

TRANSMISSION

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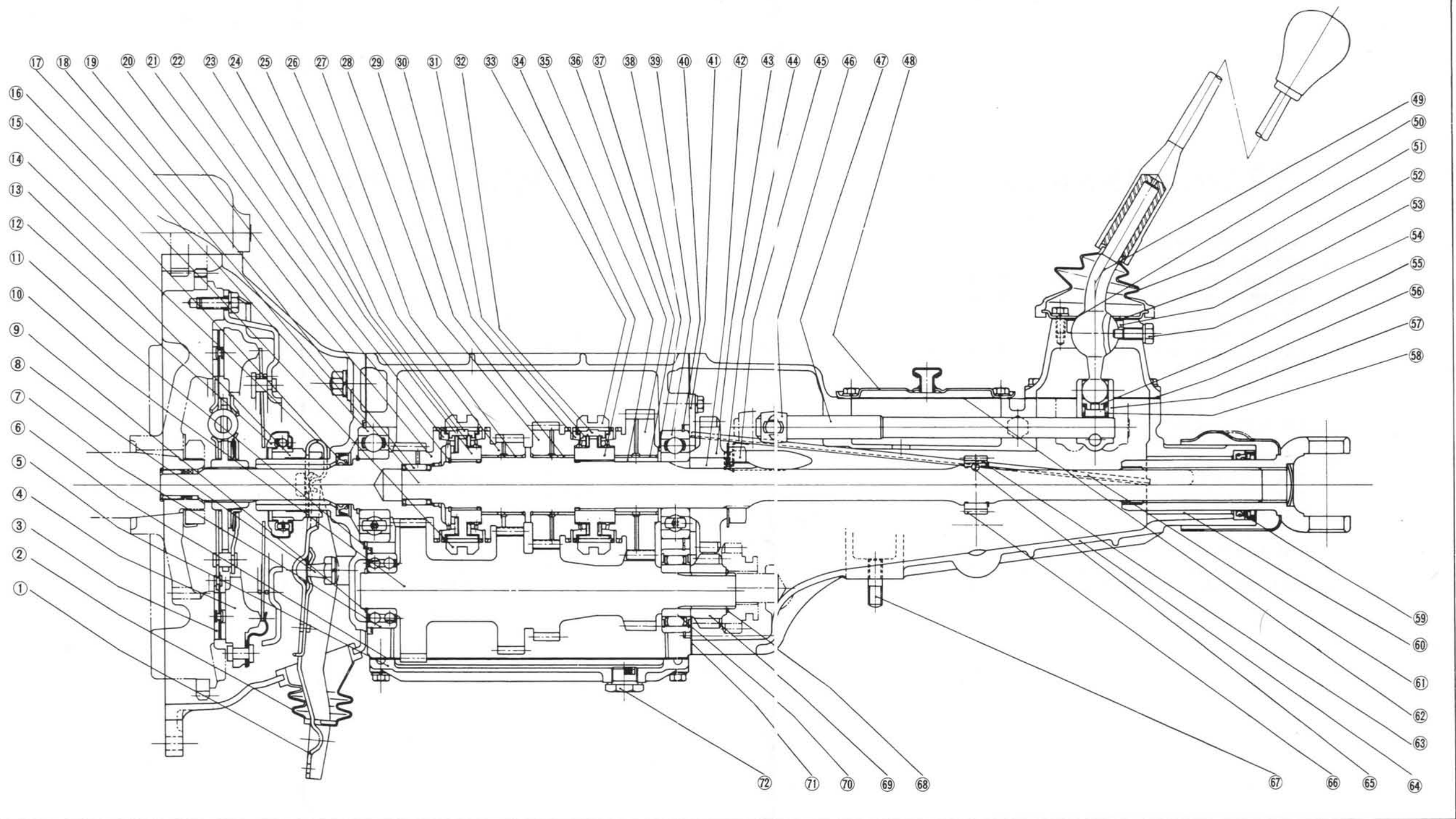


Fig. 7-1 Clutch and Transmission

- | | | | | | |
|----------------------------|---------------------------|-------------------------|--------------------|----------------------|--------------------------|
| 1. Release Fork | 13. Clutch Release Collar | 25. Synchronizer Key | 3. Bush | 49. Change Lever | 61. Oil Pass |
| 2. Dust Boot | 14. Collar Spring | 26. Synchronizer Ring | 3. Thrust Washer | 50. Shim | 62. Gasket |
| 3. Clutch Disk Assembly | 15. Oil Seal | 27. Bush | 3. Ball Bearing | 51. Dust Boot | 63. Snap Ring |
| 4. Pressure Plate Assembly | 16. Clutch Hub Sleeve | 28. Second Gear | 4. Adjust Shim | 52. Cover Plate | 64. Extension Housing |
| 5. Under Cover | 17. Ball Bearing | 29. Bush | 4. Bearing Stopper | 53. Bush | 65. Steel Ball |
| 6. Gasket | 18. Main Shaft | 30. Synchronizer Ring | 4. Key | 54. Set Screw | 66. Speed Drive Gear |
| 7. Ball Bearing | 19. Needle Bearing | 31. Synchronizer Spring | 4. Reverse | 55. Spring Seat | 67. Stud |
| 8. Pilot Pin | 20. Main Drive Gear | 32. Synchronizer Key | 4. Washer | 56. Gasket | 68. Snap Ring |
| 9. Snap Ring | 21. Snap Ring | 33. Clutch Hub Sleeve | 4. Lock Nut | 57. Control Rod Gate | 69. Counter Reverse Gear |
| 10. Counter Shaft Gear | 22. Synchronizer Ring | 34. 1-2 Clutch Hub | 4. Control Lever | 58. Spring | 70. Needle Bearing |
| 11. Adjust Shim | 23. 3-4 Clutch Hub | 35. Gear Sleeve | 4. Control Rod | 59. Oil Seal | 71. Gasket |
| 12. Clutch Bearing | 24. Synchronizer Spring | 36. Low Gear | 4. Blind Cover | 60. Bush | 72. Magnet Plug |

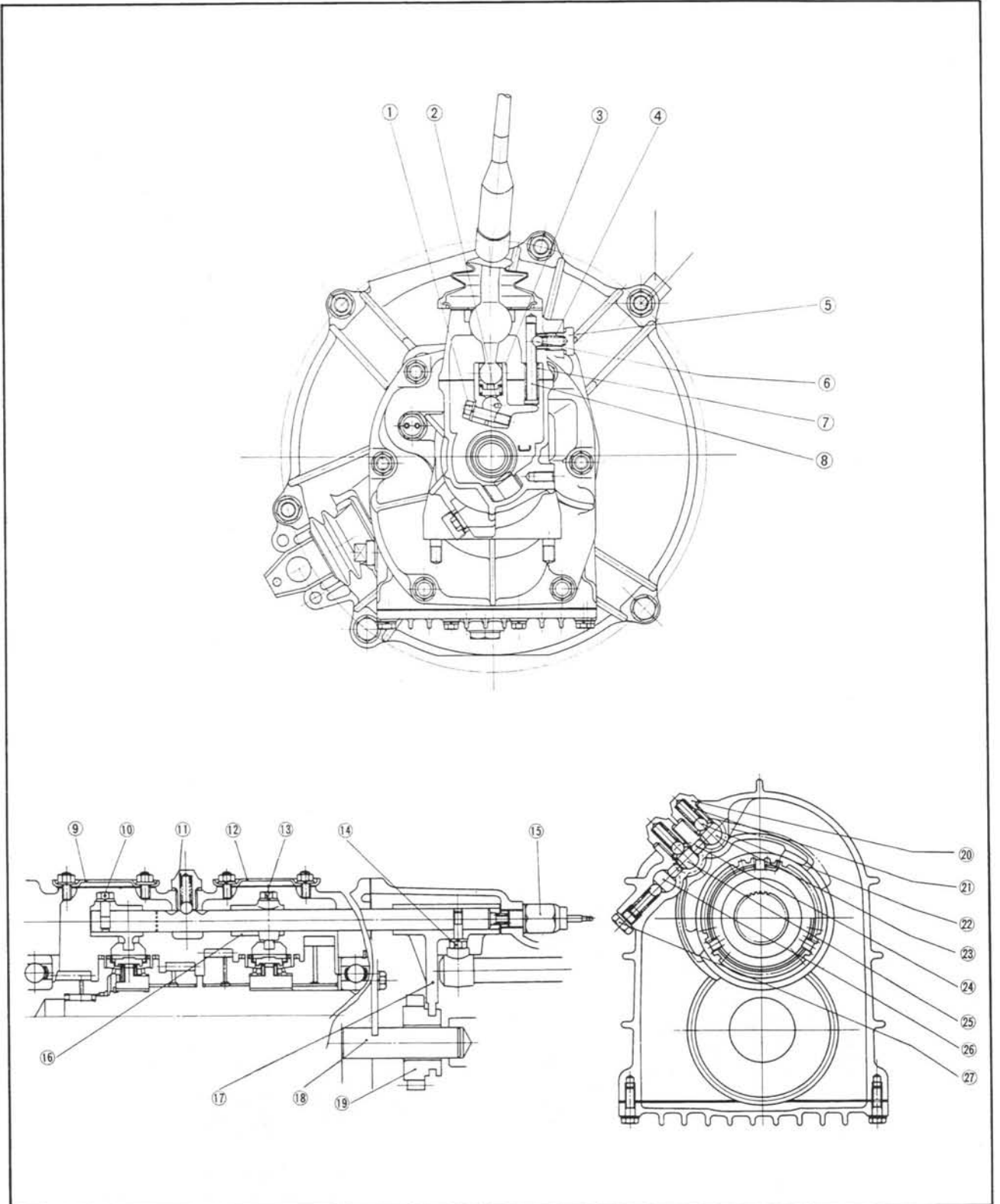


Fig. 7-2 Transmission

- | | | |
|------------------------|-----------------------------|---------------------------|
| 1. Reamer Bolt | 10. Set Screw (3rd top) | 19. Reverse Idle Gear |
| 2. Key | 11. Spring Cap | 20. Spring Cap |
| 3. Control Lever End | 12. Blind Cover | 21. Spring |
| 4. Spring | 13. Set Screw (Low & 2nd) | 22. Steel Ball |
| 5. Spring Cap | 14. Set Screw (reverse) | 23. Shift Rod (Low & 2nd) |
| 6. Steel Ball | 15. Reverse Lamp Switch | 24. Inter Lock Pin |
| 7. Spring | 16. Shift Fork (Low & 2nd) | 25. Shift Rod (3rd & top) |
| 8. Select Lock Spindle | 17. Shift Fork (reverse) | 26. Shift Rod (reverse) |
| 9. Blind Cover | 18. Reverse Idle Gear Shaft | 27. Spring Set Plug |

TRANSMISSION

RX-2 is equipped with a four-speed manual transmission of the synchromesh type with helical gears to provide silent operation. Gear shifting is of the direct control floor-shift type.

The transmission gear ratio is as follows:

Gear	Gear Ratio
First	3.683
Second	2.263
Third	1.397
Top	1.000
Reverse	3.692

7-A. REMOVING THE TRANSMISSION

When removing only the transmission from the vehicle, proceed as follows:

1. Disconnect the earth wire of the battery.
2. Remove the console assembly and dust boot of the gear shift lever. Loosen the attaching bolts on the cover plate and remove the dust boots, cover plate and bush together with the shift lever from the transmission housing.
3. Disconnect the wirings of the starting motor and the reverse lamp switch and then remove the starting motor.
4. Remove the drain plug and drain the transmission oil. Clean the drain plug and reinstall after draining.
5. Disconnect the speedometer cable from the speedometer driven gear.
6. Remove the release fork return spring. Loosen the nuts and remove the clutch release cylinder with the

push rod from the clutch housing.

7. Disconnect the exhaust pipe from the exhaust manifold by loosening the nuts.
8. Disconnect the propeller shaft from the transmission.
9. Support the transmission with a jack and a block of wood and remove the nuts holding the supporter on to the side frame member.
10. Remove the bolts holding the transmission on to the clutch housing.
11. Move the transmission toward the rear so as to remove the main drive shaft from the clutch disk. Lower the jack and remove the transmission from the vehicle.

7-B. DISASSEMBLING THE TRANSMISSION

1. Remove the release bearing, spring and fork.
2. Loosen the bolts attaching the clutch housing to the case and remove the clutch.
3. Remove the change control case from the extension housing.
4. Remove the spring seat and spring from the control lever end.
5. Loosen the nuts attaching the extension housing to the transmission case. Slide the extension housing off through the main shaft, laying down the control lever end to the left as far as it will go.
6. After removing the reamer volt and the friction piece, remove the control lever and the control lever end.
7. Remove the speedometer driven gear from the extension housing by loosening the set screw.

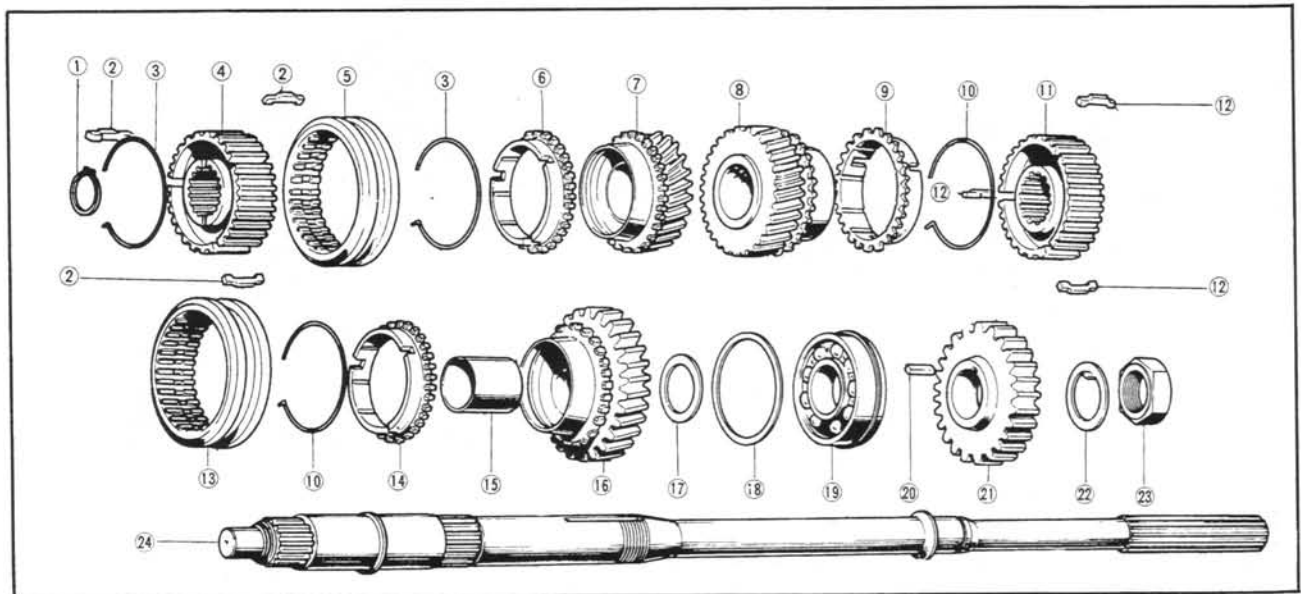


Fig. 7-3 Main shaft assembly

- | | | |
|----------------------------------|-----------------------------------|-------------------|
| 1. Snap ring | 9. Synchronizer ring (2nd) | 17. Thrust washer |
| 2. Key | 10. Spring | 18. Adjust shim |
| 3. Spring | 11. Clutch hub (3rd & Top) | 19. Ball bearing |
| 4. Clutch hub (Low & 2nd) | 12. Key | 20. Key |
| 5. Clutch hub sleeve (Low & 2nd) | 13. Clutch hub sleeve (3rd & Top) | 21. Reverse gear |
| 6. Synchronizer ring (3rd) | 14. Synchronizer ring (low) | 22. Lock washer |
| 7. Third gear | 15. Low gear sleeve | 23. Lock nut |
| 8. Second gear | 16. Low gear | 24. Main shaft |

8. Remove the under cover and two blind covers.
9. Remove the shift fork rod locking balls and springs, and remove the interlock pins. Loosen the shift fork nuts and remove the shift forks with reverse idle gear from the case.
10. After removing the snap ring on the rear side of the speedometer drive gear, slide the speedometer drive gear off from the main shaft and remove the steel ball.
11. Mount the main shaft assembly on the **main shaft holder** (49 0259 440) as shown in Fig. 7-4 and loosen the reverse gear lock nut, and remove lock nut, lock washer, reverse gear and key.

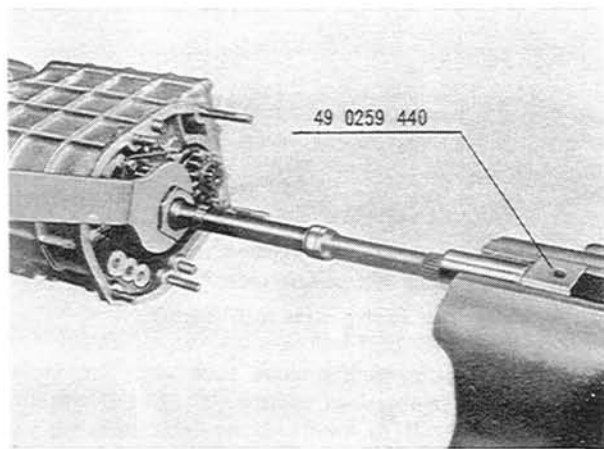


Fig. 7-4 Loosening lock nut

12. Remove the snap ring on the counter shaft gear, and remove the counter reverse gear.
13. Remove the bearing stopper, and then remove the reverse idle gear shaft.
14. Remove the ball bearing on the main shaft and needle bearing on the counter shaft from the rear side of the case using the **bearing puller set** (49 0839 425).
15. Remove the snap rings from the ball bearings of the front side of the case. Remove the ball bearings from the main drive gear and counter shaft gear using the bearing puller

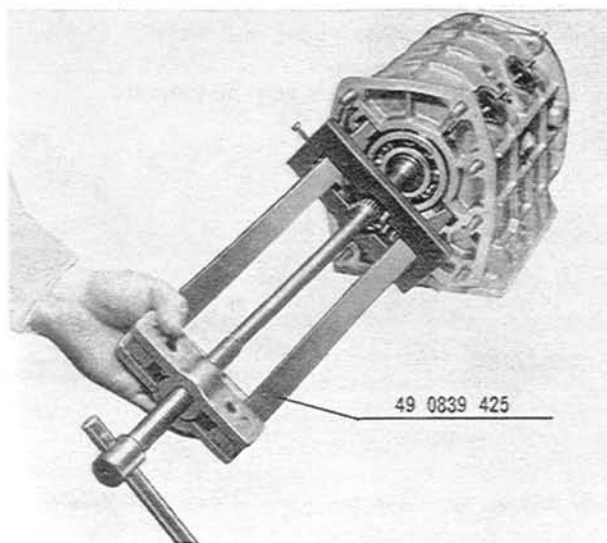


Fig. 7-5 Removing ball bearing

16. Take out counter shaft gear, main drive gear and main shaft assembly from the case.
17. Remove the thrust washer, low gear and sleeve assembly, synchronizer ring, low and second clutch hub assembly, synchronizer ring and the second gear in that order.
18. Remove the snap ring on the front end of the main shaft. Remove the third and top clutch hub assembly, synchronizer ring and third gear.

7-C. INSPECTING THE TRANSMISSION

7-C-1. Inspecting the Transmission Case

Clean the transmission case thoroughly with a suitable solvent, and dry with compressed air. Inspect the case for cracks or any damage.

7-C-2. Checking the Bearings

Inspect each bearing for roughness and excessive wear. They can be determined by slowly turning the outer race by fingers. If excessive wear or roughness is found, replace with new bearing as it will cause the noises.

7-C-3. Checking the Gears

Inspect the teeth of each gear. If excessively worn, broken or chipped, replace with new gears. Excessive wear of the gears causes increase of backlash, which results in producing noises or may cause the gear to work off while running.

7-C-4. Checking the Synchronizer Mechanism

1. To check the contact between the inner surface of the synchronizer ring and the cone surface of the gear, apply a thin coat of Prussian Blue on the cone surface of the gear and fit the ring to it.

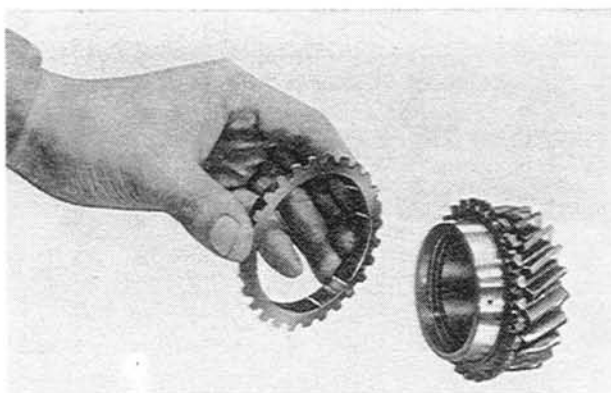


Fig. 7-6 Inspecting synchronizer ring

The contact should be even and uniform over the contacting surface. If the contact is one-sided or spotty, this must be corrected. If the amount of correction is small, this may be done by lapping the surfaces lightly together with compound. If the defects are excessive, replace the synchronizer ring or the gear.

2. Even when the synchronizer ring seats well on the gear cone, if the ring is worn to the extent of no oil grooves remaining on its inside, synchronization can not be obtained.

It is necessary, then, to check the extent of wear of the corn or ring. For this, uniformly fit the ring to the gear corn, and measure clearance (A) between the side faces of the ring teeth and gear teeth with a feeler gauge. The standard clearance is 1.6 mm (0.06 in). If the clearance is less than 0.8 mm (0.031 in), it is an indication of excessive wear of the corn or the internal surface of the ring. In such cases, check the corn and ring and replace the defective part with a new one.

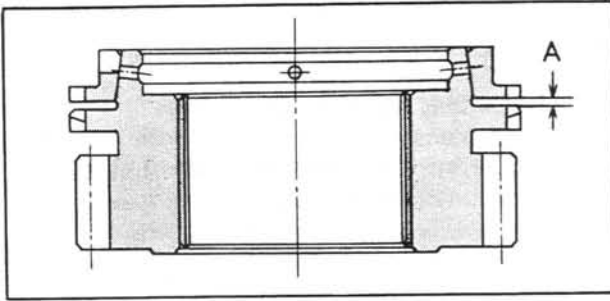


Fig. 7-7

3. Check the synchronizer key, the inner surface of the clutch sleeve, and the key groove on the clutch hub for wear. If wear is excessive, it will cause difficulties in maintaining the neutral position of the clutch sleeve or will cause inferior functioning of the synchronizer ring and make shifting difficult.
4. Check the key spring tension. Decrease tension or damaged key springs will result in uneven pressure against the three keys and will cause improper functioning of the keys and inferior synchronization.

5-C-5. Checking the Run-Out of Main Shaft

Check the run-out on the main shaft and if the deflection is excessive, correct it by using a press. The standard reading on the dial indicator for run-out should be less than 0.03 mm (0.0012 in).

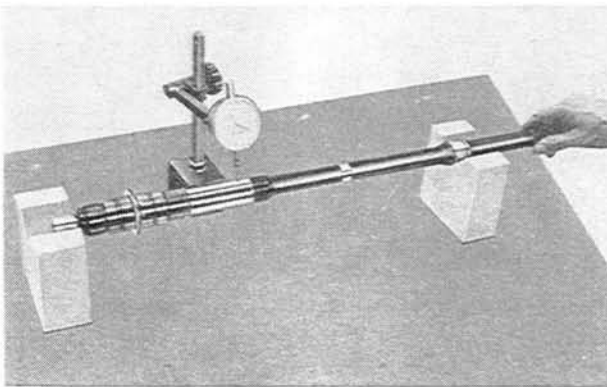


Fig. 7-8 Checking run-out of main shaft

7-D. ASSEMBLING THE TRANSMISSION

7-D-1. Assembling the Transmission Case

1. Assemble the low-and-second clutch hub and sleeve, and third-and-top clutch hub and sleeve.
2. Install the second gear, synchronizer ring, low-and-second clutch hub assembly, synchronizer ring, low gear sleeve, low gear and thrust washer, in

that order, onto the main shaft from the rear side.

3. Install the third gear, synchronizer ring and third-and-top clutch hub assembly onto the front side of the main shaft, and fit the snap ring on the groove.
4. Install the needle roller bearing and synchronizer ring to the main drive shaft.
5. Place the main drive gear assembly and main shaft assembly into the transmission case temporarily without ball bearings.

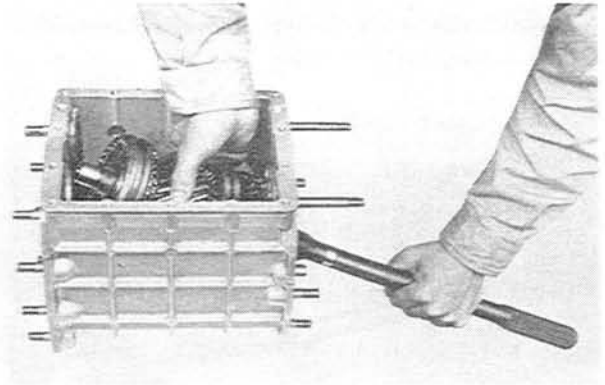


Fig. 7-9 Placing main shaft assembly

6. Put the low-and-second shaft fork and third-and-top one on the respective groove of the clutch sleeve.

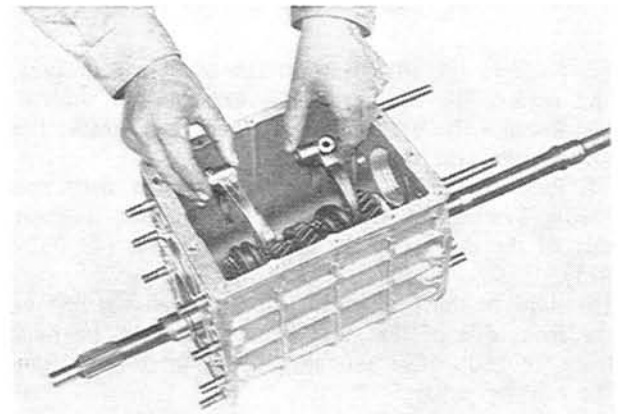


Fig. 7-10 Fitting shaft forks

7. Place the counter shaft gear in the case.

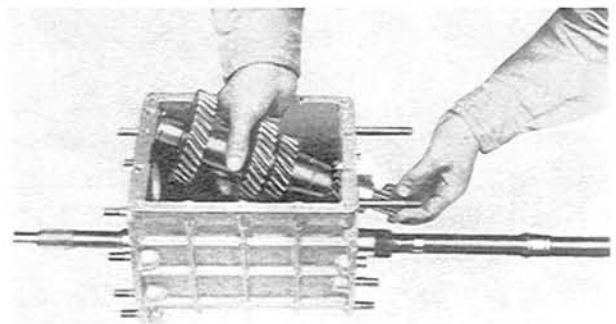


Fig. 7-11 Placing counter shaft gear

8. Install the needle roller bearing of the counter shaft to the rear side, and install the roller bearing of the counter shaft with proper size of adjust shim to the front side and fit the snap ring.
9. Install the roller bearings with proper size of shims to the main drive shaft and main shaft, and fit the snap ring on the main drive shaft.

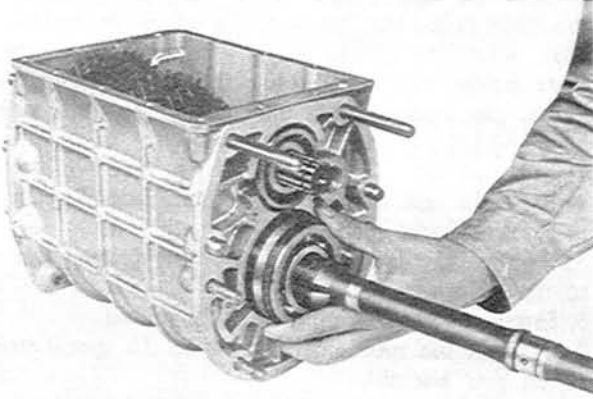


Fig. 7-12 Installing ball bearing

10. Install the reverse gear and snap ring to the counter shaft.
11. Fit the bearing stopper and reverse idle gear shaft to the case. Tighten the bolts of the bearing stopper to 1.0 m-kg (7 ft-lb).
12. Install the reverse gear with key onto the main shaft. Install the lock washer and lock nut, and tighten the lock nut to 23 m-kg (170 ft-lb) while holding the rear end of the main shaft with **main shaft holder** (49 0259 440). Then bent the lock washer.
13. Install the low-and-second shift rod into the case and set the low-and-second shift fork, which has been placed on the groove of the clutch hub temporarily, with the set screw.
14. Place the shift rod on the neutral position and insert the inter lock pin.
15. Install the third-and-top shift rod and set shift fork with set screw. Insert the inter lock pin.

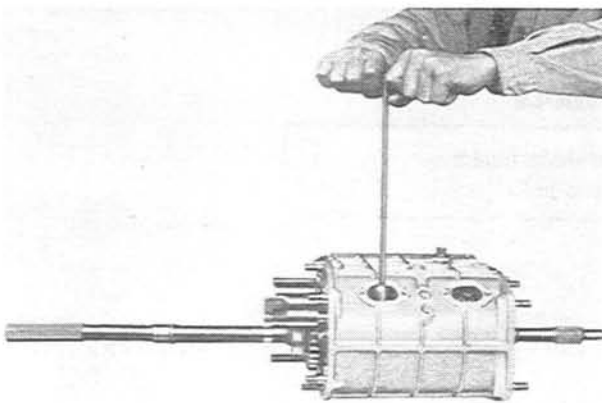


Fig. 7-13 Securing shift fork

16. Install the reverse shift rod with the reverse idle gear.
17. Put the shift locking ball and spring to the groove

- of each shift rod and install the spring caps.
18. Install the under cover and two blind covers.
19. Install the speedometer drive gear with locking ball onto the main shaft and secure it with a snap ring.

7-D-2. Assembling the Extension

1. Install the oil seal to the rear side of the extension by using suitable tool.
2. Insert the control rod, install the control lever end with key and tighten the reamer bolts.

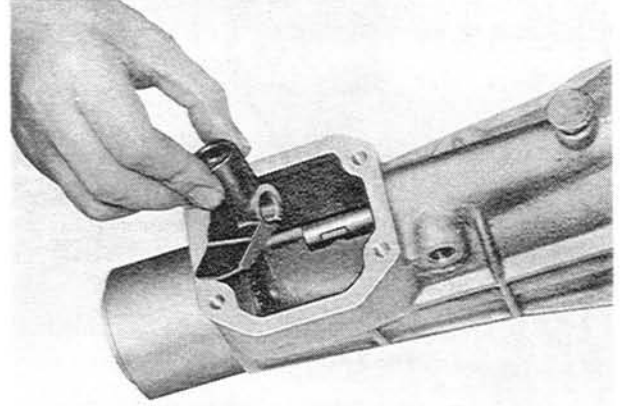


Fig. 7-14 Installing control lever end

3. Fit the friction piece and the spring to the extension and install the spring cap.

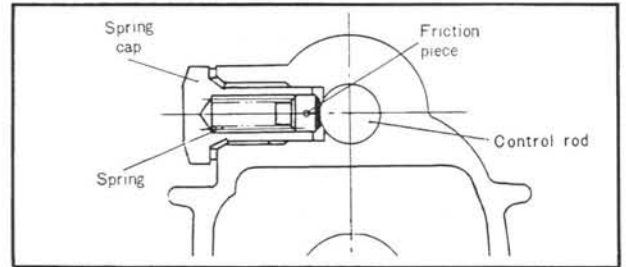


Fig. 7-15 Friction piece of control rod

4. Install the reverse lamp switch.
5. Install the speedometer driven gear assembly and secure with the lock plate.

7-D-3. Installing the Extension Assembly

1. Place the gasket on the rear side of the transmission case and install the extension assembly to the

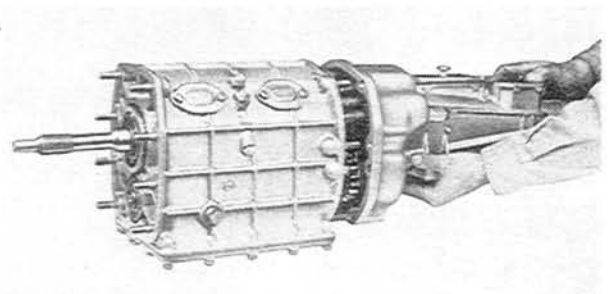


Fig. 7-16 Installing extension

transmission case, laying down the control lever end to the left as far as it will go. Tighten the nuts and confirm that the control rod operates properly.

2. Insert the select lock spindle and return spring. Install the locking ball and the spring in alignment with the spindle groove and fit the spring cap. Install the set screw to the control case.

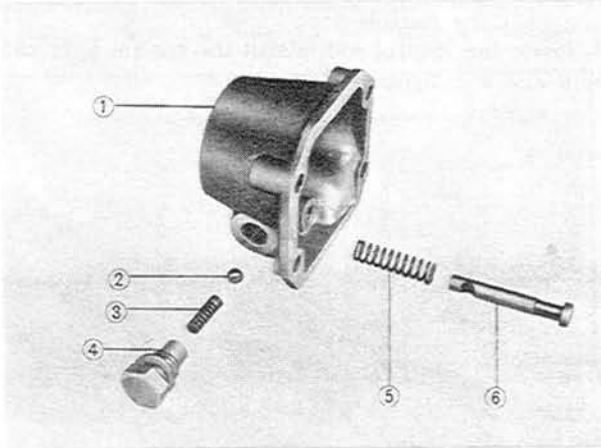


Fig. 7-17 Control case

- | | |
|-----------------|------------------------|
| 1. Control case | 4. Spring cap |
| 2. Locking ball | 5. Spring |
| 3. Spring | 6. Select lock spindle |

3. Insert the spring and seat into the control lever end and install the control case assembly to the extension together with the gasket.

7-D-4. Installing the Clutch Housing

1. Place the gasket on the front surface of the transmission case. Install the clutch housing, being careful not to damage the oil seal.
2. Install the release bearing, spring and fork.

7-E. INSTALLING THE TRANSMISSION

1. Shift the transmission into top gear. Support the transmission with a jack and a block of wood and move it under the vehicle.

2. Lower the rear end of the transmission and align the centers of the main drive shaft and the clutch disk by raising the jack.

3. Move the transmission forward until the spline on the main drive shaft contacts the spline on the clutch disk. Align the splines properly by turning the **main shaft holder** (49 0259 440) and after aligning the knock pin, mount the transmission to the engine body.

Tighten the bolts. Secure the earth wire with bolt.

4. Raise the jack and install the transmission supporter to the side frame member. Tighten the nuts.

5. Remove the jack and connect the propeller shaft to the transmission.

6. Install the exhaust pipe to the manifold.

7. Connect the speedometer cable to the speedometer driven gear assembly.

8. Install the release cylinder to the clutch housing and the return spring. If necessary, adjust the free play on the release fork. (See Par. 6-B)

9. Move the lever end from top gear to neutral. Align the groove on the spherical surface of the shift lever with the set screw on the control case and insert the tip of the shift lever into the control lever end.

Then, fit the bush into the control case. Install the cover plate with the packing and tighten the bolts.

The operation of the shift lever may be adjusted by inserting adjust shims on the 3 bolts between the cover plate and the packing. The standard force of the shift lever at the knob is 2.0 ~ 4.0 kg (4.4 ~ 8.8 lb). Install the dust boots to the case. After installing the starting motor, connect the wirings of the starting motor and reverse lamp switch.

10. Supply the transmission with the proper amount of transmission oil through the dipstick gauge inlet.

The following transmission oils are available:

SAE EP 80 Below -18°C (0°F)

SAE EP 90 Above -18°C (0°F)

11. Connect the earth wire to the battery.

SPECIAL TOOLS

49 0259 440	Main shaft holder
49 0839 425	Bearing puller set