

TRANSMISSION

(Column Shift)

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TRANSMISSION

7A-A. TRANSMISSION REMOVAL

When removing only the transmission from the vehicle, take the following procedures:

1. Drain the lubricant from the transmission.
2. Disconnect the earth wire of the battery.
3. Disconnect the wires of the starting motor and the reverse lamp switch.
4. Remove the propeller shaft from the rear axle and the transmission.
5. Disconnect the speedometer cable from the extension housing.
6. Disconnect the changing rods and remove the counter lever bracket from the transmission.
7. Remove the bolts attaching the exhaust pipe to the bracket on the transmission case.
8. Remove the nuts and disconnect the rear end of the exhaust manifold from the pre-silencer pipe.
9. Unhook the clutch release fork return spring and remove the clutch release cylinder from the clutch housing.
10. Remove the starting motor.
11. Remove the nuts and bolts holding the transmission to the rear end plate of the cylinder block.
12. Place a jack under the engine, protecting the engine oil pan with a block of wood.
13. Remove the nuts holding the transmission support to the cross member.
14. Remove the nuts holding the cross member to the frame side rails and remove the cross member.
15. Lower the jack, slide the transmission rearward until the main drive shaft clears the clutch disk, and remove the transmission from under the vehicle.

7A-B. TRANSMISSION DISASSEMBLY

The procedures for disassembling the transmission after removing the transmission from the vehicle are as follows:

1. Remove the clutch release bearing return spring and slide off the bearing.
2. Remove the clutch release fork.
3. Remove the bolts attaching the front cover to the transmission case and remove the front cover, shim and gasket.

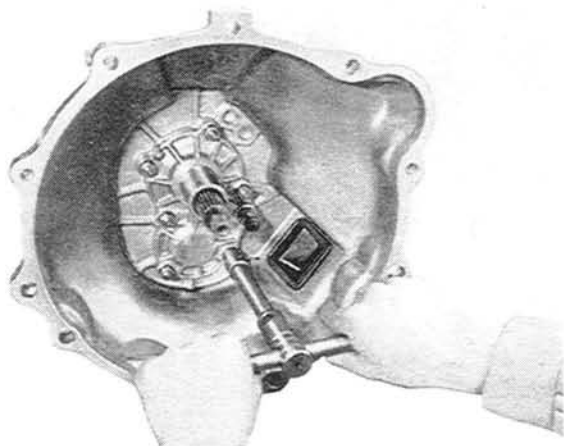


Fig. 7A-1 Removing of front cover

4. Remove the snap rings on the main drive shaft and counter shaft.
5. Remove the nuts attaching the extension housing to the transmission case. Slide the extension housing off the main shaft, with outer shift lever laid down to the left as far as it will go.

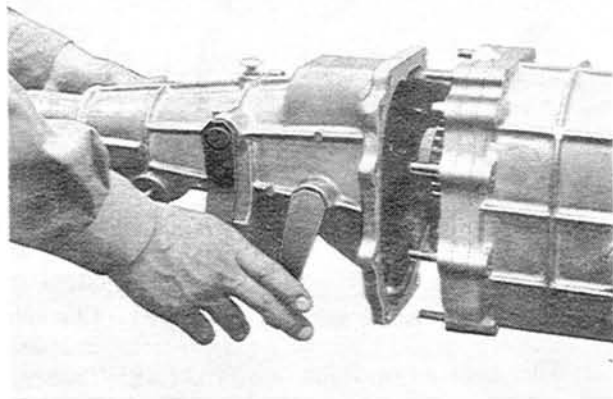


Fig. 7A-2 Removing of extension housing

6. Remove the speedometer driven gear from the extension housing by loosening the set screw.
7. Remove the reverse lamp switch.
8. Remove the snap ring that secures the speedometer drive gear to the main shaft. Slide the speedometer drive gear off the main shaft and remove the lock ball.
9. Tap the front end of the main drive shaft and counter shaft in turn with the plastic hammer and remove the bearing housing (intermediate plate) assembly from the transmission case.

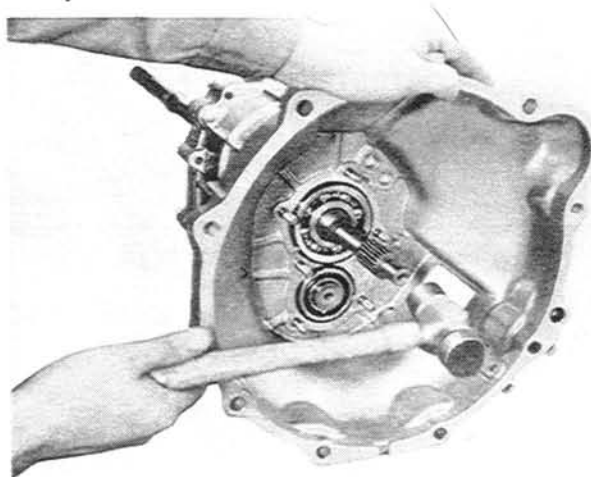


Fig. 7A-3 Removing of bearing assembly

10. Remove the main drive shaft and needle bearing from the main shaft.
11. Remove the three bolts and remove the springs and the shift locking balls.
12. Remove the shift lever attaching nut and remove the reverse shift rod together with the reverse idle gear and shift lever from the bearing housing.
13. Remove each set screw attaching the shift fork to the rod. Push each of the shift rods rearward through the fork and bearing housing and remove

the shift rods and forks.

14. Remove the reverse shift rod locking ball and spring, and the interlock pins from the bearing housing.
15. Straighten the tub of the lockwasher, hold the main shaft with the **holder** (49 0259 440) as shown in Fig. 7-4 and loosen the lock nut by using the **spanner** (49 0164 631). Remove the reverse gear from the main shaft.

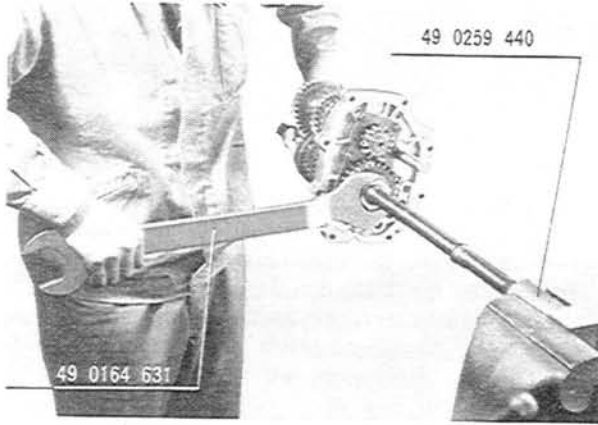


Fig. 7A-4 Loosening of lock nut

16. Remove the snap ring from the rear of the counter shaft and slide off the counter reverse gear as shown in Fig. 7A-5.

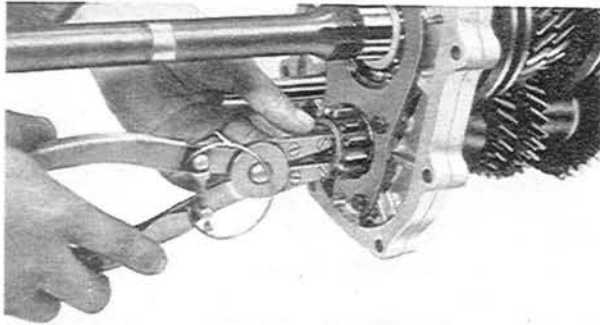


Fig. 7A-5 Removing of snap ring

17. Remove the bearing cover from the bearing housing.
18. With the plastic hammer, tap the rear end of the main shaft and counter shaft in turn, being careful not to damage the shafts, and remove these shafts from the bearing housing.

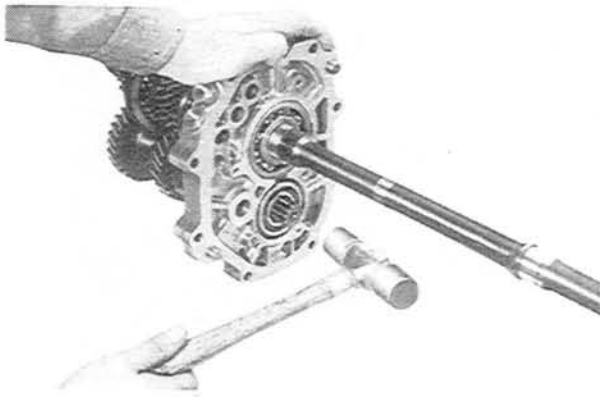


Fig. 7A-6 Removing of counter shaft

19. Remove the bearings from the bearing housing and transmission case.
20. Using the snap ring pliers, remove the snap ring from the front of the main shaft.
21. Slide the third-and-top clutch hub and sleeve assembly, synchronizer ring and third gear off the main shaft.
22. Remove the thrust washer, low gear and sleeve, synchronizer ring, first-and-second clutch hub and sleeve assembly, synchronizer ring, and second gear from the rear of the main shaft in this sequence.

7A-C. TRANSMISSION INSPECTION

7A-C-1. Checking of Transmission Case and Bearing Housing

Clean the transmission case and bearing housing thoroughly, using a suitable solvent, and dry with compressed air. Inspect the case and bearing housing for cracks and the machined mating surfaces for burrs, nicks or any damages.

Note: As the bearing housing is machined under the condition of being fitted with the transmission case, the center of bearing housing and transmission case are completely matched. Therefore, the bearing housing only should not be replaced.

7A-C-2. Checking of Bearings

Inspect each bearing for roughness. This can be determined by slowly turning the outer race by hand.

7A-C-3. Checking of Gears

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

7A-C-4. Checking of Synchronizer Mechanism

1. Inspect the gear teeth on the synchronizer ring. If there is evidence of chipping or excessively worn teeth, replace with new parts.

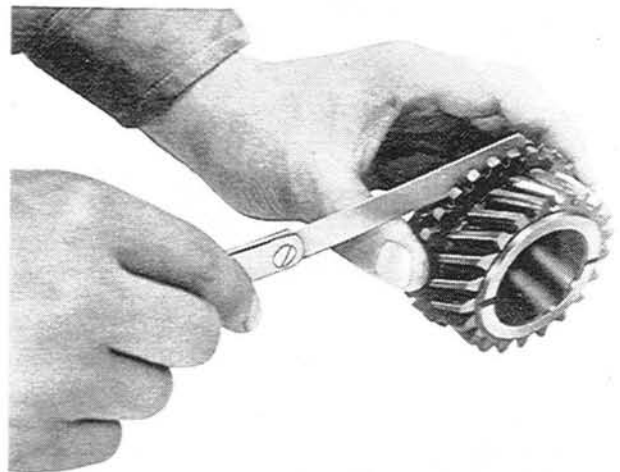


Fig. 7A-7 Checking of synchronizer ring

2. Inspect the synchronizer ring for wear. To check the wear of the synchronizer ring, fit the synchronizer ring evenly to the gear cone and measure the clearance between the side faces of the synchronizer ring and the gear with a feeler gauge, as shown in Fig. 7A-7. If it is less than **0.8 mm (0.032 in)**, replace the synchronizer ring or gear. The standard clearance is 1.5 mm (0.060 in).

3. Inspect the contact between the inner surface of the synchronizer ring and the cone surface of the gear. To inspect, apply a thin coat of "Prussian Blue" on the cone surface of the gear and fit it into the ring. If the contact pattern is poor, correct this by applying the compound and lapping the surfaces together.

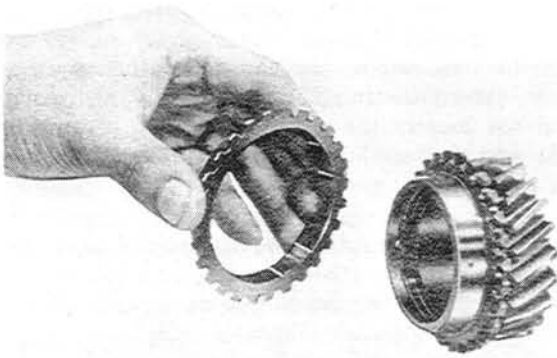


Fig. 7A-8 Checking of synchronizer ring

4. See if the clutch sleeve slides easily on the clutch hub.
5. Check the synchronizer key, the inner surface of the clutch sleeve, and the key groove on the clutch hub for wear.
6. Check the synchronizer key spring for tension.

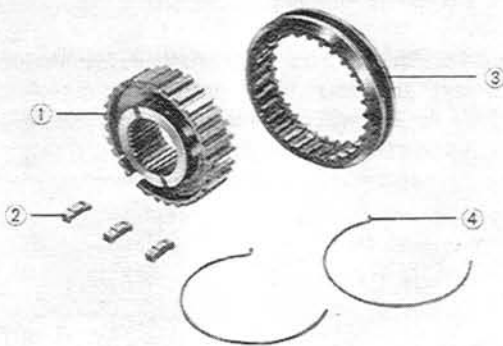


Fig. 7A-9 Clutch hub and sleeve assembly

- | | |
|---------------|------------------|
| 1. Clutch hub | 3. Clutch sleeve |
| 2. Key | 4. Spring |

7A-C-5. Checking of Main Shaft Run-Out

Inspect the main shaft for run-out by applying a dial indicator to several places along the shaft. The standard reading of the indicator for run-out should be less than **0.03 mm (0.0012 in)**. If the run-out exceeds 0.03 mm (0.0012 in), correct with a press or replace with a new one.

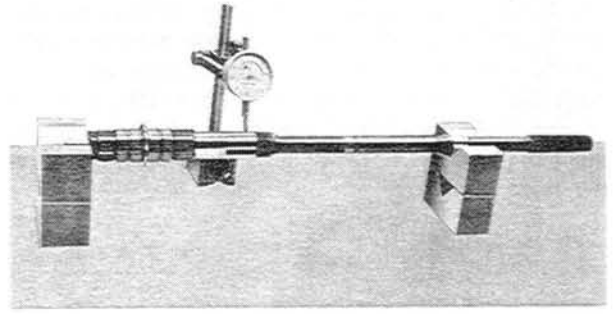


Fig. 7A-10 Checking of run-out

7A-D. TRANSMISSION ASSEMBLY

1. Apply grease to the oil seal for the outer select lever, and install the outer select lever and inner select lever to the extension housing.
2. Install the outer shift lever and inner shift lever to the extension housing.

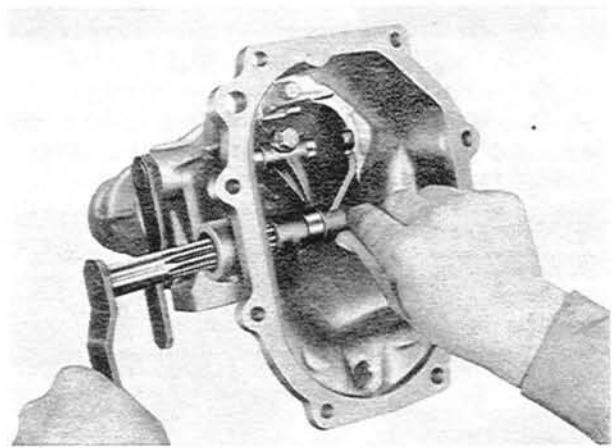


Fig. 7A-11 Installing of shift lever

3. Install the speedometer driven gear assembly to the extension housing and fix with the screw.
4. Install the third gear and synchronizer ring onto the front section of the main shaft.
5. Assemble the third-and-top clutch hub and sleeve, and install it to the main shaft.

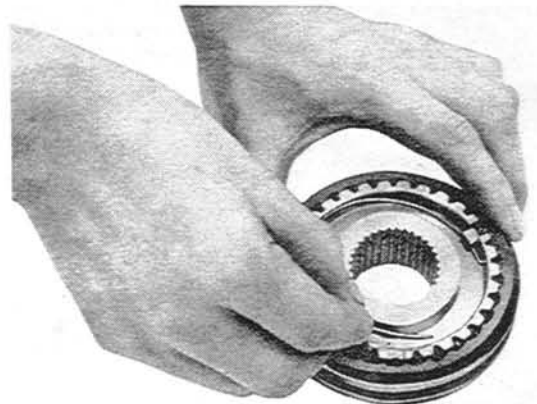


Fig. 7A-12 Assembling of clutch hub and sleeve

6. Fit the snap ring on the main shaft.



Fig. 7A-13 Installing of snap ring

7. Assemble the low-and-second clutch hub and sleeve.
8. Install the second gear, synchronizer ring, low-and-second clutch hub and sleeve, synchronizer ring, low gear with sleeve, and thrust washer in this sequence to the rear section of the main shaft.
9. Install the main drive shaft and the needle roller bearing to the main shaft.

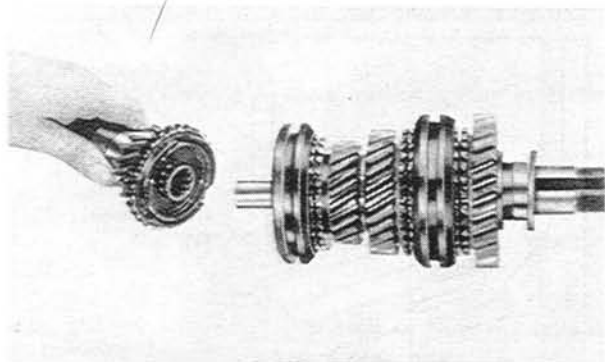


Fig. 7A-14 Installing of main drive shaft

10. Press fit the ball bearing for the counter shaft to the bearing housing.
11. Install the counter shaft to the ball bearing of the bearing housing by using a press.
12. Position the main shaft assembly in the bearing housing, and install the ball bearing while tapping the outer race of the bearing with the plastic hammer.

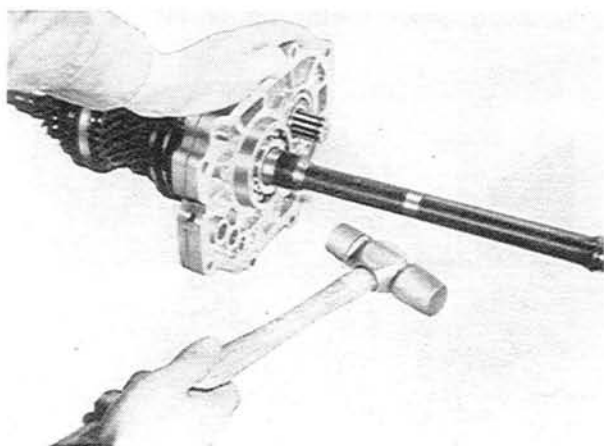


Fig. 7A-15 Installing of bearing housing

13. Install the bearing cover to the bearing housing.
14. Install the reverse gear with the key onto the main shaft and tighten the lock nut by using the holder (49 0259 440) and spanner (49 0164 631). Bend the tab of the lock washer.

Note: When installing the main shaft reverse gear and the counter shaft reverse gear, both gears should be fitted so that the chamfer on the teeth is faced rearward.

15. Install the counter shaft reverse gear and secure it with the snap ring.
16. Insert the locking ball and spring into the (A) of the bearing housing as shown in Fig. 7A-16.

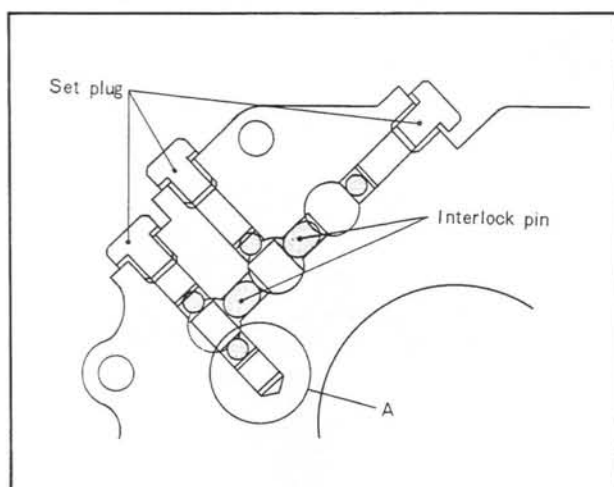


Fig. 7A-16 Shift locking balls and interlock pins

17. Push down the ball with a suitable screwdriver.
18. Install the reverse shift fork rod and shift lever with the reverse idle gear at the same time.
19. Install the shift forks to their respective clutch sleeve.
20. Using the shift fork rod guide (49 0187 441A) and interlock pin installer (49 0187 451A), insert the interlock pin, as shown in Fig. 7A-17.

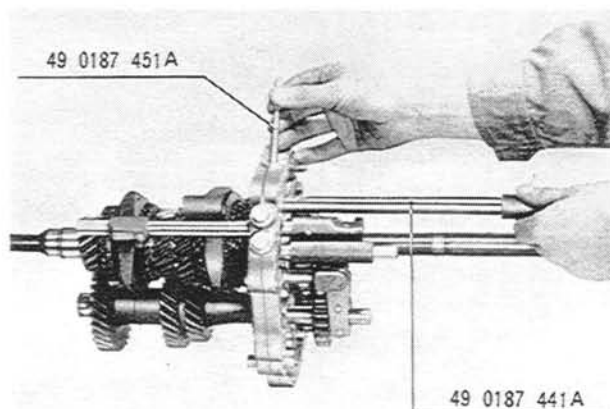


Fig. 7A-17 Installing of interlock pin

21. Remove the tools and install the low-and-second shift rod through the holes of the bearing housing and fork.

22. With the same tools that were used in step 20, install the interlock pin.
23. Remove the tools and install the third-and-top shift rod.
24. Align the lock bolt holes of the shift fork and rod. Install the lock bolt.
25. Install the shift locking balls and springs into their respective positions and install the plugs.
26. Apply a thin coat of sealing agent on both contact surfaces of the bearing housing.
27. Install the bearing housing assembly to the transmission case.

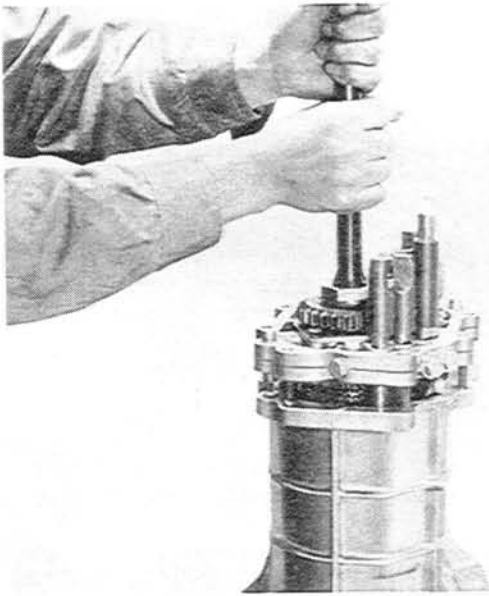


Fig. 7A-18 Installing of bearing housing

28. Install the speedometer drive gear with the steel ball onto the main shaft and secure it with the snap ring as shown in Fig. 7A-19.

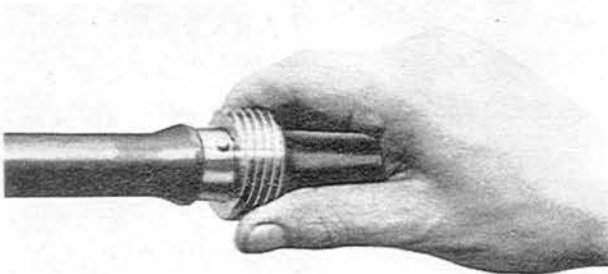


Fig. 7A-19 Installing of speedometer drive gear

29. Install the ball bearings for the main drive shaft and counter shaft with the installer (49 0180 321) and secure it with the snap rings.

Note: When installing the ball bearing, the main drive shaft may slide slightly toward the extension housing, causing difficulty in fitting the snap ring. Softly peen the rear end of the main shaft with the

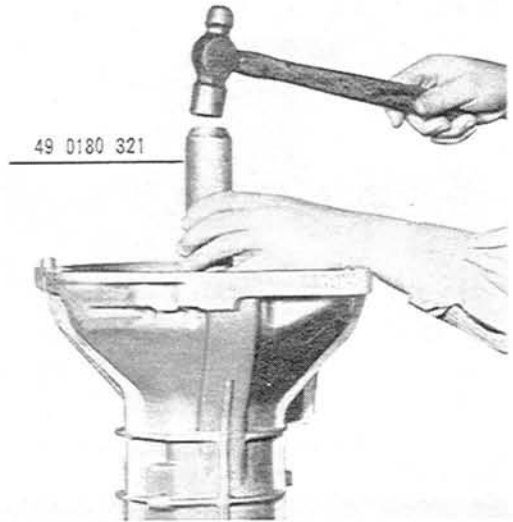


Fig. 7A-20 Installing of bearings

copper hammer until the main drive shaft rests in a suitable position.

30. Install the speedometer driven gear assembly to the extension housing and fix with the screw.

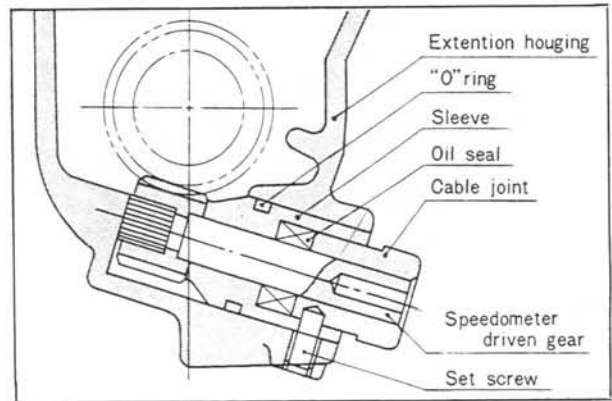


Fig. 7A-21 Speedometer driven gear

31. Install the extension housing to the bearing housing with the outer shift lever laid down to the left as far as it will go. Tighten the attaching nuts. Check to ensure that the outer shift lever operates properly.
32. Apply grease to the lip of the oil seal inside

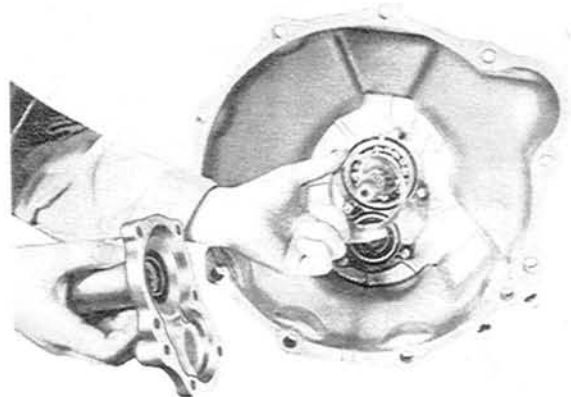


Fig. 7A-22 Installing of front cover

the front cover and install the front cover to the transmission case.

Note: When the front cover is installed, the clearance between the bearing outer race and the front cover should be **less than 0.15 mm (0.006 in)**.

This clearance can be adjusted by inserting the adjusting shim of 0.15 mm (0.006 in) or 0.30 mm (0.012 in).

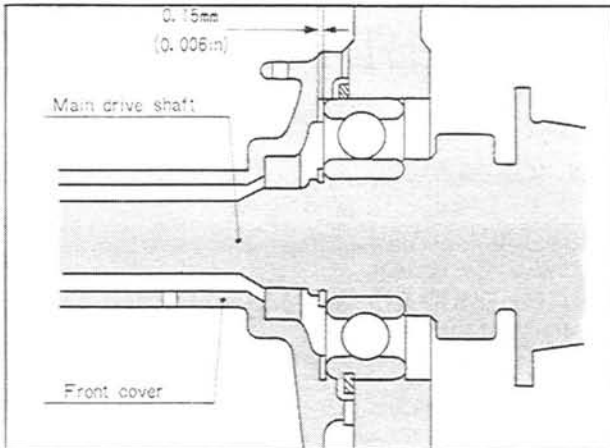


Fig. 7A-23 Adjusting of bearing end play

33. Install the release bearing, return spring and the release fork.

7A-E. INSTALLING OF TRANSMISSION

Carry out the removing operations in the reverse order.

Note: Use the tool (49 0259 440) to align the splines of the main drive shaft and clutch disk.

7A-F. CHANGE LEVER ADJUSTMENT

1. The standard position of the change lever in neutral should be at angle of 8 degrees forward (toward

the window glass) from the horizontal plane through the control rod. To obtain this position, adjust the length of the front shift rod by loosening the lock nut and turning the front shift rod so that the tip of the change lever rests approximately 40 mm (1.6 in) from the horizontal plane.

2. When in neutral, adjust the length of the front selection rod by loosening the lock nut and turning the rod so that the distance between the steering wheel and the change lever becomes 85 mm (3.35 in) as shown in Fig. 7A-24.



Fig. 7A-24 Change lever adjustment

3. After the above adjustment, shift the change lever into each position to make sure that it can be shifted smoothly and securely. If it does not shift smoothly and securely, adjust the front selection and shift rods again. Tighten the lock nuts of each rod after final adjustment.

7A-F-1. Adjusting of Sleeve

The standard torque, when the ball stud begins to move, is 1 to 3 cm-kg (0.9 to 2.7 in-lb).

To adjust, remove the split pin and turn the end screw until the correct adjustment is obtained. Fix the end screw with the split pin.

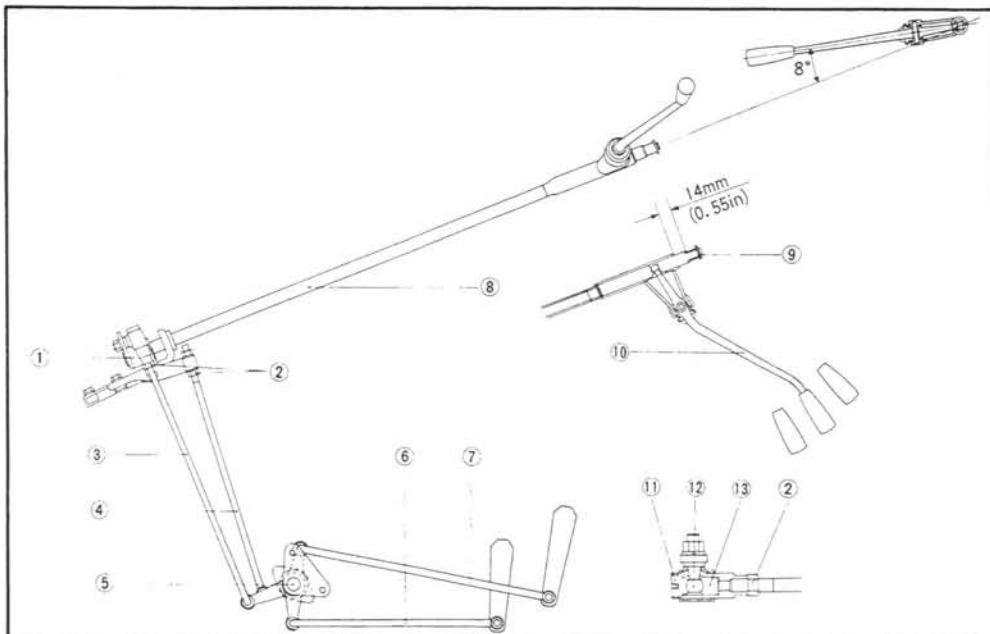


Fig. 7A-25

Change mechanism

1. Lower bracket assembly
2. Lock nut
3. Front shift rod
4. Front selection rod
5. Counter lever
6. Rear shift rod
7. Rear selection rod
8. Control rod
9. Adjusting washer
10. Change lever
11. End screw
12. Ball stud
13. Ball seat

SPECIAL TOOLS

49 0259 440	Main shaft holder
49 0164 631	Spanner (for reverse gear lock nut)
49 0187 441A	Shift fork rod guide
49 0187 451A	Interlock pin installer
49 0180 321	Bearing installer