

# AUTOMATIC TRANSAXLE ASSY (A245E/A246E)

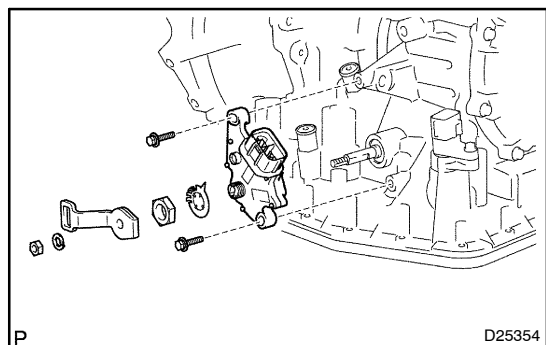
4003Q-01

## OVERHAUL

### 1. REMOVE BREATHER PLUG HOSE

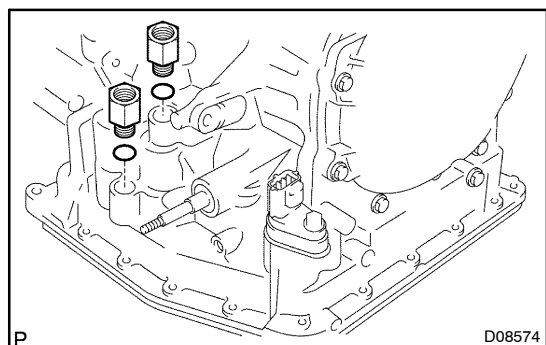
### 2. REMOVE TRANSAXLE CASE NO.1 PLUG

- (a) Remove the transaxle case No. 1 plug and O-ring.



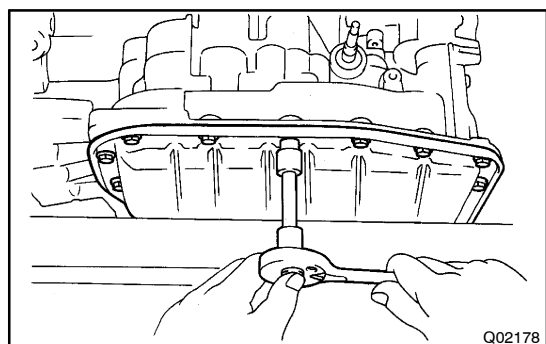
### 3. REMOVE NEUTRAL START SWITCH ASSY

- (a) Remove the nut, washer and manual shift lever.  
 (b) Pry off the lock washer and remove the manual valve shaft nut.  
 (c) Remove the 2 bolts and pull out the neutral start switch assy.



### 4. REMOVE OIL COOLER TUBE UNION

- (a) Using an open end wrench, remove the 2 oil cooler tube unions.  
 (b) Remove the 2 O-rings from the oil cooler tube unions.



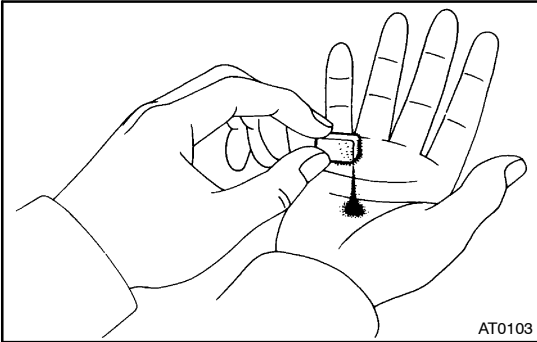
### 5. REMOVE AUTOMATIC TRANSAXLE OIL PAN SUB-ASSY

- (a) Remove the 18 bolts.  
 (b) Remove the automatic transaxle oil pan sub-assy by lifting the transaxle case.

#### NOTICE:

**Do not turn the transaxle over as it will contaminate the valve body with the foreign materials from the bottom of the pan.**

- (c) Remove the gasket.  
 (d) Place the transaxle on wooden blocks to prevent damage to the pipes.



## 6. INSPECT AUTOMATIC TRANSAXLE OIL PAN SUB-ASSY

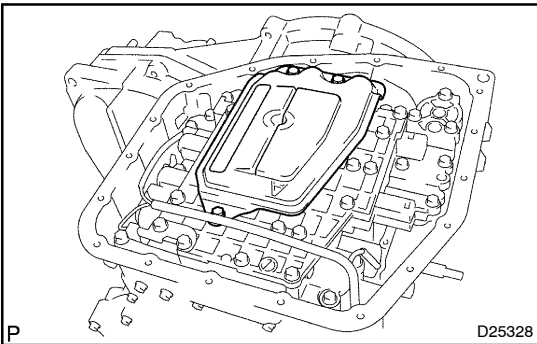
- (a) Remove the magnets and use them to collect any steel chips. Carefully examine the chips and particles in the pan and on the magnet to determine what type of wear has occurred in the transaxle:

Steel (magnetic)..... bearing, gear and plate wear

Brass (non-magnetic).....bushing wear

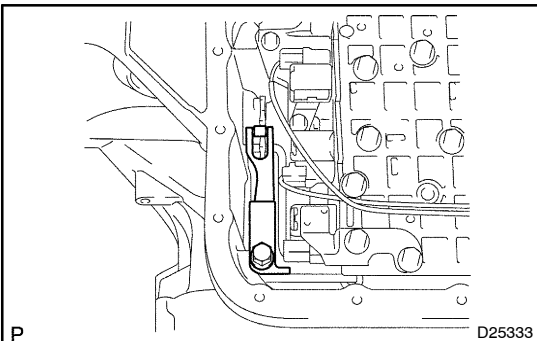
## 7. FIX AUTOMATIC TRANSAXLE ASSY

- (a) Place automatic transaxle assy on wooden blocks.

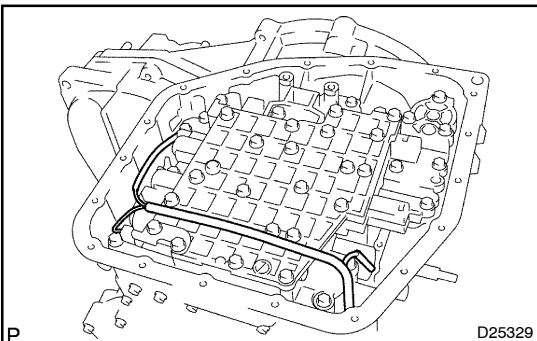


## 8. REMOVE VALVE BODY OIL STRAINER ASSY

- (a) Remove the 3 bolts and valve body oil strainer assy.

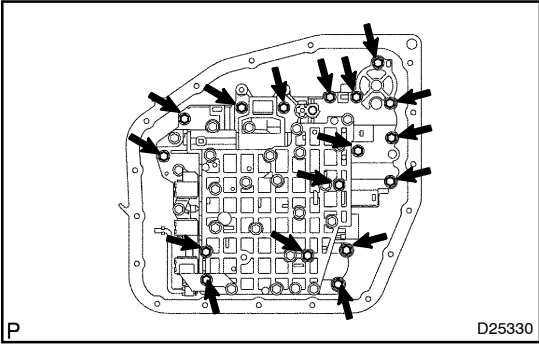


## 9. REMOVE MANUAL DETENT SPRING SUB-ASSY

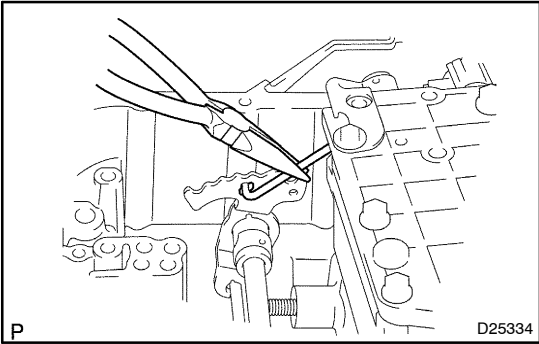


## 10. REMOVE TRANSMISSION VALVE BODY ASSY

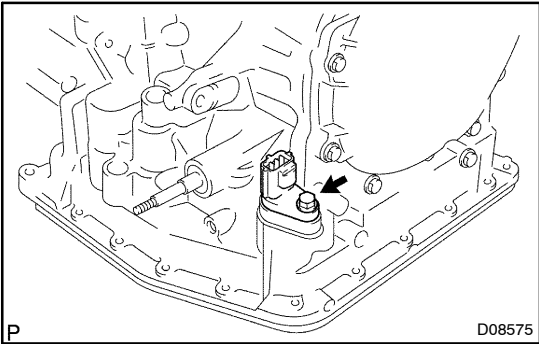
- (a) Disconnect the solenoid connectors.



(b) Remove the 17 bolts.

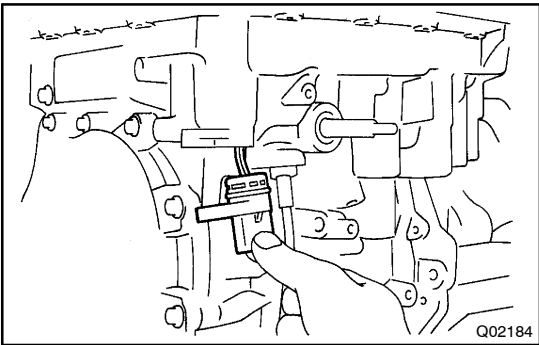


- (c) While disconnecting the manual valve connecting rod from the manual valve lever, remove the valve body.
- (d) Remove the manual valve from the transmission valve body assy.

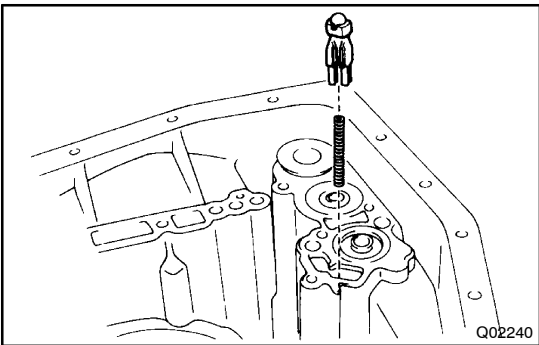


**11. REMOVE TRANSMISSION WIRE**

(a) Remove the bolt.

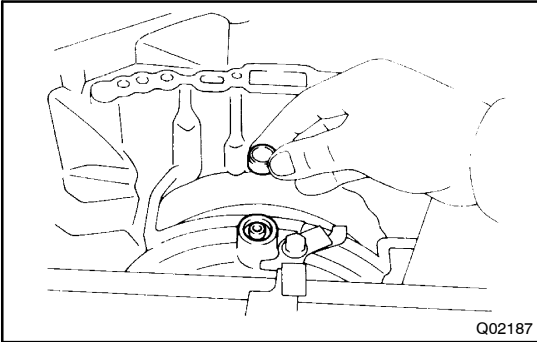
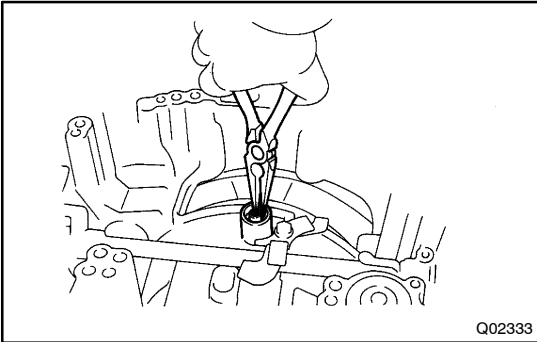


(b) Remove the transmission wire.



**12. REMOVE CHECK BALL BODY**

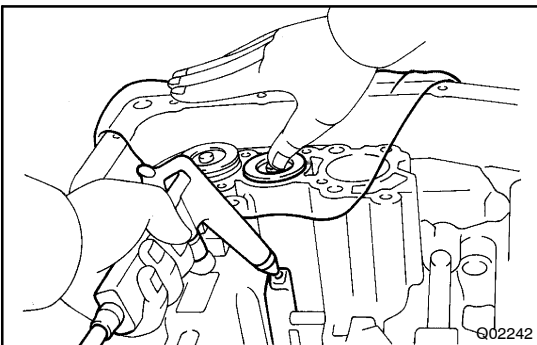
(a) Remove the check ball body and spring.

**13. REMOVE GOVERNOR APPLY GASKET NO.1****14. REMOVE BRAKE DRUM GASKET**

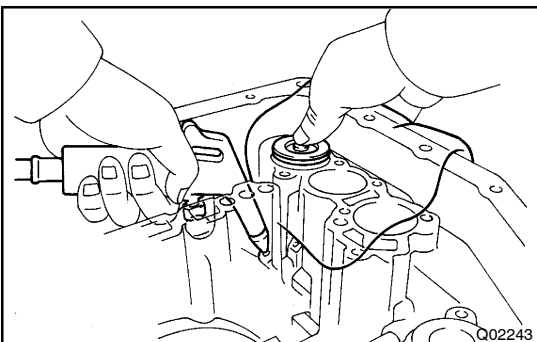
- (a) Using needle-nose pliers, pull out the brake drum gasket.

**15. REMOVE B-2 ACCUMULATOR PISTON**

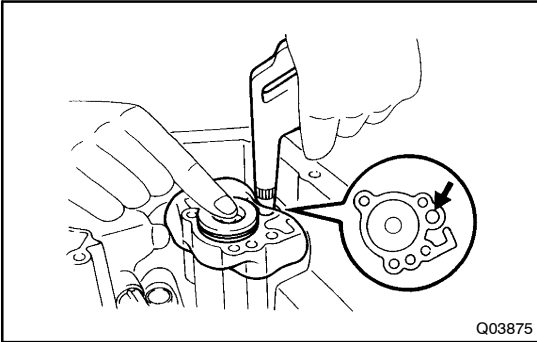
- (a) Using low-pressure compressed air (98 kPa, 1 kgf/cm<sup>2</sup>, 14 psi), pop out the B-2 accumulator piston into a rag and remove the spring.
- (b) Remove the 2 O-rings from the B-2 accumulator piston.

**16. REMOVE C-2 ACCUMULATOR PISTON**

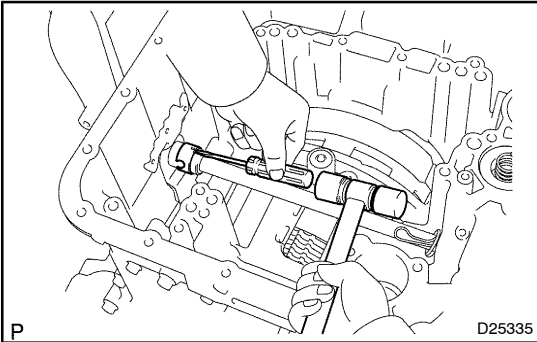
- (a) Using low-pressure compressed air (98 kPa, 1 kgf/cm<sup>2</sup>, 14 psi), pop out the C-2 accumulator piston into a rag and remove the spring.
- (b) Remove the 2 O-rings from the C-2 accumulator piston.

**17. REMOVE C-1 ACCUMULATOR PISTON**

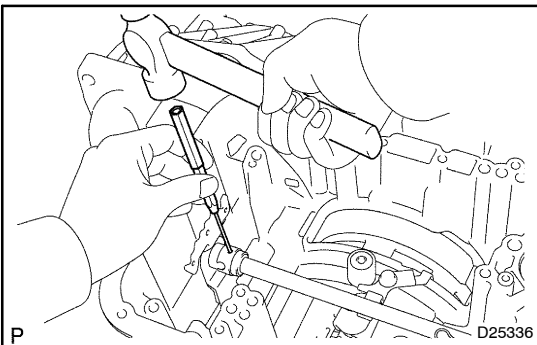
- (a) Using low-pressure compressed air (98 kPa, 1 kgf/cm<sup>2</sup>, 14 psi), pop out the C-1 accumulator piston into a rag and remove the spring.
- (b) Remove the 2 O-rings from the C-1 accumulator piston.

**18. REMOVE C-3 ACCUMULATOR PISTON**

- (a) Using low-pressure compressed air (98 kPa, 1 kgf/cm<sup>2</sup>, 14 psi), pop out the C-3 accumulator piston into a rag and remove the spring.
- (b) Remove the 2 O-rings from the C-3 accumulator piston.

**19. REMOVE MANUAL VALVE LEVER SHAFT**

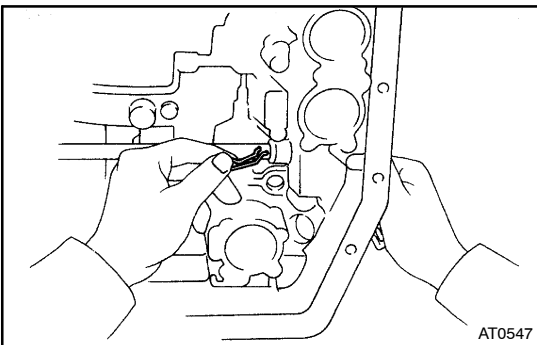
- (a) Using a screwdriver and hammer, unstick the spacer and remove it.



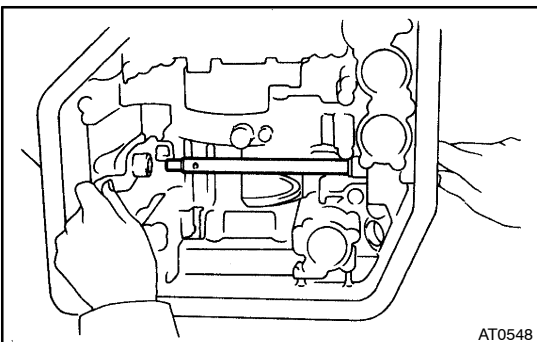
- (b) Using a pin punch and hammer, drive out the pin.

**HINT:**

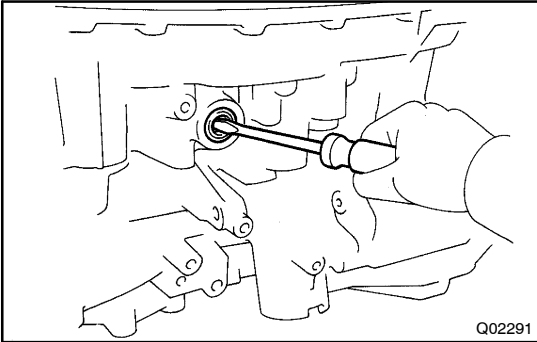
Drive out the spring pin slowly so that it will not fall into the trans-axle case.



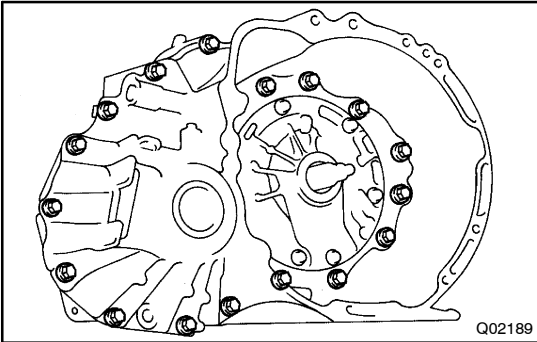
- (c) Remove the spring retainer.



- (d) Slide out the manual valve lever shaft and remove the manual valve lever and plate washer.

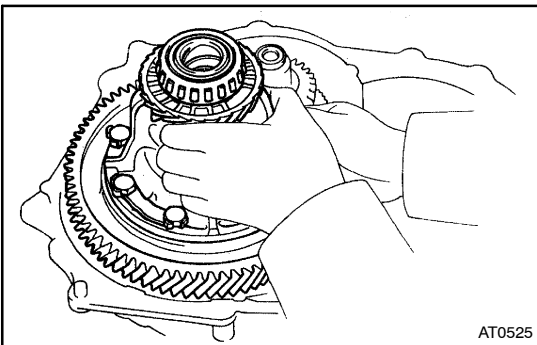


- (e) Using a screwdriver, remove the manual lever shaft oil seal.

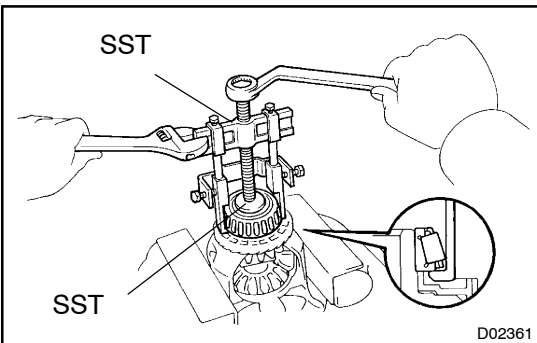


## 20. REMOVE TRANSAXLE HOUSING

- (a) Remove the 17 bolts and transaxle housing.

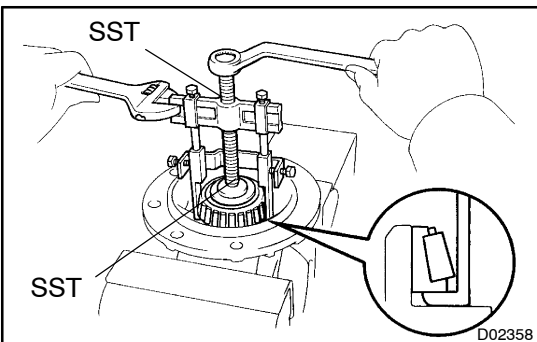


## 21. REMOVE FRONT DIFFERENTIAL ASSY



## 22. REMOVE FRONT DRIVE PINION FRONT TAPERED ROLLER BEARING

- (a) Setting SST to the cut-out portion on the speedometer drive gear, remove the bearing from the differential case. SST 09950-40011, 09950-60010 (09951-00340)
- (b) Remove the speedometer drive gear.

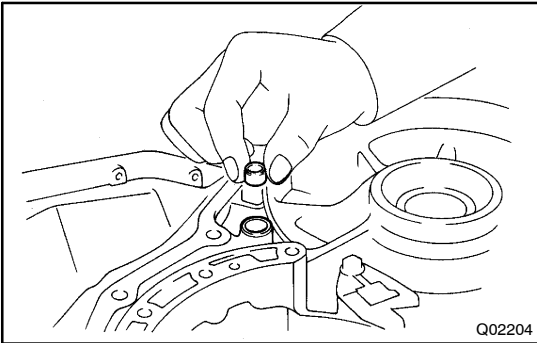
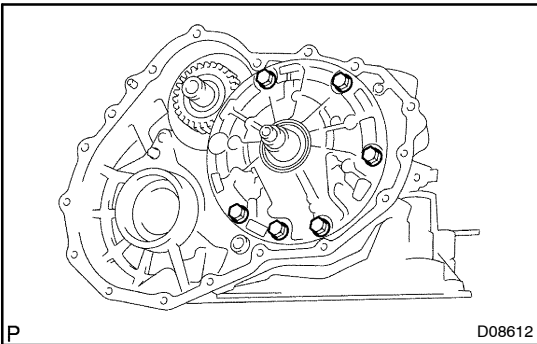


## 23. REMOVE FRONT DRIVE PINION REAR TAPERED ROLLER BEARING

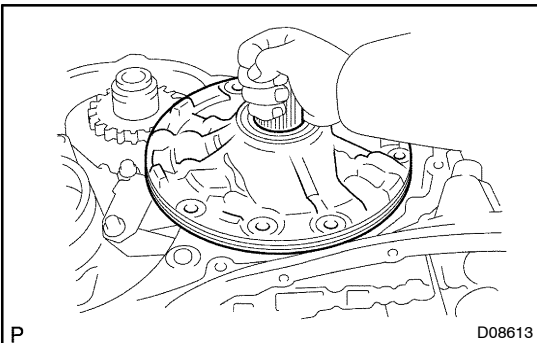
- (a) Setting SST to the cut-out portion on the differential case, remove the bearing. SST 09950-40011, 09950-60010 (09951-00410)

**24. REMOVE TRANSMISSION CASE PLATE NO.1**

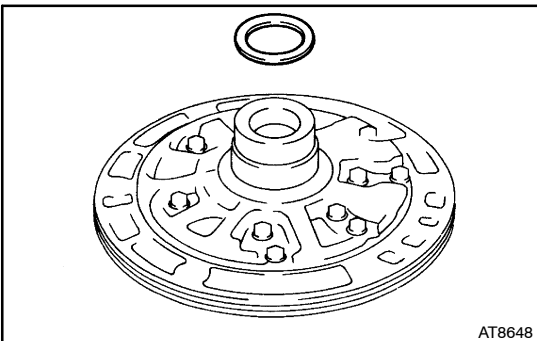
- (a) Remove the bolt and transmission case plate No. 1.

**25. REMOVE GOVERNOR APPLY GASKET NO.2****26. REMOVE OIL PUMP ASSEMBLY**

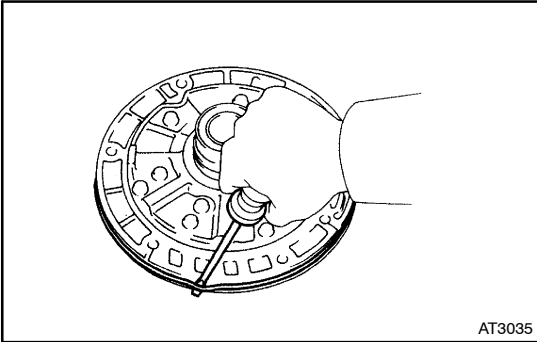
- (a) Remove the 6 bolts and holding the oil pump assembly to the transaxle case.



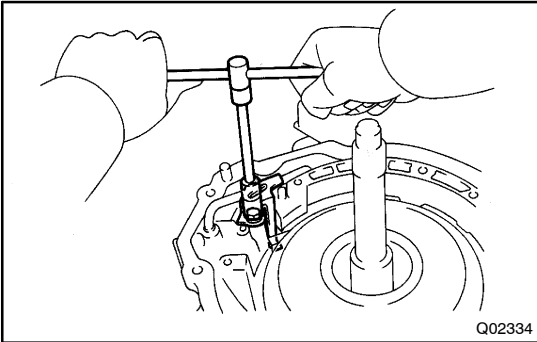
- (b) Pull out the oil pump assembly from the transaxle case.



- (c) Remove the race from the oil pump assembly.

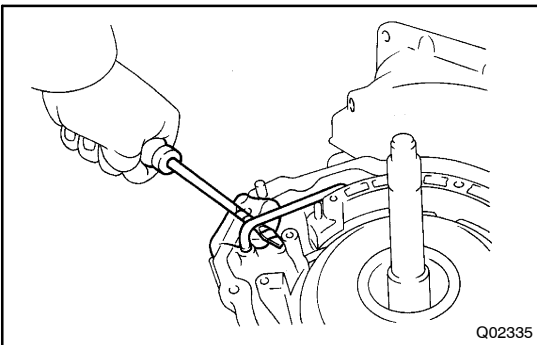


- (d) Using a screwdriver, remove the O-ring from the oil pump assembly.



## 27. REMOVE TRANSAXLE APPLY TUBE CLAMP NO.3

- (a) Remove the bolt and transaxle apply tube clamp No. 3.



## 28. REMOVE GOVERNOR PRESSURE TUBE

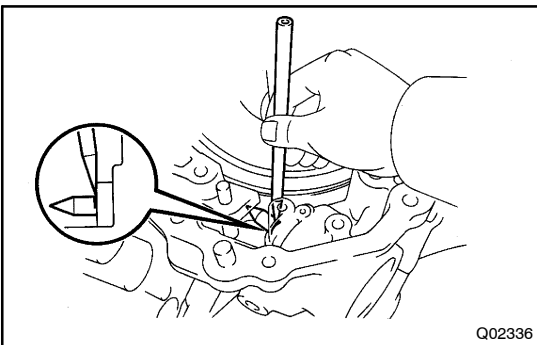
- (a) Using a screwdriver, remove the governor pressure tube.

**HINT:**

Tape the screwdriver tip before use.

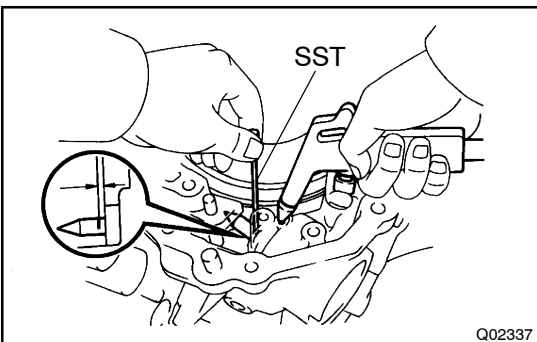
**NOTICE:**

**Be careful not to bend or damage the tube.**



## 29. INSPECT PISTON STROKE OF 2ND COAST BRAKE

- (a) Apply a small amount of paint to the piston rod at the point where it meets the case.



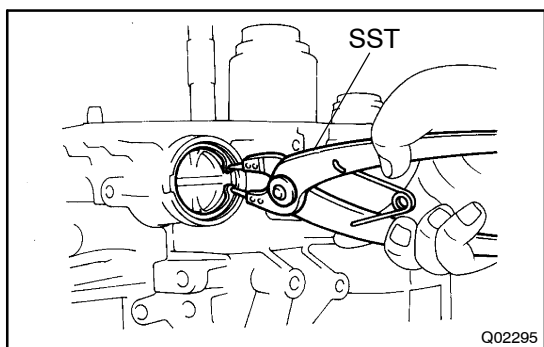
- (b) Using SST, measure the piston stroke while applying and releasing compressed air (392 – 785 kPa, 4 – 8 kgf/cm<sup>2</sup>, 57 – 114 psi).

SST 09240-00020

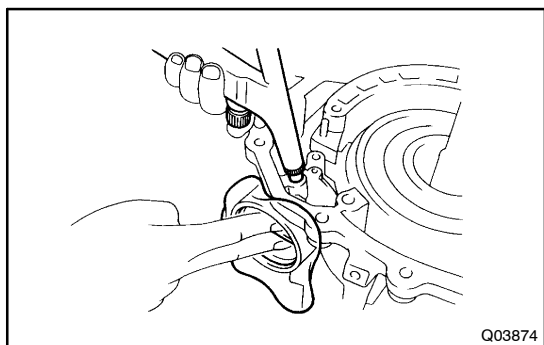
**Piston stroke: 1.5 – 3.0 mm (0.059 – 0.118 in)**

If the piston stroke exceeds the limit, inspect the brake band.

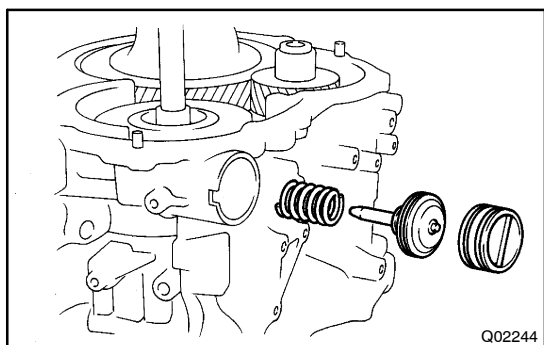


**30. REMOVE 2ND COAST BRAKE PISTON**

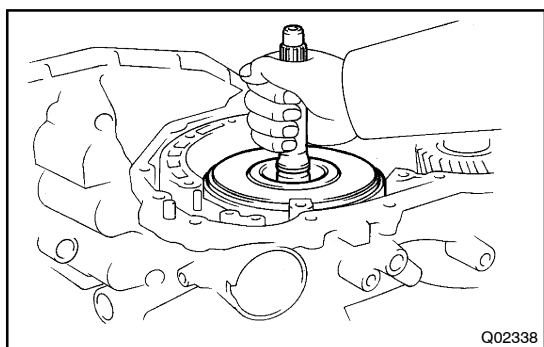
- (a) Using SST, remove the snap ring.  
SST 09350-32014 (09351-32050)



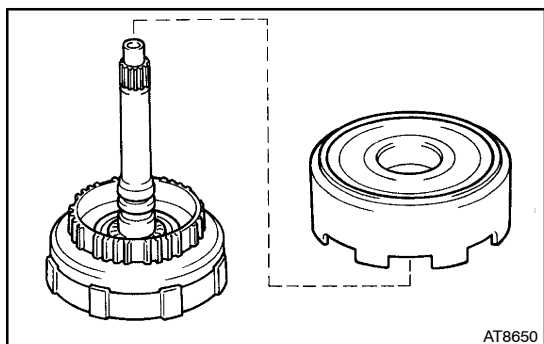
- (b) Using low-pressure compressed air (98 kPa, 1 kgf/cm<sup>2</sup>, 14 psi), pop out the cover into a rag.



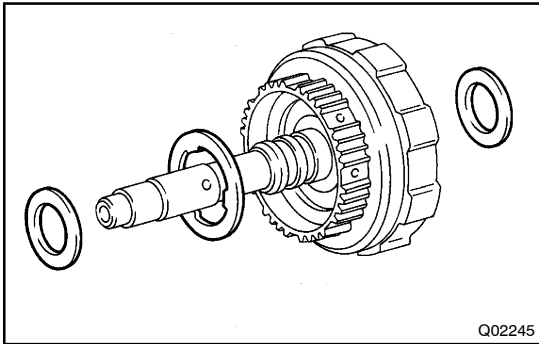
- (c) Remove the cover, 2nd coast brake piston and spring.  
(d) Remove the 2 O-rings from the cover.  
(e) Remove the oil seal ring.

**31. REMOVE INPUT SHAFT ASSY**

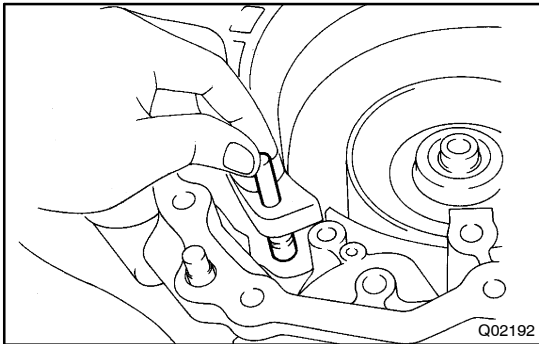
- (a) Remove the direct clutch with the forward clutch from the case.



- (b) Remove the direct clutch from the forward clutch.

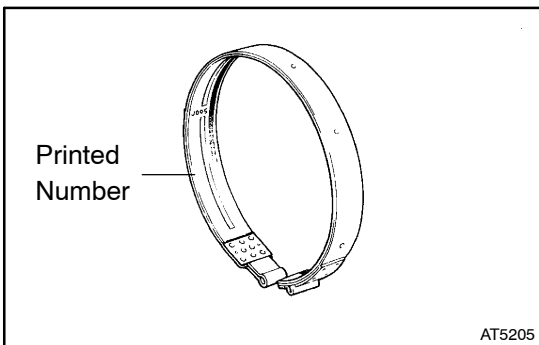


- (c) Remove the thrust washer and 2 assembled bearings and races from the forward clutch.



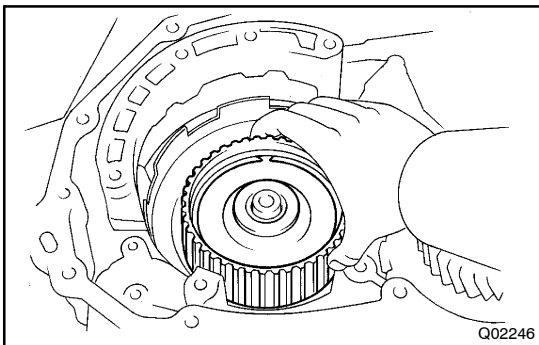
### 32. REMOVE 2ND COAST BRAKE BAND ASSY

- (a) Pull out the pin.  
 (b) Remove the 2nd coast brake band assy.



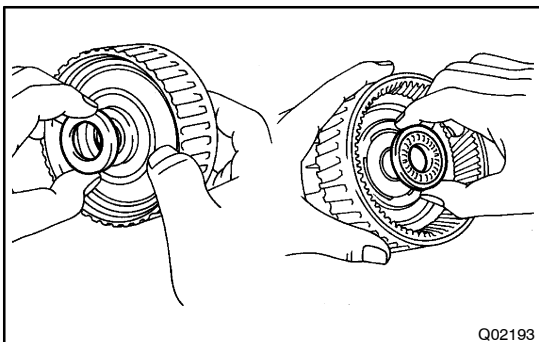
### 33. INSPECT 2ND COAST BRAKE BAND ASSY

If the lining of the 2nd coast brake band assy is peeling off or discolored, or even if a part of the printed numbers are defaced, replace the 2nd coast brake band assy.

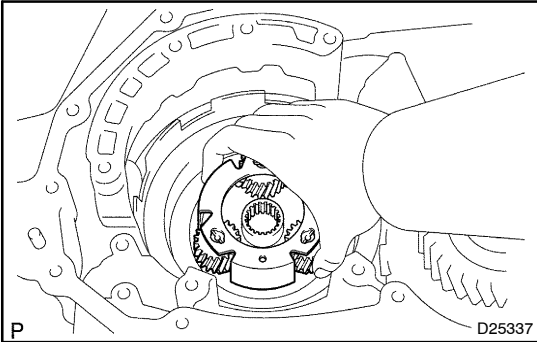


### 34. REMOVE FRONT PLANETARY RING GEAR

- (a) Remove the front planetary ring gear.

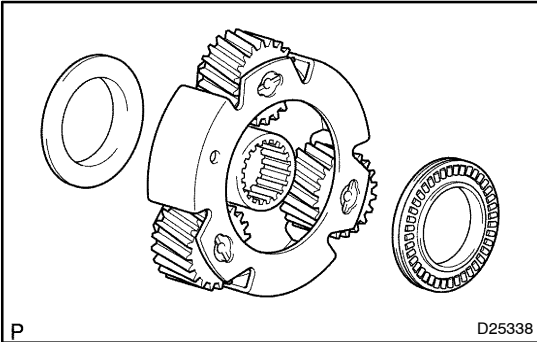


- (b) Remove the assembled bearing and race and race from the front planetary ring gear.

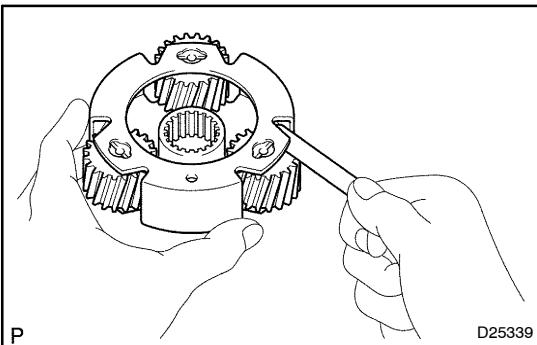


### 35. REMOVE FRONT PLANETARY GEAR ASSY

- (a) Remove the front planetary gear assy with the bearing and race.



- (b) Remove the assembled bearing and race and race from the front planetary gear assy.



### 36. INSPECT FRONT PLANETARY GEAR ASSY

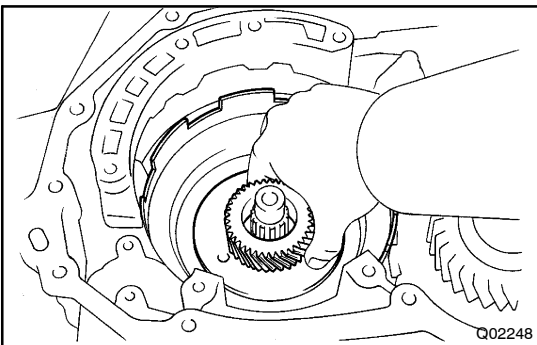
- (a) Using a feeler gauge, measure the planetary pinion gear thrust clearance.

**Standard clearance:**

**0.2 - 0.5 mm (0.008 - 0.020 in.)**

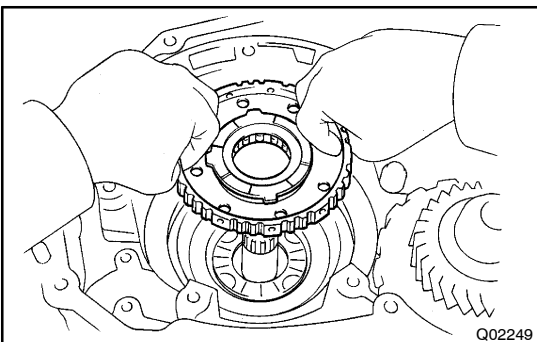
**Maximum clearance: 0.5 mm (0.020 in.)**

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

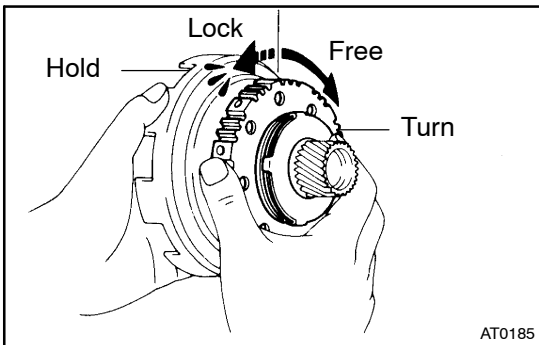


### 37. REMOVE PLANETARY SUN GEAR SUB-ASSY

- (a) Remove the planetary sun gear sub-assy with the sun gear input drum and thrust washer.



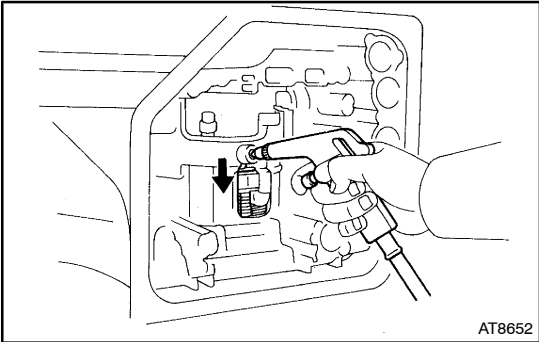
### 38. REMOVE 1 WAY CLUTCH ASSY



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**39. INSPECT 1 WAY CLUTCH ASSY**

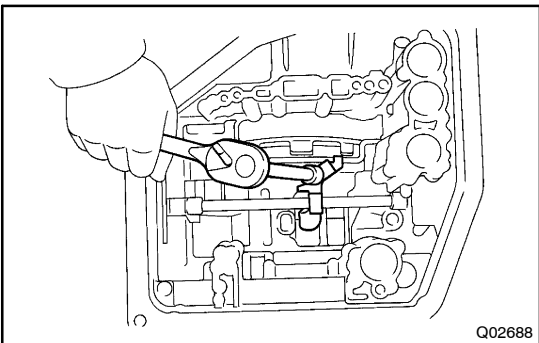
- (a) Hold the sun gear and turn the hub. The hub should turn freely clockwise and should lock if turned counterclockwise.



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**40. INSPECT 2ND BRAKE PISTON**

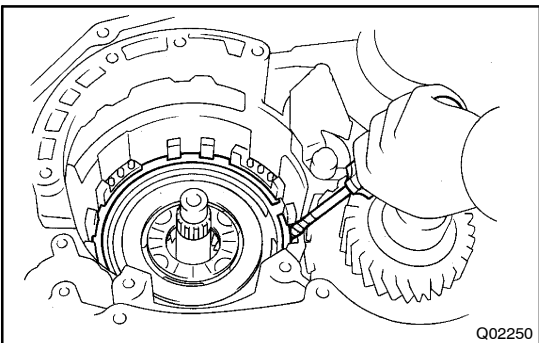
- (a) Using compressed air, check that the 2nd brake piston moves smoothly.



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**41. REMOVE 2ND BRAKE PISTON RETURN SPRING SUB-ASSY**

- (a) Remove the bolt and 2nd coast brake band guide.

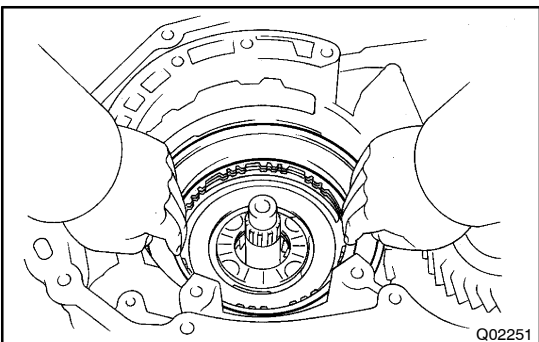


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- (b) Using a screwdriver, remove the snap ring.

HINT:

Tape the screwdriver tip before use.

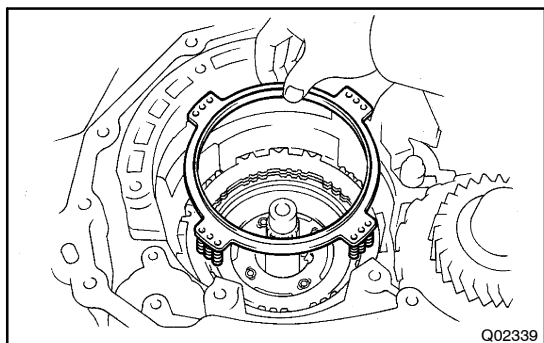


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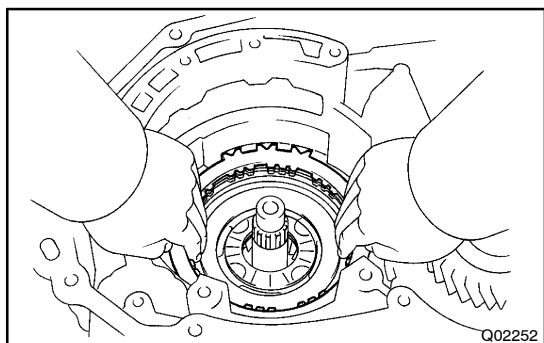
- (c) Remove the 2nd brake drum.

HINT:

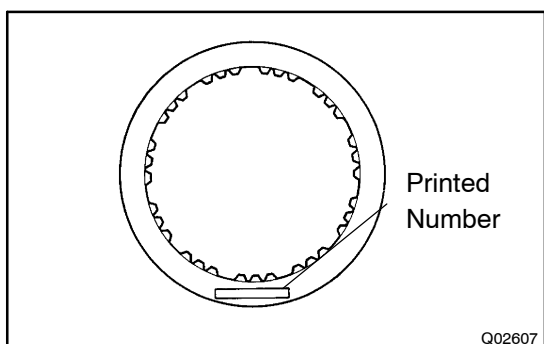
If the brake drum is difficult to remove, lightly tap it with a wooden block.



- (d) Remove the 2nd brake piston return spring sub-assy.



- (e) Remove the plates, discs and flange.

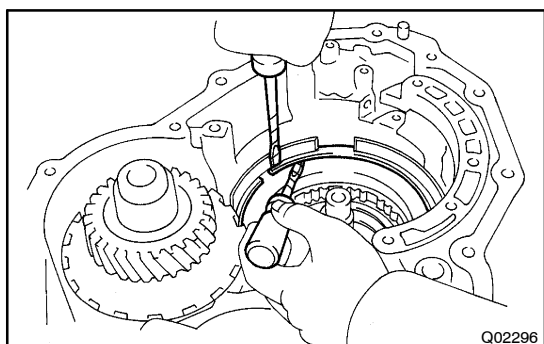


#### 42. INSPECT 2ND BRAKE CLUTCH DISC

- (a) Check if the sliding surfaces of the discs, plates and flanges are worn or burnt. If necessary, replace them.

##### HINT:

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

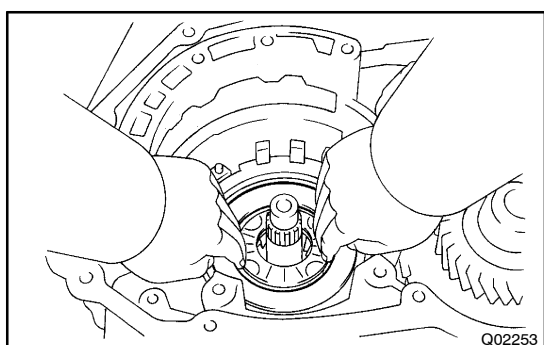


#### 43. REMOVE REAR PLANETARY GEAR ASSY

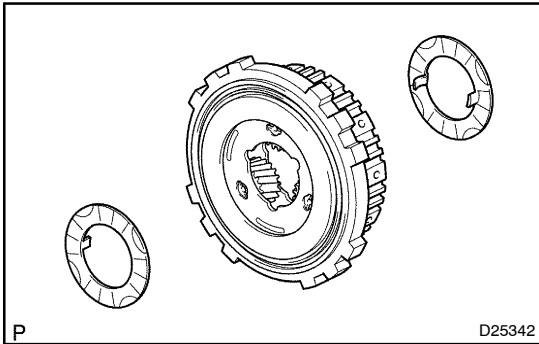
- (a) Using 2 screwdrivers, remove the snap ring.

##### HINT:

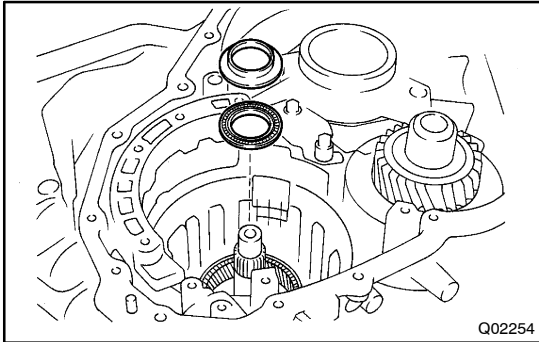
Tape the screwdriver tip before use.



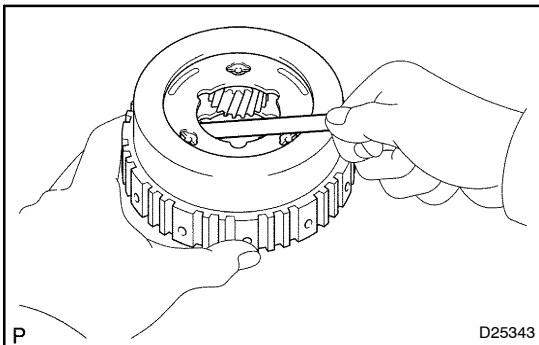
- (b) Remove the No. 2 1 way clutch and rear planetary gear assy with the 2 thrust washers.



- (c) Remove the 2 thrust washers from the rear planetary gear assy.
- (d) Remove the No. 2 1 way clutch from the rear planetary gear assy.



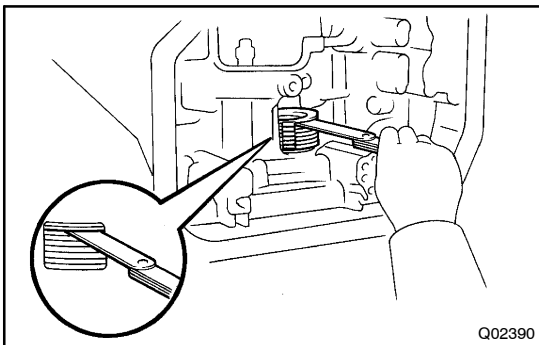
- (e) Remove the assembled bearing and race and race from the planetary ring gear.



#### 44. INSPECT REAR PLANETARY GEAR ASSY

- (a) Using a feeler gauge, measure the planetary pinion gear thrust clearance.  
**Standard clearance: 0.2 – 0.5 mm (0.008 – 0.020 in.)**  
**Maximum clearance: 0.5 mm (0.020 in.)**

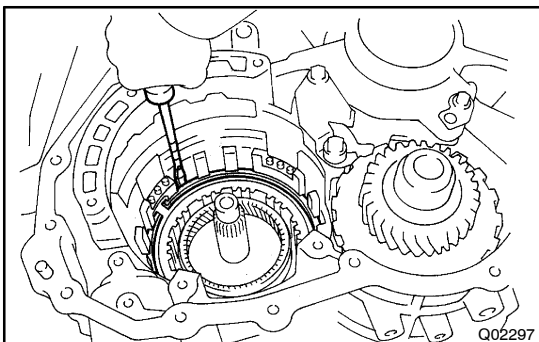
If the clearance is greater than maximum, replace the rear planetary gear assembly.



#### 45. INSPECT PACK CLEARANCE OF FIRST & REVERSE BRAKE

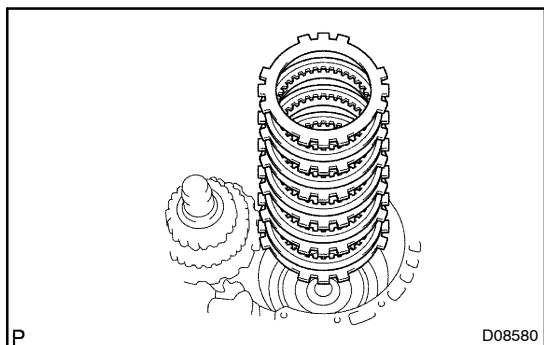
- (a) Using a feeler gauge, measure the first and reverse brake pack clearance.  
**Pack clearance:**  
**A245E: 1.00 – 2.00 mm (0.0393 – 0.0787 in.)**  
**A246E: 1.19 – 2.25 mm (0.0469 – 0.0886 in.)**

If the pack clearance is non-standard, check the disc.

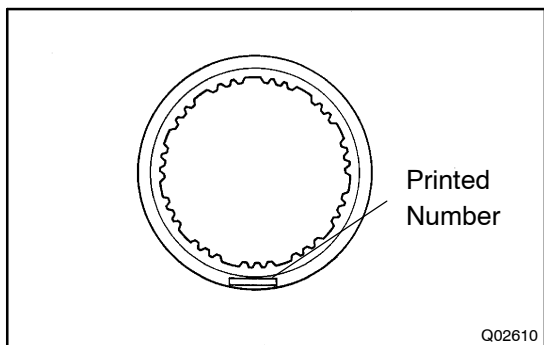


#### 46. REMOVE 1ST & REVERSE BRAKE CLUTCH DISC

- (a) Using a screwdriver, remove the snap ring.  
**HINT:**  
 Tape the screwdriver tip before use.



- (b) Remove the flange, plates and discs.

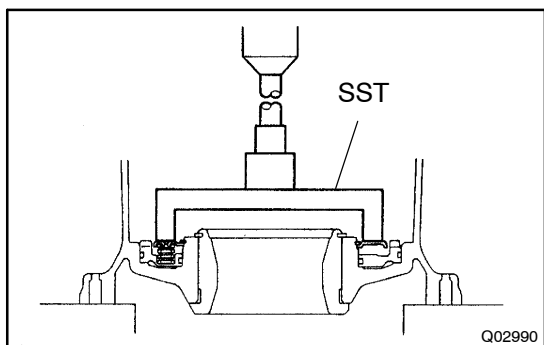


#### 47. INSPECT 1ST & REVERSE BRAKE CLUTCH DISC

- (a) Check if the sliding surfaces of the discs, plates and flanges are worn or burnt. If necessary, replace them.

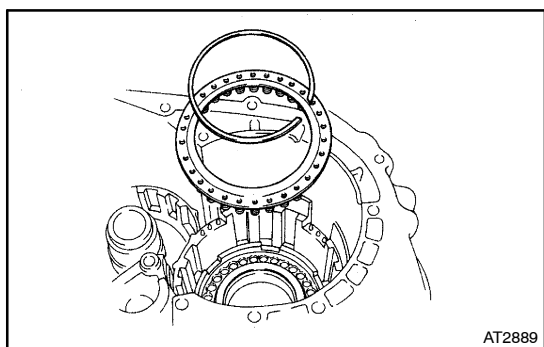
#### HINT:

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

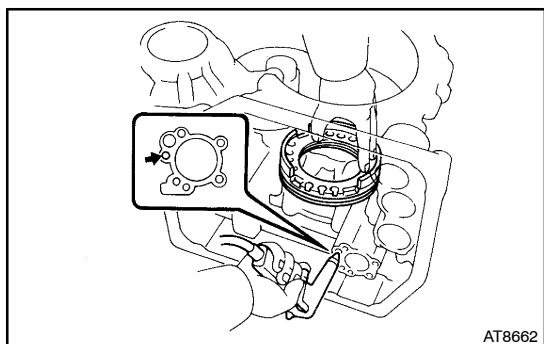


#### 48. REMOVE 1ST & REVERSE BRAKE RETURN SPRING SUB-ASSY

- (a) Using SST and a press, in the return spring until the snap ring is free from the return spring.  
SST 09350-32014 (09351-32040)
- (b) Using snap ring pliers, remove the snap ring.



- (c) Remove the 1st and reverse brake return spring sub-assy.



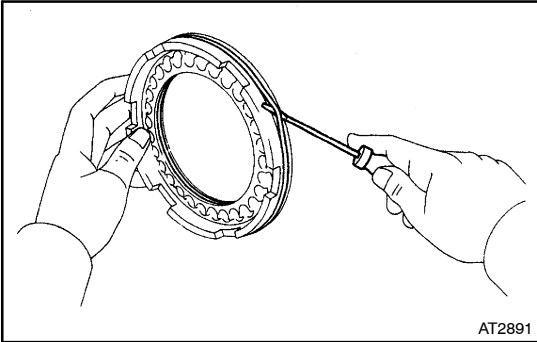
#### 49. REMOVE 1ST & REVERSE BRAKE PISTON

- (a) Apply compressed air into the oil passage of the case to remove the 1st and reverse piston.

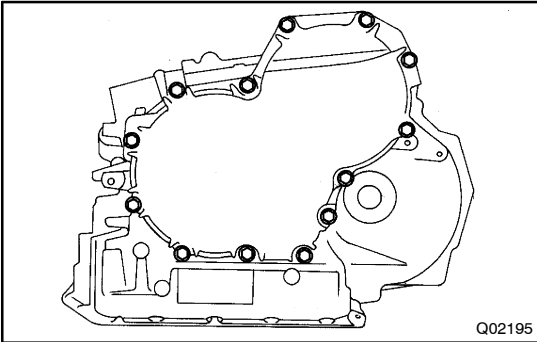
#### HINT:

Hold the 1st and reverse piston so it is not slant and blow with the gun slightly away from the oil hole.

- (b) If the 1st and reverse piston does not pop out with compressed air, use needle-nose pliers to remove it.

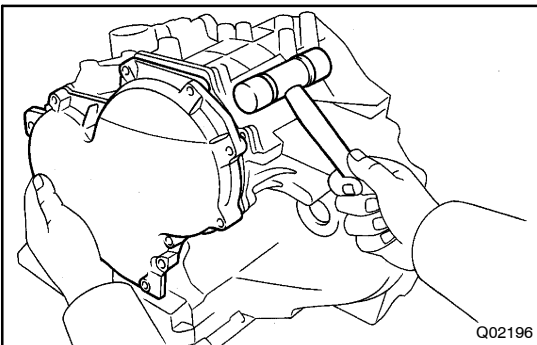


- (c) Using a screwdriver, remove the 2 O-rings from the 1st and reverse piston.

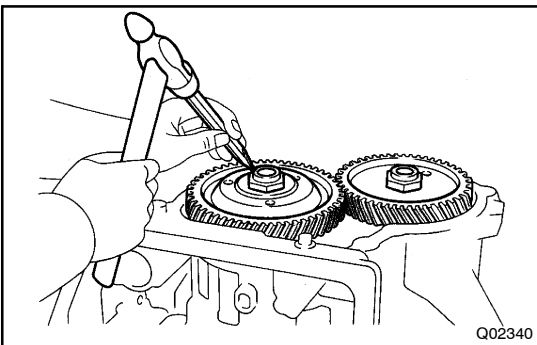


## 50. REMOVE TRANSMISSION CASE COVER REAR

- (a) Remove the 13 bolts.

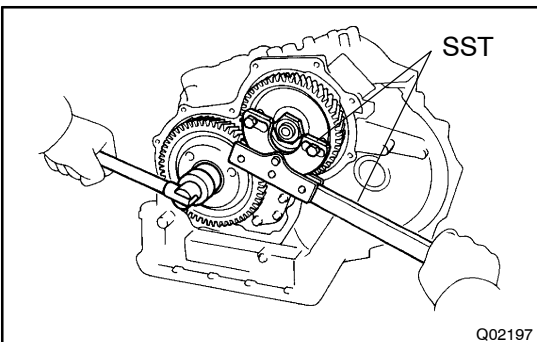


- (b) Tap off the circumference of the transmission case cover rear with a plastic hammer to remove the rear case from the transaxle case, and remove the transmission case cover rear.



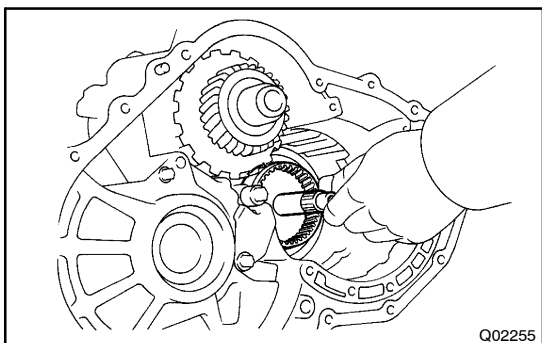
## 51. REMOVE INTERMEDIATE SHAFT SUB-ASSY

- (a) Using a chisel and hammer, unstick the counter driven gear nut.

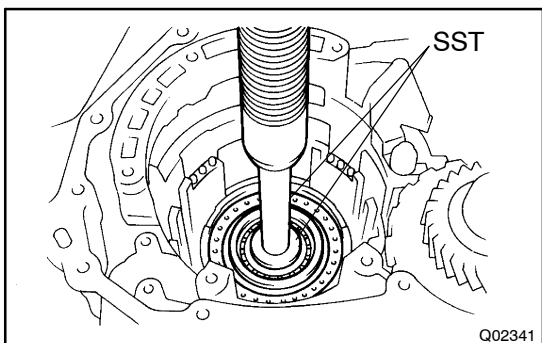


- (b) Using SST, remove the counter driven gear nut.  
SST 09330-00021, 09350-32014 (09351-32032)



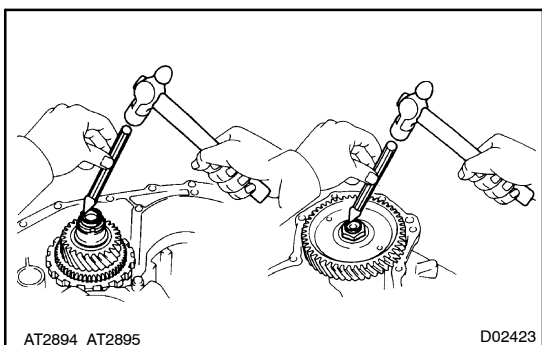


- (c) Remove the intermediate shaft sub-assy.



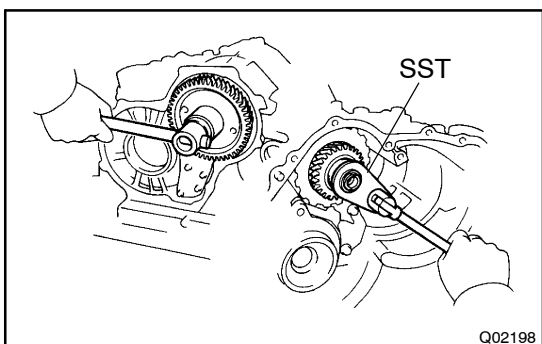
## 52. REMOVE COUNTER DRIVE GEAR

- (a) Using SST and a press, remove the counter drive gear.  
SST 09950-60010 (09951-00380), 09950-70010 (09951-07100)
- (b) Remove the spacer from the counter drive gear assembly.

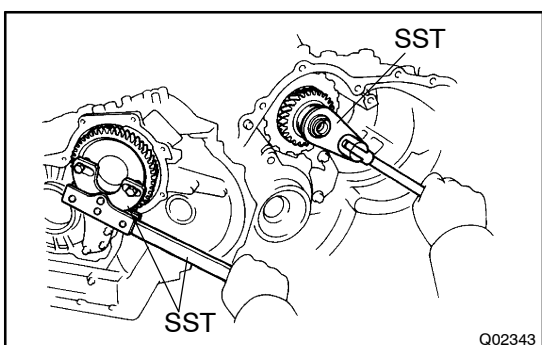


## 53. REMOVE COUNTER DRIVEN GEAR

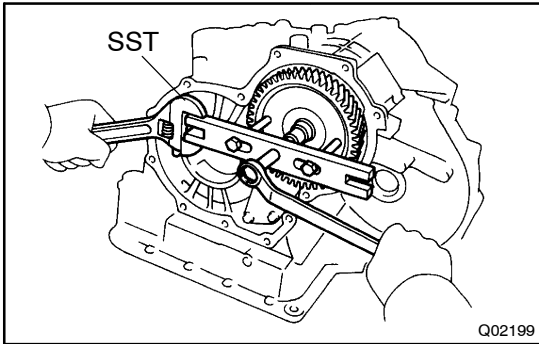
- (a) Using a chisel and hammer, unstake the counter driven gear nut on both sides.



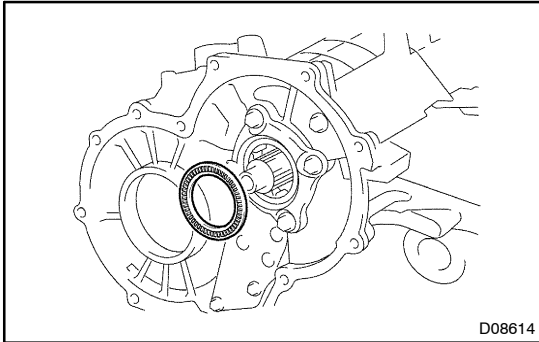
- (b) Using SST to hold the counter shaft assy, remove the lock nut on the counter driven gear side.  
SST 09350-32014 (09351-32170), 09330-00021 (09351-32032, 09351-32061)



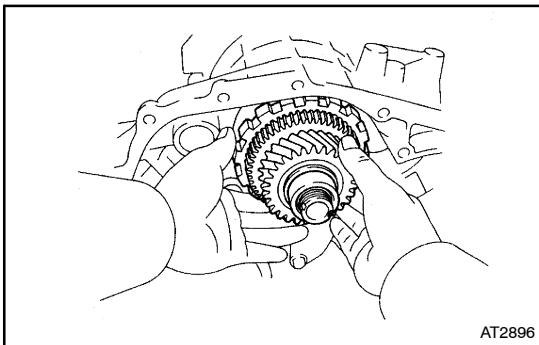
- (c) Using SST to hold the counter driven gear, remove the counter driven gear nut of the other side.  
SST 09350-32014 (09351-32170), 09330-00021 (09351-32032, 09351-32061)



- (d) Using SST, remove the counter driven gear.  
 SST 09350-32014 (09351-32170), 09330-00021  
 (09351-32032, 09351-32061)

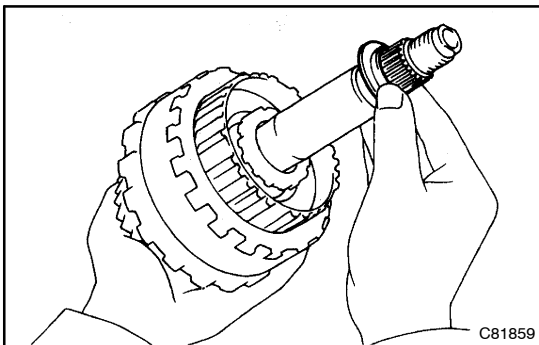


- (e) Remove the thrust needle bearing.

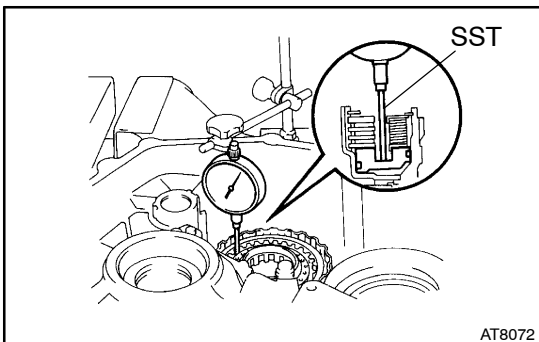


#### 54. REMOVE COUNTER SHAFT ASSY

- (a) Pull out the counter shaft assembly.

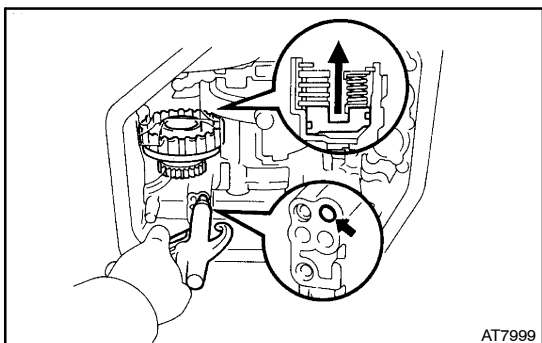


- (b) Remove the thrust bearing with race from the counter shaft assembly.



#### 55. INSPECT PISTON STROKE OF UNDERDRIVE CLUTCH

- (a) Set a dial indicator (long type pick or SST)  
 SST 09350-32014 (09351-32190)



AT7999

- (b) While applying and releasing compressed air (392 – 785 kPa, 4 – 8 kgf/cm<sup>2</sup>, 57 – 114 psi), measure the underdrive clutch piston stroke.

**Piston stroke: 1.5 – 1.9 mm (0.059 – 0.075 in.)**

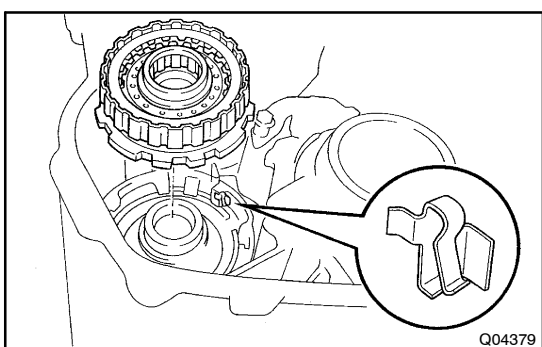
If the piston stroke is non-standard, select another flange.

HINT:

There are 4 different flange thickness.

**Flange thickness: mm (in.)**

| Thickness     | Thickness     |
|---------------|---------------|
| 2.04 (0.0803) | 2.40 (0.0945) |
| 2.20 (0.0866) | 2.50 (0.0984) |

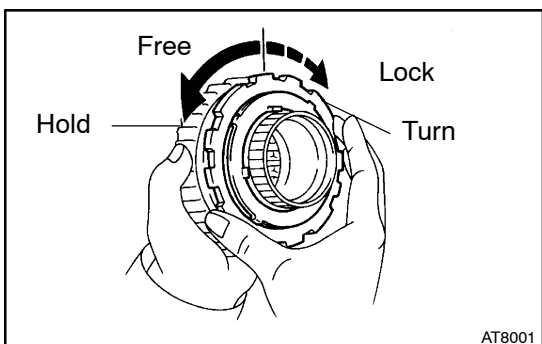


Q04379

## 56. REMOVE UNDERDRIVE CLUTCH DRUM SUB-ASSY

- (a) Remove the underdrive clutch drum sub-assy.

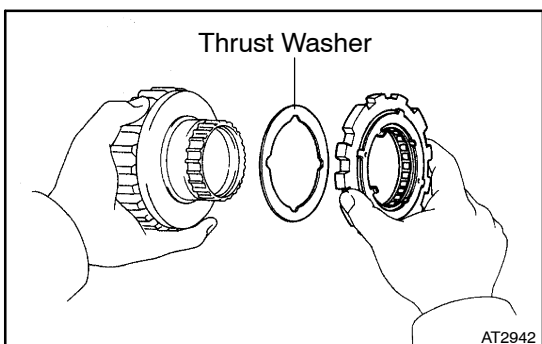
## 57. REMOVE UNDERDRIVE 1 WAY CLUTCH RETAINER



AT8001

## 58. INSPECT UNDERDRIVE 1 WAY CLUTCH ASSY

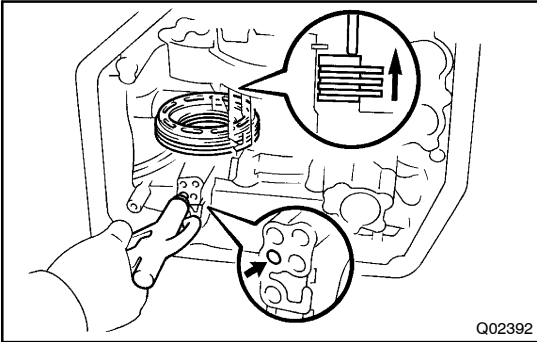
- (a) Hold the 1 way clutch drum and turn the 1 way clutch. Check that the 1 way clutch must be able to turn free counterclockwise and will lock if turned clockwise.



AT2942

## 59. REMOVE UNDERDRIVE 1 WAY CLUTCH ASSY

- (a) Remove the 1 way clutch and thrust washer from the underdrive clutch drum.



Q02392

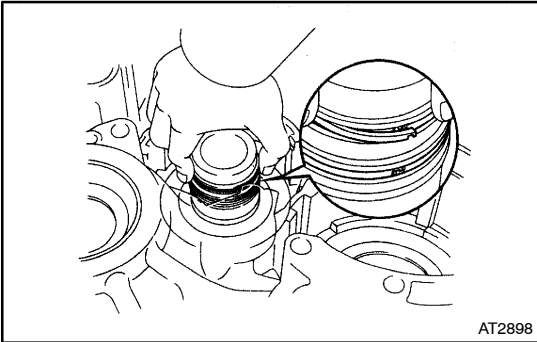
### 60. INSPECT PACK CLEARANCE OF UNDERDRIVE BRAKE

- (a) Using a dial indicator, measure the underdrive brake pack clearance.

**Pack clearance:**

**1.15 – 1.97 mm (0.0453 – 0.0786 in.)**

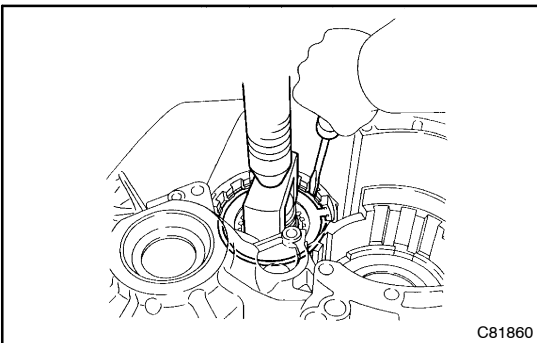
If clearance is non-standard, check the disc.



AT2898

### 61. REMOVE OVERDRIVE CLUTCH DRUM OIL SEAL RING

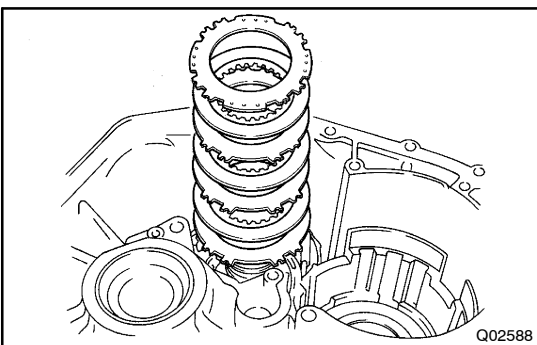
- (a) Remove the 2 overdrive clutch drum oil seal rings.



C81860

### 62. REMOVE UNDERDRIVE CLUTCH FLANGE NO.2 HOLE SNAP RING

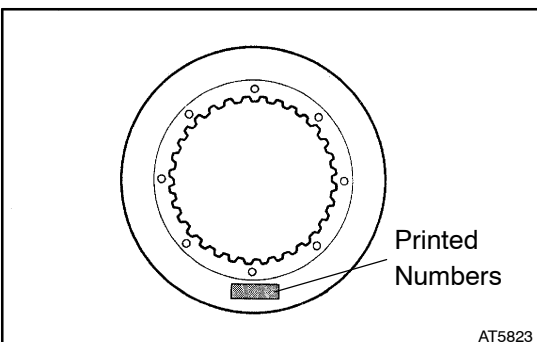
- (a) Using SST and a press, press in the flange until the snap ring is free from the flange.  
SST 09350-32014 (09351-32070)
- (b) Using a screwdriver, remove the underdrive clutch flange No. 2 hole snap ring.



Q02588

### 63. REMOVE UNDERDRIVE CLUTCH DISC NO.2

- (a) Remove the flange, plates and discs.



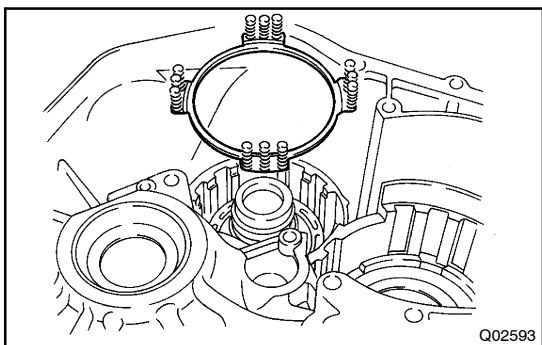
AT5823

### 64. INSPECT UNDERDRIVE CLUTCH DISC NO.2

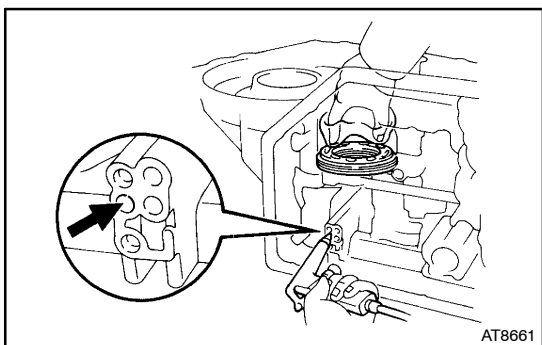
- (a) Check if the sliding surfaces of the discs, plates and flanges are worn or burnt. If necessary, replace them.

**HINT:**

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

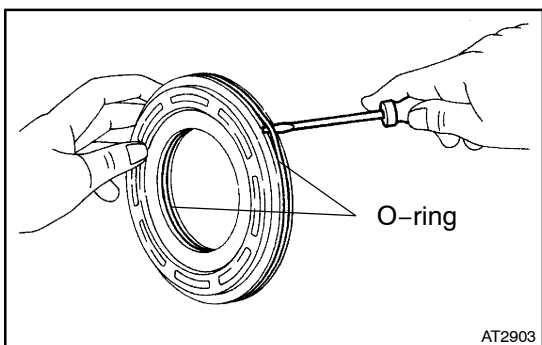


### 65. REMOVE UNDERDRIVE BRAKE RETURN SPRING SUB-ASSY

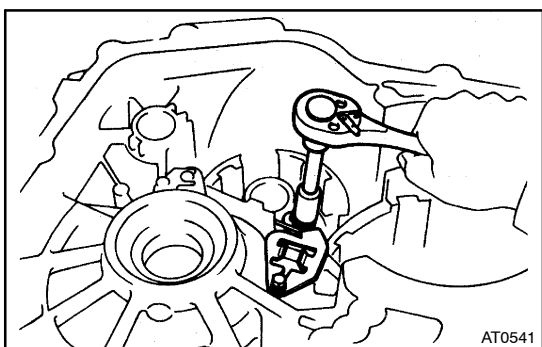


### 66. REMOVE UNDERDRIVE BRAKE PISTON

- (a) Using low-pressure compressed air (98 kPa, 1 kgf/cm<sup>2</sup>, 14 psi), pop out the underdrive brake piston into a rag.

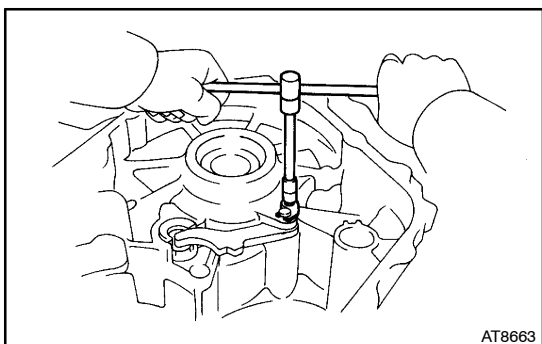


- (b) Using a screwdriver, remove the 2 O-rings from the underdrive brake piston.

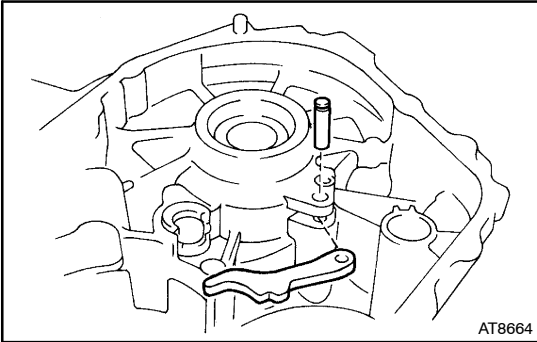


### 67. REMOVE PARKING LOCK PAWL

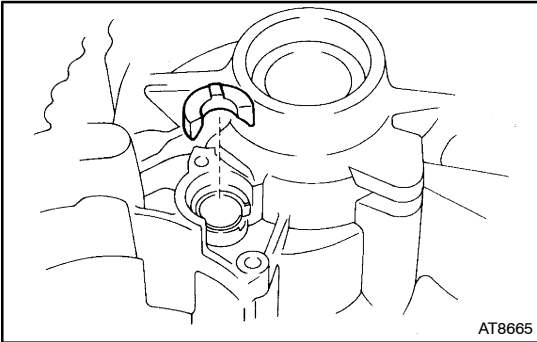
- (a) Remove the 2 bolts, parking lock pawl stopper plate, torsion spring and spring guide.



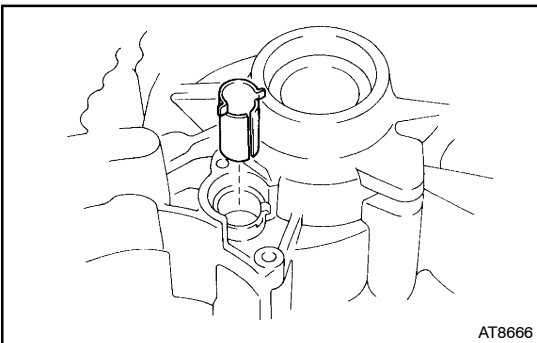
- (b) Remove the bolt and pawl shaft clamp.



- (c) Remove the parking lock pawl shaft and lock pawl.

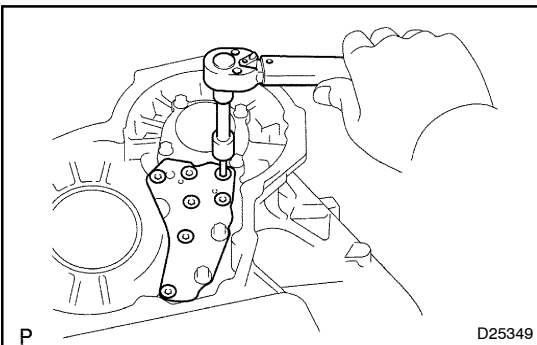


**68. REMOVE PARKING LOCK SLEEVE**



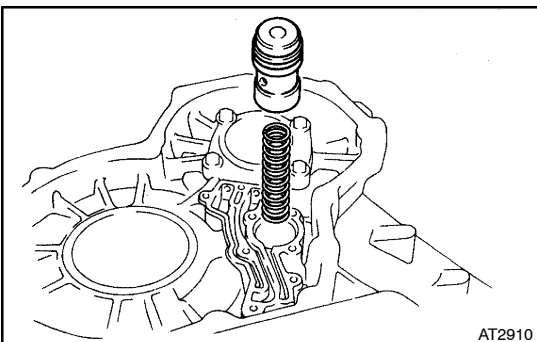
**69. REMOVE CAM GUIDE SLEEVE**

- (a) Remove the cam guide sleeve.



**70. REMOVE B-4 ACCUMULATOR PISTON**

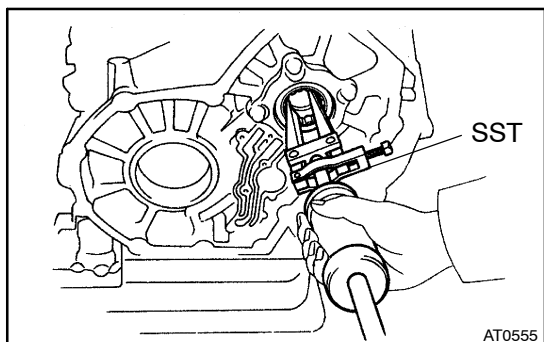
- (a) Remove the 2 bolts.  
 (b) Using a torx wrench, remove the 7 screws.  
 Remove the oil gallery cover and gasket.



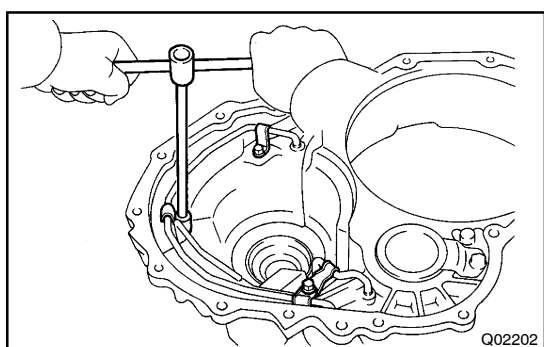
- (c) Remove the B-4 accumulator piston and spring.

**71. REMOVE TRANSMISSION CASE PLATE NO.3**

- (a) Remove the bolt and transmission case plate No. 3.

**72. REMOVE COUNTER DRIVEN GEAR CYLINDRICAL ROLLER BEARING**

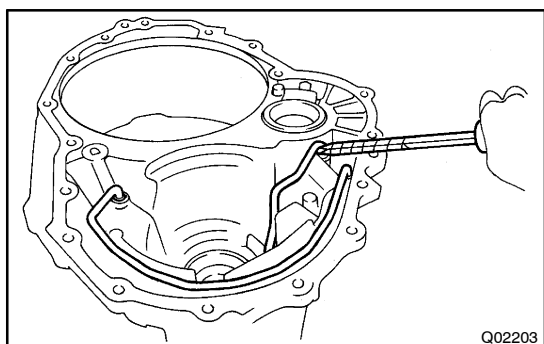
- (a) Using SST, remove the counter driven gear cylindrical roller bearing.  
SST 09308-00010

**73. REMOVE TRANSAXLE APPLY TUBE CLAMP NO.1**

- (a) Remove the 2 bolts and transaxle apply tube clamps No. 1.

**74. REMOVE TRANSAXLE APPLY TUBE CLAMP NO.2**

- (a) Remove the bolt and transaxle apply tube clamp No. 2.

**75. REMOVE TRANSMISSION LUBE APPLY TUBE**

- (a) Using a screwdriver, remove the transmission lube apply tube.

**HINT:**

Tape the screwdriver tip before use.

**NOTICE:**

**Be careful not to bend or damage the tube.**

**76. REMOVE DIFFERENTIAL GEAR LUBE APPLY TUBE**

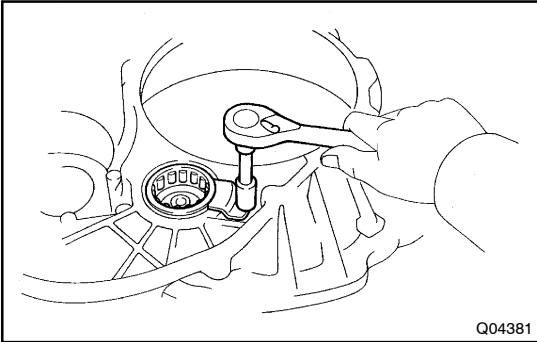
- (a) Using a screwdriver, remove the differential gear lube apply tube.

**HINT:**

Tape the screwdriver tip before use.

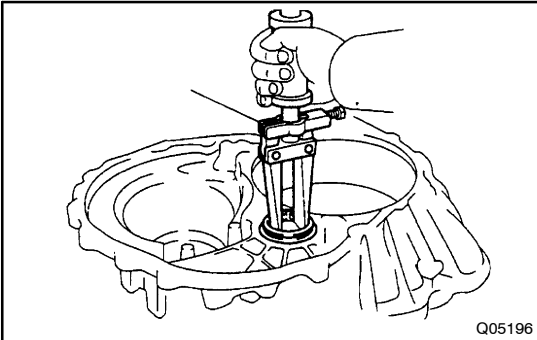
**NOTICE:**

**Be careful not to bend or damage the tube.**



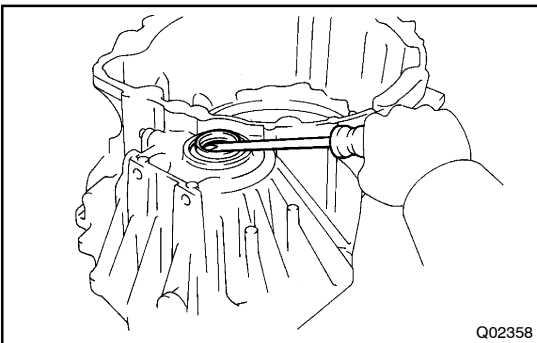
### 77. REMOVE UNDERDRIVE CYLINDRICAL ROLLER BEARING

- (a) Remove the bolt and retainer.



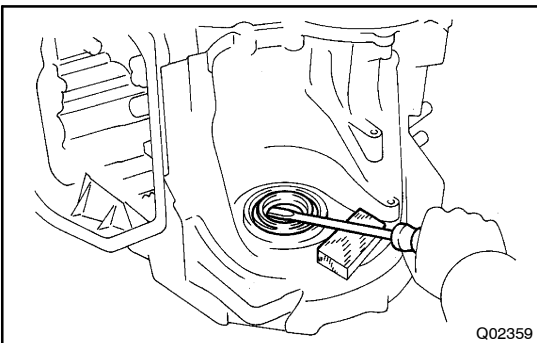
- (b) Using SST, remove the underdrive cylindrical roller bearing.

SST 09308-00010



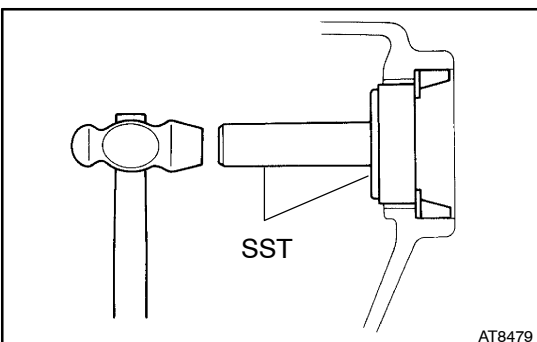
### 78. REMOVE TRANSAXLE HOUSING OIL SEAL

- (a) Using a screwdriver, remove the transaxle housing oil seal.



### 79. REMOVE TRANSAXLE CASE OIL SEAL

- (a) Using a screwdriver, remove the transaxle case oil seal.



### 80. REMOVE SIDE BEARING OUTER RACE

- (a) TRANSAXLE CASE:

Using SST and a hammer, drive out the side bearing outer race and adjusting shim.

SST 09350-32014 (09351-32090, 09351-32130, 09351-32150)



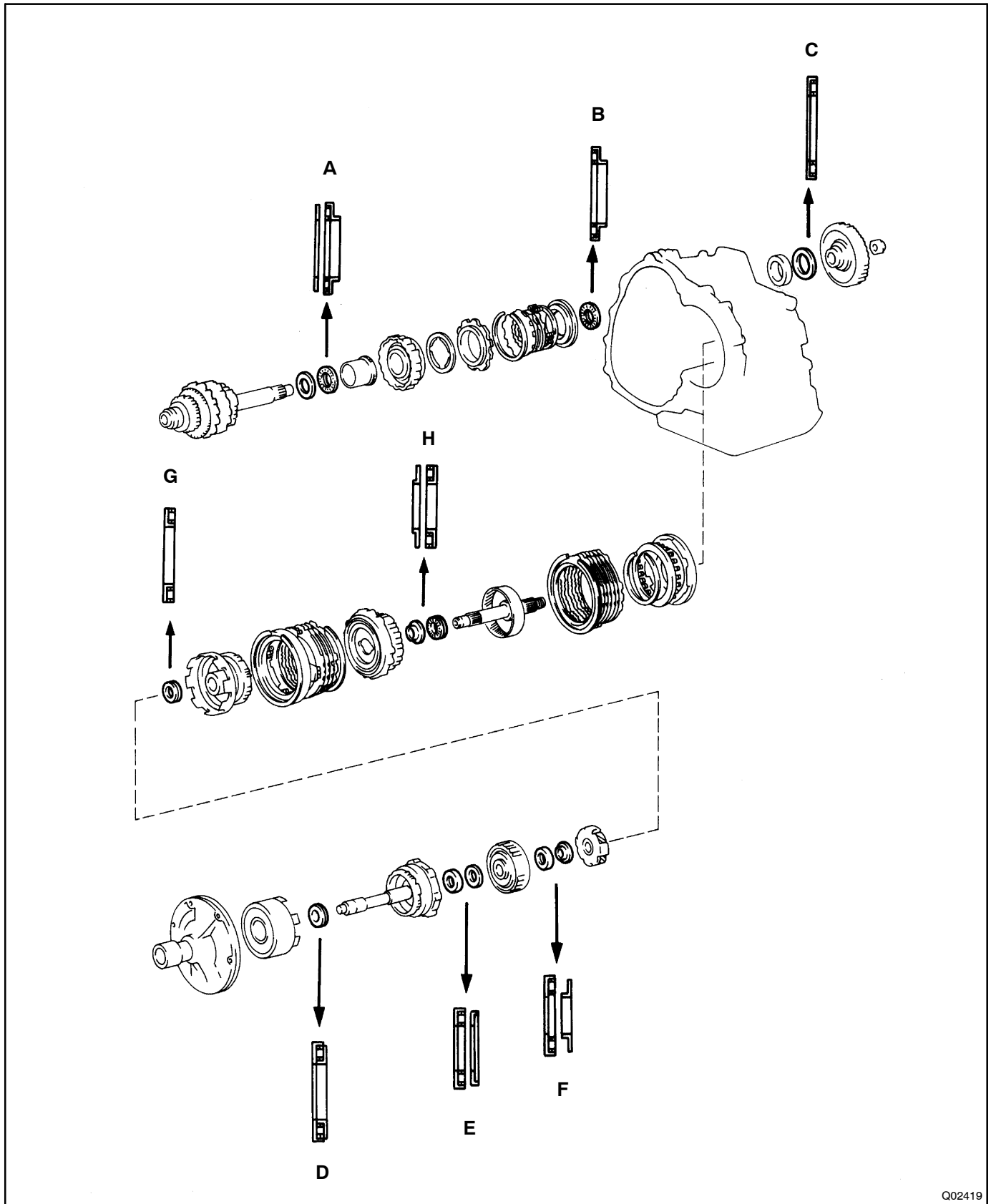
**NOTICE:**

- The automatic transaxle is composed of highly precision-finished parts, necessitating careful inspection before reassembly because even a small nick could cause fluid leakage or affect performance. The instructions here are organized so that you work on only one component group at a time. This will help avoid confusion from similar-looking parts of different sub-assemblies being on your workbench at the same time. The component groups are inspected and repaired from the converter housing side. As much as possible, complete the inspection, repair and reassembly before proceeding to the next component group. If a defect is found in a certain component group during reassembly, inspect and repair this group immediately. If a component group cannot be assembled because parts are being ordered, be sure to keep all parts of that group in a separate container while proceeding with disassembly, inspection, repair and reassembly of other component groups.

**Recommended ATF: T-IV**

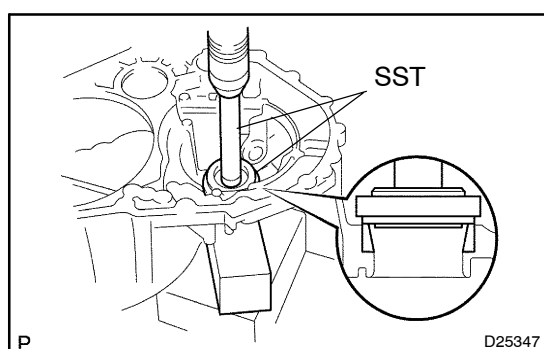
- All disassembled parts should be washed clean and any fluid passages and holes should be blown through with compressed air.
- Dry all parts with compressed air-never use shop rags.
- When using compressed air, always aim away from yourself to prevent accidentally spraying ATF or kerosene on your face.
- The recommended automatic transaxle fluid or kerosene should be used for cleaning.
- After cleaning, the parts should be arranged in the correct order to allow efficient inspection, repairs, and reassembly.
- When disassembling a valve body, be sure to keep each valve together with the corresponding spring.
- New discs for the brakes and clutches that are to be used for replacement must be soaked in ATF for at least 15 minutes before reassembly.
- All oil seal rings, clutch discs, clutch plates, rotating parts, and sliding surfaces should be coated with ATF prior to reassembly.
- All gaskets and rubber O-rings should be replaced.
- Do not use adhesive cements on gaskets and similar parts.
- Make sure that the ends of a snap ring are not aligned with one of the cutouts and are installed in the groove correctly.
- If a worn bushing is to be replaced, the sub-assembly containing that bushing must also be replaced.
- Check thrust bearings and races for wear or damage. Replace if necessary.
- Use petroleum jelly to keep parts in place.
- When working with FIPG material, you must observe the following.  
Using a razor blade and gasket scraper, remove all the old packing (FIPG) material from the gasket surface.  
Thoroughly clean all components to remove all the loose material.  
Clean both sealing surfaces with a non-residue solvent.  
Parts must be reassembled within 10 minutes of application. Otherwise, the packing (FIPG) material must be removed and reapplied.

81. BEARING POSITION



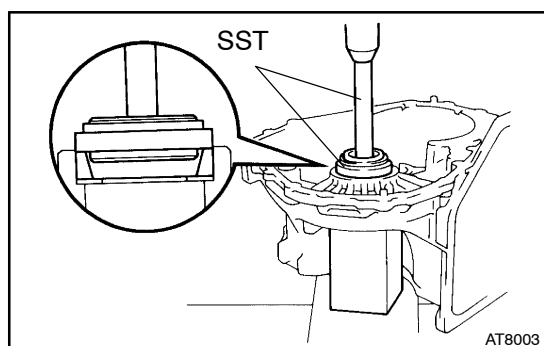
Q02419

| Mark | Front Race Diameter<br>Inside / Outside mm (in.) | Thrust Bearing Diameter<br>Inside / Outside mm (in.) | Rear Race Diameter<br>Inside / Outside mm (in.) |
|------|--|--|---|
| A    | 30.0 (1.181) / 41.8 (1.646)                      | 31.0 (1.220) / 43.9 (1.728)                          | -   |
| B    | -  | 31.0 (1.220) / 43.9 (1.728)                          | -   |
| C    | -  | 41.0 (1.614) / 58.0 (2.283)                          | -   |
| D    | -  | 30.7 (1.209) / 46.0 (1.811)                          | -   |
| E    | -  | 25.8 (1.016) / 42.0 (1.654)                          | 26.0 (1.024) / 39.5 (1.555)                     |
| F    | -  | 22.0 (0.866) / 38.0 (1.496)                          | 19.0 (0.748) / 35.0 (1.378)                     |
| G    | -  | 28.1 (1.106) / 45.0 (1.772)                          | -   |
| H    | 24.1 (0.949) / 37.6 (1.480)                      | 22.1 (0.870) / 37.6 (1.480)                          | -   |

**82. INSTALL SIDE BEARING OUTER RACE**

- (a) Using SST and a press, press a new side bearing outer race into the transaxle housing.

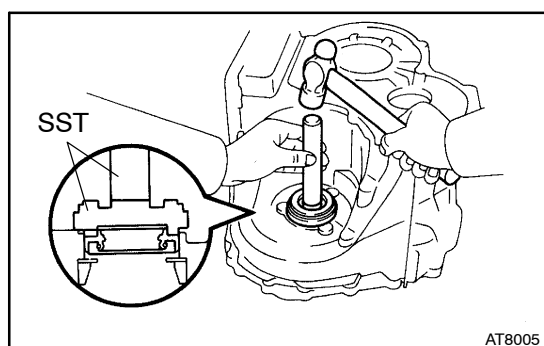
SST 09350-32014 (09351-32111, 09351-32130)



- (b) Place the adjusting shim onto the transaxle case.

- (c) Using SST and a press, press a new side bearing outer race into the transaxle case.

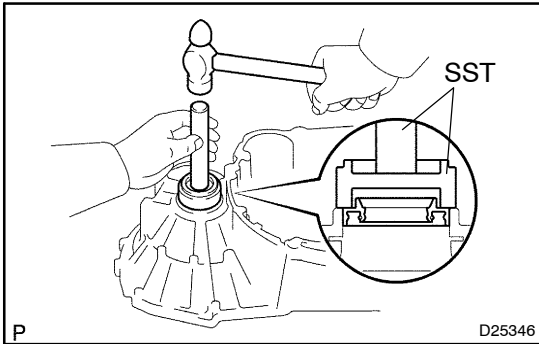
SST 09350-32014 (09351-32111, 09351-32130)

**83. INSTALL TRANSAXLE CASE OIL SEAL**

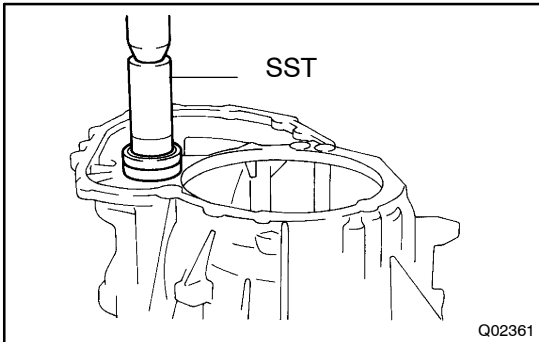
- (a) Using SST and a hammer, drive in a new transaxle case oil seal.

SST 09350-32014 (09351-32111, 09351-32130)

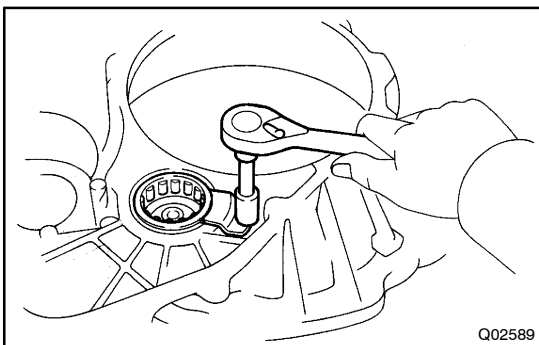
- (b) Coat the lip of oil seal with MP grease.

**84. INSTALL TRANSAXLE HOUSING OIL SEAL**

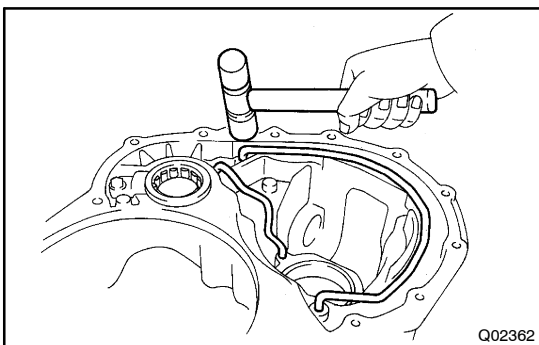
- (a) Using SST and a hammer, drive in a new transaxle housing oil seal.  
SST 09350-32014 (09351-32130, 09351-32150)
- (b) Coat the lip of oil seal with MP grease.

**85. INSTALL UNDERDRIVE CYLINDRICAL ROLLER BEARING**

- (a) Using SST and a press, install the underdrive cylindrical roller bearing into the transaxle housing.  
SST 09350-32014 (09351-32140)



- (b) Install the bearing stopper with the bolt.  
**Torque: 17 N·m (173 kgf·cm, 13 ft·lbf)**

**86. INSTALL DIFFERENTIAL GEAR LUBE APPLY TUBE**

- (a) Using a plastic hammer, install the differential gear lube apply tube.

**NOTICE:**

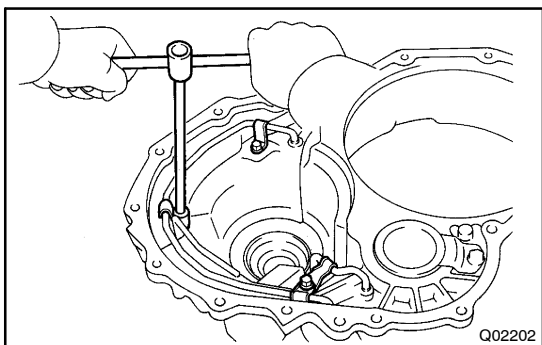
**Be careful not to bend or damage the tube.**

**87. INSTALL TRANSMISSION LUBE APPLY TUBE**

- (a) Using a plastic hammer, install the transmission lube apply tube.

**NOTICE:**

**Be careful not to bend or damage the tube.**

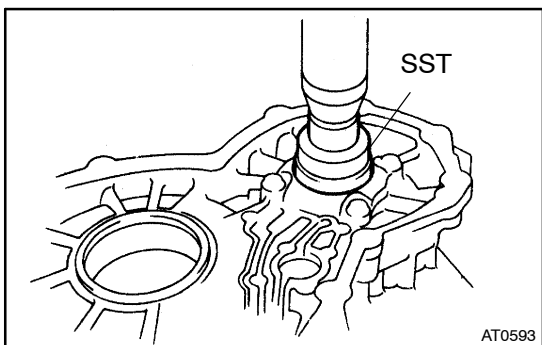
**88. INSTALL TRANSAXLE APPLY TUBE CLAMP NO.2**

- (a) Install the transaxle apply tube clamps No.2 with the bolt.  
**Torque: 5.4 N·m (55 kgf·cm, 48 in·lbf)**

**89. INSTALL TRANSAXLE APPLY TUBE CLAMP NO.1**

- (a) Install the transaxle apply tube clamps No. 1 with the 2 bolts.

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

**90. INSTALL COUNTER DRIVEN GEAR CYLINDRICAL ROLLER BEARING**

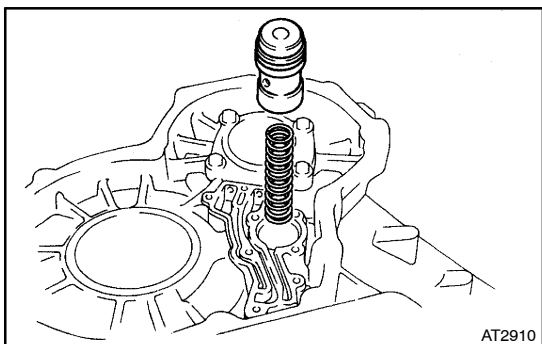
- (a) Using SST and a press, install the counter driven gear cylindrical roller bearing into the transaxle case.

SST 09350-32014 (09351-32090)

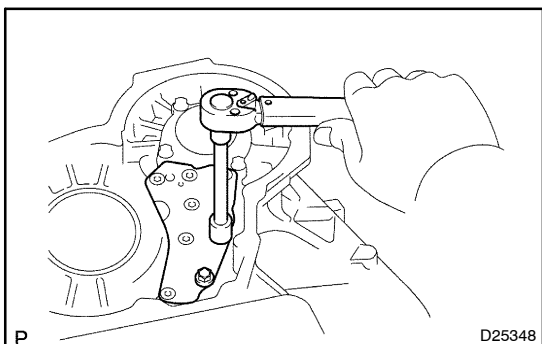
**91. INSTALL TRANSMISSION CASE PLATE NO.3**

- (a) Install the transmission case plate No. 3 with the bolt.

**Torque: 10 N·m (102 kgf·cm, 7 ft·lbf)**

**92. INSTALL B-4 ACCUMULATOR PISTON**

- (a) Coat new O-ring with ATF, and install them to the B-4 accumulator piston.  
(b) Install the B-4 accumulator piston and spring to the case.

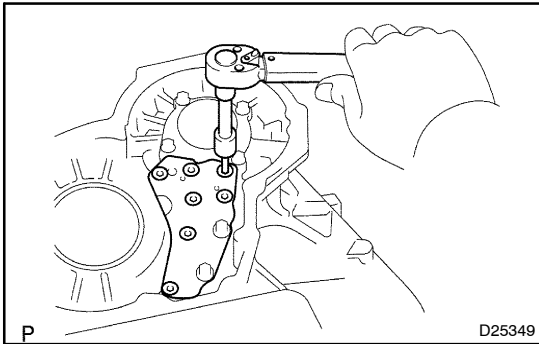


- (c) Clean the threads of the screws and case with white gasoline.

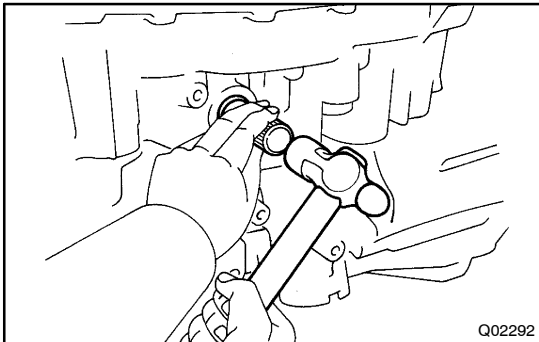
- (d) Install a new gasket and oil gallery cover in place.

- (e) Install and tighten the 2 bolts.

**Torque: 10 N·m (102 kgf·cm, 7 ft·lbf)**

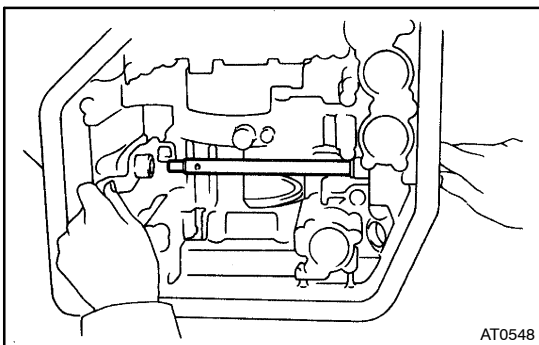


- (f) Apply seal packing or equivalent to the 7 screws.  
**Seal packing:**  
**Part No. 08833 - 00070, THREE BOND 1324 or equivalent**
- (g) Using a torx wrench, install the 7 screws.  
**Torque: 7.0 N·m (71 kgf·cm, 62 in·lbf)**

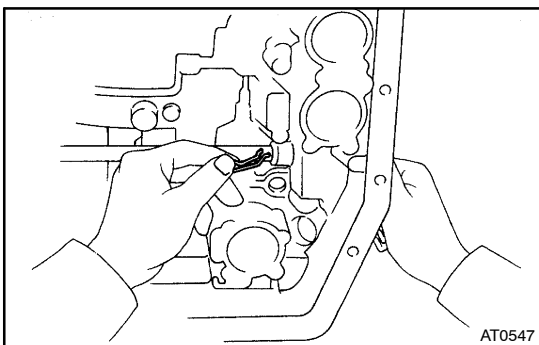


### 93. INSTALL MANUAL VALVE LEVER SHAFT

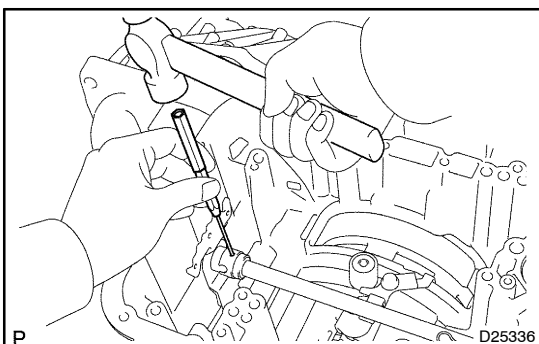
- (a) Using a 14 mm socket wrench and hammer, drive in a new manual valve lever shaft oil seal.
- (b) Apply MP grease to the seal lip.



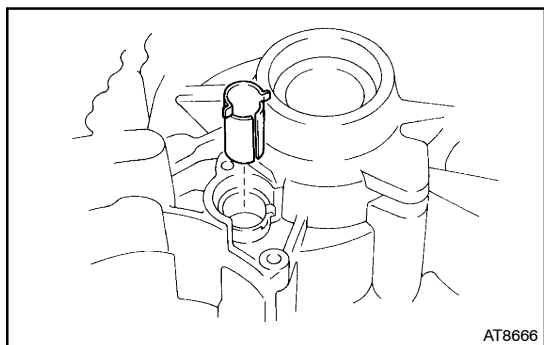
- (c) Install the parking lock rod to the manual valve lever.
- (d) Slide in the manual valve lever shaft and install the plate washer, a new spacer and manual lever.



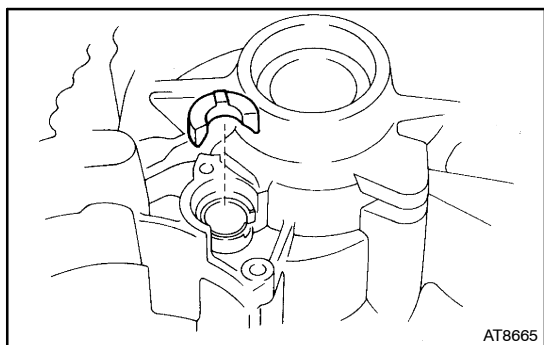
- (e) Install the retaining spring retainer.  
**HINT:**  
 Make sure there is a washer between the retaining spring and case.



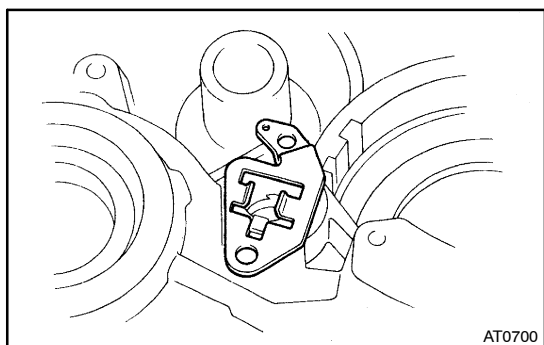
- (f) Using a pin punch and hammer, drive in the pin.
- (g) Position the spacer and stake it.

**94. INSTALL PARKING LOCK PAWL**

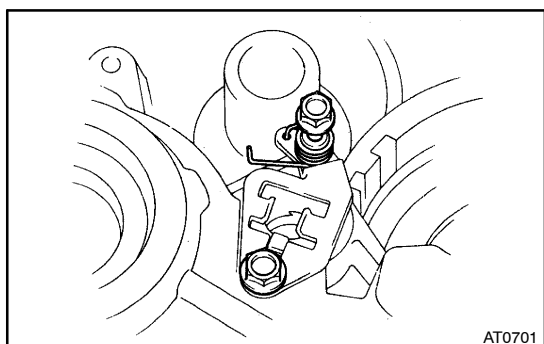
- (a) Install the cam guide bracket and then insert the parking lock rod into the guide bracket.



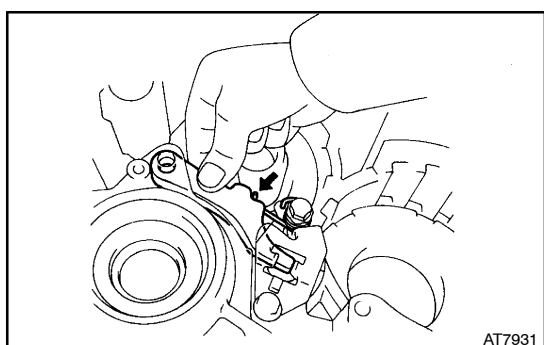
- (b) Install the parking lock sleeve with the protruding portion facing up.



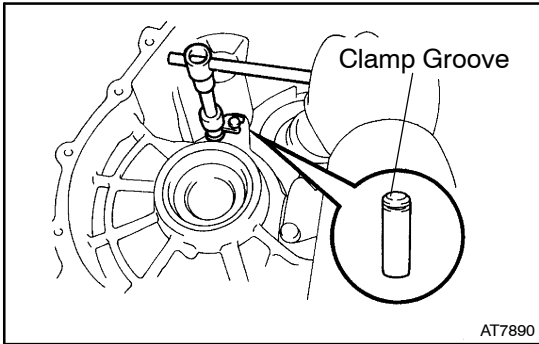
- (c) Place the stopper plate on the protruding portion of the lock sleeve.



- (d) Install the guide sleeve and spring with the 2 bolts.  
**Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)**

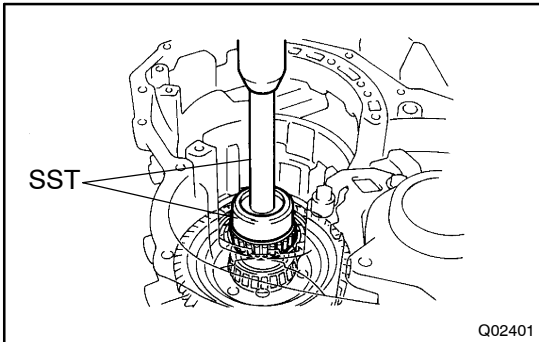


- (e) Install the parking lock pawl.



- (f) Install the parking lock pawl shaft and install the shaft clamp with the 2 bolts.

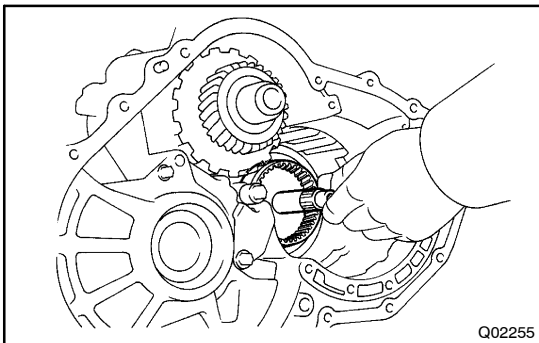
**Torque: 5.4 N·m (55 kgf·cm, 48 in·lbf)**



#### 95. INSTALL COUNTER DRIVE GEAR

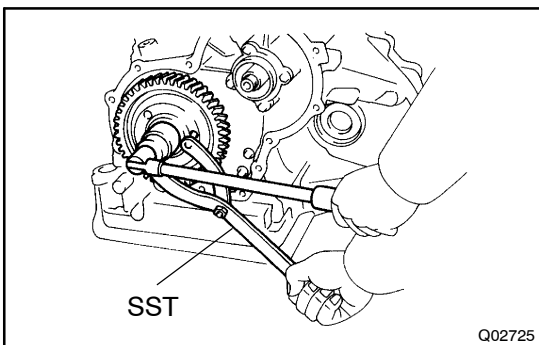
- (a) Using SST and a press, install the counter drive gear, front bearing, and a new spacer.

SST 09350-32014 (09351-32150, 09351-32130)



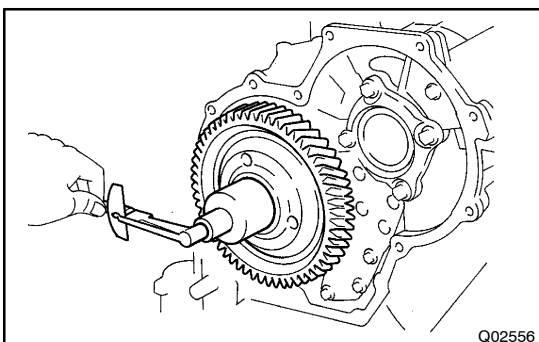
#### 96. INSTALL INTERMEDIATE SHAFT SUB-ASSY

- (a) Install the intermediate shaft sub-assy.



- (b) Using SST, install the counter driven gear nut.

SST 09960-10010 (09962-01000, 09963-01000)



#### 97. INSPECT DRIVE GEAR PRELOAD

- (a) Using a torque wrench, measure the starting torque of the counter drive gear.

**Starting torque:**

**New bearing:**

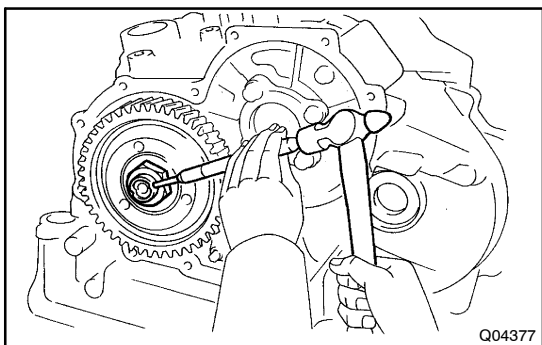
**0.3 - 0.7 N·m (3.1 - 7.1 kgf·cm, 2.6 - 6.1 in·lbf)**

**Reused bearing:**

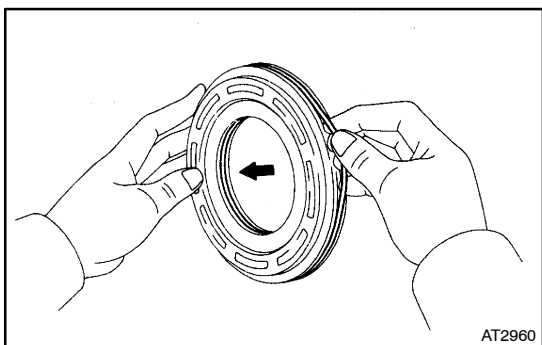
**0.2 - 0.4 N·m (2.0 - 4.1 kgf·cm, 1.7 - 3.5 in·lbf)**

If the torque exceeds the limit, replace the spacer.

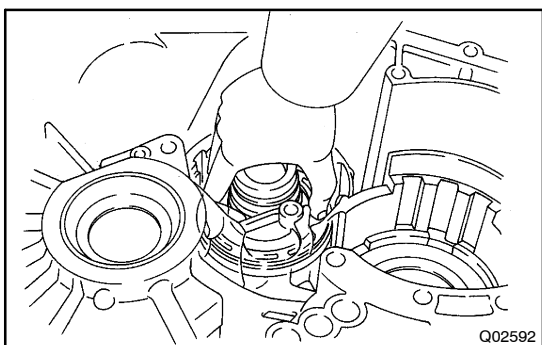


**98. TIGHTEN COUNTER DRIVEN GEAR NUT**

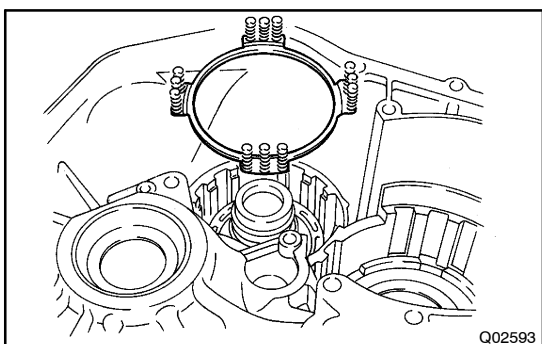
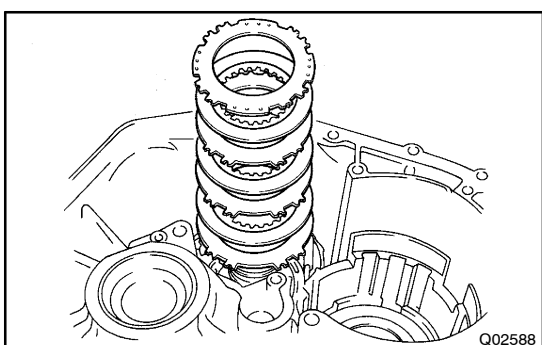
- (a) Using a pin punch and hammer, stake the counter driven gear nut.

**99. INSTALL UNDERDRIVE BRAKE PISTON**

- (a) Coat 2 new rings with ATF.  
 (b) Install the 2 O-rings to the underdrive brake piston.



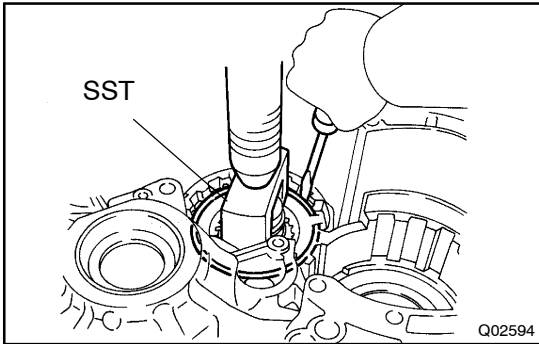
- (c) Place the piston into the case with the cup side up, being careful not to damage the O-rings.

**100. INSTALL UNDERDRIVE BRAKE RETURN SPRING SUB-ASSY****101. INSTALL UNDERDRIVE CLUTCH DISC NO.2**

- (a) Install the plates, discs and flange in order.  
**Install in order: D = Disc P = Plate F = Flange**  
**P - D - P - D - P - D - F**

**HINT:**

Install the flange with the flat side facing downward.

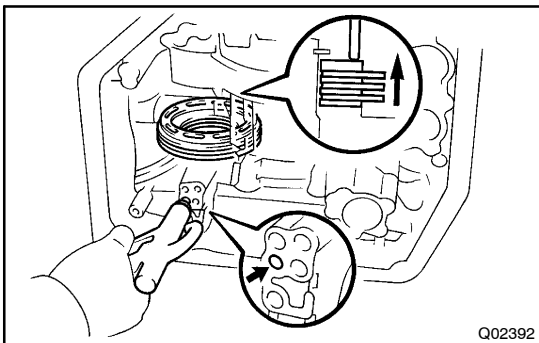


### 102. INSTALL UNDERDRIVE CLUTCH FLANGE NO.2 HOLE SNAP RING

- (a) Place SST on the flange, and compress the flange with a press.  
SST 09350-32014 (09351-32070)
- (b) Using a screwdriver, install the underdrive clutch flange No. 2 hole snap ring.

#### HINT:

Be sure the end gap of the snap ring is not aligned with one of the cutouts.



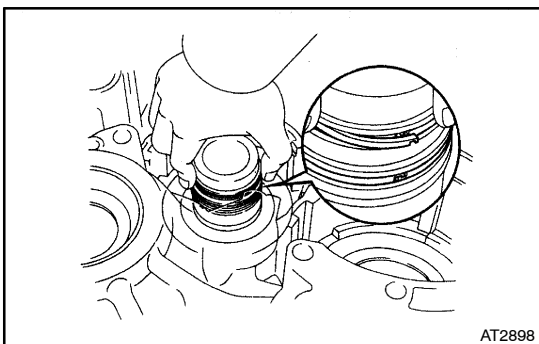
### 103. INSPECT PACK CLEARANCE OF UNDERDRIVE BRAKE

- (a) Using a dial indicator, measure the underdrive brake pack clearance.

#### Pack clearance:

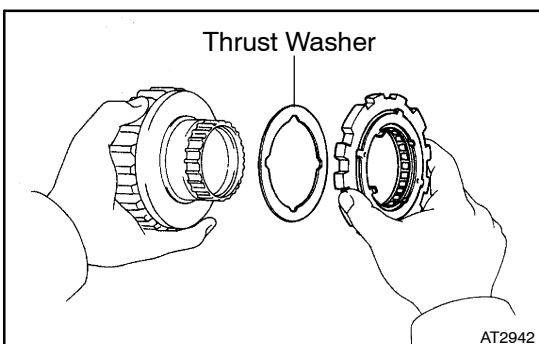
**1.15 - 1.97 mm (0.0453 - 0.0776 in.)**

If the pack clearance is non-standard, parts have been misassembled. Check them.



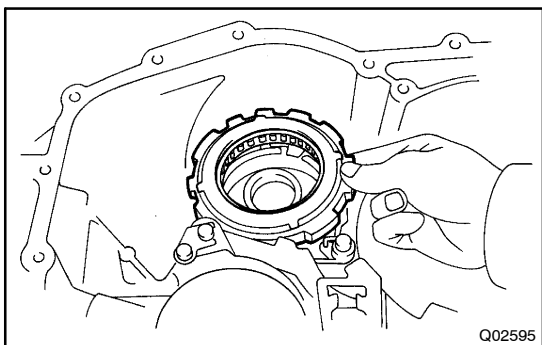
### 104. INSTALL OVERDRIVE CLUTCH DRUM OIL SEAL RING

- (a) Install the 2 overdrive clutch drum oil seal rings to the transaxle case.

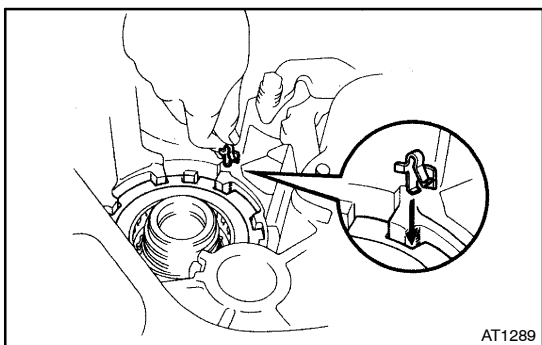


### 105. INSTALL UNDERDRIVE 1 WAY CLUTCH ASSY

- (a) Remove the underdrive 1 way clutch assy and thrust washer from the underdrive clutch drum.



(b) Install the underdrive 1 way clutch assy.

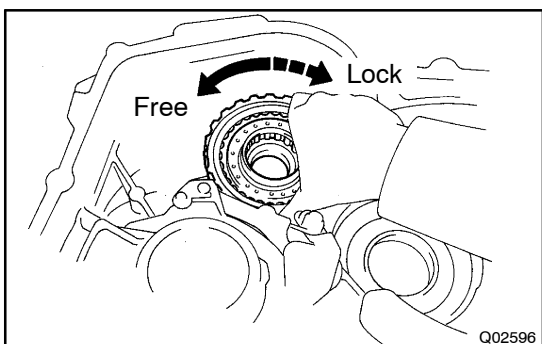


**106. INSTALL UNDERDRIVE 1 WAY CLUTCH RETAINER**

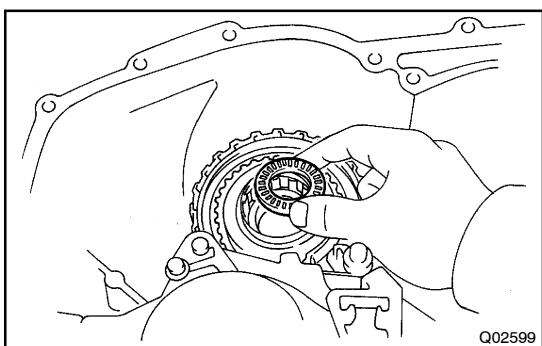
(a) In the place shown in the illustration (the space between the 1 way clutch outer race and case), push the underdrive 1 way clutch retainer in until you hear a "click".

**107. INSTALL UNDERDRIVE CLUTCH DRUM SUB-ASSY**

- (a) Coat the thrust washer with petroleum jelly and install it onto the No. 3 1 way clutch.
- (b) Align the flukes of discs in the underdrive brake.
- (c) Install the underdrive clutch assy.



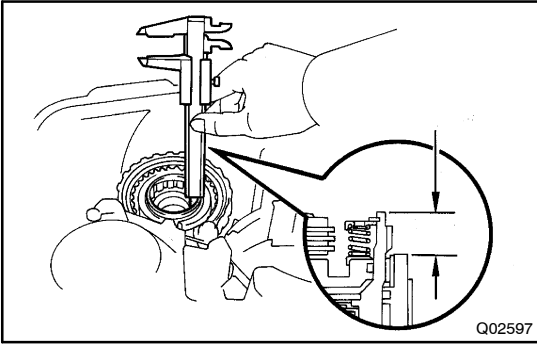
(d) Turn the underdrive clutch assy. The clutch assembly should turn freely counterclockwise and should lock clockwise.



(e) Install the assembled bearing and race, with the bearing facing upward.

**Assembled bearing and race:**

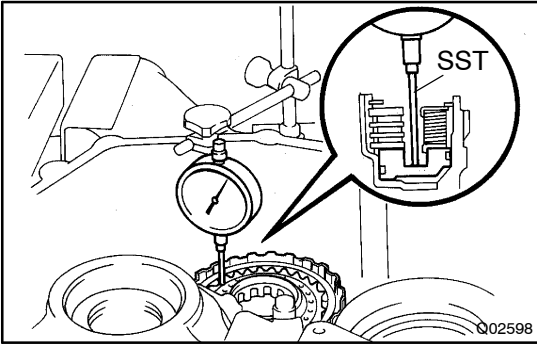
|                            | Outer diameter      | Inner diameter      |
|----------------------------|---------------------|---------------------|
| Assembled bearing and race | 43.9 mm (1.728 in.) | 31.0 mm (1.220 in.) |



**108. INSPECT HEIGHT OF CLUTCH ASSY**

- (a) Using vernier calipers, check the height from the sleeve to the inner race.

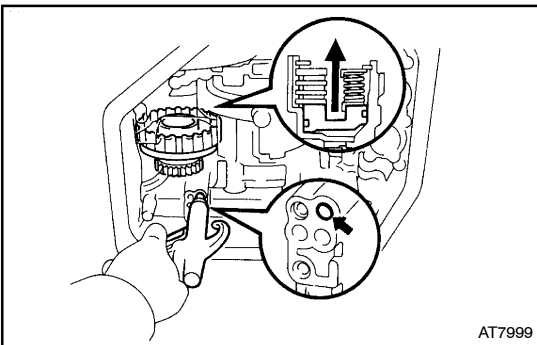
**Height: 17.3 – 18.2 mm (0.681 – 0.717 in.)**



**109. INSPECT PISTON STROKE OF UNDERDRIVE CLUTCH**

- (a) Set a dial indicator and measuring terminal (SST) together.

SST 09350-32014 (09351-32190)



- (b) While applying and releasing compressed air (392 – 785 Cps, 4 – 8 kgf/cm<sup>2</sup>, 57 – 114 psi), measure the underdrive clutch piston stroke.

**Piston stroke:**

**1.5 – 1.9 mm (0.059 – 0.075 in.)**

If the piston stroke is less than the limit, parts may have been misassembled. Check them.

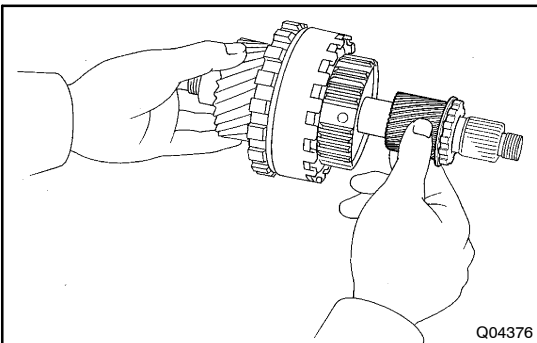
If the piston stroke is non-standard, select another flange.

**HINT:**

There are 4 different thickness for the flange.

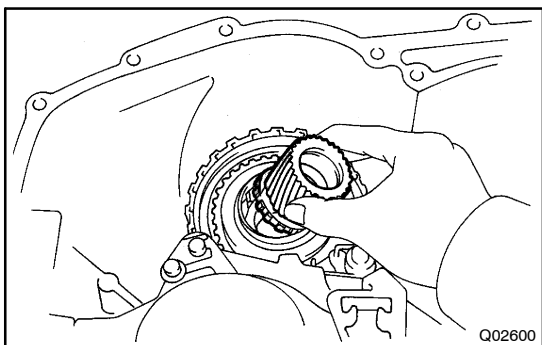
**Flange thickness:**

| Thickness     | Thickness     |
|---------------|---------------|
| 2.04 (0.0803) | 2.40 (0.0945) |
| 2.20 (0.0866) | 2.50 (0.0984) |



**110. INSTALL UNDERDRIVE PLANETARY SUN GEAR SUB-ASSY**

- (a) Remove the underdrive planetary sun gear from the counter shaft.
- (b) Remove the thrust bearing and race.



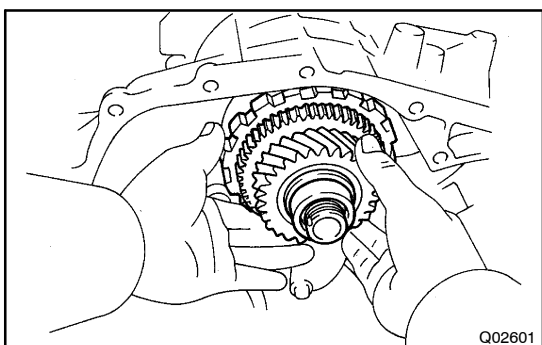
- (c) Install the underdrive planetary sun gear sub-assy of the counter shaft to the case.

### 111. INSTALL COUNTER SHAFT ASSY

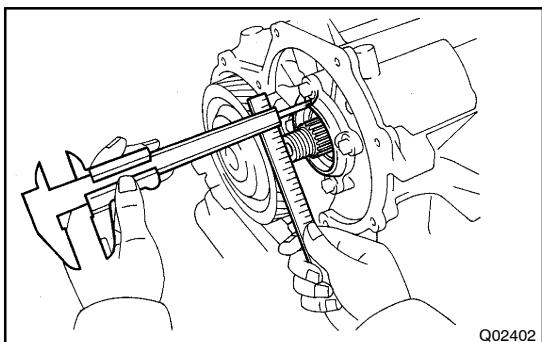
- (a) Align the flukes of the discs in the underdrive clutch.  
 (b) Install the thrust bearing with the race, with the bearing facing upward.

#### Bearing and race:

|         | Outer diameter      | Inner diameter      |
|---------|---------------------|---------------------|
| Bearing | 43.9 mm (1.728 in.) | 31.0 mm (1.220 in.) |
| Race    | 41.8 mm (1.646 in.) | 30.0 mm (1.181 in.) |

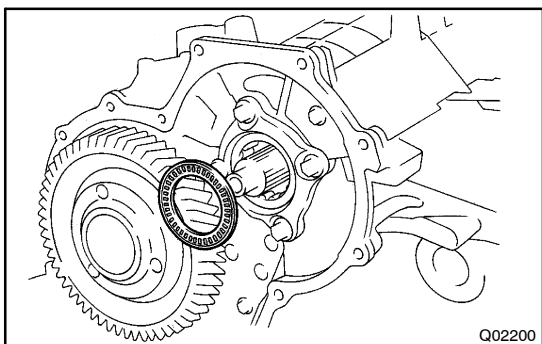


- (c) Install the counter shaft assy.



### 112. INSPECT HEIGHT OF COUNTER SHAFT

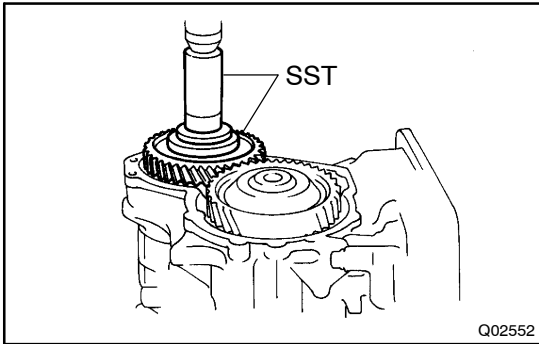
- (a) Using vernier calipers, measure the distance between the tip of the counter shaft and bolt seat of the clutch support.  
**Height: 33.3 - 35.5 mm (1.311 - 1.398 in.)**



### 113. INSTALL COUNTER DRIVEN GEAR THRUST NEEDLE ROLLER BEARING

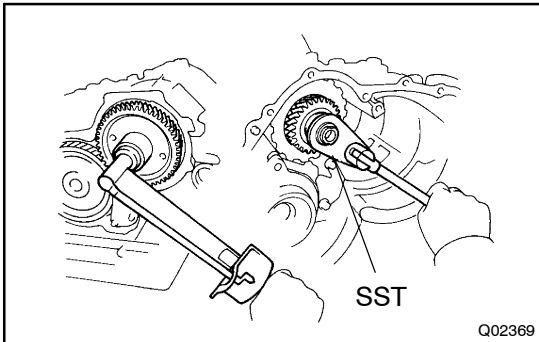
#### Bearing:

|         | Outer diameter      | Inner diameter      |
|---------|---------------------|---------------------|
| Bearing | 58.0 mm (2.283 in.) | 41.0 mm (1.614 in.) |

**114. INSTALL COUNTER DRIVEN GEAR**

Using SST and a press, press in the counter driven gear.

SST 09350-32014 (09351-32100, 09351-32140)

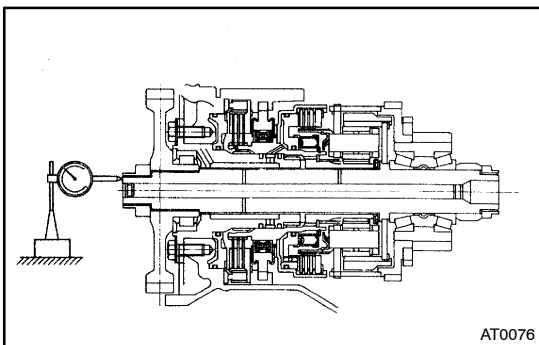
**115. INSTALL COUNTER DRIVEN GEAR NUT**

- (a) Using SST to hold the driven gear, tighten a new counter driven gear nut.

SST 09350-32014 (09351-32032)

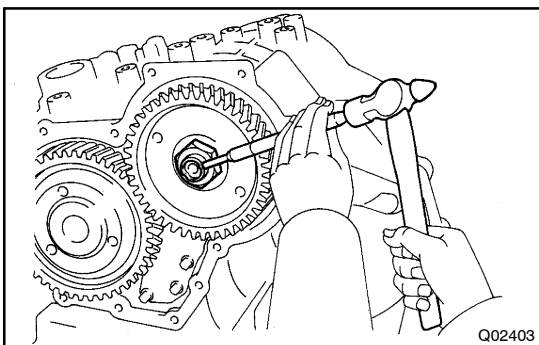
**Torque: 180 N·m (1,835 kgf·cm, 133 ft·lbf)**

- (b) Remove the SST.

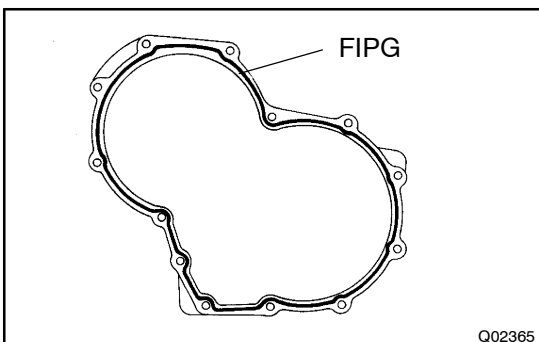
**116. INSPECT END PLAY OF COUNTER SHAFT**

- (a) Using a dial indicator, measure the end play of the counter shaft.

**End play: 0.2 - 0.9 mm (0.008 - 0.035 in.)**

**117. TIGHTEN COUNTER DRIVEN GEAR NUT**

- (a) Using a pin punch and hammer, stake the counter driven gear nut.

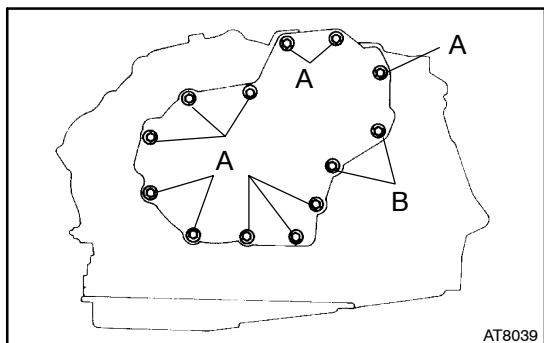
**118. INSTALL TRANSMISSION CASE COVER REAR**

- (a) Remove any packing material and be careful not to get oil on the contacting surfaces of the transmission case cover rear or transaxle case.

- (b) Apply FIPG sealant to the transmission case cover rear.

**FIPG:**

**Part No. 08826 - 00090, THREE BOND 1281 or equivalent**



(c) Install and tighten the 13 bolts.

**Torque: 10 N·m (102 kgf·cm, 7 ft·lbf)**

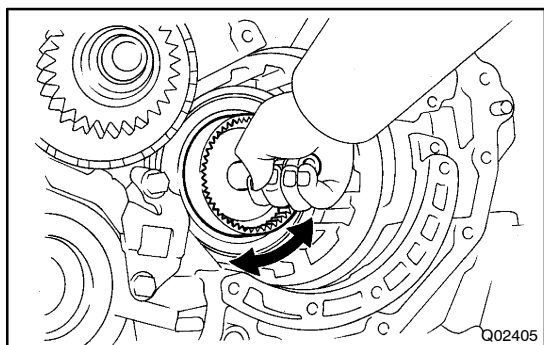
HINT:

Each bolt length is indicated in the illustration.

**Bolt length:**

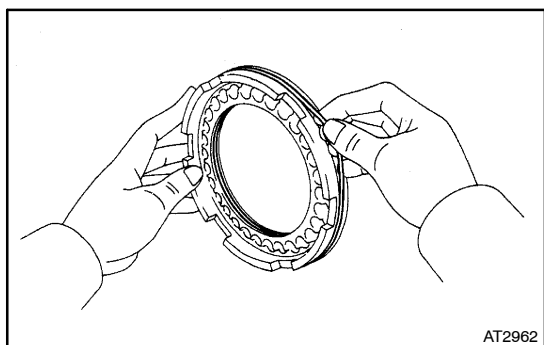
**Bolt A: 25 mm (0.98 in.)**

**Bolt B: 32 mm (1.26 in.)**



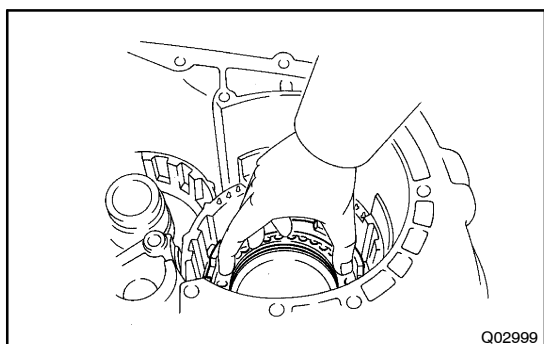
### 119. INSPECT INTERMEDIATE SHAFT SUB-ASSY

(a) Make sure that the intermediate shaft sub-assy turns smoothly.



### 120. INSTALL 1ST & REVERSE BRAKE PISTON

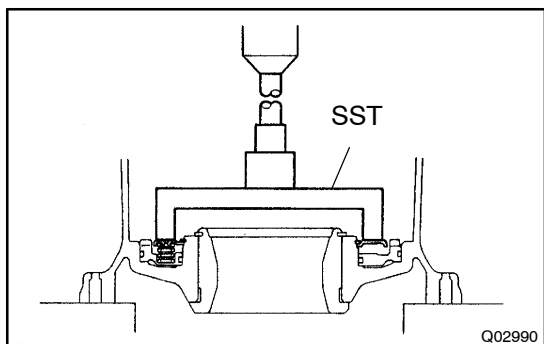
(a) Install 2 new O-rings to the 1st and reverse brake piston.  
 (b) Coat the O-rings with ATF.



(c) Place the piston into the bore of the case, facing the spring seats upward.

**NOTICE:**

**Be careful not to damage the O-rings.**



### 121. INSTALL 1ST & REVERSE BRAKE RETURN SPRING SUB-ASSY

(a) Install the 1st and reverse brake return spring sub-assy and snap ring in place.

(b) Place SST on the 1st and reverse brake return spring sub-assy, and compress the 1st and reverse brake return spring sub-assy with a press.

SST 09350-32014 (09351-32040)

(c) Using snap ring pliers, install the snap ring.

HINT:

Visually check to make sure it is fully seated and centered by the 3 lugs on the spring retainer. Be sure the end gap of snap ring is aligned with the spring retainer claw.

**122. INSTALL 1ST & REVERSE BRAKE CLUTCH DISC**

(a) Install the discs and plates in order.

HINT:

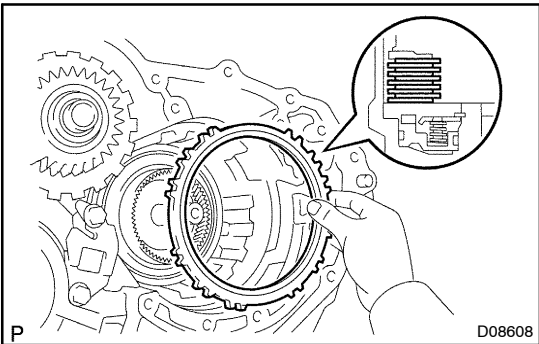
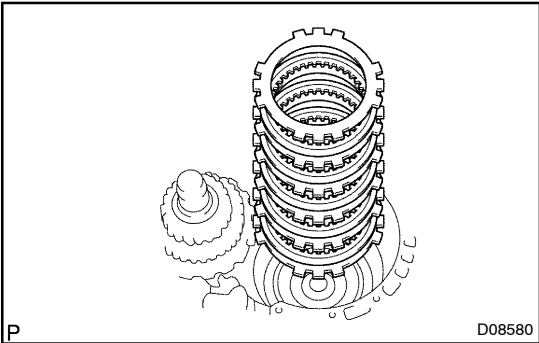
245E: 5 plates and 5 discs

246E: 6 plates and 6 discs

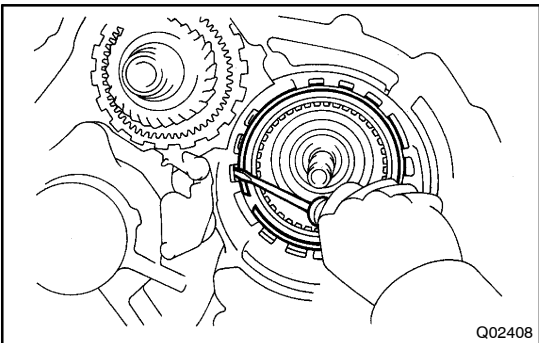
**Install in order: D = Disc P = Plate**

**245E: P - D - P - D - P - D - P - D - P - D**

**246E: P - D - P - D - P - D - P - D - P - D - P - D**



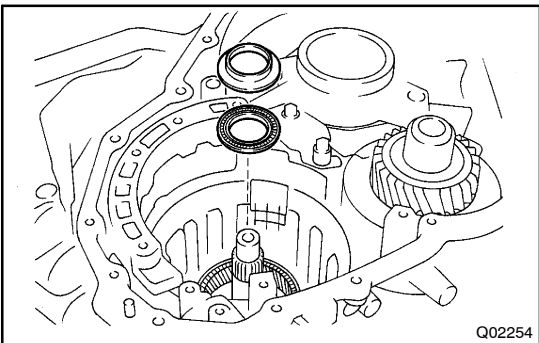
(b) Install the outer flange with the flat side facing downward.



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

HINT:

Be sure the snap ring end gap is not aligned with one of the cut-outs.

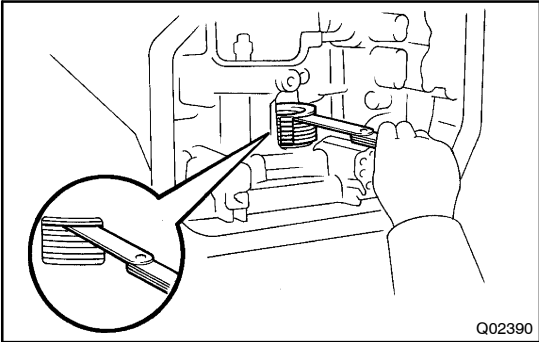


(d) Coat the races and bearing with petroleum jelly, and install them onto the ring gear.

**Bearing and race:**

|         | Outer diameter      | Inner diameter      |
|---------|---------------------|---------------------|
| Race    | 37.6 mm (1.480 in.) | 24.1 mm (0.949 in.) |
| Bearing | 37.6 mm (1.480 in.) | 22.1 mm (0.870 in.) |





**123. INSPECT PACK CLEARANCE OF FIRST & REVERSE BRAKE**

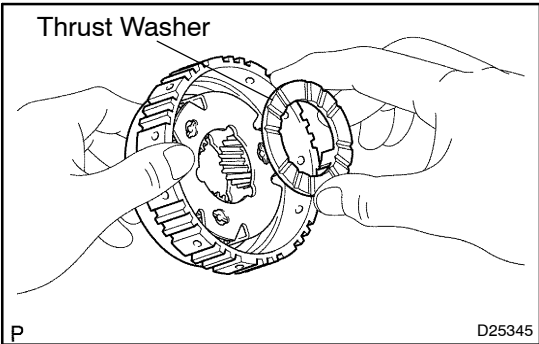
- (a) Using a feeler gauge, measure the first and reverse brake pack clearance.

**Pack clearance:**

**A245E: 1.00 – 2.00 mm (0.0393 – 0.0787 in.)**

**A246E: 1.19 – 2.25 mm (0.0469 – 0.0886 in.)**

If the pack clearance is non-standard, parts have been misassembled. Check them.

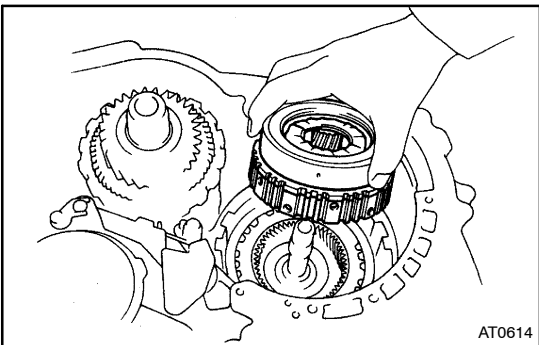


**124. INSTALL REAR PLANETARY GEAR ASSY**

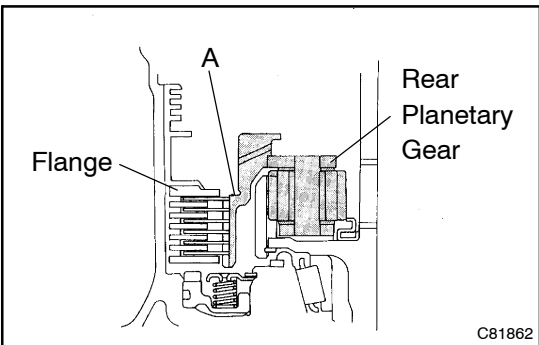
- (a) Coat the thrust washer with petroleum jelly and install it onto the rear planetary gear assy.

**HINT:**

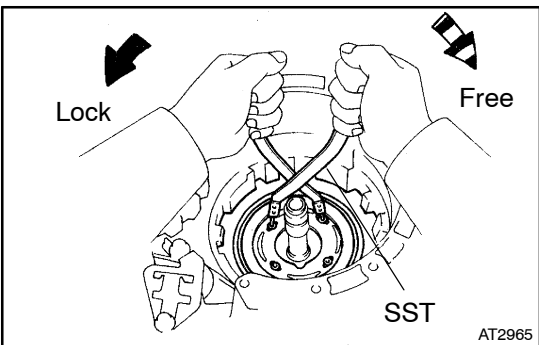
Make sure that the different lug shapes match the corresponding openings on the gear.



- (b) Align the spline of the planetary gear with the flukes of the discs and install the planetary gear into the first and reverse brake discs.

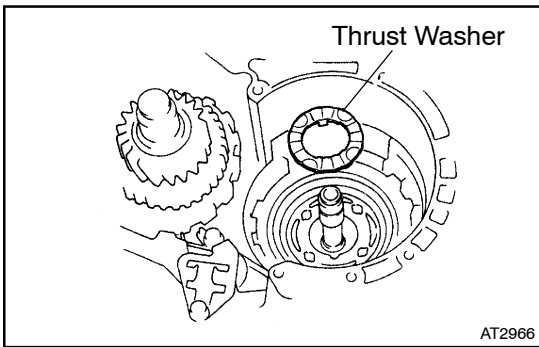


- (c) Check the part "A" of the rear planetary gear is below the upper surface of the flange.

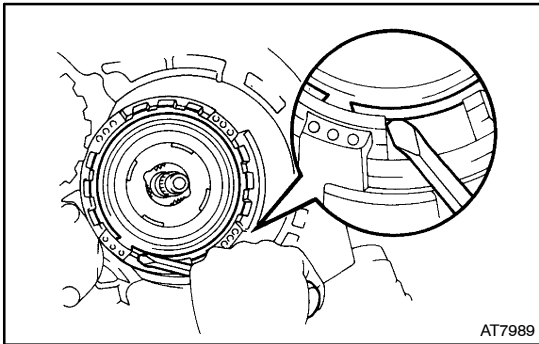


**125. INSTALL 1 WAY CLUTCH NO.2**

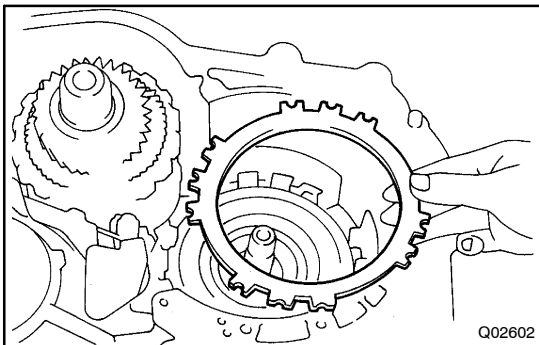
- (a) Place the 1 way clutch No. 2 into the case, with the shiny side facing upward.
- (b) Install the 1 way clutch onto the inner race while turning the planetary gear clockwise with SST.  
SST 09350-32014 (09351-32050)
- (c) Check that the planetary gear turns freely clockwise and locks if turned counterclockwise.



- (d) Coat the thrust washer with petroleum jelly and install it onto the planetary gear.

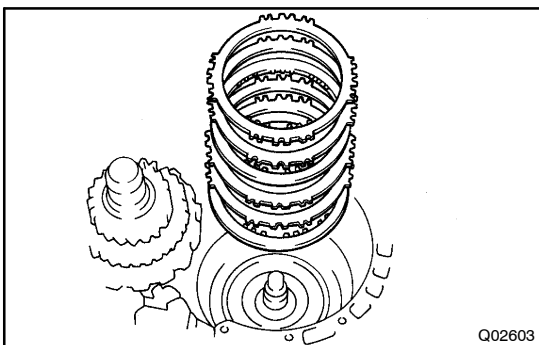


- (e) Be sure the end gap of the snap ring is not aligned with one of the cutouts.

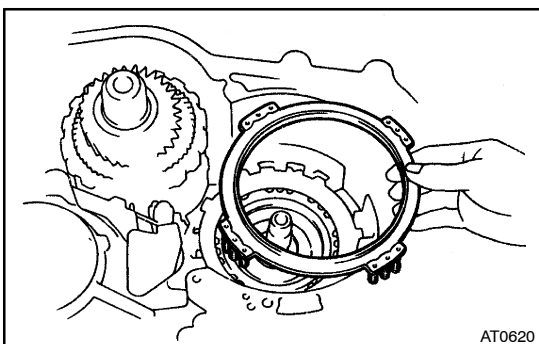


## 126. INSTALL 2ND BRAKE CLUTCH DISC

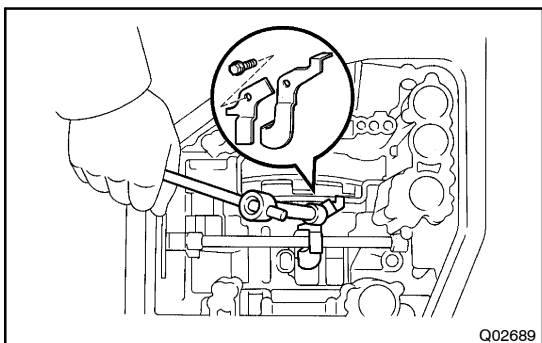
- (a) Install the flange with the flat side facing upward.



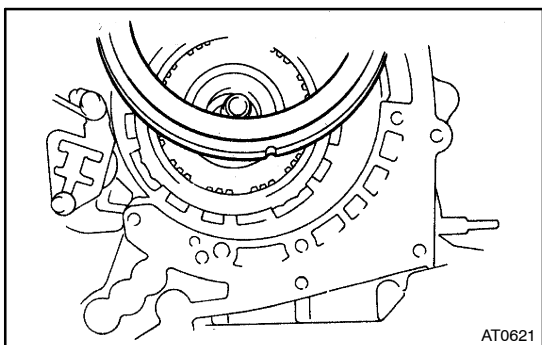
- (b) Install the discs and plates in order.  
**Install in order: D = Disc P = Plate**  
**D - P - D - P - D - P**



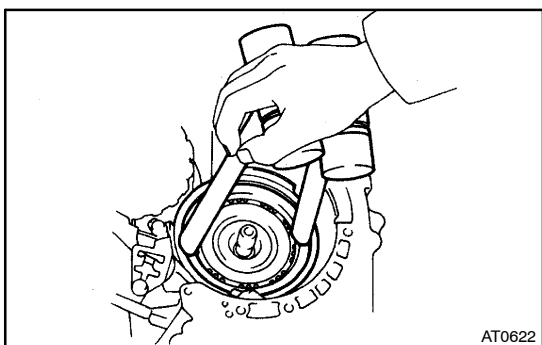
- (c) Install each of the springs over the protrusions in the case.



- (d) Install the 2nd coast brake band guide so that its tip touches the case.
- (e) Install the bolt.  
**Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)**



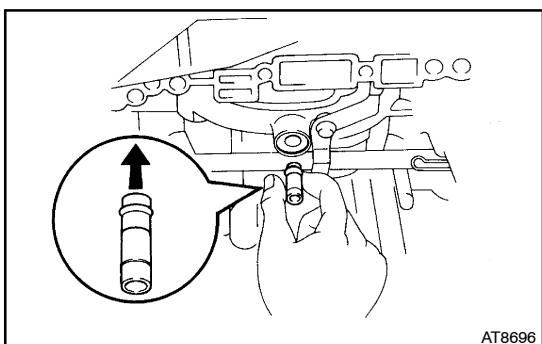
- (f) Align the groove of the drum with the bolt and place the drum into the case.



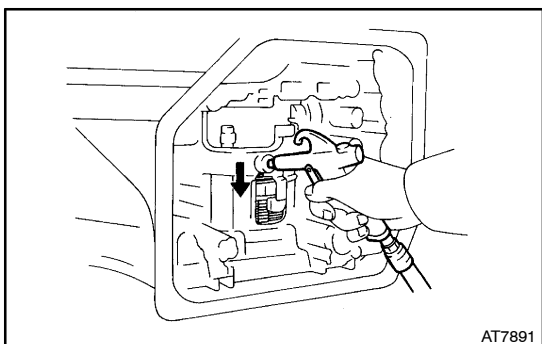
- (g) Place both ends of the snap ring in the groove, and then set the snap ring into the case.
- (h) While compressing the piston return springs over the drum with hammer handles, install the snap ring.

**HINT:**

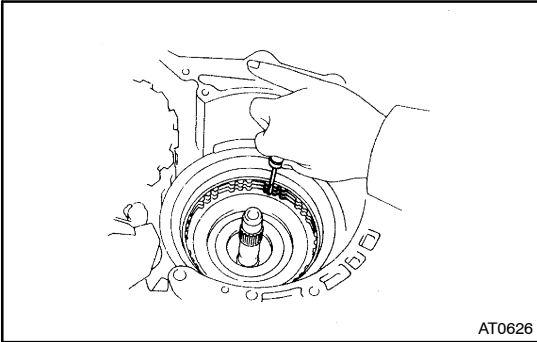
Be sure the end gap of the snap ring is not aligned with one of the cutouts.

**127. INSTALL BRAKE DRUM GASKET**

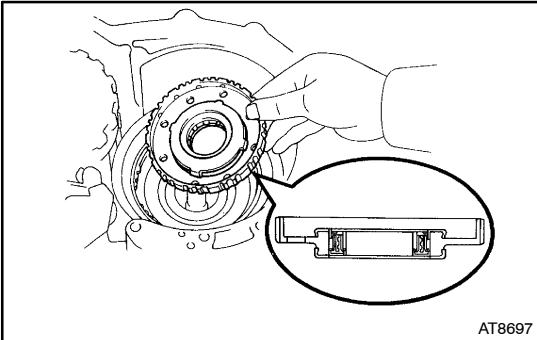
- (a) Install a new brake drum gasket until it makes contact with the 2nd brake drum.

**128. INSPECT 2ND BRAKE PISTON**

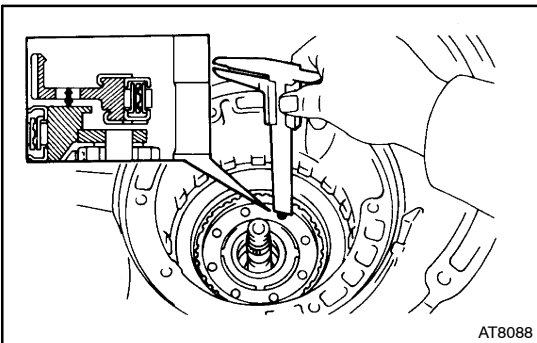
- (a) Using compressed air, check that the 2nd brake piston moves smoothly.

**129. INSTALL 1 WAY CLUTCH ASSY**

- (a) Using a screwdriver, align the flukes of the discs in the 2nd brake.

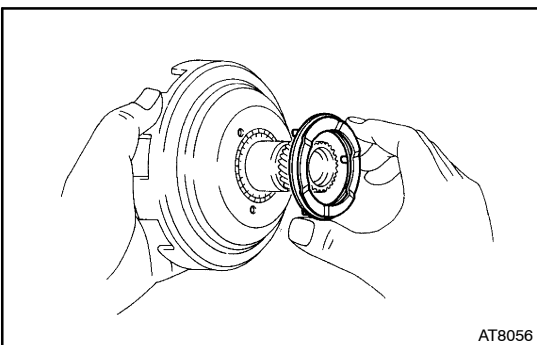


- (b) Align the spline of the 1 way clutch with the flukes of the discs and install the 1 way clutch to the 2nd brake discs.

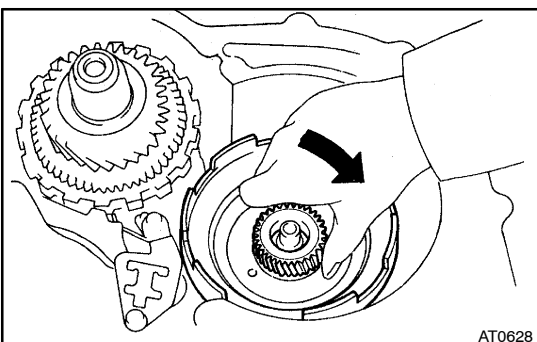
**130. INSPECT 2ND BRAKE HUB INSTALLATION DISTANCE**

- (a) Check the distance between the surface of the 2nd brake hub and rear planetary gear.

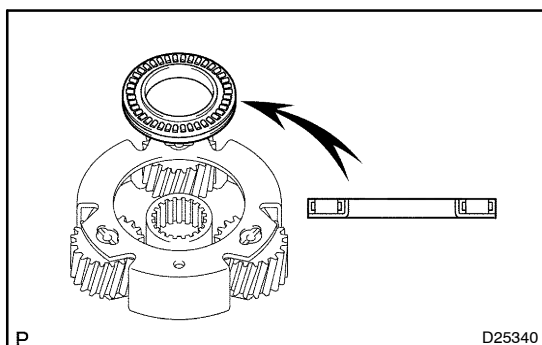
**Distance: Approx. 5 mm (0.20 in.)**

**131. INSTALL PLANETARY SUN GEAR SUB-ASSY**

- (a) Coat the thrust washer with petroleum jelly and install it on the sun gear input drum.



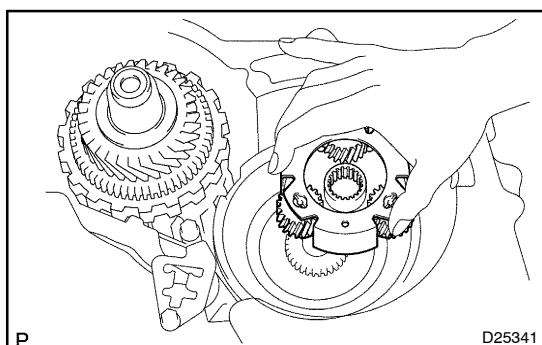
- (b) By turning the planetary sun gear sub-assy clockwise, install it into the No. 1 one-way clutch.

**132. INSTALL FRONT PLANETARY GEAR ASSY**

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

**Bearing:**

|         | Outer diameter      | Inner diameter      |
|---------|---------------------|---------------------|
| Bearing | 45.0 mm (1.772 in.) | 28.1 mm (1.106 in.) |



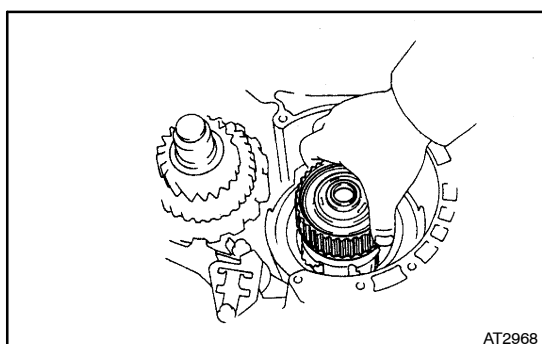
- (b) Install the front planetary gear assy.

**133. INSTALL FRONT PLANETARY RING GEAR**

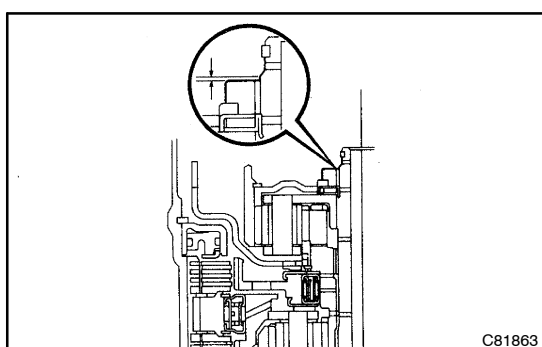
- (a) Coat the races and bearing with petroleum jelly and install them onto the front planetary ring gear.

**Bearing and races:**

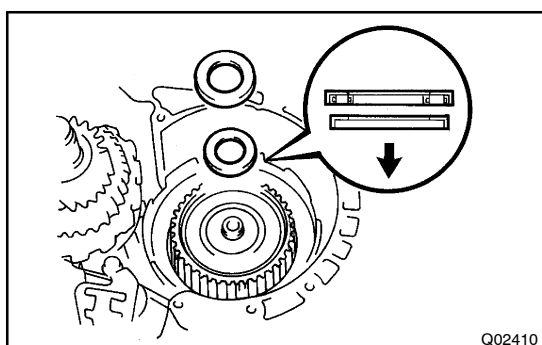
|         | Outer diameter      | Inner diameter      |
|---------|---------------------|---------------------|
| Race    | 35.0 mm (1.378 in.) | 19.0 mm (0.748 in.) |
| Bearing | 38.0 mm (1.496 in.) | 22.0 mm (0.866 in.) |



- (b) Install the front planetary ring gear.

**HINT:**

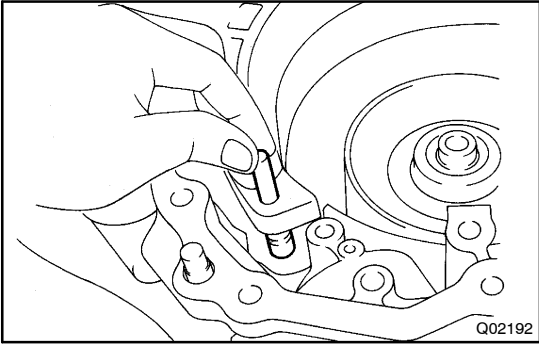
If the front planetary ring gear and the other parts are installed correctly into the case, the end of the bushing with the ring gear flange will be flush with or under the shoulder of the intermediate shaft.



- (c) Coat the races and bearing with petroleum jelly and install them onto the tip of ring gear flange.

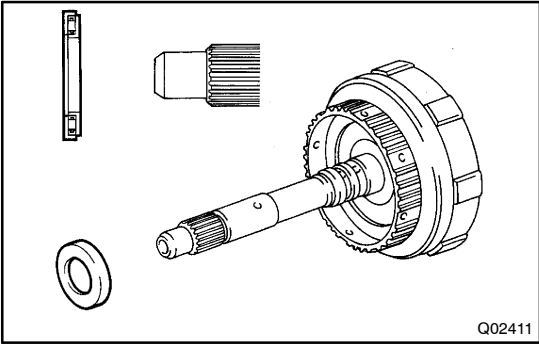
**Bearing and races:**

|         | Outer diameter      | Inner diameter      |
|---------|---------------------|---------------------|
| Race    | 39.5 mm (1.555 in.) | 26.0 mm (1.024 in.) |
| Bearing | 42.0 mm (1.654 in.) | 25.8 mm (1.016 in.) |



**134. INSTALL 2ND COAST BRAKE BAND ASSY**

- (a) Place the 2nd coast brake band assy into the case.
- (b) Install the pin.

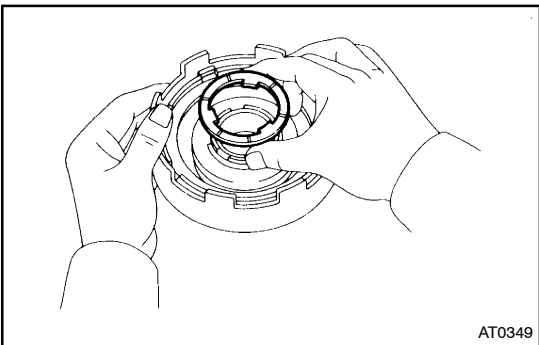


**135. INSTALL INPUT SHAFT SUB-ASSY**

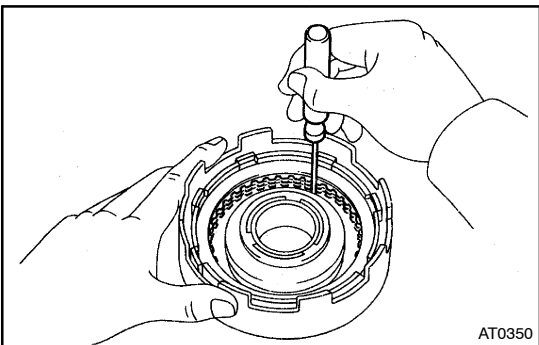
- (a) Coat the assembled bearing and race with petroleum jelly, and install it onto the forward clutch drum.

**Assembled bearing and race:**

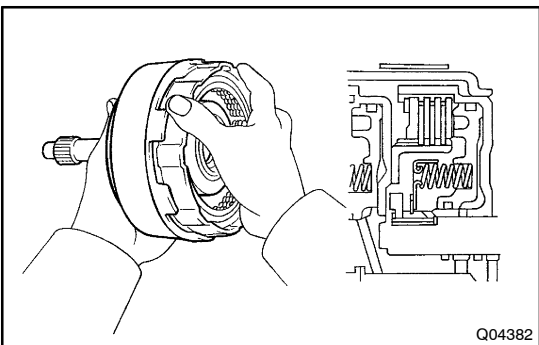
|                            | Outer diameter      | Inner diameter      |
|----------------------------|---------------------|---------------------|
| Assembled bearing and race | 46.0 mm (1.811 in.) | 30.7 mm (1.209 in.) |



- (b) Coat the clutch drum thrust washer with petroleum jelly, and install it onto the direct clutch drum with the oil groove facing upward.



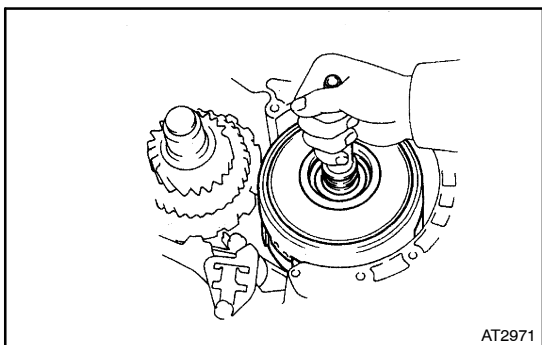
- (c) Using a screwdriver, align the flukes of the discs in the direct clutch.



- (d) Mesh the hub with the flukes of the direct clutch while turning the clutch drum or forward clutch.

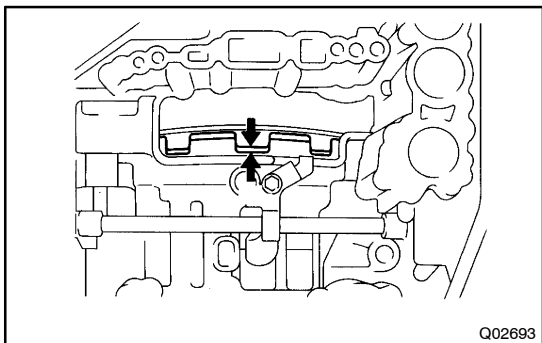
**HINT:**

If the flukes of the discs are meshed correctly, the end of the bushing with the direct clutch will be flush with the surfaces of the forward clutch.



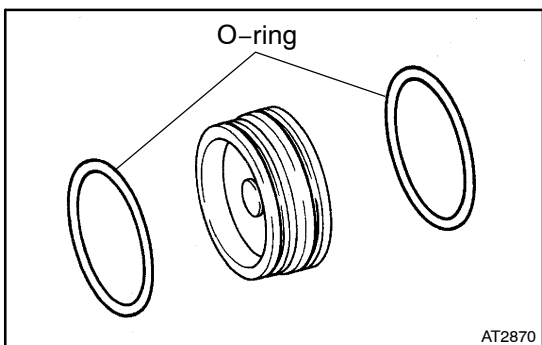
AT2971

- (e) Place the direct clutch and forward clutch into the case.
- (f) While rotating the forward clutch to mesh the front planetary ring gear and discs, install them.



Q02693

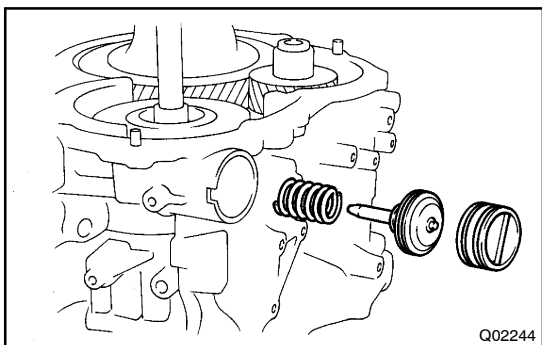
- (g) Check the distance between A and B.  
**Distance: Approx. 3 mm (0.118 in.)**



AT2870

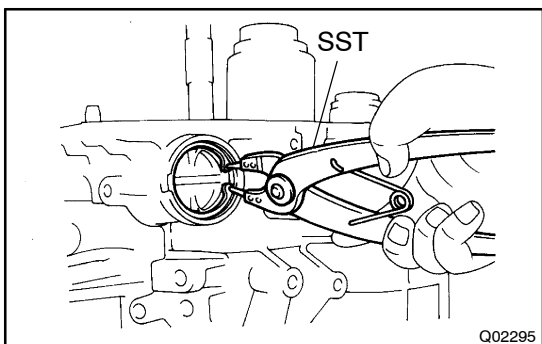
### 136. INSTALL 2ND COAST BRAKE PISTON

- (a) Install 2 new O-rings to the cover.  
**HINT:**  
Coat the O-rings with ATF before the installation.



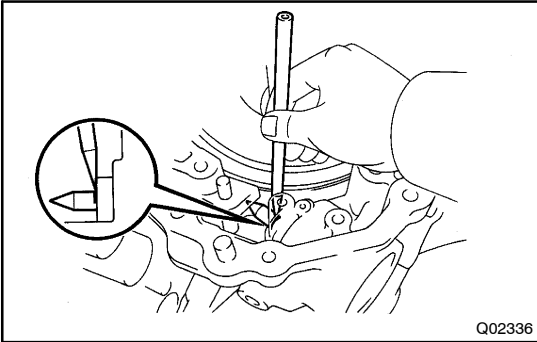
Q02244

- (b) Install the spring, 2nd coast brake piston and cover into the bore.

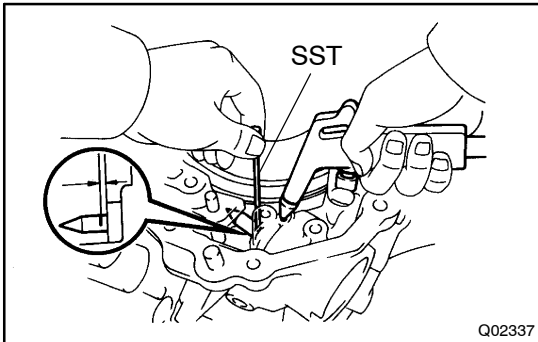


Q02295

- (c) Using SST, install the snap ring.  
SST 09350-32014 (09351-32050)

**137. INSPECT PISTON STROKE OF 2ND COAST BRAKE**

- (a) Apply a small amount of paint to the piston rod at the point where it meets the case.

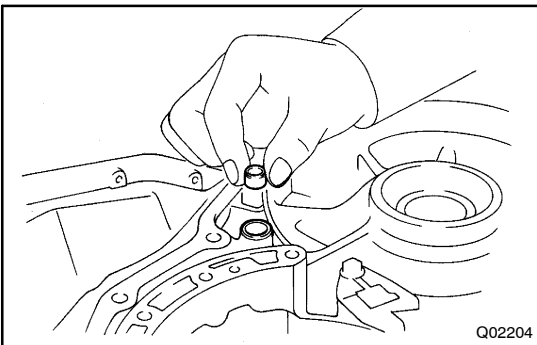


- (b) Using SST, measure the piston stroke while applying and releasing compressed air (392 – 785 kPa, 4 – 8 kgf/cm<sup>2</sup>, 57 – 114 psi).

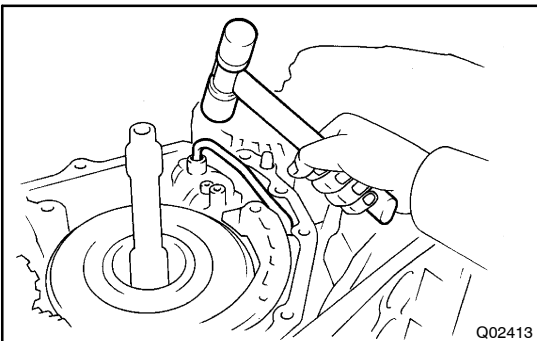
SST 09240-00020

**Piston stroke: 1.5 – 3.0 mm (0.059 – 0.138 in.)**

If the piston stroke exceeds the limit, select a new piston rod.

**138. INSTALL GOVERNOR APPLY GASKET NO.2****139. INSTALL TRANSMISSION CASE PLATE NO.1**

- (a) Install the transmission case plate No. 1 with the bolt.  
**10 N·m (102 kgf·cm, 7 ft·lbf)**

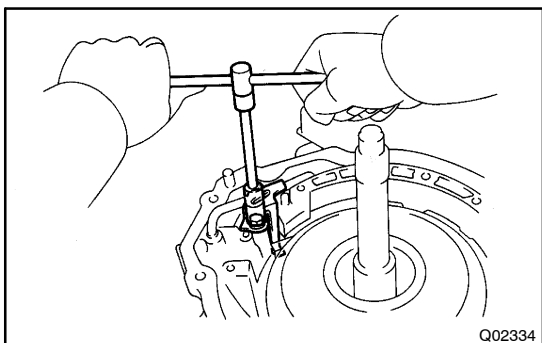
**140. INSTALL GOVERNOR PRESSURE TUBE**

- (a) Using a plastic hammer, install the governor pressure tube.

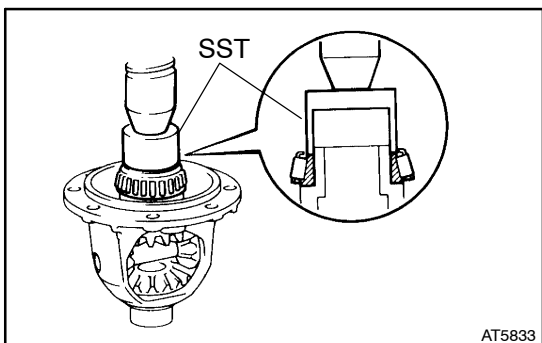
**NOTICE:**

**Be careful not to bend or damage the tube.**

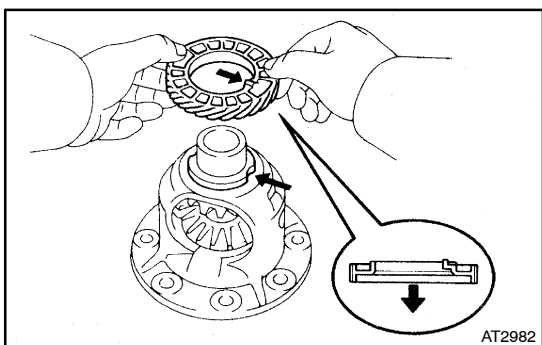


**141. INSTALL TRANSAXLE APPLY TUBE CLAMP NO.3**

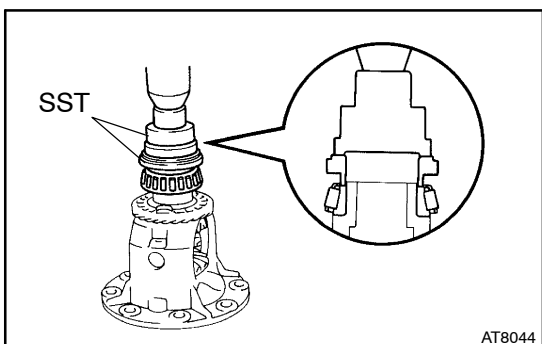
- (a) Install the transaxle apply tube clamp No. 3 with the bolt.  
**Torque: 5.4 N·m (55 kgf·cm, 48 in·lbf)**

**142. INSTALL FRONT DRIVE PINION REAR TAPERED ROLLER BEARING**

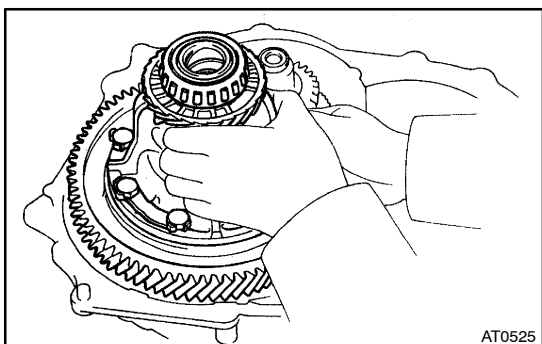
- (a) Using SST and a press, install the side bearing into the differential case.  
 SST 09710-30031 (09710-03161)

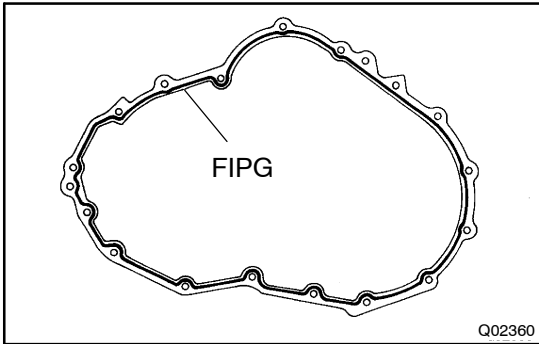
**143. INSTALL FRONT DRIVE PINION FRONT TAPERED ROLLER BEARING**

- (a) Install the speedometer drive gear to the differential case.



- (b) Using SST and a press, install the side bearing into the differential case.  
 SST 09350-32014 (09351-32090, 09351-32120)

**144. INSTALL FRONT DIFFERENTIAL ASSY**



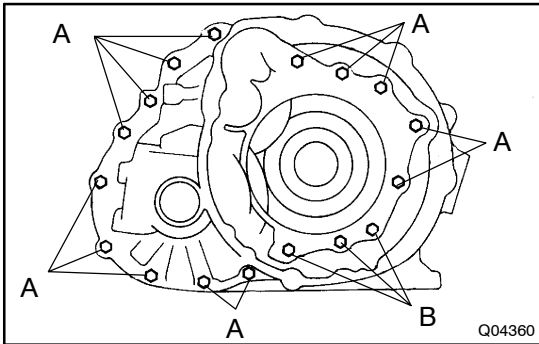
**145. INSTALL TRANSAXLE HOUSING**

- (a) Remove any packing material and be careful not to get oil on the contacting surfaces of the transaxle housing or transaxle case.

- (b) Apply FIPG to the transaxle housing.

**FIPG:**

**Part No.08826 - 00090, THREE BOND 1281 or equivalent**



- (c) Apply sealant to the bolt B threads.

**Sealant:**

**Part No.08833 - 00090, adhesive 1131, or equivalent**

- (d) Install the bolts.

**Torque: 30 N·m (306 kgf·cm, 22 ft·lbf)**

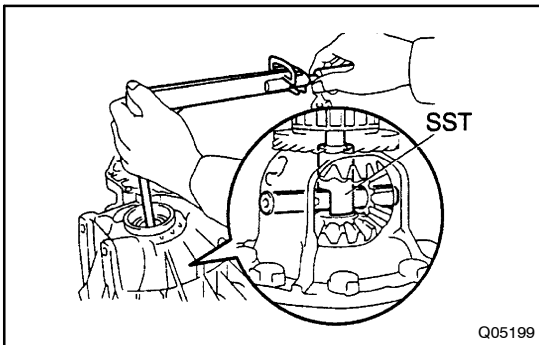
**HINT:**

Each bolt length is indicated in the illustration.

**Bolt length:**

**Bolt A: 30 mm (1.18 in.)**

**Bolt B: 35 mm (1.38 in.)**



**146. ADJUST DIFFERENTIAL SIDE BEARING RRELOAD**

- (a) Using SST, rotate the differential in both directions to snug the bearing down.

SST 09564-32011

- (b) Using SST and a torque wrench, measure the preload of the side bearing.

SST 09564-32011

**Preload (at starting):**

**New bearing:**

**0.8 - 1.4 N·m (8 - 14 kgf·cm, 6.9 - 12.2 in.·lbf)**

**Used bearing:**

**0.4 - 0.7 N·m (4 - 7 kgf·cm, 3.5 - 6.1 in.·lbf)**

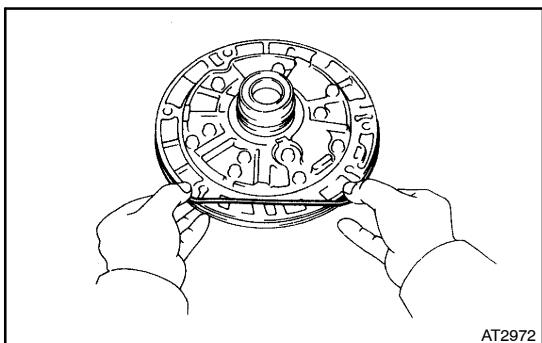
If the preload is not within the specified range, remove the differential from the transaxle case. Re-select the transaxle case side adjusting shim according to the following table.

**Adjusting shim thickness.**

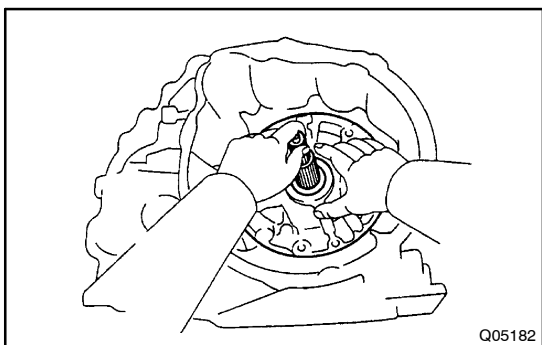
|                      |                      |                      |
|----------------------|----------------------|----------------------|
| 2.00 mm (0.0787 in.) | 2.05 mm (0.0807 in.) | 2.10 mm (0.0827 in.) |
| 2.15 mm (0.0846 in.) | 2.20 mm (0.0866 in.) | 2.25 mm (0.0886 in.) |
| 2.30 mm (0.0906 in.) | 2.35 mm (0.0925 in.) | 2.40 mm (0.0945 in.) |
| 2.45 mm (0.0965 in.) | 2.50 mm (0.0984 in.) | 2.55 mm (0.1004 in.) |
| 2.60 mm (0.1024 in.) | 2.65 mm (0.1043 in.) | 2.70 mm (0.1063 in.) |
| 2.75 mm (0.1083 in.) | 2.80 mm (0.1102 in.) | 2.85 mm (0.1122 in.) |
| 2.90 mm (0.1142 in.) | -                    | -                    |

**HINT:**

The preload will change about 0.3 - 0.4 N·m (3 - 4 kgf·cm, 2.6 - 2.9 in.·lbf) according to a change in shim thickness of 0.05 mm (0.0020 in.)

**147. INSTALL OIL PUMP ASSEMBLY**

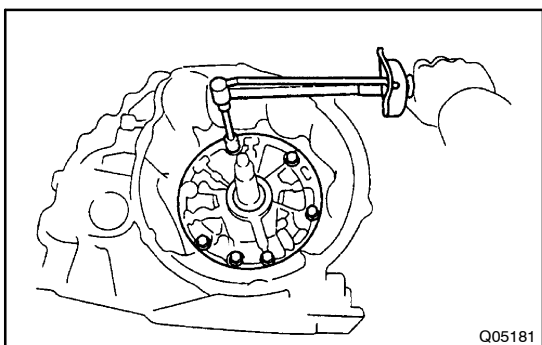
- (a) Coat a new O-ring with ATF, and install it to the pump body.



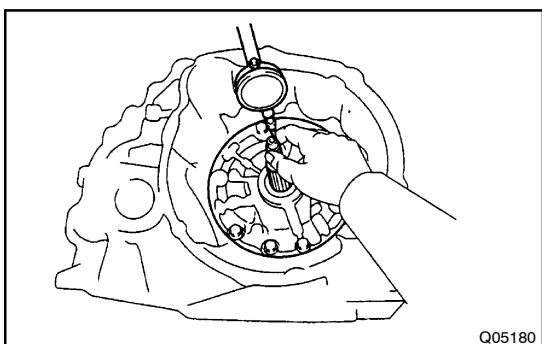
- (b) Place the oil pump through the input shaft, and align the bolt holes of the pump body with those of the transaxle case.
- (c) Hold the input shaft, and lightly press the oil pump body to slide the oil seal rings on the input shaft through the direct clutch drum.

**NOTICE:**

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



- (d) Install the 6 bolts.  
**Torque: 25 N·m (255 kgf·cm, 18 ft·lbf)**

**148. INSPECT INPUT SHAFT ASSY**

- (a) Measure the thrust play in the axial direction.  
**Thrust play: 0.3 - 0.9 mm (0.012 - 0.035 in.)**

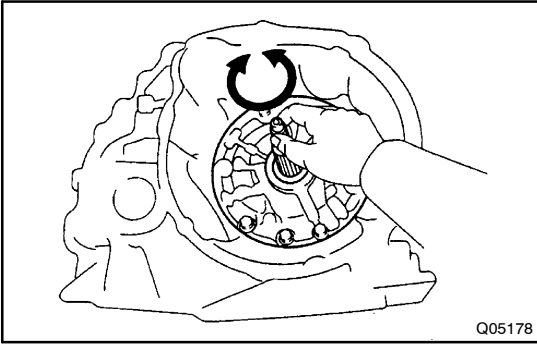
If the play is not as specified, select and replace the race for the end of the input shaft assy.

**HINT:**

There are 3 different thickness for races, if necessary, select one of them.

**Race thickness: mm (in.)**

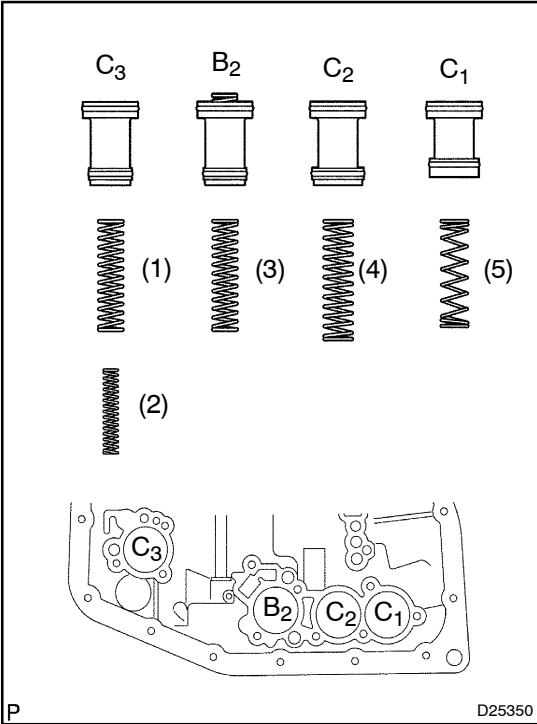
| thickness   | thickness   |
|-------------|-------------|
| 0.8 (0.031) | 1.0 (0.039) |
| 1.4 (0.055) | -           |



Q05178

**149. INSPECT INPUT SHAFT ENDPLAY**

- (a) Make sure that the input shaft rotates smoothly.



D25350

**150. INSTALL ACCUMULATOR PISTON AND SPRING**

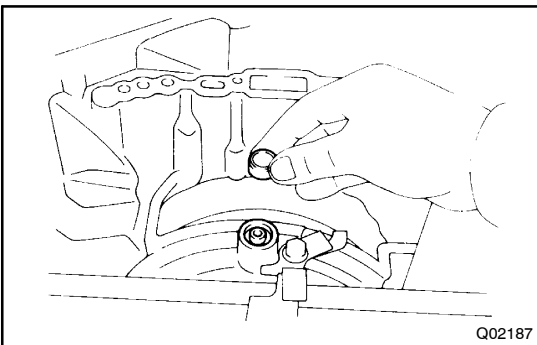
- (a) Coat new O-rings with ATF, and install them to the pistons.
- (b) Install the pistons and springs to the case.

**A245E:**

| Spring                     | Free length          | Color      |
|----------------------------|----------------------|------------|
| (1) C <sub>3</sub> (Outer) | 68.4 mm (2.815 in.)  | Yellow     |
| (2) C <sub>3</sub> (Inner) | 50 mm (1.968 in.)    | Yellow     |
| (3) B <sub>2</sub>         | 64.68 mm (2.685 in.) | Light blue |
| (4) C <sub>2</sub>         | 64.68 mm (2.547 in.) | Green      |
| (5) C <sub>1</sub> (Outer) | 60.39 mm (2.780 in.) | Pink       |

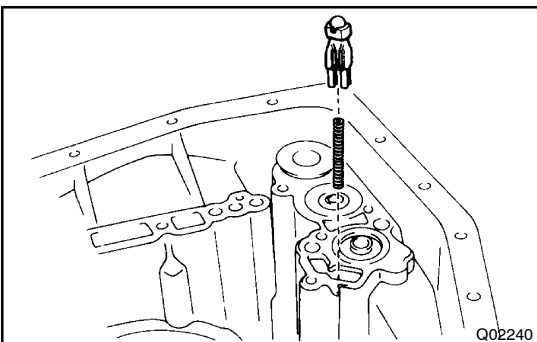
**A246E:**

| Spring                     | Free length          | Color      |
|----------------------------|----------------------|------------|
| (1) C <sub>3</sub> (Outer) | 68.4 mm (2.815 in.)  | Yellow     |
| (2) C <sub>3</sub> (Inner) | 50 mm (1.968 in.)    | Yellow     |
| (3) B <sub>2</sub>         | 64.68 mm (2.685 in.) | Light blue |
| (4) C <sub>2</sub>         | 70.45 mm (2.773 in.) | Purple     |
| (5) C <sub>1</sub> (Outer) | 60.39 mm (2.780 in.) | Pink       |



Q02187

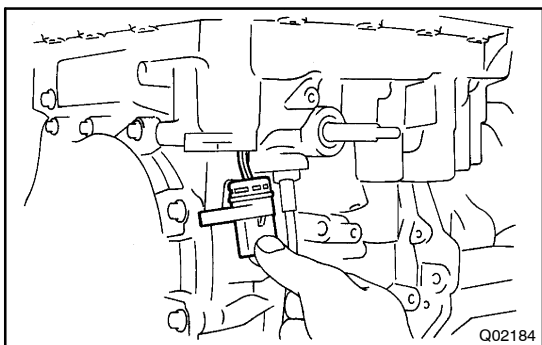
**151. INSTALL GOVERNOR APPLY GASKET NO.1**



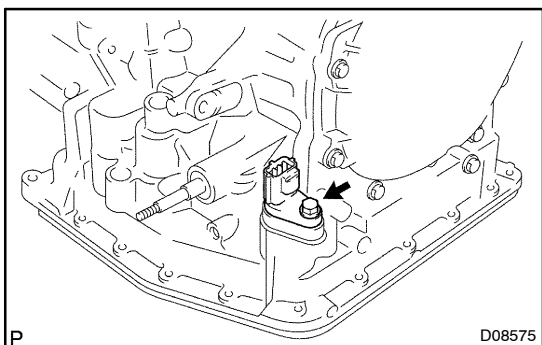
Q02240

**152. INSTALL CHECK BALL BODY**

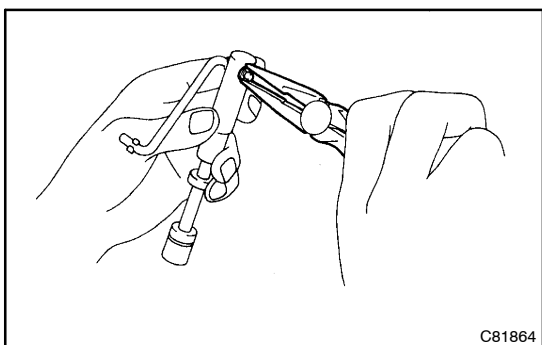
- (a) Install the check ball body and spring.

**153. INSTALL TRANSMISSION WIRE**

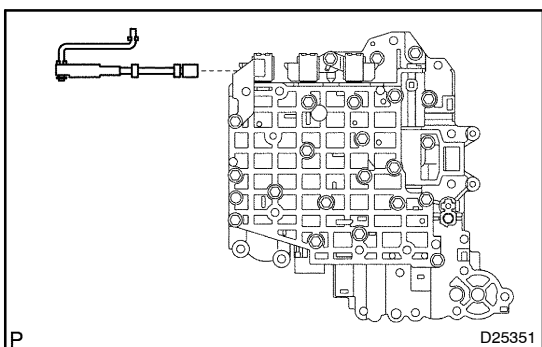
- (a) Install the transmission wire.



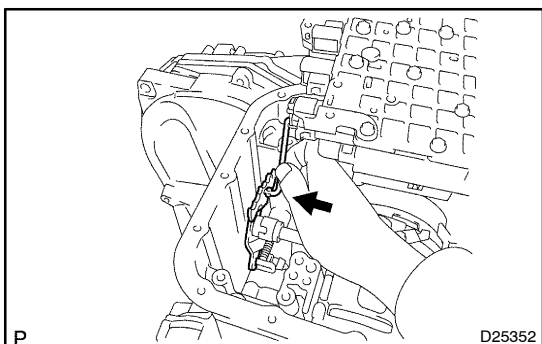
- (b) Install the bolt.  
**Torque: 5.5 N·m (56 kgf·cm, 49 in·lbf)**

**154. INSTALL TRANSMISSION VALVE BODY ASSY**

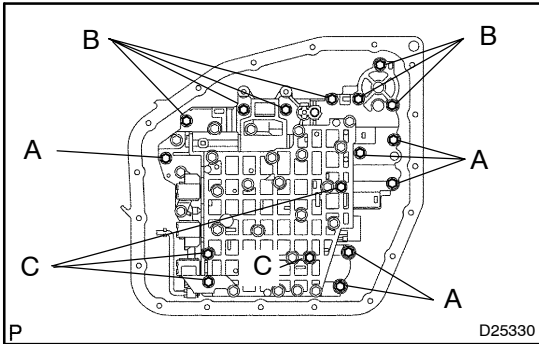
- (a) Install the connecting rod to the manual valve.  
 (b) Using needle-pliers, install the E-ring to the connecting rod.



- (c) Install the manual valve to the valve body assy.



- (d) Connect the connecting rod to the manual valve lever.



(e) Install the 17 bolts.

HINT:

Each bolt length is indicated in the illustration.

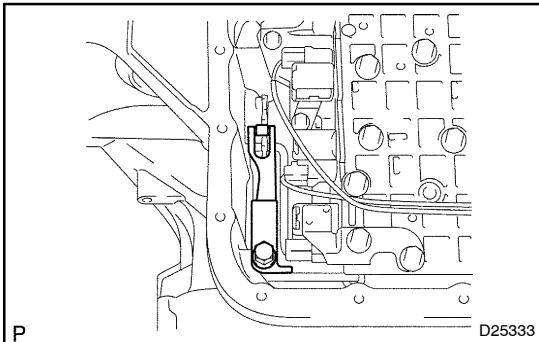
**Torque: 10 N·m (102 kgf·cm, 7 ft·lbf)**

**Bolt length:**

**Bolt A: 20 mm (0.79 in.)**

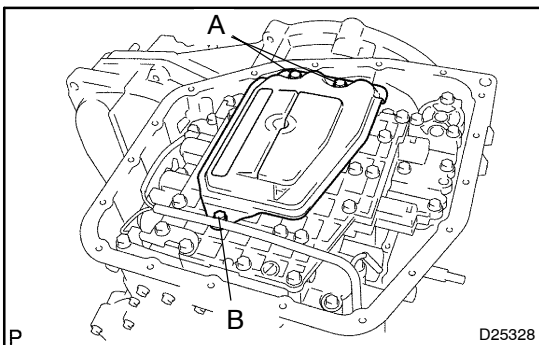
**Bolt B: 28 mm (1.10 in.)**

**Bolt C: 50 mm (1.97 in.)**



#### 155. INSTALL MANUAL DETENT SPRING SUB-ASSY

**Torque: 10 N·m (102 kgf·cm, 7 ft·lbf)**



#### 156. INSTALL VALVE BODY OIL STRAINER ASSY

Install the valve body oil strainer assy with the 3 bolts.

HINT:

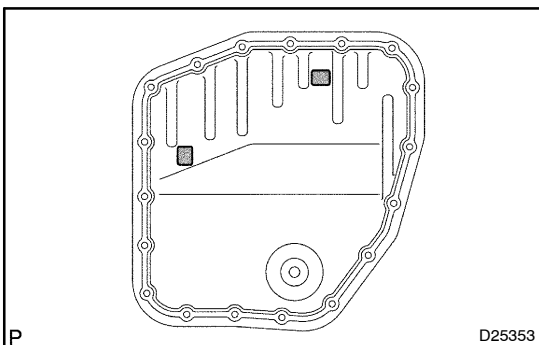
Each bolt length is indicated in the illustration.

**Torque: 10 N·m (102 kgf·cm, 7 ft·lbf)**

**Bolt length:**

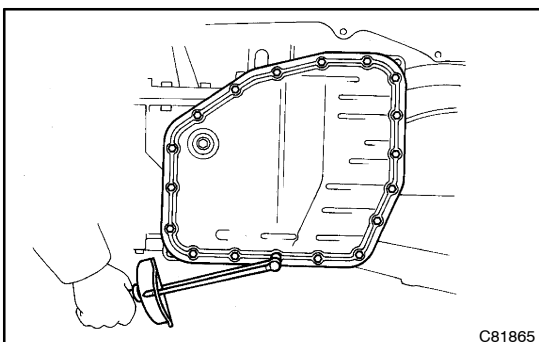
**Bolt A: 12 mm (0.47 in.)**

**Bolt B: 20 mm (0.79 in.)**



#### 157. INSTALL TRANSMISSION OIL CLEANER MAGNET

(a) Install the 2 transmission oil cleaner magnets to the oil pan.

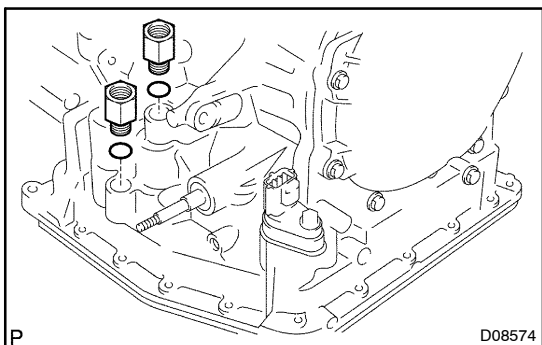


#### 158. INSTALL AUTOMATIC TRANSAXLE OIL PAN SUB-ASSY

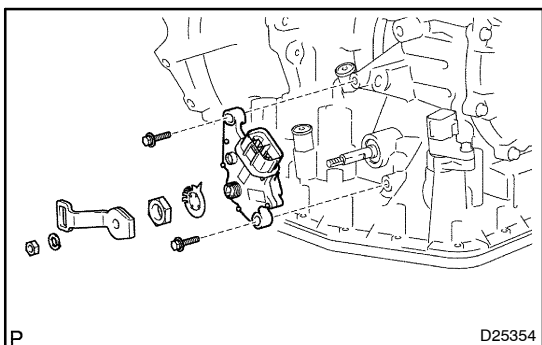
(a) Install a new gasket to the automatic transaxle oil pan sub-assy and install them to the transaxle.

(b) Tighten the 18 bolts.

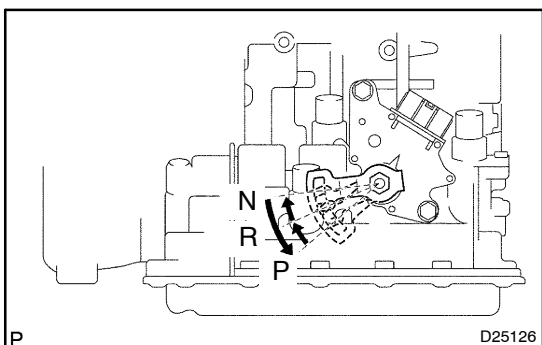
**Torque: 5.2 N·m (54 kgf·cm, 47 in·lbf)**

**159. INSTALL OIL COOLER TUBE UNION**

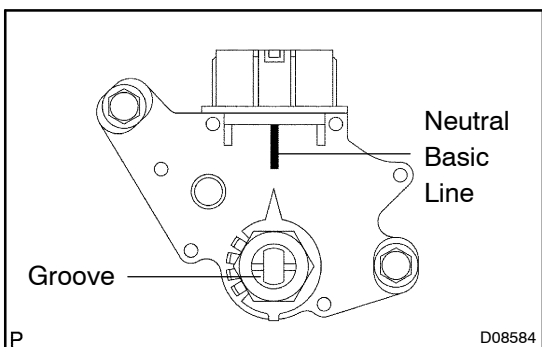
- (a) Install new O-rings to each oil cooler tube unions.
- (b) Install the oil cooler tube unions to the transaxle case.  
**Torque: 30 N·m (306 kgf·cm, 22 ft·lbf)**

**160. INSTALL NEUTRAL START SWITCH ASSY**

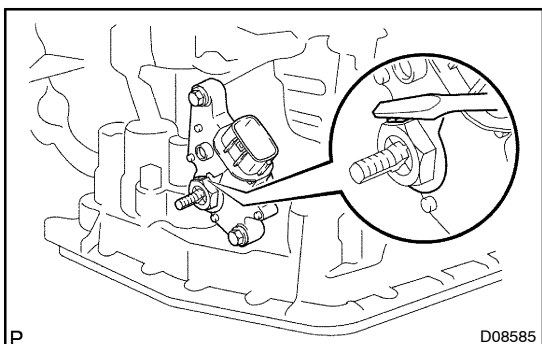
- (a) Install the neutral start switch assy to the manual valve shaft.
- (b) Place a new lock washer and tighten the nut.  
**Torque: 7.0 N·m (71 kgf·cm, 62 in·lbf)**
- (c) Temporarily install the 2 bolts.



- (d) Temporarily install the manual shift lever.
- (e) Turn the lever counterclockwise until it stops, then turn it clockwise 2 notches.
- (f) Remove the manual shift lever.



- (g) Align the groove with neutral basic line.
- (h) Install and tighten the 2 bolts.  
**Torque: 5.3 N·m (54 kgf·cm, 49 ft·lbf)**



- (i) Using a screwdriver, stake the nut with the lock washer.

**161. INSTALL MANUAL VALVE LEVER SUB-ASSY**

**162. INSTALL BREATHER PLUG HOSE**

**163. INSTALL TRANSAXLE CASE NO.1 PLUG**

- (a) Install the transaxle case No. 1 plug and O-ring.