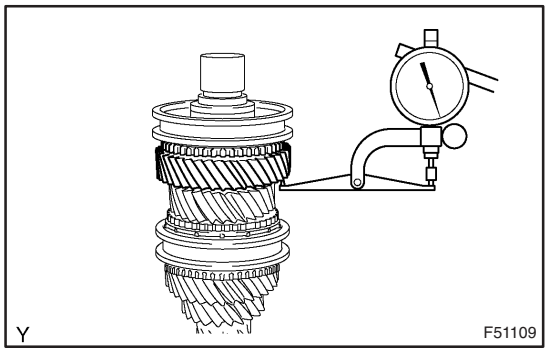
410KZ-01

OVERHAUL

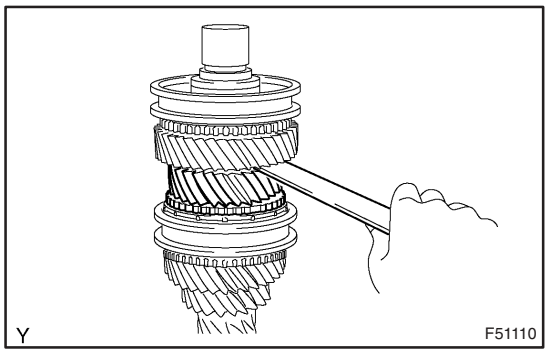


1. INSPECT 6TH GEAR THRUST CLEARANCE

(a) Using a dial indicator, measure the 6th gear thrust clearance.

Standard clearance:
0.20 to 0.49 mm (0.0079 to 0.0193 in.)

If the clearance is out of specification, replace the synchronizer ring No.3.

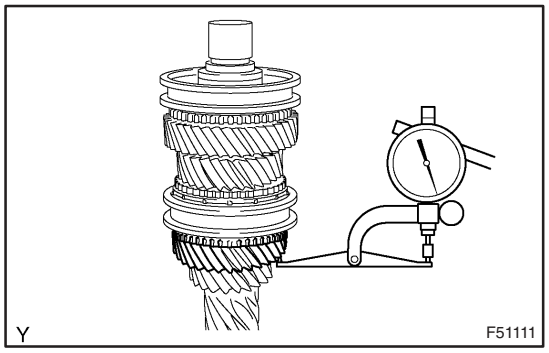


2. INSPECT 3RD GEAR THRUST CLEARANCE

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

Standard clearance:
0.09 to 0.52 mm (0.0035 to 0.0205 in.)

If the clearance is out of specification, replace the synchronizer ring set No.2.

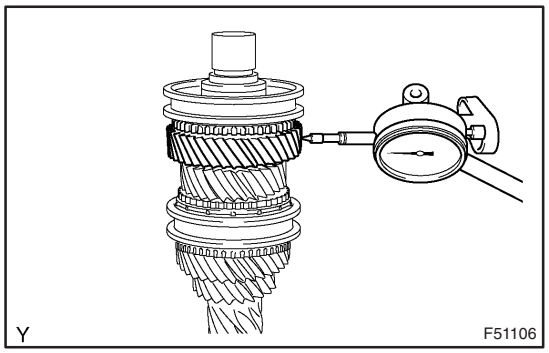


3. INSPECT 4TH GEAR THRUST CLEARANCE

(a) Using a dial indicator, measure the 4th gear thrust clearance.

Standard clearance:
0.12 to 0.38 mm (0.0047 to 0.0150 in.)

If the clearance is out of specification, replace the synchronizer ring No.3.

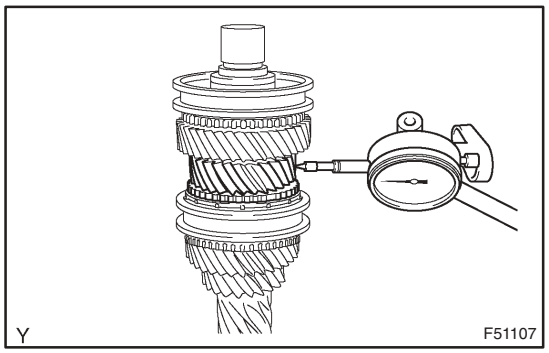


4. INSPECT 6TH GEAR RADIAL CLEARANCE

(a) Using a dial indicator, measure the 6th gear radial clearance.

Standard clearance:
0.015 to 0.065 mm (0.0006 to 0.0026 in.)

If the clearance is out of specification, replace the gear, needle roller bearing or shaft.

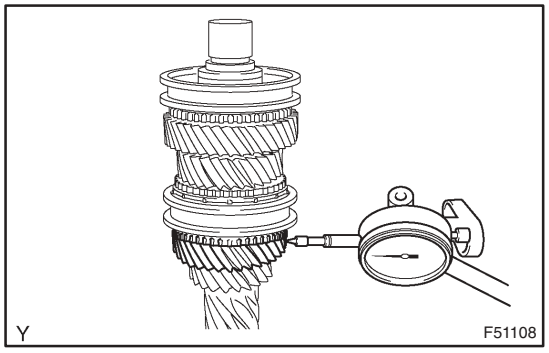


5. INSPECT 3RD GEAR RADIAL CLEARANCE

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

Standard clearance:
0.015 to 0.067 mm (0.0006 to 0.0026 in.)

If the clearance is out of specification, replace the gear, needle roller bearing or shaft.

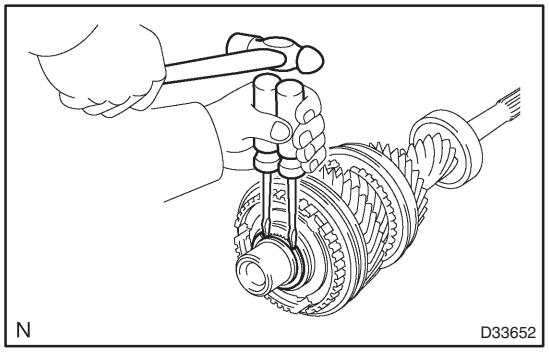


6. INSPECT 4TH GEAR RADIAL CLEARANCE

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

Standard clearance:
0.015 to 0.067 mm (0.0006 to 0.0026 in.)

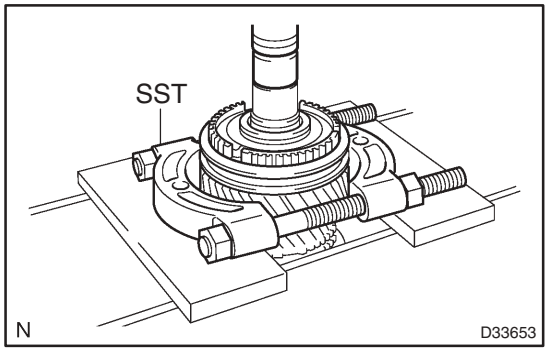
If the clearance is out of specification, replace the gear, needle roller bearing or shaft.



7. REMOVE TRANSMISSION CLUTCH HUB NO.3 SHAFT SNAP RING

(a) Using 2 screwdrivers and a hammer, remove the transmission clutch hub No.3 shaft snap ring.

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



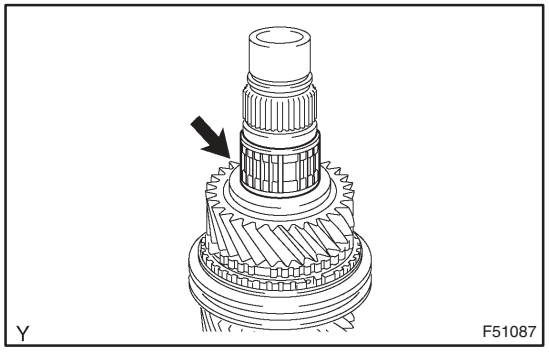
8. REMOVE 6TH GEAR

(a) Using SST and a press, remove the transmission clutch hub No.3, transmission hub sleeve No.3, synchronizer ring No.3 and 6th gear from the input shaft.

SST 09950–00020, 09950–70010 (09951–07200), 09950–60010 (09951–00300)

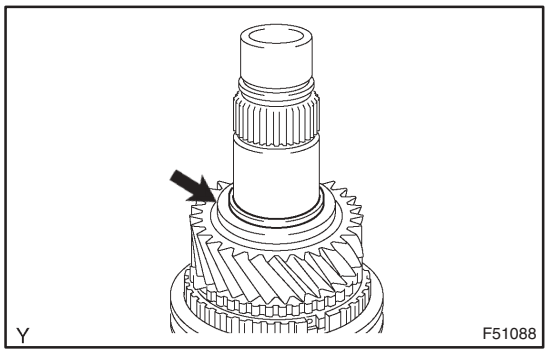
NOTICE:

- **Do not tighten SST excessively.**
- **Support the input shaft by hand so that it will not be dropped off.**



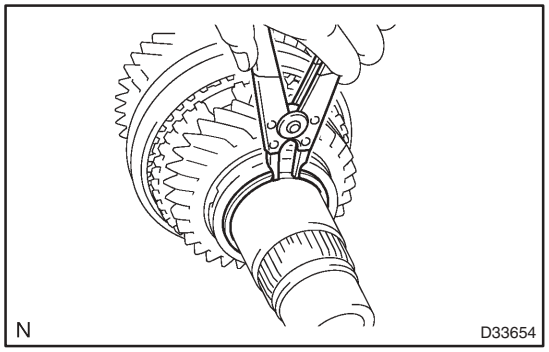
9. REMOVE 6TH GEAR NEEDLE ROLLER BEARING

(a) Remove the 6th gear needle roller bearing from the input shaft.



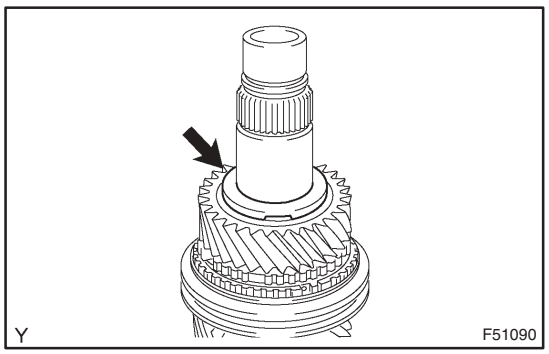
10. REMOVE RING

(a) Remove the ring from the input shaft.



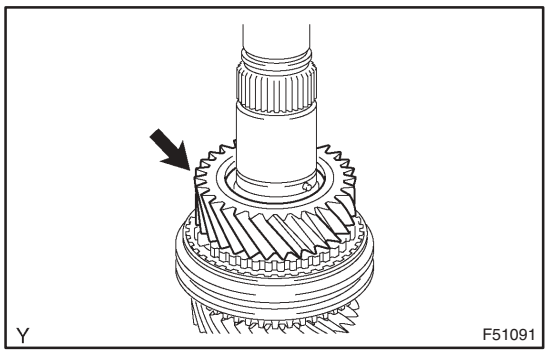
11. REMOVE GEAR THRUST WASHER SHAFT SNAP RING

(a) Using a snap ring expander, remove the gear thrust washer shaft snap ring from the input shaft.



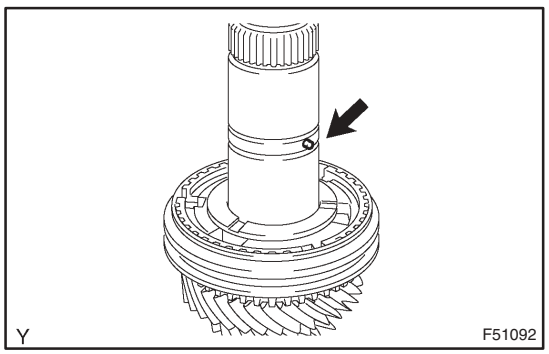
12. REMOVE 3RD GEAR THRUST WASHER

(a) Remove the 3rd gear thrust washer from the input shaft.



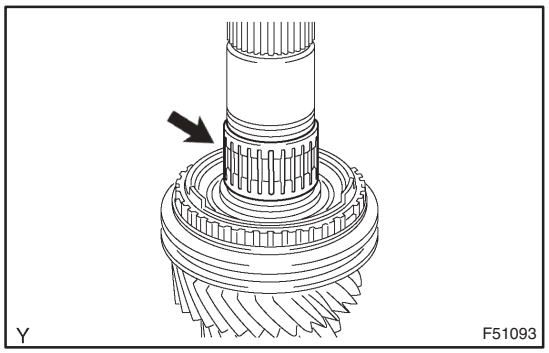
13. REMOVE 3RD GEAR

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



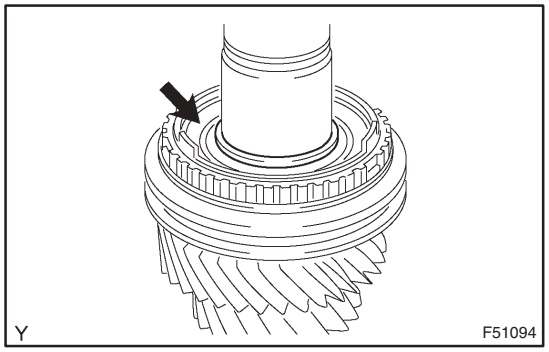
14. REMOVE STRAIGHT PIN

(a) Remove the straight pin from the input shaft.



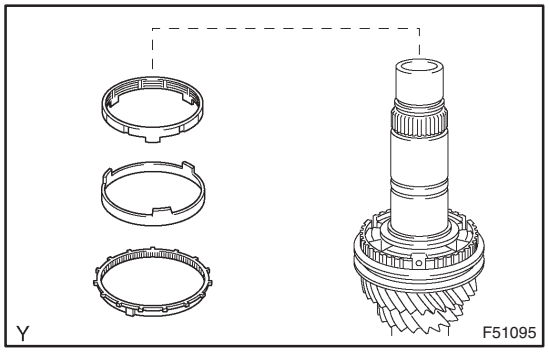
15. REMOVE 3RD GEAR NEEDLE ROLLER BEARING

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



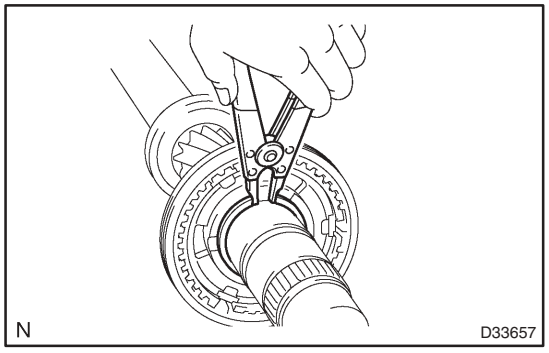
16. REMOVE SPACER

(a) Remove the spacer from the input shaft.



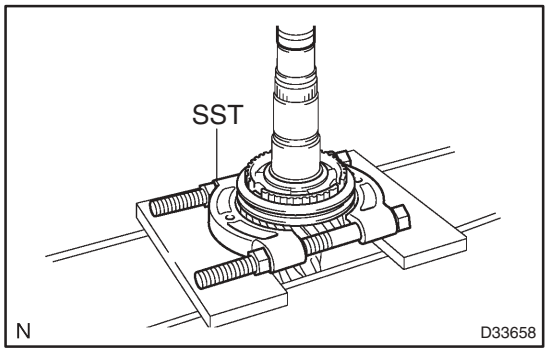
17. REMOVE SYNCHRONIZER RING SET NO.2

(a) Remove the synchronizer ring set No.2 from the input shaft.



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

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

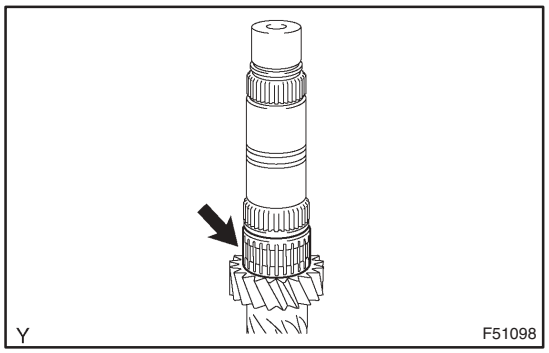


19. REMOVE 4TH GEAR

(a) Using SST and a press, remove the transmission clutch hub No.2, transmission hub sleeve No.2, synchronizer ring No.2 and 4th gear from the input shaft.
SST 09950–00020

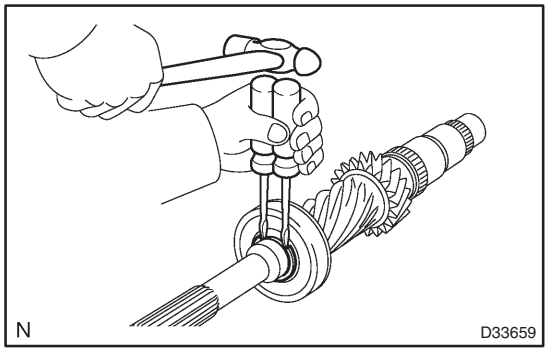
NOTICE:

Support the input shaft by hand so that it will not be dropped off.



20. REMOVE 4TH GEAR NEEDLE ROLLER BEARING

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

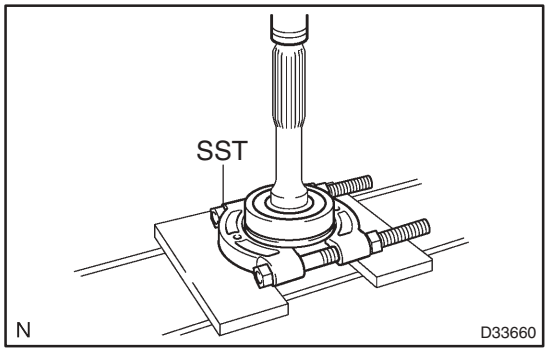


21. REMOVE INPUT SHAFT FRONT BEARING SNAP RING

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

NOTICE:

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



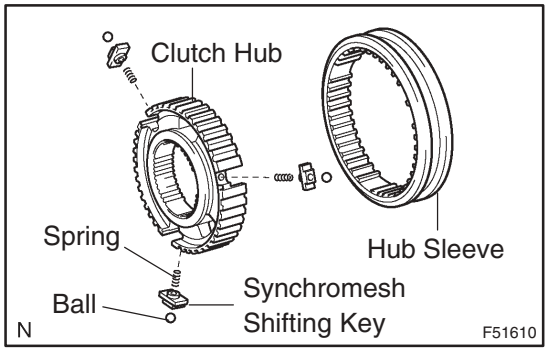
22. REMOVE INPUT SHAFT FRONT BEARING

(a) Using SST and a press, remove the input shaft front bearing from the input shaft.

SST 09950–00020

NOTICE:

Support the input shaft by hand so that it will not be dropped off.



23. REMOVE TRANSMISSION CLUTCH HUB NO.2

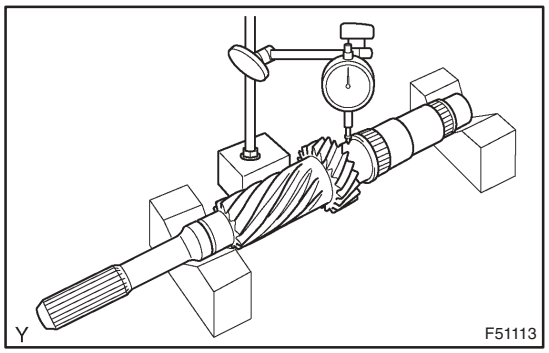
(a) Remove the clutch hub, 3 synchromesh shifting keys, 3 balls and 3 springs from the hub sleeve.

NOTICE:

Use a shop rag to prevent the balls and springs from scattering.

24. REMOVE TRANSMISSION CLUTCH HUB NO.3

(a) Perform the same procedures as for the clutch hub No.2.

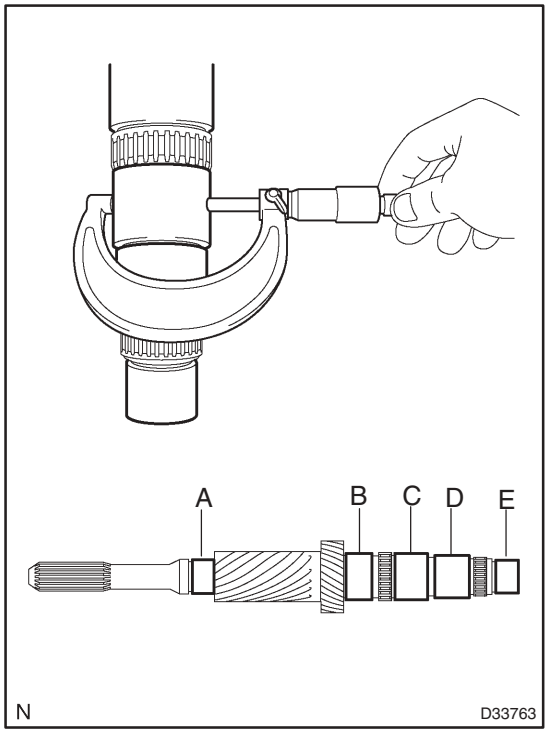


25. INSPECT INPUT SHAFT

(a) Using a dial indicator and 2 V–blocks, measure the shaft runout.

Maximum runout: 0.03 mm (0.0012 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.

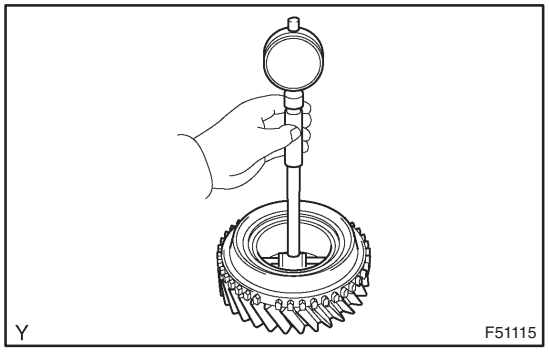
Standard:

Part	Outer diameter mm (in.)
A	34.002 to 34.015 (1.3387 to 1.3392)
B	44.985 to 45.000 (1.7711 to 1.7717)
C	44.985 to 45.000 (1.7711 to 1.7717)
D	41.985 to 42.000 (1.6530 to 1.6535)
E	32.967 to 32.980 (1.2979 to 1.2984)

Minimum:

Part	Outer diameter mm (in.)
A	34.002 (1.3387)
B	44.985 (1.7711)
C	44.985 (1.7711)
D	41.985 (1.6530)
E	32.967 (1.2979)

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

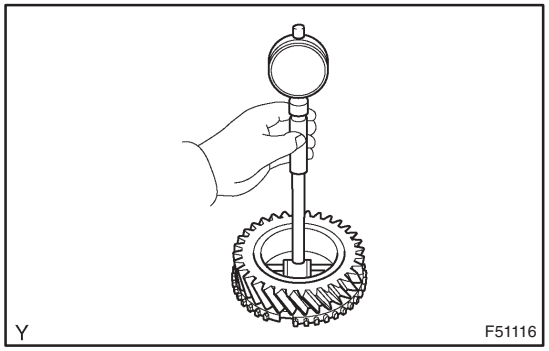


26. INSPECT 6TH GEAR

(a) Using a cylinder gauge, measure the inside diameter of the 6th gear.

Standard inside diameter:
51.015 to 51.040 mm (2.0085 to 2.0095 in.)
Maximum inside diameter: 51.040 mm (2.0095 in.)

If the inside diameter exceeds the maximum, replace the 6th gear.

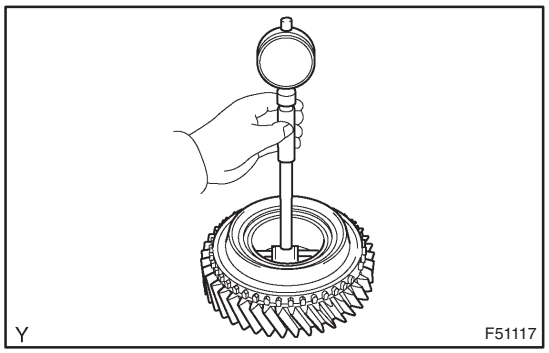


27. INSPECT 3RD GEAR

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

Standard inside diameter:
51.015 to 51.040 mm (2.0085 to 2.0095 in.)
Maximum inside diameter: 51.040 mm (2.0095 in.)

If the inside diameter exceeds the maximum, replace the 3rd gear.

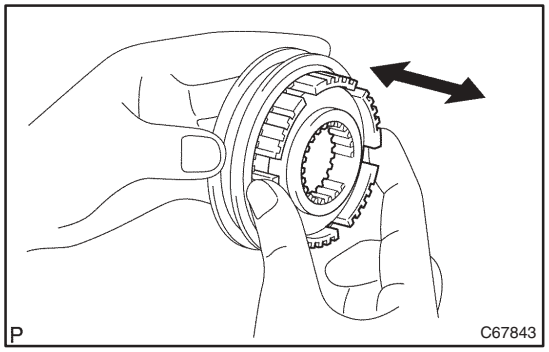


28. INSPECT 4TH GEAR

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

Standard inside diameter:
51.015 to 51.040 mm (2.0085 to 2.0095 in.)
Maximum inside diameter: 51.040 mm (2.0095 in.)

If the inside diameter exceeds the maximum, replace the 4th gear.

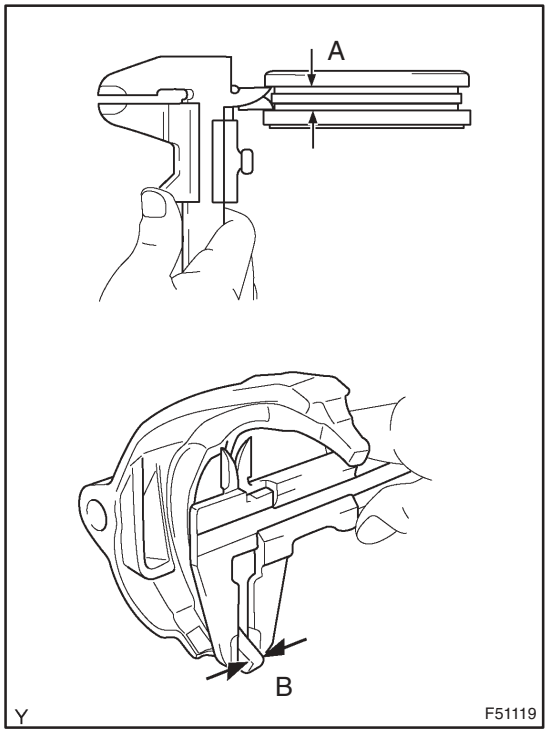


29. INSPECT TRANSMISSION HUB SLEEVE NO.2

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

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

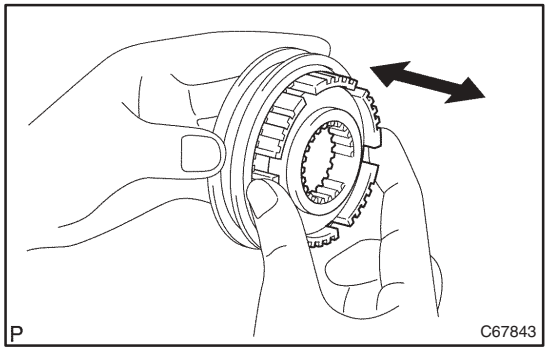
If there are any defects, replace the transmission hub sleeve No.2.



(c) Using vernier calipers, measure the width of the transmission hub sleeve No.2 groove (A) and the thickness of the claw part on the gear shift fork No.2 (B), and calculate the clearance.

Standard clearance: (A – B);
0.26 to 0.84 mm (0.0102 to 0.0331 in.)

If the clearance is out of specification, replace the transmission hub sleeve No. 2 and gear shift fork.

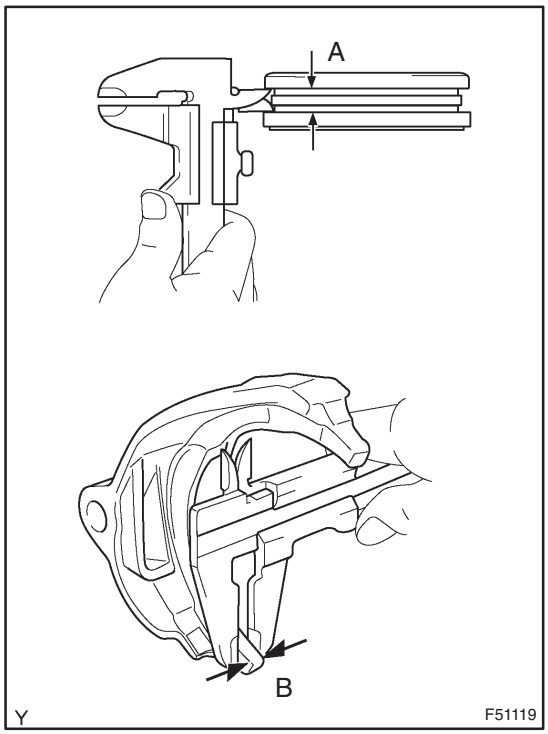


30. INSPECT TRANSMISSION HUB SLEEVE NO.3

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

(b) Check that the spline gear edges of the transmission hub sleeve No.3 are not worn down.

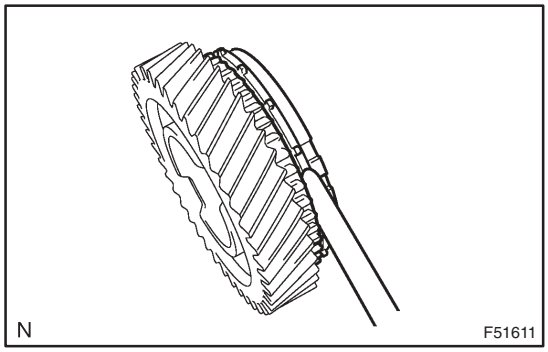
If there are any defects, replace the transmission hub sleeve No.3.



(c) Using vernier calipers, measure the width of the transmission hub sleeve No.3 groove (A) and the thickness of the claw part on the gear shift fork No.3 (B), and calculate the clearance.

Standard clearance: (A – B);
0.26 to 0.84 mm (0.0102 to 0.0331 in.)

If the clearance is out of specification, replace the transmission hub sleeve No.3 and gear shift fork.

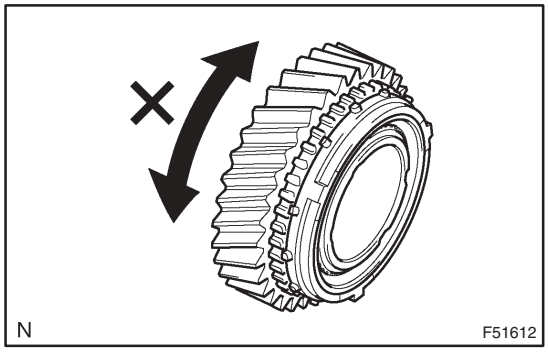


31. INSPECT SYNCHRONIZER RING NO.3 (FOR 6TH GEAR)

(a) Using a feeler gauge, measure the clearance between the synchronizer ring and 6th gear.

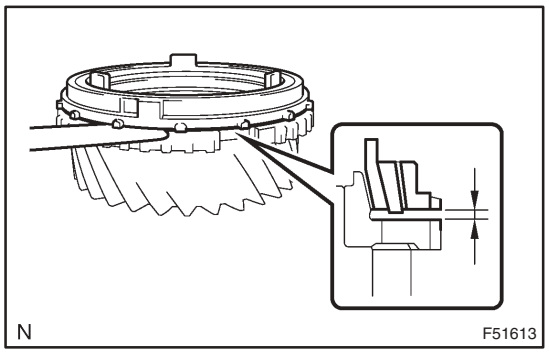
Standard clearance:
0.70 to 1.50 mm (0.0276 to 0.0591 in.)
Minimum clearance:
0.70 mm (0.0276 in.)

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



(b) Apply gear oil to the 6th gear cone. Press the synchronizer ring against the 6th gear cone and check that the synchronizer ring does not turn in the directions shown in the illustration.

If it turns, replace the synchronizer ring.

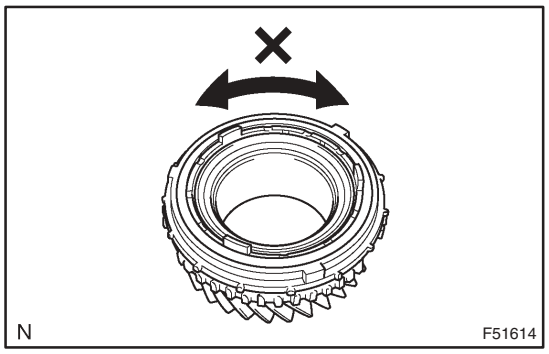


32. INSPECT SYNCHRONIZER RING SET NO.2

(a) Using a feeler gauge, measure the clearance between the synchronizer ring and 3rd gear.

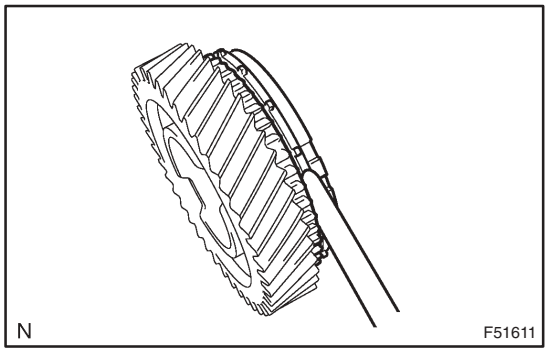
Standard clearance:
Inner: 1.20 to 2.20 mm (0.0472 to 0.0866 in.)
Middle: 0.60 to 1.80 mm (0.0236 to 0.0709 in.)
Outer: 0.80 to 1.80 mm (0.0315 to 0.0709 in.)
Minimum clearance:
Inner: 1.20 mm (0.0472 in.)
Middle: 0.60 mm (0.0236 in.)
Outer: 0.80 mm (0.0315 in.)

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



(b) Apply gear oil to the 3rd gear cone. Press the synchronizer ring against the 3rd gear cone and check that the synchronizer ring does not turn in the directions shown in the illustration.

If it turns, replace the synchronizer ring.

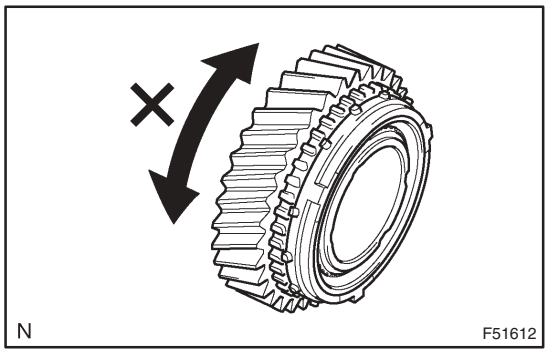


33. INSPECT SYNCHRONIZER RING NO.3 (FOR 4TH GEAR)

(a) Using a feeler gauge, measure the clearance between the synchronizer ring and 4th gear.

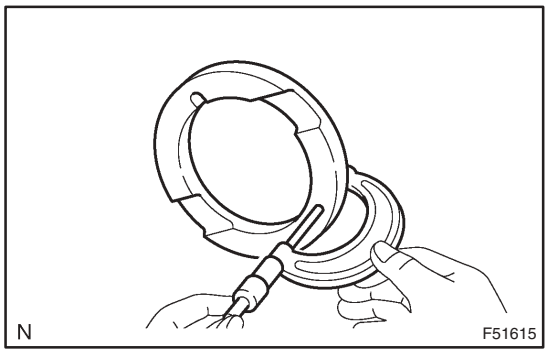
Standard clearance:
0.70 to 1.50 mm (0.0276 to 0.0591 in.)
Minimum clearance:
0.70 mm (0.0276 in.)

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



(b) Apply gear oil to the 4th gear cone. Press the synchronizer ring against the 4th gear cone and check that the synchronizer ring does not turn in the directions shown in the illustration.

If it turns, replace the synchronizer ring.

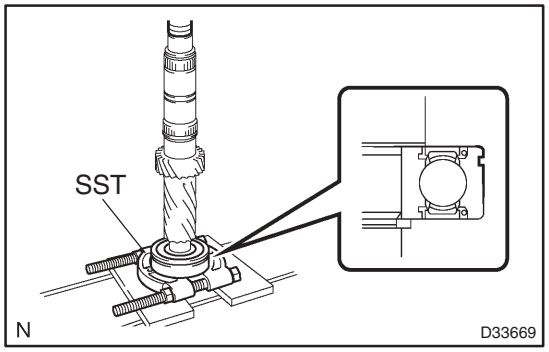


34. INSPECT 3RD GEAR THRUST WASHER

(a) Using a micrometer, measure the thrust washer thickness.

Standard thickness:
7.12 to 7.18 mm (0.2803 to 0.2827 in.)
Minimum thickness:
7.12 mm (0.2803 in.)

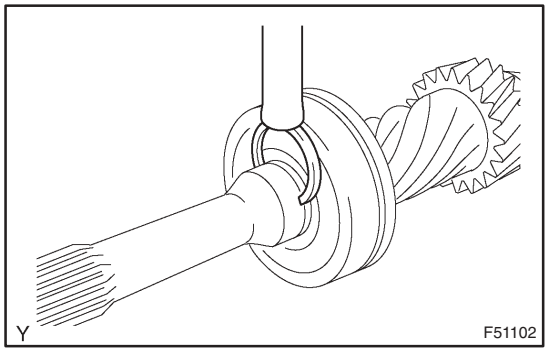
If the thickness is less than the minimum, replace the thrust washer.



35. INSTALL INPUT SHAFT FRONT BEARING

(a) Using SST and a press, install the input shaft front bearing to the input shaft.
SST 09950–00020

HINT:
Make sure that the groove of the bearing faces in the direction shown in the illustration.



36. INSTALL INPUT SHAFT FRONT BEARING SNAP RING

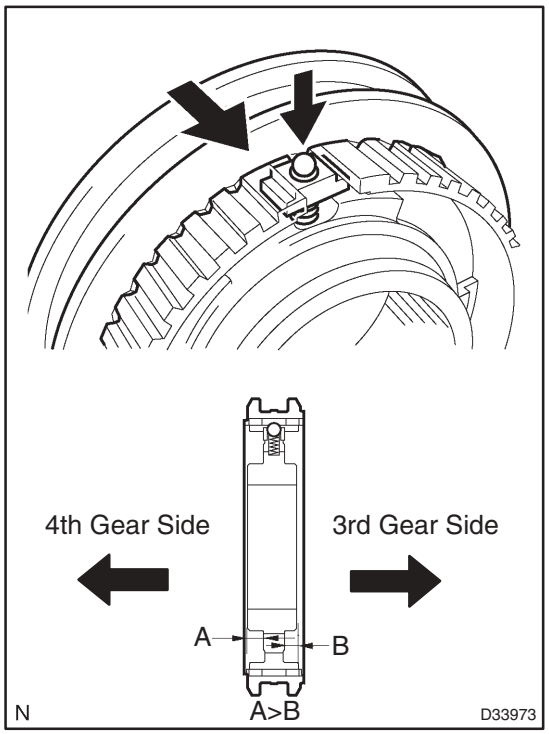
(a) Select a input shaft front bearing snap ring that will allow for the minimum amount of axial play.

Standard clearance:
0.1 mm (0.004 in.) or less

Snap ring thickness:

Part No.	Thickness: mm (in.)	Mark
90520–31026	2.65 to 2.70 (0.1043 to 0.1063)	A
90520–31027	2.70 to 2.75 (0.1063 to 0.1083)	B
90520–31028	2.75 to 2.80 (0.1083 to 0.1102)	C
90520–31029	2.80 to 2.85 (0.1102 to 0.1122)	D
90520–31030	2.85 to 2.90 (0.1122 to 0.1142)	E
90520–31031	2.90 to 2.95 (0.1142 to 0.1161)	F

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



37. INSTALL TRANSMISSION CLUTCH HUB NO.2

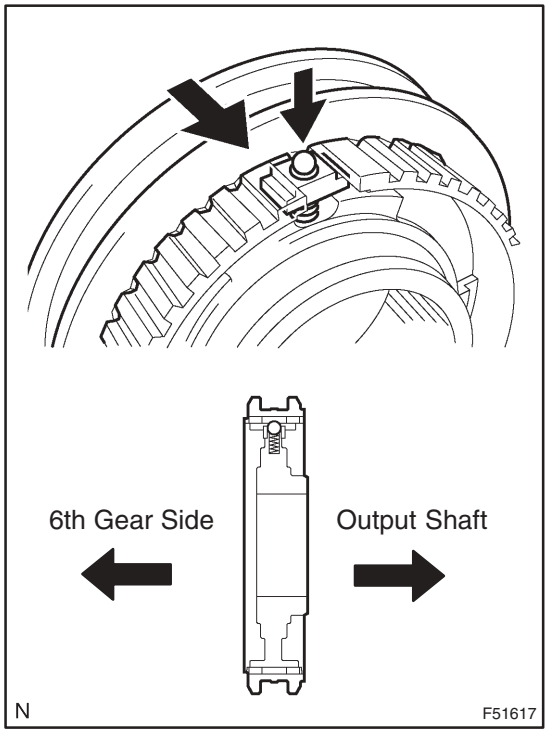
(a) Apply a thin layer of gear oil to the sleeve and hub.
(b) Install the clutch hub sleeve to the clutch hub.
(c) Install the 3 shifting keys to the clutch hub.
(d) Install the 3 shifting key springs to the clutch hub.
(e) Place the balls in the holes of the shifting keys, and install the hub sleeve while pushing in the balls.

NOTICE:

Take care to prevent the balls from scattering.

HINT:

Make sure that the clutch hub No.2 faces in the direction shown in the illustration.



38. INSTALL TRANSMISSION CLUTCH HUB NO.3

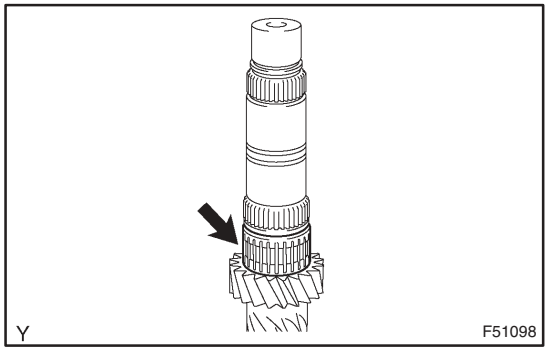
(a) Apply a thin layer of gear oil to the sleeve and hub.
(b) Install the clutch hub sleeve to the clutch hub.
(c) Install the 3 shifting keys to the clutch hub.
(d) Install the 3 shifting key springs to the clutch hub.
(e) Place the balls in the holes of the shifting keys, and install the hub sleeve while pushing in the balls.

NOTICE:

Take care to prevent the balls from scattering.

HINT:

Make sure that the clutch hub No.3 faces in the direction shown in the illustration.

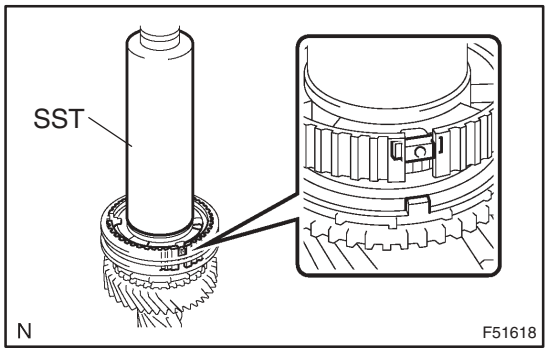


39. INSTALL 4TH GEAR NEEDLE ROLLER BEARING

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

40. INSTALL 4TH GEAR

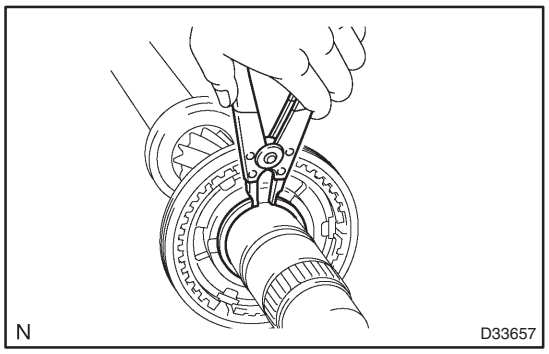
(a) Coat the 4th gear and synchronizer ring No.3 with gear oil, and install them to the input shaft.
SST 09308–14010



(b) Using SST and a press, install the clutch hub No.2 to the input shaft.
SST 09308–14010

HINT:
Align the protruding part of the synchronizer ring with the groove of the clutch hub.

(c) Install the clutch hub and confirm that the gear and synchronizer ring move smoothly.



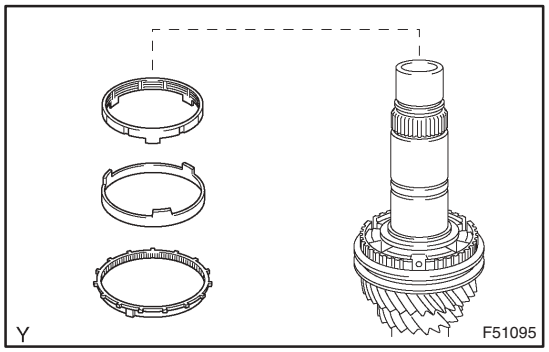
41. INSTALL CLUTCH HUB NO.2 SETTING SHAFT SNAP RING

(a) Select a clutch hub No.2 setting shaft snap ring that will allow for the minimum amount of axial play.
Standard clearance:
0.1 mm (0.004 in.) or less

Snap ring thickness:

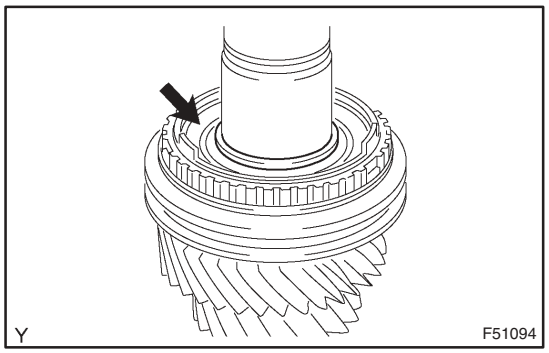
Part No.	Thickness: mm (in.)	Mark
90520–42012	1.77 to 1.82 (0.0697 to 0.0717)	A
90520–42013	1.82 to 1.87 (0.0717 to 0.0736)	B
90520–42014	1.87 to 1.92 (0.0736 to 0.0756)	C
90520–42015	1.92 to 1.97 (0.0756 to 0.0776)	D
90520–42016	1.97 to 2.02 (0.0776 to 0.0795)	E
90520–42017	2.02 to 2.07 (0.0795 to 0.0815)	F
90520–42018	2.07 to 2.12 (0.0815 to 0.0835)	G

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



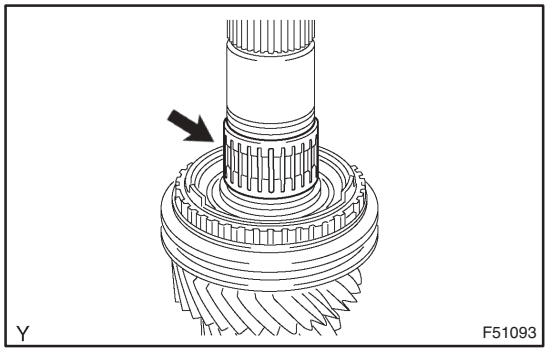
42. INSTALL SYNCHRONIZER RING SET NO.2

(a) Coat the synchronizer ring set No.2 with gear oil, and install them to the input shaft.



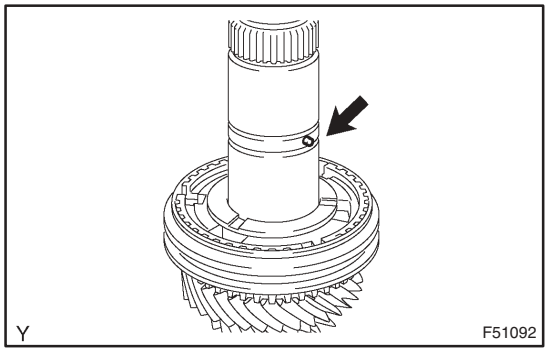
43. INSTALL SPACER

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



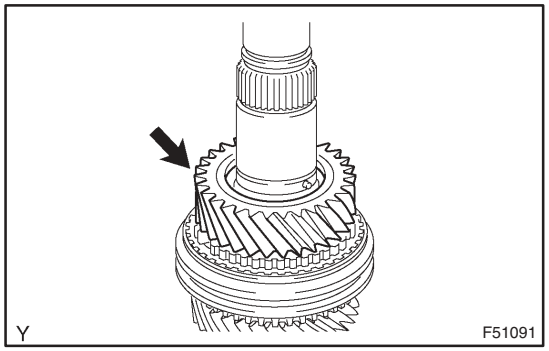
44. INSTALL 3RD GEAR NEEDLE ROLLER BEARING

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



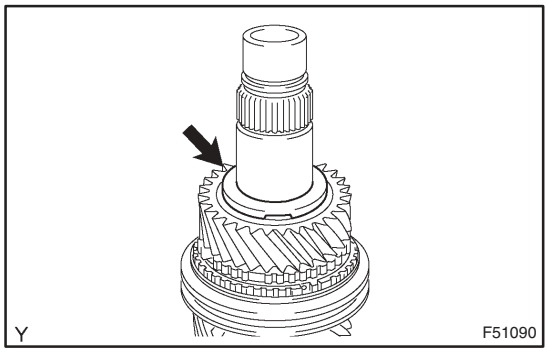
45. INSTALL STRAIGHT PIN

(a) Install the straight pin to the input shaft.



46. INSTALL 3RD GEAR

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

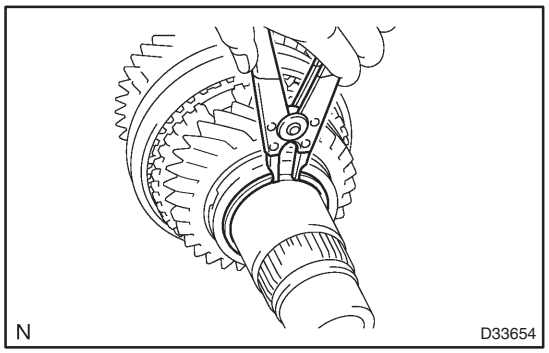


47. INSTALL 3RD GEAR THRUST WASHER

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

HINT:

Align the straight pin with the groove of the gear thrust washer and install it.



48. INSTALL GEAR THRUST WASHER SHAFT SNAP RING

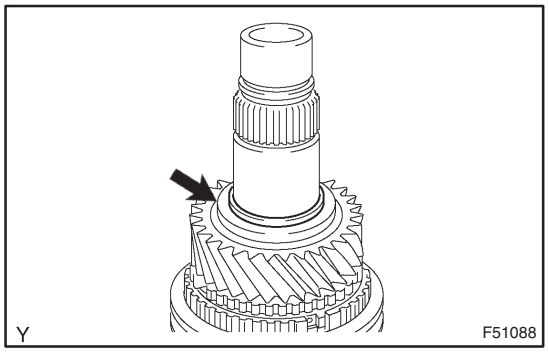
(a) Select a gear thrust washer shaft snap ring that will allow for the minimum amount of axial play.

Standard clearance:
0.1 mm (0.004 in.) or less

Snap ring thickness:

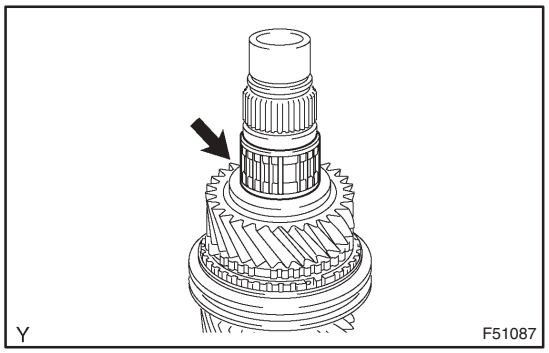
Part No.	Thickness: mm (in.)	Mark
90520–39026	2.07 to 2.12 (0.0815 to 0.0835)	A
90520–39027	2.12 to 2.17 (0.0835 to 0.0854)	B
90520–39028	2.17 to 2.22 (0.0854 to 0.0874)	C
90520–39029	2.22 to 2.27 (0.0874 to 0.0894)	D
90520–39030	2.27 to 2.32 (0.0894 to 0.0913)	E
90520–39031	2.32 to 2.37 (0.0913 to 0.0933)	F

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



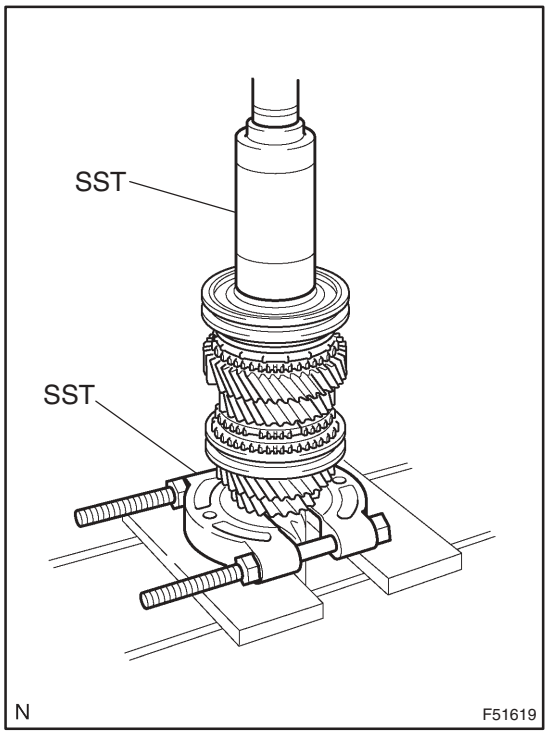
49. INSTALL RING

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



50. INSTALL 6TH GEAR NEEDLE ROLLER BEARING

(a) Coat the 6th gear needle roller bearing with gear oil, and install it to the input shaft.

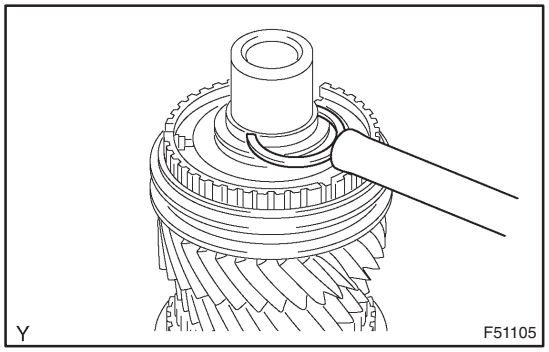


51. INSTALL 6TH GEAR

(a) Coat the 6th gear and synchronizer ring No.3 with gear oil, and install them.

(b) Using SST and a press, install the 6th gear and clutch hub to the input shaft.
SST 09309–37010, 09950–00020

(c) Install the clutch hub and confirm that the gear and synchronizer ring move smoothly.



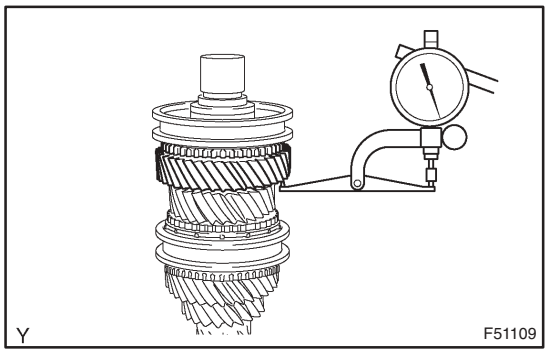
52. INSTALL TRANSMISSION CLUTCH HUB NO.3 SHAFT SNAP RING

(a) Select a transmission clutch hub No.3 shaft snap ring that will allow for the minimum amount of axial play.
Standard clearance:
0.1 mm (0.004 in.) or less

Snap ring thickness:

Part No.	Thickness: mm (in.)	Mark
90520–33022	2.10 to 2.15 (0.0827 to 0.0847)	A
90520–33023	2.15 to 2.20 (0.0847 to 0.0866)	B
90520–33024	2.20 to 2.25 (0.0866 to .0886)	C
90520–33025	2.25 to 2.30 (0.0886 to 0.0906)	D
90520–33026	2.30 to 2.35 (0.0906 to 0.0925)	E
90520–33027	2.35 to 2.40 (0.0925 to 0.0945)	F
90520–33028	2.40 to 2.45 (0.0945 to 0.0965)	G

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

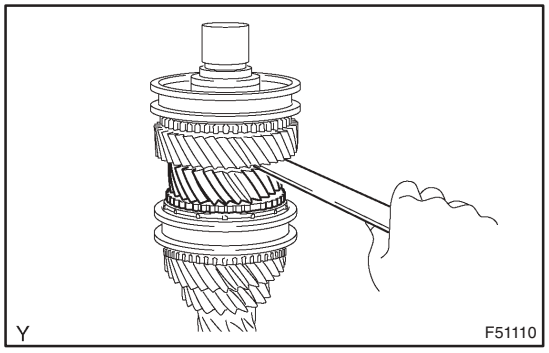


53. INSPECT 6TH GEAR THRUST CLEARANCE

(a) Using a dial indicator, measure the 6th gear thrust clearance.

Standard clearance:
0.20 to 0.49 mm (0.0079 to 0.0193 in.)

If the clearance is outside the specification, replace the synchronizer ring No.3.

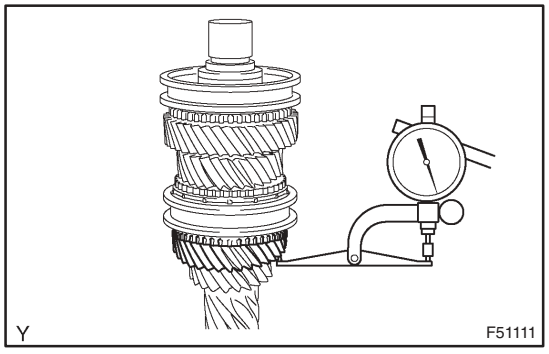


54. INSPECT 3RD GEAR THRUST CLEARANCE

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

Standard clearance:
0.09 to 0.52 mm (0.0035 to 0.0205 in.)

If the clearance is outside the specification, replace the synchronizer ring set No.2.

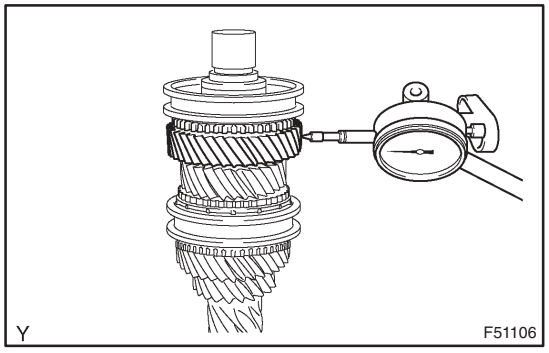


55. INSPECT 4TH GEAR THRUST CLEARANCE

(a) Using a dial indicator, measure the 4th gear thrust clearance.

Standard clearance:
0.12 to 0.38 mm (0.0047 to 0.0150 in.)

If the clearance is outside the specification, replace the synchronizer ring No.3.

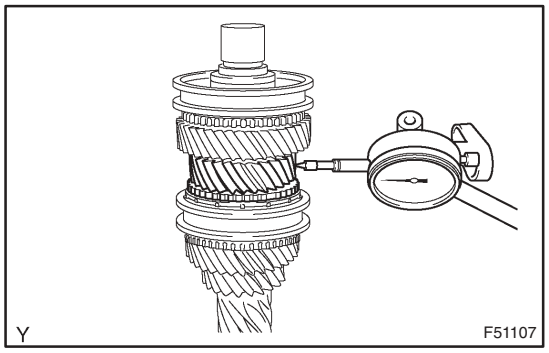


56. INSPECT 6TH GEAR RADIAL CLEARANCE

(a) Using a dial indicator, measure the 6th gear radial clearance.

Standard clearance:
0.015 to 0.065 mm (0.0006 to 0.0026 in.)

If the clearance is outside the specification, replace the gear, needle roller bearing or shaft.

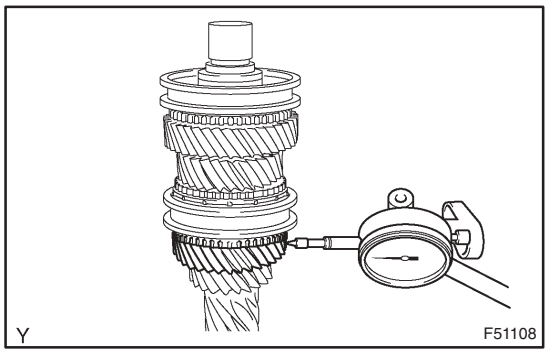


57. INSPECT 3RD GEAR RADIAL CLEARANCE

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

Standard clearance:
0.015 to 0.067 mm (0.0006 to 0.0026 in.)

If the clearance is outside the specification, replace the gear, needle roller bearing or shaft.



58. INSPECT 4TH GEAR RADIAL CLEARANCE

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

Standard clearance:
0.015 to 0.067 mm (0.0006 to 0.0026 in.)

If the clearance is outside the specification, replace the gear, needle roller bearing or shaft.