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## SERVICE INFORMATION

### GENERAL

- The gear shift linkage can be serviced with the engine in the frame (Section 7).
- For internal transmission repairs, the crankcase must be separated (Section 11).

### SPECIFICATIONS

			STANDARD	SERVICE LIMIT
Transmission	Backlash	low, 2nd	0.023–0.117 mm (0.0009–0.0046 in)	0.13 mm (0.0051 in)
		3rd, 4th, 5th	0.023–0.117 mm (0.0009–0.0046 in)	0.13 mm (0.0051 in)
	Gear I.D.	M4 gear	31.025–31.050 mm (1.2215–1.2224 in)	31.07 mm (1.223 in)
		M5 gear	31.025–31.050 mm (1.2215–1.2224 in)	31.07 mm (1.223 in)
		C1 gear	25.000–25.021 mm (0.9843–0.9851 in)	25.06 mm (0.987 in)
		C3 gear	31.025–31.050 mm (1.2215–1.2224 in)	31.07 mm (1.223 in)
	Gear bushing	M4 O.D.	30.950–30.975 mm (1.2185–1.2195 in)	30.93 mm (1.218 in)
		M5 O.D.	30.950–30.975 mm (1.2185–1.2195 in)	30.93 mm (1.218 in)
		C1 O.D.	24.959–24.980 mm (0.9826–0.9835 in)	24.93 mm (0.981 in)
		C1 I.D.	22.000–22.021 mm (0.8661–0.8669 in)	22.04 mm (0.8677 in)
		C3 O.D.	30.950–30.975 mm (1.2185–1.2194 in)	30.93 mm (1.2177 in)
	Countershaft O.D.	at C1 bushing	21.987–22.000 mm (0.8656–0.8661 in)	21.930 mm (0.8634 in)
	Gear to bushing or shaft clearance	M4 to M4 bushing	0.050–0.10 mm (0.0019–0.0039 in)	0.12 mm (0.0047 in)
		M5 to M5 bushing	0.050–0.100 mm (0.0020–0.0039 in)	0.12 mm (0.005 in)
		C1 to C1 bushing	0.020–0.062 mm (0.0007–0.0024 in)	0.08 mm (0.0031 in)
C1 bushing to shaft		0–0.034 mm (0–0.0013 in)	0.045 mm (0.0017 in)	
C3 to C3 bushing		0.050–0.010 mm (0.0019–0.0039 in)	0.12 mm (0.0047 in)	
Shift fork	Claw thickness		6.43–6.50 mm (0.253–0.256 in)	6.1 mm (0.24 in)
	I.D.	Center	13.000–13.018 mm (0.5118–0.5125 in)	13.04 mm (0.513 in)
		Left and right	13.000–13.018 mm (0.5118–0.5125 in)	13.04 mm (0.513 in)
Fork shaft	O.D.		12.996–12.984 mm (0.5116–0.5111 in)	12.90 mm (0.508 in)

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## TRANSMISSION

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### TOOLS

#### Common

Driver

Attachment, 25 mm I.D.

07746-0030100

07746-0030200

} or 07945-3710200

### TROUBLESHOOTING

#### Hard to shift

1. Improper clutch adjustment: too much free play
2. Shift fork bent
3. Shift shaft bent
4. Shift claw bent
5. Shift drum cam grooves damaged

#### Transmission jumps out of gear

1. Gear dogs worn
2. Shift shaft bent
3. Shift drum stopper broken
4. Shift forks bent

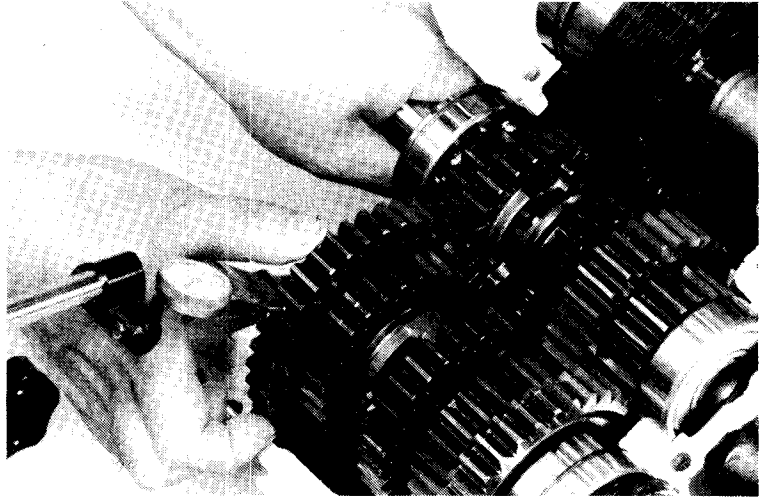


For servicing of the gearshift linkage, see Section 7.

## TRANSMISSION DISASSEMBLY

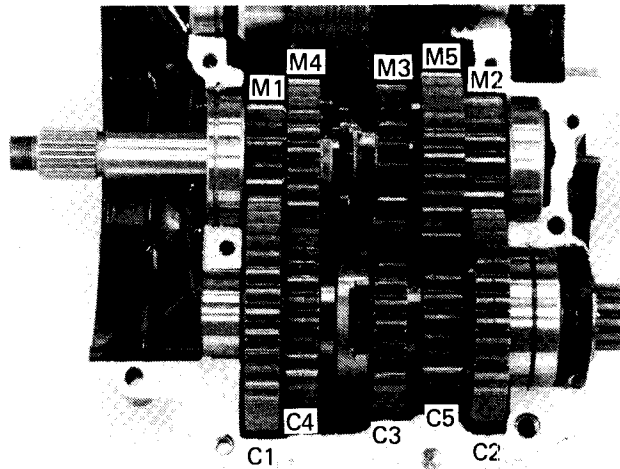
Separate the crankcase (Section 11) and inspect the backlash of each gear.

**SERVICE LIMIT: 0.13 mm (0.0051 in)**



Remove the mainshaft and countershaft.

Remove the dowel pins from the crankcase.





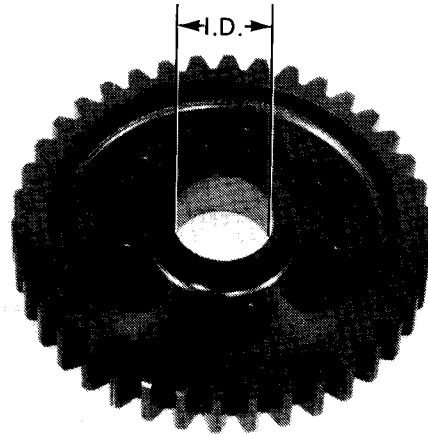
**TRANSMISSION INSPECTION**

Check gear dogs, dog holes and teeth for excessive or abnormal wear, or evidence of insufficient lubrication.

Measure the I.D. of each gear.

**SERVICE LIMITS:**

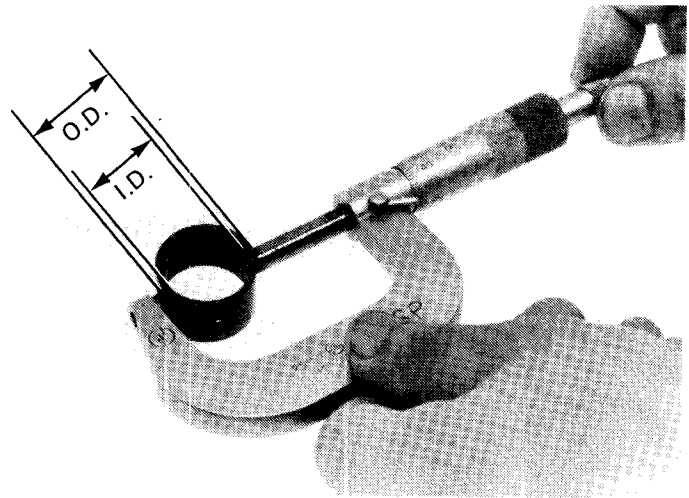
- M4 gear: 31.07 mm (1.223 in)
- M5 gear: 31.07 mm (1.223 in)
- C1 gear: 25.06 mm (0.987 in)
- C3 gear: 31.07 mm (1.223 in)



Measure the I.D. and O.D. of the gear bushings.

**SERVICE LIMITS:**

- M4 O.D.: 30.93 mm (1.218 in)
- M5 O.D.: 30.93 mm (1.218 in)
- C1 O.D.: 24.93 mm (0.981 in)
- C1 I.D.: 22.04 mm (0.868 in)
- C3 O.D.: 30.93 mm (1.218 in)



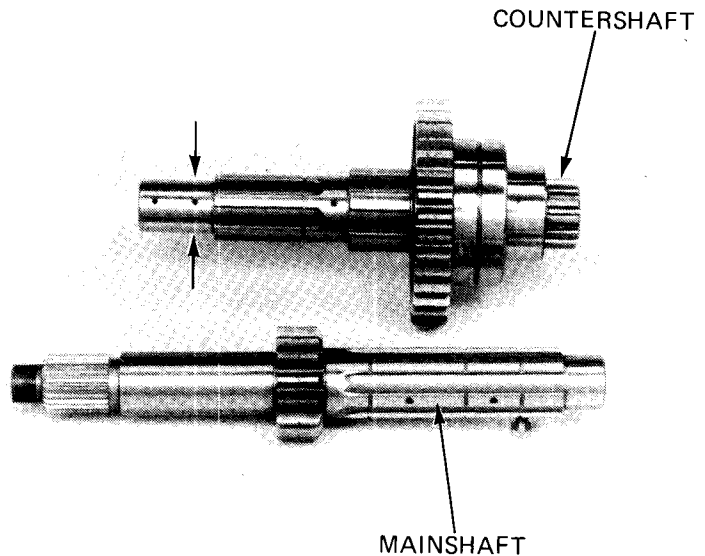
Measure the O.D. of the countershaft at the C1 bushing.

**SERVICE LIMITS: 21.930 mm (0.8634 in)**

Calculate the clearance between the gears and shaft or bushings.

**SERVICE LIMITS:**

- M5 to M5 bushing: 0.12 mm (0.005 in)
- M4 to M4 bushing: 0.12 mm (0.005 in)
- C1 to C1 bushing: 0.08 mm (0.003 in)
- C1 bushing to shaft: 0.045 mm (0.002 in)
- C3 to C3 bushing: 0.12 mm (0.005 in)

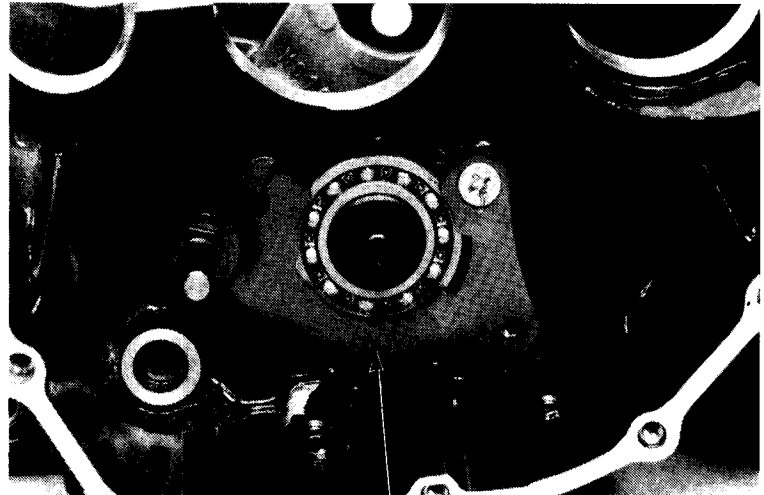




## SHIFT FORK AND SHIFT DRUM

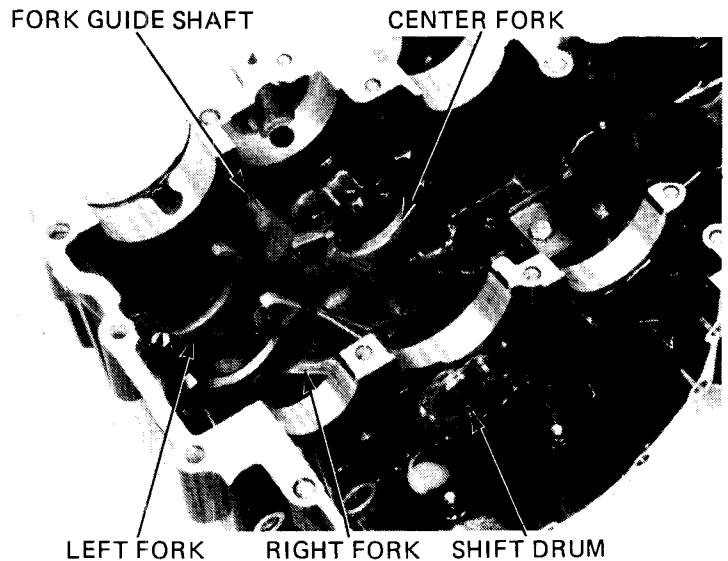
### REMOVAL

Remove the bearing stopper plate.



BEARING STOPPER PLATE

Remove the shift fork shaft and shift forks.  
Remove the shift drum.



FORK GUIDE SHAFT

CENTER FORK

LEFT FORK

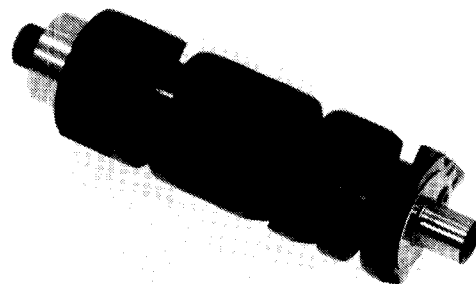
RIGHT FORK

SHIFT DRUM

### GEAR SHIFT DRUM AND SHIFT FORK INSPECTION

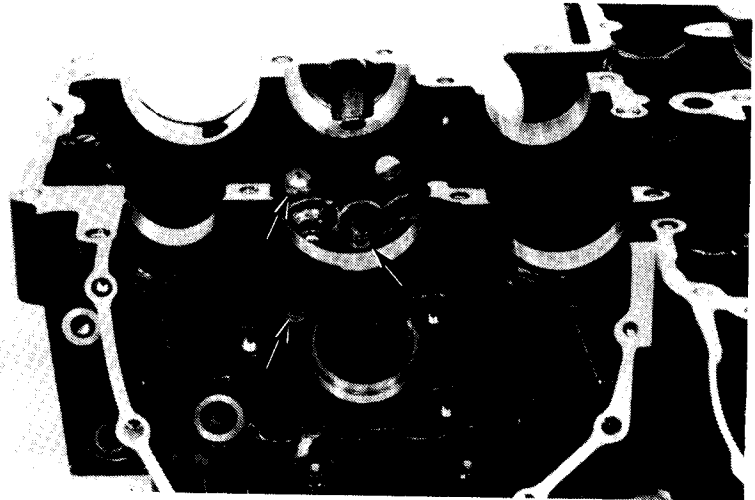
Inspect the shift drum end for scoring, scratches, or evidence of insufficient lubrication.

Check the shift drum grooves for damage.





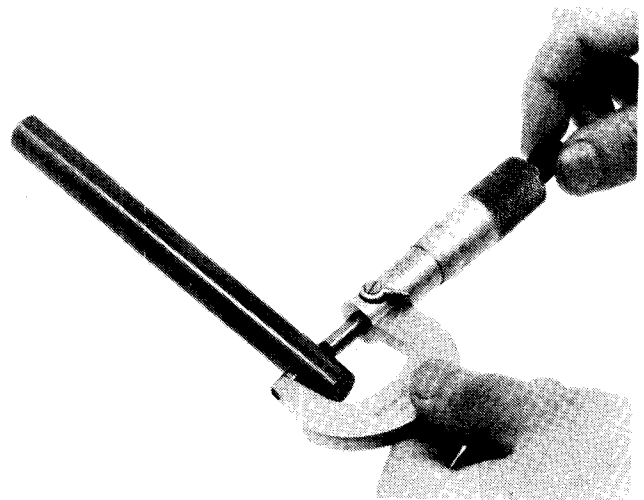
Inspect the shift drum hole and shift fork shaft holes for scoring or scratches.



Measure the shift fork shaft O.D.

**SERVICE LIMIT: 12.90 mm (0.508 in)**

Check for scratches, scoring, or evidence of insufficient lubrication.

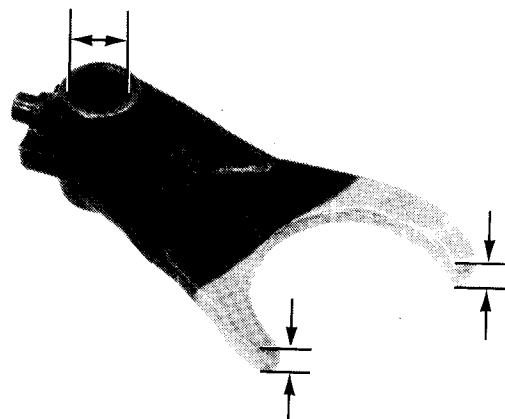


Measure the shift fork I.D. and claw thickness.

**SERVICE LIMITS:**

**I.D.:** 13.04 mm (0.513 in)

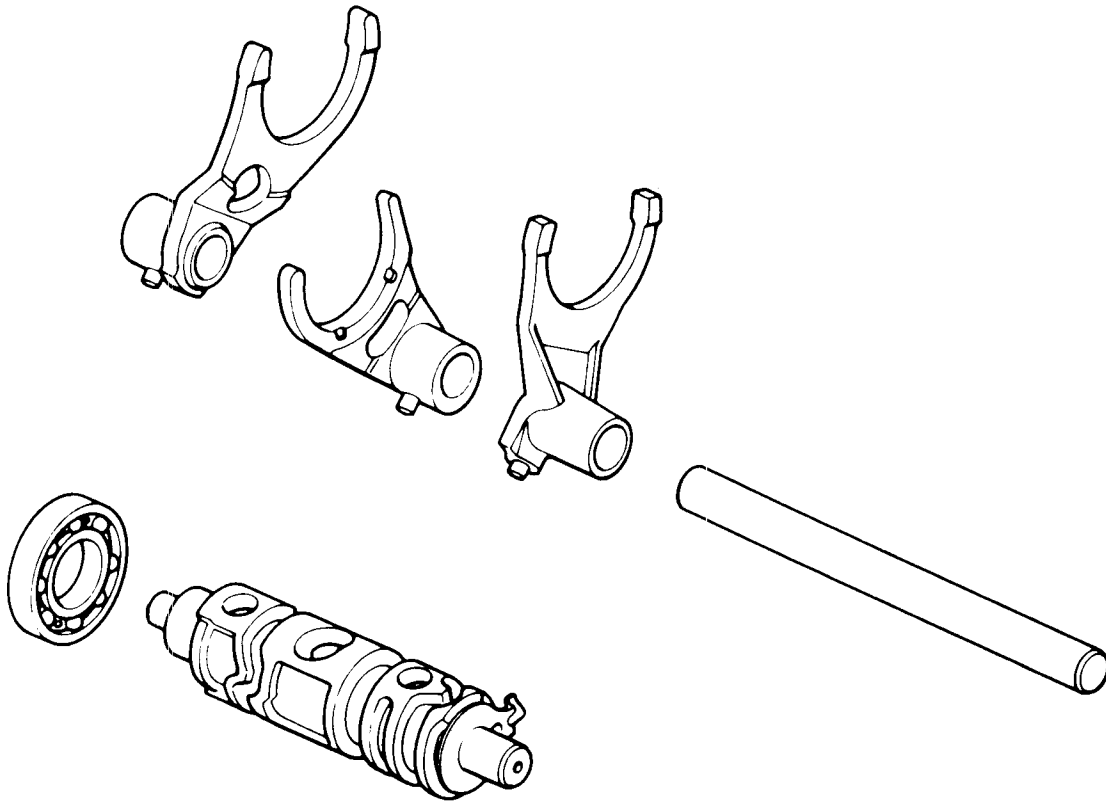
**CLAW THICKNESS:** 6.1 mm (0.24 in)





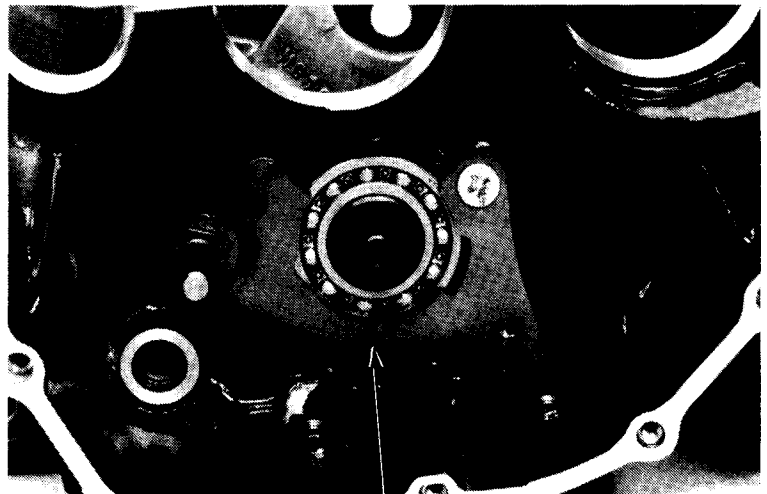
**INSTALLATION**

Install the shift drum and shift fork, by reversing the removal procedure.



**CAUTION:**

*When installing the bearing stopper plate, apply a locking agent to the screw threads.*



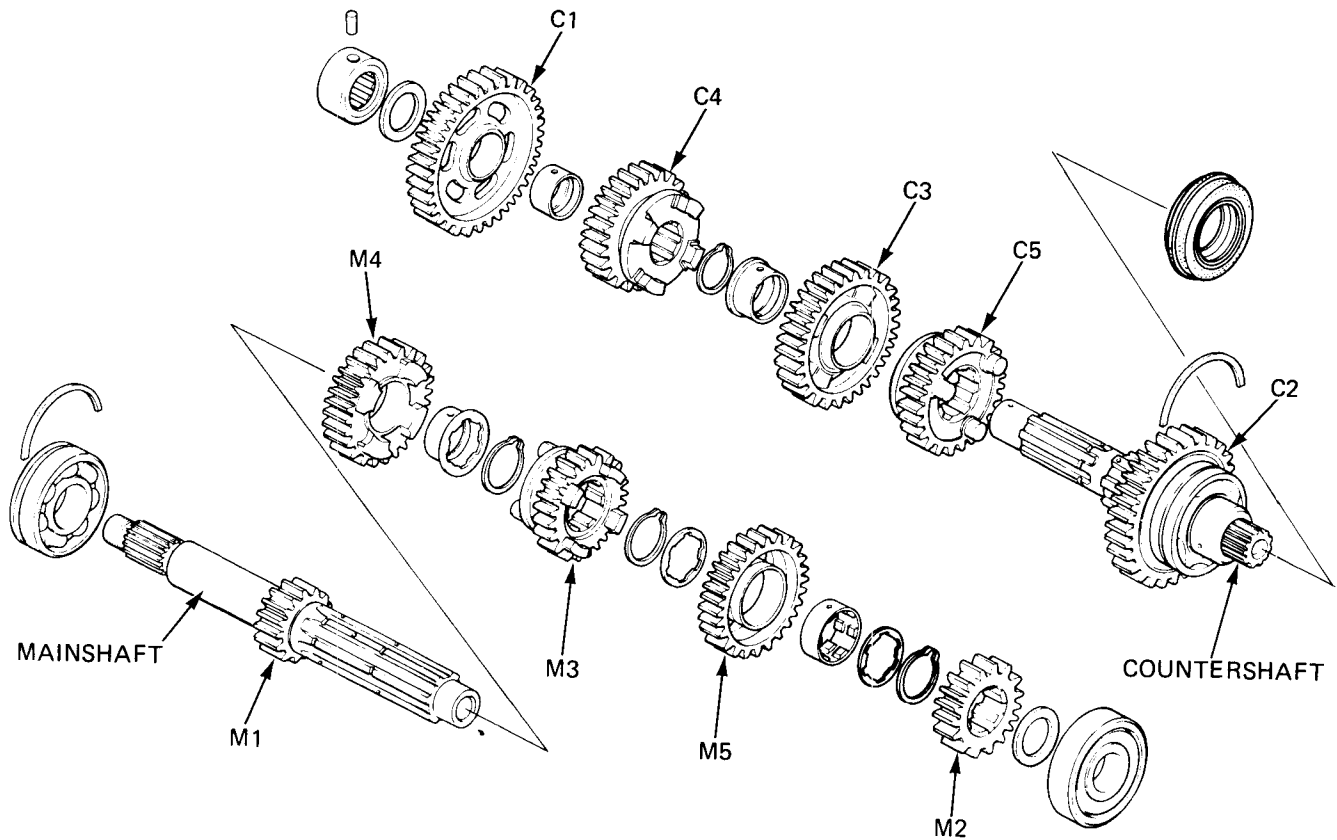
**BEARING STOPPER PLATE**

## TRANSMISSION ASSEMBLY

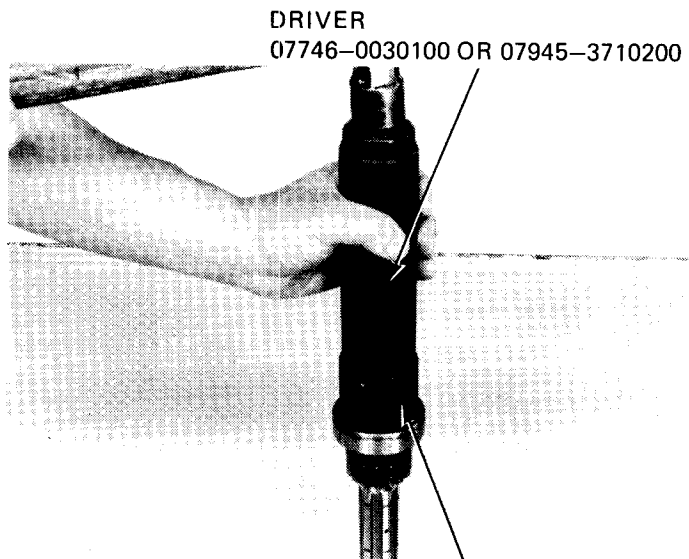
Assemble the mainshaft and countershaft.

**NOTE:**

- Check the gears for freedom of movement or rotation on the shaft.
- Check that the snap rings are seated in the grooves.



Install the mainshaft bearing with the tools.

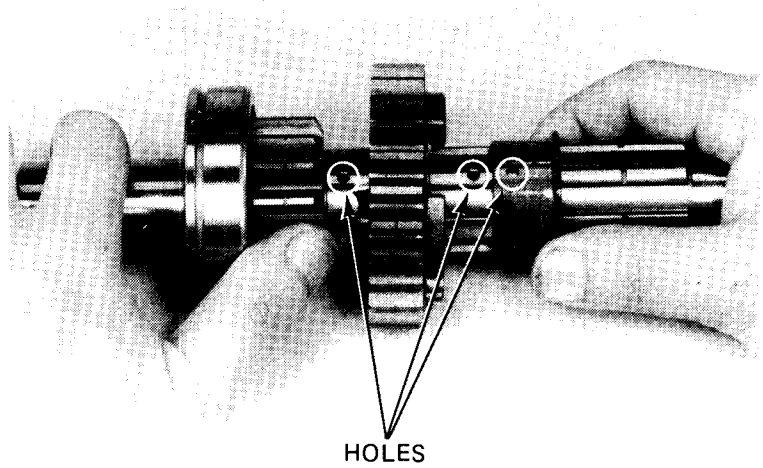


**DRIVER**  
07746-0030100 OR 07945-3710200

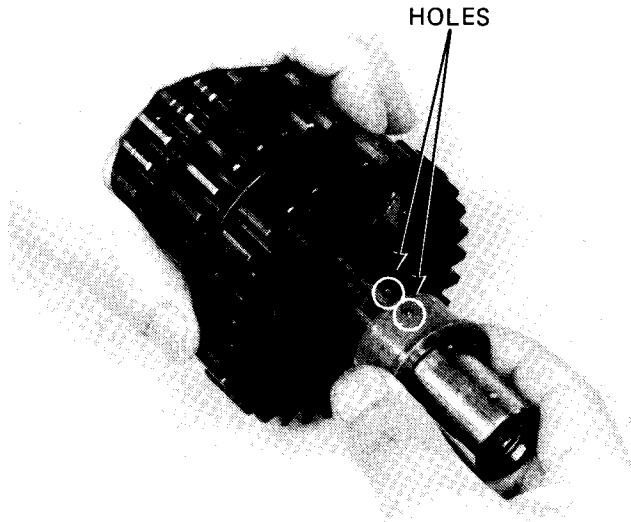
Attachment, 25 mm I.D.  
07746-0030200 OR 07945-3710200



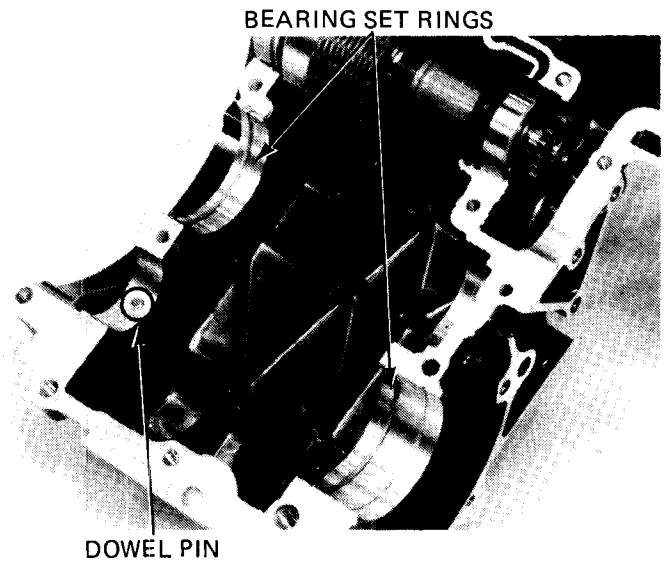
Align the holes in the M4 and M5 gear bushings with the hole in the mainshaft.



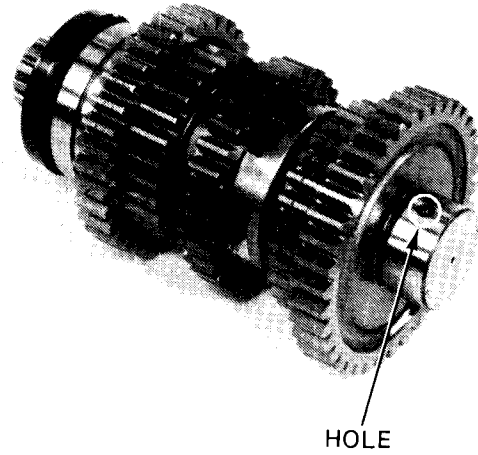
Align the hole in the C3 gear bushing with the hole in the countershaft.



Insert the dowel pin and bearing set rings.

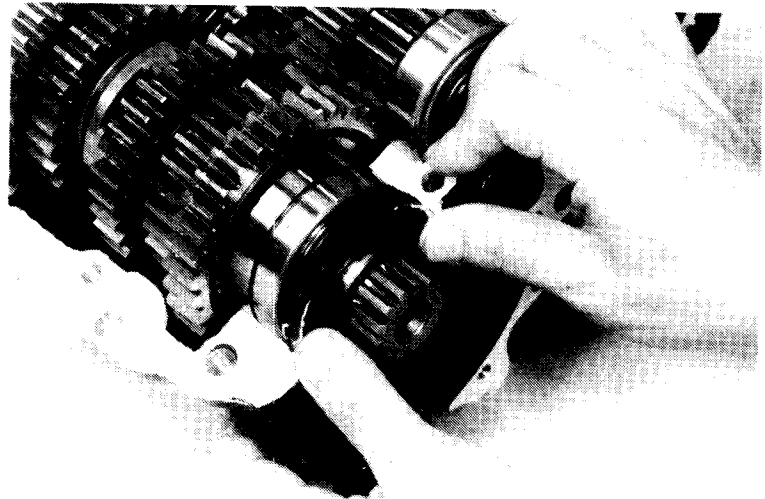


Align the hole in the countershaft bearing with the dowel pin.



**NOTE:**

Push the countershaft oil seal in until the oil seal lip is seated completely on the bearing before assembling the lower crankcase to prevent oil leakage.



Install the lower crankcase (Refer to Section 11).

**NOTE:**

Check the oil orifice for clogging, before installing the lower crankcase.

