SERVICEMAN'S TROUBLE SHOOTING HANDBOOK

VOLUME NO. 1

SPERRY NEW HOLLAND

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Reprinted

FOREWORD

The purpose of this manual is to provide in condensed form service and maintenance information which will serve as a guide to a serviceman when repairing or rebuilding New Holland equipment in the shop and be of help to him in diagnosing and correcting service difficulties in the field.

It is intended that the operator's manuals and assembly instructions issued with each machine be used in conjunction with this manual, since much of the information contained herein is condensed or supplementary in nature.

TABLE OF CONTENTS

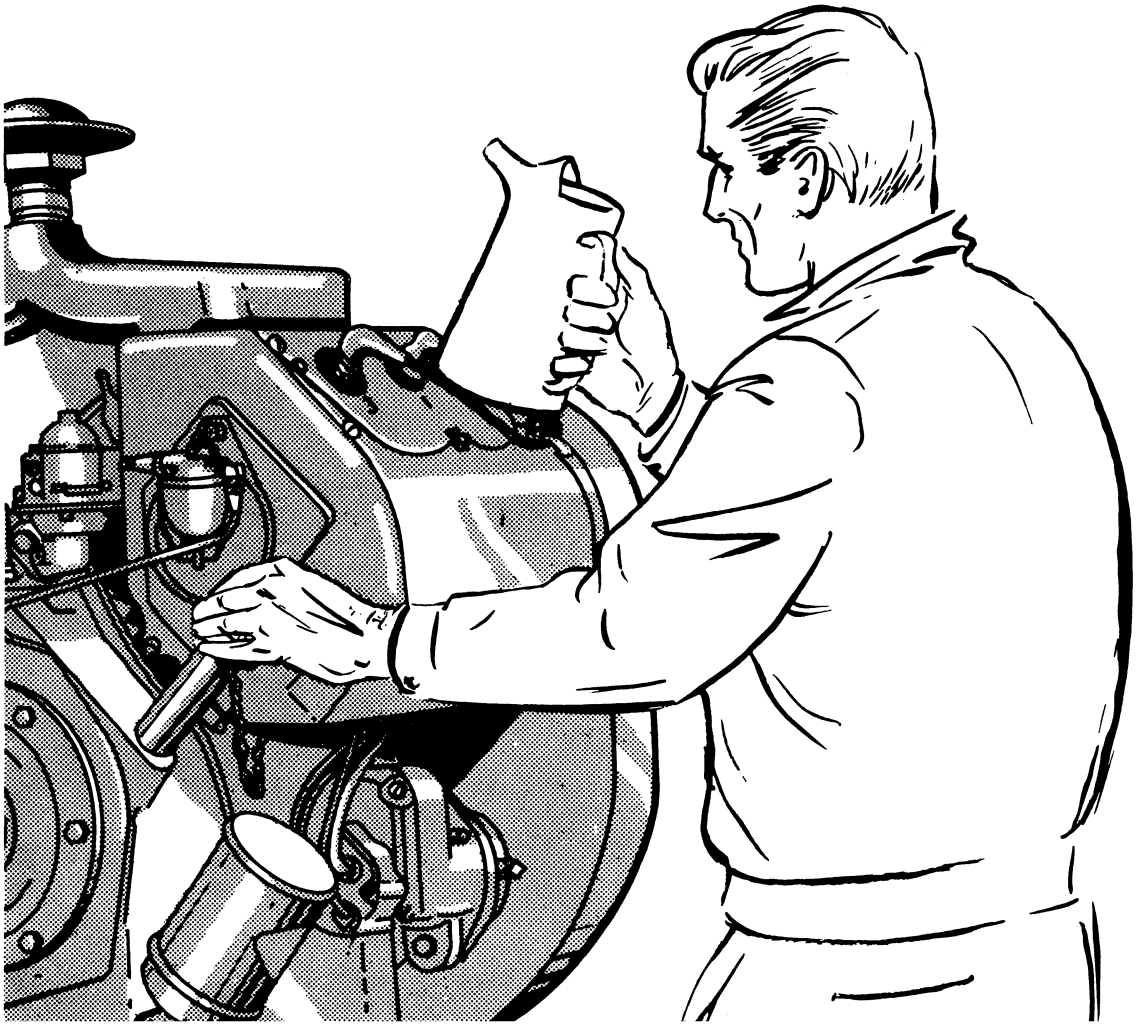
TABLE OF CONTENTS (Cont'd)

PRE-DELIVERY SERVICE AND BREAK IN OF NEW EQUIPMENT

The importance of proper pre-delivery service and break-in of a new machine cannot be over-emphasized. Many service problems will be prevented if the new machine is carefully set up, adjusted, and run in before it is delivered to the customer.

The following outline is suggested as a guide for servicing New Hollond equipment before it is put into field operation:

1. Check the machine for proper assembly, paying particular attention to assembly instructions provided. Make sure that all bolts are tight and see that all belts and chains are correctly aligned and adjusted.
2. Inflate tires to the recommended pressure.
3. Service the engine. Fill the crankcase and the air cleaner reservoir to the proper level with a good quality S.A.E. No. 30 motor oil in summer weather or S.A.E. No. 20 for temperatures below 40 degrees F. Fill the fuel tank with gasoline of 70 to 75 octane rating. (If P.T.O. equipment attach machine to tractor with standard P.T.O.) (Refer to engine section for recommended break-in procedure for all engines.)
4. Lubricate the machine carefully and check the oil level of all gear boxes on the machine. **Refer to Owner's manual for locations** of grease fittings and lubrication recommendations.
5. Check all adjustments. Refer to the owner's manual for information on the adjustments common to each machine.
6. Make sure that all persons and tools are clear and turn the machine by hand to determine that all parts move freely.
7. Start the engine and run it in at half throttle as outlined above. After the engine is warmed up, engage the clutch and operate the entire machine at half speed for 10 to 15 minutes. Gradually increase the engine speed to full throttle. Determine the speed of the machine by means of a tachometer or in the case of balers by counting plunger strokes. Adjust the governor control linkage as required to obtain the correct operating speed. Continue to operate the machine without load for at least thirty minutes. On P.T.O. equipment run in with tractor equipped with standard P.T.O.)
8. Stop the machine, check the bearings for signs of overheating and relubricate where necessary. Readjust belts, chains, etc., as required.
9. Refer to detailed instructions in the owner's manual or assembly instructions for special points on each particular machine.



DELIVERY AND INTRODUCTION OF NEW HOLLAND EQUIPMENT TO THE OWNER

The knowledge an owner has of the machine he operates is of great importance to the success of that particular machine. It is not enough that an owner receive an operator's manual with each machine for his reference. The pertinent information in this manual should be reviewed with him and the operation of the machine should be explained under actual operating conditions. Important points on lubrication, operation, care, and maintenance should be explained. Time spent with an owner in covering the following points will pay dividends in satisfied customers, fewer gratis service calls, and **repeat sales.**

I. Engine Units:

A. Cover thoroughly all points on proper break-in, operation, daily care and maintenance relative to the engine on the machine delivered.

II. Adapt the machine to the tractor:

A. Engine and P.T.O. Units.

1. Adjust the hitch clevis to the correct height so that the frame is approximately level when the machine is attached to the tractor.
2. Adjust the control levers or lift levers so that they can be reached conveniently from the tractor seat.

B. P.T.O. Units only.

1. Attach the P.T.O. machine to the tractor according to A.S.A.E. specifications. Use a hitch adapter if necessary to obtain 14" between the end of the tractor P.T.O. shaft and a vertical line through the center of the hitch pin.
2. Adjust the P.T.O. support bracket up or down as required to secure the best possible alignment of the P.T.O. drive.
3. Explain the importance of operating the tractor at proper throttle setting to provide the P.T.O. speed which will operate the machine at the recommended R.P.M. 536-540 P.T.O. speed recommended.

III. Adapt the machine to field conditions:

A. Set axles to the height necessary for proper ground clearance if they are adjustable.

B. Off-set the tongue as required to accommodate row spacing and tractor wheel setting.

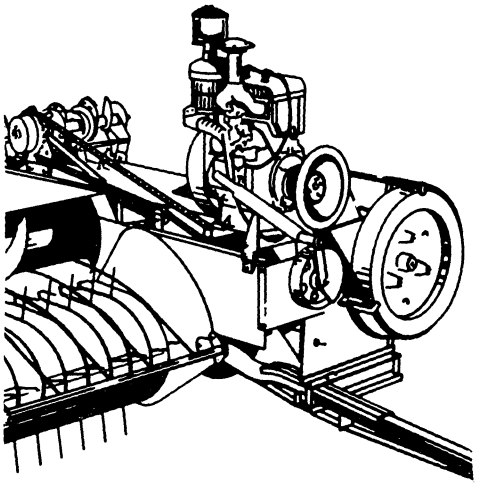
C. Install optional or special equipment if necessary to facilitate operation in adverse field or crop conditions.

IV. Instruct the customer in the operation and maintenance of the machine.

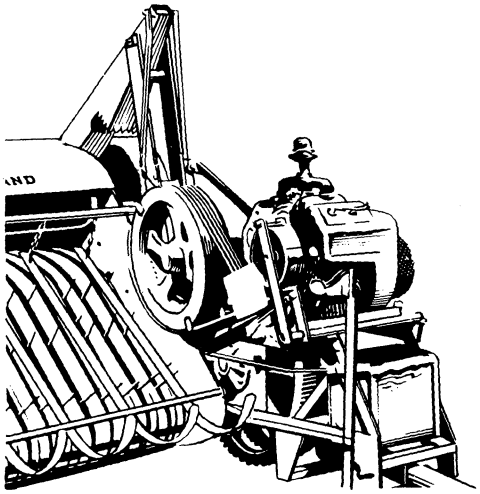
A. Discuss adjustment, lubrication, safety features, etc. and stress the safety precautions required of the operator.

B. Review the operating instruction manual with the owner and operator and encourage him to read the book carefully. Point out all points of lubrication and recommend a routine system of lubrication to the operator.

C. Have the customer operate his machine at a slow ground speed to get the "feel of it," and to allow the machine and engine to be broken-in under partial load.



66 BALER

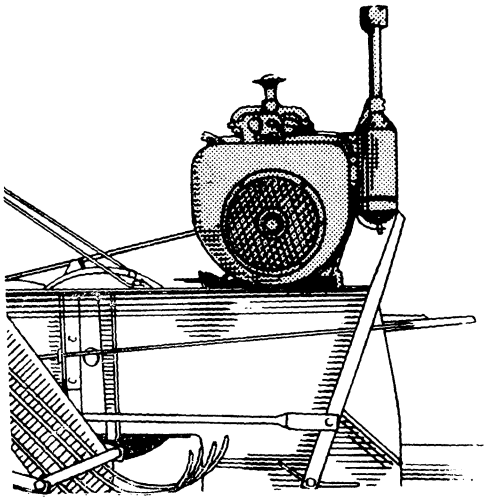


SUPER 77 BALER

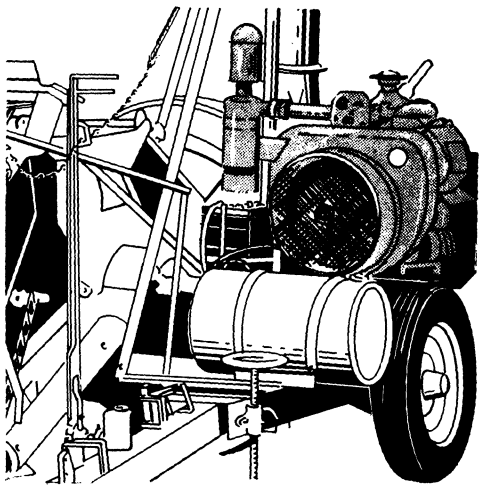
ENGINES

ON

NEW HOLLAND EQUIPMENT



80 BALER



FORAGE HARVESTER

WISCONSIN ENGINES USED ON NEW HOLLAND EQUIPMENT

BALERS

	No. of Cylinders	Rated horsepower at operating speed
Model 66		
**TF-D	2	15 H.P. at 2890 R.P.M.
Models 73, 75 and 76		
*VE-4	4	22 H.P. at 2200 R.P.M.
Model 77		
*VE-4	4	20 H.P. at 2160 R.P.M.
Model Super 77		
*VF-4	4	24 H.P. at 2270 R.P.M.
Model 87		
VF-4D	4	24 H.P. at 2270 R.P.M.
Model 80		
*VP-4D	4	31 H.P. at 2185 R.P.M.

FORAGE HARVESTERS

Model 600		
VP-4D	4	31 H.P. at 2200 R.P.M.
Model 601		
*VP-4D	4	31 H.P. at 2200 R.P.M.
**VG-4D	4	36 H.P. at 2200 R.P.M.

*Electrical starting (battery and generator type) optional.
**Electrical starting (cable type) optional.
D—Indicates Stellite exhaust valves and inserts.

ENGINE BREAK-IN

It is particularly important that new engines be run in before they are put to work because the polished bearing surfaces which are so necessary for the satisfactory performance and long life of the engine can only be obtained by running the new engine carefully under reduced speeds.

During the first 30 hours of operation it is desirable to add 1 pint of motor oil to every 10 gallons of gasoline used in the engine. The addition of this oil insures proper lubrication of all moving parts in the combustion area while proper running surfaces are being established. Caution. Do not continue this practice after 30 hours.

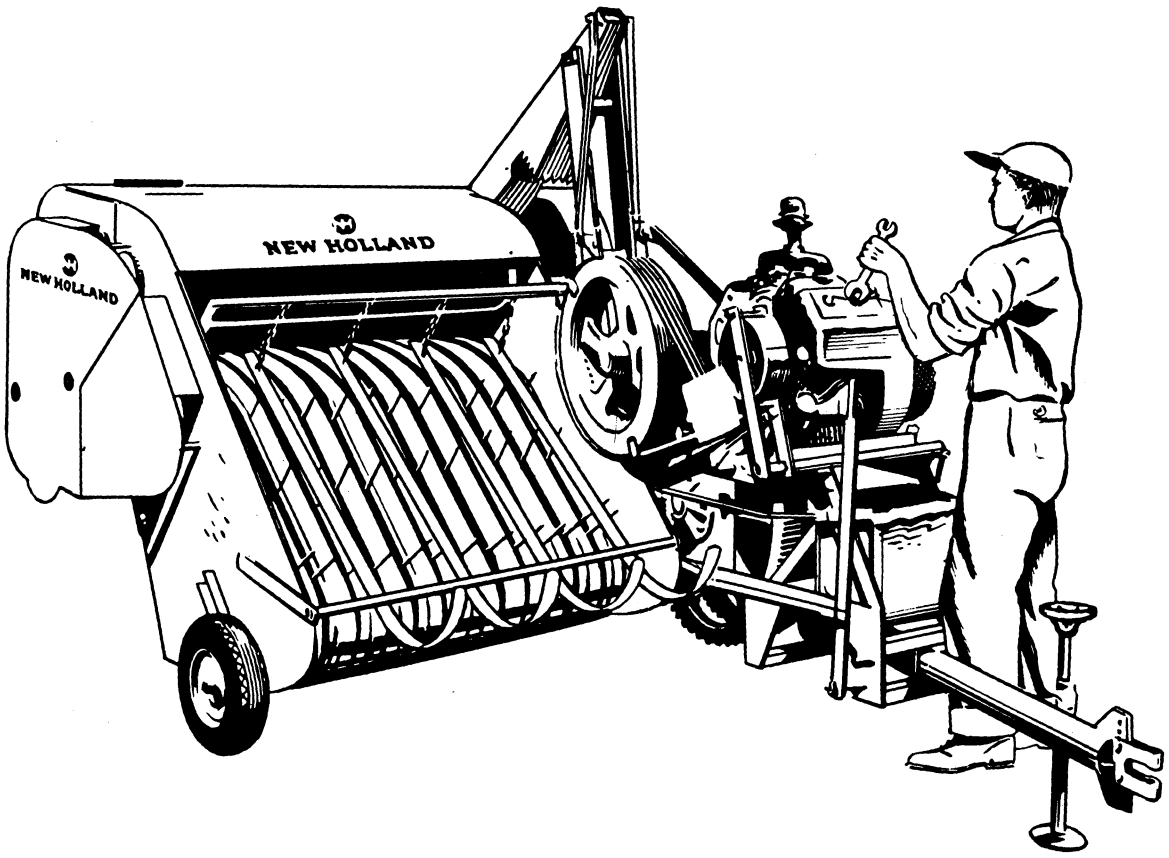
The following is an excerpt from a bulletin put out by a leading manufacturer of agricultural engines on the subject of starting and operating new engines.

"The first time a new engine is started it should be operated at low speeds (1000 to 1200 r.p.m.) for about one hour without load. The r.p.m. should then be increased to governor idle speed, still without load, for one hour. This is necessary to allow the engine oil to warm up and establish a film over the various bearings in place of the film of anti-rust processing oil with which the engine is treated before leaving the engine manufacturer's plant. This run also allows the engine to warm up so that the proper clearances are established between the various operating parts.

"After the initial run-in period the load may be applied but preferably by degrees, say one third load for 15 minutes, two thirds load for 15 minutes, and then full load. Thereafter when the engine is run, the load may be applied more quickly but a few minutes warm-up period should always be allowed to re-establish the oil films and also the proper running clearances.

"The above 'running in' schedule is very limited and only a small fraction of the time recommended by automobile manufacturers for running in new cars. Almost everyone knows that a new car started down the road with wide open throttle from a cold start could be expected to be ruined. No car manufacturer can produce a car that can do otherwise unless he would give the car a careful 'run-in' on the road of several hundred miles; which is, of course, commercially impossible. The very same principle applies to industrial engines."

ENGINE TROUBLE SHOOTING



TROUBLE SHOOTING

PROBLEM	CAUSE	CORRECTIONS
WILL NOT START	No fuel.	Fill fuel tank with good grade of recommended fuel.
		Check fuel lines for clogged condition or air leaks. Fuel tank for broken fuel line suction pipe.
		Check fuel pump operation.
	No spark.	Check for hot spark. If no spark check ignition system as outlined under faulty ignition.
	Low Compression.	See low compression.
KNOCKING	Heavy load at low speed.	Check engine speed and load.
	Valves sticking.	Check and free any sticking valves.
	Improper piston fit.	Check and repair if needed.
	Carbon or lead deposits in cylinder head.	Remove heads and clean carbon and lead deposits.
	Improper valve tappet setting.	Check and adjust valve tappets.
	Loose or damaged main bearings.	Adjust or replace main bearings.
	Loose connecting rod or burnt connecting rod bearing.	Check rods for loose or worn bearing. Adjust or replace as needed.
	Worn or loose piston pin.	Check piston pins and replace when needed.
	Worn or loose timing gears.	Check and replace if needed.
	Ignition.	Spark too far advanced, check engine timing. See operator's manual for engine concerned.
	Overheating.	See section on overheating.
	Carburetion.	Check grade of fuel. Use fuel of recommended octane rating.
	Scored cylinder.	Rebore, refinish or replace block.
	Frozen rings.	Free rings with penetrating oil. If necessary to remove pistons from cylinders, replace rings.
	Burnt valves or seats.	Grind or replace valves and seats.
	Sticky valves.	Free sticky valves.
	Improper valve adjustment.	Adjust valve tappet clearance.
	Leaking head gasket.	Replace head gasket.
	Warped head.	Replace head.
	Broken or leaking plug.	Check plugs, tighten or replace.

TROUBLE SHOOTING

PROBLEM	CAUSE	CORRECTIONS
FAULTY IGNITION	Plugs wet or faulty.	Remove plugs, check, clean, and adjust. Replace when necessary.
	Faulty Magneto.	Remove mag, repair or replace.
	Faulty Coil.	Remove and replace.
	Faulty Condenser.	Remove and replace.
	Breaker points.	Check, clean, and adjust. Replace if worn or pitted.
	Timing.	Check timing according to recommended procedure in engine manual.
	Faulty wiring.	Check all wire for loose connections or short circuits.
	Improper wiring.	Check firing order and wire plugs properly. Refer to engine manual.
FAULTY CARBURETION	Fuel.	Check fuel supply. Clean, adequate supply of good grade fuel needed. Fuel lines must be open and free of dirt or leaks.
	Fuel mixture.	Check air passages for restrictions. Service air filter, check intake manifold for air leaks. Carburetor valves for proper adjustment.
OVERHEATING AND/OR LACK OF POWER	Restricted cooling air.	Keep engine air intake screen free from dirt accumulation.
		Check cooling fins for dirt accumulation.
		Check engine cowling for damage which will cause restricted air flow or air loss.
	Air cleaner restriction.	Service air cleaner and check air intake passages for restrictions.
	Restricted exhaust.	Check exhaust for restrictions.
	Low compression.	See section on compression.
	Lubrication.	Check oil supply for dirt accumulation and for quantity.
	Low grade fuel.	Check grade of fuel.
	Improper fuel mixture.	Check air cleaner and air intake passages for restrictions.
		Check intake manifold for air leaks.
		Check carburetor adjustment.
	Ignition.	Check timing.

TROUBLE SHOOTING

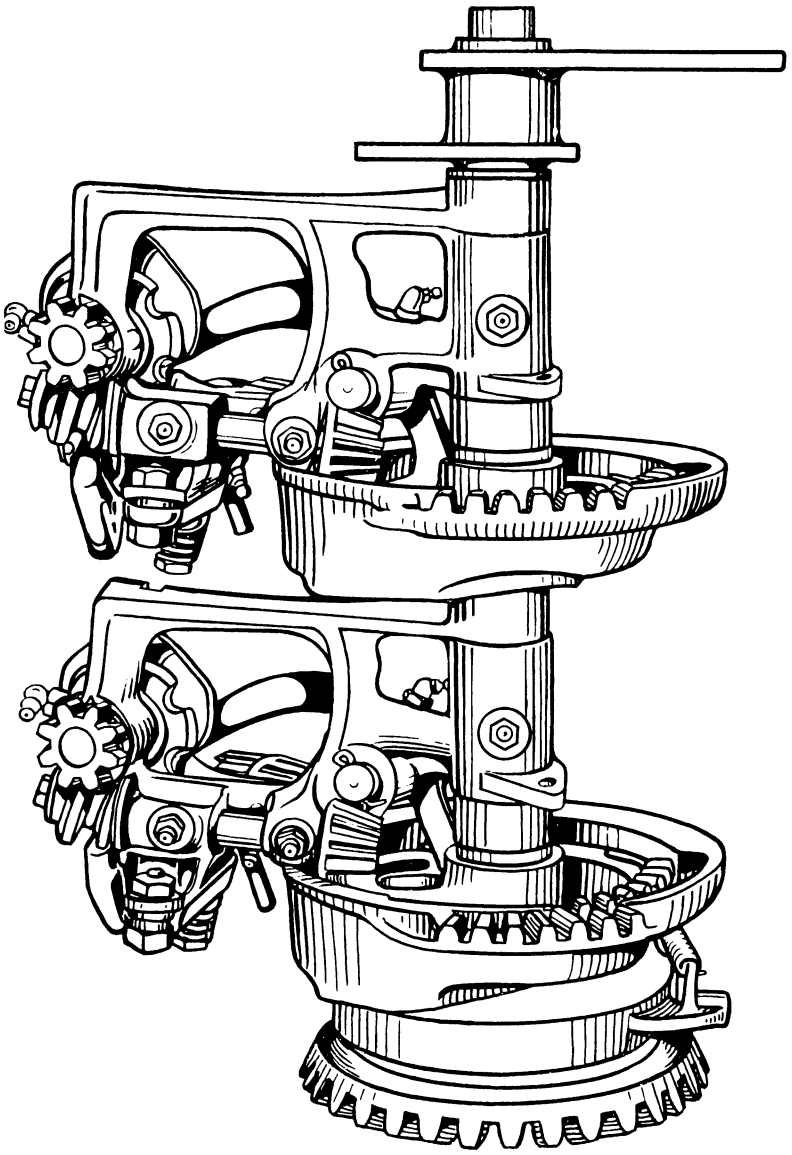
PROBLEM	CAUSE	CORRECTIONS
MISSING	Water in gas or dirty fuel.	Check fuel, fuel lines, clean sediment bowl and bowl screen.
	Carburetor.	Check for blocked passages, improper adjustment of valves, and sticking float.
	Spark plugs.	Check, clean, and adjust plugs.
	Weak spark.	Check mag on magneto engines. Check for loose connections or damaged electrical wire.
		Check breaker points for adjustment, pitting, and wear.
		Check coil and condensers.
	Fuel pump.	Check pump with hand primer, if faulty remove and repair with fuel pump kit.
	Carburetor.	Adjust as recommended in engine manual. Remove, clean, check float and float valve if necessary.
LOW COMPRESSION	Dry cylinder.	Remove spark plugs and inject oil in cylinders. See excessive oil consumption. See last 8 causes under Knocking.
ROD FAILURE	Lubrication.	Check oil supply, for quantity, quality and grade.
	Main bearings improperly adjusted.	Check crank shaft for end play, and adjust properly.
	Oil caps on rod bearings installed in reverse. (Does not apply with TF-D.)	Check engine manual for proper installation.
	Faulty oil pump.	Check oil pump, repair or replace.
	Clogged oil line.	Check all oil passages for clogged condition.
BLOWN HEAD	Over heating.	See section on over-heating.
SCORED CYLINDERS	Over heating.	See section on over-heating.
	Lubrication.	Check oil supply for quantity, quality and grade.
DAMAGED PISTONS	Over heating.	See section on over-heating.
	Piston pin fit too tight.	Fit pins properly.
	Piston installed improperly.	See engine manual for proper piston installation.
EXCESSIVE OIL CONSUMPTION	Poor grade oil.	Check grade and viscosity of oil.
	Lubrication.	Check oil pump and passages.
	Worn rings.	Replace rings.
	Sticking rings.	Free rings with penetrating oil. If necessary to remove pistons from cylinders, replace rings.
	Scored cylinder.	Replace, refinish, or rebore cylinder blocks.
	Leaking gaskets.	Check all gaskets, replace if leaking.
	Over heating.	See section on over heating.
	Over loading.	Decrease load.

KNOTTER ADJUSTMENT INFORMATION

APPLICABLE TO KNOTTERS USED ON ALL

NEW HOLLAND BALERS

EXCEPT MODEL 76 BELOW SERIAL NUMBER 241420448



CORRECTING TYING PROBLEMS IN THE FIELD

In attempting to diagnose the tying problem in the field it is advisable to make a careful check of a number of parts on the machine before changing any knotter adjustments.

Knotter problems, particularly when one knotter causes most of the trouble, is generally due to improper distribution of the hay or straw within the cross section of the bale. Before making any edjustments to the knotter check the bales that have been cast. If the bales are not square, or uniformly packed throughout, make necessary adjustments to the Hay Dogs, Wadboard, and Feeder Plunger. These areas are covered more completely in other sections of this book.

1. Clean all chaff and dirt from the knotters and the top of the bale chamber. Disassemble the flat twine disc tension springs and remove any dirt packed under it.
2. Examine the twine and make sure it is uniform in thickness and of good quality. Variation in twine thickness and strength may result in an excessive number of untied bales. Use only genuine certified New Holland Baler twine.
3. Check bale tension. Make sure that the bales are not excessively tight. Attempting to bale too tight may cause the twine to be pulled from the twine disc before the knots are tied. Excessive twine tension at the twine disc will result in untied knots. As the bill hook revolves, the twine disc and holder being too tight, will not yield enough twine to allow the knot to be formed. Do not tighten twine disc tension spring excessively.
4. Make sure that the baler is threaded properly (refer to the operating instructions manual). The twine must pass through all twine guides and under the tension clips on the lid of the twine box and must have a moderately firm tension.
5. Make sure that the spring loaded hay dogs are held in the bale chamber with a firm spring pressure. Replace all broken or weak springs.
6. Check the setting of the needles in relation to the twine disc cleaner of the knotter. (The needles should rub the knotter frame lightly and clear the twine cleaner by no more than 1/8".)
7. Check needle timing (on Model 66 and Super 77 balers). Refer to the operating instructions manual for details on needle timing.
8. Check the setting of the twine fingers carefully. Improper twine finger adjustment is responsible for a large percentage of all tying problems.
9. Eliminate excess clearance between the top of the plunger (66 Baler only) and the bale chamber. Readjust the plunger slides or replace them if necessary to reduce the plunger clearance.
10. Check end play in the knotter shaft assembly. Reduce end play to a minimum by tightening the nut at the top of the knotter shaft on the Model 77 and Super 77. End play is removed from the 66 by removing washers from under the retaining washer at the left end of the knotter shaft.

After making sure that none of the above points are responsible for the tying difficulty, proceed to check knotter adjustments. It is advisable to make a single knotter adjustment at a time and check the performance of the machine for several bales afterward to determine the result of the adjustment made. As a rule any adjusting bolt should be turned only a fraction of a turn at a time.

KNOTTER TEST STAND

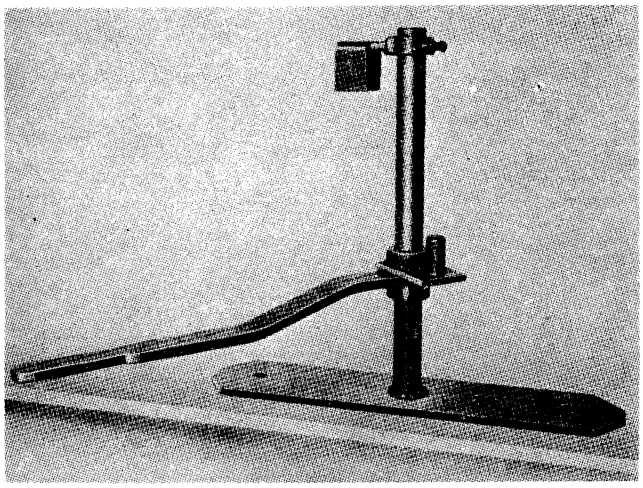


ILLUSTRATION 1

The knotter test stand shown above is useful in diagnosing knotter problems because it permits the knotter to be operated under conditions similar to those that exist in field operation. It is constructed so every part can be seen in operation making it possible to quickly diagnose knotter difficulty and determine what adjustments are needed. Keep in mind however that other factors besides the knotter assembly are involved in tying the knot when the baler is in operation. It is essential that the needles, and twine fingers are properly adjusted, and the bale tension properly adjusted to the crop condition in order for knotter to perform satisfactorily.

The test stand is built rigid enough to make most minor necessary adjustments on the knotter without removing it from the test stand.

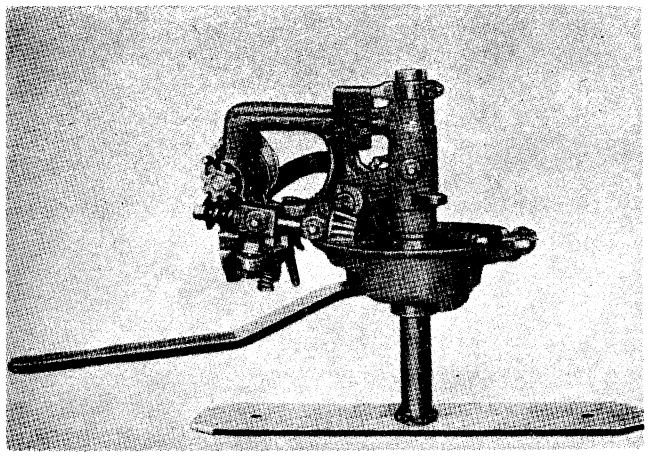


ILLUSTRATION 2

INSTALL THE KNOTTER TEST STAND AS FOLLOWS

1. Fasten to work bench with two "C" clamps, or if desired, bolt to bench with two ½" bolts.
2. Slide collar part of handle over test stand shaft with pin in upright position.
3. Slide the particular cam gear used with the knotter over shaft so that handle pin protrudes through slot in cam gear.
4. Put the H555 knotter on shaft, setting the flat surfaces of the knotter pinions squarely on the flat surface of the knotter cam gear.
5. Slide forked collar over knotter; be sure to take up all space between knotter and collar. Tighten set screws.

HOW TO USE THE TEST STAND

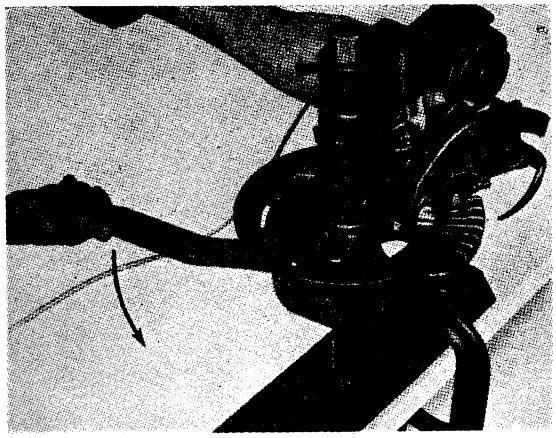


ILLUSTRATION 3

To thread knotter place one end of twine in twine disc from side of twine tension spring adjustment bolt as illustrated.

Turn handle one complete turn.

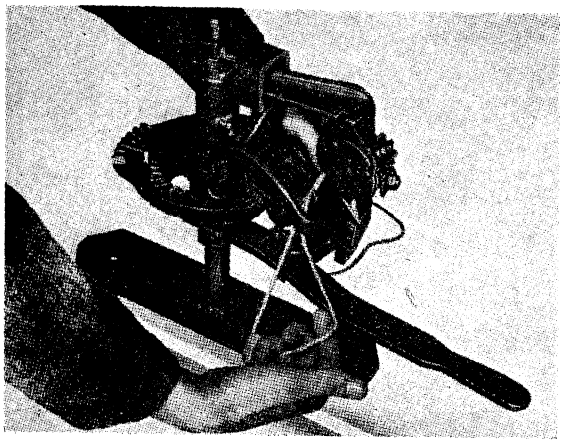


ILLUSTRATION 4

Pull a loop of twine through knotter so both strands are caught in twine disc. The twine must lay around bill hook and through crook in knife arm.

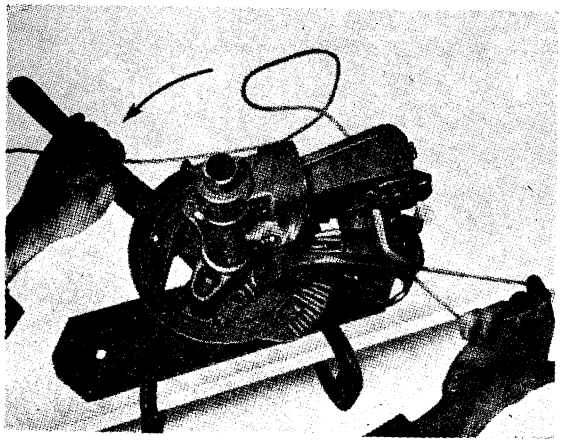


ILLUSTRATION 5

Hold twine firmly and turn handle in same direction as cam gear turns on baler.

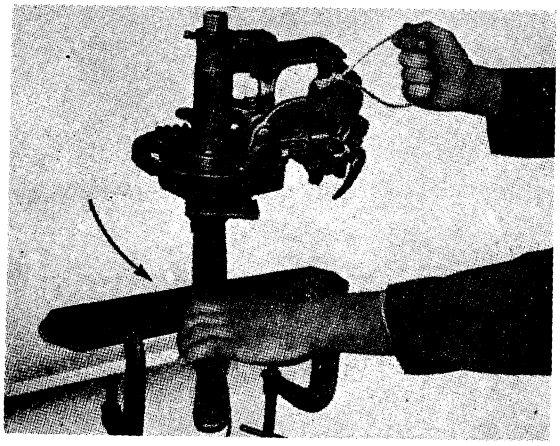


ILLUSTRATION 6

The knot as it will appear when knotter is properly adjusted.

TWINE DISC AND TAPERED LOCK KNOTTER WORM

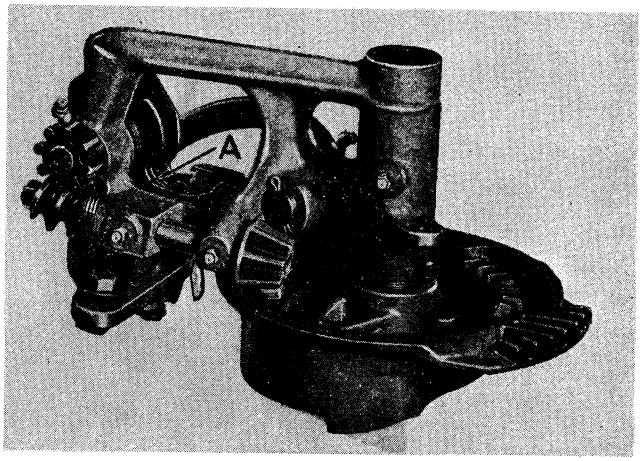


ILLUSTRATION 7

The twine disc adjustment is determined by the positioning of the notch in the disc to the twine holder at point (A) Illustration 7. The bottom of the notch should be flush with the top of the twine holder **(when the disc contains twine).** If the twine disc is advanced too far the twine from the needle will not be caught in the twine disc.

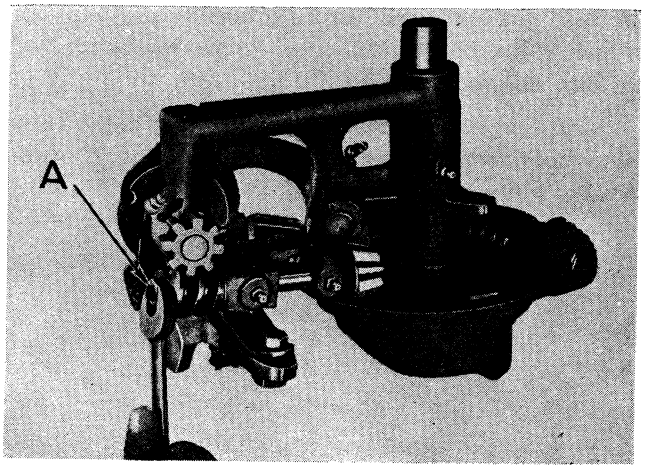


ILLUSTRATION 8

In order to adjust the disc to this position loosen nut (A) several turns as shown in Illustration 8. Tap the nut end of the shaft. Then turn the disc to the setting of the notch as shown in Illustration 7. Tap the pinion end of the shaft to move it back to its original position. Turn the worm gear so it will fit against the spacer washers then turn the lock nut tight.

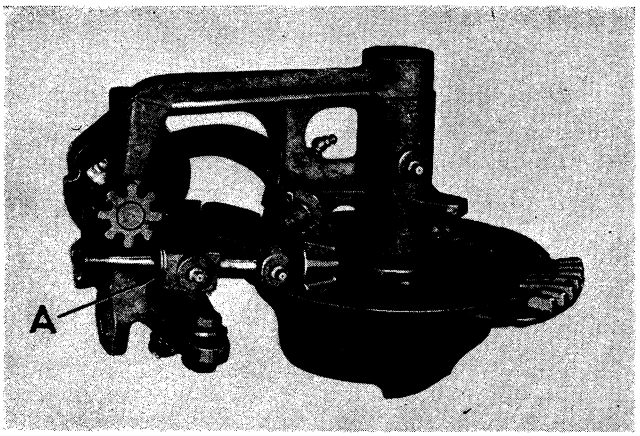


ILLUSTRATION 9

CAUTION: Be sure the spacer washers at point (A) do not catch on the taper of the Shaft as noted in Illustration 9.

TWINE HOLDER AND BILL HOOK ADJUSTMENTS

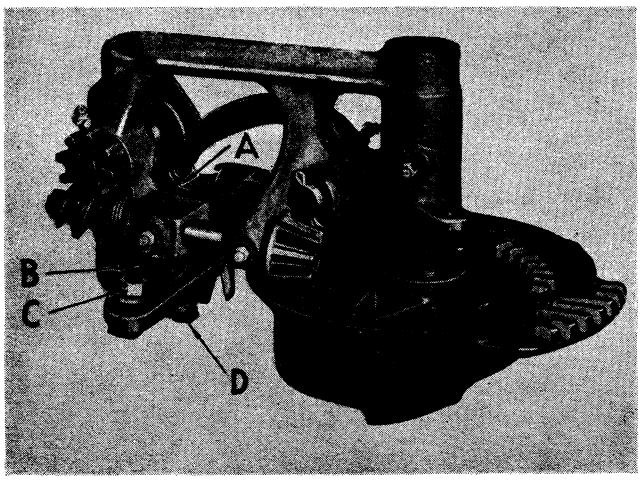


ILLUSTRATION 10

TWINE HOLDER

The twine holder (A) Illustration 10 is a double plate which holds the twine in the twine disc. The holder is retained in position by a flat spring (B) with adjustable tension screw (C). The twine holder tension spring exerts pressure against the twine holder, which in turn holds the twine in the disc under pressure.

The tension spring must be adjusted according to the weight bales that are produced. When the weight of the bale is increased, it may be necessary to increase tension on the twine holder spring at (C). The reverse adjustment should be made when the weight is lightened.

It will often be found that moving from one field to another, the tension on the twine holder must be changed due to the moisture contents in different types of hay.

BILL HOOK

Proper adjustment of the bill hook is very important because it is here that knots are formed.

If for any reason the bill hook tongue is bent there is a possibility the bill hook may not catch both strands of twine. The back of the tongue should be straight, not curved. Rough edges and fins on any parts of the bill hook will cause the knots to cling to the bill hook. All these rough edges should be removed with a file, then thoroughly smoothed with emery cloth.

Knots may hang on the bill hook due to excessive tension on the bill hook cam. Some of the tension should be relieved, by loosening the bill hook adjusting screw (D) slightly.

Knots may also hang on the bill hook if the knife arm has insufficient lift. When adjusted properly, the stripper flange of the knife arm will clear the end of the bill hook by not less than ⅜" and not more than ½".

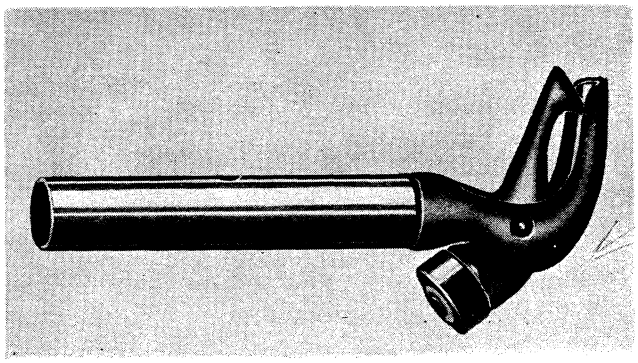


ILLUSTRATION 11

If the knot opens after it has been tied or is very loose and can be pulled open, it is possible that the bill hook does not close tight enough to hold the ends of the twine securely between the bill hook tongue and the bill hook jaw until knife arm stripper flange strips the loop over the ends of the twine.

This condition may exist in bill hooks similar to the bill hook in Illustration 11. This is caused by the sharp end of the bill hook tongue shown in Illustration 12. To correct this, file the sharp end slightly until the tongue is rounded as shown in Illustration 13.

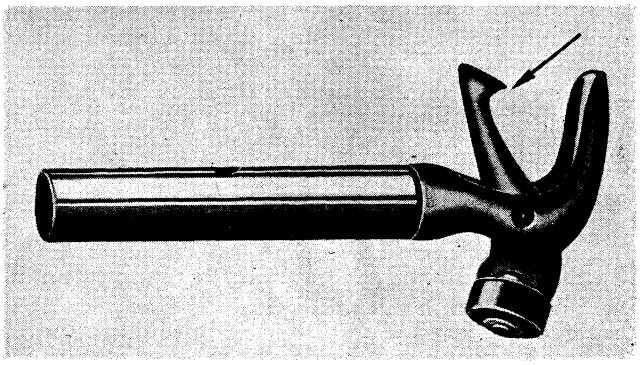


ILLUSTRATION 12

KNIFE ARM ADJUSTMENTS

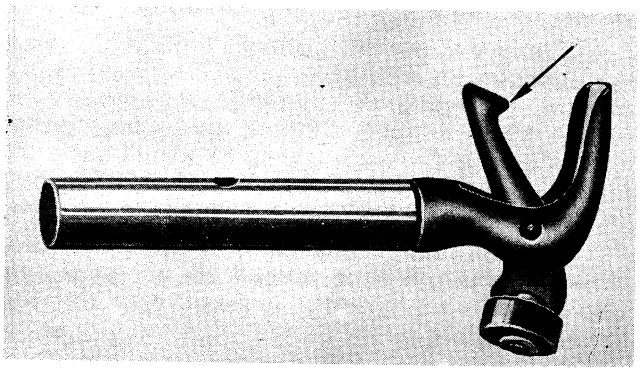


ILLUSTRATION 13

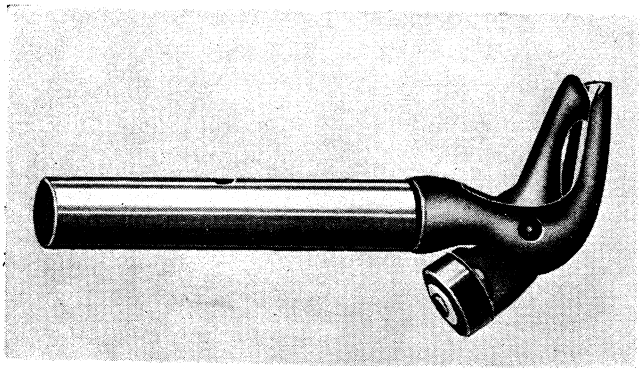


ILLUSTRATION 14

Illustration 14 shows a closed bill hook with proper amount of space between the bill hook jaw and bill hook tongue. The ends of the twine will be held securely in the bill hook and the loop will be drawn tight over the ends of the twine forming a good knot.

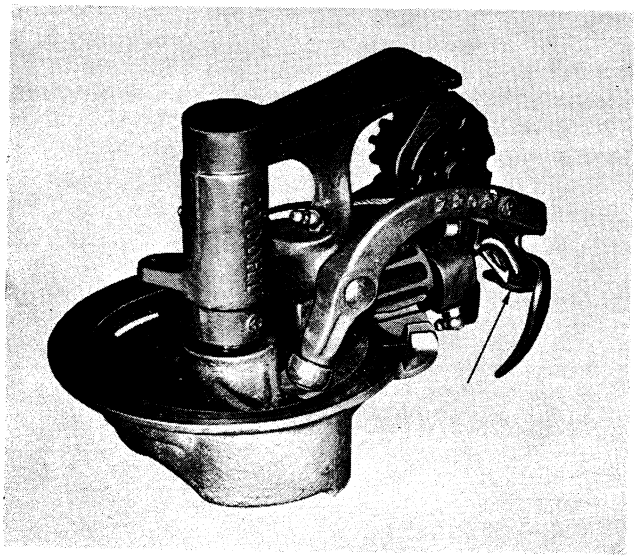


ILLUSTRATION 15

When the Knife Arm is adjusted too high the Knotter Bill Hook (Part Number 00040) will rub against the Stripper Flange of the Knife Arm as shown in Illustration 15. The Bill Hook should revolve without

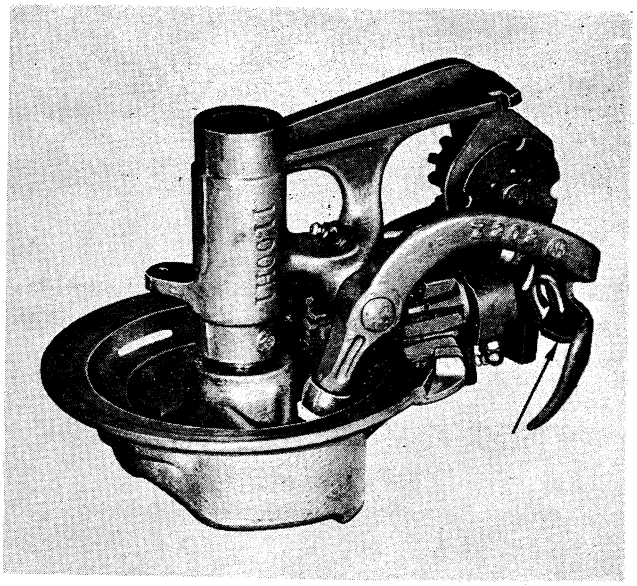


ILLUSTRATION 16

contacting any surface of the Knife Arm Assembly, as shown in Illustration 16. NOTE: Raise Knife Arm as indicated by arrow in Illustration 16 when checking this adjustment.

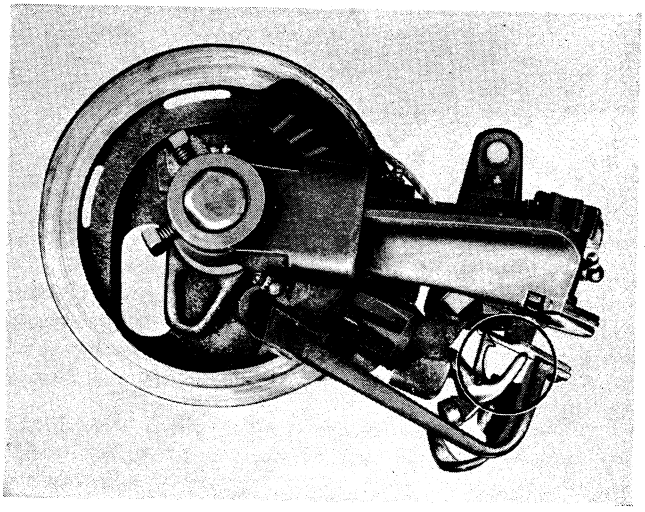


ILLUSTRATION 17

This Knife Arm is adjusted too close to the Bill Hook, causing the Bill Hook to strike the Knife Blade riveted to the Knife Arm Assembly.

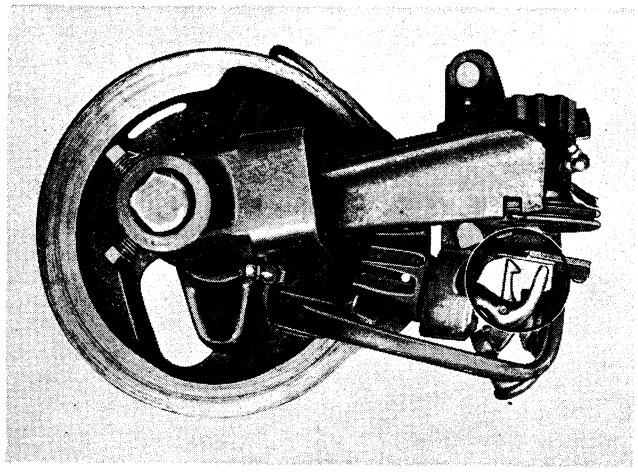


ILLUSTRATION 18

This Bill Hook turns freely without striking the Knife Blade.

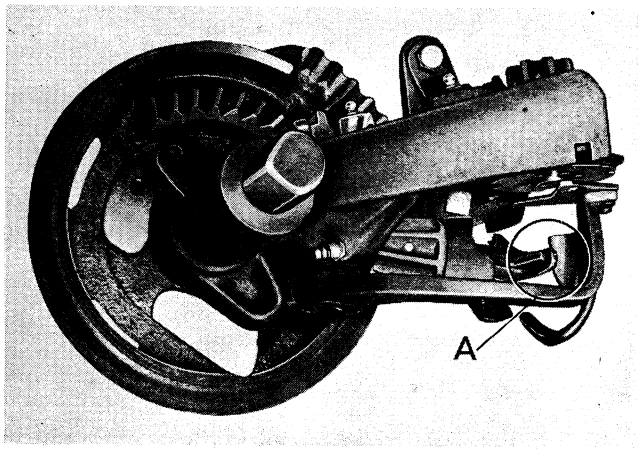


ILLUSTRATION 19

The concave shaped Knife Arm Stripper Flange should rub against the heel of the Bill Hook when the Knife Arm raises—Illustration 19. When set in this position, this Flange will lift the knot loop off the Bill Hook, the Bill Hook jaw will hold the two ends and form a good knot. When this concave shaped Stripper Flange does not rub against the Bill Hook heel it will pass by the twine, as shown in Illustration 20 and, as a result, the twine will not be removed from the Bill Hook.

The only method of adjusting Knife Arms is by bending. This can be done because the Knife Arm is a malleable casting. The best method of bending is by placing the Knife Arm in a wide jawed vise, where shop facilities are available. A slight degree of bending can be made by using a hammer or pry bar.

To determine when Knife Arm Adjustment is necessary, trip the knotter and turn the Flywheel manually

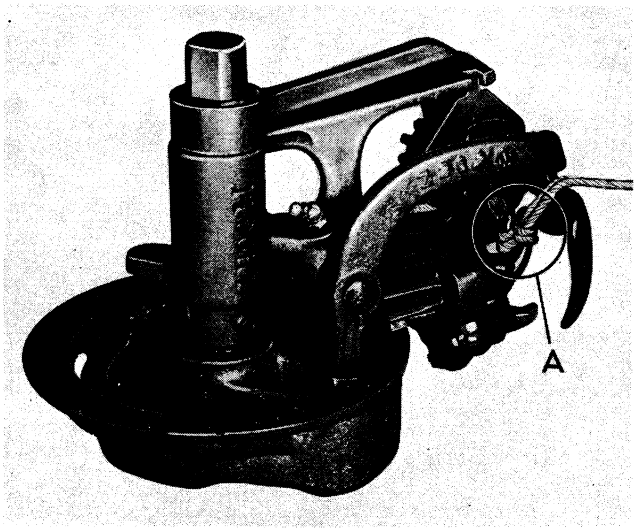
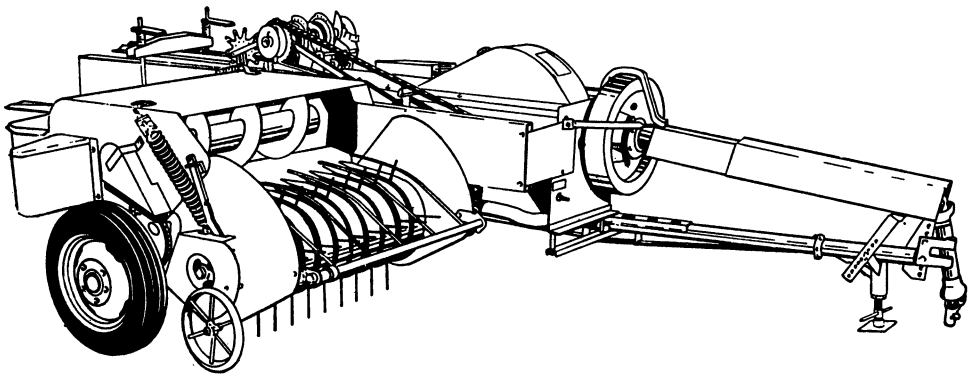


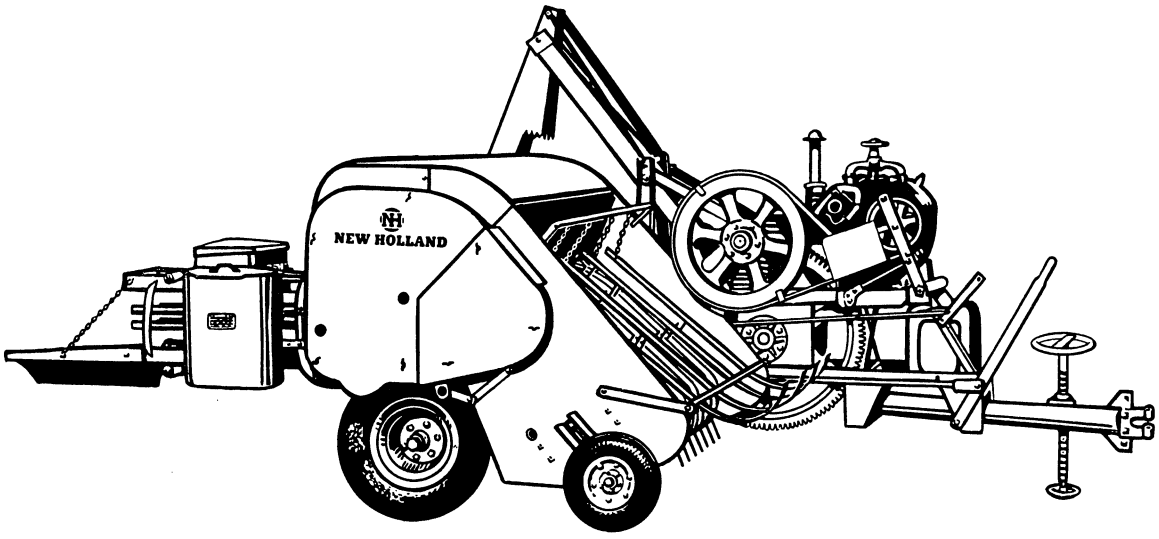
ILLUSTRATION 20

and run the Knotter one complete cycle. By watching the Knife Arm operation, see if any of the above mentioned Knife Arm misadjustments can be noted. If they are noticed, or if there is any reasonable doubt, remove the Knotter Mounting Bolt (⅜" x 1¼"), and swing the Knotter Assembly out from its regular position. By doing this, a closer inspection can be made of Knife Arm setting. If it appears that Knife Arm adjustment is necessary, and if the amount of adjustment is slight, it may be possible to make such adjustment with a hammer or pry bar without removing any parts of the Knotter.

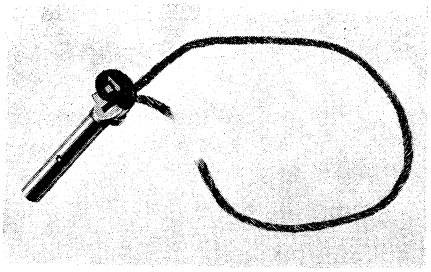
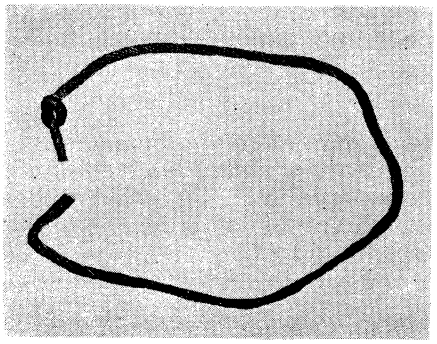
When considerable adjustment is necessary it is advisable to remove the Knife Arm Assembly and make such adjustment by using a vise as mentioned previously. The Knife Arm Assembly can most easily be removed by first removing the Bill Hook Adjusting Cam and the Bill Hook.



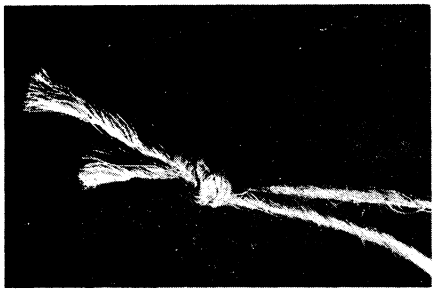
KNOTTER PROBLEMS
Common To
Models 66 - 77 – Super 77 Balers



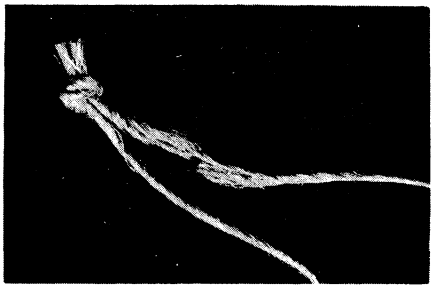
TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSE	CORRECTION
KNOTS HANGING ON BILL HOOK.  FIGURE 1	Too much tension on bill hook cam.	Loosen bill hook cam adjusting screw.
	Rough bill hook.	Smooth off all rough edges with mill file and emery cloth.
	Bill hook cam binding on bill hook adjusting screw.	Smooth all rough edges of hole in bill hook cam.
	Knife arm stripper flange doesn't contact back of bill hook.	Bend knife arm so stripper flange touches bill hook lightly.
	Knife arm does not have sufficient throw.	Increase throw of knife arm. The knife arm stripper flange should move past the end of the bill hook not less than ⅜" or more than ½". Increase throw by bending the casting.
		DO NOT HEAT CASTING as this will destroy its malleability.
	Dull twine knife.	Sharpen knife with a fine mill file.
	Twine fingers out of adjustment.	Adjust twine fingers.
KNOT TIED ONLY ON ONE END OF TWINE.  FIGURE 2	Twine fingers too low in relation to needle.	Adjust twine fingers.
	Too much clearance between end of twine finger and needle.	Adjust needle to knotter, then if necessary on 77 and Super 77 add spacer washer between twine finger bearing and attaching point so as to reduce clearance. The 66 twine fingers are mounted on slotted holes to allow the fingers to be moved toward the needles.
	Twine disc may be too late.	Set twine disc. See twine disc adjustment.
	Bill hook tongue fails to open wide enough.	Knotter bill hook roller has worn a groove in kotter frame. Replace frame or rebuild groove with weld.
	Bent bill hook tongue.	Straighten tongue, or replace bill hook.
	Worn needle eye, needle yoke drag rod and knotter arm.	Shorten needle yoke drag link as much as possible, allowing clearance between the needle yoke and bale chamber when the yoke has moved its maximum distance toward bale chamber. If this doesn't correct the problem, replace worn parts.

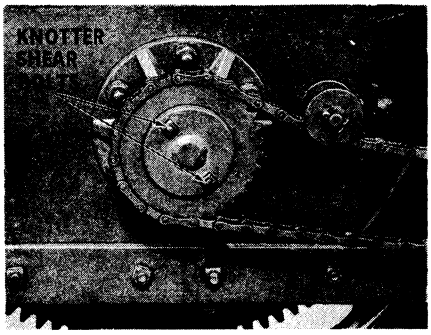
TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSE	CORRECTION
	66 BALER ONLY	
	Too much clearance between the top of plunger and bale chamber due to worn plunger bearings and slides.	Replace worn bearings on balers below serial No. 25658 on balers above serial No. 25658 adjust plunger bearings.
	Plunger dogs not holding hay. Worn hay stops.	Keep chaff and dirt from between dog and bale chamber. Replace worn hay stops.
	Weak dog springs.	Replace springs. Special attention should be given to the lower right dog spring.
TWINE CUT OR BROKEN, BUT NO EVIDENCE OF A KNOT IS PRESENT.	Tension spring on twine holder does not allow enough twine to slip through holder to form knot.	Loosen twine holder tension adjusting screw. Clean dust and chaff from under flat twine holder spring.
	Rough edges on twine holder or disc. Detected by one miss in every four bales.	Remove sharp edges if possible with emery cloth. Replace parts.
 FIGURE 3	Twine tension spring too loose allowing twine to slip out of disc when bill hook revolves.	Tighten twine holder tension spring.
	Reverse side of bill hook tongue slot has sharp edges.	Under cut with small grinding wheel.
	Knife arm has excessive throw.	Knife arm should move not less than ⅜" past the end of bill hook, or more than ½". This adjustment is of special importance when changing knotter cam gears.
ONE END OF TWINE LONGER THAN OTHER, OR LOOP IN ONE TWINE END.	Dull twine knife.	Sharpen knife with a fine cut mill file, be careful to maintain original bevel on knife edge, DO NOT SHARPEN GUIDE EDGE ON KNIFE.
 FIGURE 4	Insufficient tension on twine holder.	Tighten twine holder tension spring.
	Twine holder tension springs too loose.	Tighten twine holder tension adjusting screw.
	Insufficient throw on knife arm.	Increase throw on knife arm.
	Bale weight too light.	Increase bale tension.

TROUBLE SHOOTING

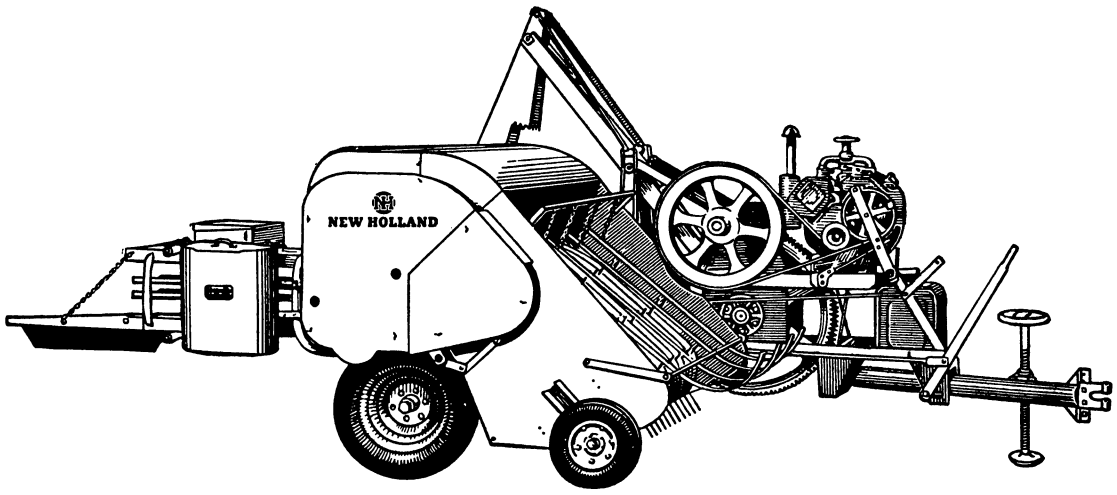
PROBLEM	POSSIBLE CAUSE	CORRECTION
TWINE FRAYED OR BROKEN APPROXIMATELY ½" BACK OF KNOT.  FIGURE 5	Insufficient clearance between back of bill hook and inside face of knife arm. See figure 15 on knotter adjustments.	Bend knife arm so bill hook revolves freely. However, when the knife arm raises, the stripper flange must touch the bill hook.
TWINE FRAYED OR BROKEN APPROXIMATELY 3" BACK OF KNOT.  FIGURE 6	Rough fins on knife arm. **77 AND SUPER 77 ONLY** Twine finger pinches twine against bale chamber or knife arm.	Remove rough surfaces with emery cloth. Bend twine finger away from bale chamber, allowing 3/16" clearance between the twine finger and knife arm.
TWINE FRAYED OR BROKEN APPROXIMATELY 6-8" BACK OF KNOT.  FIGURE 7	Rough surface on needle and twine slots in bale chamber.	Remove sharp edges on these parts with a mill file and emery cloth. Bend twine finger away from bale chamber allowing 3/16" clearance between the twine finger and knife arm.
BROKEN KNOTTERS, CAM GEARS, AND PINIONS.	Too much end play in knotter stack. **66 & 68 BALER ONLY**	Ascertain that the 11582 cone point set screw in the 11531 knotter clutch disc is tight. Then tighten the castellated nut on top of the knotter shaft until the flat surface of the knotter pinion gears seat against the knotter cam gears. Remove spacer washers at the extreme end of knotter shaft.

TROUBLE SHOOTING

TWINE DISC DOES NOT STAY IN TIME.	Twine disc pinion Part No. 11111 driv-lok pin sheared.	Replace pin.
	Spline shaft in twine disc turns in hub.	Replace twine disc assembly.
	Adjustable knotter worm slips on shaft.	Lock nut not tight enough or spacer washers wedged between recess on taper shaft and gear.
SHEARING KNOTTER DRIVE BOLTS.	Dirty knotter.	Clean knotters.
 FIGURE 8 (77 & S77)	Top knotter support bearing 40064 freezing on shaft.	Loosen bearing and lubricate.
	Too much end play in knotter assembly.	Re-assemble complete knotter assembly. For proper sequence and spacing refer to assembling and operating instruction book.
	Broken needles.	Eliminate cause of breakage. See assembling and operating instruction book.

GENERAL PROBLEMS

77 BALER ONLY



TROUBLE SHOOTING

PROBLEM	CAUSE	CORRECTION
MIS-SHAPED BALES. BALES LONG ON TOP, SHORT ON BOTTOM.	Short wadboard stroke.	Lower wadboard by turning hexagon adjusting nuts to left.
BALES SHORT ON TOP, LONG ON BOTTOM.	Long wadboard stroke.	Raise wadboard by turning nuts to right.
VARIANCE IN BALE LENGTH.	Over center assembly not working freely.	Remove grease and oil and free any binding parts on the over-center assembly.
	Plunger latch not in correct adjustment.	Adjust plunger latch.
	Push rod not set correctly.	Adjust to ⅛" clearance between 1 and 2; 1/16"—⅛" between 2 and 3. (See Figure 1.)
	Push rod pawl worn.	Replace with 12605 or file pawl square on edge next to push rod.
	Push rod slipping over push rod pawl.	Raise push rod pawl to the level of the intermediate trip rod guide.
		Bend the push rod tip down so that it will engage the push rod pawl.
	Arms of 11540 push rod collapsed or worn.	Replace 11540.
LONG BUNCHES OF HAY ON TOP AND ENDS OF BALES.	Dull slicing knives. Too much clearance between knives. Worn plunger wear plates.	Sharpen or replace knives. Adjust slicing knives. Replace 00859 wear plates.
WADBOARD FORMS A HOLE IN MATERIAL AND DOES NOT DELIVER MATERIAL INTO BALE CHAMBER WITH EACH STROKE.	Materials being baled are exceptionally dry and slippery.	Bend the jagged edge on end of wadboard so that one tooth is out and the next one is in giving increased pushing area.
		Add a 00589 wadboard face.
		Place space washers over 2 lower bolts between the steel wadboard and the 00589 wooden wadboard extension so that the maximum distance at the edge of the teeth on the wooden face is 3 inches from the steel teeth.

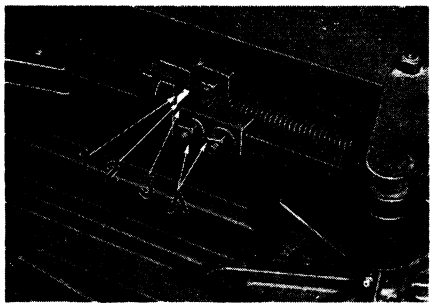


FIGURE 1

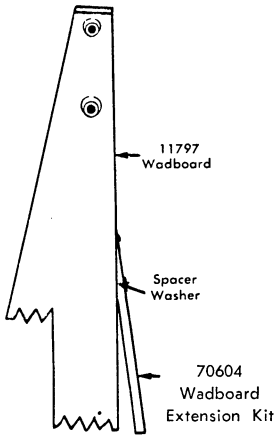
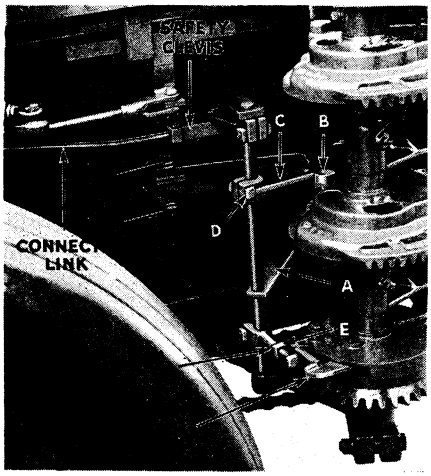


FIGURE 2

TROUBLE SHOOTING

PROBLEM	CAUSE	CORRECTION
PLUNGER RUBBING SIDE OF BALE CHAMBER AND HEATING.	Plunger wear plates worn. Baling material which is too green.	Replace wear plates.
	Material between plunger and side of bale chamber	Remove material, ascertain that plunger 27184 and 27185 shields are installed.
PLUNGER MISSING MORE THAN ONE STROKE.	Improper adjustments of plunger latch.	Adjust 3/16"—¼" clearance between plunger latch and plunger when plunger is at extreme end of compression stroke under load.
 FIGURE 3	Binding action of plunger latch.	Remove plunger latch, clean off any paint or foreign material. Occasionally it may be necessary to use a file or emery cloth. IMPORTANT: DO NOT GREASE THIS ASSEMBLY.
	Insufficient stroke on push rod.	Adjust to clearance shown in Fig. 1.
	Collapsed or worn 11540.	Replace 11540.
	Over-center spring too weak.	Replace over-center spring.
	Slipping of the safety clevis on the connecting link.	Determine that the 11869 ball bearing is well seated in the depression in the 11559 knotter connecting link.
	Worn knotter clutch.	Replace clutch.
	Binding knotter clutch pawl in knotter clutch disc.	Replace necessary parts.
	Weak 00018 clutch pawl spring.	Bend the 12567 knotter trip lever control safety spring to secure more compression. Add an additional knotter trip lever control safety spring (12567).
		Polish knotter clutch stop (01002) on the trip shaft and the 11530 knotter clutch pawl.
		Lessen tension on the needle yoke spring (13981) by placing a ⅜" flat washer between the needle yoke spring and the knotter support (bottom). This lessens tension between knotter clutch pawl and knotter stop.
BALES TOO TIGHT WITH THE TENSION SCREWS OPEN.	Baling green or wet material.	Remove material from bale chamber and inspect closely.
	Some foreign object lodged in bale chamber corners.	

NEEDLE BREAKAGE

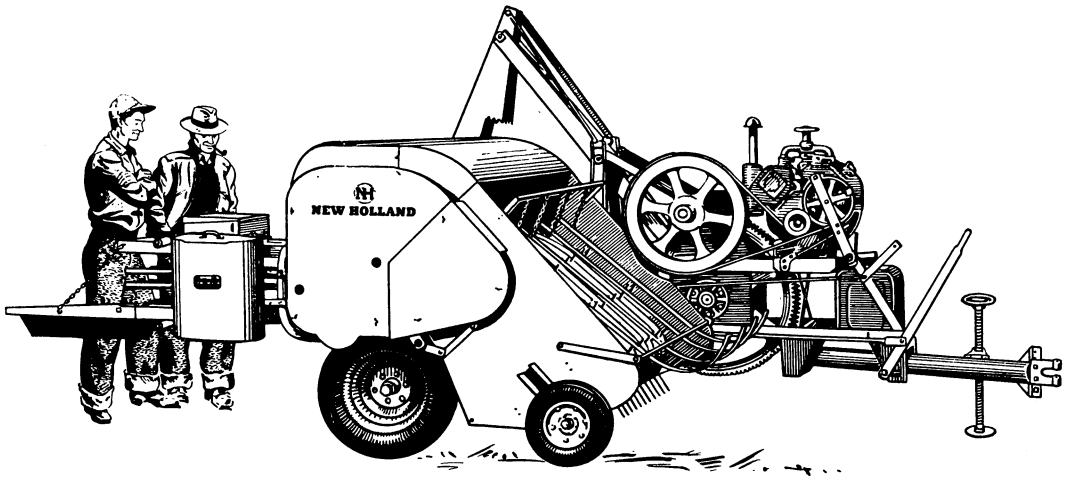
77 BALER ONLY

If only one needle breaks:

1. Inspect the slots in the plunger where the needle comes through the frame. One or both slots may be plugged with stones or other foreign material.
2. The needle may have slipped out of adjustment and struck against some part of the Baler frame or knotter.

When both needles break:

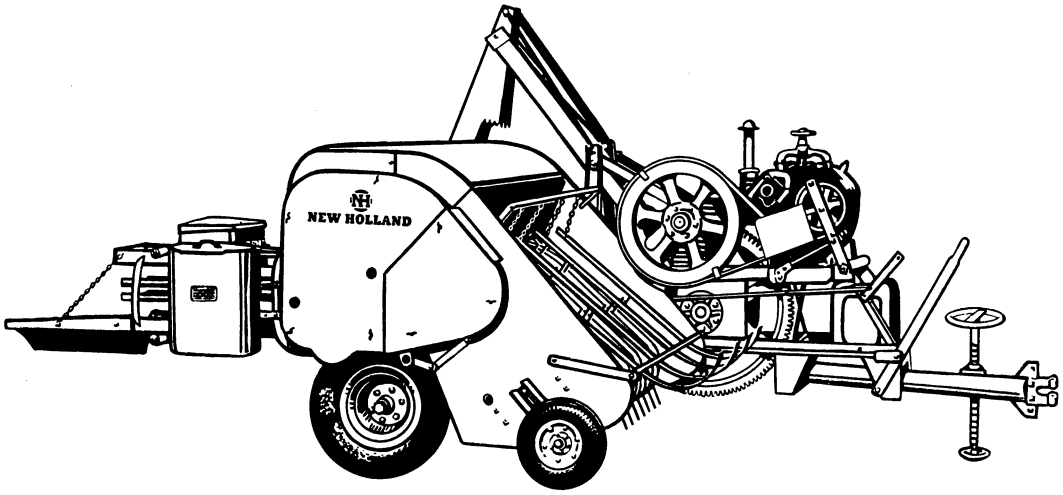
1. Does safety clevis work freely on connecting link?
2. Are clevises in position, or have they slipped on the trip shaft?
3. Does knotter stop set squarely in front of clutch pawl?
4. Remove the knotter clutch gear in the clutch disc, and if indication of wear in either gear or clutch is present, replace.
5. Bale chamber spread, due to broken weld on chamber brace. This brace is found between chamber walls immediately beneath the front feeder angle. Loosen the feeder mounting bolts and pull chamber walls back into position, re-weld brace into position. Then re-adjust over-center assembly and knotter trip shaft.
6. Plunger welds may be broken. Inspect plunger top plate, re-weld if necessary.



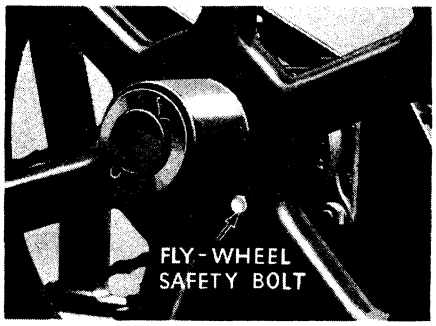
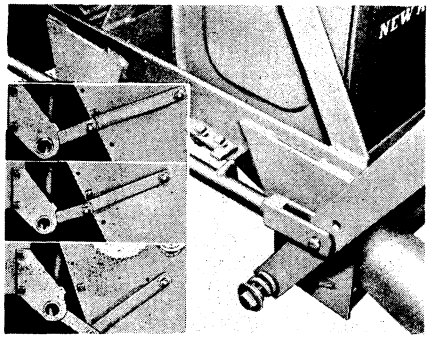
PROBLEMS

COMMON TO

77 AND SUPER 77 BALERS



TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSE	CORRECTION
SHEARING FLY WHEEL SAFETY BOLTS.	Baling too heavy.	Loosen bale tension.
 FIGURE 1	Safety bolt nut loose.	Tighten safety bolt nut securely. Use jam nut if necessary.
	Dull knives.	Sharpen knives.
	Excessive clearance between knives.	Adjust knives.
	Flywheel safety bolt sleeve worn. Worn sleeve in overload safety hub.	Replace with 12117 and 12119 sleeves.
	77 BALER ONLY	
	Over-center mechanism requires adjustment.	Adjust as required (using Assembly and Operating Manual as guide.
AUGER AND/OR FEED ROLL WRAPPING.	Material too green.	Bale only sufficiently cured material until baler is completely broken in.
	Material not traveling along inside edge of pick-up.	Drive the tractor so that the windrow travels up the inside of the pick-up assembly (side toward bale chamber).
	Rough edges on auger.	Polish rough edges on auger. Cut off right end of auger flight to a well rounded and/or tapered radius.
AUGER VIBRATION OR AUGER STRIKING FEED ROLL.	Broken welds.	Check for broken weld on support angles on feeder end plate (right).
PICK-UP RAISES AND REMAINS UP.	Improper adjustment of the pick-up lever stop.	Adjust pick-up lever stop toward tractor as required.
 FIGURE 2		