

# FINAL DRIVE 4.58:1 PLANETARY (C-6) 5.80:1 PLANETARY (TC-12)

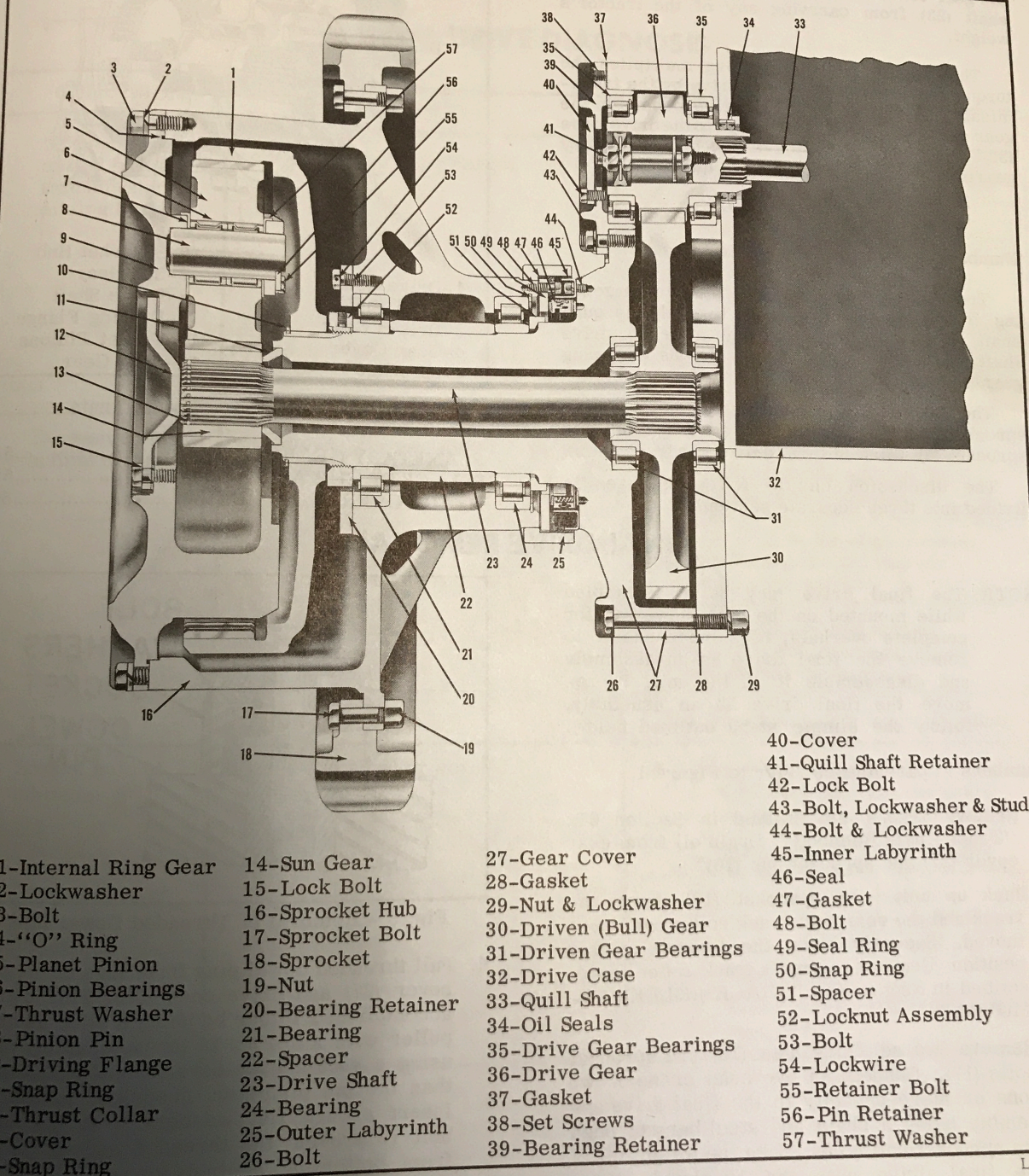


Fig. 1 - Cutaway View of Final Drive

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## DESCRIPTION

Numbers in parentheses refer to Figure 1.

The final drive assembly is a full-floating, double reduction type. Full floating means that the sprocket (18) and the tractor weight is fully supported by two bearings (21 & 24) mounted on the gear cover (27). This design prevents the drive shaft (23) from carrying any of the tractor's weight.

The double reduction gearing multiplies the torque delivered to the final drive by the transmission. The first gear reduction occurs in the gear cover (27) which is mounted to the drive case (32). The second reduction occurs in the planetary gearing located in each sprocket hub (16).

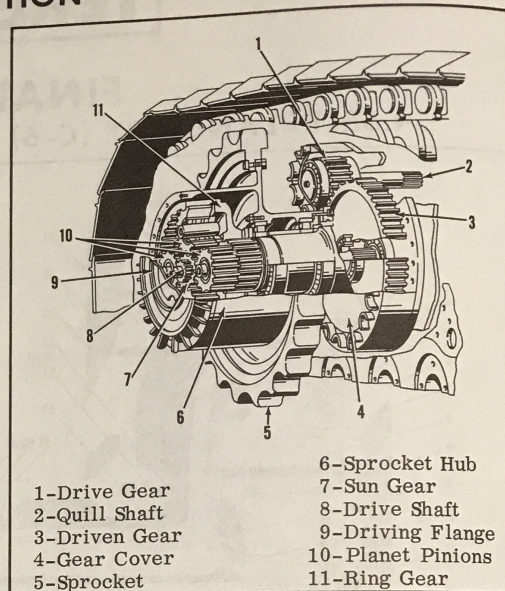
## POWER FLOW

Numbers in parentheses refer to Figure 2.

Torque from the transmission reduction gearing flows into the final drive through the quill shaft (2), drive gear (1), driven gear (3), drive shaft (8), sun gear (7), planet pinions (10), ring gear (11) and driving flange (9).

The driving flange (9) which is bolted to the sprocket hub (6), drives the sprocket hub and sprocket (5) which in turn, drives the track chain.

The discussion on the following pages is divided into three separate sections:



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Fig. 2 - Final Drive Power Train

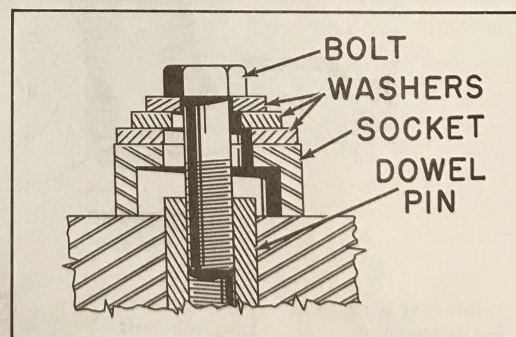
PLANETARY GEARING.....5A  
 SPROCKET HUB AND SPROCKET .....5B  
 GEAR COVER.....5C

## FINAL DRIVE REMOVAL

NOTE: The final drive may be disassembled while mounted on the unit; however, for complete overhaul, it is much easier to remove the final drive as an assembly and disassemble it off the unit. To remove the final drive as an assembly, follow the simple steps outlined below.

Numbers in parentheses refer to Figure 1.

1. Remove tracks as outlined in Section 6B, "Track Chain Removal". Drain oil from gear cover (27) and sprocket hub (16).
2. Jack up unit until sprocket (18) clears the track and the rearmost track roller can be removed. Securely block the tractor in this position. Remove rearmost track roller as described in Section 6C, "TRACK ROLLER REMOVAL".
3. Remove two adjoining nuts (19) and sprocket bolts (17). Connect an overhead crane of two tons or more capacity to the final drive assembly using a chain and steel bars through the sprocket bolt holes. Take the weight off of the final drive with the overhead crane.



L-5063

Fig. 3 - Removal of Threaded Dowel Pins

4. Pull threaded dowel pins from lugs on the gear cover (27) and drive case (32). This can be accomplished either by using a slide hammer puller with a 3/4" x 10 thread adaptor, or by using a socket or sleeve with an I.D. larger than the pin diameter, described as follows: Insert enough flat washers over the puller bolt to prevent the threaded end of the bolt from bottoming against the end of the hole from which the pin is being pulled. The socket



and washers are then positioned over the pin and the bolt is screwed into the threaded hole. (Figure 3 shows this method). Remove bolts (26, nuts, and lockwashers (29) mounting gear cover to drive case.

5. When the gear cover is off, remove the driven gear (30) which will remain in the cover.

6. Place the assembly, gear cover (27) down, on wooden blocking and proceed with disassembly as discussed in the succeeding sections.

### INSTALLATION

Refer to Sections 5C GEARCOVER, 5B SPROCKET HUB AND SPROCKET, and 5A PLANETARY GEARING in that sequence when reassembling the final drive.

## FINAL DRIVE DIAGNOSIS

CONDITION	REASON	REMEDY
No power transmitted from transmission to driving flange	Broken drive or quill shaft	A. Remove driving flange cover and pull drive shaft and sun gear.
		B. Remove cover from gear cover at drive gear. Pull gear and inspect quill shaft.
		C. Check for full quill shaft engagement in transmission ring gear through cover at rear of drive case.
Excessive noise in final drive	Chipped gear teeth, broken planetary gears or transfer gears	A. Pull cover from driving flange. Pull drive shaft and sun gear and inspect planetaries.
		B. Pull cover at top of gear cover. Pull drive gear and inspect transfer gear train.
		C. Pull planetary and inspect sprocket hub bearings. Check spindle nut for tightness.
	Loose sprocket	Torque sprocket nuts to specification.
Loss of gain of lubricant	Seals damaged or worn	A. If lubricant loss, check <ol style="list-style-type: none"> <li>1. Seal between gear cover and sprocket hub.</li> <li>2. For leaks at driving flange.</li> </ol>
		B. If lubricant gain, check <ol style="list-style-type: none"> <li>1. Oil level in drive case. Drain down to proper level if too high.</li> <li>2. Seal between drive case and gear cover.</li> </ol>

\* \* \* \*



## PLANETARY ASSEMBLIES WITH 3 OR 4 GEAR PLANET PINIONS

### OPERATION

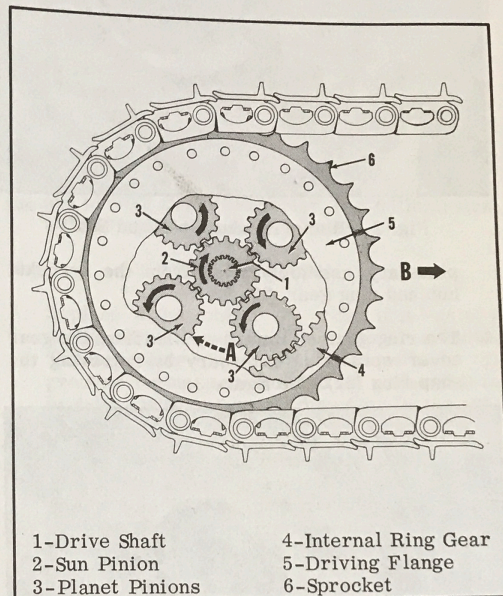
(Numbers in parentheses refer to Figure 1.)

The planetary assemblies are located in the sprocket hub of each sprocket, where they may be easily reached for servicing. It is possible to perform any necessary service on the planetary assembly without jacking up the tractor or removing the tracks.

The inboard end of the drive shaft (1) is splined into the large transfer gear driven by the transmission quill shaft and the transmission drive gear. As the drive shaft revolves, the sun pinion (2), which is splined to the outboard end of the drive shaft, also rotates. The sun pinion is meshed with the planet pinions (3) which are mounted between the driving flange (5) and planetary carrier. The internal ring gear (4) is also meshed with the planet pinions but is splined to the outside diameter of the gear cover spindle and cannot rotate.

As the planetary pinions (3) are rotated on their axes by the sun pinion (2), the planetary carrier and driving flange (5) also rotate in direction (A). This occurs because the planetaries (3) are meshed with the stationary ring gear (4). The driving flange is bolted to the sprocket hub, therefore the sprocket hub and sprocket (6) rotate with the driving flange, moving the tractor in the direction indicated by arrow (B).

The torque multiplication of this type of gear set is found by dividing the number of teeth in the



L-5490

Fig. 1 - Schematic of Planetary Operation

ring gear by the number of teeth in the sun gear and adding one. For example, a ring gear of 30 teeth and a sun pinion of 10 teeth would produce a torque multiplication of 4.

### PLANETARY REMOVAL

(Numbers in parentheses refer to Figure 5.)

NOTE: An alternate method of removal is discussed in section 5 where the entire final drive assembly, including the planetaries, may be removed as a unit for overhaul.

1. Drain lubricant from planetary reservoir by moving tractor until drain plug (2) in driving flange (9) is at its lowest point of travel and remove plug.
2. Remove lock bolts (4) and pull off flange cover (3 or 5). Remove sun pinion (19)

and drive shaft (20) as an assembly. See Figure 2.

NOTE: If inspection shows that the sun pinion or drive shaft is the only part needing replacement, make the replacement and install the drive shaft and sun pinion as discussed under "Installation", paragraph 3.

3. Remove driving flange mounting bolts and lock-washers (1). Install lifting bolts in three threaded (3/4-10) flange puller holes. Attach a chain hoist and break the driving flange loose and away from the dowels (8). Swing the





Fig. 2 - Removing Sun Gear and Shaft

planetary assembly away from the sprocket hub and ring gear (22).

4. The ring gear (22) may be pulled from the gear cover spindle if necessary by removing the snap ring (21). See figure 3.



Fig. 3 - Ring Gear Snap Ring

## DISASSEMBLY

NOTE: In disassembling the planetary carrier it is wise to mark the retainers, retainer pins, bearings and pinion gears so that they may be reassembled in their original positions.

1. Place the planetary assembly on a clean work surface with the gear side up. Remove and discard "O" ring (10). Remove lockwire (15) and bolts (14) from pinion pin retainers (13). Remove retainers. The pinion pins (11) may

be pulled by threading puller bolts into their end holes and lifting out. The pinion gears (17) may now be removed from the carrier. Re-cover the thrust washers (12) as the gears are removed. The planet pinion roller bearings (16) may be pressed from the pinion gear bores,



Fig. 4 - Planetary Carrier-Driving Flange

using an arbor press and sleeve. Early models had a one-roller and a two-roller bearing section in each gear (Current models have two identical roller bearing sections). The planetary carrier and driving flange is now completely disassembled. See figure 4.

## INSPECTION

1. Thoroughly clean the parts with a suitable solvent and air dry. Wash the roller bearings in fresh clean solvent and lubricate thoroughly with same type of lubricant used in operation.
2. Inspect all parts for damage and excessive wear. Check the driving flange for elongated pinion pin holes. Replace damaged or worn parts.
3. Check condition of thrust collar (23 or 24) installed in the end of the gear cover spindle. Replace if it is worn.

## ASSEMBLY

1. Build up the planetary carrier and driving flange assembly. Lay the driving flange (9) on a clean surface. If the roller bearings (16) were removed from the planet pinion gears, install them using a bearing sleeve and arbor press. Use a prick punch or similar method to identify the one and two-roller sections which are installed in each gear. (This step is unnecessary with current identical bearings.) Later when the gear is installed in the carrier the two-roller bearing section in each



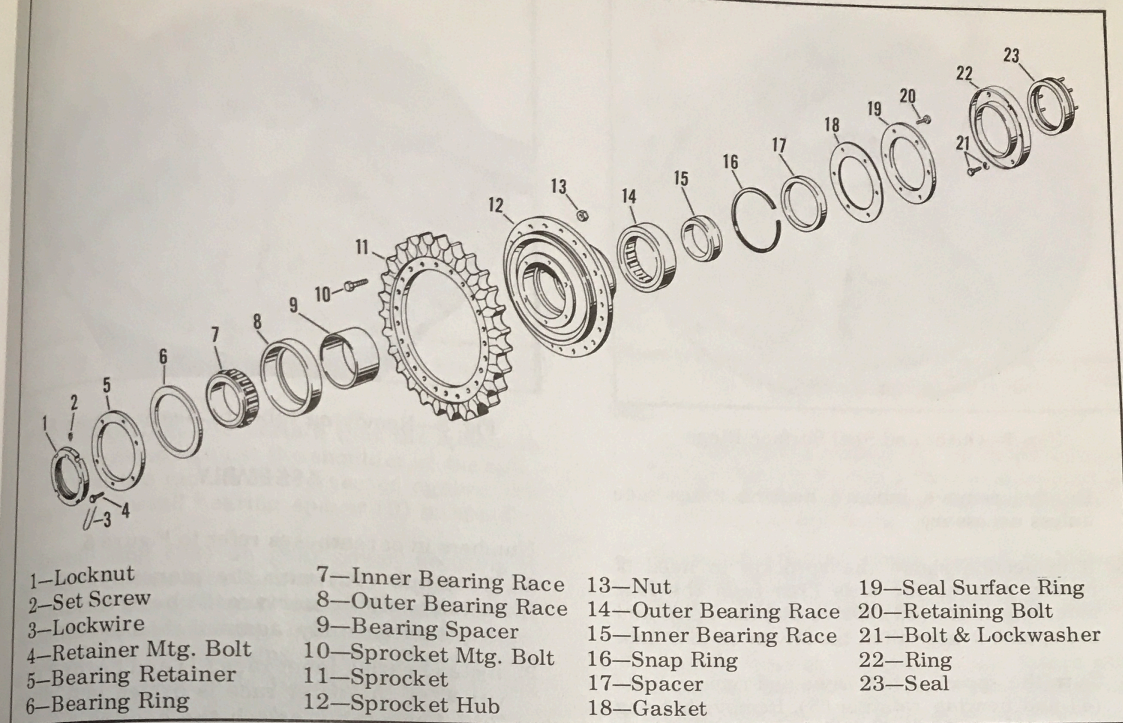
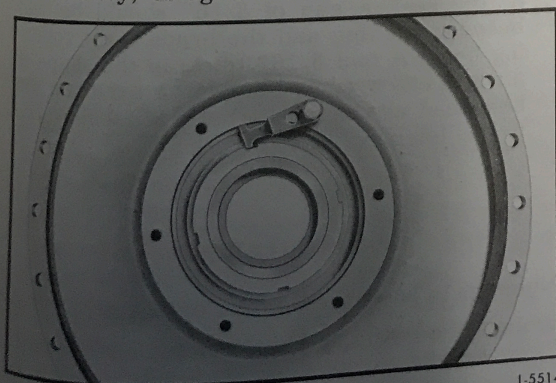


Fig. 5—Exploded View of Sprocket Hub and Sprocket

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3. Install Fishtail Wrench J-8551, using a 5/8-11x3 bolt in one of the bearing retainer bolt holes. (This wrench is furnished in the standard tool kit which is supplied with the unit.) Unstake the set screws (2) in locknut (1). Place fishtail wrench in one of the locknut slots and break the locknut loose by turning the sprocket hub (12). (See Figure 6.) Remove the locknut and fishtail wrench. Temporarily replace bearing retainer (5) and mounting bolts (4).

4. Connect an overhead crane to the sprocket assembly, using a chain and two steel bars



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Fig. 6—Using Fishtail Wrench J-8551

through two sprocket bolt holes. Remove the sprocket and hub assembly from the gear cover spindle, being careful not to damage the seal (23) or seal ring (22).

5. Remove seal (23) and ring (22) from gear cover. Place seal in a box and cover it to prevent damage.

## DISASSEMBLY

Numbers in parentheses refer to Figure 5.

1. Lay hub on planetary mounting face. Remove retaining bolts (20) and pull off the seal surface ring (19) and gasket (18). (See Figure 6.) Place seal surface ring (19) in the box with the seal (23) to prevent sealing surfaces from being damaged.
2. If it is necessary to remove the bearing outer race (14), remove snap ring (16) from the bore of the sprocket hub (12). (See Figure 8.) Pull race (14) out with a bearing puller. Remove spacer (9). The bearing inner race (15) may be removed from the spindle by applying heat and using a puller. Do not heat the race to a point where it cannot be touched by hand. If overheated, a thermal fit may result. Spacer (16) is removed with the race.



cover. Make sure that the shaft is pushed in as far as it will go. Measure from the outer surface of the driving flange (9) to shaft (20), this is dimension 1. Measure height of thrust button (6) in cover (5), above inner face of cover (Dimension 2). Subtract dimension 2 from Dimension 1. The difference is shaft end play; minimum allowable shaft end play is  $1/16''$ . If everything is correctly assembled, the shaft end play should exceed  $1/16''$ .

On later models equipped with cover (3), obtain dimension 2 by measuring the height of the cover center portion above the cover mounting face.

6. Coat mounting face of cover (3 or 5) with No. 2 Permatex or equivalent and install with gasket (7) using bolts and lockwashers (1).
7. Make sure that the short bolts and lockwashers (1) are installed in the three threaded puller holes in the flange. Move tractor until "Oil Level" index mark is in horizontal position and fill the planetary reservoir through the drain plug hole in the flange. This hole serves as a filler and level check hole as well as a drain. Fill reservoir with type of lubricant recommended in Section 11 until lubricant runs out filler hole. Replace plug (2).

\* \* \* \*



## SPROCKET HUB AND SPROCKET

### DESCRIPTION

The sprocket hub is bolted to the planetary housing and rides on the gear cover spindle, supported by two bearings. The hub transfers torque from the planetary gearing to the track by means of the sprocket, which is bolted to both the planetary housing and the sprocket hub. Both the hub and the sprocket are steel cast-

ings with their bearing bores and other finished surfaces machined after casting.

The sprocket is secured to the hub and planetary housing by special heat-treated and machined bolts. This allows the sprocket to be removed, inspected and repaired, if necessary, without disassembling the remaining final drive assembly.

### SPROCKET REPAIR

#### CHECKING SPROCKET WEAR

It is difficult to measure sprocket wear in exact numerical dimensions since the tops of the sprocket teeth (that do not wear under normal conditions) cannot be used as measurement reference points. This is because the tips are not machined, but are left "as cast", and may vary as much as a quarter of an inch in height.

Sprocket wear can best be checked by inspecting the tooth wear pattern. The rate and degree of sprocket wear is determined by the accuracy of mating of the track bushings with the sprocket teeth. As track stretch (and pitch) increases, bushings no longer mate smoothly with the sprocket, and wear occurs on the drive sides of the sprocket teeth. The more the track stretches, the greater this wear becomes. If left unchecked, the sprocket teeth eventually wear to a knife edge, making the sprocket unfit for further use.

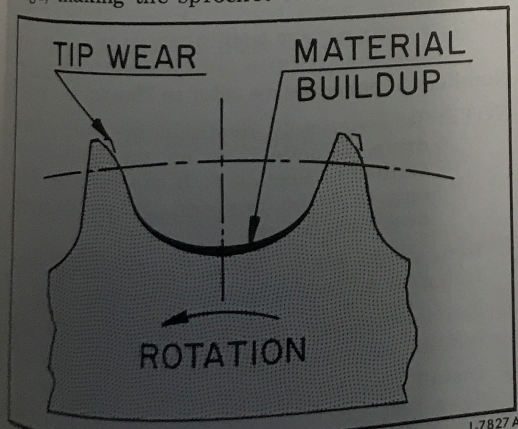


Fig. 1—Material Buildup on Sprocket

While the unit is working, certain types of moist material may become wedged in between the track bushings and the roots of the sprocket teeth and remain in the root area of the teeth until it builds up to a thickness of 1/16 to 1/8 of an inch. This buildup of material increases the root diameter of the sprocket teeth which in turn makes the pitch diameter of the sprocket greater than the track pitch. Under this condition, sprocket tooth tip wear appears. Figure 1 illustrates this material buildup and the sprocket tooth tip wear. Such a wear pattern is normal with the above conditions and does not indicate abnormal wear.

Figure 2 shows sprocket tooth wear caused by material buildup in the tooth roots. Note that the tooth tips have worn to a rounded condition. This wear is a continuation of the initial tip wear shown in Figure 1. Additional service on this sprocket will continue the normal wear pattern that has started at the root area on each side of the teeth. In time, both sides of the teeth

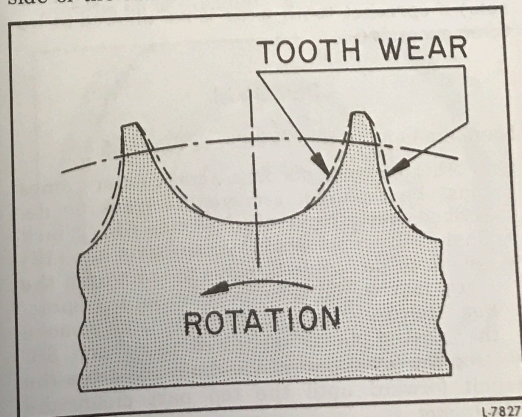


Fig. 2—Tooth Tip Wear



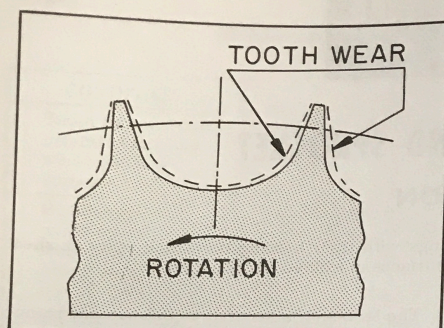


Fig. 3—Normal Sprocket Wear

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will wear in the normal manner from the root area upward. The rounded side of the tooth tips will wear away from below until these tips are worn to a knife edge.

When the unit has been working in dry materials that do not build up in the sprocket tooth roots, the tooth tips do not wear prematurely and a normal sprocket wear pattern develops. This normal wear pattern is shown in Figure 3.

A sprocket that has reached its life expectancy is pictured in Figure 4. When the sprocket is worn this far, the track bushings jump the sprocket teeth frequently.

Turning track pins and bushings before normal sprocket wear becomes excessive will extend the life of the sprocket substantially. Pins and bushings should be turned 180° or replaced before the worn areas of the drive sides of the sprocket teeth wear to within a quarter of an inch of the tooth tips. Wear on the sprocket teeth beyond this point makes it impractical to turn or replace the pins and bushings without replacing the sprocket.

Sprockets normally last through two sets of track pins and bushings (including turning of both sets) if sprocket tooth wear is not allowed to become excessive.

### REMOVAL

Numbers in parentheses refer to Figure 8.

1. If other components on the track roller frames must be repaired, remove the track as described under "Removal" in Section 6B, "Track Chain". If the sprocket hub only is to be repaired, move the unit until the track master pin is midway up on the sprocket. Release the track tension and remove the master pin as discussed in Section 6B. Drop the lower part of the chain and drive the unit forward until the top part clears the sprocket.
2. Jack up the drive case until the sprocket and

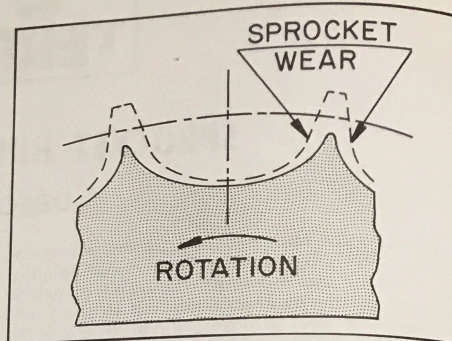


Fig. 4—Worn Sprocket

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rearmost track roller clear the track. Block the unit in position and remove the jacks. Remove the rearmost track roller as described under "Removal" in Section 6C.

3. Remove the planetary housing as described under "Removal" in Section 5A. There are twenty-four mounting bolts (10) and nuts (13); twenty holding the planetary housing to the sprocket and hub, and the other four that mount the sprocket only to the hub. The bolts must be driven out and care should be taken to prevent damaging the threads.
4. After driving out the mounting bolts, break the sprocket (11) loose from the hub (12). Attach a sling to the sprocket and remove.

### INSTALLATION

1. The installation of the sprocket is the reverse of the removal. When placing the sprocket on the hub, be sure that the hub and sprocket holes are aligned before driving the mounting bolts (10) into place. The nuts (13) should be on the inboard side of the sprocket.
2. Be sure that the sprocket mounting bolts are tightened to the torque specified in Section 12C.

### SPROCKET HUB REMOVAL

Numbers in parentheses refer to Figure 5.

NOTE: To completely overhaul the entire final drive, it may be removed as an assembly as described in Section 5. If sprocket hub only is to be removed, follow the steps described below.

1. Remove the planetary assembly and internal ring gear as described in Section 5A. Leave sprocket attached to hub.
2. Cut lockwire (3) and remove bolts (4) and bearing retainer (5).



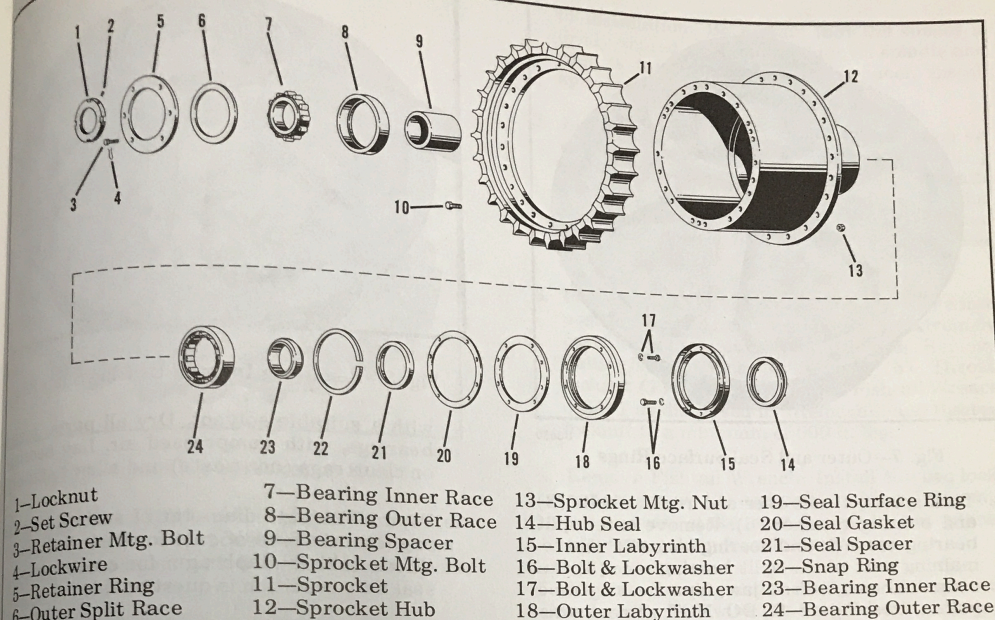


Fig. 5—Exploded View of Sprocket Hub and Sprocket

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locknut (1). Place Fishtail Wrench in one of the locknut slots and break the locknut loose by turning the sprocket hub (12). Remove locknut and Fishtail Wrench. Temporarily replace bearing retainer (5) and mounting bolts (3).

4. Remove two adjoining sprocket mounting bolts (10) and nuts (13). Connect an overhead crane to the sprocket assembly, using a chain and two steel bars through the sprocket bolt holes. Remove the sprocket hub assembly from the gear cover spindle being careful not to damage seal (14) or seal ring (19).

5. Remove seal (14) and inner labyrinth (15) from gear cover. Place seal in a box and cover it to prevent it from being damaged.

### DISASSEMBLY

Numbers in parentheses refer to Figure 5.

1. Lay hub on planetary mounting face. Remove bolts and lockwashers (17) and pull off outer labyrinth (18), seal surface ring (19) and gasket (20). See Figure 7. Place seal surface ring in box with seal to prevent sealing surfaces from being damaged.

2. If it is necessary to remove the inboard bearing assembly (24), remove snap ring (22)

from bore of hub (12). See Figure 8. Pull assembly (24) out with a bearing puller. Remove spacer (9) from gear cover spindle. Bearing race (23) may be removed by applying heat and using puller. Do not heat race to a point where it cannot be touched by hand. If overheated a thermal fit may result. Spacer (21) is removed with the race. Do not remove inboard bearing assembly unless necessary.

3. If inspection shows sprocket in need of repair remove nuts (13) from mounting bolts (10). Drive out bolts. The sprocket may then be driven off of the hub.

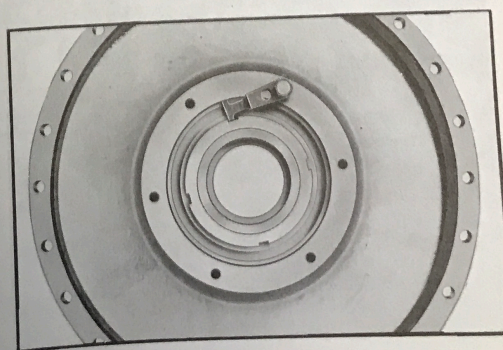
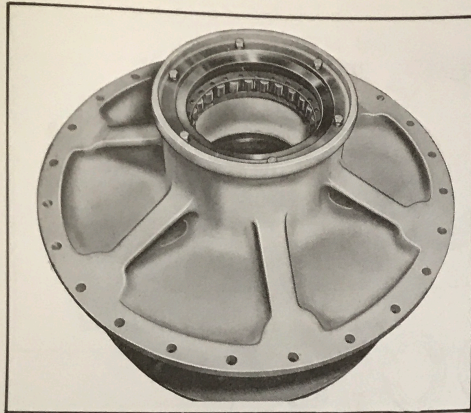


Fig. 6—Using Fishtail Wrench J-8551

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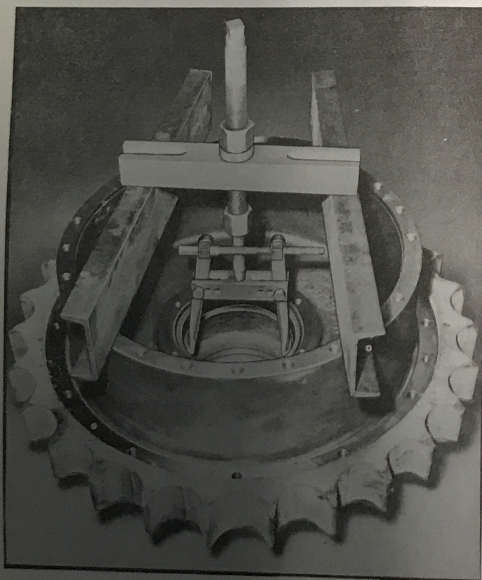
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Fig. 7—Outer and Seal Surface Rings

4. Turn sprocket hub over and remove bolts (3) and bearing retainer (5). Remove outer split bearing race (6) and bearing cone (7). The remaining part of the split bearing race (8) can be pulled out with a jaw type bearing race puller. See Figure 9. DO NOT remove this half of race unless a complete new bearing assembly (6, 7, & 8) is to be installed.

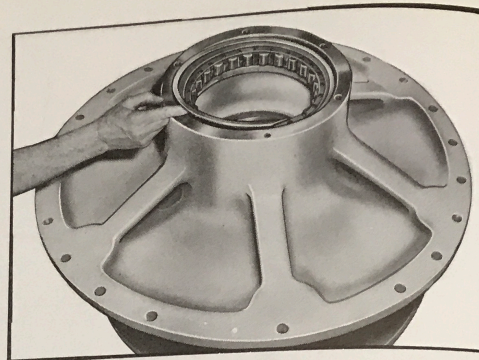
### INSPECTION

1. Thoroughly clean all parts except seal (14)



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Fig. 9—Removing Outboard Bearing Race



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Fig. 8—Removing Inboard Bearing Snap Ring

with a suitable solvent. Dry all parts, except bearings, with compressed air. Lay bearings on clean rags (not waste) and allow to air dry.

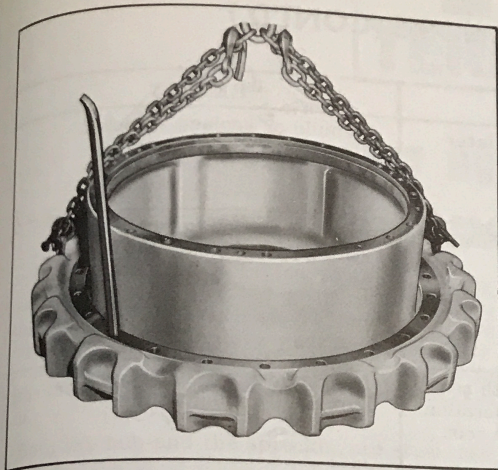
2. Wipe off outside diameter of seal with a clean rag. Inspect face of seal for wear and cracks. Check rubber diaphragm for cracks. Replace seal if its condition is questionable.
3. Check bearings for chips, pulled metal, cracks and wear; replacing those in questionable condition. Always replace bearings as an assembly, never one part at a time. Before installing bearings, lubricate them thoroughly with type of oil that they will run in.
4. Inspect seal surface ring (19) for wear. This ring may be reversed if the seal side has become worn.

### ASSEMBLY

Numbers in parentheses refer to Figure 5.

1. Place hub (12) planetary end up. Install inboard half of split bearing race (8), being certain it is seated firmly against shoulder in bore.
2. Install bearing cone (7) in the split race (8). Place outer half of the split race (6) in the bore so that the chamfered side is facing up. Temporarily install bearing retainer (5) and mounting bolts (3).
3. Install sprocket (11) on hub (12). See Figure 10. Install mounting bolts (10), driving them into place, and securing them on the inboard side of sprocket with nuts (13).
4. Turn sprocket hub over. Install bearing assembly (24) in hub bore. Make certain cone is seated against bore shoulder. Install snap ring (22) in its groove in hub.





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Fig. 10—Installing Sprocket on Hub

5. Place gasket (20), seal ring (19) and outer labyrinth (18) on sprocket hub in that order. Secure these parts with bolts and lockwashers (17).

## INSTALLATION

Numbers in parentheses refer to Figure 5.

1. Install bearing spacer (21) and inner race (23) on gear cover spindle. For ease of installation the race may be heated in oil at 250° F. for approximately thirty minutes prior

to installation. Be certain that the spacer is firmly seated against shoulder on spindle and race is firmly seated against spacer. Install spacer (9) on spindle.

2. Install inner labyrinth (15) on gear cover securing it with bolts and lockwashers (16). Apply a good grade of cup grease or white lubricant to seal (14) to provide lubrication during run-in period. Install seal, making certain seal dowels fit in their respective hole in gear cover.
3. Pick up sprocket hub with crane and move into position on gear cover spindle. Be extremely careful not to damage spindle threads. Remove bolts (3) and bearing retainer (5). Thread locknut (1) on spindle. Install Fishtail Wrench J-8551 as discussed in "Removal" and tighten locknut to a minimum of 900 ft. lbs.
4. Remove Fishtail Wrench. Install the two locknut set screws (2) and tighten. After tightening set screws, stake each screw in two places to prevent them from loosening up.
5. Replace bearing retainer (5) and fasten with bolts (3). Lockwire (4) bolts after tightening.
6. Check sprocket mounting bolts nuts (13) making certain they are torqued to specification given in Section 12C.
7. Install ring gear and planetary assembly as discussed in Section 5A under "INSTALLATION".

## SPECIAL TOOLS

The Fishtail Wrench J-8551, illustrated in Figure 6, may be obtained from your local TEREX Dealer or directly from the Kent Moore Organization whose address is:

Kent Moore Organization  
1501 South Jackson Street  
Jackson, Michigan

## SPROCKET WEAR DIAGNOSIS

CONDITION	REASON	REMEDY
Forward side tooth wear with normal bushing contact.	Normal wear pattern.	Turn pins and bushings; replace sprocket; switch sprockets.
Reverse side tooth wear with normal bushing contact.	Normal wear pattern.	Turn pins and bushings; replace sprocket; switch sprockets.
Climbing tooth wear; excessive pin, bushing, and sprocket tooth wear.	Excessive track pitch.	Turn pins and bushings; replace sprocket; switch sprockets.



## SPROCKET WEAR DIAGNOSIS (CONT'D.)

CONDITION	REASON	REMEDY
Tooth root wear; accelerated bushing wear, reduced sprocket pitch.	Bushing sliding radially or laterally across tooth root.	Rebuild or replace sprocket.
Bushing rotative wear; accelerated tooth wear under heavy reverse loading and high reverse speeds.	Bushing rotates at engagement with top of sprocket tooth.	Operate at slow reverse speeds; switch sprockets.
Reverse side tooth wear; increased sprocket pitch and bushing wear.	Bushing forced against tooth reverse side tip in forward operation by material packed in tooth root.	In extreme cases, use snow sprockets and shoes.
Sprocket tooth side wear; accelerated link face wear.	Side slope operation; misaligned track frame.	Use track retention guards; rebuild or replace sprocket.
Gouged sprocket tooth tip corners; accelerated sprocket tooth and link face wear.	Side slope operation; misaligned track frame; excessive track pitch.	Use track retention guards; align track frame.



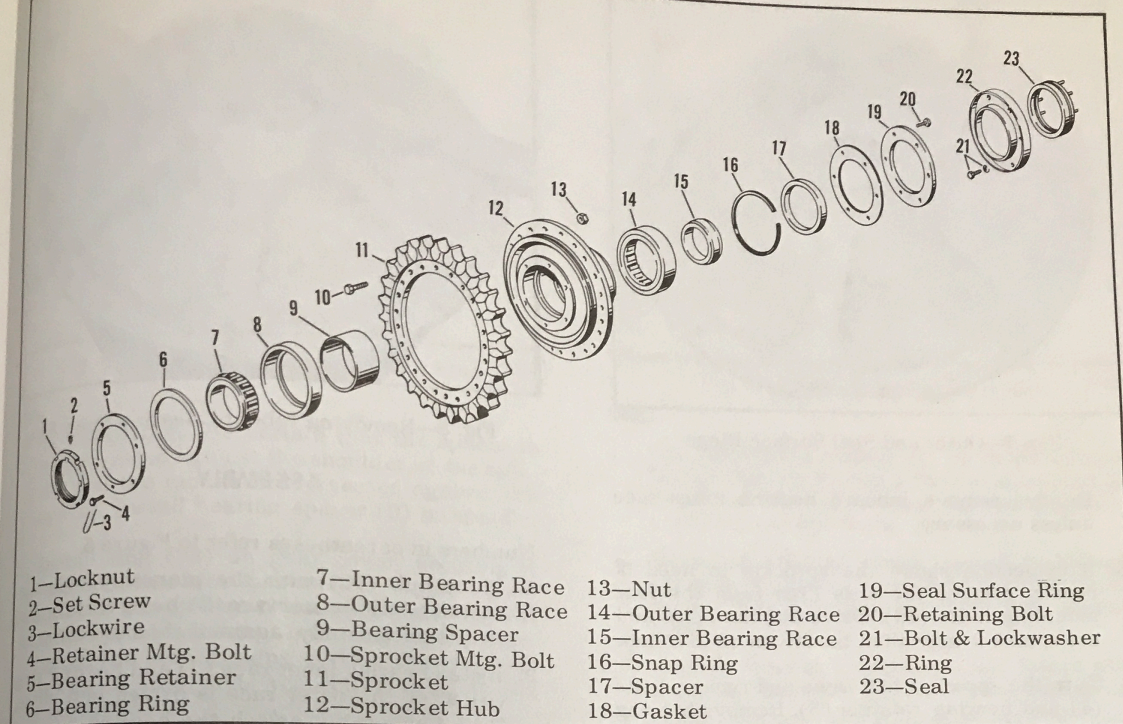
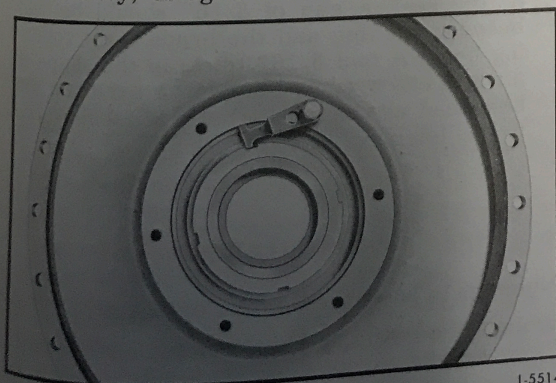


Fig. 5—Exploded View of Sprocket Hub and Sprocket

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3. Install Fishtail Wrench J-8551, using a 5/8-11x3 bolt in one of the bearing retainer bolt holes. (This wrench is furnished in the standard tool kit which is supplied with the unit.) Unstake the set screws (2) in locknut (1). Place fishtail wrench in one of the locknut slots and break the locknut loose by turning the sprocket hub (12). (See Figure 6.) Remove the locknut and fishtail wrench. Temporarily replace bearing retainer (5) and mounting bolts (4).

4. Connect an overhead crane to the sprocket assembly, using a chain and two steel bars



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Fig. 6—Using Fishtail Wrench J-8551

through two sprocket bolt holes. Remove the sprocket and hub assembly from the gear cover spindle, being careful not to damage the seal (23) or seal ring (22).

5. Remove seal (23) and ring (22) from gear cover. Place seal in a box and cover it to prevent damage.

## DISASSEMBLY

Numbers in parentheses refer to Figure 5.

1. Lay hub on planetary mounting face. Remove retaining bolts (20) and pull off the seal surface ring (19) and gasket (18). (See Figure 6.) Place seal surface ring (19) in the box with the seal (23) to prevent sealing surfaces from being damaged.
2. If it is necessary to remove the bearing outer race (14), remove snap ring (16) from the bore of the sprocket hub (12). (See Figure 8.) Pull race (14) out with a bearing puller. Remove spacer (9). The bearing inner race (15) may be removed from the spindle by applying heat and using a puller. Do not heat the race to a point where it cannot be touched by hand. If overheated, a thermal fit may result. Spacer (16) is removed with the race.



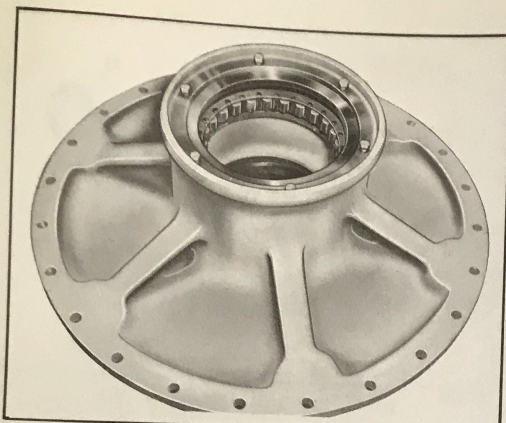


Fig. 7—Outer and Seal Surface Rings

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Do not remove inboard bearing inner race unless necessary.

3. If inspection shows the sprocket in need of repair, remove the nuts (13) from the four mounting bolts (10). Drive out the bolts and the sprocket may then be driven off the hub.
4. Turn the sprocket hub over and remove bolts (4) and bearing retainer (5). Remove bearing ring (6) and bearing inner race (7). The remaining bearing outer race (8) can be pulled with a bearing puller. DO NOT remove this half of the race unless a complete new bearing assembly is to be installed.

### INSPECTION

1. Thoroughly clean all parts except the seal (23) with a suitable solvent. Dry all parts, except bearings, with compressed air. Lay bearings on clean rags (not waste) and allow to air dry.
2. Wipe off the outside diameter of seal (23) with a clean rag. Inspect face of seal for wear and cracks. Check rubber diaphragm for cracks. Replace the seal if its condition is questionable.
3. Check the bearings for chips, pulled metal, cracks and wear, replacing those in questionable condition. Always replace bearings as an assembly, never one part at a time. Before installing bearings, lubricate them thoroughly with the type of oil that they will run in.
4. Inspect the seal surface ring (19) for wear. This ring may be reversed if the seal side has become worn.

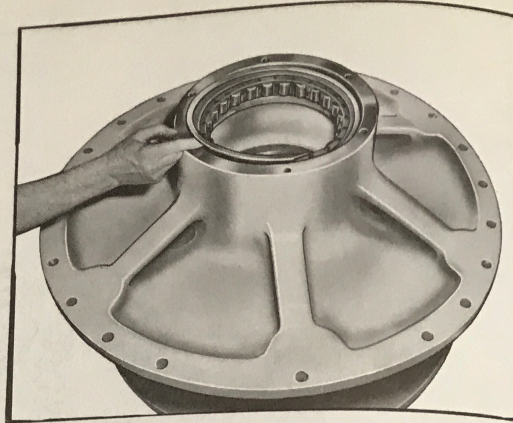


Fig. 8—Removing Inboard Bearing Snap Ring

L-3631

### ASSEMBLY

Numbers in parentheses refer to Figure 5.

1. Place hub (12) with the planetary side up. Install bearing outer race (8), being certain that it is sealed firmly against shoulder in bore.
2. Install bearing inner race (7) and bearing ring (6) after the outer race is driven into place, then temporarily attach the bearing retainer (5) and mounting bolts (4).
3. If sprocket (11) was removed, position it on hub at this point and drive in the four mounting bolts (9). Secure the bolts on the inboard side of the sprocket with nuts (13).
4. Turn sprocket hub over. Install bearing outer race (14) in the hub bore. Make certain it is seated evenly against the bore shoulder. Install snap ring (14) in its groove in the hub.
5. Place gasket (16) and seal surface ring (17) on sprocket hub in that order. Secure these parts with three retaining bolts (20). To maintain the desired clearance between the seal and seal surface ring due to the bellows action of the seal, a gap of  $3/16$ " should be held between the ring and the heads of the retaining bolts. A tool  $3/16$ " thick, in the shape of an open end wrench, can be inserted under the bolt head as the bolt is being tightened down to this tolerance. (See Figure 9.)

### INSTALLATION

Numbers in parentheses refer to Figure 5.

1. Install bearing spacer (17) and bearing inner race (15) on gear cover spindle. For ease of installation the race may be heated in oil at  $250^{\circ}$  F. for approximately thirty minutes prior



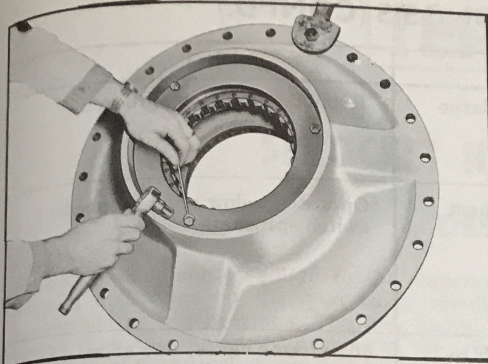


Fig. 9—Using Tool on Seal Surface Ring L-5516

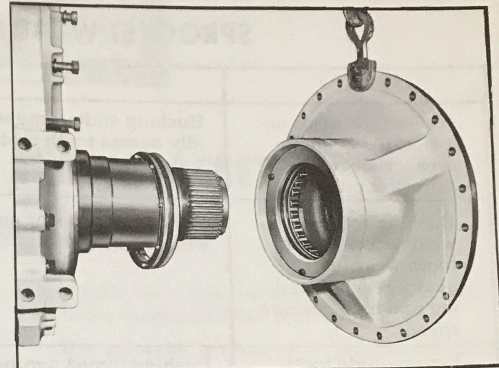


Fig. 10—Positioning Sprocket Hub L-5517

to installation. Be certain that the spacer is firmly seated against the shoulder on the spindle and the race is firmly seated against the spacer. Install bearing spacer (9) on spindle.

2. Install ring (22) on gear cover, securing it with bolts and lockwashers (21). Apply a good grade of cup grease or white lubricant to seal (23) to provide lubrication during run-in period. Install the seal, making certain that the seal dowels fit into their respective holes in the gear cover.
3. Pick up the sprocket hub with a crane and move it into position on the gear cover spindle. (See Figure 10.) Be extremely careful not to damage the spindle threads or seal (23). Remove bolts (4) and bearing retainer

(5). Thread the locknut (1) on to the spindle. Install Fishtail Wrench J-8551 as discussed on Page 2 of this section, and tighten locknut to a minimum of 900 ft. lbs.

4. Remove the fishtail wrench. Install the locknut set screws (2) and tighten. Stake each screw in two places to prevent them from coming loose.
5. Replace bearing retainer (5) and fasten with bolts (4). Lockwire (3) bolts after tightening.
6. Check sprocket mounting bolt nuts (13), making certain that they are torqued to specifications given in Section 12C.
7. Install the internal ring gear and planetary assembly as discussed in Section 5A under "Installation".

## SPECIAL TOOLS

The Fishtail Wrench J-8551, illustrated in Figure 6, may be obtained from your local TEREX Dealer or directly from the Kent Moore Organization whose address is:

Kent Moore Organization  
1501 South Jackson Street  
Jackson, Michigan

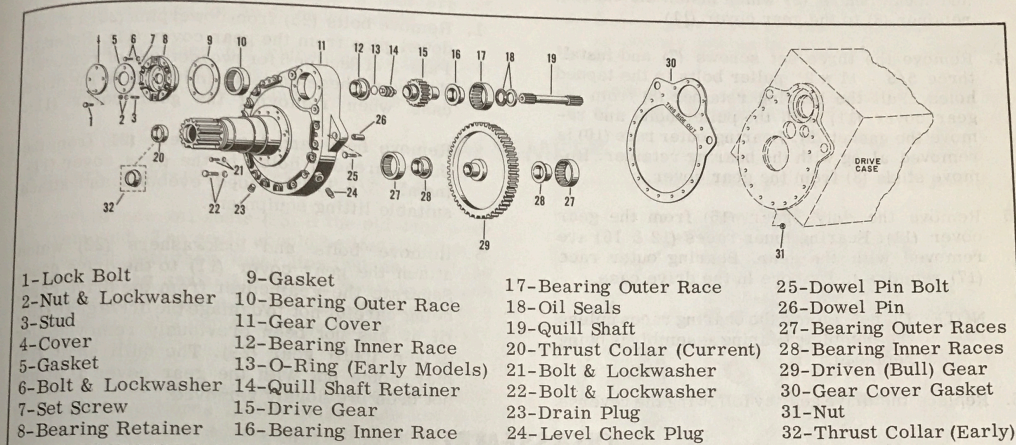
## SPROCKET WEAR DIAGNOSIS

CONDITION	REASON	REMEDY
Forward side tooth wear with normal bushing contact.	Normal wear pattern.	Turn pins and bushings; replace sprocket; switch sprockets.
Reverse side tooth wear with normal bushing contact.	Normal wear pattern.	Turn pins and bushings; replace sprocket; switch sprockets.
Climbing tooth wear; excessive pin, bushing, and sprocket tooth wear.	Excessive track pitch.	Turn pins and bushings; replace sprocket; switch sprockets.





## GEAR COVER



L-3850

Fig. 1 - Exploded View of Gear Cover

## DESCRIPTION AND OPERATION

The gear cover performs two functions: It acts as a spindle for the sprocket hub and it houses the drive and driven gears, which provide the first gear reduction in the final drive assembly.

The gear cover is rigidly secured to the drive case by bolts and dowels. It is a steel casting whose bearing bores and finished surfaces are machined after casting. The drive gear and driven (bull) gear are mounted within the cover, next to the drive case.

Torque from the transmission is transferred

through the quill shaft to the drive gear. This gear, mounted on roller bearings, is meshed with the driven gear. The driven gear is splined to one end of the short drive shaft. The other end of the shaft is splined to the planetary assembly sun gear, which transmits the torque through the planetary system to the sprocket hub, sprocket, and track chain.

**NOTE:** The entire final drive may be removed as an assembly. If necessary, refer to Section 5, "Final Drive Removal" for the correct procedure.

## REMOVAL

### GENERAL

1. Drain lubricant from the planetary assembly and gear cover reservoirs by removing the drain plugs.
2. Remove planetary assembly according to the instructions found in Section 5A of this manual.
3. Remove the sprocket hub and sprocket according to the instructions found in Section 5B of this manual.

### QUILL SHAFT AND DRIVE GEAR

Numbers in parentheses refer to Figure 1.

1. Remove lock bolts (1), cover (4) and gasket (5) from the bearing retainer (8). Pull the quill shaft retainer (14) out of the bore of the drive gear (15) and remove and discard the "O" ring (13), if used. Current model vehicles have a quill shaft retainer without an "O" ring.
2. Thread a slide hammer with a 1/2-13 thread adapter into the end of the quill shaft (19) and pull it out.



NOTE: If only the quill shaft is being replaced, it can be installed by reversing the removal procedure.

3. Remove the bolts and lockwashers (6) and nuts and lockwashers (2) which fasten the bearing retainer (8) to the gear cover (11).
4. Remove the three set screws (7) and install three 5/8 - 11 x 2" puller bolts in the tapped holes. Pull the bearing retainer (8) from the gear cover (11) with the puller bolts and remove the gasket (9). Bearing outer race (10) is removed along with the bearing retainer. Remove studs (3) from the gear cover.

5. Remove the drive gear (15) from the gear cover (11). Bearing inner races (12 & 16) are removed with the gear. Bearing outer race (17) remains in its bore in the drive case.

NOTE: Do not remove the bearing races unless the complete bearing assembly is being replaced.

6. Replace the drive gear by following the reverse

of the removal procedure. When installing the set screws (7), be sure they are flush with the bearing retainer (8).

### GEAR COVER

1. Remove bolts (25) from dowel pins (26) and pull dowel pins from the gear cover (11). Refer to Page 2 of Section 5 for two methods of removal. However, these dowels can be left in the drive case when removing the gear cover (11).
2. Remove bolts and lockwashers (21) from the three threaded holes in the gear cover (11). Install 5/8-11 threaded eyebolts and attach suitable lifting equipment.
3. Remove bolts and lockwashers (22) which attach the gear cover (11) to the drive case. Separate the gear cover from the drive case, being careful not to damage the drive gear (15), (if it has not been previously removed), or driven (bull) gear (29). The quill shaft (19) may come out with the gear cover if it has not been previously removed.

### DISASSEMBLY

Numbers in parentheses refer to Figure 1.

1. Remove drive gear (15), if not already removed, and the driven gear (29) from the gear cover (11).

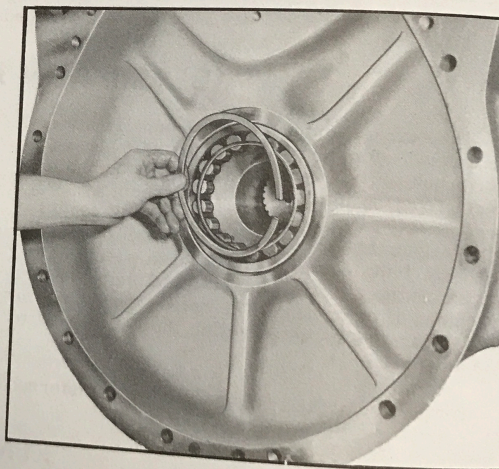
NOTE: Do not remove the bearing inner races (12, 16 or 28) or bearing outer races (10, 17 or 27) unless the entire bearing assembly is to be replaced with a new assembly.

2. Bearing inner races (12, 16 & 28) on the drive and driven gears (15 & 29) can be removed with a bearing puller. Always use a step plate over the gear hubs when pulling the races, especially over the cup in the outboard end of the drive gear (15).

3. To remove the driven gear bearing outer race (27) from the gear cover (11), remove the snap ring from the race, as shown in Figure 2, and remove the rollers and retainer. Use a slide hammer to pull out the outer race. The bearing outer race (10) in bearing retainer (8) is removed in the same manner.

NOTE: Failure to remove the bearing rollers may result in their damage when pulling the outer races.

4. To remove the bearing outer races (17 & 27) from the drive case, first remove the snap rings, rollers and retainers; then remove races with a bearing puller.



L-3646

Fig. 2 - Removing Snap Ring from Bearing

5. If the oil seals (18) are being replaced, remove them with a slide hammer and discard them.
6. If thrust collar (20 or 32) is being replaced, remove it from the end of the gear cover (11) spindle.

NOTE: Current thrust collar (20) has four half-inch slots milled on the back side to facilitate removal from the spindle.



## INSPECTION

1. Thoroughly clean all parts with a suitable solvent. Dry all parts, except bearing, with compressed air. Place bearings on clean rags (not waste) and allow to air dry. Lubricate bearings with light oil and wrap them if they are not being installed for an extended period.
2. Check bearings for chips, metal particles, cracks or wear. Replace those in doubtful condition. Always replace bearings as complete assemblies, never one part at a time. Before installing bearings, lubricate them thoroughly with a gear cover lubricant.
3. Inspect gear teeth for cracks and wear. Clean up splines with an India stone and rewash gear.
4. Inspect gear cover for cracks and wear, replacing it if necessary.

## ASSEMBLY

Numbers in parentheses refer to Figure 1.

1. Install new oil seals (18) if the old ones were removed. The seals should be installed back-to-back with their inner lips that mate with the drive gear shaft (15) facing away from each other. See Figure 3. Coat the seal lips with a good grade of cup grease or lubriplate before installation.
2. Drive bearing outer races (17 & 27) into their respective bores in the drive case and gear cover (11). Press bearing outer race (10) into its bore in the bearing retainer (8). When correctly installed, the snap ring grooves of the bearing races will face toward the gears. Install the bearing rollers, retainers, and snap ring in the bearing outer races.

NOTE: To facilitate installation, cool the bearing outer races in dry ice for approximately thirty minutes before installation.

3. Install the bearing inner races (12, 16 & 28) on the gear hubs of the drive gear (15) and driven gear (29). When correctly installed, the flanged ends of the races will be firmly seated against the shoulders on the gears.

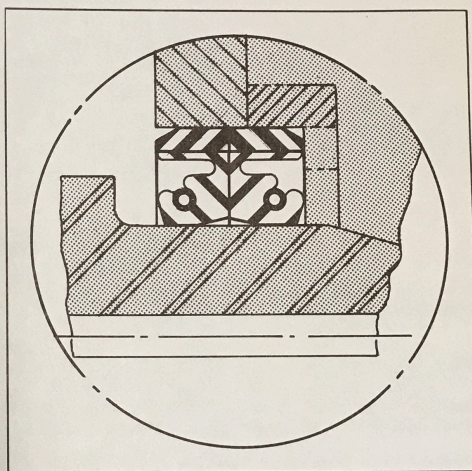


Fig. 3 - Drive Gear Seal Installation

L-6773

NOTE: To facilitate installation, heat the bearing inner races in oil at 250° F. for approximately thirty minutes.

## INSTALLATION

Numbers in parentheses refer to Figure 1.

1. Install the driven gear (29) in place on the drive case. Coat both sides of the new gasket (30) with suitable sealing compound and install it.
2. Lift gear cover (11) and guide it into position on the drive case. Be extremely careful not to damage the bearings during installation. Align the dowel pins (26) with their respective holes in the drive case, then drive on the gear cover. Replace mounting bolts and lockwashers (22) and nuts (31) and pull the gear cover up evenly. Replace the three bolts and lockwashers (21) in the gear cover and the two bolts (25) in the dowel pin (26).
3. If it was removed, install thrust collar (20 & 32) in the end of gear cover (11) spindle. Thrust collar (20) is installed with the oil grooves facing outward. Thrust collar (32) is installed with the small diameter facing outward.
4. Install quill shaft (19) and spline to transmission final drive, then install the assembled drive gear (15) on the quill shaft. When installing the gear be careful not to damage the seals (18) or bearing (17).



