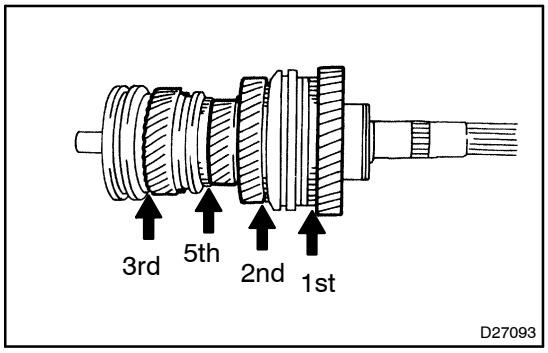
410CM–01

OVERHAUL

HINT:
When placing a part in a vise, be sure to use a cloth or something similar.



1. INSPECT EACH GEAR THRUST CLEARANCE

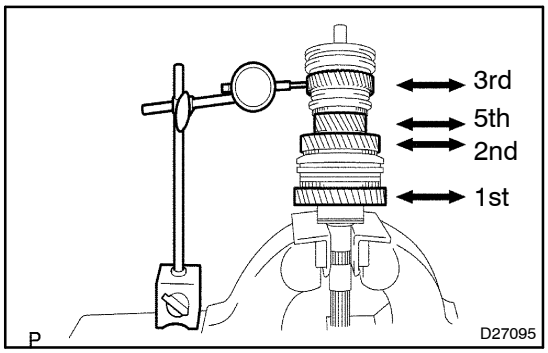
(a) Using a feeler gauge, measure the thrust clearance of each gear.

Standard thrust clearance

Gear	Clearance mm (in.)
1st and 3rd	0.10 – 0.45 (0.0039 – 0.0177)
2nd and 5th	0.10 – 0.35 (0.0039 – 0.0138)

Maximum thrust clearance

Gear	Clearance mm (in.)
1st and 3rd	0.45 (0.0177)
2nd and 5th	0.35 (0.0138)



2. INSPECT EACH GEAR RADIAL CLEARANCE

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

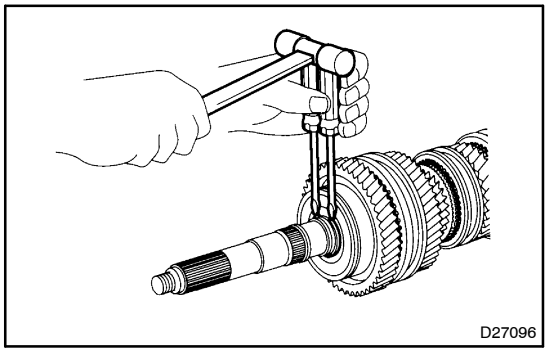
Standard radial clearance

Gear	Clearance mm (in.)
1st and 3rd	0.020 – 0.073 (0.0079 – 0.0029)
2nd and 5th	0.015 – 0.068 (0.0006 – 0.0027)

Maximum radial clearance

Gear	Clearance mm (in.)
1st and 3rd	0.073 (0.0029)
2nd and 5th	0.068 (0.0027)

If the clearance is greater than the maximum, replace the gear, needle roller bearing or shaft.

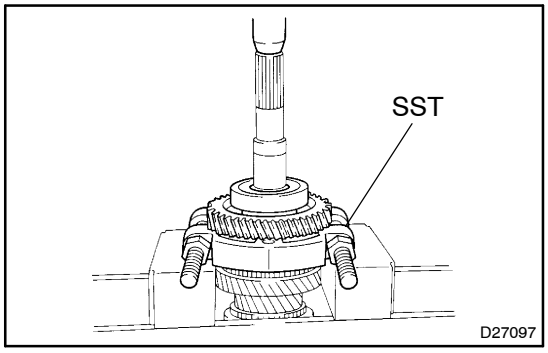


3. REMOVE OUTPUT SHAFT CENTER BEARING SHAFT SNAP RING

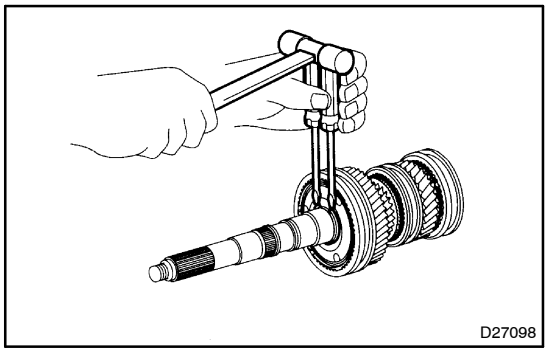
(a) Using 2 screwdrivers and a hammer, tap out the snap ring.

4. REMOVE 1ST GEAR

(a) Shift the hub sleeve No. 1 onto the 2nd gear.

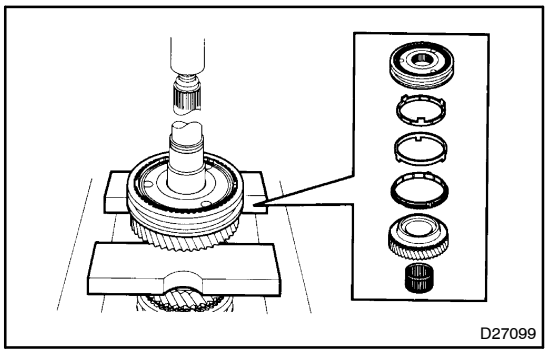


(b) Using SST and a press, press out the output shaft center bearing, 1st gear and synchronizer ring set No. 1.
SST 09555–55010
(c) Remove the needle roller bearing.



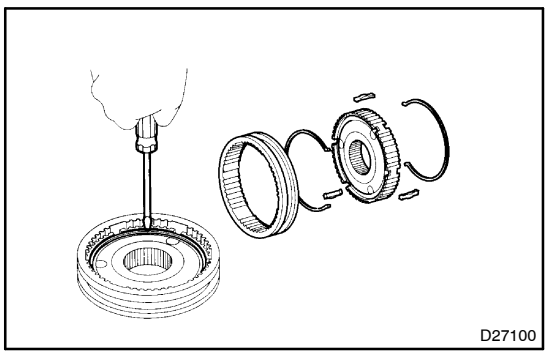
5. REMOVE CLUTCH HUB NO.1 SHAFT SNAP RING

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



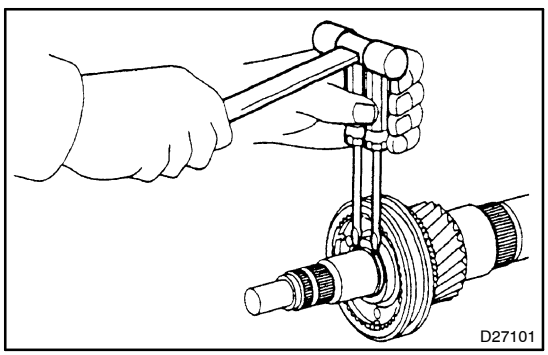
6. REMOVE 2ND GEAR

(a) Using a press, press out the hub sleeve No. 1 assembly, synchronizer rings No. 2 and 2nd gear.
(b) Remove the needle roller bearing.



7. REMOVE TRANSMISSION HUB SLEEVE NO.1

(a) Using a screwdriver, remove the hub sleeve No. 2, 3 shifting keys and 2 springs from the clutch hub No. 1.

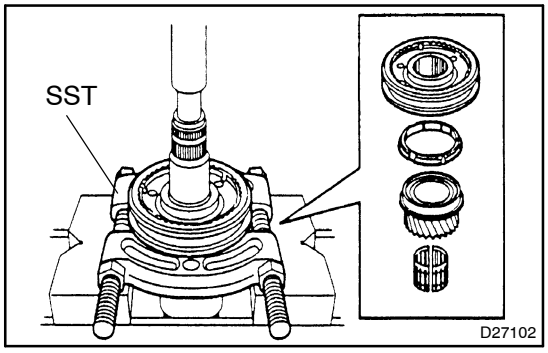


8. REMOVE CLUTCH HUB NO.2 SETTING SHAFT SNAP RING

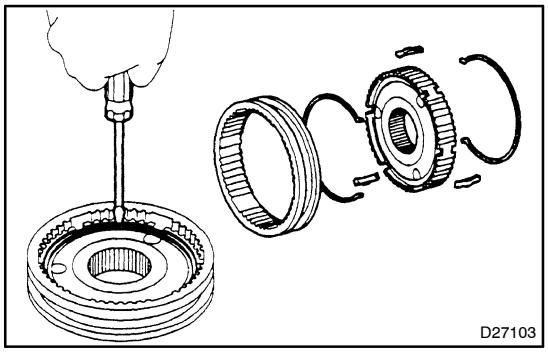
(a) Using 2 screwdrivers and a hammer, tap out the snap ring.

9. REMOVE 3RD GEAR

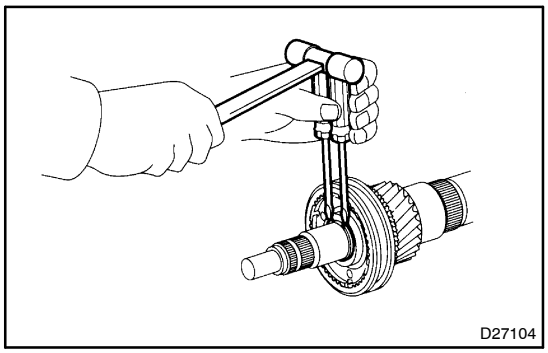
(a) Shift the hub sleeve No. 3 onto the 5th gear.



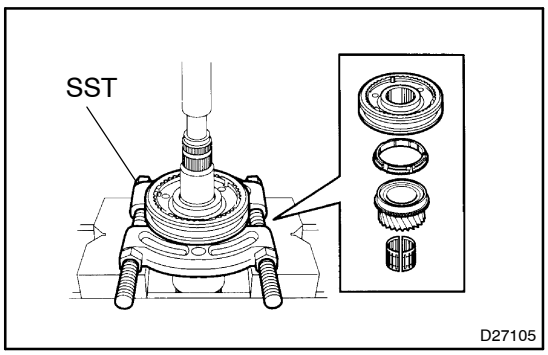
(b) Using SST and a press, press out the hub sleeve No. 2 assembly, synchronizer ring set No. 3 and 3rd gear.
SST 09555–55010
(c) Remove the needle roller bearing.



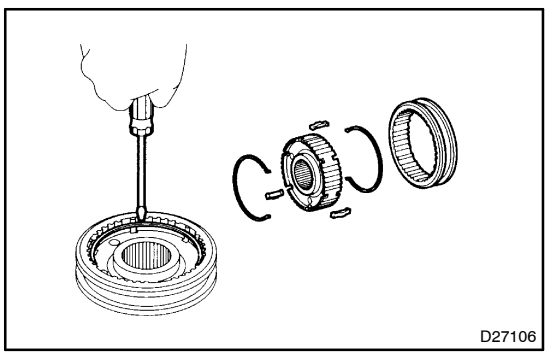
10. REMOVE TRANSMISSION HUB SLEEVE NO.2
(a) Using a screwdriver, remove the 3 shifting keys and 2 springs from the clutch hub No. 2.



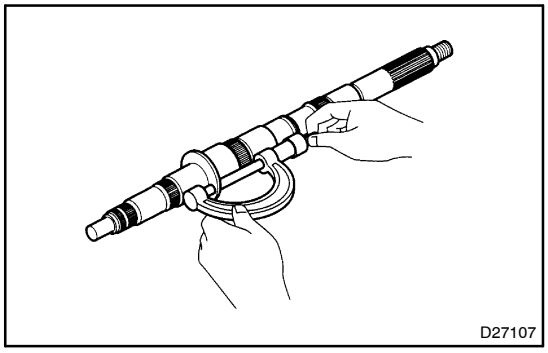
11. REMOVE TRANSMISSION CLUTCH HUB NO.3 SHAFT SNAP RING
(a) Using 2 screwdrivers and a hammer, tap out the snap ring.



12. REMOVE 5TH GEAR
(a) Using SST and a press, press out the hub sleeve No. 3 assembly, synchronizer ring No. 3 and 5th gear.
SST 09555–55010
(b) Remove the needle roller bearing.



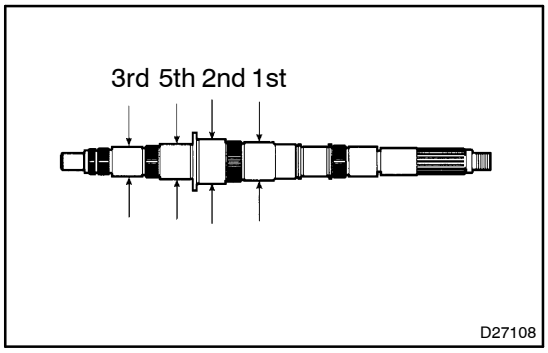
13. REMOVE TRANSMISSION HUB SLEEVE NO.3
(a) Using a screwdriver, remove the 3 shifting keys and 2 springs from the clutch hub No. 3.


D27107

14. INSPECT OUTPUT SHAFT

(a) Using micrometer, measure the flange thickness.
Minimum flange thickness: 4.725 mm (0.1860 in.)

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

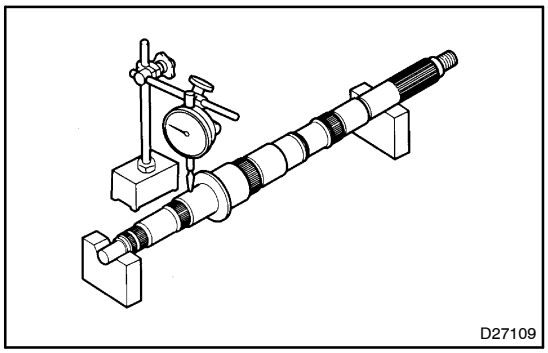


D27108

(b) Using a micrometer, measure the journal diameter.
Minimum journal diameter:

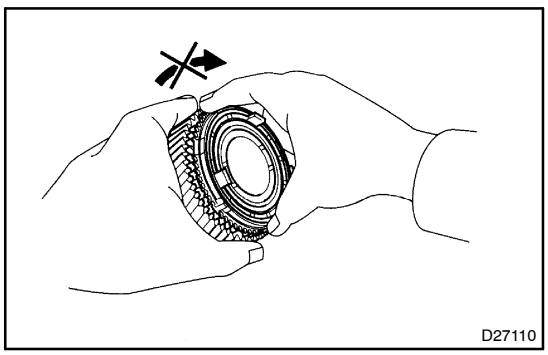
Gear	Diameter mm (in.)
1st	49.979 (1.9677)
2nd	57.984 (2.2828)
3rd	37.979 (1.4952)
5th	45.984 (1.8104)

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


D27109

(c) Using a dial indicator, measure the shaft runout.
Maximum runout: 0.03 mm (0.0012 in.)

If the runout is greater than the maximum, replace the output shaft.


D27110

15. INSPECT SYNCHRONIZER RING

(a) Check for wear or damage.

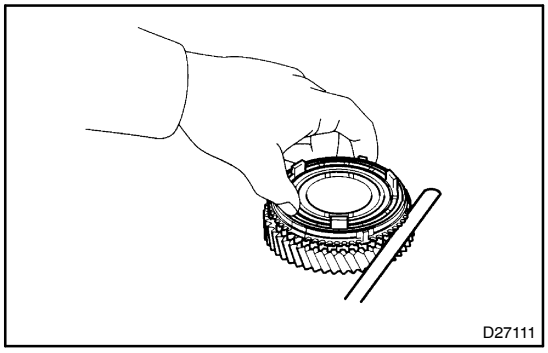
(b) Check the braking effect of the synchronizer ring. Turn the synchronizer ring in one direction while pushing it to the gear cone. Check that the ring locks.

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

NOTICE:

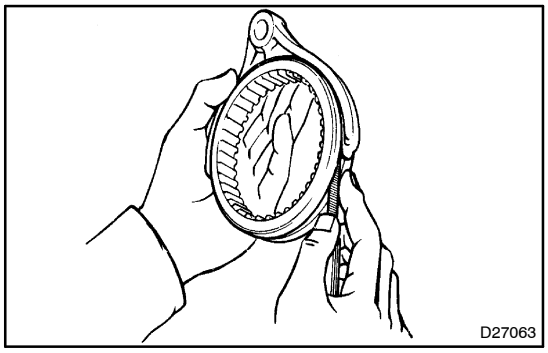
Ensure the fine lapping compound is completely washed off after rubbing.

(c) Check again the braking effect of the synchronizer ring.



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

Gear	Clearance mm (in.)
1st	1.25 (0.0492)
2nd	1.23 (0.0484)
3rd	1.15 (0.0453)
5th	0.80 (0.0315)



16. INSPECT SHIFT FORK AND HUB SLEEVE CLEARANCE

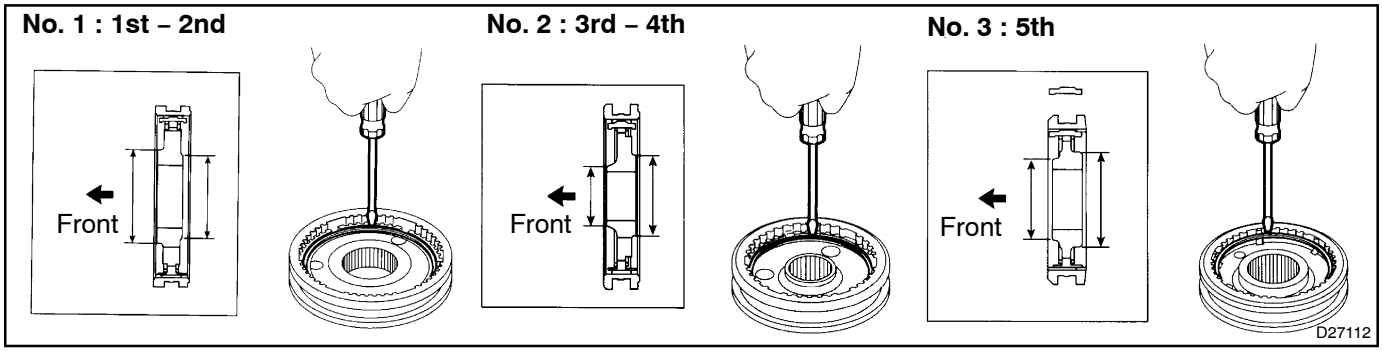
(a) Using a feeler gauge, measure the clearance between the hub sleeve and shift fork.
Maximum clearance:

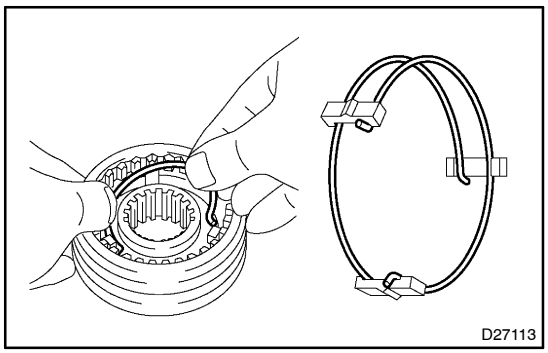
Gear	Clearance mm (in.)
1st–2nd, 3rd–4th	0.35 (0.0138)
5th	0.84 (0.0331)

If the clearance is greater than the maximum, replace the shift fork or hub sleeve.

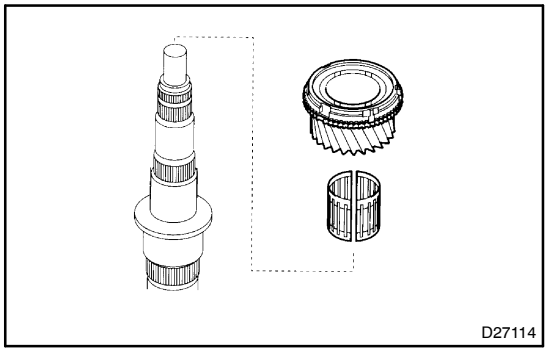
17. INSTALL CLUTCH HUB NO. 1, NO. 2 AND NO. 3 INTO HUB SLEEVE

(a) Install the clutch hub and 3 shifting keys to the hub sleeve.
(b) Install the 2 springs under the shifting keys.





NOTICE:
Position the key springs so that their end gaps are not aligned.

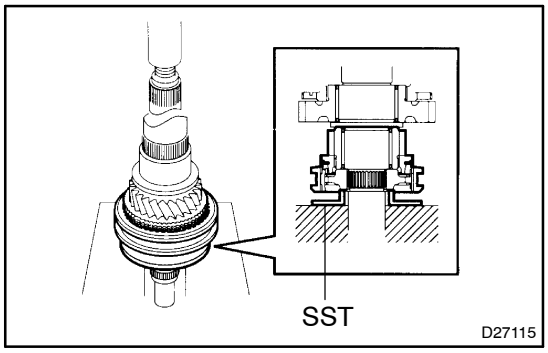


18. INSTALL 5TH GEAR

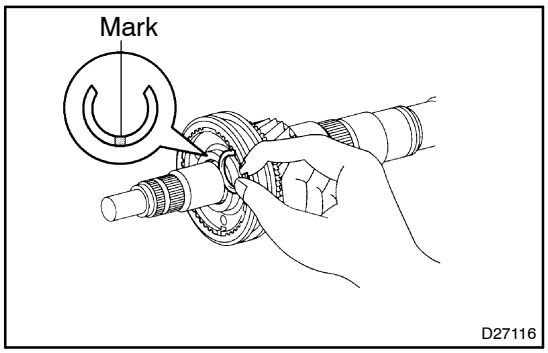
(a) Apply gear oil to the shaft and needle roller bearing.

(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 5th gear.



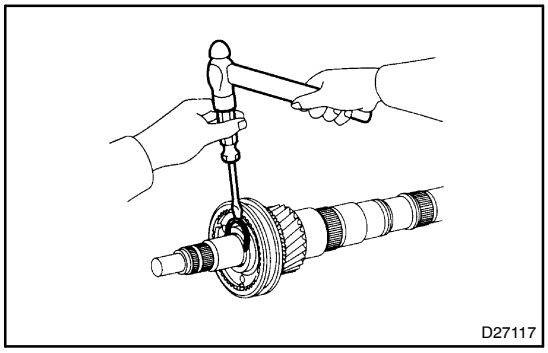
(d) Using SST and a press, press in the 5th gear and hub sleeve No. 3 assembly.
SST 09316–60011 (09316–00041)



19. INSTALL TRANSMISSION CLUTCH HUB NO.3 SHAFT SNAP RING

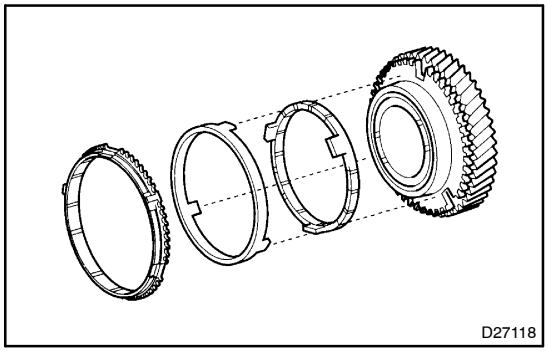
(a) Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)
A	2.40 – 2.45 (0.0945 – 0.0965)
B	2.45 – 2.50 (0.0965 – 0.0984)
C	2.50 – 2.55 (0.0984 – 0.1004)
D	2.55 – 2.60 (0.1004 – 0.1024)
E	2.60 – 2.65 (0.1024 – 0.1044)
F	2.65 – 2.70 (0.1044 – 0.1063)



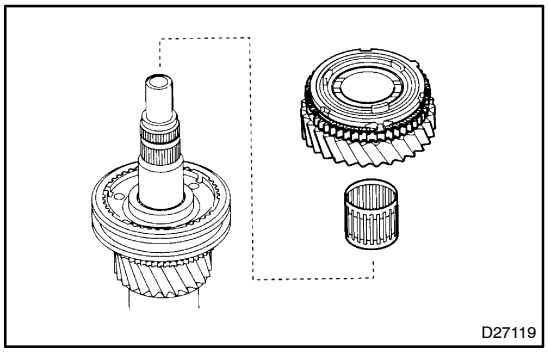
(b) Using a screwdriver and a hammer, tap in the snap ring.

20. INSPECT 5TH GEAR THRUST CLEARANCE (See step 1)

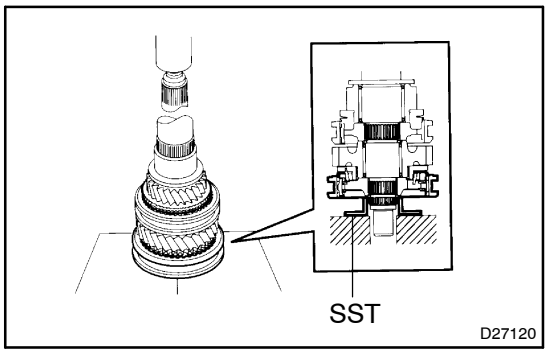


21. INSTALL 3RD GEAR

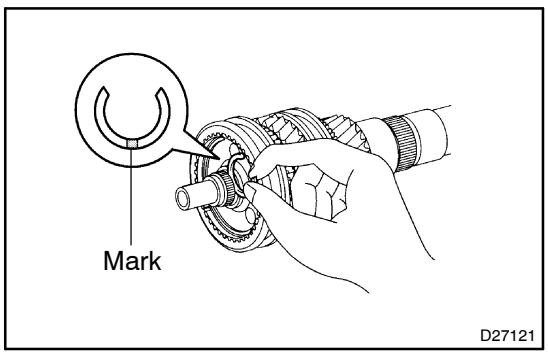
(a) Place the synchronizer ring on the gear, and align the ring slots with the shifting keys.



(b) Apply gear oil to the shaft and needle roller bearing.
(c) Install the needle roller bearing in the 3rd gear.



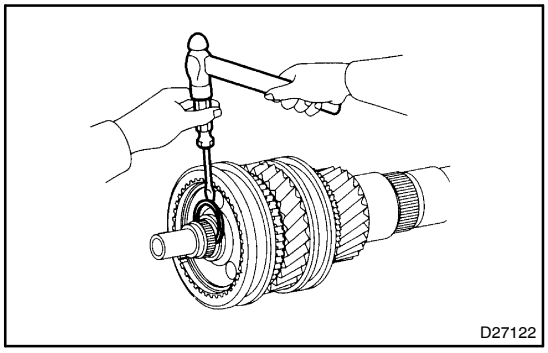
(d) Using SST and a press, press in the 3rd gear and hub sleeve No. 2 assembly.
SST 09316–60011 (09316–00031)



22. INSTALL CLUTCH HUB NO.2 SETTING SHAFT SNAP RING

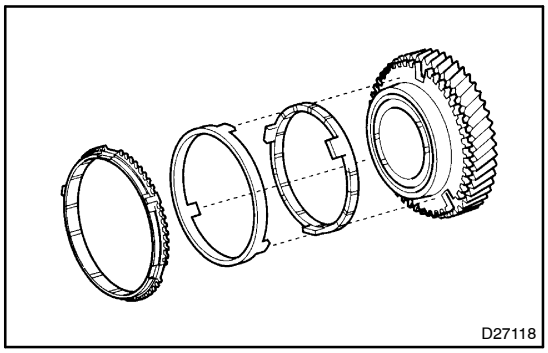
(a) Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)
4	1.90 – 1.95 (0.0748 – 0.0768)
5	1.95 – 2.00 (0.0768 – 0.0787)
6	2.00 – 2.05 (0.0787 – 0.0807)
7	2.05 – 2.10 (0.0807 – 0.0827)
8	2.10 – 2.15 (0.0827 – 0.0847)
9	2.15 – 2.20 (0.0847 – 0.0866)



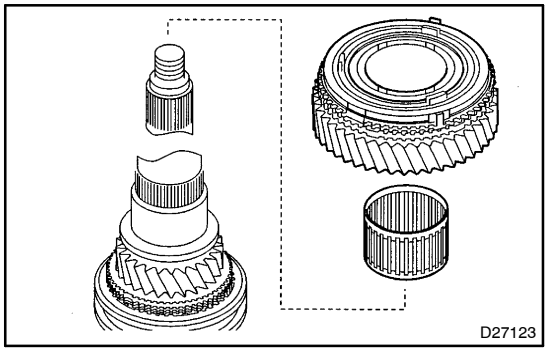
(b) Using a screwdriver and a hammer, tap in the snap ring.

23. INSPECT 3RD GEAR THRUST CLEARANCE (See step 1)

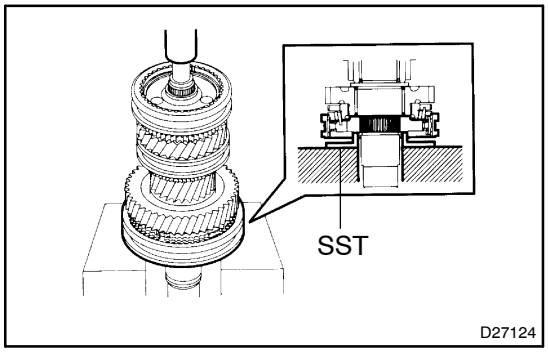


24. INSTALL 2ND GEAR

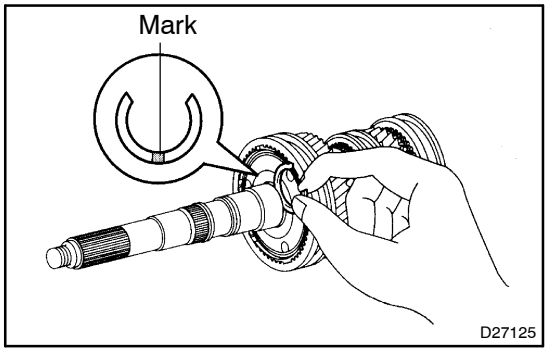
(a) Place the synchronizer ring on the gear and align the ring slots with the shifting keys.



(b) Apply gear oil to the shaft and needle roller bearing.
(c) Install the needle roller bearing in the 2nd gear.



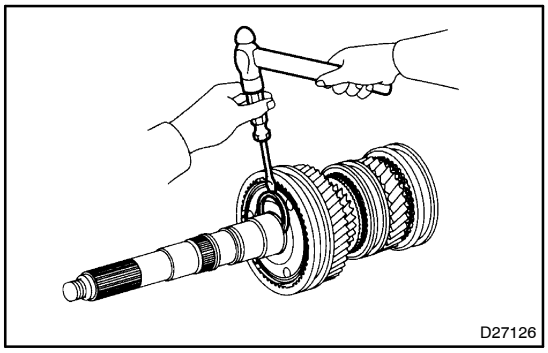
(d) Using SST and a press, press in the 2nd gear and hub sleeve No. 1 assembly.



25. INSTALL CLUTCH HUB NO.1 SHAFT SNAP RING

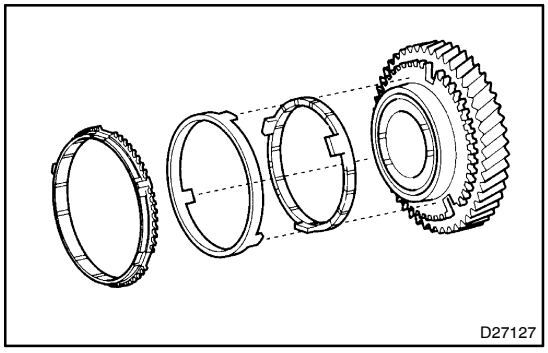
(a) Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)
A	2.90 – 2.95 (0.1142 – 0.1161)
B	2.95 – 3.00 (0.1161 – 0.1181)
C	3.00 – 3.05 (0.1181 – 0.1201)
D	3.05 – 3.10 (0.1201 – 0.1220)
E	3.10 – 3.15 (0.1220 – 0.1240)
F	3.15 – 3.20 (0.1240 – 0.1260)



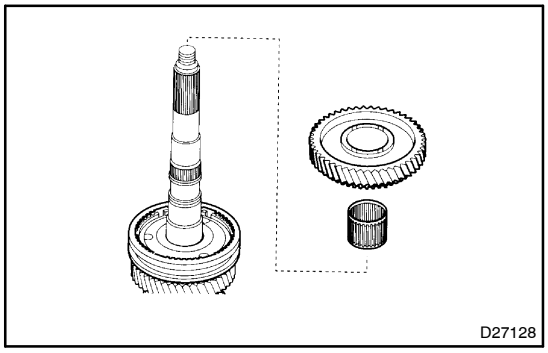
(b) Using a screwdriver and hammer, tap in the snap ring.

26. INSPECT 2ND GEAR THRUST CLEARANCE (See step 1)

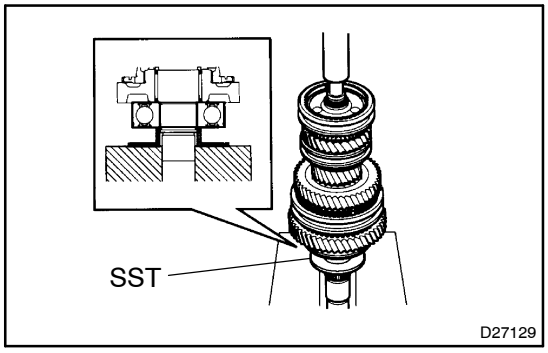


27. INSTALL 1ST GEAR

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

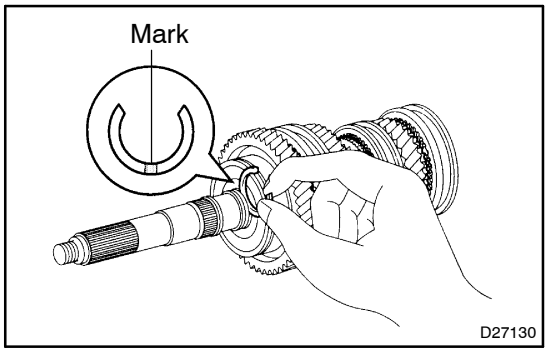


(b) Apply gear oil to the shaft and needle roller bearing.
(c) Install the needle roller bearing in the 1st gear.
(d) Install the 1st gear to the output shaft.



28. INSTALL OUTPUT SHAFT CENTER BEARING

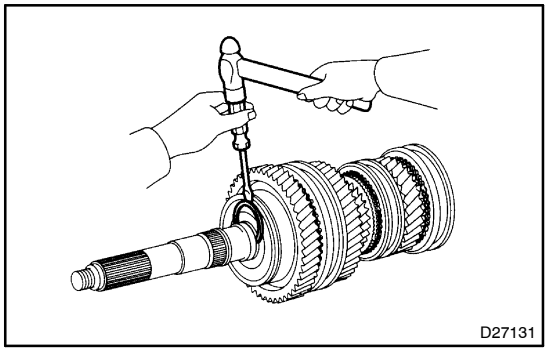
(a) Using SST and a press, press in the center bearing.
SST 09316–20011



29. INSTALL OUTPUT SHAFT CENTER BEARING SHAFT SNAP RING

(a) Select a snap ring that allows the minimum axial play.

Mark	Thickness mm (in.)
A	2.40 – 2.45 (0.0945 – 0.0965)
B	2.45 – 2.50 (0.0965 – 0.0984)
C	2.50 – 2.55 (0.0984 – 0.1004)
D	2.55 – 2.60 (0.1004 – 0.1024)
E	2.60 – 2.65 (0.1024 – 0.1044)
F	2.65 – 2.70 (0.1044 – 0.1063)
G	2.70 – 2.75 (0.1063 – 0.1083)
H	2.75 – 2.80 (0.1083 – 0.1102)



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

30. INSPECT 1ST GEAR THRUST CLEARANCE (See step 1)

31. INSPECT EACH GEAR RADIAL CLEARANCE (See step 2)