FOREWORD

This repair manual covers Disassembly, Inspection and Assembly procedures for the following Automatic Transaxle:

Automatic Transaxle	Applicable Model
A540E	’93 Lexus ES300

For On-vehicle Servicing (Inspection, Adjustment, Troubleshooting, Removal and Installation) of Automatic Transaxle, refer to the repair manual for the applicable vehicle model.

Pub. Name	Pub. No.
’93 LEXUS ES300 Repair Manual	RM318U1

All information contained in this manual is the most up-to-date at the time of publication. However, specifications and procedures are subject to change without notice.

TOYOTA MOTOR CORPORATION

HOW TO USE THIS MANUAL

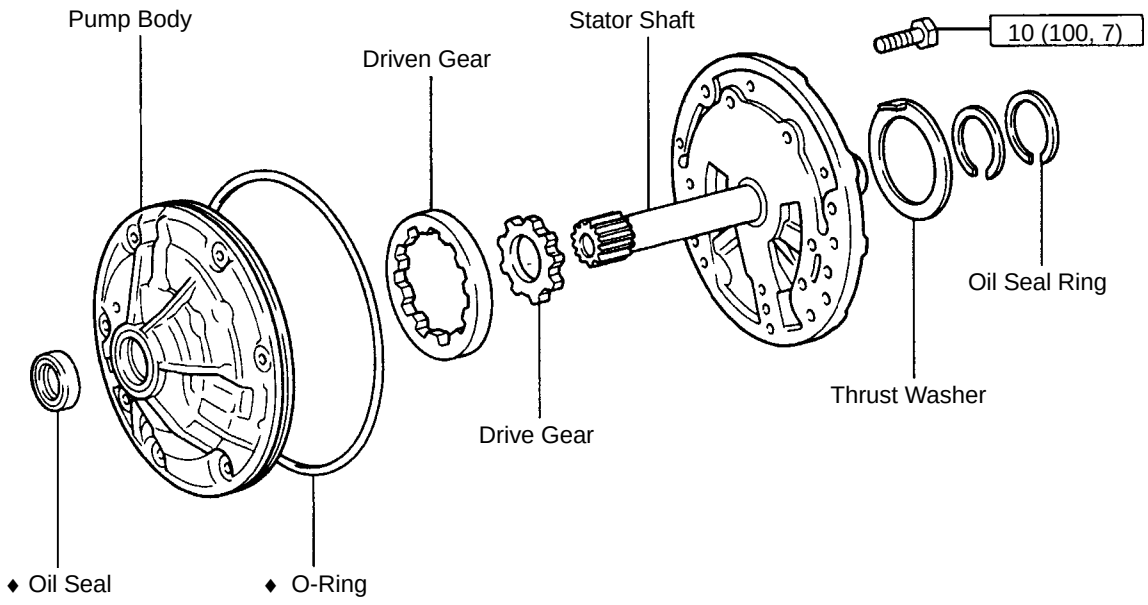
To assist you in finding your way through the manual, the Section Title and major heading are given at the top of every page.

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.

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

AT8669

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

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

Example:

Task heading: what to do

21. CHECK PISTON STROKE OF OVERDRIVE BRAKE

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

SST 09350-30020 (09350-06120)

Set part No.

Component part No.

Detail text: how to do task

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

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

Specification

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

REFERENCES

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

SPECIFICATIONS

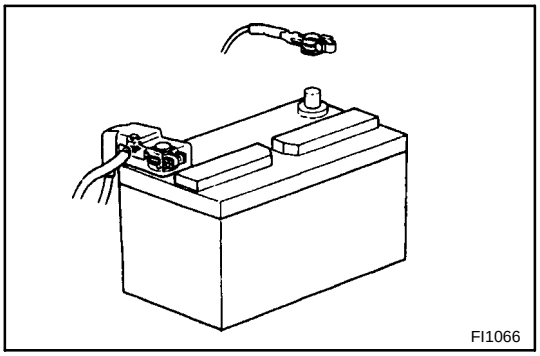
Specifications are presented in bold type throughout the text where needed. You never have to leave the procedure to look up your specifications. They are also found at the back of AX section, for quick reference.

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.

SI UNIT

The UNITS given in this manual are primarily expressed according to with the SI UNIT (International System of Unit), and alternately expressed in the metric system and in the English System.
Example:
Torque: 30 N-m (310 kgf-cm, 22 ft-lbf)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GENERAL REPAIR INSTRUCTIONS

1. Use fender, seat and floor covers to keep the vehicle clean and prevent damage.

2. During disassembly, keep parts in the appropriate order to facilitate reassembly.

3. Observe the following:

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

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

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

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

(e) Install the cable terminal to the battery post with the nut loose, and tighten the nut after installation. Do not use a hammer to tap the terminal onto the post.

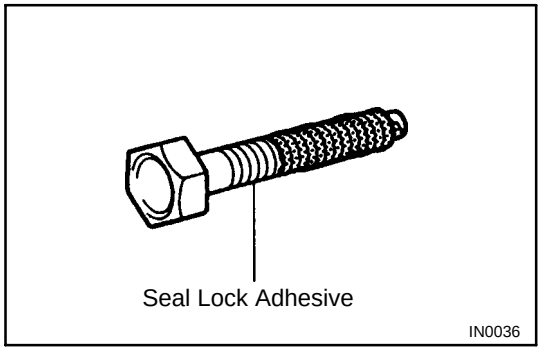
(f) Be sure the cover for the positive (+) terminal is properly in place.

4. Check hose and wiring connectors to make sure that they are secure and correct.

5. Non-reusable parts

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

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



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6. Precoated parts

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

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

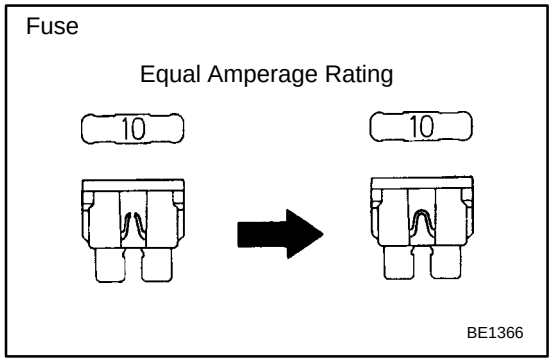
(b) When reusing precoated parts, clean off the old adhesive and dry with compressed air. Then apply the specified seal lock adhesive to the bolt, nut or threads.

(c) Precoated parts are indicated in the component illustrations by the "○" symbol.

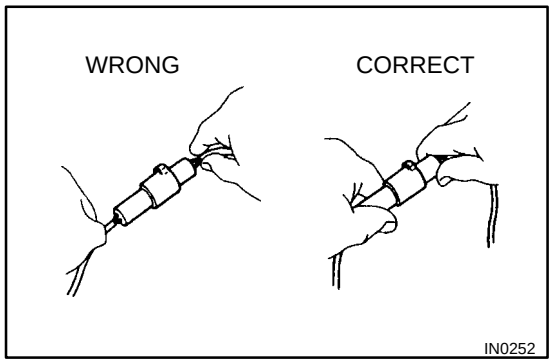
7. When necessary, use a sealer on gaskets to prevent leaks.

8. Carefully observe all specifications for bolt tightening torques. Always use a torque wrench.

9. 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 at the preparation of AX section.



10. 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.



11. To pull apart electrical connectors, pull on the connector itself, not the wires.

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

(a) 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.

(b) 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.

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 ABBRE-VIATIONS	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: Toyota 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	Toyota Distributorless Ignition (TDI)
EM	Engine Modification	Engine Modification (EM)
EPROM	Erasable Programmable Read Only Memory	Programmable Read Only Memory (PROM)
EVAP	Evaporative Emission	Evaporative Emission Control (EVAP)
FC	Fan Control	—
FEEPROM	Flash Electrically Erasable Programmable Read Only Memory	—
FEPROM	Flash Erasable Programmable Read Only Memory	—
FF	Flexible Fuel	—
FP	Fuel Pump	Fuel Pump
GEN	Generator	Alternator
GND	Ground	Ground (GND)
HO2S	Heated Oxygen Sensor	Heated Oxygen Sensor (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)
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	—

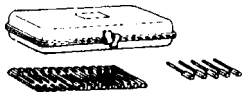
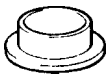
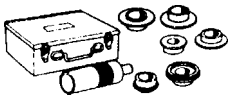
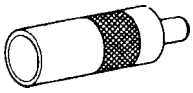
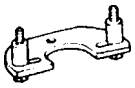
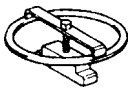
TVV	Thermal Vacuum Valve	Bimetal Vacuum Switching Valve (BVSV) Thermostatic Vacuum Switching Valve (TVSV)
TWC	Three-Way Catalytic Converter	Three-Way Catalyst (TWC) CC_{RO}
TWC + OC	Three-Way + Oxidation Catalytic Converter	CC_R + CCo
VAF	Volume Air Flow	Air Flow Meter
VR	Voltage Regulator	Voltage Regulator
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	—

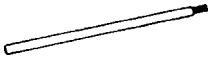
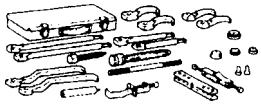
ABBREVIATIONS USED IN THIS MANUAL

ATF	Automatic Transaxle Fluid
B_0	Overdrive Brake
B_1	Second Coast Brake
B_2	Second Brake
B_3	First and Reverse Brake
C_0	Overdrive Clutch
C_1	Forward Clutch
C_2	Direct Clutch
D	Disc
D/F	Differential
F	Flange
F_1	No. 1 One-way Clutch
F_2	No. 2 One-way Clutch
LH	Left-Hand
MP	Multipurpose
O/D	Overdrive
P	Plate
RH	Right-Hand
SSM	Special Service Materials
SST	Special Service Tools

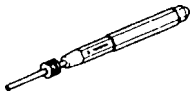
PREPARATION

SST (SPECIAL SERVICE TOOLS)

	09240 - 00020	Wire Gauge Set	
	09316 - 20011	Transfer Bearing Replacer	
	09316 - 60010	Transmission & Transfer Bearing Replacer	
	(09316 - 00010)	Replacer Pipe	
	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 - 32140) Oil Seal Replacer	
	(09351 - 32150) Oil Seal Replacer	
	(09351 - 32190) Measure Terminal	
	(09351 - 32200) No. 3 Piston Spring Compressor	
	09612 - 65014 Steering Worm Bearing Puller	Remove pinion shaft Bearing outer race
	09950 - 20017 Universal Puller	

RECOMMENDED TOOL

	09031 - 00030 Pin Punch	

EQUIPMENT

Feeler gauge	Check major clearance.
Vernier calipers	Check length of second coast brake piston rod.
Dial indicator with magneticbase	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	

LUBRICANT

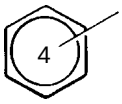
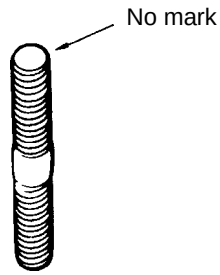
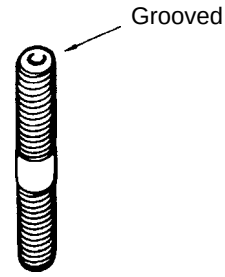
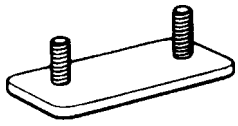
Item	Capacity	Classification
Automatic transaxle fluid Dry fill Drain and refill	 6.5 liters (6.9 US qts, 5.7 Imp. qts) 2.5 liters (2.6 US qts, 2.2 Imp. qts)	 ATF DEXRON○ II
Differential oil	0.8 liter (0.8 US qts, 0.7 Imp. qts)	ATF DEXRON○ II

SSM (SPECIAL SERVICE MATERIALS)

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

STANDARD BOLT TORQUE SPECIFICATIONS

HOW TO DETERMINE BOLT STRENGTH

	Mark	Class		Mark	Class
Hexagon head bolt	 4- 5- 6- 7- 8- 9- 10- 11-	4T 5T 6T 7T 8T 9T 10T 11T	Stud bolt		4T
	 No mark	4T			
Hexagon flange bolt w/ washer hexagon bolt	 No mark	4T			6T
Hexagon head bolt	 Two protruding lines	5T			
Hexagon flange bolt w/ washer hexagon bolt	 Two protruding lines	6T	Welded bolt		4T
Hexagon head bolt	 Three protruding lines	7T			
Hexagon head bolt	 Four protruding lines	8T			

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

SERVICE SPECIFICATIONS

SERVICE DATE

Second 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	0.07 - 0.15 mm	0.0028 - 0.0059 in.
	Maximum	0.3 mm	0.012 in.
Tip clearance	STD	0.11 - 0.14 mm	0.0043 - 0.0055 in.
	Maximum	0.3 mm	0.012 in.
Side clearance	STD	0.02 - 0.05 mm	0.0008 - 0.0020 in.
	Maximum	0.1 mm	0.004 in.
Pump body bushing inside diameter	Maximum	38.18 mm	1.5031 in.
Stator shaft bushing inside diameter			
Front side	Maximum	21.57 mm	0.8492 in.
Rear side	Maximum	27.07 mm	1.0657 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	0.0705 - 0.0870 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	1.1842 in.
Planetary pinion gear thrust clearance	Maximum	0.61 mm	0.024 in.

Rear Planetary Gear

Planetary pinion gear thrust clearance	Maximum	0.61 mm	0.024 in.

First and Reverse Brake

Pack clearance	0.85 - 2.05 mm	0.033 - 0.081 in.

Overdrive 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	0.16 - 0.56 mm	0.0063 - 0.0220 in.
	Maximum	0.61 mm	0.024 in.

Valve Body Spring

Spring	Free length / Coil outer diameter mm (in.)	Total No. of coils / Color
(Upper valve body)		
Second coast modulator valve	27.5 (1.083) / 8.9 (0.350)	14.6 / Brown
B_1 orifice control valve	24.8 (0.976) / 8.0 (0.315)	12.0 / White
Down shift plug	29.8 (1.173) / 8.7 (0.343)	13.5 / Yellow
Throttle valve	30.7 (1.209) / 9.2 (0.6.2)	9.5 / Purple
Throttle modulator valve	21.7 (0.854) / 9.5 (0.374)	9.5 / Orange
Cut-back valve	21.8 (0.858) / 6.0 (0.236)	13.5 / Red
No. 1 accumulator control valve	28.1 (1.106) / 10.6 (0.417)	13.0 / Yellow
Lock-up relay valve	26.6 (1.047) / 10.2 (0.402)	11.5 / Green
(Lower valve body)		
Pressure relief valve	11.2 (0.441) / 6.4 (0.252)	7.5 / None
2 - 3 shift valve	28.0 (1.102) / 9.4 (0.370)	10.3 / None
Low coast modulator valve	20.2 (0.795) / 7.9 (0.311)	11.9 / Purple
Check valve	19.9 (0.783) / 11.0 (0.433)	8.5 / None
Secondary regulator valve	38.5 (1.516) / 8.4 (0.331)	17.0 / Purple
Second lock valve	20.7 (0.815) / 6.1 (0.240)	12.0 / Orange
No. 2 accumulator control valve	23.0 (0.906) / 6.3 (0.248)	12.0 / Gray
1 - 2 shift valve	29.2 (1.150) / 8.9 (0.350)	12.0 / Light Green
3 - 4 shift valve	29.2 (1.150) / 8.9 (0.350)	12.0 / Light Green
Primary regulator valve	64.2 (2.528) / 18.6 (0.732)	12.5 / None

Valve Body Key

Key	Height mm (in.)	Width mm (in.)	Thickness mm (in.)
(Upper valve body)			
Lock-up relay valve	6.5 (0.256)	5.0 (0.197)	3.2 (0.126)
Throttle modulator valve	6.5 (0.453)	5.0 (0.197)	3.2 (0.126)
Second coast modulator valve	6.5 (1.142)	5.0 (0.197)	3.2 (0.126)
Cut-back valve	9.2 (0.362)	5.0 (0.197)	3.2 (0.126)
No. 1 accumulator control valve	6.5 (0.256)	5.0 (0.197)	3.2 (0.126)
B_1 orifice control valve	11.5 (0.453)	5.0 (0.197)	3.2 (0.126)
(Lower valve body)			
Primary regulator valve	9.2 (0.362)	5.0 (0.197)	3.2 (0.126)
Secondary regulator valve	15.0 (0.591)	5.0 (0.197)	3.2 (0.126)
No. 2 accumulator control valve	9.2 (0.362)	5.0 (0.197)	3.2 (0.126)
1 - 2 shift valve	6.5 (0.256)	5.0 (0.197)	3.2 (0.126)
2 - 3 shift valve	9.2 (0.362)	5.0 (0.197)	3.2 (0.126)
3 - 4 shift valve	6.5 (0.256)	5.0 (0.197)	3.2 (0.126)
Second lock valve	11.5 (0.453)	5.0 (0.197)	3.2 (0.126)
Low coast modulator valve	11.5 (0.453)	5.0 (0.197)	3.2 (0.126)

Accumulator Spring

Spring	Free length mm (in.)	Color
C_1	71.2 (2.803)	Blue / Green
C_2	55.2 (2.173)	Yellow / Purple
B_0	67.7 (2.665)	Pink
B_2	68.6 (2.701)	Blue / Yellow

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)		Add drive pinion preload		
New bearing		0.3 - 0.4 N-m	2.8 - 4.4 kgf-cm	2.4 - 3.8 in.-lbf
Reused bearing		0.1 - 0.2 N-m	1.4 - 2.2 kgf-cm	1.2 - 1.9 in.-lbf
Pinion to side gear backlash		0.05 - 0.20 mm	0.0020 - 0.0079 in.	
Side gear thrust washer thickness		0.80 mm	0.0315 in.	
		0.90 mm	0.0354 in.	
		1.00 mm	0.0394 in.	
		1.10 mm	0.0433 in.	
		1.20 mm	0.0472 in.	
		1.30 mm	0.0512 in.	
		1.40 mm	0.0551 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.	

TORQUE SPECIFICATIONS

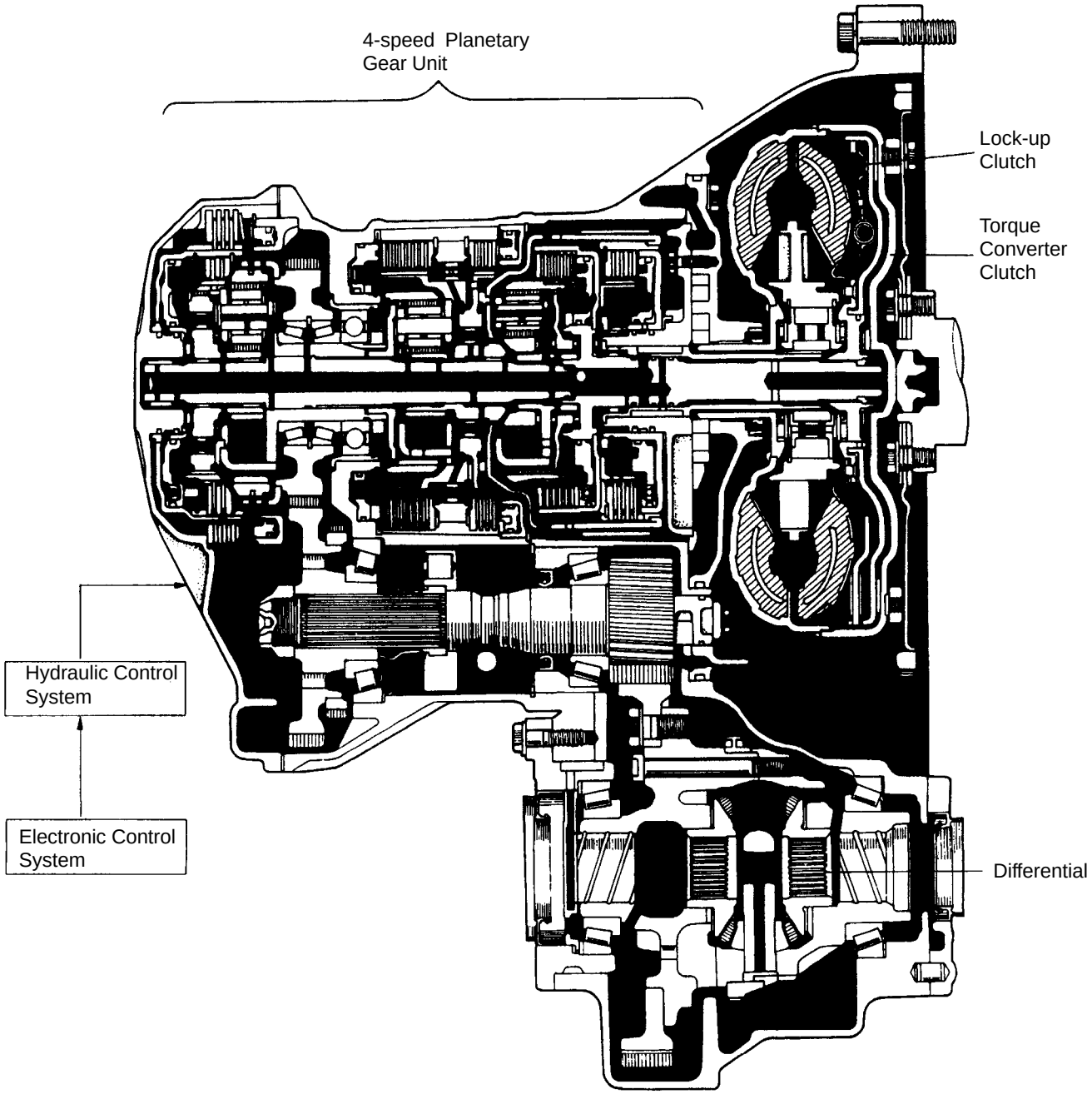
Part tightened	N-m	kgf-cm	ft-lbf
Oil cooler pipe union	27	275	20
Oil pan	4.9	50	43 in.-lbf
Valve body × Transaxle case	11	110	8
Accumulator × Cover	10	100	7
Oil pump × Transaxle case	22	225	16
O/D case × Transaxle case	25	250	18
Differential LH side bearing retainer	19	195	14
Differential RH retainer	19	195	14
Differential carrier cover	39	400	29
Oil pump body × Stator shaft	10	100	7
Upper valve body × Lower valve body	6.6	67	58 in.-lbf
Differential left case × Right case	63	640	46
Ring gear × Differential case	124	1,260	91
Upper valve body × Lower valve body	6.6	67	58 in.-lbf
Accumulator cylinder × Valve body	6.6	67	58 in.-lbf
Solenoid × Valve body	6.6	67	58 in.-lbf
Differential LH case × Differential RH case	63	640	46
Differential case × Ring gear	124	1,260	91
Counter drive gear lock nut	206	2,100	152
Carrier cover × Transaxle case	39	400	29
LH bearing retainer × Transaxle case	19	195	14
RH bearing retainer × Transaxle case	19	195	14
Parking lock pawl bracket	7.4	75	65 in.-lbf
Oil strainer × Transaxle case	11	110	8

DESCRIPTION

GENERAL DESCRIPTION

The A540E is a 4-speed, Electronically Controlled Transaxle developed exclusively for use with transversely-mounted engines. A lock-up is built into the torque converter clutch.
The A540E transaxle is mainly composed of a torque converter clutch, a 4-speed planetary gear unit, a differential, a hydraulic control system and an electronic control system.

Sectional View



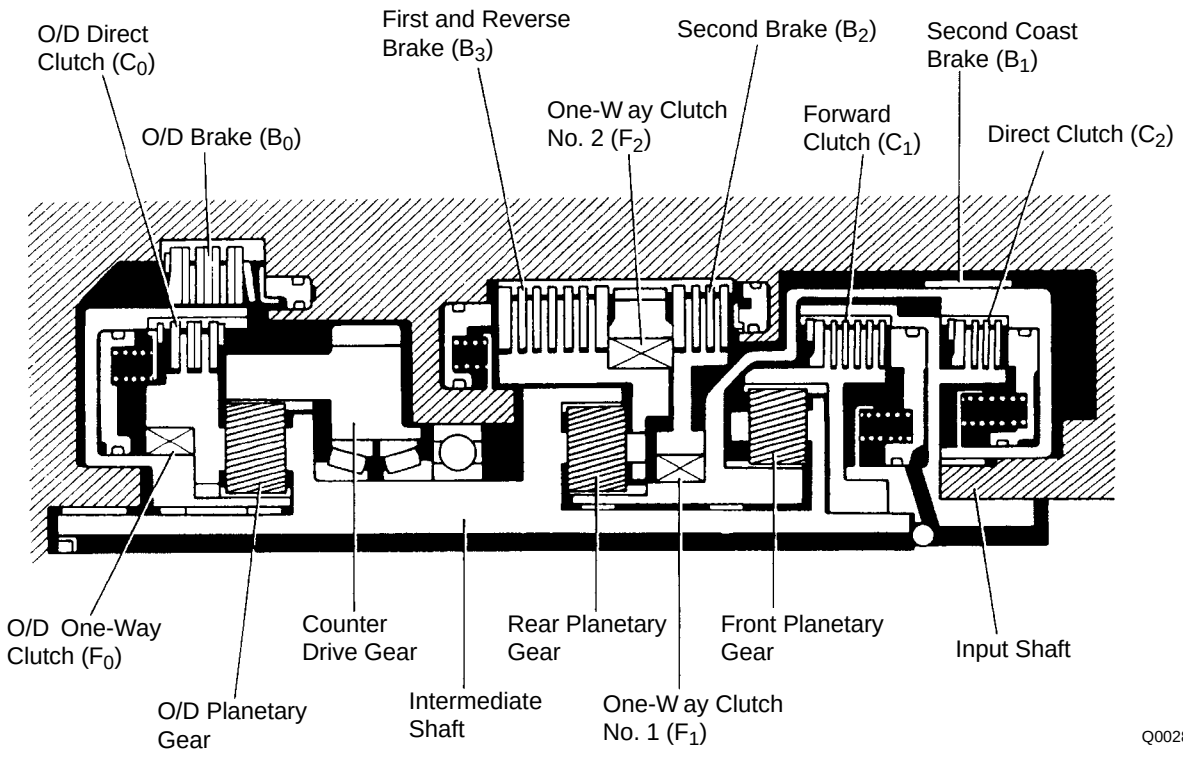
Q00169

GENERAL SPECIFICATION

Type of Transaxle		A540E
Type of Engine		3VZ-FE
Torque Converter Clutch Stall Torque Ratio		1.9 : 1
Lock-up Mechanism		Equipped
Gear Ratio	1st Gear	2.810
	2nd Gear	1.549
	3rd Gear	1.000
	O/D Gear	0.734
	Reverse Gear	2.296
Number of Discs and Plates	(Disc and Plate)	
	O/D Direct Clutch (C_0)	2/2
	Forward Clutch (C_1)	5/5
	Direct Clutch (C_2)	3/3
	2nd Brake (B_2)	3/3
	First and Reverse Brake (B_3)	7/7
	O/D Brake (B_0)	3/3
B_1 Band Width	mm (in.)	38 (1.50)
ATF Type		ATF DEXRON○ II
Capacity (US qts, Imp. qts)	A/T	6.5 (6.9, 5.7)
	D/F	0.8 (0.8, 0.7)

OPERATION

Planetary Gear Unit



○ ... Operating

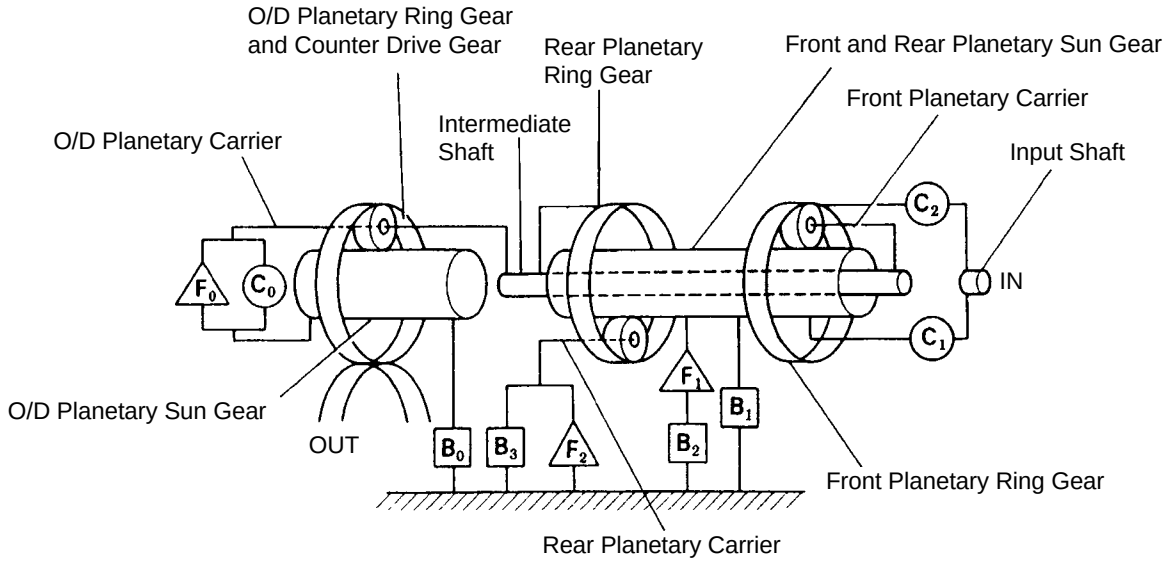
Shift lever position	Gear position	C_0	C_1	C_2	B_0	B_1	B_2	B_3	F_0	F_1	F_2
P	Parking	○									
R	Reverse	○		○				○			
N	Neutral	○									
D	1st	○	○						○		○
	2nd	○	○				○		○	○	
	3rd	○	○	○			○		○		
	O/D		○	○	○		○				
2	1st	○	○						○		○
	2nd	○	○			○	○		○	○	
	*3rd	○	○	○			○		○		
L	1st	○	○					○	○		○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

*Down-shift - no up-shift

V00337

1. FUNCTION OF COMPONENTS

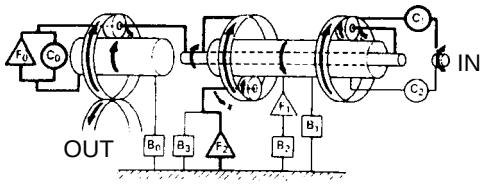
COMPONENT		FUNCTION
Forward Clutch	C_1	Connects input shaft and front planetary ring gear
Direct Clutch	C_2	Connects input shaft and front & rear planetary sun gear
2nd Coast Brake	B_1	Prevents front & rear planetary sun gear from turning either clockwise or counterclockwise
2nd Brake	B_2	Prevents outer 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 overdrive sun gear and overdrive planetary carrier
O/D Brake	B_0	Prevents overdrive sun gear from turning either clockwise or counterclockwise
O/D One-Way Clutch	B_0	When transaxle is being driven by engine, connects overdrive sun gear and overdrive 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



V00341

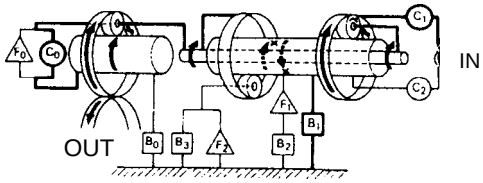
Power from the engine transmitted to the input shaft via the torque converter clutch is then transmitted to the planetary gears by the operation of the clutch.
By operation of the brake and one-way clutch, either the planetary carrier or the planetary sun gear are immobilized, altering the speed of revolution of the planetary gear unit.
Shift change is carried out by altering the combination of clutch and brake operation.
Each clutch and brake operates by hydraulic pressure; gear position is decided according to throttle opening angle and vehicle speed, and shift change automatically occurs.
The conditions of operation for each gear position are shown on the following illustrations:

D or 2 Position 1st Gear



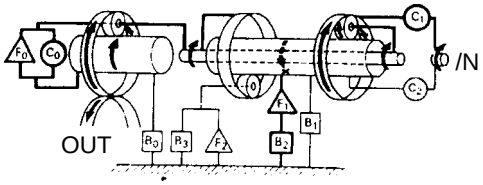
AT1097

2 Position 2nd Gear



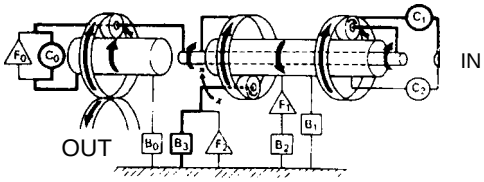
AT1102

D Position 2nd Gear



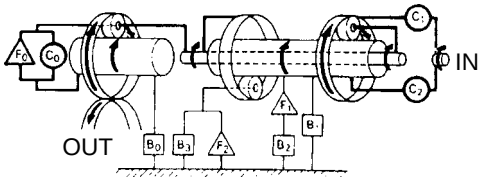
AT1098

L Position 1st Gear



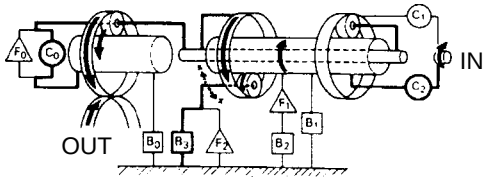
AT1103

D Position 3rd Gear



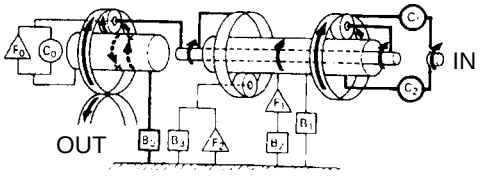
AT1099

R Position Reverse Gear



AT1101

D Position O/D Gear



AT1100

V02644

2. HYDRAULIC CONTROL SYSTEM

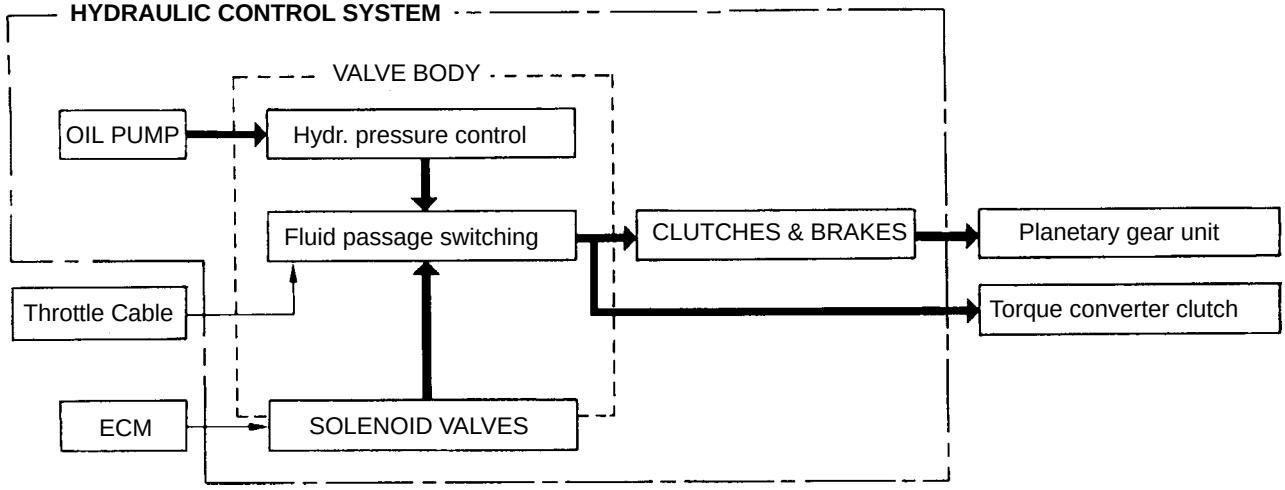
The hydraulic control system is composed of the oil pump, the valve body, the solenoid valves, the accumulators, the clutches and brakes as well as the fluid passages which connect all of these components.

Based on the hydraulic pressure created by the oil pump, the hydraulic control system governs the hydraulic pressure acting on the torque converter clutch, clutches and brakes in accordance with the vehicle driving conditions.

These are three solenoid valves on the valve body.

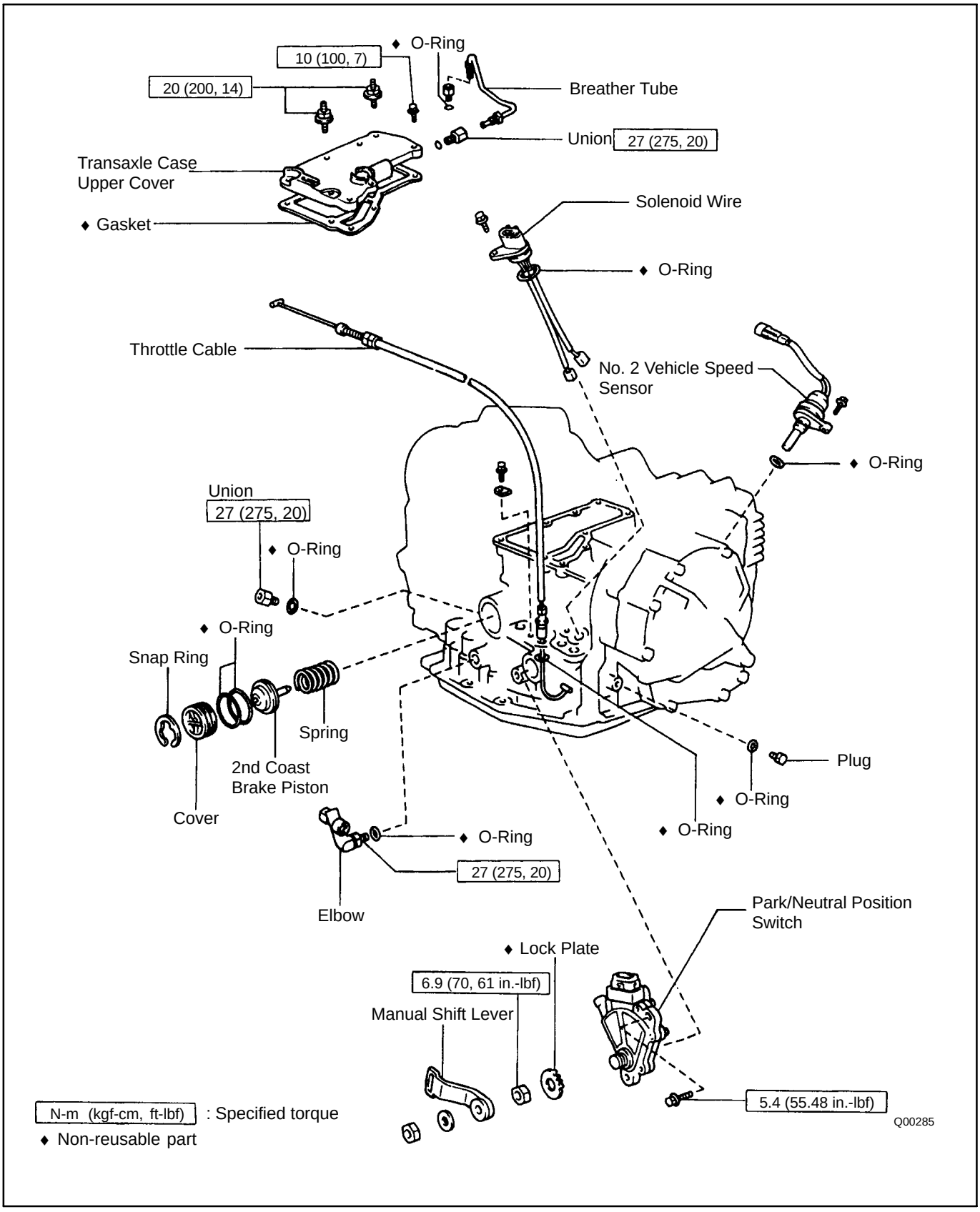
The No. 1 and No. 2 solenoid valves are turned on and off by signals from ECM to operate the shift valves and change the gear shift position.

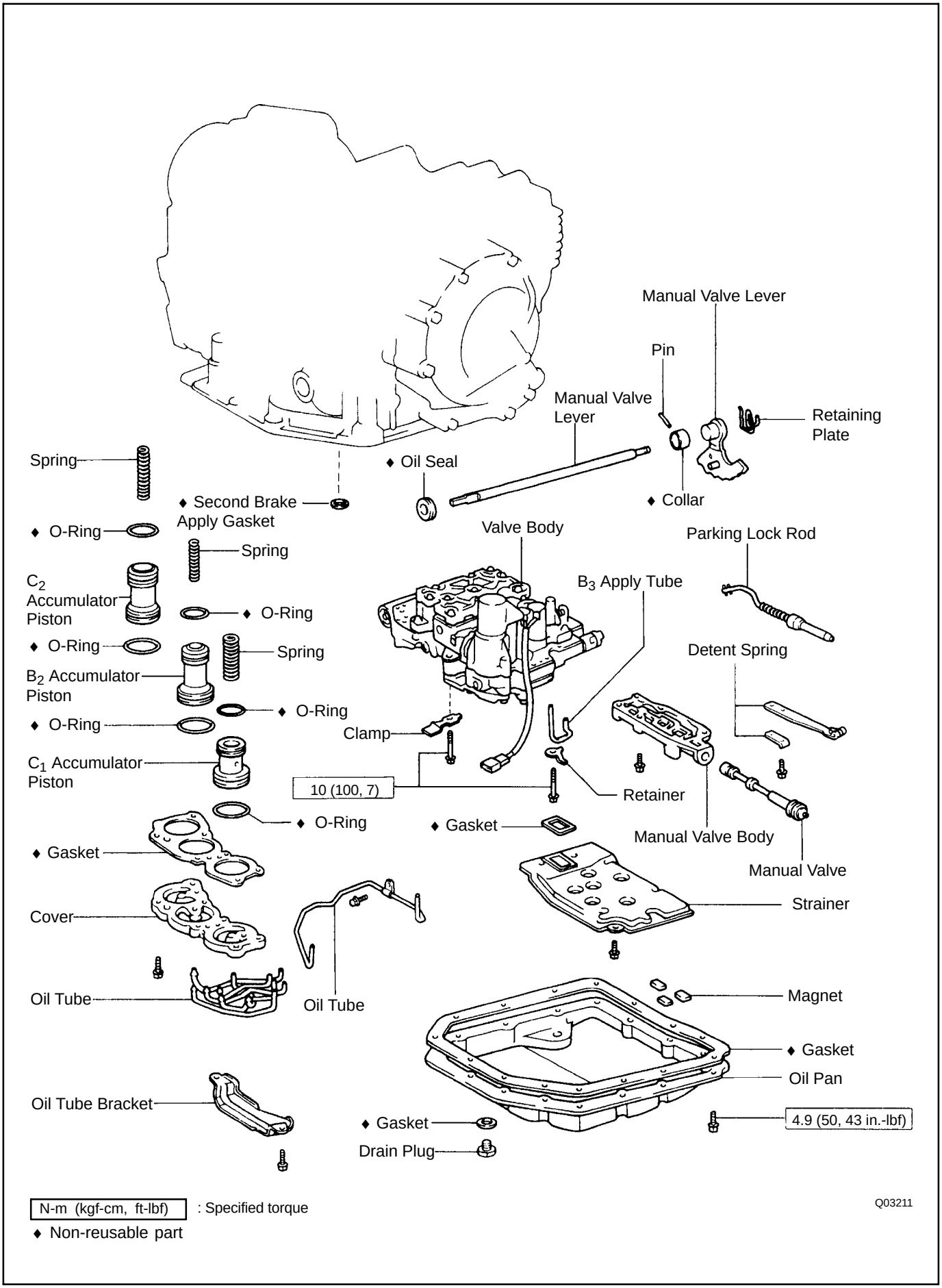
The No. 3 solenoid valve is operated by signals from the ECM to engage or disengage the lockup clutch of the torque converter clutch.



COMPONENT PARTS REMOVAL

COMPONENTS

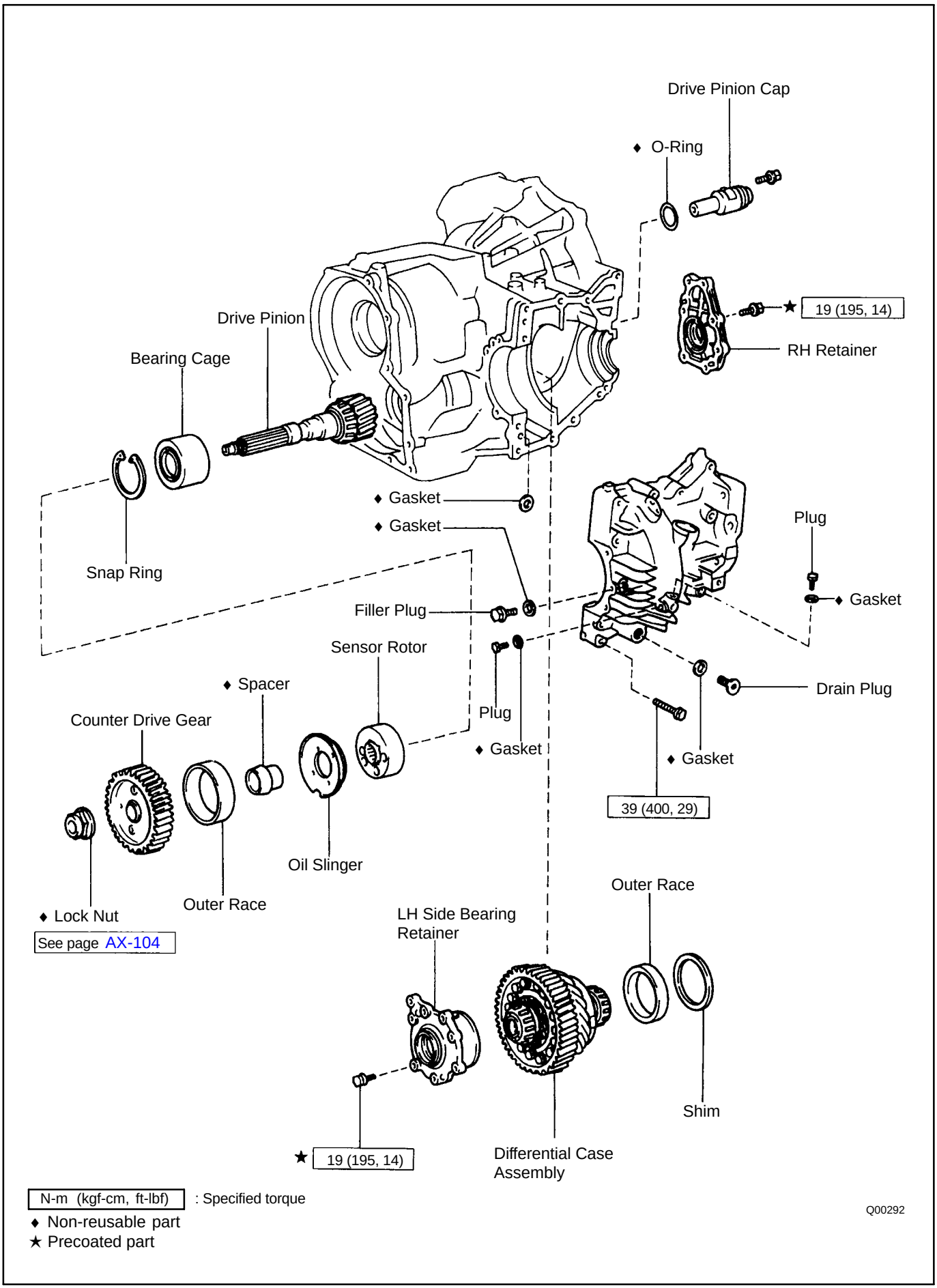




N-m (kgf-cm, ft-lbf) : Specified torque

♦ Non-reusable part

Q03211

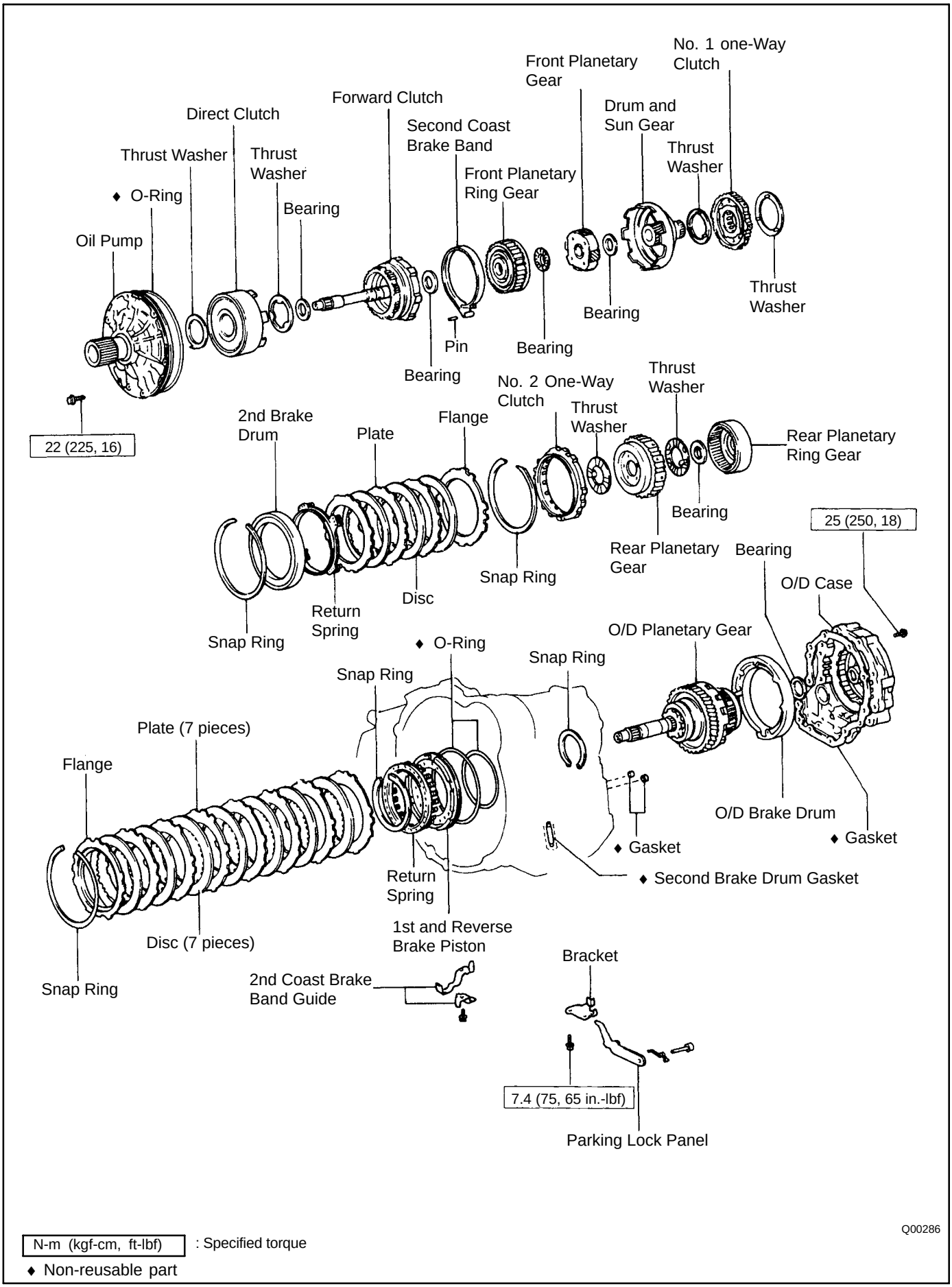


N-m (kgf-cm, ft-lbf) : Specified torque

♦ Non-reusable part

★ Precoated part

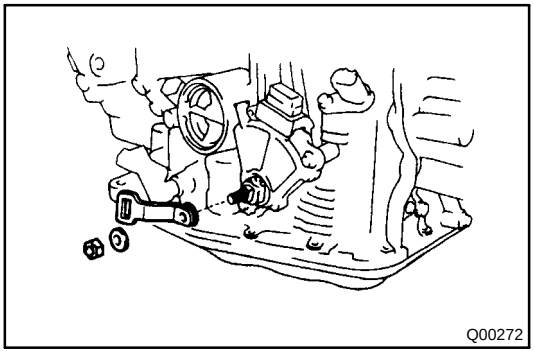
Q00292



Q00286

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

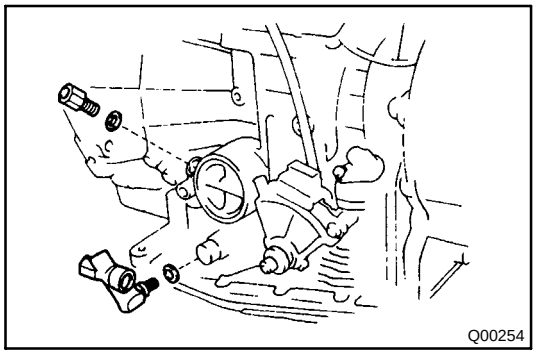
♦ Non-reusable part


Q00272

SEPARATE BASIC SUBASSEMBLY

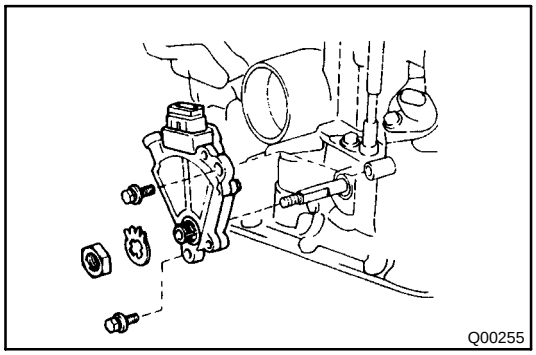
1. REMOVE UNION AND ELBOW

(a) Remove the manual shift lever.


Q00254

(b) Using the open and wrench, remove the union and elbow.

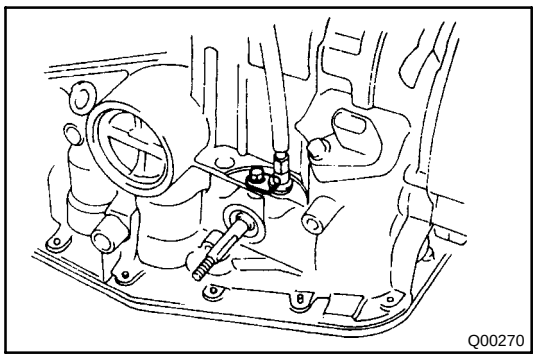
(c) Remove the O-rings from the union and elbow.


Q00255

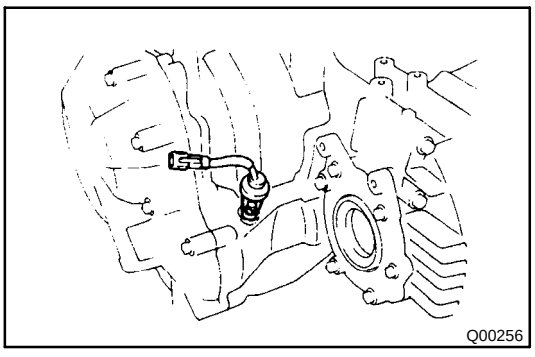
2. REMOVE PARK/NEUTRAL POSITION SWITCH

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

(b) Remove the two bolts and pull out the park/neutral position switch.


Q00270

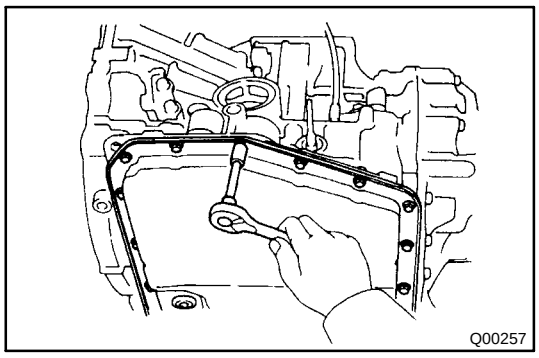
3. REMOVE THROTTLE CABLE RETAINING BOLT AND PLATE


Q00256

4. REMOVE NO. 2 VEHICLE SPEED SENSOR

(a) Remove the bolt and pull out the vehicle speed sensor.

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



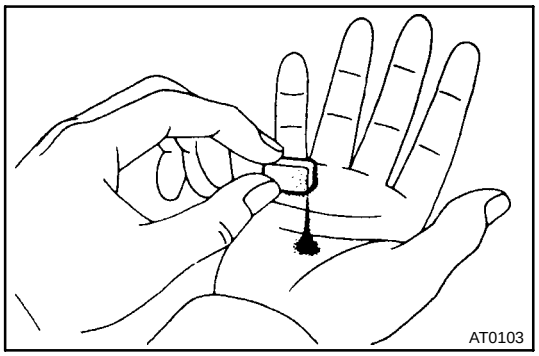
5. REMOVE OIL PAN AND GASKET

(a) Remove the seventeen 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 tube bracket.

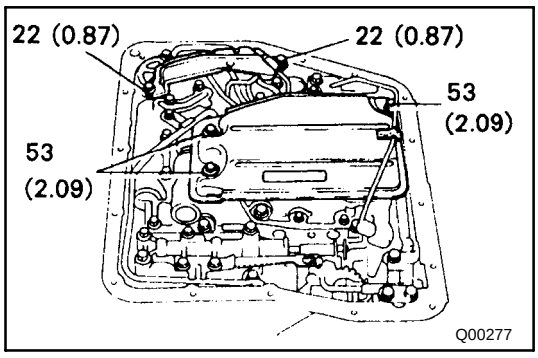


6. EXHAUST PARTICLES IN PAN

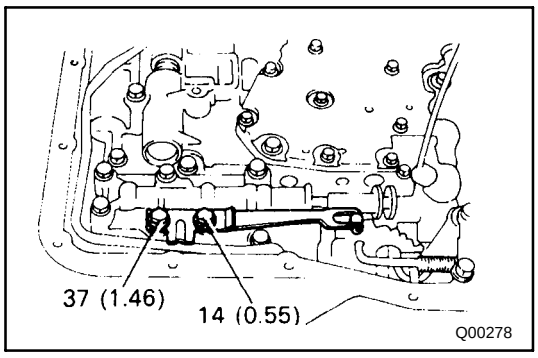
Remove the magnet and use it to collect any steel chips.

Lock carefully at the chips and particles in the oil pan and on magnet to anticipate what type of wear you will find in the transaxle.

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

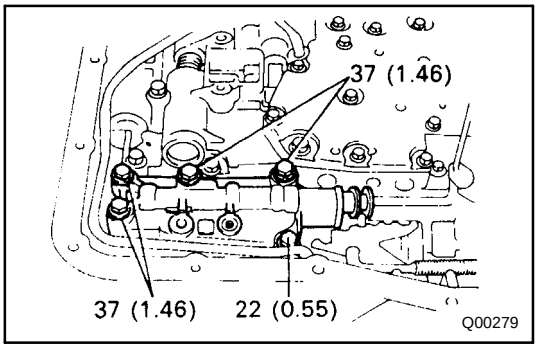


7. REMOVE OIL TUBE BRACKET AND STRAINER



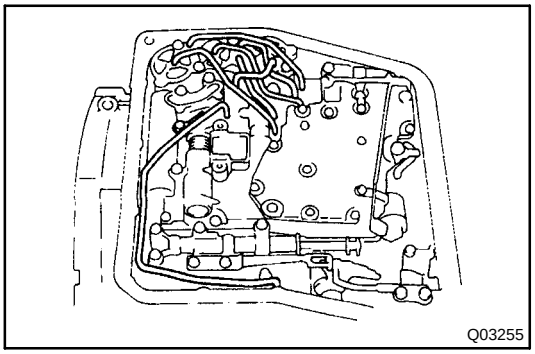
8. REMOVE MANUAL VALVE BODY

(a) Remove the two bolts and detent spring.



(b) Remove the five bolts and manual valve body with the manual valve.

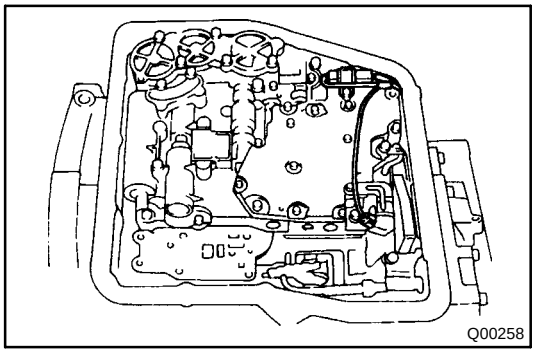
(c) Remove the manual valve from the manual valve body.


Q03255

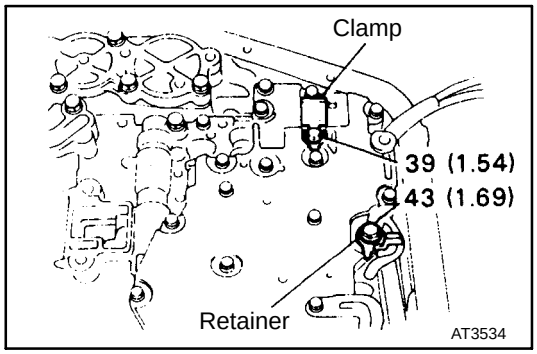
9. REMOVE OIL TUBES

(a) Remove the bolt.

(b) Pry up both tube ends with a large screwdriver and remove the seven tubes.

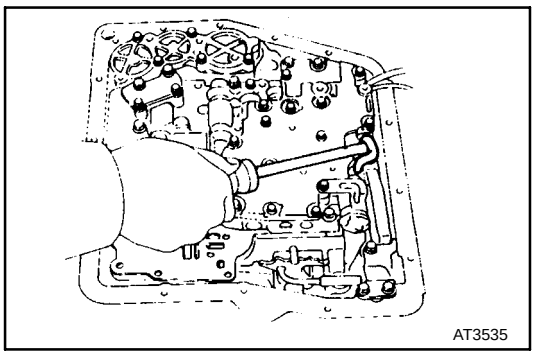

Q00258

10. DISCONNECT SOLENOID CONNECTORS



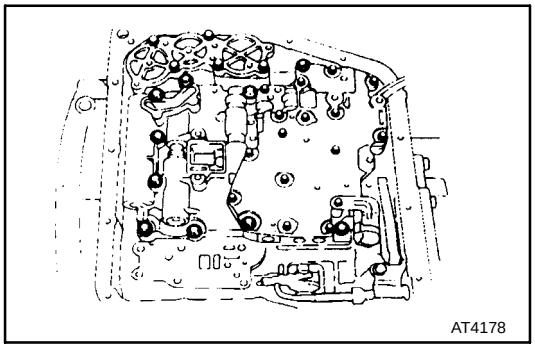
AT3534

11. REMOVE CONNECTOR CLAMP AND TUBE RETAINER


AT3535

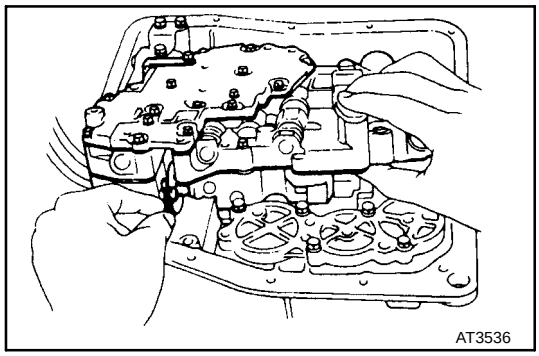
12. REMOVE B_3 APPLY TUBE

Pry up the tube with a screwdriver and remove the tube.

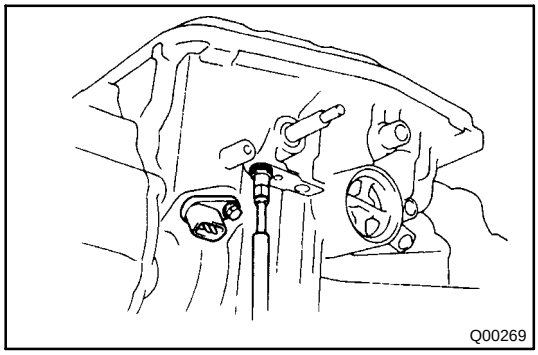

AT4178

13. REMOVE VALVE BODY

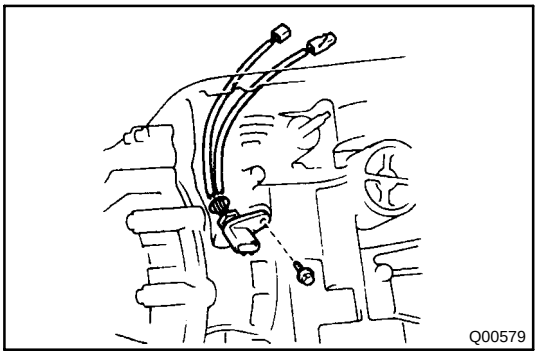
(a) Remove the ten bolts.



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

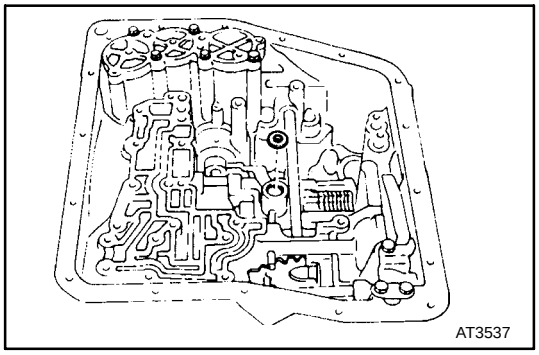


14. REMOVE THROTTLE CABLE

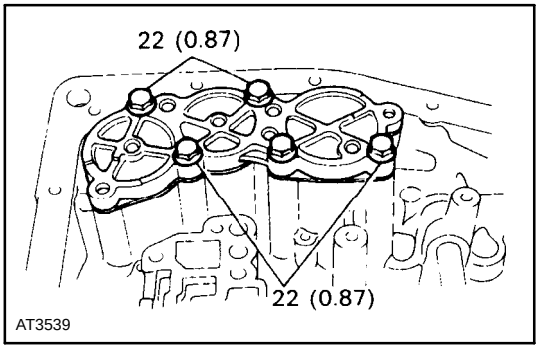


15. REMOVE SOLENOID WIRING

Remove the bolt and the solenoid wiring.



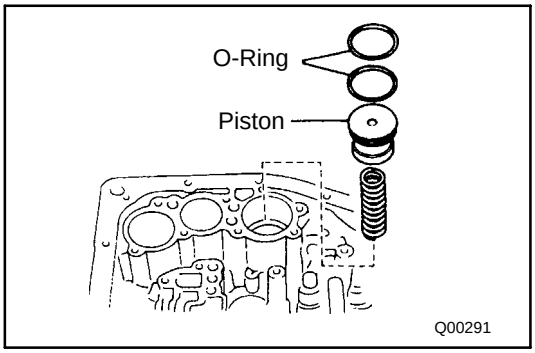
16. REMOVE SECOND BRAKE APPLY GASKET



17. REMOVE ACCUMULATOR PISTONS AND SPRINGS

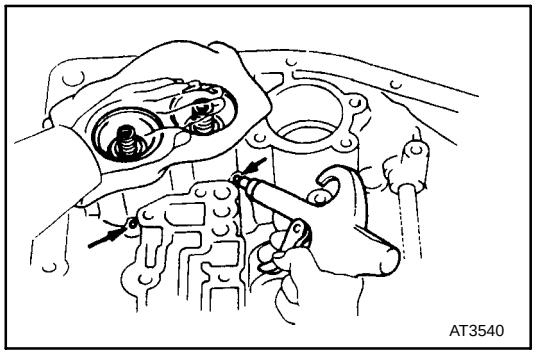
(a) Loosen the five bolts one turn at a time until the spring tension is released.

(b) Remove the cover and gasket.



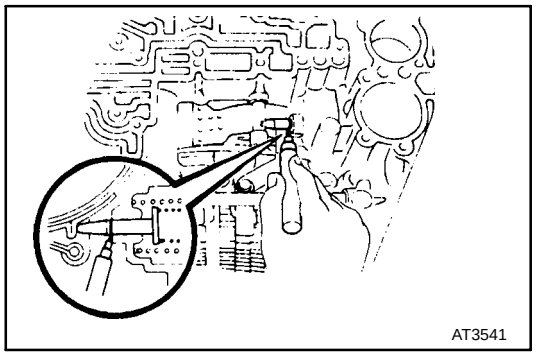
(c) Remove the C_1 accumulator piston and spring.

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



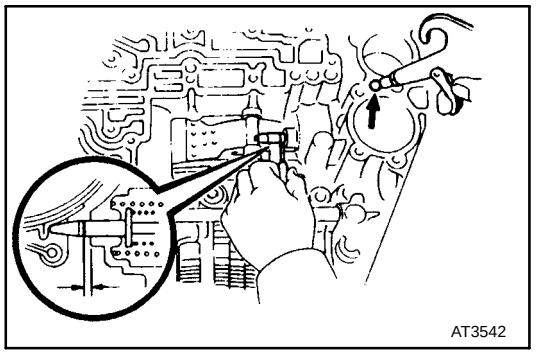
(e) Pop out pistons for C and B_2 into a rag, using low-pressure compressed air (98 kPa, 1 kgf/cm^2, 14 psi). Force air into the holes shown and remove the pistons and springs.

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



18. MEASURE PISTON STROKE SECOND COAST BRAKE

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



(b) Using SST, measure the piston stroke applying and releasing the compressed air (392 - 785 kPa, 4 - 8 kgf/cm^2, 57 - 114 psi), as shown.

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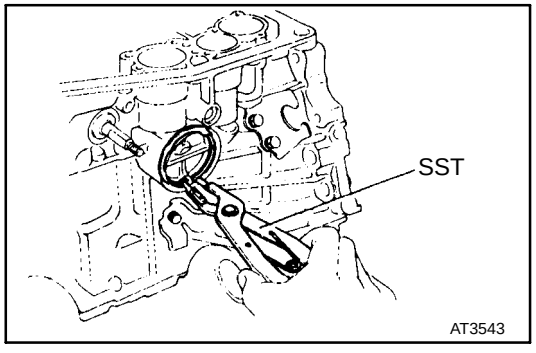
Maximum thrust clearance:

2.0 - 3.5 mm (0.079 - 0.138 in.)

If the piston stroke exceeds the limit, inspect the second coast brake band (See page AX-37).



19. REMOVE SECOND COAST BRAKE PISTON

(a) Using SST, remove the snap ring.

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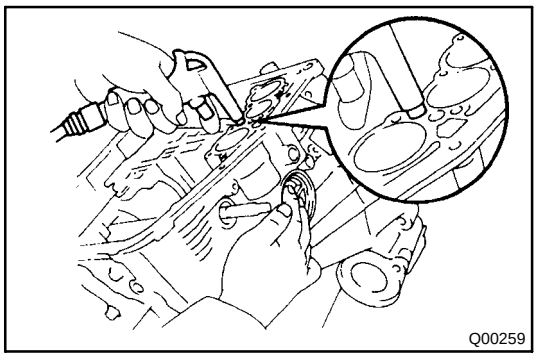
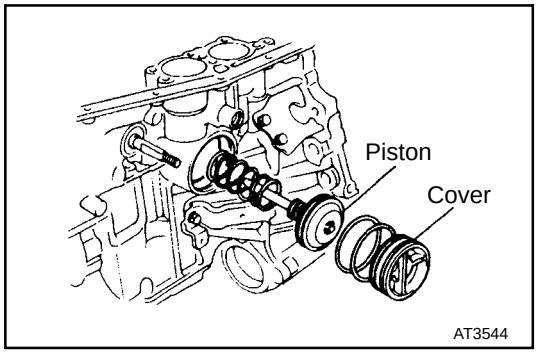
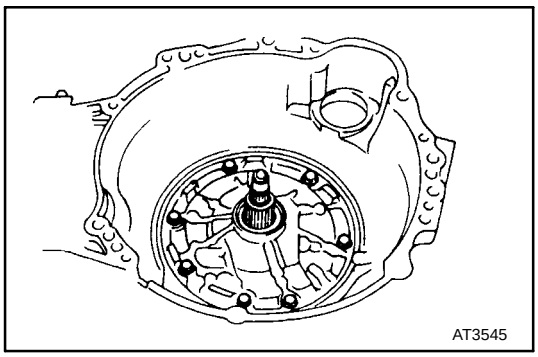


(b) Applying compressed air to the oil hole, remove the second coast brake cover, piston assembly and spring.

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



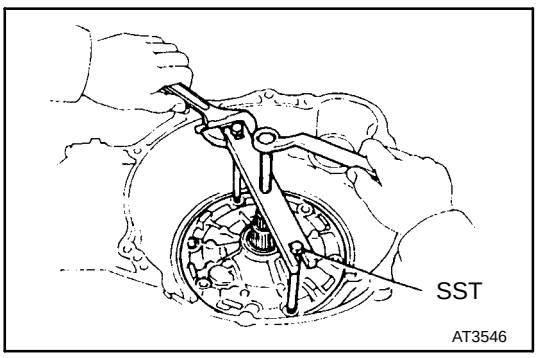


20. STAND TRANSAXLE ENGINE SIDE UPWARD

21. REMOVE OIL PUMP

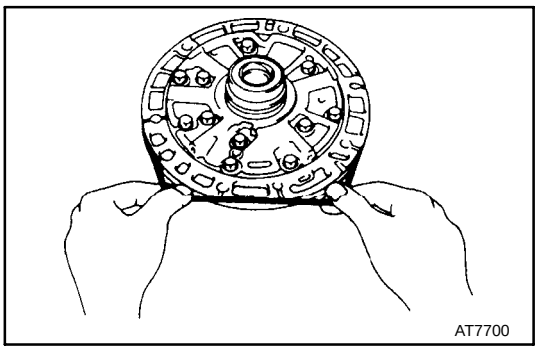
NOTICE: Before removing the oil pump, remove the second coast brake piston.

(a) Remove the seven bolts.

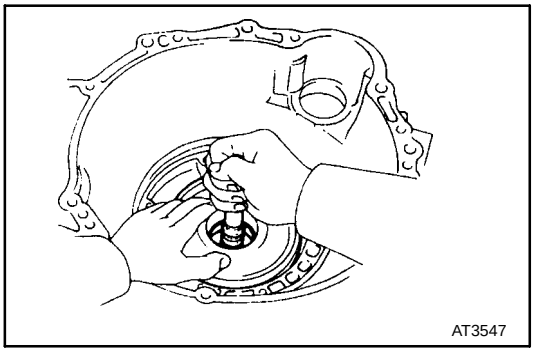


(b) Using SST, pull out the oil pump from the transaxle case.

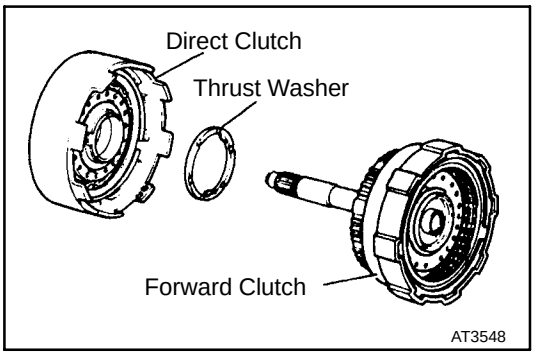
SST 09350-32014



22. REMOVE O-RING FROM OIL PUMP



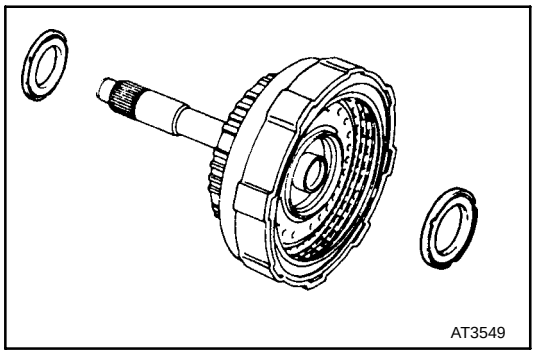
23. REMOVE DIRECT CLUTCH AND FORWARD CLUTCH



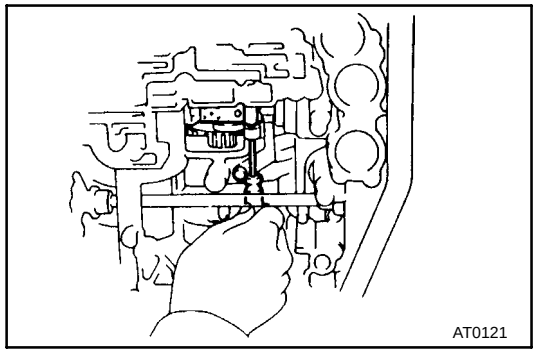
24. SEPARATE DIRECT CLUTCH AND FORWARD CLUTCH

(a) Separate the direct clutch and forward clutch.

(b) Remove the thrust washer from direct clutch.



25. REMOVE BEARING FROM FORWARD CLUTCH

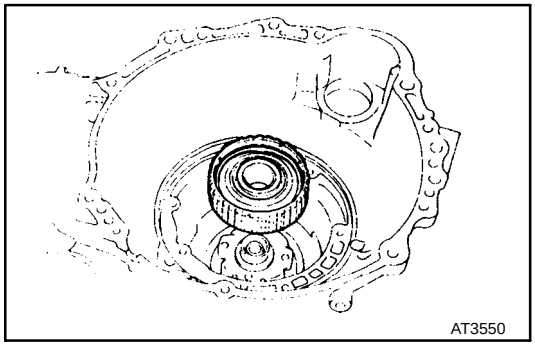


26. REMOVE SECOND COAST BRAKE BAND

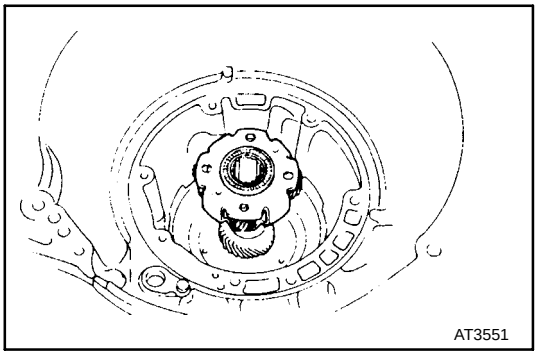
(a) Push the pin with a small screwdriver and remove it from the bolt hole of the oil pump mounting.

(b) Remove the brake band.

HINT: For the method of inspection, refer to page AX-37 .

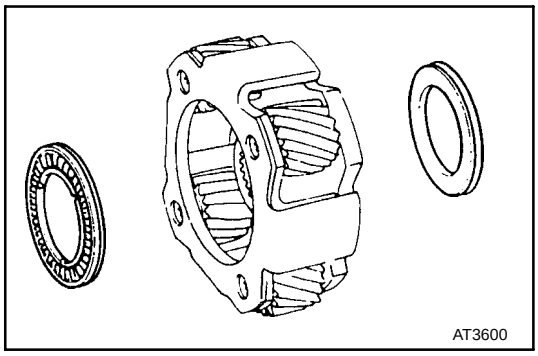


27. REMOVE FRONT PLANETARY RING GEAR

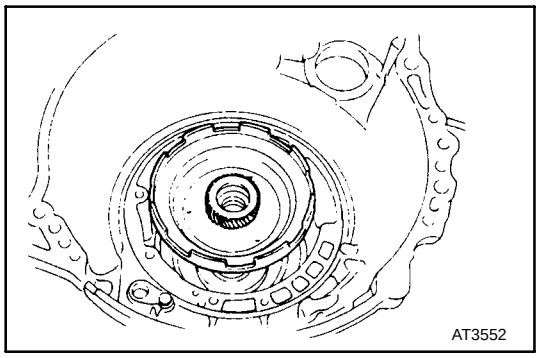


28. REMOVE FRONT PLANETARY GEAR

(a) Remove the front planetary gear.

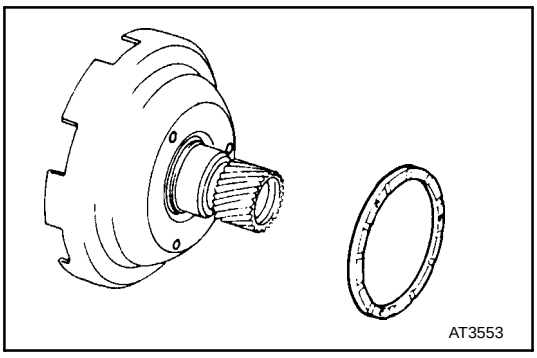


(b) Remove the two bearings from the planetary gear.

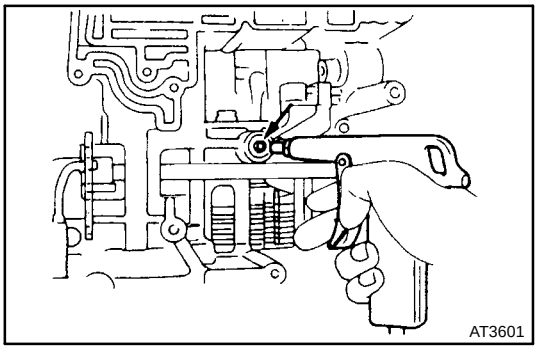


29. REMOVE SUN GEAR AND SUN GEAR INPUT DRUM

(a) Remove the sun gear and the sun gear input drum.

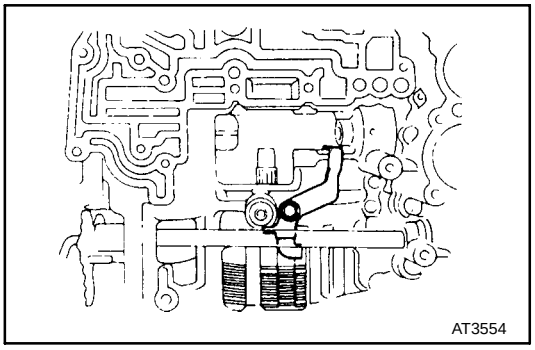


(b) Remove the thrust washer from sun gear input drum.

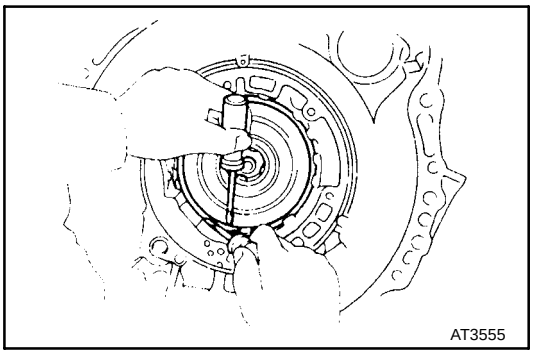


30. CHECK OPERATION OF SECOND BRAKE PISTON

Apply compressed air into the case passage and confirm that the piston moves.
If the piston does not move, disassembly and inspect.

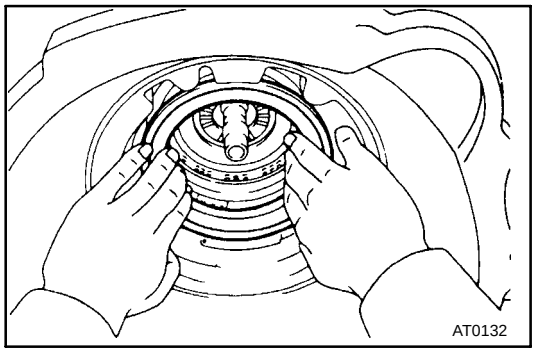


31. REMOVE SECOND COAST BRAKE BAND GUIDE

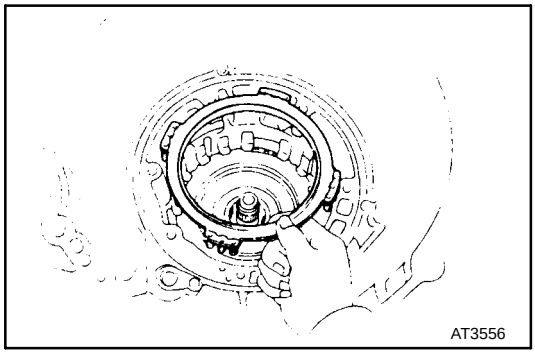


32. REMOVE SECOND BRAKE DRUM

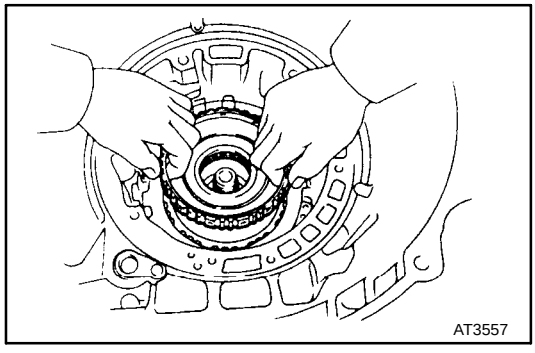
(a) Remove the snap ring.



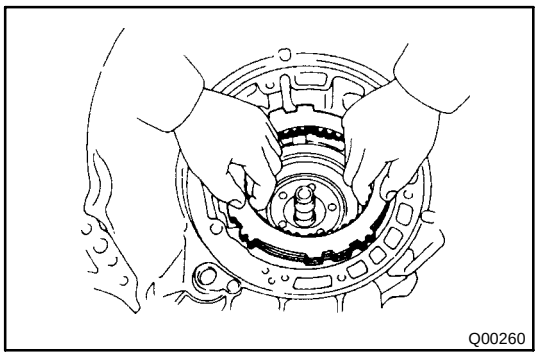
(b) Remove the second brake drum.



33. REMOVE SECOND BRAKE PISTON RETURN SPRING

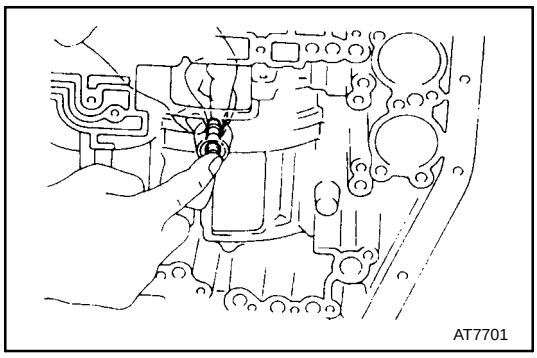


34. REMOVE NO. 1 ONE-WAY CLUTCH



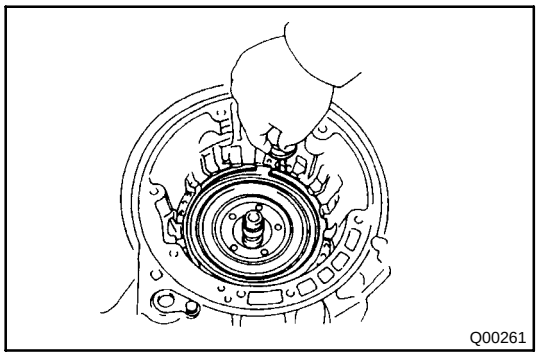
35. REMOVE PLATES, DISCS AND FLANGE

HINT: For the method of inspection, refer to page AX-57 .



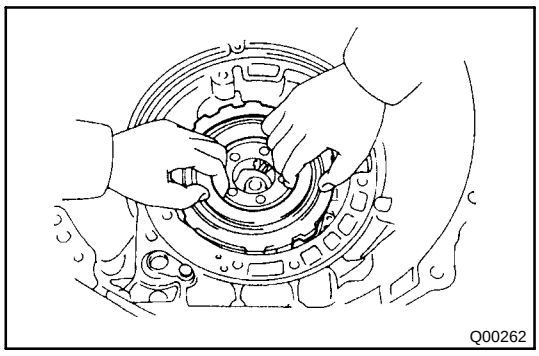
36. REMOVE SECOND BRAKE DRUM GASKET

Remove the gasket.

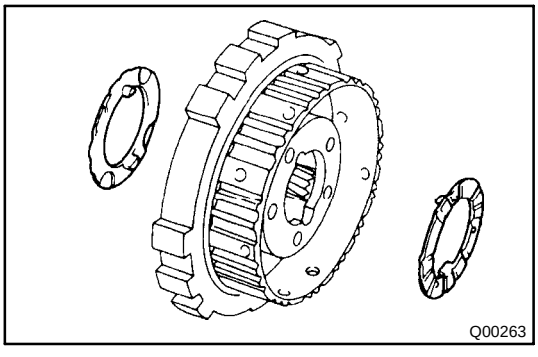


37. REMOVE NO. 2 ONE-WAY CLUTCH AND REAR PLANETARY GEAR

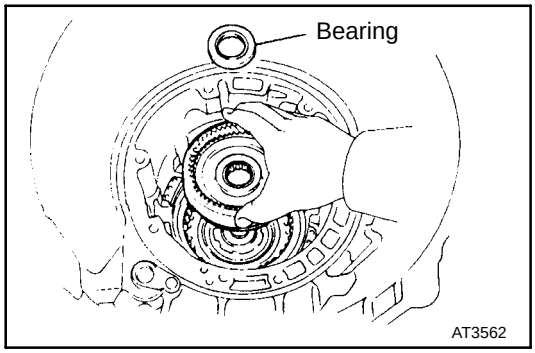
(a) Remove the snap ring.



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



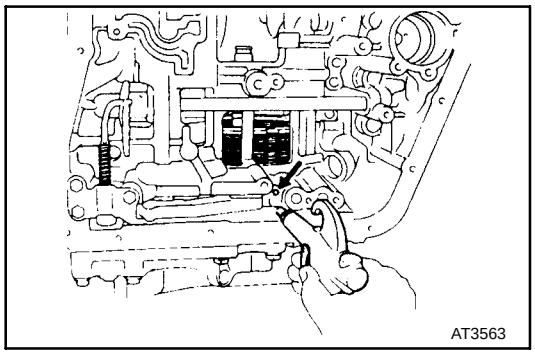
(c) Remove two thrust washers from the rear planetary gear.



38. REMOVE REAR PLANETARY RING GEAR

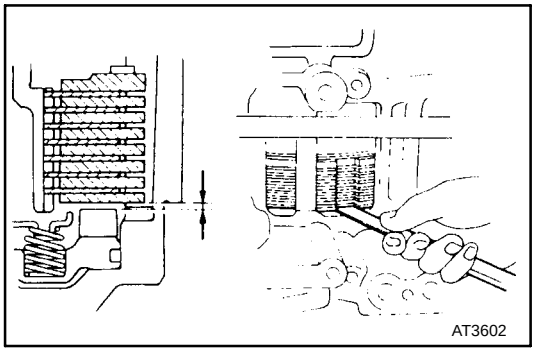
(a) Remove the rear planetary ring gear.

(b) Remove the bearing from the ring gear.



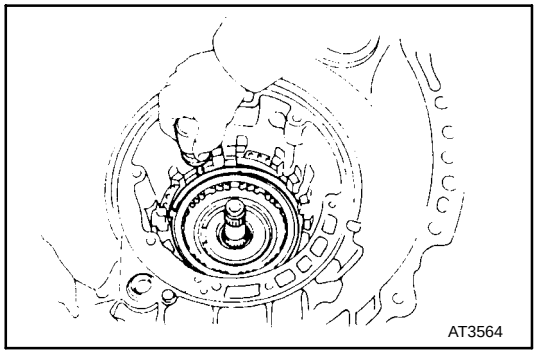
39. CHECK FIRST AND REVERSE BRAKE

(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.



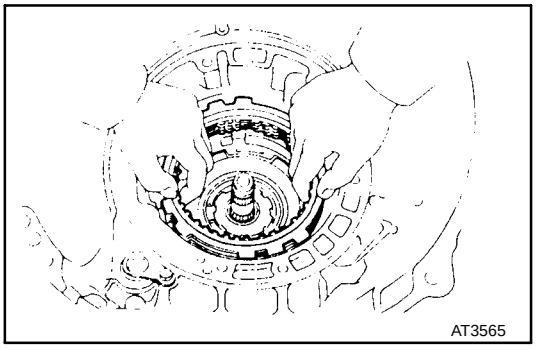
(b) Using a filler gauge, check the pack clearance of the first and reverse brake.

Clearance:
0.85 - 2.05 mm (0.033 - 0.081 in.)



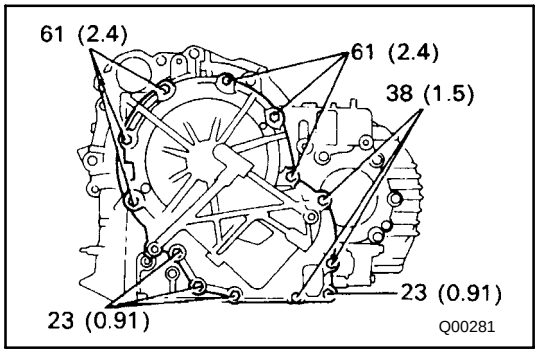
40. REMOVE FLANGE, DISCS AND PLATES OF FIRST AND REVERSE BRAKE

(a) Remove the snap ring.



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

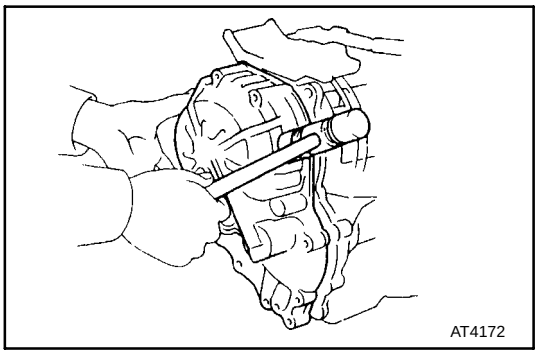
HINT: For the method of inspection, refer to AX-61 .



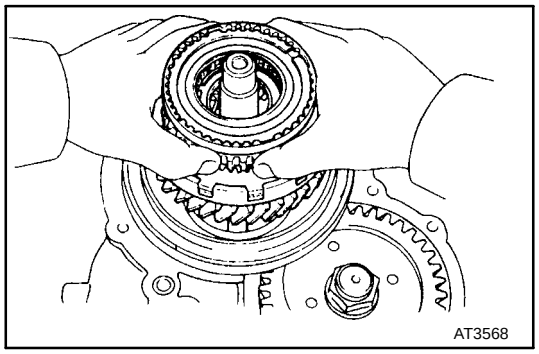
41. TURN TRANSAXLE CASE AROUND

42. REMOVE OVERDRIVE UNIT

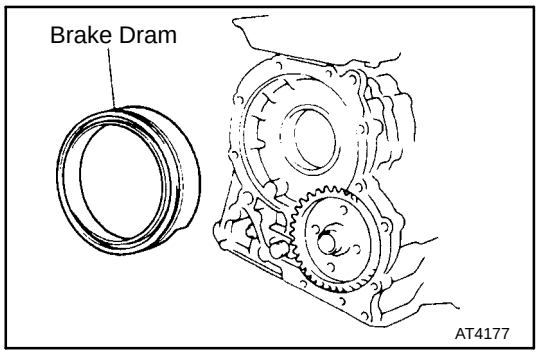
(a) Remove the thirteen bolts.



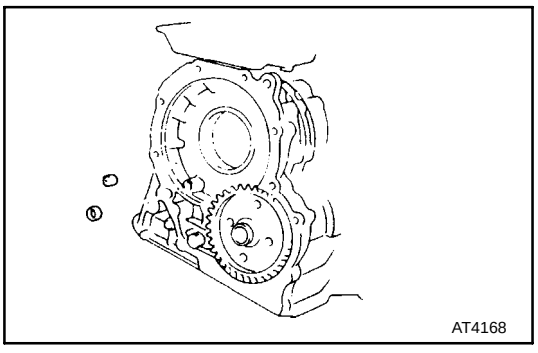
(b) Tap on the circumference of the overdrive case with a plastic hammer to remove the overdrive case and gasket.



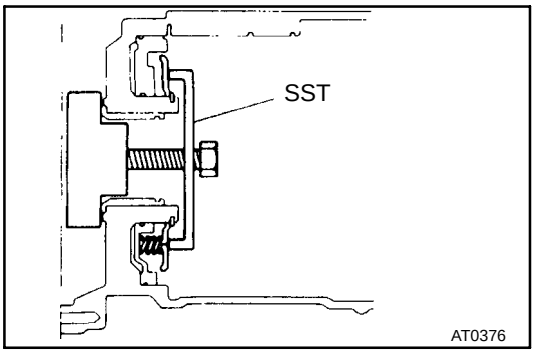
(c) Remove the overdrive planetary gear from transaxle case.



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



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



43. REMOVE FIRST AND REVERSE BRAKE PISTON

(a) Remove the piston return spring.

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

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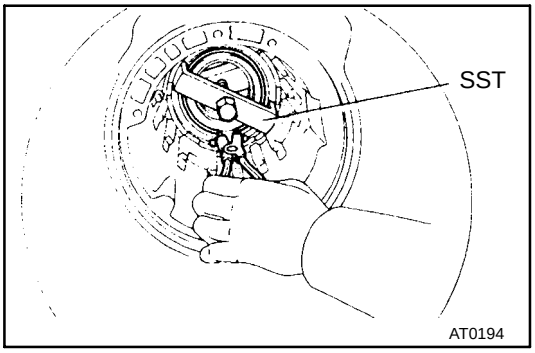
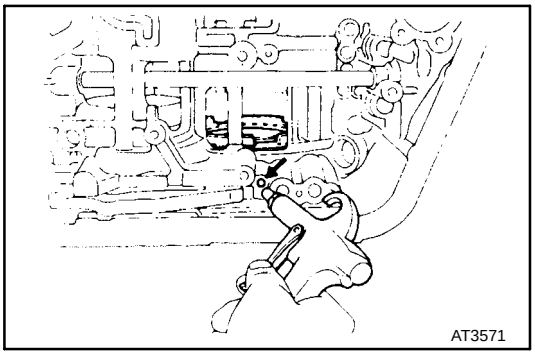
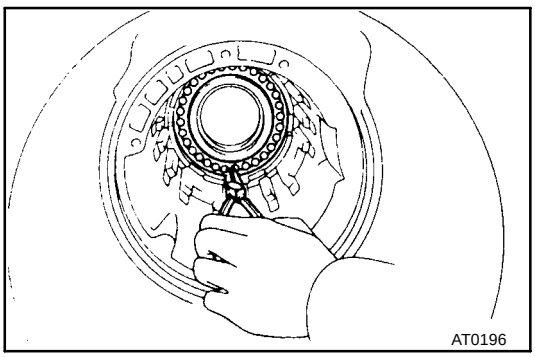


Using snap ring pliers, remove the snap ring.
Remove SST.
Remove the return spring from the case.

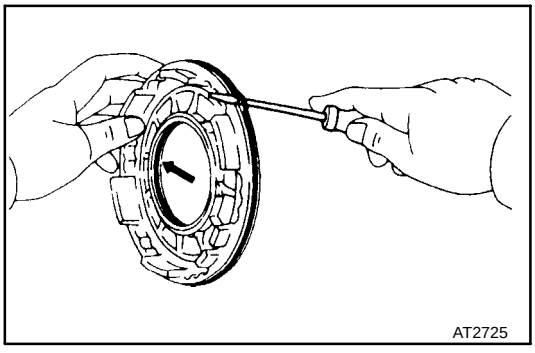


(b) Apply compressed air into the passage of the case to remove the piston.

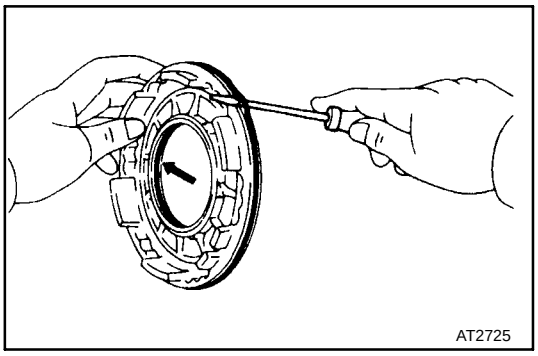
HINT: Hold the piston so it is not slanted and blow with the gun slightly away from the oil hole.



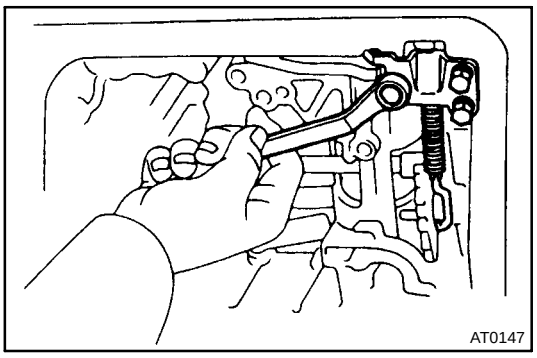
(c) If the piston does not pop out with compressed air, use needle-nose pliers to remove it.



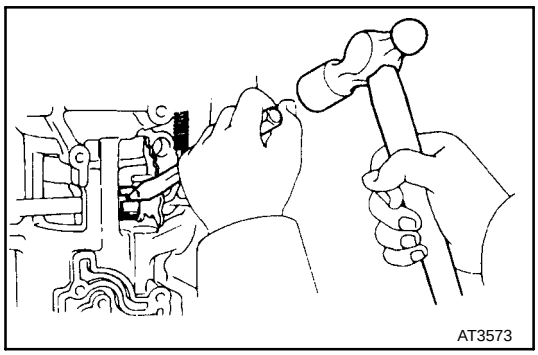
(d) Remove the two O-rings from the piston.



44. REMOVE SNAP RING FROM TRANSAXLE CASE

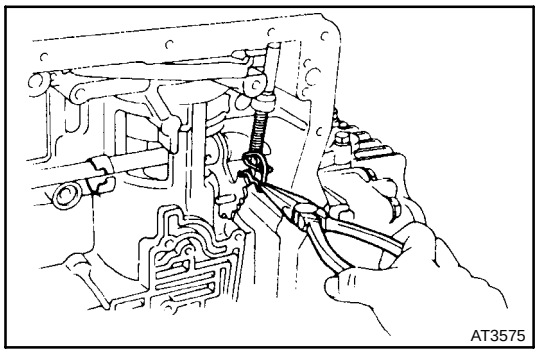


45. REMOVE PARKING LOCK PAWL BRACKET

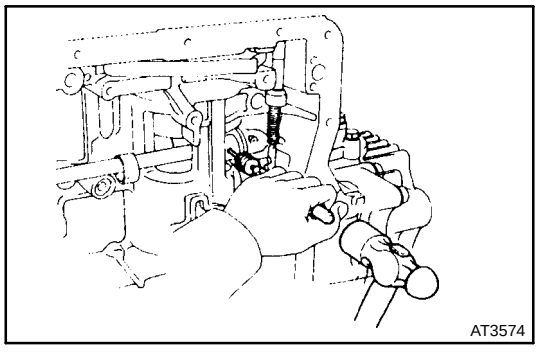


46. REMOVE MANUAL VALVE SHAFT

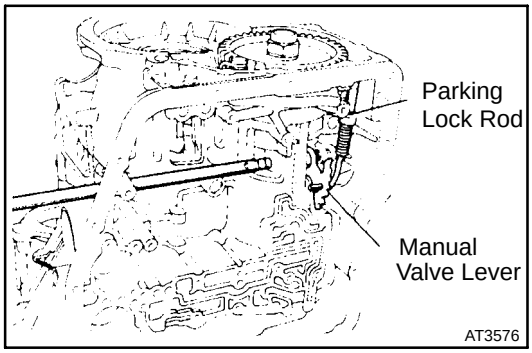
(a) Using a cold chisel and hammer, cut the collar.



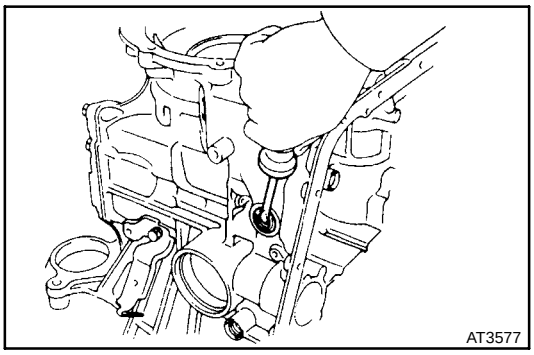
(b) Remove the retaining spring.



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

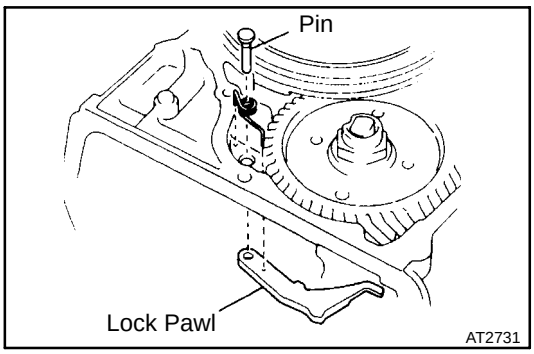


(d) Slide out the shaft from the transaxle case and remove the manual valve lever and parking lock rod.

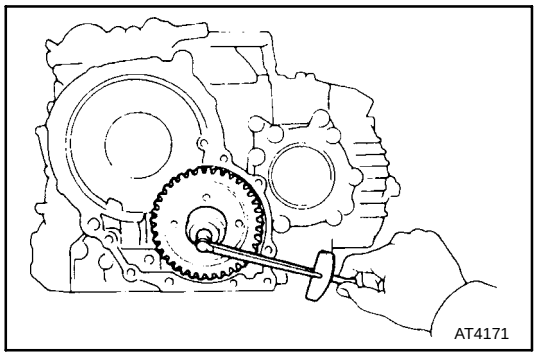


47. REMOVE MANUAL VALVE SHAFT OIL SEAL

Using a screwdriver, remove the oil seal.



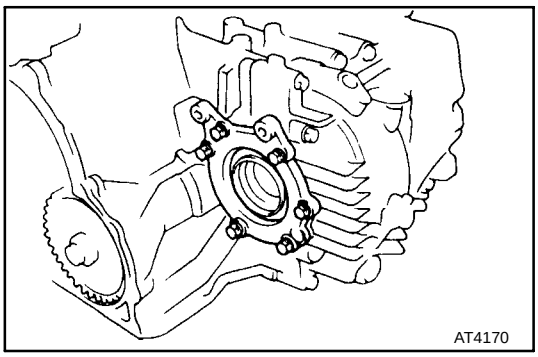
48. REMOVE PIN, SPRING AND PARKING LOCK PAWL


AT4171

DIFFERENTIAL COMPONENT PARTS REMOVAL

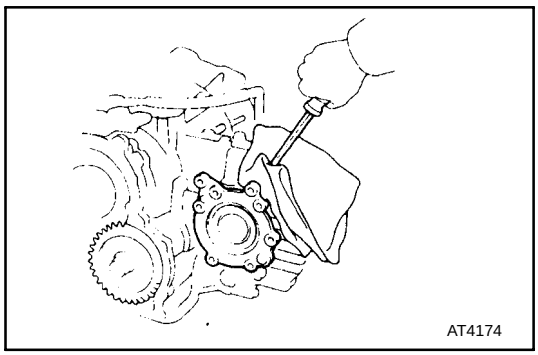
1. MEASURE DIFFERENTIAL TOTAL PRELOAD

Using a torque meter, measure the total preload and make a note of it.


AT4170

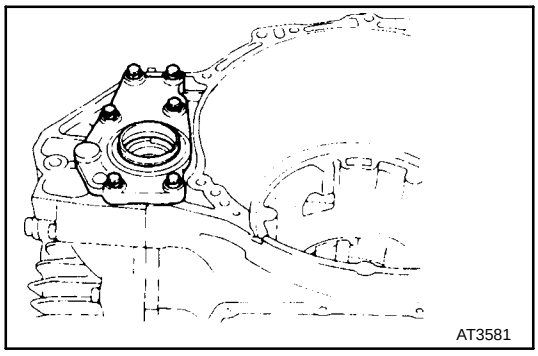
2. REMOVE LH BEARING RETAINER

(a) Remove the six bolts.


AT4174

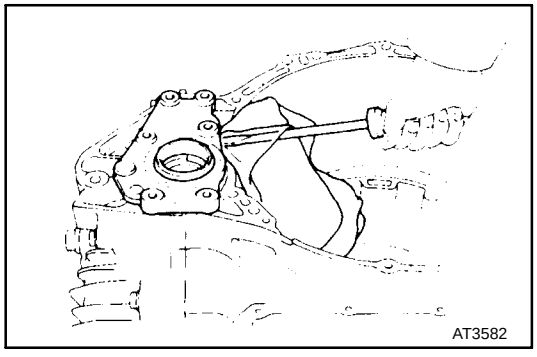
(b) Using a large screwdriver, remove the LH bearing retainer.

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


AT3581

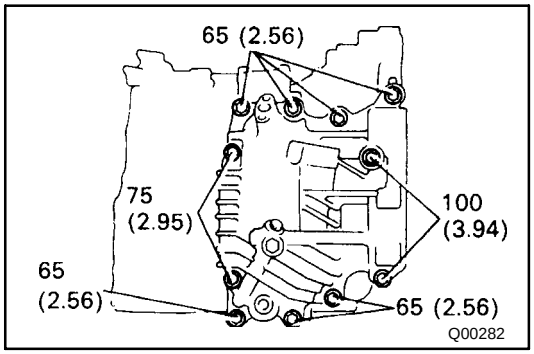
3. REMOVE RH RETAINER

(a) Remove the six bolts.


AT3582

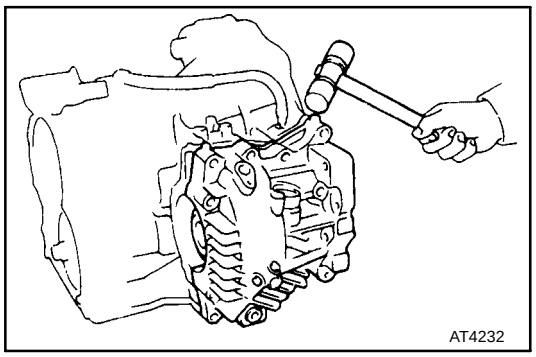
(b) Using a large screwdriver, remove the RH retainer.

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

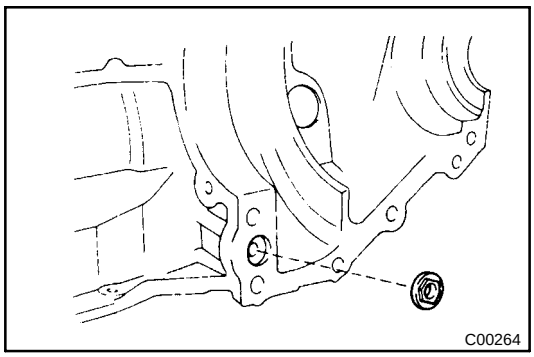


4. REMOVE CARRIER COVER

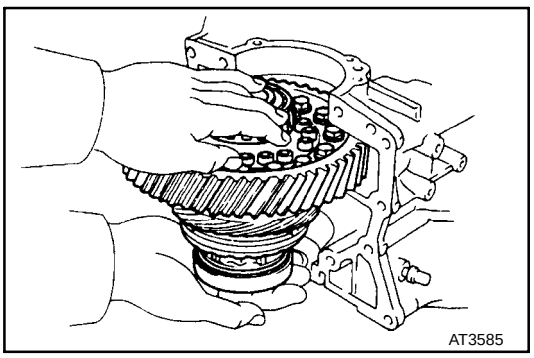
(a) Remove the eleven bolts.



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

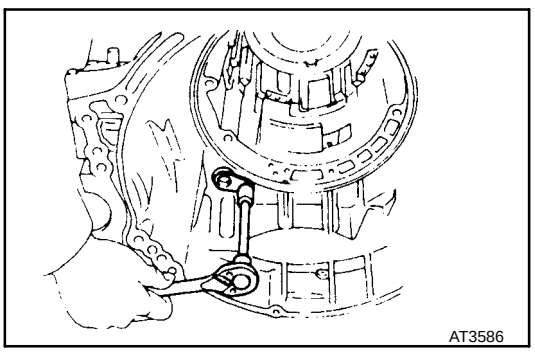


(c) Remove the apply gasket.



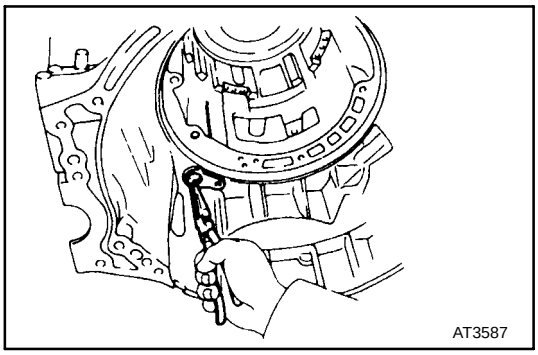
5. REMOVE DIFFERENTIAL CASE

Remove the differential case, outer case and shim from the transaxle case.



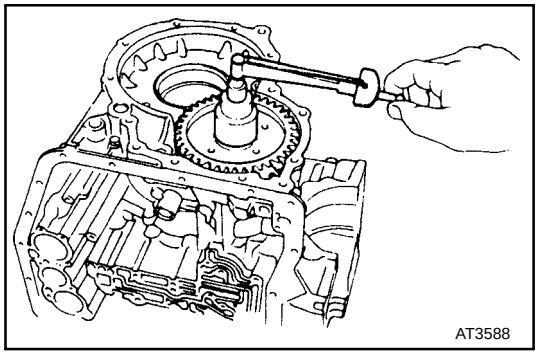
6. REMOVE DRIVE PINION CAP

(a) Remove the bolt.



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

(c) Remove the O-rings from the cap.



7. MEASURE DRIVE PINION PRELOAD

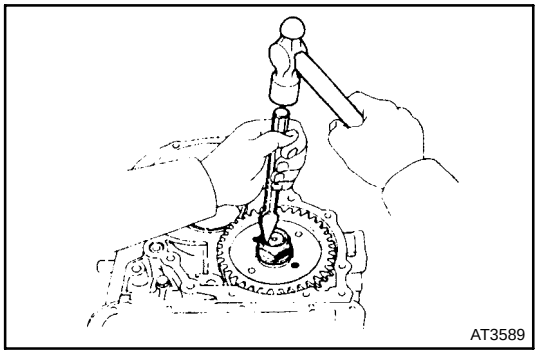
Using a torque meter, measure the drive pinion preload.

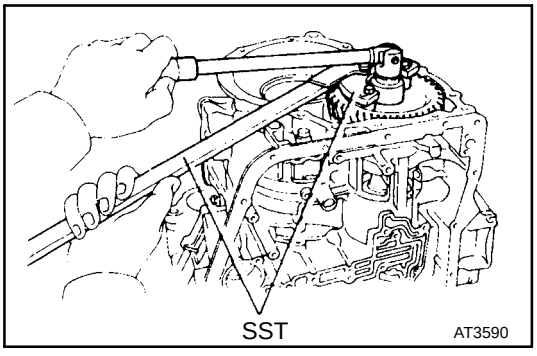
Preload (at starting):
Reused bearing
0.5 - 0.8 N-m (5 - 8 kgf-cm, 4.3 - 6.9 in.-lbf)

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 is bad.

8. REMOVE COUNTER DRIVEN GEAR

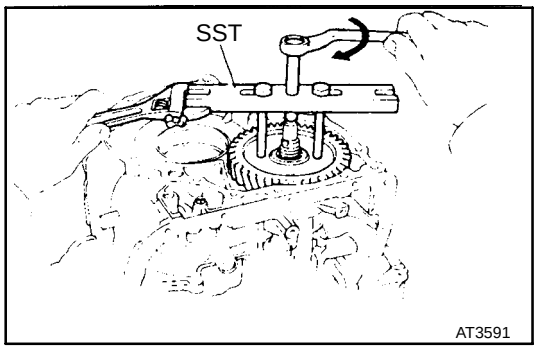
(a) Using a chisel, loosen the staked part of the nut.





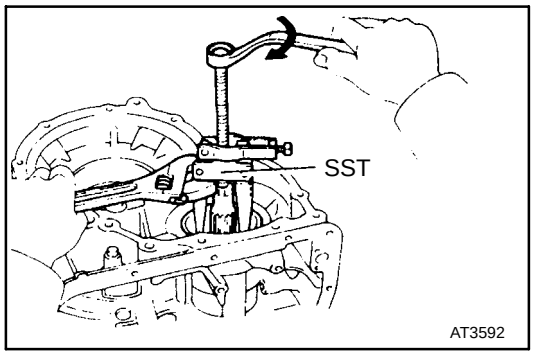
(b) Using SST to hold the gear, remove the nut.

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



(c) Using SST, remove the gear and bearing.

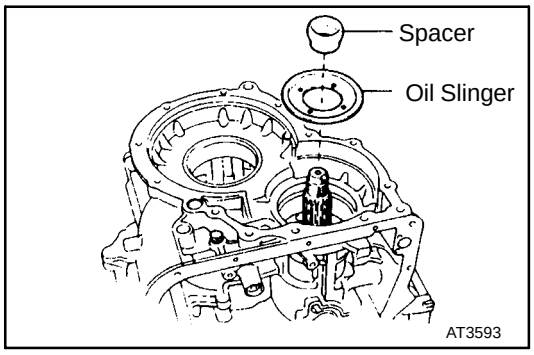
SST 09350-32014 (09351-32061)



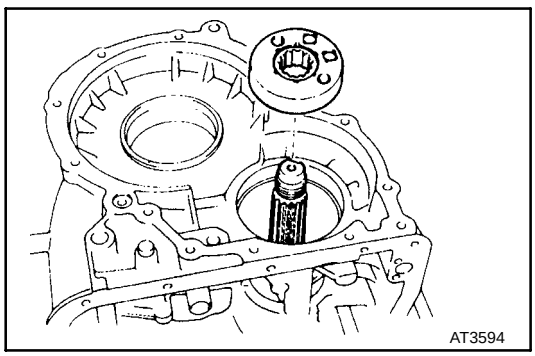
9. REMOVE OUTER RACE, SPACER AND OIL SLINGER

(a) Using SST, remove the outer race.

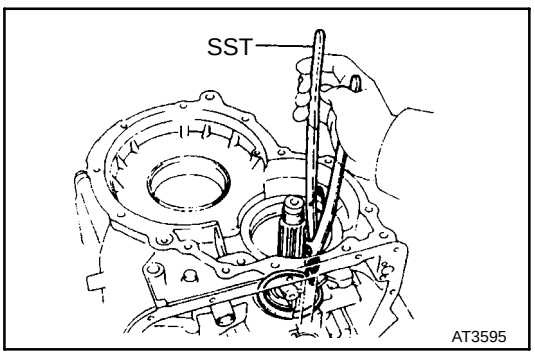
SST 09350-32014 (09308-10010)



(b) Remove the spacer and oil slinger.



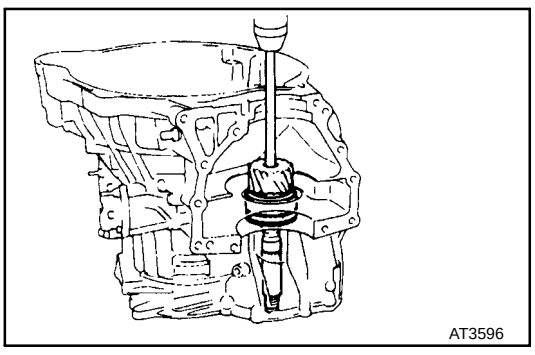
10. REMOVE SENSOR ROTOR



11. REMOVE DRIVE PINION

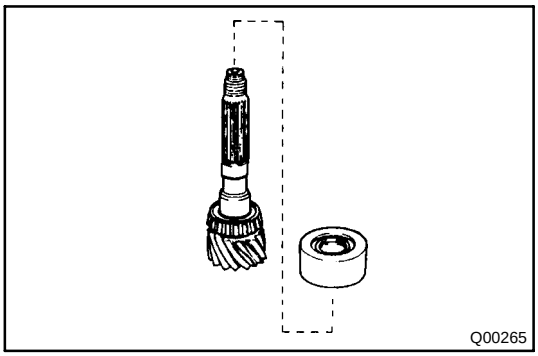
(a) Using SST, remove the snap ring.

SST 09350-32014 (09351-32050)



(b) Install the bar into the case hole to drive out the drive pinion.

(c) Using a press, drive out the drive pinion from transaxle case.



(d) Remove the bearing cage from drive pinion.

GENERAL NOTES

The instructions here are organized so that you work on only one component group at a time. This will help avoid confusion from similar-looking parts of different subassemblies being on your workbench at the same time.
The component groups are inspected and repaired from the converter housing side.
As much as possible, complete the inspection, repair and assembly before proceeding to the next component group. If a component group can not be assembled because parts are being ordered, be sure to keep all parts off that group in a separate container while proceeding with disassembly, inspection, repair and assembly of other component groups.
Recommended fluid for the automatic transaxle:
ATF DEXRON® II

1. GENERAL CLEANING NOTES:

(a) All disassembled parts should be washed clean and any fluid passages and holes blown through with compressed air.

(b) When using compressed air to dry parts, always aim away from yourself to prevent accidentally spraying automatic transaxle fluid or kerosene in your face.

(c) The recommended automatic transaxle fluid or kerosene should be used for cleaning.

2. PARTS ARRANGEMENT:

(a) After cleaning, the parts should be arranged in the correct order to allow efficient inspection, repairs, and reassembly.

(b) When disassembling a valve body, be sure to keep each valve together with the corresponding spring.

(c) New brakes and clutches that are to be used for replacement must be soaked in transaxle fluid for at least fifteen minutes before assembly.

3. GENERAL ASSEMBLY:

(a) All oil seal rings, clutch discs, clutch plates, rotating parts, and sliding surfaces should be coated with transmission fluid prior to reassembly.

(b) All gaskets and rubber O-rings should be replaced.

(c) Make sure that the ends of a snap ring are not aligned with one of the cutouts and are installed in the groove correctly.

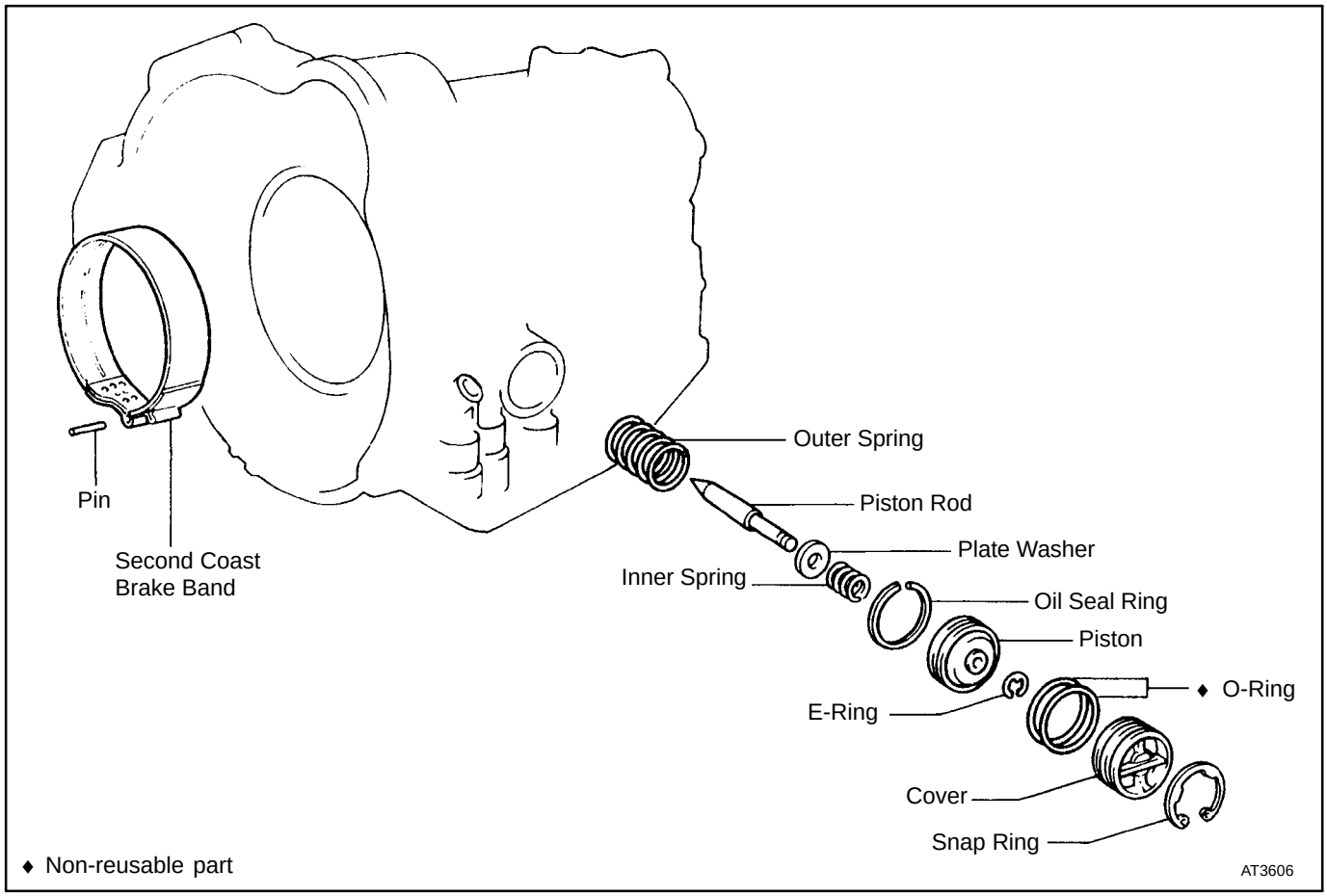
(d) If a worn bushing is to be replaced, the subassembly containing that bushing must be replaced.

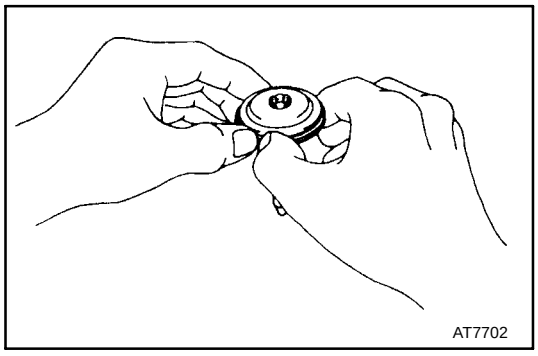
(e) Check thrust bearings and races for wear or damage. Replace if necessary.

(f) Use petroleum jelly to keep parts in place.

SECOND COAST BRAKE

COMPONENTS

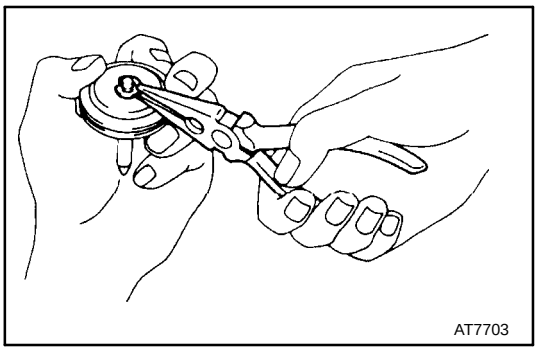




SECOND COAST BRAKE PISTON DISASSEMBLY

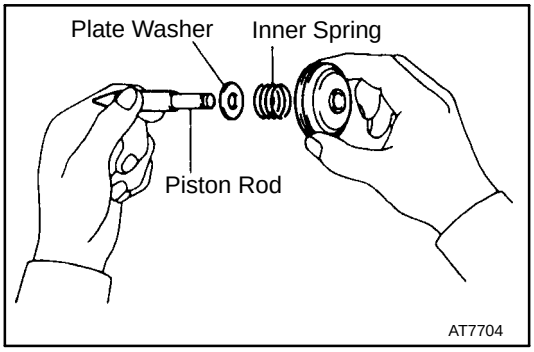
1. REMOVE OIL SEAL RING

Remove the oil seal ring from the piston.

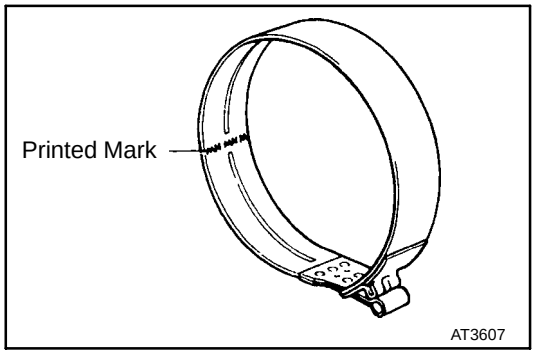


2. REMOVE PISTON ROD

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

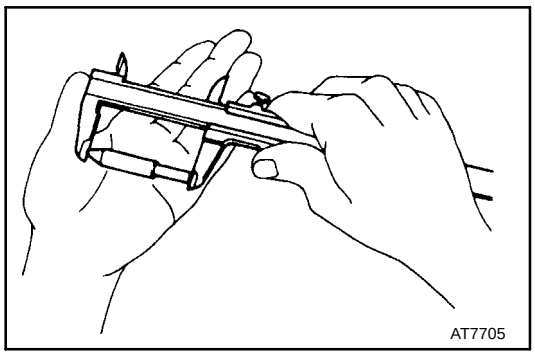


(b) Remove the inner spring, plate washer and piston rod.



SECOND COAST BRAKE COMPONENT INSPECTION

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



SECOND COAST BRAKE PISTON ASSEMBLY

1. SELECT PISTON ROD

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

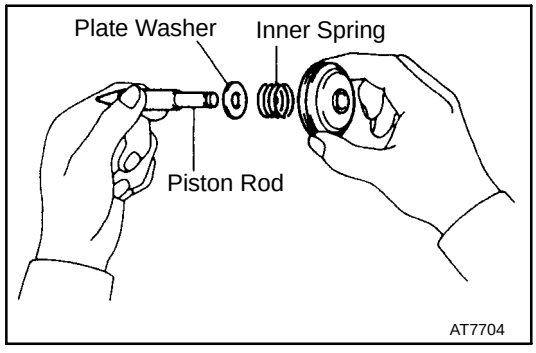
Piston stroke:

2.0 - 3.5 mm (0.079 - 0.138 in.)

There are two lengths of piston rod.

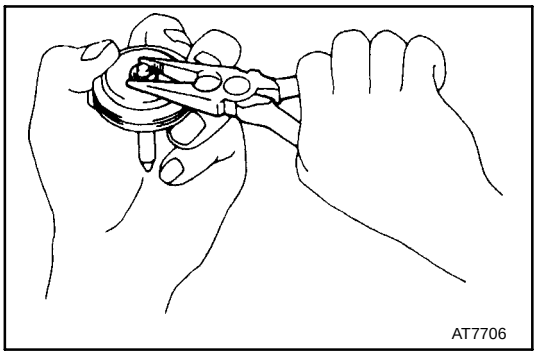
Piston rod length:

95.2 mm (3.748 in.)
96.3 mm (3.791 in.)

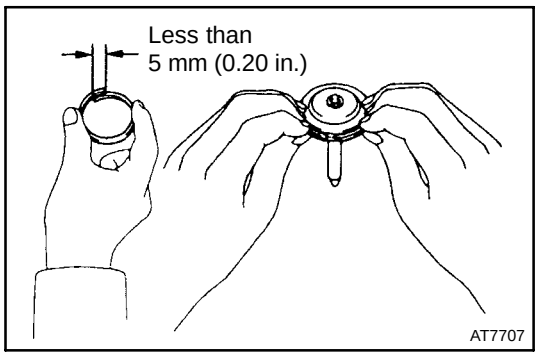


2. INSTALL PISTON ROD

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



(b) Install the E-ring while pushing the piston.



3. INSTALL OIL SEAL RING

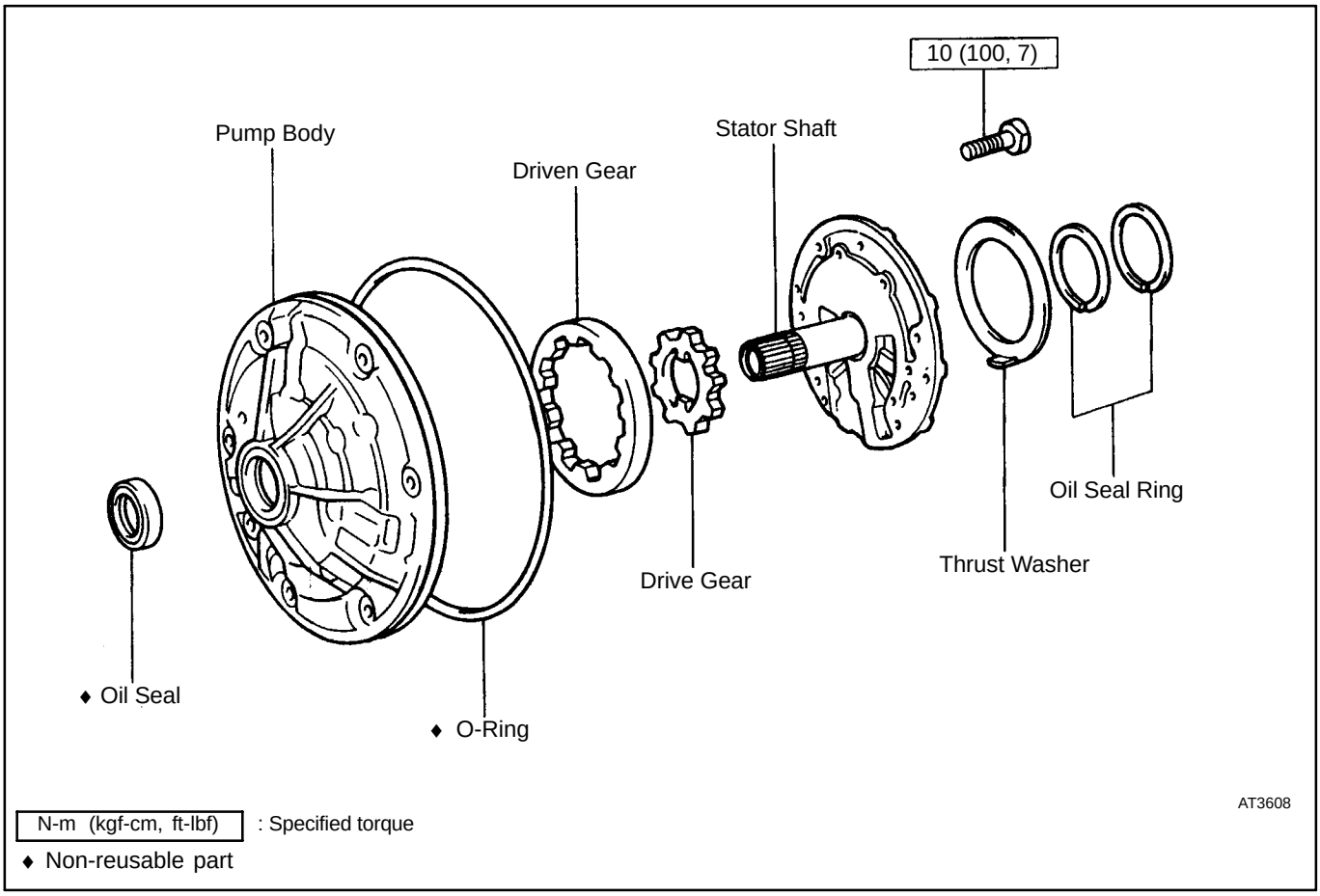
(a) Apply ATF to the oil seal ring.

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

NOTICE: Do not spread the ring ends more than necessary.

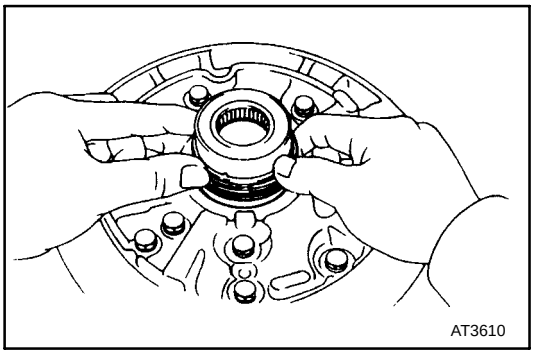
OIL PUMP

COMPONENTS



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

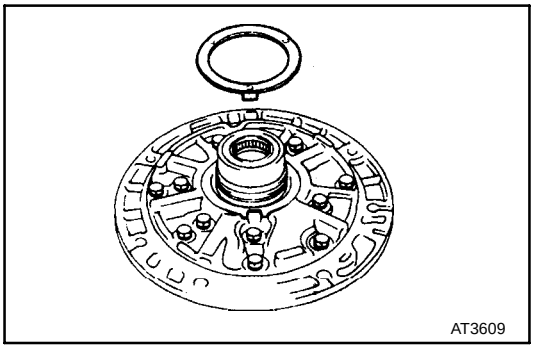
♦ Non-reusable part



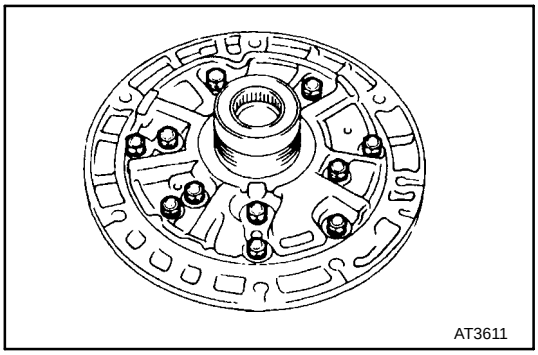
OIL PUMP DISASSEMBLY

1. REMOVE OIL SEAL RINGS

Remove the two oil seal rings from the stator shaft back side.

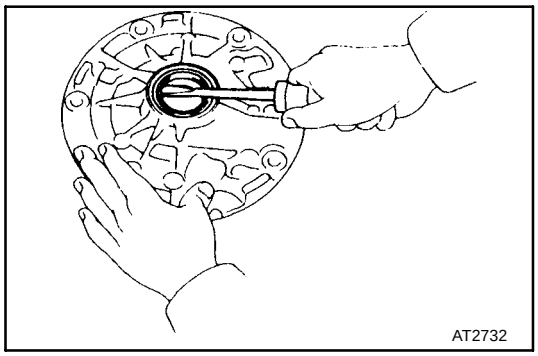


2. REMOVE THRUST WASHER FROM STATOR SHAFT BACK SIDE



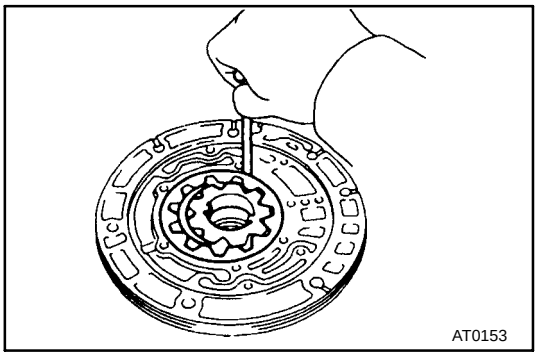
3. REMOVE STATOR SHAFT

Remove the eleven bolts and stator shaft.
HINT: Keep the gears in assembly order.



4. REMOVE FRONT OIL SEAL

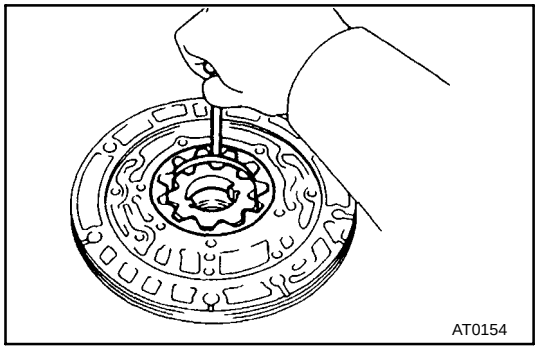
Pry off the oil seal with a screwdriver.



OIL PUMP BUSHING INSPECTION

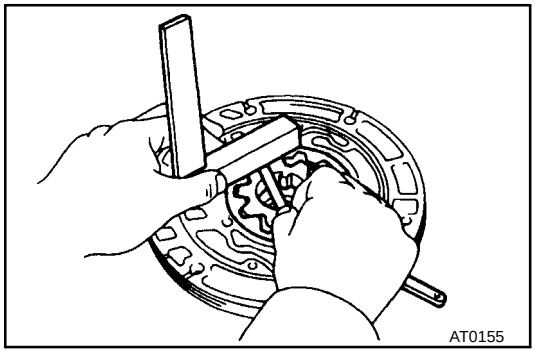
1. CHECK BODY CLEARANCE OF DRIVEN GEAR

Push the driven gear to one side of the body.
Using a feeler gauge, measure the clearance.
Standard body clearance:
0.07 - 0.15 mm (0.0028 - 0.0059 in.)
Maximum body clearance:
0.3 mm (0.012 in.)
If the body clearance is greater than the maximum, replace the oil pump body subassembly.



2. CHECK TIP CLEARANCE OF DRIVEN GEAR

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:
0.3 mm (0.012 in.)
If the tip clearance is greater than the maximum, replace the oil pump body subassembly.



3. CHECK SIDE CLEARANCE OF BOTH GEARS

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

Standard side clearance:

0.002 - 0.005 mm (0.0008 - 0.0020 in.)

Maximum side clearance:

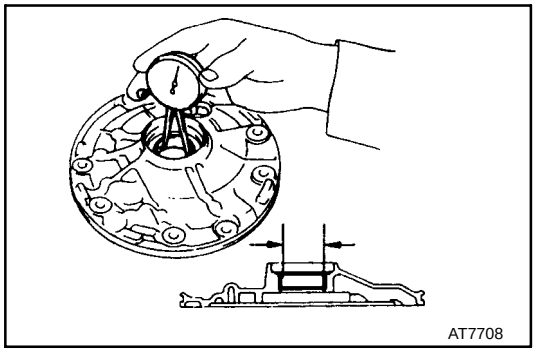
0.1 mm (0.004 in.)

There are three different thickness 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 subassembly.



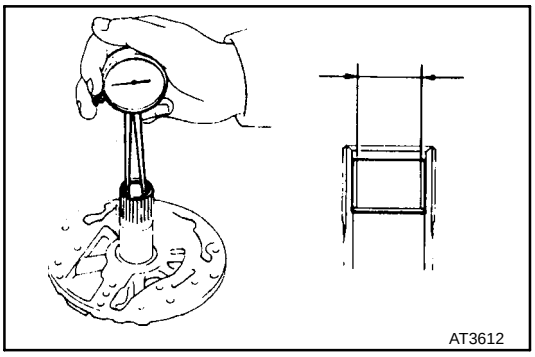
4. CHECK OIL PUMP BODY BUSHING

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 subassembly.



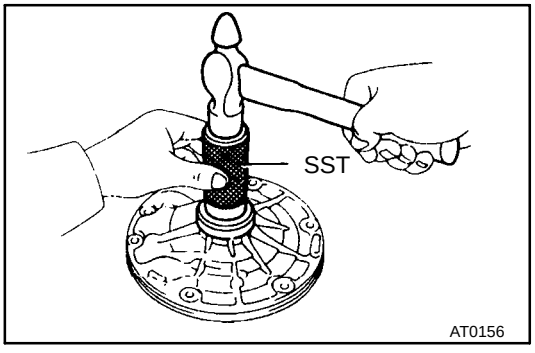
5. CHECK STATOR SHAFT BUSHING

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

Maximum inside diameter:

21.57 mm (0.8492 in.)

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

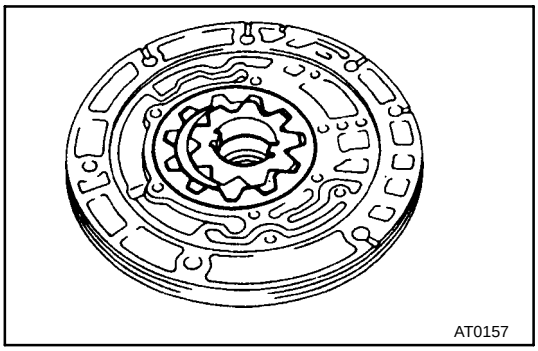


OIL PUMP ASSEMBLY

1. INSTALL FRONT OIL SEAL

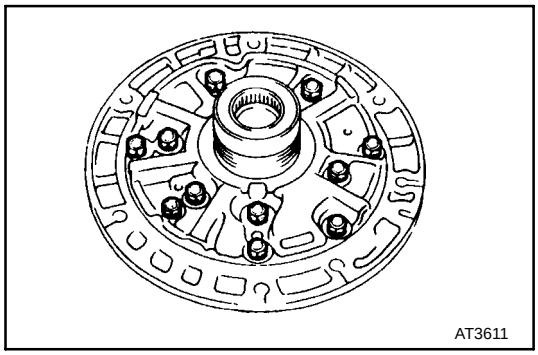
Using SST and a hammer, install a new oil seal. The seal end should be flush with the outer edge of the pump body.

SST 09350-32014 (09351-32140)



2. INSTALL DRIVEN GEAR AND DRIVE GEAR

Make sure the top of the gears are facing upward.

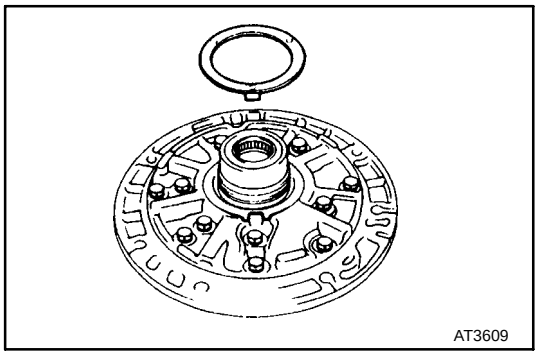


3. INSTALL STATOR SHAFT TO PUMP BODY

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

(b) Torque the eleven bolts.

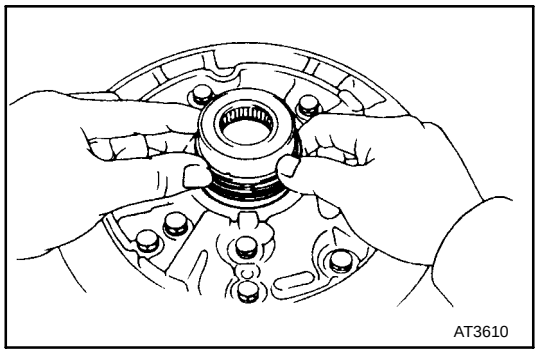
Torque: 10 N-m (100 kgf-cm, 7 ft-lbf)



4. INSTALL THRUST WASHER

(a) Coat the thrust washer with petroleum jelly.

(b) Align the tab of the washer with the hollow of the pump body.

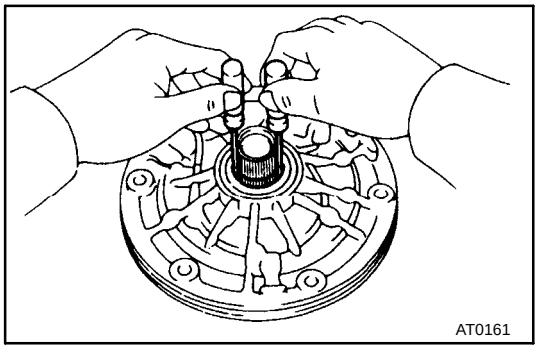


5. INSTALL OIL SEAL RINGS

Install the two oil seal rings to the stator shaft back side.

NOTICE: Do not spread the ring ends more than necessary.

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



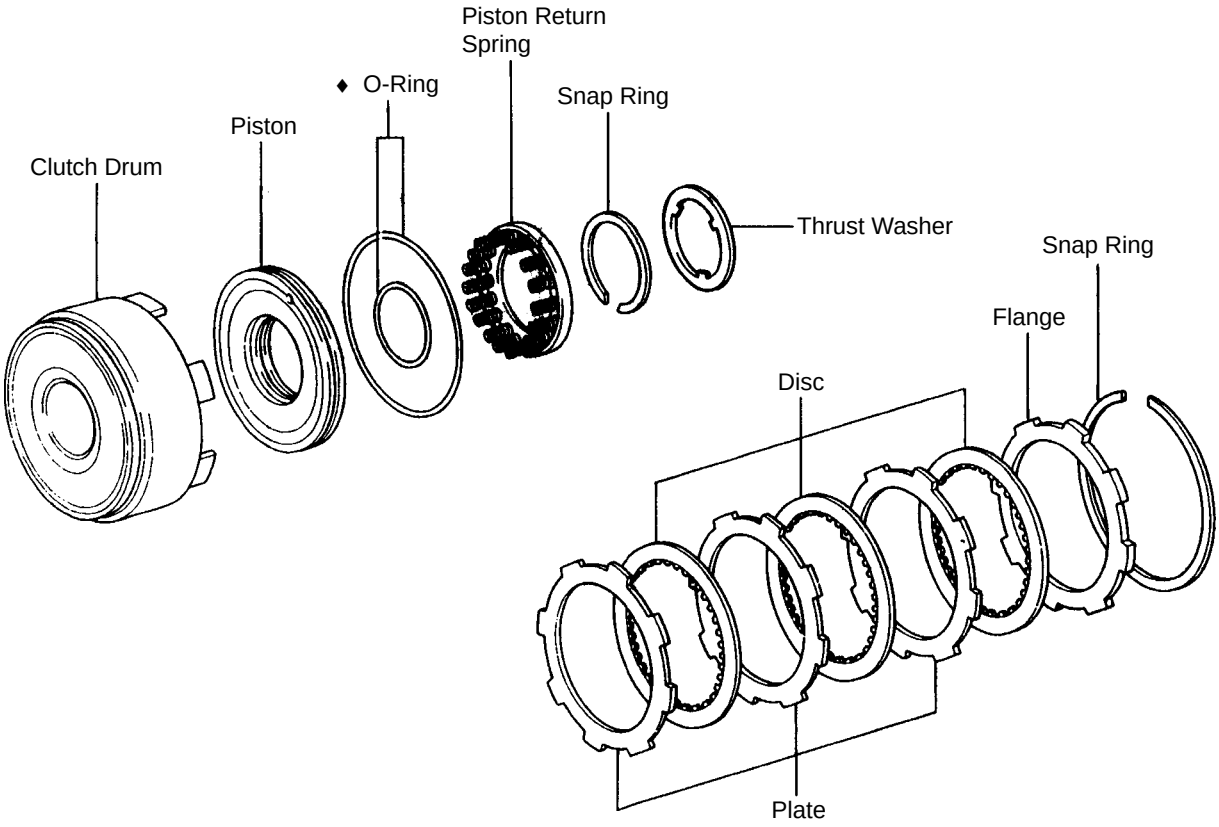
6. CHECK PUMP DRIVE GEAR ROTATION

Turn the drive gear with two screwdrivers and make sure it rotates smoothly.

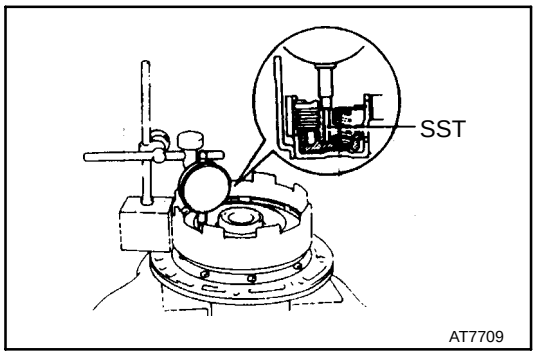
NOTICE: Be careful not to damage the oil seal lip.

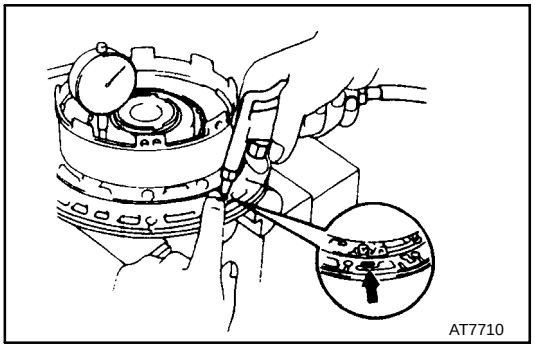
DIRECT CLUTCH

COMPONENTS



♦ Non-reusable part





DIRECT CLUTCH DISASSEMBLY

1. CHECK PISTON STROKE OF DIRECT CLUTCH

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

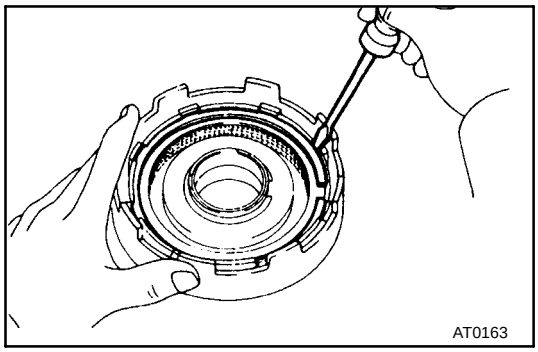
(b) Using a dial indicator (long type pick or SST), measure the direct clutch piston stroke applying and releasing the compressed air (392 - 785 kPa, 4 - 8 kg/cm^2, 57-114 psi), as shown.

SST 09350-32014 (09351-32190)

Piston stroke:

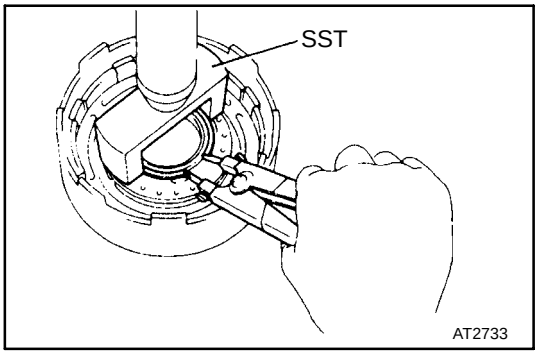
0.91 - 1.35 mm (0.0358 - 0.0531 in.)

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



2. REMOVE SNAP RING FROM CLUTCH DRUM

3. REMOVE FLANGE, DISCS AND PLATES

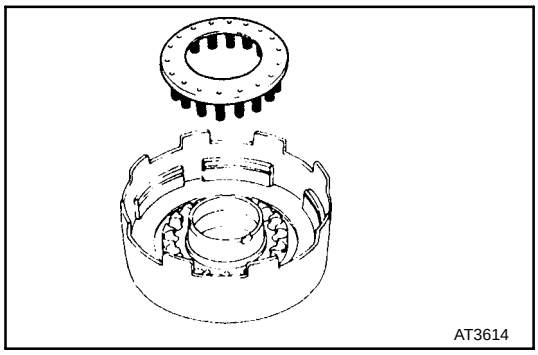


4. REMOVE PISTON RETURN SPRING

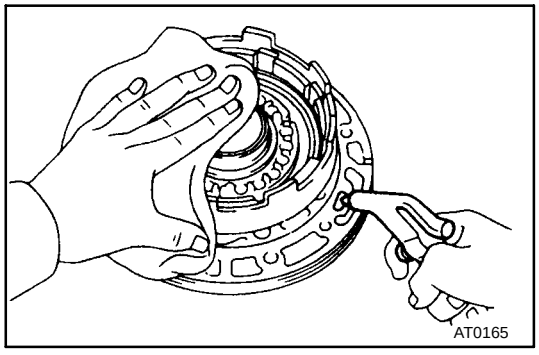
(a) Place SST on the spring retainer and compress the springs with a shop press.

SST 09350-32014 (09351-32070)

(b) Remove the snap ring with snap ring pliers.



(c) Remove the piston return spring.

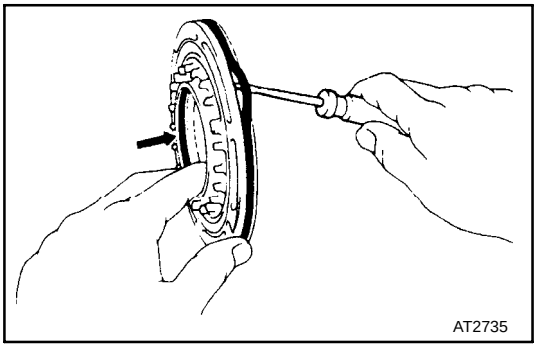


5. REMOVE CLUTCH PISTON

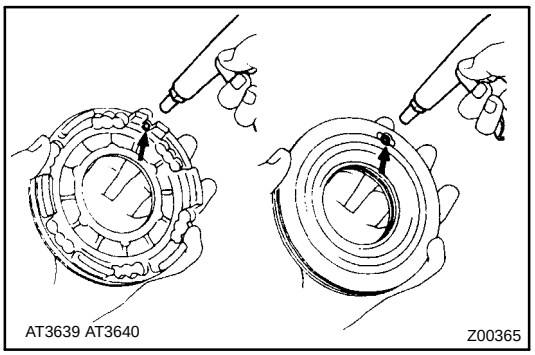
(a) Install the direct clutch onto the oil pump.

(b) Apply compressed air to the oil pump to remove the piston. (If the piston does not come out completely, use needle-nose plies to remove it.)

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



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

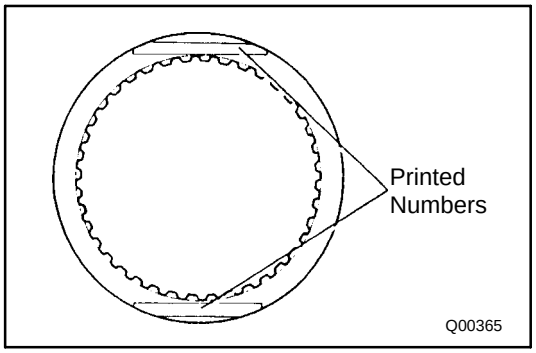


DIRECT CLUTCH INSPECTION

1. INSPECT CLUTCH PISTON

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

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

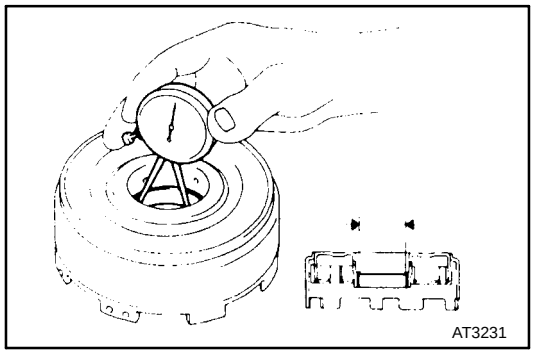


2. INSPECT DISCS, PLATES AND FLANGE

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 a part of the printed numbers are defaced, replace all discs.

® Before assembling new discs, soak them in ATF for at least fifteen minutes.



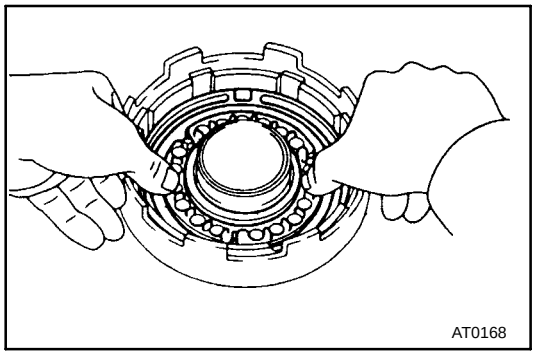
3. CHECK DIRECT CLUTCH BUSHING

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.

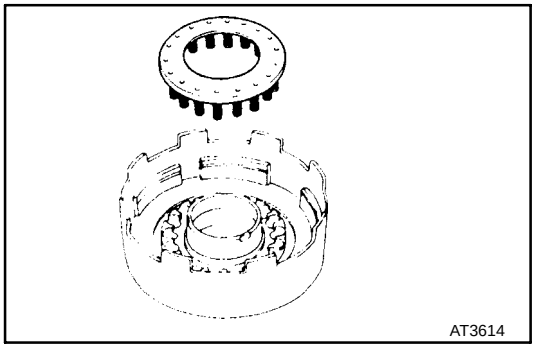


DIRECT CLUTCH ASSEMBLY

1. INSTALL CLUTCH PISTON IN DIRECT CLUTCH DRUM

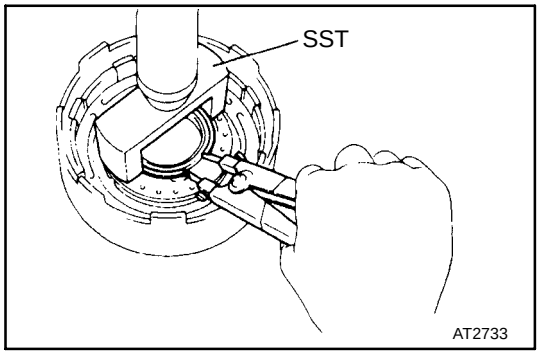
(a) Install new O-rings to the piston. Coat the O-rings with ATF.

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



2. INSTALL PISTON RETURN SPRING

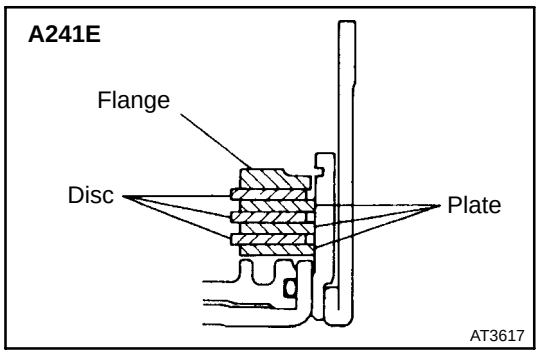
(a) Place the return spring and snap ring onto the piston.



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

SST 09350-32014 (09351-32070)

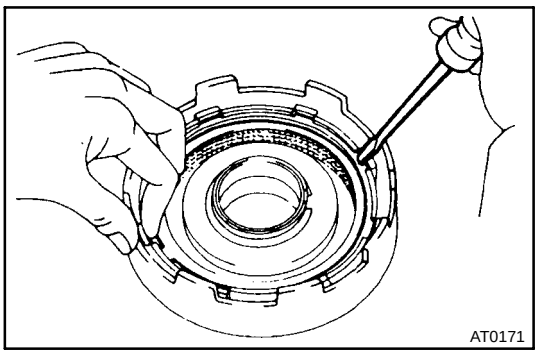
(c) Install the snap ring using snap ring pliers. Be sure the end gap of snap ring is aligned with the spring retainer claw.



3. INSTALL PLATES, DISCS AND FLANGE

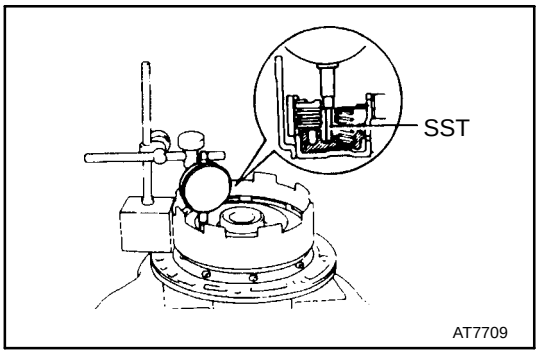
(a) Install plates and discs.
Install in order:
P = Plate D=Disc
P-D-P-D-P-D

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



4. INSTALL SNAP RING

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



5. RECHECK PISTON STROKE OF DIRECT CLUTCH

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

(b) Using a dial indicator (long type pick or SST), measure the direct clutch piston stroke applying and releasing the compressed air (392 - 785 kPa, 4 - 8 kgf/cm^2, 57-114 psi), as shown.

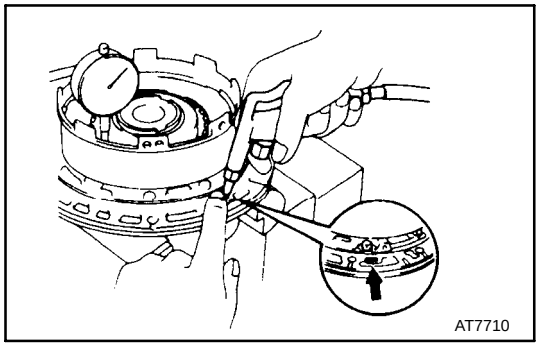
SST 09350-32014 (09351-32190)

Piston stroke:
0.91 - 1.35 mm (0.0358 - 0.0531 in.)

If the piston stroke is nonstandard, select another flange.

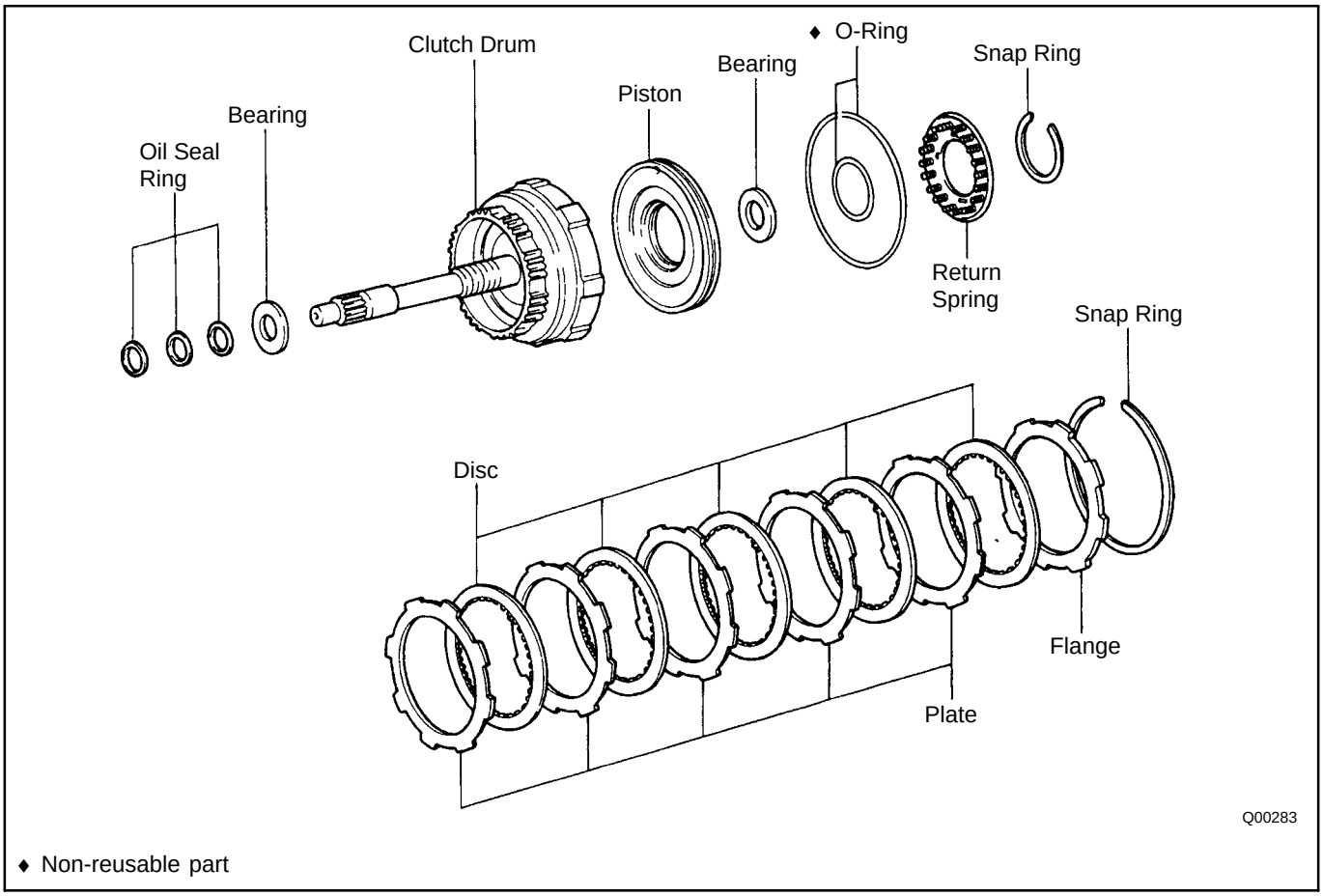
HINT: There are two different thickness for the flange.

Flange thickness:
2.70 mm (0.1063 in.)
3.00 mm (0.1181 in.)

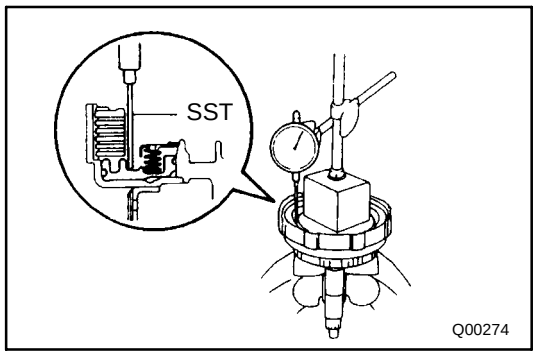


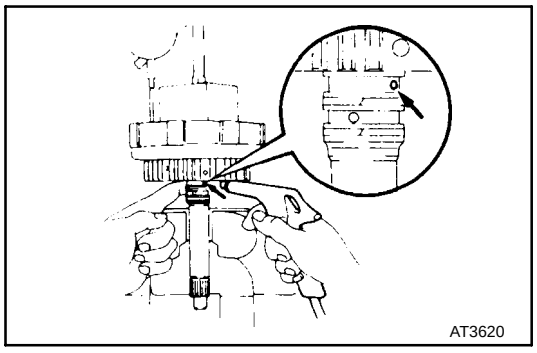
FORWARD CLUTCH

COMPONENTS



♦ Non-reusable part





FORWARD CLUTCH DISASSEMBLY

1. CHECK PISTON STROKE OF FORWARD CLUTCH

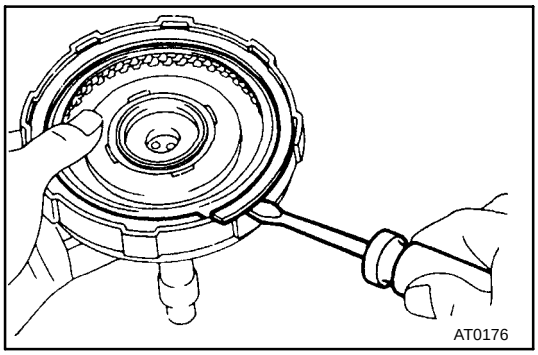
Using a dial indicator (long type pick or SST), measure the forward clutch piston stroke applying and releasing the compressed air (392 - 785 kPa, 4 - 8 kgf/cm^2, 57 - 114 psi), as shown.

SST 09350-32014 (09351-32190)

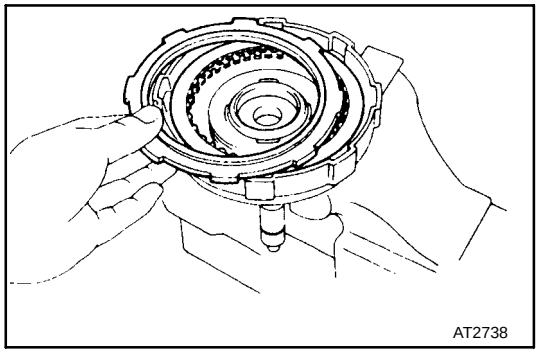
Piston stroke:

1.79 - 2.21 mm (0.0705 - 0.0870 in.)

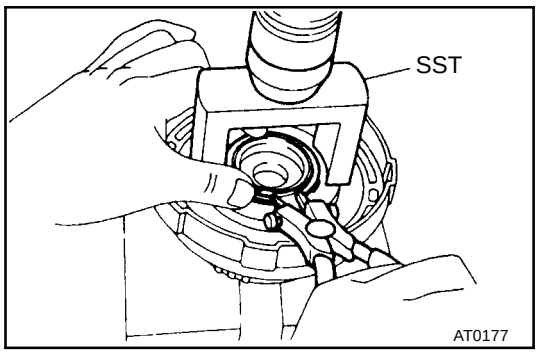
If the piston stroke is greater than the maximum, inspect each component.



2. REMOVE SNAP RING FROM CLUTCH DRUM



3. REMOVE FLANGE, DISCS AND PLATES

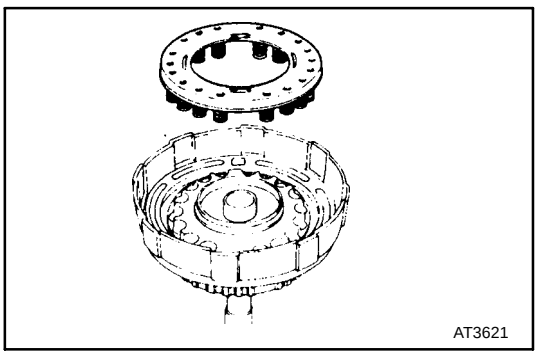


4. REMOVE RETURN SPRING

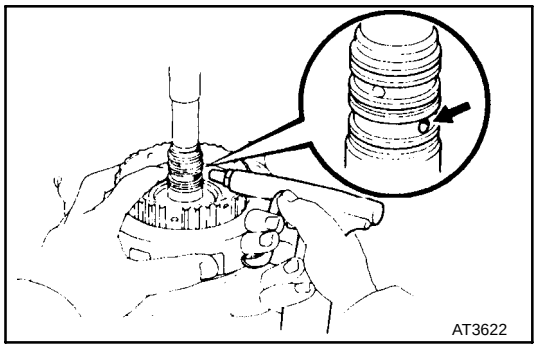
(a) Place SST on the spring retainer and compress the springs with a shop press.

SST 09350-32014 (09351-32070)

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

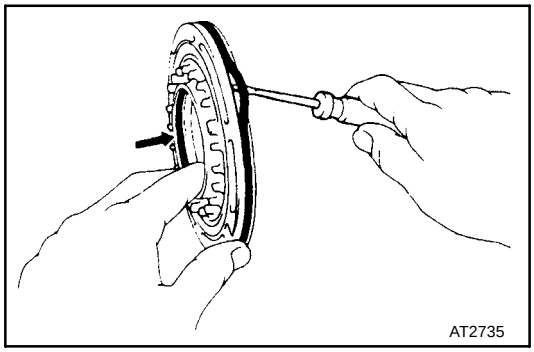


(c) Remove the return spring.

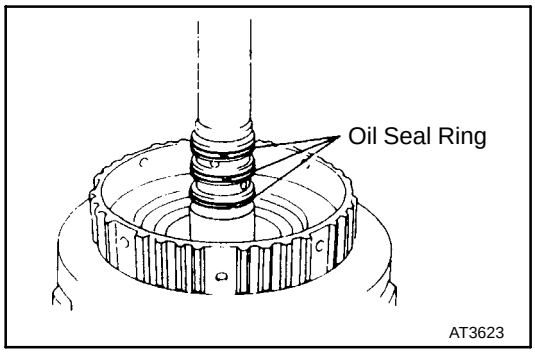


5. REMOVE CLUTCH PISTON

(a) Apply compressed air into the oil passage to remove the piston.
If the piston does not come out, use needle-nose pliers to remove it.



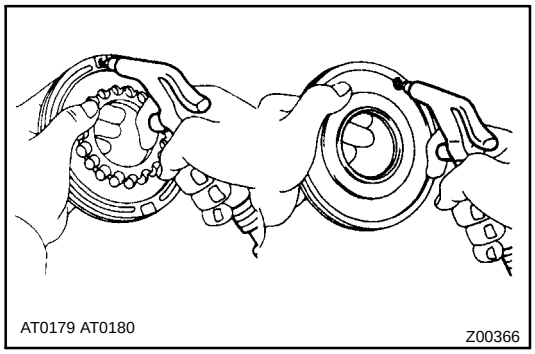
(b) Remove the two O-rings from the piston.



6. IF NECESSARY, REMOVE OIL SEAL RINGS

Remove the three oil seal rings from the shaft.

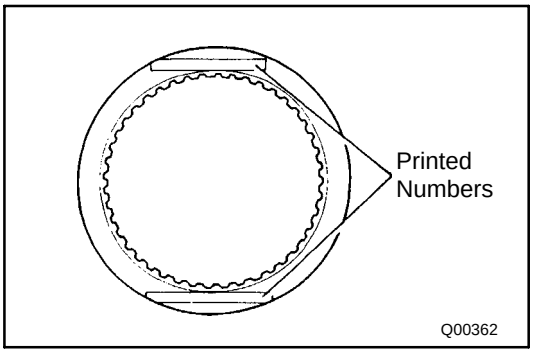
FORWARD CLUTCH INSPECTION



1. INSPECT CLUTCH PISTON

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

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



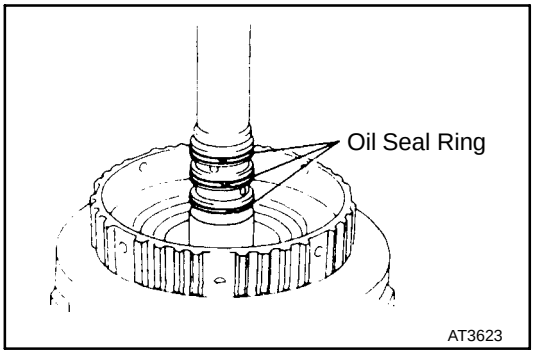
2. INSPECT DISCS, PLATES AND FLANGE

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 a part of the printed numbers are defaced, replace all discs.
- Before assembling new disc, soak them in ATF for at least fifteen minutes.

FORWARD CLUTCH ASSEMBLY

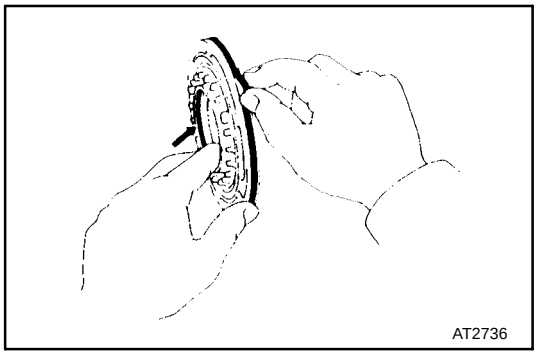


1. INSTALL OIL SEAL RINGS

Install the three oil seal rings to the shaft.

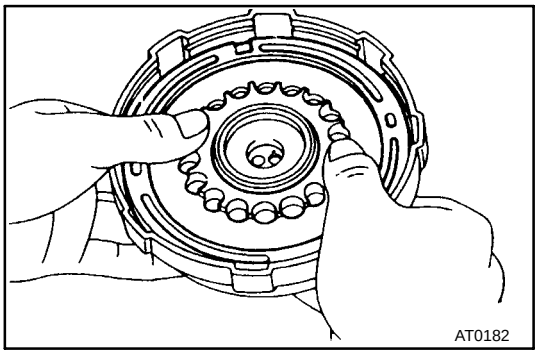
NOTICE: Do not spread the ring ends more than necessary.

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



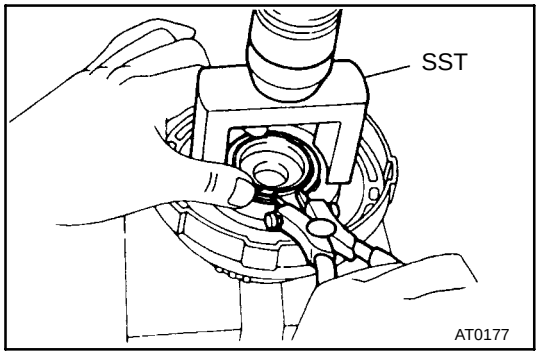
2. INSTALL CLUTCH PISTON TO CLUTCH DRUM

(a) Install the two 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, being careful not to damage the O-rings.



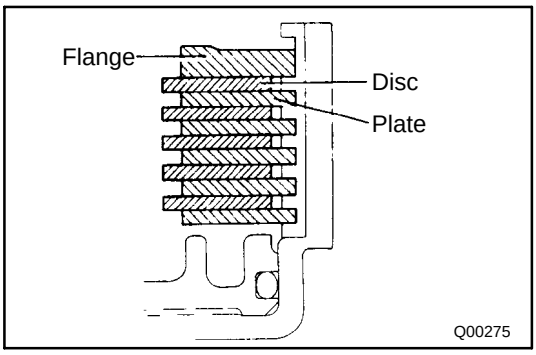
3. INSTALL PISTON RETURN SPRINGS

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

(b) Place SST on the spring retainer, and compress the springs with a shop press.

SST 09350-32014 (09351-32070)

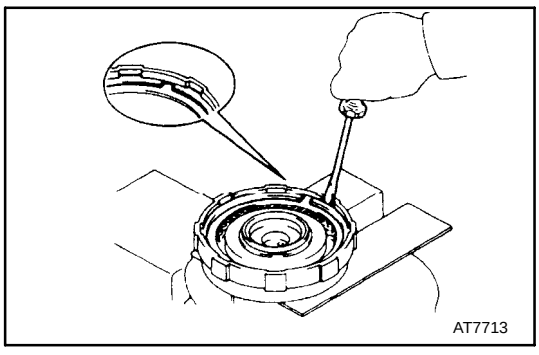
(c) Install the snap ring with snap ring pliers.
Be sure the end gap of the snap ring is not aligned with the spring retainer claw.



4. INSTALL PLATES, DISCS AND FLANGE

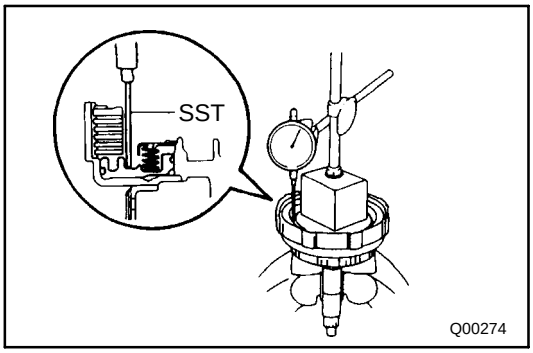
(a) Install the plates and discs.
Install in order:
P = Plate D = Disc
P-D-P-D-P-D-P-D-P-D

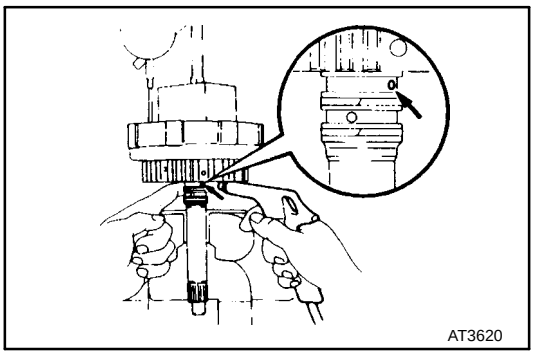
(b) Install the flange with the flat end facing downward.



5. INSTALL SNAP RING

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





6. RECHECK PISTON STROKE OF FORWARD CLUTCH

Using a dial indicator (long type pick or SST), measure the forward clutch piston stroke applying and releasing the compressed air (392 - 785 kPa, 4 - 8 kgf/cm^2, 57 - 114 psi), as shown.

SST 09350-32014 (09351-32190)

Piston stroke:

1.79 - 2.21 mm (0.0705 - 0.0870 in.)

If the piston stroke is nonstandard, select another flange.

HINT: There are two different thicknesses for the flange.

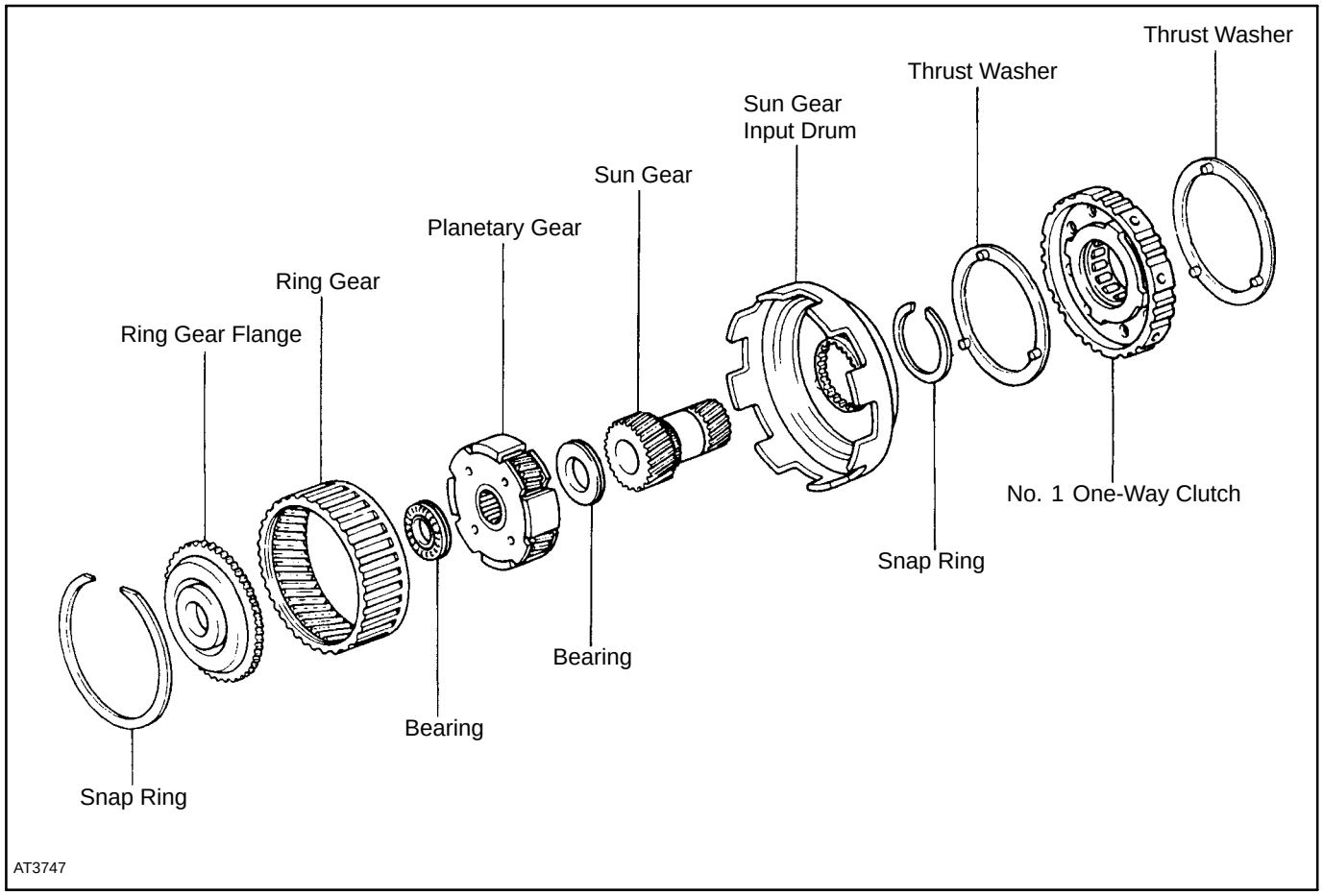
Flange thickness:

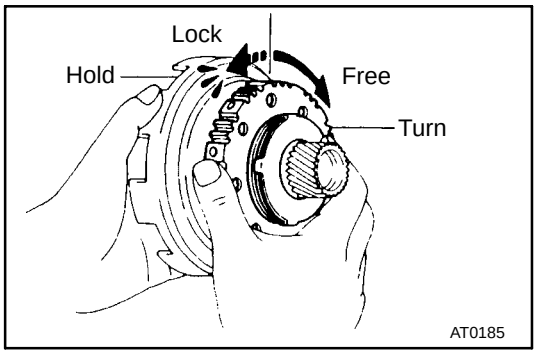
2.30 mm (0.0906 in.)

2.70 mm (1.0630 in.)

FRONT PLANETARY GEAR

COMPONENTS

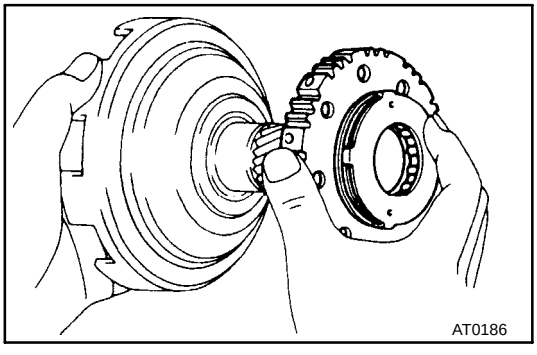




NO. 1 ONE-WAY CLUTCH AND SUN GEAR DISASSEMBLY

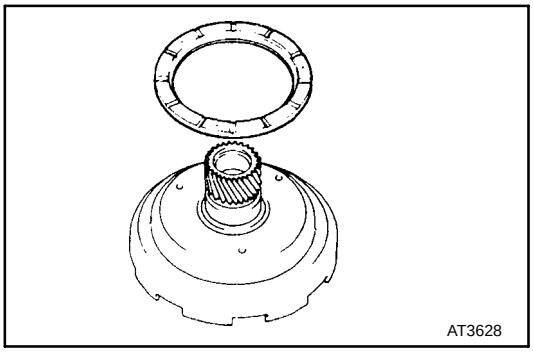
1. CHECK OPERATION OF NO. 1 ONE-WAY CLUTCH

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

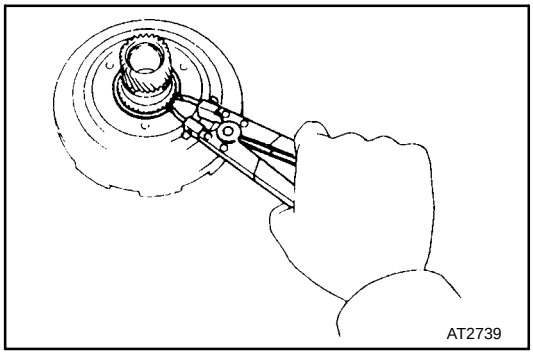


2. REMOVE NO. 1 ONE-WAY CLUTCH FROM SUN GEAR

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



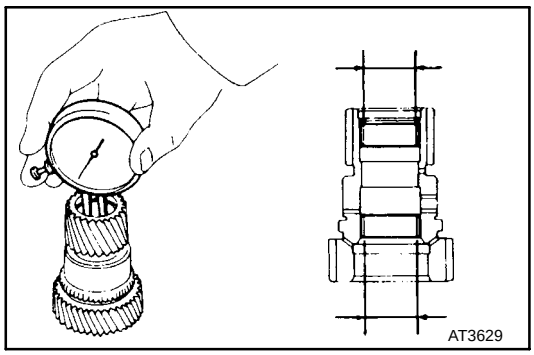
3. REMOVE THRUST WASHER FROM SUN GEAR INPUT DRUM



4. REMOVE SUN GEAR FROM DRUM

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

(b) Remove the sun gear from the drum.



5. CHECK SUN GEAR BUSHINGS

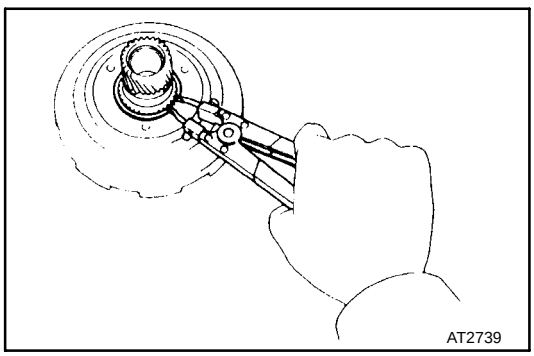
Using a dial indicator, measure the inside diameter of the sun gear bushings.

Maximum inside diameter:

22.59 mm (0.08894 in.)

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

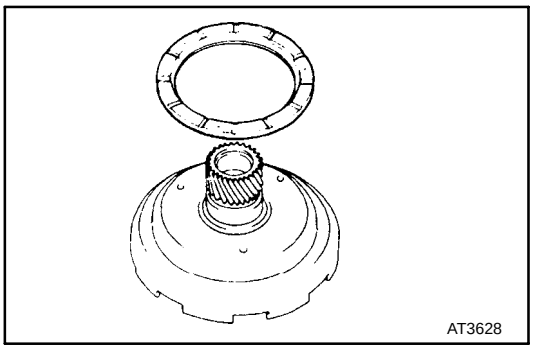
NO. 1 ONE-WAY CLUTCH AND SUN GEAR ASSEMBLY



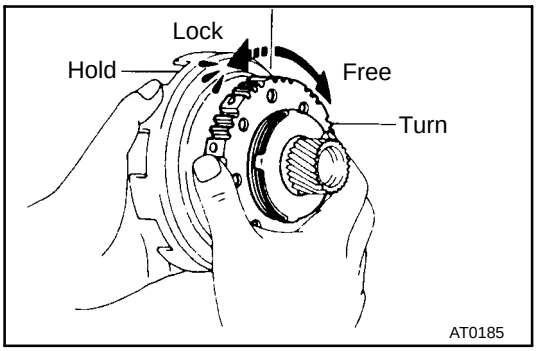
1. INSTALL SUN GEAR TO DRUM

(a) Install the sun gear to the drum.

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



2. INSTALL THRUST WASHER TO SUN GEAR INPUT DRUM

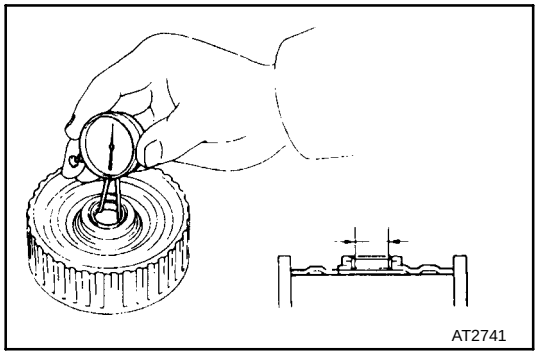


3. INSTALL NO. 1 ONE-WAY CLUTCH ON SUN GEAR

While turning the hub clockwise, slide the No. 1 one-way clutch onto the sun gear.

4. RECHECK OPERATION OF NO. 1 ONE-WAY CLUTCH

PLANETARY RING GEAR INSPECTION



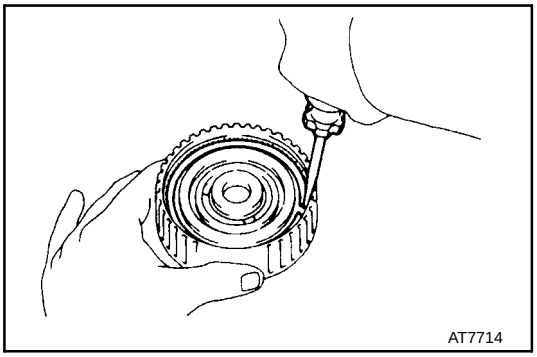
1. INSPECT RING GEAR FLANGE BUSHING

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

Maximum inside diameter:

30.08 mm (1.1842 in.)

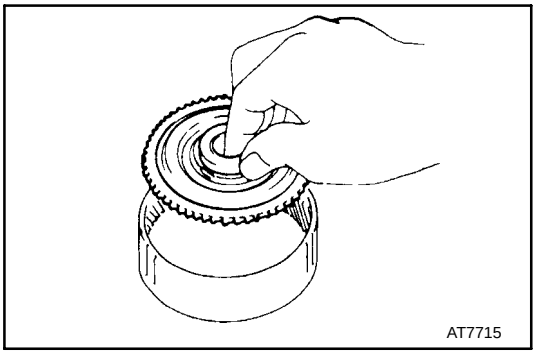
If the inside diameter is greater then the maximum, replace the flange.



2. REMOVE RING GEAR FLANGE

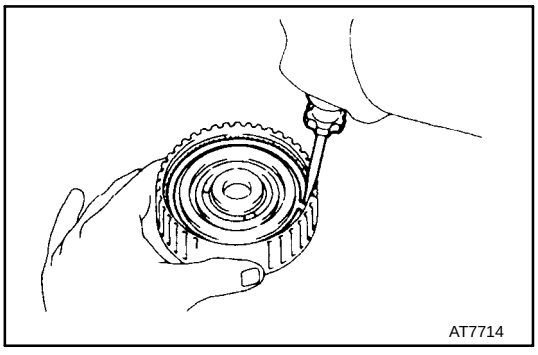
(a) Using a screwdriver, remove the snap ring.

(b) Remove the flange from the ring gear.

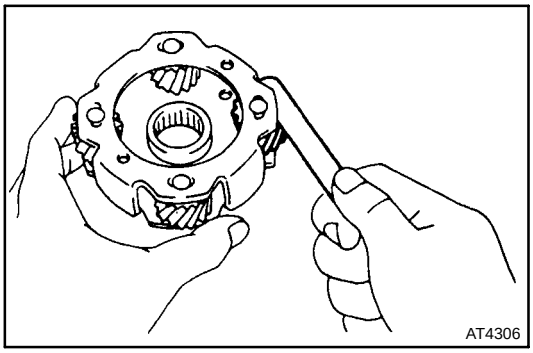


3. INSTALL RING GEAR FLANGE

(a) Position the flange into the ring gear.



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



FRONT PLANETARY GEAR INSPECTION

MEASURE PLANETARY PINION GEAR THRUST CLEARANCE

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

Standard clearance:

0.16 - 0.56 mm (0.0063 - 0.0220 in.)

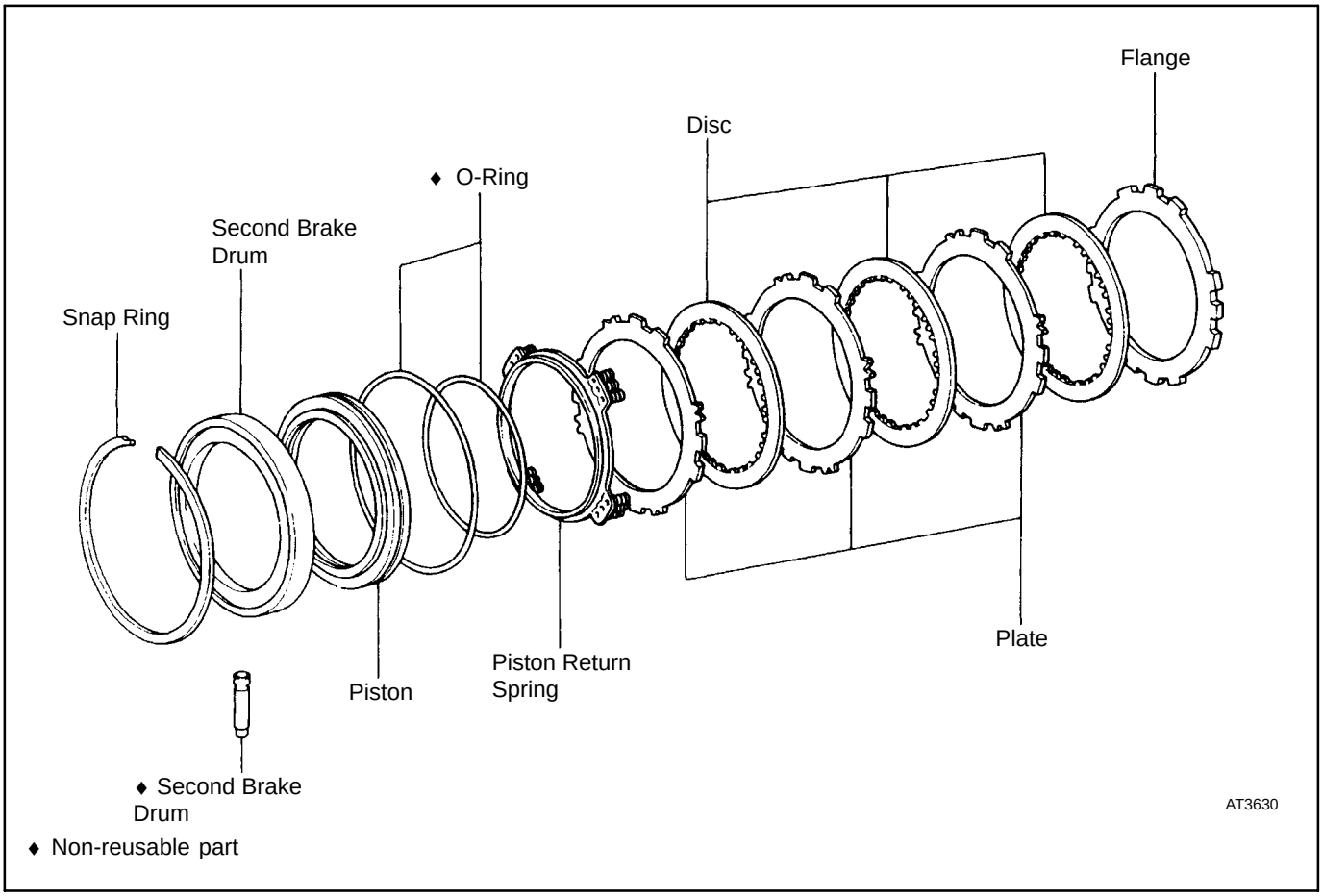
Maximum clearance:

0.61 mm (0.0240 in.)

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

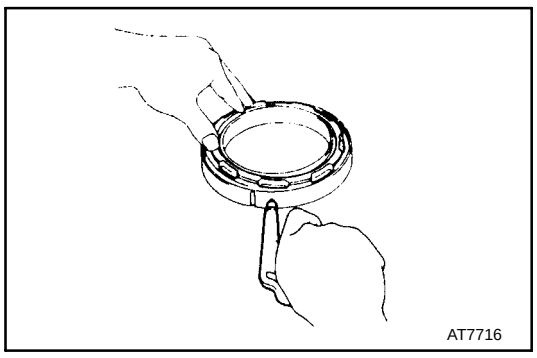
SECOND BRAKE

COMPONENTS

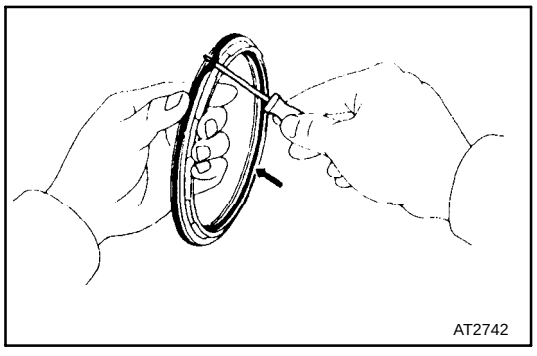


SECOND BRAKE PISTON DISASSEMBLY

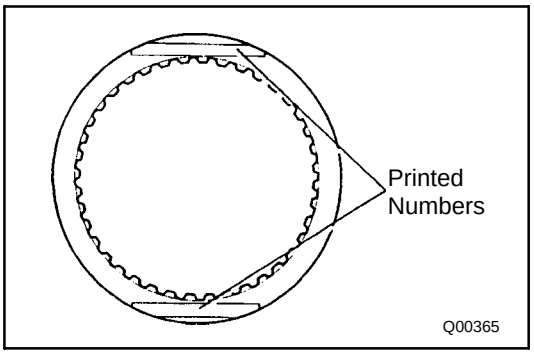
REMOVE SECOND BRAKE PISTON



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



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

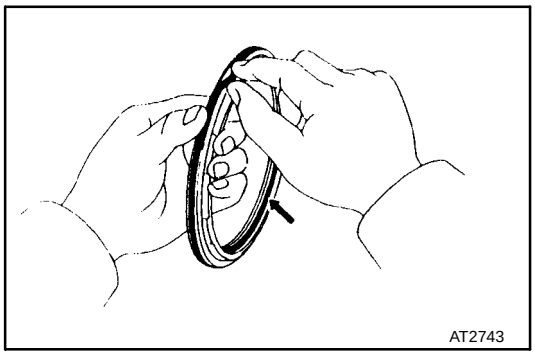


SECOND BRAKE COMPONENT INSPECTION

INSPECT DISCS, PLATES AND FLANGE

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 a part of the printed numbers are defaced, replace all discs.
- ® Before assembling new discs, soak them in ATF for at least fifteen minutes.

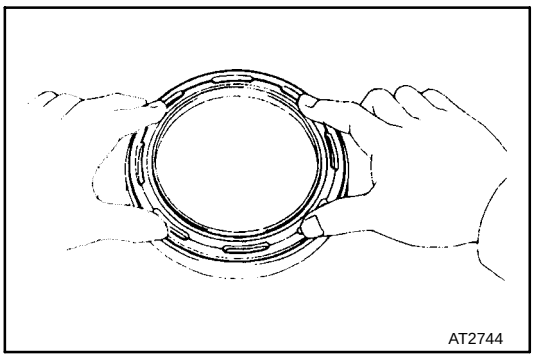


SECOND BRAKE PISTON ASSEMBLY

INSTALL PISTON

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

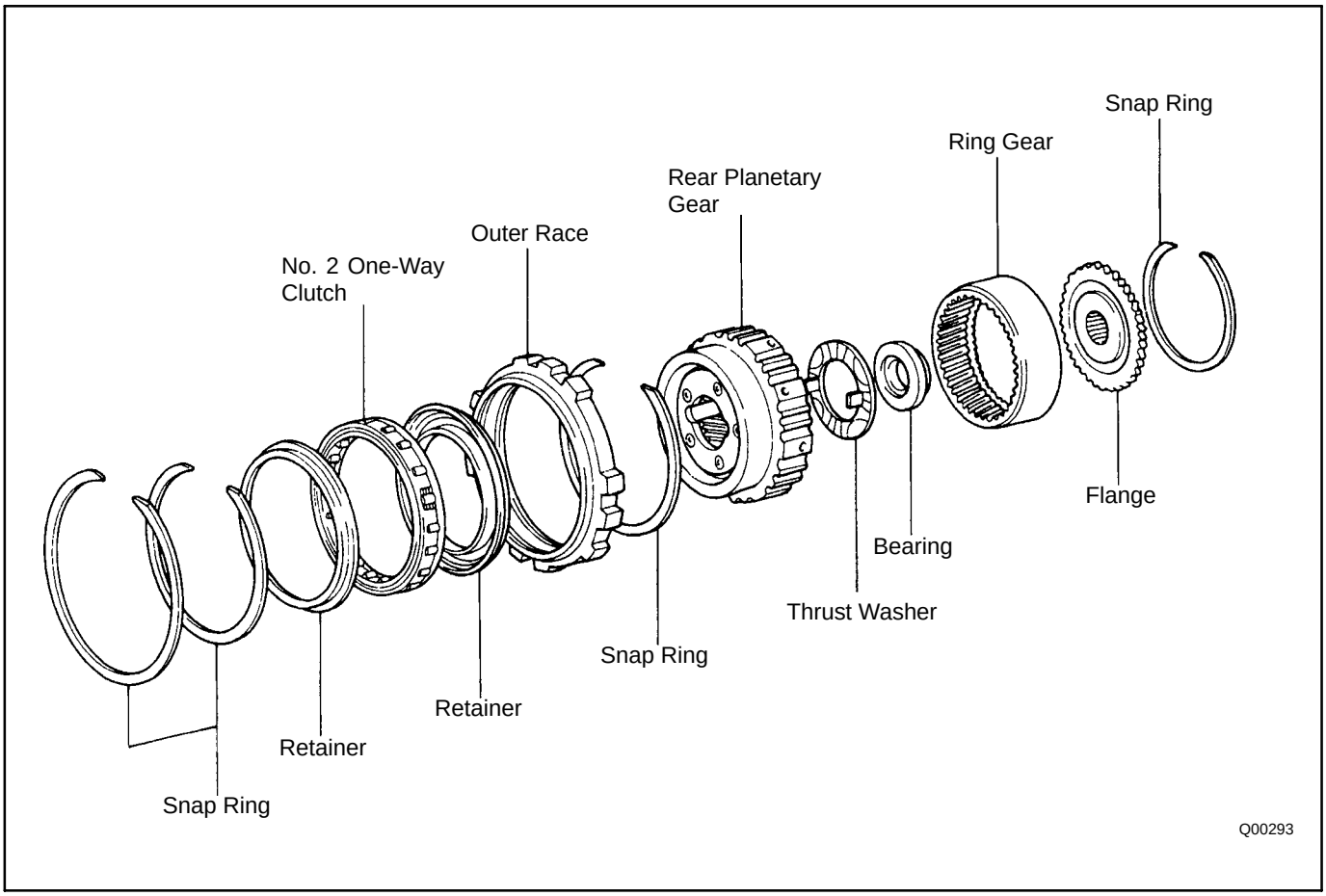
(b) Install the two O-rings on the piston.

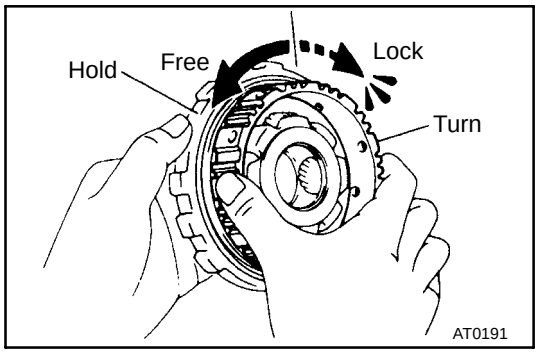


(c) Press the piston into the drum, being careful not to damage the O-rings.

REAR PLANETARY GEAR

COMPONENTS

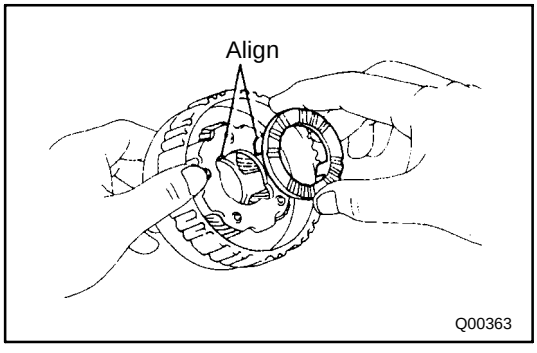




NO. 2 ONE-WAY CLUTCH DISASSEMBLY

1. CHECK OPERATION OF NO. 2 ONE-WAY CLUTCH

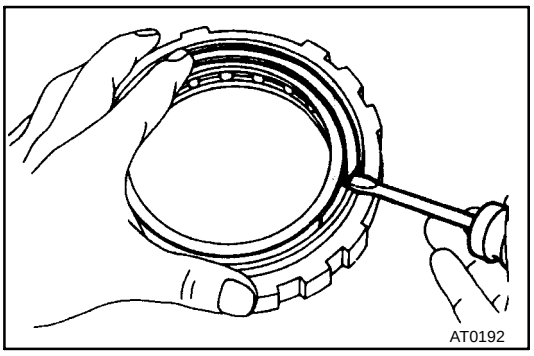
Hold the outer race and turn the rear planetary gear. The rear planetary gear should turn freely counter-clockwise and should lock clockwise.



2. SEPARATE NO. 2 ONE-WAY CLUTCH AND REAR PLANETARY GEAR

3. REMOVE THRUST WASHER

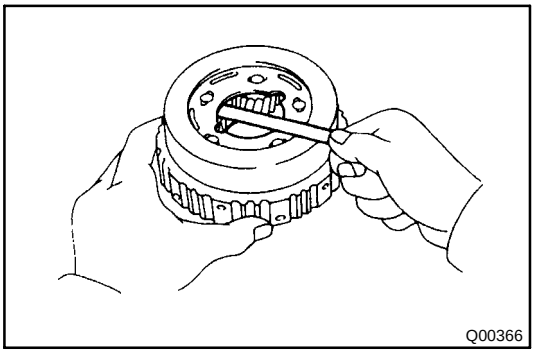
Remove the thrust washer from the rear side of planetary gear.



4. REMOVE NO. 2 ONE-WAY CLUTCH FROM OUTER RACE

(a) Remove the two snap rings and retainers from both sides.

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



REAR PLANETARY GEAR INSPECTION

MEASURE PLANETARY PINION GEAR THRUST CLEARANCE

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

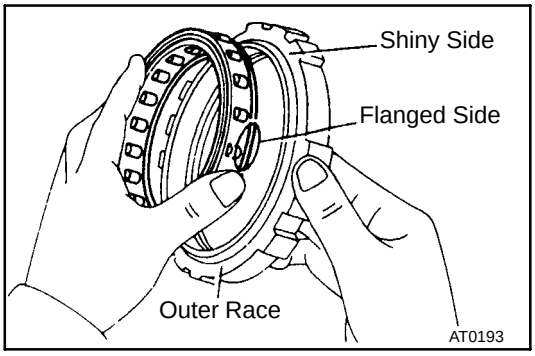
Standard clearance:

0.16 - 0.56 mm (0.0063 - 0.0220 in.)

Maximum clearance:

0.61 mm (0.0240 in.)

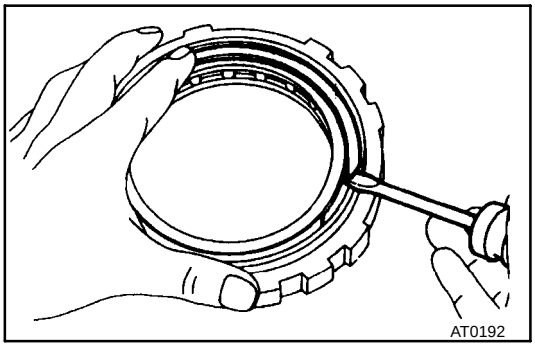
If the clearance is greater than the maximum, replace the planetary gear assembly.



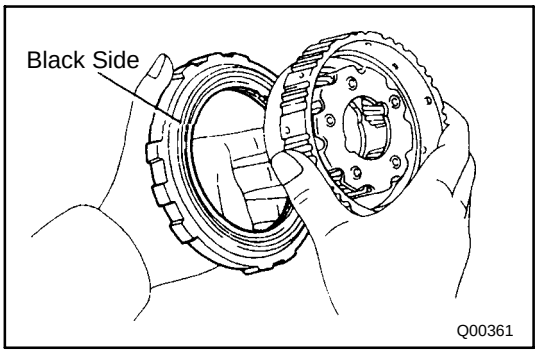
NO. 2 ONE-WAY CLUTCH ASSEMBLY

1. INSTALL ONE-WAY CLUTCH

(a) Install the No. 2 one-way clutch into the outer race, facing the flanged side of the No. 2 one-way clutch toward the shiny side of the outer race.

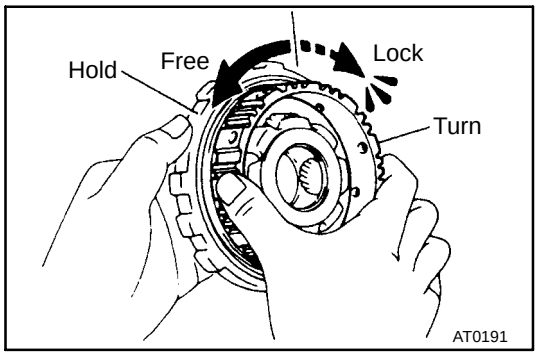


(b) Install the two retainers and snap rings to both sides.

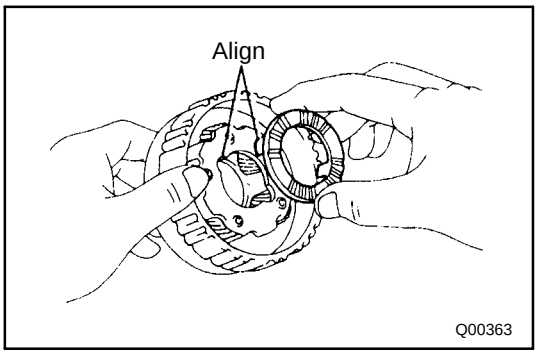


2. INSTALL PLANETARY GEAR INTO NO. 2 ONE-WAY CLUTCH

Install the planetary gear into the No. 2 one-way clutch, facing the inner race of the rear planetary gear toward the black side of the No. 2 one-way clutch outer race.



3. CHECK OPERATION OF NO. 2 ONE-WAY CLUTCH

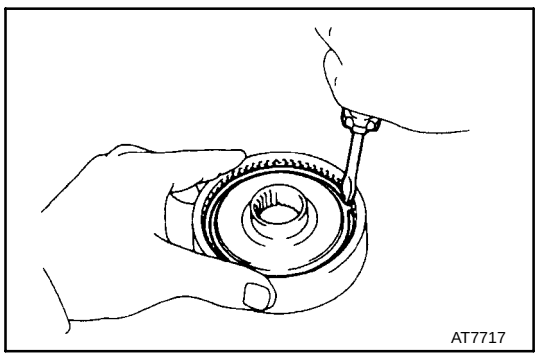


4. INSTALL THRUST WASHER

(a) Coat the thrust washer with petroleum jelly.

(b) Align the tab of the washer with the hollows of the carrier.

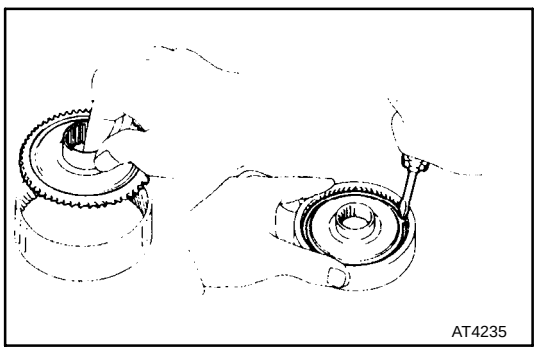
RING GEAR FLANGE REPLACEMENT



1. REMOVE RING GEAR FLANGE

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

(b) Remove the flange from the ring gear.



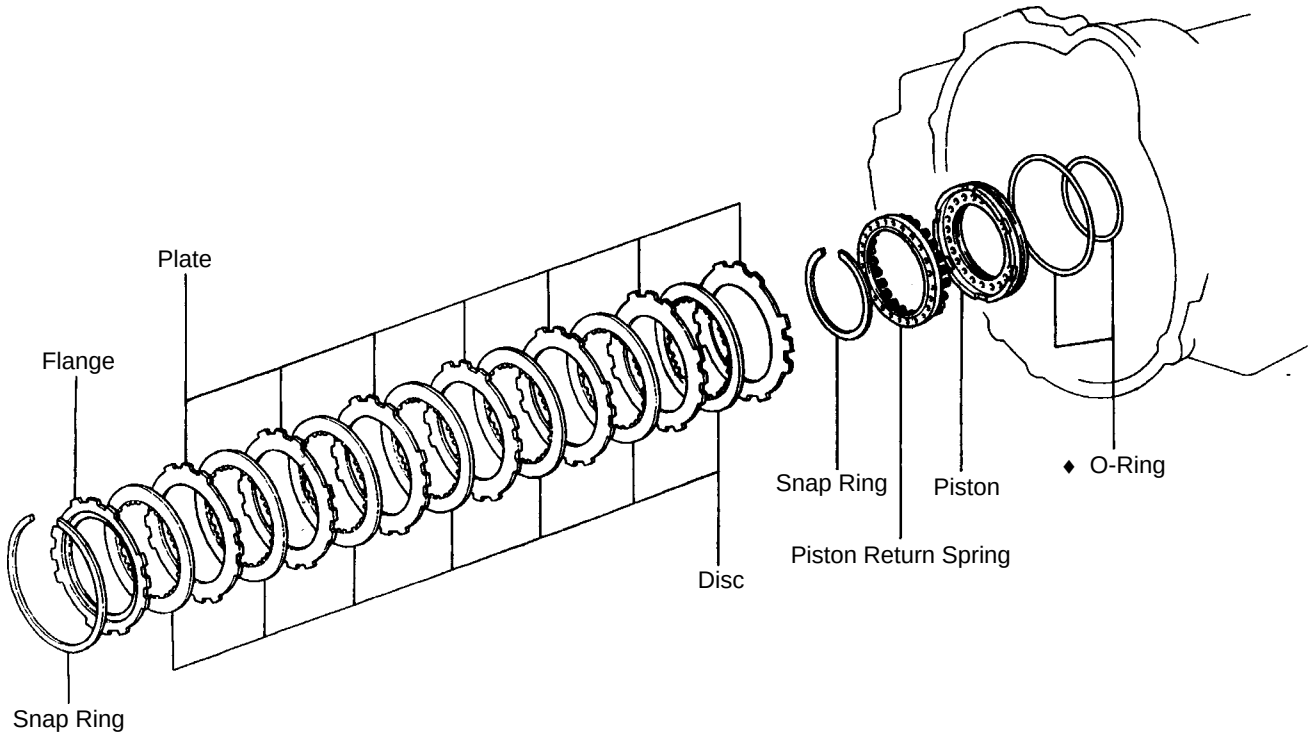
2. INSTALL RING GEAR FLANGE

(a) Position the flange into the ring gear.

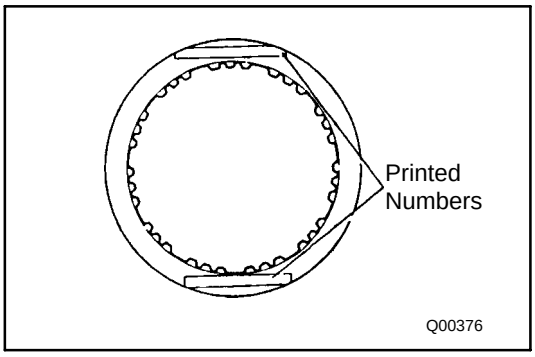
(b) Using a screwdriver, install the snap ring.

FIRST AND REVERSE BRAKE

COMPONENTS



♦ Non-reusable part



FIRST AND REVERSE BRAKE COMPONENTS INSPECTION

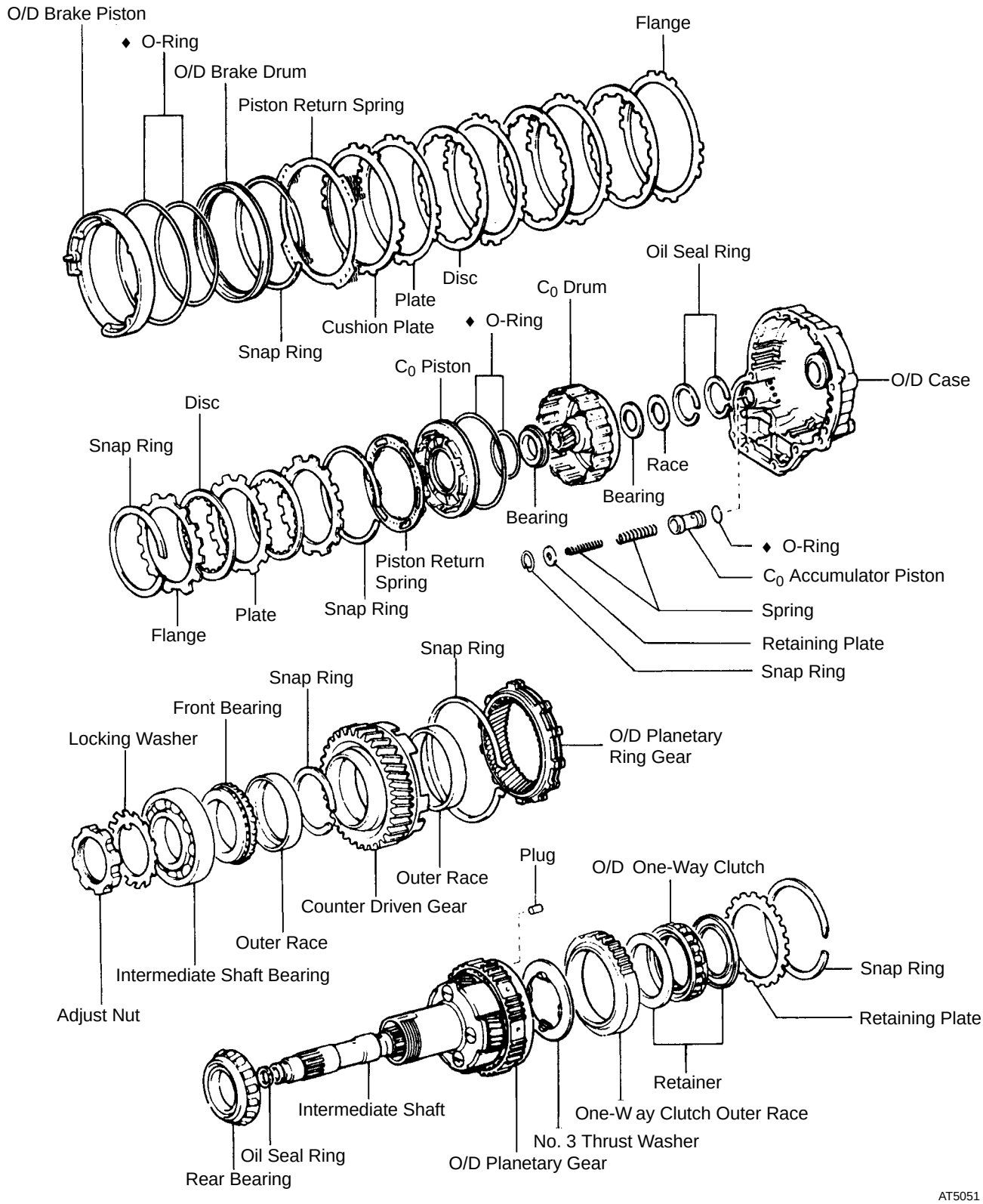
INSPECT DISCS, PLATES AND FLANGES

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

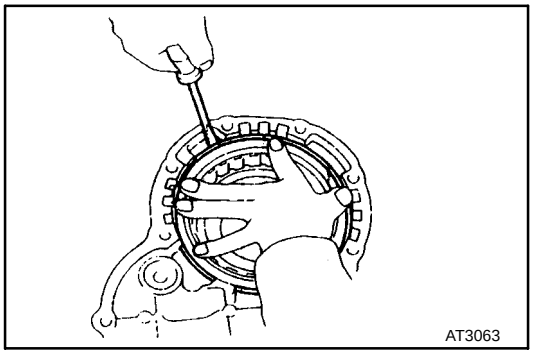
- ® If the lining of the disc is peeling off or discolored, or even a part of the printed numbers are defaced, replace all discs.
- ® Before assembling new discs, soak them in ATF for at least fifteen minutes.

OVERDRIVE UNIT

COMPONENTS



♦ Non-reusable part

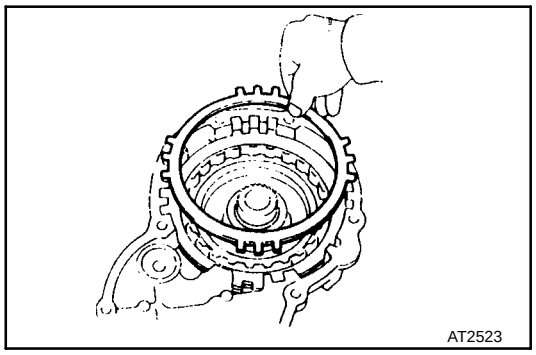


OVERDRIVE BRAKE DISASSEMBLY

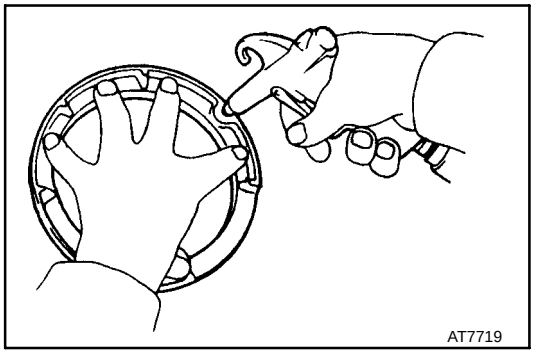
1. REMOVE PISTON RETURN SPRING

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

(b) Remove the piston return spring.

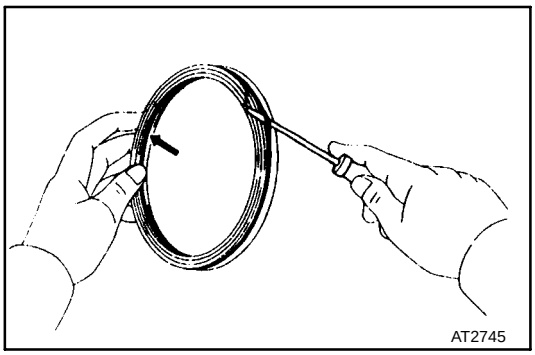


2. REMOVE PLATES, DISCS AND FLANGE



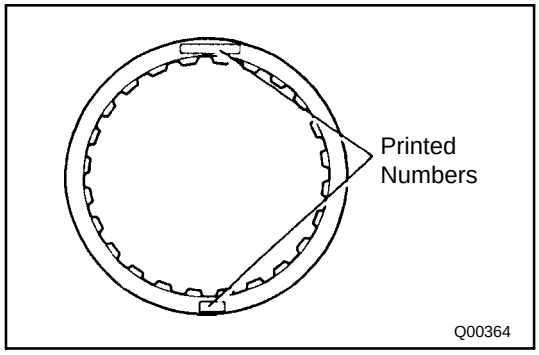
3. REMOVE PISTON FROM DRUM

Apply compressed air 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 tilt.



4. REMOVE O-RINGS

Remove the inner and outer O-rings from the piston.



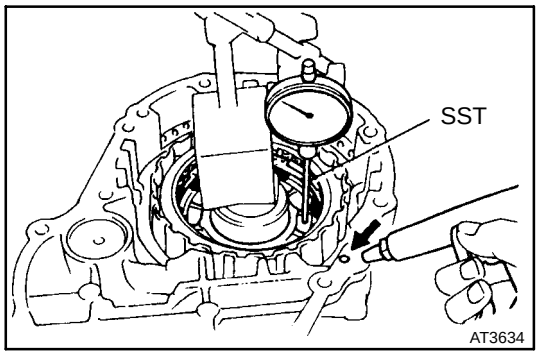
OVERDRIVE BRAKE INSPECTION

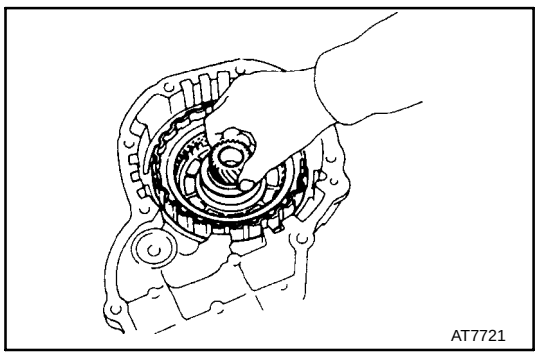
INSPECT DISCS, PLATES AND FLANGE

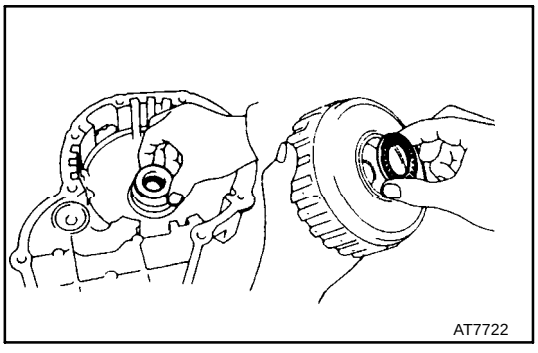
Check if the sliding surfaces of the discs, plates and flange are worn or burnt. If necessary, replace them.

HINT:

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







OVERDRIVE DIRECT CLUTCH DISASSEMBLY

1. CHECK PISTON STROKE OF DIRECT CLUTCH

Using a dial indicator, measure the piston stroke while applying and releasing the compresses air (392 - 785 kPa, 5 - 8 kgf/cm^2, 57 - 114 psi), as shown.

Piston stroke:

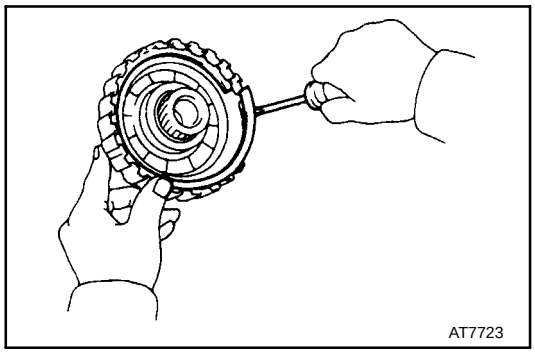
1.75 - 2.49 mm (0.0689 - 0.0980 in.)

SST 09350-32014 (09351-32190)

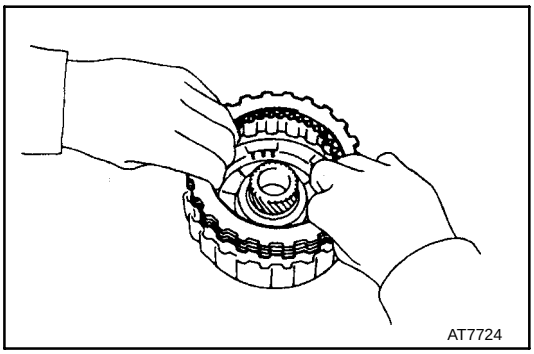
If the piston stoke is greater than the maximum, inspect each component.

2. REMOVE OVERDRIVE DIRECT CLUTCH FROM CASE

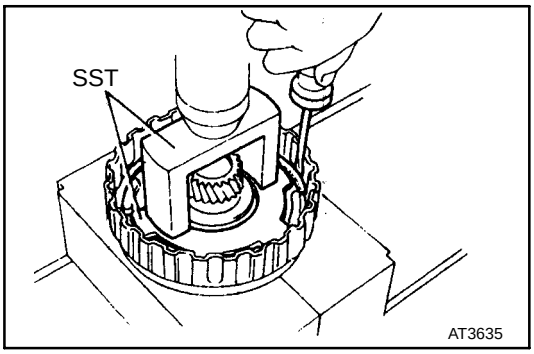
3. REMOVE BEARING AND RACE FROM CLUTCH DRUM AND CASE



4. REMOVE SNAP RING WITH SCREWDRIVER



5. REMOVE FLANGES, DISCS AND PLATES

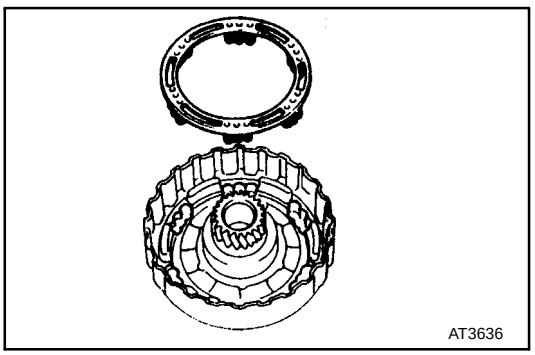


6. REMOVE PISTON RETURN SPRING

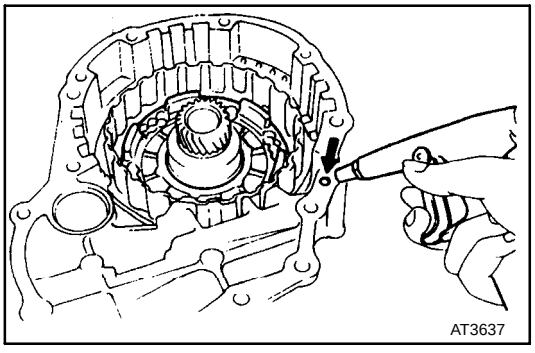
(a) Place SST on the spring retainer and compress the spring with a shop press.

SST 09350-32014 (09351-32070, 09351-32200)

(b) Remove the snap ring.



(c) Remove the piston return spring.



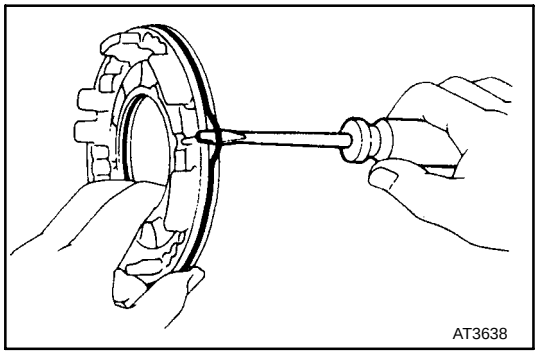
7. REMOVE PISTON FROM CLUTCH DRUM

(a) Install the clutch drum on the case.

(b) Apply compressed air 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.

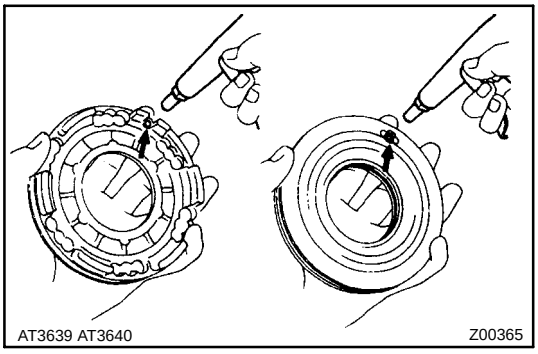
(d) Remove the clutch drum from the case.



8. REMOVE O-RINGS

Remove the two O-rings from the piston.

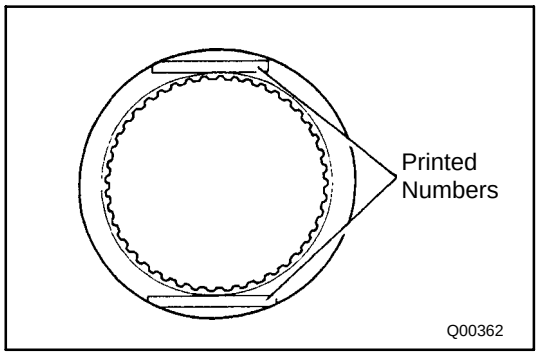
OVERDRIVE DIRECT CLUTCH INSPECTION



1. INSPECT OVERDRIVE DIRECT CLUTCH

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

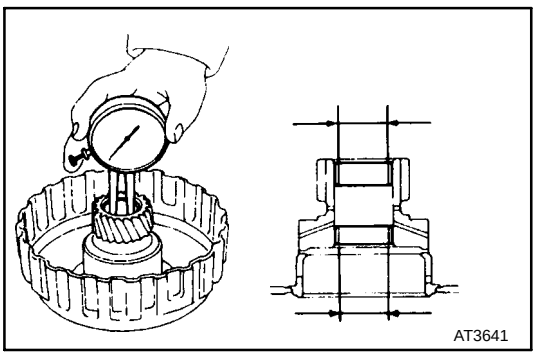
(b) Check that the valve does not leak by applying low-pressure compressed air.



2. INSPECT DISCS, PLATES AND FLANGES

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

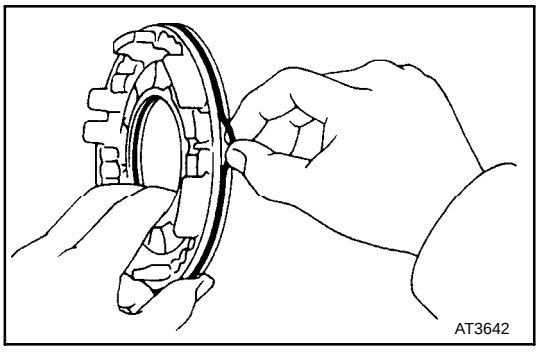
- If the lining of the disc is peeling off or discolored, or even a part of the printed numbers are defaced, replace all discs.
- Before assembling new discs, soak them in ATF for at least fifteen minutes.



3. CHECK DIRECT CLUTCH BUSHING

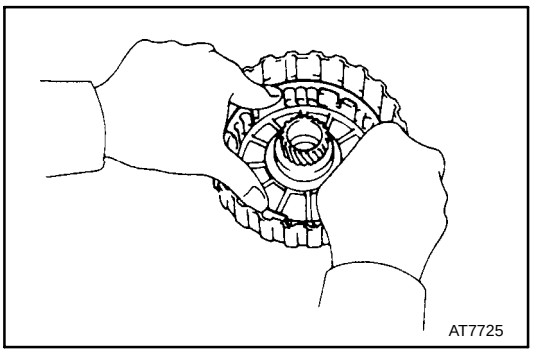
Using a dial indicator, measure the inside diameter of the two direct clutch bushings.
Maximum inside diameter:
22.13 mm (0.8713 in.)
If the inside diameter is greater than the maximum, replace the direct clutch drum.

OVERDRIVE DIRECT CLUTCH ASSEMBLY

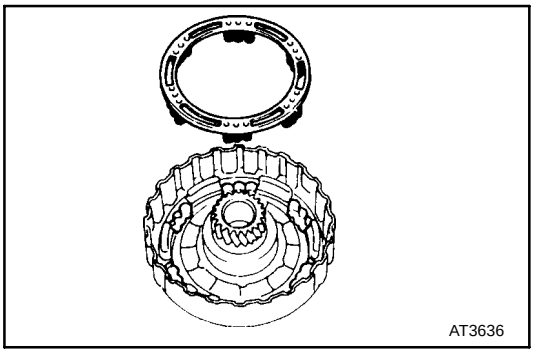


1. INSTALL CLUTCH PISTON

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

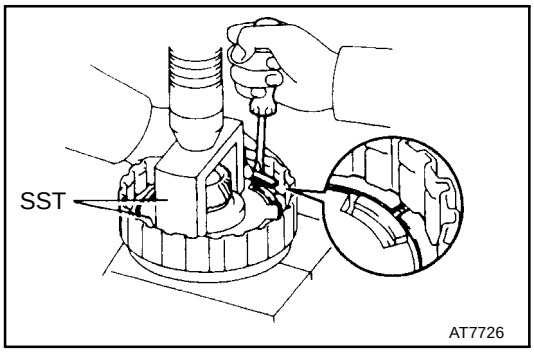


(b) Press the piston into the drum with the cup side up, being careful not to damage the O-ring.



2. INSTALL PISTON RETURN SPRING

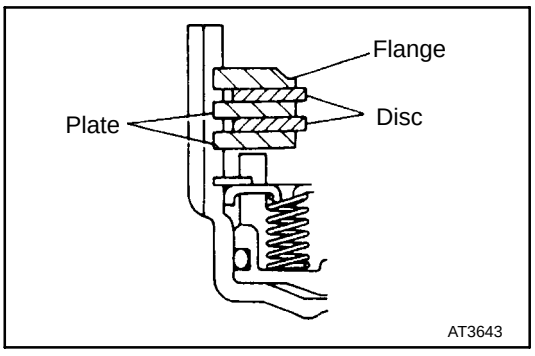
(a) Install the return spring and seat snap ring in place.



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

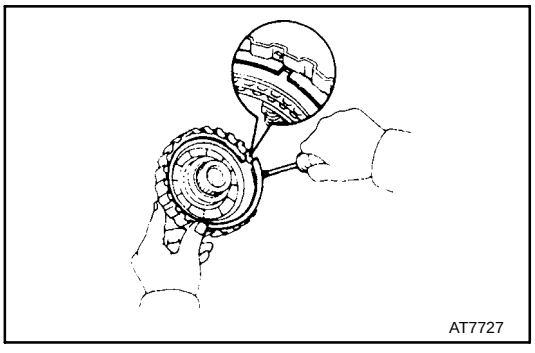
SST 09350-32014 (09351-32070, 09351-32200)

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



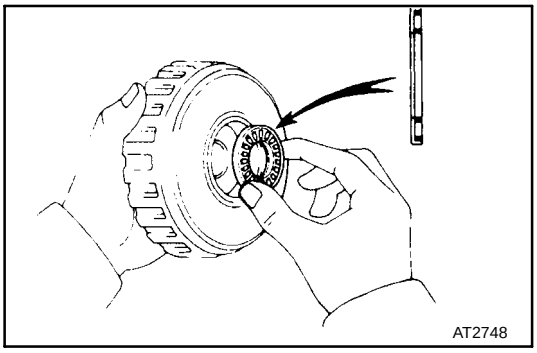
3. INSTALL PLATES, DISCS AND FLANGE

Install in order:
P = Plate D = Disc
P-D-P-D-Flange



4. INSTALL SNAP RING

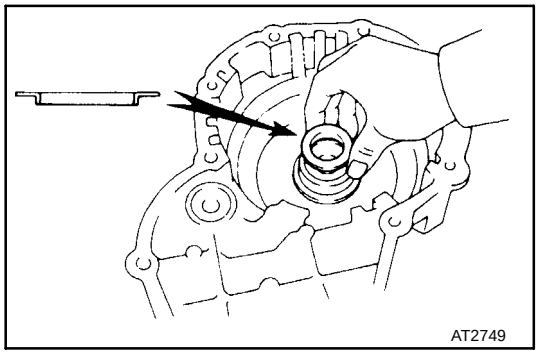
Be sure end gap of the snap ring is not aligned with the groove of the clutch drum.



5. INSTALL BEARING AND RACE

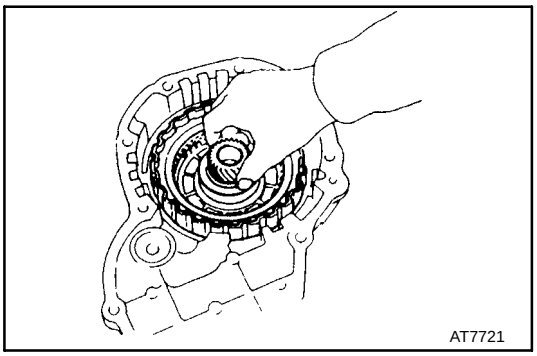
(a) Coat the bearing with petroleum jelly and install it facing the race side downward to the clutch drum.

Bearing outer diameter:
46.3 mm (1.823 in.)
Bearing inner diameter:
26.2 mm (1.031 in.)

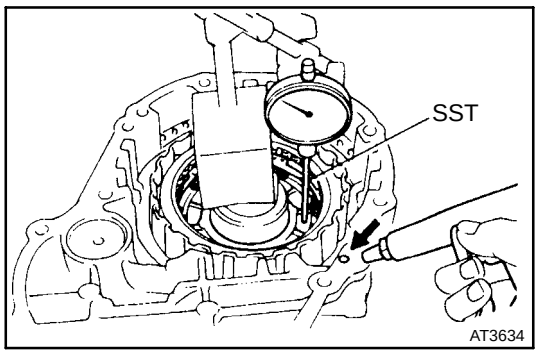


(b) Coat the race with petroleum jelly and install it to the case.

Race outer diameter:
43.0 mm (1.693 in.)
Race inner diameter:
24.5 mm (0.965 in.)



6. INSTALL DIRECT CLUTCH ON CASE

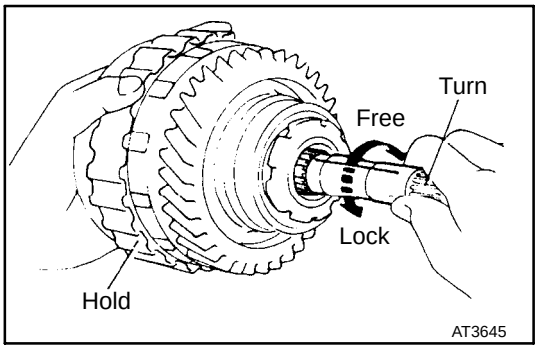


7. RECHECK PISTON STROKE OF DIRECT CLUTCH

Using a dial indicator, measure the piston stroke while applying and releasing the compressed air (392 - 785 kPa, 4 - 8 kgf/cm^2, 57 - 114 psi), as shown.

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

SST 09350-32014 (09351-32190)



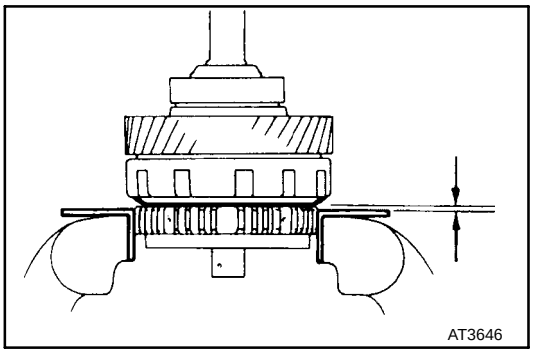
COUNTER DRIVE GEAR DISASSEMBLY

1. CHECK OPERATION OF 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.

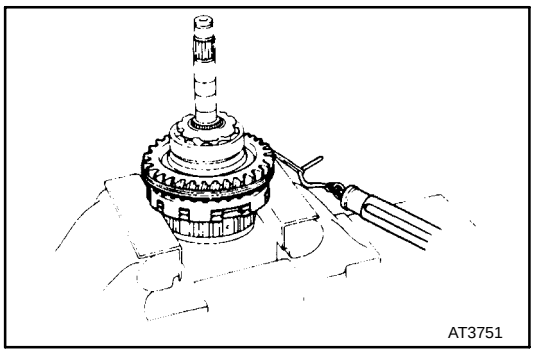
(c) Remove the overdrive direct clutch.


AT3646

2. CHECK COUNTER DRIVE GEAR PRELOAD

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

HINT: Do not let the counter drive gear touch the vise.

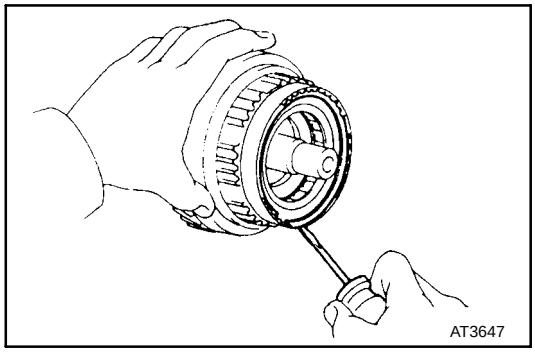

AT3751

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

Preload (at starting):

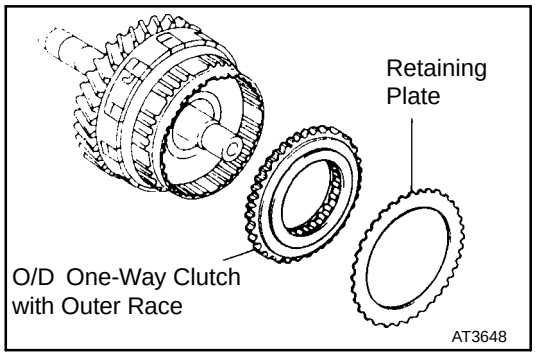
9.2 - 15.3 N (940 - 1,560 g, 2.1 - 3.4 lb)

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


AT3647

3. REMOVE O/D ONE-WAY CLUTCH AND OUTER RACE

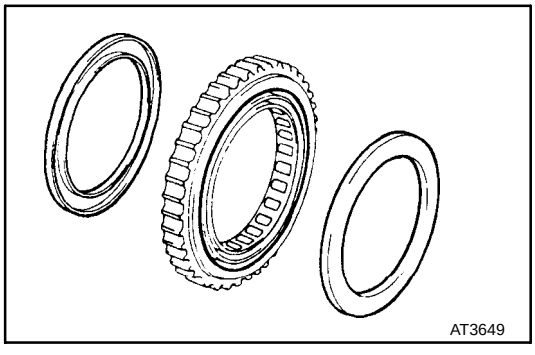
(a) Remove the snap ring.



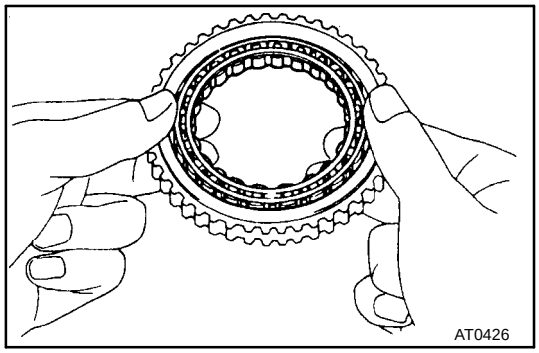
AT3648

(b) Remove the retaining plate.

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

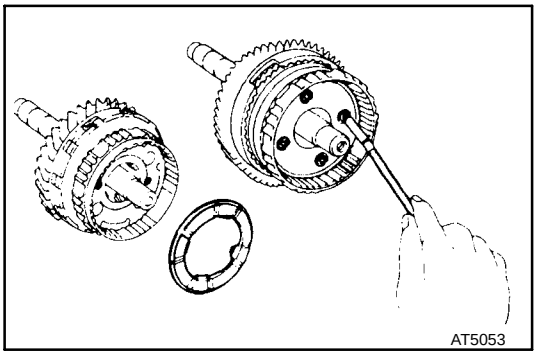

AT3649

(d) Remove the two 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.

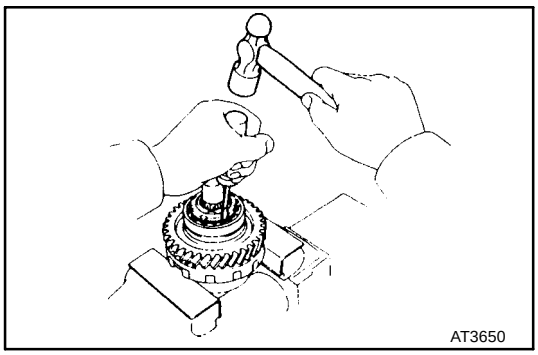


4. REMOVE NO. 3 PLANETARY THRUST WASHER

5. REMOVE PLUGS FROM PLANETARY GEAR

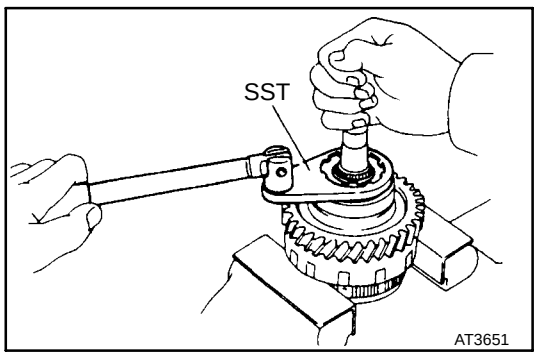
Remove the four plugs with a magnetic finger.

HINT: Be careful not to lose them.



6. REMOVE ADJUSTING NUT AND LOCKING WASHER

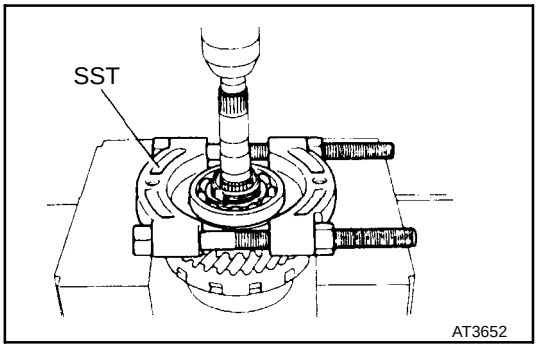
(a) Pry off the locking washer.



(b) Using SST, loosen the adjusting nut.

SST 09350-32014 (09351-32080)

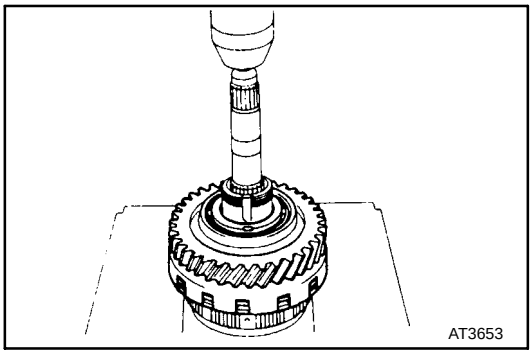
(c) Remove the adjusting nut and locking washer.



7. REMOVE INTERMEDIATE SHAFT BEARING

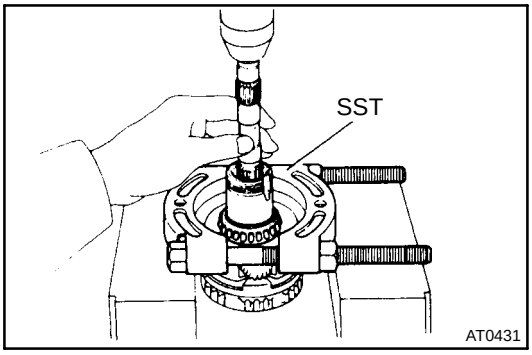
Using SST, press out the bearing from the shaft.

SST 09950-00020



8. REMOVE COUNTER DRIVE GEAR AND FRONT BEARING

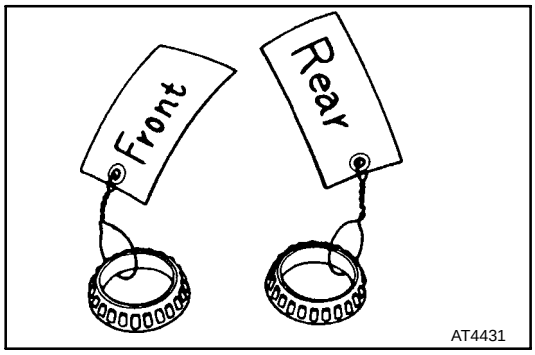
Press out the gear and bearing together.



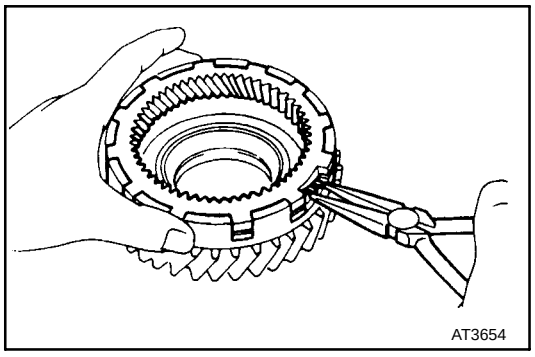
9. REMOVE REAR BEARING

(a) Using SST, press out the bearing.

SST 09950-00020



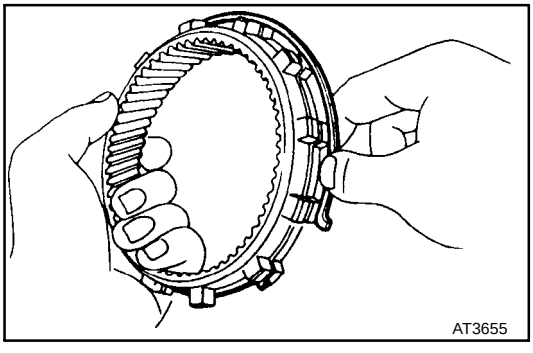
(b) Tag the bearings to show the location for reassembly.



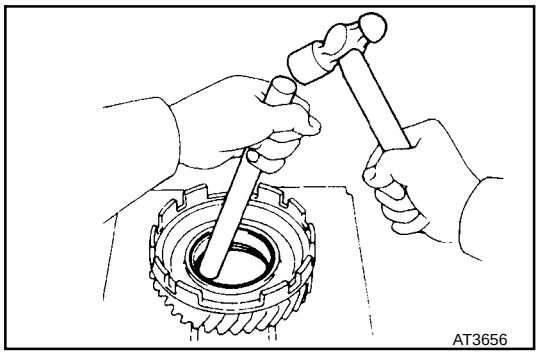
10. REMOVE OVERDRIVE PLANETARY RING GEAR FROM COUNTER DRIVE GEAR

(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.

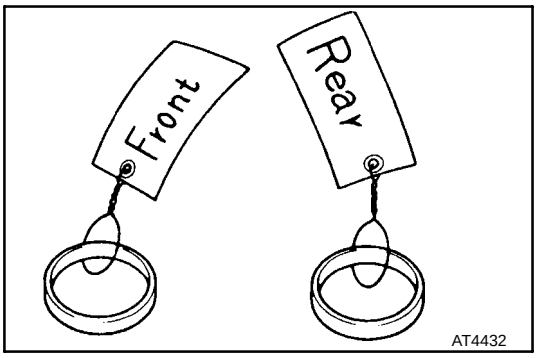


(c) Remove the snap ring from the ring gear.

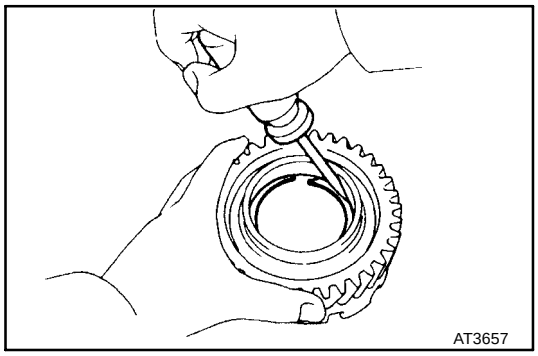


11. REMOVE OUTER RACES FROM COUNTER DRIVE GEAR

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

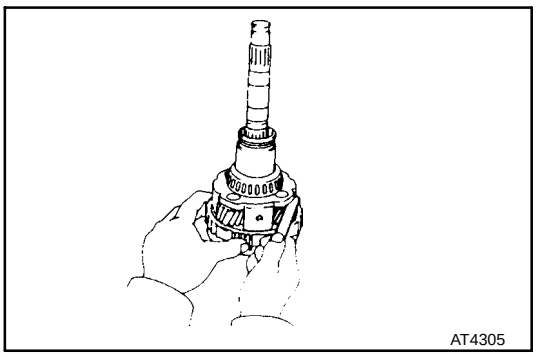


(b) Tag the races to show the location for reassembly.



12. REMOVE SNAP RING FROM COUNTER DRIVE GEAR

Using a screwdriver, remove the snap ring.



OVERDRIVE PLANETARY GEAR INSPECTION

MEASURE PLANETARY PINION GEAR THRUST CLEARANCE

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

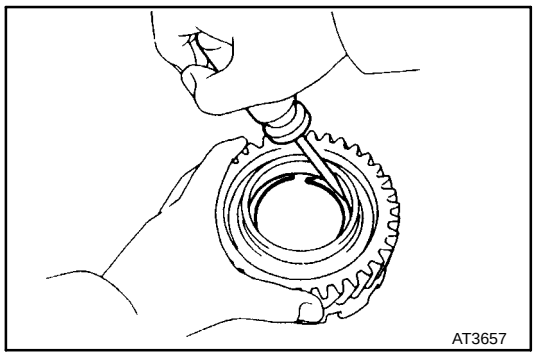
Standard clearance:

0.16 - 0.56 mm (0.0063 - 0.0220 in.)

Maximum clearance:

0.61 mm (0.0240 in.)

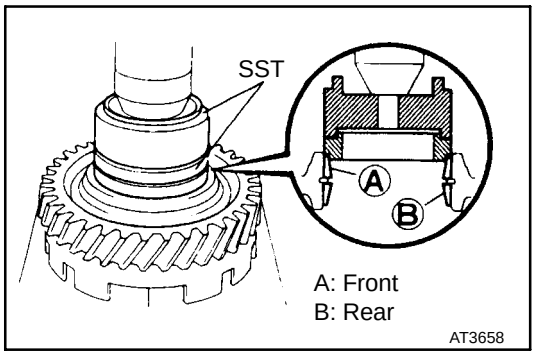
If the clearance is greater then the maximum, replace the planetary gear assembly.



COUNTER DRIVE GEAR ASSEMBLY

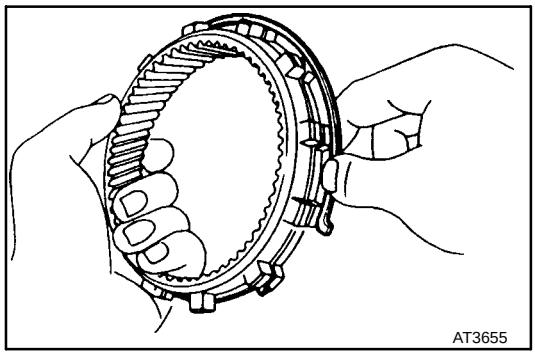
1. INSTALL SNAP RING INTO COUNTER GEAR

Install the snap ring with a screwdriver.



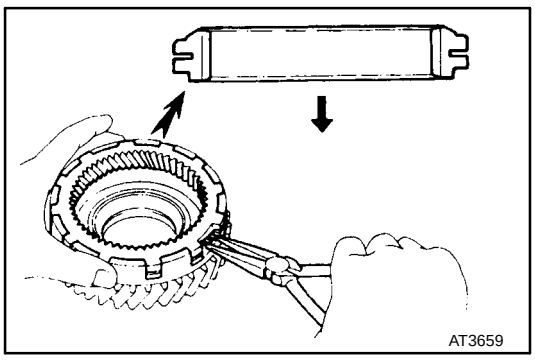
2. INSTALL OUTER RACES INTO COUNTER DRIVE GEAR

Using SST, press in the two outer races to both sides of the gear.
SST 09350-32014 (09351-32120, 09351-32150)
HINT: Press in the two outer races until they touch the snap ring. Tap the races in straight, so that they do not tilt.

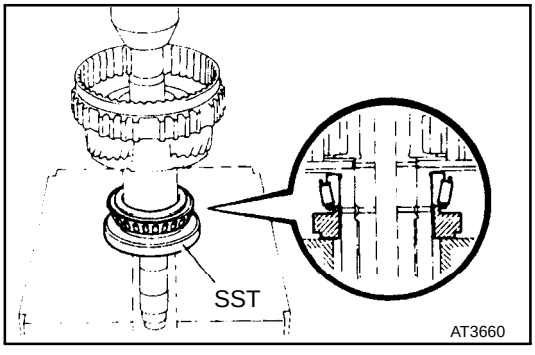


3. INSTALL OVERDRIVE PLANETARY RING GEAR INTO COUNTER DRIVE GEAR

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

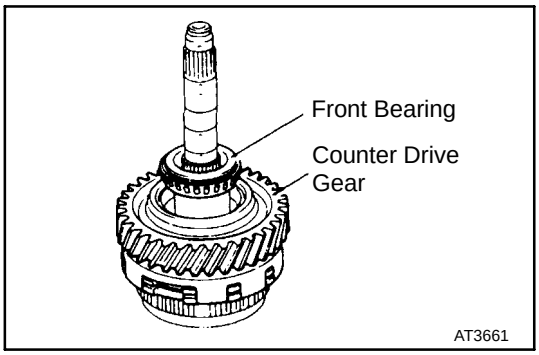


(b) While pushing down the ring gear, squeeze the snap ring and with needle-nose pliers, and install it into the groove.



4. INSTALL REAR BEARING

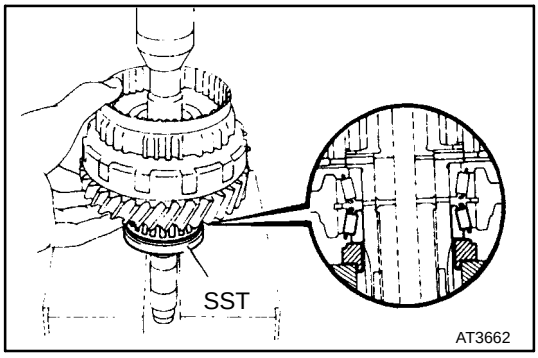
Using SST, press in the bearing onto the shaft.
SST 09350-32014 (09351-32120)
HINT: Press in the bearing until the side surface of the inner race touches the planetary carrier.



5. INSTALL COUNTER DRIVE GEAR AND FRONT BEARING

(a) install the gear onto the shaft, and mesh the ring gear with the planetary pinions.

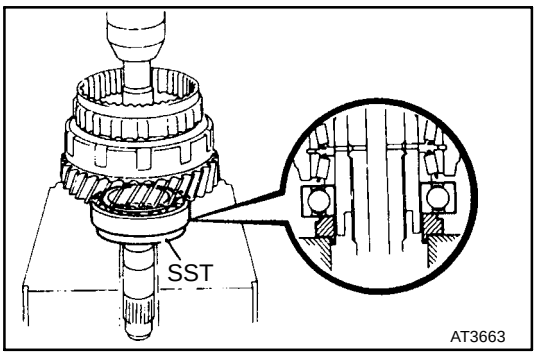
(b) Place the front bearing on to the shaft.



(c) Using SST, press in the bearing until slightly play between the bearings.

SST 09350-32014 (09351-32120)

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

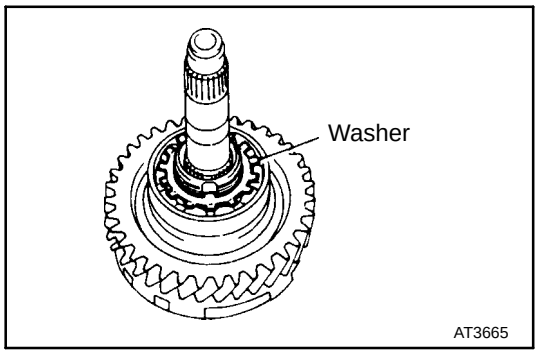


6. INSTALL INTERMEDIATE SHAFT BEARING

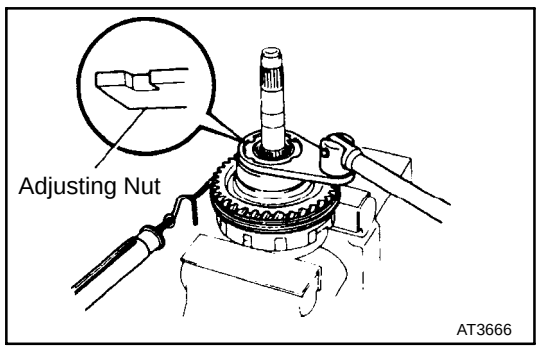
Using SST, press in the bearing until it slightly touches the front bearing of the counter drive gear.

SST 09350-32014 (09351-32120)

HINT: The counter drive gear can be turned lightly.



7. PLACE NEW LOCKING WASHER



8. INSTALL ADJUSTING NUT AND ADJUST PRELOAD OF COUNTER DRIVE GEAR

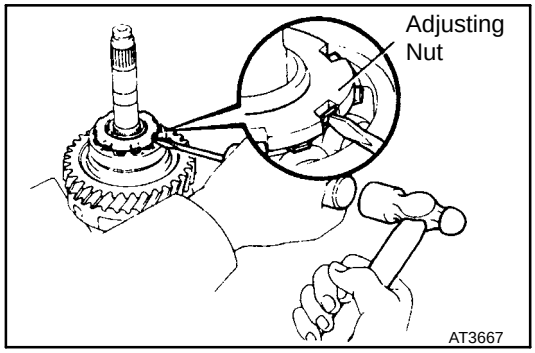
(a) Hold the overdrive planetary gear in a vise with soft jaws.

(b) Using SST, tighten the adjusting nut until the following gear starting load is reached on the tension gauge.

SST 09350-32014 (09351-32080)

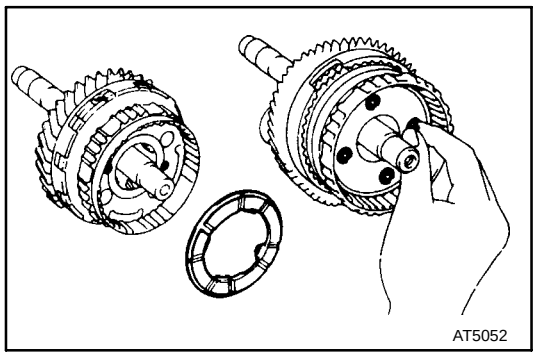
Preload (at starting):

9.2 - 15.3 N (940 - 1,560 g, 2.1 - 3.4 lb)



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

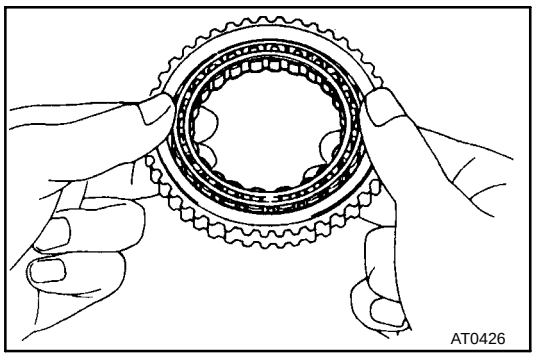
(c) Lock the adjusting nut with one tab on locking washer. Bend the locking washer tab until it is even with the adjusting nut groove.



9. INSTALL NO. 3 OVERDRIVE PLANETARY THRUST WASHER

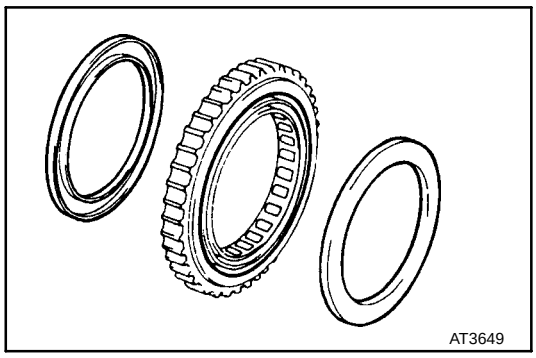
10. INSTALL PINION SHAFT PLUGS

Install the four plugs into the pinion shaft.

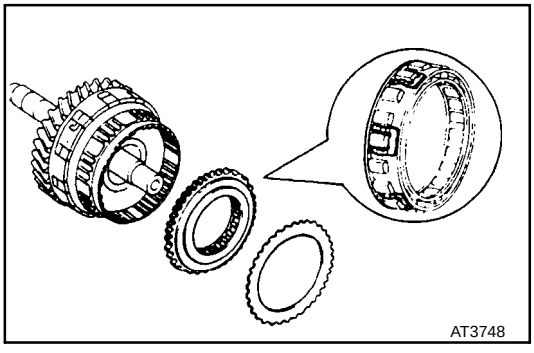


11. INSTALL OVERDRIVE ONE-WAY CLUTCH AND RETAINING PLATE

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



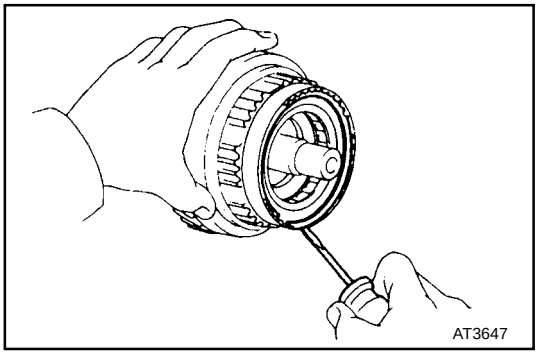
(b) Install the two retainer on both sides of the one-way clutch.



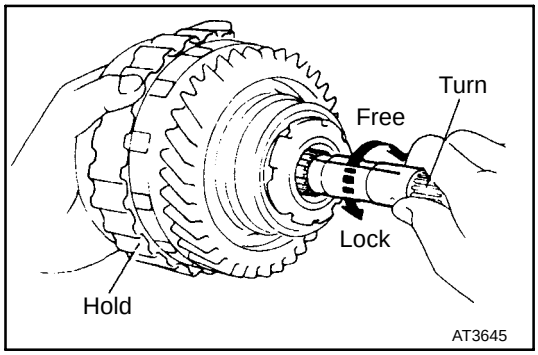
(c) Install the one-way clutch into the overdrive planetary gear.

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

(d) Install the retaining plate.



(e) Install the snap ring.



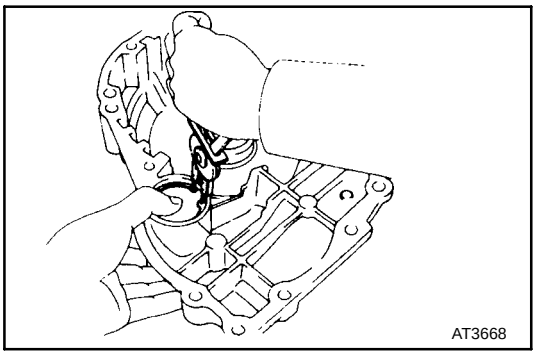
12. CHECK OPERATION OF O/D ONE-WAY CLUTCH

(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.

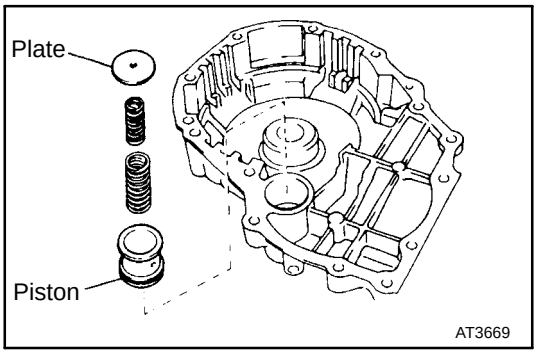
(c) Remove the overdrive direct clutch.

OVERDRIVE CASE DISASSEMBLY



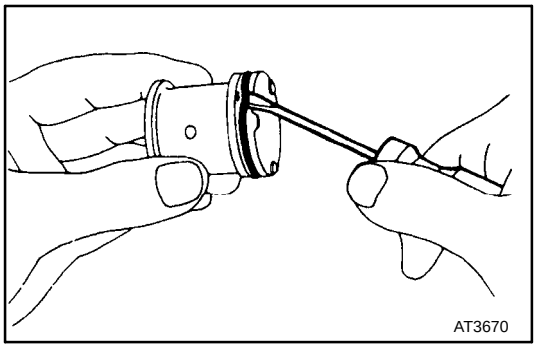
1. REMOVE C0 ACCUMULATOR PISTON FROM OVERDRIVE CASE

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

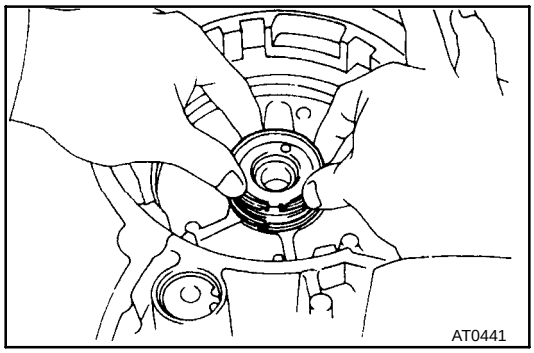


(b) Remove the retaining plate and two springs.

(c) Remove the accumulator piston.



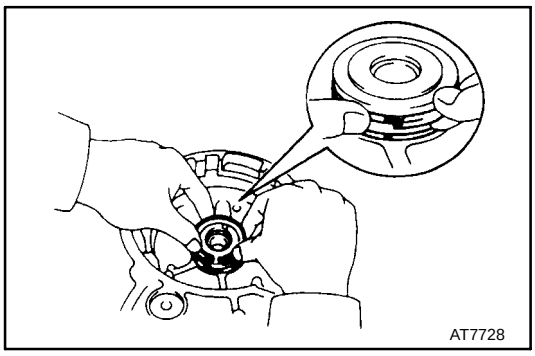
(d) Remove the O-ring from the piston.



2. REMOVE OIL SEAL RINGS

Spread the two rings apart and remove them.

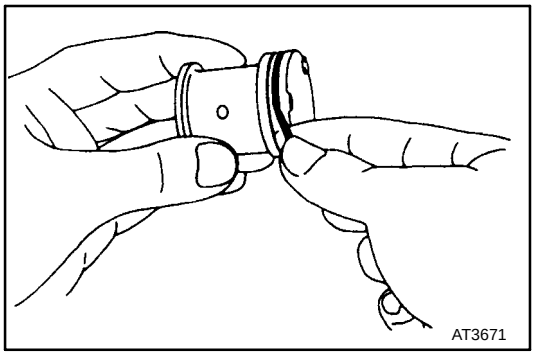
OVERDRIVE CASE ASSEMBLY



1. INSTALL OIL SEAL RINGS ON OVERDRIVE CASE

Spread the two rings apart and install them into the groove.

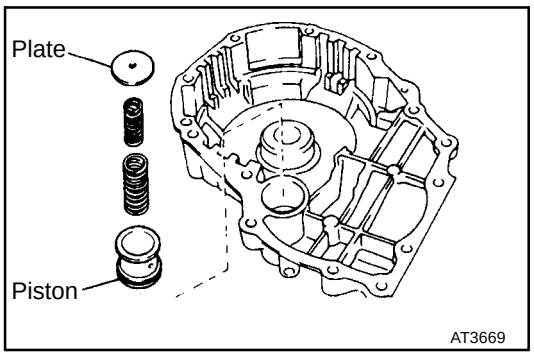
HINT: After installing the oil seal rings, check that they move smoothly.



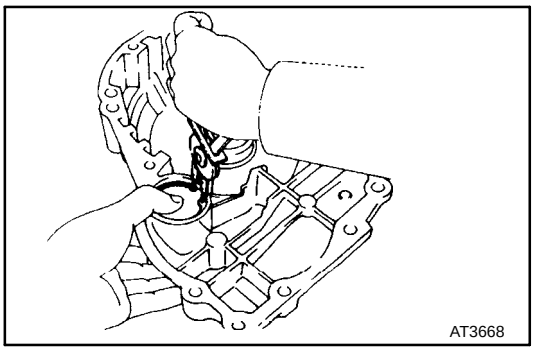
2. INSTALL C0 ACCUMULATOR PISTON TO OVERDRIVE CASE

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

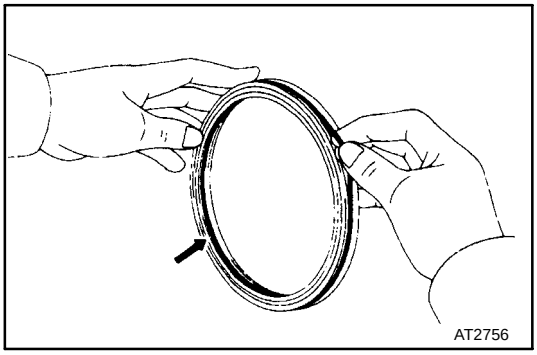
(b) Coat the O-ring with ATF.



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



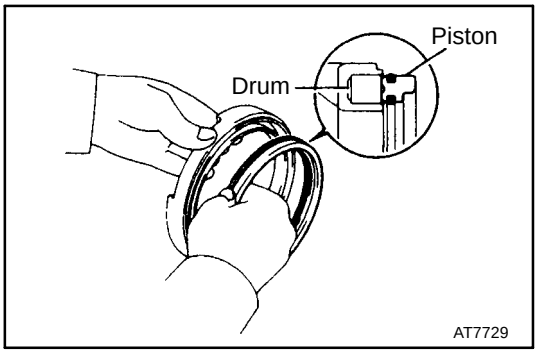
(d) Using snap ring pliers, install the snap ring.



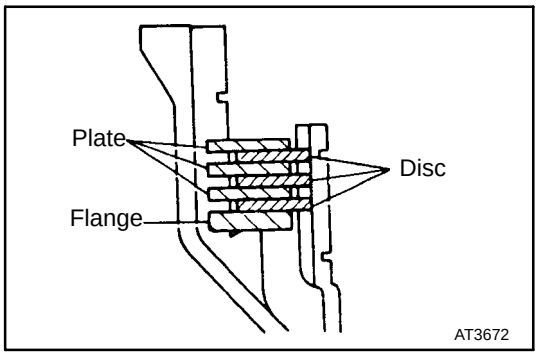
OVERDRIVE BRAKE ASSEMBLY

1. INSTALL PISTON INTO DRUM

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

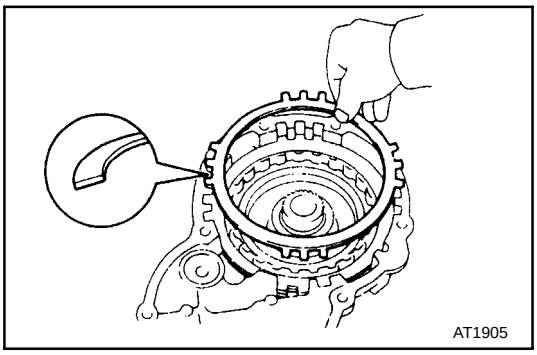


(b) Press the piston into the drum, being careful not to damage the O-rings.

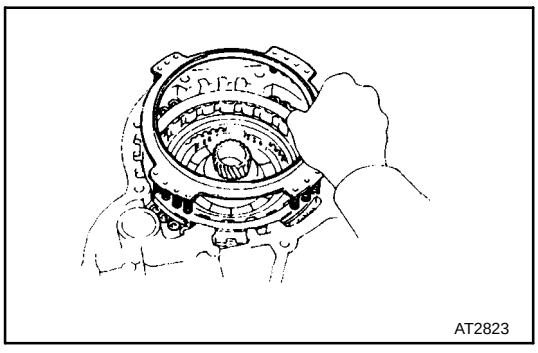


2. INSTALL FLANGE, DISCS AND PLATES

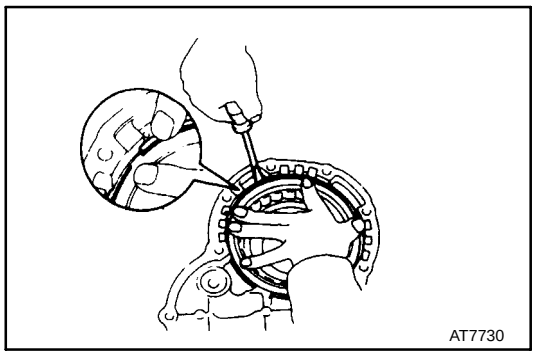
(a) Install the flange, discs and plates.
Install in order:
P = Plate D = Disc
Flange-D-P-D-P-D-P



(b) Install the cushion plate with the rounded end facing upward.

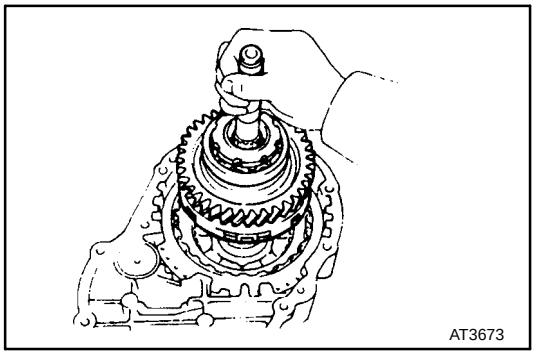


3. POSITION PISTON RETURN SPRING



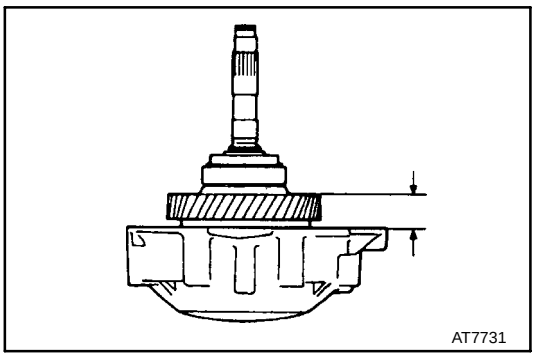
4. INSTALL SNAP RING INTO CASE

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



5. INSTALL OVERDRIVE PLANETARY GEAR ONTO OVERDRIVE DIRECT CLUTCH

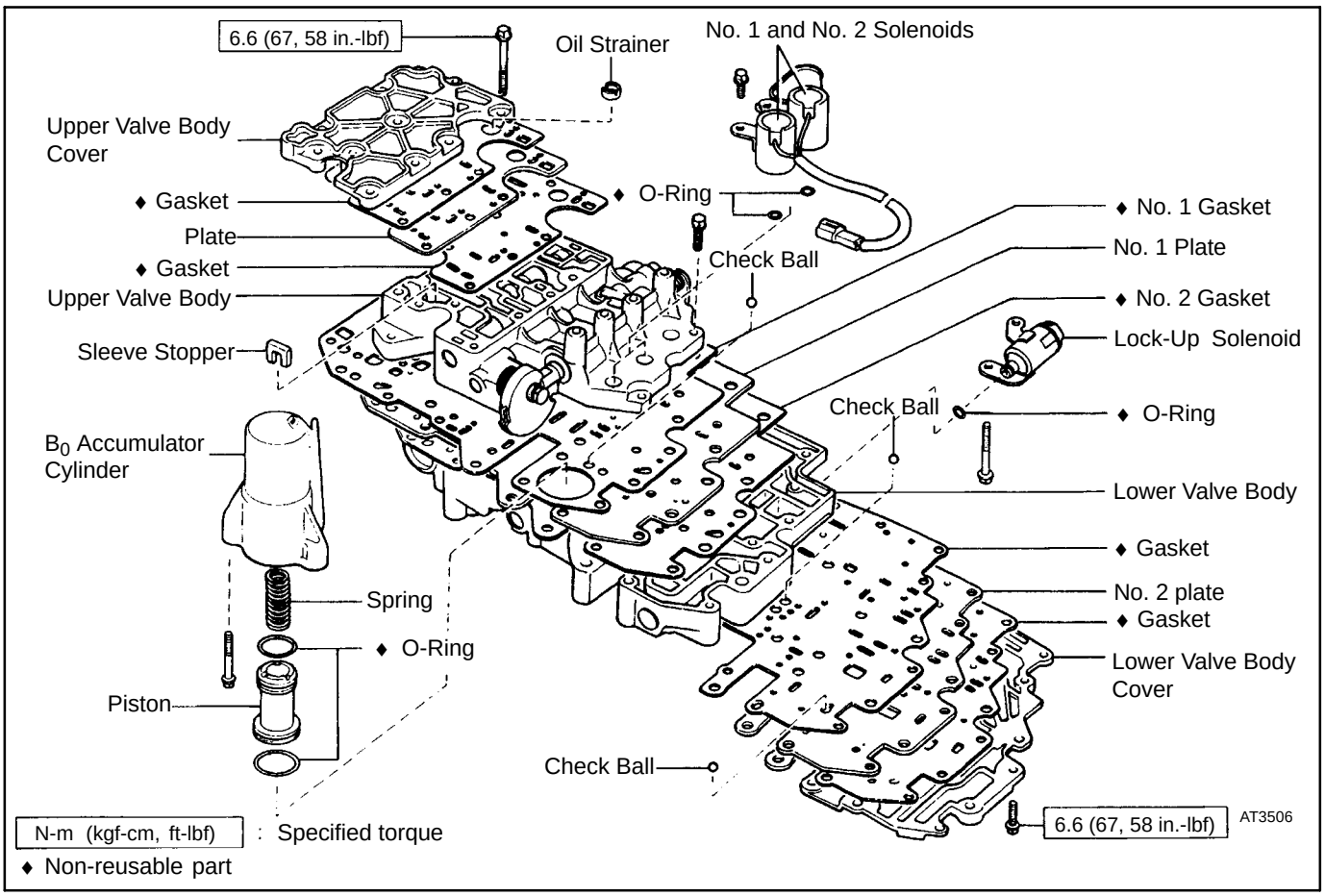
While turning the overdrive planetary gear clockwise, install it onto the overdrive direct clutch.

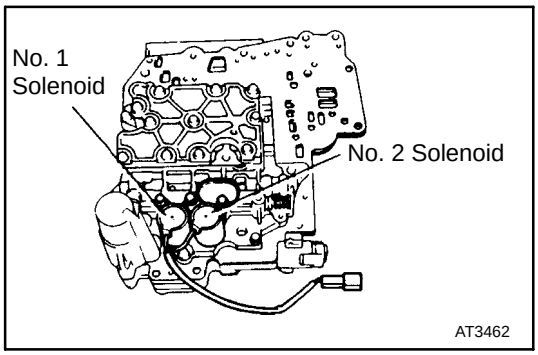


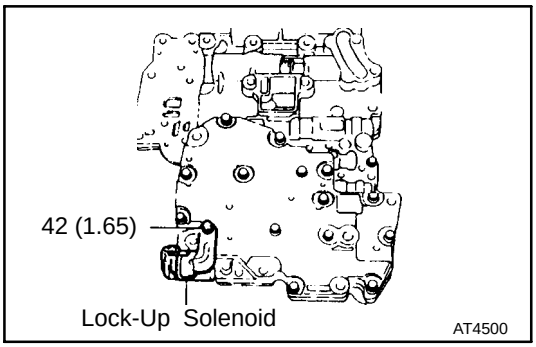
HINT: If the overdrive planetary gear is properly installed onto the direct clutch, the counter drive gear height from the overdrive case will be about 24 mm (0.94 in.).

VALVE BODY

COMPONENTS







VALVE BODY DISASSEMBLY

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

1. REMOVE SOLENOIDS

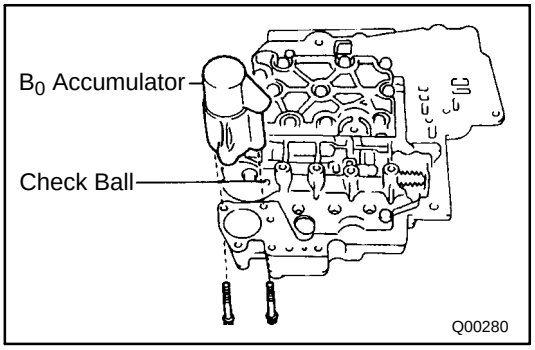
(a) Remove No. 1 and No. 2 solenoids.

NOTICE: When removing the solenoid, do not use a screwdriver, etc. to pry up the solenoid.

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

(c) Remove the lock-up solenoid.

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

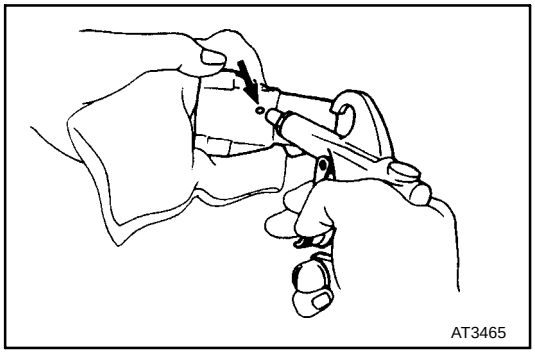


2. REMOVE B_0 ACCUMULATOR ASSEMBLY

(a) Remove the two bolts.

(b) Remove the B_0 accumulator assembly.

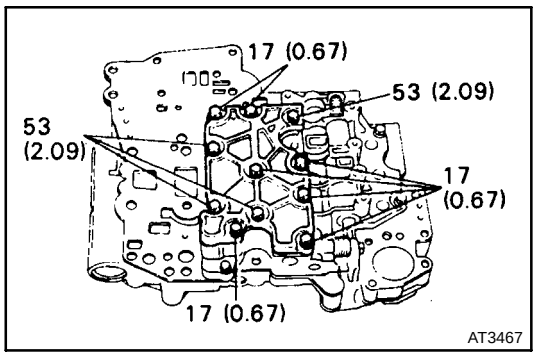
(c) Remove the check ball on No. 1 plate.



3. DISASSEMBLY B_0 ACCUMULATOR ASSEMBLY

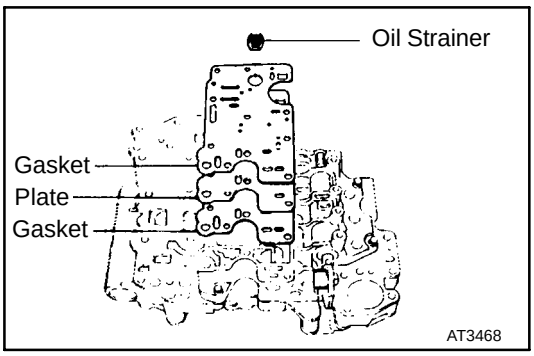
(a) Applying compressed air to the cylinder hole, remove the piston and spring.

(b) Remove the two O-ring from the piston.



4. REMOVE UPPER AND BODY COVER

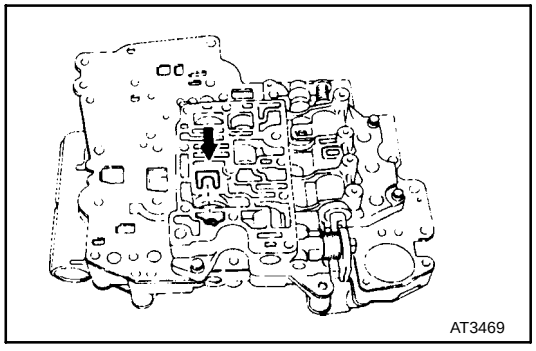
Remove the eleven bolts and upper and body cover.



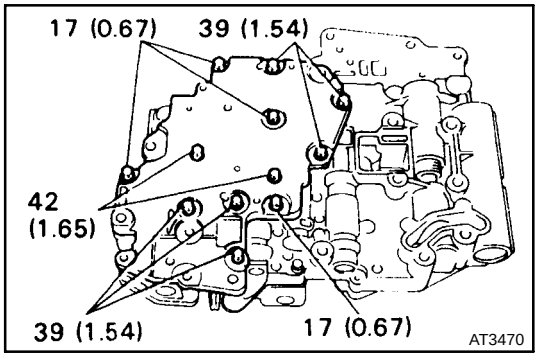
5. REMOVE OIL STRAINER, UPPER VALVE BODY COVER GASKETS AND PLATE

(a) Remove the oil strainer on the gasket.

(b) Remove the two gaskets and plate from the upper valve body.

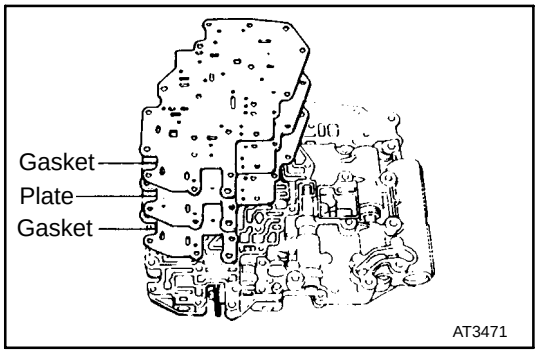


6. REMOVE LOCK-UP RELAY VALE SLEEVE STOPPER

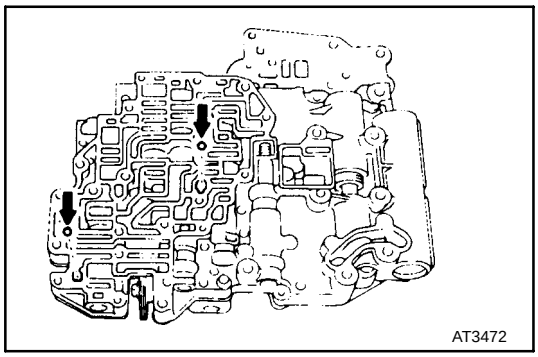


7. REMOVE LOWER VALVE BODY COVER

Remove the twelve bolts and lower valve body cover.

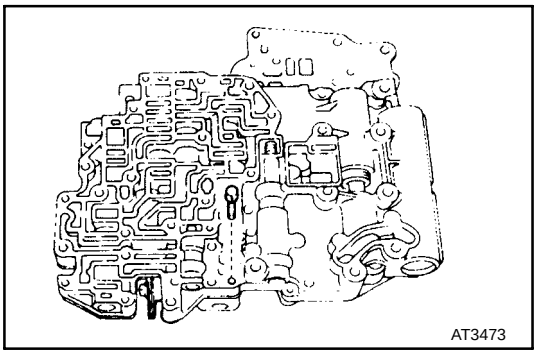


8. REMOVE LOWER VALVE BODY COVER GASKETS AND NO. 2 PLATE

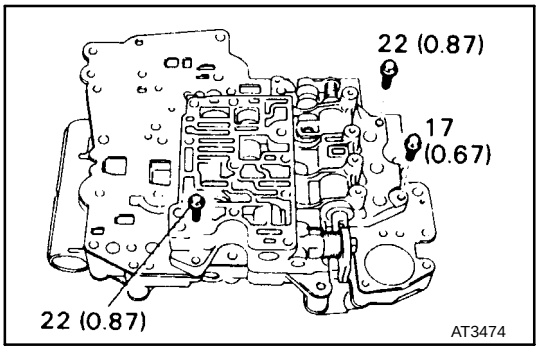


9. REMOVE CHECK BALLS

Remove the two check balls from the lower valve body.

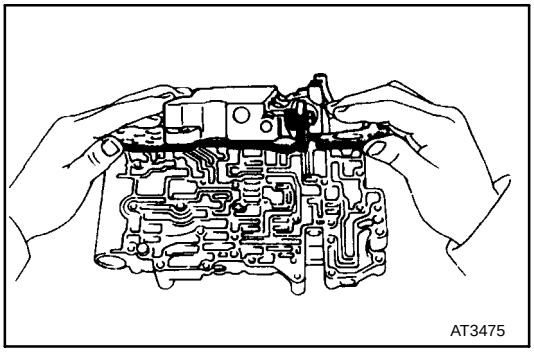


10. REMOVE BOLT FROM LOWER VALVE BODY



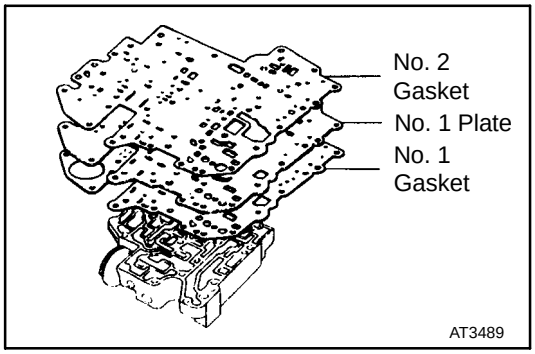
11. REMOVE BOLTS FROM UPPER VALVE BODY

Remove the three bolts.


AT3475

12. LIFT OFF UPPER VALVE BODY AND NO. 1 PLATE AS A SINGLE UNIT

Hold No. 1 plate to the upper valve body and lift off the upper valve body.
HINT: Be careful that the check balls and oil strainer do not fall out:

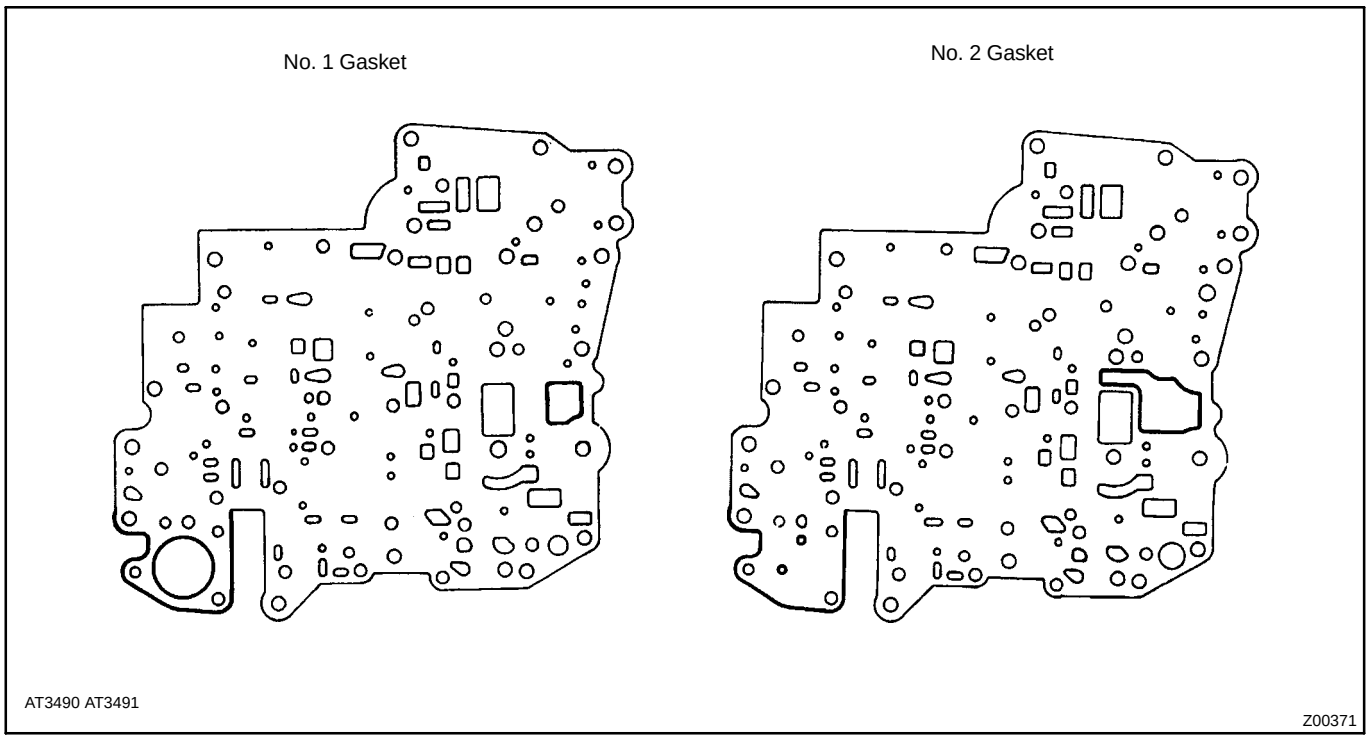


AT3489

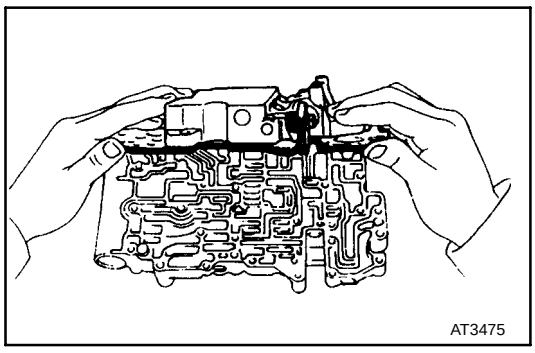
VALVE BODY ASSEMBLY

1. POSITION NO. 1 PLATE AND NEW GASKETS ON UPPER VALVE BODY

Position new No. 1 gasket, No. 1 plate and then new No. 2 gasket on the upper valve body.
HINT: Since No. 1 gasket and No. 2 gasket are similar, use the illustration below to discriminate between them.

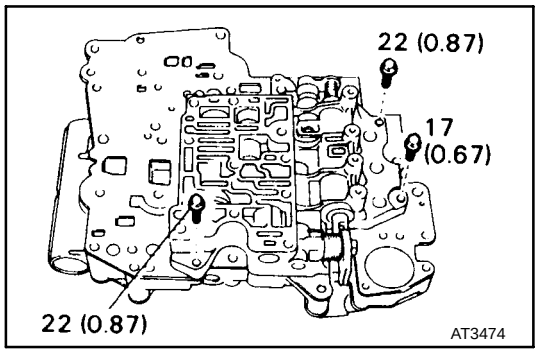


AT3490 AT3491
Z00371


AT3475

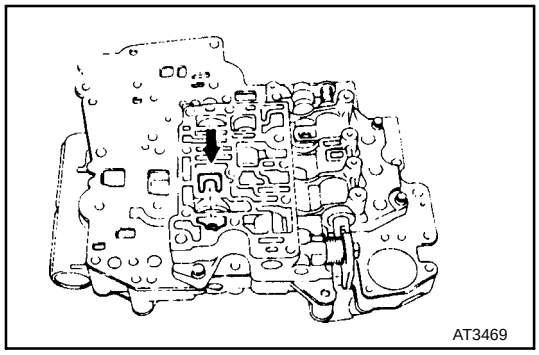
2. PLACE UPPER VALVE BODY WITH NO. 1 PLATE AND GASKETS ON LOWER VALVE BODY

Hold the upper valve body, No. 1 plate and gaskets securely so they do not separate.
Align each bolt hole in the valve bodies with the gaskets and plate.

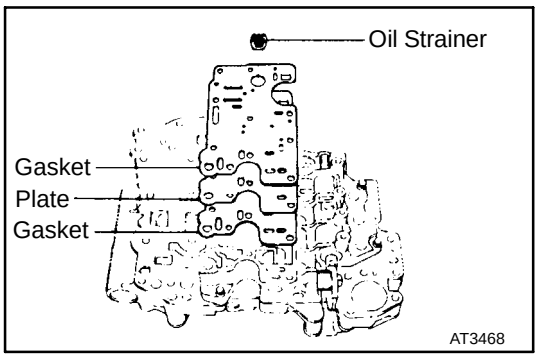


3. INSTALL AND FINGER TIGHTEN BOLTS IN UPPER VALVE BODY TO SECURE LOWER VALVE BODY

Install and finger tighten the three bolts.
HINT: Each bolt length (mm, in.) is indicated in the illustration.



4. INSTALL LOCK-UP RELAY VALVE SLEEVE STOPPER

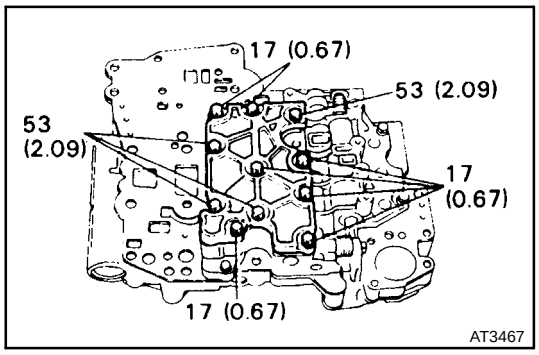


5. INSTALL UPPER VALVE BODY COVER GASKETS, PLATE AND THROTTLE MODULATOR OIL STRAINER

(a) Position a new gasket and plate and then another new gasket.

HINT: Both gasket are same one.

(b) Install the oil strainer onto the gasket.

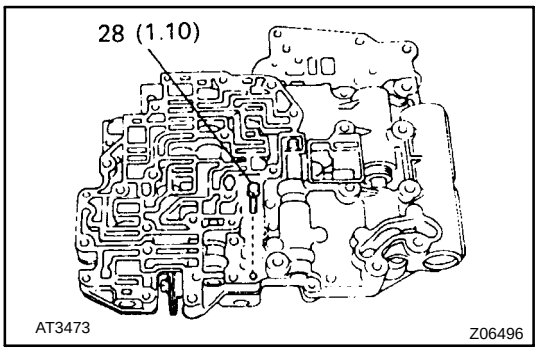


6. INSTALL UPPER VALVE BODY COVER

(a) Position the upper valve body cover.

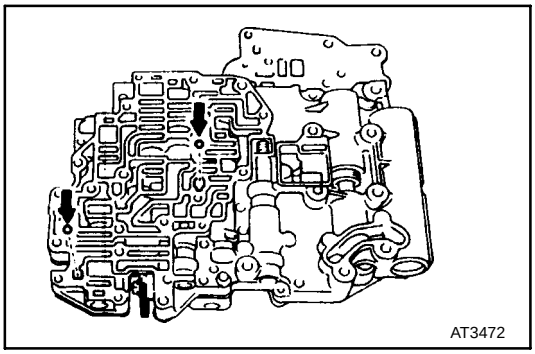
(b) Install and finger tighten the eleven bolts.

HINT: Each bolt length (mm, in.) is indicated in the illustration.



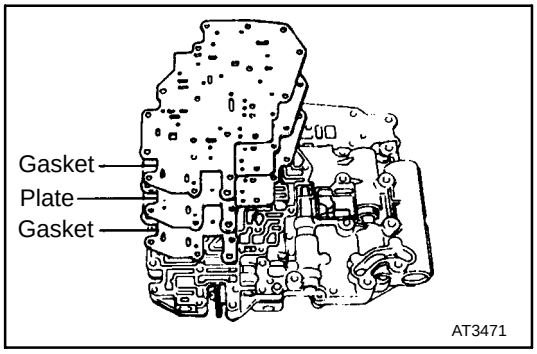
7. INSTALL AND FINGER TIGHTEN BOLT LOWER VALVE BODY

HINT: Bolt length (mm, in.) is indicated in the illustration.



8. INSTALL CHECK BALLS

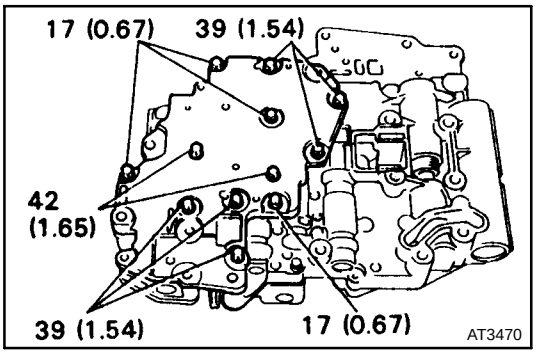
Install the two check balls into the lower valve body.



9. INSTALL LOWER VALVE BODY COVER GASKETS AND NO. 2 PLATE

Position a new gasket and plate and then another new gasket.

HINT: Both gaskets are same one.

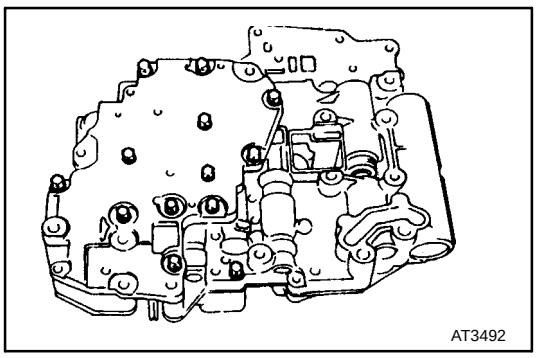


10. INSTALL LOWER VALVE BODY COVER

(a) Position the lower valve body cover.

(b) Install and finger tighten the twelve bolts.

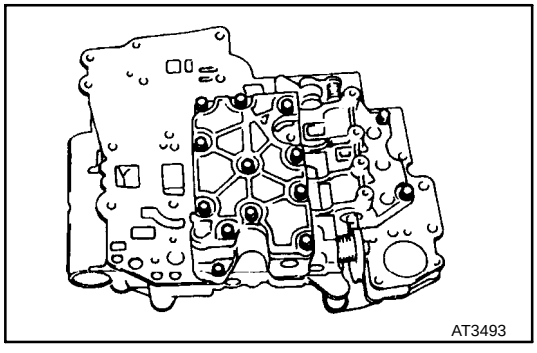
HINT: Each bolt length (mm, in.) is indicated in the illustration.



11. TIGHTEN BOLTS OF UPPER AND LOWER VALVE BODIES

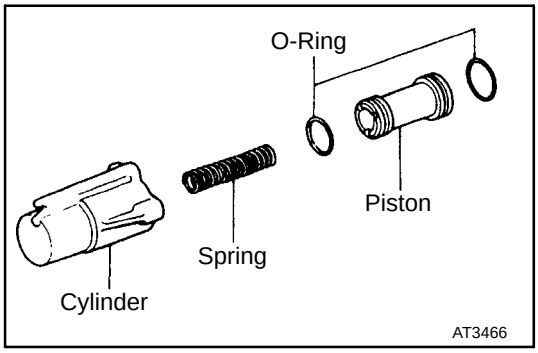
(a) Tighten the thirteen bolts in the lower valve body.

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



(b) Tighten the fourteen bolts in the upper valve body.

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

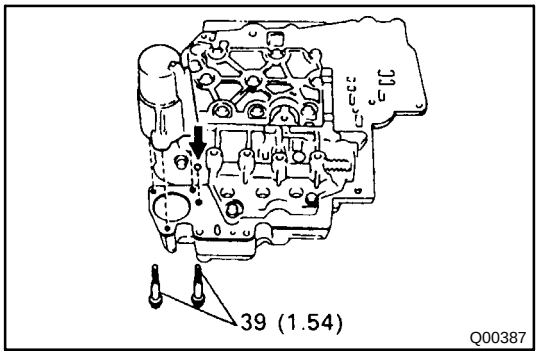


12. INSTALL B_0 ACCUMULATOR ASSEMBLY

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

(b) Install the spring and piston into the cylinder.

Free length mm (in.)	Coil outer diameter mm (in.)	Color
67.7 (2.665)	14.0 (0.551)	Pink



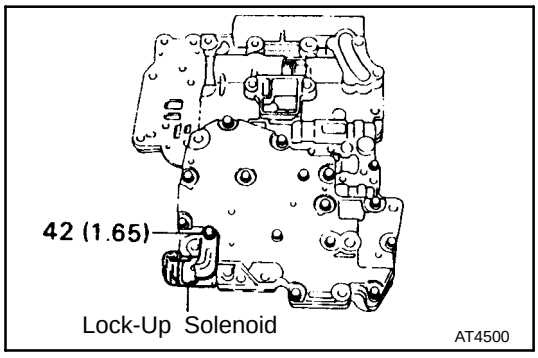
(c) Plate the check ball on No. 1 gasket.

(d) Install the B_0 accumulator assembly.

(e) Install the torque the two bolts.

HINT: Each bolt length (mm, in.) is indicated in the illustration.

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



13. INSTALL SOLENOIDS

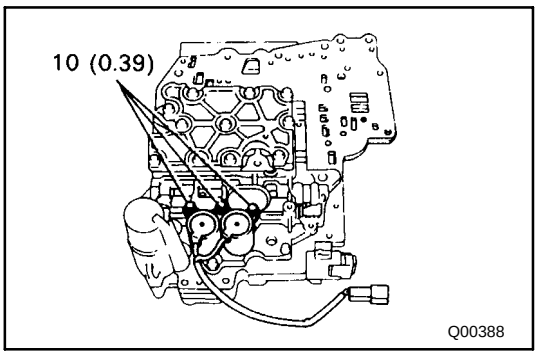
(a) Coat new O-rings with ATF and install them to the solenoids.

(b) Install the lock-up solenoid.

(c) Install and torque the bolt.

HINT: Bolt length (mm, in.) is indicated in the illustration.

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



(d) Install No. 1 and No. 2 solenoids.

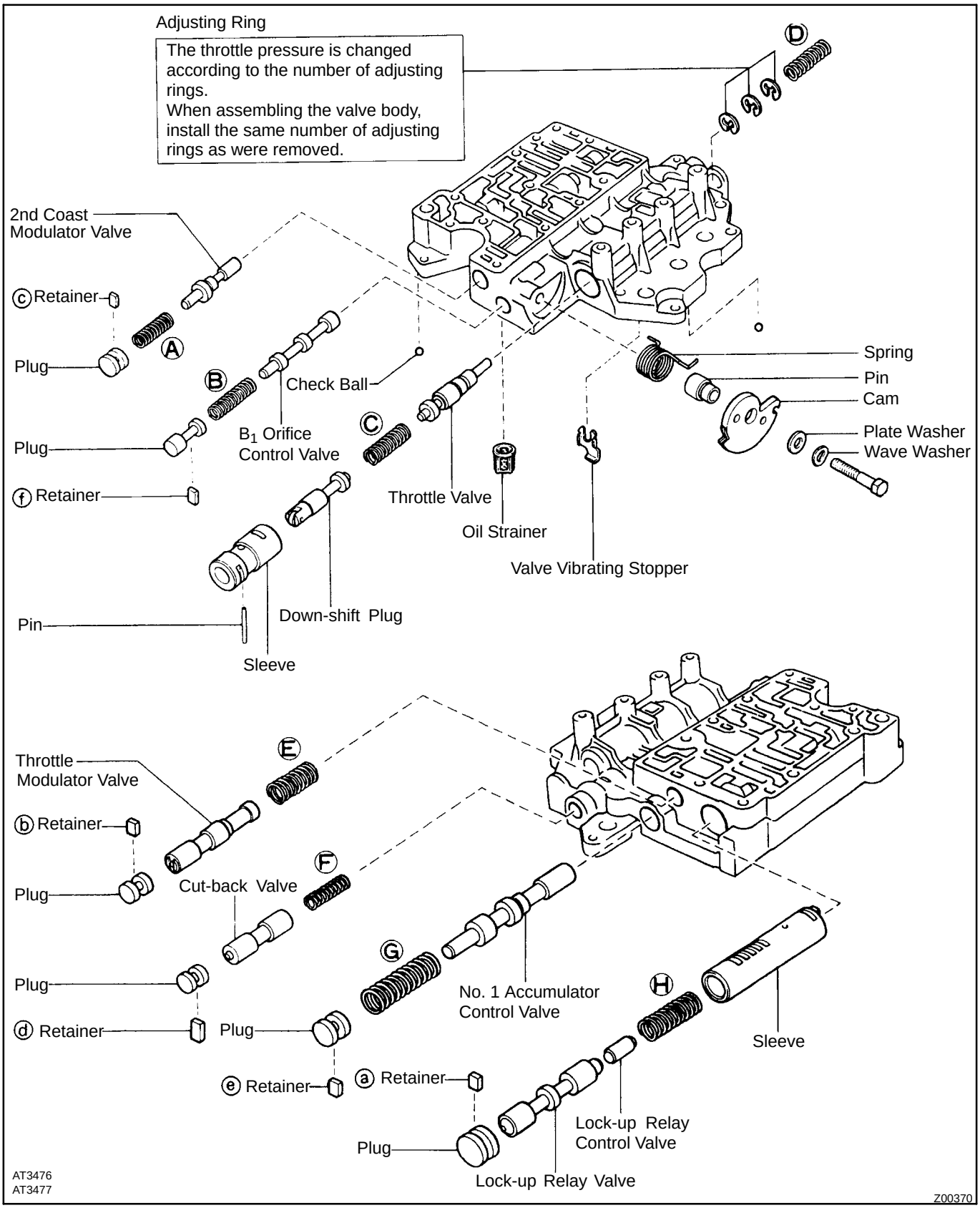
(e) Install and torque the three bolts.

HINT: Each bolt length (mm, in.) is indicated in the illustration.

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

UPPER VALVE BODY

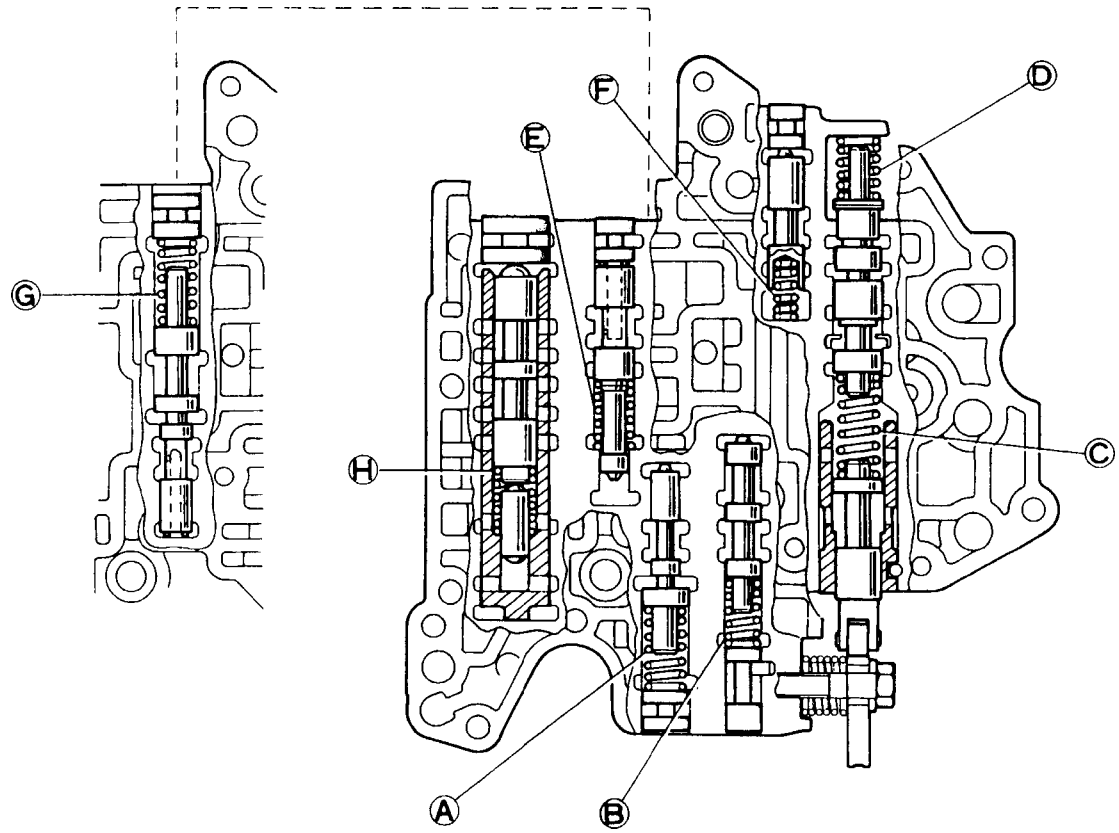
COMPONENTS



VALVE BODY SPRINGS SPECIFICATIONS

HINT: During reassembly please refer to the spring specifications above to help discriminate the different springs.

Sectional View

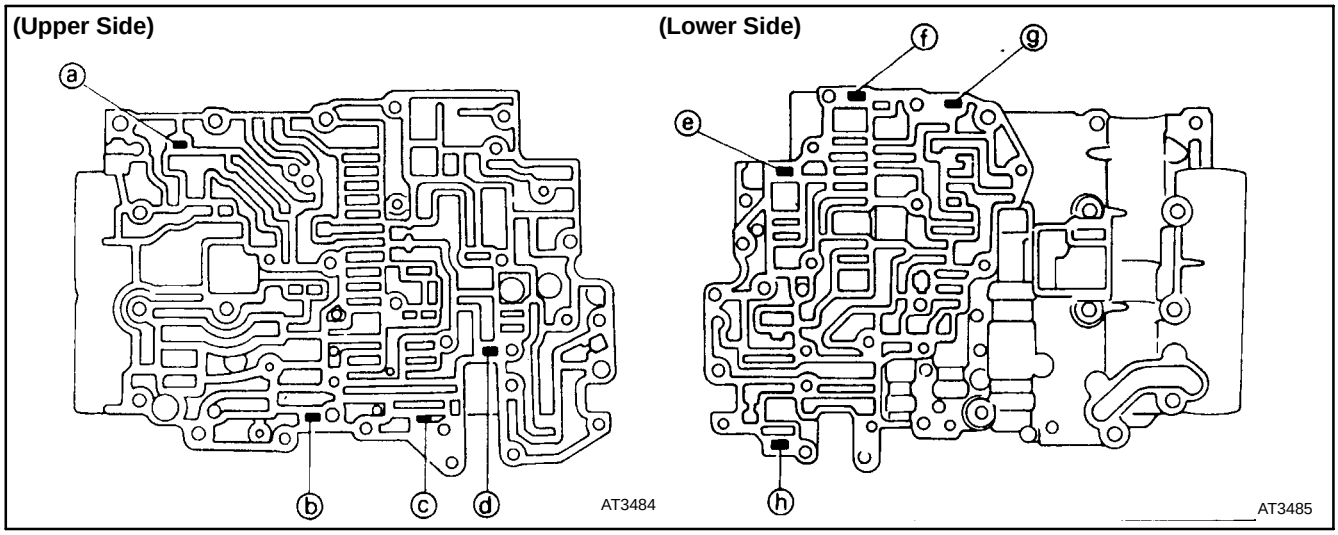


AT3603

Mark	Name (Color)	Free Length / Outer Diameter mm (in.)	Total No. of Coils
Ⓐ	Second Coast Modulator Valve (Brown)	27.5 (1.083) / 8.9 (0.350)	14.6
Ⓑ	B_1 Orifice Control Valve (White)	24.8 (0.976) / 8.0 (0.315)	12.0
Ⓒ	Down-Shift Plug (Yellow)	25.7 (1.012) / 6.7 (0.246)	9.65
Ⓓ	Throttle Valve (Purple)	30.7 (1.209) / 9.2 (0.362)	9.5
Ⓔ	Throttle Modulator Valve (Orange)	21.7 (0.854) / 9.5 (0.374)	9.5
Ⓕ	Cut-Back Valve (Red)	21.8 (0.858) / 6.0 (0.236)	13.5
Ⓖ	No. 1 Accumulator Control Valve (Yellow)	28.1 (1.106) / 10.6 (0.417)	13.0
Ⓗ	Lock-Up Relay Valve (Green)	26.6 (1.047) / 10.2 (0.402)	11.5

RETAINERS, PIN, STOPPER, CHECK BALL AND STRAINER LOCATION

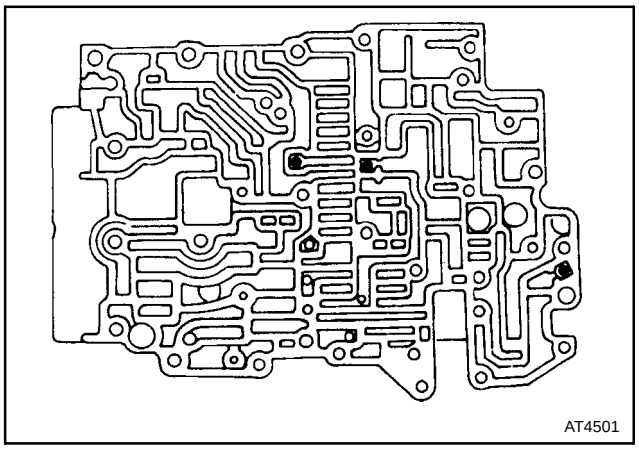
1. RETAINER



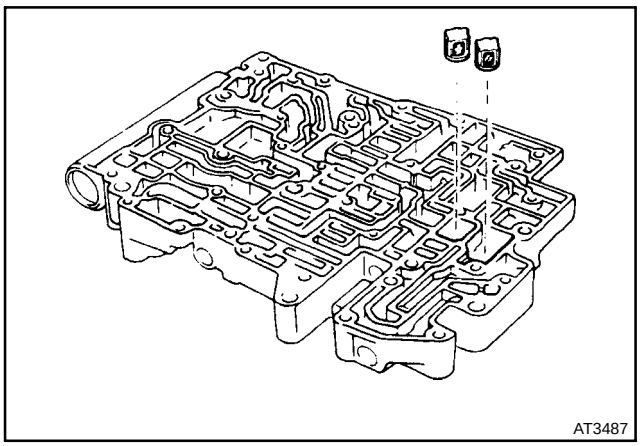
V02459

Mark	Name	Height / Width / Thickness mm (in.)
Ⓘ	Primary Regulator Valve	9.2 (0.362) / 5.0 (0.197) / 3.2 (0.126)
Ⓙ	Secondary Regulator Valve	15.0 (0.591) / 5.0 (0.197) / 3.2 (0.126)
Ⓚ	No. 2 Accumulator Control Valve	9.2 (0.362) / 5.0 (0.197) / 3.2 (0.126)
Ⓛ	Second Lock Valve	11.5 (0.453) / 5.0 (0.197) / 3.2 (0.126)
Ⓜ	Low Coast Modulator Valve	11.5 (0.453) / 5.0 (0.197) / 3.2 (0.126)
Ⓝ	1 - 2 Shift Valve	6.5 (0.256) / 5.0 (0.197) / 3.2 (0.126)
Ⓞ	2 - 3 Shift Valve	9.2 (0.362) / 5.0 (0.197) / 3.2 (0.126)
Ⓟ	3 - 4 Shift Valve	6.5 (0.256) / 5.0 (0.197) / 3.2 (0.126)

2. CHECK BALL



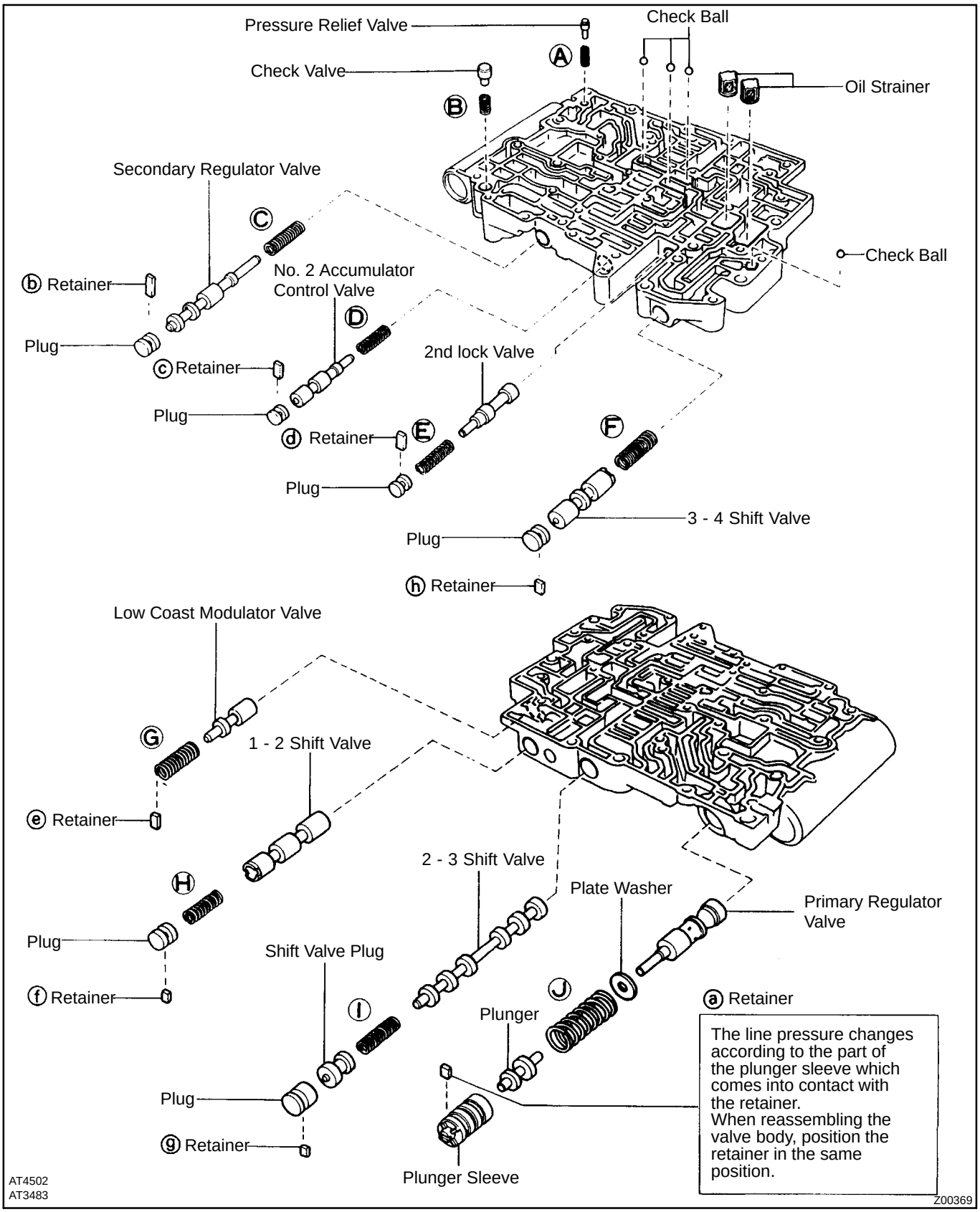
3. STRAINER



V02460

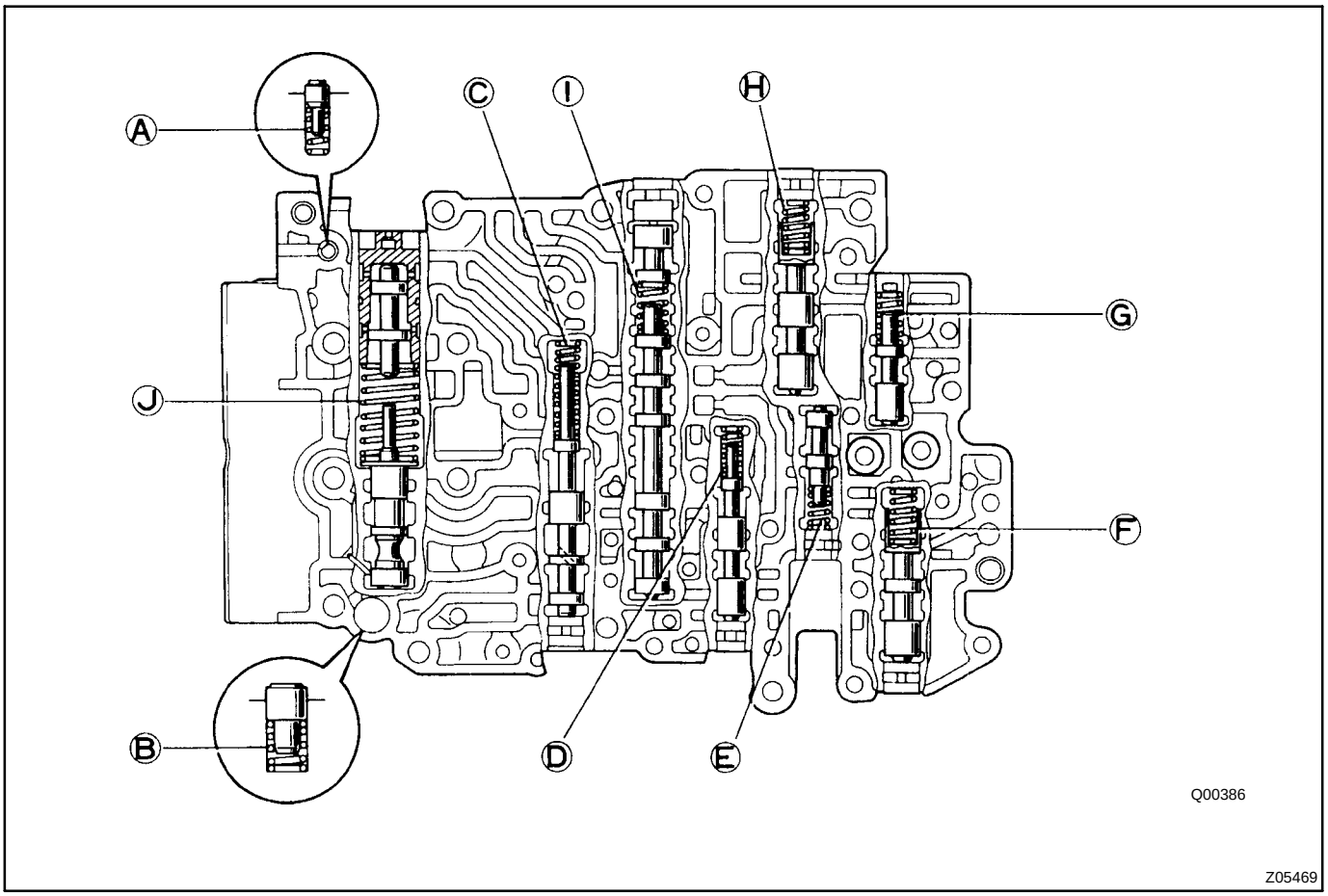
LOWER VALVE BODY

COMPONENTS



VALVE BODY SPRINGS SPECIFICATIONS

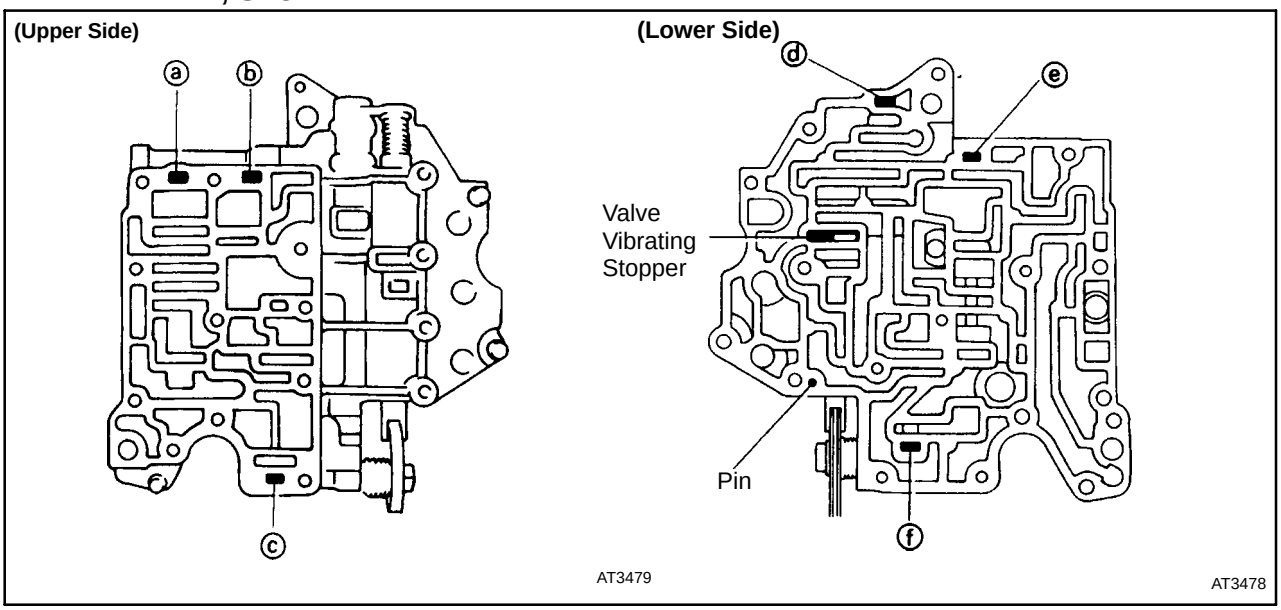
HINT: During reassembly please refer to the spring specifications above to help discriminate the different springs.



Mark	Name (Color)	Free Length / Outer Diameter mm (in.)	Total No. of Coils
Ⓐ	Pressure Relief Valve (None)	11.2 (0.441) / 6.4 (0.252)	7.5
Ⓑ	Check Valve (None)	19.9 (0.783) / 11.0 (0.433)	8.5
Ⓒ	Secondary Regulator Valve (Purple)	38.5 (1.516) / 8.4 (0.331)	17.0
Ⓓ	No. 2 Accumulator Control Valve (Gray)	23.0 (0.906) / 6.3 (0.248)	12.0
Ⓔ	Second Lock Valve (Orange)	20.7 (0.815) / 6.1 (0.240)	12.0
Ⓕ	3 - 4 Shift Valve (Light Green)	29.2 (1.150) / 8.9 (0.350)	12.0
Ⓖ	Low Coast Modulator Valve (Purple)	20.2 (0.975) / 7.9 (0.311)	11.9
Ⓗ	1 - 2 Shift Valve (None)	33.5 (1.319) / 8.9 (0.350)	12.0
Ⓘ	2 - 3 Shift Valve (None)	28.0 (1.102) / 9.4 (0.370)	10.3
Ⓙ	Primary Regulator Valve (None)	64.2 (2.528) / 18.6 (0.732)	12.5

RETAINERS, CHECK BALLS AND STRAINERS LOCATION

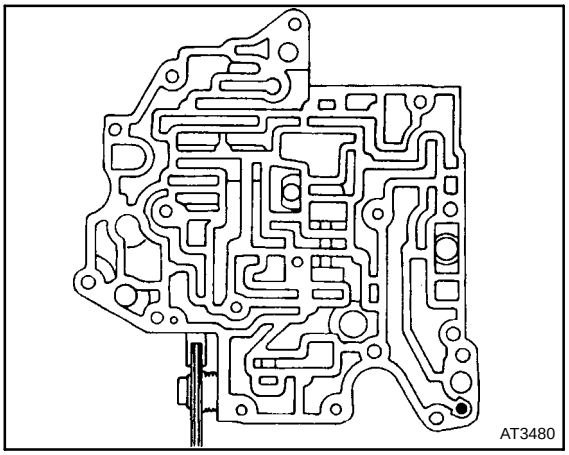
1. RETAINER, STOPPER AND PIN



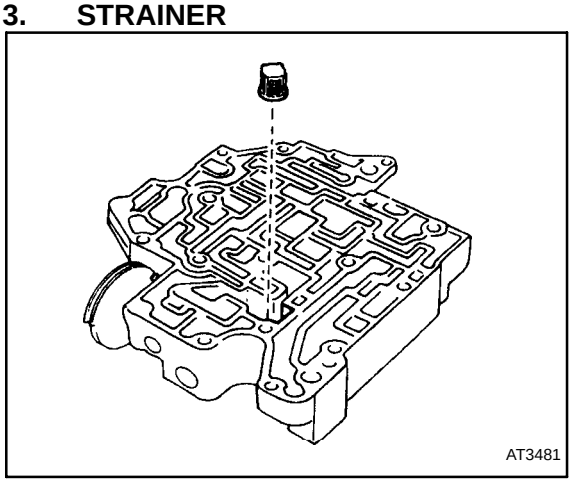
V02463

Mark	Name	Height / Width / Thickness mm (in.)
Ⓚ	Lock-Up Relay Valve	6.5 (0.256) / 5.0 (0.197) / 3.2 (0.126)
Ⓛ	Throttle Modulator Valve	6.5 (0.256) / 5.0 (0.197) / 3.2 (0.126)
Ⓜ	Second Coast Modulator Valve	6.5 (0.256) / 5.0 (0.197) / 3.2 (0.126)
Ⓝ	Cut-Back Valve	9.2 (0.362) / 5.0 (0.197) / 3.2 (0.126)
Ⓞ	No. 1 Accumulator Control Valve	6.5 (0.256) / 5.0 (0.197) / 3.2 (0.126)
Ⓟ	B_1 Orifice Control Valve	11.5 (0.453) / 5.0 (0.197) / 3.2 (0.126)

2. CHECK BALL



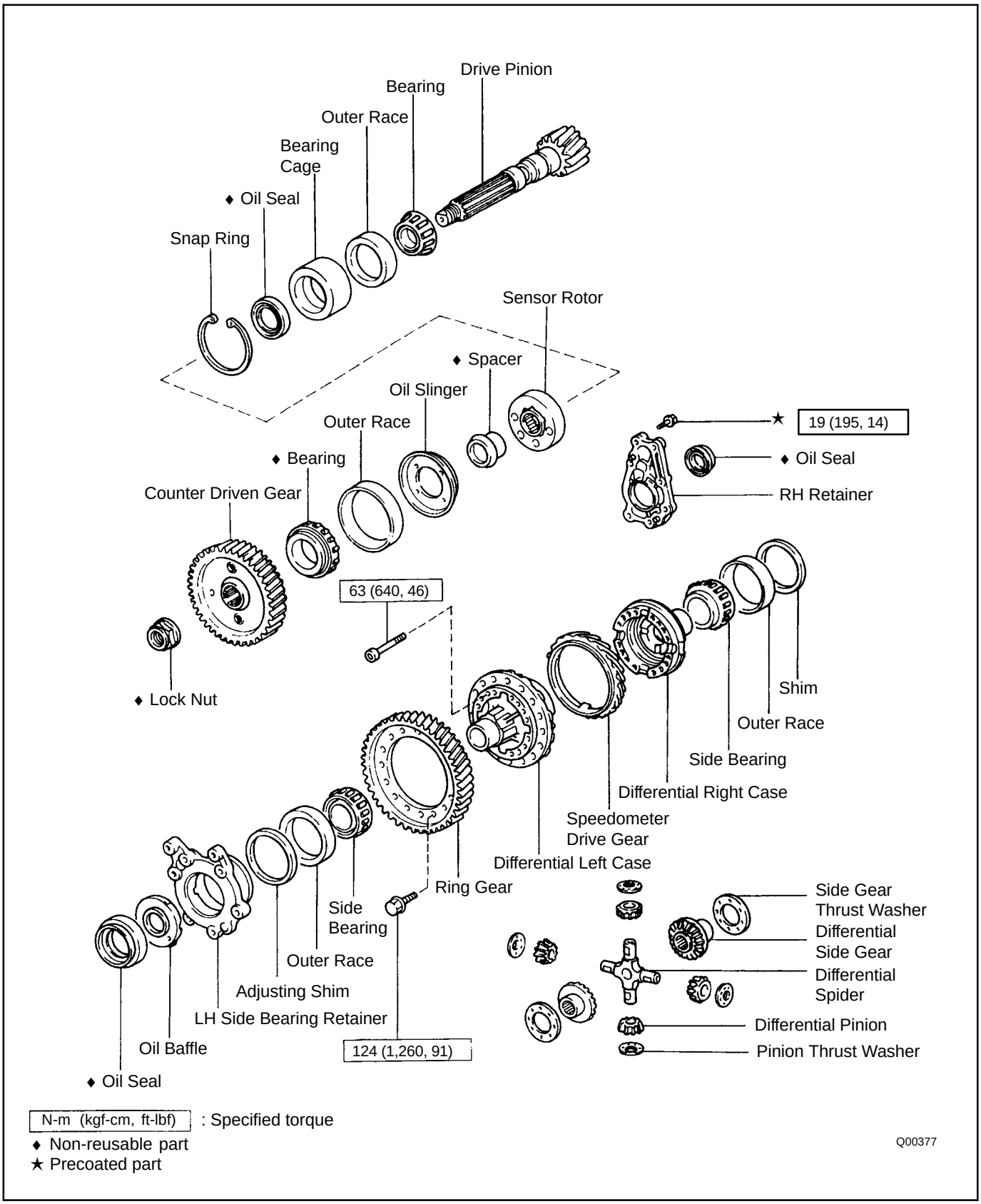
3. STRAINER



V02464

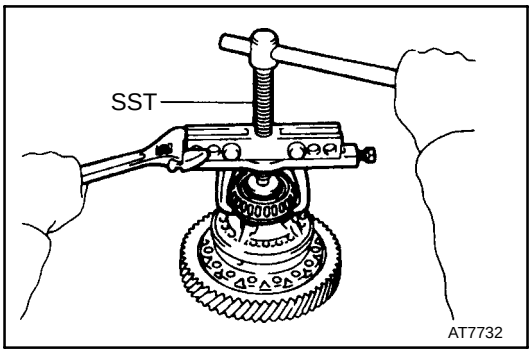
DIFFERENTIAL ASSEMBLY

COMPONENTS



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

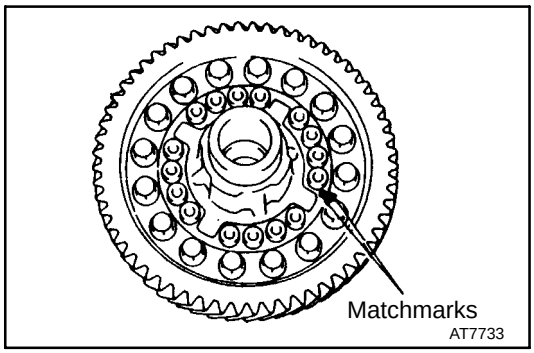
Q00377



DIFFERENTIAL CASE DISASSEMBLY

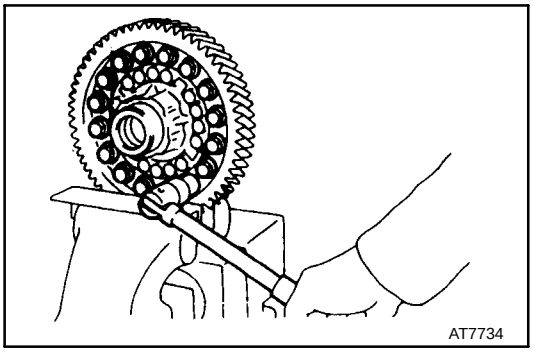
1. REMOVE SIDE BEARING

Using SST, remove the two side bearings.
SST 09550-20017

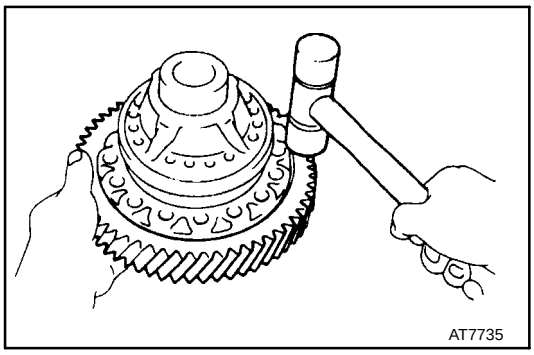


2. REMOVE RING GEAR

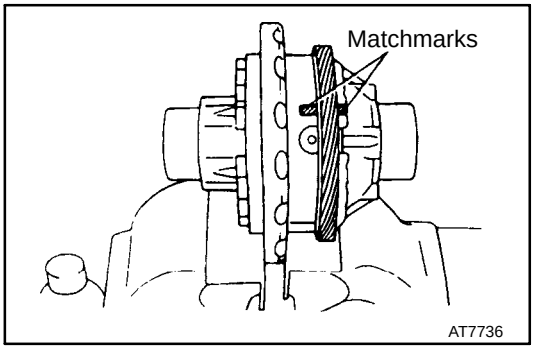
(a) Place the matchmarks on both the differential case and ring gear.



(b) Remove the sixteen bolts.

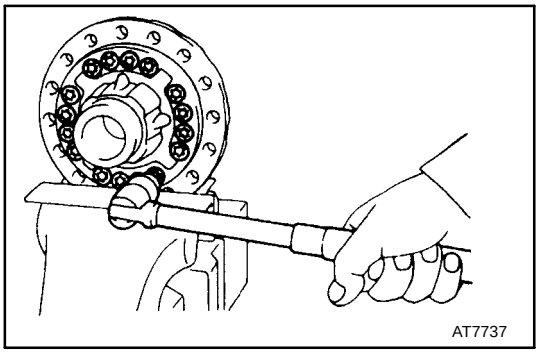


(e) Using a plastic hammer, tap out the ring gear.

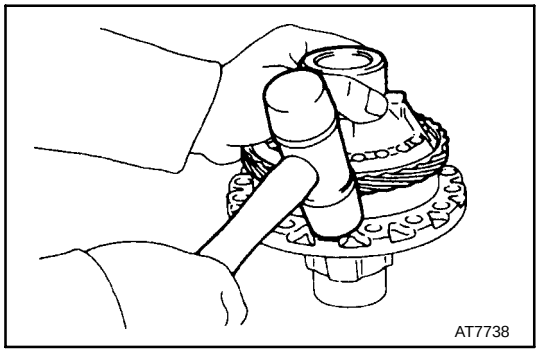


3. DISASSEMBLY OF DIFFERENTIAL CASE

(a) Place the matchmarks on the differential right and left case.

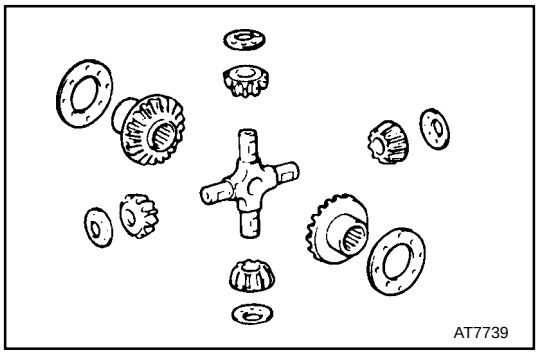


(b) Using a torx wrench, remove the sixteen torx screws.

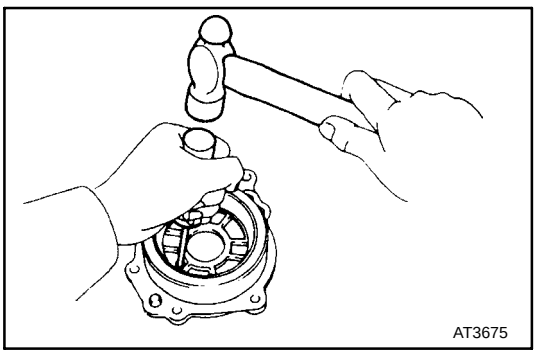


(c) Using a plastic hammer, tap out the differential left case.

(d) Remove the speedometer drive gear from the differential right case.



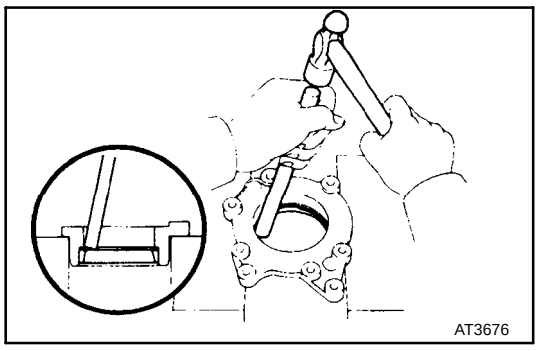
(e) Remove the two differential side gears, two side thrust washers, differential spider, four differential pinions and four pinion washers from the differential left case.



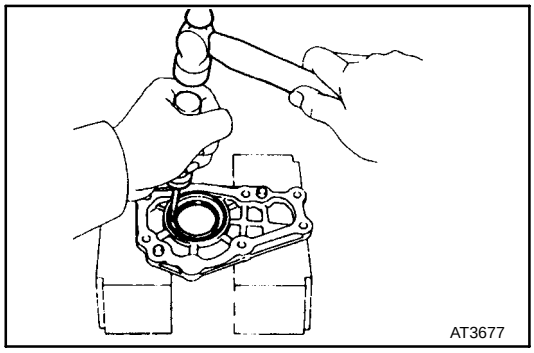
4. DISASSEMBLY LH BEARING RETAINER

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

(b) Remove the oil baffle from the LH bearing retainer.



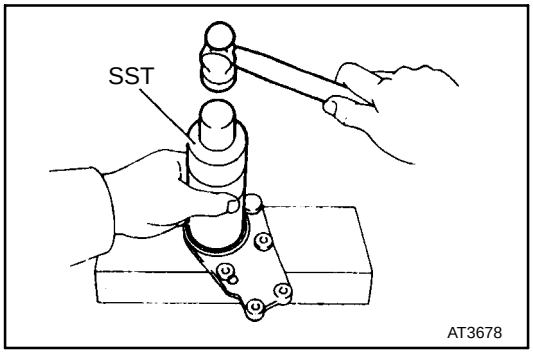
(c) Using a hammer and brass bar, drive out the outer race and adjusting shim from LH bearing retainer.



5. REMOVE RH OIL SEAL FROM RH RETAINER

Using a hammer and screwdriver, drive out the oil seal.

DIFFERENTIAL CASE ASSEMBLY

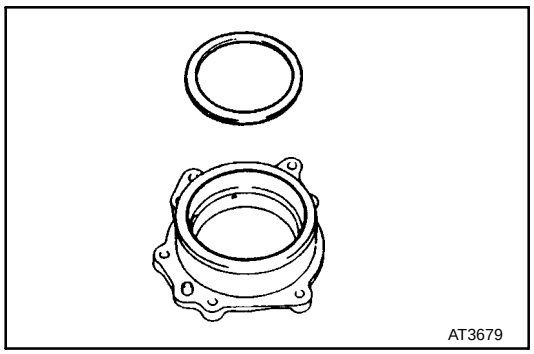


1. INSTALL RH OIL SEAL TO RH RETAINER

(a) Using SST, drive in a new oil seal until its surface is flush with the surface of RH retainer.

SST 09316-60010 (09316-00010)

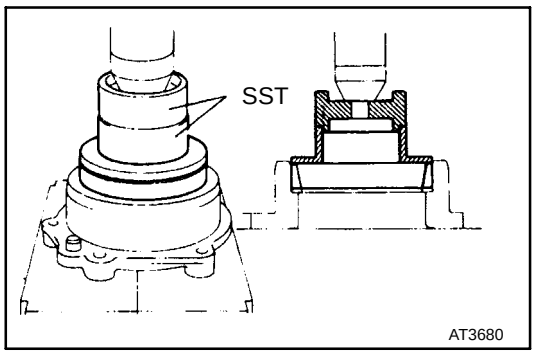
(b) Coat the oil seal lip with MP grease.



2. INSTALL ADJUSTING SHIM AND BEARING OUTER RACE TO LH BEARING RETAINER

(a) Place the adjusting shim into the LH bearing retainer.

HINT: Use either the shim which was removed or one 2.40 mm (0.0945 in.).

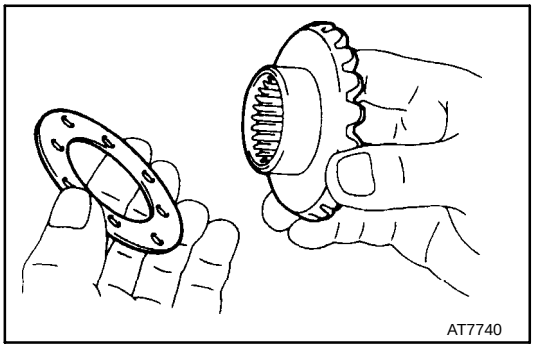


(b) Using SST, press the outer race into the LH retainer.

SST 09316-2001 1, 09350-32014 (09351-32150)

HINT: Install the oil baffle and oil seal after adjusting the differential side bearing preload.

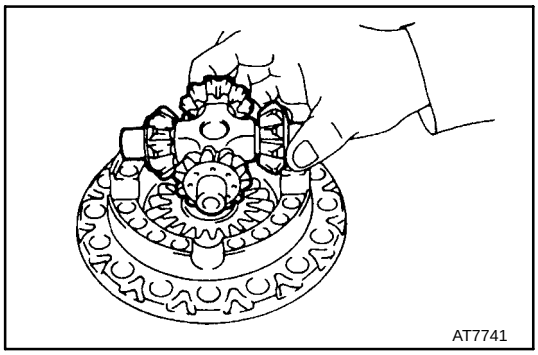
(See page AX-106)



3. ASSEMBLE DIFFERENTIAL CASE

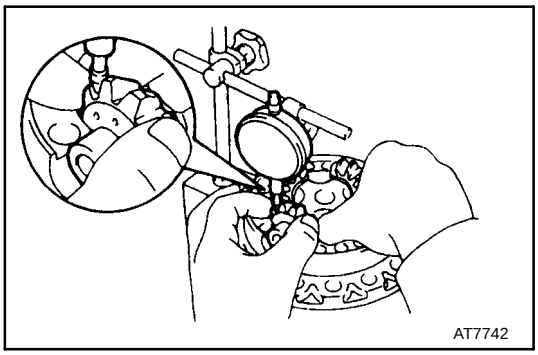
HINT: Coat all of the sliding and rotating surface with ATF before assembly.

(a) Install the thrust washer to the side gear.



(b) Install the four pinions and thrust washers to the spider.

(c) Install the side gear and spider with four pinions to the differential left case.



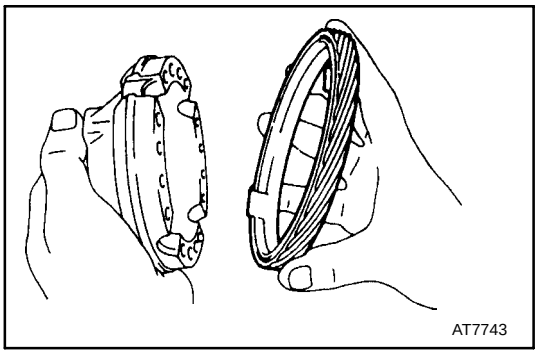
(d) Using a dial indicator, measure the backlash of one pinion gear while holding the side gear.

Standard backlash:
0.05 - 0.20 mm (0.0020 - 0.0079 in.)

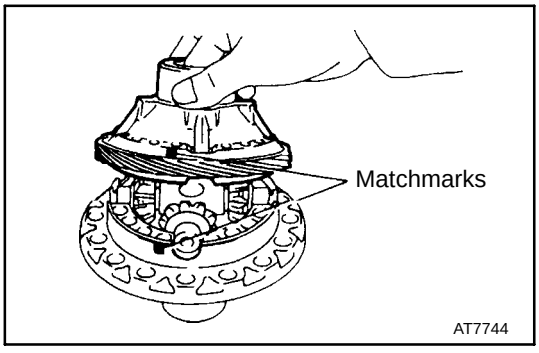
(e) Install the side gear and spider with four pinions to the right side of the differential case. And check the pinion gear backlash.

(f) Referring to the table below, select the side gear thrust washer which will ensure that the backlash is within specification. Try to select a washer of the same size.

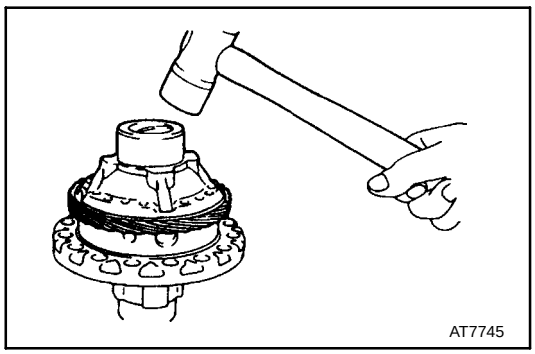
Thickness mm (in.)	Thickness mm (in.)
0.80 (0.0315)	1.20 (0.0472)
0.90 (0.0354)	1.30 (0.0512)
1.00 (0.0394)	1.40 (0.0551)
1.10 (0.0433)	



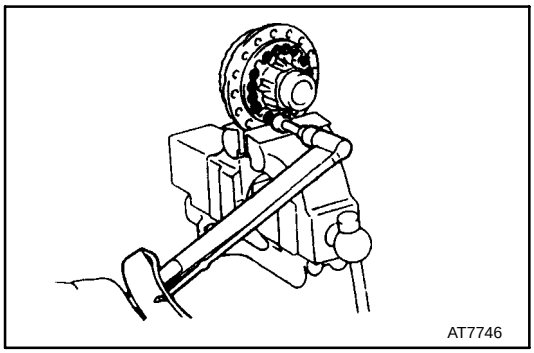
(g) Install the speedometer drive gear.



(h) Align the matchmarks on the differential cases.

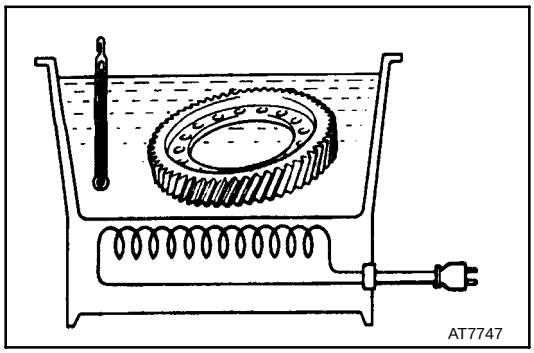


(l) Using a plastic hammer, carefully tap the differential right case.



(j) Using a torx wrench, install and torque the sixteen torx screws.

Torque: 63 N-m (640 kgf-cm, 46 ft-lbf)



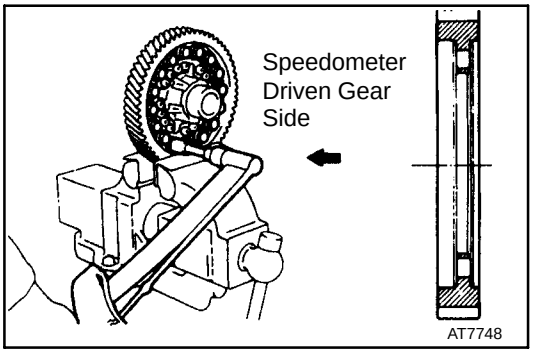
4. INSTALL RING GEAR

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

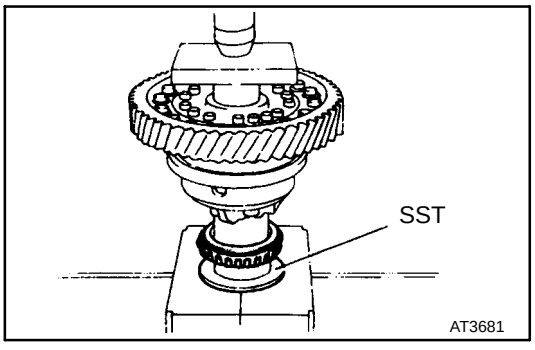


(d) Quickly install the ring gear on the differential case. Install the sixteen bolts.

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

(e) Tighten the set bolts uniformly and a little at a time. Torque the bolts.

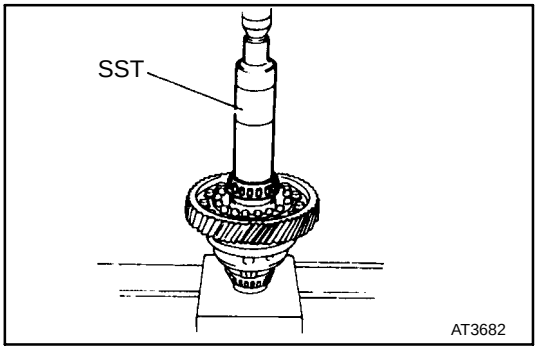
Torque: 124 N-m (1,260 kgf-cm, 91 ft-lbf)



5. INSTALL SIDE BEARINGS

(a) Using SST and a press, install the RH side bearing to the differential case.

SST 09361-2001 1



(b) Using SST and a press, install the LH side bearing.
SST 09316-60010 (09316-00010)

COMPONENT PARTS INSTALLATION

Disassembly, inspection and assembly of each component group have been indicated in the preceding chapter. Before assembly, make sure, again, that all component groups are assembled correctly.
If something wrong is found in a certain component group during assembly, inspect and repair this group immediately.
Recommended ATF:
DEXRON® II

GENERAL INSTALLATION NOTES:

(a) The automatic transaxle is composed of highly precision-finished parts, necessitating careful inspection before assembly because even a small nick could cause fluid leakage or affect performance.

(b) Before assembling new clutch discs, soak them in automatic transaxle fluid for at least fifteen minutes.

(c) Apply automatic transaxle fluid on the, sliding or rotating surfaces of parts before assembly.

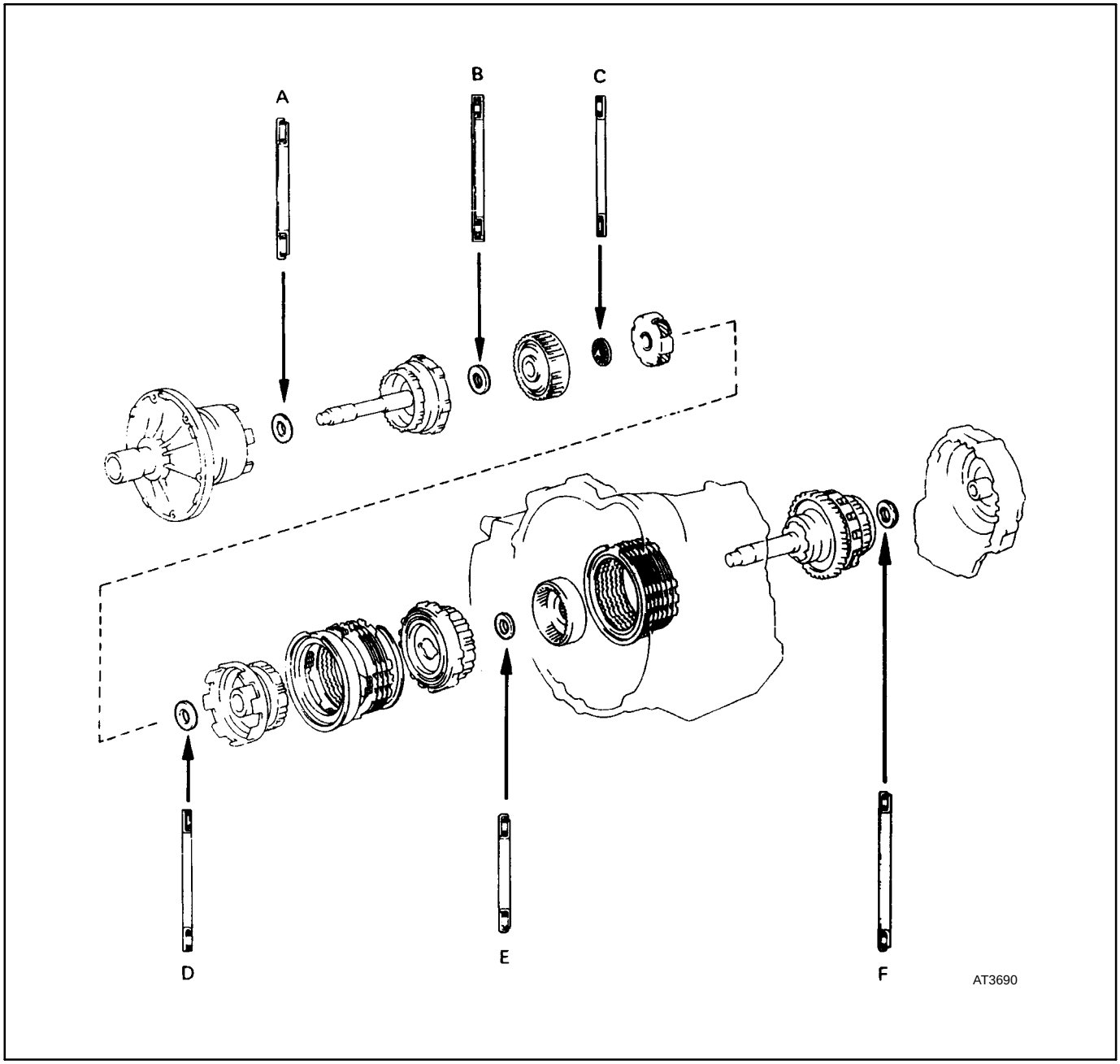
(d) Use petroleum jelly to keep small parts in their places.

(e) Do not use adhesive cements on gaskets and similar parts.

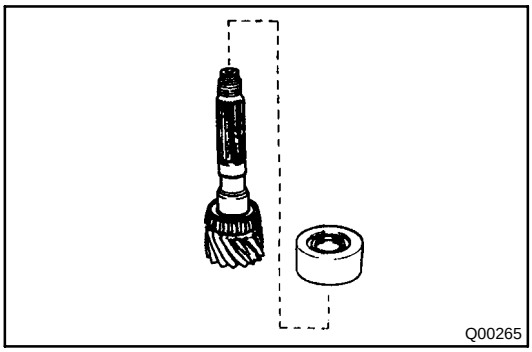
(f) When assembling the transaxle, be sure to use new gaskets and O-rings.

(g) Dry all parts with compressed air - never use shop rags.

(h) Be sure to install the thrust bearings and races in the correct direction and position.



Mark	Thrust Bearing Outside Diameter mm (in.)	Thrust Bearing Inside Diameter mm (in.)
A	See page AX-118	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)

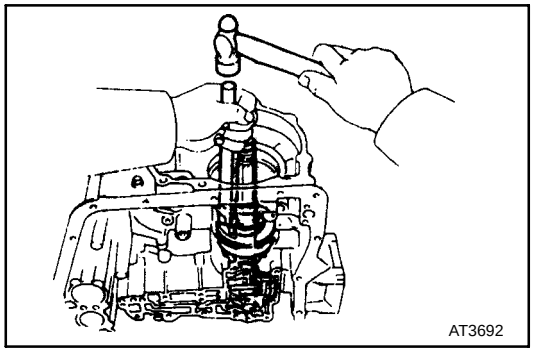


DIFFERENTIAL AND DRIVE PINION INSTALLATION

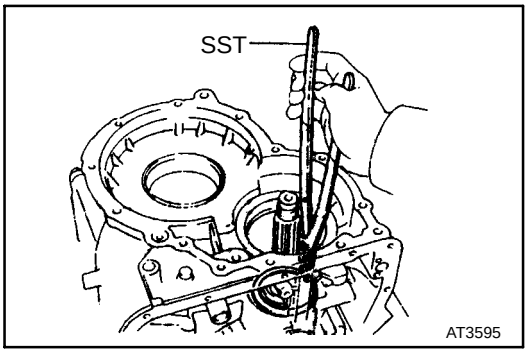
1. INSTALL DRIVE PINION INTO TRANSAXLE CASE

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

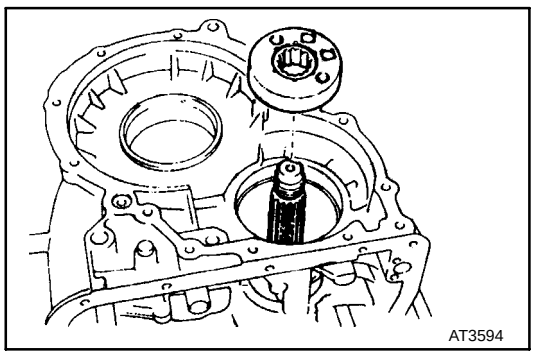
NOTICE: Be careful not to damage the oil seals with the pinion shaft.



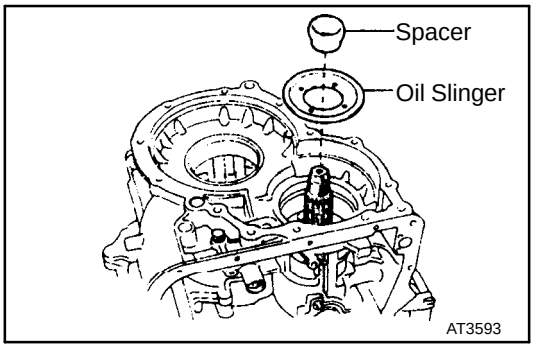
(b) Using a hammer and brass bar, slightly tap the bearing cage into the transaxle case until the snap ring groove in the bore can be seen.



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

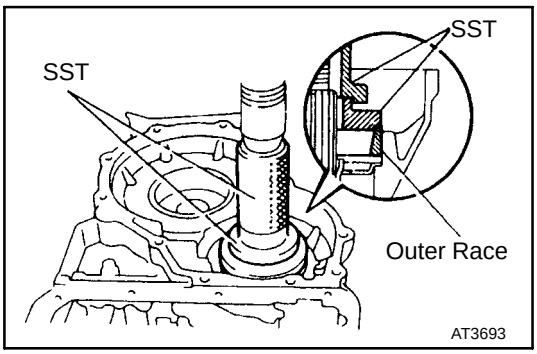


2. PLACE SENSOR ROTOR ONTO DRIVE PINION SHAFT



3. PLACE OIL SLINGER AND NEW SPACER

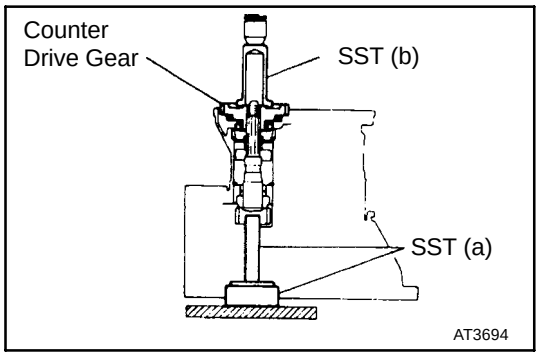
HINT: Install the spacer with the small end downward.



4. INSTALL OUTER RACE TO TRANSAXLE CASE

Using SST, press in the outer race.

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



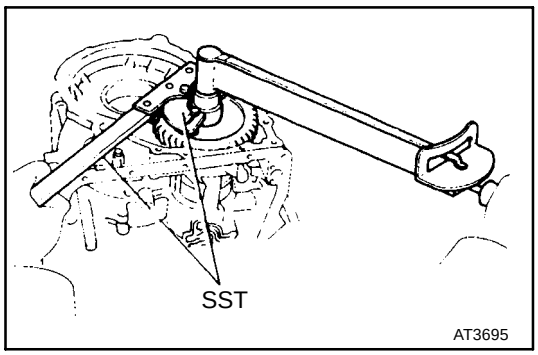
5. INSTALL COUNTER DRIVE GEAR

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

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

(a) Using SST, press in the counter driven gear until slightly thickness between the counter driven gear bearing and outer race.

SST 09350-32014 (09351-32140)



6. INSTALL NEW LOCK NUT AND ADJUST DRIVE PINION PRELOAD

(a) Install the new lock nut.

(b) Using SST to hold the gear, tighten the nut.

Torque: 206 N-m (2,100 kgf-cm, 152 ft-lbf)

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

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

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

Drive pinion preload (at starting):

New bearing

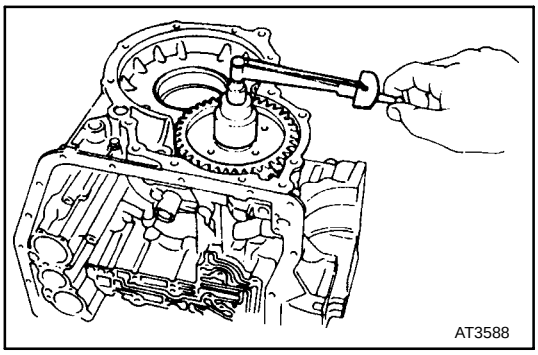
1.0 - 1.6 N-m (10 - 16 kgf-cm, 8.7 - 13.9 in.-lbf)

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.

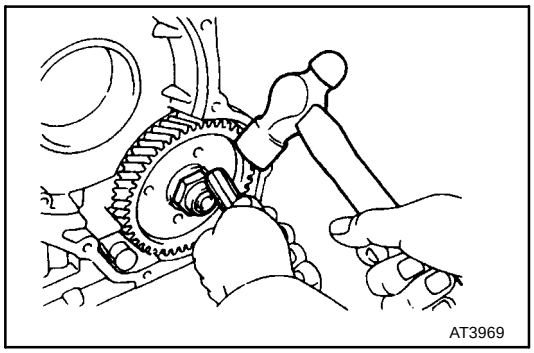
If the preload is less then specified, retighten the nut 13 N-m (130 kgf-cm, 9 ft-lbf) at a time until the specified preload is reached.



If the maximum torque is exceeded while retightening the nut, replace the bearing spacer and repeat the preload procedure.

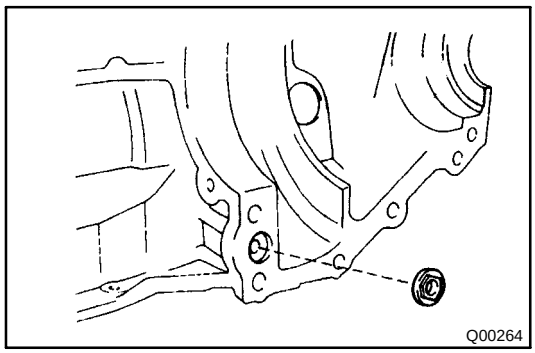
Do not back off the nut to reduce the preload.

Maximum torque: 353 N-m (3,600 kgf-cm, 260 ft-lbf)

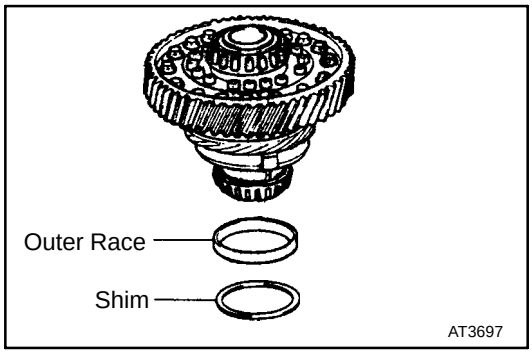


(e) If the preload is adjusted within specification, make a note of it.

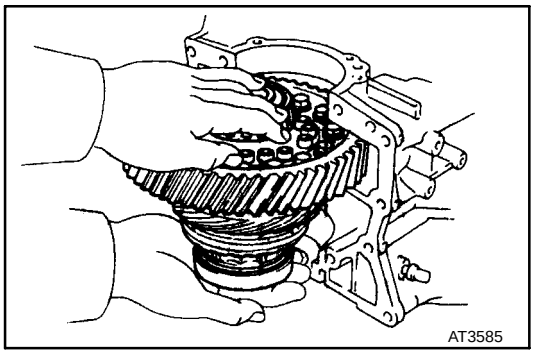
(f) Stroke the lock nut.



7. INSTALL APPLY GASKET

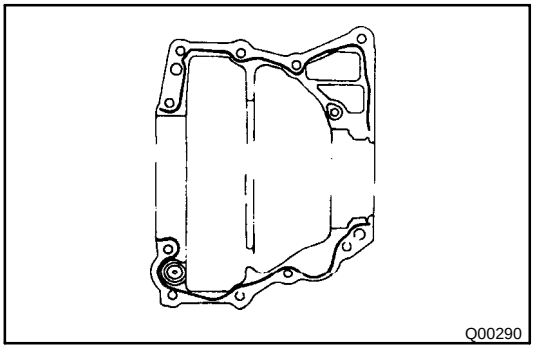


8. PLACE OUTER RACE AND SHIM ONTO RH SIDE BEARING



8. PLACE DIFFERENTIAL CASE INTO TRANAXLE CASE

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



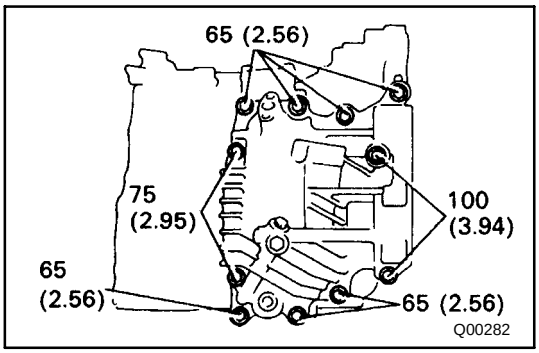
10. INSTALL CARRIER COVER

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

(b) Apply seal packing to the carrier cover, as shown.

Seal packing:
Part No. 08826 - 00090, THREE BOND 1281 or equivalent

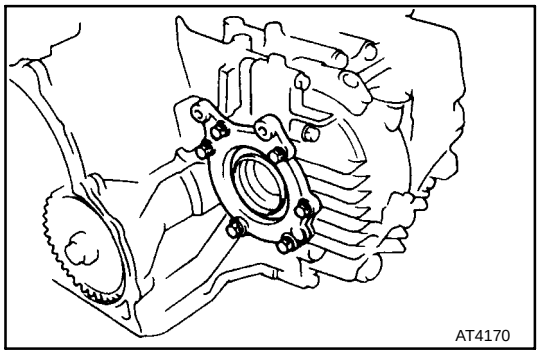
HINT: Install the carrier cover within ten minutes after applying seal packing.



(c) Install and torque the eleven bolts.

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

HINT: Each bolt length (mm, in.) is indicated in the illustration.



11. ADJUST SIDE BEARING PRELOAD

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

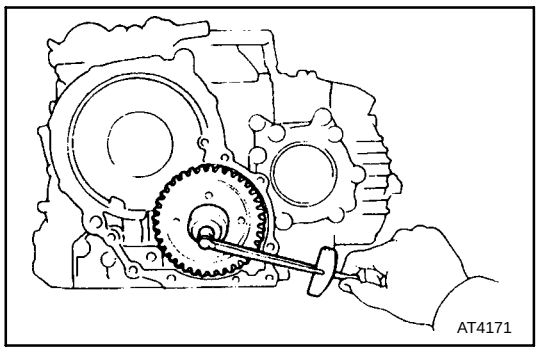
HINT: Do not apply seal packing yet.

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

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

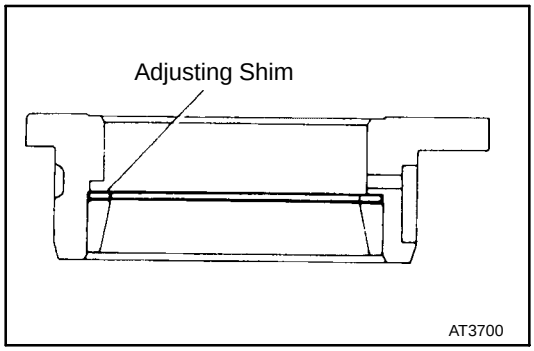
(c) Snap down the bearings by turning the differential case several times.

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



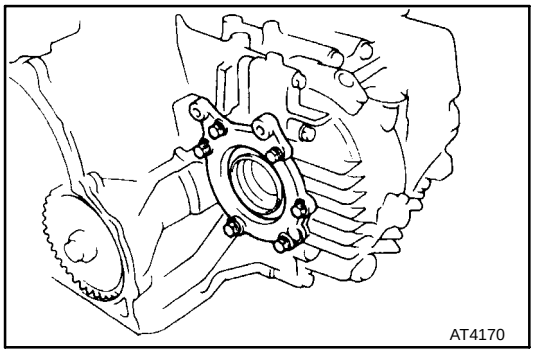
Total preload (at starting):
Add drive pinion preload
New bearing
0.2 - 0.4 N-m (2.5 - 5.1 kgf-cm, 2.2 - 3.6 in.-lbf)
Reused bearing
0.1 - 0.2 N-m (1.3 - 2.0 kgf-cm, 1.1 - 1.7 in.-lbf)

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



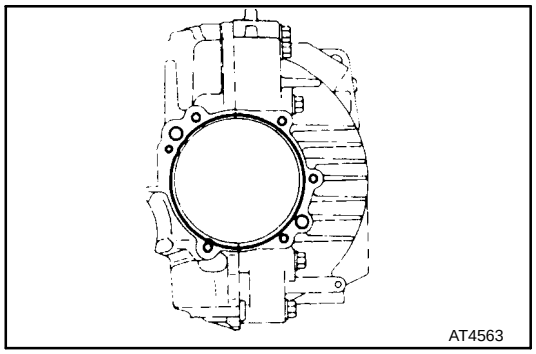
Adjusting shim thickness:

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 (0.0886)	E	2.70 (0.1063)
6	2.30 (0.0906)	F	2.75 (0.1083)
7	2.35 (0.0925)	G	2.80 (0.1102)
8	2.40 (0.0945)	H	2.85 (0.1122)



12. INSTALL LH BEARING RETAINER

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



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

(c) Apply the seal packing to the transaxle case and carrier cover, as shown.

Seal packing:
Part No. 08826 - 00090, THREE BOND 1281 or equivalent

HINT: Install the LH bearing retainer with ten minutes after applying seal packing.

(d) Install the LH bearing retainer.

(e) Coat the threads of bolts with sealer.

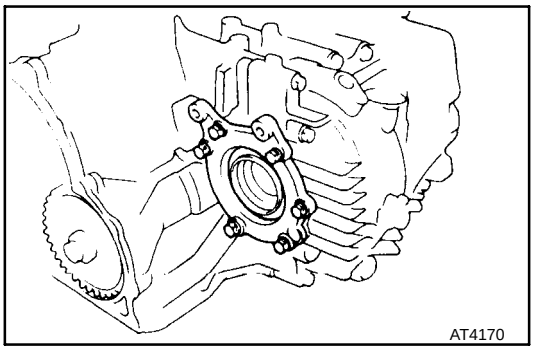
Sealer:
Part No. 08833 - 00070, THREE BOND 1324 or equivalent

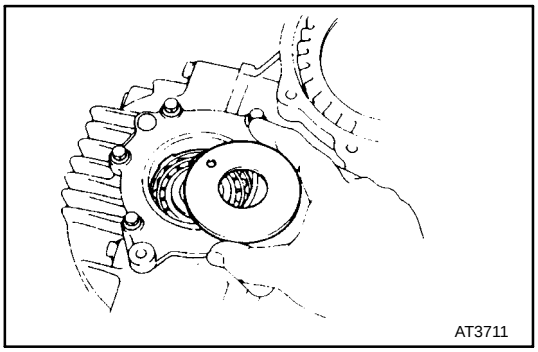
(f) Tighten the bolts.

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

(g) Snap down the bearings.

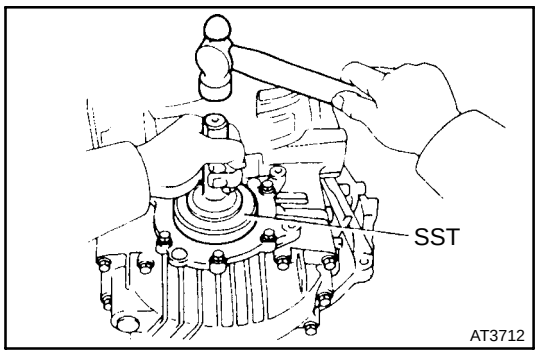
(h) Recheck the differential total preload.





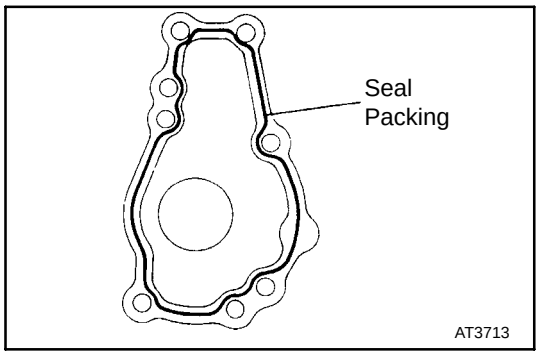
13. INSTALL NEW OIL SEAL

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



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

SST 09223-15010



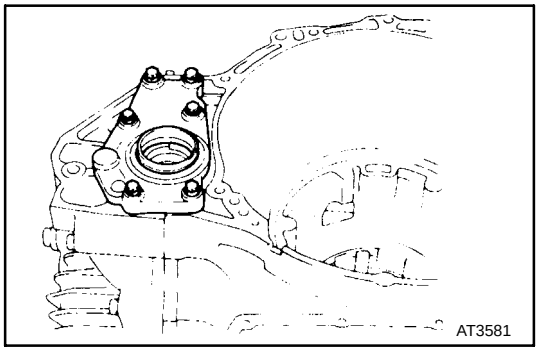
14. INSTALL RH RETAINER

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

(b) Apply the seal packing to the RH retainer, as shown.

Seal packing:
Part No. 08826 - 00090, THREE BOND 1281 or equivalent

HINT: Install the RH retainer within ten minutes after applying seal packing.

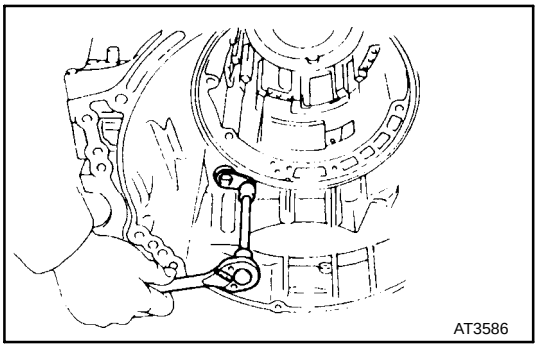


(c) Coat the threads of bolts with sealer.

Sealer:
Part No. 08833 - 00070, THREE BOND 1324 or equivalent

(d) Tighten the bolts.

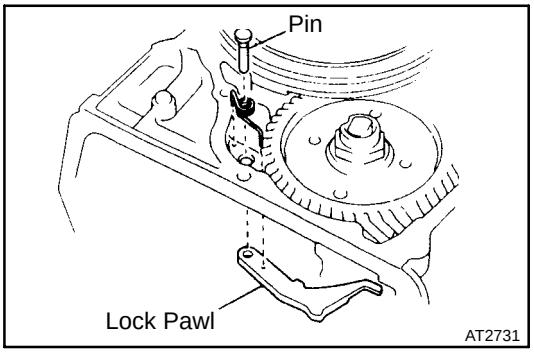
Torque: 19 N-m (195 kgf-cm, 14 ft-lbf)



15. INSTALL DRIVE PINION CAP

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

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

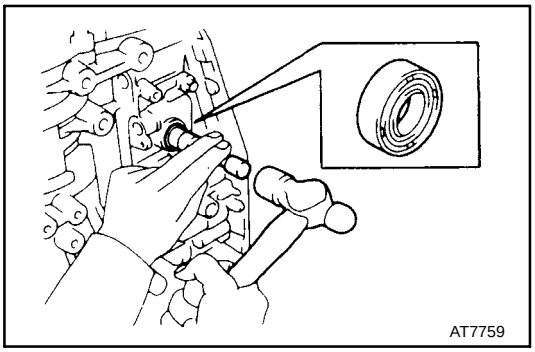


4-SPEED GEAR UNIT INSTALLATION

1. INSTALL PARKING LOCK PAWL

(a) Place the parking lock pawl onto the case. Hook the spring ends to the case and pawl.

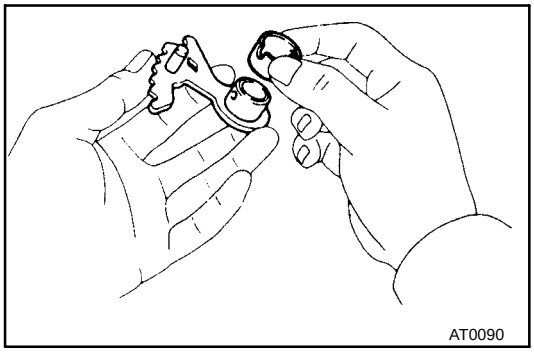
(b) Instal the pin into the hole of the case through the spring and pawl.



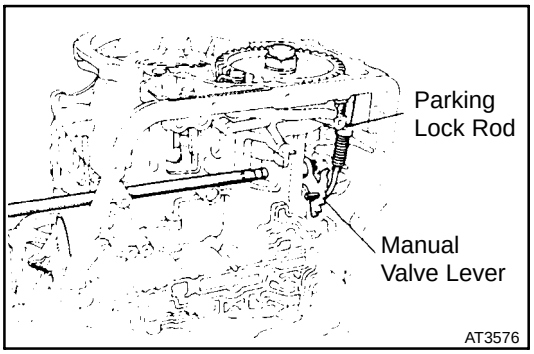
2. INSTALL MANUAL VALVE SHAFT

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

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

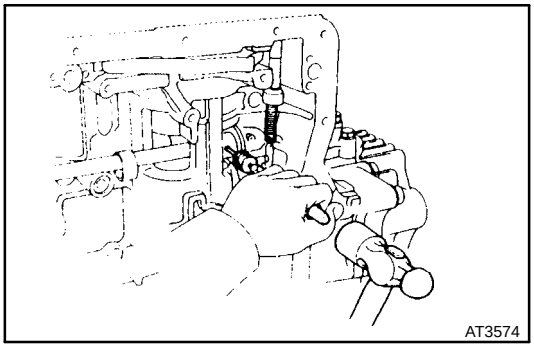


(c) Assembly a new collar to the manual valve lever.

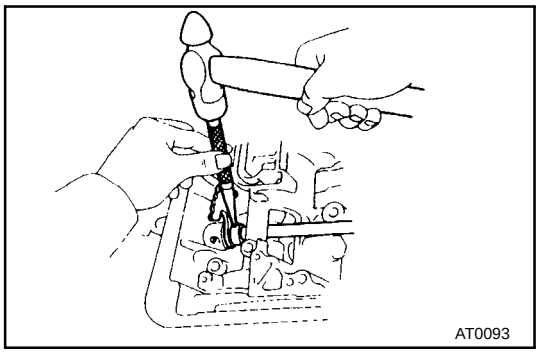


(d) Install the manual valve shaft to the transmission case through the manual lever.

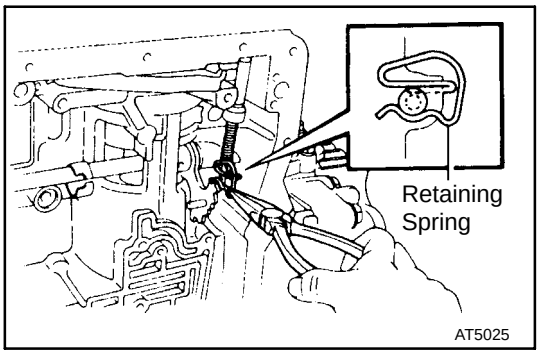
(e) Install the parking lock rod.



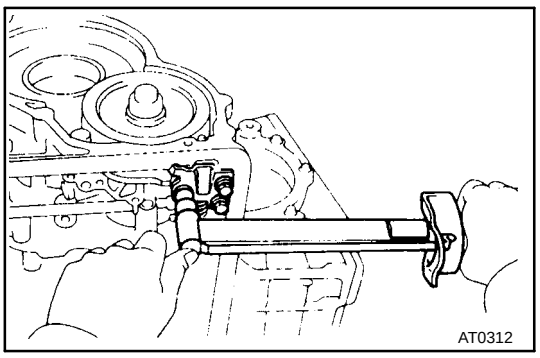
(f) Using a pin punch, drive in the roll pin until its surface is flush with the manual valve lever surface.



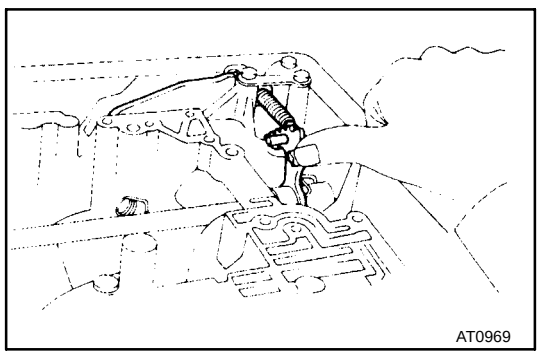
(g) Match the collar hole to the lever calking hollow and calk the collar to the lever.



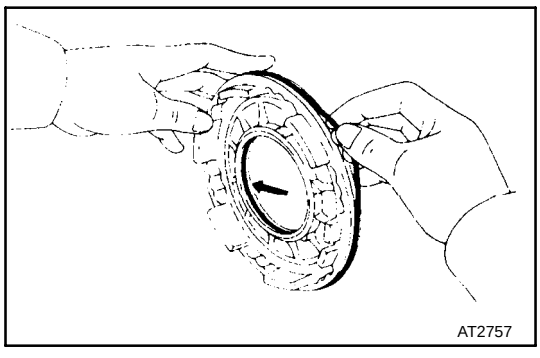
(h) Install the retaining spring.



3. INSTALL PARKING LOCK PAWL BRACKET
Torque: 7.4 N-m (75 kgf-cm, 65 in.-lbf)



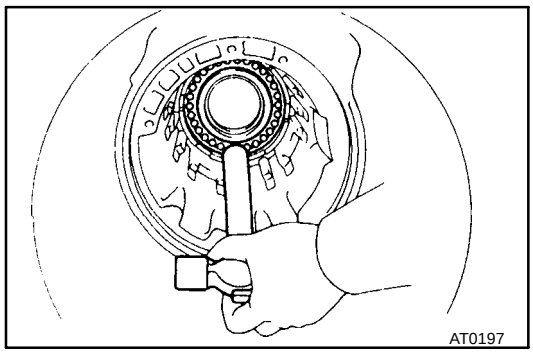
4. CHECK OPERATION OF PARKING LOCK PAWL
Make sure the counter driven gear is locked when the manual valve lever is in the P position.



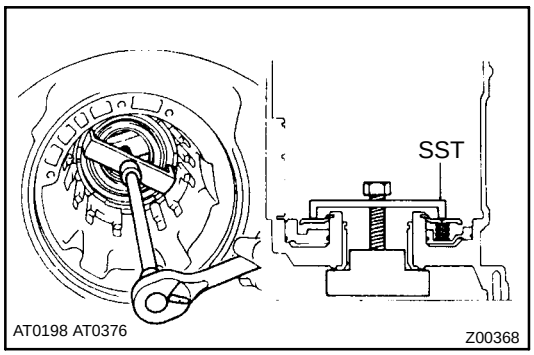
5. INSTALL FIRST AND REVERSE BRAKE PISTON TO TRANSMISSION CASE

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

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



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

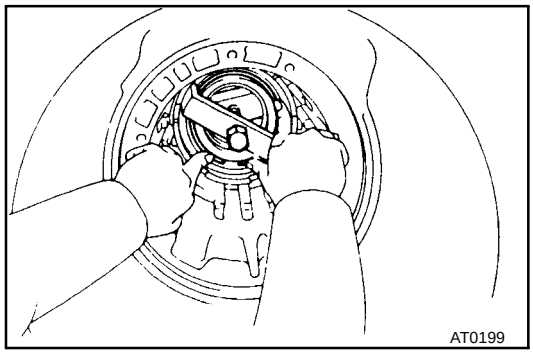


6. INSTALL PISTON RETURN SPRING

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

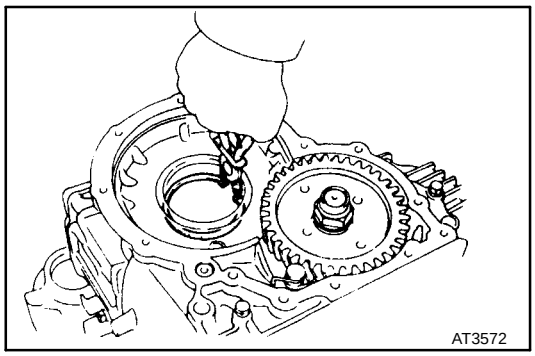
(b) Place SST, and compress the return spring evenly by tightening the bolt gradually.

SST 09350-32014 (09351-32040)

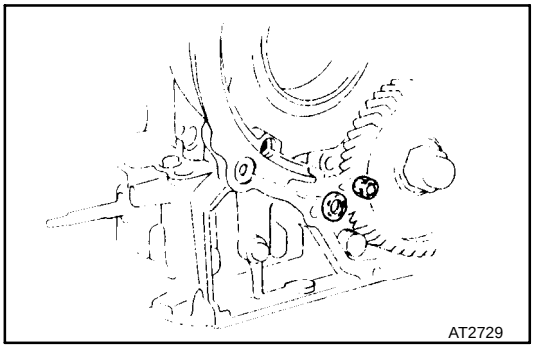


(c) Install snap ring. Visually check to make sure it is fully seated and centered by the three lugs on the spring retainer.
Be sure the end gap of snap ring is not aligned with the spring retainer claw.

(d) Remove the SST.

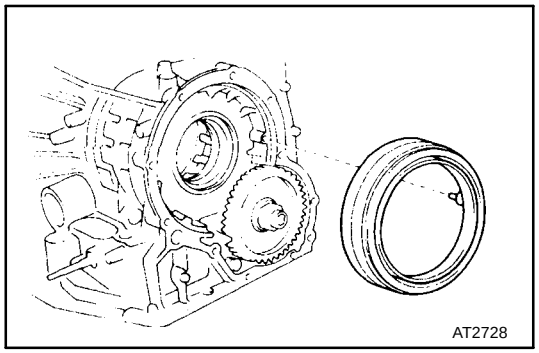


7. INSTALL SNAP RING TO TRANSAXLE CASE



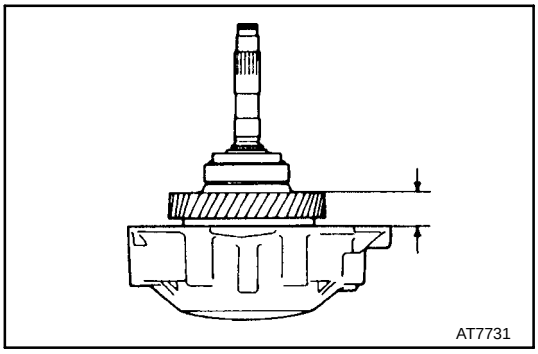
8. INSTALL OVERDRIVE UNIT

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

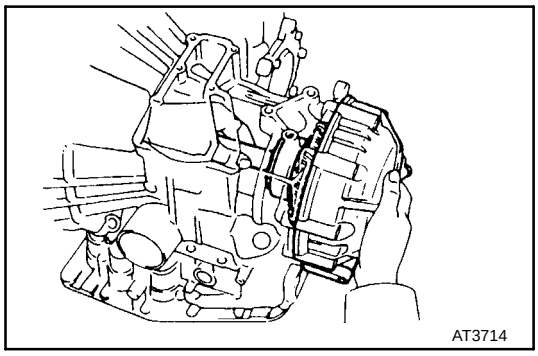


(b) Install the overdrive brake drum to the case.

(c) Install the new case gasket to the case.

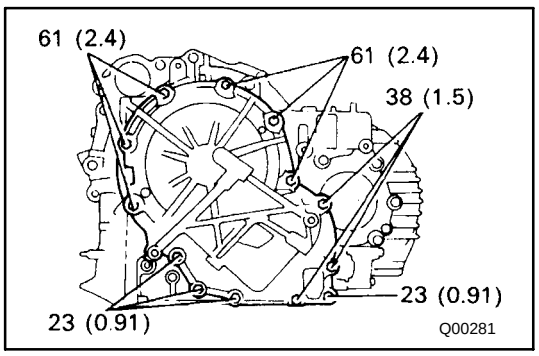


(d) Make sure that the length from the top surface of the case to the counter driven gear surface should be about 24 mm (0.94 in.).



(e) Place the new gasket onto the transaxle case.

(f) Install the overdrive assembly with overdrive case to the transaxle case.



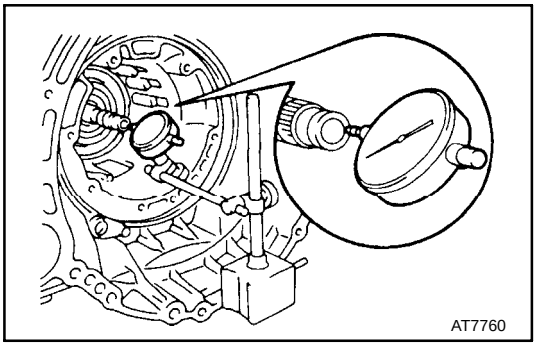
(g) Coat the threads of 23 mm (0.91 in.) bolts with sealer.

Sealer:

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

(h) Install and tighten the thirteen bolts.

HINT: Each bolt length (mm, in.) is indicated in the illustration.



9. CHECK INTERMEDIATE SHAFT END PLAY

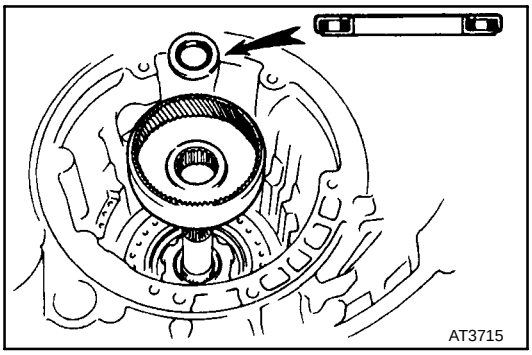
(a) Make sure that the intermediate shaft as thrust play in axial direction.

Thrust play:

0.47 - 1.50 mm (0.0185 - 0.0591 in.)

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

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

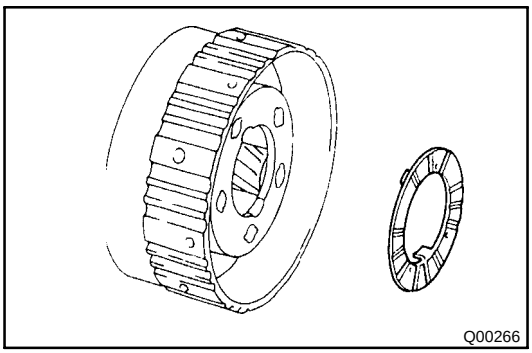


10. INSTALL REAR PLANETARY GEAR

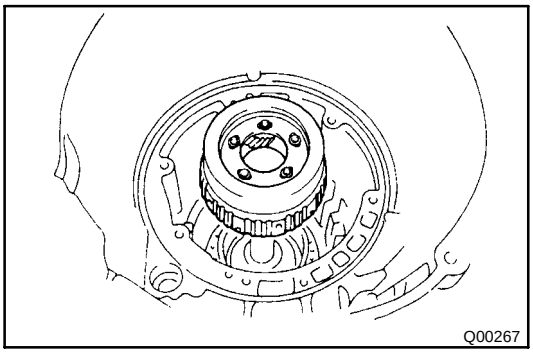
(a) Install the rear planetary ring gear.

(b) Place the bearing onto the ring gear.

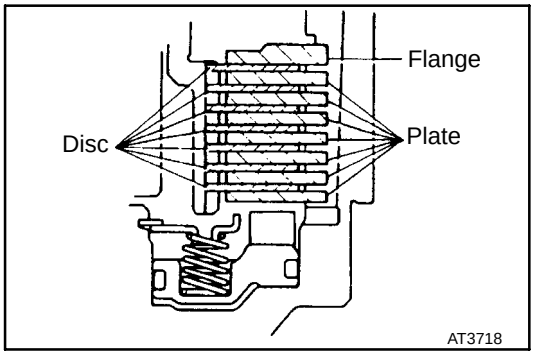
Bearing outer diameter:
38.7 mm (1.524 in.)
Bearing inner diameter:
22.6 mm (0.890 in.)



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



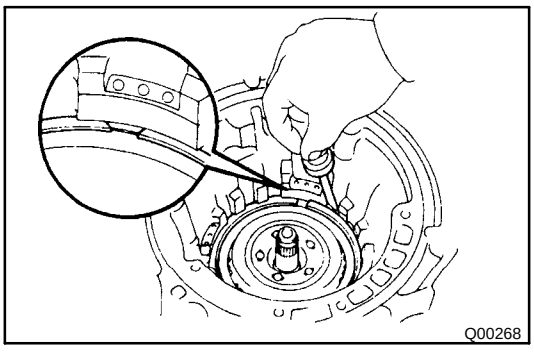
(d) Install the rear planetary gear.



11. INSTALL DISCS, PLATES AND FLANGE OF FIRST AND REVERSE BRAKE

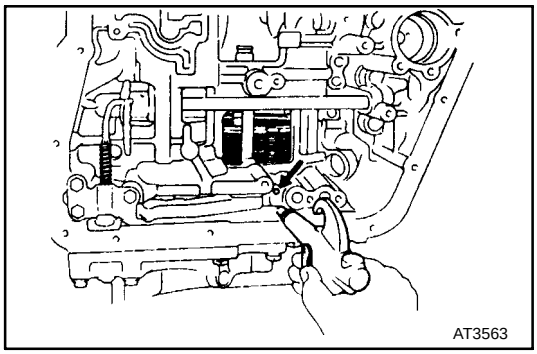
(a) Install the seven plates and seven discs.
Install in order:
P = Plate D = Disc
P-D-P-D-P-D-P-D-P-D-P-D-P-D

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



(c) Install the snap ring.

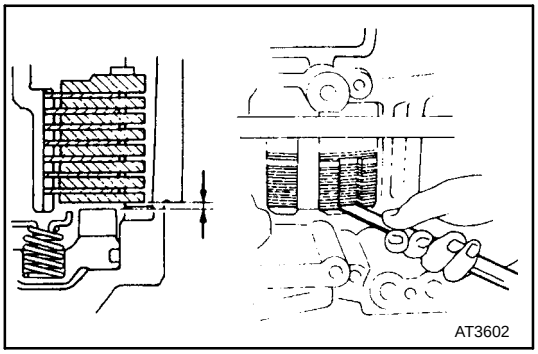
HINT: Be sure that the end gap of the snap ring is not aligned with one of cutouts.



12. CHECK FIRST AND REVERSE BRAKE

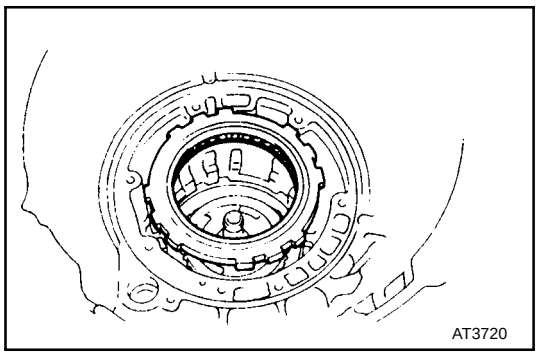
(a) Check the operation of the first and reverse brake piston.

Apply compressed air into the case passage and confirm that the piston moves.



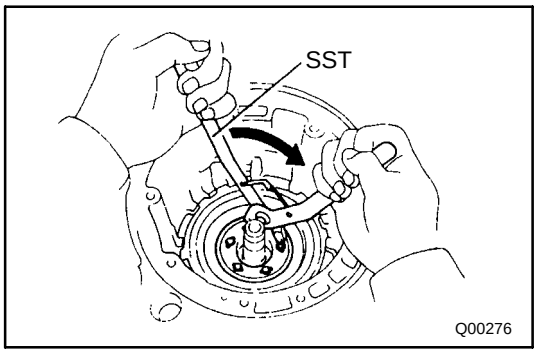
(b) Using a filler gauge, check that pack clearance of the first and reverse brake.

Clearance:
0.85 - 2.05 mm (0.033 - 0.081 in.)



13. INSTALL NO. 2 ONE-WAY CLUTCH INTO CASE

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



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

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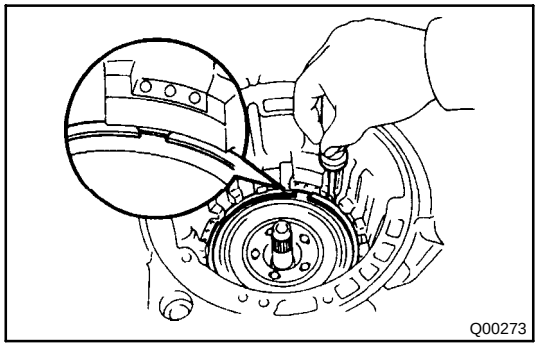
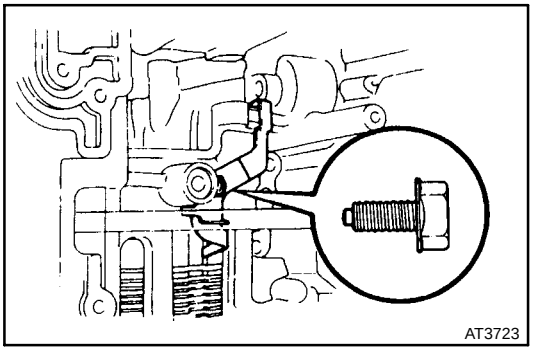
If can not turn the planetary gear clockwise, check the installation of the one-way clutch.



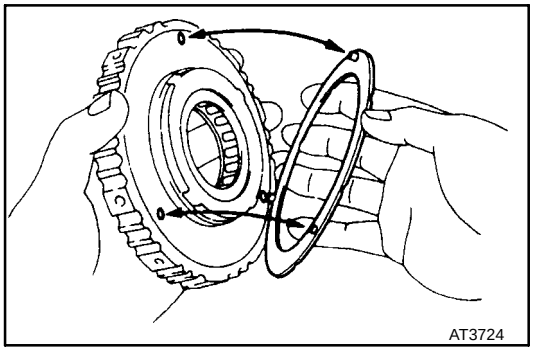
(c) Install the snap ring.

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

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

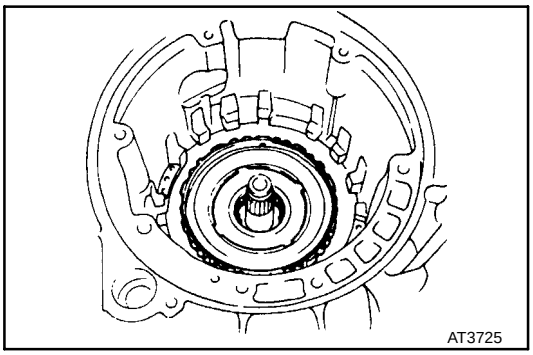


14. INSTALL SECOND COAST BRAKE BAND GUIDE

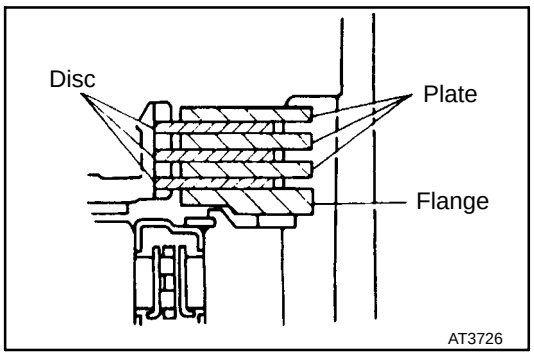


15. PLACE NO. 1 ONE-WAY CLUTCH

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



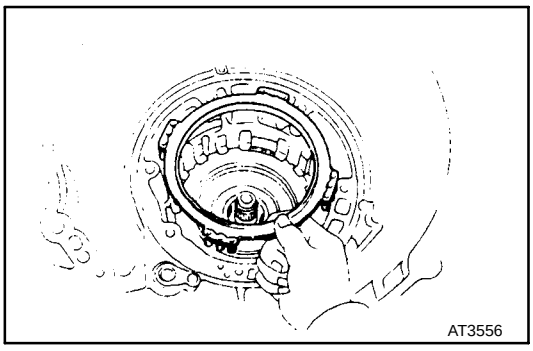
(b) Place the No. 1 one-way clutch onto the rear planetary gear.



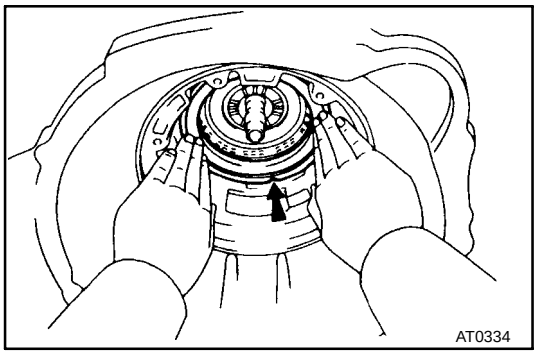
16. INSTALL SECOND BRAKE

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

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

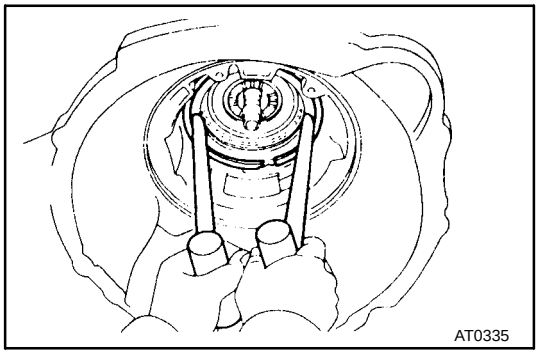


(c) Place the piston return spring into the case.



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

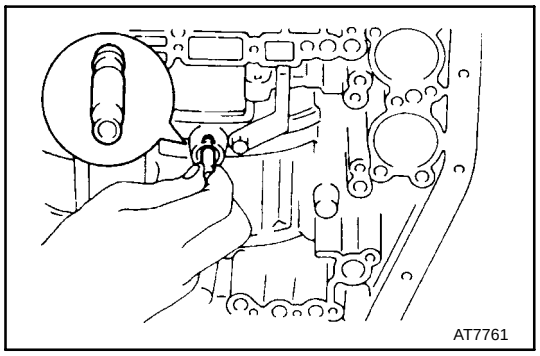
HINT: Align the groove of the drum with the bolt.



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

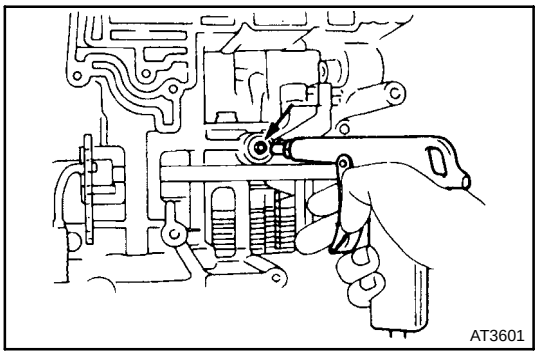
(f) While compressing the piston return spring over the drum with hammer handles, install the snap ring into the groove.

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



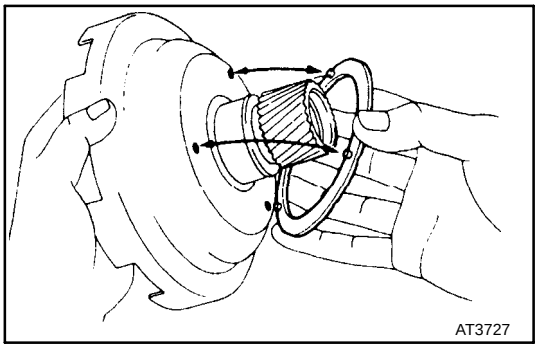
17. INSTALL NEW SECOND BRAKE GASKET

Install a new gasket until it makes contact with the second brake drum.



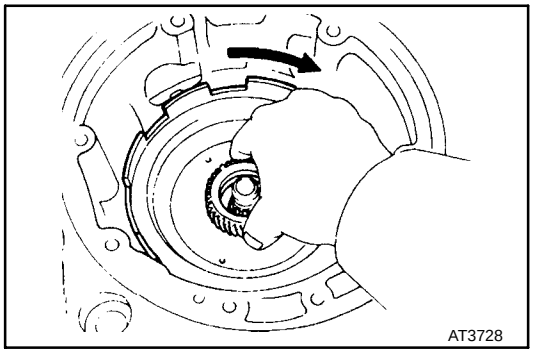
18. CHECK OPERATION OF SECOND BRAKE

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

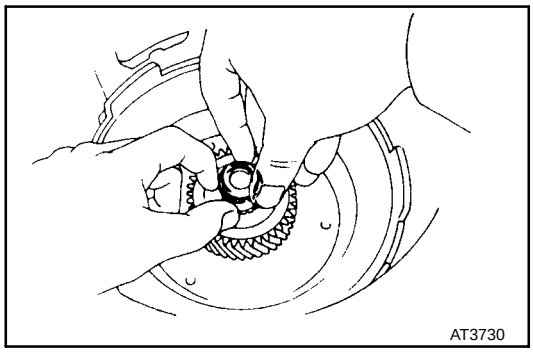


19. INSTALL SUN GEAR AND SUN GEAR INPUT DRUM

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

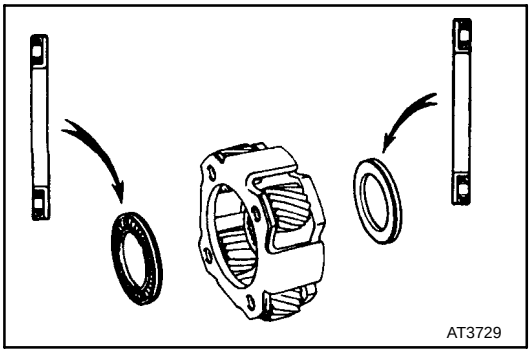


(b) While turning the sun gear clockwise, install it into the No. 1 one-way clutch.



20. INSTALL OIL SEAL RING TO INTERMEDIATE SHAFT

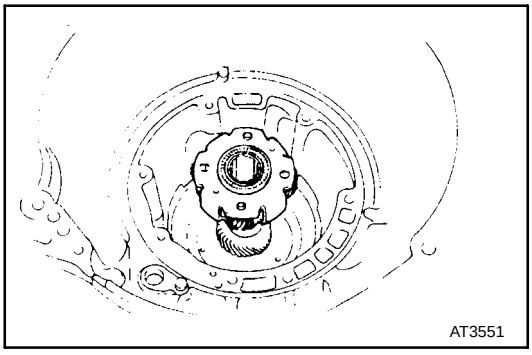
HINT: After installing the oil seal ring, check that it moves smoothly.



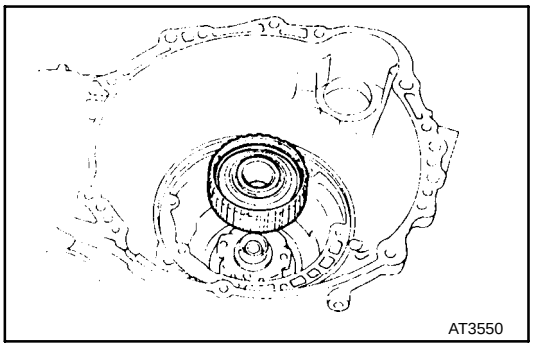
21. INSTALL FRONT PLANETARY GEAR

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

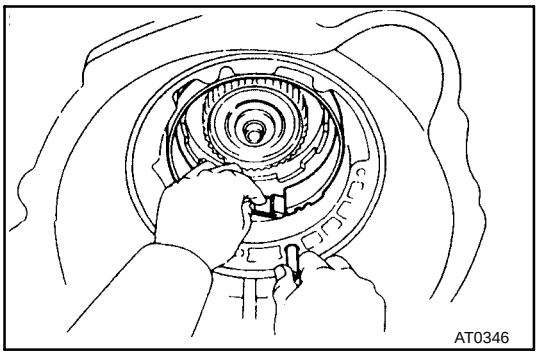
Bearing outer diameter:
45.5 mm (1.791 in.)
Bearing inner diameter:
30.1 mm (1.185 in.)



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



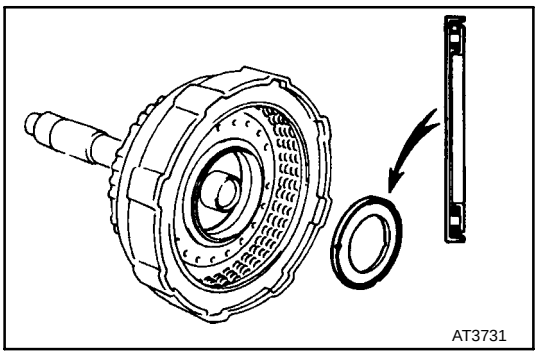
22. INSTALL FRONT PLANETARY RING GEAR



23. INSTALL SECOND COAST BRAKE BAND

(a) Place the band into the case.

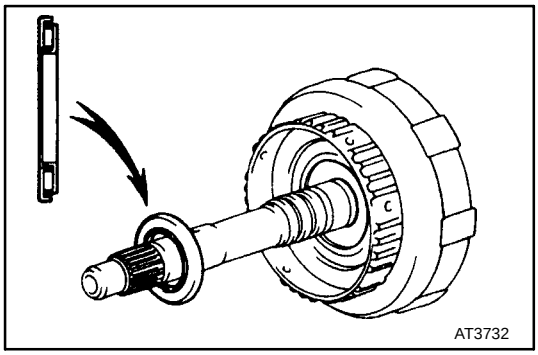
(b) Install the pin through the oil pump mounting bolt hole.



24. INSTALL FORWARD CLUTCH AND DIRECT CLUTCH

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

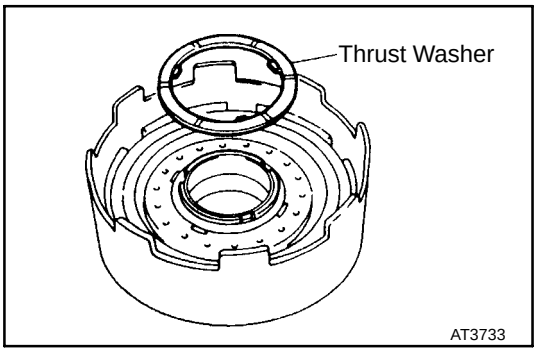
Bearing outer diameter:
47.6 mm (1.874 in.)
Bearing inner diameter:
31.4 mm (1.236 in.)



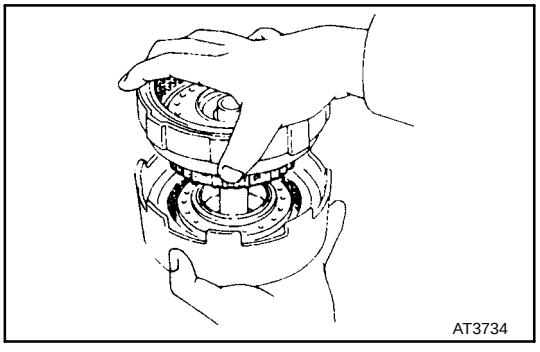
(b) Coat the bearing with petroleum jelly and install it onto front side of the forward clutch.

HINT: There are two different-thick bearings for adjustment of the input shaft thrust play.

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

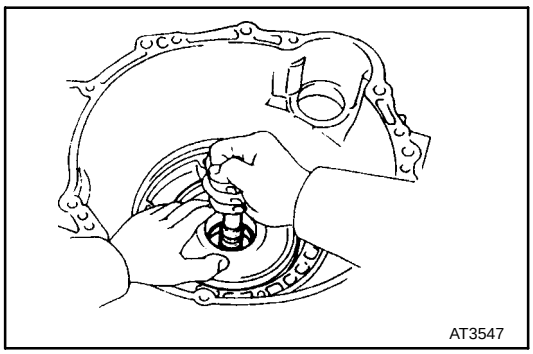


(c) Coat the thrust washer with petroleum jelly and install it with the oil groove facing upward onto the direct clutch drum.



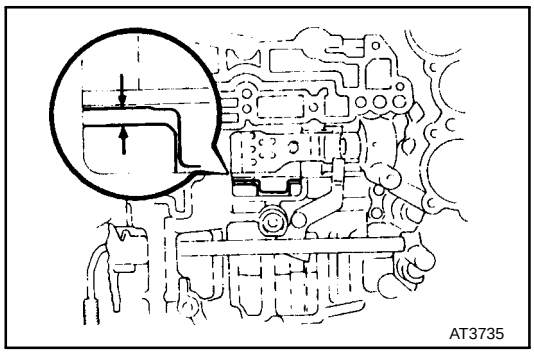
(d) Mesh the hub of the forward clutch flukes of the direct clutch discs.

HINT: Be careful that the bearing and thrust washer do not get out of place.



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

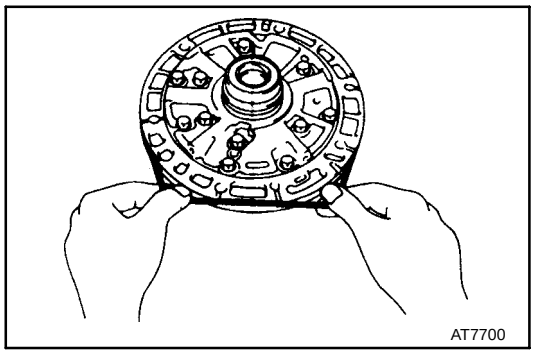
HINT: Hold the direct clutch toward the forward clutch to prevent the thrust washer from getting out of place.



(f) Check the distance between the direct clutch drum and the sun gear input drum.

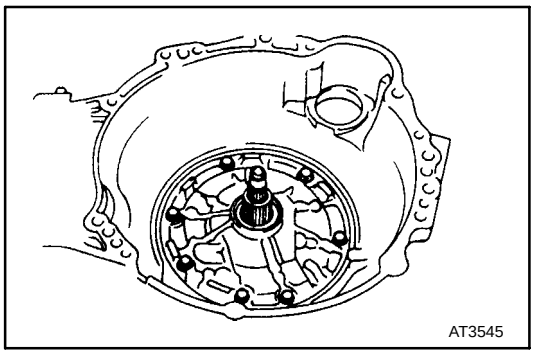
Distance:

Approx. 3 mm (0.12 in.)



25. INSTALL OIL PUMP INTO CASE

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



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

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

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

26. MEASURE THRUST PLAY OF INPUT SHAFT

Measure the thrust play with a dial gauge.

Thrust play:

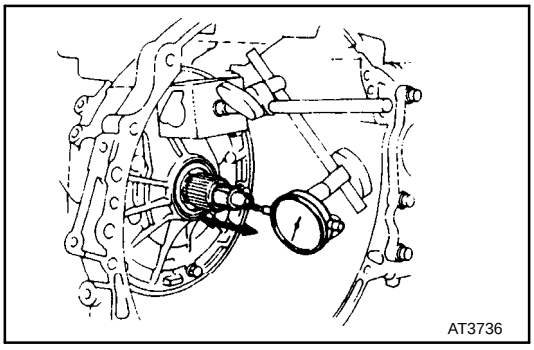
0.25 - 0.90 mm (0.0098 - 0.0354 in.)

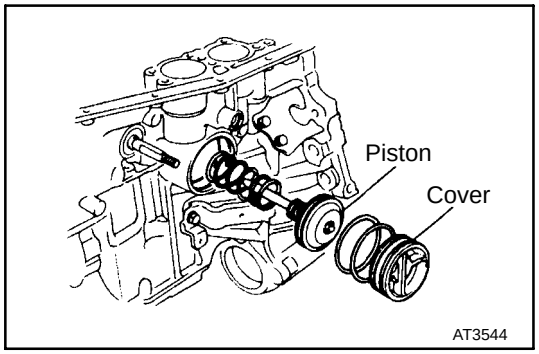
HINT: There are two different - thick bearings for end of stator shaft. If the thrust play is in excess of standard, select one of them.

Bearing thickness:

3.60 mm (0.1417 in.)

4.19 mm (0.1650 in.)





27. CHECK INPUT SHAFT ROTATION

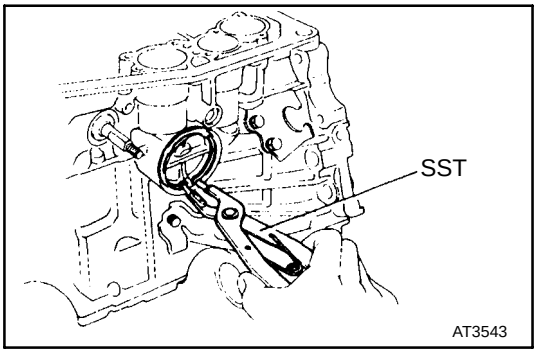
Make sure that the input shaft rotates smoothly.

28. INSTALL SECOND COAST BRAKE PISTON

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

(b) Install the outer spring with the piston.

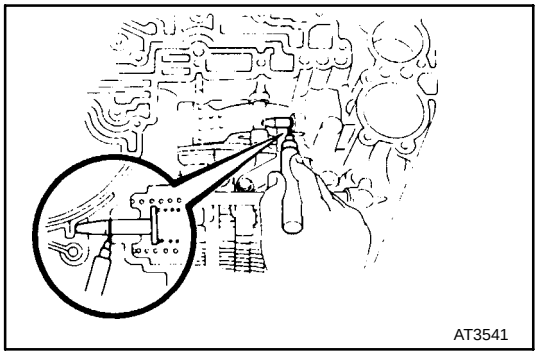
(c) Place the cover into the bore.



(d) Using SST, install the snap ring while pressing the cover.

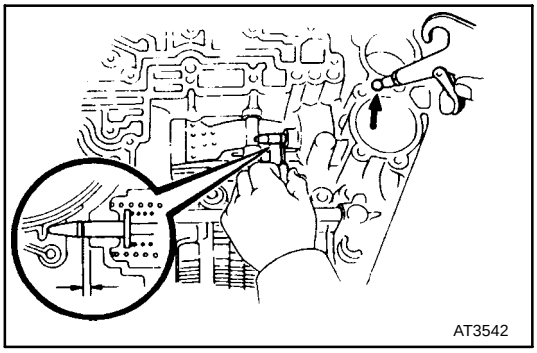
SST 09350-32014 (09351-32050)

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



29. CHECK SECOND COAST BRAKE PISTON STROKE

(a) Apply a small amount of paint to the piston rod at the point it meets the case, as shown in the illustration.



(b) Using SST, measure the piston stroke applying and releasing the compressed air (392 - 785 kPa, 4 - 8 kgf/cm^2, 57 - 114 psi), as shown.

SST 09240-00020

Piston stroke:

2.0 - 3.5 mm (0.079 - 0.138 in.)

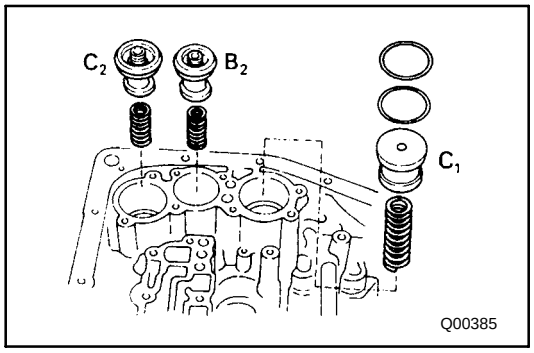
If the stroke is more than specified, replace the piston rod with a longer one.

Piston rod length:

9.52 mm (3.748 in.)

96.3 mm (3.791 in.)

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



HYDRAULIC CONTROL UNIT INSTALLATION

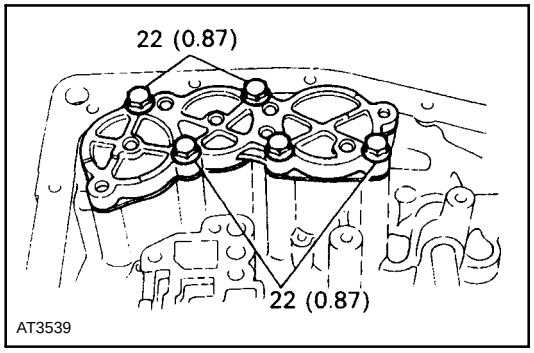
1. INSTALL ACCUMULATOR PISTONS AND SPRINGS

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

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

Spring	Free length mm (in.)	Outer diameter mm (in.)	Color
C_2	55.2 (2.173)	18.0 (0.709)	Yellow + Purple
B_2	68.6 (2.701)	16.3 (0.642)	Blue + White
C_1	71.2 (2.803)	25.2 (0.992)	Blue + Green

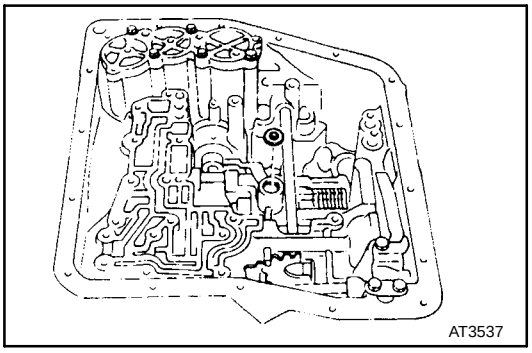
V00519



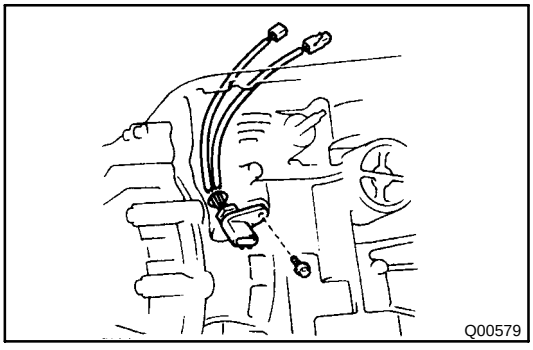
(c) Place the cover with a new gasket and gradually tighten the bolts a little a time in sequence.

HINT: Each bolt length (mm, in.) is indicated in the illustration.

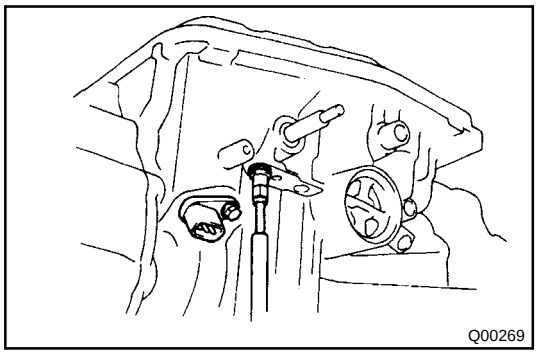
Torque: 10 N-m (100 kgf-cm, 7 ft-lbf)



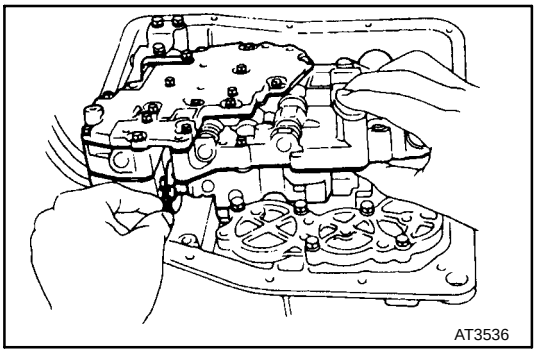
2. PLACE NEW SECOND BRAKE APPLY GASKET



3. INSTALL SOLENOID WIRE



4. INSTALL THROTTLE CABLE

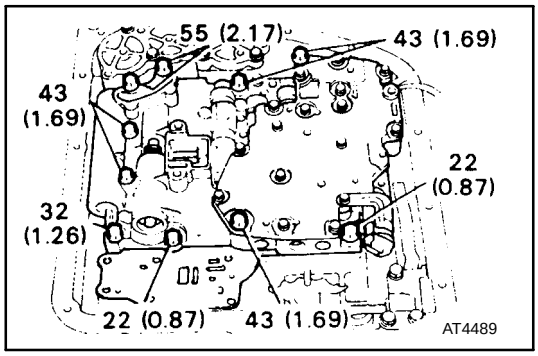


5. INSTALL VALVE BODY TO TRANSAXLE CASE

(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.



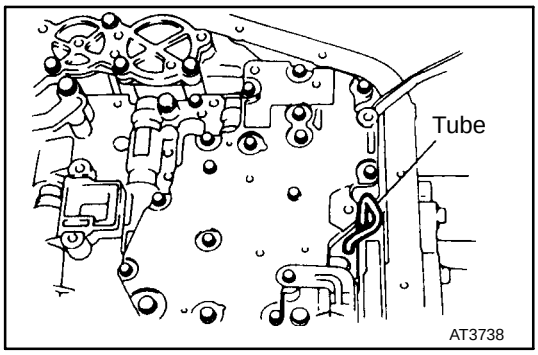
(c) Install and tighten the ten bolts.

HINT:

Each bolt length (mm, in.) is indicated in the illustration.

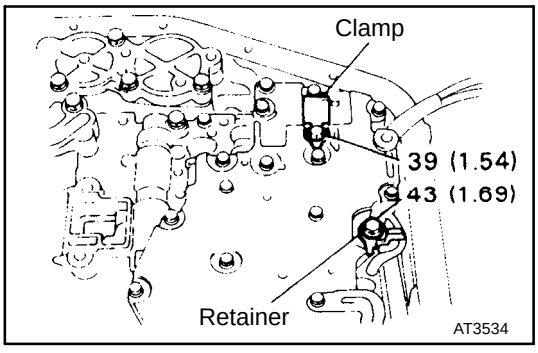
Hand tighten the ten bolts first, then torque with a torque wrench.

Torque: 11 N-m (110 kgf-cm, 8 ft-lbf)



6. INSTALL B_3 APPLY TUBE

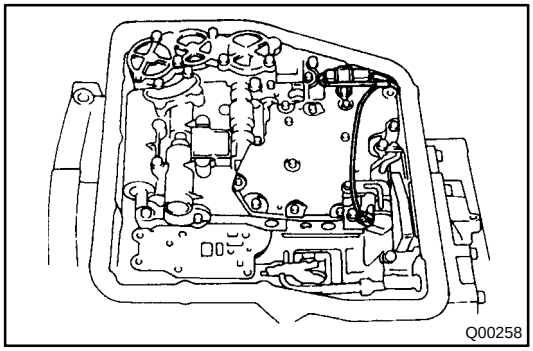
NOTICE: Be careful not to bend or damage the tube.



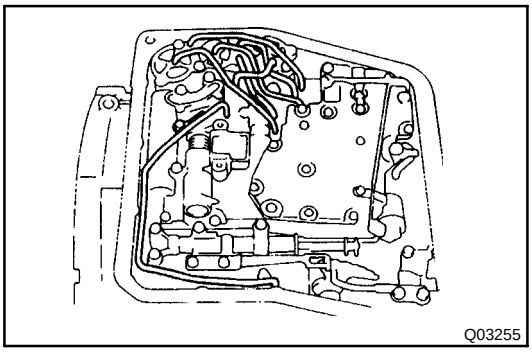
7. INSTALL CONNECTOR CLAMP AND TUBE RETAINER

HINT: Each bolt length (mm, in.) is indicated in the illustration.

Torque: 11 N-m (110 kgf-cm, 8 ft-lbf)



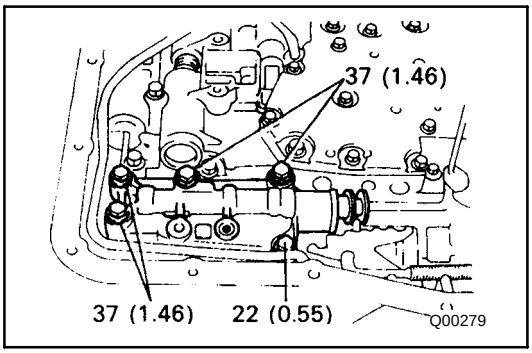
8. CONNECT SOLENOID CONNECTORS

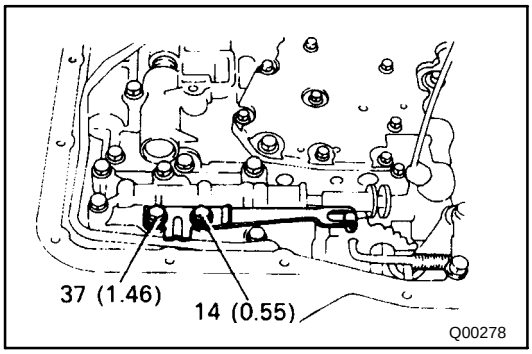


9. INSTALL OIL TUBES

Using a plastic hammer, install the tubes into the positions indicated in the illustration.

NOTICE: Be careful not to bend or damage the tubes.





10. INSTALL MANUAL VALVE BODY AND DETENT SPRING

HINT: Each bolt length (mm, in.) is indicated in the illustration.

(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 five bolts first. Then, tighten them with a torque wrench.

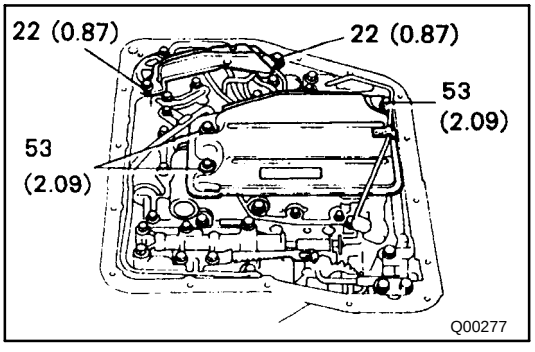
Torque: 11 N-m (110 kgf-cm, 8 ft-lbf)

(d) Place the detent springs on the manual valve body and hand tighten the two bolts first. Then, tighten them with a torque wrench.

Torque: 11 N-m (110 kgf-cm, 8 ft-lbf)

HINT: Each bolt length (mm, in.) is indicated in the illustration.

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



11. INSTALL TUBE BRACKET AND OIL STRAINER

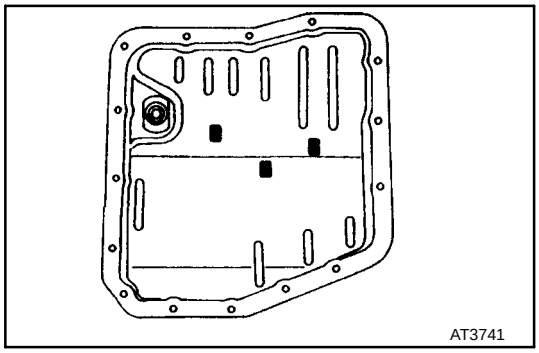
Each bolt length (mm, in.) is indicated in the illustration.

Tube bracket

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

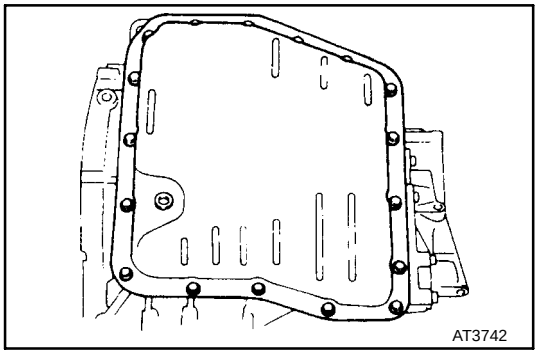
Oil strainer

Torque: 11 N-m (110 kgf-cm, 8 ft-lbf)



12. INSTALL MAGNETS IN PLACE AS SHOWN

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

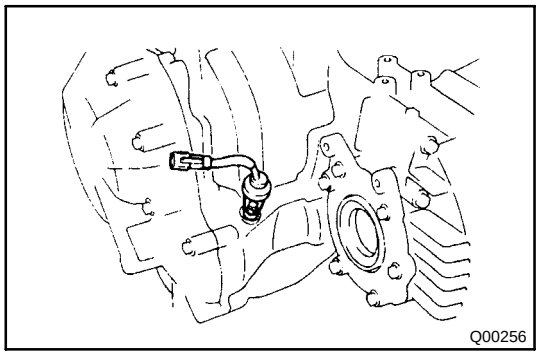


13. INSTALL OIL PAN WITH NEW GASKET

(a) Install a new gasket and oil pan.

(b) Install and torque new seventeen bolts.

Torque: 4.9 N-m (50 kgf-cm, 43 in.-lbf)



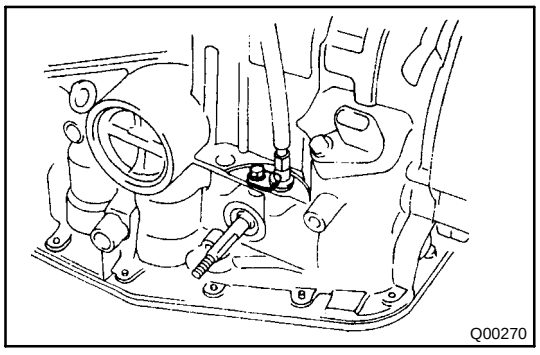
14. INSTALL NO. 1 VEHICLE SPEED SENSOR

(a) Install a new O-ring to the vehicle speed sensor.

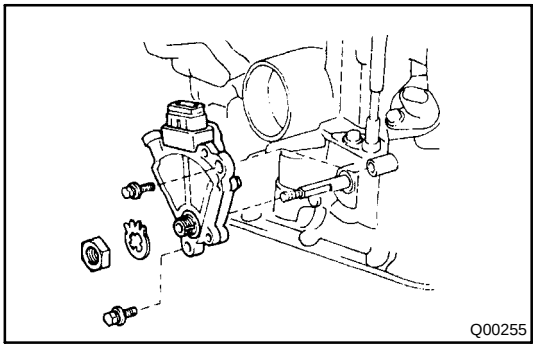
(b) Install the vehicle speed sensor to the transaxle case.

(c) Tighten the bolt.

(d) Connect the sensor connector.



15. INSTALL THROTTLE CABLE RETAINING PLATE



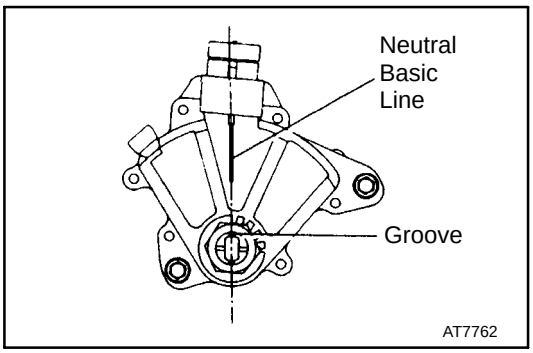
16. INSTALL PARK/NEUTRAL POSITION SWITCH

(a) Install the park/neutral position switch to the manual valve shaft.

(b) Place the new locking plate and tighten the nut.

(c) Stake the nut with locking plate.

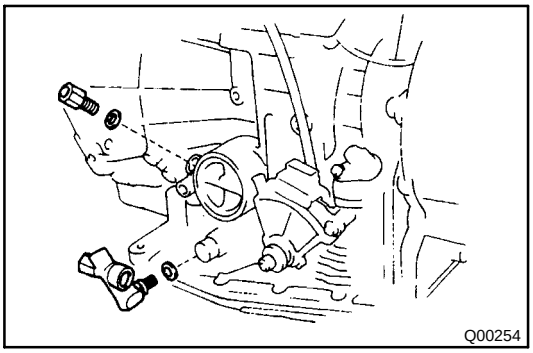
(d) Install the two bolts.



(e) Adjust the park/neutral position switch.

HINT: Align the groove and neutral basic line.

(f) Tighten the two bolts.

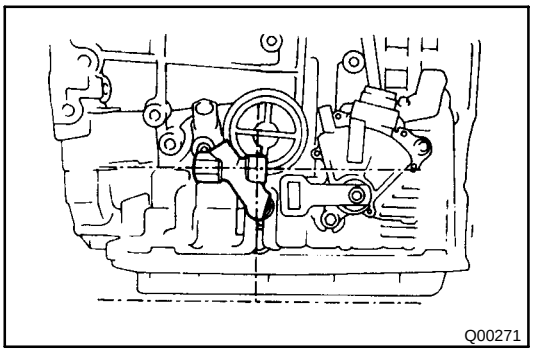


17. INSTALL UNION AND ELBOW

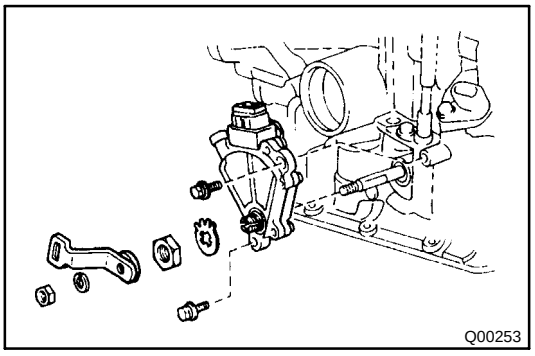
(a) Install the new O-rings to the union and elbow.

(b) Install the union elbow to the transaxle case.

Torque: 27 N-m (275 kgf-cm, 20 ft-lbf)



HINT: Install the elbow, as shown in the illustration.



18. INSTALL MANUAL SHAFT LEVER