INTRODUCTION

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HOW TO USE THIS MANUAL

IN047-09

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.

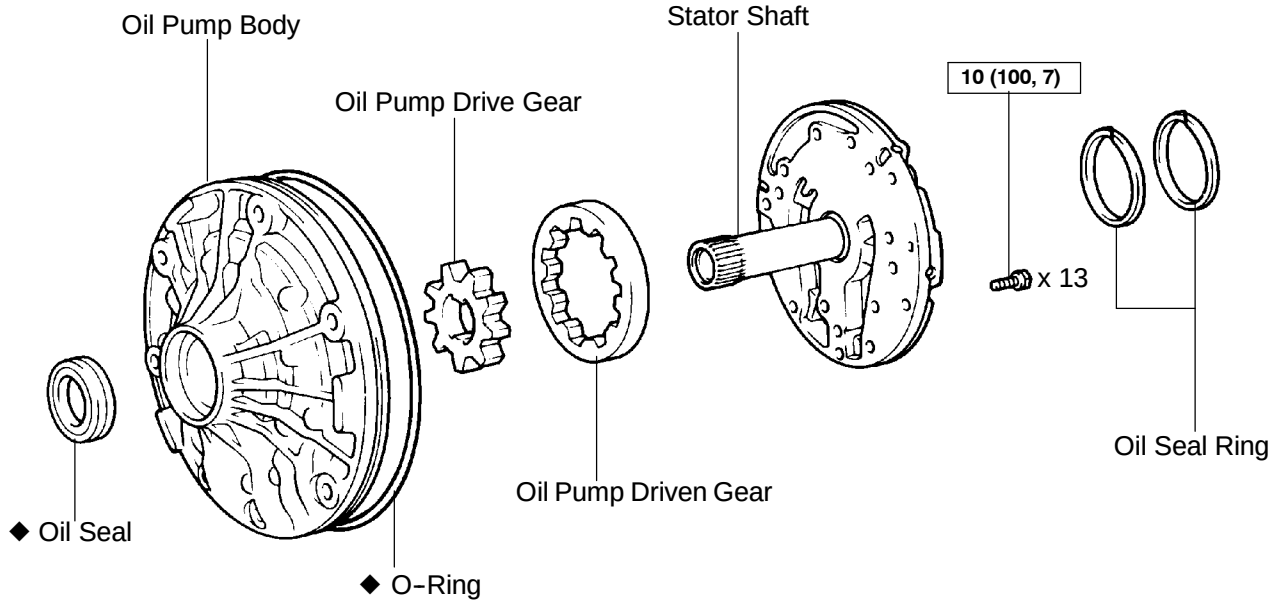
2. PREPARATION

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:



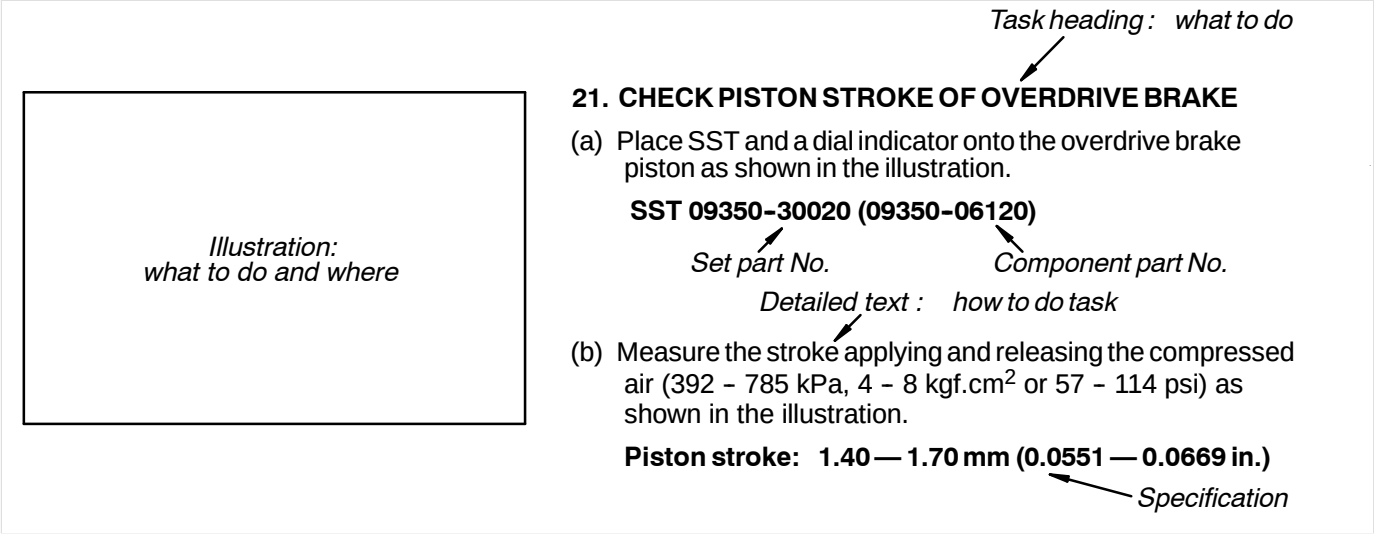
N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non-reusable part

D01280

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:



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 in the Service Specification section, for quick reference.

6. CAUTIONS, NOTICES, HINTS:

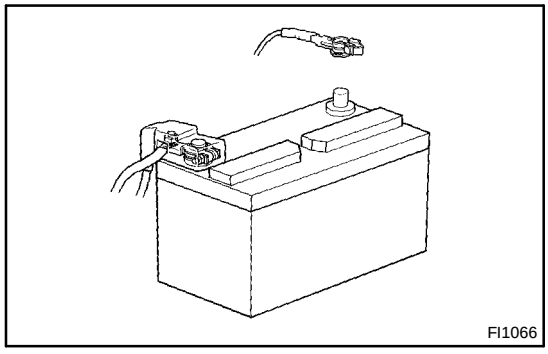
- CAUTIONS are presented in bold type, and indicate there is a possibility of injury to you or other people.
- NOTICES are also presented in bold type, and indicate the possibility of damage to the components being repaired.
- HINTS are separated from the text but do not appear in bold. They provide 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 are alternately expressed in the metric system and in the English System.

EXAMPLE:

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


FI1066

REPAIR INSTRUCTIONS

IN0FO-01

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.

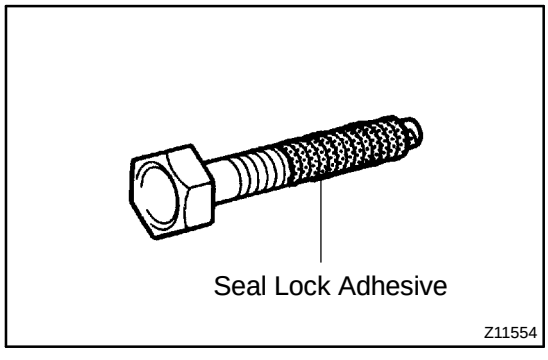
(6) Be sure the cover for the positive (+) terminal is properly in place.

(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.



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(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.

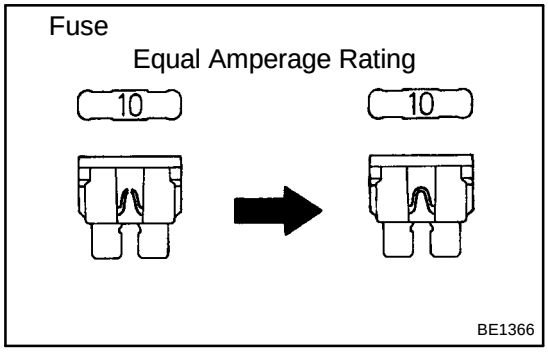
(2) When reusing precoated parts, clean off the old adhesive and dry with compressed air. Then apply the specified seal lock adhesive to the bolt, nut or threads.

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

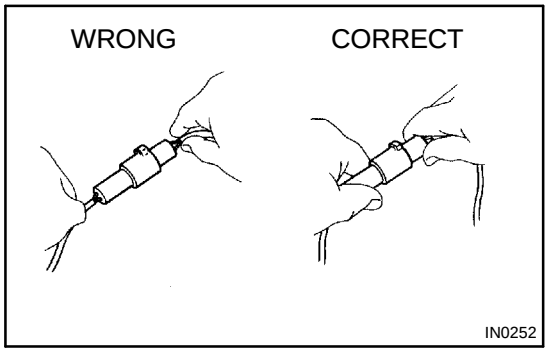
(g) When necessary, use a sealer on gaskets to prevent leaks.

(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 section in this manual.



(j) When replacing fuses, be sure the new fuse has the correct amperage rating. DO NOT exceed the rating or use one with a lower rating.



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

(l) Care must be taken when jacking up and supporting the vehicle. Be sure to lift and support the vehicle at the proper locations.

(1) If the vehicle is to be jacked up only at the front or rear end, be sure to block the wheels at the opposite end in order to ensure safety.

(2) After the vehicle is jacked up, be sure to support it on stands. It is extremely dangerous to do any work on a vehicle raised on a jack alone, even for a small job that can be finished quickly.

TERMS

ABBREVIATIONS USED IN THIS MANUAL

IN049-10

Abbreviations	Meaning
A/T	Automatic Transaxle
ATF	Automatic Transaxle Fluid
B_0	O/D Brake
B_1	2nd Coast Brake
B_2	2nd Brake
B_3	1st & reverse Brake
C_0	O/D Direct Clutch
C_1	Forward Clutch
C_2	Direct Clutch
D	Disc
F	Flange
F_0	O/D 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
SSM	Special Service Materials
SST	Special Service Tools
w/	with
w/o	without
1st	First
2nd	Second

IN0E2-02

GLOSSARY OF SAE AND TOYOTA TERMS

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

SAE ABBREVIATIONS	SAE TERMS	TOYOTA TERMS ( )--ABBREVIATIONS
A/C	Air Conditioning	Air Conditioner
ACL	Air Cleaner	Air Cleaner
AIR	Secondary Air Injection	Air Injection (AI)
AP	Accelerator Pedal	-
B+	Battery Positive Voltage	+B, Battery Voltage
BARO	Barometric Pressure	-
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	-
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 Communication 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	Distributorless Ignition (DI)
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)

SAE ABBREVIATIONS	SAE TERMS	TOYOTA TERMS ( )--ABBREVIATIONS
HO2S	Heated Oxygen Sensor	Heated Oxygen Sensor (HO2S)
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
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 Light
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 (OBD)
OC	Oxidation Catalytic Converter	Oxidation Catalyst Converter (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	–
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)

SAE ABBREVIATIONS	SAE TERMS	TOYOTA TERMS ( )--ABBREVIATIONS
TC	Turbocharger	Turbocharger
TCC	Torque Converter Clutch	Torque Converter
TCM	Transmission Control Module	Transmission ECU (Electronic Control Unit)
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) 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 (Read Switch Type)
WOT	Wide Open Throttle	Full Throttle
WU-OC	Warm Up Oxidation Catalytic Converter	-
WU-TWC	Warm Up Three-Way Catalytic Converter	Manifold Converter
3GR	Third Gear	-
4GR	Fourth Gear	-

PREPARATION

AUTOMATIC TRANSAXLE 02-1

SST (SPECIAL SERVICE TOOLS) 02-1

RECOMMENDED TOOLS 02-3

EQUIPMENT 02-4

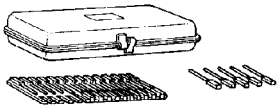
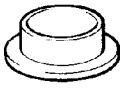
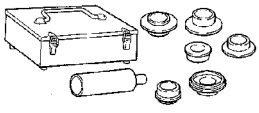
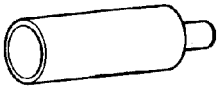
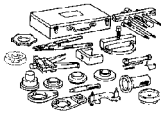
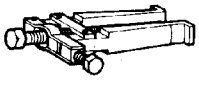
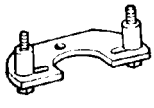
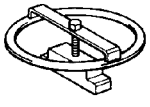
LUBRICANT 02-5

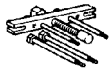
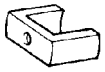
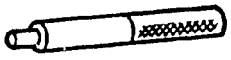
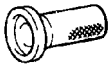
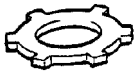
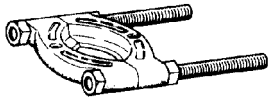
SSM (SPECIAL SERVICE MATERIALS) 02-6

AUTOMATIC TRANSAXLE

PP2GQ-01

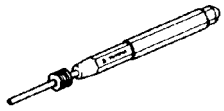
SST (Special Service Tools)

	09223-15020	Oil Seal & Bearing Replacer	
	09226-10010	Crankshaft Front & Rear Bearing Replacer	Install RH retainer oil seal
	09240-00020	Wire Gauge Set	
	09316-20011	Transfer Bearing Replacer	
	09316-60011	Transmission & Transfer Bearing Replacer	
	(09316-00011)	Replacer Pipe	
	09330-00021	Companion Flange Holding Tool	
	09350-32014	TOYOTA Automatic Transmission Tool Set	
	09308-10010	Oil Seal Puller	
	(09351-32032)	Counter Driven Gear Holding Tool	
	(09351-32040)	No.1 Piston Spring Compressor	
	(09351-32050)	Snap Ring Expander	

	(09351-32061) Oil Pump Puller	
	(09351-32070) No.2 Piston Spring Compressor	
	(09351-32080) Lock Nut Wrench	
	(09351-32100) Drive Pinion Bearing Replacer	
	(09351-32120) Overdrive Bearing Replacer	
	(09351-32130) Handle	
	(09351-32140) Oil Seal Replacer	
	(09351-32150) Oil Seal Replacer	
	(09351-32190) Measure Terminal	
	(09351-32200) No.3 Piston Spring Compressor	
	09608-16011 Rear Hub Bearing Tool-	Remove differential side bearing
	09950-00020 Bearing Remover	
	09950-40011 Puller B Set	

PP2GR-01

RECOMMENDED TOOLS

	09031-00030 Pin Punch .	

PP2GS-01

EQUIPMENT

Feeler gauge	Check major clearance.
Vernier calipers	Check length of 2nd coast brake piston rod.
Dial indicator with magnetic base	Check piston stroke and end play of the output shaft.
Dial indicator	Check inside diameter of major bushing.
Straight edge	Check side clearance of oil pump.
Torque wrench	

PP2GT-01

LUBRICANT

Item	Capacity	Classification
Automatic transaxle fluid: Dry fill Drain and refill	 8.0 litres (8.5 US qts, 7.0 Imp. qts) 4.75 litres (5.02 US qts, 4.18 Imp. qts)	ATF D-II or DEXRON?III (DEXRON?II)
Differential oil	N/A (Differential integral with transaxle)	

PP2GU-01

SSM (Special Service Materials)

08826-00090	Seal Packing 1281, THREE BOND 1281 or equivalent (FIPG)	Differential LH bearing retainer Differential RH retainer
08833-00070	Adhesive 1324, THREE BOND 1324 or equivalent	Differential RH retainer set bolt

SERVICE SPECIFICATIONS

STANDARD BOLT 03–1

HOW TO DETERMINE BOLT STRENGTH 03–1

SPECIFIED TORQUE FOR STANDARD BOLTS 03–2

HOW TO DETERMINE NUT STRENGTH 03–3

AUTOMATIC TRANSAXLE 03–4

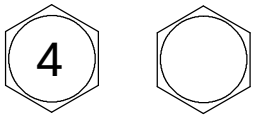
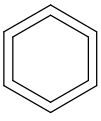
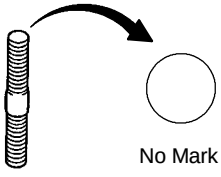
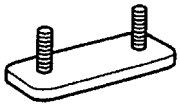
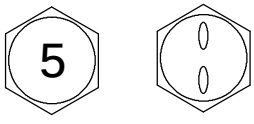
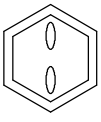
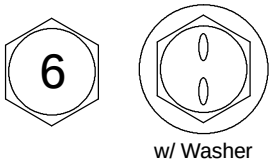
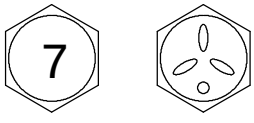
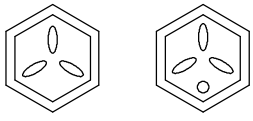
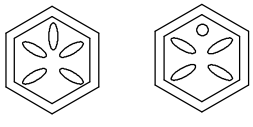
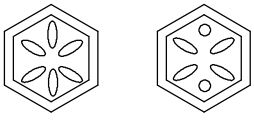
SERVICE DATA 03–4

TORQUE SPECIFICATION 03–7

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

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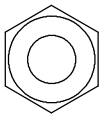
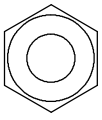
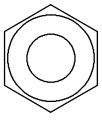
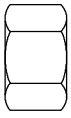
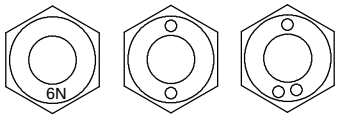
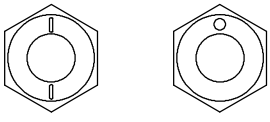
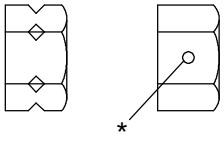
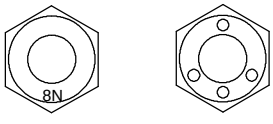
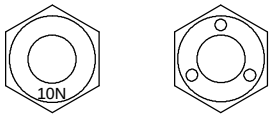
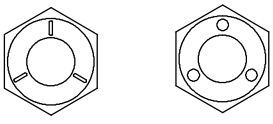
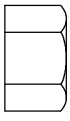
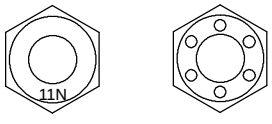
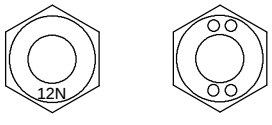
SS0ZT-01

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

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

Example: Bolt = 4T
Nut = 4N or more

AUTOMATIC TRANSAXLE

SERVICE DATA

SS17P-01

2nd coast brake		
Piston stroke		2.0 – 3.5 mm (0.079 – 0.138 in.)
Piston rod length		95.2 mm (3.748 in.) 96.3 mm (3.791 in.)
Oil pump		
Body clearance	STD Maximum	0.07 – 0.15 mm (0.0028 – 0.0059 in.) 0.30 mm (0.0118 in.)
Tip clearance	STD Maximum	0.11 – 0.14 mm (0.0043 – 0.0055 in.) 0.30 mm (0.0118 in.)
Side clearance	STD Maximum	0.002 – 0.005 mm (0.0008 – 0.0020 in.) 0.10 mm (0.0039 in.)
Pump body bushing inside diameter	Maximum	38.18 mm (1.5031 in.)
Stator shaft bushing inside diameter Front side Rear side	 Maximum Maximum	 21.57 mm (0.8492 in.) 27.07 mm (1.0657 in.)
Drive and driven gear thickness	A B C	9.440 – 9.456 mm 0.3717 – 0.3723 in.) 9.456 – 9.474 mm 0.3723 – 0.3730 in.) 9.474 – 9.490 mm 0.3730 – 0.3736 in.)
Direct clutch		
Piston stroke		0.91 – 1.35 mm (0.0358 – 0.0531 in.)
Drum bushing inside diameter		48.27 mm (1.9004 in.)
Flange thickness		2.70 mm (0.1063 in.) 3.00 mm (0.1181 in.)
Forward clutch		
Piston stroke		1.79 – 2.21 mm (0.0704 – 0.0870 in.)
Input shaft end play		0.25 – 0.90 mm (0.0098 – 0.0354 in.)
Flange thickness		2.30 mm (0.0906 in.) 2.70 mm (0.1063 in.)
Front planetary gear		
Sun gear bushing inside diameter	Maximum	22.59 mm (0.8894 in.)
Ring gear flange bushing inside diameter	Maximum	30.08 mm (1.1842 in.)
Planetary pinion gear thrust clearance	STD Maximum	0.16 – 056 mm (0.0063 – 0.0220 in.) 0.61 mm (0.024 in.)
Rear planetary gear		
Planetary pinion gear thrust clearance	STD Maximum	0.16 – 056 mm (0.0063 – 0.0220 in.) 0.61 mm (0.024 in.)
1st & reverse brake		
Pack clearance		1.92 – 2.68 mm (0.0756 – 0.1055 in.)
O/D unit		
Piston stroke		1.75 – 2.49 mm (0.0689 – 0.0980 in.)
Direct clutch bushing inside diameter	Maximum	22.13 mm (0.8713 in.)
Planetary pinion gear thrust clearance	STD Maximum	0.16 – 0.56 mm (0.0063 – 0.0220 in.) 0.61 mm (0.024 in.)
Intermediate shaft end play		0.47 – 1.50 mm (0.0185 – 0.0591 in.)

Valve body spring			
Spring (Color)	Free length	Coil outer diameter	Total No. of coils
Upper valve body			
Low coast modulator valve (Purple)	20.78 mm (0.818 in.)	7.9 mm (0.311 in.)	11.9
B_1 orifice control valve (White)	24.8 mm (0.976 in.)	6.4 mm (0.252 in.)	12.0
Down-shift plug (None)	15.0 mm (0.591 in.)	11.0 mm (0.433 in.)	7.0
Throttle valve (Green)	31.5 mm (1.240 in.)	7.0 mm (0.276 in.)	11.4
Lock-up relay valve (Yellow)	26.8 mm (1.055 in.)	10.2 mm (0.402 in.)	10.8
Lower valve body			
2-3 shift valve (None)	28.0 mm (1.102 in.)	9.4 mm (0.370 in.)	10.3
2nd coast modulator valve (White)	32.2 mm (1.268 in.)	9.0 mm (0.354 in.)	11.4
Accumulator control valve (Red)	25.1 mm (0.988 in.)	8.6 mm (0.339 in.)	8.0
Secondary regulator valve (None)	46.9 mm (1.846 in.)	5.9 mm (0.232 in.)	21.8
2nd lock valve (None)	20.7 mm (0.815 in.)	7.4 mm (0.291 in.)	9.5
Reverse control valve (White/Purple)	38.1 mm (1.500 in.)	6.5 mm (0.256 in.)	19.0
1-2 shift valve (Light Green)	29.2 mm (1.150 in.)	8.9 mm (0.350 in.)	12.0
3-4 shift valve (None)	28.0 mm (1.102 in.)	7.6 mm (0.299 in.)	10.3
Primary regulator valve (None)	36.6 mm (1.441 in.)	16.1 mm (0.634 in.)	6.3
Cut-back valve (None)	21.8 mm (0.858 in.)	6.0 mm (0.236 in.)	13.5
Solenoid modulator valve (Purple/Pink)	30.2 mm (1.189 in.)	5.6 mm (0.220 in.)	15.3

Valve body key			
Key	Height	Width	Thickness
Upper valve body			
B_1 orifice control valve	8.9 mm (0.350 in.)	5.0 mm (0.197 in.)	3.2 mm (0.126 in.)
Low coast modulator valve	8.5 mm (0.335 in.)	5.0 mm (0.197 in.)	3.2 mm (0.126 in.)
Lower valve body			
Accumulator control valve	8.5 mm (0.335 in.)	5.0 mm (0.197 in.)	3.2 mm (0.126 in.)
2 - 3 shift valve	8.5 mm (0.335 in.)	5.0 mm (0.197 in.)	3.2 mm (0.126 in.)
Second lock valve	11.5 mm (0.453 in.)	5.0 mm (0.197 in.)	3.2 mm (0.126 in.)
1 - 2 shift valve	8.5 mm (0.335 in.)	5.0 mm (0.197 in.)	3.2 mm (0.126 in.)
Reverse control valve	8.5 mm (0.335 in.)	5.0 mm (0.197 in.)	3.2 mm (0.126 in.)
Cut-back valve	6.5 mm (0.256 in.)	5.0 mm (0.197 in.)	3.2 mm (0.126 in.)
Secondary regulator valve	11.0 mm (0.433 in.)	5.0 mm (0.197 in.)	3.2 mm (0.126 in.)

Solenoid modulator valve	8.5 mm (0.335 in.)	5.0 mm (0.197 in.)	3.2 mm (0.126 in.)
Lock-up control valve	9.2 mm (0.362 in.)	5.0 mm (0.197 in.)	3.2 mm (0.126 in.)
2nd coast modulator valve	8.0 mm (0.315 in.)	5.0 mm (0.197 in.)	3.2 mm (0.126 in.)
3 – 4 shift valve	6.5 mm (0.256 in.)	5.0 mm (0.197 in.)	3.2 mm (0.126 in.)

Accumulator spring

Spring		Free length	Color
C_0	Inner	47.5 mm (1.870 in.)	White
	Outer	16.3 mm (0.642 in.)	None
C_1		73.6 mm (2.898 in.)	None
C_2		51.8 mm (2.039 in.)	Yellow / Purple
B_0		66.8 mm (2.630 in.)	Red / Yellow
B_2	Inner	70.3 mm (2.767 in.)	None
	Outer	88.2 mm (3.473 in.)	None

Differential assembly

Drive pinion preload (at starting)		
	New bearing	1.0 – 1.6 N·m (10 – 16 kgf·cm, 8.7 – 13.9 in.·lbf)
	Reused bearing	0.5 – 0.8 N·m (5 – 8 kgf·cm, 4.3 – 6.9 in.·lbf)
Total preload (at starting)		
	New bearing	Drive pinion preload plus 0.2 – 0.5 N·m (2.5 – 5.1 kgf·cm, 2.2 – 4.4 in.·lbf)
	Reused bearing	Drive pinion preload plus 0.1 – 0.2 N·m (1.3 – 2.0 kgf·cm, 1.1 – 1.7 in.·lbf)
Pinion to side gear backlash		0.05 – 0.20 mm (0.0020 – 0.0079 in.)
Side gear thrust washer thickness		1.60 mm (0.0630 in.) 1.70 mm (0.0670 in.) 1.80 mm (0.0709 in.)
Side bearing adjusting shim thickness	Mark	
	0	2.00 mm (0.0787 in.)
	1	2.05 mm (0.0807 in.)
	2	2.10 mm (0.0827 in.)
	3	2.15 mm (0.0846 in.)
	4	2.20 mm (0.0866 in.)
	5	2.25 mm (0.0886 in.)
	6	2.30 mm (0.0906 in.)
	7	2.35 mm (0.0925 in.)
	8	2.40 mm (0.0945 in.)
	9	2.45 mm (0.0965 in.)
	A	2.50 mm (0.0984 in.)
	B	2.55 mm (0.1004 in.)
	C	2.60 mm (0.1024 in.)
	D	2.65 mm (0.1043 in.)
	E	2.70 mm (0.1063 in.)
	F	2.75 mm (0.1083 in.)
	G	2.80 mm (0.1102 in.)
	H	2.85 mm (0.1122 in.)

SS17Q-01

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
Oil cooler pipe union x Transaxle case		27	275	20
Oil pan		4.9	50	43 in.·lbf
Valve body x Transaxle case		11	110	8
Oil pump x Transaxle case		22	225	16
O/D case x Transaxle case		25	250	18
Differential LH side bearing retainer		19	195	14
Differential RH retainer		19	195	14
Differential carrier cover x Transaxle case		39	400	29
Oil pump body x Stator shaft		10	10	7
Ring gear x Differential case		124	1,260	91
Upper valve body x Lower valve body		6.6	67	58 in.·lbf
Accumulator cylinder x Valve body		6.6	67	58 in.·lbf
Shift solenoid valve x Valve body		6.6	67	58 in.·lbf
Counter drive gear lock nut		280	2,855	206
Parking lock pawl bracket		7.4	75	65 in.·lbf
Oil strainer x Transaxle case		11	110	8
Direct clutch speed sensor x Transaxle case upper cover		10	100	70
Transaxle case upper cover x Transaxle	Bolt A	19.6	200	14
	Bolt B	9.8	100	7
Solenoid wire x Transaxle case		5.4	55	48 in.·lbf
Retaining plate x Transaxle case		5.4	55	48 in.·lbf
Park/neutral position switch x Transaxle case	Bolt	5.4	55	48 in.·lbf
	Nut	6.9	70	61 in.·lbf
Manual shift lever x Manual valve lever		12.7	130	9
B_3 apply pipe x Valve body		10	100	7
Manual valve body x Transaxle case		10.8	110	8
Detent spring x Manual valve body		10.8	110	8
Accumulator piston cover x Transaxle case		9.8	100	7
Transaxle cap x Transaxle case		5.4	55	48 in.·lbf
2nd coast brake band guide		7.4	75	65 in.·lbf
Throttle valve cam x Upper valve body		7.4	75	65 in.·lbf

AUTOMATIC TRANSAXLE

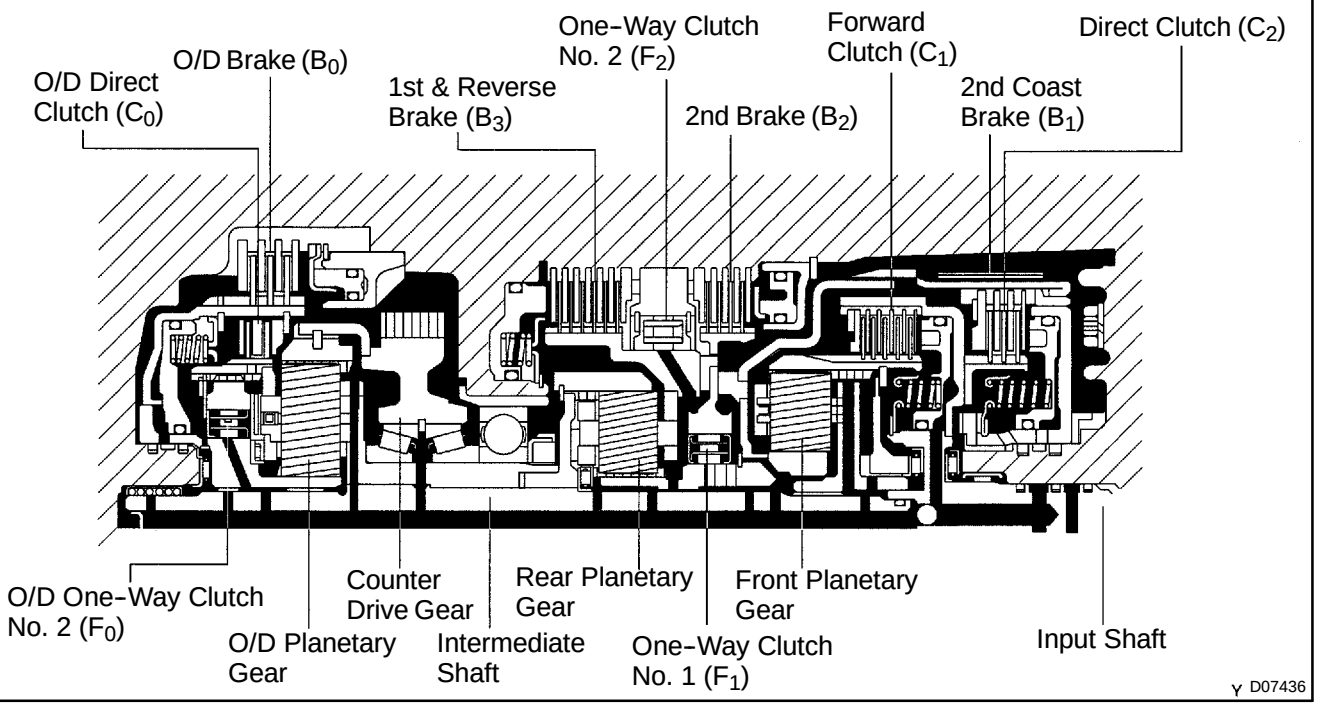
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AUTOMATIC TRANSAXLE SYSTEM

OPERATION

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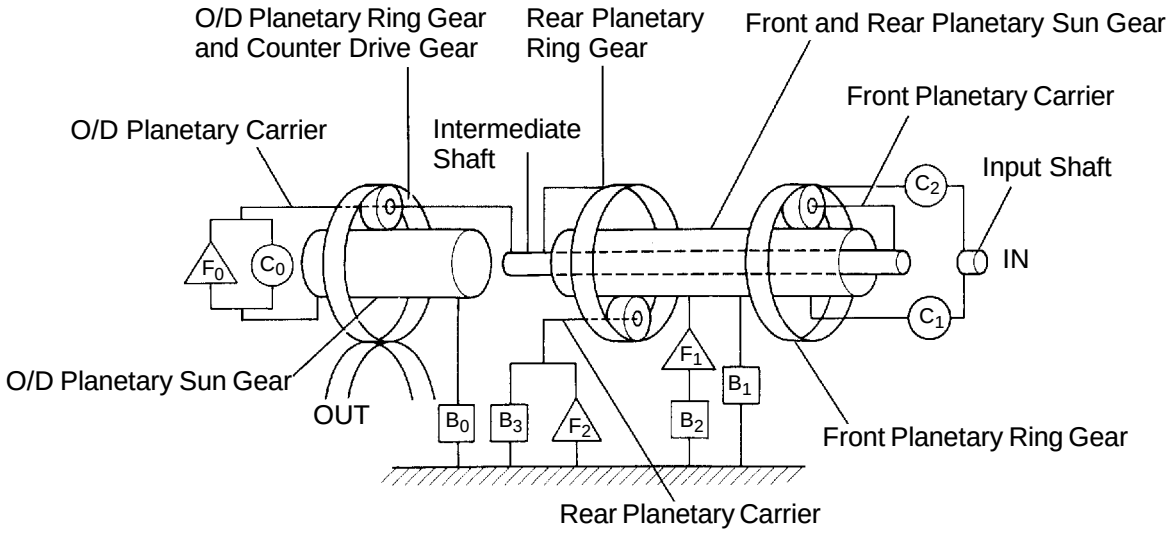


○ ... Operating

Shift lever position	Gear position	C_0	C_1	C_2	B_0	B_1	B_2	B_3	F_0	F_1	F_2
P	Parking	○									
R	Reverse	○		○				○			
N	Neutral	○									
D	1st	○	○						○		○
	2nd	○	○				○		○	○	
	3rd	○	○	○			○		○		
	O/D		○	○	○		○				
2	1st	○	○						○		○
	2nd	○	○			○	○		○	○	
	* 3rd	○	○	○			○		○		
L	1st	○	○					¡	○		○
	* 2nd	○	○			○	○		○	○	

*Down-shift only – no up-shift

COMPONENT		FUNCTION
Forward Clutch	C_1	Connects input shaft and front planetary ring gear
Direct Clutch	C_2	Connects input shaft and front & rear planetary sun gear
2nd Coast Brake	B_1	Prevents front & rear planetary sun gear from turning either clockwise or counterclockwise
2nd Brake	B_2	Prevents outer race of F_1 from turning either clockwise or counterclockwise, thus preventing front & rear planetary sun gear from turning counterclockwise
1st & Reverse Brake	B_3	Prevents rear planetary carrier from turning either clockwise or counterclockwise
No. 1 One-way Clutch	F_1	When B_2 is operating, prevents front & rear planetary sun gear from turning counterclockwise
No. 2 One-Way Clutch	F_2	Prevents rear planetary carrier from turning counterclockwise
O/D Direct Clutch	C_0	Connects O/D sun gear and O/D planetary carrier
O/D Brake	B_0	Prevents overdrive sun gear from turning either clockwise or counterclockwise
O/D One-Way Clutch	F_0	When transaxle is being driven by engine, connects O/D sun gear and O/D carrier
Planetary Gears		These gears change the route through which driving force is transmitted in accordance with the operation of each clutch and brake in order to increase or reduce the input and output speed

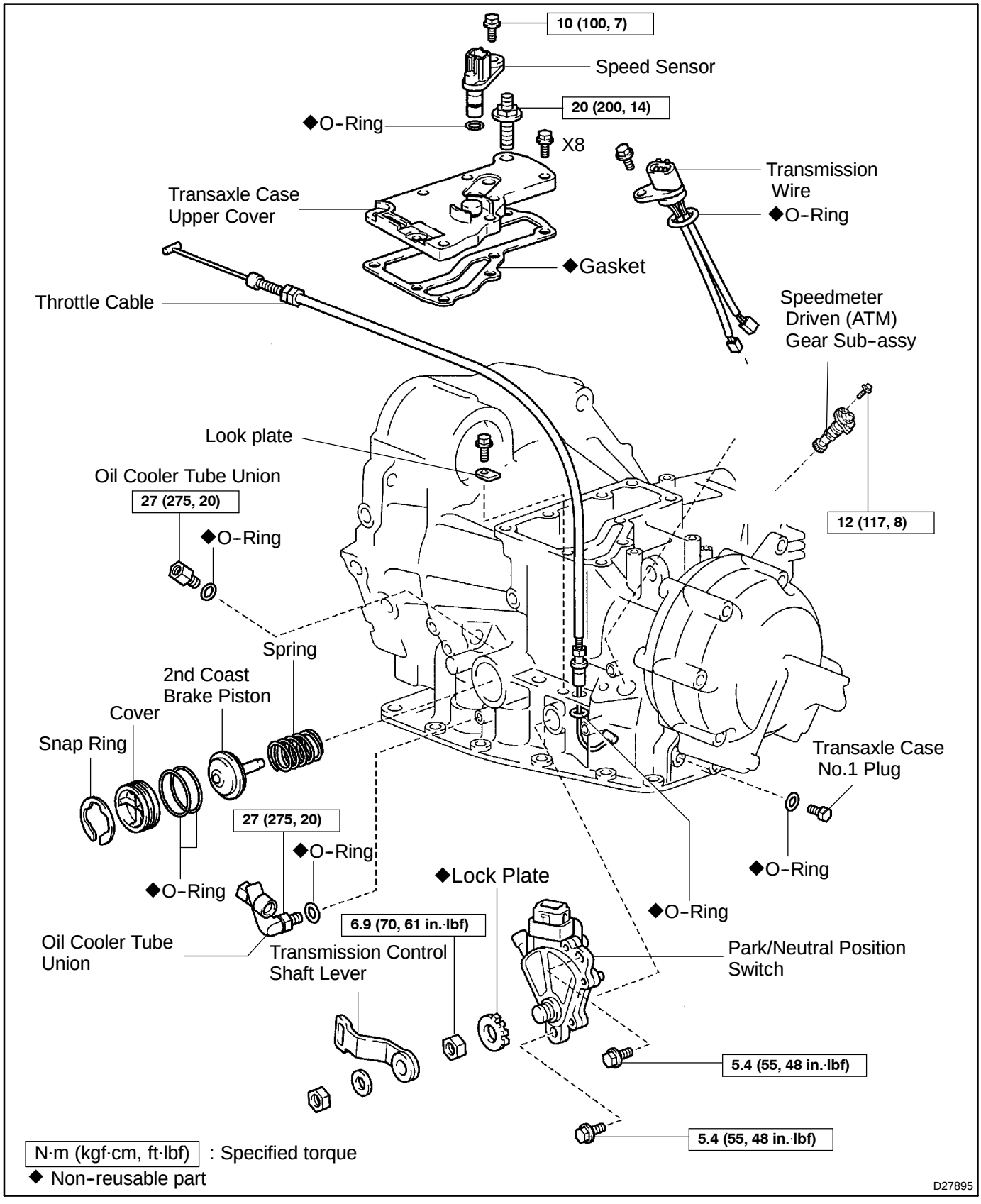


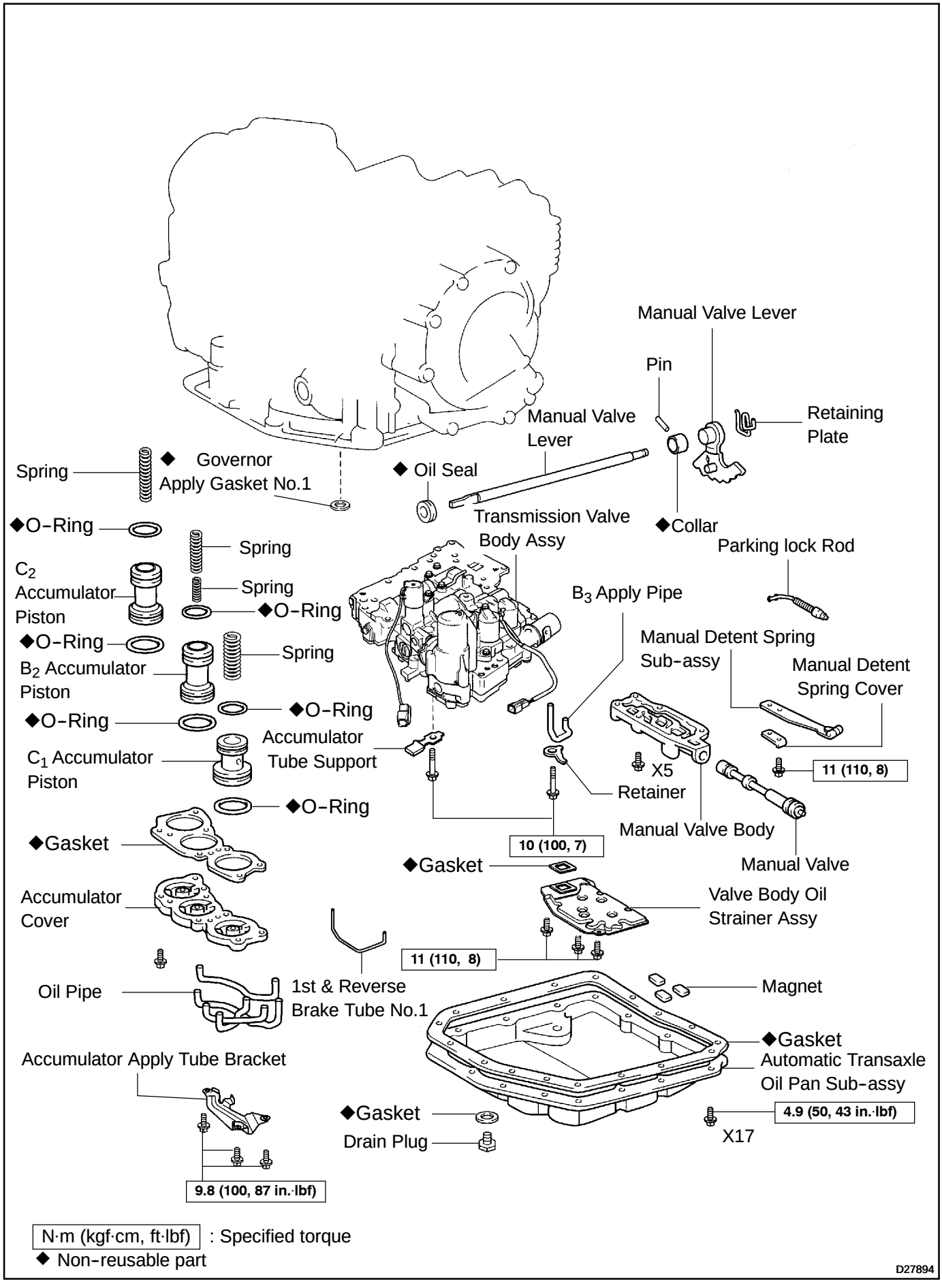
D07437

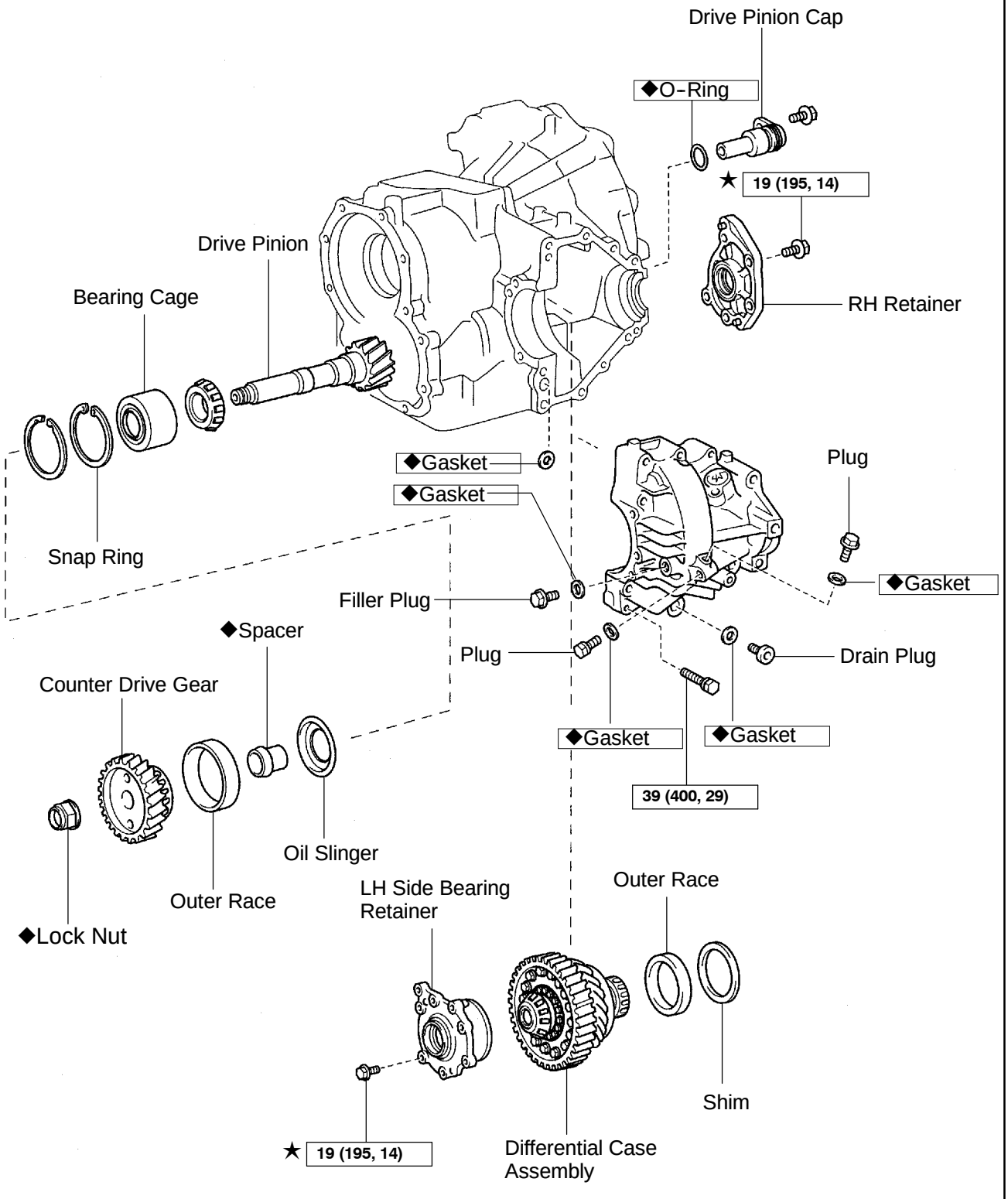
AUTOMATIC TRANSAXLE ASSY (A541E)

400P6-02

COMPONENTS

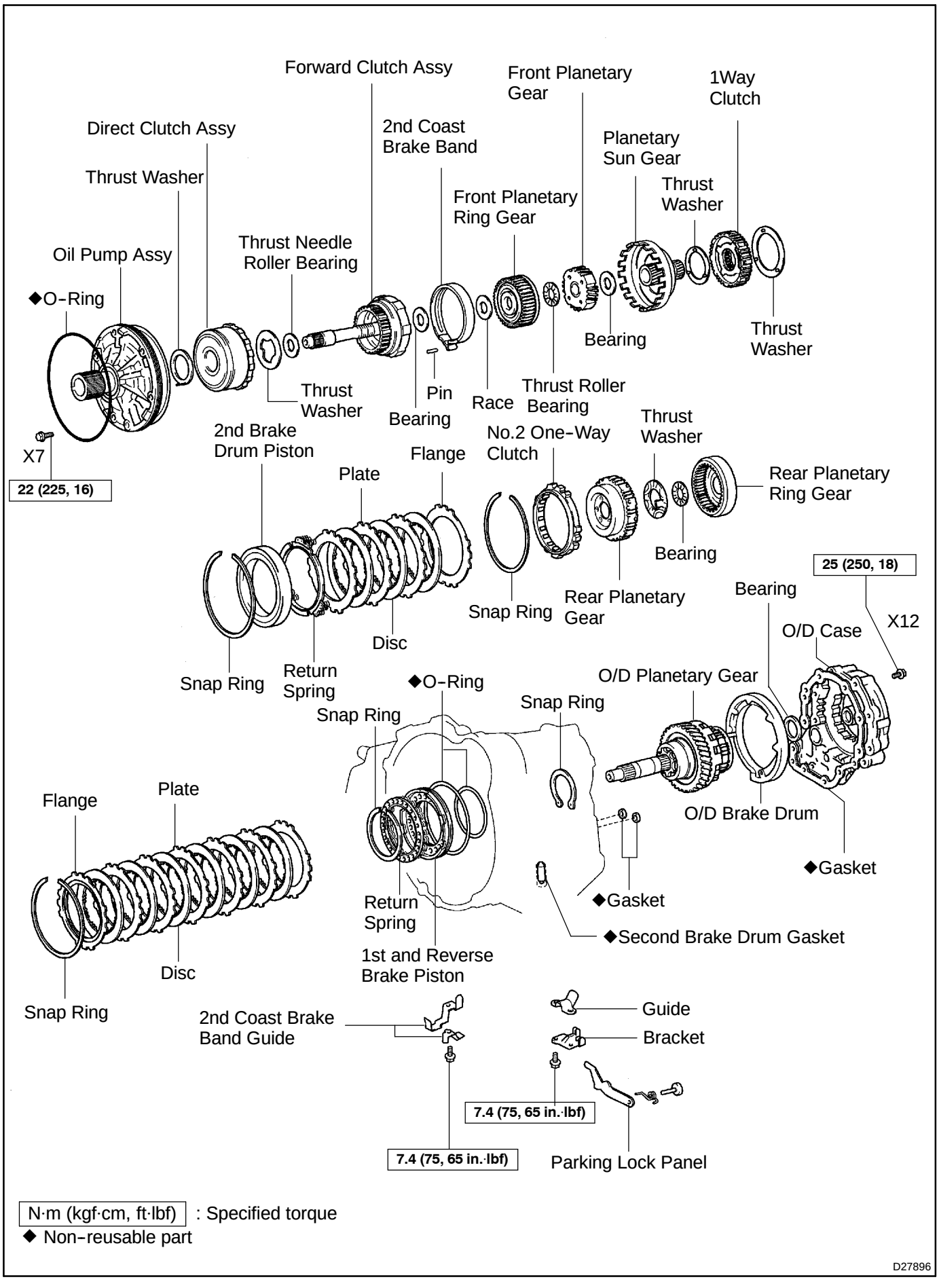



Manual Valve Lever
Pin
Retaining Plate
Manual Valve Lever
Spring
◆ Governor Apply Gasket No.1
◆ Oil Seal
◆Collar
◆O-Ring
Spring
Transmission Valve Body Assy
Parking lock Rod
C2 Accumulator Piston
Spring
◆O-Ring
B3 Apply Pipe
◆O-Ring
B2 Accumulator Piston
Spring
Manual Detent Spring Sub-assy
Manual Detent Spring Cover
◆O-Ring
◆O-Ring
Accumulator Tube Support
C1 Accumulator Piston
X5
11 (110, 8)
◆O-Ring
Retainer
Manual Valve Body
◆Gasket
10 (100, 7)
Manual Valve
◆Gasket
Accumulator Cover
Valve Body Oil Strainer Assy
11 (110, 8)
Oil Pipe
1st & Reverse Brake Tube No.1
Magnet
◆Gasket
Automatic Transaxle Oil Pan Sub-assy
Accumulator Apply Tube Bracket
◆Gasket
Drain Plug
4.9 (50, 43 in.·lbf)
X17
9.8 (100, 87 in.·lbf)
N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non-reusable part
D27894



N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non-reusable part
★ Precoated Part

Q05661

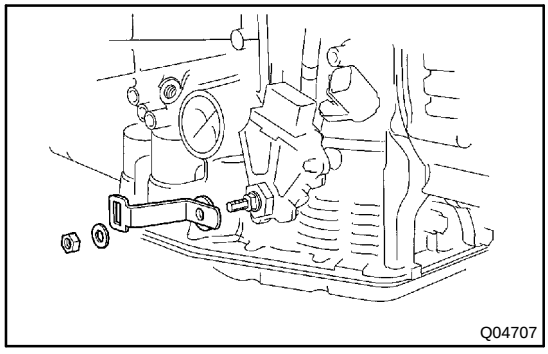


N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non-reusable part

D27896

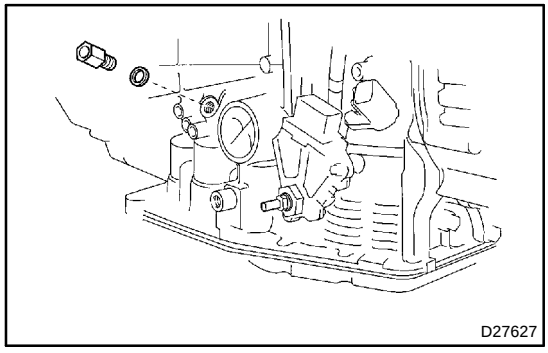
400QK-01

OVERHAUL



1. REMOVE TRANSMISSION CONTROL SHAFT LEVER

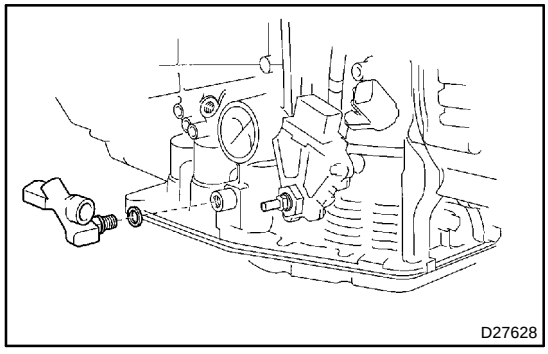
(a) Remove the nut, washer and transmission control shaft lever.



2. REMOVE OIL COOLER TUBE UNION (INLET OIL COOLER UNION)

(a) Remove the oil cooler tube union.

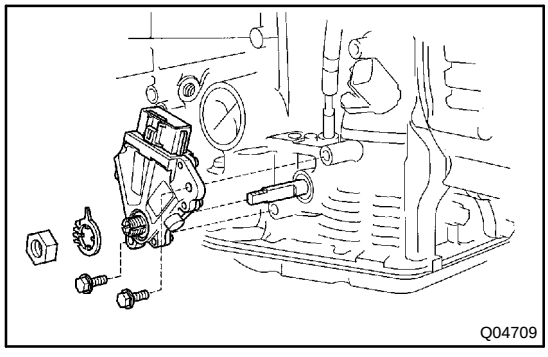
(b) Remove the O-ring from the oil cooler tube union.



3. REMOVE OIL COOLER TUBE UNION (OUTLET OIL COOLER UNION)

(a) Remove the oil cooler tube union.

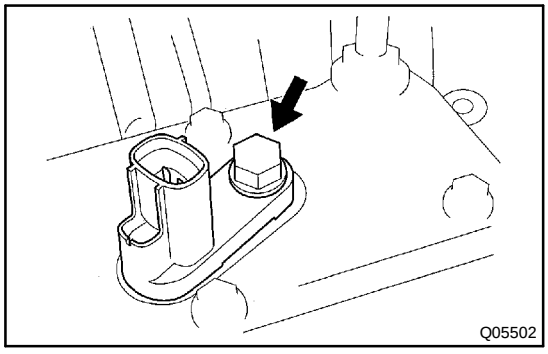
(b) Remove the O-ring from the oil cooler tube union.



4. REMOVE PARK/NEUTRAL POSITION SWITCH ASSY

(a) Pry off the lock plate and remove the manual valve shaft nut.

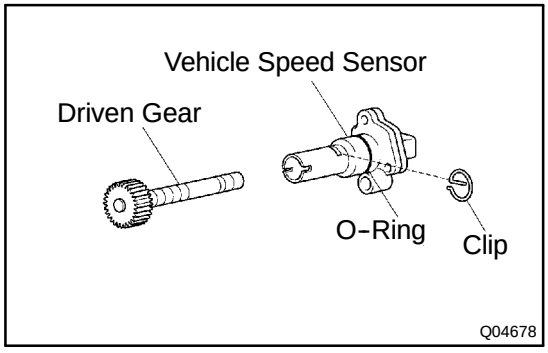
(b) Remove the 2 bolts and pull out the park/neutral position switch from the transaxle case.



5. REMOVE SPEED SENSOR

(a) Remove the bolt and speed sensor.

(b) Remove the O-ring from the speed sensor.

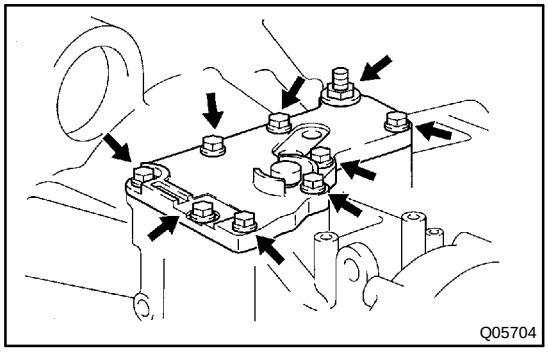


6. REMOVE SPEEDMETER DRIVEN (ATM) GEAR SUB-ASSY

(a) Remove the bolt and speedmeter driven gear.

(b) Remove the clip and speedmeter driven gear sub-assy from the speedmeter sensor.

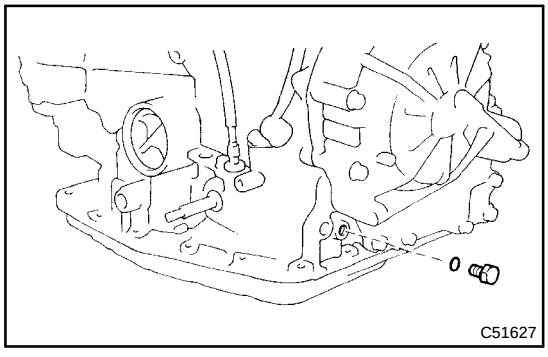
(c) Remove the O-ring from the speedmeter sensor.



7. REMOVE TRANSAXLE CASE COVER UPPER

(a) Remove the 9 bolts and transaxle case cover upper.

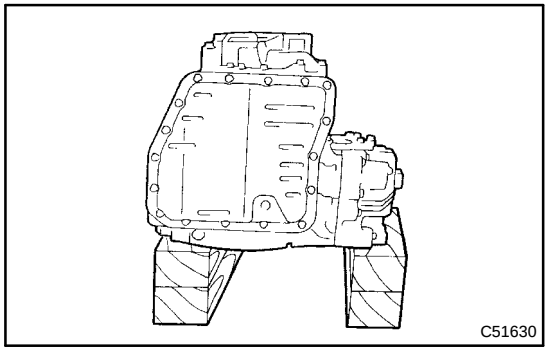
(b) Remove the transaxle case upper cover gasket.



8. REMOVE TRANSAXLE CASE NO.1 PLUG

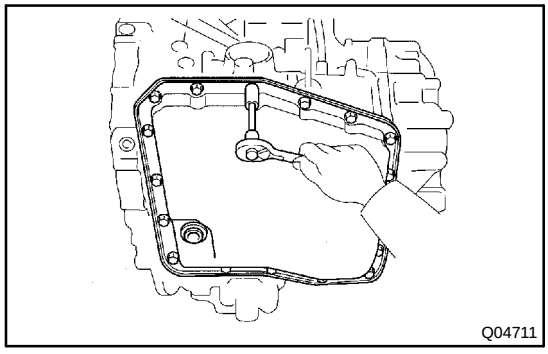
(a) Remove the transaxle case No.1 plug.

(b) Remove the O-ring from the transaxle case No.1 plug.



9. FIX AUTOMATIC TRANSAXLE ASSY

(a) Fix transaxle assy.



10. REMOVE AUTOMATIC TRANSAXLE OIL PAN SUB-ASSY

(a) Remove the 17 bolts.

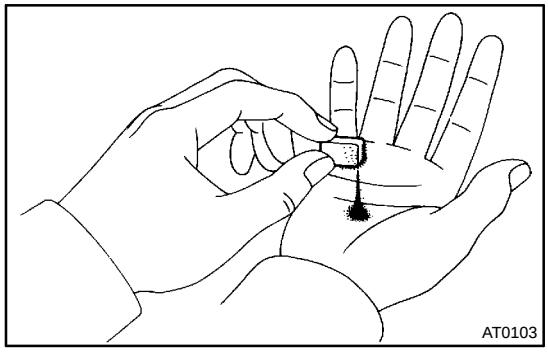
(b) Remove the oil pan by lifting transaxle case.

NOTICE:

Do not turn the transaxle over as this will contaminate the valve body with the foreign materials in the bottom of the oil pan.

(c) Place the transaxle on wooden blocks to prevent damage to the oil pipe bracket.

(d) Remove the 3 magnets from the oil pan.

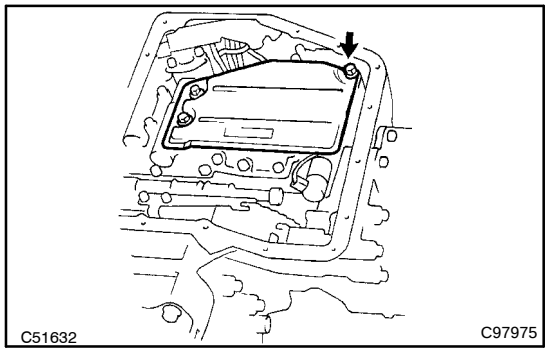


11. INSPECT TRANSMISSION OIL CLEANER MAGNET

(a) Remove the magnet and use it to collect any steel chips. Look carefully at the chips and particles in the oil pan and on the magnet to anticipate what type of wear you will find in the transaxle.

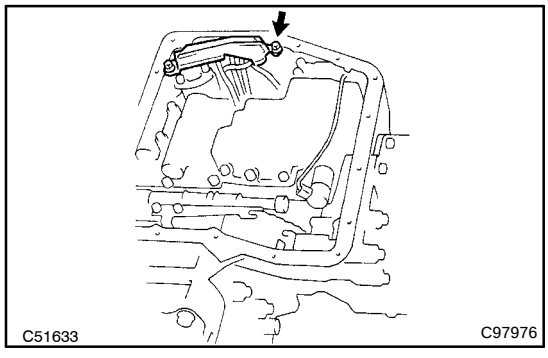
HINT:

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



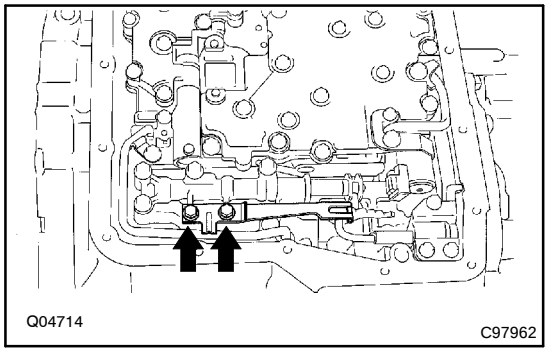
12. REMOVE VALVE BODY OIL STRAINER ASSY

(a) Remove 3 bolts, valve body oil strainer assy and oil strainer gasket.



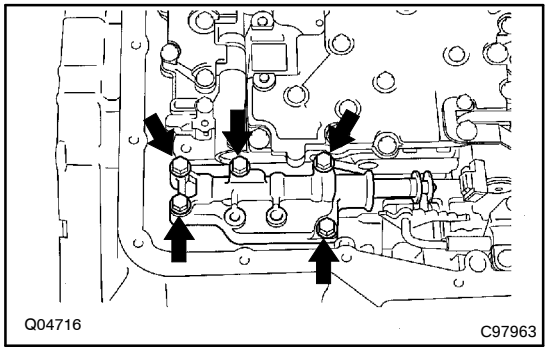
13. REMOVE ACCUMULATOR APPLY TUBE BRACKET

(a) Remove 3 bolts and accumulator apply tube bracket.



14. REMOVE MANUAL DETENT SPRING SUB-ASSY

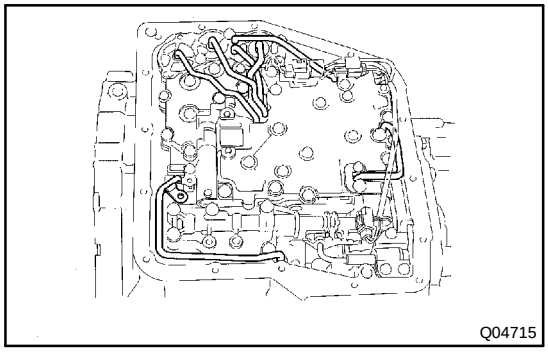
(a) Remove the 2 bolts, manual detent spring sub-assy and manual detent spring cover.



15. REMOVE MANUAL VALVE BODY

(a) Remove the 5 bolts and manual valve body with the manual valve.

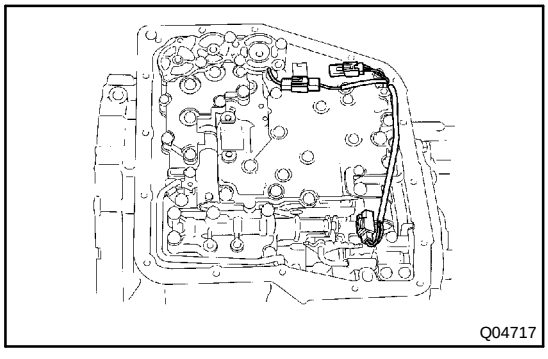
(b) Remove the manual valve from the manual valve body.



16. REMOVE TUBE

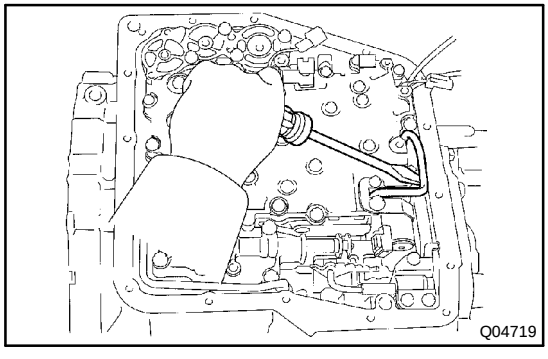
(a) Remove the bolt.

(b) Pry up the pipe with a screwdriver and remove the 6 tubes.



17. SEPARATE CONNECTOR

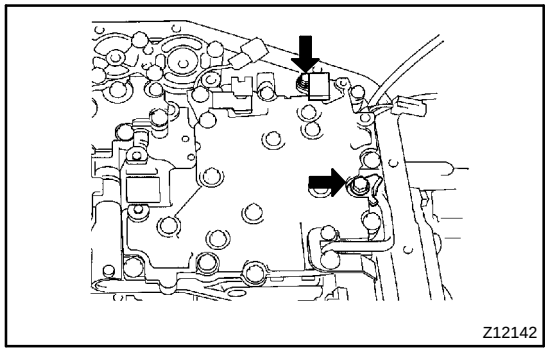
(a) Disconnect the 3 solenoid connectors.



18. REMOVE 1ST & REVERSE BRAKE TUBE NO.1

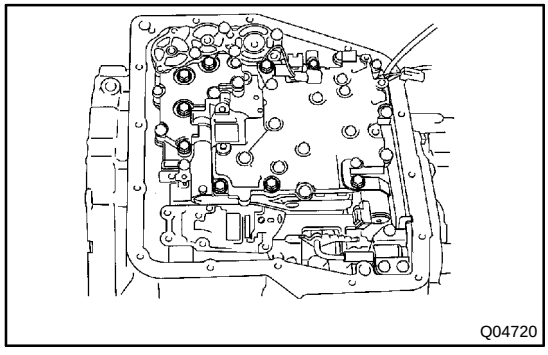
(a) Remove the bolt and accumulator tube support.

(b) Pry up the pipe with a screwdriver and remove the 1st & reverse brake tube No.1.

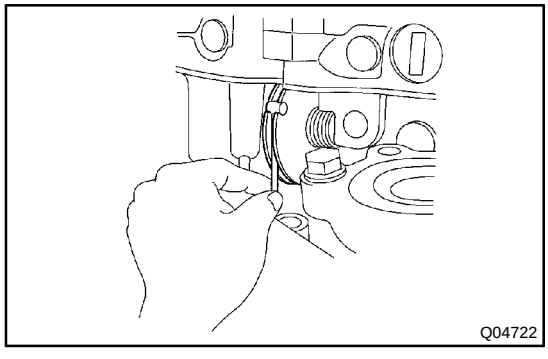


19. REMOVE TRANSMISSION VALVE BODY ASSY

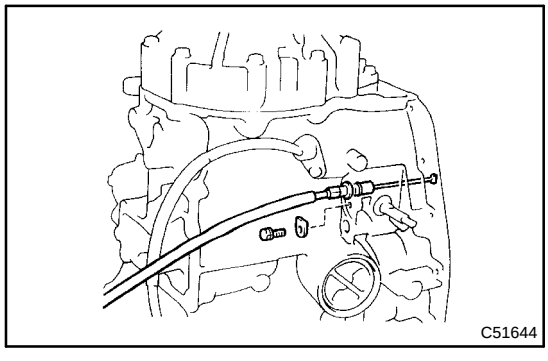
(a) Remove the 2 bolts and wire harness clamp.



(b) Remove the 9 bolts.

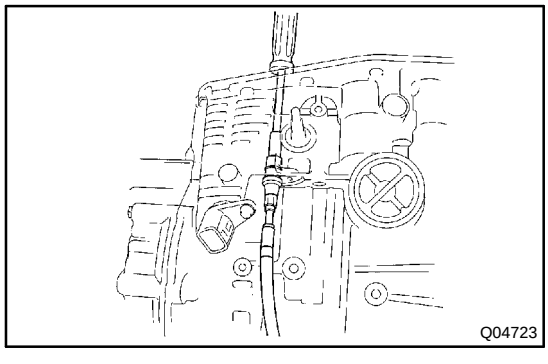


(c) Disconnect the throttle cable from the cam, and remove the valve body.

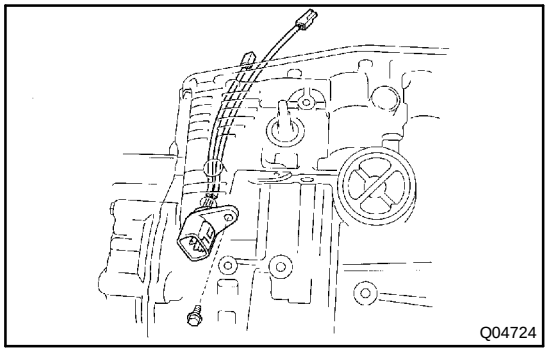


20. REMOVE THROTTLE CABLE ASSY

(a) Remove the bolt and the lock plate.



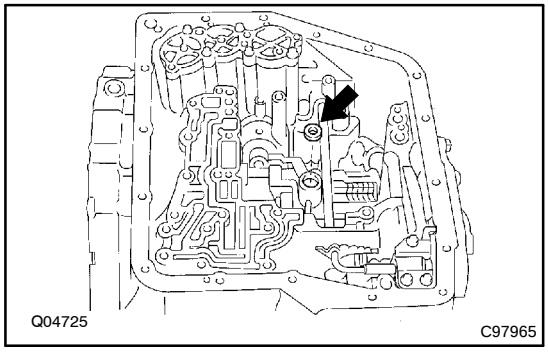
(b) Using a box driver, remove the throttle cable assy from the automatic transaxle assy.



21. REMOVE TRANSMISSION WIRE

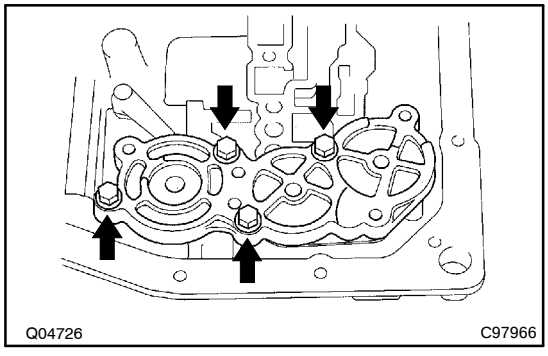
(a) Remove the bolt and the transmission wire.

(b) Remove the O-ring from the transmission wire.



22. REMOVE GOVERNOR APPLY GASKET NO.1

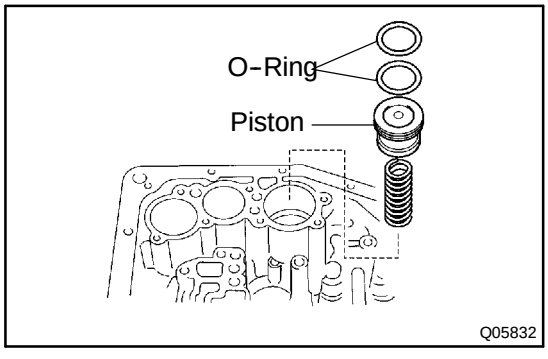
(a) Remove the governor apply gasket No.1 from the transaxle case.



23. REMOVE ACCUMULATOR COVER

(a) Loosen the 4 bolts one turn at a time until the spring tension is released.

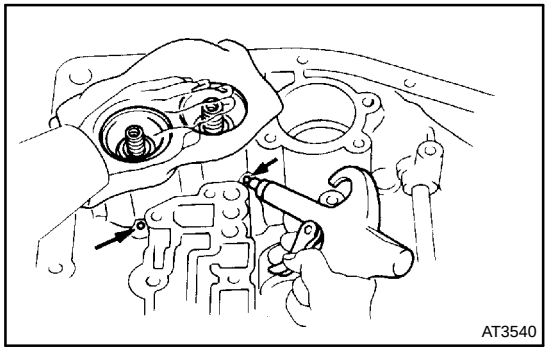
(b) Remove the cover and accumulator cover gasket.



24. REMOVE C-1 ACCUMULATOR PISTON

(a) Remove the C_1 accumulator piston and spring.

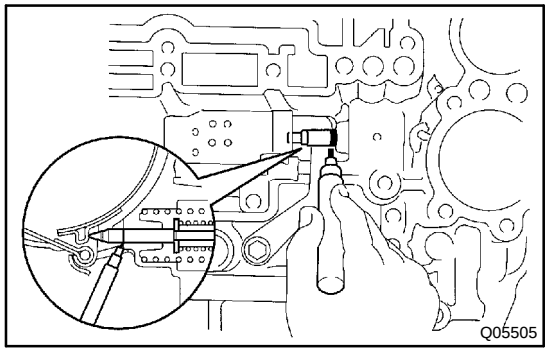
(b) Remove the 2 O-rings from the piston.



25. REMOVE C-2 ACCUMULATOR PISTON

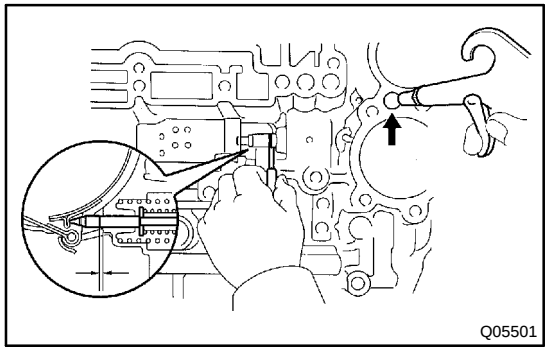
(a) Pop out pistons for C_2 and B_2 into a rag, using low-pressure compressed air (98 kPa, 1 kgf/cm^2, 14 psi).

(b) Remove the O-rings from the pistons.



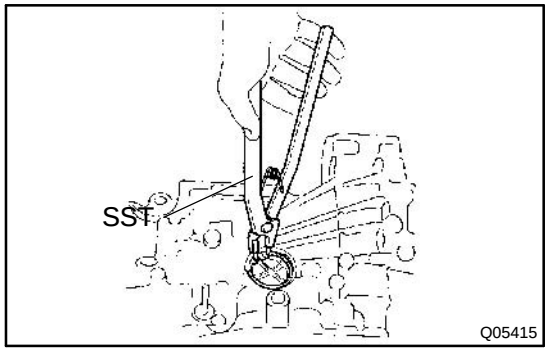
26. MEASURE SECOND COAST BRAKE PISTON ASSY

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



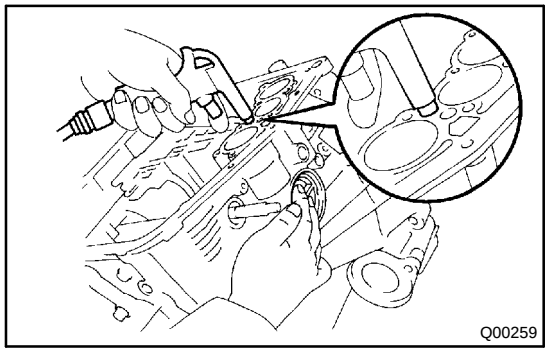
(b) Using SST, measure the piston stroke while applying and releasing compressed air (392–785 kPa, 4–8 kgf/cm^2, 57–114 psi).
SST 09240–00020
Maximum thrust clearance:
2.0 – 3.5 mm (0.079 – 0.138 in.)

If the piston stroke exceeds the limit, inspect the 2nd coast brake band.

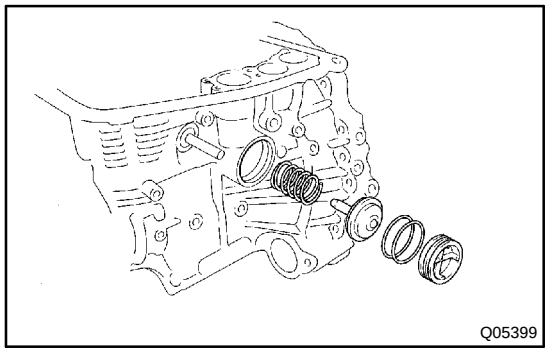


27. REMOVE 2ND COAST BRAKE PISTON

(a) Using SST, remove the snap ring.
SST 09350–32014



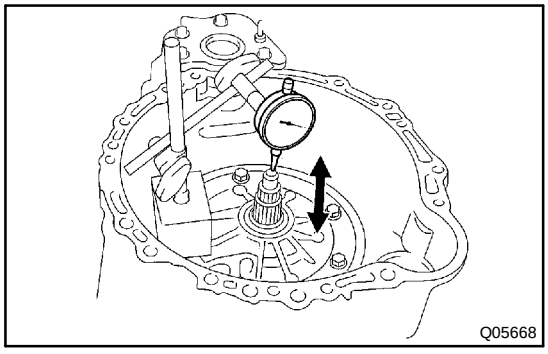
(b) Applying compressed air to the oil hole, remove the 2nd coast brake cover, piston assembly and spring.



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

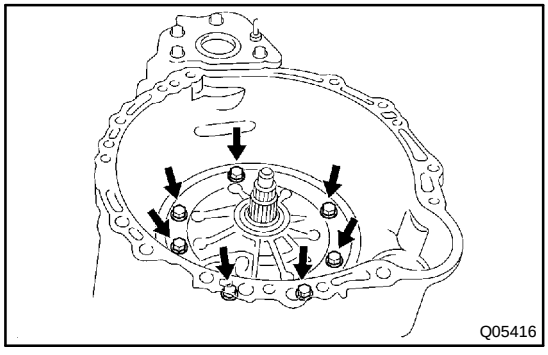
NOTICE:

- **Using compressed air may cause the piston to jump out. When removing the piston, use waste cloth between your hand and the piston.**
- **Take care not to splash ATF when using compressed air.**



28. INSPECT INPUT SHAFT ENDPLAY

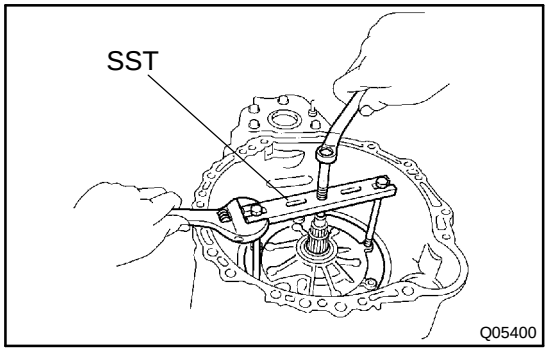
(a) Measure the end play with a dial indicator.
End play: 0.25 - 0.90 mm (0.0098 - 0.0354 in)



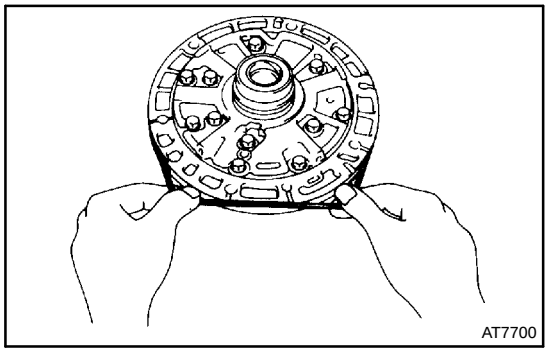
29. REMOVE OIL PUMP ASSY

NOTICE:
Before removing the oil pump, remove the second coast brake piston.

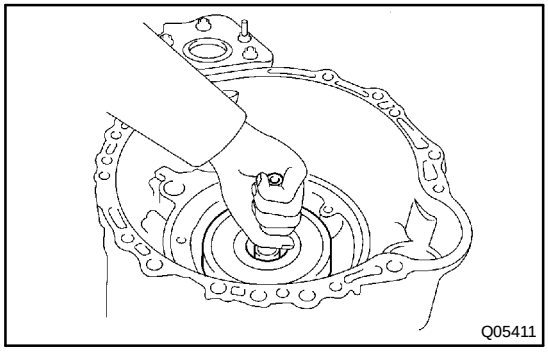
(a) Stand transaxle engine side upward.
(b) Remove the 7 bolts.



(c) Using SST, pull out the oil pump out of the transaxle case.
SST 09350-32014 (09351-32061)

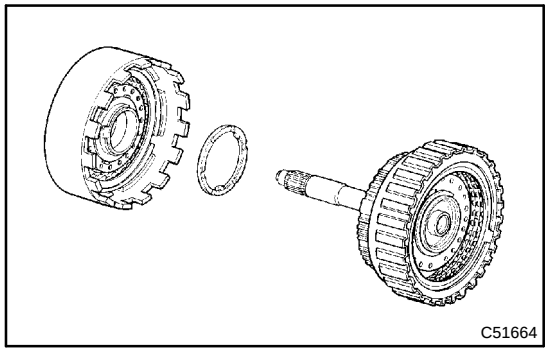


(d) Remove the front oil pump body O-ring from the oil pump.



30. REMOVE FORWARD CLUTCH ASSY

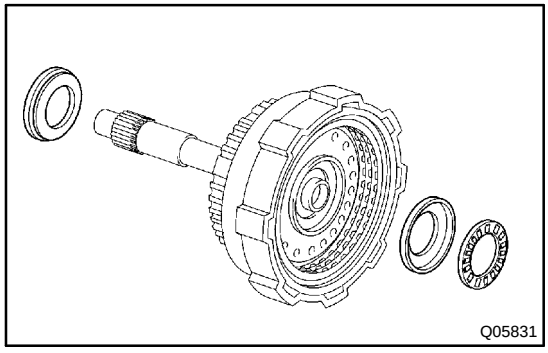
(a) Remove the forward clutch from the automatic transaxle case.


C51664

31. REMOVE DIRECT CLUTCH ASSY

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

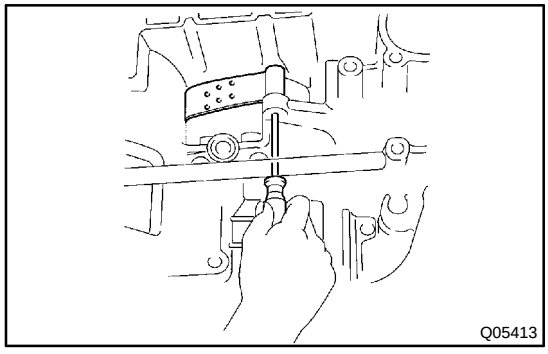
(b) Remove the thrust washer from the direct clutch.


Q05831

32. REMOVE INPUT SHAFT THRUST NEEDLE ROLLER BEARING

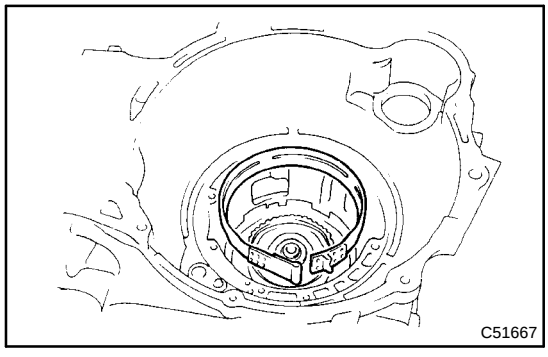
(a) Remove the thrust needle roller bearing from the input shaft assy.

(b) Remove the thrust needle roller bearing and thrust bearing race from the input shaft assy.

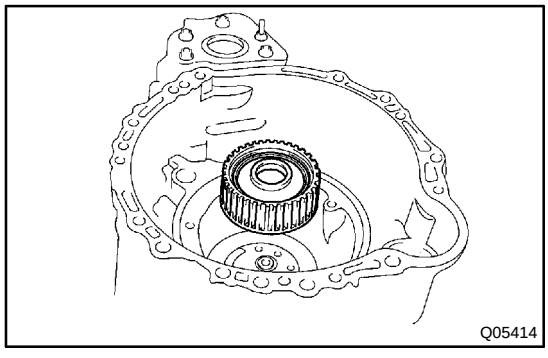

Q05413

33. REMOVE 2ND COAST BRAKE BAND ASSY

(a) Push the pin with a small screwdriver and remove it from the bolt hole of the oil pump mounting.

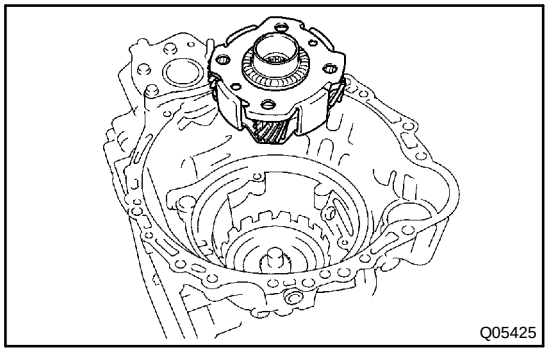

C51667

(b) Remove the brake band.


Q05414

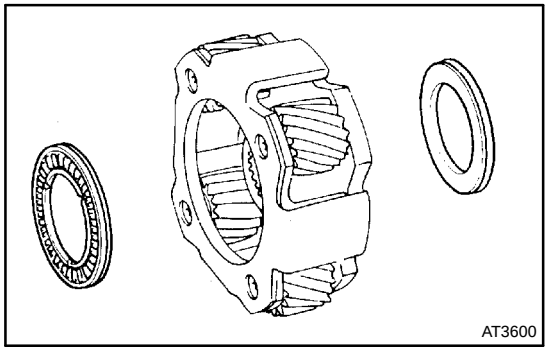
34. REMOVE FRONT PLANETARY RING GEAR

(a) Remove the front planetary ring gear from the transaxle case.

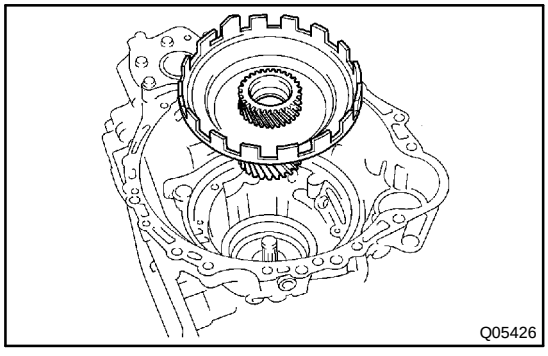


35. REMOVE FRONT PLANETARY GEAR ASSY

(a) Remove the front planetary gear from the transaxle case.

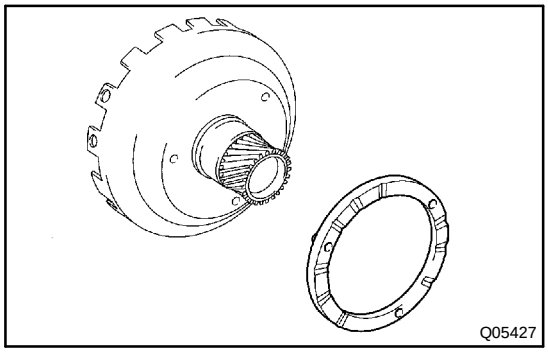


(b) Remove the planetary sun gear thrust needle roller bearing and front planetary gear thrust needle roller bearing from the planetary gear.

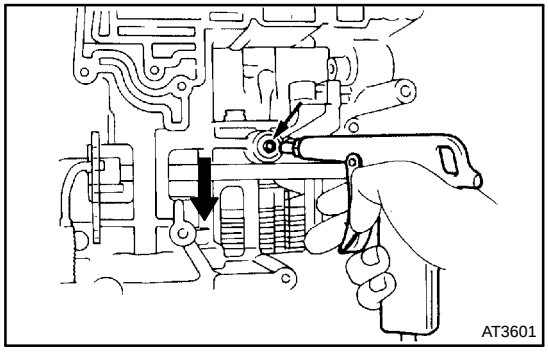


36. REMOVE PLANETARY SUN GEAR SUB-ASSY

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



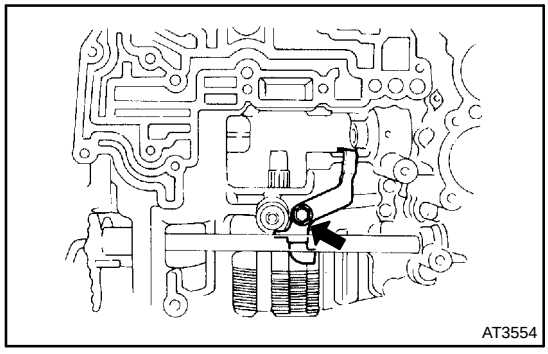
(b) Remove the thrust washer from the sun gear input drum.



37. INSPECT SECOND COAST BRAKE PISTON ASSY

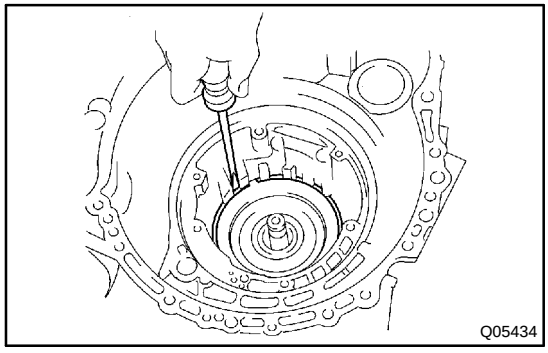
(a) Apply compressed air (392-785 kPa, 4-8 kgf/cm^{2}, 57-114 psi) into the case passage and confirm that the piston moves.

If the piston does not move, disassemble and inspect.



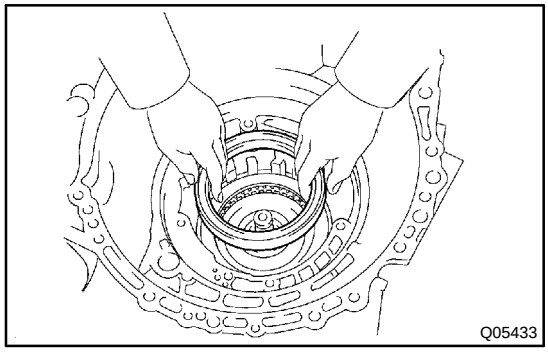
38. REMOVE 2ND COAST BRAKE BAND GUIDE PLATE

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

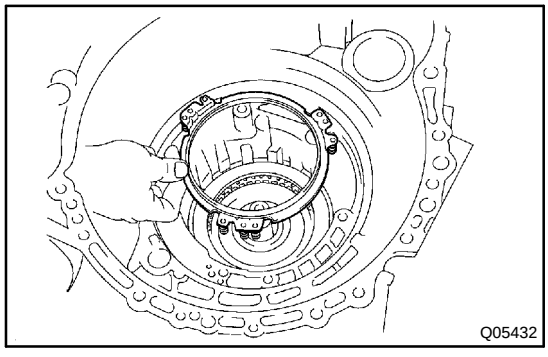


39. REMOVE 2ND BRAKE PISTON

(a) Using a screwdriver remove the snap ring from the transaxle case.

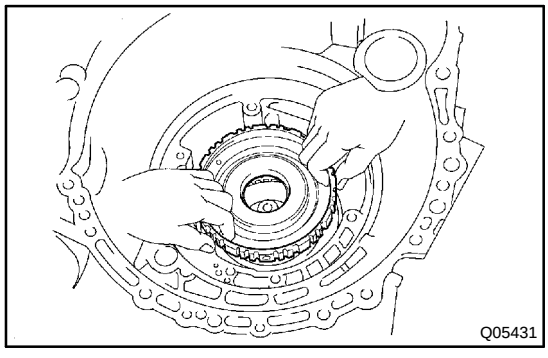


(b) Remove the 2nd brake piston.



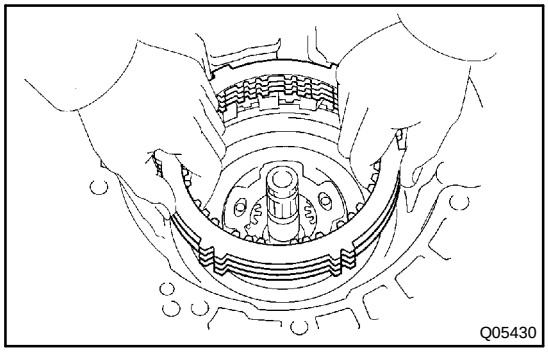
40. REMOVE 2ND BRAKE PISTON RETURN SPRING SUB-ASSY

(a) Remove the second brake piston return spring sub-assy from the transaxle case.



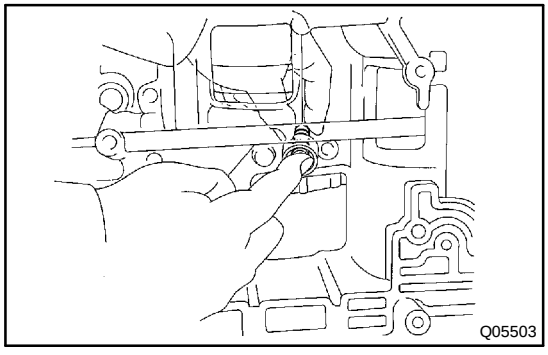
41. REMOVE ONE-WAY CLUTCH ASSY

(a) Remove the one-way clutch assy.



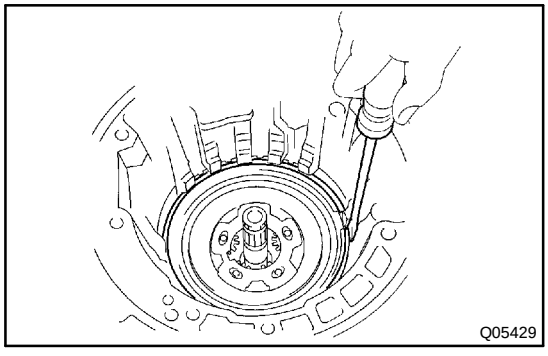
42. REMOVE 2ND BRAKE BRAKE FLANGE

(a) Remove the 2nd brake flange, 3 second brake clutch discs and 3 2nd brake clutch plates from the transaxle case.



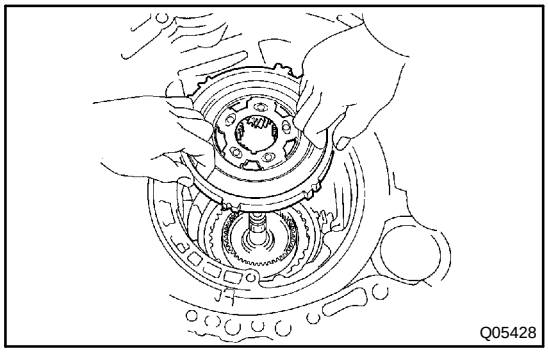
43. REMOVE BRAKE DRUM GASKET

(a) Remove the brake drum gasket from the transaxle case.

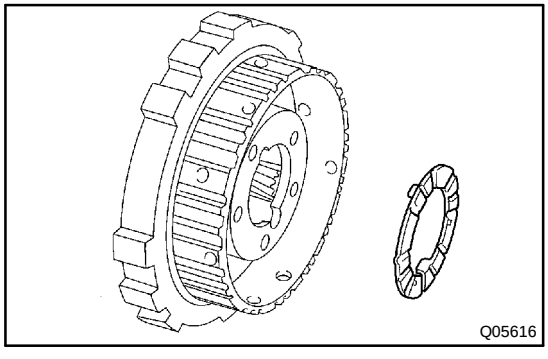


44. REMOVE ONE-WAY NO.2 CLUTCH ASSY

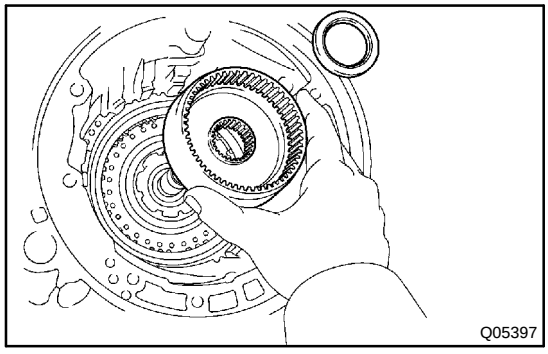
(a) Using a screwdriver, Remove the snap ring from the transaxle case.



(b) Remove the one-way No. 2 clutch and rear planetary gear assy from the transaxle case.



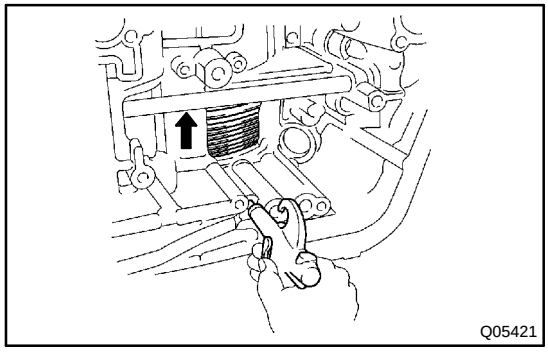
(c) Remove the thrust washer from the rear planetary gear assy.



45. REMOVE REAR PLANETARY RING GEAR

(a) Remove the rear planetary ring gear from the transaxle case.

(b) Remove the overdrive planetary gear radial ball bearing from the ring gear.

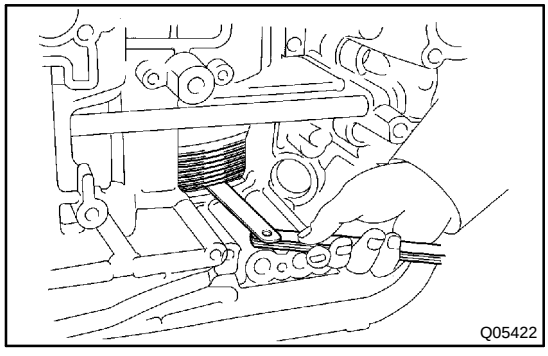


46. INSPECT 1ST & REVERSE BRAKE PISTON

(a) Check the operation of the 1st & reverse brake piston.

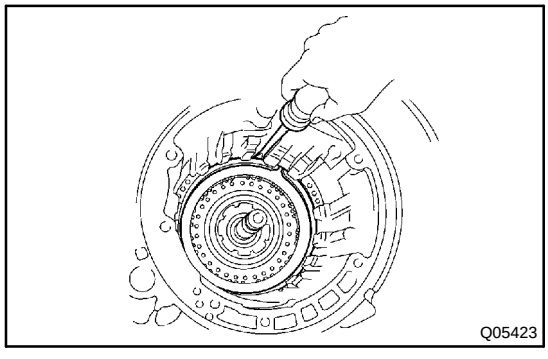
(1) Apply compressed air (392–785 kPa, 4–8 kgf/cm^2, 57–114 psi) into the case passage and confirm that the piston moves.

If the piston does not move, disassemble and inspect.



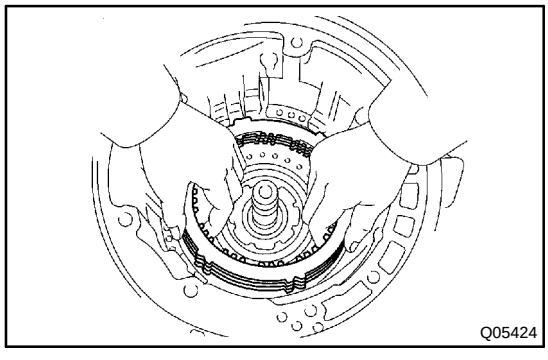
(b) Using a feeler gauge, check the pack clearance of the first and reverse brake.

Clearance: 0.84 – 1.96 mm (0.0331 – 0.0772 in.)

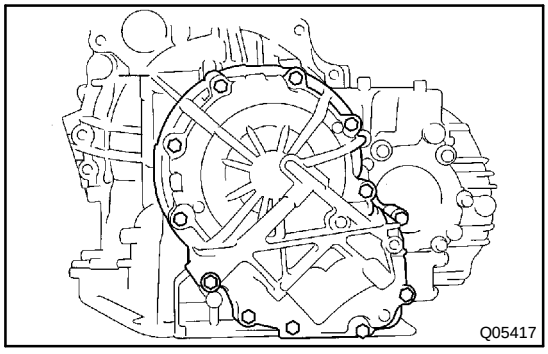


47. REMOVE 1ST & REVERSE BRAKE BRAKE FLANGE

(a) Using a screwdriver, remove the snap ring from the transaxle case.

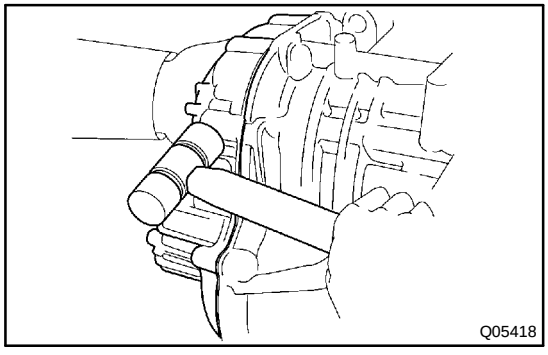


(b) Remove the 1st & reverse brake flange, 6 discs and plates from the transaxle case.

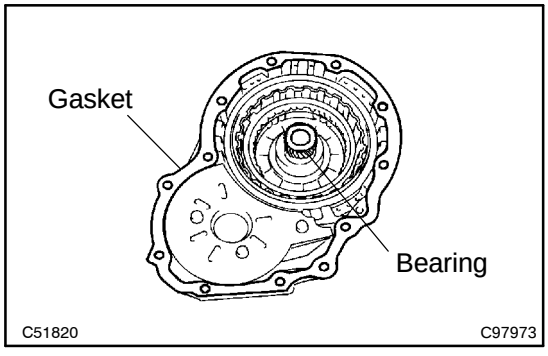


48. REMOVE OVERDRIVE BRAKE DRUM SUB-ASSY

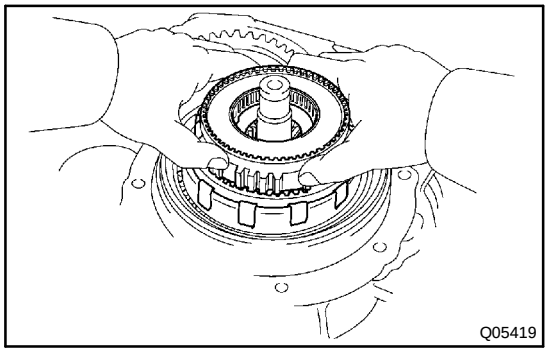
(a) Remove the 12 bolts.



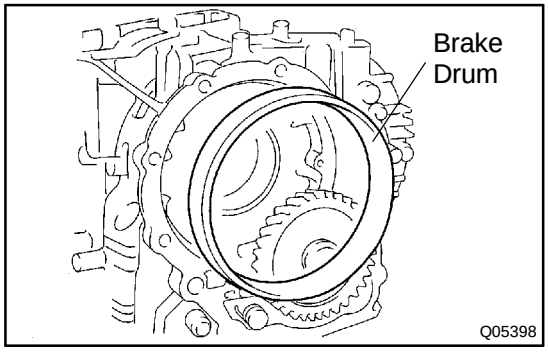
(b) Tap on the circumference of the overdrive case with a plastic hammer to remove the overdrive case and gasket.



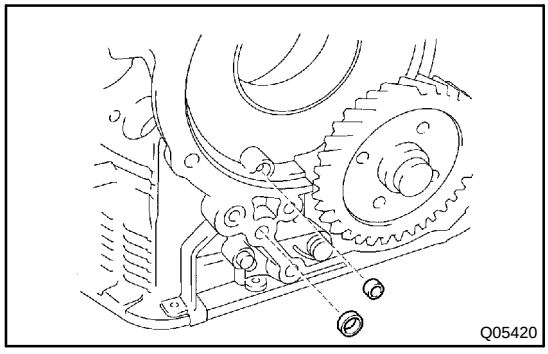
(c) Remove the overdrive planetary gear thrust needle roller bearing and overdrive case gasket.



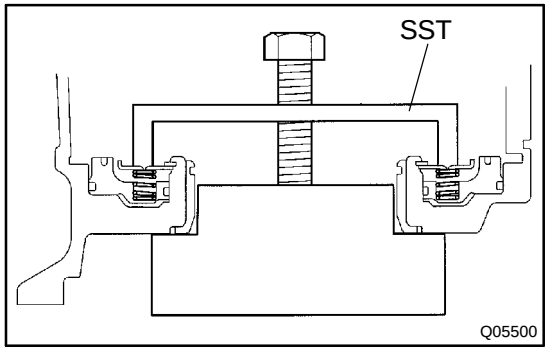
(d) Remove the overdrive planetary gear from the transaxle case.



(e) Remove the overdrive brake drum from the transaxle case.



(f) Remove the overdrive clutch apply gasket and overdrive brake apply gasket.



49. REMOVE 1ST & REVERSE BRAKE PISTON

(a) Remove the piston return spring.

(1) Place SST, compress the return spring evenly by tightening the bolt gradually.

SST 09350–32014 (09351–32040)

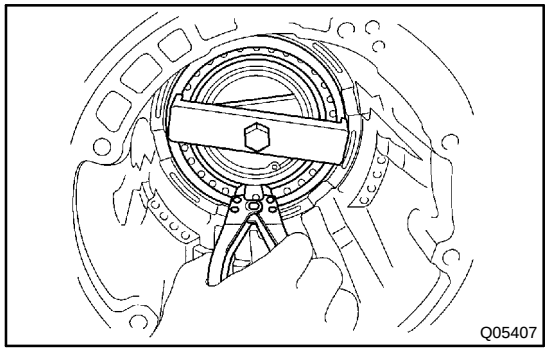
NOTICE:

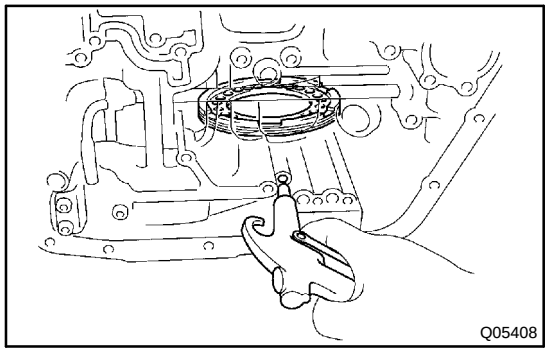
- **Stop pressing when the spring sheet is lowered 1–2 mm (0.039–0.078 in.) from the snap ring groove, preventing the spring sheet from deforming.**
- **Do not expand the snap ring excessively.**

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

(3) Remove the SST.

(4) Remove the return spring from the case.



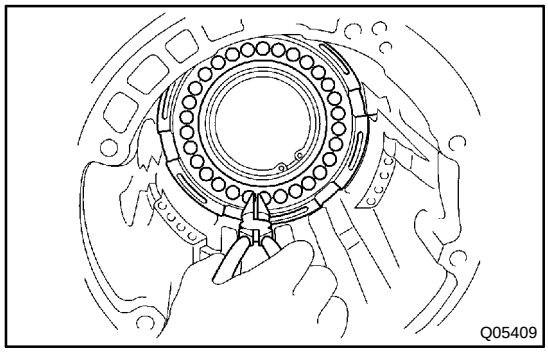


(b) Apply compressed air (392–785 kPa, 4–8 kgf/cm^2, 57–114 psi) into the passage of the case to remove the piston.

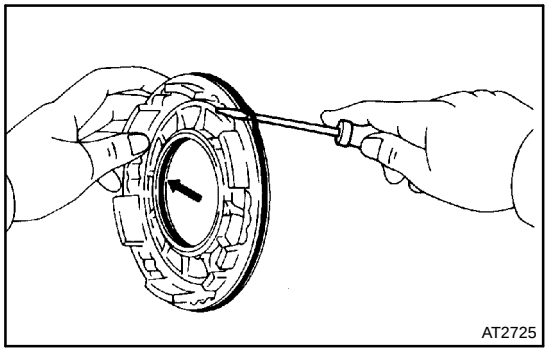
HINT:

Hold the piston so it is not slanted and blow with the gun slightly away from the oil hole.

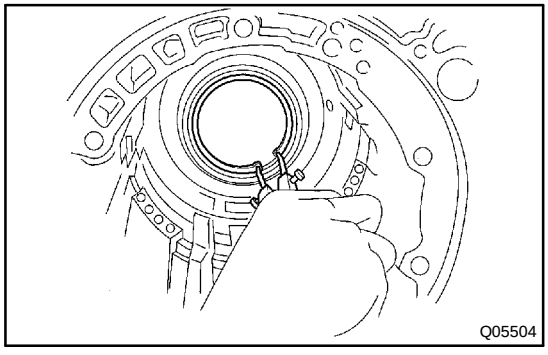
Hold the piston and blow with the gun slightly away from the oil hole, preventing the piston to be slanted.



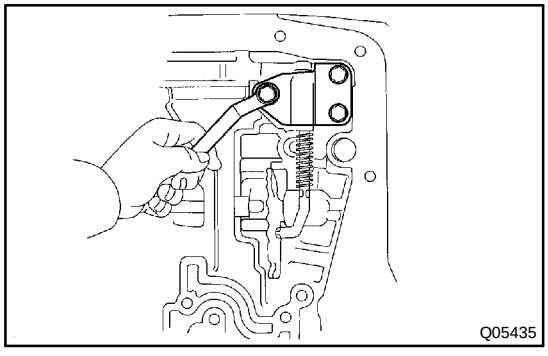
(c) If the piston does not pop out with compressed air, use needle–nose pliers to remove it.



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

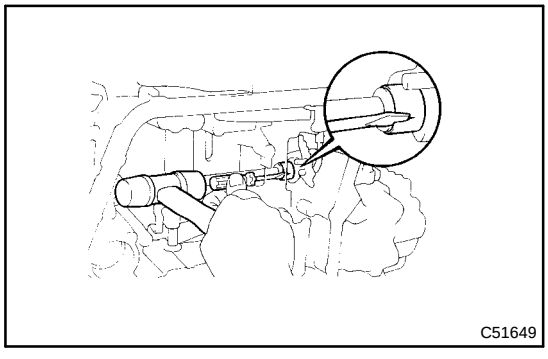


(e) Remove the snap ring.



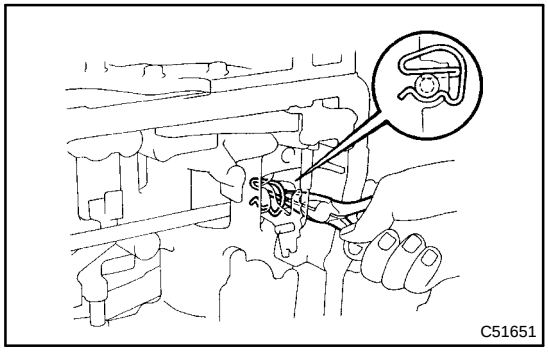
50. REMOVE PARKING LOCK PAWL BRACKET

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

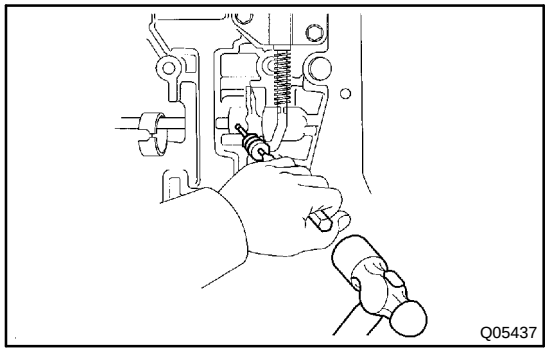


51. REMOVE MANUAL VALVE LEVER SHAFT

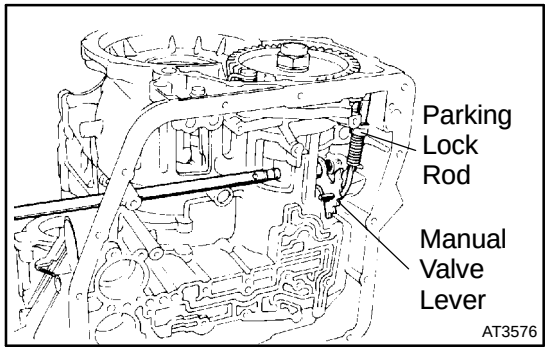
(a) Using a chisel and hammer, cut the manual valve lever spacer.



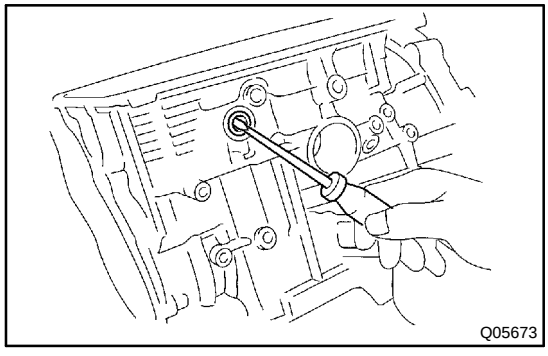
(b) Remove the parking lock pawl torsion spring.



(c) Using a pin punch and hammer, drive out the manual valve lever slotted spring pin.

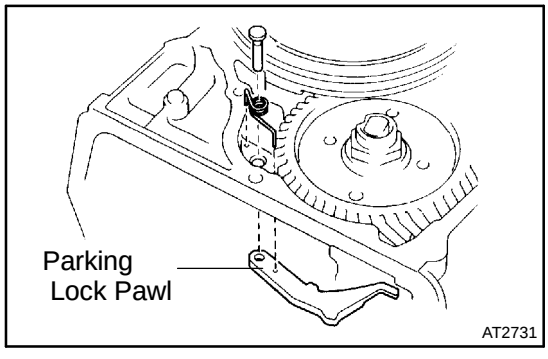


(d) Slide out the shaft from the transaxle case and remove the manual valve lever and parking lock rod.



52. REMOVE MANUAL VALVE LEVER SHAFT OIL SEAL

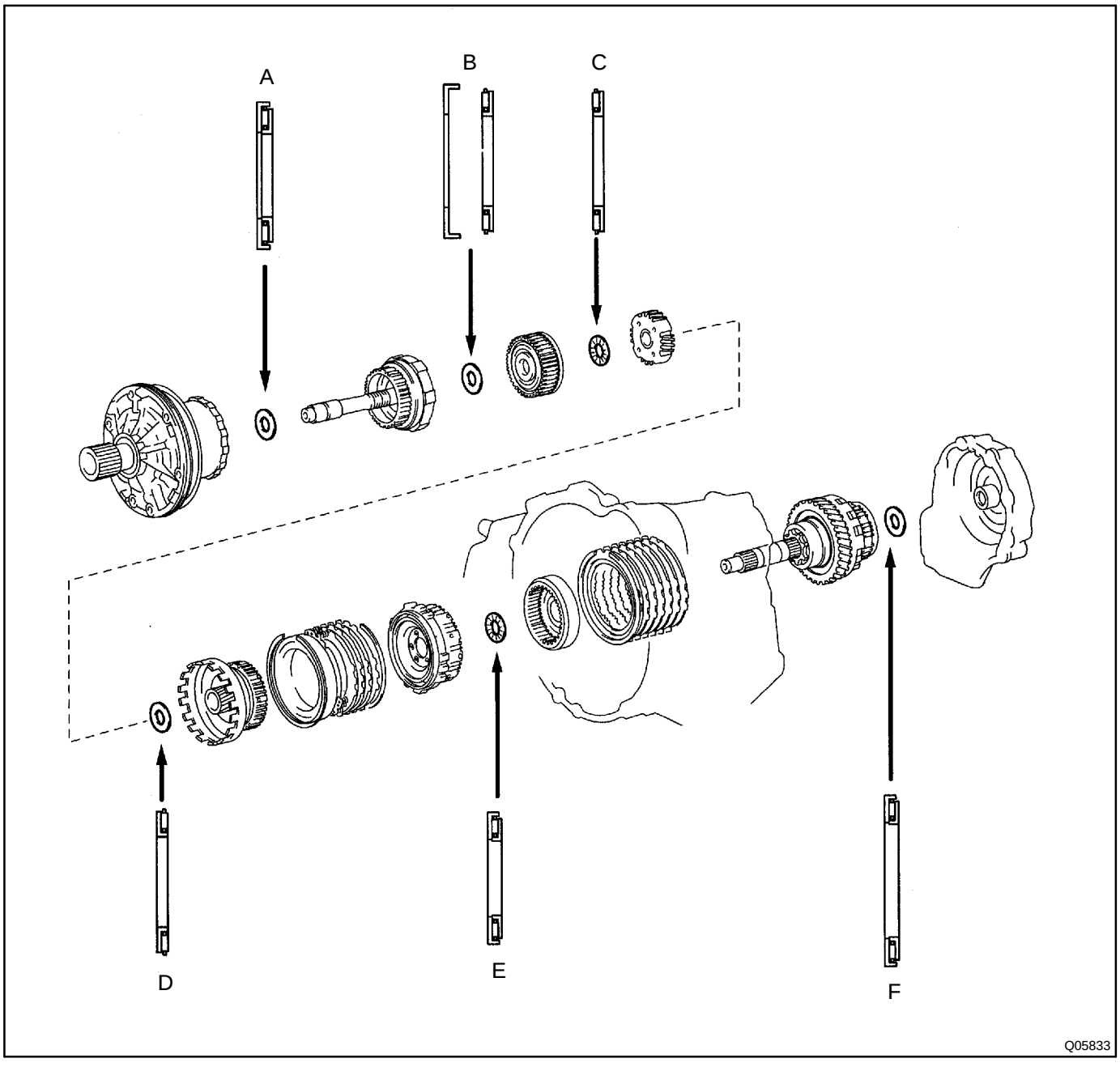
(a) Using a screwdriver, remove the oil seal.



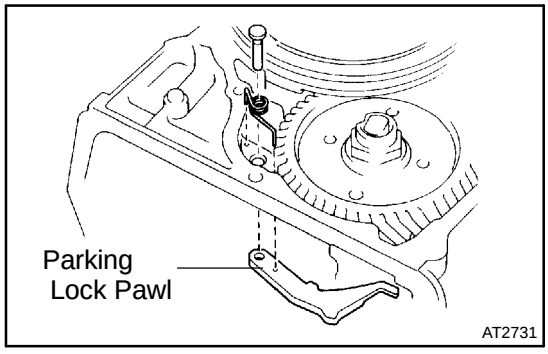
53. REMOVE PARKING LOCK PAWL

(a) Remove the spring and parking lock pawl.

54. BEARING POSITION



Mark	Thrust Bearing Outside Diameter mm (in.)	Thrust Bearing Inside Diameter mm (in.)
A	See page 40-34	27.7 (1.091)
B	47.6 (1.874)	31.4 (1.236)
C	45.5 (1.791)	30.1 (1.185)
D	45.5 (1.791)	30.1 (1.185)
E	38.7 (1.524)	22.6 (0.890)
F	46.3 (1.823)	28.6 (1.126)

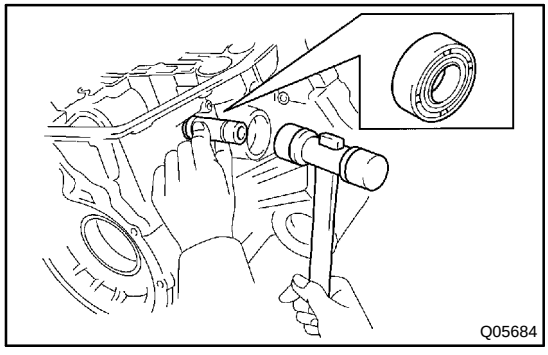


55. INSTALL PARKING LOCK PAWL

(a) Place the parking lock pawl onto the case.

(b) Hook the spring ends to the case and pawl.

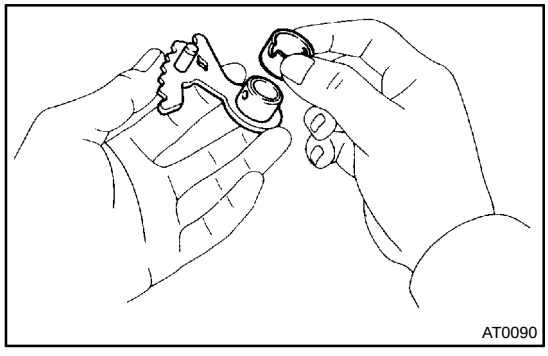
(c) Install the pin on the hole of the case through the spring and pawl.



56. INSTALL MANUAL VALVE LEVER SHAFT OIL SEAL

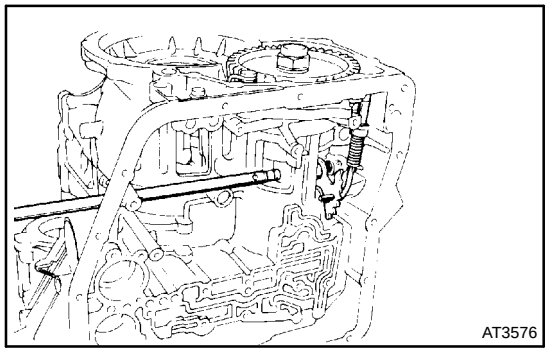
(a) Coat the oil seal lip with MP grease.

(b) Install the manual valve shaft oil seal on the case.



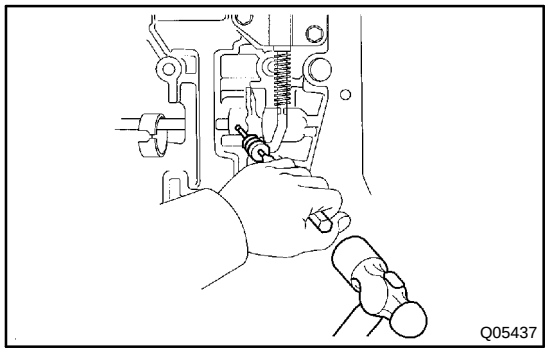
57. IINSTALL MANUAL VALVE LEVER SHAFT

(a) Assemble a new collar to the manual valve lever.

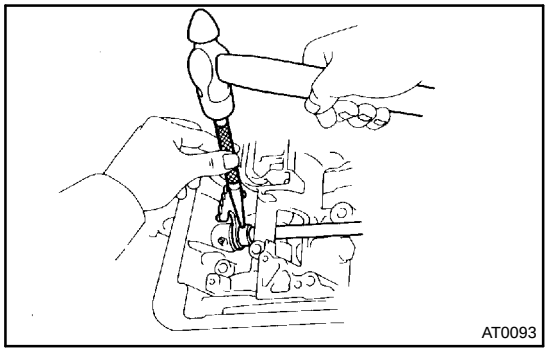


(b) Install the manual valve shaft on the transmission case through the manual lever.

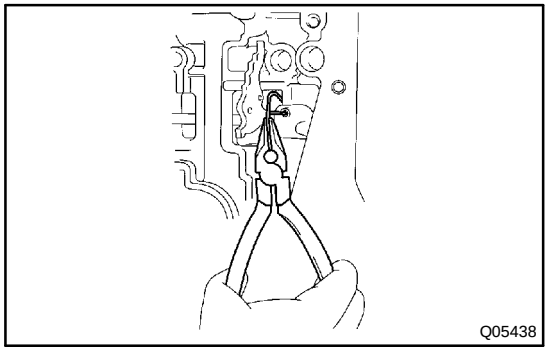
(c) Install the parking lock rod.



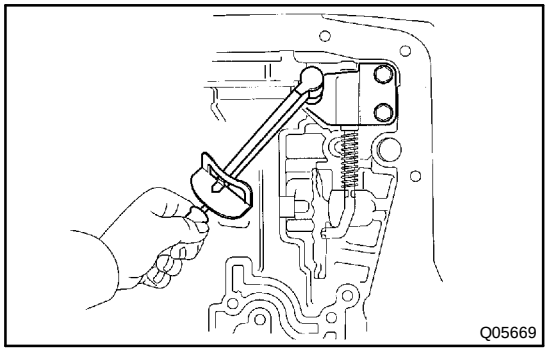
(d) Using a pin punch and hammer, drive in the roll pin until its surface is flush with the manual valve lever surface.



(e) Match the collar hole to the lever caulking hollow and caulk the collar to the lever.

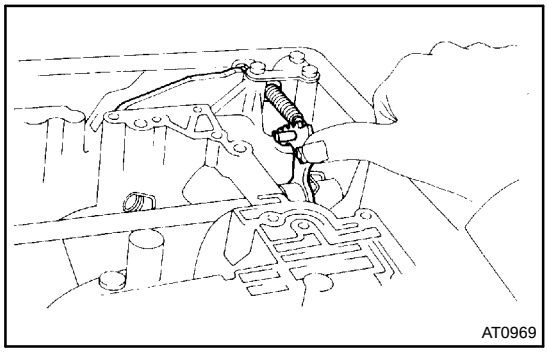


(f) Install the retaining spring.



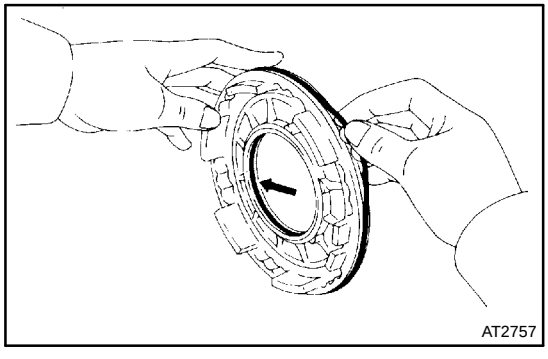
58. INSTALL PARKING LOCK PAWL BRACKET

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



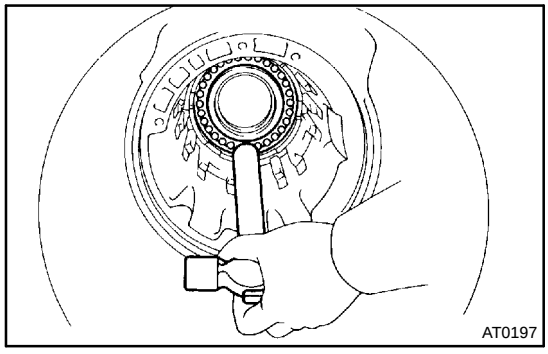
59. INSPECT PARKING LOCK PAWL

(a) Make sure the counter driven gear is locked when the manual valve lever is in the P position.

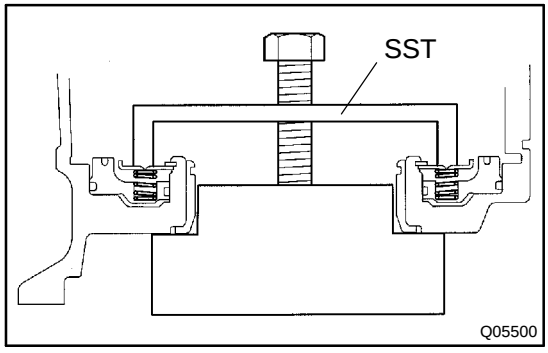


60. IINSTALL 1ST & REVERSE BRAKE O-RING

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



(c) Push the piston into the bore of the case, facing the spring seat upward.



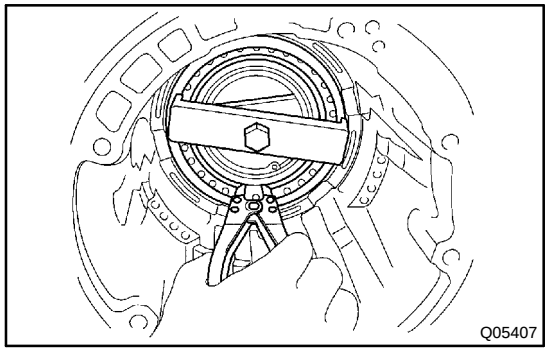
61. INSTALL 1ST & REVERSE BRAKE PISTON

(a) Place the return spring and snap ring on the piston.

(b) Place SST, and compress the return spring evenly by tightening the bolt gradually.
SST 09350-32014 (09351-32040)

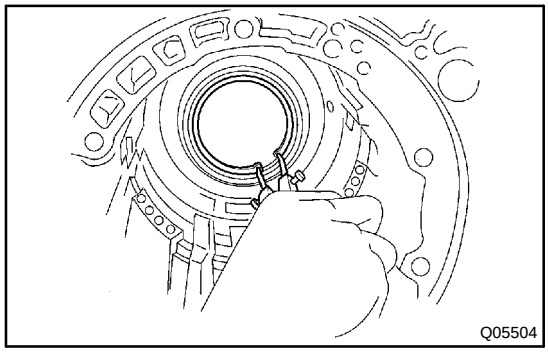
NOTICE:

- **Stop pressing when the spring sheet is lowered 1-2 mm (0.039-0.078 in.) from the snap ring groove, preventing the spring sheet from deforming.**
- **Do not expand the snap ring excessively.**

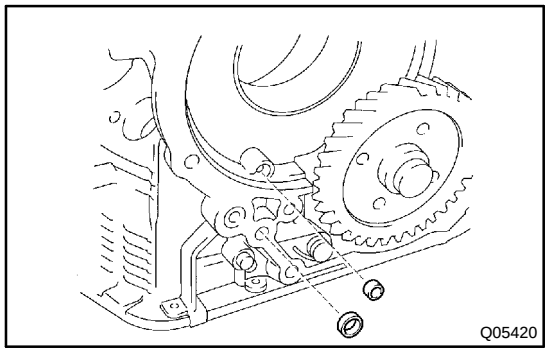


(c) Install snap ring. Visually check to make sure it is fully seated and centered by the 3 lugs on the spring retainer. Be sure the end gap of the snap ring is not aligned with the spring retainer claw.

(d) Remove the SST.

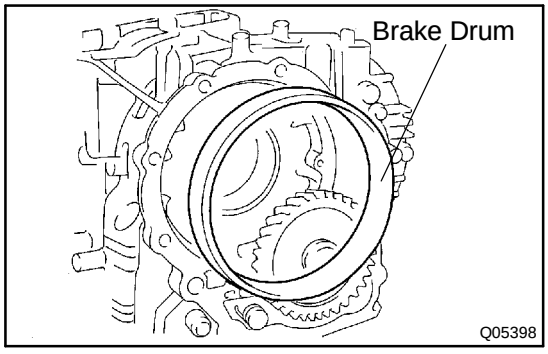


(e) Install snap ring.

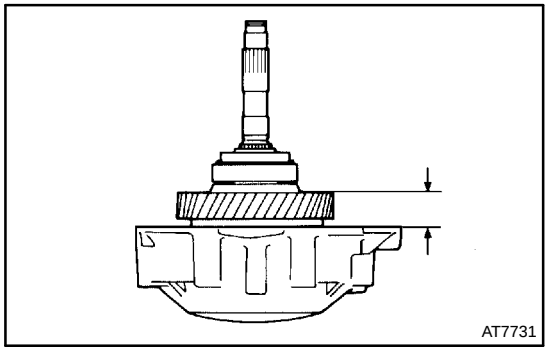


62. INSTALL OVERDRIVE BRAKE DRUM SUB-ASSY

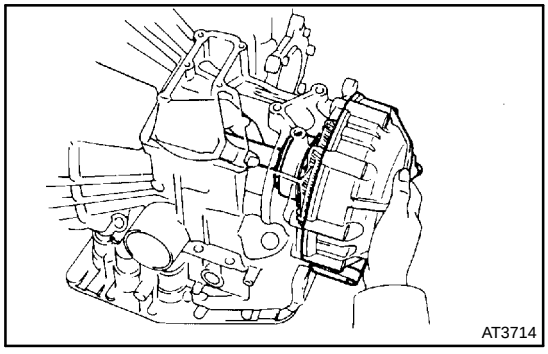
(a) Install the overdrive brake apply gasket and overdrive clutch apply gasket.



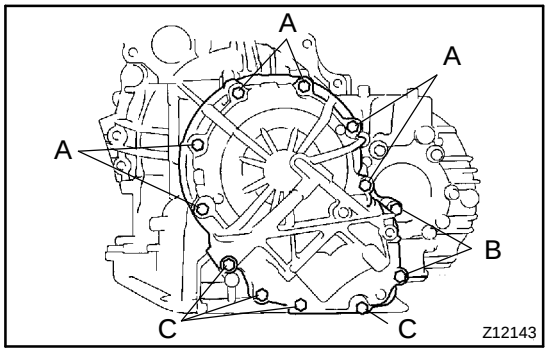
(b) Install the overdrive brake drum on the case.
(c) Install the new case gasket on the case.



(d) Make sure that the distance from the top surface of the case to the counter driven gear surface is about 24 mm (0.94 in.).

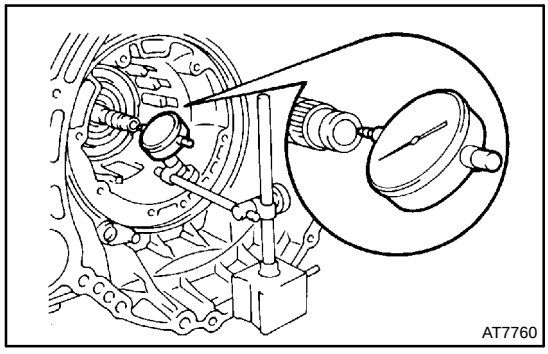


(e) Place the new gasket onto the transaxle case.
(f) Install the overdrive assembly with overdrive case on the transaxle case.



(g) Coat the threads of 23 mm (0.91 in.) bolts with sealer.
Sealer:
Part No.08833 – 00070, THREE BOND 1324 or equivalent
(h) Install and tighten the 13 bolts.

HINT:
Each bolt length is indicated below.
Bolt length:
Bolt A: 61 mm (2.402 in.)
Bolt B: 38 mm (1.496 in.)
Bolt C: 23 mm (0.906 in.)
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)



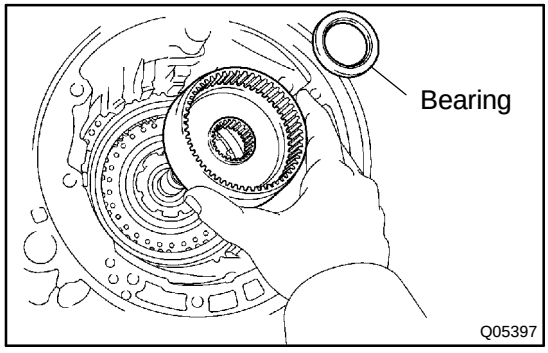
63. INSPECT INTERMEDIATE SHAFT ASSY

(a) Make sure that the intermediate shaft has end play in an axial direction.

End play: 0.47 – 1.50 mm (0.0185–0.0591 in.)

If the end play is not within specification, check the installation of the intermediate shaft.

(b) Make sure that the intermediate shaft turns smoothly.



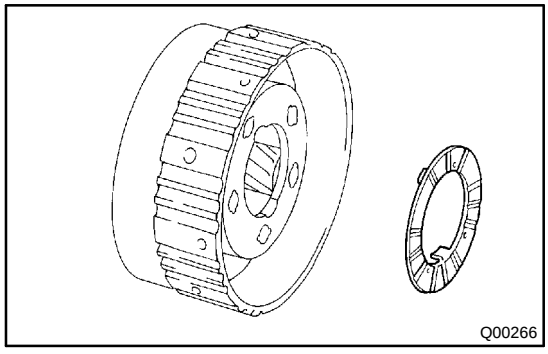
64. INSTALL REAR PLANETARY RING GEAR

(a) Install the rear planetary ring gear.

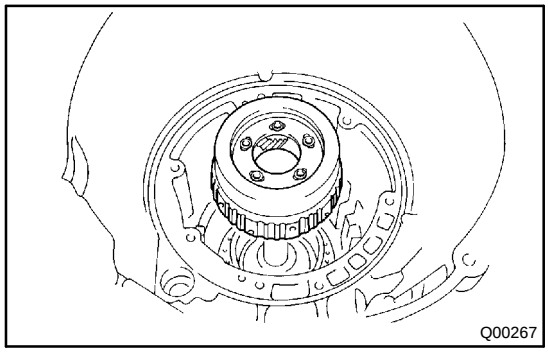
(b) Place the bearing onto the ring gear.

Bearing outer diameter: 38.7 mm (1.524 in.)

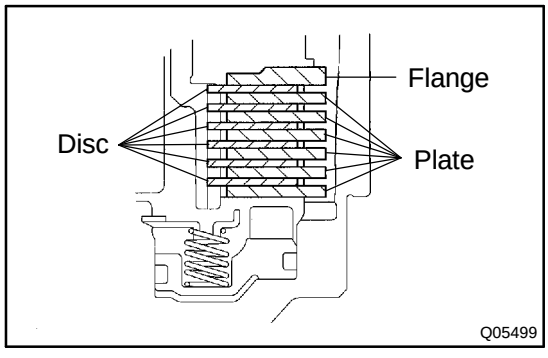
Bearing inner diameter: 22.6 mm (0.890 in.)



(c) Coat the thrust washer with petroleum jelly and place it onto the rear planetary gear.



(d) Install the rear planetary gear.



65. INSTALL 1ST & REVERSE BRAKE BRAKE FLANGE

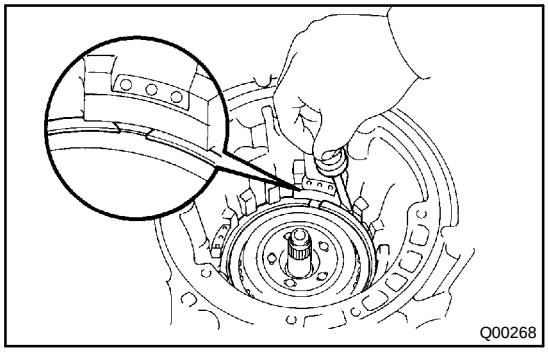
(a) Install the 6 plates and discs.

Install in order:

P = Plate D = Disc

P – D – P – D – P – D – P – D – P – D – P – D

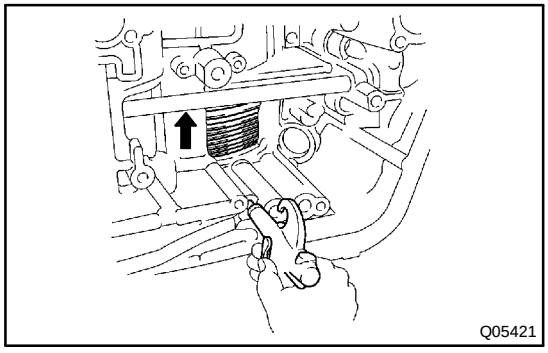
(b) Install the flange, facing the flat end downward.



(c) Install the snap ring.

HINT:

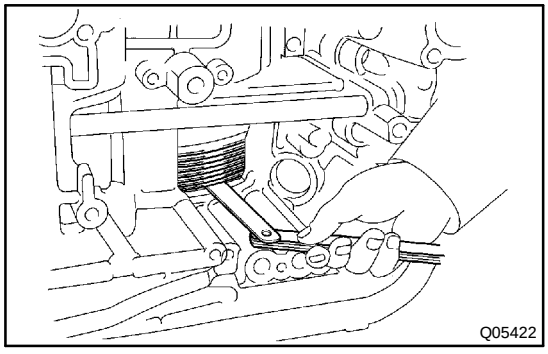
Be sure that the end gap of the snap ring is not aligned with one of the cutouts.



66. INSPECT 1ST & REVERSE BRAKE PISTON

(a) Check the operation of the first and reverse brake piston. Apply compressed air into the case passage and confirm that the piston moves.

If the piston does not move, disassemble and inspect it.

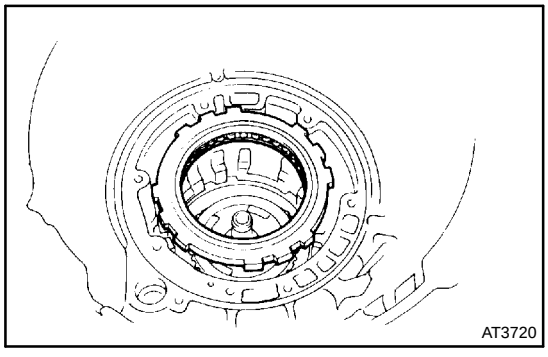


67. INSPECT PACK CLEARANCE OF REVERSE CLUTCH

(a) Using a feeler gauge, check the pack clearance of the first and reverse brake.

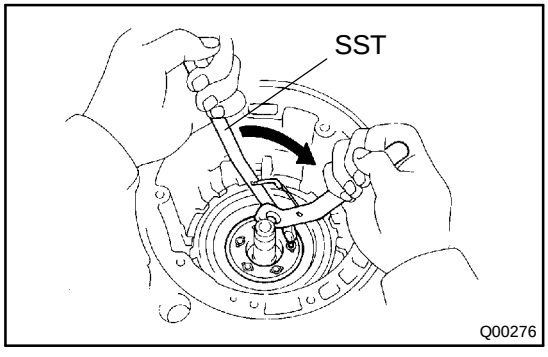
Clearance:

1.92 - 2.68 mm (0.0756-0.1055 in.)



68. INSTALL ONE-WAY NO.2 CLUTCH ASSY

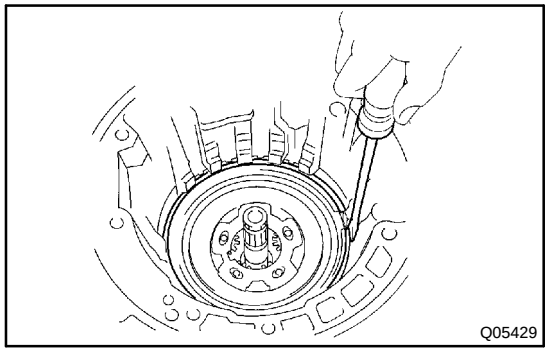
(a) Place the No.2 one-way clutch with the shiny side of the flange facing upward.



(b) Install the one-way clutch while turning the planetary gear clockwise with SST.

SST 09350-32014 (09351-32050)

If the planetary gear cannot turn clockwise, check the installation of the one-way clutch.

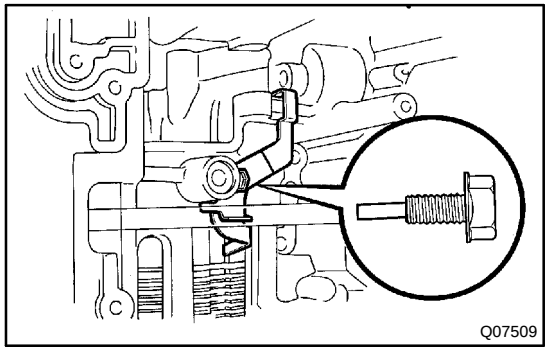


(c) Using a screwdriver, install the snap ring.

HINT:

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

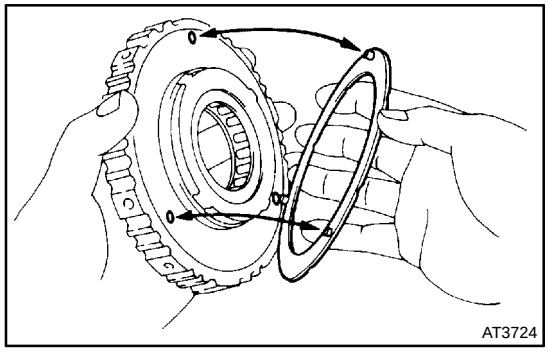
(d) Coat the thrust washer with petroleum jelly and install it onto the rear planetary gear.



69. IINSTALL 2ND COAST BRAKE BAND GUIDE PLATE

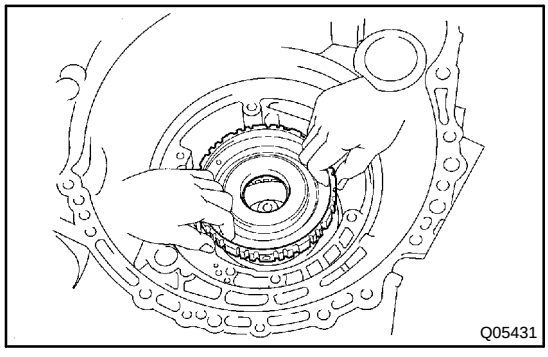
(a) Install the brake band guide plate retainer and second coast brake band guide plate with the bolt.

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

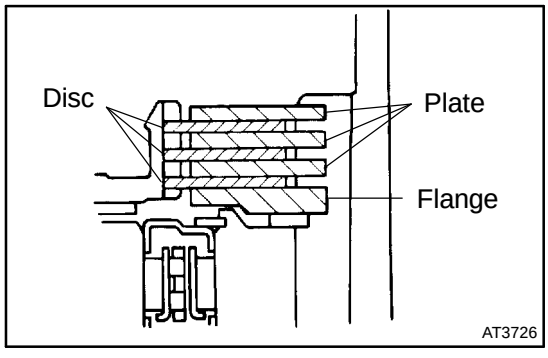


70. INSTALL ONE-WAY CLUTCH ASSY

(a) Coat the thrust washer with petroleum jelly and install it on the No.1 one-way clutch.



(b) Place the No.1 one-way clutch onto the rear planetary gear.



71. INSTALL 2ND BRAKE PISTON RETURN SPRING SUB-ASSY

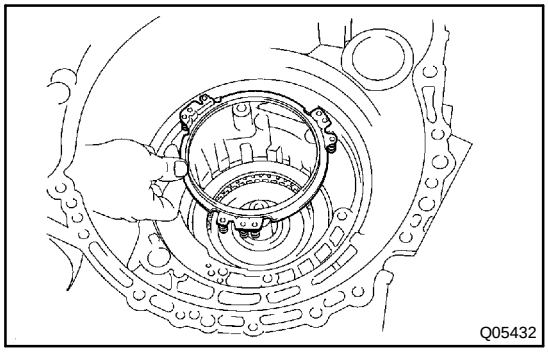
(a) Install the flange, facing the flat end upward.

(b) Install the 3 discs and plates.

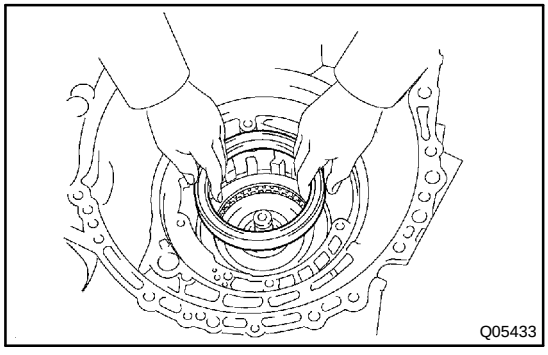
Install in order:

P = Plate D = Disc

D - P - D - P - D - P



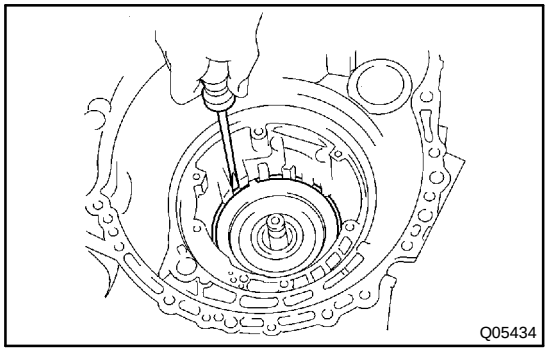
(c) Place the piston return spring into the case.



(d) Place the second brake drum into the case.

HINT:

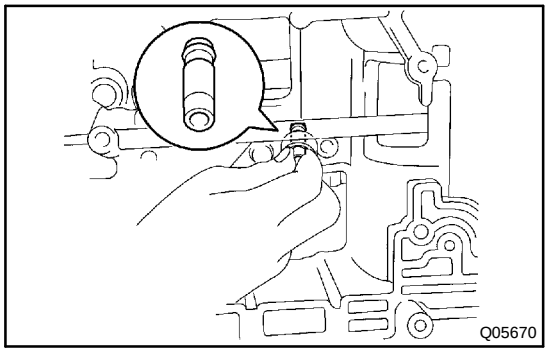
Align the groove of the drum with the bolt.



(e) Place the snap ring into the case so that the end gap is installed into the groove.

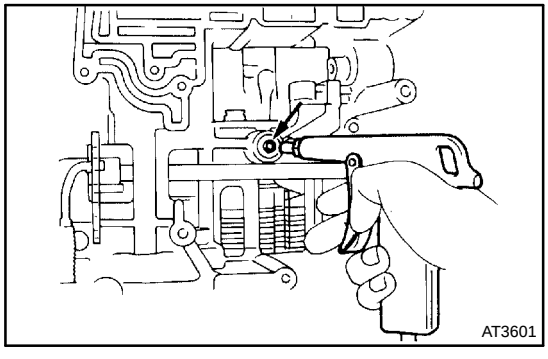
(f) While compressing the piston return spring over the drum with a screwdriver, install the snap ring into the groove.

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



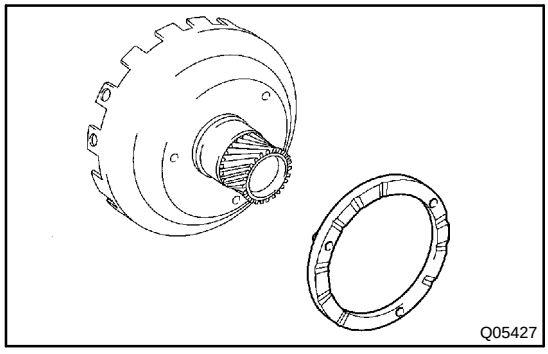
72. INSTALL BRAKE DRUM GASKET

(a) Push into a new gasket until it makes contact with the second brake drum.



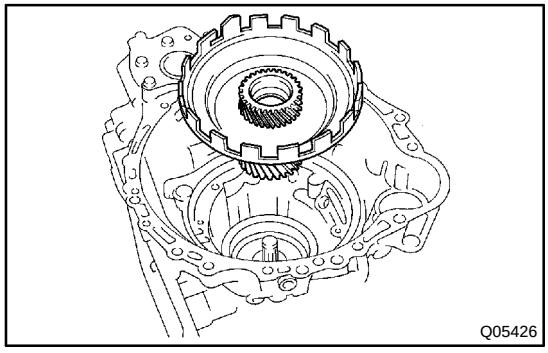
73. INSPECT SECOND COAST BRAKE PISTON ASSY

(a) Apply compressed air into the second brake gasket and confirm that the piston moves.

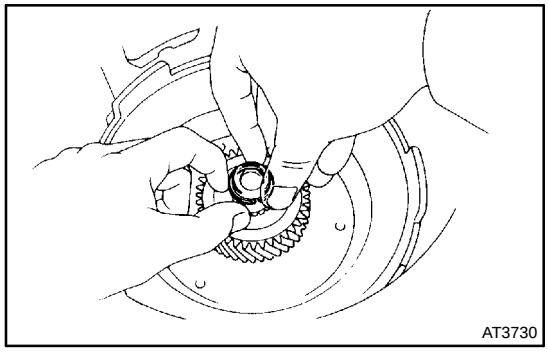


74. IINSTALL PLANETARY SUN GEAR SUB-ASSY

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



(b) While turning the sun gear clockwise, install it into the No.1 one-way clutch.

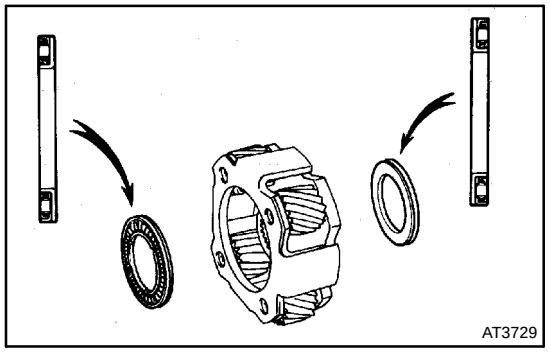


75. INSTALL OVERDRIVE INTERMEDIATE SHAFT OIL SEAL RING

(a) Install the intermediate shaft oil seal ring on the intermediate shaft.

HINT:

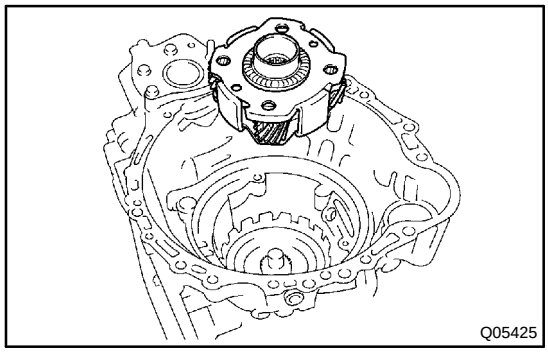
After installing the oil seal ring, check that it moves smoothly.



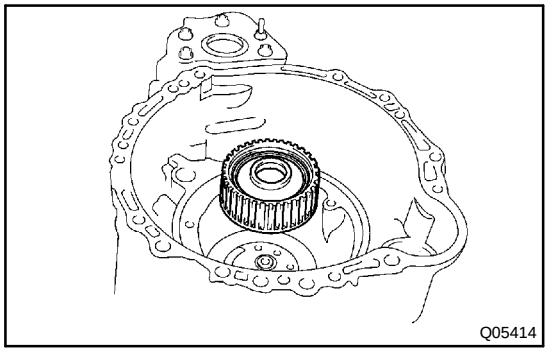
76. INSTALL FRONT PLANETARY GEAR ASSY

(a) Coat the bearings with petroleum jelly, and install them onto both sides of the planetary gear.

Bearing outer diameter: 45.5 mm (1.791 in.)
Bearing inner diameter: 30.1 mm (1.185 in.)

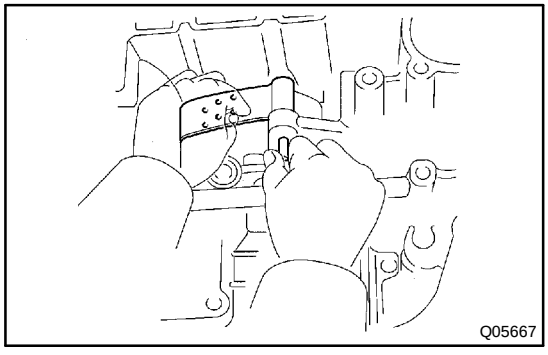


(b) Install the planetary gear onto the sun gear.


Q05414

77. INSTALL FRONT PLANETARY RING GEAR

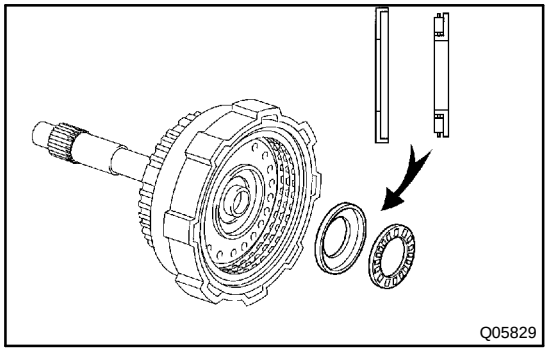
(a) Install the front planetary ring gear on the transaxle case.


Q05667

78. INSTALL 2ND COAST BRAKE BAND ASSY

(a) Place the band into the case.

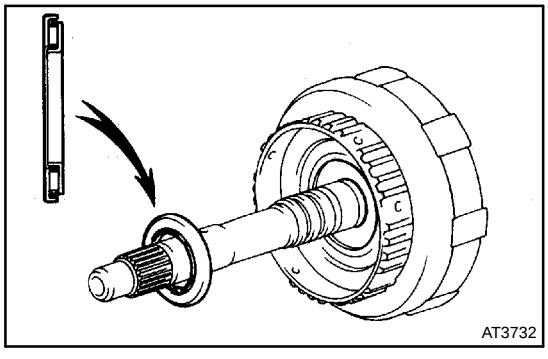
(b) Install the pin through the oil pump mounting bolt hole.


Q05829

79. INSTALL OVERDRIVE DIRECT CLUTCH THRUST NEEDLE ROLLER BEARING

(a) Coat the bearing with petroleum jelly and install it onto the rear side of the forward clutch.

Bearing outer diameter: 47.6 mm (1.874 in.)
Bearing inner diameter: 31.4 mm (1.236 in.)


AT3732

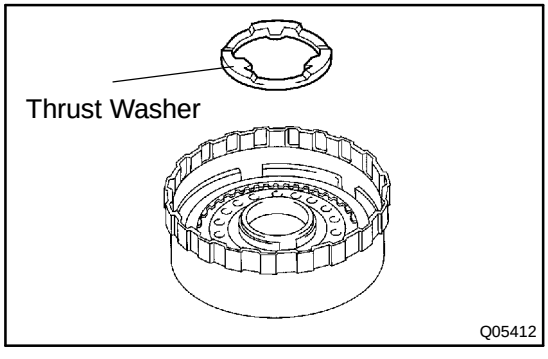
(b) Coat the bearing with petroleum jelly and install it onto the front side of the forward clutch.

HINT:

There are 2 different thickness bearings for adjustment of the input shaft thrust play.

Bearing thickness

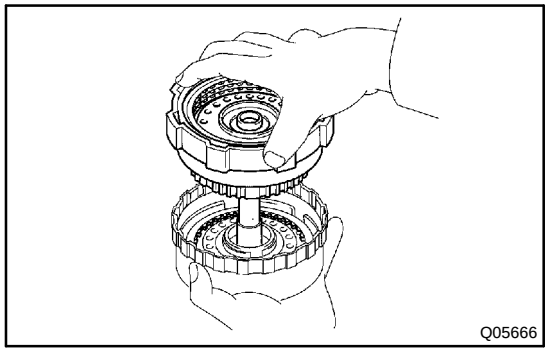
Thickness	Outer diameter	Inner diameter
3.60 (0.1417)	45.9 (1.807)	27.7 (1.091)
4.19 (0.1650)	47.1 (1.854)	27.7 (1.091)



Q05412

80. INSTALL DIRECT CLUTCH ASSY

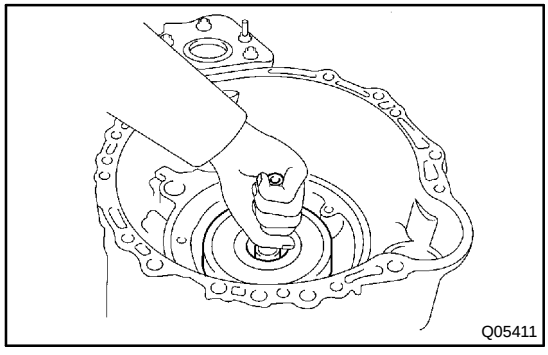
(a) Coat the thrust washer with petroleum jelly and install it with the oil groove facing upward onto the direct clutch drum.


Q05666

(b) Mesh the hub of the forward clutch flukes with the direct clutch discs.

HINT:

Be careful that the bearing and thrust washer do not come out.

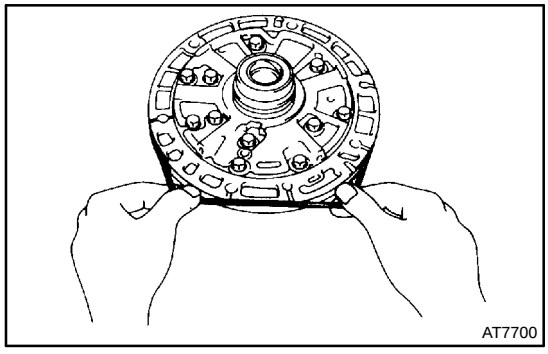

Q05411

81. INSTALL FORWARD CLUTCH ASSY

(a) Install the direct clutch and forward clutch into the case.

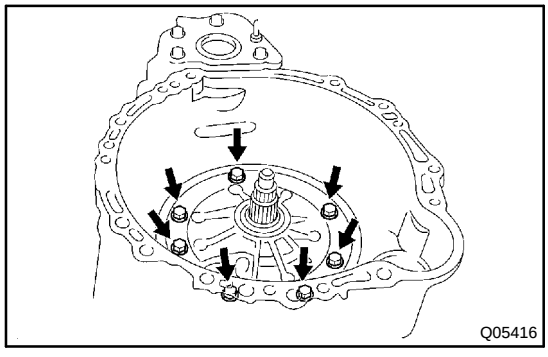
HINT:

Hold the direct clutch toward the forward clutch to prevent the thrust washer from coming out.


AT7700

82. INSTALL OIL PUMP ASSY

(a) Coat a new O-ring with ATF and install it on the oil pump.

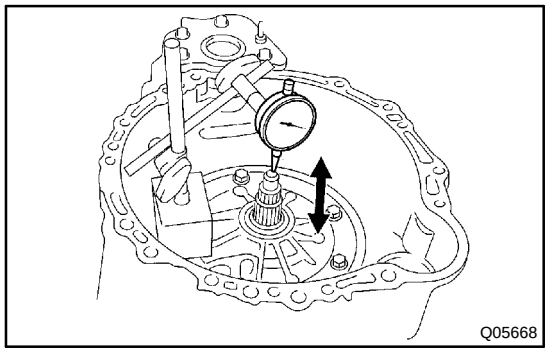

Q05416

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

Torque: 22 N·m (225 kgf·cm, 16 ft.lbf)

NOTICE:

- **Do not push on the oil pump strongly or the oil seal ring will stick to the direct clutch drum.**
- **Do not press on the oil pump hard to prevent the oil seal ring to stick on the direct clutch drum.**


Q05668

83. INSPECT INPUT SHAFT ENDPLAY

(a) Measure the end play with a dial gauge.

End play: 0.25 – 0.90 mm (0.0098 – 0.0354 in.)

HINT:

There are 2 different thickness bearings for the end of the stator shaft. If the end play is in excess of standard, select one of them.

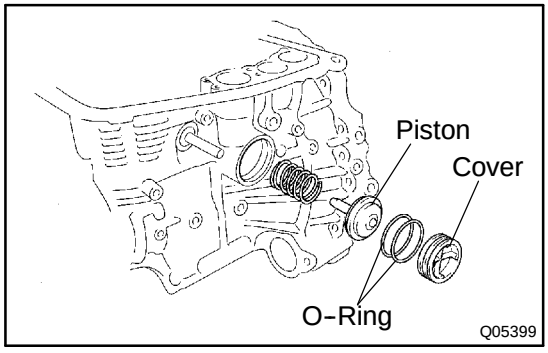
Bearing thickness:

3.60 mm (0.1417 in.)

4.14 mm (0.1650 in.)

84. INSPECT INPUT SHAFT ASSY

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

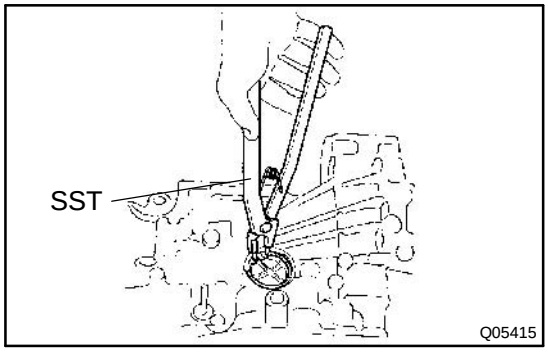


85. INSTALL 2ND COAST BRAKE PISTON

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

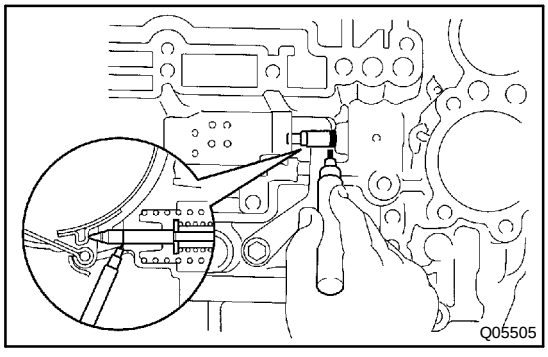
(b) Install the outer spring with the piston.

(c) Place the cover into the bore.



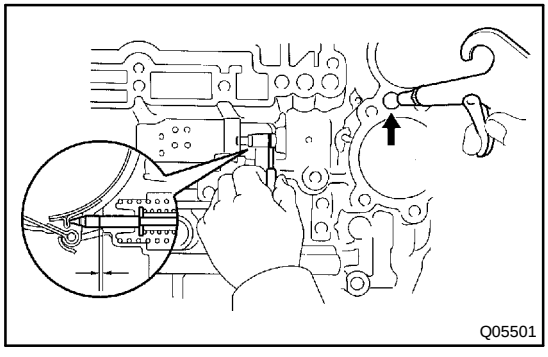
(d) Using SST, install the snap ring as pressing the cover.
SST 09350-32014 (09351-32050)

(e) Check that the front end of the piston rod contacts the center of the second brake band depression.



86. INSPECT SECOND COAST BRAKE PISTON ASSY

(a) Apply a small amount of paint on the piston rod where it meets the case.

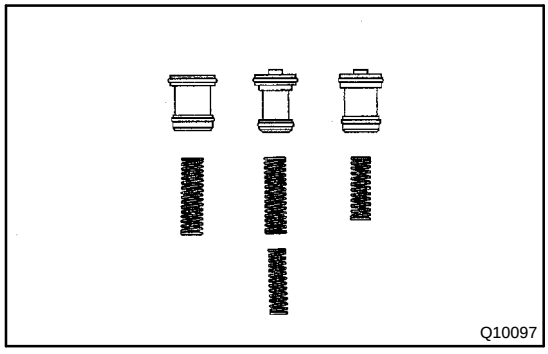


(b) Using SST, measure the piston stroke as applying and releasing compressed air (392-785 kPa, 4-8 kgf/cm^2, 57-114 psi).
SST 09240-00020
Piston stroke: 2.0 - 3.5 mm (0.079 - 0.138 in.)

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

Piston rod length:
95.2 mm (3.748 in.)
96.3 mm (3.791 in.)

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


Q10097

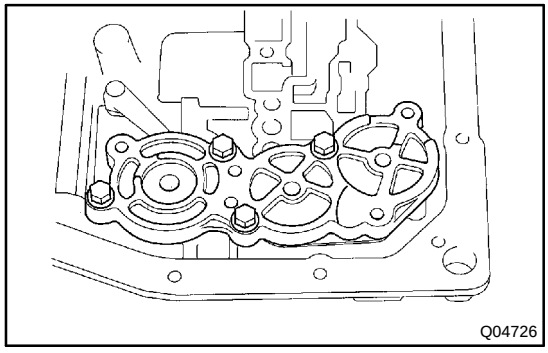
87. INSTALL C-2 ACCUMULATOR PISTON

(a) Install the new O-ring to the pistons.

(b) Install the springs and pistons into the bores.

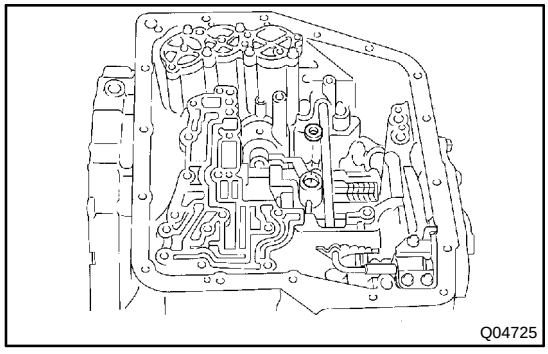
Spring dimensions:

Spring	Color	Free length mm (in.)
C_2	Yellow/Purple	51.8 (2.039)
B_2	None	88.2 (3.473)
B_2	None	70.3 (2.767)
C_1	None	73.6 (2.898)


Q04726

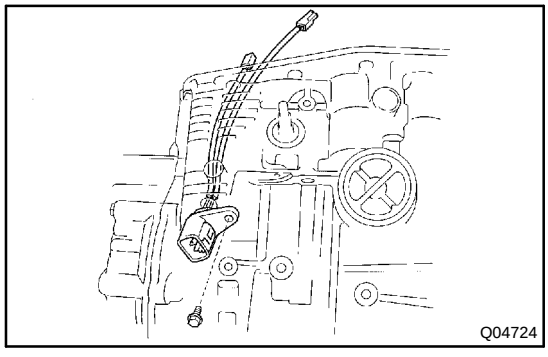
88. INSTALL ACCUMULATOR COVER

(a) Place the cover with a new gasket and gradually tighten the bolts little by little at a time in sequence.
Torque: 10 N·m (100 kgf·cm, 7 ft.lbf)


Q04725

89. INSTALL GOVERNOR APPLY GASKET NO.1

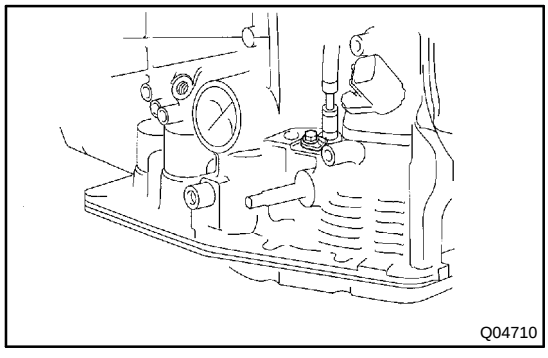
(a) Install the new apply gasket to the transaxle case.


Q04724

90. INSTALL TRANSMISSION WIRE

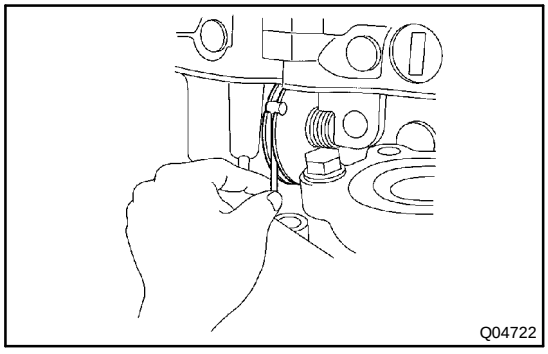
(a) Coat a new O-ring with ATF, install it to the transmission wire.

(b) Install the transmission wire retaining bolt.
Torque: 5.4 N·m (55 kgf·cm, 48 in.lbf)


Q04710

91. INSTALL THROTTLE CABLE ASSY

(a) Install the throttle cable retaining bolt.
Torque: 5.4 N·m (55 kgf·cm, 48 in.lbf)


Q04722

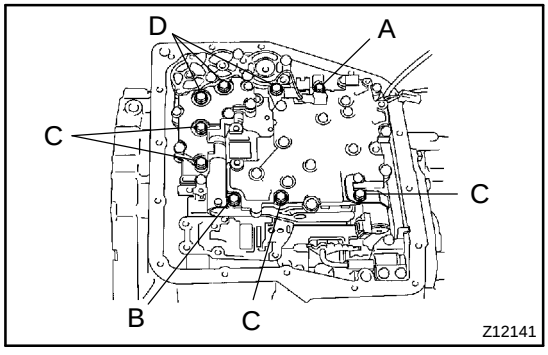
92. INSTALL TRANSMISSION VALVE BODY ASSY

(a) While holding the cam down with your hand, slip the cable end into the slot.

(b) Lower the valve body into place.

NOTICE:

Do not entangle the solenoid wire.



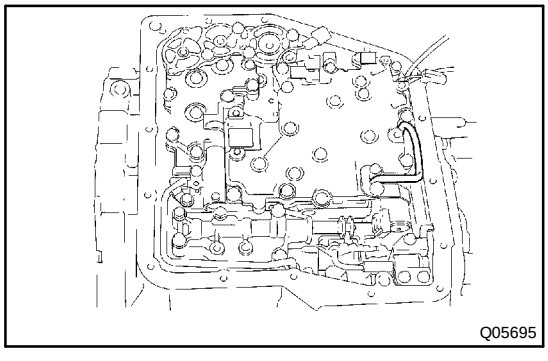
Z12141

(c) Install and tighten the 9 bolts.

HINT:

- Each bolt length is indicated below.
- Hand tighten the 9 bolts first, then torque with a torque wrench.

Bolt length:
Bolt A: 30 mm (1.181 in.)
Bolt B: 43 mm (1.693 in.)
Bolt C: 48 mm (1.890 in.)
Bolt D: 52 mm (2.047 in.)
Torque: 11 N·m (110 kgf·cm, 8 ft·lbf)

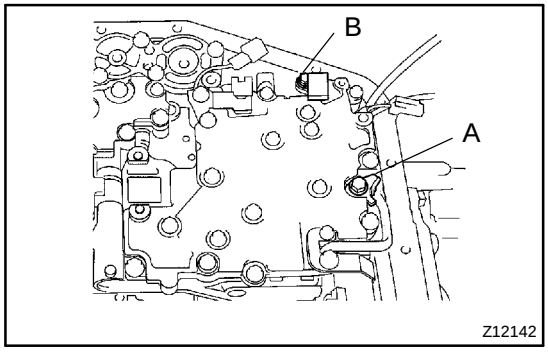

Q05695

93. INSTALL 1ST & REVERSE BRAKE TUBE NO.1

(a) Install the 1st & reverse brake tube No.1 and accumulator tube support with the bolt.

NOTICE:

Be careful not to bend or damage the tube.



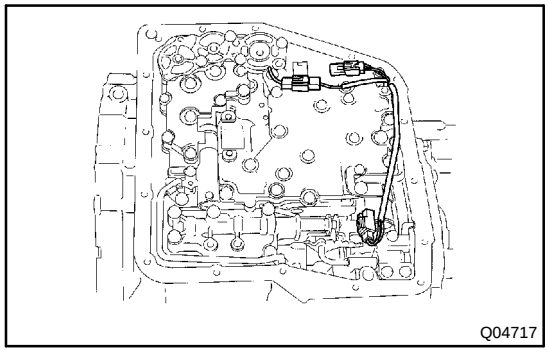
Z12142

(b) Install the wire harness clamp with the 2 bolts.

HINT:

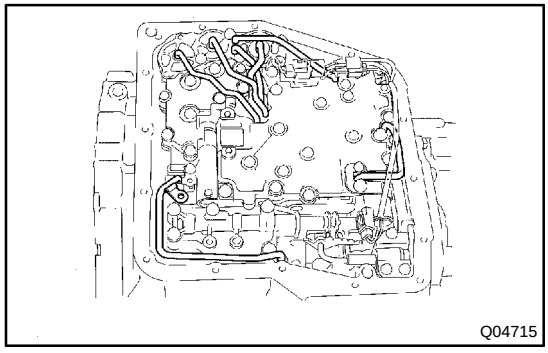
Each bolt length is indicated below.

Bolt length:
Bolt A: 48 mm (1.890 in.)
Bolt B: 39 mm (1.535 in.)
Torque: 11 N·m (110 kgf·cm, 8 ft·lbf)



94. INSTALL CONNECTOR

(a) Connect the 3 solenoid connectors.

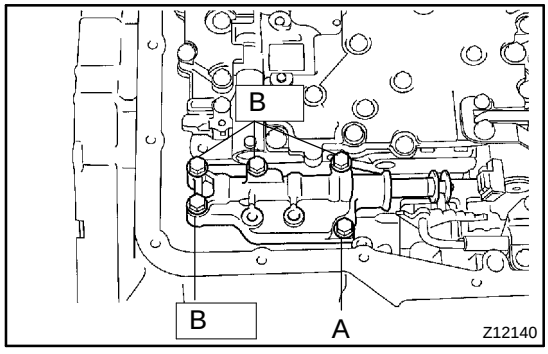


95. INSTALL TUBE

(a) Using a plastic hammer, install the tubes into the positions.

NOTICE:

Be careful not to bend or damage the tubes.



96. INSTALL MANUAL VALVE BODY

HINT:

Each bolt length is indicated below.

Bolt length:

Bolt A: 22 mm (0.866 in.)

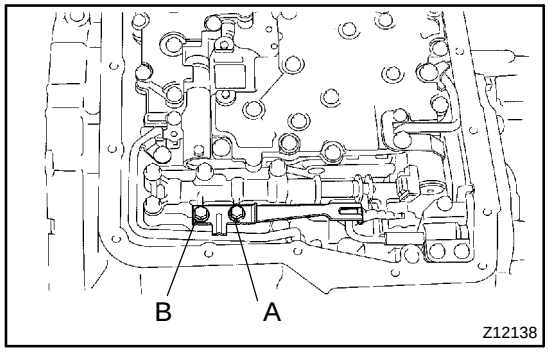
Bolt B: 37 mm (1.457 in.)

(a) Align the manual valve with the pin on the manual shaft lever.

(b) Lower the manual valve body into place.

(c) Hand tighten the 5 bolts first. Then, tighten them with a torque wrench.

Torque: 11 N·m (110 kgf·cm, 8 ft·lbf)



97. INSTALL MANUAL DETENT SPRING SUB-ASSY

(a) Place the detent springs on the manual valve body and hand tighten the 2 bolts first.

Then, tighten them with a torque wrench.

Torque: 11 N·m (110 kgf·cm, 8 ft·lbf)

HINT:

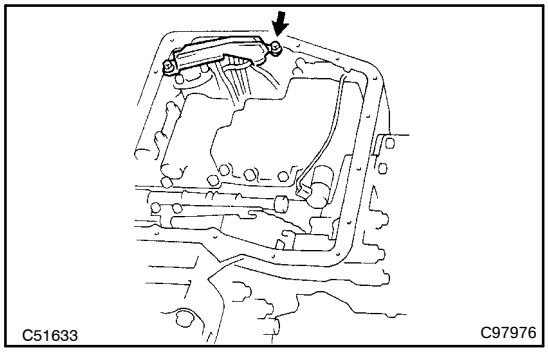
Each bolt length is indicated below.

Bolt length:

Bolt A: 14 mm (0.551 in.)

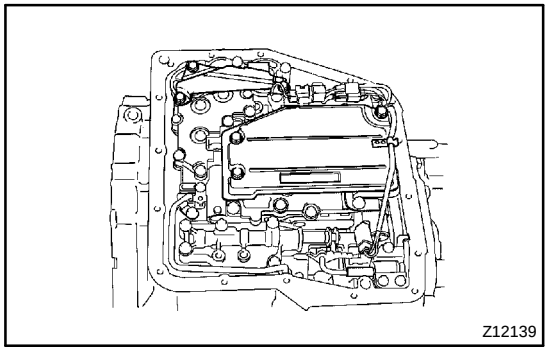
Bolt B: 37 mm (1.457 in.)

(b) Check that the manual valve lever is touching the center of the detent spring tip roller.



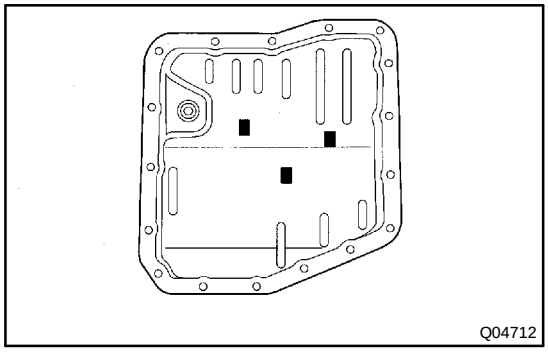
98. INSTALL ACCUMULATOR APPLY TUBE BRACKET

(a) Install the accumulator apply tube bracket with the 3 bolts.
Torque: 9.8 N·m (100 kgf·cm, 87 in·lbf)



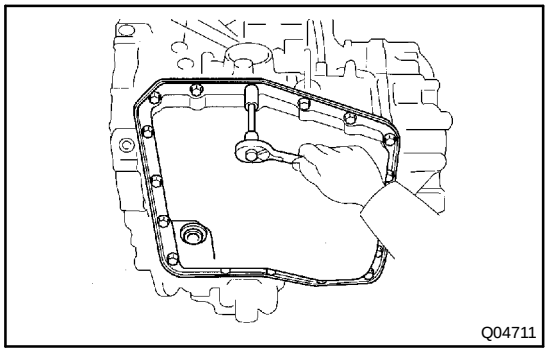
99. INSTALL VALVE BODY OIL STRAINER ASSY

(a) Install the valve body oil strainer assy with the 3 bolts.
Torque: 11 N·m (110 kgf·cm, 8 ft·lbf)

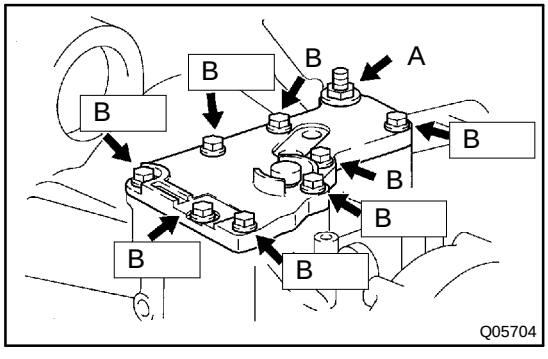


100. INSTALL AUTOMATIC TRANSAXLE OIL PAN SUB-ASSY

NOTICE:
Make sure that the magnets do not interfere with the oil tubes.

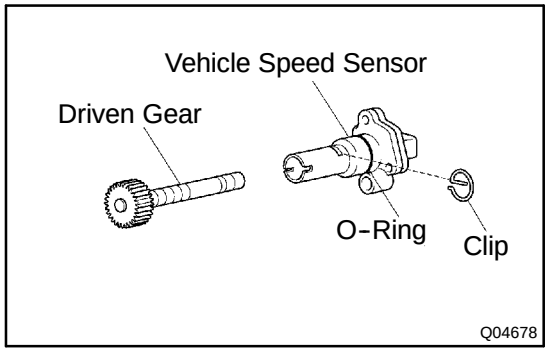


(a) Install a new gasket and oil pan.
(b) Install and torque the 17 bolts.
Torque: 7.8 N·m (80 kgf·cm, 69 in.·lbf)



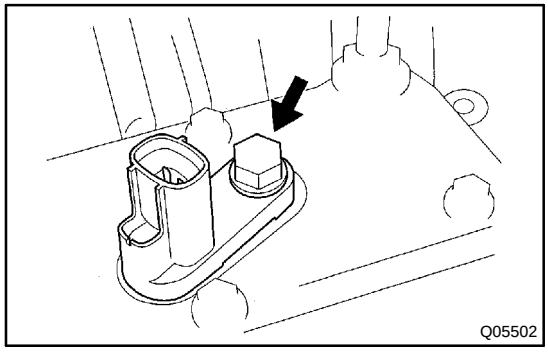
101. INSTALL TRANSAXLE CASE COVER UPPER

(a) Install the new gasket and the transaxle case upper cover with the 9 bolts.
Torque:
Bolt A: 20 N·m (200 kgf·cm, 1.4 ft.·lbf)
Bolt B: 9.8 N·m (100 kgf·cm, 87 in.·lbf)



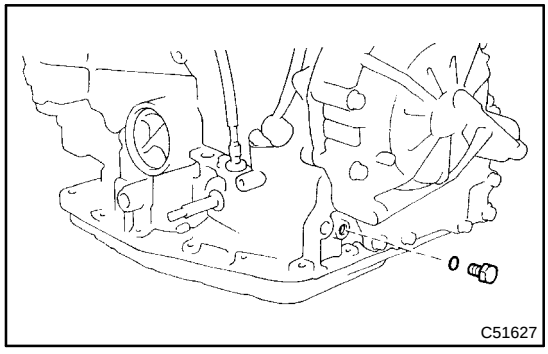
102. INSTALL SPEEDMETER DRIVEN (ATM) GEAR SUB-ASSY

(a) Coat a new O-ring with ATF, install it on the speedmeter sensor.
(b) Install the speedmeter driven gear sub-assy and clip on the speedmeter sensor.
(c) Install the speedmeter driven gear with the bolt.
Torque: 5 N·m (55 kgf·cm, 71 in.·lbf)
(d) Connect the speedmeter driven gear connector.



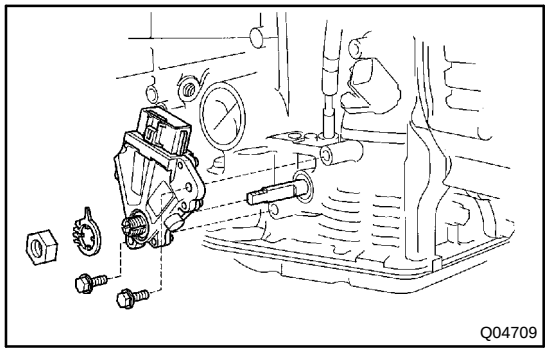
103. INSTALL SPEED SENSOR

(a) Install a new O-ring to the T/M revolution sensor.
(b) Install the T/M revolution sensor with the bolt.
Torque: 11 N·m (110 kgf·cm, 8.1 ft.·lbf)



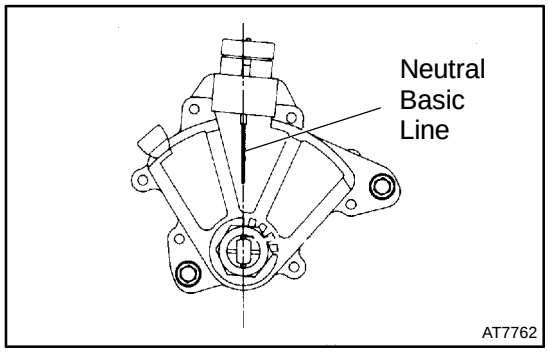
104. INSTALL TRANSAXLE CASE NO.1 PLUG

(a) Install the new O-ring to the transaxle case No.1 plug.
(b) Install the transaxle case No.1 plug to the transaxle case.
Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)



105. INSTALL PARK/NEUTRAL POSITION SWITCH ASSY

(a) Install the park/neutral position switch to the manual valve shaft.
(b) Install the new locking plate and tighten the nut.
(c) Stake the nut with the locking plate.
(d) Install the 2 bolts.

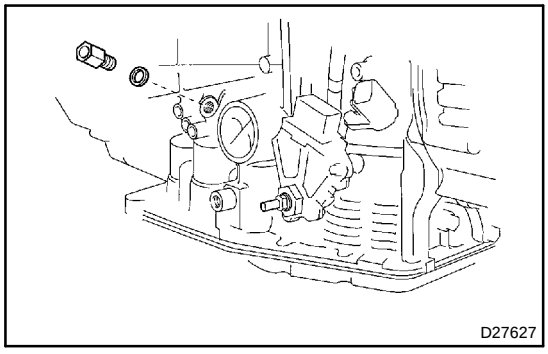


(e) Adjust the park/neutral position switch.

HINT:

Align the groove and neutral basic line.

(f) Tighten the 2 bolts.
Torque: 5.4 N·m (55 kgf·cm, 48 in·lbf)



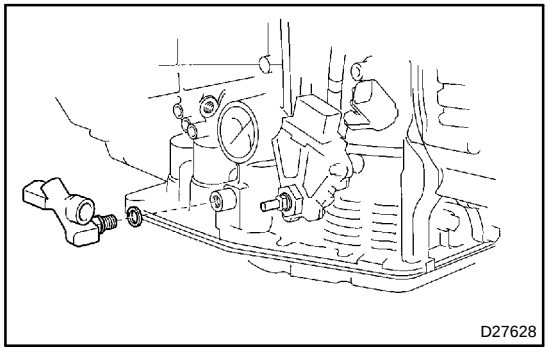
106. INSTALL OIL COOLER TUBE UNION (OUTLET OIL COOLER UNION)

(a) Install the new O-rings on the union and elbow.

(b) Install the union elbow on the transaxle case.
Torque: 27 N·m (275 kgf·cm, 20 ft·lbf)

HINT:

Install the elbow, as shown in the illustration.



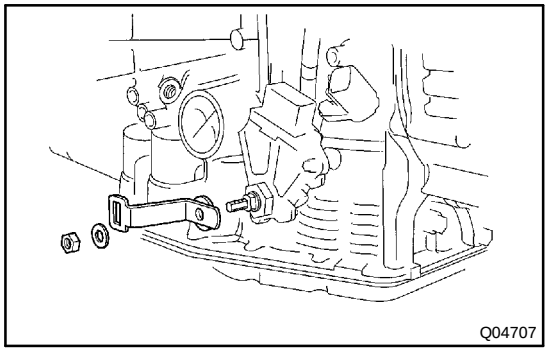
107. INSTALL OIL COOLER TUBE UNION (INLET OIL COOLER UNION)

(a) Install the new O-rings on the union and elbow.

(b) Install the union elbow on the transaxle case.
Torque: 27 N·m (275 kgf·cm, 20 ft·lbf)

HINT:

Install the elbow, as shown in the illustration.



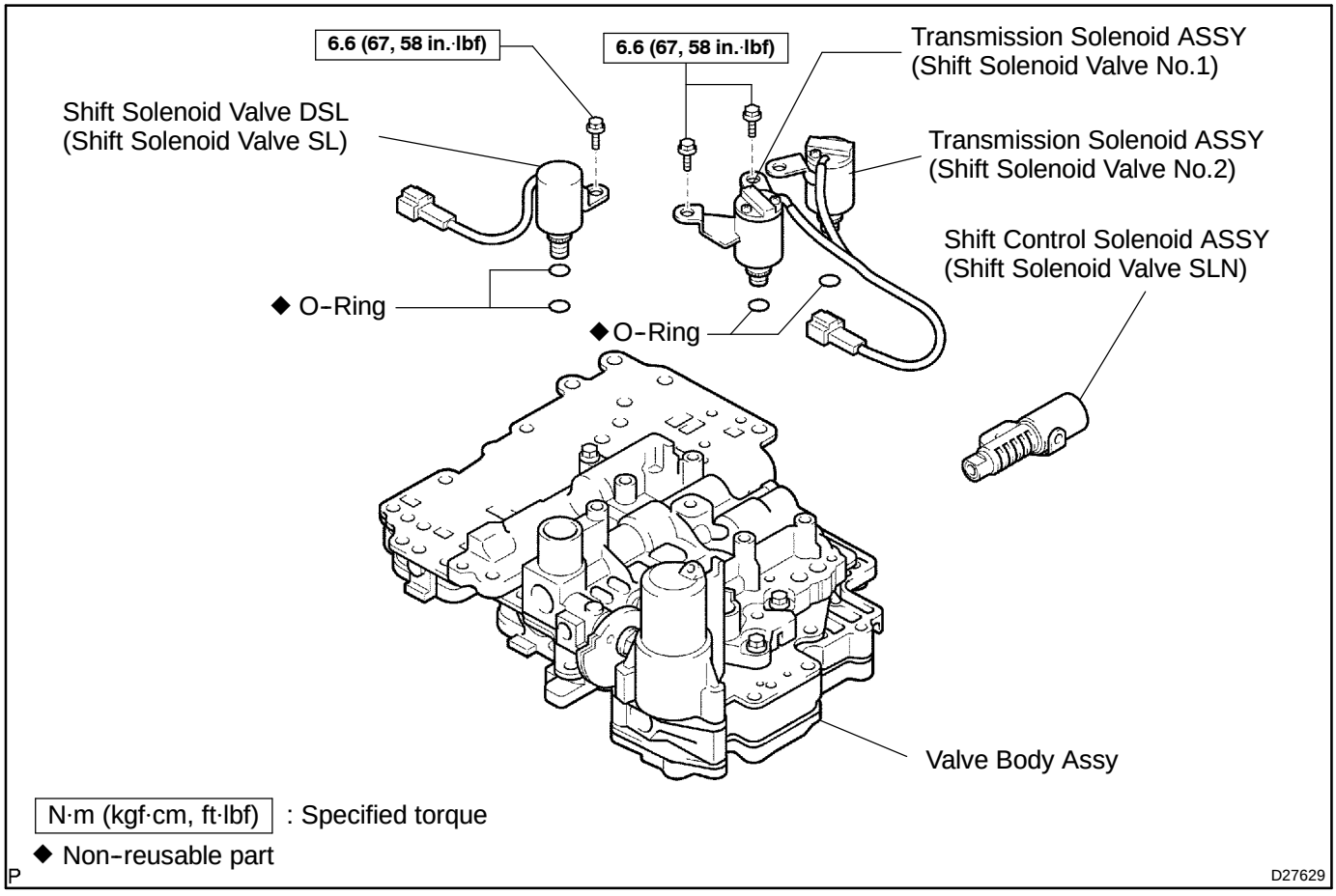
108. INSTALL TRANSMISSION CONTROL SHAFT LEVER

(a) Install the control shaft lever, washer and nut.
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

TRANSAXLE VALVE BODY ASSY (A541E)

400PJ–02

COMPONENTS

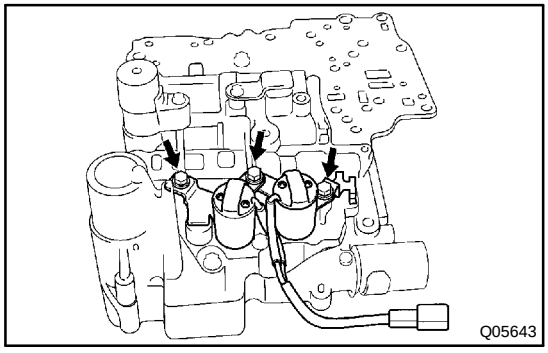


400P8-02

OVERHAUL

NOTICE:

When disassembling the valve body, be careful not to damage or deform the plate which overhangs the valve body.



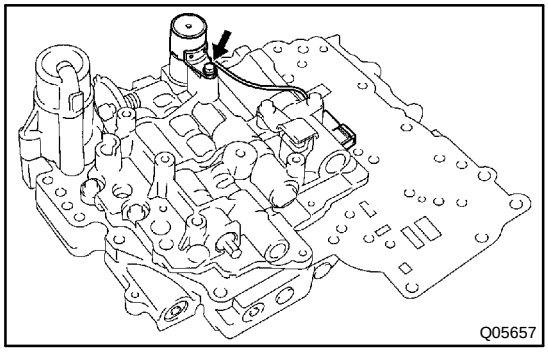
1. REMOVE TRANSMISSION SOLENOID ASSY

(a) Remove the 3 bolts, Transmission solenoid assy (shift solenoid valve No.1) and Transmission solenoid assy (shift solenoid valve No.2) with the retainer.

NOTICE:

When removing the solenoid, do not use a screwdriver, etc..

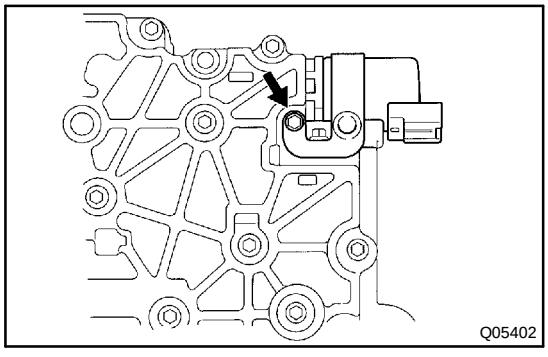
(b) Remove the O-ring from each solenoid.



2. REMOVE SHIFT SOLENOID VALVE DSL

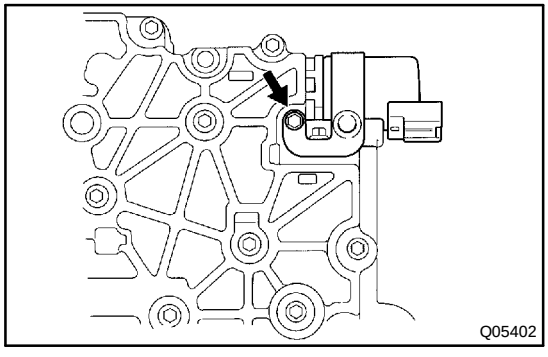
(a) Remove the shift solenoid valve DSL (shift solenoid valve SL).

(b) Remove the O-rings from the shift solenoid valve DSL (shift solenoid valve SL).



3. REMOVE SHIFT CONTROL SOLENOID ASSY

(a) Remove the shift control solenoid assy (shift solenoid valve SLN).

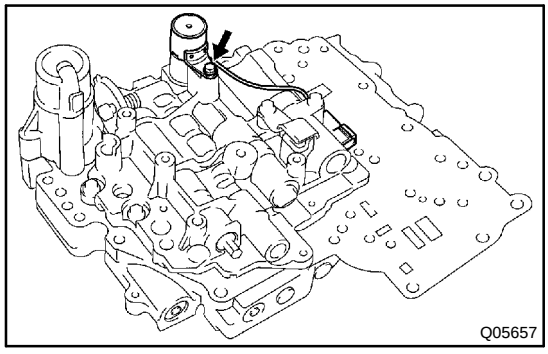


4. INSTALL SHIFT CONTROL SOLENOID ASSY

(a) Install the shift control solenoid assy (shift solenoid valve SLN).

(b) Install and torque the bolt.

Torque: 6.6 N·m (67 kgf·cm, 58 in.·lbf)



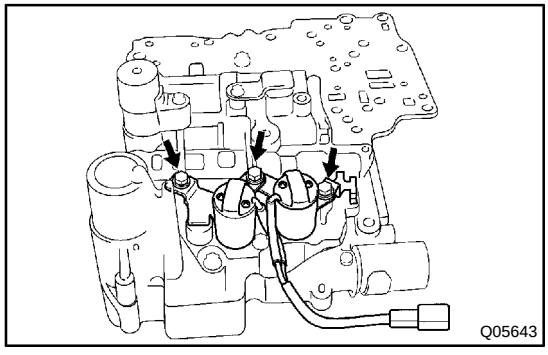
5. INSTALL SHIFT SOLENOID VALVE DSL

(a) Coat new O-rings with ATF and install them on the solenoid.

(b) Install the new shift solenoid valve DSL (shift solenoid valve SL).

(c) Install the bolt.

Torque: 6.6 N·m (67 kgf·cm, 58 in.·lbf)



6. INSTALL TRANSMISSION SOLENOID ASSY

(a) Coat new O-rings with ATF and install them to each shift solenoid.

(b) Install Transmission solenoid assy (shift solenoid valve No.1) and Transmission solenoid assy (shift solenoid valve No.2).

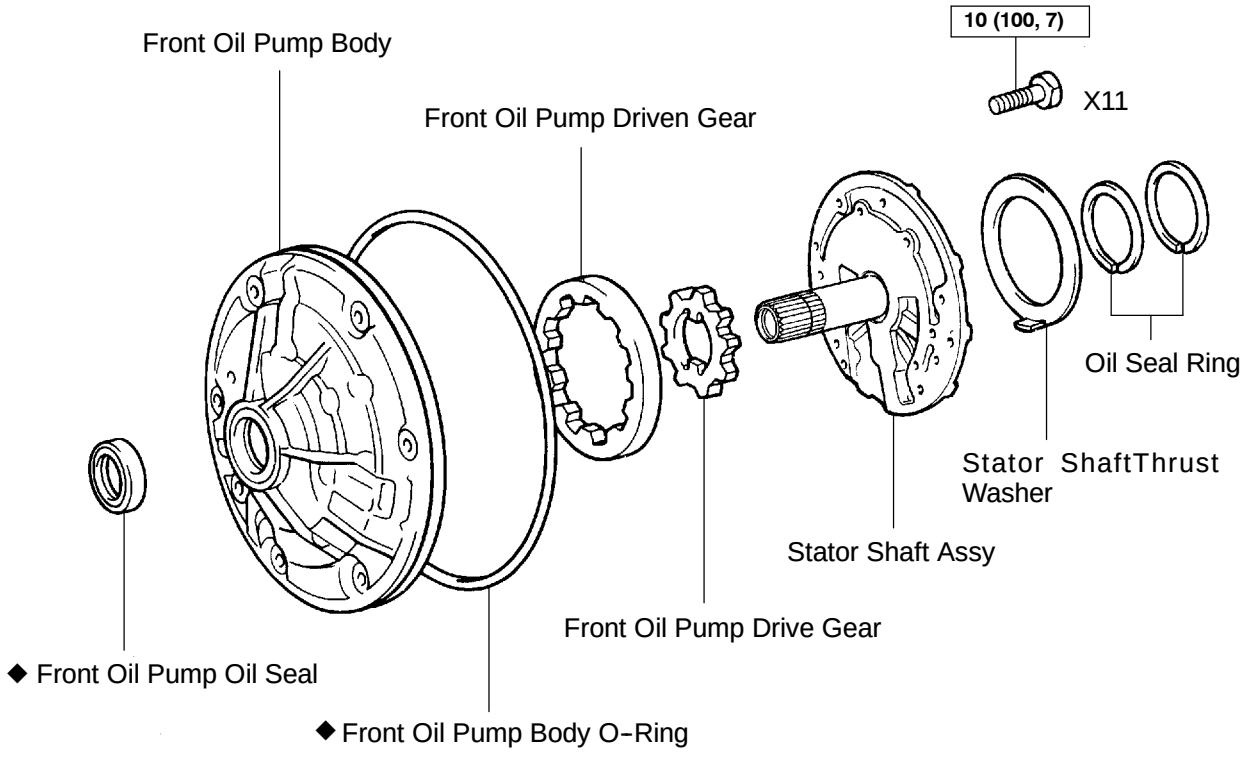
(c) Install and torque the 3 bolts.

Torque: 6.6 N·m (67 kgf·cm, 58 in.·lbf)

OIL PUMP ASSY (A541E)

COMPONENTS

400PK-02

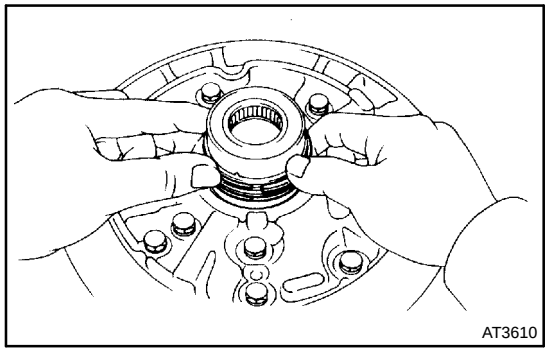


N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non–reusable part

AT3608

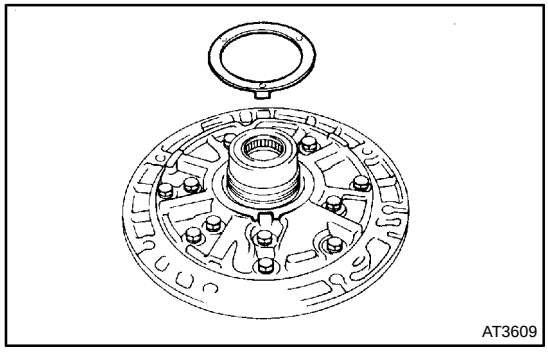
400P9-02



OVERHAUL

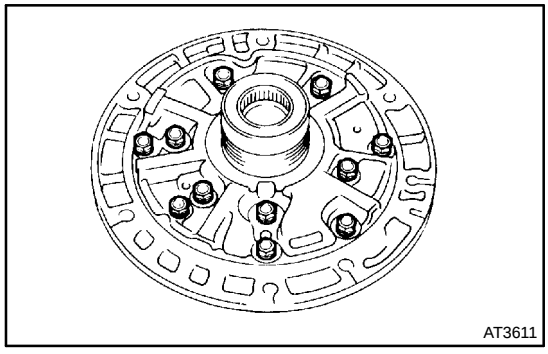
1. REMOVE CLUTCH DRUM OIL SEAL RING

(a) Remove the 2 oil seal rings from the stator shaft back side.



2. REMOVE STATOR SHAFT CLUTCH DRUM THRUST WASHER

(a) Remove the thrust washer from the stator shaft back side.

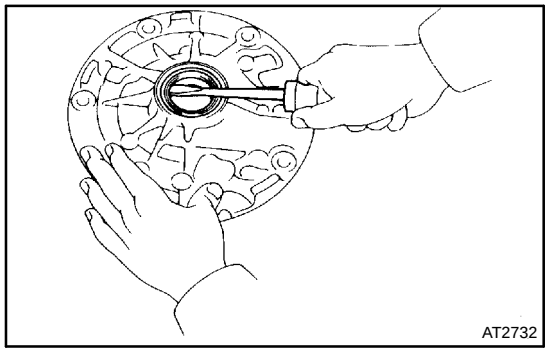


3. REMOVE STATOR SHAFT ASSY

(a) Remove the 11 bolts and stator shaft assy.

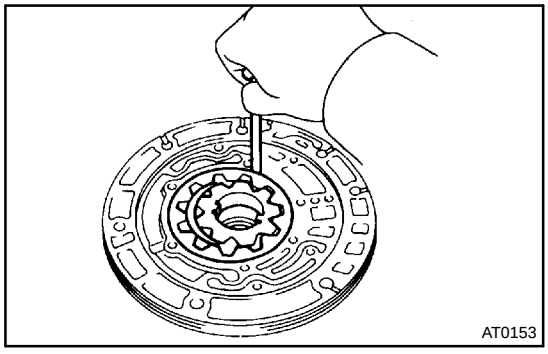
HINT:

Keep the gears in assembly order.



4. REMOVE FRONT OIL PUMP OIL SEAL

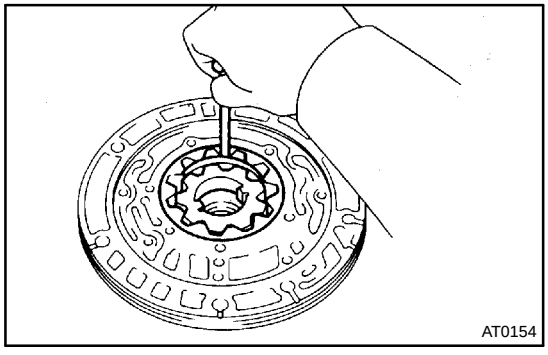
(a) Pry off the front oil pump oil seal with a screwdriver.



5. INSPECT ROTOR BODY CLEARANCE

(a) 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:
0.30 mm (0.0118 in.)

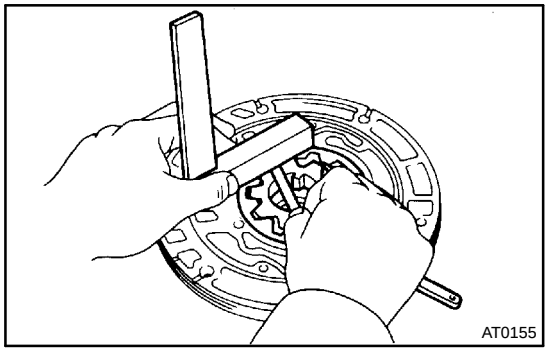
If the body clearance is greater than the maximum, replace the oil pump body subassembly.



6. INSPECT ROTOR TIP CLEARANCE

(a) Using a feeler gauge measure 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:
0.30 mm (0.0118 in.)

If the tip clearance is greater than the maximum, replace the oil pump body sub-assembly.



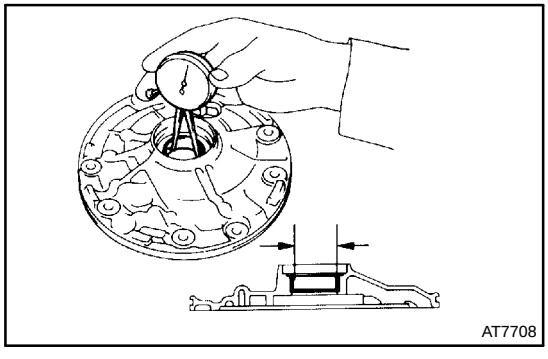
7. INSPECT ROTOR SIDE CLEARANCE

(a) Using a steel straight edge and feeler gauge, measure the side clearance of both gears.
Standard side clearance:
0.002 - 0.005 mm (0.00008 - 0.00020 in.)
Maximum side clearance:
0.100 mm (0.0039 in.)

HINT:
There are 3 different thicknesses for drive and driven gears.
Drive and driven gear thickness:

Mark	Thickness mm (in.)
A	9.440 - 9.456 (0.3717 - 0.3723)
B	9.456 - 9.474 (0.3723 - 0.3730)
C	9.474 - 9.490 (0.3730 - 0.3736)

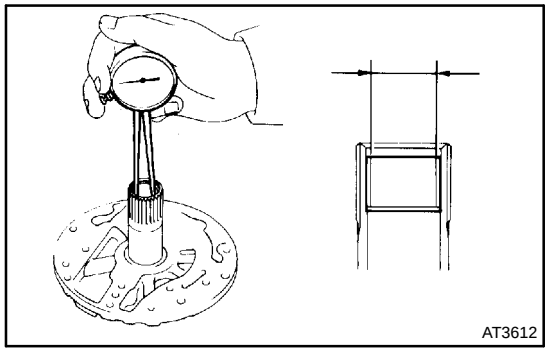
If the thickest gear can not make the side clearance within standard specification, replace the oil pump body sub-assembly.



8. INSPECT FRONT OIL PUMP BODY SUB-ASSY

(a) Using a dial indicator, measure the inside diameter of the oil pump body bushing.
Maximum inside diameter:
38.18 mm (1.5031 in.)

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

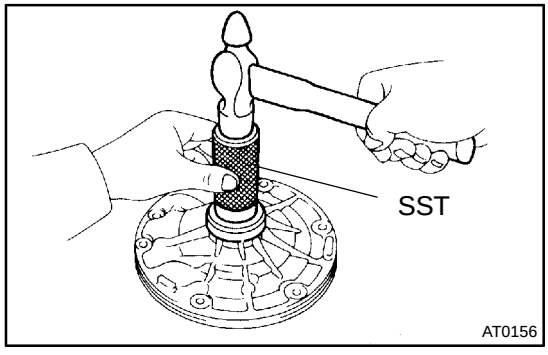

AT3612

9. INSPECT STATOR SHAFT ASSY

(a) Using a dial indicator, measure the inside diameter stator shaft bushing.

Maximum inside diameter:
Front side: 21.57 mm (0.8492 in.)
Rear side: 27.07 mm (1.0657 in.)

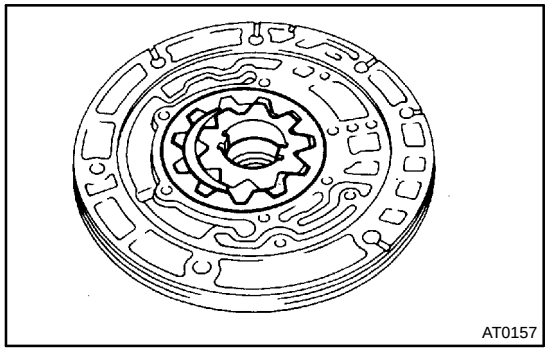
If the inside diameter is greater than the maximum, replace the stator shaft.



AT0156

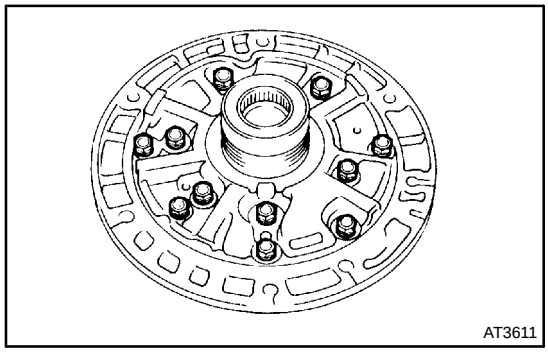
10. INSTALL FRONT OIL PUMP OIL SEAL

(a) Using SST and a hammer, install a new front oil pump oil seal. The seal end should be flush with the outer edge of the pump body.
SST 09350–32014 (09351–32140)


AT0157

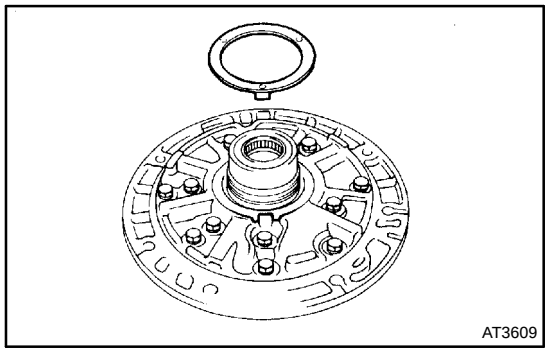
11. INSTALL FRONT OIL PUMP DRIVE GEAR

(a) Make sure the top of the gears are facing upward.


AT3611

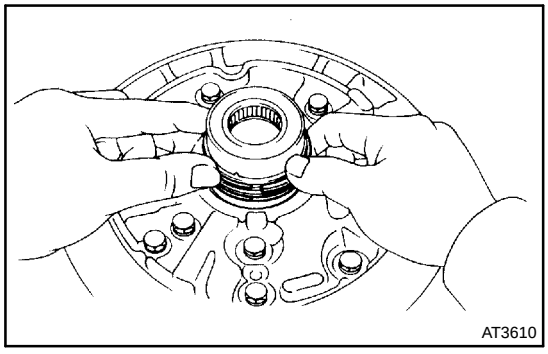
12. INSTALL STATOR SHAFT ASSY

(a) Align the stator shaft with each bolt hole.
(b) Install the 11 bolts.
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)


AT3609

13. INSTALL STATOR SHAFT CLUTCH DRUM THRUST WASHER

(a) Coat the thrust washer with petroleum jelly.
(b) Align the tab of the washer with the hollow of the pump body.



14. INSTALL CLUTCH DRUM OIL SEAL RING

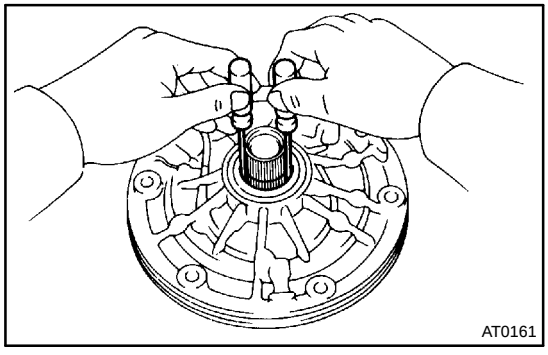
(a) Install the 2 oil seal rings to the stator shaft back side.

NOTICE:

Do not over-expand the ring ends.

HINT:

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



15. INSPECT OIL PUMP ASSY

(a) Turn the drive gear with 2 screwdrivers and make sure it rotates smoothly.

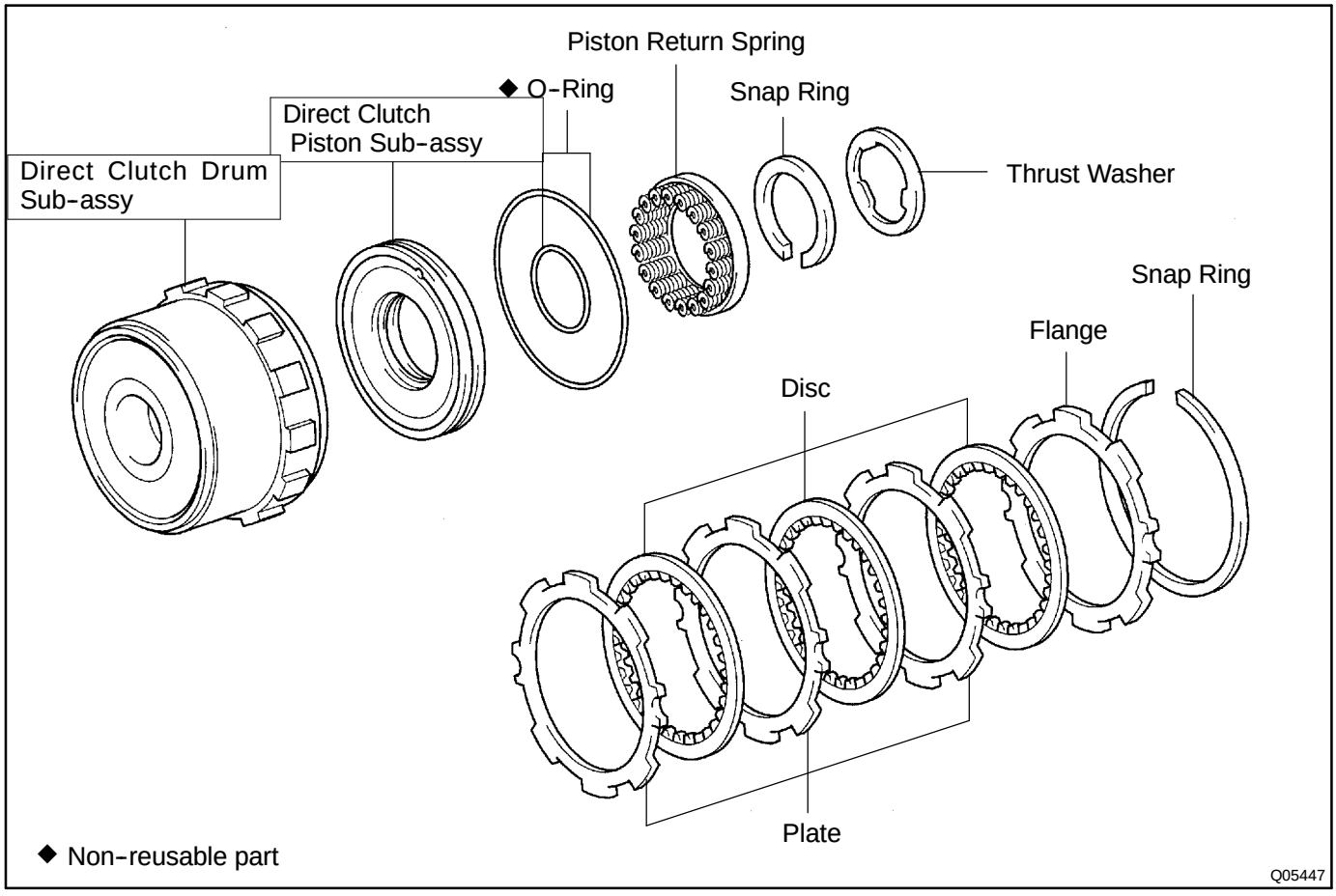
NOTICE:

Be careful not to damage the oil seal lip.

DIRECT CLUTCH ASSY (A541E)

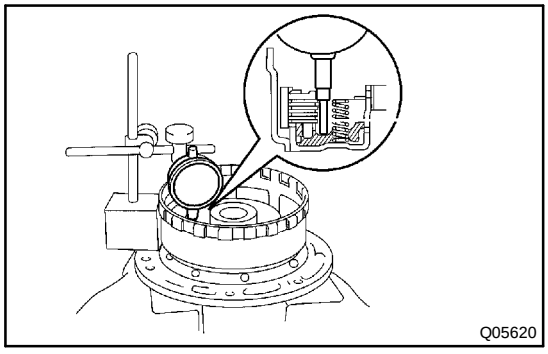
400PL-02

COMPONENTS



400PA-02

OVERHAUL


Q05620

1. INSPECT PISTON STROKE OF DIRECT CLUTCH

(a) Install the direct clutch on the oil pump.

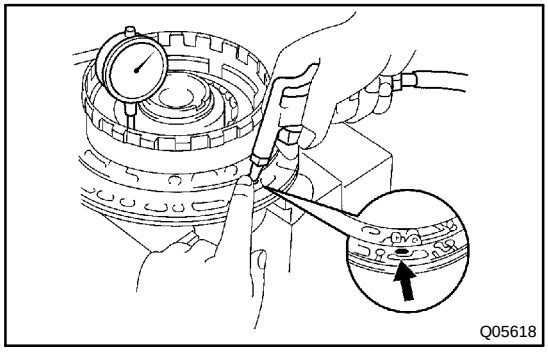
(b) Install a dial indicator and measuring terminal (SST) together, measure the direct clutch piston stroke as applying and releasing compressed air (392 – 785 kPa, 4 – 8 kg/cm^2, 57 – 114 psi).

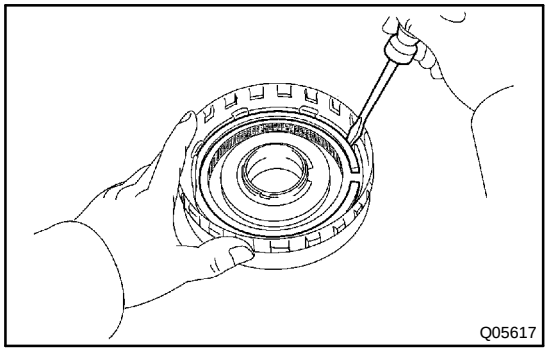
SST 09350-32014 (09351-32190)

Piston stroke:

0.91 - 1.35 mm (0.0358 - 0.0531 in.)

If the piston stroke is greater than the maximum, inspect each component.


Q05618

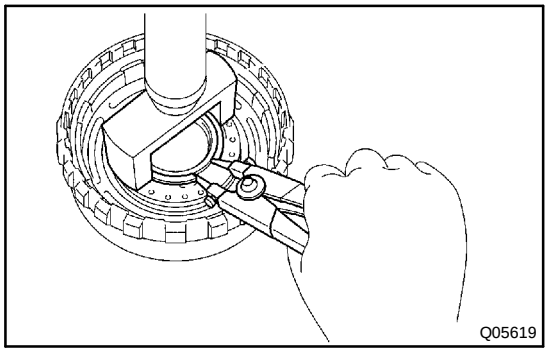

Q05617

2. REMOVE DIRECT CLUTCH PISTON RETURN SPRING SHAFT SNAP RING

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

3. REMOVE DIRECT MULTIPLE DISC CLUTCH CLUTCH PLATE

(a) Remove the flange, 3 discs and 3 plates.


Q05619

4. REMOVE DIRECT CLUTCH RETURN SPRING SUB-ASSY

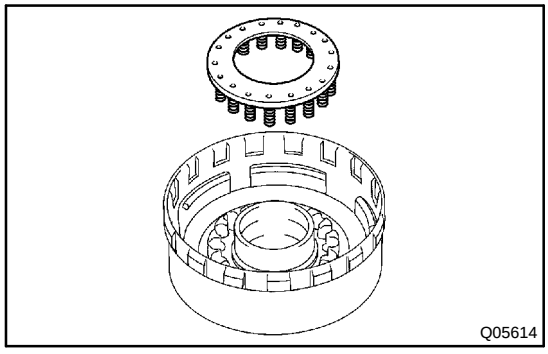
(a) Place SST on the piston spring retainer and compress the springs with a press.

SST 09350-32014

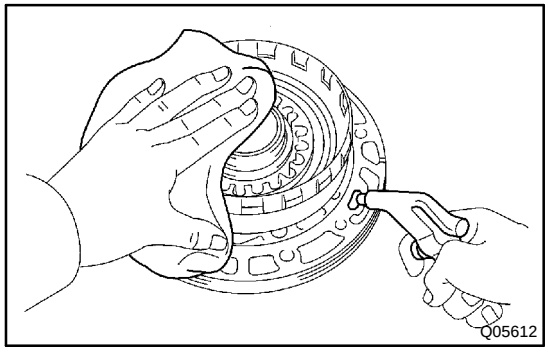
NOTICE:

- **Stop pressing when the spring sheet is lowered 1-2 mm (0.039-0.078 in.) from the snap ring groove, preventing the spring sheet from deforming.**
- **Do not expand the snap ring excessively.**

(b) Remove the snap ring with a snap ring expander.



(c) Remove the piston return spring.

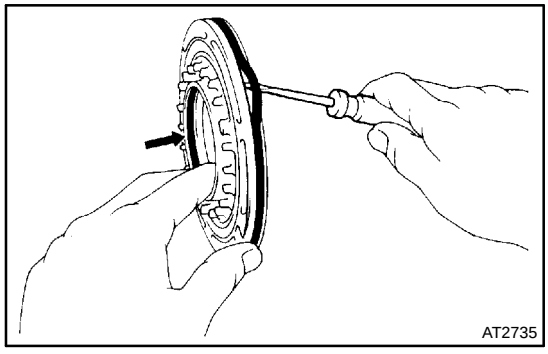


5. REMOVE DIRECT CLUTCH PISTON SUB–ASSY

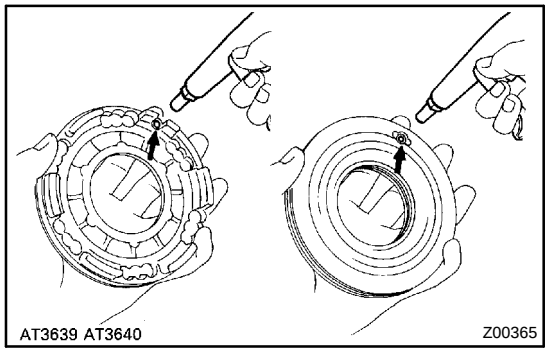
(a) Install the direct clutch onto the oil pump.

(b) Apply compressed air (392–785 kPa, 4–8 kgf/cm^2, 57–114 psi) to the oil pump to remove the piston (if the piston does not come out completely, use needle–nose pliers to remove it).

(c) Remove the direct clutch from the oil pump.



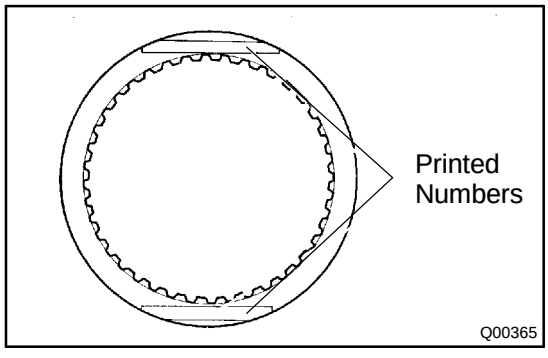
(d) Using a small screwdriver, Remove the 2 O–rings from the piston.



6. INSPECT DIRECT CLUTCH PISTON SUB–ASSY

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

(b) Check that the leakage does not occure from the valve by applying low–pressure compressed air.

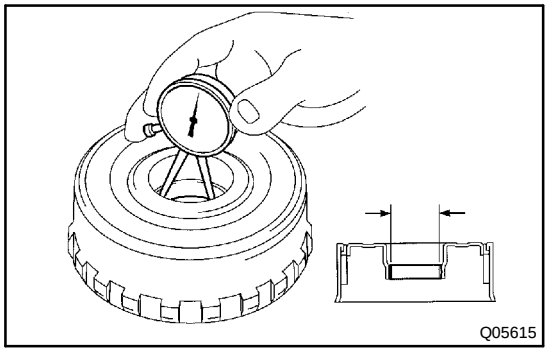


7. INSPECT DIRECT MULTIPLE DISC CLUTCH CLUTCH PLATE

(a) Check if the sliding surfaces of the discs, plates 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 are defaced, replace all discs.
- Before assembling new discs, soak them in ATF for at least 15 minutes.

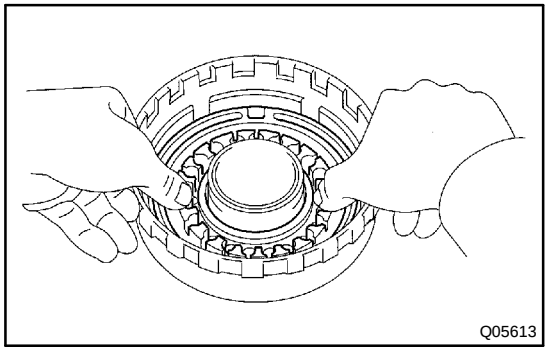

Q05615

8. INSPECT DIRECT CLUTCH DRUM SUB-ASSY

(a) Using a dial indicator, measure the inside diameter of the direct clutch bushing.

Maximum inside diameter:
48.27 mm (1.9004 in.)

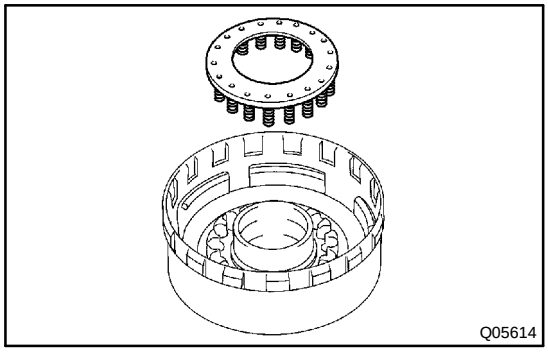
If the inside diameter is greater than the maximum, replace the direct clutch drum.


Q05613

9. INSTALL DIRECT CLUTCH PISTON SUB-ASSY

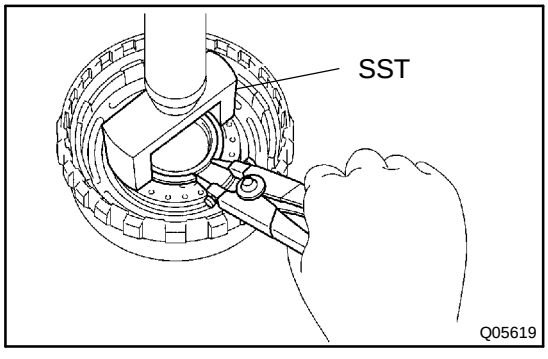
(a) Install new O-rings to the piston. Coat the O-rings with ATF.

(b) Being careful not to damage the O-rings, press the piston into the drum with the cup side up.


Q05614

10. INSTALL DIRECT CLUTCH RETURN SPRING SUB-ASSY

(a) Place the return spring and snap ring onto the piston.



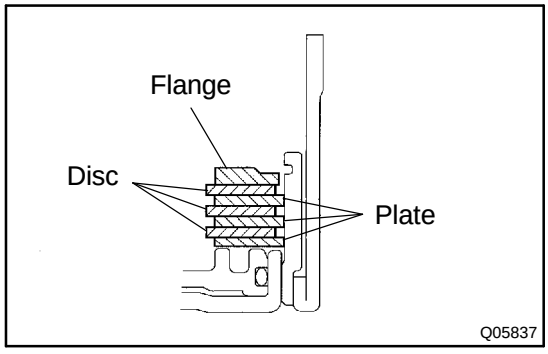
Q05619

(b) Place SST on the spring retainer, and compress the return spring with a press.
SST 09350-32014 (09351-32070)

NOTICE:

- **Stop pressing when the spring sheet is lowered 1-2 mm (0.039-0.078 in.) from the snap ring groove, preventing the spring sheet from deforming.**
- **Do not expand the snap ring excessively.**

(c) Install the snap ring using a snap ring expander. Be sure the end gap of the snap ring is aligned with the spring retainer claw.



11. INSTALL DIRECT MULTIPLE DISC CLUTCH CLUTCH PLATE

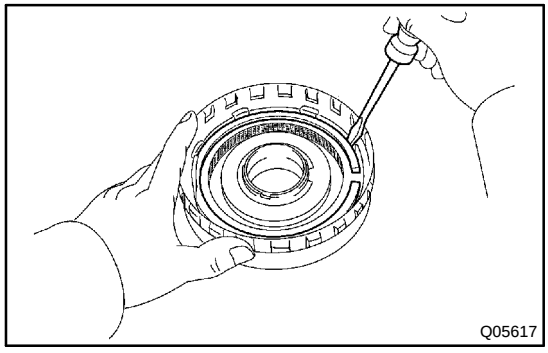
(a) Install plates and discs.

Install in order:

P = Plate D = Disc

P – D – P – D – P – D

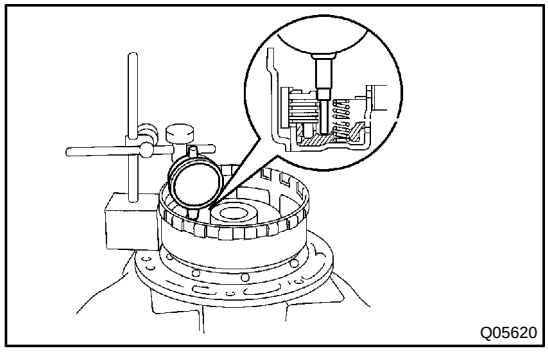
(b) Install the flange with the flat end facing downward.



12. INSTALL DIRECT CLUTCH PISTON RETURN SPRING SHAFT SNAP RING

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

(b) Check that the end gap of the snap ring is not aligned with one of the cutouts.



13. INSPECT PACK CLEARANCE OF DIRECT CLUTCH & OVERDRIVE CLUTCH

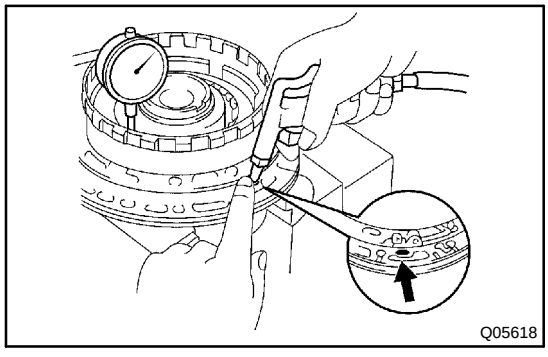
(a) Install the direct clutch on the oil pump.

(b) Install a dial indicator and measuring terminal (SST) together, measure the direct clutch piston stroke as applying and releasing compressed air (392 – 785 kPa, 4 – 8 kgf/cm^2, 57 – 114 psi).

SST 09350–32014 (09351–32190)

Piston stroke:

0.91 – 1.35 mm (0.0358 – 0.0531 in.)



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

HINT:

There are 2 different thickness for the flange.

Flange thickness:

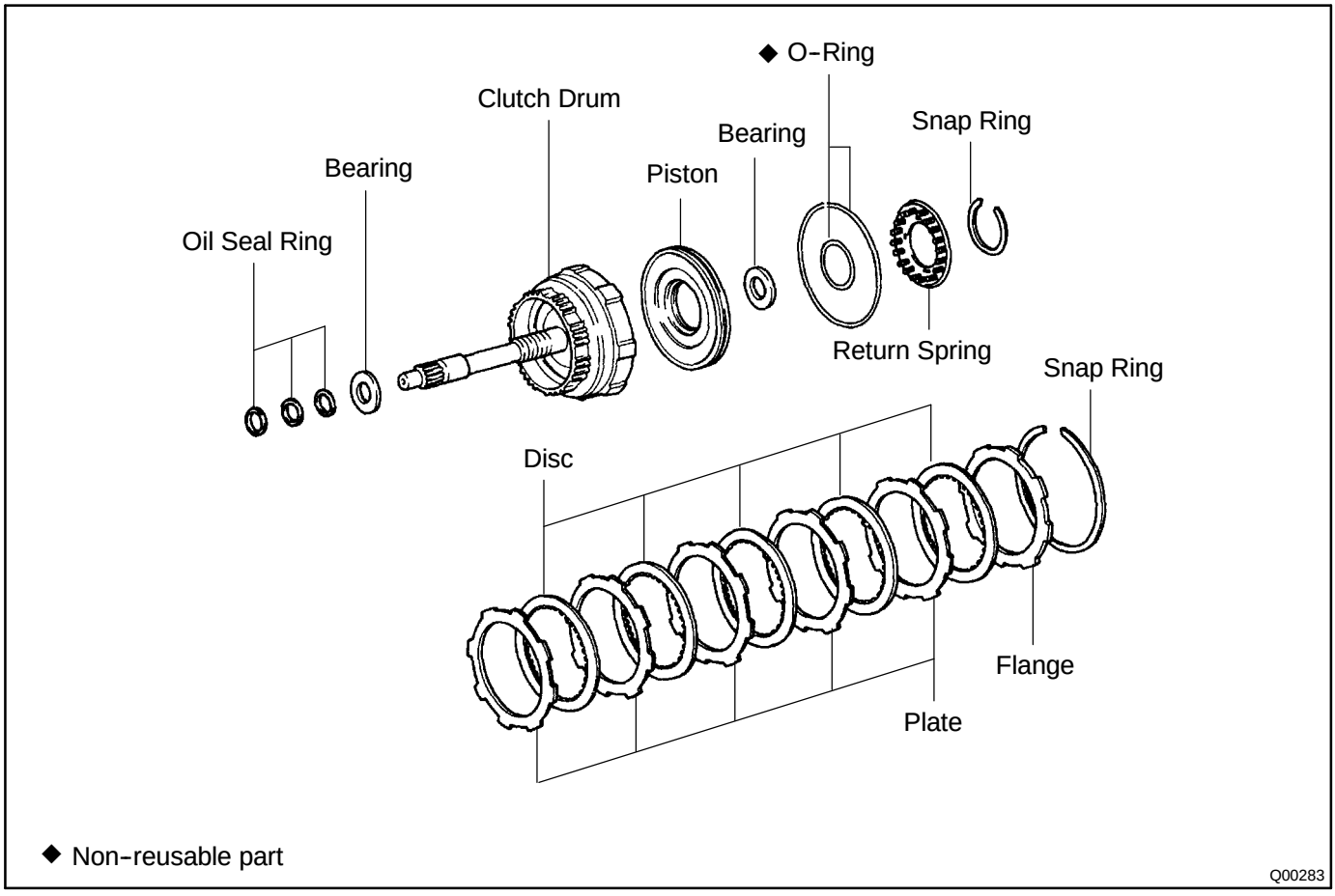
2.70 mm (0.1063 in.)

3.00 mm (0.1181 in.)

FORWARD CLUTCH ASSY (A541E)

400PM-02

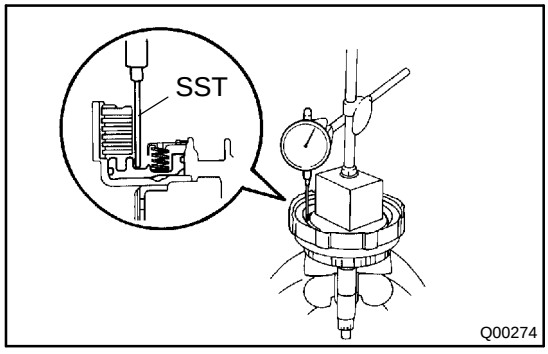
COMPONENTS



◆ Non-reusable part

Q00283

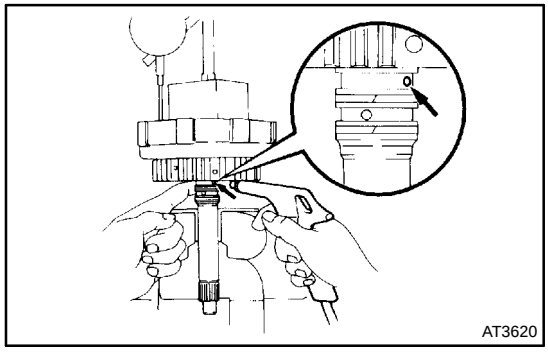
400PB-02



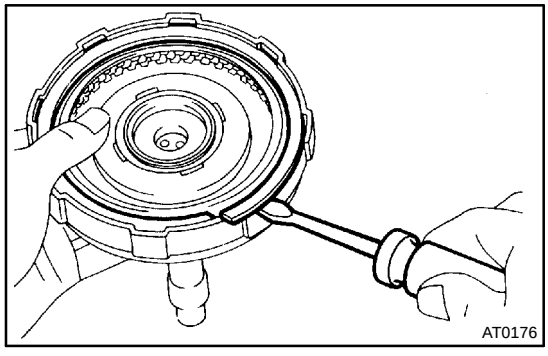
OVERHAUL

1. INSPECT PISTON STROKE OF FORWARD CLUTCH

(a) Install a dial indicator and measuring terminal (SST) together, measure the forward clutch piston stroke while applying and releasing compressed air (392–785 kPa, 4–8 kgf·cm^2, 57–114 psi).
SST 09350–32014 (09351–32190)
Piston stroke:
1.79 – 2.21 mm (0.0704 – 0.0870 in.)

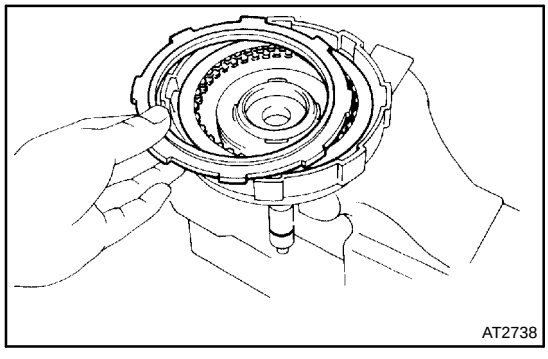


If the piston stroke is greater than the maximum, inspect each component.



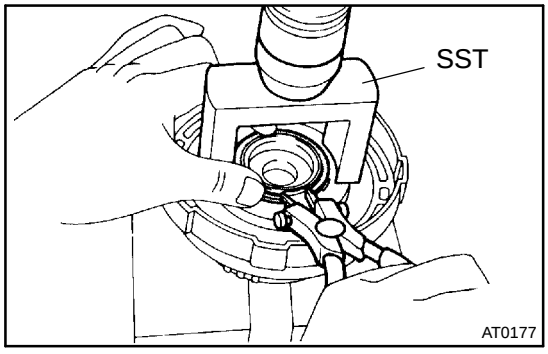
2. REMOVE FORWARD CLUTCH FLANGE HOLE SNAP RING

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



3. REMOVE FORWARD CLUTCH FLANGE

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



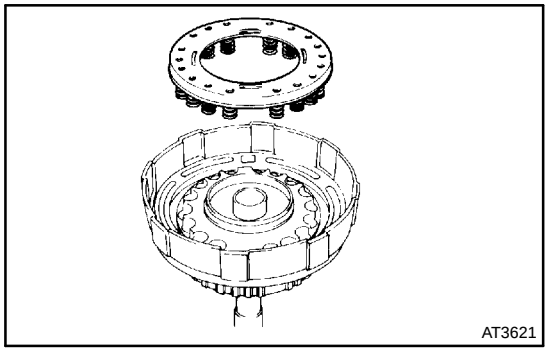
4. REMOVE FORWARD CLUTCH RETURN SPRING SUB-ASSY

(a) Place SST on the spring retainer and compress the springs with a press.
SST 09350-32014 (09351-32070)

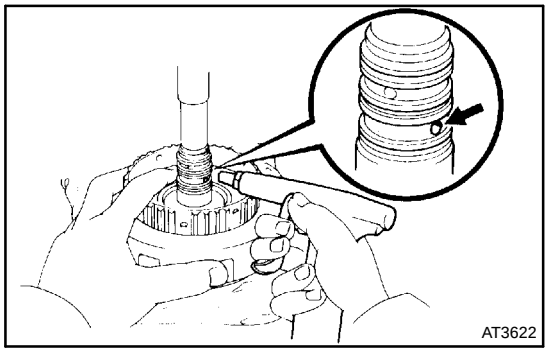
NOTICE:

- **Stop pressing when the spring sheet is lowered 1-2 mm (0.039-0.078 in.) from the snap ring groove, preventing the spring sheet from deforming.**
- **Do not over-expand the snap ring.**

(b) Using a snap ring expander, remove the snap ring.



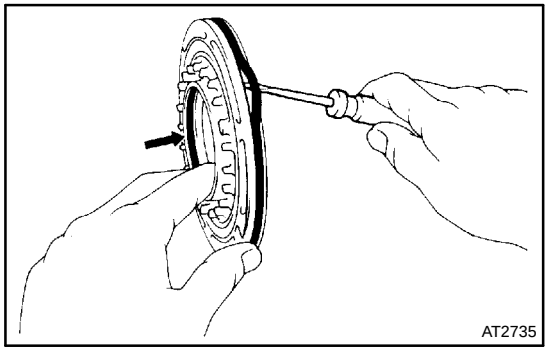
(c) Remove the return spring.



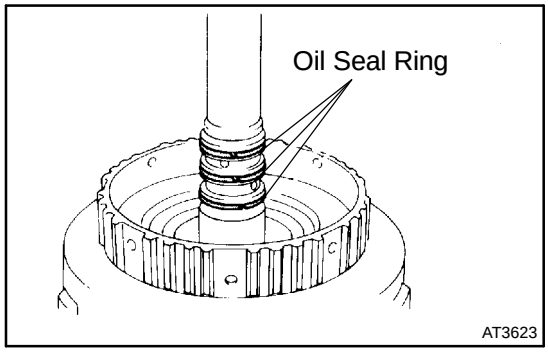
5. REMOVE FORWARD CLUTCH PISTON SUB-ASSY

(a) Apply compressed air (392 - 785 kPa, 4 - 8 kg/cm^2, 57 - 114 psi) into the oil passage to remove the piston.

If the piston does not come out, use needle-nose pliers to remove it.

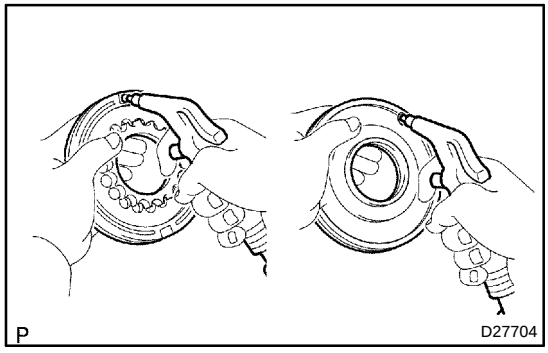


(b) Using a small screwdriver, Remove the 2 O-rings from the piston.



6. REMOVE INPUT SHAFT OIL SEAL RING

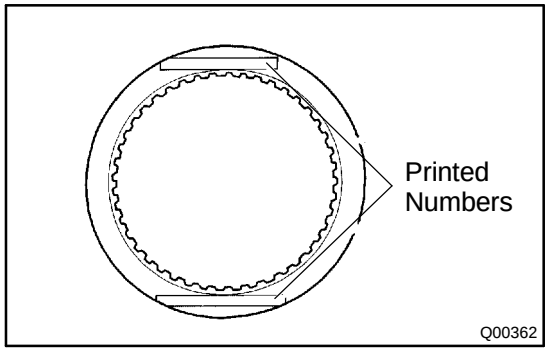
(a) Remove the 3 oil seal rings from the shaft.



7. INSPECT FORWARD CLUTCH PISTON SUB-ASSY

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

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

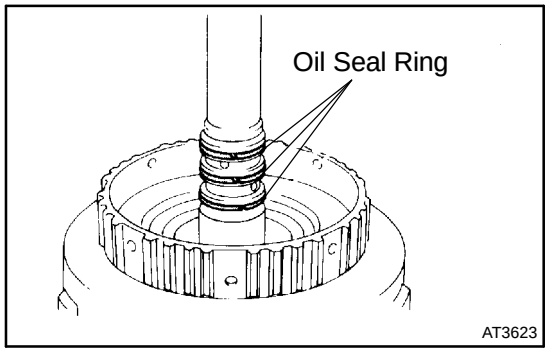


8. INSPECT FORWARD CLUTCH FLANGE

(a) Check if the sliding surfaces of the discs, plates 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 are defaced, replace all discs.
- Before assembling new discs, soak them in ATF for at least 15 minutes.



9. INSTALL INPUT SHAFT OIL SEAL RING

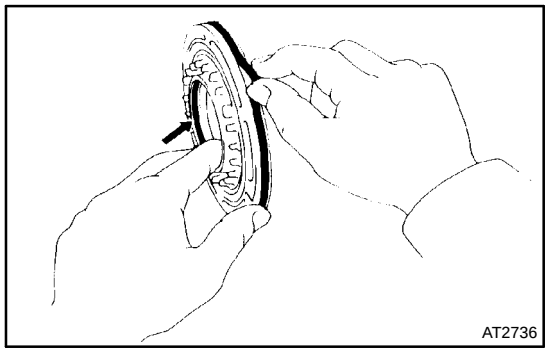
(a) Install the 3 oil seal rings to the shaft.

NOTICE:

Do not over-expand the ring ends.

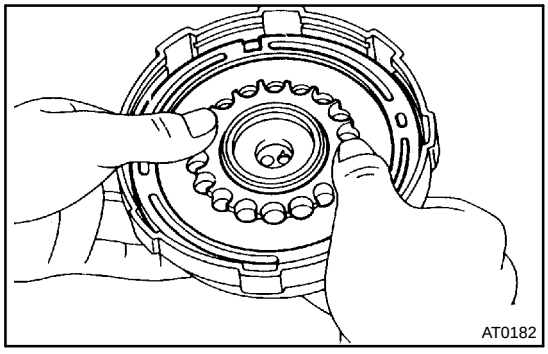
HINT:

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



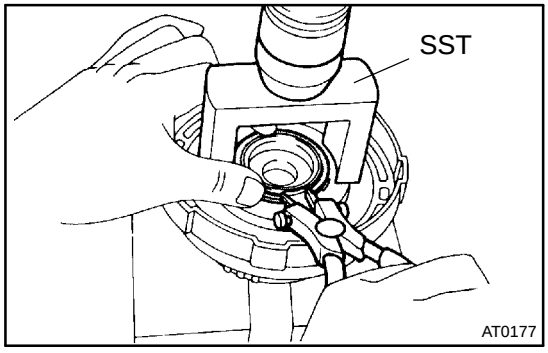
10. INSTALL FORWARD CLUTCH PISTON SUB-ASSY

(a) Install the 2 new O-rings to the piston.



(b) Coat the O-ring with ATF.
(c) Press the piston into the drum with the cup side up.

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

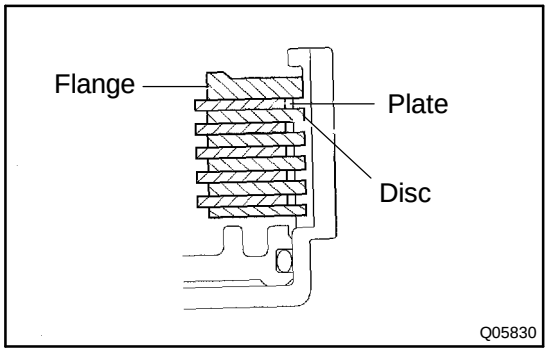


11. INSTALL FORWARD CLUTCH RETURN SPRING SUB-ASSY

(a) Place the return spring and snap ring onto the piston.
(b) Place SST on the spring retainer, and compress the springs with a press.
SST 09350-32014 (09351-32070)

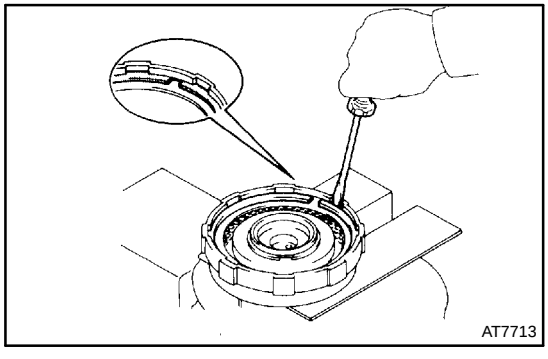
NOTICE:
- **Stop pressing when the spring sheet is lowered 1-2 mm (0.039-0.078 in.) from the snap ring groove, preventing the spring sheet from deforming.**
- **Do not expand the snap ring excessively.**

(c) Install the snap ring with a snap ring expander.
Be sure the end gap of the snap ring is not aligned with the spring retainer claw.



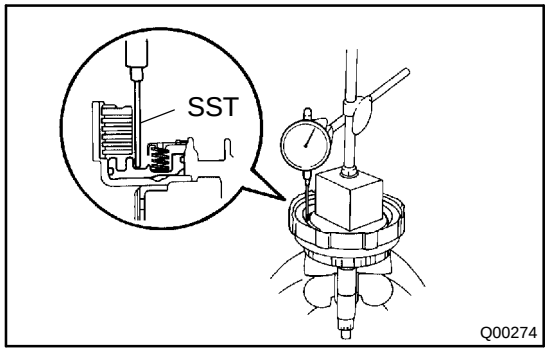
12. INSTALL FORWARD CLUTCH FLANGE

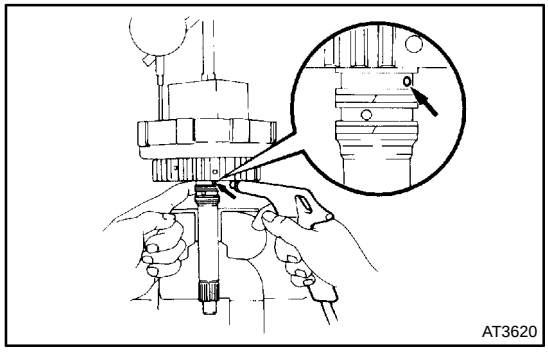
(a) Install the plates and discs.
Install in order:
P = Plate D = Disc
P - D - P - D - P - D - P - D - P - D
(b) Install the flange with the flat end facing downward.



13. INSTALL FORWARD CLUTCH FLANGE HOLE SNAP RING

(a) Using a screwdriver install the snap ring.
(b) Check that the end gap of the snap ring is not aligned with one of the cutouts.





14. INSPECT PISTON STROKE OF FORWARD CLUTCH

(a) Install a dial indicator and measuring terminal (SST) together, measure the forward clutch piston stroke as applying and releasing compressed air (392 – 785 kPa, 4 – 8 kgf·cm^2, 57 – 114 psi).

SST 09350–32014 (09351–32190)

Piston stroke:

1.79 – 2.21 mm (0.0704 – 0.0870 in.)

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

HINT:

There are 2 different thickness for the flange.

Flange thickness:

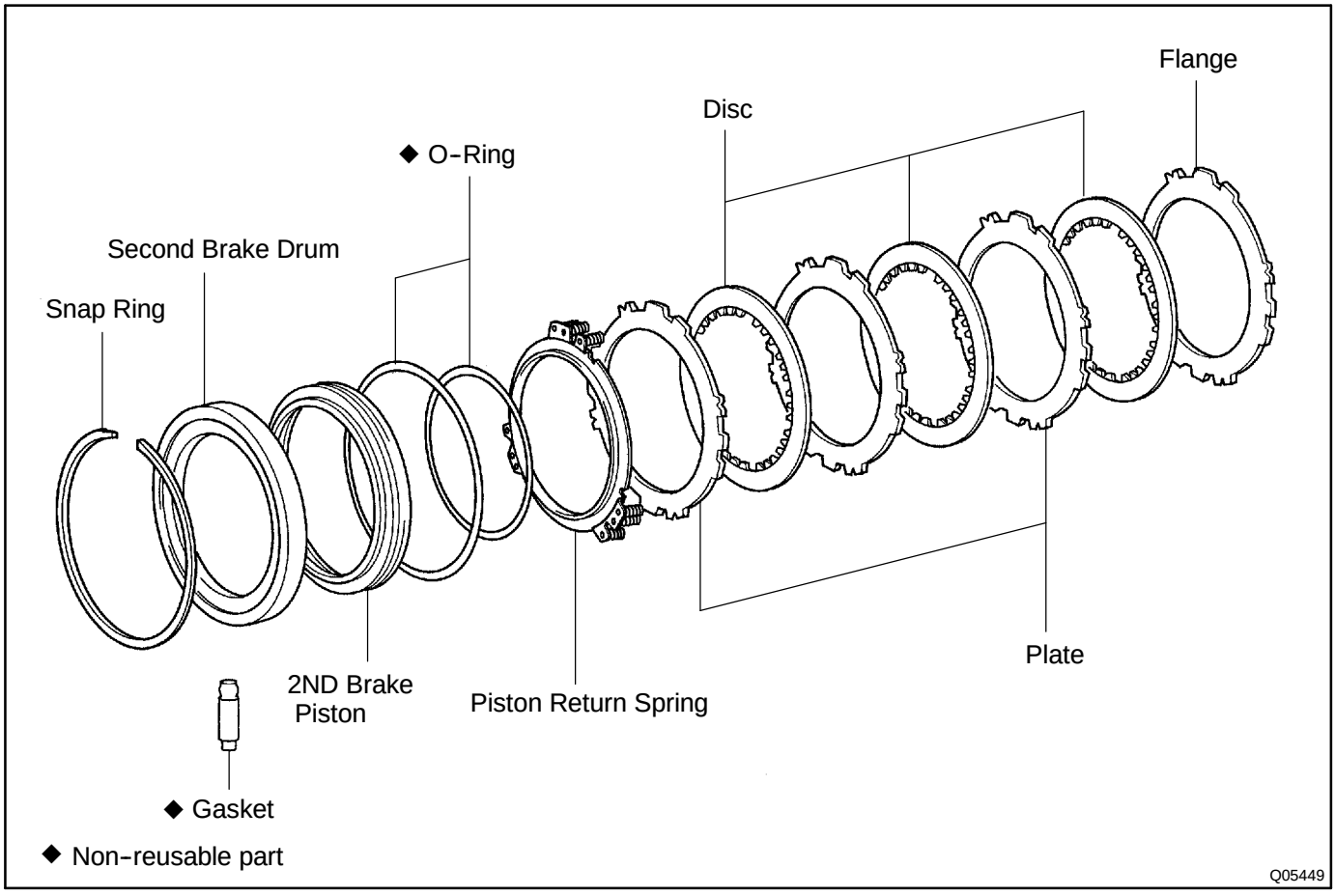
2.30 mm (0.0906 in.)

2.70 mm (1.0630 in.)

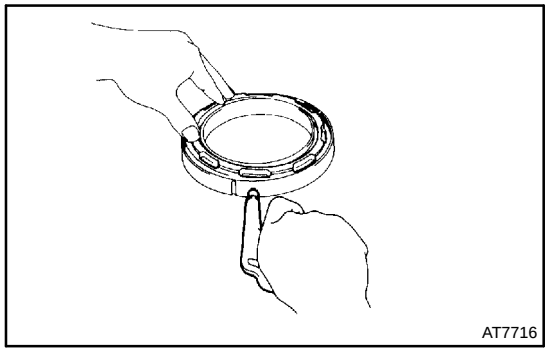
SECOND BRAKE PISTON ASSY (A541E)

400PN-02

COMPONENTS



400PC-02


AT7716

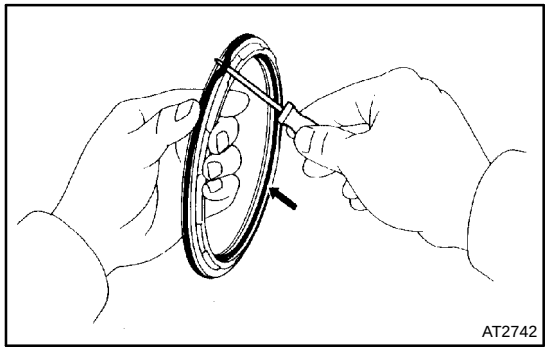
OVERHAUL

1. REMOVE 2ND BRAKE PISTON

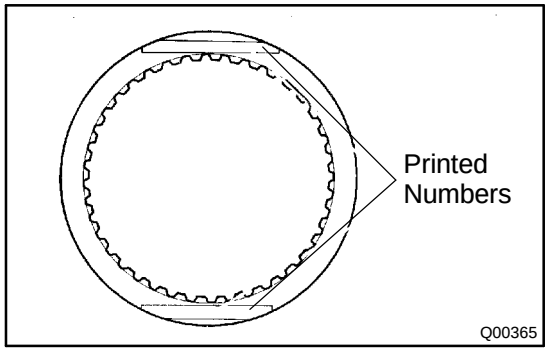
(a) Apply compressed air to the oil hole to remove the piston.

HINT:

When the piston cannot be removed because it is slanted, either blow the air again while holding the protruding side or remove the piston using needle nose pliers with vinyl tape on the tips.


AT2742

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



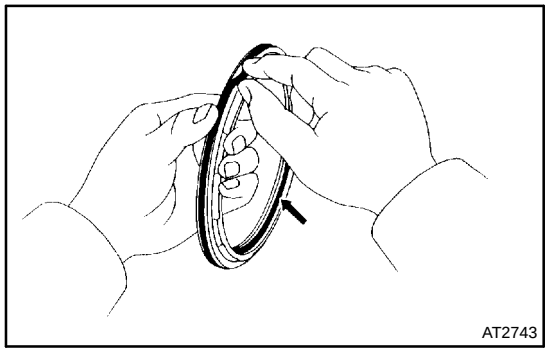
Q00365

2. INSPECT 2ND BRAKE BRAKE FLANGE

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

HINT:

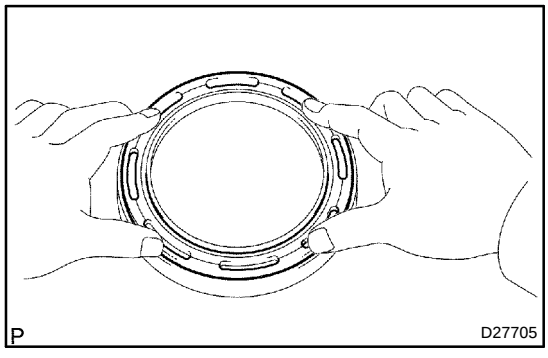
- If the lining of the disc is peeling off or discolored, or even if a part of the printed numbers are defaced, replace all discs.
- Before assembling new discs, soak them in ATF for at least 15 minutes.


AT2743

3. INSTALL 2ND BRAKE PISTON

(a) Coat a new O-ring with ATF.

(b) Install the 2 O-rings on the piston.


P D27705

(c) Press the piston into the drum, being careful not to damage the O-ring.

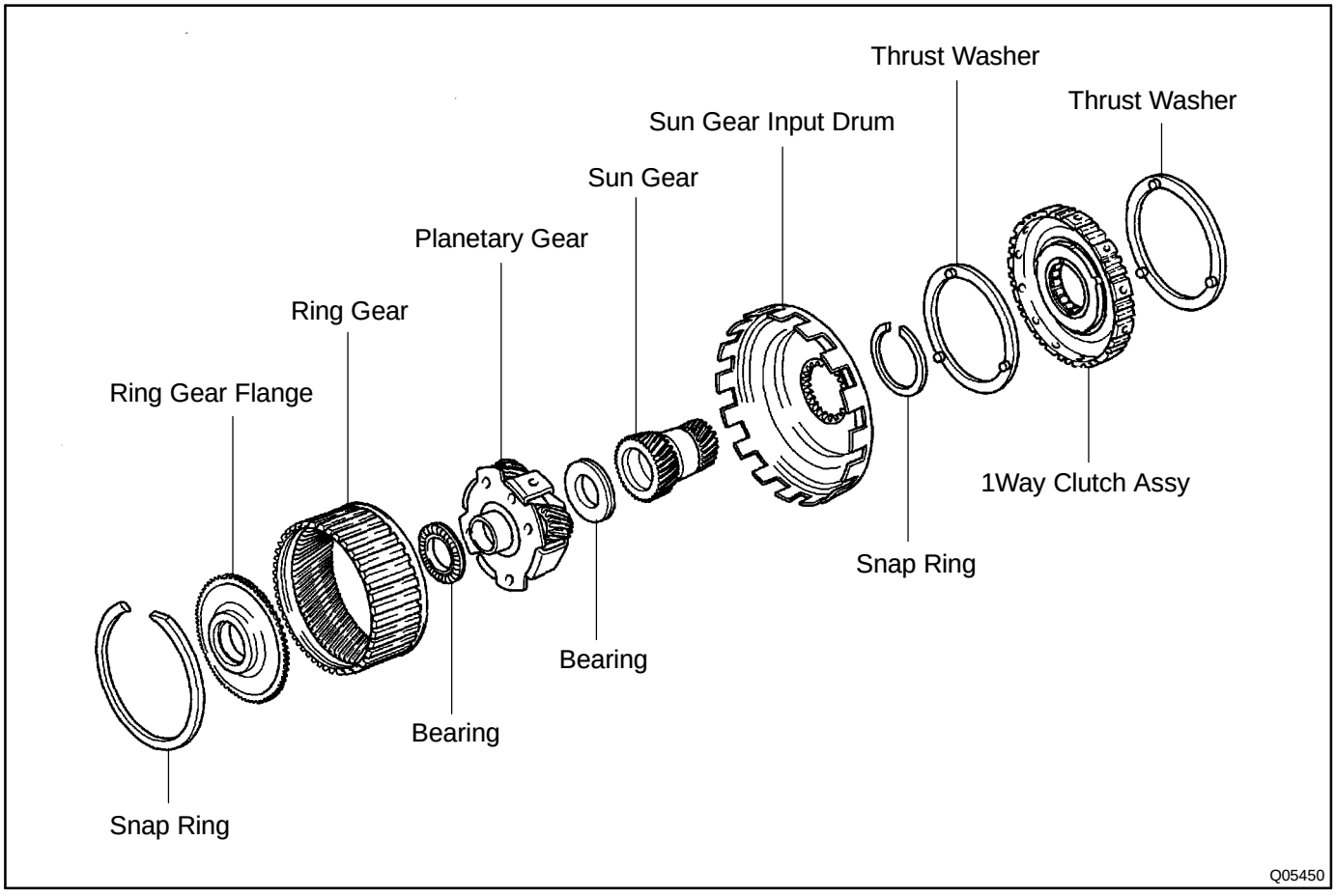
NOTICE:

Be careful not to damage the O-ring.

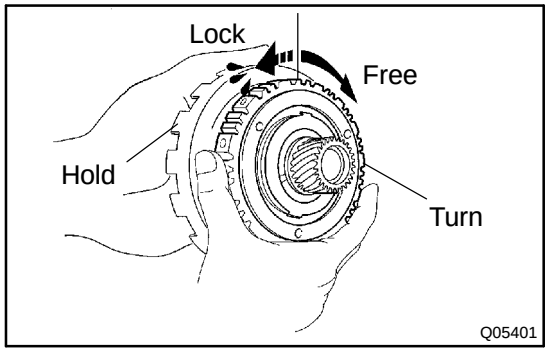
FRONT PLANETARY GEAR ASSY (A541E)

COMPONENTS

400PO-02



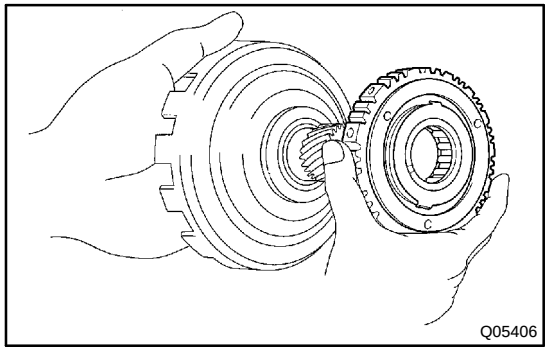
400PD-02



OVERHAUL

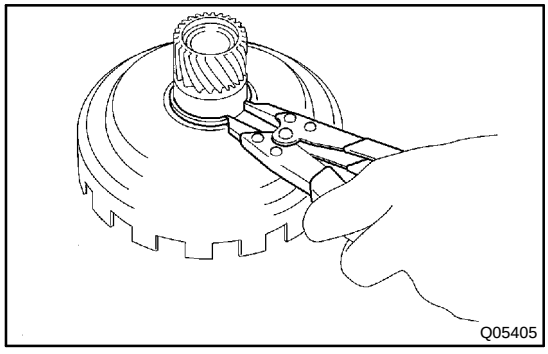
1. INSPECT 1 WAY CLUTCH ASSY

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



2. REMOVE 1 WAY CLUTCH ASSY

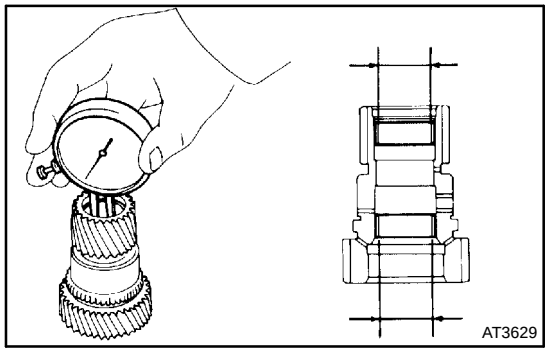
(a) While turning the hub clockwise, remove the No.1 one-way clutch from the sun gear.



3. REMOVE SUN GEAR INPUT DRUM SHAFT SNAP RING

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

(b) Remove the sun gear from the drum.

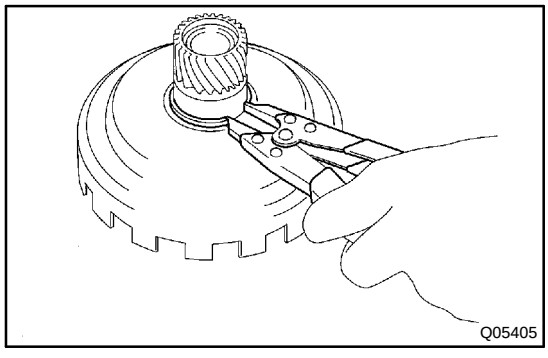


4. INSPECT PLANETARY SUN GEAR SUB-ASSY

(a) Using a dial indicator, measure the inside diameter of the sun gear bushings.

Maximum inside diameter:
22.59 mm (0.8894 in.)

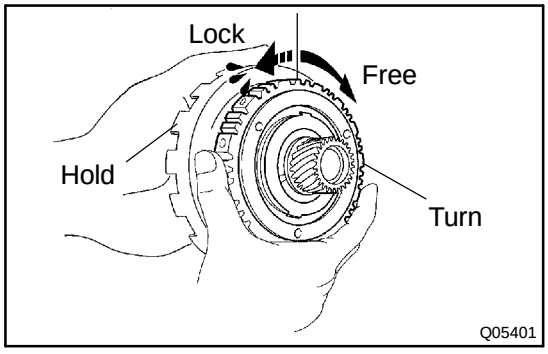
If the inside diameter is greater than the maximum, replace the sun gear.



5. INSTALL SUN GEAR INPUT DRUM SHAFT SNAP RING

(a) Install the sun gear to the drum.

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



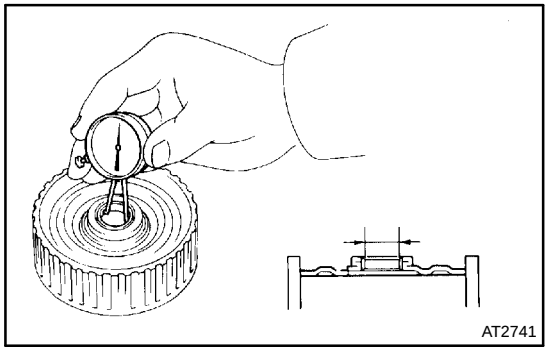
6. REMOVE 1 WAY CLUTCH ASSY

(a) Install the thrust washer.

(b) While turning the hub clockwise, slide the 1way clutch onto the sun gear.

7. INSPECT 1 WAY CLUTCH ASSY

(a) Recheck the opration of the 1way clutch (see step 1.)

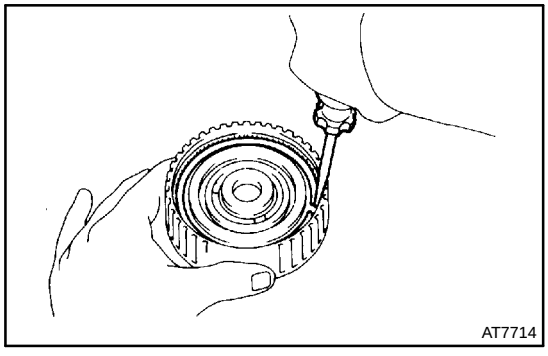


8. INSPECT FRONT PLANETARY RING GEAR

(a) Using a dial indicator, measure the inside diameter of the flange bushing.

Maximum inside diameter:
30.08 mm (1.1842 in.)

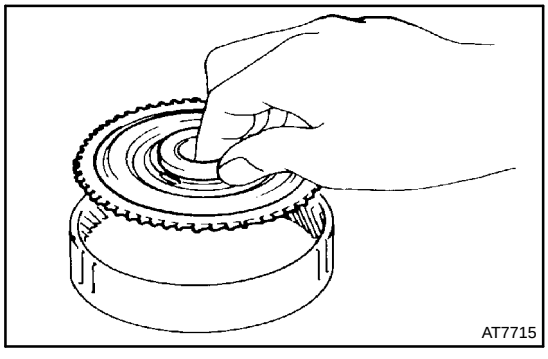
If the inside diameter is greater than the maximum, replace the flange.



9. REMOVE FRONT PLANETARY RING GEAR HOLE SNAP RING

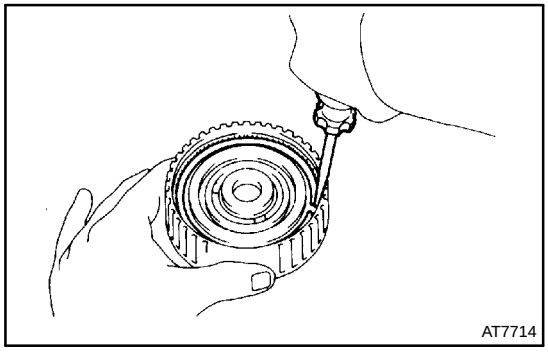
(a) Using a screwdriver, remove the snap ring.

(b) Remove the flange from the ring gear.

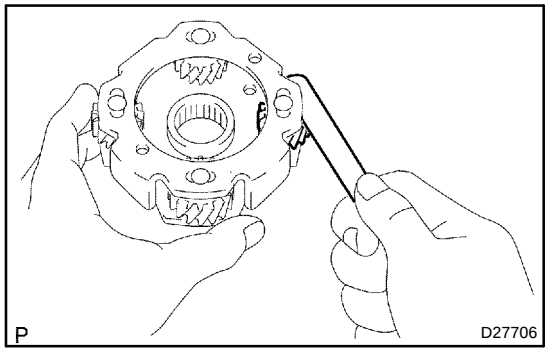


10. IINSTALL FRONT PLANETARY RING GEAR HOLE SNAP RING

(a) Position the flange into the ring gear.



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



11. INSPECT FRONT PLANETARY GEAR ASSY

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

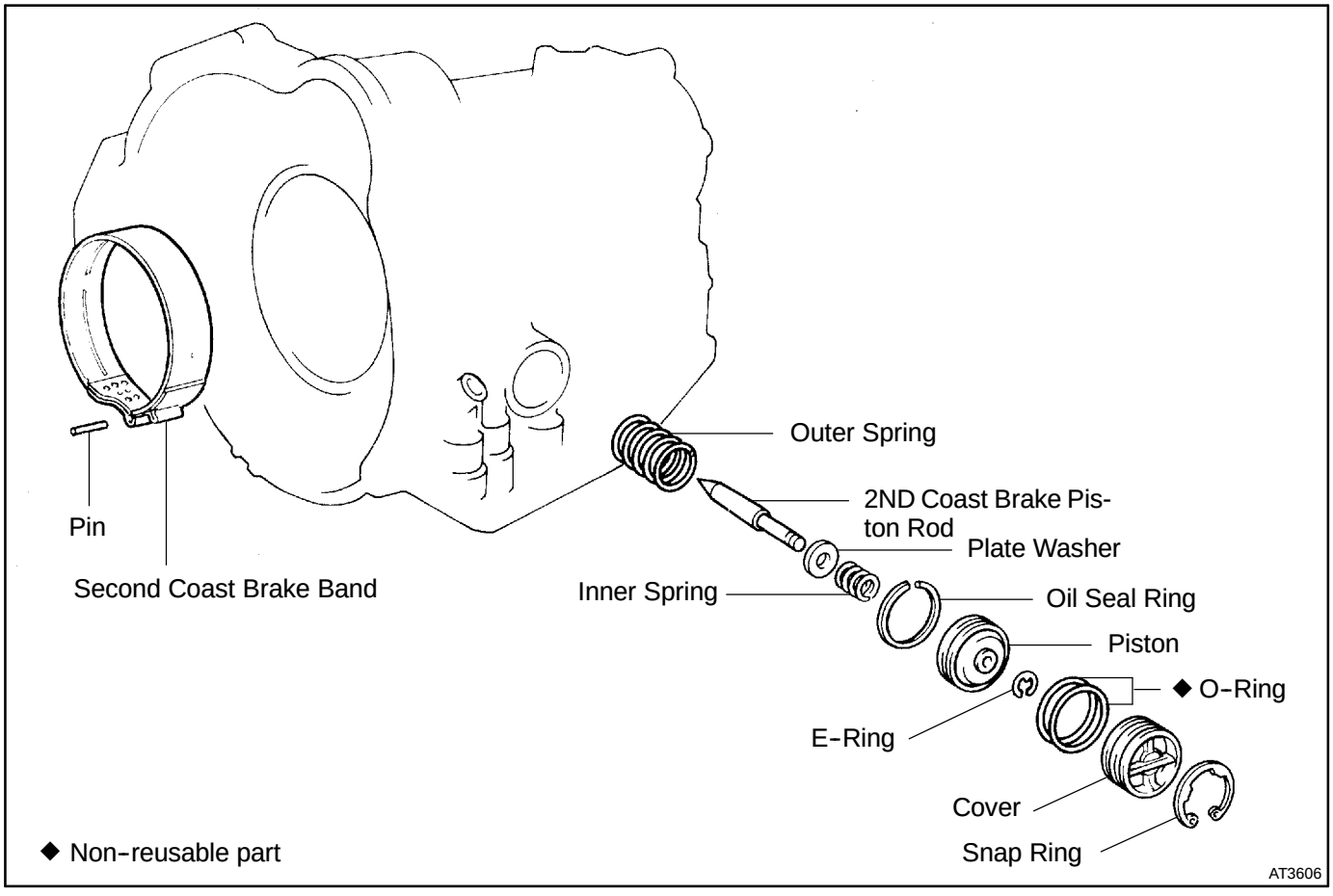
Standard clearance:
0.16 – 0.56 mm (0.0063 – 0.0220 in.)
Maximum clearance:
0.61 mm (0.0240 in.)

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

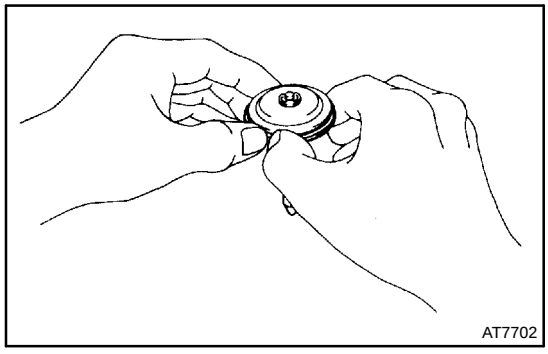
PISTON, 2ND COAST BRAKE (A541E)

400PP-02

COMPONENTS



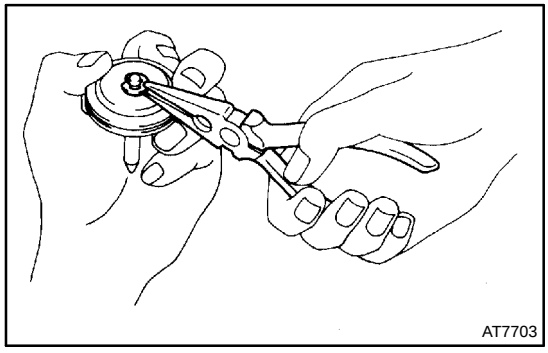
400PE-02



OVERHAUL

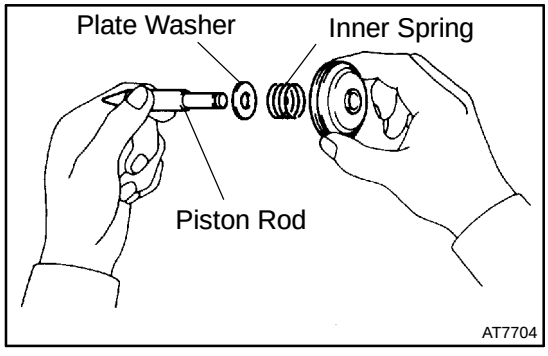
1. REMOVE 2ND COAST BRAKE PISTON OIL SEAL RING

(a) Remove the oil seal ring from the piston.

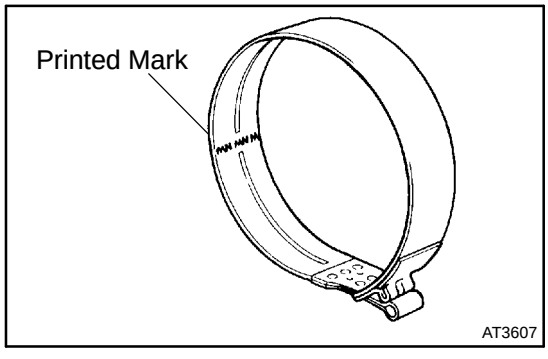


2. REMOVE 2ND COAST BRAKE PISTON ROD

(a) Remove the E-ring as pushing the piston with needle-nose pliers.

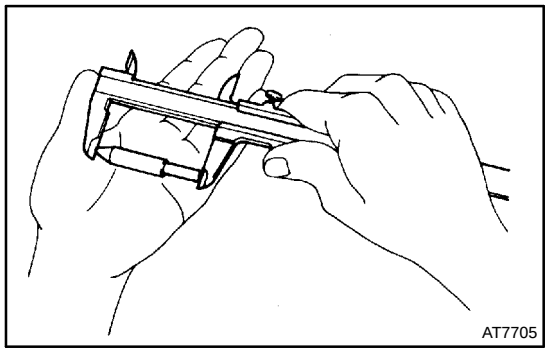


(b) Remove the inner spring, plate washer and piston rod.



3. INSPECT 2ND COAST BRAKE BAND ASSY

If the lining of the brake band is peeling off or discolored, or even part of the printed mark is defaced, replace the brake band.



4. ADJUST 2ND COAST BRAKE PISTON ROD

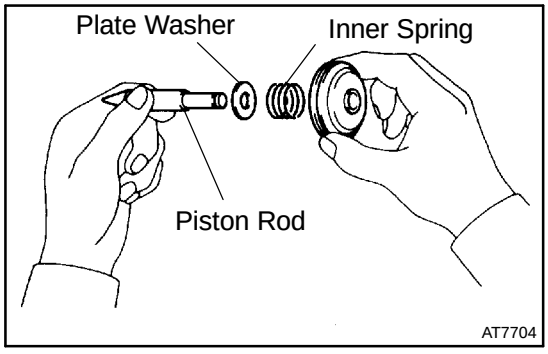
If the band is OK but the piston stroke is not within the standard value, select a new piston rod.

Piston stroke: 2.0 – 3.5 mm (0.079 – 0.138 in.)

HINT:

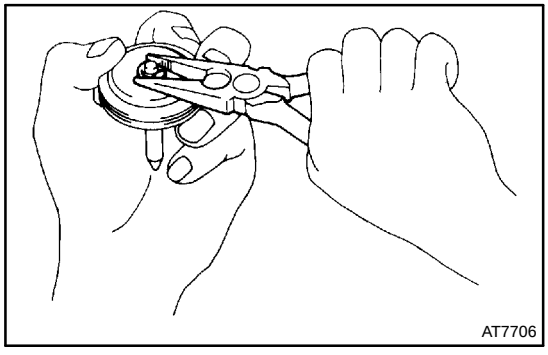
There are 2 lengths of piston rod.

Piston rod length:
95.2 mm (3.748 in.)
96.3 mm (3.791 in.)

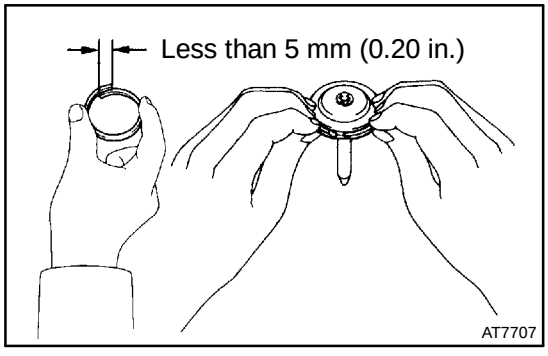


5. INSTALL 2ND COAST BRAKE PISTON ROD

(a) Install the plate washer and inner spring to the piston rod.



(b) Using needle-nose pliers install the E-ring while pushing the piston.



6. IINSTALL 2ND COAST BRAKE PISTON OIL SEAL RING

(a) Apply ATF to the oil seal ring.

(b) Install the oil seal ring to the piston.

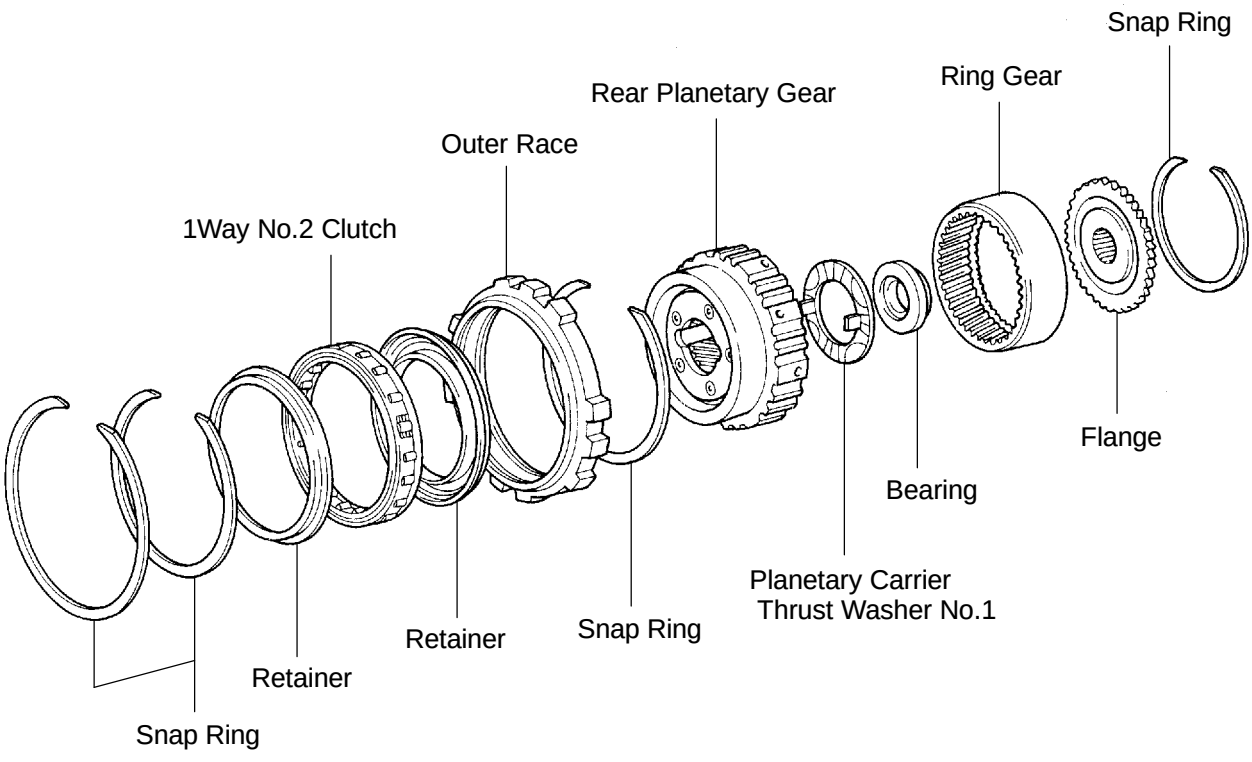
NOTICE:

Do not over-expand the ring ends.

REAR PLANETARY GEAR ASSY (A541E)

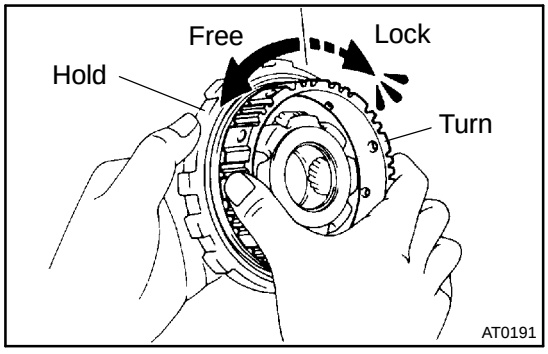
400PQ-02

COMPONENTS



400PF-02

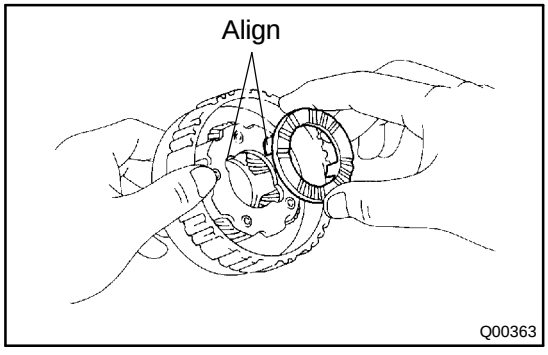
OVERHAUL



1. INSPECT 1 WAY NO.2 CLUTCH ASSY

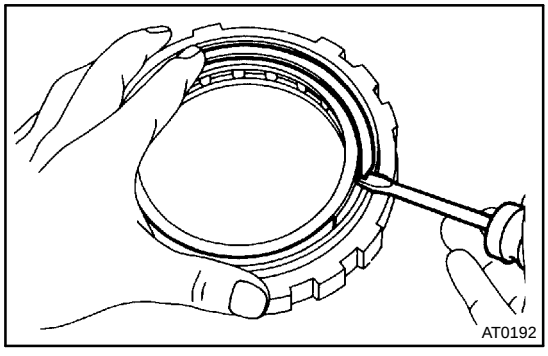
(a) Hold the outer race and turn the rear planetary gear. The rear planetary gear should turn freely counterclockwise and should lock clockwise.

2. SEPARATE 1 WAY NO.2 CLUTCH ASSY



3. REMOVE PLANETARY CARRIER THRUST WASHER NO.1

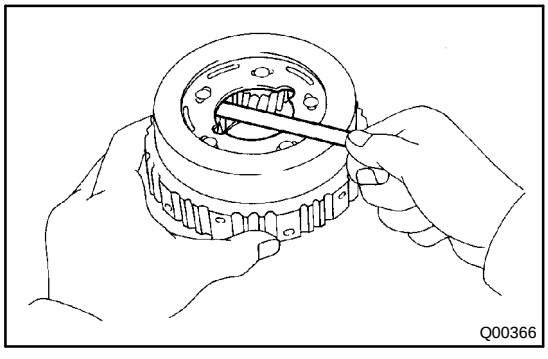
(a) Remove the thrust washer from the rear side of the planetary gear.



4. REMOVE 1 WAY NO.2 CLUTCH ASSY

(a) Using a screwdriver, remove the 2 snap rings and retainers from both sides.

(b) Remove the 1way No.2 clutch from the outer race.

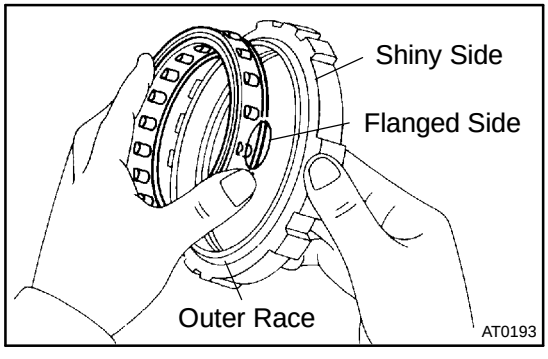


5. INSPECT REAR PLANETARY GEAR ASSY

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

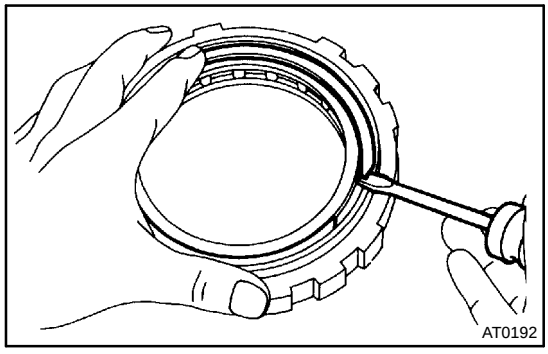
Standard clearance:
0.16 - 0.56 mm (0.0063 - 0.0220 in.)
Maximum clearance:
0.61 mm (0.0240 in.)

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

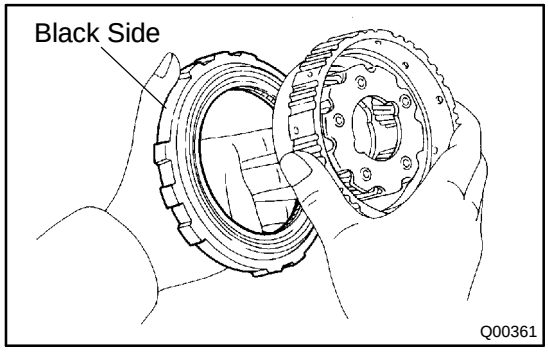


6. INSTALL 1 WAY NO.2 CLUTCH ASSY

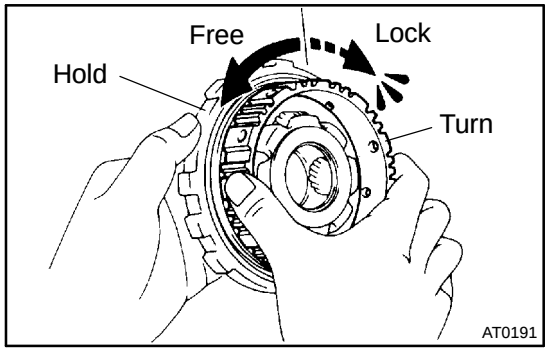
(a) Install the 1way No.2 clutch on the outer race, facing the flange side of the 1way No.2 clutch toward the shiny side of the outer race.



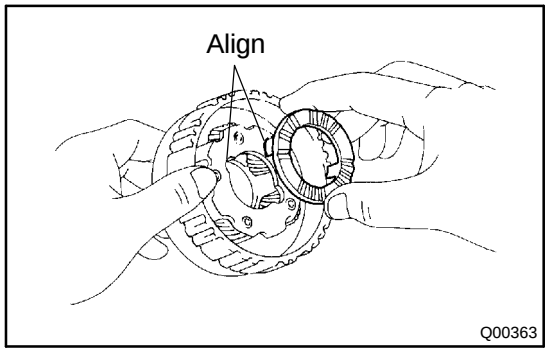
(b) Install the 2 retainers and snap rings to both sides.



(c) Install the planetary gear on the 1way No.2 clutch, facing the inner race of the rear planetary gear toward the black side of the 1way No.2 clutch outer race.

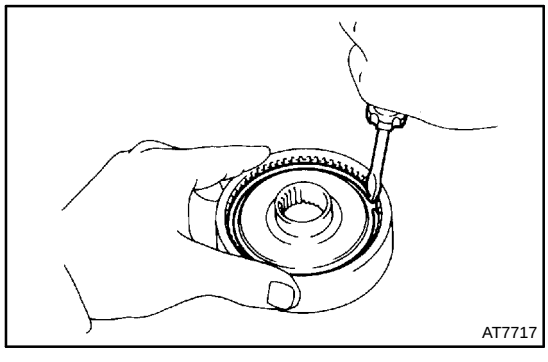


7. INSPECT 1 WAY NO.2 CLUTCH ASSY



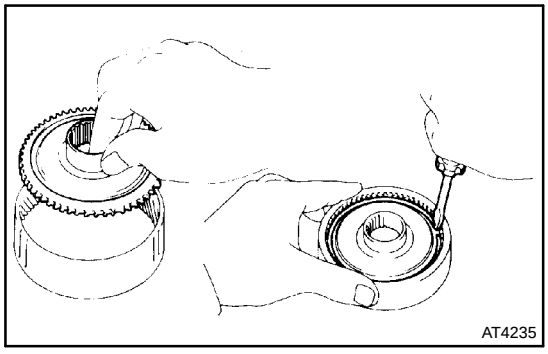
8. INSTALL PLANETARY CARRIER THRUST WASHER NO.1

(a) Coat the thrust washer with petroleum jelly.
(b) Align the planetary carrier tab of the washer with the hollows of the carrier.



9. REMOVE REAR PLANETARY RING GEAR FLANGE

(a) Using a screwdriver, remove the snap ring.
(b) Remove the flange from the ring gear.



10. INSTALL REAR PLANETARY RING GEAR FLANGE

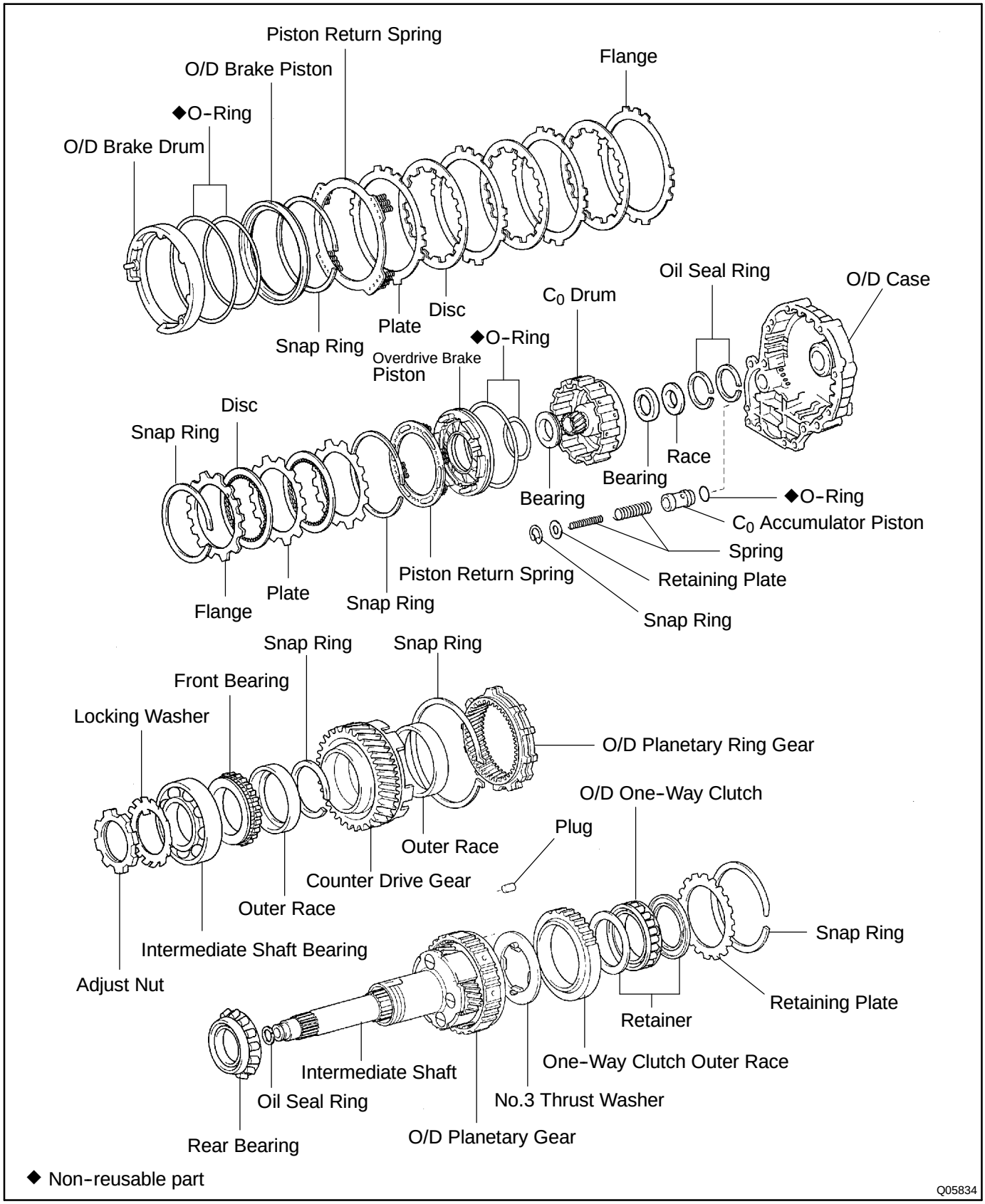
(a) Position the flange into the ring gear.

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

OVERDRIVE DIRECT CLUTCH ASSY (A541E)

400PR-02

COMPONENTS

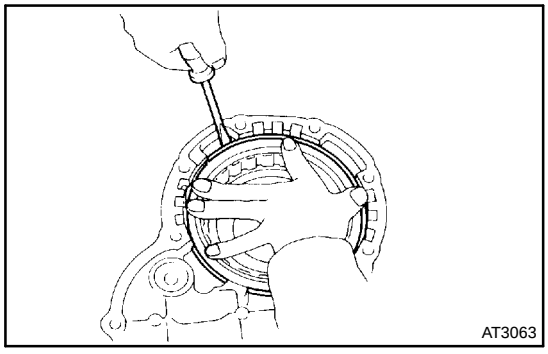


◆ Non-reusable part

Q05834

400PG-02

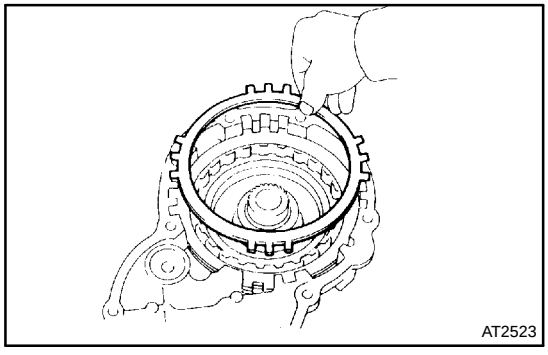
OVERHAUL



1. REMOVE OVERDRIVE BRAKE RETURN SPRING SUB-ASSY

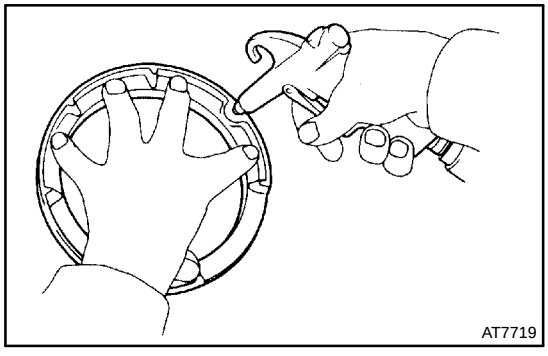
(a) While pushing the return spring, remove the snap ring with a screwdriver.

(b) Remove the piston return spring.



2. REMOVE OVERDRIVE BRAKE CLUTCH PLATE

(a) Remove the 2 plate, 2 discs and flange.

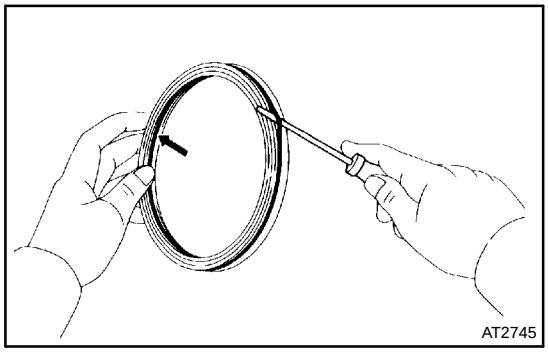


3. REMOVE OVERDRIVE BRAKE PISTON

(a) Apply compressed air (392-785 kPa, 4-8 kgf/cm^2, 57-114 psi) to oil hole to remove the piston.

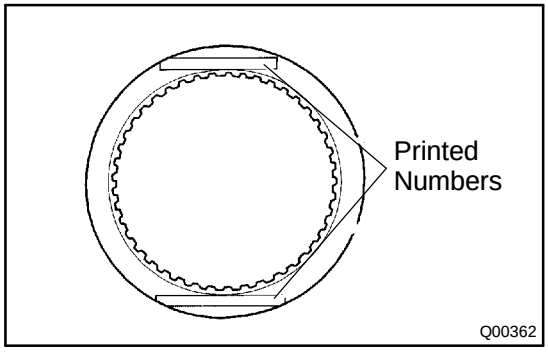
HINT:

Blow with the gun slightly away from the oil hole, and be careful that the piston does not slant.



4. REMOVE OVERDRIVE BRAKE PISTON O-RING

(a) Using a screwdriver, remove the inner and outer O-rings from the piston.

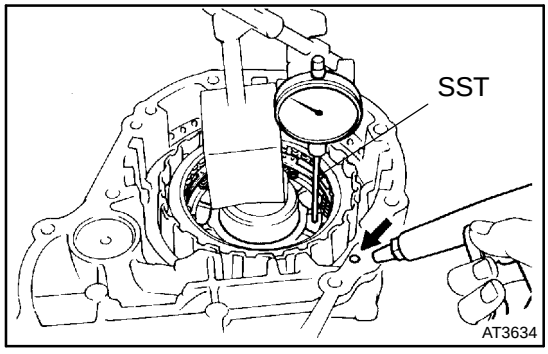


5. INSPECT OVERDRIVE BRAKE CLUTCH PLATE

(a) Check if the sliding surfaces of the discs, plates 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 are defaced, replace all discs.
- Before assembling new discs, soak them in ATF for at least 15 minutes.



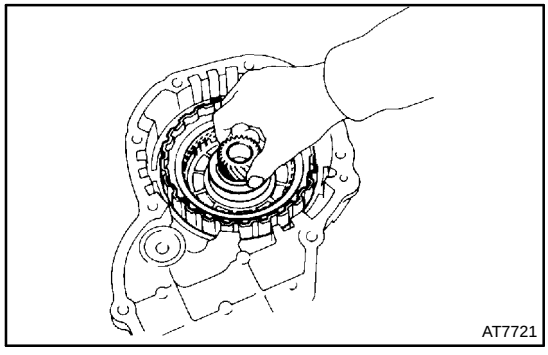
6. INSPECT PISTON STROKE OF OVERDRIVE DIRECT CLUTCH

(a) Install a dial indicator and measuring terminal (SST) together, measure the piston stroke while applying and releasing compressed air (392 – 785 kPa, 5 – 8 kgf/cm^2, 57 – 114 psi).

SST 09350–32014 (09351–32190)

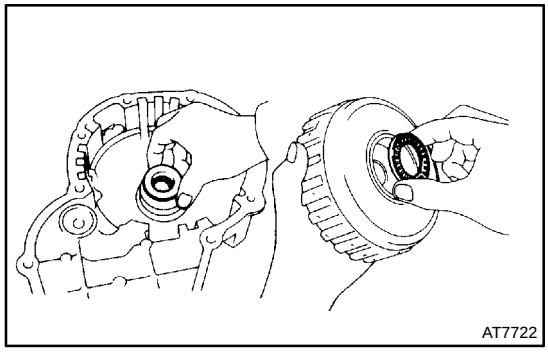
Piston stroke: 1.75 – 2.49 mm (0.0689 – 0.0980 in.)

If the piston stroke is greater than the maximum, inspect each component.

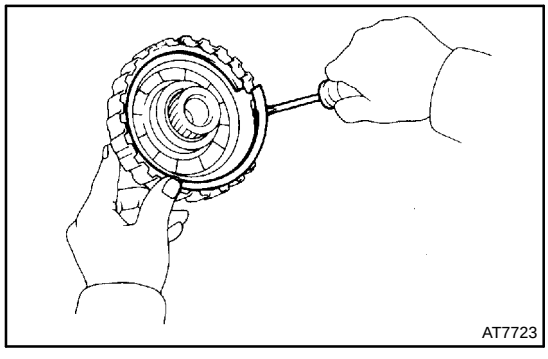


7. REMOVE OVERDRIVE DIRECT CLUTCH PISTON SUB–ASSY

(a) Remove the overdrive direct clutch piston sub–assy.

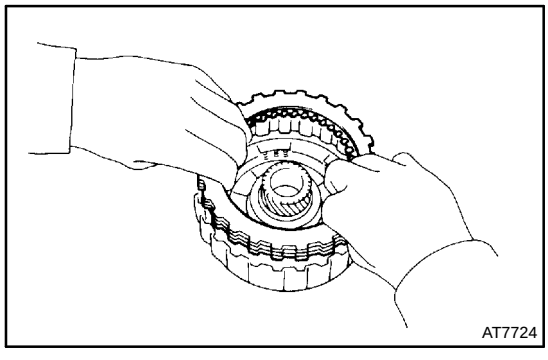


(b) Remove the bearing and race from the clutch drum and case.

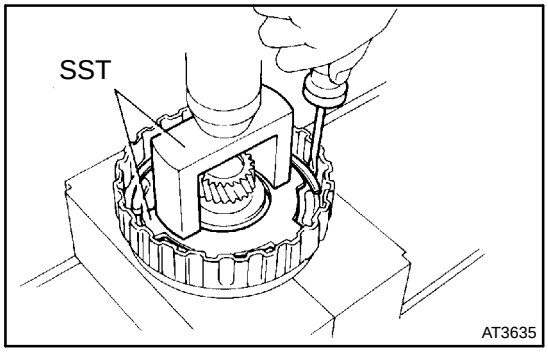


8. REMOVE OVERDRIVE CLUTCH FLANGE

(a) Remove the snap ring.



(b) Remove the flanges, discs and plates.



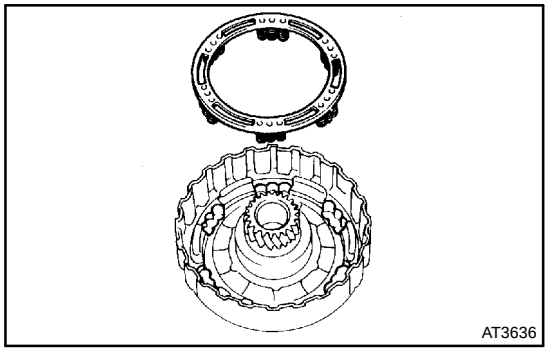
9. REMOVE OVERDRIVE CLUTCH RETURN SPRING SUB-ASSY

(a) Place SST on the spring retainer and compress the spring with a press.
SST 09350-32014 (09351-32070, 09351-32200)

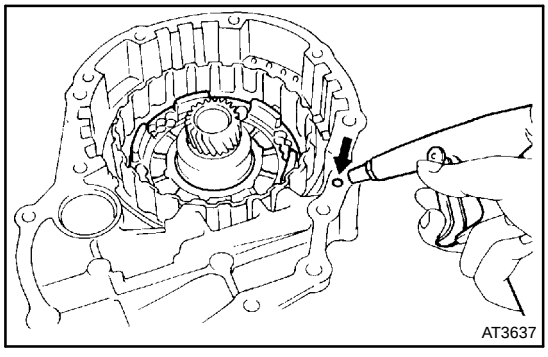
NOTICE:

- **Stop pressing when the spring sheet is lowered 1-2 mm (0.039-0.078 in.) from the snap ring groove, preventing the spring sheet from deforming.**
- **Do not expand the snap ring excessively.**

(b) Remove the snap ring.



(c) Remove the piston return spring.



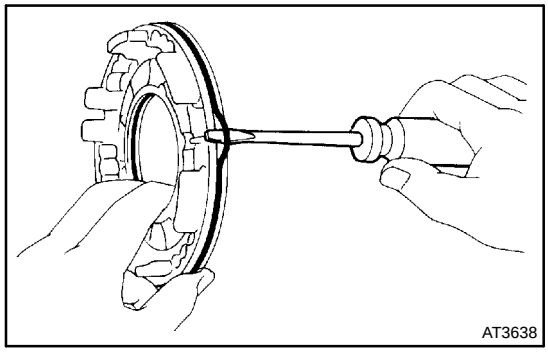
10. REMOVE OVERDRIVE DIRECT CLUTCH PISTON SUB-ASSY

(a) Install the clutch drum on the case.

(b) Apply compressed air (392 - 785 kPa, 5 - 8 kgf/cm^2, 57 - 114 psi) to the pressure apply hole of the case.

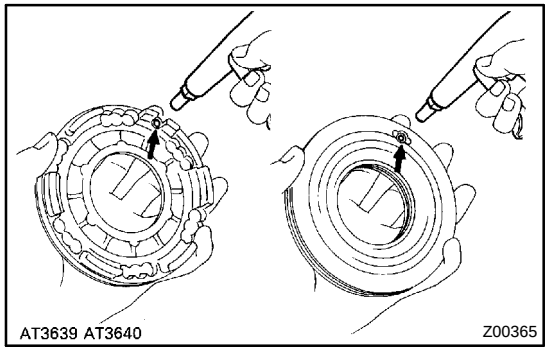
(c) Remove the piston from the clutch drum.
If the piston does not come out completely, use needle-nose pliers to remove it.

(d) Remove the clutch drum from the case.



11. REMOVE OVERDRIVE DIRECT CLUTCH PISTON O-RING

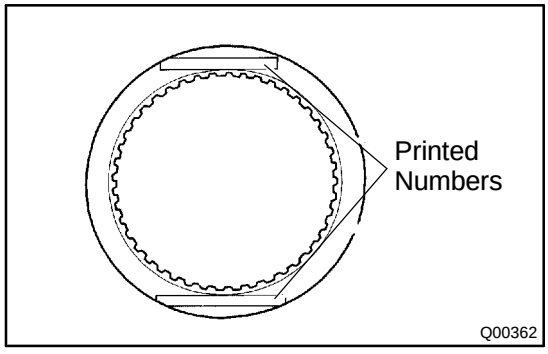
(a) Remove the 2 O-rings from the piston.



12. INSPECT OVERDRIVE DIRECT CLUTCH PISTON SUB-ASSY

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

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

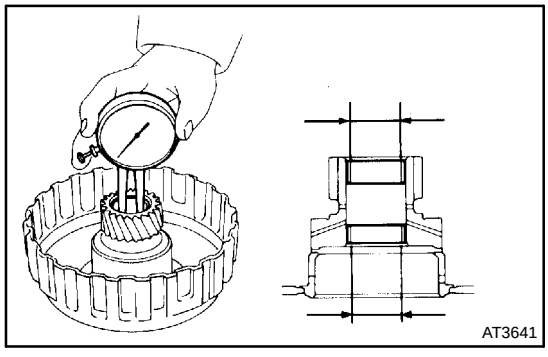


13. INSPECT OVERDRIVE CLUTCH FLANGE

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

HINT:

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

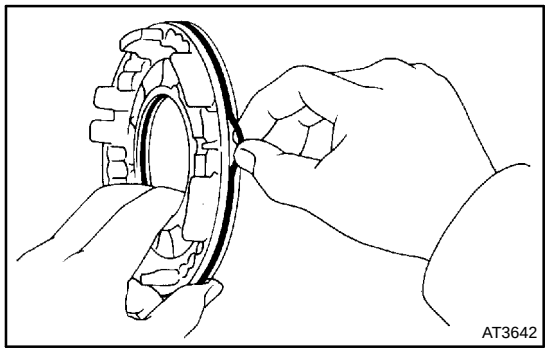


14. INSPECT OVERDRIVE DIRECT CLUTCH DRUM SUB-ASSY

(a) Using a dial indicator, measure the inside diameter of the 2 direct clutch bushings.

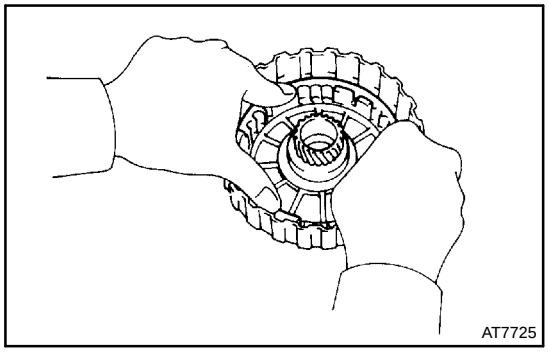
Maximum inside diameter: 22.13 mm (0.8713 in.)

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



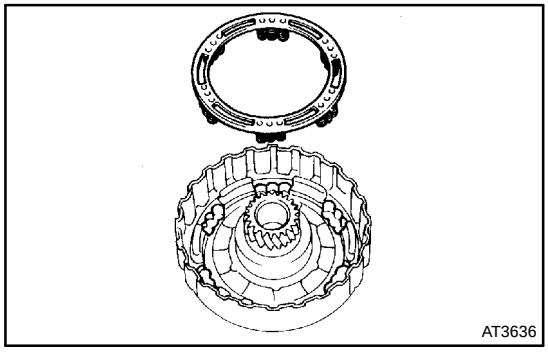
15. INSTALL OVERDRIVE DIRECT CLUTCH PISTON O-RING

(a) Install new O-rings to the piston. Coat the O-rings with ATF.



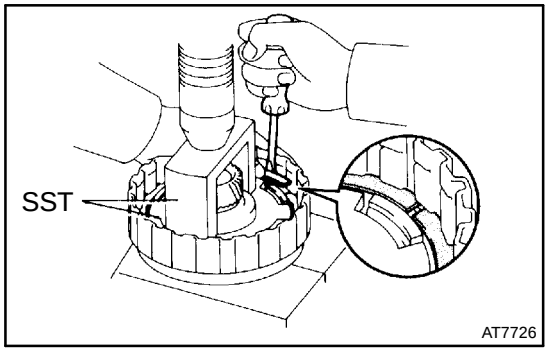
(b) Press the piston into the drum with the cup side up, being careful not to damage the O-ring.

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



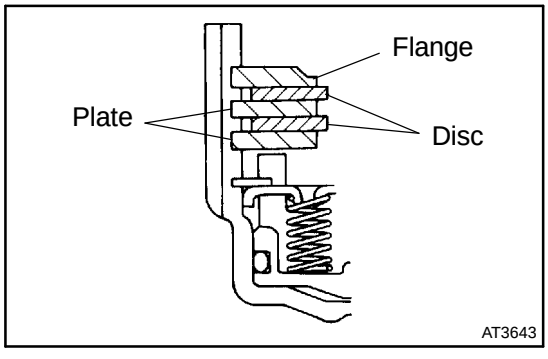
16. INSTALL OVERDRIVE CLUTCH RETURN SPRING SUB-ASSY

(a) Install the return spring and seat snap ring in place.

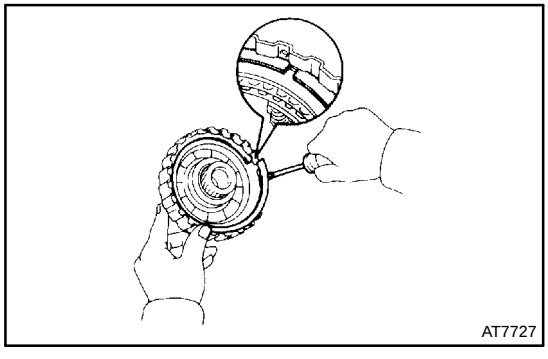


(b) Place SST on the spring retainer, and compress the spring with a press.
SST 09350-32014 (09351-32070, 09351-32200)

(c) Install the snap ring with a screwdriver. Be sure the end gap of the snap ring is aligned with the groove of the clutch drum.

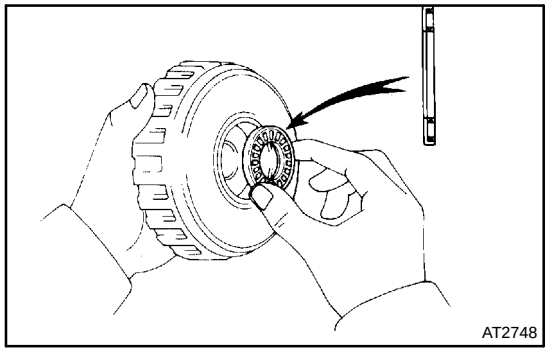


17. INSTALL OVERDRIVE CLUTCH FLANGE
Install in order: P = Plate D = Disc
P - D - P - D - Flange



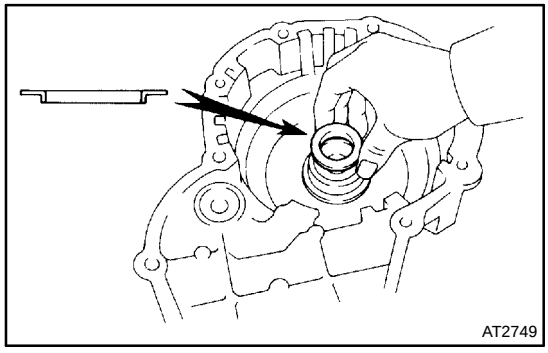
18. INSTALL OVERDRIVE CLUTCH FLANGE HOLE SNAP RING

(a) Be sure the end gap of the snap ring is not aligned with the groove of the clutch drum.

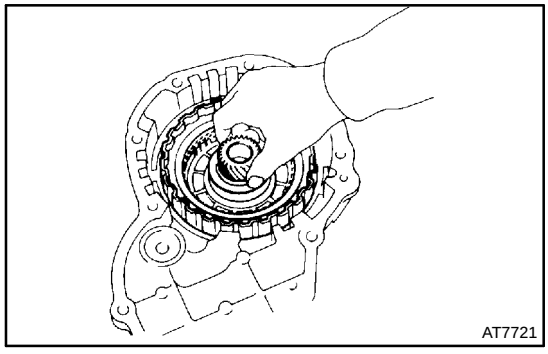


19. INSTALL OVERDRIVE DIRECT CLUTCH THRUST NEEDLE ROLLER BEARING

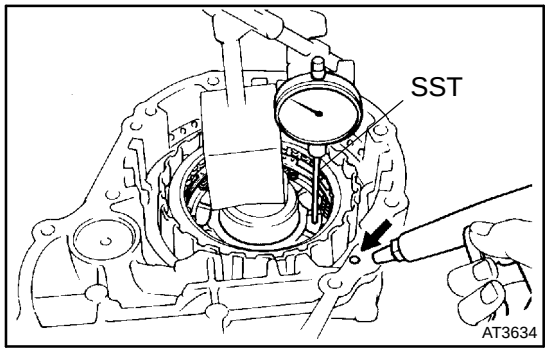
(a) Coat the bearing with petroleum jelly and install it facing the race side downward to the clutch drum.
Bearing outer diameter: 46.3 mm (1.823 in.)
Bearing inner diameter: 26.2 mm (1.031 in.)



(b) Coat the race with petroleum jelly and install it in the case.
Race outer diameter: 43.0 mm (1.693 in.)
Race inner diameter: 24.5 mm (0.965 in.)

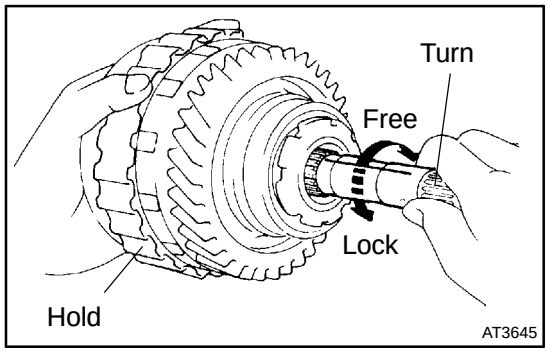


20. INSTALL OVERDRIVE DIRECT CLUTCH DRUM SUB-ASSY



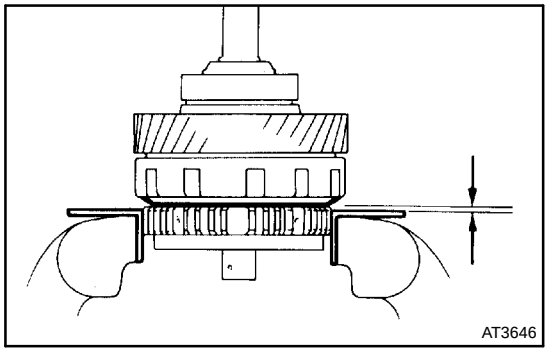
21. INSPECT PISTON STROKE OF OVERDRIVE DIRECT CLUTCH

(a) Install a dial indicator and measuring terminal (SST) together, measure the piston stroke while applying and releasing compressed air (392 – 785 kPa, 4 – 8 kgf/cm^2, 57 – 114 psi).
Piston stroke: 1.75 – 2.49 mm (0.0689 – 0.0980 in.)
SST 09350-32014 (09351-32190)



22. INSPECT OVERDRIVE ONE WAY CLUTCH

(a) Install the O/D direct clutch on the one-way clutch.
(b) Hold the O/D direct clutch and turn the intermediate shaft. The shaft should turn freely clockwise and should lock counterclockwise.
(c) Remove the O/D direct clutch.

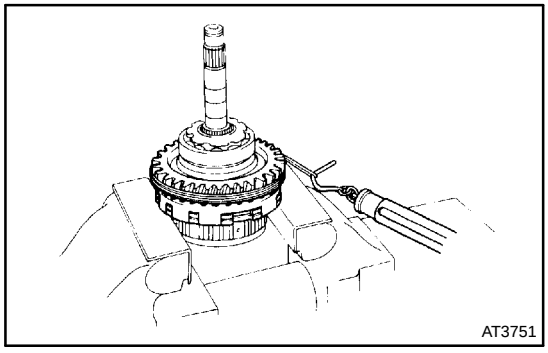

AT3646

23. INSPECT OVERDRIVE PLANETARY GEAR ASSY

(a) Hold the O/D planetary gear in a vise with soft jaws.

HINT:

Do not let the counter drive gear to touch the vise directly.


AT3751

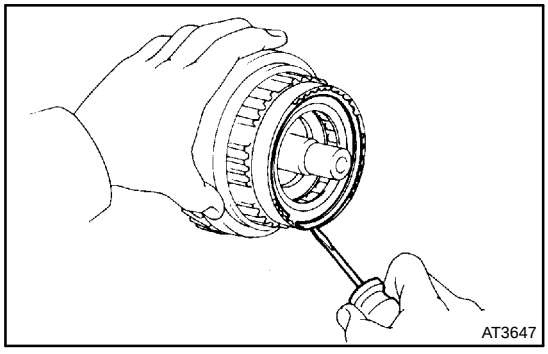
(b) Using a tension gauge, measure the preload.

Preload (at starting):

9.2 - 15.3 N (940 - 1560 g, 2.1 - 3.4 lb)

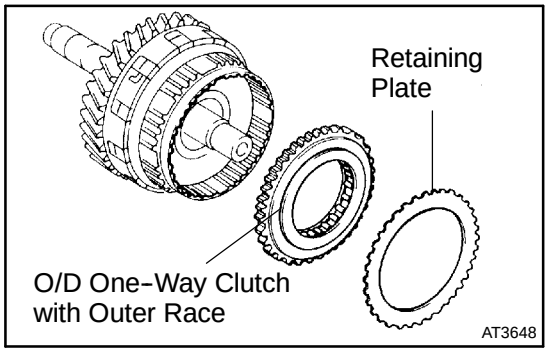
HINT:

Turn the counter drive gear right and left several times before measuring the preload.


AT3647

24. REMOVE OVERDRIVE 1 WAY CLUTCH

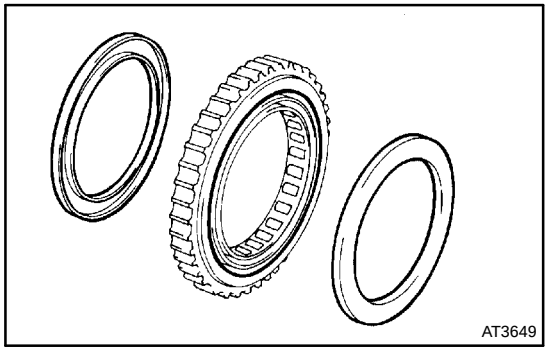
(a) Remove the snap ring.



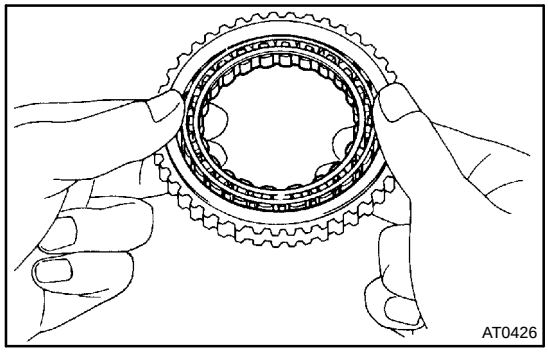
AT3648

(b) Remove the retaining plate.

(c) Remove the O/D one-way clutch with outer race.


AT3649

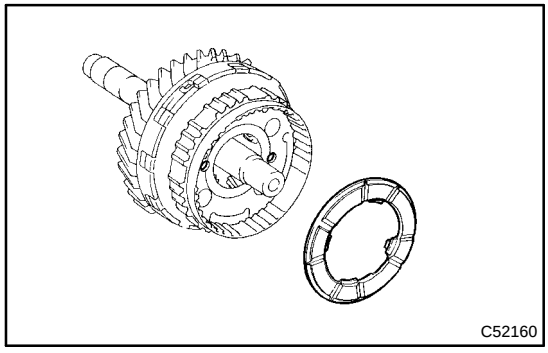
(d) Remove the 2 retainers from both sides of the O/D one-way clutch.



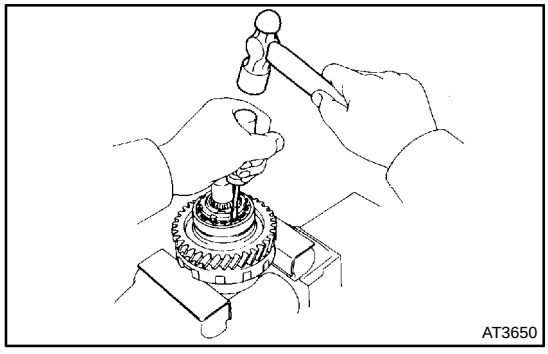
(e) Remove the O/D one-way clutch from the outer race.

HINT:

Note the direction of the one-way clutch.

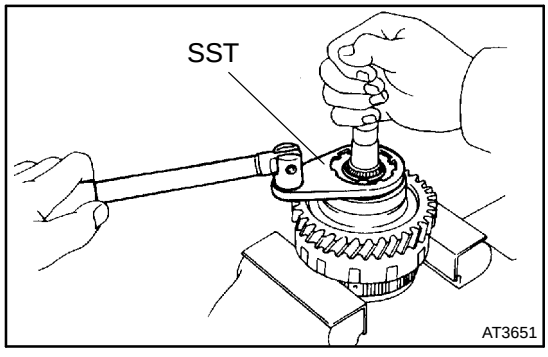


25. REMOVE OVERDRIVE PLANETARY GEAR THRUST WASHER NO.3



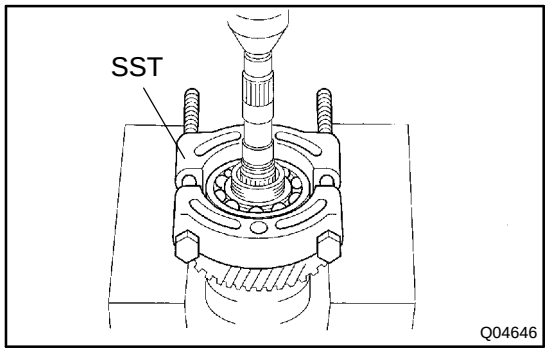
26. REMOVE OVERDRIVE PLANETARY GEAR NUT

(a) Pry off the locking washer.



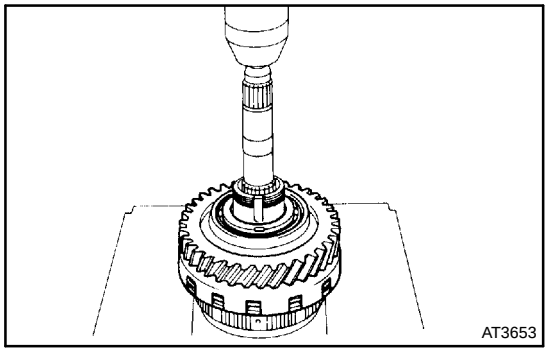
(b) Using SST, loosen the adjusting nut.
SST 09350-32014 (09351-32080)

(c) Remove the adjusting nut and locking washer.



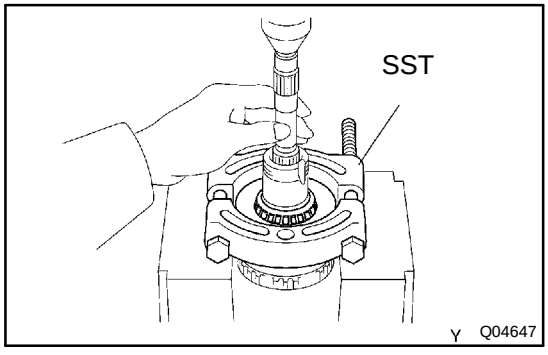
27. REMOVE OVERDRIVE PLANETARY GEAR RADIAL BALL BEARING

(a) Using SST, press out the bearing from the shaft.
SST 09350-32014 (09351-32080)

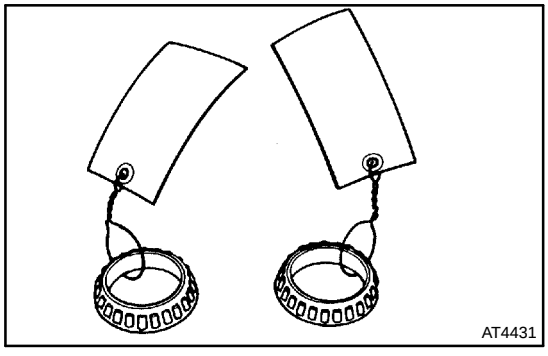


28. REMOVE COUNTER DRIVE GEAR BEARING

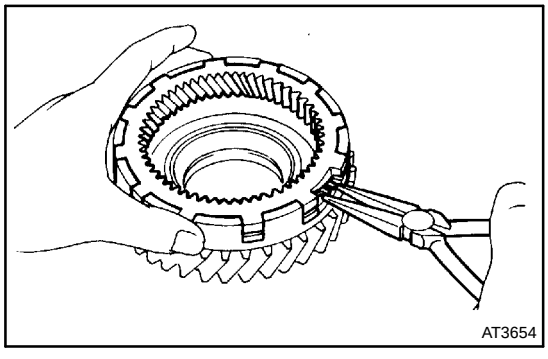
(a) Press out the gear and bearing together.



(b) Using SST, press out the bearing.
SST 09950-00020



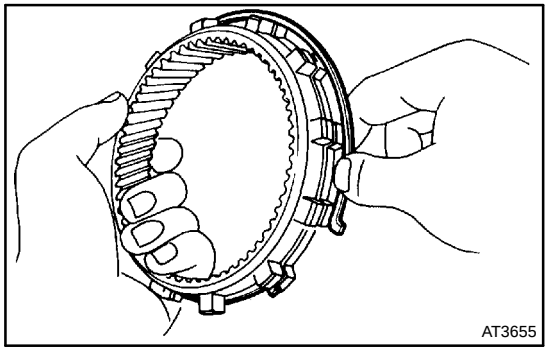
(c) Tag the bearings to show the location for reassembly.



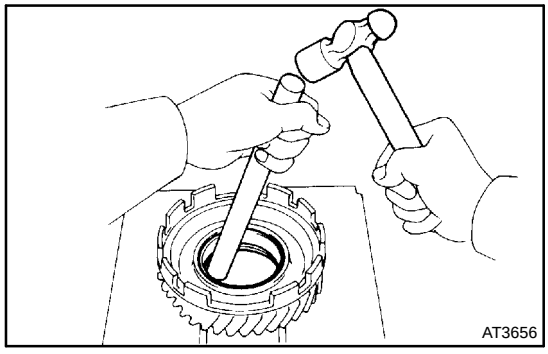
29. REMOVE OVERDRIVE PLANETARY RING GEAR

(a) While pulling up the ring gear, compress the snap ring with needle-nose pliers and remove it from the groove.

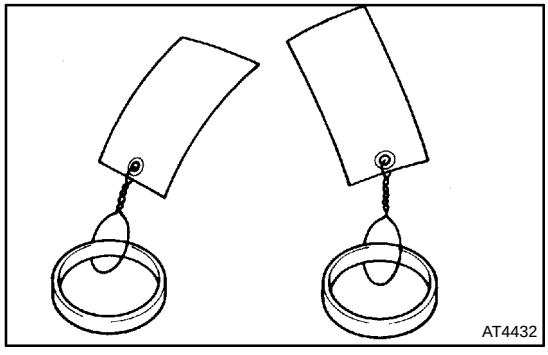
(b) Remove the ring gear from the counter drive gear.



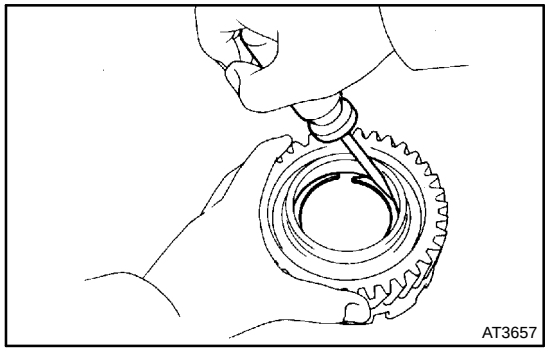
(c) Remove the snap ring from the ring gear.



(d) Drive out the 2 races with a brass bar and hammer.

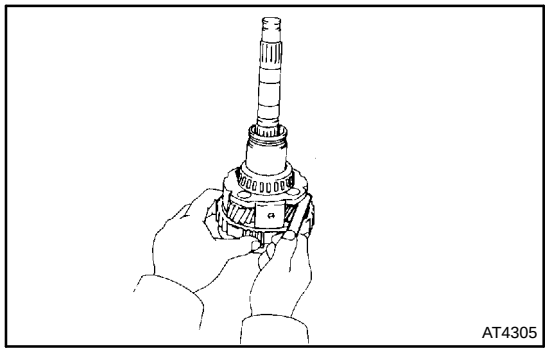


(e) Tag the races to show the location for reassembly.



30. REMOVE OVERDRIVE PLANETARY RING GEAR HOLE SNAP RING

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

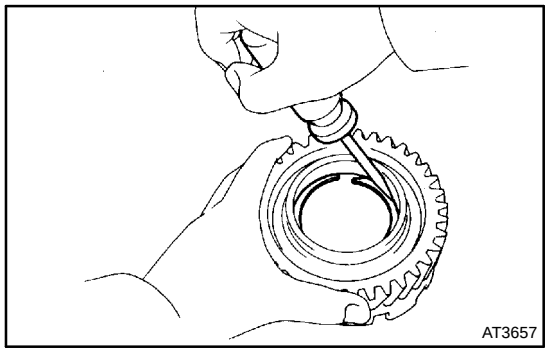


31. INSPECT OVERDRIVE PLANETARY GEAR ASSY

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

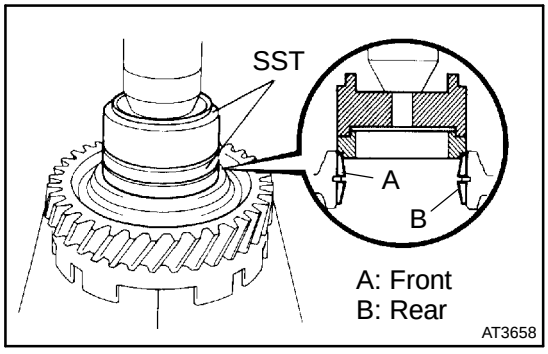
Standard clearance:
0.16 – 0.56 mm (0.0063 – 0.0220 in.)
Maximum clearance: 0.61 mm (0.0240 in.)

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



32. INSTALL OVERDRIVE PLANETARY RING GEAR HOLE SNAP RING

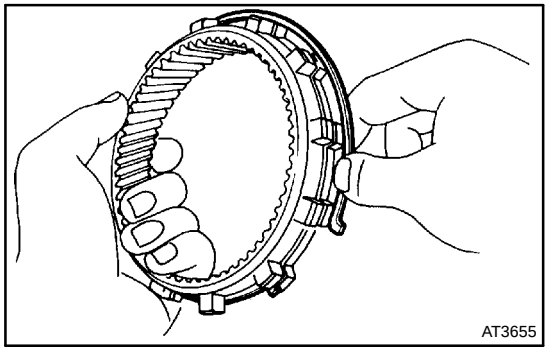
(a) Install the snap ring with a screwdriver.



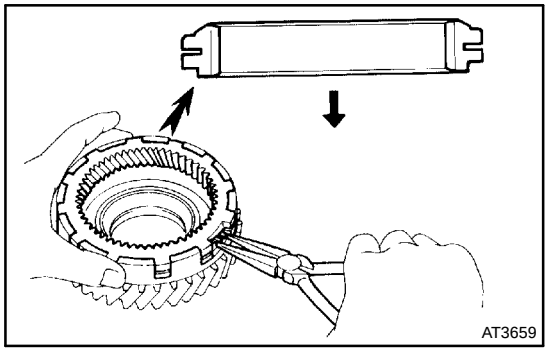
33. INSTALL OVERDRIVE PLANETARY RING GEAR

(a) Using SST, press in the 2 outer races to both sides of the gear.
SST 09350-32014 (09351-32120, 09351-32150)

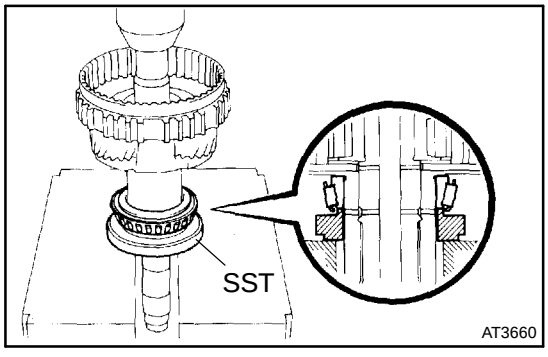
HINT:
Press in the 2 outer races until they touch the snap ring. Tap the races in straight, to avoid slanting.



(b) Install the snap ring to the ring gear.



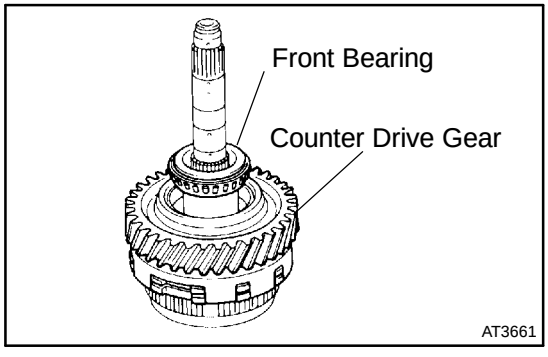
(c) As pushing down the ring gear, squeeze the snap ring end with needle-nose pliers, and install it into the groove.



34. INSTALL COUNTER DRIVE GEAR BEARING

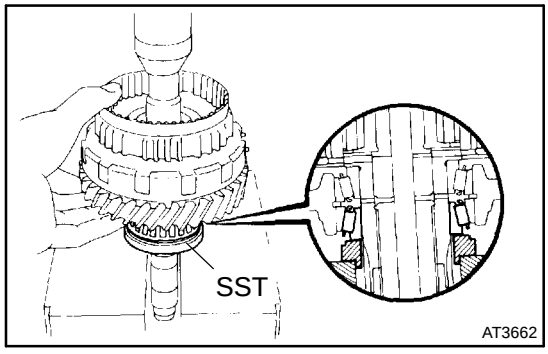
(a) Using SST, press the bearing onto the shaft.
SST 09350-32014 (09351-32120)

HINT:
Press the bearing until the side surface of the inner race touches the planetary carrier.



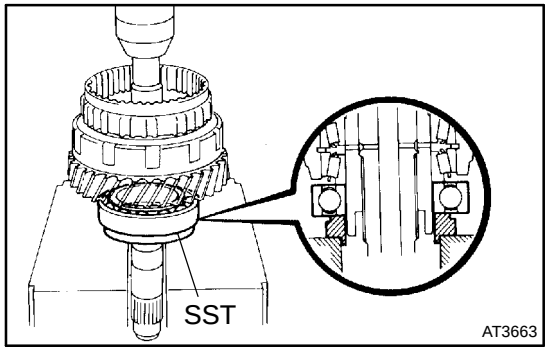
(b) Install the gear onto the shaft, and mesh the ring gear with the planetary pinions.

(c) Place the front bearing onto the shaft.



(d) Using SST, press in the bearing until there is slight play between the bearings.

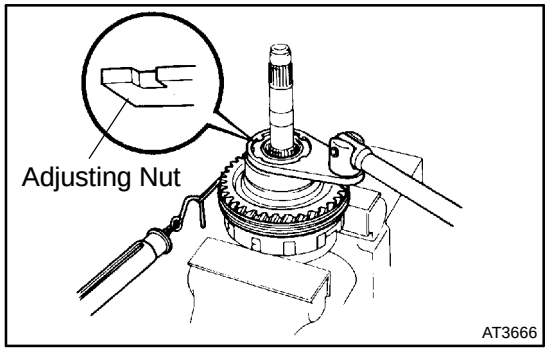
HINT:
Hold the ring gear to prevent it from falling.



35. INSTALL OVERDRIVE PLANETARY GEAR RADIAL BALL BEARING

(a) Using SST, press the bearing until it slightly touches the front bearing of the counter drive gear.
SST 09350–32014 (09351–32080)

HINT:
The counter drive gear should be turned.

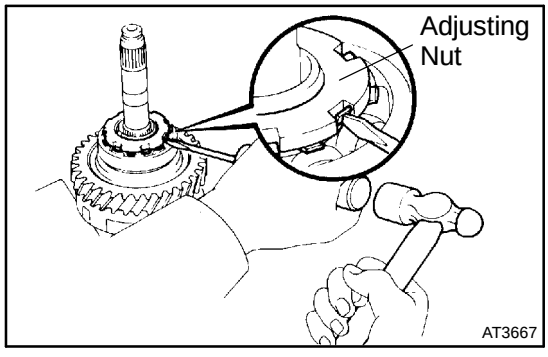


36. INSTALL OVERDRIVE PLANETARY GEAR NUT

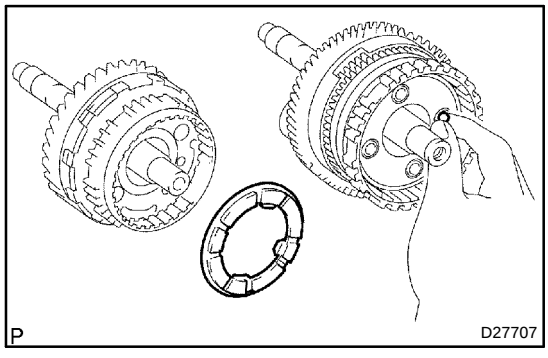
(a) Hold the overdrive planetary gear in a vise with soft jaws.

(b) Using SST, tighten the adjusting nut until the following gear starting load is reached on the tension gauge.
SST 09350–32014 (09351–32080)
Preload (at starting):
9.2 – 15.3 N (940 – 1,560 g, 2.1 – 3.4 lb)

HINT:
Turn the counter drive gear to the right and left several times before measuring the preload.

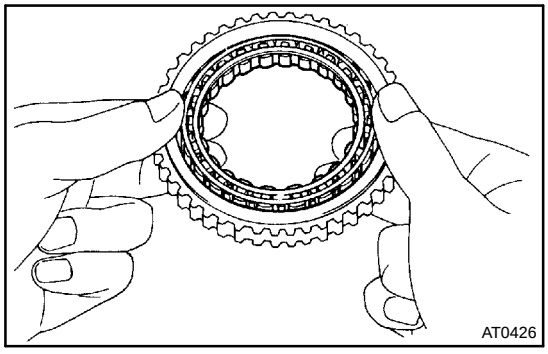


(c) Engage grooues of the adjusting not with a locking washer tab by bending its clams.



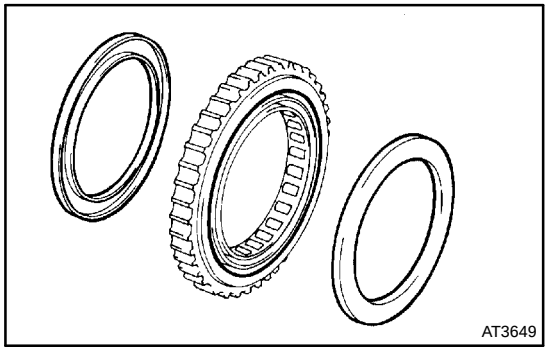
37. INSTALL OVERDRIVE PLANETARY GEAR THRUST WASHER NO.3

(a) Install the overdrive planetary gear thrust washer No.3.

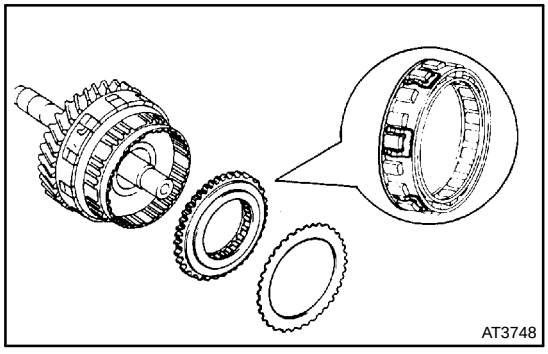


38. INSTALL OVERDRIVE 1 WAY CLUTCH

(a) Install the one-way clutch into the outer race.



(b) Install the 2 retainers on both sides of the one-way clutch.

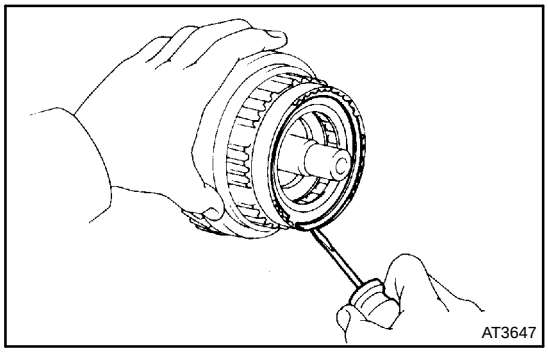


(c) Install the one-way clutch into the overdrive planetary gear.

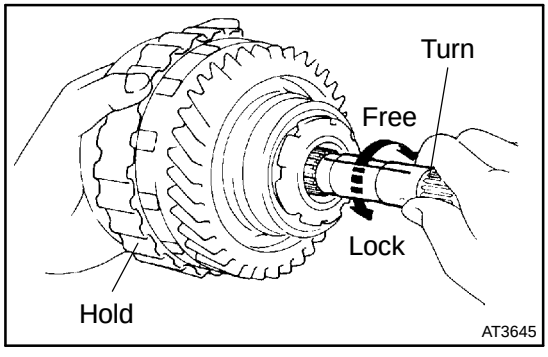
HINT:

Be sure that the one-way clutch is installed in the correct direction.

(d) Install the retaining plate.



(e) Install the snap ring.

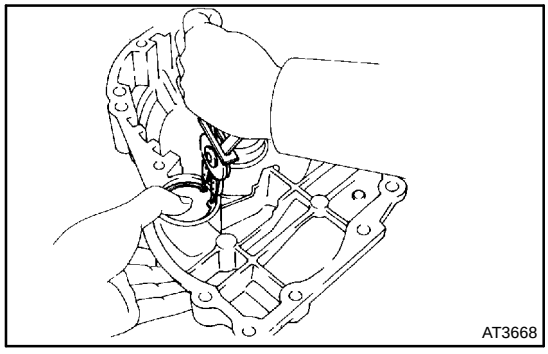


39. INSPECT OVERDRIVE ONE WAY CLUTCH

(a) Install the overdrive direct clutch into the one-way clutch.

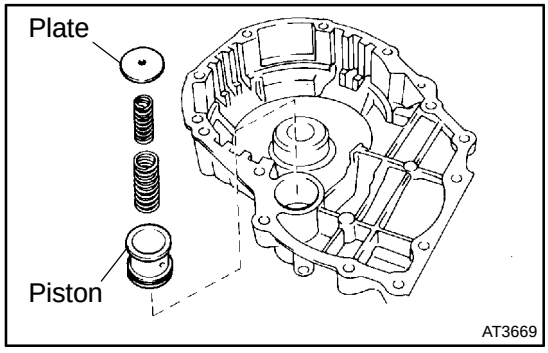
(b) Hold the overdrive direct clutch and turn the intermediate shaft. The shaft should turn freely clockwise and should lock counterclockwise.

(c) Remove the overdrive direct clutch.



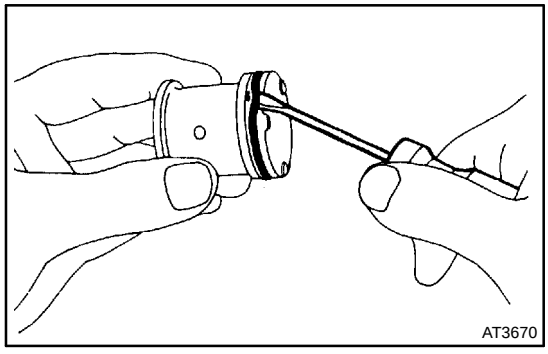
40. REMOVE C-0 ACCUMULATOR PISTON

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

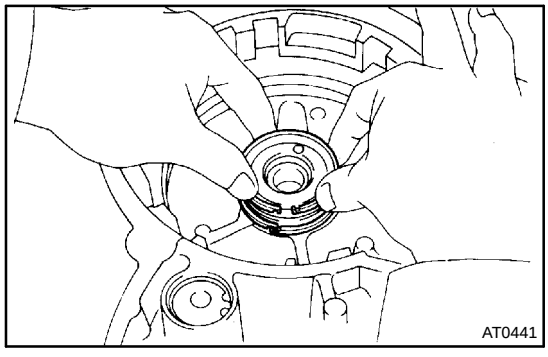


(b) Remove the retaining plate and 2 springs.

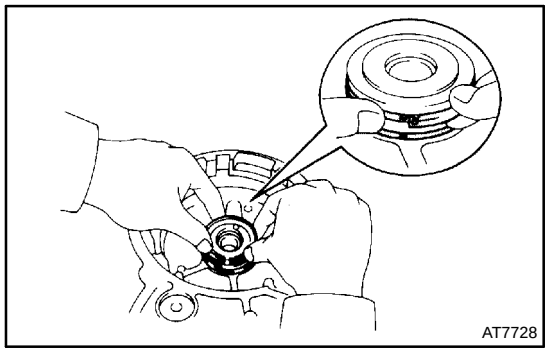
(c) Remove the accumulator piston.



(d) Remove the O-ring from the piston.



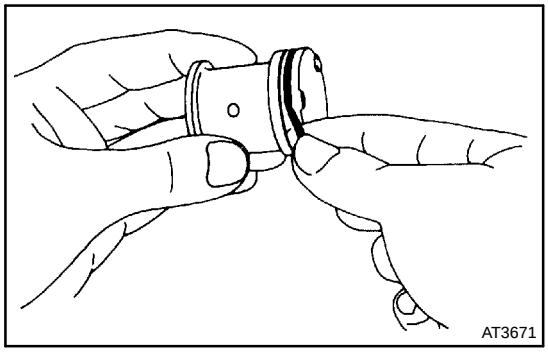
41. REMOVE OVERDRIVE CLUTCH DRUM OIL SEAL RING



42. INSTALL OVERDRIVE CLUTCH DRUM OIL SEAL RING

HINT:

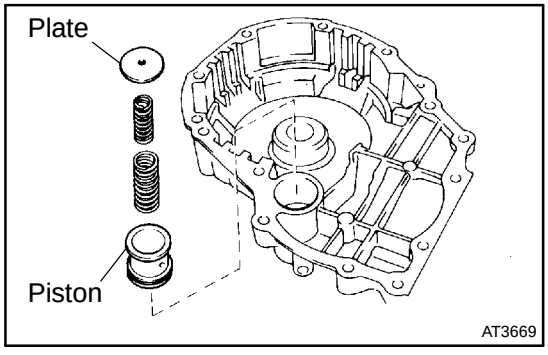
After installing the oil seal rings, check that they move smoothly.



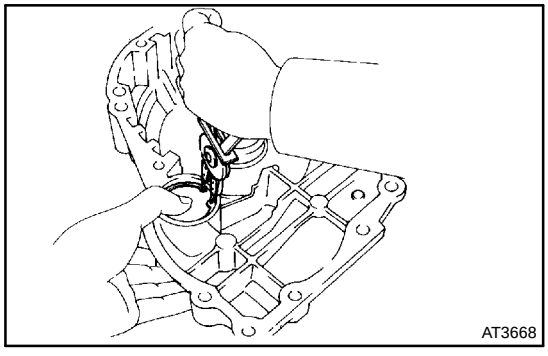
43. INSTALL C-0 ACCUMULATOR PISTON

(a) Install a new O-ring to the accumulator piston.

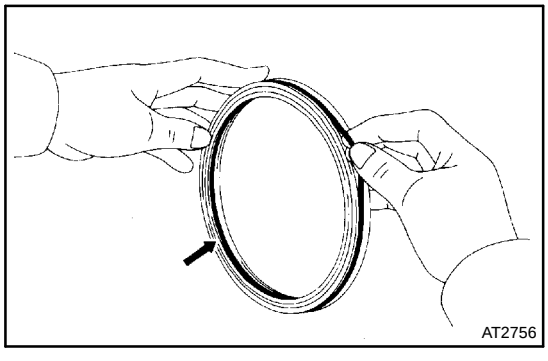
(b) Coat the O-ring with ATF.



(c) Install the accumulator piston, 2 springs and retaining plate.

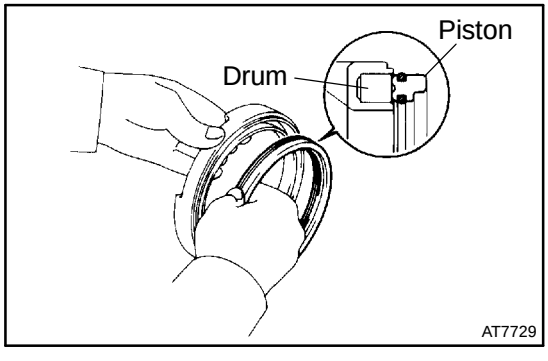


(d) Using snap ring pliers, install the snap ring.



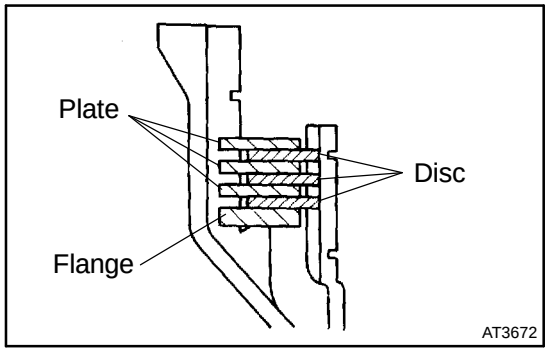
44. INSTALL OVERDRIVE BRAKE PISTON

(a) Install new O-rings to the piston.
Coat the new O-rings with ATF.



(b) Press the piston into the drum, be careful not to damage the O-rings.

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



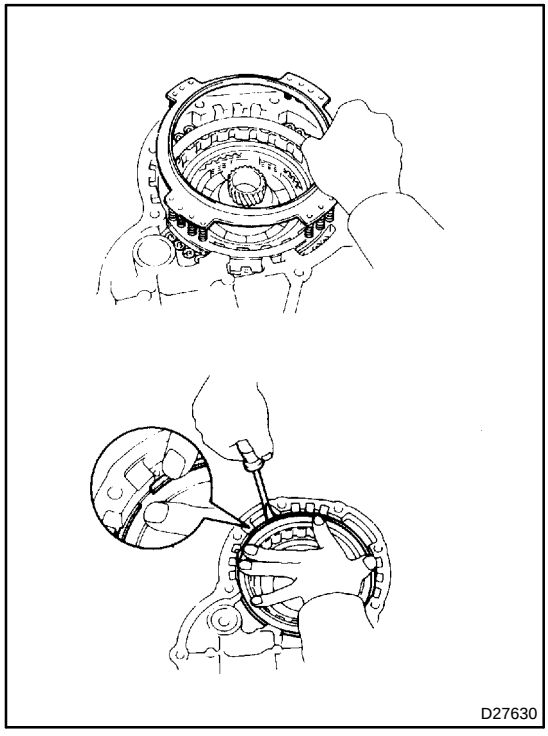
45. INSTALL OVERDRIVE BRAKE CLUTCH PLATE

(a) Install the flange, discs and plates.

Install in order:

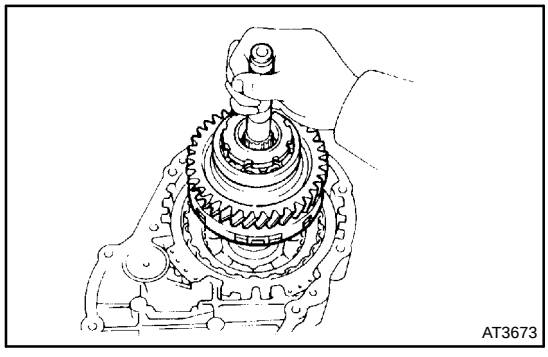
P = Plate D = Disc

Flange – D– P – D – P – D – P



46. INSTALL OVERDRIVE BRAKE RETURN SPRING SUB–ASSY

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

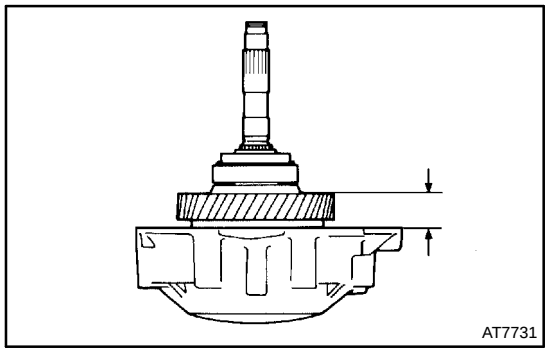


47. INSTALL OVERDRIVE PLANETARY GEAR ASSY

(a) While turning the overdrive planetary gear clockwise, install it on the overdrive direct clutch.

HINT:

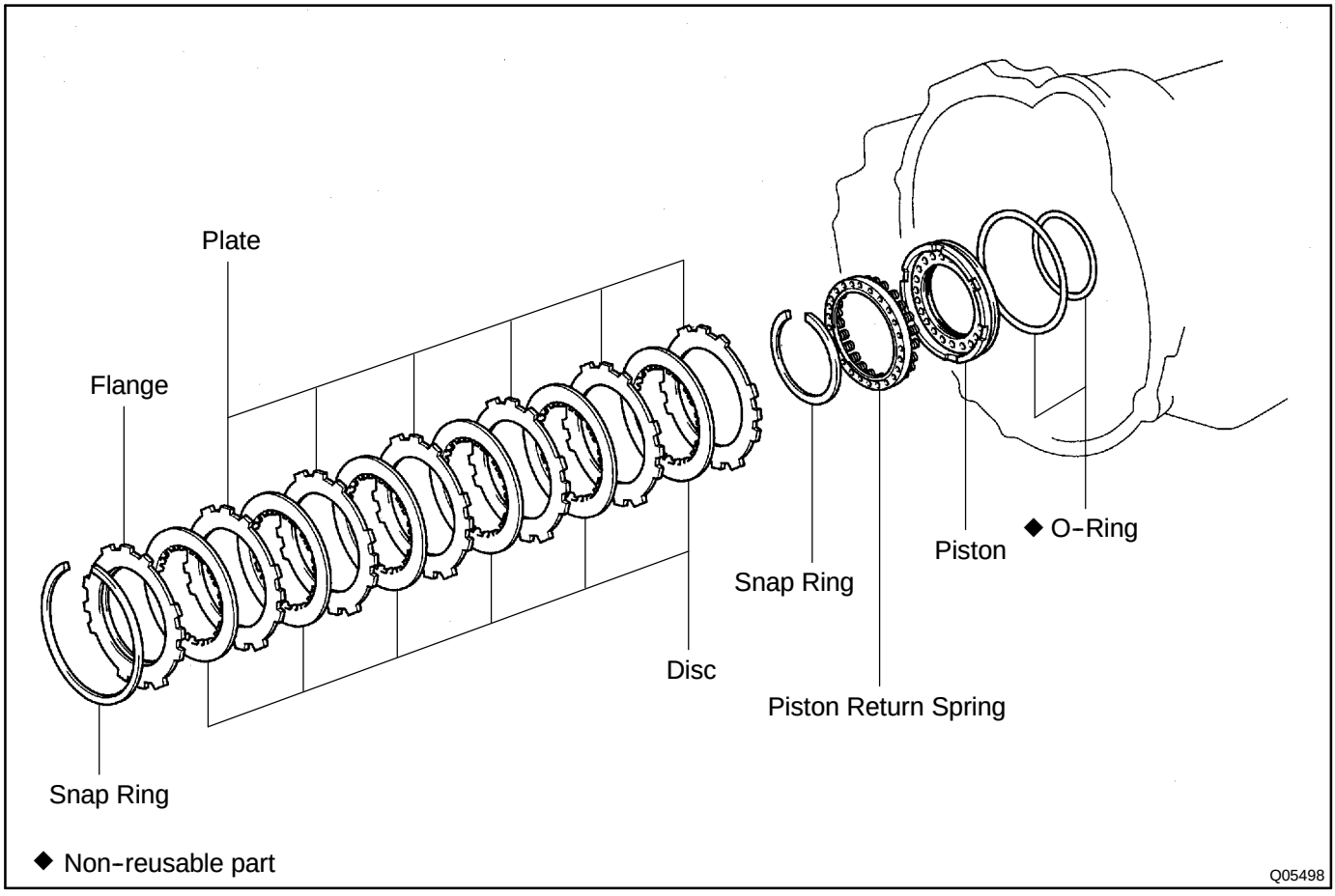
If the overdrive planetary gear is properly installed onto the direct clutch, the counter drive gear height from the overdrive case will be about 24 mm (0.94 in.).



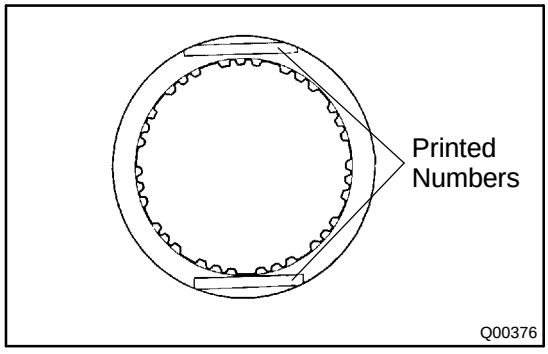
FIRST AND REVERSE BRAKE ASSY (A541E)

COMPONENTS

400PS-02



400PH-02



OVERHAUL

1. IINSPECT 1ST & REVERSE BRAKE CLUTCH PLATE

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

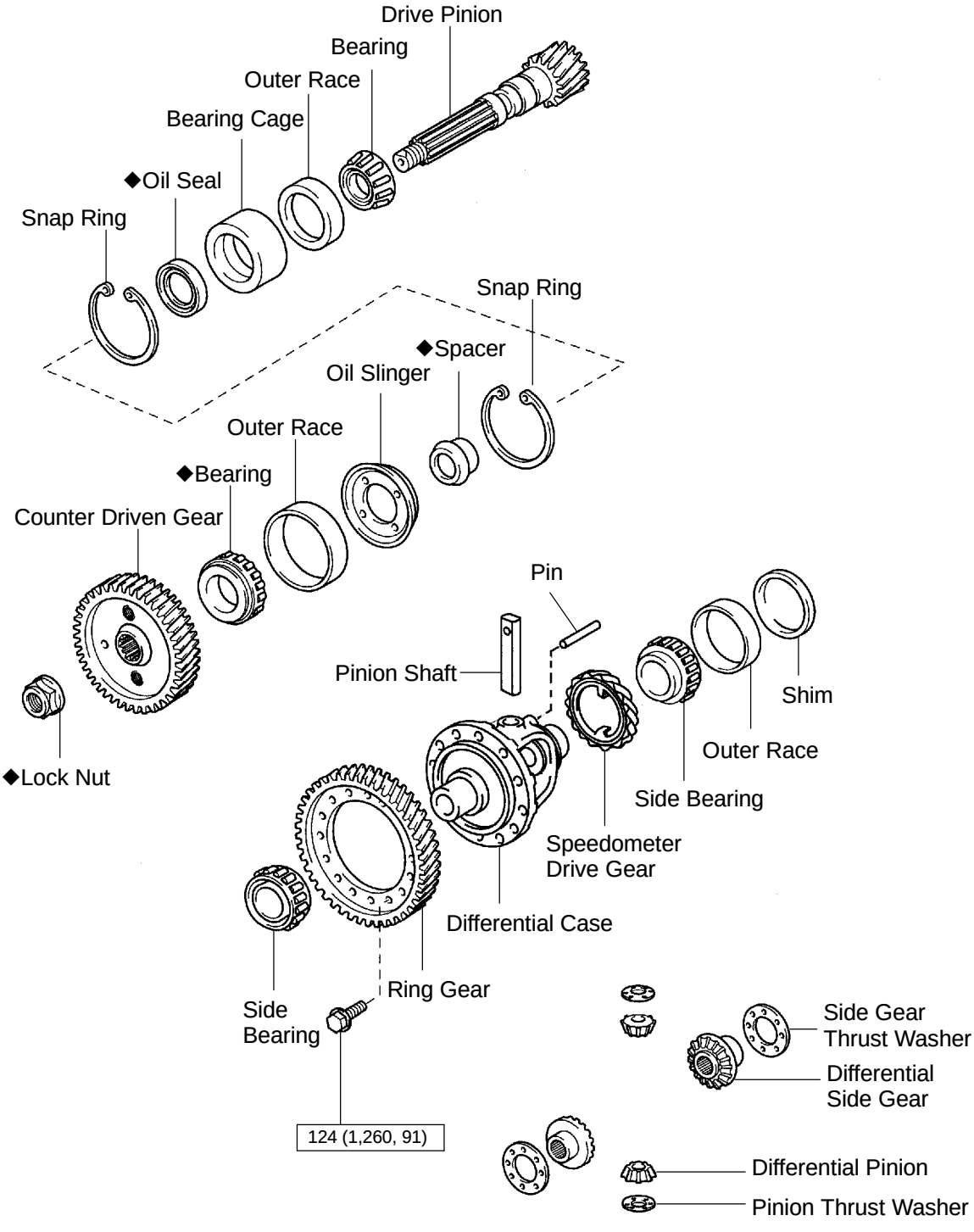
HINT:

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

FRONT DIFFERENTIAL ASSY (A541E)

400PT-02

COMPONENTS

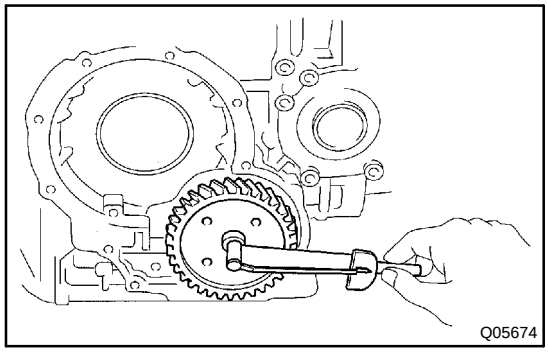


N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

Q05838

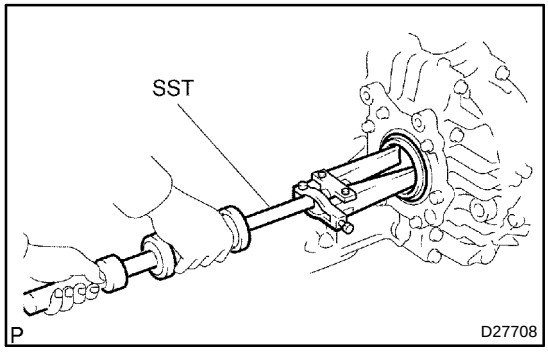
400PI-02



OVERHAUL

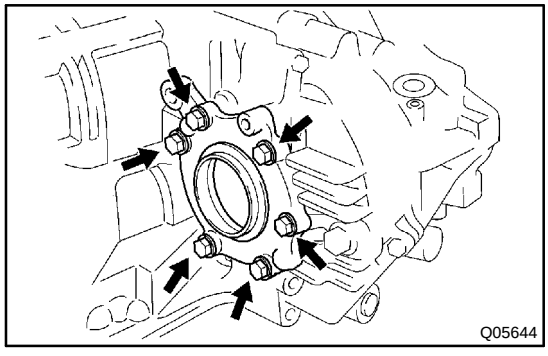
1. INSPECT FRONT DIFFERENTIAL CARRIER ASSY PRELOAD

(a) Using a small torque wrench, measure the total preload and make a note of it.



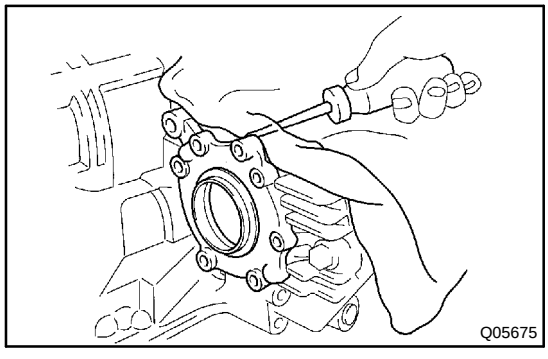
2. REMOVE DIFFERENTIAL SIDE BEARING RETAINER OIL SEAL

(a) Using SST, remove the oil seal.
SST 09308-00010



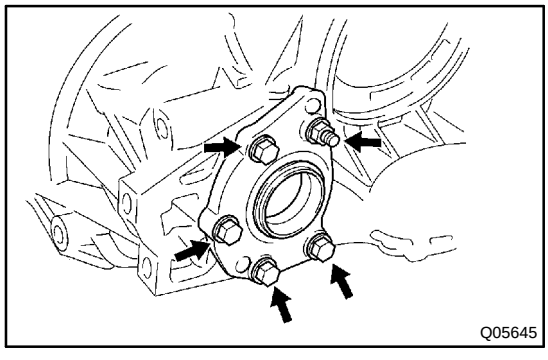
3. REMOVE FRONT DIFFERENTIAL SIDE BEARING RETAINER

(a) Remove the 6 bolts.



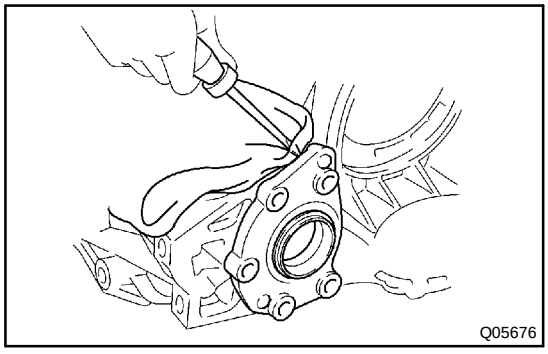
(b) Using a large screwdriver, remove the LH bearing retainer.

NOTICE:
Wrap the screwdriver tip in a rag, etc. to avoid damaging the case and retainer.



4. REMOVE FRONT DIFFERENTIAL OIL SEAL RETAINER SUB-ASSY

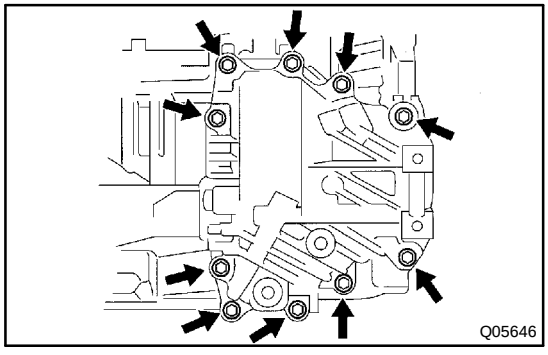
(a) Remove the 5 bolts.



(b) Using a large screwdriver, remove the RH retainer.

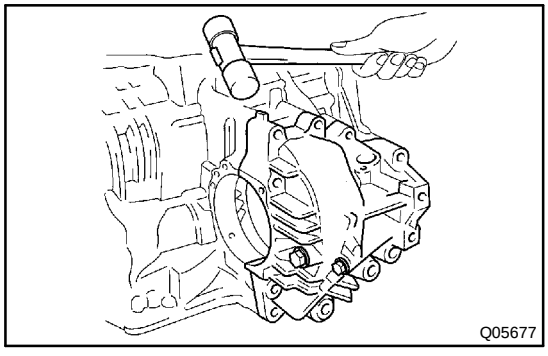
NOTICE:

Wrap the screwdriver tip in a rag, etc. to avoid damaging the case and retainer.

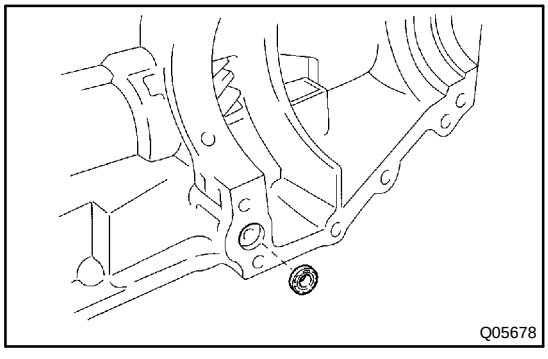


5. REMOVE DIFFERENTIAL CARRIER COVER

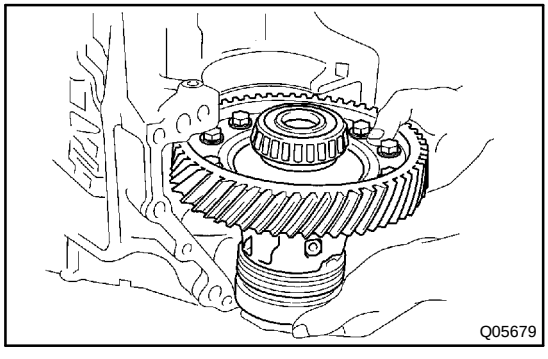
(a) Remove the 10 bolts.



(b) Tap the carrier cover with a plastic hammer to remove it.

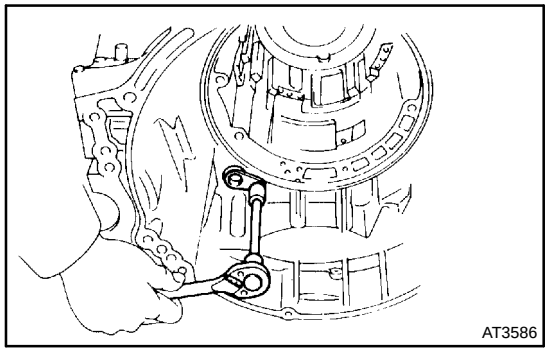


(c) Remove the apply gasket.



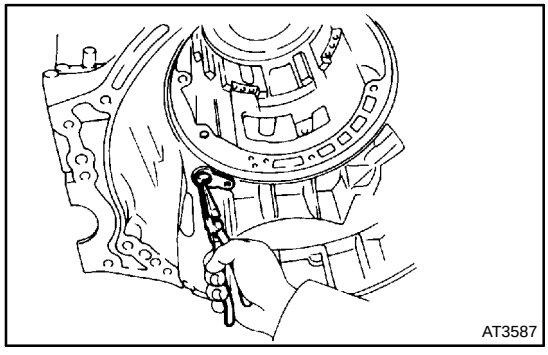
6. REMOVE FRONT DIFFERENTIAL CASE

(a) Remove the differential case, outer case and shim from the transaxle case.



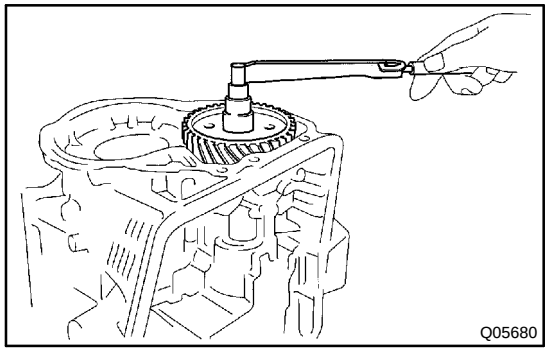
7. REMOVE TRANSAXLE CASE CAP NO.2

(a) Remove the bolt.



(b) Using needle–nose pliers, pull out the drive pinion cap.

(c) Remove the O–rings from the cap.



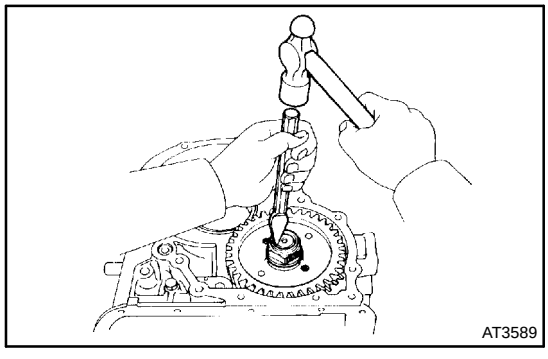
8. INSPECT DIFFERENTIAL DRIVE PINION PRELOAD

(a) Using a small torque wrench, measure the drive pinion preload.

Preload (Reused bearing at starting):
0.5 – 0.8 N·m (5 – 8 kgf·cm, 4.3 – 6.9 in.·lbf)

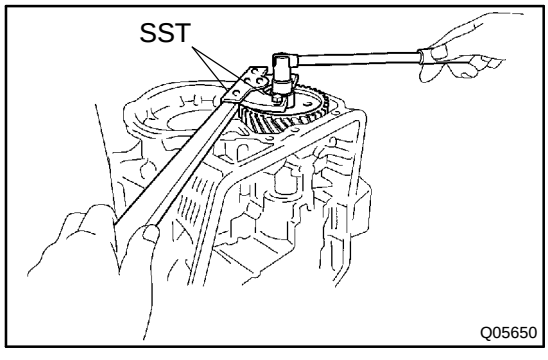
HINT:

The total preload measured in step 1 minus the drive pinion preload equals 0.1 – 0.2 N·m (1.3 – 2.0 kgf·cm, 1.1 – 1.7 in.·lbf). If the result is not within this specification, the side bearing preload may be incorrect.



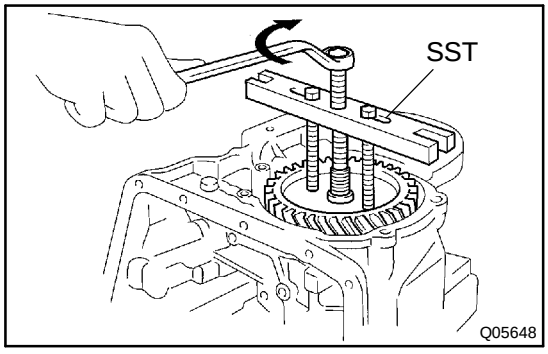
9. REMOVE COUNTER DRIVEN GEAR

(a) Using a chisel and hammer, loosen the staked part of the nut.

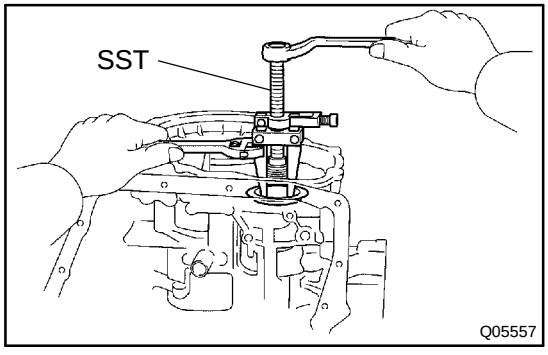


(b) Using SST, hold the gear and remove the nut.

SST 09330–00021, 09350–32014 (09351–32032)

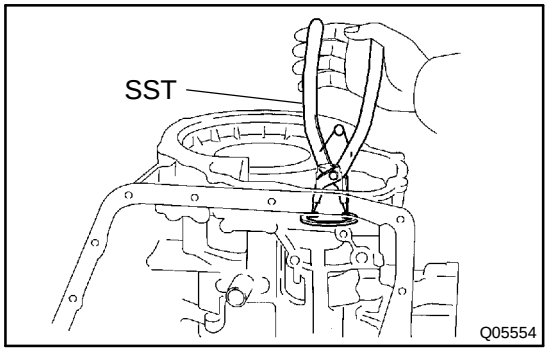


(c) Using SST, remove the gear and bearing.
SST 09350-32014 (09351-32061)

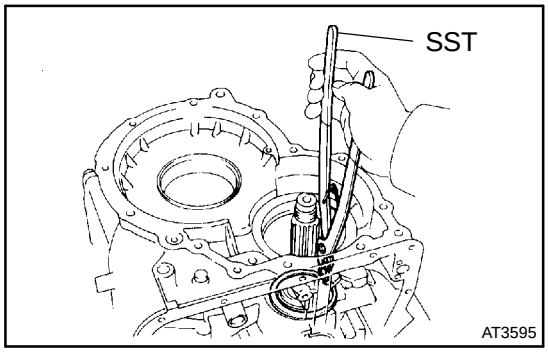


10. REMOVE FRONT DIFFERENTIAL DRIVE PINION OIL SLINGER

(a) Using SST, remove the outer race with oil slinger and spacer.
SST 09350-32014, 09308-10010

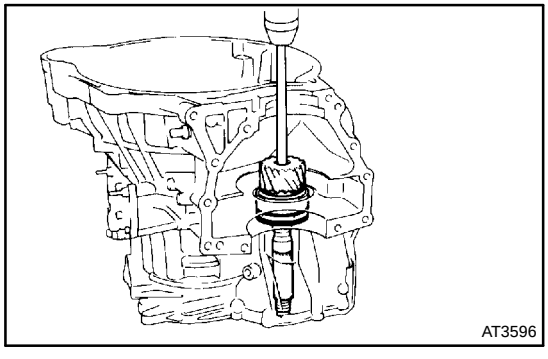


(b) Using SST, remove the snap ring.
SST 09350-32014 (09351-32050)

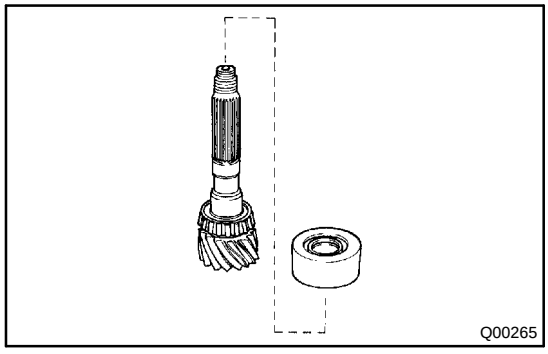


11. REMOVE DIFFERENTIAL DRIVE PINION

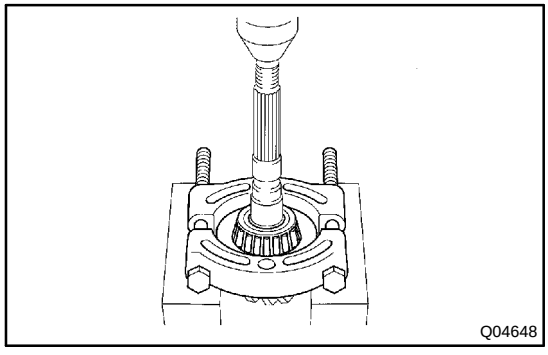
(a) Using SST, remove the snap ring.
SST 09350-32014 (09351-32050)



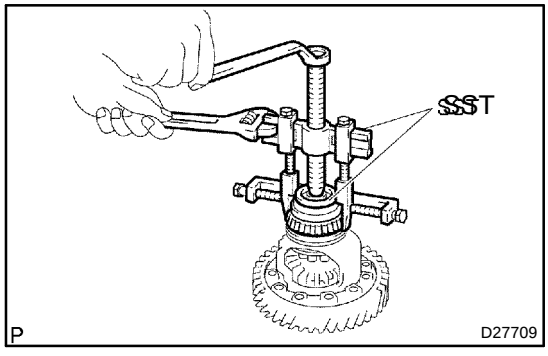
(b) Install a bar into the case hole to drive out the drive pinion.
(c) Using a press, drive out the drive pinion from the transaxle case.



(d) Remove the bearing cage from the drive pinion.



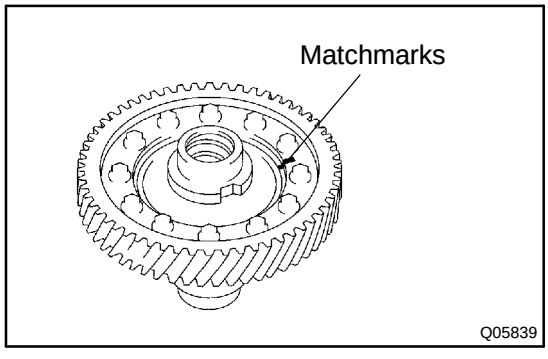
(e) Using SST, press out the bearing.
SST 09950-00020



12. REMOVE FR DIFFERENTIAL CASE FRONT TAPERED ROLLER BEARING

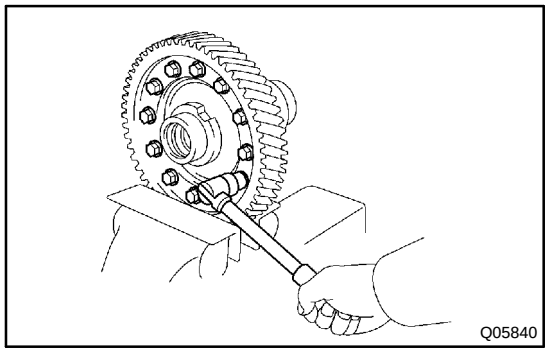
(a) Using SST, remove the 2 side bearings.
SST 09950-00020, 09950-00030, 09950-60010 (09951-00490), 09950-40011 (09957-04010), 09608-16011

(b) Remove the speedmeter driven gear.

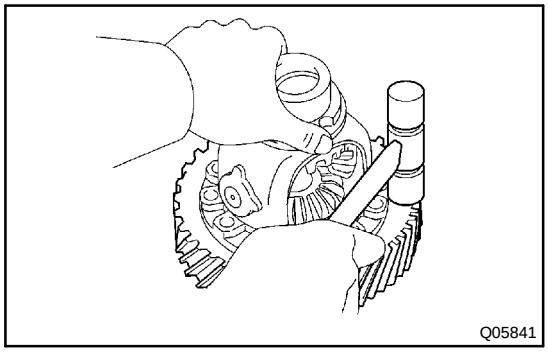


13. REMOVE FRONT DIFFERENTIAL RING GEAR

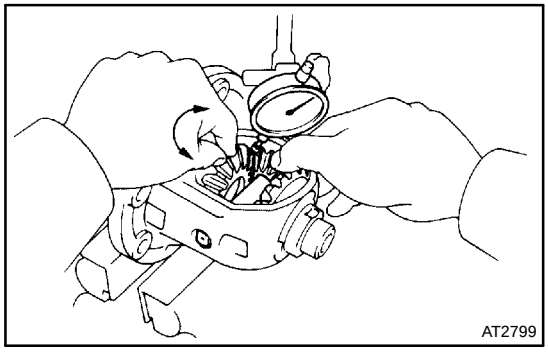
(a) Place matchmarks on both the differential case and the ring gear.



(b) Remove the 12 bolts.

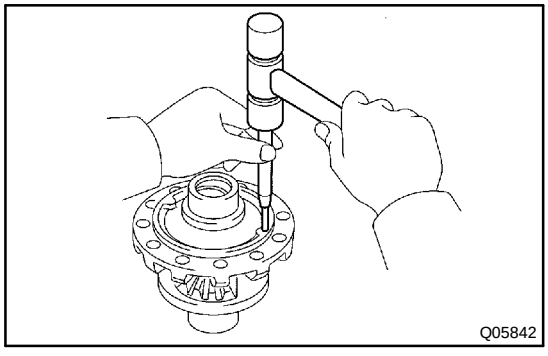


(c) Using a plastic hammer, tap out the ring gear.



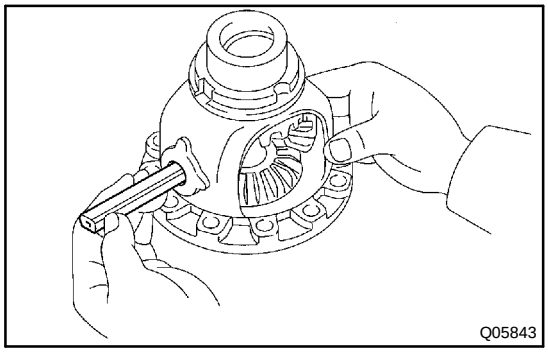
14. INSPECT DIFFERENTIAL PINION AND SIDE GEAR BACKLASH

(a) Using a dial indicator, measure the backlash of each side gear as holding one pinion toward the case.
Standard backlash:
0.05 – 0.20 mm (0.0020 – 0.0079 in.)

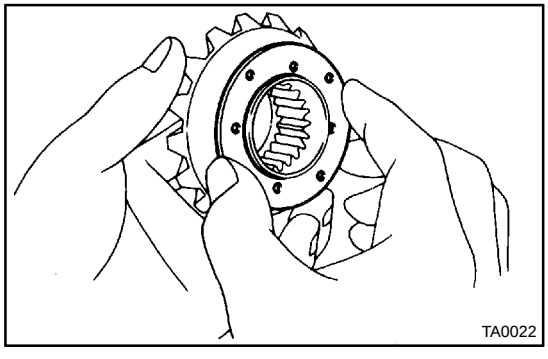


15. REMOVE FRONT DIFFERENTIAL PINION SHAFT NO.1

(a) Drive out the pinion shaft lock pin from the side on which the ring gear is installed.

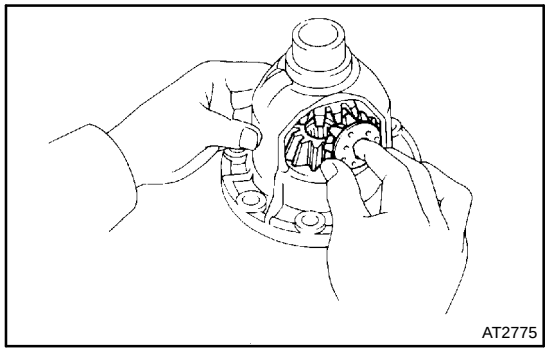


(b) Remove the pinion shaft from the case.
(c) Remove the 2 pinions and side gears with the 4 thrust washers.

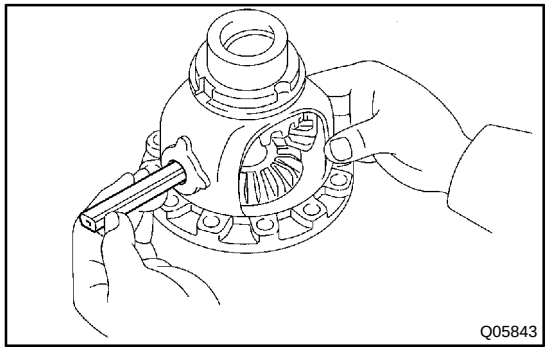


16. INSTALL FRONT DIFFERENTIAL PINION SHAFT NO.1

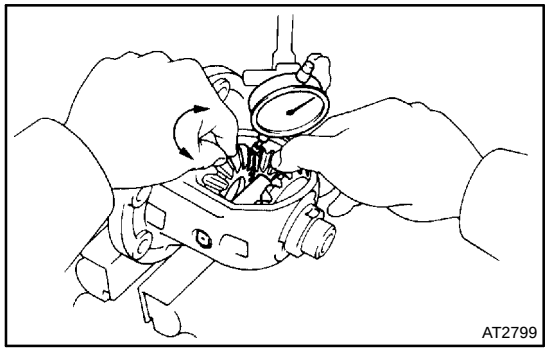
(a) Install the removed thrust washers to the side gears.



(b) Install the side gears with thrust washers, pinion thrust washers and pinion gears.



(c) Install the pinion shaft.



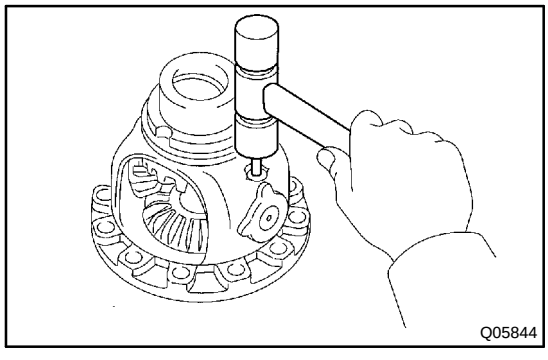
(d) Check the side gear backlash.
Using a dial indicator, measure the side gear backlash while holding one pinion gear toward the case.
Standard backlash:
0.05 – 0.20 mm (0.0020 – 0.0079 in.)

HINT:
Refering to the table below, select thrust washers which will ensure the backlash to be within the specification. Try selecting the same size for both sides.

Thrust washer thickness:

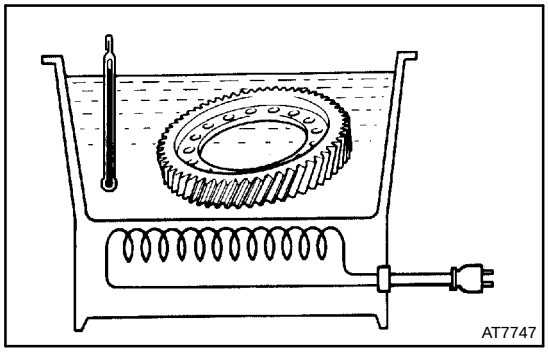
Thickness mm (in.)	Thickness mm (in.)
1.60 (0.0630)	1.70 (0.0670)
1.80 (0.0709)	-

If the backlash is not within specification, install a thrust washer of a different thickness.



(e) Using a pin punch and hammer, drive the lock pin through the case and hole in the pinion shaft.

(f) Stake the differential case.



17. INSTALL FRONT DIFFERENTIAL RING GEAR

(a) Clean the contact surface of the differential case.

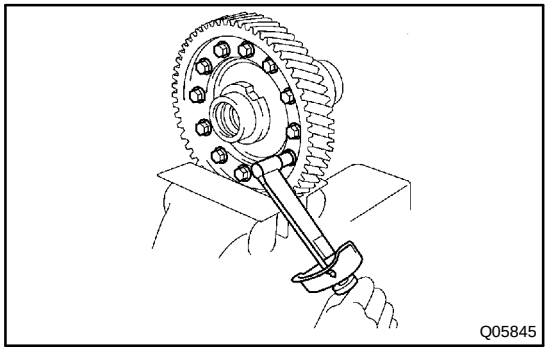
(b) Heat the ring gear to about 100°C (212°F) in an oil bath.

NOTICE:

Do not heat the ring gear above 110°C (230°F).

(c) Carefully remove the ring gear from the oil bath.

(d) Clean the contact surface of the ring gear with cleaning solvent.



(e) Quickly install the ring gear on the differential case. Install the 12 bolts.

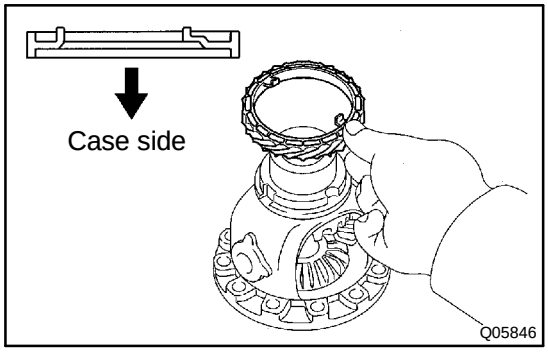
HINT:

Align the matchmarks on the differential left case and contact the ring gear.

(f) Tighten the set bolts uniformly little by little diagonaly at a time.

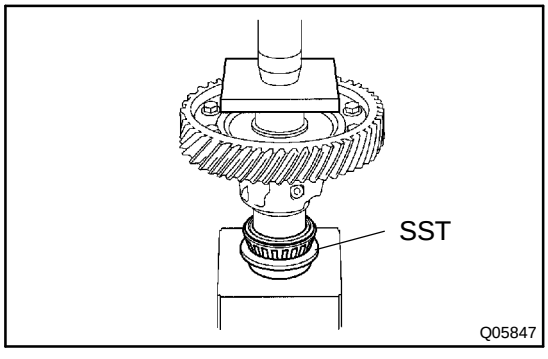
Torque the bolts.

Torque: 123 N·m (1,254 kgf·cm, 91 ft·lbf)



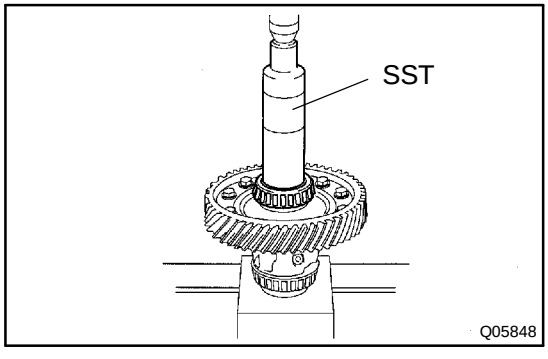
18. INSTALL FR DIFFERENTIAL CASE FRONT TAPERED ROLLER BEARING

(a) Install the speedmeter drive gear on the differential case.



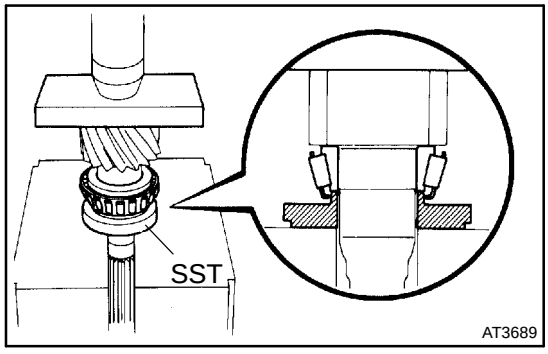
(b) Using SST, a steel plate and press, press in the RH side bearing on the differential case.

SST 09316-20011



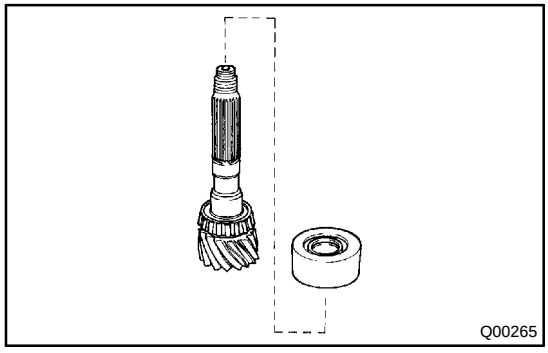
(c) Using SST and a press, press the LH side bearing onto the differential case.

SST 09316-20011



19. INSTALL DIFFERENTIAL DRIVE PINION

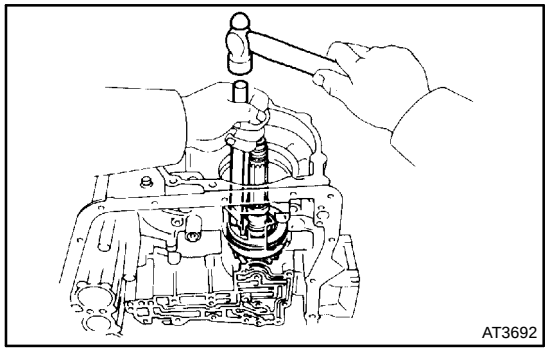
(a) Using SST and a press, install the bearing onto the drive pinion shaft.
SST 09350–32014 (09351–32120)



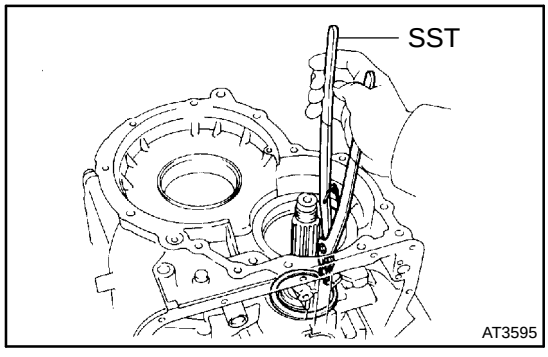
(b) Place the bearing cage onto the drive pinion shaft.

NOTICE:

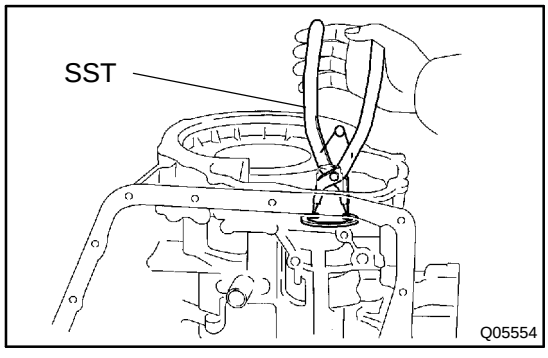
Be careful not to damage the oil seals with the pinion shaft.



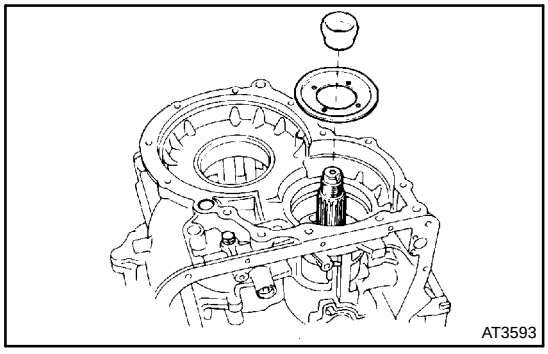
(c) Using a brass bar and hammer, slightly tap the bearing cage into the transaxle case until the snap ring groove in the bore can be seen.



(d) Using SST, install the snap ring into the bore.
SST 09350–32014 (09351–32050)



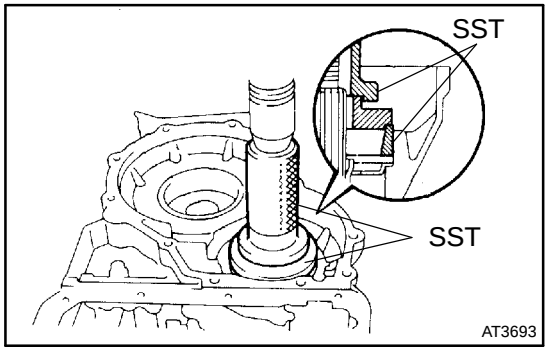
(e) Using SST, install the snap ring.
SST 09350–32014 (09351–32050)



20. INSTALL FRONT DIFFERENTIAL DRIVE PINION OIL SLINGER

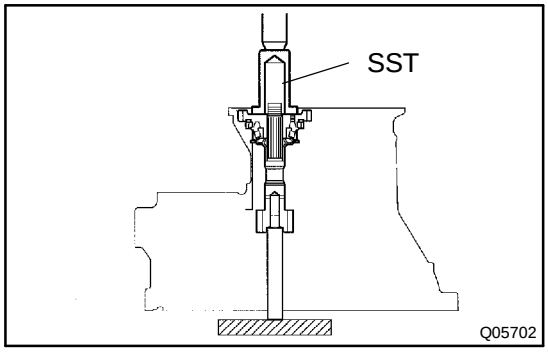
HINT:

Install the spacer with the small end downward.



21. INSTALL FRONT BEARING OUTER RACE

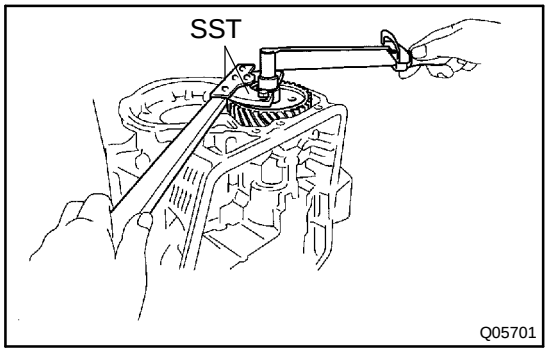
(a) Using SST and a press, press in the outer race.
SST 09350-32014 (09351-32100, 09351-32140)



22. INSTALL COUNTER DRIVEN GEAR

(a) Place a brass bar into the transaxle hole to hold the drive pinion shaft.

(b) Using SST, press in the counter driven gear until the counter driven gear bearing almost touches the counter gear.
SST 09350-32014 (09351-32140)

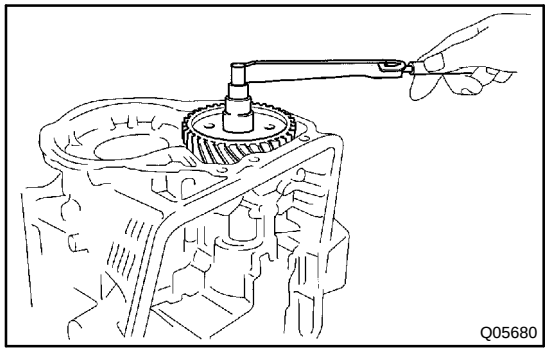


23. ADJUST DIFFERENTIAL DRIVE PINION PRELOAD

(a) Install the new lock nut.

(b) Using SST to hold the gear, tighten the nut.
Torque: 280 N·m (2,855 kgf·cm, 206 ft·lbf)
SST 09330-00021, 09350-32014 (09351-32032)

(c) Turn the gear counterclockwise and clockwise several times.



(d) Using a small torque wrench, measure the preload of the drive pinion.

Drive pinion preload (at starting):

New bearing

1.0 – 1.6 N·m (10 – 16 kgf·cm, 8.7 – 13.9 in.·lbf)

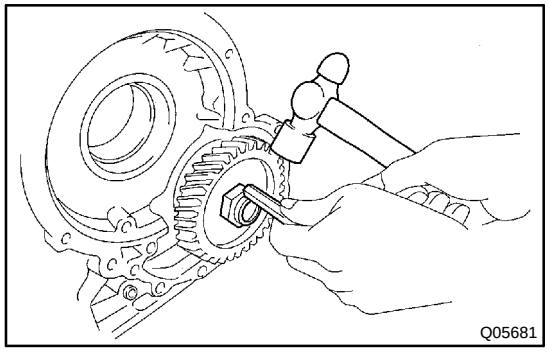
Reused bearing

0.5 – 0.8 N·m (5 – 8 kgf·cm, 4.3 – 6.9 in.·lbf)

- If the preload is greater than specified, replace the bearing spacer.
- If the preload is less then specified, retighten the nut 13 N·m (130 kgf·cm, 9 ft·lbf) little by little at a time until the specified preload is reached.

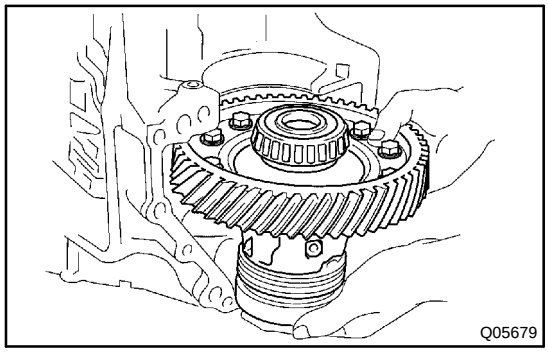
If the maximum torque is exceeded while retightening the nut, replace the bearing spacer and repeat the preload procedure. Do not back off the nut to reduce the preload.

Maximum 353 N·m (3,600 kgf·cm, 260 ft·lbf)



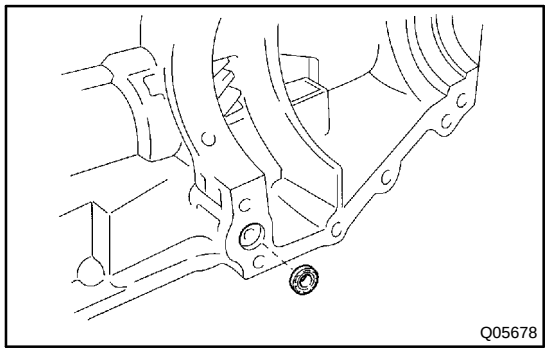
(e) If the preload is adjusted within specification, make a note of it.

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



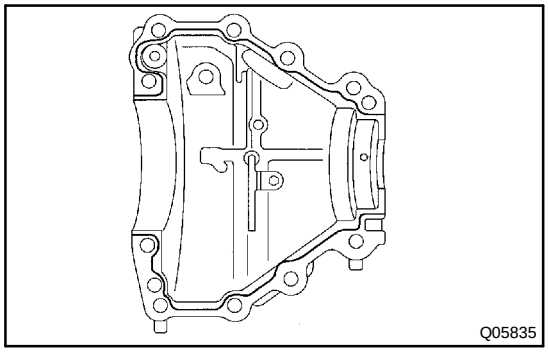
24. INSTALL FRONT DIFFERENTIAL CASE

(a) Be sure to install the shim and outer race into place.



25. INSTALL DIFFERENTIAL CARRIER COVER

(a) Install the apply gasket.



(b) Remove and be careful not to drop oil on the contacting surfaces of the carrier cover and transaxle case.

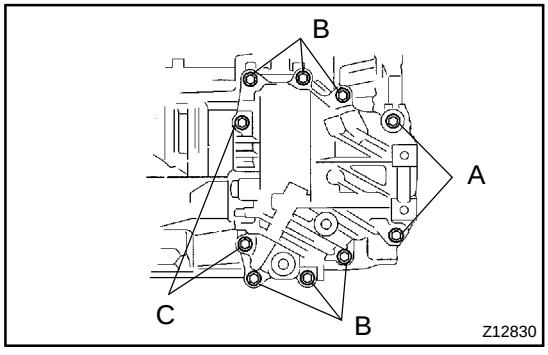
(c) Apply seal packing to the carrier cover.

Seal packing:

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

HINT:

Install the carrier cover within 10 minutes after applying seal packing.



(d) Install and torque the 10 bolts.

Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

HINT:

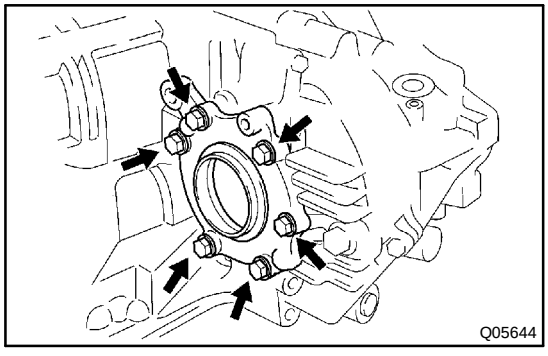
Each bolt length is indicated below.

Bolt length:

Bolt A: 100 mm (3.937 in.)

Bolt B: 65 mm (2.559 in.)

Bolt C: 75 mm (2.953 in.)



26. ADJUST DIFFERENTIAL SIDE BEARING PRELOAD

(a) Remove on the contacting surfaces of the LH bearing retainer and transaxle case.

HINT:

Do not apply seal packing yet.

(b) Install the LH bearing retainer and torque the 6 bolts.

Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

(c) Snap down the bearings by turning the differential case several times.

(d) Using a small torque wrench, measure the differential total preload.

Total preload (at starting):

New bearing

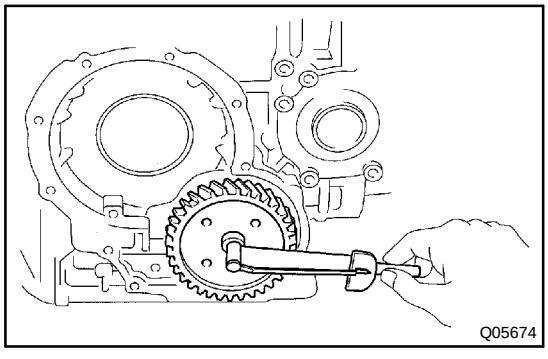
Drive pinion preload plus 0.2 – 0.4 N·m

(2.5 – 5.1 kgf·cm, 2.2 – 3.6 in.·lbf)

Reused bearing

Drive pinion preload plus 0.1 – 0.2 N·m

(1.3 – 2.0 kgf·cm, 1.1 – 1.7 in.·lbf)

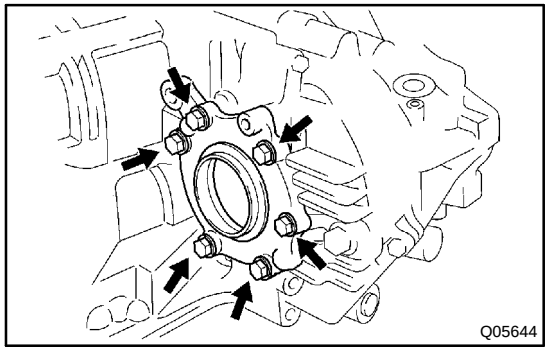


If the preload is not within specification, replace the adjusting shim in the LH bearing retainer with one of a different thickness.

AT3700: Adjusting shim thickness

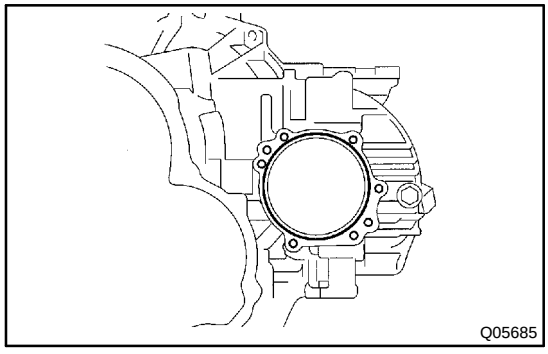
Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
0	2.00 (0.0787)	9	2.45 (0.0965)
1	2.05 (0.0807)	A	2.50 (0.0984)
2	2.10 (0.0827)	B	2.55 (0.1004)
3	2.15 (0.0846)	C	2.60 (0.1024)
4	2.20 (0.0866)	D	2.65 (0.1043)
5	2.25 (0.0866)	E	2.70 (0.1063)
6	2.30 (0.0906)	F	2.75 (0.1083)

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
7	2.35 (0.0925)	G	2.80 (0.1102)
8	2.40 (0.0945)	H	2.85 (0.1122)



27. INSTALL FRONT DIFFERENTIAL OIL SEAL RETAINER SUB-ASSY

(a) Remove the 6 bolts and LH bearing retainer.



(b) Remove any FIPG material on the contacting surfaces of LH bearing retainer, transaxle case and carrier cover.

(c) Apply FIPG to the transaxle case and carrier cover.
FIPG: Part No.08826 – 00090, THREE BOND 1281 or equivalent

HINT:
Install the LH bearing retainer within 10 minutes after applying FIPG.

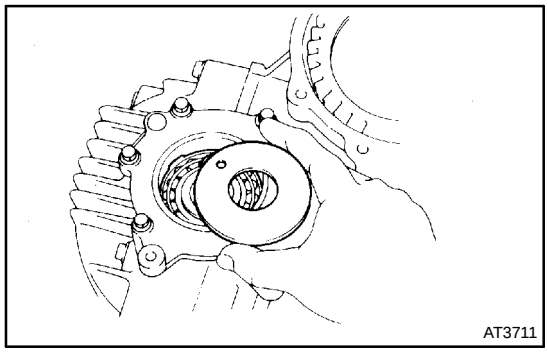
(d) Install the LH bearing retainer.

(e) Coat the threads of bolts with sealer.
Sealer: Part No.08833 – 00070, THREE BOND 1324 or equivalent

(f) Tighten the bolts.
Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

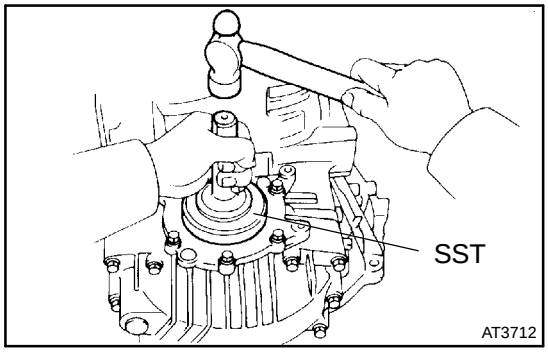
(g) Snap down the bearings.

(h) Recheck the differential total preload.

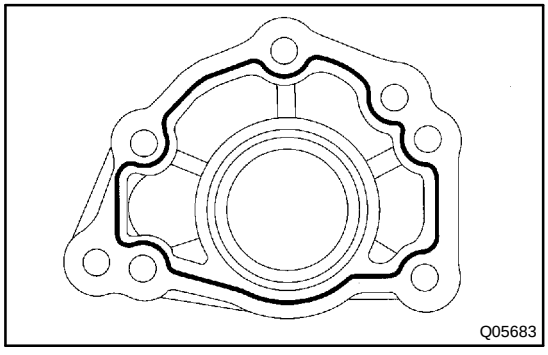


28. INSTALL DIFFERENTIAL SIDE BEARING RETAINER OIL SEAL

(a) Place the oil baffle onto the LH bearing retainer.



(b) Using SST, drive in a new oil seal unit until its end is flush with the surface of the LH bearing retainer.
SST 09223-46011

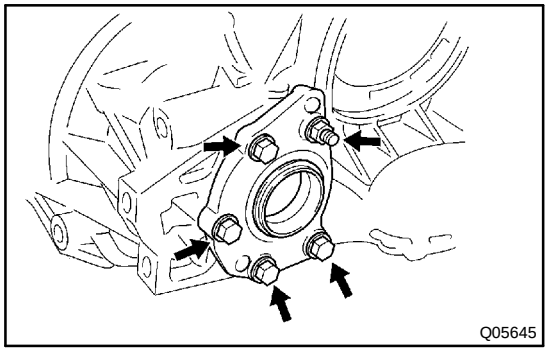


29. INSTALL FRONT DIFFERENTIAL SIDE BEARING RETAINER

(a) Remove any FIPG material on the contacting surfaces of RH retainer and transaxle case.

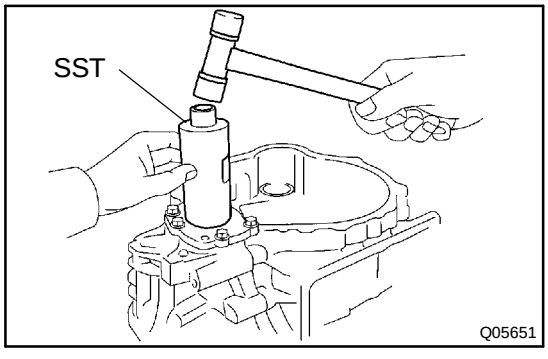
(b) Apply FIPG to the RH retainer.
FIPG: Part No.08826 - 00090, THREE BOND 1281 or equivalent

HINT:
Install the RH retainer within 10 minutes after applying FIPG.

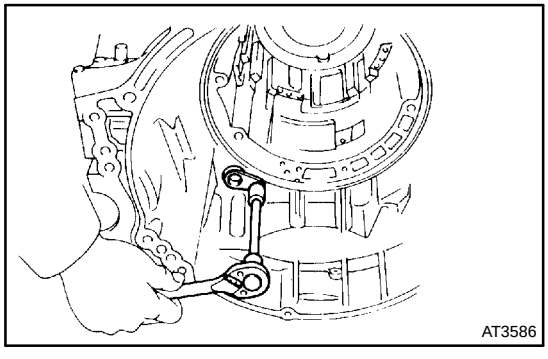


(c) Coat the threads of bolts with sealer.
Sealer: Part No.08833 - 00070, THREE BOND 1324 or equivalent

(d) Tighten the bolts.
Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)



(e) Using SST, in the oil seal.
SST 09226-10010



30. INSTALL TRANSAXLE CASE CAP NO.2

(a) Install a new O-ring to the cap.

(b) Install the drive pinion cap on the transaxle case.

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