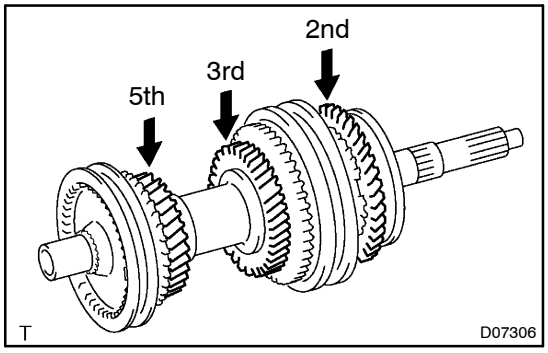
4106Z–01

OVERHAUL

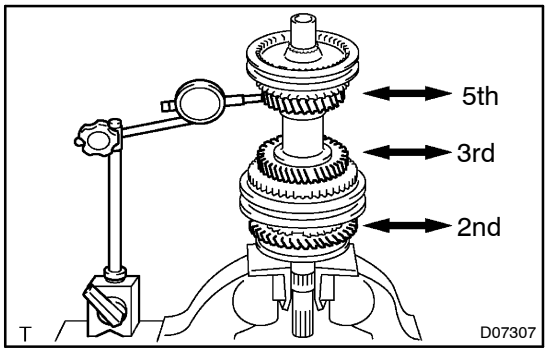


1. INSPECT EACH GEAR THRUST CLEARANCE

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

Standard thrust clearance:

Gear	Clearance mm (in.)
2nd	0.10 – 0.55 (0.0039 – 0.0217)
3rd and 5th	0.10 – 0.35 (0.0039 – 0.0138)



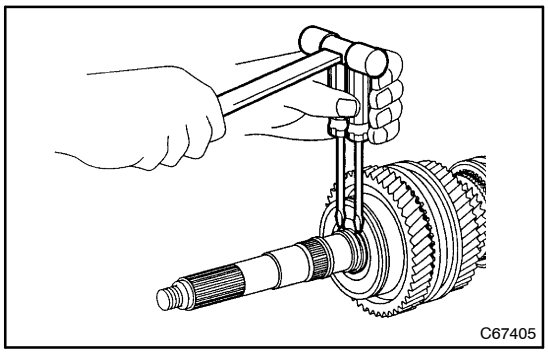
2. INSPECT EACH GEAR RADIAL CLEARANCE

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

Standard radial clearance:

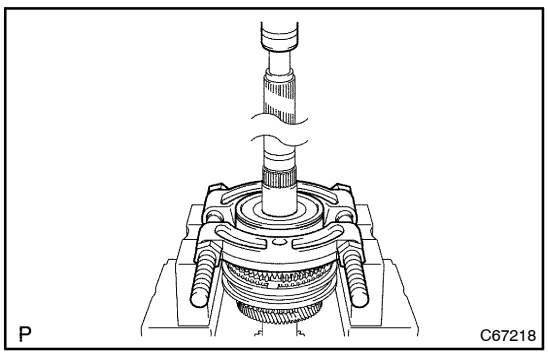
Gear	Clearance mm (in.)
3rd	0.015 – 0.068 (0.0006 – 0.0027)
2nd and 5th	0.020 – 0.073 (0.0008 – 0.0029)

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



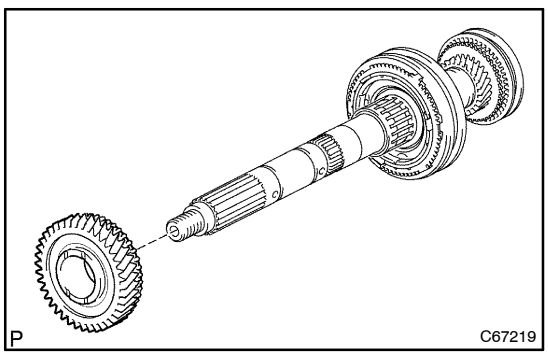
3. REMOVE OUTPUT SHAFT CENTER BEARING SHAFT SNAP RING

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



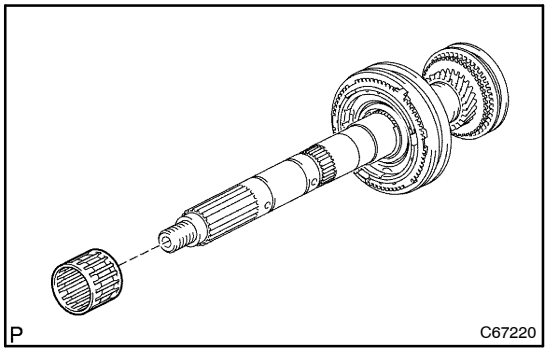
4. REMOVE OUTPUT SHAFT CENTER BEARING

(a) Using SST and a press, press out the center bearing.
SST 09555–55010



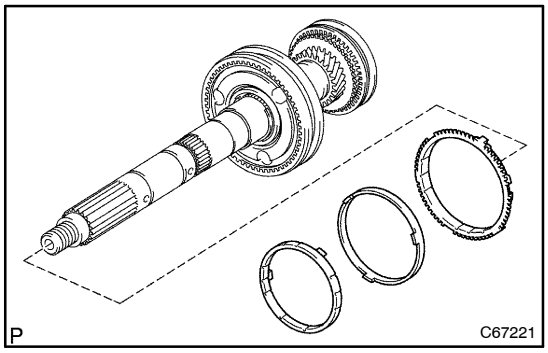
5. REMOVE 2ND GEAR

(a) Remove the 2nd gear from the output shaft.



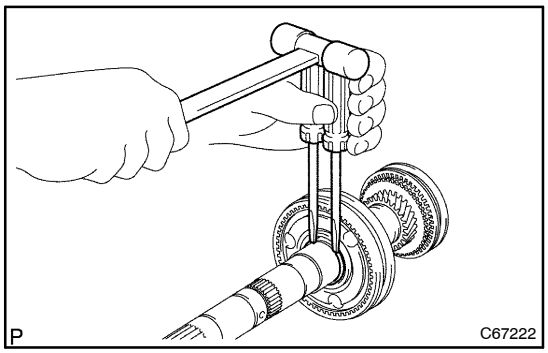
6. REMOVE 2ND GEAR NEEDLE ROLLER BEARING

(a) Remove the needle roller bearing from the output shaft.



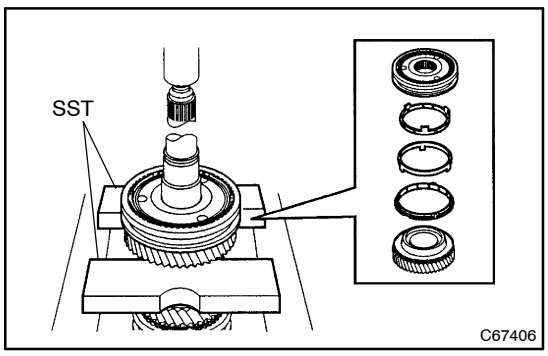
7. REMOVE SYNCHRONIZER RING SET NO.2

(a) Remove the synchronizer ring set No. 2 from the clutch hub No. 1 assy.



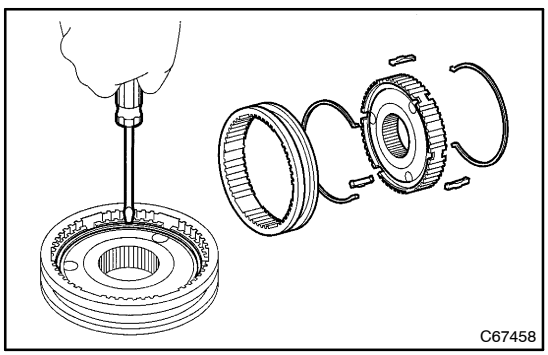
8. REMOVE CLUTCH HUB NO.1 SHAFT SNAP RING

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



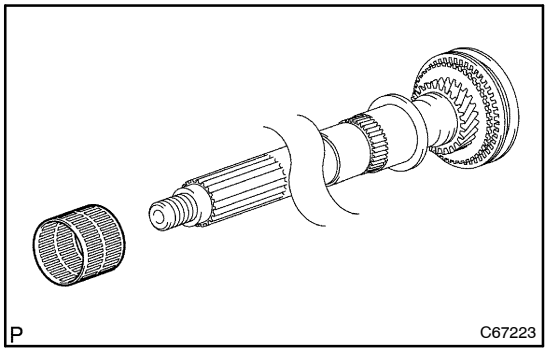
9. REMOVE 3RD GEAR

(a) Using SST and a press, press out the clutch hub No. 2 assy, synchronizer ring set No. 3 and 3rd gear.
SST 09527–20011



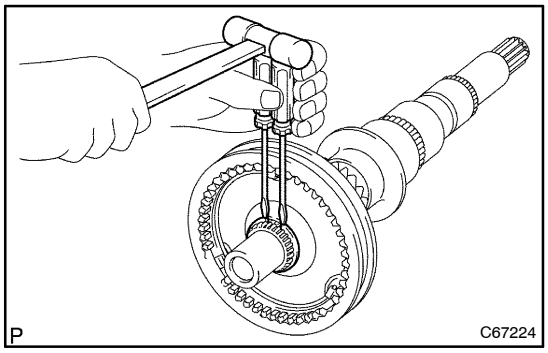
10. REMOVE TRANSMISSION CLUTCH HUB NO.2

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



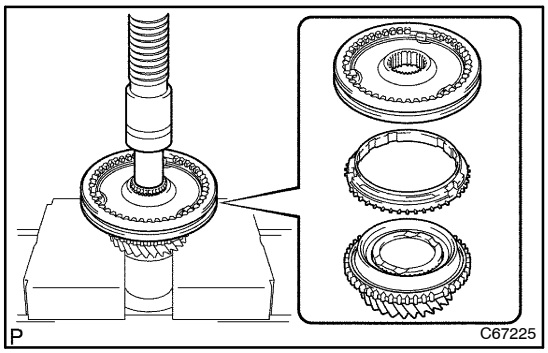
11. REMOVE 3RD GEAR NEEDLE ROLLER BEARING

(a) Remove the needle roller bearing from the output shaft.



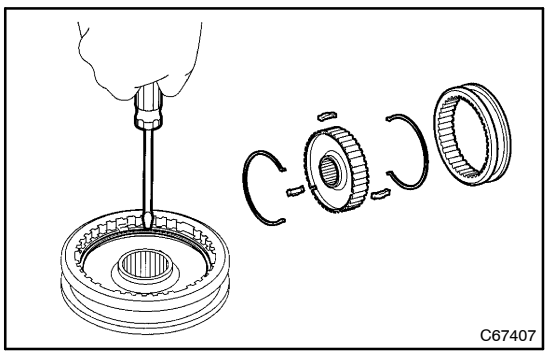
12. REMOVE CLUTCH HUB NO.2 SETTING SHAFT SNAP RING

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



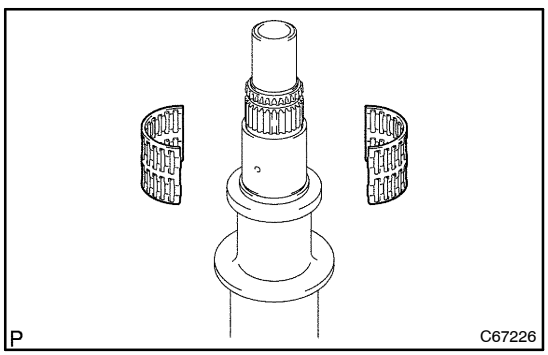
13. REMOVE 5TH GEAR

(a) Using a press, press out the clutch hub No. 3 assy, 5th gear synchronizer ring and 5th gear.



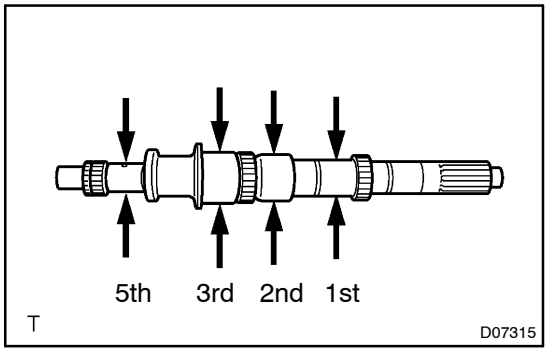
14. REMOVE TRANSMISSION CLUTCH HUB NO.3

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



15. REMOVE 5TH GEAR NEEDLE ROLLER BEARING

(a) Remove the needle roller bearing from the output shaft.

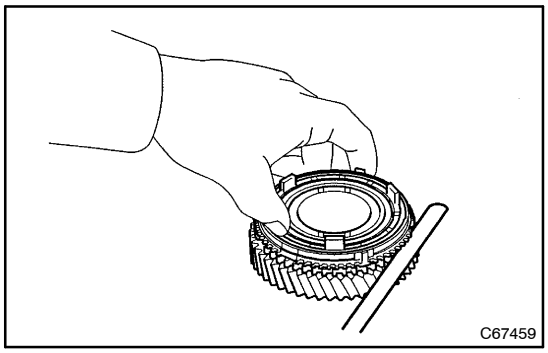


16. INSPECT OUTPUT SHAFT

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

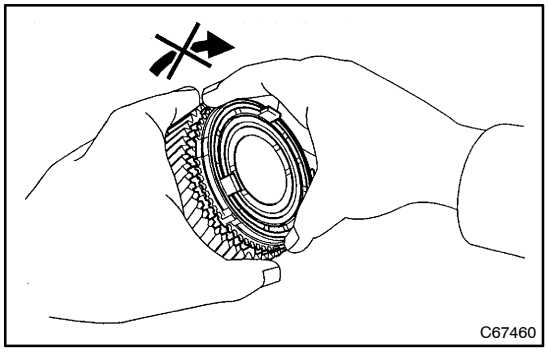
Journal	Diameter mm (in.)
1st	44.484 (1.7513)
2nd	49.979 (1.9677)
3rd	57.984 (2.2828)
5th	37.979 (1.4952)

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

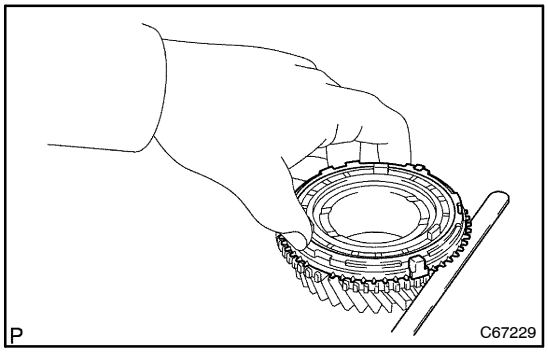


17. INSPECT SYNCHRONIZER RING SET NO.2

(a) Check the synchronizer ring for wear or damage.
(b) Using a feeler gauge, measure the clearance between the synchronizer ring No. 2 and the 2nd gear.
Standard clearance:
1.25 – 2.15 mm (0.0492 – 0.0846 in.)

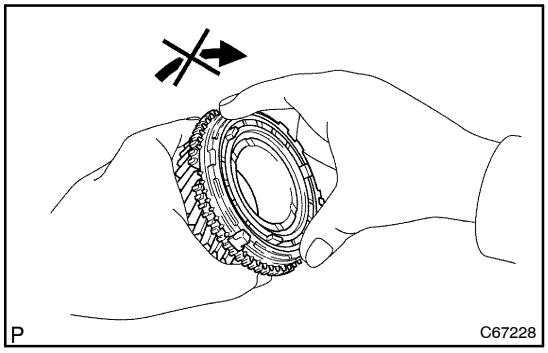


(c) Check the braking effect of the synchronizer ring, turn the synchronizer ring in one direction while pushing it to the gear cone, and then check that the ring locks.

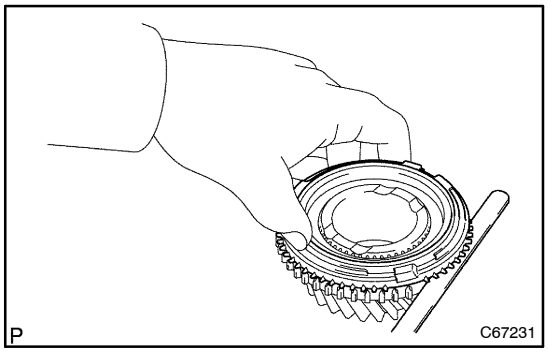


18. INSPECT SYNCHRONIZER RING SET NO.3

(a) Check for wear or damage.
(b) Using a feeler gauge, measure the clearance between the synchronizer ring back and the gear spline end.
Standard clearance:
1.23 – 2.13 mm (0.0484 – 0.0839 in.)



(c) Check the braking effect of the synchronizer ring, turn the synchronizer ring in one direction while pushing it to the gear cone, and then check that the ring locks.

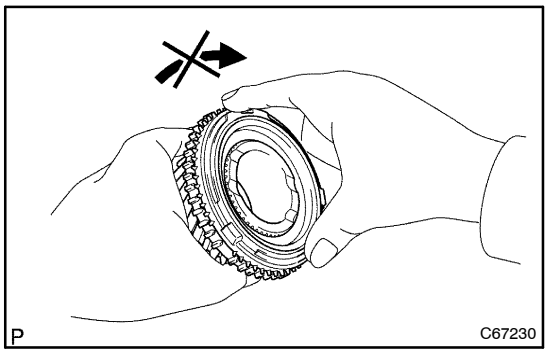


19. INSPECT 5TH GEAR SYNCHRONIZER RING

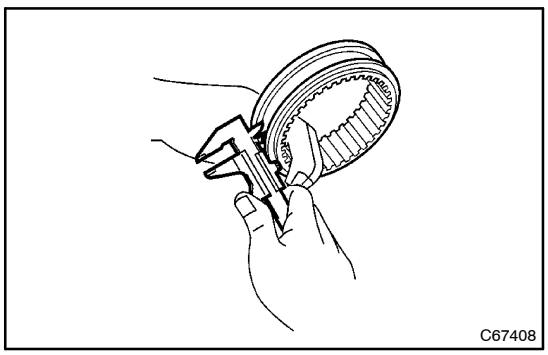
(a) Check for wear or damage.

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

Standard clearance:
0.8 – 1.6 mm (0.0315 – 0.0630 in.)



(c) Check the braking effect of the synchronizer ring, turn the synchronizer ring in one direction while pushing it to the gear cone, and then check that the ring locks.

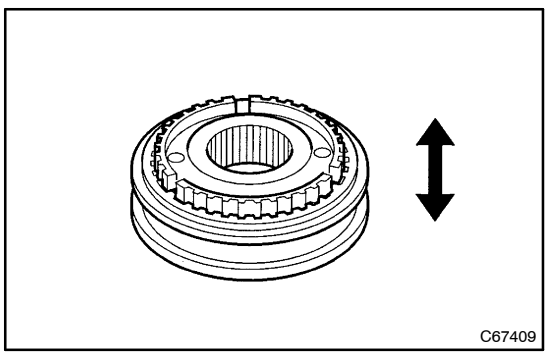


20. INSPECT TRANSMISSION HUB SLEEVE NO.2

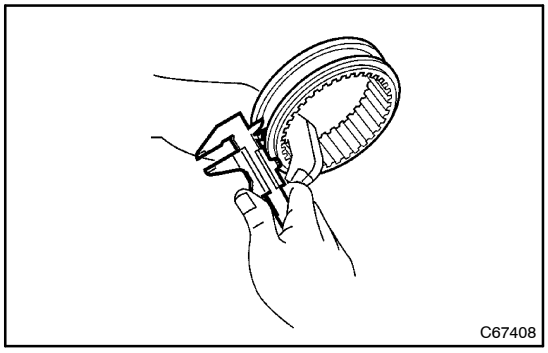
(a) Using vernier calipers, measure the hub sleeve No. 2.

Standard clearance:
12.0 – 12.1 mm (0.4724 – 0.4764 in.)
Maximum clearance: 12.1 mm (0.4764 in.)

(b) Check the tip of the spline gear of the hub sleeve No. 2 for wear.



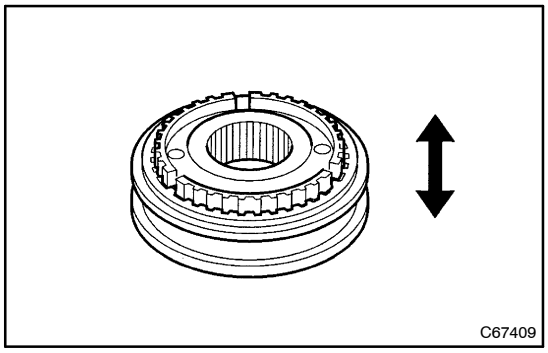
(c) Check the sliding condition between the clutch hub No .2 and the hub sleeve No. 2.



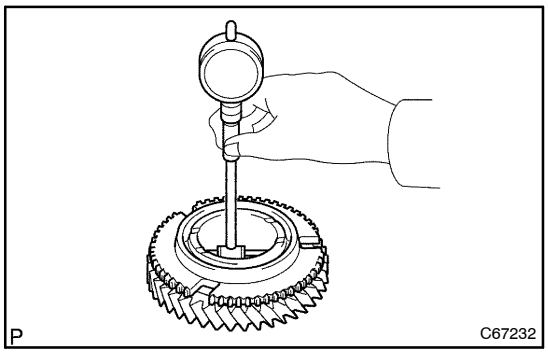
21. INSPECT TRANSMISSION HUB SLEEVE NO.3

(a) Using vernier calipers, measure the hub sleeve No. 3.
Standard clearance:
12.0 – 12.1 mm (0.4724 – 0.4764 in.)
Maximum clearance: 12.1 mm (0.4764 in.)

(b) Check the tip of the spline gear of the hub sleeve No. 3 for wear.

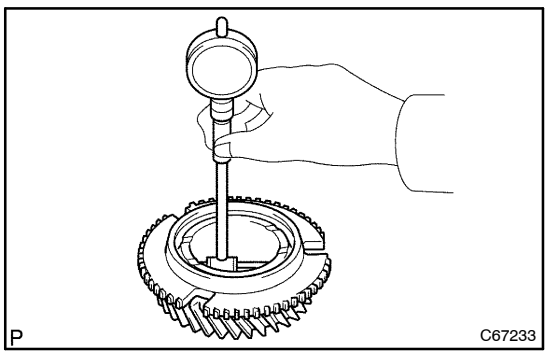


(c) Check the sliding condition between the clutch hub No. 3 and the hub sleeve No. 3.



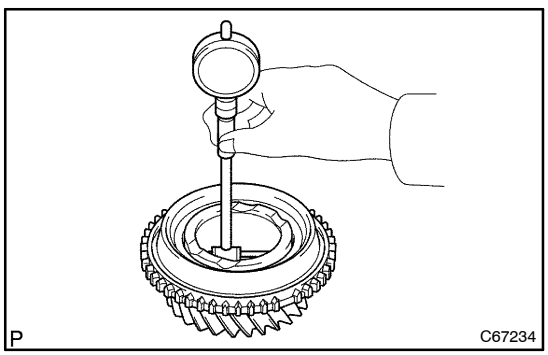
22. INSPECT 2ND GEAR

(a) Using a cylinder gauge, measure the inside diameter of the 2nd gear.
Standard inside clearance:
57.015 – 57.040 mm (2.2447 – 2.2457 in.)
Maximum inside clearance: 57.040 mm (2.2457 in.)



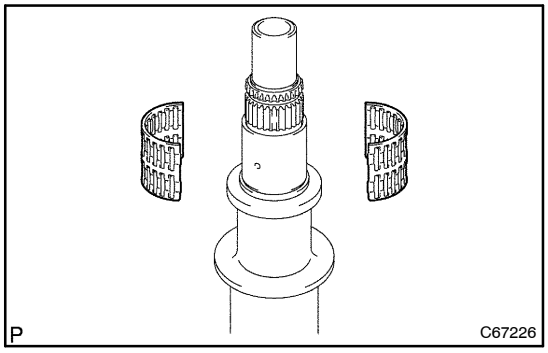
23. INSPECT 3RD GEAR

(a) Using a cylinder gauge, measure the inside diameter of the 3rd gear.
Standard inside clearance:
65.015 – 65.040 mm (2.5596 – 2.5606 in.)
Maximum inside clearance: 65.040 mm (2.5606 in.)



24. INSPECT 5TH GEAR

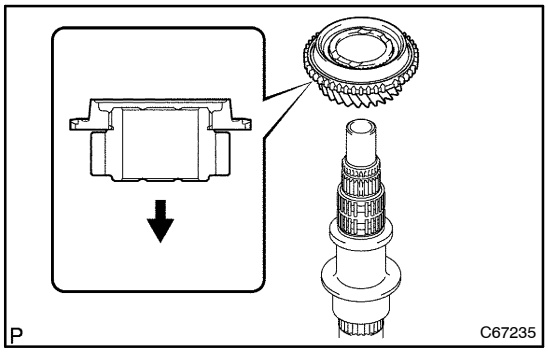
(a) Using a cylinder gauge, measure the inside diameter of the 3rd gear.
Standard inside clearance:
44.015 – 44.040 mm (1.7329 – 1.7339 in.)
Maximum inside clearance: 44.040 mm (1.7339 in.)



25. INSTALL 5TH GEAR NEEDLE ROLLER BEARING

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

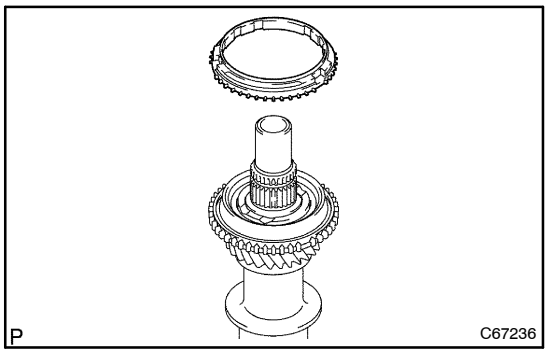
(b) Install the needle roller bearing to the output shaft.



26. INSTALL 5TH GEAR

(a) Apply gear oil to the 5 th gear.

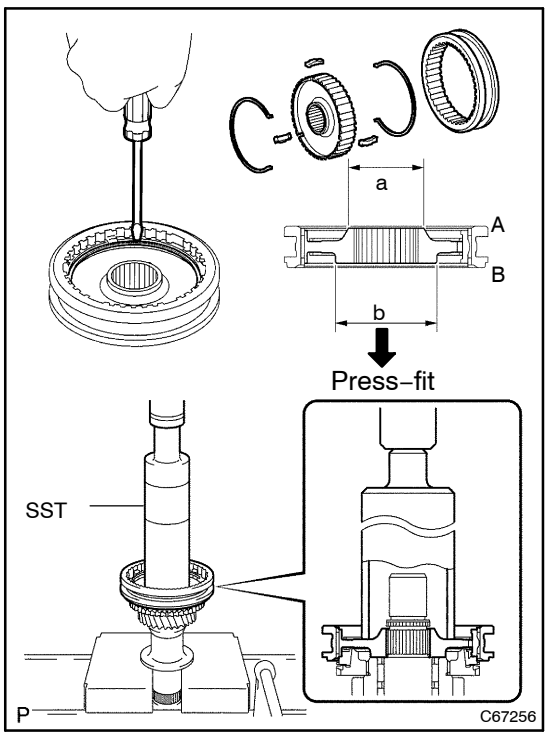
(b) Install the 5 th gear to the output shaft.



27. INSTALL 5TH GEAR SYNCHRONIZER RING

(a) Apply gear oil to the synchronizer ring.

(b) Install the synchronizer ring to the 5th gear.



28. INSTALL TRANSMISSION CLUTCH HUB NO.3

(a) Install the hub sleeve No. 3 to the clutch hub No. 3.

NOTICE:

The orientation of the clutch hub can be recognized by the dimensions (a, b) of the boss part.

The orientation of the hub sleeve can be recognized by the shape (A, B) of the outer circumference.

(b) Using a screwdriver, install the 3 shifting keys and 2 shifting key springs.

NOTICE:

The opening part of the key spring must not be placed in the same direction.

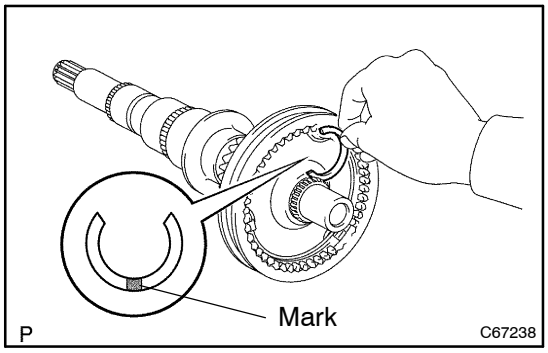
(c) Using SST and a press, press in the clutch hub No. 3 assy.
SST 09316–60011 (09316–00011)

NOTICE:

Take care not to install the clutch hub No. 3 assembly in the wrong direction.

Aligning the key groove of the 5th gear synchronizer ring with synchromesh shifting key, install them.

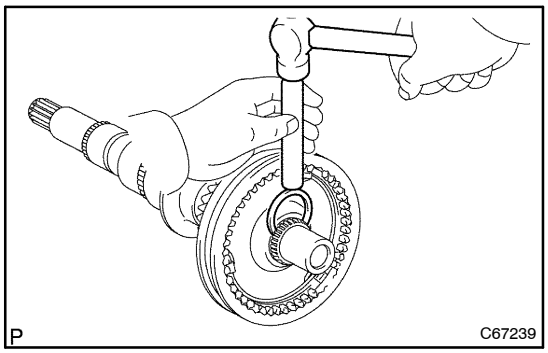
(d) Check that the 5 th gear rotates smoothly and that the 5th gear synchronizer ring is not stuck.



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

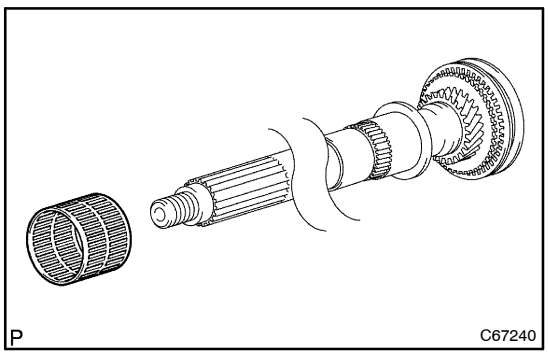
(a) Select a snap ring that allows the minimum axial play.

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 – 0.0846)
9	2.15 – 2.20 (0.0846 – 0.0866)



(b) Using a brass bar and hammer, tap in a new snap ring.

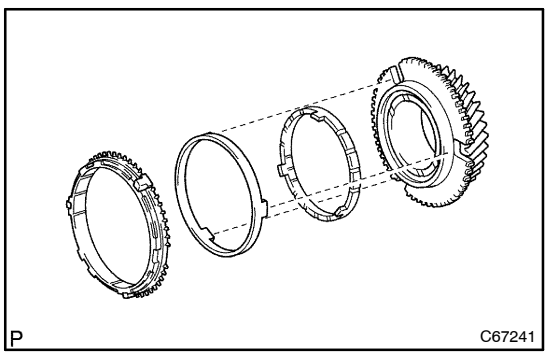
30. INSPECT 5TH GEAR THRUST CLEARANCE (See step 1)



31. INSTALL 3RD GEAR NEEDLE ROLLER BEARING

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

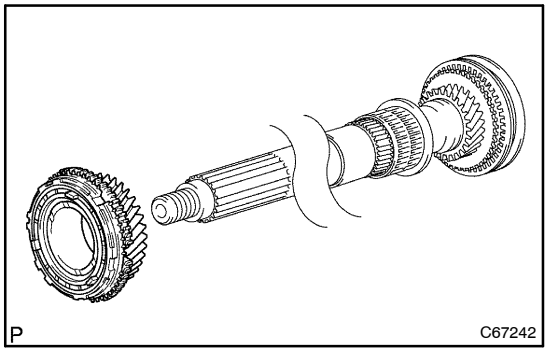
(b) Install the needle roller bearing to the output shaft.



32. INSTALL SYNCHRONIZER RING SET NO.3

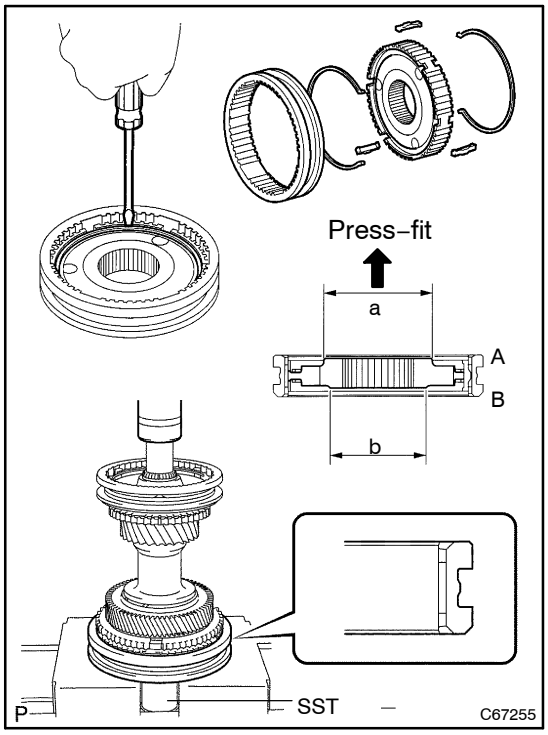
(a) Apply gear oil to the taper cone of the synchronizer ring set No. 3.

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



33. INSTALL 3RD GEAR

(a) Apply gear oil to the 3rd gear.
(b) Install the 3rd gear to the output shaft.



34. INSTALL TRANSMISSION CLUTCH HUB NO.2

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

NOTICE:

The orientation of the clutch hub can be recognized by the dimensions (a, b) of the boss part.

The orientation of the hub sleeve can be recognized by the shape (A, B) of the outer circumference.

(b) Using a screwdriver, install the 3 shifting keys and 2 shifting key springs.

NOTICE:

The opening part of the key spring must not be placed in the same direction.

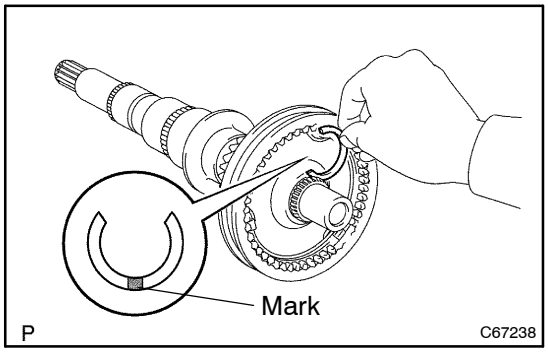
(c) Using SST and a press, press in the clutch hub No. 2 assy.
SST 09316–20011

NOTICE:

Take care not to install the clutch hub No. 2 assembly in the wrong direction.

Aligning the key groove of the synchronizer ring set No. 3 outer ring with synchromesh shifting key, install them.

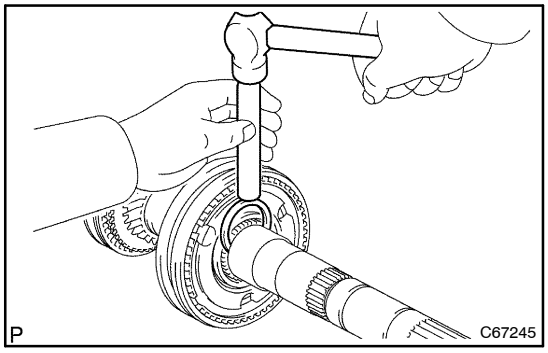
(d) Check that the 3rd gear rotates smoothly and that the synchronizer ring is not stuck.



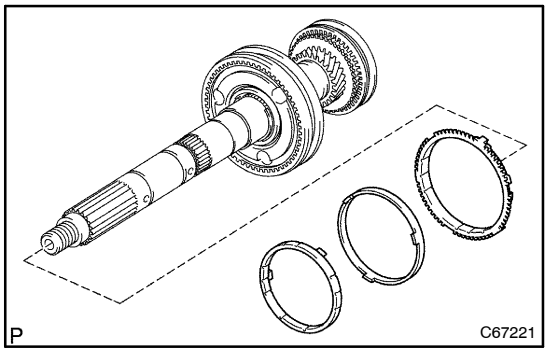
35. INSTALL CLUTCH HUB NO.1 SHAFT SNAP RING

(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)

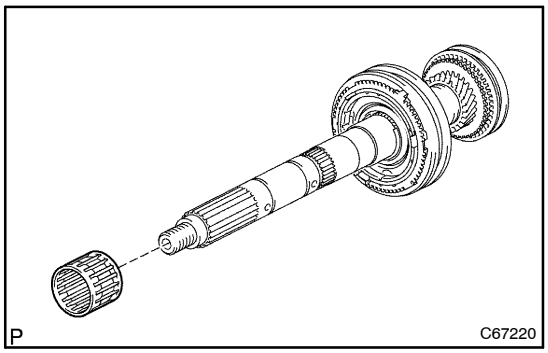


(b) Using a brass bar and hammer, tap in the snap ring.



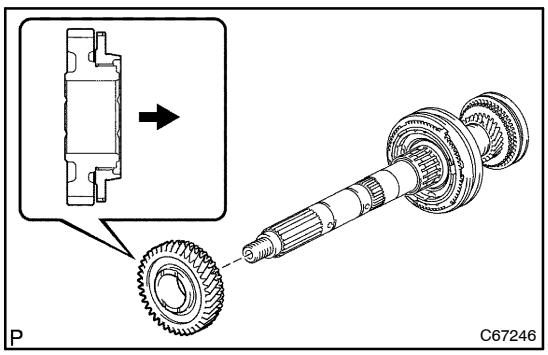
36. INSTALL SYNCHRONIZER RING SET NO.2

(a) Apply gear oil to the taper cone of the synchronizer ring.
(b) Install the synchronizer ring set No. 2 to the clutch hub No. 2 assy and align the ring slots with the shifting keys.



37. INSTALL 2ND GEAR NEEDLE ROLLER BEARING

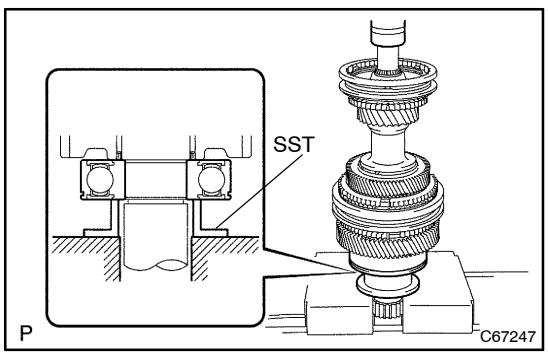
(a) Apply gear oil to the needle roller bearing.
(b) Install the needle roller bearing to the output shaft.



38. INSTALL 2ND GEAR

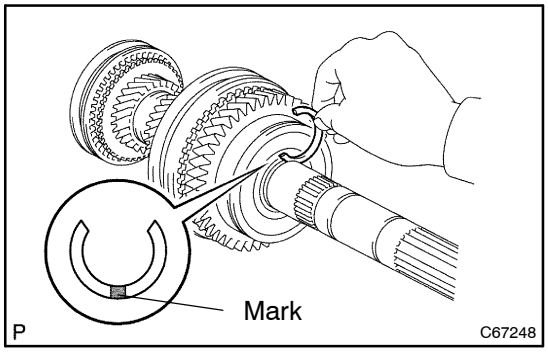
(a) Apply gear oil to the 2 nd gear.
(b) Install the 2 nd gear to the output shaft.

HINT:
Align the cut–out of the second gear with the claw of the middle ring of the synchronizer ring set No. 2.



39. INSTALL OUTPUT SHAFT CENTER BEARING

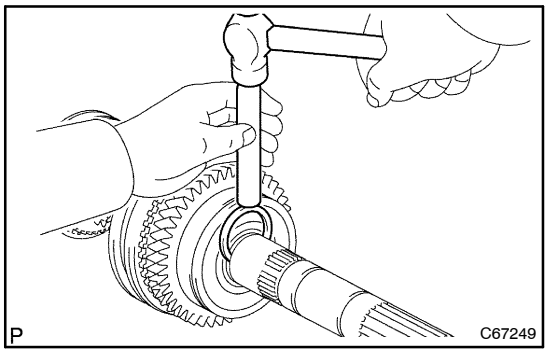
(a) Using SST and a press, press in a new bearing.
(b) Check that the bearing and 2nd gear rotates smoothly and that the synchronizer ring is not stuck.



40. 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 brass bar and hammer, tap in the snap ring.

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

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

43. INSPECT 5TH GEAR RADIAL CLEARANCE (See step 2)

44. INSPECT 3RD GEAR RADIAL CLEARANCE (See step 2)

45. INSPECT 2ND GEAR RADIAL CLEARANCE (See step 2)