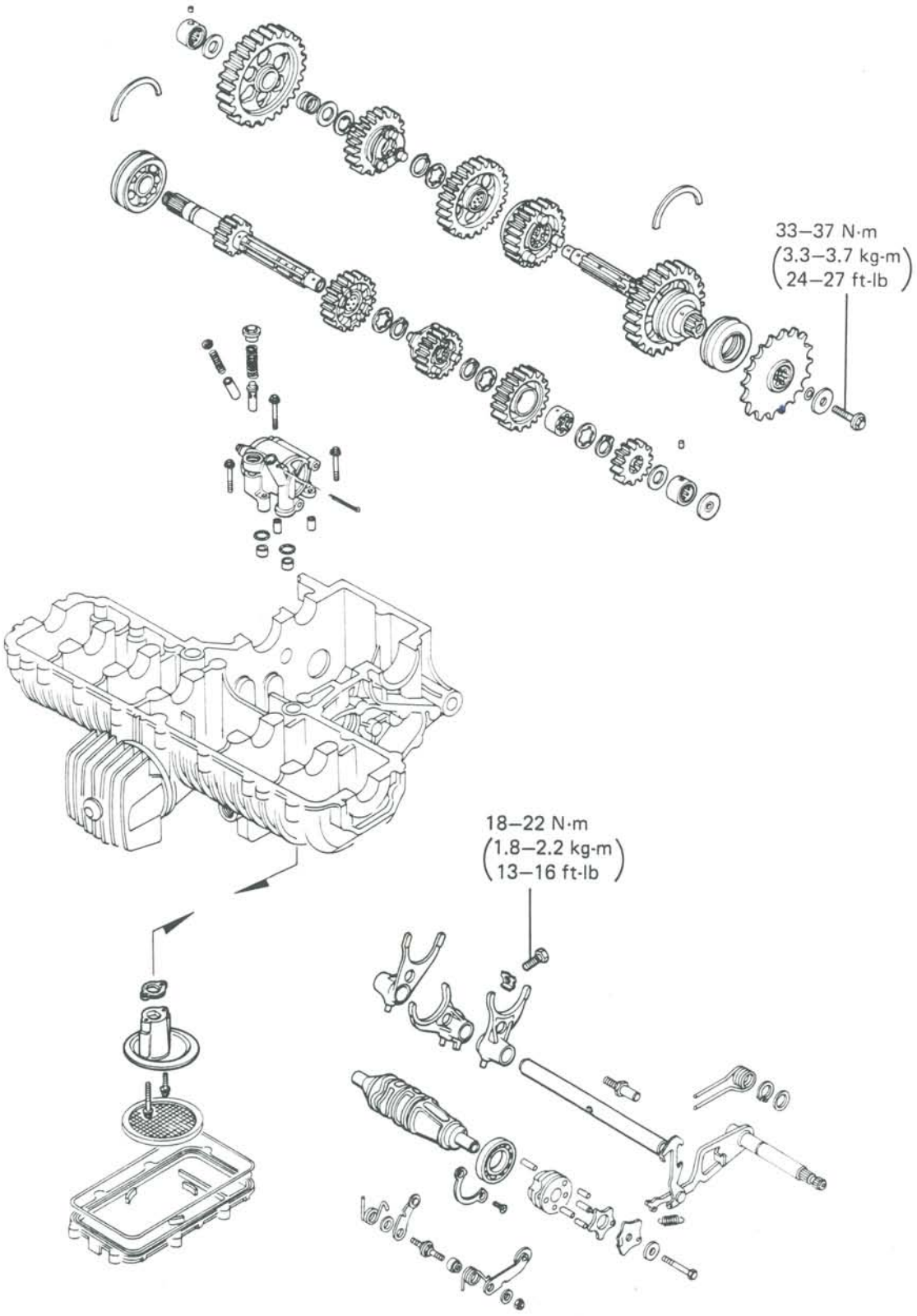
TRANSMISSION/OIL PUMP

TRANSMISSION/ POMPE A HUILE

GETRIEBE/ÖLPUMPE

TRANSMISION/ BOMBA DE ACEITE


33–37 N·m
(3.3–3.7 kg-m
24–27 ft-lb)
18–22 N·m
(1.8–2.2 kg-m
13–16 ft-lb)

SERVICE INFORMATION	11–1
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SERVICE INFORMATION

WORKING PRACTICE

The gear shift linkage can be serviced with engine in the frame. For internal transmission repairs, the crankcase must be separated (Refer to Section 10).

SPECIAL TOOLS

Common Tools

Driver Handle	07746–0030100
30mm Inner Driver	07746–0030300

TORQUE VALUES

Drive sprocket	33–37 N·m (3.3–3.7 kg-m, 24–27 ft-lb)
Shift fork shaft	18–22 N·m (1.8–2.2 kg-m, 13–16 ft-lb)

SPECIFICATIONS

			STANDARD	SERVICE LIMIT
Transmission	Backlash		0.024–0.074 mm (0.0009–0.0029 in)	0.12 mm (0.005 in)
	Gear I.D.	M4 gear	28.020–28.041 mm (1.1031–1.1040 in)	28.06 mm (1.105 in)
		M5 gear	31.000–31.025 mm (1.2205–1.2215 in)	31.04 mm (1.222 in)
		C1 gear	28.000–28.021 mm (1.1024–1.1032 in)	28.04 mm (1.104 in)
		C3 gear	28.020–28.041 mm (1.1031–1.1040 in)	28.06 mm (1.105 in)
	Gear bushing	M5 O.D.	30.950–30.975 mm (1.2185–1.2195 in)	30.93 mm (1.218 in)
		C1 O.D.	27.959–27.980 mm (1.1007–1.1016 in)	27.94 mm (1.100 in)
		C1 I.D.	24.007–24.028 mm (0.9452–0.9460 in)	24.05 mm (0.947 in)
	Mainshaft O.D	at M4	27.959–27.980 mm (1.1007–1.1016 in)	27.94 mm (1.100 in)
	Countershaft O.D.	at C1 bushing	23.9935–24.0065 mm (0.9446-0.9451 in)	23.97 mm (0.944 in)
		at C3	27.959–27.980 mm (1.1007–1.1016 in)	27.94 mm (1.100 in)
	Gear to bushing or shaft clearance	M4 to shaft	———	0.10 mm (0.004 in)
		M5 to M5 bushing	———	0.10 mm (0.004 in)
		C1 to C1 bushing	———	0.10 mm (0.004 in)
		C1 bushing to shaft	———	0.10 mm (0.004 in)
		C3 to shaft	———	0.10 mm (0.004 in)

			Standard	Service limit
Shift fork	Claw thickness		6.43–6.50 mm (0.253–0.256 in)	6.1 mm (0.24 in)
	I.D.	Center	16.009–16.012 mm (0.6303–0.6304 in)	———
		Left and right	16.000–16.021 mm (0.6299–0.6307 in)	16.55 mm (0.652 in)
Fork shaft	O.D.		15.966–15.984 mm (0.6286–0.6293 in)	15.95 mm (0.628 in)
Oil pump	Pressure	Left pump	49.0–98.1 kPa (0.5–1.0 kg/cm², 7.1–14.2 psi)	———
		Right pump	392.3–519.8 kPa (4.0–5.3 kg/cm², 56.9–75.4 psi)	———
	Left pump clearances	Tip clearance	0.08–0.12 mm (0.003–0.005 in)	0.15 mm (0.006 in)
		Body clearance	0.15–0.21 mm (0.006–0.008 in)	0.35 mm (0.014 in)
		End clearance	0.02–0.07 mm (0.001–0.003 in)	0.10 mm (0.004 in)
	Right pump clearances	Tip clearance	0.08–0.12 mm (0.003–0.005 in)	0.15 mm (0.006 in)
		Body clearance	0.15–0.21 mm (0.006–0.008 in)	0.35 mm (0.014 in)
		End clearance	0.02–0.07 mm (0.001–0.003 in)	0.10 mm (0.004 in)

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

Low Oil Pressure
1. Pressure relief valve stuck open
2. Plugged oil pick-up screen
3. Oil pump worn
4. External oil leaks
5. Oil level low

High Oil Pressure
1. Pressure relief valve stuck closed
2. Plugged oil filter, gallery, or mating orifice
3. Incorrect oil being used

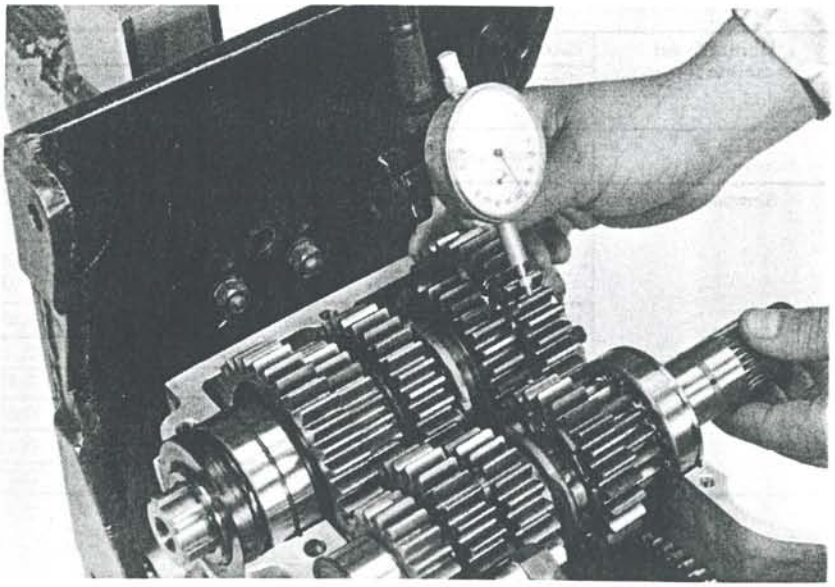
No Oil Pressure
1. Oil level low
2. Oil pump drive chain broken
3. Oil pump faulty
4. Internal oil leakage

For servicing of the gearshift linkage, see Section 9.

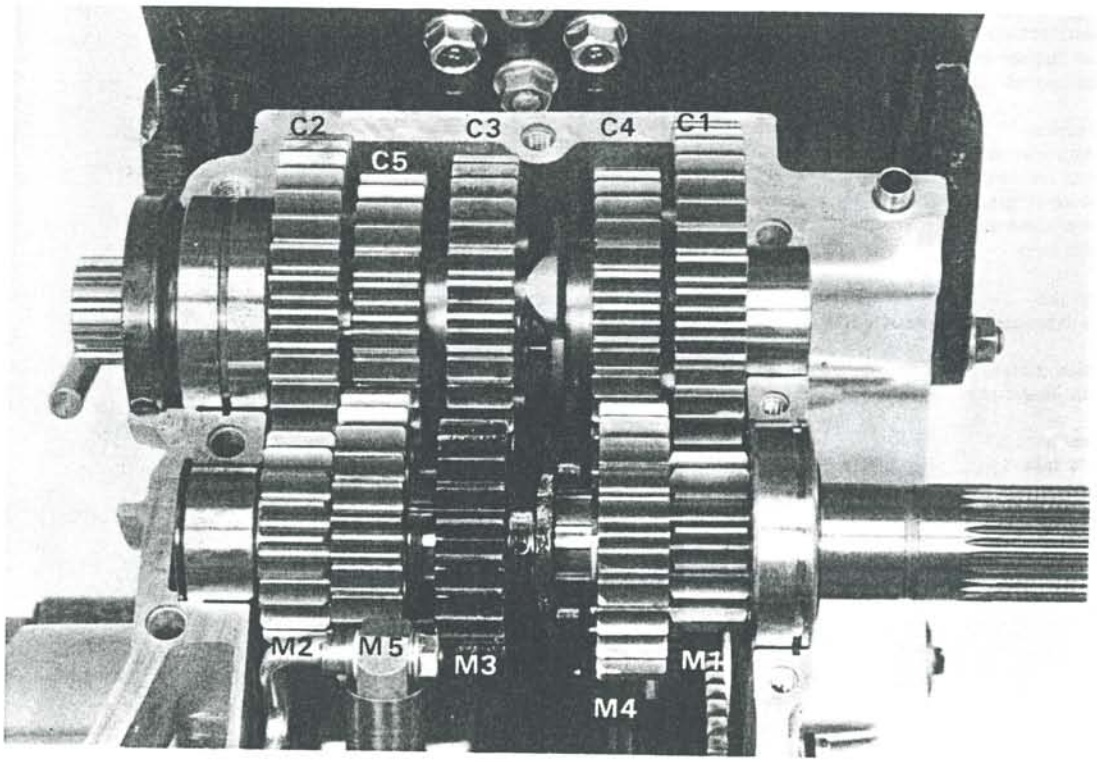
TRANSMISSION DISASSEMBLY

Separate the crankcase (Section 10).
Inspect each gear for backlash.

SERVICE LIMIT: 0.12 mm (0.005 in)



Remove the main and countershafts.
Remove the dowel pins from the crankcase.

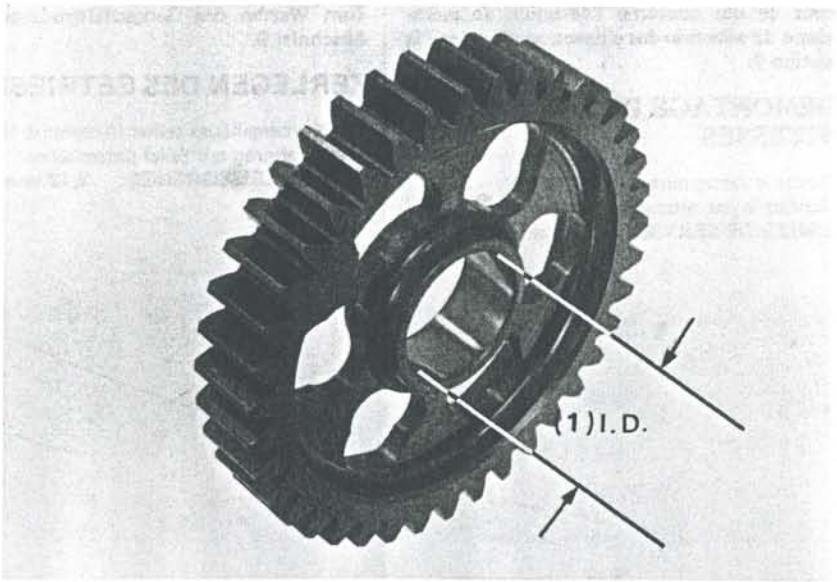


TRANSMISSION INSPECTION

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

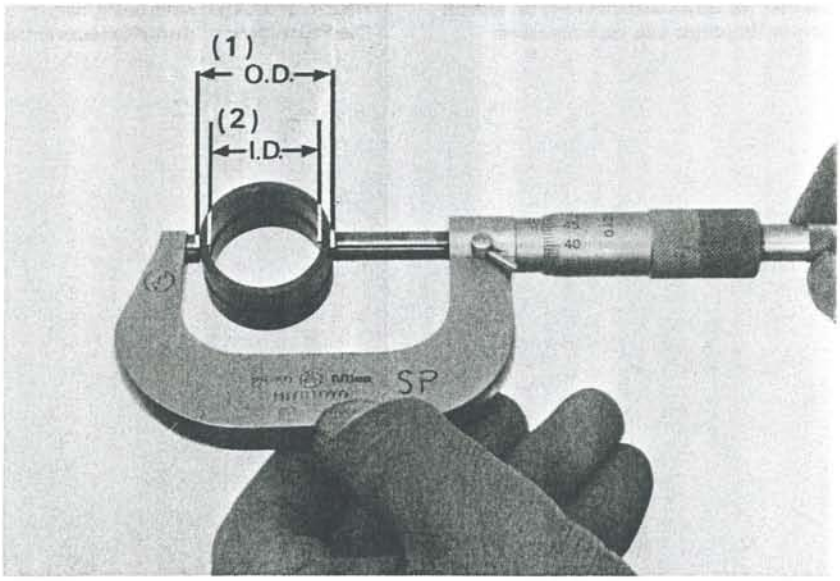
Measure the I. D. of each gear.

SERVICE LIMITS:
M4 gear: 28.06 mm (1.105 in)
M5 gear: 31.04 mm (1.222 in)
C 1 gear: 28.04 mm (1.104 in)
C 3 gear: 28.06 mm (1.105 in)



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

SERVICE LIMITS:
M5 O.D.: 30.93 mm (1.218 in)
C 1 O.D.: 27.94 mm (1.100 in)
C 1 I.D. : 24.05 mm (0.947 in)

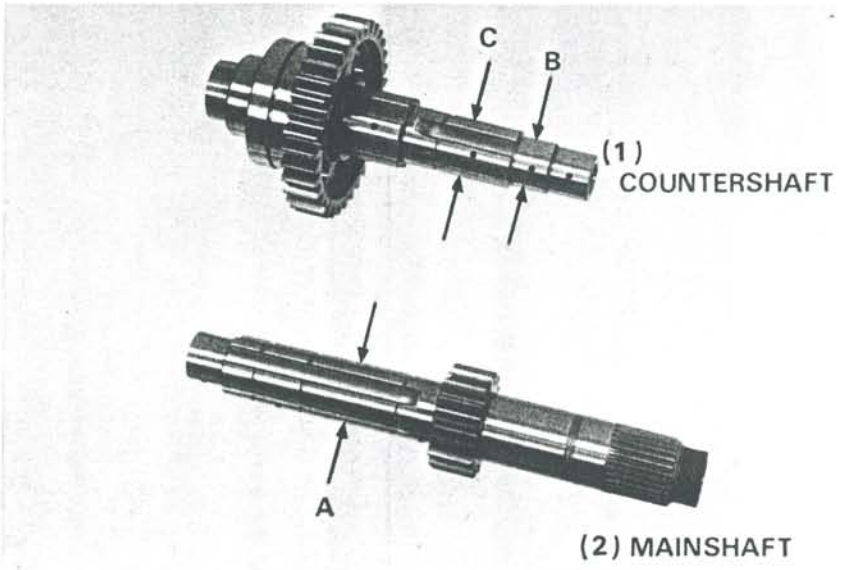


Measure the O.D. of the mainshaft and countershaft.

SERVICE LIMITS:
A: 27.94 mm (1.100 in)
B: 23.97 mm (0.944 in)
C: 27.94 mm (1.100 in)

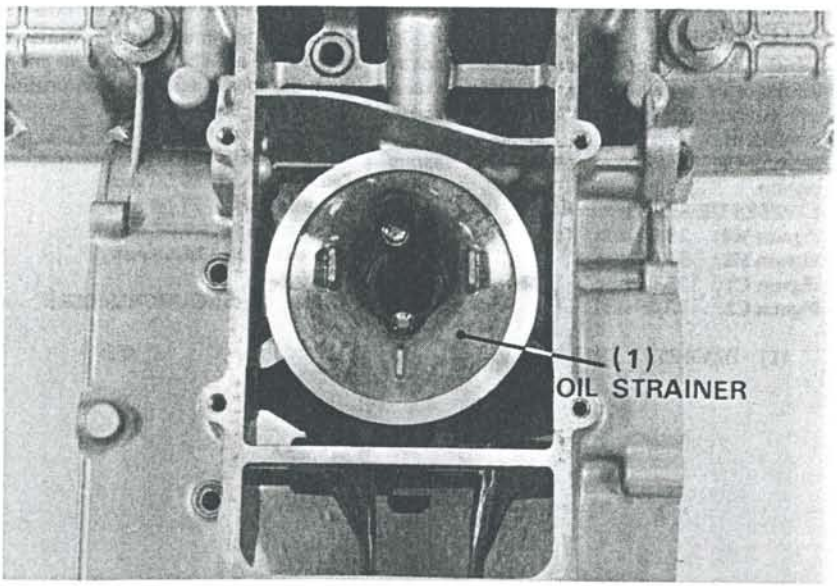
Calculate the clearance between the gear and gear shaft or bushing.

SERVICE LIMIT: 0.10 mm (0.004 in)

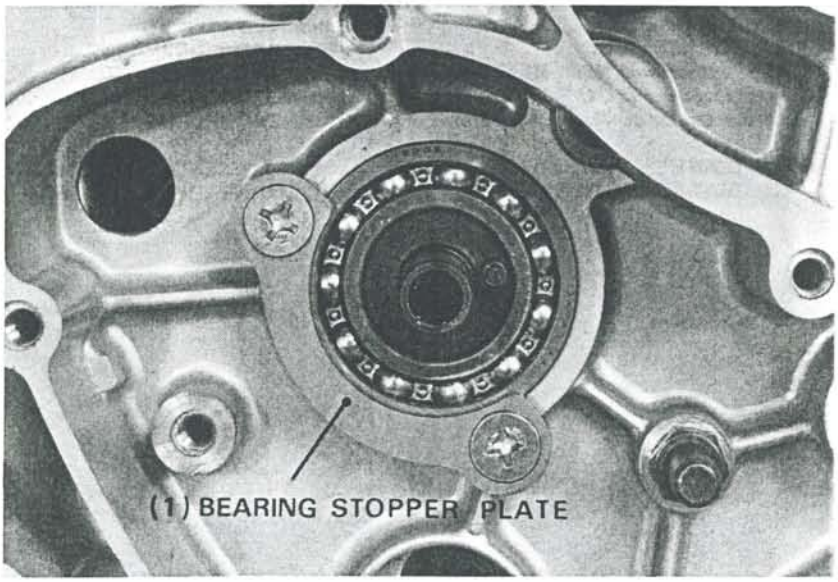


SHIFT FORK, SHIFT DRUM AND OIL PUMP REMOVAL

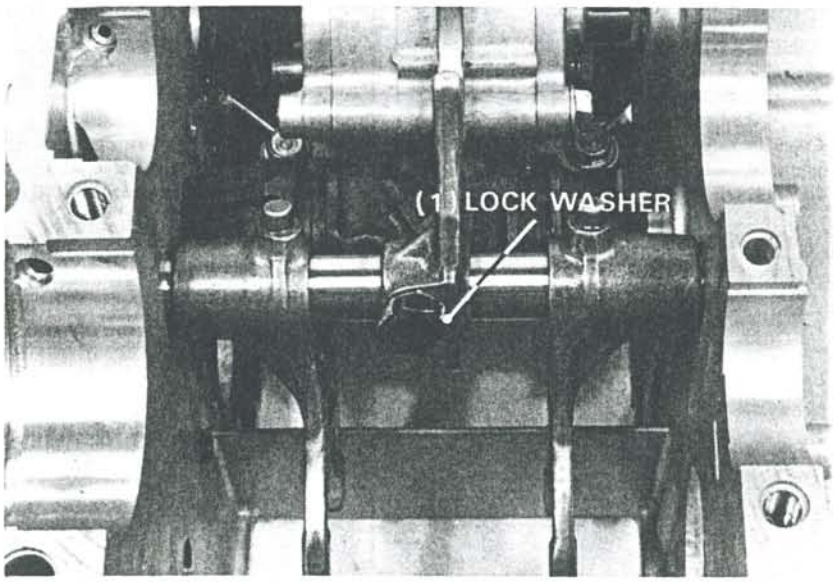
Remove the oil strainer.



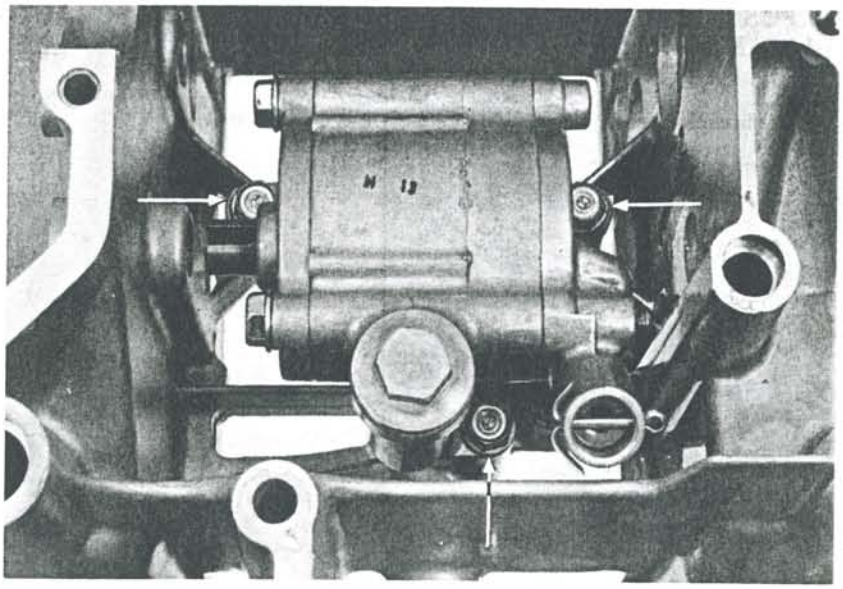
Remove the bearing stopper plate.
Remove the bearing.



Bend the tabs of the lock washer at the center shift fork.
Loosen the bolt.
Remove the shift fork shaft.
Remove the shift forks, shaft and shift drum.



Remove the oil pump.

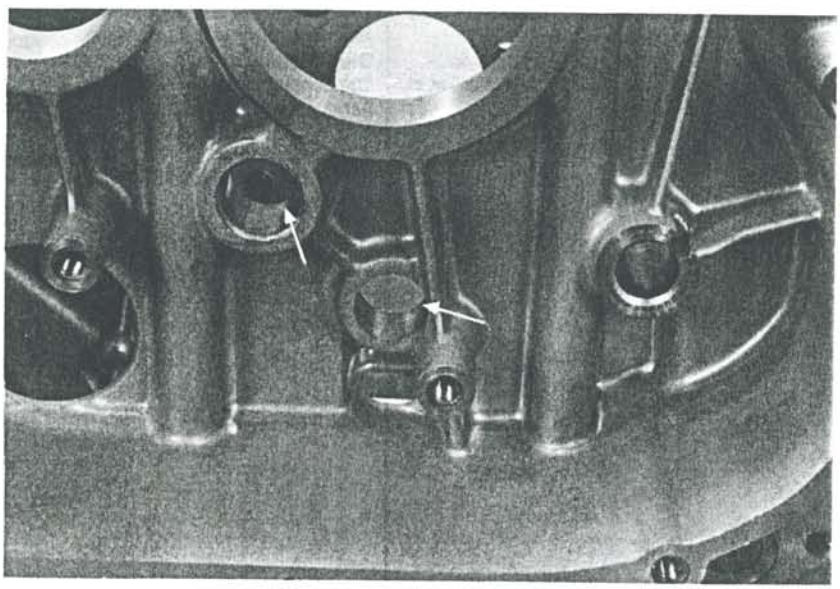


EAR SHIFT DRUM AND SHIFT FORK INSPECTION

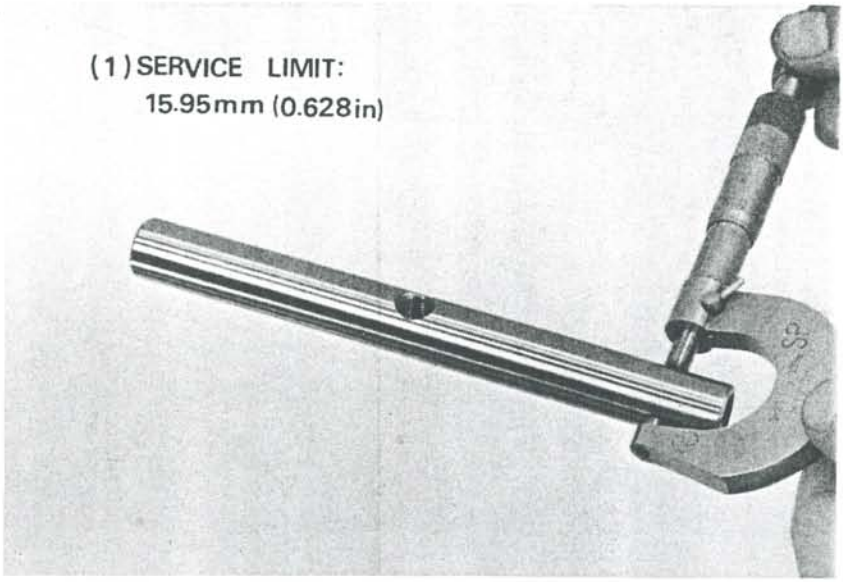
Inspect the shift drum end for scoring, scratches, or evidence of insufficient lubrication.
Check the shift grooves for damage.



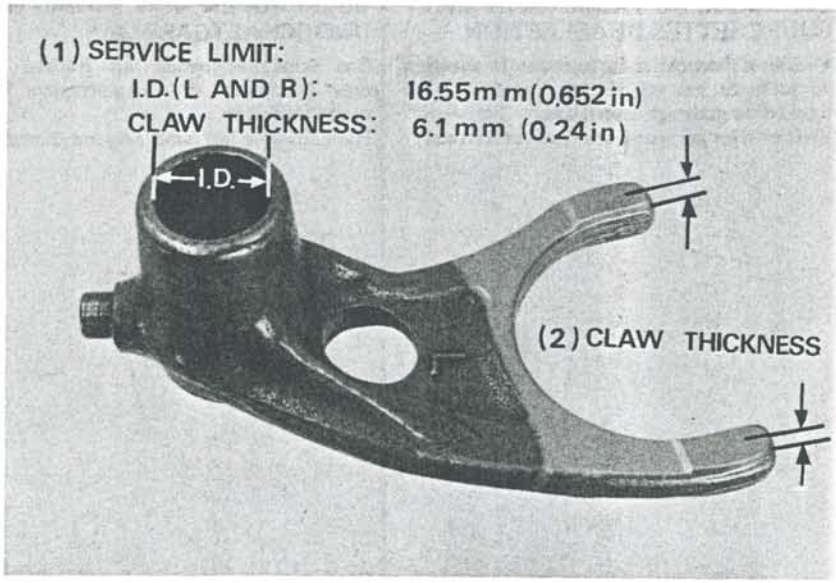
Inspect the shift drum hole and shift fork shaft hole for scoring or scratches.



Measure the shift fork shaft O.D.
Check for scratches, scoring, or evidence of insufficient lubrication.

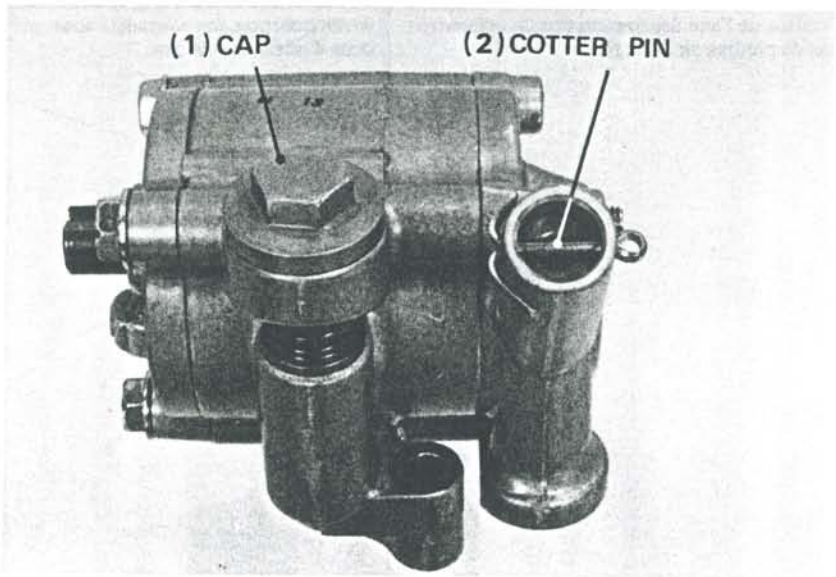


Measure the shift fork I.D. and claw thickness.

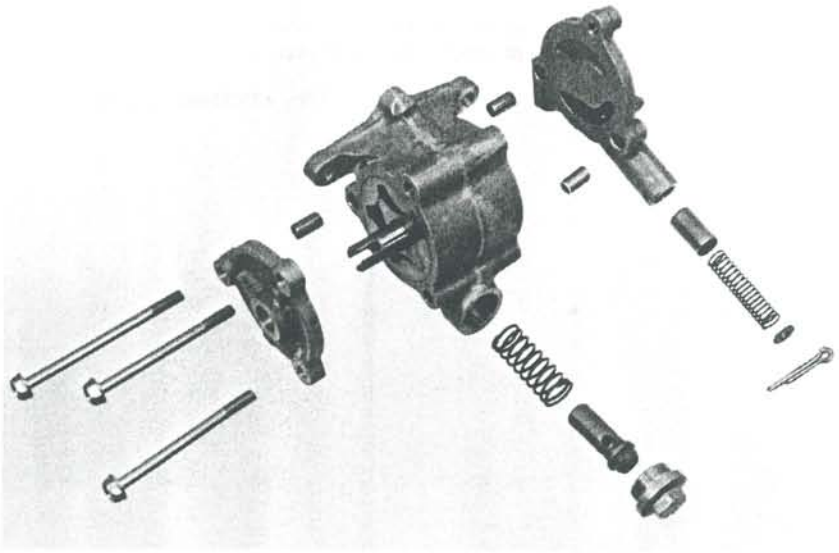


OIL PUMP DISASSEMBLY

Remove the relief valve cap and cotter pin.

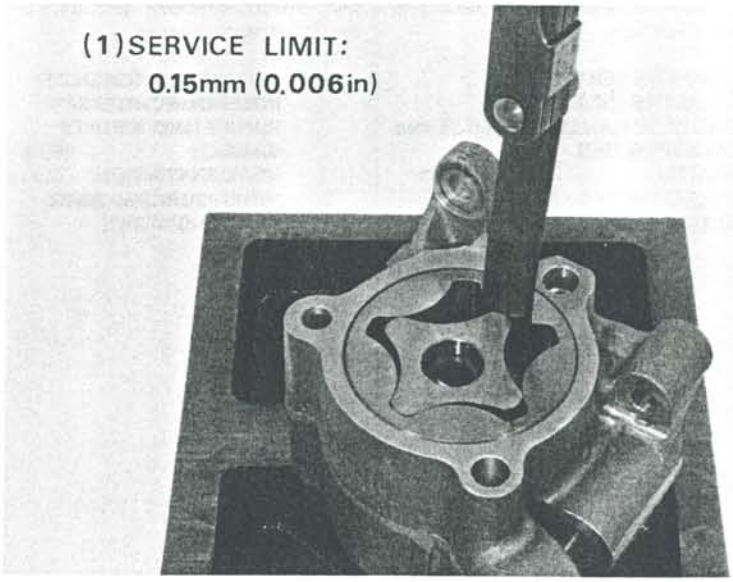


Remove the oil pump side covers.

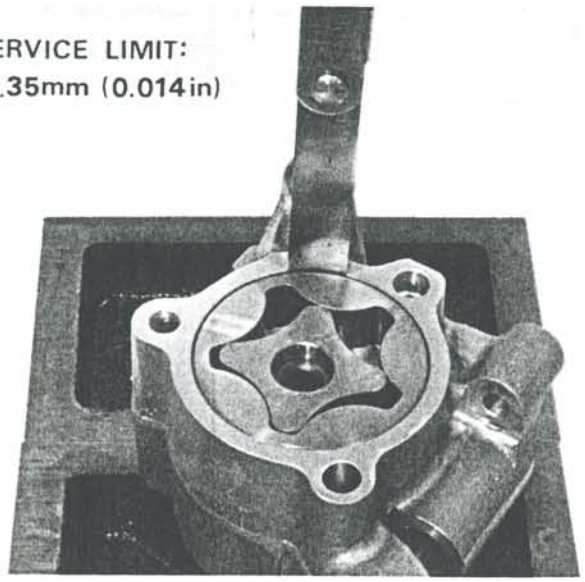


OIL PUMP INSPECTION

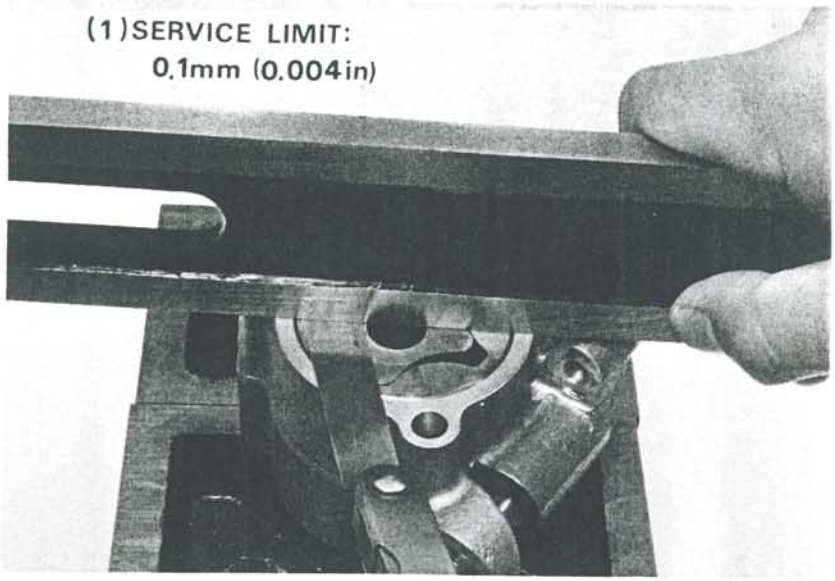
Measure the left pump tip clearance.



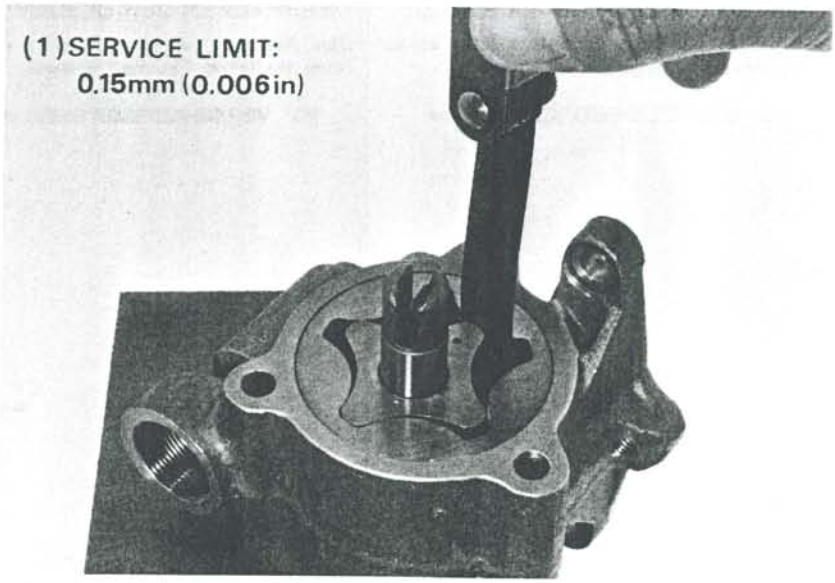
Measure the left pump body clearance.



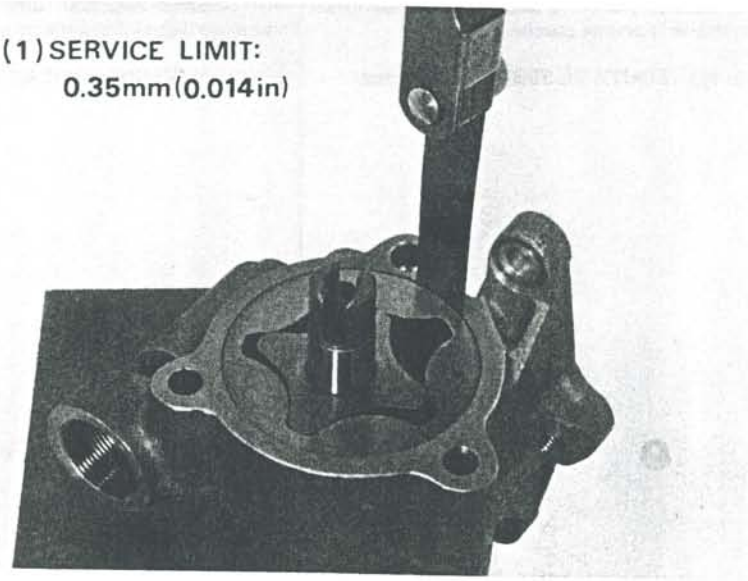
Measure the left pump end clearance.



Measure the right pump tip clearance.

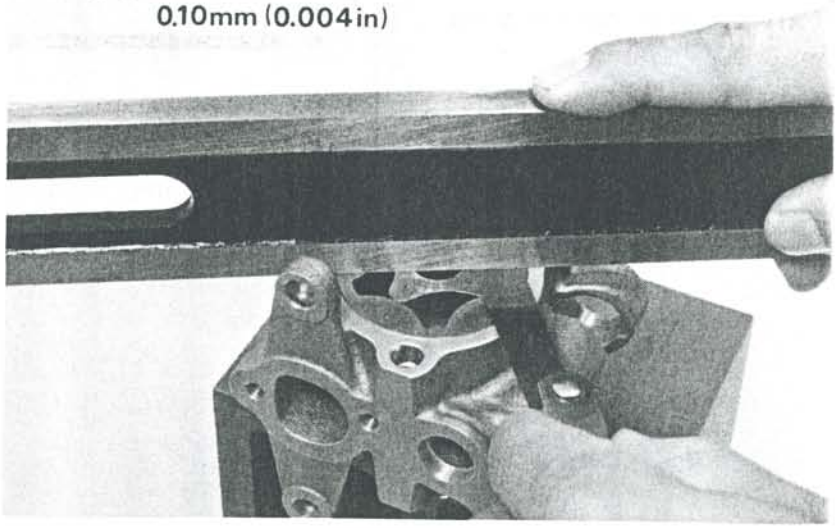


Measure the right pump body clearance.



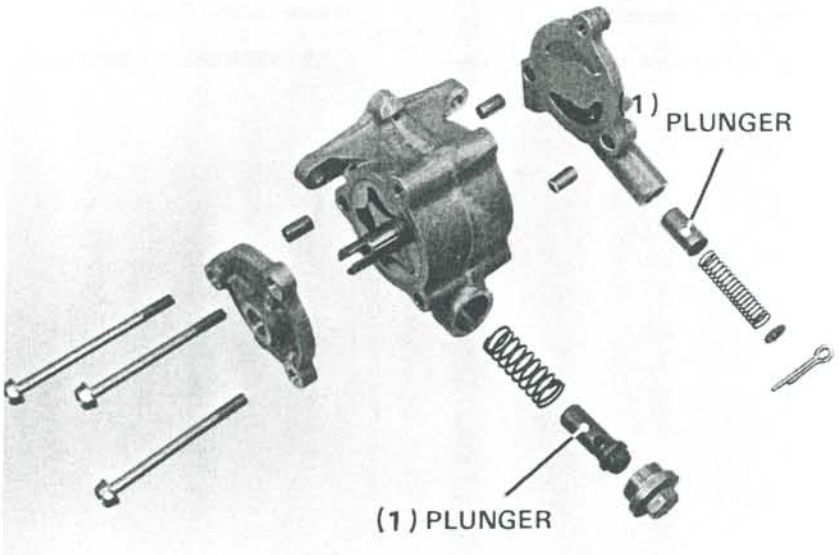
Measure the right pump end clearance.

(1) SERVICE LIMIT:
0.10mm (0.004in)



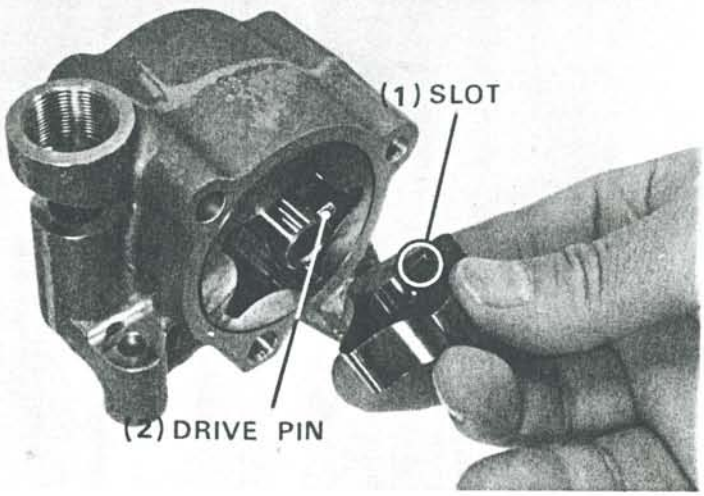
RELIEF VALVE INSPECTION

Check that the plungers operate smoothly and that the springs are not damaged or weak. Replace the relief valve as a unit if the spring must be replaced.



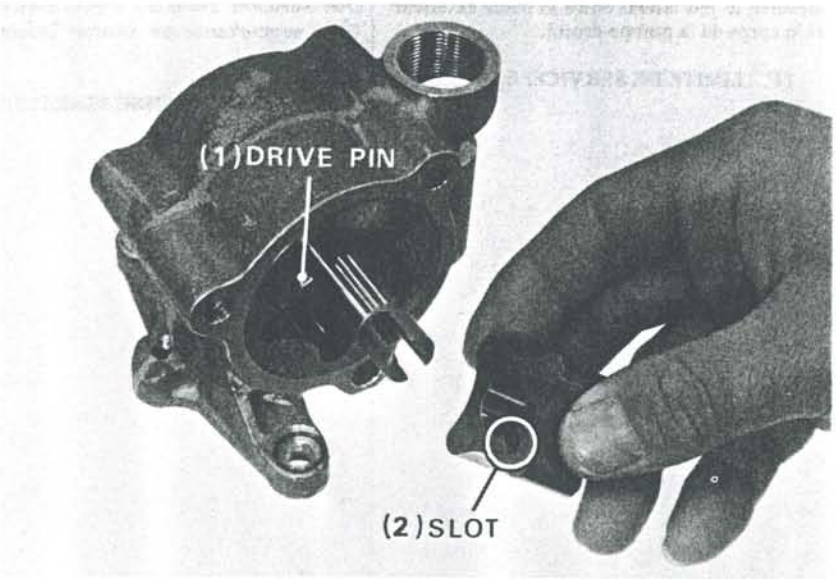
OIL PUMP ASSEMBLY

Install the left outer rotor.
Insert the drive pin into the shaft.
Align the slot in the left inner rotor with the drive pin.



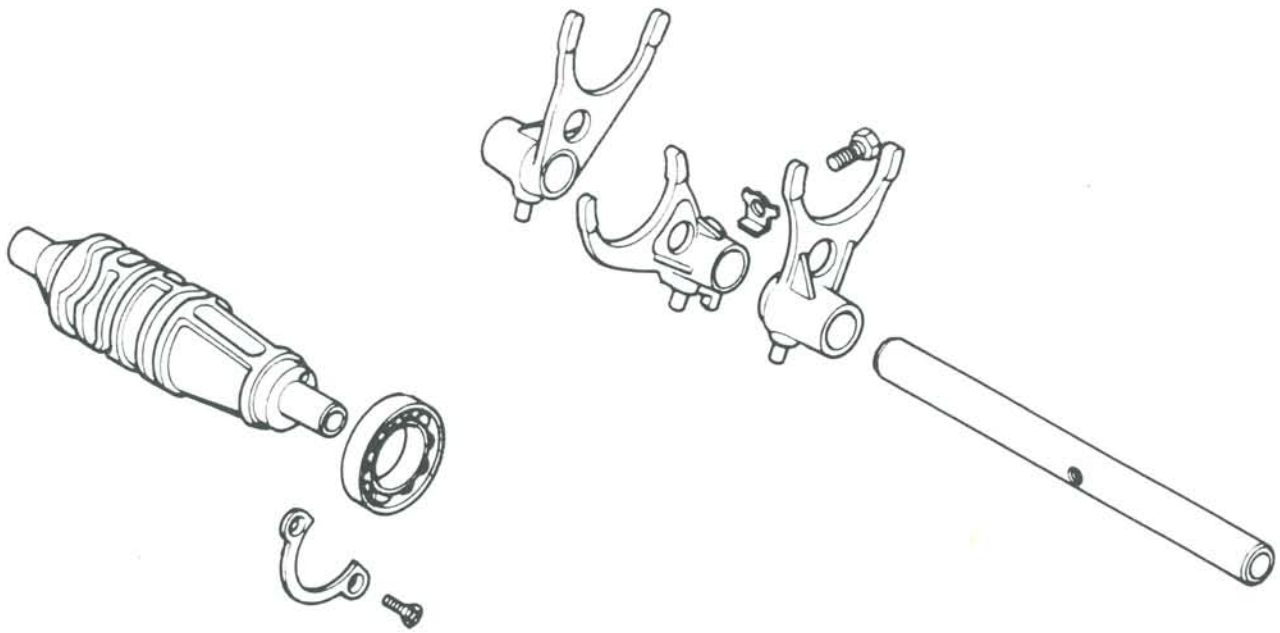
Install the right outer rotor.
Insert the drive pin into the shaft.
Align the slot in the inner rotor with the drive pin.

Install the side covers.
Install the relief valves.



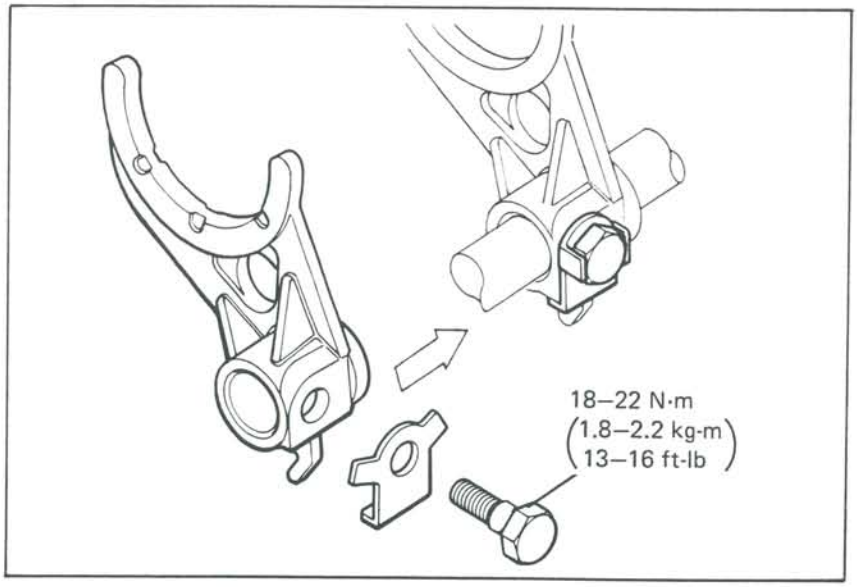
OIL PUMP, SHIFT DRUM AND SHIFT FORK INSTALLATION

To install the oil pump, shift drum and shift fork, reverse the removal procedure.
Key points are shown here.



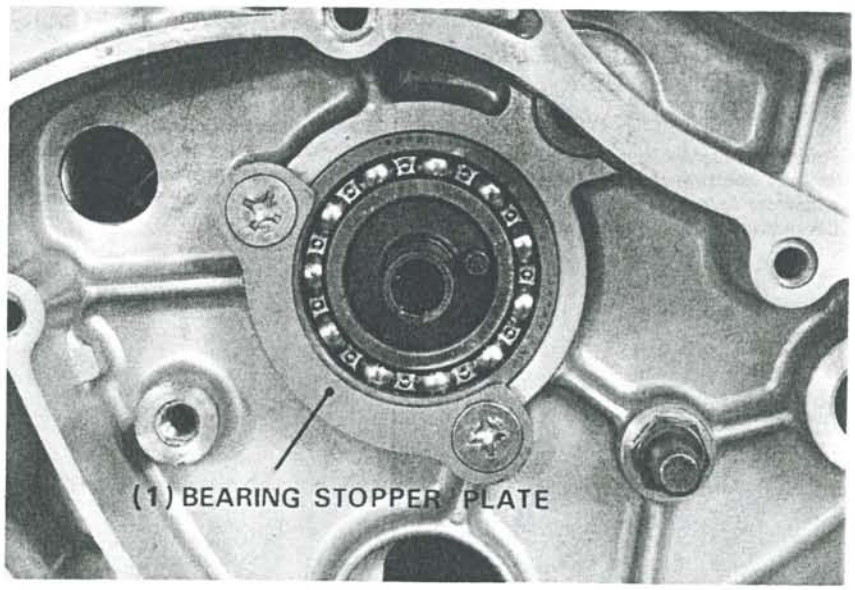
NOTE

After tightening the center shift fork, secure the bolt by bending the lock washer tabs against the bolt head.



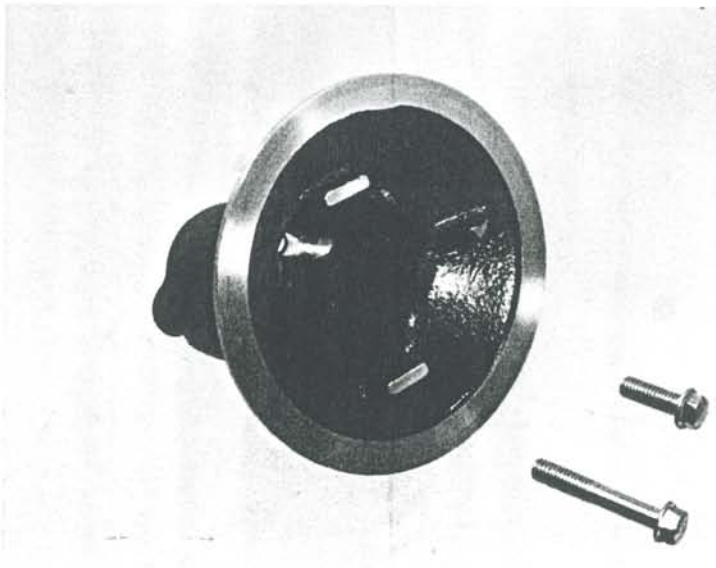
NOTE

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



CAUTION

The oil strainer bolts are different lengths. Use the bolts correctly when installing the oil strainer. If the bolts are used incorrectly, the shift drum may lock.

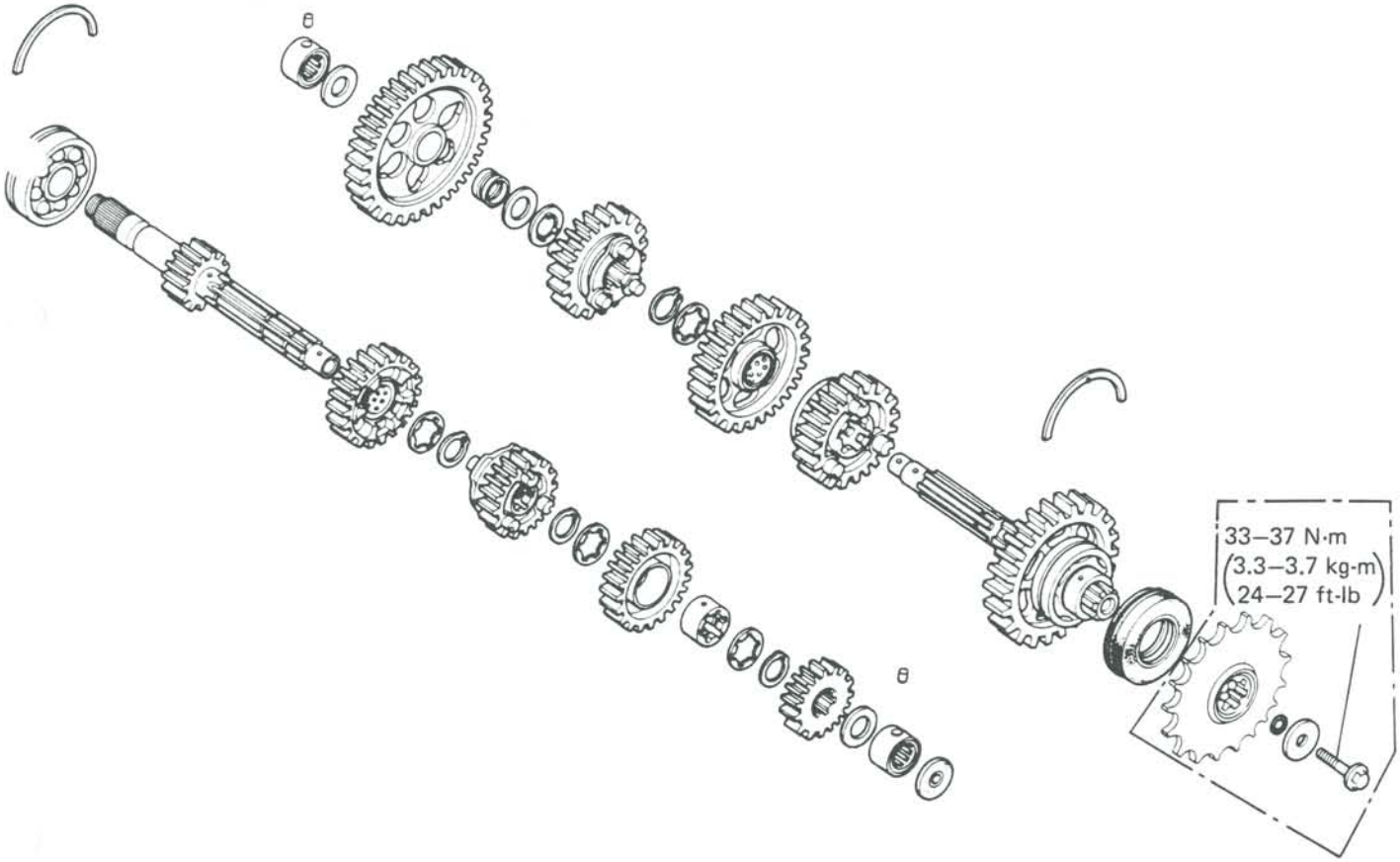


TRANSMISSION ASSEMBLY

Assemble the mainshaft and countershaft.

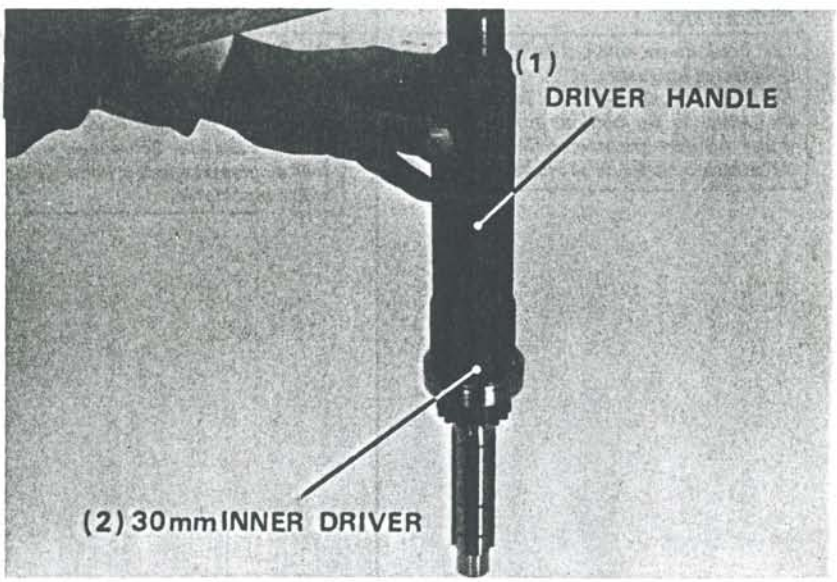
NOTE

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

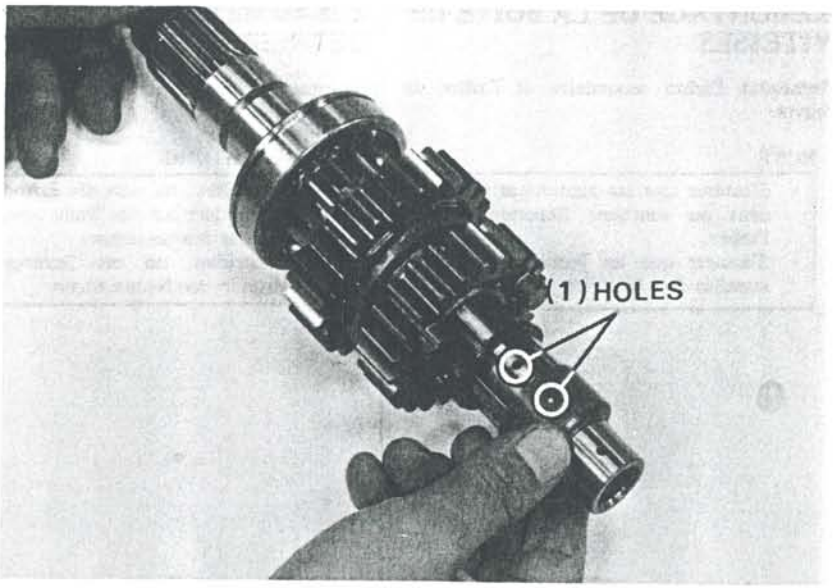


NOTE

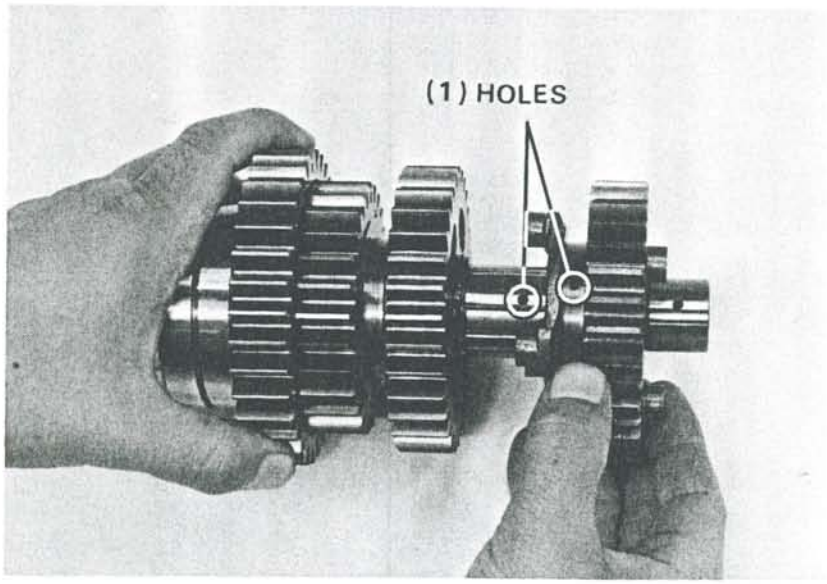
Install the mainshaft bearing with the special tools.



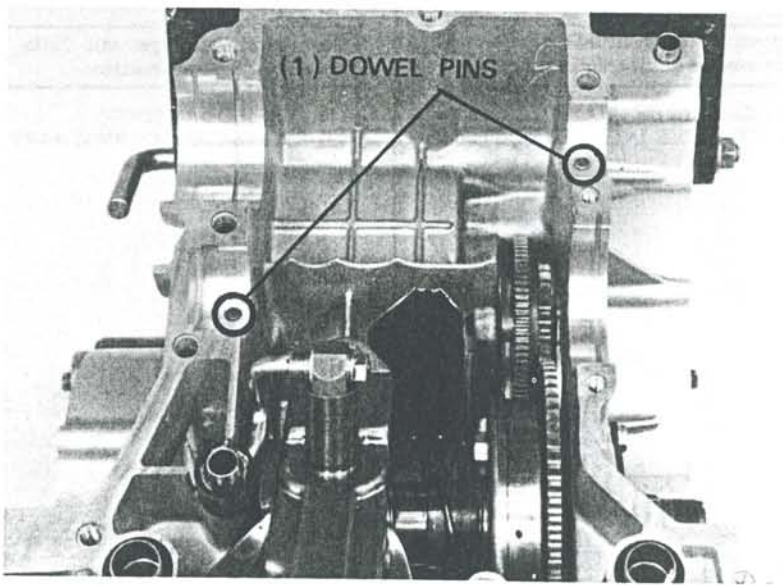
Align the hole in the M5 gear bushing with the hole in the mainshaft.



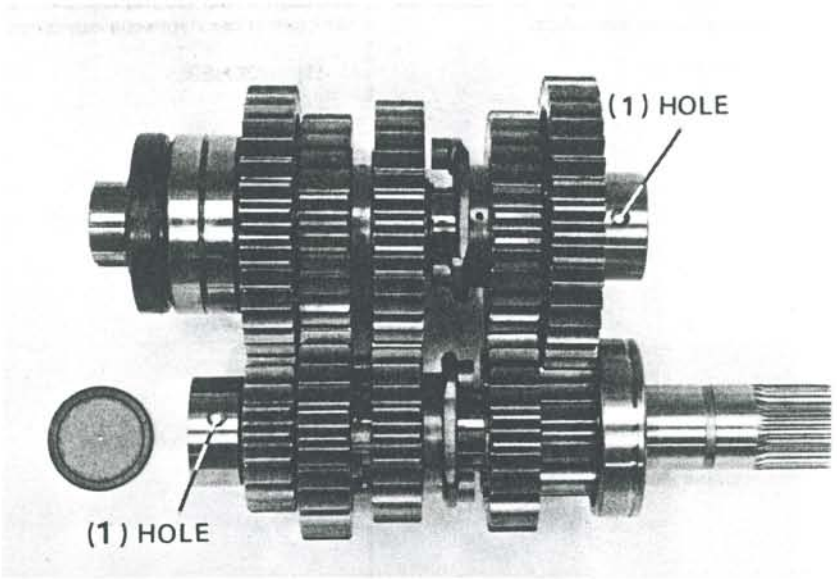
.lign the hole in the C5 gear with the hole in the countershaft.



Insert the dowel pins.

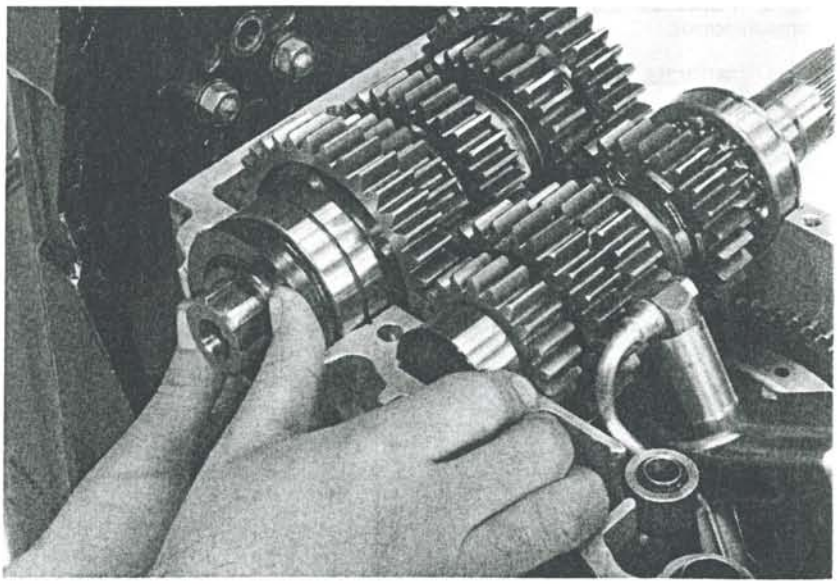


Align the holes in the mainshaft bearing and countershaft bearing with the dowel pins.



NOTE

- Install the countershaft oil seal carefully so that the oil seal lip is seated completely on the bearing before assembling the lower crankcase.
- Apply molybdenum disulfied grease to the shift fork groove of M-3 gear.



Install the lower crankcase (Refer to Section 10).

NOTE

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

