

FOOTE 3 & 6-SPEED TRANSMISSION REPAIR MANUAL, FICHE WH 5 BLUE

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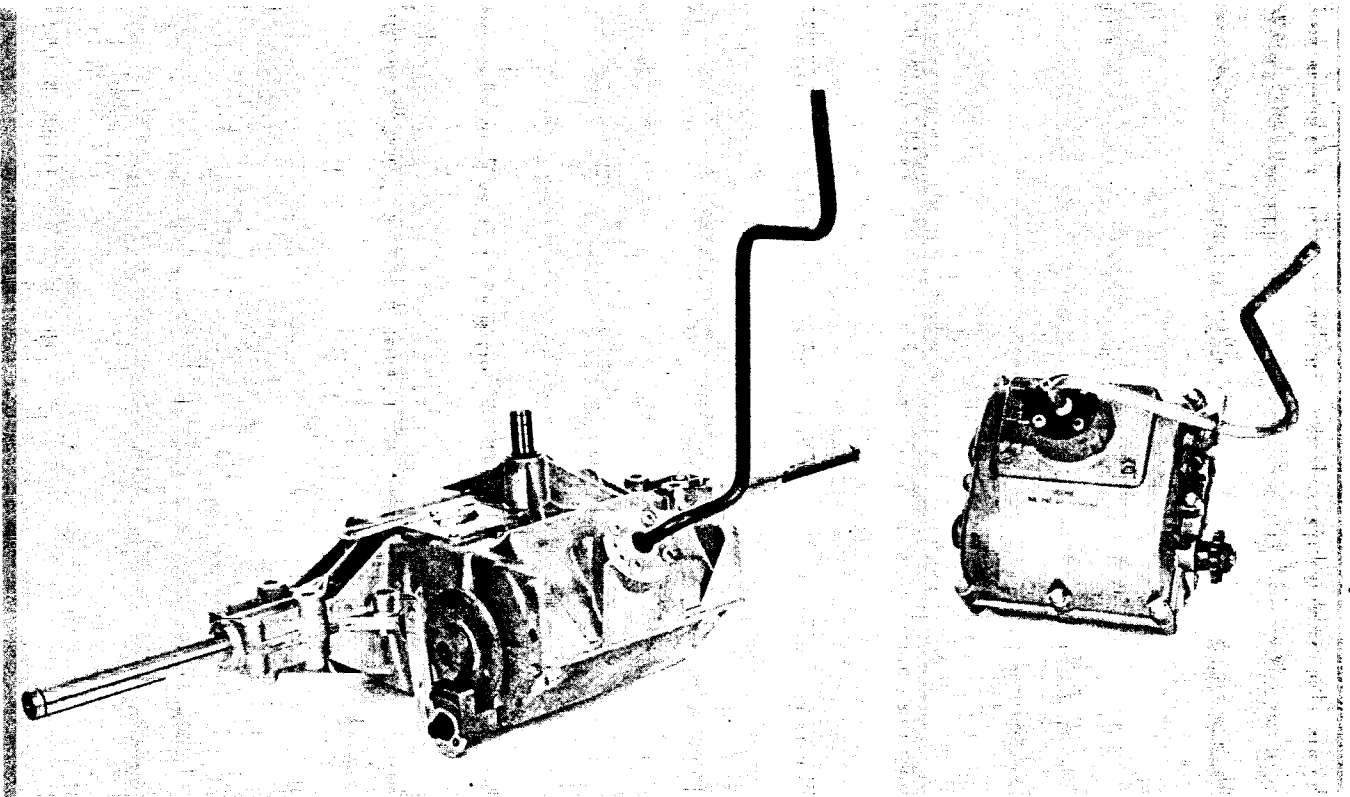
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FOOTE TRANSMISSION REPAIR MANUAL



WHEEL HORSE

lawn & garden tractors

Printed in U.S.A. 0979

Price \$2.50

PART NO. 803743R2

FOREWORD

This service and repair manual has been compiled to provide authorized Wheel Horse service personnel with the proper procedures and techniques for servicing Foote mechanical transmissions as used in Wheel Horse equipment.

The following index lists all areas covered. It is advisable to read all of the sections first to gain a proper understanding of the mechanical transmission.

The transmission is a sophisticated piece of machinery. Maintain strict cleanliness control during all stages of service and repair. Even a small amount of dirt or other contamination can severely damage the components.

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SPECIFICATIONS

3-SPEED

DESCRIPTION:

Foote Model 2010-55 or 2010-65 Sliding Gear Transmission; three speeds, with reverse

LUBRICATION:

Main Case — 12 oz. (350 gm), Shell Darina "O" grease*

Interlock switch cavity, nylon seat for shift lever — light coating, Lubriplate DS-ES switch lubricant.

TOLERANCES:

Bevel Gear/Pinion backlash — 0-.015 in. (.4 mm)

Drive shaft end play — 0-.015 in. (.4 mm)

Output shaft end play — 0-.012 in. (.3 mm)

Input shaft end play — .010-.020 in. (.25-.50 mm)

TORQUE VALUE:

Housing bolts — 80-90 in. lbs. (9.2-10.4 Nm)

6-SPEED

DESCRIPTION:

Foote Model 4000-5 Sliding Gear Transmission; six speeds, with reverse

LUBRICATION:

Main Case — 24 oz. (700 gm) Shell Darina "O" grease*

Input Shaft Needle Bearings, Axle Cavities — pack with Exxon Unirex N-3 grease**

TOLERANCES:

Drive Shaft End Play — .020-.030 in. (.5-.7 mm)

Intermediate Shaft End Play — .020-.030 in. (.5-.7 mm)

Input Shaft End Play — .010-.020 in. (.3-.5 mm)

Axle Shafts — Shim for minimum end play without binding

Brake Air Gap — .020 in. (.5 mm)

TORQUE VALUES:

Housing Case Bolts — 80-90 in. lbs. (9.2-10.4 Nm)

Housing Center Support Bolt — 100-110 in. lbs. (11.7-12.8 Nm)

Reverse Idler Shaft Bolt — 80-90 in. lbs. (9.2-10.4 Nm)

Brake Shoulder Bolt — 200-250 in. lbs. (23.3-29 Nm)

Shift Fork Screws — Back off $\frac{1}{4}$ turn from snug

Apply Loctite 271 (Red) to threads of Brake Shoulder Bolt and Shift Fork Screws

*Available through Foote Co. distribution system in 16 oz. (460 gm) can — order P/N 1866

**Available through Foote Co. distribution system in 5 oz. (150 gm) tube — order P/N 2801

For name of nearest distributor contact:

J. B. Foote Foundry Co.
P. O. Box 236
Fredrickstown, Ohio 43019
Phone 614-694-2055

TROUBLESHOOTING GUIDE

SHIFTING DIFFICULT

Clutch not releasing completely.

Worn shift linkage.

Shifts being made under load or without using clutch.

Shift forks or shift lever bent.

Brake dragging (6-Speed)

NOISY

Gears worn or damaged.

Improper bevel gear/pinion backlash.

Bearings worn or damaged.

JUMPS OUT OF GEAR OR GEAR DOES NOT ENGAGE COMPLETELY

Lugs on clutch collars worn or damaged.

Shift forks or shift lever bent.

Detent balls or springs broken or damaged.

Part of vehicle interfering with full travel of shift lever.

Hi-Lo shift fork broken (6-Speed).

BRAKE NOT EFFECTIVE (6-Speed)

Friction pucks worn.

Brake air gap too large.

Bent or damaged brake linkage.

Shoulder bolt loose.

3-SPEED TRANSMISSION

INTERLOCK SWITCH

DISASSEMBLY

The main components of the neutral interlock switch are contained under the nylon cover that retains the shift stick at the top of the transmission (Fig. 1).

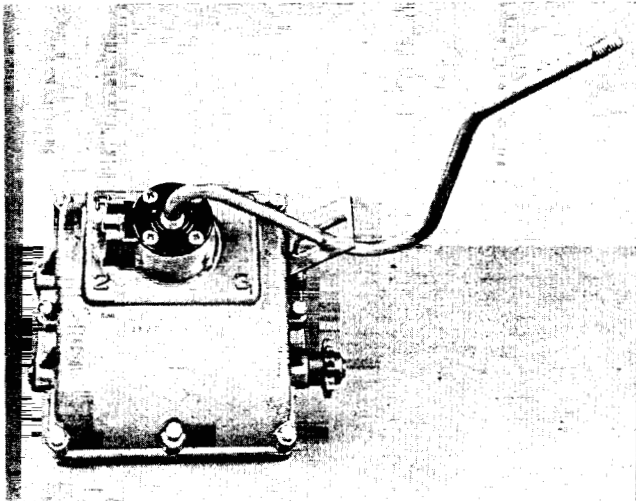


FIG. 1. Foote 3-Speed Transmission

To service the switch, shift the transmission into neutral. If in the vehicle disconnect electrical wiring. Remove the four Phillips head screws securing the nylon cover (Fig. 2).

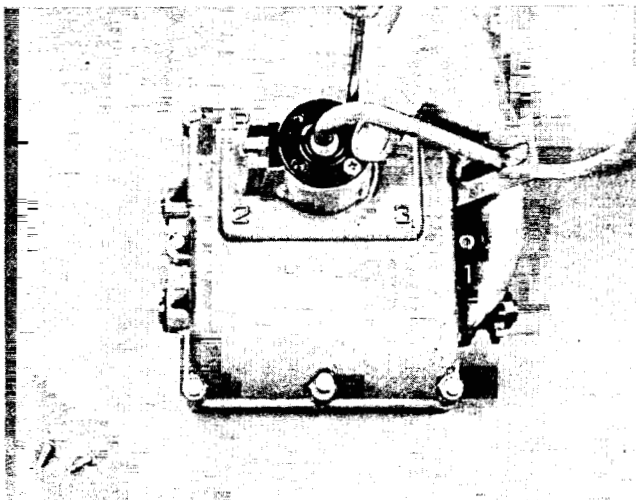


FIG. 2. Remove Nylon Cover

Lift the nylon cover off the top of the transmission noting the position of the two long pins. Remove the interlock detent spring. Lift out the interlock contact plate and the moveable contact bar, spring and housing assembly. Using a small magnet, remove the detent pin and detent ball (Fig. 3).

Clean and inspect all parts for wear and damage. The switch components are serviced as an assembly.

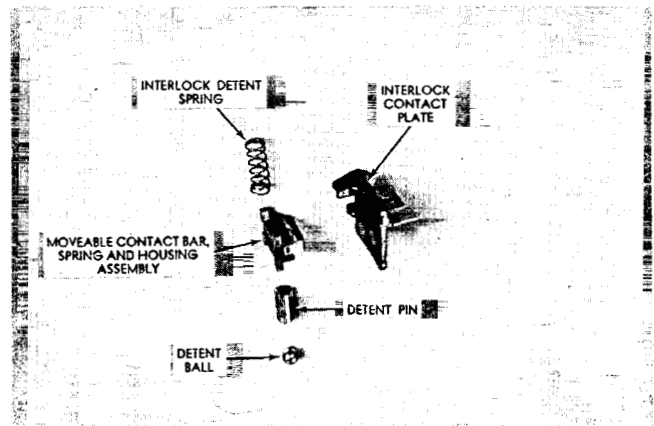


FIG. 3. Interlock Switch Components

REASSEMBLY

To reassemble, drop the detent ball into the hole. Next, replace the detent pin, with the hollowed side toward the ball. Apply a light coating of switch lubricant to the interlock switch cavity. Install the moveable contact bar, spring and housing assembly so the bar faces outward. Be sure the bar slides freely. Compress the contact bar, spring and housing and install the contact plate so the rivets are toward the bottom (Fig. 4).

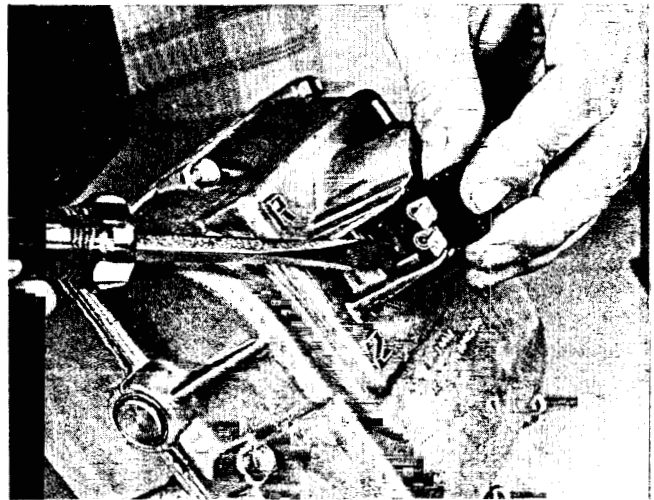


FIG. 4. Interlock Switch Installation

Replace the detent spring. Coat the nylon seat in the shift lever recess with switch lubricant. Slip the nylon cover back into position and align the two long pins with the two large holes between the "1" and "3" markings on the transmission cover (Fig. 5).

Press firmly on the nylon cover directly over the two long pins and install the screws closest to the "1" and "3" marks. Reinstall the two remaining screws. (Fig. 6).

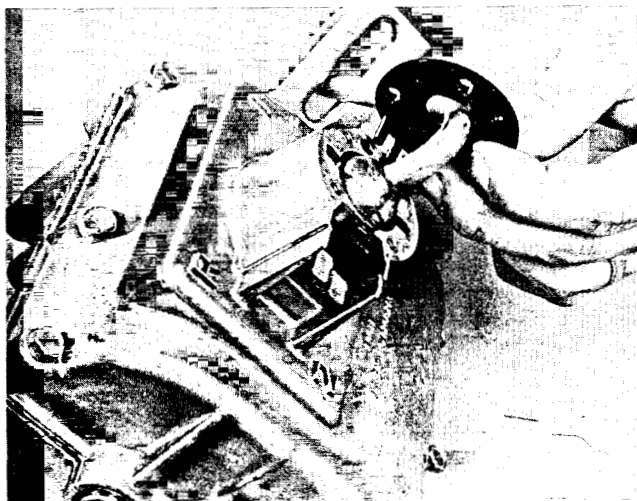


FIG. 5. Align Detent Pins

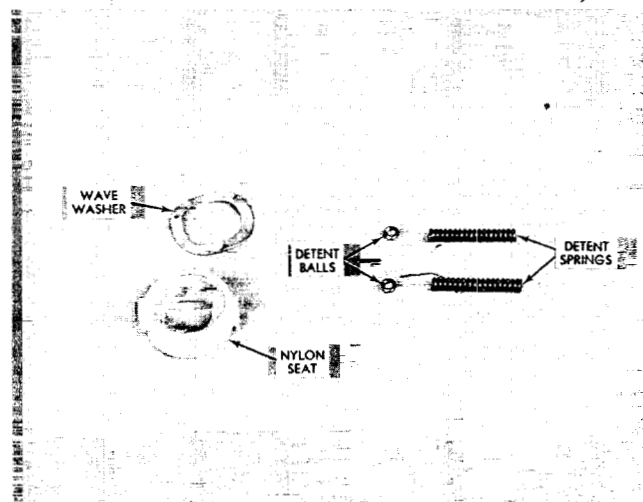


FIG. 7. Shift Control Components

Remove the eight hex bolts ($\frac{1}{4}$ -20 x $1\frac{5}{8}$) that hold the two case halves together. Lift the top case from the bottom case (Fig. 8).

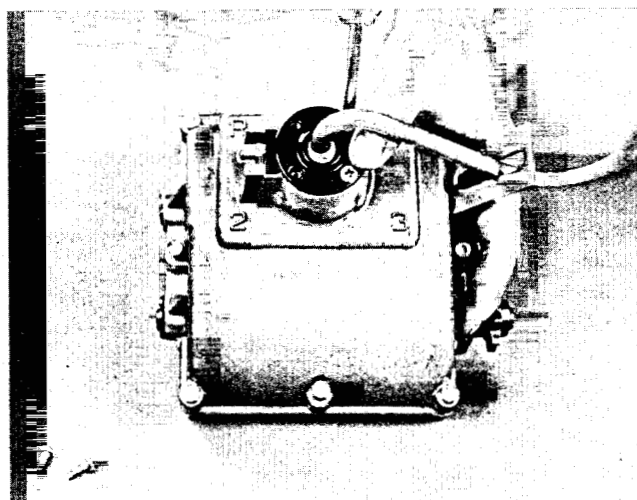


FIG. 6. Replace Nylon Cover

Check the two leads for continuity with the transmission in the neutral position. Continuity should exist with the transmission in neutral only. Reconnect the switch wiring and test for proper operation with the transmission in each gear. Starting the engine should only be possible with the shift lever in neutral.

OVERHAUL — DISASSEMBLY

Remove the transmission from the vehicle and remove the input shaft pulley.

SHIFT FORKS

Remove the nylon top plate and interlock switch components as described under "INTERLOCK SWITCH". Remove the shift lever nylon seat and wave washer. Note that the nylon seat is recessed at the top to accommodate the ball on the shift lever. Turn the transmission over so the detent springs and detent balls fall out of their bores (Fig. 7).

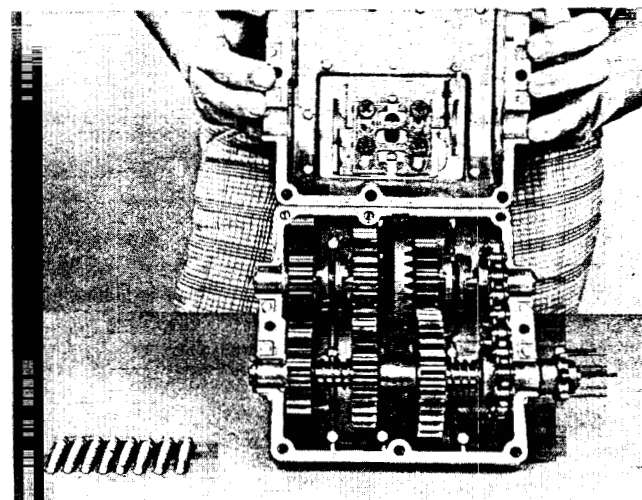


FIG. 8. Separate Case Halves

The shift forks are held in place by four Phillips head shoulder screws. Remove the four screws. Remove the lockout plate and the two shift forks. The shift forks are different, and their mounting positions should be noted during removal (Fig. 9).

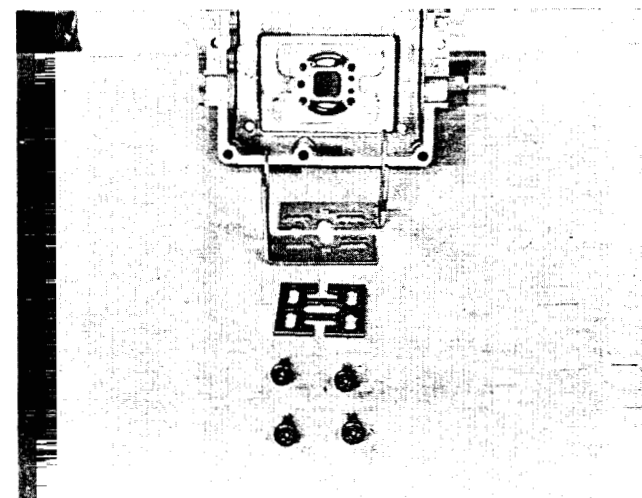


FIG. 9. Shift Forks and Lockout Plate

OUTPUT SHAFT

Lift both the output and the drive shaft assemblies out of the bottom case half (Fig. 10).

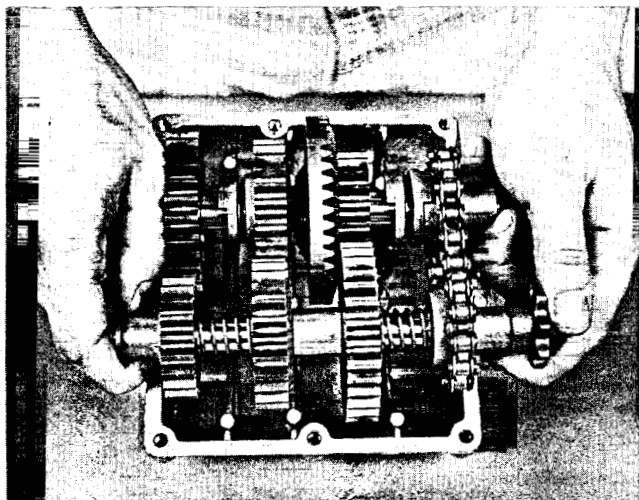


FIG. 10. Lift Shafts from Case Half

Work the chain off of the two sprockets and separate the shaft assemblies (Fig. 11).

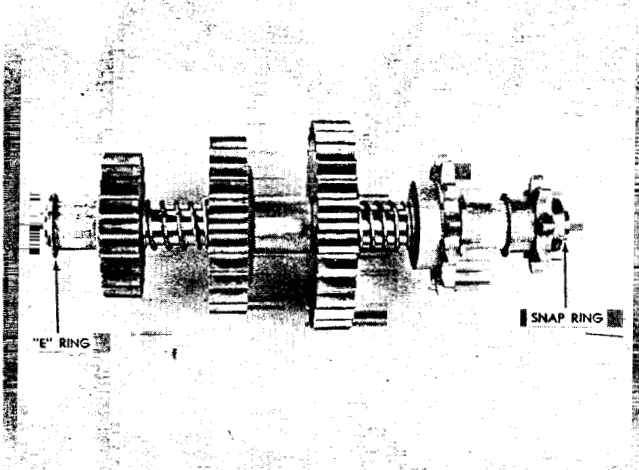


FIG. 11. Output Shaft Assembly

All parts of the output shaft assembly are slip fits. The gears and sprockets are keyed to the shaft. Remove the "E" ring and the snap ring from the ends of the shaft and disassemble. The shim washers should be identified so they can be returned to their original positions to simplify adjusting output shaft end play (Fig. 12).

DRIVE SHAFT

The components of the drive shaft assembly are also slip fits. There are two snap rings on the drive shaft to keep the bevel gear and the drive shaft in proper position (Fig. 13).

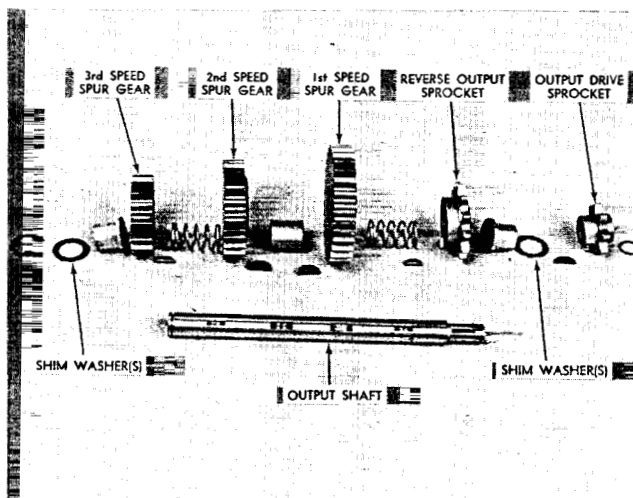


FIG. 12. Output Shaft Disassembled

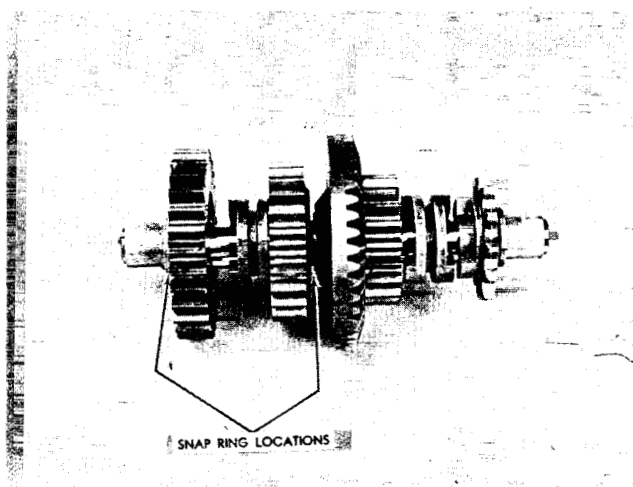


FIG. 13. Drive Shaft Assembly

Remove the component parts and snap rings from the drive shaft. Shim washers are located at the 3rd gear end of the drive shaft, and normally on both sides of the bevel gear. The shim washers should be identified so they can be returned to their original positions during reassembly.

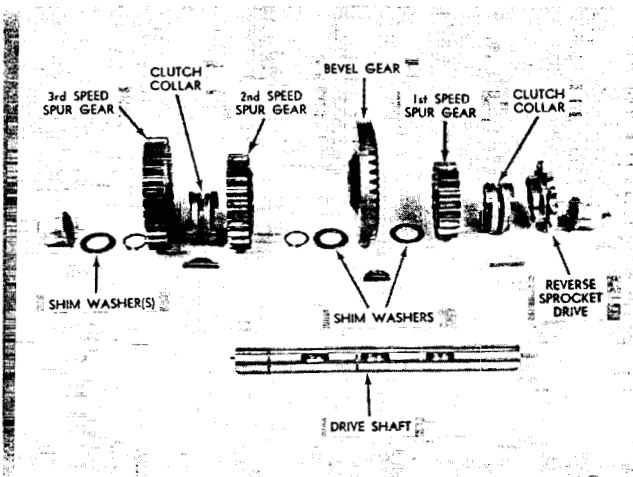


FIG. 14. Drive Shaft Disassembled

INPUT SHAFT

(Bevel Pinion Assembly)

Remove the woodruff key, the snap ring and shim washers outside of the case. Push the input shaft out of lower transmission case half.

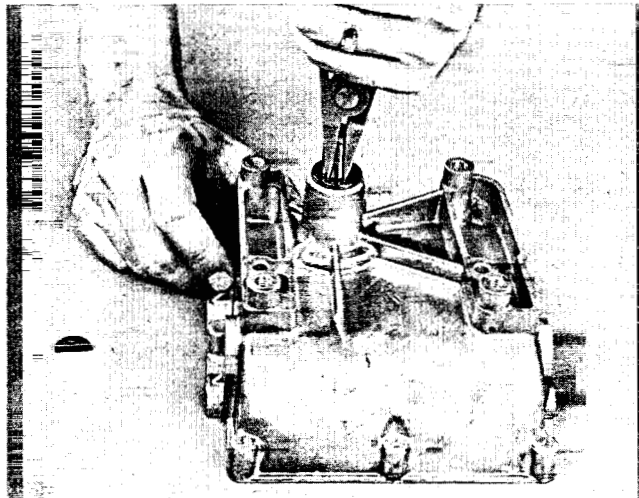


FIG. 15. Remove Input Shaft

The bevel gear is removed from the shaft by removing the snap ring and pressing the shaft out of the gear.

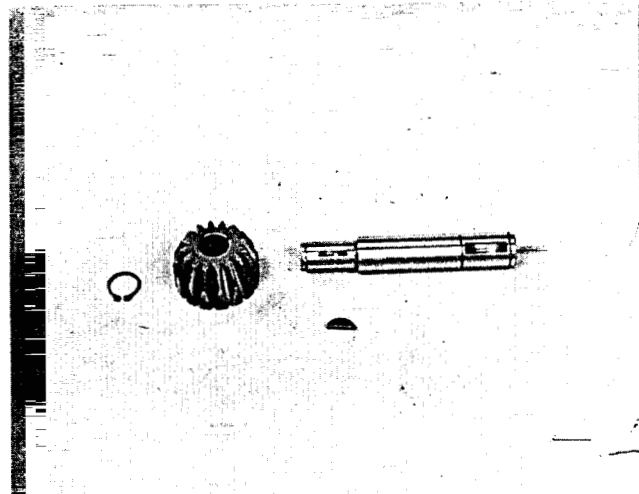


FIG. 16. Input Shaft Disassembled

The input shaft bushings are pressed out of the case from the outside, pushing in. If replacement of the bushings is required, a new input shaft and O-ring seal must also be installed, which is supplied as a part of a service kit.

CLEANING AND INSPECTION

Clean all parts in solvent, except O-ring seals, switch components and other plastic parts. Inspect all parts for serviceability. Check the bevel pinion for unusual wear, which indicates improper bevel gear/pinion backlash. Inspect the gears, clutch collars, sprockets and drive chain. Check the "ears" on the

clutch collars and the recessed sides of the drive gears. Wear in this area may be the result of worn or bent shift forks, or excessive drive shaft end play.

Inspect the drive and output shaft bushings for wear. Also check that the bushing recesses, machined into the transmission case halves, are not worn. Wear in these recesses may indicate loose case bolts, or excessive stress being applied to the transmission during operation.

Check the input, output and drive shafts for scoring or damage to keyways. Light scoring can be removed with a crocus cloth. Replace any shaft(s) with damaged keyway(s).

OVERHAUL — REASSEMBLY

INPUT SHAFT

New input shaft bushings are pressed into place; the flanged bushing is installed from the inside and the straight bushing is installed from the outside. Both bushings are pressed in flush with the case. A rubber O-ring fits between the bushings and should be installed after both bushings are pressed into place (Fig. 17).

Install the woodruff key on the input shaft. The input gear is then pressed on the shaft, taking care to align the gear and #9 woodruff key before pressing. Install the snap ring onto the shaft so that the sharp edge is away from the gear. Apply a light coating of grease to the shaft and install the shaft into the case and replace shim washers. Reinstall the snap ring so that the sharp edge is away from the shim washers. Using a feeler gauge, check between the shim washers and the case to gauge the shaft end play. Correct end play is .010-.020 in. (.25-.50 mm). Shim washers may be used in any combination to achieve proper end play.

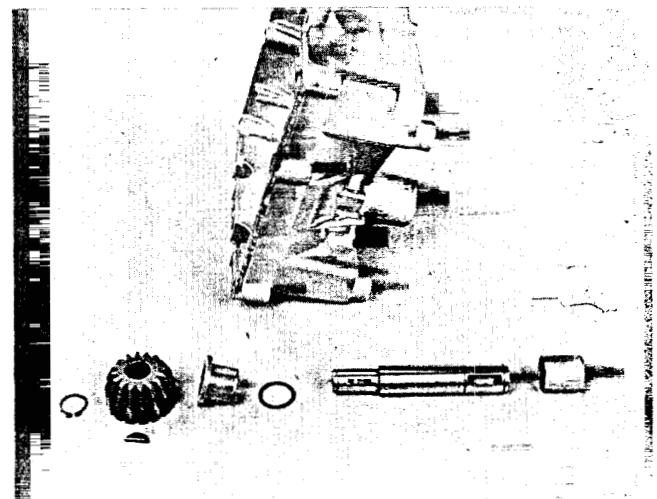


FIG. 17. Input Shaft, Bushings and O-Ring

DRIVE SHAFT

Apply a light coating of grease to the drive shaft. Reassemble the components on the shaft. Proper assembly order is shown in Fig. 18. Note that the bevel gear teeth face the reverse sprocket and make certain that the shim washers are installed in the same position as when removed. The two snap rings are installed with their sharp edge facing away from the bevel gear and 3rd gear (Fig. 18).

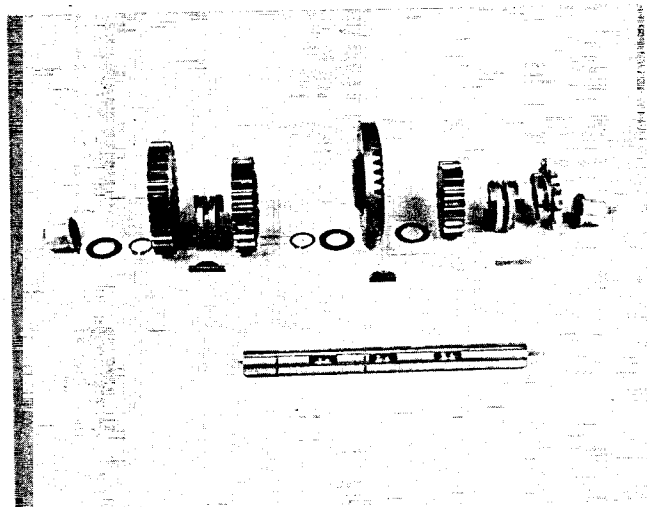


FIG. 18. Drive Shaft Assembly Order

Install the drive shaft in the lower case half. Using a feeler gauge, check the drive shaft end play between the snap ring and the shim washer at the 3rd gear end of the shaft. Correct end play is 0-.015 in. (0-.4 mm). Shim washers may be used in any combination to achieve proper end play.

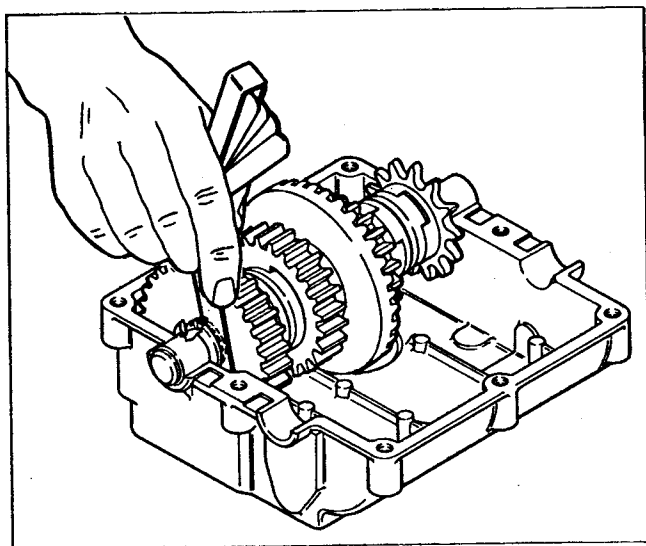


FIG. 19. Check Drive Shaft End Play

After the drive shaft end play is within tolerances, check the bevel gear/pinion backlash. Use a dial indicator and adjust the shims on both sides of the bevel gear. Correct backlash is 0-.015 in. (0-.4 mm). If a dial indicator is not available, backlash can be adjusted by shimming both sides of the bevel gear so no play exists between the shim washer and the back side of the bevel gear (Fig. 20). The shims on

the tooth side of the bevel gear should be selected to permit the bevel gear and pinion gear to mesh fully.

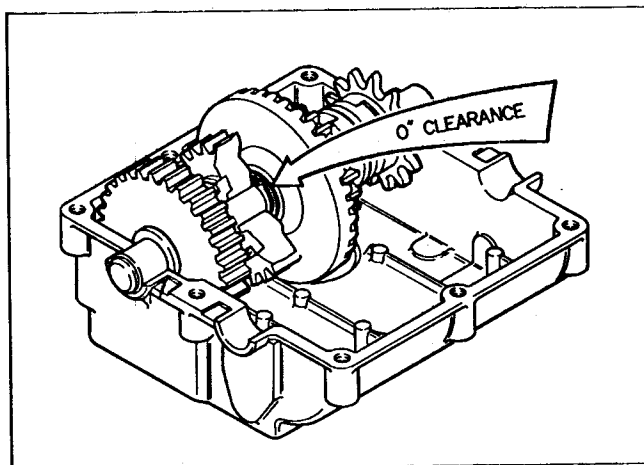


FIG. 20. Adjusting Bevel Gear/Pinion Backlash

OUTPUT SHAFT

Apply a light coating of grease to the output shaft.

Replace the special #4 woodruff key into the smaller portion of the output shaft. Install the drive sprocket with the large shoulder toward the inside of the shaft. Secure the sprocket with a snap ring, with the sharp edge of the snap ring away from the sprocket (Fig. 21).

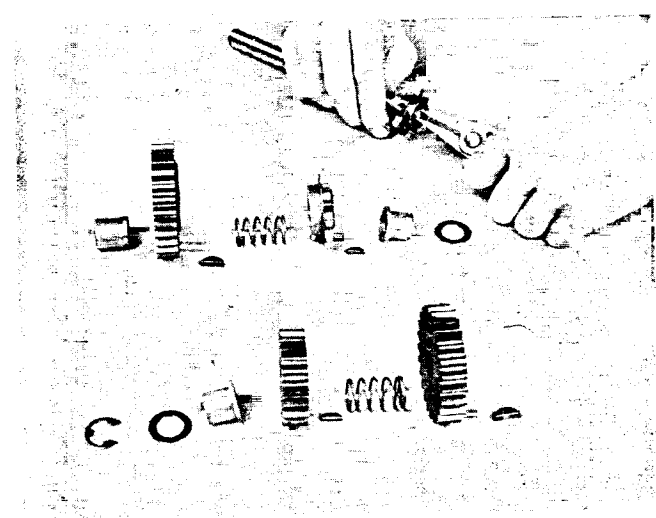


FIG. 21. Install Drive Sprocket

Slide the remaining components on the output shaft, installing the shims in their original positions. Secure the components on the shaft with the "E" ring (Fig. 22 & 23). Note that the shoulder on the reverse output sprocket and the raised side of the 2nd gear both face toward the first speed gear.

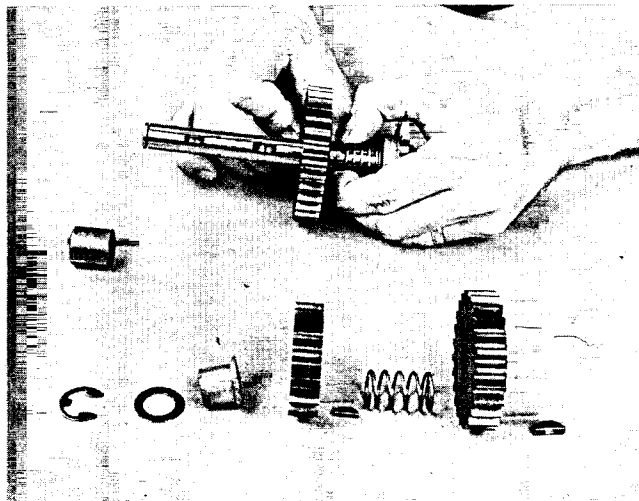


FIG. 22. Assembling Output Shaft

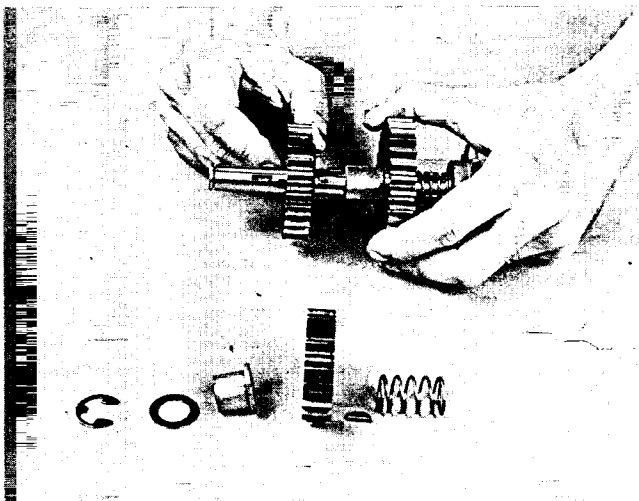


FIG. 23. Output Shaft Assembly Order

Place the output shaft assembly into the lower case half. Check the end play of the output shaft by inserting a feeler gauge between the shim washer and "E" ring. Correct end play is 0-.012 in. (0-.3 mm). Shim washers can be used in any combination to achieve proper end play.

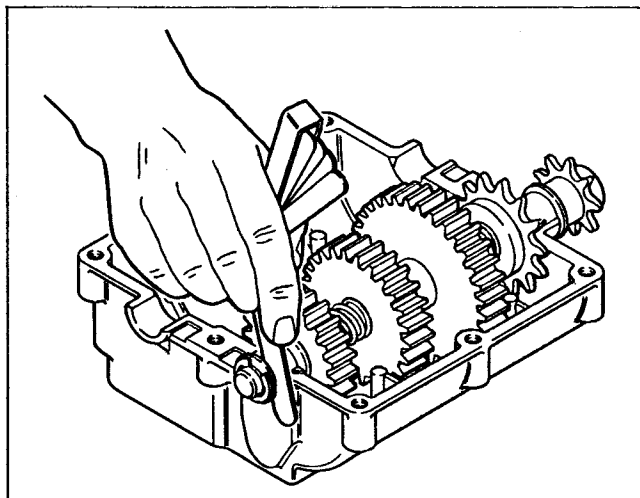


FIG. 24. Checking Output Shaft End Play

Remove the input and the output shafts from the lower case half. Fill the lower case half with 12 oz. (350 gm) of grease. Replace the chain on the two reverse sprockets and reinstall the shafts.

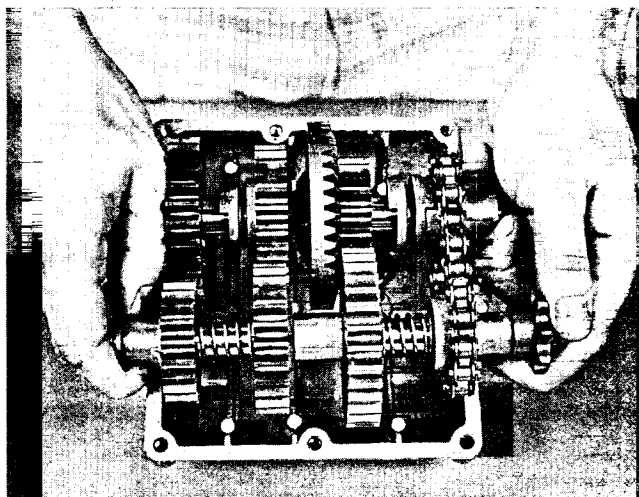


FIG. 25. Install Shafts into Case Half

The four shoulder bushings have triangular shaped feet that must seat in the notches provided for them (Fig. 26).

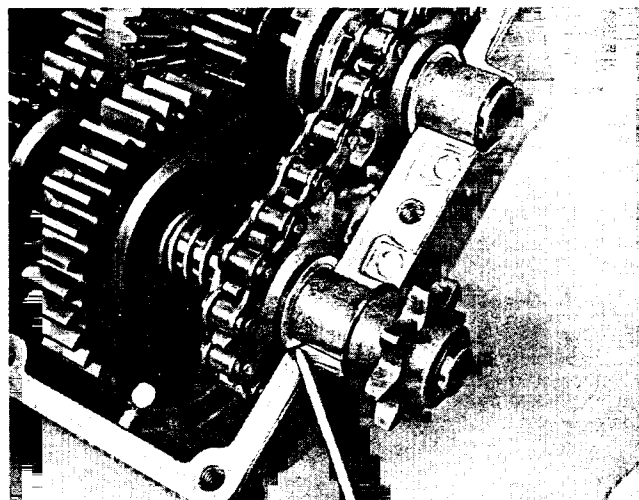


FIG. 26. Align Shoulder Bushings

Check the gears for proper alignment.

SHIFT FORKS

Each shift fork has three small holes in line with each other. Install the shift forks so the three small holes are on the same side of the case as the shift lever bracket.

Install the lockout bracket so the two "T" shaped slots are over the raised tabs on the shift forks. Reinstall the four Phillips head shoulder screws (Fig. 27). Coat the shift forks and lockout plate with grease.

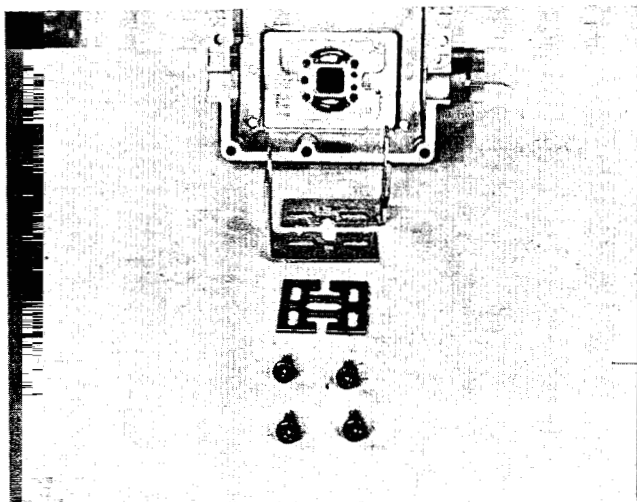


FIG. 27. Shift Forks and Lockout Plate

Align the shift forks with the clutch collars and reassemble the case halves. Tighten the case bolts to 80-90 in. lbs. (9.2-10.4 Nm).

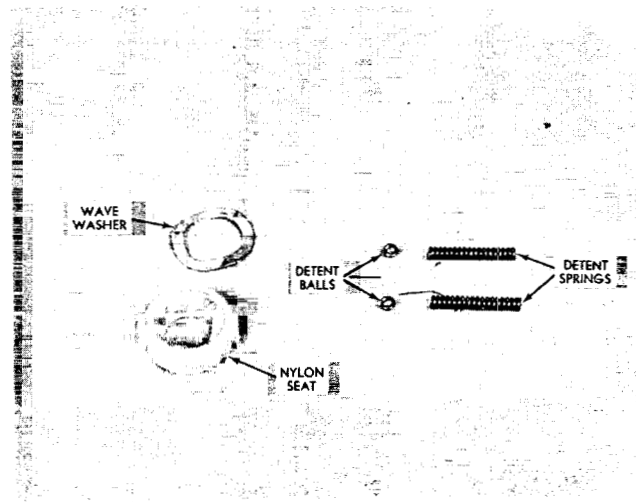


FIG. 29. Shift Control Components

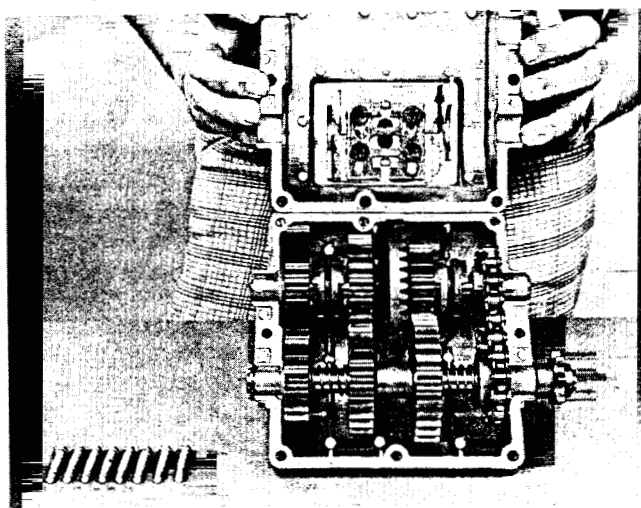


FIG. 28. Assemble Case Halves

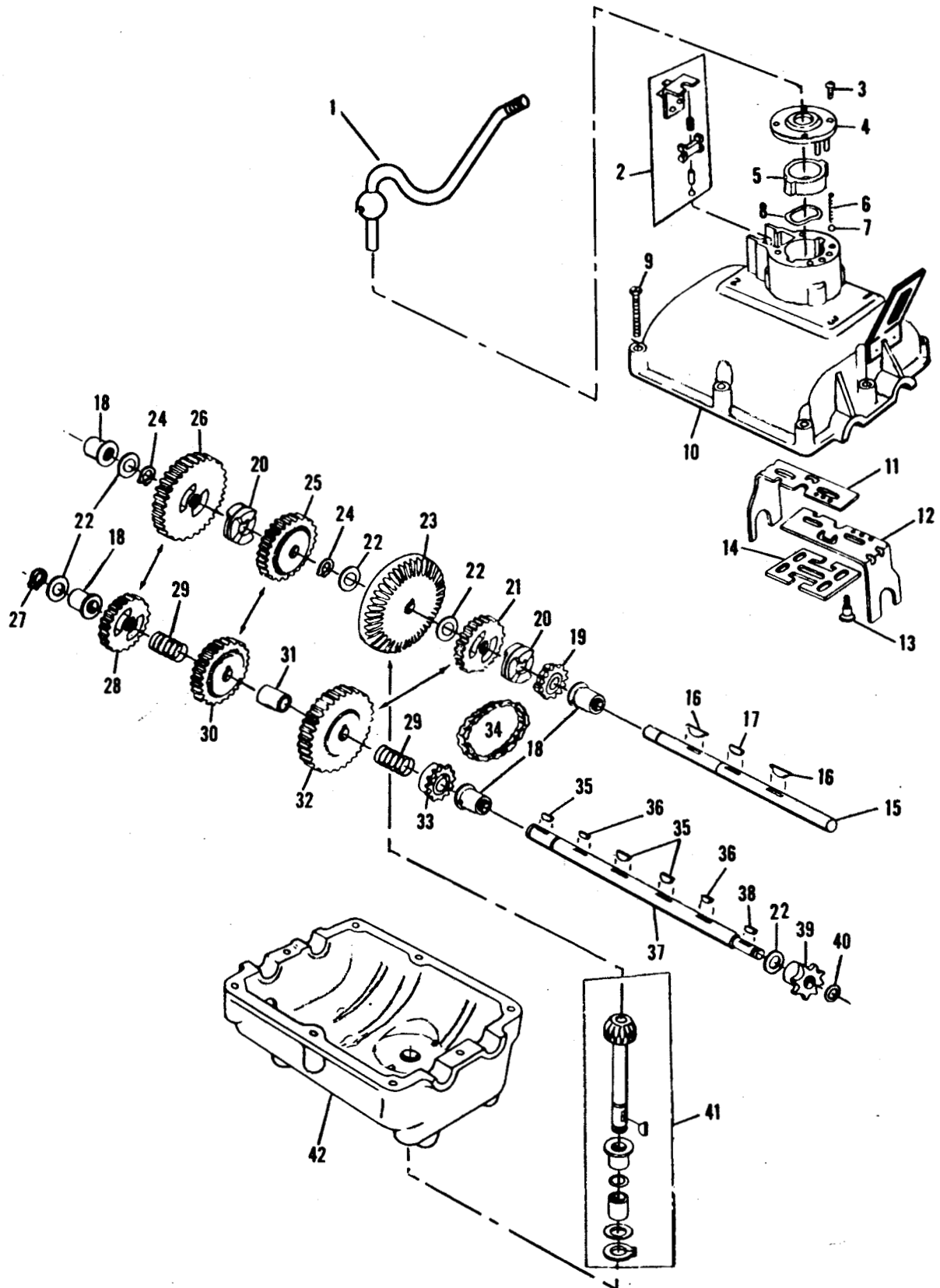
Replace the detent balls and detent springs into their proper bores. Apply a coating of switch lubricant to the wave washer and the nylon insert and reinstall into the recess. The two feet on the nylon insert should face down so the recess in the nylon seat will accommodate the ball on the shift lever (Fig. 29).

Using a screw driver, align the shift forks to the neutral position.

Replace the shift lever and interlock switch as outlined under "INTERLOCK SWITCH".

Reinstall the input pulley and check the transmission's shifting action before reinstalling the transmission in the vehicle.

WHEEL HORSE 225287/225608 3-SPEED TRANSMISSION



PARTS LIST — 3-SPEED TRANSMISSION

Parts available only through Authorized Dealers.
When ordering parts always list Part No. and Description.
(Specifications subject to change without notice.)

ITEM NO.	PART NO.	DESCRIPTION	NO. REQ'D.
	225287	Transmission Assembly Complete (Foote Model 2010-55)	1
	225608	Transmission Assembly Complete (Foote Model 2010-65)	1
1	225526	Shift Lever Assembly	1
2	225527	Switch Assembly, Kit	1
3	225528	Screw, Truss Hd., 10-24 x 1/2 in.	4
4	225529	Cover, Nylon	1
5	225530	Insert, Nylon	1
6	225531	Spring, Detent	2
7	225532	Ball, Detent	2
8	225533	Wave Washer	1
9	225534	Screw, Hex Hd., 1/4-20 x 1 3/8 in.	8
10	225535	Housing, Upper	1
11	225536	Fork, Shifter, R.H.	1
12	225537	Fork, Shifter, L.H.	1
13	225538	Screw, Shoulder	4
14	225539	Plate, Shifter Lockout	1
15	225540	Shaft, Drive	1
16	225541	Key, Hi-Pro	2
17	225542	Key, Woodruff	1
18	225543	Bearing, Flange	4
19	225544	Sprocket, 12-Tooth	1
20	225545	Collar, Clutch	2
21	225546	Gear	1
22	225547	Washer .031 Thk	†
22	225548	Washer .040 Thk	†
22	225549	Washer .050 Thk	†
22	225550	Washer .060 Thk	†
22	225551	Washer .025 Thk	†
22	225552	Washer .035 Thk	†
22	225553	Washer .045 Thk	†
22	225554	Washer .020 Thk	†
23	225555	Gear, Bevel 42-Tooth	1
24	225025	Ring, Retaining	2
25	225556	Gear 25-Tooth	1
26	225557	Gear 30-Tooth	1
27	225021	Ring, Retaining	1
28	225558	Gear 20-Tooth	1
29	225559	Spring, Compression	2
30	225560	Gear 25-Tooth	1
31	225561	Spacer	1
32	225562	Gear 30-Tooth	1
33	225563	Sprocket, 12-Tooth	1
34	225564	Chain, 22 Pitches	1
35	225565	Key, Woodruff	3
36	225566	Key, Woodruff	2
37	225567	Shaft, Output	1
38	225568	Key, Woodruff	1
39	225569	Sprocket, 8-Tooth (For 225287)	1
39	225640	Sprocket, 8-Tooth (For 225608)	1
40	225570	Ring, Retaining	1
41	225571	Input Shaft Assy, Kit	1
42	225572	Housing, Lower	1

† Used in various combinations to maintain proper clearance.

6-SPEED TRANSMISSION

DISASSEMBLY

Remove the transmission from the tractor and remove the input pulley. Clean the exterior of the case and shift the transmission to neutral.

BRAKE AND SHIFT LEVER

Remove the shoulder bolt securing the brake assembly and remove the brake jaw, spring, friction pucks, backup plate, brake disc and woodruff key (Fig. 1). Heat the case with a propane torch if the shoulder bolt cannot be loosened easily, as Loctite is used to secure it.

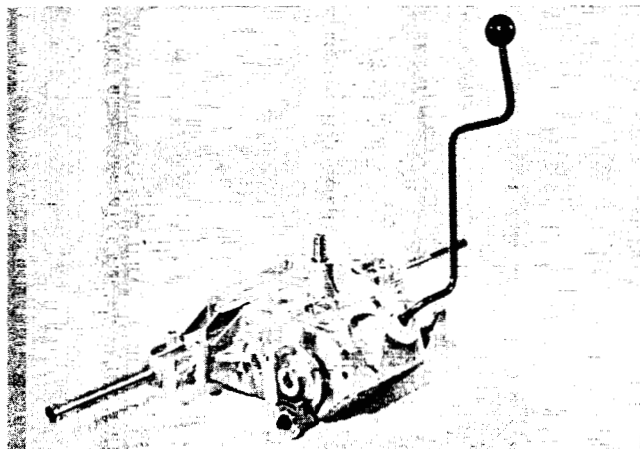


FIG. 1. Foote 6-Speed Transmission

Remove the screws from the nylon cover and remove the shift lever, nylon insert and wave washer. Remove the two set screws from transmission case; turn the transmission over and catch the two detent springs and balls as they fall out of the set screw holes (Fig. 2).

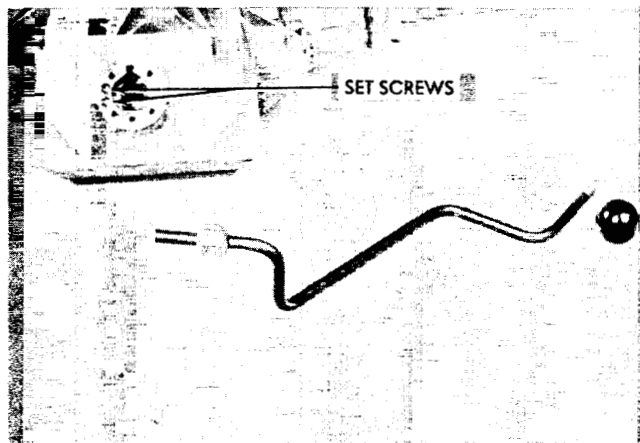


FIG. 2. Remove Shift Lever & Detent Set Screws

DRIVE SHAFT

With the transmission upside down, remove the single bolt from the recess in the center of the case, and the 14 bolts from around the outside of the case. Lift the lower case half from the upper case half; tap the case halves lightly with a mallet if they do not separate easily (Fig. 3).

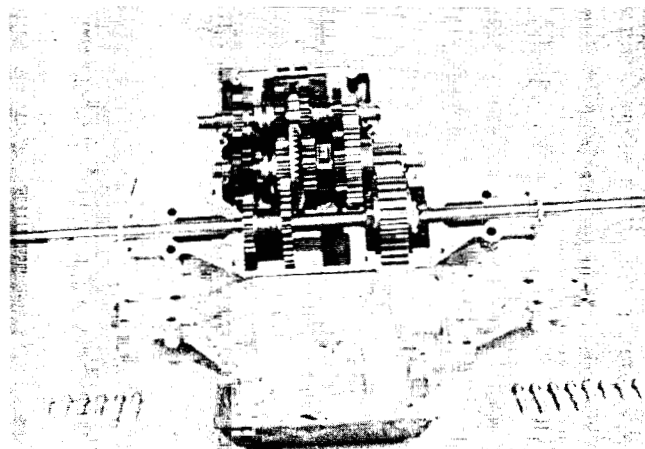


FIG. 3. Remove Lower Case Half

NOTE

The location of spacers and washers on the shaft assemblies is critical. Place removed parts on the workbench in assembly sequence.

Lift the drive shaft out of the upper case half (Fig. 4). All parts on the drive shaft are slip fits. Slide parts from the shaft, placing them in the order of removal (Fig. 5).

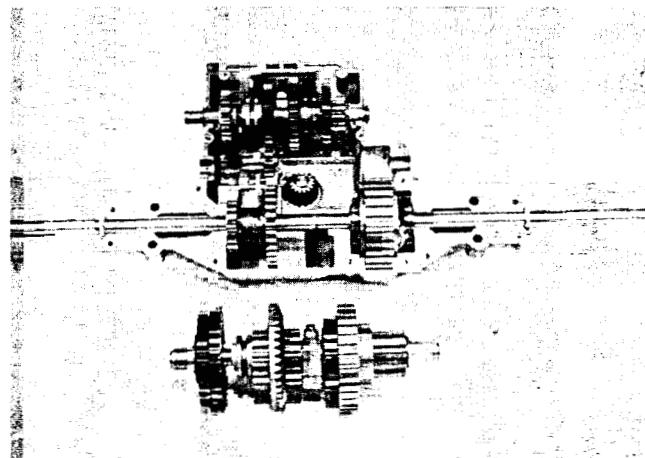


FIG. 4. Remove Drive Shaft

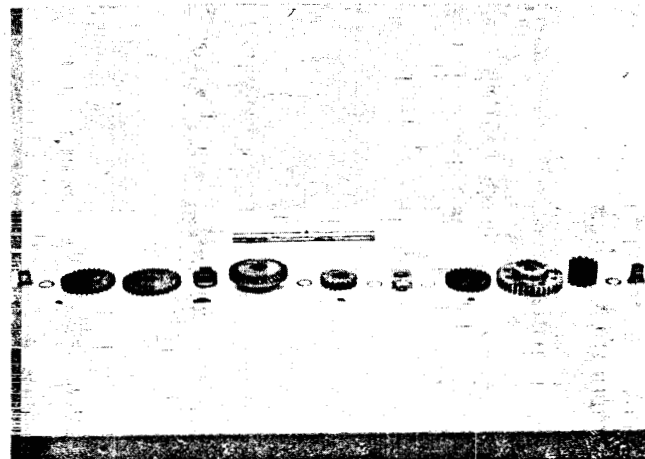


FIG. 5. Drive Shaft Disassembled

INTERMEDIATE SHAFT

Lift the intermediate shaft out of the upper case half (Fig. 6). Remove an E-ring from one end of the intermediate shaft. Slide parts from the shaft, being careful to keep removed parts in the same order (Fig. 7).

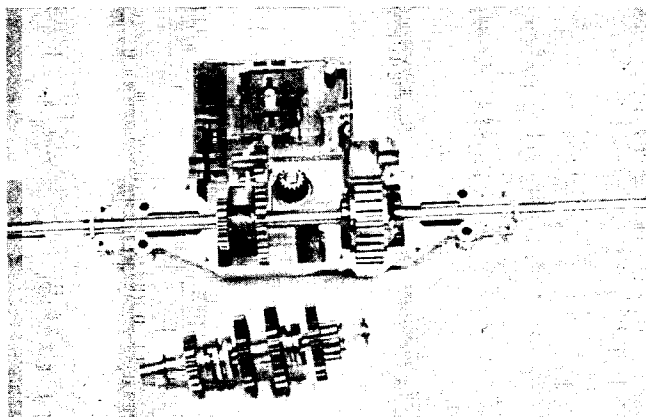


FIG. 6. Remove Intermediate Shaft

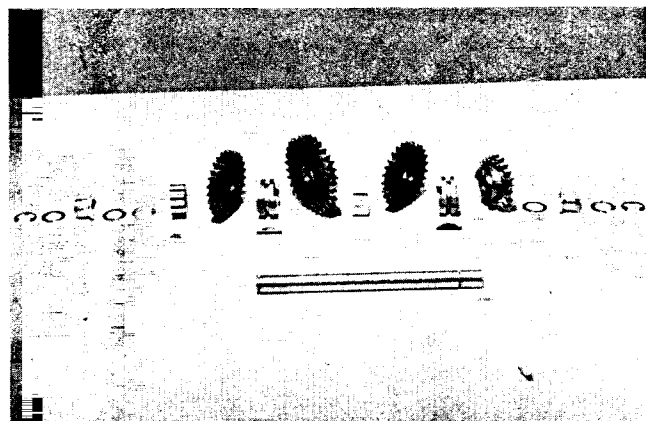


FIG. 7. Intermediate Shaft Disassembled

DIFFERENTIAL & AXLES

Remove the rear axles and differential as a unit (Fig. 8). Push axles together as they are removed from the case. The bevel gears on the axles are press fits; removal is not required unless an axle or gear must be replaced. All other parts are slip fits.

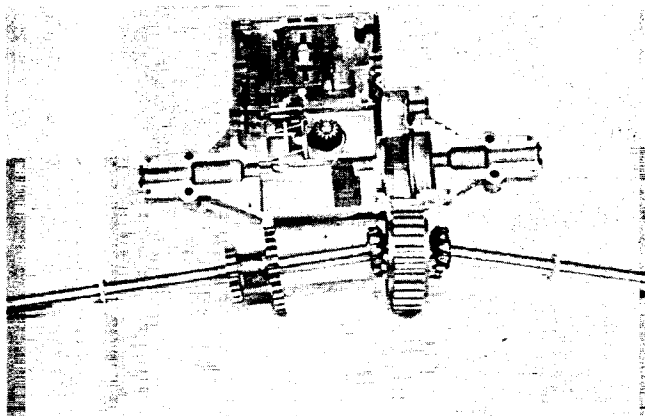


FIG. 8. Remove Differential & Axles

REVERSE IDLER & SHIFT FORKS

Remove bolt from reverse idler shaft and remove reverse idler, shaft and shims (Fig. 9).

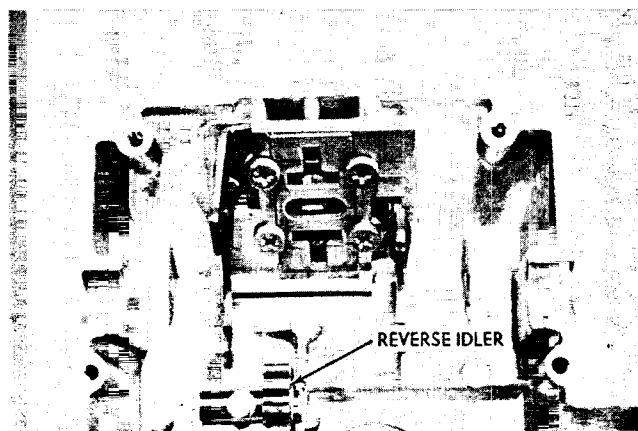


FIG. 9. Reverse Idler and Shift Forks

Remove the four screws to remove the fork support, lockout plate, and the two shift forks (Fig. 9).

HI-LO SHIFT & INPUT SHAFT

Remove three bolts from Hi-Lo cover plate and remove plate, shift lever, detent pin and spring. Use care when removing cover, as detent pin or spring may jump out and become lost (Fig. 10).

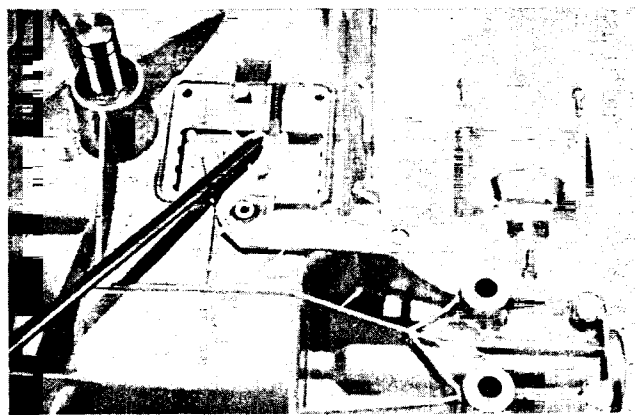


FIG. 10. Remove Hi-Lo Shift & Input Shaft

On the outside of the upper case half, remove the snap ring to remove the input shaft (bevel pinion assembly). Remove the square section O-ring from the bearing bore, inside the case half. Do not remove bevel pinion from shaft unless it requires replacement. If the needle bearings or shaft require replacement, all input shaft parts must be replaced. A kit is available for this purpose. If necessary, press needle bearings out, working from inside the case (Fig. 10 & 11).

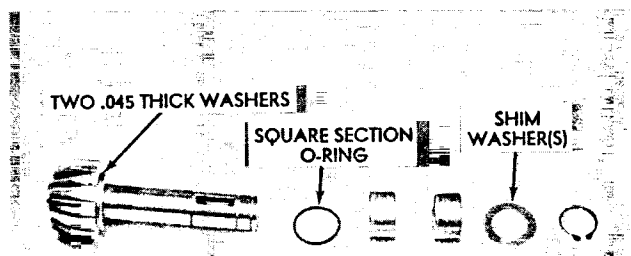


FIG. 11. Input Shaft Disassembled

CLEANING AND INSPECTION

Clean all parts in solvent, except seals and plastic parts. Inspect all parts for general serviceability, and also for the following defects:

Spur Gears — Worn, chipped or missing teeth, excess wear or scoring in the hub bore, or wear and chipping in the clutch engagement slots.

Bevel Gears — Worn, chipped, or missing teeth; excess wear or scoring in the hub bore. Unusual or uneven wear pattern on teeth indicates improper shimming of input/drive shafts.

Shafts — Excessive wear or scoring where contact is made with gears or bearings. Damaged keyways and snap ring grooves.

Clutch Collars — Wear or scoring in bore; chipped, cracked or excessively worn (rounded corners) on clutch "ears".

Bushings/Bearings — Wear or scoring; loose, missing or damaged needles.

Shift Forks — Wear, cracks, breaks, or bending.

Brake Disc and Pucks — Wear, scoring.

Case Halves — Cracks, distortion, or worn bearing bores.

SPECIAL NOTE

Refer to Service Bulletin 244 for information concerning:

1. Correction of poor clutch action due to abrupt engagement of transmission drive belt, which can place high loads on internal parts.
2. Correction of interference between shift stick and frame, preventing proper engagement of 2nd gear.
3. Stronger Hi-Lo shift fork.

REASSEMBLY

NOTE

Grease used during assembly is Shell Darina "O", unless specified otherwise.

INPUT SHAFT

Needle bearings are pressed into case half as shown in Fig. 12. Pack the needle bearings and the cavity between them with Exxon Unirex N-3 grease. Install the square section O-ring at the bottom of the input shaft bore; this O-ring is used to keep the special grease in the input shaft bore.

The bevel gear is a press fit on the input shaft, and is secured in place with a snap ring. Assemble the gear on the shaft, if removed, and install the snap ring with the sharp edge away from the gear. Install the input shaft, with washers placed as shown in Fig. 12. The snap ring should be installed with the sharp edge away from the shim washer.

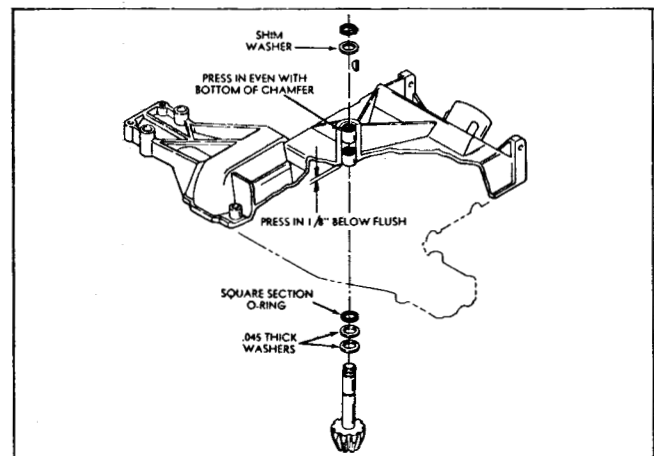


FIG. 12. Input Shaft Assembly

HI-LO SHIFT

Apply a light coat of grease to the Hi-Lo shift cavity in the upper case half. Install the shift fork, detent pin and spring, shift lever and cover (Fig. 13). Shift from Hi to Lo several times to check for free action.

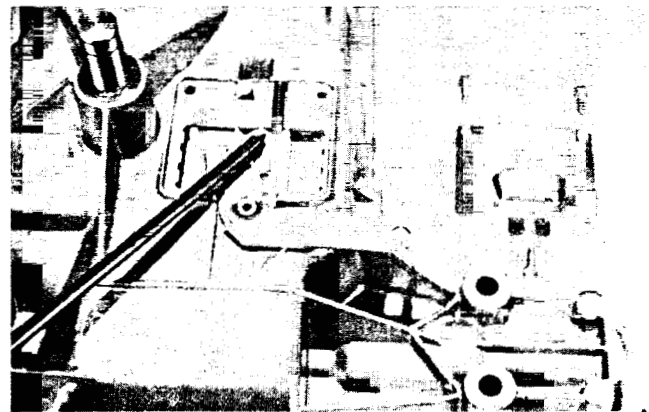


FIG. 13. Hi-Lo Shift Assembly

SHIFT FORKS

Apply Loctite to four screws used to secure shift forks. Coat parts with grease, then install the shift forks, support plate and lockout plate; the shift forks are interchangeable side to side (Fig. 14). Install and tighten the screws evenly, then back off $\frac{1}{4}$ turn to free shift forks.

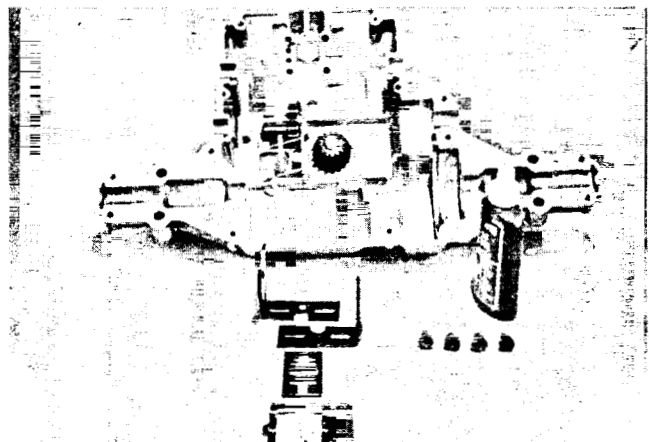
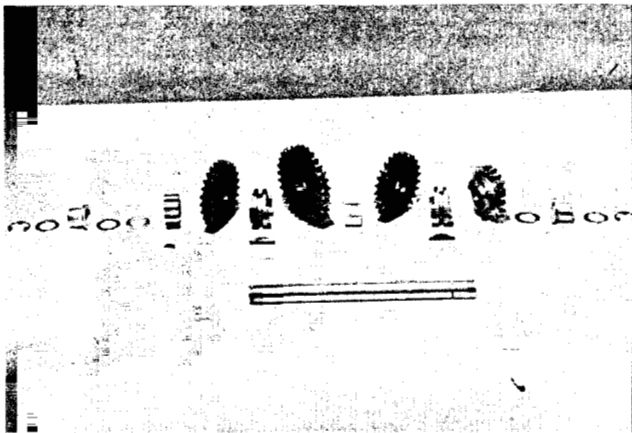


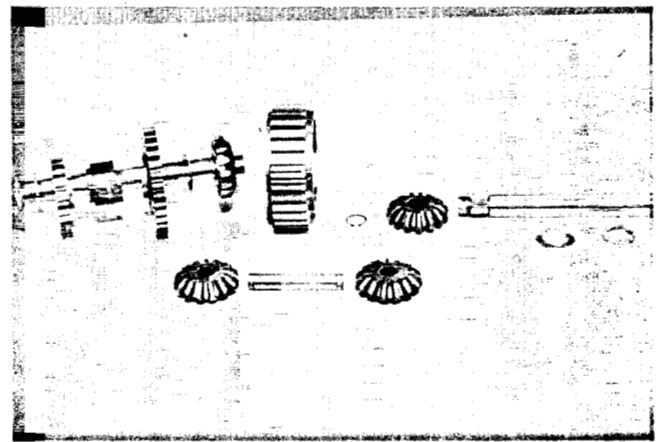
FIG. 14. Assemble Shift Forks

A high-contrast, black and white photograph of a mechanical assembly, likely a valve or actuator. The image shows a complex arrangement of metal parts, including a central body with various ports and a prominent diagonal rod or lever extending from the center towards the bottom right. The background is a light, textured surface, and the overall image has a grainy, high-contrast appearance.

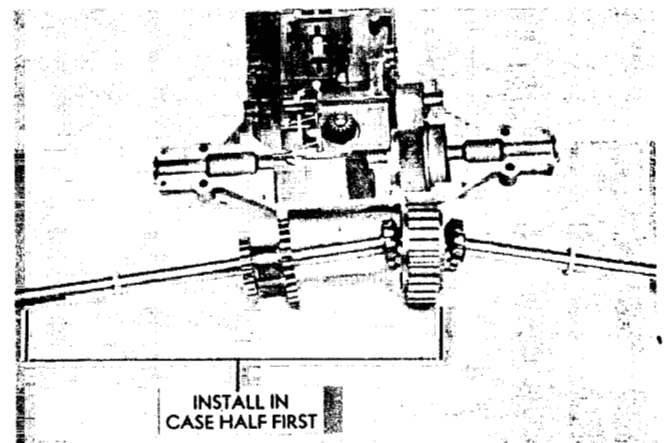
INTERMEDIATE SHAFT



DIFFERENTIAL & AXLES



Slide shim washer and felt seal on short axle shaft. With the index and middle fingers of the left hand, hold the differential bevel gears outward. While holding the assembly firmly against the installed axle gear, carefully raise the differential until the opposite axle gear can be engaged with the differential bevel gears. If the entire assembly will not drop into place in the case, repeat the procedure, reindexing the gear on the short axle with a differential bevel gear one tooth at a time (Fig. 18).



INTERMEDIATE SHAFT

SHIM LOCATIONS

DRIVE SHAFT

This diagram illustrates the internal components of a gearbox assembly. It shows the intermediate shaft, the drive shaft, and the shim locations. The diagram is a technical drawing with labels and arrows pointing to the respective parts.

Shim the short (LH) axle shaft for the minimum end play that still permits free rotation of the axle/ differential gears.

DRIVE SHAFT

Apply a light coating of grease to the drive shaft. Refer to Fig. 20 and assemble drive shaft. Note the location of the two "special" woodruff keys, which have one end ground off to prevent interference with adjacent gears or washers. Install the drive shaft assembly in the upper case half, making sure that the clutch collar engages with the Hi-Lo shift fork, and that the tabs on the bearings are placed in the notches in the case halves (Fig. 21).

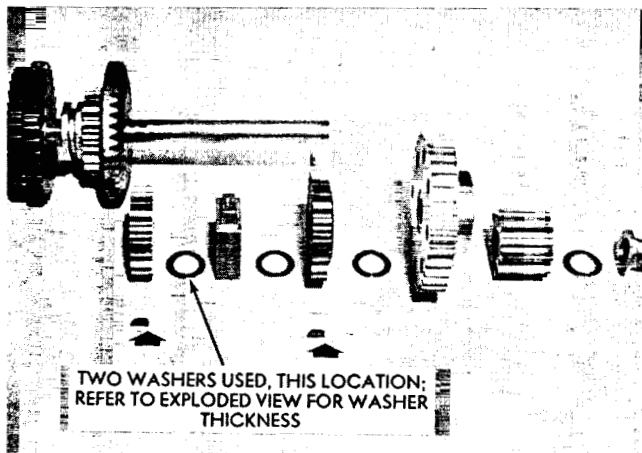


FIG. 20. Drive Shaft Assembly

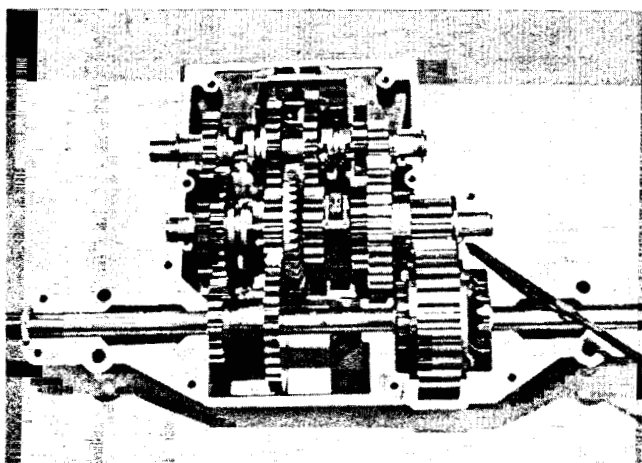


FIG. 21. Drive Shaft Installed

Check drive shaft end play, which should be .020-.030 in. (.5-.7 mm). Use shims in locations shown in Fig. 19, to adjust end play.

LUBRICATION

Pack axle cavities of both case halves with Exxon Unirex N-3 grease. Use 24 oz. (700 gm) of Shell Darina "O" grease in the main part of the gearcase, distributed evenly.

Position the threaded hole in the drive shaft support block upward. Place the lower case half on the upper case half, checking to see that the felt seals on the axle shafts seat properly, and that the hole in the drive shaft support block aligns with the hole in the center of the case half. Install the center support bolt and the 14 case bolts. Tighten the center bolt to 100-110 in. lbs. (11.7-12.8 Nm). Tighten the case bolts to 80-90 in. lbs. (9.2-10.4 Nm).

BRAKE

Install woodruff key and slide brake disc on intermediate shaft. Place a friction puck in the recess in the lower case half (rounded side out). Assemble brake jaw parts and insert shoulder bolt. Apply a drop of Loctite on shoulder bolt threads and install in case (Fig. 22 & 23). Torque the shoulder bolt to 200-250 in. lbs. (23.3-29 Nm).

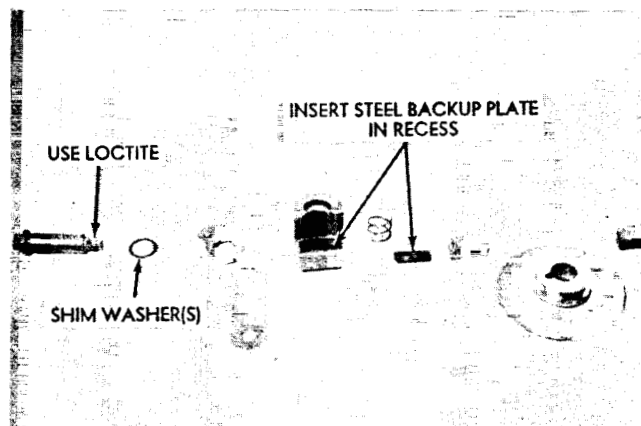


FIG. 22. Brake Parts

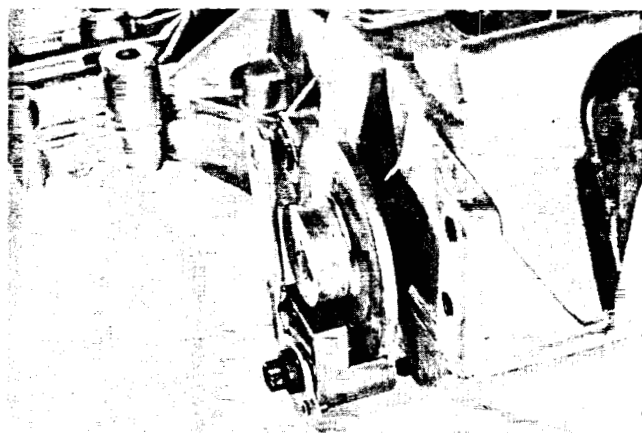


FIG. 23. Brake Assembly

Check and adjust the air gap between the brake disc and one friction puck to .020 in. (.5 mm). The gap can be set by adjusting the set screw in the center of the brake jaw, or through use of shim washers under the head of the shoulder bolt (Fig. 24). Once this adjustment is made, periodic brake adjustment is not required while the transmission is in service.

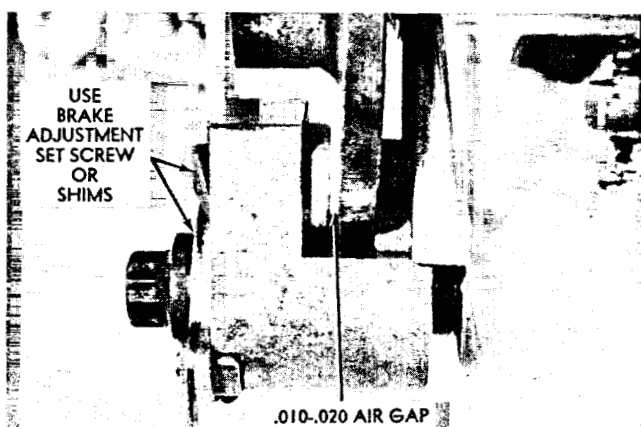


FIG. 24. Brake Adjustment

SHIFT LEVER

Turn the transmission over and install the two detent balls, springs and set screws in the transmission case (Fig. 25). Tighten set screws until the heads of the screws are flush with the top of the case.

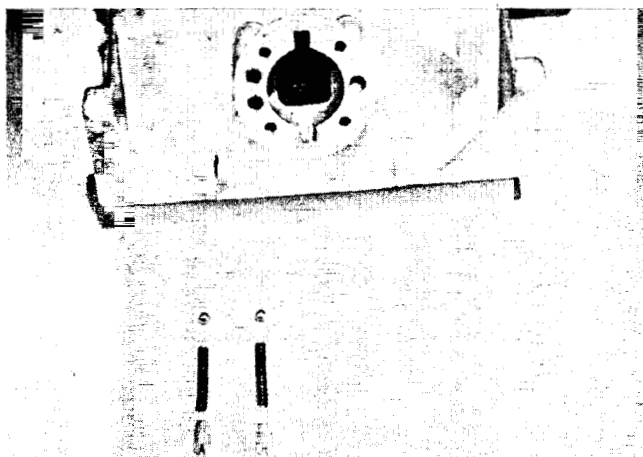


FIG. 25. Install Shift Fork Detents

Install wave washer, nylon insert, shift lever and nylon cover. Secure with four screws (Fig. 26).

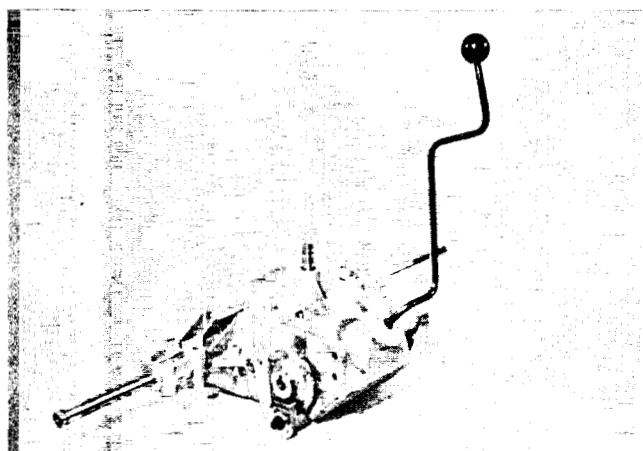


FIG. 26. Install Gear Shift

INPUT SHAFT END PLAY

Check that input shaft end play is .010-.020 in. (.3-.5 mm). End play is adjusted by changing the shim washer under the input shaft snap ring (Fig. 27).

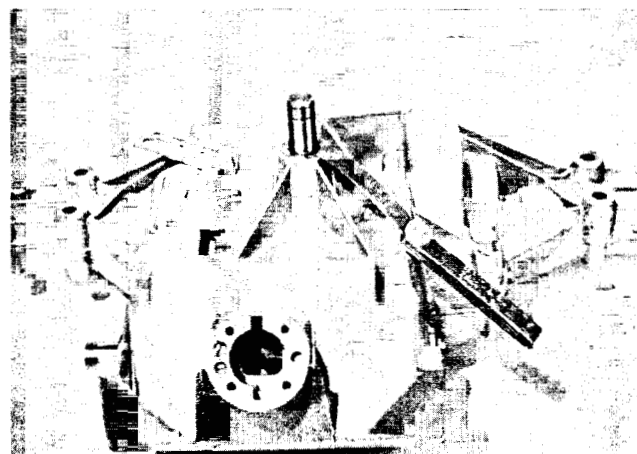


FIG. 27. Check Input Shaft End Play

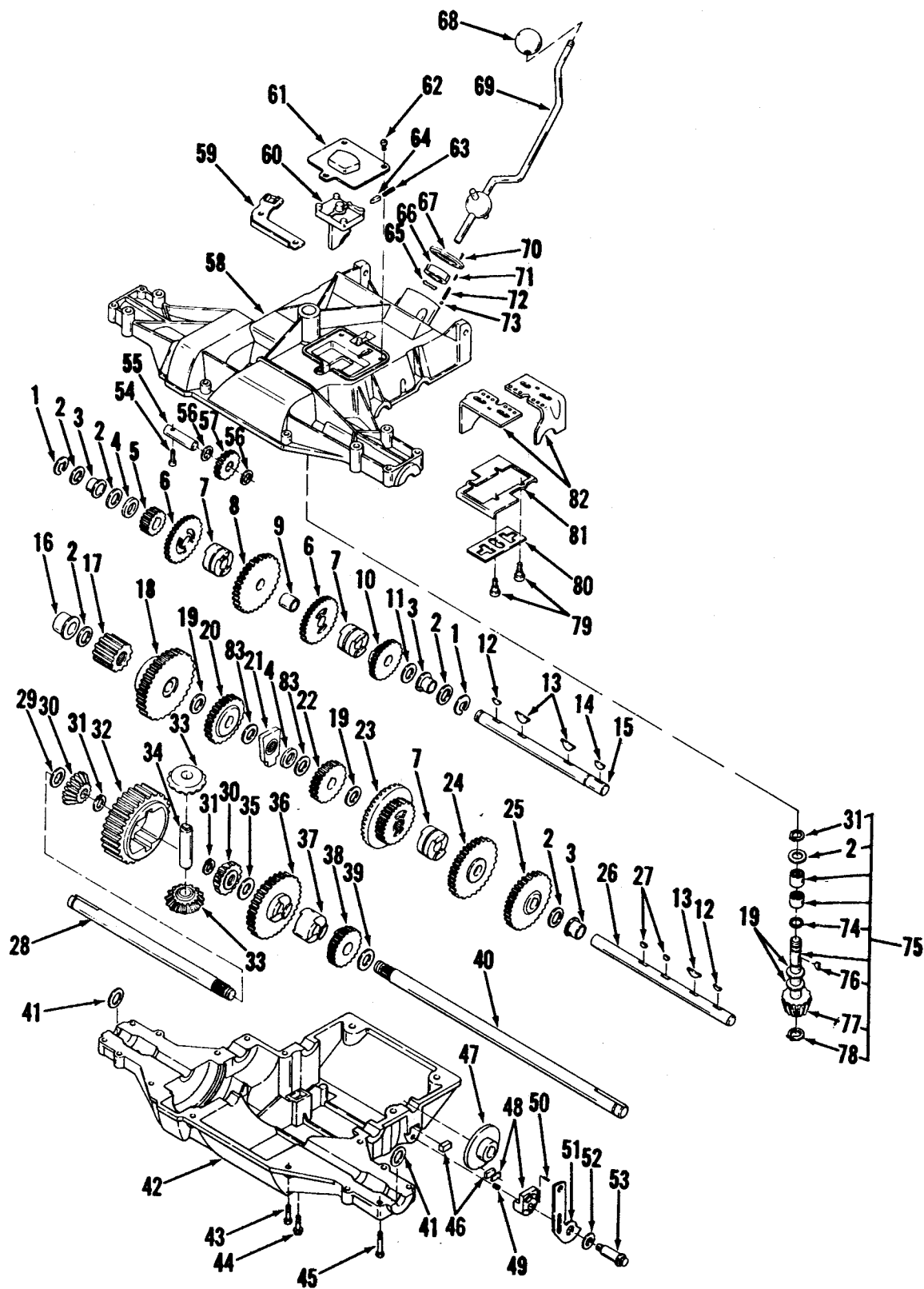
PARTS LIST — 6-SPEED TRANSMISSION

Parts available only through Authorized Dealers.
When ordering parts always list Part No. and Description.
(Specifications subject to change without notice.)

ITEM NO.	PART NO.	DESCRIPTION	NO. REQ'D.
	107972 *	Transmission - Foote Model 4000-5	1
1	107836	E-Ring	2
2	107837	Shim Washer .060	X
2	107838	Shim Washer .050	X
2	107839	Shim Washer .045	X
2	107840	Shim Washer .040	X
2	107841	Shim Washer .035	X
2	107842	Shim Washer .031	X
2	107843	Shim Washer .025	X
2	107844	Shim Washer .020	X
3	107845	Flange Bearing	3
4	107846	Spacer 1.00 X .630 X .110	2
5	107847	Spur Gear 13T	1
6	107848	Spur Gear 25T	2
7	107849	Clutch Collar	3
8	107850	Spur Gear 30T	1
9	107851	Spacer .87 X .632 X .679	1
10	107852	Spur Gear 20T	1
11	107844	Shim Washer .020	1
12	107854	Woodruff Key #3	2
13	107855	HI-Pro Key, Special	3
14	107856	Woodruff Key #61	1
15	107857	Intermediate Shaft	1
16	107858	Flange Bearing	1
17	107859	Gear Assy. 12T	1
18	107860	Spur Gear 37T	1
19	107839	Shim Washer .045	4
20	107862	Spur Gear 25T	1
21	107863	Shaft Support Assy.	1
22	107864	Spur Gear 20T	1
23	107865	Bevel Gear Assy.	1
24	107866	Spur Gear 33T	1
25	107867	Spur Gear 30T	1
26	107868	Drive Shaft	1
27	107869	Woodruff Key #3, Special	2
28	107870	Axle LH	1
29	107871	Shim Washer 1.25 X .755 X .062	X
29	107872	Shim Washer 1.25 X .755 X .031	X
29	107873	Shim Washer 1.25 X .755 X .040	X
30	107874	Bevel Gear 15T Splined	2
31	107875	Retaining Ring	3
32	107876	Spur Gear 32T	1
33	107877	Bevel Gear 15T	2
34	107878	Cross Shaft	1
35	107872	Shim Washer 1.25 X .755 X .031	1
36	107853	Spur Gear 35T	1
37	107879	Gear Lock	1

• ALTERNATE 108282

WHEEL HORSE 107972/108282 6-SPEED TRANSMISSION



WHEEL HORSE
lawn & garden tractors

0313

PARTS LIST — 6-SPEED TRANSMISSION

Parts available only through Authorized Dealers.
When ordering parts always list Part No. and Description.
(Specifications subject to change without notice.)

ITEM NO.	PART NO.	DESCRIPTION	NO. REQ'D.
38	107880	Spur Gear 22T	1
39	107871	Shim Washer 1.25 X .755 X .062	1
40	107881	Axle RH	1
41	107882	Felt Seal	2
42	107883	Case Half, Lower	1
43	107884	S.T. Bolt 1/4-20 X 3/4	8
44	107885	Hex HD. Machine Screw #12-24 X 5/8	1
45	107886	S.T. Bolt 1/4-20 X 1 5/16	6
46	107887	Friction Puck	2
47	107888	Brake Disc	1
48	107889	Brake Jaw Assembly	1
49	107890	Compression Spring	1
50	107891	Set Screw #8-32 X 5/16	1
51	107892	Brake Lever	1
52	107893	Shim Washer .750 X .505 X .015	X
52	107895	Shim Washer .750 X .505 X .006	X
53	107896	Shoulder Bolt	1
54	107897	S.T. Screw #10-24 X 1	1
55	107898	Idler Shaft	1
56	107899	Washer 1.00 X .505 X .020	2
57	107900	Idler Gear Assembly	1
58	107901	Case Half, Upper	1
59	107902	Lever, HI-Lo Shift	1
60	*107903	Shift Fork, HI-Lo	1
61	107904	Cover Plate	1
62	107905	S.T. Bolt #8-32 X 1/2	3
63	107906	Detent Spring	1
64	107907	Detent Pin	1
65	107908	Wave Washer	1
66	107909	Nylon Insert	1
67	107910	Nylon Cover	1
68	107871	Shift Knob	1
69	*107912	Shift Lever	1
70	107913	S.T. Screw #10-24 X 1/2 Truss HD.	4
71	107914	Set Screw 1/4-20 X 1/2	1
72	107915	Detent Spring	1
73	107916	Detent Ball	1
74	107917	O-Ring	1
75	107918	Input Shaft Kit	1
76	107919	Woodruff Key #9	1
77	107920	Bevel Pinion 16T	1
78	107921	Retaining Ring	1
79	107922	Screw 1/4-28 X 3/4 Posi-Drive	4
80	107923	Lock-Out Plate	1
81	107924	Support Plate	1
82	107925	Shift Fork	2
83	107843	Shim Washer .025	2

*ALTERNATE 108283

**Use 108513