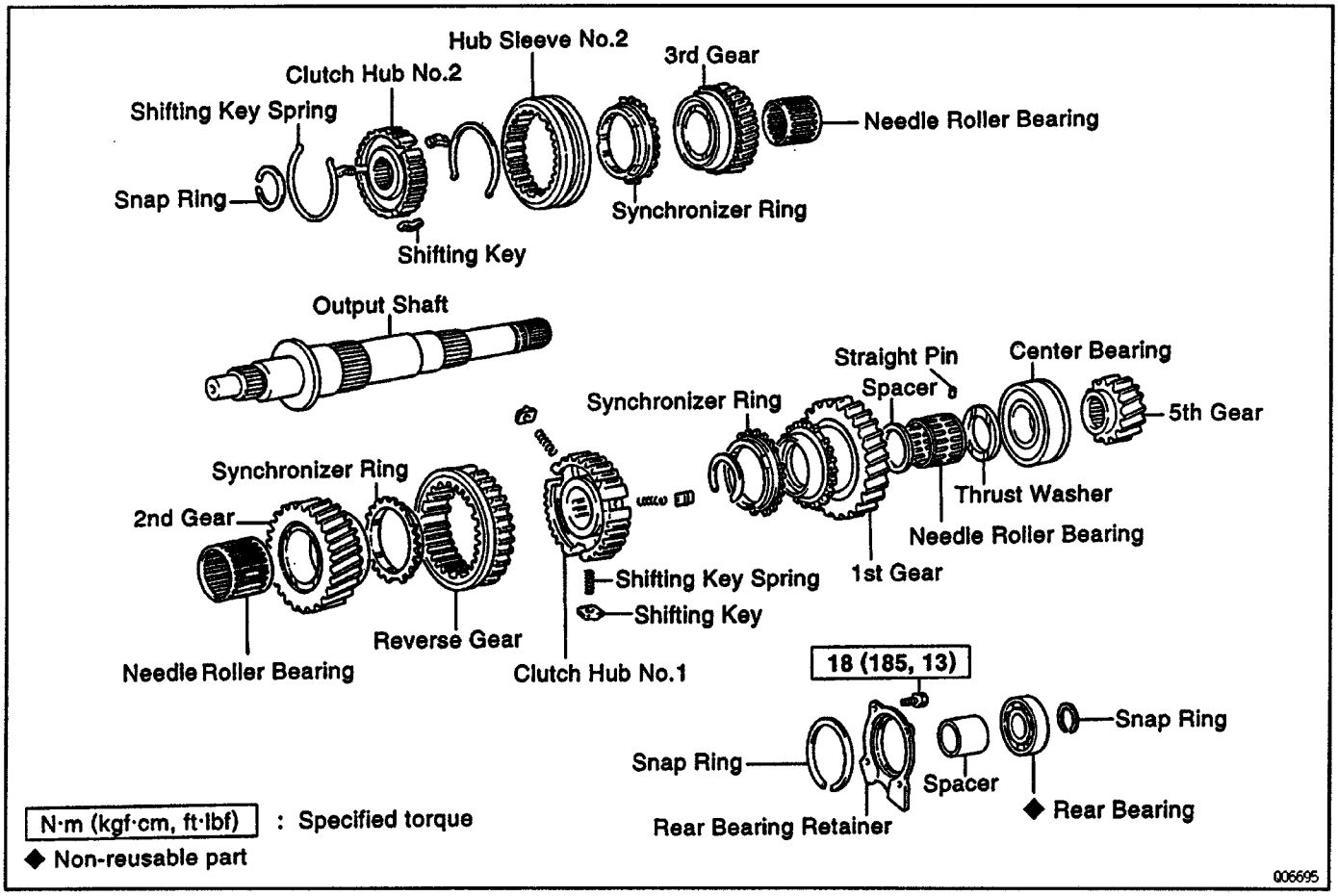
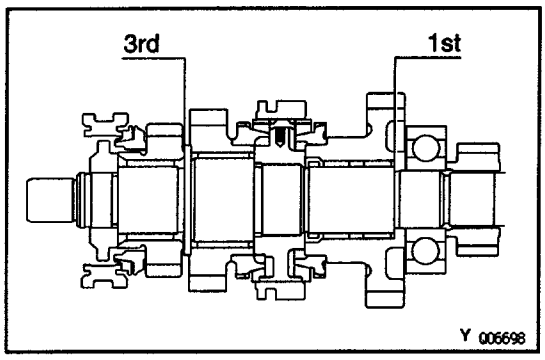
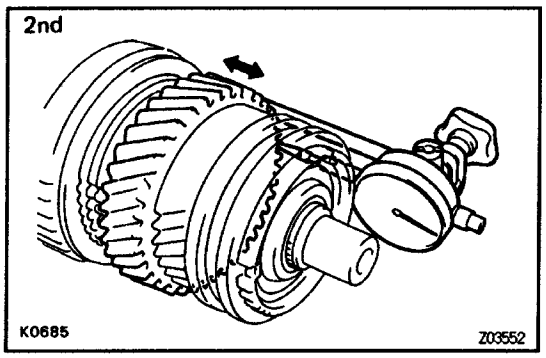
OUTPUT SHAFT

COMPONENTS







OUTPUT SHAFT DISASSEMBLY

1. INSPECT EACH GEAR THRUST CLEARANCE

Measure the thrust clearance of each gear.

Standard clearance:

1st gear

0.10–0.45 mm (0.0039–0.0177 in.)

2nd and 3rd gears

0.10–a.25 mm (0.0039–0.0098 in.)

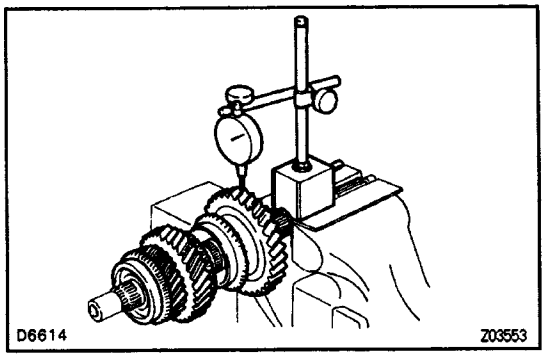
Maximum clearance:

1st gear

0.50 mm (0.0197 in.)

2nd and 3rd gears

0.30 mm (0.0118 in.)



2. INSPECT RADIAL CLEARANCE

Using a dial indicator, measure the radial clearance of each gear.

Standard clearance:

1st gear

0.020–0.073 mm (0.0008–0.0029 in.)

2nd and 3rd gears

0.015–0.068 mm (0.0006–0.0027 in.)

Maximum clearance:

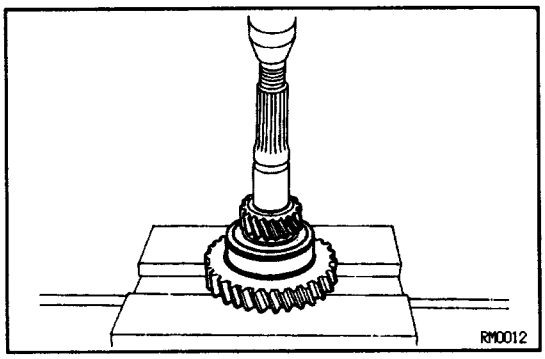
1st gear

0.160 mm (0.0063 in.)

2nd and 3rd gears

0.180 mm (0.0063 In.)

If the clearance exceeds maximum, replace the gear, needle roller bearing or shaft.

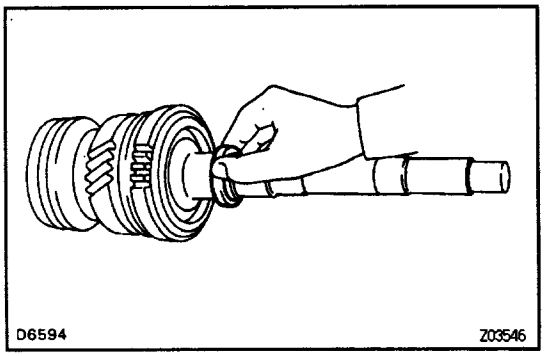


3. REMOVE 5TH GEAR. CENTER BEARING AND 1ST GEAR ASSEMBLY

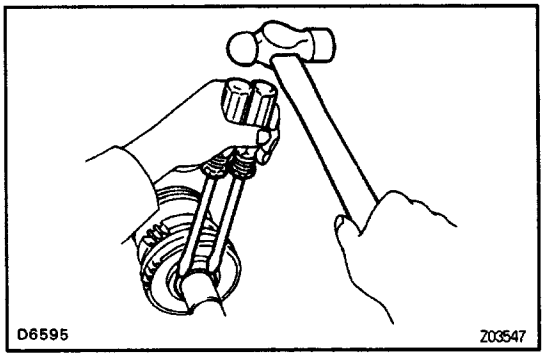
(a) Using a press, remove the 5th gear, center bearing, thrust washer and 1st gear.

(b) Remove the synchronizer ring.

(c) Remove the straight pin and needle roller bearing.

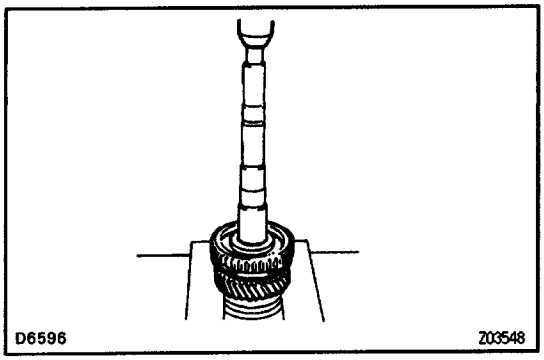


(d) Remove the spacer.

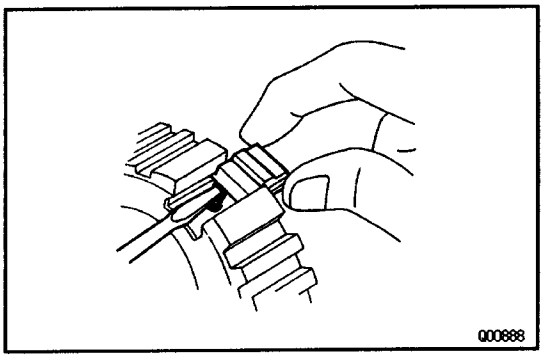


4. REMOVE REVERSE GEAR ASSEMBLY AND 2 ND GEAR ASSEMBLY

(a) Using 2 screwdrivers and a hammer, tap out the snap ring.

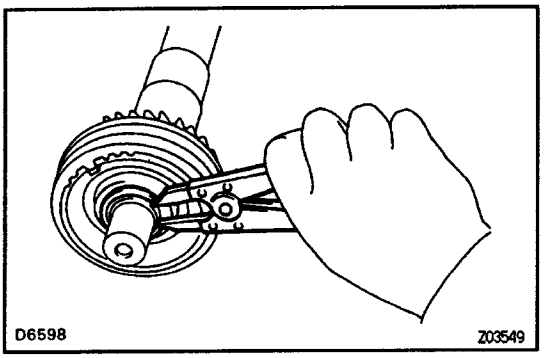


(b) Using a press, remove the reverse gear assembly and 2nd gear.
(c) Remove the needle roller bearing.



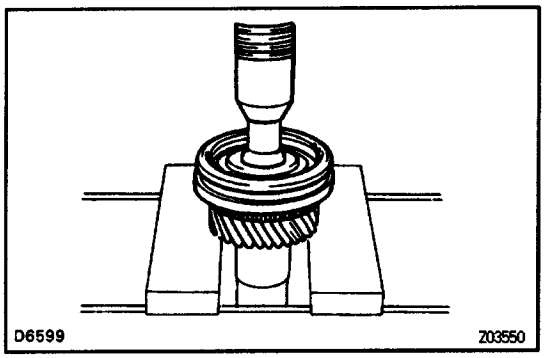
6. REMOVE REVERSE GEAR, SHIFTING KEYS AND SPRINGS FROM CLUTCH HUB NO.1

(a) Remove the reverse gear from the clutch hub No. 1.
(b) Push the shifting key spring with a screwdriver, remove the 3 shifting keys and key springs.



6. REMOVE HUB SLEEVE NO.2 ASSEMBLY AND 3RD GEAR ASSEMBLY

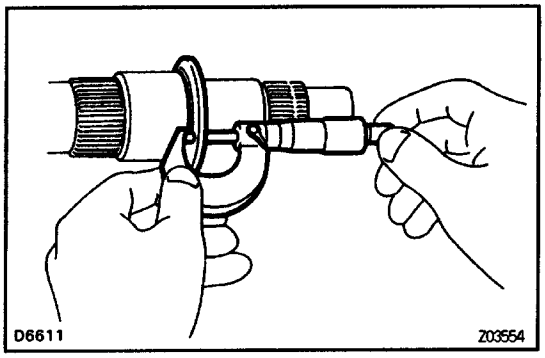
(a) Using a snap ring expander, remove the snap ring.



(b) Using a press, remove the hub sleeve No. 2, synchronizer ring and 3rd gear.
(c) Remove the needle roller bearing.

7. REMOVE SHIFTING KEYS AND SPRINGS FROM HUB SLEEVE NO.2 ASSEMBLY

Using a screwdriver, remove the 3 shifting keys and 2 springs.



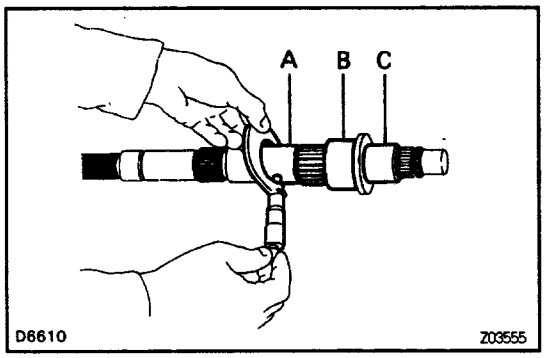
OUTPUT SHAFT COMPONENT PARTS INSPECTION

1. INSPECT OUTPUT SHAFT

(a) Using a micrometer, measure the output shaft flange thickness.

Minimum thickness:
4.70 mm (0.1850 in.)

If the thickness is less than the minimum, replace the output shaft.

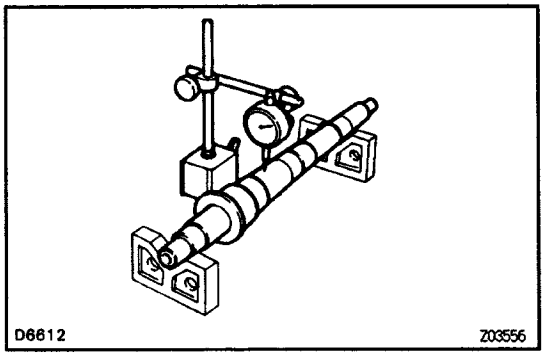


(b) Using a micrometer, measure the outer diameter of the output shaft journal.

Minimum diameter:

A 1st gear 38.860 mm (1.5299 in.)
B 2nd gear 46.860 mm (1.8449 in.)
C 3rd gear 37.860 mm (1.4905 in.)

If the outer diameter is less than the minimum, replace the output shaft.

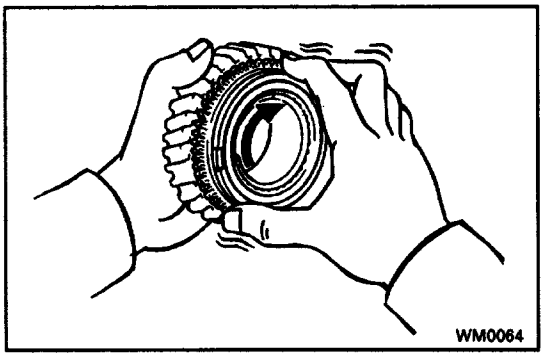


(c) Using a dial indicator, check the shaft runout.

Maximum runout:

0.06 mm (0.0024 in.)

If the runout exceeds the maximum, replace the output shaft.



2. INSPECT SYNCHRONIZER RINGS

(a) Check for wear or damage.

(b) Check the braking effect of the synchronizer ring.

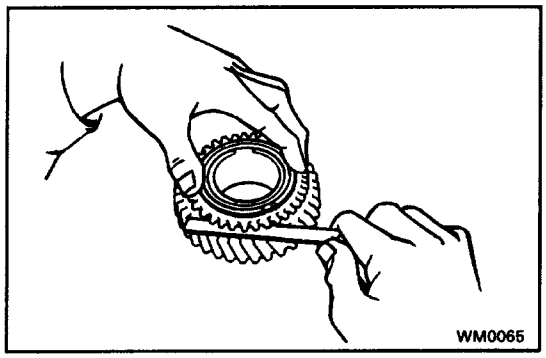
Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

If the braking effect is insufficient, apply a small amount of fine lapping compound between the synchronizer ring and gear cone.

Lightly rub the synchronizer ring and gear cone together.

NOTICE: Ensure the fine lapping compound is completely washed off after rubbing.

(c) Check again the braking effect of the synchronizer ring. If it does not lock, replace the synchronizer ring.



(d) Using a feeler gauge, measure the clearance between the synchronizer ring back and gear spline end.

Minimum clearance:

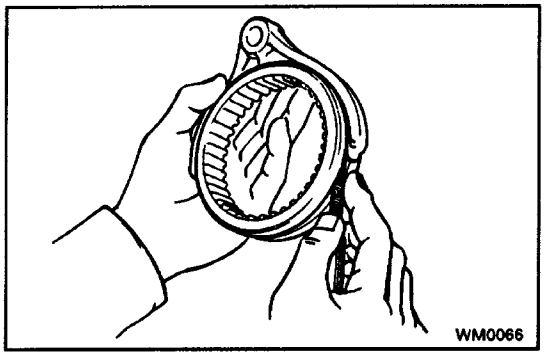
0.8 mm (0.031 in.)

HINT:

- When replacing either a synchronizer ring or gear, apply a small amount of fine lapping compound between the synchronizer ring and gear cone.

  Lightly rub the synchronizer ring and gear cone together.
- When replacing both the synchronizer ring and gear, there is no need to apply any compound or to rub them together.

NOTICE: Ensure the fine lapping compound is completely washed off after rubbing.



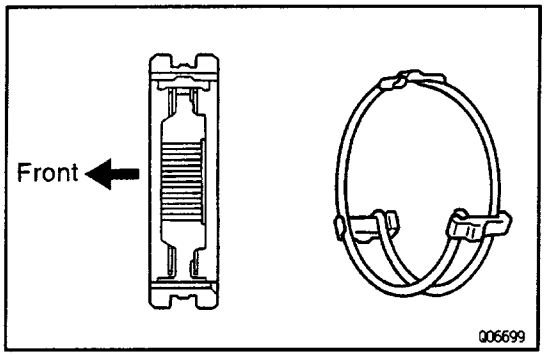
3. INSPECT SHIFT FORKS AND HUB SLEEVES CLEARANCE

Using a feeler gauge, measure the clearance between the hub sleeve and shift fork.

Maximum clearance:

1.0 mm (0.039 in.)

If the clearance exceeds the maximum, replace the shift fork or hub sleeve.



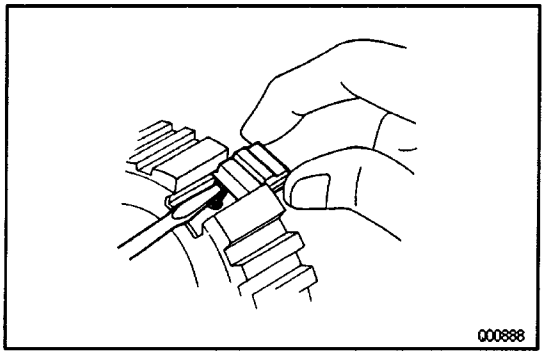
OUTPUT SHAFT ASSEMBLY

1. INSTALL CLUTCH HUB NO.2 INTO HUB SLEEVE NO.2

(a) Install the clutch hub No.2 and shifting keys to the hub sleeve No.2.

(b) Install the shifting key springs under the shifting keys.

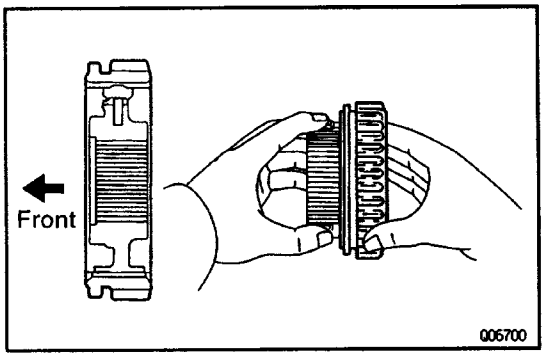
NOTICE: Position the key springs :o that their end gaps are not in line.



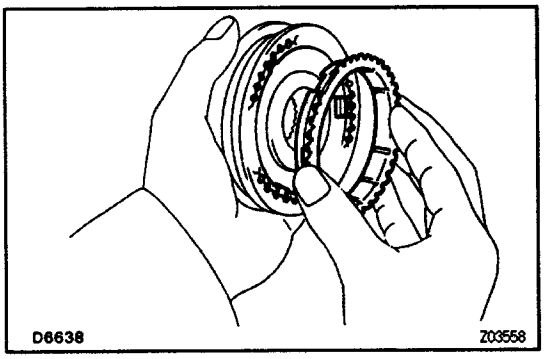
2. INSTALL CLUTCH HUB NO.1 INTO REVERSE GEAR

(a) Install the 3 shifting key springs to the clutch hub No. 1.

(b) While pushing the shifting key spring with a screwdriver, install the 3 shifting keys.



(c) While pushing the 3 shifting keys, install the clutch hub No.1 to the reverse gear, as shown.

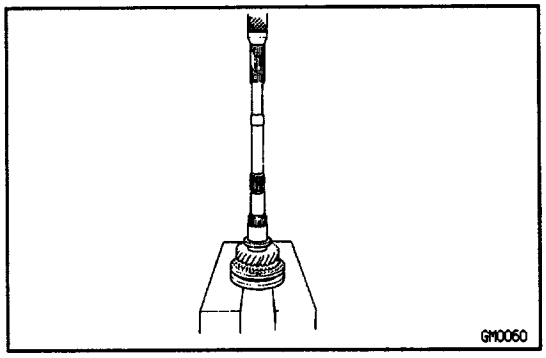


3. INSTALL 3RD GEAR AND HUB SLEEVE NO.2 ON OUTPUT SHAFT

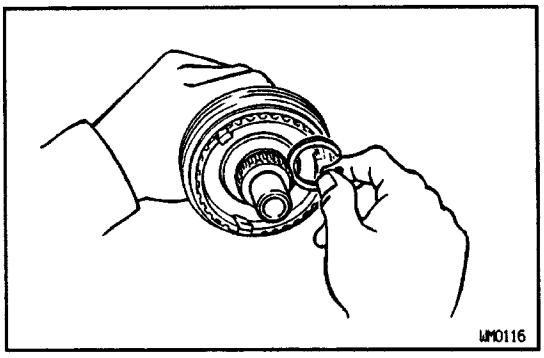
(a) Apply gear oil to the shaft and needle roller bearing.

(b) Place the synchronizer ring on the gear and align the ring slots with the shifting keys.

(c) Install the needle roller bearing in the 3rd gear.



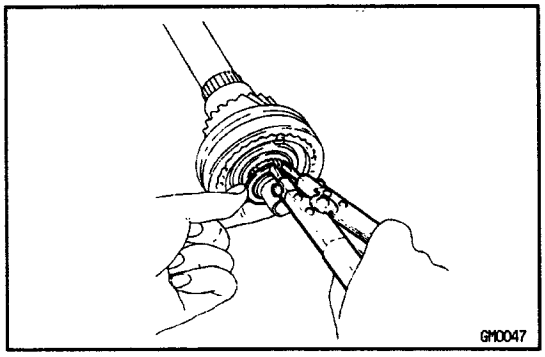
(d) Using a press, install the 3rd gear and hub sleeve No.2.



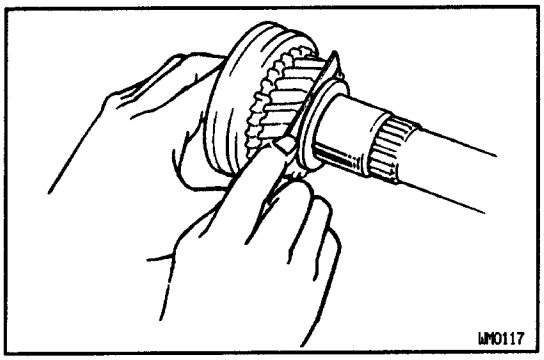
4. INSTALL SNAP RING

(a) Select a snap ring that will allow minimum axial play.

Mark	Thickness mm (in.)
A	1.80 – 1.85 (0.0709 – 0.0728)
B	1.85 – 1.90 (0.0728 – 0.0748)
C	1.90 – 1.95 (0.0748 – 0.0768)
D	1.95 – 2.00 (0.0768 – 0.0787)
E	2.00 – 2.05 (0.0787 – 0.0807)
F	2.05 – 2.10 (0.0807 – 0.0827)
G	2.10 – 2.15 (0.0827 – 0.0846)



(b) Using a snap ring expander, install the snap ring.



5. INSPECT 3RD GEAR THRUST CLEARANCE

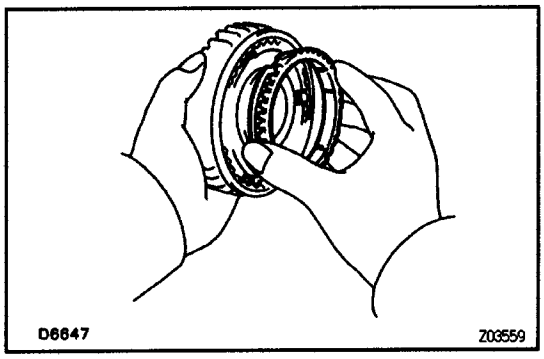
Using a feeler gauge, measure the 3rd gear thrust clearance.

Standard clearance:

0.10 – 0.25 mm (0.0039 – 0.0098 in.)

Maximum clearance:

0.30 mm (0.0118 in.)

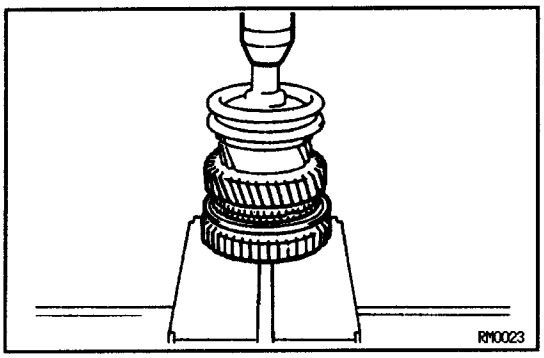


6. INSTALL 2ND GEAR AND REVERSE GEAR

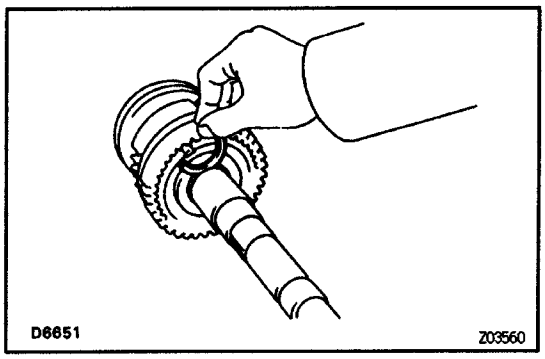
(a) Apply gear oil to the shaft and needle roller bearing.

(b) Place the synchronizer ring on the gear and align the ring slots with the shifting keys.

(c) Install the needle roller bearing in the 2nd gear.



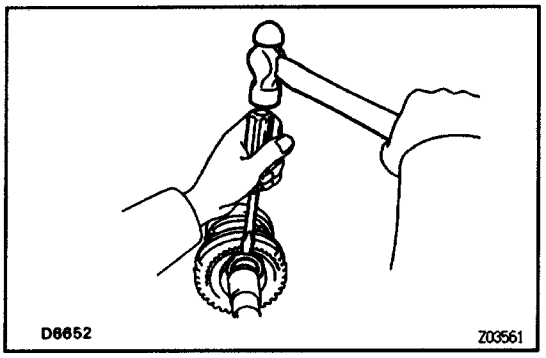
(d) Using a press, install the 2nd gear assembly and reverse gear assembly.



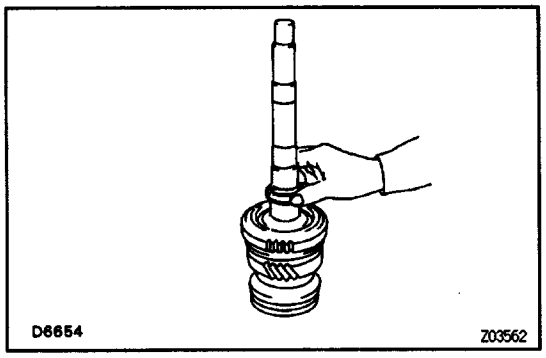
7. INSTALL SNAP RING

(a) Select a snap ring that will allow minimum axial play.

Mark	Thickness mm (in.)
A	2.30 – 2.35 (0.0906 – 0.0925)
B	2.35 – 2.40 (0.0925 – 0.0945)
C	2.40 – 2.45 (0.0945 – 0.0965)
D	2.45 – 2.50 (0.0965 – 0.0984)
E	2.50 – 2.55 (0.0984 – 0.1004)
F	2.55 – 2.60 (0.1004 – 0.1024)
G	2.60 – 2.65 (0.1024 – 0.1043)

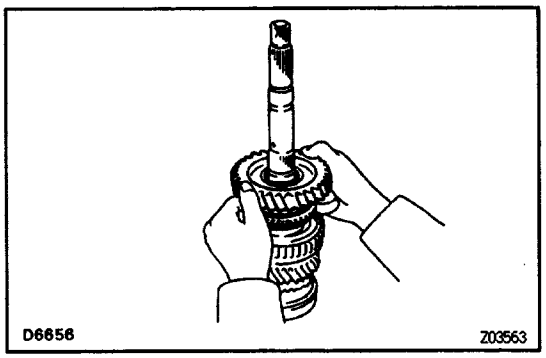


(b) Using a screwdriver and hammer, install the snap ring.

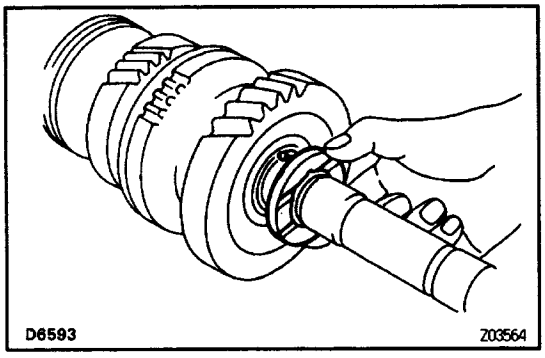


8. INSTALL SPACER AND 1ST GEAR ASSEMBLY

(a) Install the spacer on the output shaft.

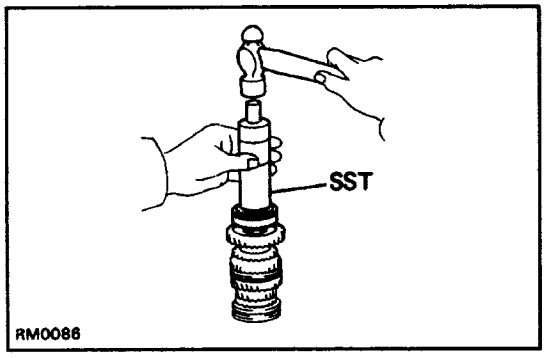


(b) Apply gear oil to the needle roller bearing.
(c) Assemble the 1st gear, synchronizer ring and needle roller bearing.
(d) Install the assembly on the output shaft with the synchronizer ring slots aligned with the shifting keys.



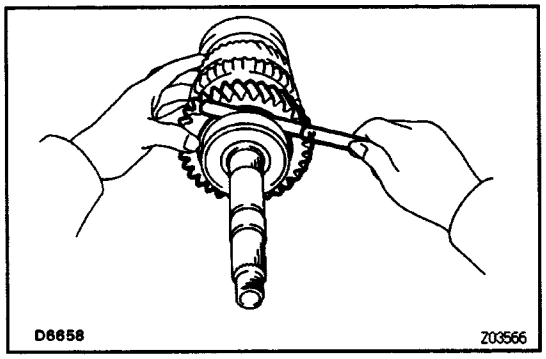
9. INSTALL STRAIGHT PIN AND 1ST GEAR THRUST WASHER

Install the 1st gear thrust washer onto the output shaft with the straight pin aligned with the 1 st gear thrust washer.



10. INSTALL OUTPUT SHAFT CENTER BEARING

Using SST and a hammer, drive in the bearing with the outer race snap ring groove toward the rear.
SST 09316–60010 (09316–00010, 09316–00070)



11. INSPECT 1 ST GEAR THRUST CLEARANCE

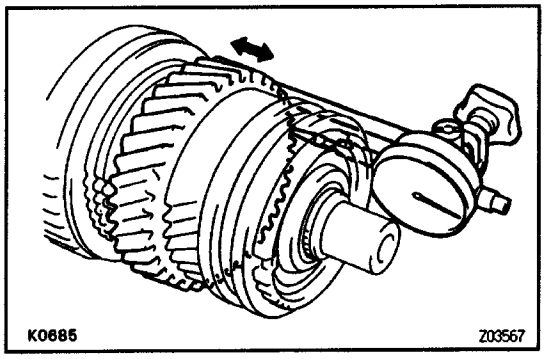
Using a feeler gauge, measure the 1 st gear clearance.

Standard clearance:

0.10 – 0.45 mm (0.0039 – 0.0177 in.)

Maximum clearance:

0.50 mm (0.0197 in.)



12. INSPECT 2ND GEAR THRUST CLEARANCE

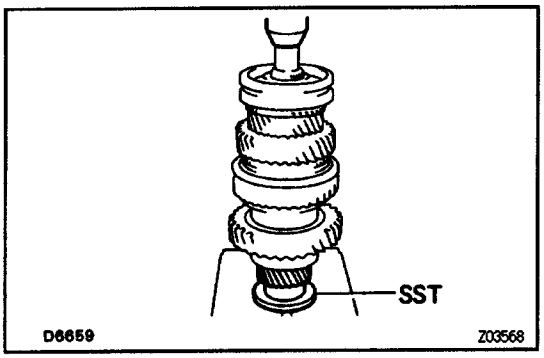
Using a dial indicator, measure the 2nd gear thrust clearance.

Standard clearance:

0.10 – 0.25 mm (0.0039 – 0.0098 in.)

Maximum clearance:

0.30 mm (0.0118 in.)



13. INSTALL 5TH GEAR

Using SST and a press, install the 5th gear.

SST 09316–60010 (09316–00030)