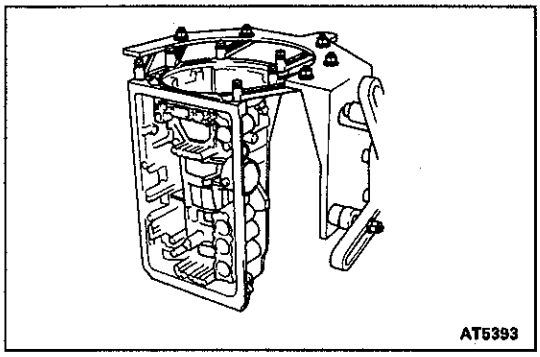
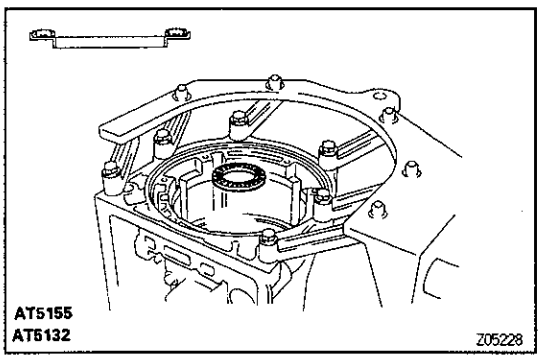


BASIC SUBASSSEMBLY REASSEMBLY ATGPW-02

1. INSTALL TRANSMISSION CASE

Install the transmission case in the overhaul attachment.



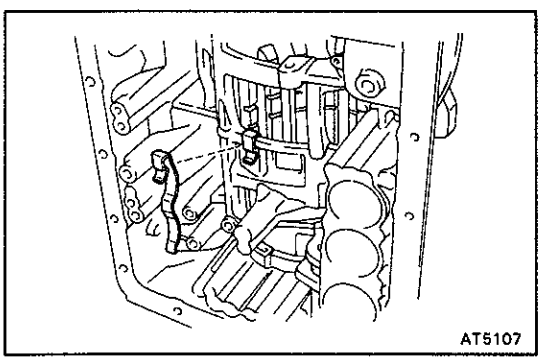
2. INSTALL BEARING AND RACE

(a) Coat the assembled bearing and race with petroleum jelly.

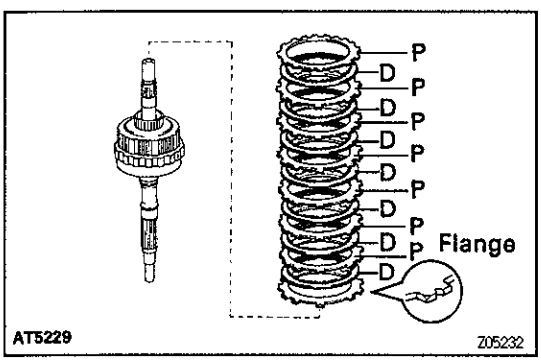
(b) Install it onto the case.

Assembled bearing and race diameter:

	Inside mm (in.)	Outside mm (in.)
Assembled bearing and race	39.0 (1.535)	57.7 (2.272)



3. INSTALL LEAF SPRING



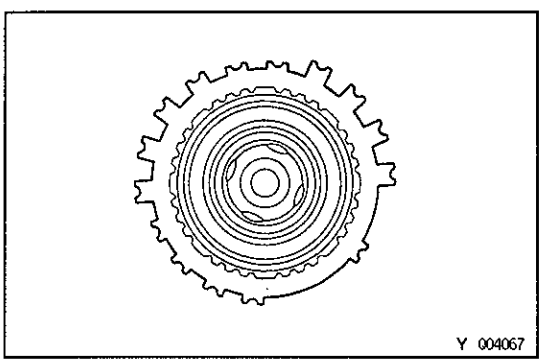
4. INSTALL REAR PLANETARY GEAR UNIT WITH FIRST AND REVERSE BRAKE AND OUTPUT SHAFT

(a) Install the flange, the rounded edge facing upward.

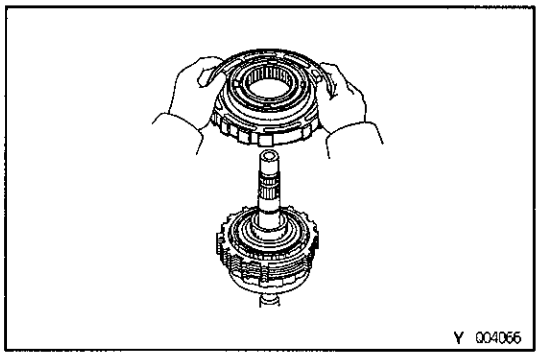
(b) Install the 7 plates and 7 discs.

Install in order: P=Plate D=Disc

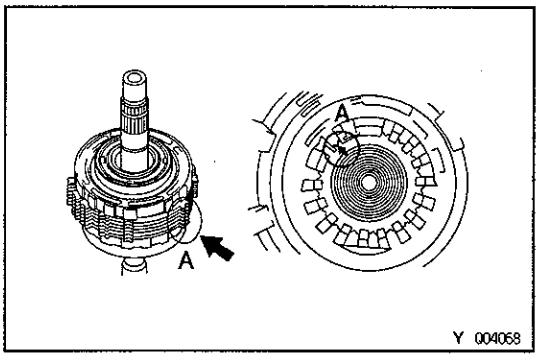
D−P−D−P−D−P−D−P−D−P−D−P−D−P



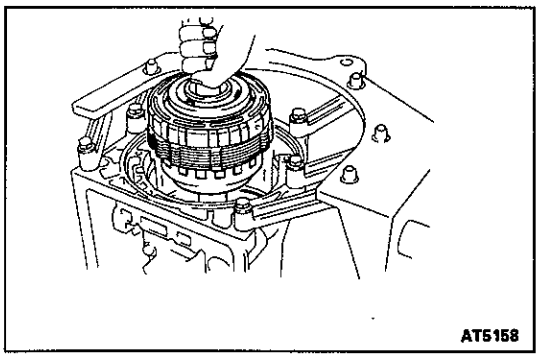
(c) Align the teeth of the flange, discs and plates, as shown.



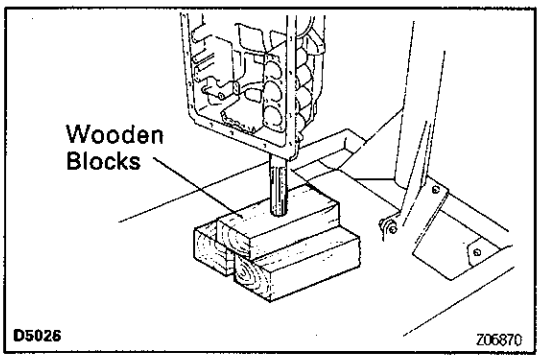
(d) Face the snap ring upward (front side) and install the second brake drum to the planetary gear.
NOTICE: Face the oil hole in the drum towards the lower side of the transmission case (the side the valve body is installed).



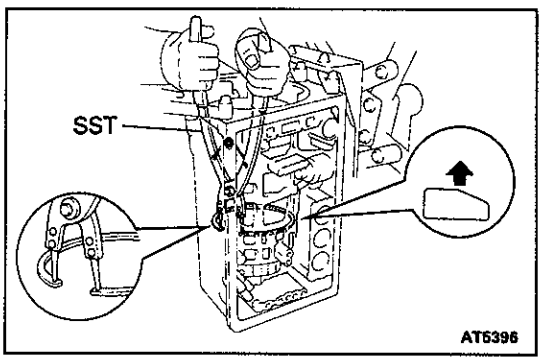
(e) Align the splines of the transmission case and the assembled rear planetary gear, first and reverse brake pack and output shaft, indicated by A.



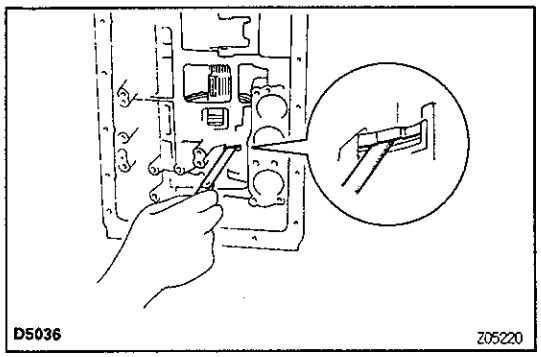
(f) Install the assembled rear planetary gear, first and reverse brake pack and output shaft.



(g) Rest the output shaft on wooden blocks.



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



5. CHECK PACK CLEARANCE OF FIRST AND REVERSE BRAKE

Using a feeler gauge, measure the clearance between the plate and second brake drum, as shown.

Clearance:

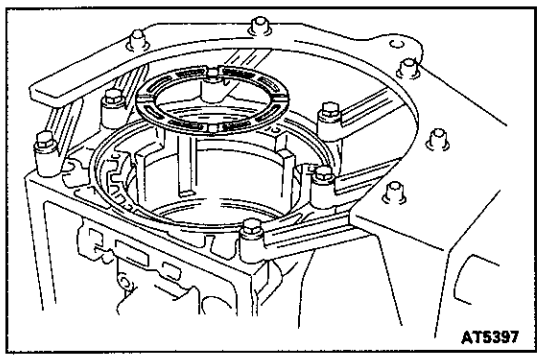
0.70–1.00 mm (0.028–0.039 in.)

If the values are nonstandard, select another flange.

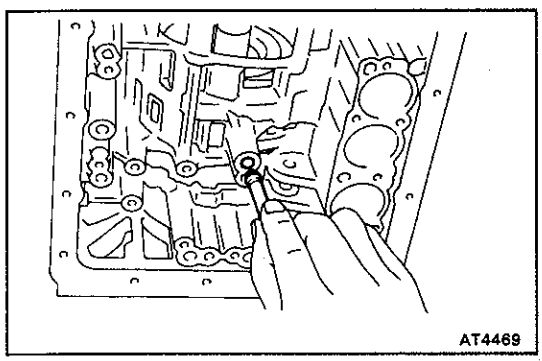
HINT: There are 8 different flange thickness.

Flange Thickness:

No.	Thickness mm (in.)	No.	Thickness mm (in.)
68	5.4 (0.213)	52	4.6 (0.181)
67	5.2 (0.205)	53	4.4 (0.173)
50	5.0 (0.197)	54	4.2 (0.165)
51	4.8 (0.189)	55	4.0 (0.157)



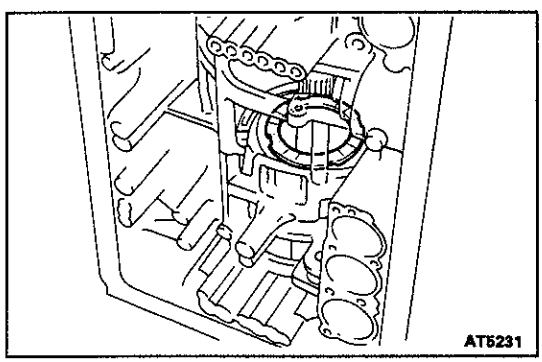
6. INSTALL SECOND BRAKE PISTON SLEEVE



7. INSTALL NEW BRAKE DRUM GASKET

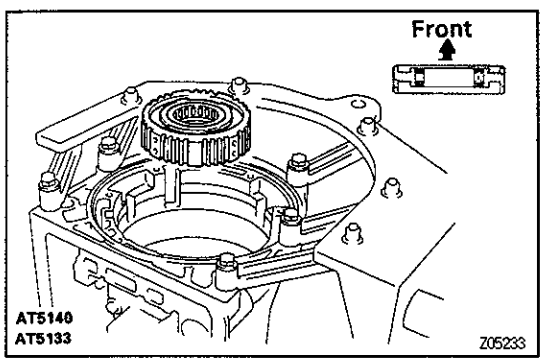
(a) Coat the gasket with ATF.

(b) Install a new brake drum gasket.

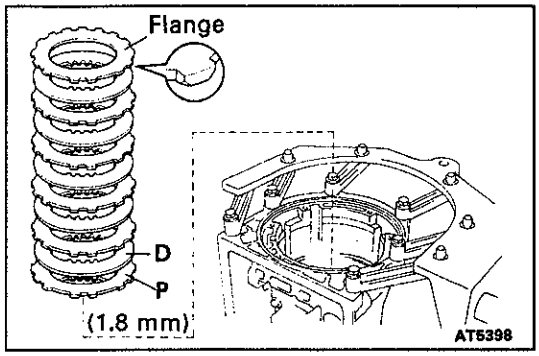


8. INSTALL NO.1 ONE–WAY CLUTCH

(a) Install the No.1 thrust washer onto the second brake.



(b) Install the No.1 one–way clutch.

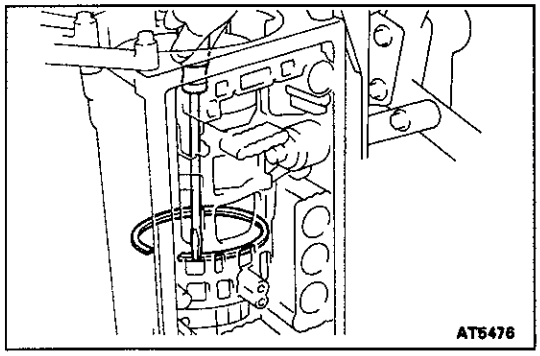


9. INSTALL FLANGE, PLATES AND DISCS OF SECOND BRAKE

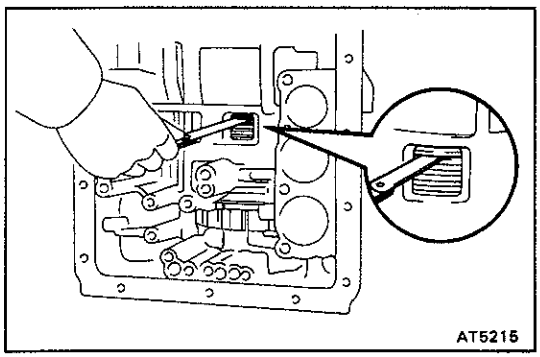
(a) Install the 1.8 mm (0.071 in.) thick plate with the rounded–edge side of the plate facing the disc.

(b) Install the 5 plates and 5 discs.
Install in order: P=Plate D=Disc
D–P–D–P–D–P–D–P–D–P

(c) Install the flange with the rounded edge of the flange facing the disc.



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



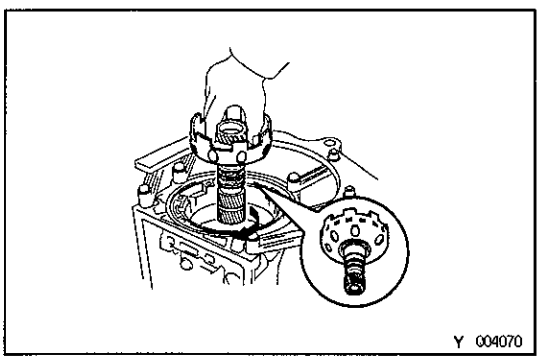
10. CHECK PACK CLEARANCE OF SECOND BRAKE

Using a feeler gauge, measure the clearance between the snap ring and flange, as shown.

Clearance:

0.49–1.11 mm (0.0193–0.0437 in.)

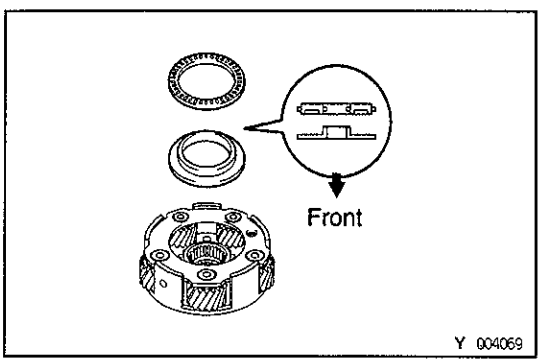
If the values are nonstandard, check for improper installation.



11. INSTALL PLANETARY SUN GEAR

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

HINT: Confirm the thrust washer is installed correctly.

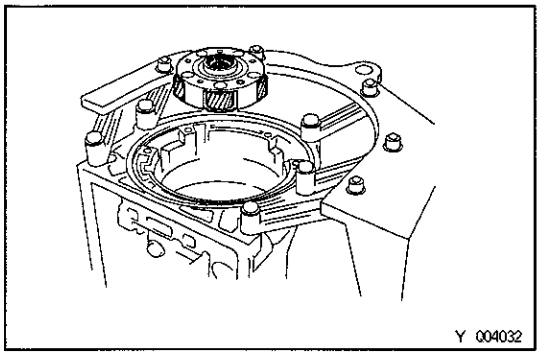


12. INSTALL FRONT PLANETARY GEAR

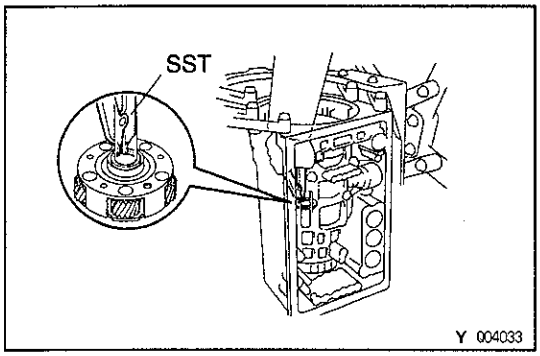
(a) Coat the bearing and race with petroleum jelly and install them onto the front planetary gear.

Bearing and race diameter:

	Inside mm (in.)	Outside mm (in.)
Bearing	35.4 (1.394)	48.0 (1.890)
Race	33.5 (1.319)	47.8 (1.882)

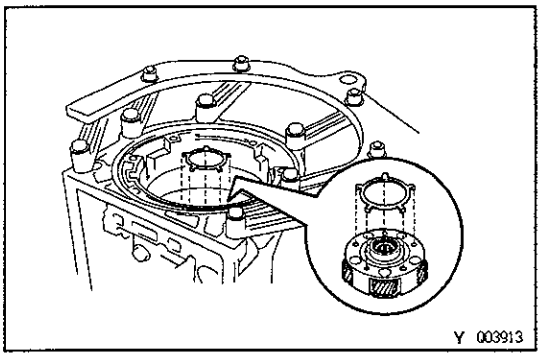

Y 004032

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



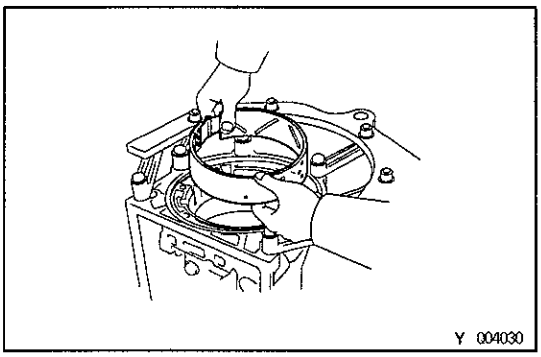
Y 004033

(c) Using SST, install the snap ring.
SST 09350–30020 (09350–07070)
(d) Remove the wooden blocks under the output shaft.


Y 003913

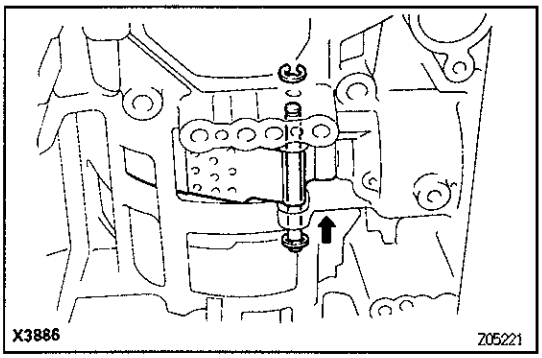
(e) Coat the race with petroleum jelly and install it onto the front planetary gear.
Race diameter:

	Inside mm (in.)	Outside mm (in.)
Race	34.0 (1.339)	48.0 (1.890)

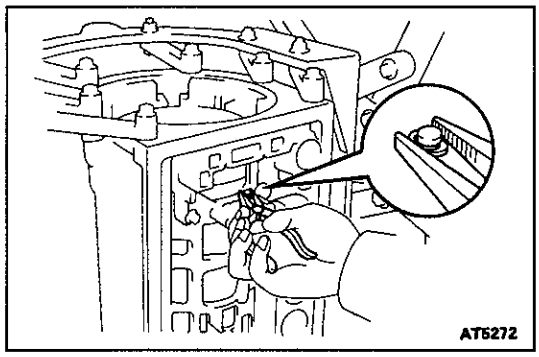

Y 004030

14. INSTALL SECOND COAST BRAKE BAND

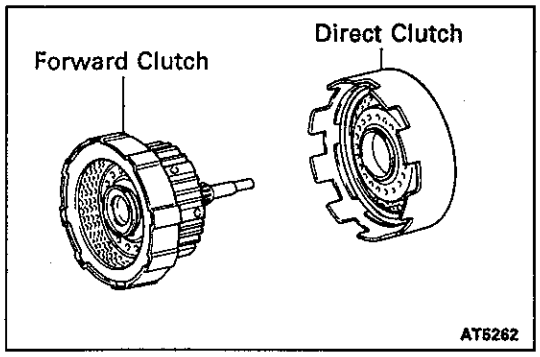
(a) Install the second coast brake band to the transmission case.


X3886 Z05221

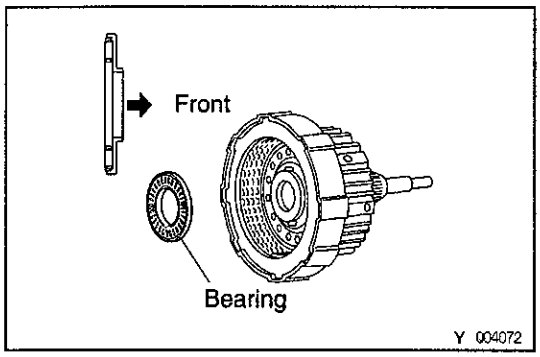
(b) Install the E–ring to the pin.
(c) Install the pin through the brake band.



(d) Install the E—ring to the pin.



15. INSTALL DIRECT CLUTCH TO FORWARD CLUTCH

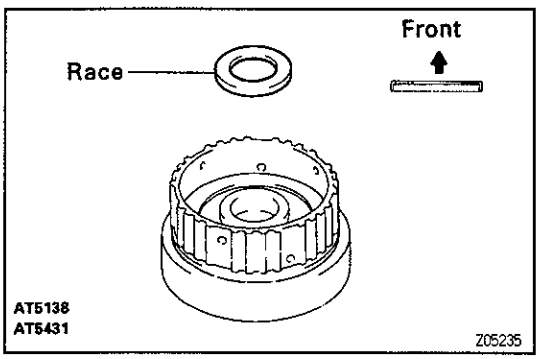


16. INSTALL FRONT PLANETARY RING GEAR TO FORWARD AND DIRECT CLUTCH

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

Bearing and race diameter:

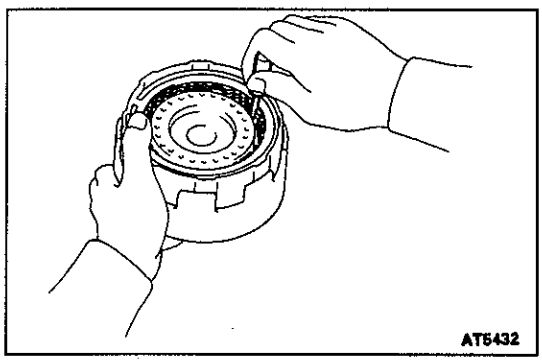
	Inside mm (in.)	Outside mm (in.)
Bearing	25.9 (1.020)	48.9 (1.925)



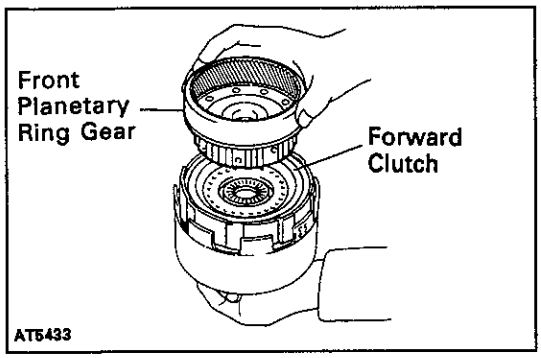
(b) Coat the race with petroleum jelly and install it onto the front planetary ring gear.

Race diameter:

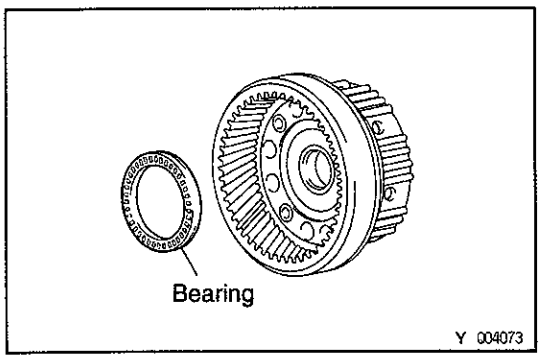
	Inside mm (in.)	Outside mm (in.)
Race	26.5 (1.043)	47.0 (1.850)



(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.

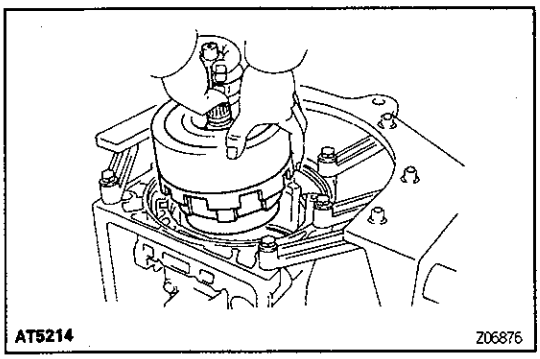


17. INSTALL ASSEMBLED DIRECT CLUTCH, FORWARD CLUTCH AND FRONT PLANETARY RING GEAR INTO CASE

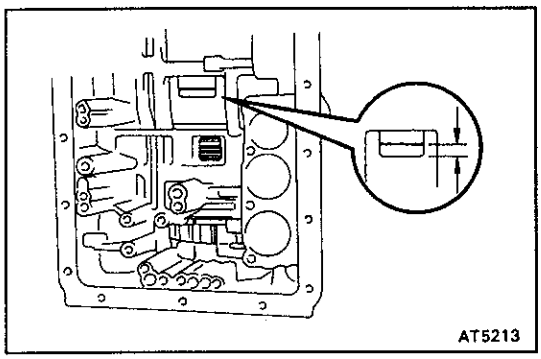
(a) Coat the bearing and race with petroleum jelly and install them onto the ring gear.

Bearing and race diameter:

	Inside mm (in.)	Outside mm (in.)
Bearing and Race	35.0 (1.378)	53.8 (2.118)



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

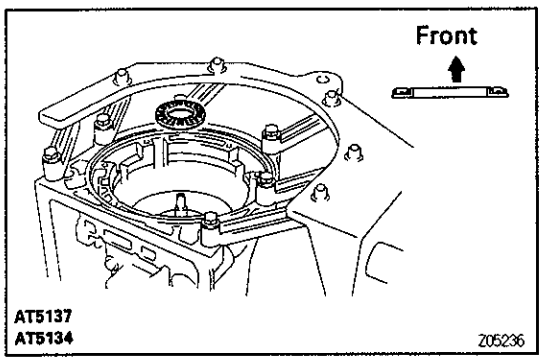


(c) Using vernier calipers, measure the distance between the sun gear input drum and direct clutch drum, as shown.

Height:

9.8 — 11.8 mm (0.386 — 0.465 in.)

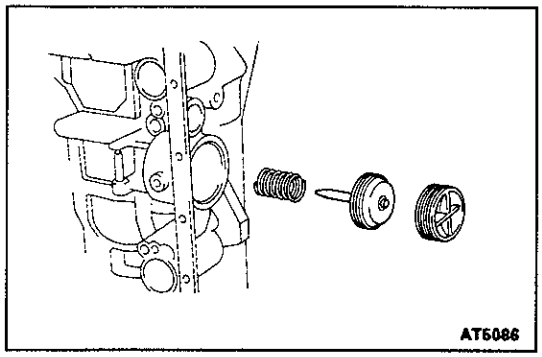
If the values are nonstandard, check for improper installation.



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

Assembled bearing and race diameter:

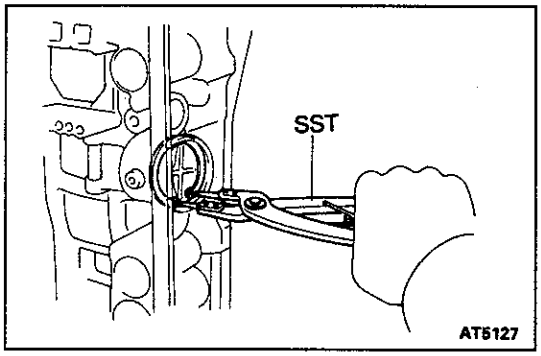
	Inside mm (in.)	Outside mm (in.)
Assembled bearing and race	33.5 (1.319)	47.8 (1.882)



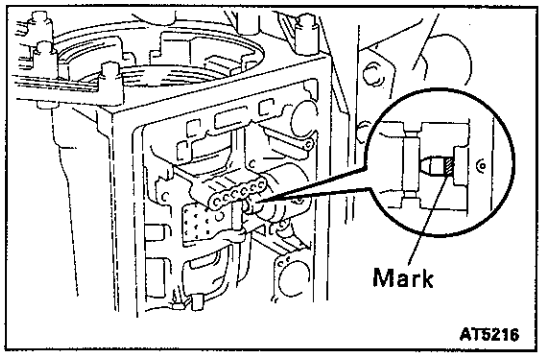
18. INSTALL SECOND COAST BRAKE COVER, PISTON ASSEMBLY AND SPRING

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

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

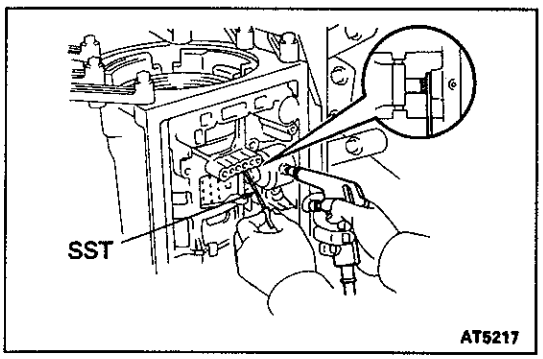


(c) Using SST, install the snap ring.
SST 09350–30020 (09350–07060)



19. CHECK PISTON ROD STROKE OF SECOND COAST BRAKE

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



(b) Using SST, measure the stroke applying the compressed air (392–785 kPa, 4–8 kgf/cm² or 57–114 psi), as shown.
SST 09240–00020

Piston rod stroke:

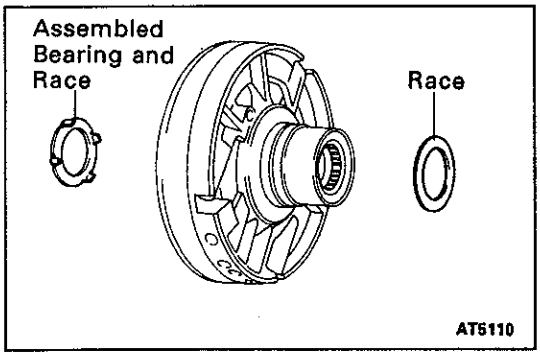
1.0–2.0 mm (0.039–0.079 in.)

If the stroke is more than specified, replace the piston rod with a longer one.

Piston rod length:

70.7 mm (2.783 in.)
71.4 mm (2.811 in.)
72.2 mm (2.843 in.)
72.9 mm (2.870 in.)
73.7 mm (2.902 in.)

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

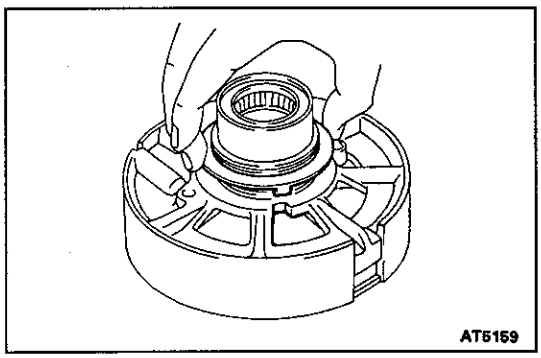


20. INSTALL OVERDRIVE SUPPORT ASSEMBLY

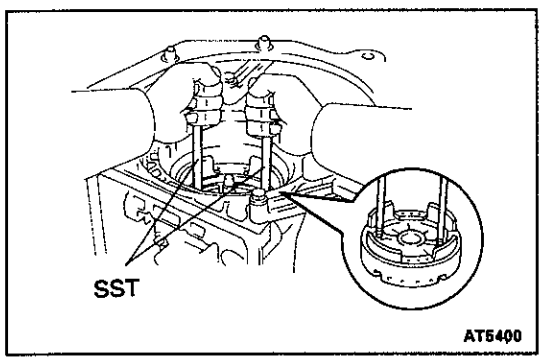
(a) Coat the assembled bearing and races with petroleum jelly and install them onto the overdrive support assembly.

Assembled bearing and race diameter:

	Inside mm (in.)	Outside mm (in.)
Assembled bearing and race	33.6 (1.323)	50.3 (1.980)
Race	37.0 (1.457)	51.0 (2.008)

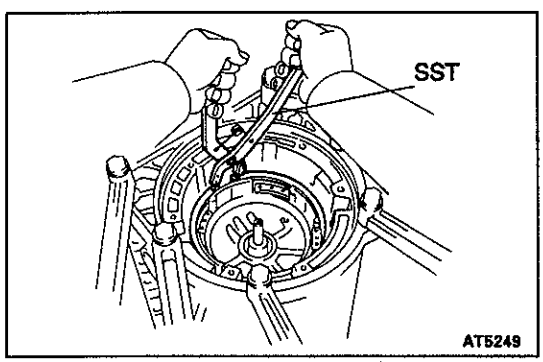


(b) Confirm the thrust washer is installed correctly.
HINT: Make sure that the lug shape matches the hole on the O/D support.

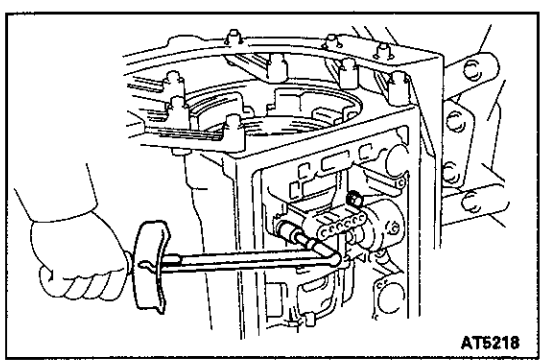


(c) Using 2 bolts of SST, aim the bolt and oil holes of the overdrive support toward the valve body side, align them with the bolt holes of the transmission case.
SST 09350–30020 (09350–07020)

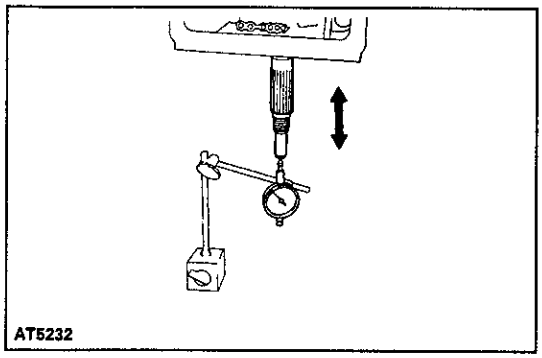
(d) Temporarily install the 2 bolts.



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



(f) Install and torque the 2 bolts.
Torque: 25 N·m (260 kgf·cm, 19 ft·lbf)


AT5232

21. CHECK OUTPUT SHAFT

(a) Using a dial indicator, measure the end play of the output shaft.
End play:
1.63—2.89 mm (0.0642—0.1138 in.)
If the values are nonstandard, check for improper installation.

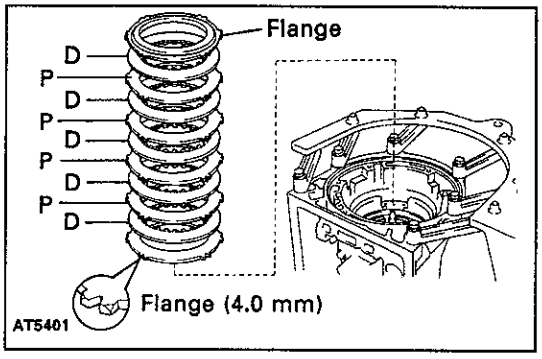
(b) Check to see that output shaft rotates smoothly.

22. INSTALL FLANGES, PLATES AND DISCS OF OVERDRIVE BRAKE

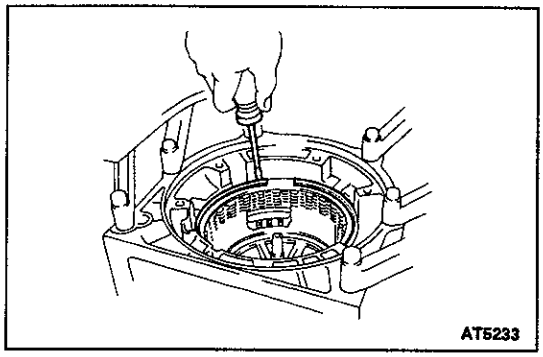
(a) Install the 4.0 mm (0.157 in.) thick flange (flat ring) with the rounded—edge side of the flange facing the disc.

(b) Install the 4 plates and 5 discs.
Install in order: P=Plate D=Disc
D—P—D—P—D—P—D—P—D

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



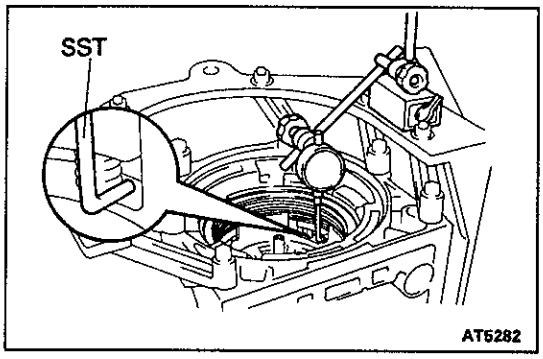
AT5401


AT5233

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

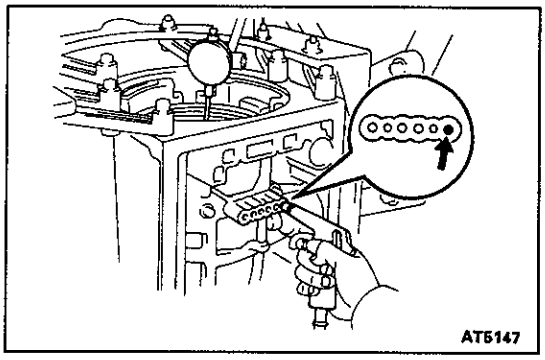
23. CHECK PISTON STROKE OF OVERDRIVE BRAKE

(a) Place SST and a dial indicator onto the overdrive brake piston, as shown.
SST 09350—30020 (09350—06120)



AT5282

(b) Measure the stroke applying and releasing the compressed air (392—785 kPa, 4—8 kgf/cm² or 57—114 psi), as shown.
Piston Stroke:
1.75—2.05 mm (0.0690—0.0807 in.)


AT5147

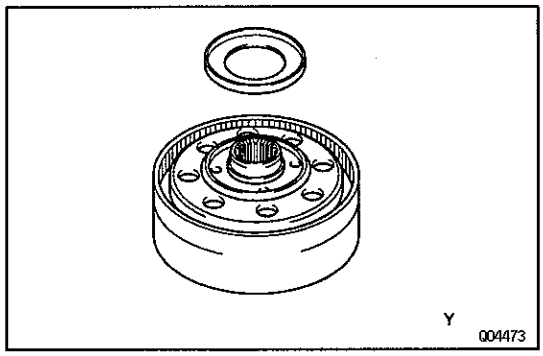
If the piston stroke is less than the limit, parts may have been assembled incorrectly, so check and reassemble again.

If the piston stroke is nonstandard, select another flange.

HINT: There are 7 different flange thicknesses.

Flange thickness:

No.	Thickness mm (in.)	No.	Thickness mm (in.)
26	3.3 (0.130)	11	3.8 (0.150)
25	3.5 (0.138)	23	3.9 (0.154)
12	3.6 (0.142)	None	4.0 (0.157)
24	3.7 (0.146)	–	–

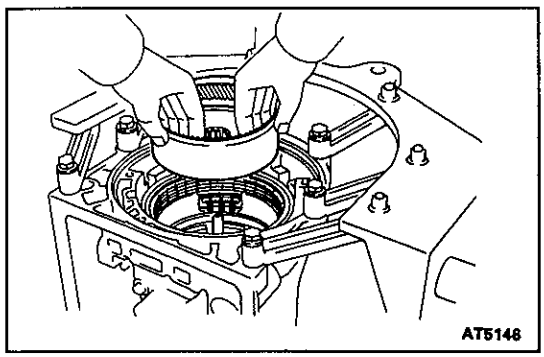


24. INSTALL OVERDRIVE PLANETARY GEAR UNIT WITH OVERDRIVE DIRECT CLUTCH AND ONE-WAY CLUTCH

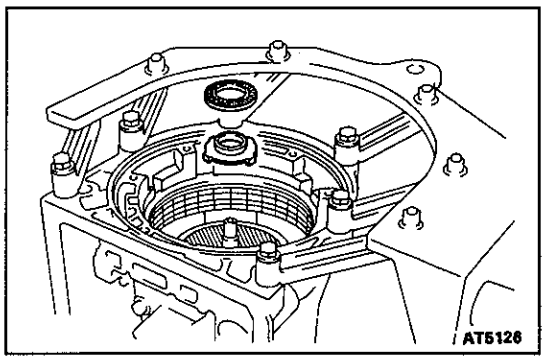
(a) Coat the race with petroleum jelly and install it onto the overdrive planetary ring gear.

Race diameter:

	Inside mm (in.)	Outside mm (in.)
Race	37.1 (1.461)	59.0 (2.323)



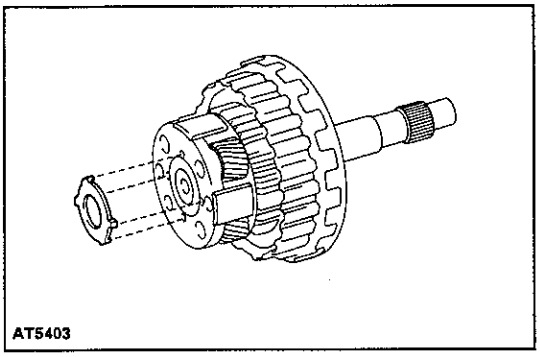
(b) Install the overdrive planetary ring gear.



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

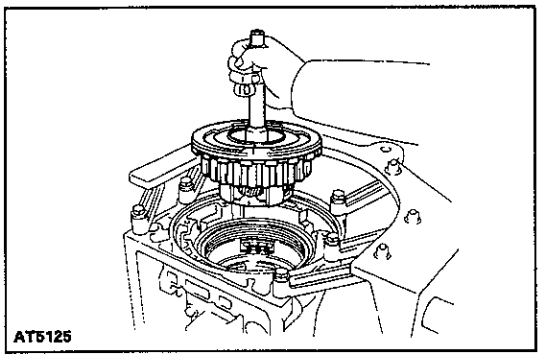
Bearing and race diameter:

	Inside mm (in.)	Outside mm (in.)
Bearing	25.9 (1.020)	47.0 (1.850)
Race	24.0 (0.945)	48.0 (1.890)

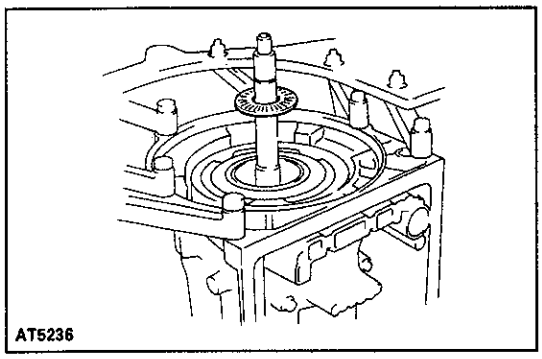

AT5403

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

	Inside mm (in.)	Outside mm (in.)
Race	27.2 (1.071)	42.0 (1.654)

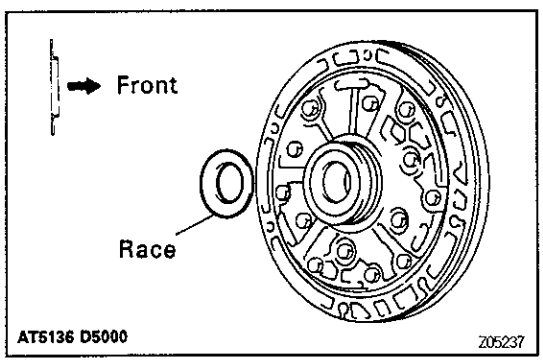

AT5125

(e) Install the overdrive planetary gear with the overdrive direct clutch and one–way clutch.


AT5236

(f) Coat the assembled bearing and race with petroleum jelly and install them onto the overdrive direct clutch.
Assembled bearing and race diameter:

	Inside mm (in.)	Outside mm (in.)
Assembled bearing and race	28.8 (1.134)	50.4 (1.984)



AT5136 D5000 Z05237

25. INSTALL OIL PUMP INTO CASE

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

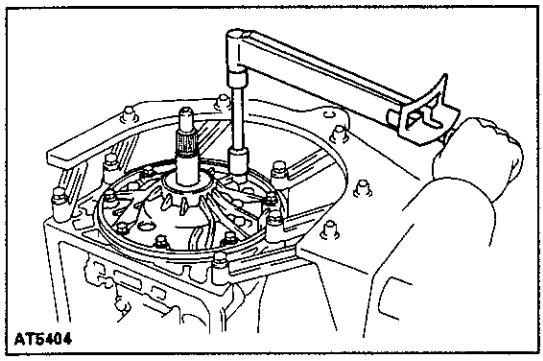
	Inside mm (in.)	Outside mm (in.)
Race	28.1 (1.106)	47.5 (1.870)

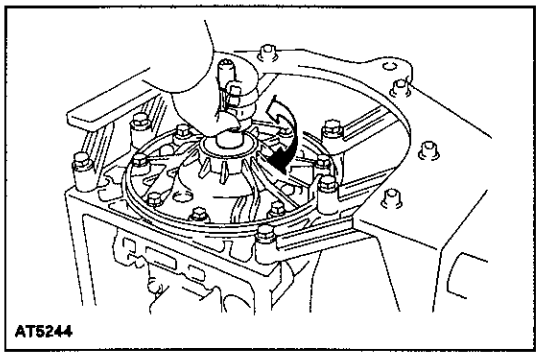
(b) Coat a new O–ring with ATF and install it around the pump body.

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

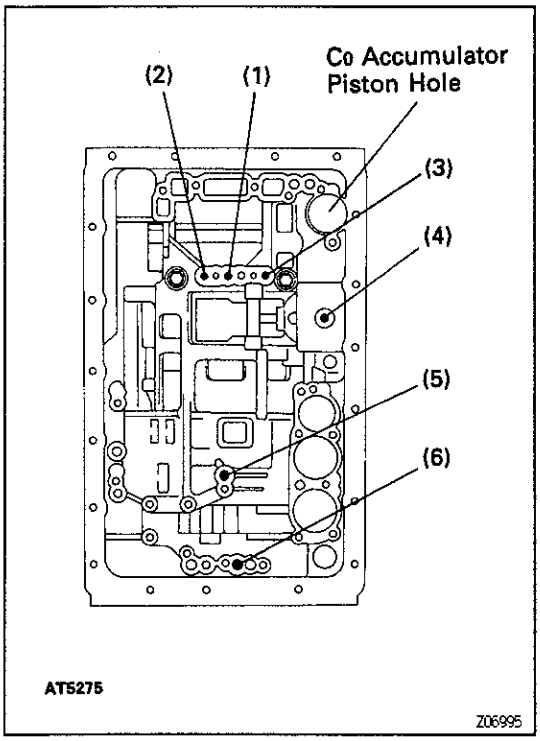
(e) Install the 7 bolts.
Torque: 21 N·m (215 kgf·cm, 16 ft·lbf)


AT5404



26. CHECK INPUT SHAFT ROTATION

Make sure the input shaft rotates smoothly.



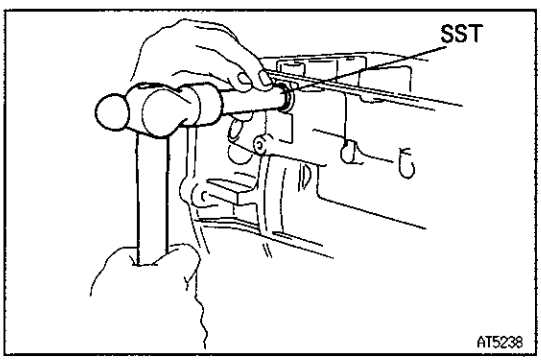
27. INDIVIDUAL PISTON OPERATION INSPECTOION

Check for the sound of operation while applying compressed air into the oil holes indicated in the illustration.

HINT: When inspecting the O/D direct clutch, check with the C_o accumulator piston hole closed.

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

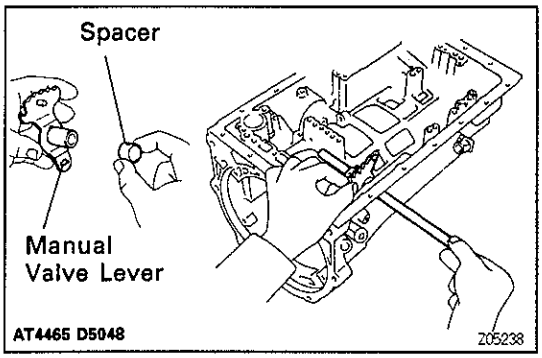
(1) Direct clutch
(2) Forward clutch
(3) O/D brake
(4) Second coast brake
(5) Second brake
(6) First and reverse brake



28. INSTALL MANUAL VALVE LEVER, SHAFT AND OIL SEAL

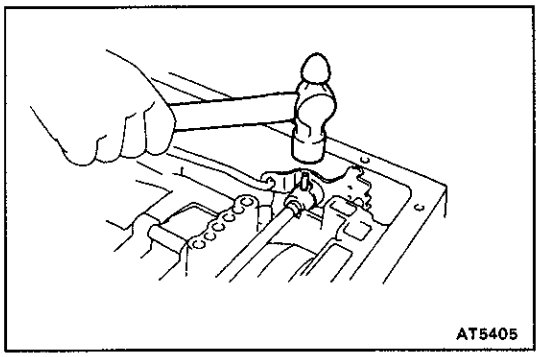
(a) Using SST, drive in a new oil seal.
SST 09350–30020 (09350–07110)

(b) Coat the oil seal lip with MP grease.

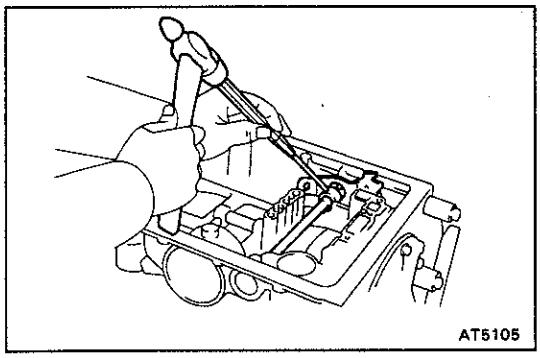


(c) Install a new spacer to the manual valve lever.

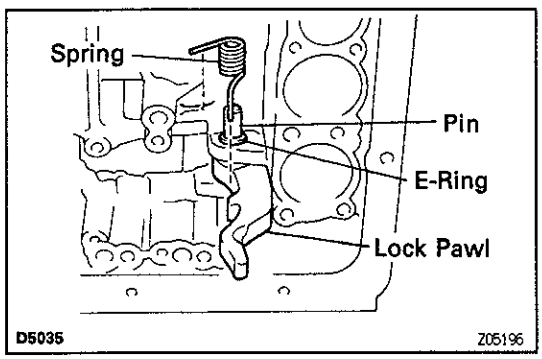
(d) Install the manual valve lever shaft to the transmission case through the manual valve lever.



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

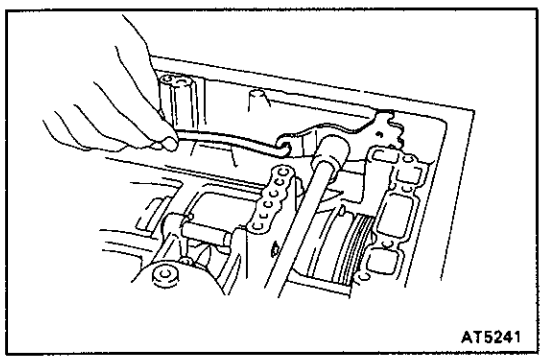


(f) Match the manual valve lever indentation with the spacer hole and calk them together with the punch.
(g) Make sure the shaft rotates smoothly.

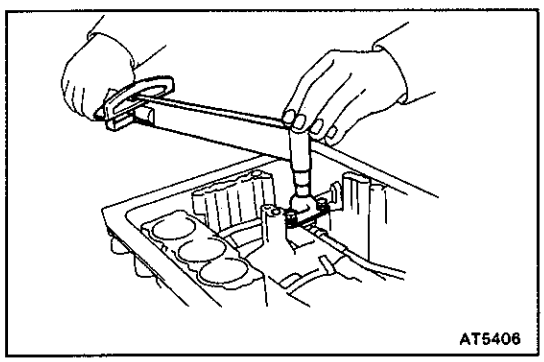


29. INSTALL PARKING LOCK PAWL AND ROD

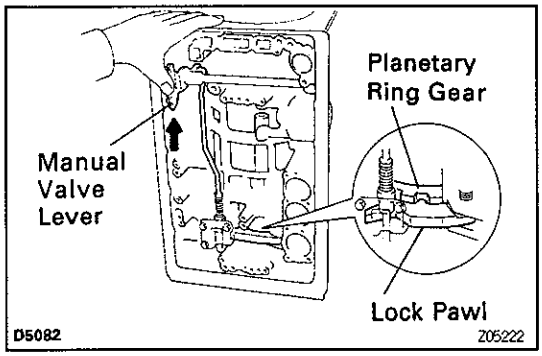
(a) Install the E–ring to the shaft.
(b) Install the parking lock pawl, shaft and spring.



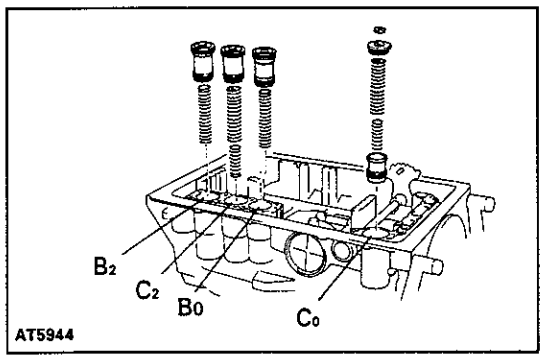
(c) Connect the parking lock rod to the manual valve lever.



(d) Place the parking lock pawl bracket onto the transmission case and torque the 3 bolts.
Torque: 7 N·m (75 kgf·cm, 65 in.·lbf)



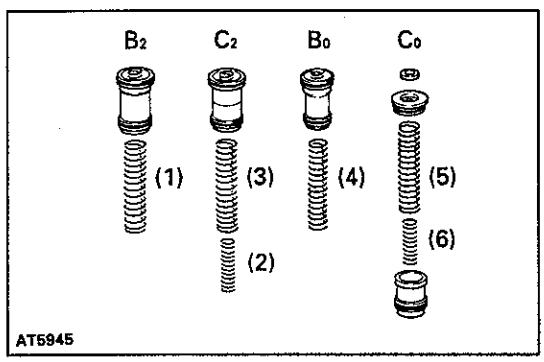
(e) Shift the manual valve lever to the P position, and confirm the planetary ring gear is correctly locked up by the lock pawl.



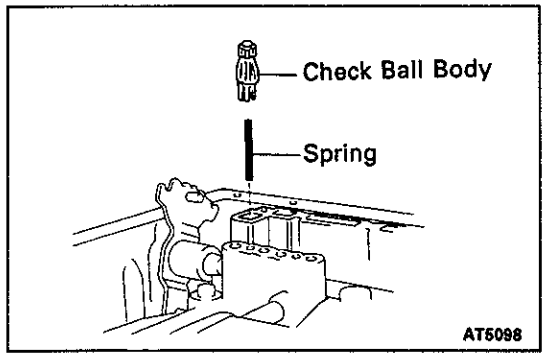
30. INSTALL ACCUMULATOR SPRINGS AND PISTONS

(a) Coat new O—rings with ATF and install them to the pistons.

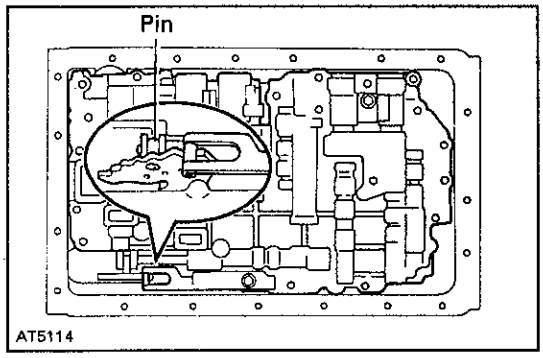
(b) Install the 6 springs and 4 accumulator pistons to the bore, as shown.
HINT: The pistons are marked in relief with either C_0, B_0, C_2 or B_2 to discriminate between them.
Accmulator spring:



Spring		Free length Outer diameter	Color
(1) B_2		75.25 mm (2.9626 in.) 19.97 mm (0.7862 in.)	White & Red
(2) C_2	(Inner)	40.0 mm (1.575 in.) 14.11 mm (0.5556 in.)	White & Dark Blue
(3) C_2	(Outer)	77.51 mm (3.0516 in.) 20.1 mm (0.791 in.)	Light Blue
(4) B_0		66.97 mm (2.6366 in.) 16.24 mm (0.6394 in.)	White & Blue
(5) C_0	(Outer)	63.35 mm (2.5728 in.) 20.59 mm (0.8106 in.)	White & Orange
(6) C_0	(Inner)	38.42 mm (1.5126 in.) 14.03 mm (0.5524 in.)	White

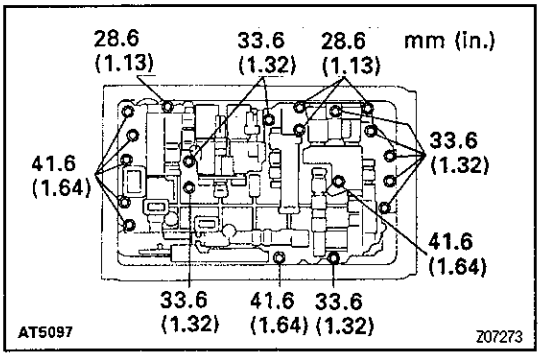


31. INSTALL SPRING AND CHECK BALL BODY

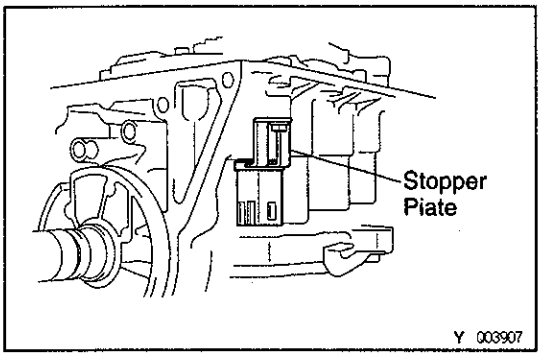


32. INSTALL VALVE BODY

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



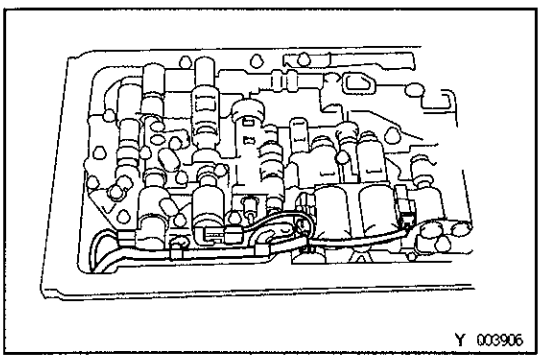
(b) Install the 20 bolts.
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)
HINT: Each bolt length (mm, in.) is indicated in the illustration.



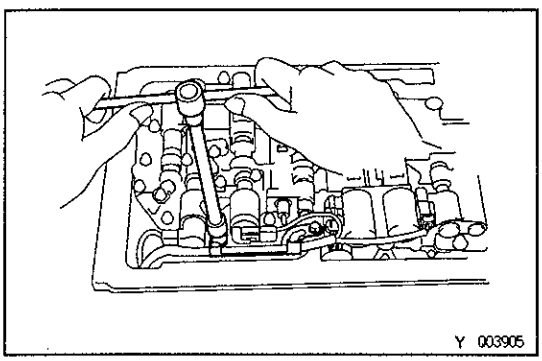
33. INSTALL SOLENOID WIRING

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

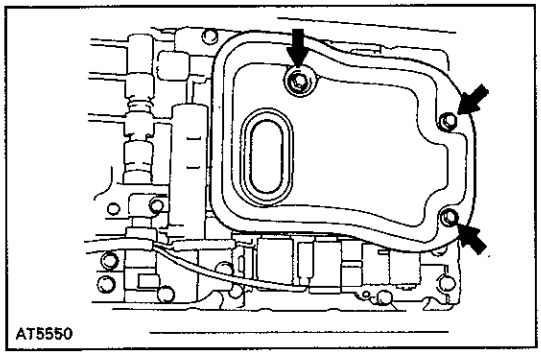
(b) Install the solenoid wiring to the case and install the stopper plate.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)



(c) Connect the 5 solenoid connectors.



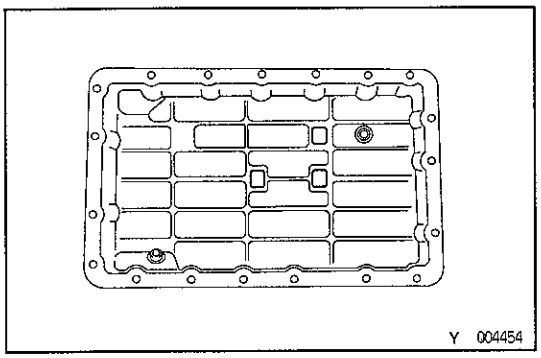
(d) Install the clamp with 2 bolts.



34. INSTALL OIL STRAINER AND GASKETS

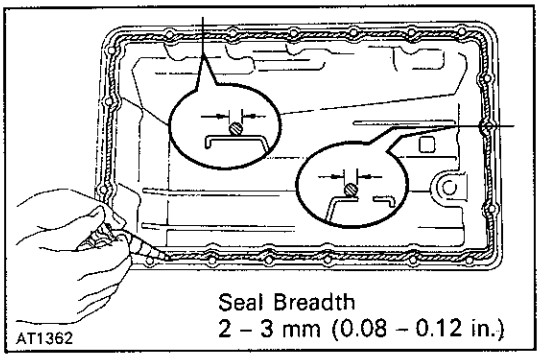
Install the oil strainer and torque the 3 bolts.

Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)



35. INSTALL OIL PAN

(a) Install the 3 magnets in the oil pan, as shown.

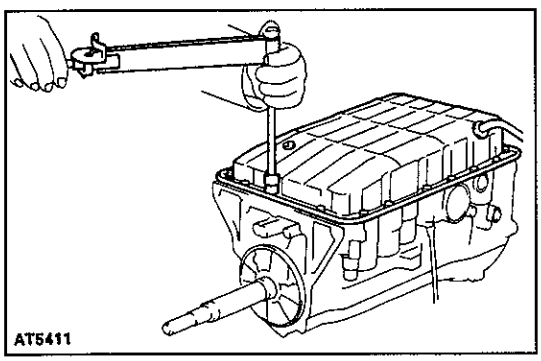


(b) Remove any packing material and be careful not to drop oil on the contacting surfaces of the transmission case and oil pan.

(c) Apply seal packing to the oil pan, as shown.

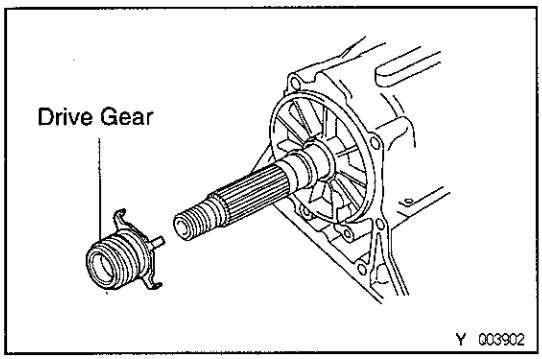
Seal packing:

Part No.08826–00090, THREE BOND 1281 or equivalent

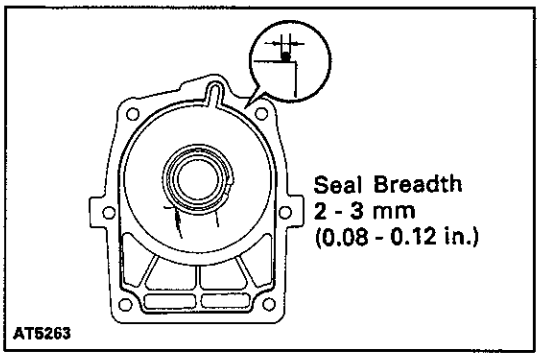


(d) Install and torque the 19 bolts.

Torque: 17 N·m (75 kgf·cm, 67 in.·lbf)



36. INSTALL SPEEDOMETER DRIVE GEAR



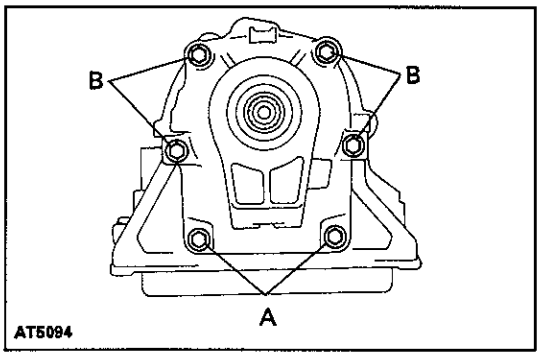
37. INSTALL EXTENSION HOUSING

(a) Clean the threads of the bolts and case with white gasoline.

(b) Apply seal packing to the extension housing, as shown.

Seal packing:

Part No.08826–00090, THREE BOND 1281 or equivalent



(c) Apply seal packing or equivalent to the 6 bolts.

Seal packing:

Part No.08833–00070, THREE BOND 1324 or equivalent

(d) Install and torque the 6 bolts.

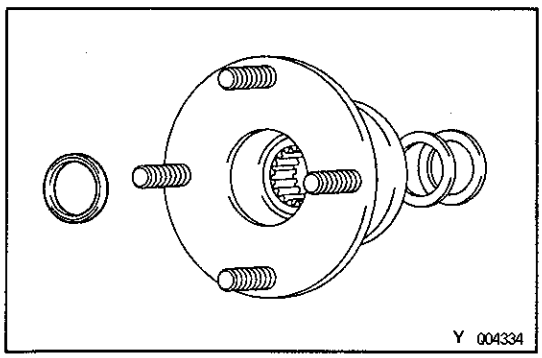
Torque: 34 N·m (345 kgf·cm, 25 ft·lbf)

HINT: Each bolt length is indicated below.

Bolt length:

A Bolt: 35 mm (1.378 in.)

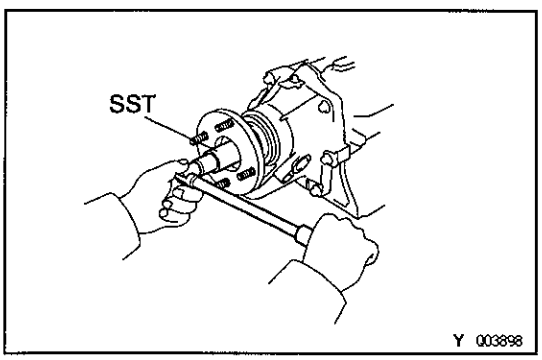
B Bolt: 45 mm (1.772 in.)



38. INSTALL TRANSMISSION OUTPUT FLANGE

(a) Install a new oil seal to the output flange.

(b) Install the output flange and 2 washers.

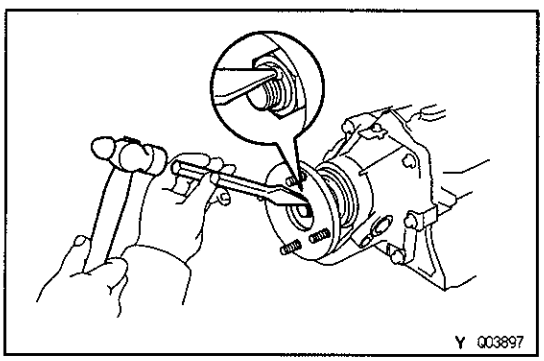


(c) Using SST, install a new nut.

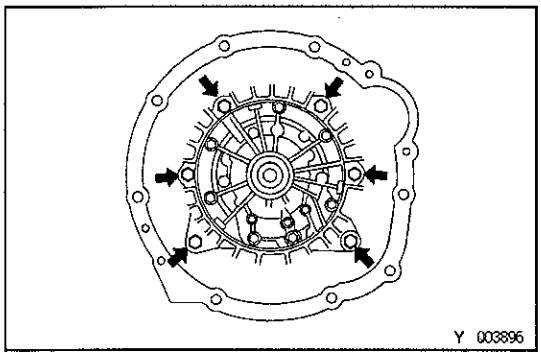
SST 09060–20100

Torque: 123 N·m (1,250 kgf·cm, 90 ft·lbf)

HINT: Shift the manual valve lever to the P position.



(d) Using a hammer and chisel, stake the nut.



39. REMOVE TRANSMISSION CASE FROM OVERHAUL ATTACHMENT

40. INSTALL TRANSMISSION HOUSING

(a) Clean the threads of the bolts and case with white gasoline.

(b) Apply seal packing or equivalent to the 6 bolts.

Seal packing:

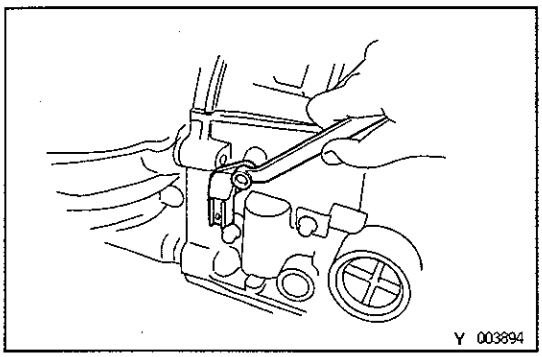
Part No.08833–00070, THREE BOND 1324 or equivalent

(c) Install and torque 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)



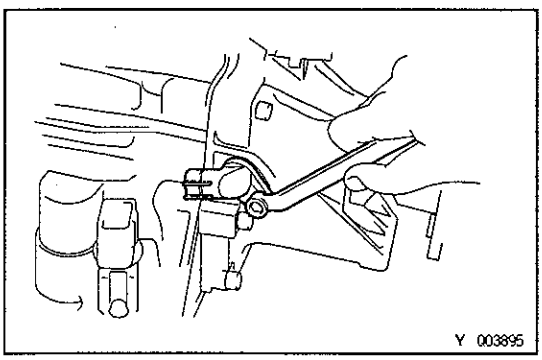
41. INSTALL O/D DIRECT CLUTCH SPEED SENSOR

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

(b) Install the speed sensor.

(c) Install and torque the bolts.

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



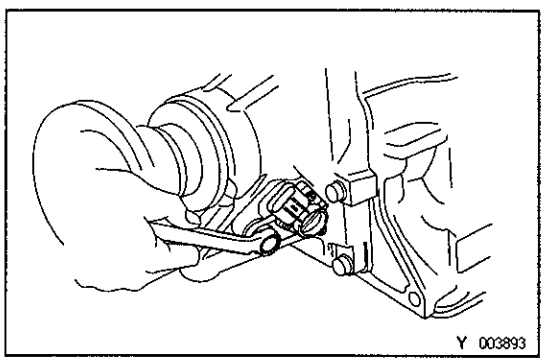
42. INSTALL NO.2 SPEED SENSOR

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

(b) Install the speed sensor.

(c) Install and torque the bolts.

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



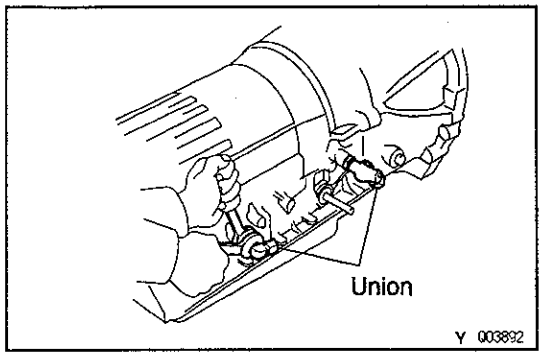
43. INSTALL NO.1 SPEED SENSOR

(a) Coat a new O–ring with ATF and install it to the No. 1 speed sensor.

(b) Install the No.1 speed sensor.

(c) Install and torque the bolt.

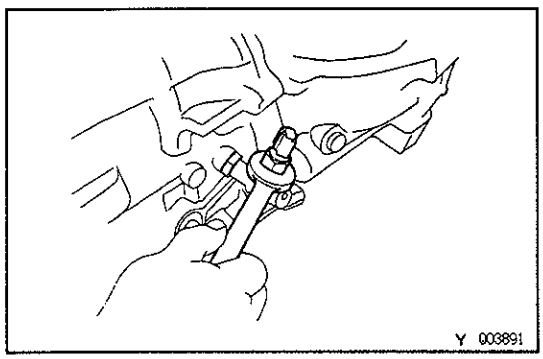
Torque: 16 N·m (160 kgf·cm, 12 ft·lbf)



44. INSTALL UNIONS

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

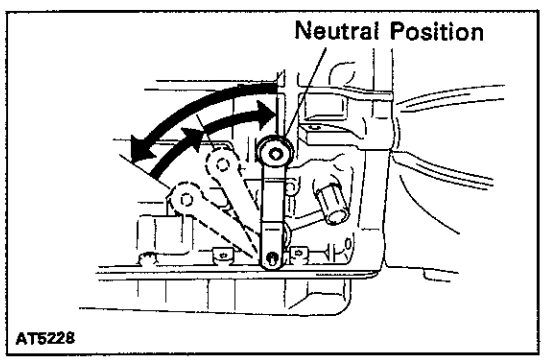
(b) Install each union.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)



45. INSTALL OIL TEMPERATURE SENSOR

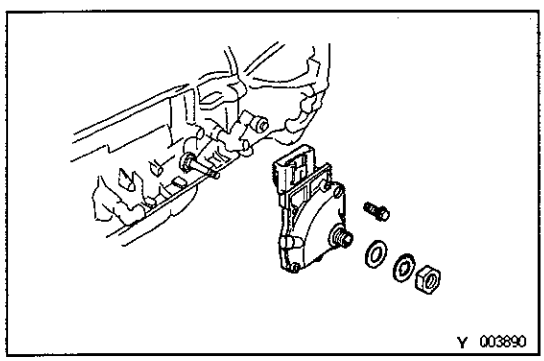
(a) Coat a new O–ring with ATF and install it to the oil temp. sensor.

(b) Install the oil temp. sensor.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)



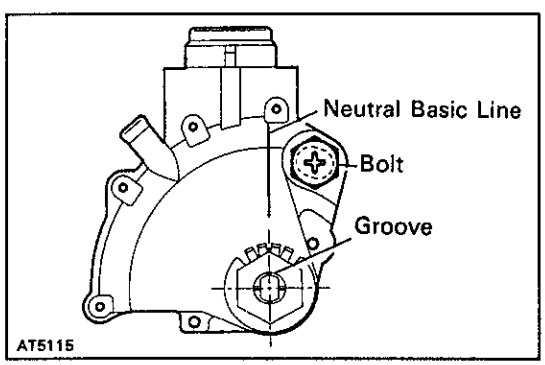
46. INSTALL NEUTRAL START SWITCH

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



(b) Insert the neutral start switch onto the manual valve lever shaft and temporarily tighten the adjusting bolt.

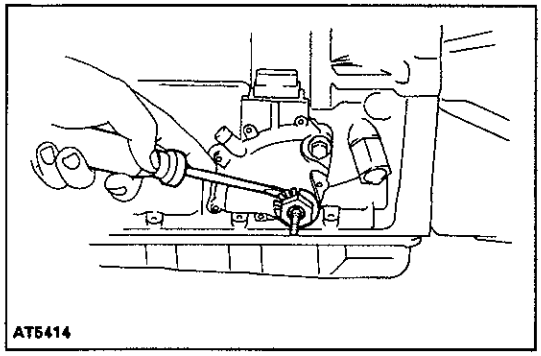
(c) Install the grommet and a new lock washer. Install and torque the nut.
Torque: 7 N·m (70 kgf·cm, 61 in.·lbf)



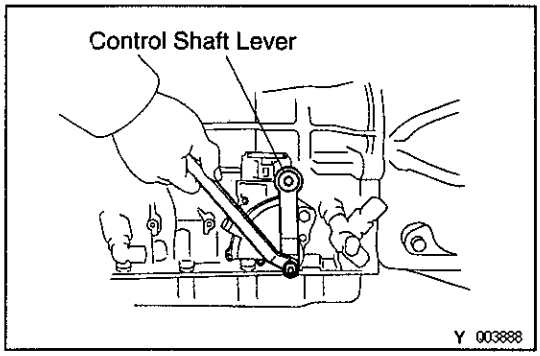
(d) Clean the threads of the adjusting bolt and case with white gasoline.

(e) Apply seal packing or equivalent to the adjusting bolt.
Seal packing:
Part No.08833–00070, THREE BOND 1324 or equivalent

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


AT5414

(g) Using a screwdriver, bend the tabs of the lock washer.
HINT: Bend at least 2 of the lock washer tabs.



47. INSTALL CONTROL SHAFT LEVER
Torque: 16 N·m (160 kgf·cm, 12 ft·lbf)