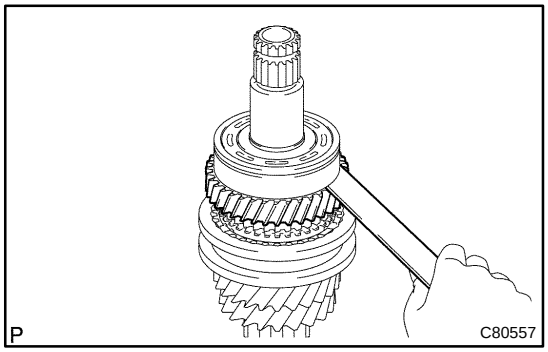
410F5–01

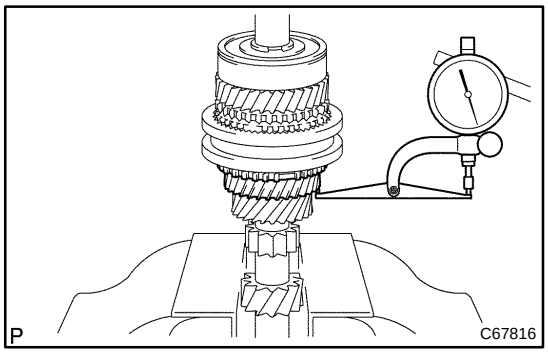
OVERHAUL



1. INSPECT 4TH GEAR THRUST CLEARANCE

(a) Using a feeler gauge, measure the 4th gear thrust clearance.

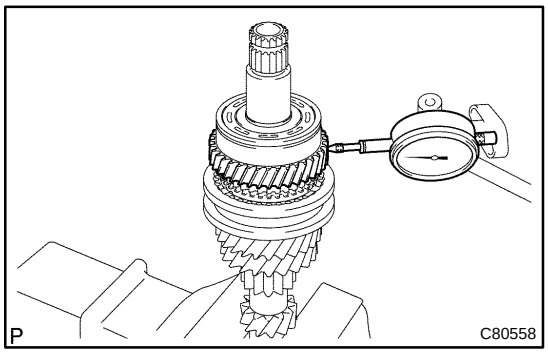
Standard clearance:
0.1 to 0.55 mm (0.0039 to 0.0217 in.)
Maximum clearance:
0.55 mm (0.0217 in.)



2. INSPECT 3RD GEAR THRUST CLEARANCE

(a) Using a dial gauge, measure the 3rd gear thrust clearance.

Standard clearance:
0.1 to 0.35 mm (0.0039 to 0.0138 in.)
Maximum clearance:
0.35 mm (0.0138 in.)

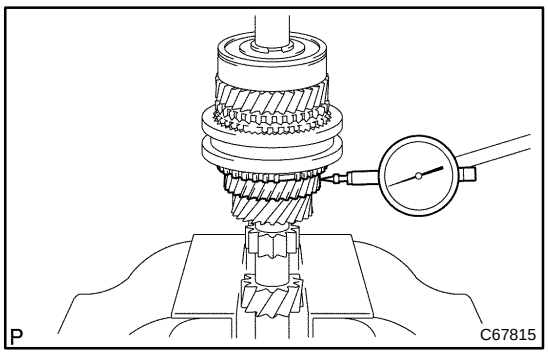


3. INSPECT 4TH GEAR RADIAL CLEARANCE

(a) Using a dial indicator, measure the 4th gear radial clearance between the gear and shaft.

Standard clearance:
0.009 to 0.050 mm (0.0004 to 0.0020 in.)
Maximum clearance:
0.050 mm (0.0020 in.)

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

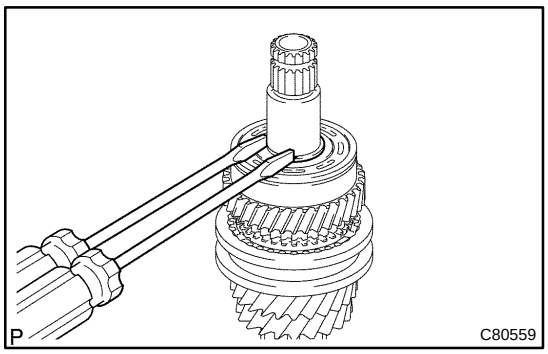


4. INSPECT 3RD GEAR RADIAL CLEARANCE

(a) Using a dial gauge, measure the 3rd gear radial clearance between the gear and shaft.

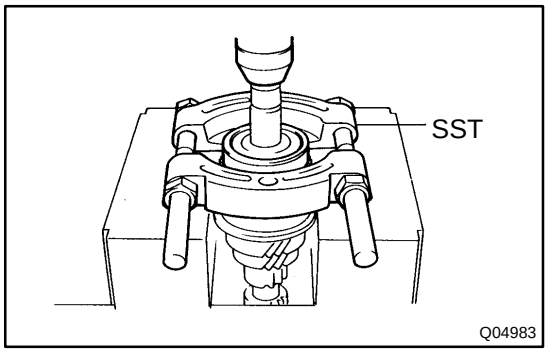
Standard clearance:
KOYO made:
0.015 to 0.058 mm (0.0006 to 0.0023 in.)
NSK made:
0.015 to 0.056 mm (0.0006 to 0.0022 in.)
Maximum clearance:
KOYO made: 0.058 mm (0.0023 in.)
NSK made: 0.056 mm (0.0022 in.)

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



5. REMOVE 4TH GEAR

(a) Using 2 screwdrivers and a hammer, remove the input shaft rear bearing shaft snap ring from the input shaft.

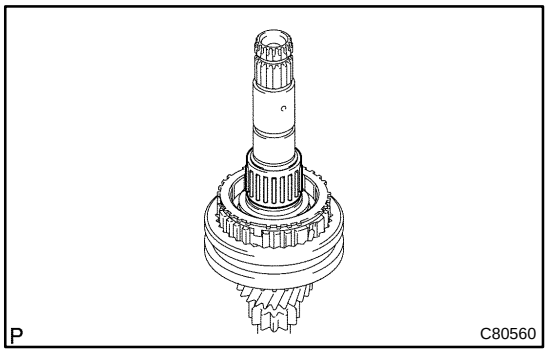


(b) Using SST and a press, remove the input shaft rear radial ball bearing and 4th gear from input shaft.

NOTICE:

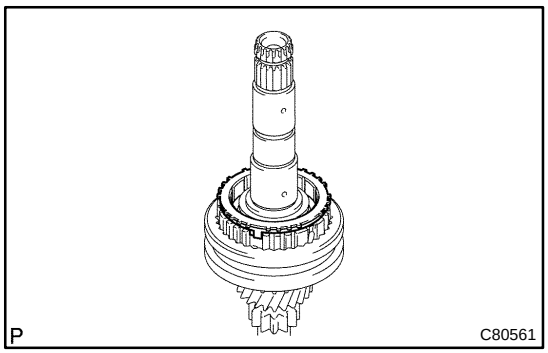
Do not tighten SST excessively.

SST 09950–00020



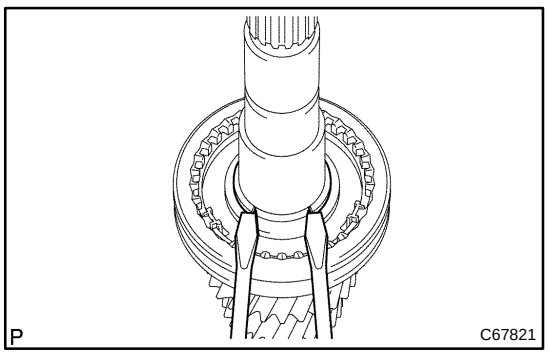
6. REMOVE 4TH GEAR NEEDLE ROLLER BEARING

(a) Remove the 4th gear needle roller bearing and 4th gear bearing spacer from the input shaft.



7. REMOVE SYNCHRONIZER RING NO.2 (FOR FOURTH SYNCHRONIZER RING)

(a) Remove synchronizer ring No.2 from transmission clutch hub No.2.

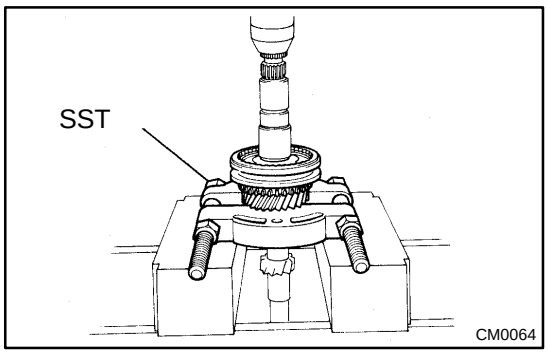


8. REMOVE 3RD GEAR

(a) Using 2 screwdrivers and a hammer, remove the clutch hub No.2 setting shaft snap ring from the input shaft.

NOTICE:

Use a shop rag to keep the snap ring from flying.

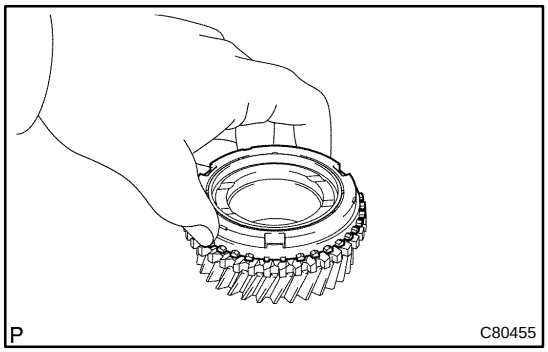


(b) Using SST and a press, remove the transmission clutch hub No.2 and 3rd gear from the input shaft.

NOTICE:

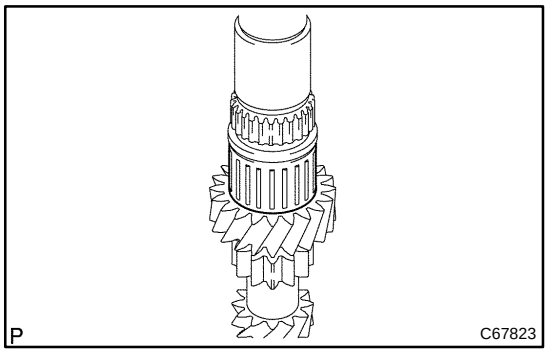
Do not tighten SST excessively.

SST 09950–00020



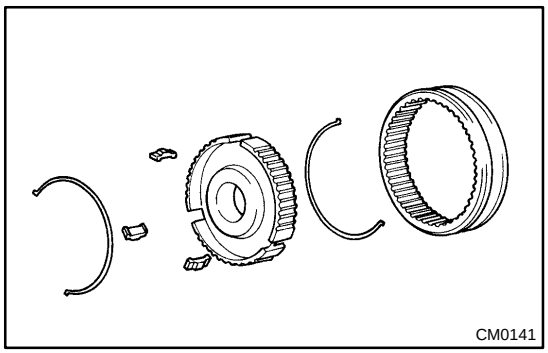
9. REMOVE SYNCHRONIZER RING NO.2 (FOR THIRD SYNCHRONIZER RING)

(a) Remove the synchronizer ring No.2 from the 3rd gear.



10. REMOVE 3RD GEAR NEEDLE ROLLER BEARING

(a) Remove the 3rd gear needle roller bearing from the input shaft.

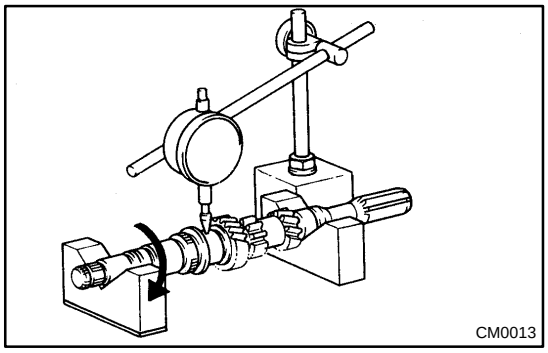


11. REMOVE TRANSMISSION HUB SLEEVE NO.2

(a) Remove the transmission hub sleeve No.2, 3 synchromesh shifting keys No.2 and 2 synchromesh shifting key springs No.2 from the transmission clutch hub No.2.

NOTICE:

Use a shop rag to keep the shifting key and shifting key spring from flying.

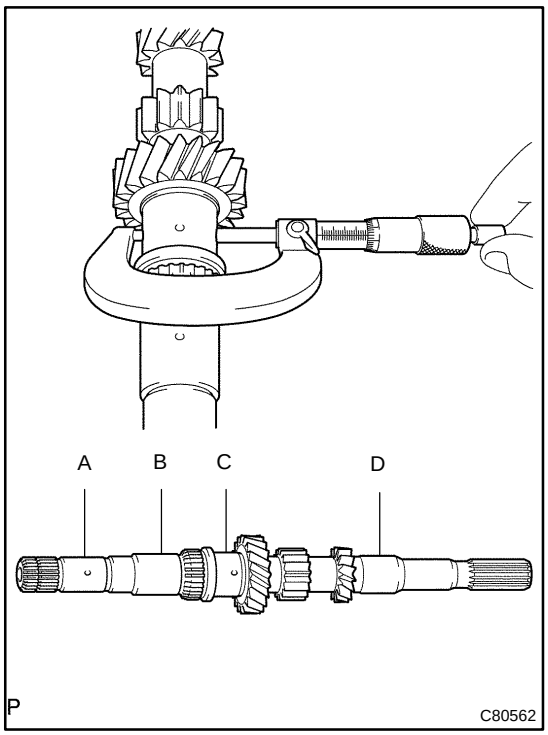


12. INSPECT INPUT SHAFT

(a) Using a dial gauge, check the input shaft runout.

Maximum runout: 0.015 mm (0.00059 in.)

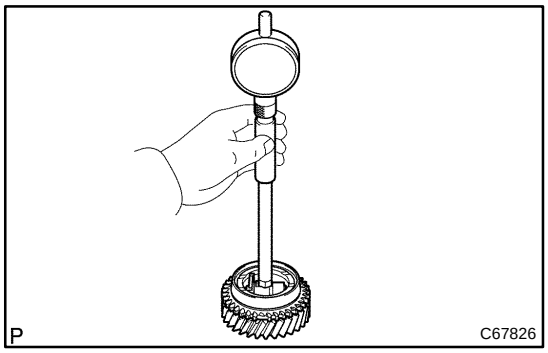
If the runout exceeds the maximum, replace the input shaft.



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

Standard outer diameter:
Part A: 24.885 to 24.900 mm (0.9797 to 0.9803 in.)
Part B: 28.991 to 29.006 mm (1.1414 to 1.1420 in.)
Part C: 30.985 to 31.000 mm (1.2198 to 1.2204 in.)
Part D: 24.985 to 25.000 mm (0.9836 to 0.9842 in.)
Minimum outer diameter:
Part A: 24.885 mm (0.9797 in.)
Part B: 28.991 mm (1.1414 in.)
Part C: 30.985 mm (1.2198 in.)
Part D: 24.985 mm (0.9836 in.)

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

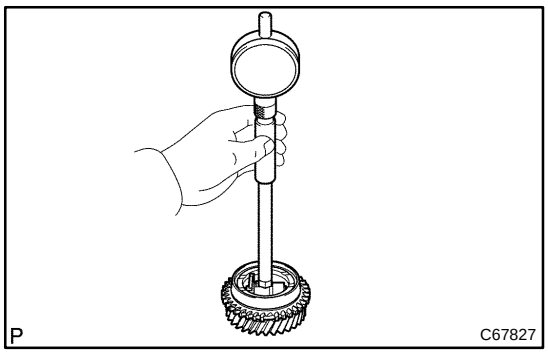


13. INSPECT 4TH GEAR

(a) Using a cylinder gauge, measure the inside diameter of the 4th gear.

Standard clearance:
34.015 to 34.031 mm (1.3391 to 1.3398 in.)
Maximum clearance:
34.031 mm (1.3398 in.)

If the clearance exceeds the maximum, replace the 4th gear.

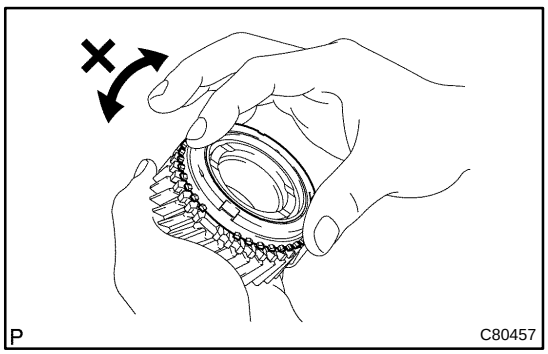


14. INSPECT 3RD GEAR

(a) Using a cylinder gauge, measure the inside diameter of the 3rd gear.

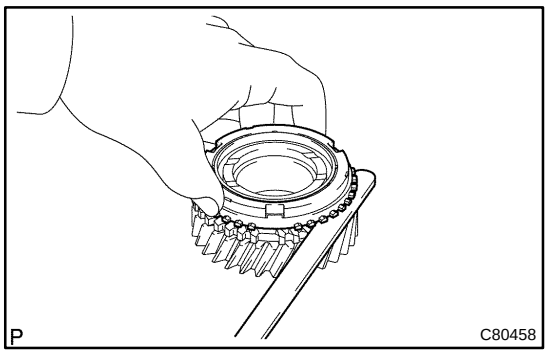
Standard clearance:
36.015 to 36.031 mm (1.4179 to 1.4185 in.)
Maximum clearance:
36.031 mm (1.4185 in.)

If the clearance exceeds the maximum, replace the 3rd gear.



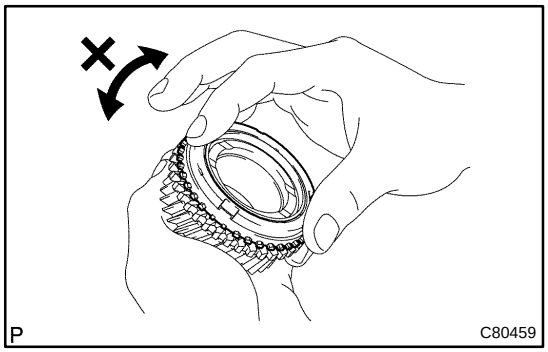
15. INSPECT SYNCHRONIZER RING NO.2 (FOR FOURTH SYNCHRONIZER RING)

(a) Apply gear oil to the cone of the 4th gear and check with the synchronizer ring No.2 contacted by pressure that the gear does not turn in the direction as shown in the illustration.



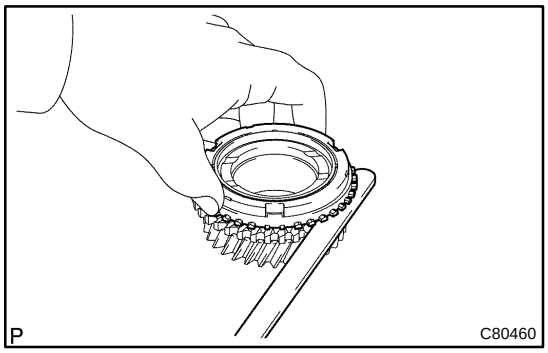
(b) Using a feeler gauge, check the clearance between the synchronizer ring No.2 and 4th gear with the synchronizer ring No.2 contacted to the cone of the 4th gear.
Standard clearance:
0.75 to 1.65 mm (0.0295 to 0.0649 in.)
Minimum clearance:
0.75 mm (0.0295 in)

If the clearance is less than the minimum, replace the synchronizer ring.



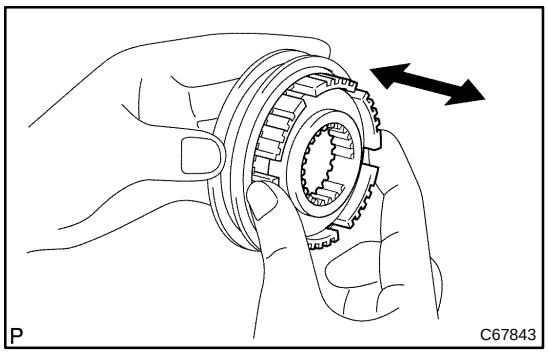
16. INSPECT SYNCHRONIZER RING NO.2 (FOR THIRD SYNCHRONIZER RING)

(a) Apply gear oil to the cone of the 3rd gear and check with the synchronizer ring No.2 contacted by pressure that the gear does not turn in the direction as shown in the illustration.



(b) Using a feeler gauge, check the clearance between the synchronizer No.2 and 3rd gear with the synchronizer ring No.2 contacted to the cone of the 3rd gear.
Standard clearance:
0.75 – 1.65 mm (0.0295 – 0.0650 in.)
Minimum clearance:
0.75 mm (0.0295 in)

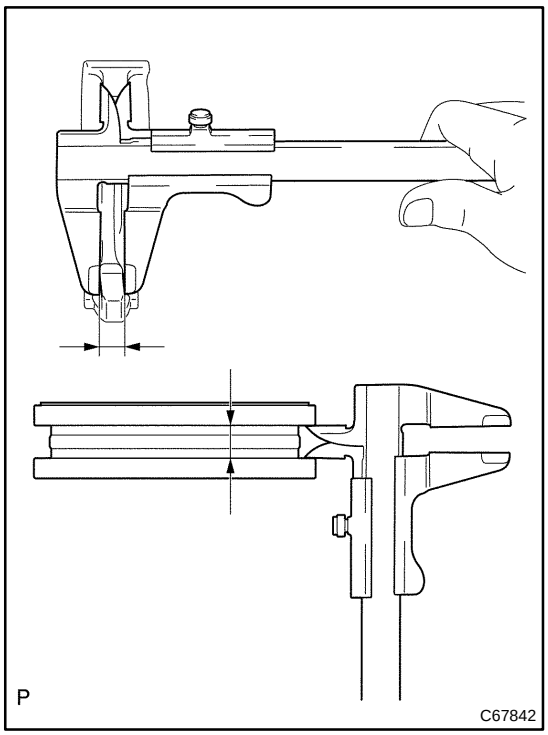
If the clearance is less than the minimum, replace the synchronizer ring .



17. INSPECT TRANSMISSION HUB SLEEVE NO.2

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

(b) Check that the spline gear's edges of the transmission hub sleeve No.2 are not worn down.

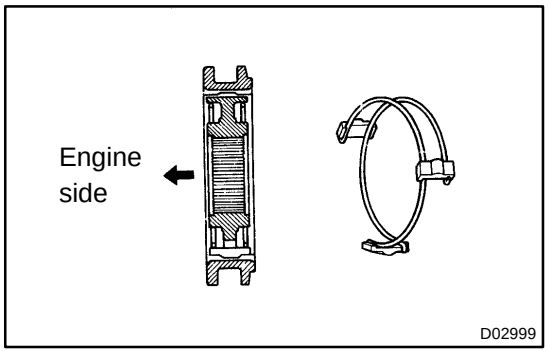


(c) Using vernier calipers, measure the clearance between the transmission hub sleeve No.2 and gear shift fork No.2.

Standard clearance:

0.15 to 0.35 mm (0.0059 to 0.0137 in.)

If the clearance exceeds the standard clearance, replace the transmission hub sleeve No.2 and gear shift fork No.2.



18. INSTALL TRANSMISSION HUB SLEEVE NO.2

(a) Coat the transmission hub sleeve No.2 with gear oil, and install it to the transmission clutch hub No.2.

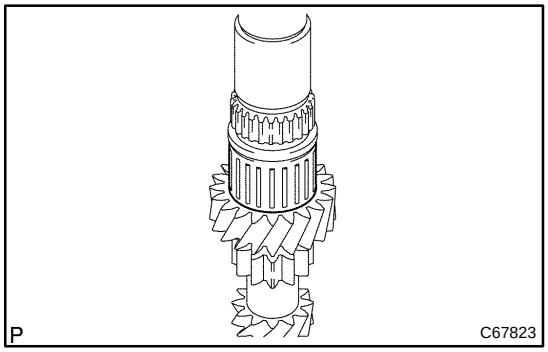
NOTICE:

Do set the transmission hub sleeve No.2 and the transmission clutch hub No.2 in correct orientation.

(b) Install the 2 synchromesh key springs with 3 synchromesh shifting key No.2 to the transmission clutch hub No.2.

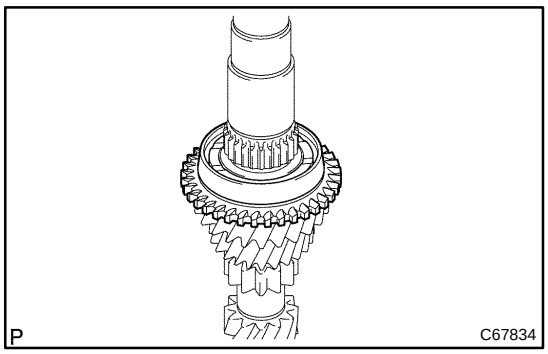
NOTICE:

Do not set both openings of the shifting keys in the same position.



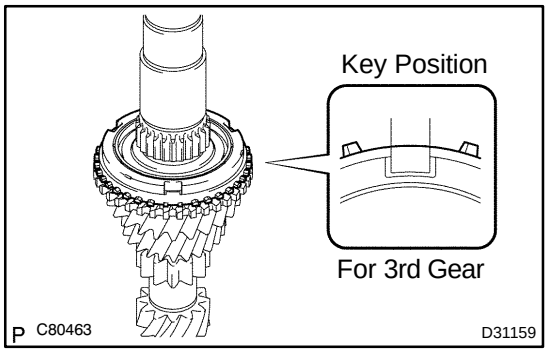
19. INSTALL 3RD GEAR NEEDLE ROLLER BEARING

(a) Coat the 3rd gear needle roller bearing with gear oil, and install it to the input shaft.



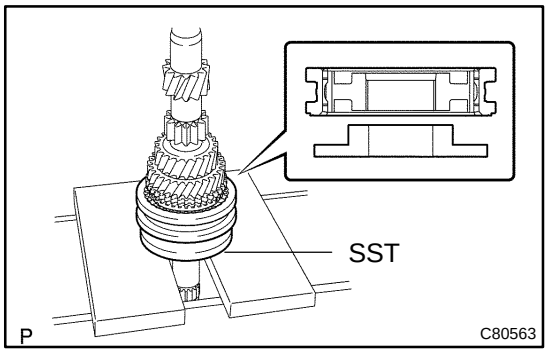
20. INSTALL 3RD GEAR

(a) Coat the 3rd gear with gear oil, and install it to the input shaft.



21. INSTALL SYNCHRONIZER RING NO.2 (FOR THIRD SYNCHRONIZER RING)

(a) Coat the synchronizer ring No.2 with gear oil, install it to the 3rd gear.



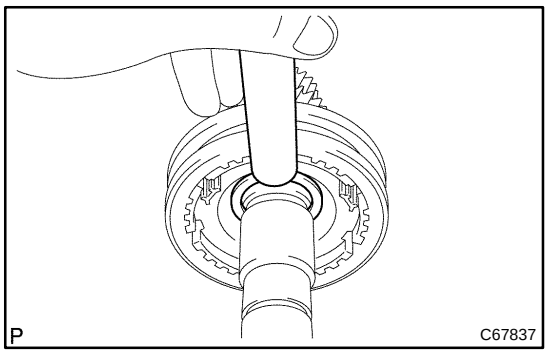
22. INSTALL TRANSMISSION CLUTCH HUB NO.2

(a) Using SST and a press, install the transmission clutch hub No.2 to the input shaft.

SST 09316–60011 (09316–00021)

NOTICE:

Fit the synchromesh shifting key into the groove of the synchronizer ring correctly.



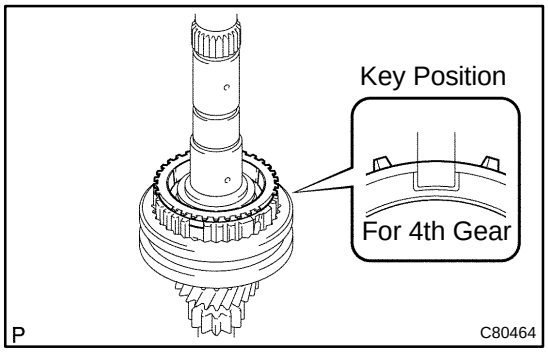
(b) Select a snap ring that will allow minimum axial play.

Standard clearance:

0.1 mm (0.0039 in.) or less.

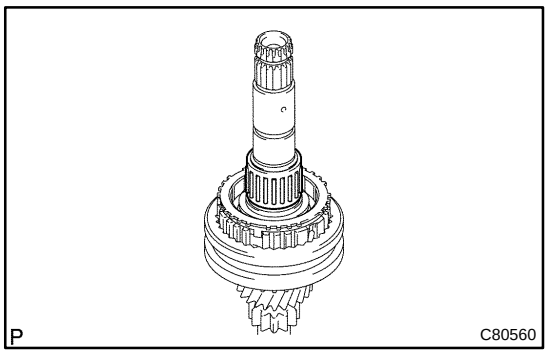
Mark	Thickness mm (in)	Mark	Thickness mm (in)
0	2.30 (0.0906)	3	2.48 (0.0976)
1	2.36 (0.0929)	4	2.54 (0.1000)
2	2.42 (0.0953)	5	2.60 (0.1024)

(c) Using a brass bar and a hammer, and install the snap ring to the input shaft.



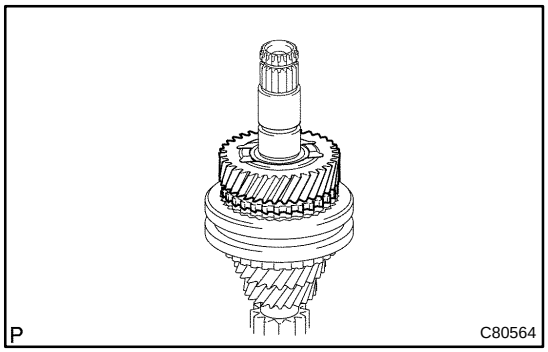
23. INSTALL SYNCHRONIZER RING NO.2 (FOR FOURTH SYNCHRONIZER RING)

(a) Coat the synchronizer ring No.2 with gear oil, install it to the transmission clutch hub No.2.



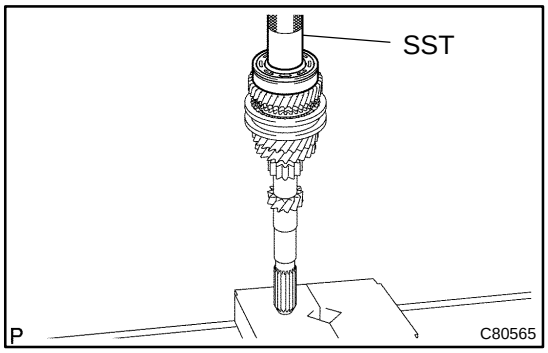
24. INSTALL 4TH GEAR NEEDLE ROLLER BEARING

(a) Coat the 4th gear needle roller bearing and 4th gear bearing spacer with gear oil, and install them to the transmission clutch hub No.2.



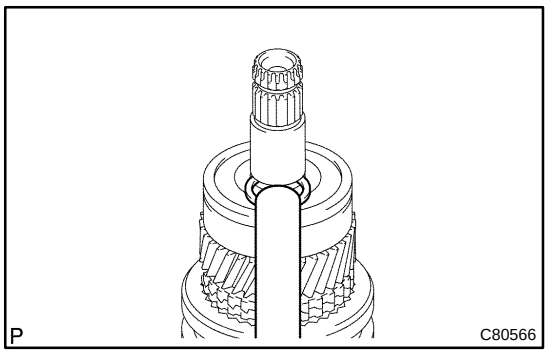
25. INSTALL 4TH GEAR

(a) Coat the 4th gear with gear oil, and install it to the input shaft.



26. INSTALL INPUT SHAFT REAR RADIAL BALL BEARING

(a) Using SST and a press, install the input shaft rear radial ball bearing to the input shaft.
SST 09608–04031

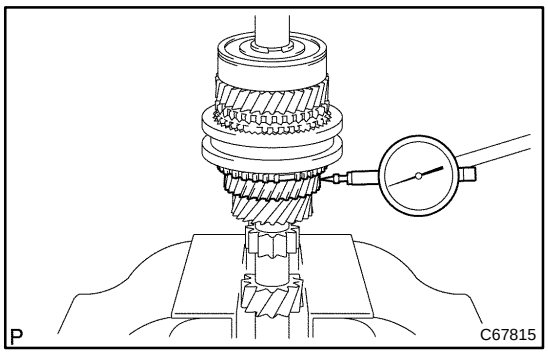


(b) Select a snap ring that will allow minimum axial play.
Standard clearance:
0.1 mm (0.0039 in.) or less

Mark	Thickness mm (in)	Mark	Thickness mm (in)
A	2.29 (0.0901)	D	2.47 (0.0972)
B	2.35 (0.0925)	E	2.53 (0.0996)
C	2.41 (0.0948)	F	2.59 (0.1019)

If the clearance is less than the limit, replace the input shaft rear radial ball bearing.

(c) Using a brass bar and a hammer, and install the snap ring to the input shaft.

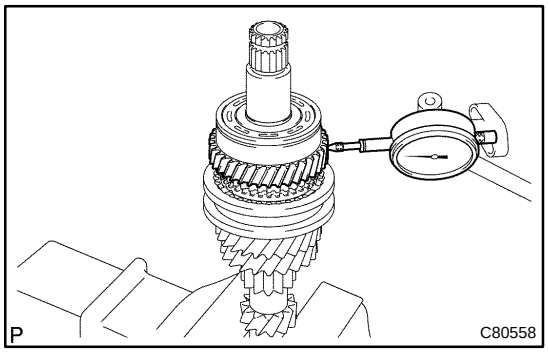


27. INSPECT 3RD GEAR RADIAL CLEARANCE

(a) Using a dial gauge, measure the radial clearance between the 3rd gear.

Standard clearance:
KOYO made:
0.015 to 0.058 mm (0.0006 to 0.0023 in.)
NSK made:
0.015 to 0.056 mm (0.0006 to 0.0022 in.)

If the clearance is less than the limit, replace the 3rd gear.

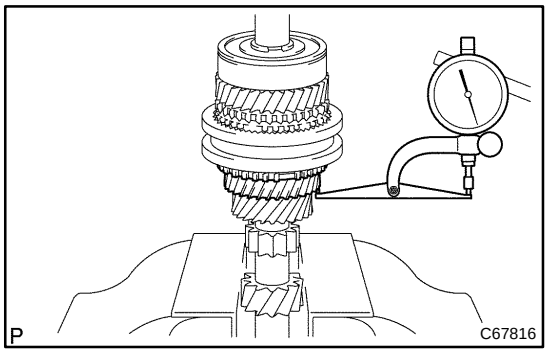


28. INSPECT 4TH GEAR RADIAL CLEARANCE

(a) Using a dial gauge, measure the radial clearance between the 4th gear.

Standard clearance:
KOYO made:
0.009 to 0.050 mm (0.0004 to 0.0020 in.)
NSK made:
0.009 to 0.050 mm (0.0004 to 0.0020 in.)

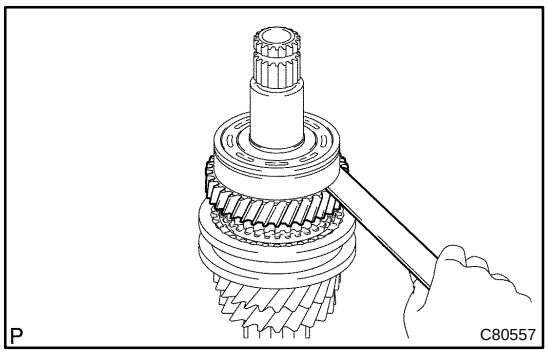
If the clearance is less than the limit, replace the 4th gear.



29. INSPECT 3RD GEAR THRUST CLEARANCE

(a) Using a dial gauge, measure the 3rd thrust clearance.

Standard clearance:
0.1 to 0.35 mm (0.0039 to 0.0138 in.)



30. INSPECT 4TH GEAR THRUST CLEARANCE

(a) Using a feeler gauge, measure the 4th thrust clearance.

Standard clearance:
0.1 to 0.55 mm (0.0039 to 0.0217 in.)

If the clearance is less than the limit, replace the 4th gear.