216 SERIES
BALERS

JOHN DEERE

OPERATORS MANUAL

216 SERIES
BALERS

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INTRODUCTION

Your new John Deere Baler is a dependable machine. With proper care and operation, you can expect to receive the service and long life designed and built into it. Like any precision machine your baler will require some attention at regular intervals. When any questions arise regarding lubrication and adjustments, etc., use your manual as a guide to service your machine the RIGHT WAY.

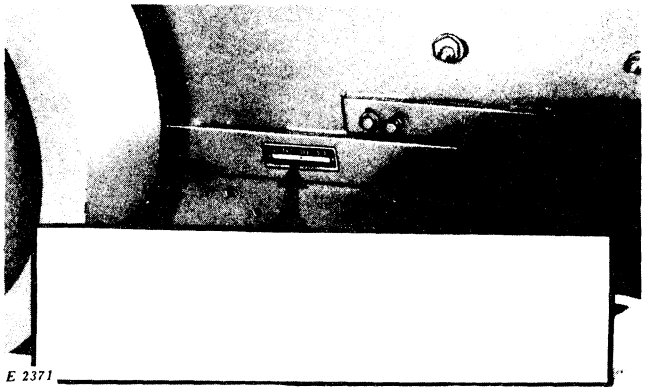
If you need additional information or special service not covered in this manual, see your John Deere dealer.

When in need of parts either to replace worn parts or to make emergency repairs, see your local John Deere dealer.

When ordering parts, give your dealer the model and serial number of your baler. This information will help him give you prompt and efficient service.

Information concerning the warranty on this equipment will be found on the inside back cover of this manual and in your copy of the delivery receipt which you should have received from your dealer when the equipment was delivered to you.

The serial number of your baler is located on the lower left-hand side of the bale case in front of the wheel. (Record it in the space below.)



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CONTENTS

Identification views 1

Specifications 2

Operation 3

Lubrication 17

Trouble shooting 20

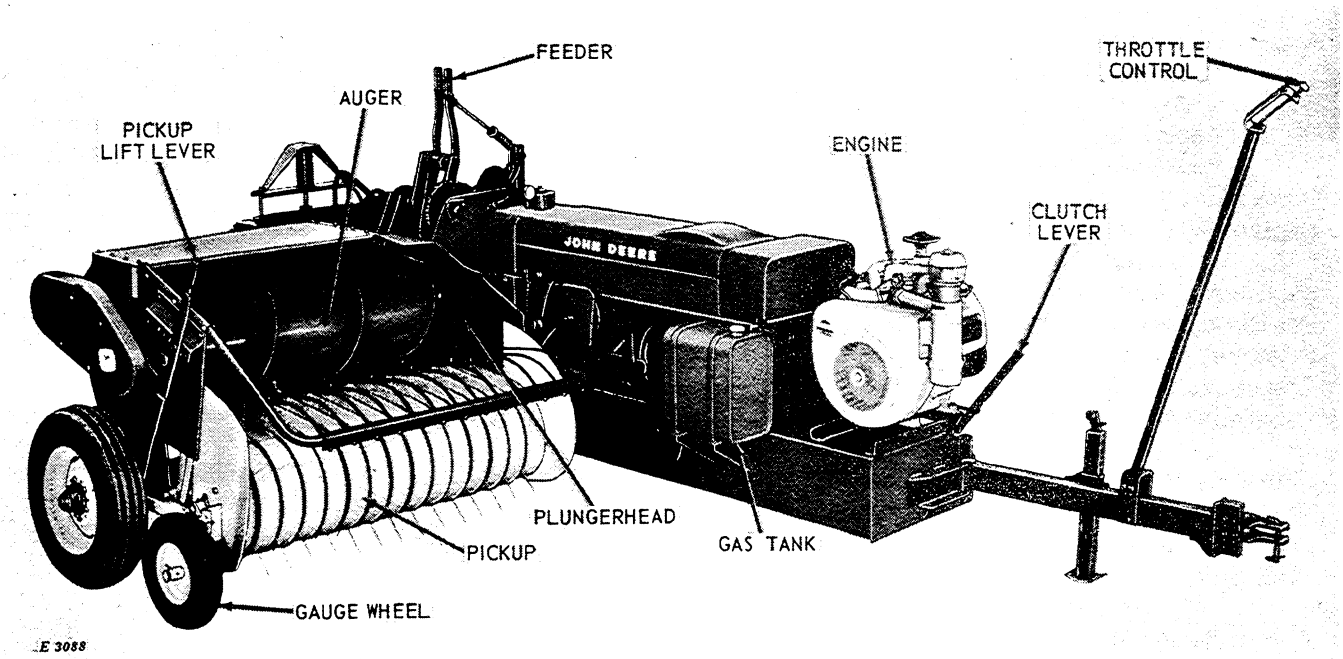
Service 28

Attachments 44

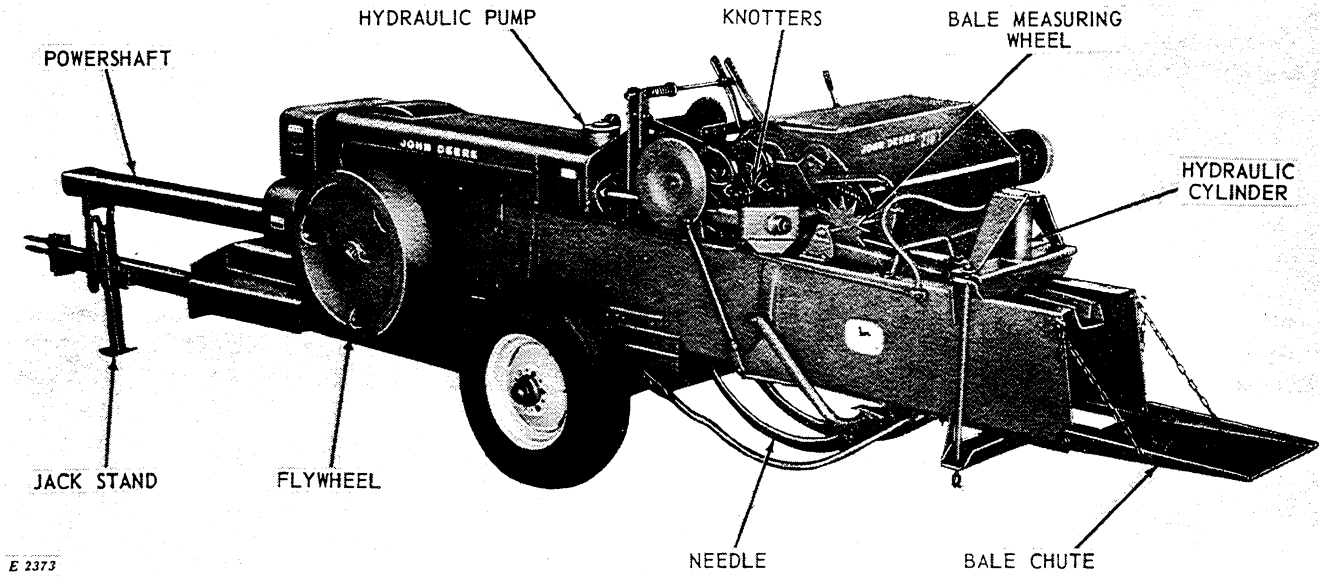
Assembly 47

Index 52

NOTE: Right and left-hand sides referred to in this manual are determined from a position at the rear of the machine facing in the direction of travel.



Right Front View—John Deere 216WS Engine Baler



Left Rear View—John Deere 216T Power Take-Off Baler

SPECIFICATIONS

Auger: Diameter	16 in.
Length	4 ft. 8 in.
Bale: Cross-section	16 in. x 18 in.
Length	Adjustable 12 to 50 in.
Weight regulation	Hydraulically controlled
Compression chamber length	50 in.
Engine: Wisconsin model VH4D	Electric starting, generator, 26.5 horsepower
Wisconsin model VG4D	Electric starting, generator, 36 horsepower
Engine fuel tank capacity	9 gal.
Feeder opening dimensions	Bottom: 22 in., top: 23-3/8 in., height: 14-3/8 in.
Flywheel diameter	27 in.
Height (maximum)	6 ft. 2 in.
Length: with tongue and bale chute	19 ft. 7 in.
less tongue and bale chute	14 ft. 5 in.
Lubrication (knotter area)	18-point Multi-Luber system
Pickup stripper diameter	17 in.
Pickup height adjusting range	5 in.
Pickup width: Inside	5 ft.
On flare	5 ft. 3 in.
Plungerhead: Stroke	32 in.
Speed	Normal (under load) 65 strokes per minute Maximum (no load) 72 strokes per minute
Bearings	Sealed, ball bearing rollers
Power take-off shaft speed	ASAE-SAE standard—540 rpm
Size of tractor recommended	3-Plow Tractor or larger
Tires: R.H. (Inflation pressure, 40 psi)	6.40 x 15—6-ply
L.H. (Inflation pressure, 50 psi)	7.50 x 16—10-ply
Pickup (Inflation pressure, 20 psi)	4.00 x 8—4-ply
Transmission: Gears	Helical, steel cut, enclosed
Weight (Approximate): With PTO (216T)	4059 lbs.
(216WS)	4114 lbs.
With VH4D Engine (216T)	4508 lbs.
(216WS)	4563 lbs.
With VG4D Engine (216T)	4775 lbs.
(216WS)	4830 lbs.
Wheel tread	8 ft. 6-1/2 in.
Width	9 ft. 5 in.
Wire (216WS)	14-1/2 gauge. Annealed oiled
Wire coil (216WS)	ASAE standard. 6500 ft. of wire
Wire carton size	13-1/2 in. sq., 6-1/2 in. wide

(Specifications and design subject to change without notice.)

OPERATION

PREPARING BALER

THE OPERATOR

The degree of satisfaction given by your baler is directly dependent upon the care given by the operator. Once the baler has been adjusted to meet the crop condition, the rest is up to the operator.

UNDERSTAND THE FUNCTION OF ALL WORKING UNITS

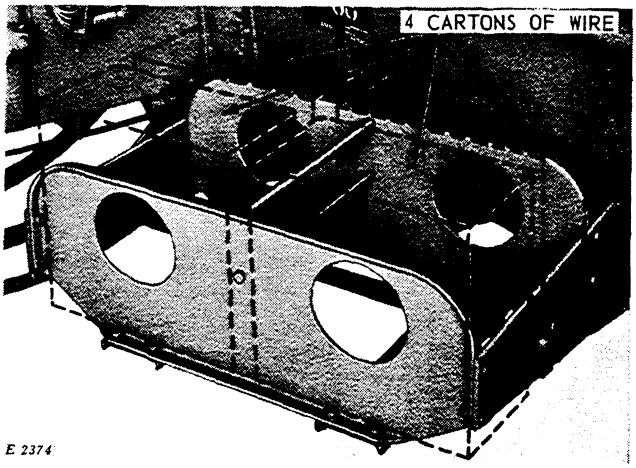
This baler is built to handle a wide range of conditions. Field conditions vary from year to year, from day to day, and even from hour to hour. Different varieties of crops present widely different baling problems. A careful study of the adjustments on your baler, and what they accomplish under different conditions, will allow you to reap the many benefits and economies that a baler can provide.

Before starting your baler in the field, be sure you are thoroughly familiar with the function of each working unit. Study the illustrations carefully and become familiar with the adjustments necessary to obtain best results.

LUBRICATION

Check to see that your baler has been lubricated according to lubricating instructions, pages 17 to 19.

LOADING THE WIRE BOX—WIRE BALER



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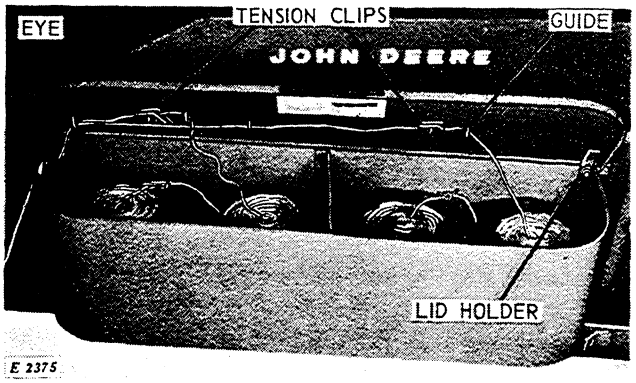
Place four cartons of wire in the wire box.

NOTE: Splice the center wire of each rear coil to the outside wire of its respective front coil of wire. Make a small tight splice so the wire will pull through the wire guides and needles without snagging.

When the front coils of wire have run out, place the rear coils forward and locate two new cartons of wire in the wire box and splice wires.

Thread the baler with the center wire from each front coil of wire as shown on page 4.

LOADING TWINE BOX—TWINE BALER



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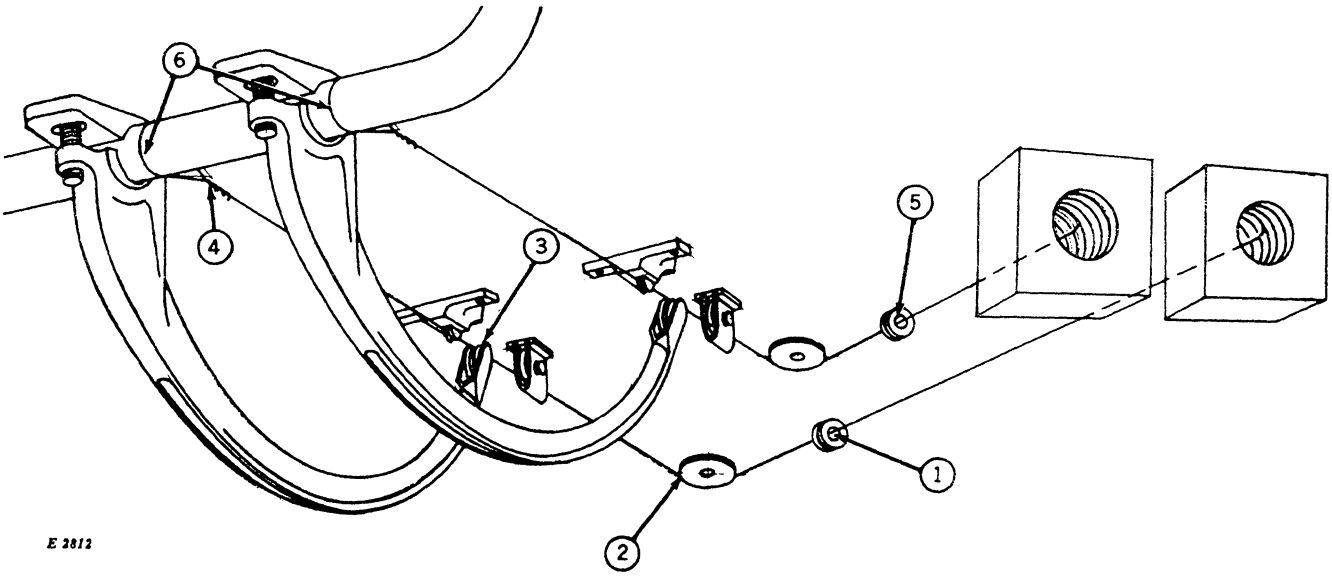
When loading or unloading the twine box, use the holder (located inside the twine box) to hold the lid out of the way.

Two balls of good quality twine should be placed in each compartment of the twine box.

NOTE: Be sure twine is pulled from the end of the ball marked top. The two balls in each section should be joined by tying the inside end of one ball to the outside end of the other ball. In joining the twine, use a square knot. The loose ends of the twine should be trimmed as close to the knot as possible. Thread the twine from the center of each ball through its respective guide in the box lid; then thread both ends of twine through the eye on the side of the twine box.

THREADING NEEDLES—WIRE BALER



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1. Thread the wire from the right-hand coil through the front hole in the main frame.

2. Continue threading the wire around front left-hand wire pulley inside of guides.

3. With the needles in home position, thread the wire under the left-hand center wire pulley and over the left-hand needle pulley.

4. Pull wire back and loop around the needle frame and secure with a twist.

5. Thread the left-hand wire through rear hole in the main frame and repeat Steps 2, 3, and 4 through the right-hand pulleys and needle.

When both strands of wire have been properly threaded, trip the measuring arm and turn the flywheel counter-clockwise by hand. Continue turning the flywheel until the needles are all the way up—the wire is held by the grippers, and the needles returned to the "home" position.

6. Remove the loose wire from the needle frame.

NOTE: Check front wire pulleys frequently to make sure they turn freely.

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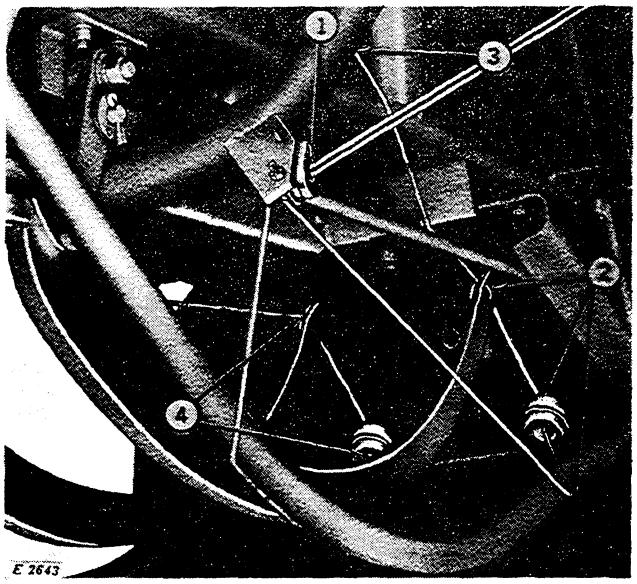
THREADING NEEDLES—TWINE BALER



1. Thread both ends of twine through eye on needle frame.

2. With the needles in "home" position, run end of one strand of twine below needle guard, through eye beneath right-hand needle and through right-hand needle.

NOTE: Thread twine OVER guide on end of needle.

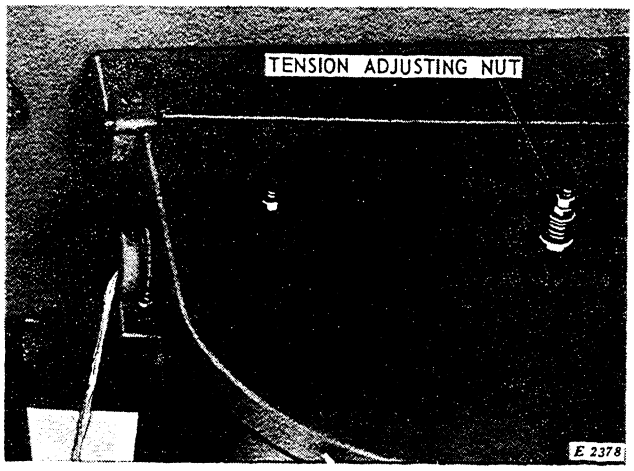
3. Run twine between needle frame and bale case and fasten around bale case top brace.

4. Repeat Steps 2 and 3 with the other strand of twine to thread left-hand needle.

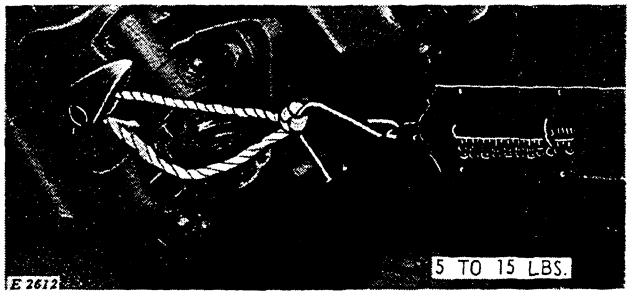
When both strands of twine have been properly threaded, trip the measuring arm and turn flywheel counter-clockwise by hand. Continue turning flywheel until needles are all the way up, twine is held in twine disk, and needles have returned to the "home" position.

Remove the twine which was temporarily secured to the bale case top brace. The twine is now ready for the baling operation.

TWINE TENSION—TWINE BALER



Twine tension is controlled by spring-loaded pressure plates on the inside of the twine box lid. Adjustment is made by the twine tension adjusting nuts on the outside of the twine box lid.

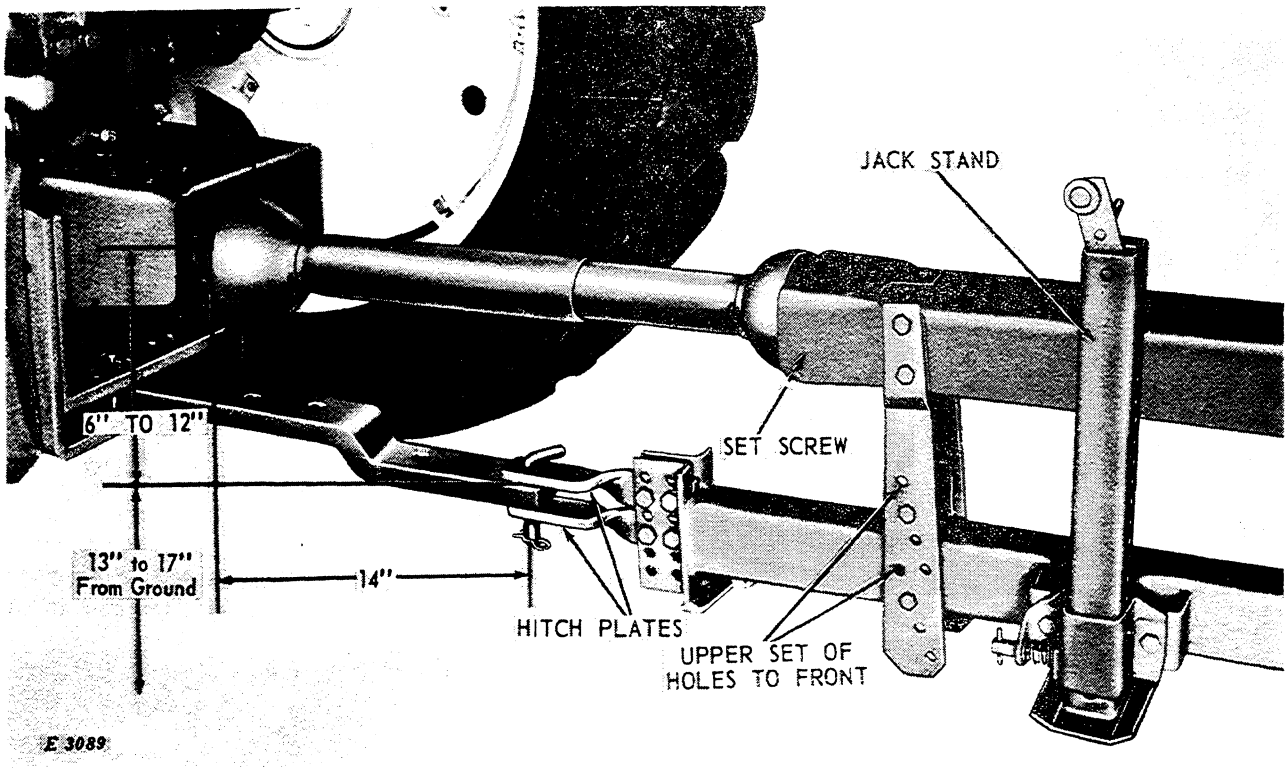


To test twine tension raise needles until the twine guide rivet is even with the top of the twine disk. Then attach a spring scale to twine as shown. Twine should pull from the twine box at 5 to 15 pounds pull. If twine pulls out at less than 5 pounds, tighten the twine tension adjusting nut. If more than 15 pounds of pull is required, loosen the twine tension adjusting nut.

KNOTTER ADJUSTMENTS—TWINE BALER

The knotter is carefully adjusted and tested at the factory and should give satisfactory performance with little or no adjustment. Make no adjustments until paint is worn off and all parts work smoothly. If trouble is then experienced, determine where it exists before making any adjustments. To correct the trouble, refer to the "Trouble Shooting" section of this manual or call your John Deere dealer. He is equipped to give you prompt "know-how" service in the field or in his shop.

HITCHING 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 rpm) to match the powershaft speed of your baler.

The tractor tire inflation pressures specified in the tractor operator's manual will apply.

DRAWBAR

Adjust the tractor drawbar so it measures 14 inches from the end of the power take-off shaft to the hitch pin hole in the drawbar, and 6 to 12 inches from the center of the PTO shaft to the top of the drawbar. The top of the rear end of the drawbar should be 13 to 17 inches from the ground. The drawbar hitch pin hole must be aligned vertically with the center line of the tractor power take-off shaft.

TONGUE HEIGHT

Hitch baler to the tractor drawbar. The hitch plates may be mounted lower for more ground clearance. They should be set to keep the power line as straight as possible.

ATTACHING UNIVERSAL JOINT

Attach the rear end of the baler universal joint to the powershaft and secure it with a set screw and lock nut. Attach the front end of the universal joint to the tractor powershaft.

When hooking up to a tractor equipped with a side-mounted mower, it may be necessary to cut off 1/4-inch from the front end of the universal joint.

NOTE: Never use a steel hammer when attaching or removing universal joints. Keep the universal joint splines clean.

JACK STAND

After the baler has been properly hooked up, raise the jack stand.

POSITIONING POWERSHAFT SUPPORT BRACKETS

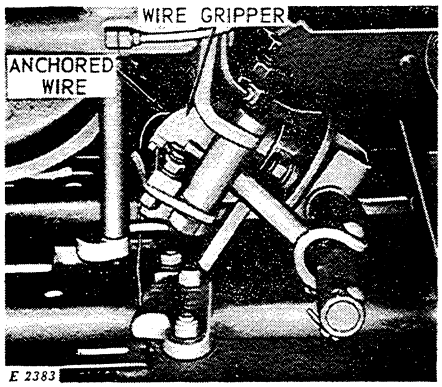
Set the support brackets with the upper set of height adjusting holes towards the front as shown. Set the support brackets to keep the power line in as straight a line as possible.

CAUTION: Never hook up your 540 rpm baler to a 1000 rpm tractor.

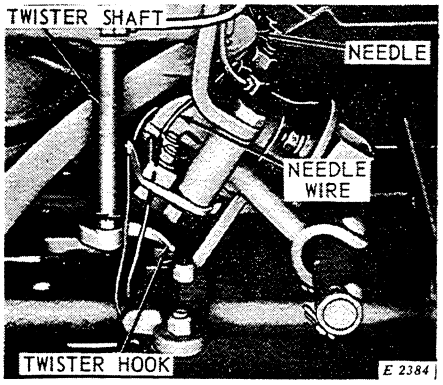
IMPLEMENT OPERATION

HOW THE WIRE IS JOINED—WIRE BALER

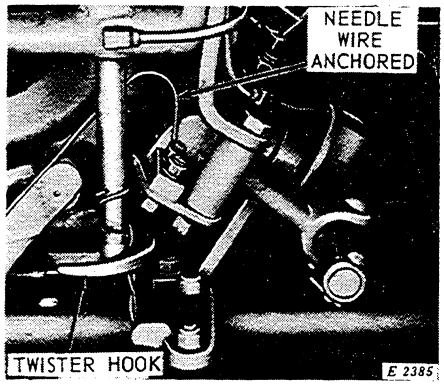
To get a better understanding of the operation and the importance of the various adjustments dealt with on your baler, an understanding of the tying cycle is important. The following steps illustrate and describe the action of various stages of one complete twist formation.



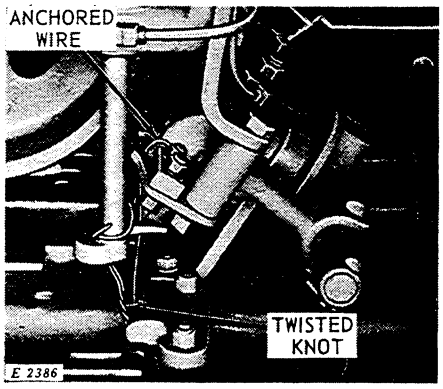
1. After the needle has been threaded, the end of the wire is anchored by the wire gripper. As the bale is formed, the needle wire is pulled from the wire box around the bale.



2. When the bale reaches its proper length, the measuring wheel trips the twisting mechanism. As the needle starts up, it catches the wire around the bottom of the bale and carries it up the front of the bale. The intermittent drive gear on the needle lift shaft engages the pinion on the bevel gear drive shaft which turns the pinion on the twister shafts. The needle continues to raise and locate the wire in the notch in the shear plate on the opposite side of the anchored wire, while the twister hook on the twister shaft is rotating in a clockwise direction. The twister hook completes one revolution and grasps both strands of wire.



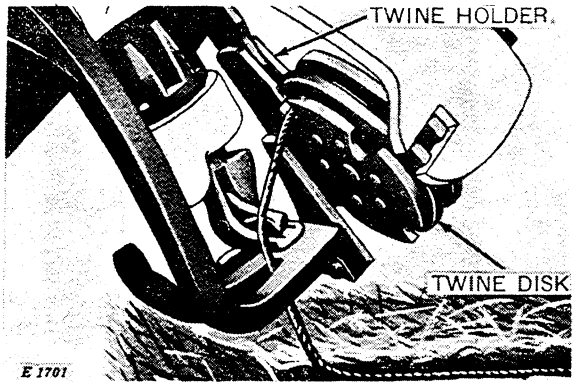
3. At this stage, the wire gripper drive pinion is engaged by the intermittent drive gear. This pinion drives the gripper shaft which actuates the arm of the gripper to release the anchored wire, also shearing and anchoring the needle wire as the gripper moves to the other side. At this time, the needle returns home, the twister hook makes five complete revolutions twisting the wire ends together.



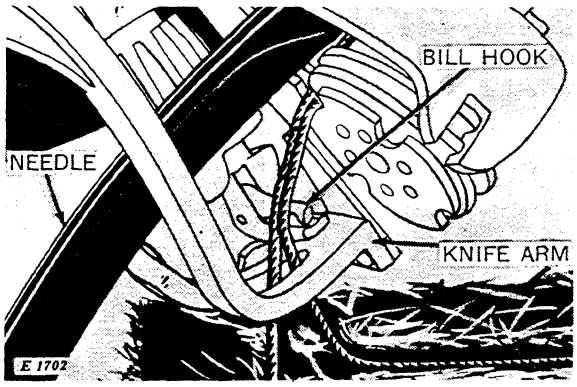
4. The completed bale coming out of the bale case pulls the twisted knot off the twister hook. The next bale pulls the anchored wire into position for the next twisting cycle.

HOW THE KNOT IS TIED—TWINE BALER

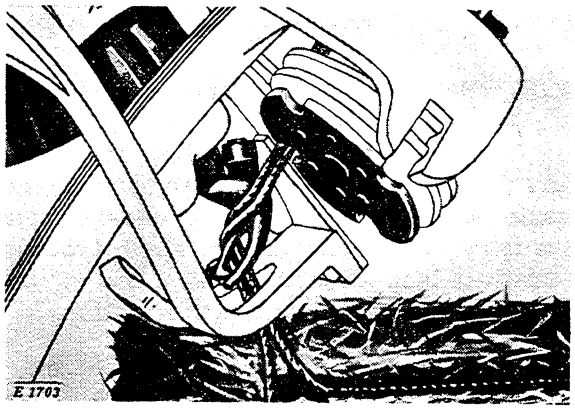
To get a better understanding of the operation of your baler and the importance of the various adjustments dealt with in this manual, an understanding of the tying cycle of the baler is important. This illustrates and describes the knotter action at various stages of one complete knot formation.



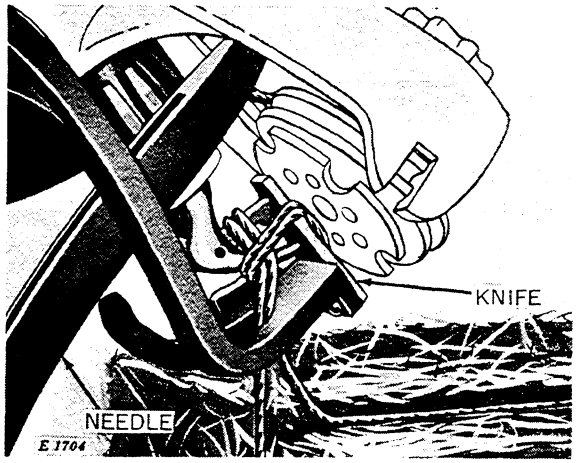
1. After the needle has been threaded, the end of the twine is held in the twine disk by the twine holder. As the bale is formed, it pulls twine from the twine box.



2. When the bale reaches its proper length, the measuring wheel trips the tying mechanism and the needle (with the help of the tucker finger) brings the second strand of twine through the guide on the knife arm—across the billhook and into the twine disk.

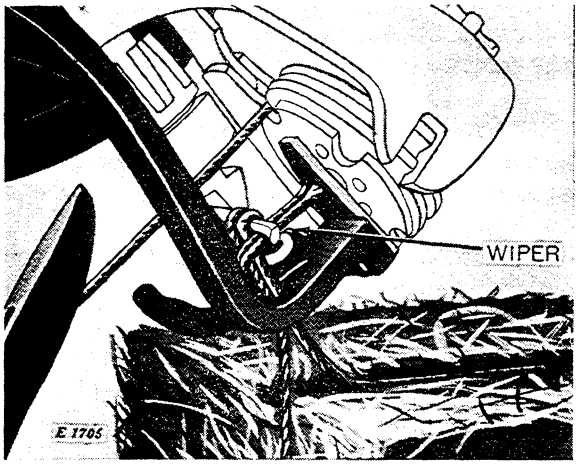


3. The billhook starts its revolution when the gear teeth on the intermittent knotter gear have operated the disk driving pinion and turned the disk sufficiently to permit the twine holder to secure both strands of twine in the disk.

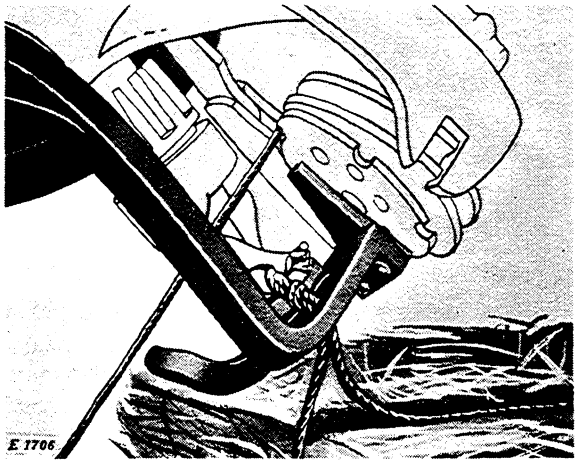


4. As the billhook turns, it forms a loop of twine around the hook, the jaw opens to receive the twine. The knife advances ready to cut the twine between the billhook and the disk.

NOTE: At this stage, the needle begins to recede—leaving twine in the disk which will be held there for the next knot.



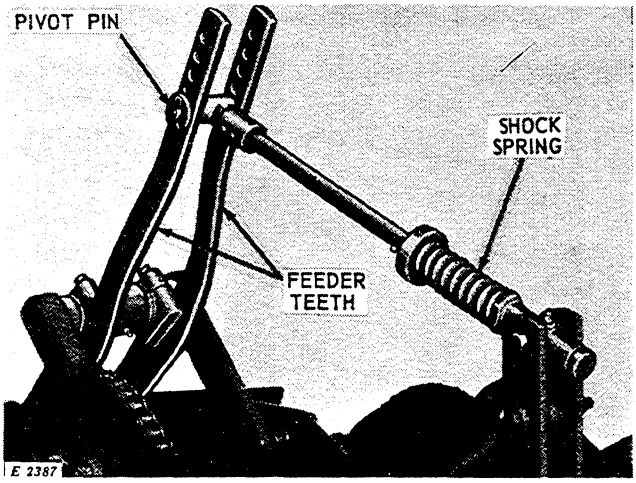
5. The billhook jaw has closed and now holds the ends of the twine tightly. The twine has been cut and the wiper on the knife arm advances to wipe the looped twine from the outside of the billhook—as the jaws hold the two cut ends of twine preparatory to completing the knot.



6. The knot is tied and drops from the billhook, which completes the tie around the bale.

The needles then return to the "home" position leaving the strand of twine in the disk and extending through the bale chamber ready to receive material for the next bale, at the end of which another tying cycle will be performed.

ADJUSTMENT OF FEEDER TEETH



Two feeder teeth feed hay from the auger into the bale chamber. The teeth are adjustable to produce bales of uniform density when operating in hay of varied conditions. The teeth may be adjusted to increase or decrease their stroke, which alters the distance they move into the bale chamber.

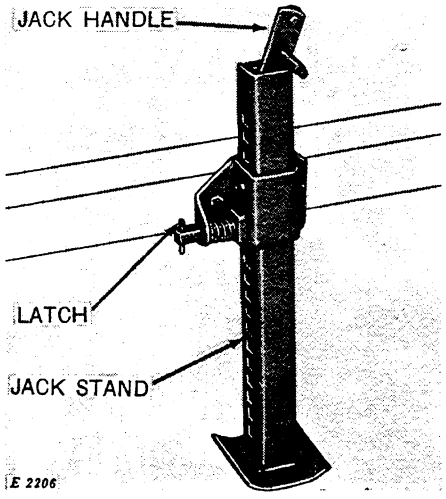
Increase the length of the feeder teeth stroke if material is not coming far enough into the bale chamber; decrease the stroke if material is coming in too far.

To increase the stroke of the teeth, place the pivot pin in the lower holes of the feeder teeth. To decrease the stroke of the teeth place the pivot pin in the upper holes of the feeder teeth.

If the teeth are set for their longest stroke and the material is still not coming far enough into the bale chamber, the baler is probably being underfed. This happens when baling too slow or when picking up windrows which are too light.

A shock spring helps protect the teeth from damage as a result of oversize charges of hay or from striking a solid object.

JACK STAND



During operation or transporting, the jack stand is held firmly out of the way by a spring-loaded latch.

NOTE: Seat the latch in one of the five bottom holes to lock the stand in raised position. Operate the jack stand as follows:

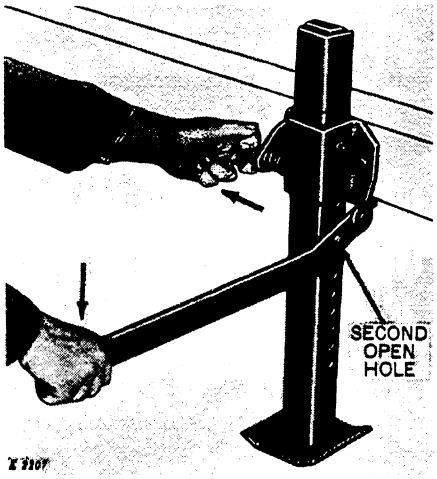
Raising Tongue

1. Place the pin on the jack handle completely through the first open hole in the rear of the jack stand which is immediately under the jack stand mounting bracket.

2. Push down on the jack handle to raise the tongue.

3. Repeat Steps 1 and 2 to raise the tongue higher.

Lowering Tongue



1. Place the pin on the jack handle completely through the second open round hole below the jack mounting bracket.

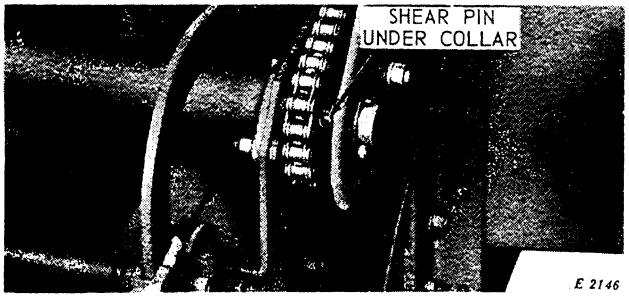
2. Push down on the jack handle and pull out the latch; relax pressure on jack handle and release latch.

3. Repeat Steps 1 and 2 to drop the tongue lower.

Replace the jack handle in the top of the jack stand.

NOTE: It is not necessary to use the jack handle after weight of baler is removed from the jack. The jack may be raised by pulling the latch and lifting the jack by hand. The jack will lower itself to the ground by pulling the latch.

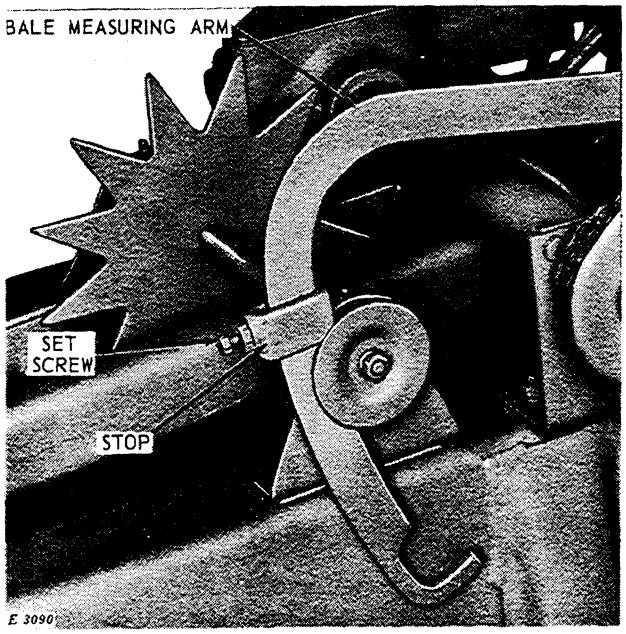
KNOTTER AND NEEDLE DRIVE SHEAR PIN



The knotter and needle drive special shear pin helps protect the knotter and needle drive from damage if the knotters become obstructed or if the needles are prevented from completing their cycle. Correct the trouble and replace the special shear pin.

CAUTION: The plungerhead and needles must be retimed before operating baler. (See step 5 on page 29.

BALE MEASURING CONTROL



Adjust the stop on the measuring wheel control arm up or down for the desired bale length. Raise the stop for bales up to 50 inches long or lower the stop for bales as short as 12 inches long.

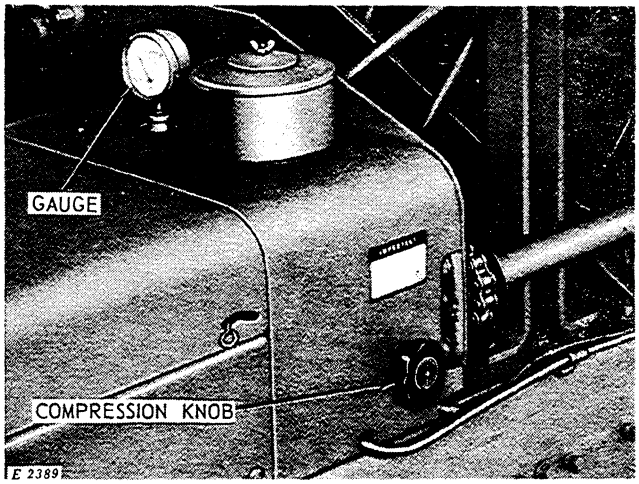
Irregular length bales are caused by lack of density of the material. This may be remedied by increasing the ground speed, increasing the size of the windrow, or by tightening the tension control knob on the hydraulic pump.

NOTE: Bales too tight or too heavy cause excessive strain on the baler, contributing to undue breakage and wear of parts and also breakage of twine or wire.

BALE WEIGHT CONTROL

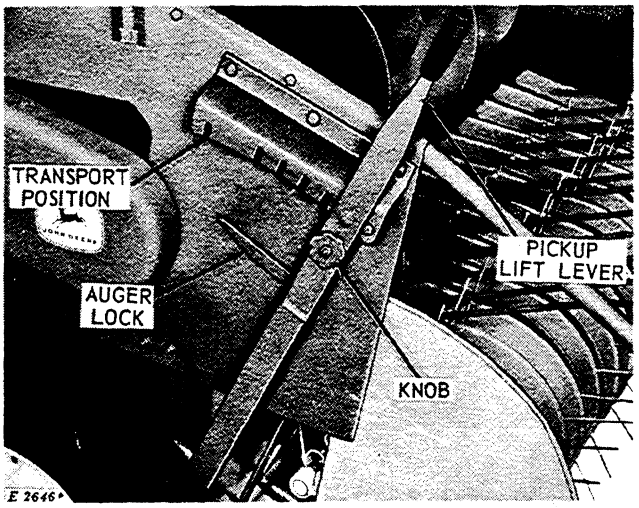
Bale weight is regulated by changing the compression on the bale chamber. Compression is changed by adjusting the compression knob on the hydraulic pump. Turning the knob clockwise increases the compression, turning the knob counter-clockwise decreases the compression.

CAUTION: When starting the first bale, leave the compression knob loose and tighten gradually as bale compression increases in the bale case. Compression in pump must never exceed 750 lbs. as indicated on the pressure gauge.



Bale weight is also affected by the size of windrows, moisture content, and the quality of the hay. Since these factors may vary from hour to hour or from windrow to windrow, the bale weight should be checked regularly during operation.

PICKUP HEIGHT

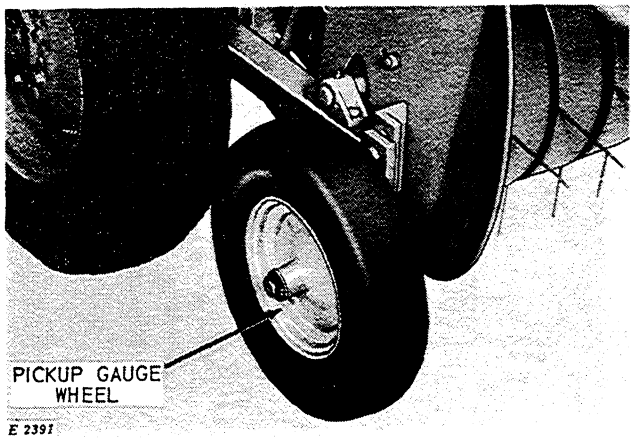


The pickup lift lever controls the working height of the pickup teeth. The lever may be adjusted to one of five operating positions or a transport position. Set the pickup teeth as high as possible but low enough so they will still pick up all the crop.

To raise or lower the pickup, loosen the locking knob and pull the lever out; then move it forward or rearward. Tighten the knob.

When the pickup lift lever is in transport position, the auger lock holds the auger to prevent bouncing.

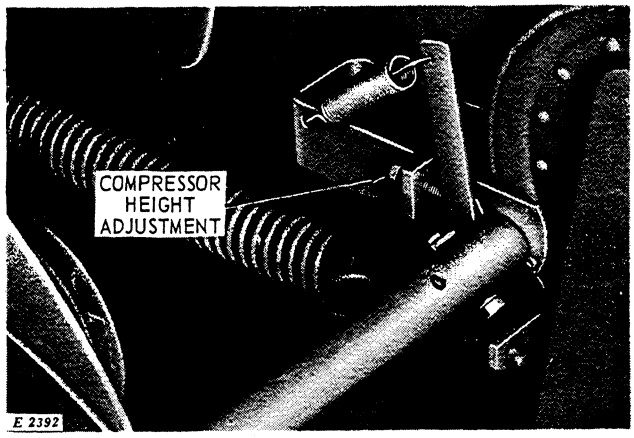
PICKUP GAUGE WHEEL



The pickup gauge wheel is adjustable to maintain the pickup at its operating height as determined by the lift lever.

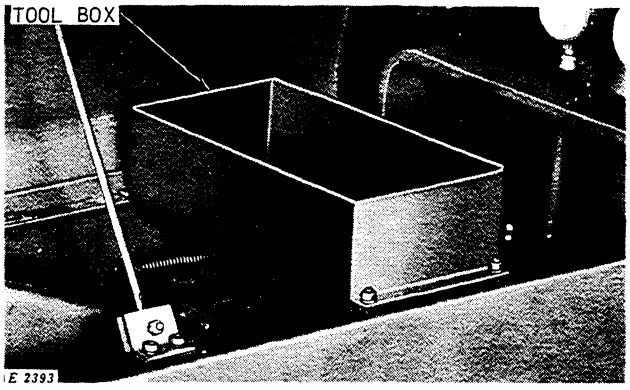
Adjust the wheel up or down by repositioning it on its mounting bracket.

PICKUP COMPRESSOR ADJUSTMENT



In normal conditions, adjust the compressors until their tips clear the strippers approximately 5 inches—with the pickup lift lever in its lowest position. When operating in flattened windrows, or stemmy material, set the tips of the compressors approximately 3 inches above the strippers.

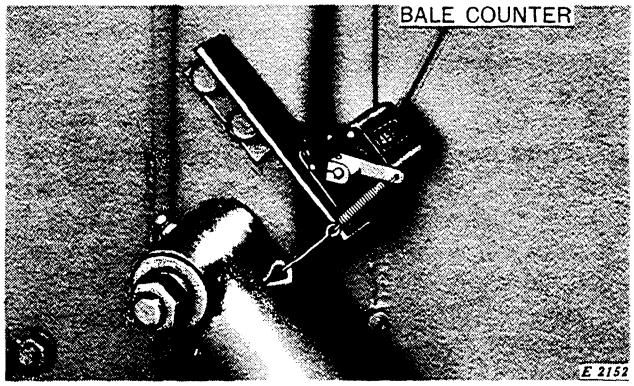
TOOL BOX



A tool box is provided as a convenient place for keeping "essential" tools and the operator's manual.

The box is located under the crank shield.

BALE COUNTER

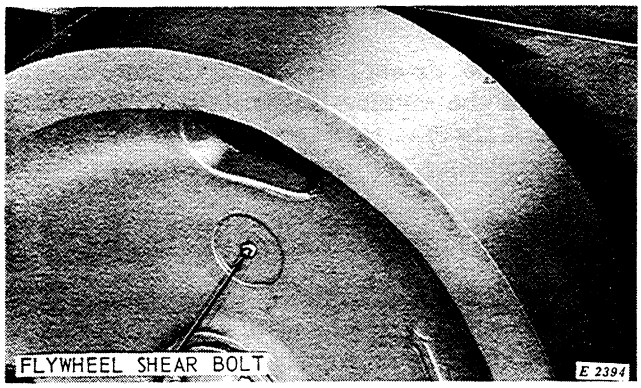


The bale counter keeps an exact record of the number of bales baled. It can be reset at any time.

TONGUE POSITION

To change from transport to operating position, remove the pin which secures the tongue in transport position, block in front of the right-hand wheel and shift the tongue to the left with the tractor. Secure the tongue with the locating pin. (See transporting on page 15.)

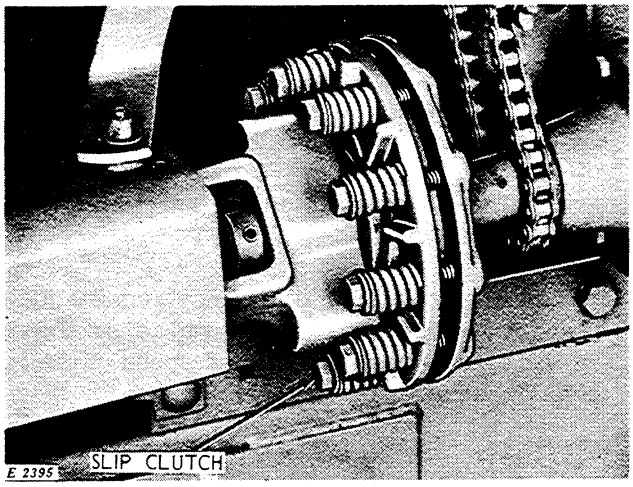
FLYWHEEL SHEAR BOLT



The special shear bolt in the flywheel will shear if the plungerhead becomes blocked during operation. (See page 27 for service.) When the cause of shearing has been located and corrected, replace with a new special shear bolt.

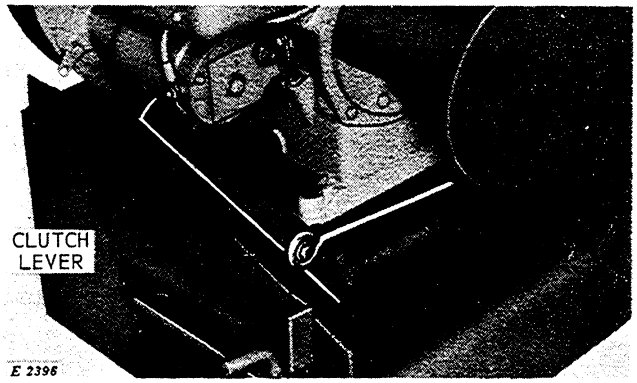
If the needles are in the bale case when the bolt shears, return the needles to home position by hand before starting the baler.

SLIP CLUTCH



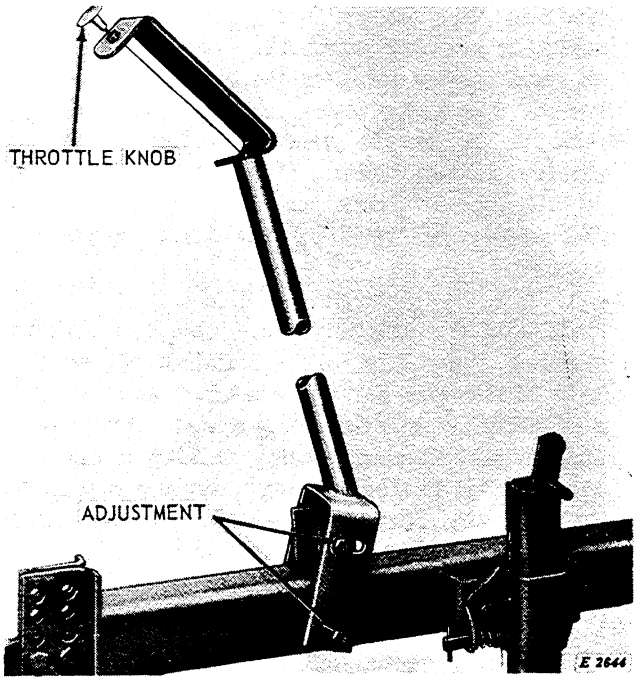
The slip clutch in the main drive helps protect the baler from undue stress resulting from: high starting torques, material too heavy, obstacles lodging between knives, etc. (See page 40 for adjustment.)

ENGAGING ENGINE DRIVE



The engine clutch lever controls the transmission of power from the engine to the flywheel. Release tension on belt when starting the engine.

THROTTLE CONTROL



The throttle control support is adjustable to permit easy access from the tractor seat.

ENGINE CONTROLS

The controls and operation of the engine are described in the engine operator's manual.

FIELD OPERATION

BREAKING IN THE NEW BALER

After the baler has been completely assembled and connected to the tractor, inspect it to be sure all bolts are tight. A loose bolt may cause wear and make premature replacement of parts necessary.

Inspect all chains for proper tension. Tighten chains only enough to prevent links from climbing sprocket teeth.

If baler is equipped with an engine, see the operator's manual that accompanies the engine for engine operation and break-in instructions. Check the drive belt (see page 42) to be sure tension is adjusted just tight enough to eliminate slippage.

NOTE: On twine balers, grease has been applied at the factory to the billhooks and twine disks to prevent paint and rust from collecting on these parts. Remove the grease and the paint before operating baler. Some misses in tying may occur in the first few bales due to this grease. Do not attempt to make adjustments until all knotter parts have had time to become thoroughly polished by the twine through operation.

The new machine should be given an empty running "breaking-in" period of at least one hour to allow the parts to work in gradually. After a short run at slow idling speed, stop machine and inspect it completely, making a check for loose bolts, heated bearings, binding parts, chain tension, etc. Run the baler at slow idling speed for the first thirty minutes and increase to full speed for the rest of the period. Inspect baler frequently during the "breaking-in" period.

CROP PREPARATION

The windrows should be of moderate size made by a side-delivery rake or windrower.

DIRECTION OF TRAVEL

Bale the driest hay first; therefore, start baling at the outside of the field. Travel in the direction that the rake or windrower traveled to pick up the hay in a head-first position.

STARTING AND DRIVING

When starting the baler, bring the tractor or engine up to recommended speed to obtain 540 rpm on the baler powershaft (plungerhead should be up to normal 65 strokes per minute under load). Drive in low gear until baler is functioning properly and a few bales have been discharged. If hay does not fill opening in the bale chamber, gradually increase ground speed up to about 3-1/2 miles per hour, or increase the size of the windrow, until good sized charges are fed into the compression chamber without straining the feeding and baling mechanisms. If the auger drive belt slips, the baler is being crowded beyond its capacity, and serious damage may result.

The baler is operating efficiently, when it is taking from 12 to 18 charges per bale.

The capacity of the baler depends upon such factors as material characteristics, ground conditions, condition of tractor, and the judgement of the operator. Do not crowd your baler. You are primarily interested in tons per day, not bales per minute.

Rough ground conditions may require judgement on the part of the operator to adjust the size of the windrow and the ground speed of the machine to obtain the best performance.

Always operate the baler with tractor or engine at recommended speed to obtain 540 rpm on the baler powershaft.

CAUTION: Disengage the tractor PTO shaft when making sharp turns at ends of the field to avoid excessive vibration.

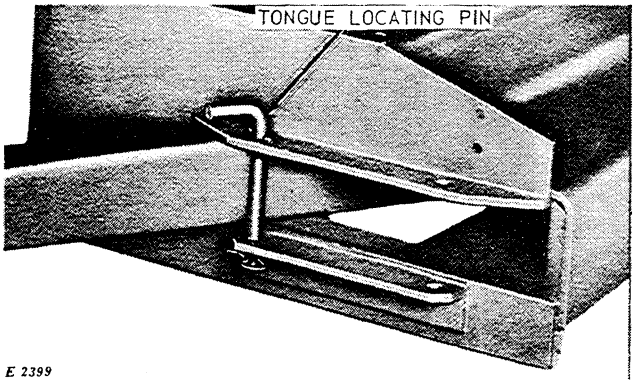
When starting with an empty bale case, the first few bales will be light and their length will be irregular until the compression of the material has been built up sufficiently to turn the bale measuring wheel positively.

The twine or wire coming out of the box should move with each stroke of the plunger. If it stops moving, the twine or wire has run out or has broken. Stop and correct the trouble.

It is essential to periodically clean out accumulated chaff and trash from around the twine or wire tying mechanism and the plungerhead stop. In most haying conditions this accumulation will not affect the operation of the baler. If material is high in moisture content or gummy, or if the accumulation gets wet, it may cause the trip device to function inaccurately, resulting in broken parts, long bales, or untied bales.

Adjust plungerhead after baling the first 1,000 bales (see page 38) and thereafter as necessary, depending upon operating conditions.

TRANSPORTING



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The baler can be easily changed from operating to transporting position by removing the locating pin, blocking behind the right-hand wheel, and shifting the tongue to the right with the tractor. Secure the tongue with the locating pin.

When transporting the baler, raise the pickup to the highest position to prevent damage to the pickup.

When the pickup lift lever is in transport position, the auger lock holds the auger to prevent bouncing.

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

SAFETY SUGGESTIONS

This machine has been carefully shielded for your protection—nevertheless, ordinary caution must be exercised in operation. Always keep all safety shields in place when operating baler. Avoid serious accidents by keeping hands and clothing away from chains and other moving parts.

Before servicing or adjusting the baler, or removing bales or other material from it, or hitching wagon to baler, always:

(a) disengage all power,

(b) shut off engine, and **then**

(c) wait until baler flywheel has stopped rotating.

Tractor hookup rotating shields must turn freely. Use light oil on nylon bearings as necessary.

Stand clear of machine at all times when machine is operating.

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

Be sure flywheel is not moved when working on knives.

Extreme caution must be exercised when tripping knotters by hand with the baler running, do not touch knotter and stand clear of needle frame.

Do not try to remove or pull twine or wire from bale case or knotter when machine is running.

Always shut off the engine before refueling.

Do not smoke or use an oil lantern when refueling any engine.

STORAGE

Your baler should be taken to an authorized John Deere dealer for a complete service check at the end of each season to assure the best of performance at the beginning of the next season.

STORAGE AT THE END OF EACH SEASON

1. Shelter the baler in a dry place.

2. Clean the baler thoroughly inside and out. Trash and dirt will draw moisture and cause rust.

3. Clean out the knotter mechanism and apply a coating of grease.

4. Thoroughly grease the machine according to the lubrication charts on page 17.

5. Paint all parts from which the paint has been worn, except the inside of the bale case. This should be brushed with grease.

6. Clean all chains by washing them with a solvent. Dry well and coat with a heavy oil.

7. Block up baler under axle, taking load off tires. DO NOT DEFLATE TIRES. If exposed, cover tires to protect them from light, grease, and oil.

8. List the replacement parts that will be needed and order them early. Your John Deere dealer at this time can expedite delivery of parts and install them during slack periods—avoiding delays next baling season.

9. If your baler is engine-mounted, see the Engine Manual for storage instructions.

PREPARATION AT THE BEGINNING OF EACH SEASON

1. Remove the grease from the knotter mechanism.

2. Remove the heavy oil and grease from the bale case and chains.

3. Lubricate complete machine (page 17); this will force any collected moisture out of the bearings.

4. Check air pressure in tires. See page 2.

5. Drain and flush the gear case and refill to check plug level with SAE 90 Extreme Pressure Gear Lubricant.

6. Tighten all bolts, nuts, and set screws.

7. Adjust and check timing of entire baler as described on page 28.

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

9. If your baler is engine-mounted, see Engine Manual for instructions.

LUBRICATION

The economical and efficient operation of any machine is dependent upon regular and proper lubrication of all moving parts with a quality lubricant. Neglect leads to wear, break-down, and needless replacement of parts.

CAUTION: Do not clean, lubricate, or adjust your machine until power is shut off and baler flywheel has stopped rotating.

IMPORTANT: Before operating machine, check oil in gear case. (See Note No. 3.)

FITTINGS

Clean grease fittings before using grease gun. Replace any lost or clogged fittings immediately.

CHAINS

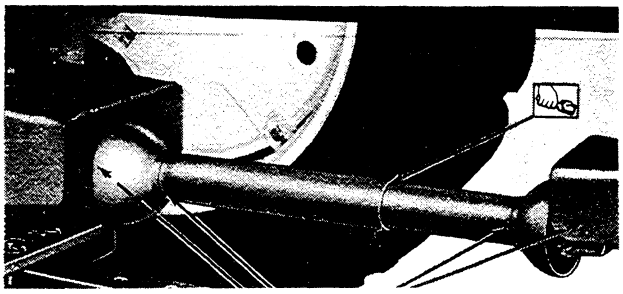
At varying intervals, depending on weather and field conditions, chains will become stiff or gummy. As necessary, remove chains and wash in diesel fuel, then dip the chains in oil. Allow the chains to drain and replace them on the machine. (Retime the baler. See page 28.)

Symbols
 Grease every 10 hours of operation with SAE multipurpose-type grease.
 Brush with grease periodically.

JACK STAND

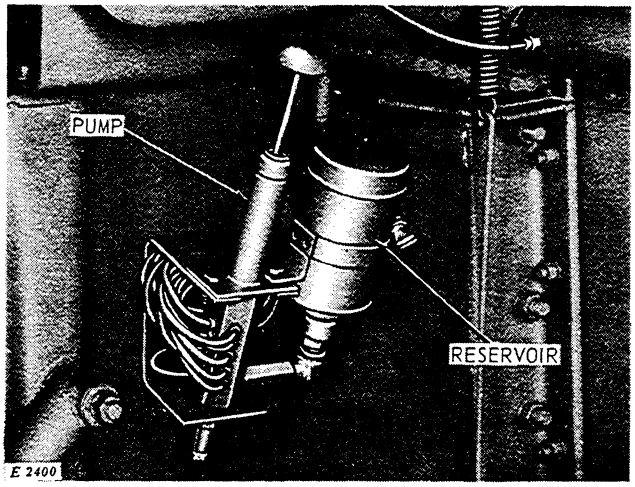
Grease jack stand fittings once each season or more often, as necessary, to insure easy operation.

TRACTOR HOOKUP



NOTE NO. 1: Oil the ratchet pins in the overrunning clutch through the spring-loaded ball valves in the front of the clutch, and the nylon retainer bearings in the tractor hookup, every 50 hours of operation. Grease tractor hookups and U-joints with SAE multipurpose-type grease every 100 hours of operation. Be careful not to blow out the grease seals. One or two pumps of grease is sufficient.

MULTI-LUBER SYSTEM



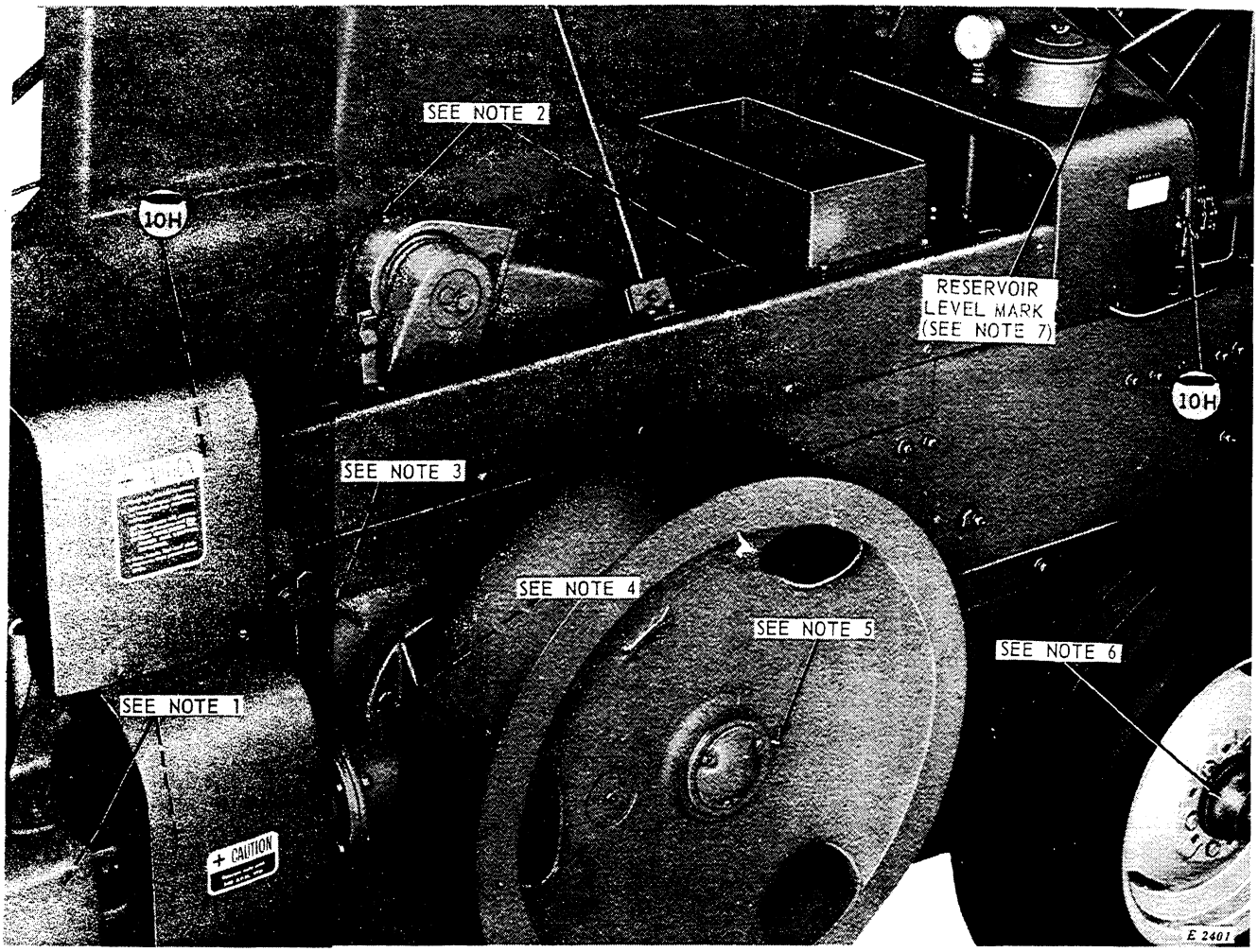
Pump Multi-Luber four times every four hours of operation.

Depress the pump handle manually through its full stroke to discharge lubricant from all outlet ports. The measuring chamber in the pump is filled as the plunger and handle returns to normal position. Refer to page 42 for the method used to detect and repair clogged or broken oil lines.

CAUTION: Excess grease in the knotter area causes accumulation of chaff and dirt, which tends to cause undue wear and breakage.

Use genuine John Deere Quik-Lube Lubricant in the Multi-Luber system. This lubricant is available from your John Deere dealer as part number AN11100N. Check reservoirs periodically to be sure lubricant is always available to system. A dip stick in the top of the reservoir is provided for this purpose.

PTO, PITMAN, GEAR CASE AND HYDRAULIC PUMP



NOTE NO. 2: Grease sealmaster front pitman bearing lightly every 100 hours of operation. Grease rear end of pitman every 10 hours of operation.

NOTE NO. 3: Check level of oil in main gear case daily. (Check-plug is on front, right-hand side of gear case.)

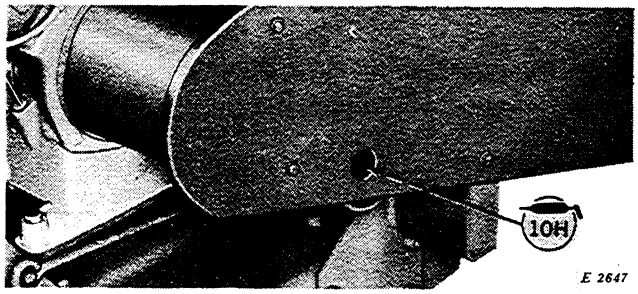
NOTE NO. 4: Drain, flush, and refill prior to each baling season. Two drain plugs are located on the bottom of the gear case. Fill to check-plug level with SAE 90 Extreme Pressure Gear Lubricant. (Capacity 4 quarts.)

NOTE NO. 5: Grease flywheel bearing when replacing flywheel shear bolt.

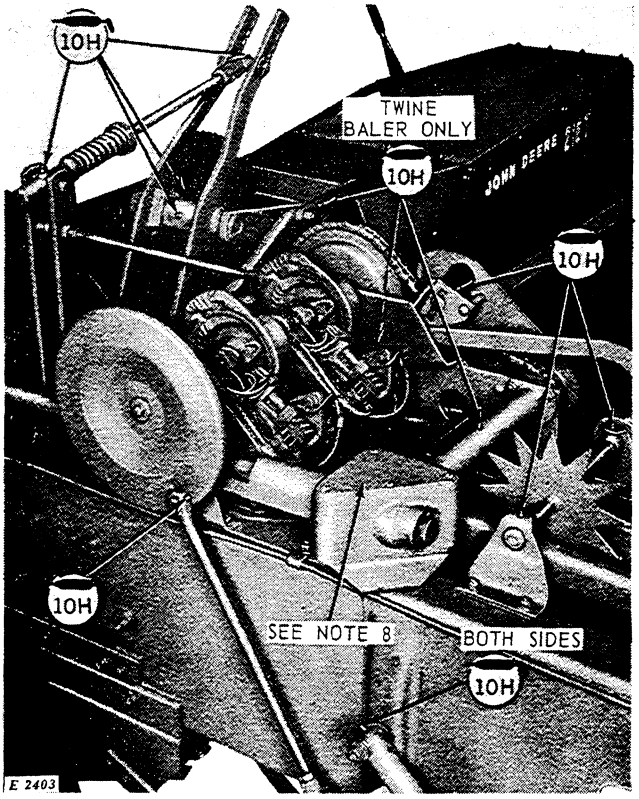
NOTE NO. 6: Pack wheel bearings with SAE multipurpose-type or wheel bearing grease once a year.

NOTE NO. 7: Keep the oil reservoir filled to the level mark with SAE 10W-30 Engine Oil or John Deere Type 303 Special Purpose Oil or its equivalent. Clean the cover and filter every 10 days or more often in extremely dusty conditions. (See page 43.)

ENGINE IDLER

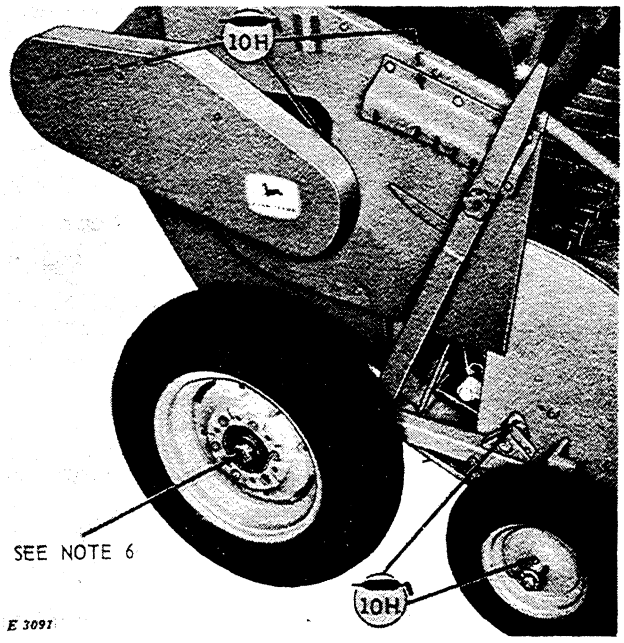


FEEDER AND KNOTTER AREA

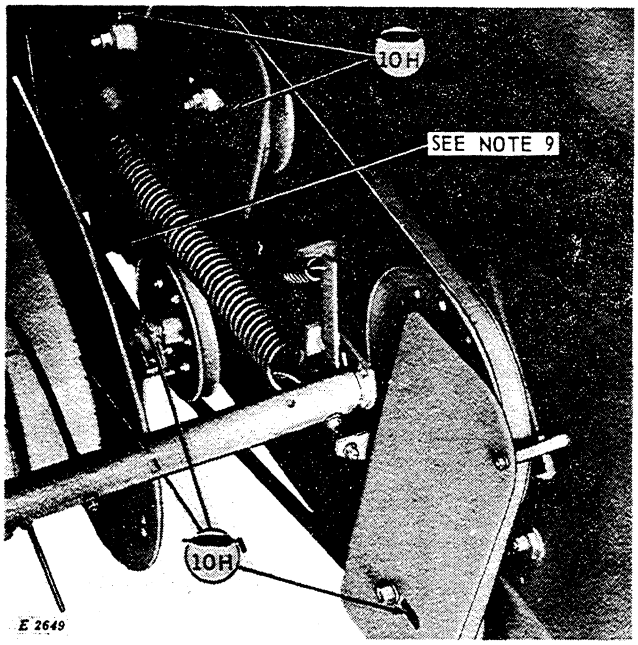


NOTE NO. 8: Keep auger drive gear case filled to within 3/4 inch of top with SAE multi-purpose-type grease.

AUGER AND PICKUP



PICKUP DRIVE

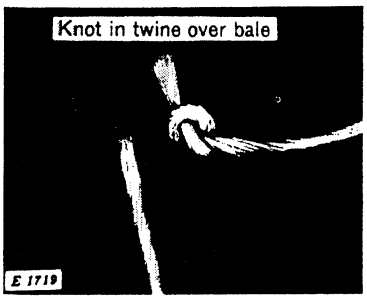
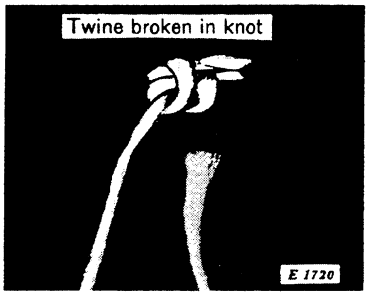
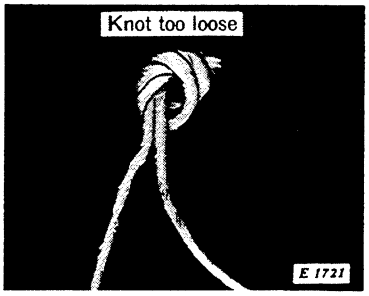
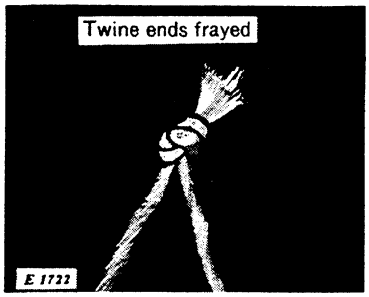


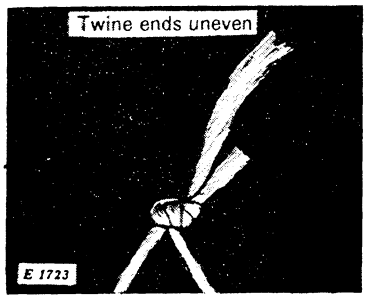
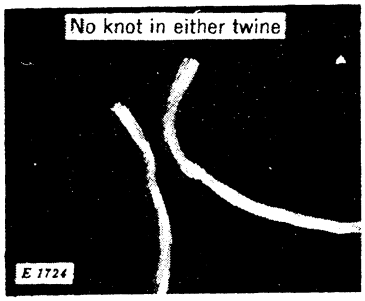
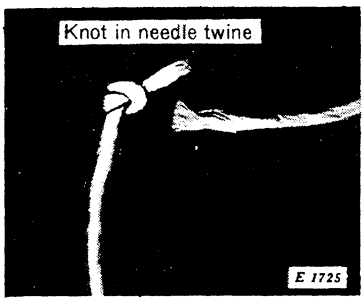
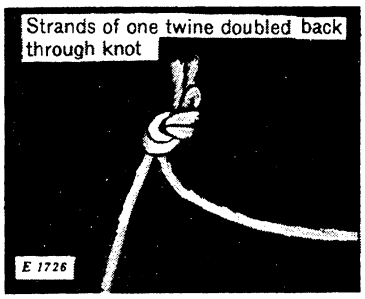
NOTE NO. 9: Oil Bell crank and other working parts of plungerhead safety stop every 30 hours of operation.

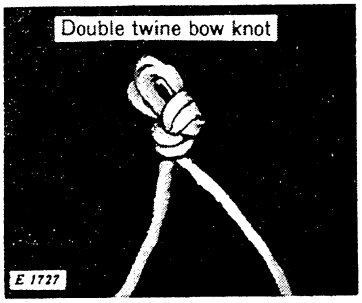
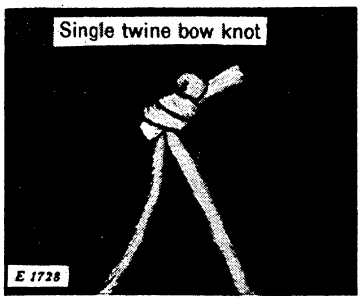
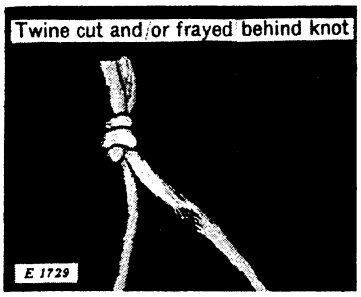
TROUBLE SHOOTING

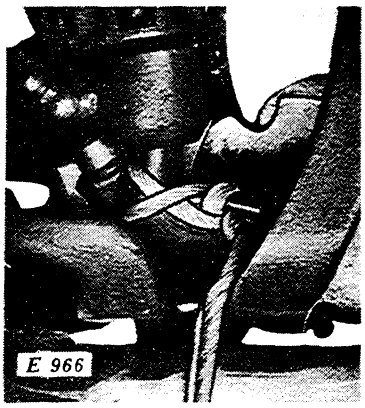
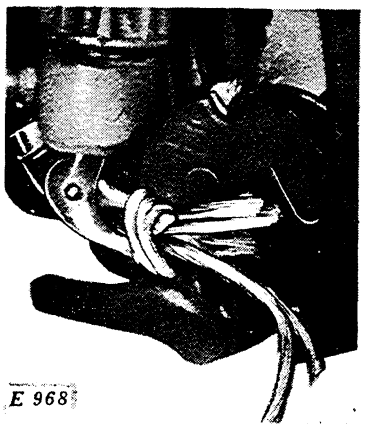
Improper adjustments account for most baling difficulties. If you are unable to solve difficulty after checking the following "Trouble Shooting" section, refer to page 28 and follow "Service Checking" as outlined. If you are unable to remedy trouble, call your local John Deere dealer.

NOTE: Faulty or poor quality twine can be a major cause of knotter difficulties.

Trouble	Possible Causes	Remedy
KNOTTER DIFFICULTIES— TWINE BALER		
	Tucker fingers did not pick up needle twine or move it into tying position properly.	Adjust tucker fingers as described on page 33. Check twine tension. Twine tension clips may need tightening if operating in short, light hay or straw.
	Needles did not place twine properly in disk.	Adjust needles and/or twine disk.
	Hay dogs are not entering bale case.	Clean out around hay dogs and examine for broken or unhooked springs.
	Extreme tension on twine around billhook during tying cycle causes twine to shear or pull apart.	Loosen twine disk holder spring. Smooth off all rough surfaces and edges on billhook.
	Worn or damaged billhook tongue.	Replace billhook.
	Bale density too low.	Tighten tension control knob.
	Dull twine knife.	Sharpen cutting edge on twine knife.

Trouble	Possible Causes	Remedy
	Insufficient tension on twine disk holder. Dull or chipped knife.	Tighten twine disk holder spring. Sharpen cutting edge on twine knife.
	Twine sheared in twine disks. Billhook not revolving. Billhook tongue fails to open.	Loosen twine holder and/or remove all sharp edges and burrs on twine holder and disks. Check for lost or sheared pin in billhook pinion. Check for lost billhook tongue roller, excessive wear on roller, and cam face, or damaged billhook tongue.
	Twine over bale pulled out of twine disk. (Can be detected by square cut end which has been flattened in disks. This twine will usually be shorter than mating twine tied on opposite side of bale.) Twine over bale sheared out of twine disks. (Distinguished from above in that twine end will be frayed and torn—not cut squarely by knife.)	Increase tension on twine holder disk spring and/or decrease tension with bale tension control. Decrease tension on twine holder disk spring. Decrease tension with bale tension control.
	Billhook tongue is closing on top of twine.	Model knife arm so that groove in knife arm will hold twine over billhook tongue farther to the right. (See page 31.) Adjust timing of twine disks as described on page 30.

Trouble	Possible Causes	Remedy
KNOTTER DIFFICULTIES—Continued		
	Insufficient travel of knife arm past billhook.	Model knife arm to obtain more travel past billhook. (See page 31.)
	Billhook pressure arm spring too loose.	Tighten adjusting nut on billhook pressure arm spring.
	Insufficient travel of knife arm past billhook	Model knife arm to obtain more travel past billhook. (See page 31.)
	Billhook pressure arm spring too loose.	Tighten adjusting nut on billhook pressure arm spring.
	As billhook turns, twine is pinched between billhook and knife arm and twine is damaged 1/2- to 1-inch from knot.	Bend knife arm so billhook turns freely. Make certain that wiper ledge on knife arm contacts back face of billhook.
	Rough knife arm cuts twine 3/4 to 1-1/4 inches from knot.	Smooth off rough edge in twine notch of knife arm.
	Extremely high top twine tension.	Reduce bale weight by loosening tension control knob and/or check twine tension.
	Needle twine did not enter twine disk.	Adjust needles as shown on page 32 and/or adjust twine disk timing as shown on page 30. Check for sheared or lost pin in twine disk pinion or in disk worm gear. Make certain twine coming from box is going under twine tension devices on twine box.
	Improper twine tension.	Adjust twine tension. (See page 5.)
Needle twine over billhook tongue roller.	Improper twine threading.	See threading needles on page 5.

Trouble	Possible Causes	Remedy
 Needle twine over billhook tongue roller and second knot tied on billhook.	Same as preceding picture; however, operator will usually find this condition rather than the condition described therein.	Make corrections as noted before and examine complete knotter for broken or damaged parts.
 Needle twine goes under billhook tongue during first quarter of billhook travel.	Tucker finger not carrying twine back to tying position.	Adjust tucker fingers as shown on page 33.
 Knot did not strip off billhook.	Excessive billhook tongue tension. Knife arm wiper is not contacting back face of billhook. Knife arm lift (or rise) is not sufficient. Rough billhook. Worn or bent billhook. Bale density too low.	Loosen billhook pressure arm spring adjusting nut. Model knife arm so that wiper contacts back face of billhook. Model knife arm to increase movement past end of billhook. (See page 31). Smooth off all rough edges on billhook with emery cloth. Replace billhook. Increase bale case tension.

Trouble	Possible Causes	Remedy
TWISTER MECHANISM DIFFICULTIES—WIRE BALER		
Wire not holding properly.	Loose bolts in twister assembly.	Tighten all bolts.
	Foreign material in twister assembly.	Clean out twister assembly.
	Springs frozen in gripper drive tube assembly.	Clean out gripper drive tube.
	Shear blade mounting screw loose or broken.	Tighten or replace screw.
Wire not cutting clean.	Gripper and shear blade assembly not adjusted properly.	Place shims between top of gripper arm and mounting plate. (See page 34.)
	Worn or broken parts.	Replace worn or broken parts.
Wires not twisted together.	Foreign material in twister assembly.	Clean out twister assembly.
	Needles not adjusted properly.	Adjust needles (See page 36.)
	Springs frozen in gripper drive tube assembly.	Clean out gripper drive tube.
Wire broken.	Wire guide pulleys not turning.	Free pulleys.
	Wire threaded wrong.	Thread wire as described on page 4.
	Foreign material in wire pulleys.	Clean and free wire pulleys.
	Bale too heavy.	Loosen tension control.
	Twister hook worn.	Replace with new twister hook.
	Worn upper wire guide.	Replace with new upper wire guide.
	Hook advanced too far.	Retard twister hook. (See page 34.)
	Rusty wire.	Keep wire oiled.

Trouble	Possible Causes	Remedy
BALE NOT OF PROPER WEIGHT		
Bale too light in weight.	Tension knob too loose.	Tighten tension knob and/or install hay resisters (See page 46.)
Bale too heavy in weight.	Tension knob too tight.	Loosen tension knob and/or remove hay resisters.
Bale too heavy with knob screwed out.	Hay too wet or too green.	Let hay dry or cure before baling.
	Hay resisters.	Remove hay resisters.
Bale too long.	Not enough material in top of bale and/or measuring wheel not contacting crop properly.	Tighten tension knob.
Bale too short.	Measuring arm not dropping home.	Adjust bale measuring control. (See page 39.)
BALE NOT UNIFORM		
L.H. side of bale is loose.	Feeder teeth out of adjustment.	Adjust feeder teeth.
R.H. side of bale is loose.	Feeder teeth out of adjustment.	Adjust feeder teeth.
Not enough material in top of bale.	Ground speed of baler too slow and/or windrow too small.	Increase ground speed and/or make larger windrows.
	Tension knob too loose.	Tighten tension knob.
	Baling extremely light hay.	Place feeder teeth in bottom hole and/or make larger windrows.
	Pickup compressors set too high.	Lower compressors.
Ragged bale.	Dull knives. Plungerhead out of adjustment.	Sharpen knives. Adjust plungerhead.
NEEDLES NOT RAISING		
Trip dog not functioning.	Broken release arm spring or trip dog spring lost.	Replace broken or lost spring.
Sheared knotter drive pin.	(See "Shear bolt difficulties.")	(See "Shearbolt difficulties.")

Trouble	Possible Causes	Remedy
PICKUP DIFFICULTIES		
Pickup teeth digging in ground.	Lift lever set too low.	Raise lift lever.
Not picking up hay clean.	Pickup stays up.	Loosen lift spring.
	Pickup teeth set too high.	Lower pickup lift lever.
	Ground speed too fast.	Slow down to 3-1/2 mph.
	Hay not all raked.	Turn all hay onto clean stubble.
	Pickup teeth bent or broken.	Repair or replace teeth.
	Windrows too light.	Rake heavier windrows.
Hay build-up under compressors.	Compressor rods set too low.	Adjust compressor height (See page 12.)
Pickup teeth do not revolve.	Pickup drive V-belt off or slipping.	Replace or tighten belt. (See page 40.) Loosen pickup balancing spring. (See page 40.)
FEEDING DIFFICULTIES		
Plungerhead hitting feeder teeth at top of case.	Out of time.	Retime plunger and feeder.
Baler stalls when plungerhead is even with rear side of feed opening.	Dull knives and/or plungerhead out of adjustment.	Sharpen knives and/or adjust plungerhead (see page 38).
Baler stalls on compression stroke.	Baling too heavy.	Loosen tension knob.
	Plungerhead obstructed.	Remove obstruction.
Baler fails to start after being stalled on compression stroke.	Plungerhead obstructed.	Turn flywheel in clockwise direction for two or three revolutions; then engage clutch on tractor or engine. **CAUTION: Be sure that needles are in "home" position before turning flywheel by hand.**
Hay not feeding under auger.	Pickup compressors set too high.	Set compressors lower (see page 12).
	Auger drive V-belt slipping.	Adjust V-belt. (See page 41.)

Trouble	Possible Causes	Remedy
POWER DRIVE DIFFICULTIES		
Engine belt slips.	Clutch lever out of adjustment.	Adjust clutch lever.
Engine belt wearing more on one side than the other.	Pulleys not in alignment.	Align pulleys.
PTO slip clutch slips during normal operation.	Slip clutch bolts loose.	Tighten clutch bolts. (See page 40.)
SHEAR BOLT DIFFICULTIES		
Flywheel special shear bolt sheared.	Dull knives.	Sharpen knives.
	Obstruction in bale chamber.	Remove all obstructions.
	Too much clearance between knives.	Adjust plungerhead. (See page 38.)
	Plungerhead safety stop improperly adjusted.	Adjust safety stop. (Page 37.)
	Worn clutch ring.	Replace.
	Baling too heavy.	Loosen tension knob.
	Needles in bale case.	Place needles in home position.
Sheared knotter and needle drive shear pin.	Knotter drive brake too tight.	Loosen knotter drive brake.
	Needles out of time.	Retime needles.
	Needles hitting obstruction.	Remove all obstructions.
	Obstruction in knotter.	Remove all obstructions.
	Needles out of adjustment.	Adjust needles.
HYDRAULIC PUMP DIFFICULTIES		
Pump not delivering oil.	Clogged filter.	Remove, flush, clean filter thoroughly.
	Not enough oil in tank.	Add oil as necessary.
Pump not developing sufficient pressure.	Valving surfaces scored by abrasive matter.	Replace all scored or worn parts.
	Leak in hydraulic system connections and cylinders.	Eliminate all leaks.
	Oil not of correct weight.	Use correct weight oil.
External leakage.	Shaft oil seal.	Replace shaft oil seal.

SERVICE

SERVICE CHECKING

To remedy most tying troubles not solved in the "Trouble Shooting" section, pages 20-27, perform the following related major service checks in the order listed:

Follow this same procedure for pre-season service.

TWINE BALER

1. Adjusting needle frame.
2. Timing the baler (pages 28 and 29).
3. Adjusting billhook (page 30).
4. Adjusting twine disk (page 30).
5. Adjusting knife (wiper) arm (page 31).
6. Adjusting twine holder (page 32).
7. Adjusting and timing needle (page 32).
8. Adjusting tucker fingers (page 33).
9. Adjusting knotter drive brake (page 37).
10. Adjusting plungerhead safety stop (page 37).

WIRE BALER

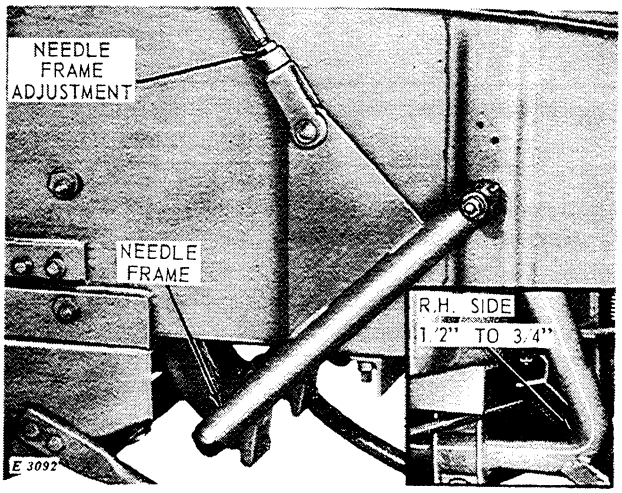
1. Timing the baler (pages 28 and 29).
2. Adjusting bevel gear and pinion (page 34).
3. Adjusting intermittent drive gear (page 34).
4. Adjusting grippers (page 34).
5. Adjusting twister hooks (pages 34 and 35).
6. Adjusting needle link (page 35).
7. Adjusting needles (pages 35 and 36).
8. Adjusting wire guides (page 36).
9. Adjusting knotter drive brake (page 37).
10. Adjusting plungerhead safety stop (page 37).

Service information pertaining to parts or adjustments not listed above is covered on pages 38 through 43.

ADJUSTING NEEDLE FRAME—TWINE BALER

The needle frame is properly adjusted when it will clear the main frame on the right-hand side of the bale case by 1/2 to 3/4 inch with needles fully raised.

Adjust for correct needle frame clearance by disconnecting the lift link from the needle frame and turning the clevis on the lift link. After adjusting the length of the lift link, tighten the locking nut against the clevis.



CAUTION: The plungerhead and needle timing, and the plungerhead stop, must be checked after making any adjustments with the needle lift link.

TIMING THE BALER

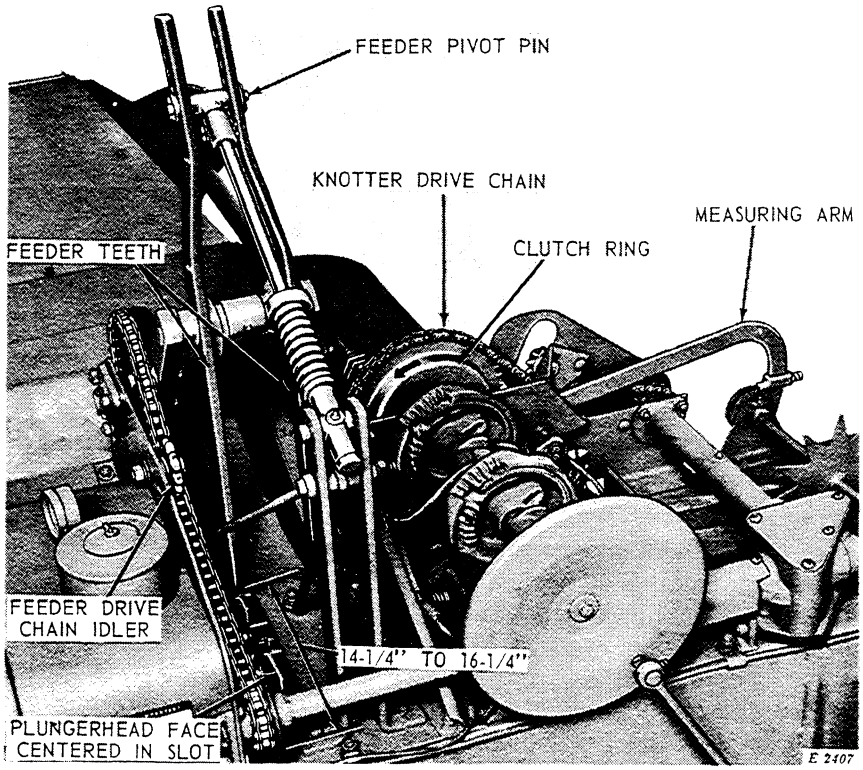
Timing is controlled by the main drive chain, feeder drive chain, and the knotter drive chain. If any of these chains are uncoupled or if parts are removed for servicing, check all timing operations before operating baler. Each of the following checks or adjustments should be made as the baler is run, by hand, through one complete tying cycle.

1. Place feeder pivot pin in bottom hole of feeder teeth.

2. Turn flywheel by hand in a counter-clockwise direction until the face of the plungerhead (on a compression stroke) is centered in the front feeder slot.

The left-hand edge of the tip of the front feeder tooth should measure 14-1/4 to 16-1/4 inches from the left-hand edge of the front feeder support. If the feeder tooth does not fall within this range, disconnect the feeder drive chain and set the tooth 15-1/4 inches (measured horizontally) from the extreme left-hand edge of the feeder support. A block may be used to hold the teeth in this position.

3. Connect the feeder drive chain. Turn the flywheel clockwise as necessary to install chain with drive side tight. Tighten the idler against the chain with thumb pressure.



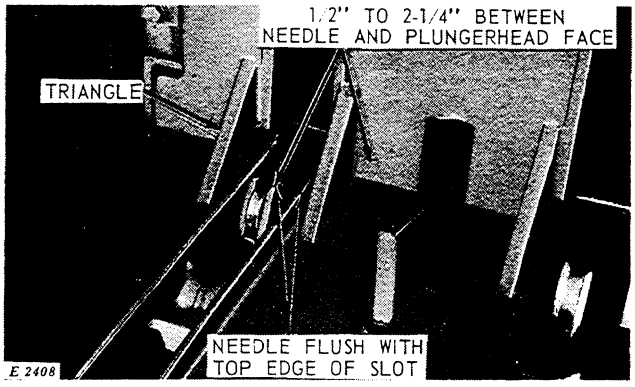
NOTE: After connecting chain, relocate plungerhead face in center of slot. If feeder dimension does not measure between 14-1/4 and 16-1/4 inches, retime feeder using the main drive chain instead of the feeder drive chain—for a finer adjustment.

CAUTION: Using the main drive chain for timing will also affect the timing of the plungerhead to the needles. The needles may have to be retimed as described in Step No. 5.

4. After the correct feeder teeth timing has been obtained, move the plungerhead through one complete cycle to make certain that the feeder teeth and the plungerhead clear each other when checked with feeder pivot pin in both top and bottom holes.

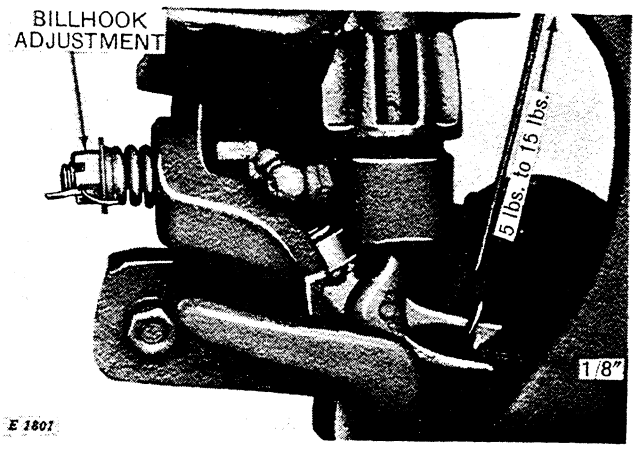
5. With the needles in "home" position, trip the bale measuring arm. Continue turning flywheel counter-clockwise until the tip of the highest needle is flush with the top edge of the bale case bottom groove flanges. The face of the plungerhead should measure from 1/2 to 2-1/4 inches from the tip of the needle. If the plungerhead is not within this range from the needle, disconnect the knotter drive chain, and move plungerhead to within these limits. Replace the knotter drive chain. Adjust the chain idler.

NOTE: If knotter drive chain is removed, place the needles (by hand) in home position. Locate the points of the plungerhead triangles (on compression stroke) directly above the tips of the needles. Trip the measuring arm and raise the needles (by hand) until the tip of the highest needle is flush with the top edge of the bale case bottom groove flanges. Move plungerhead face to 1-3/8 inch from tip of needle. Rotate clutch ring counter-clockwise (as shown) until clutch ring contacts the trip dog roller. Replace the knotter drive chain and adjust the chain idler.



It is preferable to adjust the plungerhead closer to the 2-1/4-inch rather than the 1/2-inch clearance between the needle and the face of the plungerhead.

ADJUSTING BILLHOOK—TWINE BALER



The adjustment of the billhook tongue pressure is extremely important as it is here that the knot is formed. Make all adjustments when the billhook tongue is free of twine.

The billhook is in proper adjustment when an outward pull of from 5 to 15 pounds on the billhook tongue will separate the jaws 1/8-inch. The tongue should be tight when it is closed.

To increase the pressure on the billhook tongue, tighten the nut on the billhook adjusting stud. Loosen the nut to reduce pressure.

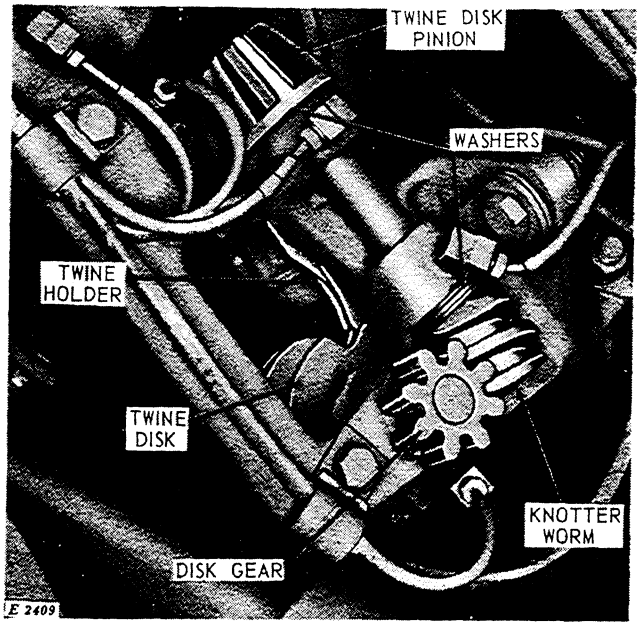
Excessive tension on the billhook tongue may cause knots to remain on the billhook, thus breaking the twine. Incomplete knots may be the result of insufficient pressure on the billhook tongue.

ADJUSTING TWINE DISK—TWINE BALER

The twine disk adjustment is determined by the position of the twine disk notch in relation to the twine holder. The right-hand corner of the notch in the CENTER plate of the twine disk should be flush to 1/16-inch to the right of the left-hand edge of the twine holder when twine is located in twine disk.

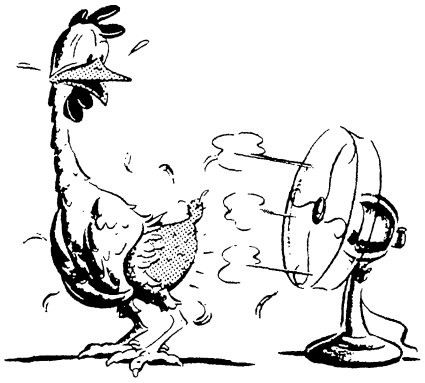
NOTE: Make this adjustment after tying a minimum of two bales and with twine remaining in the twine disk.

If the twine disk is advanced too far (twine disk notch is located past twine holder) remove the knotter disk pinion and the knotter worm, and relocate washers from the bottom position to the top position on the worm shaft.



If the twine disk is not advanced far enough (twine disk notch is located ahead of twine holder) remove the knotter disk pinion and the knotter worm, and relocate washers from the top position to the bottom position on the worm shaft.

Do not allow the right-hand edge of the notch to protrude to the left of the twine holder. There must not be more than .015-inch end play in the worm shaft.



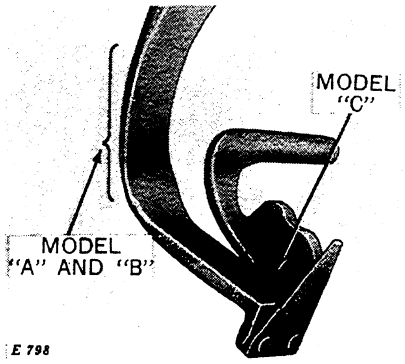
Be Extra Cautious around Moving Machinery!

R 2330

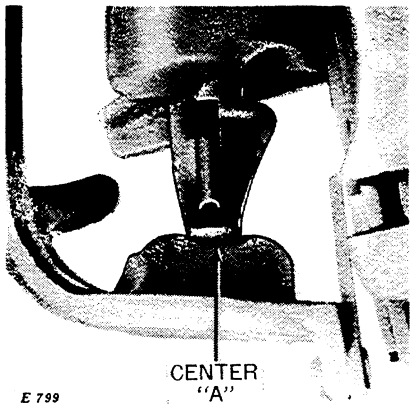
ADJUSTING KNIFE ARM—TWINE BALER

Proper knife (wiper) arm adjustment is essential because the stripping of the knot from the billhook, once it has been tied, is accomplished by a wiper on the knife arm.

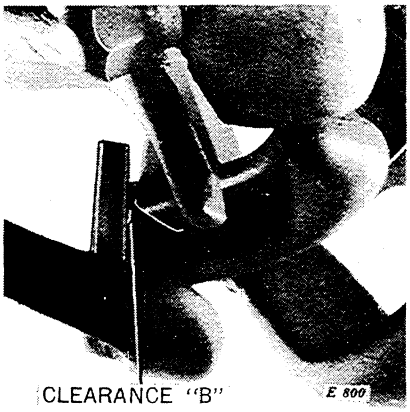
Remove knife arms and sharpen knives when they become dull and make a ragged cut.



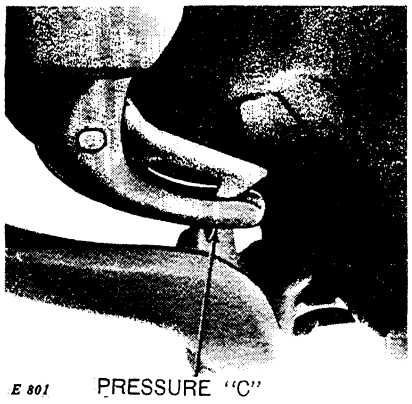
The wiper arm is adjusted to the billhook by modeling or bending the arm in the areas shown. It is seldom necessary to remove the wiper arm to model the arm. Three modeling operations may be necessary to align the wiper arm properly with the billhook:



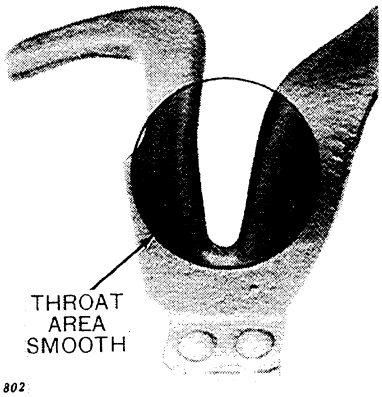
A. The wiper arm ledge must be centered with the billhook heel.



B. The billhook tongue must just clear the wiping ledge on the wiper arm by a maximum of not more than 3/32 inch, as the billhook tongue passes the wiper arm. Rotate the billhook 180 degrees and move the tongue by hand, up and down, to check clearance at the closest point between the tongue and ledge.

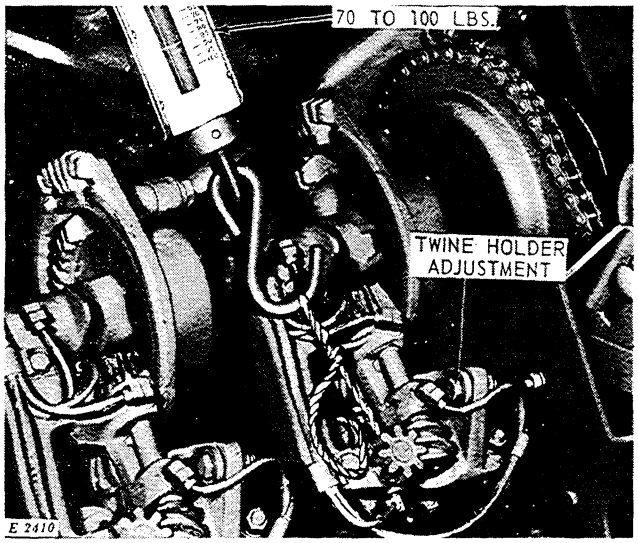


C. Between 5 and 10 pounds of pressure is required to pull the wiper arm ledge across the heel of the billhook.



The wiper arm must have well rounded and smooth surfaces at all portions that contact the twine or knots (particularly in the throat area) to prevent twine fracture.

ADJUSTING TWINE HOLDER—TWINE BALER



The twine holder holds the twine in the twine disk (while the bale is being formed and the knot is being tied) by the application of pressure on the twine holder. The pressure is regulated by a pressure spring with adjusting screw.

In most baling conditions, an upward pressure of from 70 to 100 pounds—pulling parallel with twine disk, is required to pull the remaining twine out of the holder after a knot has been tied. If the twine pulls free at less than 70 pounds pressure, loosen the lock nut and tighten the adjusting screw. If the twine pulls free with more than a 100 pound application of pressure, loosen the lock nut and loosen the adjusting screw. Retighten the lock nut.

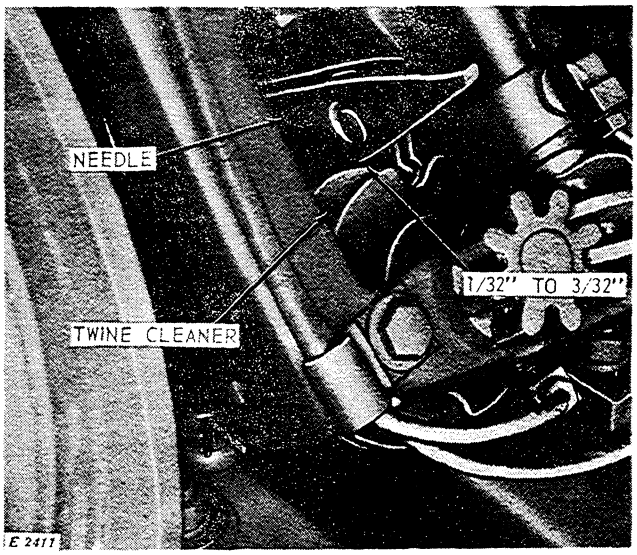
NOTE: Adjust the twine holder only as tight as necessary to prevent the twine from pulling out of the twine disk—resulting in a missed tie. The greater the twine tension the more likely twine fracture will occur.

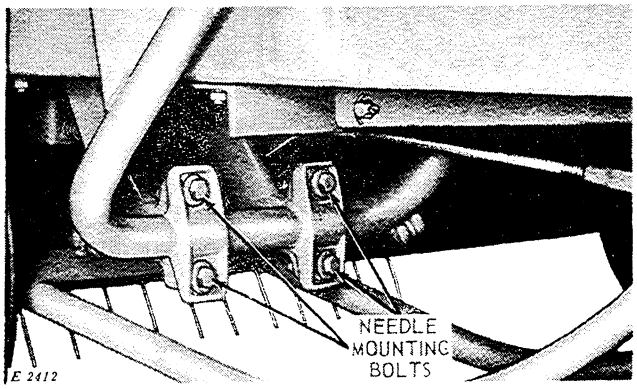
Various hay conditions and moisture content may require greater or lesser twine holder tension—as conditions change.

ADJUSTING NEEDLE—TWINE BALER

As the needles pass through the knotting mechanism, they should clear the closest point to the twine cleaner or the twine disk 1/32 to 3/32 inch.

NOTE: The twine cleaner should move freely through the twine disk and must be in its extreme left position when measuring needle clearance.





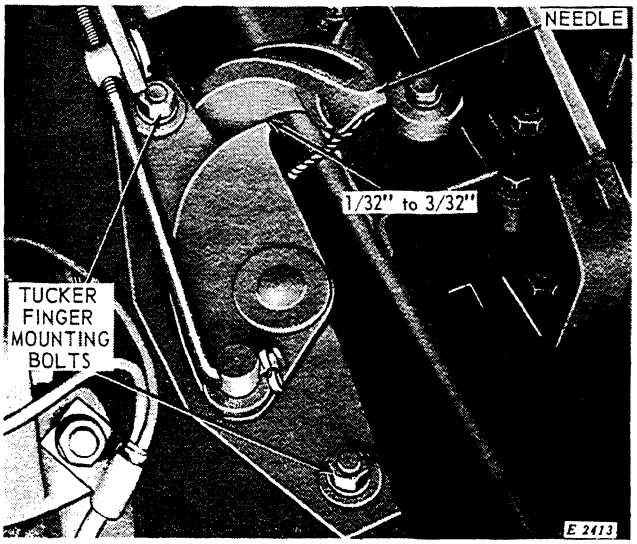
To adjust the position of the needles in relation to the twine cleaner, loosen the four needle mounting bolts slightly, trip the bale measuring arm, rotate flywheel counter-clockwise to raise needle frame and bring the needles through the bale chamber until they are in the position shown. Move the needles sideways until their right-hand sides exert a pressure of from 5 to 15 pounds against the knotter frame. Adjust the four needle mounting bolts until the desired clearance is obtained. Tighten needle mounting bolts to 50 to 80 foot-pounds of torque.

To increase the distance between the needles and the twine cleaners, loosen the front needle mounting bolts slightly and tighten the rear bolts. Reverse this procedure to reduce the distance.

When the needles are properly adjusted, tighten all bolts and again check needles through their cycle.

ADJUSTING TUCKER FINGERS—TWINE BALER

The tucker fingers "catch" the twine, as it is brought to the knotter mechanism by the needles, and hold the twine in position for engagement by the billhooks.

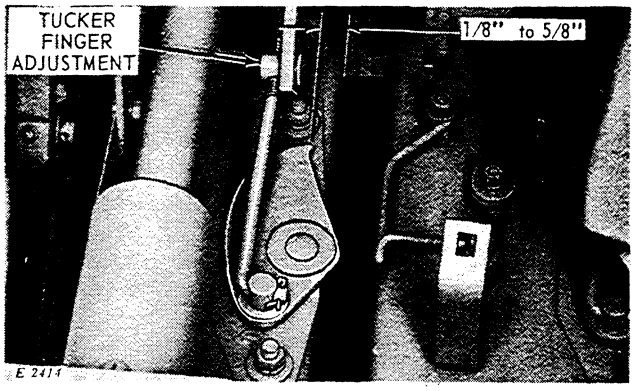


Adjust the tucker fingers as follows:

1. Make sure needles are in proper adjustment.
2. Trip the bale measuring arm and turn the flywheel counter-clockwise (by hand) until the needles have risen and the tucker fingers are closest to the needles.
3. Loosen the tucker finger mounting bolts and move the tucker fingers forward or rearward in their mounting slots until the tucker fingers clear the needles 1/32 to 3/32 inch.

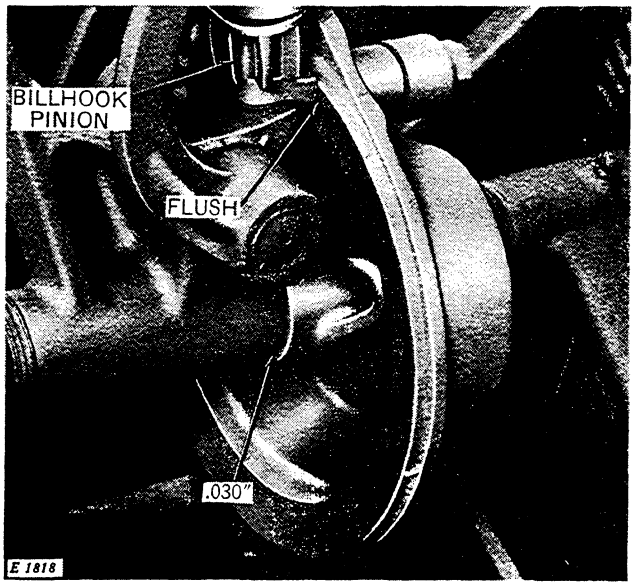
NOTE: The end of each tucker finger must be held upward and to the left with hand pressure while setting clearance.

Retighten tucker fingers mounting bolts to 27 to 43 foot-pounds torque.



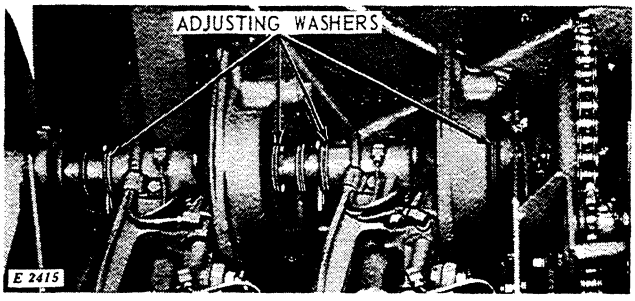
4. Continue turning flywheel until the tucker fingers have returned to their resting position. The tucker finger tips must be from 1/8 to 5/8 inch to the left of the needle slot while the tip of each finger is held toward the left. Adjust the pull rods to secure the proper resting position of the tucker fingers.

ADJUSTING KNOTTER GEARS—TWINE BALER



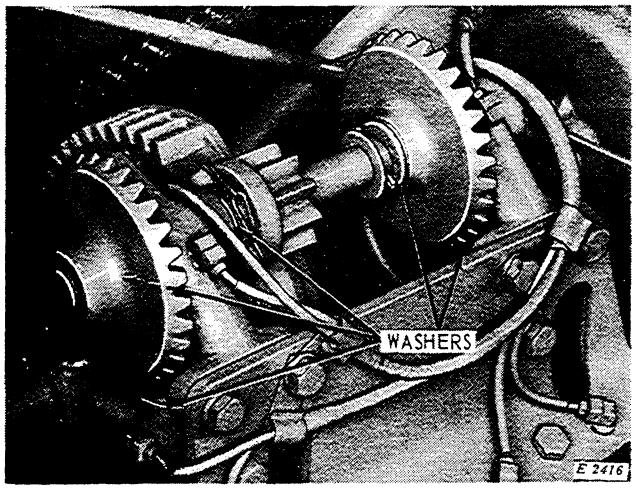
The flat side of the billhook pinion must ride flush with the smooth face of the intermittent knotter gear to help eliminate tooth breakage and to insure proper meshing.

Adjust the intermittent knotter gear flush against billhook pinion by shifting washers on the needle lift shaft. Remove knotter and shaft assembly and add washers, as shown, to gain additional adjustment.



NOTE: Add or remove washers as necessary to maintain a clearance of .030" between intermittent knotter gear and the knotter frame when gears are adjusted flush. Recheck needle adjustment after adjusting knotters or intermittent gears.

ADJUSTING BEVEL GEAR AND PINION—WIRE BALER



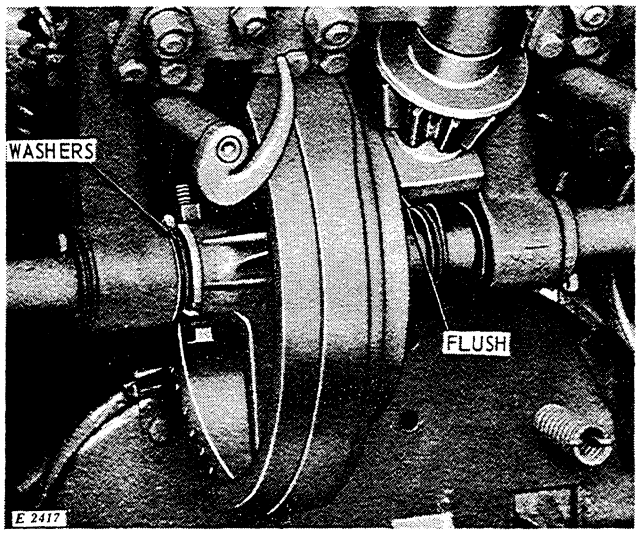
The bevel gears must be adjusted to mesh properly and have even heel alignment with the pinions on the twister shafts.

The bevel gears may be adjusted to the right by removing washers between the left-hand bevel gear and twister frame, and relocating them between the left-hand twister frame and the bevel gear shaft drive pinion. The right-hand bevel gear may be individually adjusted by adding or removing washers behind the roll pin.

CAUTION: Check twister hook adjustment after replacing bevel gears.

The twister pinions may be adjusted higher by adding washers between the pinions and the twister frames.

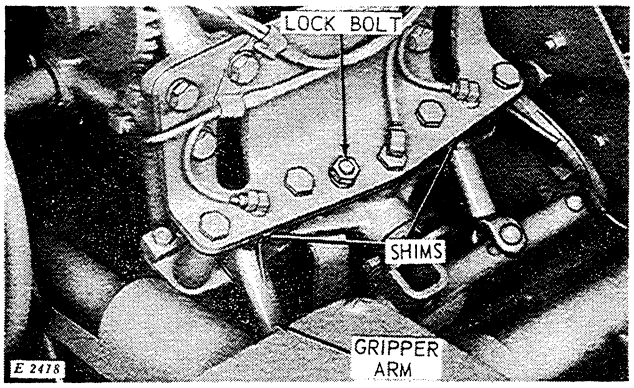
ADJUSTING INTERMITTENT DRIVE GEAR—WIRE BALER



To eliminate tooth breakage and insure proper mesh, the flat side of the gripper drive pinion must ride flush on the smooth surface of the intermittent drive gear.

Adjust gears by removing pin in needle lift shaft and locating washers on shaft as necessary to get proper mesh. Replace the pin in the shaft.

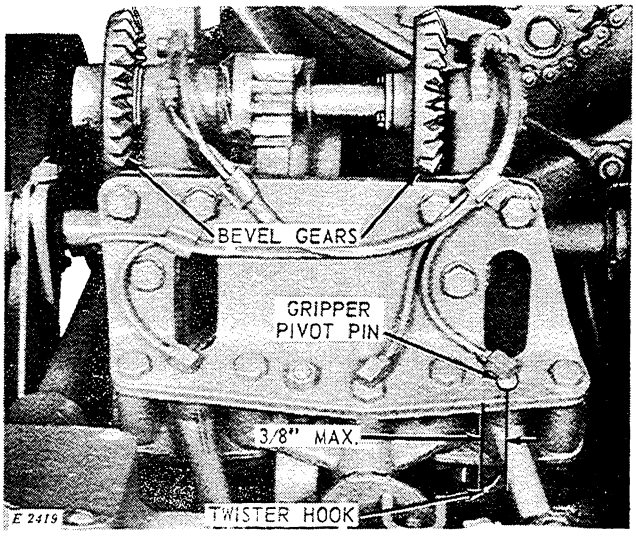
ADJUSTING GRIPPERS—WIRE BALER



To provide a positive shearing action on the wire, adjust the grippers with shims. To shim a gripper, pivot the knotter assemblies upward by loosening the lock bolt and removing the lock nut from the bottom of the gripper pivot pin. Remove the pivot pin, then insert the necessary shims between the gripper arm and the knotter mounting plate, and replace the pivot pin. Tighten the pivot pin and secure with the lock nut.

Replace the knotter assemblies to their original position and secure with the lock bolt.

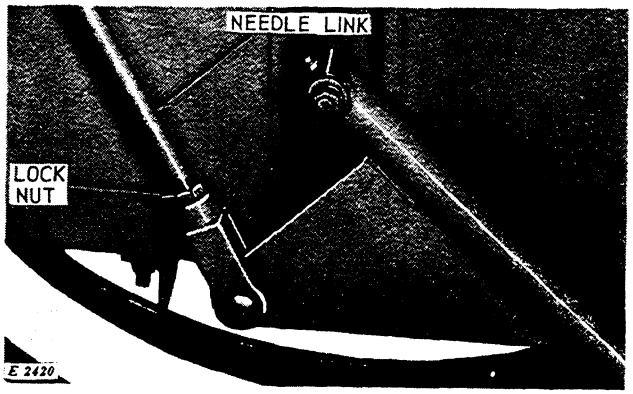
ADJUSTING TWISTER HOOKS—WIRE BALER



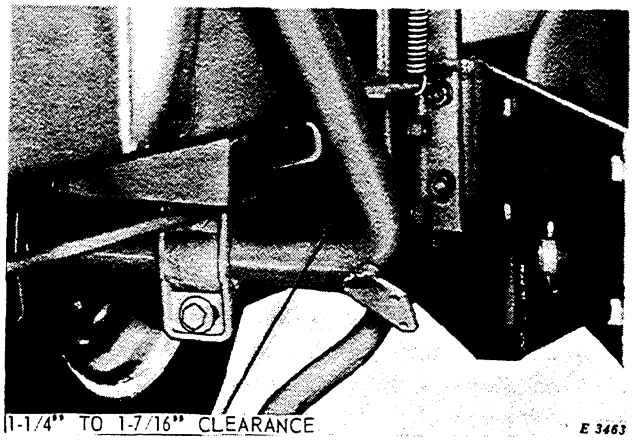
With the needles in home position, the twister hook is properly adjusted when the inside of the point of the hook is within 3/8 inch either side of the center of the gripper pivot pin, when finger pressure is applied to retard the twister hook.

Adjust the left-hand twister hook by removing its respective bevel gear from the drive shaft, and rotating the twister shaft and pinion one tooth at a time, as necessary, for correct alignment of the hook. Remove the roll pin securing the right-hand bevel gear and slide the bevel gear to the left and adjust the right-hand twister hook. Relocate the bevel gear on the shaft and secure it with the roll pin.

ADJUSTING NEEDLE LINK—WIRE BALER



The needle lift link controls the height of the needles in relation to the wire and the wire pulleys, and the bale case bottom.

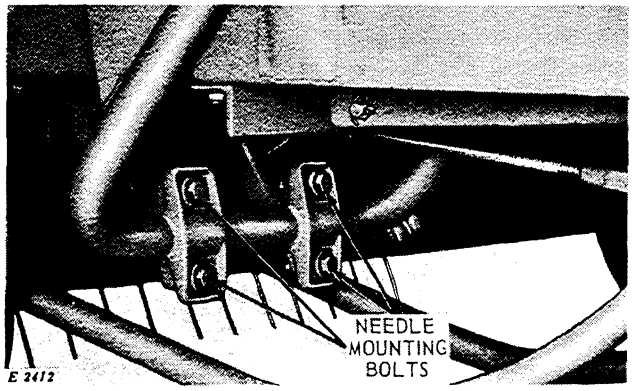


Adjust the needle lift link so that the needle frame will clear the main frame on the right-hand of the bale case by 1-1/4 to 1-7/16 inches with the needles fully raised.

Loosen the lock nut on the threaded end of the link, remove the pin in the yoke, and turn the yoke as necessary. Replace yoke on needle frame and tighten lock nut against the yoke.

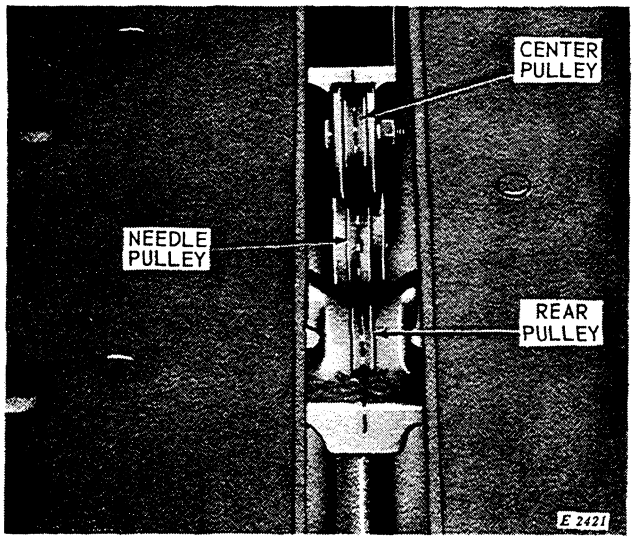
CAUTION: The plungerhead and needle timing, and the plungerhead stop, must be checked after making any adjustments with the needle lift link.

ADJUSTING NEEDLES—WIRE BALER



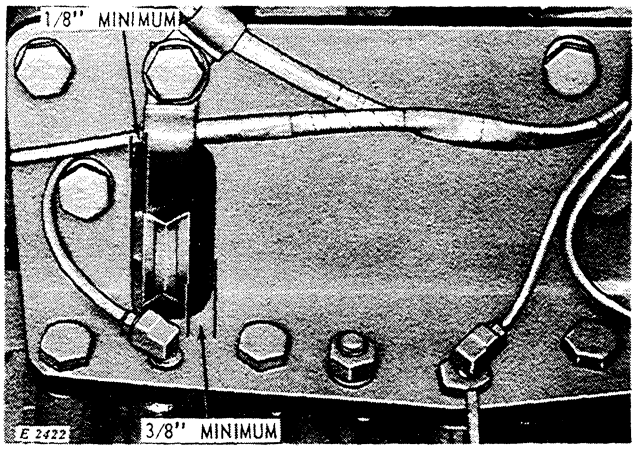
The needle mounting bolts control the position of the needles in relation to the center and rear wire guides, the slots in the twister mounting plate, and the wire grippers.

Each needle may be adjusted forward or rearward by loosening one of the needle mounting bolts and tightening the other, or it may be shifted sideways by loosening both mounting bolts.



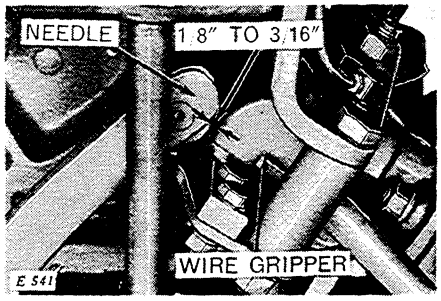
Adjust the center pulley to the side, as necessary, to allow the needle to pick up the wire as the needles raise.

ADJUSTING NEEDLES—WIRE BALER—Continued



Each needle must be within 1/8-inch minimum from the left-hand side of its respective slot in the twister mounting plate and 3/8-inch minimum from the right-hand side of the slot when the needle is in its highest position.

To align each needle with the wire guide pulleys, and the slot in the twister mounting plate, trip the measuring arm and raise the needles. Loosen both needle mounting bolts and move the needle sideways until it is aligned. (See " Center Wire Guides.")



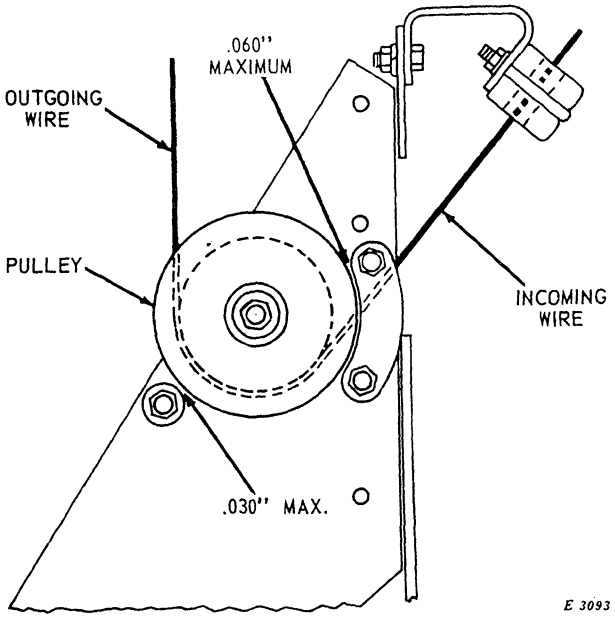
As the needles pass through the knotting mechanism, the closest point of each needle should clear the front of each wire gripper by 1/8 to 3/16 inch.

To increase the distance between the needles and the grippers, loosen the front needle mounting bolts slightly and tighten the rear bolts. Reverse this procedure to reduce the distance.

When the needles are properly adjusted, tighten all bolts to 50 to 80 foot-pounds of torque and again check needles through their cycle.

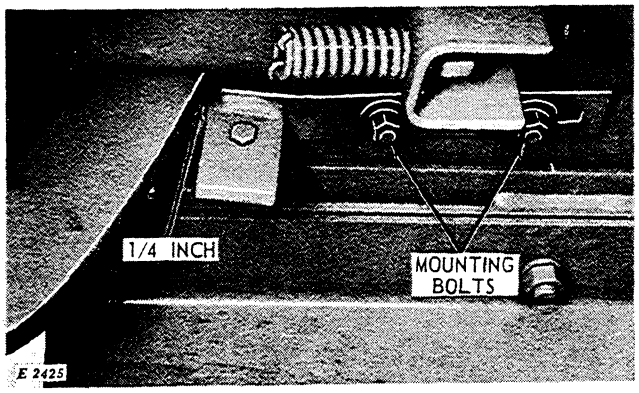
ADJUSTING WIRE GUIDES—WIRE BALER

FRONT WIRE GUIDES



Adjust the front pulleys and cast wire guides to clear each other a maximum of 0.060-inch. Adjust the front sleeve guides to clear the pulleys a maximum of 0.030-inch. Each pulley must turn freely.

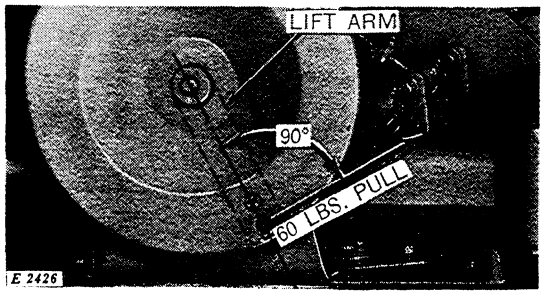
CENTER WIRE GUIDES



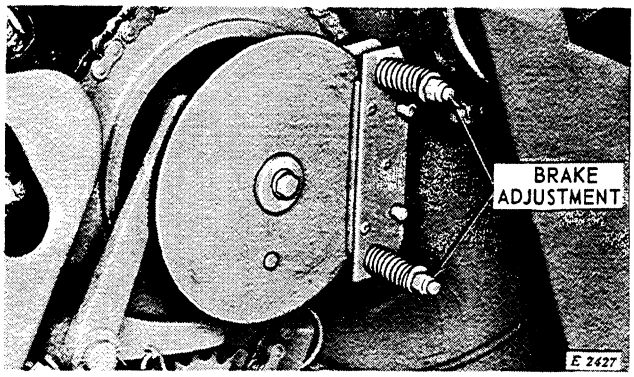
The center wire guides must be 1/4-inch forward of the closest point of the needles when the needles are in their highest position, and the wire guides are aligned with the needle pulley.

Adjust the guides by loosening the two mounting bolts in each guide. Shift the guides to the left or right for alignment. Shift them forward or to the rear for the desired clearance. After setting the guides, tighten the mounting bolts.

ADJUSTING KNOTTER DRIVE BRAKE



The knotter drive brake eliminates loose, erratic action of the knotter mechanism. To adjust the brake, place the needles in "home" position and trip the measuring arm. Disconnect the lift link from the needle lift arm shield and needle lift arm. Apply pressure at the lift link mounting hole in the shield and arm at a 90-degree rearward angle to a center line of the lift shaft and the lift link mounting hole.

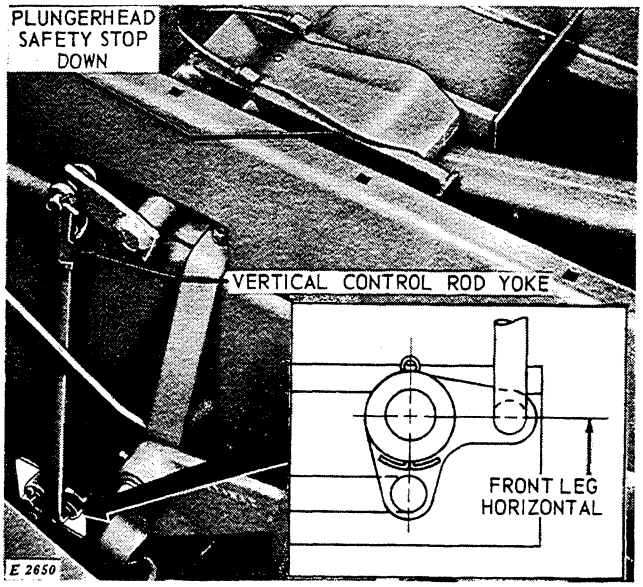


Loosen or tighten the nuts on the brake adjusting bolts until 60 pounds pull will move the needle lift arm.

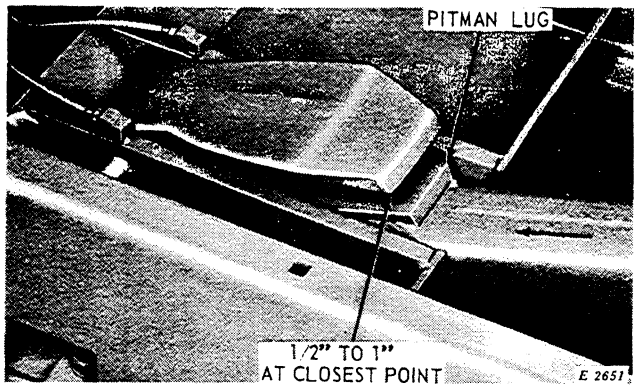
ADJUSTING PLUNGERHEAD SAFETY STOP

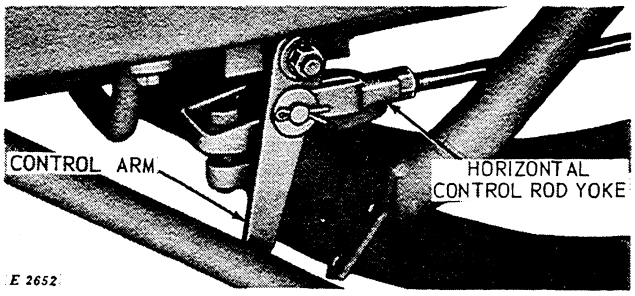
The safety stop helps protect the needles from damage by the plungerhead if the needles enter the bale chamber too soon or remain there too long.

NOTE: The needle to plungerhead timing must be correct before adjusting the plungerhead safety stop. *(See page 29.)*



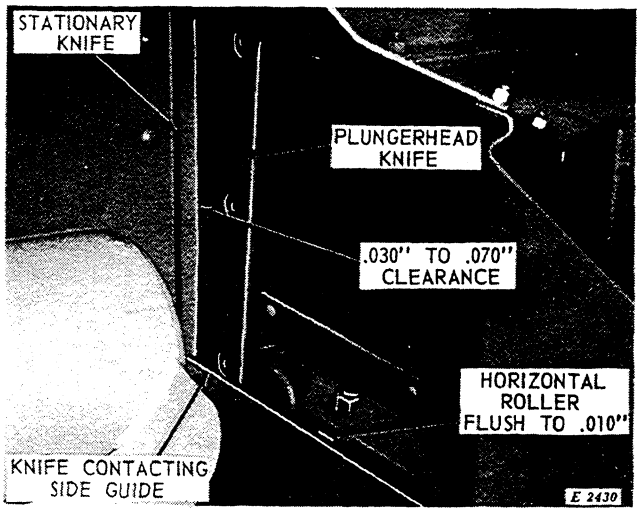
With the needles raised into the bale case, and the plungerhead safety stop resting on the bale case top, adjust the vertical control rod yoke until the front leg of the bell crank is horizontal.





With the needles in home position, adjust the horizontal control rod yoke so the front end of the plungerhead stop will clear the closest point of the lug on the pitman by 1/2 to 1 inch as the lug passes the stop.

ADJUSTING PLUNGERHEAD AND KNIVES



The plungerhead and knives are in proper adjustment when the plungerhead fits snug, yet moves freely. There must be a clearance of .030- to .070-inch between the plungerhead knife and the stationary knife.

KNIVES

Turn flywheel by hand until knives are opposite, as shown.

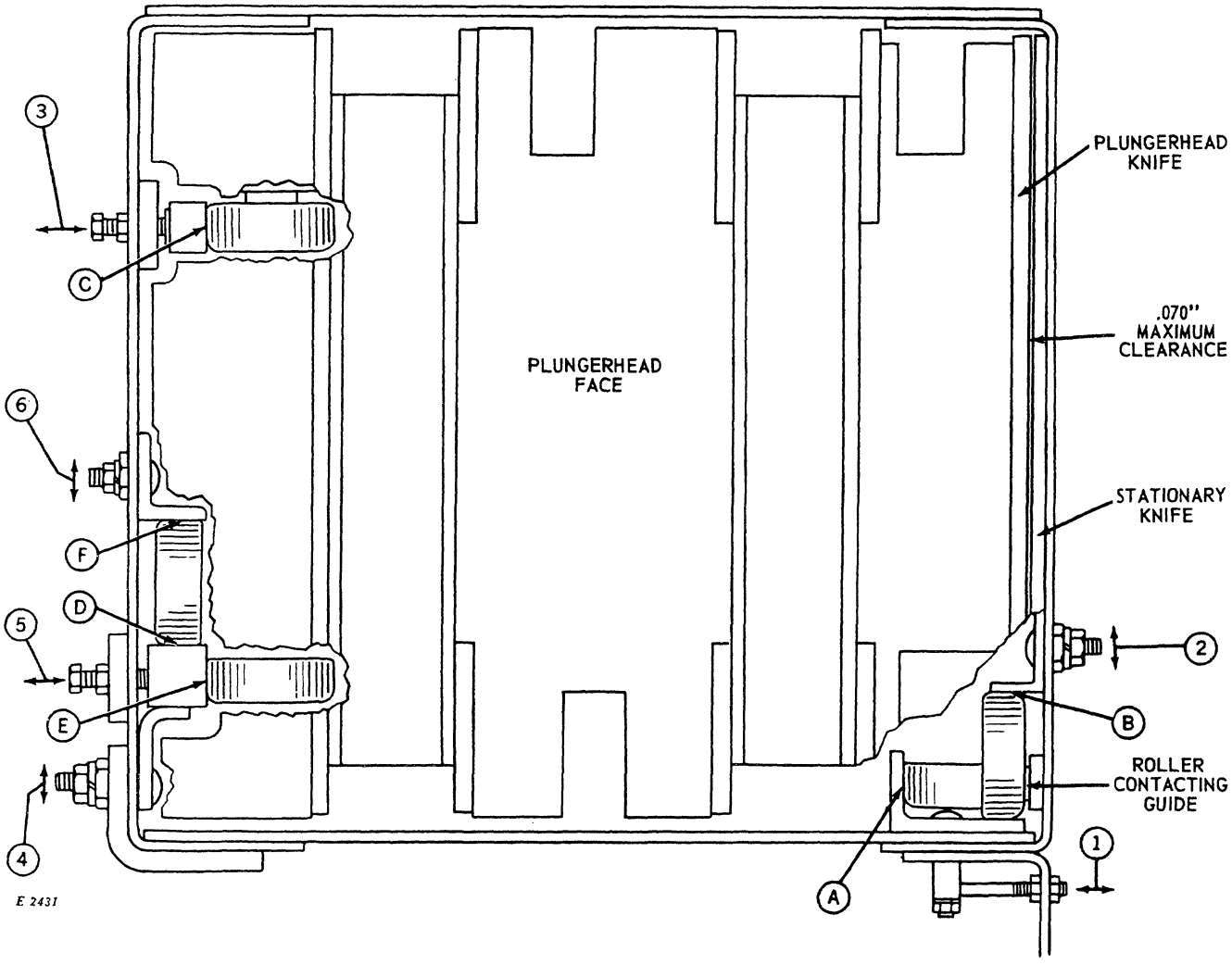
Use shims behind the plungerhead knife to set the knife flush to .010-inch to the right of the horizontal roller. The knife must contact the lower guide when making this adjustment.

CAUTION: Knife adjusted too far to right of roller may cause locking of knives. Knife adjusted to left of roller may not allow proper knife register.

Adjust stationary knife to .030- to .070-inch clearance from plungerhead knife by adding or removing shims behind the stationary knife.

CAUTION: The stationary knife must be set at least .030-inch to the right or behind the plungerhead guide to prevent locking of knives.

ROLLER GUIDES



NOTE: Loosen all bolts in the left-hand and right-hand guides and scrapers before making adjustments.

CAUTION: Adjust all guides (both front and rear) straight and parallel to each other.

1. Move plungerhead to its extreme forward position. With the right-hand horizontal rollers contacting the side wear guide, adjust the right-hand bottom angular guide "A" in the bale case bottom until the guide nearly contacts both right-hand horizontal rollers. (.020" maximum clearance.) Tighten guide bolts. Secure with the jack screw and lock nut.

NOTE: Material build-up between angular guides and bale case side may have to be removed before making this adjustment.

2. Adjust the right-hand roller hold-down angular guide "B" with two eccentric cams until the guide nearly contacts the tops of the two right-hand vertical rollers. (.020-inch maximum clearance.)

3. Move plungerhead to the rear until top of knives are opposite. Adjust the left-hand top square guide "C" to give proper knife register.

NOTE: The clearance at the top of the knives must be greater than at the bottom and must not exceed .070-inch.

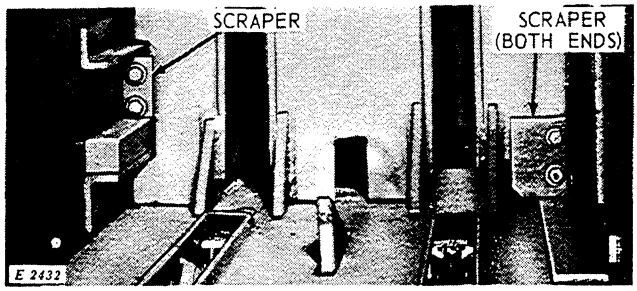
4. Adjust the left-hand bottom angular guide support with the eccentric cams until the guide "D" barely contacts the bottom of the left-hand vertical roller.

5. Adjust the left-hand lower square guide "E" to barely contact the lower horizontal roller.

6. Adjust the left-hand angular center guide "F" with eccentric cams to nearly contact the top of the vertical roller. (.020-inch maximum clearance.)

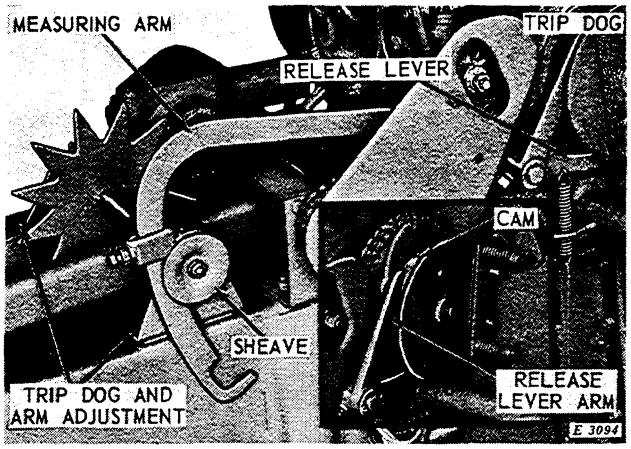
NOTE: Plungerhead must travel free and approximately level through its complete cycle.

SCRAPERS



To prevent material build-up on guides, adjust each of the three scrapers to barely clear its respective guide at the closest point.

BALE MEASURING CONTROL

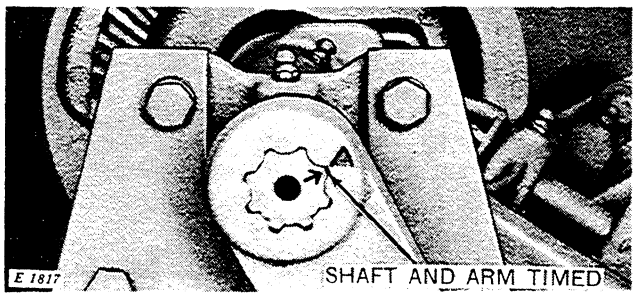


Locate the needles in the "home" position; then adjust the measuring wheel mounting forward or rearward so the top corner of the trip dog does not project more than 1/16-inch above or below the top corner of the release lever as the measuring arm stop rests on the measuring wheel shaft sheave.

With the needles in home position, trip the measuring arm. The trip release lever must not interfere with the rotation of the trip dog.

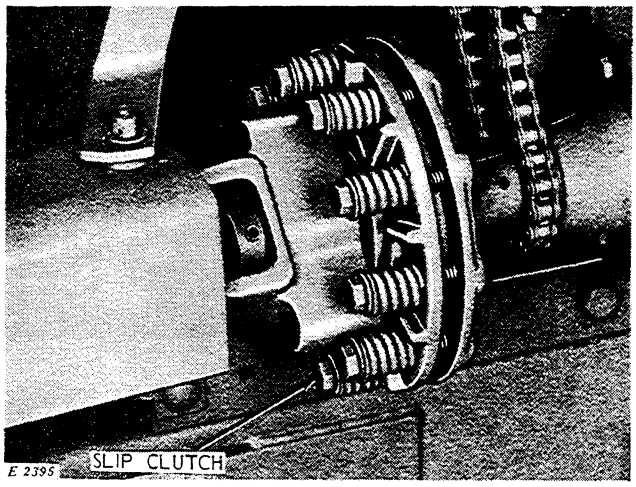
Raise the needles until the release lever arm is on the high point of the cam. The measuring arm must have ample clearance through its complete range to clear the measuring wheel mounting. Recheck the release lever and trip dog for proper contact.

TIMING NEEDLE LIFT SHAFT



The arrow on the left-hand end of the needle lift shaft must align with the timing mark on the needle lift arm. An arrow on the right-hand end of the needle lift shaft (not illustrated) must align with a timing mark on the trip dog hub when properly assembled.

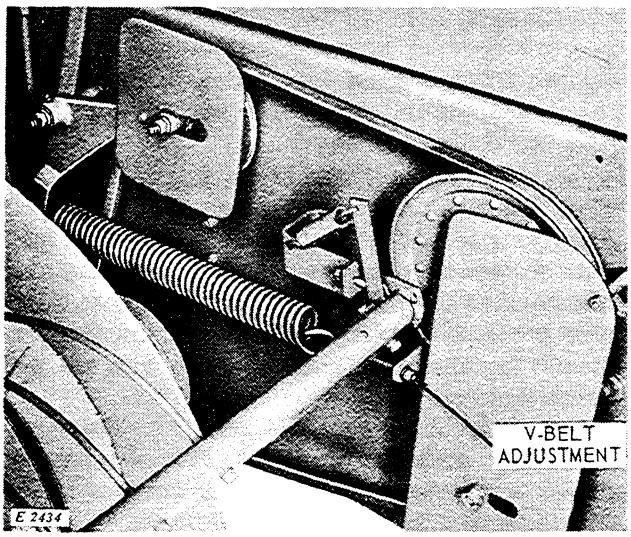
SAFETY SLIP CLUTCH



Test the slip clutch prior to each baling season for a static slip torque of 375 to 500 foot-pounds.

The clutch may be tested by blocking movement of plungerhead and GENTLY applying a load of from 37 to 50 pounds on the end of a 10-foot lever attached to clutch drive joint shaft. A testing scale should be attached to the end of the 10-foot lever and pressure applied at a right angle with the lever. If the clutch does not slip within this range, adjust clutch by loosening or tightening spring bolts. Adjust all bolts equally.

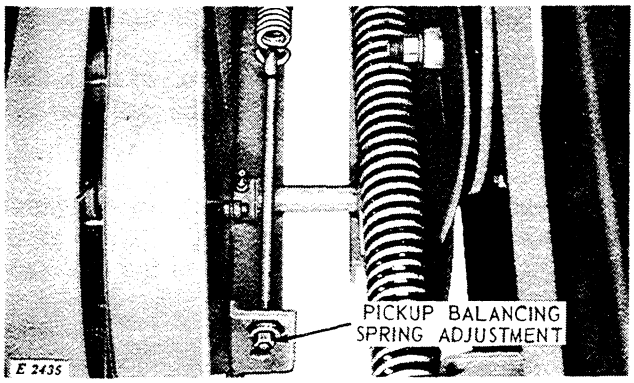
PICKUP V-BELT TENSION



Keep the V-belt adjusted tight enough to eliminate slippage when operating in normal conditions.

Adjust the tension on the belt by tightening or loosening the nut on the tension spring.

PICKUP BALANCING SPRING



The pickup is protected from damage, which could result from striking objects in the field, by a safety spring attached to the left-hand side of the pickup. This spring allows the pickup to raise and lower itself easily when coming in contact with immovable objects.

With the pickup lift lever seated in the lowest notch in the positioning plate, loosen or tighten the spring to permit the lift stop on the pickup frame to rest lightly against the lift lever.

CAUTION: When the pickup balancing spring adjustment is changed, it may affect the pickup V-belt tension; therefore, check the V-belt after setting the balancing spring.

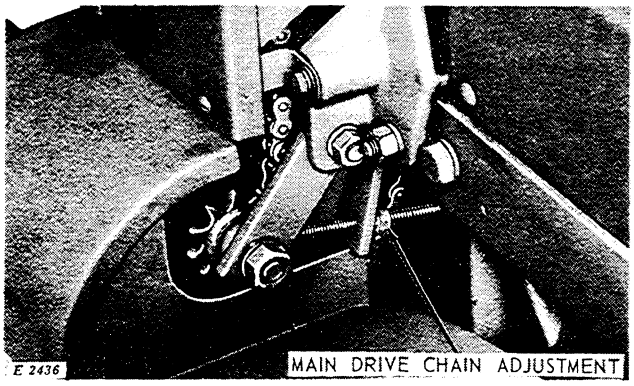
GEAR CASE AND PITMAN

The gear case and pitman should require no servicing or adjustments if kept lubricated as ›er instructions. (See "Lubrication," page 17.)

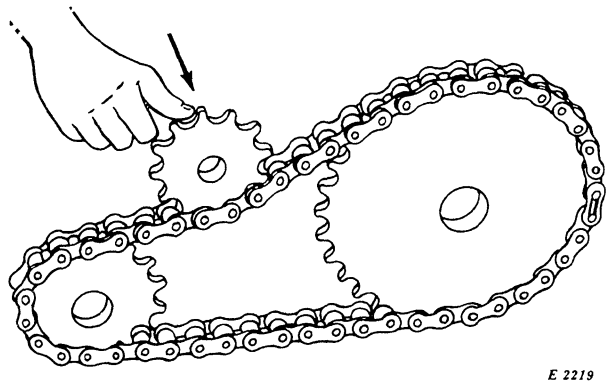
If the gear case or pitman requires servicing, consult your local John Deere dealer.

CHAIN ADJUSTMENTS

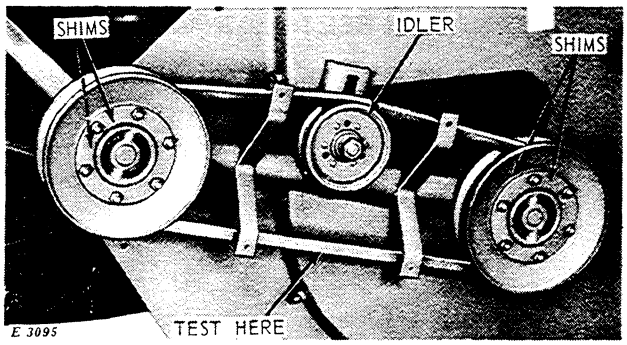
All drive chains should be kept snug to prevent the chains from jumping sprockets.



Adjust the tension on the main drive chain by loosening the idler arm mounting bolt and adjusting tension on the eyebolt. Tighten the arm mounting bolt.



Adjust the tension on all other chains by loosening the idler mounting bolt and pressing the idler against the chain with thumb pressure. Tighten the idler mounting bolt.



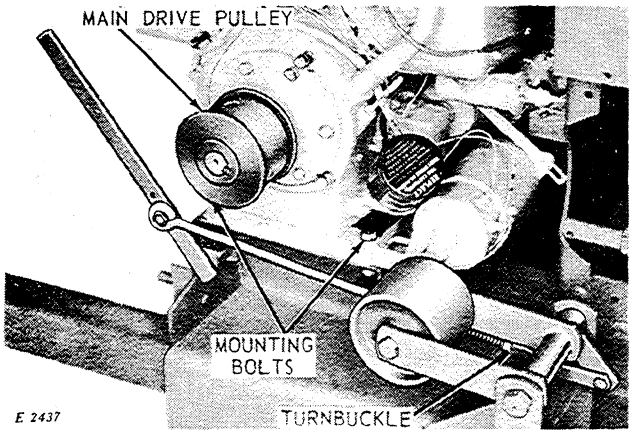
The auger drive belt is correctly adjusted when it will deflect 7/8-inch under 25 pounds of pressure.

For normal belt adjustment, loosen the idler mounting bolt and adjust belt tension with the idler.

For extreme belt adjustment, due to stretching of the belt, add shims between the pulley halves. Place the extra shims on the outside of each pulley.

NOTE: The quantity of shims between pulley halves on the drive pulley must not vary more than one shim with the quantity of shims between driven pulley halves.

ENGINE AND BELT ALIGNMENT



ENGINE ALIGNMENT

The engine must be aligned on the mounting frame with the flywheel. This is done by loosening the engine mounting bolts and shifting the engine until the engine drive pulley shaft is parallel with the flywheel shaft. Tighten mounting bolts.

DRIVE PULLEY ALIGNMENT

The center of the drive pulley must be aligned with the center of the flywheel. To adjust, loosen the set screws in drive pulley, place pulley in alignment with flywheel and retighten set screws.

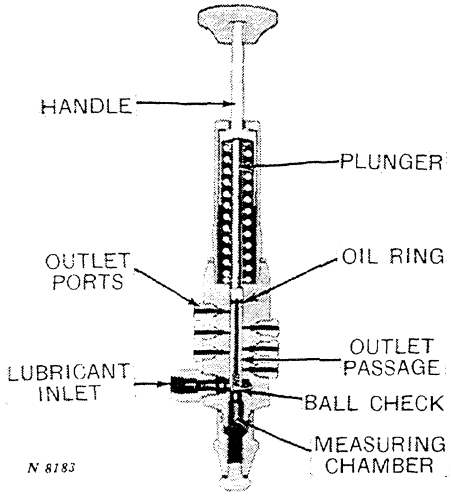
BELT TENSION

If the engine drive belt is slipping, it may be the result of inadequate tension on the belt. Adjust the turnbuckle for desired belt tension. If more adjustment is needed, move the rod to the second hole in the clutch lever.

MULTI-LUBER SYSTEM

PLUGGED OIL LINES AND BEARINGS

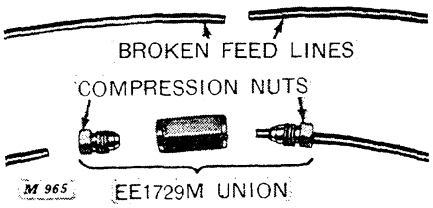
When operating properly, the plunger will move through its full stroke without difficulty. If an oil line or bearing becomes clogged, the normal stroke of the plunger will be interrupted when it reaches the outlet port of the clogged line. Clear the obstruction in the following way:



1. Determine which line is clogged by estimating how far the plunger has moved. Check to make sure by disconnecting the suspected oil line at the bearing and moving the plunger.
2. After disconnecting the clogged line, move the plunger to determine if the clogging is in the bearing or in the oil line.
3. Clean bearing if clogged and refill with grease before attaching Multi-Luber feed line. If oil line is clogged, operate the pump until lubricant is forced through the line.

CAUTION: Do not force oil through oil line with a pressure grease gun. Burst pressure of the oil line is 3000 psi.

BROKEN OIL LINES

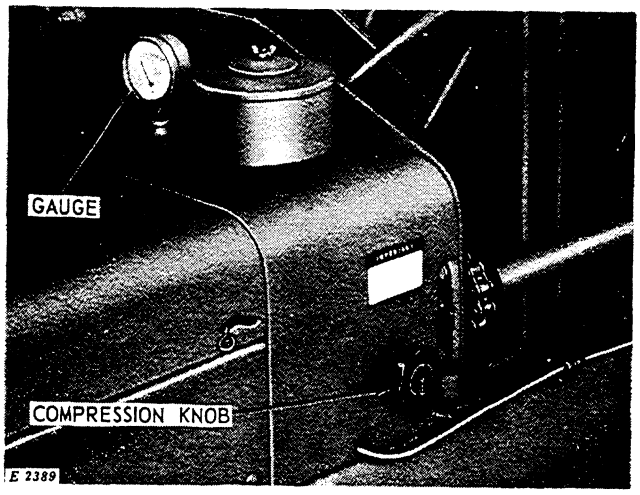


Whenever an oil line has been damaged and broken, the action of the plunger will speed up as it passes the outlet port having a broken or punctured oil line.

Determine the location of the break in the oil line. Cut broken ends of oil lines square and insert them into compression nuts and union as shown above. Tighten nuts firmly.

NOTE: Compression nuts can be used only once.

SERVICING HYDRAULIC COMPRESSION SYSTEM



Bale weight is controlled by adjusting the knob on the pump. Turning the knob clockwise increases bale compression, turning the knob counter-clockwise lessens bale compression. Once the knob has been set to accommodate the type or condition of the crop, bales of more uniform weight will be obtained without continual readjustment.

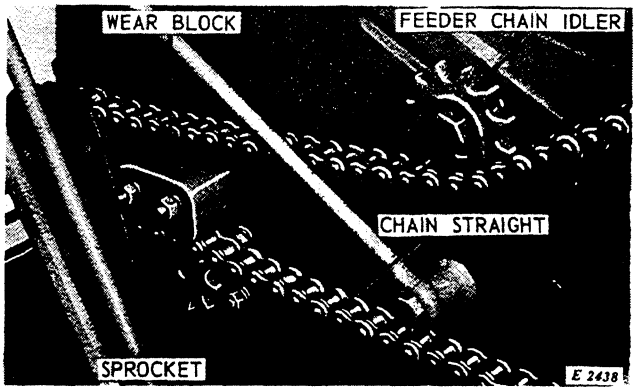
Periodically check the oil level in the hydraulic reservoir. For maximum compression control, the oil must be at the level mark on the reservoir when the hydraulic cylinder is completely depressed.

If necessary, add SAE 10W-30 engine oil or John Deere Type 303 Special Purpose Oil or its equivalent.

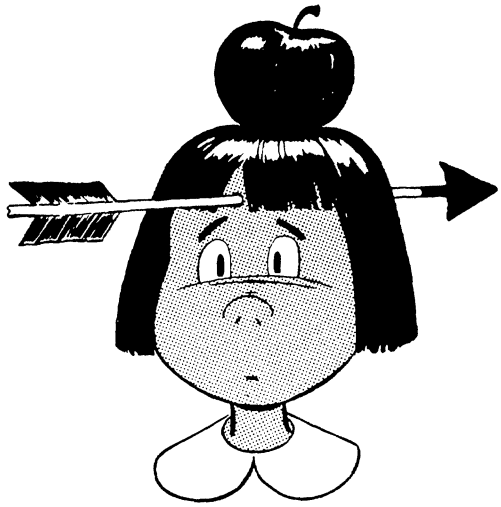
CAUTION: Keep oil clean, free of dust, water, and sealing compound. Do not use hydraulic brake fluid.

Every 10 days of operation, remove the cover and filter and clean them in diesel fuel; dip the cover in clean oil before replacing. When operating in extremely dusty conditions, clean these parts more often.

Whenever necessary, bleed air from the hydraulic system by loosening the hose at the hydraulic cylinder. Start the tractor or baler engine and engage the clutch. The engine must be idling while air is being forced out of the hose. When all air has been forced out of the hose, tighten the hose at the hydraulic cylinder.



The pump drive chain must be operated with the chain wear block holding the chain on the sprocket. Loosen the wear block and the pump; then adjust the feeder drive chain idler so that the lower side of the chain is straight. Position the wear block to just touch the chain without deflecting it; then tighten the block mounting bolts. Adjust the pump sprocket to the chain. Tighten the mounting bolts.

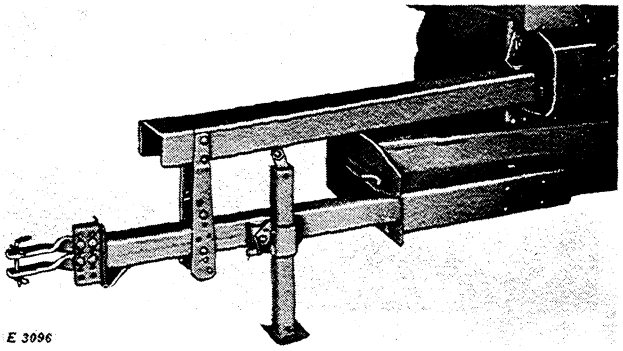


Accidents don't just happen
They are CAUSED!

R 2390

ATTACHMENTS

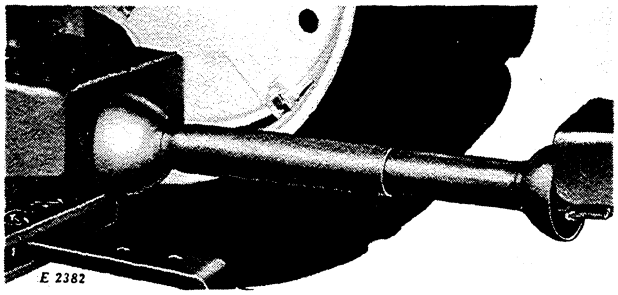
POWER TAKE-OFF UNIT



This attachment is available for converting an engine-mounted baler to power take-off.

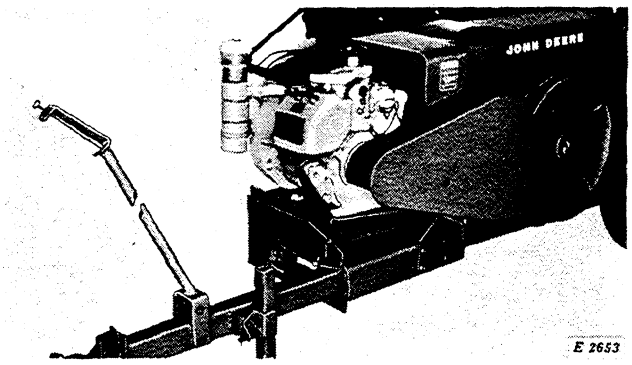
A tractor hookup attachment is also necessary when using the power take-off.

TRACTOR HOOKUP



This bundle is available for use when the baler is used as a power take-off machine. The hookup unit accommodates the 1-3/8-inch tractor spline.

WISCONSIN ENGINES AND MOUNTINGS



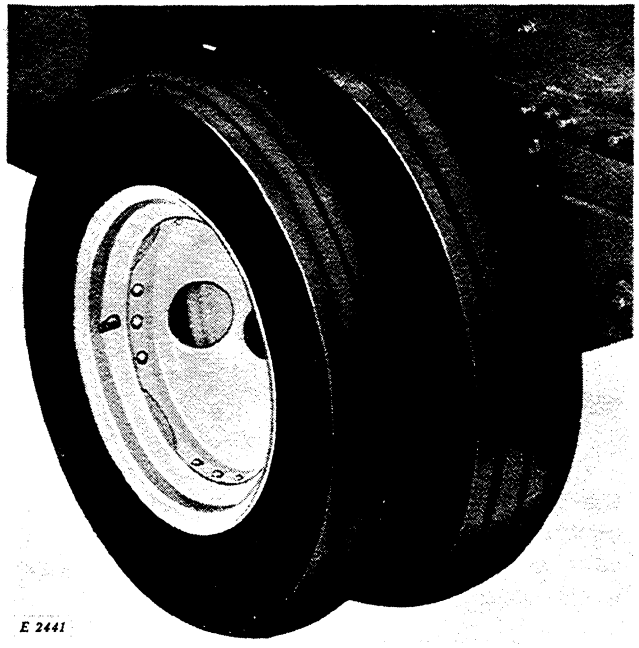
If your tractor is too small to operate the baler as a power take-off machine, if you pull a trailer, or operate the baler in hilly conditions, a self-starting 26.5 h.p. Wisconsin "VH4D" engine or a self-starting 36 h.p. Wisconsin "VG4D" engine is available. Each engine is equipped with a throttle control accessible from the tractor seat.

To increase operating efficiency in altitudes above 4,000 feet, a Wisconsin Engine with a high altitude head should be purchased.

CAUTION: Engines with high altitude heads are not to be used under altitudes of 4,000 feet or serious damage to the engine will result.

NOTE: See page 48 to determine the type of battery to be purchased with this unit.

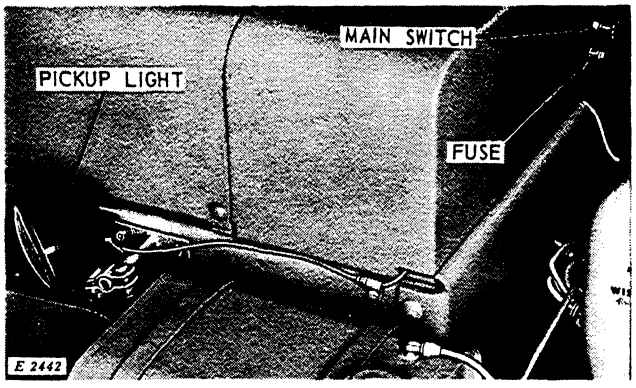
DUAL WHEELS (LESS TIRES)



A dual wheel is available for either side of your baler.

The dual wheels are intended for added flotation when operating in soft or sandy soil. The dual tire should never be of larger size than the inside tire, and preferably smaller.

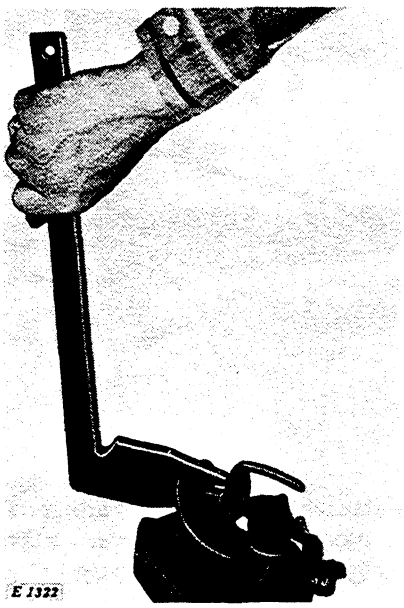
AUXILIARY LIGHTING EQUIPMENT



Auxiliary lighting equipment offers convenience for night-time baling.

The equipment consists of a light control switch to control a pickup area light and a knotter area light, and a switch to control a light for the twine or wire box area. All lights are included with the attachment.

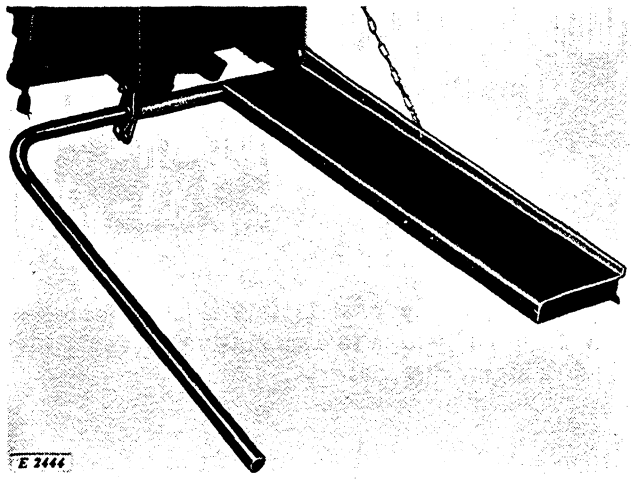
WIPER ARM MODELING TOOL–TWINE BALER



The wiper arm modeling tool will make it easier and faster to obtain proper adjustment of the twine knotter wiper arm.

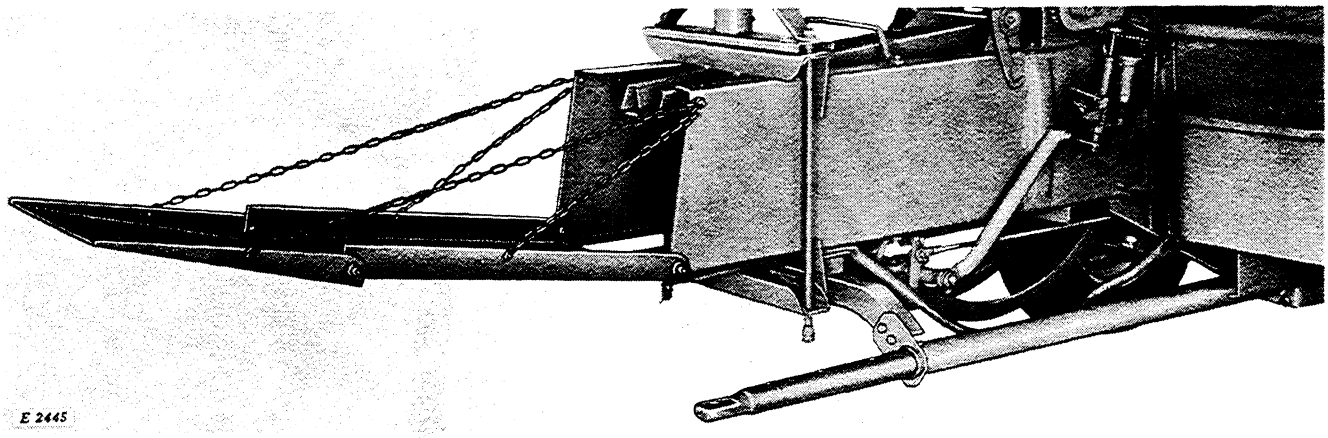
The wiper arm modeling tool allows ample leverage and at the same time complete control of the modeling operation.

SIDE-DROP BALE CHUTE



The side drop bale chute will drop bales on their narrow sides. The chute is reversible to drop bales to the left or to the right.

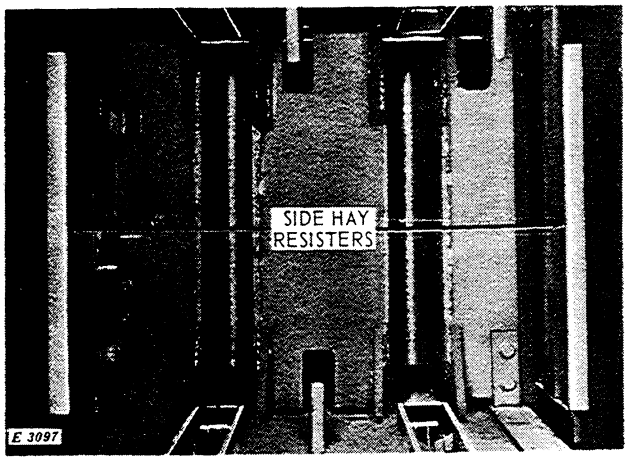
WAGON HITCH AND BALE CHUTE



This attachment permits loading bales directly from the baler to a wagon or trailer, thus eliminating the job of picking up bales.

This chute attaches in the same manner as the regular chute and is supported by four chains. The hitch is bolted to the frame and bale case and is adjustable for wagons or trailers having tongues of varying lengths.

SIDE HAY RESISTERS



The side hay resisters will offer increased bale density which is especially desirable when baling light, dry material.

Up to four sets of resisters may be used—depending upon the amount of density required.

ASSEMBLY

SHIPPING BUNDLES

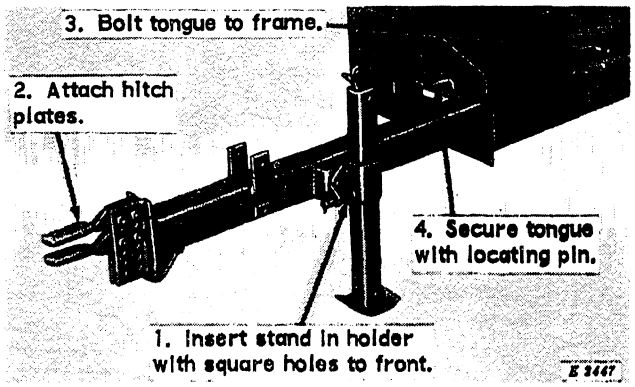
Bundle No.	Description
Code 1032	216T Baler—basic unit
AE 12475 E	Bale chute
BE 10540 E	Baler
BE 10542 E	Tongue
Code 1033	216WS Baler—basic unit
AE 12475 E	Bale chute
BE 10541 E	Baler
BE 10542 E	Tongue
Code 1034	VH4D Engine unit
AE 13829 E	Engine
BE 10348 E	Hitch plates
BE 10545 E	Fuel tank, shield, cables
BE 10546 E	Engine mounting
Code 1035	PTO unit (540 rpm)
AE 13953 E	Powershaft and yoke
BE 10344 E	Hitch plates
BE 10539 E	Slip clutch
BE 10538 E	Shields and support
Code 1037	216T Baler—basic unit with dual wheels
3642 E	L.H. dual wheel
AE 12475 E	Bale chute
BE 10542 E	Tongue
BE 10549 E	Baler with R.H. dual spindle
JD 679 E	R.H. dual wheel
Code 1038	216WS Baler—basic unit with dual wheels
3642 E	L.H. dual wheel
AE 12475 E	Bale chute
BE 10542 E	Tongue
BE 10550 E	Baler with R.H. dual spindle
JD 679 E	R.H. dual wheel
Code 1039	VH4D Engine unit "high altitude head"
AE 13831 E	Engine
BE 10348 E	Hitch plates
BE 10545 E	Fuel tank, shield, cables
BE 10546 E	Engine mounting
Code 1068	Side wagon hitch and bale chute
BE 10031 E	Wagon hitch axle connection
BE 10443 E	Bale chute extension
BE 10543 E	Hitch extension

Bundle No.	Description
Code 1069	Side-drop bale chute
AE 14008 E	Bale guide
BE 10534 E	Side-drop bale chute
Code 1082	VG4D Engine unit
AE 15314 E	Engine
BE 10348 E	Hitch plates
BE 10545 E	Fuel tank, shield, cables
BE 10641 E	Engine mounting
Code 1083	VG4D Engine unit "high altitude head"
AE 15313 E	Engine
BE 10348 E	Hitch plates
BE 10545 E	Fuel tank, shield, cables
BE 10641 E	Engine mounting
3642 E	L.H. dual wheel
AE 13260 E	Wiper arm modeling tool (216T Baler)
AE 15546 E	Side hay resisters
BE 10193 E	Tractor hookup (540 rpm)
BE 10439 E	R.H. dual wheel and spindle
BE 10544 E	Auxiliary lighting equipment

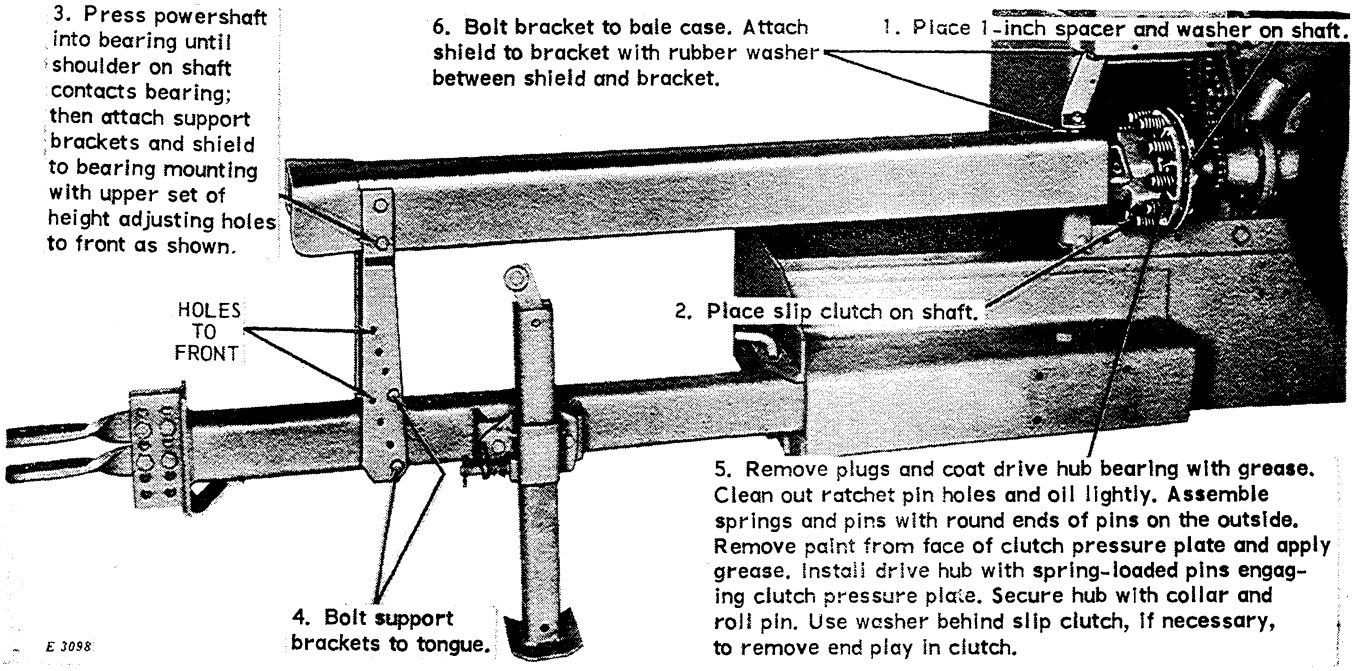
Assemble the baler as illustrated in the following pages. The illustrations show clearly the parts to be assembled and attached in their proper order.

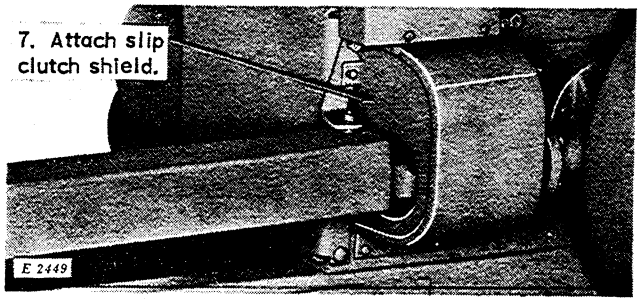
After unpacking and placing all parts where they will be handy, follow all the instructions carefully. Practically all trouble with new machines is due to improper assembly and lack of lubrication.

TONGUE AND JACK STAND



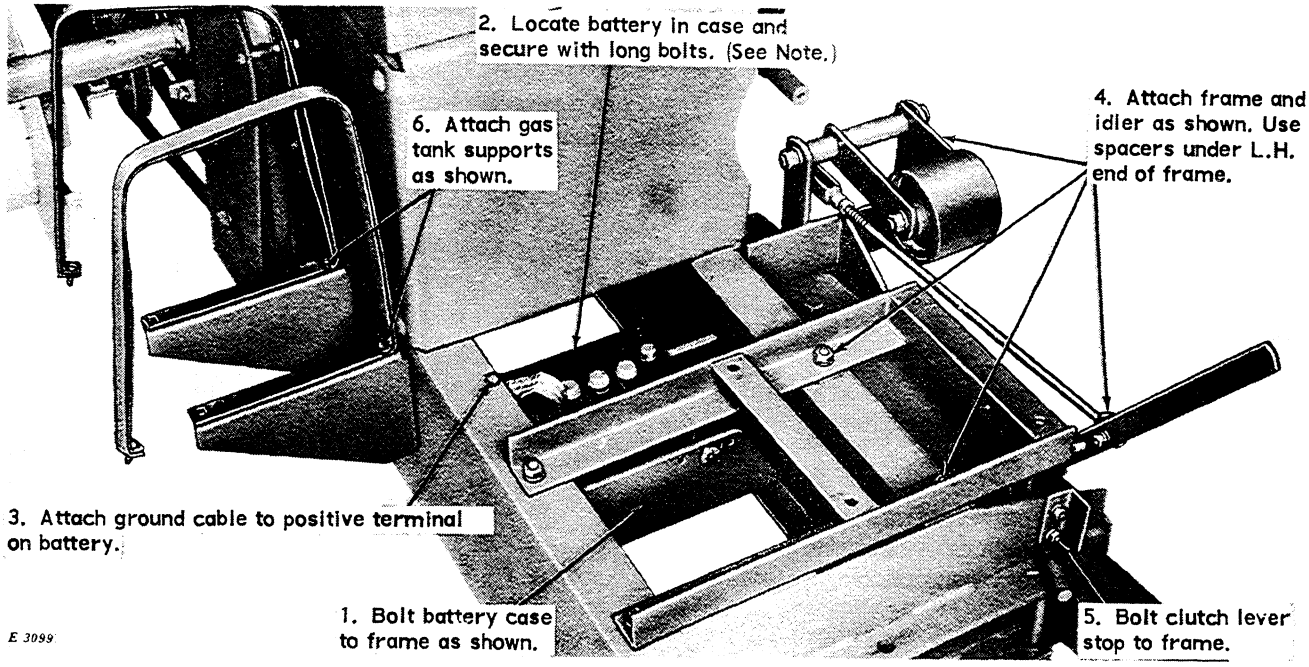
POWER TAKE-OFF UNIT



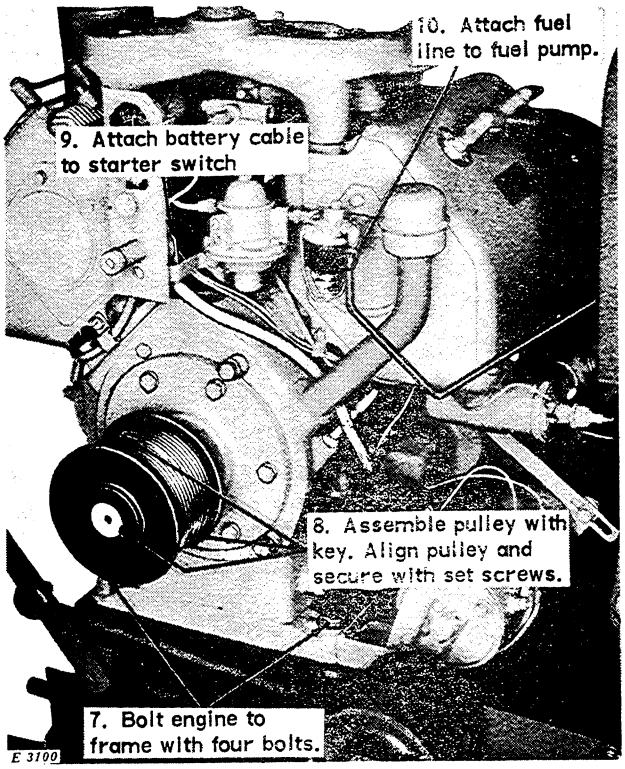


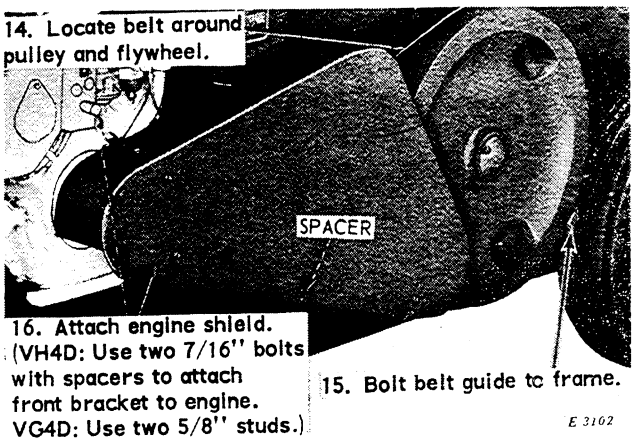
ENGINE UNIT

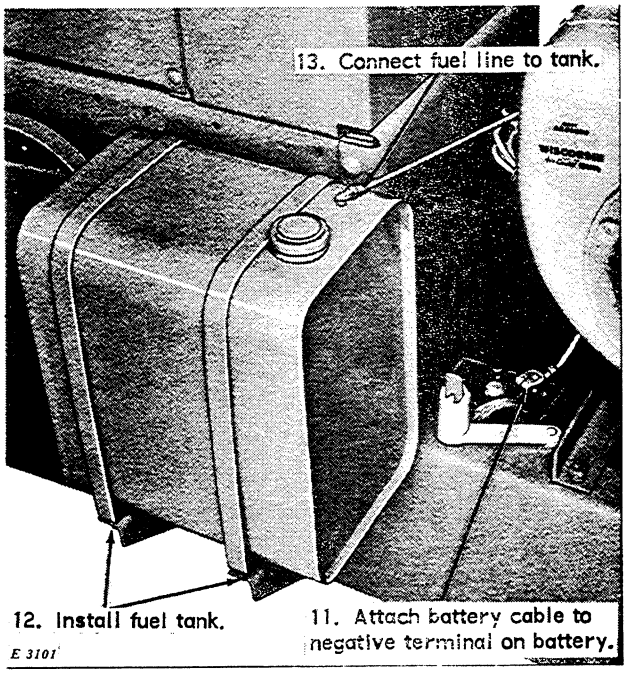
NOTE: Use a 12-volt battery that has both terminals on the same side. The positive ground terminal should be on the right-hand side. The type of SAE recommended batteries which may be used are: 2SMA, 2SMB, 2SMC, 2SHA, 2SHB, 2STA, 3SHA, and 3SMA.

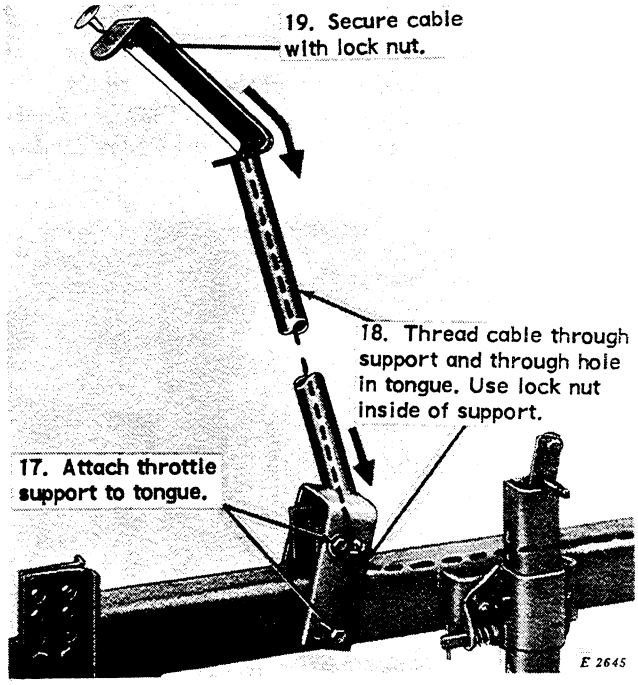


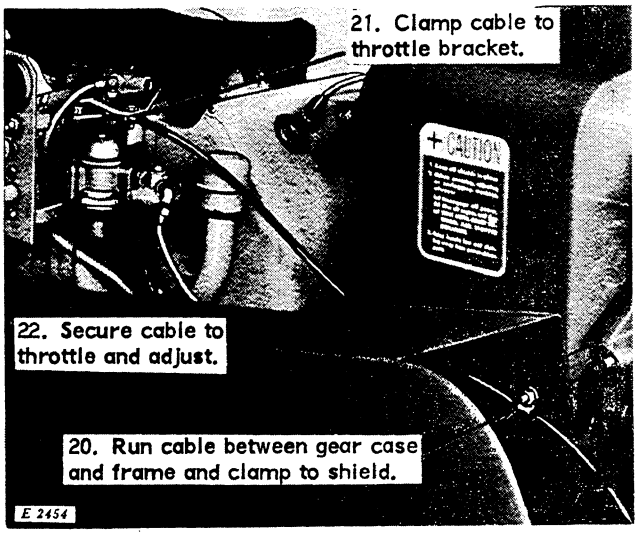
ENGINE UNIT—Continued



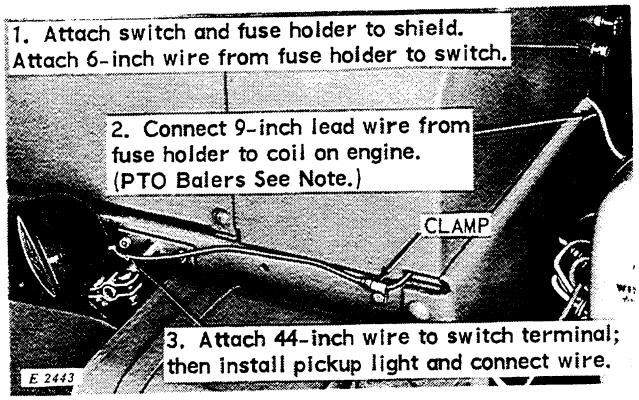




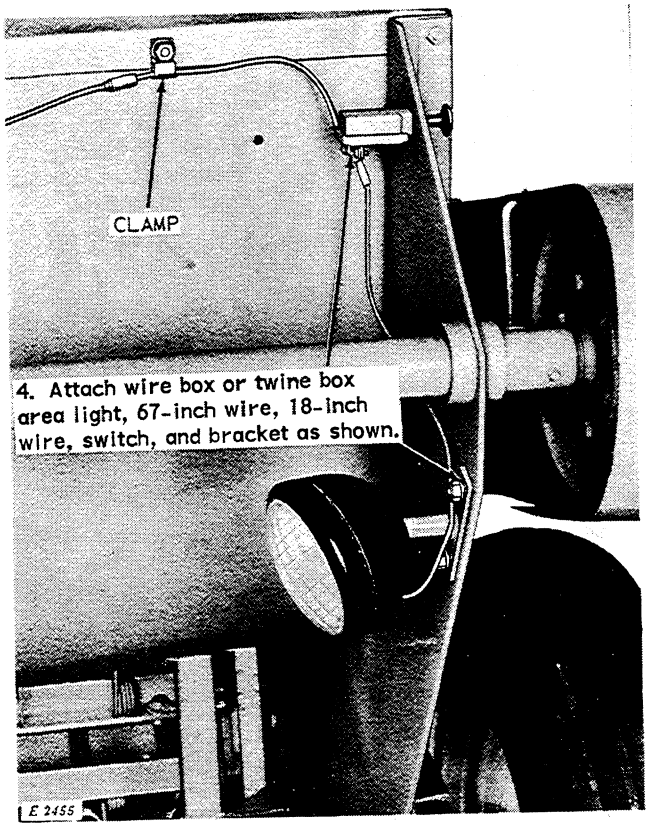


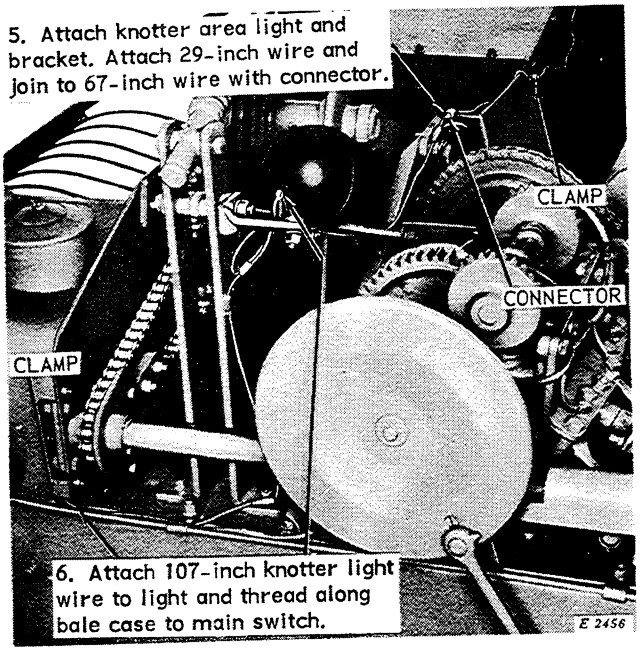


AUXILIARY LIGHTING EQUIPMENT

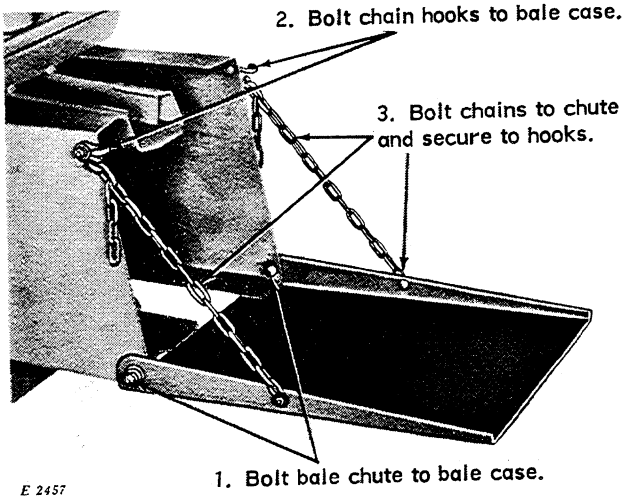


NOTE: PTO balers use 2-wire coil with plug and connect to terminal on 12-volt tractors only. Attach one wire to 9-inch lead wire from fuse holder and ground the other wire to the bale case. (25-foot coil with plug, part no. AA5691R, may be purchased from your John Deere dealer.)

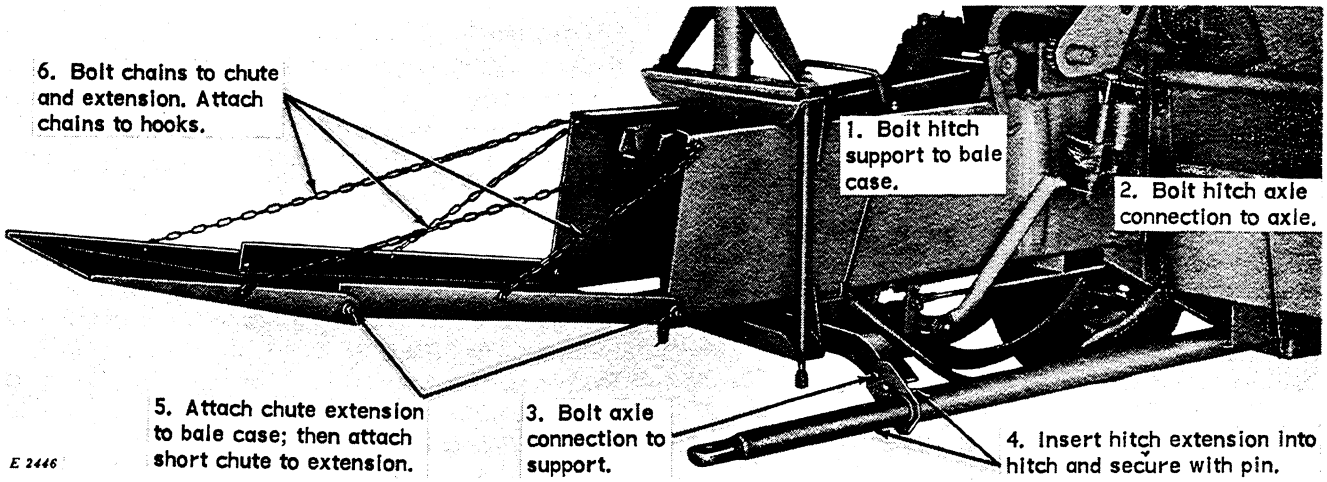




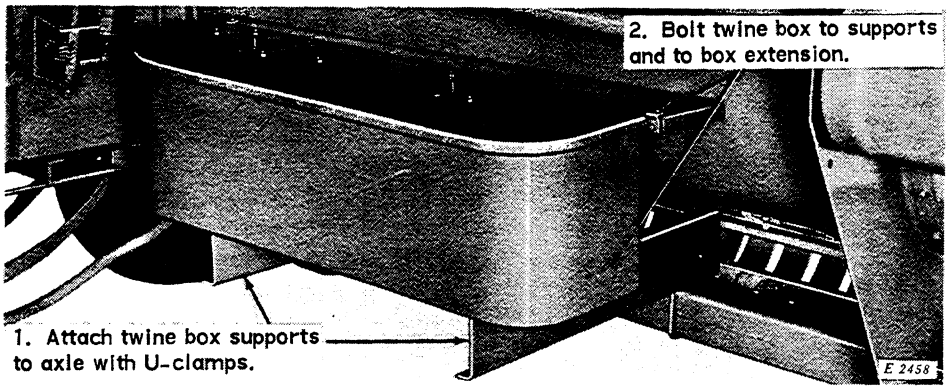
BALE CHUTE



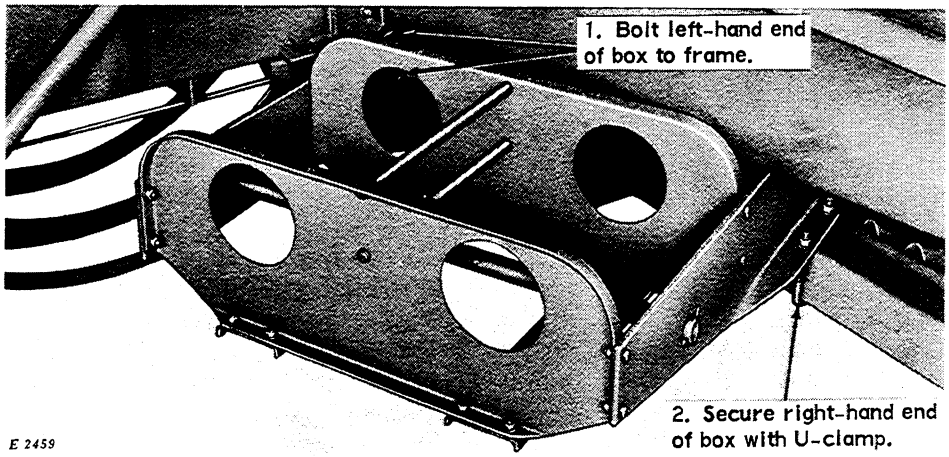
WAGON HITCH AND BALE CHUTE



TWINE BOX—TWINE BALER



WIRE BOX—WIRE BALER



INDEX

Assembly 47
Attachments 44
Auger drive belt 41
Bale chute 45, 46, 50, 51
Bale counter 12
Bale measuring control 11, 39
Bale weight control 11, 25
Belt, auger drive 41
Belt, engine 42
Belt tension, pickup 40
Bevel gear and pinion adj. (wire) 34
Billhook (twine) 30
Brake, knotter drive 37
Breaking in baler 14
Chain adjustments 41
Clutch lever, engine 13, 42
Clutch, slip 13, 40
Compressor adjustment, pickup 12
Counter, bale 12
Crop preparation 14
Direction of travel 14
Drawbar 6
Dual wheels 45
Engine 44, 48
Engine and belt alignment 42
Feeder teeth, adjustment 9
Feeding difficulties 26
Field operation 14
Flywheel shear bolt 13, 27
Gear case and pitman 41
Gripper adjustment (wire) 34
Guide adjustment, plungerhead 38
Hitching to tractor 6
Hookup instructions 6
Hookup, tractor 6, 44
How the knot is tied (twine) 8
How the wire is joined 7
Hydraulic pump 11, 18, 27, 43
Identification views 1
Implement operation 7
Intermittent gear adj. (wire) 34
Jack stand 6, 10, 17, 47
Knife adjustment, plungerhead 38
Knife arm (twine) 31
Knotter adjustments (twine) 5
Knotter and needle drive shear pin . . . 10, 27
Knotter difficulties (twine) 20
Knotter drive brake 37
Knotter gears (twine) 33
Lift lever, pickup 11
Lighting equipment, auxiliary 45, 50
Loading twine box 3
Loading wire box 3
Lubrication 17
Measuring control, bale 11, 39
Multi-Luber 17, 42
Needle adjustment (twine) 32
Needle adjustment (wire) 35
Needle frame adjustment (twine) 28
Needle link adjustment (wire) 35
Needles, threading (twine) 5
Needles, threading (wire) 4
Operation 3
Pickup balancing spring 40
Pickup compressor adjustment 12
Pickup difficulties 26
Pickup gauge wheel 12
Pickup height 11
Pickup V-belt tension 40
Pitman and gear case 41
Plungerhead and knife adjustment 38
Plungerhead guide adjustment 38
Plungerhead safety stop 37
Powershaft support brackets 6
Power take-off unit 44, 48
Preparing implement 3
Safety suggestions 15
Scrapers, plungerhead 39
Service 28
Service checking 28
Shear bolt, flywheel 13, 27
Shear pin, knotter and needle drive . . 10, 27
Shipping bundles 47
Side-drop bale chute 45
Side hay resisters 46
Slip clutch 13, 40
Specifications 2
Starting and driving 14
Storage 16
Threading needles (twine) 5
Threading needles (wire) 4
Throttle control 13
Timing baler 28
Timing needle lift shaft 40
Tongue height 6
Tongue position 12, 15
Tool box 12
Transporting 15
Trouble shooting 20
Tucker fingers (twine) 33
Twine box 3, 51
Twine disk 30
Twine holder 32
Twine tension 5
Twister difficulties (wire) 24
Twister hook adjustment (wire) 34
Wagon hitch and bale chute 46, 50
Wiper arm modeling tool (twine) 45
Wire box 3, 51
Wire guide adjustments 36