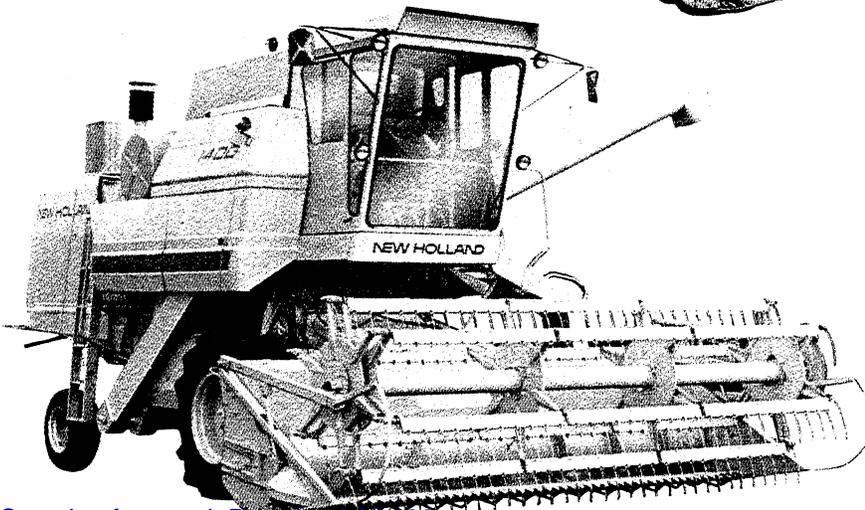
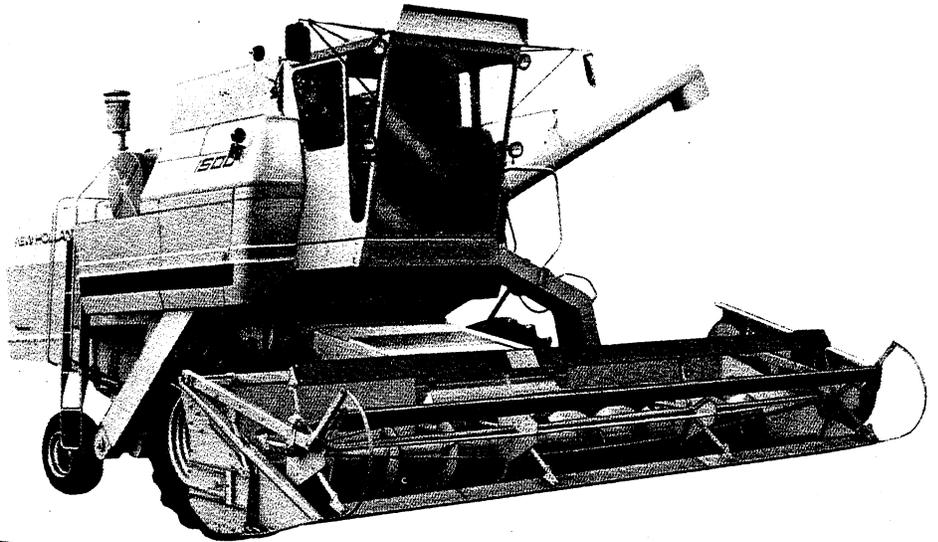


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# SERVICE MANUAL COMBINES 1400-1500

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## INTRODUCTION

Knowing that time is of the utmost importance during the harvest season, we have prepared this manual so you can obtain quick, detailed information on servicing the Models 1400 and 1500 Combines. This book is the prime source of information for overhauling and repairing machines in all the major areas.

### ARRANGEMENT OF MANUAL

This manual is arranged in 18 Sections which cover the entire machine except for special equipment, such as headers and optional equipment.

Each section begins with a table of contents where needed, a short introduction and specifications.

All tools mentioned in the manual, such as spanners, punches, hammers, etc., usually are in a normal service tool kit. **Special** tools have a part number and are listed in Section 17.

Whenever the terms "left and right" are used it should be understood to mean from a position facing in the direction of combine travel.

## ABOUT IMPROVEMENTS

Sperry New Holland is continually striving to improve its products, and, therefore, reserves the right to make improvements or changes, when it becomes practical and possible to do so, without incurring any obligations to make changes, or additions to the equipment sold previously.

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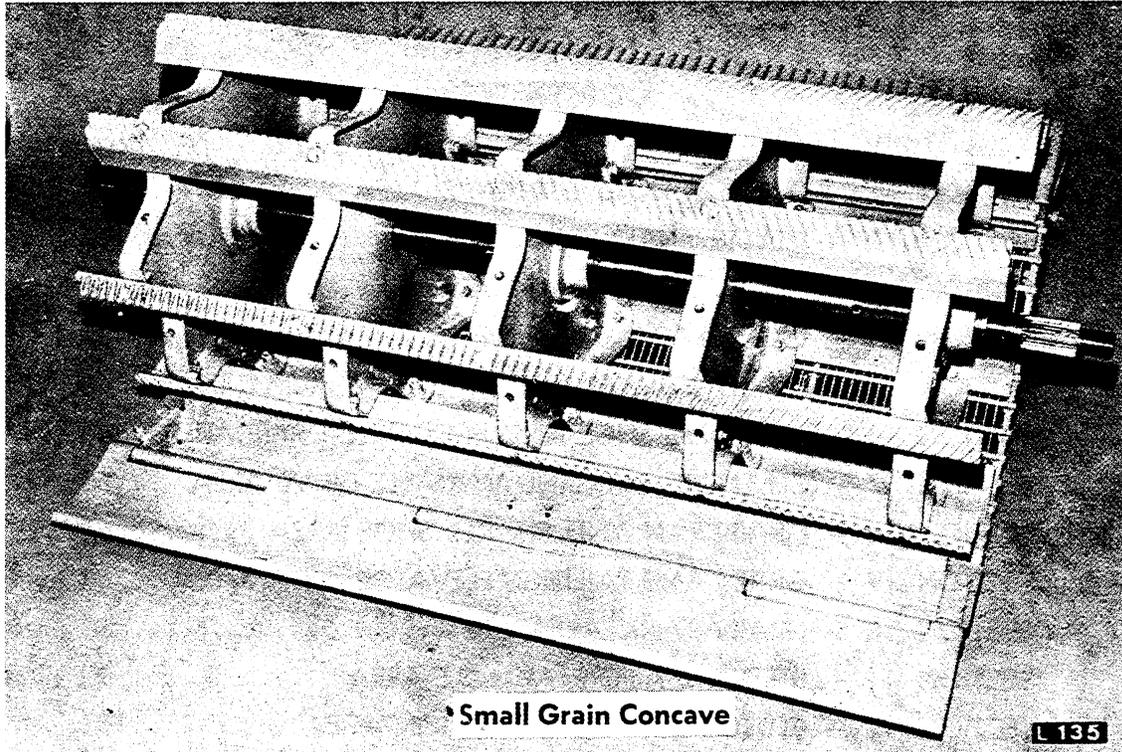
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**BE CAREFUL! THIS SYMBOL IS USED THROUGHOUT THIS BOOK WHENEVER YOUR OWN PERSONAL SAFETY IS INVOLVED. TAKE TIME TO BE CAREFUL!**

# SECTION 1

## CYLINDER AND CONCAVE AREA



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### INTRODUCTION

The cylinder and concave are located just behind the straw elevator, and are protected by a stone trap against stones and other foreign objects. The clearance between the concave and the cylinder is adjustable, by means of a control lever located on the driver's platform. Further

fine clearance adjustment can be obtained using the adjustment rods of the concave suspension. The cylinder is driven by a variator from the main shaft. The cylinder speed is adjustable by using a control lever located on the

driver's platform. The cylinder is equipped with eight rasp bars, alternately four left- and four right-ribbed bars. The concave has fourteen bars. Awning plates can be installed for the threshing of crops needing more aggressive threshing, particularly barley, or other difficult-

to-thresh crops. A finger grate, fitted at the rear of the concave, insures a regular flow of straw coming from the cylinder to the straw walkers. To meet different conditions in a cold or warm climate, two types of concaves have been designed, universal or small grain .

## SPECIFICATIONS

	1500	1400
Cylinder: Type:	rasp bars	rasp bars
Number of bars:	8	8
Diameter:	600 mm (23 <sup>5</sup> / <sub>8</sub> "")	600 mm (23 <sup>5</sup> / <sub>8</sub> "")
Width:	1255 mm (49 <sup>3</sup> / <sub>8</sub> "")	1000 mm (39 <sup>3</sup> / <sub>8</sub> "")
Drive:	infinitely variable V-belt drive	infinitely variable V-belt drive
Speed range:	approx. 450-1200 r.p.m.	approx. 450-1200 r.p.m.
Concave: Type:	bar and wire grate	bar and wire grate
Number of bars:	14	14
Stone trap:	standard	standard
Awning plates:	standard	standard
Cylinder to concave clearance:	from 1 mm (3/64") to 35 mm (1 <sup>3</sup> / <sub>8</sub> "")	from 1 mm (3/64") to 35 mm (1 <sup>3</sup> / <sub>8</sub> "")
Tightening torques: rasp bar bolts: nut	10.3 kgm (75 lb.-ft.)	
lock nut	8.2 kgm (60 lb.-ft.)	
Cylinder and concave spike tooth: nut	9.5 kgm (69 lb.-ft.)	
lock nut	12 kgm (87 lb.-ft.)	
Additional and special equipment:	universal concave cylinder-cover plates finger grate cover plate cylinder speed indicator spike tooth cylinder and concave	

## REMOVAL AND INSTALLATION OF THE STONE TRAP AND CONCAVE

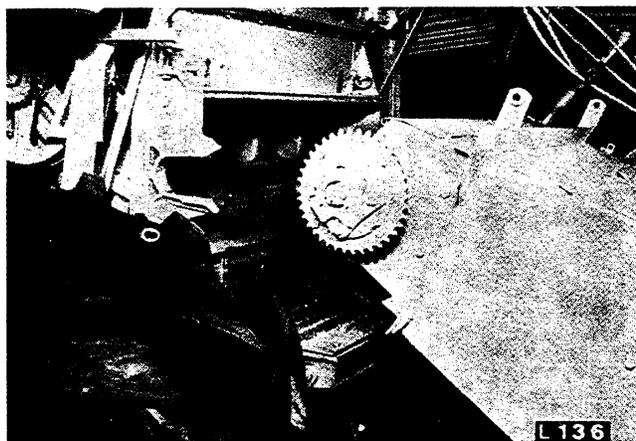


FIGURE 1

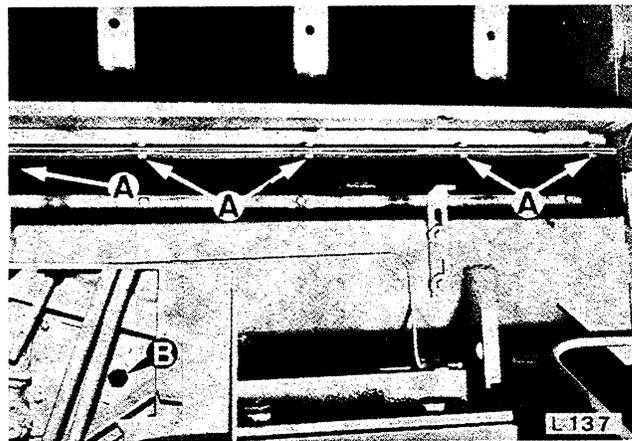


FIGURE 2

Detach the header and straw elevator from the combine, see Figure 1.

Remove bolts A and B, Figure 2, on both sides of the combine and remove the stone trap.

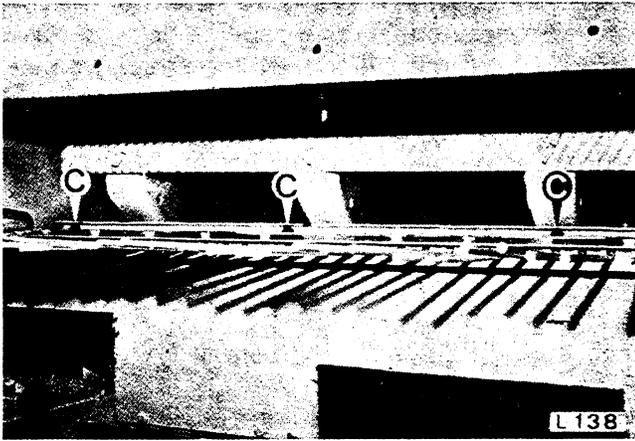


FIGURE 3

Remove bolts C, shown in Figure 3.  
 Remove nuts D, Figure 4, on both sides of the machine. Push the bolts to the inside until the concave levers are clear.

Remove concave, see Figure 5. To re-install the concave, reverse the removal procedure. The stone trap height is adjustable. Adjustment must be made each time after horizontal alignment of the header has been performed.

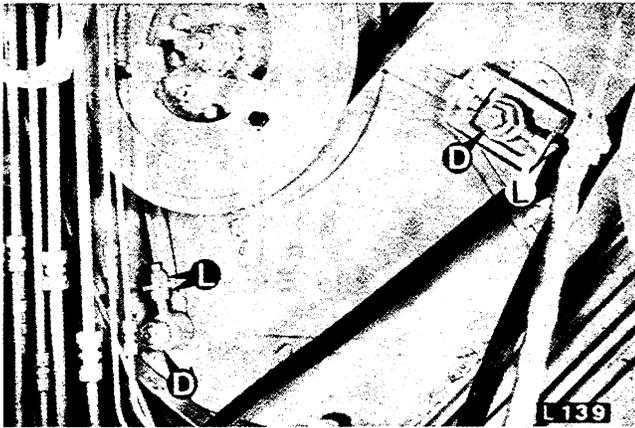


FIGURE 4

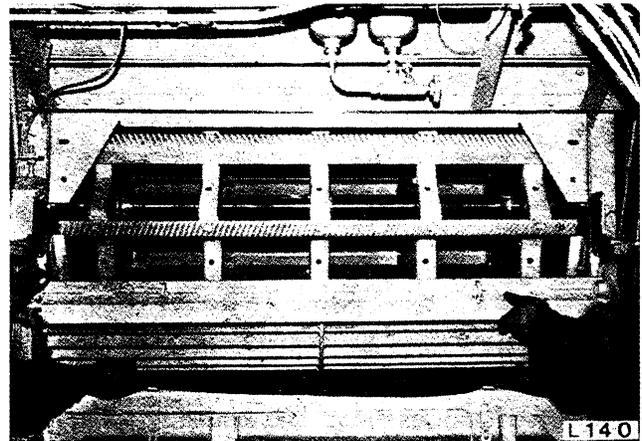


FIGURE 5

## DISASSEMBLY AND ASSEMBLY OF THE CONCAVE CONTROL LEVER

Remove lever knob D, Figure 6, remove bolts E and F, Figure 6 from lever and then remove lever links G and H.

Remove bolts I, Figure 7 and remove lever J, Figure 6 from the operator's platform. To re-assemble, reverse the disassembly sequence.

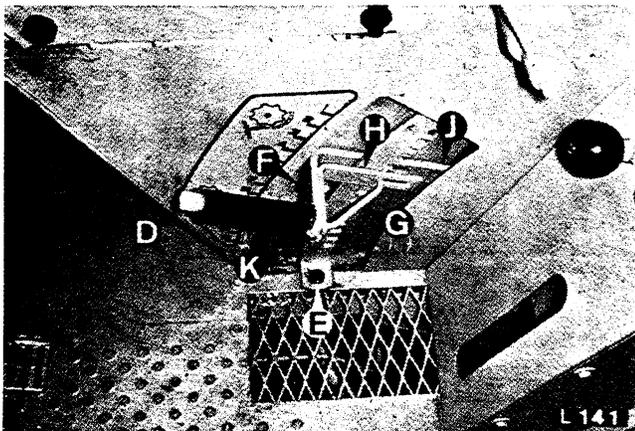


FIGURE 6

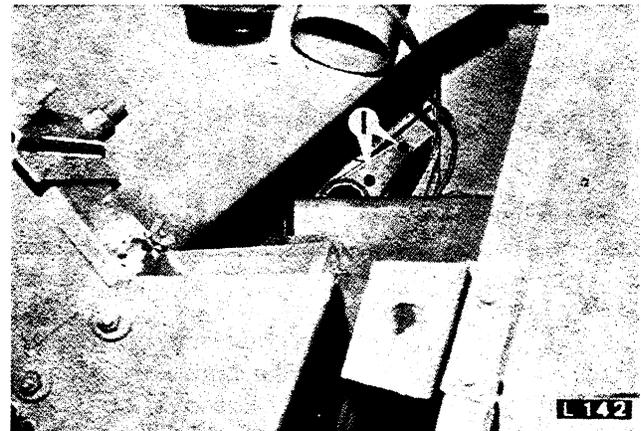


FIGURE 7

## ADJUSTMENT OF THE CONCAVE

Place the adjustment control lever K, Figure 6, in the second position; at this stage the distance between the cylinder and the first concave bar should be 10mm ( $13/32''$ ), see Figure 8. The distance between the cylinder and the tenth concave bar should also be 10mm ( $13/32''$ ).

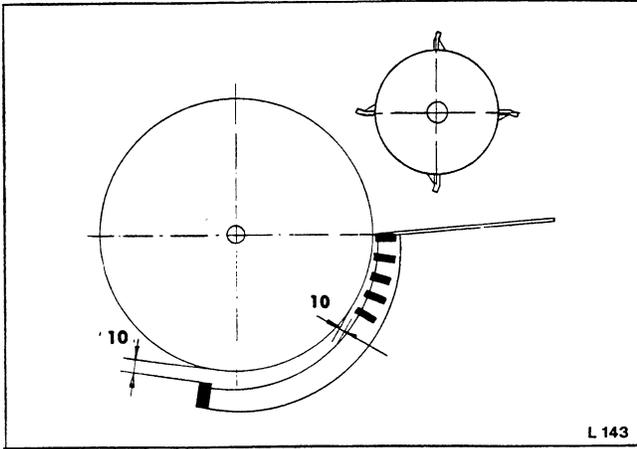


FIGURE 8

Adjust nuts L, Figure 4 to obtain this clearance. Be sure that the concave is always parallel from left to right with respect to the cylinder.

**NOTE:** If a front-to-rear wedge is desired for tough threshing conditions, adjust the concave as follows:

Place the control lever, located on the operator's platform, in Notch #1 (top). Adjust the clearance between the rasp bars and the second concave rub bar to 8 mm ( $5/16''$ ).

Adjust the clearance between the rasp and the ninth concave rub bar to 1.5 mm ( $1/16''$ ).

Additional minor adjustment may be necessary in specific crop conditions. Lock the concave, with the bolts D, Figure 4, when threshing corn, sorghum, beans, sunflowers, or when operating with a windrow pick-up attachment.

## REMOVAL AND INSTALLATION OF THE CYLINDER

Remove the header and straw elevator from the combine.

Remove angles A, Figure 9 and the support plates B, from both sides.

Remove belt D, shown in Figure 10 and support E. Remove bolts F and pulley G, Figure 10. Also remove tachometer cable from cylinder shaft.

Disconnect rod G, Figure 11, spring H and remove snap ring I. Then remove lever J, from the cylinder shaft bearing housing.

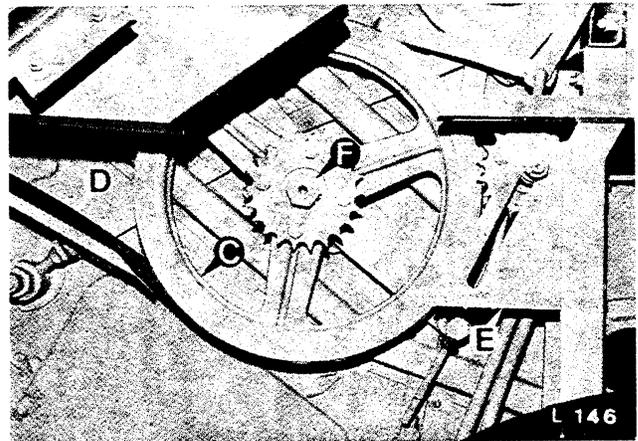


FIGURE 10

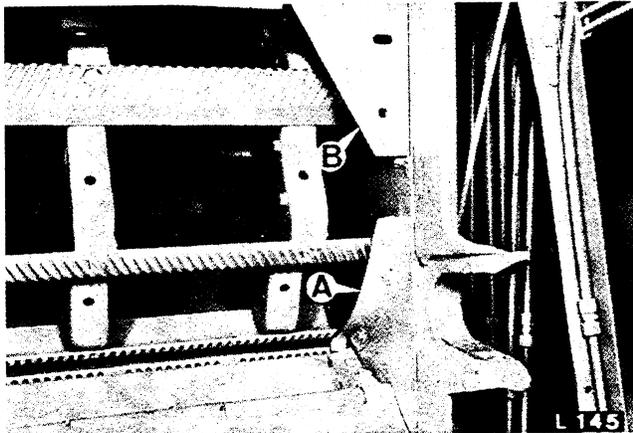


FIGURE 9

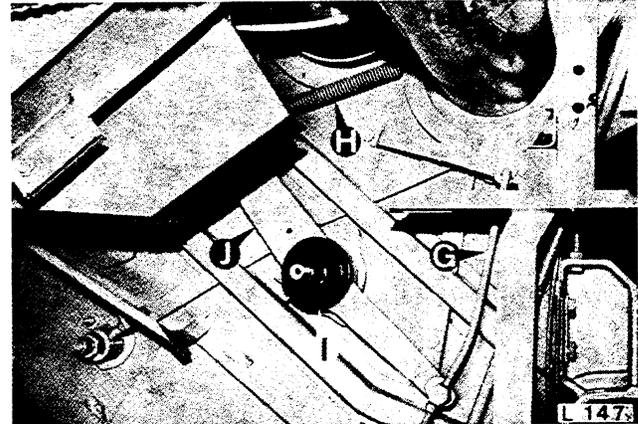


FIGURE 11

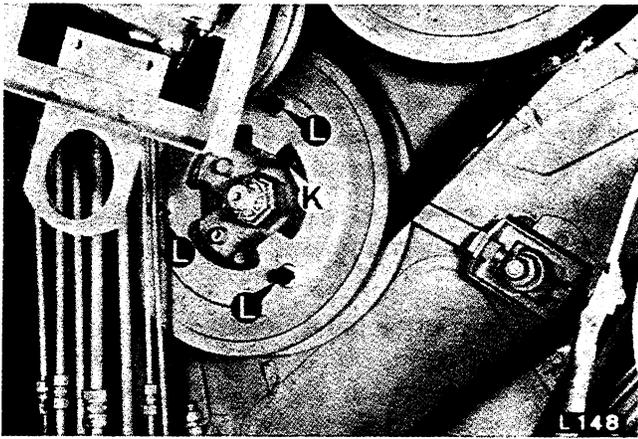


FIGURE 12

Remove bolt K, Figure 12, then loosen the three bolts at point L, Figure 12.

Unscrew sheave half M, see Figure 13, using tool N, Figure 13.

**NOTE:** Tool N is standard with each combine.

**NOTE:** The sheave half is provided with left-hand thread; this means that, to loosen the sheave half, the sheave must be turned to the right.

Remove cotter pin O, shown in Figure 14 and remove nut P.

Remove sheave half Q, Figure 15. It may be necessary to use special pullers #327402 and #321246 to remove sheave half.

Remove bolts R shown in Figure 16. Bearing housing S, then can be removed from cylinder shaft.

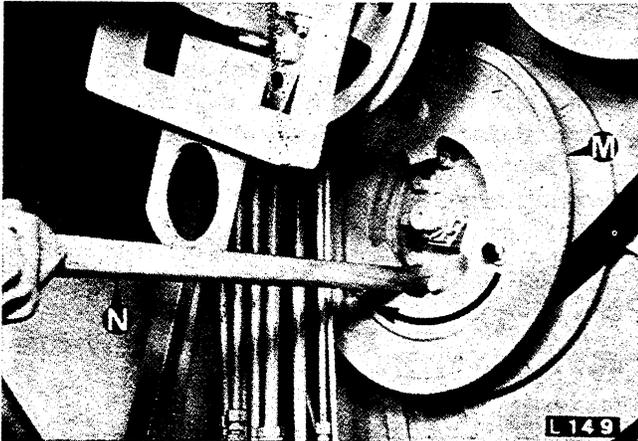


FIGURE 13

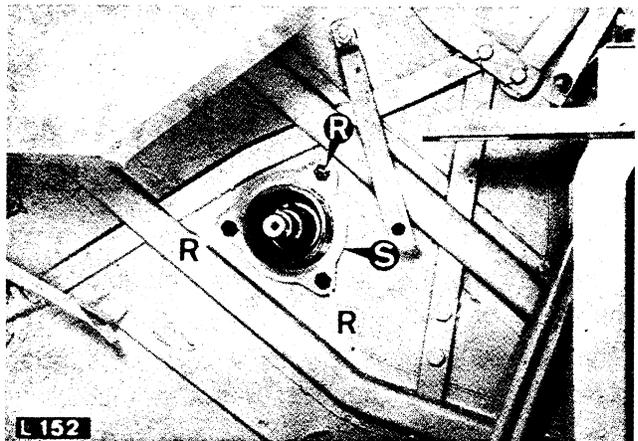


FIGURE 16

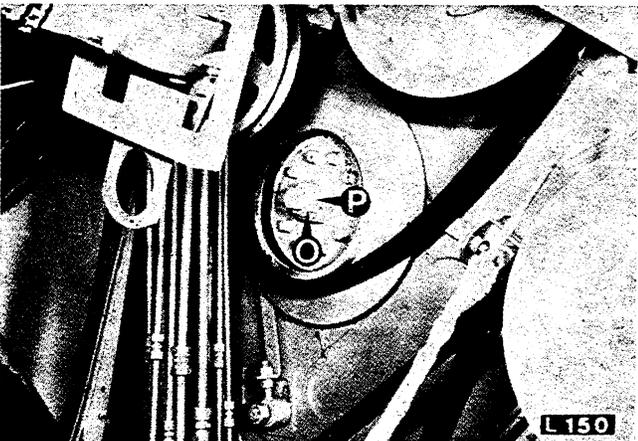


FIGURE 14

Remove snap ring point T, Figure 17. Screw a bolt in the shaft to protect the threads when using puller to remove bearing.

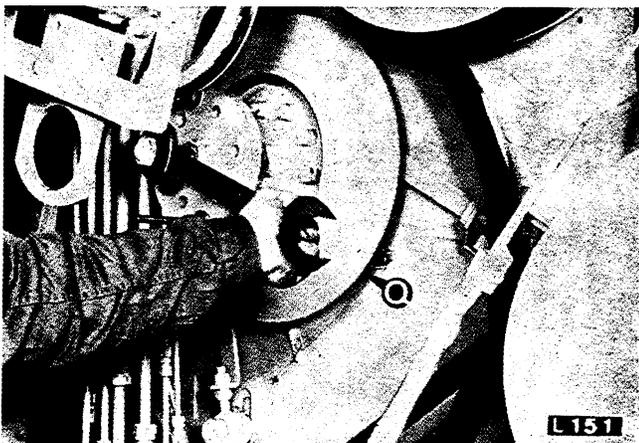


FIGURE 15

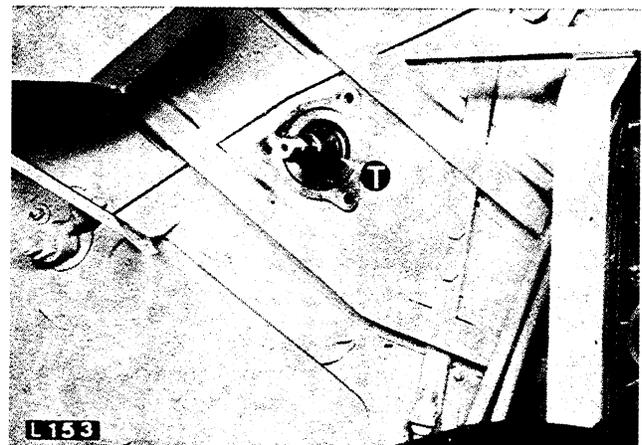


FIGURE 17

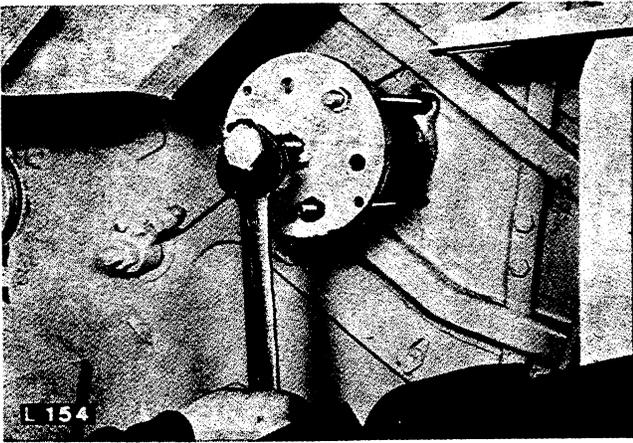


FIGURE 18

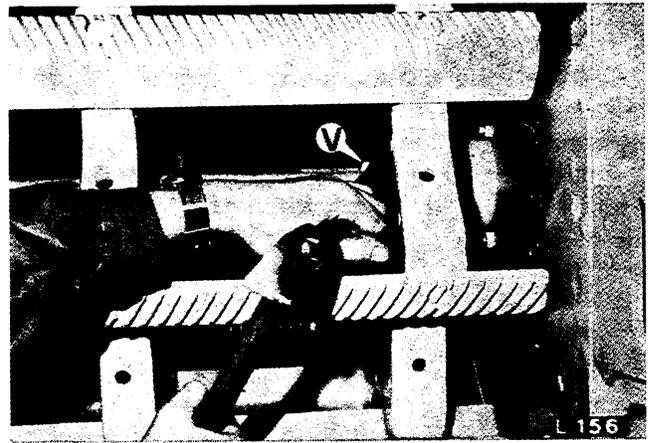


FIGURE 20

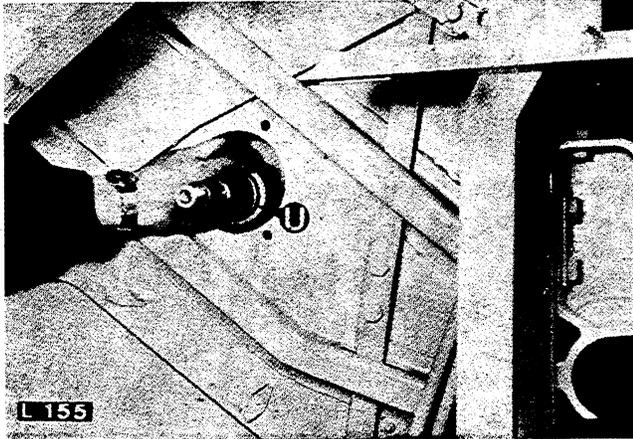


FIGURE 19

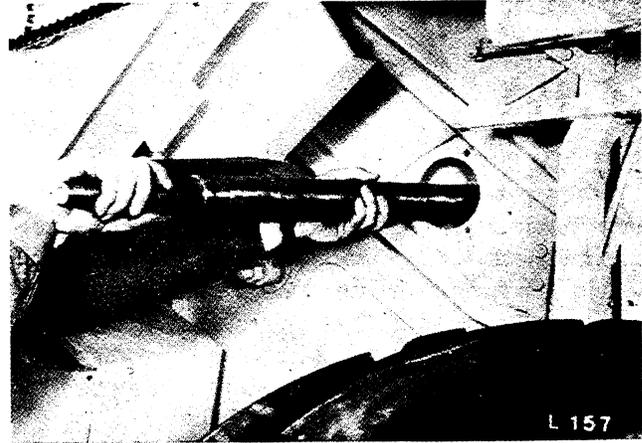


FIGURE 21

Pull the bearing and bearing housing from the shaft using the special tools #327402 and #356388, as shown in Figure 18.

Remove collar U, Figure 19.

Remove the gib keys point V, Figure 20 from the left and right cylinder disc using special tools #301335 and #301336.

Block up the cylinder by placing a wooden block between cylinder and concave. Cylinder shaft then can be removed and shown in Figure 21.

The cylinder assembly now can be removed as shown in Figure 22. **BE CAREFUL — CYLINDER ASSEMBLY IS HEAVY.**

Remove bearing from bearing housing as shown in Figure 23. Be sure when a new bearing is installed that the groove in the thrust ring, W, Figure 23, is facing bearing.

**IMPORTANT:** When re-installing the cylinder, note the direction of rotation. Install the cylinder in the middle of the combine.

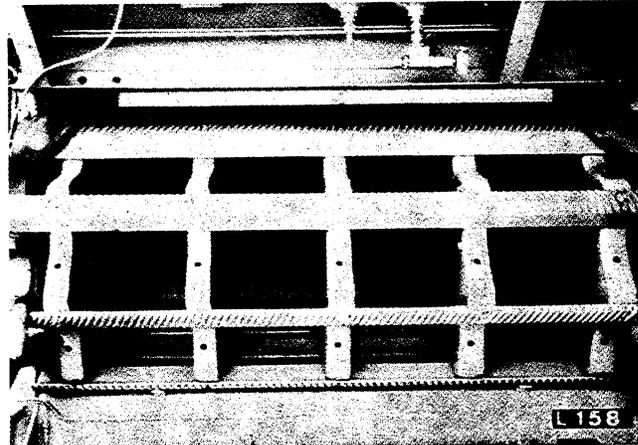


FIGURE 22

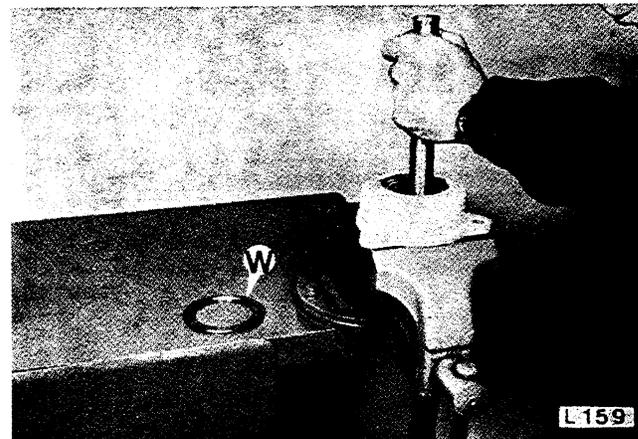


FIGURE 23

Re-install the collars, point U, Figure 19. Install bearings as shown in Figure 24. Install gib keys and secure them. Install sheave half, point Q, Figure 15, 30 mm (1 $\frac{3}{8}$ "") from the frame, and hold in place with shims. Re-install the remaining parts in reverse order of the removal sequence.

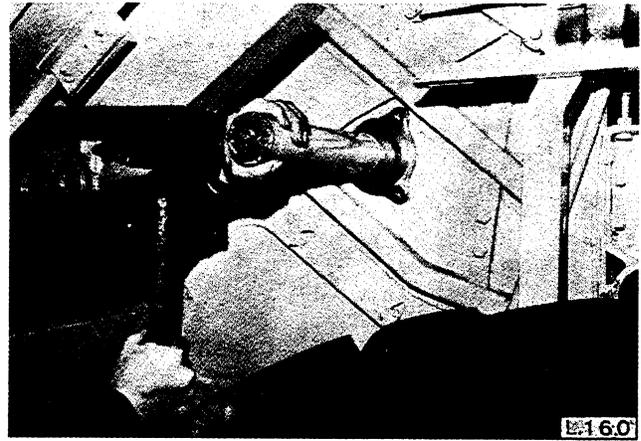


FIGURE 24

## REPLACEMENT OF CYLINDER RASP BARS

When replacing rasp bars, it is important that they be installed in matched pairs. Two new rasp bars are secured together and are balanced within 25 grams, to be sure that the cylinder is always in balance. The shims shown at Point A, Figure 25, are installed between the rasp bar and the cylinder disc, as required in order to keep run-out to approximately 0.030".

To install a new set of rasp bars, first locate the cylinder disc aligning marks as shown at Point Y, Figure 26, and install the first rasp bar at this point.

Torque the bottom nut to 75 foot-pounds and then hit the head of the cap screw with a hammer to seat it. Then re-torque and install the jam nut to 60 foot-pounds. **IMPORTANT:** THE BOTTOM NUT SHOULD BE KEPT FROM TURNING WHILE THE TOP NUT IS BEING TORQUED.

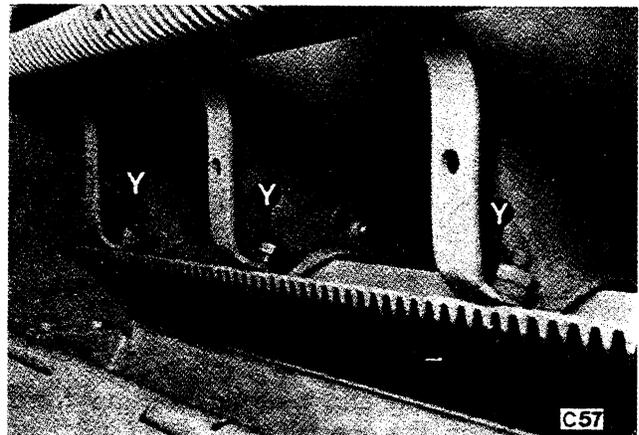


FIGURE 26

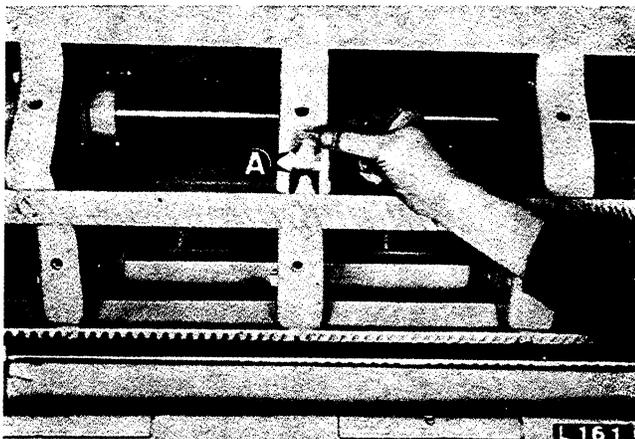


FIGURE 25

Rotate the cylinder half way around, and install the matching rasp bar on that side, torquing

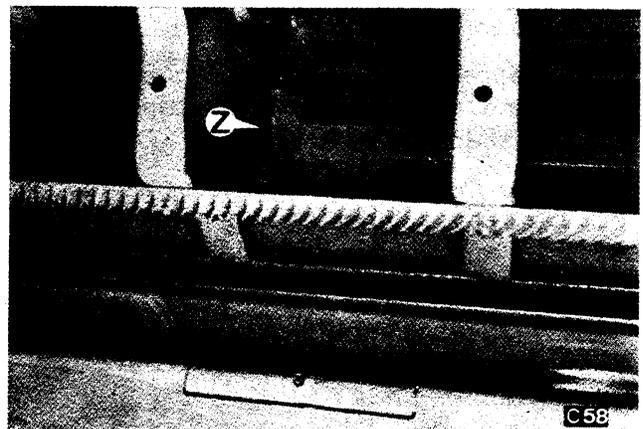


FIGURE 27

the bolts as described above. Continue this procedure until all rasp bars have been installed. After replacement of the rasp bars, the cylinder should be statically balanced. To do so, remove the variator sheaves, as detailed in Section 4.

The cylinder discs are provided with holes which enable the installation of balance weights required as shown at Point Z, Figure 27.

## ADJUSTMENT OF THE CYLINDER DRIVE BELT

Replacement of the cylinder drive belt is explained in Section 4.

Adjust the cylinder drive belt tension as follows: Loosen the three bolts as shown at Point B, Figure 28. The cap screw shown at Point C, Figure 28, must be on the right hand side of one of the three lugs, as shown in Figure 28. This will allow the outer sheave half to turn in the left-hand direction to tighten the belt. Leaving bolt C in will prevent over-tightening of the belt. Start the engine and engage the thresher clutch. The sudden rotating movement will tighten the drive belt. This is done by the outer sheave half turning on the left-hand threads of the inner sheave half. This procedure

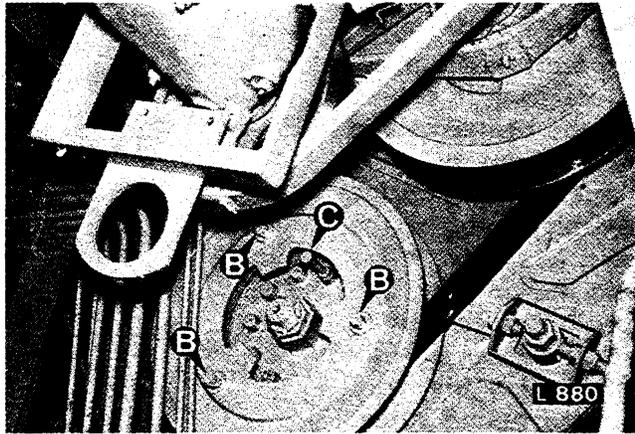


FIGURE 28

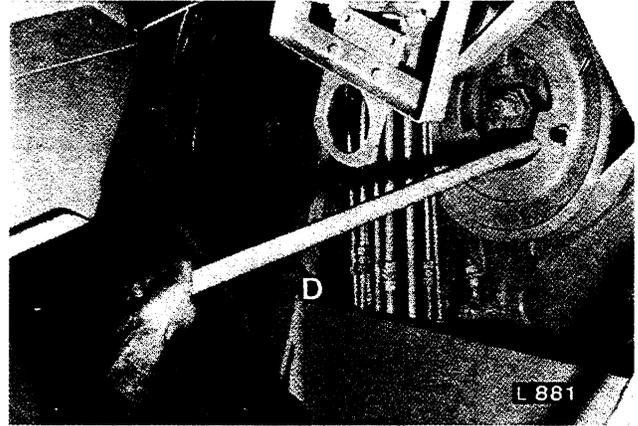


FIGURE 29

can be repeated each time until the correct belt tension is obtained, simply move bolt C to the opposite hole, provided in the inner sheave half.

The cylinder belt tension is correct when the belt can be deflected 5 millimeters or  $\frac{3}{16}$ " with a 32-pound pull, applied midway between the drive and driven sheaves.

If necessary, the belt also can be tightened using the special tool provided with each combine, Point D, Figure 29.

After the correct belt tension is obtained, re-tighten the three bolts at Point B, Figure 23, and secure the lock nut. Also, tighten the lock bolt C, Figure 28.

## REPLACEMENT OF THE CONCAVE RAKE

Remove bolt at Point P, Figure 30, from both sides of the combine. Also, remove bolts shown at Point C, Figure 3. The rake can be removed from the combine. Installation of the rake assembly is in reverse sequence of the disassembly procedure.

Adjustment location for specific crop conditions can be found in the Operator's Manual.

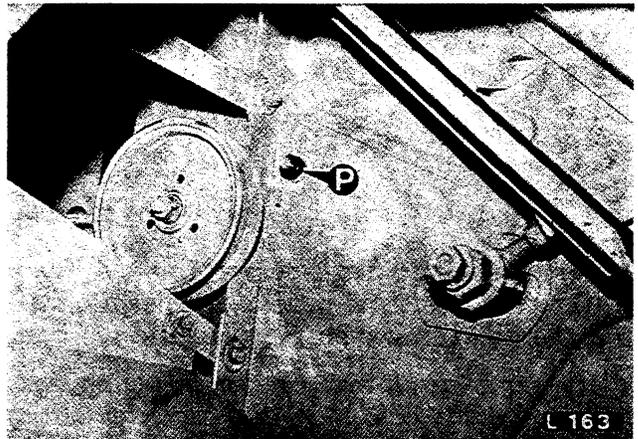


FIGURE 30

## SECTION 2

### BEATER AREA

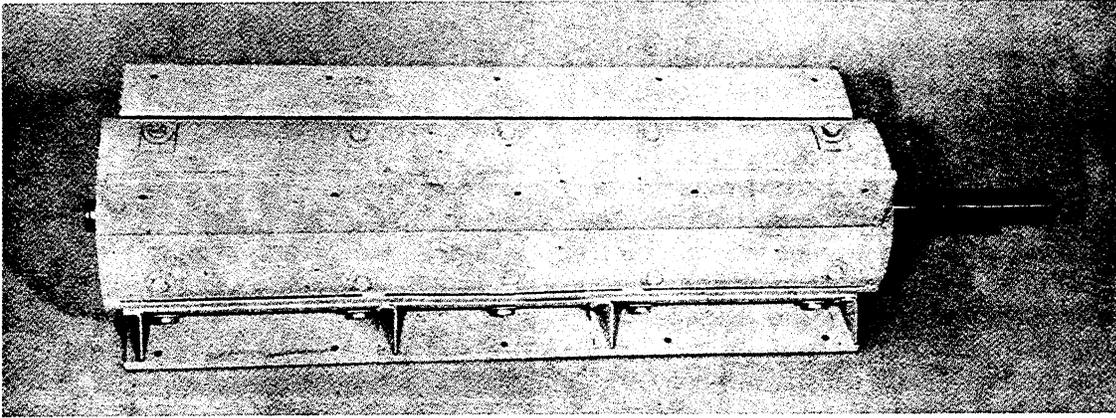


FIGURE 31

### INTRODUCTION

A drum-type beater provided with four adjustable stripper plates is located just behind the cylinder. The purpose of the beater behind the cylinder is to take the straw from the cylinder and guide it over the concave rake on the straw walkers. The stripper plates throw the straw onto the straw walkers, and prevent the straw from wrapping around the cylinder. Another four additional stripper plates can be installed on the beater or, the beater can be provided with four spike bars which are very efficient for crops with long and humid straw. The inspection hole in the grain tank gives easy access to the beater.

### SPECIFICATIONS

**Type:** drum-type provided with four adjustable stripper plates.

**Drive:** with a V-belt from the main shaft via a variable drive which also drives the cylinder.

**Speed range:** 425 to 1100 r.p.m.

**Additional and special equipment:** 4 spike tooth bars and 4 stripper plates.

### REMOVAL OF THE BEATER AND BEATER SHAFT

Remove belt guides shown at Points A, B and C, Figure 32. Also remove belt idler, Point D, and the grain tank unloading auger drive belt.

For removal of the variator adjusting fork, refer to Section 4. Remove the cap screw, Point E, Figure 33. Thrust plate F can then be removed.

Remove the grain tank unloading auger sheave, Point G, Figure 34. Place the unloading tube in the approximate mid-position. On units below serial number 2904001 (Model 1500), the outer variator sheave half, Point H, Figure 34, will have to be removed before the grain tank unloading auger sheave can be removed. On units above this serial number, the grain

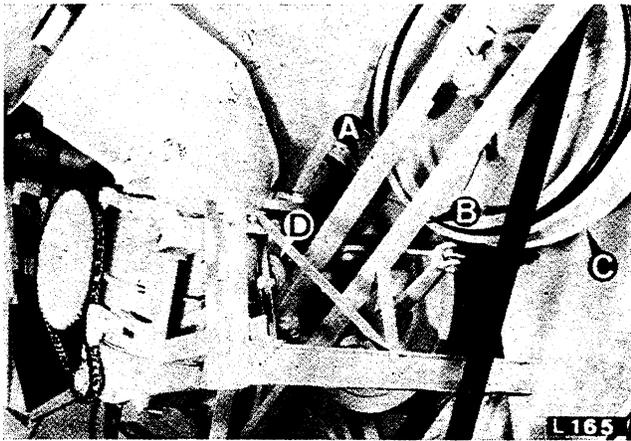


FIGURE 32



FIGURE 35

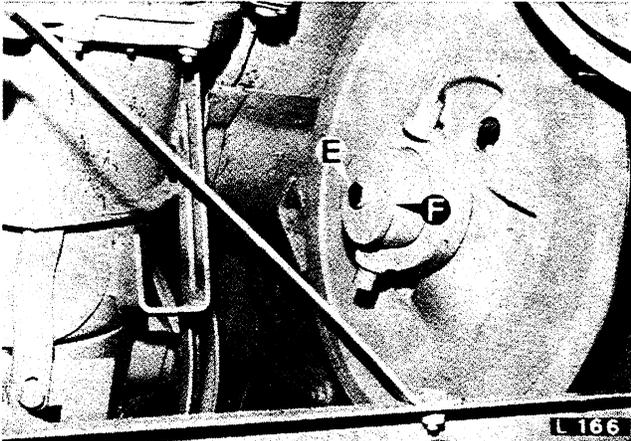


FIGURE 33

Re-install the cap screw at Point E, Figure 36 in the beater shaft. To remove the sheave hub, Point O, Figure 36, use a puller as shown.

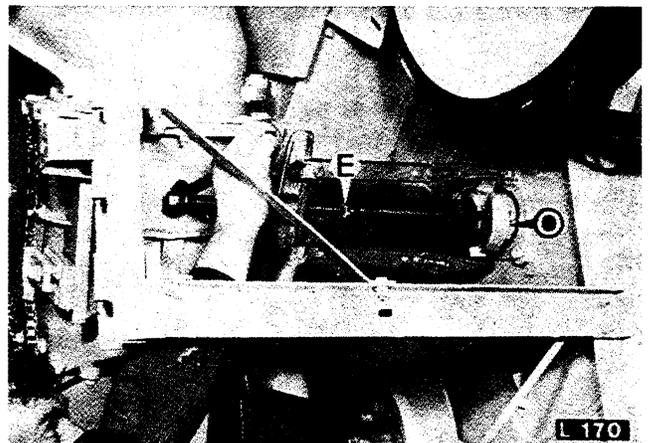


FIGURE 36

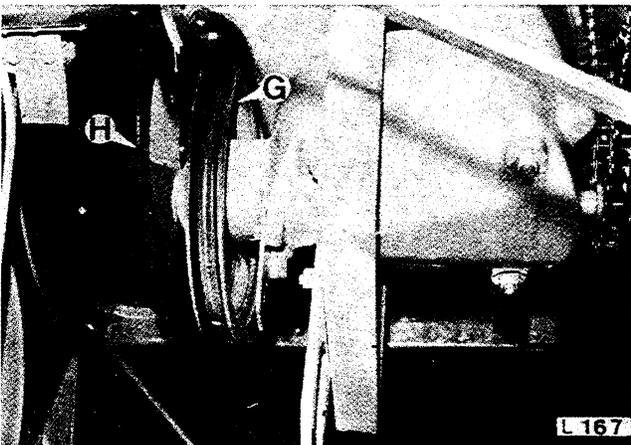


FIGURE 34

tank unloading auger sheave shown at Point G, Figure 34, can be removed without removing the variator sheave half.

If it is necessary to remove the cylinder outer sheave half, refer to Section 1 for the removal of sheave and drive belt.

To remove sheave half M, see Figure 35, first remove bolts shown at Point L, then the inner sheave half can be removed from the shaft.

Remove the flat key, Point P, Figure 37, and washers Q. Remove the three cap screws at Point R. The bearing housing can then be removed by using a puller, or special pullers part #327402 and #327406.

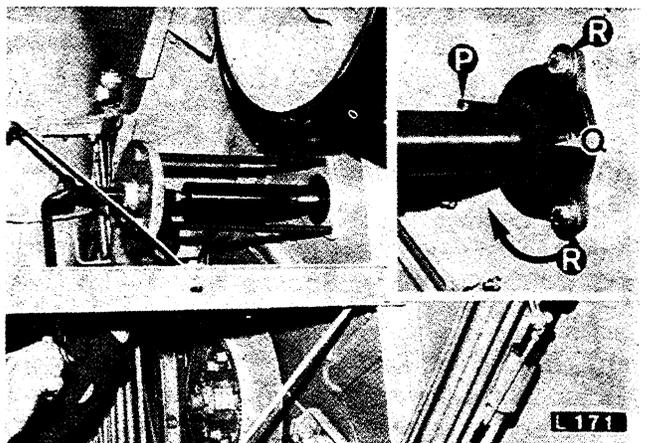


FIGURE 37

**NOTE:** In reassembling, be sure to use the same number of washers shown at Q, Figure 37, to maintain proper sheave alignment. The distance should be 30 mm, or 1 $\frac{3}{16}$ " clearance between the inner pulley sheave half and the frame.

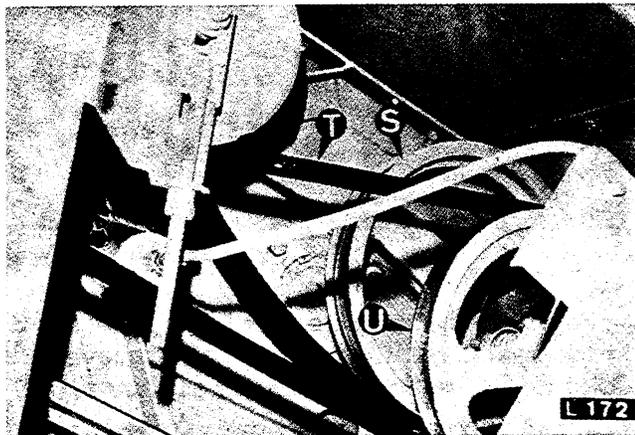


FIGURE 38

On the machine's right-hand side, remove the header clutching sheave S, Figure 38, and tailings elevator sheave shown at Point U. For the latter refer to Section 9. Remove the snap ring shown at Point A, cap at Point B, and cap screws at Point C, Figure 39 on the right-hand end of the beater shaft.

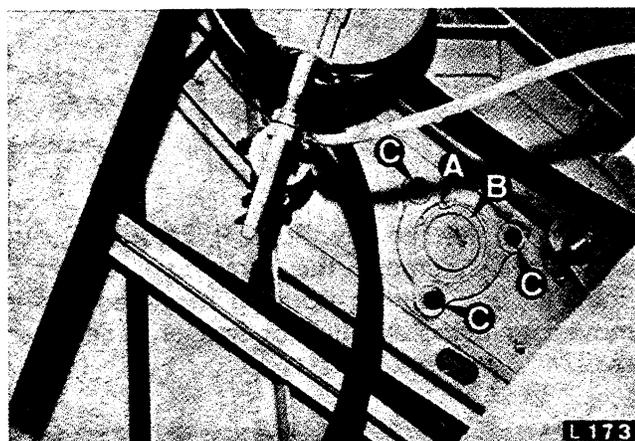


FIGURE 39

Remove snap ring shown at Point D, Figure 40, and collar E from the beater shaft.

The bearing and housing can then be removed from the shaft by using special pullers #327402 and #356385, see Figure 41.

Remove the grain tank cover plate, as shown at F, Figure 42. Removal of this door provides access to the beater area. Turn the beater until set screw G, Figure 44, is on top. This can best be done by looking through the cut-out on either side of the combine.

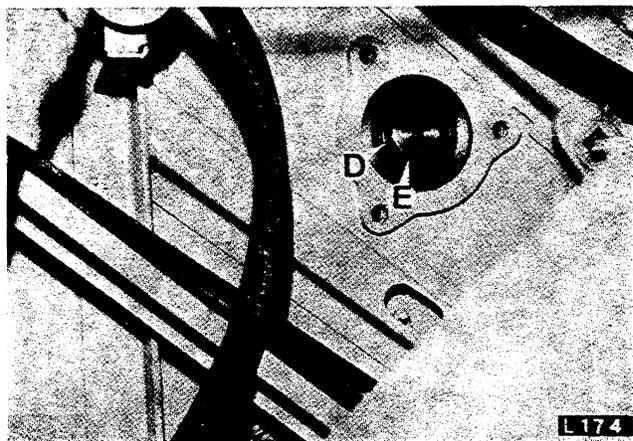


FIGURE 40

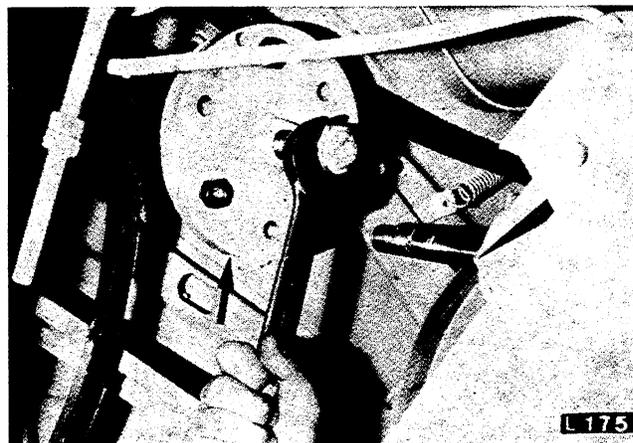


FIGURE 41



FIGURE 42

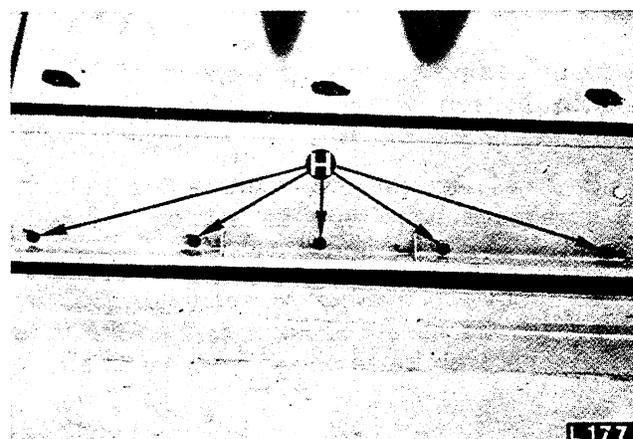


FIGURE 43

Remove the bolt on stripper plate or finger bar, whichever may be installed on the beater by removing bolts H, shown in Figure 43.

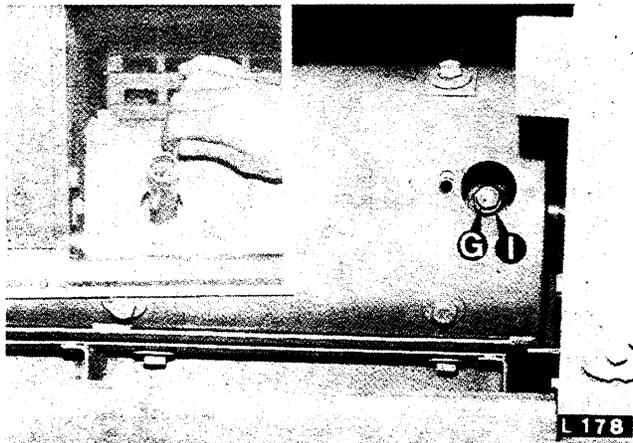


FIGURE 44

Loosen lock nut I, Figure 44, on both sides of the beater, and remove set screw G.

The beater shaft can then be removed. It should be taken out the left side of the combine as shown in Figure 45. After the shaft is removed, check to be sure that the keys are still in the key area of the shaft. If they have fallen out, they will have to be retrieved from inside the beater.

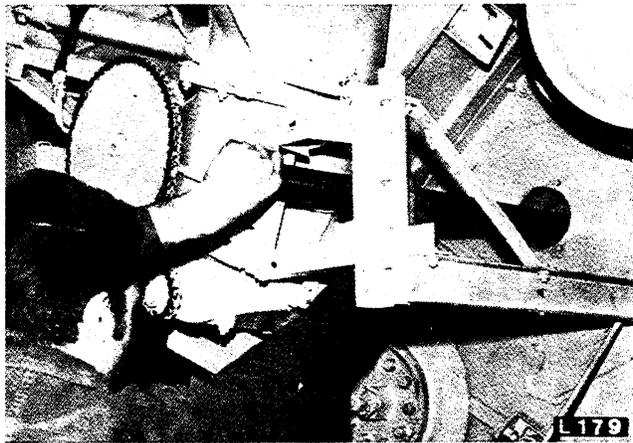


FIGURE 45

The beater can now be removed from the combine, see Figure 46. Placing 2 x 4's or boards over the walkers will ease the removal of the beater out the rear of the combine.

To disassemble the beater, remove cap screws shown at Point H, Figure 47. Also remove the remaining stripper plates or finger bars. The welds shown at Point I, Figure 47, will also have to be cut.

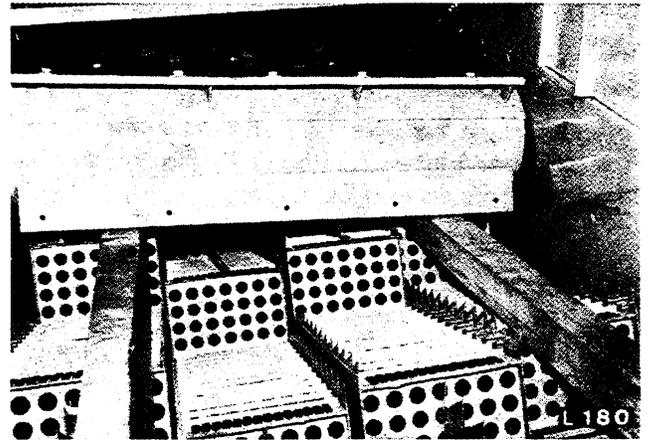


FIGURE 46

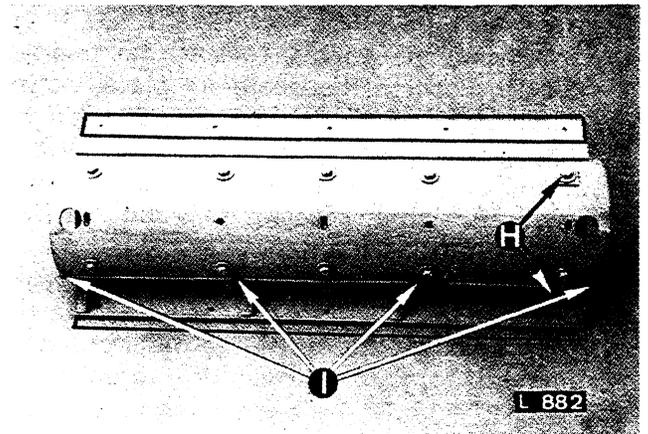


FIGURE 47

The assembly of the beater is in reverse of the disassembly sequence.

Before tightening bolts, Point H, Figure 48, reinstall the beater shaft and keys and tighten set screws shown at Point G, Figure 44, and secure the jam nut.

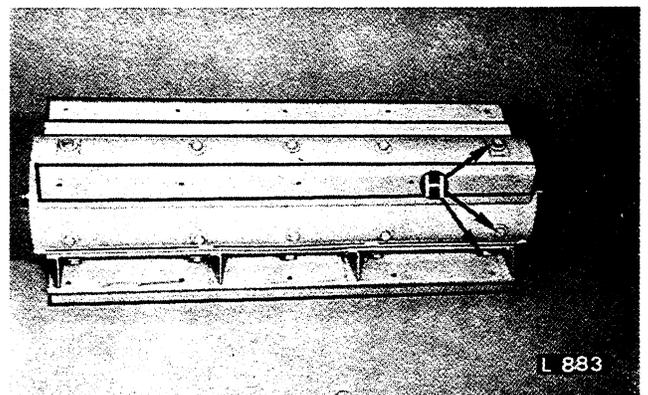


FIGURE 48

After the beater has been completely assembled, it must be balanced statically. First, push the stripper plates in, Points P, Figure 49. Balance weights should be added at Point J, Figure 49, if necessary.

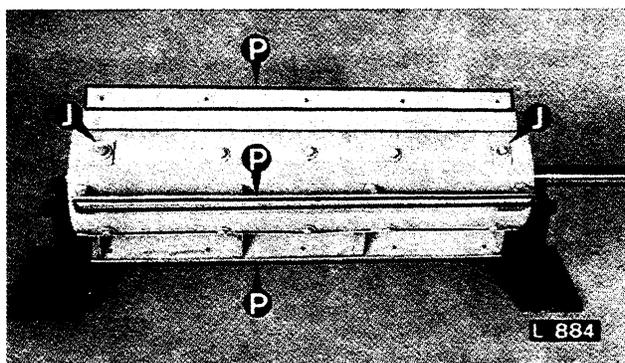


FIGURE 49

## REASSEMBLY OF THE BEATER AND SHAFT

To reinstall the beater, reverse the removal procedure. Position the beater in place, noting the direction of rotation, see Figure 50. Position the key grooves facing up to keep the keys in place on the shaft center in the frame as shown in Figure 50. Tighten set screws G, and lock nuts I, Figure 44. Install the removed stripper plates, Point P, Figure 49, and adjust them to approximately 3 mm ( $1/8$ "') from the rasp bars on the cylinder. Reinstall the remaining parts previously removed. To adjust the variator, refer to Section 4. For cylinder belt adjustment, see Section 1.

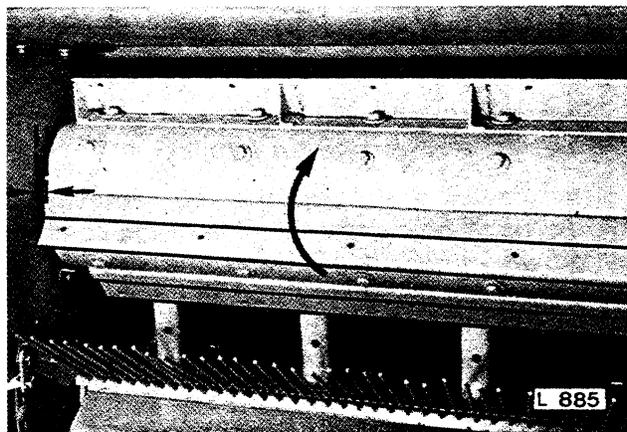


FIGURE 50

## SECTION 3 INTERMEDIATE SHAFT AREA

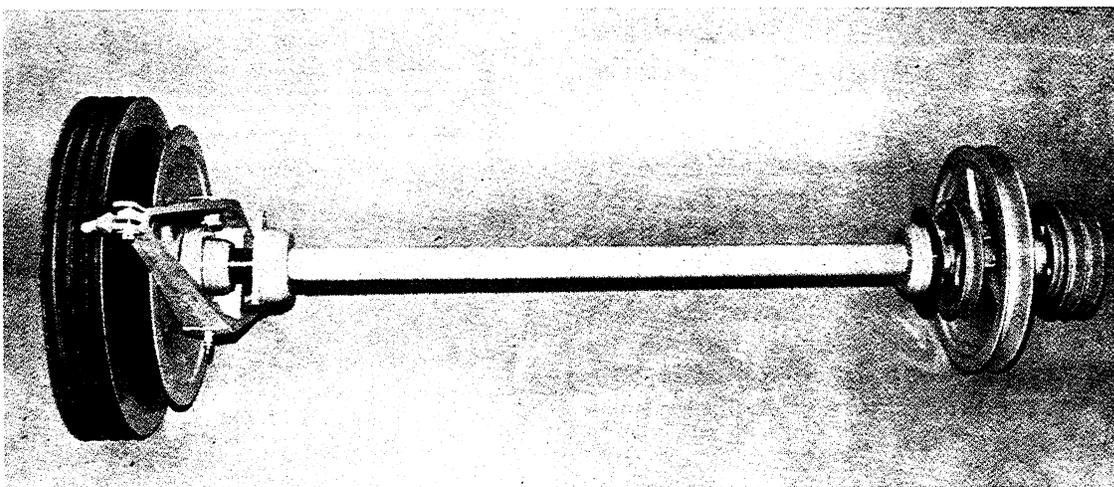


FIGURE 53

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## INTRODUCTION

The intermediate shaft is driven directly from the engine by the banded V-belt from the engine sheave. The speed of the intermediate shaft should be 780 R.P.M.'s with gasoline engine, and 760 R.P.M.'s with diesel engine. This is essential because all other threshing and cleaning drives are driven from this shaft. The engagement and declutching of the intermediate shaft is controlled from the operator's platform by means of the thresher clutching lever. The intermediate shaft is mounted on ball bearings which are lubricated from a central point. The pulley variator sheaves are dynamically balanced to prevent vibration. This section deals with the replacement of the intermediate shaft, the engagement mechanism, and the different adjustments to be made in this area.

## SPECIFICATIONS

**Drive:** Banded V-belt, directly from the engine.

**Bearings:** Ball bearings, greased from a central point.

**Speed:** 780 r.p.m.'s gasoline engines, 760 r.p.m.'s diesel engines.

## REPLACEMENT OF THE INTERMEDIATE SHAFT LEFT-HAND BEARING – MACHINES 1971 THROUGH 1972

Remove the belt guide A, shown in Figure 54, belt B, and traction belt C. Refer to Section 10 and Section 14 for the removal of these belts.

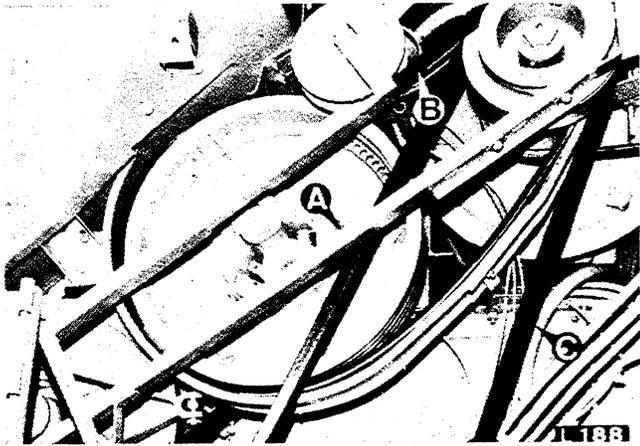


FIGURE 54

Remove the grain tank unloading mechanism clutching sheaves Point D, Figure 55, and belt guides E and F. The banded V-belt can also be removed now. The tension should be released from the cylinder variator belt at this time. Refer to Section 4.

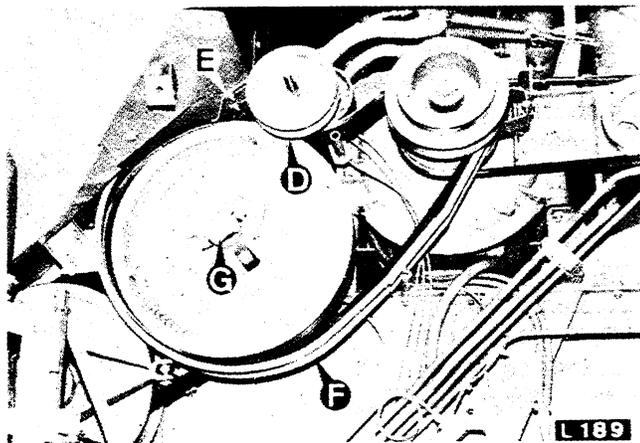


FIGURE 55

Mark the thresher sheave and the rear variator sheave as shown in Figure 56, Point X, in order to re-install them in their original position. The thresher sheave is installed on a conical shaft. To remove the sheave, it will be necessary to use a puller, see Figure 56.

Remove the flat key Point H, Figure 57, and the variator belt I, if it has not been removed

before. The inner variator sheave half J then can be removed.

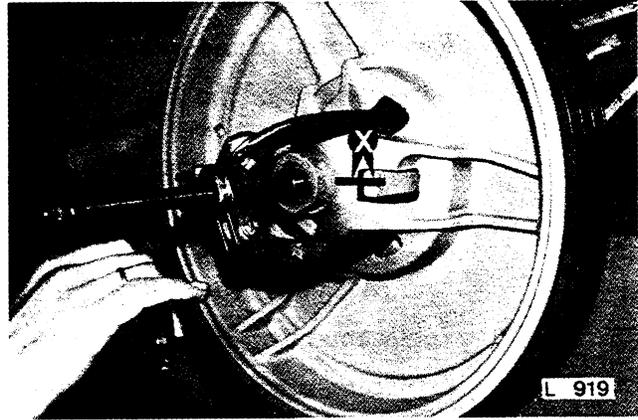


FIGURE 56

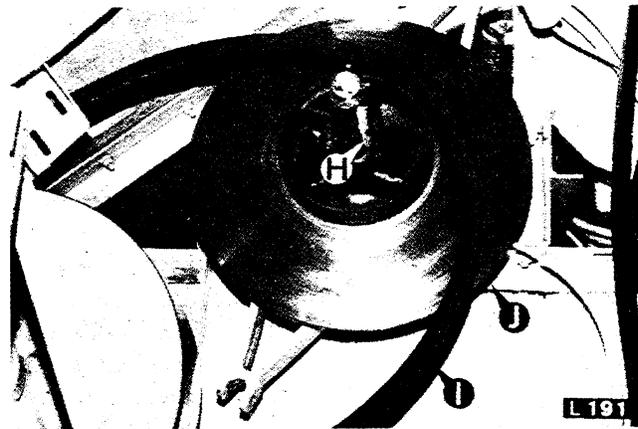


FIGURE 57

Loosen nut at Point L, Figure 58, and remove the grease tube. Remove cotter pins at Point K. The variator adjusting fork M can then be removed.

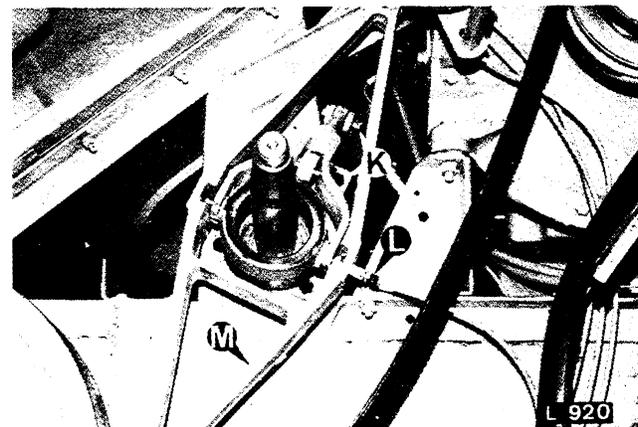


FIGURE 58

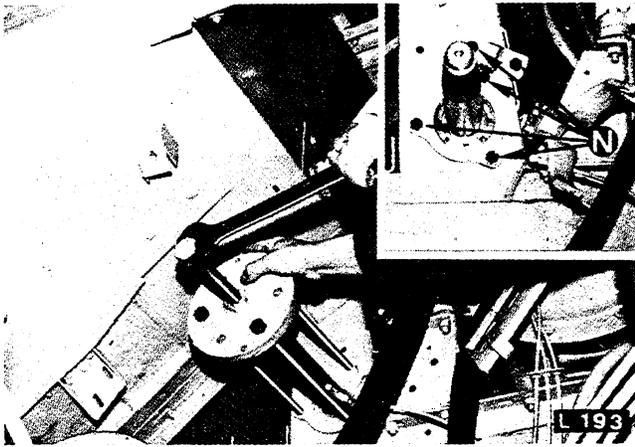


FIGURE 59

Remove bolts at Point N, Figure 59. Remove the grease tube, Point L, Figure 66, and remove the tube fitting shown at Point M, Figure 66. The bearing and bearing housing then can be removed. It may be necessary to use the special pullers, #327402 and #327406, as shown in Figure 59, to remove the bearing and bearing housing. The replacement of the bearing in the bearing housing will be covered later in this section.

Install the bearing housing as follows: Slide the bearing housing with the bearing on the shaft along with the spacer shown at Point B,

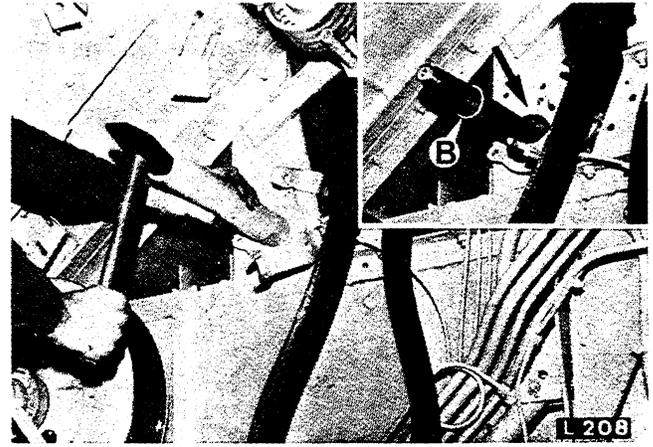


FIGURE 60

Figure 60. Tap the bearing on its seat, using a piece of pipe as shown in Figure 60. Be sure that the pipe is of proper diameter, to avoid damage to the bearing seals. Also be sure that the shaft turns without binding. If the shaft is binding, it can be freed by lightly tapping the shaft, as shown in Figures 81 and 82. Continue assembly in the reverse order as disassembled. Adjustment of the banded V-belt will be covered later on in this section. For adjustment of the cylinder variator, refer to Section 4. For adjustment of the ground speed variator, see Section 14.

## REPLACEMENT OF THE INTERMEDIATE SHAFT RIGHT- HAND BEARING – MACHINES 1971 THROUGH 1972

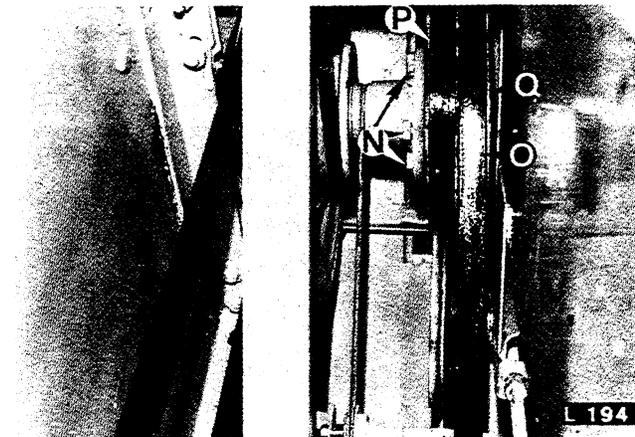


FIGURE 61

Remove the drive belts shown at Points P and O, Figure 61, and remove the bolts shown at Point N. The sheave can then be removed.

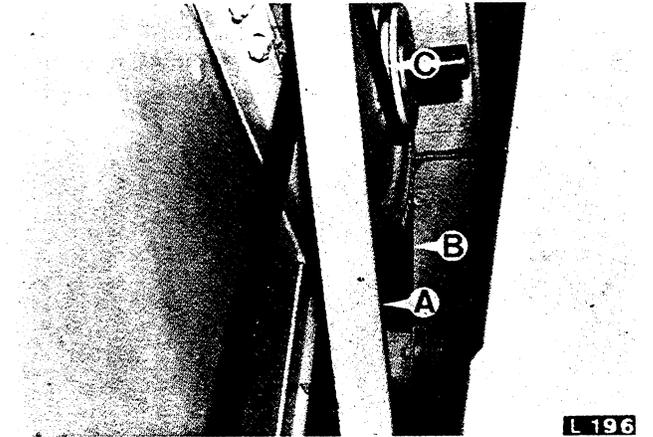


FIGURE 63

Remove belt guide, Point A, Figure 63, and then remove belt shown at Points B and C, Figure 63.

Remove tension pulley shown at Point D, Figure 64. Sheave E, belt F, and sheave G, see Figure 64, can then be removed.

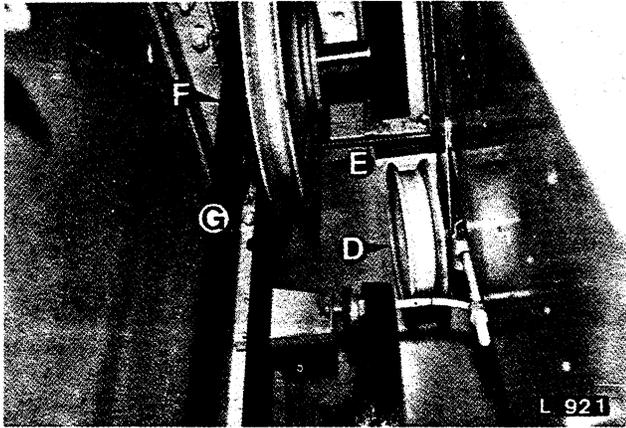


FIGURE 64

Remove the flat key, Point H, Figure 65, and spacer-washers Point I and remove the three cap screws shown at Point J, Figure 65. **NOTE:** In re-assembling, the same number of spacer-washers should be re-installed.

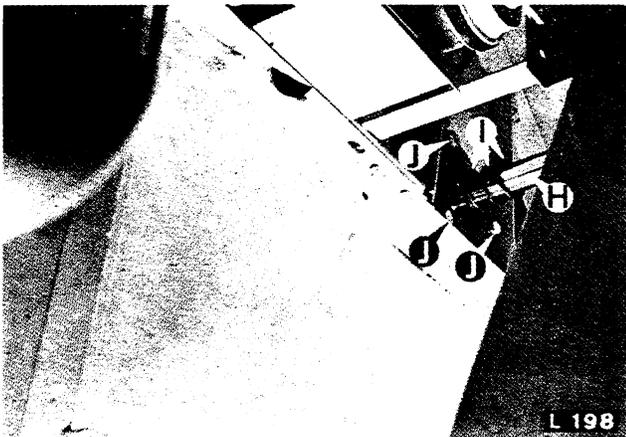


FIGURE 65

If the grease tube shown at Point L, Figure 66, and pipe clamp shown at Point M have not been removed, they must be removed from the bearing housing at this time.

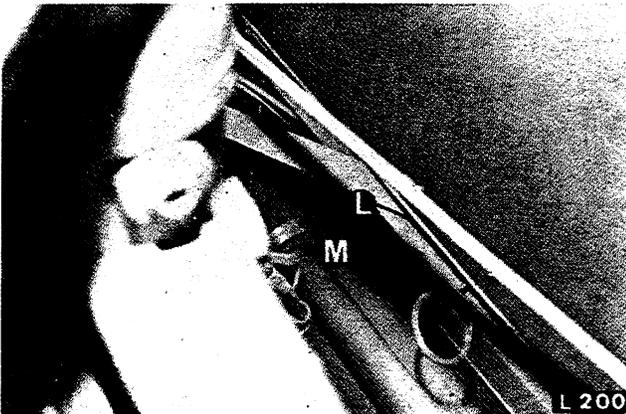


FIGURE 66

To remove the bearing and bearing housing from the shaft, it may be necessary to use the special tools, #327402 and #356388, see Figure 67.

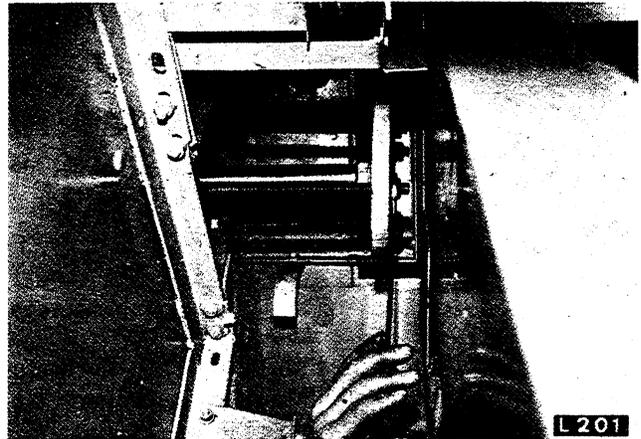


FIGURE 67

Remove the bearing housing together with the bearing, and spacer shims at Point O, Figure 68.

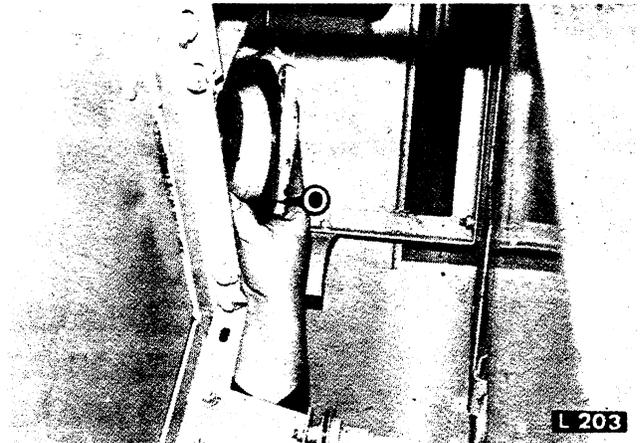


FIGURE 68

When reassembling, it is recommended that the special tool, #378170 be used, shown at Point C, Figure 69. Place this tool on the shaft,

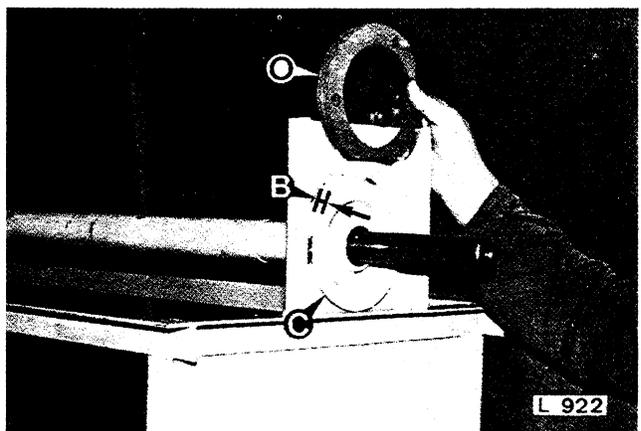


FIGURE 69

as shown, against the collar. Measure the space B between the special tool C, and the bearing housing support plate. Remove the special tool and install the necessary number of shims to fill the space shown at Point B, Figure 69.

Install the bearing housing with the bearing and the sheave temporarily on the shaft as shown in Figure 70. Press the bearing on the shaft by tightening the cap screw at Point A, Figure 70. Tighten cap screw A as much as possible and tap on the shaft a few times with a hammer, to relieve tension between the bearing and shaft. After tapping on the shaft, bolt A may be tightened still more. Tap again on the shaft and continue until cap screw A is tightened securely.

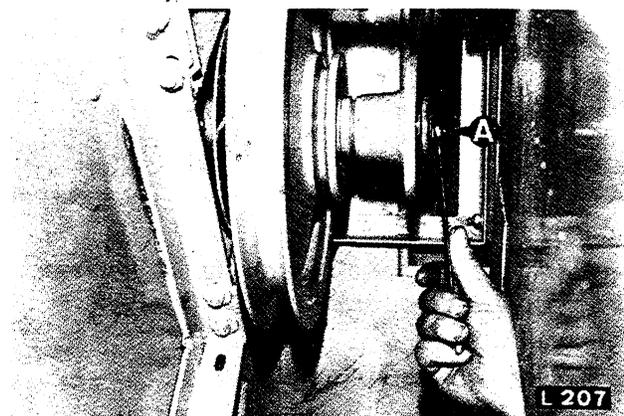


FIGURE 70

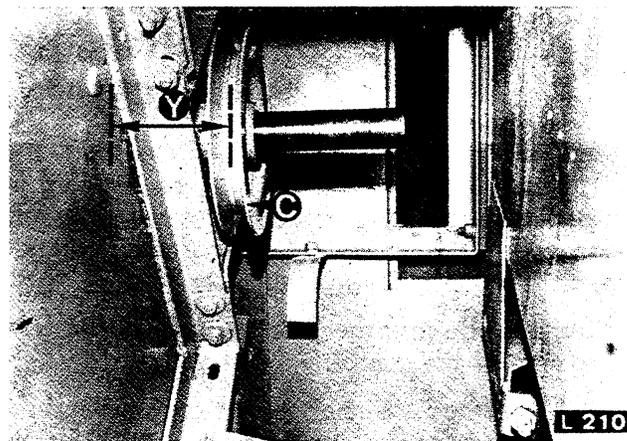


FIGURE 71

Now remove cap screw at Point A, Figure 70, and remove the sheave hub and sheave from the shaft. Install the spacer-washers and key shown at Points I, and H, Figure 65, and sheave C, shown in Figure 71. Check the distance between the frame of the combine and the center line of the sheave as shown at Point Y, Figure 71. This distance should be 60 mm, (3 $\frac{3}{8}$ "'). If this distance is greater, remove some of the spacer shims; if it is less, add spacer shims. Assemble the remaining parts in the reverse order of disassembly.

## REPLACEMENT OF AN INTERMEDIATE BEARING IN THE BEARING HOUSING – MACHINES 1971 AND 1972

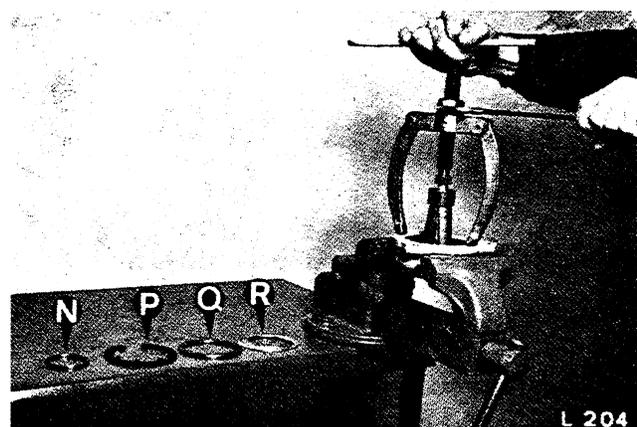


FIGURE 72

Remove snap ring shown at Point P, Figure 72, and spacer ring Q. Seal ring shown, Point R, should also be removed. The bearing can then be removed from the bearing housing using a puller as shown in Figure 72.

The bearing can be replaced in the bearing housing as shown in Figure 73 by the use of a

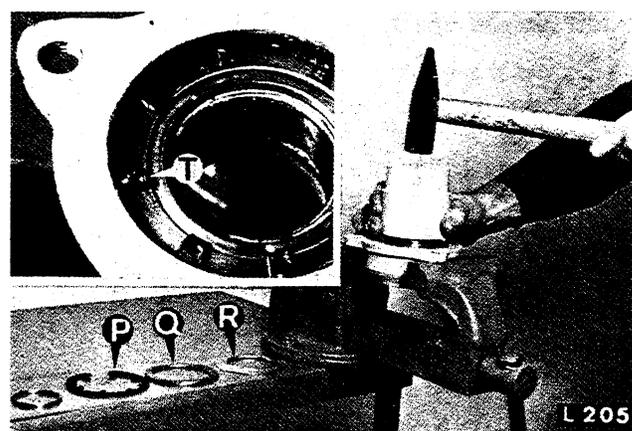


FIGURE 73

bearing drive or special tool, #356358. **NOTE:** Special attention should be taken when installing the snap ring, Point P, Figure 73. The ears on this snap ring should touch against the spacer ring Q.

## REPLACEMENT OF INTERMEDIATE SHAFT – MACHINES 1971 AND 1972

**NOTE:** To replace the intermediate shaft, the bearings must be removed first, as detailed in an earlier part of this section. However, the left hand bearing may stay on the shaft as it will not interfere with shaft removal.

Remove the intermediate shaft from the left-hand side of the combine.

The intermediate shaft can then be clamped in a vise and the left-hand bearing and housing can be removed from the shaft as shown in Figure 74. It may be necessary to use special tools #327402 and #327406 to do this. **NOTE:** Be careful not to lose the spacer shown at Point N, Figure 76, as it must be re-installed during assembly of the intermediate shaft and bearing.

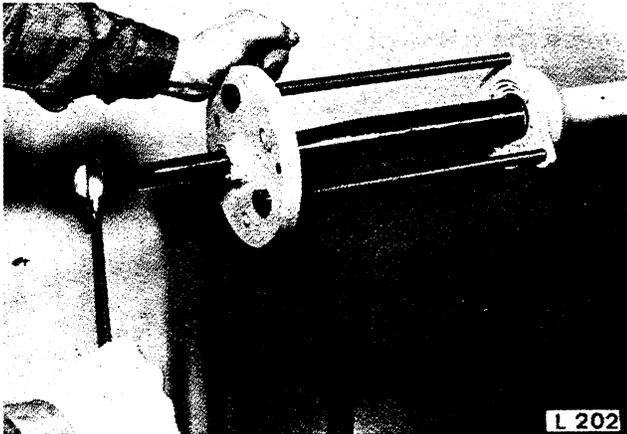


FIGURE 74

To reassemble the left-hand bearing on the intermediate shaft, proceed as follows:

Clamp the shaft in a vise and install the left-hand bearing and bearing housing, see Figure 75. The distance, Point X, Figure 75, should be 320 mm (12 $\frac{5}{8}$ "'), measuring from end of the shaft up to the bearing housing as shown.

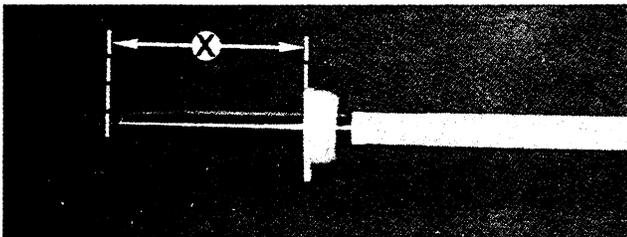


FIGURE 75

The intermediate shaft can then be re-installed in the combine, see Figure 76. Special spacer ring shown at Point N, Figure 76, should

be installed on the shaft and set up against the bearing. Continue assembly of the intermediate shaft in the reverse order of disassembly.



FIGURE 76

Assemble the variator sheaves in the reverse order of the disassembly.

Install the bearing and the special gauge #378170 on the right-hand end of the shaft, see Figure 77. At this time, the sheaves can be temporarily installed and cap screw shown, Point A, Figure 80, can be tightened.

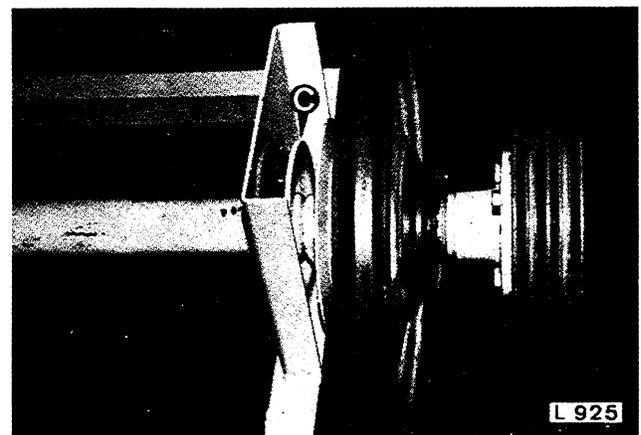


FIGURE 77

Place a wooden block or brass drift on the left-hand end of the intermediate shaft and drive the shaft to the right until the distance shown at Point X, Figure 78, is 256 mm, or 10 inches. The measurement is made from the outer edge of the thresher drive sheave to the frame as shown, thus aligning the engine drive sheave with the intermediate shaft sheave. It is also possible to shift the engine slightly on its mounts to improve this alignment if necessary.

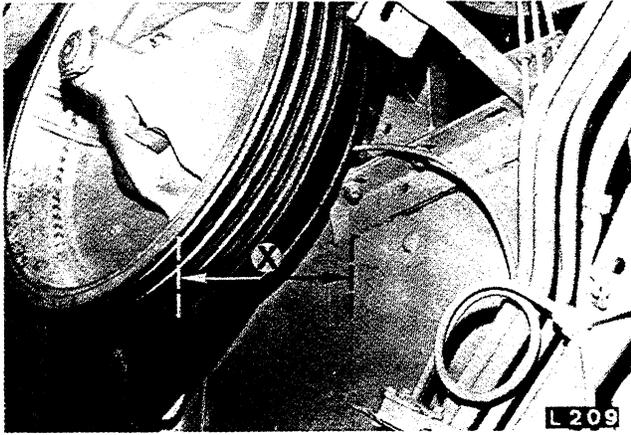


FIGURE 78

Check the amount of spacer shims, shown at Point O, Figure 79, that are required to fill the space between the special tool and frame.

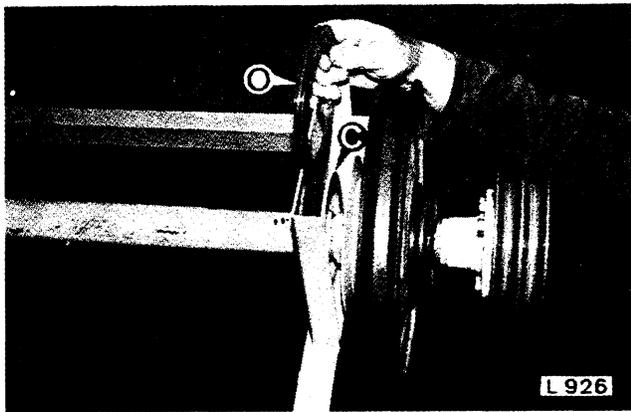


FIGURE 79

The sheaves now have to be removed from the right-hand end of the intermediate shaft along with the special tool and the required spacers installed. Re-assemble the sheaves and cap screws as shown at Point A, Figure 80. The cap screw should be tightened until the bearing moves against the shoulder on the shaft.

Tap the shaft with a hammer as near as possible to the left-hand bearing housing. Then, following the same procedure, tap the shaft near the right hand bearing housing as shown in Figures 81 and 82 to neutralize the tension on the bearings and shaft. Re-tighten cap screw A, Figure 80. If the cap screw can be tightened more, repeat this procedure until the cap screw is tight.

Sheaves shown at Point C, Figure 83, should be located on the intermediate shaft so that the distance Y is 60 mm or 2 $\frac{3}{8}$ ". The spacing of the sheave is controlled by adding or removing special spacer washers I, see Figure 65.

The adjustment of the thresher belt tension can be found at the end of this section. For adjustment of the variator linkage refer to Section 4 and for adjustment of the ground speed variator, refer to Section 14.

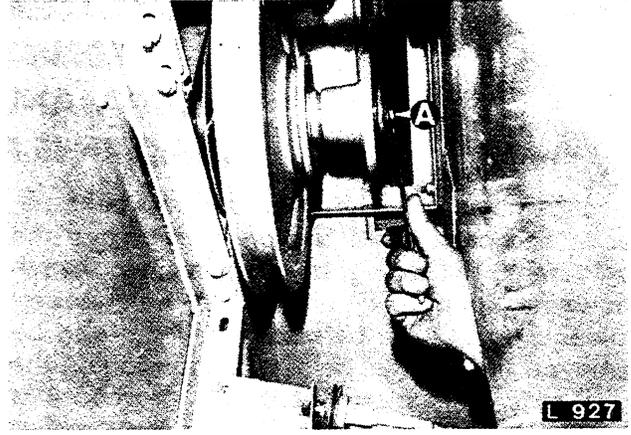


FIGURE 80

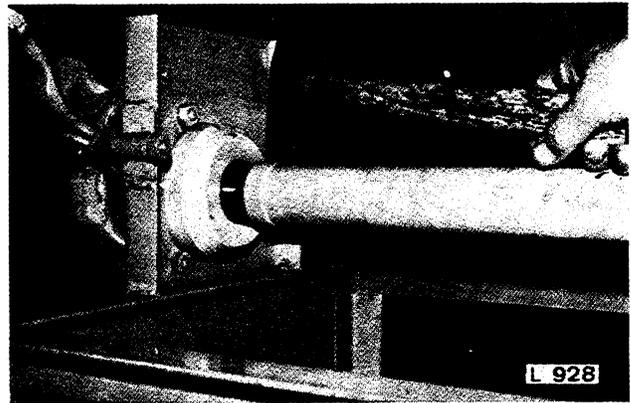


FIGURE 81

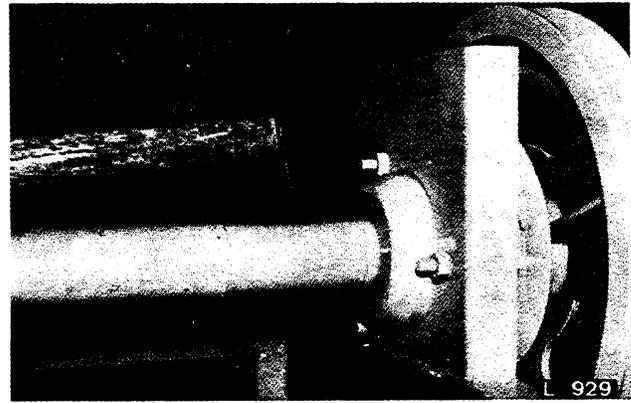


FIGURE 82

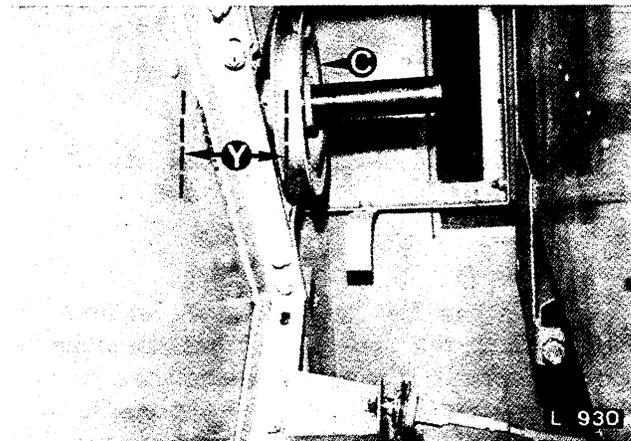


FIGURE 83

## REPLACEMENT OF THE INTERMEDIATE SHAFT LEFT-HAND BEARING – MACHINES FROM 1973 ON

For removal of the belt guides and belts, refer to Section 10 and Section 14. Remove the grain tank unloading drive clutching sheave shown at Point D, Figure 84, as well as belt guides E and F. The banded V-belt can also be removed at this time. Release the tension on the cylinder drive variator belt. This procedure is covered in Section 4. Mark the outer thresher

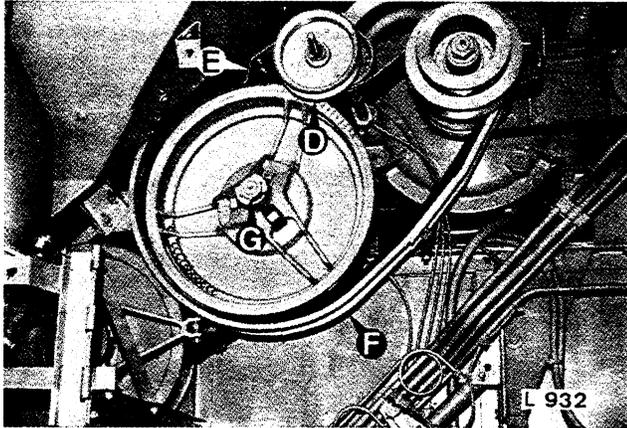


FIGURE 84

drive and inner sheaves as shown at Point X, Figure 85 so these components can be reassembled in their original position. The thresher drive sheave can now be removed from the intermediate shaft with a puller, see Figure 85.

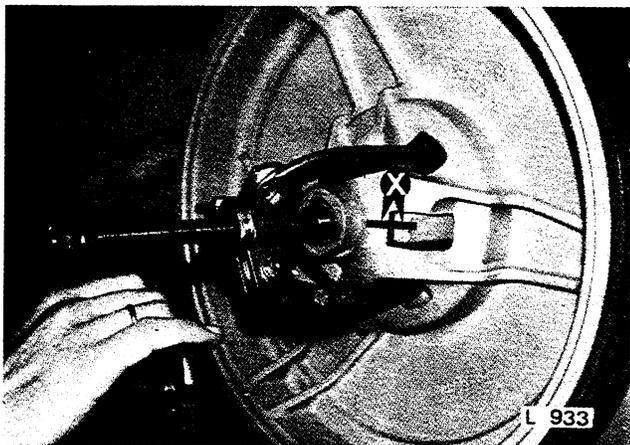


FIGURE 85

Remove the flat key as shown at Point H, Figure 86. If the variator belt has not been removed, remove it at this time and then remove the inner sheave half, Point J, Figure 86.



FIGURE 86

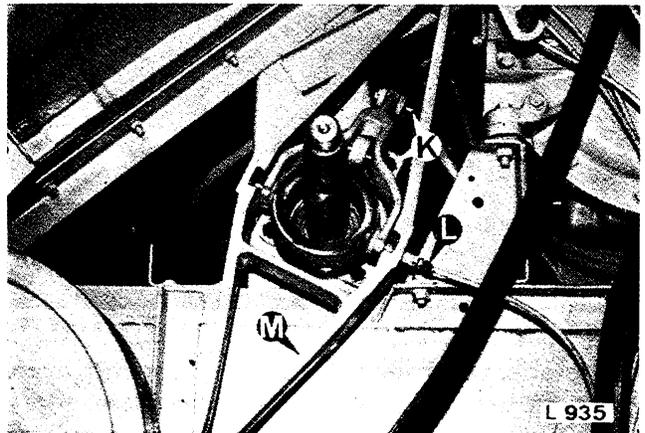


FIGURE 87

Loosen the nut on the grease tube, Point L, Figure 87 and remove the grease tube. Remove the cotter pin and linkage pin shown at Point K, Figure 87. The variator adjusting fork can now be removed. Remove the grease tube, Point L, Figure 87 and pipe clamp M. The bear-

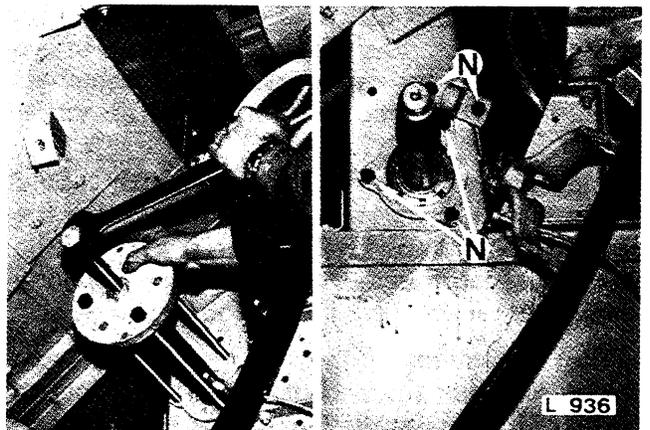


FIGURE 88

ing and bearing housing now can be removed from the shaft. It may be necessary to use special pullers #327402 and #327406 as shown in Figure 88 to remove the bearing and bearing housing.

**NOTE:** TAKE SPECIAL CARE NOT TO LOSE THE SPACER RING "Q" SHOWN IN FIGURE 90.

When assembling a new bearing and bearing housing, tap the bearing on the shaft as shown in Figure 89, until there is a space of 1 mm, 3/64", between the bearing housing and the frame.

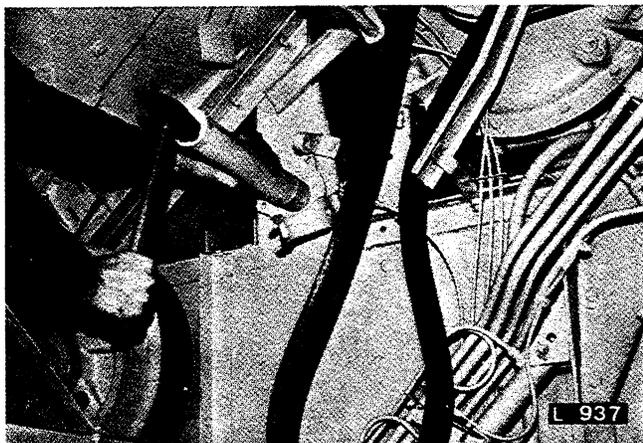


FIGURE 89

Install a new seal, Point R, Figure 90, then install a spacer ring as shown at Point Q, Figure 90 on the shaft. Place the beveled side of the spacer facing toward the bearing. The seal ring should be moved up against the bearing. This can be done with a piece of pipe of the proper diameter, see Figure 90.

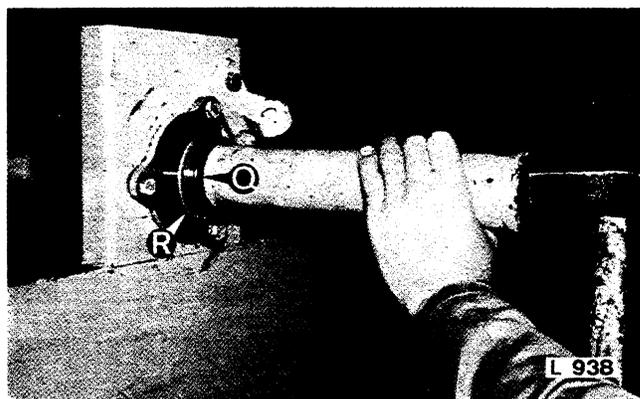


FIGURE 90

Remove three one millimeter, 3/64", thick spacer washers from between the bearing housing and frame. Re-install the mounting bolts and tighten them. By doing this, the bearing will move 1 mm, 3/64", inside the bearing housing, see Point X, Figure 91. Re-assemble the remaining components in reverse order of disassembly. For adjustment of the variator, refer to Section 4 and for adjustment of the ground speed variator linkage, refer to Section 14.

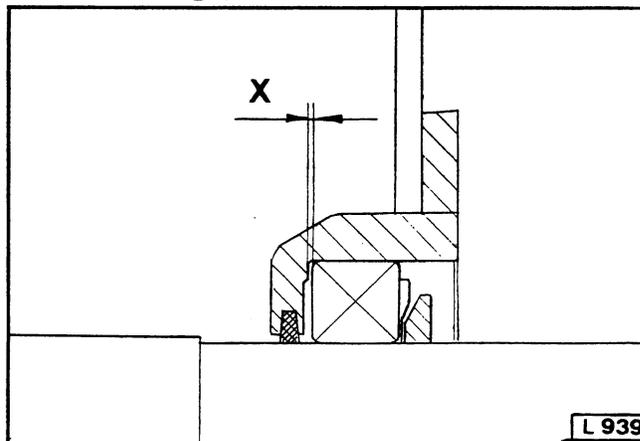


FIGURE 91

## REPLACEMENT OF THE INTERMEDIATE SHAFT RIGHT-HAND BEARING – MACHINES FROM 1973 ON

Remove the drive belts shown at Point P and O, Figure 92, and cap screws shown at Point N. Sheave Q can then be removed.

Remove cap screw shown at Point R, Figure 93, and sheave hub, Point T, Figure 93.

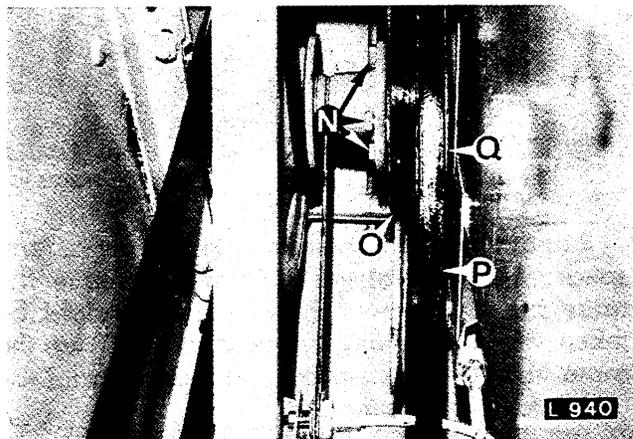


FIGURE 92

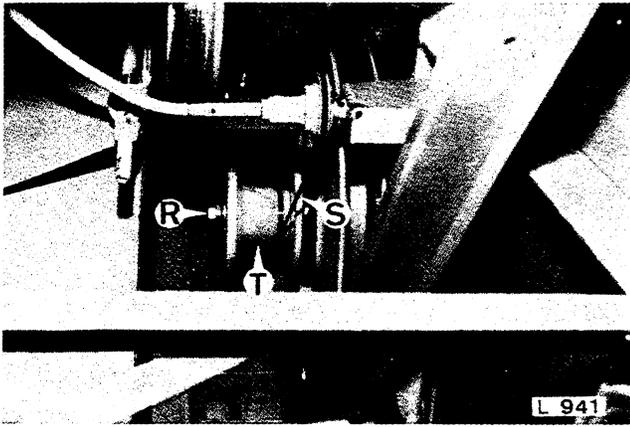


FIGURE 93

Remove the belt guide shown at Point A, Figure 94 along with belts B and C.

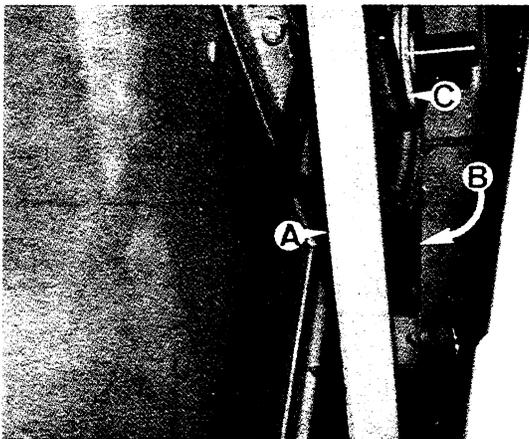


FIGURE 94

Remove tension pulley shown at Point D, Figure 95, sheave-E, belt F, and sheave G.

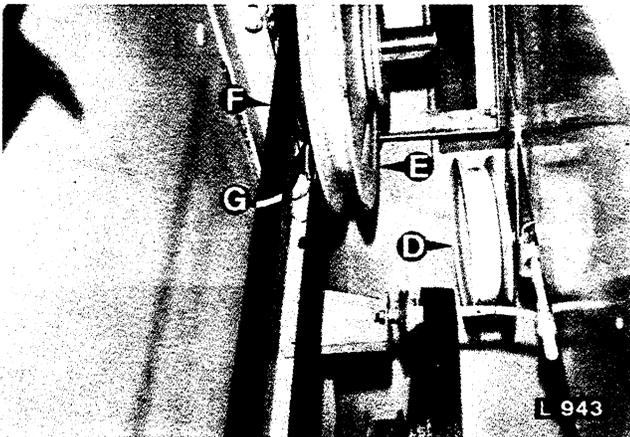


FIGURE 95

Remove key shown at Point H, Figure 96, and spacer washers shown at Point I. Remove the three bolts shown at Point J. Care should be taken when removing space washers I, for the same thickness of spacer washers should be used in reassembly.

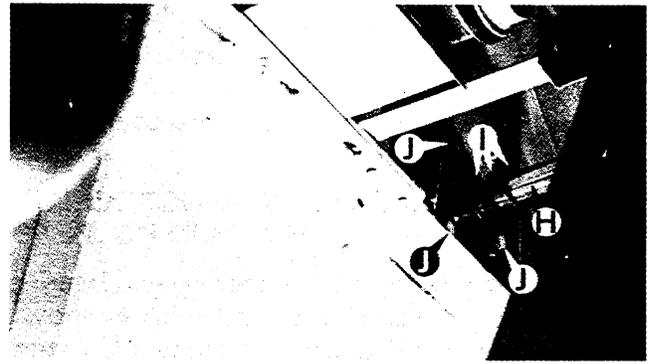


FIGURE 96

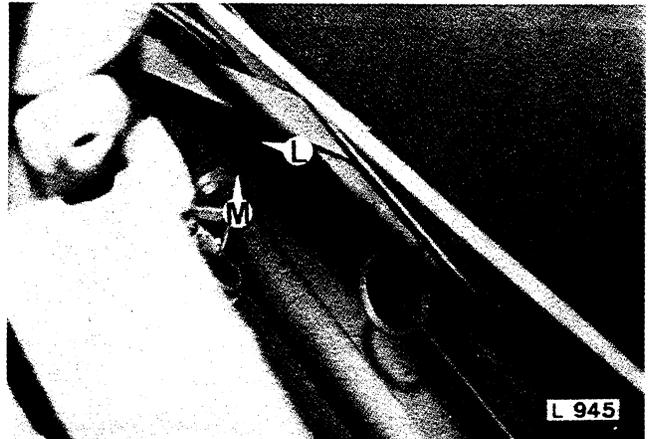


FIGURE 97

Loosen the nut on the grease pipe shown at Point L, Figure 97 and remove the pipe clamp M on the bearing housing.

The right-hand bearing and bearing housing can now be removed from the intermediate shaft. It may be necessary to use special tools #327402 and #356388 as shown in Figure 98 to remove the bearing and bearing housing from the shaft.

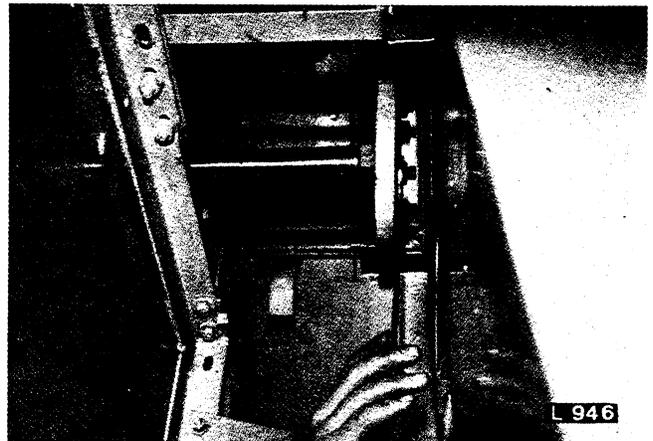


FIGURE 98

When installing a new bearing and bearing housing, place the special tool shown at Point C, Figure 99, part #378170 on the intermediate

shaft up against the collar and measure the space between the gauge and the bearing support plate as shown at Point B, Figure 99. Remove the special gauge and install the required number of spacer shims as shown at Point O, Figure 99.

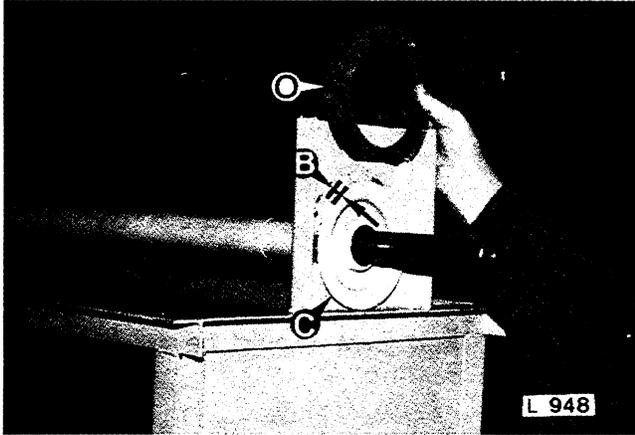


FIGURE 99

Install the bearing housing with bearing without the seal ring shown at Point X, Figure 104 in bearing.

Install the sheaves loosely on the shaft and press the bearing on the shaft by tightening the cap screw shown at Point A, Figure 100. Remove cap screw, Point A, Figure 100 and remove the sheaves.

Now install seal ring X and bearing cover Y as shown in Figure 104. Tighten the bearing mounting bolts.

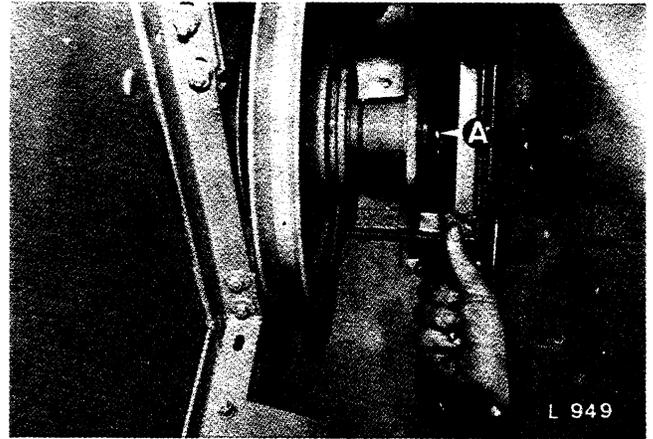


FIGURE 100

Install the spacer washers Point I, and key H, Figure 96. Also install sheave C, Figure 101. The distance Y shown in Figure 101 should be 60 mm (2 $\frac{3}{8}$ "'). If this distance is not correct, remove or add spacer washers as required until distance Y is 60 mm (2 $\frac{3}{8}$ "'). Assemble the remaining parts in the reverse order of the disassembly.

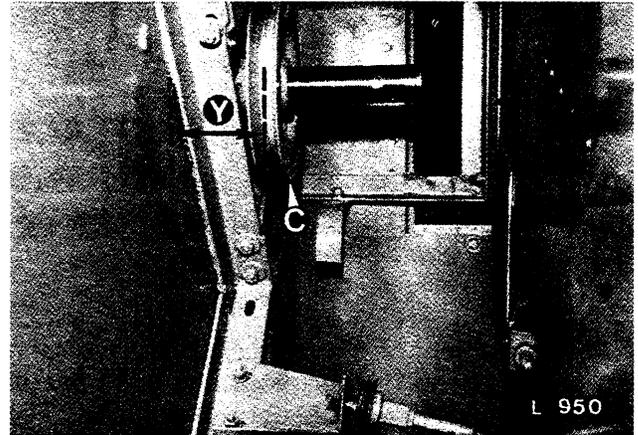


FIGURE 101

## REPLACEMENT OF A BEARING IN THE BEARING HOUSING – MACHINES FROM 1973 ON

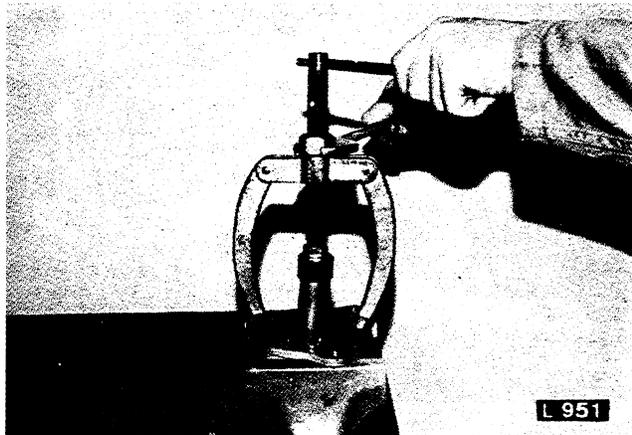


FIGURE 102

### A – LEFT-HAND BEARING

Use a bearing puller to remove the bearing from the bearing housing as shown in Figure 102.

A new bearing can be installed into the bearing housing as shown in Figure 103, using special tool #356358 or a similar tool. Care should be taken not to damage the bearing.

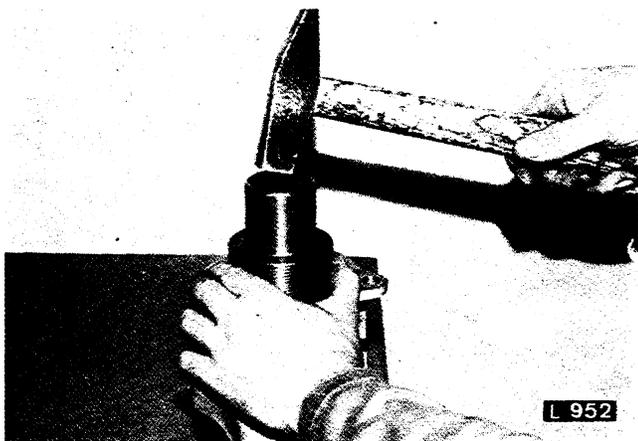


FIGURE 103

### B — RIGHT-HAND BEARING

The right-hand bearing can be removed from the bearing housing using a puller as shown in Figure 104. A new bearing can be installed into

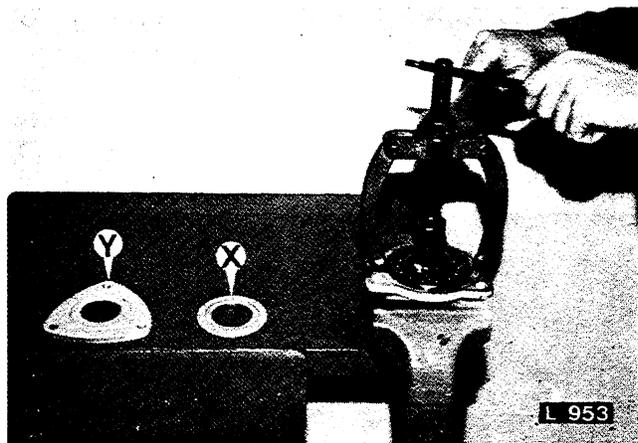


FIGURE 104

the bearing housing using special tool #356358 or a similar tool. Care should be taken not to damage the bearing.

## REPLACEMENT OF THE INTERMEDIATE SHAFT — MACHINES FROM 1973 ON

If replacement of the main shaft is necessary, the bearings and bearing housings will have to be removed first as previously outlined. The left-hand bearing can be removed from the intermediate shaft after the shaft has been removed from the combine by placing the shaft on a workbench or a vise and pulling the bearing and bearing housing from the shaft using the special tool #327402 and #327406 as shown in Figure 105.

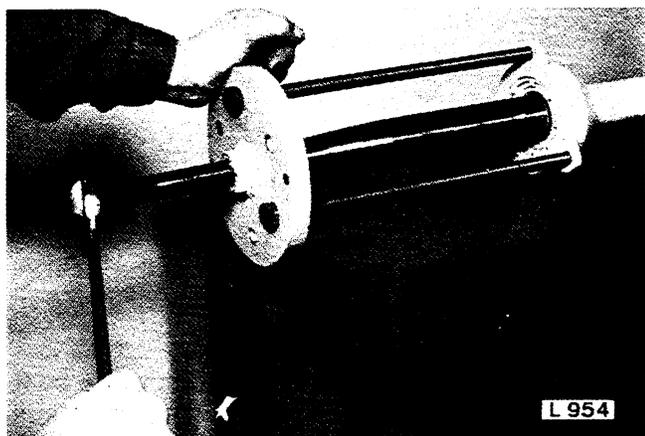


FIGURE 105

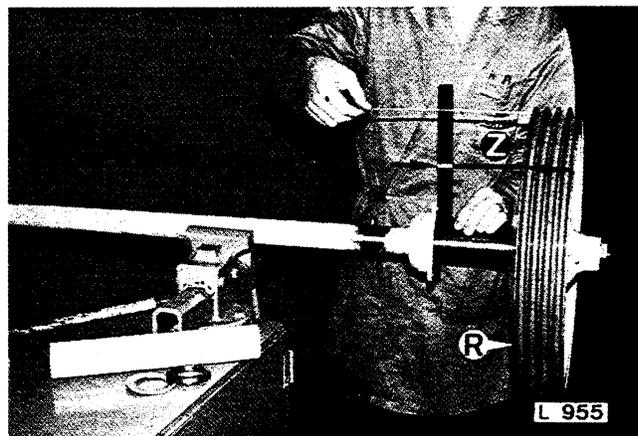


FIGURE 106

In reassembling the intermediate shaft components, first install the bearing and bearing housing on the shaft. Also install the power band sheave Point R, Figure 106. Place a square on the shaft as shown in Figure 106, against the bearing housing, and measure distance Z which should be 165 mm (6½"). This distance is obtained by moving the bearing housing on the shaft.

Remove the sheave R shown in Figure 106 and install seal ring S and back-up ring T, Figure 107 on the shaft. Be sure to install the back-up ring with the beveled side facing the bearing. Drive the back-up ring against the bearing using a piece of pipe as shown in Figure 107 to force the seal ring against the bearing.

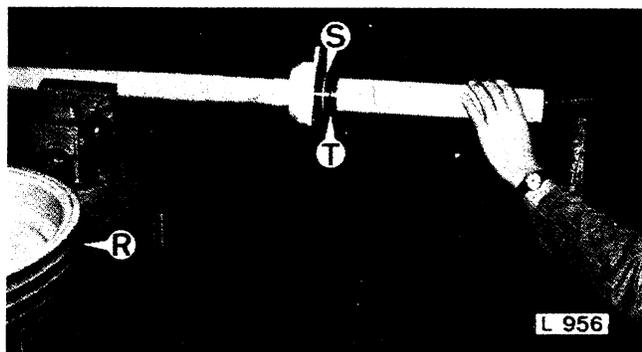


FIGURE 107

Install the intermediate shaft back on the combine and secure the left-hand bearing housing to the frame with the three cap screws shown at Point N, Figure 108.

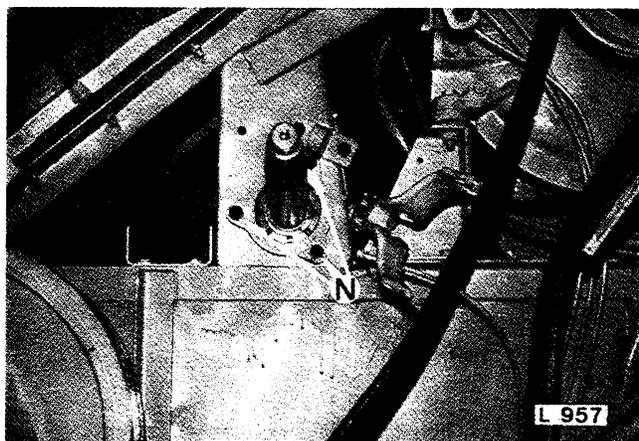


FIGURE 108

Install the other components on the left end of the shaft following the reverse of the disassembly procedure.



FIGURE 109

Check the distance between the main frame and the inner edge of the intermediate drive sheave as shown in Figure 109. Distance X shown in Figure 109 should be 166 mm or 6-35-64". This insures alignment of the engine drive sheave with the intermediate shaft sheave. It is also possible to shift the engine slightly on its mounts to improve this alignment if necessary.

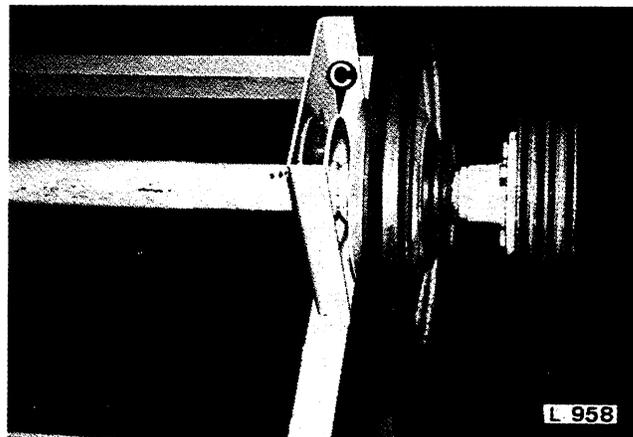


FIGURE 110

Put the special gauge #378107, shown at Point C, Figure 110, on the right-hand side of the shaft. Then install the sheaves temporarily on the shaft, and tighten the cap screw shown at Point A, Figure 112.

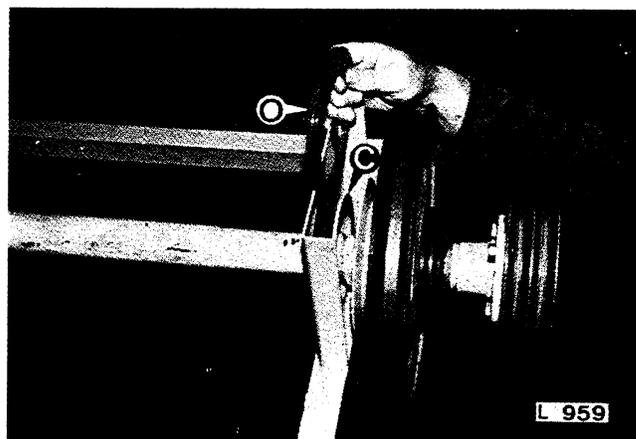


FIGURE 111

Determine how many spacer washers shown at Point O, Figure 111, are required to fill the space between the frame and the special gauge C. Reduce the thickness of these spacer shims 2 mm (5/64") and set aside.

Remove the cap screw shown at Point A, Figure 112, the sheaves, and the special gauge. Then install the special spacer shims, Point O, Figure 111, that were set aside.

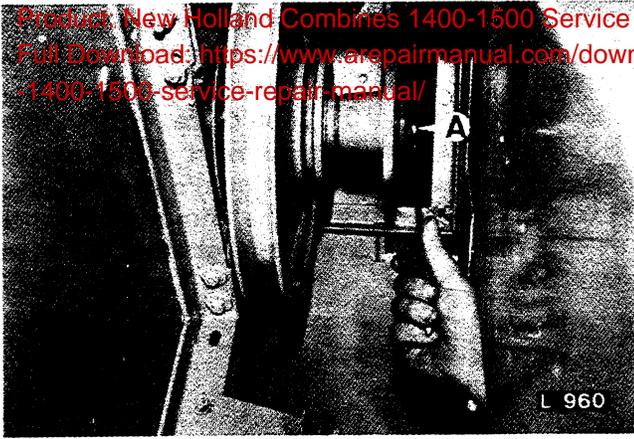


FIGURE 112

Install the bearing housing with bearing. Install the seal ring as shown at Point X, Figure 113, and bearing cover shown at Point Y on the shaft. Slide the sheaves back on the shaft temporarily and tighten cap screw shown at Point A, Figure 112, so that the bearing pushes against the shoulder on the shaft. Install the three bearing mounting bolts previously removed and tighten them so that the bearing housing is pulled against the bearing support plate. This provides the 2 mm space as shown at Point X, Figure 91, insuring that the shaft and bearings are properly positioned and that the bearings will not be in a bind, causing them to run hot.

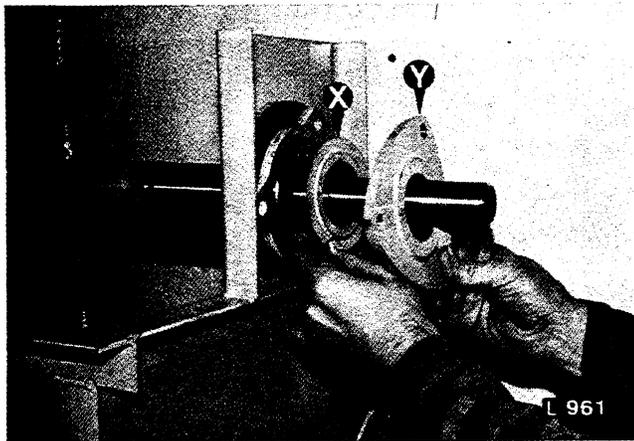


FIGURE 113

Tap the shaft with a hammer, as shown in Figure 115, as near as possible to the bearing housing a few times to remove any binding between the shaft and bearings. Again, check cap

screw, Point A, Figure 112, to be sure it did not loosen.

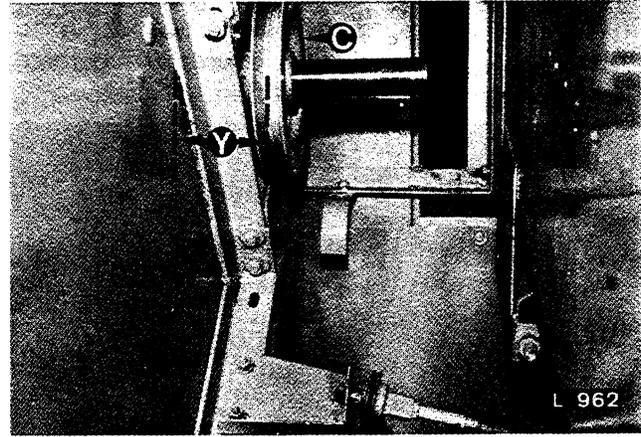


FIGURE 114

Measure the distance Y, Figure 114. This should be 60 mm (2 $\frac{3}{8}$ "'). This distance is obtained by adding or subtracting special washers I shown in Figure 96. Removal of the sheaves will be necessary in order to add or subtract washers and when distance Y, Figure 114, is correct, be sure to install the key back under the sheaves as shown in Figure 114.

Adjusting of the banded V-belt tension will be covered later in this section.

For adjustment of the variator linkage, refer to Section 4. For adjustment of the ground speed variator, refer to Section 14.

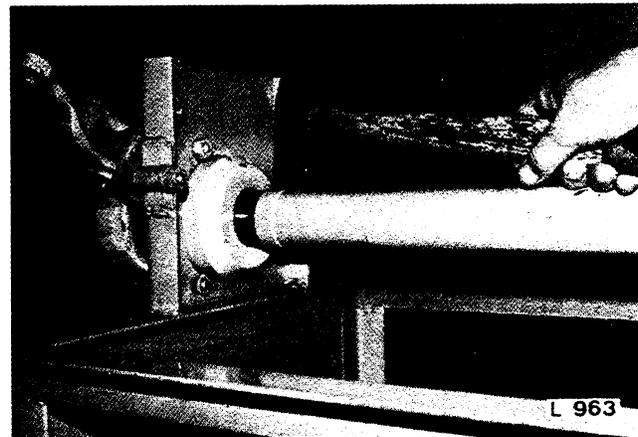


FIGURE 115