TERMS

IN049-26

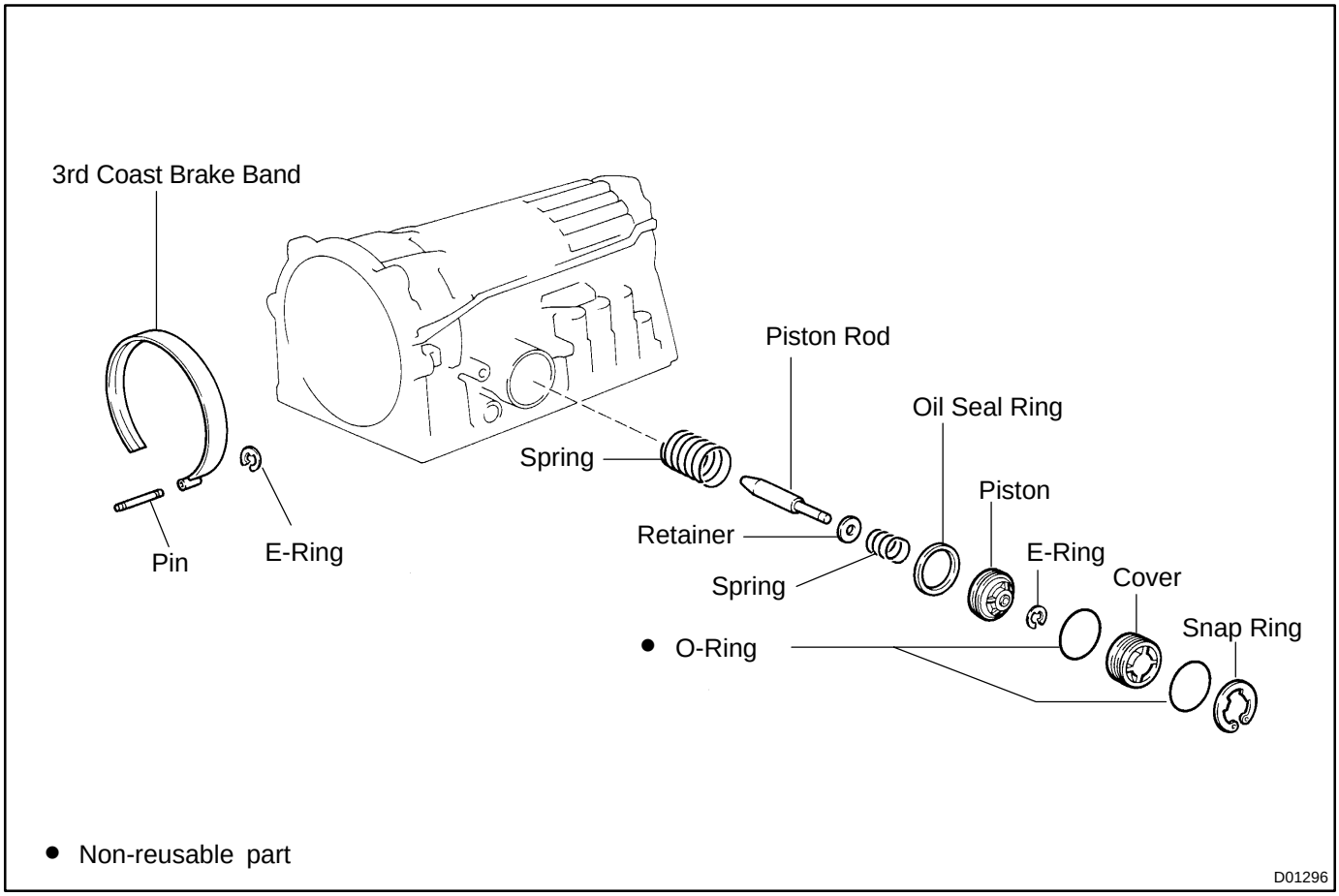
ABBREVIATIONS USED IN THIS MANUAL

Abbreviations	Meaning
A/T	Automatic Transmission
ATF	Automatic Transmission Fluid
B_0	Overdrive Brake
B_1	3rd Coast Brake
B_2	3rd Brake
B_3	2nd Brake
B_4	1st & Reverse Brake
C_0	Overdrive Direct Clutch
C_1	Forward Clutch
C_2	Direct Clutch
D	Disc
F	Flange
F_0	Overdrive One-way Clutch
F_1	No. 1 One-way Clutch
F_2	No. 2 One-way Clutch
FIPG	Formed in Place Gasket
MP	Multipurose
O/D	Overdrive
P	Plate
S1	Shift Solenoid Valve No. 1
S2	Shift Solenoid Valve No. 2
S3	Shift Solenoid Valve No. 3
S4	Shift Solenoid Valve No. 4
SSM	Special Service Materials
SST	Special Service Tools
w/	with
w/o	without

THIRD COAST BRAKE

COMPONENTS

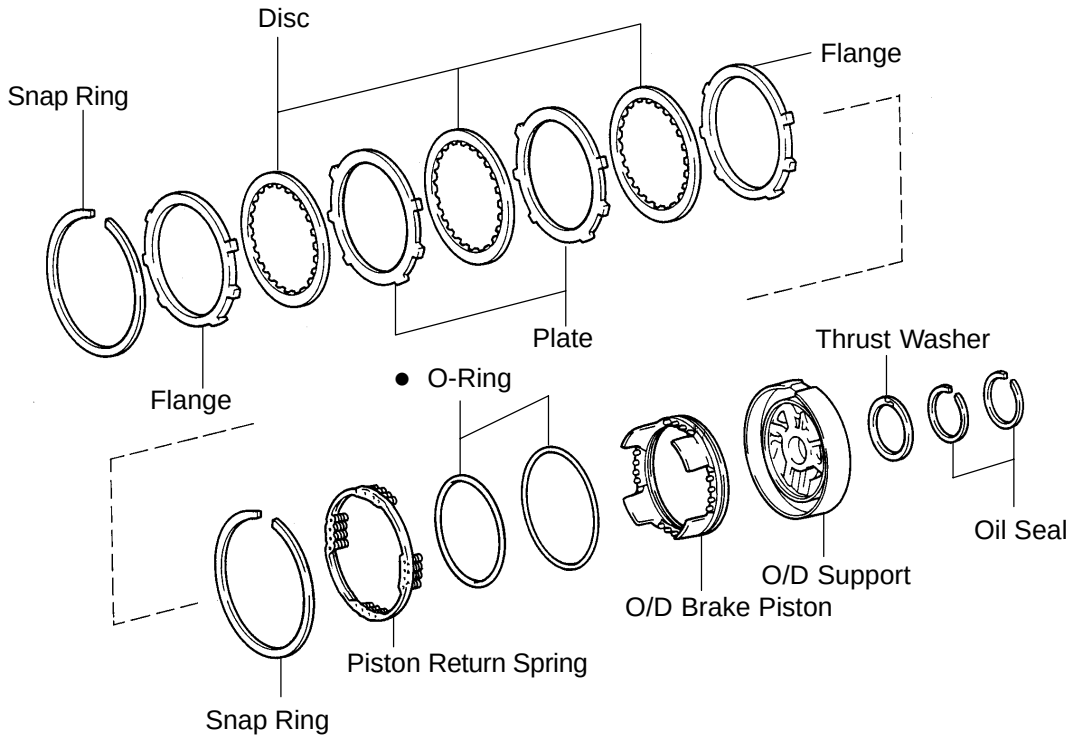
AT04F-02



OVERDRIVE BRAKE

AT04N-02

COMPONENTS



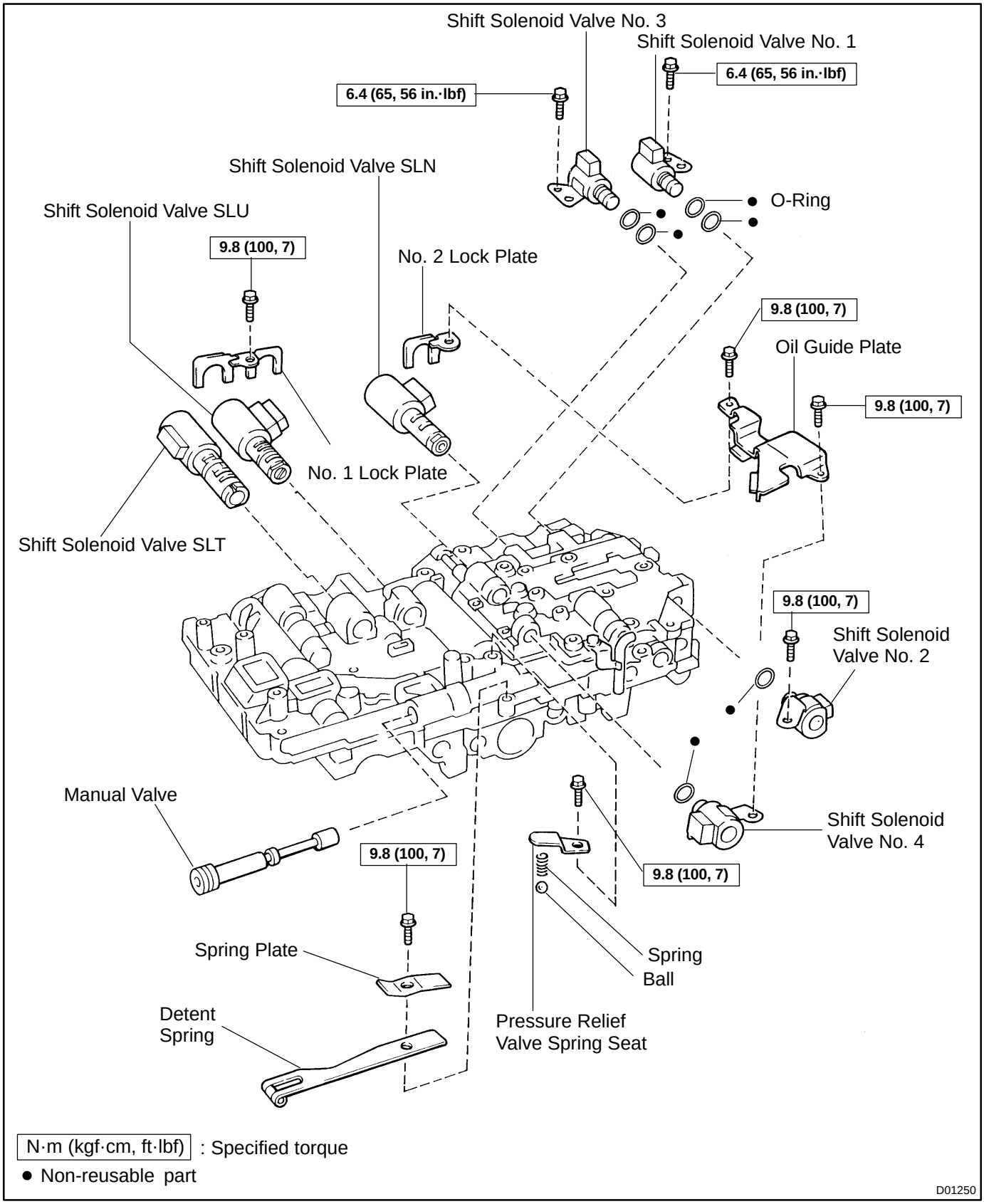
N ● Non-reusable part

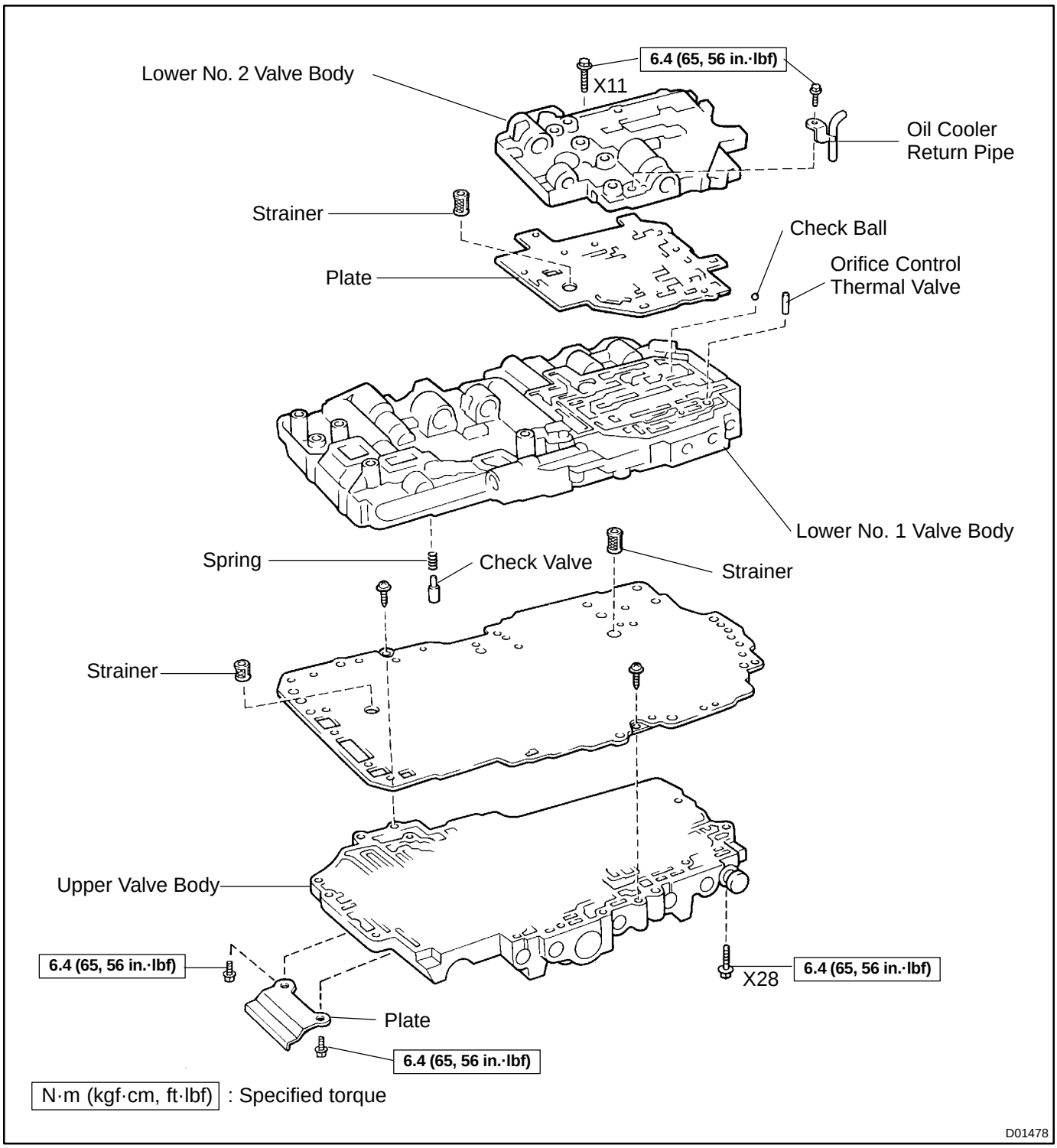
D09433

VALVE BODY

COMPONENTS

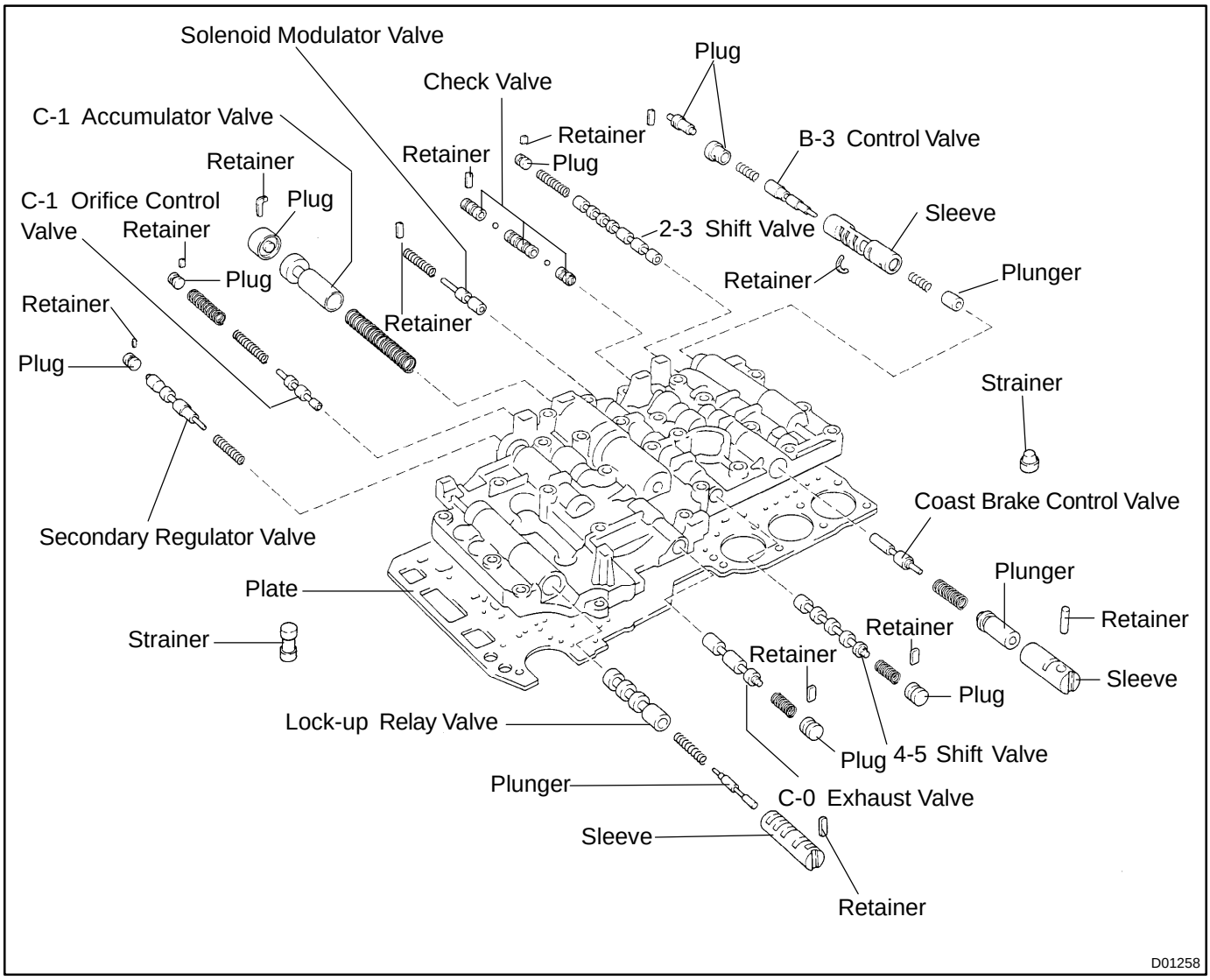
AT05H-02





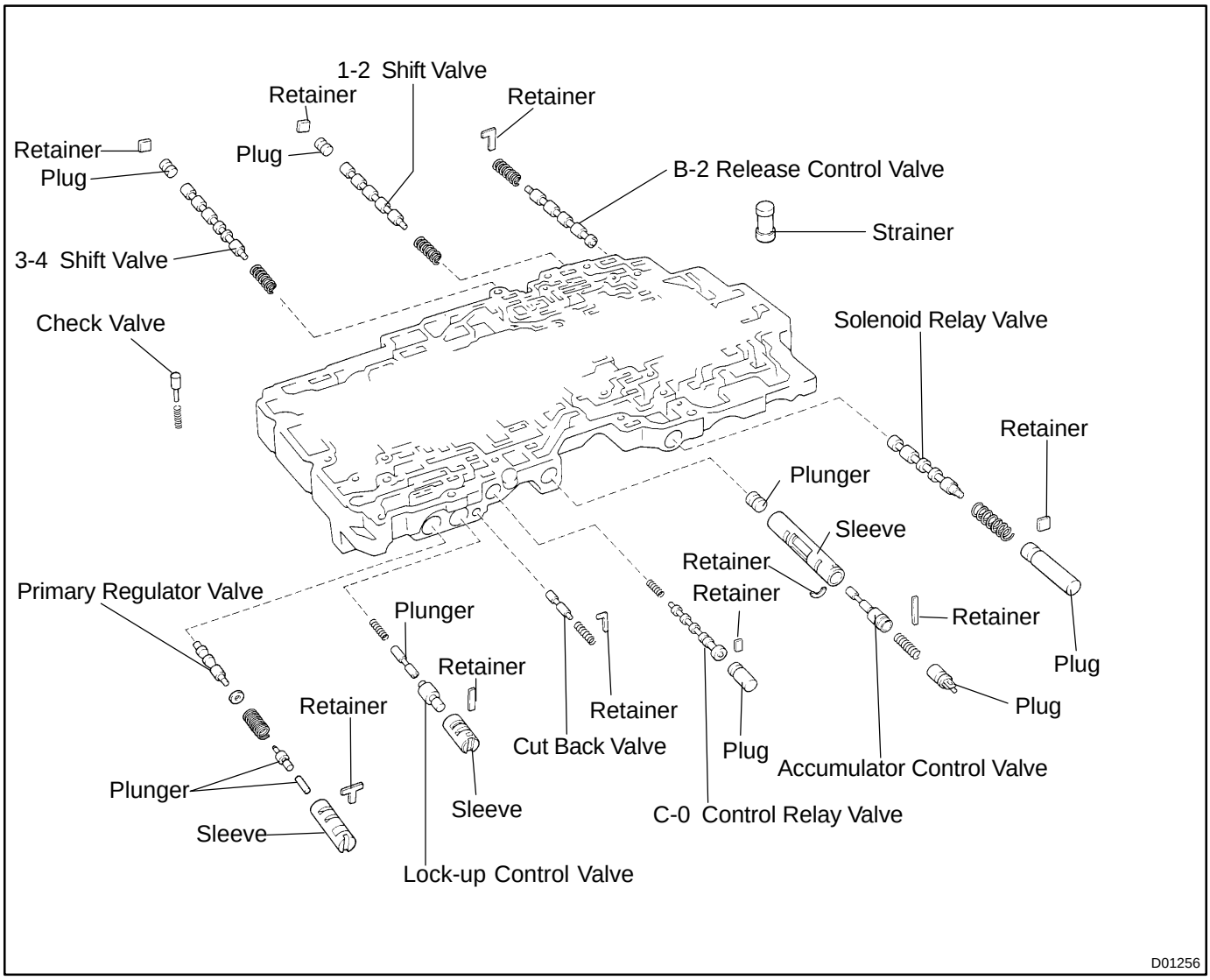
AT05K-01

COMPONENTS



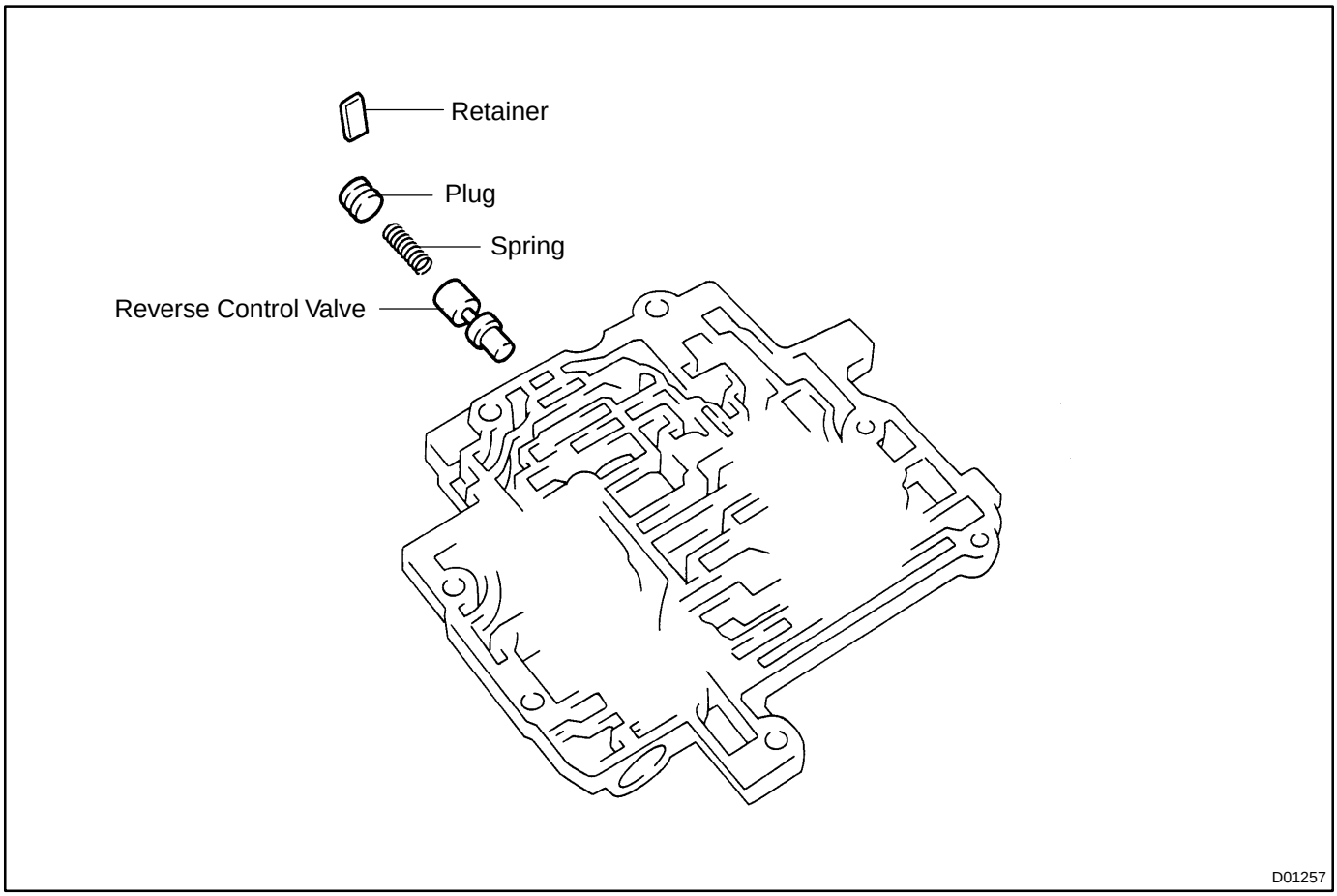
AT05M-01

COMPONENTS



AT05O-01

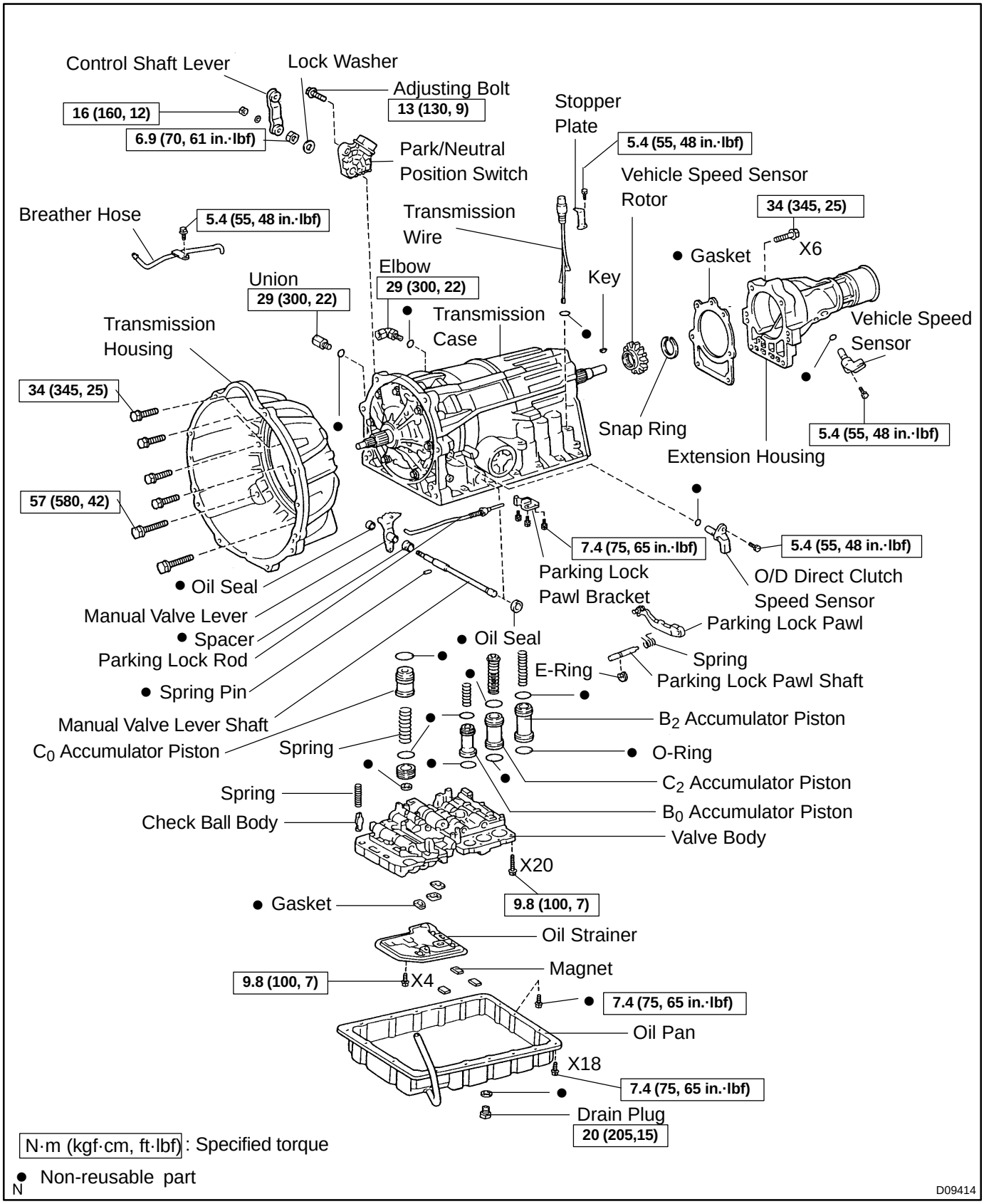
COMPONENTS

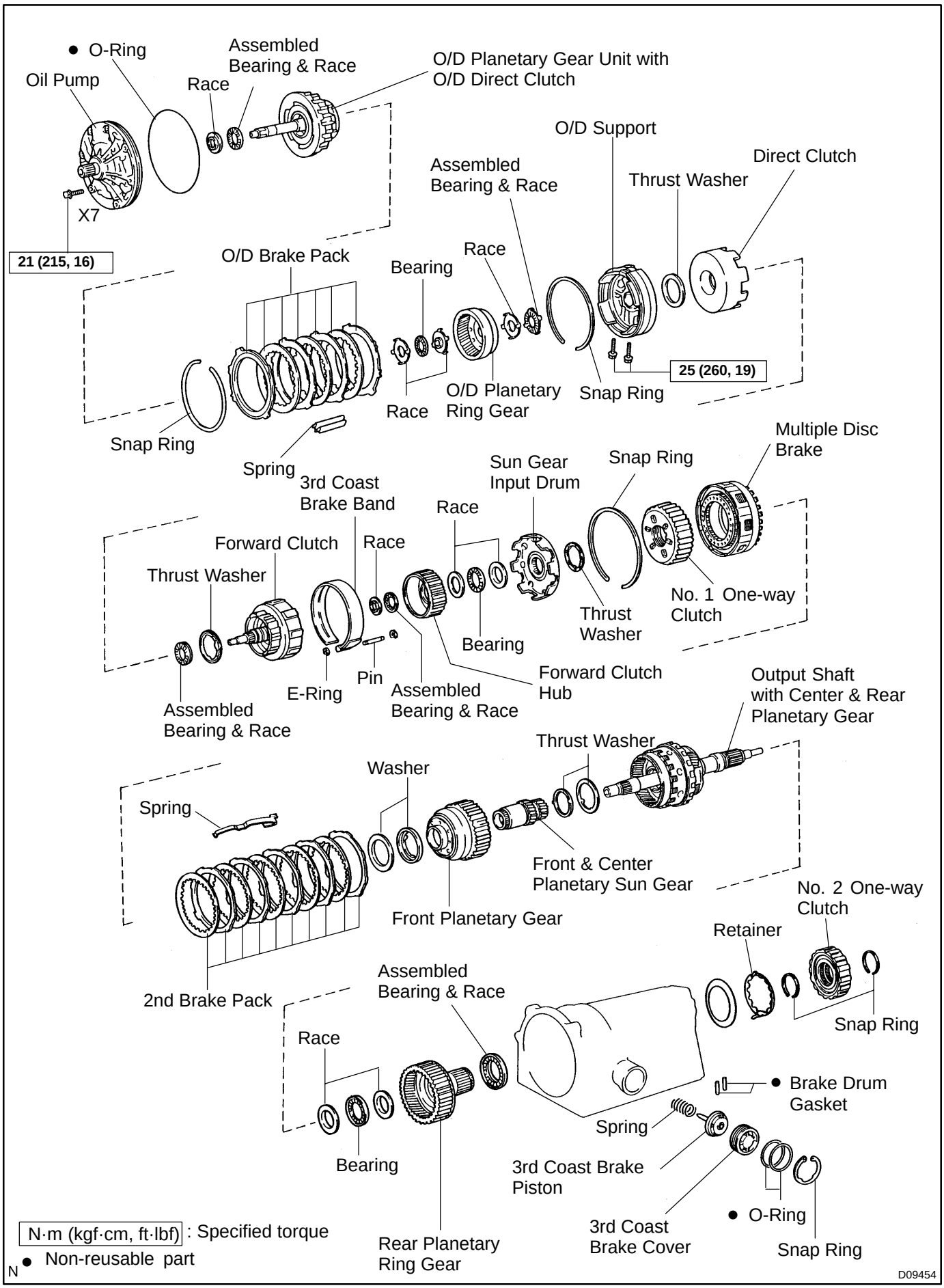


COMPONENT PARTS

COMPONENTS

AT05Q-02

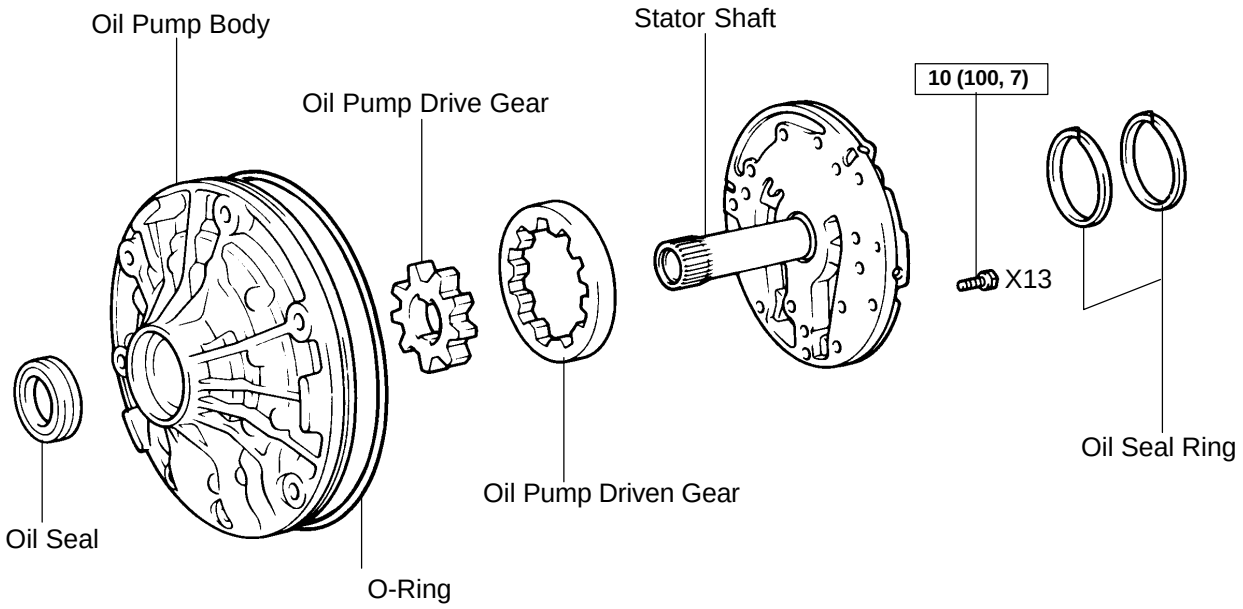




OIL PUMP

COMPONENTS

AT04B-02



N·m (kgf·cm, ft·lbf) : Specified torque

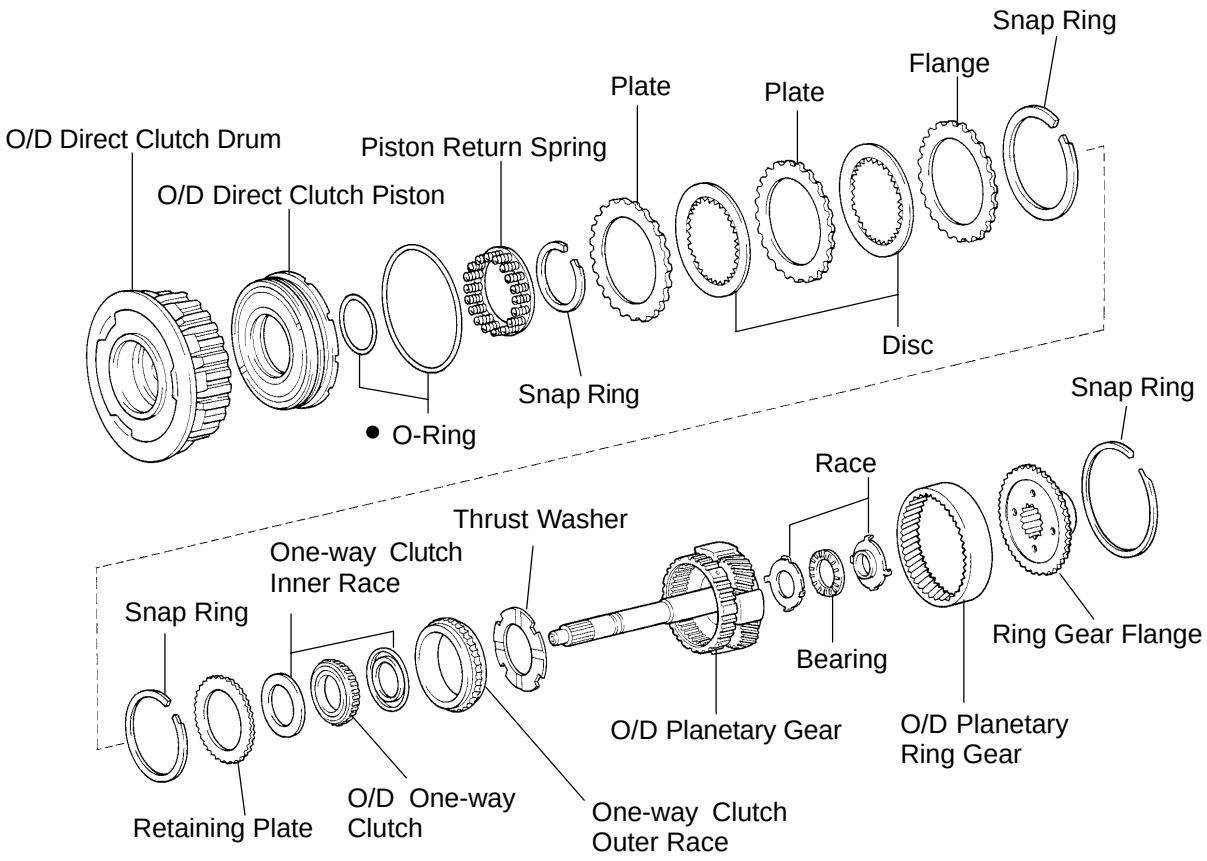
Non-reusable part

D01280

OVERDRIVE DIRECT CLUTCH

AT04J-02

COMPONENTS



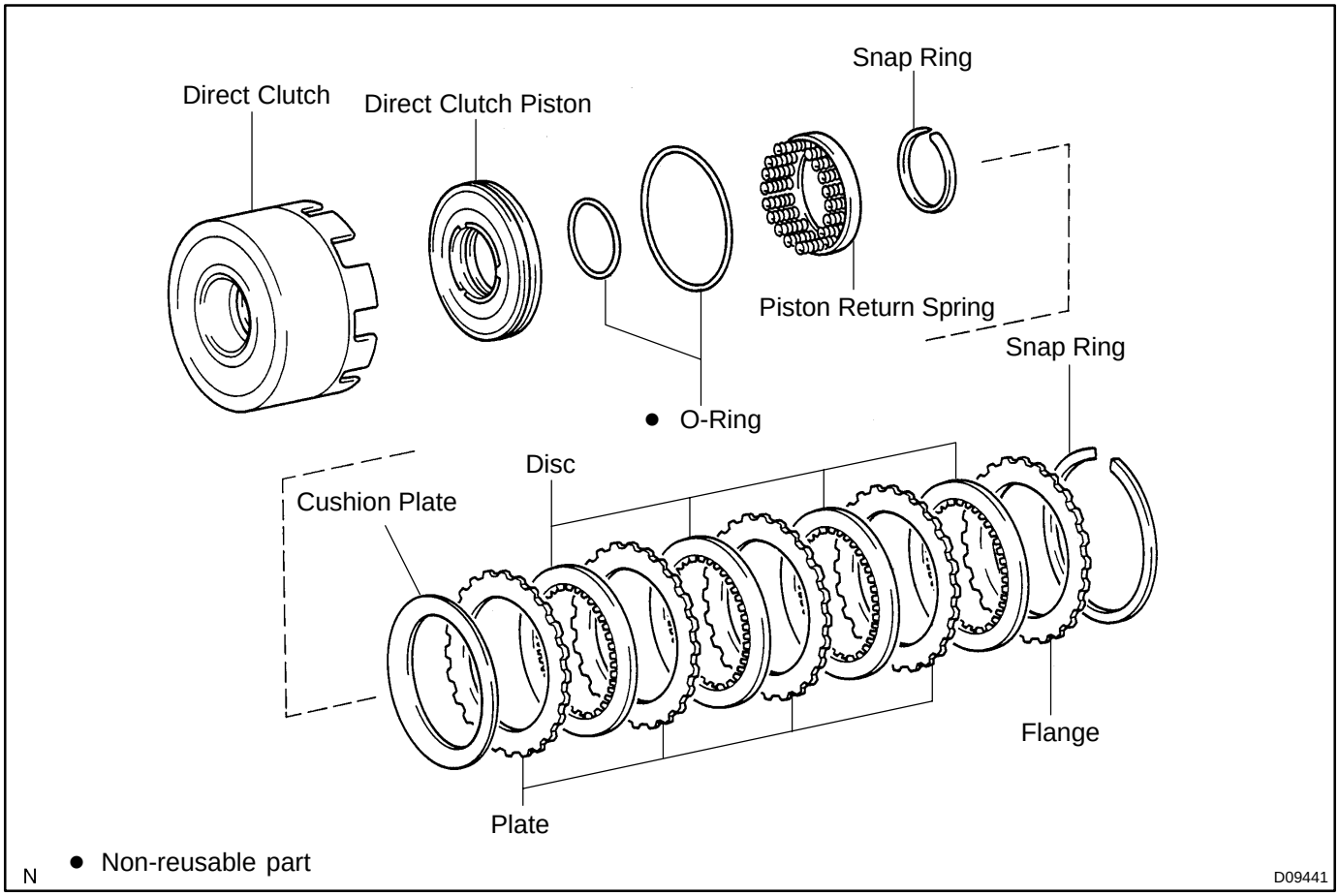
● Non-reusable part

D01414

DIRECT CLUTCH

COMPONENTS

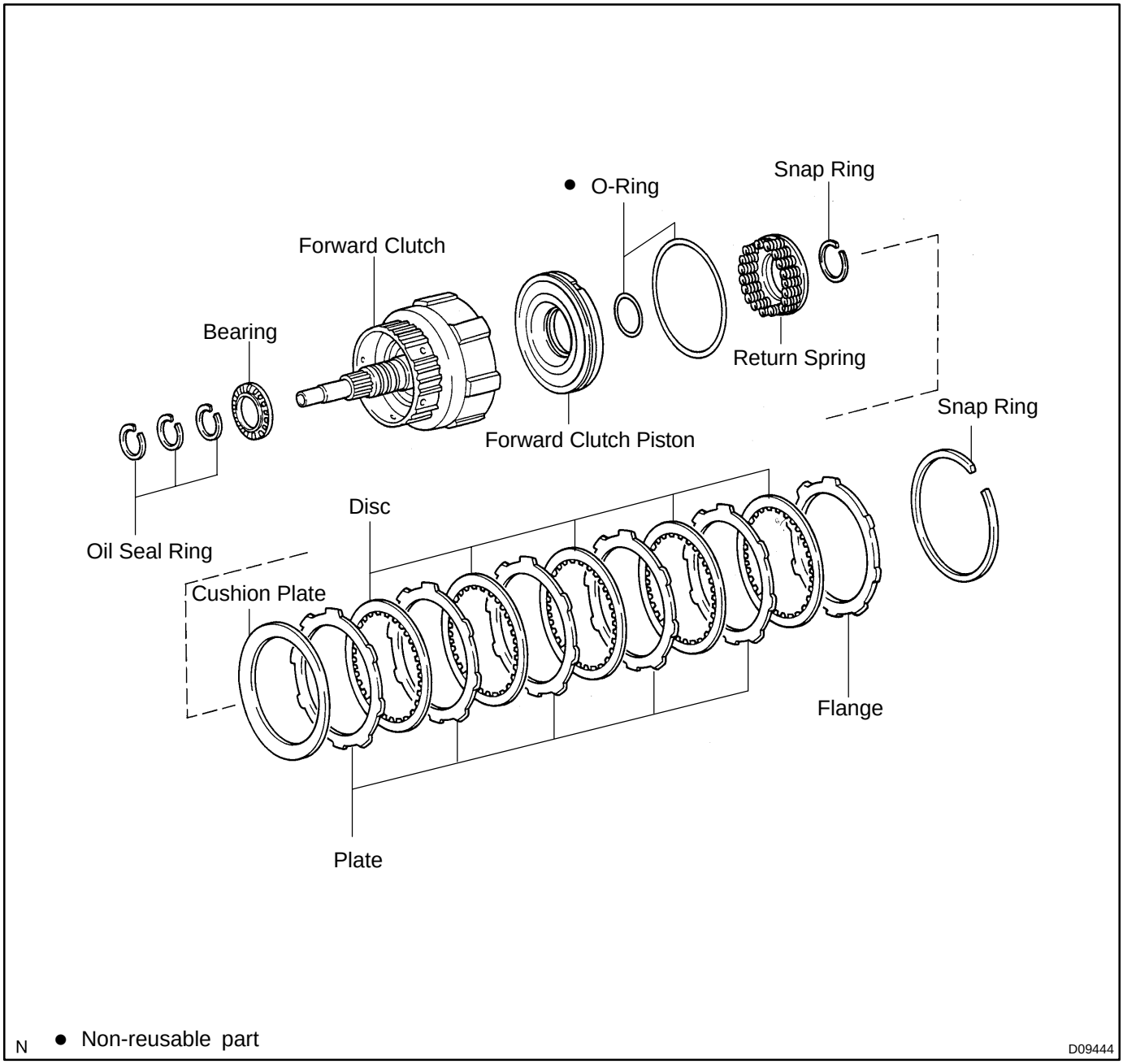
AT04R-02



FORWARD CLUTCH

COMPONENTS

AT04V-02



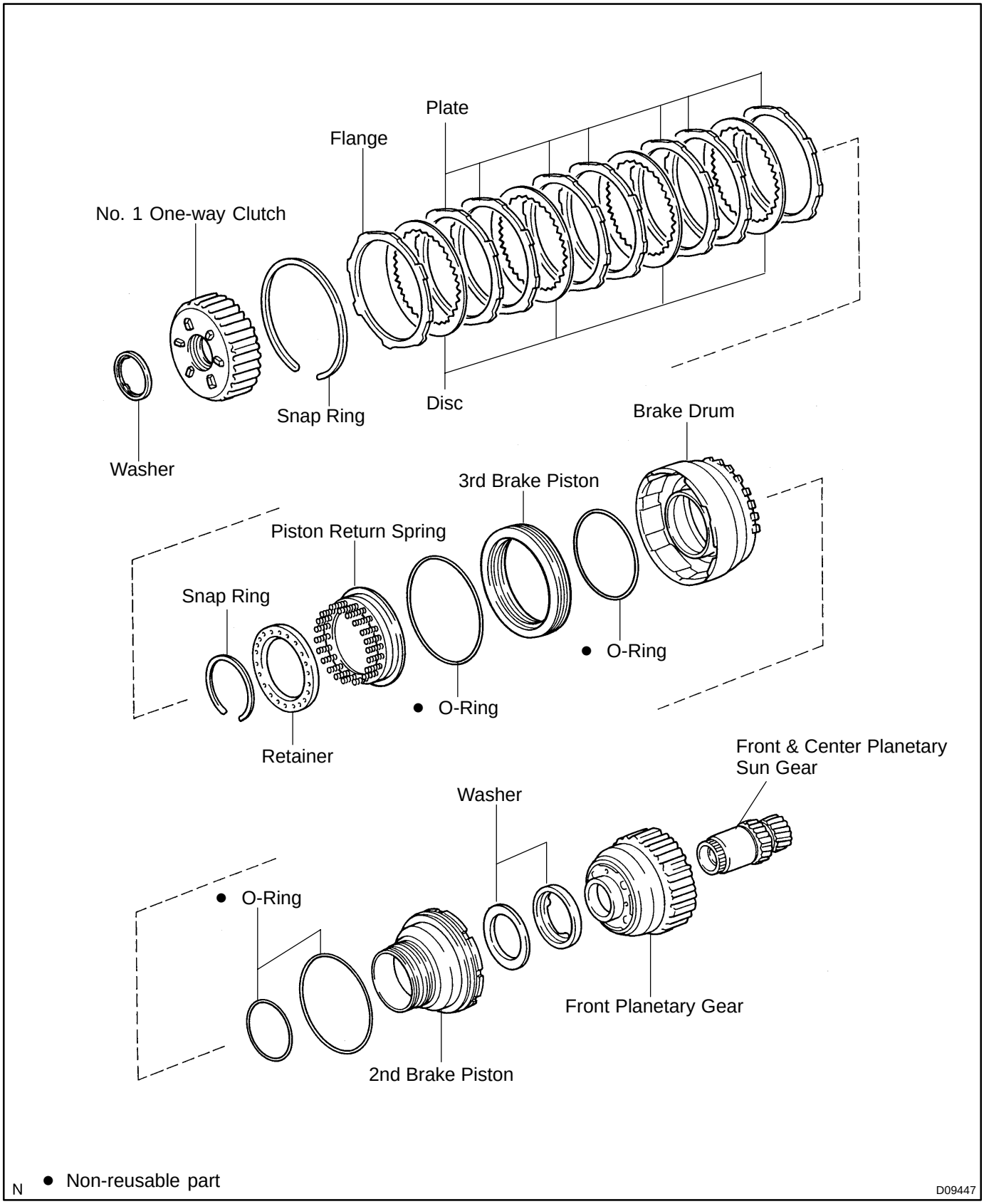
N ● Non-reusable part

D09444

MULTIPLE DISC BRAKE

AT04Z-02

COMPONENTS



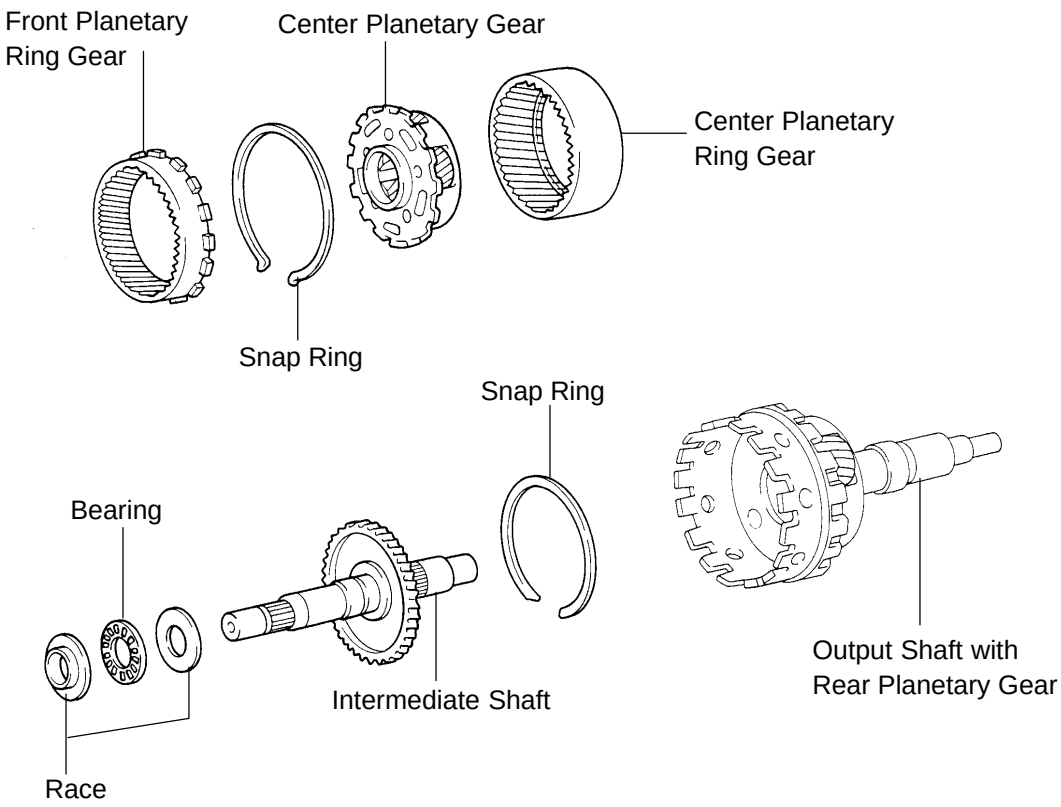
N ● Non-reusable part

D09447

CENTER PLANETARY GEAR

COMPONENTS

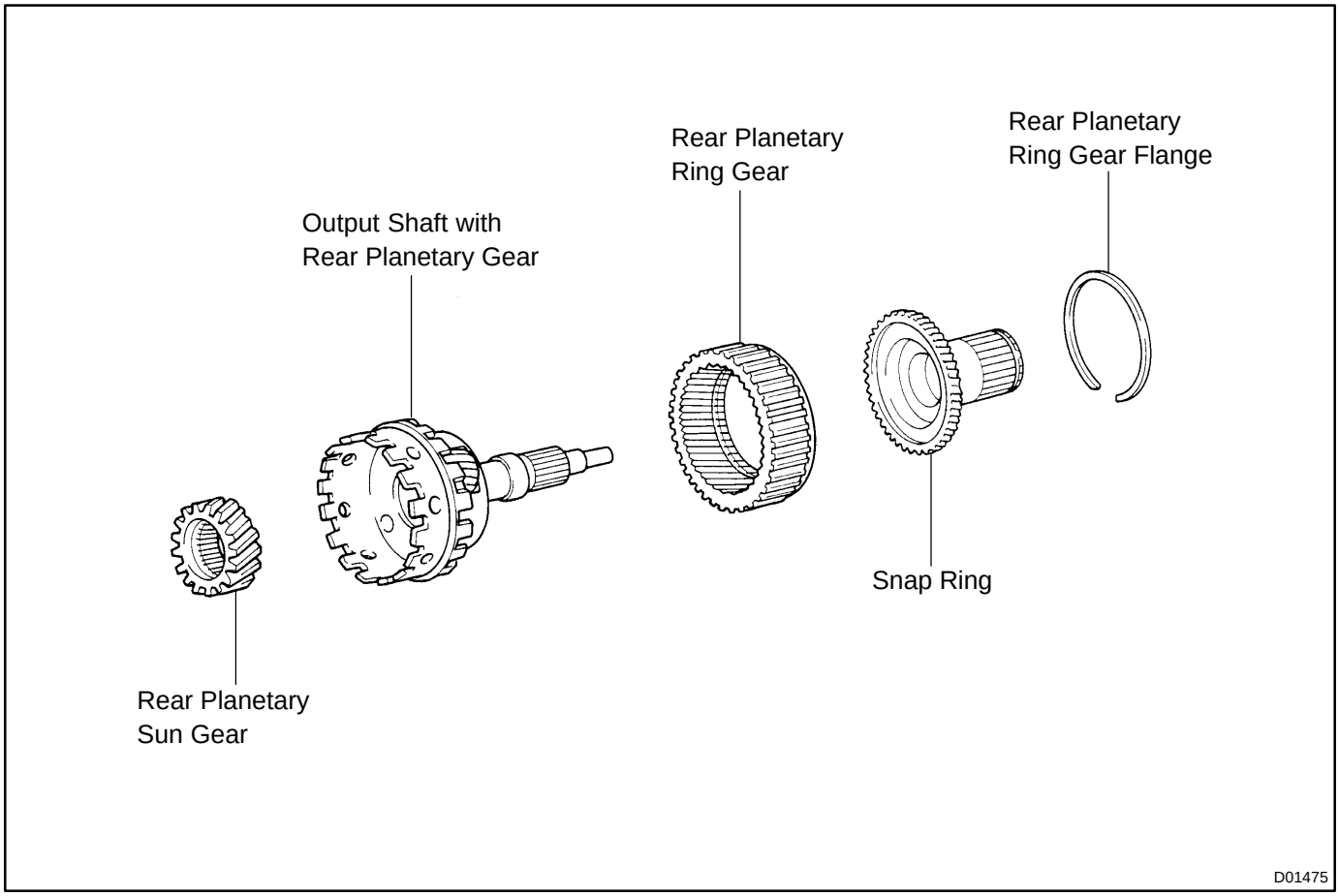
AT053-01



REAR PLANETARY GEAR

COMPONENTS

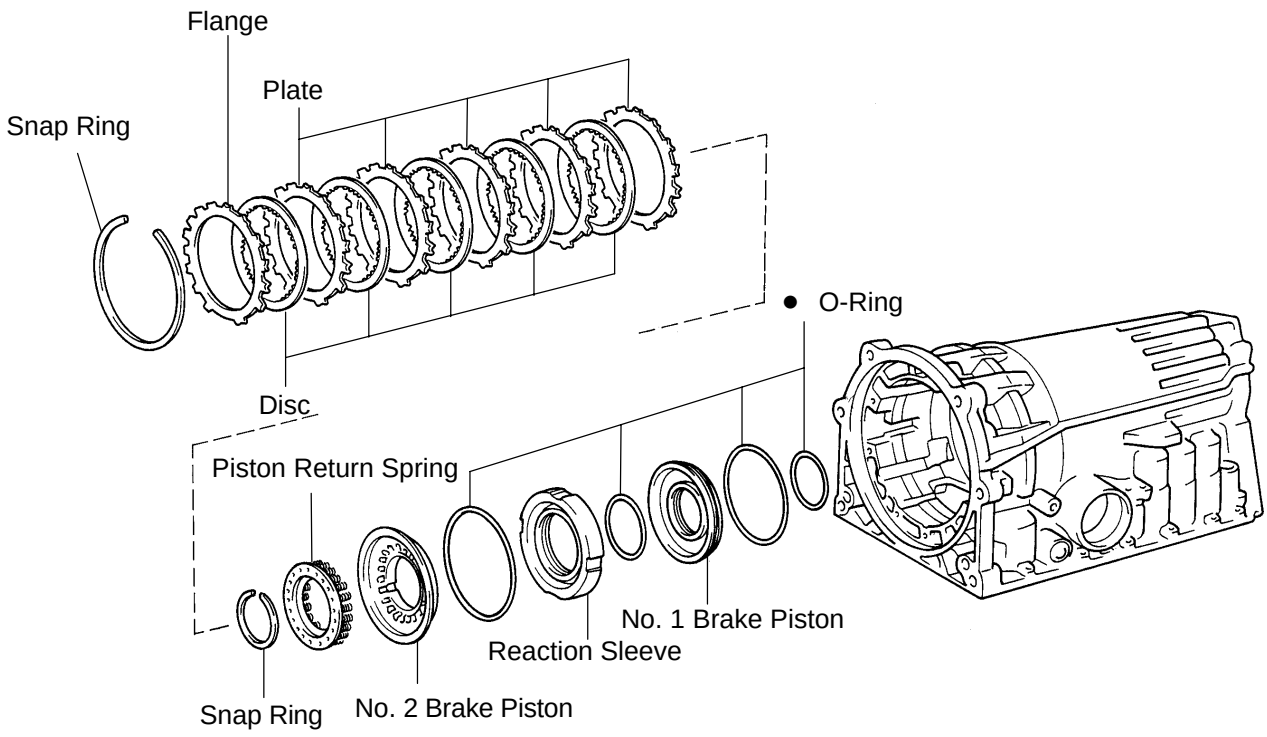
AT057-01



FIRST AND REVERSE BRAKE

COMPONENTS

AT05B-02



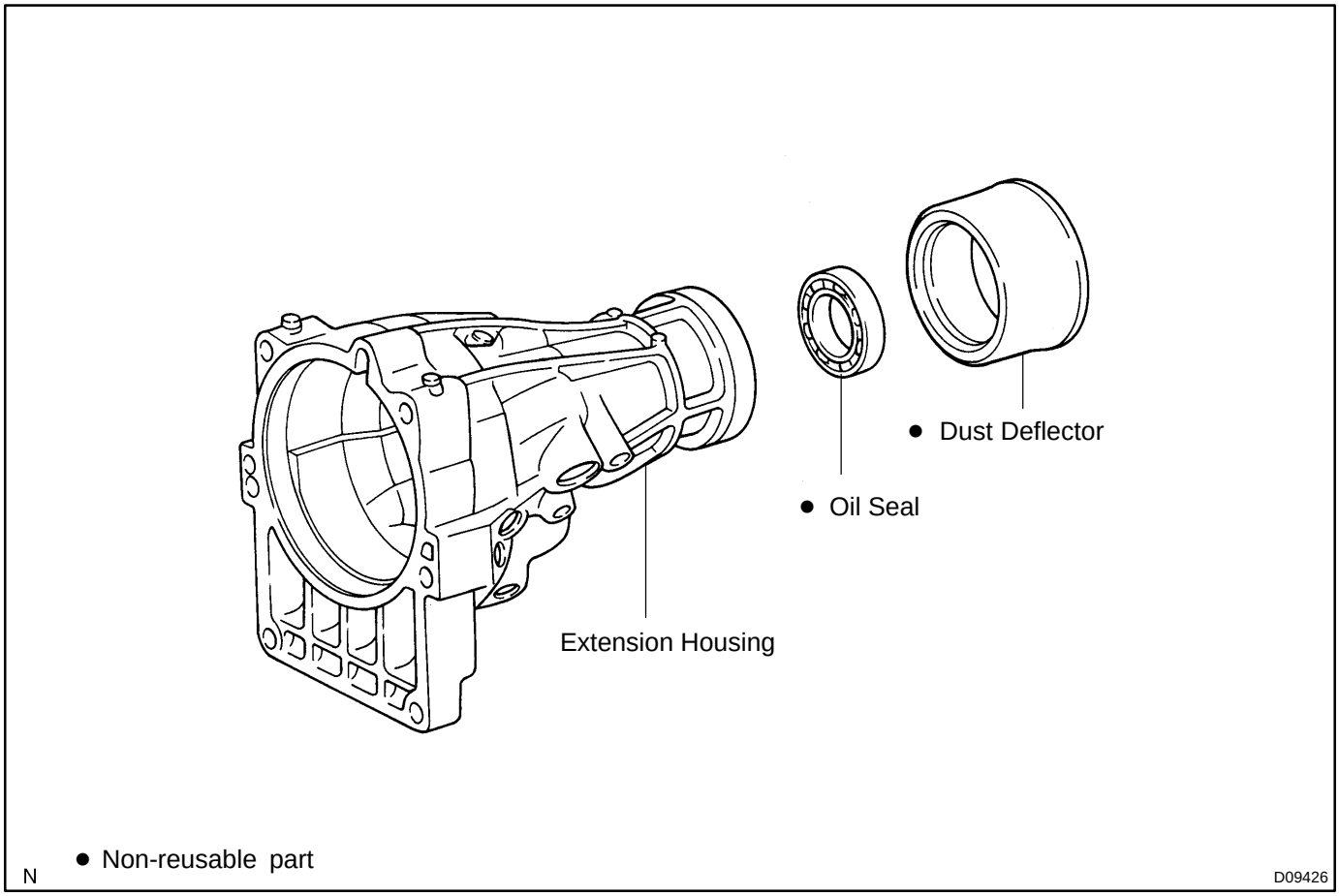
N ● Non-reusable part

D09451

EXTENSION HOUSING

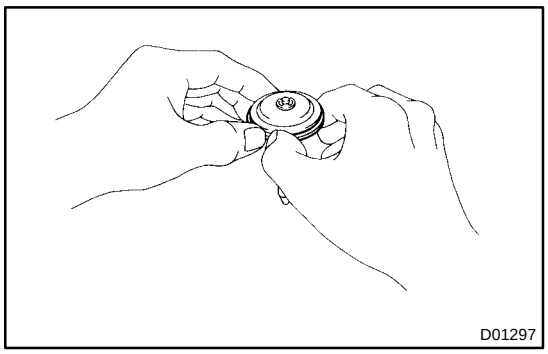
COMPONENTS

AT0Y1-01

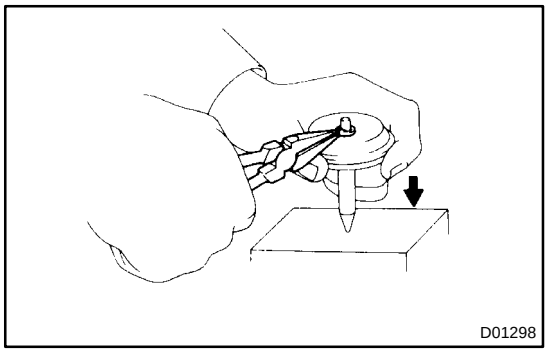


AT04G-01

DISASSEMBLY



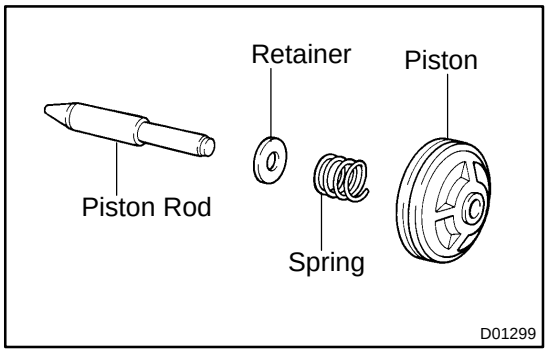
1. REMOVE 3RD COAST BRAKE PISTON OIL SEAL RING



2. REMOVE 3RD COAST BRAKE PISTON ROD

(a) Firmly hold down the piston, then compress the compression spring.

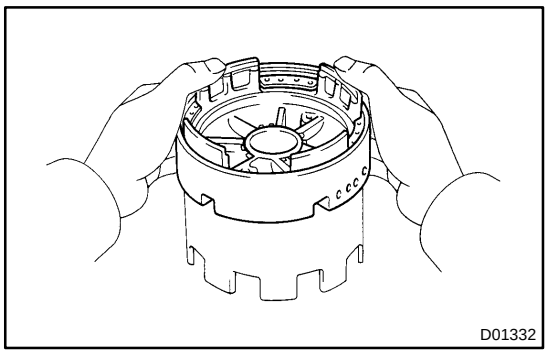
(b) Remove the E-ring.



(c) Remove the compression spring, retainer and piston rod.

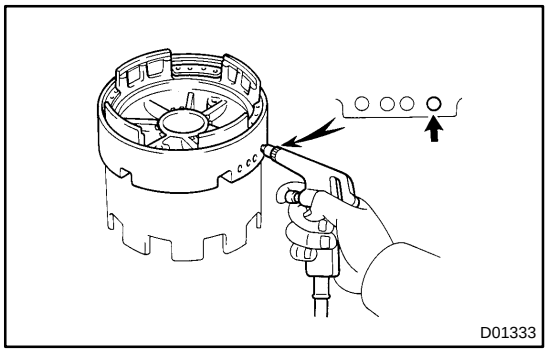
AT04O-02

DISASSEMBLY

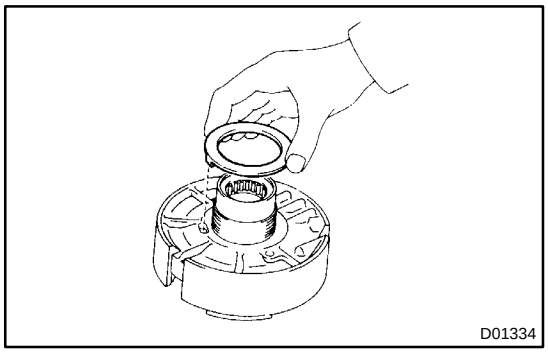


1. CHECK PISTON OPERATION OF O/D BRAKE

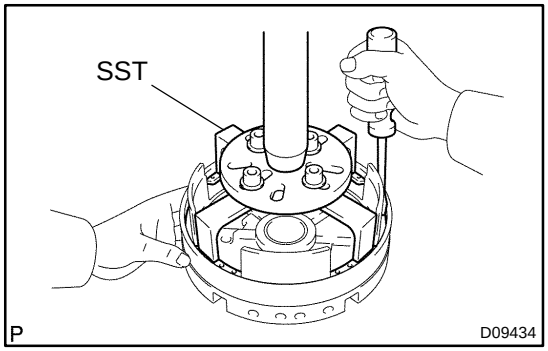
(a) Place the O/D support assembly onto the direct clutch assembly.



(b) Apply compressed air (392 kPa, 4 kgf/cm^2, 57 psi) into the oil passage and be sure that the O/D brake piston moves smoothly.



2. REMOVE CLUTCH DRUM THRUST WASHER FROM O/D SUPPORT

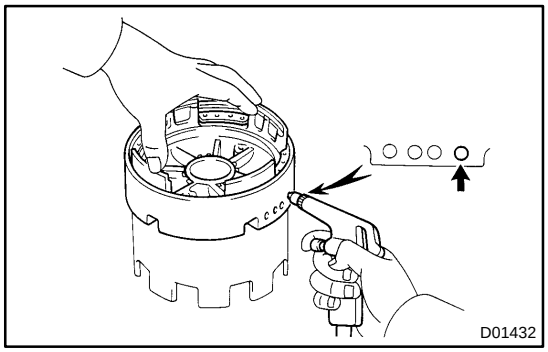


3. REMOVE PISTON RETURN SPRING

(a) Place SST on the spring retainer, and compress the return spring with a press.
SST 09387-00100

(b) Remove the snap ring with a screwdriver.

(c) Remove the piston return spring.

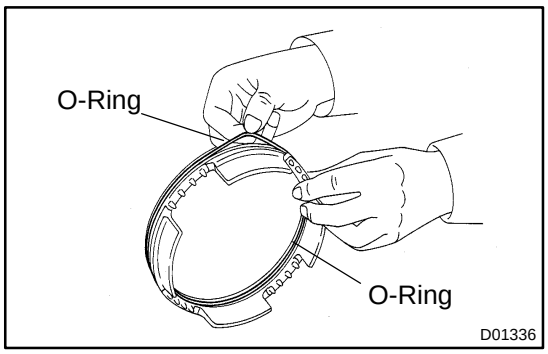


4. REMOVE O/D BRAKE PISTON

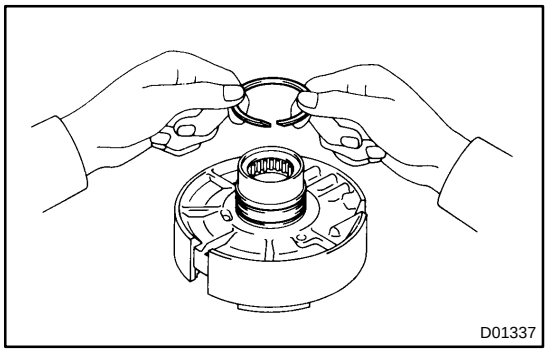
(a) Place the O/D support onto the direct clutch assembly.

(b) Hold the O/D brake piston so it does not slant, and apply compressed air (392 kPa, 4 kgf/cm^2, 57 psi) into the passage to remove the O/D brake piston.

(c) Remove the O/D brake piston.



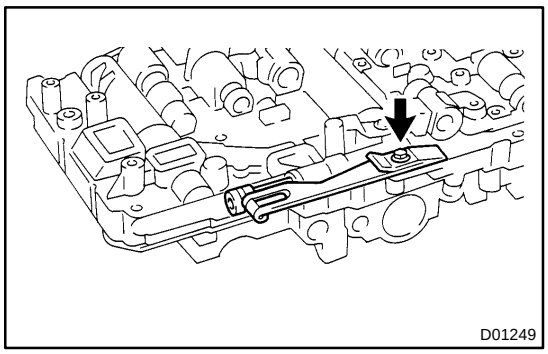
(d) Remove the 2 O-rings.



5. REMOVE 2 OIL SEAL RINGS

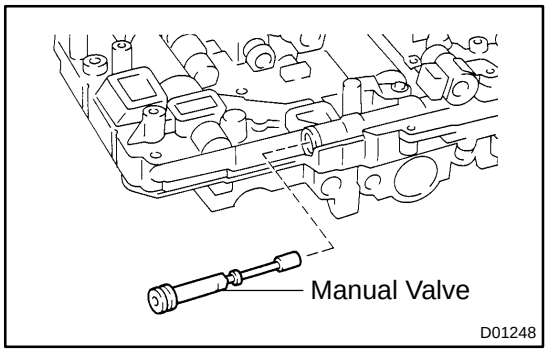
AT05I-02

DISASSEMBLY

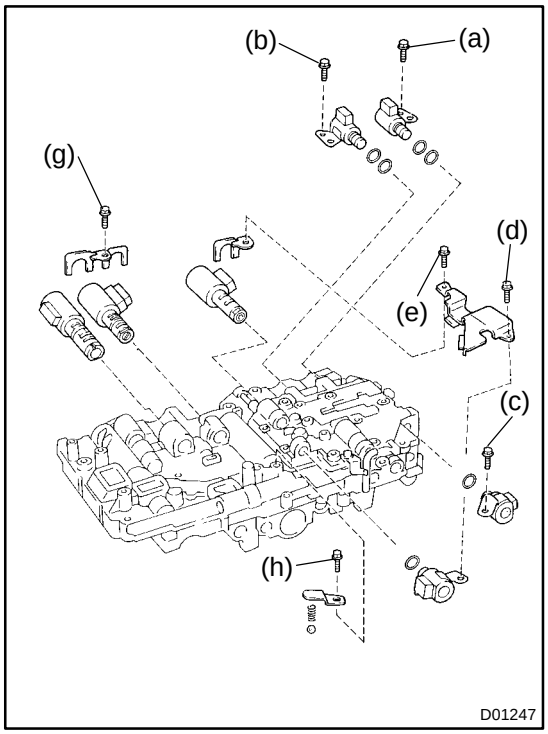


1. REMOVE DETENT SPRING AND SPRING PLATE

Remove the bolt, detent spring and spring plate.

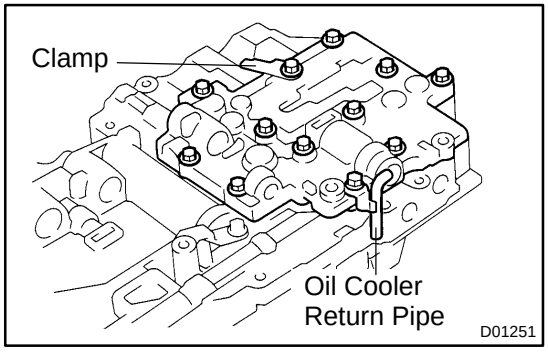


2. REMOVE MANUAL VALVE



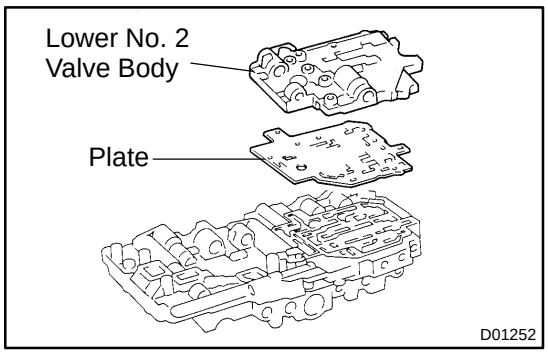
3. REMOVE 7 SOLENOIDS

(a) Remove the bolt and shift solenoid valve No. 1.
(b) Remove the bolt and shift solenoid valve No. 3.
(c) Remove the bolt and shift solenoid valve No. 2.
(d) Remove the bolt and shift solenoid valve No. 4.
(e) Remove the bolt, No. 2 lock plate and shift solenoid valve SLN.
(f) Remove the oil guide plate.
(g) Remove the bolt, No. 1 lock plate and shift solenoid valve SLU, SLT.
(h) Remove the bolt, pressure relief valve spring seat, spring and ball.
(i) Remove the 6 O-rings from shift solenoid valve No. 1, No. 2, No. 3 and No. 4.

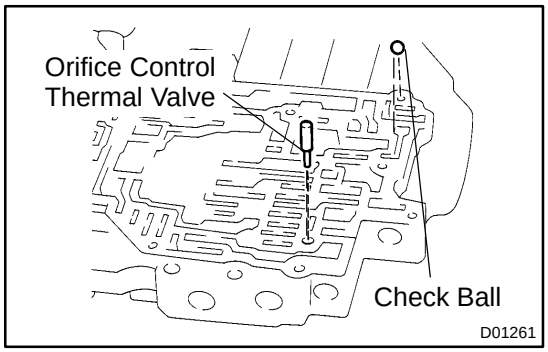


4. REMOVE LOWER NO. 2 VALVE BODY

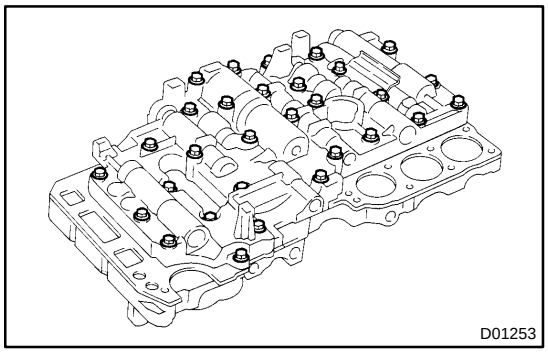
(a) Remove the 12 bolts. 2 of them are attached to the oil cooler return pipe and clamp. So remove them all together.



(b) Remove the lower No. 2 valve body.
(c) Remove the plate.
(d) Remove the strainer.

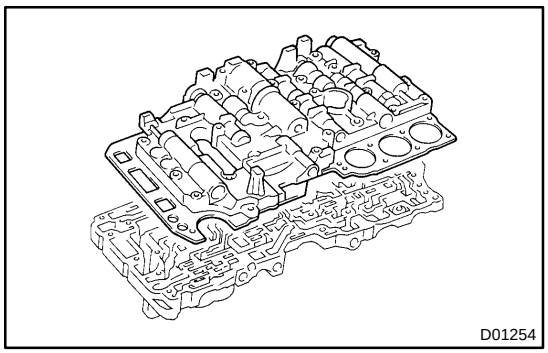


(e) Remove the orifice control thermal valve and check ball.

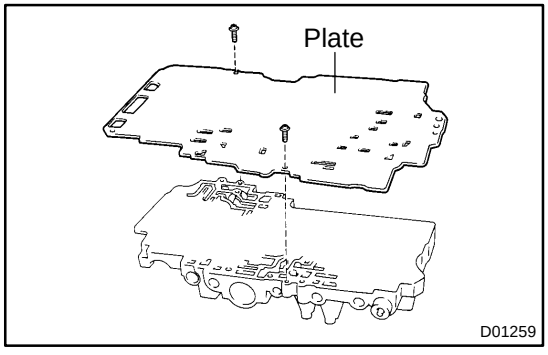


5. REMOVE UPPER VALVE BODY

(a) Turn over assembly and remove the 30 bolts.
(b) Remove the plate from the upper valve body.



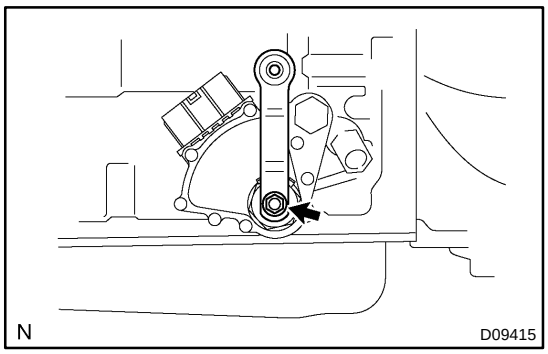
(c) Remove the upper valve body with the plate.
(d) Remove the check valve and spring.



(e) Turn over upper valve body, remove the 2 screws and plate.
(f) Remove the 2 strainers.

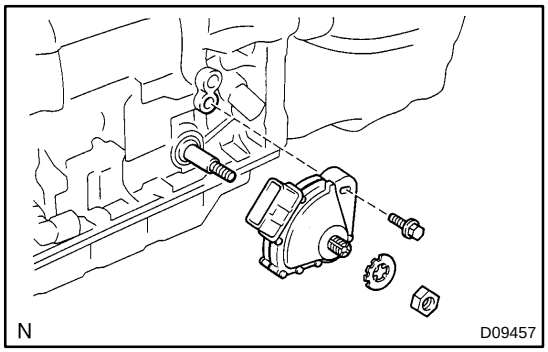
AT0XZ-01

DISASSEMBLY



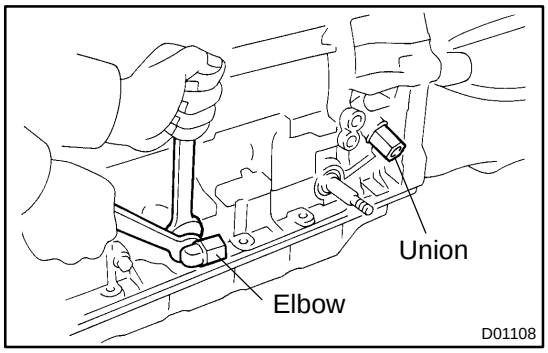
1. REMOVE CONTROL SHAFT LEVER

Remove the nut, washer and control shaft lever.



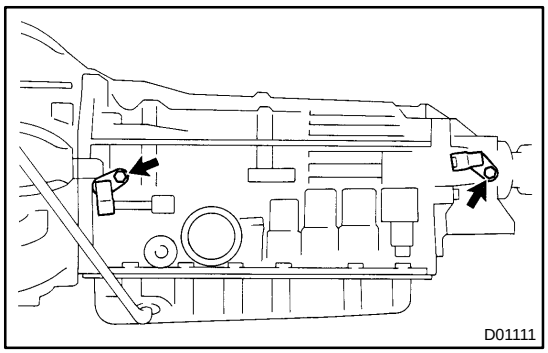
2. REMOVE PARK/NEUTRAL POSITION SWITCH

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



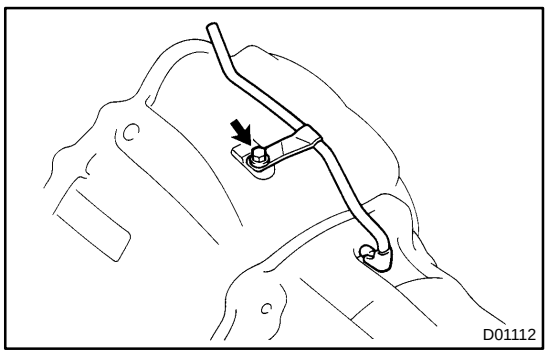
3. REMOVE UNION AND ELBOW

(a) Remove the union and elbow.
(b) Remove the 2 O-rings from the union and elbow.



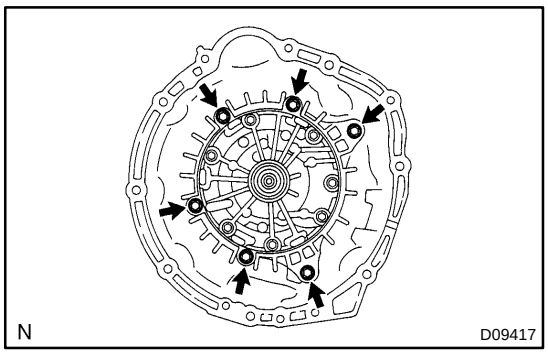
4. REMOVE SPEED SENSOR

(a) Remove the 2 bolts and 2 speed sensors.
(b) Remove the O-ring from each one.

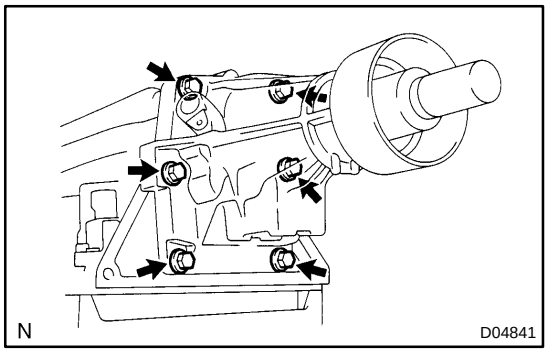


5. REMOVE TRANSMISSION HOUSING

(a) Remove the bolt and breather hose.



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



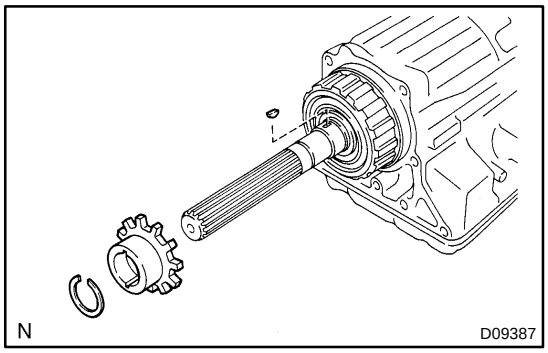
6. REMOVE EXTENSION HOUSING

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

HINT:

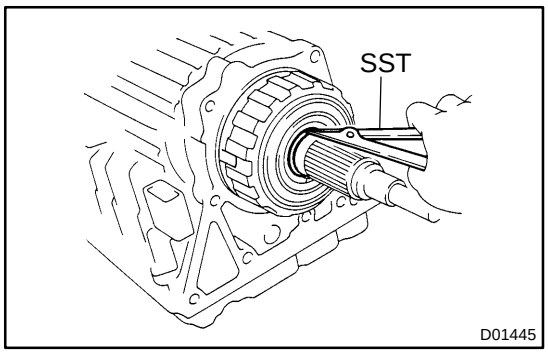
If necessary, tap the extension housing with a plastic hammer.

(c) Remove the extension housing gasket.



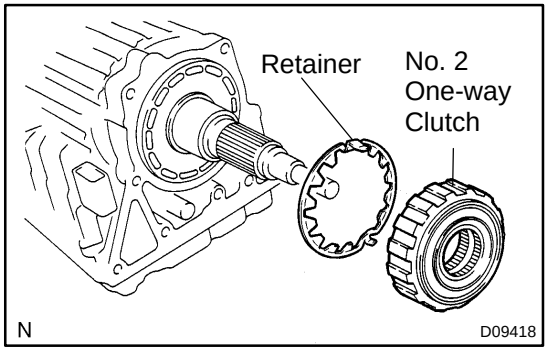
7. REMOVE SENSOR ROTOR AND KEY

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

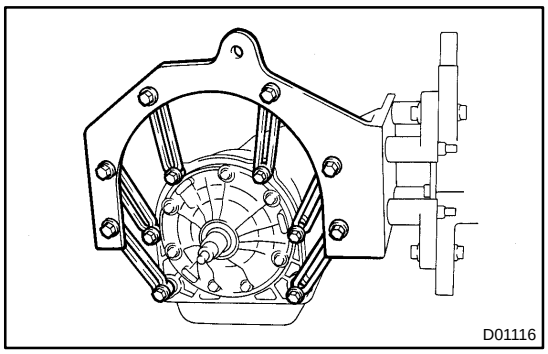


8. REMOVE ONE-WAY CLUTCH

(a) Using SST, remove the snap ring.
SST 09350-30020 (09350-07070)



(b) Remove the No. 2 one-way clutch and the retainer.



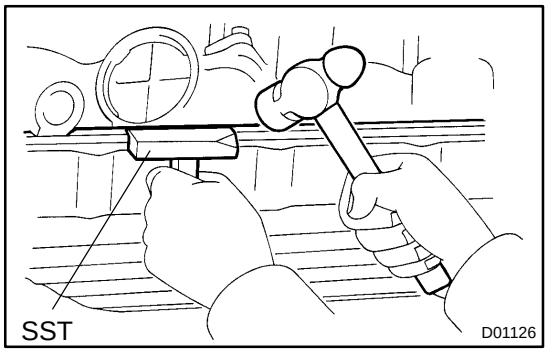
9. INSTALL TRANSMISSION CASE ON OVERHAUL ATTACHMENT

10. REMOVE OIL PAN

NOTICE:

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

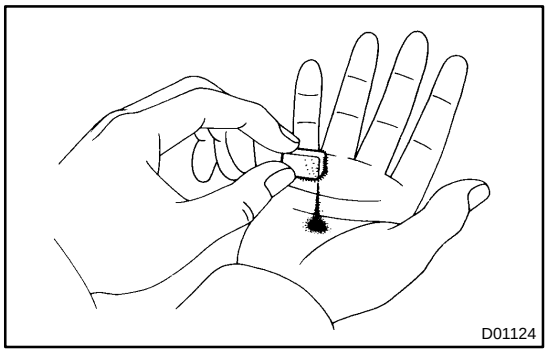
(a) Remove the 19 bolts.



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

NOTICE:

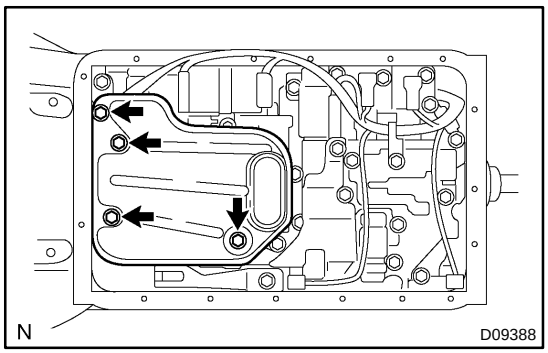
Be careful not to damage the oil pan flange.



11. EXAMINE PARTICLES IN PAN

Remove the magnets and use them to collect steel particles. Carefully lock at the foreign matter and particles in the pan and on the magnets to anticipate the type of wear you will find in the transmission.

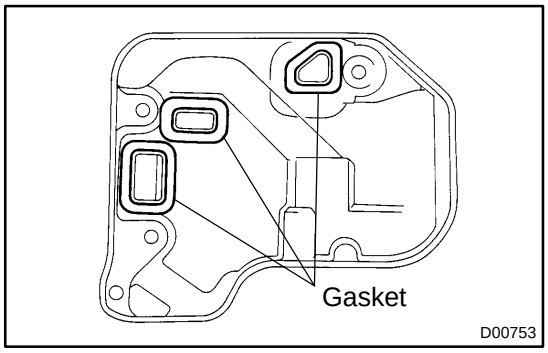
- Steel (magnetic): bearing, gear and clutch plate wear
- Brass (non-magnetic): bushing wear



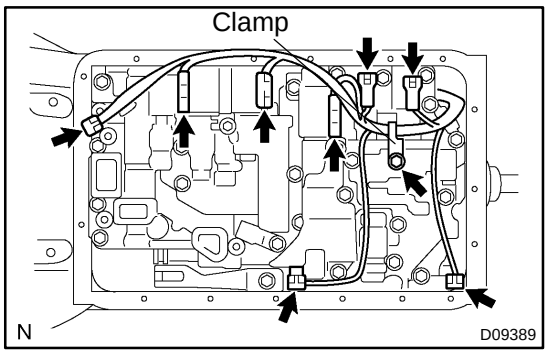
12. REMOVE OIL STRAINER

(a) Turn over the transmission.

(b) Remove the 4 bolts holding the oil strainer to the valve body.

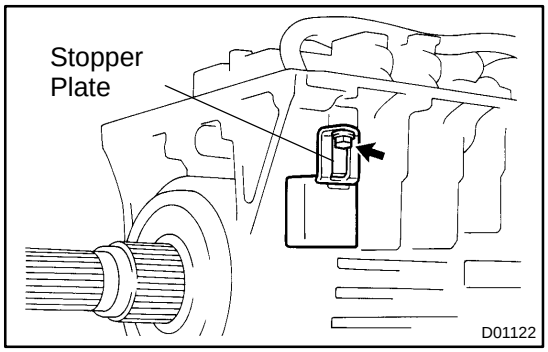


(c) Remove the 3 gaskets from the oil strainer.

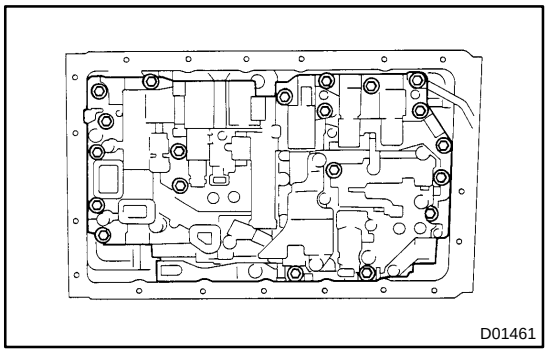


13. REMOVE TRANSMISSION WIRE

(a) Remove the ATF temperature sensor.
(b) Remove the bolt and clamp.
(c) Disconnect the 7 connectors from the shift solenoid valves.

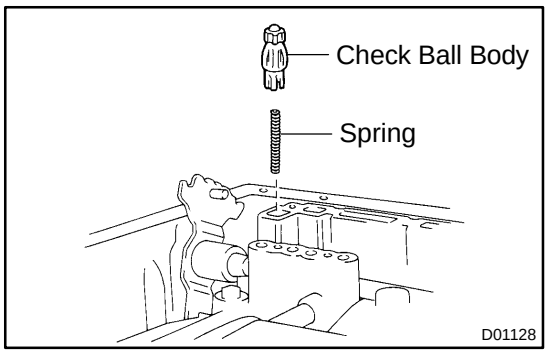


(d) Remove the bolt and stopper plate from the case.
(e) Pull the transmission wire out of the transmission case.
(f) Remove the O-ring from the grommet.



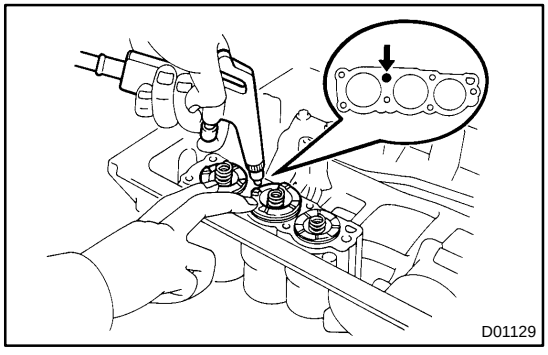
14. REMOVE VALVE BODY

(a) Remove the 20 bolts.
(b) Remove the valve body.



15. REMOVE CHECK BALL BODY

Remove the check ball body and spring.

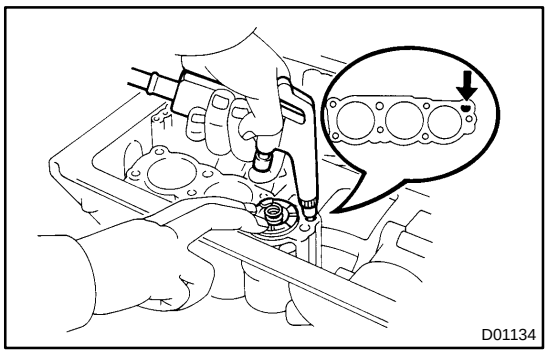


16. REMOVE ACCUMULATOR SPRING AND PISTON

(a) Applying compressed air to the oil hole, remove the B_2 and C_2 accumulator pistons and springs.
(b) Remove the O-rings from each pistons.

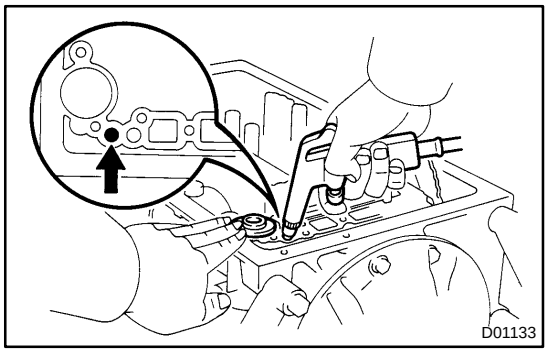
NOTICE:

Take care as the B_0 and C_0 accumulator piston may jump out.



(c) Applying compressed air to the oil hole, remove the B_0 accumulator piston and spring.
(d) Remove the O-rings from the piston.

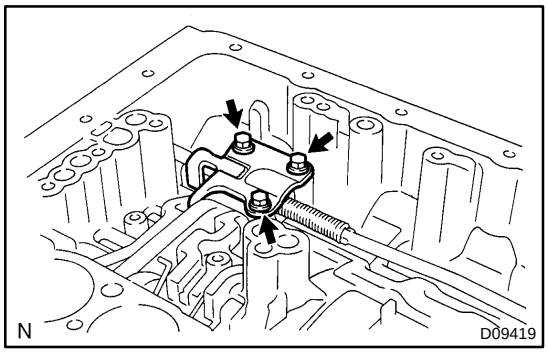
NOTICE:
Take care as the C_0 accumulator piston may jump out.



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

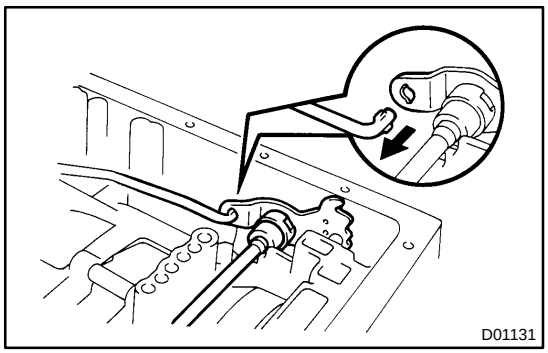
HINT:
The C_0 accumulator piston is deviated in 2 parts, so if only the top part is removed, after removing the spring reapply compressed air to remove the bottom part.

(f) Remove the O-rings from the piston.

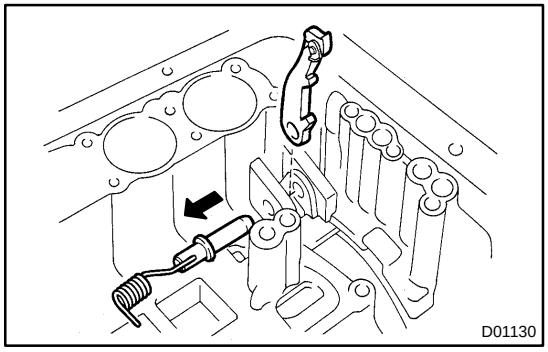


17. REMOVE PARKING LOCK ROD AND PAWL

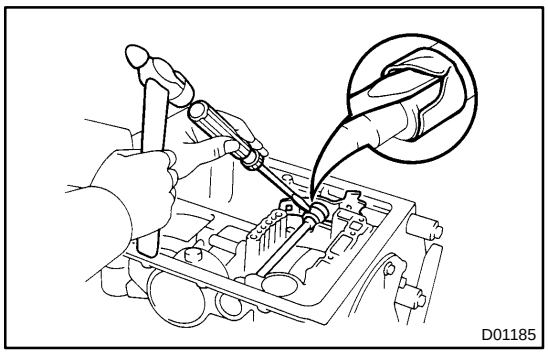
(a) Remove the 3 bolts and parking lock pawl bracket.



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

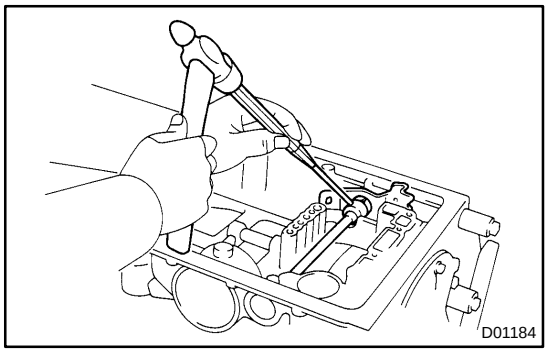


(c) Pull out the parking lock pawl shaft from the front side, then remove the lock pawl and spring.
(d) Remove the E-ring from the shaft.



18. REMOVE MANUAL VALVE LEVER SHAFT

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

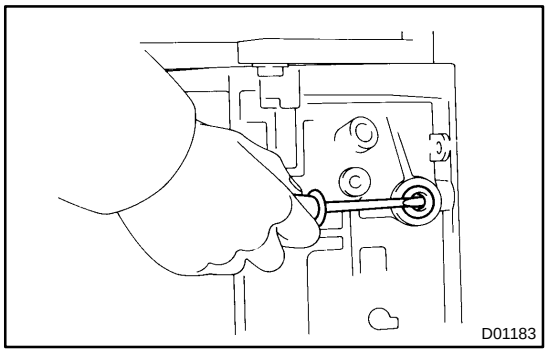


(b) Using a pin punch and hammer, drive out the spring pin.

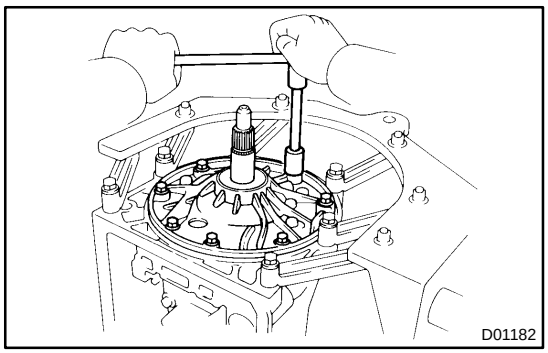
HINT:

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

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

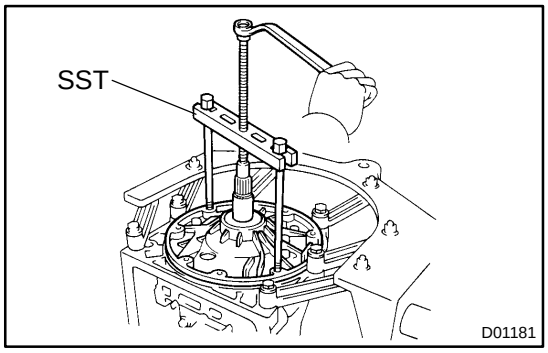


(d) Using a screwdriver, remove the 2 oil seals.



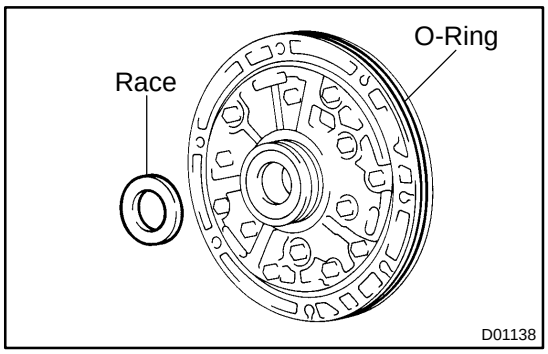
19. REMOVE OIL PUMP

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

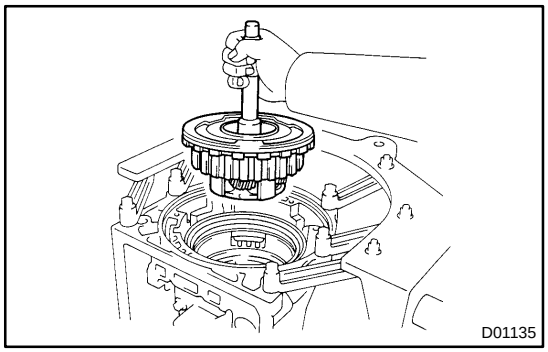


(b) Using SST, remove the oil pump.

SST 09350-30020 (09350-07020)

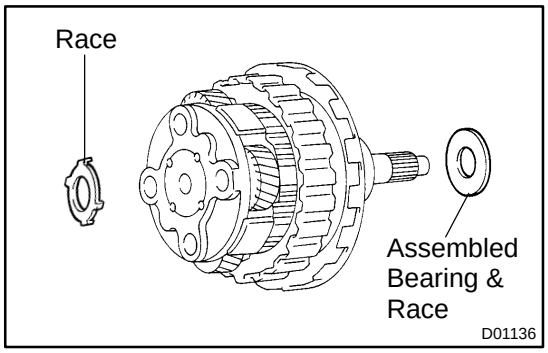


(c) Remove the race from the oil pump.
(d) Remove the O-ring from the oil pump.

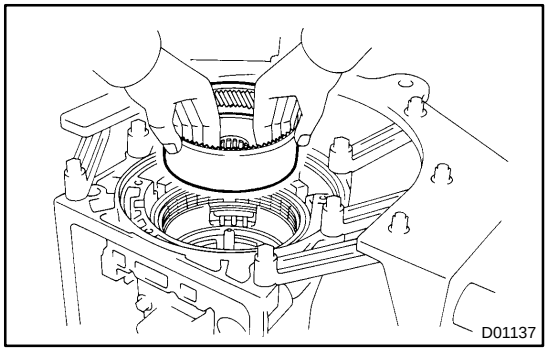


20. REMOVE O/D PLANETARY GEAR UNIT WITH O/D DIRECT CLUTCH

(a) Remove the O/D planetary gear with the O/D direct clutch from the transmission case.

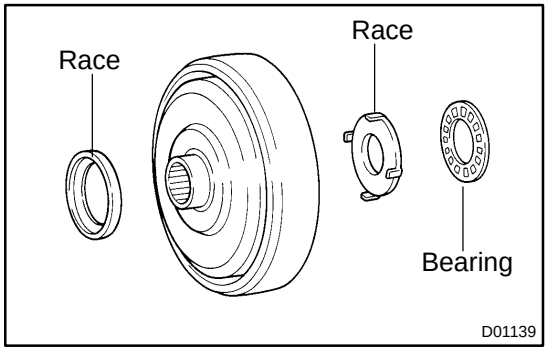


(b) Remove the race and assembled bearing & race.

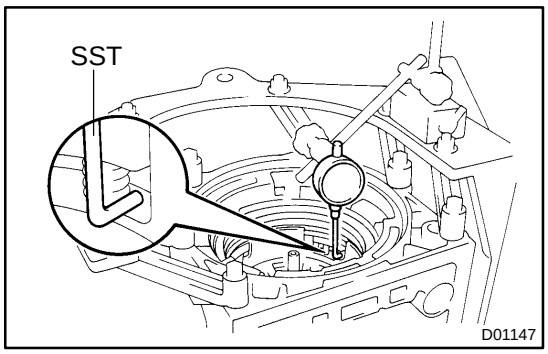


21. REMOVE O/D PLANETARY RING GEAR

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

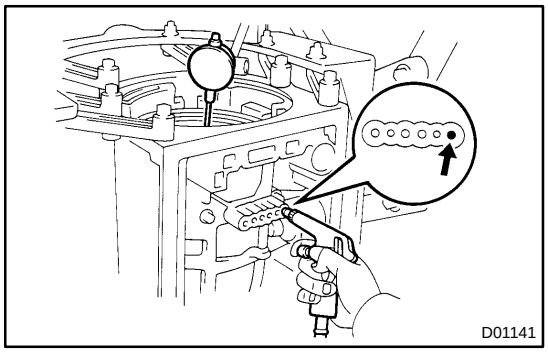


(b) Remove the bearing and 2 races from the planetary ring gear.



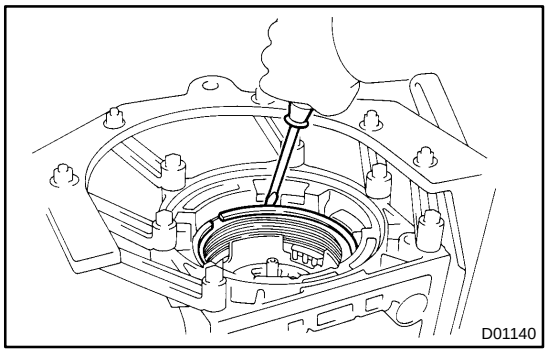
22. CHECK PISTON STROKE OF O/D BRAKE

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



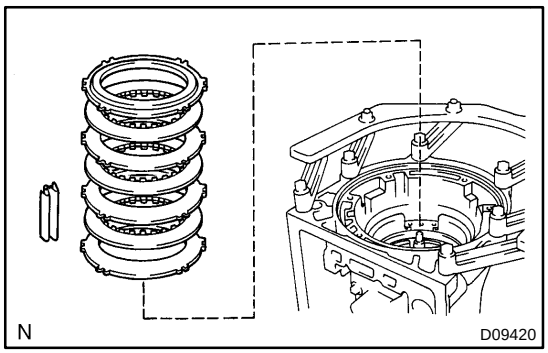
(b) Measure the stroke while applying and releasing compressed air (392 kPa, 4 kgf/cm^2, 57 psi).
Piston stroke: 1.32 - 1.62 mm (0.052 - 0.064 in.)

If the stroke is non-standard, inspect the discs.



23. REMOVE FLANGE, PLATE AND DISC OF O/D BRAKE

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

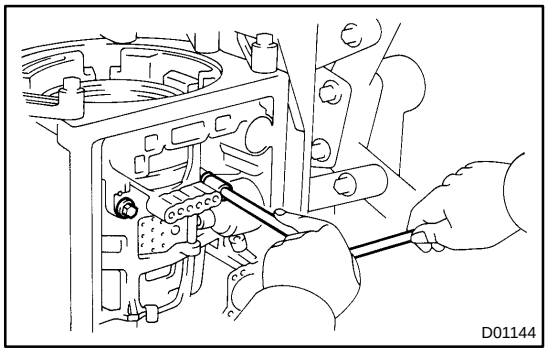


(b) Remove the O/D brake pack as a set.

HINT:

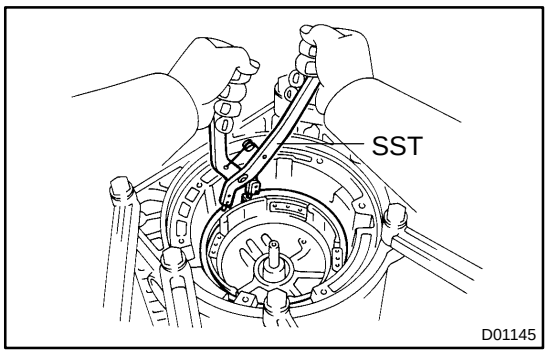
Flange, 3 plates and 3 discs

(c) Remove the spring from the case.

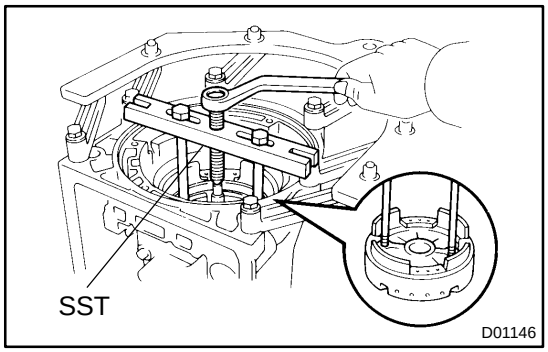


24. REMOVE O/D SUPPORT ASSEMBLY

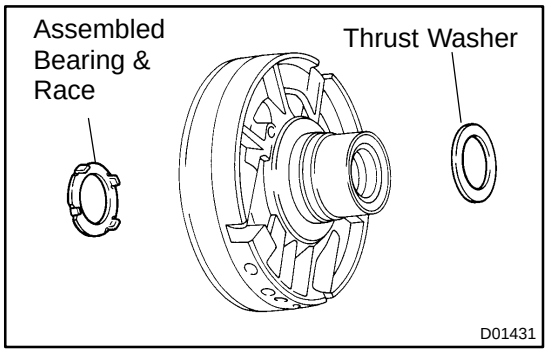
(a) Remove the 2 bolts holding the O/D support assembly from the case.



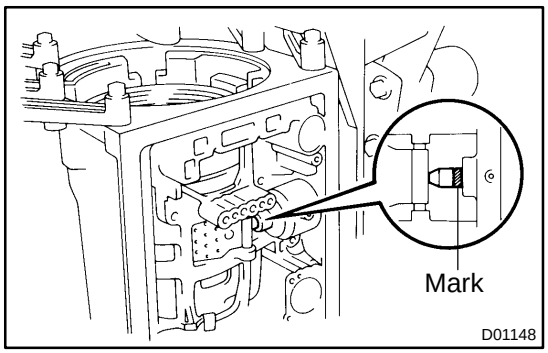
(b) Using SST, remove the snap ring.
SST 09350-30020 (09350-07060)



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

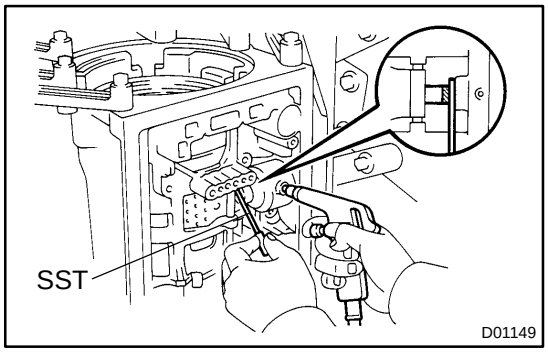


(d) Remove the assembled bearing & race and thrust washer from the O/D support.



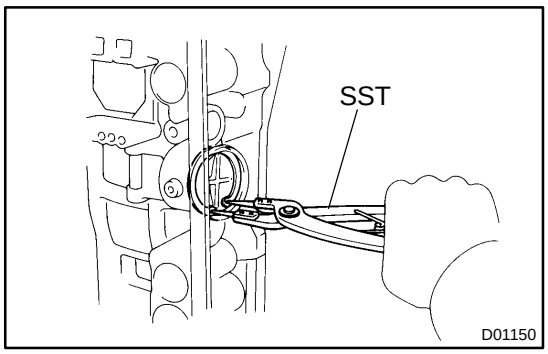
25. CHECK PISTON ROD STROKE OF 3RD COAST BRAKE

(a) Using a water proof pen, place a mark in the 3rd coast brake piston rod, as shown in the illustration.



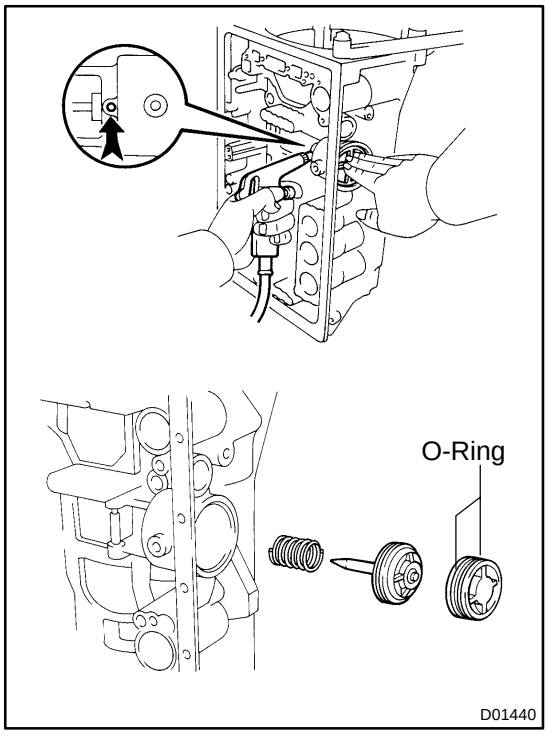
(b) Using SST, measure the stroke while applying compressed air (392 kPa, 4 kgf/cm^2, 57 psi).
SST 09240-00020
Piston rod stroke: 2.0 - 3.0 mm (0.079 - 0.118 in.)

If the stroke is non-standard, inspect the brake band.



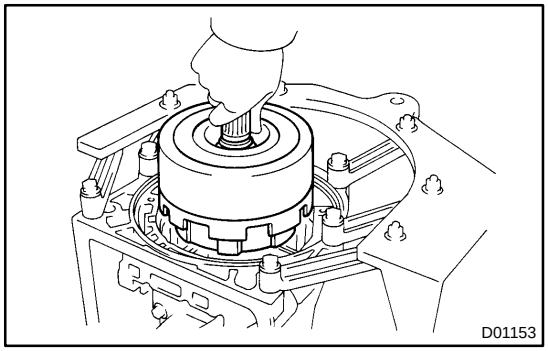
26. REMOVE 3RD COAST BRAKE COVER, PISTON ASSEMBLY AND SPRING

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



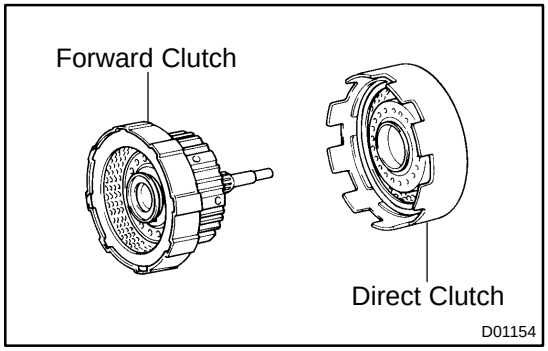
(b) Applying compressed air to the oil hole, remove the 3rd coast brake cover, piston and spring.

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

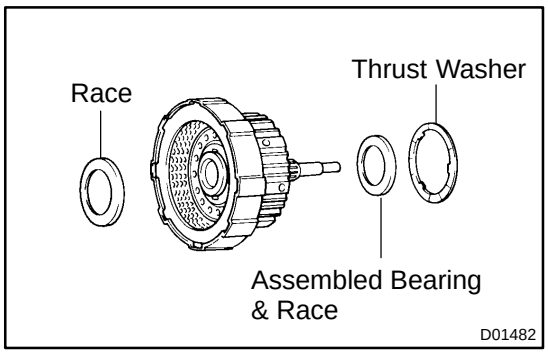


27. REMOVE DIRECT CLUTCH WITH FORWARD CLUTCH

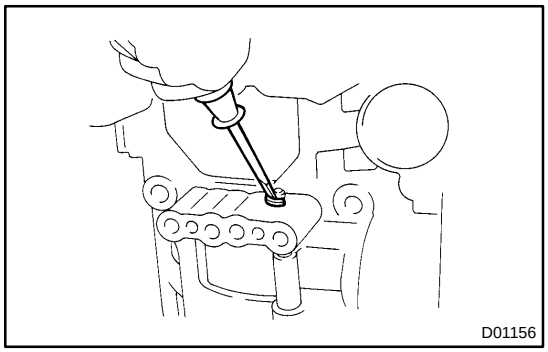
(a) Remove the direct clutch with forward clutch from the case.



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



(c) Remove the assembled bearing & race, thrust washer and race from the forward clutch.



28. REMOVE 3RD COAST BRAKE BAND

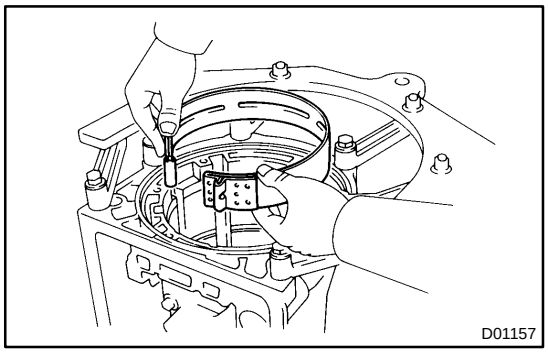
(a) Using a screwdriver, remove the E-ring from the pin.

HINT:

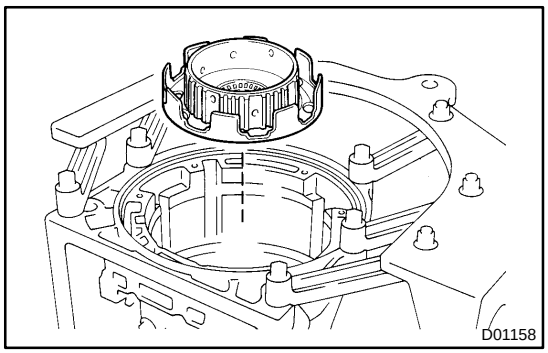
Apply the grease to the E-ring and pin before the work so that the ring does not fly out.

(b) Remove the pin from the brake band.

(c) Remove the E-ring from the pin.

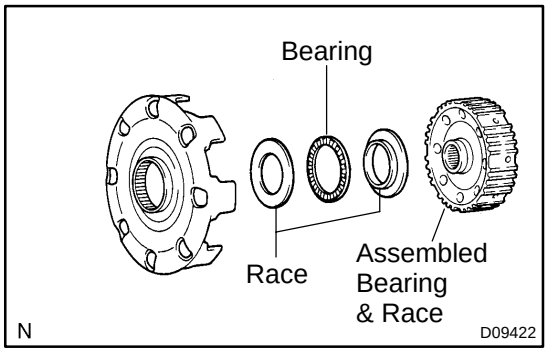


(d) Remove the 3rd coast brake band from the case.

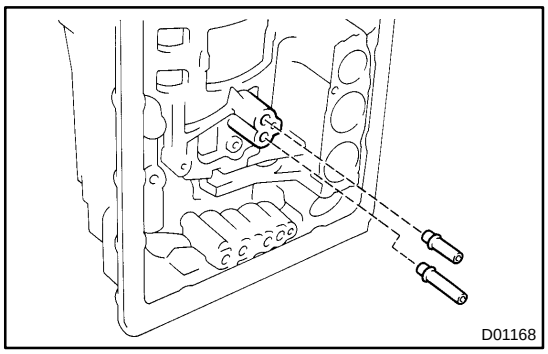


29. REMOVE FORWARD CLUTCH HUB AND SUN GEAR INPUT DRUM

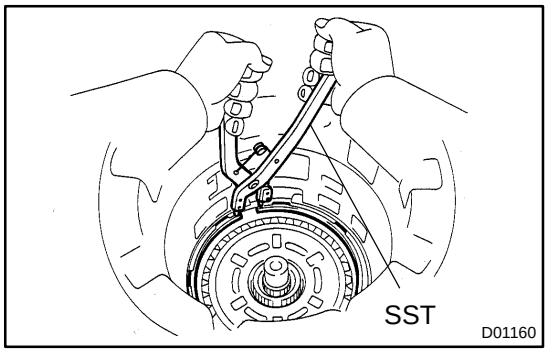
(a) Remove the forward clutch hub and the sun gear input drum.



(b) Remove the assembled bearing & race, 2 races, bearing and sun gear input drum, from forward clutch hub.

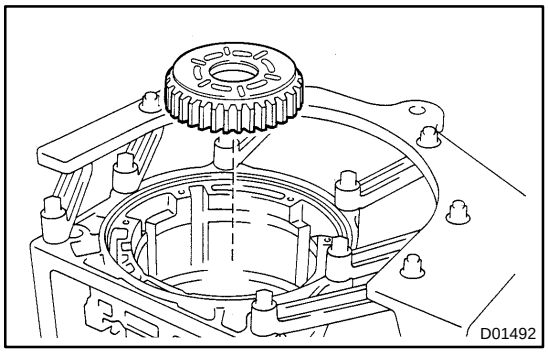


30. REMOVE 2 BRAKE DRUM GASKETS

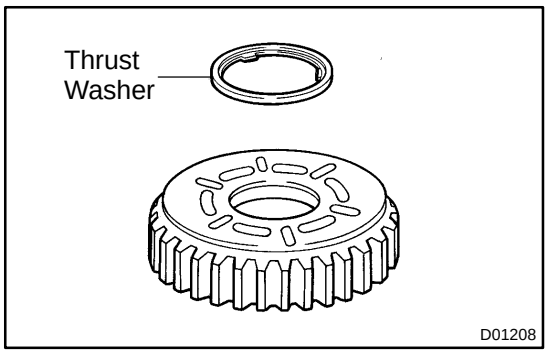


31. REMOVE NO. 1 ONE-WAY CLUTCH MULTIPLE DISC BRAKE AND FRONT PLANETARY GEAR

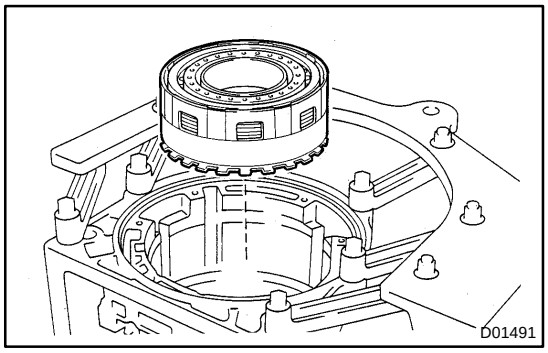
(a) Using SST, remove the snap ring.
SST 09350-30020 (09350-07060)



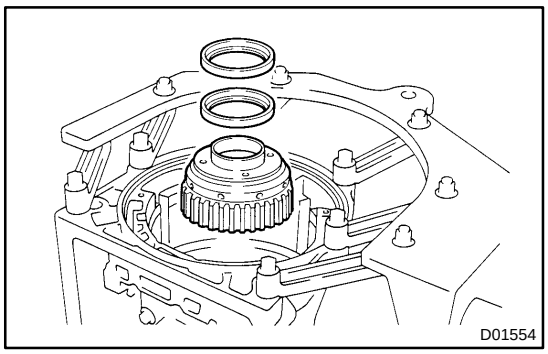
(b) Remove the No. 1 one-way clutch from the case.



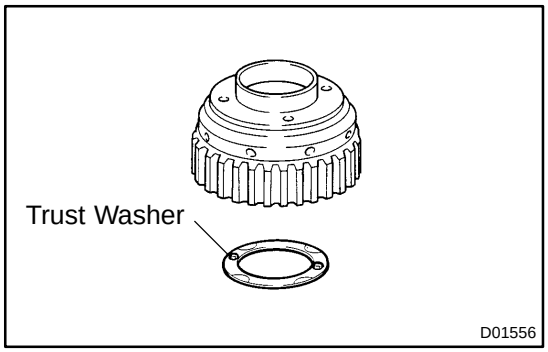
(c) Remove the thrust washer from the No. 1 one-way clutch.



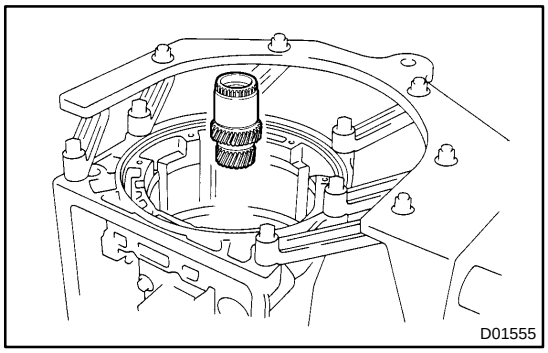
(d) Remove the multiple disc brake from the case.



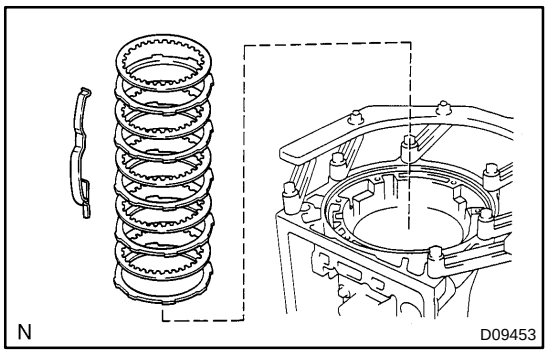
(e) Remove the 2 washers and front planetary gear from the case.



(f) Remove the thrust washer from the front planetary gear.



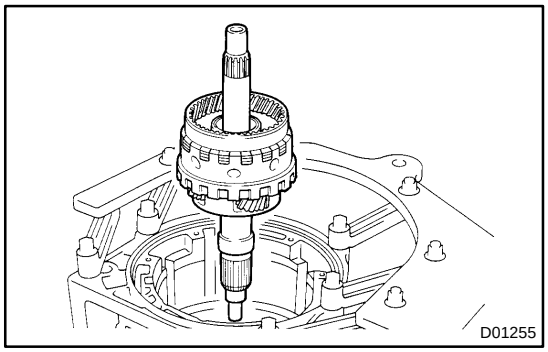
(g) Remove the front & center planetary sun gear from the case.



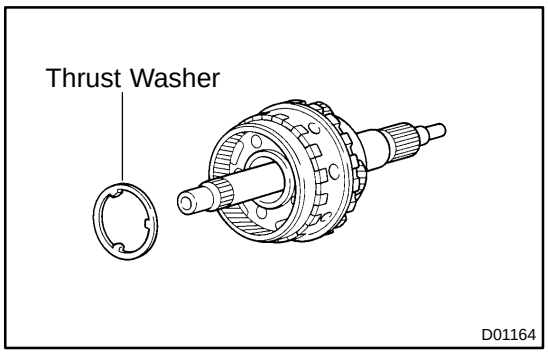
32. REMOVE OUTPUT SHAFT WITH CENTER & REAR PLANETARY GEAR

(a) Remove the 2nd brake pack (flange, 5 discs and 4 plates) from the case.

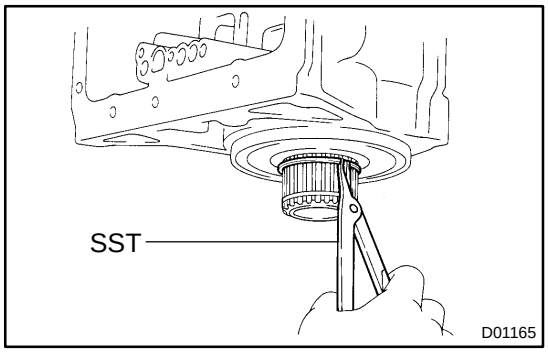
(b) Remove the spring from the case.



(c) Remove the output shaft with center & rear planetary gear from the case.

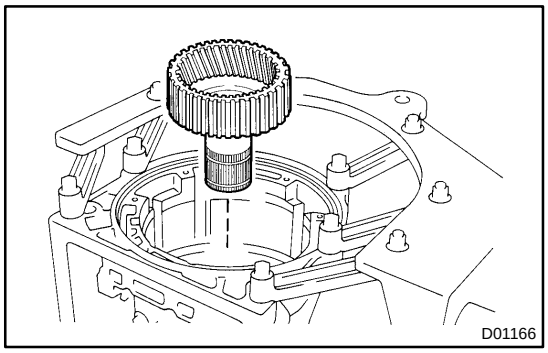


(d) Remove the thrust washer from the output shaft with center & rear planetary gear.

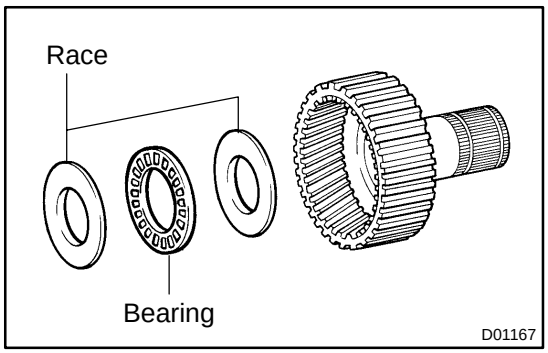


33. REMOVE REAR PLANETARY RING GEAR

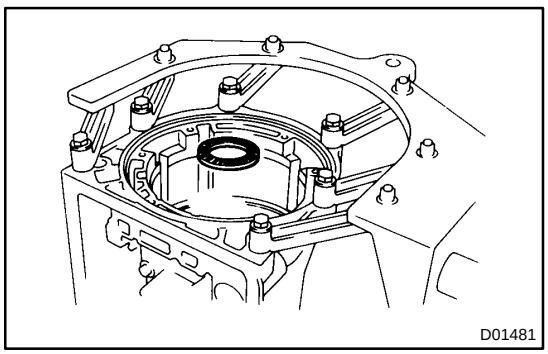
(a) Using SST, remove the snap ring.
SST 09350-30020 (09350-07070)



(b) Remove the rear planetary ring gear from the case.



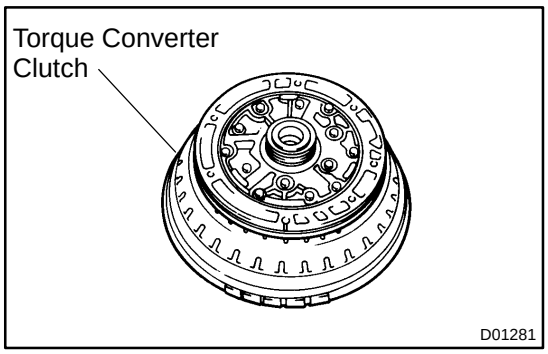
(c) Remove the assembled bearing & race and 2 races from the rear planetary ring gear.



(d) Remove the assembled bearing & race from the case.

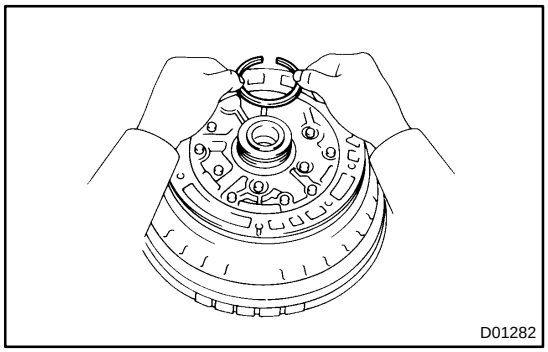
AT04C-02

DISASSEMBLY



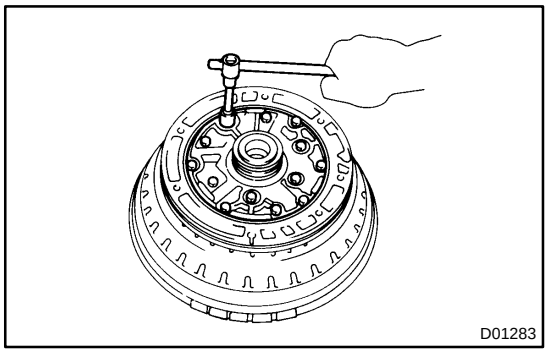
1. USE TORQUE CONVERTER CLUTCH AS WORK STAND

Place the oil pump body on the torque converter clutch.



2. REMOVE OIL SEAL RING

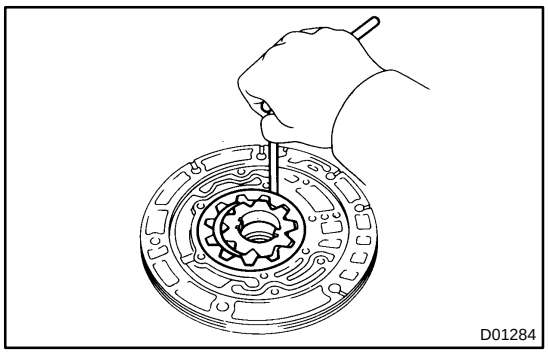
Remove the 2 oil seal rings.



3. REMOVE STATOR SHAFT

(a) Remove the 13 bolts, and then remove the stator shaft from the oil pump body.

(b) Remove the oil pump body from the torque converter clutch.



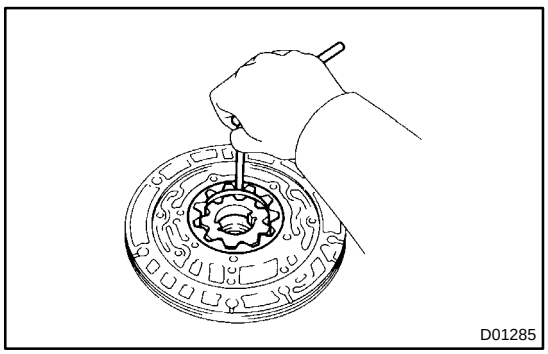
4. CHECK BODY CLEARANCE OF DRIVEN GEAR

Push the driven gear to one side of the body.

Using a feeler gauge, measure the clearance.

Standard body clearance:
0.07 - 0.15 mm (0.0028 - 0.0059 in.)
Maximum body clearance: 0.3 mm (0.012 in.)

If the body clearance is greater than the maximum, replace the drive gear, driven gear or pump body.

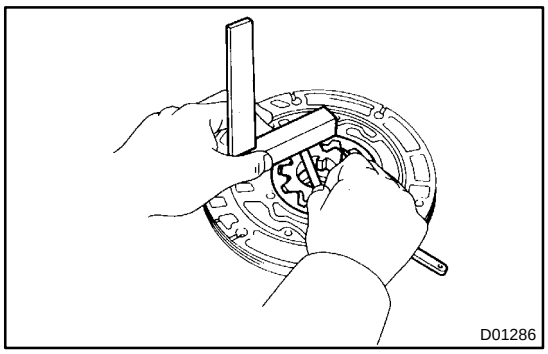


5. CHECK TIP CLEARANCE OF DRIVEN GEAR

Using a feeler gauge, measure the clearance between the driven gear teeth and the crescent-shaped part of the pump body.

Standard tip clearance:
0.11 - 0.14 mm (0.0043 - 0.0055 in.)
Maximum tip clearance: 0.3 mm (0.012 in.)

If the tip clearance is greater than the maximum, replace the drive gear, driven gear or pump body.

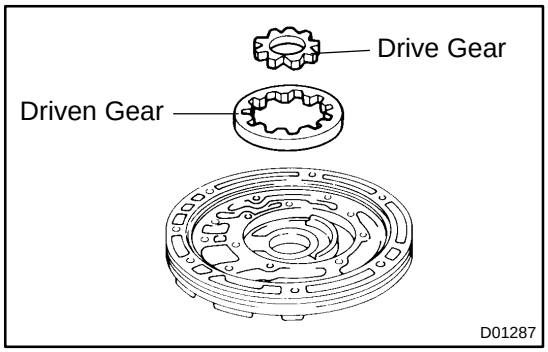


6. CHECK SIDE CLEARANCE OF BOTH GEARS

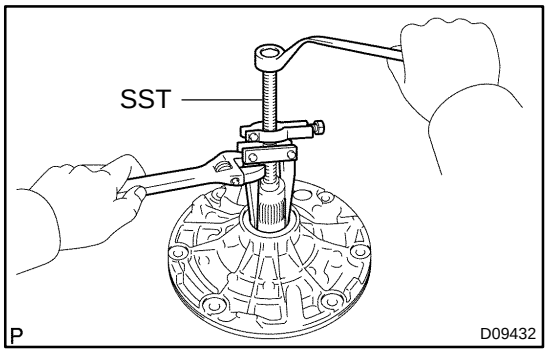
Using a steel straight edge and feeler gauge, measure the side clearance of both gears.

Standard side clearance:
0.02 - 0.04 mm (0.0008 - 0.0016 in.)
Maximum side clearance: 0.1 mm (0.004 in.)

If the side clearance is greater than the maximum, replace the drive gear, driven gear or pump body.



7. REMOVE OIL PUMP DRIVE GEAR AND DRIVEN GEAR



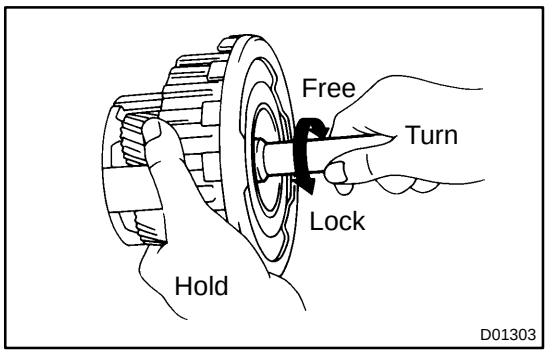
8. REMOVE OIL SEAL

Using SST, remove the oil seal.

SST 09308-10010, 09950-60010 (09951-00300)

AT04K-02

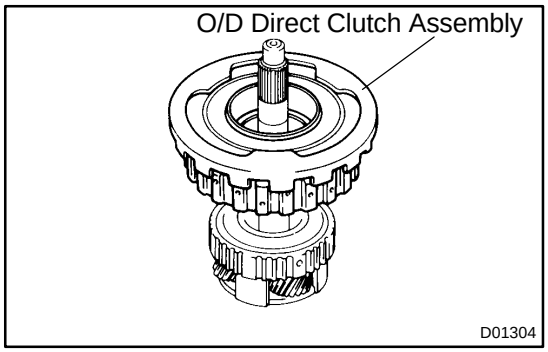
DISASSEMBLY



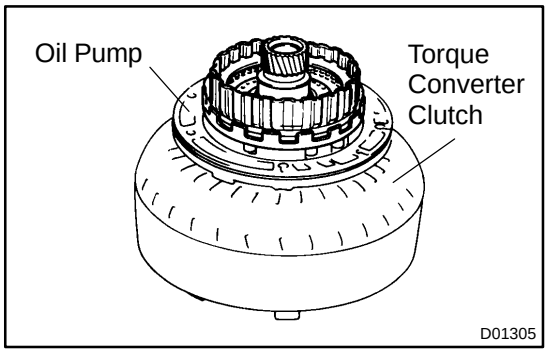
1. CHECK OPERATION OF ONE-WAY CLUTCH

Hold the O/D direct clutch drum and turn the input shaft.

The input shaft turns freely clockwise and locks counterclockwise.

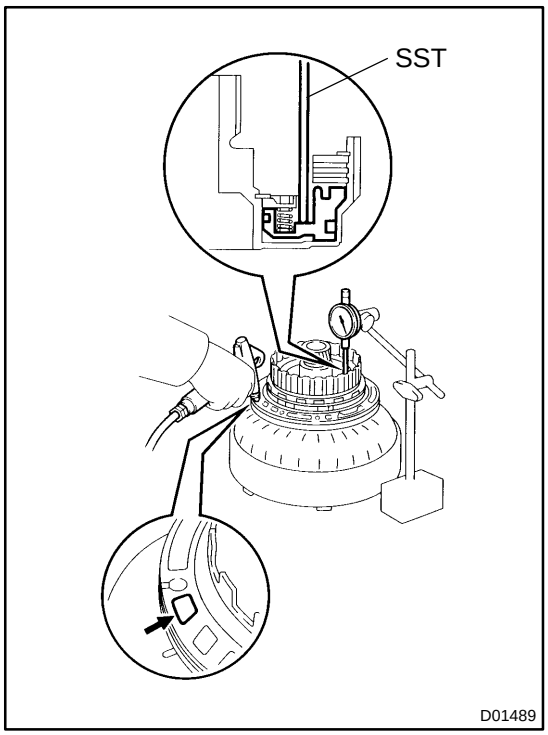


2. REMOVE O/D DIRECT CLUTCH ASSEMBLY FROM O/D PLANETARY GEAR



3. CHECK PISTON STROKE OF O/D DIRECT CLUTCH

(a) Place the oil pump onto the torque converter clutch, and then place the O/D direct clutch assembly onto the oil pump.

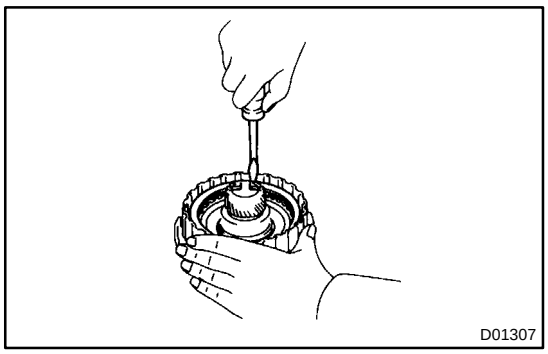


(b) Using SST and a dial indicator, measure the O/D direct clutch piston stroke while applying and releasing compressed air (392 kPa, 4 kgf/cm^2, 57 psi).

SST 09350-30020 (09350-06120)

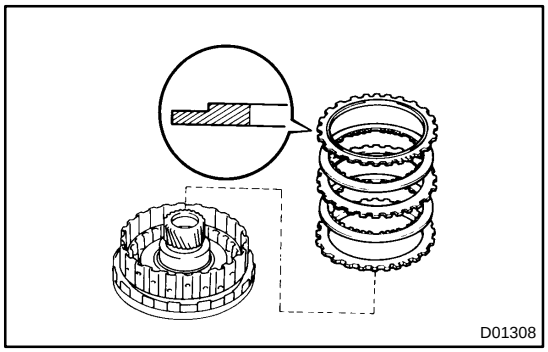
Piston stroke: 0.85 - 1.10 mm (0.033 - 0.043 in.)

If the stroke is non-standard, inspect the discs.

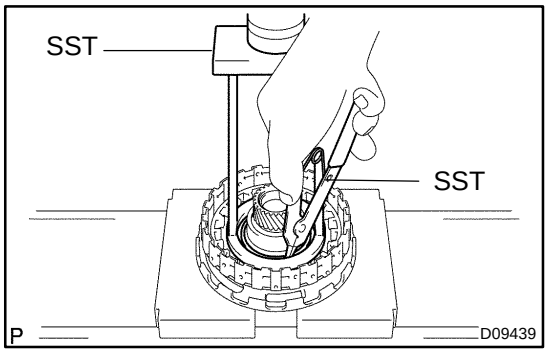


4. REMOVE FLANGE, PLATE AND DISC

(a) Using a screwdriver, remove the snap ring from the O/D direct clutch drum.



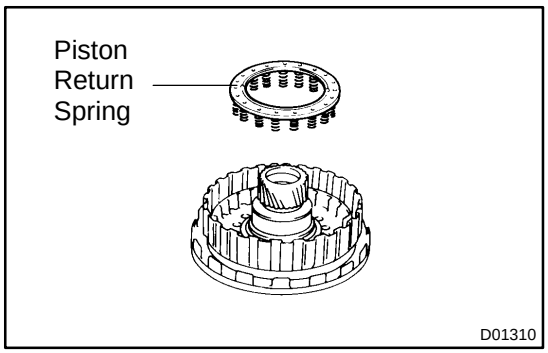
(b) Remove the flange, 2 plates and 2 discs.



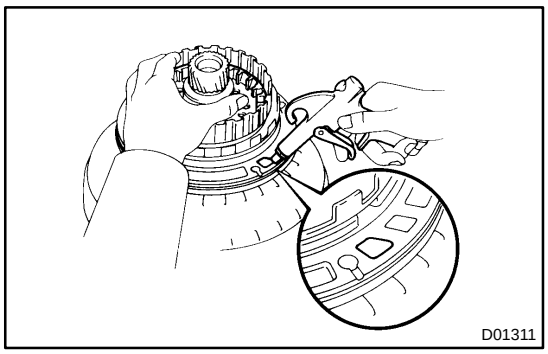
5. REMOVE PISTON RETURN SPRING

(a) Place SST on the spring retainer and compress the return spring with a press.
SST 09387-00020

(b) Using SST, remove the snap ring.
SST 09350-30020 (09350-07070)



(c) Remove the piston return spring.



6. REMOVE O/D DIRECT CLUTCH PISTON

(a) Place the oil pump onto the torque converter clutch and then place the O/D direct clutch onto the oil pump.

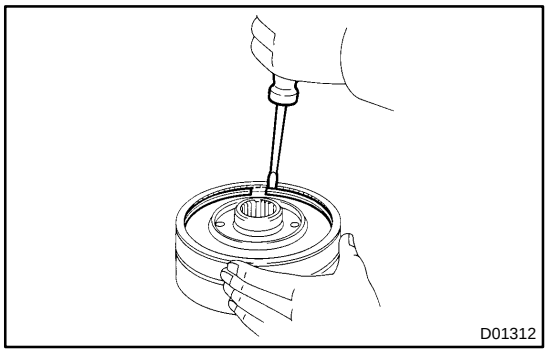
(b) Hold the O/D direct clutch piston with hand, and apply compressed air (392 kPa, 4 kgf/cm^2, 5 psi) to the oil pump to remove the O/D direct clutch piston.

(c) Remove the O/D direct clutch piston.

HINT:

If the piston is at an angle and cannot be removed, press down on the side jutting out and again apply compressed air, or else wind vinyl tape around the piston end and remove it with needle nose pliers.

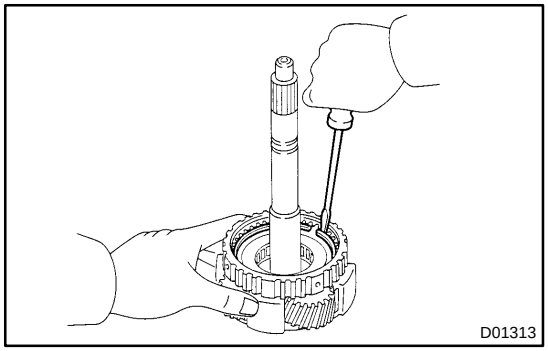
(d) Remove the 2 O-rings from the piston.



7. REMOVE RING GEAR FLANGE

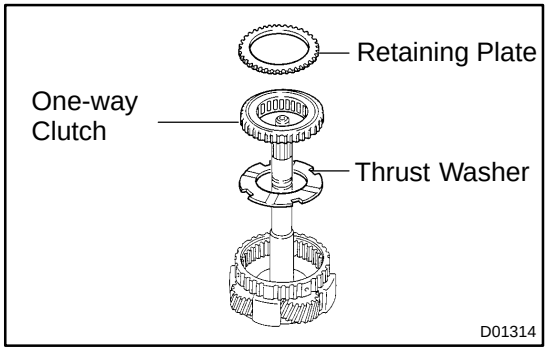
(a) Using a screwdriver, remove the snap ring.

(b) Remove the ring gear flange.

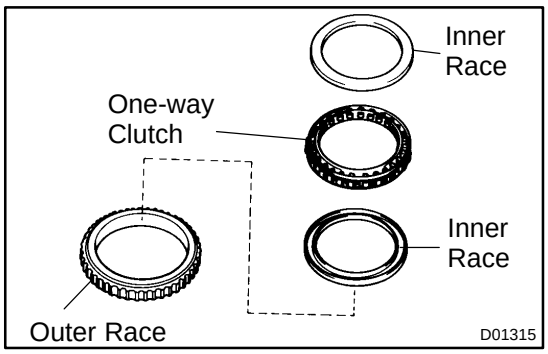


8. REMOVE RETAINING PLATE

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



(b) Remove the retaining plate, one-way clutch and thrust washer.

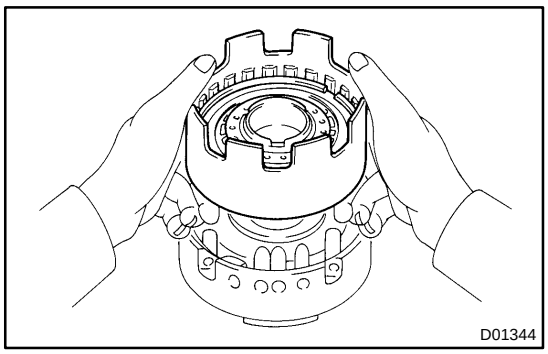


9. REMOVE ONE-WAY CLUTCH FROM OUTER RACE

Remove the 2 inner races and one-way clutch to the outer race.

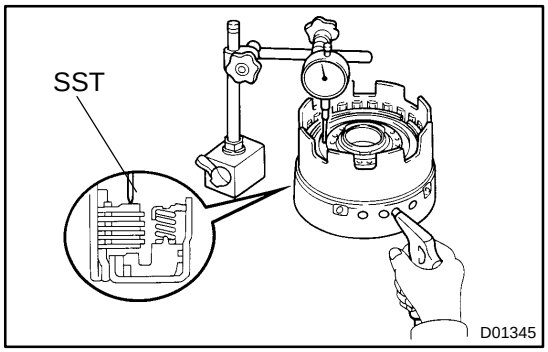
AT04S-02

DISASSEMBLY



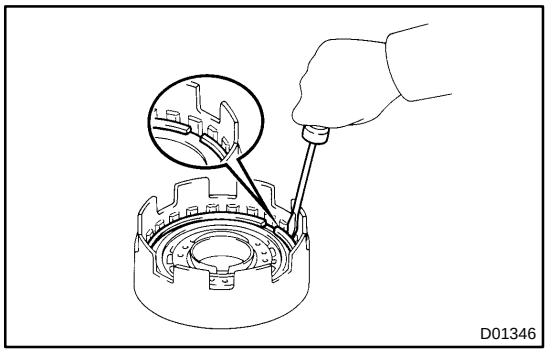
1. CHECK PISTON STROKE OF DIRECT CLUTCH

(a) Place the direct clutch assembly onto the O/D support assembly.



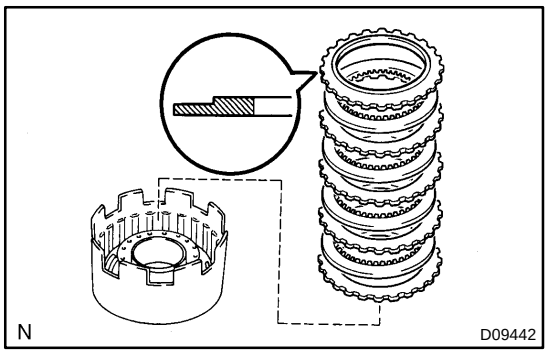
(b) Using SST and a dial indicator, measure the direct clutch piston stroke while applying and releasing compressed air (186 - 206 kPa, 1.9 - 2.1 kgf/cm^2, 27 - 30 psi).
SST 09350-30020 (09350-06120)
Piston stroke: 0.40 - 0.70 mm (0.016 - 0.028 in.)

If the clearance is non-standard inspect the discs.

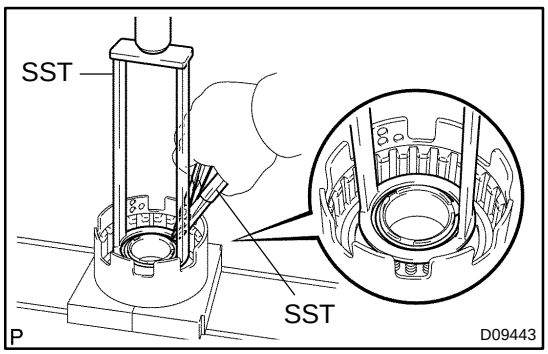


2. REMOVE FLANGE, PLATE AND DISC

(a) Using a screwdriver, remove the snap ring from the direct clutch drum.



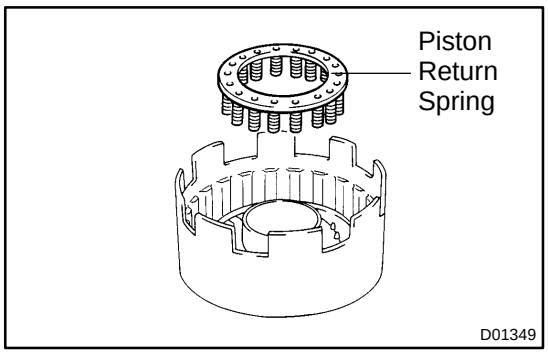
(b) Remove the flange, 4 plates and 4 discs.
(c) Remove the cushion plate.



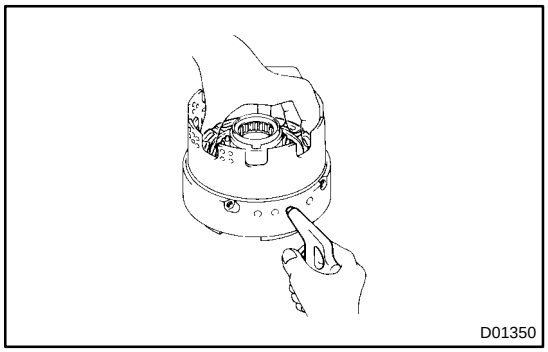
3. REMOVE PISTON RETURN SPRING

(a) Place SST on the piston return spring and compress.
SST 09387-00020

(b) Using SST, remove the snap ring.
SST 09350-30020 (09350-07070)



(c) Remove the piston return spring.



4. REMOVE DIRECT CLUTCH PISTON

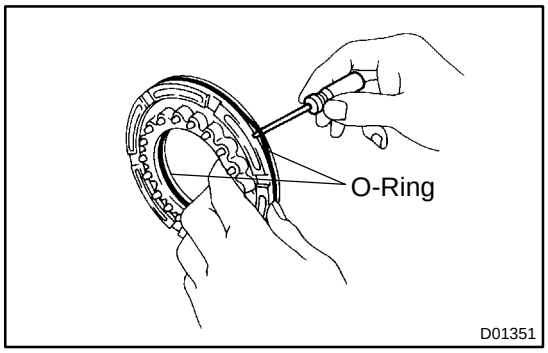
(a) Place the direct clutch drum onto the O/D support.

(b) Hold the direct clutch piston and apply compressed air (186 kPa, 1.9 kgf/cm^2, 27 psi) to the O/D support to remove the direct clutch piston.

HINT:

Make sure the direct clutch piston squares in the drum before applying compressed air

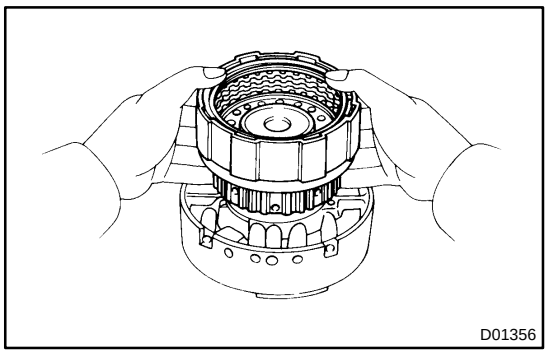
(c) Remove the direct clutch piston.



(d) Using a small screwdriver, remove the 2 O-rings from the piston.

AT04W-02

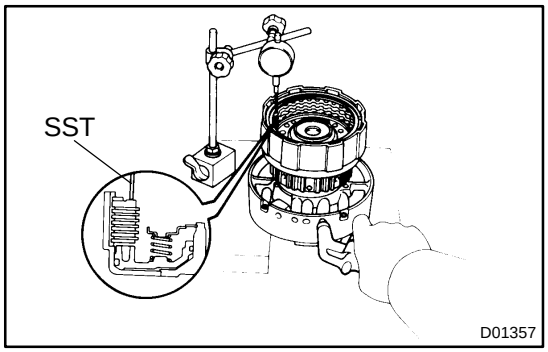
DISASSEMBLY



1. PLACE FORWARD CLUTCH INTO O/D SUPPORT

(a) Place wooden blocks, etc, to prevent forward clutch shaft from touching the work stand, and place the O/D support on them.

(b) Place the forward clutch into the O/D support.



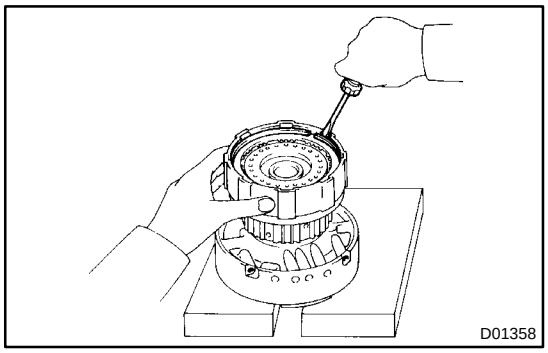
2. CHECK PISTON STROKE OF FORWARD CLUTCH

Using SST and a dial indicator, measure forward clutch piston stroke while applying and releasing compressed air (186 kPa, 1.9 kgf/cm^2, 27 psi).

SST 09350-30020 (09350-06120)

Piston stroke: 0.60 - 0.90 mm (0.024 - 0.035 in.)

If the clearance is non-standard, inspect the discs.

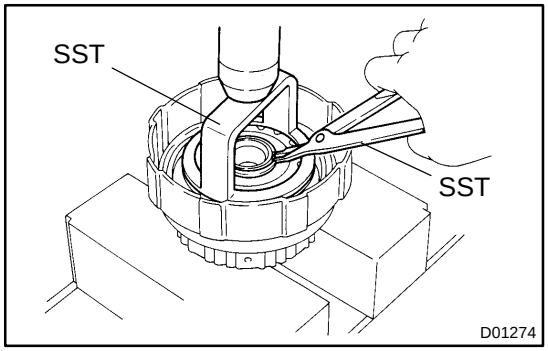


3. REMOVE FLANGE, PLATE AND DISC

(a) Using a screwdriver, remove the snap ring from the forward clutch drum.

(b) Remove the flange, 5 plates and 5 discs.

(c) Remove the cushion plate.



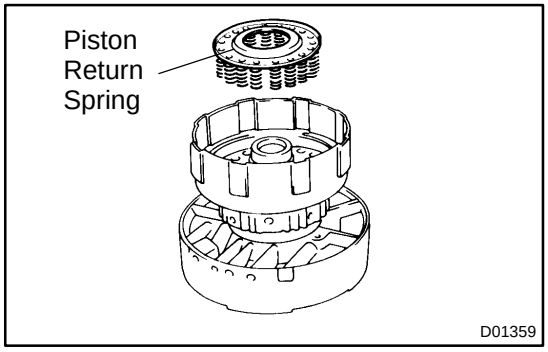
4. REMOVE PISTON RETURN SPRING

(a) Place SST on the spring retainer and compress the return spring with a press.

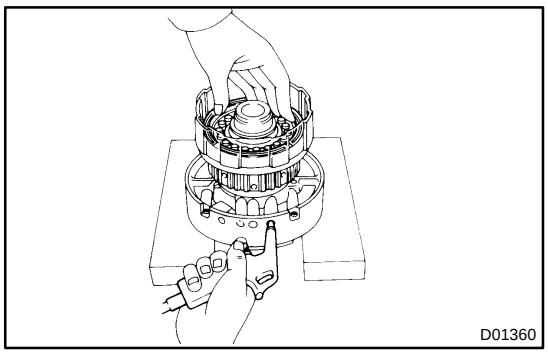
SST 09350-30020 (09350-07040)

(b) Using SST, remove the snap ring.

SST 09350-30020 (09350-07070)



(c) Remove the piston return spring.

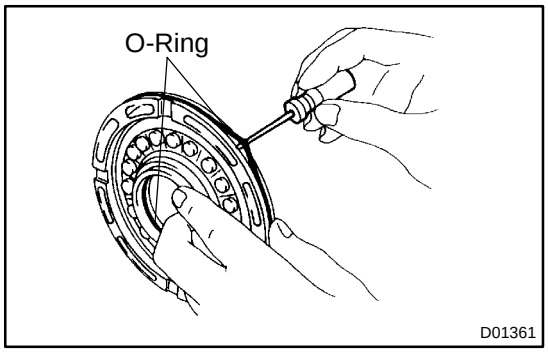


5. REMOVE FORWARD CLUTCH PISTON

(a) Place the forward clutch drum onto the O/D support.

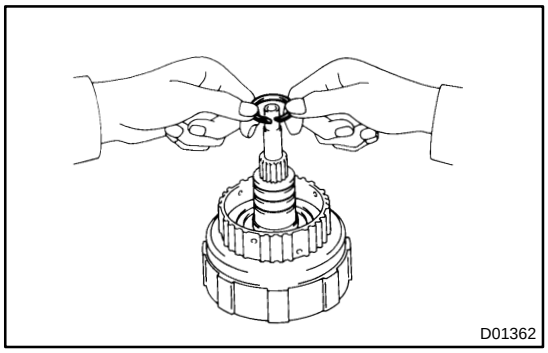
(b) Hold the forward clutch piston with hand, apply compressed air (186 kPa, 1.9 kgf/cm^2, 27 psi) to the O/D support to remove the forward clutch piston.

(c) Remove the forward clutch piston.



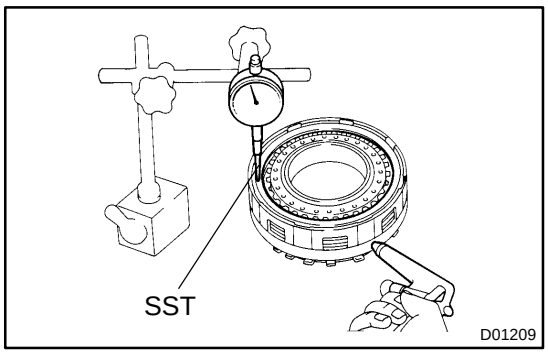
6. REMOVE 2 O-RINGS FROM PISTON

Using a small screwdriver, remove the 2 O-rings.



7. REMOVE 3 OIL SEAL RINGS FROM FORWARD CLUTCH

AT050-02



DISASSEMBLY

1. CHECK PISTON STROKE OF 3RD BRAKE PISTON

Using SST and a dial indicator, measure the 3rd brake piston stroke while applying and releasing compressed air (392 kPa, 4 kg/cm^2, 57 psi).

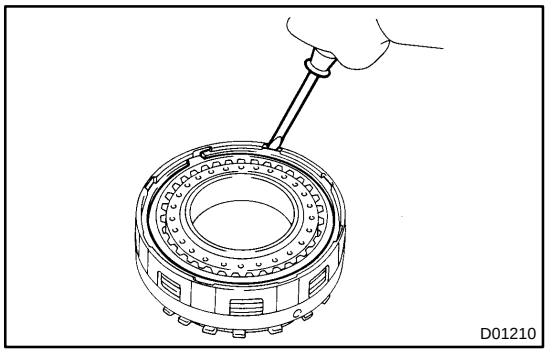
SST 09350-30020 (09350-06120)

If the stroke is non-standard, inspect the disc.

Piston stroke: 0.56 - 0.86 mm (0.022 - 0.036 in.)

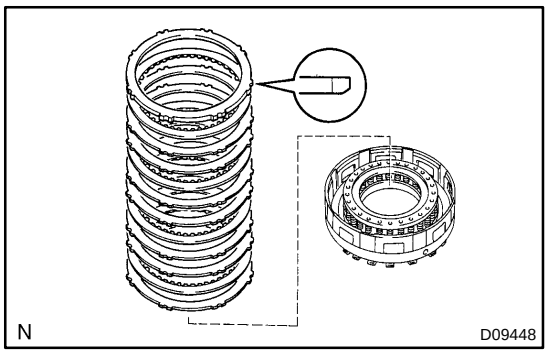
NOTICE:

Do not applying compressed air into the 2nd brake hole.

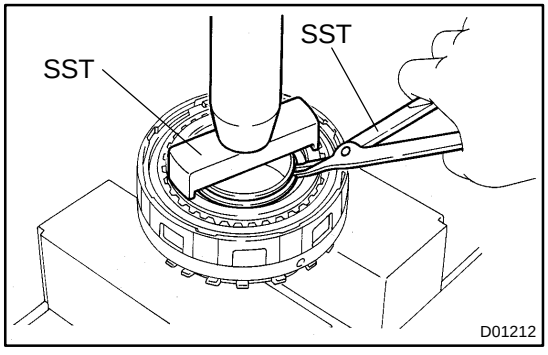


2. REMOVE FLANGE, PLATE AND DISC

(a) Using a screwdriver, remove the snap ring from the brake drum.



(b) Remove the flange, 7 plates and 4 discs.



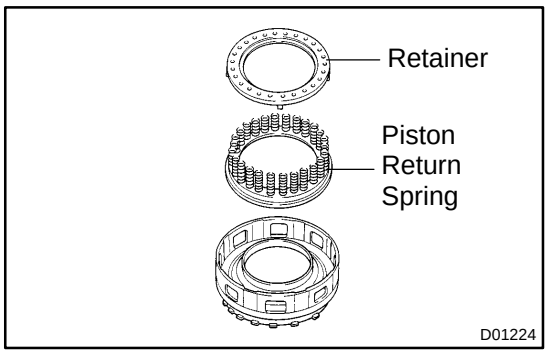
3. REMOVE PISTON RETURN SPRING

(a) Place SST on the spring retainer and compress the return spring with a press.

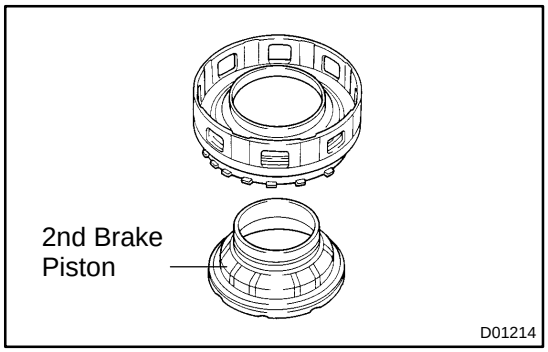
SST 09350-32014 (09351-32040)

(b) Using SST, remove the snap ring.

SST 09350-30020 (09350-07070)

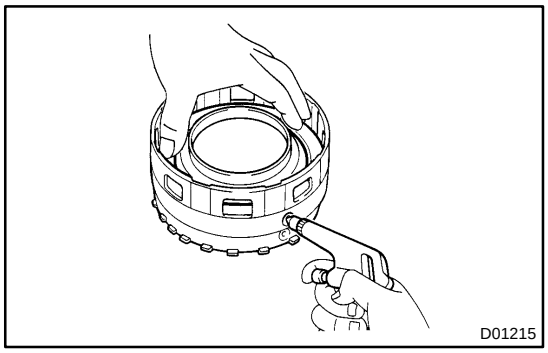


(c) Remove the retainer and piston return spring.

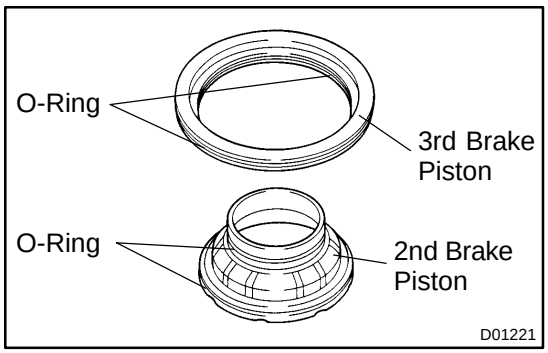


4. REMOVE 3RD AND 2ND BRAKE PISTON

(a) Push the 2nd brake piston down with fingers to remove.



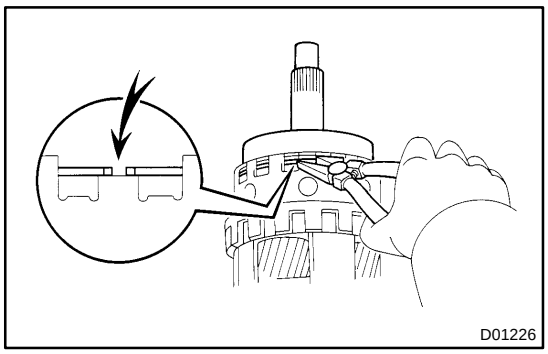
(b) Hold the 3rd brake piston so that it dose not slant, and apply compressed air (392 kPa, 4 kg/cm^2, 57 psi) into the passage to remove the 3rd brake piston.



(c) Remove the 4 O-rings from the 3rd and 2nd brake pistons.

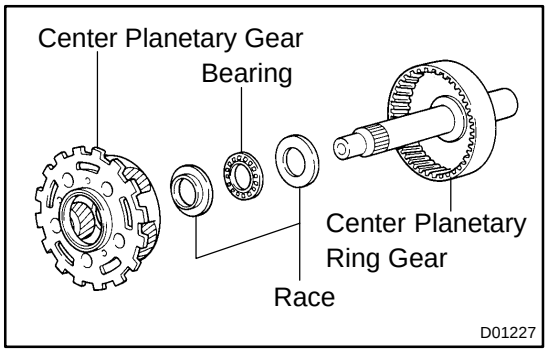
AT054-01

DISASSEMBLY

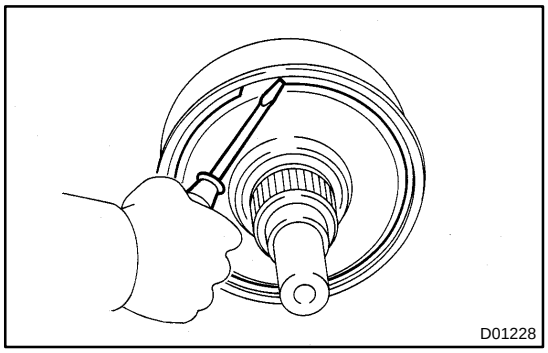


1. REMOVE CENTER PLANETARY GEAR

(a) Using a needle nose plier, nip the snap ring to remove the front planetary ring gear.

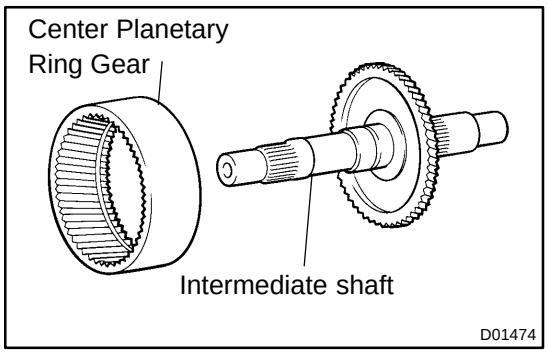


(b) Remove the center planetary gear, bearing and 2 races from center planetary ring gear.



2. REMOVE CENTER PLANETARY RING GEAR

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

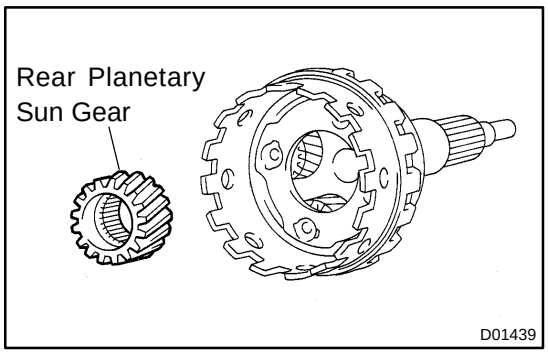


(b) Remove the center planetary ring gear from the intermediate shaft.

AT058-01

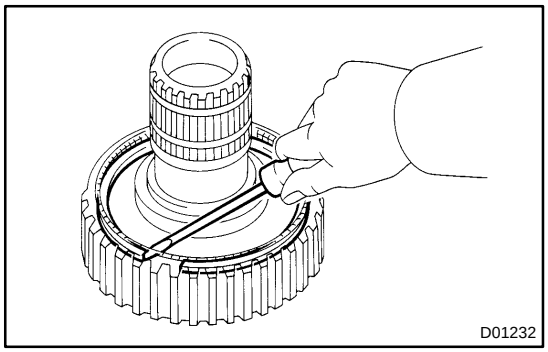
DISASSEMBLY

1. REMOVE REAR PLANETARY SUN GEAR

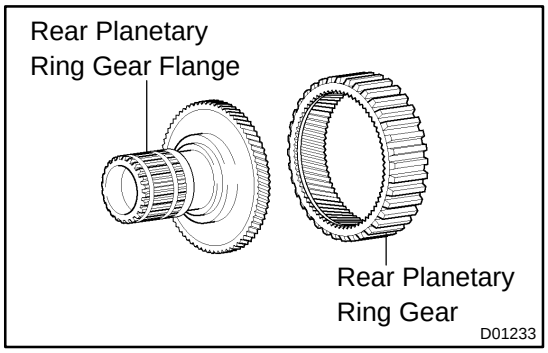


2. REMOVE REAR PLANETARY RING GEAR FLANGE

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

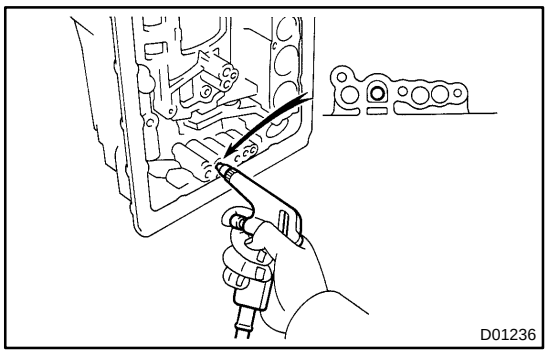


(b) Remove the rear planetary ring gear flange from the rear planetary ring gear.



AT05C-02

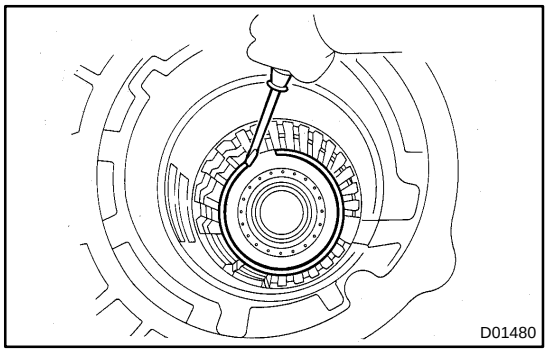
DISASSEMBLY



1. CHECK PACK CLEARANCE OF 1ST & REVERSE BRAKE

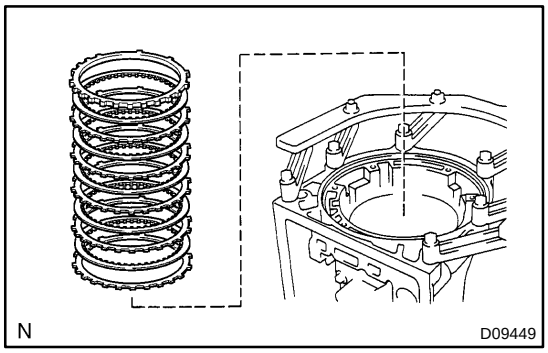
Make sure the 1st & reverse brake pistons move smoothly when applying and releasing the compressed air (392 kPa, 4 kgf/cm^2, 57 psi) into the transmission case.

Pack clearance: 0.5 - 0.8 mm (0.021 - 0.031 in.)

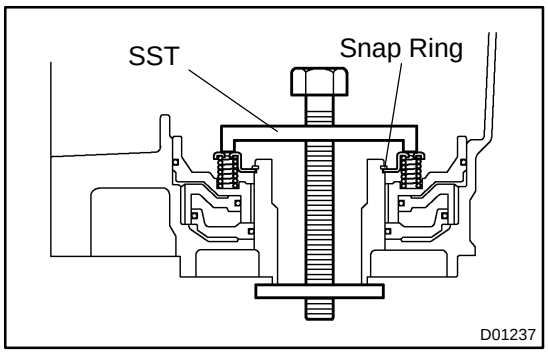


2. REMOVE DISC, PLATE AND FLANGE

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



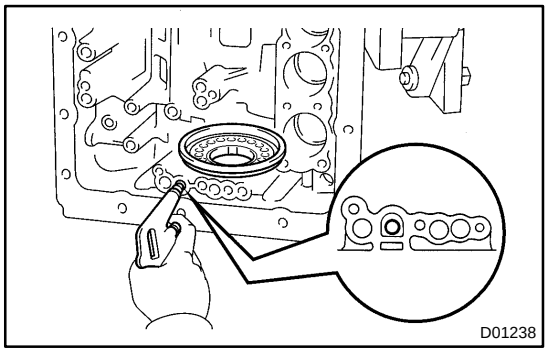
(b) Remove the flange, 5 discs and 5 plates.



3. REMOVE PISTON RETURN SPRING

(a) Place SST on the spring retainer and compress the return spring.
SST 09350-30020 (09350-07050)

(b) Using SST, remove the snap ring and return spring.
SST 09350-30020 (09350-07070)



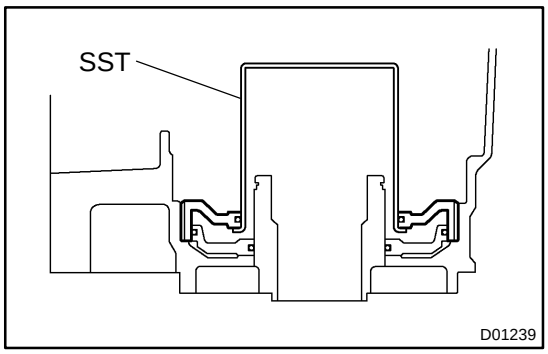
4. REMOVE NO. 2 BRAKE PISTON

(a) Hold No. 2 brake piston by hand, apply compressed air (392 kPa, 4 kgf/cm^2, 57 psi) to transmission case to remove No. 2 brake piston.

HINT:

If the piston dose not pop out with compressed air, lift the piston out with needle-nose pliers.

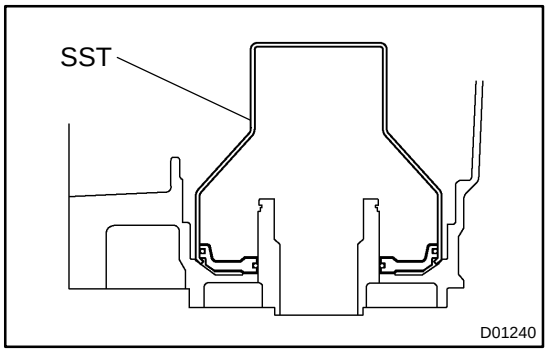
(b) Remove the O-ring from No. 2 brake piston.



5. REMOVE REACTION SLEEVE

(a) Using SST, remove the reaction sleeve.
SST 09350-30020 (09350-07080)

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



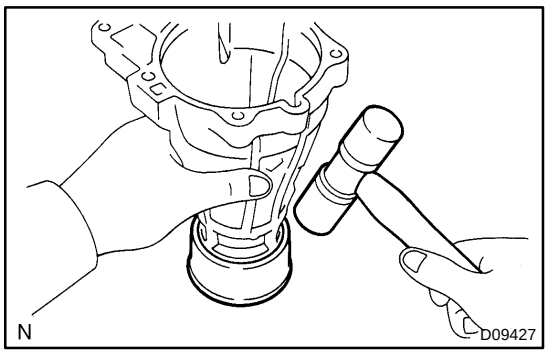
6. REMOVE NO. 1 BRAKE PISTON

(a) Using SST, remove the No. 1 brake piston.
SST 09350-30020 (09350-07090)

(b) Remove the 2 O-rings from the No. 1 piston.

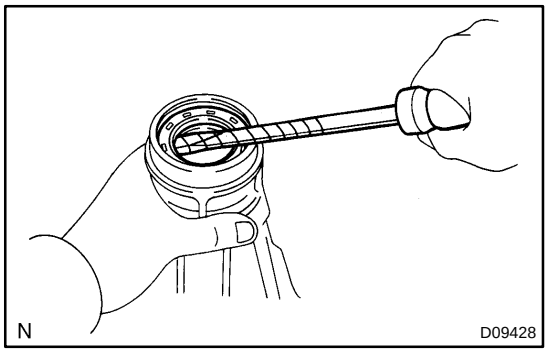
AT0Y2-01

DISASSEMBLY



1. REMOVE EXTENSION HOUSING DUST DEFLECTOR

Using a plastic hammer, remove the dust deflector.



2. REMOVE EXTENSION HOUSING OIL SEAL

Using a screwdriver, remove the oil seal.

IN0D6-01

GLOSSARY OF SAE AND LEXUS TERMS

This glossary lists all SAE-J1930 terms and abbreviations used in this manual in compliance with SAE recommendations, as well as their LEXUS equivalents.

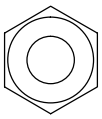
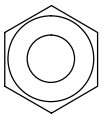
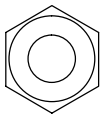
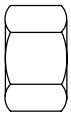
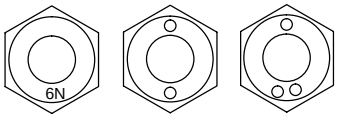
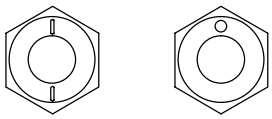
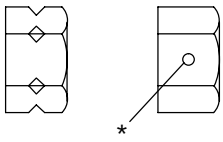
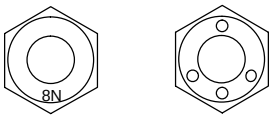
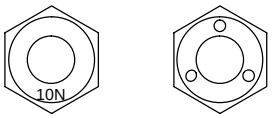
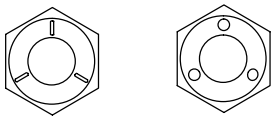
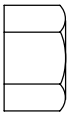
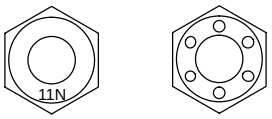
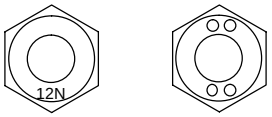
SAE ABBREVIATIONS	SAE TERMS	LEXUS TERMS ( )--ABBREVIATIONS
A/C	Air Conditioning	Air Conditioner
ACL	Air Cleaner	Air Cleaner, A/CL
AIR	Secondary Air Injection	Air Injection (AI)
AP	Accelerator Pedal	-
B+	Battery Positive Voltage	+B, Battery Voltage
BARO	Barometric Pressure	HAC
CAC	Charge Air Cooler	Intercooler
CARB	Carburetor	Carburetor
CFI	Continuous Fuel Injection	-
CKP	Crankshaft Position	Crank Angle
CL	Closed Loop	Closed Loop
CMP	Camshaft Position	Cam Angle
CPP	Clutch Pedal Position	-
CTOX	Continuous Trap Oxidizer	-
CTP	Closed Throttle Position	LL ON, Idle ON
DFI	Direct Fuel Injection (Diesel)	Direct Injection (DI)
DI	Distributor Ignition	-
DLC1 DLC2 DLC3	Data Link Connector 1 Data Link Connector 2 Data Link Connector 3	1: Check Connector 2: Total Diagnosis Comunication Link (TDCL) 3: OBD II Diagnostic Connector
DTC	Diagnostic Trouble Code	Diagnostic Code
DTM	Diagnostic Test Mode	-
ECL	Engine Control Level	-
ECM	Engine Control Module	Engine ECU (Electronic Control Unit)
ECT	Engine Coolant Temperature	Coolant Temperature, Water Temperature (THW)
EEPROM	Electrically Erasable Programmable Read Only Memory	Electrically Erasable Programmable Read Only Memory (EEPROM), Erasable Programmable Read Only Memory (EPROM)
EFE	Early Fuel Evaporation	Cold Mixture Heater (CMH), Heat Control Valve (HCV)
EGR	Exhaust Gas Recirculation	Exhaust Gas Recirculation (EGR)
EI	Electronic Ignition	TOYOTA Distributorless Ignition (TDI)
EM	Engine Modification	Engine Modification (EM)
EPROM	Erasable Programmable Read Only Memory	Programmable Read Only Memory (PROM)
EVAP	Evaporative Emission	Evaporative Emission Control (EVAP)
FC	Fan Control	-
FEEPROM	Flash Electrically Erasable Programmable Read Only Memory	-
FEPROM	Flash Erasable Programmable Read Only Memory	-
FF	Flexible Fuel	-
FP	Fuel Pump	Fuel Pump
GEN	Generator	Alternator
GND	Ground	Ground (GND)

HO2S	Heated Oxygen Sensor	Heated Oxygen Sensor (HO_2S)
IAC	Idle Air Control	Idle Speed Control (ISC)
IAT	Intake Air Temperature	Intake or Inlet Air Temperature
ICM	Ignition Control Module	-
IFI	Indirect Fuel Injection	Indirect Injection (IDL)
IFS	Inertia Fuel-Shutoff	-
ISC	Idle Speed Control	-
KS	Knock Sensor	Knock Sensor
MAF	Mass Air Flow	Air Flow Meter
MAP	Manifold Absolute Pressure	Manifold Pressure Intake Vacuum
MC	Mixture Control	Electric Bleed Air Control Valve (EBCV) Mixture Control Valve (MCV) Electric Air Control Valve (EACV)
MDP	Manifold Differential Pressure	-
MFI	Multiport Fuel Injection	Electronic Fuel Injection (EFI)
MIL	Malfunction Indicator Lamp	Check Engine Lamp
MST	Manifold Surface Temperature	-
MVZ	Manifold Vacuum Zone	-
NVRAM	Non-Volatile Random Access Memory	-
O2S	Oxygen Sensor	Oxygen Sensor, O_2 Sensor (O_2S)
OBD	On-Board Diagnostic	On-Board Diagnostic System (OBD)
OC	Oxidation Catalytic Converter	Oxidation Catalyst Convert (OC), CCo
OP	Open Loop	Open Loop
PAIR	Pulsed Secondary Air Injection	Air Suction (AS)
PCM	Powertrain Control Module	-
PNP	Park/Neutral Position	-
PROM	Programmable Read Only Memory	-
PSP	Power Steering Pressure	-
PTOX	Periodic Trap Oxidizer	Diesel Particulate Filter (DPF) Diesel Particulate Trap (DPT)
RAM	Random Access Memory	Random Access Memory (RAM)
RM	Relay Module	-
ROM	Read Only Memory	Read Only Memory (ROM)
RPM	Engine Speed	Engine Speed
SC	Supercharger	Supercharger
SCB	Supercharger Bypass	E-ABV
SFI	Sequential Multiport Fuel Injection	Electronic Fuel Injection (EFI), Sequential Injection
SPL	Smoke Puff Limiter	-
SRI	Service Reminder Indicator	-
SRT	System Readiness Test	-
ST	Scan Tool	-
TB	Throttle Body	Throttle Body
TBI	Throttle Body Fuel Injection	Single Point Injection Central Fuel Injection (Ci)
TC	Turbocharger	Turbocharger
TCC	Torque Converter Clutch	Torque Converter

TCM	Transmission Control Module	Transmission ECU, ECT ECU
TP	Throttle Position	Throttle Position
TR	Transmission Range	-
TVV	Thermal Vacuum Valve	Bimetallic Vacuum Switching Valve (BVSV) Thermostatic Vacuum Switching Valve (TVSV)
TWC	Three-Way Catalytic Converter	Three-Way Catalytic (TWC) Manifold Converter CC_{RO}
TWC+OC	Three-Way + Oxidation Catalytic Converter	CC_R + CCo
VAF	Volume Air Flow	Air Flow Meter
VR	Voltage Regulator	Voltage Regulator
VSS	Vehicle Speed Sensor	Vehicle Speed Sensor
WOT	Wide Open Throttle	Full Throttle
WU-OC	Warm Up Oxidation Catalytic Converter	-
WU-TWC	Warm Up Three-Way Catalytic Converter	-
3GR	Third Gear	-
4GR	Fourth Gear	-

SS0ZU-01

HOW TO DETERMINE NUT STRENGTH

Nut Type			Class
Present Standard Hexagon Nut	Old Standard Hexagon Nut		
	Cold Forging Nut	Cutting Processed Nut	
 No Mark			4N
 No Mark (w/ Washer)	 No Mark (w/ Washer)	 No Mark	5N (4T)
 6N			6N
		 *	7N (5T)
 8N			8N
 10N		 No Mark	10N (7T)
 11N			11N
 12N			12N

*: Nut with 1 or more marks on one side surface of the nut.

B06432

HINT:

Use the nut with the same number of the nut strength classification or the greater than the bolt strength classification number when tightening parts with a bolt and nut.

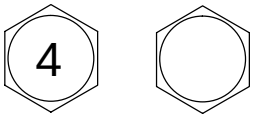
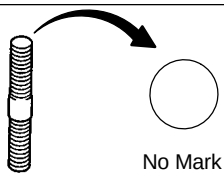
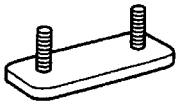
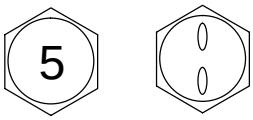
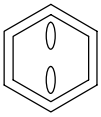
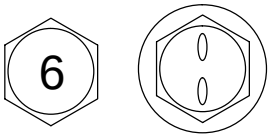
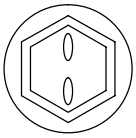
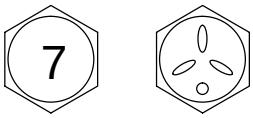
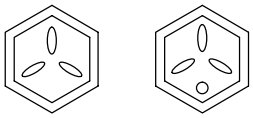
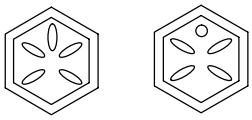
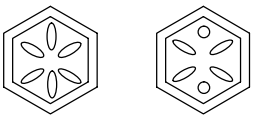
Example: Bolt = 4T

Nut = 4N or more

STANDARD BOLT

HOW TO DETERMINE BOLT STRENGTH

SS0ZS-01

Bolt Type				Class
Hexagon Head Bolt		Stud Bolt	Weld Bolt	
Normal Recess Bolt	Deep Recess Bolt			
 No Mark	 No Mark	 No Mark		4T
				5T
 w/ Washer	 w/ Washer			6T
				7T
				8T
				9T
				10T
				11T

B06431

HOW TO USE THIS MANUAL

IN047-15

GENERAL INFORMATION

1. INDEX

An INDEX is provided on the first page of each section to guide you to the item to be repaired. To assist you in finding your way through the manual, the Section Title and major heading are given at the top of every page.

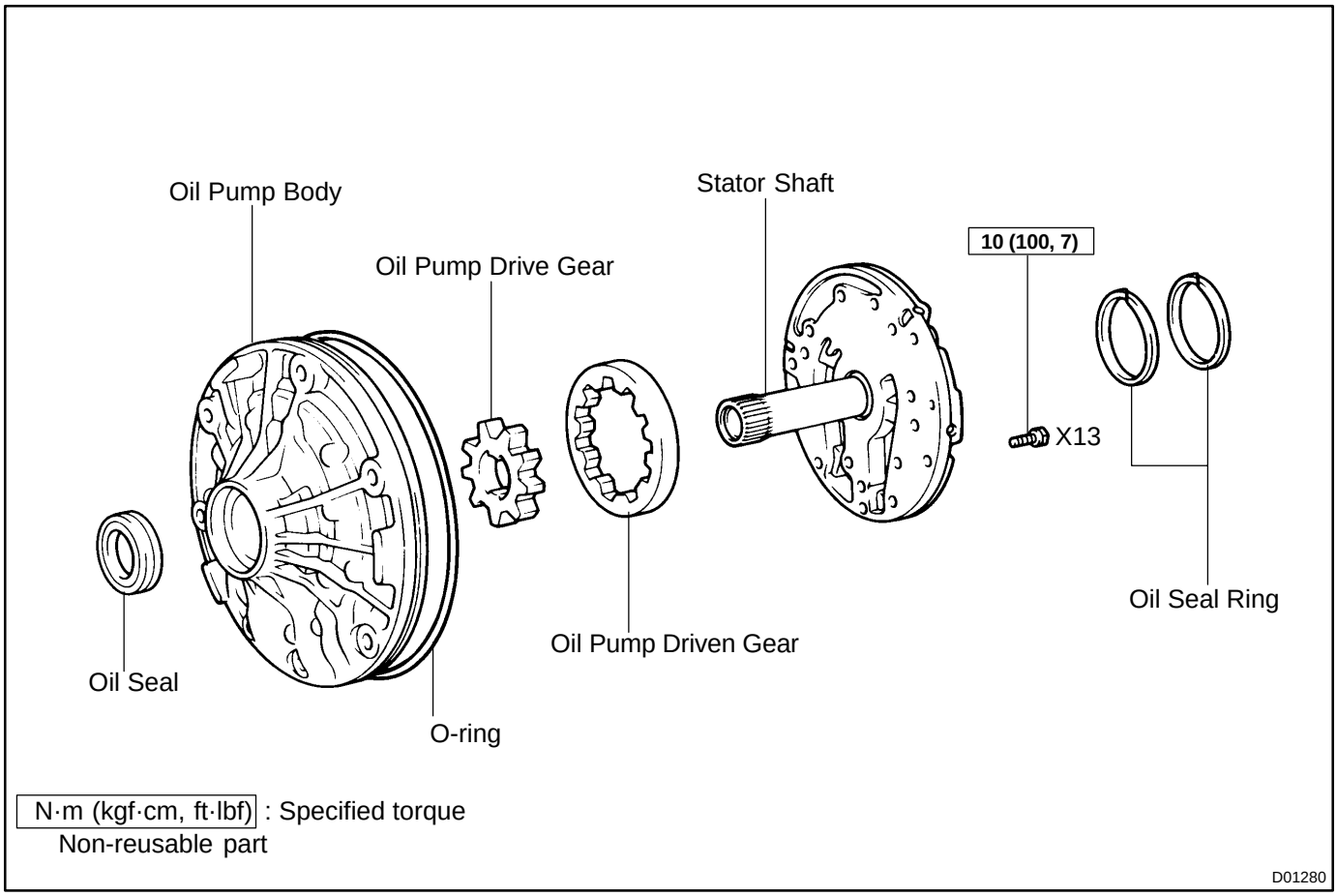
2. PREPARATION

Preparation lists the SST (Special Service Tools), recommended tools, equipment, lubricant and SSM (Special Service Materials) which should be prepared before beginning the operation and explains the purpose of each one.

3. REPAIR PROCEDURES

Most repair operations begin with an overview illustration. It identifies the components and shows how the parts fit together.

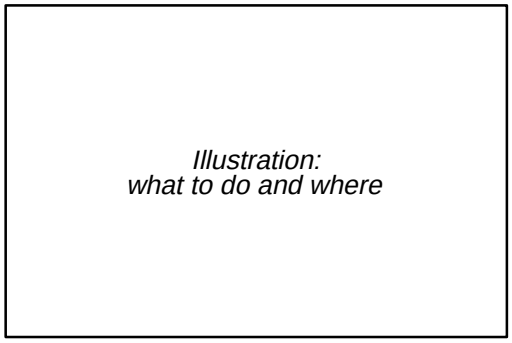
Example:



The procedures are presented in a step-by-step format:

- The illustration shows what to do and where to do it.
- The task heading tells what to do.
- The detailed text tells how to perform the task and gives other information such as specifications and warnings.

Example:



Task heading : what to do

21. CHECK PISTON STROKE OF OVERDRIVE BRAKE

(a) Place SST and a dial indicator onto the overdrive brake piston as shown in the illustration.

SST 09350-30020 (09350-06120)

Set part No. *Component part No.*

Detailed text : how to do task

(b) Measure the stroke applying and releasing the compressed air (392 - 785 kPa, 4 - 8 kgf.cm^2 or 57 - 114 psi) as shown in the illustration.

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

Specification

This format provides the experienced technician with a FAST TRACK to the information needed. The upper case task heading can be read at a glance when necessary, and the text below it provides detailed information. Important specifications and warnings always stand out in bold type.

4. REFERENCES

References have been kept to a minimum. However, when they are required you are given the page to refer to.

5. SPECIFICATIONS

Specifications are presented in bold type throughout the text where needed. You never have to leave the procedure to look up your specifications. They are also found at the end of each section, for quick reference.

6. CAUTIONS, NOTICES, HINTS:

- CAUTIONS are presented in bold type, and indicate there is a possibility of injury to you or other people.
- NOTICES are also presented in bold type, and indicate the possibility of damage to the components being repaired.
- HINTS are separated from the text but do not appear in bold. They provide additional information to help you perform the repair efficiently.

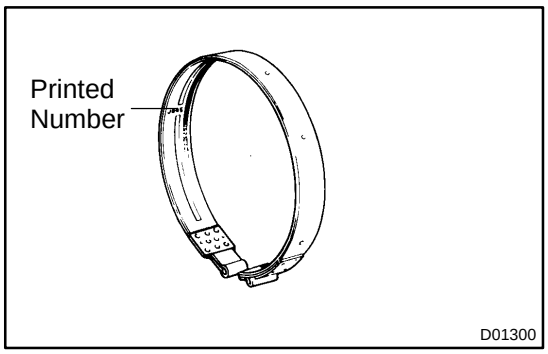
7. SI UNIT

The UNITS given in this manual are primarily expressed according to the SI UNIT (International System of Unit), and alternately expressed in the metric system and in the English System.

Example:

Torque: 30 N·m (310 kgf·cm, 22 ft·lbf)

AT04H-02



INSPECTION

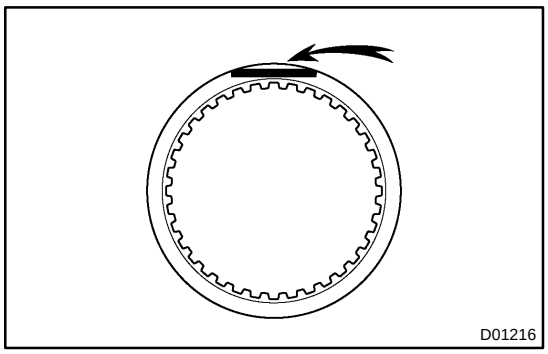
INSPECT BRAKE BAND

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

HINT:

Before assembling the new band, soak it in ATF for at least 15 minutes.

AT04P-02



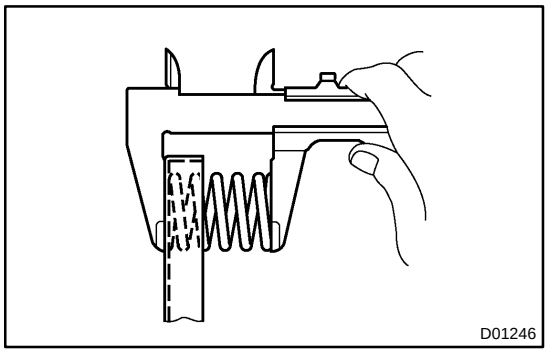
INSPECTION

1. INSPECT DISC, PLATE AND FLANGE

Check to see if the sliding surface of the disc, plate and flange are worn or burnt. If necessary, replace them.

HINT:

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

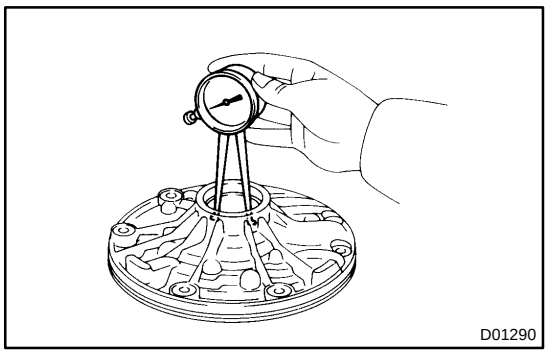


2. CHECK O/D BRAKE PISTON RETURN SPRING

Measure the free length of the spring together with the spring seat.

Standard free length: 17.82 mm (0.702 in.)

AT04D-02


D01290

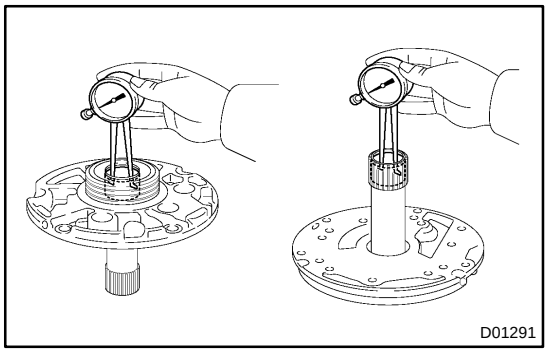
INSPECTION

1. CHECK OIL PUMP BODY BUSHING

Using a caliper gauge, measure the inside diameter of the oil pump body bushing.

Maximum inside diameter: 38.19 mm (1.5035 in.)

If the inside diameter is greater than the maximum, replace the oil pump body.


D01291

2. CHECK STATOR SHAFT BUSHING

Using a caliper gauge, measure the inside diameter of the stator shaft bushing.

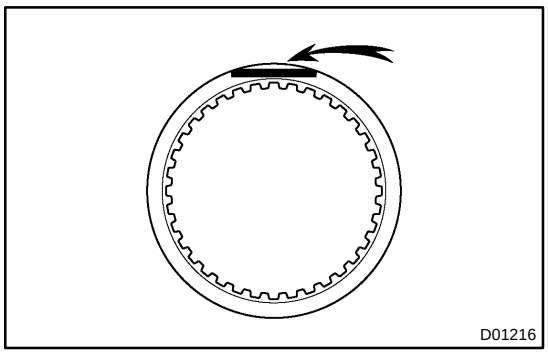
Maximum inside diameter:

Front side: 21.58 mm (0.8496 in.)

Rear side: 27.08 mm (1.0661 in.)

If the inside diameter is grater than the maximum, replace the stator shaft.

AT04L-01


D01216

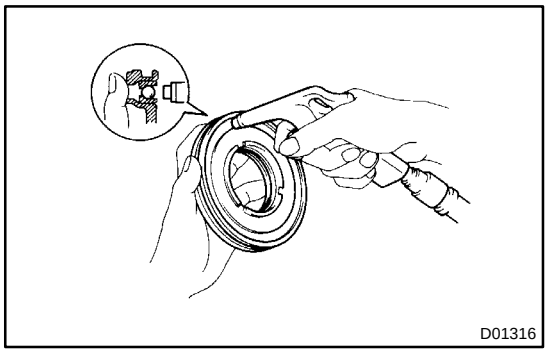
INSPECTION

1. INSPECT DISC AND FLANGE

Check to see if the sliding surface of the disc, plate and flange are worn or burnt. If necessary, replace them.

HINT:

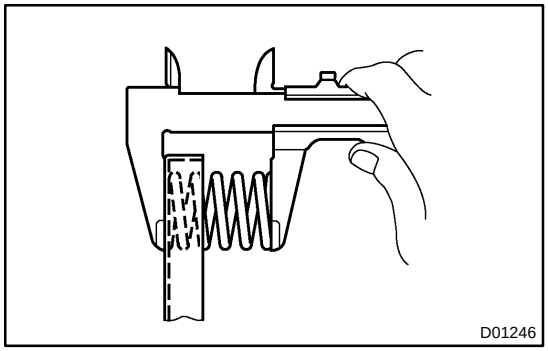
- If the lining of the disc is peeling off or discolored, or even if a part of the printed numbers is defaced, replace all discs.
- Before assembling new discs, soak them in ATF for at least 15 minutes.


D01316

2. CHECK O/D DIRECT CLUTCH PISTON

(a) Check that the check ball is free by shaking the piston.

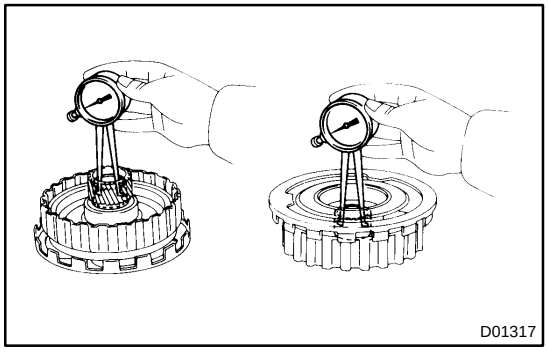
(b) Check that the valve does not leak by applying low-pressure compressed air.


D01246

3. CHECK O/D DIRECT CLUTCH RETURN SPRING

Measure the free length of the spring together with the spring seat.

Standard free length: 15.8 mm (0.622 in.)

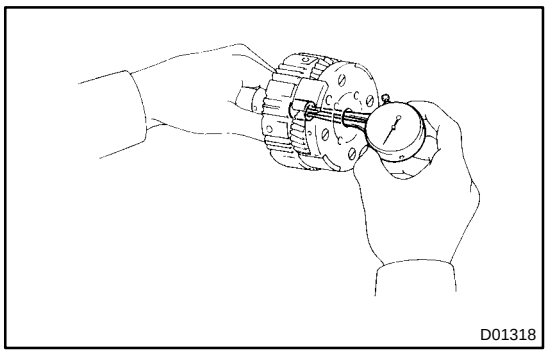

D01317

4. CHECK O/D DIRECT CLUTCH DRUM BUSHINGS

Using a dial indicator, measure the inside diameter of the clutch drum bushings.

Maximum inside diameter: 27.11 mm (1.0673 in.)

If the inside diameter is greater than the maximum, replace the clutch drum.

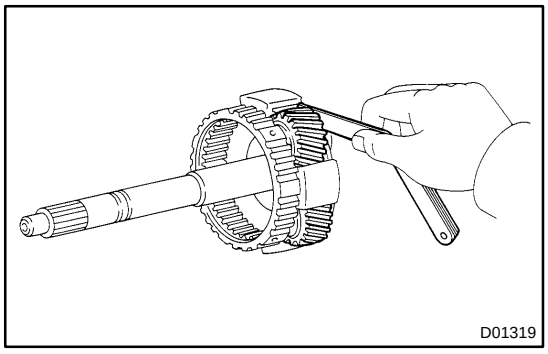

D01318

5. CHECK O/D PLANETARY GEAR BUSHING

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

Maximum inside diameter: 11.27 mm (0.444 in.)

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


D01319

6. MEASURE PLANETARY PINION GEAR THRUST CLEARANCE

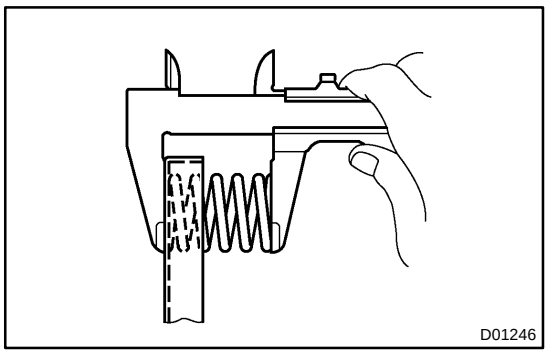
Using a feeler gauge, measure the planetary pinion gear thrust clearance.

Standard clearance: 0.2 - 0.6 mm (0.008 - 0.024 in.)
Maximum clearance: 1.0 mm (0.039 in.)

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

AT04T-01

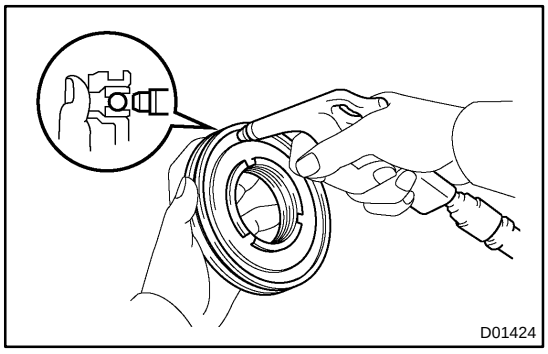
INSPECTION



1. CHECK DIRECT CLUTCH PISTON RETURN SPRING

Measure the free length of the spring together with the spring seat.

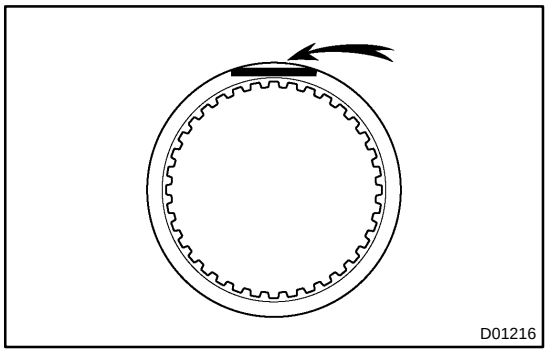
Standard free length: 23.25 mm (0.915 in.)



2. CHECK DIRECT CLUTCH PISTON

(a) Check that the check ball is free by shaking the piston.

(b) Check that the valve does not leak by applying low-pressure compressed air.

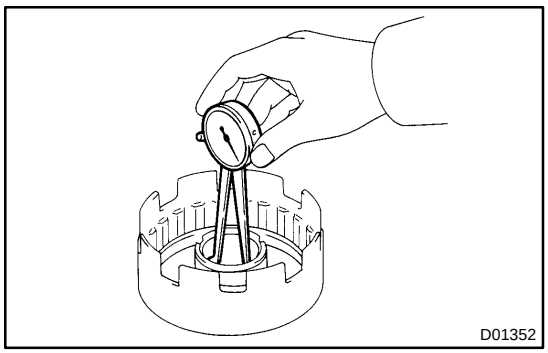


3. INSPECT DISC, PLATE AND FLANGE

Check to see if the sliding surface of the disc, plate and flange are worn or burnt. If necessary, replace them.

HINT:

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



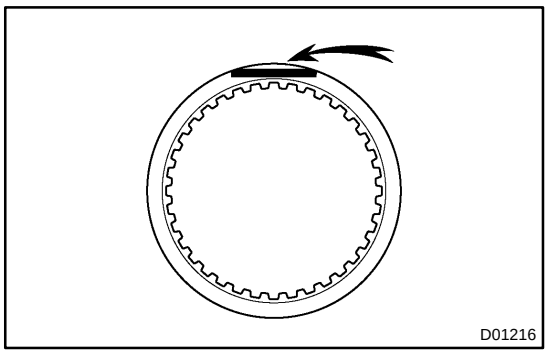
4. CHECK DIRECT CLUTCH BUSHING

Using a deal indicator, measure the inside diameter of the clutch drum bushing.

Maximum inside diameter: 53.97 mm (2.1248 in.)

If the inside diameter is greater than the maximum, replace the clutch drum.

AT04X-01


D01216

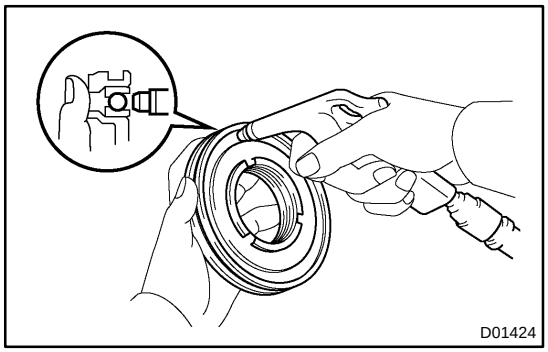
INSPECTION

1. INSPECT DISC, PLATE AND FLANGE

Check to see if the sliding surface of the disc, plate and flange are worn or burnt. If necessary, replace them.

HINT:

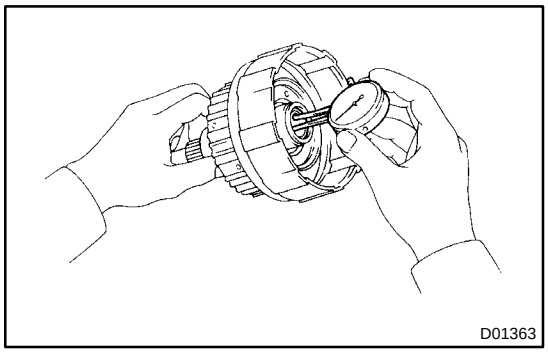
- If the lining of the disc is peeling off or discolored, or even if a part of th printed numbers is defaced, replace all discs.
- Before assembling new discs, soak them in ATF for at least 15 minutes.


D01424

2. CHECK FORWARD CLUTCH PISTON

(a) Check that the check ball is free by shaking the piston.

(b) Check that the valve does not leak by applying low-pressure compressed air.


D01363

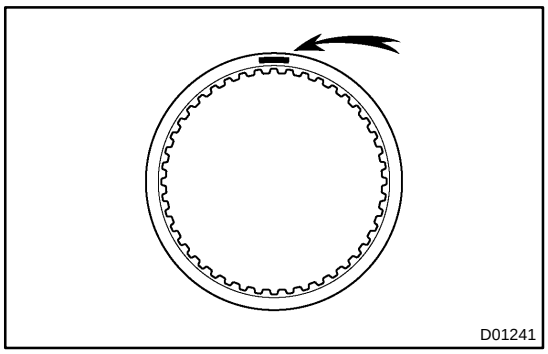
3. CHECK FORWARD CLUTCH DRUM BUSHING

Using a dial indicator, measure the inside diameter of the forward clutch drum bushing.

Maximum inside diameter: 20.08 mm (0.790 in.)

If the inside diameter is greater than the maximum, replace the forward clutch drum.

AT051-01


D01241

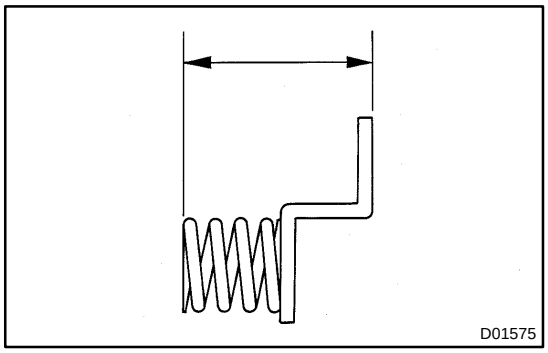
INSPECTION

1. INSPECT DISC AND FLANGE

Check to see if the sliding surface of the disc, plate and flange are worn or burnt. If necessary, replace them.

HINT:

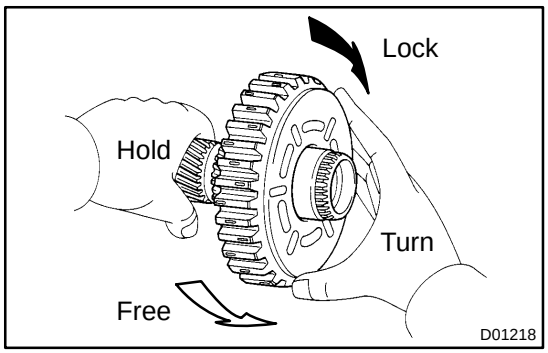
- If the lining of the disc is peeling off or discorded, or even if a part of the printed numbers is defaced, replace all discs.
- Before assembling new discs, soak them in ATF for at least 15 minutes.


D01575

2. CHECK PISTON RETURN SPRING

Measure the free length of the spring together with the spring seat.

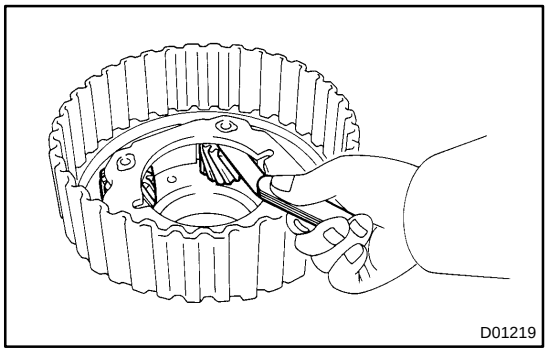
Standard free length: 36.8 mm (1.449 in.)



D01218

3. CHECK OPERATION OF ONE-WAY CLUTCH

Hold the front & center planetary sun gear and turn the hub. The hub must be able to turn freely clockwise and locks counter-clockwise.

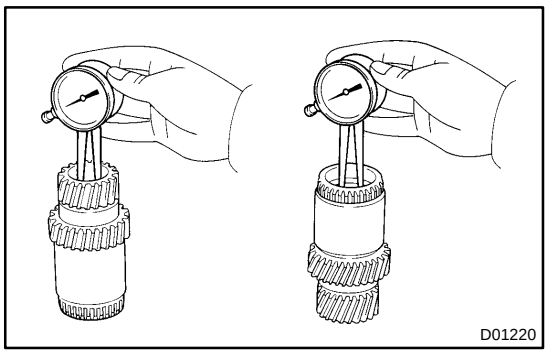

D01219

4. MEASURE PLANETARY PINION GEAR THRUST CLEARANCE

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

Standard clearance: 0.2 - 0.6 mm (0.008 - 0.024 in.)
Maximum clearance: 1.0 mm (0.039 in.)

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



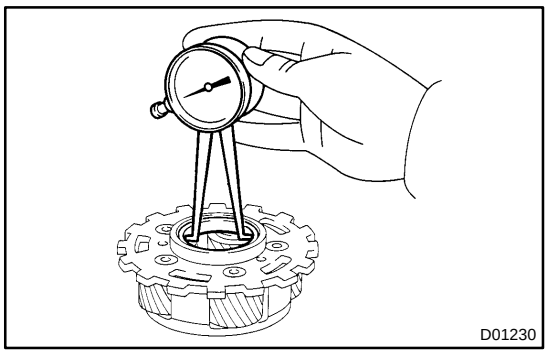
5. CHECK FRONT & CENTER PLANETARY SUN GEAR BUSHING

Using a dial indicator, measure the inside diameter of the planetary sun gear bushing.

Maximum inside diameter: 24.79 mm (0.976 in.)

If the inside diameter is greater then the maximum, replace the planetary sun gear.

AT055-01


D01230

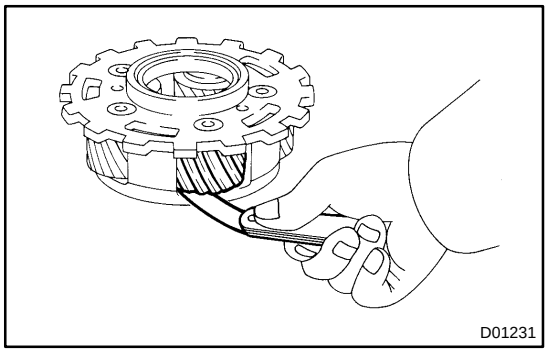
INSPECTION

1. CHECK CENTER PLANETARY GEAR BUSHING

Using a dial indicator, measure the inside diameter of the planetary gear bushing

Maximum inside diameter: 41.31 mm (1.626 in.)

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


D01231

2. MEASURE PLANETARY PINION GEAR THRUST CLEARANCE

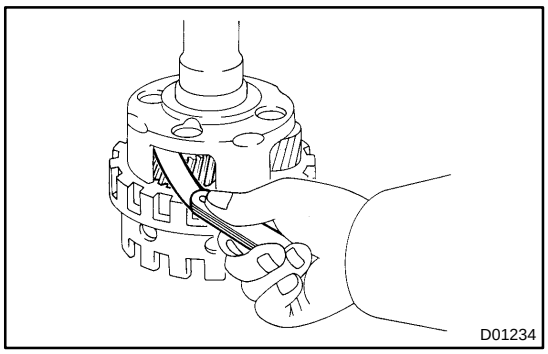
Using a feeler gauge, measure the planetary pinion gear thrust clearance.

Standard clearance: 0.2 - 0.6 mm (0.008 - 0.024 in.)
Maximum clearance: 1.0 mm (0.039 in.)

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

AT059-02

INSPECTION

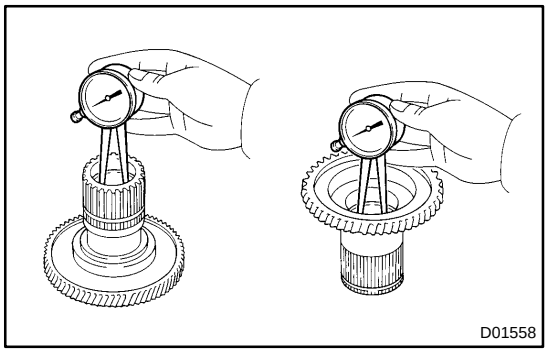


1. MEASURE PLANETARY PINION GEAR THRUST CLEARANCE

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

Standard clearance: 0.2 - 0.6 mm (0.008 - 0.024 in.)
Maximum clearance: 1.0 mm (0.039 in.)

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

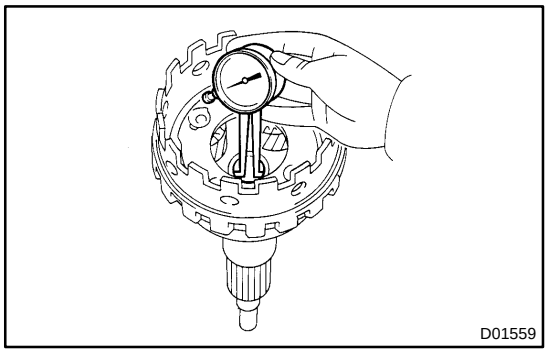


2. CHECK REAR PLANETARY RING GEAR BUSHING

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

Maximum inside diameter: 38.56 mm (1.518 in.)

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

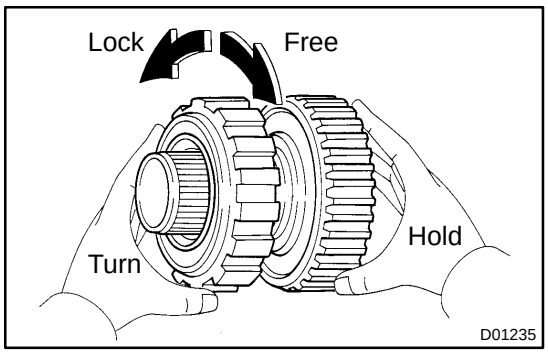


3. CHECK OUTPUT SHAFT BUSHING

Using a dial indicator, measure the inside diameter of the output shaft bushing.

Maximum inside diameter: 20.08 mm (0.791 in.)

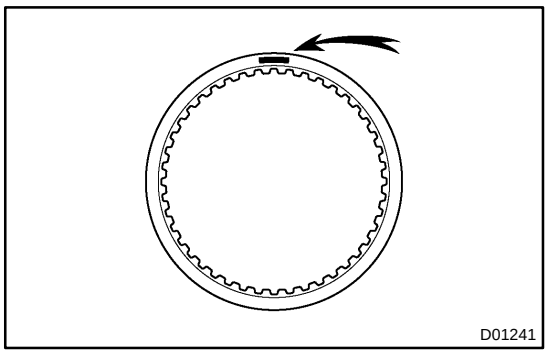
If the inside diameter is greater than the maximum, replace the output shaft.



4. CHECK OPERATION ONE-WAY CLUTCH

(a) Install the No. 2 one-way clutch to rear planetary ring gear.
(b) Hold the rear planetary ring gear and turn the one-way clutch.
(c) The one-way clutch turns freely clockwise and locks counterclockwise.
(d) Remove the No. 2 one-way clutch from rear planetary ring gear.

AT05D-01



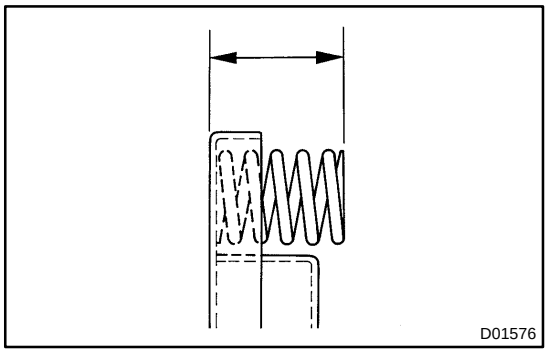
INSPECTION

1. CHECK DISC, PLATE AND FLANGE

Check to see if the sliding surface of the disc, plate and flange are worn or burnt. If necessary, replace them.

HINT:

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

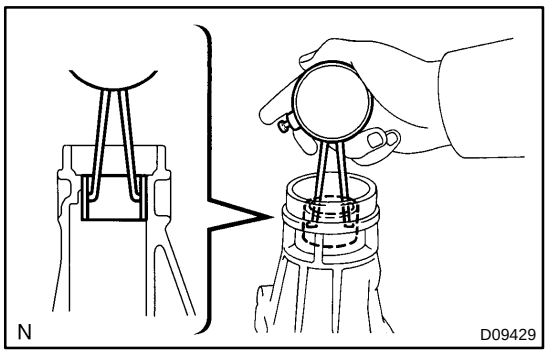


2. CHECK PISTON RETURN SPRING

Measure the free length of the spring together with the spring seat.

Standard free length: 20.0 mm (0.787 in.)

AT0J9-04



INSPECTION

INSPECT EXTENSION HOUSING BUSHING

Using a calipers gauge, measure the inside diameter of the extension housing bushing.

Maximum inside diameter: 40.08 mm (1.5779 in.)

If the inside diameter is greater than the maximum, replace the extension housing.

UPPER VALVE BODY

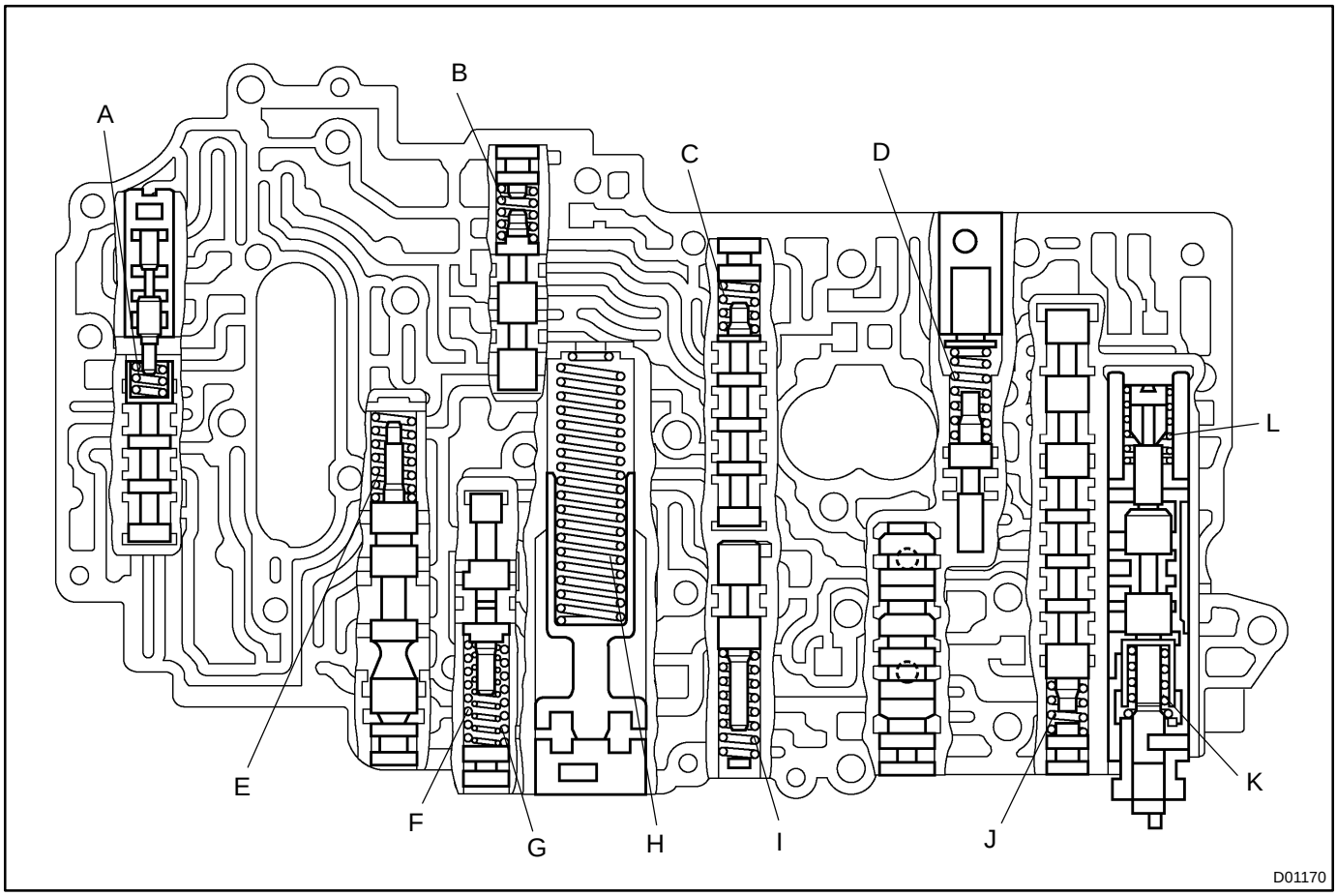
AT0Y4-01

LOCATION

1. SPRING

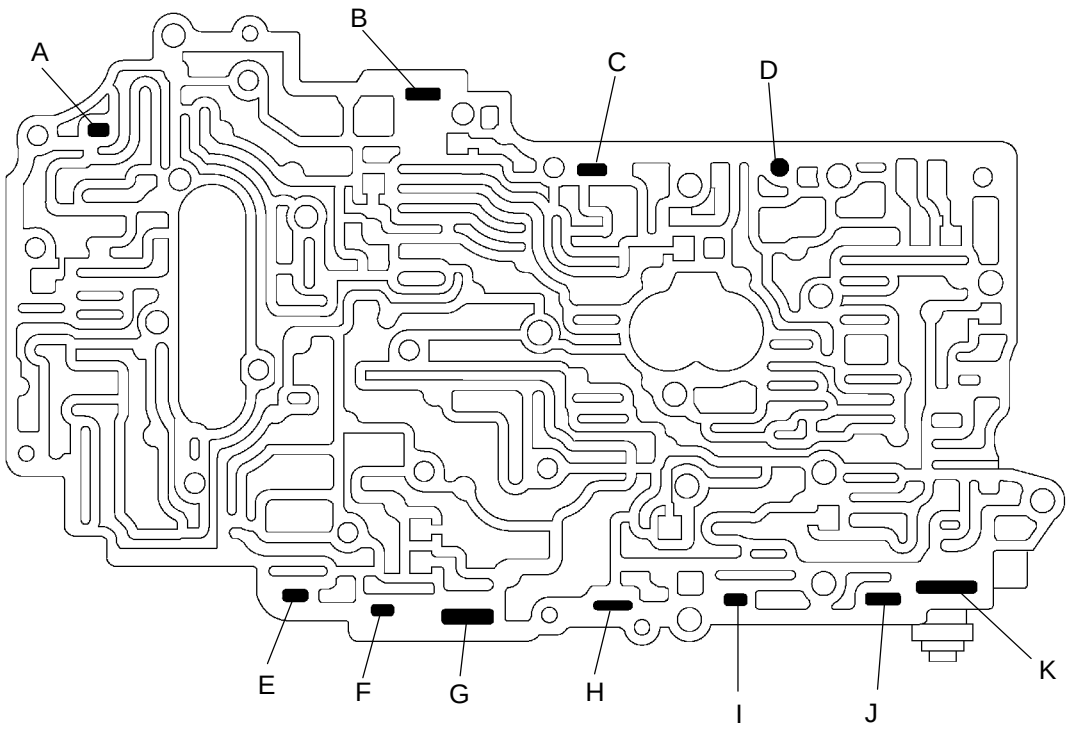
HINT:

During reassembly, please refer to the spring specifications below to help you differentiate among the different springs.



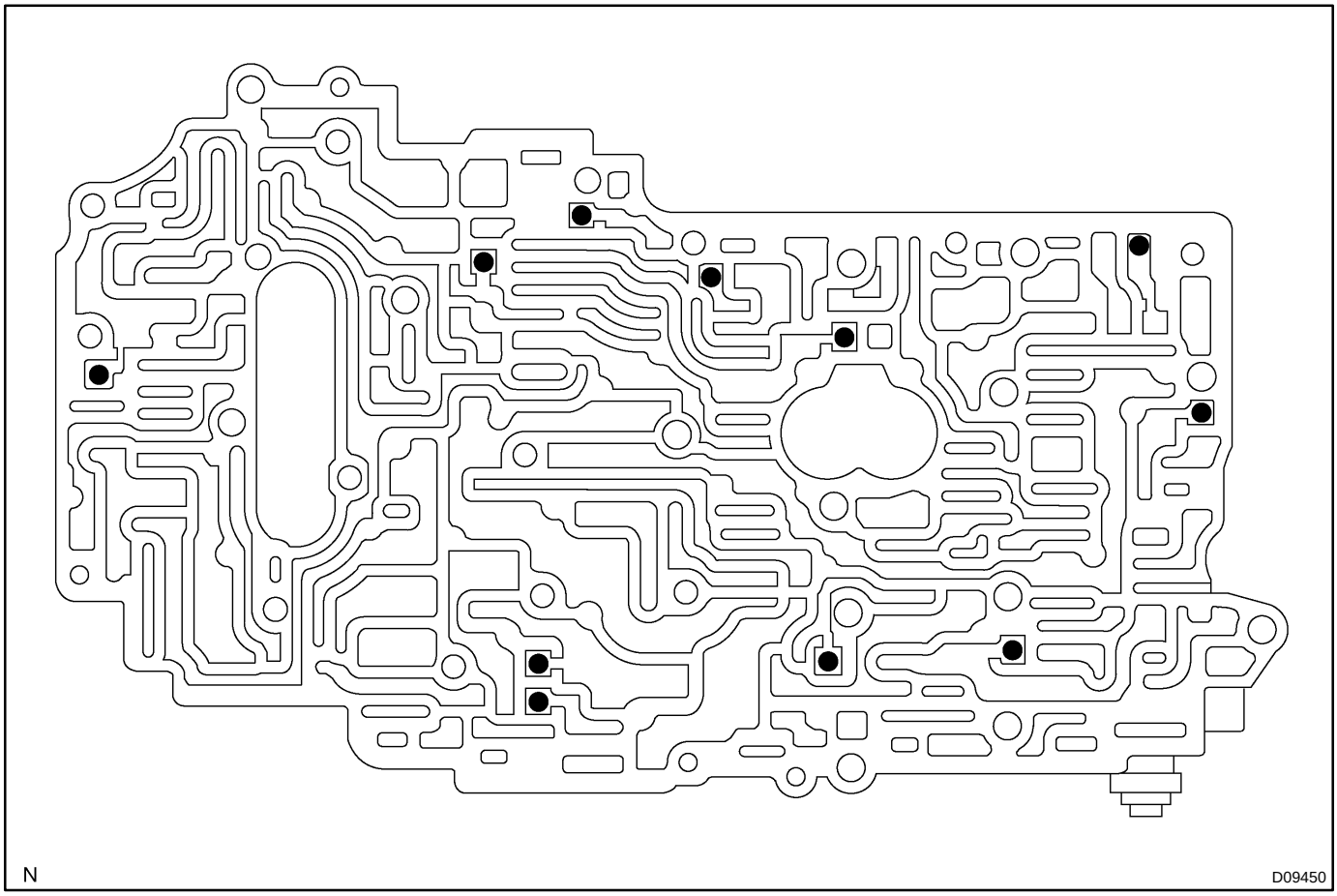
Mark	Name (Color)		Free length / Outer diameter mm (in.)	Total No. of coils
A	Lock-up Relay Valve	(Red)	23.42 (0.922) / 5.86 (0.231)	12.25
B	C-0 Exhaust Valve	(Orange)	24.25 (0.955) / 8.70 (0.343)	7.58
C	4-5 Shift Valve	(Red)	25.50 (1.004) / 9.73 (0.383)	7.75
D	Coast Brake Control Valve	(Green)	26.92 (1.060) / 8.70 (0.343)	10.53
E	Secondary Regulator Valve	(Red)	34.48 (1.357) / 9.22 (0.363)	13.5
F	C-1 Orifice Control Valve	(White)	37.13 (1.461) / 11.14 (0.439)	11.25
G	C-1 Orifice Control Valve	(None)	21.50 (0.846) / 7.76 (0.306)	11.5
H	C-1 Accumulator Valve	(Yellow)	78.16 (3.077) / 17.50 (0.689)	15.9
I	Solenoid Modulator Valve	(Light blue)	35.99 (1.417) / 8.30 (0.327)	13.8
J	2-3 Shift Valve	(Red)	25.50 (1.004) / 9.73 (0.383)	7.75
K	B-3 Control Valve	(Yellow)	26.05 (1.026) / 7.20 (0.283)	11.83
L	B-3 Control Valve	(Pink)	19.79 (0.779) / 7.70 (0.303)	8.51

2. RETAINER



Mark	Retainer	Height / Width / Thickness mm (in.)
A	Lock-up Relay Valve	- / - / -
B	C-0 Exhaust Valve	8.5 (0.335) / 5.0 (0.197) / 3.2 (0.126)
C	4-5 Shift Valve	10.0 (0.394) / 5.0 (0.197) / 3.2 (0.126)
D	Coast Brake Control Valve	15.0 (0.591) / ø 5.0 (ø 0.197) / ø 5.0 (ø 0.197)
E	Secondary Regulator Valve	10.0 (0.394) / 5.0 (0.197) / 3.2 (0.126)
F	C-1 Orifice Control Valve	8.5 (0.335) / 5.0 (0.197) / 3.2 (0.126)
G	C-1 Accumulator Valve	36.5 (1.437) / - / 3.2 (0.126)
H	Solenoid Modulator Valve	21.0 (0.827) / - / 3.2 (0.126)
I	Check Valve	10.0 (0.394) / 5.0 (0.197) / 3.2 (0.126)
J	2-3 Shift Valve	8.0 (0.315) / 8.0 (0.315) / 3.2 (0.126)
K	B-3 Control Valve	16.5 (0.650) / 6.0 (0.236) / 3.2 (0.126)

3. CHECK BALL



LOWER NO.1 VALVE BODY

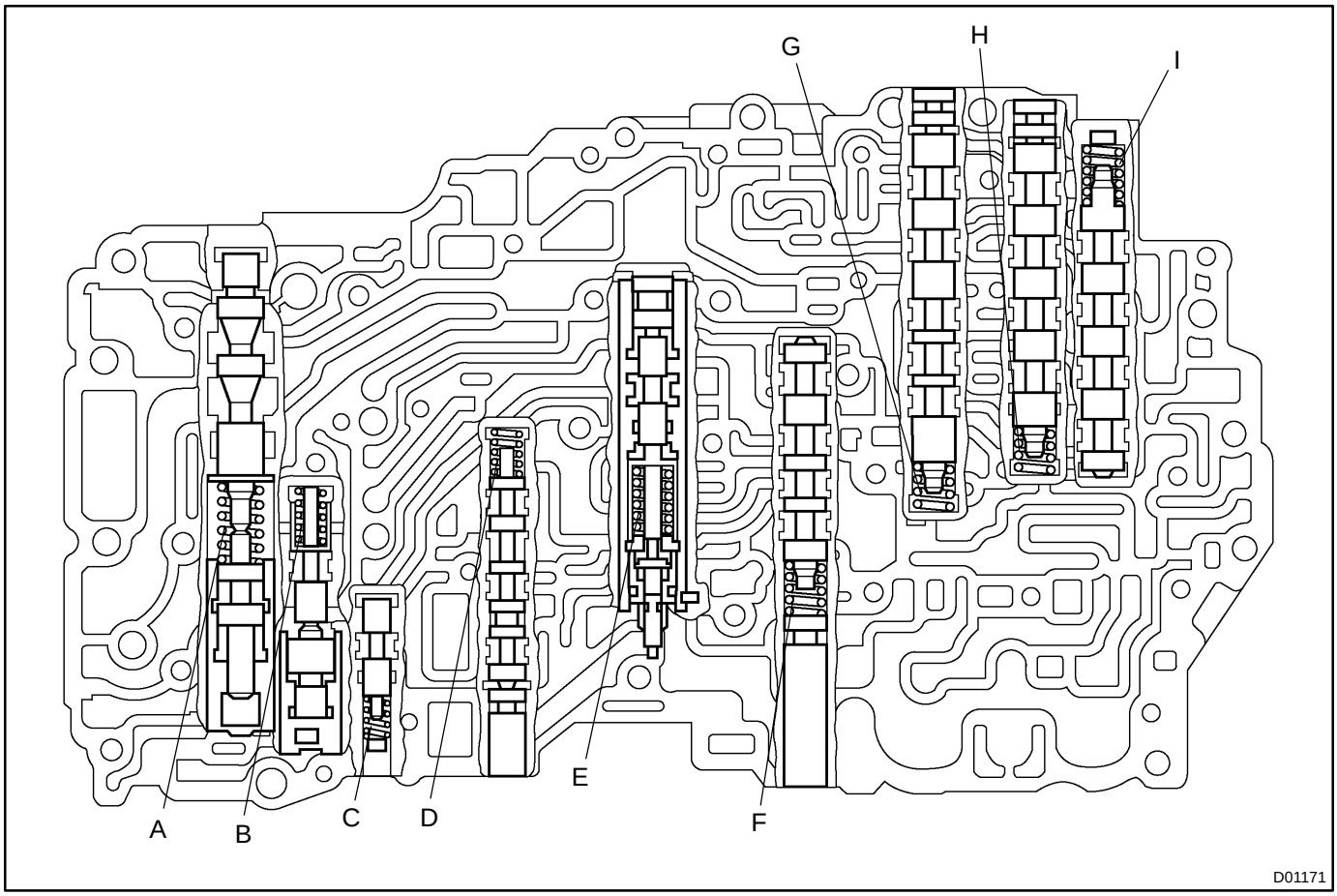
AT0Y5-01

LOCATION

1. SPRING

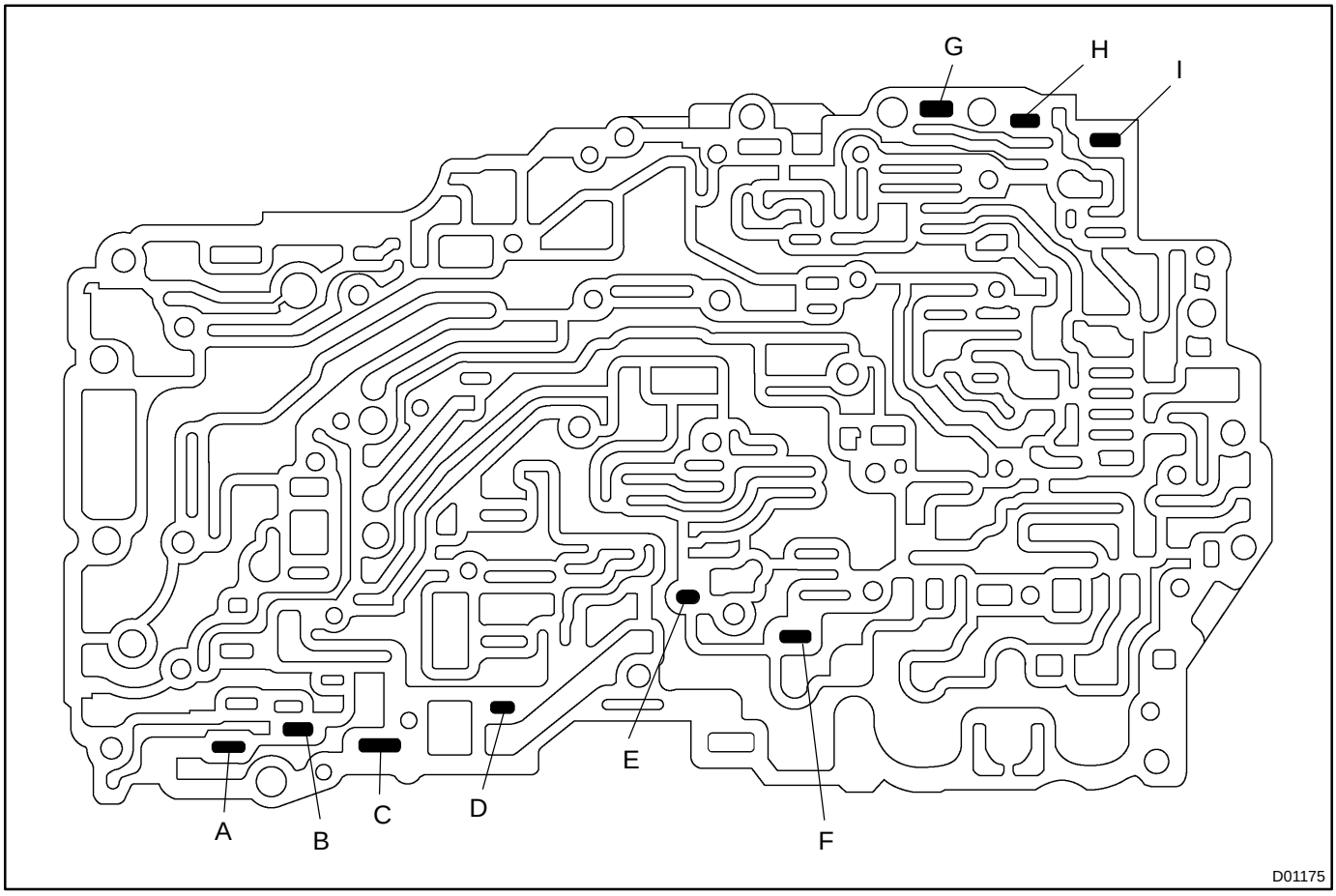
HINT:

During reassembly, please refer to the spring specifications below to help you differentiate among the different springs.



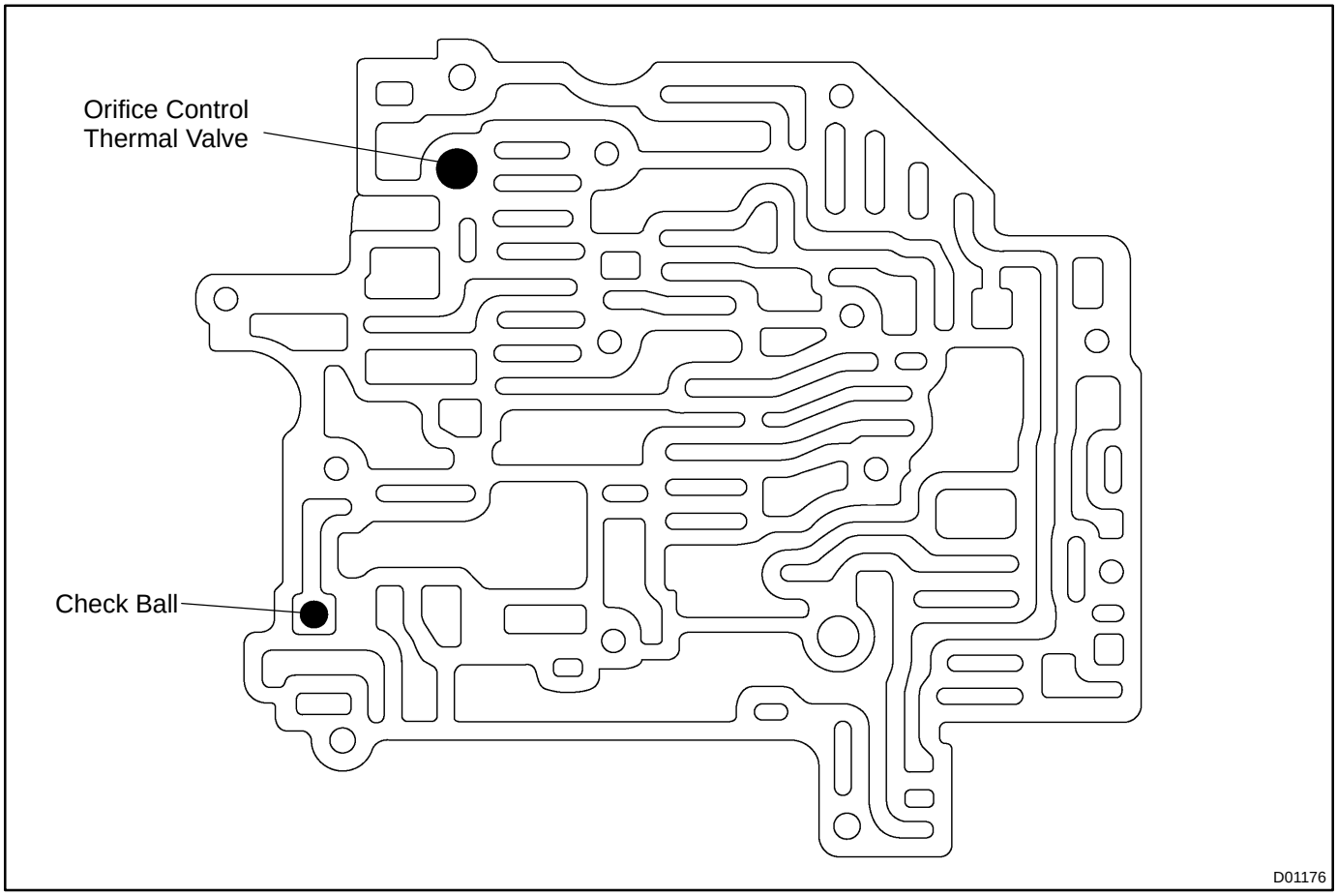
Mark	Name (Color)		Free length / Outer diameter mm (in.)	Total No. of coils
A	Primary Regulator Valve	(Lignt green)	39.78 (1.566) / 18.88 (0.743)	6.65
B	Lock-up Control Valve	(Yellow)	20.87 (0.822) / 5.55 (0.219)	11.15
C	Cut Back Valve	(None)	22.60 (0.890) / 8.13 (0.320)	8.0
D	C-0 Control Relay Valve	(None)	20.30 (0.799) / 6.10 (0.240)	12.75
E	Accumulator Control Valve	(Light green)	27.47 (1.081) / 8.85 (0.348)	11.59
F	Solenoid Relay Valve	(Beige)	32.11 (1.264) / 8.80 (0.346)	8.6
G	3-4 Shift Valve	(Red)	25.50 (1.004) / 9.73 (0.383)	7.75
H	1-2 Shift Valve	(Red)	25.50 (1.004) / 9.73 (0.383)	7.75
I	B-2 Release Control Valve	(Orange)	24.25 (0.955) / 8.70 (0.343)	7.58

2. RETAINER



Mark	Retainer	Height / Width / Thickness mm (in.)
A	Primary Regulator Valve	- / - / 3.2 (0.126)
B	Lock-up Control Valve	19.0 (0.748) / 5.0 (0.197) / 3.2 (0.126)
C	Cut Back Valve	21.0 (0.827) / - / 3.2 (0.126)
D	C-0 Control Relay Valve	8.5 (0.335) / 5.0 (0.197) / 3.2 (0.126)
E	Accumulator Control Valve	29.0 (1.142) / 5.0 (0.197) / 3.2 (0.126)
F	Solenoid Relay Valve	8.0 (0.315) / 8.0 (0.315) / 3.2 (0.126)
G	3-4 Shift Valve	8.0 (0.315) / 8.0 (0.315) / 3.2 (0.126)
H	1-2 Shift Valve	8.0 (0.315) / 8.0 (0.315) / 3.2 (0.126)
I	B-2 Release Control Valve	21.0 (0.827) / - / 3.2 (0.126)

3. CHECK BALL AND ORIFICE CONTROL THERMAL VALVE



LOWER NO.2 VALVE BODY

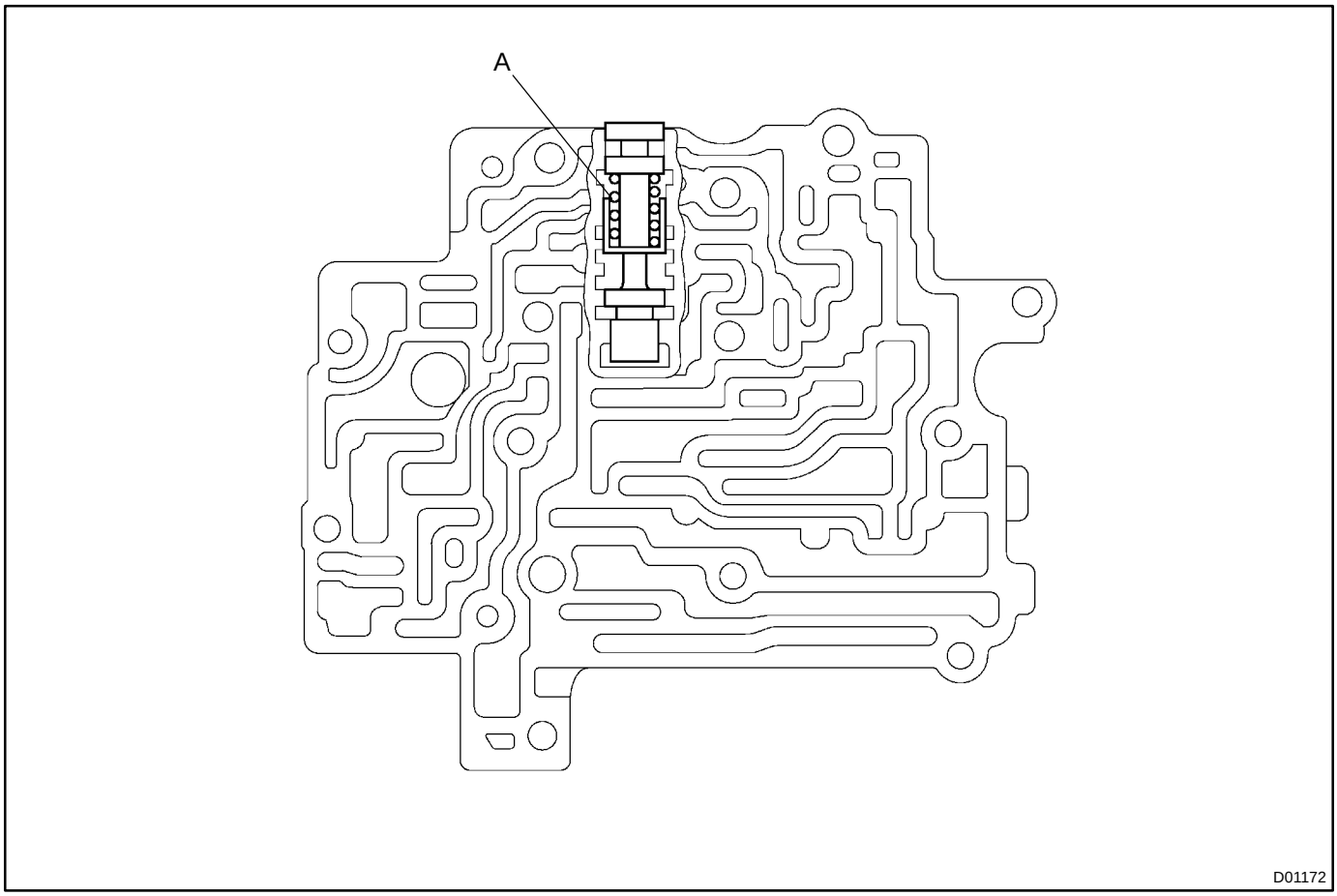
AT0Y6-01

LOCATION

1. SPRING

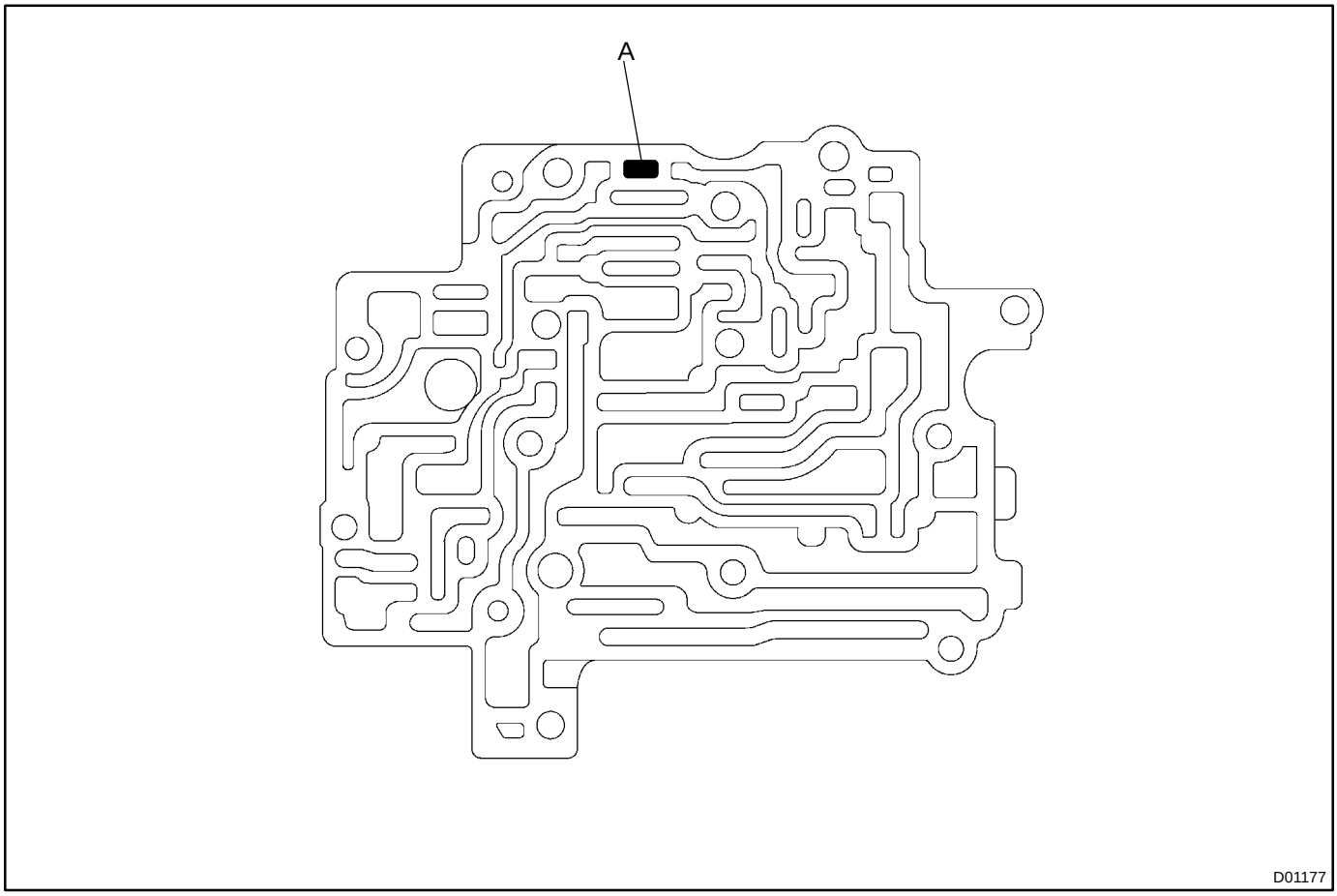
HINT:

During reassembly, please refer to the spring specifications below to help you differentiate among the different springs.



Mark	Name (Color)	Free length / Outer diameter mm (in.)	Total No. of coils
A	Reverse Control Valve (None)	25.58 (1.007) / 8.64 (0.340)	8.75

2. RETAINER

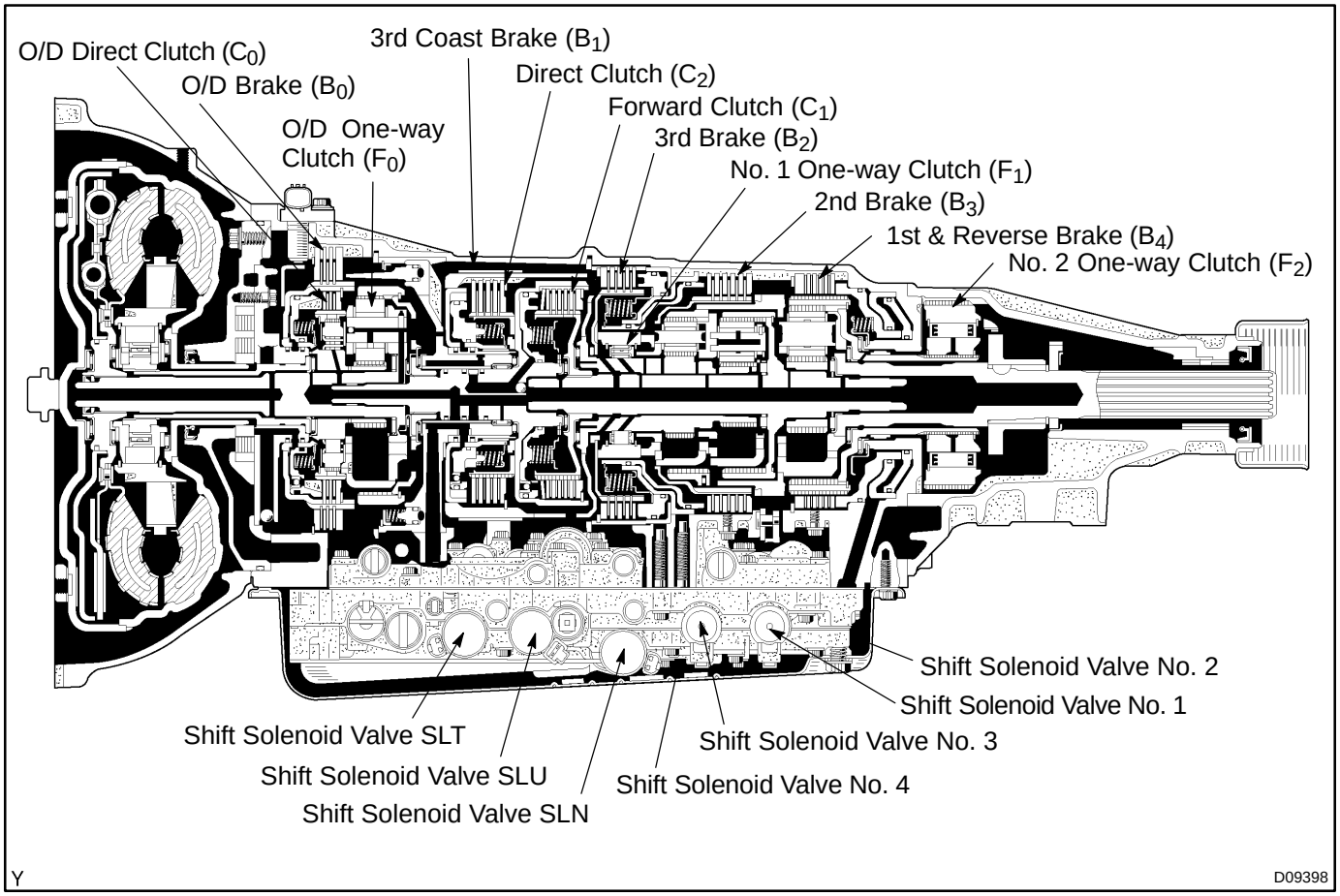


Mark	Retainer	Height / Width / Thickness mm (in.)
A	Reverse Control Valve	8.5 (0.335) / 5.0 (0.197) / 3.2 (0.126)

AUTOMATIC TRANSMISSION SYSTEM

OPERATION

AT04A-02

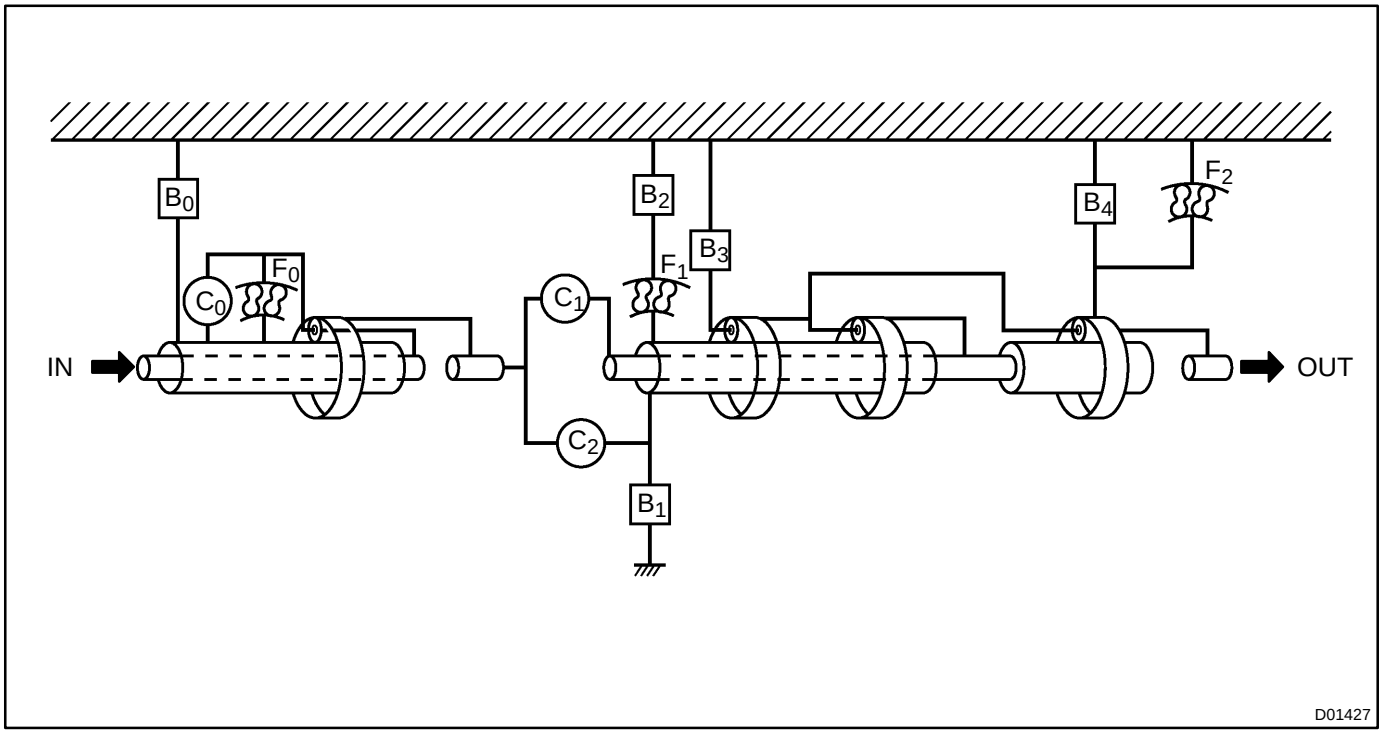


Shift Lever Position	Gear Position	S1	S2	S3	S4	C_0	C_1	C_2	B_0	B_1	B_2	B_3	B_4	F_0	F_1	F_2
P	Park	ON	OFF	ON	OFF	○										
R	Reverse	ON	OFF	OFF	OFF			○	○				○			
N	Neutral	ON	OFF	ON	OFF	○										
D M (5)*	1st	ON	OFF	OFF	OFF	○	○							○		○
	2nd	ON	ON	OFF	OFF	○	○					○		○		
	3rd	OFF	ON	OFF	OFF	○	○				○			○	○	
	4th	OFF	OFF	ON	OFF	○	○	○			○			○		
	5th	OFF	OFF	OFF	ON		○	○	○		○					
3	1st	ON	OFF	OFF	OFF	○	○							○		○
	2nd	ON	ON	OFF	OFF	○	○					○		○		
	3rd	OFF	ON	ON	OFF	○	○			○	○			○	○	
2	1st	ON	OFF	ON	OFF	○	○							○		○
	2nd	ON	ON	OFF	OFF	○	○					○		○		
L	1st	ON	OFF	OFF	OFF	○	○						○	○		○

○ : Operating

* : When the shift lever position is ”M” and the gear position indicator shows ”5”.

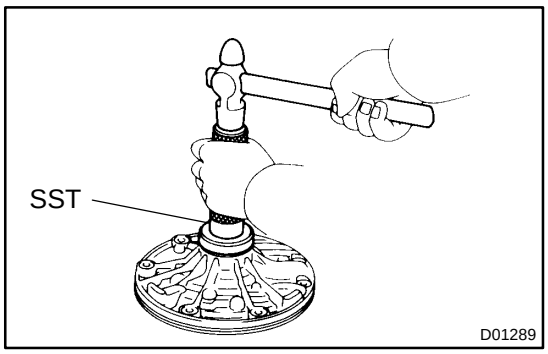
FUNCTION OF COMPONENTS



Component		Function
C_0	O/D Direct Clutch	Connects O/D sun gear & O/D planetary carrier.
C_1	Forward Clutch	Connects input shaft and rear planetary sun gear.
C_2	Direct Clutch	Connects input shaft and front & center planetary sun gear.
B_0	O/D Brake	Prevents O/D sun gear from turning either clockwise or counterclockwise.
B_1	3rd Coast Brake	Prevents front & center planetary sun gear from turning either clockwise or counterclockwise.
B_2	3rd Brake	Prevents outer race of F_1 from turning either clockwise or counterclockwise thus preventing the front & center planetary sun gear from turning counterclockwise.
B_3	2nd Brake	Prevents front planetary carrier from turning either clockwise or counterclockwise.
B_4	1st & Reverse Brake	Prevents rear planetary ring gear from turning either clockwise or counterclockwise.
F_0	O/D One-way Clutch	When the transmission is being driven by the engine, this clutch connects the O/D sun gear and O/D planetary carrier.
F_1	No.1 One-way Clutch	When B_2 is operating, this clutch prevents the front & center planetary sun gear from turning counterclockwise.
F_2	No.2 One-way Clutch	Prevents rear planetary ring gear from turning clockwise.

AT04E-01

REASSEMBLY



1. INSTALL OIL SEAL

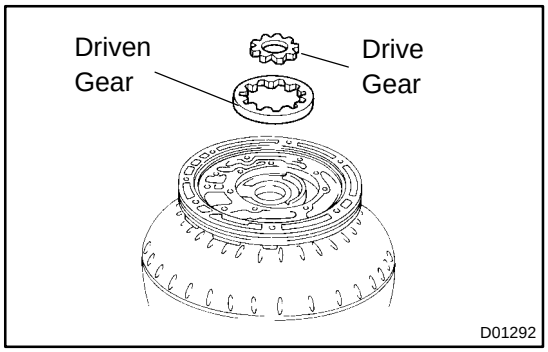
(a) Using SST, install a new oil seal.

HINT:

The oil seal end should be flush with the outer edge of the pump body.

SST 09350-30020 (09351-32140)

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

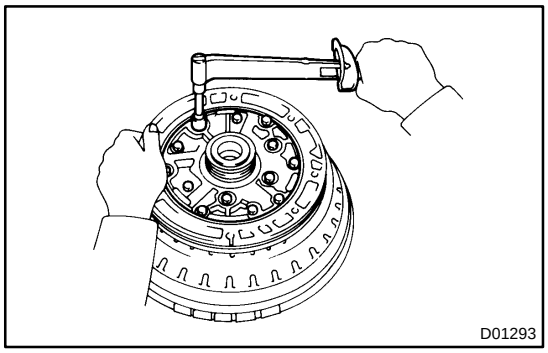


2. INSTALL DRIVEN GEAR AND DRIVE GEAR TO OIL PUMP BODY

(a) Place the oil pump body on the torque converter clutch.

(b) Coat the driven gear and drive gear with ATF.

(c) Install the driven gear and drive gear.

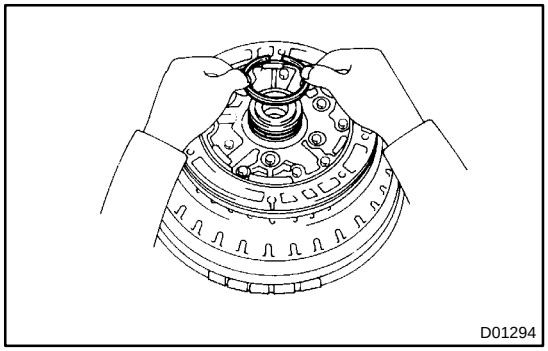


3. INSTALL STATOR SHAFT TO OIL PUMP BODY

(a) Align the stator shaft with each bolt hole.

(b) Install the 13 bolts.

Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)



4. INSTALL OIL SEAL RINGS

(a) Coat the 2 oil seal rings with ATF.

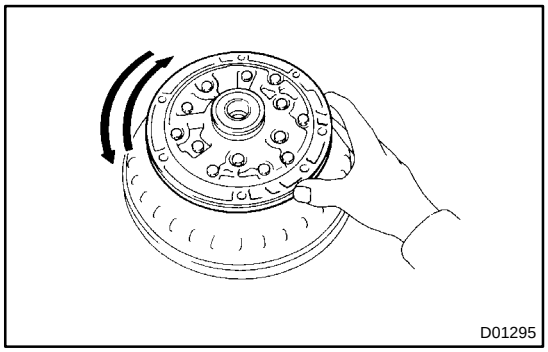
(b) Install the 2 oil seal rings to the stator shaft groove, then snug them down by squeezing their ends together.

NOTICE:

Do not spread the ring ends too much.

HINT:

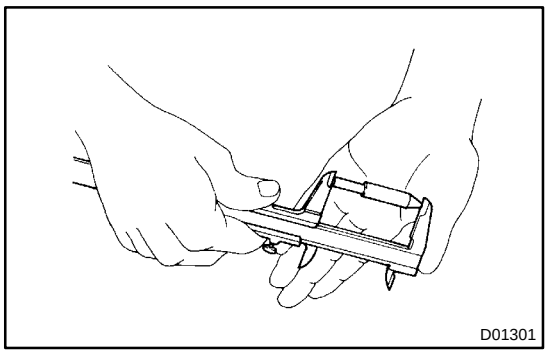
After installing the oil seal rings, check that they rotate smoothly.



5. CHECK OIL PUMP DRIVE GEAR ROTATION

Make sure the drive gear rotates smoothly.

AT04I-02



REASSEMBLY

1. SELECT PISTON ROD

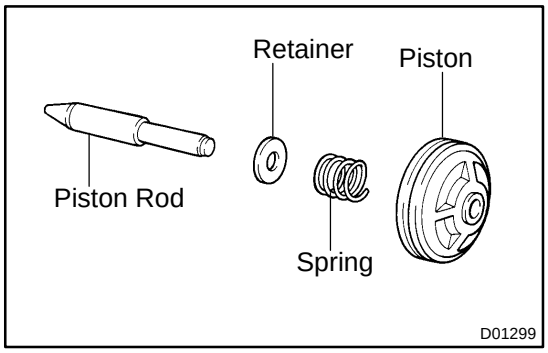
If the band is OK with piston rod stroke not within the standard value, select a new piston rod.

HINT:

There are 5 different lengths for piston rod.

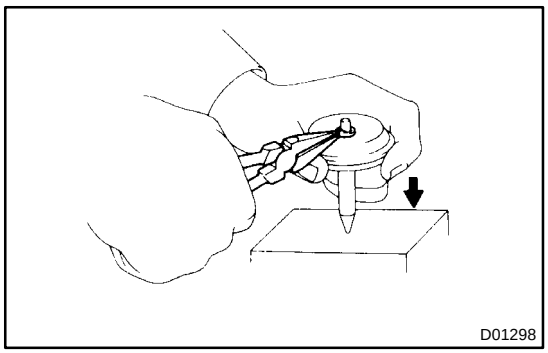
Piston rod length: mm (in.)

77.65 (3.057)	79.90 (3.146)
78.40 (3.087)	80.65 (3.175)
79.15 (3.116)	-



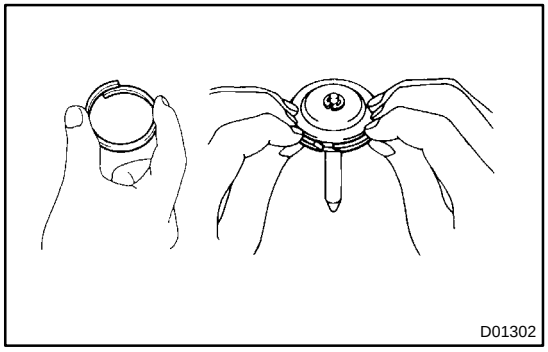
2. ASSEMBLE 3RD COAST BRAKE PISTON

(a) Install the retainer, compression spring and piston to the piston rod.



(b) Firmly hold down the piston, then compress the compression spring.

(c) Install the E-ring.



3. INSTALL 3RD COAST BRAKE PISTON OIL SEAL RING

(a) Coat the oil seal ring with ATF.

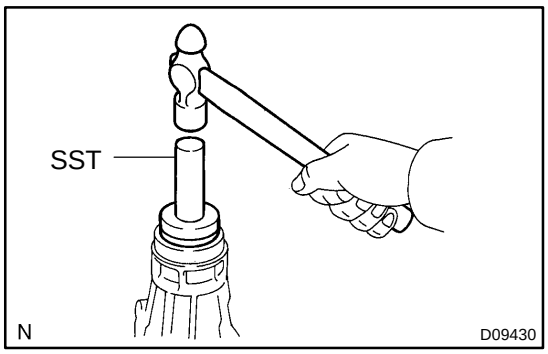
(b) Install the oil seal ring to the piston groove, then snug it down by squeezing its ends together.

NOTICE:

Do not spread the ring ends more than necessary.

AT0Y3-01

REASSEMBLY



1. INSTALL NEW EXTENSION HOUSING OIL SEAL

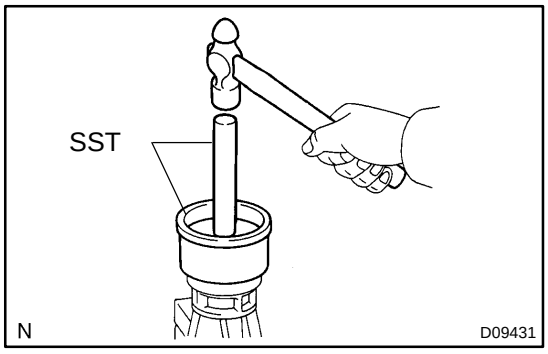
(a) Using SST and a hammer, carefully drive a new oil seal in as far as it will go.

SST 09325-20010

NOTICE:

Clean the extension housing before removing the oil seal.

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



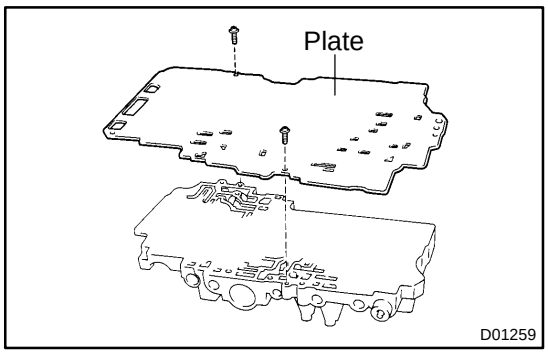
2. INSTALL NEW EXTENSION HOUSING DUST DEFLECTOR

Using SST and hammer, carefully drive a new dust deflector in as far as it will go.

SST 09223-15030, 09950-70010 (09951-07100)

AT05J-02

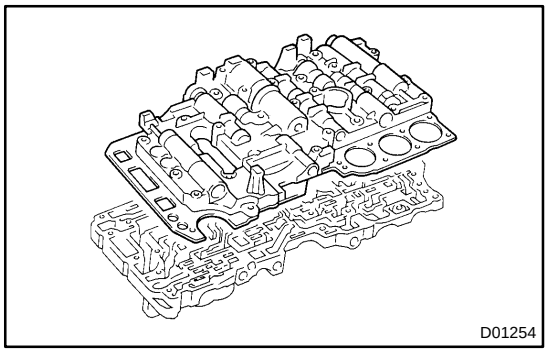
REASSEMBLY



1. INSTALL PLATE ON UPPER VALVE BODY

(a) Align the plate with each bolt hole and install the 2 screws.

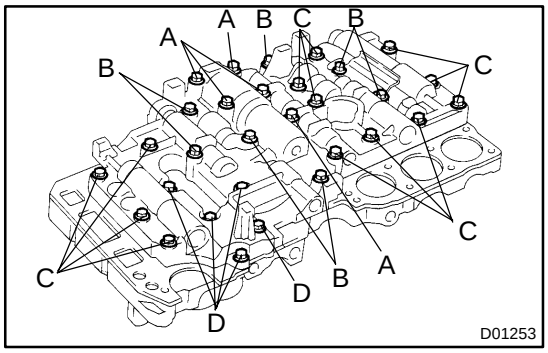
(b) Install the 2 strainers.



2. PLACE UPPER VALVE BODY WITH PLATE ON TOP OF NO. 1 LOWER VALVE BODY

(a) Install the spring and check valve.

(b) Align the plate in the valve body with each bolt hole.



3. INSTALL UPPER VALVE BODY TO NO. 1 LOWER VALVE BODY WITH 30 BOLTS

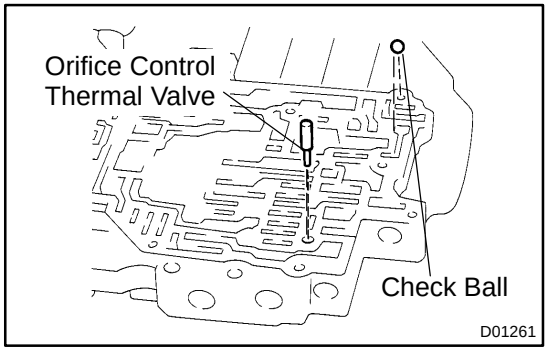
Install the plate from the upper valve body.

Torque: 6.4 N·m (65 kgf·cm, 56 in.·lbf)

HINT:

Each bolts length is indicated below.

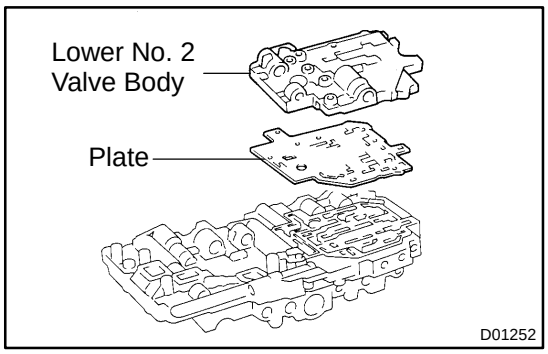
Bolt length:
Bolt A: 40 mm (1.575 in.)
Bolt B: 35 mm (1.378 in.)
Bolt C: 28 mm (1.102 in.)
Bolt D: 20 mm (0.787 in.)



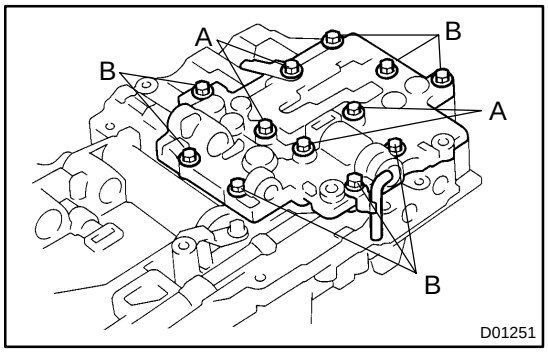
4. INSTALL THE LOWER NO. 2 VALVE BODY AND PLATE TO LOWER NO. 1 VALVE BODY

(a) Install the check ball and orifice control thermal valve.

(b) Install the strainer.



(c) Align the holes of lower No. 2 valve body with those of plate and place them on the lower No. 1 valve body with aligning all the holes.

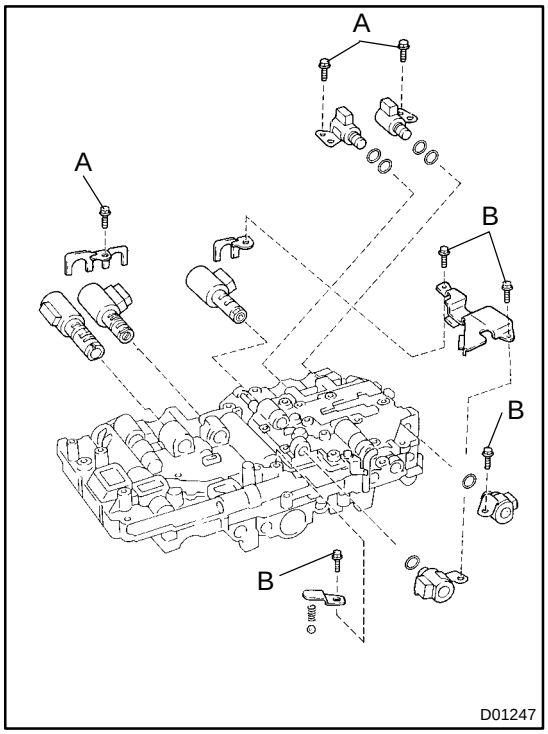


(d) Install the 12 bolts. 2 of them are attached to the oil cooler pipe and clamp. So install them all together.
Torque: 6.4 N·m (65 kgf·cm, 56 in.·lbf)

HINT:

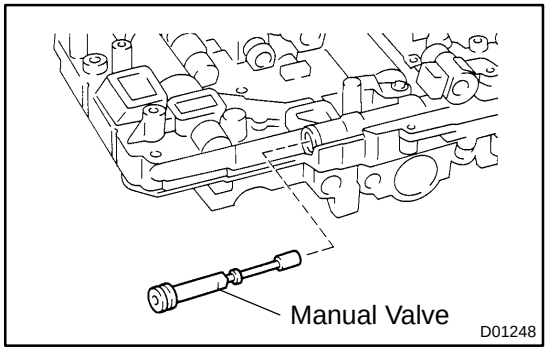
Each bolts length is indicated below.

Bolt length:
Bolt A: 28 mm (1.102 in.)
Bolt B: 20 mm (0.787 in.)

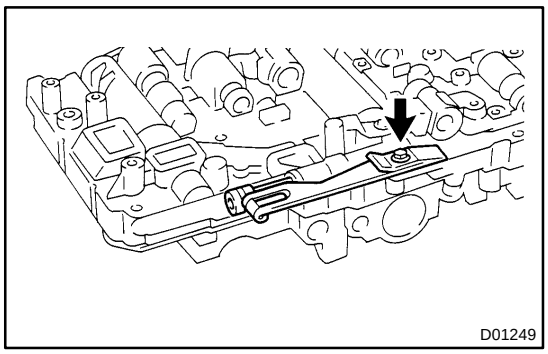


5. INSTALL 7 SOLENOIDS

(a) Coat 6 new O-rings with ATF and install them on the shift solenoid No. 1, No. 2, No. 3 and No. 4.
(b) Install the shift solenoid valve S1 and the bolt.
(c) Install the shift solenoid valve S3 with the bolt.
(d) Install the shift solenoid valve S2 with the bolt.
(e) Install the shift solenoid valve S4.
(f) Install the shift solenoid valve SLN, and No. 1 solenoid lock plate.
(g) Install the oil guide plate with the 2 bolts.
(h) Install the shift solenoid valve SLU, SLT, and No. 2 solenoid lock plate with the bolt.
(i) Install the ball, spring, pressure relief valve spring seat and bolt.
Torque:
Bolt A: 6.4 N·m (65 kgf·cm, 56 in.·lbf)
Bolt B: 9.8 N·m (100 kgf·cm, 7 ft·lbf)



6. INSTALL MANUAL VALVE



7. INSTALL DETENT SPRING AND SPRING PLATE
Torque: 9.8 N·m (100 kgf·cm, 7 ft·lbf)

8. MAKE SURE MANUAL VALVE MOVES SMOOTHLY

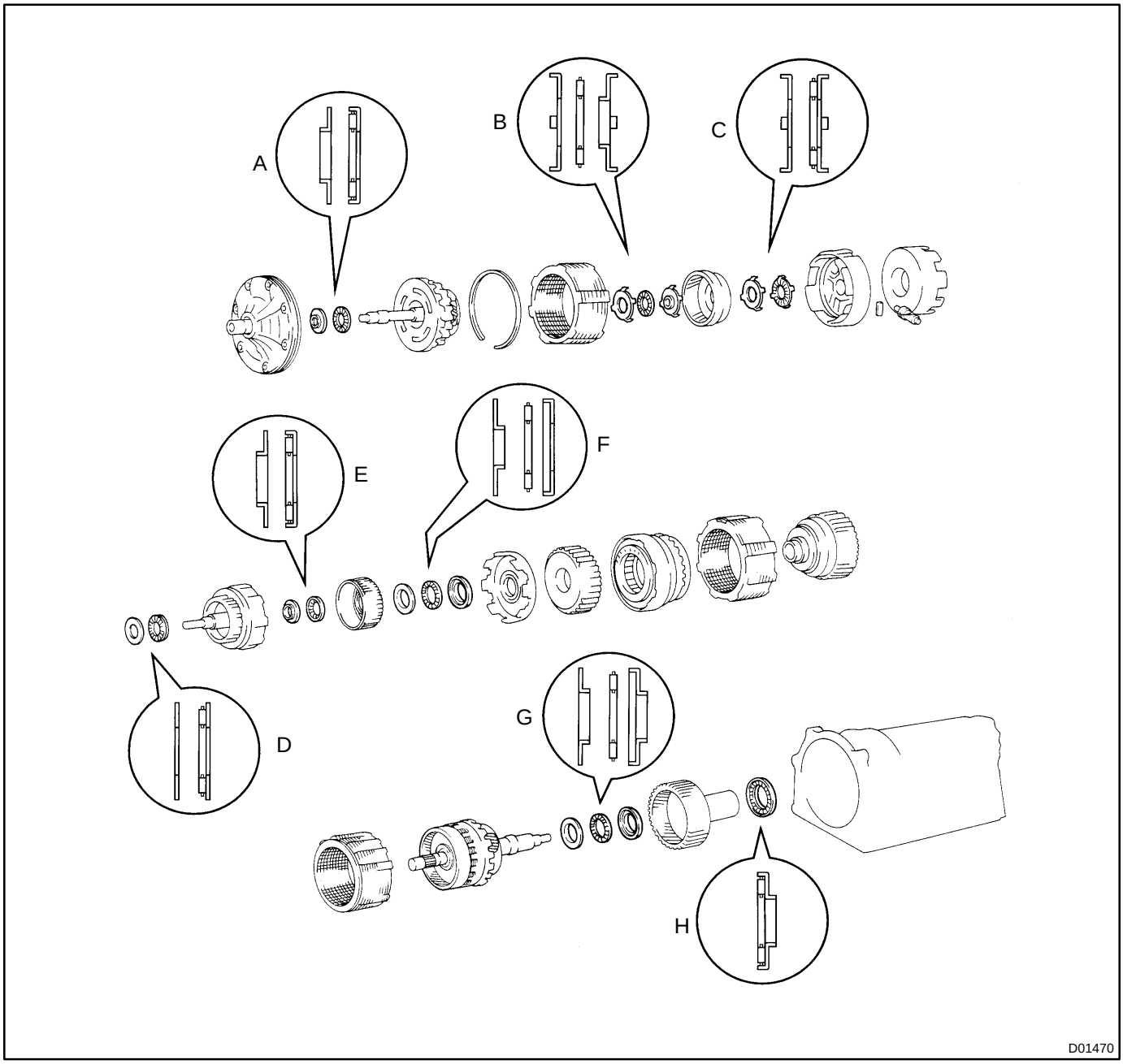
AT0Y0-01

REASSEMBLY

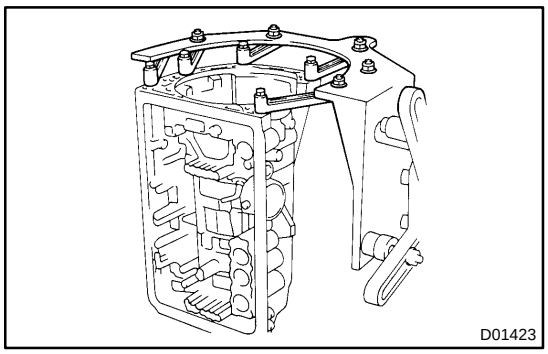
NOTICE:

- **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 the 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 the group in a separate container while proceeding with disassembly, inspection, repair and reassembly of other component groups.**
  Recommended ATF: Type 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 for efficient inspection, repairs, and reassembly.**
- **When disassembling a valve body, be sure to match 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 apply adhesive cements to 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 the 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 a 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.

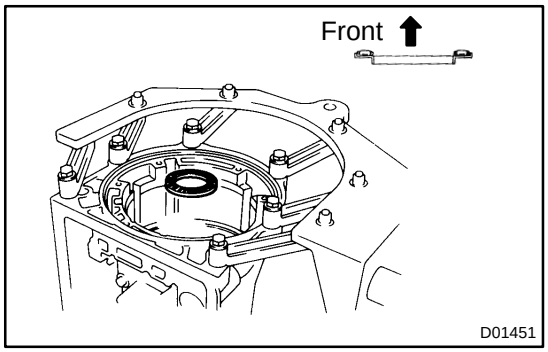
BEARING AND RACES INSTALLATION POSITION AND DIRECTION



Mark	Front Race Diameter Inside / Outside mm (in.)	Thrust Bearing Diameter Inside / Outside mm (in.)	Rear Race Diameter Inside / Outside mm (in.)
A	28.1 (1.106) / 47.5 (1.870)	28.8 (1.134) / 50.4 (1.984)	-
B	27.2 (1.070) / 42.0 (1.654)	25.9 (1.020) / 47.0 (1.850)	24.0 (0.945) / 48.0 (1.890)
C	37.1 (1.461) / 59.0 (2.323)	33.6 (1.323) / 50.3 (1.980)	-
D	37.0 (1.457) / 51.0 (2.008)	33.5 (1.319) / 47.8 (1.882)	-
E	26.2 (1.031) / 41.1 (1.618)	26.3 (1.035) / 44.0 (1.732)	-
F	32.5 (1.280) / 59.0 (2.323)	43.5 (1.712) / 59.8 (2.354)	43.5 (1.712) / 61.5 (2.421)
G	39.2 (1.543) / 56.8 (2.236)	40.7 (1.602) / 57.0 (2.244)	41.2 (1.620) / 59.8 (2.354)
H	-	52.9 (2.083) / 70.6 (2.780)	-



1. INSTALL TRANSMISSION CASE ON OVERHAUL ATTACHMENT

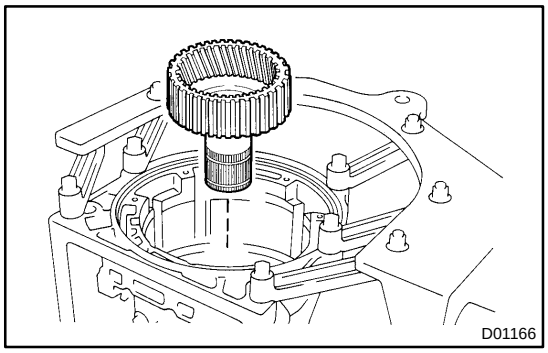


2. INSTALL REAR PLANETARY RING GEAR

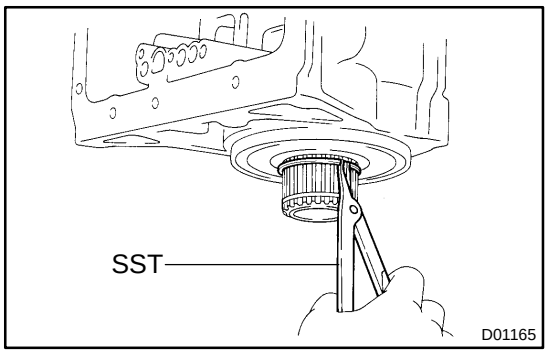
(a) Install the assembled bearing & race.

Assembled bearing & race diameter: mm (in.)

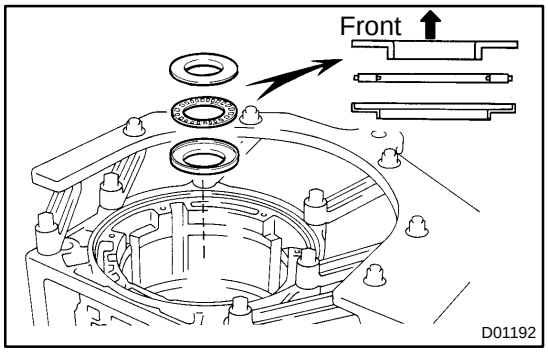
	Inside	Outside
Assembled bearing & race	52.9 (2.083)	70.6 (2.780)



(b) Install the rear planetary ring gear.



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

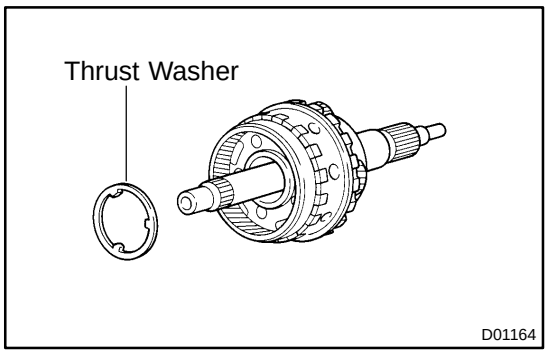


3. INSTALL OUTPUT SHAFT WITH CENTER AND REAR PLANETARY GEAR

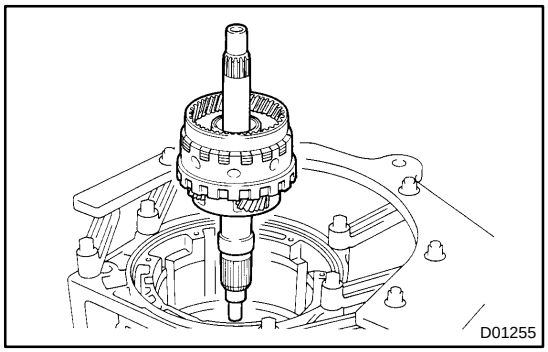
(a) Install the 2 races and bearing onto the rear planetary ring gear.

Bearing and race diameter: mm (in.)

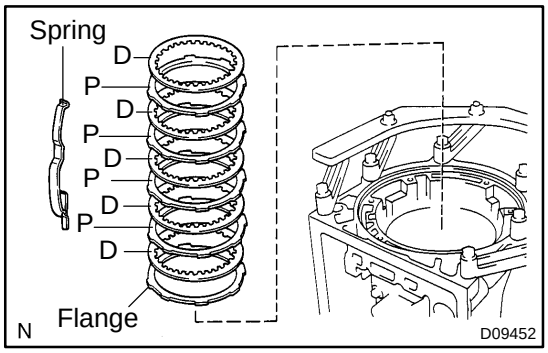
	Inside	Outside
Race	39.2 (1.543)	56.8 (2.236)
Bearing	40.7 (1.602)	57.0 (2.244)
Race	41.2 (1.620)	59.8 (2.354)



(b) Install the thrust washer to the output shaft with center & rear planetary gear.



(c) Install the output shaft with center & rear planetary gear.

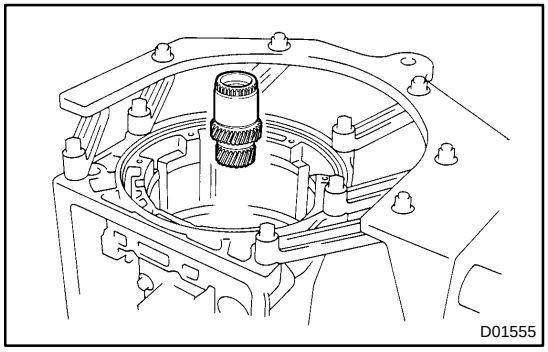


4. INSTALL FRONT PLANETARY GEAR

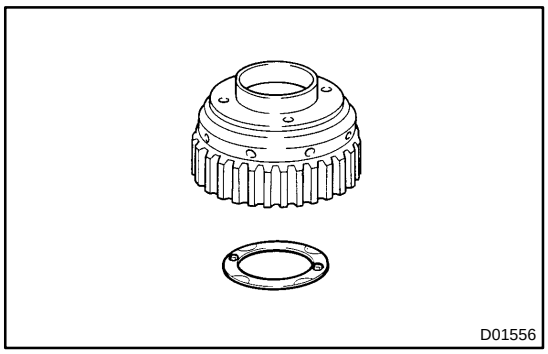
(a) Install the spring to the case.

(b) Install the 2nd brake pack (4 plates, 5 discs and flange).
Install in order: P = Plate, D = Disc
D - P - D - P - D - P - D - P - D
Flange thickness: mm (in.)

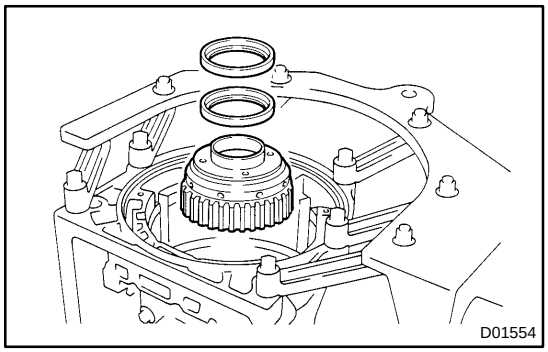
No.	Thickness	No.	Thickness
21	2.1 (0.083)	27	2.7 (0.106)
23	2.3 (0.091)	29	2.9 (0.114)
25	2.5 (0.098)	31	3.1 (0.122)



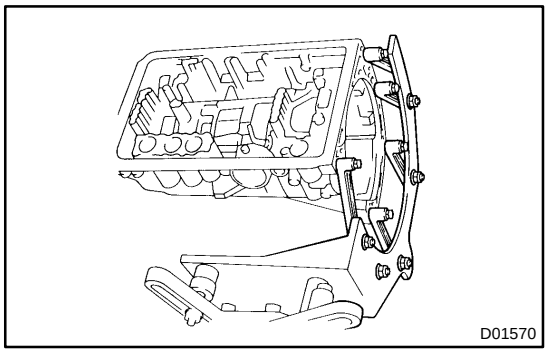
(c) Install the front & center planetary sun gear from the case.


D01556

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

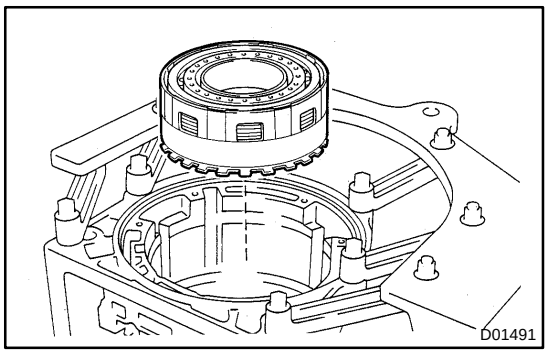

D01554

(e) Install the front planetary gear and 2 washers from the case.

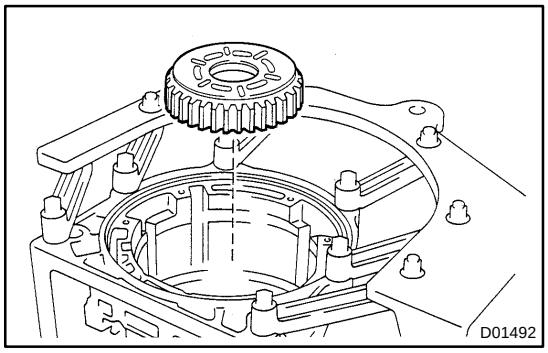

D01570

5. INSTALL MULTIPLE DISC BRAKE AND NO. 1 ONE-WAY CLUTCH

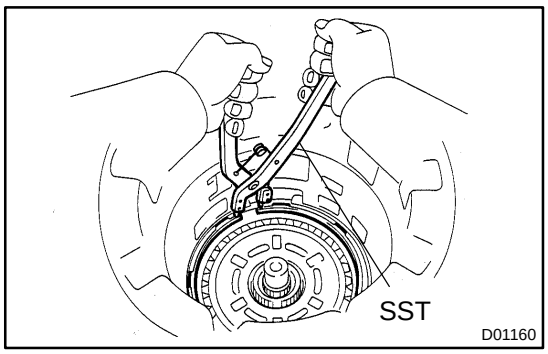
(a) Lay the transmission case.


D01491

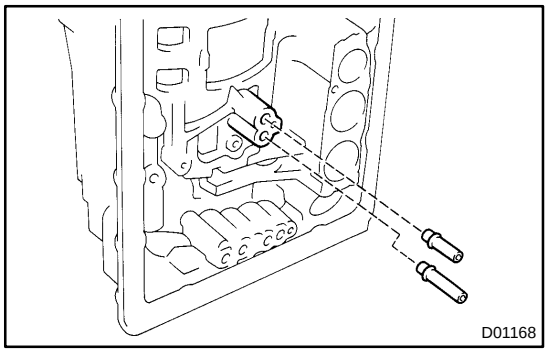
(b) Install the multiple disc brake to the case.


D01492

(c) Install the No. 1 one-way clutch to the multiple disc brake.



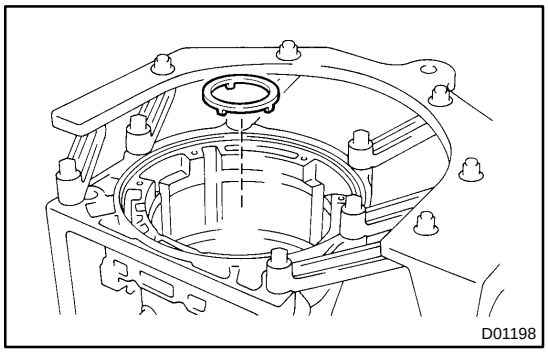
(d) Using SST, install the snap ring.
SST 09350-30020 (09350-07060)



6. INSTALL BRAKE DRUM GASKET

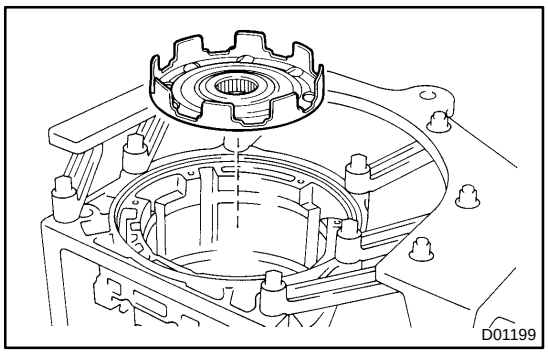
(a) Coat 2 new gaskets with ATF.

(b) Install the 2 brake drum gaskets.

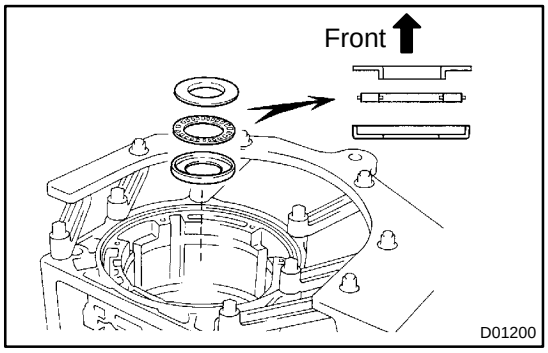


7. INSTALL SUN GEAR INPUT DRUM

(a) Install the thrust washer.



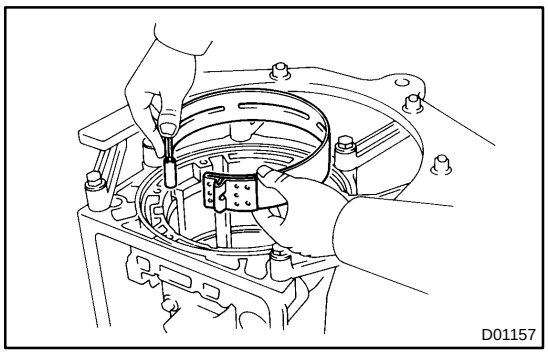
(b) Install the sun gear input drum.



(c) Coat the bearing, 2 races with petroleum jelly and install them onto the sun gear input drum.

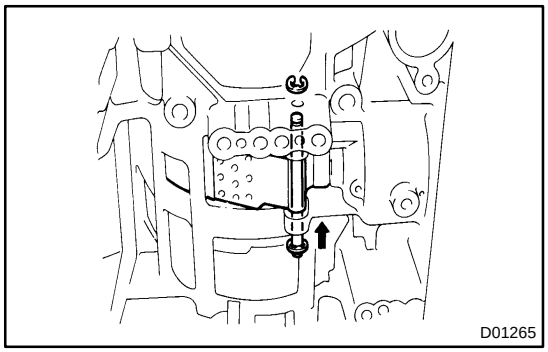
Bearing and race diameter: mm (in.)

	Inside	Outside
Race	32.5 (1.280)	59.0 (2.323)
Bearing	43.5 (1.712)	59.8 (2.354)
Race	43.5 (1.712)	61.5 (2.421)



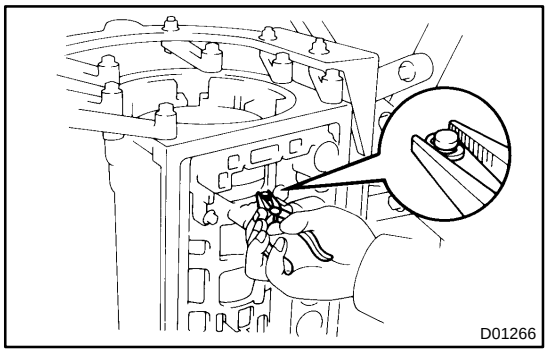
8. INSTALL 3RD COAST BRAKE BAND

(a) Install the 3rd coast brake band to the transmission case.

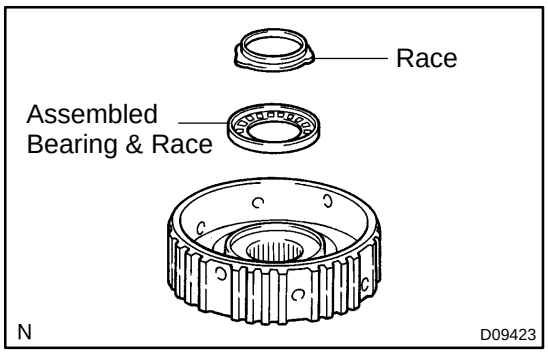


(b) Install the E-ring to the pin.

(c) Install the pin through the brake band.



(d) Using a needle nose plier, install the E-ring to the pin.

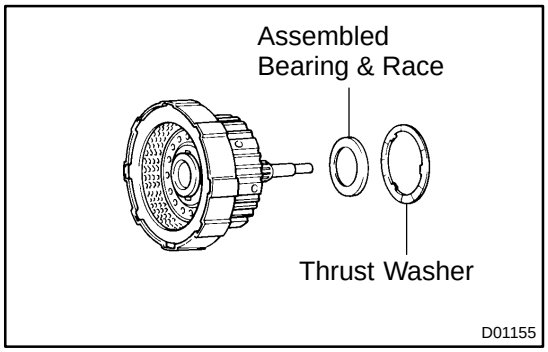


9. INSTALL DIRECT CLUTCH WITH FORWARD CLUTCH

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

Assembled bearing & race and diameter: mm (in.)

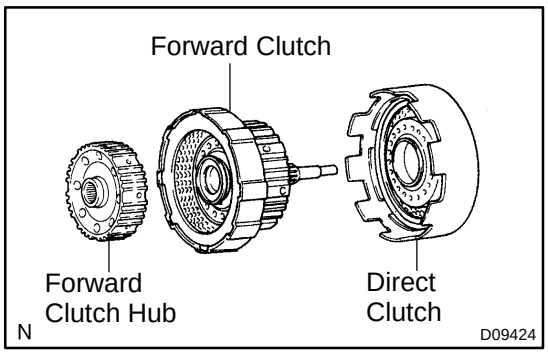
	Inside	Outside
Assembled bearing & race	26.3 (1.035)	44.0 (1.732)
Race	26.2 (1.031)	41.1 (1.618)



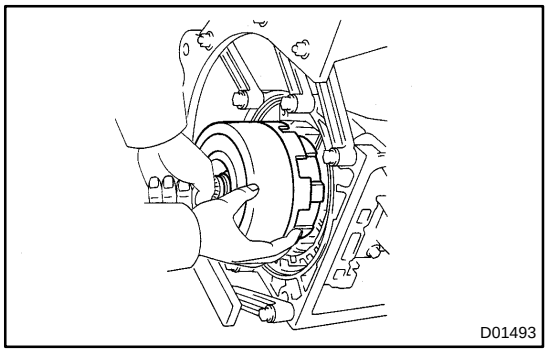
(b) Install the assembled bearing & race and thrust washer to the forward clutch.

Assembled bearing & race diameter: mm (in.)

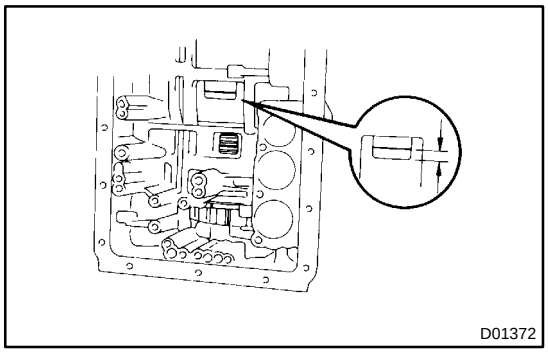
	Inside	Outside
Assembled bearing & race	33.5 (1.319)	47.8 (1.882)



(c) Install the direct clutch and forward clutch hub to the forward clutch.

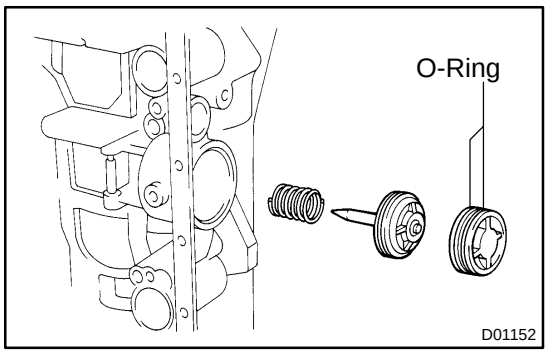


(d) Insert the direct clutch with forward clutch to the case.



(e) With the case set upright, using vernier calipers, measure the distance between the sun gear input drum and direct clutch drum.
Height: 4.1 - 6.0 mm (0.161 - 0.236 in.)

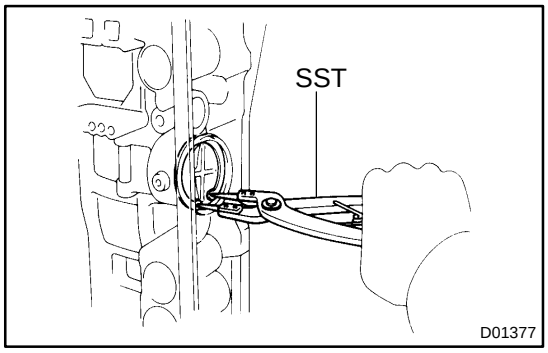
If the height is non-standard, check for improper installation.



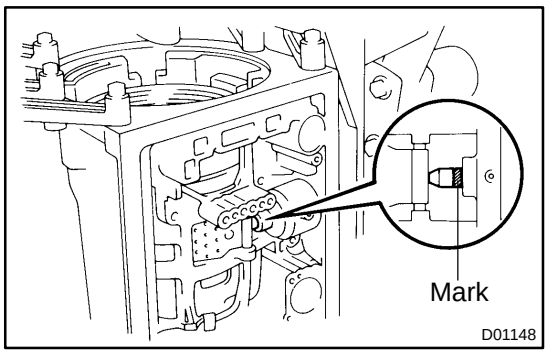
10. INSTALL 3RD COAST BRAKE COVER, PISTON ASSEMBLY AND SPRING

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

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

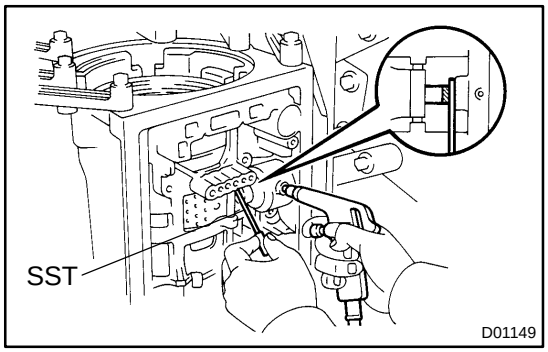


(c) Using SST, install the snap ring.
SST 09350-30020 (09350-07060)



11. CHECK PISTON ROD STROKE OF 3RD COAST BRAKE

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



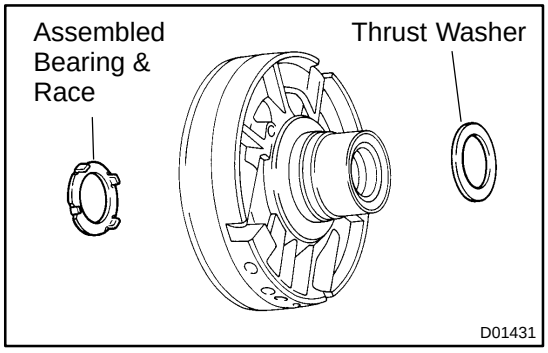
(b) Using SST, measure the stroke while applying and releasing compressed air (392 kPa, 4 kgf/cm^2, 57 psi).
SST 09240-00020
Piston rod stroke: 2.0 - 3.0 mm (0.079 - 0.118 in.)

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

Piston rod length: mm (in.)

77.65 (3.057)	79.90 (3.146)
78.40 (3.087)	80.65 (3.175)
79.15 (3.116)	-

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

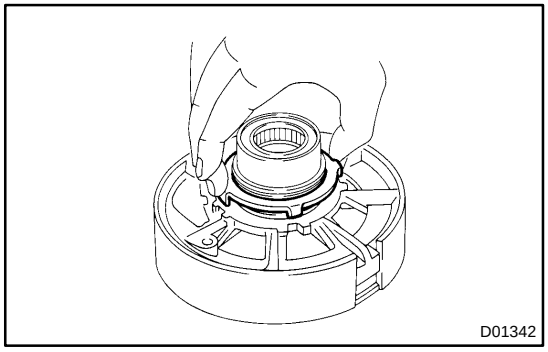


12. INSTALL O/D SUPPORT ASSEMBLY

(a) Coat the assembled bearing & race and thrust washer with petroleum jelly and install them onto the O/D support assembly.

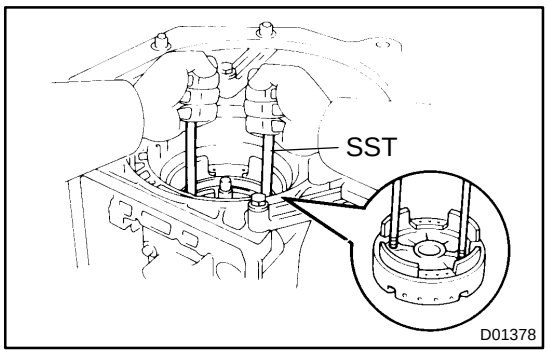
Assembled bearing & race and race diameter: mm (in.)

	Inside	Outside
Assembled bearing & race	33.6 (1.323)	50.3 (1.980)
Thrust washer	37.0 (1.457)	51.0 (2.008)

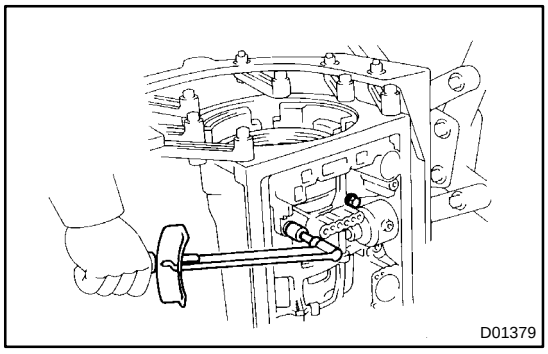


(b) Coat the thrust washer with petroleum jelly and install it onto the O/D support assembly.

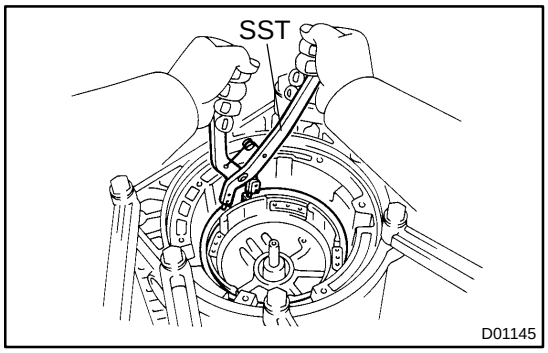
HINT:
Make sure that the lug shapes match the holes on the O/D support.



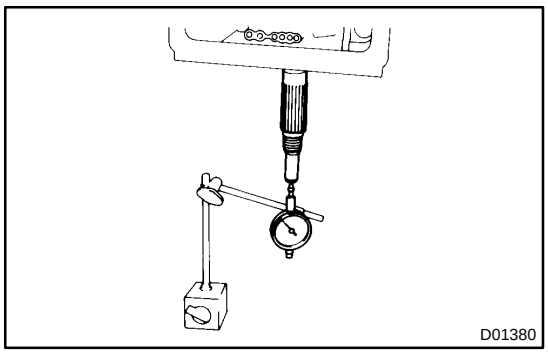
(c) Using 2 bolts of SST, face the bolt and oil holes of the O/D support toward the valve body side, align them with the bolt holes of the transmission case and install the bolts.
SST 09350-30020 (09350-07020)



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



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

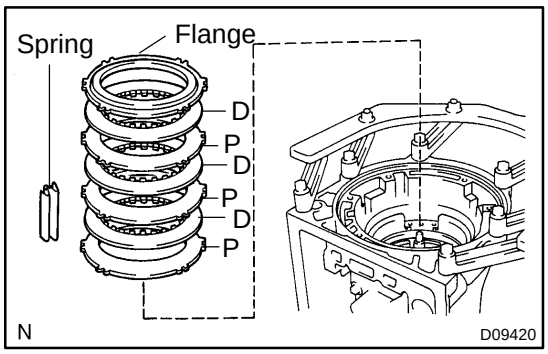


13. CHECK OUTPUT SHAFT

(a) Using a dial indicator, measure the end play of the output shaft with hand.
End play: 1.63 - 2.89 mm (0.064 - 0.114 in.)

If the values are non-standard, check for improper installation.

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



14. INSTALL FLANGES, PLATES AND DISCS OF O/D BRAKE

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

(b) Install the O/D brake pack.

HINT:

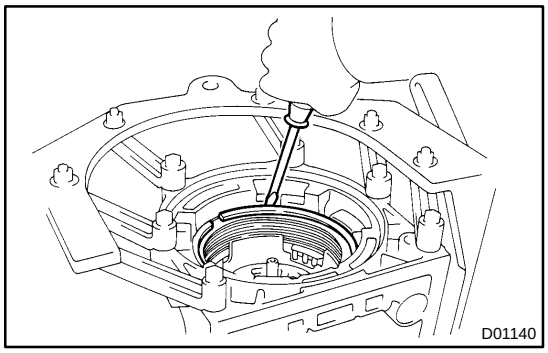
3 plates, 3 discs and flange

Install in order: P = Plate, D = Disc

P - D - P - D - P - D

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

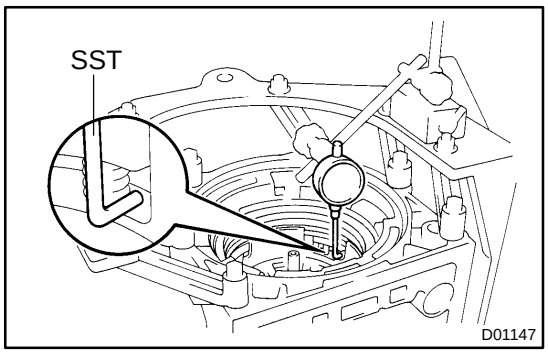
(d) Install the spring to the case.



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

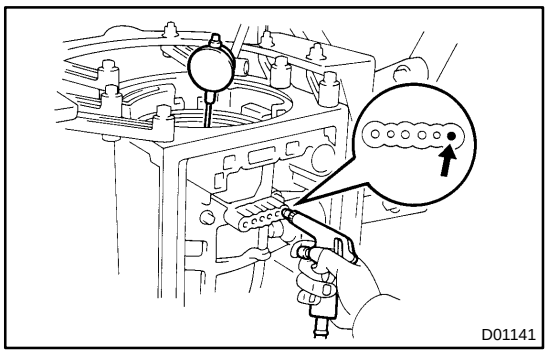
NOTICE:

Be sure the end gap of the snap ring is not aligned with cut-out portion of the brake drum.



15. CHECK PISTON STROKE OF O/D BRAKE

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



(b) Measure the stroke while applying and releasing compressed air (392 kPa, 4 kgf/cm^2, 57 psi).

Piston Stroke: 1.32 - 1.62 mm (0.052 - 0.064 in.)

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

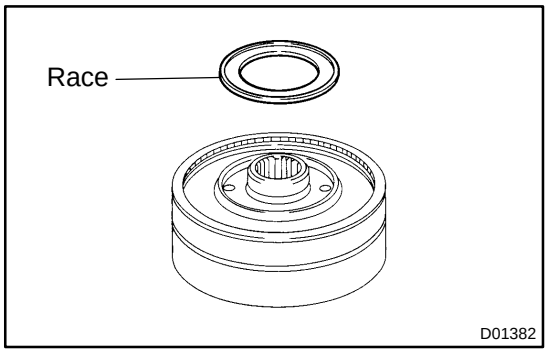
If the piston stroke is non-standard, select another flange.

HINT:

There are 7 different thickness for the flange.

Flange thickness: mm (in.)

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

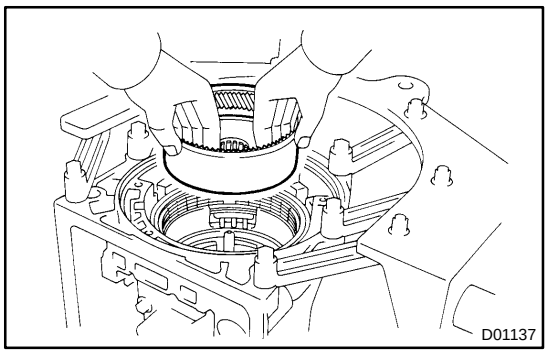


16. INSTALL O/D PLANETARY GEAR UNIT WITH O/D DIRECT CLUTCH & O/D ONE-WAY CLUTCH

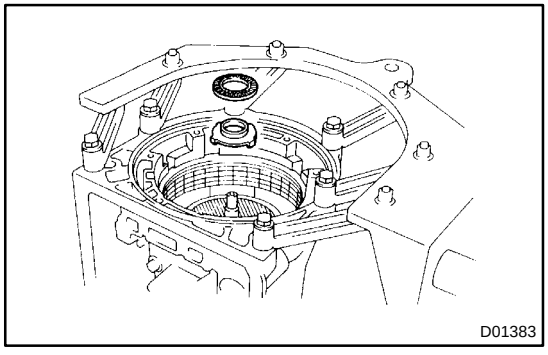
(a) Coat the race with petroleum jelly and install it onto the O/D planetary ring gear.

Race diameter: mm (in.)

	Inside	Outside
Race	37.1 (1.461)	59.0 (2.323)



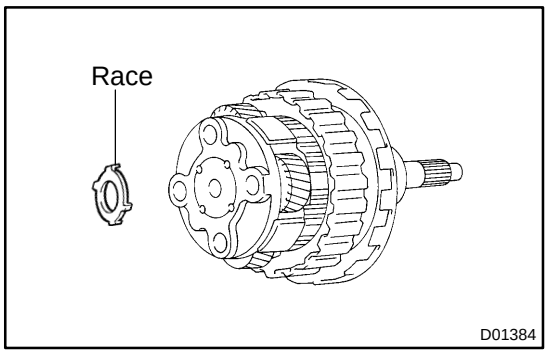
(b) Install the O/D planetary ring gear.



(c) Install the bearing and race onto the O/D planetary ring gear.

Bearing and race diameter: mm (in.)

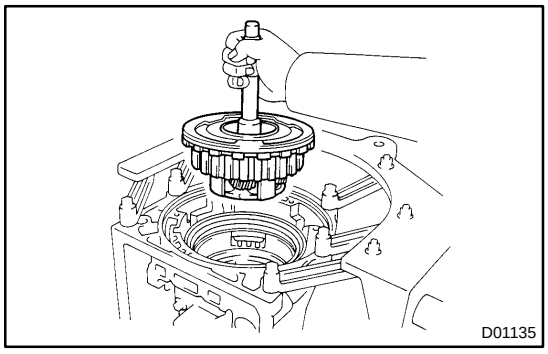
	Inside	Outside
Bearing	25.9 (1.020)	47.0 (1.850)
Race	24.0 (0.945)	48.0 (1.890)



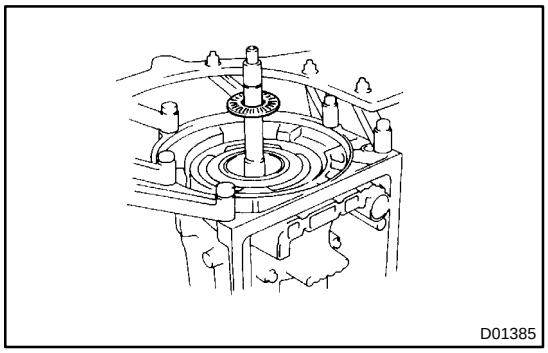
(d) Coat the race with petroleum jelly and install it onto the O/D planetary gear.

Race diameter: mm (in.)

	Inside	Outside
Race	27.2 (1.071)	42.0 (1.654)



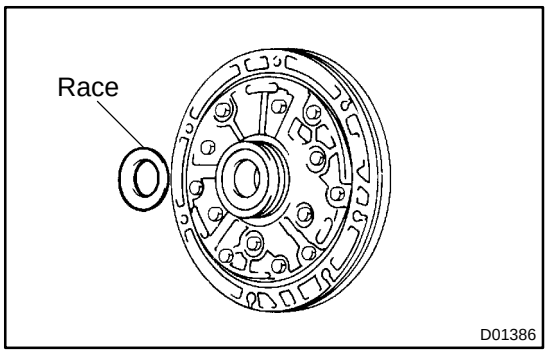
(e) Install the O/D planetary gear with the O/D direct clutch & O/D one-way clutch.



(f) Install the assembled bearing & race onto the O/D direct clutch.

Assembled bearing & race diameter: mm (in.)

	Inside	Outside
Assembled bearing & race	28.8 (1.134)	50.4 (1.984)



17. INSTALL OIL PUMP INTO CASE

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

Race diameter: mm (in.)

	Inside	Outside
Race	28.1 (1.106)	47.5 (1.870)

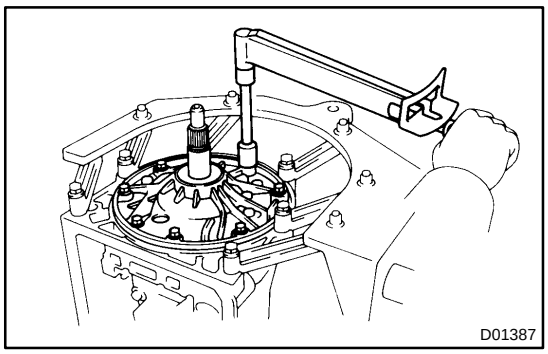
(b) Coat a new O-ring with ATF and install it around the pump body.

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

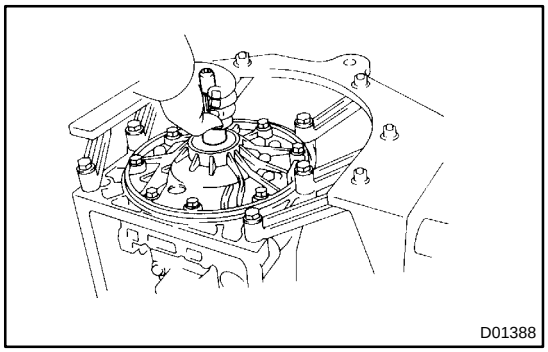
(d) Hold the input shaft, and lightly press the oil pump body to slide the oil seal rings into the overdrive direct clutch drum.

NOTICE:

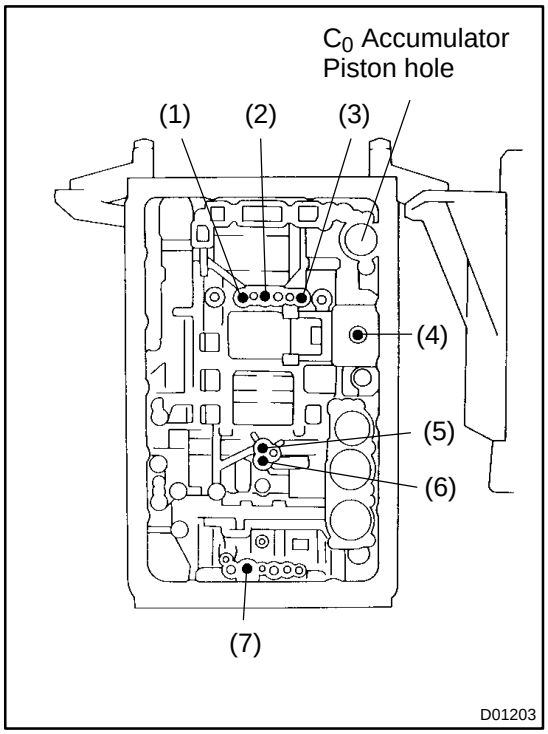
Do not push on the oil pump strongly, or the oil seal ring will stick to the direct clutch drum.



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

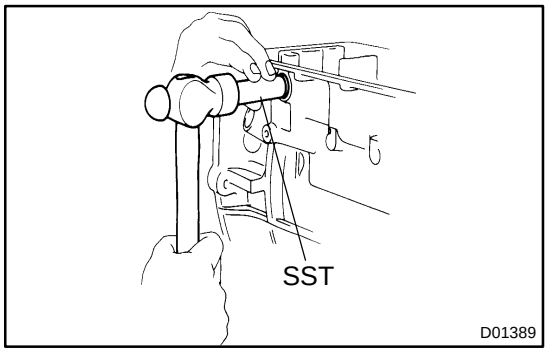


18. CHECK INPUT SHAFT ROTATION
Make sure the input shaft rotates smoothly.

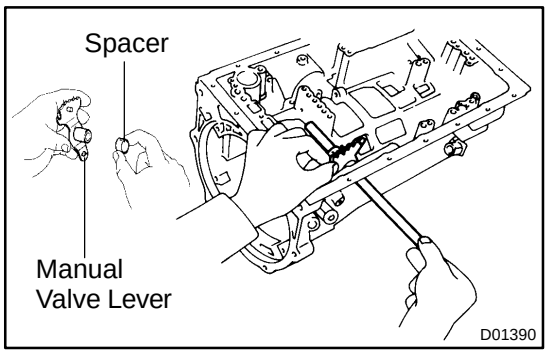


19. INDIVIDUAL PISTON OPERATION INSECTION
Check for the sound of operation while applying compressed air into the oil holes indicated in the illustration.
HINT:
When inspecting the O/D direct clutch, check with the C_0 accumulator piston hole closed.
If there is no noise, disassemble and check the installation condition of the parts.

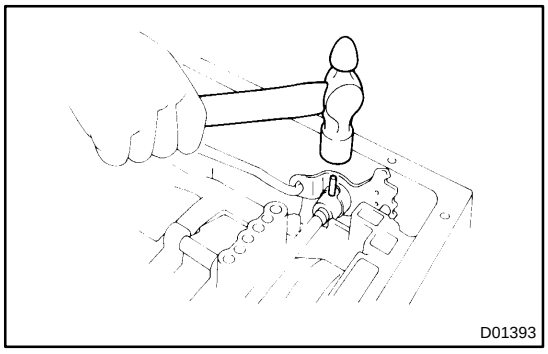
(1) Forward clutch
(2) Direct clutch
(3) O/D brake
(4) 3rd coast brake
(5) 3rd brake
(6) 2nd brake
(7) 1st & reverse brake



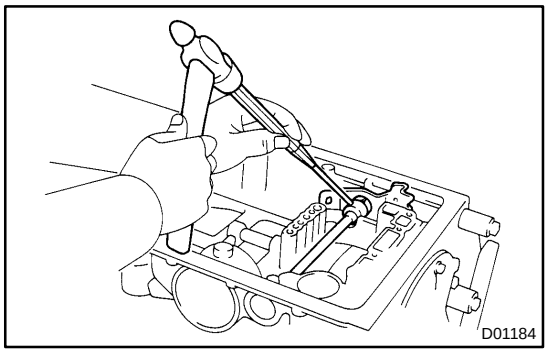
20. INSTALL MANUAL VALVE LEVER, SHAFT AND OIL SEAL
(a) Using SST, drive in a 2 new oil seals.
SST 09350-30020 (09350-07110)
(b) Coat the oil seal lip with MP grease.



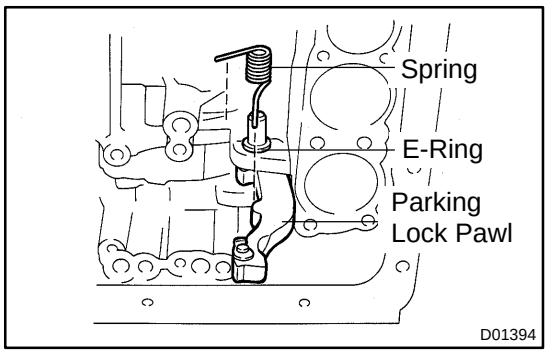
(c) Install a new spacer to the manual valve lever.
(d) Install the manual valve lever shaft to the transmission case through the manual valve lever.



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

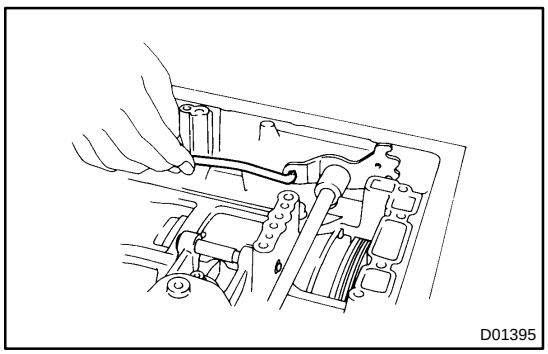


(f) Match the manual valve lever indentation with the spacer hole and stake them together with the punch.
(g) Make sure the shaft rotates smoothly.

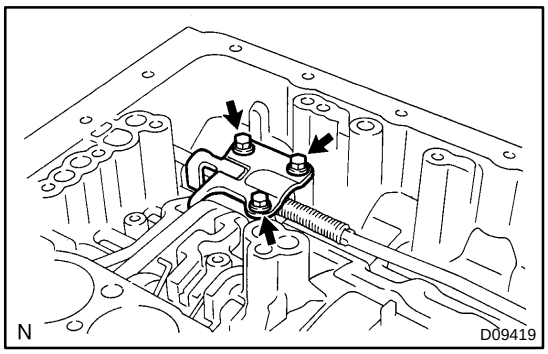


21. INSTALL PARKING LOCK PAWL AND ROD

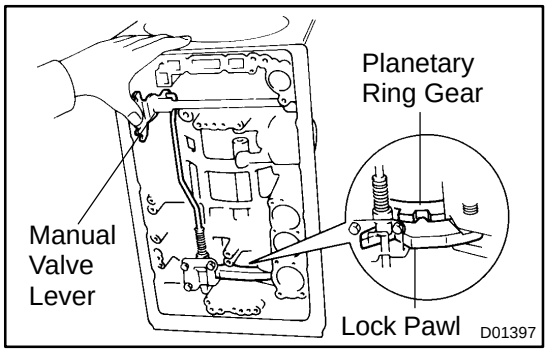
(a) Install the E-ring to the shaft.
(b) Install the parking lock pawl, shaft and spring.



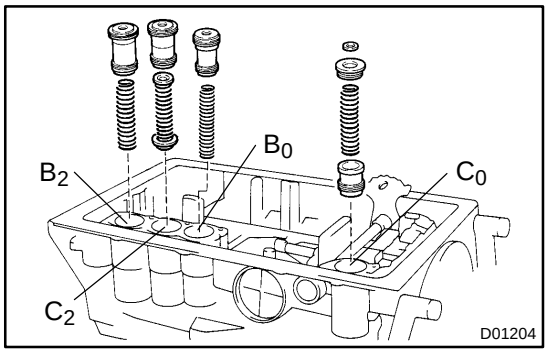
(c) Connect the parking lock rod to the manual valve lever.



(d) Place the parking lock pawl bracket onto the transmission case and torque the 3 bolts.
Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)



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



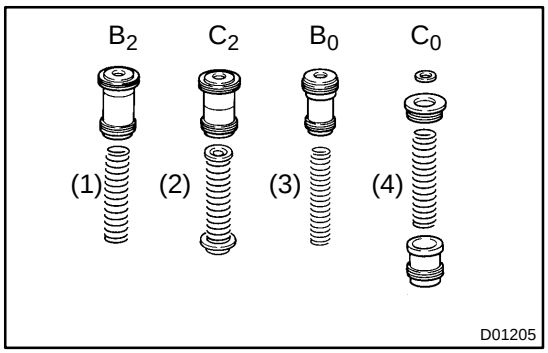
22. INSTALL ACCUMULATOR SPRINGS AND PISTONS

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

(b) Install the 4 springs and 4 accumulator pistons to the holes.

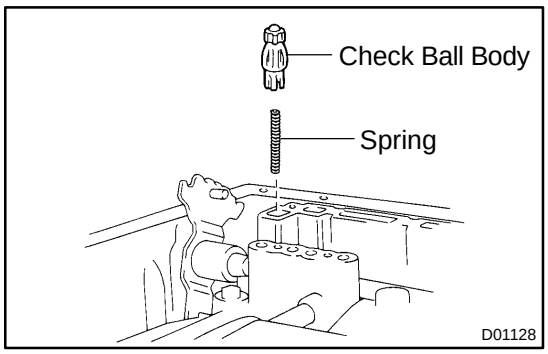
HINT:

The pistons are marked in relief with either C_0, B_0, C_2 or B_2 to discriminate each other.

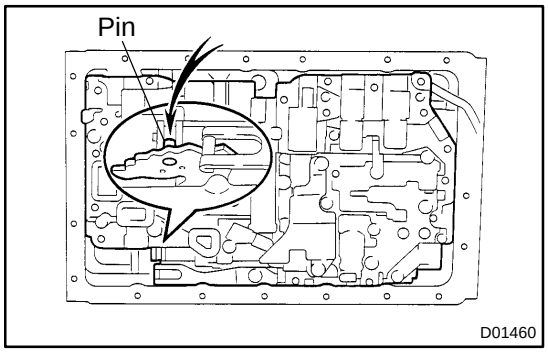


Accumulator spring:

Spring		Free length Outer diameter mm (in.)	Color
(1) B_2		80.91 (3.185) 19.97 (0.786)	Pink & white
(2) C_2	Inner	41.00 (1.614) 14.10 (0.555)	Orange
	Outer	75.20 (2.961) 20.10 (0.791)	White & Blue
(3) B_0		69.40 (2.732) 16.25 (0.640)	White
(4) C_0		65.00 (2.559) 20.59 (0.811)	None

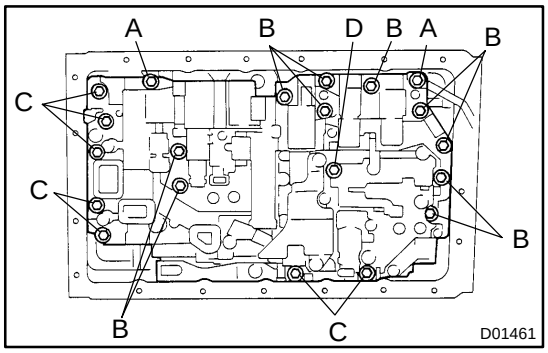


23. INSTALL SPRING AND CHECK BALL BODY



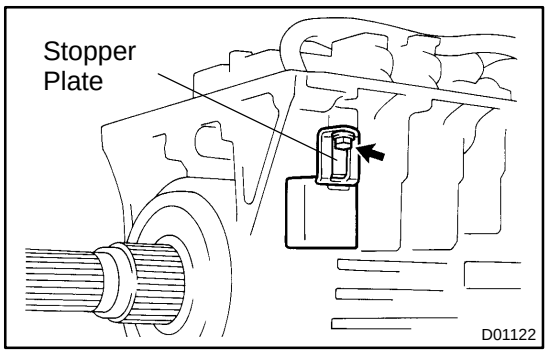
24. INSTALL VALVE BODY

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



(b) Install the 20 bolts.
Torque: 9.8 N·m (100 kgf·cm, 7 ft·lbf)

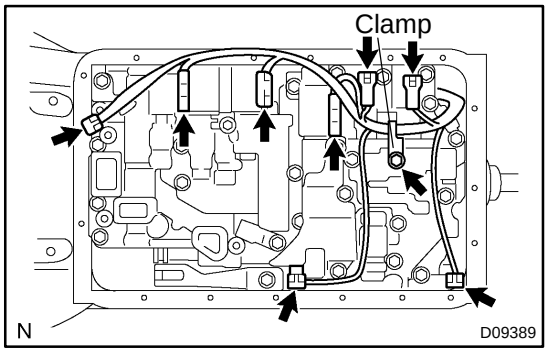
HINT:
Each bolt length is indicated below.
Blot length:
Bolt A: 23 mm (0.866 in.)
Bolt B: 28 mm (1.102 in.)
Bolt C: 36 mm (1.417 in.)
Bolt D: 55 mm (2.165 in.)



25. INSTALL TRANSMISSION WIRE

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

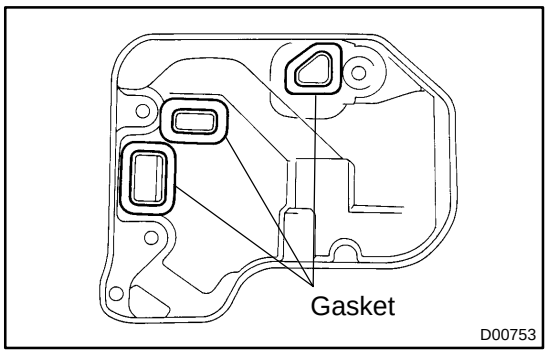
(b) Insert the transmission wire to the case and install the stopper plate with the bolt.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)



(c) Connect the 7 solenoid connectors.

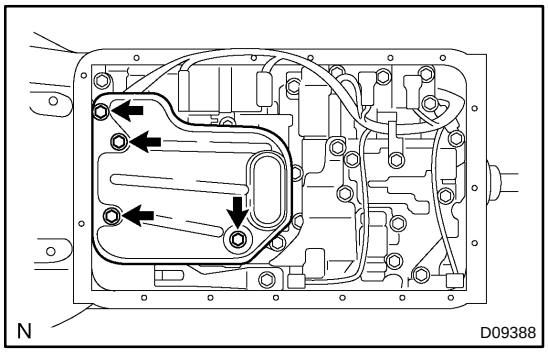
(d) Install the ATF temperature sensor.

(e) Install the clamp and bolt.
Torque: 6.4 N·m (65 kgf·cm, 56 in.·lbf)

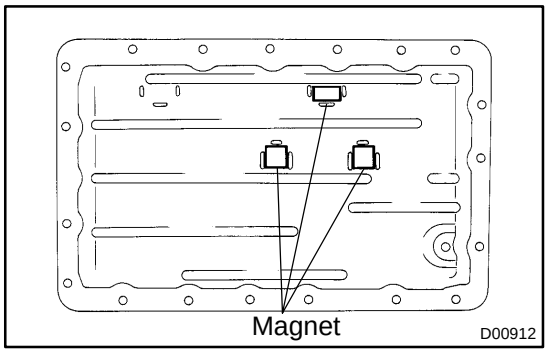


26. INSTALL OIL STRAINER AND GASKET

(a) Install new 3 gaskets to oil strainer.

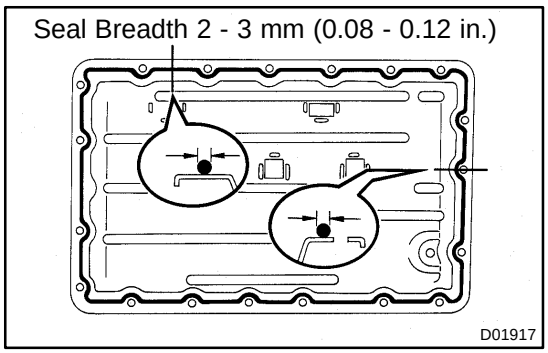


(b) Install the oil strainer with the 4 bolts.
Torque: 9.8 N·m (100 kgf·cm, 7 ft·lbf)



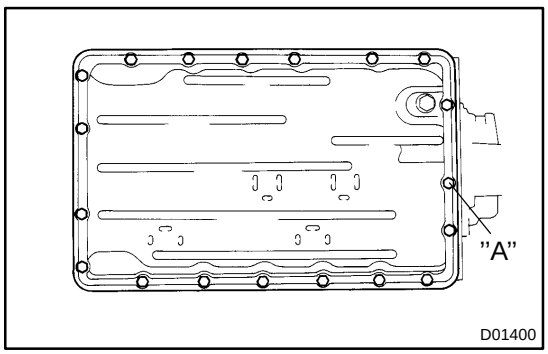
27. INSTALL OIL PAN

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



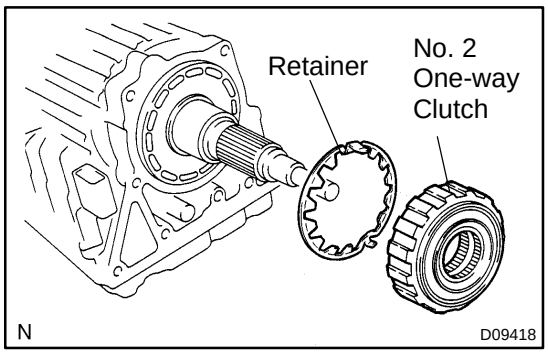
(b) Remove any FIPG material and be careful not to drop oil on the contacting surfaces of the transmission case and oil pan.

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



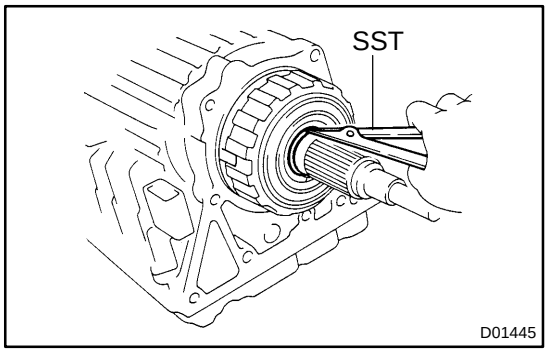
(d) Install and torque the 19 bolts.
Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)

HINT:
Replace the only "A" bolt with a new one.

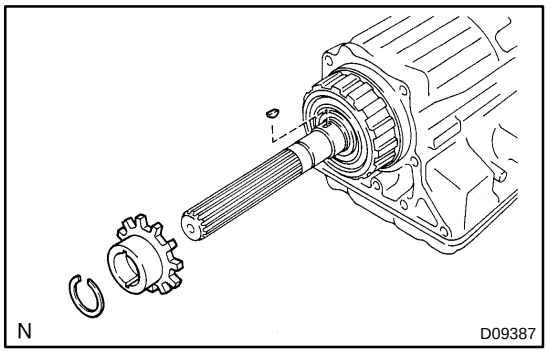


28. INSTALL ONE-WAY CLUTCH

(a) Install the retainer and the No. 2 one-way clutch.



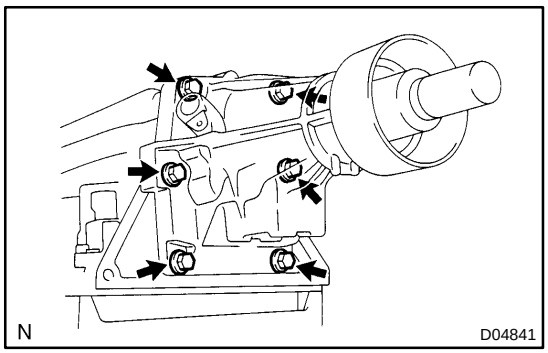
(b) Using SST, install the snap ring.
SST 09350-30020 (09350-07070)



29. INSTALL KEY AND SENSOR ROTOR

(a) Install the key and sensor rotor.

(b) Using a snap ring expander, install a new snap ring.



30. INSTALL EXTENSION HOUSING

(a) Install a new extension housing gasket.

(b) Install the extension housing with the 6 bolts.
Torque: 34 N·m (345 kgf·cm, 25 ft·lbf)

HINT:

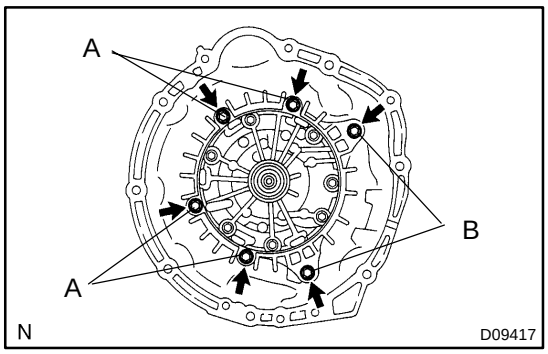
Coat the thread of the all bolts with sealant.
Sealant:
Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

31. REMOVE TRANSMISSION CASE FROM OVERHAUL ATTACHMENT

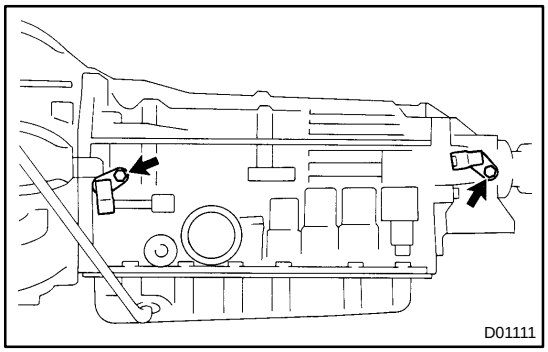
32. INSTALL TRANSMISSION HOUSING

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

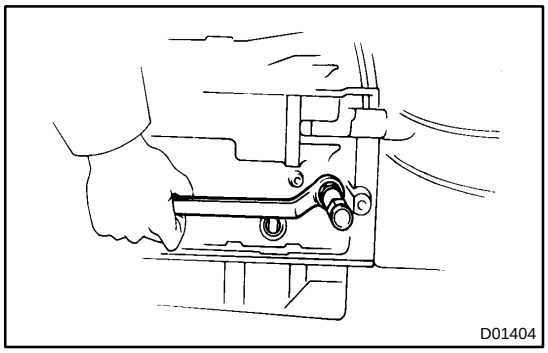
(b) Apply seal packing or equivalent to the 6 bolts.
Seal packing:
Part No. 08833-00070, THREE BOND 1324 or equivalent.



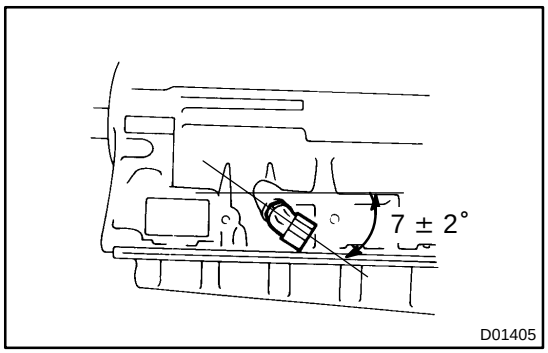
(c) Install the transmission housing with the 6 bolts.
Torque:
A (14 mm bolt): 34 N·m (345 kgf·cm, 25 ft·lbf)
B (17 mm bolt): 57 N·m (580 kgf·cm, 42 ft·lbf)



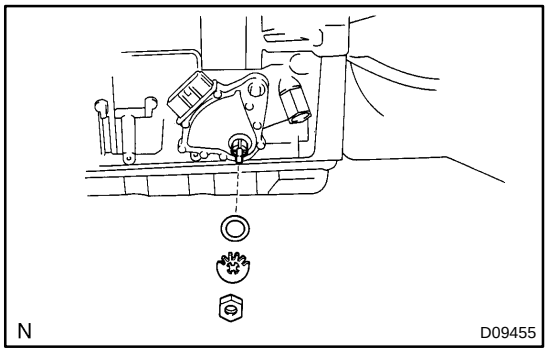
33. INSTALL VEHICLE SPEED SENSORS
(a) Coat 2 new O-rings with ATF and install it to the speed sensor.
(b) Install the 2 vehicle speed sensors.
(c) Install the bolts.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)



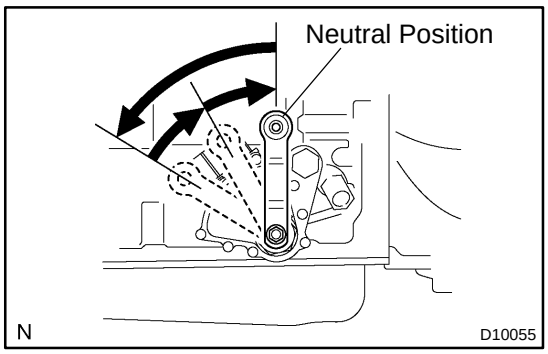
34. INSTALL UNION AND ELBOW
(a) Coat 2 new O-rings with ATF, install them to union and elbow.
(b) Install the union.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)



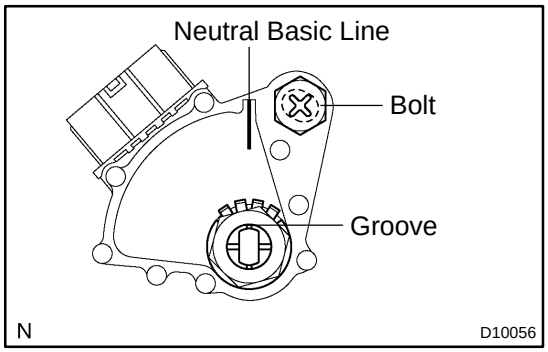
(c) Install the elbow.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)



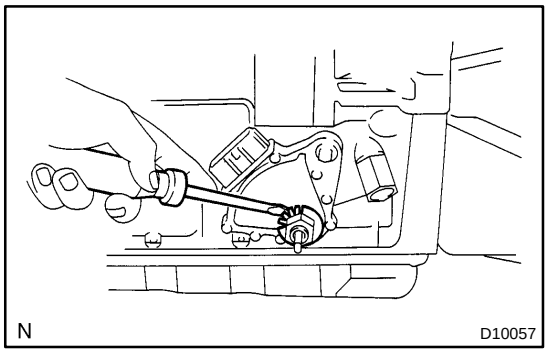
35. INSTALL PARK/NEUTRAL POSITION SWITCH
(a) Install the park/neutral position switch onto the manual valve lever shaft and temporarily install the adjusting bolt.
(b) Install the grommet and a new lock washer. Install and torque the nut.
Torque: 6.9 N·m (70 kgf·cm, 61 in.·lbf)



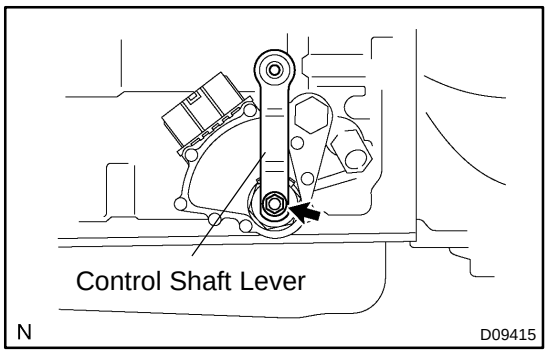
(c) Using the control shaft lever, fully turn the manual lever shaft back and return 2 notches. It is now in neutral.



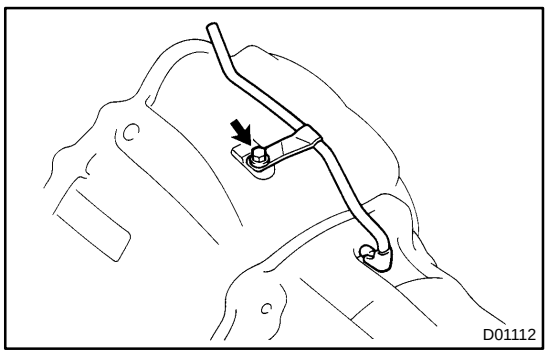
(d) Align the neutral basic line with the switch groove, and tighten the adjusting bolt.
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)



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

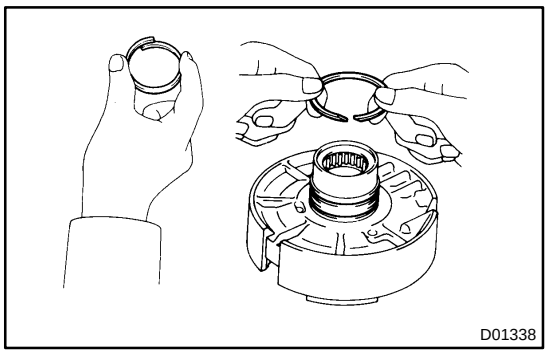


36. INSTALL CONTROL SHAFT LEVER
Install the washer and nut to the control shaft lever.
Torque: 16 N·m (160 kgf·cm, 12 ft·lbf)



37. INSTALL BREATHER PIPE
Install the breather hose and bolt.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)

AT04Q-02


D01338

REASSEMBLY

1. INSTALL OIL SEAL RING

(a) Coat the 2 oil seal rings with ATF.

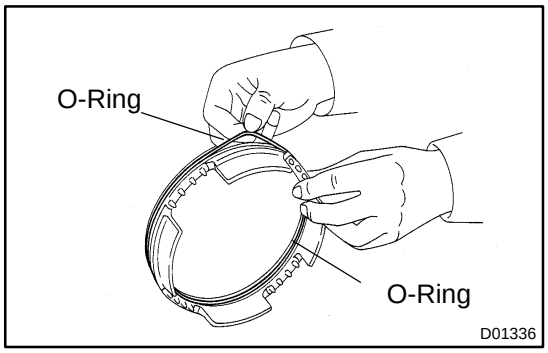
(b) Install the 2 oil seal rings to the O/D support groove, then snug them sown by squeezing their ends together.

NOTICE:

Do not spread the ring ends more than necessary.

HINT:

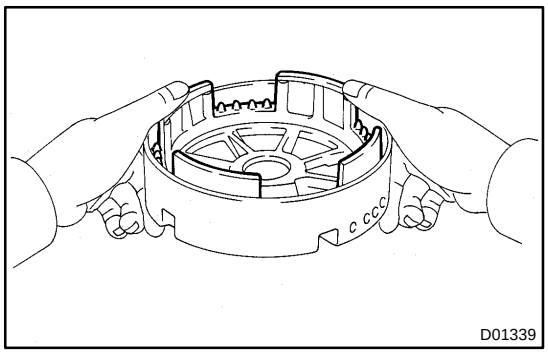
After installing the oil seal rings, check that they rotate smoothly.



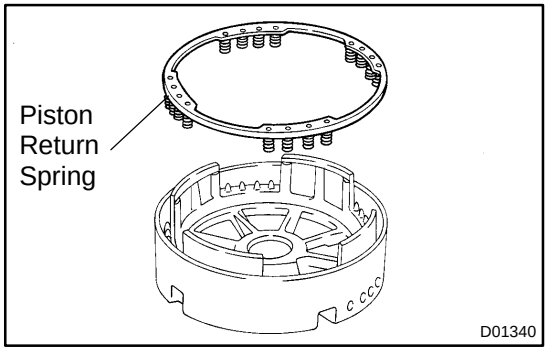
D01336

2. INSTALL O/D BRAKE PISTON

(a) Coat 2 new O-rings with ATF and install them in the O/D brake piston.


D01339

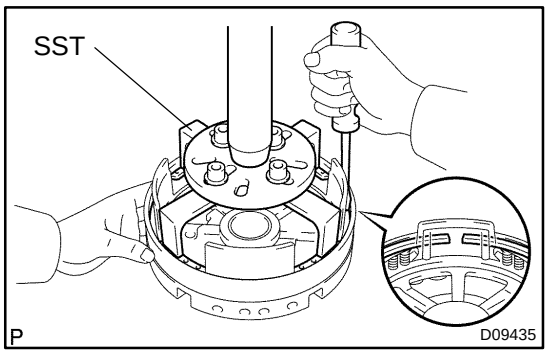
(b) Being careful not to damage the O-rings, press in the brake piston into the O/D support with both hands.



D01340

3. INSTALL PISTON RETURN SPRING

(a) Install the piston return spring.

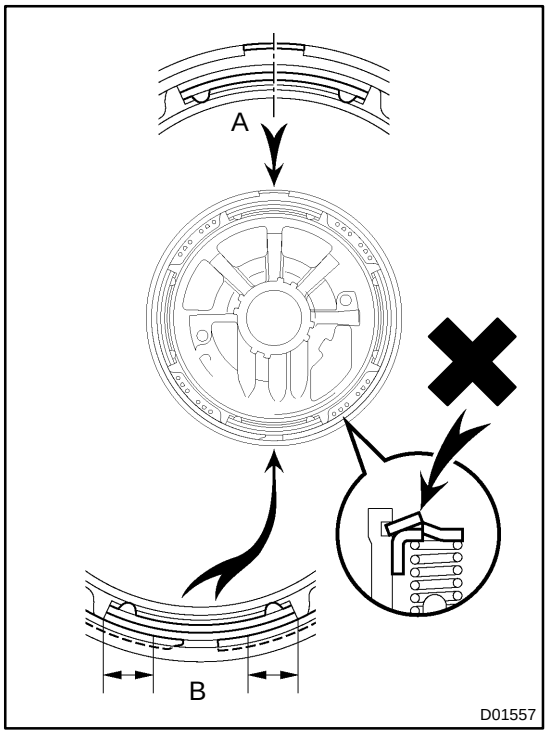


(b) Place SST on the spring retainer, and compress the return spring with a shop press.
SST 09387-00100

(c) Install the snap ring with a screwdriver.

NOTICE:

Be sure the end gap of the snap ring is not aligned with the cutout portion of the O/D support.

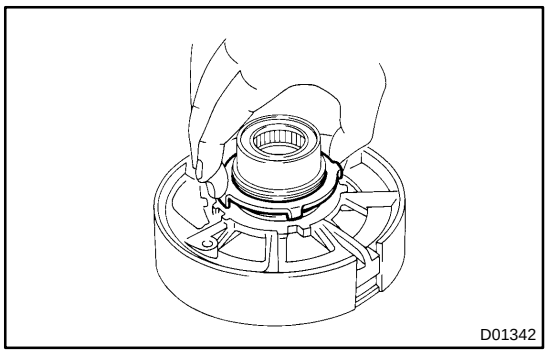


HINT:

After assembling the O/D support assembly completely, align the position of the piston with the position shown in the illustration ''A''.

Align the end gap of the snap ring as shown in the illustration ''B''.

Make sure that the snap ring is not on the part of return spring which prevents the spring from coming off. Check this on 8 places.

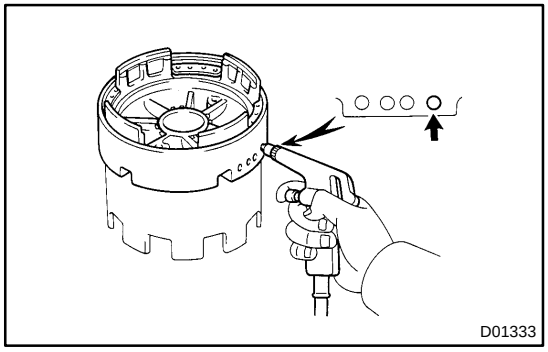


4. INSTALL CLUTCH DRUM THRUST WASHER

Coat the thrust washer with petroleum jelly and install it into the O/D support.

HINT:

Make sure that the lugs shapes match the holes on the O/D support.



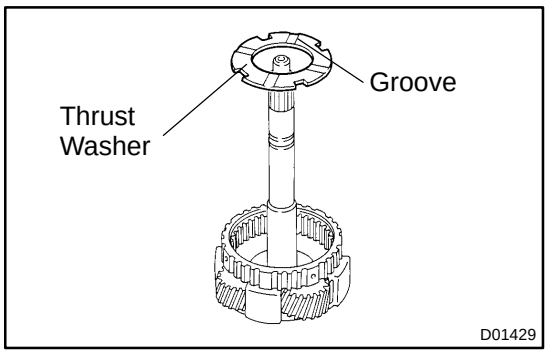
5. CHECK PISTON OPERATION OF O/D BRAKE

(a) Place the O/D support assembly onto the direct clutch assembly.

(b) Apply compressed air (392 kPa, 4 kgf/cm^2, 57 psi) into the oil passage as shown, and be sure that the O/D brake piston moves smoothly.

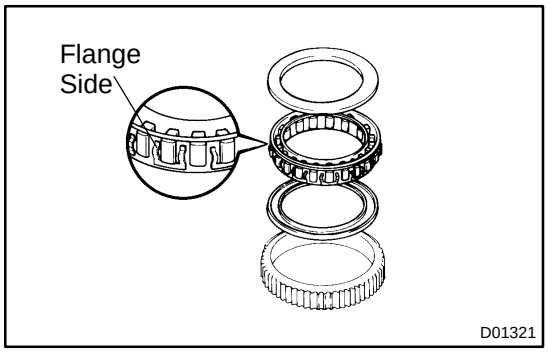
AT04M-02

REASSEMBLY

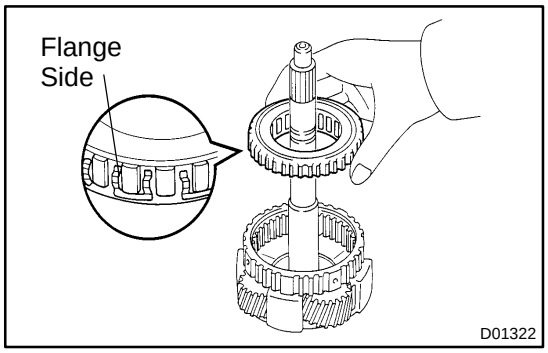


1. INSTALL O/D ONE-WAY CLUTCH

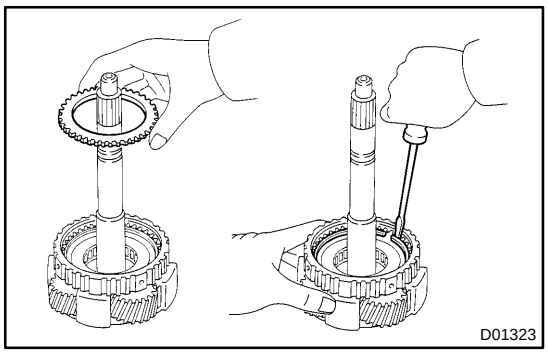
(a) Install the thrust washer to the O/D planetary gear, the grooved side facing upward.



(b) Install the one-way clutch and 2 inner races into the outer race with the flange side of the one-way clutch facing upward.

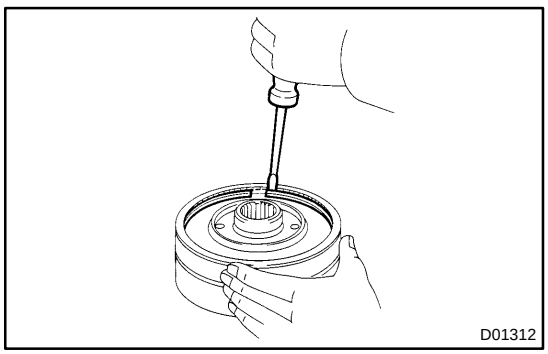


(c) Install the O/D one-way clutch with the outer race to the O/D planetary gear.



(d) Install the retaining plate.

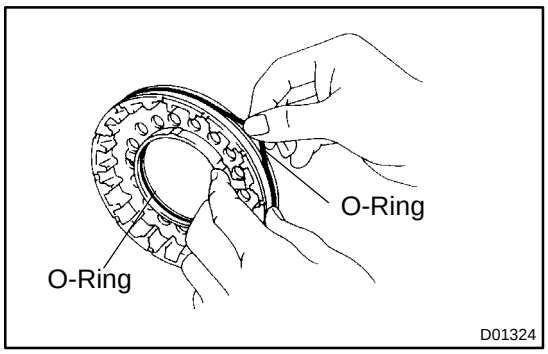
(e) Using a screwdriver, install the snap ring.



2. INSTALL RING GEAR FLANGE TO O/D PLANETARY RING REAR

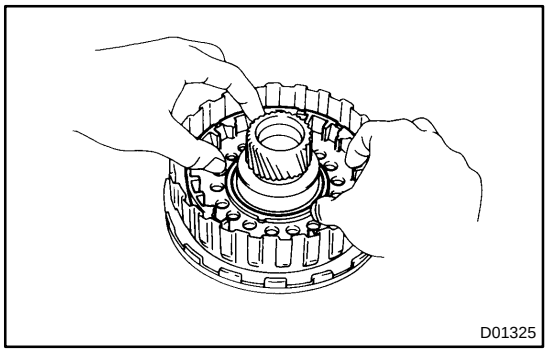
(a) Install the ring gear flange.

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

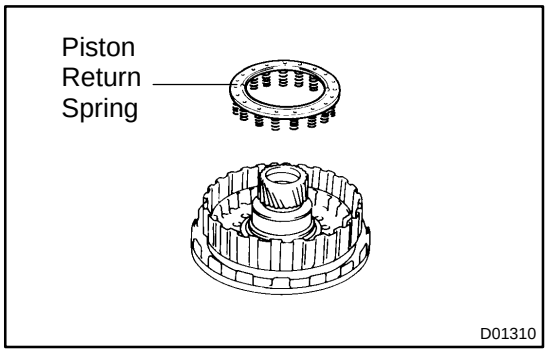


3. INSTALL O/D DIRECT CLUTCH PISTON

(a) Coat 2 new O-rings with ATF and install them on the O/D direct clutch piston.

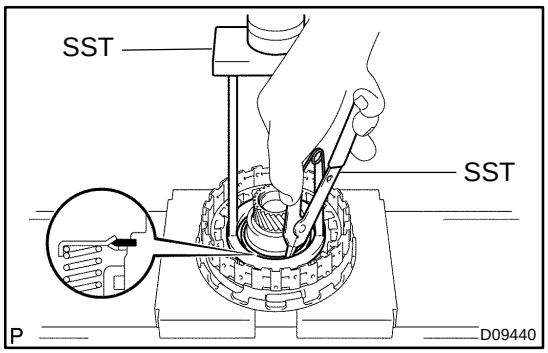


(b) Being careful not to damage the O-rings, press the direct clutch piston into the clutch drum with both hands.



4. INSTALL PISTON RETURN SPRING

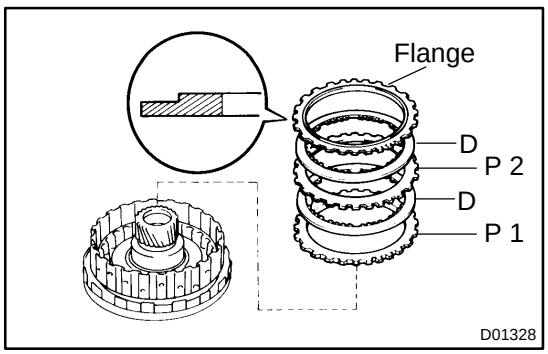
(a) Install the piston return spring to the piston.



(b) Place SST on the spring retainer, and compress the return spring with a press.
SST 09387-00020

(c) Install the snap ring with SST.
SST 09350-30020 (09350-07070)

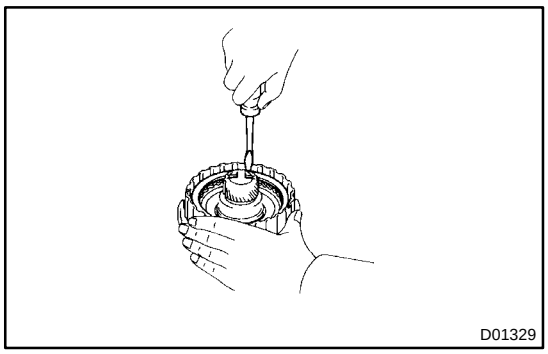
NOTICE:
Be sure the end gap of the snap ring is not aligned with the spring retainer claw.



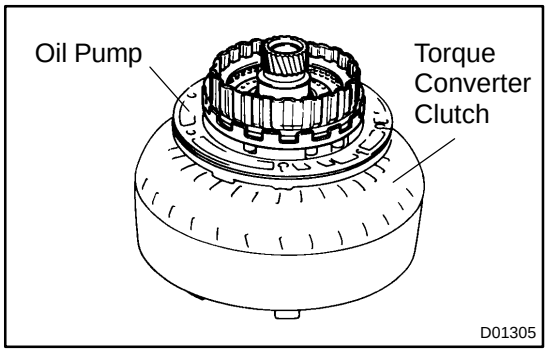
5. INSTALL PLATES, DISCS AND FLANGE

(a) Install the 2 plates and 2 discs.
Install in order: P = Plate, D = Disc
P 1 - D - P 2 - D

(b) Install the flange, with the flat end facing downward.

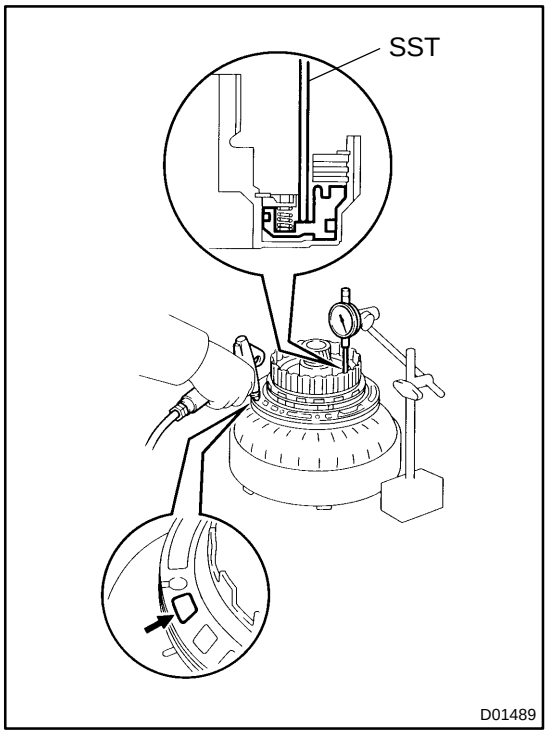


(c) Using a screwdriver, install the snap ring.



6. CHECK PISTON STROKE OF O/D DIRECT CLUTCH

(a) Place the oil pump onto the torque converter clutch, then place the O/D direct clutch assembly into the oil pump.



(b) Using SST and a dial indicator, measure the O/D direct clutch piston stroke while applying and releasing compressed air (392 kPa, 4 kgf/cm^2, 57 psi).
SST 09350-30020 (09350-06120)
Piston stroke: 0.85 - 1.10 mm (0.033 - 0.043 in.)

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

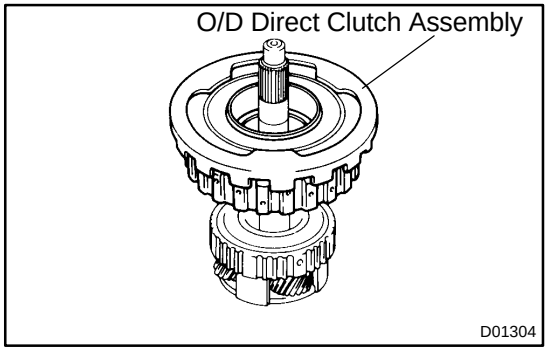
If the stroke is non-standard, select another flange.

HINT:

There are 8 flanges in different thickness.

Flange Thickness: mm (in.)

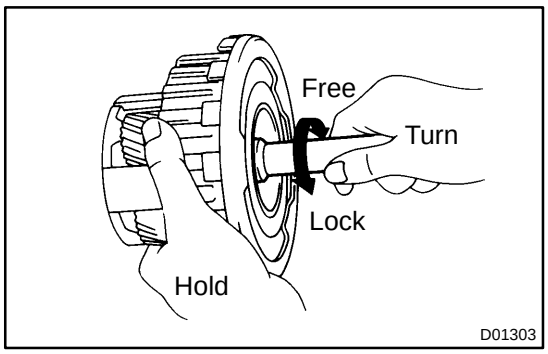
No.	Thickness	No.	Thickness
23	3.8 (0.151)	18	3.4 (0.134)
22	3.7 (0.146)	19	3.3 (0.130)
16	3.6 (0.142)	20	3.2 (0.126)
17	3.5 (0.138)	21	3.1 (0.122)



7. INSTALL O/D DIRECT CLUTCH ASSEMBLY

(a) Align the flukes of the discs in the direct clutch.

(b) Install the direct clutch assembly onto the O/D planetary gear.

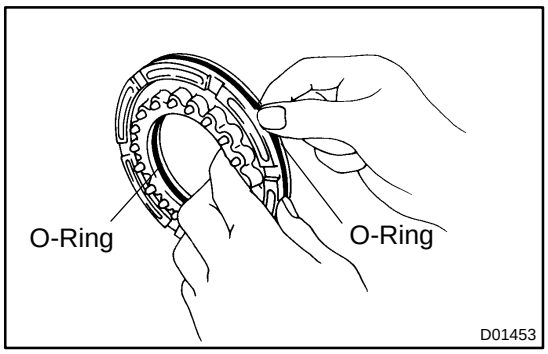


8. CHECK OPERATION OF ONE-WAY CLUTCH

Hold the O/D direct clutch drum and turn the input shaft.
Check that the input shaft turns freely clockwise and locks counterclockwise.

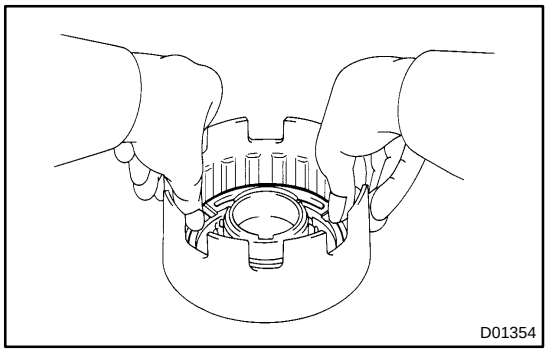
AT04U-02

REASSEMBLY

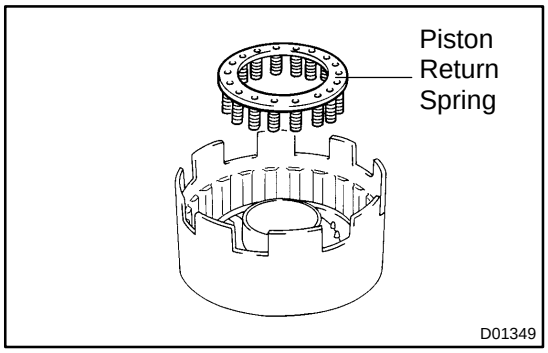


1. INSTALL DIRECT CLUTCH PISTON TO DIRECT CLUTCH DRUM

(a) Coat 2 new O-rings with ATF and install them in the direct clutch piston.

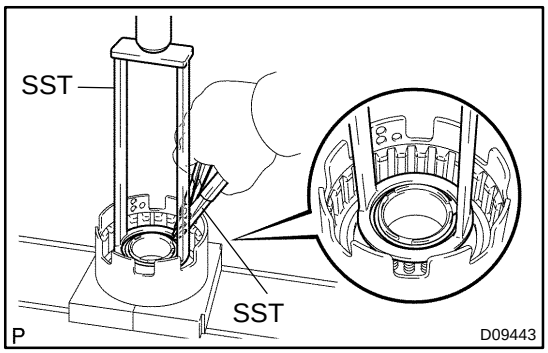


(b) Being careful not to damage the O-rings press in the direct clutch piston into the clutch drum with both hands.



2. INSTALL PISTON RETURN SPRING

(a) Install the piston return spring.

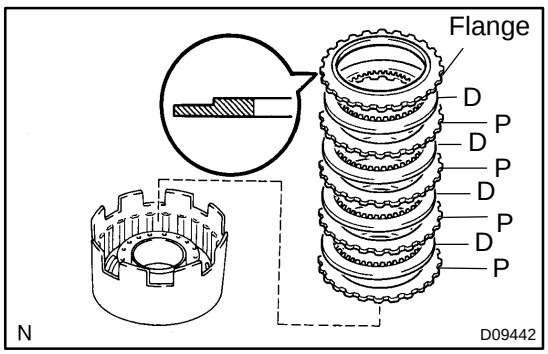


(b) Place SST on the spring retainer, and compress the return spring with a press.
SST 09387-00020

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

NOTICE:

Be sure the end gap of the snap ring is not aligned with the spring retainer claw.

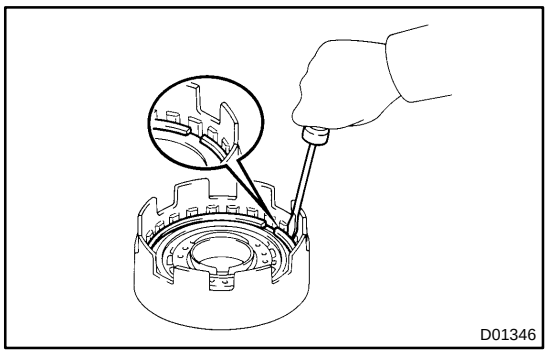


3. INSTALL PLATE, DISC AND FLANGE

(a) Install the cushion plate.

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

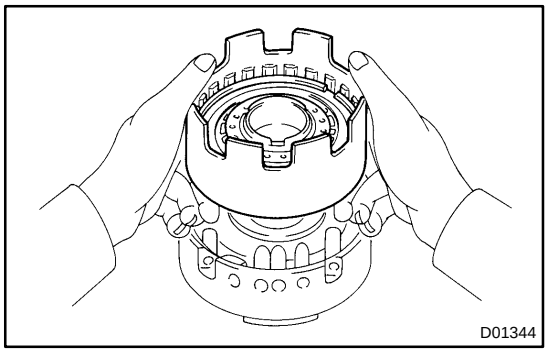
(c) Install the flange, the flat end facing downward.



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

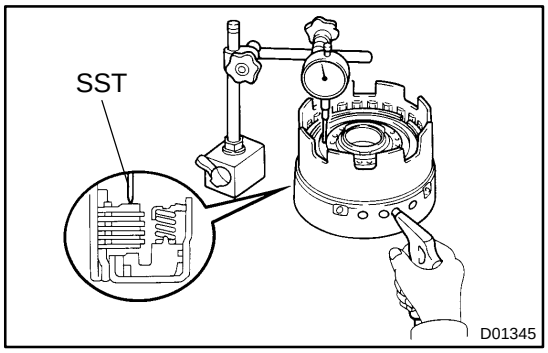
NOTICE:

Be sure the end gap of the snap ring is not aligned with the cutout portion of the direct clutch drum.



4. CHECK PISTON STROKE OF DIRECT CLUTCH

(a) Place the direct clutch assembly onto the O/D support assembly.



(b) Using SST and a dial indicator, measure the direct clutch piston stroke while applying and releasing compressed air (186 kPa, 1.9 kgf/cm^2, 27 psi).

SST 09350-30020 (09350-06120)

Piston stroke: 0.40 - 0.70 mm (0.016 - 0.028 in.)

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

If the clearance is non-standard, select another flange.

HINT:

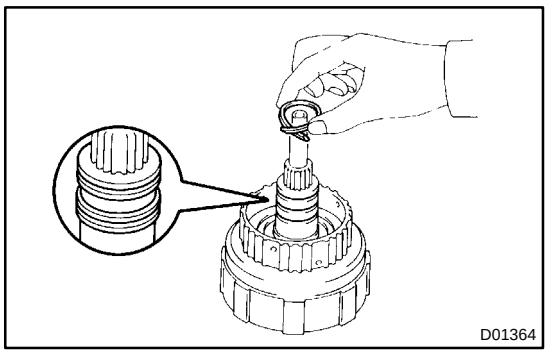
There are 9 different flanges in thickness.

Flange thickness: mm (in.)

No.	Thickness	No.	Thickness
53	3.3 (0.130)	38	3.8 (0.150)
34	3.4 (0.134)	39	3.9 (0.154)
35	3.5 (0.138)	40	4.0 (0.157)
36	3.6 (0.142)	41	4.1 (0.161)
37	3.7 (0.146)	-	-

AT04Y-02

REASSEMBLY



1. INSTALL OIL SEAL RING

(a) Coat the 3 oil seal rings with ATF.

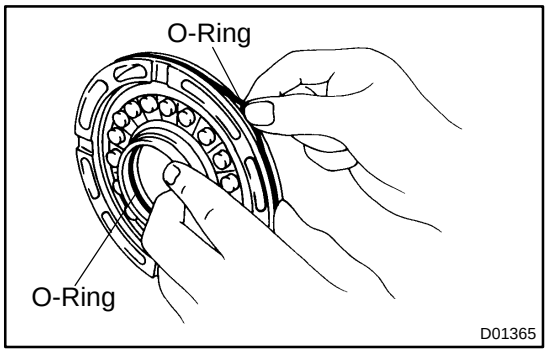
(b) Install the 3 oil seal rings to the forward clutch drum groove, then snug them down by squeezing their ends together.

NOTICE:

Do not spread the ring ends more than necessary.

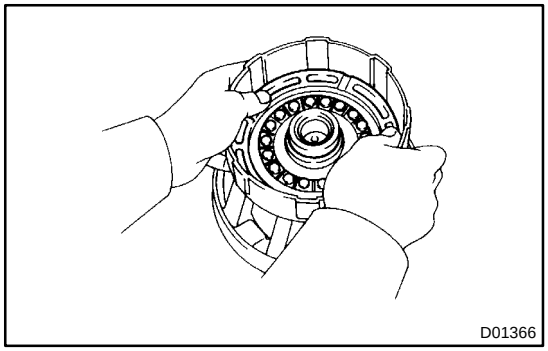
HINT:

After installing the oil seal rings, check that they rotate smoothly.

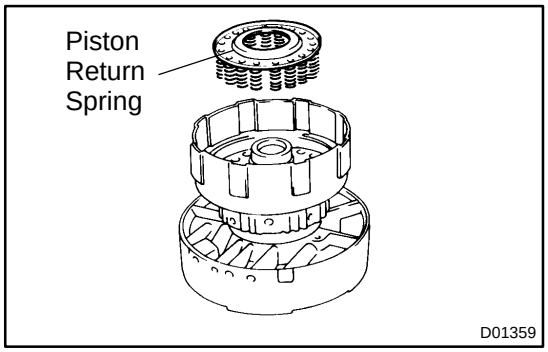


2. INSTALL FORWARD CLUTCH PISTON

(a) Coat 2 new O-rings with ATF and install them on the forward clutch piston.

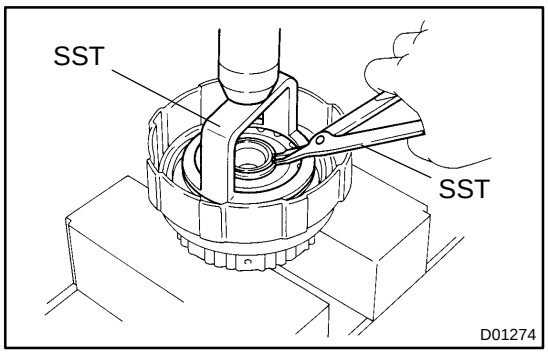


(b) Being careful not to damage the O-rings, press the clutch piston into the forward clutch drum with both hands.



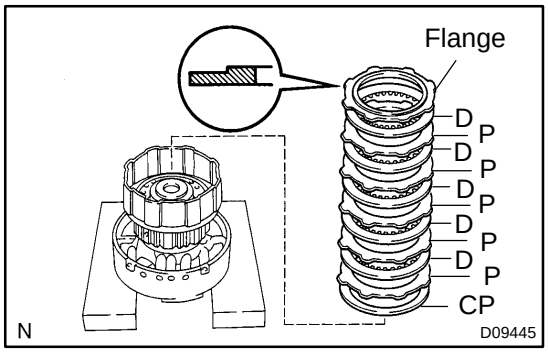
3. INSTALL PISTON RETURN SPRING

(a) Install the piston return spring.



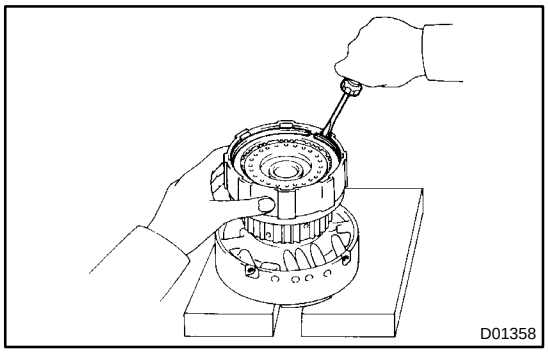
(b) Place SST on the spring retainer, and compress the return spring with a press.
SST 09350-30020 (09350-07040)
(c) Using SST, install the snap ring.
SST 09350-30020 (09350-07070)

NOTICE:
Be sure the end gap of the snap ring is not aligned with the spring retainer claw.



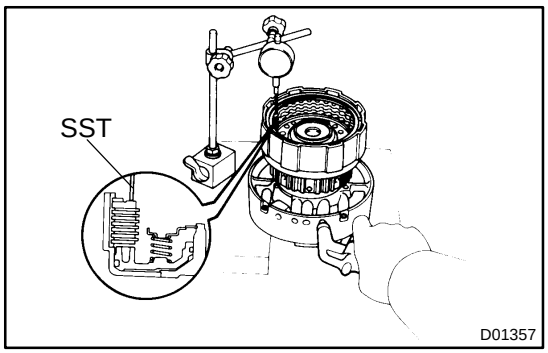
4. INSTALL PLATE, DISC AND FLANGE

(a) Install the cushion plate.
CP = Cushion Plate
(b) Install the flange, 5 plates and 5 discs.
(c) Then install the flange, with the flat end facing downward.
Install in order: P = Plate, D = Disc
P - D - P - D - P - D - P - D - P - D



(d) Install the snap ring with a screwdriver.

NOTICE:
Be sure the end gap of the snap ring is not aligned with the cutout portion of the forward clutch drum.



5. CHECK PISTON STROKE OF FORWARD CLUTCH

(a) Using SST and a dial indicator, measure the forward clutch piston stroke while applying and releasing compressed air (186 kPa, 1.9 kgf/cm^2, 27 psi).
SST 09350-30020 (09350-06120)
Piston stroke: 0.60 - 0.90 mm (0.024 - 0.035 in.)

If the piston stroke is less than the limit, parts may have been assembled incorrectly, check and reassemble again.
If the clearance is non-standard, select another flange.
HINT:
There are 6 different flanges in thickness.

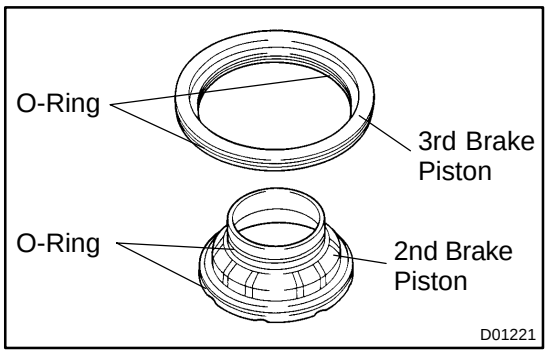
Flange thickness

No.	Thickness	No.	Thickness
42	4.0 (0.157)	45	3.4 (0.134)
44	3.8 (0.150)	60	3.2 (0.126)
62	3.6 (0.142)	61	3.0 (0.118)

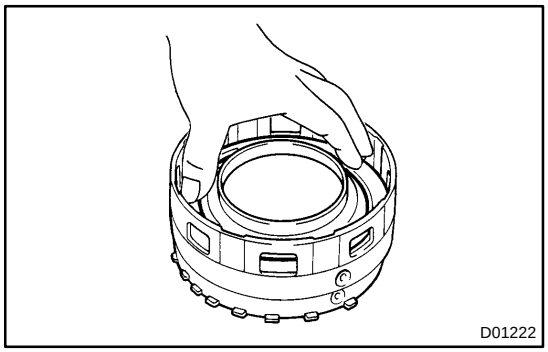
AT052-02

REASSEMBLY

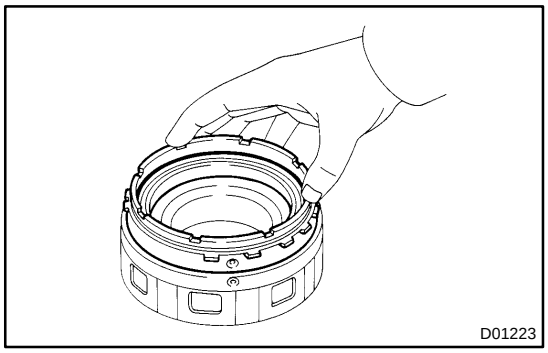
1. INSTALL 3RD & 2ND PISTON



(a) Coat 4 new O-rings with ATF and install them on 3rd and 2nd brake pistons.

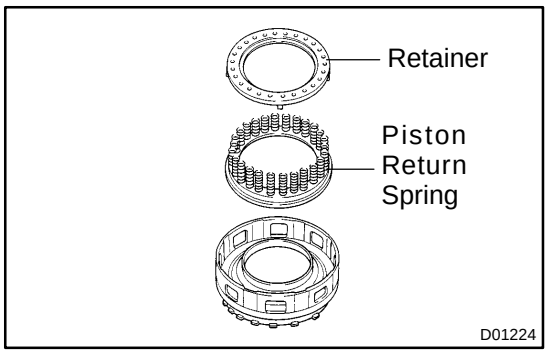


(b) Being careful not to damage the O-rings, press the 3rd brake piston into the brake drum with both hands.

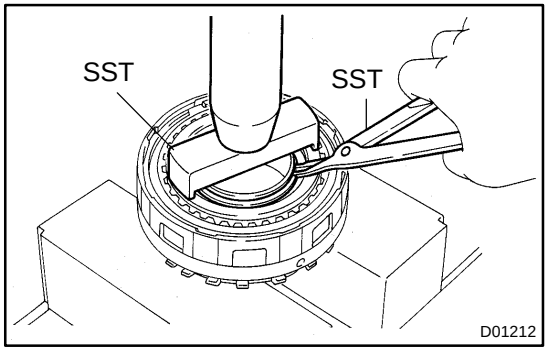


(c) Being careful not to damage the O-rings, press the 2nd brake piston into the brake drum with both hands.

2. INSTALL PISTON RETURN SPRING

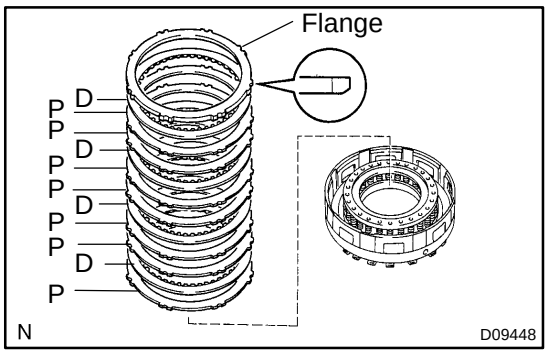


(a) Install the piston return spring.
(b) Install the piston retainer.



(c) Place SST on the spring retainer, and compress the return spring with a press.
SST 09350-32014 (09351-32040)
(d) Using SST, install the snap ring.
SST 09350-30020 (09350-07070)

NOTICE:
Be sure the end gap of the snap ring is not aligned with the spring retainer claw.



3. INSTALL PLATE, DISC AND FLANGE

(a) Install the 7 plates and 4 discs.

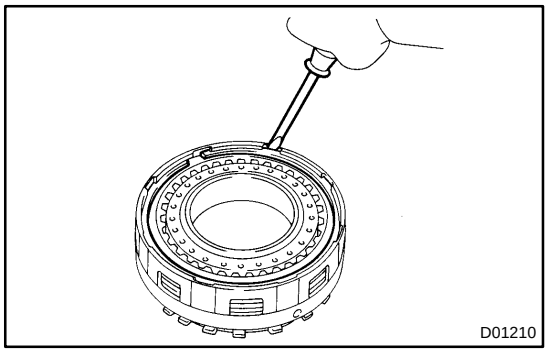
Install in order: P = Plate, D = Disc

P - D - P - P - D - P - P - D - P - P - D

(b) Install the flange, with the Facing its bevelled part down ward.

HINT:

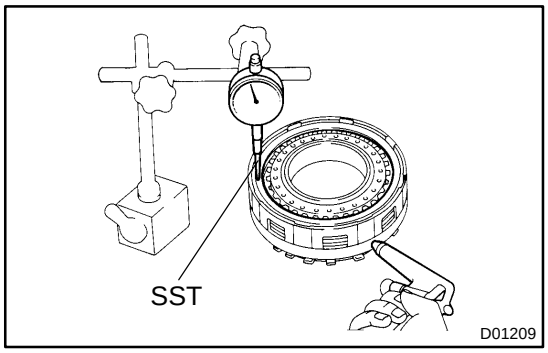
Assemble the flange to the brake drum with facing a carved mark on the flange upward.



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

NOTICE:

Be sure the end gap of the snap ring is not aligned with cut-out portion of the brake drum.



4. CHECK PISTON STROKE OF 3RD BRAKE PISTON

Using SST and a dial indicator, measure the 3rd piston stroke while applying and releasing compressed air (392 kPa, 4 kgf/cm^2, 57 psi).

SST 09350-30020 (09350-06120)

Piston stroke: 0.56 - 0.86 mm (0.022 - 0.036 in.)

NOTICE:

Do not applying compressed air into the 2nd brake piston hole.

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

If the clearance is non-standard, select another flange.

HINT:

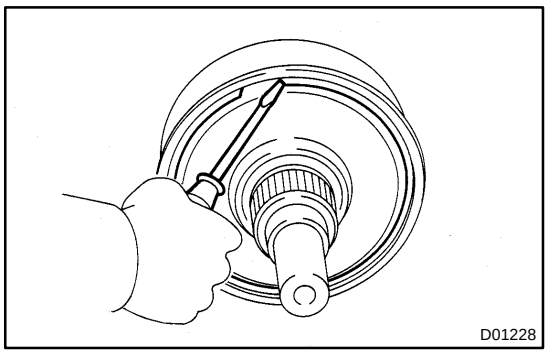
There are 7 different flanges in thickness.

Flange thickness: mm (in.)

No.	Thickness	No.	Thickness
36	3.6 (0.142)	40	4.0 (0.157)
37	3.7 (0.146)	41	4.1 (0.161)
38	3.8 (0.150)	42	4.2 (0.165)
39	3.9 (0.154)	-	-

AT056-01

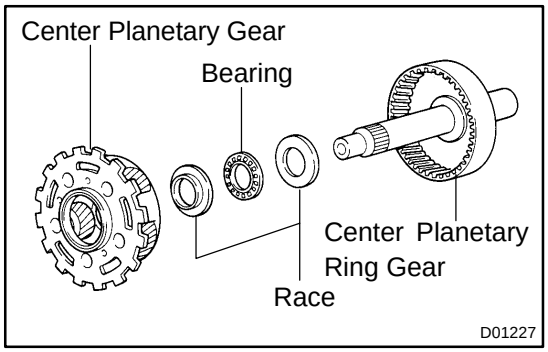
REASSEMBLY



1. INSTALL CENTER PLANETARY RING GEAR

(a) Install the center planetary ring gear to the intermediate shaft.

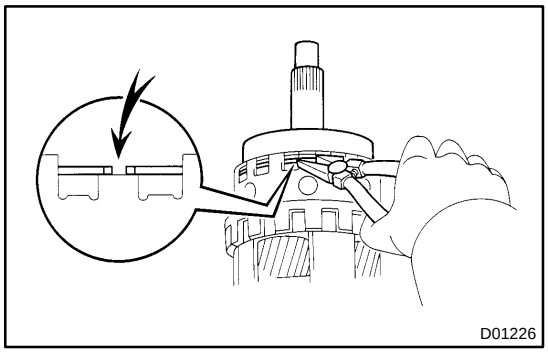
(b) Using a screwdriver, install the snap ring.



2. INSTALL CENTER PLANETARY GEAR

(a) Install the bearing and 2 races to the center planetary ring gear.

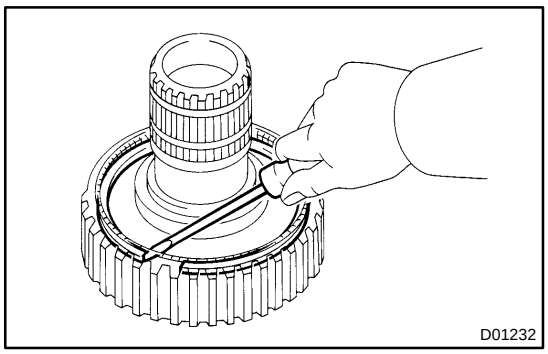
(b) Install the center planetary gear.



(c) Assemble the snap ring to the front planetary ring gear. Nip the both ends of snap ring using needle nose pliers and install them to the output shaft with rear planetary gear so that the end gap of the snap ring comes on the indented part of the output shaft with rear planetary gear.

AT05A-01

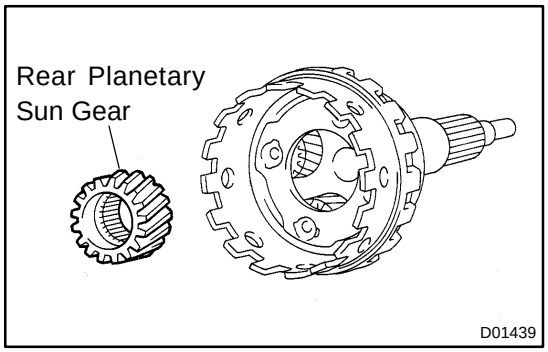
REASSEMBLY



1. INSTALL RING GEAR FLANGE

(a) Install the ring gear flange to the rear planetary ring gear.

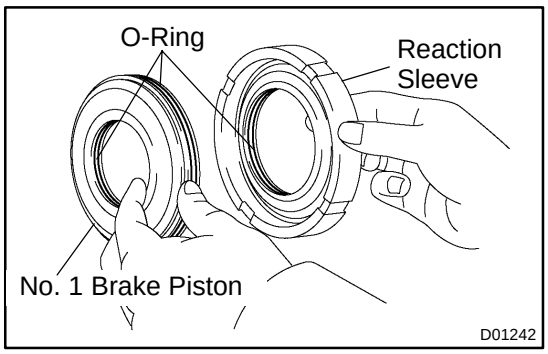
(b) Using a screwdriver, install the snap ring.



2. INSTALL REAR PLANETARY SUN GEAR

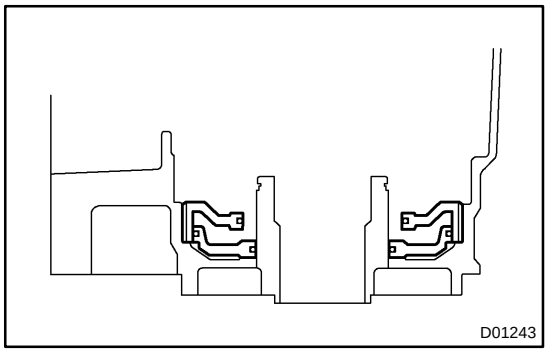
AT05E-02

REASSEMBLY



1. INSTALL NO. 1 BRAKE PISTON

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

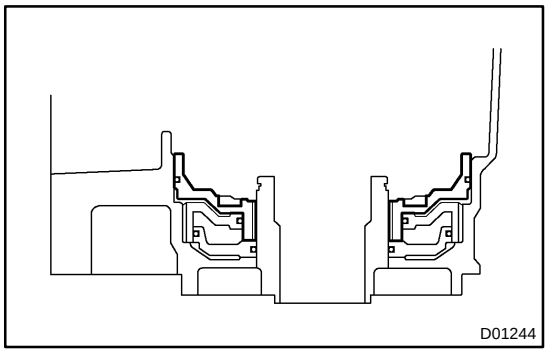


2. INSTALL REACTION SLEEVE AND NO. 1 BRAKE PISTON TO TRANSMISSION CASE

With the No. 1 brake piston underneath (the rear side), install the brake reaction sleeve and No. 1 brake piston to the transmission case.

NOTICE:

Be careful not to damage the O-rings.

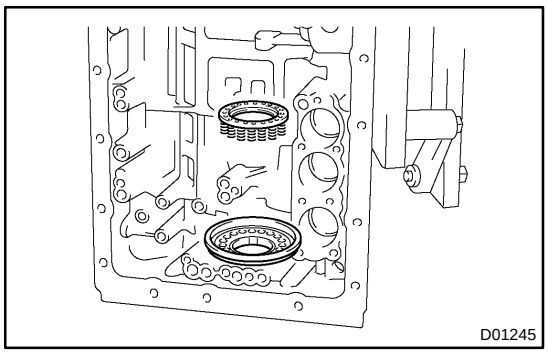


3. INSTALL NO. 2 BRAKE PISTON

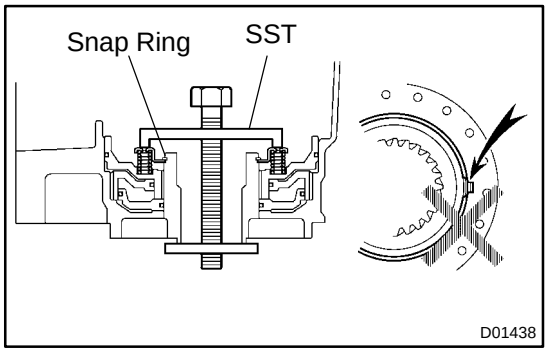
(a) Coat new O-ring with ATF.
(b) Install the O-ring on No. 2 brake piston.
(c) With the spring seat of the piston upwards (the front side), place the piston in the transmission case.

NOTICE:

Be careful not to damage the O-ring.

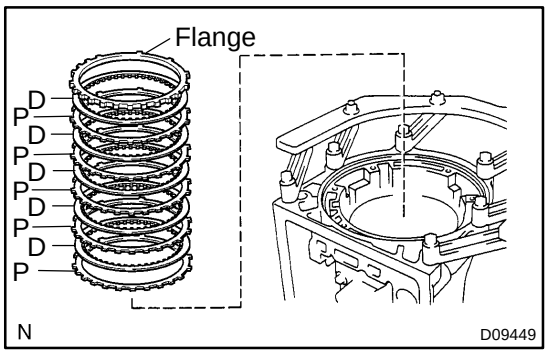


(d) Place the piston return spring onto the No. 2 brake piston.



4. INSTALL PISTON RETURN SPRING

(a) Place SST on the spring retainer and compress the return spring.
SST 09350-30020 (09350-07050)
(b) Using SST, install the snap ring.
SST 09350-30020 (09350-07070)

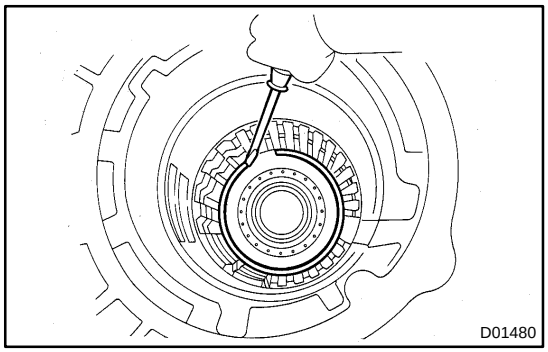


5. INSTALL PLATE, DISC AND FLANGE

(a) Install the 5 plates, 5 discs and flange.

Install in order: P = Plate, D = Disc

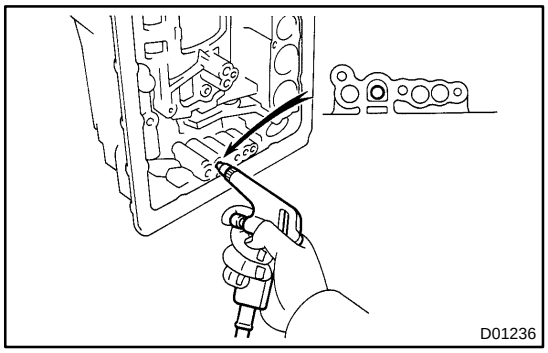
P - D - P - D - P - D - P - D - P - D



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

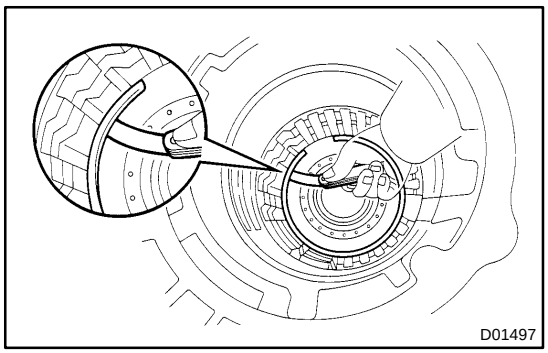
NOTICE:

Be sure the end gap of the snap ring is not aligned with the cutout portion of the case.



6. CHECK PACK OPERATION OF 1ST & REVERSE BRAKE

(a) Make sure the 1st & reverse brake pistons move smoothly when applying and releasing the compressed air (392 kPa, 4 kgf/cm^2, 57 psi) into the transmission case.



(b) Using feeler gauge, measure 1st & reverse brake pack clearance between the snap ring and the flange.

Pack clearance: 0.50 - 0.80 mm (0.020 - 0.031 in.)

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

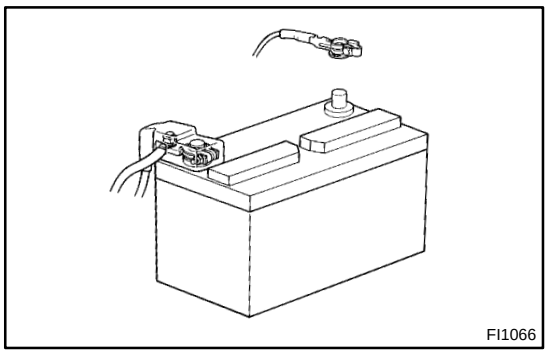
If the stroke is non-standard, select another plate.

HINT:

There are 13 different plates in thickness for the bottom plate. For the other plates, the thickness is 1.8 mm (0.071 in.).

Plate thickness: mm (in.)

No.	Thickness	No.	Thickness
01	1.8 (0.071)	08	2.5 (0.098)
02	1.9 (0.075)	09	2.6 (0.102)
03	2.0 (0.079)	10	2.7 (0.106)
04	2.1 (0.083)	11	2.8 (0.110)
05	2.2 (0.087)	12	2.9 (0.114)
06	2.3 (0.090)	13	3.0 (0.118)
07	2.4 (0.094)	-	-


FI1066

REPAIR INSTRUCTIONS

IN048-08

GENERAL INFORMATION

BASIC REPAIR HINT

(a) Use fender, seat and floor covers to keep the vehicle clean and prevent damage.

(b) During disassembly, keep parts in the appropriate order to facilitate reassembly.

(c) Observe the following operations:

(1) Before performing electrical work, disconnect the negative (-) terminal cable from the battery.

(2) If it is necessary to disconnect the battery for inspection or repair, always disconnect the negative (-) terminal cable which is grounded to the vehicle body.

(3) To prevent damage to the battery terminal, loosen the cable nut and raise the cable straight up without twisting or prying it.

(4) Clean the battery terminals and cable ends with a clean shop rag. Do not scrape them with a file or other abrasive objects.

(5) Install the cable ends to the battery terminals with the nut loose, and tighten the nut after installation. Do not use a hammer to tap the cable ends onto the terminals.

(6) Be sure the cover for the positive (+) terminal is properly in place.

(d) Check hose and wiring connectors to make sure that they are secure and correct.

(e) Non-reusable parts

(1) Always replace cotter pins, gaskets, O-rings and oil seals etc. with new ones.

(2) Non-reusable parts are indicated in the component illustrations by the " " symbol.

(f) Precoated parts

Precoated parts are bolts and nuts, etc. that are coated with a seal lock adhesive at the factory.

(1) If a precoated part is retightened, or loosened or caused to move in any way, it must be precoated with the specified adhesive.

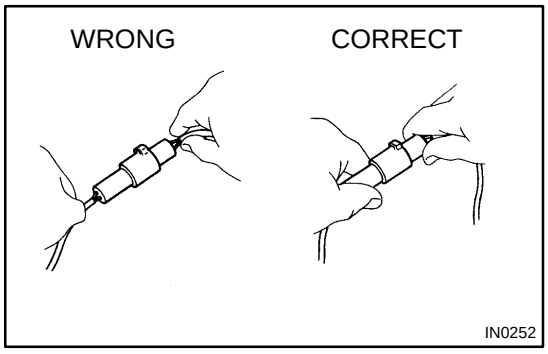
(2) When reusing precoated parts, clean off the old adhesive and dry with compressed air. Then apply the specified seal lock adhesive to the bolt, nut or threads.

(3) Precoated parts are indicated in the component illustrations by the "● " symbol.

(g) When necessary, use a sealer on gaskets to prevent leaks.

(h) Carefully observe all specifications for bolt tightening torques. Always use a torque wrench.

(i) Use of special service tools (SST) and special service materials (SSM) may be required, depending on the nature of the repair. Be sure to use SST and SSM where specified and follow the proper work procedure. A list of SST and SSM can be found in the preparation of AT section.



(j) To pull apart electrical connectors, pull the connector itself, not the wires.

AUTOMATIC TRANSMISSION

SS1HQ-01

SERVICE DATA

Oil Pump		
Body clearance	STD	0.07 - 0.15 mm (0.0028 - 0.0059 in.)
	Maximum	0.3 mm (0.012 in.)
Tip clearance	STD	0.11 - 0.14 mm (0.0043 - 0.0055 in.)
	Maximum	0.3 mm (0.012 in.)
Side clearance	STD	0.02 - 0.04 mm (0.0008 - 0.0016 in.)
	Maximum	0.1 mm (0.004 in.)
Pump body bushing inside diameter	Maximum	38.19 mm (1.5035 in.)
Stator shaft inside diameter	(Front side) Maximum	21.58 mm (0.8496 in.)
	(Rear side) Maximum	27.08 mm (1.0661 in.)
3rd Coast Brake		
Piston rod stroke		2.0 - 3.0 mm (0.079 - 0.118 in.)
Piston rod length		77.65 mm (3.057 in.) 78.40 mm (3.087 in.) 79.15 mm (3.116 in.) 79.90 mm (3.146 in.) 80.65 mm (3.175 in.)
O/D Direct Clutch		
Piston stroke		0.85 - 1.10 mm (0.033 - 0.043 in.)
Clutch return spring free length	STD	15.8 mm (0.622 in.)
Clutch drum bushing inside diameter	Maximum	27.11 mm (1.0673 in.)
O/D planetary gear bushing	Maximum	11.27 mm (0.444 in.)
Planetary pinion gear thrust clearance	STD	0.2 - 0.6 mm (0.008 - 0.024 in.)
	Maximum	1.0 mm (0.039 in.)
Flange thickness	No. 21	3.1 mm (0.122 in.)
	No. 20	3.2 mm (0.126 in.)
	No. 19	3.3 mm (0.130 in.)
	No. 18	3.4 mm (0.134 in.)
	No. 17	3.5 mm (0.138 in.)
	No. 16	3.6 mm (0.142 in.)
	No. 22	3.7 mm (0.146 in.)
	No. 23	3.8 mm (0.151 in.)
O/D Brake		
Piston return spring free length	STD	17.82 mm (0.702 in.)
Piston stroke		1.32 - 1.62 mm (0.052 - 0.064 in.)
Flange thickness	No. 77	3.3 mm (0.130 in.)
	No. 78	3.5 mm (0.138 in.)
	No. 79	3.6 mm (0.142 in.)
	No. 80	3.7 mm (0.146 in.)
	No. 81	3.8 mm (0.150 in.)
	No. 82	3.9 mm (0.154 in.)
	No. 83	4.0 mm (0.157 in.)

Direct Clutch		
Piston stroke		0.40 - 0.70 mm (0.016 - 0.028 in.)
Clutch piston return spring free length	STD	23.25 mm (0.915 in.)
Clutch drum bushing inside diameter	Maximum	53.97 mm (2.1248 in.)
Flange thickness	No. 53	3.3 mm (0.130 in.)
	No. 34	3.4 mm (0.134 in.)
	No. 35	3.5 mm (0.138 in.)
	No. 36	3.6 mm (0.142 in.)
	No. 37	3.7 mm (0.146 in.)
	No. 38	3.8 mm (0.150 in.)
	No. 39	3.9 mm (0.154 in.)
	No. 40	4.0 mm (0.157 in.)
	No. 41	4.1 mm (0.161 in.)
Forward Clutch		
Piston stroke		0.60 - 0.90 mm (0.024 - 0.035 in.)
Clutch drum bushing inside diameter	Maximum	20.08 mm (0.790 in.)
Flange thickness	No. 61	3.0 mm (0.118 in.)
	No. 60	3.2 mm (0.126 in.)
	No. 45	3.4 mm (0.134 in.)
	No. 62	3.6 mm (0.142 in.)
	No. 44	3.8 mm (0.150 in.)
	No. 42	4.0 mm (0.157 in.)
Multiple Disc Brake		
Piston stroke		0.56 - 0.86 mm (0.022 - 0.034 in.)
Piston return spring free length	STD	36.8 mm (1.449 in.)
Flange thickness	No. 36	3.6 mm (0.142 in.)
	No. 37	3.7 mm (0.146 in.)
	No. 38	3.8 mm (0.150 in.)
	No. 39	3.9 mm (0.154 in.)
	No. 40	4.0 mm (0.157 in.)
	No. 41	4.1 mm (0.161 in.)
	No. 42	4.2 mm (0.165 in.)
Front Planetary Gear		
Planetary pinion gear thrust clearance	STD	0.2 - 0.6 mm (0.008 - 0.024 in.)
	Maximum	1.0 mm (0.0394 in.)
Front & Center Planetary Sun Gear		
Sun gear bushing inside diameter	Maximum	24.79 mm (0.976 in.)
Center Planetary Gear		
Planetary gear bushing inside diameter	Maximum	41.31 mm (1.626 in.)
Planetary pinion gear thrust clearance	STD	0.2 - 0.6 mm (0.008 - 0.024 in.)
	Maximum	1.0 mm (0.039 in.)
2nd Brake		
Flange thickness	No. 21	2.1 mm (0.083 in.)
	No. 23	2.3 mm (0.091 in.)
	No. 25	2.5 mm (0.098 in.)
	No. 27	2.7 mm (0.106 in.)
	No. 29	2.9 mm (0.114 in.)
	No. 31	3.1 mm (0.118 in.)

Rear Planetary Gear		
Planetary pinion gear thrust clearance	STD	0.2 - 0.6 mm (0.008 - 0.024 in.)
	Maximum	1.0 mm (0.0394 in.)
Rear planetary ring gear inside bushing	Maximum	38.56 mm (1.518 in.)
1st & Reverse Brake		
Pack clearance		0.5 - 0.8 mm (0.021 - 0.031 in.)
Piston return spring free length	STD	20.0 mm (0.787 in.)
Plate thickness	No. 01	1.8 mm (0.071 in.)
	No. 02	1.9 mm (0.075 in.)
	No. 03	2.0 mm (0.079 in.)
	No. 04	2.1 mm (0.083 in.)
	No. 05	2.2 mm (0.087 in.)
	No. 06	2.3 mm (0.090 in.)
	No. 07	2.4 mm (0.094 in.)
	No. 08	2.5 mm (0.098 in.)
	No. 09	2.6 mm (0.102 in.)
	No. 10	2.7 mm (0.106 in.)
	No. 11	2.8 mm (0.110 in.)
	No. 12	2.9 mm (0.114 in.)
	No. 13	3.0 mm (0.118 in.)
Output Shaft		
Output shaft thrust play		1.63 - 2.89 mm (0.064 - 0.114 in.)
Output shaft inside bushing	Maximum	20.08 mm (0.791 in.)
Extension Housing		
Extension housing inside bushing	Maximum	40.08 mm (1.5779 in.)

Valve Body Spring		
Spring	Free length/Outer diameter mm (in.)	Total No. of coils & (Color)
●Upper Valve Body		
Lock-up relay valve	23.42 (0.922) / 5.86 (0.231)	12.25 (Red)
C-0 exhaust valve	24.25 (0.955) / 8.70 (0.343)	7.58 (Orange)
4-5 shift valve	25.50 (1.004) / 9.73 (0.383)	7.75 (Red)
Coast brake control valve	26.92 (1.060) / 8.70 (0.343)	10.53 (Green)
Secondary regulator valve	34.48 (1.357) / 9.22 (0.363)	13.5 (Red)
C-1 orifice control valve	37.13 (1.461) / 11.14 (0.439)	11.25 (White)
C-1 orifice control valve	21.50 (0.846) / 7.76 (0.306)	11.5 (None)
C-1 accumulator	78.16 (3.077) / 17.50 (0.689)	15.9 (Yellow)
Solenoid modulator valve	35.99 (1.417) / 8.30 (0.327)	13.8 (Light blue)
2-3 shift valve	25.50 (1.004) / 9.73 (0.383)	7.75 (Red)
B-3 control valve	26.05 (1.026) / 7.20 (0.283)	11.83 (Yellow)
B-3 control valve	19.79 (0.779) / 7.70 (0.303)	8.51 (Pink)
●Lower Valve No. 1 Body		
3-4 shift valve	25.50 (1.004) / 9.73 (0.383)	7.75 (Red)
1-2 shift valve	25.50 (1.004) / 9.73 (0.383)	7.75 (Red)
B-2 release control valve	24.25 (0.955) / 8.70 (0.343)	7.58 (Orange)
Primary regulator valve	39.78 (1.566) / 18.88 (0.743)	6.65 (Light green)
Lock-up control valve	20.87 (0.822) / 5.55 (0.219)	11.15 (Yellow)
Cut back valve	22.60 (0.890) / 8.13 (0.320)	8.0 (None)
C-0 control relay valve	20.30 (0.799) / 6.10 (0.240)	12.75 (None)
Accumulator control valve	27.47 (1.081) / 8.85 (0.348)	11.59 (Light green)
Solenoid relay valve	32.11 (1.264) / 8.80 (0.346)	8.6 (Beige)
●Lower Valve No. 2 Valve		
Reverse control valve	25.58 (1.007) / 8.64 (0.340)	8.75 (None)
Accumulator Spring		
Spring	Free length/Outer diameter mm (in.)	Color
B_2	80.91 (3.185) / 19.97 (0.786)	Pink & White
C_2 Inside	41.00 (1.614) / 14.10 (0.555)	Orange
Outside	75.20 (2.961) / 20.10 (0.791)	White & Blue
B_0	69.4 (2.732) / 16.25 (0.640)	White
C_0	65.00 (2.559) / 20.59 (0.811)	None

Valve Body Key			
Key	Hight mm (in,)	Width mm (in.)	Thickness mm (in.)
●Upper Valve Body			
Lock-up relay valve	-	-	-
C-0 exhaust valve	8.5 (0.335)	5.0 (0.197)	3.2 (0.126)
4-5 shift valve	10.0 (0.394)	5.0 (0.197)	3.2 (0.126)
Coast brake control valve	15.0 (0.591)	ø 5.0 (0.197)	ø 5.0 (0.197)
Secondary regulator valve	10.0 (0.394)	5.0 (0.197)	3.2 (0.126)
C-1 orifice control valve	8.5 (0.335)	5.0 (0.197)	3.2 (0.126)
C-1 accumulator	36.5 (1.437)	-	3.2 (0.126)
Solenoid modulator valve	21.0 (0.827)	-	3.2 (0.126)
Check valve	10.0 (0.394)	5.0 (0.197)	3.2 (0.126)
2-3 shift valve	8.0 (0.315)	8.0 (0.315)	3.2 (0.126)
B-3 control valve	16.5 (0.650)	6.0 (0.236)	3.2 (0.126)
●Lower Valve No. 1 Body			
3-4 shift valve	8.0 (0.315)	8.0 (0.315)	3.2 (0.126)
1-2 shift valve	8.0 (0.315)	8.0 (0.315)	3.2 (0.126)
B-2 release control valve	21.0 (0.827)	-	3.2 (0.126)
Primary regulator valve	-	-	3.2 (0.126)
Lock-up control valve	19.0 (0.748)	5.0 (0.197)	3.2 (0.126)
Cut back valve	21.0 (0.827)	-	3.2 (0.126)
C-0 control relay valve	8.5 (0.335)	5.0 (0.197)	3.2 (0.126)
Accumulator control valve	29.0 (1.142)	5.0 (0.197)	3.2 (0.126)
Solenoid relay valve	8.0 (0.315)	8.0 (0.315)	3.2 (0.126)
●Lower Valve No. 2 Body			
Reverse control valve	8.5 (0.335)	5.0 (0.197)	3.2 (0.126)

SS0ZT-01

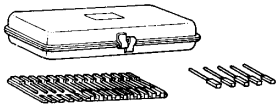
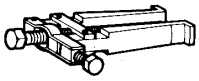
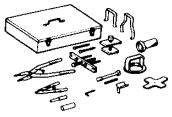
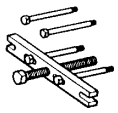
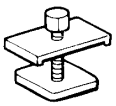
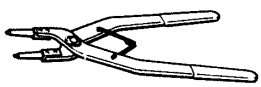
SPECIFIED TORQUE FOR STANDARD BOLTS

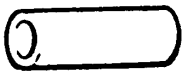
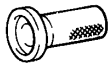
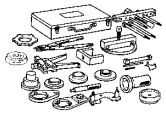
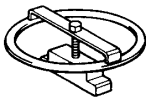
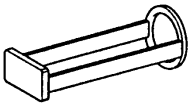
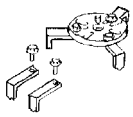
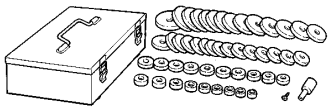
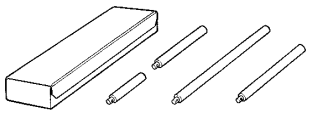
Class	Diameter mm	Pitch mm	Specified torque					
			Hexagon head bolt			Hexagon flange bolt		
			N·m	kgf·cm	ft·lbf	N·m	kgf·cm	ft·lbf
4T	6	1	5	55	48 in.·lbf	6	60	52 in.·lbf
	8	1.25	12.5	130	9	14	145	10
	10	1.25	26	260	19	29	290	21
	12	1.25	47	480	35	53	540	39
	14	1.5	74	760	55	84	850	61
	16	1.5	115	1,150	83	-	-	-
5T	6	1	6.5	65	56 in.·lbf	7.5	75	65 in.·lbf
	8	1.25	15.5	160	12	17.5	175	13
	10	1.25	32	330	24	36	360	26
	12	1.25	59	600	43	65	670	48
	14	1.5	91	930	67	100	1,050	76
	16	1.5	140	1,400	101	-	-	-
6T	6	1	8	80	69 in.·lbf	9	90	78 in.·lbf
	8	1.25	19	195	14	21	210	15
	10	1.25	39	400	29	44	440	32
	12	1.25	71	730	53	80	810	59
	14	1.5	110	1,100	80	125	1,250	90
	16	1.5	170	1,750	127	-	-	-
7T	6	1	10.5	110	8	12	120	9
	8	1.25	25	260	19	28	290	21
	10	1.25	52	530	38	58	590	43
	12	1.25	95	970	70	105	1,050	76
	14	1.5	145	1,500	108	165	1,700	123
	16	1.5	230	2,300	166	-	-	-
8T	8	1.25	29	300	22	33	330	24
	10	1.25	61	620	45	68	690	50
	12	1.25	110	1,100	80	120	1,250	90
9T	8	1.25	34	340	25	37	380	27
	10	1.25	70	710	51	78	790	57
	12	1.25	125	1,300	94	140	1,450	105
10T	8	1.25	38	390	28	42	430	31
	10	1.25	78	800	58	88	890	64
	12	1.25	140	1,450	105	155	1,600	116
11T	8	1.25	42	430	31	47	480	35
	10	1.25	87	890	64	97	990	72
	12	1.25	155	1,600	116	175	1,800	130

AUTOMATIC TRANSMISSION

PP3CJ-01

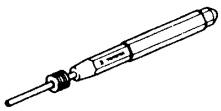
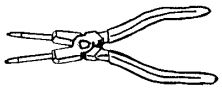
SST (Special Service Tools)

	09032-00100	Oil Pan Seal Cutter	
	09223-15030	Oil Seal & Bearing Replacer	
	09240-00020	Wire Gauge Set	
	09308-10010	Oil Seal Puller	
	09325-20010	Transmission Oil Plug	
	09350-30020	TOYOTA Automatic Transmission Tool Set	
	(09350-06120)	No.2 Measure Terminal	
	(09350-07020)	Oil Pump Puller	
	(09350-07040)	No.2 Piston Spring Compressor	
	(09350-07050)	No.3 Piston Spring Compressor	
	(09350-07060)	No.1 Snap Ring Expander	
	(09350-07070)	No.2 Snap Ring Expander	

	(09350-07080)	Brake Reaction Sleeve Puller	
	(09350-07090)	Brake No.1 Piston Puller	
	(09350-071 10)	Oil Seal Replacer	
	(09351-32140)	Oil Seal Replacer	
	09350-32014	TOYOTA Automatic Transmission Tool Set	
	(09351-32040)	No.1 Piston Spring Compressor	
	09387-00020	Direct Clutch Wrench	
	09387-00100	Brake Spring Compression Wrench	
	09950-60010	Replacer Set	
	(09951-00300)	Replacer 30	
	09950-70010	Handle Set	
	(09951-07100)	Handle 100	

PP3CK-01

RECOMMENDED TOOLS

	09031-00030 Pin Punch .	
	09905-00013 Snap Ring Pliers .	

PP0S9-03

EQUIPMENT

Feeler gauge	Check major clearance.
Vernier calipers	Check length of 2nd coast brake piston rod.
Calipers gauge	Check inside diameter of the extension housing bushing.
Dial indicator or dial indicator with magnetic base	Check piston stroke and play of the output shaft.
Dial indicator	Check inside diameter of major bushing.
Straight edge	Check side clearance of oil pump.
Torque wrench	
Cylinder gauge	Check inside diameter of the transmission case rear bushing.

PP0SA-03

LUBRICANT

Item	Capacity	Classification
Dry fill	8.0 liters (8.5 US qts, 7.0 lmp qts)	ATF Type T-IV or equivalent
Drain and refill	2.4 liters (2.5 US qts, 2.1 lmp. qts)	

PP3BR-01

SSM (Special Service Materials)

	08826-00090	Seal Packing 1281, THREE BOND 1281 or equivalent (FIPG)	Transmission case x Oil pan
	08833-00070	Adhesive 1324, THREE BOND 1324 or equivalent	Extension housing set bolt
	08833-00080	Adhesive 1344 THREE BOND 1344 LOCTITE 242 or equivalent	Transmission case x Extension housing

SS0F0-03

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
Transmission housing x Transmission case	14 mm	34	345	25
	17 mm	57	580	42
Extension housing x Transmission case		34	345	25
Breather pipe x Transmission housing		5.4	55	48 in.·lbf
Packing lock pawl bracket x Transmission case		7.4	75	65 in.·lbf
O/D support x Transmission case		25	260	19
Oil pump x Transmission case		21	215	16
Oil pump body x Stator shaft		10	100	7
Valve body x Transmission case		9.8	100	7
Upper valve body x Lower No. 1 valve body		6.4	65	56 in.·lbf
Lower valve No. 1 body x Lower valve No. 2 body		6.4	65	56 in.·lbf
Detent spring x Lower valve No. 1 body		9.8	100	7
Oil strainer x Valve body		9.8	100	7
Oil pan x Transmission case		7.4	75	65 in.·lbf
Drain plug		20	205	15
Vehicle speed sensor x Transmission case		5.4	55	48 in.·lbf
O/D direct clutch vehicle speed sensor x Transmission case		5.4	55	48 in.·lbf
Transmission wiring stopper plate x Transmission case		5.4	55	48 in.·lbf
ATF temperature sensor wire harness clamp set bolt		6.4	65	56 in.·lbf
Shift solenoid valve No. 1 and No. 3 x Lower valve No. 1 body		6.4	65	56 in.·lbf
Shift solenoid valve No. 2 and No. 4 x Lower valve No. 2 body		9.8	100	7
No. 1 Lock Plate x Lower valve No. 1 body		6.4	65	56 in.·lbf
No. 2 Lock Plate x lower valve No. 2 body		9.8	100	7
Union x Transmission case		29	300	22
Elbow x Transmission case		29	300	22
Park/Neutral position switch	Bolt	13	130	9
	Nut	6.9	70	61 in.·lbf
Control shaft lever		16	160	12