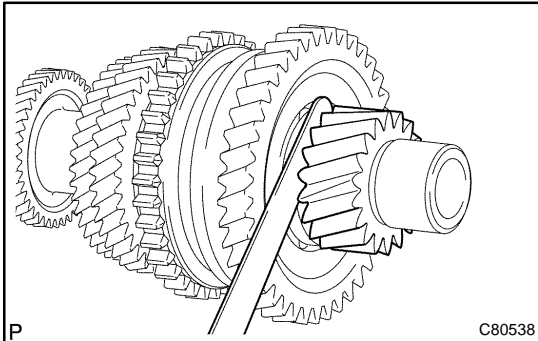


## OVERHAUL



### 1. INSPECT 1ST GEAR THRUST CLEARANCE

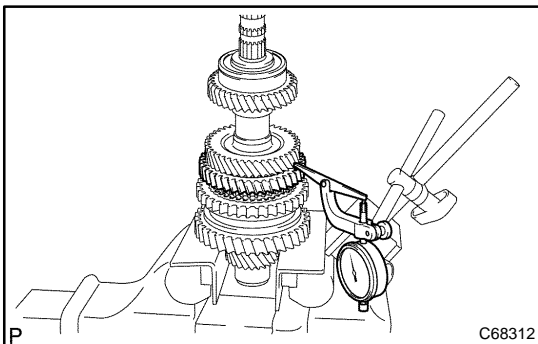
- (a) Using a feeler gauge, measure the 1st gear thrust clearance.

**Standard clearance:**

**0.10 to 0.40 mm (0.0039 to 0.0157 in.)**

**Maximum clearance:**

**0.40 mm (0.0157 in.)**



### 2. INSPECT 2ND GEAR THRUST CLEARANCE

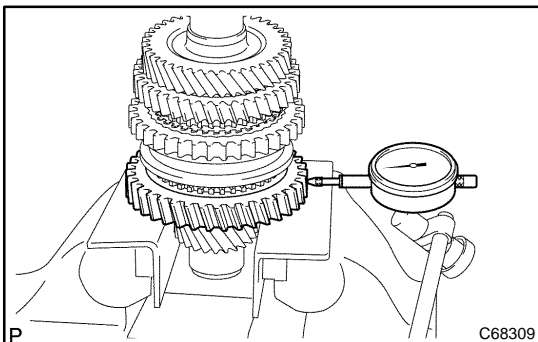
- (a) Using a dial gauge, measure the 2nd gear thrust clearance.

**Standard clearance:**

**0.10 to 0.45 mm (0.0039 to 0.0177 in.)**

**Maximum clearance:**

**0.45 mm (0.0177 in.)**



### 3. INSPECT 1ST GEAR RADIAL CLEARANCE

- (a) Using a dial gauge, measure the 1st 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:**

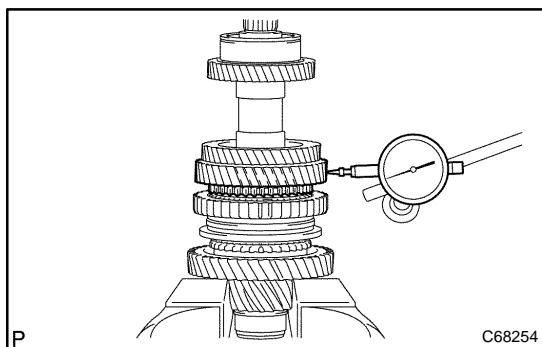
**0.015 to 0.056 mm (0.0006 to 0.0022 in.)**

**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.



#### 4. INSPECT 2ND GEAR RADIAL CLEARANCE

- (a) Using a dial gauge, measure the 2nd 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:**

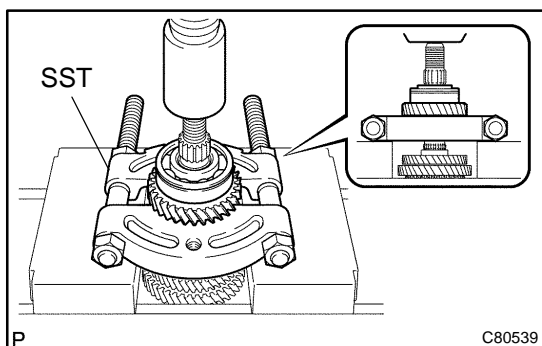
**0.015 to 0.056 mm (0.0006 to 0.0022 in.)**

**Maximum clearance:**

**KOYO made: 0.058 mm (0.0023 in.)**

**NSK made: 0.056 mm (0.0022 in.)**

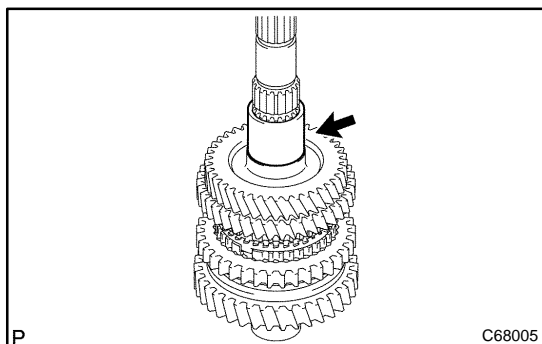
If the clearance exceeds the maximum, replace the 2nd gear needle roller bearing.



#### 5. REMOVE 4TH DRIVEN GEAR

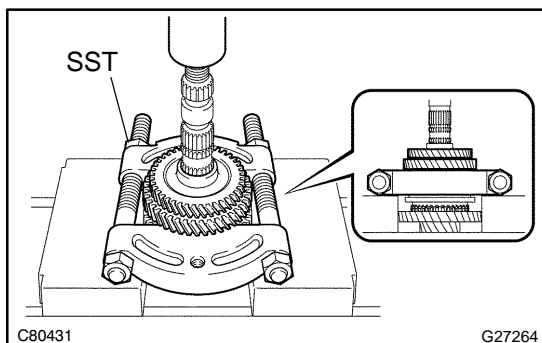
- (a) Using SST and a press, remove the output shaft rear bearing and 4th driven gear from the output shaft.

SST 09950-00020



#### 6. REMOVE OUTPUT GEAR SPACER

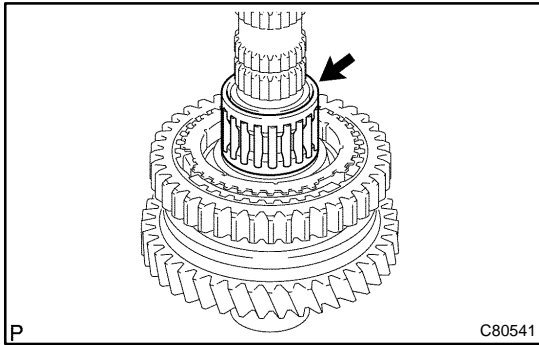
- (a) Remove the output gear spacer from the output shaft.



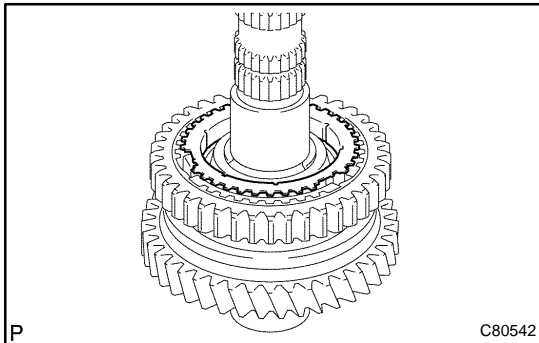
#### 7. REMOVE 2ND GEAR

- (a) Using SST, remove the 3rd driven gear and 2nd gear from the output shaft.

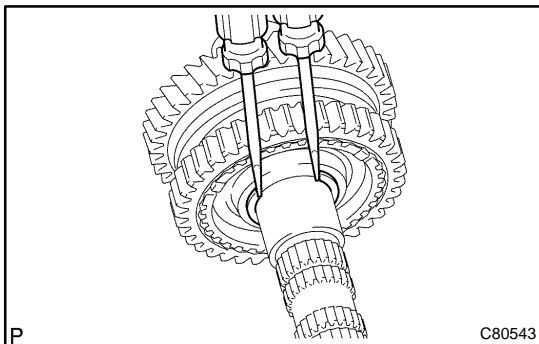
SST 09950-00020

**8. REMOVE 2ND GEAR NEEDLE ROLLER BEARING**

- (a) Remove the 2nd gear needle roller bearing and 2nd gear bearing spacer from the output shaft.

**9. REMOVE SYNCHRONIZER RING NO.1 (FOR SECOND SYNCHRONIZER RING)**

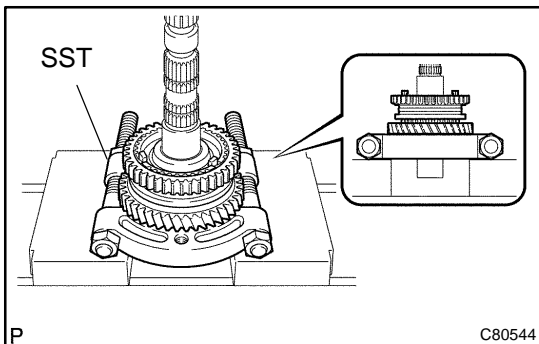
- (a) Remove the synchronizer ring No.1 from the output shaft.

**10. REMOVE 1ST GEAR**

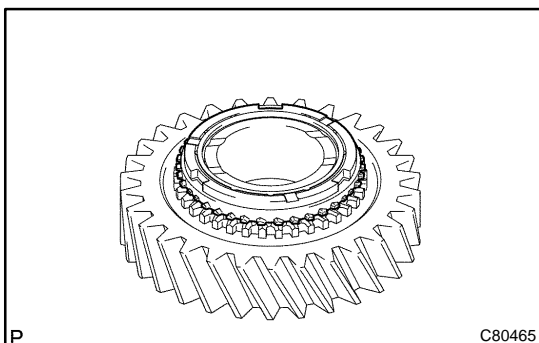
- (a) Using 2 screwdrivers and a hammer, remove the clutch hub No.1 shaft snap ring from the output shaft.

**NOTICE:**

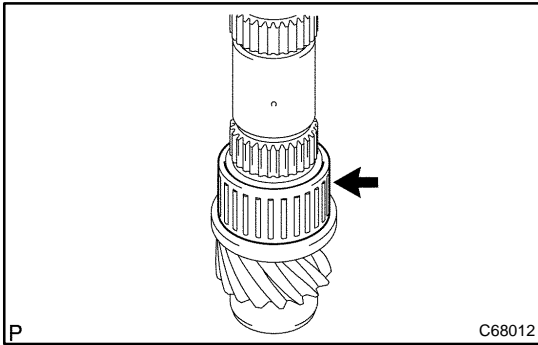
Use a shop rag to keep the shaft snap ring from flying.



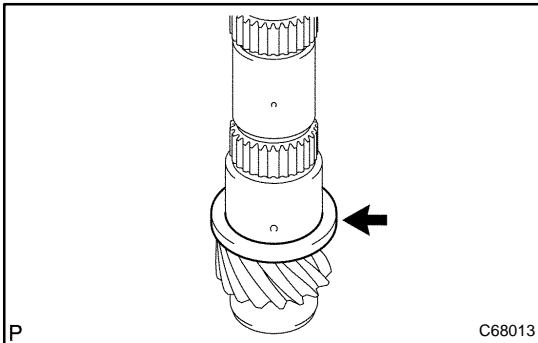
- (b) Using SST and a press, remove the clutch hub No.1 assy and 1st gear from the output shaft.  
SST 09950-00020

**11. REMOVE SYNCHRONIZER RING NO.1 (FOR FIRST SYNCHRONIZER RING)**

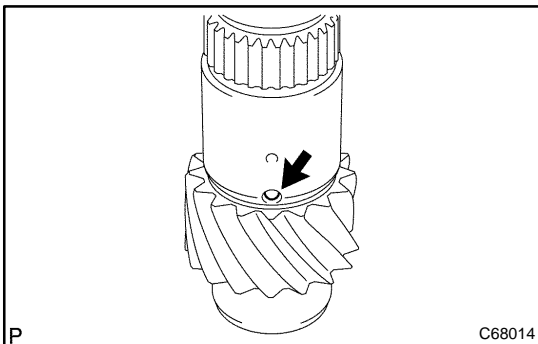
- (a) Remove the synchronizer ring No.1 from the 1st gear.

**12. REMOVE 1ST GEAR NEEDLE ROLLER BEARING**

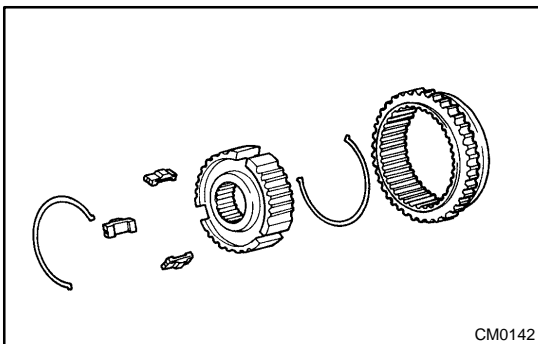
- (a) Remove the 1st gear needle roller bearing from the output shaft.

**13. REMOVE 1ST GEAR THRUST WASHER**

- (a) Remove the 1st gear thrust washer from the output shaft.

**14. REMOVE 1ST GEAR THRUST WASHER PIN OR BALL**

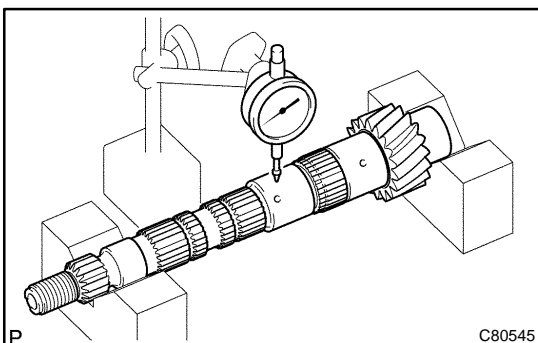
- (a) Remove the 1st gear thrust washer pin or ball from the output shaft.

**15. REMOVE REVERSE GEAR**

- (a) Remove the reverse gear, 3 synchromesh shifting key No.1 and 2 synchromesh shifting key spring No.1 from the transmission clutch hub No.1.

**NOTICE:**

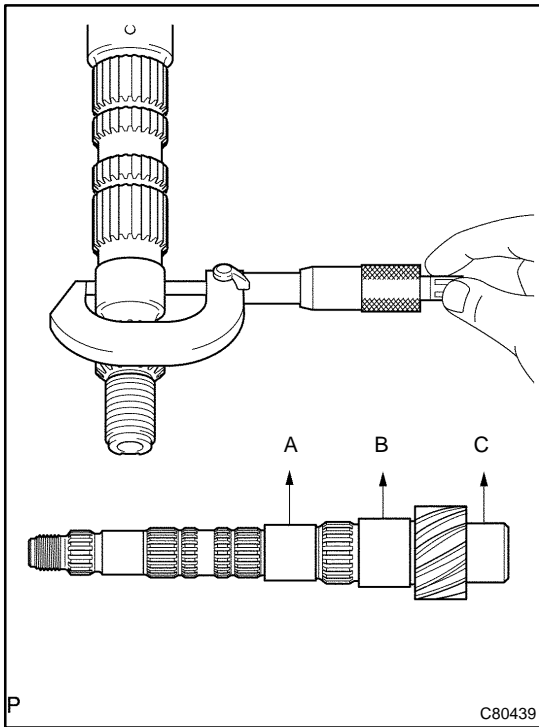
Use a shop rag to keep the shifting key and shifting key spring from flying.

**16. INSPECT OUTPUT SHAFT**

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

**Maximum runout: 0.015 mm (0.0006 in.)**

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



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

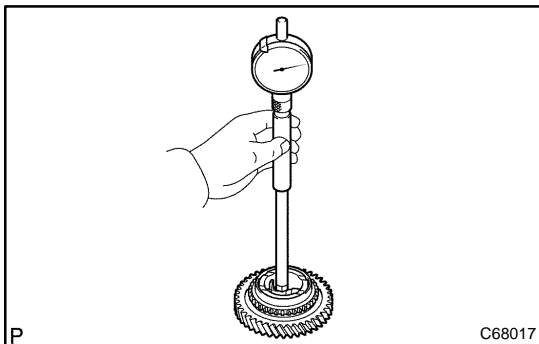
**Standard outer diameter:**

**Part A: 31.985 to 32.000 mm (1.2592 to 1.2598 in.)**

**Part B: 37.985 to 38.000 mm (1.4955 to 1.2598 in.)**

**Part C: 32.985 to 33.000 mm (1.2986 to 12.992 in.)**

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



#### 17. INSPECT 2ND GEAR

- (a) Using a cylinder gauge, measure the clearance of the 2nd gear.

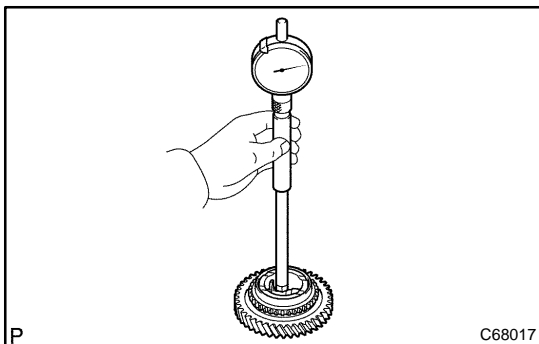
**Standard clearance:**

**38.015 to 38.031 mm (1.4967 to 1.4972 in.)**

**Maximum clearance:**

**38.031 mm (1.4972 in.)**

If the clearance exceeds the maximum, replace the 1st gear.



#### 18. INSPECT 1ST GEAR

- (a) Using a cylinder gauge, measure the clearance of the 1st gear.

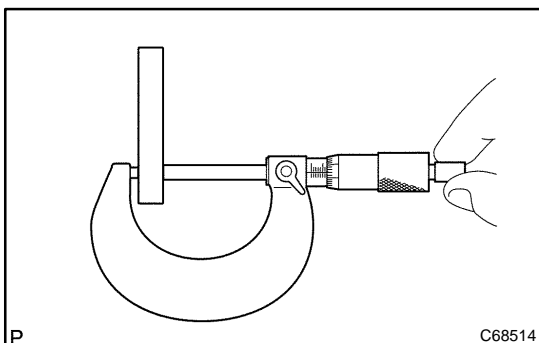
**Standard clearance:**

**44.015 to 44.031 mm (1.7328 to 1.7335 in.)**

**Maximum clearance:**

**44.031 mm (1.7335 in.)**

If the clearance exceeds the maximum, replace the 1st gear.



#### 19. INSPECT 1ST GEAR THRUST WASHER

- (a) Using a micrometer, measure the 1st gear thrust washer.

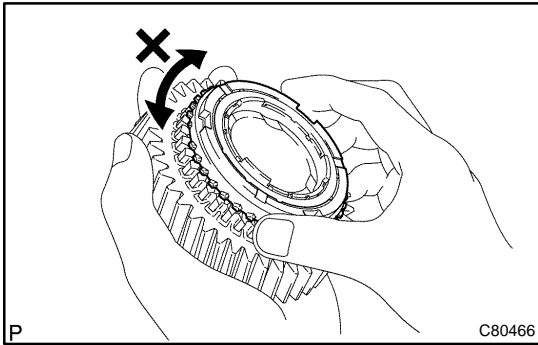
**Standard thickness:**

**5.975 to 6.025 mm (0.2352 to 0.2372 in.)**

**Minimum thickness:**

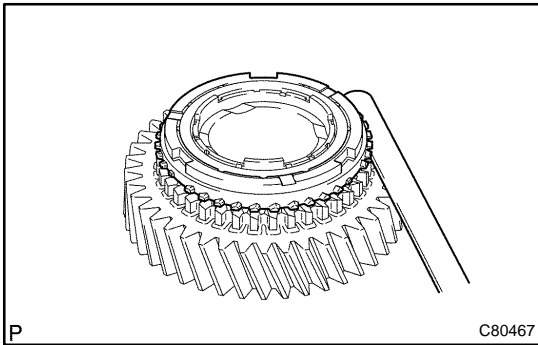
**5.975 mm (0.2352 in.)**

If the clearance exceeds the minimum, replace the 1st gear.



## 20. INSPECT SYNCHRONIZER RING NO.1 (FOR SECOND SYNCHRONIZER RING)

- (a) Coat the 2nd gear with gear oil. 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.



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

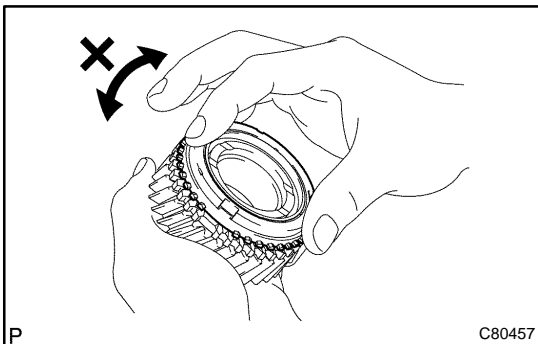
**Standard clearance:**

**0.75 to 1.65 mm (0.0295 to 0.0650 in.)**

**Minimum clearance:**

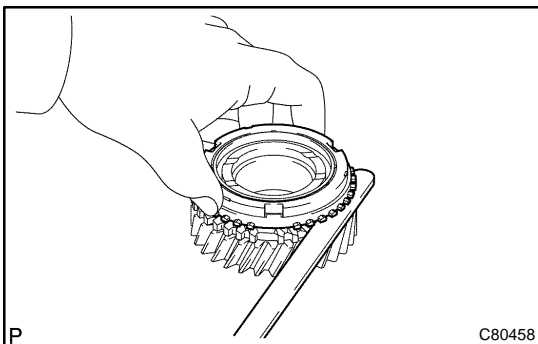
**0.75 mm (0.0295 in.)**

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



## 21. INSPECT SYNCHRONIZER RING NO.1 (FOR FIRST SYNCHRONIZER RING)

- (a) Coat the 1st gear cone with gear oil. 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.



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

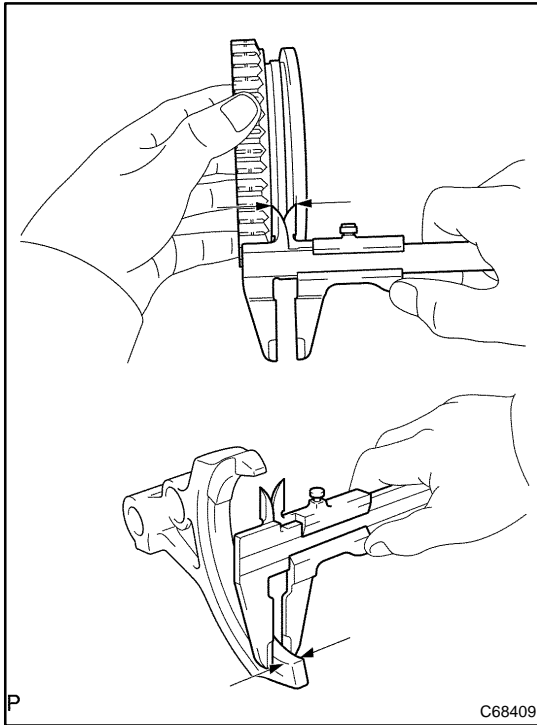
**Standard clearance:**

**0.75 to 1.65 mm (0.0295 to 0.0650 in.)**

**Minimum clearance:**

**0.75 mm (0.0295 in.)**

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

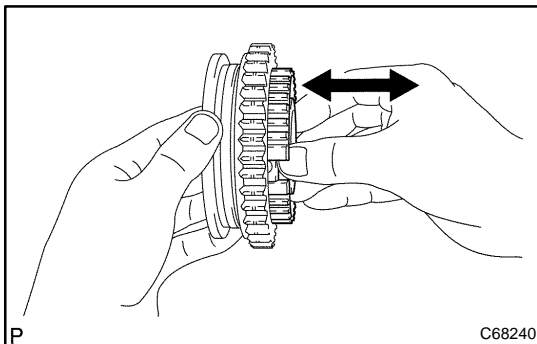


## 22. INSPECT REVERSE GEAR

- (a) Using vernier calipers, measure the clearance between the reverse gear and shift fork.

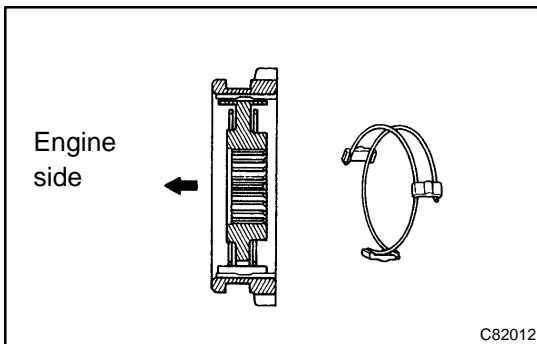
**Maximum clearance: 0.35 mm (0.014 in.)**

If the clearance exceeds the maximum, replace the shift fork and reverse gear.



## 23. INSPECT TRANSMISSION CLUTCH HUB NO.1

- (a) Check that the transmission clutch hub No.1 and reverse gear slide smoothly.
- (b) Check that the spline gear's edges of the reverse gear are not worn down.



## 24. INSTALL REVERSE GEAR

- (a) Coat the reverse gear with gear oil, and install it to the transmission clutch hub No.1.

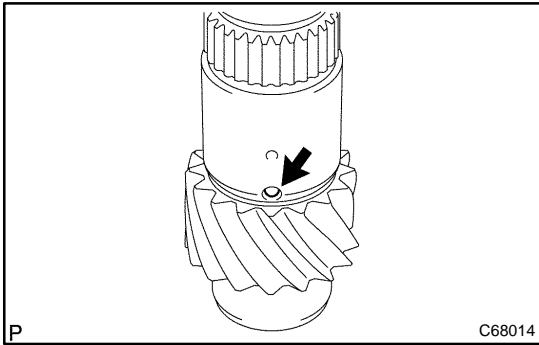
### NOTICE:

**Do set the reverse gear and transmission clutch hub No.1 in correct orientation.**

- (b) Install the 2 synchromesh shifting key spring No.1 and 3 synchromesh key No.1 to the transmission clutch hub No.1.

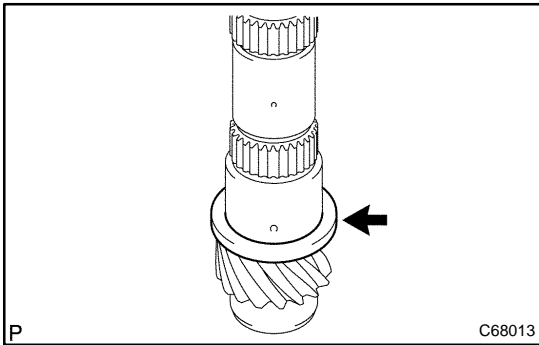
### NOTICE:

**Do not set both openings of the shifting key springs in the same position.**



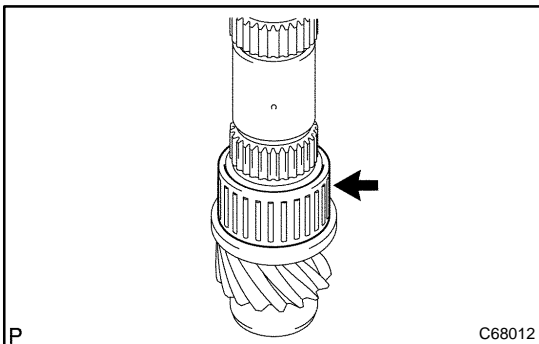
**25. INSTALL 1ST GEAR THRUST WASHER PIN OR BALL**

- (a) Coat the 1st gear thrust washer pin or ball with gear oil, and install it to the output shaft.



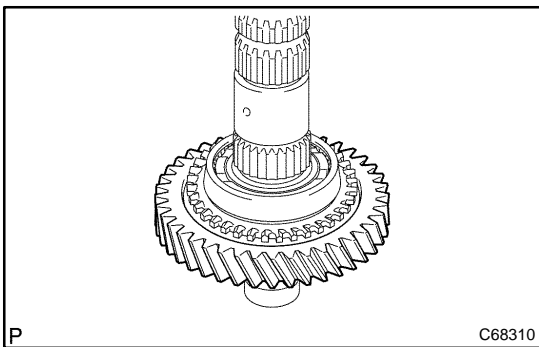
**26. INSTALL 1ST GEAR THRUST WASHER**

- (a) Coat the 1st gear thrust washer with gear oil, and install it to the output shaft.



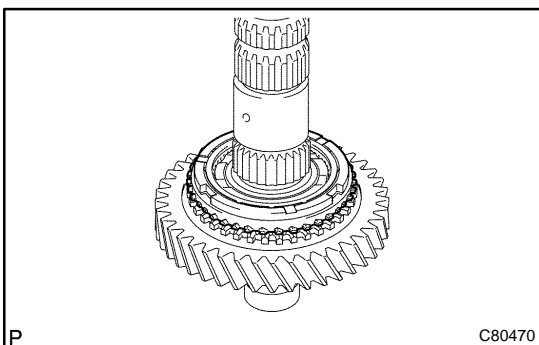
**27. INSTALL 1ST GEAR NEEDLE ROLLER BEARING**

- (a) Coat the 1st gear needle roller bearing with gear oil, and install it to the output shaft.



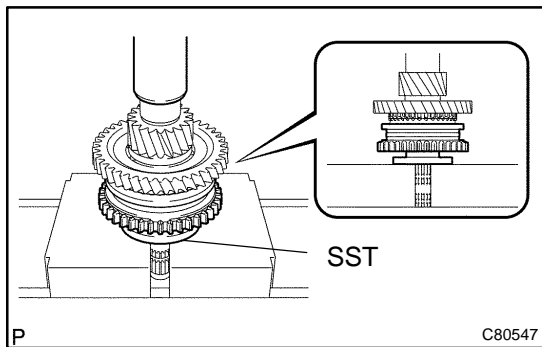
**28. INSTALL 1ST GEAR**

- (a) Coat the 1st gear with gear oil, and install it to the output shaft.



**29. INSTALL SYNCHRONIZER RING NO.1 (FOR FIRST SYNCHRONIZER RING)**

- (a) Coat the synchronizer ring No.1 with gear oil, and install it to the 1st gear.

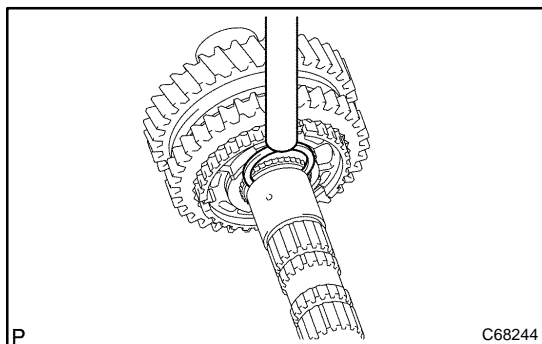


**30. INSTALL TRANSMISSION CLUTCH HUB NO.1**

- (a) Using SST and a press, install the transmission clutch hub No.1 to the output shaft.  
SST 09316-60011 (09316-00031)

**HINT:**

- The 1st gear can be turned.
- While checking that the 1st gear thrust washer pin or ball is inserted into the groove of the 1st gear thrust washer, press and fit the clutch hub No.1.



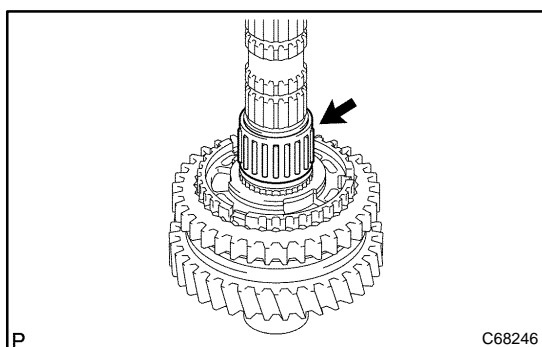
- (b) Select a snap ring that will allow minimum axial play.

**Standard clearance:**

**0.1 mm (0.039 in.) or less**

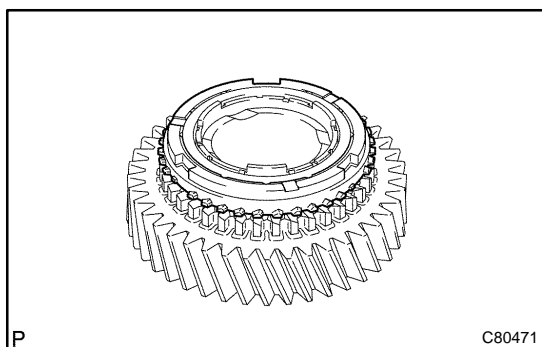
Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
A	2.50 (0.0984)	D	2.68 (0.1055)
B	2.56 (0.1008)	E	2.74 (0.1079)
C	2.62 (0.1031)	F	2.80 (0.1102)

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



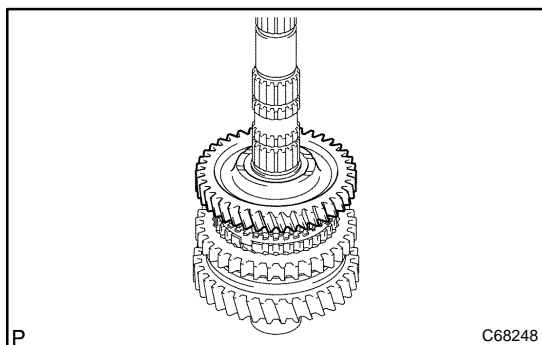
**31. INSTALL 2ND GEAR NEEDLE ROLLER BEARING**

- (a) Coat the 2nd gear needle roller bearing and 2nd gear bearing spacer with gear oil, and install them to the output shaft.



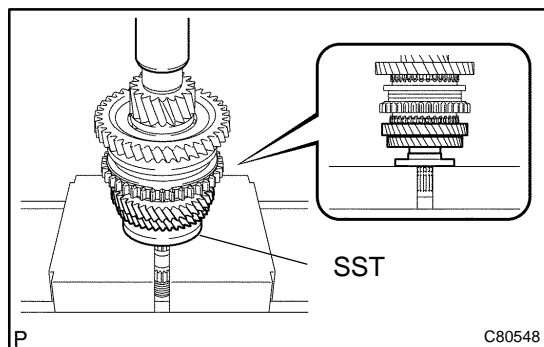
**32. INSTALL SYNCHRONIZER RING NO.1 (FOR SECOND SYNCHRONIZER RING)**

- (a) Coat the synchronizer ring No.1 with gear oil, and install it to the 2nd gear.

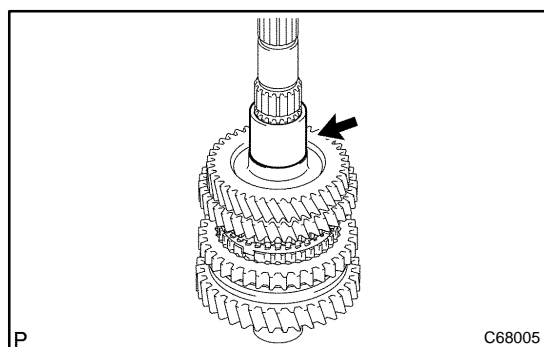


**33. INSTALL 2ND GEAR**

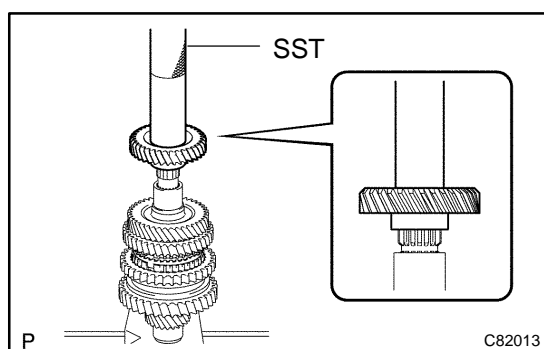
- (a) Coat the 2nd gear with gear oil, and install it to the output shaft.

**34. INSTALL 3RD DRIVEN GEAR**

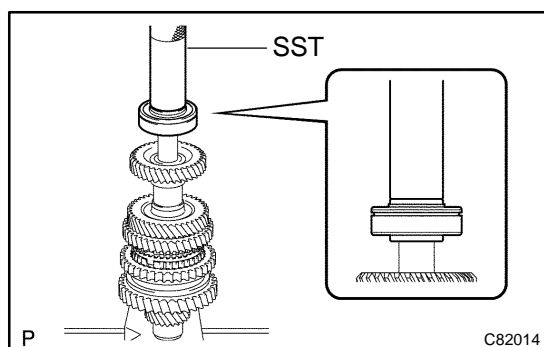
- (a) Using SST and a press, install the 3rd driven gear to the output shaft.  
SST 09950-00020

**35. INSTALL OUTPUT GEAR SPACER**

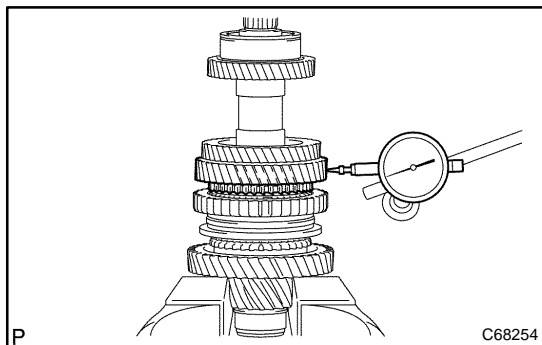
- (a) Install the output gear spacer to the output shaft.

**36. INSTALL 4TH DRIVEN GEAR**

- (a) Using SST and a press, install the 4th driven gear to the output shaft.  
SST 09612-22011

**37. INSTALL OUTPUT SHAFT REAR BEARING**

- (a) Using SST and a press, install the output shaft rear bearing to the output shaft.  
SST 09612-22011

**38. INSPECT 2ND GEAR RADIAL CLEARANCE**

- (a) Using a dial gauge, measure the 2nd 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:**

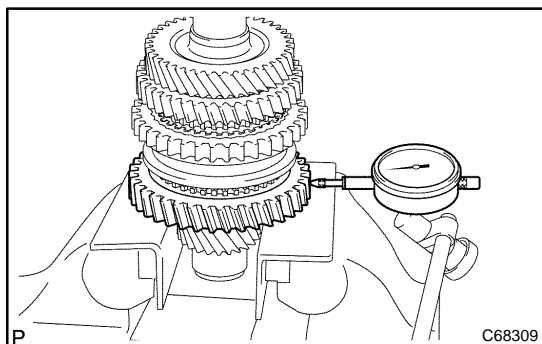
**0.015 to 0.056 mm (0.0006 to 0.0022 in.)**

**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 2nd gear and needle roller bearing.

**39. INSPECT 1ST GEAR RADIAL CLEARANCE**

- (a) Using a dial gauge, measure the 1st 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:**

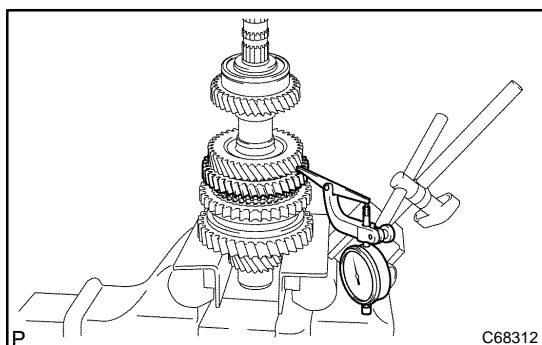
**0.015 to 0.056 mm (0.0006 to 0.0022 in.)**

**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 1st gear and needle roller bearing.

**40. INSPECT 2ND GEAR THRUST CLEARANCE**

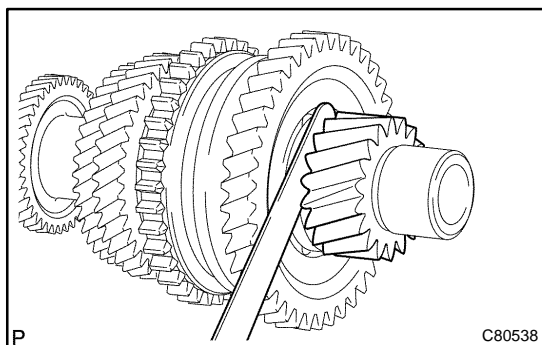
- (a) Using a dial gauge, measure the 2nd gear thrust clearance.

**Standard clearance:**

**0.10 to 0.45 mm (0.0039 to 0.0177 in.)**

**Maximum clearance:**

**0.45 mm (0.0177 in.)**

**41. INSPECT 1ST GEAR THRUST CLEARANCE**

- (a) Using a feeler gauge, measure the 1st gear thrust clearance.

**Standard clearance:**

**0.10 to 0.40 mm (0.0039 to 0.0157 in.)**

**Maximum clearance:**

**0.40 mm (0.0157 in.)**