INTERNATIONAL HARVESTER

OPERATOR'S MANUAL

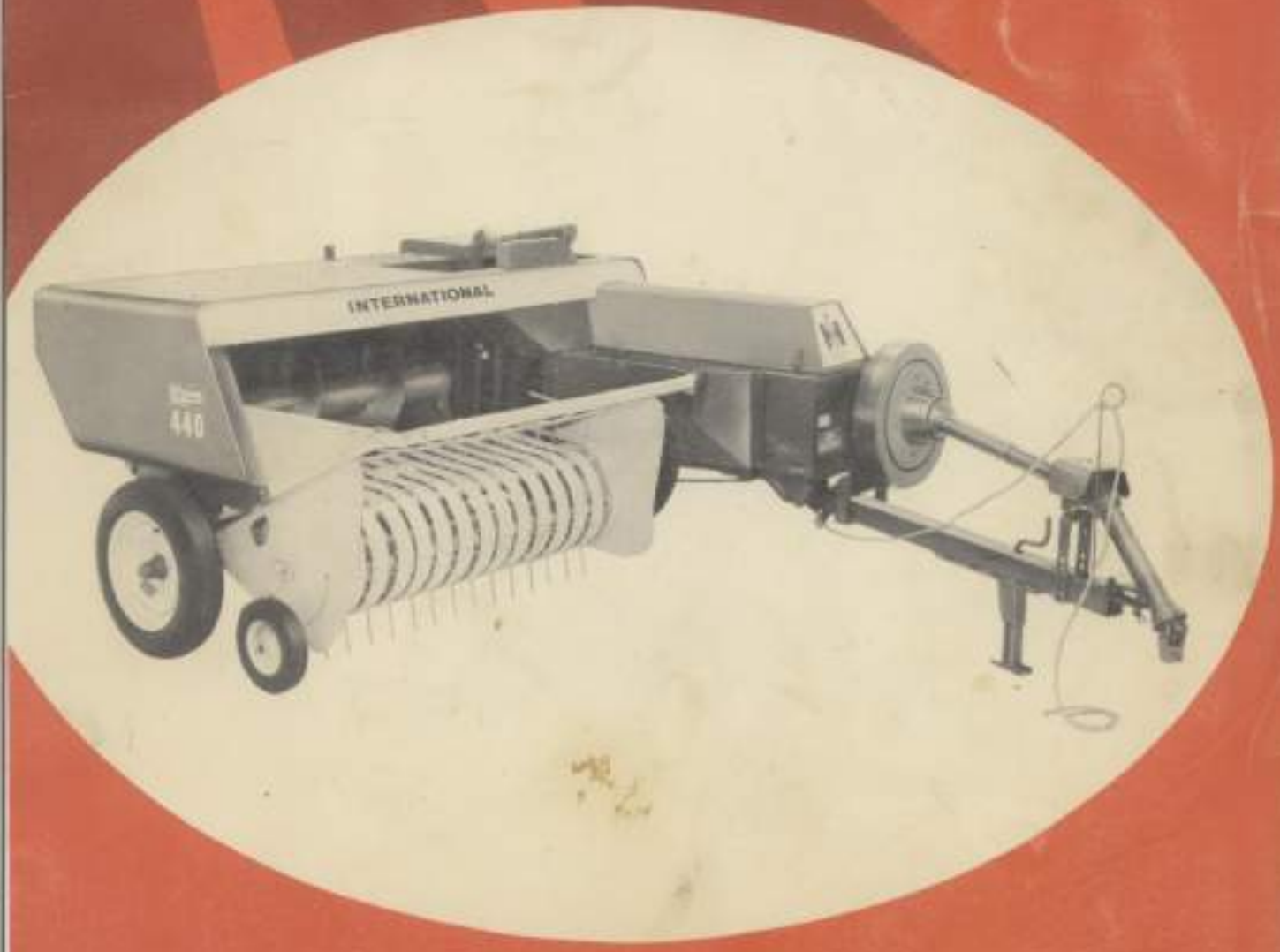
INTERNATIONAL®

430 and 440

(All Twine and Lok Twist)

Balers

OPERATION
MAINTENANCE
LUBRICATION



To The Owner

Your new International Harvester baler is designed to meet today's exacting operating requirements. The ease of operation, and ability to adjust to field conditions lighten your work and shorten your hours on the job.

You are urged to consult your International Harvester dealer concering unusual conditions or special applications. Let the experience of your dealer and the organization associated with him serve you.

Be sure to read the instructions for the care and operation of your baler in this manual. Check each item referred to and acquaint yourself with the adjustments required to obtain efficient operation and maximum trouble-free service. Remember, a baler which is properly lubricated and adjusted saves time, labor, and fuel.

After the operating season, thoroughly clean your baler and inspect it. Preventive maintenance pays dividends. Your dealer has original-equipment parts which assure proper fit and best performance. He is able to recondition your equipment to a like new condition.

When in need of parts for the baler, always specify the serial number, including any prefix or suffix letters. The serial number of the baler is stamped on a plate attached to the bale chamber right front side. Write this serial number in the space provided below.

Additional copies of this manual may be ordered from your International Harvester dealer at a nominal price.

1 - Baler serial number _____

CONTENTS

INTERNATIONAL HARVESTER

WORK SAFELY—FOLLOW THESE RULES

This symbol is used to call your attention to instructions concerning your personal safety. Be sure to observe and follow these instructions.

These balers have been designed to minimize the chances of an accident; however, there is no substitute for a careful operator.

Before Operating

Review the Operator's Manual.

To refuel the tractor or baler engine, shut it off. Do not smoke. Be sure to ground the hose nozzle or can and funnel. Always refuel in a well ventilated area and avoid spilling fuel.

Fire extinguisher should be in place and in good operating condition.

Make sure everyone is in the clear before starting the machine.

Inspect the bale chamber before operating to make sure that there are no obstructions.

See that all safety shields are in place and properly secured before starting to operate the baler.

After servicing, be sure all tools, parts, or servicing equipment are removed before starting to bale.

Never permit anyone on the tractor except the operator and keep off of the baler while operating.

Be sure the correct power take-off parts are used and properly secured.

During Operation

Do not attempt to pull hay from the pickup or from under the auger while the baler is operating.

Do not attempt to pull hay from the pickup when the baler is running.

Do not try to remove or pull twine or wire from the bale chamber twine or wire mechanism while the baler is operating.

Avoid the possibility of fire by keeping the tractor and baler free of trash.

Use extreme care when operating close to ditches, fences, or on hillsides.

Keep your hands, feet, and clothing away from the power-driven parts.

Stop the baler and shut off the tractor or baler engine before lubricating, cleaning, or adjusting.

Do not leave tractor seat without disengaging the drive and stopping engine.

After Operation

Block wheel securely if the machine is parked on a hillside.

Take all precautions so that children can not start the tractor or baler engine while it is unattended.

On-Highway Operation

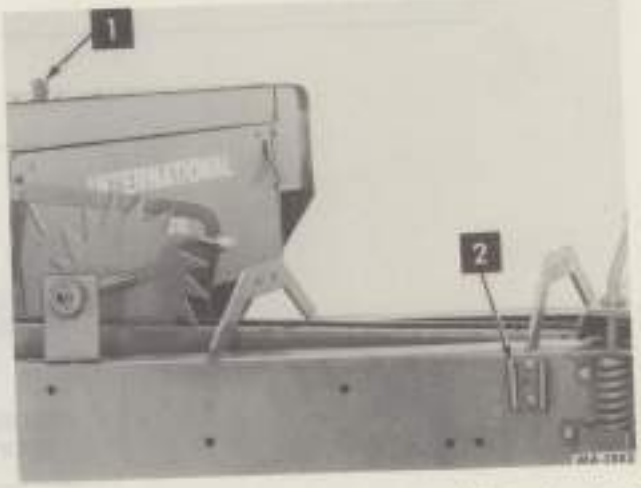
Check clearance carefully before driving machines on bridges or into buildings.

Comply with your state and local laws governing highway safety and with regulations when moving machinery on a highway.

An SMV (slow-moving vehicle) emblem bracket "1" (Illust. 2) is provided on your baler. Whenever transporting the baler on the highway, remove the SMV emblem from the tractor and mount it on the baler.

A safety lighting bracket "2" (Illust. 2) is provided on the baler. The lighting attachment may be obtained from your International Harvester dealer.

Maintain complete control of machines at all times when traveling on the highway.



1 - SMV bracket 2 - Safety lighting bracket

Illust. 2

INTRODUCTION

Throughout this manual when a twine baler is mentioned, it refers to an All Twine baler and when a wire baler is mentioned it refers to a Lok Twist baler.

The contents of this manual are instructions for use with balers having serial numbers as indicated below:

430 All Twine Baler Serial No. U005756 and up
430 Lok Twist Baler Serial No. U001195 and up

440 All Twine Baler Serial No. U002160 and up
440 Lok Twist Baler Serial No. U001304 and up

In order to provide a baler equipped as nearly as possible to suit each customer's needs, a variety of extra equipment is available. The function and operation of this equipment is described in this manual.

Illustrations are numbered to correspond with the page number on which they are located; for example, Illusts. 4 and 4A are on page 4.

Wherever the terms "right" and "left" are used, it should be understood to mean from a position behind and facing the machine.

1 - Pickup
2 - Pickup height control
3 - Bale chamber
4 - Knotter
5 - Packer fingers
6 - Plunger
7 - Power take-off drive

Illust. 3
440 All-twine baler.

PREPARING YOUR BALER FOR WORK

GENERAL

Your new baler has been checked carefully by your International Harvester dealer. He has gone over the entire machine and has made sure that it is in good working order and ready to give you dependable service. There are, however, a few things which you must do before you put your new baler to work in the field.

Lubricate Completely

Be sure the baler has been completely lubricated. Use the handy lubrication chart on pages 58 to 61 as a check list.

HITCHING BALER TO TRACTOR

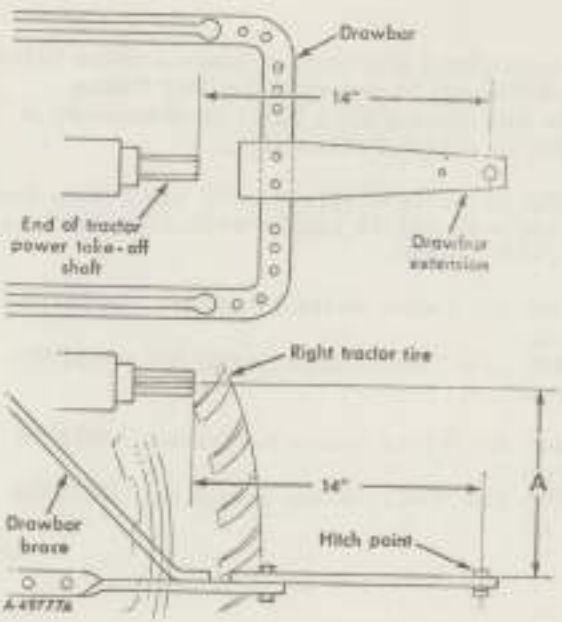
Your baler can be attached to any tractor having a drawbar and power take-off that conforms to ASAE-SAE standards and having a power take-off speed (540 r.p.m.) to match the power shaft speed of your baler.

The service life of the power take-off drive is dependent upon the baler being hitched correctly to the tractor. An improperly located hitch puts angular stresses on the universal joints of the power shaft.

For information concerning standard drawbar height for International Harvester an other tractors, refer to the Operator's Manual furnished with the tractor or hitch.

The hitch point must be 14 inches from the end of the power take-off shaft on the tractor and directly beneath the power drive line. The vertical distance "A" (Illust. 4) from the top of the drawbar to the center line of the power take-off shaft must be 6 to 15 inches, 8 inches being recommended. The length of the hitch on the baler is designed to meet these requirements when hitched to any tractor with a standardized hitch. On most tractors, the hitch is standardized by a hitch plate attached to the drawbar.

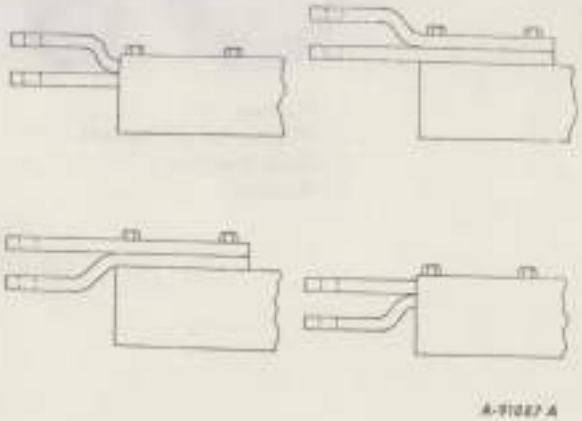
Caution! When attaching the yoke of the universal to the power take-off shaft on the tractor, it is important that the yoke is secured to the power take-off shaft with the spring actuated locking pin. **Note:** Be sure that this pin slides freely and is seated in the groove on the tractor power take-off shaft.



Illust. 4
Standardized location of hitch point.

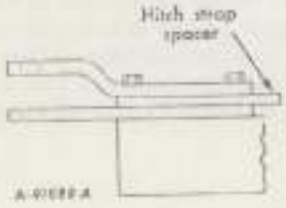
Note: The hitch point must not be changed to prevent the tractor drive wheel from running on the windrow. Instead, the tractor wheel must be moved in.

The height of the hitch on the baler should be adjusted so that the bale chamber is approximately level. The two clevis straps can be inverted and may be installed inside or outside of the hitch in order to level the baler. See Illust. 4A.



Illust. 4A
Clevis positions for leveling adjustment.

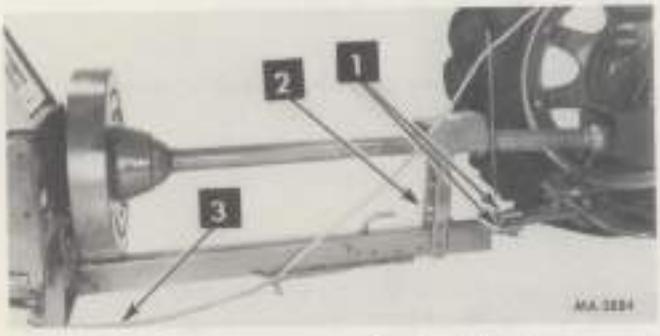
HITCHING BALER TO TRACTOR - Continued



Illust. 5

When the baler is attached to a tractor, equipped with a drawbar 7/8 to 1-1/4-inch thick, a hitch strap spacer (668 758 R1) (Illust. 5) must be used between the clevis straps to increase the distance between the straps. Two hitch strap spacers are used between the clevis straps when the baler is attached to a tractor equipped with a drawbar that is over 1-1/4-inch thick. This hitch strap spacer (668 758 R1) and two 5/8 x 3-1/4-inch hex-head bolts must be obtained from your International Harvester dealer.

The height of the three-joint universal power take-off shaft is adjustable at the center bearing support "2" (Illust. 5A) This should be adjusted up or down in order to align the two front universal joints.

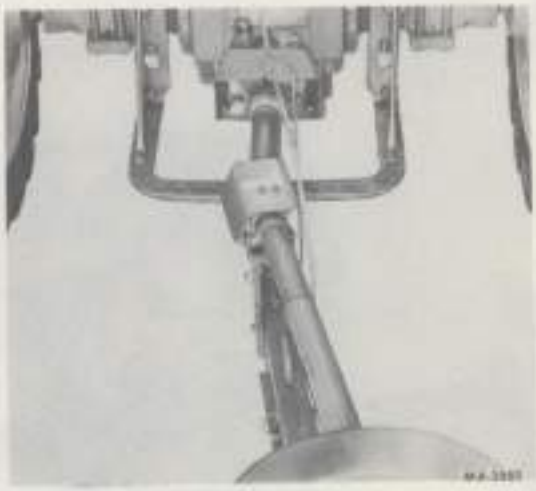


1 - Clevis
2 - Center bearing support
3 - Hitch latch rope

Illust. 5A
440 Baler - 430 Baler is similar
Three-joint universal drive shaft.

Illust. 5B
430 Baler.
Two-joint universal drive shaft.

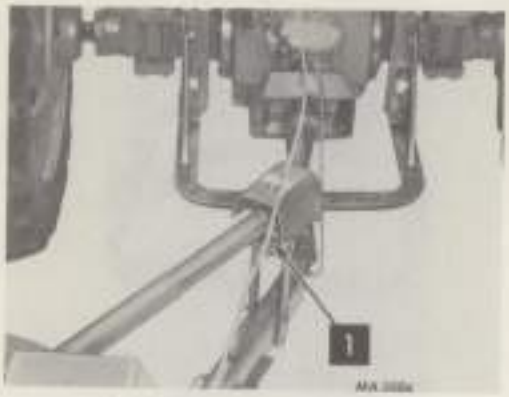
The normal operating position for baling is shown in Illusts. 5B and 5C. Note: The baler is hitched power take-off shaft is in the nearly straight position.



Illust. 5C
440 Baler hitched to the tractor for baling.
430 Baler is similar.
(Three-joint universal drive shaft).

PREPARING YOUR BALER FOR WORK

HITCHING BALER TO TRACTOR - Continued



1 - Center bearing support.

Illust. 6
440 Baler hitched to the tractor for transporting.
430 Baler is similar.
(Three-joint universal drive shaft).

In order to place the baler more nearly behind the tractor for transporting between fields, the hitch can be shifted to the transport position as shown in Illusts. 6 and 6A.

To shift the hitch from one position to the other, pull the hitch latch rope "3" (Illust. 5A) to release the latch and then by backing the tractor in the proper direction the hitch will swing to the alternate position. In some cases it may be necessary to block the right wheel for this to be accomplished.

Caution! When operating the power take-off, be sure that the master shield covering the power take-off shaft is always in place.

Illust. 6A
430 Baler hitched to tractor for transporting.
(Two-joint universal drive shaft).

430 Baler with two-joint universal drive shaft: When transporting the baler, always disconnect the power take-off shaft as shown in Illust. 6A and connect the shaft to the hitch pin assembly, using a 3/16-inch quick-attachable cotter pin. This must be done to protect the drive shaft from damage by turning too short.

PROTECTIVE DEVICES ON YOUR BALER

Your baler is equipped with safety devices to protect it from damage resulting from obstruction or overloads. Acquaint yourself with these devices before operating your baler.

Shear Bolts

Illust. 6B
Shear bolts must have this marking to be the correct hardness.

The shear bolt (Illust. 6B) used in the flywheel wheel, needle, and packer fingers is a 5/16NF x 2-inch hex. head cap screw (type 5) with lock washer, and nut, available at your International Harvester dealer. Regular bolts (type 1) are too soft and shear too easily. Special bolts (type 8) are too hard and won't shear easily enough to prevent damage to the machine.

When replacing the shear bolts, always draw them up to a snug fit.

FLYWHEEL

The purpose of the flywheel shear bolt (Illust. 7) is to protect the baler against damage from stone or other foreign materials picked up accidentally with the hay.

The shear bolt makes a loud noise when it shears. This is your warning to stop the tractor and the baler immediately and determine the cause of the shearing. See the "Trouble Finding Chart" on pages 56 and 57 for possible causes. When the cause of shearing has been determined and eliminated, replace the shear bolt as follows:

PROTECTIVE DEVICES ON YOUR BALER - Continued

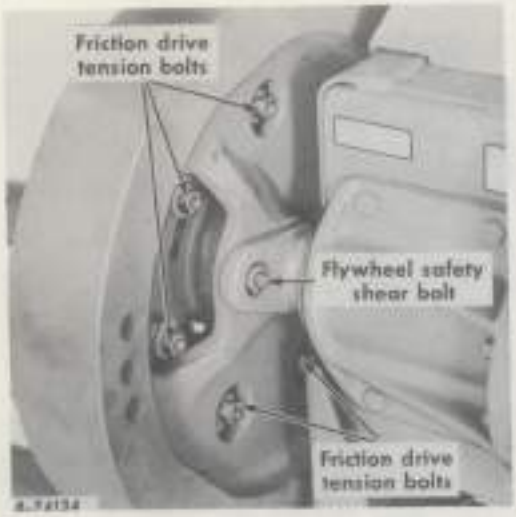
Shear Bolts - Continued

FLYWHEEL - Continued

Knock out the remaining pieces of sheared bolt (if any) from the shear bolt bushings. The flywheel hub may be rotated to a convenient location by inserting the new shear bolt in the flywheel and turning the flywheel by hand until the bolt engages the side of the hub shear plate.

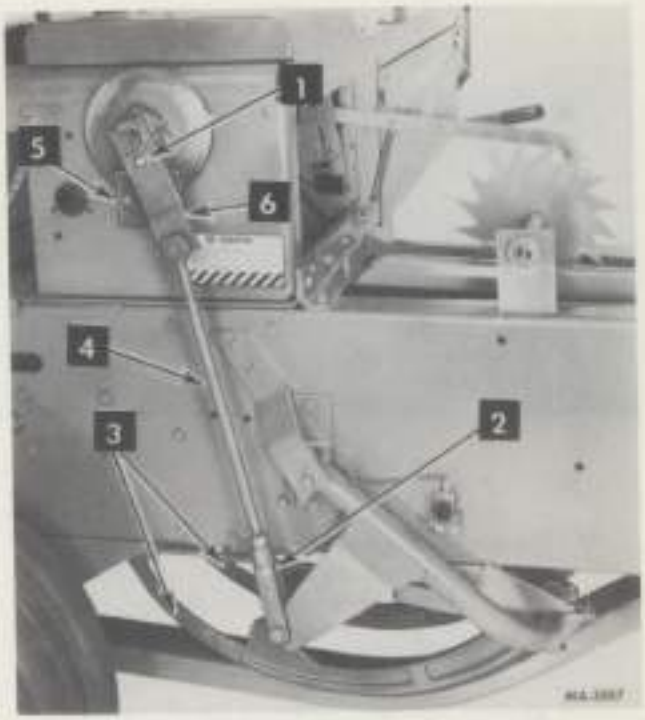
Note: Be sure the needles are in the "home" position "6" as shown in Illust. 7A and that the needle shear bolt "1" (Illust. 7A) is not sheared.

Turn the baler flywheel and power shaft by hand after replacing the shear bolt to make sure the obstruction that caused the trouble has been removed.



Illust. 7
The flywheel shear bolt is located in flywheel at the front of the bale chamber.

NEEDLE



1 - Needle shear bolt
2 - Needle pitman yoke
3 - Needles
4 - Needle pitman
5 - Knotter shaft brake
6 - Home position

Illust. 7A
Needle shear bolt that guards the needles. The knotter shaft brake "5" is also shown. Twine baler shown - wire baler is similar.

The needle shear bolt "1" (Illust. 7A) protects the needle drive from damage should the needles "3" (Illust. 7A) be prevented from going through their normal cycle. If the needles are obstructed, the sear bolt shears and permits the needle drive hub to go through the rest of the cycle without needles. If the obstruction is such that the needles are left in the bale chamber, the plunger stop comes into play and shears the flywheel shear bolt. When the cause of the shearing has been determined and the obstruction has been eliminated, replace with a new shear.

PREPARING YOUR BALER FOR WORK

PROTECTIVE DEVICES ON YOUR BALER - Continued

Shear Bolts - Continued

PACKER FINGER

1 - Packer finger bolt

Illust. 8
The packer fingers are equipped with a shear bolt to protect the feeding mechanism. View shown is the 440 Baler.

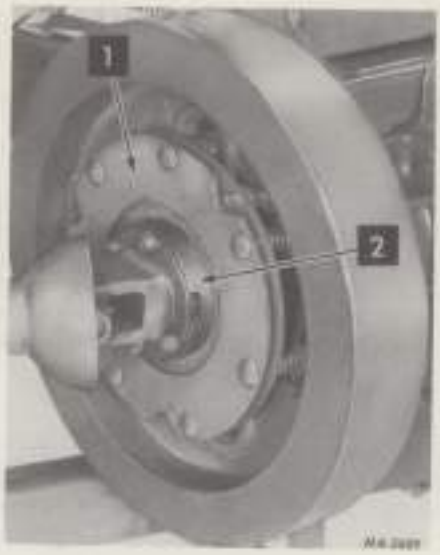
The packer fingers are equipped with a shear bolt "1" (Illust. 8) which protects the feeding mechanism in case an extremely heavy charge of hay is encountered. When the bolt shears, the packer fingers retract and swing harmlessly until the baler is stopped and the shear bolt is replaced. The feed opening must be cleaned out before resuming operation. **Always stop the baler before cleaning out the feed opening area.** Replace with a new shear bolt.

Overrunning Clutch

The overrunning clutch "2" (Illust. 8A) lets the flywheel keep on spinning when you slow down or stop your tractor. This automatic action disengages the flywheel from the tractor drive, freeing the tractor transmission for easier shifting.

Friction Drive

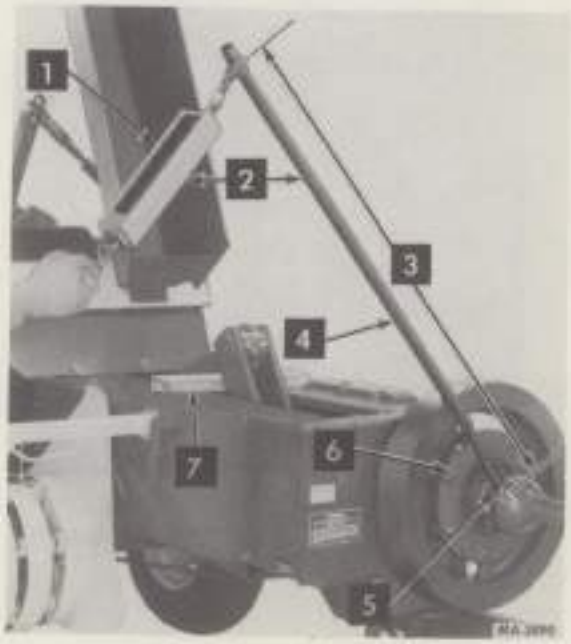
The friction drive "1" (Illust. 8A) protects the power line from damage caused by angular stresses placed on the drive when turning. By limiting the power input to the baler, it also prevents harmful overloading. If the friction drive slips, that indicates the baler is overloaded or needs adjustment.



1 - Friction drive 2 - Overrunning clutch

Illust. 8A
Friction drive in the flywheel guards against overloads.

To adjust the clutch "6" (Illust. 8B) tighten the spring adjusting nuts until the seven springs are compressed to 1-5/16-inch in length. This will set the clutch so that it should slip at 400 ft-lb torque.



1 - Scale
2 - 90 degrees
3 - Dimension is 4-feet
4 - Bar
5 - Power take-off drive shaft yoke
6 - Clutch
7 - Block

Illust. 8B
Friction drive clutch adjustment.

PROTECTIVE DEVICES ON YOUR BALER - Continued

Friction Drive - Continued

A check can be made to determine if the clutch "6" slips at 400 foot-pound specified torque. Place a block "7" (Illust. 8B) underneath the plunger crank at the top of the bale chamber. Attach a scale "1" (Illust. 8B) to the end of a bar "4" (Illust. 8B). Pass the other end of the bar through the power take-off drive shaft yoke "5" (Illust. 8B) so that a 4 foot dimension "3" (Illust. 8B) is obtained between centers of the scale and yoke. Pull on the scale keeping it at 90 degrees "2" (Illust. 8B) to the bar. A scale reading of 100 pounds is equivalent to 400 foot-pound torque using this method.

A simplified method of releasing the friction drive clutch in the event of seizing during storage has been provided.

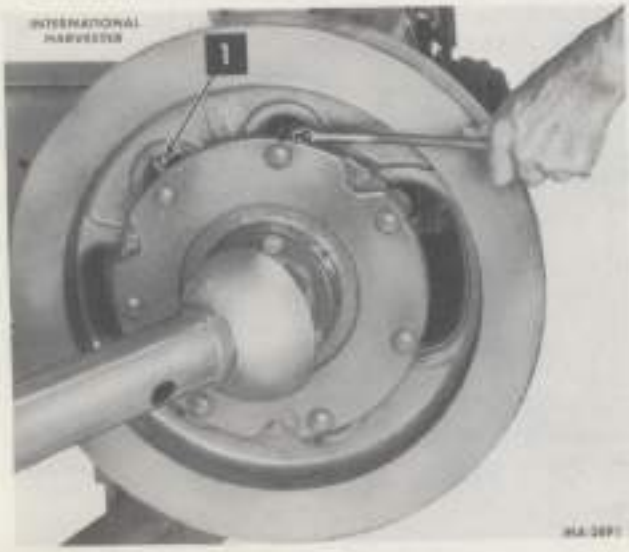
Just prior to placing the baler in service after storage, place the seven clutch release pins "1" (Illust. 9) (obtained from your IH Dealer) between the clutch plates and alongside each tension bolt and turn each one-quarter of a revolution with a suitable wrench. This will release the clutch. Spin the clutch several revolutions and remove the seven pins by again turning each one-quarter of a revolution. See Illust. 9.

Note: Be sure to retain the seven pins for reinstallation before the next season. These pins were developed to save time in properly caring for the friction drive, which is one of the most important protective devices on your baler.

Pickup Slip Clutch

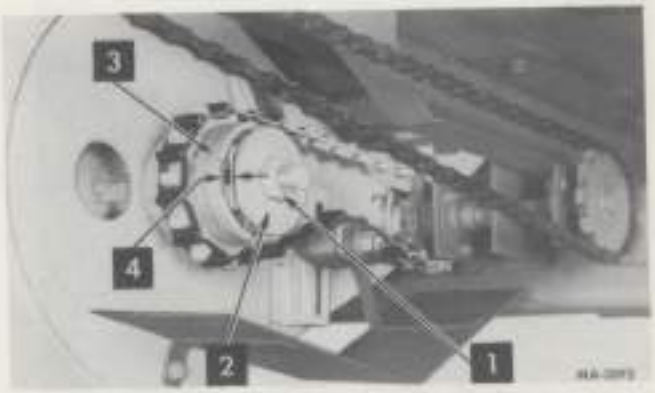
The purpose of the pickup slip clutch is to protect the pickup cylinder from damage by overloading, or from striking field obstructions. The slip clutch may also slip if it is adjusted too loosely. The slip clutch is adjusted by turning the spring tension nut "1" (Illust. 9A) to increase or decrease the tension on the spring.

The clutch springs are properly adjusted when the dimension "4" (Illust. 9A) between the retainer washer "2" (Illust. 9A) and the slip clutch hub "3" (Illust. 9A) is 3/8-inch, plus or minus 1/32-inch. Note: On custom pickup (optional), the dimension "4" (Illust. 9A) is 5/16-inch, plus or minus 1/32-inch.



1 - Clutch release pin

Illust. 9
Friction drive with seven clutch release pins in position for storage.



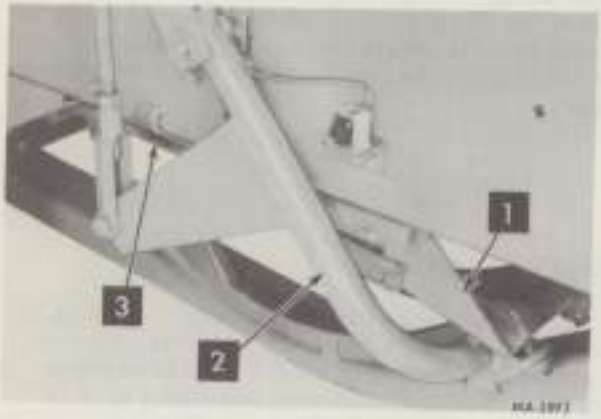
1 - Spring tension nut
2 - Retainer washer
3 - Slip clutch hub
4 - Dimension is 3/8-inch, plus or minus 1/32-inch; with custom pickup (optional) dimension is 5/16-inch, plus or minus 1/32-inch

Illust. 9A
The pickup slip clutch is adjusted by turning the spring tension nut.

PREPARING YOUR BALER FOR WORK

PROTECTIVE DEVICES ON YOUR BALER - Continued

Plunger Stop



1 - Plunger stop arm
2 - Needle support pipe
3 - Plunger stop rod

Illust. 10
Plunger stop arm and needle support pipe.
Twine baler shown - wire baler is similar.

The purpose of the plunger stop "2" (Illust. 10A) is to protect the needles "1" (Illust. 10A) if, for any reason, they are left in the bale chamber at the wrong time. The stop, in the bottom of the bale chamber, is controlled by the needle support pipe "2" (Illust. 10) and plunger stop arm "1" (Illust. 10). The plunger stop (Illusts. 10A and 10B) enters the bale chamber at the same time as the needles. Should the needles remain in the bale chamber during the next rearward stroke of the plunger, the plunger is caught and held by the plunger stop. This prevents the plunger from pressing hay against the needles and damaging them. When the plunger stops, it shears the shear bolt. This prevents serious damage to the baler and helps you guard against costly, time-wasting breakdowns.

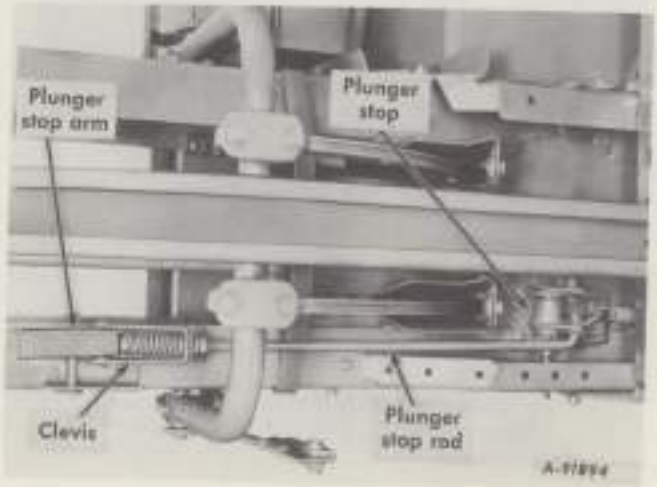
A clevis adjusts the length of the plunger stop link "3" (Illust. 10) and must be set so that the point of the plunger stop is 1/2 to 5/8-inch below the top of the bale chamber bottom plate when the needles are in home position. See Illust. 10B.

If the safety device has caused the shear bolt to shear, clean out the charge of hay between the plunger and the needles. The difficulty which caused the needles to be left in the chamber must then be cleared up.

The needles must be returned to the home position, and the needle drive shear bolt replaced before attempting to operate the machine. Otherwise, the plunger will again contact the safety device and shear the flywheel shear bolt. To return the needles to the home position, pull rearward on the needle support pipe until the shear bolt holes are in line. The needles shear bolt can then be replaced.

1 - Needles
2 - Plunger stop

Illust. 10A
Plunger stop dog shown in bale chamber.
(Twine baler shown)



Illust. 10B
View from underneath the baler showing plunger stop that keeps plunger from compressing hay against the needles if they are left in the bale chamber.

THREADING TWINE TYING MECHANISM

Make sure that the twine you use is fresh and dry. Twine that has been stored too long in a dry place kinks and breaks easily. Wet balls of twine swell and snarl in the twine containers. For best results, use IH baler twine. It is manufactured to meet the requirements of your baler and gives bales that will stay tied.

Open the door on the twine chest and place two balls of twine each in the right and left twine containers as shown in Illust. 11. Connect the inside end of ball "A" to the outside end of ball "B", connecting the two balls of twine in the right twine container. Connect the inside end of ball "C" to the outside end of ball "D", connecting the two balls of twine in the left twine container. If twine is taken from the wrong end of a ball, it will twist and snarl in the tying mechanism. Join the twine ends with a firm square knot. Trim the loose ends about 1/2-inch from the knot and you are ready to thread the tying mechanism.

Step-by-Step Threading Procedure

1. Make sure the needles are in their extreme rearward position. If they are not, turn the flywheel and power take-off drive by hand until the needles reach the extreme position of their rearward stroke.

2. Thread the twine from the inside of ball "B" through the guide in the top right compartment and the grommet in the right partition and the right guide in the top of the left compartment of the twine chest. Thread the twine from the inside of ball "D" through the left guide in the left compartment of the twine chest. Thread the twine balls "B" and "D" through the grommet in the left partition of the twine chest.

3. Thread the twine between the pressure plates of the twine tension device and through the grommet in the bottom of the twine chest. Run the twine through the spring slack ring.

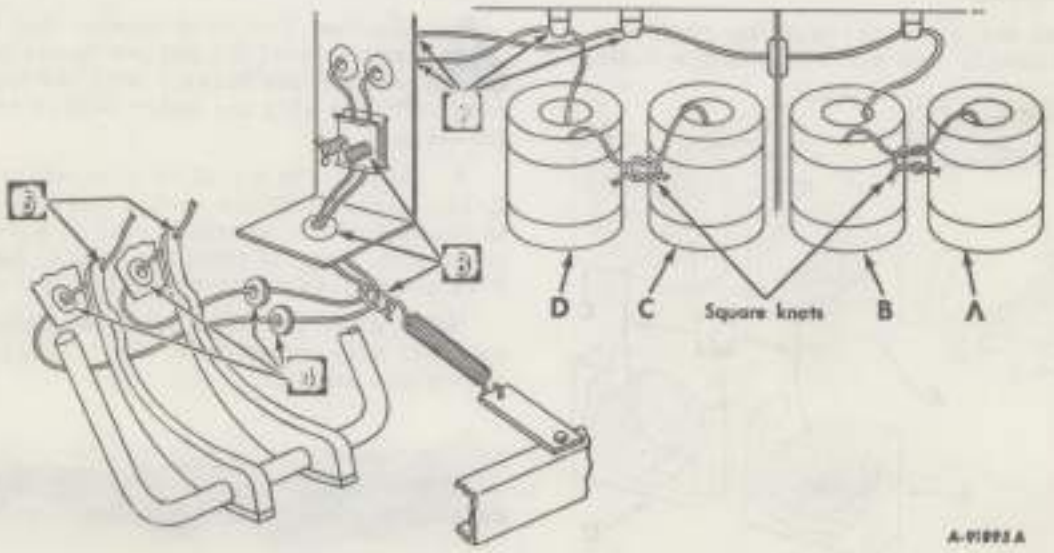
4. Run the twine through the four twine guides underneath the bale chamber. The twine balls "A" and "B" from the right twine container furnish twine for the right needle and the twine balls "C" and "D" from the left twine container furnish twine for the left needle.

5. Thread the ends of the twine through the holes of the needle tip. Pull these two twine ends up through the bale chamber and tie the twines to the bale chamber tie strap.

6. Operate the baler slowly under power. Turn the metering wheel until it trips and starts the tying mechanism.

7. Strip the single knots off the knotter hooks to complete the threading operation. Always stop the baler to remove the knots from the knotter.

8. Operate the tying mechanism several times at rated engine speed to be sure it is working smoothly. Tie the twine to the bale chamber tie strap each time to prevent the twine from fouling in the knotters. This is done by grasping the twines midway between the bottom plate and the knotter breast plate and tying them to the bale chamber tie strap. Always stop the baler before grasping the twines.



Illust. 11
Threading twine baler.

PREPARING YOUR BALER FOR WORK

THREADING WIRE TWISTING MECHANISM

Knock out the center openings of the cartons. Make sure that the wire is not rusted or has not been damaged in shipment. For best results, use only high quality ASAE approved wire. It should be annealed for easy twisting and should withstand 250 pounds tension load. The wire should be covered with an oil base protective coating, placed there at the time of manufacture. If the wire is not coated, lubricate it thoroughly with crankcase oil or other similar type oil. The specifications for this wire can be found on page 62.

Step-by-Step Threading Procedure

1. Place the cartons of coils of wire into the wire containers as shown in Illust. 12, then cut the band ties. **Note:** If baler is equipped with two coil wire containers, or only two coils of wire are being used, only the front containers are used.

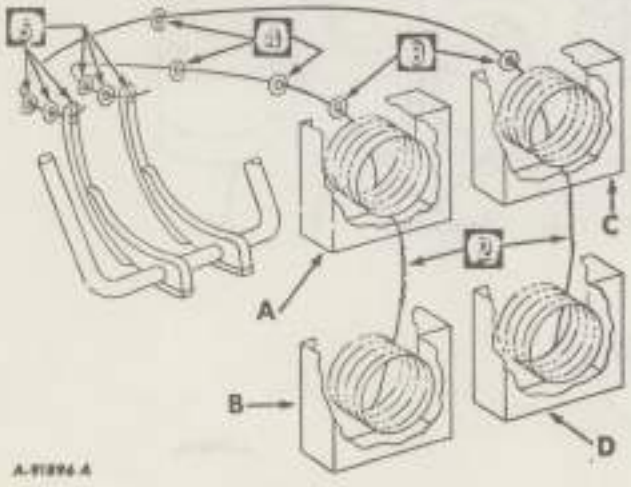
Note: When using coils of wire removed from the cartons, coil bottom plates must be used and they must be obtained from your IH dealer.

2. Connect the inside end of the outside coils of wire "B" and "D" to the outside end of the inside coils of wire "A" and "C" using a small splice as shown in Illust. 12.

3. Thread the wires from the coils "A" and "C" through the guides in the wire container.

4. Run the wire from the inside coil through the guide on the wire container stabilizer and through the guide below the right side of the bale chamber. Run the wire from the outside coil through the guide below the right side of the bale chamber.

5. Thread the wires through the guides in front of the needle tips and between the roller and pin of each needle. Each wire must be threaded separately from the carton or coil of wire to the needle eye on the initial threading and when the wire is lost from the needle. **Note:** The wires must be threaded so that the wires will not twist around one another as they travel from the wire containers to the needle tips.



Illust. 12
Threading wire baler (four wire container).

6. After threading the wire through the wire guides and between the roller and pin in the ends of the needles, pull these two wires up through the bale chamber and wrap them around the bale chamber tension channel. Next, turn the metering wheel, found on the center of the bale chamber, until it trips the clutch starting the twisting mechanism. Care must be exercised when going through this first twisting cycle to make sure that all parts turn freely. If extreme pressure is needed at any point during this cycle, check thoroughly and remove the obstruction. If the machine turns freely, continue through the cycle, and the needles will thread the wire twister mechanism. After the needles have returned to "home" position, it will be necessary to pull the wire from the twister mechanism. Always stop the baler before removing the wire twists.

7. Operate the twisting mechanism several times at slow engine speed to be sure it is working smoothly. Wrap the wire around the bale tension channel each time to prevent the wire from fouling in the wire twister mechanism. This is done by grasping the wire midway between the bottom plate and the wire twister base plate, and wraping it around the bale chamber tension channel; then tripping the mechanism with the metering wheel. Always stop the baler before grasping the wires.

Caution! The wire twister and needles move fast! Do not put hands in or around the twister with the baler running. Always stop the baler before removing the wire.

8. To replace a coil of wire while in the field, simply join the inside end of the new coil to the end of the previous coil of wire at any point with a small compact splice. See Illust. 12A. It is not necessary to re-thread the wire guides.

Note: When the wire baler is equipped with two coil wire containers, the instructions shown are similar.

Illust. 12A
Splicing a new coil of wire to the previous coil of wire.

OPERATION OF YOUR BALER

OPERATIONAL CHECK

To avoid possible damage to your baler, see that all parts operate freely before you operate it under power for the first time or after storage. Turn the baler flywheel and power shaft by hand to make sure there are no obstructions in the bale chamber or other parts of the machine that would interfere with its operation.

OPERATING SPEED

When you start out with your new baler, operate the tractor in low gear. This will give you a chance to become familiar with the operation of the baler and gauge its capacity in relation to the size of windrow so that you can determine the most efficient travel speed.

The speed of baling and size of windrows will vary with crop and field conditions. Excessive field speed will slug and overload the baler, while slow speeds that do not keep your baler going at full capacity will limit your daily tonnage. You should travel at a speed that will let you do a clean job of picking up the windrow and feeding it to the baler in a steady, uniform flow. A good rule to follow is to first determine the correct throttle setting on the tractor or engine (if the baler is engine driven) to maintain a plunger speed of 75 strokes per minute. Then starting in low gear, determine the best gear speed which crop and field conditions permit. Change gears if it is desired to slow down or speed up in varying windrow conditions; do not throttle the tractor engine.

Note: Disengage the tractor power take-off shaft when making sharp turns at the ends of the field to avoid excessive strain and vibration being imposed on the drive shaft.

PICKUP HEIGHT

Adjust the height of the pickup cylinder so that its teeth will pick up the windrow cleanly without striking the ground. You can raise the cylinder so that its spring teeth are about 3-1/2 inches above the ground, or lower it so they work just above the ground by adjusting the pickup cylinder adjusting lever "2" (Illust. 13B). A height of about 1 inch above the ground (Illust. 13) gives you a good pickup height for most baling conditions. Light crops require lower pickup settings than heavy crops; however, you should always keep the cylinder as high as you can and still get all of the crop. The teeth bend and wear quickly when they dig into the ground. See Illust. 13A. They also pick up dirt and rocks with the crop when set too low.

PICKUP COVER

The pickup cover "1" (Illust. 13B) is mounted over the pickup cylinder. It directs the crop to the underside of the floating auger to insure uniform feeding to the bale chamber. It also prevents the crop from being blown off the pickup cylinder or out over the auger on windy days.

Adjustment is provided by changing the pickup cover adjusting plate (Illust. 14) at the inner end of the pickup cover support bar. This adjusts the clearance between the pickup strippers and the pickup cover tines, which should be 2 to 4 inches. If the pickup cover "1" is set too high, material may flow over the top of the auger.

Do not operate the baler without the pickup cover. When you are doing stationary baling, leave the cover on! Feed the crop to the front of the cylinder so it will pick it up and send it under the pickup cover to the auger.

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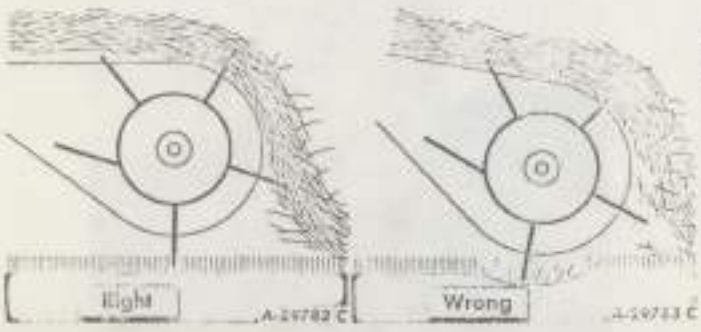
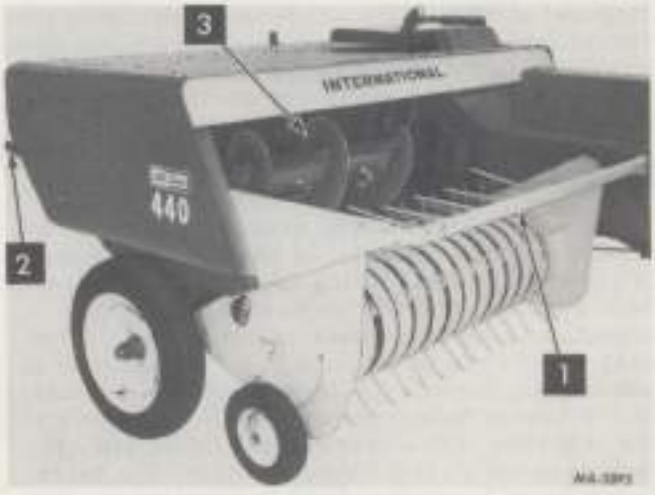


Illust. 13
Cylinder pickup teeth should be set as high as possible without leaving any of the crop on the ground.

Illust. 13A
The teeth should not dig into the ground. They bend, wear quickly, and pick up dirt and rocks with the crop.



1 - Pickup cover
2 - Pickup cylinder adjustment lever
3 - Pickup feeder auger

Illust. 13B
The pickup cover is adjustable for varying baling conditions. Never operate your baler without it.

OPERATION OF YOUR BALER

PICKUP COVER - Continued

Illust. 14

PICKUP FEED AUGER

The pickup feed auger "3" (Illust. 13B) floats, therefore adjusting itself automatically to varying amounts of material. This assures positive feeding to the packer fingers. No mechanical adjustments are necessary. See Illust. 13B.

PACKER FINGERS

Three packer fingers move the incoming hay from the auger into the bale chamber. **Packer fingers with relief guide rod:** A spring (Illust. 14B) protects the packer fingers from damage by solid objects or an overcharge of hay.

Packer fingers are adjustable to give uniform bales in varied hay conditions. The adjustment is made by changing the length of the fingers' stroke. This changes the distance they travel into the bale chamber. Three holes are provided on the fingers "A" (Illust. 14A and 14B). Different stroke lengths are obtained by setting the pin in different holes. The longest stroke is provided when the pin is in the lowest hole. The top hole provides the shortest stroke.

Curved bales or wire breakage can result when too much material is packed on one side. If material is not coming far enough into the bale chamber and the packer fingers are mounted on the right side of the bearing (Illust. 14A), set the pin in a lower hole. If material is not coming far enough, even though the pin is in the lowest hole, move the packer fingers to the left side of the bearing "B" (Illust. 14B). If this does not correct the condition, the baler is probably being overfed by traveling too fast or trying to pick up a windrow which is too heavy.

When changing the packer fingers from the right to the left side of the bearing, or when changing from the left to the right side, the short finger must always be mounted to the front of the baler.

Illust. 14A
Packer finger adjustment changes the distance fingers travel into bale chamber. (Packer fingers shown on 430 Baler).

Packer fingers with relief guide rod: The relief guide rod (Illust. 14B) is also threaded to provide additional adjustment, if required. **Note:** This adjustment is intended to be used for rod lengths between 21 and 22 inches, center to center. Damage to the top sheets can occur if these measurements are exceeded.

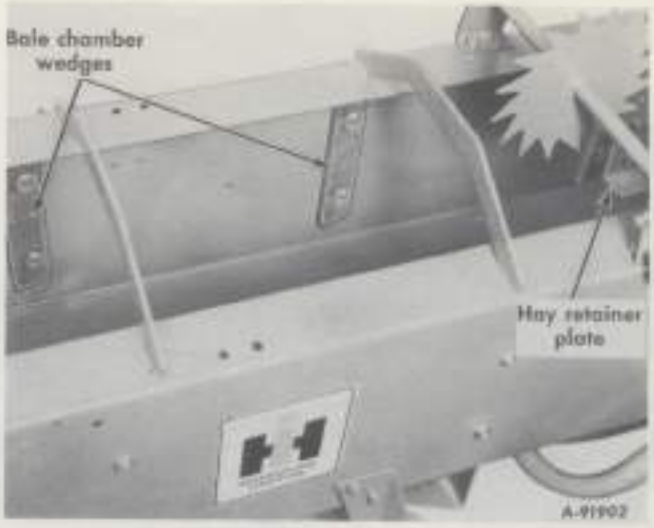
Check the bales and adjust the packer fingers so the bale chamber is filling evenly. Light, fluffy materials usually require a longer stroke to carry them well into the chamber. Heavy, coarse material usually requires a shorter stroke.

Illust. 14B
Packer finger adjustment changes the distance fingers travel into bale chamber. (Packer fingers shown on 440 Baler).

BALE CHAMBER TENSION

Tension Adjusting Screws

Illust. 15
Bale chamber tension is adjusted by two tension adjusting screws at rear of bale chamber (Top and bottom bale chamber tension shown on 440 Baler). 430 Baler is similar.



Illust. 15A
Additional bale tension adjustment can be obtained by removing bale chamber wedges.

The bale chamber tension requires periodic adjustment to maintain uniform bale density. Size of windrows, moisture content, and the condition of the crop affect bale density. In general, light, fluffy materials require more tension than heavier, damp materials.

Check bale density regularly during the baling operation, and make adjustments when necessary. Bales should not be too compact. They do not cure well, and they cause excessive tension on the twine or wire between bales. This may also result in twine or wire breakage over the breast plate finger or wire base plate finger.

Normal adjustments in bale chamber tension are made by turning the two tension adjusting screws "A" (Illust. 15) on the rear of the chamber. Be sure to adjust both tension adjusting screws the same number of turns.

If, under adverse baling conditions, it is found that the bale tension adjustment does not reduce bale density sufficiently, additional adjustment can be obtained by removing bale chamber wedges (Illust. 15A). Wedges should be removed in pairs, beginning with the rear pair. A pair consists of the wedges directly across the chamber from each other.

If excessive "build-up conditions", (due to high moisture content or insect damage) are present, remove the stationary wedges (See Illust. 19B) under the plate.

When replacing wedges, be careful to mount them with the high side toward the rear. Do not remove the hay retainers. They are necessary to keep the partially formed bale compressed.

Hydraulic Bale Tension Device

The hydraulic bale tension device controls the density and weight of the bales being formed in the bale chamber.

When starting to bale, turn the hand control pressure relief valve "2" (Illust. 16) counterclockwise as far as possible to remove all the pressure from the tension channels. Operate the baler until the bale chamber is full of hay and then adjust the hand control pressure relief valve slowly clockwise, with the baler running, until the gauge "1" (Illust. 16) reads approximately 50 pounds pressure. Resume baling and after a minimum of six bales have been produced by the machine, check the density and weight. If the bales are not of the desired density and weight, adjust the hand control pressure relief valve. Check several bales at each new setting until the desired bale weight is obtained.

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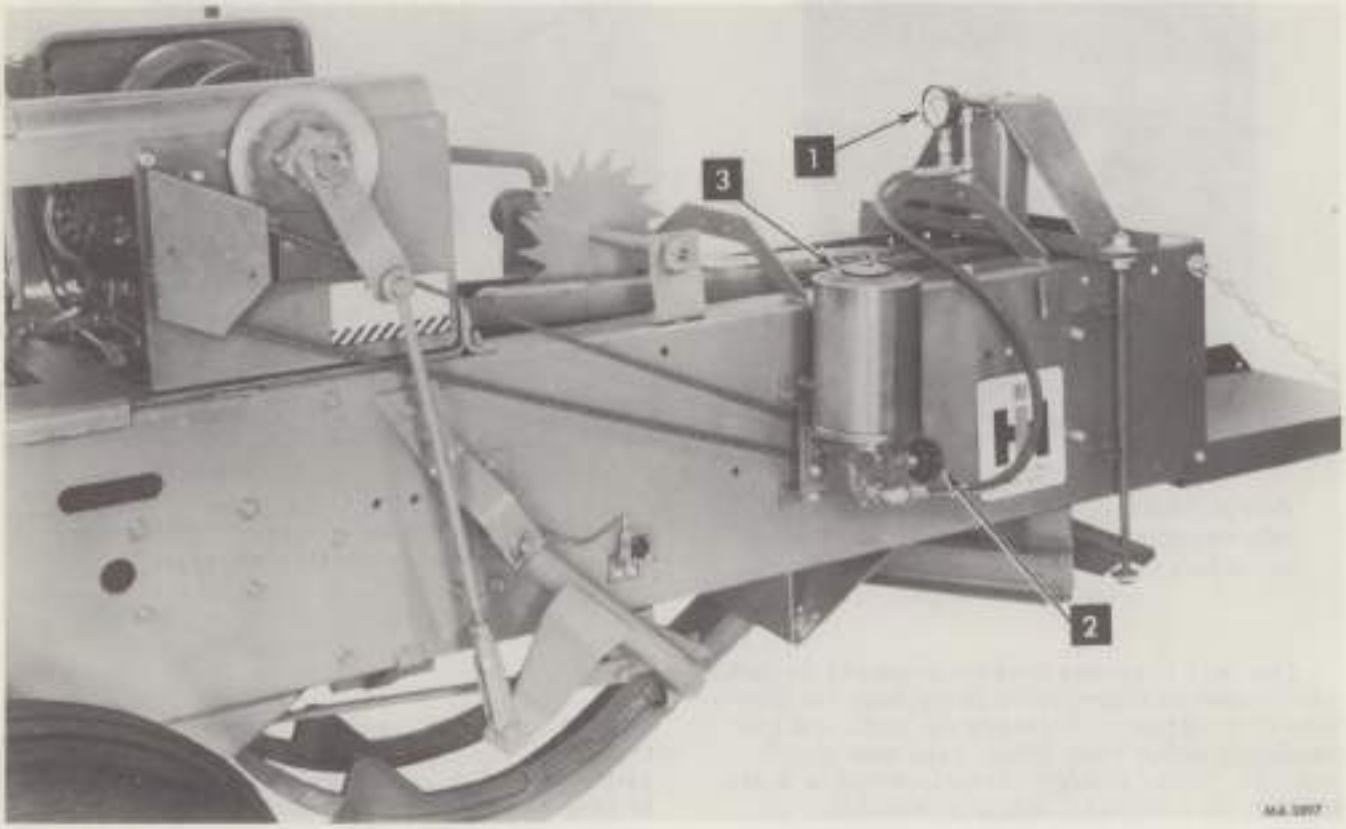
OPERATION OF YOUR BALER

BALE CHAMBER TENSION - Continued

Hydraulic Bale Tension Device - Continued



1 - Gauge 2 - Hand control pressure relief valve 3 - Hydraulic pump and reservoir

Illust. 16
Hydraulic bale tension device assembled on the 430 All Twine Baler.

The pressure varies approximately 65 pounds for a 1/4 turn of the hand control pressure relief valve.

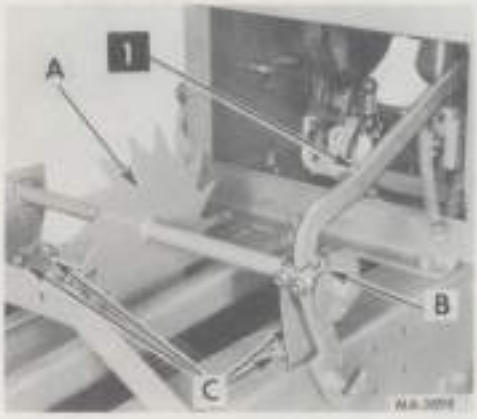
Experience has shown that a pressure of 200 to 400 pounds gauge pressure will take care of most baling conditions, but operator observance of the gauge settings for his particular area, season, and crop will bring the best results in baling.

The hydraulic reservoir "3" (Illust. 16) must be checked at intervals to see that the proper fluid level is maintained at all times to obtain satisfactory results. The reservoir must be filled with IH Hy-Tran ® fluid or equivalent to the mark shown on the side of the reservoir when the cylinder is completely retracted. **Note:** If fluid is used which does not meet requirements of IH B-6 specifications, International Harvester will not be responsible for substandard performance.

When a new baler is placed in operation and the bales drag through the bale chamber (caused by the paint or rust on the inside of the bale chamber sides or under adverse baling conditions) and it is found that the hydraulic bale tension device may not reduce bale density and weight sufficiently, additional adjustment can be obtained by removing the bale chamber wedges (Illust. 15A). Wedges should be removed in pairs, beginning with the rear pair. A pair consists of the wedges directly across the chamber from one another.

When replacing wedges, be careful to mount them with the high side toward the rear. Do not remove the hay retainers. They are necessary to keep the partially formed bale compressed. However, if the stationary wedges (Illust. 19B) cause a material buildup under the plate, they should be removed.

BALE LENGTH



1 - Trip rod

Illust. 17

The length of the bale is controlled by a metering wheel "A" (Illust. 17), with projections that contact the material in the bale chamber. The metering wheel can be reversed if desired.

To make the bale longer, move the trip rod "1" (Illust. 17) and set the collar "B" up; to make the bale shorter, lower the collar.

If all your bales are overlength, the metering device is not working properly. The bale density may be too low to turn the metering wheel consistently or there may be a binding that keeps the metering wheel from turning and operating the trip clutch. The metering wheel shaft must be kept square with the bale chamber to prevent binding.

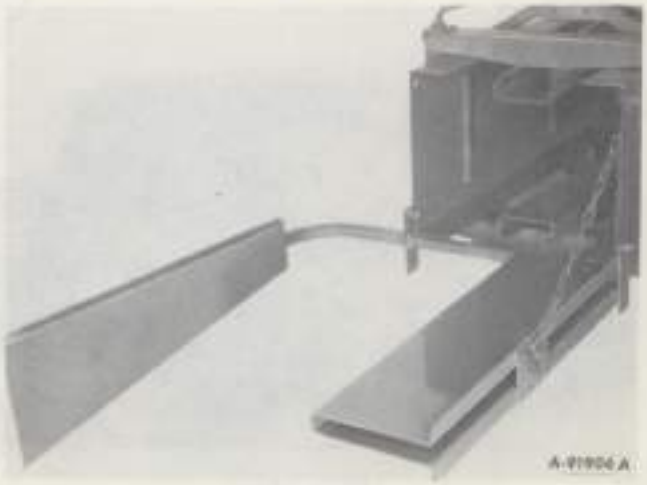
BALE CHAMBER EXTENSION

Illust. 17A

The bale chamber extension (Illust. 17A) causes the bale to drop directly behind the bale chamber.

BALE TURNER

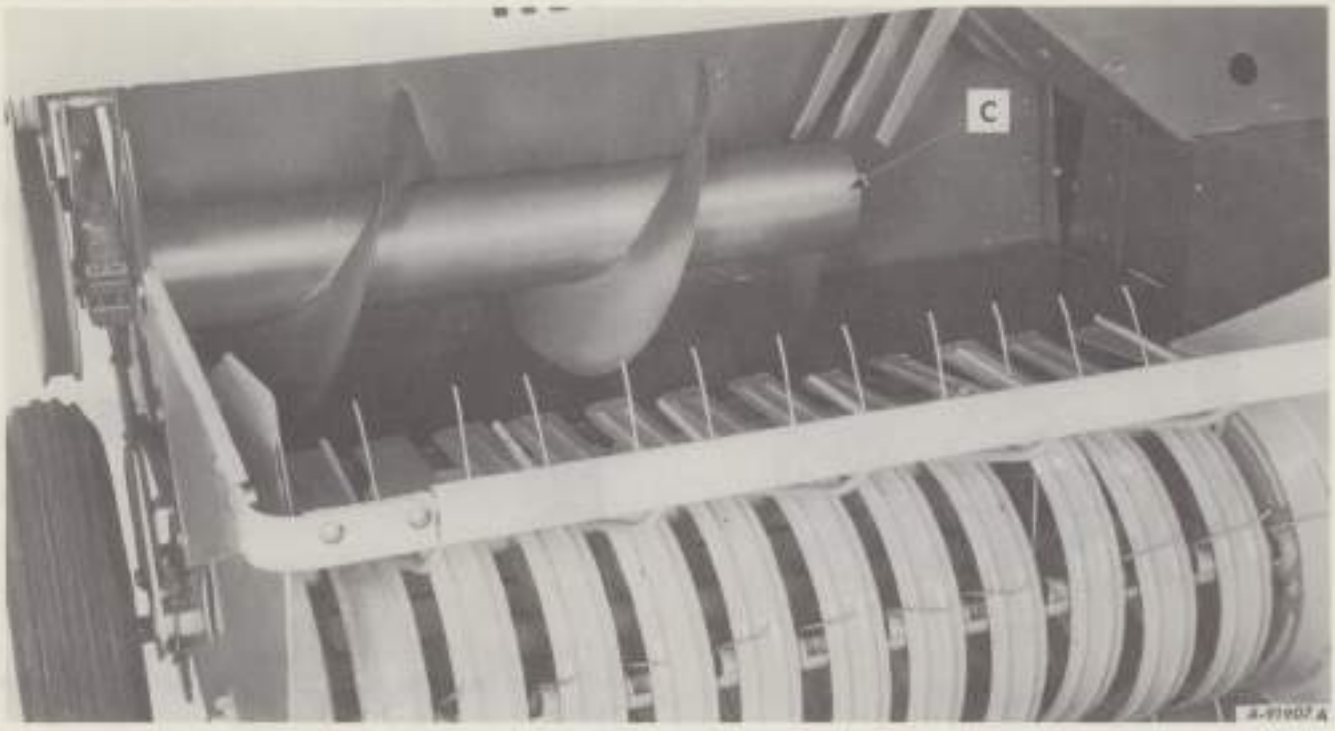
The bale turner (Illust. 17B) drops each bale on its side. This keeps the twine or wire off the ground, preventing deterioration of the twine or rusting of the wire, if bales are left in the field for a time. Dropping bales on the side also puts them in a better position for picking up with an automatic bale loader. The bale turner may be assembled to turn the bales to the left (as shown) or to the right by removing the bolts and rotating the turner 180 degrees and reassembling.



Illust. 17B

CARE OF YOUR BALER

PICKUP AND FEEDER



Illust. 18
Pickup unit showing pickup cover, pickup teeth, strippers, and feeder of the baler showing V-belt drive, spiral auger, cross conveyor platform, and packer fingers.

Auger

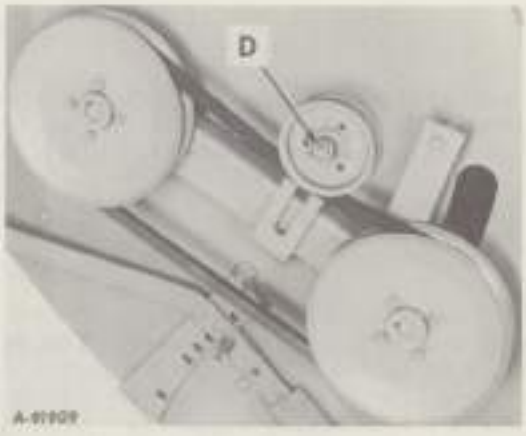
The spiral flights on the auger "C" (Illust. 18) must be kept smooth. Rough edges will catch hay and cause it to wind. File out nicks in the edges of the spiral flights when they appear.

In order to adjust the auger drive belt, the auger shield end may be removed by loosening bolts "F" and removing bolts "E" (Illust. 18A).

The auger drive belt (Illust. 18B) is adjusted by loosening nut "D" on the idler pulley bolt and moving the idler pulley bolt in the support until the belt is tight. Then tighten nut "D" on the idler pulley bolt. The V-belt also serves as a safety device on the auger. It slips if the auger is too heavily loaded.

V-Belt Drive

Illust. 18A
Removal of auger shield end.



Illust. 18B
Auger drive belt adjustment.

PICKUP BALANCE SPRING

Illust. 19
430 Baler shown.

The pickup balance spring (Illust. 19) protects the pickup from damage, which could result from striking objects in the field. This spring allows the pickup to raise and lower itself when coming in contact with immovable objects.

Adjust the pickup balance spring until the pickup cylinder adjustment lever lifts the pickup cylinder easily.

PICKUP DRIVE

The pickup cylinder is power driven. When windrows are heavy or uneven the power driven pickup cylinder will help tear a heavy windrow apart and spread it out as it is fed to the auger.

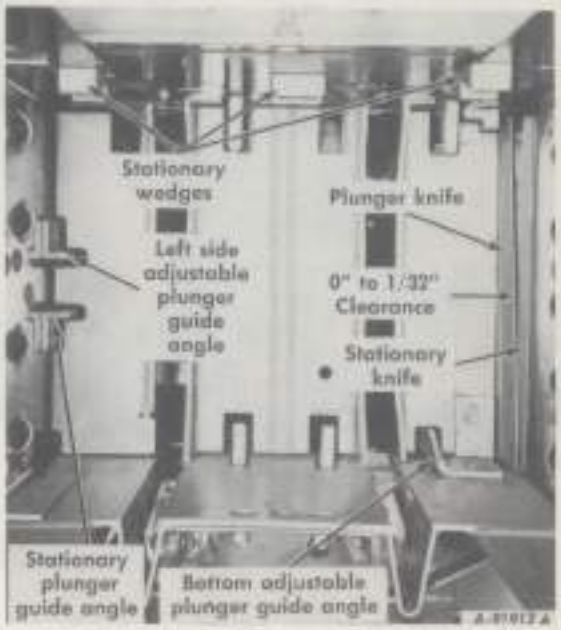
The power drive also allows you to take the tractor out of gear and keep the pickup cylinder running at normal speed to pick up heavy bunches that might otherwise push in front of the pickup. For stationary baling, use the power drive and feed the material being baled to the front side of the pickup cylinder.

Adjust the main pickup drive chain by loosening the tightener block mounting bolt and exerting thumb pressure against the block. Retighten the tightener block mounting bolt. See Illust. 19A.

Illust. 19A

BALE CHAMBER AND PLUNGER

Plunger Knife Clearance



Illust. 19B
This head-on view shows the relationship of plunger hay knife to stationary knife. Clearance between these baler parts may range from zero to 1/32 inch. (Twine baler shown)

The clearance between the plunger hay knife and the stationary knife must be held to a maximum of 1/32 inch (Illust. 19B). To check this clearance, move the plunger to a position which will place the plunger knife along side the stationary knife. Use a feeler gauge to check the clearance. Permissable clearance ranges from zero to 1/32 inch.

Clearance is adjusted by loosening the six bolts "A" and "B" (Illust. 20) which secure the bottom adjustable plunger guide angle. Move the angle by the adjustable eye bolts at "A" to obtain the zero to 1/32 inch clearance at the bottom of the plunger and stationary knives.

You should now check the knife clearance at the top of the plunger and stationary knives to see if they are within the zero to 1/32 inch clearance. If the clearance is not in the range of zero to 1/32 inch, you should proceed as follows:

1. Loosen the plunger dual roller cap screw at "C". See Illusts. 20A, 20B, and 21.

2. Loosen the plunger adjusting screw locking nut "E" several turns.

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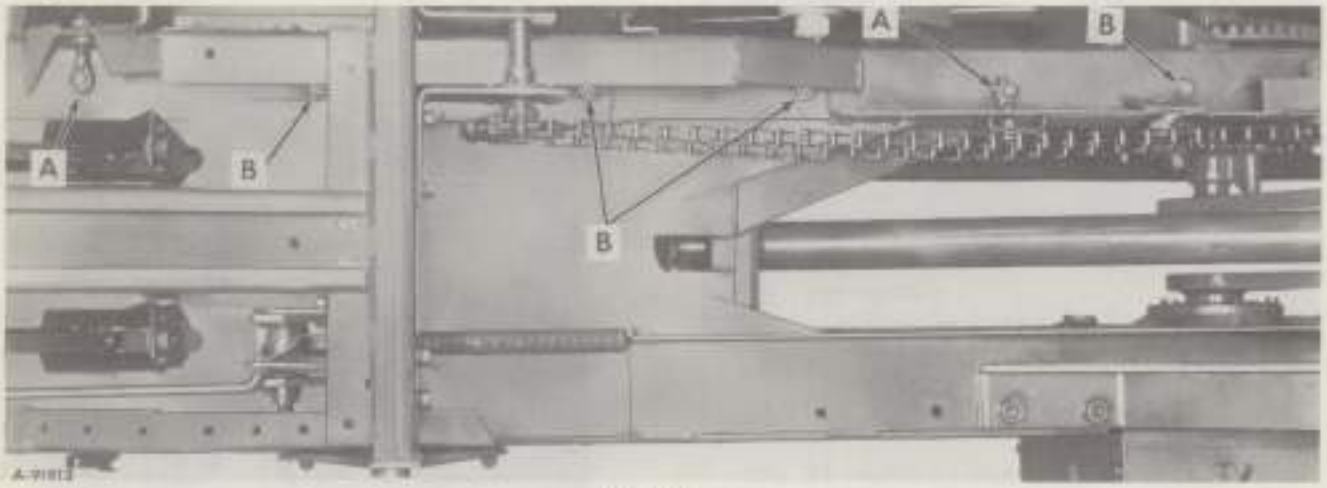
BALE CHAMBER AND PLUNGER - Continued

Plunger Knife Clearance - Continued



Illust. 20
View from underneath the baler showing the bolts and eyebolts to loosen to secure the bottom plunger adjustable plunger guide angle. (Twine baler shown)

3. Move the plunger adjusting screw locking nut "D" in the direction that is required to bring the top of the plunger and stationary knives to the zero to 1/32 inch clearance (left to increase clearance and right to decrease clearance). Check the plunger and stationary knives to see if they are parallel and that the clearance is zero to 1/32 inch.

4. When the clearance is obtained, tighten the plunger roller cap screw "C" and the plunger adjusting screw locking nut "E".

5. Tighten the rear bolt "A" near the stationary knife slightly, turn the flywheel by hand until the plunger is at the forward end of the stroke, and then pull the bottom adjustable plunger guide angle at the front bolt "A" until the angle is against the plunger thrust roller. Tighten all the bolts at "A" and "B".

6. Turn the flywheel until the plunger has made a complete cycle to see if the plunger is binding; if there is binding, readjust the bottom adjustable plunger guide.

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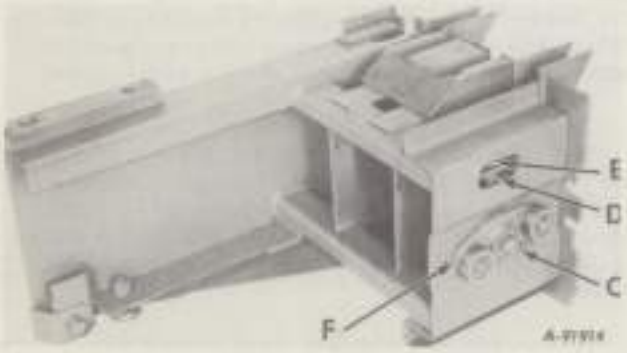


Illust. 20A
Plunger adjusting screw and lock nuts and plunger adjusting slide block.

Illust. 20B
Plunger adjusting screw and lock nuts.

BALE CHAMBER AND PLUNGER - Continued

Plunger Adjusting Slide Block

Illust. 21
Loosening the plunger slide cap screw "C" and the plunger adjusting screw locking nut "E" and "D" for obtaining plunger knife clearance of zero to 1/32 inch clearance. (440 Baler shown)

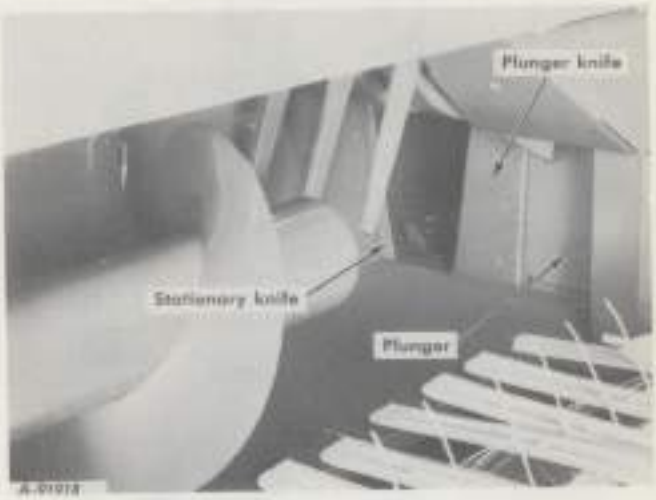
Wear on the left side adjustable plunger guide angle and stationary plunger guide angle can be corrected by loosening the six bolts "G" (Illust. 21). Place the plunger all the way to the front of the baler and adjust the front end of the adjustable plunger guide angle to 1/64 inch clearance over the plunger dual roller, then tighten the front bolt "G". Place the plunger all the way to the rear of the baler and adjust the rear end of the left side adjustable plunger guide to 1/64 inch clearance over the plunger dual roller, then tighten the other five bolts "G". Turn the flywheel by hand until a plunger cycle has been made to see if there is a binding. If there is a binding, readjust as outlined above.

Shimming Plunger Upper Right Block

Wear on the plunger right upper block can be corrected by inserting shims as required at "A" (Illust. 21A) between the plunger wood block and the plunger. The clearance between the wooden block and the top of the bale chamber should be zero to 1/64 inch. The shims may be obtained from your International Harvester dealer.

Illust. 21A
Shims between the wood block and plunger.

Sharpening Plunger and Stationary Knives



Illust. 21B
Here the plunger hay knife is shown in position for removal through the feed opening. It is attached to the plunger by means of three bolts (nuts are on the inside of the plunger).

The plunger knife and stationary knife must be kept sharp. A dull knife, which doesn't slice the hay cleanly, increases the load on the baler and makes a ragged bale.

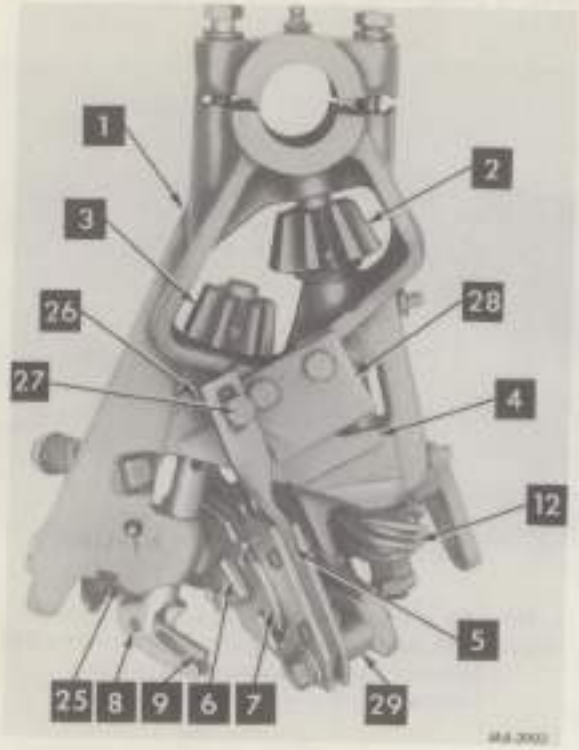
You can remove the plunger hay knife for sharpening while the plunger remains in the bale chamber. Move the plunger into a position which brings the plunger knife opposite the feed opening (Illust. 21B). Place a wedge (a screw driver or chisel point will do) under face of plunger on knife side to prevent plunger dropping when roller is removed. Next unscrew hex-head cap screw securing roller to knife and remove nuts from the three plow bolts which attach knife to plunger. These are all located inside the plunger. The knife may now be removed through the feed opening.

METERING WHEEL ADJUSTMENT

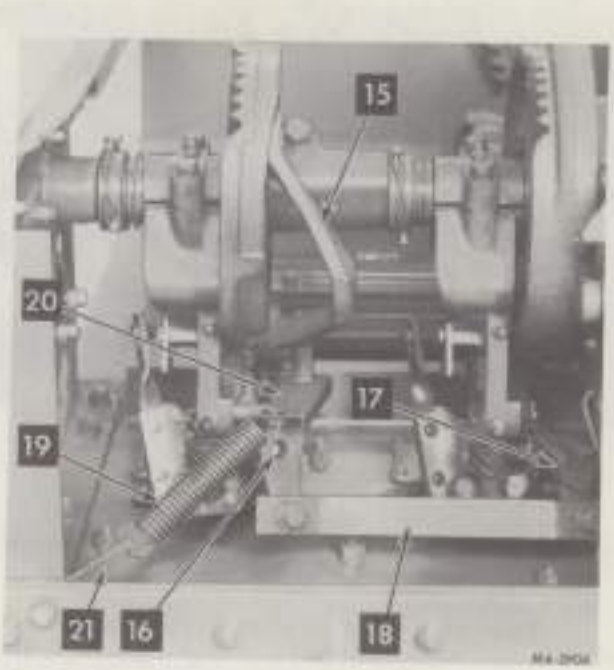
The metering wheel should be located so that the trip rod falls freely when the knotter or twister cam resets the trip rod. To make this adjustment, trip the knotter or twister and rotate the assembly until the trip rod reset cam has moved the trip rod to its most rearward position. Loosen bolts "C" (Illust. 17) and move brackets until proper adjustment is obtained. Retighten bolts making sure that the left and right brackets are positioned so that the meter wheel shaft is 90 degrees to the bale chamber.

CARE OF YOUR BALER

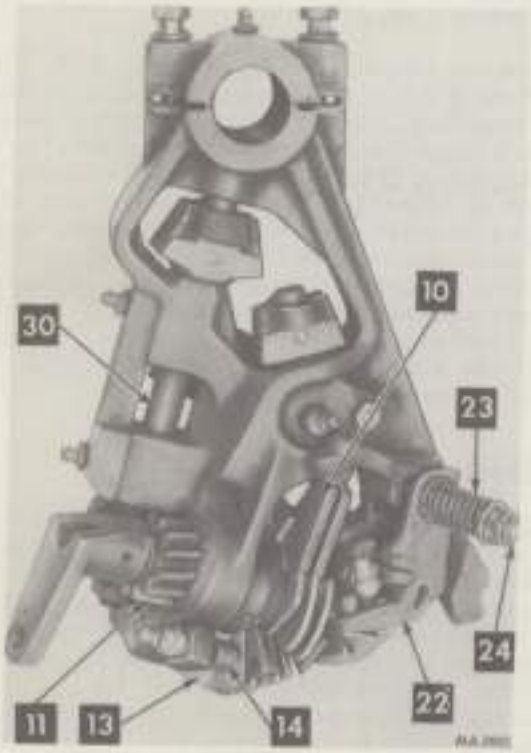
ALL TWINE BALER KNOTTER NOMENCLATURE



Illust. 22



Illust. 22B



Illust. 22A

1. Knotter frame w/cap, bushings and wearing piece.
2. Twine disk pinion.
3. Knotter hook pinion.
4. Knotter frame gauging surface.
5. Spring loaded keeper blade assembly.
6. Swinging knife shaft w/replaceable knife blade.
7. Self cleaning triple twine disk assembly.
8. Knotter hook.
9. Knotter hook jaw.
10. Disk cleaners.
11. Disk helical pinion tube.
12. Tapered disk timing pinion.
13. Twine end retainer spring.
14. Twine end retainer helper spring.
15. Knife driving cam.
16. Left knife actuating arm w/cam follower.
17. Right knife actuating arm.
18. Knife connecting link.
19. Knife return spring.
20. Knife return spring clip.
21. Knife spring anchor.
22. Knotter hook jaw closing cam.
23. Knotter hook jaw closing cam spring.
24. Closing cam spring bolt.
25. Knotter hook jaw opening wear piece.
26. Keeper blade adjusting spring.
27. Keeper blade spring adjusting bolt.
28. Needle guide.
29. Keeper blade pivot.
30. Cord holder drive shaft.

TYING MECHANISM

The All Twine Baler Knotters on your baler were properly timed and adjusted when they left the factory. The knotters will accept all sizes of sisal or plastic twine without requiring adjustments. Even when changing from the thickest sisal to the thinest plastic twine, adjustments are seldom necessary. This is made possible by the spring loaded keeper blades and the triple disk knotter design. The size and weight of bales being formed is limited only by the tensile strength of the twine used. If the knotters should fail to operate properly, only minor adjustments need to be made to correct the malfunction.

The needles and the various knotter components work in close coordination. Servicing and adjusting one part may have a chain reaction that affects the operation of several parts of the knotter. If an adjustment is made, it is important to carefully check all parts involved. A good practice is to turn the baler through a tying cycle by hand whenever adjustments are made to insure that all parts function properly.

KNOTTER OPERATION

The knotter mechanism is "threaded" by operating it through a tying cycle. This places the twine in the twine disks and over the breast plate finger ready for the formation of a bale. The incoming hay is encircled by the twine which is pulled through the needles and twine guides as the bale is formed in the chamber.

1 - Needle 2 - Disk 3 - Breast plate finger

Illust. 23
The needle is up and lays the twine in the wide slot as the disks begin to turn.

1 - Knotter hook 2 - Breast plate finger

Illust. 23A
Needle starting down, disk turning hook removing twine from breast plate finger.

After the bale is formed, the trip operates and the tying cycle starts. The needles "1" (Illust. 23) bring the twine up and lays it in the shallow, wide notch in the twine disk "2" (Illust. 23). The triple disk assembly then starts to rotate and the spring loaded keeper blades release the twine over the bale (disk twine). This twine, over the bale, is still partially held by the narrow notch in the disk and the twine end retainer spring with additional retention being provided by the twine end retainer helper spring. This insures that the twine (disk twine) will be in the correct position for the knotter hook.

1 - Knotter hook 2 - Needle 3 - Knife

Illust. 23B
Knot is completely formed before disk twine is cut.

CARE OF YOUR BALER

KNOTTER OPERATION - Continued

1 - Knotter hook

Illust. 24
Tying mechanism in home position; knot being stripped from the knotter hook by incoming charges of hay.

As soon as the disk assembly and keeper blades have secured the incoming twine for the next bale, the knotter hook "1" (Illust. 23A) starts to rotate and sweeps both the disk and the needle twines from the breast plate finger 1/2" (Illust. 23B).

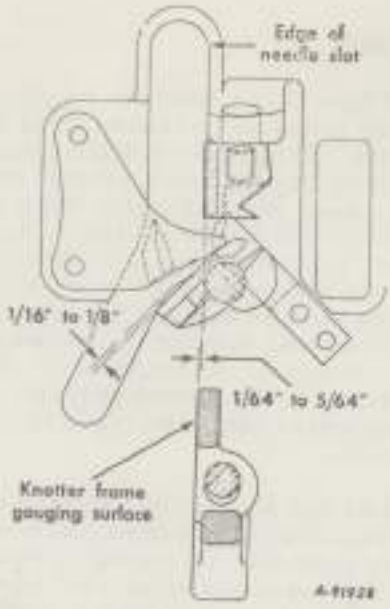
As the knotter hook "1" (Illust. 23C) rotates, it wraps both twines around its body and then grasps the two ends nearest the disk assembly as the knotter hook jaw closes. After the knotter hook jaw closes, the swinging twine knife "3" (Illust. 23C) cuts the disk twine retained in the shallow wide disk notch. The new twine in the narrow notch is not cut since the twine is held away from the blade by the notch in the swinging knife arm.

The action of the trip arm releases the drive as the knotter reaches the home position. In order for the knot to be completed, the baler feeding must be continued. This incoming hay pushes the finished bale on through the chamber and the twine around the bale is stripped or pulled off of the knotter hook "1" (Illust. 24). The knotter hook jaw pulls the bow in the knot. The bow is pulled from under the jaw by more incoming hay, finishing the knot and forming the bale.

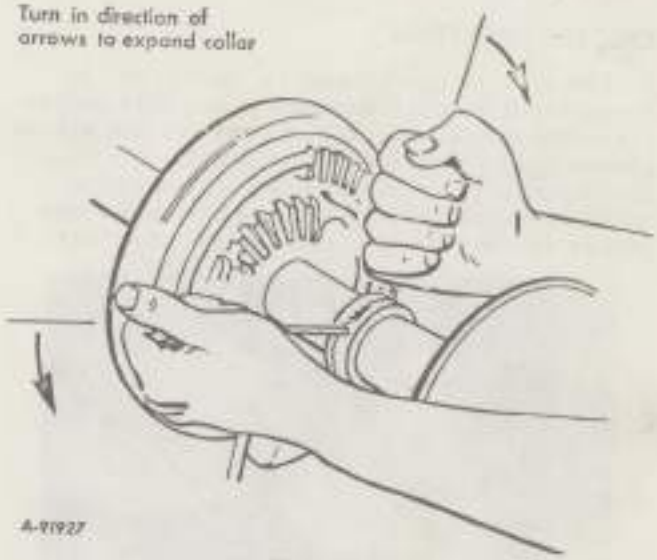
KNOTTER POSITION

The knotters must be positioned correctly to the breast plate, as the breast plate is an integral part of the tying mechanism.

Only two dimensions are needed to correctly locate the knotters.



Illust. 24A
Correct position of the breast plate finger and twine release spring and positioning of related parts to the needle slot when in the "home" position.



Illust. 24B
Adjusting collars on left knotter shaft.

1 - Pins
Illust. 24C – Wiring the pins.

GAUGE SURFACE TO BREAST PLATE

Left to right location - The milled gauge surface of the knotter frame should be 1/64 inch to 5/64 inch to the left of the needle slot in the breast plate. **See Illust. 24A.**

Adjustment of this dimension is made by shifting washers on the knotter shaft. **See Illust. 27.**

KNOTTER ADJUSTING COLLARS

Special adjusting collars are provided for quick adjustment of the knotter to the knotter drive gear and of the gauge surface to breast plate relationship. **(See Illust. 24B).**

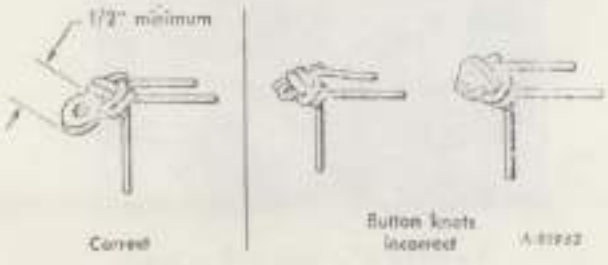
Use two punches to expand the collar to force the knotter against the knotter drive gear.

The distance between the right and left knotter can be increased by expanding the collar next to the right knotter and repositioning the left hand driving cam.

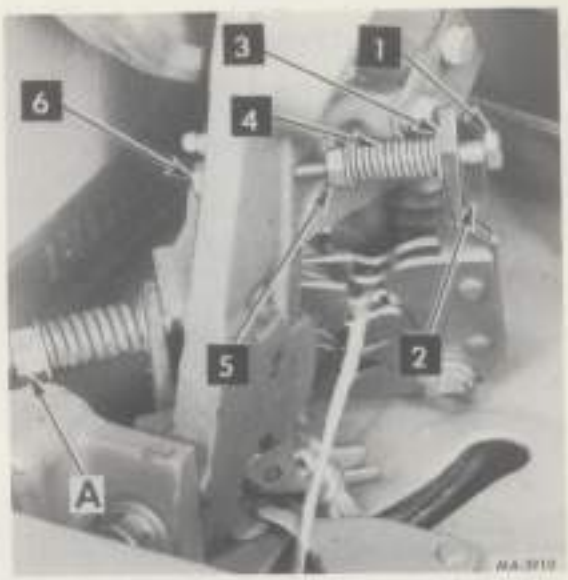
After adjustment, the collars should be wired about the two pins "1" **(Illust. 24C)**, wire from pin to pin in direction punches were turned to hold the collar halves in the set relationship.

KNOTTER HOOK

The knotter hook is opened and closed by means of two cams. The opening cam is a stationary wear piece and non-adjustable. The closing cam is movable and spring loaded. The amount of closing pressure applied by the spring determines the presence and length of the bow knot. **See Illust. 25.** Tighten nut "A" to increase bow length or loosen nut "A" to shorten bow length. **See Illust. 25A.**



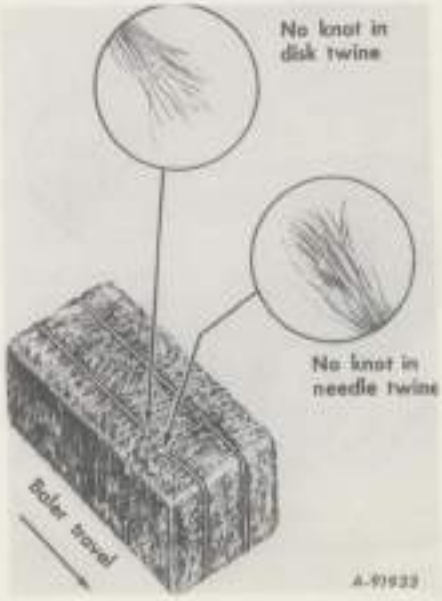
Illust. 25



1 - Keeper blade adjusting bolt.
2 - Dimension is 1/16 inch minimum
3 - Keeper blade arm
4 - Keeper blade spring.
5 - Lock nut
6 - Jam nut

Illust. 25A
Knotter hook adjustment; Keeper blade adjustment.

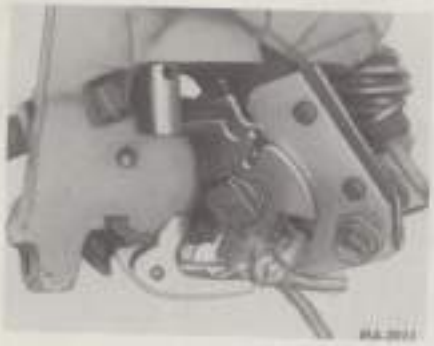
Too little pressure can result in short or "button" knots. Button knots will pull apart when the twine tightens up on the bale, or later when handling bales. Misses will appear as shown in **Illusts. 25, 25B and 26.**



Illust. 25B
No knot in either end.

Continued on next page.

KNOTTER HOOK ADJUSTMENT - Continued



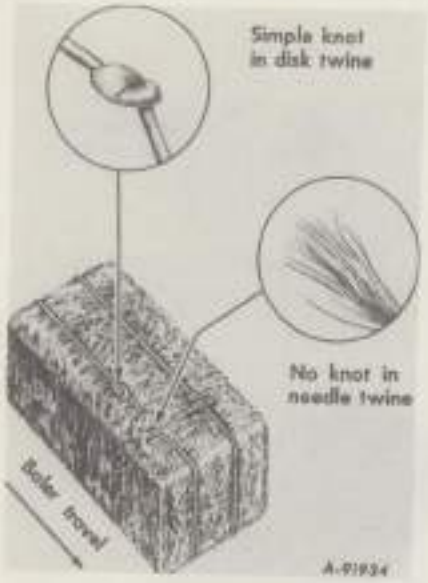
Illust. 26
Disk twine broken; knot did not strip.

Too little pressure can result in no knot in the needle (front) twine. Low closing pressure will not close the jaw completely and will allow the needle twine to be lost from the jaw and it will not be included in the bow. See Illust. 26A.

Too much pressure will not allow the knot to strip, thereby breaking the disk twine (top twine) at the knot and leaving the knot on the hook. See Illust. 26.

If the knot is left on the hook, succeeding knots will be missed, and the result will be several twines wrapped around the hook. See Illust. 26B.

The correct setting will give knots with 1/2-inch bow loops.



Illust. 26A
Needle twine slip knot.

DISK TIMING

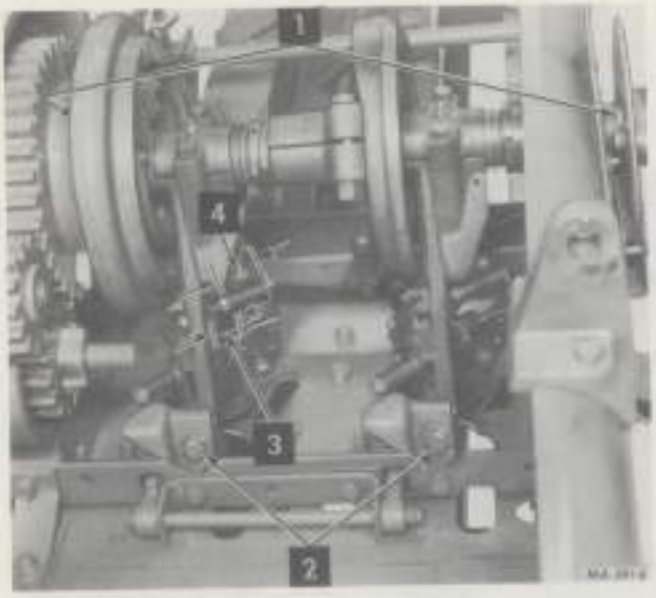
The knotters must be in the home position to time the disk assembly. Loosen the two nuts

Illust. 26B
Knot left on hook; succeeding knots missed.

"A" (Illust. 26C) locking the pinion to the tapered cord holder drive shaft. Use a brass rod or similar tool which will not damage the pinion and lightly rap the tool or rod with a hammer to break the tapered lock. Rotate the disk assembly until the timing hole in the rear disk is in line with the timing hole in the knotter frame. Insert a 3/16 inch diameter punch or drill "1" (Illust. 26C) in the timing hole in the frame and through the timing hole in the rear disk. Tighten the nut until the pinion is locked on the tapered shaft. (Torque the nut to 40 Ft.-Lbs.) Tighten the jam nut. Remove the 3/16 inch diameter punch or drill from the timing holes. This correctly times the disk assembly. Without twine in the disk the edge of the center disk is approximately 1/2 inch from the keeper blade assembly. Note: In operation the timing holes will not align.

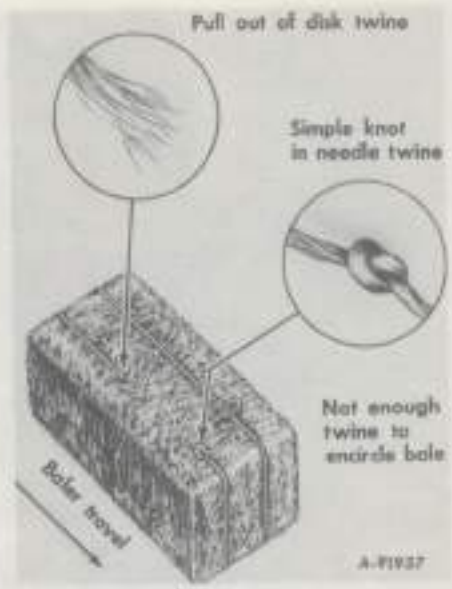
1 - Insert 3/16-inch drill or punch
Illust. 26C
Timing hole in knotter frame and disk.

KEEPER BLADE



1 - Adjusting washers
2 - Knotter anchor bolts
3 - Dimension is 1/2-inch
4 - Dimension is 1-3/8-inches

Illust. 27
Keeper blade adjustment.



Illust. 27A
Pull out.

If for any reason the keeper blade assembly has been removed, it must be reinstalled as follows. With the disk properly timed (See Disk Timing) without twine in the disk, adjust the keeper blade bolt until the distance from the knotter frame finished surface to the rear keeper blade is 7/16 to 1/2-inch shown at "3" **in Illust. 27. Note:** A piece of 1/2-inch steel can be used as a gauge. When this dimension is obtained, install the jam nut and tighten while holding the head of the bolt. The keeper blade adjusting nut should be set to give a spring length of 1-3/8 inches shown at "4" **in Illust. 27. Note:** This should be sufficient for more conditions.

KEEPER BLADE ADJUSTMENT

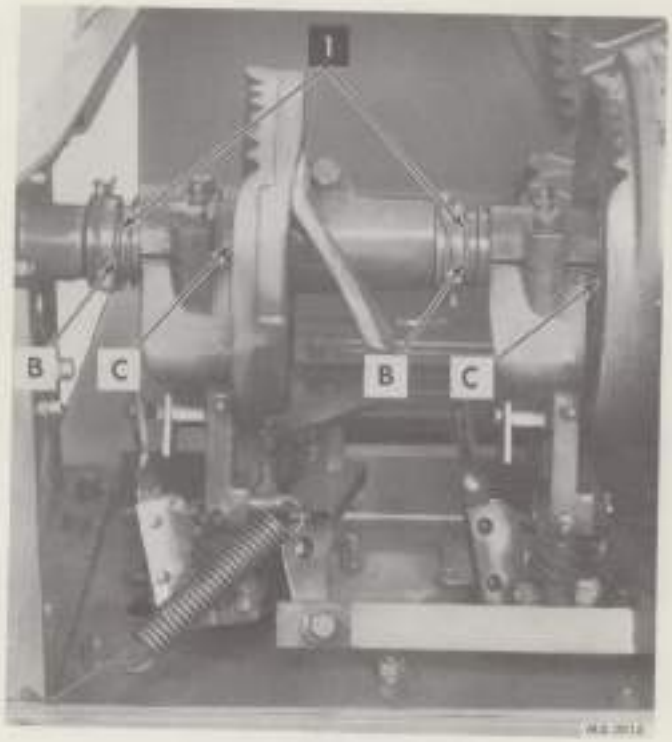
If the spring pressure on the keeper blade is too low, the disk twine will pull out of the disk while the bale is being formed. This twine will not be long enough to encircle the bale. A double crimp, made by the two keeper blades between the disks, will appear on the end of the disk twine. **See Illust. 27A.** Increase the spring pressure by tightening the lock nut while holding the head of the bolt.

If the spring pressure on the keeper blade is too tight, the miss will appear the same as **in Illust. 27A.** In some instances, the twine will not be long enough to encircle the bale but no knot will be in the disk twine, but instead of being pulled out of the disk, the end will be pinched off by the crimping action of the keeper blade. The twine will be lost in the same manner as a pull out, also short (1/2 inch to 1 inch) pieces of twine will be found on the breast plate below the disk. Decrease the spring pressure by loosening the lock nut while holding the head of the bolt.

A disk twine pull out will occur if the 1/16 inch minimum dimension "2" **(Illust. 25A)** between the keeper blade arm "3" **(Illust. 25A)** and the head of the keeper blade bolt "1" **(Illust. 25A)** is not maintained. **Note:** This dimension must be obtained with twine in the cord holder. With larger twines, this dimension will be greater than 1/16 inch. If a 1/16 inch clearance is not obtained, loosen the jam nut "6" **(Illust. 25A)** and adjust the keeper blade arm "3" to obtain the 1/16 inch.

DELAY SURFACE

Illust. 28
Measuring delay surface clearance.



1 - Adjustment shims

Illust. 28A
Delay surface adjustment.

Proper clearances of .001 to .010 inch between the knotter drive gear delay surface and the disk pinion and .001 to .020 inch between the knotter drive gear delay surface and the hook pinion insures proper positioning of the hook and disk in the home position.

To check the delay surface clearance, the knotter frames must be bolted in the operating position.

The clearances should be checked for excessive wear with a "feeler gauge". **See Illust. 28.**

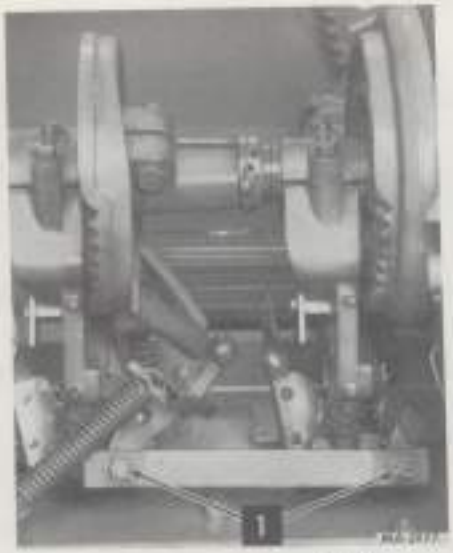
The "stack-up" of the knotter shaft assembly must be tight when checking for delay surface clearance. To decrease the delay surface clearances move the adjusting shims "1" **(Illust. 28A)** as necessary from "C" to "B". To increase the delay surface clearances move the adjusting shims "1" **(Illust. 28A)** as necessary from "B" to "C".

When the delay surface clearances are greater than the .020 inch clearance after all the shims have been removed from "C", replace the pinion. If the clearance is over .020 inch after replacing the pinion, the drive gear must be replaced also.

TWINE KNIFE

The twine knife blade should be changed when the blade becomes dull. A dull knife causes incomplete cuts which results in button knots, no knot in either end, or no knot in the needle twine. **See Illusts. 25, 25B and 26A.**

TWINE KNIFE - Continued



1 - Knife connecting link bolts

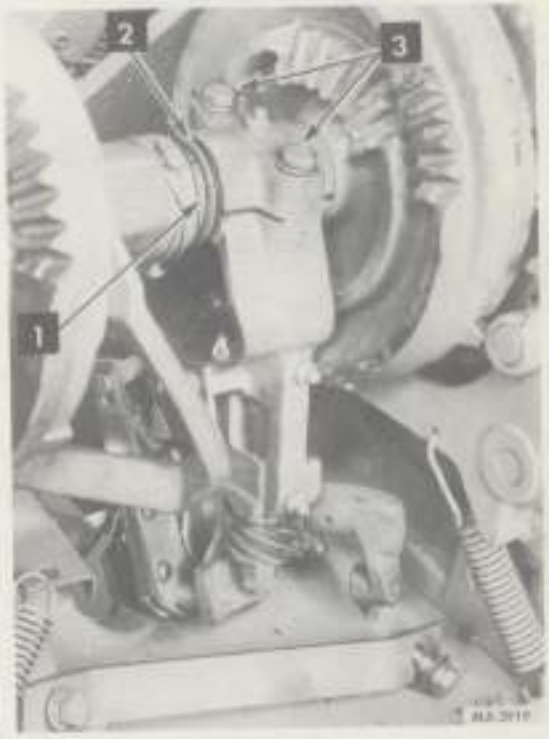
Illust. 29
Knife connecting link.

To replace the twine knife blade "1" (Illust. 29A), remove the knotter anchor bolt "2" (Illust. 27) and the knife connecting link bolt "1" (Illust. 29) from the frame to be serviced. Raise the frame and insert a punch "3" (Illust. 29A) through the hole in the knotter gear. Let the frame rest on the punch and loosen the twine knife blade screw "2" (Illust. 29A). Remove the dull blade and install a new blade. Tighten the twine knife blade screw. Remove the punch from the hole in the knotter gear and return the knotter to the operating position. Reinstall the knotter anchor bolt and the knife connecting link bolt previously removed.

1 - Twine knife blade
2 - Twine knife blade screw
3 - Punch

Illust. 29A
Replace twine knife.

REMOVAL OF KNOTTER FRAME ASSEMBLY

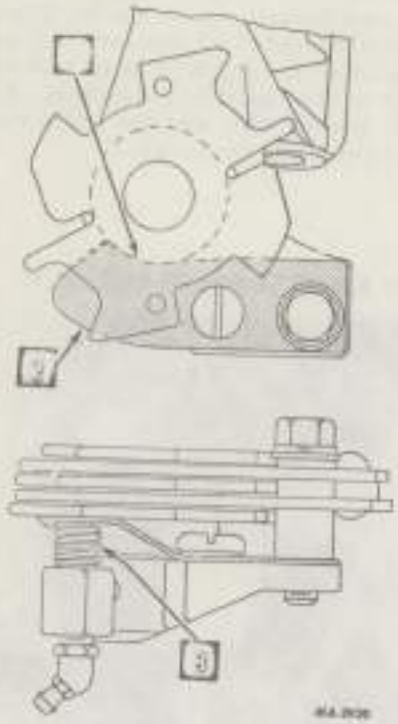


1 - Split spacer
2 - Two-piece snap ring
3 - Cap bolts

Illust. 29B
Knotter frame removal.

The knotter frame assembly is removed from the knotter shaft by removing the knotter anchor bolt "2" (Illust. 27) and the knife connecting link bolt "1" (Illust. 29). Remove the two-piece snap ring "2" (Illust. 29B) and the split spacer "1" (Illust. 29B) then remove the two cap bolts "3" (Illust. 29B) from the frame. **Note:** Knotter frames and caps are not interchangeable. The cap must remain with the frame from which it was removed. The number on the cap and the number on the frame must match and be on the same side when reassembled.

TWINE END RETAINER SPRING



1 - Spring must fit snugly about hub diameter
2 - Twine end retainer spring
3 - Twine end retainer helper spring

Illust. 30

The function of the twine end retainer spring "2" (Illust. 30) is to hold the disk twine end after the disk has rotated releasing the twine from the keeper blades, and until the hook has completed its rotation and closed on both ends of the twine. If the spring is broken or improperly mounted, it will not perform this function and disk twine slip knots will occur. There will also be a noticeable build-up of loose twine fibers in the knotter area if the spring is not functioning properly. The twine end retainer helper spring "3" (Illust. 30) assists the twine end retainer spring in its function.

TWINE NEEDLE ADJUSTMENT

Illust. 30A
Needle adjustment.

Measure the projection of the needle tips past the rear edge of the knotter frames with the needles at the highest position. The distance should be 1-3/8 to 1-9/16 inches as shown at "A" (Illust. 30A). There must not be more than 1/8 inch variation between the two needles.

If the needles "3" (Illust. 31) do not rise far enough, shorten the needle pitman "1" (Illust. 31) by removing the pin from the needle pitman yoke "2" (Illust. 31), loosen the jam nut "4" (Illust. 31) and adjust the yoke. If the needles rise too far, it is necessary to lengthen the needle pitman.

STORING THE BALER

Shelter the machine in a dry place.

Thoroughly clean the baler inside and out. Trash and dirt will draw moisture and cause rust.

Clean out and grease all polished surfaces. Grease the plunger guides and runners, and cross conveyor platform.

Grease the bale chamber between crops to avoid "heating" of the hay and corrosion.

Lubricate the machine thoroughly in accordance with the instructions under "Lubrication Guide".

Clean all chains thoroughly and protect them with a coating of heavy oil or grease.

Put the baler up on blocks or jacks. Do not deflate the tires. Clean the tires thoroughly. If the baler is not jacked up, inflate the tires at regular intervals. If exposed, cover the tires to protect them from light, grease, and oil.

Make a list of replacement parts that will be needed and order them early. Your IH dealer at this time can expedite delivery of parts, thus avoiding delays at the next baling season.

If your baler is equipped with an engine, refer to the Operator's Manual for instructions for storing the engine.

BEFORE STARTING THE BALER AFTER STORAGE

Remove the grease from the polished surfaces, bale chamber, plunger guides and runners, and cross conveyor platform.

Lubricate the machine thoroughly in accordance with the instructions under "Lubrication".

Remove the heavy oil or grease from the chains.

Check tire pressures.

Be sure to check the level in the gear case.

Tighten all bolts, nuts and set screws.

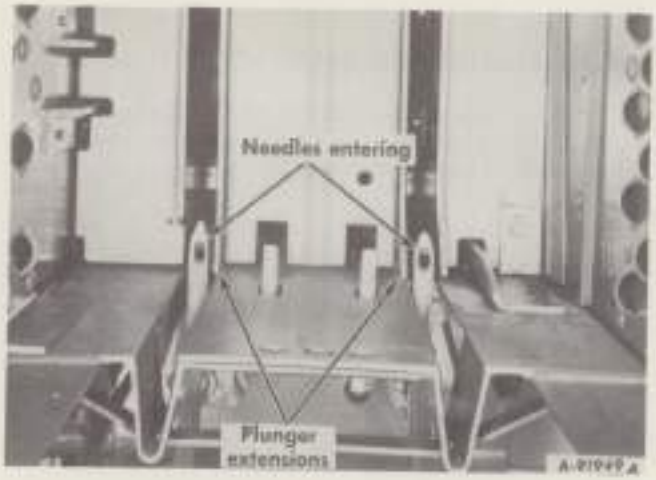
Adjust and check timing of entire baler.

If any major moving parts have been replaced, they should be run in.

If your baler is equipped with an engine, refer to the Engine Operator's Manual for instructions.

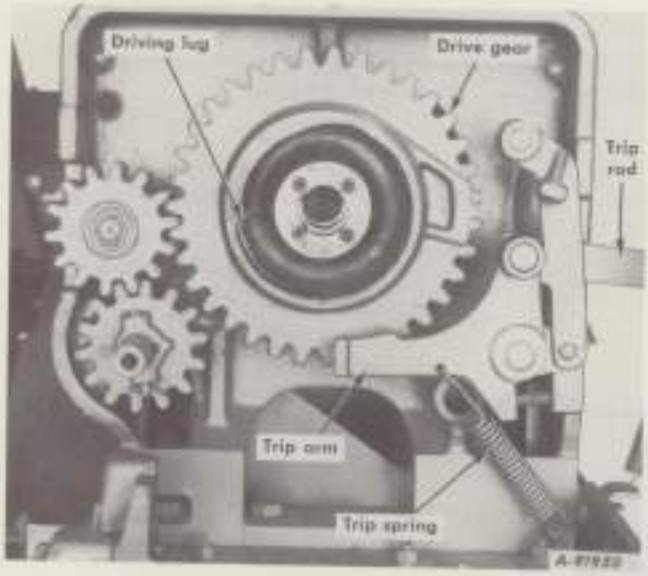
INTERNATIONAL HARVESTER

TIMING THE BALER - Continued

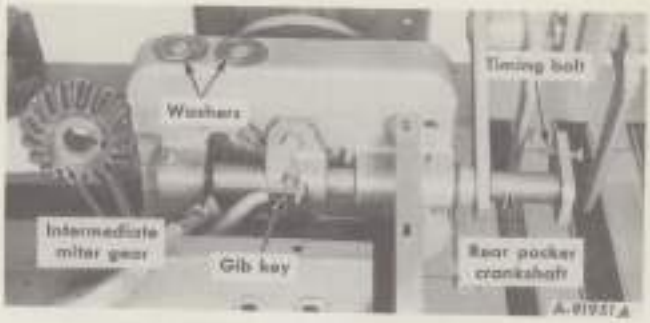


Illust. 39
Needle-to-plunger timing as seen inside the bale chamber.

4. Remove the gib key from the intermediate miter gear on the rear packer crank shaft. This is accomplished by inserting a punch from the rear of the intermediate miter gear through a hole in the gear and driving the gib key forward. **See Illust. 38B.**



Illust. 39A
Knotter drive gear and driving lug.



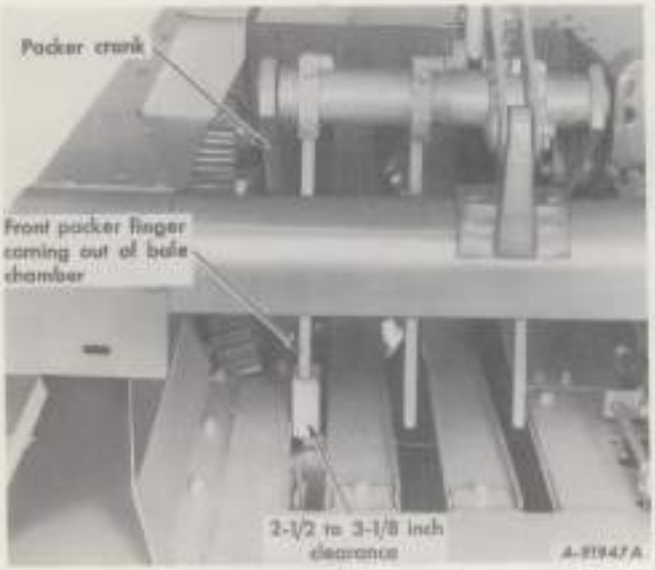
Illust. 39B
Intermediate miter gear, gib key, washers, rear packer crank shaft and timing bolt.

5. Move the plunger to the rear and release the needles until the needles enter the bale chamber just after the plunger face extensions pass the point where the needle tips enter. **See Illust. 39.** Without disturbing this position of the plunger or needles, rotate the knotter drive gear counterclockwise until the trip dog roller engages the driving lug on the knotter gear. **See Illust. 39A.**

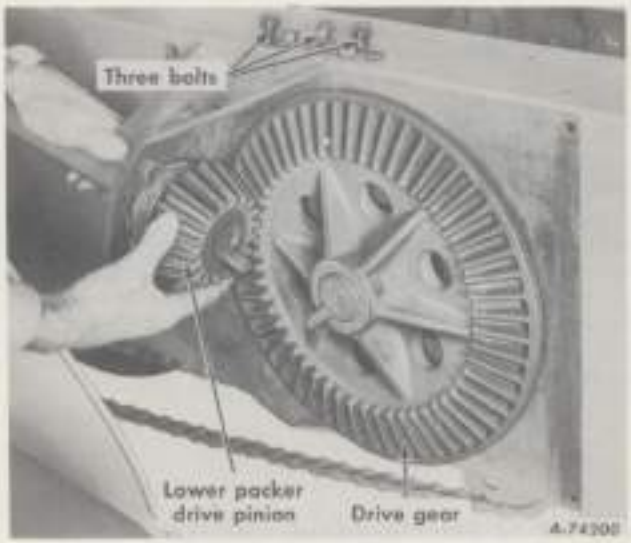
6. Without disturbing the positions acquired in reference 4 and 5, remove the timing bolt **(Illust. 39B)** and pull the rear packer crank forward until the intermediate miter gear is free from the shaft. With the center hole in the rear packer crank in line with the center hole in the rear crank arm of the packer crank and with the keyway in the shaft and intermediate miter gear with the knotter drive gear, move the rear packer crank rearward sliding it through the intermediate miter gear and washers. The number of washers located here (between the intermediate miter gear and the rear bearing or the knotter drive frame) is determined by the backlash between the intermediate miter gear and the knotter drive gear. There should be a maximum backlash of 1/16 inch and a minimum so that there is no binding between the gears at the tightest point.

7. Rotate the packer fingers and the knotter drive gear until the keyway is visible and in line and replace the gib key **(Illust. 39B).** Turn the baler through a cycle by hand, checking out the timing of all related components.

TIMING THE BALER



Illust. 38
Packer finger-to-plunger timing.



Illust. 38A
Pickup drive cover removed, showing the three bolts removed in the lower packer shaft bearing.

The knotter and the wire twisting mechanism is the heart of the baler and its operation must be correctly in time with the other mechanisms that complete the baling process.

The packer fingers must be properly timed so that they will complete their task and get out from in front of the plunger on its rearward stroke. The needles also must be timed with the plunger.

To time the packer fingers and needles, perform the following steps in the sequence as listed:

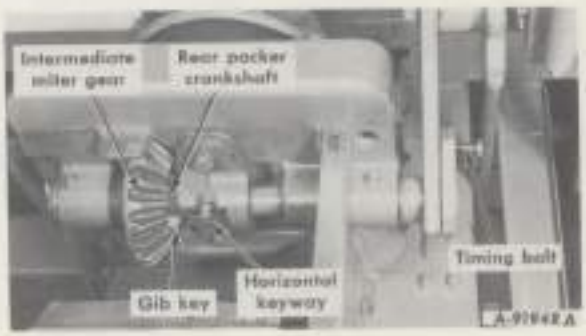
1. Rotate the flywheel in the normal direction of rotation until the plunger deflectors are centered in the front packer finger slot on the compression stroke. **See Illust. 38.**

2. With the packer relief rod or the packer control links in the center hole of the packer finger arm as shown **in Illusts. 14A and 14B,** the front packer finger should be 2-1/2 to 3-1/8 inches above the plunger; if timing is found to be correct proceed to step 3.

Note: A closer adjustment than 2-1/2 inches will cause the front finger to be bent during operation.

If the front packer finger is more or less than the 2-1/2 to 3-1/8 inches, remove the pickup cover and the packer drive cover and remove the three bolts from the lower packer shaft bearing and pull the lower packer drive pinion from the drive gear, disengaging the drive gear and pinion teeth. Rotate the packer drive shaft until the correct relationship is obtained. Install the three bolts removed in the lower packer shaft bearing. **See Illust. 38A.** Install the pickup cover and the packer drive cover.

3. With the trip rod released, rotate the flywheel to move the plunger to the rear. The needles should enter the bale chamber flush or 2 inches behind the plunger face extension. **See Illust. 39.** If a one or two inch correction in the needle to plunger timing is required, remove the timing bolt in the packer crank and advance or retard it in the alternate holes provided until the proper timing is obtained. **See Illust. 38B.** Continue with step 4 if correct timing is not obtained by this method.



Illust. 38B
Top view of machine with parts removed for easy changing needle-to-plunger timing.

Continued on next page.

WIRE SHEAR KNIFE

When the wire shear knife is cutting the wire improperly or has become dull or damaged, the knife can be removed and sharpened by removing the twister frame anchor bolt and raising the twister frame. Remove the two bolts holding the knife. **Note:** The shims between the keeper blade and the frame must be in position when knife is reinstalled. Reinstall knife after sharpening or install new knife using shims as necessary to properly position the knife. Proper position of space between the knife and front disk is zero to .010 inch. Use a feeler gauge to check the clearance. **See Illust. 35A.**

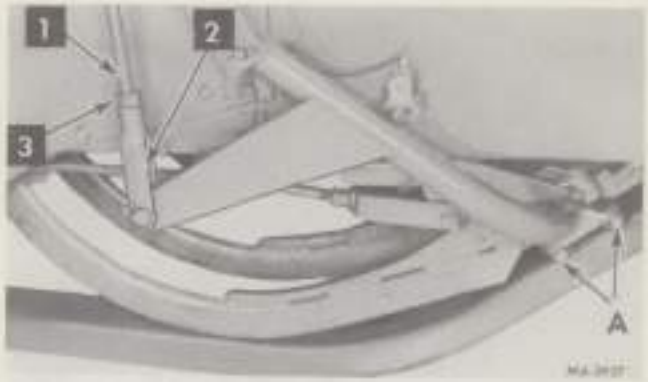
REMOVAL OF TWISTER FRAME ASSEMBLY

The twister frame assembly is removed from the twister shaft by removing the twister anchor bolt. Remove the two piece snap ring and the split spacer, then remove the two cap bolts from the frame. **Note:** Twister frames and caps are not interchangeable. The cap must remain with the frame from which it was removed. The number on the cap and the number on the twister frame must match and be on the same side when reassembled. **See Illust. 35.**

NEEDLE ADJUSTMENT

The needle height is properly adjusted when the needle tips are 3/8 to 3/4-inch "4" (**In Illust. 33A**) below the twister frame when the needles (threaded with wire) are at the maximum upward point of travel. If the needles do not rise far enough, shorten the needle pitman "1" (**Illust. 37**) by removing the pin from the needle pitman yoke "2" (**Illust. 37**), loosen the jam nut "3" (**Illust. 37**) and adjust the yoke. If the needles rise too far, it is necessary to lengthen the needle pitman. The side adjustment of the needles should be 1/32-inch interference to 1/32-inch clearance "1" (**Illust. 37A**) to the twister frame. After the adjustment has been made, tighten all parts securely.

As the needle tip passes over the upper disk, it should have a clearance of 1/16 to 3/16-inch "2" (**Illust. 37A**). The needles can be individually adjusted, vertically or sideways by adjusting bolts "A". **See Illust. 37.**



1 - Needle pitman
2 - Needle pitman yoke
3 - Jam nut

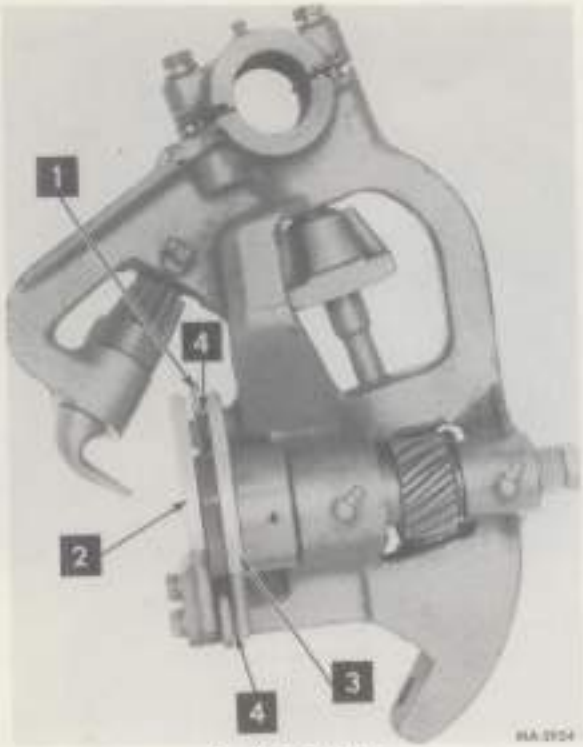
Illust. 37
Needle adjustment.

The needle assembly has individually replaceable needles. If for any reason one or both needles become damaged or broken, they can be removed and replaced by removing bolts "A" (**Illust. 37**) securing them to the needle tie pipe. After replacing the needle it is important to see that it is properly adjusted in relation to the twister. After all adjustments have been made, torque the bolts securing the needles to the needle tie pipe to 95 to 105 foot-pounds. Then check to see that the needle adjustments have not been affected.

1 - Dimension is 1/32-inch interference to 1/32-inch clearance.
2 - Dimension is 1/16 to 3/16-inch

Illust. 37A
Needle clearance.

KEEPER BLADE TO DISK SPACING



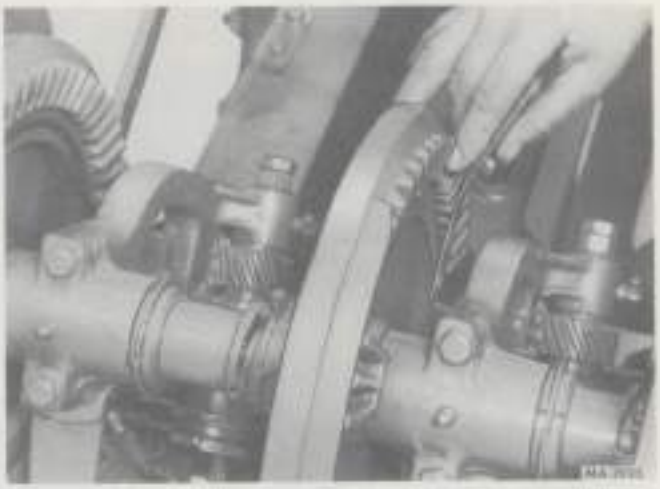
1 - Keeper blade
2 - Front disk
3 - Rear disk
4 - Shims

Illust. 36
Keeper blade spacing.

The keeper blade "4" (Illust. 36) should be centered as nearly as possible between the front disk "2" (Illust. 36) and the rear disk "3" (Illust. 36), the two spaces should not vary over .010 inch. Use a feeler gauge to check these two spaces. This is accomplished by shifting the shims "4" (Illust. 36) on either side of the keeper blade. The same number of shims should be between the keeper blade and the twister frame on all three mounting bolts.

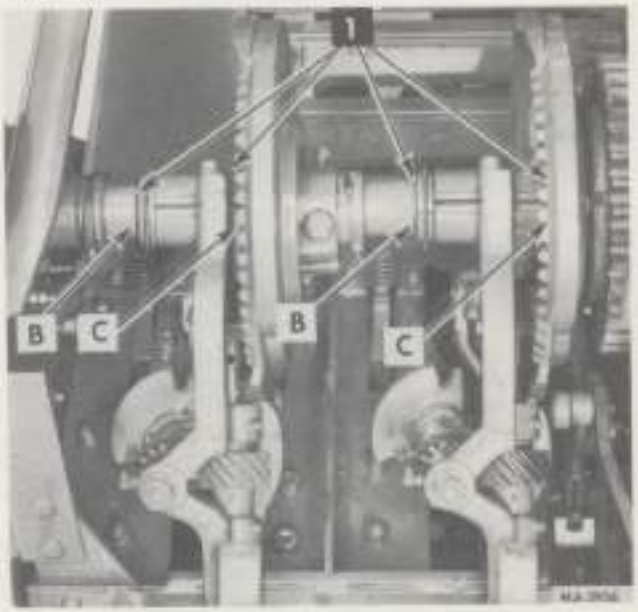
DELAY SURFACE

Proper clearances of .001 to .020 between the twister drive gear delay surfaces and the pinions (hook and disk) insure proper positioning of the hook and disk in the home position. The twisters must be bolted in the home position to check the clearances for excessive wear with a feeler gauge. See Illust. 36A.



Illust. 36A
Measuring delay surface clearance.

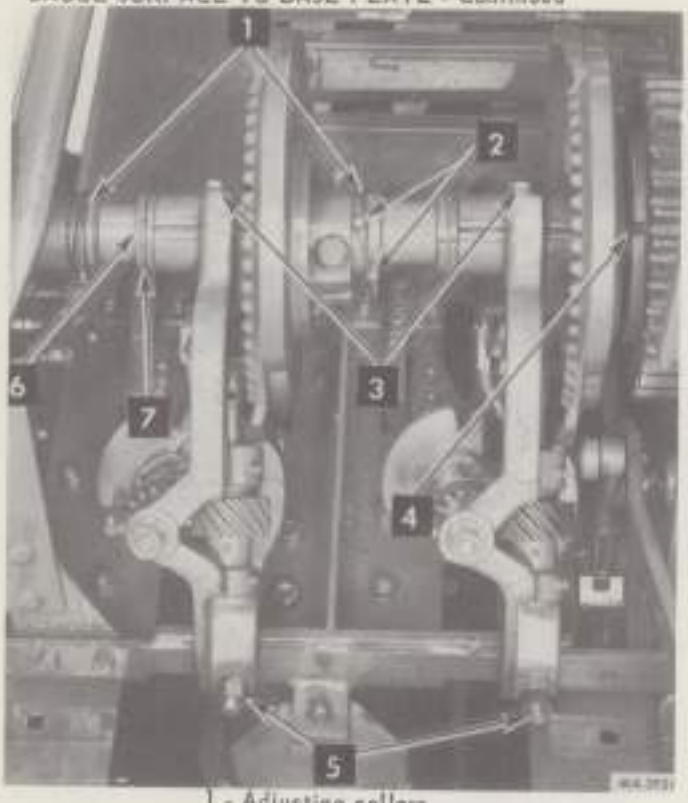
The "stack-up" of the twister shaft assembly must be tight when checking for delay surface clearance. To decrease the delay surface clearances move the adjusting shims "1" (Illust. 36B) as necessary from "C" to "B". To increase the delay surface clearances move the adjusting shims as necessary from "B" to "C". If either clearance is over .030 inch that pinion should be replaced. If the clearance is still over over .030 inch after the pinion has been replaced, the twister drive gear should be replaced.



1 - Adjusting shims

Illust. 36B
Delay surface adjustment.

GAUGE SURFACE TO BASE PLATE - Continued



1 - Adjusting collars
2 - Wired pins
3 - Cap bolts
4 - Adjusting washers
5 - Anchor bolts
6 - Two-piece split spacer
7 - Two-piece snap ring

Illust. 35
Twister position adjustment.

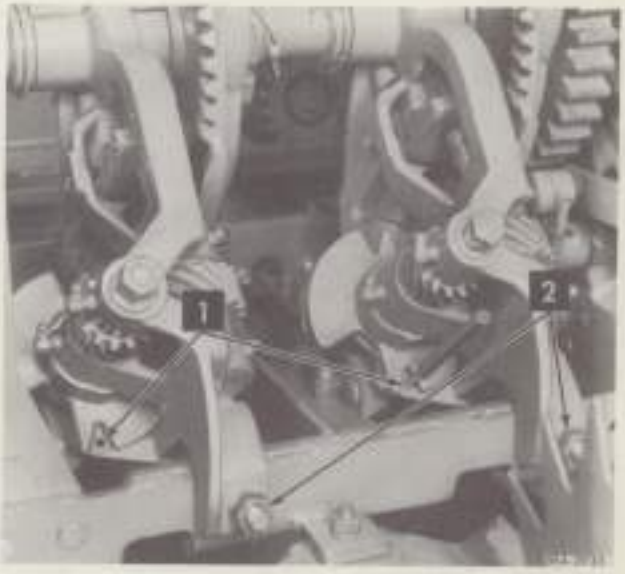
WIRE DISK TIMING

To correctly time the disk assembly, remove the anchor bolt "3" (Illust. 33) and raise the twister frame. Loosen the knife mounting bolts "1" (Illust. 35A). This is necessary to provide the clearance for loosening the tapered lock. Return the twister frame to the home position and replace the anchor bolt. Remove the jam nut "5" and loosen the regular nut on the tapered disk shaft. **Note:** The regular nut must be flush with the end of the shaft to prevent damage to the threads. Tapping the shaft gently will loosen the tapered lock. Insert a 3/16-inch drill or punch through the small notch in the disk assembly and into the timing hole "1" (Illust. 35B) in the keeper blade. Turn the disk assembly clockwise (looking from the rear) until the edge of the disk is against the punch or drill. Turn the pinion counterclockwise until all backlash is removed. Hold the pinion in this position and tighten the regular nut to set the taper lock and reinstall the jam nut "5" (Illust. 35A). Remove the 3/16-inch drill

1 - Knife mounting bolts
2 - Knife
3 - Knife shim
4 - Front disk
5 - Jam nut

Illust. 35A
Wire knife.

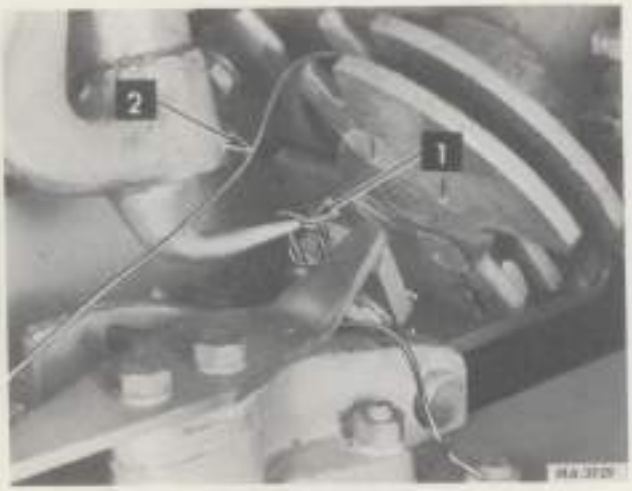
or punch. Remove the anchor bolt, raise the twister frame and tighten the two knife mounting bolts. Return the twister frame to the home position and reinstall the anchor bolt.



1 - Timing holes
2 - Anchor bolts

Illust. 35B
Disk timing.

TWISTER OPERATION - Continued



1 - Twist loop
2 - New disk wire

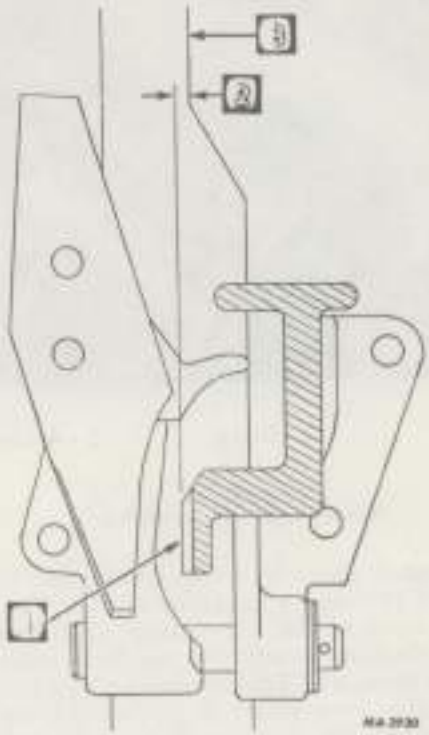
Illust. 34
Wire twist stripped from the hook.

pocket during the rotation of the twister hook and are wrapped around the twister wires under the twist loop "4" (Illust. 33C). The incoming hay then pushes or strips the twist from the twister hook. A large loop of wire is left above the disks by the needles as they return downward toward the home position. This wire than becomes the disk wire for the next bale and is retained in the disks by the crimp which is formed by the stationary wire holder keeper and wire holder disks. As the bale is formed this disk wire is pulled tightly in the wide notch of the disks and on the base plate fingers. The twisters are then prepared for the next twisting cycle. See Illust. 34.

Illust. 34A
Proper wire twist.

ADJUSTING AND SERVICING THE TWISTER

TWISTER POSITION



1 - Twister frame gauging surface
2 - Dimension is 3/32 to 7/32-inch
3 - Edge of needle slot

Illust. 34B
Gauge surface to edge of needle slot.

The twisters must be positioned correctly to the base plate, as the base plate is an integral part of the twisting mechanism.

GAUGE SURFACE TO BASE PLATE

Left to right location - the milled gauge surface of the twister frame should be 3/32-inch to 7/32-inch to the left of the needle slot in the base plate. See Illust. 34B.

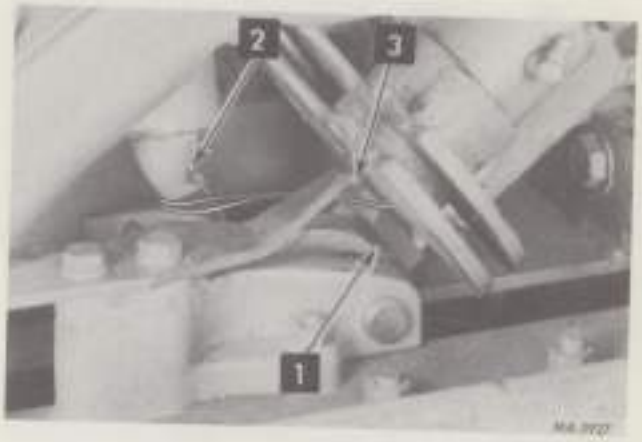
Adjustment of the finished surface of the twister frame to left side of the needle slot is accomplished by adding or removing washers "4" (Illust. 35) from the right end of the twister shaft. Special adjusting collars "1" (Illust. 35) are provided for taking up any clearance in the build up of the twister shaft or any wear that might occur after extended use. Use two punches to expand the collar to take up the clearance. After adjustment, the collar should be wired about the two pins, wire from pin to pin in direction punches were turned to hold the collar halves in the set relation. See Illust. 35.

1 - Needle 2 - Disks 3 - Anchor bolt

Illust. 33
Needle lays wire in disks.

The twister mechanism is "threaded" by operating it through a twisting cycle. This places the wire in the wire disks and over the base plate fingers ready for the formation of a bale. See Illust. 33. The incoming hay is encircled by the wire which is pulled through the needles and the wire guides as the bale is formed in the chamber.

After the bale is formed, the trip mechanism is actuated and the twisting cycle starts. The needles bring the wires up and lay them in the narrow notch of the wire holder disks "2". (Illust. 33A). The disks begin to rotate releasing the disk wires "1" (Illust. 33A) (the



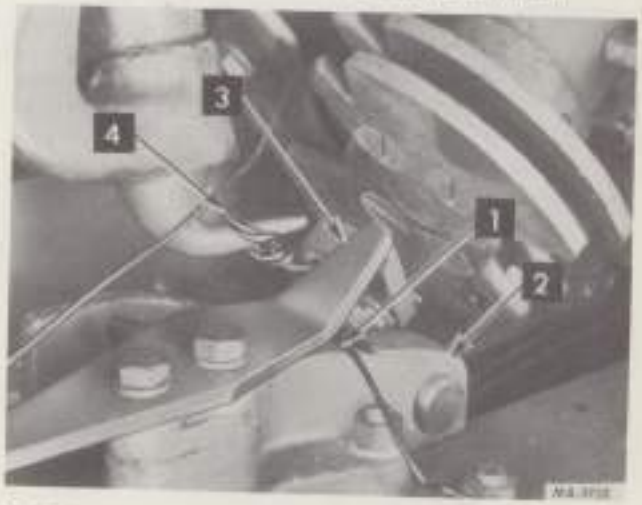
1 - Stationary knife
2 - Twister hook
3 - Needle wire

Illust. 33B
Twister hook sweeping wires from base plate fingers as keeper blades release disk wires.

wires on top of the bale) and cutting the needle wires "3" (Illust. 33A) (the wires at the front of the bale) as the wires contact the stationary knives "1" (Illust. 33B). As the disks are rotating, the twister hooks "2" (Illust. 33B) turn contacting both wires sweeping them from the base plate fingers and making three revolutions twisting the wires together See Illust. 33B. Both wire ends are guided into the pocket "1" (Illust. 33C) formed by the base plate finger mount casting "2" (Illust. 33C) and the wire tail guide "3" (Illust. 33C). The wires remain in this

1 - Disk wire 3 - Needle wire
2 - Disks 4 - Dimension is 3/8 to 3/4-inch

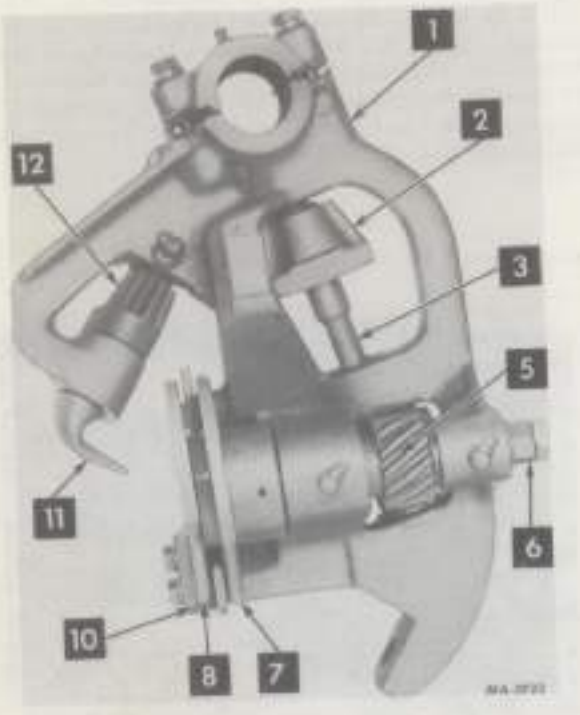
Illust. 33A
Disk rotates placing new wire under keeper blade.



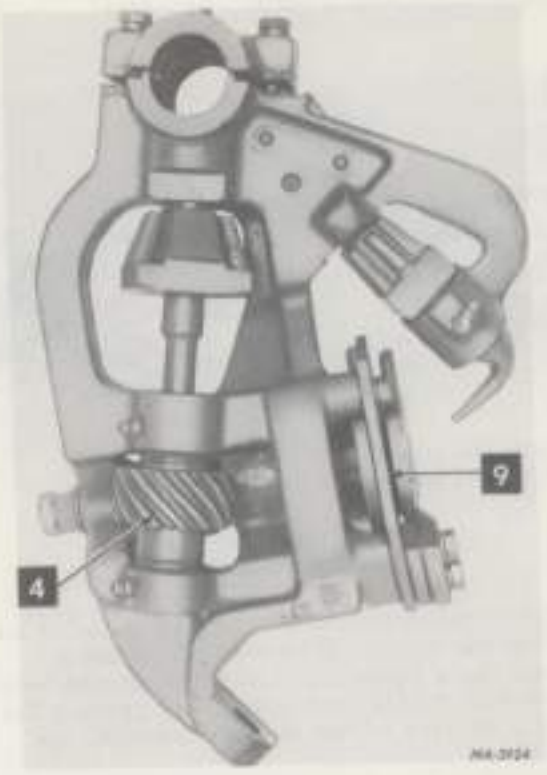
1 - Pocket 3 - Wire tail guide
2 - Base plate finger mounting casting 4 - Twist loop

Illust. 33C
Completed wire twist.

LOK TWIST BALER TWISTER NOMENCLATURE



Illust. 32



Illust. 32A

1. Wire twister frame with cap.
2. Wire disk pinion.
3. Wire disk pinion shaft.
4. Wire disk helical pinion.
5. Wire disk tapered timing gear.
6. Wire disk tapered shaft.
7. Upper wire holder disk.
8. Lower wire holder disk.
9. Wire keeper blade.
10. Wire shear knife.
11. Wire twister hook.
12. Twister hook pinion.

TWISTER MECHANISM

The wire twisters on your Lok Twist baler were properly timed and adjusted when they left the factory.

The needles and the various twisters components work in close coordination. Only minor adjustments need to be made if the twisters should fail to operate properly. Servicing and adjusting one part may have a chain reaction that affects the operation of several parts of the twister. If an adjustment is made, it is important to carefully check all parts involved. A good practice is to turn the baler through a twisting cycle by hand whenever adjustments are made to insure that all parts function properly.

TWINE NEEDLE ADJUSTMENT - Continued

1 - Needle pitman
2 - Needle pitman yoke
3 - Needles
4 - Jam nut

Illust. 31
Needle replacement.

The needles should contact the gauging surfaces of the knotter frames as they pass through their cycle. The needles should be deflected about 1/32 inch when they contact the gauging surface of the knotter frames. See Illust. 30A.

As the needle tip passes over the center disk, it should have a clearance of 1/32 to 1/8 inch. The needles can be individually adjusted, vertically or sideways, by adjusting the two bolts "A" (Illust. 31).

The needle assembly has individually replaceable needles. If for any reason, one or both of these needles become damaged or broken, they can be removed and replaced by removing the two cap screws securing them to the needle tie pipe. See "A" in Illust. 31. After replacing the needle, it is important to see that it is properly adjusted in relation to the knotter. After all adjustments have been made, torque the cap screws securing the needles to the needle tie pipe to 85 to 95 foot pounds torque; then check to see that the needle adjustments have not been affected.

Twine Tension for the Twine Balers

Illust. 31A
Twine tension device.

In order to maintain uniform tension between the twine chest and the cord holder disks while the bale is being formed and the knotter hook is tying, a twine tension device is provided in the twine chest. Adjustment is made by setting the twine tension wing nuts (Illust. 31A) to maintain a uniform twine tension at the knotter through the tying cycle. See "Trouble Shooting" on pages 47 to 57, for corrections of twing troubles.

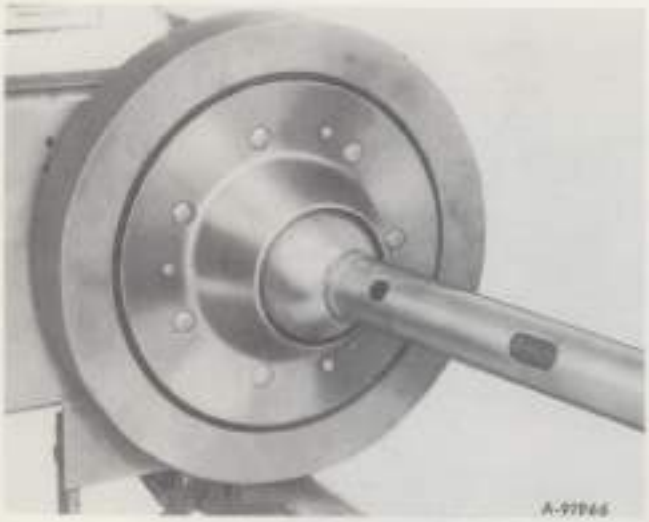
OPTIONAL EQUIPMENT

TRAILER HITCH AND BALE CHUTE

Illust. 41

The trailer hitch (Illust. 41) is used to pull a trailer or wagon. It attaches to the axle, bale chamber and to the diagonal brace located on the right side of the bale chamber. The bale chute makes it easy to load bales directly onto a trailing trailer or wagon from the baler. It attaches to the bale chamber with the regular bale chamber extension.

FLYWHEEL AND KNUCKLE SHIELD



Illust. 41A

This shield (Illust. 41A) covers the flywheel. It is a safety attachment to protect the operator.

LIFTING JACK

The lifting jack attachment eliminates all manual lifting and makes hitching easy and fast. It supports the front of the baler and can be turned so that the hitch is at the tractor drawbar level.

Raising the Baler: Turn the jack stem screw clockwise until the baler is in the position desired.

Operating the Baler: Turn the jack stem screw until the lock pin lines up with the pin holder; then fold the jack into the hitch and lock.

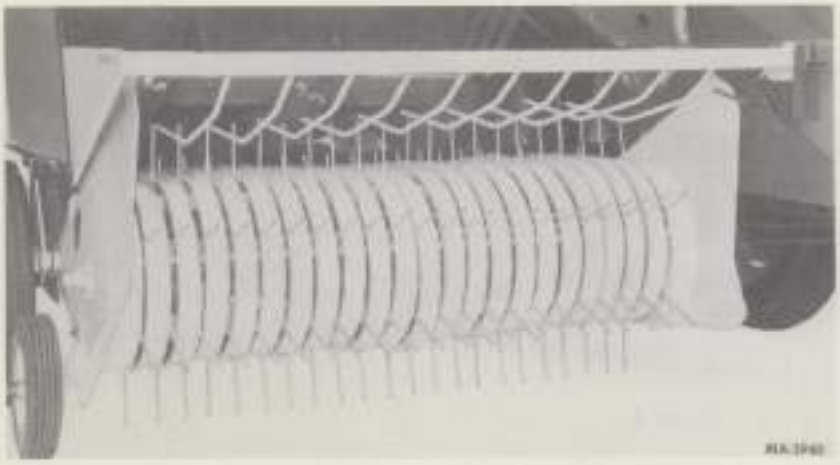
For lubrication, refer to the "Lubrication Guide."

Illust. 41B
Lifting jack in position.

Illust. 41C
Lifting jack in stored position.

OPTIONAL EQUIPMENT

CUSTOM PICKUP



Illust. 42
Custom Pickup

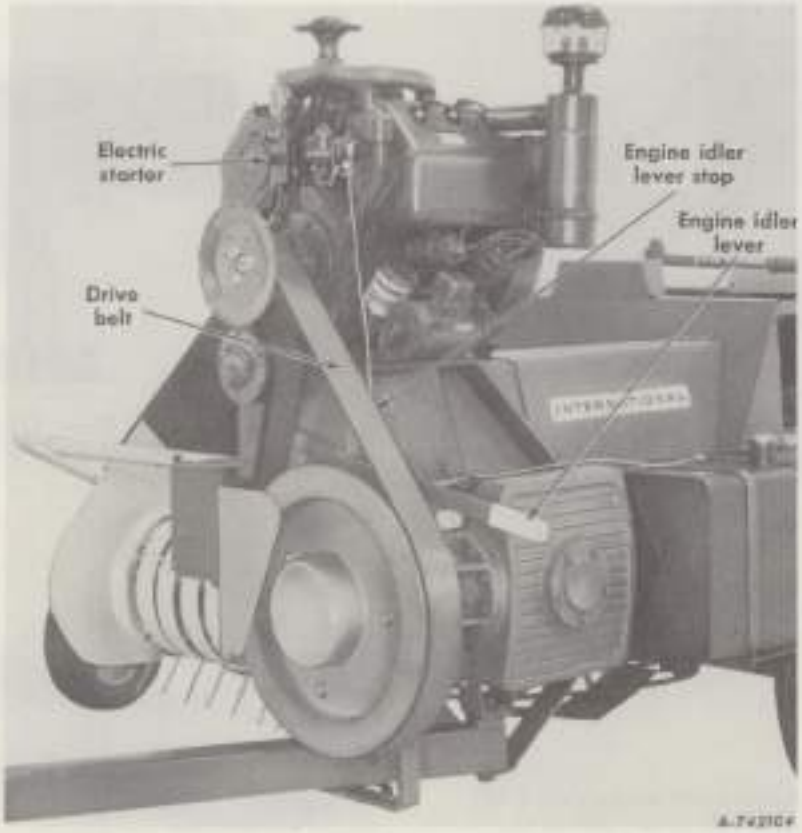
The custom pickup has rubber mounted tines for longer service life. The channel shaped strippers and close tines insure that all leaves and short material is deposited in the feed area.

The custom pickup is designed to provide an even flow of material for light windrows or short crop.

RUBBER MOUNTED PICKUP TINES

The individually rubber mounted pickup tines are designed to provide additional operating time before having to be replaced.

VH4D WISCONSIN ENGINE



Illust. 42A
VH4D Wisconsin Engine attachment equipped with electric starter.

VH4D WISCONSIN ENGINE - Continued

The VH4D Wisconsin engine attachment is designed to provide constant power independent of the power take-off on the tractor. The operator can keep the baler near its full capacity in windrows which vary in size, regardless of the size of the tractor being used.

The Wisconsin engine attachment is available with an engine equipped with an electric self-contained cranking motor.

Adjusting the Drive Belt Tension

The drive belt is adjusted by changing the position of the idler lever stop. Tension at the end of the engine idler lever should never exceed 65 pounds pull to engage.

Replacing the Drive Belt

Put the drive belt in place and adjust the tension on the drive belt.

Align the drive belt with the center of the drive pulley by placing 9/16 x 1-5/8-inch x 22 gauge plain washers as required between the engine and engine support. Do not use belt dressing on the belt.

Speed of the Baler Mechanism

Before placing the baler in operation in the field, the speed of the baler must be checked to see that the plunger crank on the baler operates at 75 strokes per minute. This is accomplished by adjusting the throttle control on the engine to obtain the desired strokes.

Lubrication

Before operating the engine attachment refer to the "Lubrication Guide." For lubricating the engine, refer to the manual furnished with the engine.

Hitching the Baler

When using the baler with the engine attachment, it is not necessary to place the baler directly in line with the power take-off shaft on the tractor.

When baling in the field with an engine attachment on the baler, the baler can be hitched near the right side of the drawbar. This will provide maximum clearance between the windrow and the tractor wheel.

When transporting, less road width will be required if the baler hitch is swung full right to transport position.

For service parts for the Wisconsin engine, see your nearest Wisconsin engine dealer, or the Wisconsin Motor Corp., Milwaukee, Wisconsin, 53246.

FLYWHEEL AND BELT SHIELD

Wisconsin Engine

These shields (Illust. 43) cover the flywheel and flywheel belt. They are a safety attachment to protect the operator.

Illust. 43

OPTIONAL EQUIPMENT

DUAL WHEEL (Left)

Illust. 44
Left dual wheel attachment.

The left dual wheel attachment makes it possible to operate the baler over extremely soft ground. It consists of an extra wheel complete with a 5.00-15 tire for the 430 Balers and a 6.40-15 tire for the 440 Balers. When installing the dual wheel attachment be sure that the valve on the left wheel tire can be seen through the opening in the dual wheel.

DUAL WHEEL (Right)

Illust. 44A
Right dual wheel attachment.

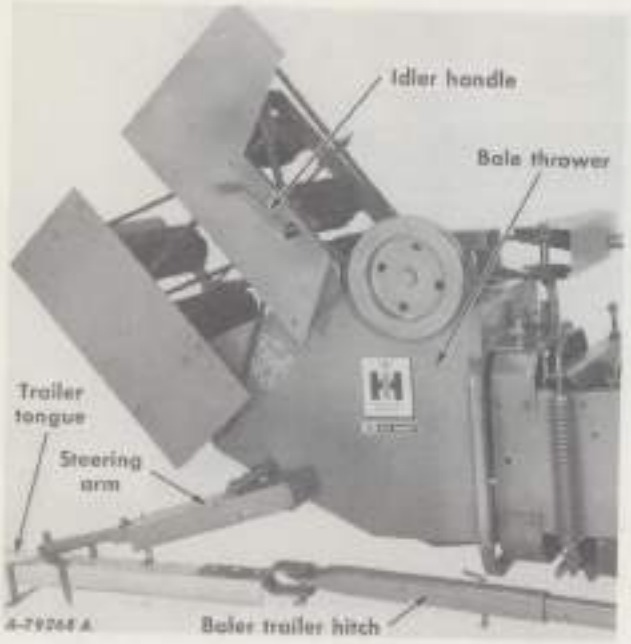
The right dual wheel attachment is used to improve the pickup flotation when operating the baler in corrugated fields or over extremely soft ground. It consists of an extra wheel complete with a 5.00-15 tire.

SAFETY LIGHTING

Illust. 44B

When transporting your baler at night, be sure that your baler is equipped with the safety light "A" and "Scotchlite" reflective material "B" as shown in Illust. 44B.

10 BALE THROWER



Illust. 45

The 10 Bale Thrower saves you time and labor in the field. You save all the time formerly required to pick up and load bales in the field and drying time if the bales are dried in the wagons.

PLUNGER CRANK SHIELD
440 Baler, Special for 430 Baler

This shield is hinged at the rear. It can be lifted out of the way when inspecting or servicing the drive gears, plunger or other parts.

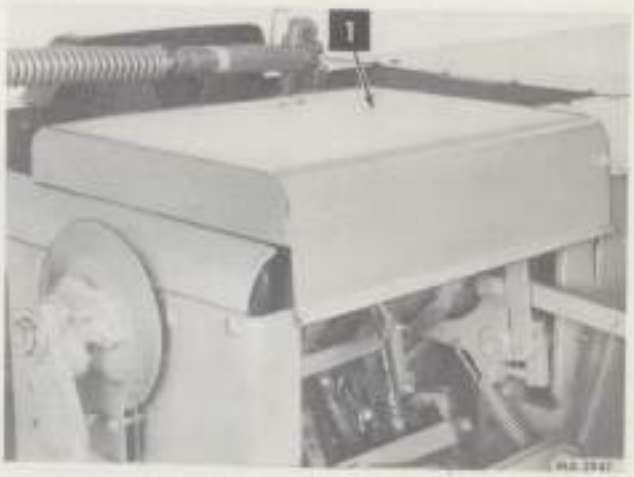
Illust. 45A

PICKUP WHEEL
440 Baler, Special for 430 Baler

Illust. 45B

The pickup wheel is designed to maintain proper relation of the pickup spring teeth with the ground and guide the pickup cylinder over field obstructions. The wheel with rubber tire is shown in Illust. 45B.

KNOTTER COVER
440 Baler, Special for 430 Baler



1 - Knotter cover

Illust. 45C

The knotter cover provides weather protection for the knotter area.

OPTIONAL EQUIPMENT

AUXILIARY NEEDLE GUARD

Illust. 46

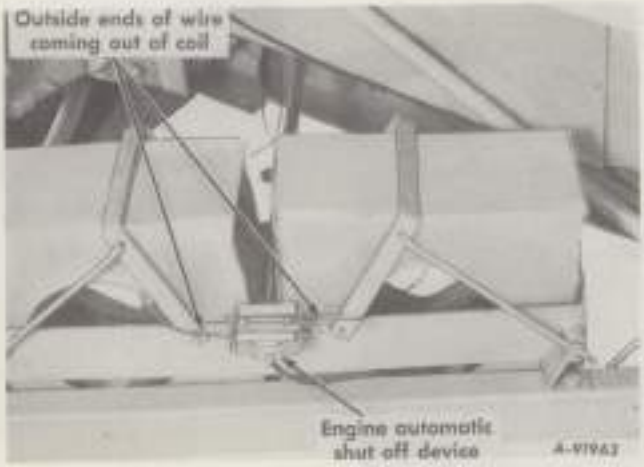
The Auxiliary Needle Guard Attachment gives extra protection to the needles especially when traveling over rough and irregular ground.

ENGINE SHUT-OFF

Wire Baler

The engine shut-off device (Illust. 46A) stops the engine on the tractor pulling the baler or the auxiliary engine mounted on the baler when the wire supply in the wire containers has been exhausted. The outside ends of the coil wire are placed through the holes on the body of this device pressing the contact member down. The right coil wire should be threaded through the forward set of holes and the left coil wire through the rear set of holes. When the wire supply is exhausted, the device grounds the distributor or breaks contact, shutting off the engine.

The advantage of this device is that operation ceases immediately when the engine is shut off, thus preventing baling without wire. This also makes it unnecessary for the operator to periodically check the wire supply.



Illust. 46A
Two-coil container shown.

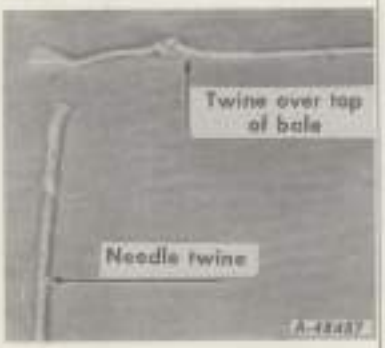
TROUBLE SHOOTING

Mechanical Problems and their Probable Cause.

Most baler difficulties are caused by improper adjustment. When you encounter trouble in the field, make a systematic check of all baler adjustments. Examine the tying or twister wire mechanism if bales are improperly tied. Don't forget, however, that improper adjustment of the pickup cover, packer fingers, and similar parts can cause poor performance. Checking and correcting operating adjustments usually clears up baler troubles. If it does not, refer to "Trouble Shooting" which follows.

If baler difficulties cannot be corrected by making these adjustments, see your International Harvester dealer.

CONDITION	POSSIBLE CAUSES	REMEDIES	PAGE
KNOTTER PROBLEMS – TWINE BALER			
1. Needle twine is wrapped around shank of knotter hook as the result of being looped over the knotter hook roller. 	1. Needle missed laying twine into wide notch of disk on upward stroke. A. Insufficient twine tension. B. Speed of the baler is too high. C. Improperly adjusted or bent needle. D. Improper timing of twine disk. E. Needle is improperly threaded. F. Twine not threaded through slack arm spring ring.	1. Correct that condition by action as follows: A. Increase twine tension. B. Reduce the speed of the baler to 75 strokes per minute as recommended. C. Adjust and straighten or replace needle. D. Retime twine disk. E. Thread needle properly. F. Rethread twine correctly.	31 13 26 11, 12 11
2. Twine over the bale is broken near the knot and the knot remains on the knotter hook. 	1. Knotter hook tension is excessive. 2. A rough or sharp edge on the twine slot in the breastplate is cutting the twine.	1. Reduce knotter hook tension. 2. Polish out rough edges with emery cloth.	25, 26

CONDITION	POSSIBLE CAUSES	REMEDIES	PAGE
KNOTTER PROBLEMS – TWINE BALER - Continued			
3. Twine over bale is not tied and there is a simple knot in the needle twine.	1. Twine over bale is released by cord holder before knot is complete.	1. Correct as follows:	
	A. Twine end retainer spring is broken, bent, or misposi-tioned.	A. Replace or reposition twine end retainer spring.	30
	B. Twine end retainer helper spring missing or broken.	B. Reinstall new twine end retainer helper spring.	30
	2. Twine over bale gets past breast plate finger before tying cycle.	2. Correct as follows:	
	A. Breast plate finger spring broken, missing or loose.	A. Replace breast plate finger spring.	
	B. Breast plate finger loose or rivets or mispositioned.	B. Re-rivet breast plate finger.	
4. Needle twine is not tied and there is a simple knot in the twine over the bale.	1. Bill hook jaw does not close completely.	1. Correct as follows:	
	A. Insufficient bill hook pressure.	A. Tighten closing cam spring.	
	B. Worn closing cam.	B. Replace closing cam.	
	2. Bill hook pinion worn causing jaw to close late.	2. Replace bill hook pinion.	
	3. Twine tension too great.	3. Reduce twine can tension.	31

CONDITION	POSSIBLE CAUSES	REMEDIES	PAGE
KNOTTER PROBLEMS – TWINE BALER - Continued			
5. There is not enough twine to encircle the bale and there is a simple knot in the needle twine.	1. Twine breaking before bale is completed.	1. Correct as follows:	
	A. Bale chamber tension is excessive.	A. Reduce bale chamber tension.	15, 16
	B. Material too wet to bale.	B. Allow more time for material to dry.	
	C. Twine tension is excessive.	C. Reduce twine can tension.	31
	D. Twine is tangled or caught somewhere in system.	D. Replace faulty twine with proper quality.	11, 12
	2. Twine is pulling out of twine disk before bale is completed.	2. Correct as follows:	
	A. Late twine disk timing in home position.	A. Retime twine disk.	26
	B. Worn keeper blade assembly.	B. Replace keeper blade assembly.	27
	C. Twine end being pinched off by keeper blade.	C. Reduce keeper blade pressure.	
	D. Insufficient keeper blade pressure.	D. Increase keeper blade pressure.	27
	E. Twine diameter is not uniform.	E. Replace faulty twine with proper quality.	11, 12
6. Twine is not tied.	1. Two separate malfunctions occuring at once.	1. Correct as follows:	
	A. See all causes in condition No. 3 for twine over the bale and all causes in condition No. 4 for needle twine.	A. See remedies in conditions No. 3 and No. 4.	
	2. Needle striking knotter hook roller or knotter hook cam on the way down.	2. Correct as follows:	
	A. Needles improperly adjusted to cord holder disk.	A. Adjust needles to clear cord holder disk.	30, 31
	B. Improper needle height adjustment.	B. Adjust needles.	30, 31
	3. Trash holding knotter hook open.	3. Correct as follows:	
	A. Excessive trash in knotter area.	A. Clean out knotter area periodically.	

CONDITION	POSSIBLE CAUSES	REMEDIES	PAGE
KNOTTER PROBLEMS – TWINE BALER - Continued			
7. Knot was completed but has become untied.  	1. Insufficient knotter hook tension. A. Knotter hook tension adjustment too loose. B. Knotter hook cam broken. C. Excessive trash in knotter area.	1. Correct as follows: A. Increase knotter hook tension. B. Replace broken cam. C. Clean out knotter area periodically.	25, 26
8. Knot is tied but not pulled tight enough.	1. Too little knotter hook tension.	1. Increase knotter hook tension.	25, 26
9. Twine has been lost out of needle.	1. Twine is tangled or spliced somewhere in the system.	1. Remove tangled twine and rethread knotter mechaniam.	11
10. There is no twine between the bales.	1. Needle is not laying the twine properly in the cord holder. (This may result in loop being left between bales.) A. Speed of the baler is too high. B. Not enough twine tension. C. Twine is improperly threaded.	1. Correct the condition by rethreading baler and checking tying cycle to locate the trouble. A. Maintain speed as recommended. B. Adjust twine tension. C. Thread twine properly.	13 31 11
11. Several knots are left.	1. Knot has failed to strip because: A. Knotter hook jaw tension is too tight. B. Twine knife blade is dull.	1. Correct by the following adjustment: A. Loosen knotter hook jaw tension until both twine ends are still contained in the knot. B. Replace blade.	11 29

CONDITION	POSSIBLE CAUSES	REMEDIES	PAGE
KNOTTER PROBLEMS – TWINE BALER - Continued			
12. Needle twine breaks at base of knot after knot has stripped from hook.	1. Excessive bale chamber tension.	1. Reduce bale chamber tension.	15, 16
	2. Knotter hook tension is too high.	2. Reduce knotter hook tension.	25, 26
	3. Inferior twine.	3. Replace with twine of proper quality.	11
	4. Rough knotter anchor or twine retainer spring.	4. Smooth parts.	
13. Excessive wear of left knotter cam when delay surfaces are within specifications.	1. Excessive torque required to turn cord holder assembly.	1. Clean the cord holder assembly of material buildup.	
TWISTER PROBLEMS – WIRE BALER			
14. Baler goes through a tying cycle and no wire is placed in the wire holder disk.	1. The needle shear bolt has sheared because:	1. Correct that condition by action as follows:	
	A. Some obstructions prevent needles from going through their full cycle.	A. Locate and remove the obstruction.	
	B. There may be a tangle in the baling wire coil.	B. Remove tangled wire and rethread wire twisting machanism.	12
	C. Needle shear bolt is too soft.	C. Use correct bolt.	7
	2. Wire disk timing may be incorrect, preventing the wire from being placed in the correct notched in disk.	2. Retime disks.	35
	3. Needle height may be incorrect.	3. Adjust needles to the correct height.	37
15. Twist is found on the twister hook after the twisting cycle.	1. Grooves worn in twister hook.	1. Replace or grind and polish smooth.	

CONDITION	POSSIBLE CAUSES	REMEDIES	PAGE
	TWISTER PROBLEMS – WIRE BALER - Continued		
16. Poor twists obtained.	1. Wire grooves worn either into the twister hook or slots of the wire keeper disks giving a poor stripping action of the wire out of the disk as the twist is being formed.	1. Replace defective parts or eliminate sharp corners and wire grooves by polishing.	
17. A short piece of wire is cut off and is found on the breastplate after twisting cycle.	1. Wire is getting out of the wide slot of the wire keeper disk and is being laid in the top narrow slot or over the corner of the front disk just after completion of a twisting cycle. Wire disk is too far advanced.	1. Disks are properly timed when the distance from the corner of the narrow notch on the rear disk and the edge of the twister frame is 3/16-inch, plus or minus 1/32-inch.	35
	2. Needles are too high.	2. Adjust needles.	37
18. Wire is not being cut properly during twisting cycle, but is being pulled in two.	1. Wire not being laid in narrow slot of wire disk as needles bring up wire.	1. Readjust disk timing, needle height, and clearance between wire disk and needle tip.	35, 37
	2. Wire shear blade not properly adjusted.	2. Resharpen knife, or replace, if necessary. Adjust clearance between knife and wire disk. Check to see that shear knife covers bottom of narrow slot of wire disk for proper shearing action.	35, 37
19. Wire is not being held in disk during formation of a new bale.	1. Wire is being pulled out of disk by friction of the hay.	1. Replace worn disks or worn keeper blade. Check disk timing.	35, 36
	BALE NOT UNIFORM		
20. Material not uniformly packed in the bales. Bales are curved.	1. Improper packer finger adjustment.	1. Adjust packer fingers.	14
	2. Improper raking of hay.	2. Rake hay properly.	
	3. Picking up hay with the inside of the pickup.	3. Pick up hay in middle of pickup.	
	4. Auger belt slipping or auger speed not high enough.	4. Adjust belt tension.	18

CONDITION	POSSIBLE CAUSES	REMEDIES	PAGE
	BALE NOT UNIFORM - Continued		
21. In operation, some bales will be longer than others.	1. This condition is caused by extremely heavy or erratic charges of hay.	1. Check operating speed.	13
	2. Binding within metering device.	2. Be certain all parts are working freely.	17,21
22. Double length or continuous bales.	1. Metering device not functioning properly.	1. Check parts for possible bent or broken condition.	17,21
	2. Trip arm and trip dog not disengaging.	2. Check for binding parts or rusty contact surfaces. Grease if necessary.	17,21
		A. Check to be sure spring is operating properly.	
	3. Knotter mechanism not tripping.	3. Correct as follows:	
	A. Trip sheave support pulled too far to the rear, raising the front of the trip arm above the specified height.	A. Move trip sheave support slightly forward.	17,21
	B. Weak or broken trip arm spring.	B. Replace spring.	
	4. There is no twine between the bales.	4. See condition 10.	
23. Twister ties on every stroke.	1. Trip sheave support moved too far forward lowering front of trip arm below specified height.	1. Move trip sheave support rearward for proper overlap between trip dop and arm adjustment 3/8-inch to 5/8-inch.	17,21
24. Knotter ties on every stroke.	1. Trip sheave support moved too far forward lowering front of trip arm below specified height.	1. Move trip sheave support slightly to the rear.	17,21

TROUBLE SHOOTING

CONDITION	POSSIBLE CAUSES	REMEDIES	PAGE
	POWER DRIVE PROBLEMS		
25. Failure of power drive line or overrunning clutch.	1. Operating baler excessively in the transport position.	1. Change to baling position operation when possible.	4 to 6
	2. Hitch is not standardized.	2. Use standard hitch.	4 to 6
	3. Drive is overloaded because of:		
	A. Handling too much material.	A. Reduce feed rate.	
	B. Overtightening of the friction drive.	B. Loosen drive clutch.	8, 9
	PICKUP PROBLEMS		
26. Material tends to go over top of feed auger instead of under.	1. Pickup cover is too high.	1. Lower pickup cover.	13, 14
27. Pickup cylinder not delivering material fast enough during normal operation.	1. Pickup slip clutch slipping because of poor adjustment or wear.	1. Adjust slip clutch spring tension.	
	2. Uncut hay under windrow.	2. Best results are obtained by good mowing and raking procedures.	9
28. Pickup is not picking up all the hay cleanly.	1. Pickup not set close enough to the ground.	1. Adjust pickup height.	13
	2. Hay is raked improperly.	2. As hay is raked, all the windrow must be turned over to place it on top of the stubble.	
	3. Baler is not being operated in correct direction.	3. Operate the baler in the same direction the hay has been mowed.	
	4. Broken pickup teeth.	4. Replace.	
	TWINE OR WIRE BREAKAGE PROBLEMS		
29. Wire broken at some point around the bale.	1. Too much bale chamber tension.	1. Loosen bale chamber tension springs or remove wedges from bale chamber. Bale chamber tension should be set to produce a good solid bale, but should not exceed the maximum weights listed in the Specifications. See page 62.	15, 16
	2. Tangle in wire or twine coil.	2. Remove obstruction to free flow of wire or twine.	
	3. Excessive friction between hay in the bale chamber and the wire.	3. Friction can be reduced by pouring used motor oil or diesel fuel over the wire coils in the wire container.	12

CONDITION	POSSIBLE CAUSES	REMEDIES	PAGE
	FEEDING PROBLEMS		
30. Breakage of one wire or twine.	1. This is caused from uneven packing of the hay by the packer finger.	1. Adjust the packer fingers.	14
31. Packer fingers raking through hay.	1. Roughness in the bottom of the cross conveyor platform, such as projecting bolts, bent sheet metal, rust, paint, etc.	1. Remove all roughness.	
32. Hay wraps on auger.	1. Sharp corners or nicks outer periphery of auger catching hay or sharp corner at extreme outer end of auger. 2. Hay too green or wet.	1. Remove all sharp corners and nicks to prevent hay from catching. 2. Hay should be properly cured.	
33. Material piles up between pickup cylinder and feed auger.	1. Auger drive belt is and slipping. 2. Hay lodged under pick-up strippers. 3. Windrows extremely light.	1. Tighten by adjusting idler pulley. 2. Raise pickup strippers. 3. Increased ground speed or rerake hay into larger windrow.	18
34. Bales are unevenly packed, resulting in greater density on one side than the other.	1. This is caused from uneven packing of the hay by the packer fingers 2. Light windrows and short hay. 3. Rust, paint or restrictions in cross conveyor. 4. Improper packer finger relief rod adjustment.	1. Adjust the packer fingers. 2. Where this condition occurs, rake two windrows together. 3. Clean surface of cross conveyor. 4. Adjust packer finger relief rod.	14 14

CONDITION	POSSIBLE CAUSES	REMEDIES	PAGE
	SHEAR BOLT PROBLEMS		
35. If your baler shears the flywheel shear bolt.	1. Some foreign object may have been picked up in the field and caught by the hay knife.	1. Locate the obstruction and remove it. Replace with new shear bolt.	6, 7
	2. The plunger stop may be improperly adjusted.	2. Adjust plunger stop rod. Any change in adjustment of needle pitman must also be followed by re-adjustment of plunger stop, otherwise, plunger stop location will be found incorrect.	10
	3. The trip clutch may be functioning improperly, allowing needles to drop into the bale chamber.	3. Determine difficulty in clutch and replace defective parts or lubricate if clutch dogs are dry and rusty preventing them from functioning properly.	
	4. The shear bolt may be loose and chucking as the machine runs, causing undue wear on the bolt.	4. Replace shear bolt and tighten.	6, 7
	5. Needles may not return fully to home position due to excessive drag from wire, excessive needle brake tension, or some obstruction in their path.	5. Check for badly worn wire sheaves in needle tip or wire lodging between sheave and needle tip. Replace defective parts. Plunger stop must be kept well greased to insure its full freedom to actuate, and needle brakes must be just tight enough to prevent needles from sliding back into bale chamber.	
	6. Needle brakes are too loose, needles may drift into bale chamber, causing plunger to contact plunger stop.	6. Tighten the needle brakes.	

CONDITION	POSSIBLE CAUSES	REMEDIES	PAGE
	SHEAR BOLT PROBLEMS - Continued		
36. Excessive shearing of bolts in flywheel for no apparent reason.			
A. Plunger stop stopping plunger.	1. Needles out of time.	1. Check needle timing.	38, 39
	2. Needles left in bale chamber out of time for any reason.	2. Check needle shear bolt. Check timing.	7, 38 and 39
B. Bolts shearing upon compression and shearing of hay.	1. Insufficient hardness of shear bolt.	1. Use correct bolt.	6, 7
	2. Picking up re-bales without properly separating material.	2. Separate material before re-baling.	
	3. Dull plunger or stationary knife.	3. Sharpen knives.	21
	4. Excessive clearance between plunger and stationary knives.	4. Adjust clearance.	19, 20
37. Excessive shearing of packer finger shear bolt.	1. Insufficient hardness of shear bolt.	1. Use correct bolt.	8
	2. Picking up hay which is not dry enough to bale and crowding the machine.	2. Reduce feeding rate.	
	3. Picking up re-bales without properly separating material.	3. Separate material before re-baling.	
	4. **Packer fingers with relief guide rod:** Distance between centers of pivot pins exceeds 22 inches.	4. Adjust packer relief rod length.	14

INTERNATIONAL HARVESTER

LUBRICATION

These instructions are for balers not equipped with the Automatic Lubrication System. Balers are designed to require a minimum of lubrication. However, regular lubrication with quality lubricant is the best insurance against delay and repairs and greatly increases the life of the machine. Neglect leads to wear, break-down, and needless replacement of parts.

Before starting your baler, lubricate it thoroughly. Use the illustration on page 59 and the guide on pages 58 and 60 to locate all lubrication points. Be sure that the lubrication fittings are free of paint and dirt so that the lubricant gets down to the bearings. Use only high-quality lubricant and keep it free of dust and dirt.

Caution! Do not lubricate, clean or adjust the machine while it is running.

CHAINS

Lubricate all chains at frequent intervals, using a good quality light engine oil with machine not running. A paint brush is excellent for applying oil to the chains. See Illust. 58.

Illust. 58
Using a paint brush to lubricate chains.

LUBRICATION GUIDE

The symbols around the reference numbers indicate the intervals of lubrication.

More Often than Daily — 10 Hours — 50 Hours — Periodic

More Often Than Daily

1. Pitman bearing cap, front (every two hours).
2. Pitman bearing, rear (every four hours).

Use a pressure gun and apply enough IH 251H EP grease or equivalent No. 2 multi-purpose lithium grease to flush out the old grease and dirt.

Daily or After Every 10 Hours of Operation

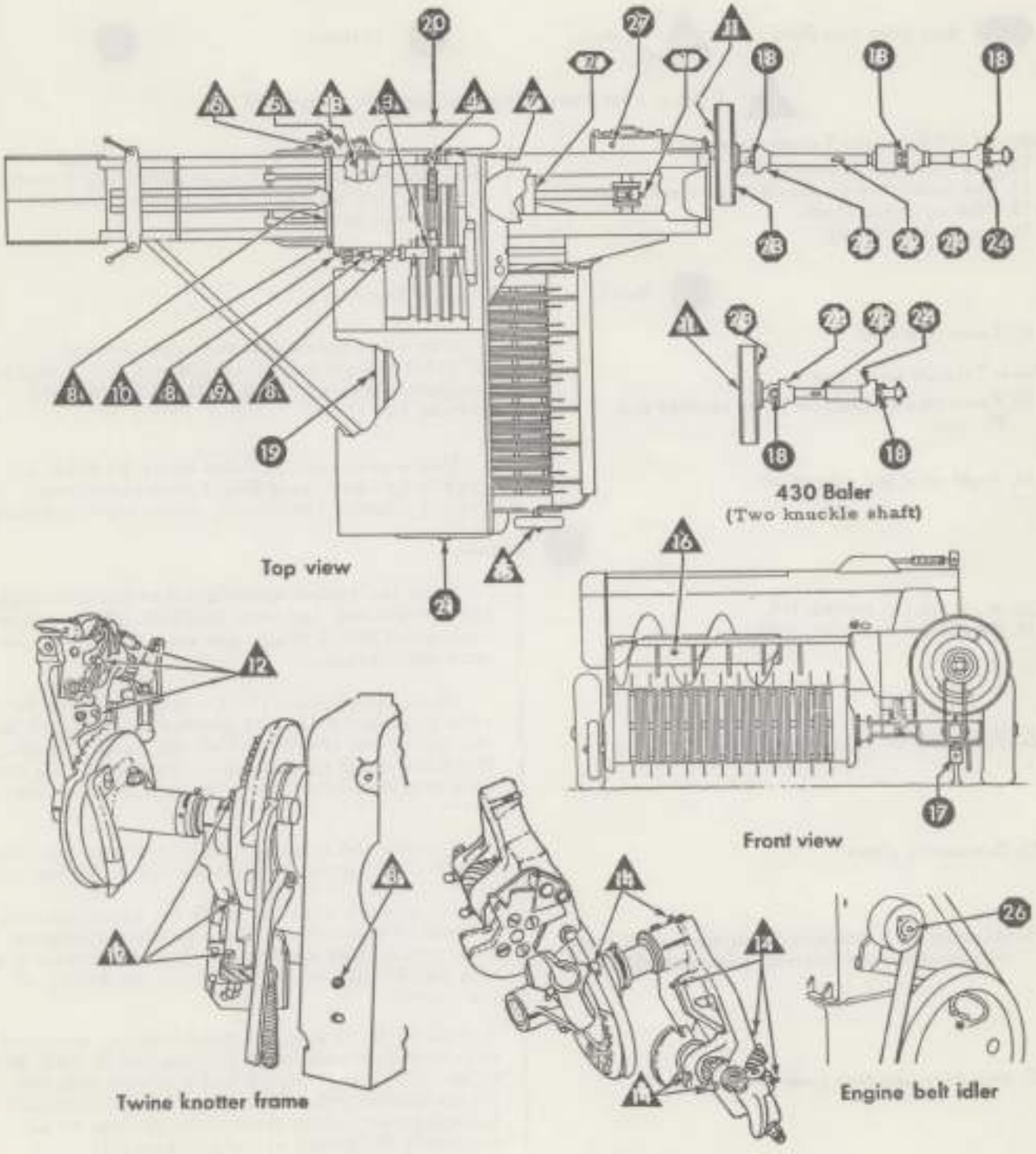
3. Packer finger bearing cap.
4. Packer relief trunnion.
5. Needle crank.
6. Needle pivot bearing, left.
7. Plunger stop.
8. Knotter and wire twister drive frame (three fittings).
9. Knotter and wire twister and gear insert support.
10. Needle pivot bearing, right.
11. Flywheel.

430 and 440 Twine Balers Knotter Assembly

12. Knotter frame (six fittings in each frame).
13. Knotter shaft bearing, left.

Use a pressure gun and apply enough IH 251H EP grease or equivalent No. 2 multi-purpose lithium grease to flush out the old grease and dirt.

Text continued on page 60.



Illust. 59
Lubrication Chart.

LUBRICATION GUIDE

The symbols around the reference numbers indicate the intervals of lubrication.

More Often than Daily — 10 Hours — 50 Hours

Daily or After Every 10 Hours of Operation - Continued

430 and 440 Wire Baler Twister Assembly

13. Wire twister shaft bearing, left.
14. Wire twister frame (seven fittings in each frame).
15. Floating pickup wheel.
16. Auger shaft bearing.

Use a pressure gun and apply enough IH 251H EP grease or equivalent No. 2 multi-purpose lithium grease to flush out the old grease and dirt.

Weekly or After 50 Hours of Operation

17. Lower jack stem.

Use a pressure gun and apply enough IH 251H EP grease or equivalent No. 2 multi-purpose lithium grease to flush out the old grease and dirt.

Power Take-Off Unit Drive

18. Power take-off knuckles (when supplied with fittings).

19. Auger relief and support unit.

Use a pressure gun and apply IH 251H EP grease or equivalent No. 2 multi-purpose grease. Large reservoir, make sure of filling.

Periodic

20. Wheel hub cap bearing, left.
21. Wheel hub cap bearing, right.

Pack the roller bearing assembly thoroughly and fill the hub cap with IH 251H EP grease or equivalent No. 2 multi-purpose lithium grease, once each season.

22. Power take-off knuckle shaft and sleeve.

When assembling the shaft and sleeve, be sure to insert a liberal amount of lubricant in the end of the sleeve and on the square shaft. Work the shaft in and out of the sleeve, so that both are well lubricated. Repeat when necessary.

23. Overrunning clutch.

Remove the overrunning clutch and lubricate with a light lubricating oil once each season.

24. Universal drive shaft shield bearings located at the rotating ends of the universal drive shaft shield).

Twice each season, work the lubricant into the end of the safety shield with your fingers or a small, flat applicator. It is important that this shield turn at all times for the safety of the operator.

25. Main drive gear case (gear housing).

Use 11 U.S. pints of good quality, extreme pressure lubricant with a viscosity of SAE-80 to 90. Flush thoroughly and fill with new lubricant once a year. The level of the lubricant should be inspected from time to time to be sure that the gears are dipping in oil.

Wisconsin Engine Attachment

26. Engine Pulley Cap.

Lubricate once a season. Use IH 251H EP grease or equivalent No. 2 multi-purpose lithium grease. **Note:** Do not over lubricate as excessive amount of grease will force seal out of position.

AUTOMATIC LUBRICATION SYSTEM (Optional)

1 - Snap-on valves.

Illust. 61
Automatic Lubrication System.

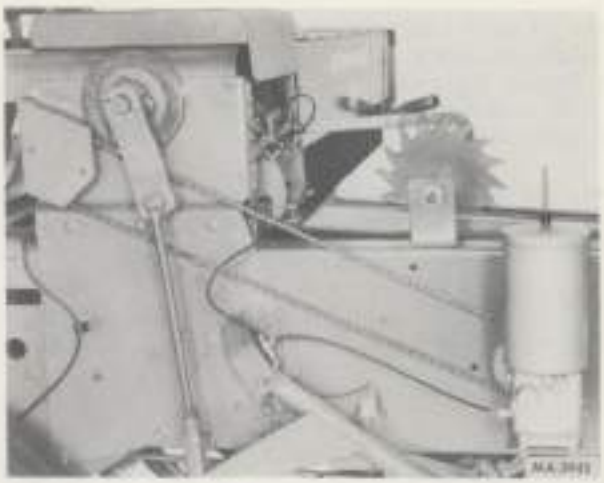
The automatic lubrication system immediately lubricates 19 points for the twine balers and 21 points for the wire balers by means of a power driven pump located on the left rear bale chamber side. See Illust. 61A. The pump is regulated to lubricate bearings at approximately 7 minute intervals.

The pump is easily filled with lubricant from the top by removing the cap. SAE-90 oil should be used as a lubricant.

Note: Do not use chassis lubricant under any circumstances because the soap or paraffin base will render the valves inoperative.

The snap-on valves "1" (Illust. 61) deliver a predetermined amount of lubricant to the lubrication points and are not internally serviceable. Once a valve has been snapped on a lubrication fitting, it should not be removed (unless faulty) as permanent damage to the valve will result. As the valves have been carefully planned to deliver the proper amount of lubricant to each location, be sure to obtain a valve of the same type and marking (one, two, or three rings) when replacing the valve. Individual valves and line and pump repair kits are available from your International Harvester dealer.

When replacing broken or damaged lines, also defective valves or tees, be sure to fully insert the tubing in the valve or tee and securely tighten the nuts so that the ball sleeves



Illust. 61A
Automatic lubrication pump and drive.

(ferrules) make a leakproof connection to the tube. Note: Before attaching the tubing end farthest from the pump, be sure to operate the pump until the lubricant is forced through the open end of the tube.

Emergency repair of broken lines may be effected by first squaring off the broken ends by cutting and then securely coupling the tubing ends together with the ball sleeve union, nuts and sleeves (ferrules) as instructed above.

Although most of the points are lubricated from the automatic lubrication system; the following points must be lubricated as shown in the lubrication chart, on pages 58 to 60.

Ref.	Description
1	Pitman bearing cap, front.
2	Pitman bearing cap, rear.
3	Packer finger bearing cap.
4	Packer relief trunnion (440 Baler).
5	Needle crank (Wire Baler).
11	Flywheel.
15	Floating pickup wheel (Optional for 430 Baler).
16	Auger shaft bearing.
17	Lower jack stem (Optional).
18	Power take-off knuckle.
19	Auger relief and support unit.
20	Wheel hub cap and bearing, left.
21	Wheel hub cap and bearing, right.
22	Power take-off knuckle shaft and sleeve.
23	Overrunning clutch.
24	Universal drive shaft shield bearings.
25	Main drive gear case.
26	Wisconsin Engine pulley cap (Optional).

SPECIFICATIONS

Size of bale chamber	14 x 18 inches
Weight of bales	
Twine Balers	up to 70 pounds
Wire Balers	up to 80 pounds
Length of bales	12 to 45 inches
Bale length controlled by	Metering Wheel
Bale tie	Twine or wire
Bales per minute	3 to 6
Type of feed	Floating auger and packer finger
Tons per hour — Alfalfa, lespedeza, clover - up to	17 tons - 430 Model 19 tons - 440 Model
Dry straw, prairie hay - up to	10 tons - 430 Model 12 tons - 440 Model
Transmission	Precision type
Plunger stroke	28 inches
Plunger strokes per minute	75 at 540 R.P.M.
Flywheel diameter and r.p.m.	22 inches Standardized power take-off speed (540 R.P.M.)
Bale separation	Timed needle action
Bale slicer	Right side knife
Hitch (regular)	Remote controlled latch
Pickup drive	Power
Type of pickup	Spring finger
Width of pickup	430 Baler - 4 feet, 4 inches, 440 Baler - 5 feet
Overall width of baler	430 Baler - 8 feet, 440 Baler - 8 feet, 8 inches
Overall length (with bale chamber extension or bale chute up)	
430 Baler	14 feet, 11 inches
440 Baler	16 feet
Power	
Tractor	2-plow rating, 1-3/8-inch power take-off and Standardized hitch.
Engine	VH4D 4-cylinder Wisconsin Engine governed at 2,680 r.p.m. high idle, developing 28.5 horsepower.
Tire pressures (ribbed implement tires)	
5.00-15, 4-ply	28 pounds
6.40-15, 6-ply	40 pounds
7.60-15, 6-ply	46 pounds
Baling twine recommended	IH baler twine

Baling wire recommended - Package No. 6500 ASAE, standard baling wire, 14-1/2 ga., 1 coil - 8-1/8-inch I.D., 13-1/4-inch O.D., 6 inches wide. Approximately 6500 feet long.

Specifications are subject to change without notice.

INDEX

MEMORANDA

Accidents can be prevented with your help

No accident-prevention program can be successful without the wholehearted co-operation of the person who is directly responsible for the operation of equipment.

To read accident reports from all over the country is to be convinced that a large number of accidents can be prevented only by the operator anticipating the result before the accident is caused and doing something about it. No power-driven equipment, whether it be transportation or processing, whether it be on the highway, in the harvest field or in the industrial plant, can be safer than the man who is at the controls. If accidents are to be prevented—and they can be prevented—it will be done by the operators who accept a full measure of their responsibility.

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