

SERVICE REPAIR

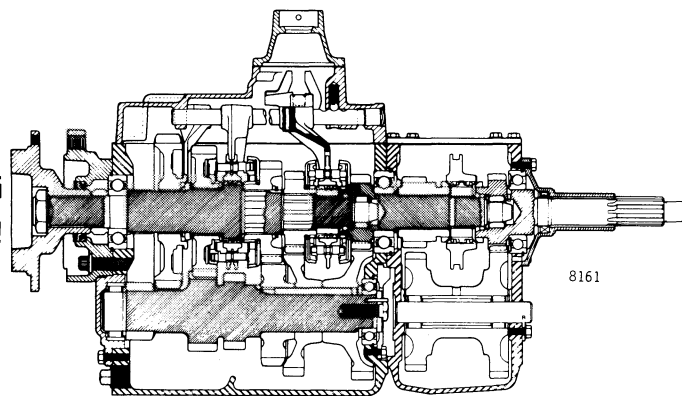
MANUAL

Hyster C007 (H150H, H165H, H180H, H200HS, H200H, H225H, H250H, H275H, P150B, P200B) Forklift

HYSTER

THE FIVE SPEED TRANSMISSION

(NEW PROCESS 542)



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This section applies to the following models:
H150-275H, H300-350B, P150-200B, M200-400H

INTRODUCTION

GENERAL

This section has a description and the repair procedures for the five speed transmission.

DESCRIPTION AND OPERATION (See Figure 1)

The transmission is made of two assemblies; a five speed range transmission and a forward/reverse gearbox.

In the range transmission, the main shaft is a support for the first, second, third and fourth speed gears. It is also a support for the two synchronizers. There is one synchronizer for second and third speeds and one synchronizer for fourth and fifth speeds. The input shaft for the range transmission is a support for the following: (1) The gear for fifth speed, (2) the gear for reverse and (3) the detent ring for forward and reverse. The countershaft has the gears that engage with the five gears in the range transmission. During operation, all gears except first speed are constantly engaged. The gear change forks are held in the transmission cover. The forks are controlled directly by the range lever.

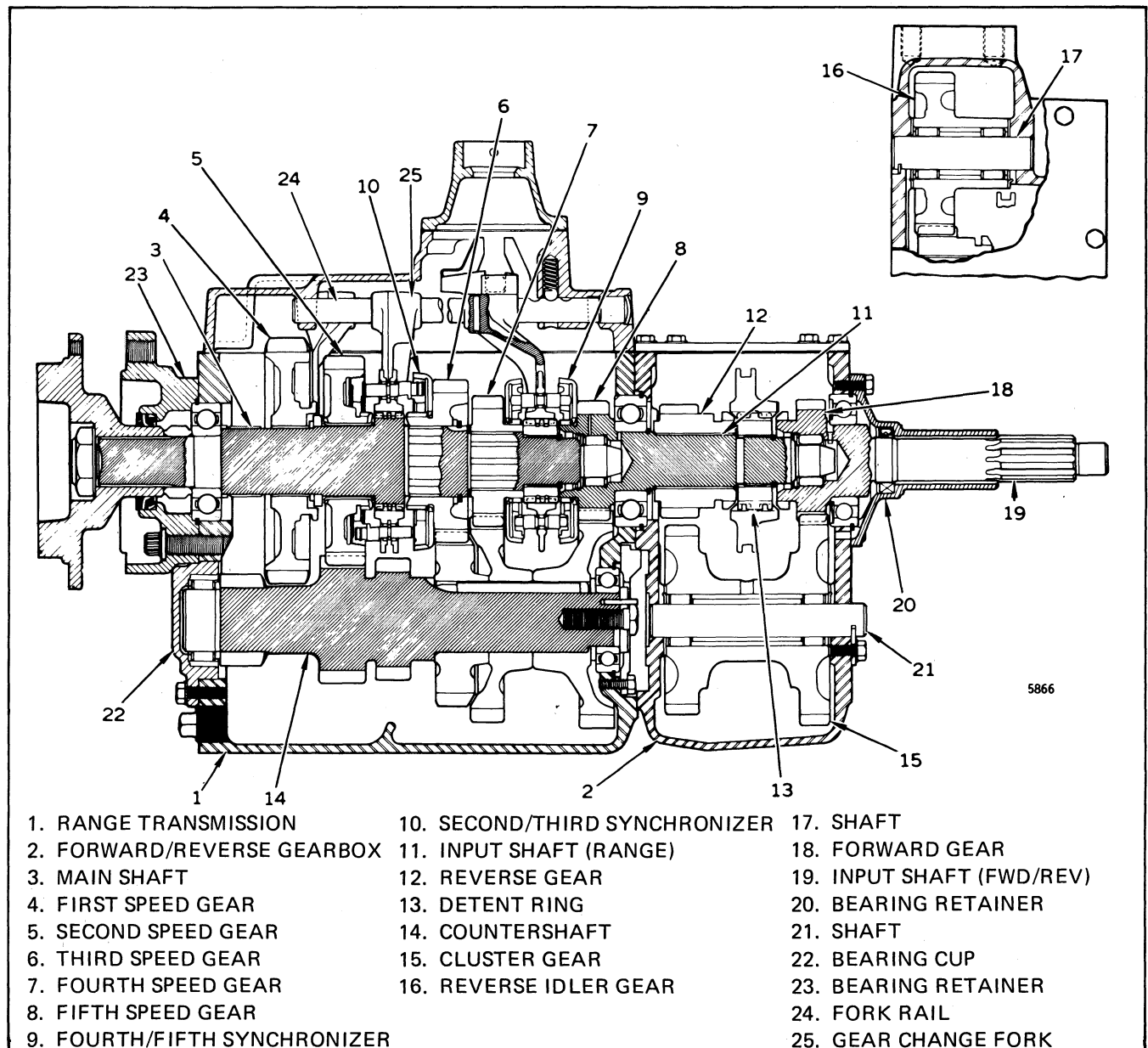


FIGURE 1. TRANSMISSION

**Thanks very much for your reading,
Want to get more information,
Please click here, Then get the complete
manual**

JustClickHere 

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The input shafts for the range transmission and the forward/reverse gearbox are held together in the forward/reverse gearbox. The forward gear is constantly engaged with the forward cluster gear. The reverse gear is constantly engaged with the reverse idler gear. The reverse idler gear is constantly engaged with the cluster gear.

The detent ring is controlled by the forward/reverse lever. In forward, the detent ring locks the forward gear to both input shafts. In reverse, the detent ring locks the reverse gear to the input shaft for the range transmission. The fork rail for forward and reverse actuates a neutral starting switch. The switch permits the engine to start only when the forward reverse/lever is in the "NEUTRAL" position.

REPAIRS

REMOVAL

NOTE: The procedures below are for removal of the transmission only. If necessary, the engine and transmission can be removed as an assembly.

- A. Drain the oil from the transmission.
- B. Remove the floorplates and the seat bracket.
- C. Disconnect the forward reverse linkage at the transmission. Remove the range lever from the transmission cover. Disconnect the wires at the neutral start switch.
- D. Disconnect the drive shaft at the parking brake drum. Disconnect the parking brake linkage.

WARNING: Make sure any lifting device can hold 500 pounds (227 kg).

- E. Connect a crane or other lifting device to the transmission. Put a block under the end of the engine with the flywheel.
- F. Remove the capscrews from the transmission mount. Remove the capscrews holding the transmission to the clutch housing.
- G. Move the transmission toward the front of the lift truck until input shaft is away from the clutch housing. Lift or lower the transmission from the truck.

DISASSEMBLY (See Figure 2)

CLEANING

The transmission housing can be cleaned with steam. Make sure all the cleaning compound is removed from the housing. Clean all mechanical parts in solvent. Dry with compressed air.

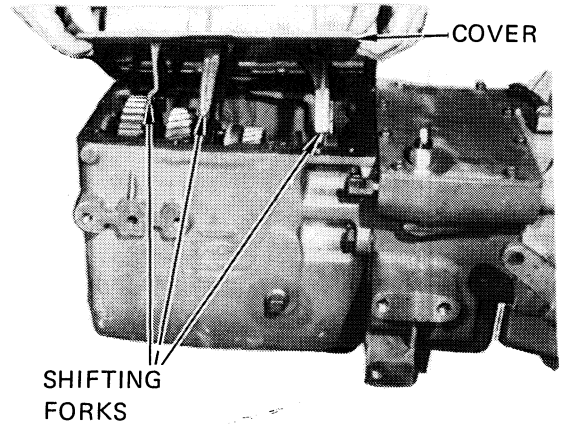
ASSEMBLY (See Figure 3)

INSTALLATION

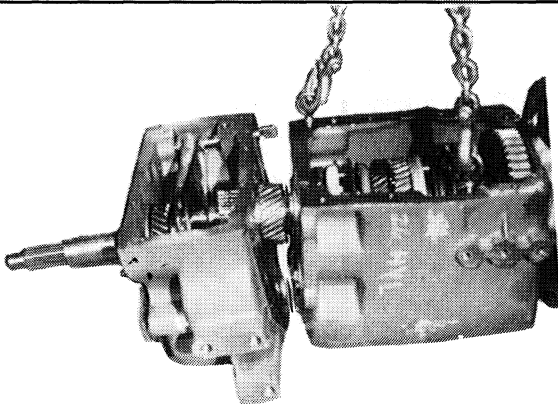
WARNING: Make sure any lifting device can hold 500 pounds (227 kg).

- A. Connect a crane or other lifting device to the transmission. Use a sealant and install a new gasket on the clutch housing. Install the transmission to the clutch housing. Tighten the capscrews to 80 foot pounds (11.1 kg m). Make sure the input shaft aligns with the clutch disc and the pilot bearing for the flywheel. Tighten the capscrews.
- B. Install the capscrews for the transmission mount. Tighten the capscrews to 135 to 140 foot pounds (18.7 to 19.4 kg m). Remove the crane.
- C. Connect the drive shaft to the flange for the universal joint. Connect the parking brake linkage. Connect the wires to the neutral starting switch.
- D. Connect the forward/reverse linkage. Adjust the linkage as described in Checks and Adjustments. Install the range lever.
- E. Fill the range transmission with 10 pounds (4.5 kg) of SAE 90 or 80-90W gear lubricant. Fill the forward/reverse gearbox with 3 pounds (1.4 kg) SAE 90 or 80W-90 gear lubricant.

STEP 1. See the Oil Clutch section and remove the clutch parts. See the Parking Brake section and remove the parking brake.

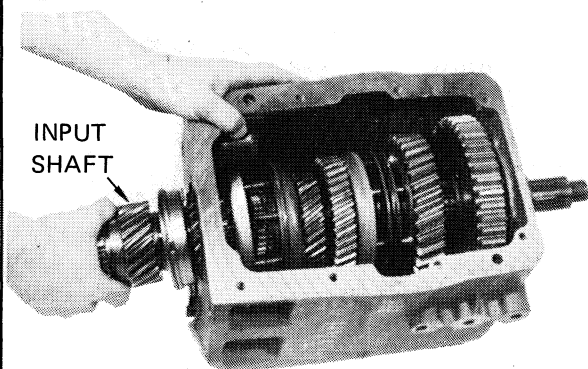


STEP 2. Remove the cover capscrews. Put the shifting forks in a position so the cover can be removed.

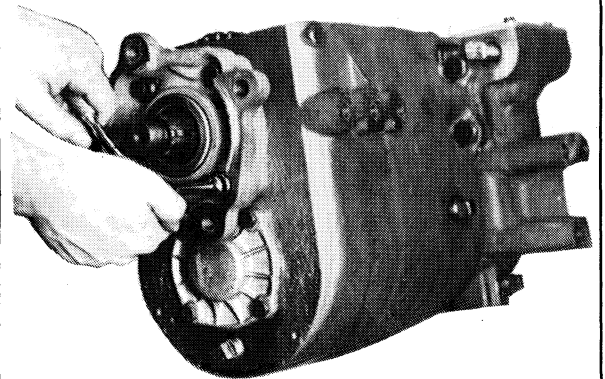


STEP 3. Remove the four capscrews holding the forward/reverse box to the transmission. Pull the housings apart. Remove the cover for forward/reverse gearbox.

NOTE Disassemble the 5-speed transmission as shown in Steps 4 to 10.
Disassemble the forward/reverse gearbox as shown in Steps 11 to 13.



STEP 4. Remove the input shaft.

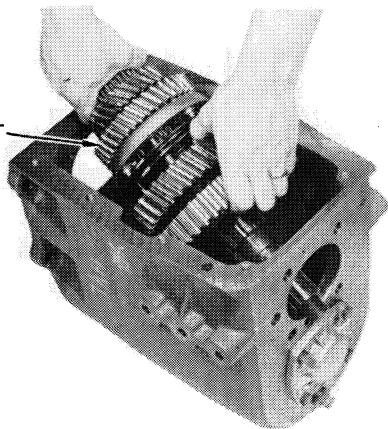


STEP 5. Remove the bearing retainer.

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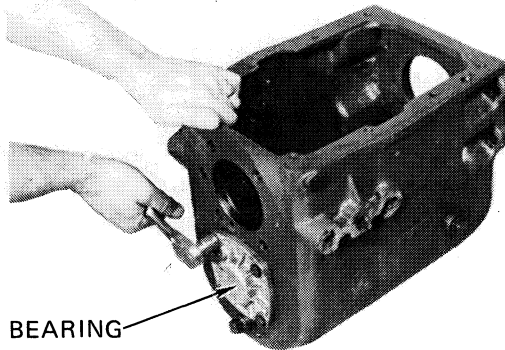
FIGURE 2. DISASSEMBLY OF THE TRANSMISSION (Sheet 1 of 3)

MAINSHAFT



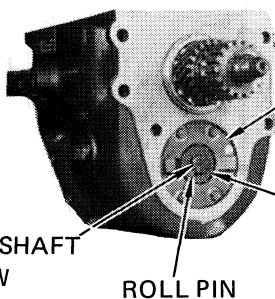
STEP 6. Hit the main shaft to loosen the bearing. Remove bearing using a puller. Remove the main shaft.

BEARING
CUP



STEP 7. Remove the bearing cup for the countershaft.

COUNTERSHAFT
CAPSCREW



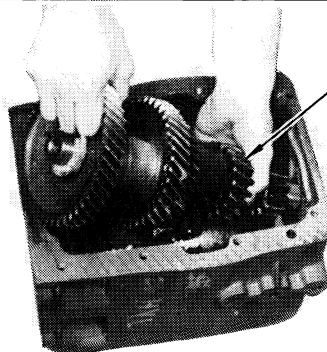
BEARING
RETAINER

BEARING
LOCK

ROLL PIN

STEP 8. Remove the bearing retainer. Remove the roll pin from bearing lock. Remove the countershaft capscREW and bearing lock.

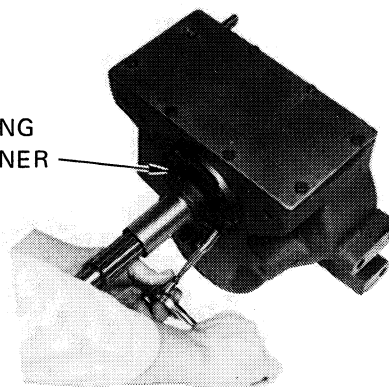
COUNTERSHAFT



STEP 9. Remove the countershaft. Push the bearing from the housing. Use a press to remove the gears from the countershaft.

STEP 10. See Figure 1 and disassemble the main shaft and input shaft. Remove the snap rings and the gears and synchronizers from the shaft.

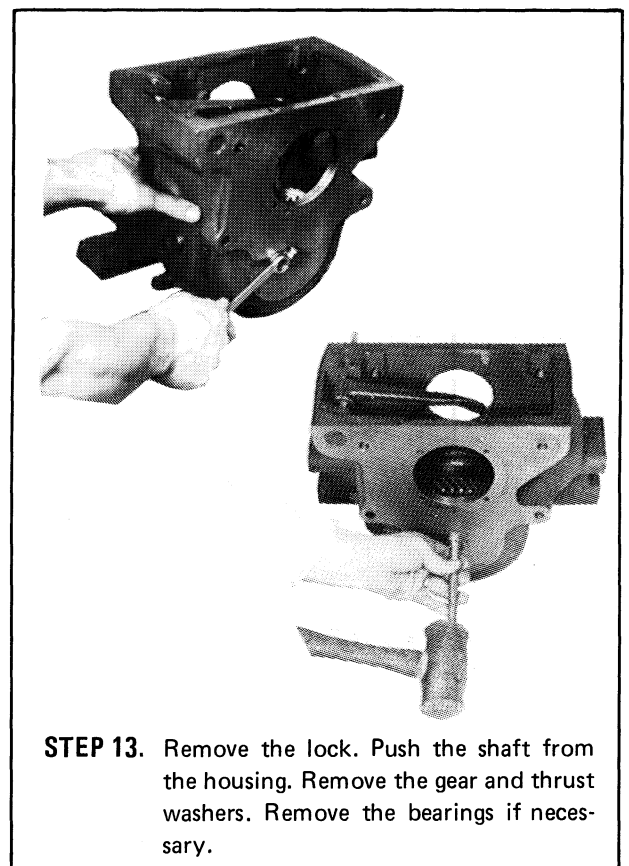
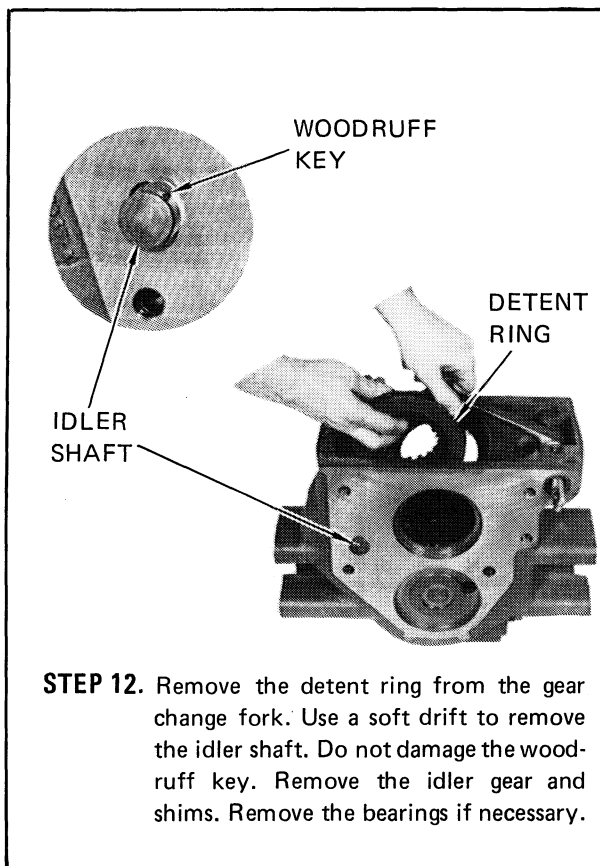
BEARING
RETAINER



STEP 11. Make marks on the bearing retainer and the housing. Remove bearing retainer. Pull the shaft from the housing.

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FIGURE 2. DISASSEMBLY OF THE TRANSMISSION (Sheet 2 of 3)

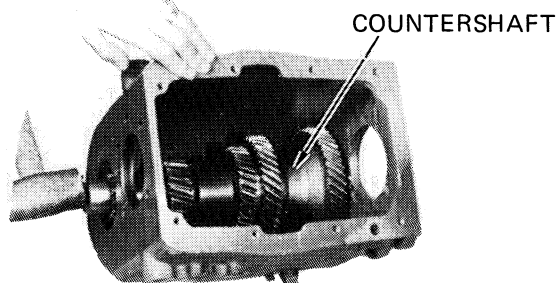
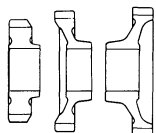
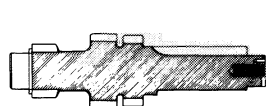


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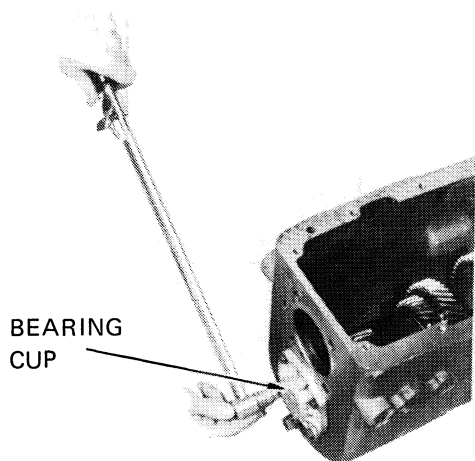
FIGURE 2. DISASSEMBLY OF THE TRANSMISSION (Sheet 3 of 3)

NOTE Assemble the 5-speed transmission as shown in Steps 1 to 13.

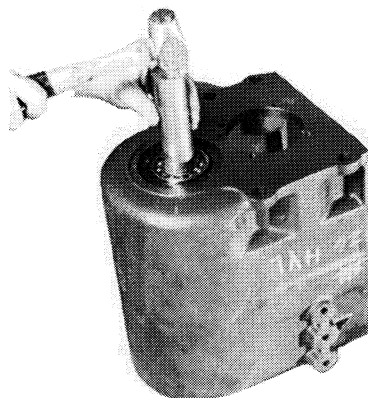
Assemble the forward/reverse gearbox as shown in Steps 14 to 20.



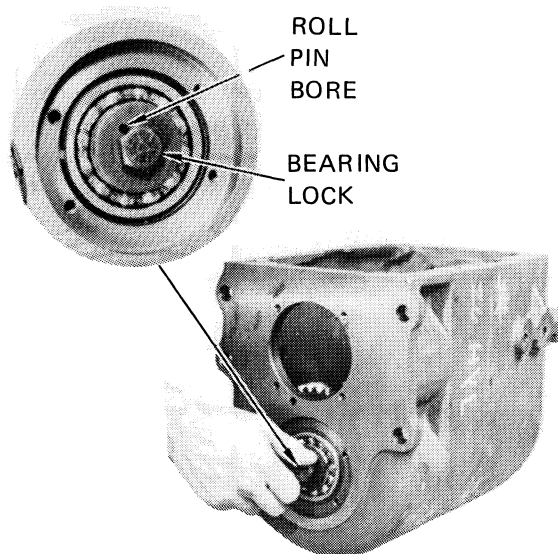
STEP 2. Use a press to install the gears on the countershaft. Install the countershaft with spacers in the housing. Push the countershaft until the bearings are in the seats.



STEP 4. Lubricate the bearing rollers with grease. Install the bearings in the bearing cup. Install the bearing cup and gasket. Tighten the capscrews to 20-40 foot-pound (2.8-5.5 kg-m).



STEP 1. Install the snap ring on the bearing. Push the countershaft bearing into the housing.



STEP 3. Install the bearing lock and capscrew. Make sure the roll pin bores in the countershaft and bearing lock are aligned. Do not tighten the capscrew.

FIGURE 3. ASSEMBLY OF THE TRANSMISSION (Sheet 1 of 6)

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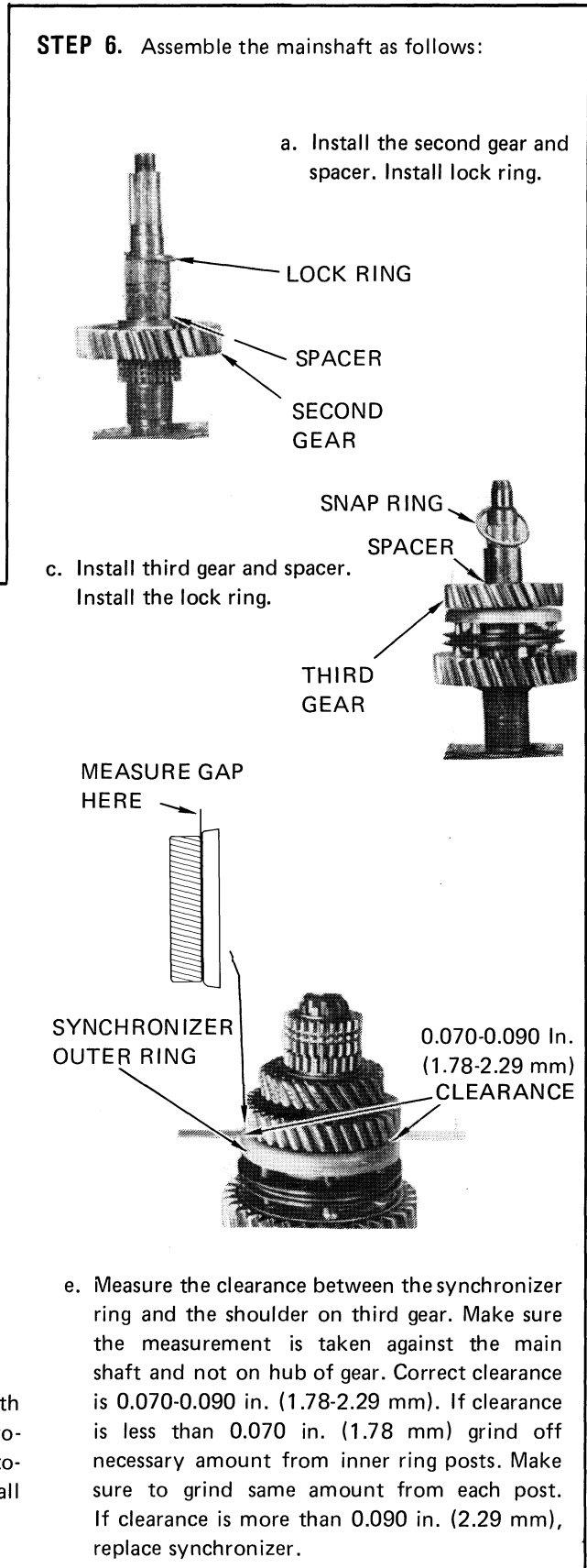
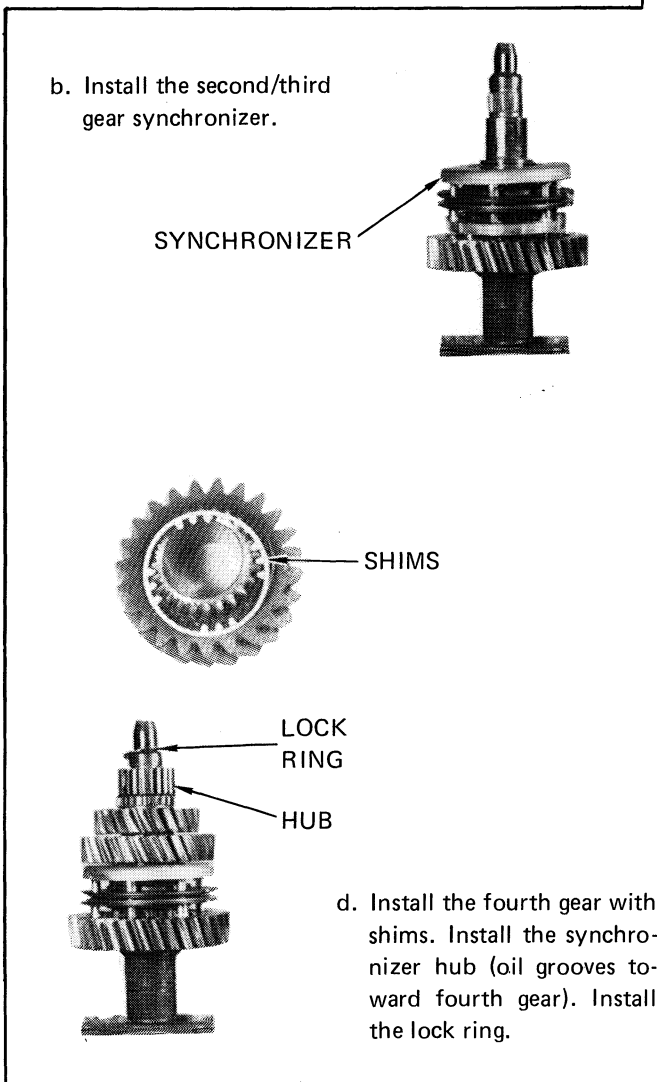
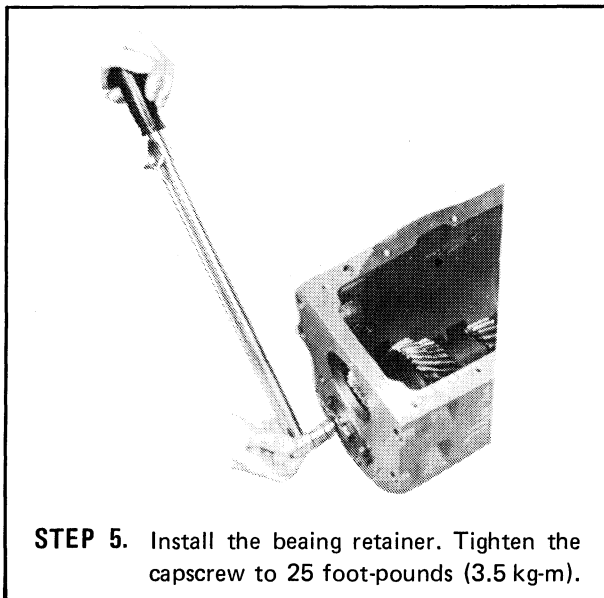
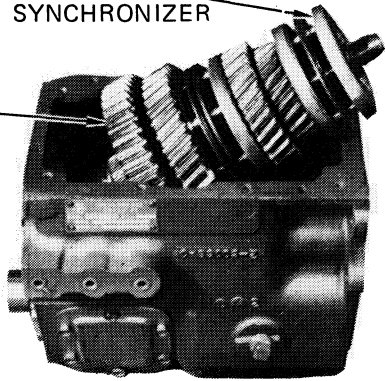


FIGURE 3. ASSEMBLY OF THE TRANSMISSION (Sheet 2 of 6)

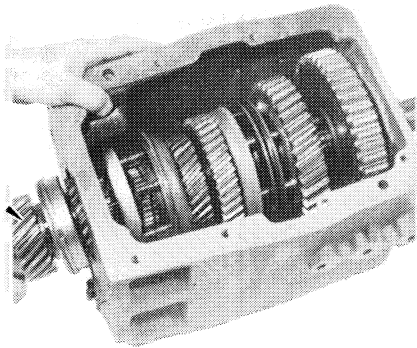
FOURTH/FIFTH
SYNCHRONIZER

FIRST
GEAR

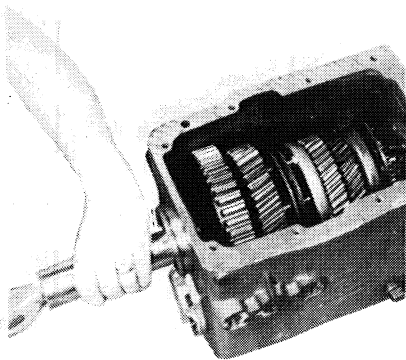


STEP 7. Install the fourth/fifth synchronizer and the first gear on the main shaft. Install the main shaft in housing.

INPUT
SHAFT

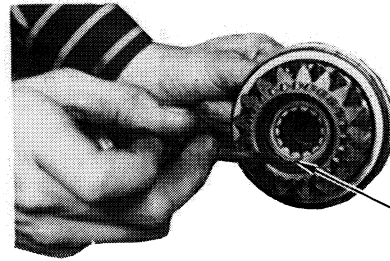


STEP 9. Install the input shaft.



STEP 10. Install the bearing on the main shaft. Push the bearing into the housing.

STEP 8. Assemble the input shaft as follows:

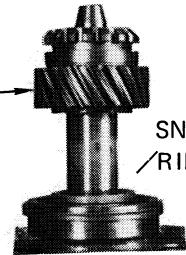


SNAP
RING

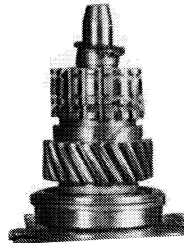
a. Lubricate the bearing rollers and install them in the shaft bore. Install the snap ring.

FIFTH
GEAR

SNAP
RING

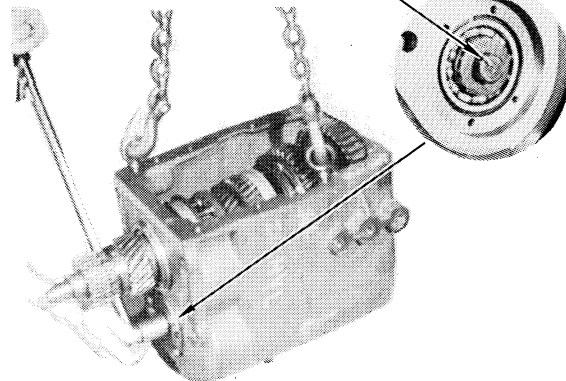


b. Use a press to install the bearing on the shaft. Install the snap ring. Install fifth gear.



c. Install the detent ring hub (oil grooves toward fifth gear). Install snap ring.

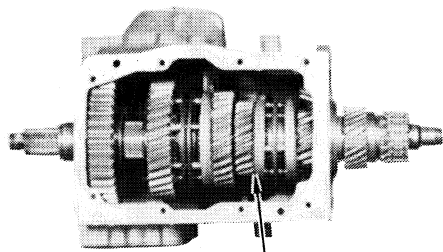
ROLL PINS



STEP 11. Put the transmission in any two gears, then tighten cap screw to 100-150 foot-pounds (14-21 kg-m). Install roll pins. Bend roll pins to hold the cap screw in place.

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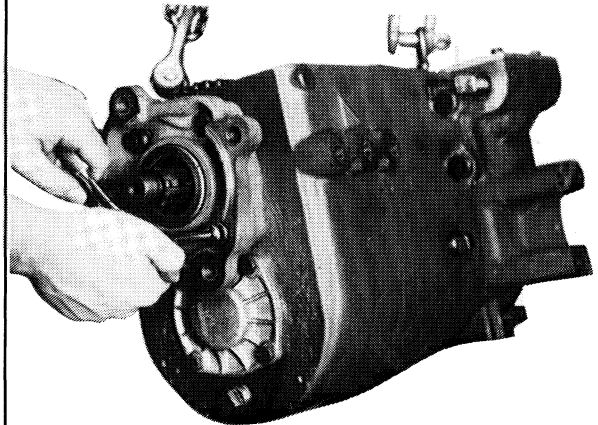
FIGURE 3. ASSEMBLY OF THE TRANSMISSION (Sheet 3 of 6)



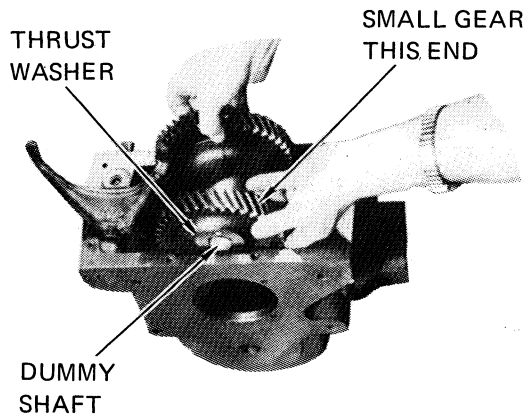
MEASURE CLEARANCE
HERE

STEP 12. Put the transmission in fourth gear. Measure the clearance between the fourth gear synchronizer outer ring and fourth gear. When making this check, put the synchronizer so that one post is directly above the center of the main shaft. Do not move the synchronizer. If clearance is not 0.050-0.070 in (1.27-1.78 mm) add or remove shims as necessary from fourth gear. (See Step 6.d.)

SPACER

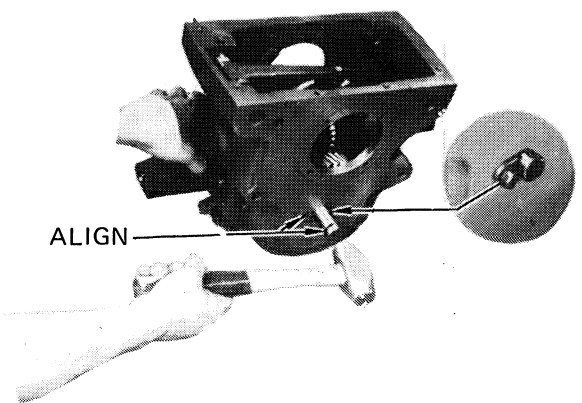


STEP 13. Install the spacer. Install the seal in the bearing retainer. Install retainer. Tighten the capscrews.



STEP 14. Install the spacer, roller bearings and retainers. Use grease to hold the parts in position. Install shaft and thrust washers with the teeth toward case. Install gear. Make sure the teeth are aligned with the slots in the case.

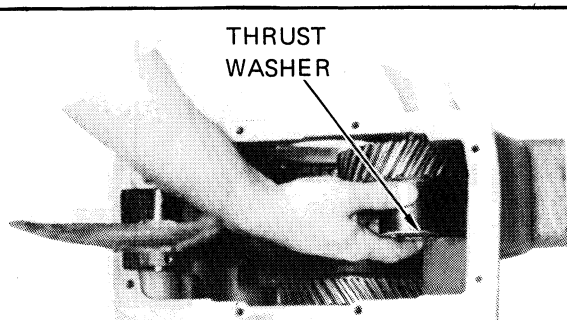
ALIGN



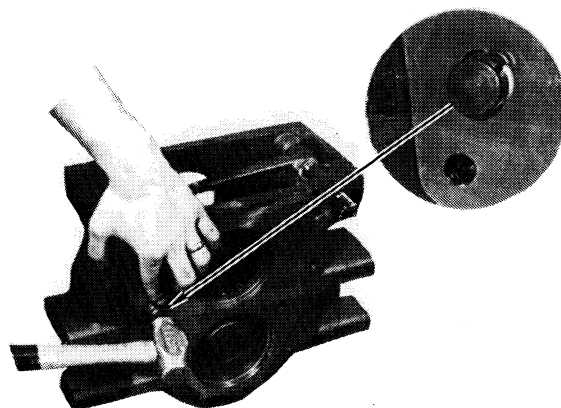
STEP 15. Install the shaft. Make sure the slot for the lock plate and the hole are aligned. Install the lock plate.

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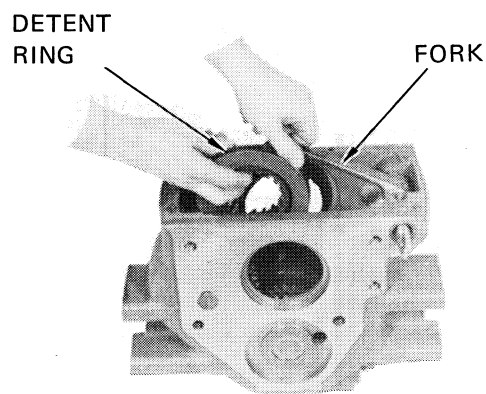
FIGURE 3. ASSEMBLY OF THE TRANSMISSION (Sheet 4 of 6)



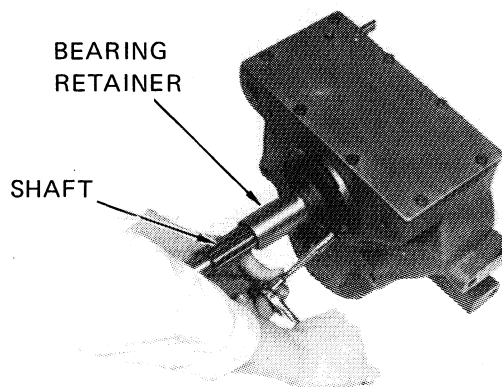
STEP 16. Install the spacer, roller bearings and retainers in the idler gear. Install thrust washers with teeth toward the case. Use grease to hold parts to gear. Install the gear. Make sure the thrust washer teeth are aligned with the slots in the case.



STEP 17. Install the idler shaft. Make sure the woodruff key is in the groove.



STEP 18. Install the detent ring in the gear change fork.



STEP 19. Install the shaft. Make sure the bearing is against the case. Install the seal in the bearing retainer (lip facing the bearing). Install the bearing retainer. Make sure the marks are aligned.

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FIGURE 3. ASSEMBLY OF TRANSMISSION (Sheet 5 of 6)

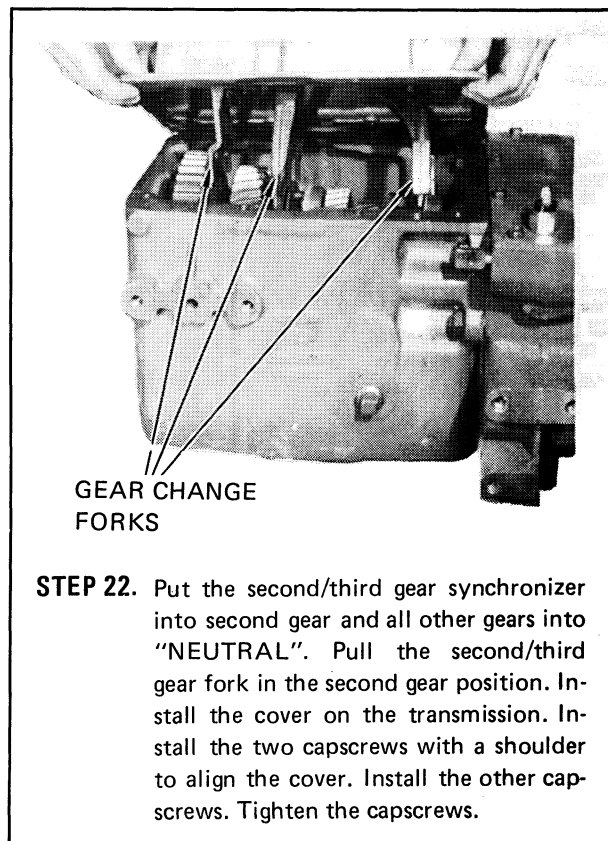
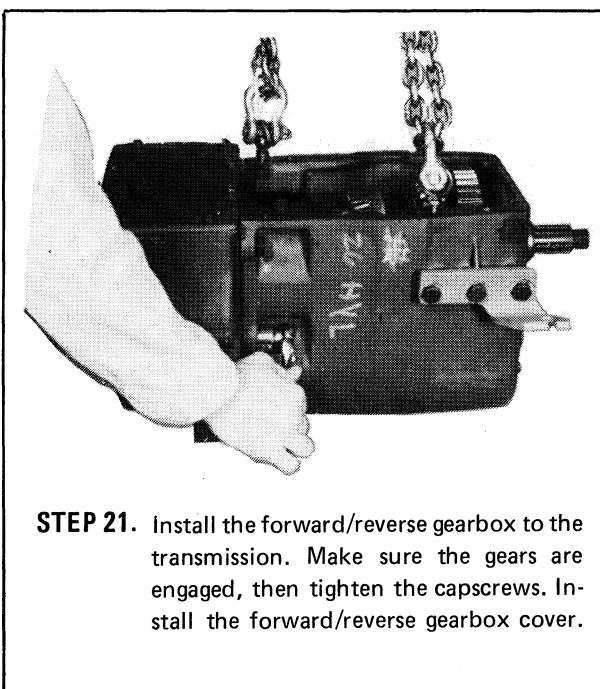
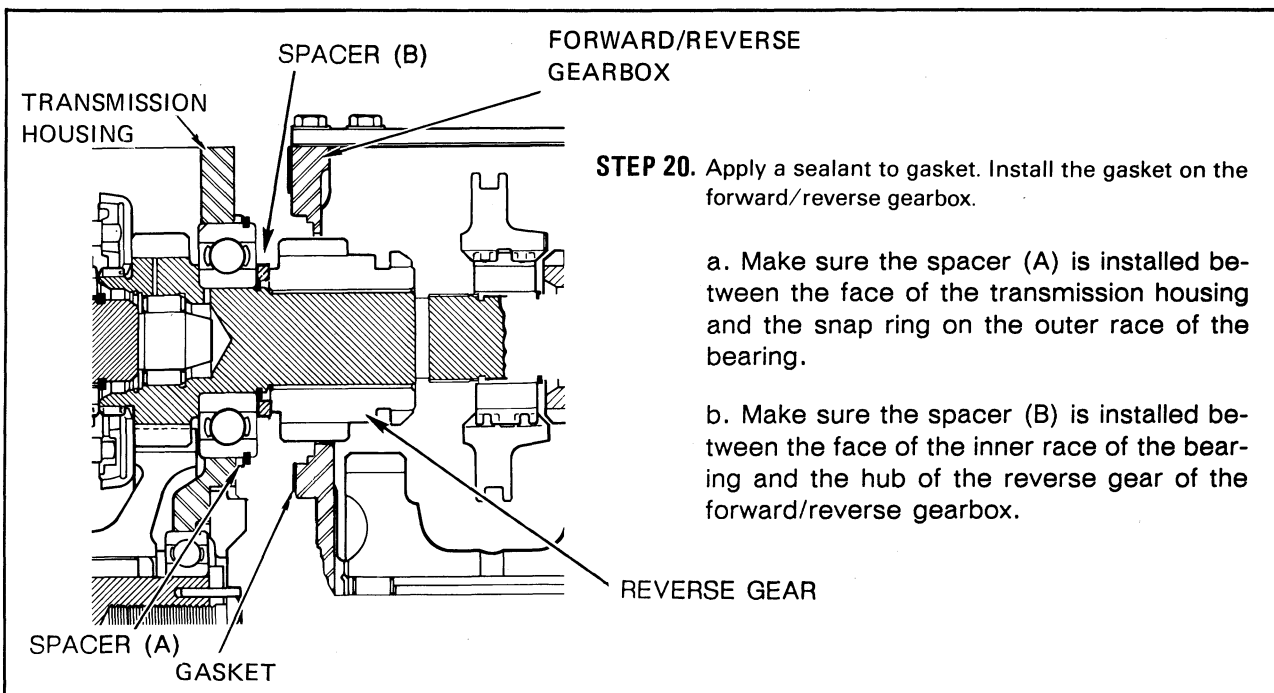


FIGURE 3. ASSEMBLY OF THE TRANSMISSION (Sheet 6 of 6)

CHECKS AND ADJUSTMENTS

FORWARD/REVERSE LINKAGE

The forward/reverse lever must be in the center (the "NEUTRAL" position) slot of the instrument panel. Use the rod ends on the linkage to change the position of the lever.

TROUBLESHOOTING

PROBLEM	CAUSE
There is no low gear or shifting is difficult.	The gear change forks are damaged.
	The gear change forks are not aligned on the rails.
	The low gear or the countershaft is damaged.
There is no second gear or shifting is difficult.	The gear change forks are damaged.
	The gear change forks are not aligned on the rails.
	The synchronizer, the second gear or the countershaft is damaged.
There is no third gear or shifting is difficult.	The gear change forks are damaged.
	The gear change forks are not aligned on the rails.
	The synchronizer is damaged.
	The gears, shafts or the countershaft key is damaged.
There is no fourth gear or shifting is difficult.	The gear change forks are damaged or not or not aligned on the rails.
	The synchronizer is damaged.
	The gears, shafts or the countershaft key is damaged.
There is no fifth gear or shifting is difficult.	The gear change forks damaged or not aligned on rail.
	Synchronizer is damaged.
	The gear or the countershaft key is damaged.

TROUBLESHOOTING

There is no forward gear or shifting is difficult	The shifting linkage is not correctly adjusted.
	The shifting linkage is damaged.
	The gear change fork, detent ring or gears are damaged.
There is no reverse gear or shifting is difficult.	The shifting linkage is not correctly adjusted.
	The shifting linkage is damaged.
	The gear change fork, detent ring or gears are damaged.
The transmission makes too much noise.	The forward/reverse gearbox housing is not tight on the transmission housing.
	The bearings are damaged or loose.
	The countershaft key is damaged.
	The oil level is not correct.
	The type of oil is not correct.