

21 and 31 Hay Conditioners



JOHN DEERE

OPERATORS MANUAL

21 and 31
Hay Conditioners

OMH90845 Issue K3 English

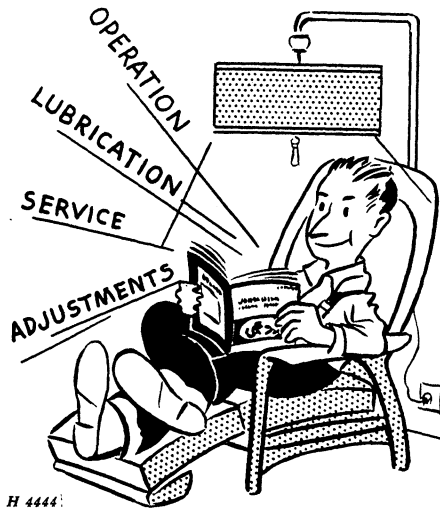
OMH90845 Issue K3

LITHO IN U.S.A.
ENGLISH



To the purchaser

This operator's manual has been prepared to provide information on operation, lubrication, adjustments and service. Follow the recommendations in this manual and you will obtain maximum service and satisfaction from your John Deere 21 or 31 Hay Conditioner.



STUDY THIS MANUAL CAREFULLY, KEEP IT HANDY, IN A SAFE PLACE, FOR FUTURE REFERENCE.

If you should find that you require information not covered in this manual, consult your John Deere dealer. He will be glad to answer any question that may arise regarding the operation and service of this implement. He has trained mechanics who are kept informed on the best John Deere service methods and will render you prompt service if needed.

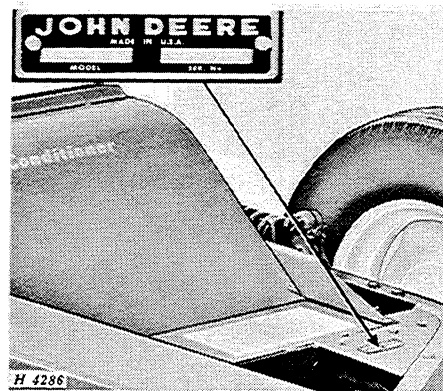
Use genuine John Deere parts

Should your Hay Conditioner require replacement parts, go to your John Deere dealer where you will receive Genuine John Deere Parts—accept no substitutes.

Location reference

"Right-hand" and "left-hand" sides are determined by facing in the direction the Hay Conditioner will travel when in use.

Serial number



The Hay Conditioner model and serial number plate is located on the left-hand side of the main frame.

Model No. _____

Serial No. _____

Date Purchased _____

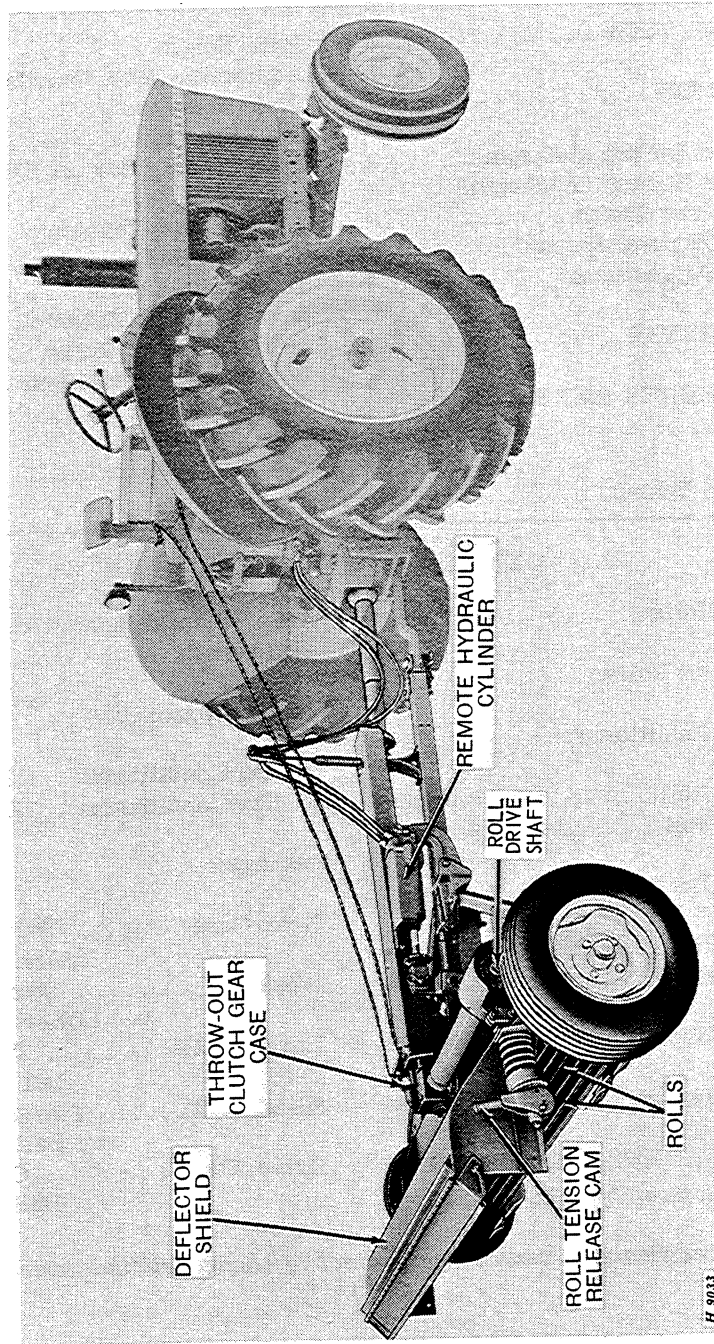
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Specifications

Width of Rolls	72 inches	Tires (when shipped with Hay Con-	
		ditioners)	6.70-15
Diameter of Rolls:		Weight (Approx.):	
21 Hay Conditioner:		21 Hay Conditioner . .	1,295 pounds
Large Roll	9 inches	31 Hay Conditioner . .	1,035 pounds
Small Roll	4 inches	Bearings:	
31 Hay Conditioner:		Gear Case	Four Tapered
Large Roll	7 inches	Roller Bearings	
Small Roll	5 inches	Wheels	Four Tapered
Over-All Width	104 inches	Roller Bearings	
Over-All Length	92-1/2 inches	Large Roll	Two Sealed
Wheels	Standard Drop	Ball Bearings	
Center Type 15-inch Rims		Small Roll	Two Self-Align-
		ing Ball Bearings	
		Drive Shaft	One Sealed
		Ball Bearing	

(Specifications and design subject to change without notice.)



John Deere 21 Hay Conditioner—1000 rpm PTO

Operation

The following pages contain instructions for operating your John Deere Hay Conditioner. Read and follow these instructions carefully for dependable, economical service.

Preoperation inspection

Do not start tractor until hay conditioner has been carefully checked for correct assembly. See that all nuts are tight and cotter pins spread. Check tires for proper operating pressure of 10 psi.

Be certain all moving parts work freely and are properly lubricated. Check to see that the powershaft telescopes freely.



CAUTION: Protect against the risk of personal injury and machine damage by operating implement only on rpm PTO for which it is designed or converted. A 540 rpm implement should be operated only on a 540 rpm PTO. A 1000 rpm implement should be operated only on a 1000 rpm PTO.

Start tractor engine and while idling, slowly engage PTO. Let hay conditioner run slowly for a while and observe all moving parts to see that they operate freely and normally.

Check tractor levers and controls to see that they operate the hay conditioner properly.

After hay conditioner has been in full speed operation for one hour, disengage the PTO and shut off tractor engine. Check hay conditioner to see that all nuts and bolts are tight.

Field operation

Various field conditions require different speeds. Best results will be obtained by running the tractor at the travel speed that will meet crop and field conditions.

Operate tractor engine to obtain the SAE rated PTO speeds. Running the engine at slow speed reduces the roll speed and may cause the hay conditioner to clog where crop is heavy. Where difficult conditions make it necessary to slow down the travel speed of tractor, shift to a lower gear rather than retard the engine speed. By shifting to a lower gear, the engine will maintain its rated speed, which will keep the rolls running at the proper speed for best results.

Do not engage PTO with engine running at high speed. To do so may cause undue wear or possible breakage.

Under some conditions, the reaction of the crop to the hay conditioner will not show up immediately; but within an hour or two, the moisture will begin to work out and the results will speak for themselves. This should be kept in mind when operating, so adjustments will not be made unnecessarily.

Hay should be conditioned before it starts to wilt—usually within 20 minutes after it has been mowed.

Direction of travel should be the same as used by the mower.

IMPORTANT: Do not use the guards under the right-hand and left-hand ends of the hay conditioner as runner shoes.

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Tractor hook-up (540 rpm)

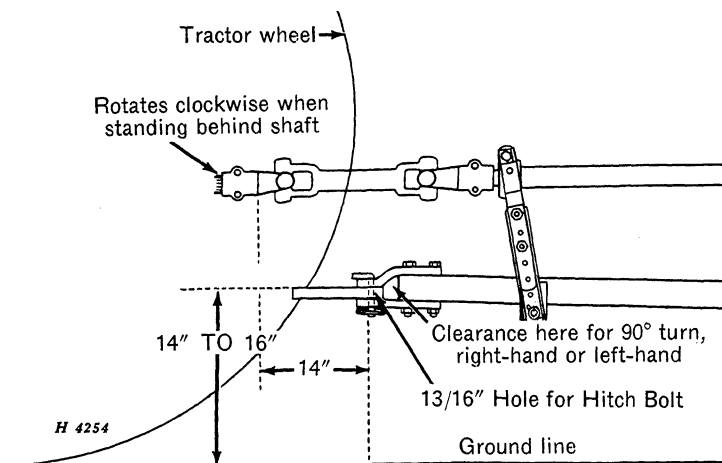
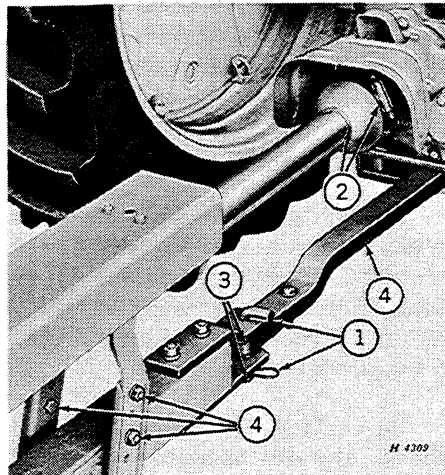
This John Deere Hay Conditioner should be operated only with an ASAE standard 540 rpm PTO. It can be attached to, and used with, any make of tractor so equipped.

1. Connect hay conditioner to tractor drawbar. Hitch point must be 14 inches to rear of tractor PTO shaft.

2. Slide front splined universal joint onto shaft on tractor.

3. Interchange the two hitch plates, or place both at the top or bottom of the hitch, so that power-shaft runs in a straight line as seen from the side.

4. Adjust the height of the power-shaft up or down so it runs in a straight line. Be sure nuts are always to the outside.



Tractor hook-up (1000 rpm)

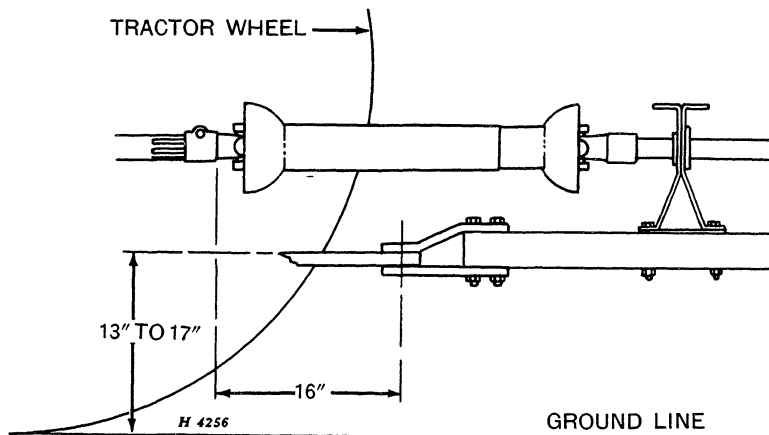
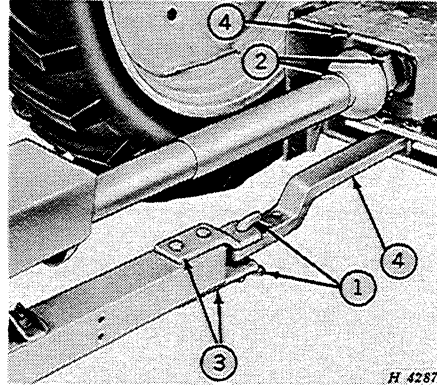
This John Deere Hay Conditioner should be operated only with an ASAE standard 1000 rpm PTO. It can be attached to, and used with, any make of tractor so equipped.

1. Connect hay conditioner to tractor drawbar. Hitch point must be 16 inches to rear of tractor PTO.

2. Assemble front section of telescoping powershaft onto rear section. Slide front splined universal joint onto splined shaft on tractor.

3. Interchange the two hitch plates, or place both at the top or bottom of the hitch, so that powershaft runs in a straight line as seen from the side.

4. Adjust tractor drawbar so powershaft runs in a straight line as seen from the top; lock drawbar in this position.

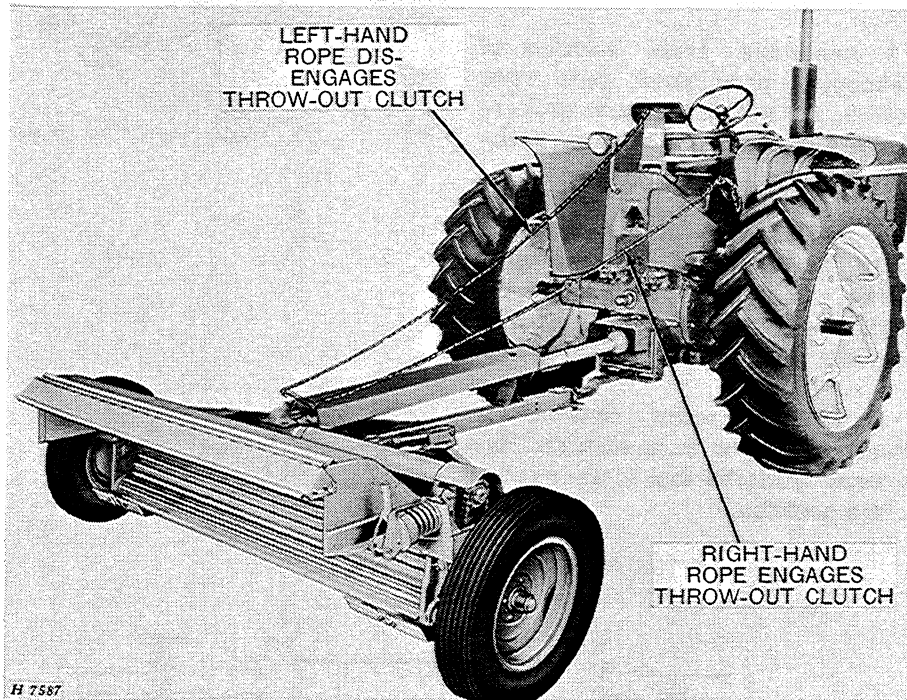
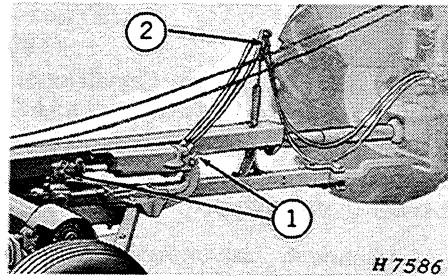


6 operation

Installing remote hydraulic cylinder

1. Position hydraulic cylinder in pivot block and secure with pins furnished.

2. Place hoses between clamps and tighten wing nut.



Throw-out clutch (Optional equipment)

To engage the throw-out clutch, pull right-hand rope. To disengage, pull left-hand rope.

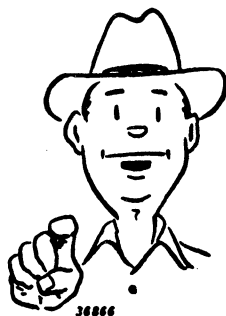
NOTE: Make certain the power take-off is disengaged before engaging throw-out clutch.

Ground travel speed

Under normal operating conditions, the tractor should be driven at 3 to 5 miles per hour with engine operating at full throttle. When operating in heavy crops or on rough ground, shift into a lower gear.



Safety suggestions



A good operator is a
careful operator

The safety of the operator was one of the prime considerations in the minds of John Deere engineers when the hay conditioner was designed. Shielding, and other safety features were built into the hay conditioner wherever possible.

However, investigation of thousands of farm machinery accidents shows that careless use of farm machinery causes nearly 1/3 of all farm accidents. You can make your farm a safer place to live and work if you observe the safety suggestions given on this page. Study these suggestions carefully and insist that they be followed by those working with you and for you.

All machinery should be operated only by responsible persons who have been delegated to do so.

Don't stand in back of the hay conditioner while it is running. Don't allow others to do so.

Never clean, oil, or adjust the hay conditioner with the tractor engine running.

Clothing worn by operator should be fairly tight and belted. Loose jackets, skirts, shirts, or sleeves should never be worn because of the danger of getting into moving parts.

Be sure shielded powershaft is in place and in good condition before starting in the field.

Make sure everyone is clear of the hay conditioner and tractor before starting so no one can be struck by moving parts.

When transporting the hay conditioner on a road or highway at night or during the day, use accessory lights and devices for adequate warning to operators of other vehicles. In this regard check local governmental regulations. Various safety lights and devices are available and may be obtained from your John Deere dealer.

Inexperience and lack of "know-how" in repair and maintenance can result in personal injury as well as equipment damage. Know what to do and how to do it before attempting a job.



CAUTION: Normal roll drive shaft speed is 810 rpm with tractor running at rated PTO speed. Any great variation from this speed may result in poor operation or serious damage. Consult your John Deere dealer if this speed is not correct.

Lubrication

Gear case

Check gear case oil level at least every 60 hours of operation.

Keep SAE 80 or 90 multipurpose gear lubricant up to the level of the oil fill plug in the gear case (about one pint is required).

Oil should be drained and replaced with new oil at the beginning of each year's operation. Do not use oil drained from automobile or tractor.

To drain oil, remove the drain plug at bottom of gear case.

Keep breather in gear case cover free of dirt at all times.

NOTE: The throw-out clutch-type gear case breathes around the shifter shaft in the cover.

Grease fittings

Wipe dirt from grease fitting and nozzle of grease gun before greasing.

Replace missing or damaged grease fittings immediately.

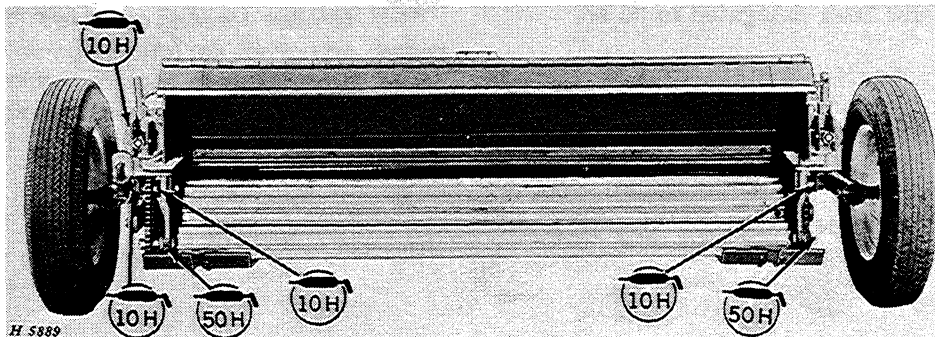
Lubricate all grease fittings thoroughly with an SAE multipurpose grease, until grease oozes out of bearing. This assures that bearing is full and also flushes out dirt that may have accumulated in the bearing. However, avoid excessive lubrication.

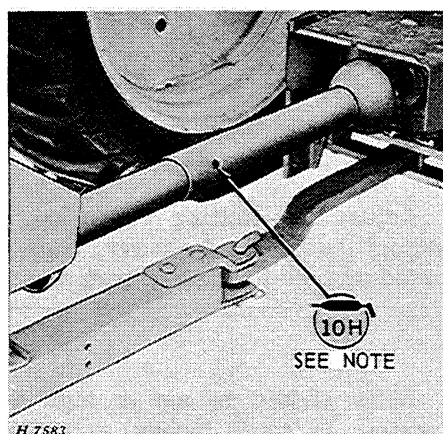
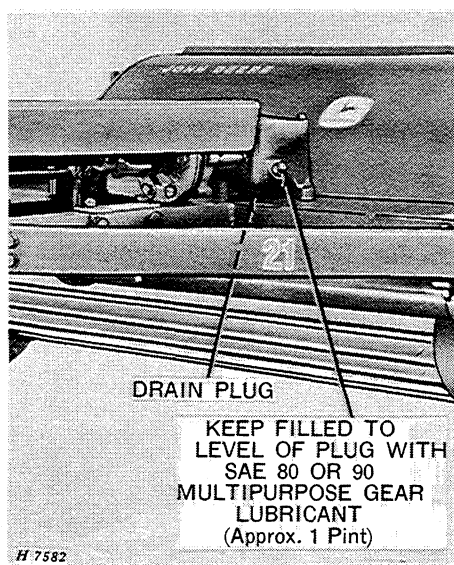
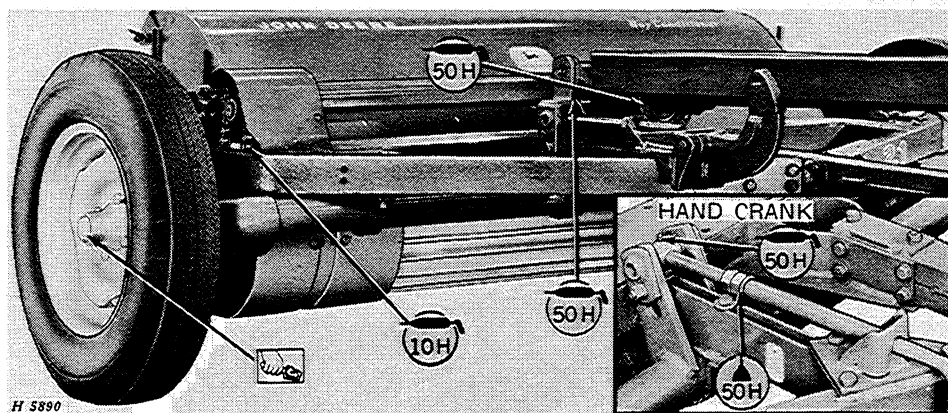
Roller drive chains

Roller drive chains should be lubricated at frequent intervals with SAE 10W oil. A clean paint brush is a good instrument for applying oil to chains.

CAUTION: Do not oil chains when operating in sandy conditions. Sand will stick to the oiled chains and act as an abrasive.

Symbols	
 Grease every 10 hours of operation with SAE multipurpose grease.	 Grease every 50 hours of operation with SAE multipurpose grease.
 Oil every 50 hours of operation with SAE 10 oil.	 Hand pack bearing once a year with SAE multipurpose grease.



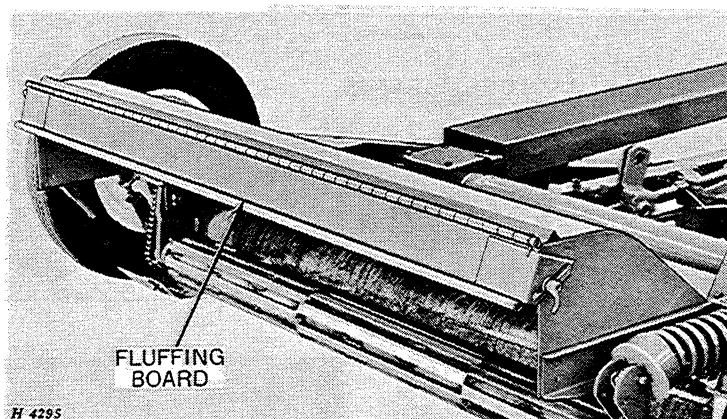


NOTE: Extend or retract power-shaft and rotate individual parts until the hole in the front shield lines up with the hole in rear shield and the hole in drive tube; grease telescoping square shaft.

CAUTION: When lubricating the hay conditioner, check all bolts and nuts to be sure they are tight. Also check the rolls and other parts for damage or undue wear.

Adjustments and service

Fluffing board



The hinged fluffing board can be adjusted to deflect the hay downward in fluffier, faster-curing swaths.

Adjust the fluffing board downward until maximum fluffing results without bunching. In heavy, rank crops, the fluffing board should be adjusted upward to prevent back feeding.

Roll height

Rolls should be set as high as possible (4 to 7 inches) and still pick up the crop.

Operate rolls higher in heavy crops than in light scattered crops.

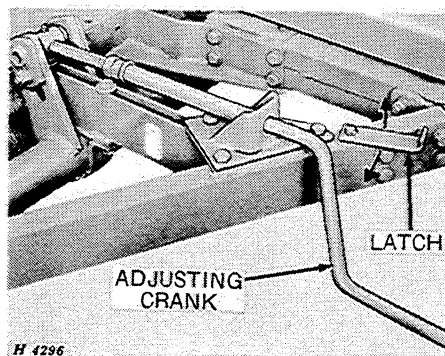
Low roll height is one of the primary causes of material wrapping on rolls.

Raise the rolls when transporting.

HEIGHT ADJUSTMENT

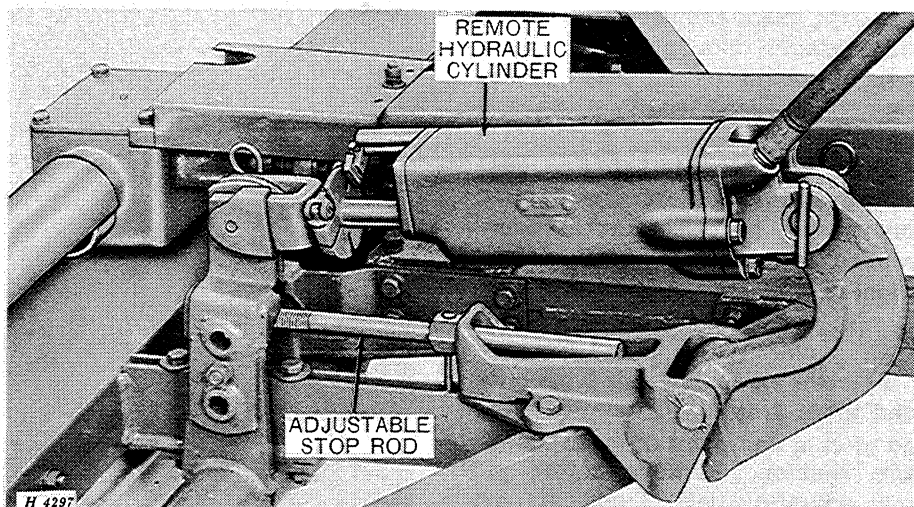
Manual control

Swing latch back onto frame so it does not interfere with rotating crank.



Turn crank counter-clockwise to raise rolls, or clockwise to lower rolls.

Position latch to hold crank.

HEIGHT ADJUSTMENT—Continued**Remote hydraulic cylinder control**

An adjustable stop rod can be set so the downward travel of rolls will stop at a predetermined height. The stop rod allows free movement of the remote hydraulic cylinder to raise the rolls at any given time.

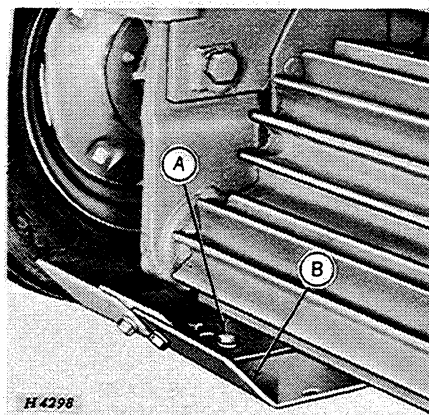
Turn the stop rod counter-clockwise to increase the minimum height, or clockwise to decrease minimum height of rolls.

Roll guard extensions

Material drawn from the adjacent swath may result in wrapping or plugging on the ends of the rolls. The effective swath drawn through the rolls can be varied by adjusting the extensions. With extensions "A" and "B" in place, there is a minimum adjustment range of six inches and a maximum range of seven inches. With extension "B" removed, the minimum range is reduced to one inch and the maximum range is three inches.

In short or light crops, it may be necessary to remove extensions "B" and possibly extensions "A."

CAUTION: Before conditioning heavy rank crops, make certain extensions are in place to avoid plugging and wrapping.



Roll pressure

Heavy, tough crops require more roll pressure than light crops. Both springs should be adjusted to the same compressed length.

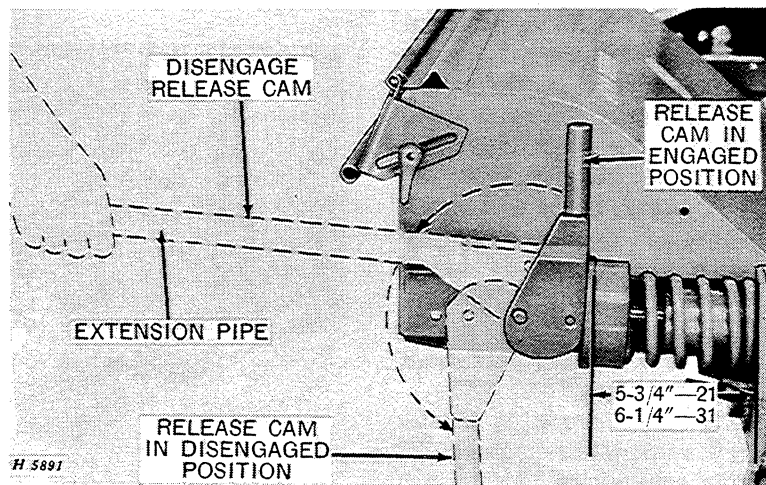
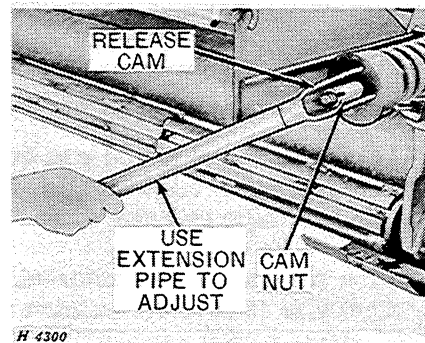
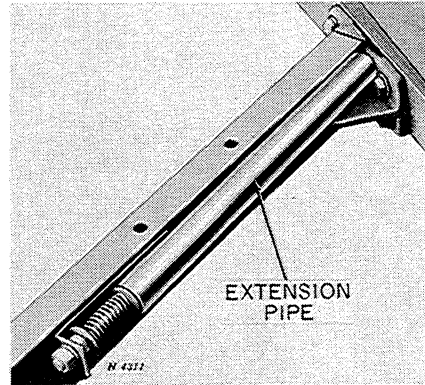
Average setting is 5-3/4 inches, compressed length for the 21 Hay Conditioner, or 6-1/4 inches compressed length for the 31 Hay Conditioner.

To adjust:

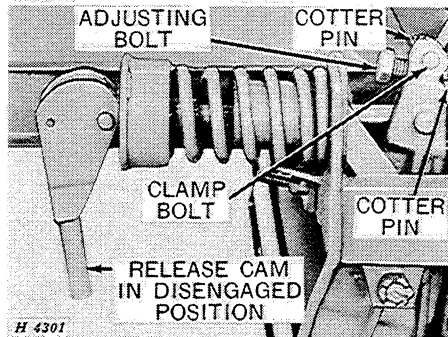
Remove extension pipe from left-hand main frame. Place pipe over end of cam and pivot down to disengage tension. Remove cotter pin from adjusting bolt. Turn cam nut clockwise to increase tension, or counter-clockwise to decrease tension.

Make certain both springs are adjusted to the same length.

Replace cotter pin. Pivot cam up to engage tension. Replace extension pipe.



Roll spacing



When rolls are too aggressive on tender crops, increase roll spacing by turning the adjusting bolt on each side an equal number of turns.

NOTE: On 31 Hay Conditioners only, the roll spacing should normally be 1/64- to 1/32-inch clearance between the rolls. This clearance will permit the stems to be crushed without damaging the leaves.

To adjust spacing

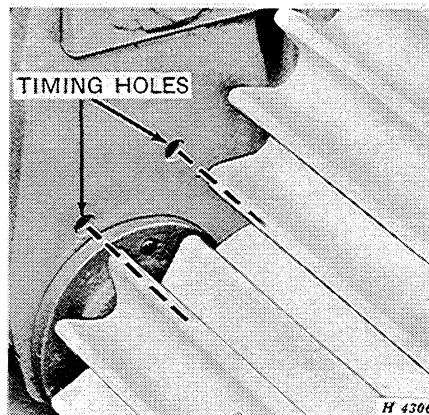
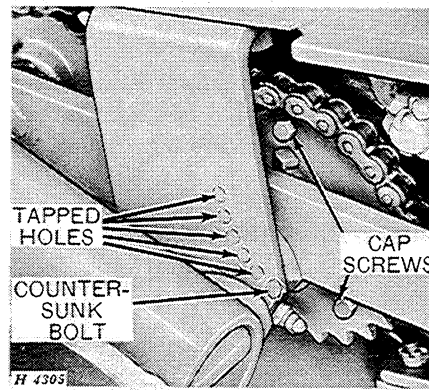
Remove cotter pins and loosen clamp bolts. Adjust both sides an equal number of turns to maintain uniform spacing (counter-clockwise increases roll spacing). Tighten clamp bolts, install cotter pins, and engage tension release cams.

Roll timing (21 hay conditioner)

The rolls are in proper time when a tooth from the small roll is in alignment with the lower timing hole and at the same time a tooth from the large roll is in alignment with the upper timing hole.

If any of the left-hand end drive parts have to be replaced, or if the rolls are not in time, check and time as necessary.

To time the rolls, remove the countersunk bolt and loosen the two



cap screws securing the sprocket to hub. Line up a tooth on small roll with lower timing hole in pivot casting and turn large roll until a tooth lines up with upper timing hole in pivot casting, making certain the small roll does not move out of position. Replace countersunk bolt in the hole that most nearly lines up with one of the tapped holes in sprocket hub. Tighten cap screws and countersunk bolt to 75-80 foot-pounds torque.

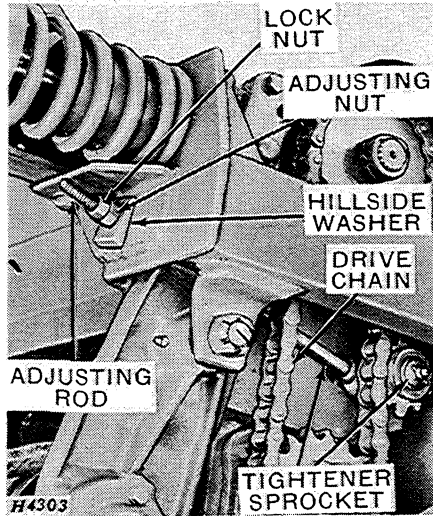
NOTE: If rolls cannot be timed because cap screws are at the end of the slots, it will be necessary to jump the chain one link on the large sprocket, moving cap screws to other end of slot and continue the timing procedure.

14 adjustments and service

Drive chain tension

Chain tension should be adjusted so the chains are just tight enough to run without climbing or jumping sprockets.

Large roll drive chain



To increase chain tension, loosen the lock nut and turn the adjusting nut clockwise on the tightener adjusting rod.

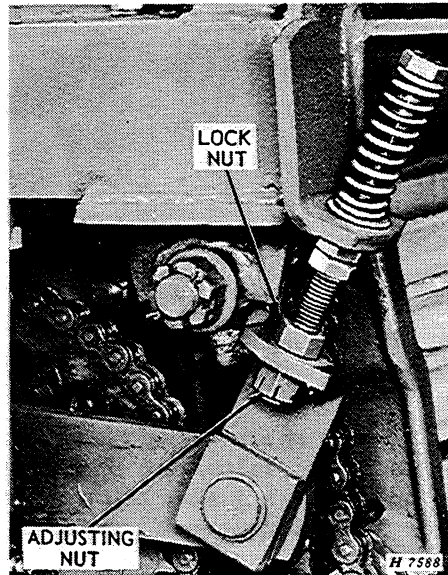
To decrease chain tension, turn adjusting nut counter-clockwise.

After adjusting chain tension, be certain to tighten the lock nut on the adjusting rod.

Small roll drive chain

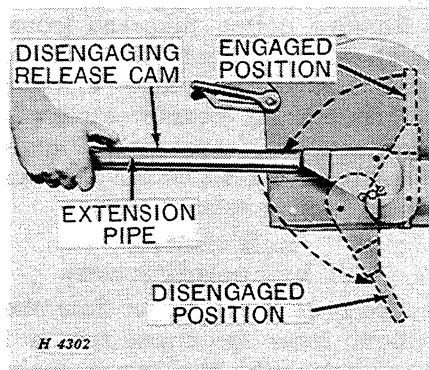
To increase tension, loosen lock nut and tighten adjusting nut until desired tension is reached. Tighten lock nut.

If more tension is desired but cannot be obtained, it will be necessary to remove one offset link from the chain to obtain proper tension. To decrease chain tension, reverse the above procedure.



IMPORTANT: The spring on the adjusting bolt is factory set at a compressed length of 2-1/4 inches. Do not disturb this setting when making tension adjustment.

Cleaning rolls



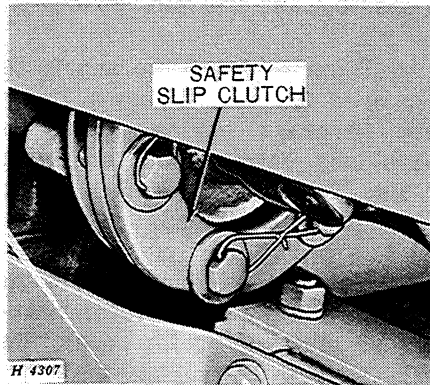
If the rolls plug, due to heavy congestion of material or a foreign object, stop hay conditioner.

Stop tractor engine.

Disengage the tension release cams.

After cleaning rolls, engage roll pressure.

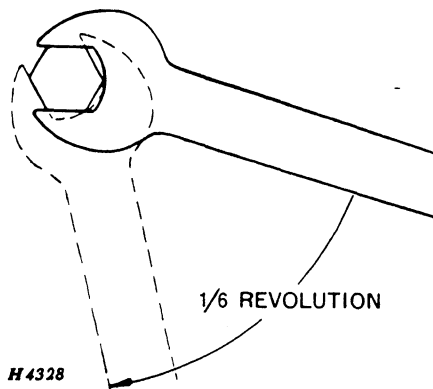
Safety slip clutch



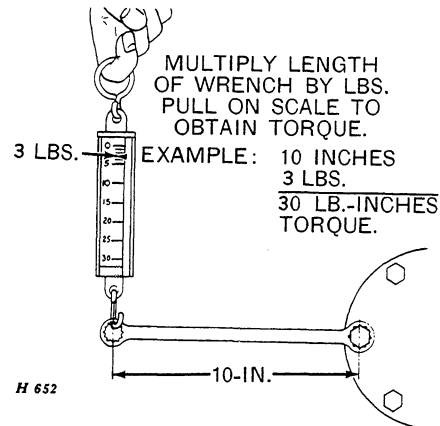
The safety slip clutch has been adjusted at the factory and should require no adjustment except for normal wear.

Check slip clutch before each season. Block rolls and use a 3-foot bar, inserted in rear universal joint to slip clutch. If clutch will not slip, loosen cap screws until clutch is free. Tighten cap screws to torque setting given on this page.

To adjust:



To adjust for normal wear remove the wire from the cap screw heads and turn each screw $1/6$ revolution as illustrated, then replace wire.



If clutch has been disassembled for repairs, tighten cap screws to specified torque:

540 rpm PTO 50 to 60-inch pounds
1000 rpm PTO 30 to 35-inch pounds

To tighten cap screws use torque wrench, or use hand scale and wrench as illustrated.

To insure satisfactory operation, follow the above instructions carefully—don't guess.



be careful.....
avoid accidents

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Prevention of material wrapping on rolls

The problem of material wrapping on the rolls is occasionally encountered when conditioning hay. Following are several recommendations for eliminating this problem:

Operate the tractor at rated PTO speed. Ground travel speed should be reduced by shifting to a lower gear when conditioning a heavy crop.

Condition the hay before it starts to wilt, usually within 20 minutes after it has been mowed.

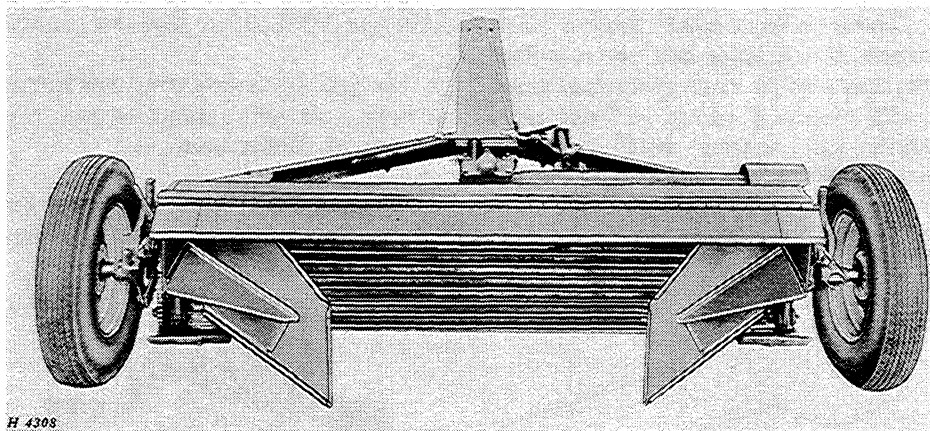
Roll height should be set as high

as possible and still pick up the hay.

Roll spring pressure should be increased for conditioning a heavy crop. Average spring setting is 5-3/4-inch compressed length for 21 Hay Conditioner and 6-1/4-inch for 31 Hay Conditioner.

If material is drawn from the adjacent swath and results in wrapping or plugging on the ends of the rolls, narrow the roll opening by adjusting the roll guard extension. (See page 11.)

Windrower attachment (Special equipment)



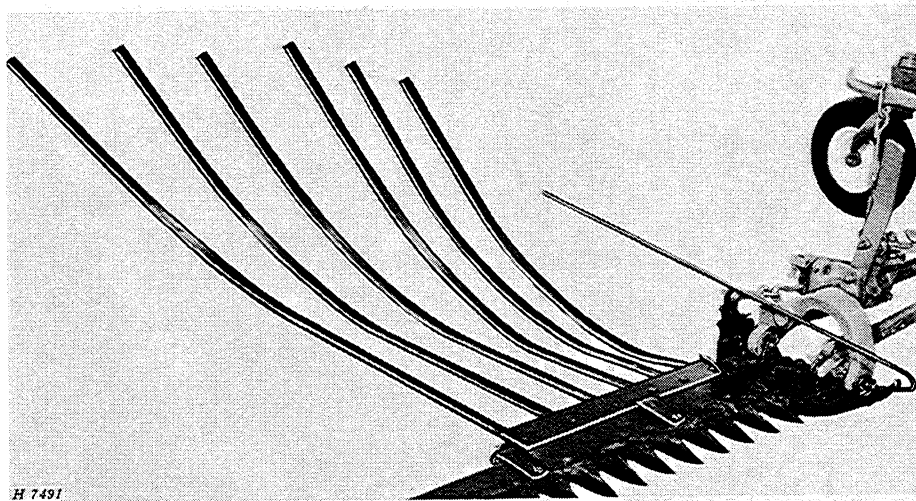
The windrower attachment makes it possible to condition and windrow hay in one operation.

When this method is used in conjunction with the special hookup for the John Deere No. 8, 9, or 10 Mower and Hay Conditioner, you can cut, condition, and windrow hay in one operation.

The windrower attachment is quickly and easily attached or detached—ready for immediate use in laying light, fluffy windrows.

Order BH50103H Windrower Attachment from your John Deere dealer.

Swath reducer (Special equipment)



The swath reducer must be used in conjunction with a longer inner shoe fender rod on a 9-foot cutter bar when using a hay conditioner with the mower.

Order: BH50499H - Swath Reducer
H32036H - Inner Shoe Fender Rod



FOR YOUR OWN PROTECTION-
DON'T TAKE A CHANCE!

