

NISSAN

TRANSMISSION

SERVICE MANUAL



NISSAN MOTOR CO., LTD.

TRANSMISSION

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TRANSMISSION

TRANSMISSION

MODEL FS5C71A TRANSMISSION

GENERAL DESCRIPTION

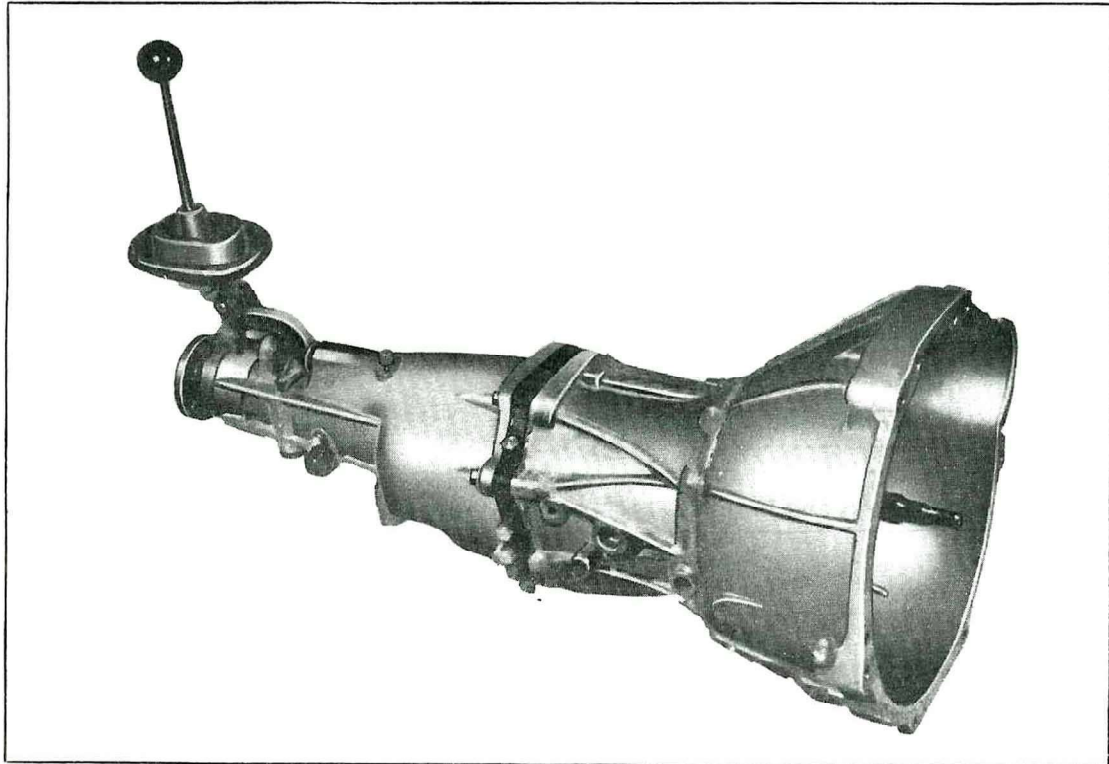


Fig. TM-1

TYPE FS5C71A transmission has 5 stage with over drive gear and divided type.

The clutch housing, gear case and rear extension can be easily divided, moreover, as the gear assembly is fixed to the gear case with

the adaptor, the gear assembly can be easily taken out from the gear case.

The front cover of the transmission is constructed in a body to the clutch housing and the synchronizing method is servo type.

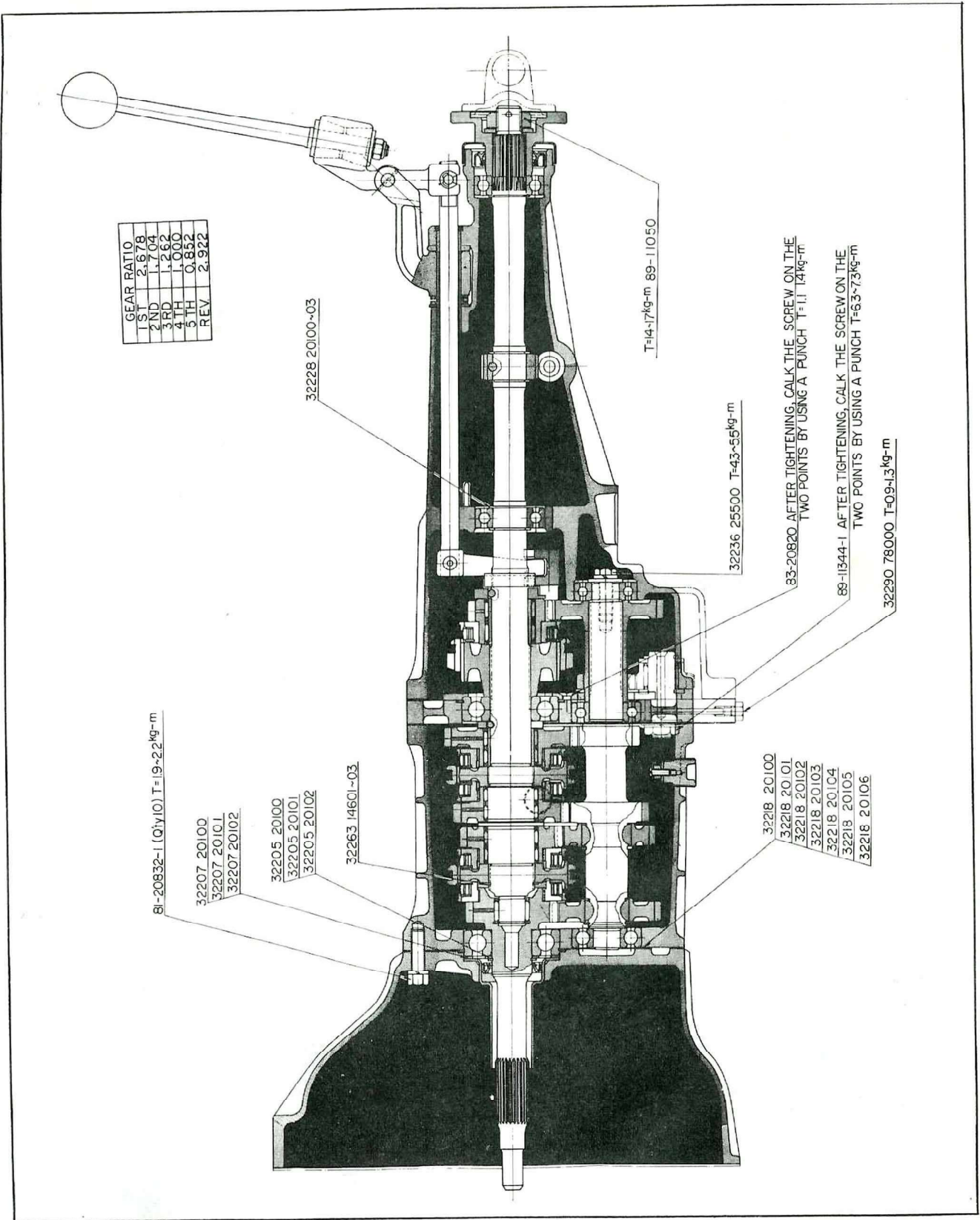


Fig. TM-2

TRANSMISSION

SERVICE OPERATION

DISMOUNT AND DISASSEMBLE

Inspect Transmission Oil

- 1) Check the transmission oil level before disassembly with the vehicle at normal flat condition.

The oil level and the oil condition can be used as a factor for judging the cause of the trouble.

- 2) As the drain plug has magnet, the condition of its gathering the iron particles will be a reference factor for analyzing the trouble.
- 3) Check the impurities or dirt obtained at screening the drained oil before disassembly.
- 4) Record the place of leakage if any found before disassembly on the followings.
 - a) Oil leakage at oil seal.
 - b) Oil leakage at packings.

Dismount Ass'y Transmission

Transmission can not be dismount with Engine in the car.

So to dismount and mount transmission assembly, remove Engine and Transmission as a unit from the car.

Refer to Engine-Remove and Replace procedure.

Detach Rear Extension, Clutch Housing and Gear Case

- 1) Drain Gear Oil.

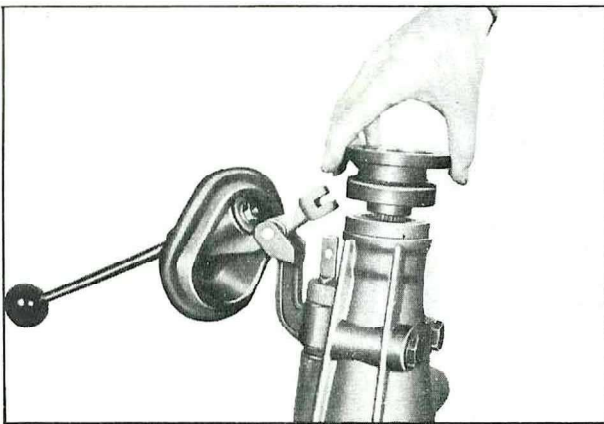


Fig. TM-3

- 2) Disconnect Striking Rod from Control Lever.
- 3) Pull up Split Pin and release nut and remove Companion Flange from Rear Extension.
- 4) Release fixing bolts and detach Rear Extension, disengaging Striking Rod from Fork Rods.

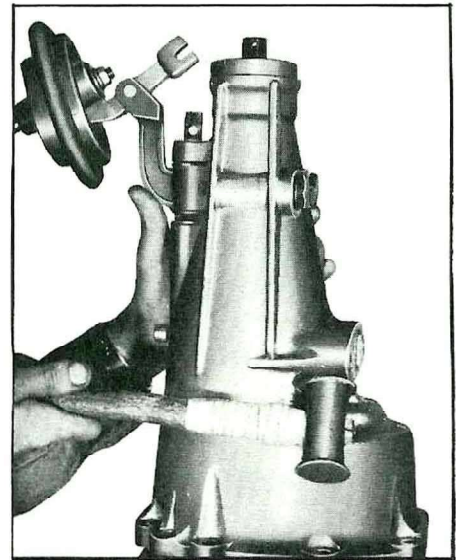


Fig. TM-4

- 5) Remove Oil Seal and Bearing, if required.
- 6) Remove Select Spring Plug and take out Select Spring & Select Pin, if required.
- 7) Pull out Striking Rod and remove "O" ring Cap and Bush-Striking, then remove Control Arm, if required.
- 8) Release fixing bolts and detach Clutch Housing from Gear Case.

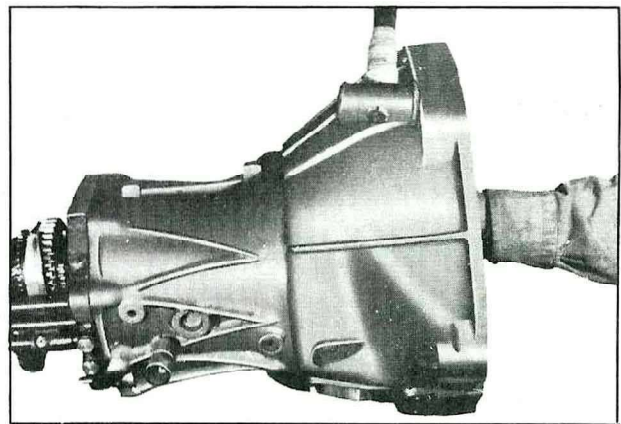


Fig. TM-5

- 9) Remove Stopper Ring on Main Drive Gear Bearing and detach Gear Ass'y from Transmission Gear Case.

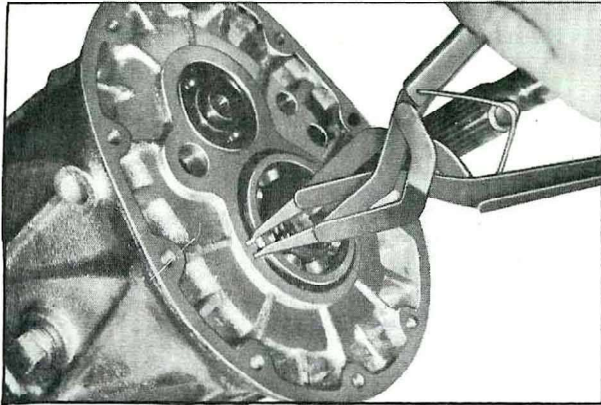


Fig. TM-6

- 2) Remove Checking Plugs and take out Checking Springs and Steel Balls.

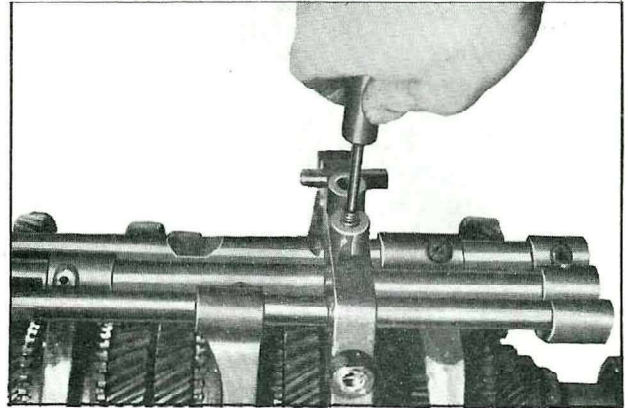


Fig. TM-9

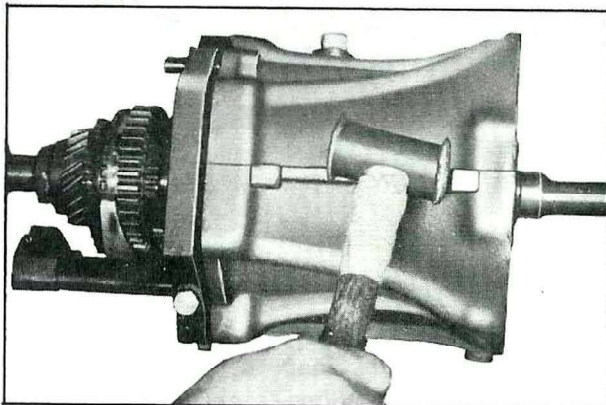


Fig. TM-7

- 3) Remove 1st-2nd, 3rd-4th & Reverse-5th Rods and four Check Balls.

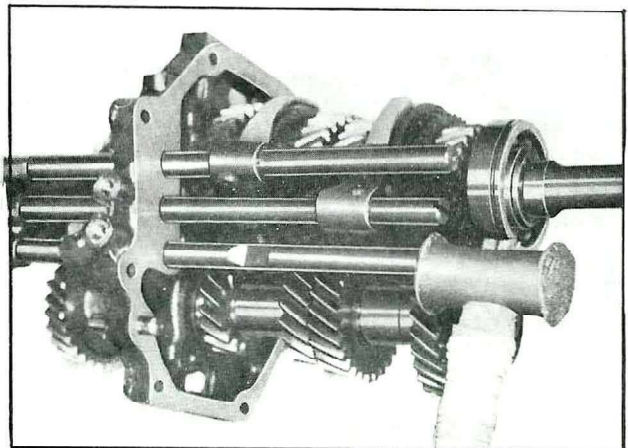


Fig. TM-10

Disassemble Gear Ass'y

- 1) Push out all Retaining Pins from Forks and Fork Rods, using a suitable drift.

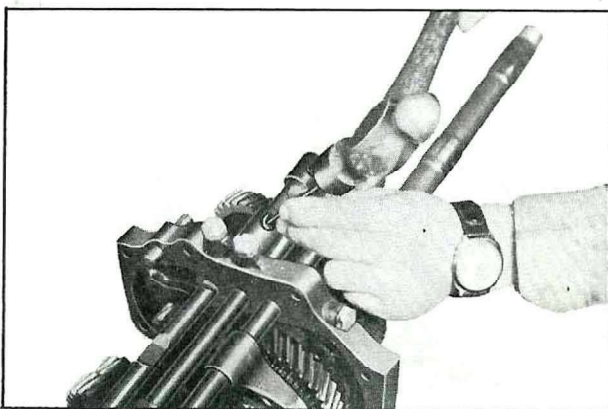


Fig. TM-8

- 4) Vise Adapter Plate on a suitable stand.
- 5) Remove Snap Rings on Main Shaft rear end and Speedometer Drive Gear rear end. Then, pull out Speedometer Gear.
- 6) Remove two Snap Rings and pull out Bearing-Main Shaft Over Drive. Remove a remaining Snap Ring.
- 7) Stretch Lock Plate and release Nut-Main Shaft. Remove Nut, Lock Plate and Thrust Washer.

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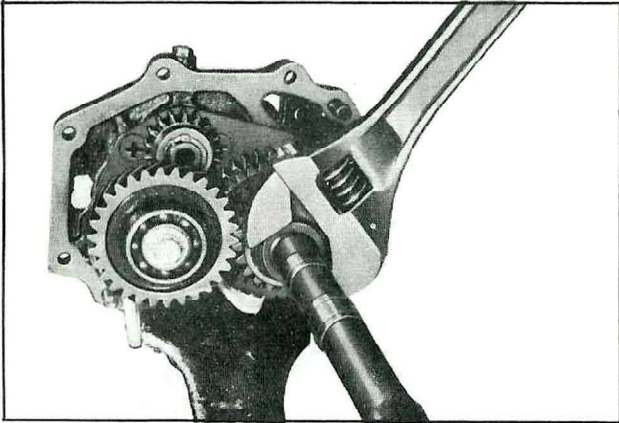


Fig. TM-11

- 8) Remove Bolt and Washer from Counter Shaft rear end and Pull out Bearing and Gear-Counter Shaft Over Drive together.

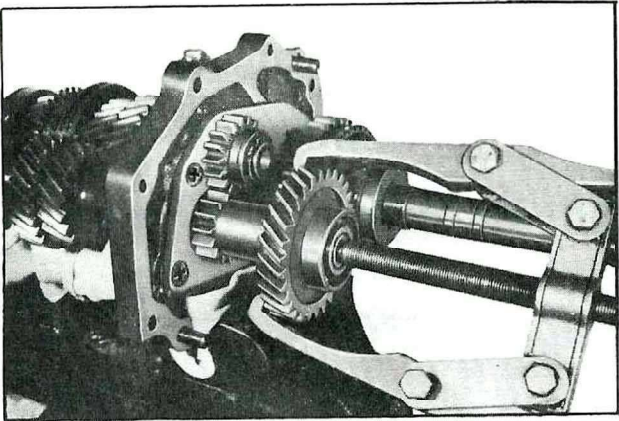


Fig. TM-12

- 9) Remove Over Drive Gear Ass'y, Needle Roller Bearing and Bushing.

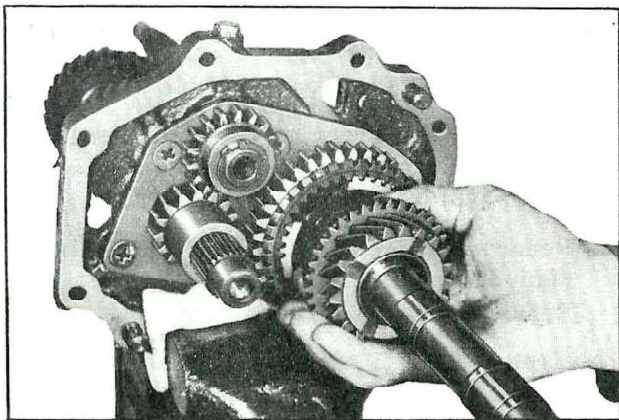


Fig. TM-13

- 10) Remove Reverse Gear Idler by removing Snap Ring.

- 11) Pull out Reverse Gear-Main Shaft and Reverse Gear-Counter Shaft.

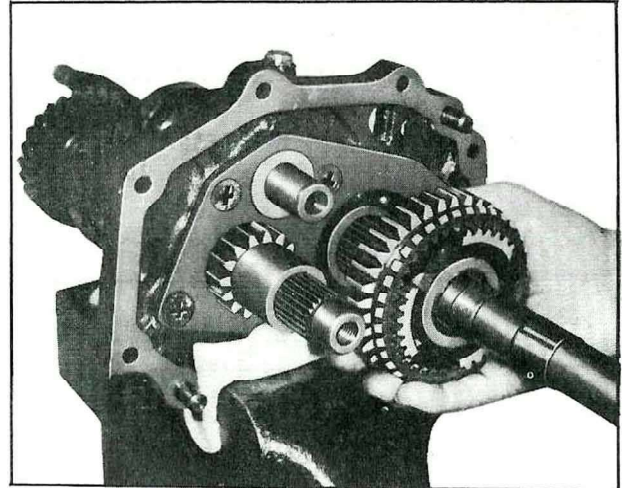


Fig. TM-14

- 12) Remove Main Shaft Bearing Retainer to Adapter Plate Screws and detach Bearing Retainer.

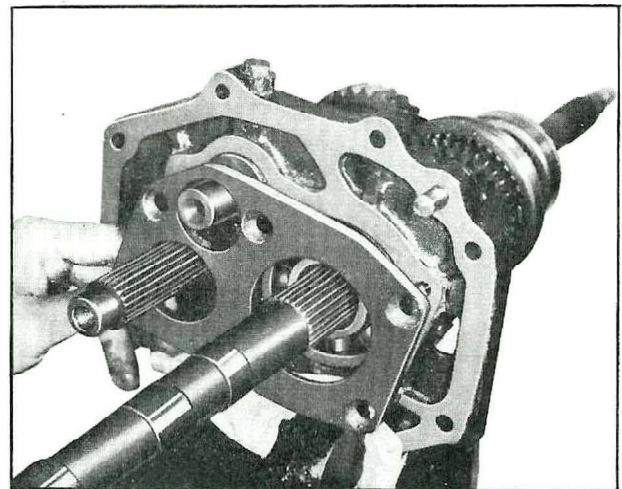


Fig. TM-15

- 13) Remove Counter Shaft and Main Shaft Assembly together, hitting lightly the outer races of Both Bearings.

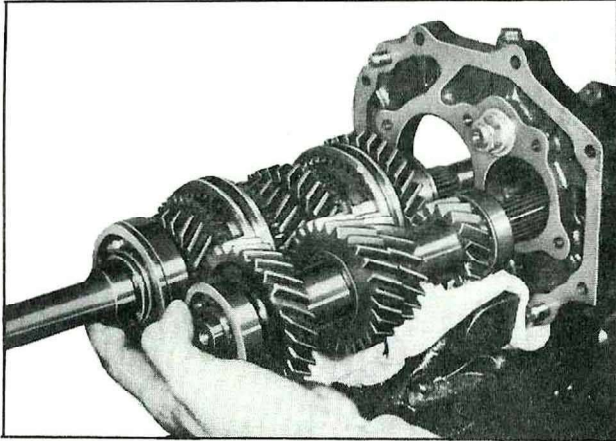


Fig. TM-16

Disassemble Main Shaft

- 1) Remove Main Shaft Bearing and Thrust Washer.

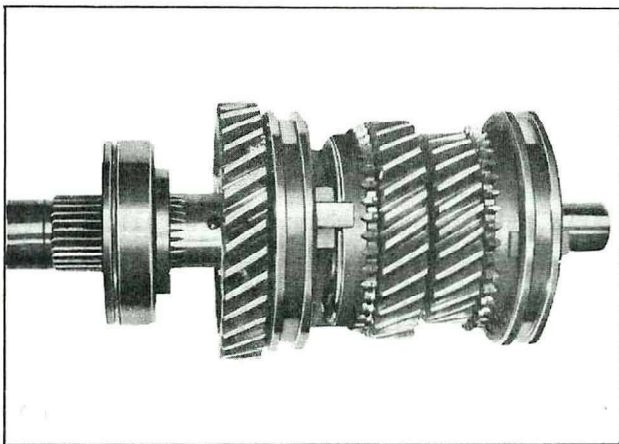


Fig. TM-17

- 2) Remove 1st Gear Ass'y, Needle Roller Bearing and Bushing.
- 3) Pull out Hub-Synchronizer and Coupling Sleeve.
- 4) Remove 2nd Gear Ass'y and Needle Roller Bearing.

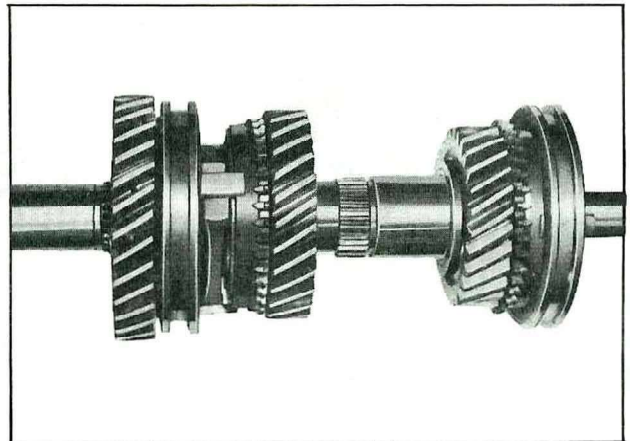


Fig. TM-18

- 5) Remove Snap Ring on Main Shaft front end and pull out Hub Synchronizer & Coupling Sleeve.

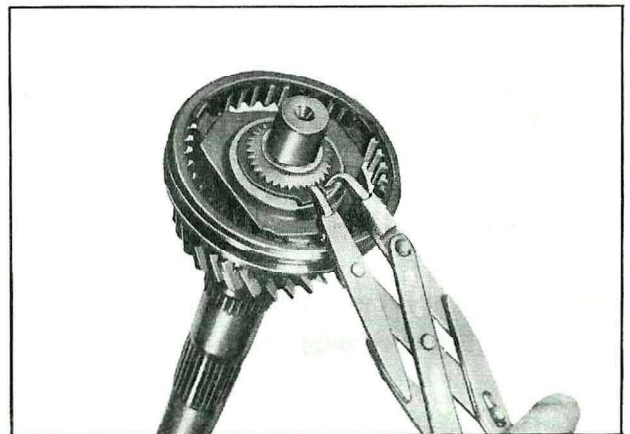


Fig. TM-19

- 6) Remove 3rd Gear Ass'y and Needle Roller Bearing.

Inspect and Replace Disassembled Parts

- 1) Check Oil Seals and "O" Rings for wear, damage, hardening of Oil Seal Lip and Outside condition. Replace them, if they are damaged.
- 2) Check Bearings and replace if they are damaged.
- 3) Check Gears and replace if they are damaged.

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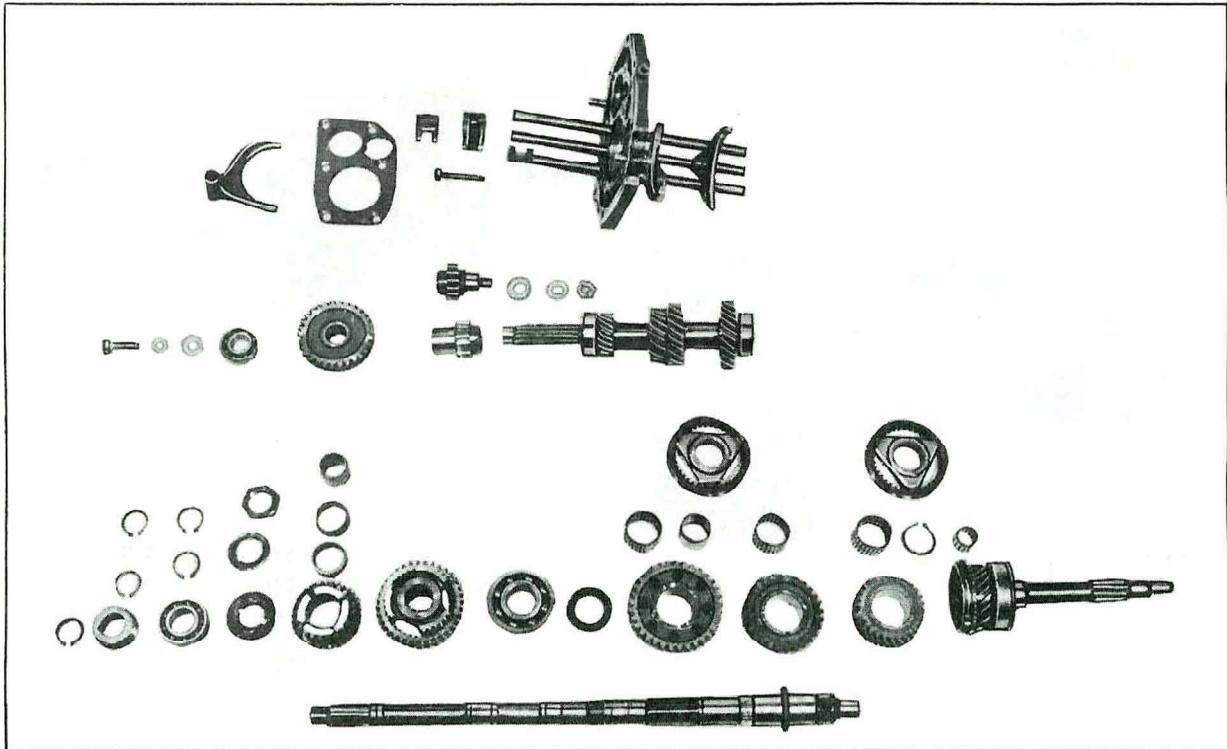


Fig. TM-20

ASSEMBLE AND MOUNT

Clean and Replace Each Part

- 1) Clean every part with clean solvent and lubricate with the transmission oil.
- 2) Remove the old gasket thoroughly and clean the trace of the sealing compound by thinner or carbon tetrachloride. Coat the new gasket with the specified compound.
- 3) Replace Oil seals with new ones. Apply the multi-purpose grease to the lip of the oil seal.
- 4) Replace damaged snap rings with new ones.

Subassembling of Main Parts

- 1) Assemble Synchronizer ring to each gear.
 1. Place each gear on a flat place.
 2. Install Synchronizer ring into the inside of Clutch gear on each gear.
 3. Install Thrust block to each gear.
4. Install Anchor block to each gear.

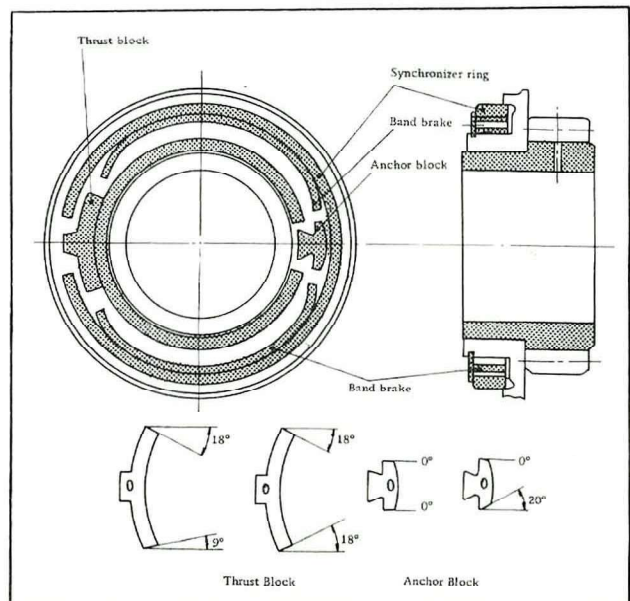


Fig. TM-21

	1st	2nd	3rd	M/D	O. D
Synchronizer ring	32611 14600	32611 14600	32611 14600	32611 14600	32316 20100
Thrust block	32617 14601 18°-9°	32612 14601 18°-18°	32612 14601	32612 14601	32362 20100 18°-18°
Anchor block	32618 14601 0°-20°	32613 14601 0°-0°	32613 14601	32613 14601	32363 20100 0°-0°
Band brake	32614 14604 2, 5t 32615 14600 2, 2t	32614 14600 2, 5t	32614 14600	32614 14600	32364 20100 2, 5t
Circlip	32616 14600	32616 14600	32616 14600	32616 14600	32366 20100

5. Install Brake band as shown in Fig. TM-21.

6. Install Circlip into the groove of each gear.

2) Install Reverse Idler Shaft to Adapter Plate.

1. Press Reverse Idler Shaft into Adapter Plate, with a suitable drift, setting the set-screw hole location.

2. Install Set-screw, smearing with some adhesive compound for sealing.

3. Install Washer, Spring washer and Nut into Reverse shaft and tighten to 6.3 ~ 7.3 kg-m (45.55 ~ 52.78 ft-lb) torque.

3) Rear Extension-Assemble

1. Install "O" rings on both ends of Control Arm.

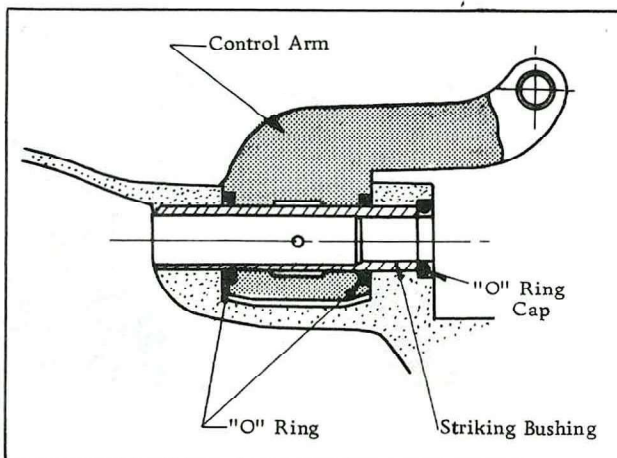


Fig. TM-22

2. Install Control Arm into Rear Extension and press in Striking Bushing by a suitable drift.

3. Install "O" ring and Retainer into Striking bushing rear end.

4. Install Control lever bracket into Control arm and insert control lever pin with washers.

5. Retain Control lever pin with Retaining pin.

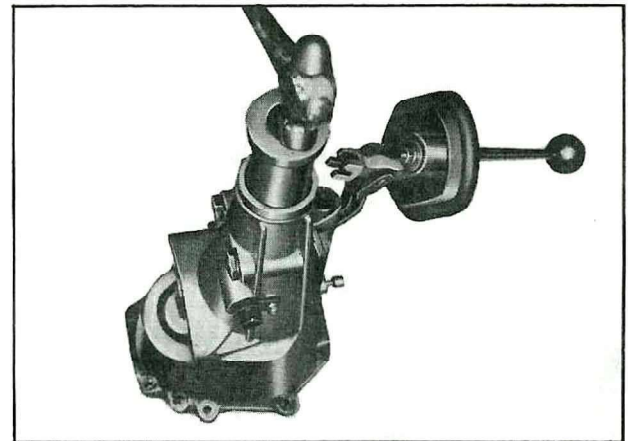


Fig. TM-23

6. Press Rear Extension Bearing into Rear Extension, using a drift.

7. Install Oil Seal.

4) Main Shaft-Assemble

1. Install Needle roller bearing and 3rd Gear Assembly into Main Shaft front end.



Fig. TM-24

TRANSMISSION

2. Install Synchronizer Hub and retain with Snap Ring.
3. Install Coupling Sleeve.
4. Install Needle roller bearing and 2nd Gear Assembly into Main Shaft from the rear end.
5. Press Synchronizer Hub into Main Shaft with a suitable drift.
6. Install Coupling Sleeve into 1st & 2nd Synchronizer Hub.
7. Press 1st speed gear bushing into Shaft.
8. Install Needle roller bearing and 1st Gear assembly.
9. Install Thrust washer and Lock ball.
10. Press in Main Shaft Bearing, using a suitable drift.

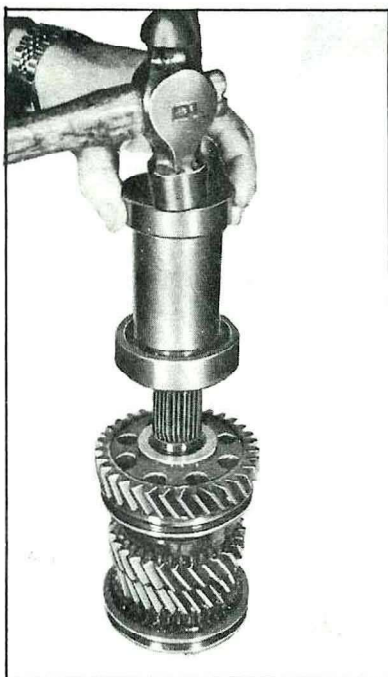


Fig. TM-25

5) Counter Shaft-Assemble

Press Counter Shaft Bearings into both ends of Counter Shaft, using a suitable drift.



Fig. TM-26

Assemble Gear Ass'y

- 1) Vise Adapter Plate on a suitable stand.
- 2) Assemble Main Shaft Ass'y, Main Drive Shaft Ass'y and Counter Shaft Ass'y together into Adapter Plate.

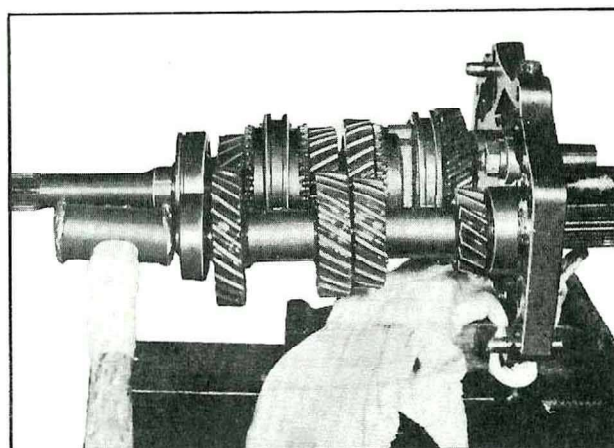


Fig. TM-27

3) Install Counter Shaft Bearing Ring at the rear end of Counter Shaft Bearing and Stopper Ring at Main Shaft Bearing.

5) Install Hub Synchro-Over Drive and Reverse Gear into Main Shaft, using a suitable drift.

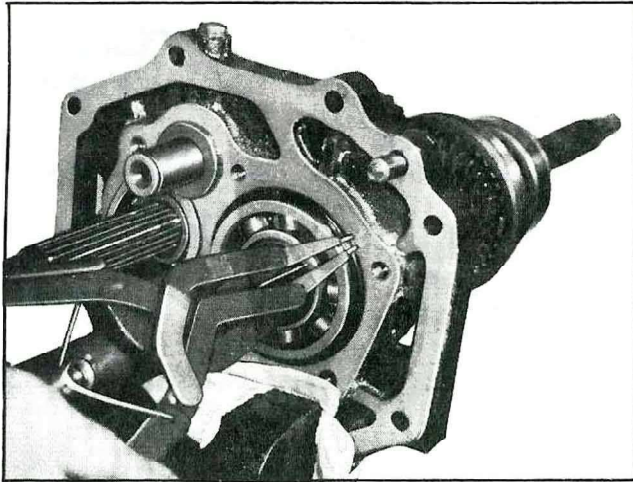


Fig. TM-28

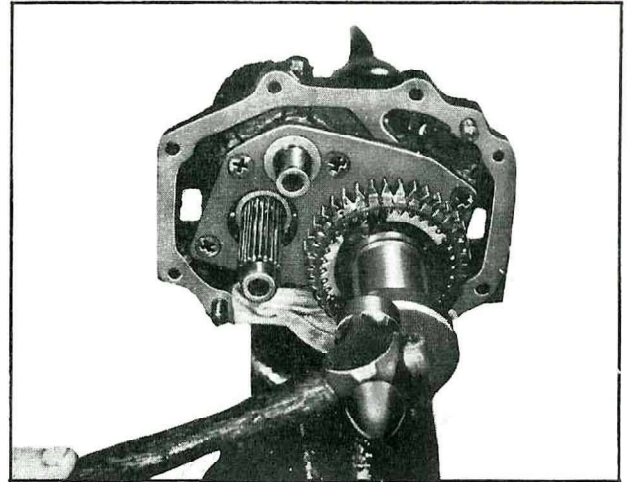


Fig. TM-30

4) Install Main Shaft Bearing Retainer. Tighten Screws to 1.1 ~ 1.4 kg-m (7.95 ~ 10.12 ft-lb) torque.

6) Press Reverse Gear into Counter Shaft, using a drift.

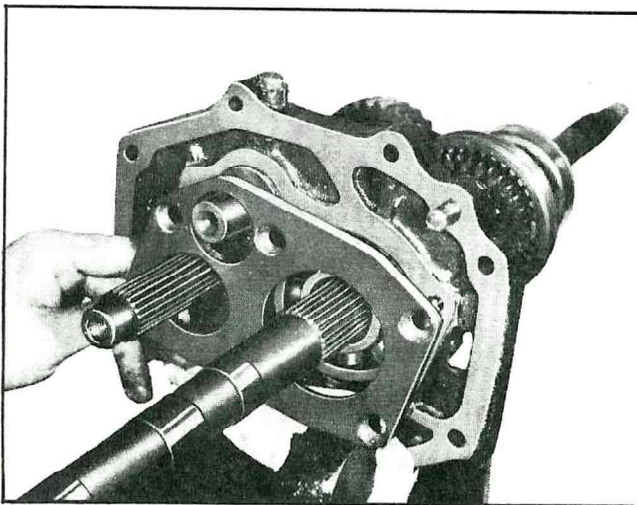


Fig. TM-29

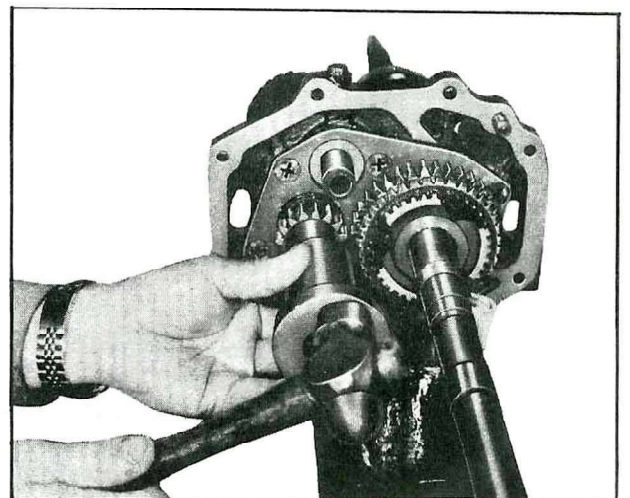


Fig. TM-31

TRANSMISSION

- 7) Install Needle Roller Bearing, Reverse Idler Gear and Thrust Washer into Reverse Idler Shaft.
Retain with Snap Ring.

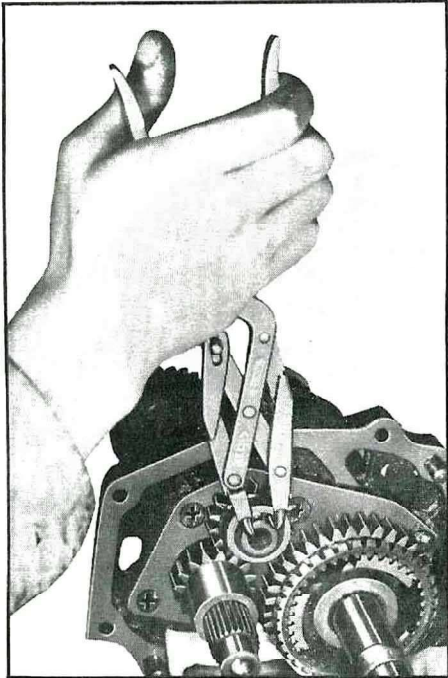


Fig. TM-32

- 8) Install Bushing-Main Shaft Over Drive, using a suitable drift.
- 9) Install Needle Roller Bearing and Over Drive Gear Assembly.
- 10) Press Over Drive Gear-Counter Shaft into Counter Shaft.
- 11) Press Bearing-Counter Shaft Over Drive into the rear end of Counter Shaft.

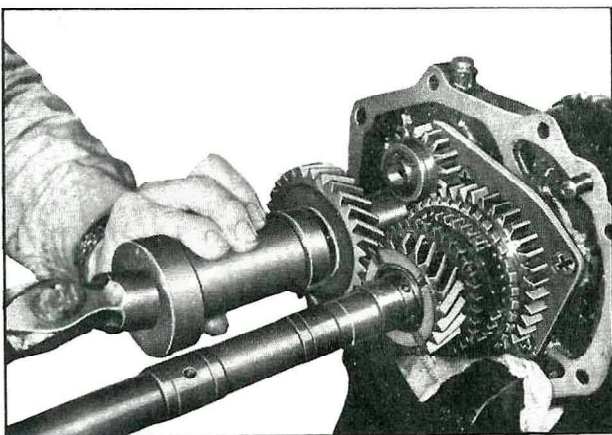


Fig. TM-33

- 12) Install Washer, Spring Washer and Bolt into Counter Shaft.
- 13) Tighten Bolt-Counter Shaft to 4.3 ~ 5.5 kg-m (31.09 ~ 39.77 ft-lb) torque.

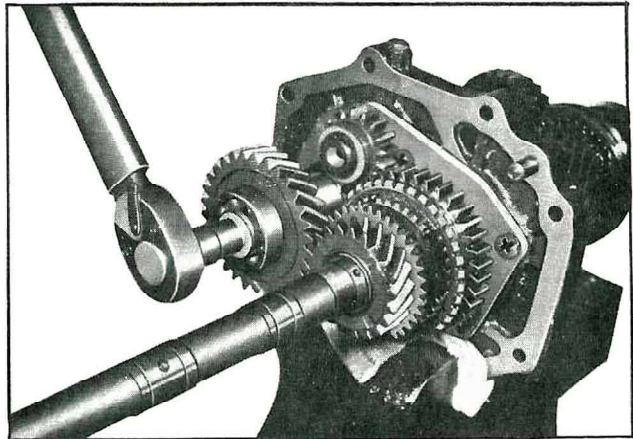


Fig. TM-34

- 14) Install Lock Ball and Thrust Washer.
- 15) Install Lock Plate and Nut. Do not tighten.
- 16) Tighten Nut-Main Shaft to 17 ~ 20 kg-m (122.9 ~ 144.6 ft-lb) torque, and turn over the lock plate to lock the nut.

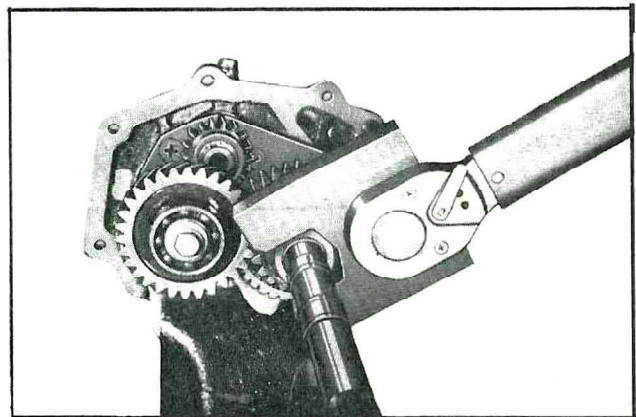


Fig. TM-35

- 17) Install Snap ring into the groove.
- 18) Press Over Drive bearing into Main shaft and retain with Snap ring in order.
- 19) Install Snap ring, Steel ball, Speedometer gear and Snap ring.
- 20) Install Reverse fork and insert Fork rod-reverse & Over drive with bracket.

- 21) Match Fork rod hole with the hole of Reverse Fork and insert Retaining pin.
- 22) Install two steel balls into Check ball hole.

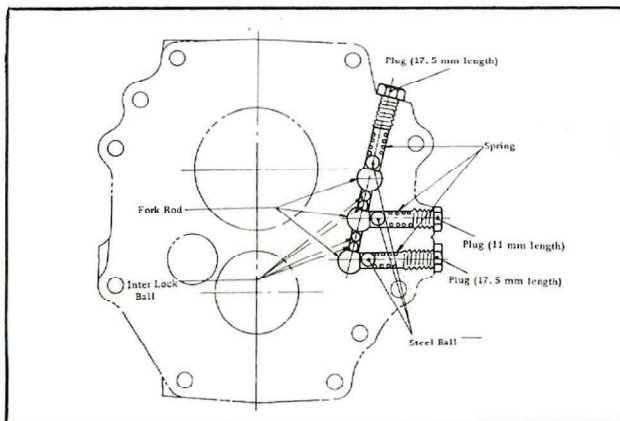


Fig. TM-36

- 23) Install Fork-3rd & 4th and insert Fork rod with bracket.
- 24) Insert Retaining pin.
- 25) Install two steel balls into Check ball hole.
- 26) Install Fork-1st & 2nd and insert Fork rod with bracket.
- 27) Insert Retaining Pin.
- 28) Install two steel balls into Check ball hole. into each check ball hole and screw in Checking plugs, smearing with the adhesive compound.

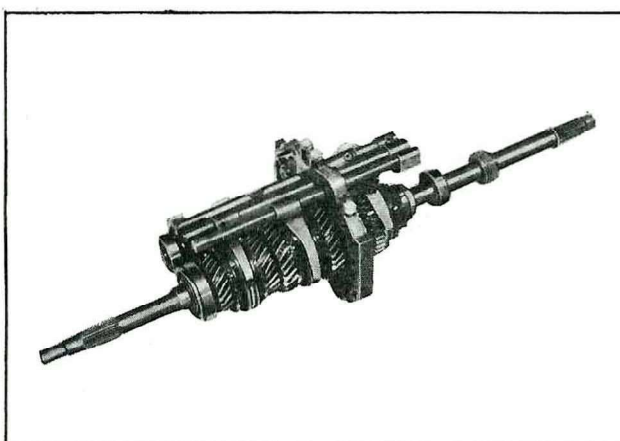


Fig. TM-37

- 29) Tighten Checking plugs to 2.2 ~ 3.0 kg-m (15.91 ~ 21.69 ft-lb) torque.

- 30) Check the end plays of Gears.
End play of Main Shaft Gears should be 0.1 ~ 0.2 mm (0.0039 ~ 0.0079 in.).

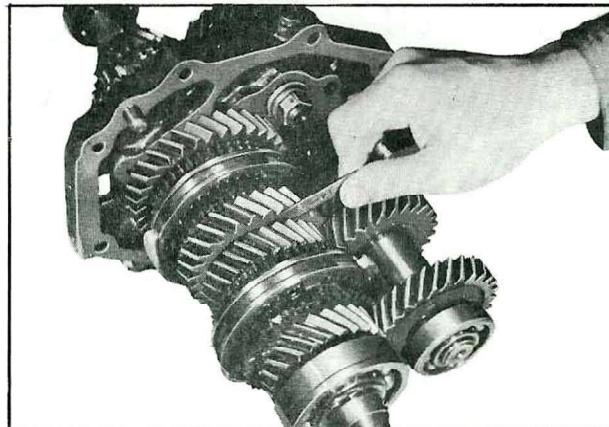


Fig. TM-38

Assemble Gear Ass'y, Gear Case, Clutch Housing and Rear Extension

- 1) Install Gear Ass'y into Gear Case, using a new gasket.

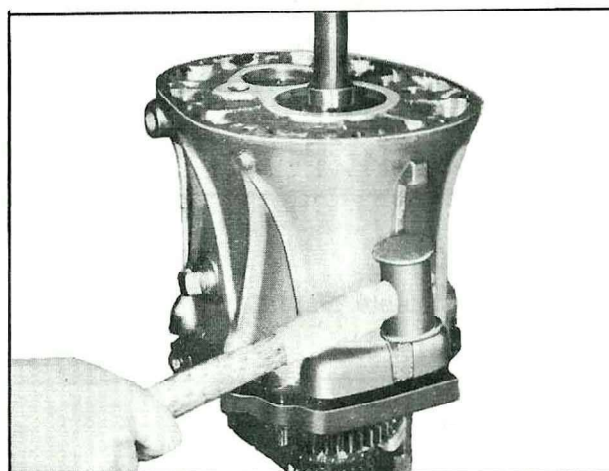


Fig. TM-39

- 2) Measure the depth from Gear case face to Bearing face and select a suitable shim. Available Counter Shaft Bearing Shims are 0.4 mm (0.0158 in.), 0.5 mm (0.0197 in.), 0.6 mm (0.0236 in.), 0.7 mm (0.0276 in.), 0.8 mm (0.0315 in.), 0.9 mm (0.0354 in.), 1.0 mm (0.0394 in.).

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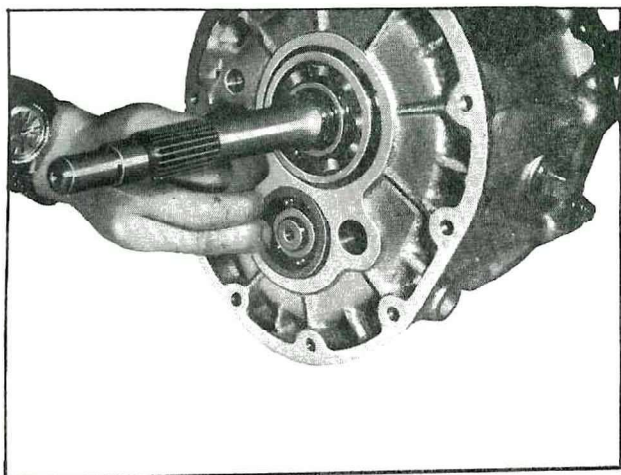


Fig. TM-40

- Install a Stopper Ring into Main Drive Gear Bearing and Press in Bearing until Stopper Ring contacts with Gear Case Face.
- Measure the height (B) of Bearing face from gear case face.

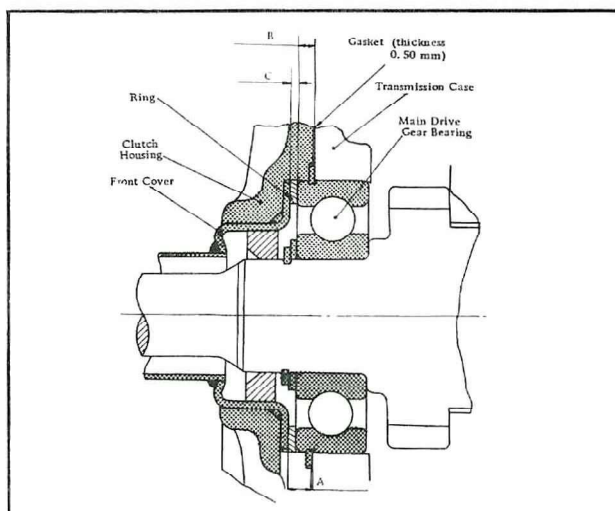


Fig. TM-43

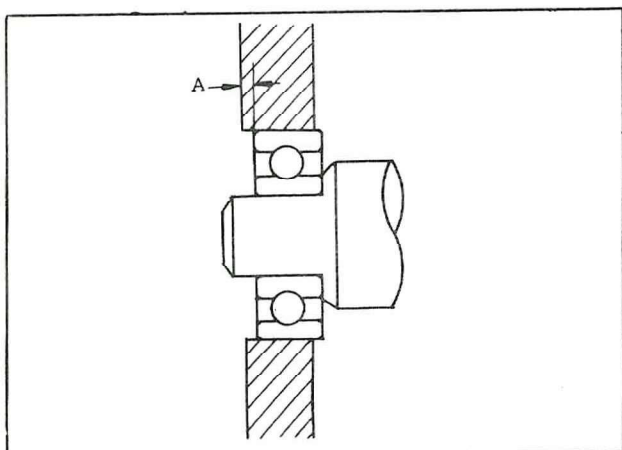


Fig. TM-41

- Measure the depth (A) of Front cover rear flange face from Clutch housing face.

Standard dimension:

A = 6.0 ~ 6.2 mm (0.2362 ~ 0.2441 in.)

B = 4.70 ~ 5.00 mm (0.1850 ~ 0.1969 in.)

- 3) Select a suitable Main Drive Gear Bearing Ring.

- Select Main Drive Bearing Ring (thickness C) such as will satisfy the following equation.

$A - B - C = -0.20 \text{ mm} \sim +0.20 \text{ mm} (-0.0079 \text{ in.} \sim +0.0079 \text{ in.})$.

Three kinds of Main Drive Bearing Rings are available (C = 1.2 mm (0.0472 in.), 1.4 mm (0.0551 in.) & 1.6 mm (0.0630 in.)).

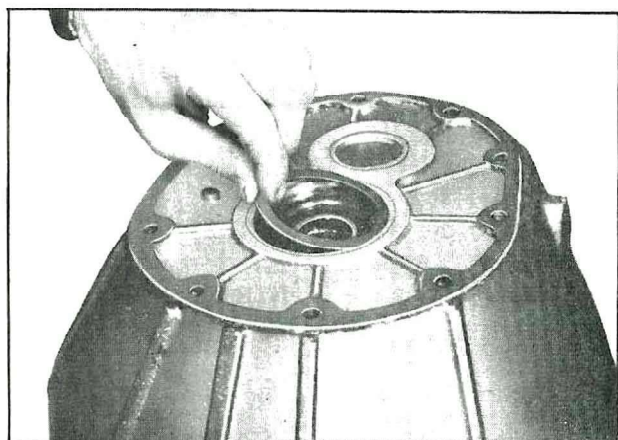


Fig. TM-42

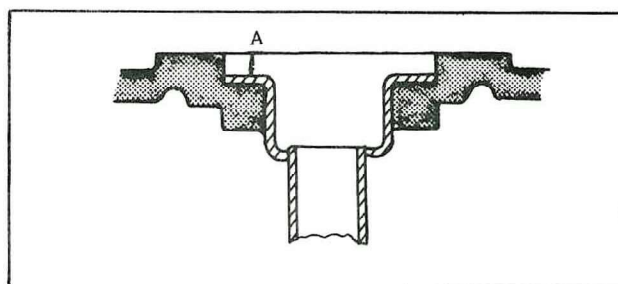


Fig. TM-44

- 4) Install Clutch housing, using a new gasket.
- 5) Install Clutch housing to Transmission bolts and spring washers.
- 6) Tighten to 1.9 ~ 2.2 kg-m (13.74 ~ 15.91 ft-lb) torque.
- 8) Install eight bolts and spring washers. Tighten bolts to 1.5 ~ 2.2 kg-m (10.85 ~ 15.91 ft-lb) torque.
- 9) Install Companion Flange Ass'y.
- 10) Install Plane Washer and Nut. After tightening to 14 ~ 17 kg-m (101.2 ~ 122.9 ft-lb) torque, retain with Cotter pin.

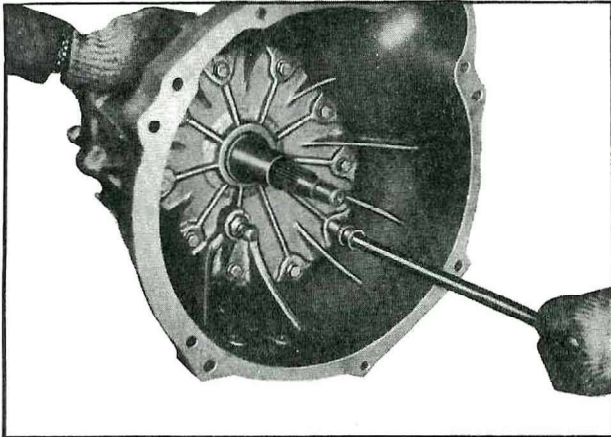


Fig. TM-45

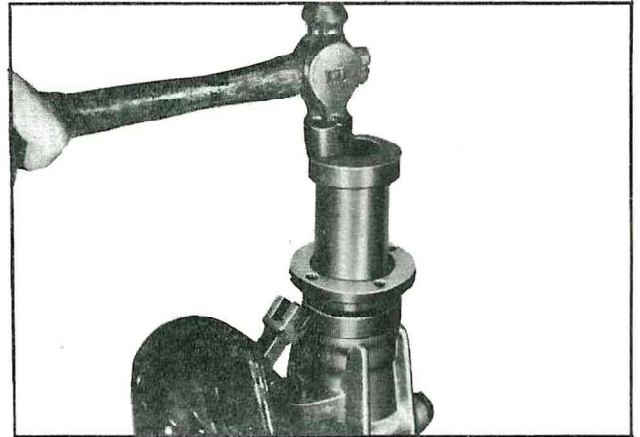


Fig. TM-47

- 7) Install Rear Extension Ass'y, engaging Striking Rod with Fork Rod. Use a new gasket.

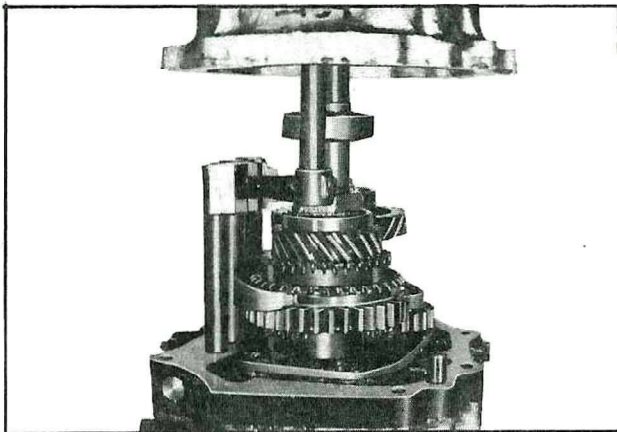


Fig. TM-46

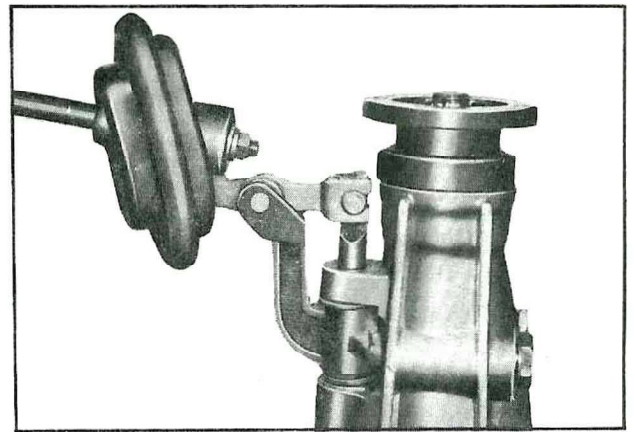


Fig. TM-48

- 11) Connect Striking Rod with Control Lever.

TRANSMISSION

SERVICE DATA

GENERAL SPECIFICATION

Model	FS5C71A	
Control Type	Floor Shift	
Synchro Type	Servo Type	
Gear Ratio	1st = 2.957	
	2nd = 1.858	
	3rd = 1.311	
	4th = 1.000	
	5th = 0.852	
	Rev. = 2.922	
 Number of Teeth		
Main Shaft	Drive gear	23
	3rd gear	28
	2nd gear	29
	1st gear	34
	Rev. gear	36
	O. D. gear	21
Counter Shaft	Driven gear	28
	3rd gear	26
	2nd gear	19
	1st gear	14
	Rev. gear	15
	O. D. gear	30
Reverse Idler Gear		17
Speedometer	Drive gear	6
	Driven gear	18

TIGHTENING TORQUE

Reverse Idler Shaft Nut	6.3 ~ 7.3 kg-m (45.55 ~ 52.78 ft-lb)			
Reverse Idler Shaft Set-Screw	1.1 ~ 1.3 kg-m (7.95 ~ 9.40 ft-lb)			
Main Bearing Retainer Screws	1.1 ~ 1.4 kg-m (7.95 ~ 10.12 ft-lb)			
Counter Shaft Overdrive Bearing Bolt	4.3 ~ 5.5 kg-m (31.09 ~ 39.77 ft-lb)			
Main Shaft Rear Nut	17 ~ 20 kg-m (122.9 ~ 144.6 ft-lb)			
Check Ball Plugs	2.2 ~ 3.0 kg-m (15.91 ~ 21.69 ft-lb)			
Rear Extension Fitting Bolts	1.5 ~ 2.2 kg-m (10.85 ~ 15.91 ft-lb)			
Companion Flange Nut	14 ~ 17 kg-m (101.2 ~ 122.9 ft-lb)			
Clutch Housing to Gear Case Bolts ..	1.9 ~ 2.2 kg-m (13.74 ~ 15.91 ft-lb)			
Speedometer Sleeve Lock Plate Bolt	0.5 ~ 0.6 kg-m (3.62 ~ 4.34 ft-lb)			
Clutch Housing to Engine Bolt	<table style="display: inline-table; vertical-align: middle;"> <tr> <td rowspan="2" style="font-size: 2em; vertical-align: middle;">{</td> <td>Large 2.7 ~ 3.7 kg-m (19.52 ~ 26.75 ft-lb)</td> </tr> <tr> <td>Small 1.1 ~ 1.4 kg-m (7.95 ~ 10.12 ft-lb)</td> </tr> </table>	{	Large 2.7 ~ 3.7 kg-m (19.52 ~ 26.75 ft-lb)	Small 1.1 ~ 1.4 kg-m (7.95 ~ 10.12 ft-lb)
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