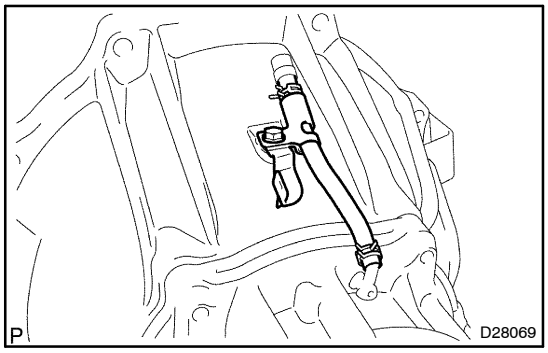
400WU–01

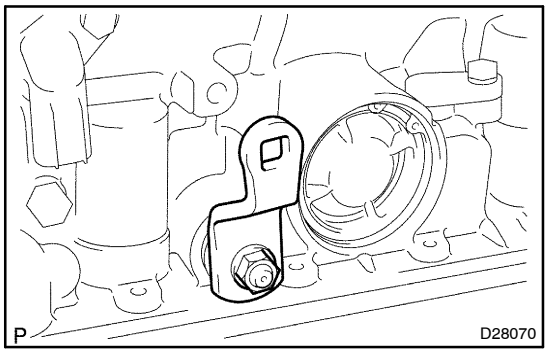
OVERHAUL

1. REMOVE DRAIN (ATM) PLUG SUB–ASSY



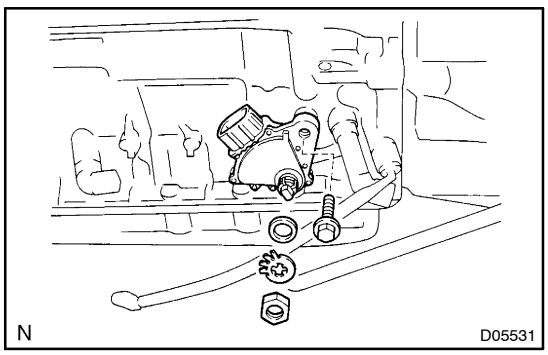
2. REMOVE BREATHER PLUG HOSE

(a) Remove the breather plug hose.



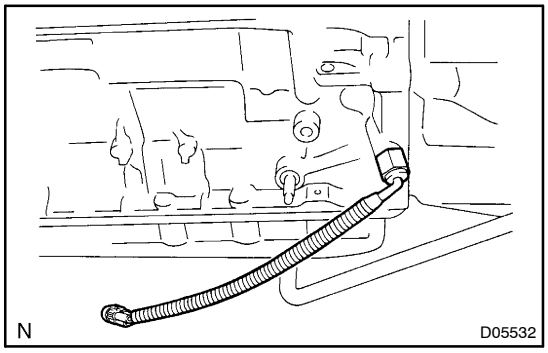
3. REMOVE TRANSMISSION CONTROL SHAFT LEVER LH

(a) Remove the nut, the washer and the control shaft lever.



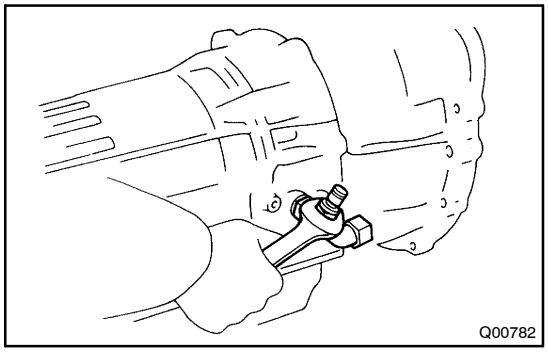
4. REMOVE PARK/NEUTRAL POSITION SWITCH ASSY

(a) Using a screwdriver, unstake the lock washer.
(b) Remove the nut, the lock washer and the grommet.
(c) Remove the bolt and the park/neutral position switch.



5. REMOVE TEMPERATURE SENSOR (3RZ–FE ENGINE TYPE, 3RZ–FE ENGINE TYPE)

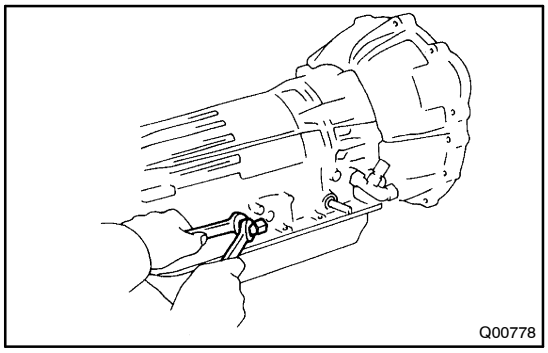
(a) Remove the ATF temperature sensor.
(b) Remove the O–ring from the sensor.



6. REMOVE TEMPERATURE SENSOR (EXCEPT 3RZ–FE ENGINE TYPE)

(a) Remove the ATF temperature sensor.

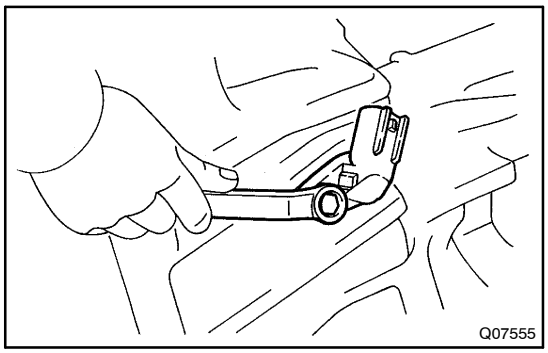
(b) Remove the O–ring from the sensor.



7. REMOVE OIL COOLER TUBE UNION

(a) Remove the union and the oil cooler tube union.

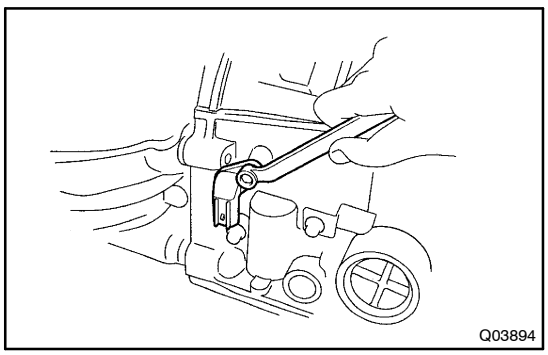
(b) Remove the O–rings from the union and oil cooler tube union.



8. REMOVE SPEED SENSOR

(a) Remove the bolt and speed sensor.

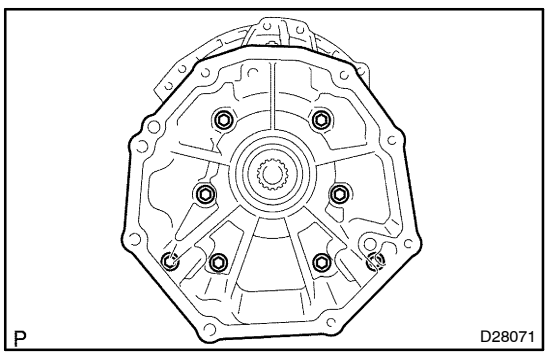
(b) Remove the O–ring from sensor.



9. REMOVE SPEED SENSOR (EXCEPT 1KD–FTV, 1KZ–TE ENGINE TYPE)

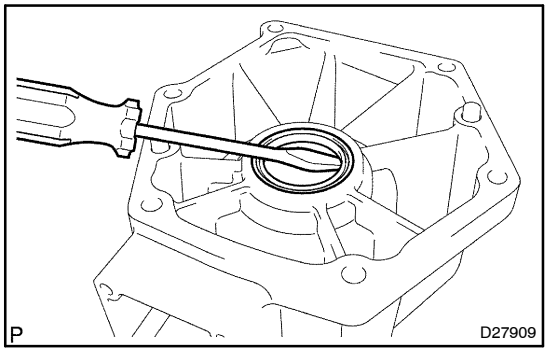
(a) Remove the bolt and speed sensor.

(b) Remove the O–ring from sensor.



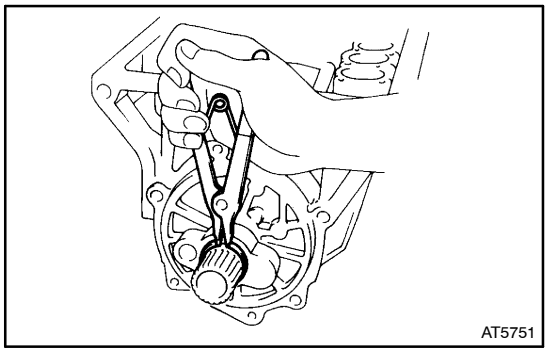
10. REMOVE REAR ADAPTOR TRANSFER

(a) Remove the 8 bolts and the case.



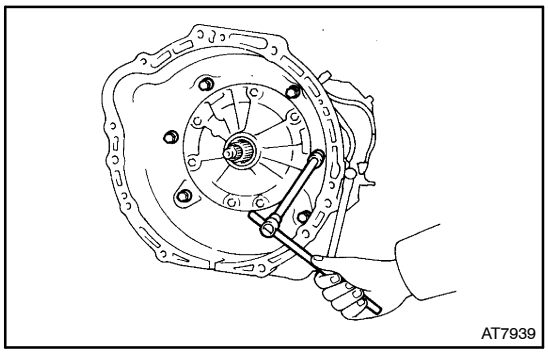
11. REMOVE TRANSFER CASE ADAPTOR REAR OIL SEAL

(a) Using a screwdriver, remove the oil seal.



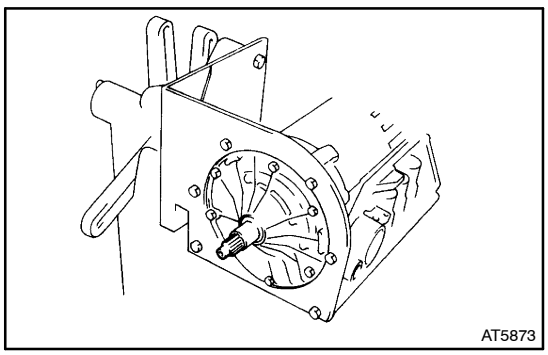
12. REMOVE SENSOR ROTOR

(a) Using a snap ring expnder, remove the snap ring.
(b) Remove the sensor rotor and the key.



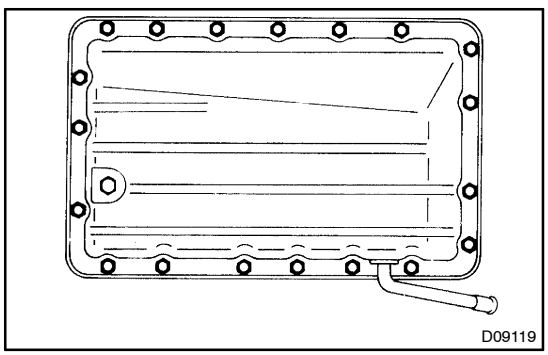
13. REMOVE AUTOMATIC TRANSMISSION HOUSING

(a) Remove the 6 bolts.
(b) Remove the transmission housing.



14. FIX AUTOMATIC TRANSMISSION CASE SUB–ASSY

(a) Install the transmission case on the overhaul attachment.

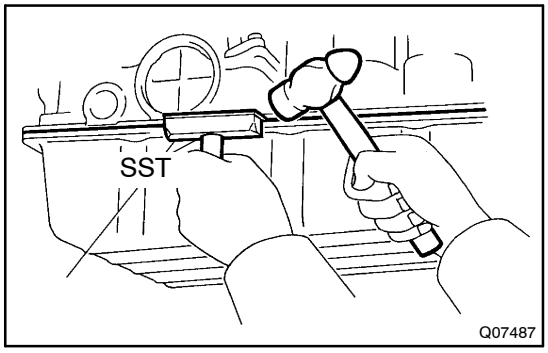


15. REMOVE AUTOMATIC TRANSMISSION OIL PAN SUB–ASSY

NOTICE:

Do not turn the transmission over as this will contaminate the valve body with any foreign matter at the bottom of the pan.

(a) Remove the 19 bolts.

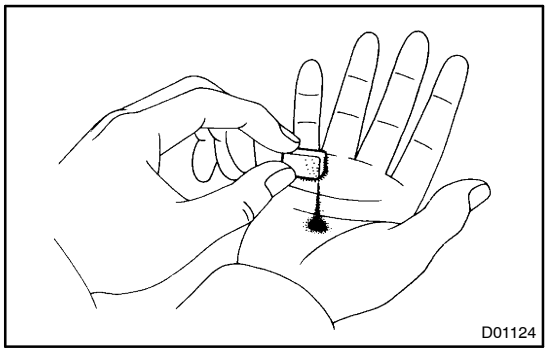


(b) Install the blade of SST between the transmission case and oil pan, and cut off the applied sealer.
SST 09032–00100

NOTICE:

Be careful not to damage the oil pan and flange.

(c) Remove the pan by lifting the transmission case.

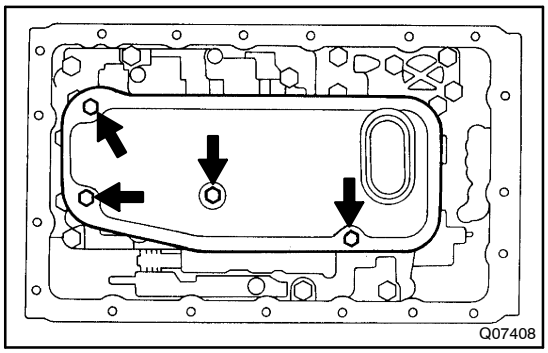


16. INSPECT AUTOMATIC TRANSMISSION OIL PAN SUB–ASSY

(a) Remove the magnets and use them to collect steel particles.

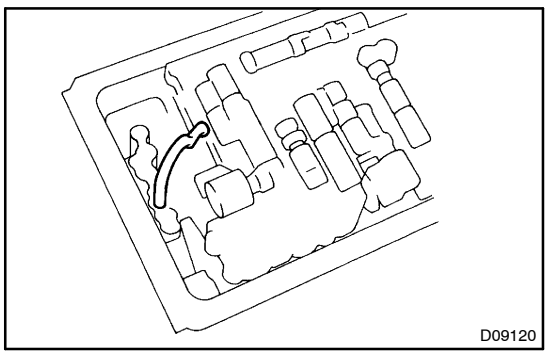
(b) Carefully lock at the foreign matter and particles in the pan and on the magnets to anticipate the type of wear you will find in the transmission.

- Steel (magnetic): bearing, gear and clutch plate wear
- Brass (non–magnetic): bushing wear

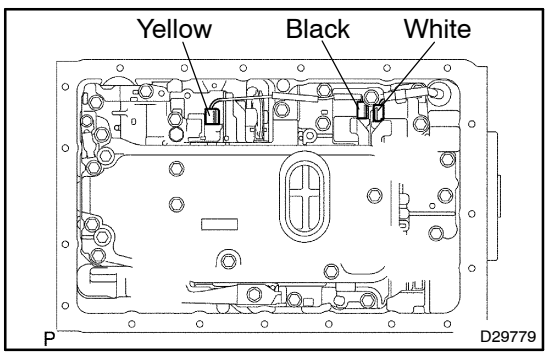


17. REMOVE VALVE BODY OIL STRAINER ASSY

(a) Remove the 4 bolts and oil strainer case.

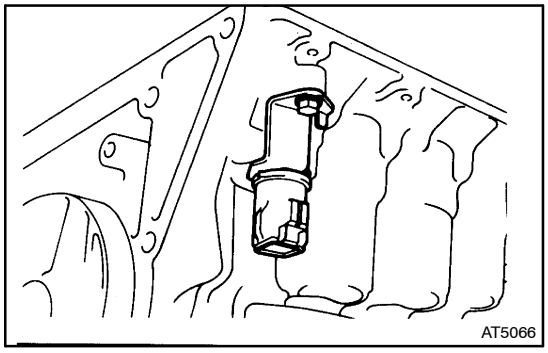


(b) Pry up the pipe ends with a large screwdriver and remove the pipe.

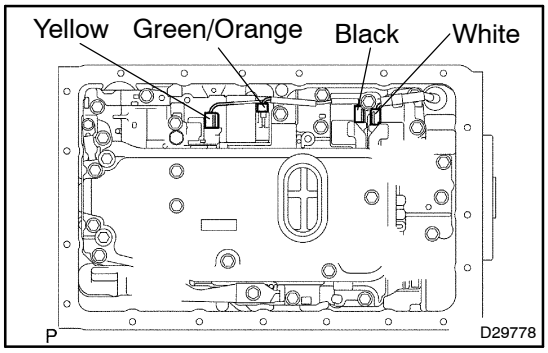


18. REMOVE TRANSMISSION WIRE (3RZ–FE ENGINE TYPE)

(a) Disconnect the 3 connectors from the shift solenoid valve No.1, No.2 and SL.

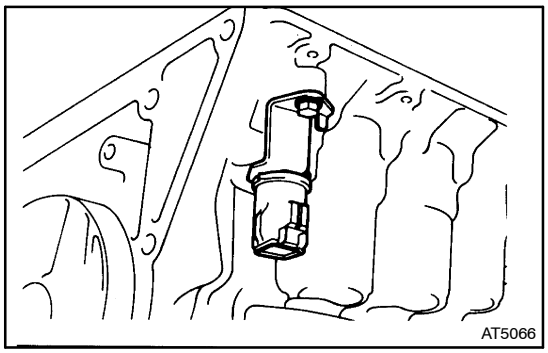


(b) Remove the bolt and the stopper plate from the case.
(c) Pull out the solenoid wiring from the transmission case.
(d) Remove the O–rings from the solenoid wiring.

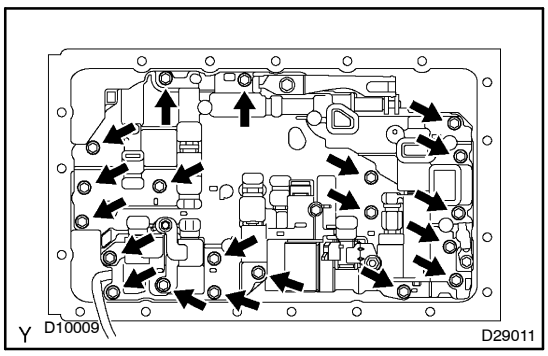


19. REMOVE TRANSMISSION WIRE (EXCEPT 3RZ–FE ENGINE TYPE)

(a) Disconnect the 4 connectors from the shift solenoid valve No.1, No.2 and SL.

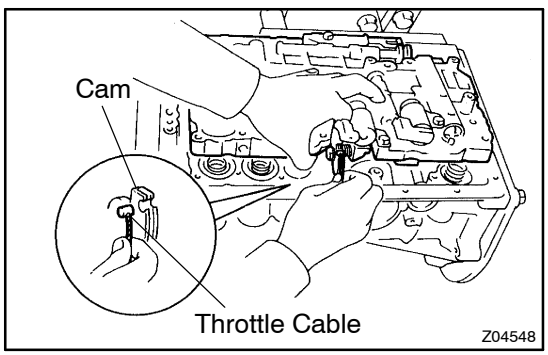


(b) Remove the bolt and the stopper plate from the case.
(c) Pull out the solenoid wiring from the transmission case.
(d) Remove the O–rings from the solenoid wiring.

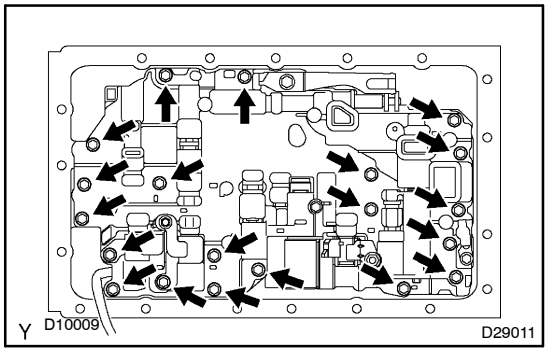


20. REMOVE TRANSMISSION VALVE BODY ASSY (3RZ–FE ENGINE TYPE)

(a) Remove the 20 bolts.

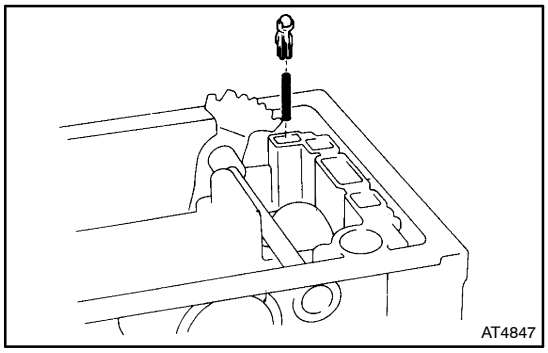


(b) Disconnect the throttle cable from the cam, and remove the valve body.



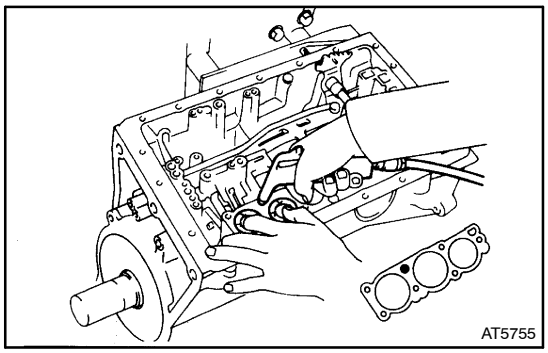
21. REMOVE TRANSMISSION VALVE BODY ASSY (EXCEPT 3RZ–FE ENGINE TYPE)

(a) Remove the 20 bolts.



22. REMOVE CHECK BALL BODY

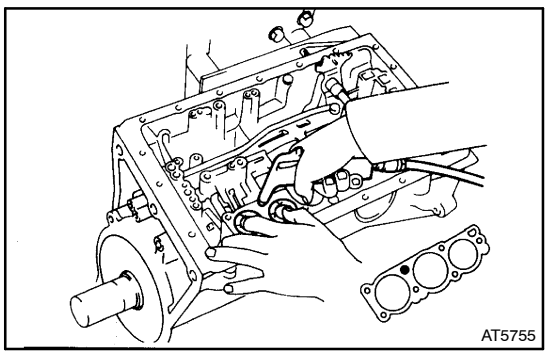
(a) Remove the check ball body and the spring.



23. REMOVE B–2 ACCUMULATOR PISTON

(a) Applying compressed air to the oil hole, remove the B_2 accumulator pistons and the spring.

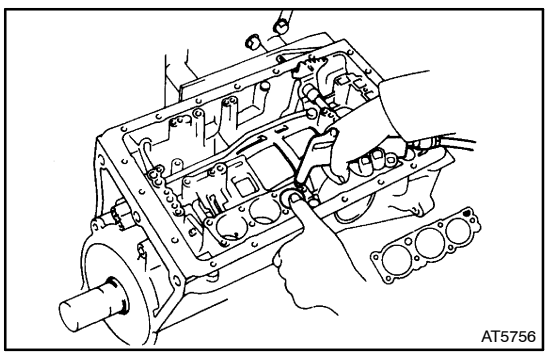
(b) Remove the O–ring from each piston.



24. REMOVE C–2 ACCUMULATOR PISTON

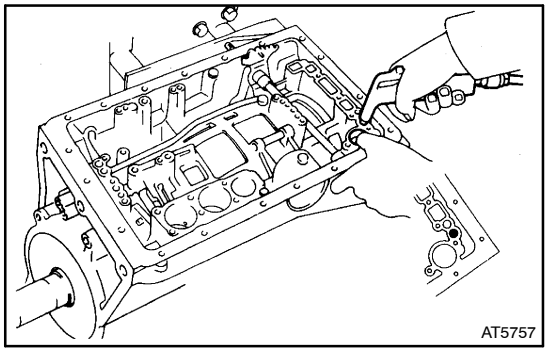
(a) Applying compressed air to the oil hole, remove the C_2 accumulator pistons and the spring.

(b) Remove the O–ring from each piston.



25. REMOVE B–0 ACCUMULATOR PISTON

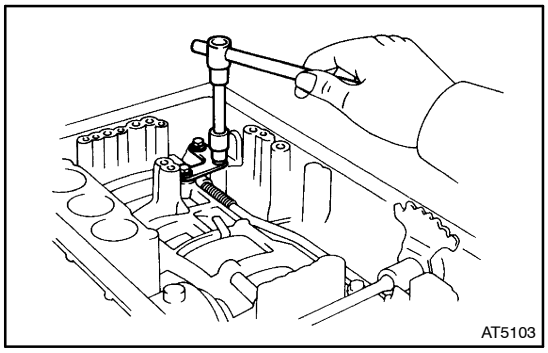
(a) Applying compressed air to the oil hole, remove the B_0 accumulator piston and the spring.



26. REMOVE C–0 ACCUMULATOR PISTON

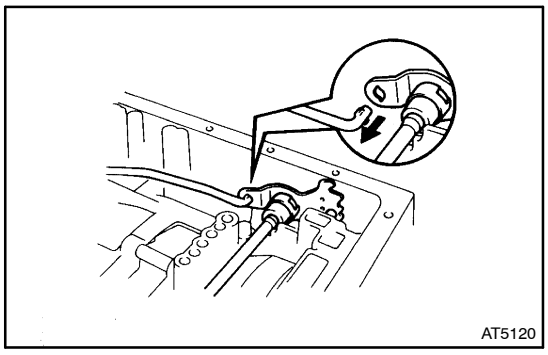
(a) Applying compressed air to the oil hole, remove the C_0 accumulator piston and the spring.

(b) Remove the O–ring from each piston.



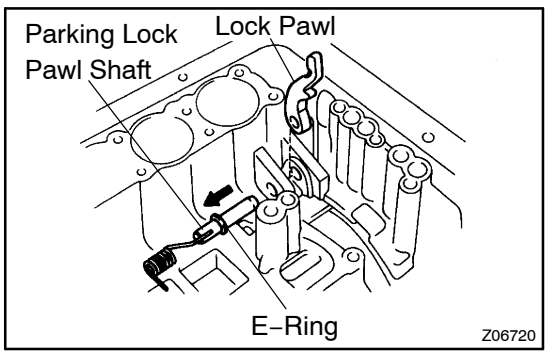
27. REMOVE PARKING LOCK PAWL BRACKET

(a) Remove the 3 bolts and the parking lock pawl bracket.



28. REMOVE PARKING LOCK ROD SUB–ASSY

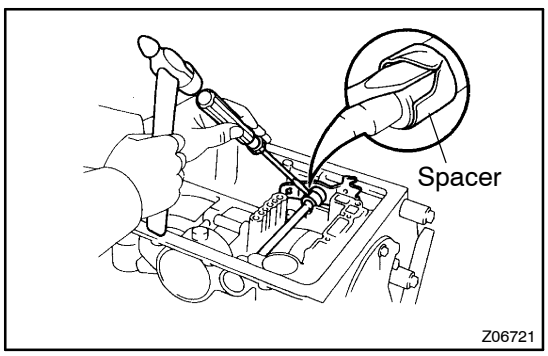
(a) Disconnect the parking lock rod from the manual valve lever.



29. REMOVE PARKING LOCK PAWL SHAFT

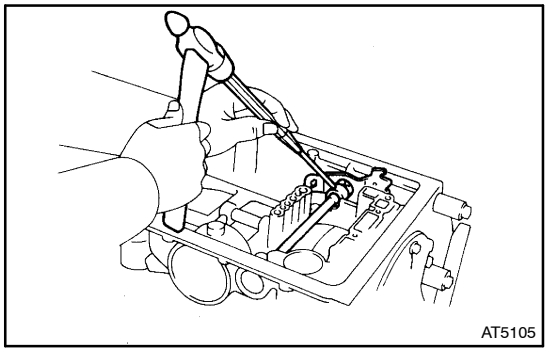
(a) Pull out the parking lock pawl shaft from the front side, then remove the lock pawl and the spring.

(b) Remove the E–ring from the shaft.



30. REMOVE MANUAL VALVE LEVER SUB–ASSY

(a) Using a hammer and a chisel, cut off the spacer and remove it from the shaft.

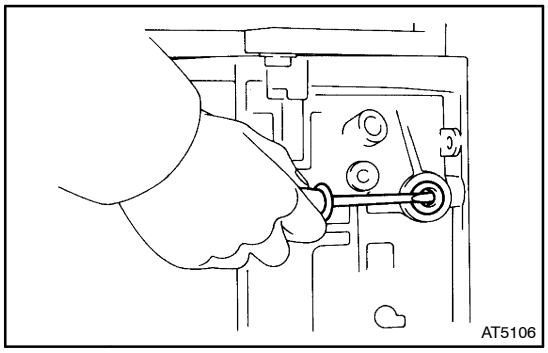


(b) Using a pin punch and a hammer, drive out the pin.

HINT:

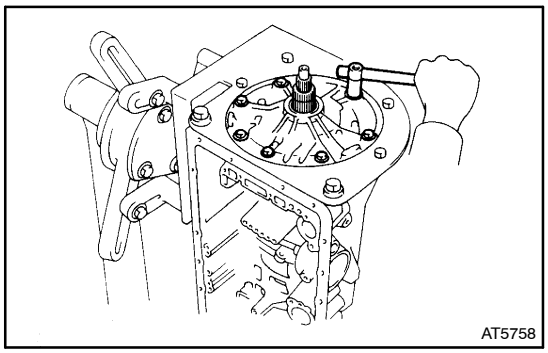
Slowly drive out the pin so that it does not fall into the transmission case.

(c) Pull out the manual valve lever shaft through the case, and remove the manual valve lever.



31. REMOVE MANUAL VALVE LEVER SHAFT OIL SEAL

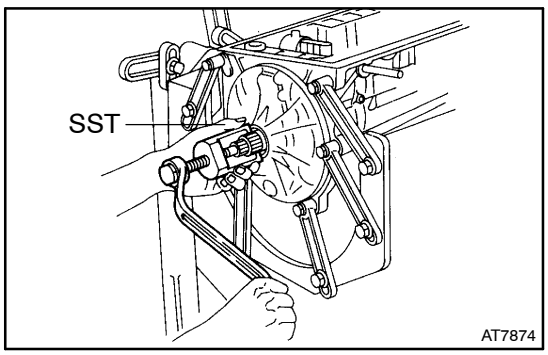
(a) Using screwdriver,remove the 2 manual valve lever shaft oil seals.



32. REMOVE OIL PUMP ASSY

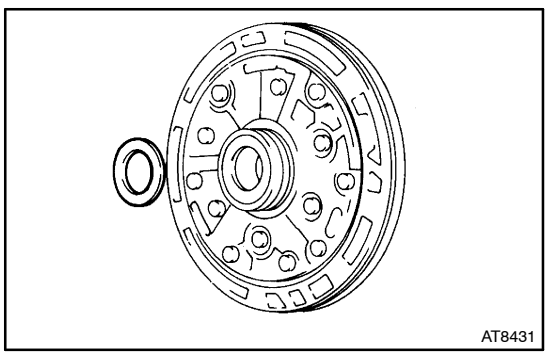
(a) Stand up the transmission.

(b) Remove the 7 bolts holding the oil pump to the transmission case.

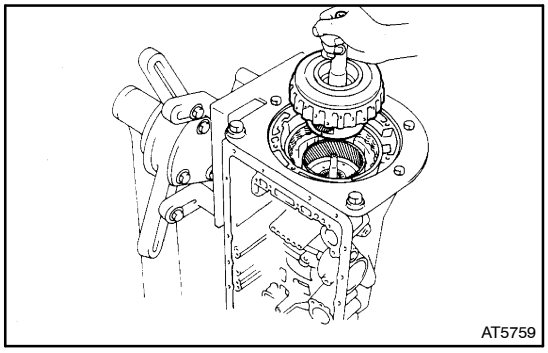


(c) Using SST, remove the oil pump.
SST 09610–20012

(d) Remove the O–ring from it.

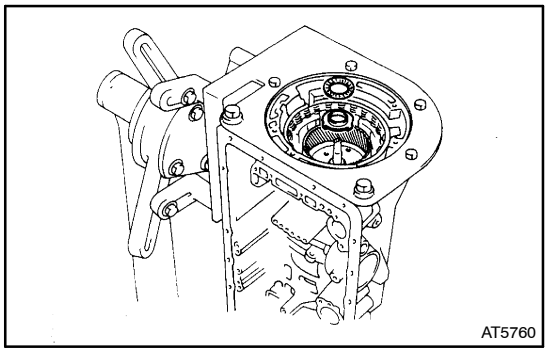


(e) Remove the race from the oil pump.

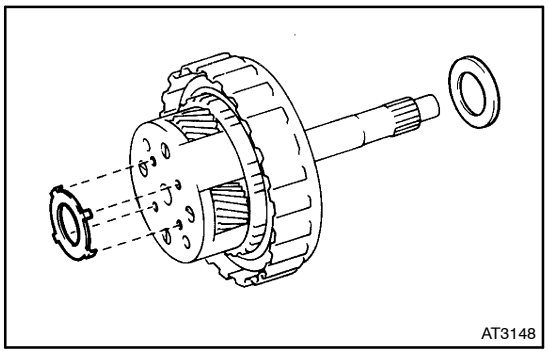


33. REMOVE OVERDRIVE PLANETARY GEAR ASSY

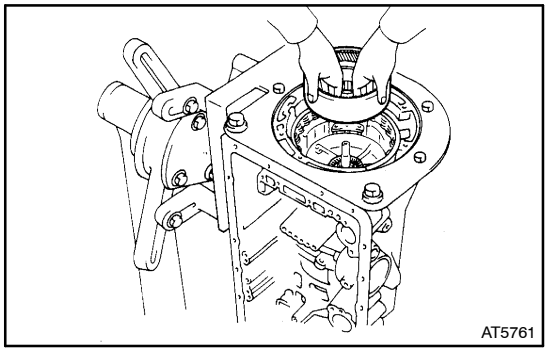
(a) Remove the O/D planetary gear, O/D direct clutch and one–way clutch from the transmission case.



(b) Remove the bearing and the race.

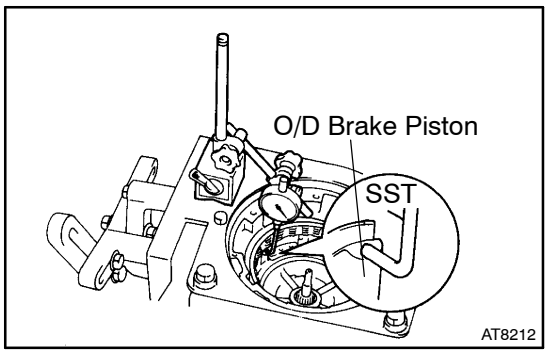


(c) Remove the race and the assembled bearing & race.



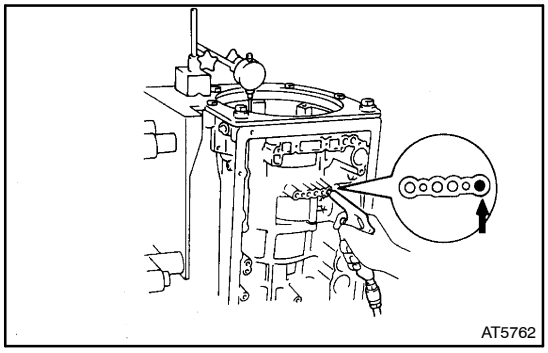
34. REMOVE OVERDRIVE PLANETARY RING GEAR

(a) Remove the O/D planetary ring gear from the transmission case.



35. INSPECT OVERDRIVE BRAKE PISTON

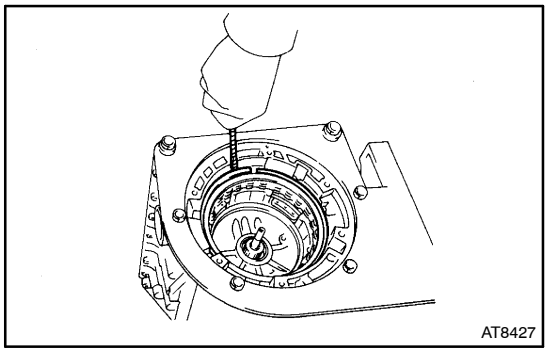
(a) Place SST and a dial indicator onto the O/D brake piston.
SST 09350–30020 (09350–06120)



(b) Measure the stroke while applying and releasing compressed air (392 – 785 kPa, 4.0 – 8.0 kgf/cm^2, 57 – 114 psi).

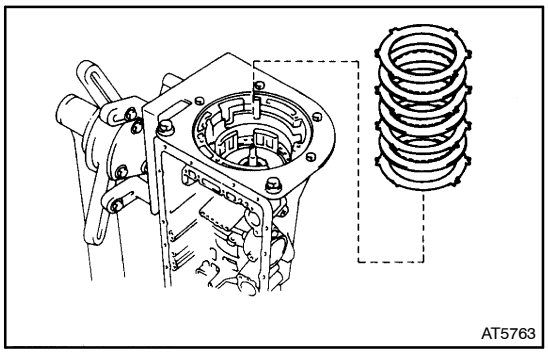
Piston stroke: 1.40 – 1.70 mm (0.0551 – 0.0669 in.)

If the stroke is outside the standard, inspect the discs.

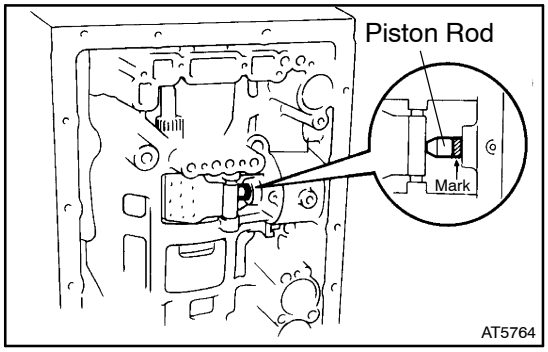


36. REMOVE OVERDRIVE BRAKE CLUTCH DISC

(a) Using a screwdriver, remove the snap ring.

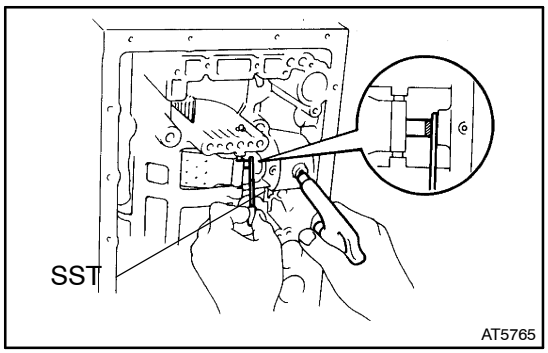


(b) Remove the O/D brake pack.



37. INSPECT PISTON STROKE OF 2ND COAST BRAKE

(a) Using a water proof pen, place a mark on the 2nd coast brake piston rod as shown in the illustration.

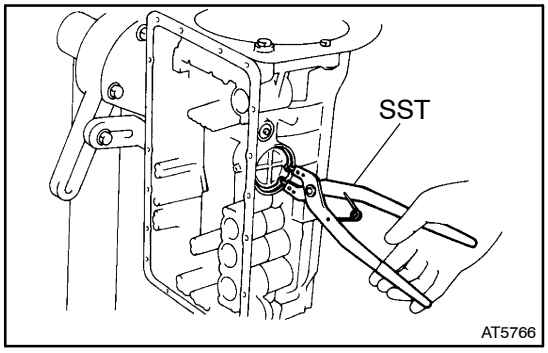


(b) Using SST, measure the stroke while applying and releasing compressed air (392 – 785 kPa, 4.0 – 8.0 kgf/cm^2, 57 – 114 psi).

SST 09240–00020

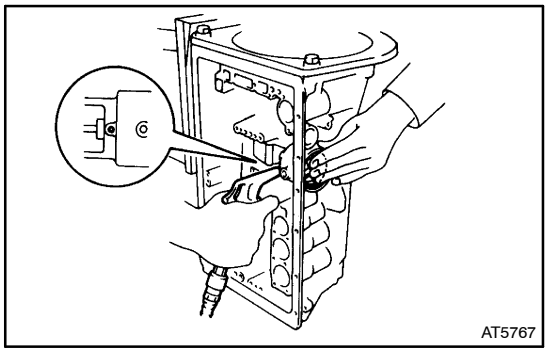
Piston stroke: 0.30 – 1.04 mm (0.0118 – 0.0409 in.)

If the stroke is outside the standard, inspect the brake band.



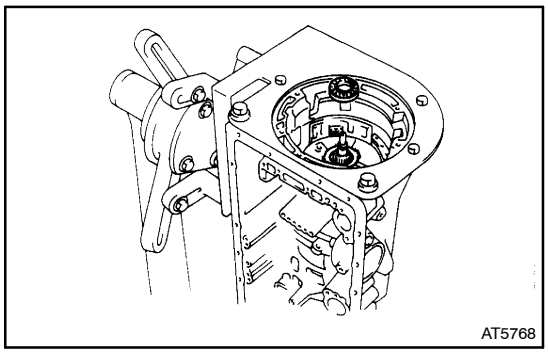
38. REMOVE 2ND COAST BRAKE PISTON

(a) Using SST, remove the snap ring.
SST 09350–30020 (09350–07060)



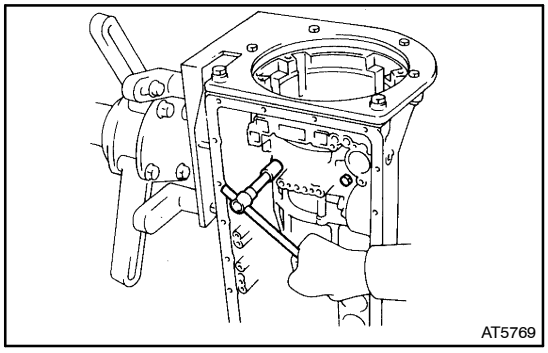
(b) Applying compressed air to the oil hole, remove the 2nd coast brake cover, piston assembly and spring.

(c) Remove the 2 O–rings from the cover.

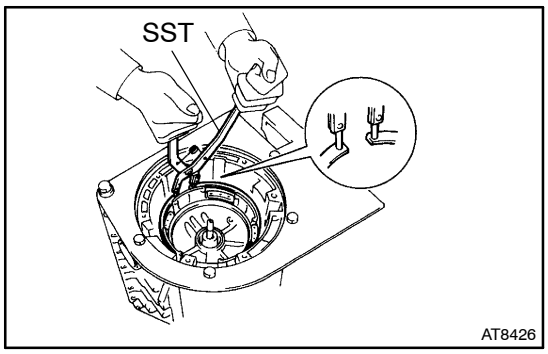


39. REMOVE OVERDRIVE SUPPORT SUB–ASSY

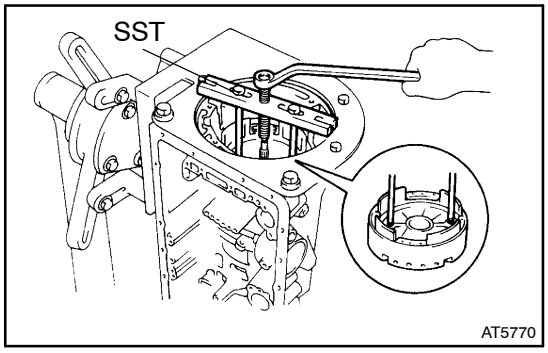
(a) Remove the assembled bearing.



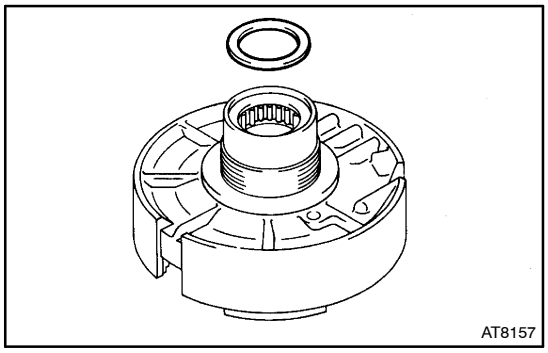
(b) Remove the 2 bolts holding the O/D support assembly to the case.



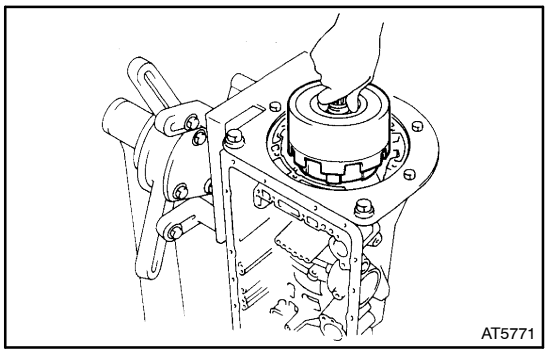
(c) Using SST, remove the snap ring.
SST 09350–30020 (09350–07060)



(d) Using SST, remove the O/D support assembly.
SST 09350–30020 (09350–07020)

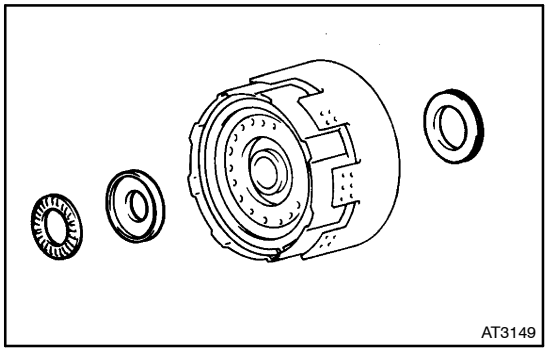


(e) Remove the race.

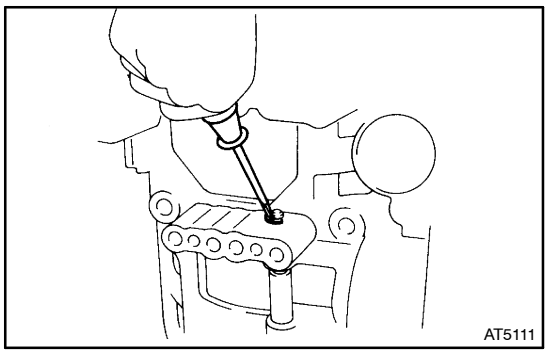


40. REMOVE DIRECT CLUTCH ASSY

(a) Remove the direct clutch with the forward clutch from the case.

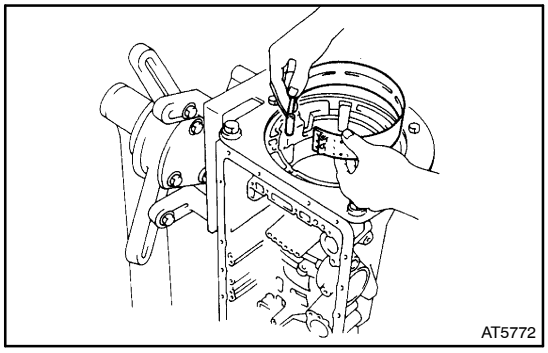


(b) Remove the 2 bearings and the races.

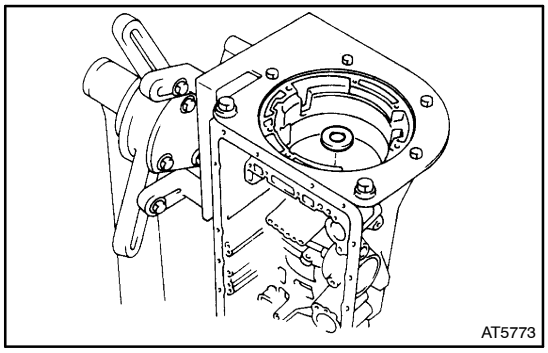


41. REMOVE 2ND COAST BRAKE BAND ASSY

(a) Using a screwdriver, remove the E–ring from the pin.

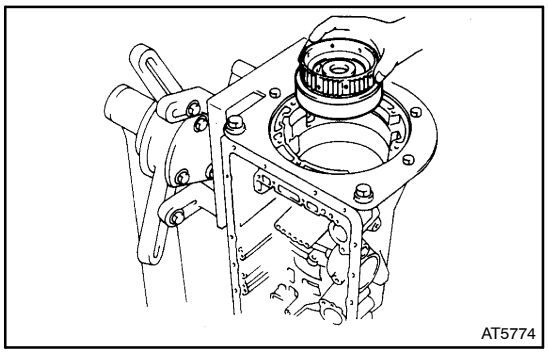


(b) Remove the 2nd coast brake band from the case.

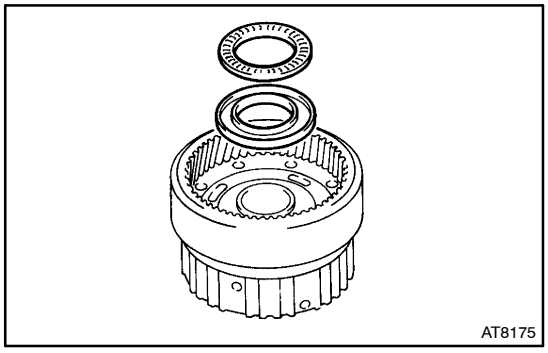


42. REMOVE FRONT PLANETARY RING GEAR SUB–ASSY

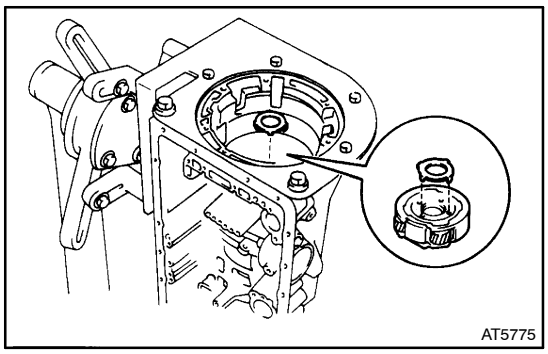
(a) Remove the race.



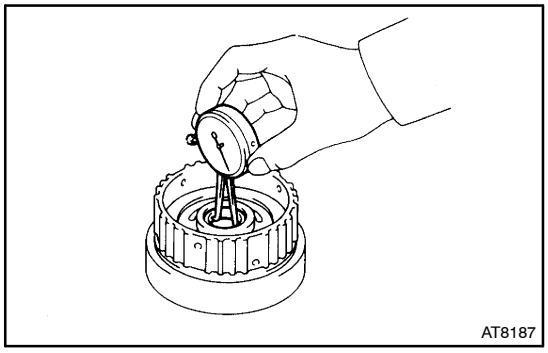
(b) Remove the front planetary ring gear from the case,



(c) Remove the bearing and race.



(d) Remove the race from the front planetary gear.

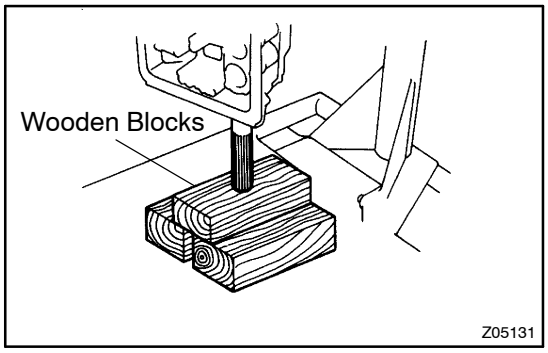


43. INSPECT FRONT PLANETARY RING GEAR SUB–ASSY

(a) Using a dial indicator, measure the inside diameter of the planetary ring gear bushing.

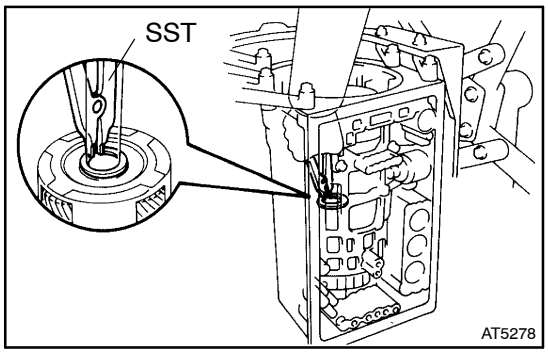
Maximum inside diameter: 24.08 mm (0.9480 in.)

If the inside diameter is greater than the maximum, replace the planetary ring gear.

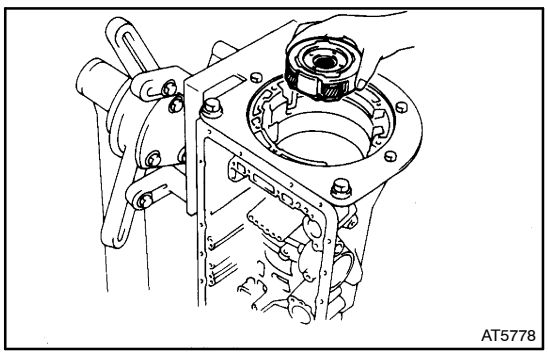


44. REMOVE FRONT PLANETARY GEAR ASSY

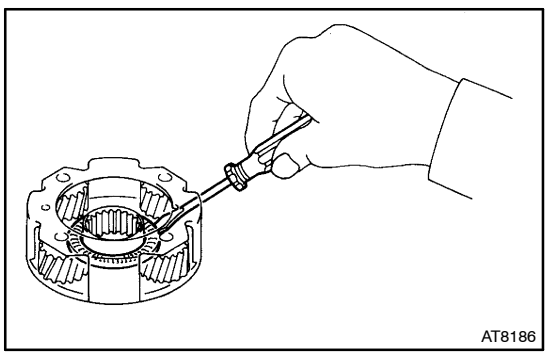
(a) With wooden blocks or equivalent under the output shaft, stand the transmission on the output shaft.



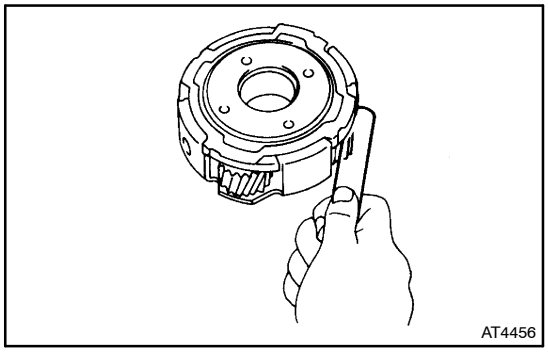
(b) Using SST, remove the snap ring.



(c) Remove the front planetary gear from the case.



(d) Using a screwdriver, remove the bearing and the race from the front planetary gear.

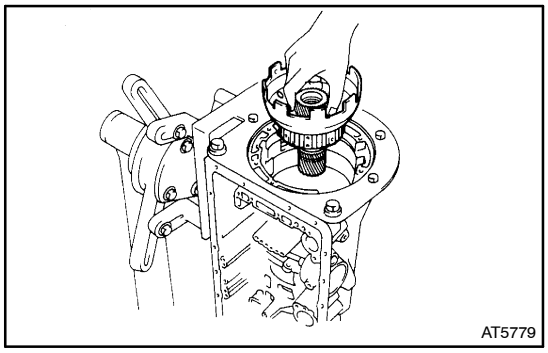


45. INSPECT PLANETARY PINION GEAR THRUST CLEARANCE

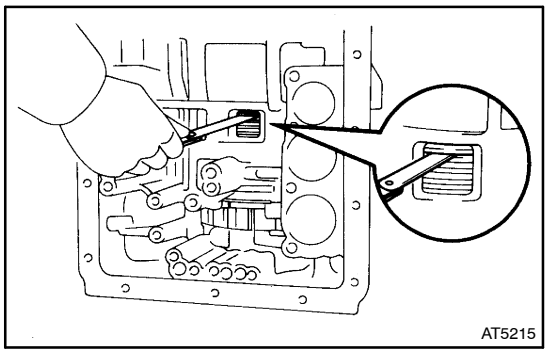
(a) Using a feeler gauge, measure the planetary pinion gear thrust clearance.

Standard clearance:
0.20 – 0.60 mm (0.0079 – 0.0236 in.)
Maximum clearance: 0.65 mm (0.0256 in.)

If the clearance is greater than the maximum, replace the planetary gear assembly.



46. REMOVE PLANETARY SUN GEAR SUB–ASSY

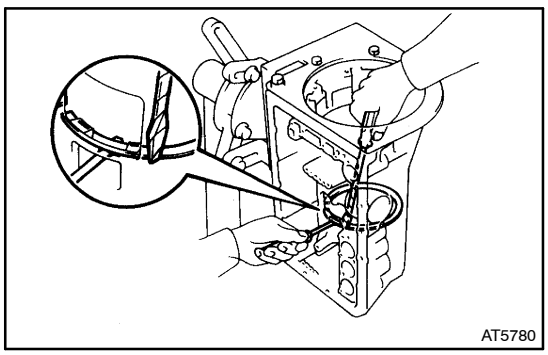


47. INSPECT PACK CLEARANCE OF SECOND BRAKE

(a) Using a feeler gauge, measure the clearance between the snap ring and the flange.

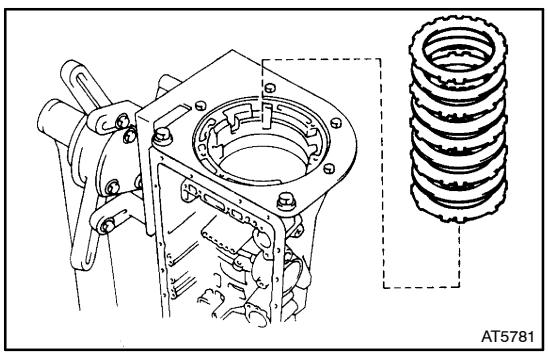
Clearance: 0.62 – 1.98 mm (0.0244 – 0.0780 in.)

If the clearance is outside the standard, inspect the discs.

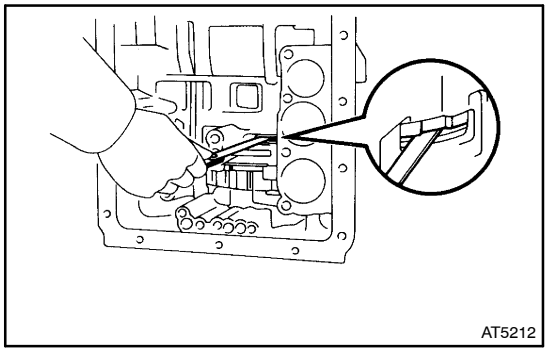


48. REMOVE 1ST & REVERSE BRAKE CLUTCH DISC

(a) Using a screwdriver, remove the snap ring.



(b) Remove the flange, the plates and the discs as a set.



49. INSPECT PACK CLEARANCE OF FIRST & REVERSE BRAKE

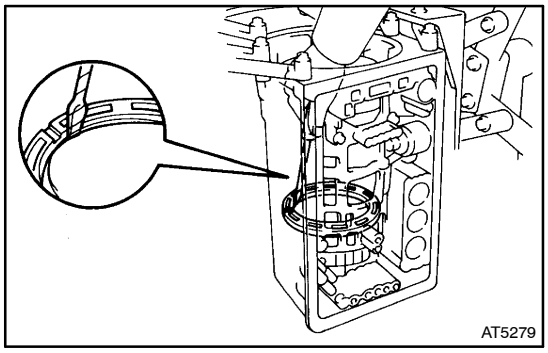
(a) Using a feeler gauge, measure the clearance between the plate and 2nd brake drum.

Clearance:

3RZ–FE: 0.60 – 1.12 mm (0.0236 – 0.0441 in.)

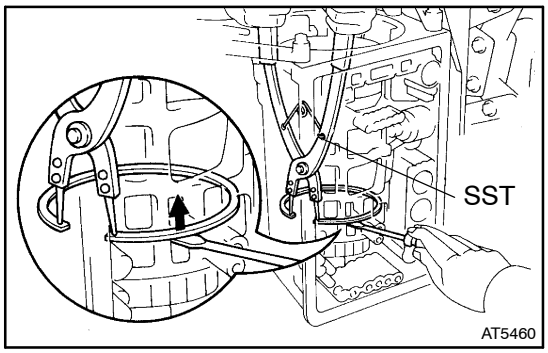
EXCEPT 3RZ–FE: 0.70 – 1.22 mm (0.0276 – 0.048 in.)

If the clearance is outside the standard, inspect the discs.



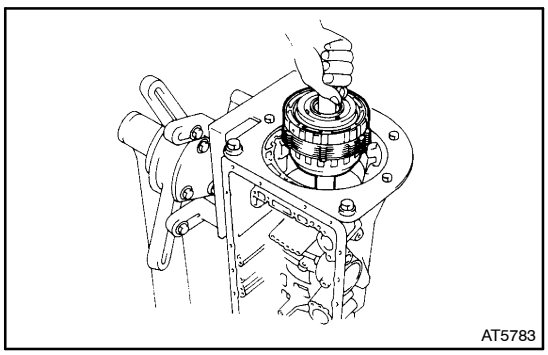
50. REMOVE 2ND BRAKE PISTON SLEEVE

(a) Using a screwdriver, remove the 2nd brake piston sleeve.

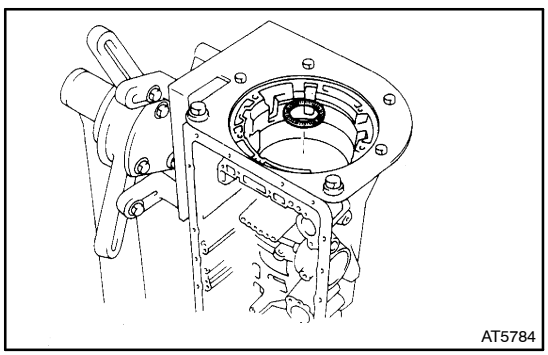


51. REMOVE REAR PLANETARY GEAR ASSY

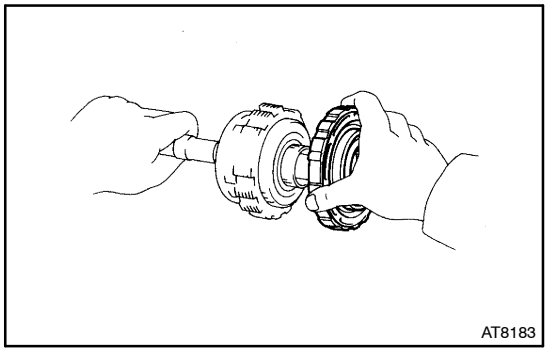
(a) Using SST and a screwdriver, remove the snap ring.



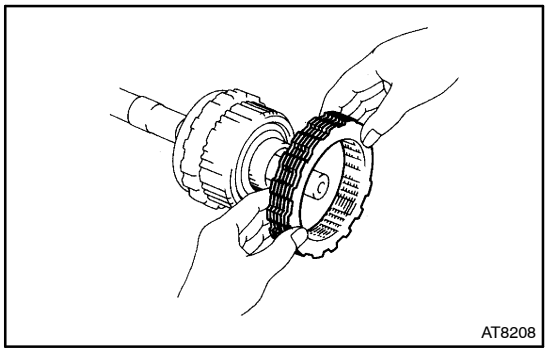
(b) Remove the rear planetary gear, the 2nd brake drum, the 1st and reverse brake pack and output shaft as an assembly.



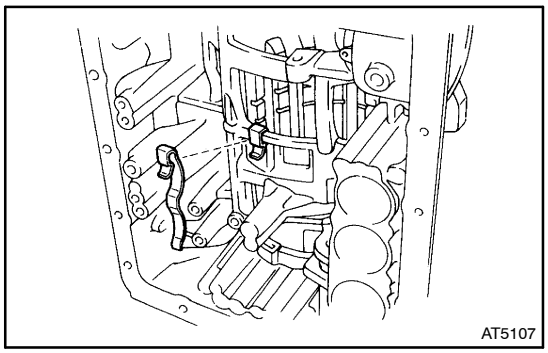
(c) Remove the assembled thrust bearing & race from the case.


AT8183

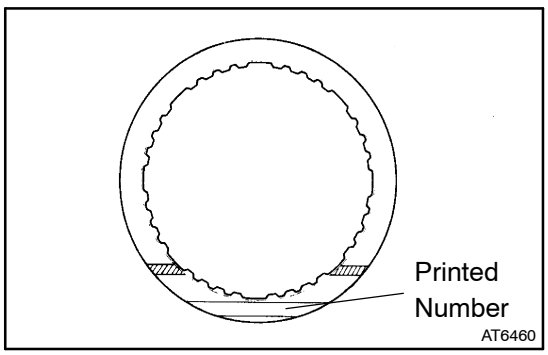
(d) Remove the 2nd brake drum assembly.


AT8208

(e) Remove the cushion plate, the flange, the plates and the discs of the 1st and reverse brake.


AT5107

(f) Remove the leaf spring.



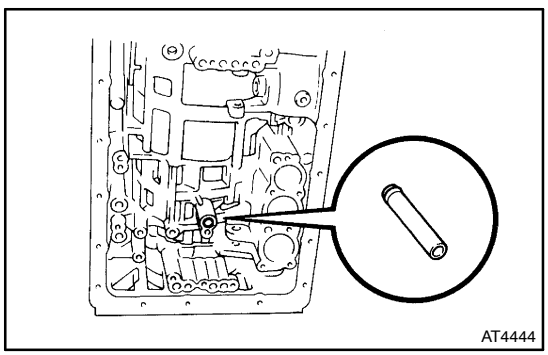
AT6460

52. INSPECT 1ST & REVERSE BRAKE CLUTCH DISC

(a) Check if the sliding surfaces of the disc, the plate and flange are worn or burnt. If necessary, replace them.

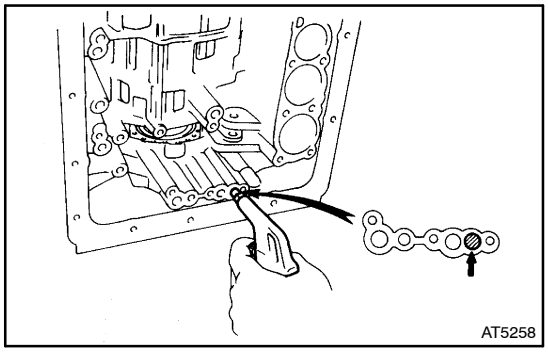
HINT:

- If the lining of the disc is peeled off or discolored, or even if only a part of the printed numbers is corroded, replace all discs.
- Before assembling new discs, soak them in ATF for at least 15 minutes.


AT4444

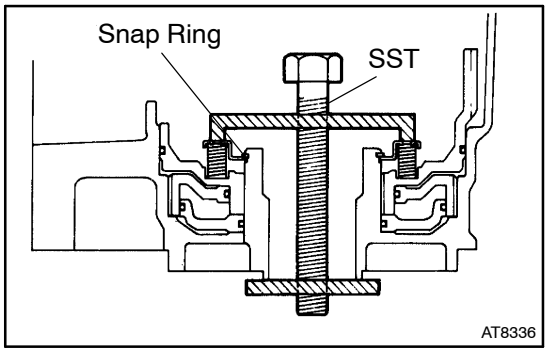
53. REMOVE BRAKE DRUM GASKET

(a) Remove the brake drum gasket.



54. INSPECT PISTON STROKE OF 1ST & REVERSE BRAKE

(a) Make sure the 1st & reverse brake pistons move smoothly when applying and releasing the compressed air into the transmission case.



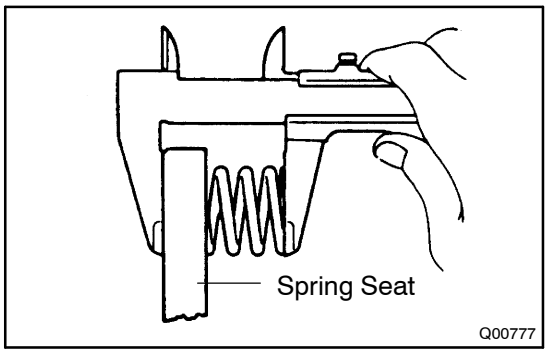
55. REMOVE 1ST & REVERSE BRAKE RETURN SPRING SUB–ASSY

(a) Set SST on the spring retainer, and compress the return spring.
SST 09350–30020 (09350–07050, 09350–07070)

(b) Using snap ring pliers, remove the snap ring.

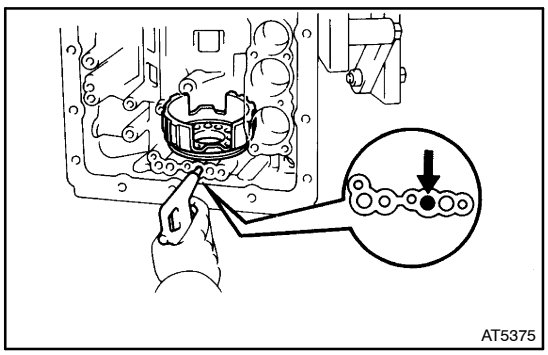
(c) Remove the piston return spring.

(d) Hold the No.2 1st & reverse brake piston by hand, and apply compressed air to the transmission case to remove the No.2 1st & reverse brake piston.



56. INSPECT 1ST & REVERSE BRAKE RETURN SPRING SUB–ASSY

(a) Check the return spring free length together with the spring seat.
Standard free length: 12.9 mm (0.508 in.)

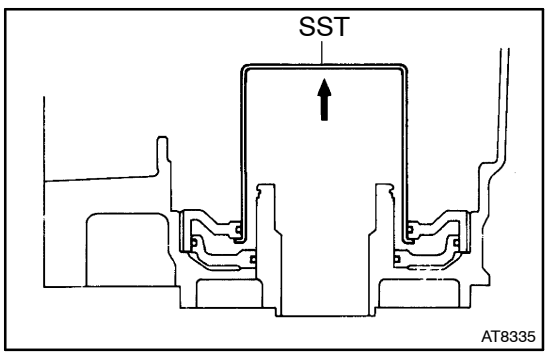


57. REMOVE 1ST & REVERSE BRAKE PISTON NO.2

(a) Remove the No.2 1st & reverse brake piston.

If the piston does not pop out with compressed air, lift the piston out with the needle–nose pliers.

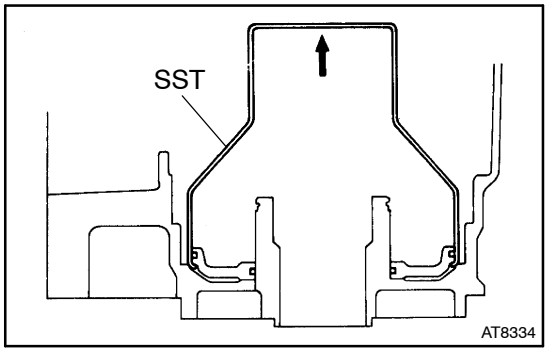
(b) Remove the O–ring from the No.2 1st & reverse brake piston.



58. REMOVE BRAKE REACTION SLEEVE

(a) Install SST behind the reaction sleeve and gradually lift it out of the transmission case.
SST 09350–30020 (09350–07080)

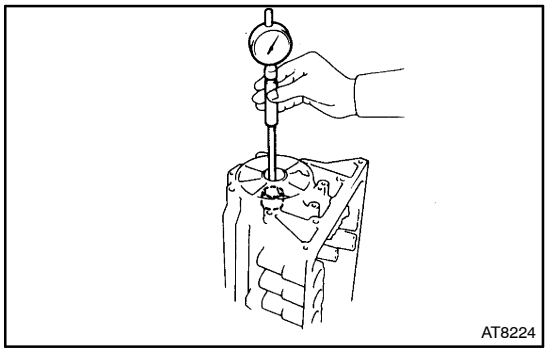
(b) Remove the O–ring from the reaction sleeve.



59. REMOVE BRAKE PISTON NO.2

(a) Install SST behind the No.1 1st & reverse brake piston, and gradually lift it out of the transmission case.
SST 09350–30020 (09350–07090)

(b) Remove the 2 O–rings from the No.1 1st & reverse brake piston.

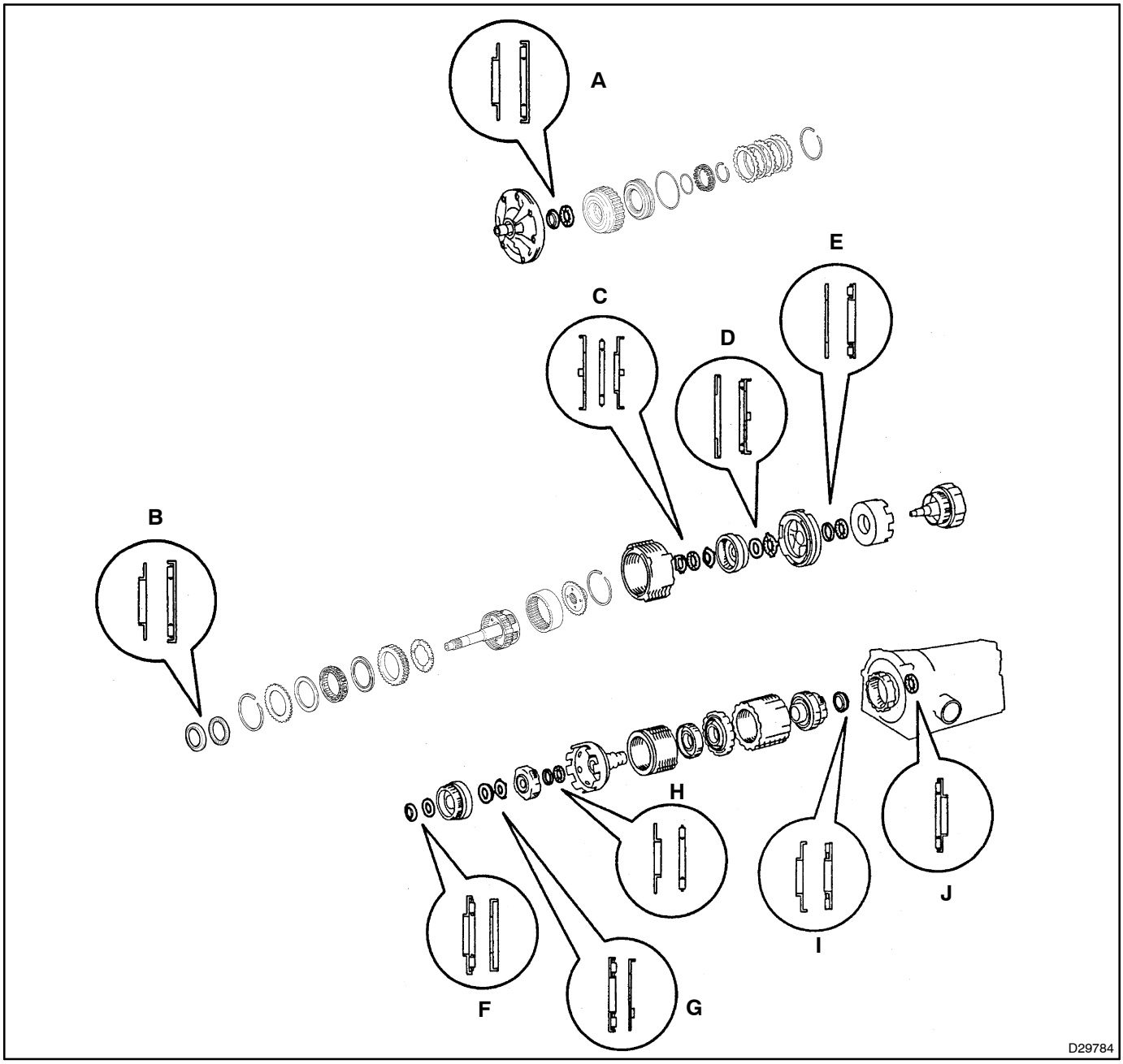


60. INSPECT AUTOMATIC TRANSMISSION CASE SUB–ASSY

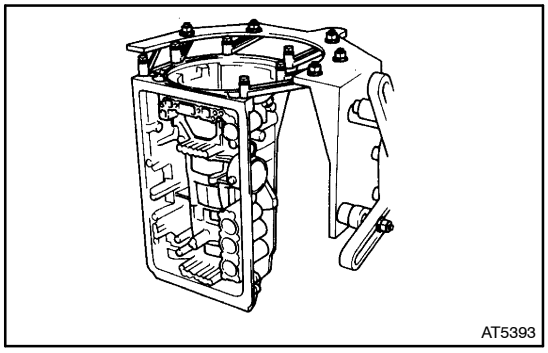
(a) Using a cylinder gauge, measure the inside diameter of the transmission case rear bushing.
Maximum inside diameter: 38.19 mm (1.5035 in.)

If the inside diameter is greater than the maximum, replace the transmission case.

61. BEARING POSITION

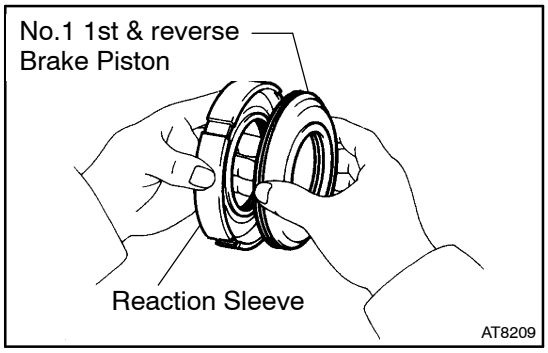


Mark	Front Race Diameter Inside / Outside mm (in.)	Thrust Bearing Diameter Inside / Outside mm (in.)	Rear Race Diameter Inside / Outside mm (in.)
A	28.45 (1.120) / 47.3 (1.862)	29.2 (1.15) / 50.2 (1.976)	–
B	28.8 (1.134) / 46.4 (1.827)	28.9 (1.138) / 50.2 (1.976)	–
C	24.7 (0.972) / 41.8 (1.646)	24.2 (0.953) / 47.8 (1.882)	–
D	37.2 (1.465) / 58.8 (2.315)	33.8 (1.331) / 50.0 (1.969)	–
E	36.8 (1.449) / 50.9 (2.004)	33.7 (1.327) / 47.6 (1.874)	–
F	26.0 (1.024) / 48.9 (1.926)	26.0 (1.024) / 46.7 (1.839)	26.8 (1.055) / 47.0 (1.850)
G	–	35.2 (1.386) / 53.6 (2.110)	34.3 (1.350) / 47.8 (1.882)
H	33.7 (1.327) / 47.6 (1.874)	35.5 (1.398) / 47.7 (1.878)	–
I	28.5 (1.122) / 44.2 (1.740)	27.7 (1.091) / 44.2 (1.740)	–
J	–	39.38 (1.550) / 58.1 (2.287)	–



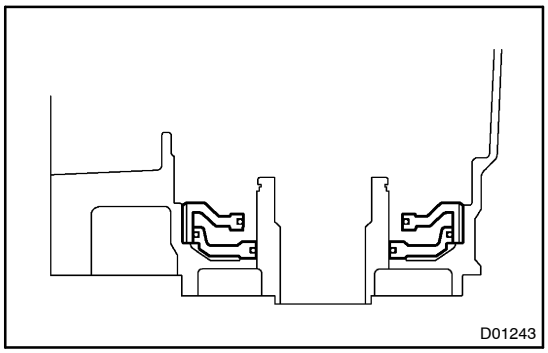
62. FIX AUTOMATIC TRANSMISSION CASE SUB–ASSY

(a) Install the transmission case in the overhaul attachment.



63. INSTALL BRAKE PISTON NO.2

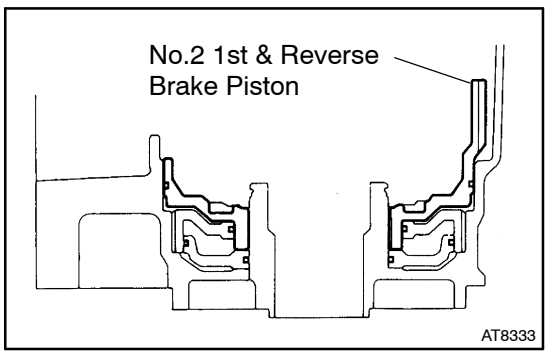
(a) Coat 3 new O–rings with ATF.
(b) Install the 2 O–rings on the No.1 1st & reverse brake piston.
(c) Install the O–rings on the reaction sleeve.
(d) Install the No.1 1st & reverse brake piston to the reaction sleeve.



64. INSTALL BRAKE REACTION SLEEVE

(a) Coat new O–ring with ATF, and install it to the reaction sleeve.
(b) With the brake piston No.1 underneath (the rear side), install the brake reaction sleeve and the brake piston No.1 to the transmission case.

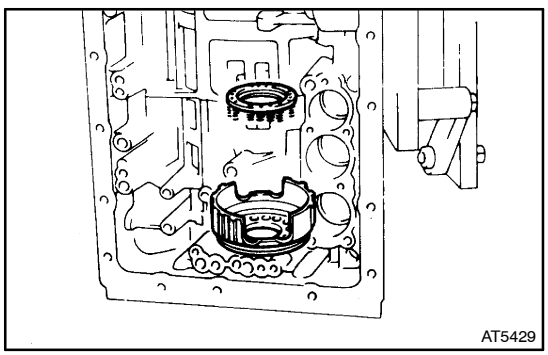
NOTICE:
Be careful not to damage the O–rings.



65. INSTALL 1ST & REVERSE BRAKE PISTON NO.2

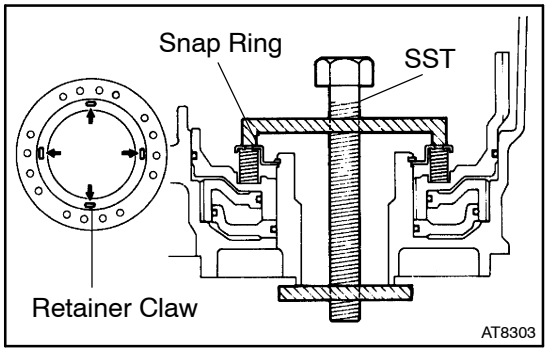
(a) Coat new O–rings with ATF.
(b) Install the O–rings on brake piston No.2.
(c) With the spring seat of the piston upwards (the front side), place the piston in the transmission case.

NOTICE:
Be careful not to damage the O–ring.



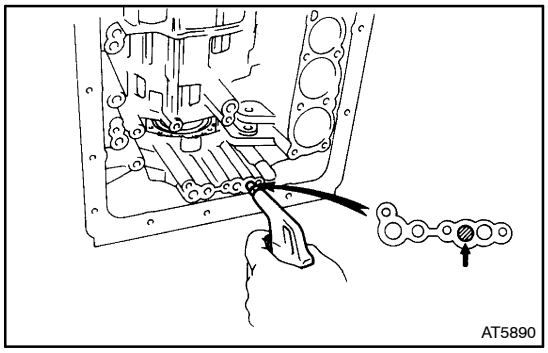
66. INSTALL 1ST & REVERSE BRAKE RETURN SPRING SUB–ASSY

(a) Place the piston return spring onto the No.2 1st & reverse brake piston.



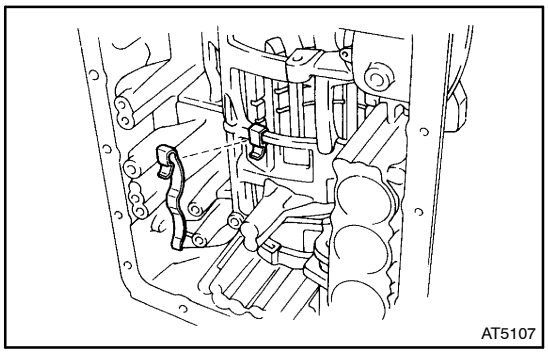
(b) Set SST as shown, and compress the return spring with SST.
SST 09350–30020 (09350–07050, 09350–07070)

(c) Using a screwdriver, install the snap ring. Make sure the end gap of the snap ring is not aligned with the spring retainer claw.



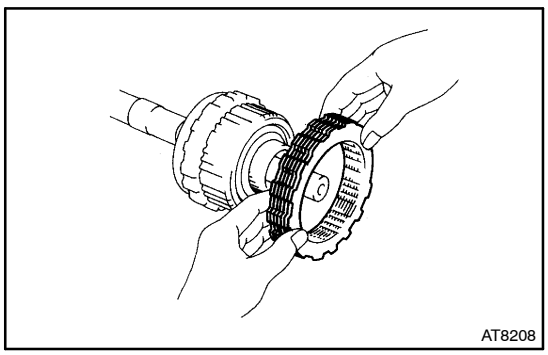
67. INSPECT PISTON STROKE OF 1ST & REVERSE BRAKE

(a) Make sure the 1st & reverse brake pistons move smoothly when applying and releasing the compressed air into the transmission case.



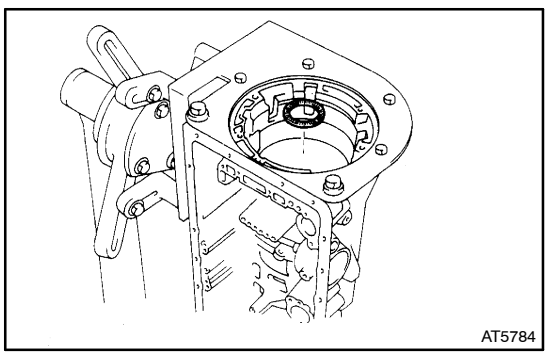
68. INSTALL REAR PLANETARY GEAR ASSY

(a) Install the leaf spring.



(b) Install the flange with the rounded edge facing forward. Reinstall the plates and discs.
Install in order: P = Plate D = Disc
D – P – D – P – D – P – D – P – D – P – D – P – D – P

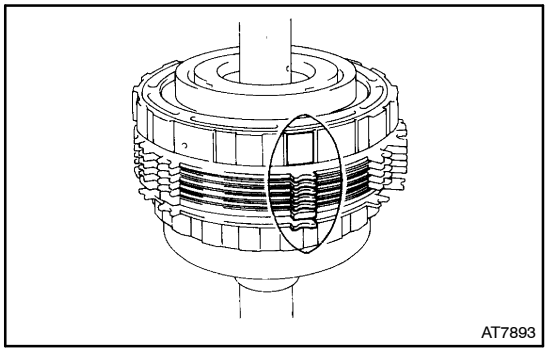
(c) Install the 2nd brake drum assembly.



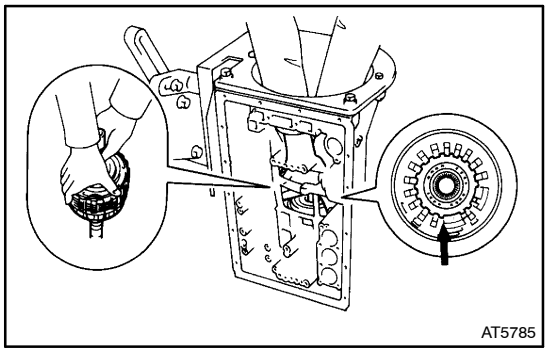
(d) Coat the assembled bearing and race with petroleum jelly and install it onto the case.

Assembled bearing and race diameter

	Inside	Outside
Assembled baring	39.38 mm (1.5504 in.)	58.1 mm (2.2874 in.)

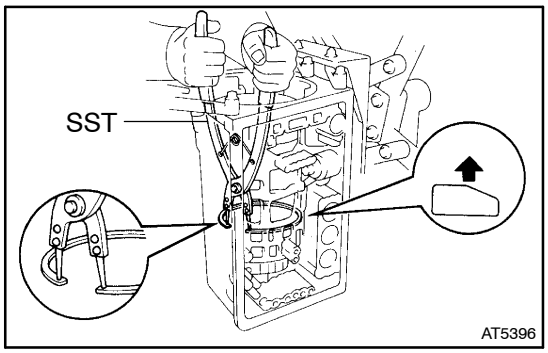


(e) Align the teeth on the flange, the discs and the plates.

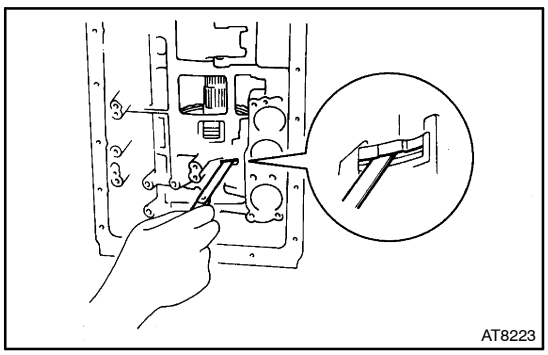


(f) Align the splines of the transmission case wint the assembled rear planetary gear, the 2nd brake drum, and the 1st and reverse brake pack with the output shaft,

(g) Hold the output shaft with wooden blocks or equivalents.



(h) Using SST, install the snap ring.
SST 09350–30020 (09350–07060)



69. INSPECT PACK CLEARANCE OF FIRST & REVERSE BRAKE

(a) Using a feeler gauge, measure the clearance between the plate and the 2nd brake drum.

Clearance:

3RZ–FE: 0.60 – 1.12 mm (0.0236 – 0.0441 in.)

EXCEPT 3RZ–FE: 0.70 – 1.22 mm (0.0276 – 0.048 in.)

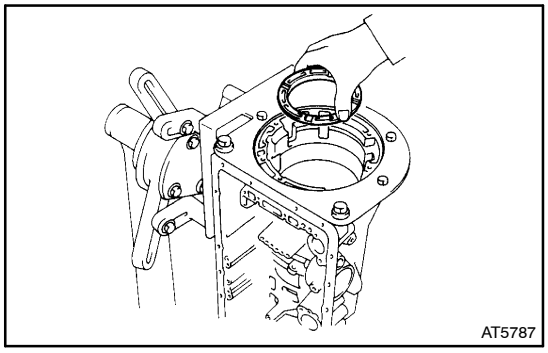
If the clearance is outside the standard, select another flange.

HINT:

There are 8 different thicknesses for the flange.

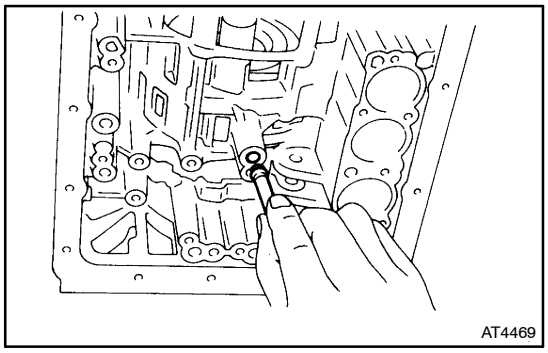
Flange thickness:

No.	Thickness	No.	Thickness
67	5.4 mm (0.213 in.)	52	4.6 mm (0.181 in.)
66	5.2 mm (0.205 in.)	53	4.4 mm (0.173 in.)
50	5.0 mm (0.197 in.)	54	4.2 mm (0.165 in.)
51	4.8 mm (0.189 in.)	55	4.0 mm (0.157 in.)



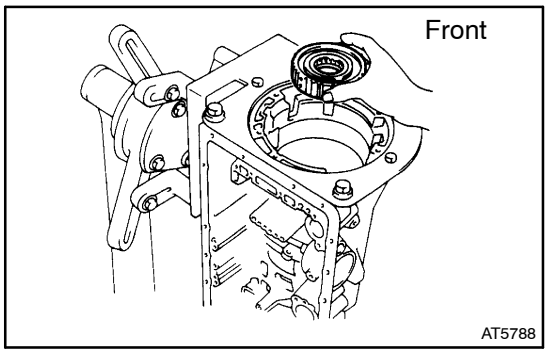
70. INSTALL 2ND BRAKE PISTON SLEEVE

(a) Install the brake reaction sleeve.



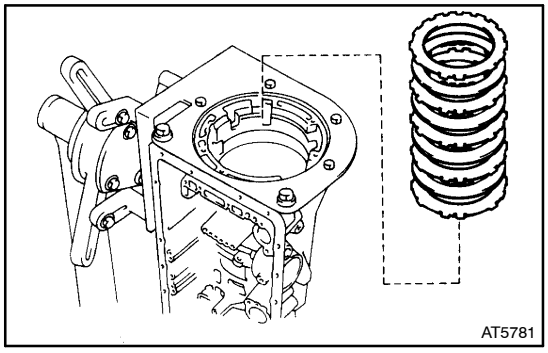
71. INSTALL BRAKE DRUM GASKET

(a) Install the brake drum gasket.



72. INSTALL 1 WAY CLUTCH ASSY

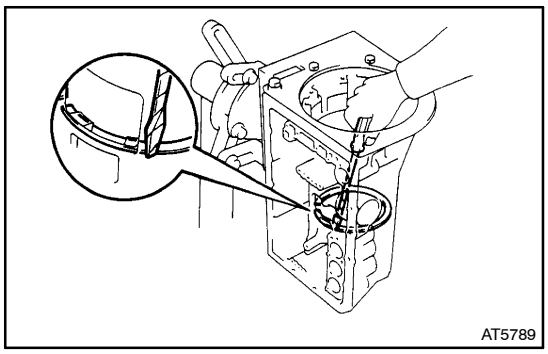
(a) Install the brake drum gasket.



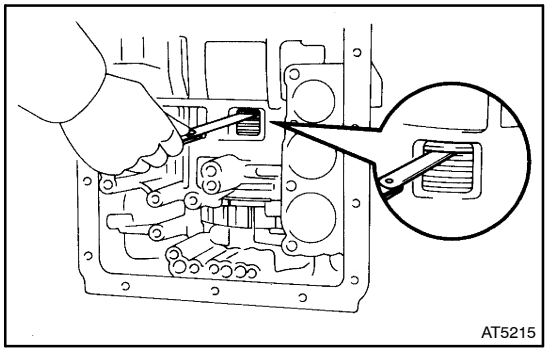
73. INSTALL 1ST & REVERSE BRAKE CLUTCH DISC

(a) Install the 1.8 mm (0.071 in.) thick plate with the rounded edge side of the plate facing the disc.

(b) Install the plates and discs.
Plate thickness: 2.5 mm (0.098 in.)
Install in order: P = Plate D = Disc
D – P – D – P – D – P – D – P – D – P



(c) Using a screwdriver, install the snap ring.

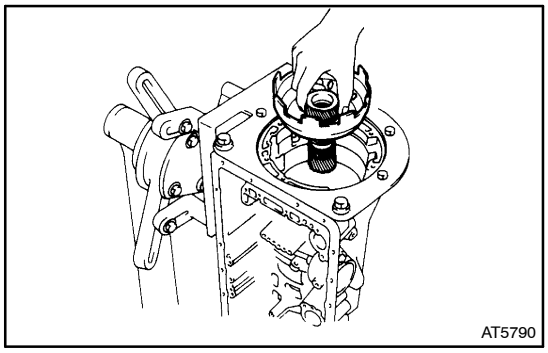


74. INSPECT PACK CLEARANCE OF SECOND BRAKE

(a) Using a feeler gauge, measure the clearance between the snap ring and the flange.

Clearance: 0.62 – 1.98 mm (0.0244 – 0.0780 in.)

If the clearance is outside the standard, check for an improper installation.

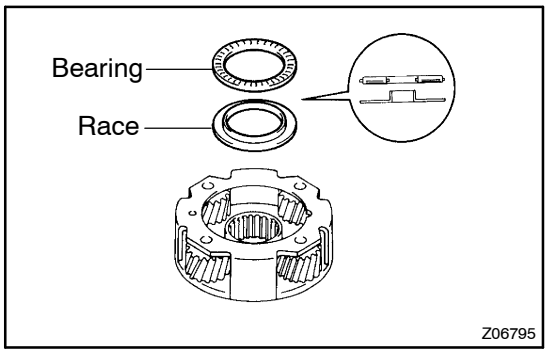


75. INSTALL PLANETARY SUN GEAR SUB–ASSY

(a) While turning the planetary sun gear clockwise, install it into the No.1 one–way clutch.

HINT:

Confirm the thrust washer is installed correctly.

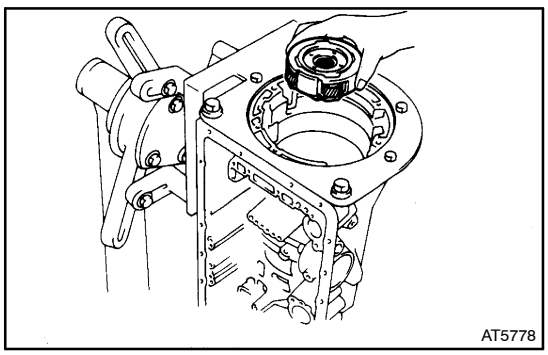


76. INSTALL FRONT PLANETARY GEAR ASSY

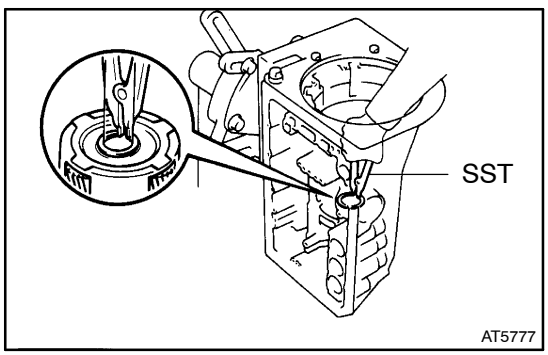
(a) Coat the bearing and race with petroleum jelly and install them onto the front planetary gear.

Bearing and race diameter:

	Inside	Outside
Bearing	35.5 mm (1.398 in.)	47.7 mm (1.878 in.)
Race	33.7 mm (1.327 in.)	47.6 mm (1.874 in.)

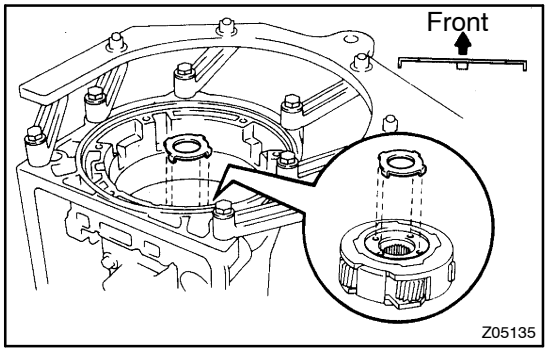


(b) Install the front planetary gear to the sun gear input drum.



(c) Using SST, install the snap ring.
SST 09350–30020 (09350–07070)

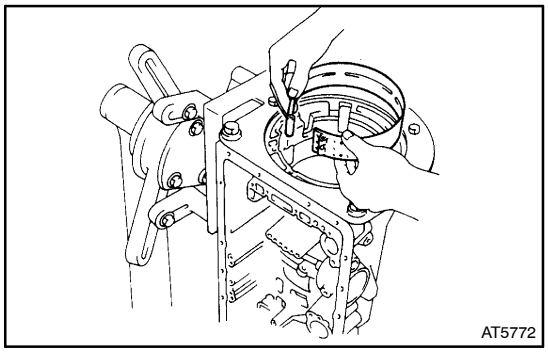
(d) Remove the wooden blocks or equivalent under the output shaft.



(e) Coat the bearing race with petroleum jelly, and install it onto the front planetary gear.

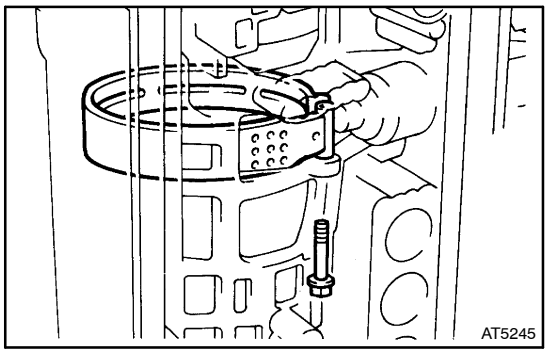
Race diameter:

	Inside	Outside
Race	34.3 mm (1.350 in.)	47.8 mm (1.882 in.)

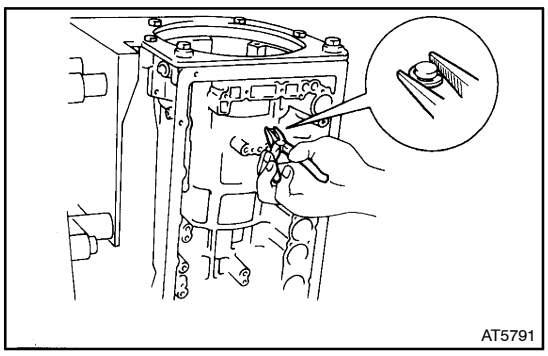


77. INSTALL 2ND COAST BRAKE BAND ASSY

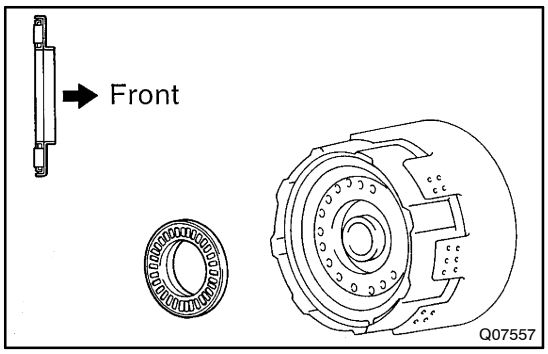
(a) Install the 2nd coast brake band to the case.



(b) Install the pin through the brake band.



(c) Using needle–nose pliers, install the E–ring to the pin.

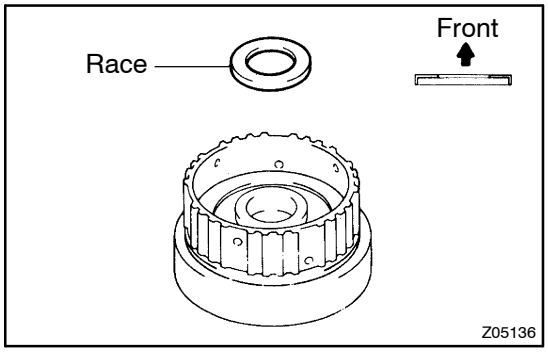


78. INSTALL DIRECT CLUTCH ASSY

(a) Coat the bearing and the race with petroleum jelly, and install them onto the forward clutch.

Bearing diameter:

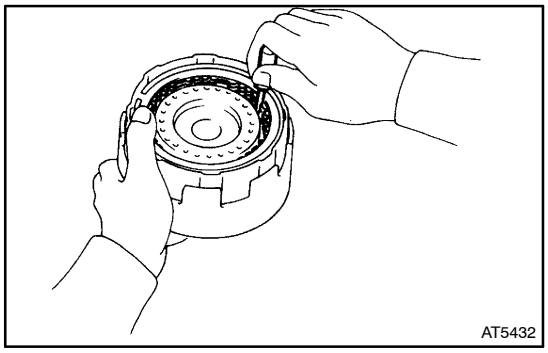
	Inside	Outside
Race	26.0 mm (1.024 in.)	48.9 mm (1.926 in.)
bearing	26.0 mm (1.024 in.)	46.7 mm (1.839 in.)



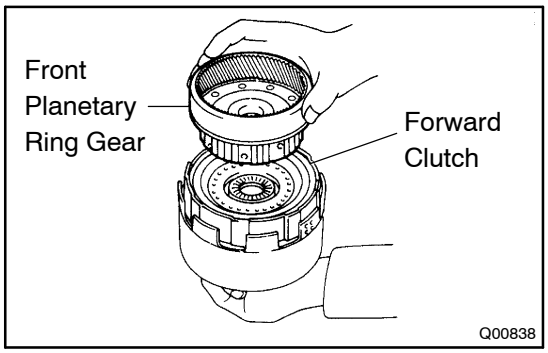
(b) Coat the race with the petroleum jelly, and install it onto the front planetary ring gear.

Race diameter:

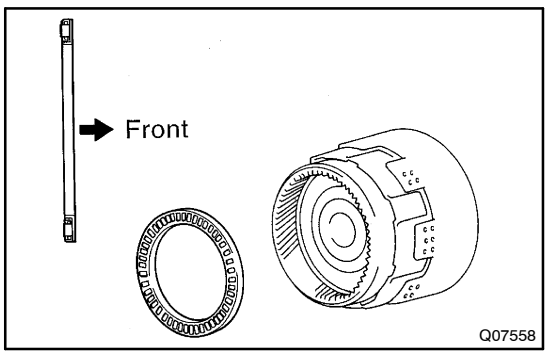
	Inside	Outside
Race	26.8 mm (1.055 in.)	47.0 mm (1.850 in.)



(c) Align the flukes of the discs in the forward clutch.



(d) Align the splines of the front planetary ring gear with the flukes of the discs and install the front planetary ring gear to the forward clutch.

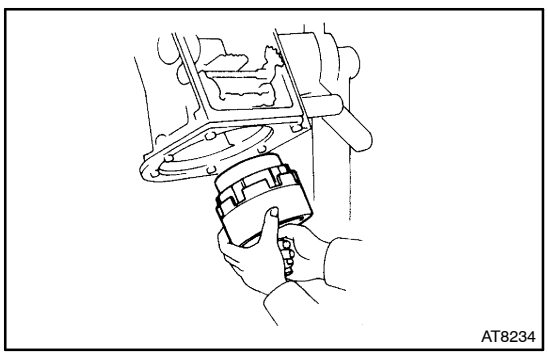


79. INSTALL FRONT PLANETARY RING GEAR SUB–ASSY

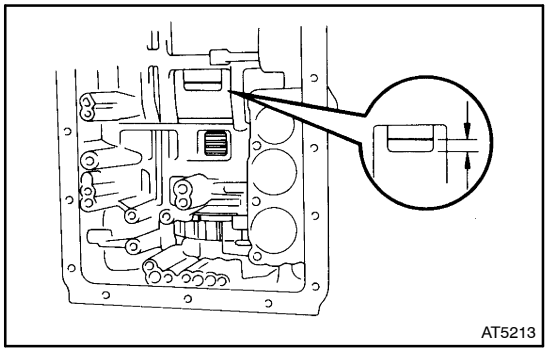
(a) Coat the bearing and the race with petroleum jelly, and install them onto the ring gear.

Bearing diameter:

	Inside	Outside
Assembled bearing	35.2 mm (1.386 in.)	53.6 mm (2.110 in.)



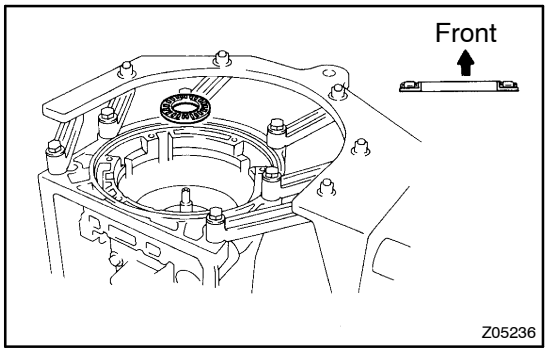
(b) Install the assembled direct clutch, the forward clutch and the front planetary ring gear into the transmission case.



(c) Using vernier calipers, measure the distance between the sun gear input drum and the direct clutch drum as shown in the illustration.

Height: 5.3 – 7.3 mm (0.209 – 0.287 in.)

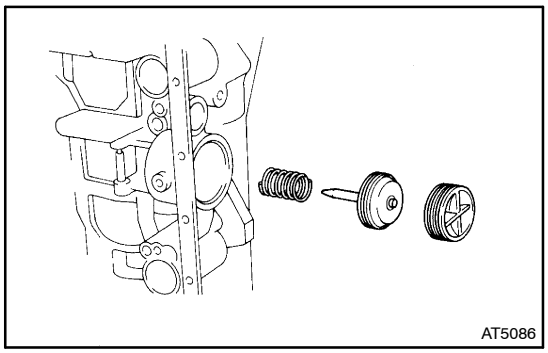
If the distance is outside standard, check for an improper installation.



(d) Coat the assembled bearing & race with petroleum jelly and install it onto the forward clutch.

Assembled bearing & race diameter:

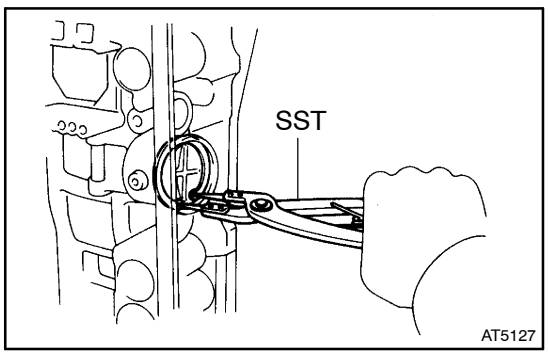
	Inside	Outside
Assembled bearing & race	33.7 mm (1.327 in.)	47.6 mm (1.874 in.)



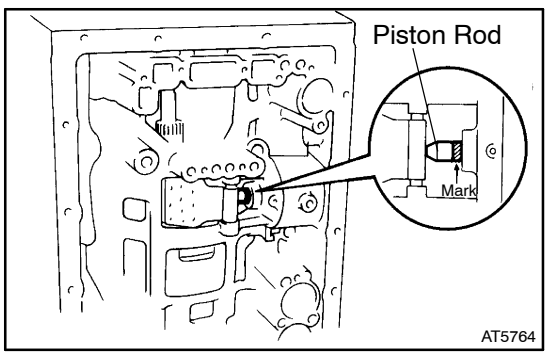
80. INSTALL 2ND COAST BRAKE PISTON

(a) Coat 2 new O–rings with ATF and install them to the cover.

(b) Install the spring, the piston assembly and the cover to the case.

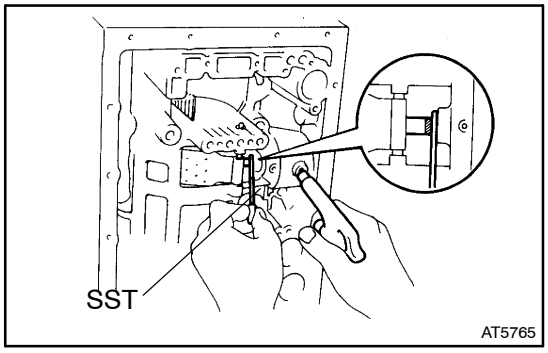


(c) Using SST, install the snap ring.
SST 09350–30020 (09350–07060)



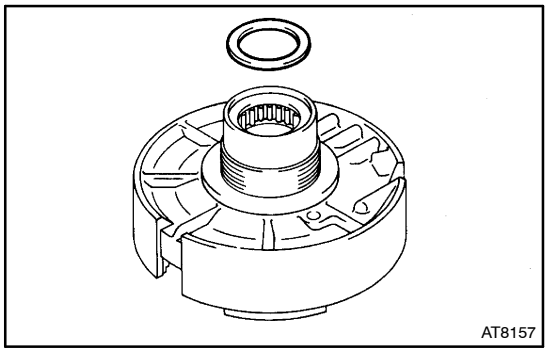
81. INSPECT PISTON STROKE OF 2ND COAST BRAKE

(a) Place a mark on the 2nd coast brake piston rod.



(b) Using SST, measure the stroke while applying and releasing compressed air (392 – 785 kPa, 4.0 – 8.0 kgf/cm^2, 57 – 114 psi).
SST 09240–00020
Piston rod stroke: 1.5 – 3.0 mm (0.059 – 0.118 in.)

If the stroke is still more than the standard value, replace the brake band with a new one.

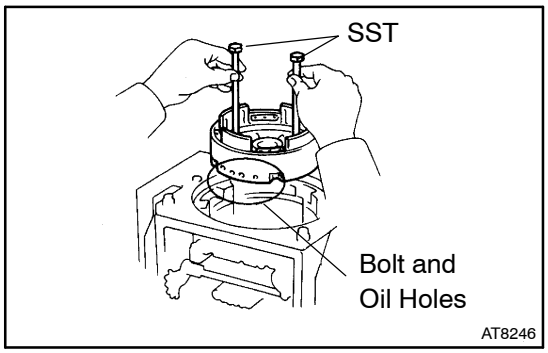


82. INSTALL OVERDRIVE SUPPORT SUB–ASSY

(a) Coat the race with petroleum jelly, and install it onto the O/D support assembly.

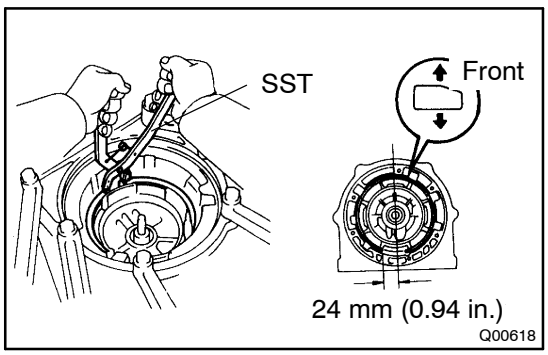
Race diameter:

	Inside	Outside
Race	36.8 mm (1.449 in.)	50.9 mm (2.004 in.)



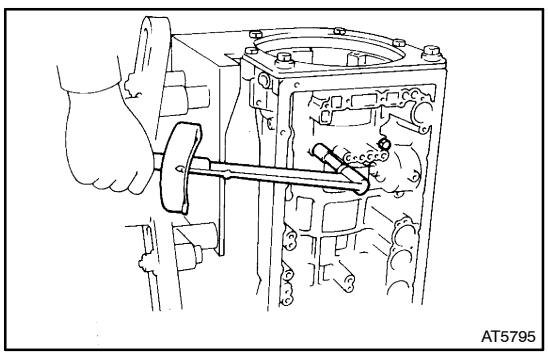
(b) Using 2 bolts of SST, aim the bolt and the oil holes of the O/D support toward the valve body side, and align them with the bolt holes of the transmission case, and insert.
SST 09350–30020 (09350–07020)

(c) Temporarily tighten the 2 bolts.

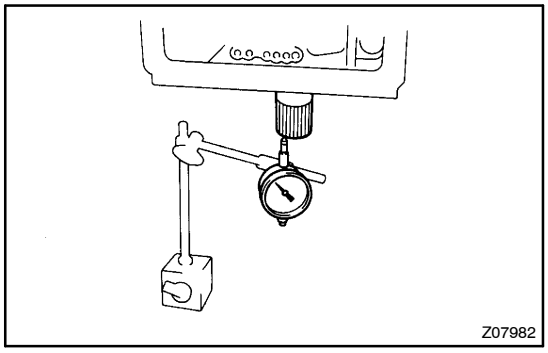


(d) Using SST, install the snap ring.
SST 09350–30020 (09350–07060)

HINT:
Install the snap ring open end toward the valve body.



(e) Torque the 2 bolts.
Toque: 25 N·m (260 kgf·cm, 19 ft·lbf)


Z07982

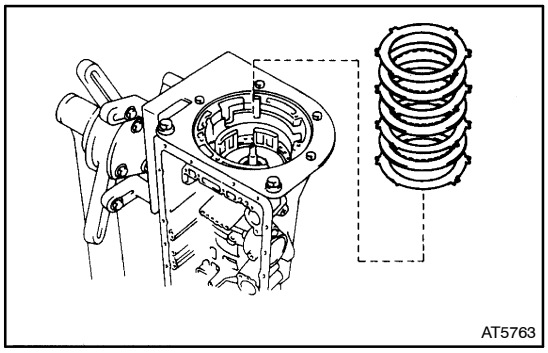
83. INSPECT OUTPUT SHAFT

(a) Using a dial indicator, measure the end play of the output shaft by hand.

End play: 0.30 – 1.04 mm (0.0118 – 0.0409 in.)

If the values are outside the standard, check for an improper installation.

(b) Check that the output shaft rotates smoothly.


AT5763

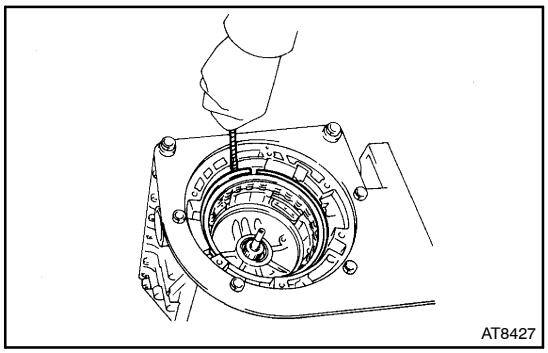
84. INSTALL OVERDRIVE BRAKE CLUTCH DISC

(a) Install the 4.0 mm (0.157 in.) thick flange (flat ring) with the rounded edge side of the flange facing the discs.

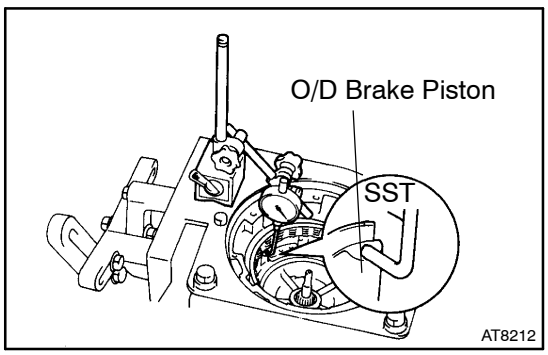
(b) Install the plates and discs.

Install in order: P = Plate D = Disc

(c) Install the flange (stepped ring) with the flat side of the flange facing the disc.


AT8427

(d) Using a screwdriver, install the snap ring.

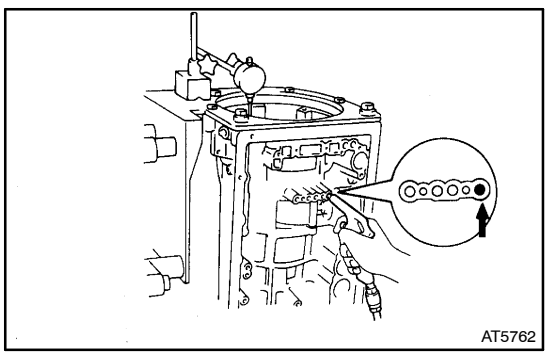


AT8212

85. INSPECT OVERDRIVE BRAKE PISTON

(a) Place SST and a dial indicator onto the O/D brake piston.

SST 09350–30020 (09350–06120)


AT5762

(b) Measure the stroke while applying and releasing compressed air (392 – 785 kPa, 4.0 – 8.0 kgf/cm^2, 57 – 114 psi).

Piston stroke: 1.40 – 1.70 mm (0.0551 – 0.0669 in.)

If the piston stroke is less than the limit, parts may have been assembled incorrectly, so check and reassemble again.

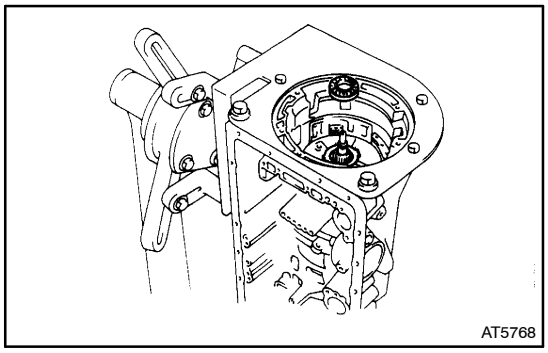
If the piston stroke is outside the standard, select another flange.

HINT:

There are 7 different thicknesses for the flange.

Flange thickness:

No.	Thickness	No.	Thickness
77	3.3 mm (0.130 in.)	81	3.8 mm (0.150 in.)
78	3.5 mm (0.138 in.)	82	3.9 mm (0.154 in.)
79	3.6 mm (0.142 in.)	83	4.0 mm (0.157 in.)
80	3.7 mm (0.146 in.)		

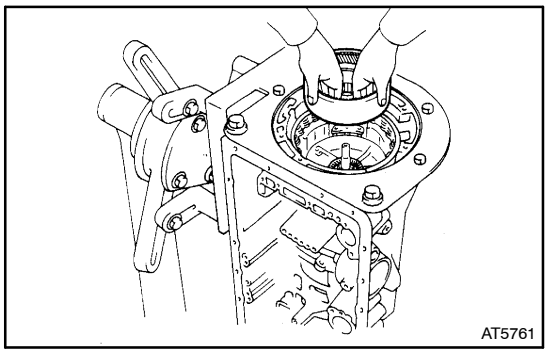

AT5768

86. INSTALL OVERDRIVE PLANETARY GEAR ASSY

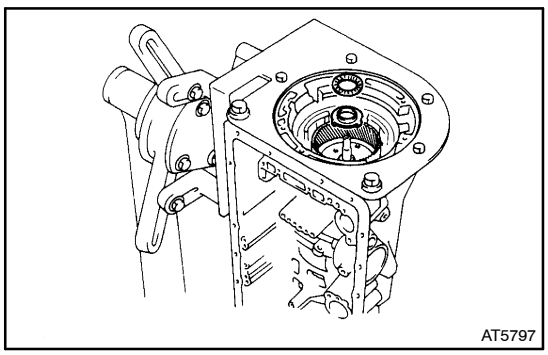
(a) Coat the race with petroleum jelly, and install it onto the O/D support.

Assembled bearing and race diameter:

	Inside	Outside
Assembled bearing	33.8 mm (1.331 in.)	50.0 mm (1.969 in.)
Race	37.2 mm (1.465 in.)	58.8 mm (2.315 in.)


AT5761

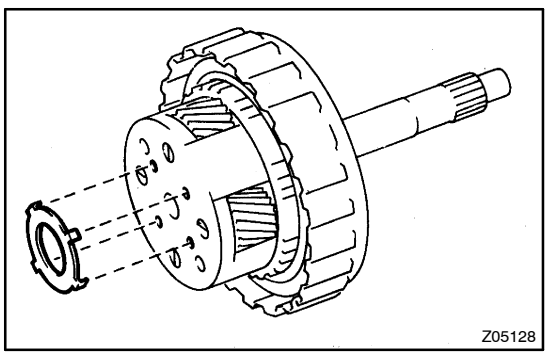
(b) Install the O/D planetary ring gear.


AT5797

(c) Coat the bearing and the race with petroleum jelly, and install them onto the planetary ring gear.

Bearing and race diameter:

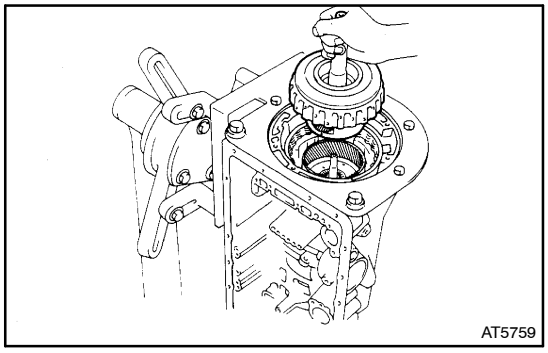
	Inside	Outside
Assembled bearing	24.2 mm (0.953 in.)	47.8 mm (1.882 in.)


Z05128

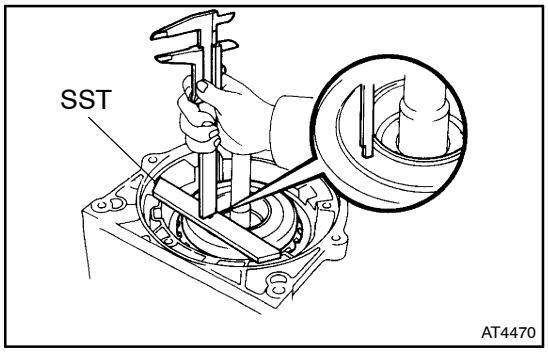
(d) Coat the race with petroleum jelly, and install it onto the planetary gear.

Race diameter:

	Inside	Outside
Race	24.7 mm (0.9724 in.)	41.8 mm (1.646 in.)



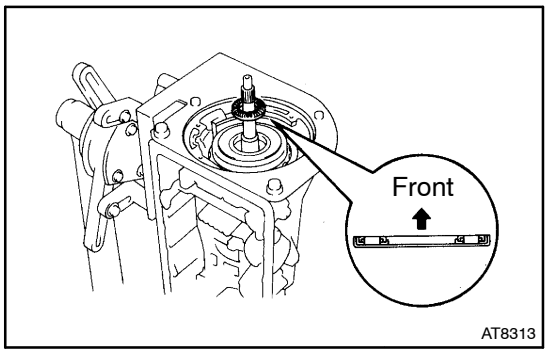
(e) Install the O/D planetary gear, O/D direct clutch and one–way clutch.



(f) Place SST on the transmission case.
SST 09350–36010 (09350–06090)

(g) Using calipers, measure distance between the tops of SST and the clutch drum.
Standard distance: 15.5 – 16.5 mm (0.610 – 0.650 in.)

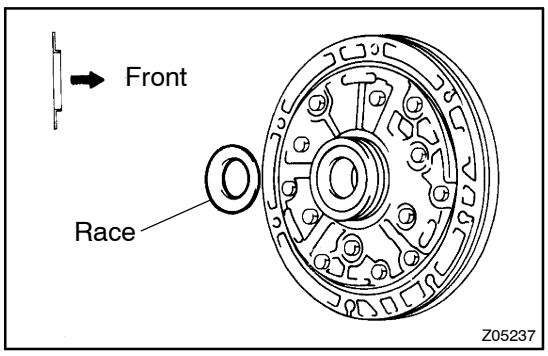
If the distance is outside the standard, check for an improper installation.



(h) Coat the assembled bearing & race with petroleum jelly and install it onto the O/D direct clutch.

Bearing and race diameter:

	Inside	Outside
Assembled bearing & race	29.2 mm (1.150 in.)	50.2 mm (1.976 in.)



87. INSTALL OIL PUMP ASSY

(a) Coat the race with petroleum jelly, and install it onto the oil pump.

Race diameter:

	Inside	Outside
Race	28.45 mm (1.120 in.)	47.3 mm (1.862 in.)

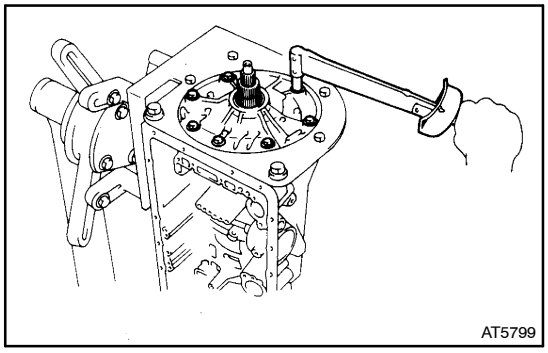
(b) Coat a new O–ring with ATF, and install it around the pump body.

(c) Place the oil pump through the input shaft, and align the bolt holes of the pump body with the transmission case.

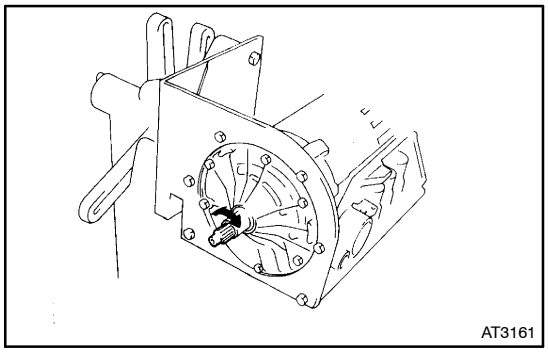
(d) Hold the input shaft, and lightly press the oil pump body to slide the oil seal rings into the O/D direct clutch drum.

NOTICE:

Do not push on the oil pump strongly, or the oil seal ring will stick to the direct clutch drum.

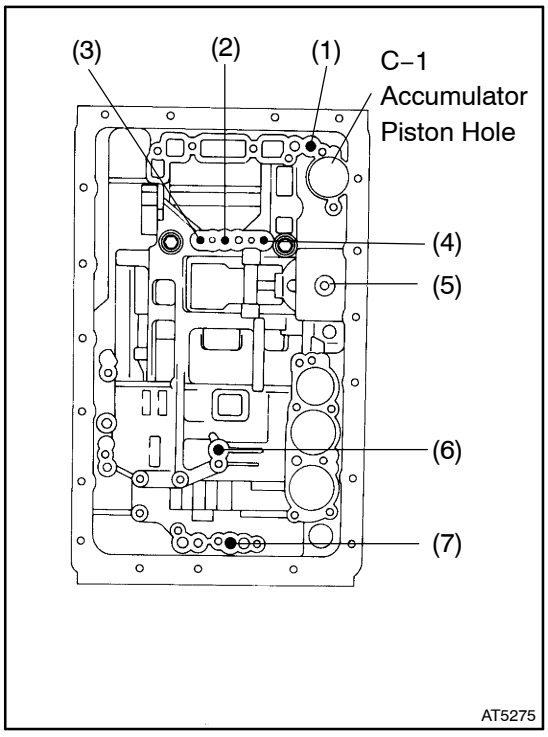


(e) Install the 7 bolts.
Torque: 22 N·m (220 kgf·cm, 16 ft·lbf)



88. INSPECT INPUT SHAFT SUB–ASSY

(a) Make sure the input shaft rotates smoothly.



89. INSPECT INDIVIDUAL PISTON OPERATION INSPECTION

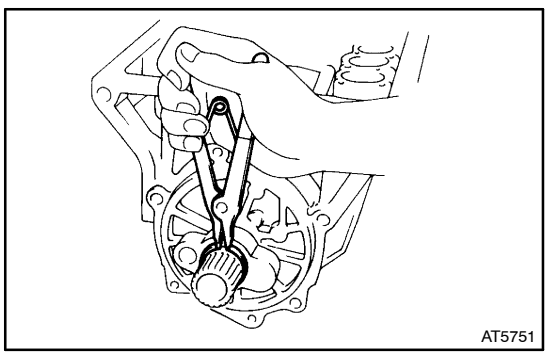
(a) Check for the sound while applying compressed air into the oil hole indicated in the illustration.

HINT:

When inspecting the O/D direct clutch, check the C_0 accumulator piston hole is closed.

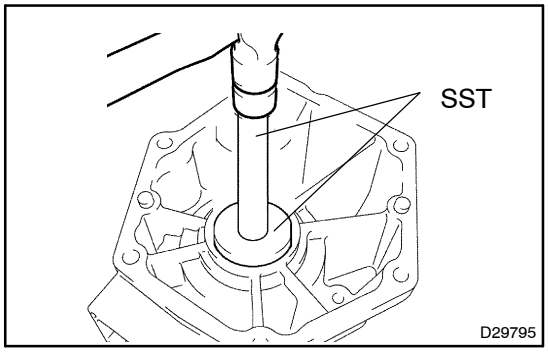
If there is no noise, disassemble and check the installation condition of the parts.

(1) O/D direct clutch
(2) Direct clutch
(3) Forward clutch
(4) O/D brake
(5) 2nd coast brake
(6) 2nd brake
(7) 1st & reverse brake



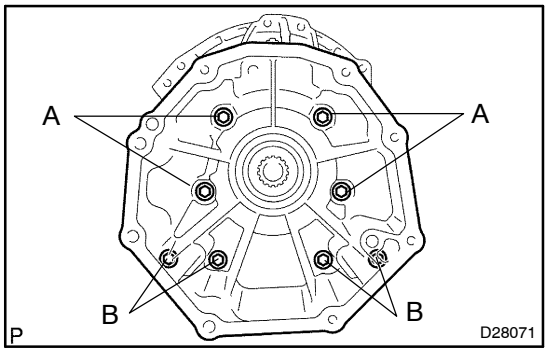
90. INSTALL SENSOR ROTOR

(a) Install the key on the output shaft.
(b) Align the groove of the sensor rotor with the key, and install the sensor rotor.
(c) Using snap ring pliers, install the snap ring.



91. INSTALL TRANSFER CASE ADAPTOR REAR OIL SEAL

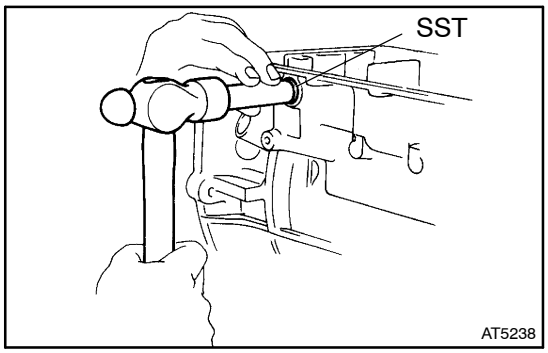
(a) Using SST and a hammer, install a new oil seal.
SST 09950–60010 (09951–00560), 09950–70010 (09951–07150)



92. INSTALL REAR ADAPTOR TRANSFER

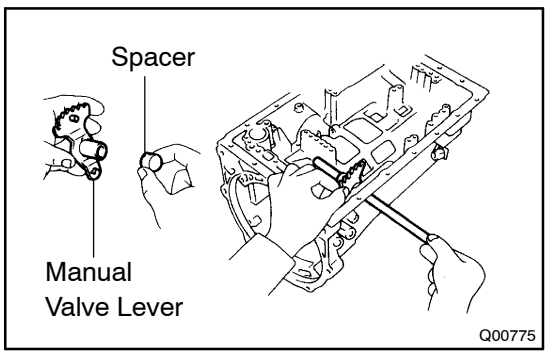
(a) Install the rear adaptor transfer and the gasket.
(b) Install the 8 bolts.
Torque: 34 N·m (345 kgf·cm, 25 ft·lbf)

HINT:
Each blot length is indicated below.
Bolt length:
Bolt A: 50 mm (1.969 in.)
Bolt B: 40 mm (1.575 in.)



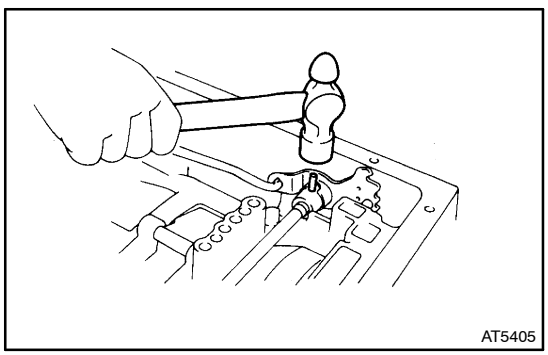
93. INSTALL MANUAL VALVE LEVER SHAFT OIL SEAL

(a) Using SST, drive in 2 new manual valve lever shaft oil seals.
SST 09350–30020 (09350–07110)

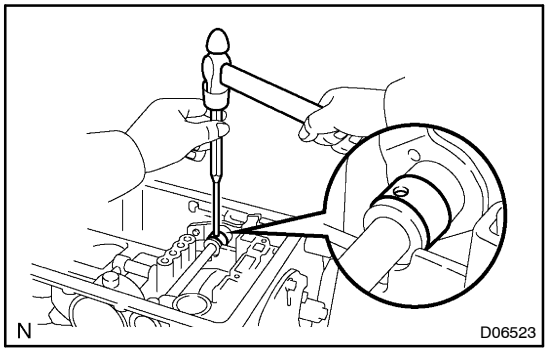


94. INSTALL MANUAL VALVE LEVER SUB–ASSY

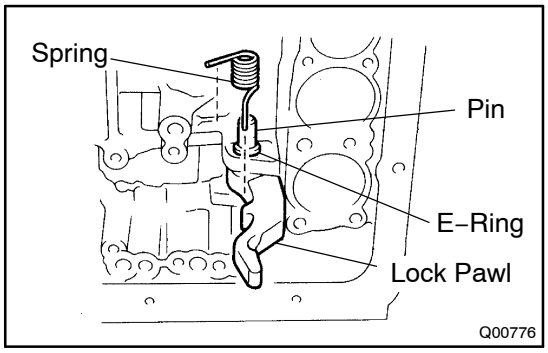
(a) Install a new spacer to the manual valve lever.
(b) Install the manual valve lever shaft to the transmission case through the manual valve lever.



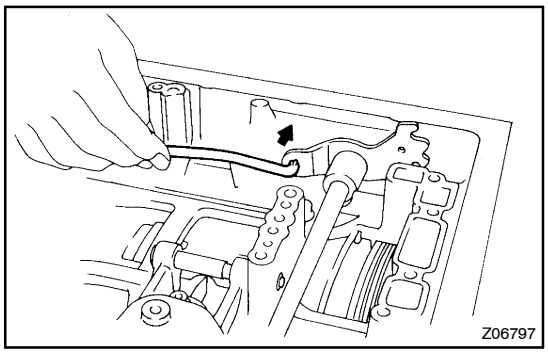
(c) Using a hammer, drive in a new spring pin.



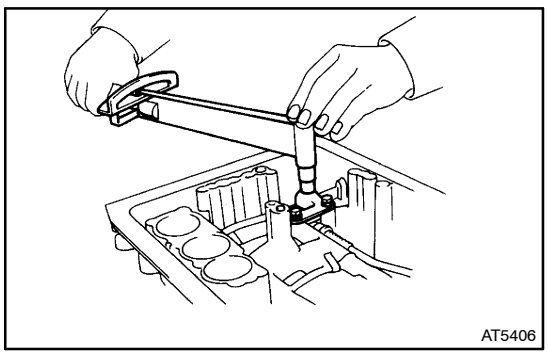
(d) Align the manual valve lever indentation with the spacer hole and stake them with a punch.
(e) Make sure the shaft rotates smoothly.



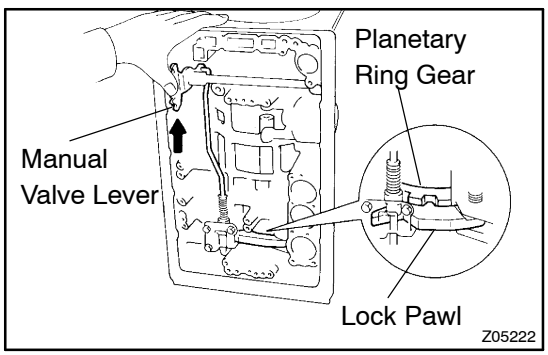
95. INSTALL PARKING LOCK PAWL SHAFT
(a) Install the E–ring to the shaft.
(b) Install the parking lock pawl, the shaft and the spring.



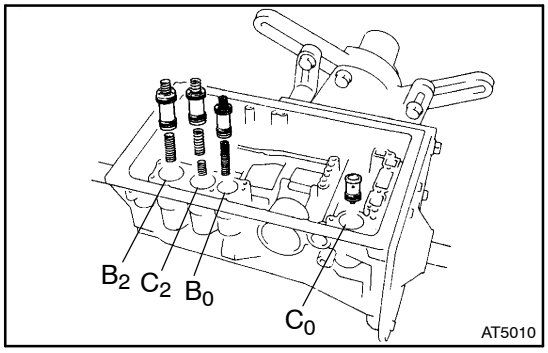
96. INSTALL PARKING LOCK ROD SUB–ASSY
(a) Connect the parking lock rod to the manual valve lever.



97. INSTALL PARKING LOCK PAWL BRACKET
(a) Install the parking lock pawl bracket with the 3 bolts.
Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)



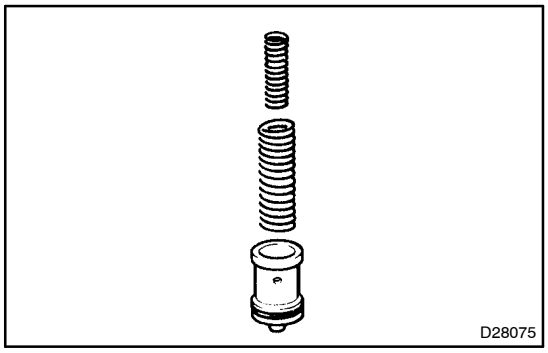
(b) Shift the manual valve lever to the P position, and confirm that the planetary ring gear is correctly locked up by the lock pawl.



98. INSTALL C–0 ACCUMULATOR PISTON

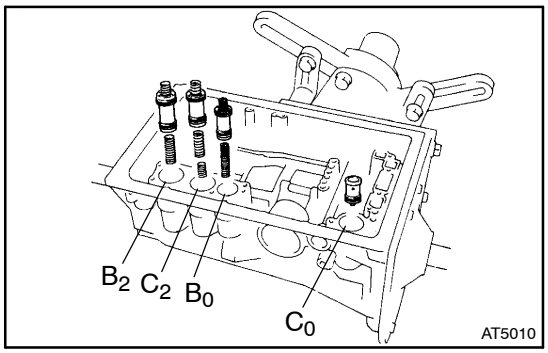
(a) Coat new O–ring with ATF, and install them to the piston.

(b) Install the 2 springs andthe accumulator piston to the hole.



Accumulator spring:

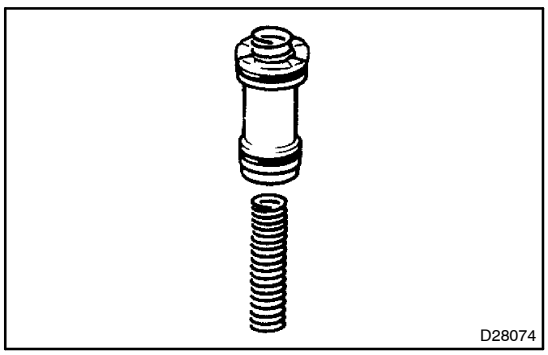
Spring		Free length Outer diameter mm (in.)	Color
C_0	Inner	46.0 mm (1.811 in.) 14.02 mm (0.552 in.)	Yellow
	Outer	74.6 mm (2.937 in.) 20.9 mm (0.823 in.)	Orange



99. INSTALL B–0 ACCUMULATOR PISTON

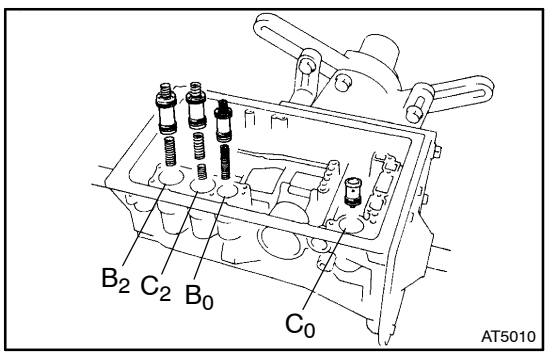
(a) Coat new O–ring with ATF, and install them to the piston.

(b) Install the 2 springs andthe accumulator piston to the hole.



Accumulator spring:

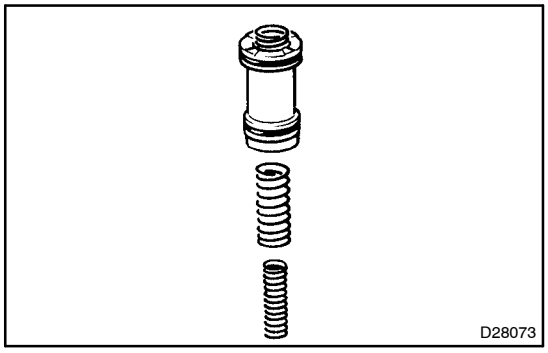
Spring	Free length Outer diameter mm (in.)	Color
B_0	63.6 mm (2.504 in.) 16.0 mm (0.630 in.)	Red



100. INSTALL C–2 ACCUMULATOR PISTON

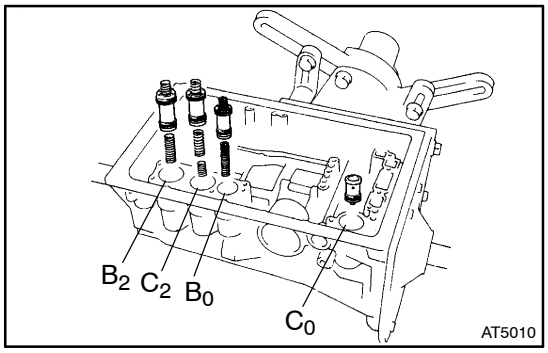
(a) Coat new O–ring with ATF, and install them to the piston.

(b) Install the 2 springs and the accumulator piston to the hole.



Accumulator spring:

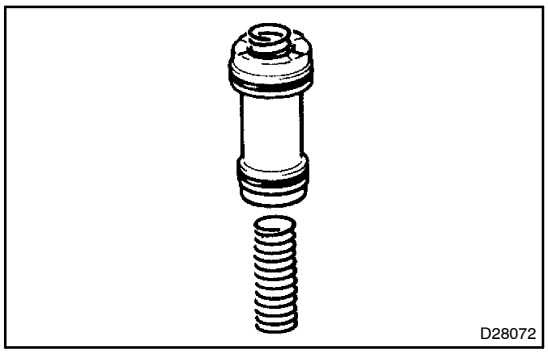
Spring		Free length Outer diameter mm (in.)	Color
C_2	Inner	42.1 mm (1.657 in.) 14.7 mm (0.579 in.)	Pink
	Outer	68.53 mm (2.698 in.) 20.2 mm (0.795 in.)	Blue



101. INSTALL B–2 ACCUMULATOR PISTON

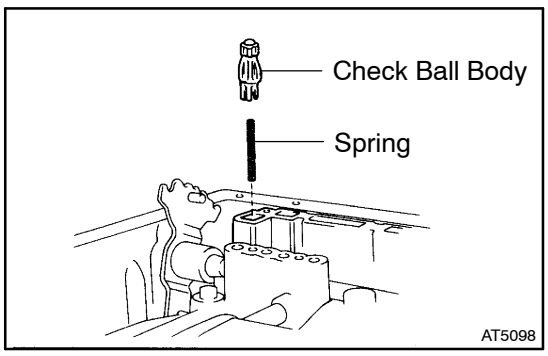
(a) Coat new O–ring with ATF, and install them to the piston.

(b) Install the 2 springs and the accumulator piston to the hole.



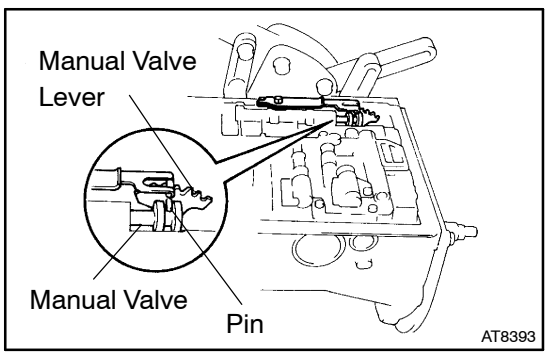
Accumulator spring:

Spring	Free length Outer diameter mm (in.)	Color
B_2	70.5 mm (2.776 in.) 19.7 mm (0.776 in.)	Red



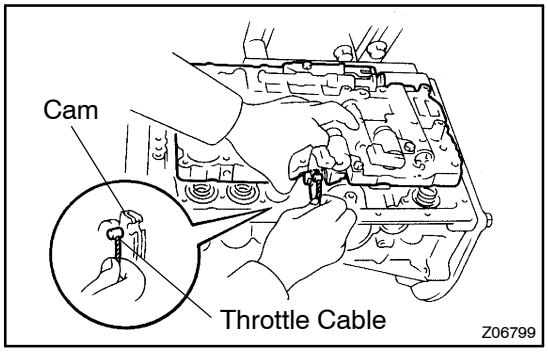
102. INSTALL CHECK BALL BODY

(a) Install the check ball body.

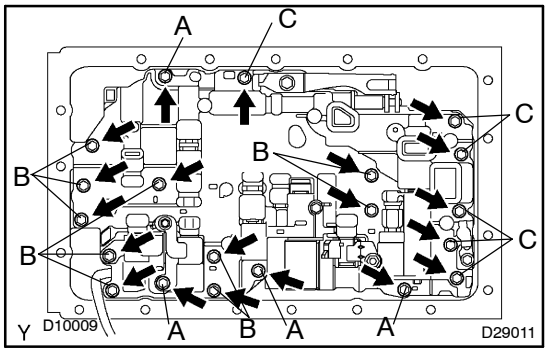


103. INSTALL TRANSMISSION VALVE BODY ASSY (3RZ–FE ENGINE TYPE)

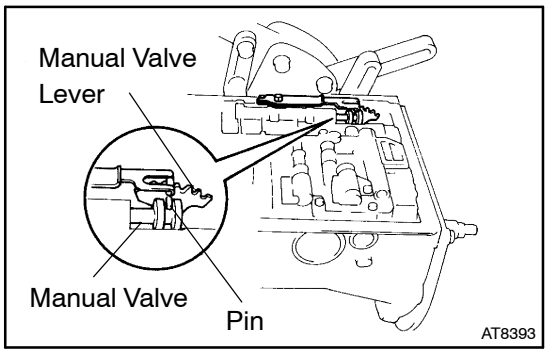
(a) Align the groove of the manual valve with the pin of the lever.



(b) Connect the throttle cable to the cam.
(c) Confirm the springs in the accumulator pistons are installed correctly.

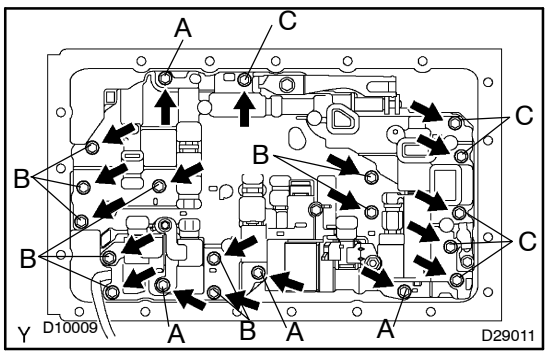


(d) Install the 20 bolts.
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)
Bolt length:
Bolt A: 23 mm (0.91 in.)
Bolt B: 28 mm (1.10 in.)
Bolt C: 36 mm (1.42 in.)

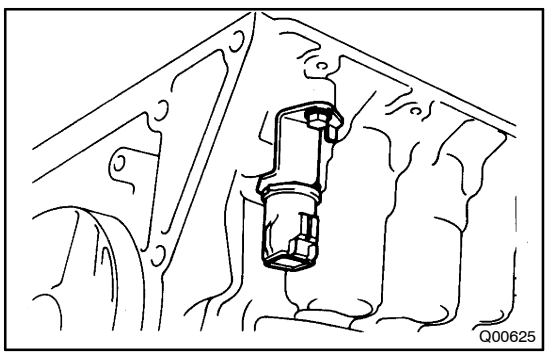


104. INSTALL TRANSMISSION VALVE BODY ASSY (EXCEPT 3RZ–FE ENGINE TYPE)

(a) Align the groove of the manual valve with the pin of the lever.

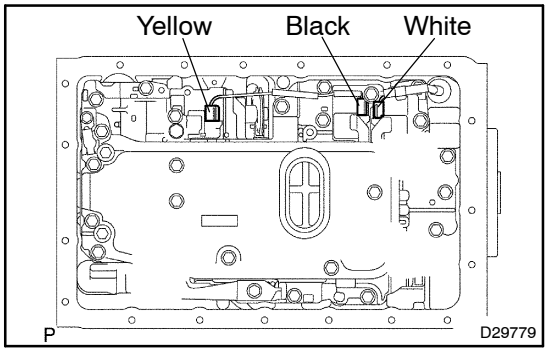


(b) Install the 20 bolts.
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)
Bolt length:
Bolt A: 23 mm (0.91 in.)
Bolt B: 28 mm (1.10 in.)
Bolt C: 36 mm (1.42 in.)

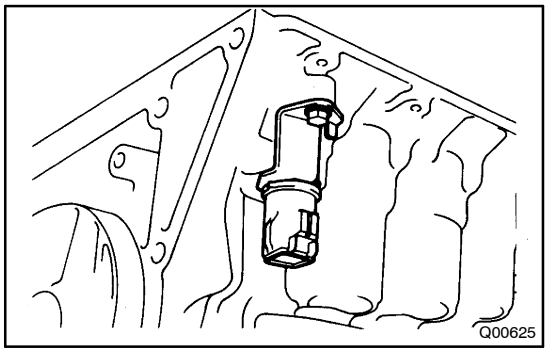


105. INSTALL TRANSMISSION WIRE (3RZ–FE ENGINE TYPE)

(a) Coat a new O–ring with ATF, and install it to the grommet.
(b) Install the solenoid wiring to the case, and then install the stopper plate.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)



(c) Connect the connectors to the shift solenoid valve No.1, No.2 and SL.

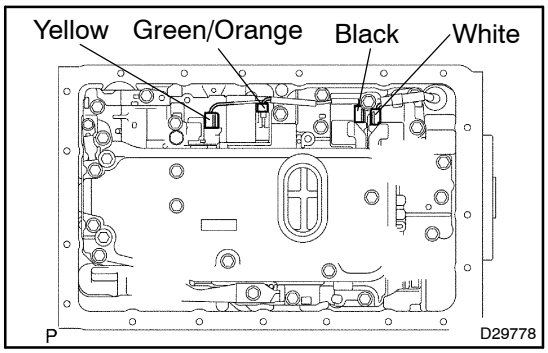


106. INSTALL TRANSMISSION WIRE (EXCEPT 3RZ–FE ENGINE TYPE)

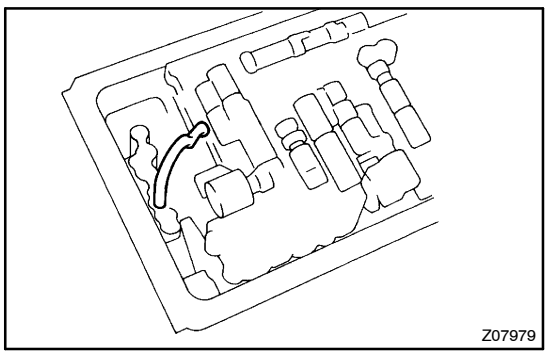
(a) Coat a new O–ring with ATF, and install it to the grommet.

(b) Install the solenoid wiring to the case, and then install the stopper plate.

Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)



(c) Connect the connectors to the shift solenoid valve No.1, No.2 and SL.

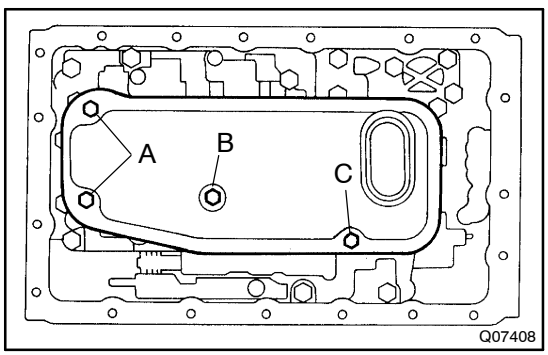


107. INSTALL VALVE BODY OIL STRAINER ASSY

(a) Using a plastic hammer, install the pipe into the position.

NOTICE:

Be careful not to bend or damage the pipes.



(b) Install the oil strainer with the 4 bolts.

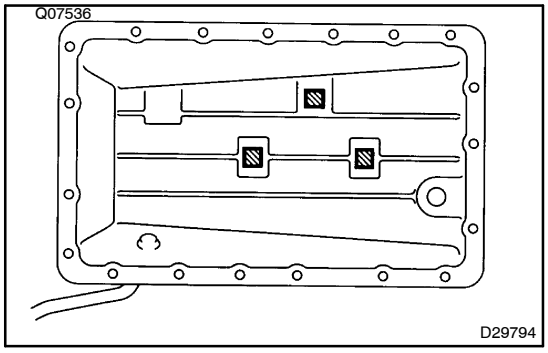
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

Bolt length:

Bolt A: 16 mm (0.63 in.)

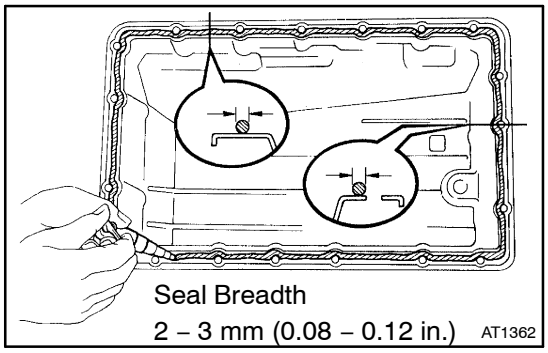
Bolt B: 20 mm (0.79 in.)

Bolt C: 28 mm (1.10 in.)



108. INSTALL TRANSMISSION OIL CLEANER MAGNET

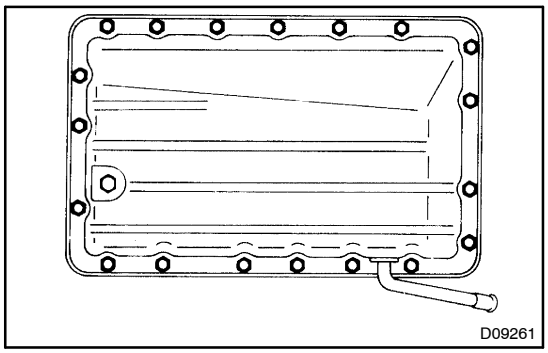
(a) Install the 3 magnets on the oil pan.



109. INSTALL AUTOMATIC TRANSMISSION OIL PAN SUB–ASSY

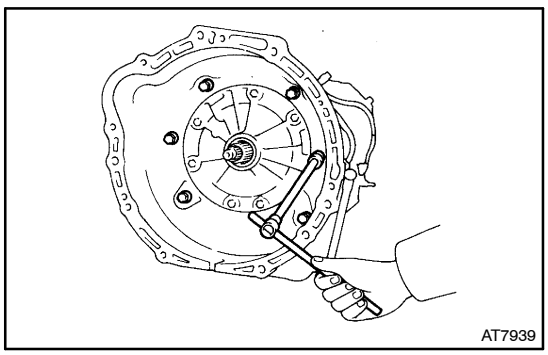
(a) Remove any FIPG material and be careful not to drop oil on the contacting surfaces of the transmission case and the oil pan.

(b) Apply FIPG to the oil pan.
FIPG:
Part No.08826–00090, THREE BOND 1281 or equivalent



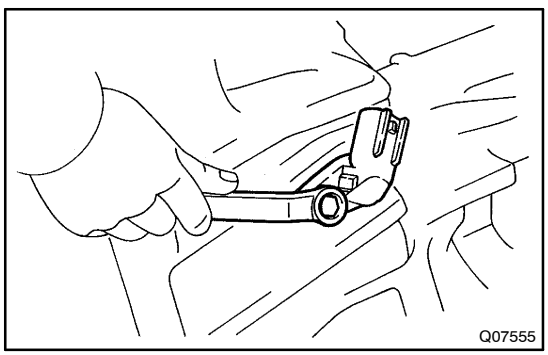
(c) Install the oil pan with the 19 bolts.
Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)

110. INSTALL SPEEDOMETER DRIVE (ATM) GEAR



111. INSTALL AUTOMATIC TRANSMISSION HOUSING

(a) Install the transmission housing with the 6 bolts.
Torque:
14 mm bolt: 34 N·m (345 kgf·cm, 25 ft·lbf)
17 mm bolt: 57 N·m (580 kgf·cm, 42 ft·lbf)

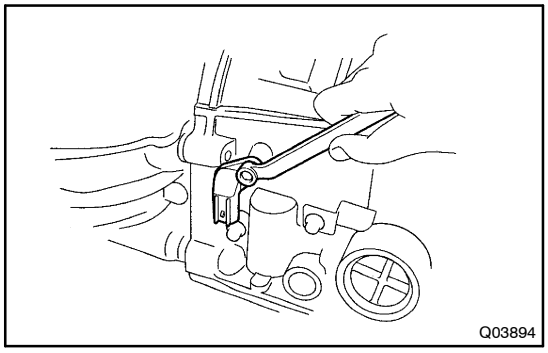


112. INSTALL SPEED SENSOR

(a) Coat a new O–ring with ATF, and install it to the sensor.

(b) Install the vehicle speed sensor.

(c) Install the stopper plate.
Torque: 5.4 N·m (55 kgf·cm, 48 in·lbf)



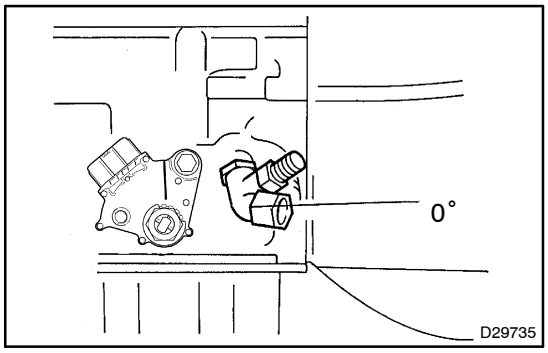
113. INSTALL SPEED SENSOR (EXCEPT 1KD–FTV, 1KZ–TE ENGINE TYPE)

(a) Coat a new O–ring with ATF, and install it to the sensor.

(b) Install the vehicle speed sensor.

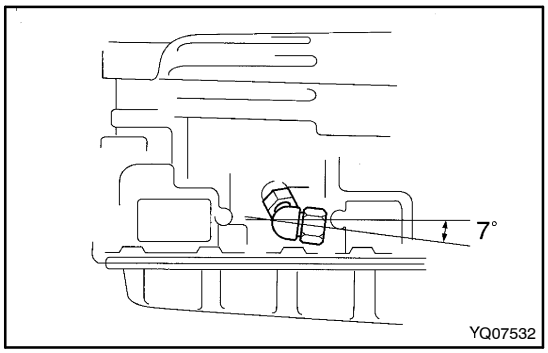
(c) Install the stopper plate.

Torque: 5.4 N·m (55 kgf·cm, 48 in·lbf)



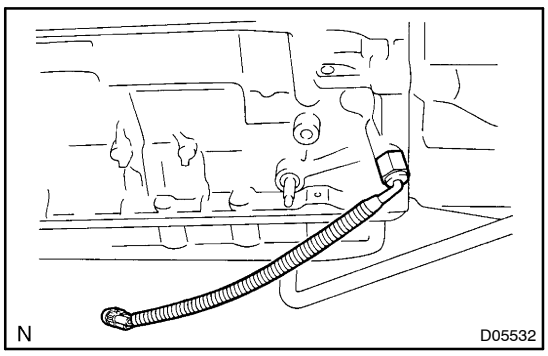
114. INSTALL OIL COOLER TUBE UNION

(a) Coat the new O–rings with ATF, and install them to the union and the elbow.



(b) Install the rear elbows.

Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

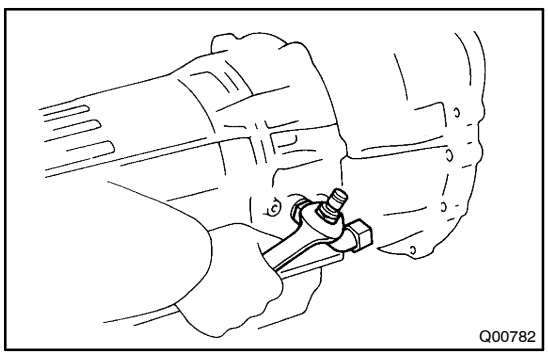


115. INSTALL TEMPERATURE SENSOR (3RZ–FE ENGINE TYPE)

(a) Coat a new O–ring with ATF, and install it to the ATF temperature sensor.

(b) Install the ATF temperature sensor.

Torque: 15 N·m (160 kgf·cm, 11 ft·lbf)

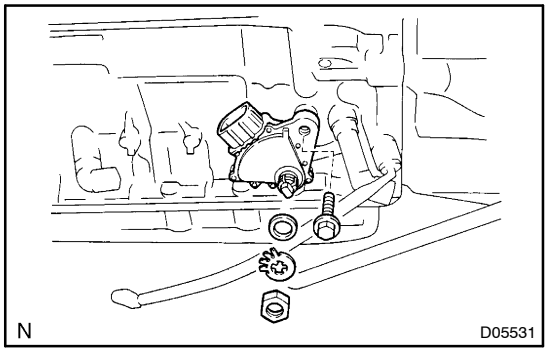


116. INSTALL TEMPERATURE SENSOR (EXCEPT 3RZ–FE ENGINE TYPE)

(a) Coat a new O–ring with ATF, and install it to the ATF temperature sensor.

(b) Install the ATF temperature sensor.

Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

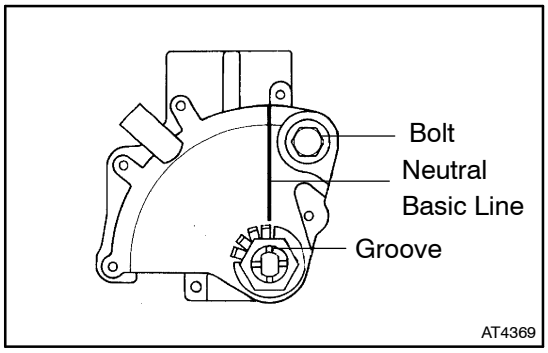


117. INSTALL PARK/NEUTRAL POSITION SWITCH ASSY

(a) Install the park/neutral position switch onto the manual valve lever shaft, and temporarily tighten the adjusting bolt.

(b) Install the grommet and a new lock washer. Install the nut.
Torque: 6.9 N·m (70 kgf·cm, 61 in.·lbf)

(c) Using the control shaft lever, fully turn the manual lever shaft back, and then return 2 notches. It is now in neutral.

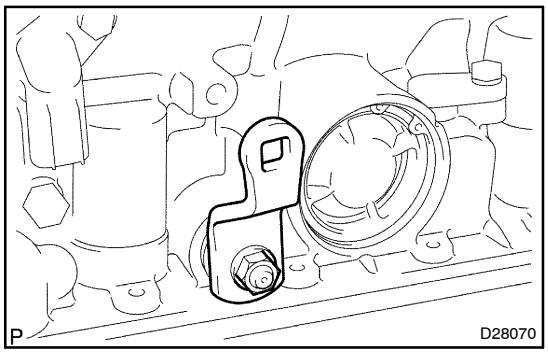


(d) Align the neutral basic line with the switch groove, and tighten the adjusting bolt.
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

(e) Bend the tabs of the lock washer.

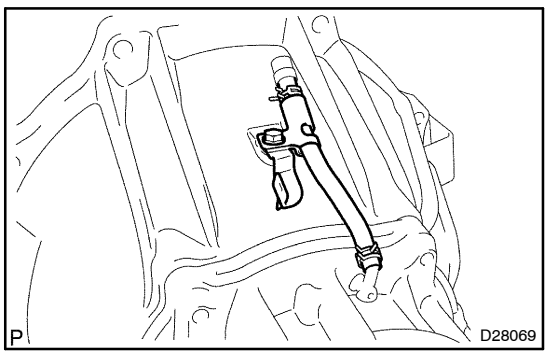
HINT:

Bend at least 2 of the lock washer tabs.



118. INSTALL TRANSMISSION CONTROL SHAFT LEVER LH

(a) Install the transmission control shaft lever and the washer. Install the nut.
Torque: 16 N·m (160 kgf·cm, 12 ft·lbf)



119. INSTALL BREATHER PLUG HOSE

(a) Install the breather plug hose.

120. INSTALL DRAIN (ATM) PLUG SUB–ASSY
Torque: 20 N·m (205 kgf·cm, 15 ft·lbf)