NEW HOLLAND

Service Manual

NEW HOLLAND

Grinder-Mixers

Issue 1-92
(Replaces All Previous Issues)



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Reprint

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SECTION I
GEARBOXES
MODELS 340 and 350

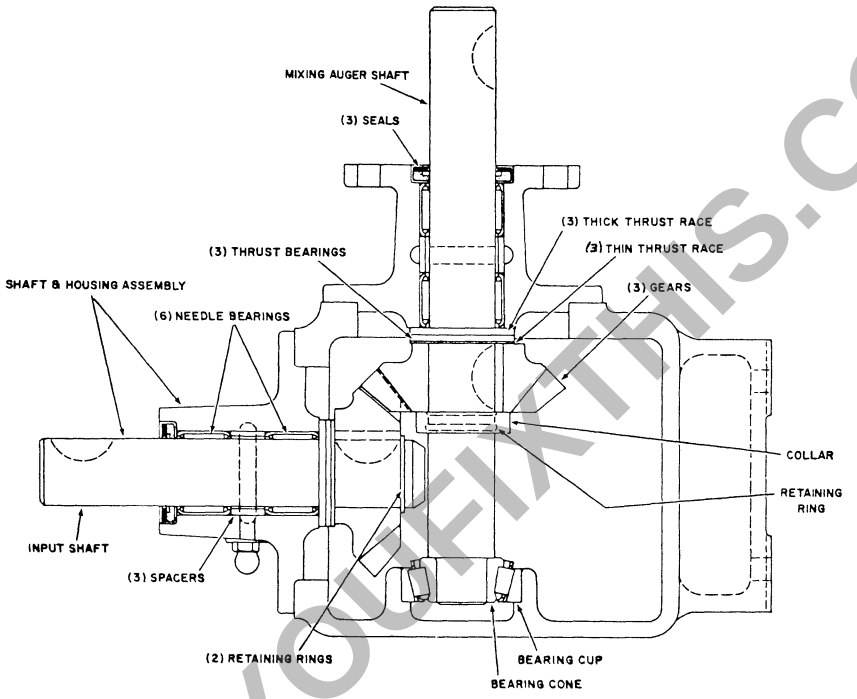


FIGURE 1-1

DISASSEMBLY

1. Normally, to service the gearbox assembly, it is desirable to remove the assembly from the grinder-mixer. This is done by disconnecting the input shaft, mixing auger, and unloading auger drive shaft. Then remove the four cap screws that secure the box to the frame.

Figure 1-1

2. Each of the shaft and housing assemblies are removable as a unit from the gearbox by removing the four cap screws holding each subassembly.
3. The shaft can be disassembled from the housing by removing the retaining ring, the gear, and the woodruff key. Then slip the shaft through the needle bearings.

ASSEMBLY

1. Flush out the gearbox and clean all parts.
2. Use the drawing as a guide for correct assembly.
3. Install the retaining ring and collar on the mixing auger shaft. Make sure the collar is firmly and squarely seated against the retaining ring.
4. Insert the woodruff keys.
5. Install the bearing cup in the gearbox housing.
6. Press the bearing cone against the shoulder on the mixing auger shaft.
7. Slip the gears into place and install the retaining rings on the input shaft and unloading auger shaft.

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10. Fill the gearbox to the level of the check plug with #90 multipurpose gear lube.
11. Reinstall the gearbox in the grinder-mixer.

PARTS LIST - MODELS 353, 355 GEARBOX

(1) Gearbox assembly
(2) Shaft - two
(3) Oil seal - three
(4) Cone - six
(5) Cup - six
(6) Spacer - three
(7) Shaft
(8) Washer - three
(9) Cover
(10) Nut - three
(11) Bevel gear, 15 T - three
(12) Square-head setscrew - five
(13) Jam nut - six
(14) Socket-head setscrew
(15) Flange-head bolt - three

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ASSEMBLY

1. Install bearing cups (3) and (8).
2. Install a bearing cone (16) against the spacer on the gearbox input shaft (15). Place a bearing cup (17) over the cone. Install the spacer (18) and the other bearing cup (17) and bearing cone (16).
3. Start the input shaft and bearing assembly into the neck of the gearbox housing. When the threaded end of the shaft enters the gearbox, start the pinion (19) on the shaft. Continue pushing the shaft through the gear until the washer (9) and nut (11) can be installed
4. Tighten the nut until it takes 2 in. lbs.-6 in. lbs. (0.226 N·m-0.678 N·m) to rotate the shaft in the bearings. If the bearing cups and spacer rotate, install the setscrew (23) and tighten it against the spacer enough to stop rotation. Once the bearing drag or preload has been set, install the cotter pin (25).

   NOTE: Do not bend the legs of the cotter pin over the end of the shaft. Loosen setscrew (23), if installed, and push the input shaft assembly outward until the pinion is against the gearbox.
5. Install the bearing cone (20) on the gearbox output shaft (1). Start the output shaft through the gearbox, installing the collar weld assembly (5), gear (6), and spacer (13) as you proceed. When the upper bearing cone (20) is seated against the cup, install a bearing cone (12), washer (9), and nut (11) on the lower end of the shaft.
6. Torque the nut on the end of the output shaft to 20 ft. lbs. (27 N·m). Back the nut off to the nearest castellation and install a cotter pin (25).

   NOTE: Do not bend the legs of the cotter pin over the end of the shaft.
7. Adjust the backlash to 0.006″-0.010″ at the closest point of mesh by moving the pinion gear and input shaft assembly in the neck of the gearbox. When the correct backlash has been obtained, coat the threads of the setscrew (23) with #2 Permatex. Install the setscrew. Torque it to 70 ft. lbs.-75 ft. lbs (94 N·m-101 N·m) and lock the jam nut (24).
8. Clean the edge of the hub cap (10) and the bore of the gearbox where it seats. Coat the edge of the hub cap with Loctite® RC 601-41. Install the hub cap, then seal the joint between the hub cap and gearbox with Permatex.
9. Apply a non-corrosive silicone sealant (Dow Corning Silastic 732 or equivalent) to the edge of the gearbox. Install the gearbox cover. If the elbow was removed from the cover, coat the threads with Permatex before reinstalling it. Coat the threads of the drain plug (26) with Permatex and reinstall it .
10. Reinstall the gearbox in the grinder-mixer. Secure the gearbox with ½″ lock washers and nuts. Torque to 66 ft. lbs. (89 N·m). Fill the gearbox with E.P. #90 gear lube to the level of the check plug. Coat the threads of the check plug with Permatex before installing it.
11. Apply grease to the splines of the gearbox output shaft and to the base of the square drive hub. Install the hub, heavy washer, and a ⅝″ x 1¾″ Grade 5 cap screw. Torque the cap screw to 150 ft. lbs. (203 N·m). Hammer seat the hub on the splines and retorque the cap screw to 150 lbs. (203 N·m).
12. Remove the wood blocks from under the mixing auger. Replace the access cover. Reconnect the gearbox drive coupler. Install the chain. Adjust the idler so there is ⅛″- ½″ (3 mm-12 mm) natural sag in the chain mid-span at the tightest point.
13. Reinstall the coupler shield and lube line.
14. Connect the PTO to the tractor. Disconnect the hammer mill drive. Operate the unit slowly and listen for any binding or unusual noises.

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The bearing is packed with an important note indicating the shim factor of that particular bearing. This shim factor is indicated by a number written on the enclosed slip, see A, Figure 1-9. This number will usually be within a range of 0-8. To determine the correct thickness of shims to be installed at A, Figure 1-8, add these two figures--the one on the gearbox at A, Figure 1-10, and the one marked on the bearing tag at A, Figure 1-9.

For example, the number or shim factor written on the enclosed slip with the bearing at A, Figure 1-9, is 5. The number stamped on the gearbox shown at A, Figure 1-10, is 8. Add 5 and 8 and the total is 13. Therefore, 0.013" thickness of shims then should be installed at A, Figure 1-8, under the inner pinion bearing race, C, Figure 1-8.

Assemble the parts in the following manner:

1. After calculating the correct thickness of shims, install them at A, Figure 1-8, and install the inner pinion bearing race, C, Figure 1-8, using a brass punch. Be sure the bearing race is properly seated.
2. Press the inner pinion bearing on the pinion shaft with a pipe placed against the inner race of the bearing, or install the bearing on the shaft by driving against the inner bearing race with a soft brass punch.

   IMPORTANT: Be certain the bearing is seated properly against the shoulder of the shaft all the way around.
3. Install the outer pinion bearing race, D, Figure 1-8. Be sure it is properly seated all the way around. Install it using a brass punch. Be careful not to damage the race.
4. Position the pinion shaft with the inner pinion bearing installed on it into the gearbox.
5. Turn the gearbox into the position shown in Figure 1-8, and support pinion, E, with a hard wooden block. Be sure the wooden block is high enough to support the weight of the pinion, pinion shaft, and gearbox so the bottom of the gearbox is not resting against the floor or workbench.
6. Install the outer pinion bearing on the pinion shaft using a pipe or a brass punch.
7. Install the inner locknut (4). Tighten this locknut until the pinion bearings are moderately preloaded. If a torque wrench is available, install the original cap screw in the end of the pinion shaft and tighten the locknut until a preload of 15 in. lbs.-25 in. lbs. (1.69 N·m-2.82 N·m) is obtained.

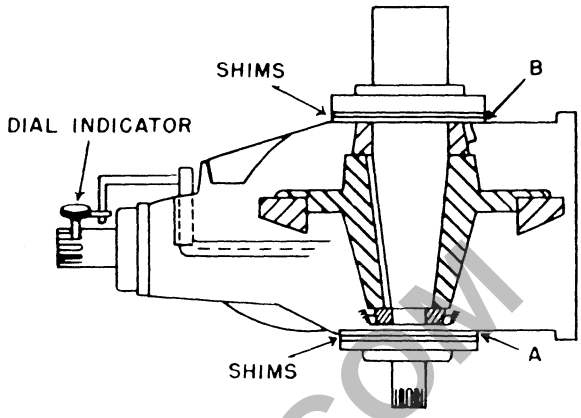


FIGURE 1-11

8. Install lock washer (5).
9. Install the outer locknut. Tighten and recheck the pinion bearing preload to be sure it has not changed. Bend one segment of the lock washer to hold it firmly in position.
10. Apply a thin coat of Permatex to the mating surface of the bearing retainer (3) and install it on the gearbox. Check oil seal (2) to be sure it is in good condition. If it is questionable, replace it.

    Check the ring gear to make certain it is correctly matched with the pinion. The identifying number etched on the outer circumference of the ring gear should correspond with the number etched on the pinion face. If the numbers on the pinion and ring gear are not the same, the gears are not matched and must not be used together.
11. Place the ring gear hub in a vise and bolt the ring gear to the ring gear hub with ten cap screws. Tighten the cap screws uniformly with 85 ft. lbs.-90 ft. lbs. (115 N·m-122 N·m) torque.
12. Position the ring gear hub in the gearbox and insert the shaft into the hub. Tap the shaft endways until the ring gear hub fits tight against the taper of the shaft. Support the smaller end of the ring gear hub on a 2½" (64 mm) pipe and press the shaft into the ring gear hub with approximately 20 tons (177,920 N) pressure.
13. Install bearing (25) on the crankshaft. Be sure it is seated tight against the ring gear hub all the way around. See Figure 1-11.
14. Install lock washer (23) and locknut (22). Tighten the locknut securely and bend one segment of the lock washer into a notch of the locknut to hold it securely in position.

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8. Place one thin thrust race against each gear, backed up by a thrust bearing and a thick thrust race at each location.
9. Press two needle bearings and a spacer into each housing.

   NOTE: Always press the needle bearings into the housing so that the bearing trade name is to the outside.

10. Insert the shafts and gears into the housings.
11. Install the seals with the lip to the inside.
12. Adjust the backlash as recommended in the "Adjustment" section.

    When installing the shaft and housing assemblies in the gearbox, coat the threads of the cap screws, as well as all joints, with #2 Permatex®.

13. Fill the gearbox to the level of the plug with #90 gear oil.
14. Reinstall the gearbox assembly in the grinder-mixer frame. Make sure all hardware is securely tightened and all drive shafts are correctly aligned.

ADJUSTMENT

Backlash between any two of the mating gears should be 0.007"-0.037". If it exceeds 0.037", add thin thrust races as required at the locations shown on the drawing. Refer to the Service Parts Catalog for the thin thrust race part number. Remove a thin thrust race if binding occurs between any of the gears, but always install at least one.

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MODEL 359

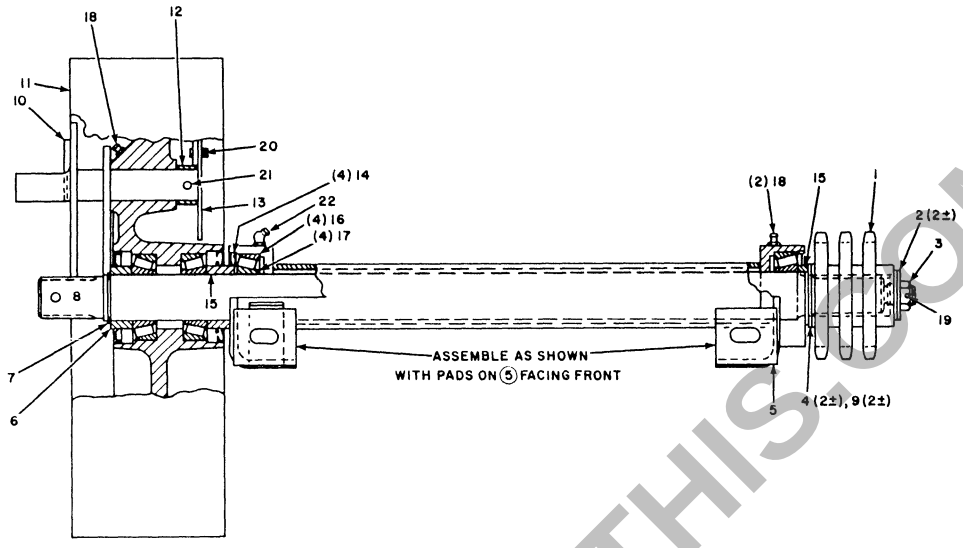


FIGURE 2-2

1. Clean all parts and inspect for wear before assembly.
2. Heat bearing cones (17) in oil to 250°F (121°C).
3. Install the bearing cups (16) into the bearing housing (5) and pulley (11).
4. Lay the drive shaft (8) in front of you with the threaded end to your right. Start at the left end of the shaft (8) and install a preheated bearing cone (17), with the taper to the right, to the right end of the largest diameter of the shaft or approximately 8⅝" (21.9 cm) from the left end.
5. Install two oil seals (14) on a spacer (15) with the lips of the seals pointed to keep grease in the housing (5) and pulley (11). Install the spacer and seals next to the bearing cone.
6. Install a preheated bearing cone (17) with the taper to the left. Install the pulley (11) and press the oil seal (14) into the right end. Install a preheated bearing cone (17) into the left side of the pulley followed by the keeper (6) and retaining ring (7).
7. Tap the bearing cone (17) at the right side of this assembly to the left until the pulley (11) has 0.002"-0.006" end play. Install an oil seal (14) in the left side of the pulley.
8. Install the bearing housing (5), pressing the oil seal (14) into place in the left end of the housing during assembly.
9. Install a preheated bearing cone (17) in the right end of the bearing housing followed by a spacer (15) and oil seal (14). Press the oil seal into the bearing housing.
10. Install the washers (4) and (9), sprocket (1), and washers (2). Install the castellated nut (3) and adjust it so the bearing housing (5) has 0.002"-0.006" end play. Secure the nut with a cotter pin (19).
11. Replace the drive shaft assembly on the grinder-mixer.
12. Align the drive and driven sheaves within 1/32" (0.78 mm). Refer to the grinder-mixer operator's manual for belt tension requirements.
13. Adjust the spring eyebolt to 2¼" (57 mm) from the bracket to the inside of the eye.

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