOTE:** The top face of nut (B) is used as the indicator for the gauge decal on the threaded rod. Each division on the roll gap decal represents a change of approximately 1/8 inch (3mm) in roll gap. The factory setting of 3/4 inch (20mm) roll gap is mark 5 on the decal. When adjusting roll gap, be sure that the decal reading is the same on both sides of the conditioner roll to achieve consistent intermesh across the rolls.

- Raise header fully.
- Loosen jam nut (B), both sides.
- To increase roll gap, turn nut (C) clockwise.
- To decrease roll gap, turn nut (C) counter-clockwise.
- Tighten jam nut (B), both sides.
- Lower header and inspect roll gap along the length of the rolls.

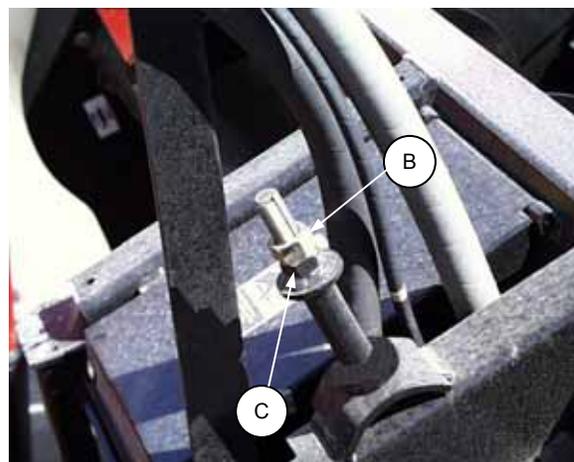
**NOTE:** Roll tension (the force holding the rolls together) is factory set and non-adjustable.



ROLL GAP



ROLL GAP DECAL



ROLL GAP ADJUSTMENT

# OPERATION

## 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 (infinite settings between 30 and 92 inches [760 - 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 wide 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. See "Haying Tips" in this section 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.

### To adjust windrow width and placement:

#### **IMPORTANT:**

Set forming shield side deflectors to desired width by repositioning adjuster rods (A) in holes. To ensure windrow placement is centered with respect to tractor wheels, rear edge of left and right side deflectors must be equal distance from tongue center pivot, as shown on decal (E) on the top shield. To achieve this setting, adjuster rods must be in the corresponding hole both sides. Count holes from inner-most hole (B).

**NOTE:** If forming shield side deflectors are too loose, or too difficult to move with adjuster rods: Back off nut (D) and adjust lower nut (C) as required. Then, holding nut (C) with a wrench, tighten top nut (D) securely against nut (C).

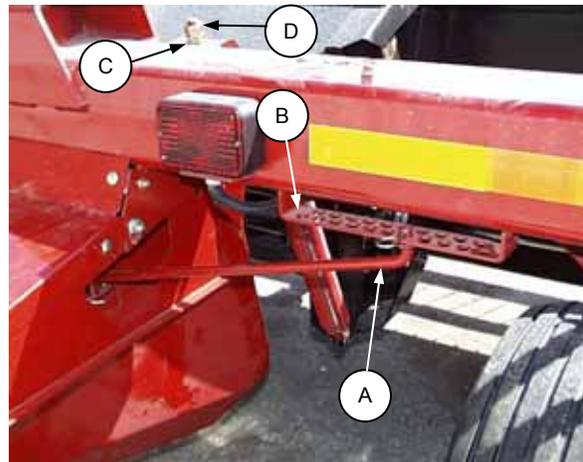
#### **Rear Deflector**

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

The rear deflector can be adjusted down for more crop control in light material, and up for clearance in heavier crops.

To adjust rear deflector, pull up or push down one side of deflector (F), then repeat at the other side. There is no hardware to be loosened.

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



FORMING SHIELD ADJUSTMENTS

# OPERATION

## **HAYING TIPS**

There is one certainty when making hay - a quick cure will maintain top quality. It is critical to have the cured hay baled as quickly as possible, for two reasons:

1. Every day hay lies on the ground, 5% of the protein is lost.
2. The sooner the cut hay is off, the earlier the start for next growth.

Generally, leaving the windrow as wide and thin as possible makes for the quickest curing, however there are other factors which affect curing time:

### **1. TOPSOIL MOISTURE**

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:

Over 45% - WET - Soil will be muddy  
25 - 45% - DAMP - Walking on soil leaves tracks  
Under 25% - DRY - Soil will be dusty on top

When ground is wet due to irrigation, wait until soil moisture drops below 45%. When 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. At this point, the cut hay will dry no more until the ground under it dries, so consider moving the windrow to drier ground.

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.

### **2. CLIMATE AND TOPOGRAPHY**

- a. Try to have as much hay cut 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 you bale and chop, 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. If there is no wind, saturated air becomes trapped around the windrow, further hindering the drying process. Raking or tedding will expose the hay to fresher, less saturated air. Cutting hay perpendicular to the direction of the prevailing winds may also help.

# OPERATION

## **HAYING TIPS (continued)**

### **3. WINDROW CHARACTERISTICS**

See "Operating Variables" in this section. Control the factors listed to produce a windrow with the following characteristics:

- a. High and fluffy for good air flow. The movement of air through the windrow is more important to the curing process than direct sunlight.
- b. Consistent formation, not bunched. A uniform windrow permits an even flow of material into the baler, chopper etc.
- c. Even distribution, not piled in the middle or higher on one side. A windrow that is higher or heavier on one side could cause stacks to lean, round bales to have one end smaller and loose, or small square bales to be heavy on one side, causing handling and stacking problems.
- d. Properly conditioned without excessive leaf damage.

### **4. RUNNING TRACTOR ON PREVIOUSLY CUT WINDROW:**

This 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. However, in high-yielding alfalfa, driving on the hay may be unavoidable if a full width windrow is necessary,

### **5. RAKING AND TEDDING**

Raking or tedding will speed up drying, however the benefits must be weighted against the additional leaf losses which will result. When the ground beneath the down hay is dry, raking or tedding is probably not worthwhile.

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

### **6. 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.

## OPERATION

### UNPLUGGING THE WINDROWER



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

#### If the sickle plugs:

1. Stop forward movement of the tractor and stop the PTO.
2. Lift the cutterbar about 12 inches (300 mm).
3. Back up about 3 feet (1 metre) while slowly engaging the PTO.
4. If the plug does not clear; raise machine, shut off engine, remove key and lock tractor brakes.
5. Engage lift cylinder stop.



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

6. Clean off cutterbar by hand.

If sickle plugging persists, see Trouble Shooting section.

#### If the rolls plug:

1. Stop forward movement of the tractor and stop the PTO.
2. Raise the machine and slowly engage the PTO.

**NOTE:** Raising the windrower automatically reduces roll tension, to ease plug removal.

3. If plug does not clear: with machine still raised, shut off engine, remove key and lock tractor brakes.
4. Engage lift cylinder stop.

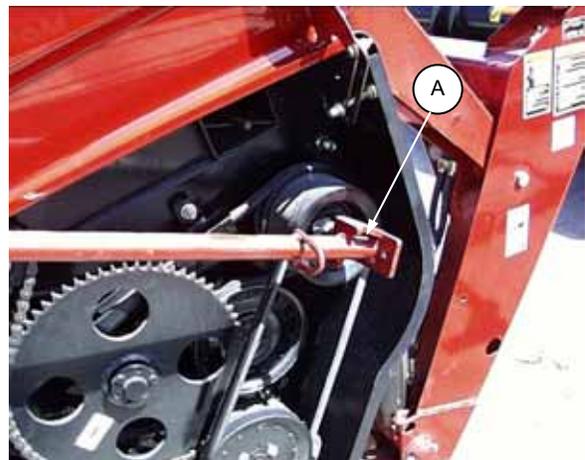


**WARNING:** Wear heavy gloves when working around sickle.

5. Clean off cutterbar and area under reel by hand.
6. Use wrench on left-hand end of primary drive shaft (A) to turn rolls forward until plug clears.

**NOTE:** Store wrench in header frame tube at left end, secured with hairpin (B) as shown.

If roll plugging persists, see Trouble Shooting section.



CLEARING PLUGGED ROLLS



WRENCH STORAGE

# OPERATION

## SHUT-DOWN PROCEDURE



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

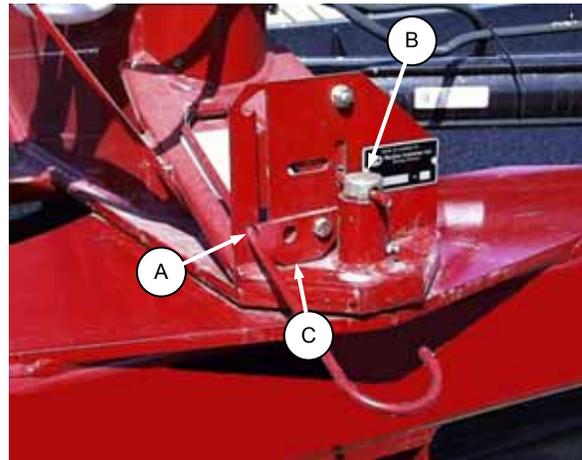
1. Park on level ground if possible.
2. Lower the windrower fully.
3. Place all controls in NEUTRAL or PARK.
4. Disengage PTO.
5. Engage the park brake.
6. Stop engine and remove key from ignition.
7. Wait for all movement to stop.
8. Lock tractor anti-vandalism covers and closures when leaving the machine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

## TRANSPORTING THE WINDROWER: TOWING



**WARNING:** To avoid injury or death from loss of control, engage transport lock pin before transporting machine. The transport lock pin locks the machine to tow directly behind the tractor and prevents inadvertent movement to either side due to accidental operation of the remote hydraulic control levers or to a malfunctioning hydraulic system. Use correct transport procedure as detailed below:

1. The hitch steering cylinder and hoses must be full of oil before towing the windrower. If not previously done, fill steering circuit as follows:
  - Connect the two hitch steering cylinder hoses to a tractor hydraulic circuit.
  - Steer the header completely to the left, then right. Repeat three or four times.
2. Place transport latch rod in transport position (A) and engage rod retainer (C).
3. Slowly shift hitch into transport position so the machine is centered directly behind the tractor. See "Steering" in this section. Hitch will lock when it reaches center position. Oscillate the header left and right a small amount to ensure transport lock pin (B) is properly engaged in the plate on carrier frame.
4. Raise the windrower fully and engage lift cylinder stop. See "Lift Cylinder Stop".
5. Do not tow with a vehicle weighing less than 5000 lbs. (2300 kg).
6. Be sure hitch chain is properly attached to towing vehicle. Provide only enough slack in chain to permit turning. See "Attaching Windrower to Tractor" in this section.
7. Be sure jack is properly attached in storage position on frame tube.
8. Check local laws for width regulations and lighting or marking requirements before transporting on roads.
9. Keep Slow Moving Vehicle emblem, reflectors and lights clean and visible at rear of windrower.



TRANSPORT LATCH ROD & LOCK

10. Be aware of roadside obstructions, oncoming traffic and bridges.
11. Travel speed should be such that complete control and machine stability are maintained at all times. Do not exceed 20 mph (30 km/h). Reduce speed for corners and slippery conditions.
12. When transporting on roads, use tractor lights and windrower flashing amber and red taillights to provide adequate warning to operators of other vehicles.
13. Do not transport the windrower on a road or highway at night, or in conditions, which reduce visibility, such as fog or rain.

# OPERATION

## TRANSPORTING THE WINDROWER: FLATBED



**CAUTION:** Use the following procedure when shipping the windrower on a flatbed trailer.

1. Raise header with tractor hydraulics and install lift cylinder stops.
2. Position lean bar to hang vertically downward. Install only one bolt per side. (Remove divider rods, if equipped.)
3. Remove complete rear forming shield group, in whole.
4. At tongue pivot, back off two 5/8 nuts (B) approximately 3/4 inch (20 mm). This clears the stop to allow pivoting the tongue past the normal travel range.

**NOTE:** If tongue does not raise up as nuts (B) are loosened, lift rear of tongue with forklift to clear stops.

5. Detach rod end of tongue shift cylinder from frame and swing tongue to the right until no part of tongue extends forward of header R/H end panel (that is, the tongue must not widen the shipping package). Secure the cylinder to the tongue for shipping. Tie tongue to frame at float arm (C) to prevent movement. (Use cardboard or suitable material under the tie to protect paint.)

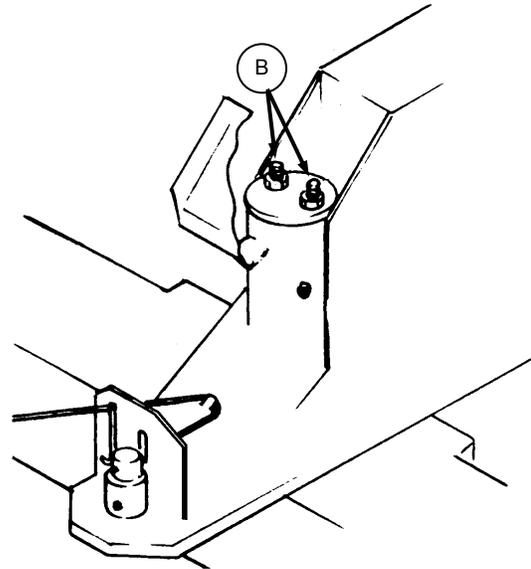
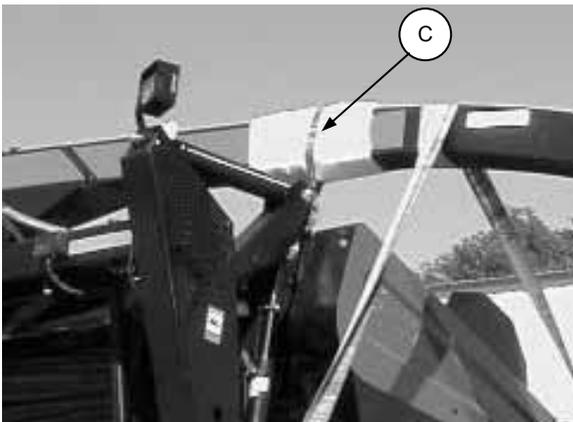


**CAUTION:** Be sure forklifts are large enough to lift the windrower safely. See Specifications section for weight of the unit.

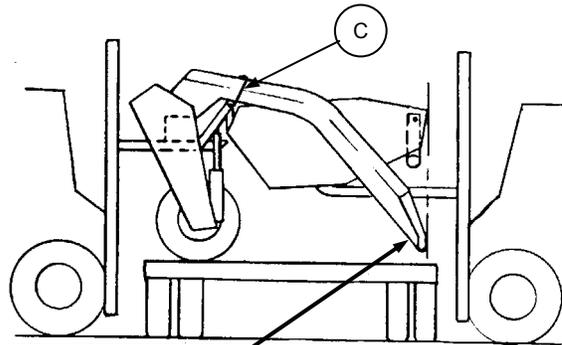
6. Position two forklifts as shown, lift windrower and back the flatbed trailer under the unit.

**IMPORTANT:** To allow windrower to rest securely on header panels, hitch end of tongue must extend over rear of flatbed by approximately 2 feet (0.6 m).

7. Lower windrower onto flatbed so its weight rests on the tires and sloped edge (D) of header end panels.
8. Block wheels and tie the unit down securely.

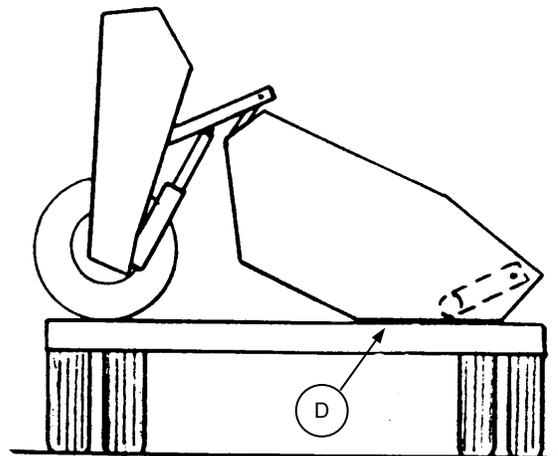


LOOSEN NUTS TO RAISE TONGUE



**NOTE:** TONGUE DOES NOT WIDEN SHIPPING PACKAGE AND HITCH END OF TONGUE EXTENDS APPROX. 2 FT. OVER END OF FLATBED

RAISE UNIT - POSITION FLATBED



LOWER AND TIE DOWN UNIT

## OPERATION

### STORAGE PROCEDURE

Do the following at the end of each operating season:



#### CAUTION:

1. Clean the windrower thoroughly. Never use gasoline, naphtha or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.
2. Cover cutterbar and sickle guards to prevent injury from accidental contact.

Also:

3. Store in a dry, protected place if possible. If stored outside, always cover windrower with a waterproof canvas or other protective material.
4. Raise header and engage lift cylinder stops.
5. If possible, block up the windrower to take weight off tires.
6. Repaint all worn or chipped painted surfaces to prevent rust.
7. Loosen drive belts.
8. 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.
9. Check for worn components and repair.
10. 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.
11. Replace or tighten any missing or loose hardware. See Specifications section for torque charts.
12. Remove divider rods (if equipped) to reduce space required for inside storage.

## MAINTENANCE/SERVICE

### SERVICE PROCEDURES



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

1. Fully lower the windrower. If necessary to service in the raised position, always engage lift cylinder stops.
2. Disengage PTO.
3. Stop engine and remove key.
4. Engage park brake.
5. Wait for all moving parts to stop.

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 to access a lube fitting) will cause drive components in other areas (belts, pulleys and sickle) to move. Stay clear of drive 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.**

# MAINTENANCE/SERVICE

## RECOMMENDED FLUIDS AND LUBRICANTS

### **GREASE**

Use an SAE Multi-Purpose High Temperature Grease with Extreme Pressure (EP) Performance and containing at least 1.5% molybdenum disulphide. (NLGI Grade 2)

Also acceptable is an SAE Multi-Purpose Lithium Base Grease.

### **HYDRAULIC OIL**

Use SAE 15W40 complying with SAE specs for API Class SJ and CH-4 engine oil.

### **WOBBLE BOX LUBRICANT**

In sickle drive wobble box, use SAE 85W-140 gear lubricant (API Service Classification GL-5)

### **ROLL DRIVE CHAIN CASE**

See "Grease", above.

### **CAPACITIES**

Wobble Box (Sickle Drive) - 2.2 litres (2.3 U.S. quarts)

Roll Drive Chain Case - 2000 grams (5 tubes)

Hydraulic Reservoir - 12 ft. windrower: 93 litres (25 U.S. gallons)

14 ft. windrower: 104 litres (27 U.S. gallons)

16 ft. windrower: 126 litres (33 U.S. gallons)

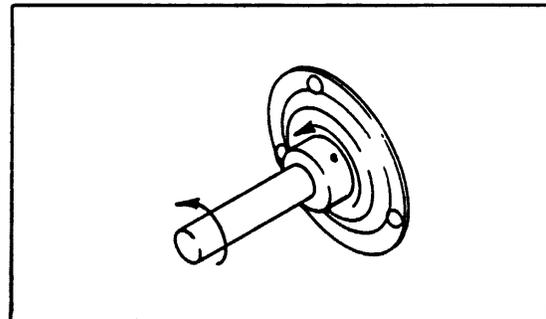
### **STORING LUBRICANTS**

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

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## SEALED BEARING INSTALLATION

1. Clean shaft and coat with rust preventative.
2. Install flangette, bearing, second flangette and lock collar.  
**NOTE:** The locking cam is only on one side of the bearing.
3. Install (but do not tighten) the flangette bolts.
4. When the shaft is correctly located, lock the lock collar with a punch. The collar should be locked in the same direction the shaft rotates. Tighten the set screw in the collar.
5. Tighten the flangette bolts.
6. Loosen the flangette bolts on the mating bearing one turn and re-tighten. This will allow the bearing to line up.



TIGHTEN COLLAR IN DIRECTION  
SHAFT ROTATES

## MAINTENANCE/SERVICE

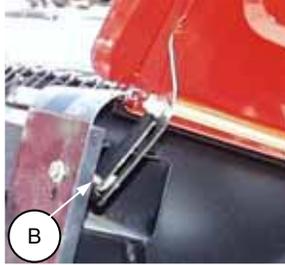
### DRIVE SHIELDS

Press a screwdriver against latch in opening at (A) to open the left and right drive shields on the header.



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

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

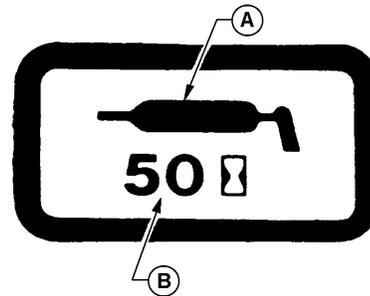


MAIN DRIVE SHIELDS

### GREASING THE WINDROWER

See "Recommended Lubricants" in this section for recommended greases.

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



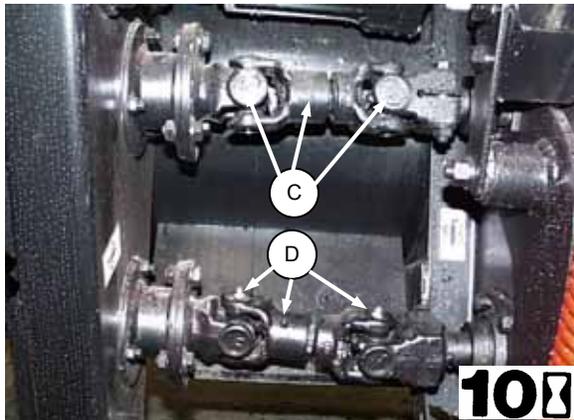
SAMPLE GREASE DECAL

Procedure:

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

#### 10 Hours or Daily

1. Upper Roll Universal Shaft (C) - three fittings
2. Lower Roll Universal Shaft (D) - three fittings

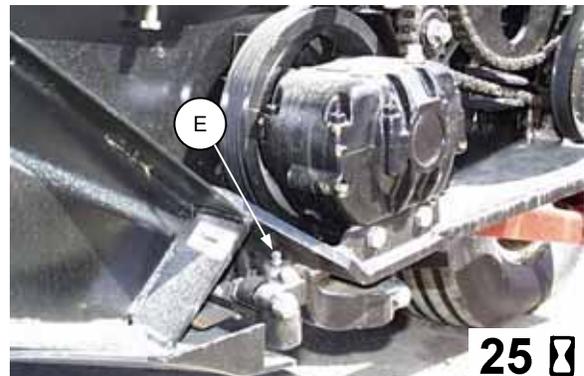


ROLL UNIVERSALS

#### 25 Hours

1. Sickle Head (E) - one fitting

**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. When changing seal, check pin and needle bearing for wear. Replace if necessary. See page 48.



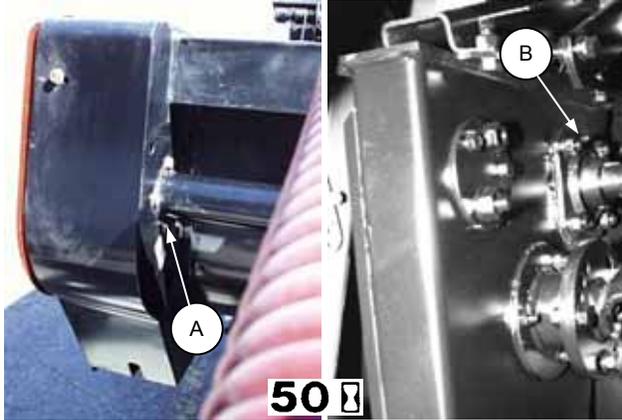
SICKLE HEAD

# MAINTENANCE/SERVICE

## GREASING THE WINDROWER (continued)

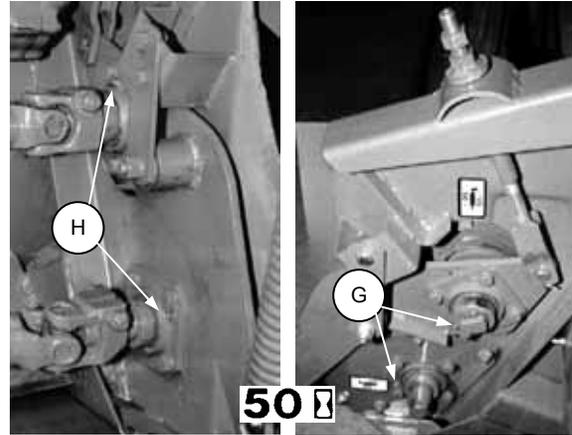
### 50 Hours:

1. Main Drive Shaft Bearings (A) & (B) - two fittings



MAIN DRIVE SHAFT BEARINGS

4. Roll Shaft Bearings (G) & (H) - four fittings



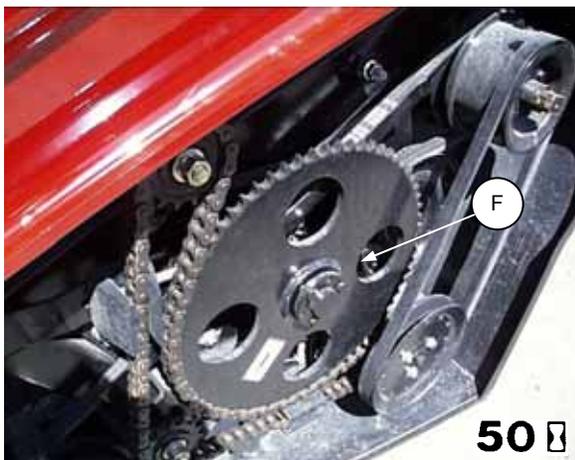
LEFT SIDE  
RIGHT SIDE  
ROLL SHAFT BEARINGS

2. Reel Shaft Bearings (C) & (D) - two fittings

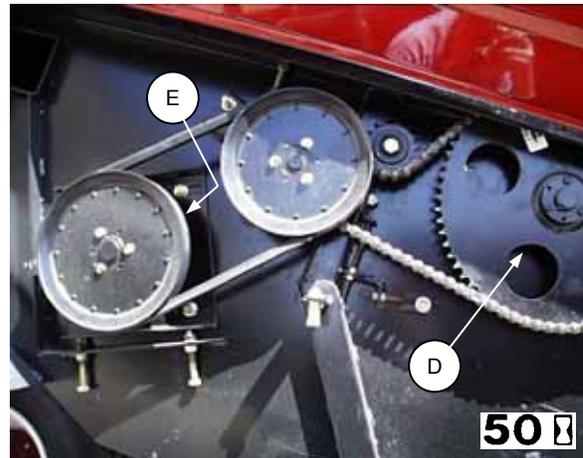


REEL SHAFT BEARING - LEFT SIDE

3. Auger Shaft Bearings (E) & (F) - two fittings



AUGER SHAFT BEARING - LEFT SIDE



REEL AND AUGER BEARINGS - RIGHT SIDE

# MAINTENANCE/SERVICE

## GREASING THE WINDROWER

### 50 Hours: (continued)

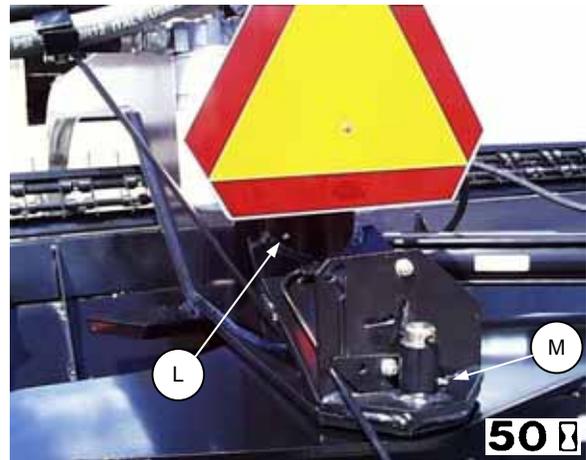
5. Frame-to-Header Pivot (J) - two fittings



FRAME-TO-HEADER PIVOT

7. Tongue Pivot (L) - one fitting

8. Transport Lock Pin (M) - one fitting



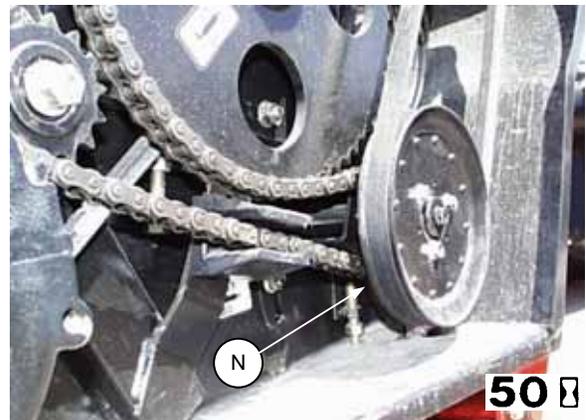
TONGUE PIVOT & TRANSPORT LOCK PIN

6. Lower Float Link Bushings (K) - two fittings



LOWER FLOAT LINK BUSHINGS

9. Auger Drive Jackshaft Bearings (N)  
- one fitting (on sprocket hub)



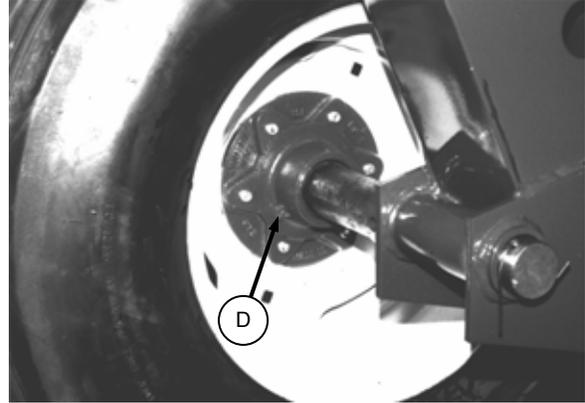
AUGER DRIVE JACKSHAFT BEARINGS

# MAINTENANCE/SERVICE

## GREASING THE WINDROWER (continued)

### 100 Hours:

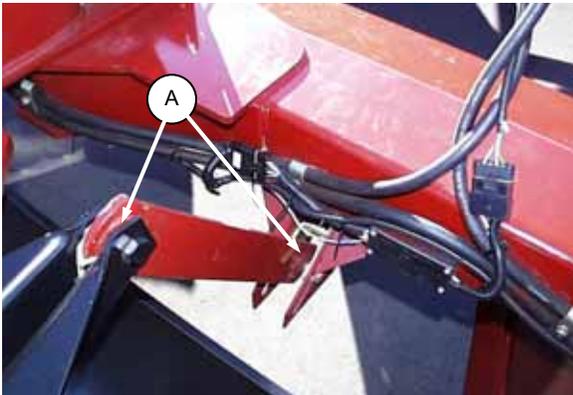
1. Wheel Hub Bearings (D) - two fittings



WHEEL HUB BEARINGS

## CENTER LINK BALL JOINTS

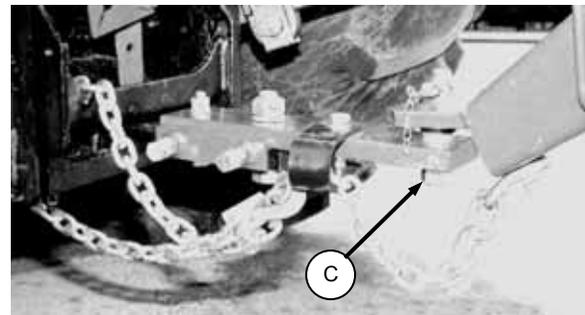
Apply SAE 30 or equivalent lightweight oil to the center link ball joints (A) every 50 hours.



OIL CENTER LINK BALL JOINTS

## HITCH PIN LOCK NUT

Check hitch pin nut (C) every 50 hours. Maintain 350 ft. lbs. (475 N·m) torque.



CHECK HITCH PIN LOCK NUT

## SPRING PIVOTS

Apply SAE 30 or equivalent lightweight oil to the spring pivots (B) every 50 hours.



OIL SPRING PIVOTS

# MAINTENANCE/SERVICE

## HYDRAULICS

The windrower is hydraulically powered using:

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

### Hydraulic 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. Use a piece of cardboard or paper to search for leaks. 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.

**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.

### Hydraulic Reservoir

The windrower's self-contained hydraulic system uses the tongue of the machine for the hydraulic oil reservoir. See "Recommended Fluids and Lubricants" on page 40 for proper oil type and capacity.

Check oil level daily (before start-up) at dipstick (A) at rear of tongue. Oil level should be between ADD and FULL marks on the dipstick when top surface (C) of tongue is level and oil is cold.



**WARNING:** To avoid injury from contact with hot oil, do not remove dipstick when system is hot. When removing dipstick (A), unscrew it slowly to vent the build-up of air pressure in the reservoir.

To add hydraulic oil:

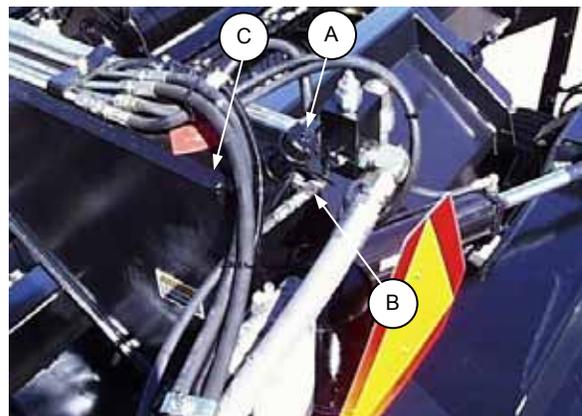
1. Loosen hydraulic fitting (B) to vent reservoir, making adding oil easier.
2. Slowly unscrew dipstick (A) from filler tube.
3. Add oil until level is between ADD and FULL marks on dipstick (A). (See page 40 for oil specs).
4. Replace dipstick and tighten fitting (B).



AVOID HIGH-PRESSURE FLUIDS



SEARCH PROPERLY FOR LEAKS



HYDRAULIC RESERVOIR

## MAINTENANCE/SERVICE

### **HYDRAULICS: Hydraulic Reservoir (continued)**

Change hydraulic oil every 600 hours or 3 years.

To drain the reservoir:

1. Loosen hydraulic fitting and remove dipstick as described under "To add hydraulic oil", previous page.
2. Disconnect the pump supply hose (A) from the pump.

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

### **Hydraulic Oil Filter**

Change hydraulic oil filter (B) after the first 100 hours operation and every 250 hours thereafter.

To change:

1. Clean around the filter head.
2. Remove the filter and clean the gasket surface of the filter head.
3. Apply a thin film of clean oil to the gasket on the new filter.
4. 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.

### **Hydraulic Relief Pressure**

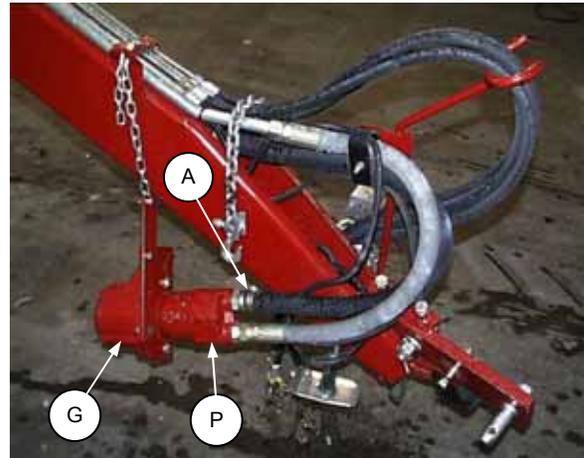
A possible cause of poor cutting performance and/or excessive heating of hydraulic oil is low relief pressure. Relief valve (D) is factory set at 4000 psi (27.6 MPa). See your dealer for adjustment or service. A pressure gauge can be installed at tapped elbow (C).

**Pump & Gearbox Matching** – Pump (P) and gearbox (G) must be properly matched for 540 or 1000 rpm. If problems arise related to RPM (sickle plugging, vibration etc.), check that components are matched as follows:

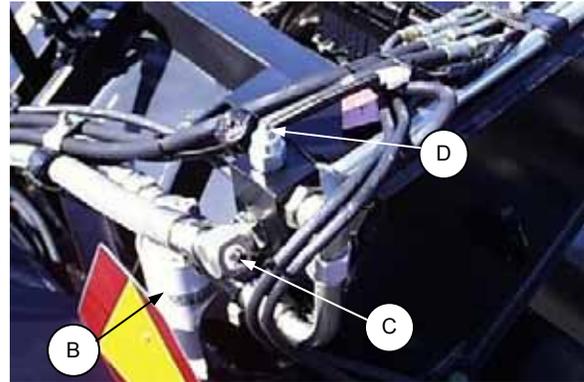
540 RPM: Pump 73428 LA\_ with Box 77020\_\_

1000 RPM: Pump 73424 LA\_ with Box 77030\_\_

Model numbers are stamped on the pump mounting flange and the gearbox front plate.



- ENSURE RPM MATCH AT PUMP/GEARBOX
- DRAIN RESERVOIR AT PUMP SUPPLY HOSE



OIL FILTER & RELIEF VALVE

## **ELECTRICAL**

Use electrical tape and wire clips as required to prevent wires from dragging or rubbing.

Keep lights clean and replace burnt bulbs.

To replace light bulbs:

1. Using a phillips screwdriver, remove screws (B) from fixture, freeing amber cover.
2. Replace bulb, plastic lens, and reinstall screws.

**NOTE:** Bulb trade #1156.

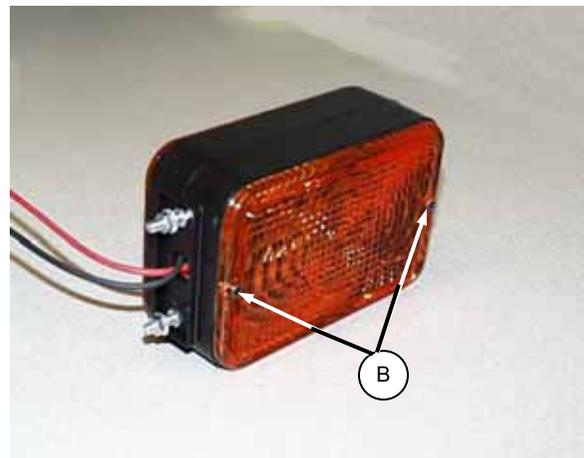
### **Wiring Harness:**

White - ground

Brown - red tail light

Yellow - L/H amber

Green - R/H amber



REPLACING LIGHT BULBS

## MAINTENANCE/SERVICE

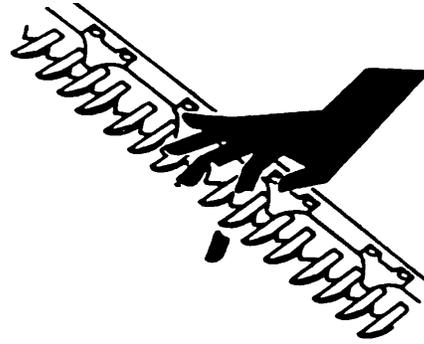
### SICKLE AND SICKLE DRIVE



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



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



KEEP HANDS AWAY FROM SICKLE

### Sickle Lubrication

Apply SAE 10 or equivalent light weight oil daily (one or two drops per section) along entire length of sickle.

**NOTE:** Do not oil sickle if operating in sandy conditions. Oil will cause sand to adhere to sickle components, resulting in excessive wear.

### Sickle Sections

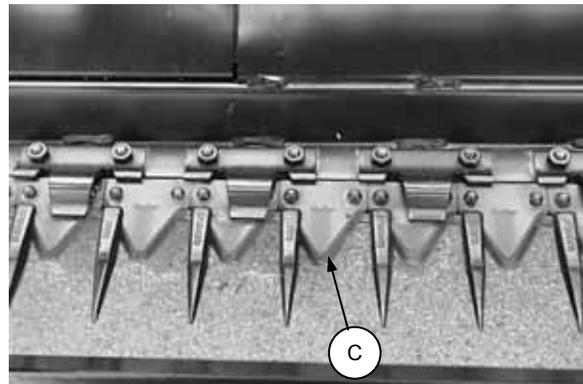
Check daily that sections are firmly bolted to the sickle back and are not worn or broken. Replace as required.

To replace sickle section:

1. A worn or broken sickle section (C) can be replaced without removing sickle from cutterbar.
2. Remove lock nuts and lift section off of bolts. **IMPORTANT:** Do not mix heavy and light sickle sections on same sickle.
3. Clean any dirt off of sickle back and position new sickle section on bolts. Secure with lock-nuts.



OIL KNIFE DAILY EXCEPT IN SANDY SOIL



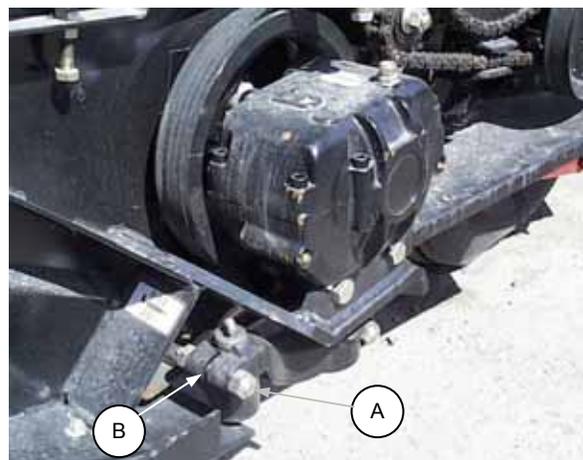
BOLT-ON SECTIONS

### To Remove Sickle



**WARNING:** Always stand to rear of sickle during removal to reduce risk of injury from cutting edges. Wear heavy gloves when handling sickle.

1. Clean area around sickle head. Stroke sickle to its outer limit and remove bolt (A).
2. Insert screwdriver in slot (B) and pry up on sickle head pin to free sickle.
3. Pull sickle out.
4. Cover sickle head to shield bearing from dirt.



REMOVING SICKLE

## MAINTENANCE/SERVICE

### SICKLE AND SICKLE DRIVE (continued)

#### Sickle Head Needle Bearing Installation

Using a flat-ended tool (A) with approximately the same diameter as the bearing, push the bearing into the sickle head until the top of the bearing is flush with the step (B) in sickle head.

**IMPORTANT:** O-ring and plug must be in place in sickle head before installing bearing. Assemble the bearing with the stamped end (the end with identification markings) against the tool.

Install seal (C) 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.

#### To Install Sickle



**WARNING:** Always stand to rear and grasp rear edge of sickle during installation to reduce risk of injury from cutting edges. Wear heavy gloves when handling sickle.

**IMPORTANT:** Always align guards and re-set sickle hold-downs while replacing sickle.

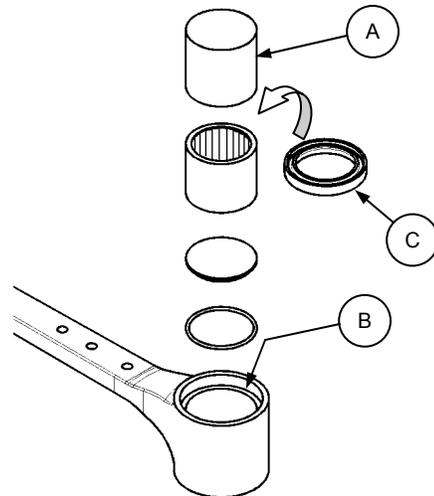
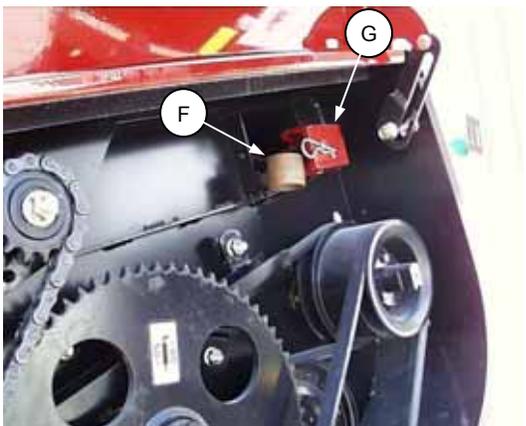
- Slide sickle into place, install sickle head pin and replace bolt (D). To ease assembly, remove lube fitting from pin. Replace when installation is complete.

**NOTE:** When installing sickle head pin (E), bottom out the pin in sickle head, then hammer sickle head back up to pitman arm.

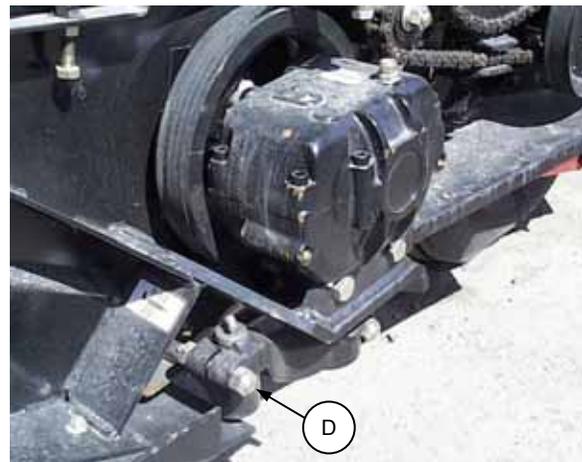
- Tighten bolt (D) to 160 ft.lbs. (220 N.m).

#### Spare Sickle Storage

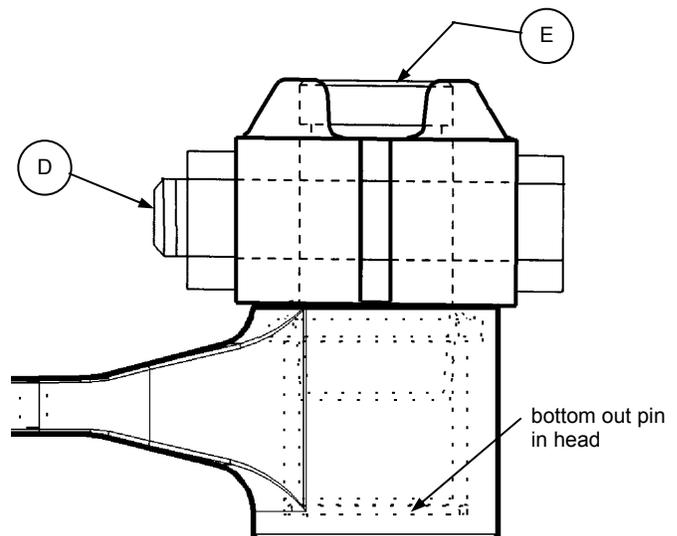
A spare sickle (F) may be stored in header frame tube at left end, as shown below. Ensure guard tool/wrench (G) and hairpin are in place as shown to secure the spare sickle.



NEEDLE BEARING INSTALLATION



INSTALLING SICKLE



INSTALLING SICKLE – FRONT VIEW

## MAINTENANCE/SERVICE

### **SICKLE AND SICKLE DRIVE** (continued)

#### **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.

Align guards with guard straightening tool provided as shown:

To bend guard tips up, position tool as shown at (A) and pull up.

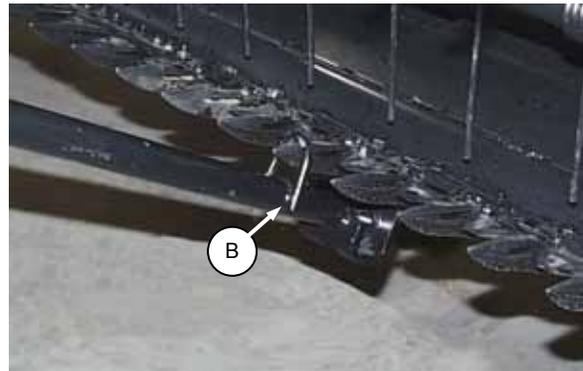
To bend tips down, position tool as at (B) and push down.

**NOTE:** Tool is stored in header frame tube at left end. See (G) in photo on page 48 (bottom left).

**TIP:** If trouble is encountered cutting tangled, but easy to cut material (canola, peas, grain) replace guards with stub guards or install a sickle hold-down on every guard. 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.



BENDING GUARD TIPS UP



BENDING GUARD TIPS DOWN

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#### **Excessive Breakage**

Excessive breakage of sickle sections and guards can be controlled by several factors. See "Cutting Height", "Header Angle" and "Header Flotation" in Operation section for recommendations.

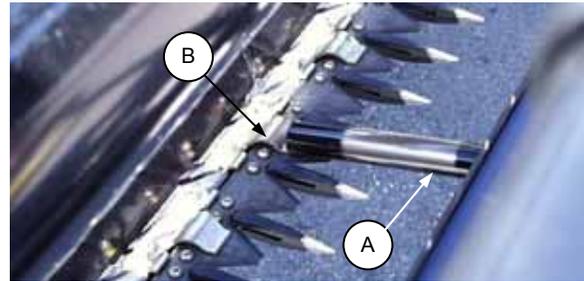
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#### **Sickle Hold-Downs**

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

To set hold-downs:

1. Use the unplug wrench (A) with the flattened end against the front edge of hold down. Strike wrench with a hammer. This allows adjustment of hold-down arch (B) without "pinching" sickle. Clearance from hold-down to sickle section should be .020 inch (0.5 mm).
2. After adjusting all hold-downs, run header at a low engine speed and listen for noise due to insufficient clearance. Re-adjust as necessary by placing a .020 inch (0.5 mm) shim between hold-down and section, then striking the hold-down arch (B) with a hammer.



SETTING SICKLE HOLD-DOWNS

## MAINTENANCE/SERVICE

### SICKLE AND SICKLE DRIVE (continued)

#### Sickle Drive Belt Tension

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

To adjust:

1. Loosen nut (A) securing idler pulley.
2. Using a punch or screwdriver in pry holes (B), raise idler until a force of 12 lbs. (55 N) deflects belt 1/2 inch (13 mm) at mid-span.
3. Tighten nut (A).
4. Re-adjust tension of a new belt after a short run-in period, (about 5 hours).

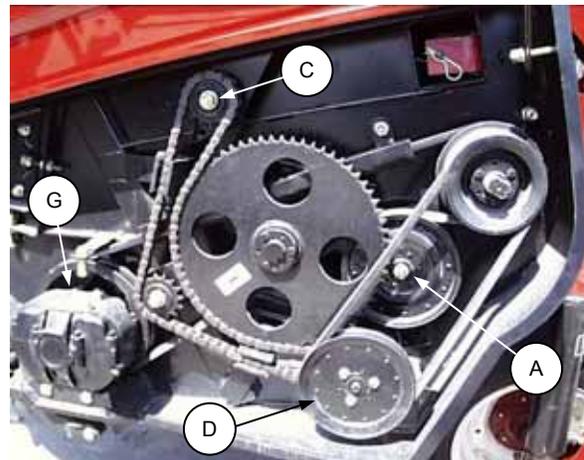


SICKLE DRIVE BELT TENSION ADJUST.

#### Sickle Drive Belt Replacement

To remove belt:

1. Loosen chain idler sprocket (C) and remove chain from drive sprocket behind pulley (D).
2. Loosen and remove auger drive belt as follows:
  - Loosen nuts (E).
  - Back off nut (F) and back bolt out of adjuster bracket until belt can be removed. (Access bolt head under end panel.)
3. Loosen sickle drive belt idler pulley (A).
4. Remove belt from sickle drive pulley.
5. Remove bolt-in plate in left end sheet at wobble box (G), and route belt through this hole.



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



SICKLE DRIVE BELT REMOVAL

# MAINTENANCE/SERVICE

## SICKLE AND SICKLE DRIVE (continued)

### Wobble Box Maintenance

**Mounting Bolts** - Check four wobble box mounting bolts (B) torque after the first 10 hours operation and every 100 hours thereafter. Torque should be 200 ft.lbs. (270 N-m). When tightening, start with the side mounting bolts.

**Lubricant** - Check wobble box lubricant level before first operation and every 100 hours thereafter. To check:

1. Raise header to a point where the wobble box base is approximately level.
2. Remove breather/dipstick (A). Oil level must be between end of dipstick and bottom hole (or groove) in dipstick.
3. Add as required. See "Recommended Lubricants" for specified gear lube and capacity of box.
4. Replace breather/dipstick.

Change wobble box lubricant after the first 50 hours operation and every 1000 hours (or 3 years) thereafter.

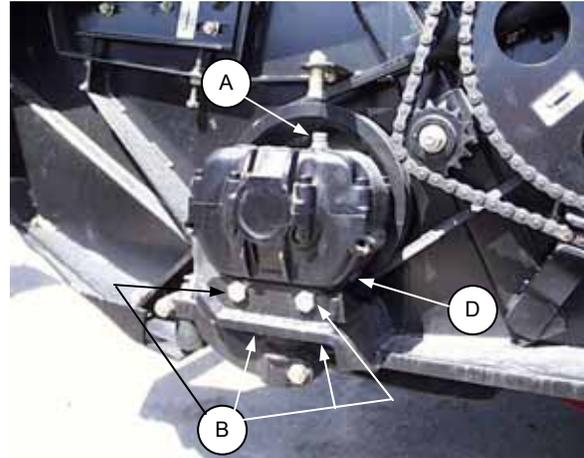
To drain wobble box, raise header fully and engage header lift cylinder stops. Remove breather/dipstick (A) and drain plug (D).

### Assembly/Disassembly

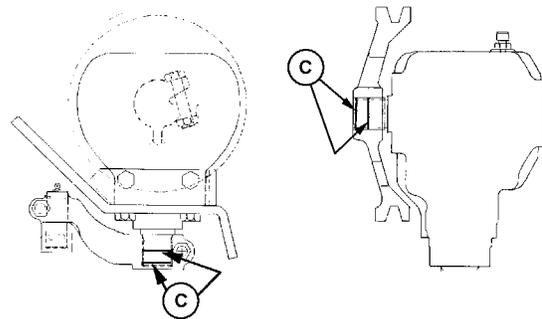
If removing wobble box pulley, a 3-jaw puller is recommended.

When reinstalling drive arm or pulley:

1. Remove any rust or paint from inner spline. For replacement parts, remove oil/grease with degreasing agent.
2. Before assembly, apply Loctite® #243 adhesive (or equivalent) to spline. Apply in two bands (C) as shown, with one band at end of spline and one band approximately mid-way.



WOBBLE BOX MOUNTING BOLTS & LUBRICANT



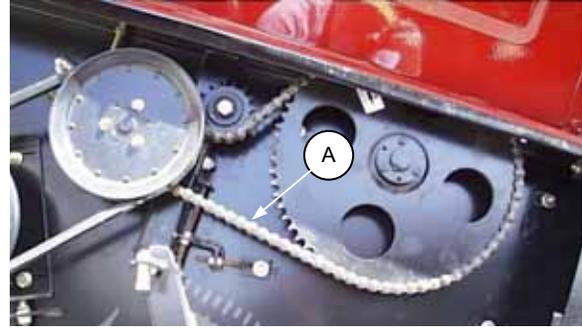
USE ADHESIVE FOR ASSEMBLY

## MAINTENANCE/SERVICE

### REEL AND REEL DRIVE

#### Reel Drive Chain Lubrication

Lubricate chain daily with a light weight oil (SAE 30). Apply oil to upper edge of lower chain span (A).



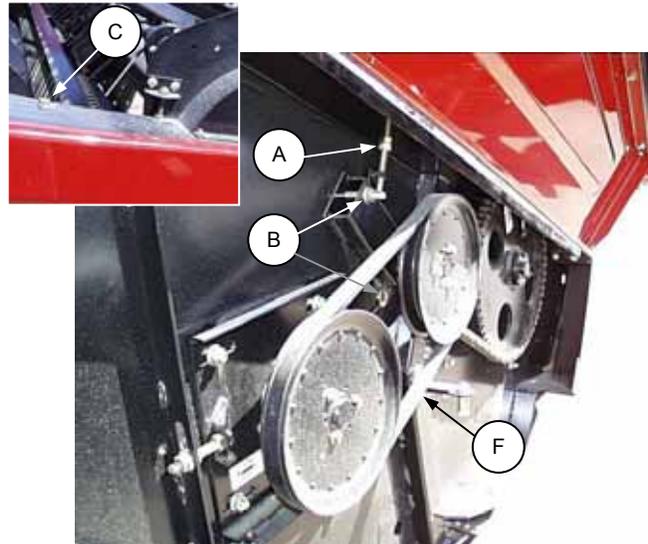
OIL REEL DRIVE CHAIN

#### Reel Drive Belt Tension

**IMPORTANT:** To prolong drive life, do not over-tighten belt. Belt slippage is used to protect the reel in an overload situation.

To adjust reel drive belt tension:

1. Loosen jam nut (A) on adjuster bolt and two flange nuts (B) at reel drive arm.
2. To tighten belt, tighten adjuster bolt (C) until a force of:  
NEW BELT - 20 lbs. (80 N)  
USED BELT - 12 lbs. (55 N)  
deflects belt 1/4 in. (6 mm) at mid-span (F).
3. Tighten jam nut (A) and two flange nuts (B).
4. Re-adjust tension of a new belt after about 5 hours of operation to used belt specifications.
5. Check reel drive chain tension and adjust if necessary. See below.



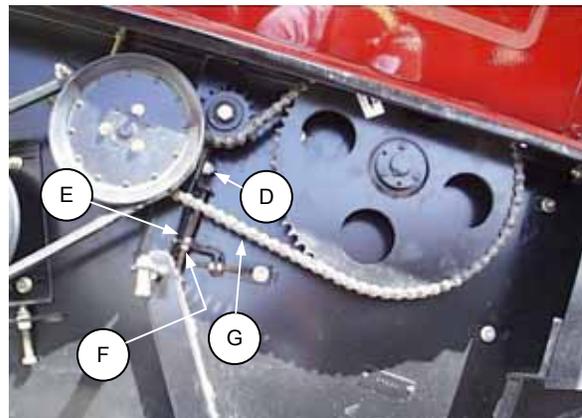
REEL DRIVE BELT TENSION ADJUSTMENT

#### Reel Drive Chain Tension

**NOTE:** For major adjustments, like after repositioning reel or auger, adjust belt tension before chain tension.

To adjust reel drive chain tension:

1. Loosen nut (D) and back off nut (E).
2. To increase tension, turn nut (F) to move idler sprocket downward until total chain slack at (G) is 1/2 in. (13 mm).
3. Tighten nuts (D) and (E).



REEL DRIVE CHAIN ADJUSTMENT

#### Reel Tines

Keep reel tines in good condition. Straighten or replace as required.

# MAINTENANCE/SERVICE

## AUGER AND AUGER DRIVE

### Auger Position

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.

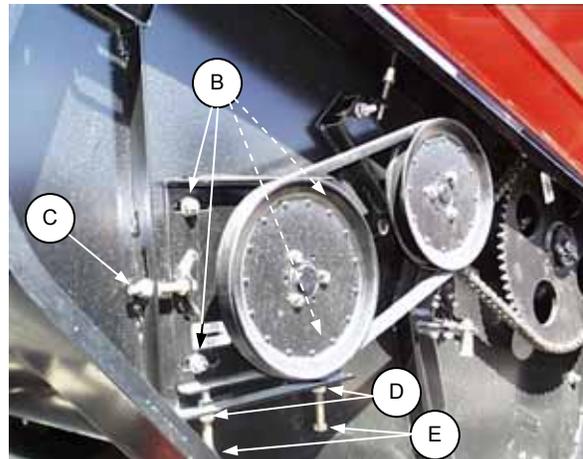
**NOTE:** In heavier crops it may be necessary to remove the front stripper for smoother crop flow across the auger.

Should adjustment be required:

1. Loosen nut (A), left side, securing auger drive chain idler sprocket.
2. Loosen reel drive belt and chain. See page 52 for adjustment details
3. Loosen bolts (B), four per side.
4. To adjust auger fore-aft:
  - a. Loosen jam nut on bolt (C), both sides.
  - b. Turn adjuster nuts to move auger fore or aft to desired position.
  - c. Tighten jam nut on bolt (C).
5. To adjust auger vertical position:
  - a. Loosen jam nuts (D), two per side.
  - b. Turn push bolts (E), two per side, to lower or raise auger.
  - c. Tighten jam nuts (D).

**NOTE:** The auger should clear the stripper bars on the auger pan by approximately  $1/32'' - 5/32''$  (1 - 4 mm). See next page for stripper adjustment.

6. Tighten bolts (B) to secure the position.
7. Adjust tension of auger drive chain, reel drive belt, and reel drive chain. Tighten hardware.



AUGER POSITION ADJUSTMENTS

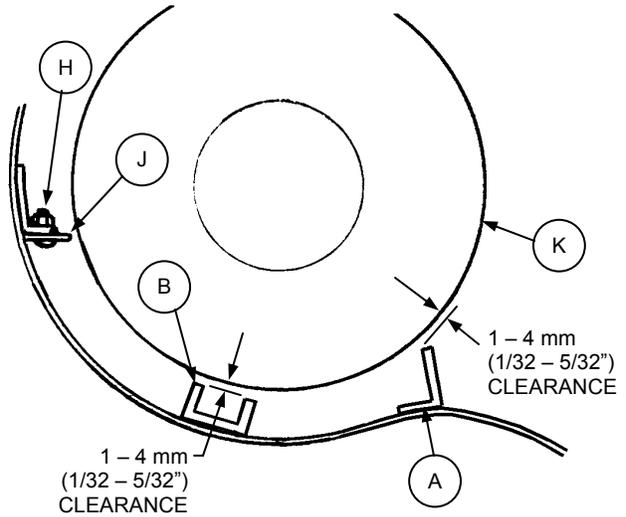
# MAINTENANCE/SERVICE

## AUGER AND AUGER DRIVE

### Stripper Bars

To adjust:

1. Position auger for clearance to strippers (A) and (B), as shown. Use shims as required at stripper bars (A) and (B). See Parts Catalog.
2. Loosen bolts (H) along upper stripper bar.
3. Slide extension bars (J) in or out to obtain approximately  $1/32 - 5/32$ " (1 - 4 mm) clearance to auger flighting (K) along entire auger length.
4. Tighten bolts (H).



STRIPPER BAR ADJUSTMENT

**NOTE:** In heavier crops it may be necessary to remove the front stripper (A) for smoother crop flow across the auger.

## MAINTENANCE/SERVICE

### AUGER AND AUGER DRIVE (continued)

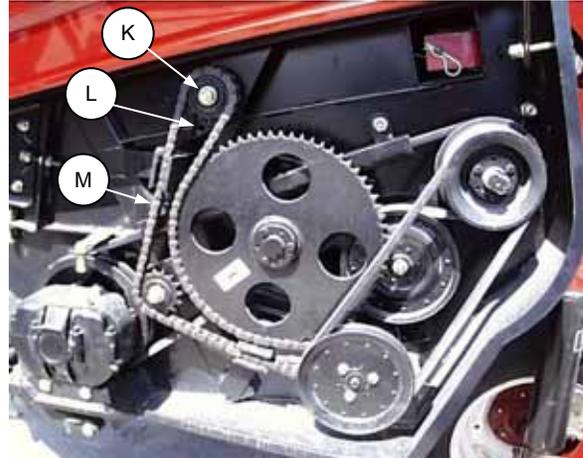
#### Auger Drive Chain Lubrication

Lubricate auger drive chain daily with lightweight oil (SAE 30).

#### Auger Drive Chain Tension

To tighten auger drive chain:

1. Loosen idler sprocket mounting bolt (K).
2. Using a punch or screwdriver in pry holes (L), move sprocket upward until deflection at (M) is 1/4 inch (6 mm).
3. Tighten bolt (K).



AUGER DRIVE CHAIN  
TENSION ADJUSTMENT

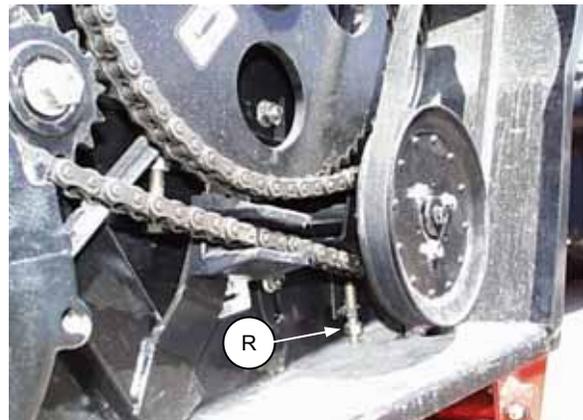
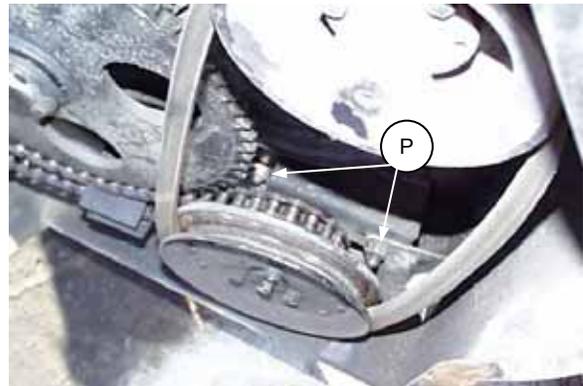
#### Auger Drive Belt Tension

**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.

To adjust auger drive belt tension:

1. Loosen nuts (P) at auger drive arm.
2. Back off jam nut (R), then turn adjuster bolt (access under end panel) until a force of:  
NEW BELT - 20 lbs. (80 N)  
USED BELT - 12 lbs. (55 N)  
deflects belt 1/4 in. (6 mm) at mid-span.
3. Tighten jam nut (R) against frame to secure the position, then tighten nuts (P).
4. Re-adjust tension of a new belt after about 5 hours of operation to used belt specifications.



AUGER DRIVE BELT  
TENSION ADJUSTMENT

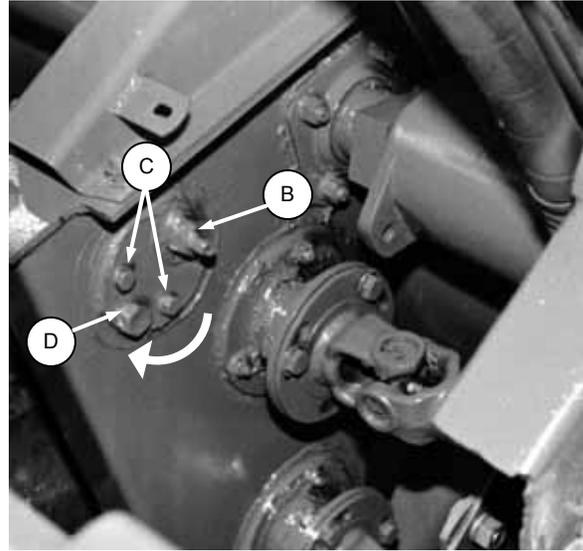
## MAINTENANCE/SERVICE

### ROLLS AND ROLL DRIVE

#### Roll Drive Chain Tension

Check chain tension after the first 10 hours operation and every 100 hours or annually thereafter, as follows:

1. Remove rubber plug at left side of chain case.  
(See "Roll Drive Chain Case Lubricant" below.)
2. Chain should deflect a maximum 1/4 inch (6 mm) each way.
3. If adjustment is required:
  - a. Loosen nut (B).
  - b. Loosen two bolts (C).
  - c. To tighten chain, rotate cam clockwise, using a 15/16 wrench on welded nut (D). (To loosen chain, rotate cam counter-clockwise.)
  - d. Tighten nut (B) and bolts (C).
4. Check chain deflection as in step 2, and replace plug (A).



CHAIN TENSION ADJUSTMENT

#### Roll Drive Chain Case Lubricant

Check chain lubrication after the first 10 hours operation and every 100 hours or annually thereafter, as follows:

1. Remove rubber plug (A) from chain case.
2. Chain should be coated with grease.
3. If required, add one complete tube (400 g) of SAE Multi-Purpose (EP) Lithium Base Grease (NLGI Grade 2) to the chain case. Case capacity is 2000 grams (5 tubes).
4. Replace plug (A).



CHECK CHAIN CASE LUBE LEVEL

# MAINTENANCE/SERVICE

## ROLLS AND ROLL DRIVE (continued)

### Roll Timing

For proper conditioning, the rolls must be timed with each steel bar on one roll centered between two bars of the other roll as shown.

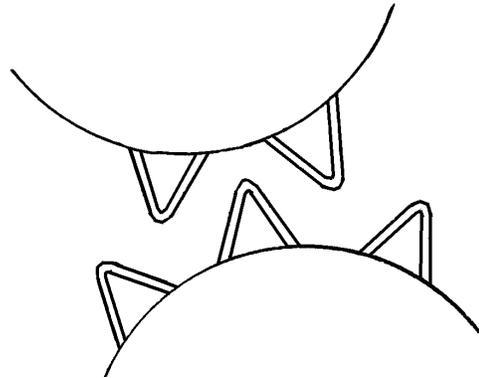


**WARNING:** To avoid bodily injury or death from unexpected start-up or fall of raised machine; stop engine, remove key and engage lift cylinder stops before going under machine to examine roll timing, or for any reason.

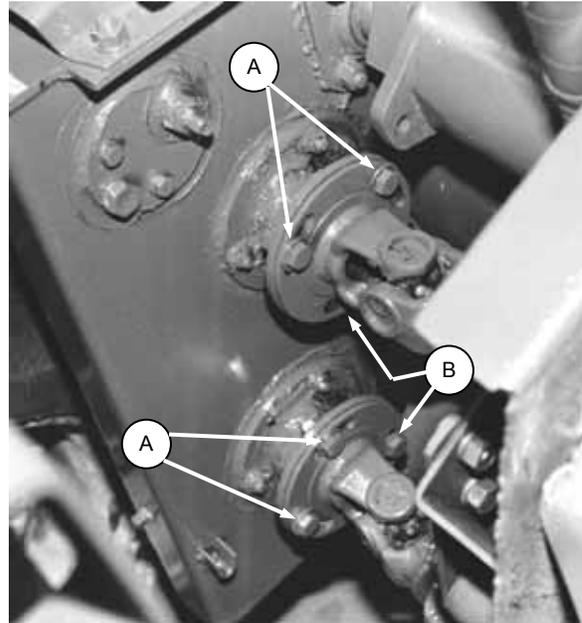
Examine roll timing along the length of the rolls and adjust to desired position as follows:

1. Adjust roll drive chain tension (previous page).
2. Loosen two bolts (A) in slots of yoke plate on either upper or lower roll universal shaft.
3. Remove bolt (B) from one of the series of holes in yoke plate.
4. Turn rolls to achieve best timing.
5. When roll timing is satisfactory, align any of the holes in yoke plate with a hole in mating plate at drive case and install and tighten bolt (B). Tighten bolts (A) to secure the position.

**NOTE:** This adjustment should be made in conjunction with the "Roll Gap" adjustment, detailed in Operation section.



ROLL TIMING



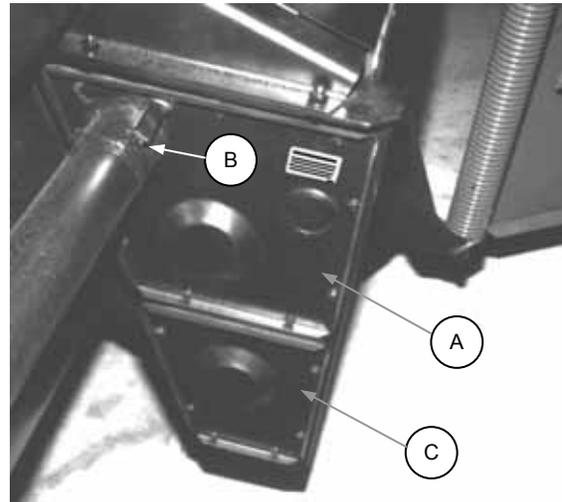
ROLL TIMING ADJUSTMENT

## MAINTENANCE/SERVICE

### ROLLS AND ROLL DRIVE (continued)

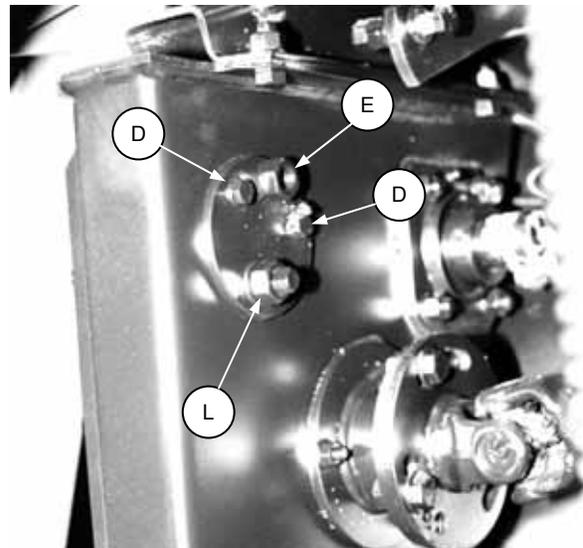
#### Roll Drive Chain Removal

1. Raise header. Stop engine, remove key and engage lift cylinder stops.
2. Remove bolts securing upper cover (A) to chain case. Loosen clamp bolt (B) and slide the cover down the drive shaft shield.
3. Remove bolts securing lower cover (C) and remove cover.



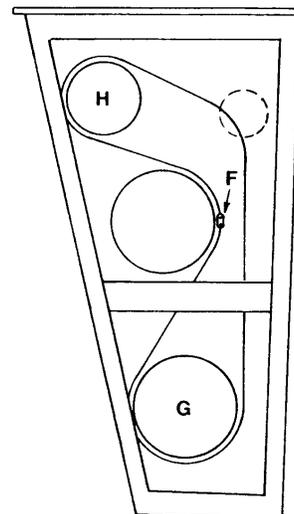
REMOVE COVERS

4. Loosen two bolts (D) and nut (L) at chain tensioner.
5. Rotate tensioner cam counter-clockwise, using a 15/16 wrench on welded nut (E).
6. Remove the chain tensioner sprocket from inside chain case.  
**NOTE:** Be careful not to lose the three washers between the sprocket and inner cam disc.



RELEASE CHAIN TENSION

7. Rotate upper or lower roll universal joint to position chain connector link (F) as shown.
8. Remove connector link (F).
9. Turn lower roll u-joint to rotate lower sprocket (G) counter-clockwise until chain is free of the lower sprocket.
10. Lift excess chain up and bring it out of the chain case through the top opening.
11. Turn sickle drive pulley at left end of header to rotate driver sprocket (H) clockwise until chain is free of driver sprocket.



REMOVE CHAIN

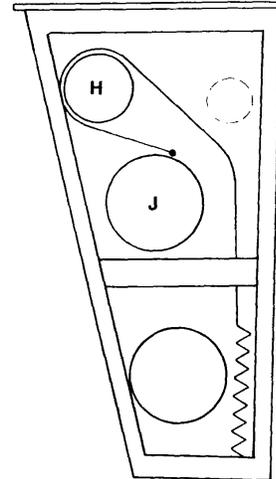
## MAINTENANCE/SERVICE

### ROLLS AND ROLL DRIVE (continued)

#### Roll Drive Chain Installation

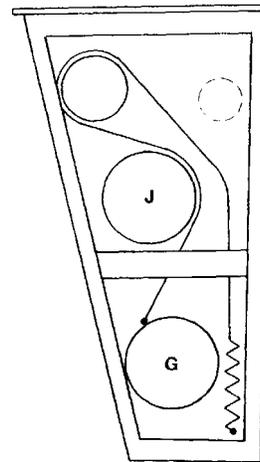
**IMPORTANT:** To ensure proper chain quality, service with original equipment part only.

1. Feed the chain into chain case.
2. Lift chain up to driver sprocket (H) and engage on first few teeth.
3. Turn sickle drive pulley at left end of header to rotate driver sprocket counter-clockwise until chain engages upper roll sprocket (J) as shown.



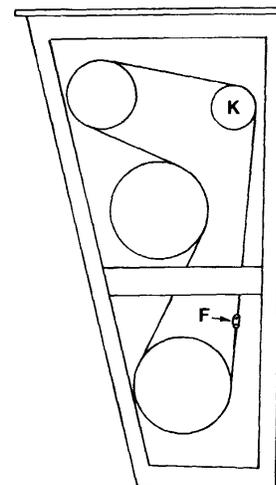
ENGAGE DRIVER AND UPPER SPROCKETS

4. Turn upper roll u-joint to rotate upper sprocket (J) clockwise until chain engages lower roll sprocket (G) as shown.
5. Turn the lower roll u-joint to rotate lower sprocket (G) counter-clockwise while holding the first link of the chain against sprocket (G). Continue turning until chain is engaged sufficiently to install connector link.



ENGAGE LOWER SPROCKET

6. Install connector link (F) and install the chain tensioner sprocket (K).
7. Tension chain as described on page 56, "Roll Drive Chain Tension".
8. Scrape old silicone off of chain case and covers, and clean these surfaces with solvent.
9. Apply new silicone to mating surfaces of chain case, upper and lower covers, and drive shaft shield.
10. Bolt covers to chain case and tighten bolt which clamps upper cover to drive shaft shield.
11. Replace chain case grease to capacity shown on page 56, "Roll Drive Chain Case Lubricant".



CONNECT CHAIN AND  
INSTALL TENSIONER SPROCKET

# MAINTENANCE/SERVICE

## WHEELS AND TIRES

### Wheel Bolts

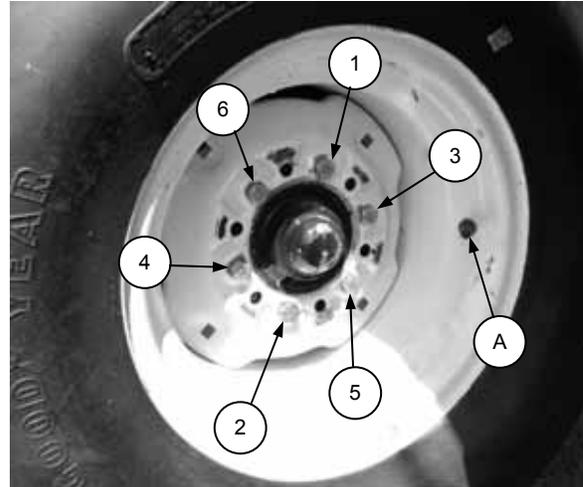
Check and tighten wheel bolts after the first 1 hour operation and every 100 hours thereafter.

Whenever a wheel is removed and re-installed, check torque after one hour of operation. Maintain 120 ft. lbs. (160 N.m) torque.

Follow proper bolt tightening sequence shown. Be sure valve stem (A) points away from wheel support.



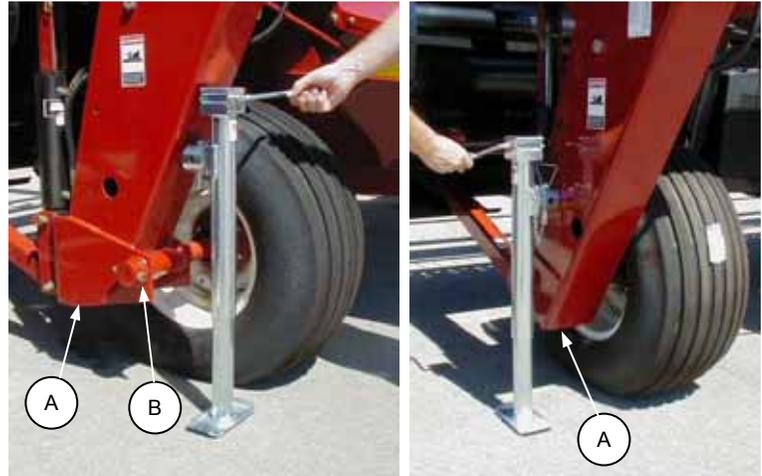
**CAUTION:** When installing wheel be sure to use the holes that are countersunk to match bolt head profile. The second set of "straight-through" holes do not seat the bolts correctly.



WHEEL BOLT TIGHTENING SEQUENCE

### Wheel Removal

1. Raise header fully and engage lift cylinder stops.
2. Position 5000 lb. capacity jack on mount provided on frame leg and raise tire just off the ground. Place block under frame leg at (A).
3. Remove wheel bolts
4. **NOTE:** To remove either wheel on 12 foot windrower, or left wheel on 14 and 16 foot windrower – Remove spindle retaining bolt (B) and slide spindle outboard until clearance to vertical float spring and chain drive housing is adequate for wheel removal.
5. Remove wheel.
6. When replacing spindle retaining bolt (B), torque nut to 80 ft.lbs. (110 N.m).



12' - REMOVING WHEEL - 14' & 16'

### Tire Inflation

Check tire pressure daily. Maintain pressures recommended in Specifications section.



**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. Make sure all the air is removed from a tire before removing the tire from a rim. Never use force on an inflated or partially inflated tire. Make sure the tire is correctly seated before inflating to operating pressure.



SERVICE TIRES SAFELY

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. 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.

# MAINTENANCE/SERVICE

**MAINTENANCE SCHEDULE** The following maintenance schedule is a listing of periodic maintenance procedures, organized by service intervals. For detailed instructions, see the specific headings in Maintenance/Service section. Use "Recommended Fluids and Lubricants" as specified under that heading.

**Service Intervals** The recommended service intervals are in hours of operation.

**IMPORTANT:** Recommended intervals are for average conditions. Service the machine more often if operated under adverse conditions (severe dust, extra heavy loads, etc.).

Regular maintenance is the best insurance against early wear and untimely breakdowns. Following this schedule will increase machine life. Where a service interval is given in more than one time frame, eg. "100 hours or Annually", service the machine at whichever interval is reached first.



**CAUTION: Carefully follow safety messages given under "Service Procedures".**

AT FIRST USE: See "Preparing the Windrower" and "Break-In Period" in Operation section.

---

## **10 HOURS OR DAILY**

- |   |   |
|---|---|
| 1. Grease roll universal shafts.              | 5. Check sickle sections, guards, & hold-downs. |
| 2. Check hydraulic oil level.                 | 6. Oil reel drive chain.                        |
| 3. Check hydraulic hoses and lines for leaks. | 7. Oil auger drive chain.                       |
| 4. Oil sickle (except in sandy conditions).   | 8. Check tire pressure.                         |
- 

## **25 HOURS**

1. Grease sickle head.
- 

## **50 HOURS**

- |  |  |
|--|--|
| 1. Grease tongue pivot and transport lock pin. | 8. Grease auger drive jackshaft bearings.  |
| 2. Grease main drive shaft bearing.            | 9. Oil center link ball joints.  |
| 3. Grease reel shaft bearings.                 | 10. Oil spring pivots.   |
| 4. Grease auger shaft bearings.                | 11. Check hitch pin lock nut torque.   |
| 5. Grease roll shaft bearings.                 | 12. Change wobble box lubricant. <b>(First 50 hours only, every 1000 hours thereafter)</b> |
| 6. Grease frame-to-header pivot.               |  |
| 7. Grease lower float link bushings.           |  |
- 

## **100 HOURS OR ANNUALLY \***

- |   |   |
|---|---|
| 1. Check roll drive chain tension.              | 6. Grease wheel hub bearings.   |
| 2. Check roll drive chain case lubricant level. | 7. Change hydraulic oil filter. <b>(First 100 hours only, every 250 hours thereafter)</b> |
| 3. Check wobble box mounting bolt torques.      |   |
| 4. Check wobble box lubricant level.            |   |
| 5. Check wheel bolt torques.                    |   |
- \* It is recommended that Annual Maintenance be done prior to start of operating season.
- 

END OF SEASON: See "Storage Procedure" in Operation section.

---

## **250 HOURS**

1. Change hydraulic oil filter.
- 

## **600 HOURS or 3 YEARS**

1. Change hydraulic oil.
- 

## **1000 HOURS or 3 YEARS**

1. Change wobble box lubricant.

## MAINTENANCE RECORD

ACTION:	✓ - Check	⬇ - Lubricate	▲ - Change																				
<b>Hour Meter Reading:</b>																							
<b>Serviced By:</b>																							
<b>Maintenance Procedure</b>																							
<b>BREAK-IN</b>	See "Preparing the Windrower" and "Break-In Period" (Pages 15 & 18) for checklist.																						
<b>10 HOURS OR DAILY</b>																							
⬇	Roll Universal Shafts																						
✓	Hydraulic Oil Level																						
✓	Hydraulic Hoses & Lines																						
⬇	Sickle Assembly																						
✓	Sections, Guards, Hold-downs																						
⬇	Reel Drive Chain																						
⬇	Auger Drive Chain																						
✓	Tire Pressure																						
<b>25 HOURS</b>																							
⬇	Sickle Head																						
<b>50 HOURS</b>																							
▲	Wobble Box Oil - First 50 H only																						
⬇	Tongue Pivot, Transport Lock																						
⬇	Main Drive Shaft Bearings																						
⬇	Reel Shaft Bearings																						
⬇	Auger Shaft Bearings																						
⬇	Roll Shaft Bearings																						
⬇	Frame-to-Header Pivot																						
⬇	Lower Float Link Bushings																						
⬇	Auger Drive Jackshaft Brngs.																						
⬇	Center Link Ball Joints																						
⬇	Spring Pivots																						
✓	Hitch Pin Nut Torque																						
<b>100 HOURS OR ANNUALLY</b>																							
▲	Hydraulic Oil Filter - First 100 H only																						
⬇	Wheel Hub Bearings																						
✓	Roll Drive Chain Tension																						
✓	Roll Drive Case Lube Level																						
✓	Wobble Box Bolt Torque																						
✓	Wobble Box Lubricant Level																						
✓	Wheel Bolt Torque																						
<b>250 HOURS</b>																							
▲	Hydraulic Oil Filter																						
<b>600 HOURS OR 3 YEARS</b>																							
▲	Hydraulic Oil																						
<b>1000 HOURS OR 3 YEARS</b>																							
▲	Wobble Box Lubricant																						

## TROUBLE SHOOTING

<u>SYMPTOM</u>	<u>PROBLEM</u>	<u>SOLUTION</u>	<u>REF.</u>
Excessive breakage of sickle sections or guards.	Cutting height too low in stony conditions.	Raise cutting height with skid plates.	29
	Header angle too steep in stony conditions.	Decrease header angle	30
	Header flotation too heavy in stony conditions	Adjust to lighter float setting.	31
	Guards, sickle and hold-downs misaligned.	Straighten guards, align hold-downs.	49
	Ground speed too high in stony conditions.	Reduce ground speed.	26
	Sickle speed too slow.	Maintain proper RPM on PTO. Check for proper match of pump & gear-drive at PTO.	---
			46
Sickle back breakage.	Bent or broken guard.	Straighten or replace.	49
	Worn sickle head pin.	Replace.	48
	Dull sickle.	Replace.	48
Ragged or uneven cutting of crop.	Header angle too flat for guards to pick up down crop.	Increase header angle.	30
	Reel position incorrect.	Move reel forward and down.	28
	PTO speed too slow.	Maintain proper RPM on PTO. Check for proper match of pump & gear-drive at PTO.	---
			46
	Relief valve pressure too low.	Replace valve.	46
	Sickle sections or guards are worn or broken.	Replace worn or broken parts.	47
	Bent sickle causing binding.	Straighten a bent sickle. Check alignment and adjust if necessary.	48
Sickle hold-downs improperly adjusted.	Adjust hold-downs so sickle works freely, but still keep sections from lifting off guards.	49	

## TROUBLE SHOOTING

<u>SYMPTOM</u>	<u>PROBLEM</u>	<u>SOLUTION</u>	<u>REF.</u>
Ragged or uneven cutting of crop. (continued)	Bent or misaligned guards causing poor shearing action.	Align guards for proper shearing action.	49
	Header flotation too light, causing bouncing.	Adjust to heavier float setting.	31
	Ground speed too fast.	Slow down. Ground speed should not exceed 8 mph (13 km/h).	26
	Sickle drive belt too loose.	Increase belt tension.	50
	Reel drive chain too loose.	Increase chain tension.	52
Long stubble in down crop.	Reel position incorrect.	Move reel forward and down.	28
		Rotate cam clockwise (viewed from R/H end) for more aggressive tine action.	28
	Header angle too flat for guards to pick up down crop.	Increase header angle.	30
	Ground speed too fast.	Slow down.	26
	Cutting height too high.	Lower cutting height with skid plates.	29
Excessive vibration of cutting parts.	Incorrect PTO speed.	Maintain proper RPM on PTO. Check for proper match of pump & gear-drive at PTO.	---
	Excessive looseness of sickle and sickle drive parts.	Remove all excessive play from cutterbar and sickle drive to reduce vibration, then adjust cutting components and drive.	47
Knocking in sickle drive.	Worn sickle head pin.	Replace.	48
	Worn needle bearing in sickle head.	Replace.	48
Pulling material by the roots or tall material leaning into machine.	Reel position incorrect.	Move reel forward and down.	28
	Ground speed too slow.	Increase ground speed.	26
	Reel speed too fast.	Reduce reel speed.	27

## TROUBLE SHOOTING

<u>SYMPTOM</u>	<u>PROBLEM</u>	<u>SOLUTION</u>	<u>REF.</u>
Leaving small strip of flattened, uncut material.	Ground speed too fast.	Slow down.	26
	Crowding of the uncut material.	Steer tractor slightly away from uncut crop.	---
	Reel position incorrect.	Move reel forward and down.	28
	Sickle sections or guards are worn or broken.	Replace worn or broken parts.	47
Sickle plugging	Extremely thick or wet undergrowth.	Raise cutting height to clear undergrowth.	29
		Move reel back and down (close to guards).	28
		Cut when undergrowth is dry.	---
	Sickle sections or guards are worn or broken.	Replace worn or broken parts.	47
	Bent or misaligned guards.	Align guards.	49
	Sickle hold-downs improperly adjusted.	Adjust hold-downs so sickle works freely.	49
	Sickle drive belt too loose.	Adjust belt tension.	50
	Header flotation too heavy.	Adjust to lighter float setting.	31
	PTO speed too slow.	Maintain proper RPM on PTO. Check for proper match of pump & gear-drive at PTO.	---
			46
Header turns while unloaded but slows or stops when starting to cut.	Cold oil in system.	Reduce ground speed until oil reaches operating temperature.	26
	Low reservoir oil level.	Add oil to reservoir.	45
	Defective O-ring inside relief valve.	Replace relief valve.	*
	Defective relief valve.	Repair relief valve.	*
	Defective motor	Repair motor.	*
	Defective pump.	Repair pump.	*
(* - See your Dealer)	PTO slipping on tractor.	Repair tractor PTO system.	*

## TROUBLE SHOOTING

<u>SYMPTOM</u>	<u>PROBLEM</u>	<u>SOLUTION</u>	<u>REF.</u>
Excessive heating of hydraulic oil.	Relief pressure too low.	Replace relief valve. (* - See your Dealer)	*
Rolls plugging.	Roll gap too large for proper feeding.	Decrease roll gap.	32
	Roll gap too small in thick stemmed cane-type crops.	Increase roll gap.	32
	Ground speed too fast.	Slow down.	26
	Rolls improperly timed.	Adjust roll timing.	57
Header stalling in extremely tall, heavy crop (6+ tons per acre)	Feeding aids for shorter, lighter crop impede flow of heavy or thick stemmed crops (cane, sudan grass etc.).	Remove front set of stripper bars. Remove rubber fingers from auger at delivery opening.	54
		Increase roll gap. Install tall crop divider.	32 67
	Insufficient crop clearance at rear of feed pan.	Lower rock drop tines	31
Leaves damaged, crushed or stripped off stems.	Roll gap too small.	Increase roll gap.	32
	Rolls improperly timed.	Adjust roll timing.	57
	Reel speed too fast.	Reduce reel speed.	27
Insufficient conditioning of stems.	Roll gap too large.	Decrease roll gap.	32
Uneven formation and bunching of windrow.	Rear deflector bypassing or dragging crop.	Adjust rear deflector for proper crop control.	33
	Auger to stripper clearance too wide.	Adjust auger to stripper bars clearance.	54
	Uneven crop flow across auger.	Remove front stripper.	54
	Reel not feeding properly in heavy crops.	Decrease ground speed.	26
Uneven windrow formation in light crop.	Rear of feed pan too low.	Raise rock drop tine bar.	31
Windrower side drift.	Low tire pressure on one side.	Check and correct tire pressure (30 psi, 207 kPa).	60
	Header is dragging on one end and pulling to that side.	Adjust header flotation.	31
		Adjust skid plates to prevent cutterbar dragging.	29
Auger and/or conditioner rolls damaged by stones.	Feed pan doesn't allow stones to fall through.	Modify feed pan, install fingers.	75

## OPTIONS & ATTACHMENTS

The following attachments and optional equipment are available from your Dealer:

### ADDITIONAL SKID PLATES

WholeGoods order number: B2149

In addition to the standard two outer skid plates, two inner plates may be added for extra control of cutting height and protection of cutting components. See "Cutting Height" in Operation section.

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### PTO CONVERSION KITS

Parts order number:

540 rpm PTO pump kit – 36909 (converts 1000 rpm to 540 rpm)

1000 rpm PTO pump kit – 36859 (converts 540 rpm to 1000 rpm)

Kits are for converting from 540 to 1000 RPM or vice-versa.

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### TALL CROP KIT

WholeGoods order number: B2539

Kit includes crop dividers and lean bar extensions.

**IMPORTANT:** Lean bar extensions provided in this kit are not for use in this application, as they will cause crop dividers to contact the swing tongue. These extensions are for use with Self-Propelled Windrower Auger Headers only.

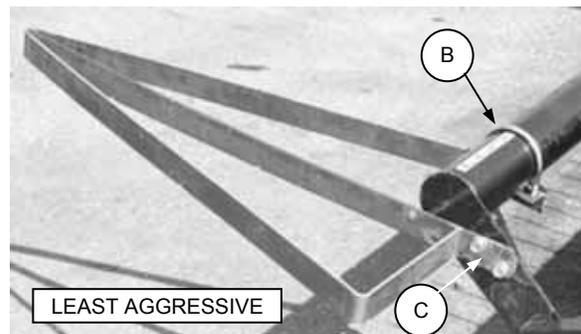
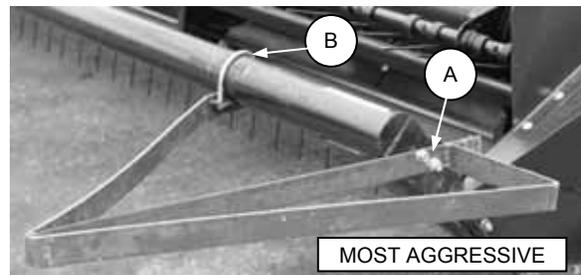
Crop dividers mount to lean bar for clean crop dividing and reel entry in tall crops. Left and right dividers are included in the kit.

The amount of crop "gathered" by the divider is adjustable. For the most aggressive gathering, mount the divider at the two forward holes (A) and position the U-bolt (B) farther inboard on the lean bar.

For the least aggressive gathering, mount the divider at the two rearward holes (C) and position the U-bolt (B) farther outboard on the lean bar.

Use minor adjustments of U-bolt position to achieve best results in specific conditions.

Crop dividers should be removed for flat-bed transport or for storage.



CROP DIVIDERS

## OPTIONS & ATTACHMENTS

### **STUB GUARD CONVERSION KIT**

WholeGoods order number:

12' – B2515

14' – B2516

16' – B2517

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

Installation and adjustment instructions are included with the kit.



STUB GUARDS

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### **HYDRAULIC HEADER ANGLE KITS**

WholeGoods order number:

With Selector Valve – B4256

Without Selector Valve – B4257

These kits allow header angle to be adjusted hydraulically with a cylinder replacing the standard mechanical link. Kit B4257 requires a separate hydraulic circuit from the tractor. Kit B4256 uses the existing tongue steering cylinder hydraulic circuit, and a remote switch-operated selector valve controls which circuit is currently active. Installation instructions are included with the kits.



HYDRAULIC HEADER ANGLE KIT

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### **REPLACEMENT REEL BAT KITS**

Wholegoods order number:

12' – B2890

14' – B2891

16' – B2892

Consists of one complete bat assembly for ease of replacement.

# UNLOADING & ASSEMBLY

## PREPARE TO UNLOAD



**CAUTION:** To avoid injury to bystanders from being struck by machinery, do not allow persons to stand in unloading area.

1. Move trailer into position and block trailer wheels.
2. Lower trailer storage stands.



**CAUTION:** Unloading equipment must meet or exceed the specified requirements. Using inadequate equipment may result in chain breakage, vehicle tipping or machine damage.



PREPARE TO UNLOAD

## LIFTING VEHICLE REQUIREMENTS

Use a lifting vehicle with a minimum 8000 lb. (3630 kg) lifting capacity and minimum 15 ft. (4.5 m) lifting height.

## CHAIN REQUIREMENTS

Use overhead lifting quality chain (1/2 inch) with minimum 5000 lb. (2270 kg) working load limit.

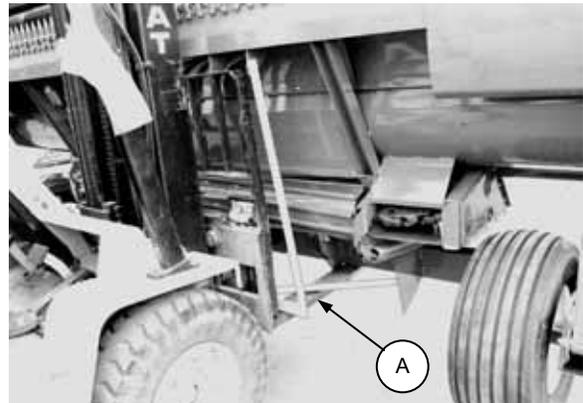
## UNLOAD WINDROWER



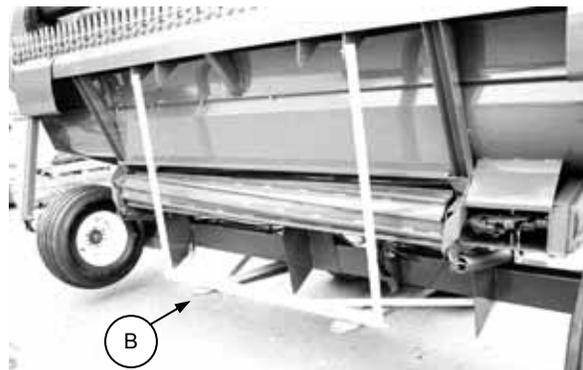
**WARNING:** Be sure forks are secure before moving away from load. Stand clear when lifting.

**IMPORTANT:** Do not unload using lean bar for lifting. Chain hook slots in lean bar are only for laying the machine over into working position after it is on the ground.

1. Approach windrower from either its "underside" as in (A) or "topside" (B) and slide forks in underneath lifting framework as far as possible. Take care not to bend parts on back tube. When possible, approach from the underside as in (A) to minimize potential for scratching the unit.
2. Remove hauler's tie down straps and chains.
3. Raise windrower off deck.  
**IMPORTANT:** Take care not to contact the other machine if load is two-wide.
4. Back up until unit clears trailer and slowly lower to 6 inches (150 mm) from ground.
5. Take to storage or set-up area.
6. Set machine down securely on level ground. Check for shipping damage and missing parts.



UNLOADING WINDROWER FROM "UNDERSIDE"

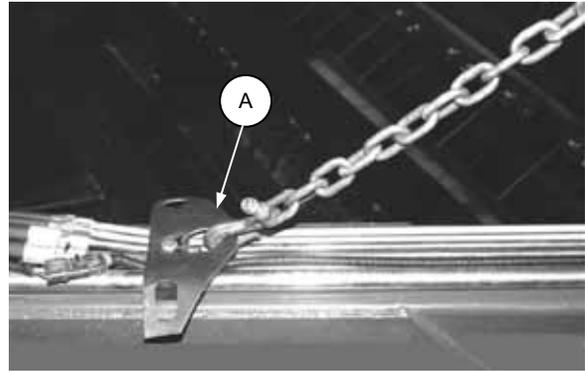


UNLOADING WINDROWER FROM "TOPSIDE"

# UNLOADING & ASSEMBLY

## UNLOAD TONGUE

Attach chain to two brackets (A) on top of tongue. Adjust chain lengths so tongue is lifted evenly.



ATTACH CHAIN TO TONGUE BRACKETS

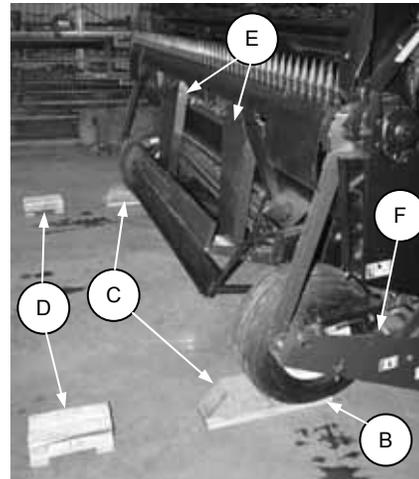
## LOWER WINDROWER TO WORKING POSITION

1. Choose an area with level ground. Rest each tire on two 2x4's (side by side) or one 2x6 (B) to provide ground clearance and prevent damage to conditioner shield when windrower is lowered.
2. Block wheels at (C) and set 14 inch (350 mm) blocks (D) for support at rear of skid plates.
3. Remove deflectors (E). Remove lights from shipping position (F) at frame legs. Set aside. Leave the lifting framework in place to support the top cover as windrower is lowered.
4. Drive lifting vehicle to approach windrower from its "underside". Attach chain hooks to lean bar at slots (G).

**NOTE:** Do not lift at lean bar when unloading from trailer. This procedure is only for laying the machine over into working position.

**IMPORTANT:** See "Chain Requirements" in this section for minimum chain specifications. Also, chain length must be sufficient to provide a minimum 4 feet (1.2 m) vertical chain height.

5. Raise forks to take most of the weight off windrower frame and back up SLOWLY to lower machine onto blocks (D).

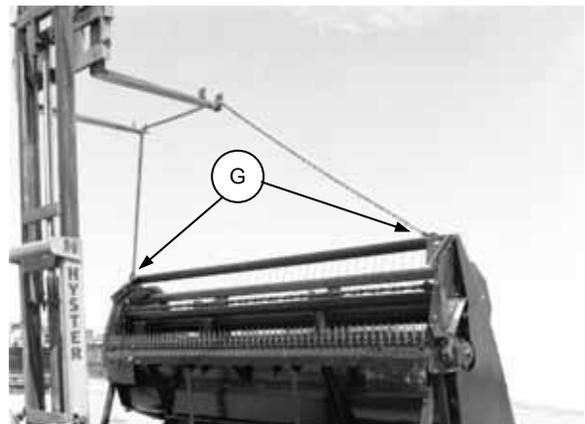


PLACE BLOCKS & REMOVE DEFLECTORS



**CAUTION:** Stand clear when lowering, as machine may swing.

6. Check that frame is sitting at proper angle, with tongue pivot pin perpendicular to ground. Remove chain hooks.



ATTACH CHAIN & LOWER ONTO BLOCKS

# UNLOADING & ASSEMBLY

## INSTALL TONGUE

**IMPORTANT:** If there is more than one machine to be assembled, and they are different sizes (12 ft., 14 ft., 16 ft.) and/or different PTO speeds (540 or 1000), be sure the proper tongue is matched to each unit. Tongues are identified on a plastic tag tied to the hose support near the front end. Should this tag be missing, tongues can be identified by length as follows:

HEADER SIZE	TONGUE LENGTH *
12 ft.	17' 7" (5360 mm)
14 ft.	19' (5780 mm)
16 ft.	21' 7 1/2" (6590 mm)

\* Tongue length is measured from center of pivot hole at back end to center of hitch pin hole at front end.

1. Ensure plastic bushings are installed in pivot hole at back end of tongue. Remove the shipping wire that secured the bushings.  
**NOTE:** The two shorter bushings (A) install from top of tongue, the longer one (F) from the bottom.
2. Install jack in working position at front of tongue.
3. Cut the banding that secures the hydraulic cylinder to the tongue, allowing cylinder to move away from frame as tongue is lowered.

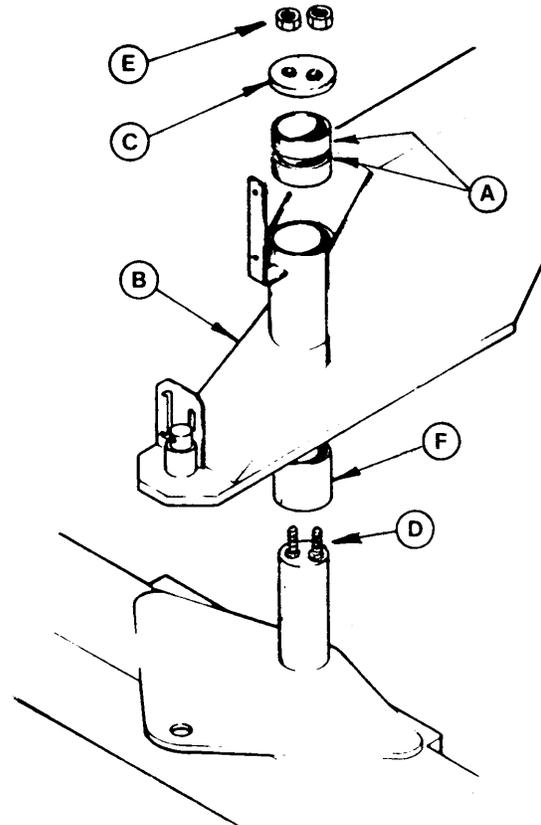


**WARNING: Keep hands clear when lowering tongue.**

4. Attach chain from lifting vehicle or hoist to tongue as described on page 70. Lower tongue (B) onto pivot pin. **NOTE:** Use the jack to adjust the pitch of the tongue for proper alignment when installing onto pivot pin.
5. Before tongue is lowered completely, position retainer (C) on top of tongue, over pivot pin bolts (D) and start 5/8 lock nuts (E). Clearance to hydraulic lines will prevent installing this retainer and nuts once the tongue is fully lowered.
6. If tongue is not fully seated on pivot pin, use nuts (E) to draw the tongue down completely. Torque two 5/8 lock nuts (E) to 160 ft.lbs. (215 N·m).
7. Remove lifting brackets from tongue when complete.

## POSITION LEAN BAR

1. Remove hardware and install lean bar in field position at height appropriate for crop.



INSTALL TONGUE



ADJUST LEAN BAR TO SUIT CROP



# UNLOADING & ASSEMBLY

## ATTACH HYDRAULICS AND ELECTRICAL

1. Attach barrel end (A) of shift cylinder to bracket on hitch. Attach rod end (B) to bracket on frame tube. Secure pins with cotter pins (installed below brackets).

**NOTE:** It may be necessary to loosen a hose fitting to allow extension of cylinder rod. Be sure to retighten fitting after cylinder installation.

2. Remove lift cylinder hoses and electrical harness from shipping position in the upright hose support near motor. Route hoses and harness through top clamp (Y) at tongue (see Step 7). Attach lift cylinder hoses to open hydraulic lines at (N) and (P) on top of tongue.

**NOTE:** Connect hose from left lift cylinder (master) to left hydraulic line, and hose from right lift cylinder (slave) to right hydraulic line. Loosen clamp on top of tongue to ease installation of hoses. Retighten clamp after attaching hoses.

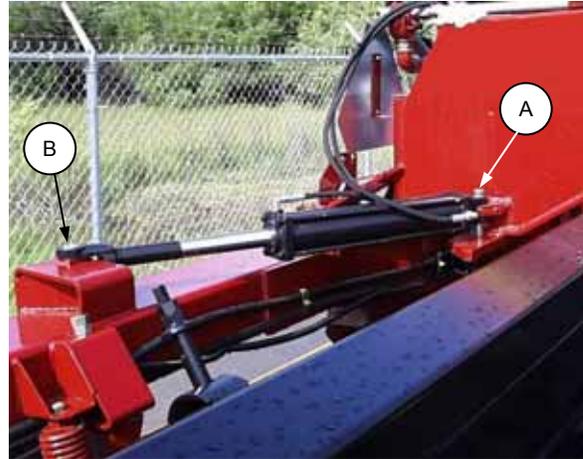
3. Connect electrical wiring harness at (R).
4. Attach hoses to header drive motor:

**NOTE:** For additional clearance when installing hoses, first lower the header if raised.

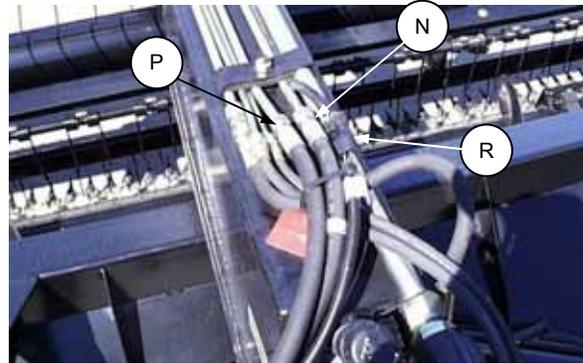
- a. Remove cotter pin securing bottom of motor shield and open shield.

- b. **IMPORTANT:** To prevent contamination of the hydraulic system, extreme care must be taken to avoid dirt entering at hose ends and motor ports. To minimize exposure to contamination, remove cap from one hose and its mating motor port plug and connect before removing other caps and plugs. Install hoses in sequence from front to rear of motor (pressure – case drain – return). Ensure that pressure and return hoses are connected to the proper fitting as shown in photo at right. Tighten all hoses securely.

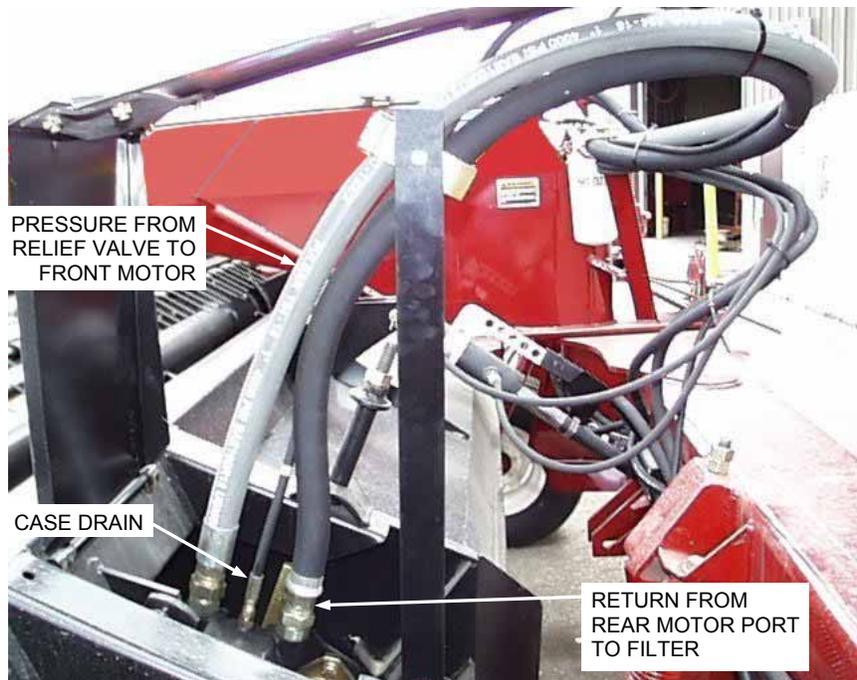
- c. Close motor shield and secure with cotter pin.



INSTALL SHIFT CYLINDER



ATTACH LIFT HOSES AND ELECTRICAL HARNESS



ATTACH HOSES TO MOTOR

## UNLOADING & ASSEMBLY

### ATTACH HYDRAULICS AND ELECTRICAL

5. Attach lights to left and right frame legs as follows:

a) Insert light support tube through welded tube on header frame.

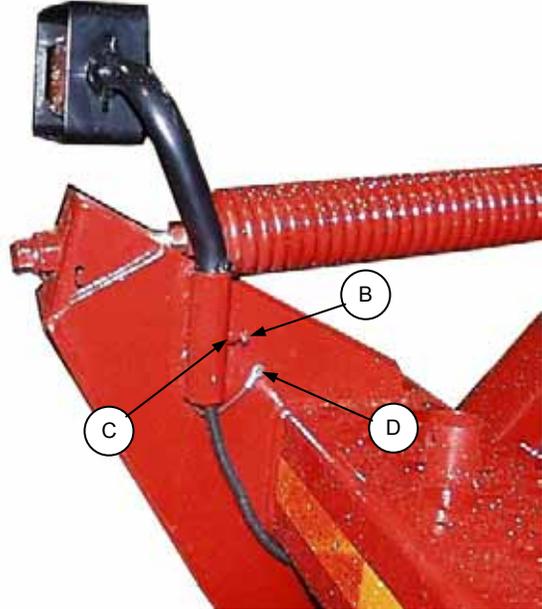
**NOTE:** Left and right lights are different. Ensure light support tube angles towards rear of unit with light outboard, as shown.

b) Install one 3/8 NC x 3/4 long hex head bolt (B) and one 3/8 NC hex nut (C).

**NOTE:** Tighten bolt (B) to secure light firmly. Do not overtighten bolt. Light must be able to be turned with minimal force. Lock jam nut (C) against tube to secure the position.

c) Secure ground wire to frame at (D) with one 1/4 NC x 5/8 long hex head bolt, one 1/4 external tooth lock washer (against frame) and one 1/4 NC lock nut.

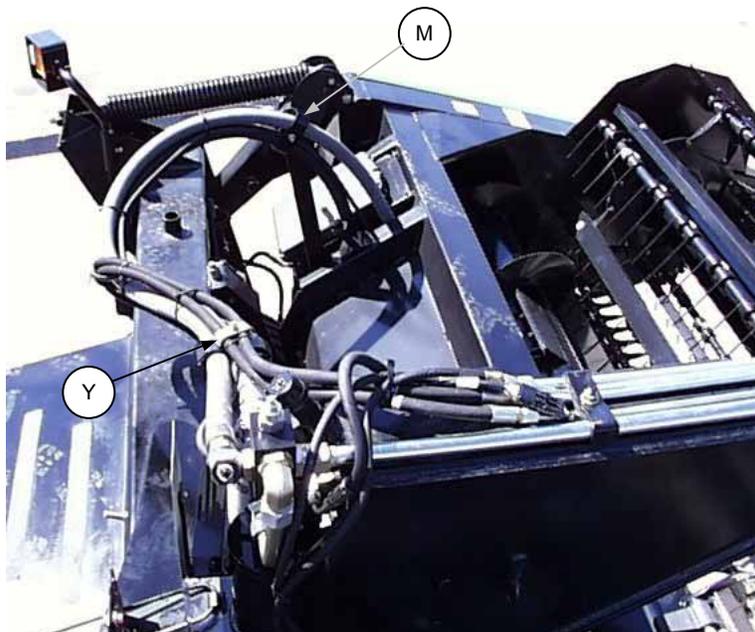
d) Attach wiring harness to light wiring and cover with plastic harness sheath.



ATTACHING LIGHTS – L/H SHOWN

6. Route motor hoses between holders (M) at support. To avoid damage to hoses, do not over-tighten holder hardware.

7. Remove top clamp (Y) and place two lift cylinder hoses and electrical harness across holder. Replace top clamp (Y) to capture hoses and harness.



HOSE ROUTING

## UNLOADING & ASSEMBLY

### ATTACH HYDRAULICS AND ELECTRICAL

8. Remove shipping material (strapping, wood blocks and foam wrap) that secures the components at the front of the tongue. Mount pump (S) in storage position at front of tongue.
9. Install quick coupler tips (matching the tractor to be used) on the remote hydraulic hoses.



MOUNT PUMP IN STORAGE POSITION

### INSTALL SMV SIGN

Install Slow Moving Vehicle sign at rear of unit with hardware provided.

### REMOVE LIFTING FRAMEWORK & SHIPPING MATERIAL

Remove the yellow lifting framework and any remaining shipping material. Retain the hardware used to secure the lifting framework. Some of this hardware will be reused to install hood and deflectors, next page.



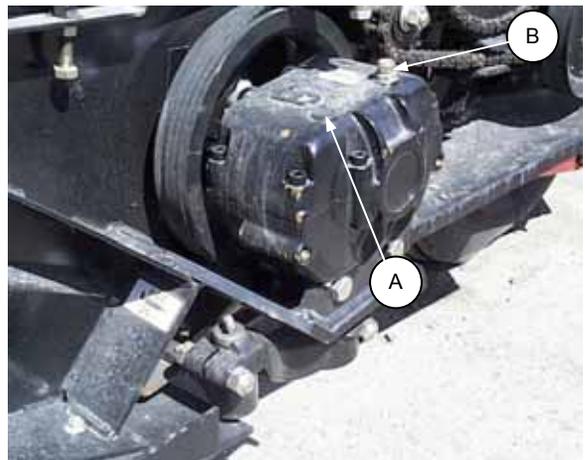
ATTACH SMV SIGN

### ATTACH WINDROWER TO TRACTOR

See "Attaching Windrower to Tractor" in Operation section for details.

### REPOSITION WOBBLE BOX BREATHER

Swap position of plug (A) and breather (B) at wobble box.



REPOSITION WOBBLE BOX BREATHER  
(FIELD POSITION SHOWN)

# UNLOADING & ASSEMBLY

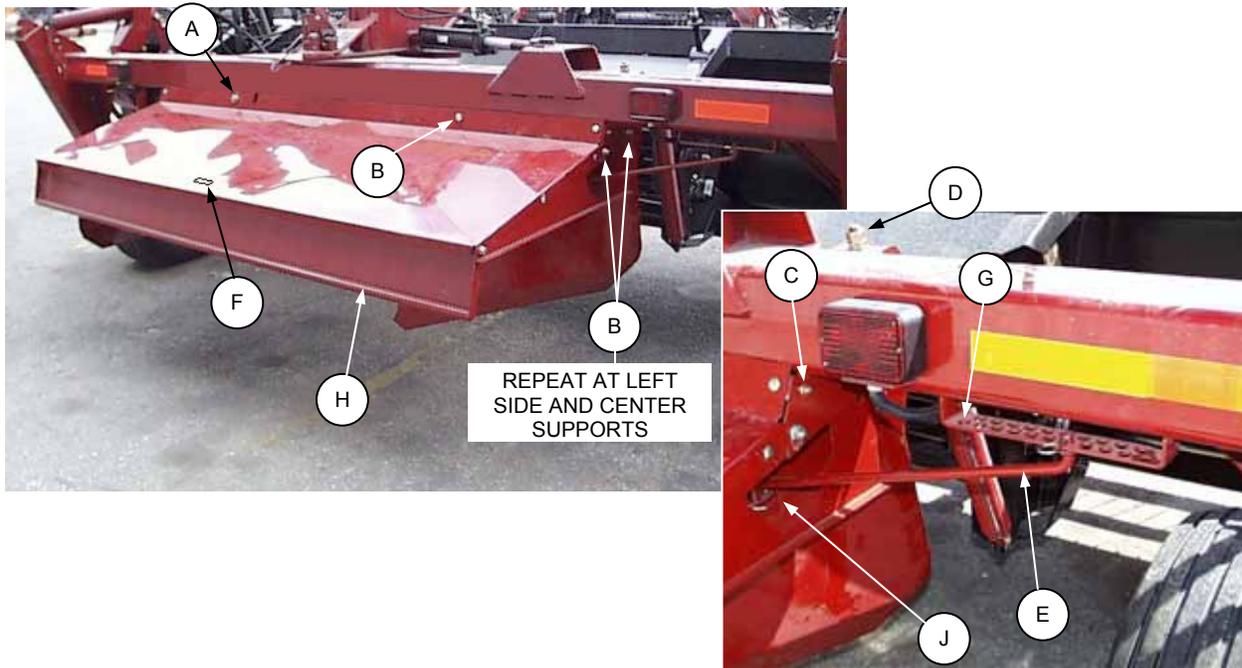
## INSTALL HOOD AND DEFLECTORS

1. Loosen 5/8 nut (A) at center link adjusting bolt.
2. Loosen three 1/2 x 1 inch carriage bolts securing hood to frame at left, right and center. Swing top hood assembly into field position and fasten to main frame with 1/2 x 1 inch carriage bolts and serrated flange nuts at (B), seven places. **NOTE:** If necessary, temporarily remove top support angle hardware (C) should it interfere with swinging the hood into field position.
3. Attach top support angles to main frame with 3/8 x 3/4 carriage bolts and smooth flange lock nuts at (C), both sides.



LOOSEN THREE BOLTS – SWING HOOD UP

4. Install side deflectors as follows: Insert deflector adjuster rod (E) through opening in hood side shield at (J), then insert threaded rod of deflector into frame bracket and secure with two 3/4 nuts at (D), both sides. Hardware (D) must be tight enough to hold deflectors in position, but still allow positioning with adjuster rods. If forming shield side deflectors are too loose, or if they bind when moved with adjuster rods, back off top nut and adjust lower nut as required. Then, holding lower nut with a wrench, tighten top nut securely against lower nut.
5. Set forming shield side deflectors to desired width by repositioning adjuster rods (E) in holes. To ensure windrow placement is centered with respect to tractor wheels, rear edge of left and right side deflectors must be equal distance from tongue center pivot, as shown on decal (F) on the top shield. To achieve this setting, adjuster rods must be in the corresponding hole both sides. Count holes from inner-most hole (G).
6. Adjust the rear deflector (H) to suit crop conditions. Adjust down for more crop control in light material, and up for clearance in heavier crops. To adjust rear deflector, pull up or push down one side of deflector, then repeat at the other side. There is no hardware to be loosened. For even windrow formation, be sure the deflector is not twisted.



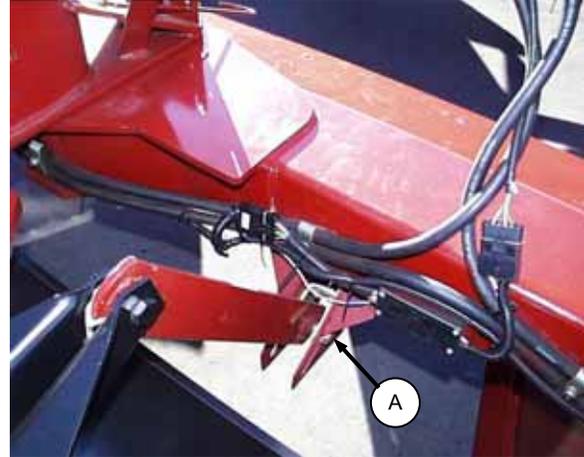
## UNLOADING & ASSEMBLY

### ADJUST HEADER ANGLE AND FLOAT

**Mechanical Center Link** – Adjust header angle by adjusting center float link to center of slot (A).

**Hydraulic Header Angle** – Adjust header angle by positioning hydraulic cylinder near center of gauge (B).

Adjust header float. See "Header Angle" and "Header Flotation" in Operation section for adjustment details.



ADJUST LINK TO CENTER OF SLOT



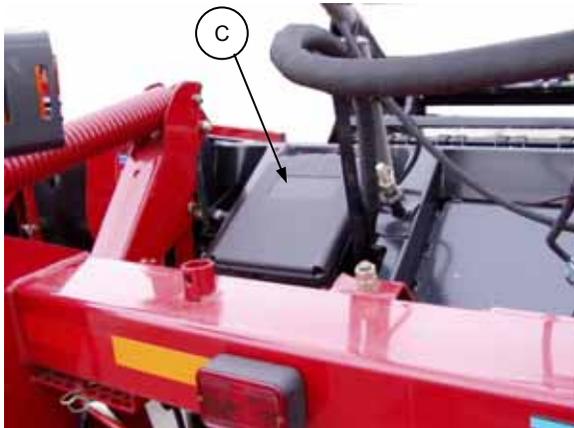
HYDRAULIC HEADER ANGLE KIT

### ADJUSTMENTS AND CHECKS

Perform the final checks and adjustments as listed on the "Pre-Delivery Checklist" (yellow sheet) to ensure the machine is field-ready.

**IMPORTANT:** To avoid machine damage, check that no shipping dunnage has fallen down between auger and pans.

Place Operator's Manual and Parts Catalog in storage case (C) provided on primary drive shield.



12' UNITS



14' & 16' UNITS

MANUAL STORAGE CASE

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# Model 5020 Mower Conditioner Windrower Pre-Delivery Checklist

Perform these checks and adjustments prior to delivery to your customer. See the Operator's Manual for adjustment details.



**CAUTION: Carefully follow the instructions given. Be alert for safety related messages which bring your attention to hazards and unsafe practices.**

**Windrower Serial Number:** \_\_\_\_\_

**Tongue Serial Number:** \_\_\_\_\_

- Check for shipping damage or missing parts. Be sure all shipping dunnage is removed.
- Check sickle drive belt tension. (P. 50)
- Check reel drive belt tension. (P. 52)
- Check auger stripper bar clearance. (P. 54)
- Set header flotation. (70 lbs. [311 N]) (P. 31)
- Set header angle to middle of adjustment range. (P. 30)
- Check skid plates are evenly adjusted at a setting appropriate for first crop. (P. 29)
- Grease all bearings and drivelines. (P. 41)
- Reposition wobble box breather. (P. 75)
- Check wobble box lube level. (P. 51)
- Check speed of wobble box pulley (725 rpm). If not to spec, check for mismatch of pump and gearbox at tractor PTO.
- Check tire pressure. (30 psi [207 kPa])
- Check wheel bolt torque. (120 ft.lbs. [160 N·m])  
(If roading machine, re-torque wheel bolts after one hour.)
- Check hydraulic oil level at dipstick at rear of tongue. (P. 45)
- Adjust side forming shields to desired position. Ensure side shields are equal distance from center line of tongue pivot. (P. 33)
- Set rear deflector about half way down. (P. 33)
- Run machine for 15 minutes, STOP ENGINE and check belt and chain drives for idler alignment and heated bearings. Check knife sections for discoloration caused by misalignment of components.
- Check hydraulic hose and wiring harness routing.
- Check lights are functional.

Date Checked: \_\_\_\_\_

Checked by: \_\_\_\_\_