HOW TO USE THIS MANUAL

IN002-0T

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

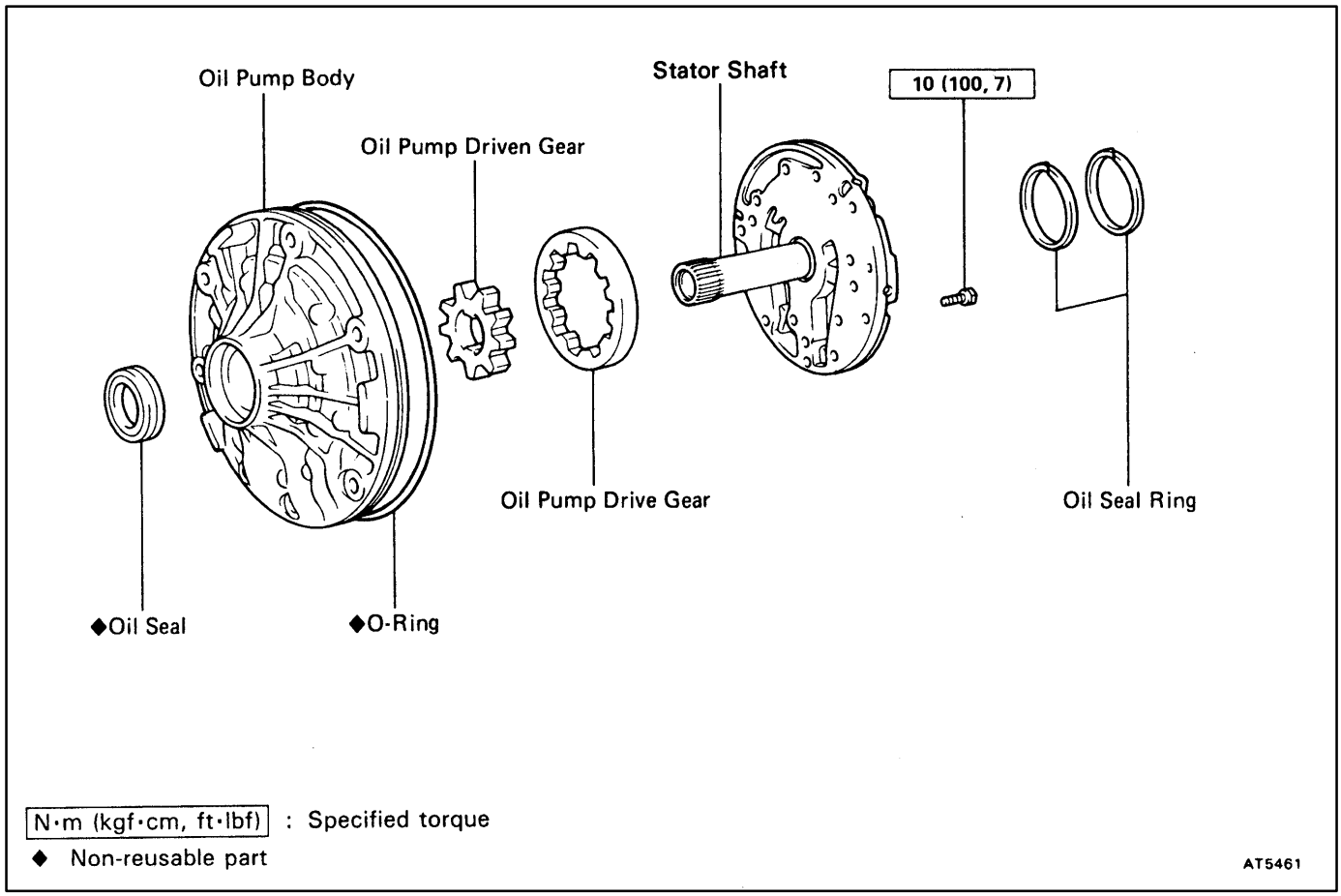
PREPARATION

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.

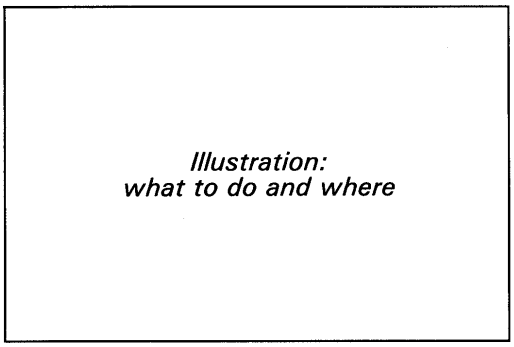
Example:



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

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

Example:



Task heading : what to do

21. CHECK PISTON STROKE OF OVERDRIVE BRAKE

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

SST 09350-30020 (09350-06120)

Set part No. *Component part No.*

Detailed text: how to do task

(b) Measure the stroke applying and releasing the compressed air (392 — 785 kPa, 4 — 8 kgf/cm² or 57 — 114 psi) as shown in the illustration.

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

Specification

V00081

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 AT section, for quick reference.

CAUTIONS, NOTICES, HINTS:

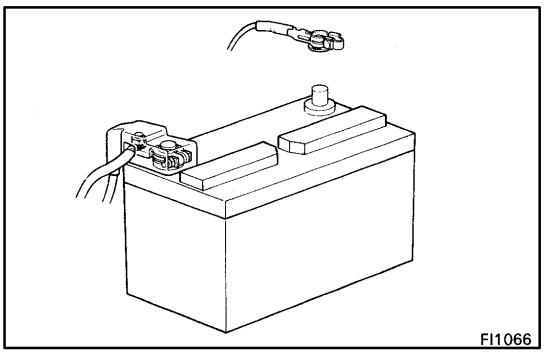
- ★ CAUTIONS are presented in bold type, and indicate there is a possibility of injury to you or other people.
- ★ NOTICES are also presented in bold type, and indicate the possibility of damage to the components being repaired.
- ★ HINTS are separated from the text but do not appear in bold. They provide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

SI UNIT

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

Example:

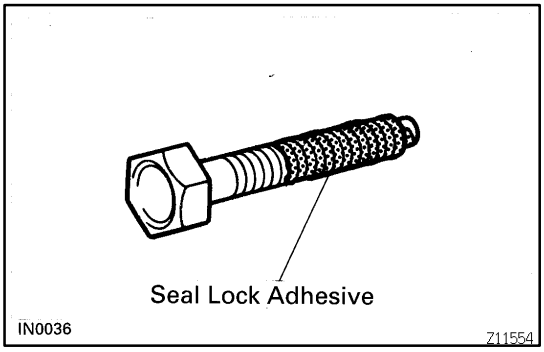
Torque: 30 N·m (310 kgf·cm, 22 ft·lbf)


FI1066

GENERAL REPAIR INSTRUCTIONS

IN022-02

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.



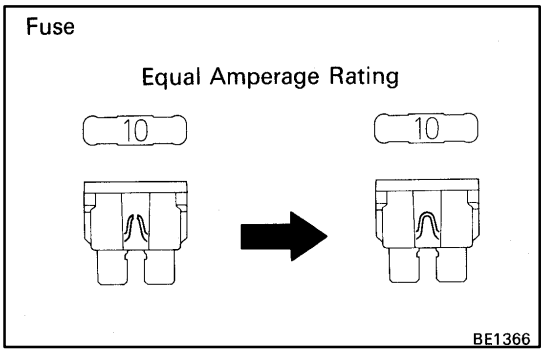
IN0036 Z11554

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

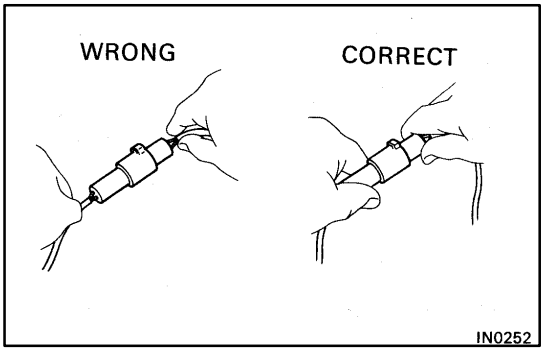
the specified seal lock adhesive to the bolt, nut or threads.

(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 AT 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.

ABBREVIATIONS USED IN THIS MANUAL

IN01H-0K

A/T ATM	Automatic Transmission
ATF	Automatic Transmission Fluid
B_0	Overdrive Brake
B_1	Second Coast Brake
B_2	Second Brake
B_3	First and Reverse Brake
C_0	Overdrive Direct Clutch
C_1	Forward Clutch
C_2	Direct Clutch
D	Disc
F	Flange
F_0	Overdrive One-way Clutch
F_1	No.1 One-way Clutch
F_2	No.2 One-way Clutch
FIPG	Formed in Place Gasket
MP	Multipurpose
O/D	Overdrive
P	Plate
SSM	Special Service Materials
SST	Special Service Tools
w/	with
w/o	without

GLOSSARY OF SAE AND TOYOTA TERMS

IN016-02

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

SAE ABBREVIATIONS	SAE TERMS	TOYOTA TERMS ( )--ABBREVIATIONS
A/C	Air Conditioning	Air Conditioner
ACL	Air Cleaner	Air Cleaner
AIR	Secondary Air Injection	Air Injection (AI)
AP	Accelerator Pedal	-
B+	Battery Positive Voltage	+B, Battery Voltage
BARO	Barometric Pressure	-
CAC	Charge Air Cooler	Intercooler
CARB	Carburetor	Carburetor
CFI	Continuous Fuel Injection	-
CKP	Crankshaft Position	Crank Angle
CL	Closed Loop	Closed Loop
CMP	Camshaft Position	Cam Angle
CPP	Clutch Pedal Position	-
CTOX	Continuous Trap Oxidizer	-
CTP	Closed Throttle Position	-
DFI	Direct Fuel Injection (Diesel)	Direct Injection (DI)
DI	Distributor Ignition	-
DLC1 DLC2 DLC3	Data Link Connector 1 Data Link Connector 2 Data Link Connector 3	1: Check Connector 2: 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)

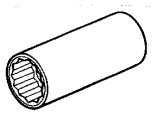
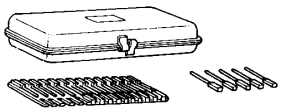
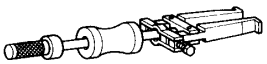
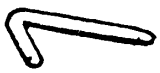
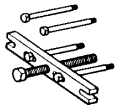
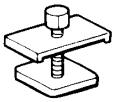
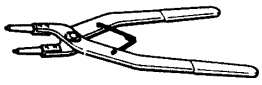
IAC	Idle Air Control	Idle Speed Control (ISC)
IAT	Intake Air Temperature	Intake or Inlet Air Temperature
ICM	Ignition Control Module	-
IFI	Indirect Fuel Injection	Indirect Injection
IFS	Inertia Fuel-Shutoff	-
ISC	Idle Speed Control	-
KS	Knock Sensor	Knock Sensor
MAF	Mass Air Flow	Air Flow Meter
MAP	Manifold 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	-

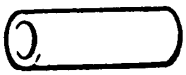
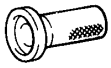
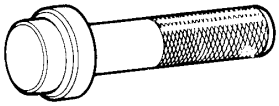
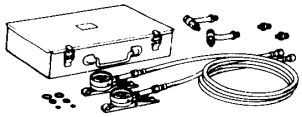
TVV	Thermal Vacuum Valve	Bimetallic Vacuum Switching Valve (BVSV) Thermostatic Vacuum Switching Valve (TVSV)
TWC	Three-Way Catalytic Converter	Three-Way Catalyst (TWC) CC_{RO}
TWC+OC	Three-Way + Oxidation Catalytic Converter	CC_R + CCo
VAF	Volume Air Flow	Air Flow Meter
VR	Voltage Regulator	Voltage Regulator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

PREPARATION

SST (SPECIAL SERVICE TOOLS)

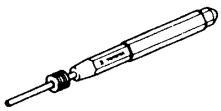
AT0D6-04

	09032-00100	Oil Pan Seal Cutter	
	09060-20100	Deeper Socket Wrench 30 mm ★	
	09240-00020	Wire Gauge Set	
	09308-00010	Oil Seal Puller	
	09309-37010	Transmission Bearing Replacer	
	09325-40010	Transmission Oil Plug	
	09350-30020	TOYOTA Automatic Transmission Tool Set	
	(09350-06120)	No.2 Measure Terminal	
	(09350-07020)	Oil Pump Puller	
	(09350-07030)	No.1 Piston Spring Compressor	
	(09350-07040)	No.2 Piston Spring Compressor	
	(09350-07050)	No.3 Piston Spring Compressor	
	(09350-07060)	No.1 Snap Ring Expander	

	(09350-07070)	No.2 Snap Ring Expander	
	(09350-07080)	Brake Reaction Sleeve Puller	
	(09350-07090)	Brake No.1 Piston Puller	
	(09350-071 10)	Oil Seal Replacer	
	(09351-32140)	Oil Seal Replacer	
	09517-36010	Rear Axle Shaft Oil Seal Replacer-	
	09992-00094	Automatic Transmission Oil Pressure Gauge Set	

AT0D7-03

RECOMMENDED TOOLS

	09031-00030	Pin Punch .	

AT0D8-03

EQUIPMENT

Feeler gauge	Check major clearance.
Vernier calipers	Check length of second coast brake piston rod.
Dial indicator or dial indicator with magnetic base	Check piston stroke and play of the output shaft.
Dial indicator	Check inside diameter of major bushing.
Straight edge	Check side clearance of oil pump.
Torque wrench	
Cylinder gauge	Check inside diameter of the transmission case rear bushing.
Ohmmeter	
Voltmeter	
Ammeter(A)	

AT0D9-02

LUBRICANT

Item	Capacity	Classification
Dry fill	8.2 liters (8.7 US qts, 7.2 Imp. qts)	ATF Type T-II or equivalent
Drain and refill	1.9 liters (2.0 US qts, 1.7 Imp. qts)	

AT0DA-05

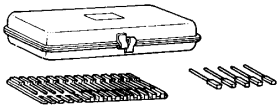
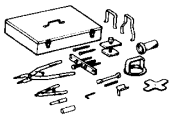
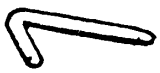
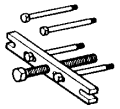
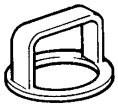
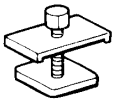
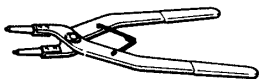
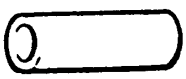
SSM (SPECIAL SERVICE MATERIALS)

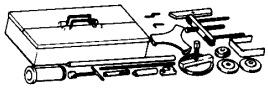
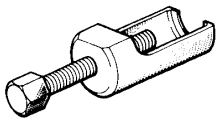
08826-00090	Seal Packing 1281, THREE BOND 1281 or equivalent (FIPG)	Oil pan
08833-00070	Adhesive 1324, THREE BOND 1324 or equivalent	Torque converter clutch housing Extension housing PNP switch

PREPARATION

SST (SPECIAL SERVICE TOOLS)

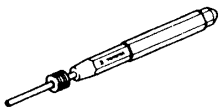
AT053-06

	09032-00100	Oil Pan Seal Cutter	
	09240-00020	Wire Gauge Set	
	09350-30020	TOYOTA Automatic Transmission Tool Set	
	(09350-06120)	No.2 Measure Terminal	
	(09350-07020)	Oil Pump Puller	
	(09350-07030)	No.1 Piston Spring Compressor	
	(09350-07040)	No.2 Piston Spring Compressor	
	(09350-07050)	No.3 Piston Spring Compressor	
	(09350-07060)	No.1 Snap Ring Expander	
	(09350-07070)	No.2 Snap Ring Expander	
	(09350-07080)	Brake Reaction Sleeve Puller	
	(09350-07090)	Brake No.1 Piston Puller	
	(09350-071 10)	Oil Seal Replacer	

	09350-36010	TOYOTA Automatic Transmission Tool Set	
	(09350-06090)	Plate	
	09610-20012	Pitman Arm Puller	Remove oil pump.

AT054-03

RECOMMENDED TOOLS

	09031-00030	Pin Punch .	

AT055-03

EQUIPMENT

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

AT056-09

LUBRICANT

Item	Capacity	Classification
Dry fill	7.2 liters (7.6 US qts, 6.3 Imp. qts)	DEXRON® II
Drain and refill	1.6 liters (1.7 US qts, 1.4 Imp. qts)	

AT057-05

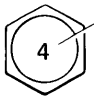
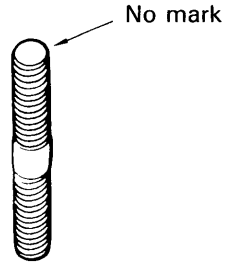
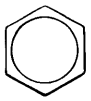
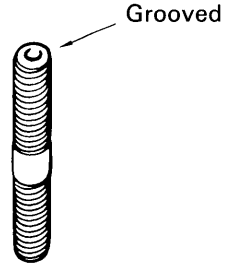
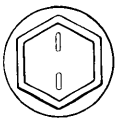
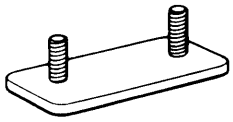
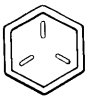
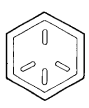
SSM (SPECIAL SERVICE MATERIALS)

	08826-00090	Seal Packing 1281, THREE BOND 1281 or equivalent (FIPG)	Oil pan

STANDARD BOLT TORQUE SPECIFICATIONS

IN008-02

HOW TO DETERMINE BOLT STRENGTH

	Mark	Class		Mark	Class
Hexagon head bolt	 Bolt head No. 4— 5— 6— 7— 8— 9— 10— 11—	4T 5T 6T 7T 8T 9T 10T 11T	Stud bolt	 No mark	4T
	 No mark	4T		 Grooved	6T
Hexagon flange bolt w/ washer hexagon bolt	 No mark	4T			
Hexagon head bolt	 2 protruding lines	5T			
Hexagon flange bolt w/ washer hexagon bolt	 2 protruding lines	6T	Welded bolt		4T
Hexagon head bolt	 3 protruding lines	7T			
Hexagon head bolt	 4 protruding lines	8T			

V00078

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 DATA

AT0F0-04

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.
Oil pump body bushing inside diameter	Maximum	38.19 mm	1.5035 in.
Stator shaft bushing inside diameter	(Front side) Maximum	21.58 mm	0.8496 in.
	(Rear side) Maximum	27.08 mm	1.0661 in.

Second Coast Brake

Piston rod stroke	1.0 - 2.0 mm	0.039 - 0.079 in.
Piston rod length	70.7 mm	2.783 in.
	71.4 mm	2.811 in.
	72.2 mm	2.843 in.
	72.9 mm	2.870 in.
	73.1 mm	2.09 in.

Overdrive Direct Clutch

Overdrive direct clutch piston stroke		1.45 - 1.70 mm	0.0571 - 0.0669 in.
Clutch return spring free length	STD	15.8 mm	0.6220 in.
Clutch drum bushing inside diameter	Maximum	27.11 mm	1.0673 in.
Overdrive planetary gear bushing	Maximum	11.27 mm	0.4437 in.
Planetary pinion gear thrust clearance	STD	0.02 - 0.60 mm	0.0079 - 0.0236 in.
	Maximum	1.00 mm	0.0394 in.
Flange thickness	No. 16	3.6 mm	0.142 in.
	No. 17	3.5 mm	0.138 in.
	No. 18	3.4 mm	0.134 in.
	No. 19	3.3 mm	0.130 in.
	No. 20	3.2 mm	0.126 in.
	No. 21	3.1 mm	0.122 in.

Overdrive Brake

Piston return spring free length	STD	17.23 mm	0.6783 in.
Piston stroke		1.75 - 2.05 mm	0.0689 - 0.0807 in.
Flange thickness	No. 26	3.3 mm	0.130 in.
	No. 25	3.5 mm	0.138 in.
	No. 12	3.6 mm	0.142 in.
	No. 24	3.7 mm	0.146 in.
	No. 11	3.8 mm	0.150 in.
	No. 23	3.9 mm	0.154 in.
	None	4.0 mm	0.157 in.

Direct Clutch

Pack clearance		0.50 - 0.80 mm	0.0197 - 0.0315 in.
Clutch piston return spring free length	STD	23.25 mm	0.9154 in.
Clutch drum bushing inside diameter	Maximum	53.97 mm	2.1248 in.
Flange thickness	No. 86	2.7 mm	0.106 in.
	No. 85	2.8 mm	0.110 in.
	No. 84	2.9 mm	0.114 in.
	No. 33	3.0 mm	0.118 in.
	No. 32	3.1 mm	0.122 in.
	No. 31	3.2 mm	0.126 in.
	No. 30	3.3 mm	0.130 in.
	No. 29	3.4 mm	0.134 in.
	No. 28	3.5 mm	0.138 in.
	No. 27	3.6 mm	0.142 in.
	No. 34	3.7 mm	0.146 in.

Forward Clutch

Pack clearance		0.70 - 1.00 mm	0.0276 - 0.0394 in.
Clutch drum bushing inside diameter	Maximum	24.08 mm	0.9480 in.
Flange thickness	No. 61	3.0 mm	0.118 in.
	No. 60	3.2 mm	0.126 in.
	No. 45	3.4 mm	0.134 in.
	No. 62	3.6 mm	0.142 in.
	No. 44	3.8 mm	0.150 in.
	No. 42	4.0 mm	0.157 in.

Front Planetary Gear

Ring gear bushing inside diameter	Maximum	24.08 mm	0.9480 in.
Planetary pinion gear thrust clearance	STD	0.20 - 0.60 mm	0.0079 - 0.0236 in.
	Maximum	1.00 mm	0.0394 in.

Planetary Sun Gear

Sun gear bushing inside diameter	Maximum	27.08 mm	1.0661 in.

Second Brake

Pack clearance		0.49 - 1.11 mm	0.0139 - 0.0437 in.
Piston return spring free length	STD	19.64 mm	0.7732 in.

Rear Planetary Gear

Planetary pinion gear thrust clearance	STD	0.20 mm - 0.60 mm	0.0079 - 0.0236 in.
	Maximum	1.00 mm	0.0394 in.

First and Reverse Brake

Pack clearance		0.70 - 1.00 mm	0.0276 - 0.0394 in.
Piston return spring free length		12.9 mm	0.508 in.
Flange thickness	No. 68	5.4 mm	0.213 in.
	No. 67	5.2 mm	0.205 in.
	No. 50	5.0 mm	0.197 in.
	No. 51	4.8 mm	0.189 in.
	No. 52	4.6 mm	0.181 in.
	No. 53	4.4 mm	0.173 in.
	No. 54	4.2 mm	0.165 in.
	No. 55	4.0 mm	0.157 in.

Transmission Case

Transmission case bushing inside diameter	Maximum	38.18 mm	1.5031 in.

Output Shaft

Output shaft thrust play	1.63 - 2.89 mm	0.0642 - 0.1138 in.

Valve Body Spring

Spring	Free length / Outer diameter mm (in.)	Total No. of coils & (Color)	
Upper valve body			
Lock - up relay valve	23.42 (0.9220) / 5.86 (0.2307)	12.25	(Red)
Secondary regulator valve	32.79 (1.2909) / 9.40 (0.3700)	12.75	(Blue)
C_1Orifice control valve	37.13 (1.4618) / 11.14 (0.4316)	11.25	(White)
C_1Orifice control valve	21.50 (0.8465) / 7.76 (0.3055)	11.50	(None)
C_1Accumulator	75.26 (2.9623) / 15.02 (0.5193)	17.06	(Pink)
2-3 Shift valve	30.77 (1.2114) / 9.70 (0.3819)	10.50	(Purple)
3-4 Shift valve	30.77 (1.2114) / 9.70 (0.3819)	10.50	(Purple)
Reverse control valve	25.58 (1.0070) / 8.64 (0.3402)	8.75	(None)
Lower valve body			
Primary regulator valve	45.62 (1.7961) / 16.88 (0.6446)	9.5	(Blue)
Lock-up control valve	18.52 (0.7291) / 5.30 (0.209)	12.75	(White)
Cut back valve	18.80 (0.740) / 7.48 (0.2995)	7.50	(None)
Solenoid relay valve	18.80 (0.740) / 7.48 (0.2995)	7.50	(None)
Solenoid modulator valve	32.13 (1.2650) / 8.00 (0.3150)	15.75	(Yellow)
Cut off valve	20.30 (0.799) / 6.10 (0.240)	12.75	(None)
Accumulator control valve	31.17 (1.2272) / 8.85 (0.3484)	12.50	(White)
1-2 Shift valve	30.77 (1.2114) / 9.70 (0.382)	10.50	(Purple)
Coast modulator valve	21.83 (0.8594) / 8.19 (0.3150)	10.5	(Green)
Coast modulator valve	26.11 (1.027) / 8.19 (0.3224)	12.0	(Blue)
	26.60 (1.043) / 8.19 (0.3224)	12.0	(Light Blue)
	27.11 (1.067) / 8.19 (0.3224)	12.0	(White)

Valve Body key

Key	Hight mm (in.)	Width mm (in.)	Thickness mm (in.)
Upper valve body			
Check valve	10.0 (0.394)	5.0 (0.197)	3.2 (0.126)
Check valve	19.0 (0.748)	5.0 (0.197)	3.2 (0.126)
Reverse control valve	16.0 (0.630)	5.0 (0.197)	3.2 (0.126)
2-3 Shift valve	12.5 (0.492)	5.0 (0.197)	3.2 (0.126)
C_1 Accumularor	37.5 (1.476)	5.0 (0.197)	3.2 (0.126)
C_1 Orifice control valve	12.5 (0.492)	5.0 (0.197)	3.2 (0.126)
Secondary regulator valve	10.0 (0.394)	5.0 (0.197)	3.2 (0.126)
3-4 Shift valve	11.5 (0.453)	5.0 (0.197)	3.2 (0.126)
Lock-up relay valve	21.2 (0.835)	5.0 (0.197)	3.2 (0.126)
Lower valve body			
1-2 Shift valve	14.0 (0.551)	5.0 (0.197)	3.2 (0.126)
Coast modulator valve	14.0 (0.551)	5.0 (0.197)	3.2 (0.126)
Coast modulator valve	14.0 (0.551)	5.0 (0.197)	3.2 (0.126)
Primary regulator valve	13.0 (0.521)	5.0 (0.197)	3.2 (0.126)
Lock-up control valve	14.5 (0.570)	5.0 (0.197)	3.2 (0.126)
Cut back valve	8.5 (0.335)	5.0 (0.197)	3.2 (0.126)
Solenoid relay valve	12.5 (0.492)	5.0 (0.197)	3.2 (0.126)
Solenoid modulator valve	14.5 (0.570)	5.0 (0.197)	3.2 (0.126)
Cut off valve	19.0 (0.748)	5.0 (0.197)	3.2 (0.126)
Accumulator control valve	29.0 (1.142)	5.0 (0.197)	3.2 (0.126)

Accumulator Spring

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

AT0F1-05

TORQUE SPECIFICATIONS

Part tightened		N·m	kgf·cm	ft·lbf
Engine x Transmissin		64	650	47
Rear support member x Body		25	260	19
Transmission housing x Transmisson case	14 mm	34	345	25
	17 mm	57	580	42
Extension housing x Transmission case		34	345	25
Packing lock pawl bracket		7	75	65 in.·lbf
O/D support x Transmission case		25	260	19
Oil pump x Transmission case		21	215	16
Oil pump body x Stator shaft		10	100	7
Valve body x Transmission case		10	100	7
Upper valve body x Lower valve body		6.5	65	56 in.·lbf
Detent spring		10	100	7
Oil strainer		10	100	7
Oil pan		7	75	65 in.·lbf
No. 1 Vehicle speed sensor		16	160	12
No. 2 Vehicle speed sensor		5.4	55	48 in.·lbf
Solenoid wiring stopper plate		5.4	55	48 in.·lbf
O/D direct clutch vehicle speed sensor		5.4	55	48 in.·lbf
Transmission output flange		123	1250	90
Throttle cable x Transmission case		5.4	55	48 in.·lbf
Union		29	300	22
Cooler pipe union nut		34	350	25
Park/Neutral position switch	Bolt	13	130	9
	Nut	6.9	70	61 in.·lbf
Control shaft lever		16	160	12

SERVICE SPECIFICATIONS

SERVICE DATE

AT06P-0F

Oil Pump

Body clearance	Standard	0.07 - 0.15 mm	0.0028 - 0.0059 in.
	Maximum	0.3 mm	0.012 in.
Tip clearance	Standard	0.11 - 0.14 mm	0.0043 - 0.0055 in.
	Maximum	0.3 mm	0.012 in.
Side clearance	Standard	0.02 - 0.05 mm	0.0008 - 0.0020 in.
	Maximum	0.1 mm	0.004 in.
Pump body bushing inside diameter	Maximum	38.19 mm	1.5035 in.
Stator shaft bushing inside diameter			
Front side	Maximum	21.58 mm	0.8496 in.
Rear side	Maximum	27.08 mm	1.0661 in.
Drive gear and driven gear thickness	Mark		
	1	9.440-9.449 (0.3717-0.3720)	
	2	9.450-9.459 (0.3720-0.3724)	
	3	9.460-9.470 (0.3724-0.3728)	
	4	9.471-9.480 (0.3720-0.3724)	
	5	9.481-9.490 (0.3729-0.3736)	

Overdrive Direct Clutch

Clutch drum bushing inside diameter	Maximum	27.11 mm	1.0673 in.
Overdrive direct clutch piston stroke		SUPRA	
		1.45 - 1.70 mm	0.0571 - 0.0669 in.
		OTHERS	
		1.85 - 2.15 mm	0.0728 - 0.0846 in.
Overdrive planetary gear bushing	Maximum	11.27 mm	0.4437 in.
Planetary pinion gear thrust clearance	Standard	0.20 - 0.60 mm	0.0079 - 0.0236 in.
	Maximum	1.00 mm	0.0394 in.
Flange thickness	No.16	3.6 mm	0.142 in.
	No.17	3.5 mm	0.138 in.
	No.18	3.4 mm	0.134 in.
	No.19	3.3 mm	0.130 in.
	No.20	3.2 mm	0.126 in.
	No.21	3.1 mm	0.122 in.

Overdrive Brake

Piston stroke		PREVIA	
		1.32 -1.62 mm	0.0520 - 0.0638 in.
		OTHERS	
		1.40 -1.70 mm	0.0551 - 0.0669 in.
Flange thickness	No.77	3.3 mm	0.130 in.
	No.78	3.5 mm	0.138 in.
	No.79	3.6 mm	0.142 in.
	No.80	3.7 mm	0.146 in.
	No.81	3.8 mm	0.150 in.
	No.82	3.9 mm	0.154 in.
	None	4.0 mm	0.157 in.

Direct Clutch

Piston stroke		1.37 - 1.60 mm	0.0359 - 0.0630 in.
Drum bushing inside diameter		53.99 mm	2.1256 in.
Flange thickness	No.33	3.0 mm	0.118 in.
	No.32	3.1 mm	0.122 in.
	No.31	3.2 mm	0.126 in.
	No.30	3.3 mm	0.130 in.
	No.29	3.4 mm	0.134 in.
	No.28	3.5 mm	0.138 in.
	No.27	3.6 mm	0.142 in.
	No.34	3.7 mm	0.146 in.

Forward Clutch

Pack clearance		0.5 - 0.9 mm	0.020 - 0.035 in.
Drum bushing inside diameter		24.08 mm	0.9480 in.
Flange thickness	No.61	3.0 mm	0.118 in.
	No.60	3.2 mm	0.126 in.
	No.45	3.4 mm	0.134 in.
	No.62	3.6 mm	0.142 in.
	No.44	3.8 mm	0.150 in.
	No.42	4.0 mm	0.157 in.
	No.63	4.2 mm	0.165 in.
	No.64	4.4 mm	0.173 in.

Second Coast Brake

Piston stroke		1.5 - 3.0 mm	0.059 - 0.118 in.
Piston rod length		72.9 mm	2.870 in.
		71.4 mm	2.811 in.

Front Planetary Gear

Maximum inside diameter		24.08 mm	0.9480 in.
Planetary pinion gear thrust clearance	Standard	0.20 - 0.60 mm	0.0079 - 0.0236 in.
	Maximum	1.00 mm	0.0394 in.

Planetary Sun Gear

Sun gear bushing inside diameter	Maximum	27.08 mm	1.0661 in.

Second Brake

Pack clearance		0.62 - 1.98 mm	0.0244 - 0.0780 in.

First and Reverse Brake

Pack clearance		0.60 - 1.12 mm	0.0236 -0.0441 in.
Flange thickness	No.50	5.0 mm	0.197 in.
	No.51	4.8 mm	0.189 in.
	No.52	4.6 mm	0.181 in.
	No.53	4.4 mm	0.173 in.
	No.54	4.2 mm	0.165 in.
	No.55	4.0 mm	0.157 in.

Rear Planetary Gear

Planetary pinion gear thrust clearance	Standard	0.20 - 0.60 mm	0.0079 - 0.0236 in.
	Maximum	1.00 mm	0.0394 in.

Valve Body Spring

Spring	Free length and Coil outer diameter mm (in.)		Total No. of coils and Color	
Upper valve body				
Secondary regulator valve	30.9 (1.217)	11.2 (0.441)	10.5	Blue
Lock-up relay valve	21.4 (0.843)	5.5 (0.217)	17.5	Light Gray
3 - 4 shift valve	30.8 (1.213)	9.7 (0.382)	10.5	Purple
Down shift plug	27.3 (1.075)	8.7 (0.343)	12.5	Yellow
Throttle valve	20.6 (0.811)	9.2 (0.362)	9.5	Blue
	or 23.3 (0.917)	9.2 (0.362)	9.5	White
SUPRA, PREVIA Second coast modulator valve	24.6 (0.967)	8.3 (0.327)	9.0	Orange
OTHERS Second coast modulator valve	25.3 (0.996)	8.6 (0.339)	9.5	Orange
Cut-back valve	21.8 (0.858)	6.0 (0.236)	13.5	Red
2 - 3 shift valve	30.8 (1.213)	9.7 (0.382)	10.5	Blue
SUPRA, PREVIA Low coast modulator valve	26.4 (1.039)	8.3 (0.327)	10.5	Yellow
OTHERS Low coast modulator valve	30.4 (1.197)	8.3 (0.327)	10.5	Yellow
Lower valve body				
Check valve	20.2 (0.796)	12.1 (0.476)	6.5	None
Pressure relief valve	11.2 (0.441)	6.4 (0.252)	7.5	None
1 - 2 shift valve	30.8 (1.213)	9.7 (0.382)	10.5	Purple
Primary regulator valve	62.3 (2.453)	18.6 (0.732)	12.5	Purple
SUPRA Accumulator control valve	36.1 (1.421)	8.9 (0.327)	14.0	White
OTHERS Accumulator control valve	33.9 (1.335)	8.8 (0.346)	12.0	Pink

Valve Body Key

Key	Height mm (in.)	Width mm (in.)	Thickness mm (in.)
Upper valve body			
Low coast modulator valve	14.5 (0.571)	5.0 (0.197)	3.2 (0.126)
2 - 3 shift valve	14.0 (0.551)	5.0 (0.197)	3.2 (0.126)
Cut-back valve	15.0 (0.591)	5.0 (0.197)	3.2 (0.126)
Secondary regulator valve	14.0 (0.551)	5.0 (0.197)	3.2 (0.126)
Lock-up relay valve	21.2 (0.835)	5.0 (0.197)	3.2 (0.126)
3 - 4 shift valve	16.5 (0.650)	5.0 (0.197)	3.2 (0.126)
2nd coast modulator valve	16.5 (0.650)	5.0 (0.197)	3.2 (0.126)
Lower valve body			
Accumulator control valve	21.2 (0.835)	5.0 (0.197)	3.2 (0.126)
1 - 2 shift valve	16.5 (0.650)	6.0 (0.236)	3.2 (0.126)
Primary regulator valve	16.2 (0.638)	5.0 (0.197)	3.2 (0.126)

Transmission Case

Transmission case bushing	Maximum	38.19 mm	1.5035 in.

Extension Housing

Extension housing bushing	Maximum	40.09 mm	1.5783 in.

Output Shaft

Thrust play	0.27 - 0.86 mm	0.0106 - 0.0339 in.

Accumulator Spring

SUPRA:

Spring	(Color)	Free length mm (in.)	Outer diameter mm (in.)
B_2	(Red)	73.4 (2.890)	19.9 (0.783)
C_2 (Inner)	(Pink)	42.1 (1.657)	14.7 (0.579)
C_2 (Outer)	(Purple)	70.2 (2.764)	20.2 (0.795)
B_0	(White & Blue)	67.0 (2.638)	16.2 (0.638)
C_0 (Outer)	(Orange)	74.6 (2.397)	20.9 (0.823)
C_0 (Inner)	(Yellow)	46.0 (1.811)	14.0 (0.551)

TRUCK, 4 RUNNER, T100:

Spring	(Color)	Free length mm (in.)	Outer diameter mm (in.)
B_2	(Yellow)	70.5 (2.776)	19.7 (0.776)
C_2 (Inner)	(Pink)	42.1 (1.657)	14.7 (0.579)
C_2 (Outer)	(Purple)	70.2 (2.764)	20.2 (0.795)
B_0	(Green)	62.0 (2.441)	16.0 (0.630)
C_0 (Outer)	(Orange)	74.6 (2.397)	20.9 (0.823)
C_0 (Inner)	(Yellow)	46.0 (1.811)	14.0 (0.551)

PREVIA:

Spring	(Color)	Free length mm (in.)	Outer diameter mm (in.)
B_2	(White & Red)	75.3 (2.965)	20.0 (0.787)
C_2 (Inner)	(Pink)	42.1 (1.657)	14.7 (0.579)
C_2 (Outer)	(Purple)	70.2 (2.764)	20.2 (0.795)
B_0	(White & Blue)	67.0 (2.638)	16.2 (0.638)
C_0 (Outer)	(Orange)	74.6 (2.397)	20.9 (0.823)
C_0 (Inner)	(Yellow)	46.0 (1.811)	14.0 (0.551)

AT06Q-0E

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
Stator shaft x Oil pump body		10	100	7
Upper valve body x Lower valve body		6.4	65	56 in.·lbf
Detent spring x Valve body		10	100	7
Parking lock pawl bracket		7.4	75	65 in.·lbf
Overdrive support x Transmission case		25	260	19
Oil pump x Transmission case		22	220	16
Valve body x Transmission case		10	100	7
Oil strainer x Valve body		10	100	7
Solenoid x Valve body		10	100	7
Oil pan x Transmission case		7.4	75	65 in.·lbf
Extension housing x Transmission case		36	370	27
Transmission housing	10 mm bolt	34	345	25
	12 mm bolt	57	580	42
Union		29	300	22
Vehicle speed sensor		16	160	12
Park/Neutral position switch		6.9	70	61 in.·lbf
Park/Neutral position switch adjusting bolt		13	130	9
Control shaft lever		16	160	12

SERVICE SPECIFICATIONS

SERVICE DATE

AT06P-0D

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	38.19 mm	1.5035 in.
Stator shaft bushing inside diameter			
Front side	Maximum	21.58 mm	0.8496 in.
Rear side	Maximum	27.08 mm	1.0661 in.

Overdrive Direct Clutch

Clutch drum bushing inside diameter	Maximum	27.11 mm	1.0673 in.
Overdrive direct clutch piston stroke		1.85 - 2.15 mm	0.0728 - 0.0846 in.
Overdrive planetary gear bushing	Maximum	11.27 mm	0.4437 in.
Planetary pinion gear thrust clearance	STD	0.20 - 0.60 mm	0.0079 - 0.0236 in.
	Maximum	1.00 mm	0.0394 in.
Flange thickness	No.16	3.6 mm	0.142 in.
	No.17	3.5 mm	0.138 in.
	No.18	3.4 mm	0.134 in.
	No.19	3.3 mm	0.130 in.
	No.20	3.2 mm	0.126 in.
	No.21	3.1 mm	0.122 in.

Overdrive Brake

Piston stroke		1.40 - 1.70 mm	0.0551 - 0.0669 in.

Direct Clutch

Piston stroke		1.37 - 1.60 mm	0.0359 - 0.0630 in.
Drum bushing inside diameter		53.99 mm	2.1256 in.
Flange thickness	No.33	3.0 mm	0.118 in.
	No.32	3.1 mm	0.122 in.
	No.31	3.2 mm	0.126 in.
	No.30	3.3 mm	0.130 in.
	No.29	3.4 mm	0.134 in.
	No.28	3.5 mm	0.138 in.
	No.27	3.6 mm	0.142 in.
	No.34	3.7 mm	0.146 in.

Forward Clutch

Pack clearance		0.5 - 0.9 mm	0.020 - 0.035 in.
Drum bushing inside diameter		24.08 mm	0.9480 in.
Flange thickness	No.61	3.0 mm	0.118 in.
	No.60	3.2 mm	0.126 in.
	No.45	3.4 mm	0.134 in.
	No.62	3.6 mm	0.142 in.
	No.44	3.8 mm	0.150 in.
	No.42	4.0 mm	0.157 in.
	No.63	4.2 mm	0.165 in.
	No.64	4.4 mm	0.173 in.

Second Coast Brake

Piston stroke		1.5 - 3.0 mm	0.059 - 0.118 in.
Piston rod length		72.9 mm	2.870 in.
		71.4 mm	2.811 in.

Front Planetary Gear

Maximum inside diameter		24.08 mm	0.9480 in.
Planetary pinion gear thrust clearance	STD	0.20 - 0.60 mm	0.0079 - 0.0236 in.
	Maximum	1.00 mm	0.0394 in.

Planetary Sun Gear

Sun gear bushing inside diameter	Maximum	27.08 mm	1.0661 in.

Second Brake

Pack clearance		0.62 - 1.98 mm	0.0244 - 0.0780 in.

First and Reverse Brake

Pack clearance		0.60 - 1.32 mm	0.0236 - 0.0520 in.

Rear Planetary Gear

Planetary pinion gear thrust clearance	STD	0.20 - 0.60 mm	0.0079 - 0.0236 in.
	Maximum	1.00 mm	0.0394 in.

Valve Body Spring

Spring	Free length and Coil outer diameter mm (in.)		Total No. of coils and Color	
Upper valve body				
Secondary regulator valve	30.9 (1.217)	11.2 (0.441)	10.5	Blue
Lock-up relay valve	21.4 (0.843)	5.5 (0.217)	17.5	Light Gray
3 - 4 shift valve	30.8 (1.213)	9.7 (0.382)	10.5	Purple
Down shift plug	27.3 (1.075)	8.7 (0.343)	12.5	Yellow
Throttle valve	20.6 (0.811)	9.2 (0.362)	9.5	Blue
	or 23.3 (0.917)	9.2 (0.362)	9.5	White
Second coast modulator valve	25.3 (0.996)	8.6 (0.339)	11.5	Orange
Cut-back valve	21.8 (0.858)	6.0 (0.236)	13.5	Red
2 - 3 shift valve	30.8 (1.213)	9.7 (0.382)	10.5	Blue
Low coast modulator valve	30.4 (1.197)	8.3 (0.327)	10.5	Light Green
Lower valve body				
Check valve	20.2 (0.796)	12.1 (0.476)	6.5	None
Pressure relief valve	11.2 (0.441)	6.4 (0.252)	7.5	None
1 - 2 shift valve	30.8 (1.213)	9.7 (0.382)	10.5	Purple
Primary regulator valve	62.3 (2.453)	18.6 (0.732)	12.5	Purple
Accumulator control valve	33.9 (1.335)	8.8 (0.346)	12.0	Pink

Valve Body Key

Key	Height mm (in.)	Width mm (in.)	Thickness mm (in.)
Upper valve body			
Low coast modulator valve	14.5 (0.571)	5.0 (0.197)	3.2 (0.126)
2 - 3 shift valve	14.0 (0.551)	5.0 (0.197)	3.2 (0.126)
Cut-back valve	15.0 (0.591)	5.0 (0.197)	3.2 (0.126)
Secondary regulator valve	14.0 (0.551)	5.0 (0.197)	3.2 (0.126)
Lock-up relay valve	21.2 (0.835)	5.0 (0.197)	3.2 (0.126)
3 - 4 shift valve	16.5 (0.650)	5.0 (0.197)	3.2 (0.126)
2nd coast modulator valve	16.5 (0.650)	5.0 (0.197)	3.2 (0.126)
Lower valve body			
Accumulator control valve	21.2 (0.835)	5.0 (0.197)	3.2 (0.126)
1 - 2 shift valve	16.5 (0.650)	5.0 (0.197)	3.2 (0.126)
Primary regulator valve	16.2 (0.638)	5.0 (0.197)	3.2 (0.126)

Output Shaft

Thrust play	0.27 - 0.86 mm	0.0106 - 0.0339 in.

Transfer Direct Clutch

Piston stroke	2.28 - 2.68 mm	0.0898 - 0.1055 in.
Drum bushing inside diameter	47.65 mm	1.8760 in.
Flange thickness	3.9 mm	0.154 in.
	4.1 mm	0.161 in.
	4.3 mm	0.169 in.
	4.5 mm	0.177 in.

Transfer Low Speed Brake

Center support bushing inside diameter	35.08 mm	1.3811 in.
Ring gear flange bushing inside diameter	35.08 mm	1.3811 in.
Planetary gear bushing inside diameter	18.08 mm	0.7118 in.
Planetary pinion gear thrust clearance STD	0.30 - 0.60 mm	0.0118 - 0.0236 in.
Maximum	1.00 mm	0.0394 in.

Transfer Front Drive Clutch

Piston stroke	2.38 - 3.22 mm	0.0937 - 0.1268 in.

Transfer Valve Body Spring

Spring	Free length and Coil outer diameter mm (in.)		Total No. of coils and Color	
Upper valve body				
Direct clutch accumulator valve	55.7 (2.193)	18.3 (0.720)	11.1	Blue
Center valve body				
Accumulator control valve	29.3 (1.154)	8.2 (0.323)	11.8	White
Low-high relay valve	31.7 (1.248)	8.5 (0.335)	11.2	Light Blue
Low shift valve	29.2 (1.213)	8.2 (0.323)		
Lower valve body				
Low-high shift timing valve	33.1 (1.303)	8.7 (0.343)	15.0	Red
Low-high orifice control valve	29.7 (1.196)	9.0 (0.354)	12.3	Green

Transfer Valve Body Key

Key	Height mm (in.)	Width mm (in.)	Thickness mm (in.)
Upper valve body			
Direct clutch accumulator valve	9.5 (0.374)	9.5 (0.374)	3.2 (0.126)
Center valve body			
Accumulator control valve	21.2 (0.835)	5.0 (0.197)	3.2 (0.126)
Low-high relay valve	8.5 (0.335)	5.0 (0.197)	3.2 (0.126)
Low shift valve	9.5 (0.374)	5.0 (0.197)	3.2 (0.126)
Lower valve body			
Low-high shift timing valve	8.5 (0.335)	5.0 (0.197)	3.2 (0.126)
Low-high orifice control valve	8.5 (0.335)	5.0 (0.197)	3.2 (0.126)

Transfer Case And Front Support

Front support bushing inside diameter	31.40 mm 1.2362 in.

Transfer Chain Front Case

Front drive shaft oil seal depth		2.7 - 3.3 mm 0.106 - 0.130 in.
Output shaft oil seal depth	Front	11.0 - 11.3 mm 0.433 - 0.445 in.
	Rear	0 - +0.3 mm 0 - +0.012 in.

Transfer Chain Rear Case

Front drive shaft bearing depth		1.2 - 1.8 mm 0.047 - 0.071 in.
Output shaft oil seal depth	Front	11.0 - 11.3 mm 0.433 - 0.445 in.
	Rear	0 - +0.3 mm 0 - +0.012 in.

Transfer 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	0.15 - 0.42 mm 0.0059 - 0.0165 in.
	Maximum	0.6 mm 0.024 in.
Side clearance	STD	0.04 - 0.15 mm 0.0016 - 0.0059 in.

Transfer Extension Housing

Extension housing oil seal depth	2.7 - 3.3 mm 0.106 - 0.130 in.

Accumulator Spring

Spring		Free length / Outer diameter mm (in.)	Color
B_2		70.5 (2.776) / 19.7(0.776)	Yellow
C_2	Inner	42.1 (1.657) / 14.7 (0.579)	Pink
C_2	Outer	70.2 (2.764) / 20.2 (0.795)	Purple
B_0		62.0 (2.441) / 16.0 (0.630)	Green
C_0	Outer	74.6 (2.937) / 20.9 (0.823)	Orange
C_0	Inner	46.0 (1.811) / 14.0 (0.551)	Yellow

AT06Q-08

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
Stator shaft x Oil pump body		10	100	7
Upper valve body x Lower valve body		6.4	65	56 in.·lbf
Detent spring x Valve body		10	100	7
Transfer lower valve body x Transfer center valve body		6.4	65	56 in.·lbf
Transfer center valve body x Transfer upper valve body		6.4	65	56 in.·lbf
Transfer upper valve body x Transfer lower valve body		6.4	65	56 in.·lbf
No.4 solenoid x Valve body		10	100	7
Transfer pressure switch x Valve body		6.9	70	61 in.·lbf
Transfer oil strainer x Transfer chain rear case		6.9	70	61 in.·lbf
Transfer oil pump x Transfer oil pump cover		10	100	7
Oil pump x Transmission case		22	220	16
Parking lock pawl bracket		7.4	75	65 in.·lbf
Transfer case x Transmission case		34	345	25
Transfer front support x Transfer case		34	345	25
Transfer chain front case x Transfer case		34	345	25
Oil receiver x Transfer chain front case		10	100	7
Transfer chain front case x Transfer chain rear case		34	345	25
Transfer oil pump x Transfer chain rear case		16	160	12
Transfer extension housing x Transfer chain rear case		34	345	25
Front companion flange		123	1,250	90
Rear companion flange		123	1,250	90
Overdrive case x Transmission case		25	260	19
Valve body x Transmission case		10	100	7
Oil strainer case x Valve body		10	100	7
Oil strainer case x Oil strainer		6.9	70	61 in.·lbf
Transfer valve body x Transfer case		10	100	7
Transfer oil pan x Transfer case		7.4	75	65 in.·lbf
Transfer position switch		3.9	40	35 in.·lbf
Transfer control shaft lever		16	160	12
Speedometer drive gear		16	160	12
Transfer oil cooler tube		34	345	25
Transmission fluid temperature sensor		15	150	11
Transfer fluid temperature sensor		15	150	11
Transmission oil pan x Transmission case		7.4	75	65 in.·lbf
Transmission housing	14 mm bolt	34	345	25
	17 mm bolt	57	580	42
Union		29	300	22
Park/Neutral position switch		6.9	70	61 in.·lbf
Park/Neutral position switch adjusting bolt		13	130	9
Control shaft lever		16	160	12

SERVICE SPECIFICATIONS

SERVICE DATE

AT06P-0E

Oil Pump

Body clearance	Standard	0.07 - 0.15 mm	0.0028 - 0.0059 in.
	Maximum	0.3 mm	0.012 in.
Tip clearance	Standard	0.11 - 0.14 mm	0.0043 - 0.0055 in.
	Maximum	0.3 mm	0.012 in.
Side clearance	Standard	0.02 - 0.05 mm	0.0008 - 0.0020 in.
	Maximum	0.1 mm	0.004 in.
Pump body bushing inside diameter	Maximum	38.19 mm	1.5035 in.
Stator shaft bushing inside diameter			
Front side	Maximum	21.58 mm	0.8496 in.
Rear side	Maximum	27.08 mm	1.0661 in.

Overdirve Direct Clutch

Clutch drum bushing inside diameter	Maximum	27.11 mm	1.0673 in.
Overdrive direct clutch piston stroke		1.77 - 2.07 mm	0.0697 - 0.0815 in.
Overdrive planetary gear bushing	Maximum	11.27 mm	0.4437 in.
Planetary pinion gear thrust clearance	Standard	0.20 - 0.60 mm	0.0079 - 0.0236 in.
	Maximum	1.00 mm	0.0394 in.
Flange thickness	No.16	3.6 mm	0.142 in.
	No.17	3.5 mm	0.138 in.
	No.18	3.4 mm	0.134 in.
	No.19	3.3 mm	0.130 in.
	No.20	3.2 mm	0.126 in.
	No.21	3.1 mm	0.122 in.

Overdrive Brake

Piston stroke		1.32 - 1.62 mm	0.0520 - 0.0638 in.
Flange thickness	No.77	3.3 mm	0.130 in.
	No.78	3.5 mm	0.138 in.
	No.79	3.6 mm	0.142 in.
	No.80	3.7 mm	0.146 in.
	No.81	3.8 mm	0.150 in.
	No.82	3.9 mm	0.154 in.
	None	4.0 mm	0.157 in.

Direct Clutch

Piston stroke		1.03 - 1.33 mm	0.0405 - 0.0524 in.
Drum bushing inside diameter		53.99 mm	2.1256 in.
Flange thickness	No.33	3.0 mm	0.118 in.
	No.32	3.1 mm	0.122 in.
	No.31	3.2 mm	0.126 in.
	No.30	3.3 mm	0.130 in.
	No.29	3.4 mm	0.134 in.
	No.28	3.5 mm	0.138 in.
	No.27	3.6 mm	0.142 in.
	No.34	3.7 mm	0.146 in.

Forward Clutch

Pack clearance		0.4 - 0.8 mm	0.016 - 0.031 in.
Drum bushing inside diameter		24.08 mm	0.9480 in.
Flange thickness	No.61	3.0 mm	0.118 in.
	No.60	3.2 mm	0.126 in.
	No.45	3.4 mm	0.134 in.
	No.62	3.6 mm	0.142 in.
	No.44	3.8 mm	0.150 in.
	No.42	4.0 mm	0.157 in.
	No.63	4.2 mm	0.165 in.
	No.64	4.4 mm	0.173 in.

Second Coast Brake

Piston stroke		1.5 - 3.0 mm	0.059 - 0.118 in.
Piston rod length		72.9 mm	2.870 in.
		71.4 mm	2.811 in.

Front Planetary Gear

Maximum inside diameter		24.08 mm	0.9480 in.
Planetary pinion gear thrust clearance	Standard	0.20 - 0.60 mm	0.0079 - 0.0236 in.
	Maximum	1.00 mm	0.0394 in.

Planetary Sun Gear

Sun gear bushing inside diameter	Maximum	27.08 mm	1.0661 in.

Second Brake

Pack clearance		0.50 - 1.76 mm	0.0197 - 0.0693 in.

First and Reverse Brake

Pack clearance		0.50 - 1.02 mm	0.0197 - 0.0402 in.
Flange thickness	No.50	5.0 mm	0.197 in.
	No.51	4.8 mm	0.189 in.
	No.52	4.6 mm	0.181 in.
	No.53	4.4 mm	0.173 in.
	No.54	4.2 mm	0.165 in.
	No.55	4.0 mm	0.157 in.

Rear Planetary Gear

Planetary pinion gear thrust clearance	Standard	0.20 - 0.60 mm	0.0079 - 0.0236 in.
	Maximum	1.00 mm	0.0394 in.

Valve Body Spring

Spring	Free length and Coil outer diameter mm (in.)		Total No. of coils and Color	
Upper valve body				
Secondary regulator valve	30.9 (1.217)	11.2 (0.441)	10.5	Blue
Lock-up relay valve	21.4 (0.843)	5.5 (0.217)	17.5	Light Gray
3 - 4 shift valve	30.8 (1.213)	9.7 (0.382)	10.5	Purple
Down shift plug	27.3 (1.075)	8.7 (0.343)	12.5	Yellow
Throttle valve	20.6 (0.811)	9.2 (0.362)	9.5	Blue
	or 23.3 (0.917)	9.2 (0.362)	9.5	White
Second coast modulator valve	25.3 (0.996)	8.6 (0.339)	11.5	Orange
Cut-back valve	21.8 (0.858)	6.0 (0.236)	13.5	Red
2 - 3 shift valve	30.8 (1.213)	9.7 (0.382)	10.5	Blue
Low coast modulator valve	30.4 (1.197)	8.3 (0.327)	10.5	Light Green
Lower valve body				
Check valve	20.2 (0.796)	12.1 (0.476)	6.5	None
Pressure relief valve	11.2 (0.441)	6.4 (0.252)	7.5	None
1 - 2 shift valve	30.8 (1.213)	9.7 (0.382)	10.5	Purple
Primary regulator valve	62.3 (2.453)	18.6 (0.732)	12.5	Purple
Accumulator control valve	33.9 (1.335)	8.8 (0.346)	12.0	Pink

Valve Body Key

Key	Height mm (in.)	Width mm (in.)	Thickness mm (in.)
Upper valve body			
Low coast modulator valve	14.5 (0.571)	5.0 (0.197)	3.2 (0.126)
2 - 3 shift valve	14.0 (0.551)	5.0 (0.197)	3.2 (0.126)
Cut-back valve	15.0 (0.591)	5.0 (0.197)	3.2 (0.126)
Secondary regulator valve	14.0 (0.551)	5.0 (0.197)	3.2 (0.126)
Lock-up relay valve	21.2 (0.835)	5.0 (0.197)	3.2 (0.126)
3 - 4 shift valve	16.5 (0.650)	5.0 (0.197)	3.2 (0.126)
2nd coast modulator valve	16.5 (0.650)	5.0 (0.197)	3.2 (0.126)
Lower valve body			
Accumulator control valve	21.2 (0.835)	5.0 (0.197)	3.2 (0.126)
1 - 2 shift valve	16.5 (0.650)	6.0 (0.236)	3.2 (0.126)
Primary regulator valve	16.2 (0.638)	5.0 (0.197)	3.2 (0.126)

Transmission Case

Transmission case bushing	Maximum	38.19 mm	1.5035 in.

Output Shaft

Thrust play	0.27 - 0.86 mm	0.0106 - 0.0339 in.

Accumulator Spring

Spring	(Color)	Free length mm (in.)	Outer diameter mm(in.)
B_2	(Yellow)	70.5 (2.776)	19.7 (0.776)
C_2	(Blue)	68.5 (2.698)	20.2 (0.795)
B_0	(Light Green)	69.7 (2.744)	16.7 (0.657)
C_0	(White)	67.0 (2.638)	17.8 (0.701)

AT06Q-0D

TORQUE SPECIFICATION

Part tightened		N·m	kgf·cm	ft·lbf
Stator shaft x Oil pump body		10	100	7
Upper valve body x Lower valve body		6.4	65	56 <in.lbf>
Detent spring x Valve body		10	100	7
Parking lock pawl bracket		7.4	75	65 in.·lbf
Overdrive support x Transmission case		25	260	19
Oil pump x Transmission case		22	220	16
Valve body x Transmisson case		10	100	7
Oil strainer x Valve body		10	100	7
Solenoid x Valve body		10	100	7
Oil pan x Transmission case		7.4	75	65 in.·lbf
Transmission housing	14 mm bolt	34	345	25
	17 mm bolt	57	580	42
Union		29	300	22
Vehicle speed sensor		16	160	12
Park/Neutral position switch		6.9	70	61 in.·lbf
Park/Neutral position switch adjusting bolt		13	130	9
Control shaft lever		16	160	12
Transmission case x Transfer adaptor		34	345	25
Transfer adaptor x Transfer		36	370	27
Dynamic damper		37	380	27

DESCRIPTION

GENERAL DESCRIPTION

AT0D4-06

The A340E automatic transmission is a 4-Speed Electronically Controlled Transmission with an intelligent control. The A340E automatic transmission have the following features.

★ When shifting, the clutch hydraulic pressure in the transmission is controlled by the ECM to reduce transmission shift shock.to reduce transmission shift shock.

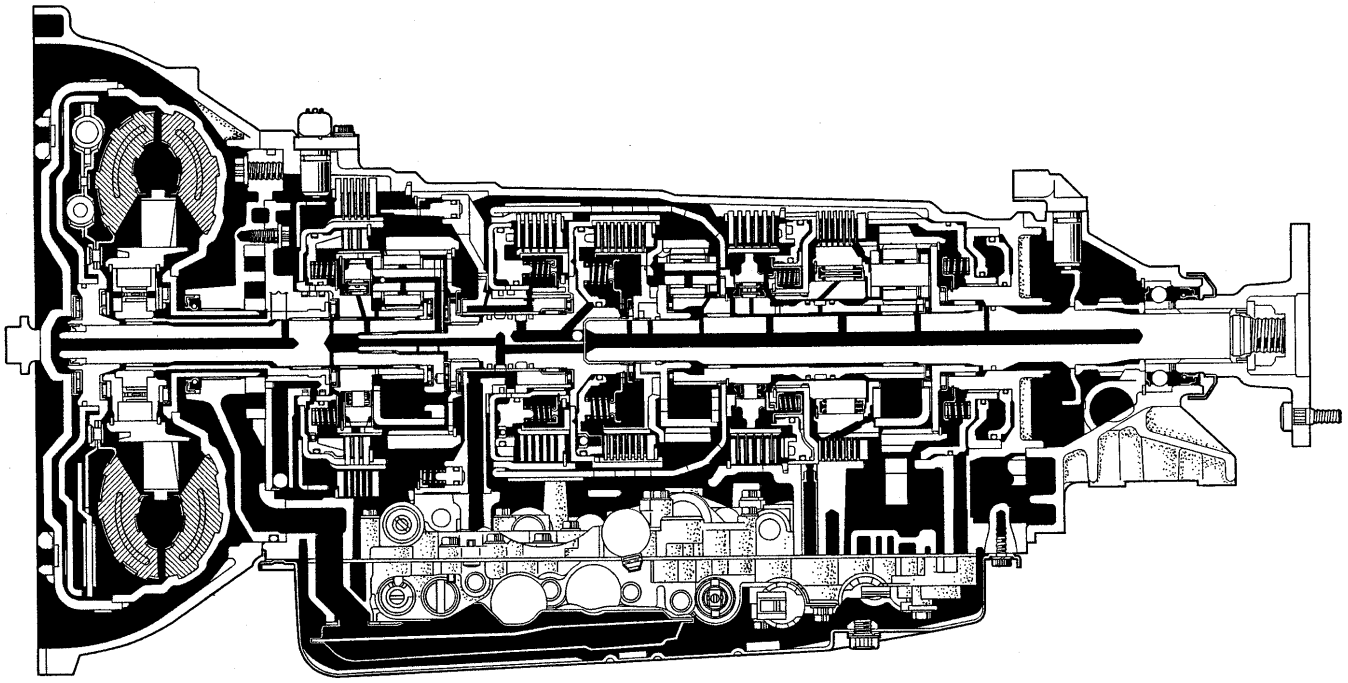
★ A new type of ATF (ATF Type T-II) is used which provides improved shifting characteristics and prevents deterioration in the ATF over time.

HINT: The A340E automatic transmission use ATF Type T-II or equivalent.

A super flow torque converter clutch is used to improve transmission efficiency.

The A340E automatic transmission is mainly composed of a torque converter clutch with lock-up clutch, a 4-speed planetary gear unit, a hydraulic control system and an electronic control system.

To minimize the possibility of incorrect operation of the automatic transmission, a shift lock mechanism has also been added.



V03556

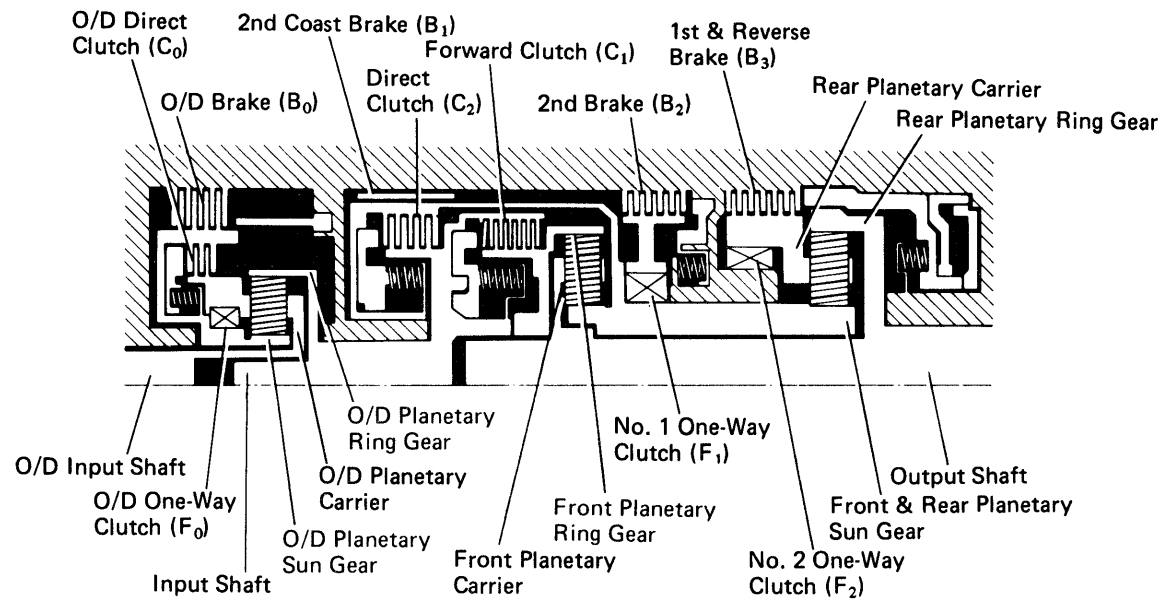
Transmission Specifications

Type of Transmisson		A340E
Type of Engine		2JZ-GTE
Torque Converter Clutch Stall Torque Ratio		2.000 : 1
Lock-up Mechanism		Equipped
Gear Ratio	1st Gear	2.804
	2nd Gear	1.531
	3rd Gear	1.000
	O/D Gear	0.705
	Reverse Gear	2.393
Number of Discs and Plates	(Disc and Plate)	
	O/D Direct Clutch (C_0)	2 / 2
	Forward Clutch (C_1)	7 / 7
	Direct Clutch (C_2)	5 / 5
	No.2 Brake (B_2)	5 / 5
	1st and Reverse Brake (B_3)	7 / 7
	O/D Brake (B_0)	5 / 5
Sedond Coast Brake Band Width	mm (in.)	40 (1.57)
ATF Type		ATF Type T-II or equivalent
Capacity Liter (US qts, Imp.qts)	Total	8.2 (8.7 , 7.2)
	Drain and Refill	1.9 (2.0 , 1.7)

OPERATION

1. OPERATING CONDITIONS

AT0PT-03



AT2157

○ ..... Operating

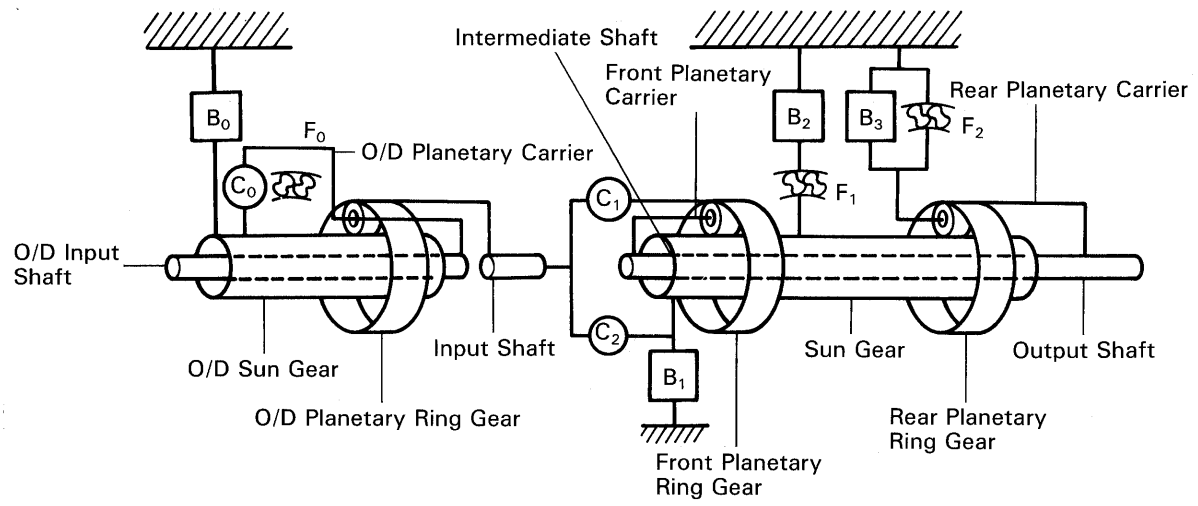
Shift lever position	Gear position	C_0	C_1	C_2	B_0	B_1	B_2	B_3	F_0	F_1	F_2
P	Parking	○									
R	Reverse	○		○				○	○		
N	Neutral	○									
D	1st	○	○						○		○
	2nd	○	○				○		○	○	
	3rd	○	○	○			○		○		
	O/D		○	○	○		○				
2	1st	○	○						○		○
	2nd	○	○			○	○		○	○	
	3rd	○	○	○			○		○		
L	1st	○	○					○	○		○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

* Down-shift only in the L position and 2nd gear — no up-shift.

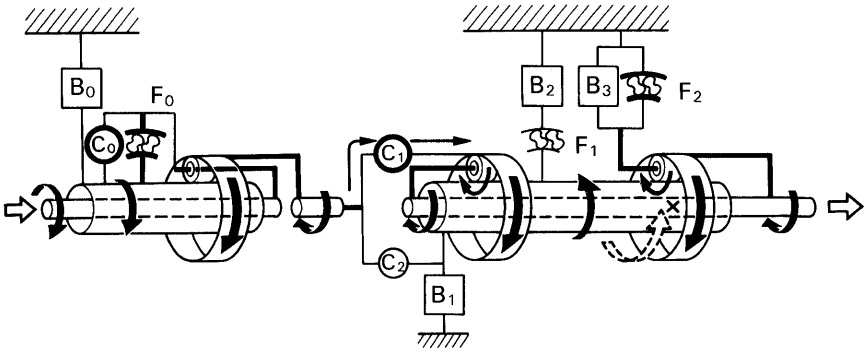
V03089

2. COMPONENTS FUNCTION

NOMENCLATURE	OPERATION
O/D Direct Clutch (C_0)	Connects overdrive sun gear and overdrive carrier
O/D Brake (B_0)	Prevents overdrive sun gear from turning either clockwise or counterclockwise
O/D One-Way Clutch (F_0)	When transmission is being driven by engine, connects overdrive sun gear and overdrive carrier
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

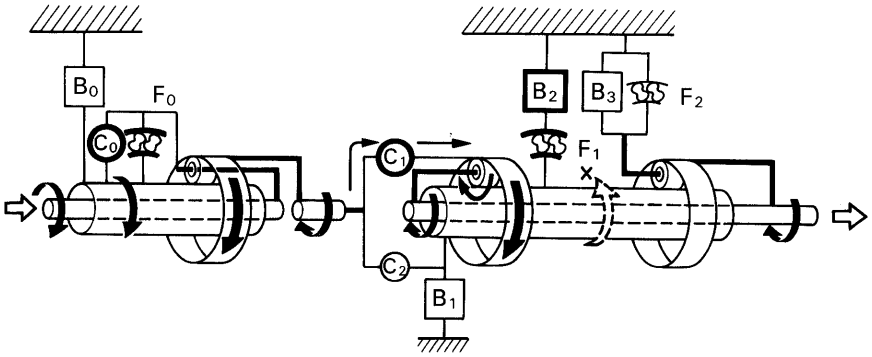


D or 2 Position 1st Gear



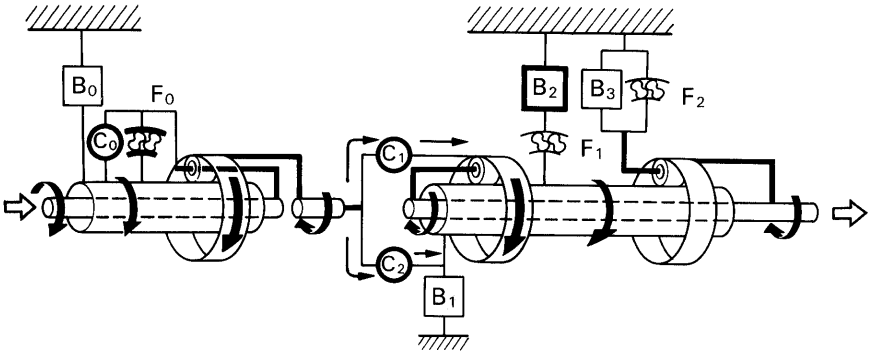
AT6675

D Position 2nd Gear



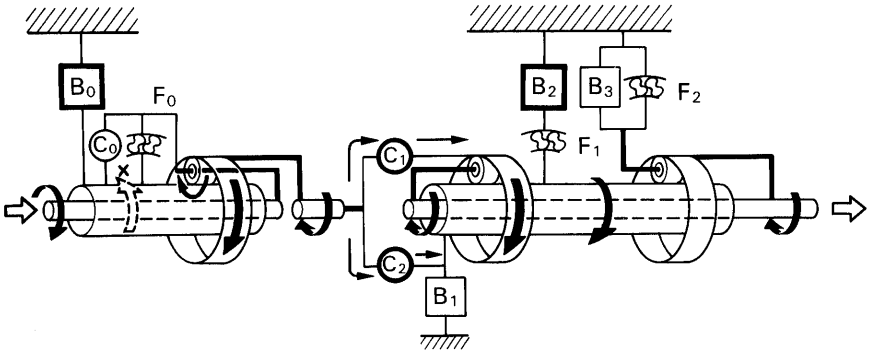
AT6676

D or 2 Position 3rd Gear



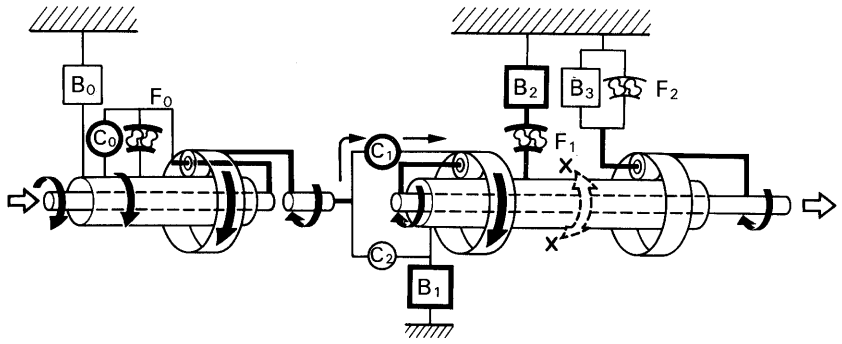
AT6677

D Position O/D



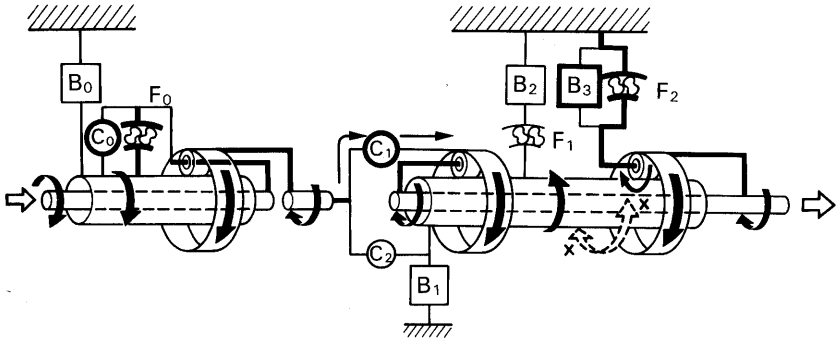
AT6678

2 or L Position 2nd Gear



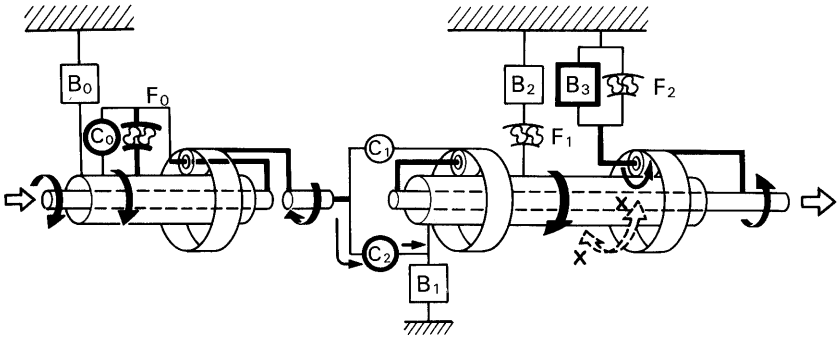
AT6679

L Position 1st Gear



AT6680

R Position Reverse Gear



AT6681

V02111

3. 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.

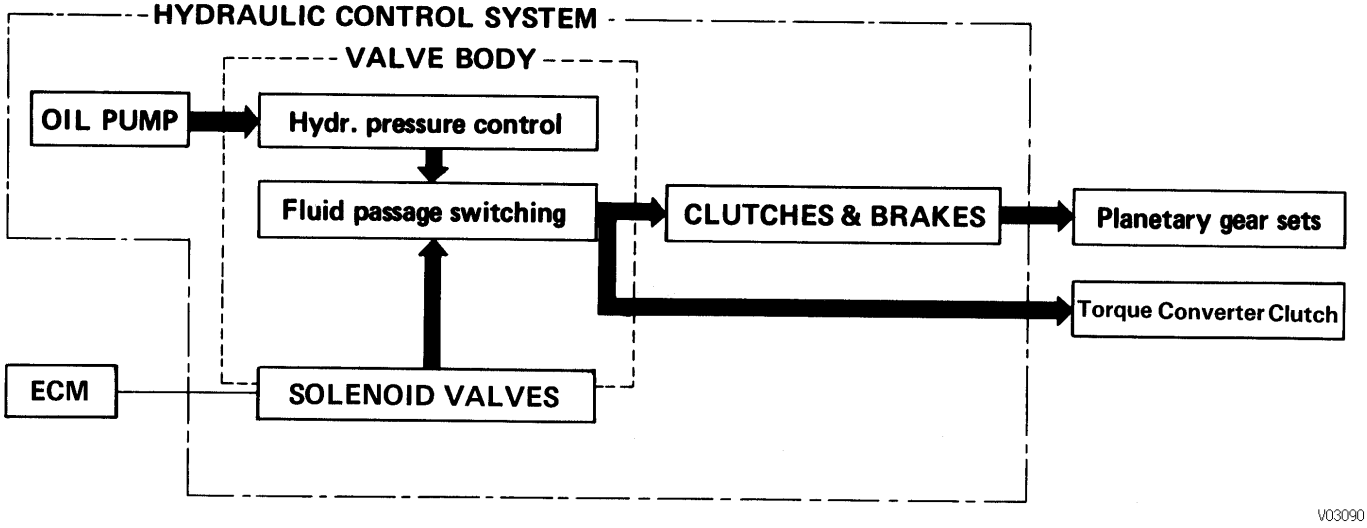
There are 5 solenoid valves on the valve body.

The No.1 and No.2 solenoid valves are turned on and off by signals from the ECM to control 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 lock-up clutch of the torque converter clutch.

The No.4 solenoid valve is operated by signals from the ECM to control the engagement speed and reduce gear shift shock.

The No.5 solenoid valve is operated by signals from the ECM to regulate the line pressure to throttle pressure.



4. ELECTRONIC CONTROL SYSTEM

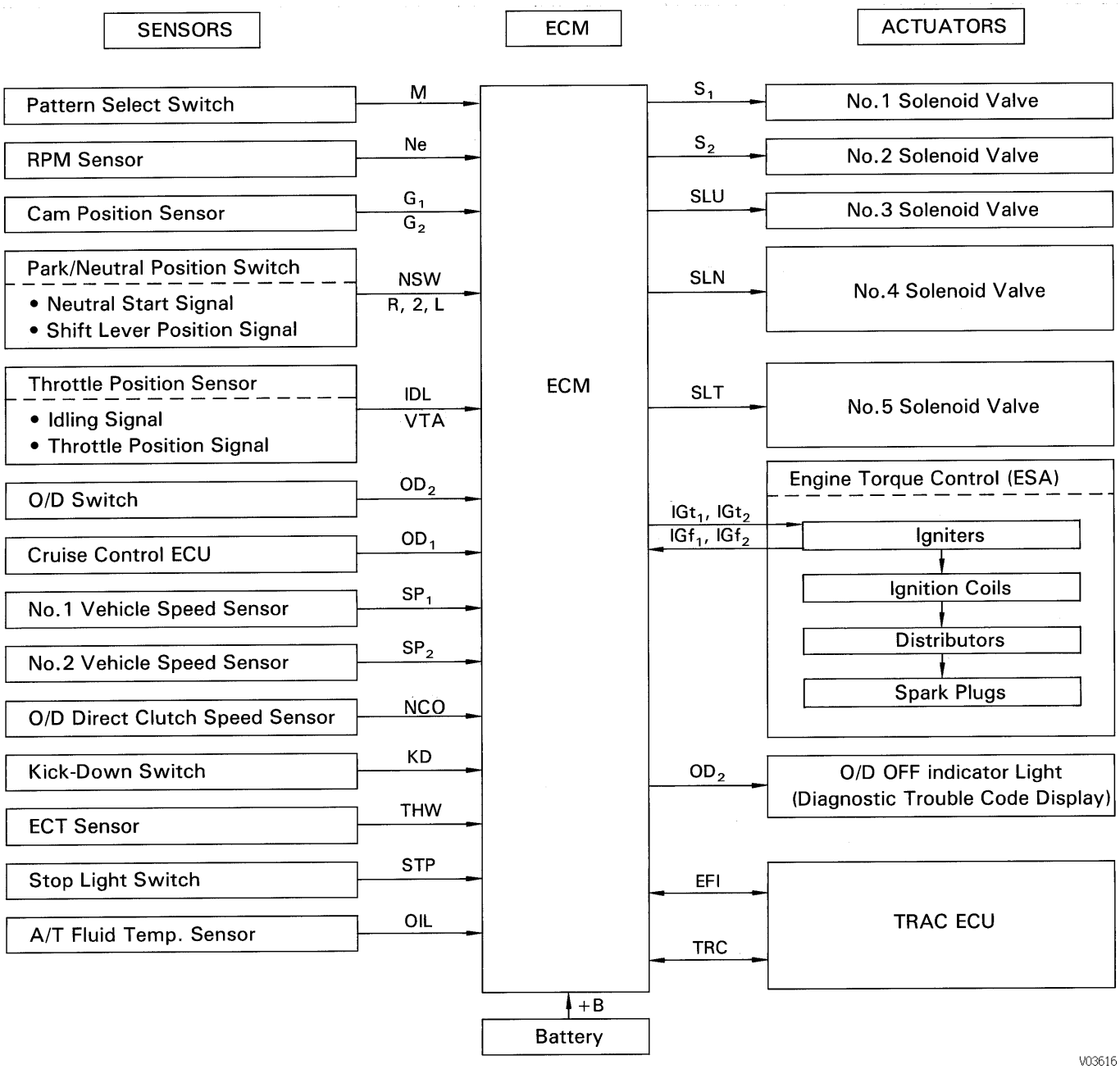
The electronic control system for the A340E automatic transmission provides extremely precise control of the gear shift timing and lock-up timing in response to driving conditions as sensed by various sensors located throughout the vehicle and in response to the engine's running condition.

In addition, the ECM control reduces vehicle squat when the shift lever is moved from N to D.

The electronic control system is also equipped with a self diagnosis system which diagnoses malfunctions for the vehicle to continue functioning when a malfunction occurs.

CONSTRUCTION

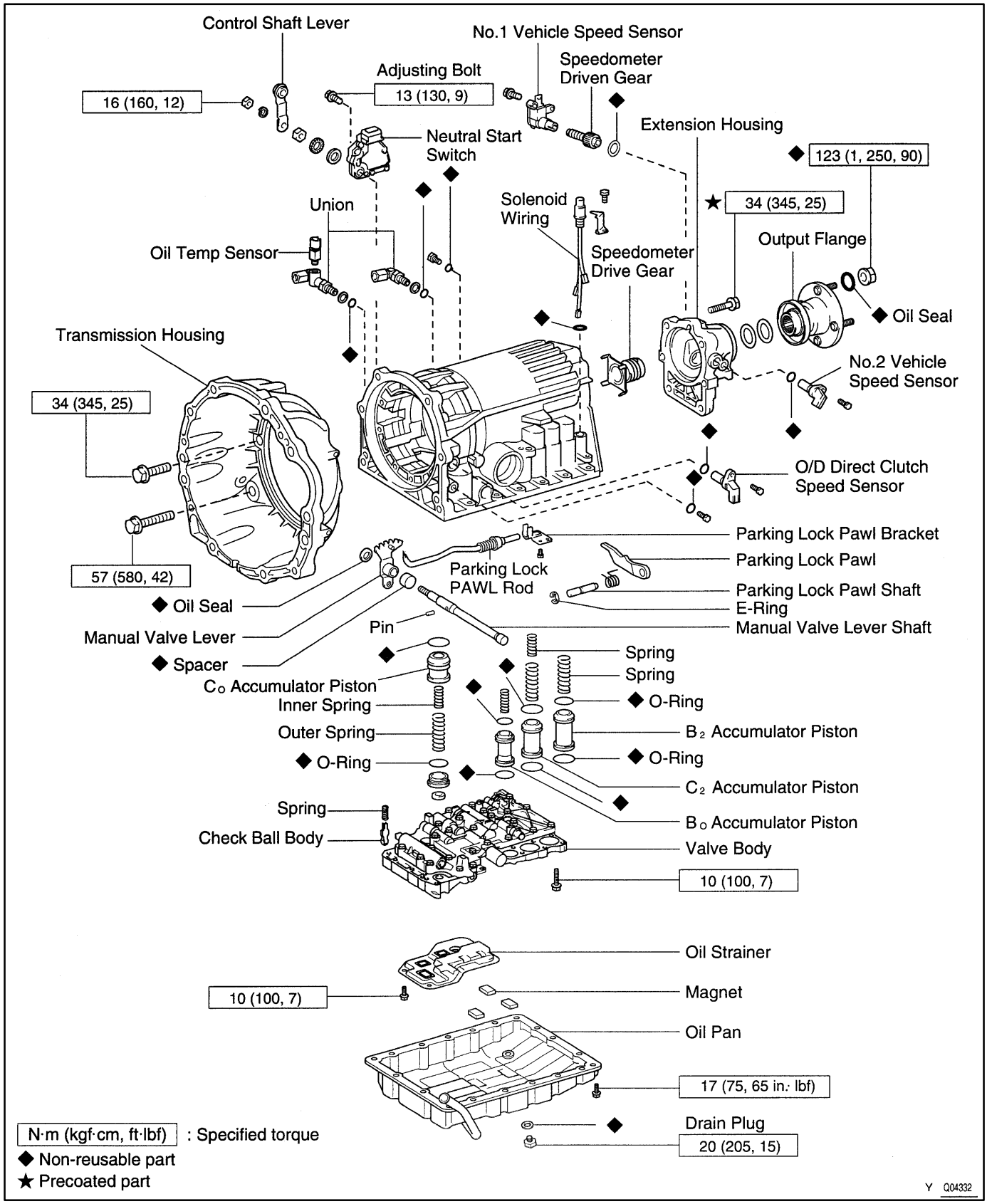
The electronic control system can be broadly divided onto three groups; the sensors, ECM and actuators.

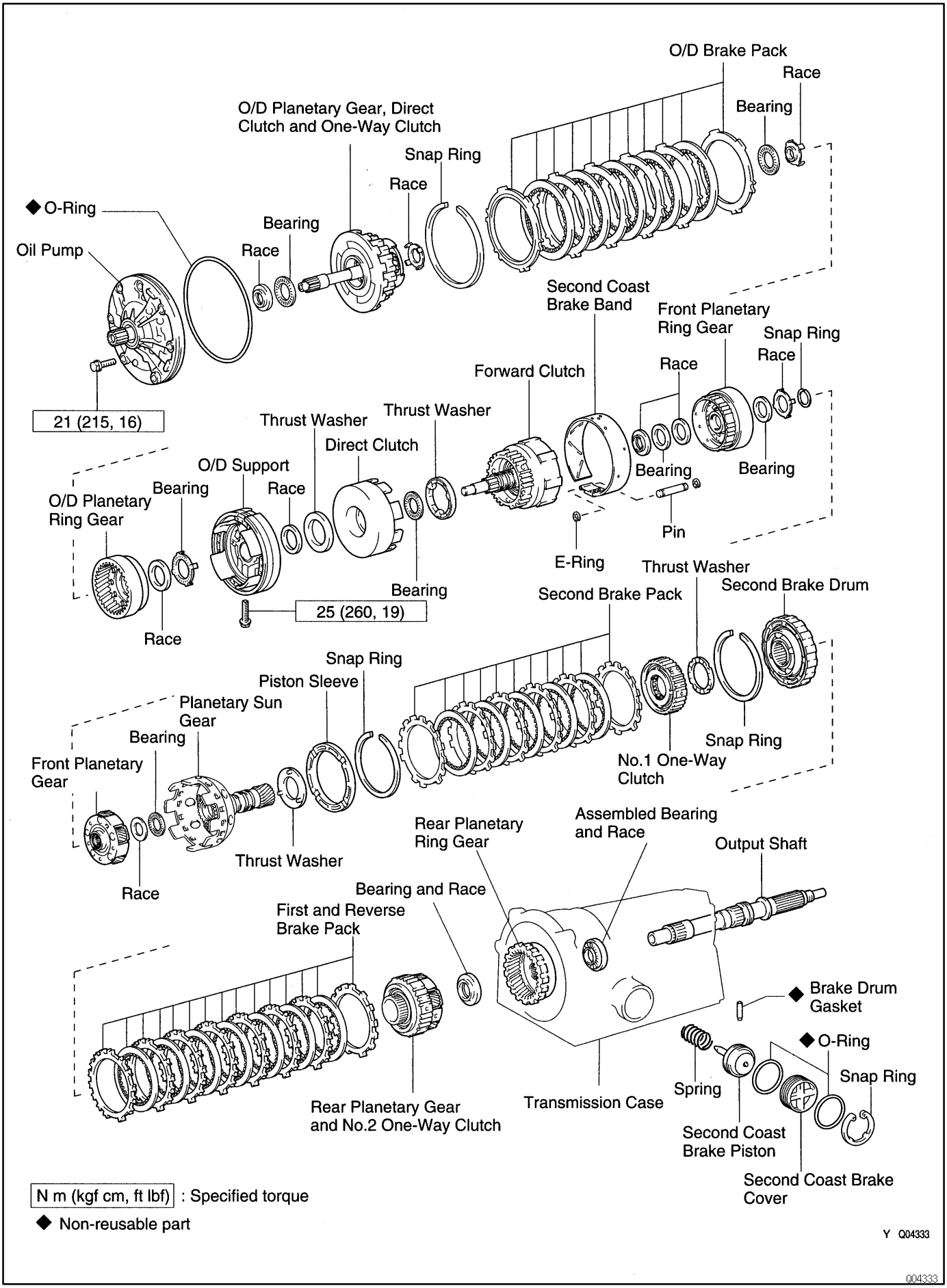


COMPONENT PARTS REMOVAL

AT0DB-02

COMPONENTS

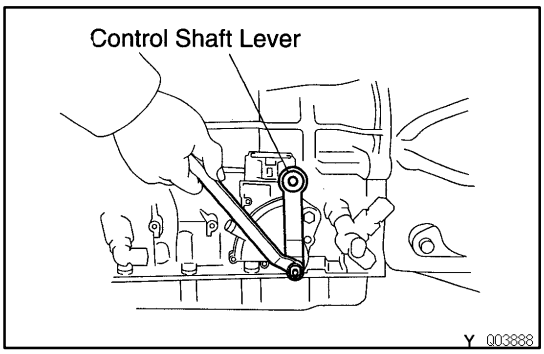



O/D Brake Pack
Race
Bearing
O/D Planetary Gear, Direct Clutch and One-Way Clutch
Snap Ring
Race
◆ O-Ring
Bearing
Race
Oil Pump
Second Coast Brake Band
Front Planetary Ring Gear
Snap Ring
Race
Race
Forward Clutch
21 (215, 16)
Thrust Washer
Thrust Washer
Direct Clutch
O/D Support
Race
Bearing
Bearing
O/D Planetary Ring Gear
Bearing
Pin
E-Ring
Thrust Washer
Second Brake Drum
Second Brake Pack
Bearing
25 (260, 19)
Race
Snap Ring
Piston Sleeve
Planetary Sun Gear
Bearing
Front Planetary Gear
Snap Ring
No.1 One-Way Clutch
Thrust Washer
Race
Rear Planetary Ring Gear
Assembled Bearing and Race
Output Shaft
Bearing and Race
First and Reverse Brake Pack
◆ Brake Drum Gasket
◆ O-Ring
Snap Ring
Spring
Rear Planetary Gear and No.2 One-Way Clutch
Transmission Case
Second Coast Brake Piston
Second Coast Brake Cover
N m (kgf cm, ft lbf) : Specified torque
◆ Non-reusable part
Y Q04333
Q04333

AT0DC-05

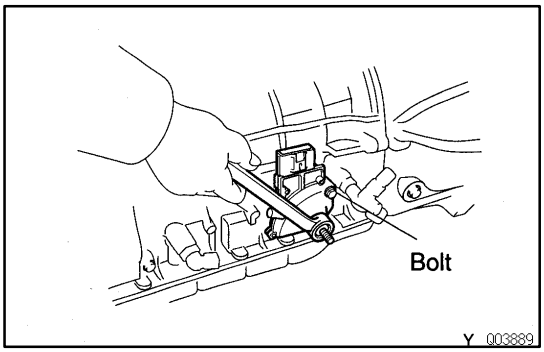
TRANSMISSION DISASSEMBLY

1. REMOVE CONTROL SHAFT LEVER

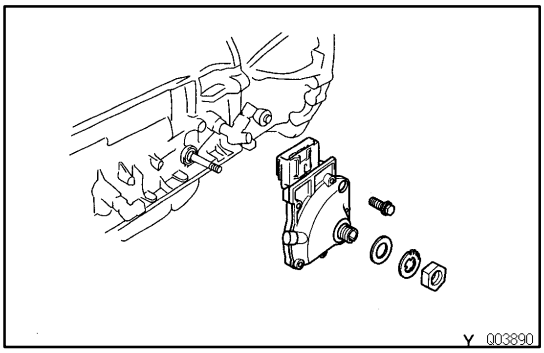


2. REMOVE PARK/NEUTRAL POSITION SWITCH

(a) Unstake the lock washer.
(b) Remove the nut and bolt.

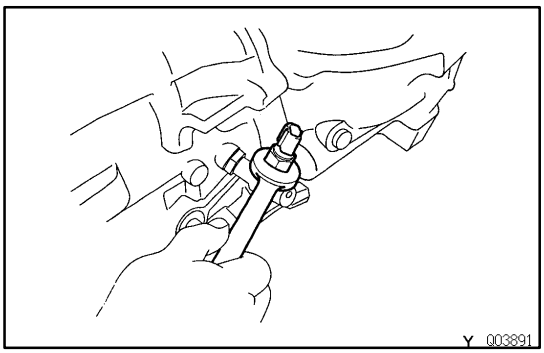


(c) Remove the park/neutral position switch.



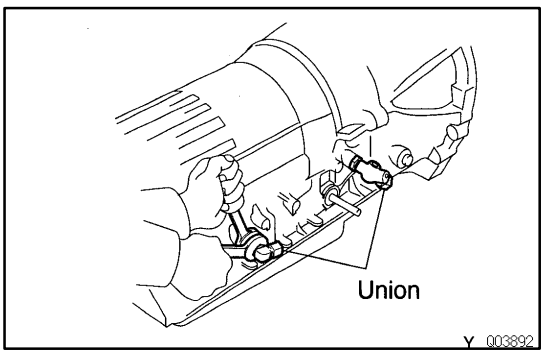
3. REMOVE OIL TEMPERATURE SENSOR

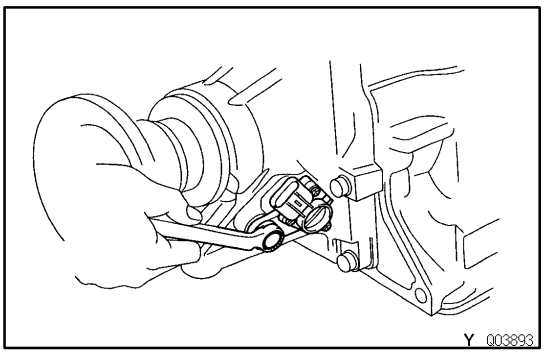
(a) Remove the oil temperature sensor.
(b) Remove the O-ring from the sensor.



4. REMOVE UNIONS

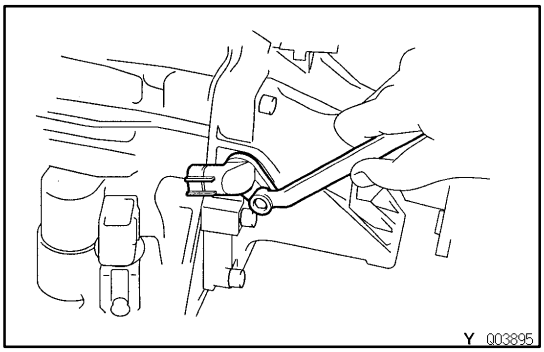
(a) Remove the 2 unions.
(b) Remove the O-ring from both unions.





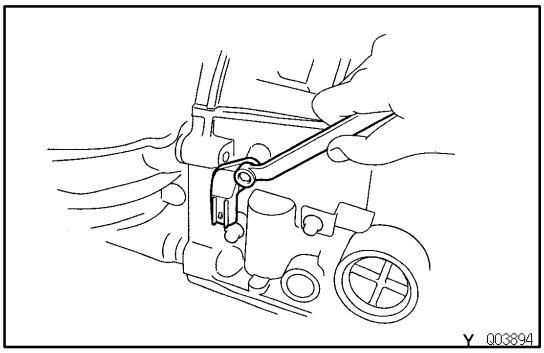
5. REMOVE NO.1 VEHICLE SPEED SENSOR

(a) Remove the No.1 vehicle speed sensor.
(b) Remove the O-ring from the sensor.



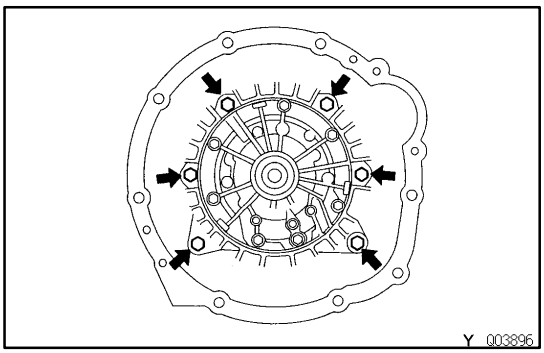
6. REMOVE NO.2 VEHICLE SPEED SENSOR

(a) Remove the No.2 vehicle speed sensor.
(b) Remove the O-ring from the sensor.



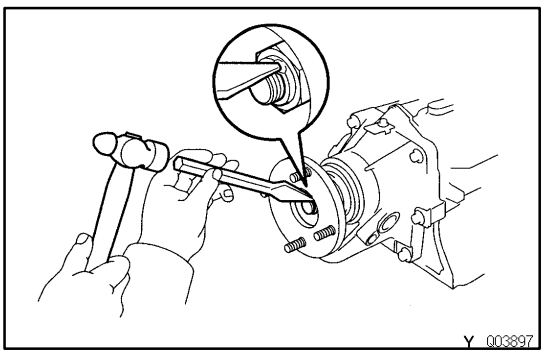
7. REMOVE O/D DIRECT CLUTCH SPEED SENSOR

(a) Remove the O/D direct clutch speed sensor.
(b) Remove the O-ring from the sensor.



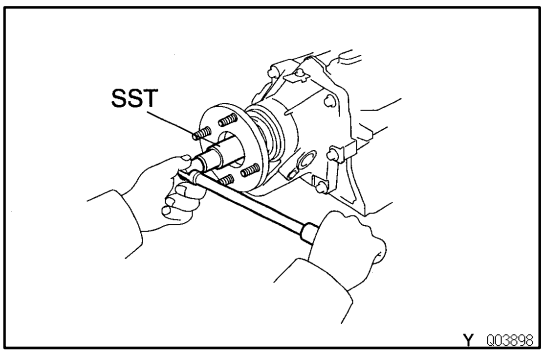
8. REMOVE TRANSMISSION HOUSING

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

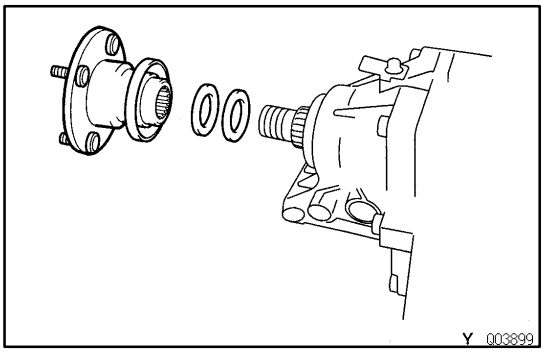


9. REMOVE TRANSMISSION OUTPUT FLANGE

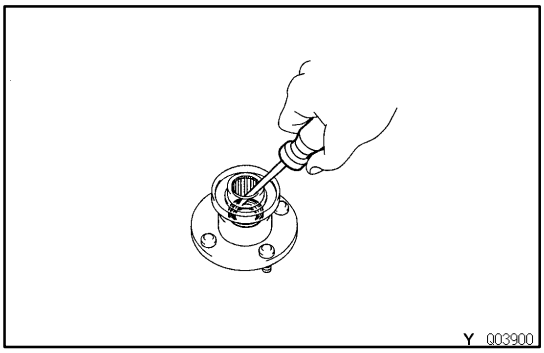
(a) Using a hammer and a chisel, loosen the staked part of the nut.
HINT: Shift the manual valve lever to the P position.



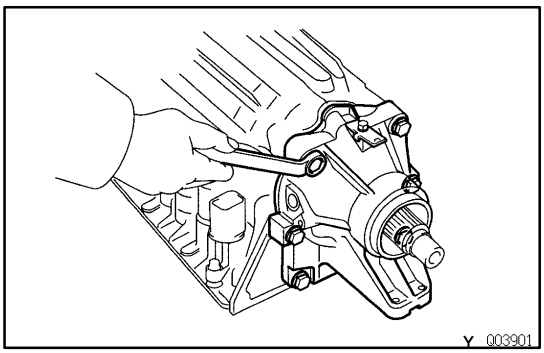
(b) Using SST, remove the nut.
SST 09060-20100



(c) Remove the output flange and 2 washers.



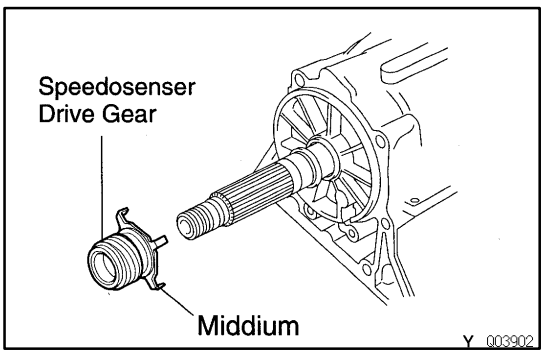
(d) Remove the oil seal from the output flange.



10. REMOVE EXTENSION HOUSING

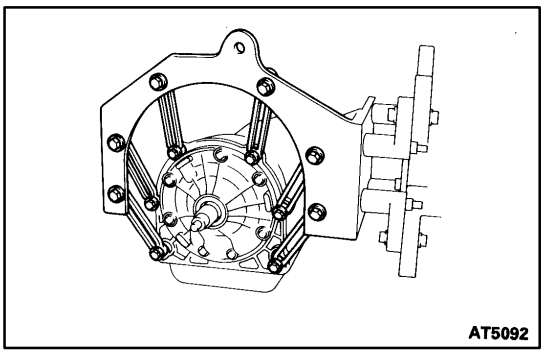
(a) Remove the 6 bolts.

(b) Using a brass bar and a hammer, remove the extension housing.



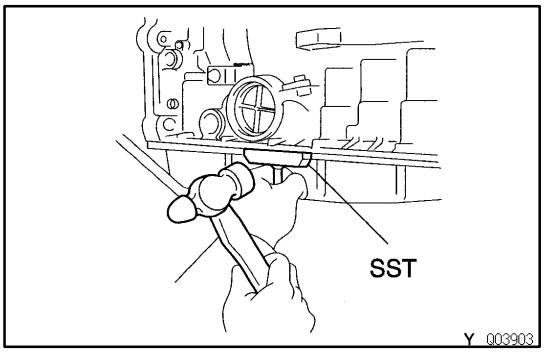
11. REMOVE SPEEDOMETER DRIVE GEAR AND SENSOR ROTOR

Remove the speedometer drive gear and sensor rotor from the output shaft.



12. INSTALL TRANSMISSION CASE

Install the transmission case on the overhaul attachment.



13. REMOVE OIL PAN

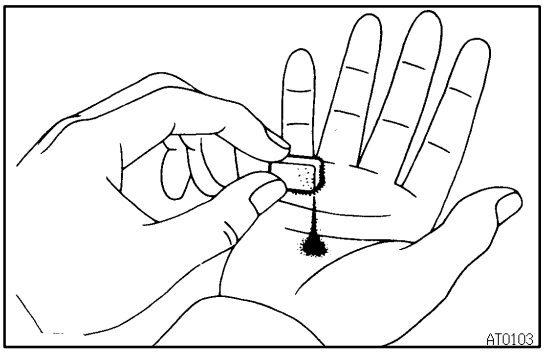
NOTICE: Do not turn the transmission over as this will contaminate the valve body with any foreign matter at the bottom of the pan.

(a) Remove the 19 bolts.

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

SST 09032-00100

NOTICE: Be careful not to damage the oil pan flange.



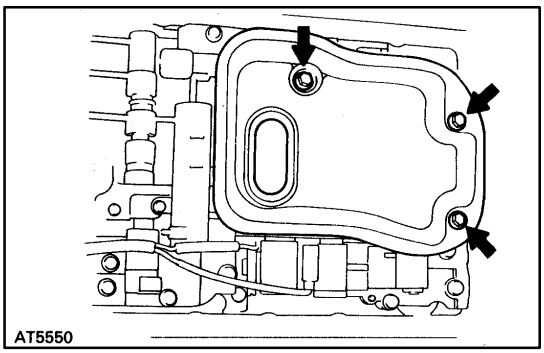
14. EXAMINE PARTICLES IN PAN

Remove the magnets and use them to collect steel particles.

Carefully lock at the foreign matter and particles in the pan and on the magnets to anticipate the type of wear you will find in the transmission:

★ Steel (magnetic): bearing, gear and clutch plate wear

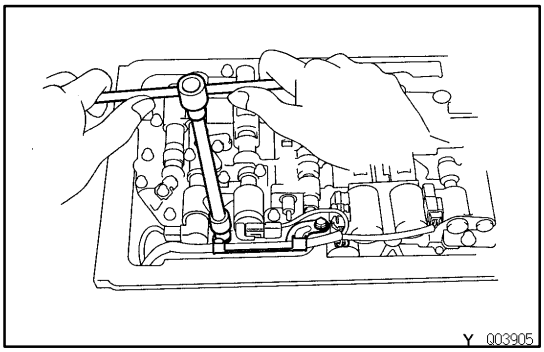
★ Brass (non-magnetic): bushing wear



15. REMOVE OIL STRAINER

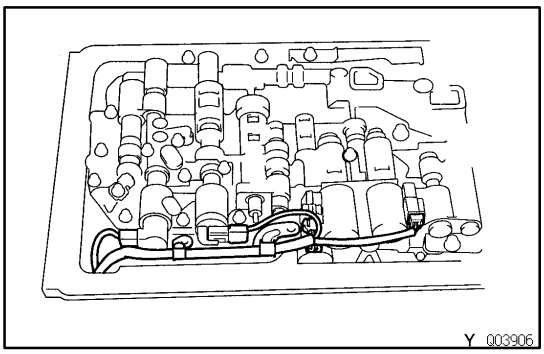
(a) Turn over the transmission.

(b) Remove the 3 bolts holding the oil strainer to the valve body.

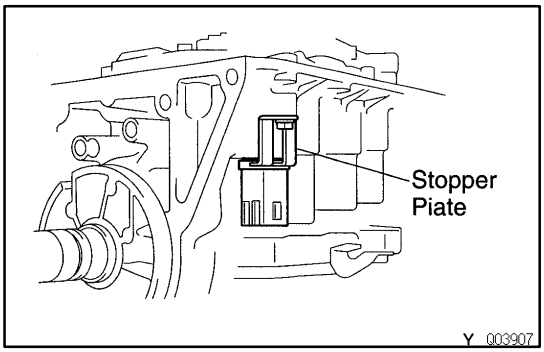


16. REMOVE SOLENOID WIRING

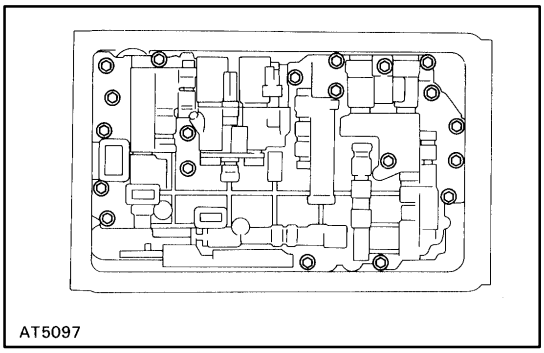
(a) Remove the 2 bolts and the clamp.



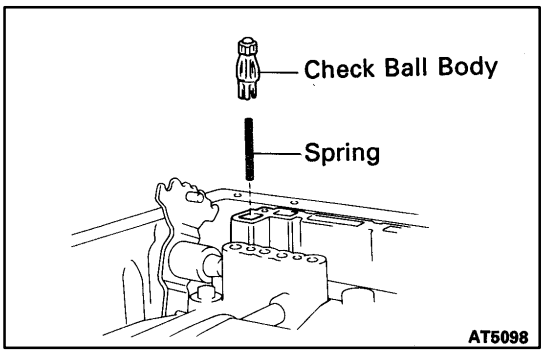
(b) Disconnect the 5 connectors from the solenoids.



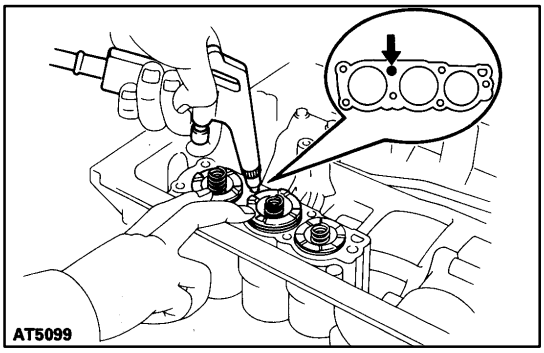
(c) Remove the stopper plate from the case.
(d) Pull the wiring out of the transmission case.
(e) Remove the O-ring from the grommet.



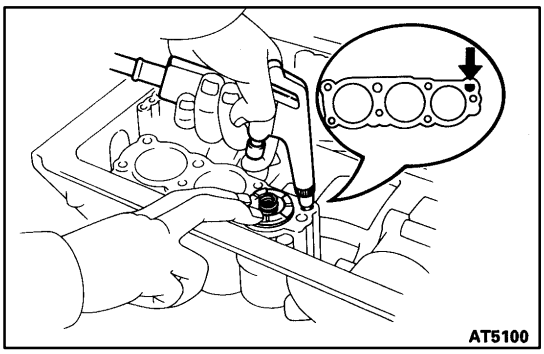
17. REMOVE VALVE BODY
(a) Remove the 20 bolts.
(b) Remove the valve body.



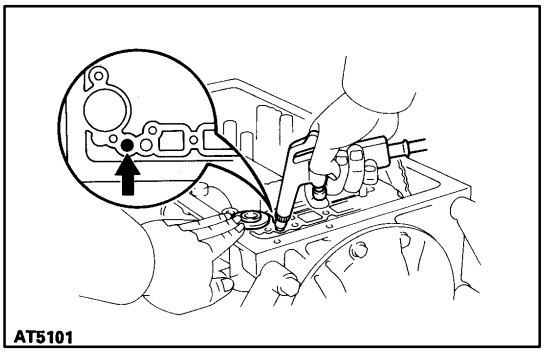
18. REMOVE CHECK BALL BODY
Remove the check ball body and spring.



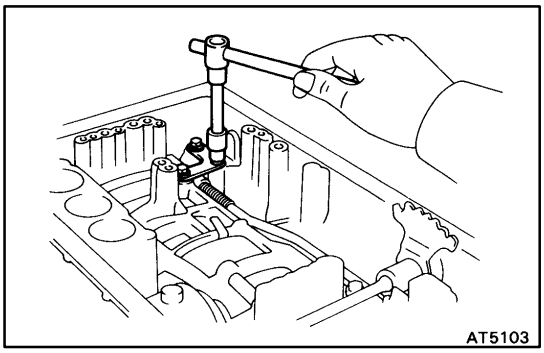
19. REMOVE ACCUMULATOR SPRINGS AND PISTONS
(a) Applying compressed air to the oil hole, remove the B_2 and C_2 accumulator pistons and 3 springs.
(b) Remove the O-rings from each piston.



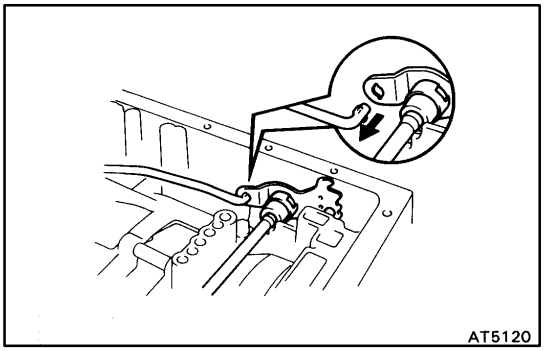
(c) Applying compressed air to the oil hole, remove the B_0 accumulator piston and spring.
(d) Remove the O-rings from the piston.
NOTICE: Take care as the C_0 accumulator piston may jump out.



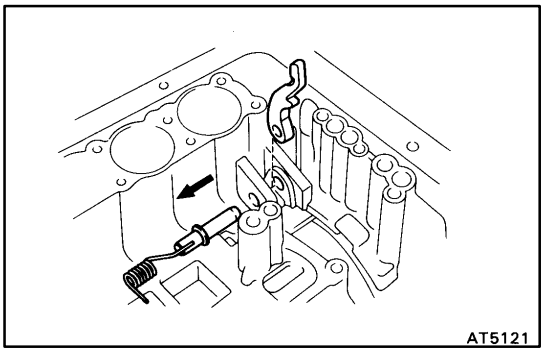
(e) Applying compressed air to the oil hole, remove the C_0 accumulator piston and spring.
HINT: The C_0 accumulator piston comes in 2 parts, so if only the top part is removed, after removing the spring reapply compressed air.
(f) Remove the O-ring from the piston.



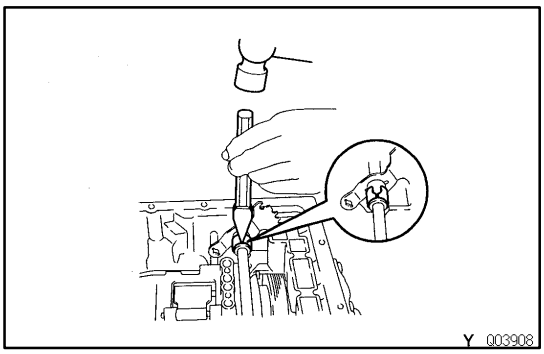
20. REMOVE PARKING LOCK ROD AND PAWL
(a) Remove the parking lock pawl bracket.



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

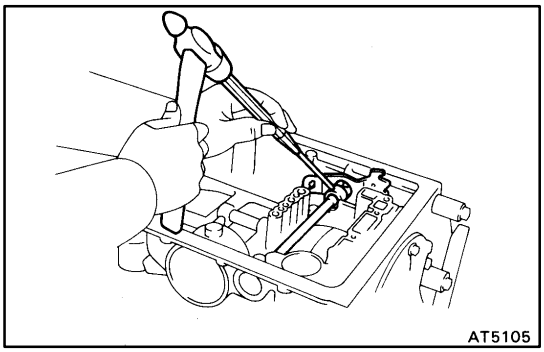


(c) Pull the parking lock pawl shaft out from the front side, then remove the pawl and spring.
(d) Remove the E-ring from the shaft.



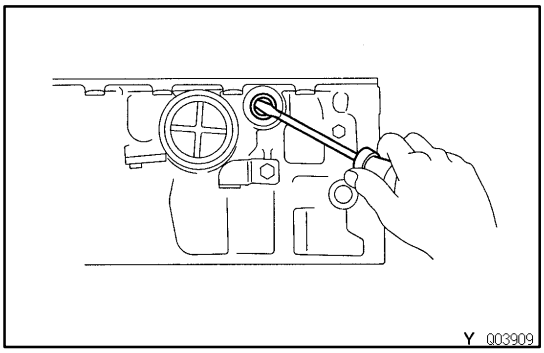
21. REMOVE MANUAL VALVE LEVER SHAFT

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

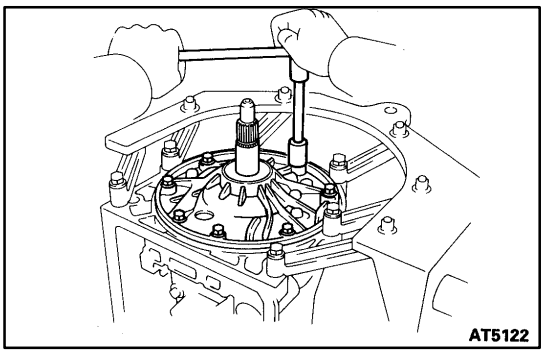


(b) Using a pin punch, drive out the spring pin.
HINT: Slowly drive out the spring pin so it does not fall into the transmission case.

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

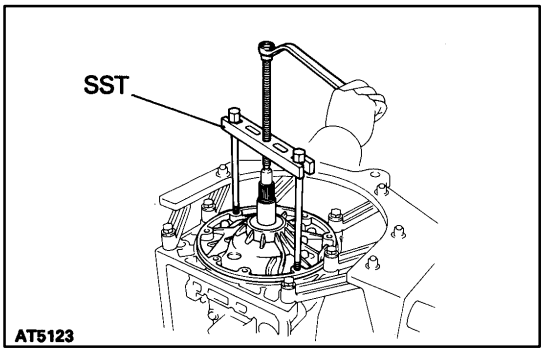


(d) Using a screwdriver, remove the oil seal.

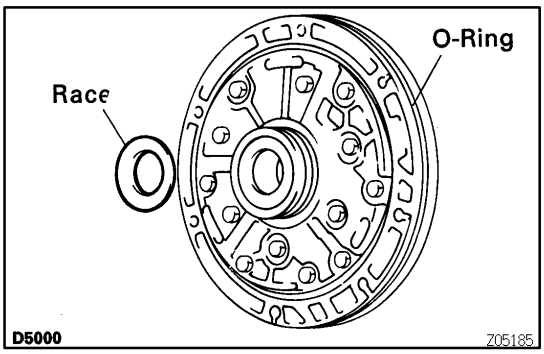


22. REMOVE OIL PUMP

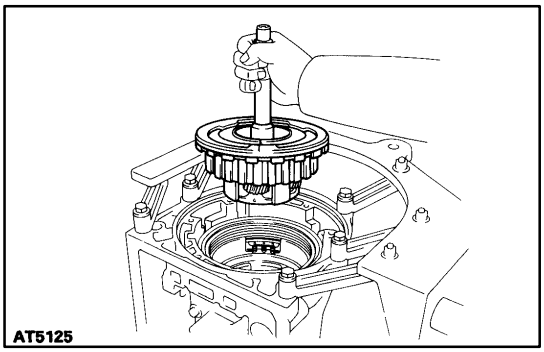
(a) Remove the 7 bolts holding the oil pump to the transmission case.



(b) Using SST, remove the oil pump.
SST 09350-30020 (09350-07020)

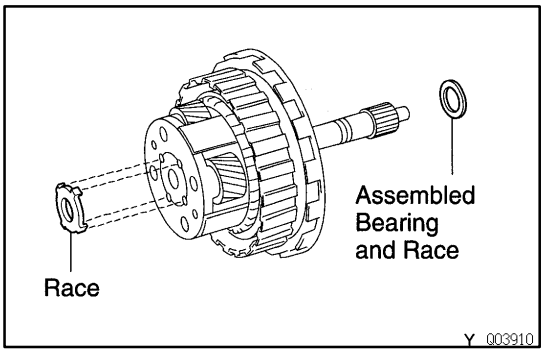


(c) Remove the race from the oil pump.
(d) Remove the O-ring from the oil pump.

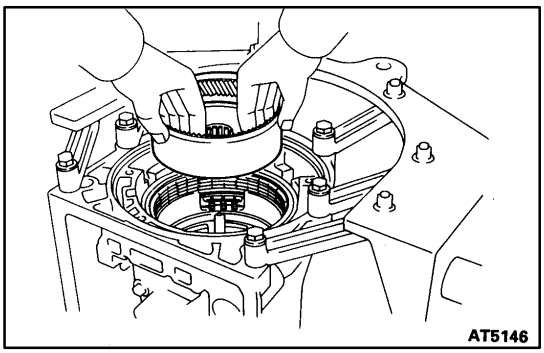


23. REMOVE OVERDRIVE PLANETARY GEAR WITH OVERDRIVE DIRECT CLUTCH

(a) Remove the overdrive planetary gear with the overdrive direct clutch from the transmission case.

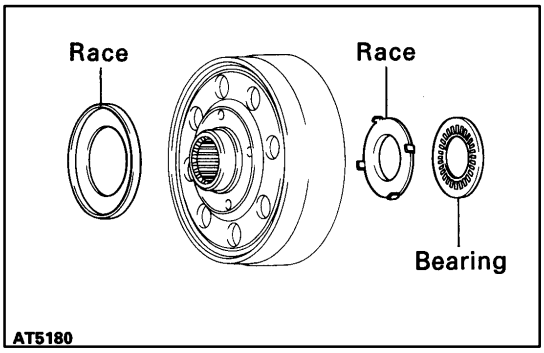


(b) Remove the race and assembled bearing and race.

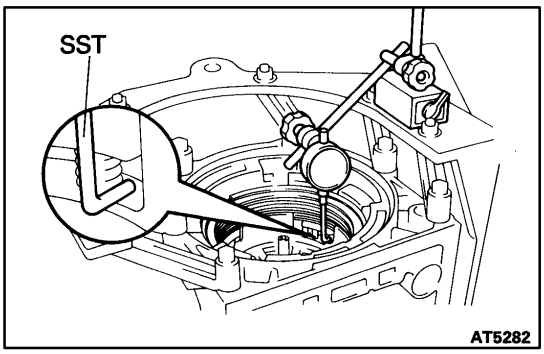


24. REMOVE OVERDRIVE PLANETARY RING GEAR

(a) Remove the overdrive planetary ring gear from the transmission case.

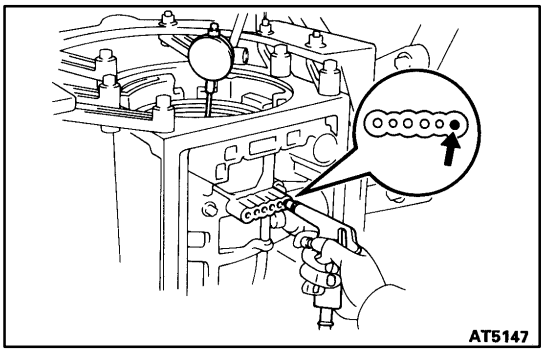


(b) Remove the bearing and races from the planetary ring gear.

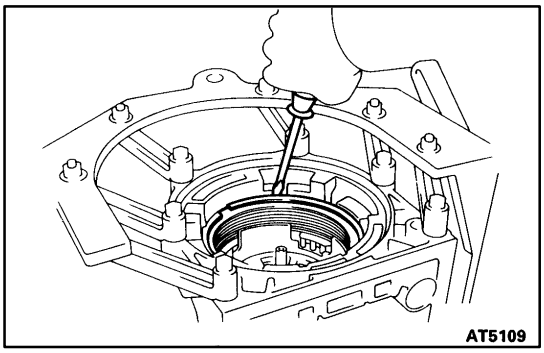


25. CHECK PISTON STROKE OF OVERDRIVE BRAKE

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

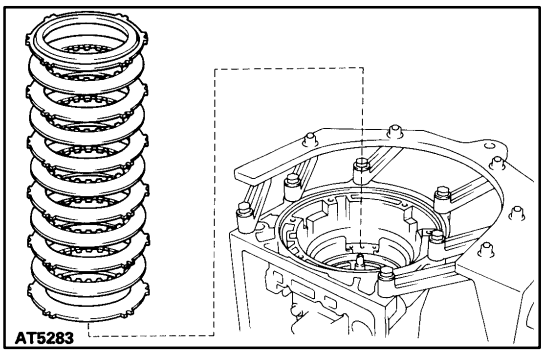


(b) Measure the stroke while applying and releasing compressed air (392-785 kPa, 4-8 kgf/cm^2 or 57-114 psi).
Piston stroke:
1.75-2.05 mm (0.0689-0.0807 in.)
If the values are non-standard, inspect the discs.

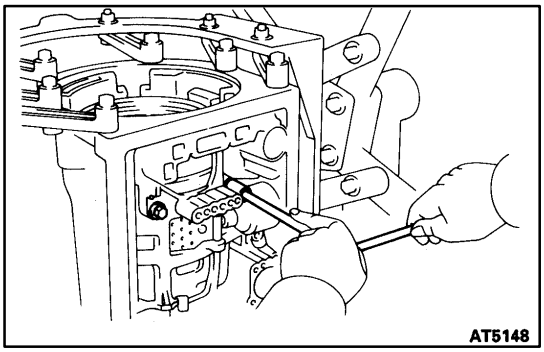


26. REMOVE FLANGES, PLATES AND DISCS OF OVERDRIVE BRAKE

(a) Remove the snap ring.

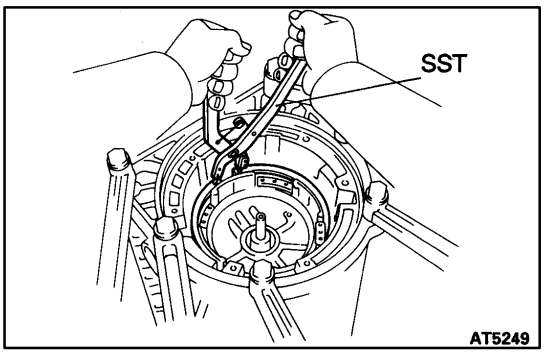


(b) Remove the flange, 5 plates and 5 discs.

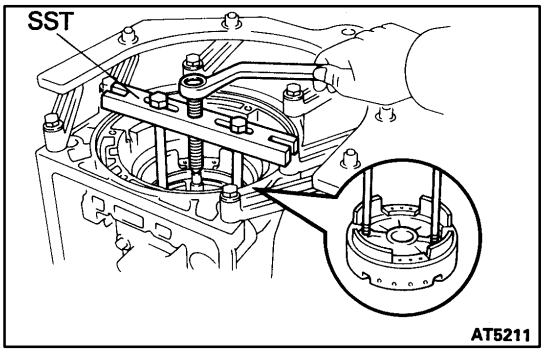


27. REMOVE OVERDRIVE SUPPORT ASSEMBLY

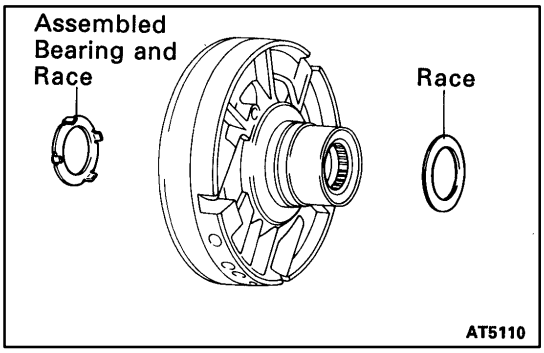
(a) Remove the 2 bolts holding the overdrive support assembly to the case.



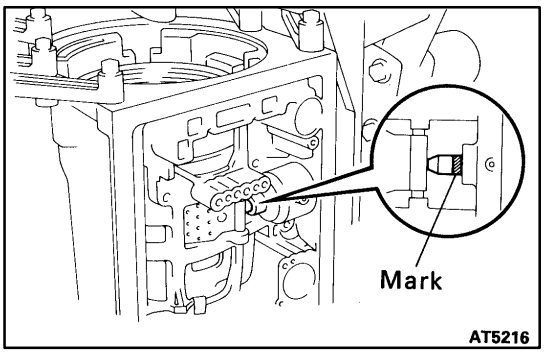
(b) Using SST, remove the snap ring.
SST 09350-30020 (09350-07060)



(c) Using SST, remove the overdrive support assembly.
SST 09350-30020 (09350-07020)

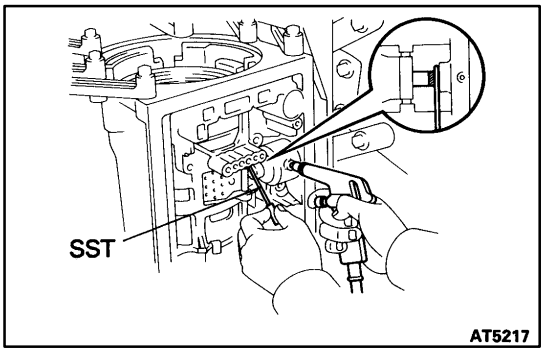


(d) Remove the assembled bearing and races from the overdrive support.

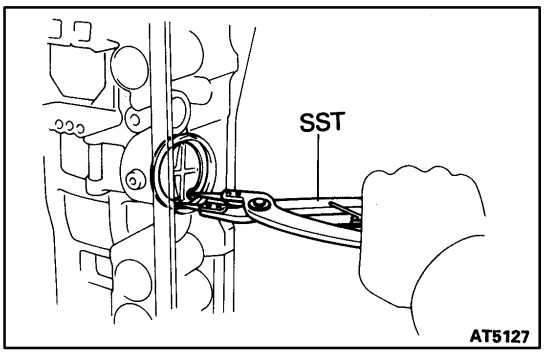


28. CHECK PISTON ROD STROKE OF SECOND COAST BRAKE

(a) Using a waterproof pen, place a mark on the second coast brake piston rod.

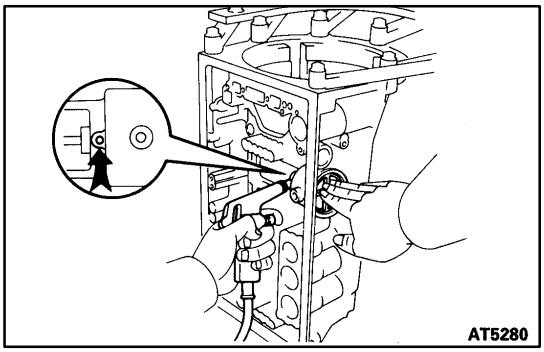


(b) Using SST, measure the stroke while applying and releasing compressed air (392-784 kPa, 4-8 kgf/cm^2 or 57-114 psi).
SST 09240-00020
Piston rod stroke:
1.0 - 2.0 mm (0.039 - 0.079 in.)
If the values are non-standard, inspect the brake band.

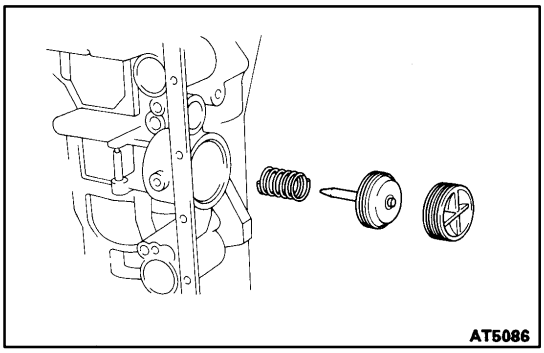


29. REMOVE SECOND COAST BRAKE COVER, PISTON ASSEMBLY AND SPRING

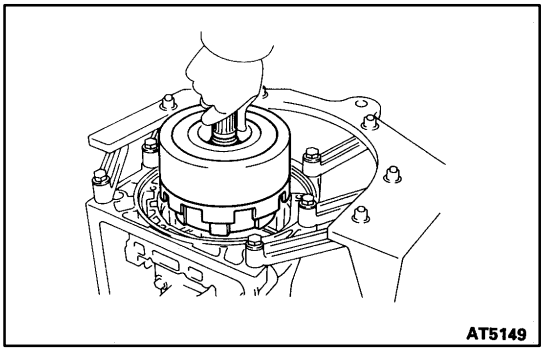
(a) Using SST, remove the snap ring.
SST 09350-30020 (09350-07060)



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

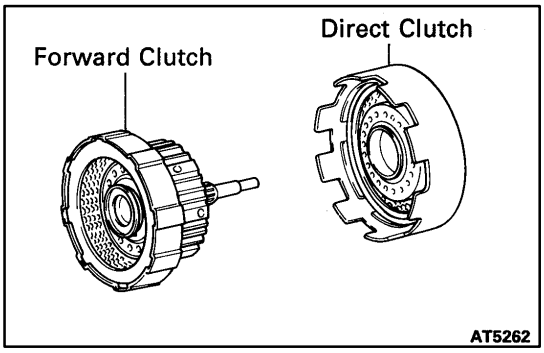


(c) Remove the 2 O-rings from the cover.

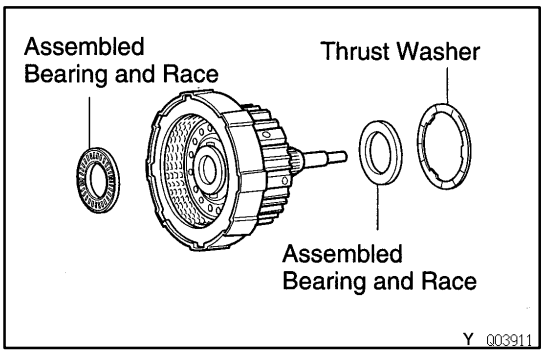


30. REMOVE DIRECT CLUTCH WITH FORWARD CLUTCH

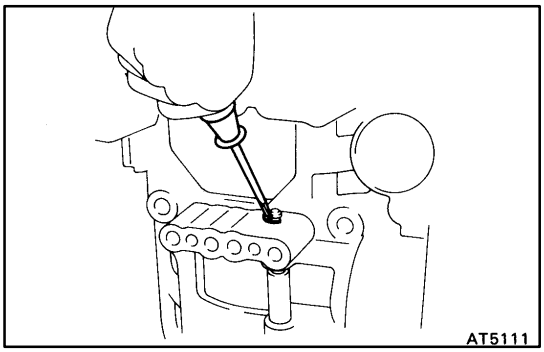
(a) Remove the direct clutch with forward clutch from the case.



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



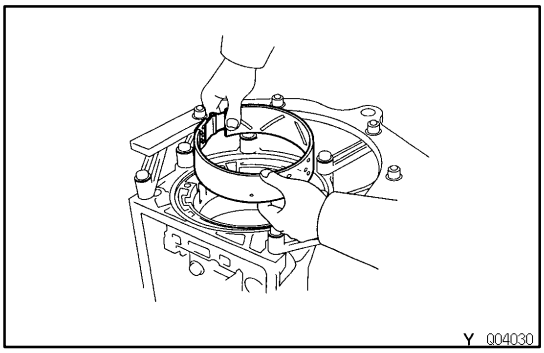
(c) Remove the assembled bearing and race, thrust washer and race from the forward clutch.



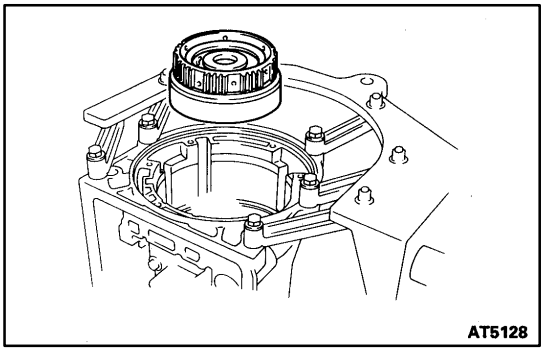
31. REMOVE SECOND COAST BRAKE BAND

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

(b) Remove the pin from the brake band.

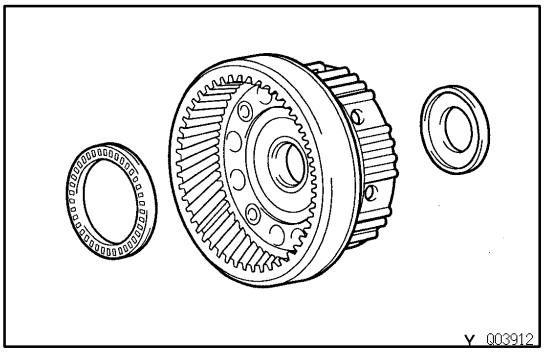


(c) Remove the second coast brake band from the case.

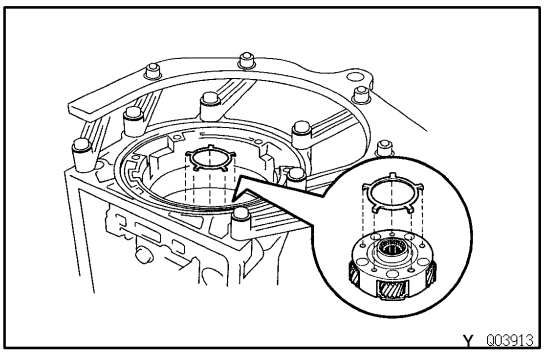


32. REMOVE FRONT PLANETARY RING GEAR

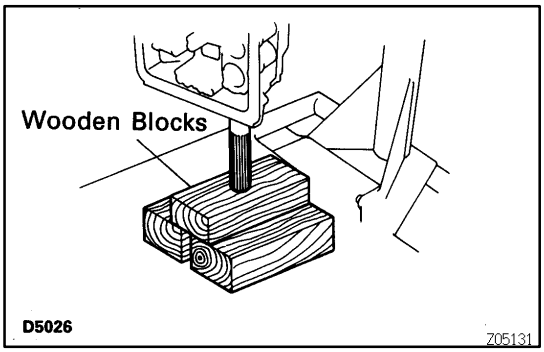
(a) Remove the front planetary ring gear from the case.



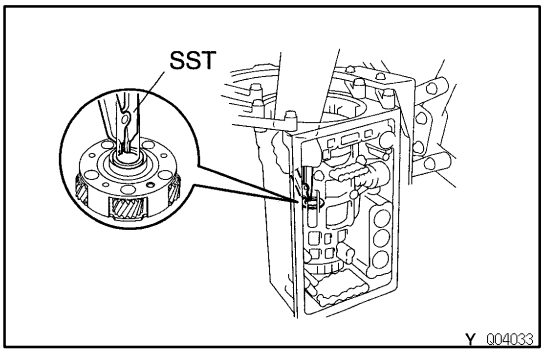
(b) Remove the bearing and race from the front planetary ring gear.



(c) Remove the race from the front planetary gear.



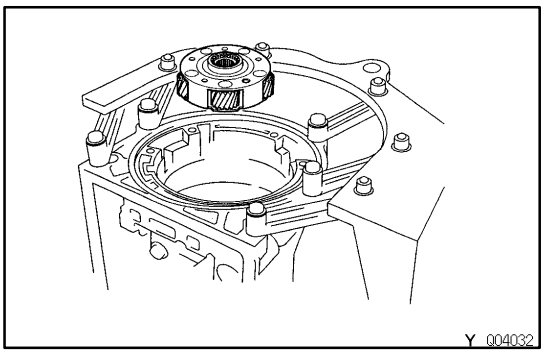
(d) With wooden blocks under the output shaft, stand the transmission on the output shaft.



33. REMOVE OUTPUT SHAFT

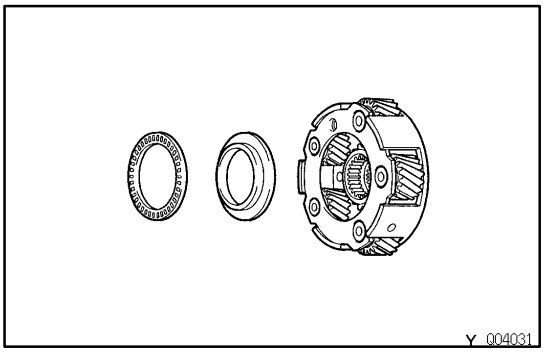
(a) Using SST, remove the snap ring.
SST 09350-30020 (09350-07070)
HINT: Pushing the output shaft towards the front makes it easier to remove.

(b) Remove the output shaft from the case.

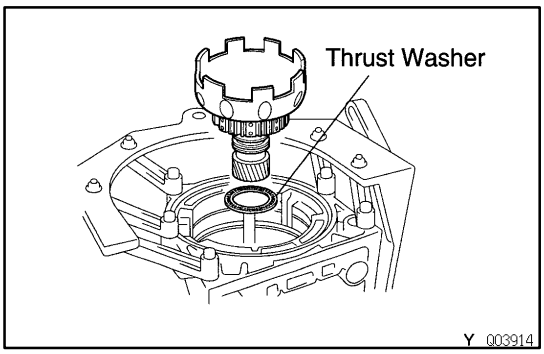


34. REMOVE FRONT PLANETARY GEAR

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



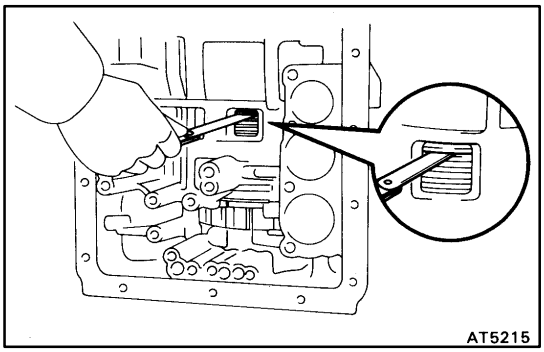
(b) Remove the bearing and race from the front planetary gear.



35. REMOVE PLANETARY SUN GEAR WITH NO.1 ONE-WAY CLUTCH

(a) Remove the planetary sun gear with No.1 one-way clutch from the case.

(b) Remove the thrust washer.



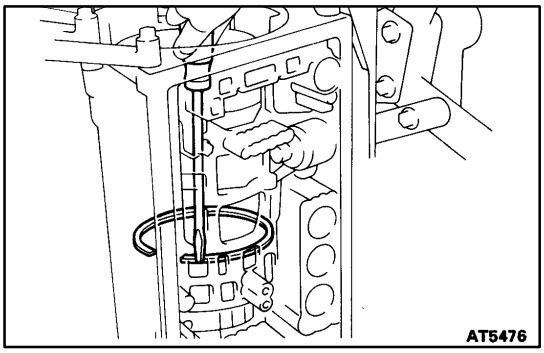
36. CHECK PACK CLEARANCE OF SECOND BRAKE

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

Clearance:

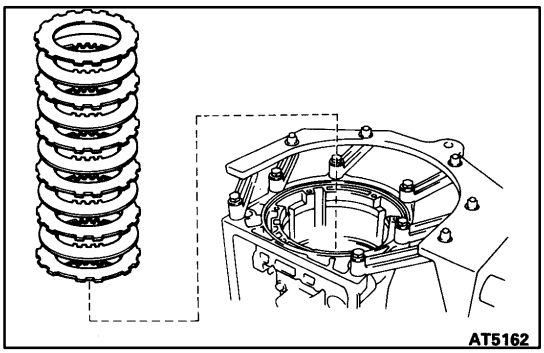
0.49 - 1.11 mm (0.0193 - 0.0437 in.)

If the values are non-standard, inspect the discs.

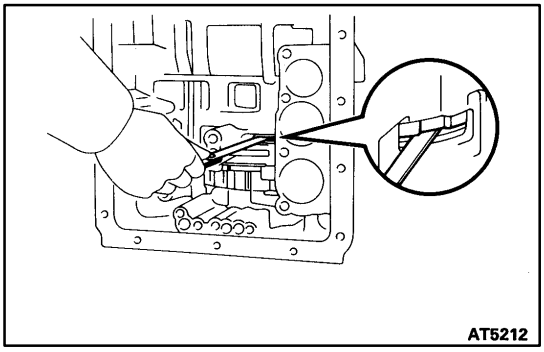


37. REMOVE FLANGE, PLATES AND DISCS OF SECOND BRAKE

(a) Remove the snap ring.



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



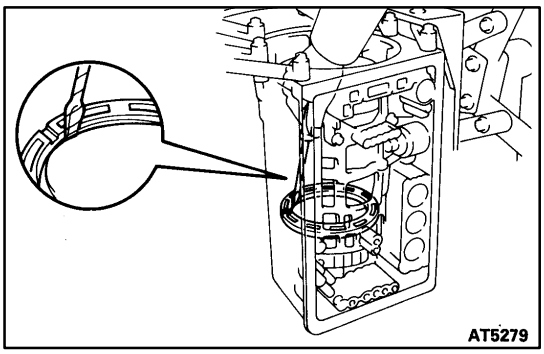
38. CHECK PACK CLEARANCE OF FIRST AND REVERSE BRAKE

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

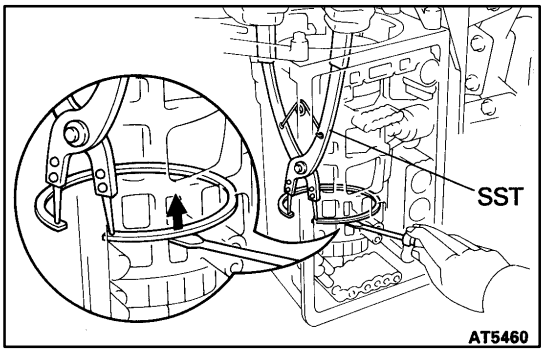
Clearance:

0.7-1.0 mm (0.028-0.039 in.)

If the values are non-standard, inspect the discs.

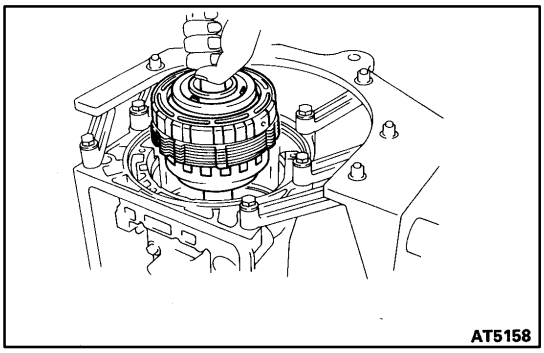


39. REMOVE SECOND BRAKE PISTON SLEEVE



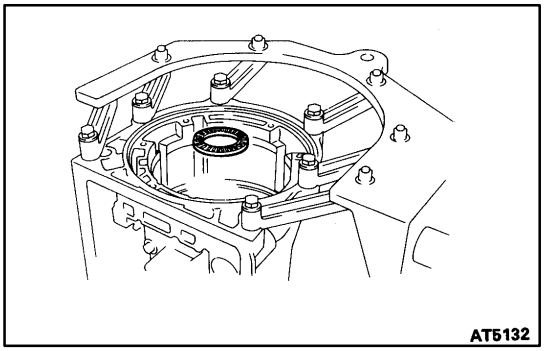
40. REMOVE REAR PLANETARY GEAR AND SECOND BRAKE

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

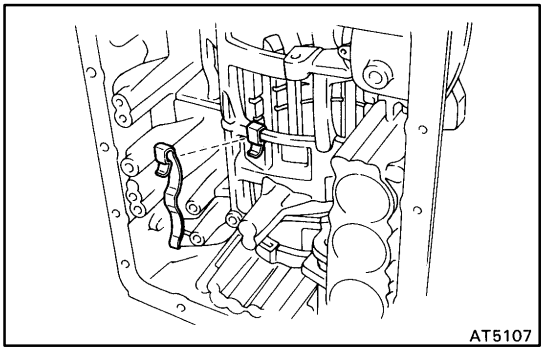


(b) Remove the output shaft.

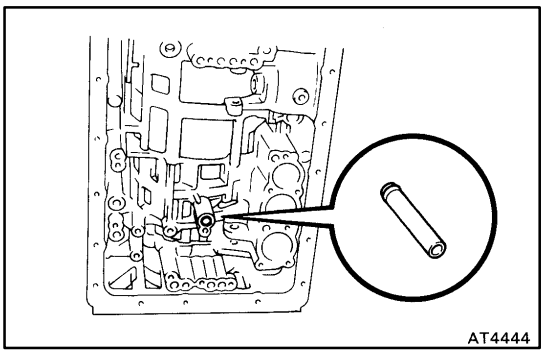
(c) Remove the rear planetary gear, second brake and first and reverse brake pack from the case.



(d) Remove the assembled bearing and race from the first and reverse brake.



(e) Remove the leaf spirng from the case.



41. REMOVE BRAKE DRUM GASKET

COMPONENT PARTS

AT0DD-03

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 cannot be assembled because parts are being ordered, be sure to keep all parts of that group in a separate container while proceeding with disassembly, inspection, repair and assembly of other component groups.

Recommended ATF:

Type T-II or equivalent

GENERAL CLEANING NOTES:

1. All disassembled parts should be washed clean and any fluid passages and holes blown through with compressed air.
2. When using compressed air to dry parts, always aim away from yourself to prevent accidentally spraying automatic transmission fluid or kerosene on your face.
3. The recommended automatic transmission fluid or kerosene should be used for cleaning.

PARTS ARRANGEMENT:

1. After cleaning, the parts should be arranged in the correct order to allow efficient inspection, repairs, and reassembly.
2. When disassembling a valve body, be sure to keep each valve together with the corresponding spring.
3. New discs for the brakes and clutches that are to be used for replacement must be soaked in transmission fluid for at least 15 minutes before assembly.

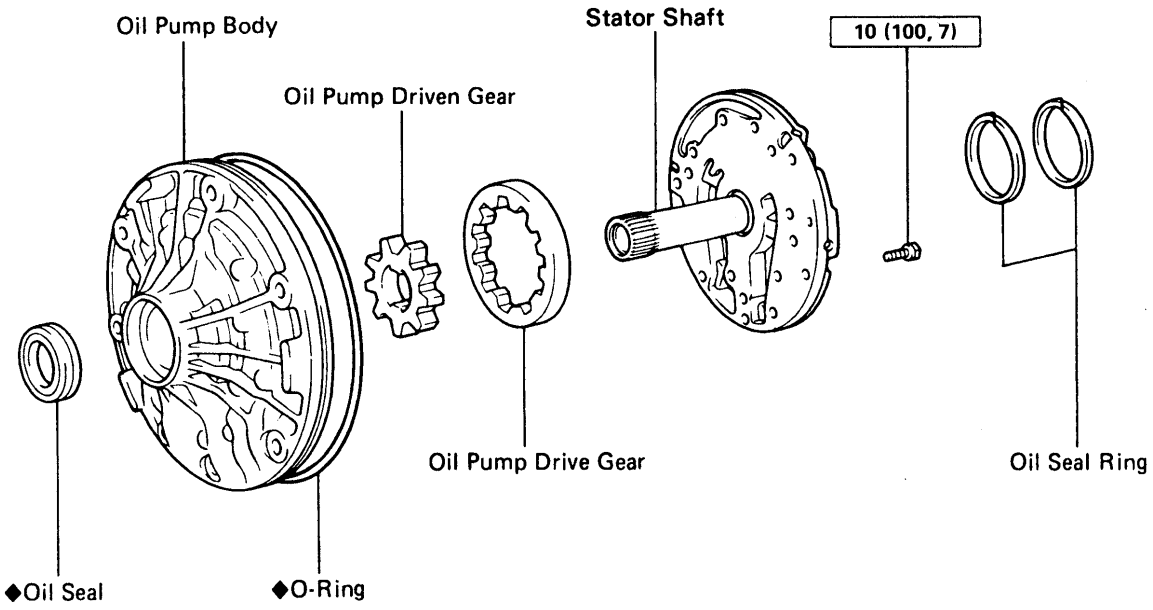
GENERAL ASSEMBLY:

1. All oil seal rings, clutch discs, clutch plates, rotating parts, and sliding surfaces should be coated with transmission fluid prior to reassembly.
2. All gaskets and rubber O-rings should be replaced.
3. Make sure that the ends of a snap ring are not aligned with one of the cutouts and are installed in the groove correctly.
4. If a worn bushing is to be replaced, the subassembly containing that bushing must also be replaced.
5. Check thrust bearings and races for wear or damage. Replace if necessary.
6. Use petroleum jelly to keep parts in place.

OIL PUMP

AT0DE-02

COMPONENTS

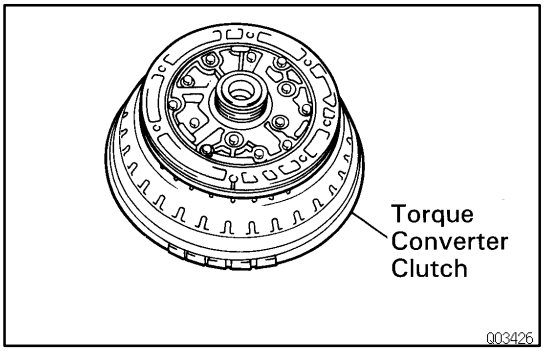


N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non-reusable part

AT5461

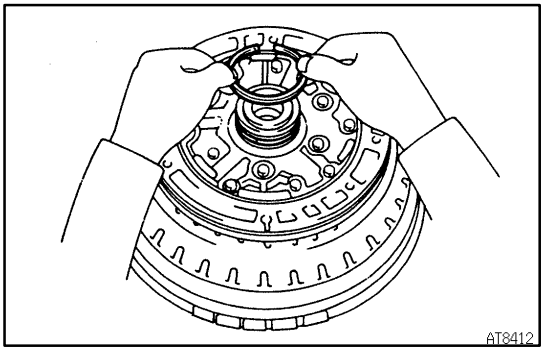
AT0DF-05

OIL PUMP DISASSEMBLY



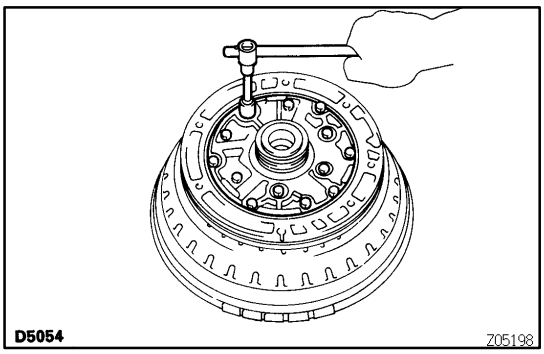
1. USE TORQUE CONVERTER CLUTCH AS WORK STAND

Place the oil pump body on the torque converter clutch.



2. REMOVE OIL SEAL RINGS

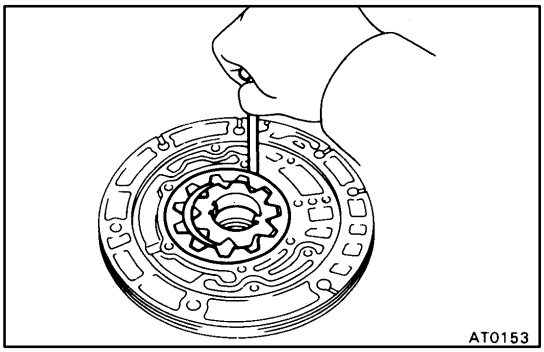
Remove the 2 oil seal rings.



3. REMOVE STATOR SHAFT

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

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



4. CHECK BODY CLEARANCE OF DRIVEN GEAR

Push the driven gear to one side of the body.

Using a feeler gauge, measure the clearance.

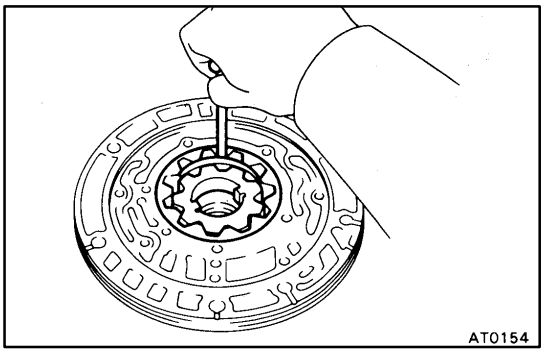
Standard body clearance:

0.07-0.15 mm (0.0028-0.0059 in.)

Maximum body clearance:

0.3 mm (0.012 in.)

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



5. CHECK TIP CLEARANCE OF DRIVEN GEAR

Measure between the driven gear teeth and the crescet-shaped part of the pump body.

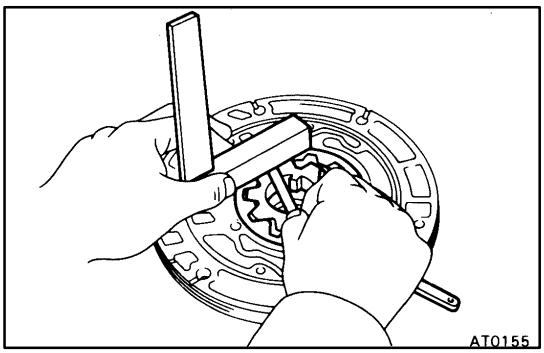
Standard tip clearance:

0.11-0.14 mm (0.0043-0.0055 in.)

Maximum tip clearance:

0.3 mm (0.012 in.)

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



6. CHECK SIDE CLEARANCE OF BOTH GEARS

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

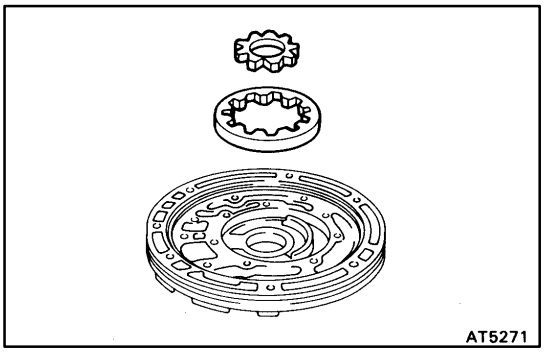
Standard side clearance:

0.02-0.05 mm (0.0008-0.0020 in.)

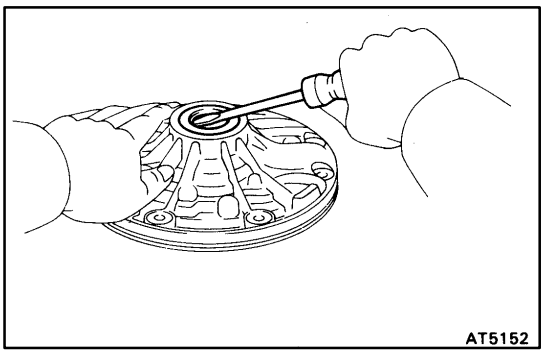
Maximum side clearance:

0.1 mm (0.004 in.)

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

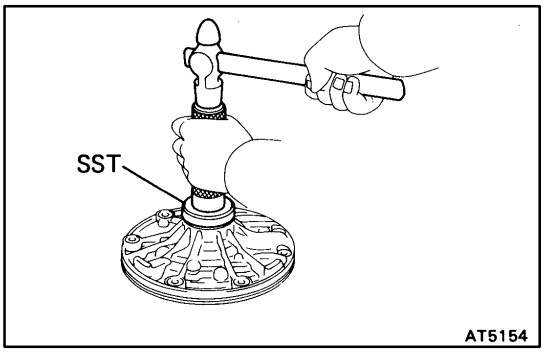


7. REMOVE OIL PUMP DRIVE GEAR AND DRIVEN GEAR



8. REMOVE OIL SEAL

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

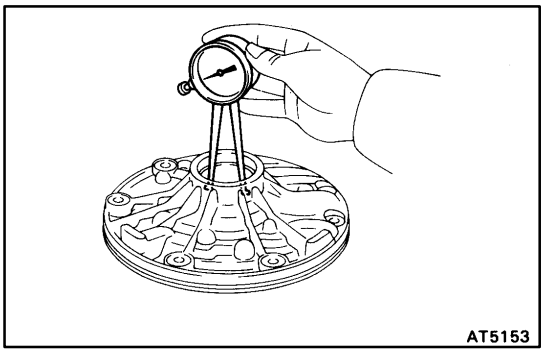


(b) Using SST, install a new oil seal.
The oil seal end should be flush with the outer edge of the pump body.
SST 09350-30020 (09351-32140)

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

AT0DG-03

OIL PUMP BUSHING CHECK



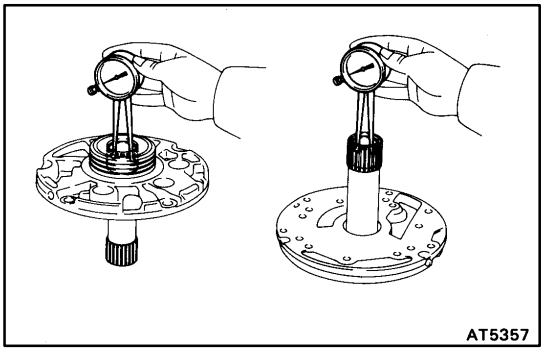
1. CHECK OIL PUMP BODY BUSHING

Using a dial indicator, measure the inside diameter of the oil pump body bushing.

Maximum inside diameter:

38.19 mm (1.5035 in.)

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



2. CHECK STATOR SHAFT BUSHING

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

Maximum inside diameter (Front):

21.58 mm (0.8496 in.)

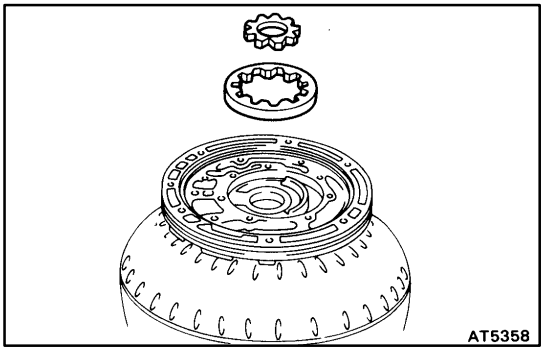
Maximum inside diameter (Rear):

27.08 mm (1.0661 in.)

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

AT0DH-05

OIL PUMP ASSEMBLY

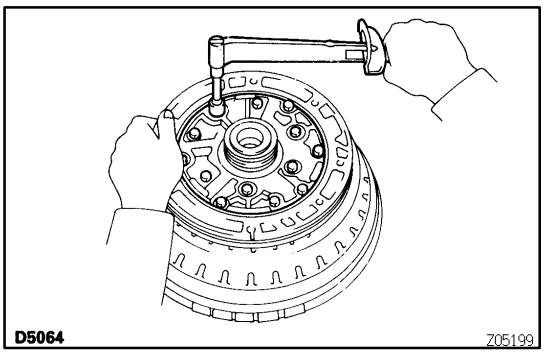


1. INSTALL DRIVEN GEAR AND DRIVE GEAR TO OIL PUMP BODY

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

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

(c) Install the driven gear and drive gear.

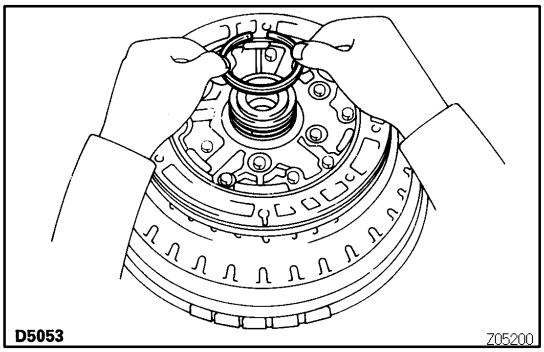


2. INSTALL STATOR SHAFT TO OIL PUMP BODY

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

(b) Tighten the 13 bolts.

Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)



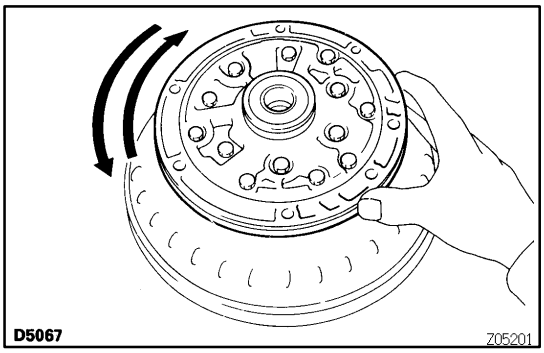
3. INSTALL OIL SEAL RINGS

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

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

NOTICE: Do not spread the ring ends too much.

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



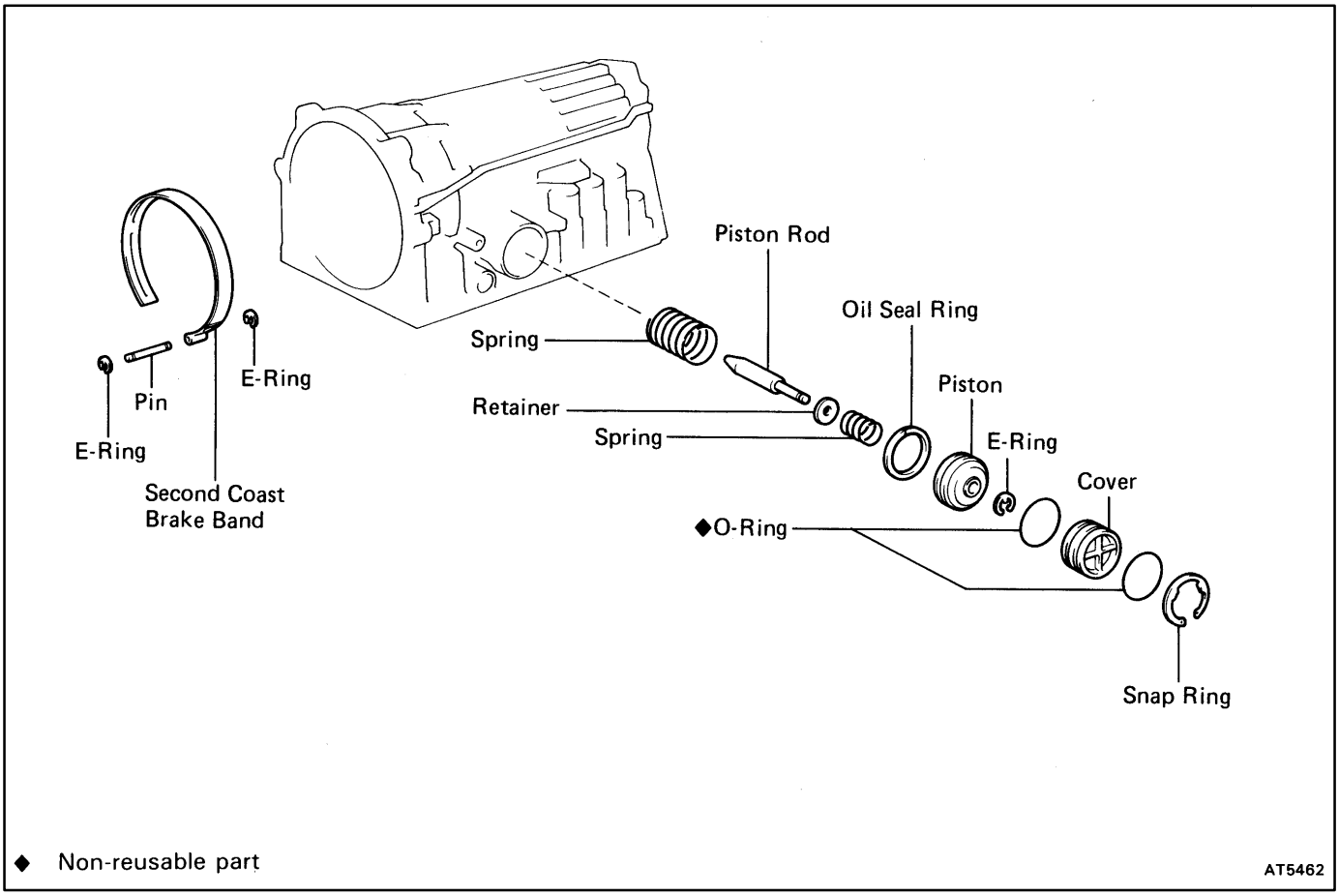
4. CHECK OIL PUMP DRIVE GEAR ROTATION

Make sure the drive gear rotates smoothly.

SECOND COAST BRAKE

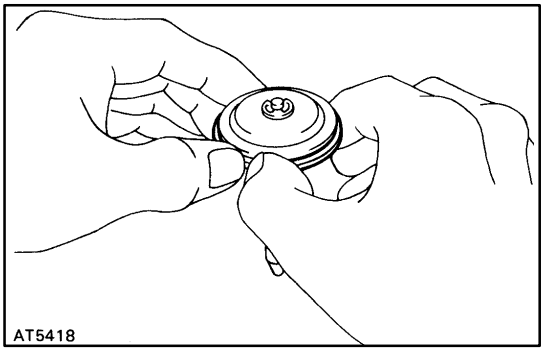
AT0DJ-02

COMPONENTS

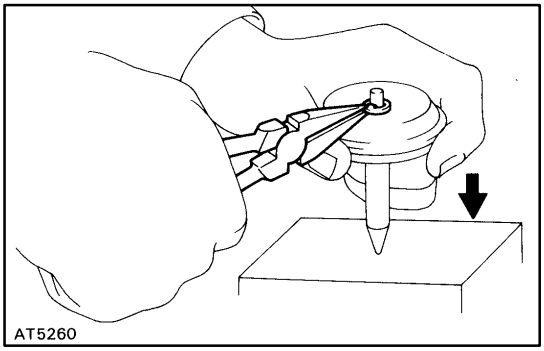


AT0DK-02

SECOND COAST BRAKE PISTON DISASSEMBLY



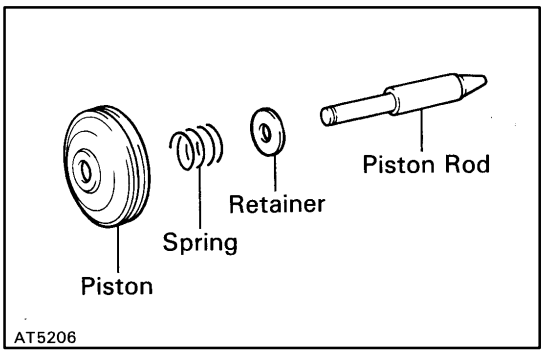
1. REMOVE SECOND COAST BRAKE PISTON OIL SEAL RING



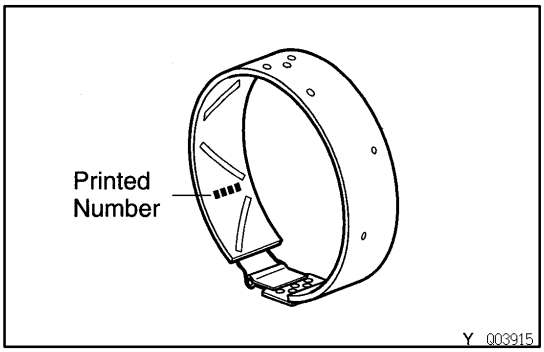
2. REMOVE SECOND COAST BRAKE PISTON ROD

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

(b) Remove the E-ring.



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



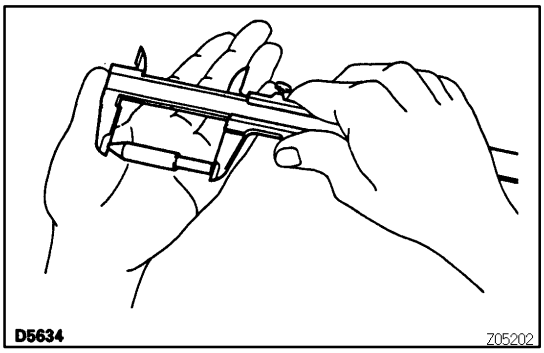
AT0DL-04

SECOND COAST BRAKE BAND INSPECTION

INSPECT BRAKE BAND

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

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



AT0DM-04

SECOND COAST BRAKE PISTON ASSEMBLY

1. SELECT PISTON ROD

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

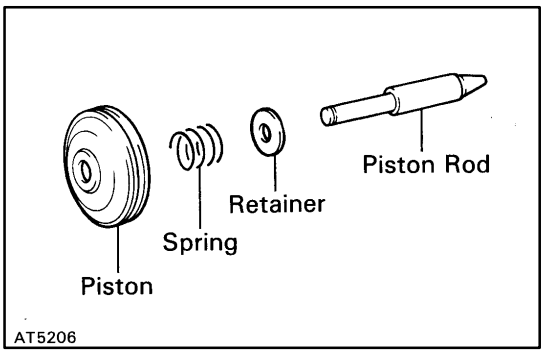
HINT: There are 5 different piston rod lengths.

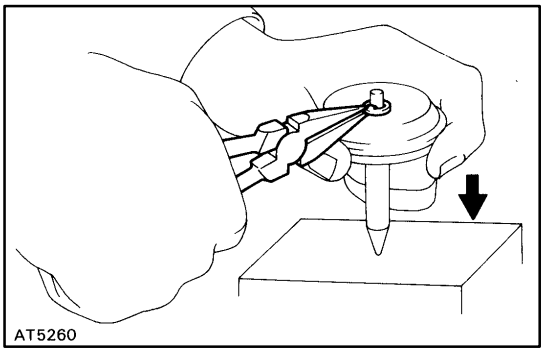
Piston rod length:

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

2. ASSEMBLE SECOND COAST BRAKE PISTON

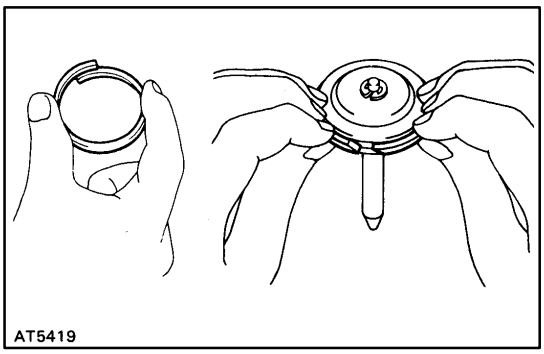
(a) Install the retainer, compression spring and piston to the piston rod.





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

(c) Install the E-ring.



3. INSTALL SECOND COAST BRAKE PISTON OIL SEAL RING

(a) Coat the oil seal ring with ATF.

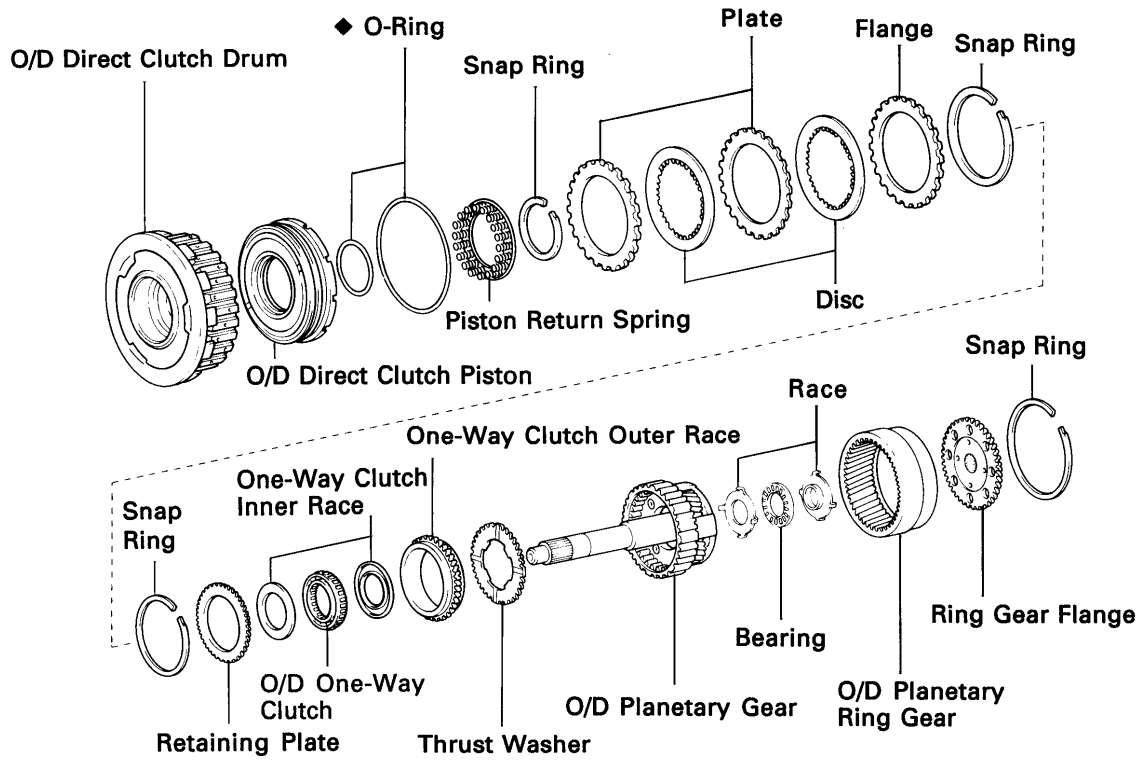
(b) Install the oil seal ring to the piston groove, then snug it down by squeezing its ends together.

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

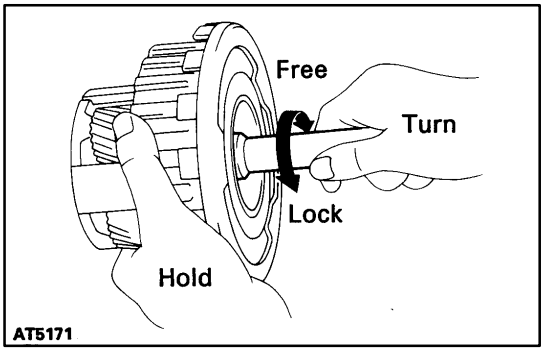
OVERDRIVE DIRECT CLUTCH

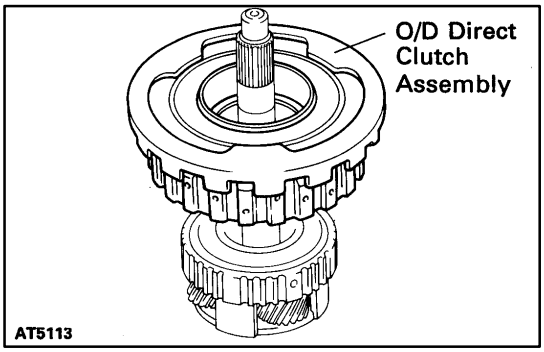
AT0DN-02

COMPONENTS



◆ Non-reusable part

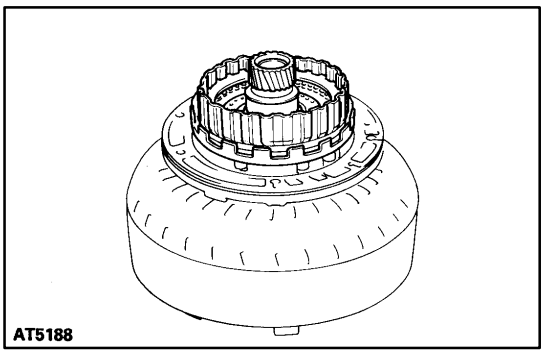




AT0DP-04

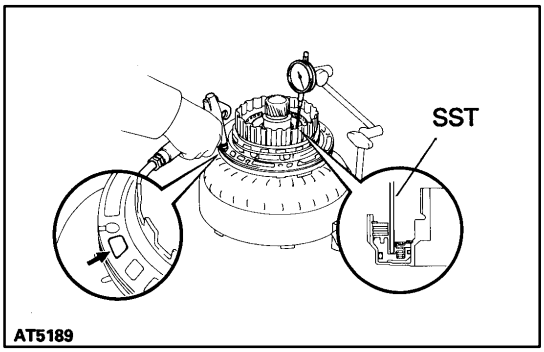
OVERDRIVE PLANETARY GEAR, OVERDRIVE DIRECT CLUTCH AND OVERDRIVE ONE-WAY CLUTCH DISASSEMBLY

1. **CHECK OPERATION OF ONE-WAY CLUTCH**
   Hold the O/D direct clutch drum and turn the input shaft. Check that the input shaft turns freely clockwise and locks counterclockwise.
2. **REMOVE OVERDRIVE DIRECT CLUTCH ASSEMBLY FROM OVERDRIVE PLANETARY GEAR**

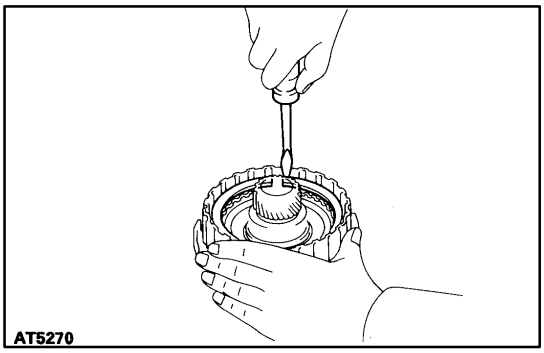


3. CHECK PISTON STROKE OF OVERDRIVE DIRECT CLUTCH

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

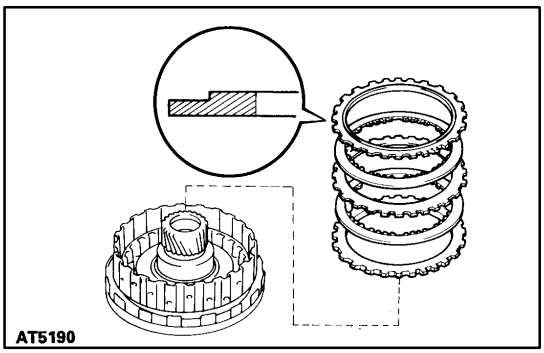


(b) Using SST and a dial indicator, measure the O/D direct clutch piston stroke while applying and releasing compressed air (392-785 kPa, 4-8 kgf/cm^2 or 57-114 psi).
SST 09350-30020 (09350-06120)
Piston stroke:
1.45-1.70 mm (0.057-0.067 in.)
If the values are non-standard, inspect the discs.

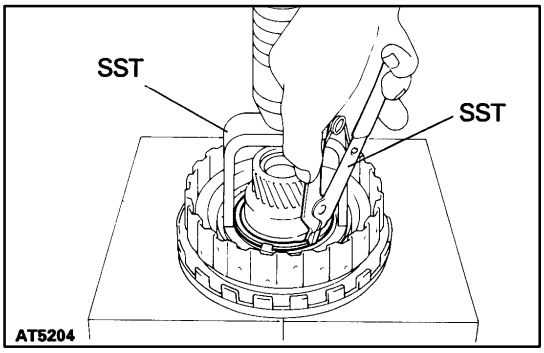


4. REMOVE FLANGE, PLATES AND DISCS

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



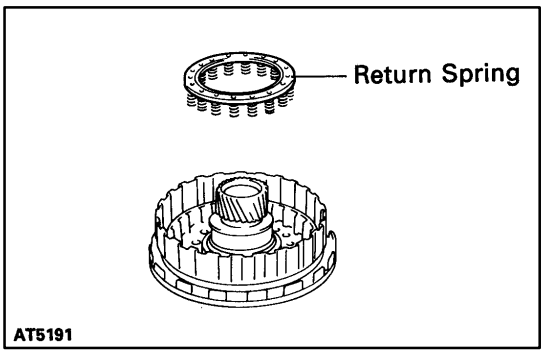
(b) Remove the flange, 2 plates and 2 discs.



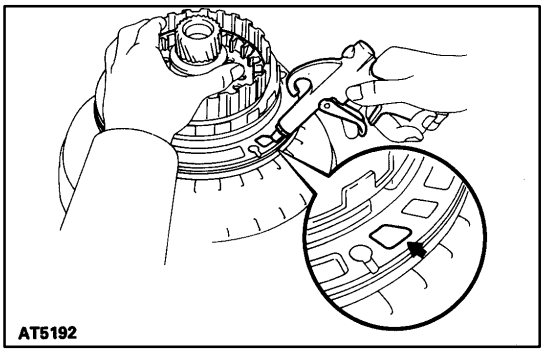
5. REMOVE PISTON RETURN SPRING

(a) Place SST on the spring retainer and compress the return spring with a shop press.
SST 09350-30020 (09350-07040)

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



(c) Remove the piston return spring.

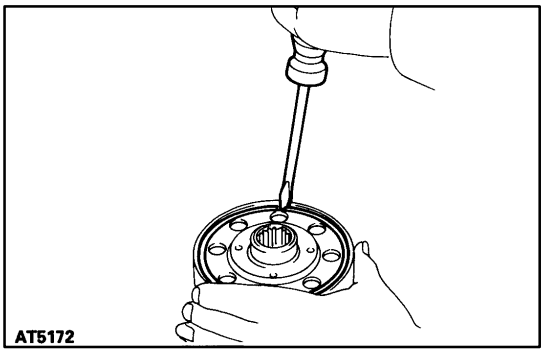


6. REMOVE OVERDRIVE DIRECT CLUTCH PISTON

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

(b) Hold the O/D direct clutch piston, apply compressed air to the oil pump to remove the O/D direct clutch piston.

(c) Remove the O/D direct clutch piston.
HINT: If the piston is at an angle and cannot be removed, press down on the side jutting out and again apply compressed air, or else wind vinyl tape around the piston end and remove it with needle nose pliers.

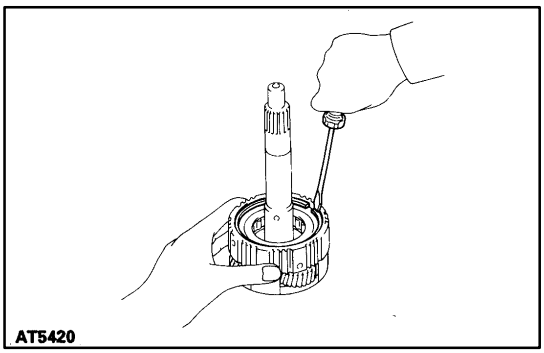


(d) Remove the 2 O-rings from the piston.

7. REMOVE RING GEAR FLANGE

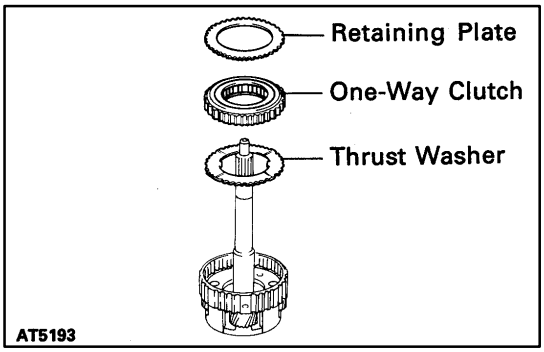
(a) Using a screwdriver, remove the snap ring.

(b) Remove the ring gear flange.

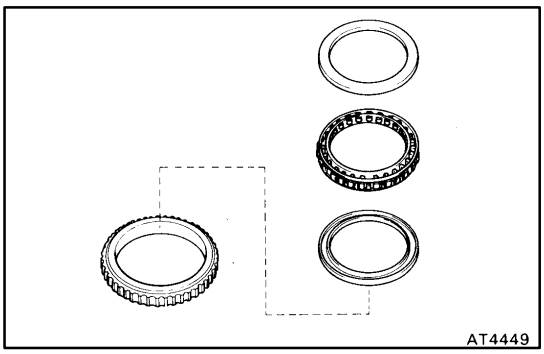


8. REMOVE RETAINING PLATE

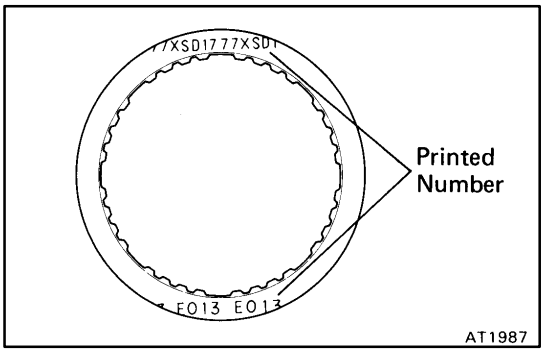
(a) Using a screwdriver, remove the snap ring.



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



9. REMOVE ONE-WAY CLUTCH FROM OUTER RACE



AT0DQ-04

OVERDRIVE PLANETARY GEAR AND OVERDRIVE DIRECT CLUTCH INSPECTION

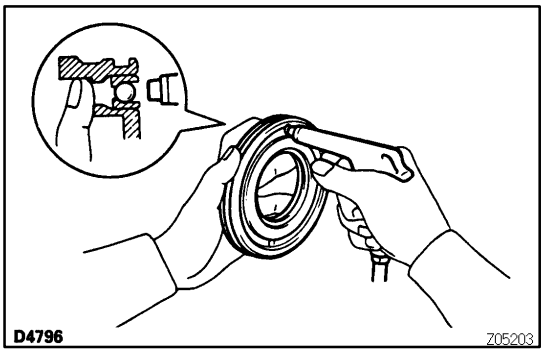
1. INSPECT DISC AND FLANGE

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

HINT:

★ If the lining of the disc is peeling off or discolored, or even if a part of the printed numbers are defaced, replace all discs.

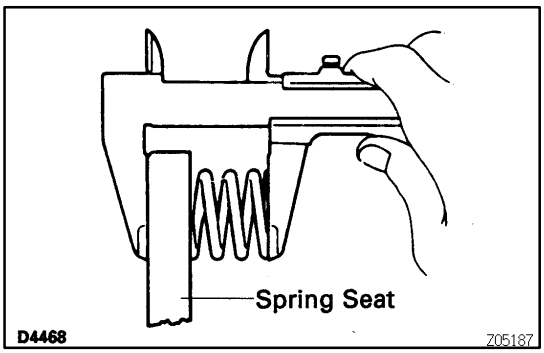
★ Before assembling new discs, soak them in ATF for at least 15 minutes.



2. CHECK OVERDRIVE DIRECT CLUTCH PISTON

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

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

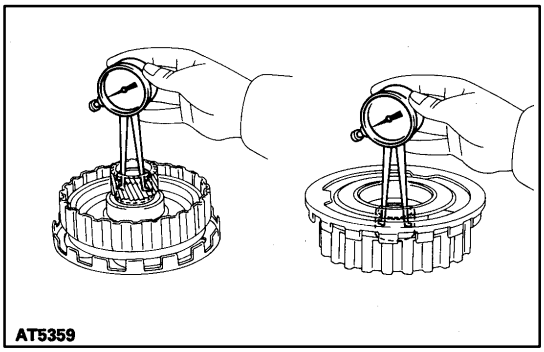


3. CHECK OVERDRIVE DIRECT CLUTCH RETURN SPRING

Check the spring free length together with the spring seat.

Standard free length:

15.8 mm (0.622 in.)



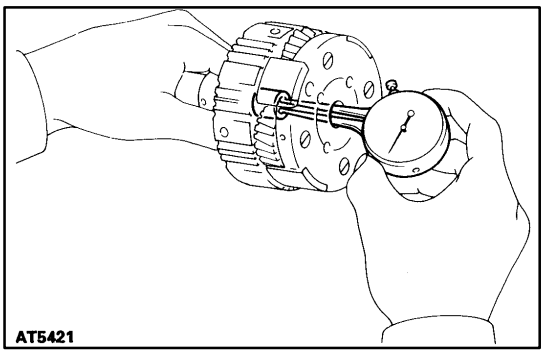
4. CHECK OVERDRIVE DIRECT CLUTCH DRUM BUSHINGS

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

Maximum inside diameter:

27.11 mm (1.0673 in.)

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



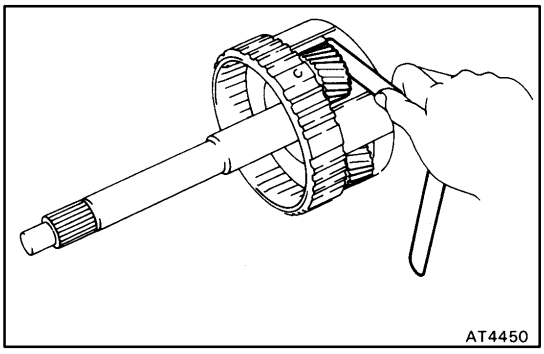
5. CHECK OVERDRIVE PLANETARY GEAR BUSHINGS

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

Maximum inside diameter:

11.27 mm (0.4437 in.)

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



6. MEASURE PLANETARY PINION GEAR THRUST CLEARANCE

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

Standard clearance:

0.2-0.6 mm (0.008-0.024 in.)

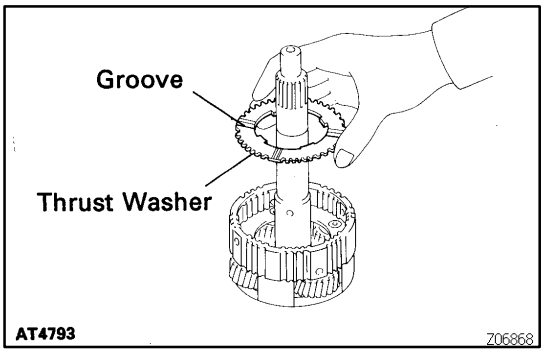
Maximum clearance:

1.0 mm (0.039 in.)

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

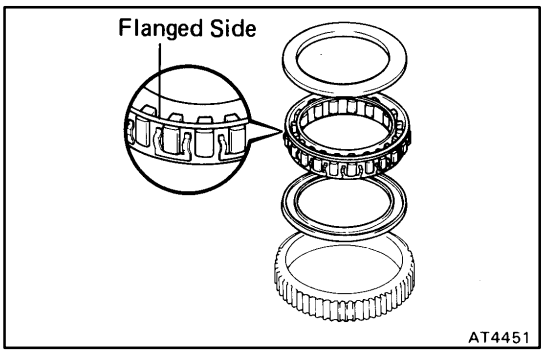
AT0DR-05

OVERDRIVE PLANETARY GEAR, OVERDRIVE DIRECT CLUTCH AND OVERDRIVE ONE-WAY CLUTCH ASSEMBLY

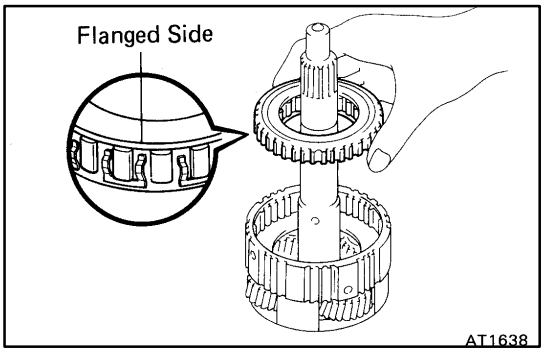


1. INSTALL OVERDRIVE ONE-WAY CLUTCH

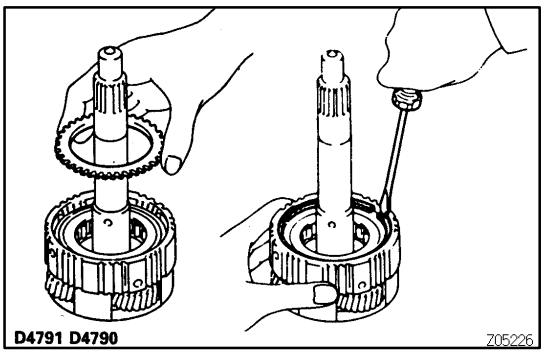
(a) Install the thrust washer to the overdrive planetary gear, the grooved side facing upward.



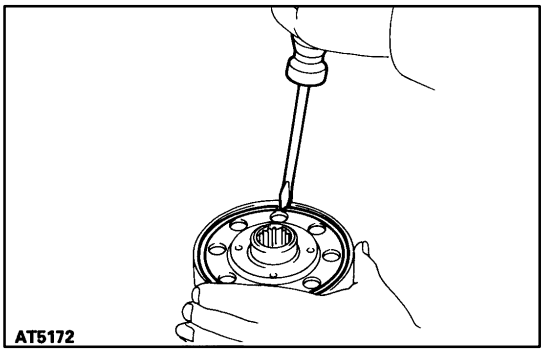
(b) Install the one-way clutch into the outer race the flanged side of the one-way clutch facing upward.



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

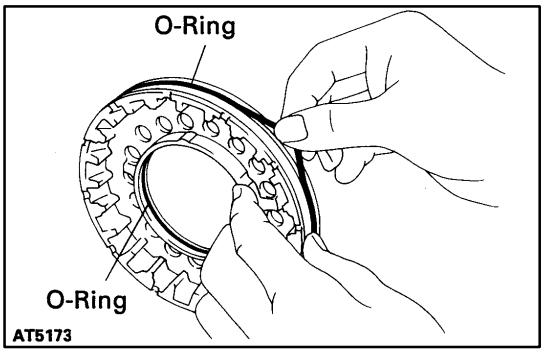


(d) Install the retaining plate.
(e) Using a screwdriver, install the snap ring.



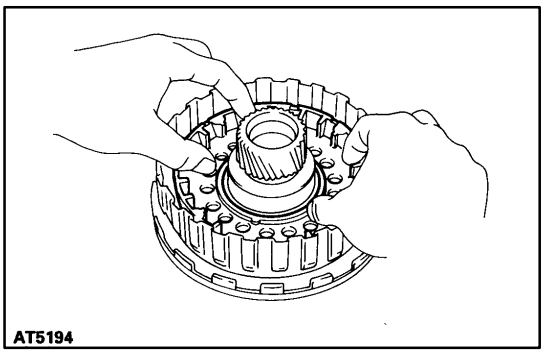
2. INSTALL RING GEAR FLANGE TO OVERDRIVE PLANETARY RING GEAR

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

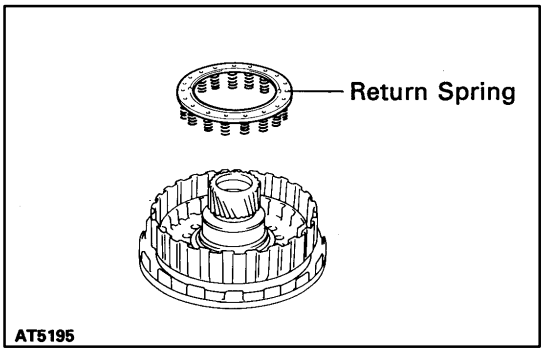


3. INSTALL OVERDRIVE DIRECT CLUTCH PISTON

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

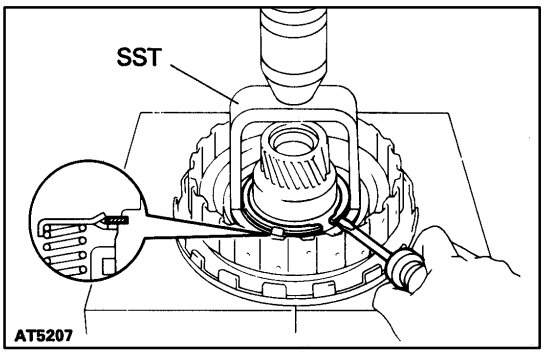


(b) Being careful not to damage the O-rings, press the direct clutch piston into the clutch drum with both hands.



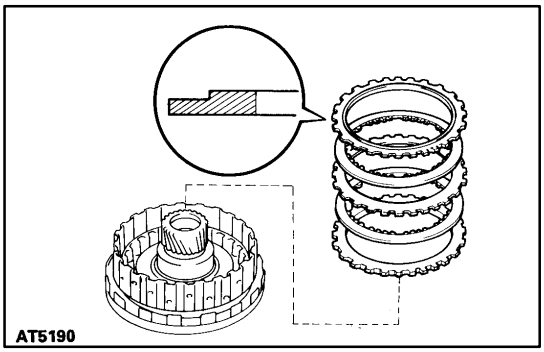
4. INSTALL PISTON RETURN SPRING

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



(b) Place SST on the spring retainer, and compress the return spring with a shop press.
SST 09350-30020 (09350-07040)

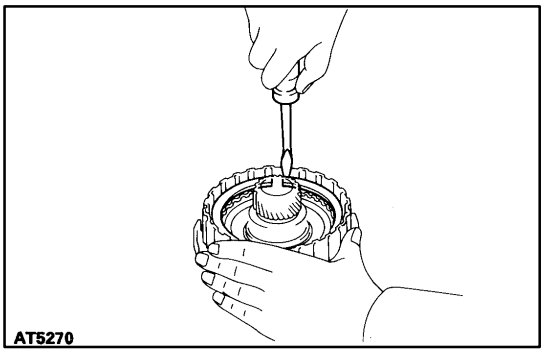
(c) Install the snap ring with SST. Be sure the end gap of the snap ring is not aligned with the spring retainer claw.
SST 09350-30020 (09350-07070)



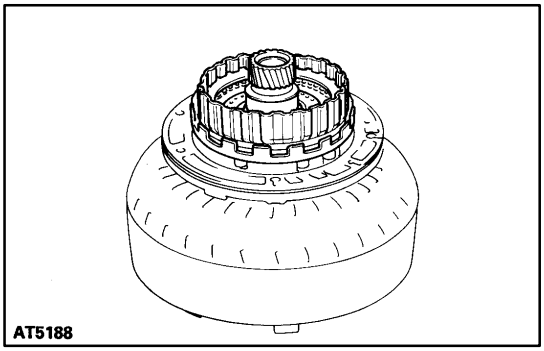
5. INSTALL PLATES, DISCS AND FLANGE

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

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

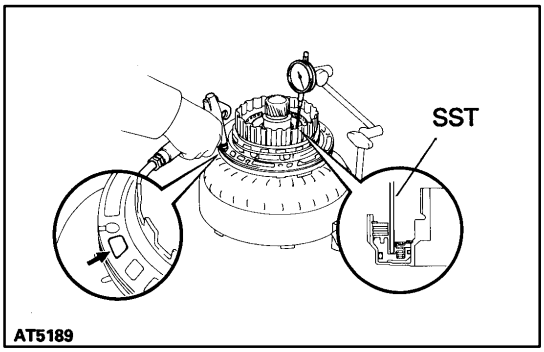


(c) Using a screwdriver, install the snap ring.



6. CHECK PISTON STROKE OF OVERDRIVE DIRECT CLUTCH

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



(b) Using SST and a dial indicator, measure the overdrive direct clutch piston stroke while applying and releasing compressed air (392-785 kPa, 4-8 kgf/cm^2 or 57-114 psi).
SST 09350-30020 (09350-06120)
Piston stroke:
1.45-1.70 mm (0.057-0.067 in.)
If the piston stroke is less than the limit, parts may have been assembled incorrectly, so check and reassemble

again.

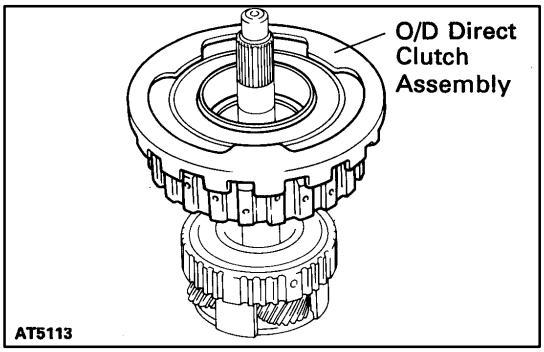
If the piston stroke is nonstandard, select another flange.

HINT: There are 6 different flange thicknesses.

Flange Thickness

mm (in.)

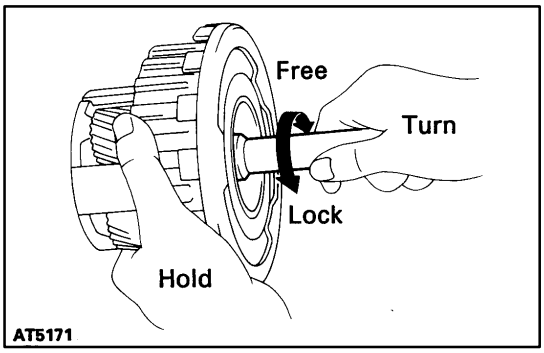
No.	Thickness	No.	Thickness
16	3.6 (0.142)	19	3.3 (0.130)
17	3.5 (0.138)	20	3.2 (0.126)
18	3.4 (0.134)	21	3.1 (0.122)



7. INSTALL OVERDRIVE DIRECT CLUTCH ASSEMBLY

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

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



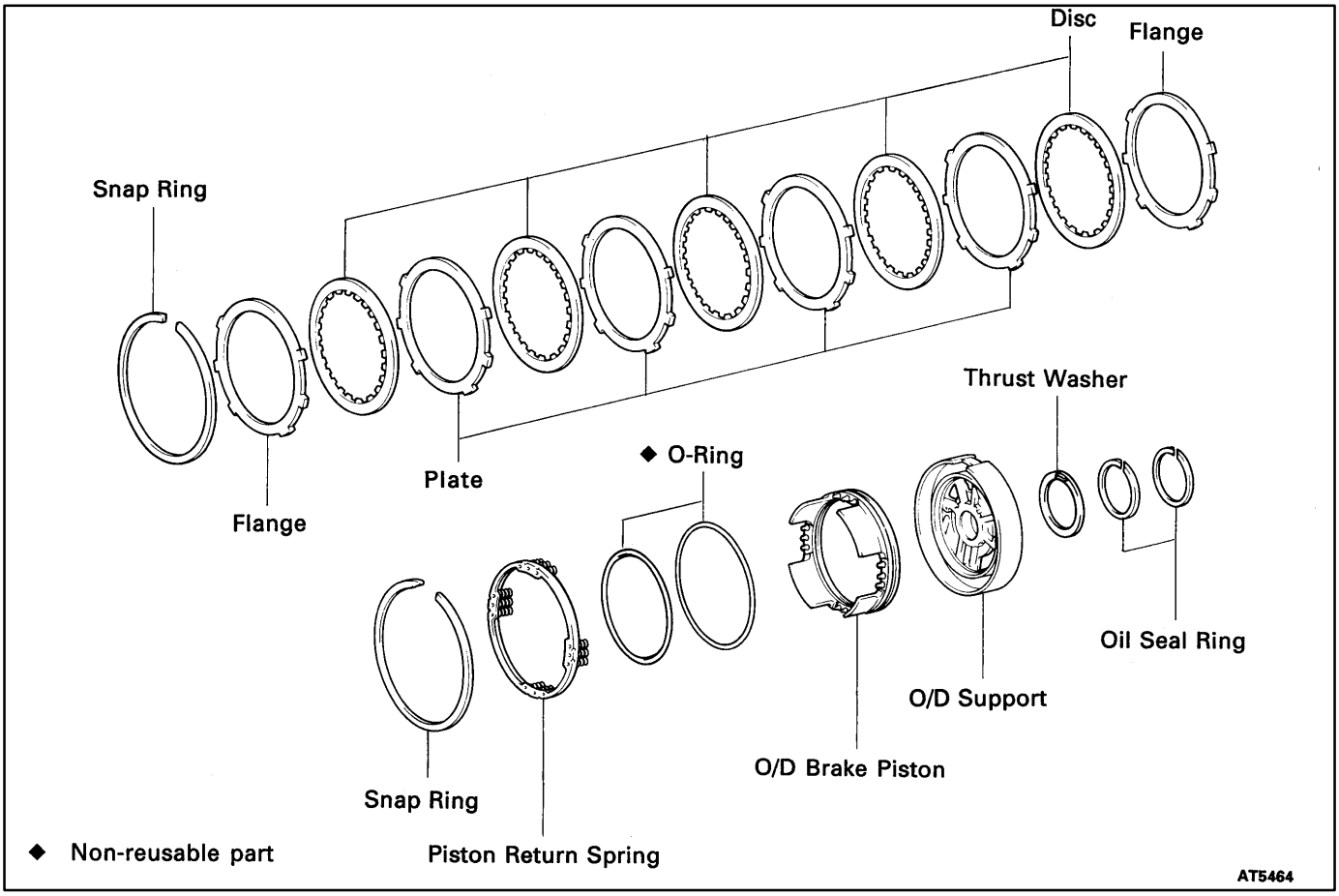
8. CHECK OPERATION OF ONE-WAY CLUTCH

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

OVERDRIVE BRAKE

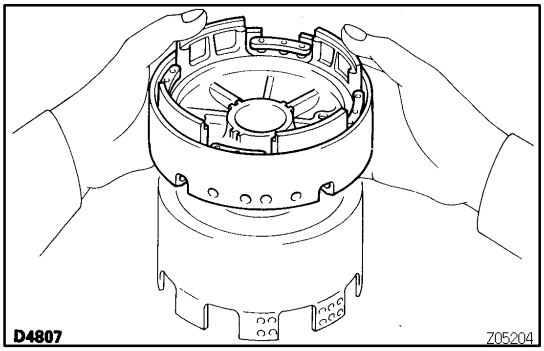
AT0DS-02

COMPONENTS



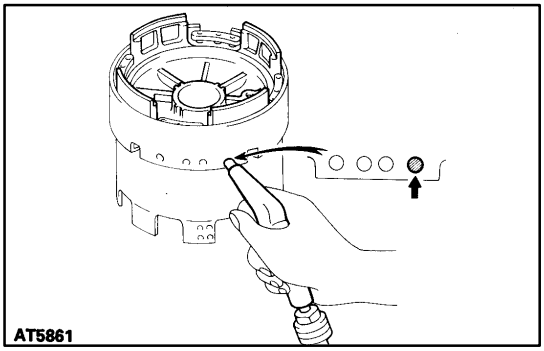
AT0DT-02

OVERDRIVE BRAKE DISASSEMBLY

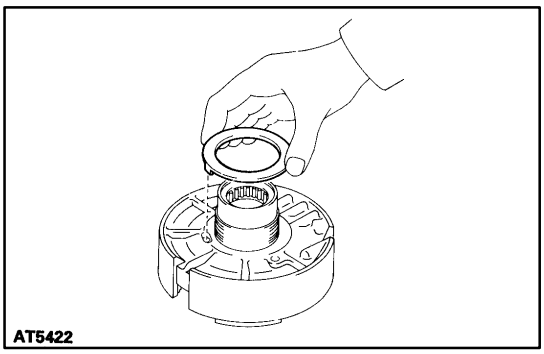


1. CHECK OVERDRIVE BRAKE PISTON MOVEMENT

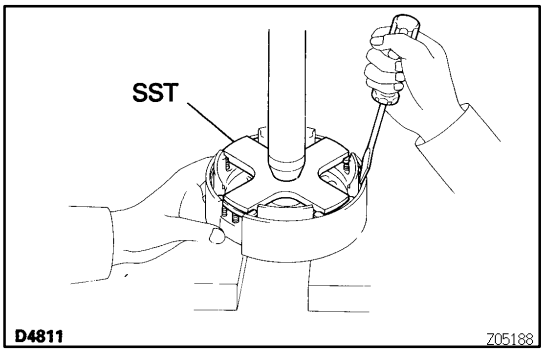
(a) Place the O/D support assembly onto the direct clutch assembly.



(b) Apply compressed air into the oil passage as shown, and be sure that the O/D brake piston moves smoothly.

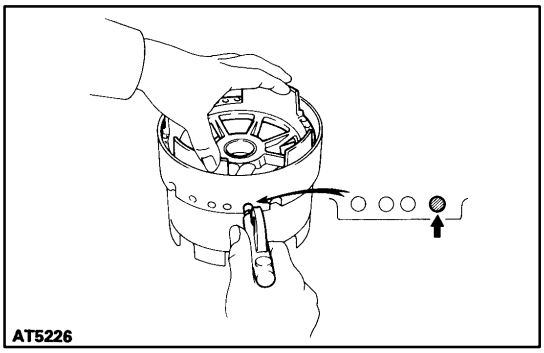


2. REMOVE CLUTCH DRUM THRUST WASHER FROM OVERDRIVE SUPPORT



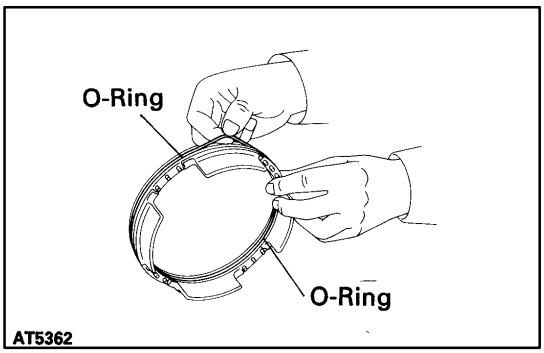
3. REMOVE PISTON RETURN SPRING

(a) Place SST on the spring retainer, and compress the return spring with a shop press.
SST 09350-30020 (09350-07030)
(b) Remove the snap ring with a screwdriver.
(c) Remove the piston return spring.

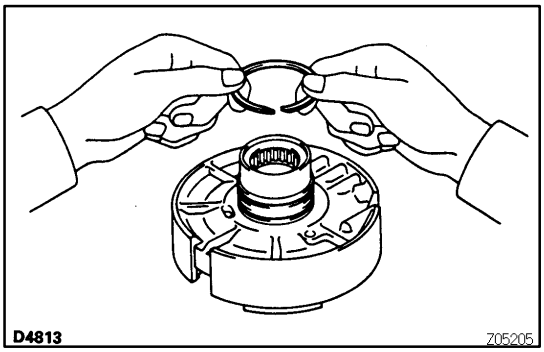


4. REMOVE OVERDRIVE BRAKE PISTON

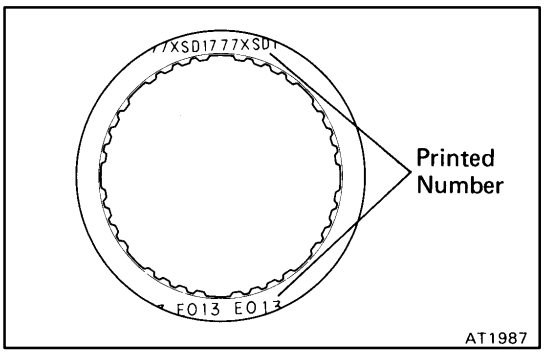
(a) Place the O/D support onto the direct clutch assembly.
(b) Hold the O/D brake piston so it does not slant, and apply compressed air into the passage to remove the O/D brake piston.
(c) Remove the O/D brake piston.



(d) Remove the 2 O-rings.



5. REMOVE OIL SEAL RINGS



AT0DU-04

OVERDRIVE BRAKE INSPECTION

1. INSPECT DISC, PLATE AND FLANGE

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

HINT:

★ If the lining of the disc is peeling off or discolored, or even if a part of the printed numbers are defaced, replace all discs.

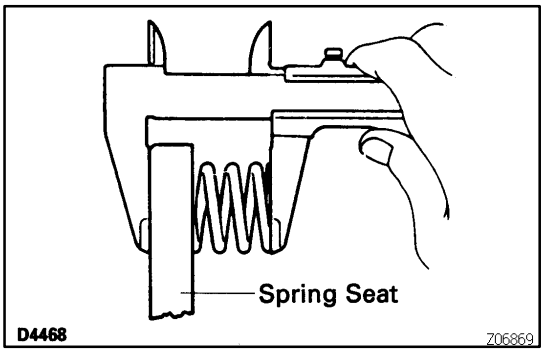
★ Before assembling new discs, soak them in ATF for at least 15 minutes.

2. CHECK OVERDRIVE BRAKE PISTON RETURN SPRING

Check the spring free length together with the spring seat.

Standard free length:

17.23 mm (0.6783 in.)



AT0DV-04

OVERDRIVE BRAKE ASSEMBLY

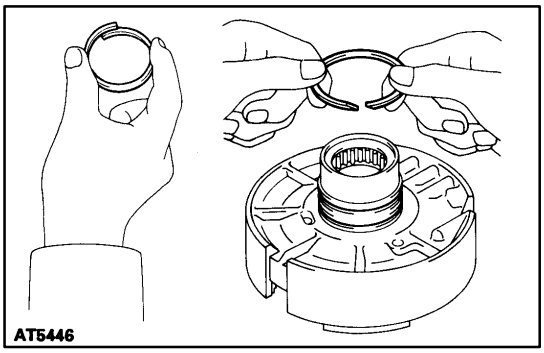
1. INSTALL OIL SEAL RINGS

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

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

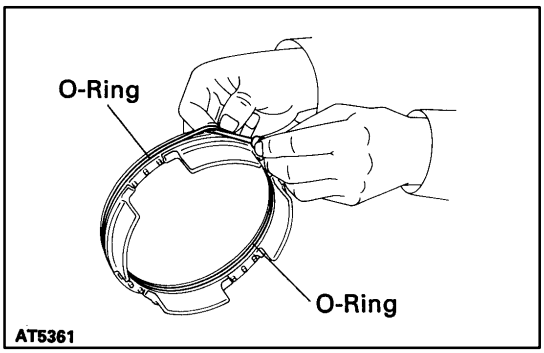
NOTICE: Do not spread the ring ends more than necessary.

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

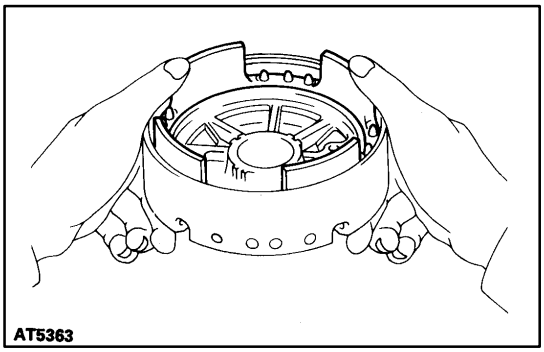


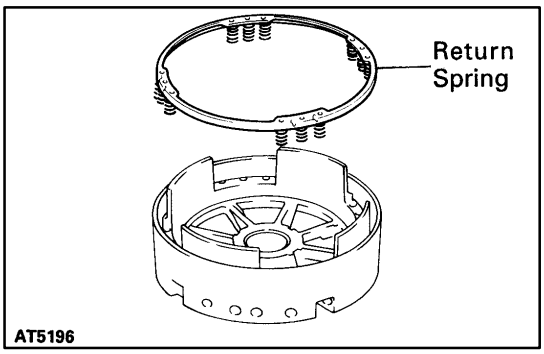
2. INSTALL OVERDRIVE BRAKE PISTON

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



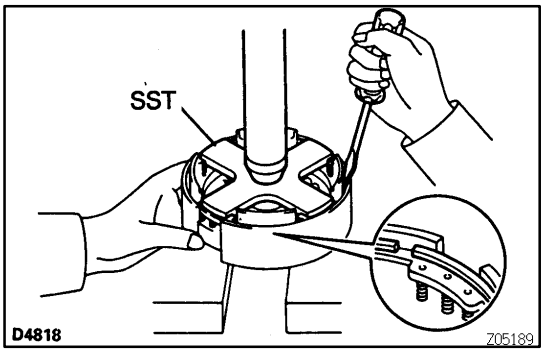
(b) Being careful not to damage the O-rings, press in the brake piston into the O/D support with both hands.





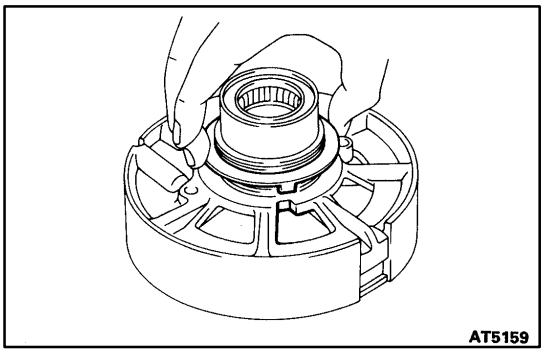
3. INSTALL PISTON RETURN SPRING

(a) Install the piston return spring.



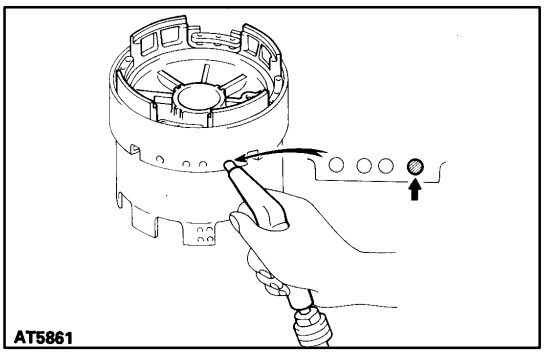
(b) Place SST on the spring retainer, and compress the return spring with a shop press.
SST 09350-30020 (09350-07030)

(c) Install the snap ring with a screwdriver. Be sure the end gap of the snap ring is not aligned with the cutout portion of the O/D support.



4. INSTALL CLUTCH DRUM THRUST WASHER

Coat the thrust washer with petroleum jelly and install it into the O/D support.
HINT: Make sure that the lug shape matches the hole on the O/D support.



5. CHECK OVERDRIVE BRAKE PISTON MOVEMENT

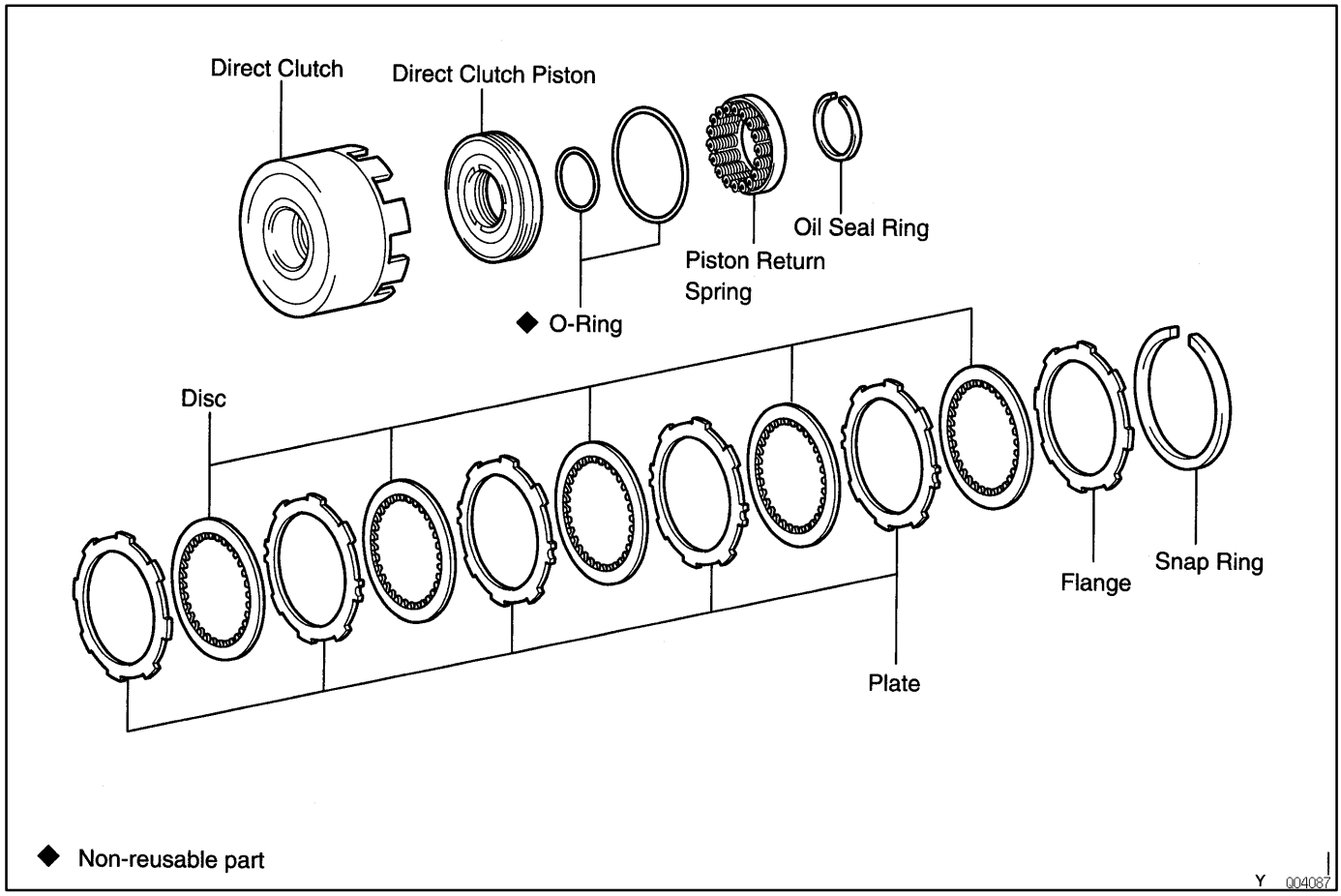
(a) Place the O/D support assembly onto the direct clutch assembly.

(b) Apply compressed air into the oil passage as shown, and be sure that the O/D Brake piston moves smoothly.

DIRECT CLUTCH

AT0DW-02

COMPONENTS

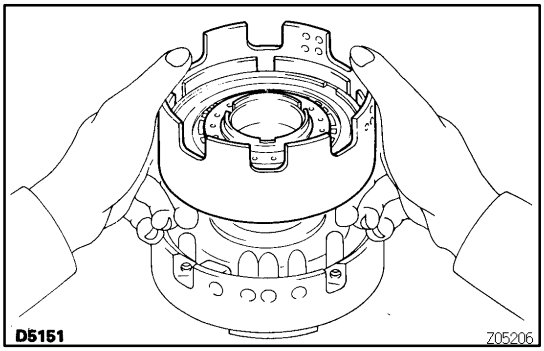


AT0DX-04

DIRECT CLUTCH DISASSEMBLY

1. CHECK PACK CLEARANCE OF DIRECT CLUTCH

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

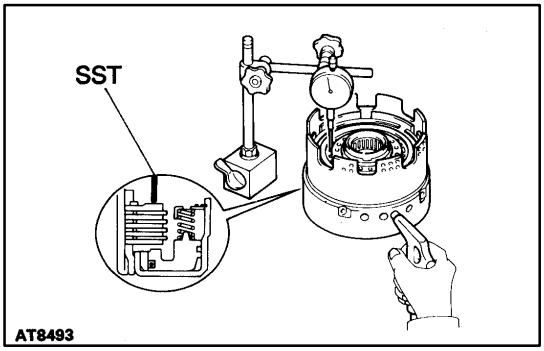


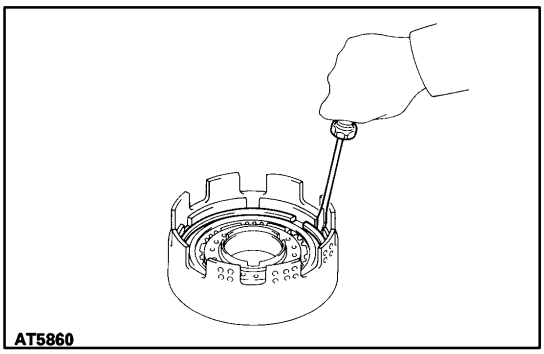
(b) Using SST and a dial indicator, measure the direct clutch pack clearancewhile applying and releasing compressed air (186-206 kPa, 1.9-2.1 kgf/cm^2, 27-30 psi).
SST 09350-30020 (09350-06120)

Pack clearance:

0.50 - 0.80 mm (0.0197 - 0.0315 in.)

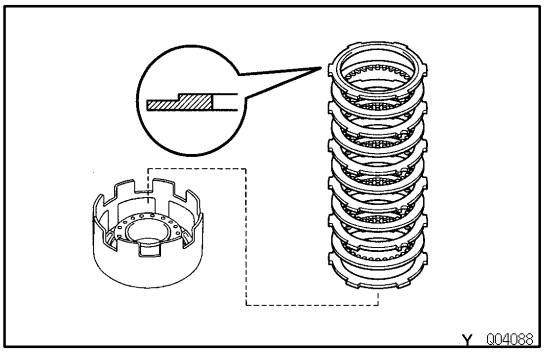
If the values are non-standard inspect the discs.



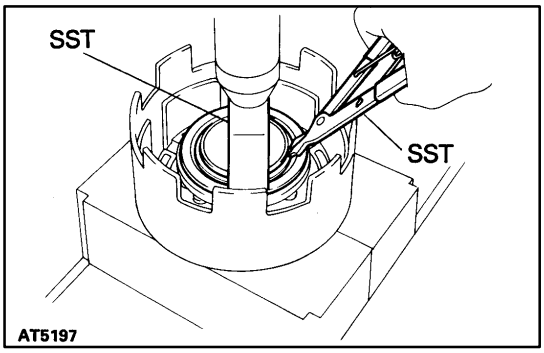


2. REMOVE FLANGE, PLATES AND DISCS

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



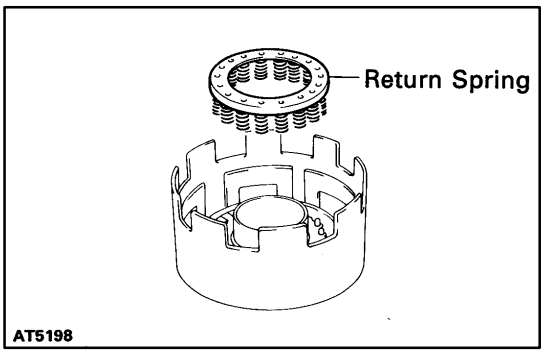
(b) Remove the flange, 5 plates and 5 discs.



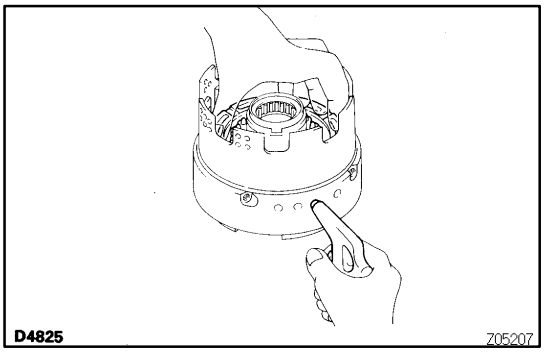
3. REMOVE PISTON RETURN SPRING

(a) Place SST on the spring retainer and compress the return spring with a shop press.
SST 09350-30020 (09350-07040)

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



(c) Remove the piston return spring.

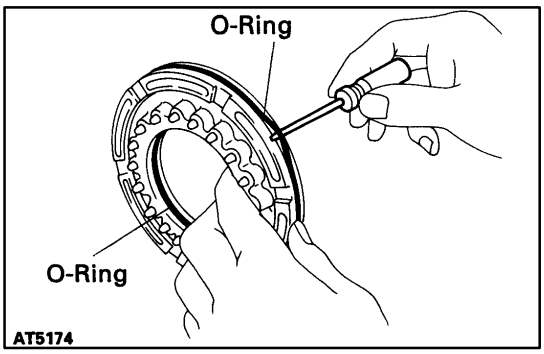


4. REMOVE DIRECT CLUTCH PISTON

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

(b) Hold the direct clutch piston and apply compressed air to the O/D support to remove the direct clutch piston.
HINT: Make sure the direct clutch piston is square in the drum before applying compressed air.

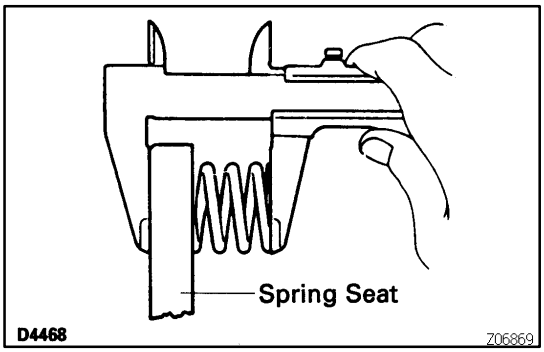
(c) Remove the direct clutch piston.



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

AT0DY-04

DIRECT CLUTCH INSPECTION

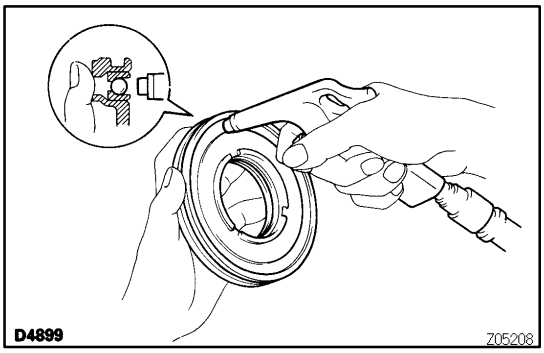


1. CHECK DIRECT CLUTCH PISTON RETURN SPRING

Check the spring free length together with the spring seat.

Standard free length:

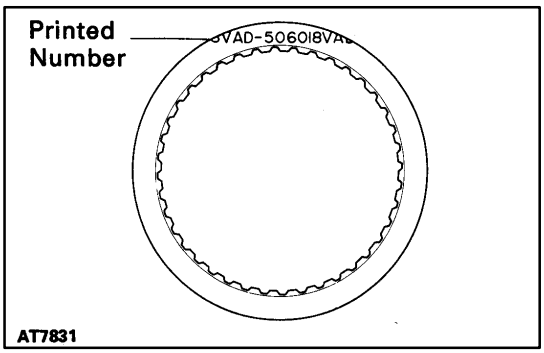
23.25 mm (0.9154 in.)



2. CHECK DIRECT CLUTCH PISTON

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

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



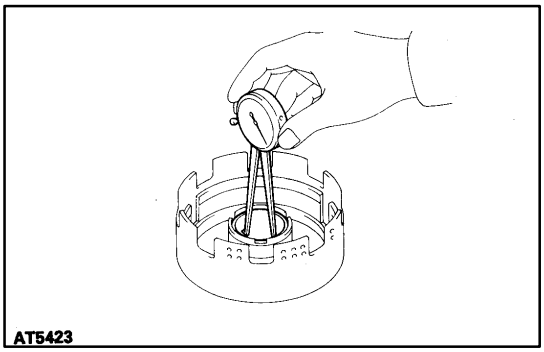
3. INSPECT DISC, PLATE AND FLANGE

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

HINT:

★ If the lining of the disc is peeling off or discolored, or even if a part of the printed numbers are defaced, replace all discs.

★ Before assembling new discs, soak them in ATF for at least 15 minutes.



4. CHECK DIRECT CLUTCH BUSHING

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

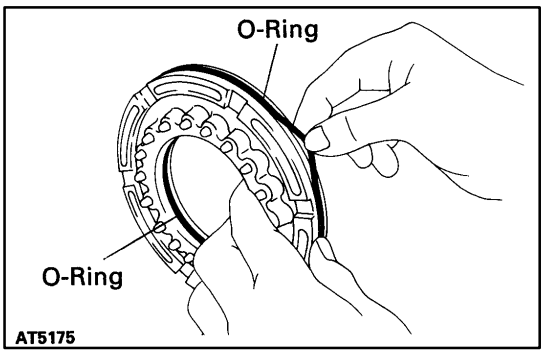
Maximum inside diameter:

53.97 mm (2.1248 in.)

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

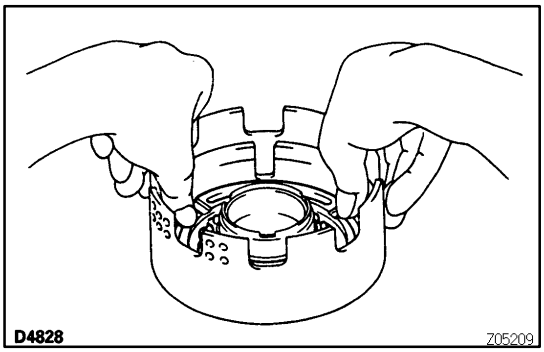
AT0DZ-04

DIRECT CLUTCH ASSEMBLY

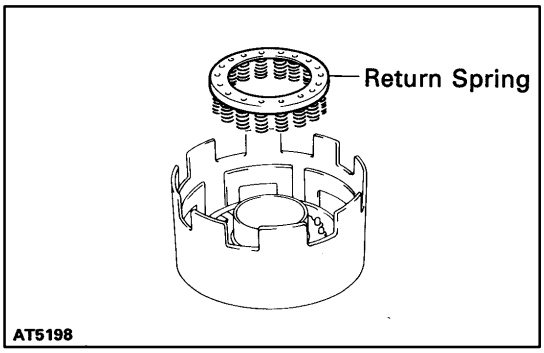


1. INSTALL DIRECT CLUTCH PISTON TO DIRECT CLUTCH DRUM

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

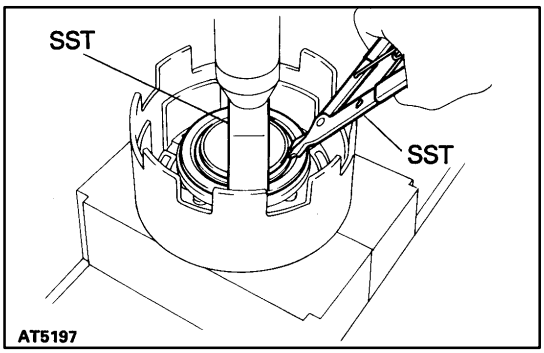


(b) Being careful not to damage the O-rings, press in the direct clutch piston into the clutch drum with both hands.



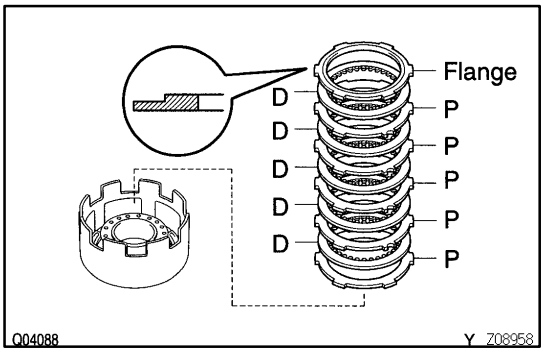
2. INSTALL PISTON RETURN SPRING

(a) Install the piston return spring.



(b) Place SST on the spring retainer, and compress the return spring with a shop press.
SST 09350-30020 (09350-07040)

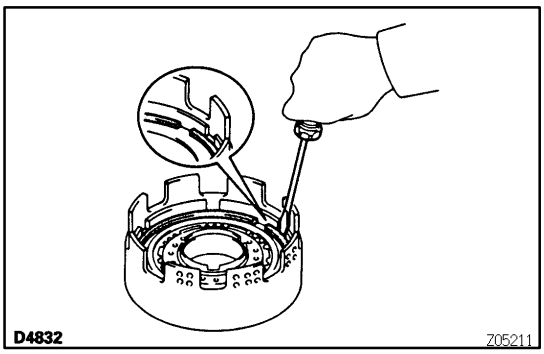
(c) Using SST, install the snap ring.
SST 09350-30020 (09350-07070)
Be sure the end gap of the snap ring is not aligned with the spring retainer claw.



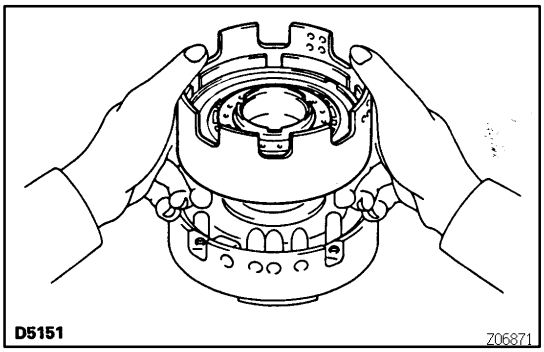
3. INSTALL PLATES, DISCS AND FLANGE

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

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

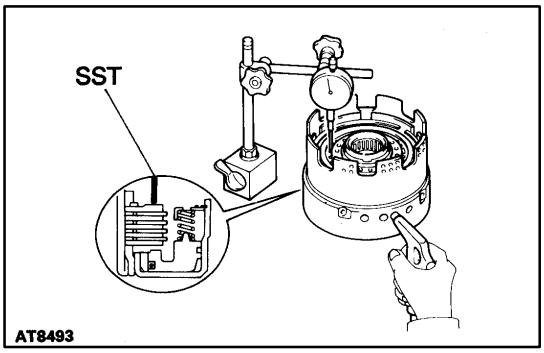


(c) Using a screwdriver, install the snap ring. Be sure the end gap of the snap ring is not aligned with the cutout portion of the direct clutch drum.



4. CHECK PISTON STROKE OF DIRECT CLUTCH

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



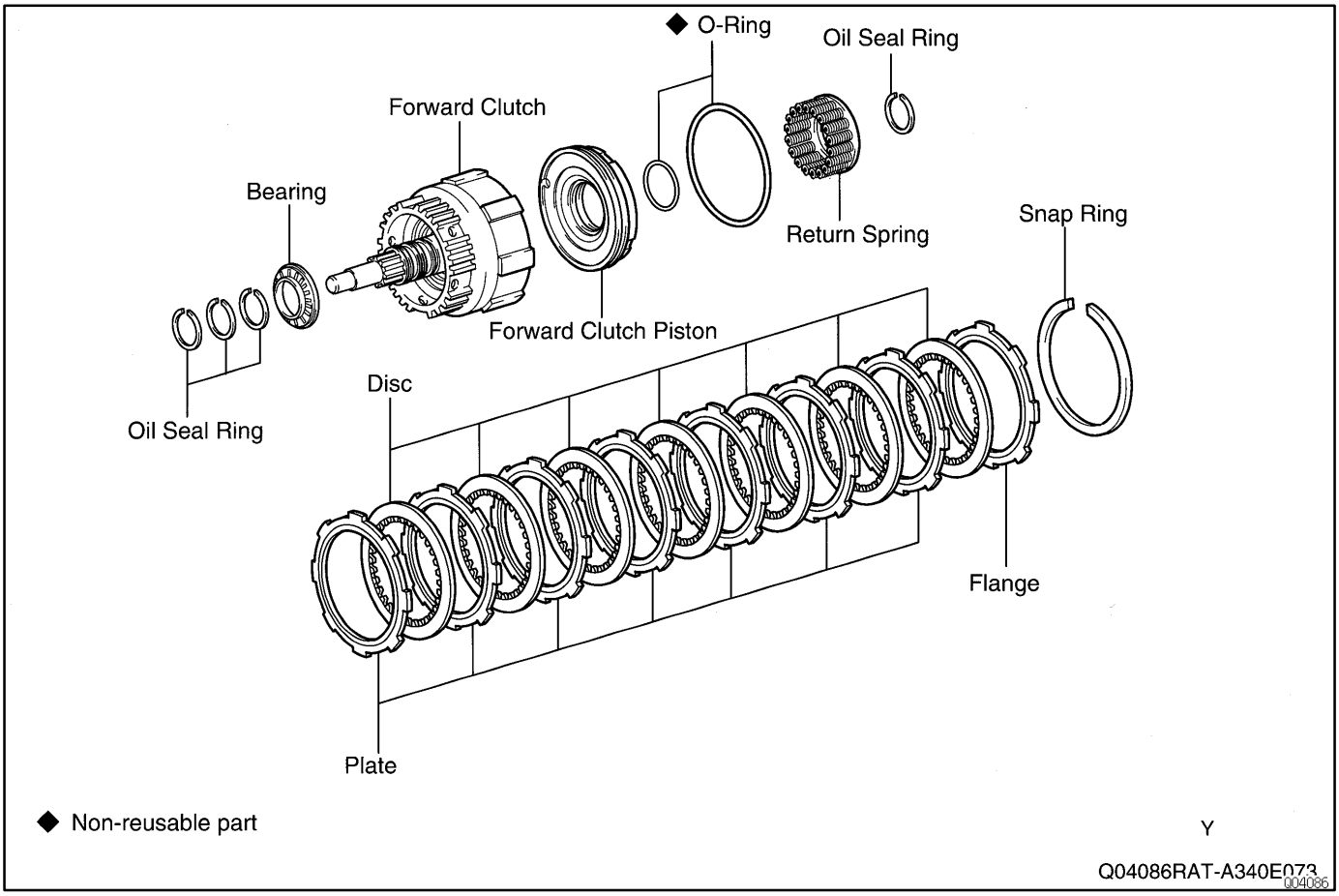
(b) Using SST and a dial indicator, measure the direct clutch pack clearance while applying and releasing compressed air (186-206 kPa, 1.9-2.1 kgf/cm^2, 27-30 psi).
SST 09350-30020 (09350-06120)
Pack clearance:
0.50 - 0.80 mm (0.0197 - 0.0315 in.)
If the pack clearance is less than the limit, parts may have been assembled incorrectly, so check and reassemble again.
If the pack clearance is non-standard, select another flange.
HINT: There are 9 different flange thicknesses.
Flange thickness
mm (in.)

No.	Thickness	No.	Thickness
86	2.7 (0.106)	30	3.3 (0.130)
85	2.8 (0.110)	29	3.4 (0.134)
84	2.9 (0.114)	28	3.5 (0.138)
33	3.0 (0.118)	27	3.6 (0.142)
32	3.1 (0.122)	34	3.7 (0.146)
31	3.2 (0.126)	-	-

FORWARD CLUTCH

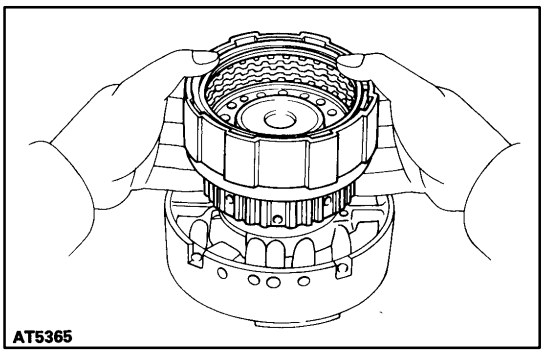
AT0E0-02

COMPONENTS



AT0E1-04

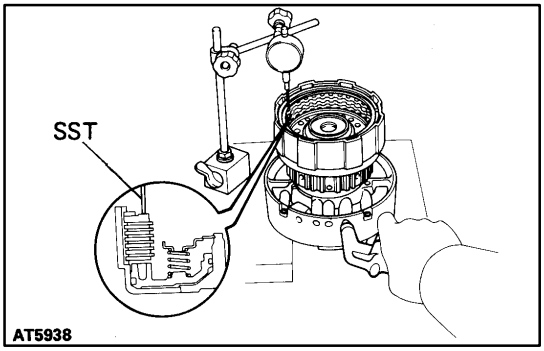
FORWARD CLUTCH DISASSEMBLY



1. PLACE FORWARD CLUTCH INTO OVERDRIVE SUPPORT

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

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



2. CHECK FORWARD CLUTCH PACK CLEARANCE

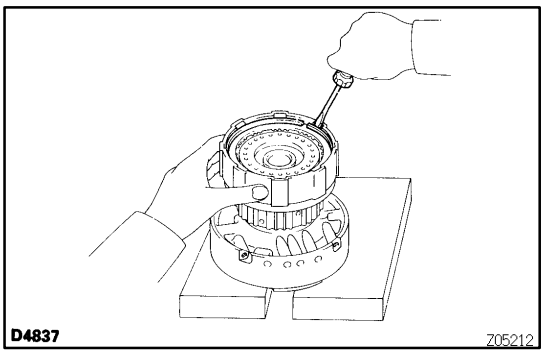
Using SST and a dial indicator, measure forward clutch pack clearance while applying and releasing compressed air (186-206 kPa, 1.9-21. kgf/cm^2, 27-30 psi).

SST 09350-30020 (09350-06120)

Pack clearance:

0.70-1.00 mm (0.0276-0.0394 in.)

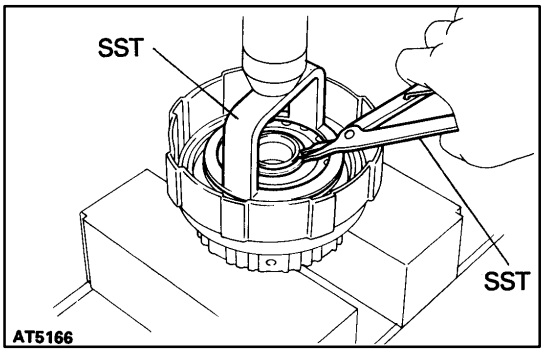
If the values are non-standard, inspect the discs.



3. REMOVE FLANGE, PLATES AND DISCS

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

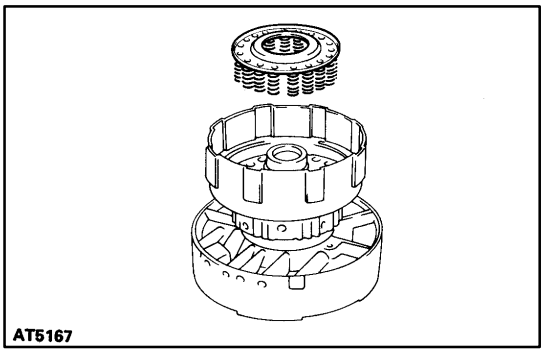
(b) Remove the flange, 7 plates and 7 discs.



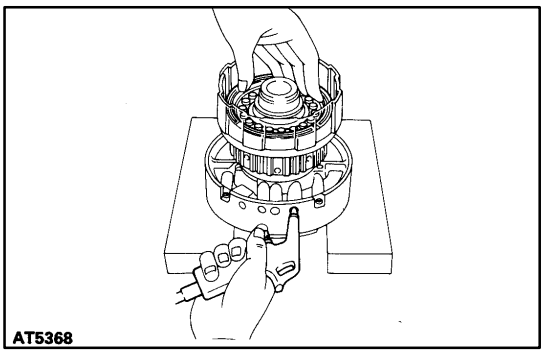
4. REMOVE PISTON RETURN SPRING

(a) Place SST on the spring retainer and compress the return spring with a shop press.
SST 09350-30020 (09350-07040)

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



(c) Remove the piston return spring.

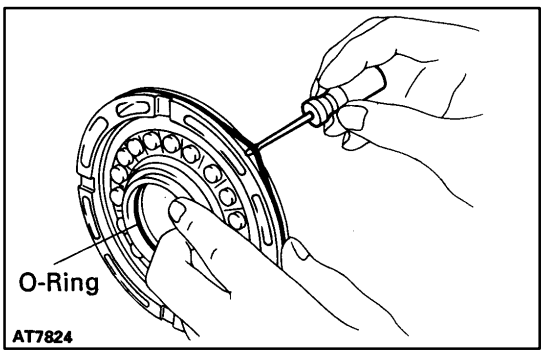


5. REMOVE FORWARD CLUTCH PISTON

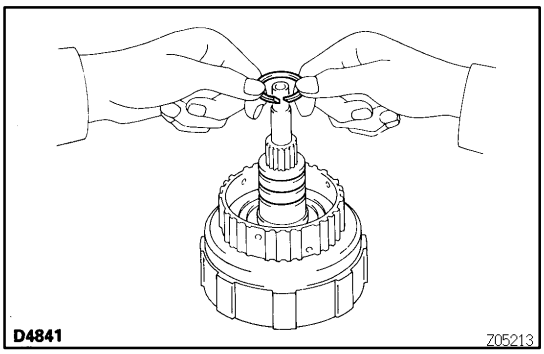
(a) Place the forward clutch drum onto the O/D support.

(b) Hold the forward clutch piston with hand, apply compressed air to the O/D support to remove the forward clutch piston.

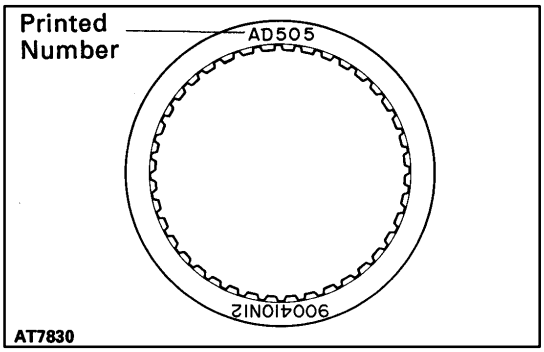
(c) Remove the forward clutch piston.



6. REMOVE 2 O-RINGS FROM PISTON



7. REMOVE 3 OIL SEAL RINGS FROM FORWARD CLUTCH



AT0E2-04

FORWARD CLUTCH INSPECTION

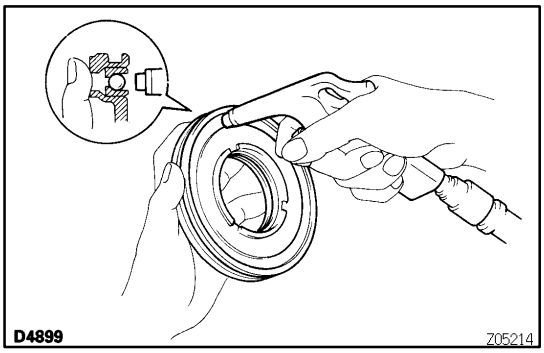
1. INSPECT DISC, PLATE AND FLANGE

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

HINT:

★ If the lining of the disc is peeling off or discolored, or even if a part of the printed numbers are defaced, replace all discs.

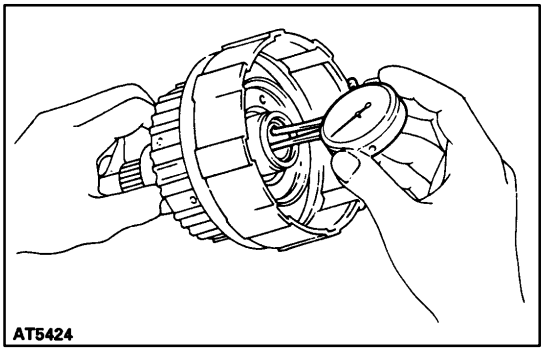
★ Before assembling new discs, soak them in ATF for at least 15 minutes.



2. CHECK FORWARD CLUTCH PISTON

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

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



3. CHECK FORWARD CLUTCH DRUM BUSHING

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

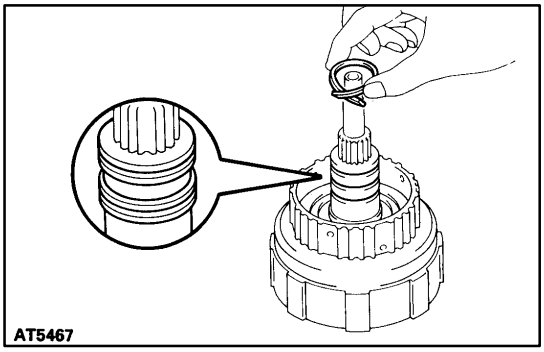
Maximum inside diameter:

24.08 mm (0.9480 in.)

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

AT0E3-04

FORWARD CLUTCH ASSEMBLY



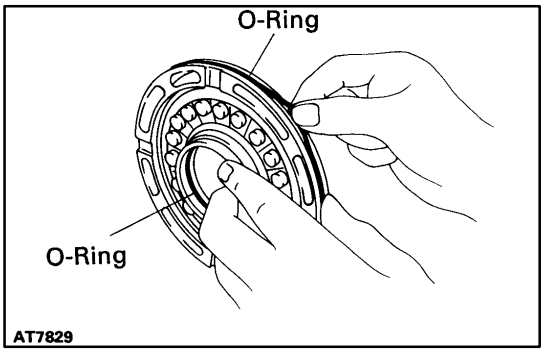
1. INSTALL OIL SEAL RINGS

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

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

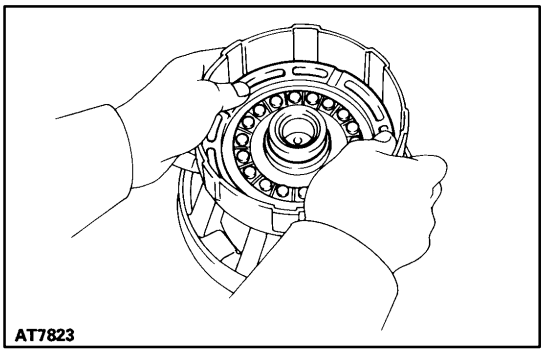
NOTICE: Do not spread the ring ends more than necessary.

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

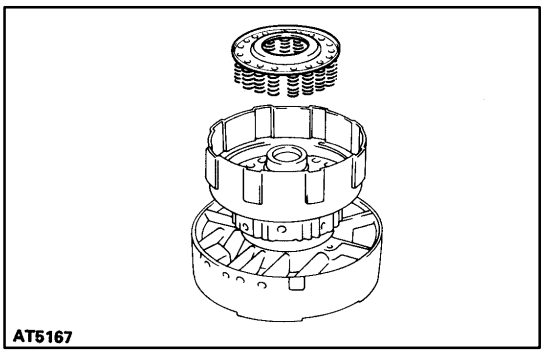


2. INSTALL FORWARD CLUTCH PISTON

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

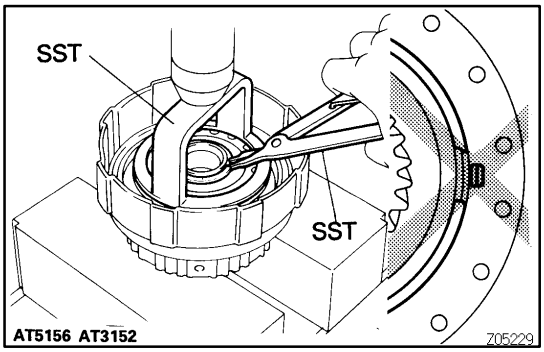


(b) Being careful not to damage the O-rings, press the clutch piston into the forward clutch drum with both hands.



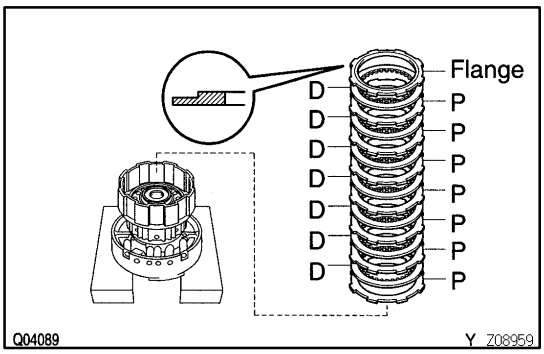
3. INSTALL PISTON RETURN SPRING

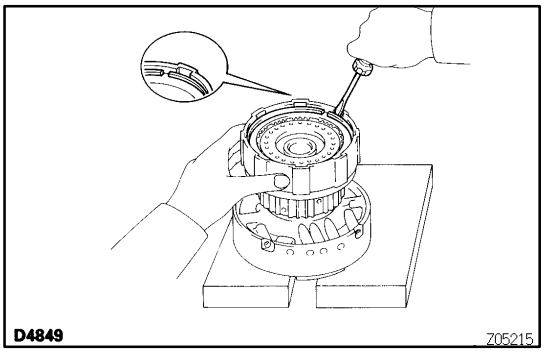
(a) Install the piston return spring.

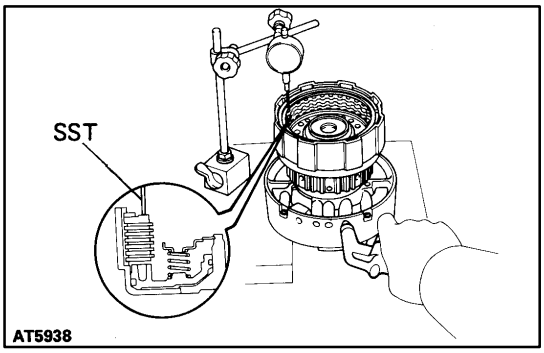


(b) Place SST on the spring retainer, and compress the return spring with a shop press.
SST 09350-30020 (09350-07040)

(c) Using SST, install the snap ring. Be sure the end gap of the snap ring is not aligned with the spring retainer claw.
SST 09350-30020 (09350-07070)







4. INSTALL PLATES, DISCS AND FLANGE

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

(b) Then install the flange, the rounded edge facing downward.
HINT: There are 6 different flange thicknesses.
Flange thickness
mm (in.)

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

(c) Install the snap ring with a screwdriver. Be sure the end gap of the snap ring is not aligned with the cutout portion of the forward clutch drum.

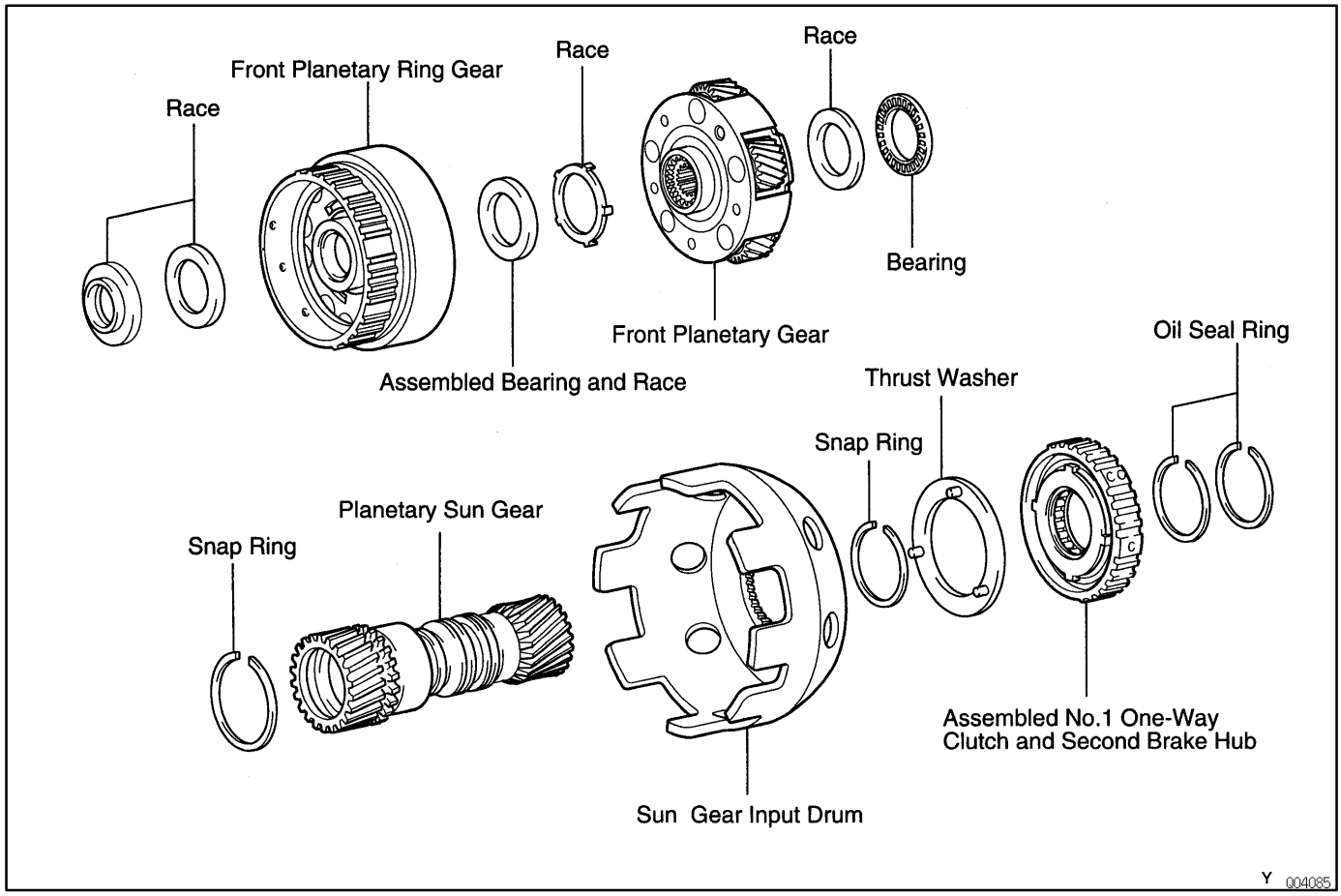
5. CHECK PACK CLEARANCE OF FORWARD CLUTCH

Using SST and a dial indicator, measure the forward clutch pack clearance while applying and releasing compressed air (186-206 kPa, 1.9-2.1 kgf/cm^2, 27-30 psi).
SST 09350-30020 (09350-06120)
Pack clearance:
0.70-1.00 mm (0.0276-0.0394 in.)
If the pack clearance is less than the limit, parts may have been assembled incorrectly, check and reassemble again.

FRONT PLANETARY GEAR

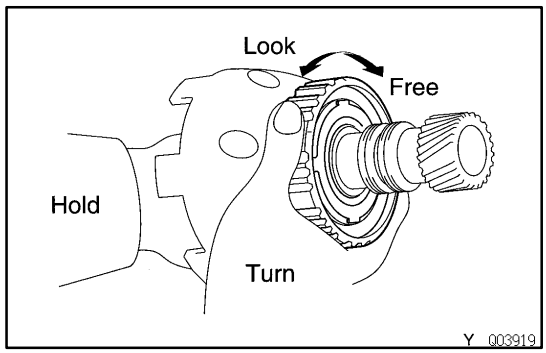
AT0E4-02

COMPONENTS



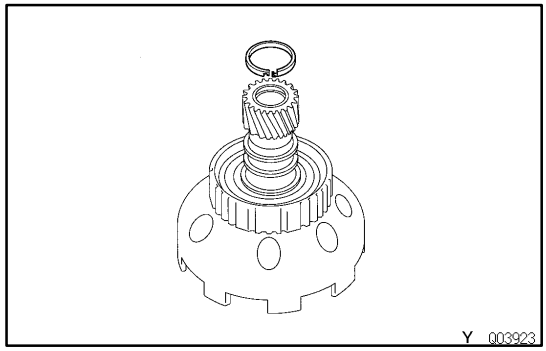
AT0E5-03

PLANETARY SUN GEAR AND NO.1 ONE-WAY CLUTCH DISASSEMBLY

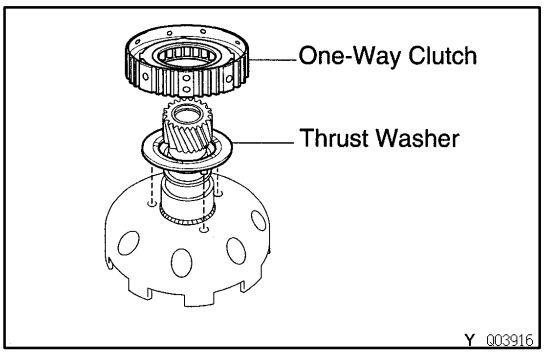


1. CHECK OPERATION OF NO.1 ONE-WAY CLUTCH

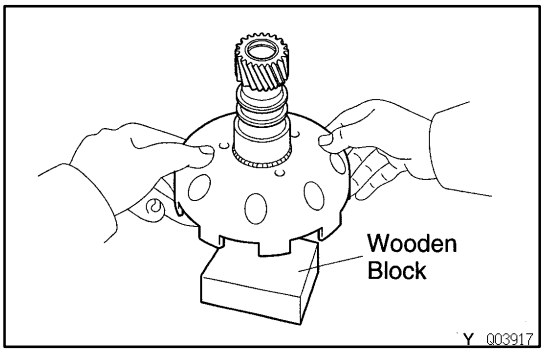
Hold the planetary sun gear and turn the second brake hub. Check that the second brake hub turns freely clockwise and locks counterclockwise.



2. REMOVE 2 OIL SEAL RINGS

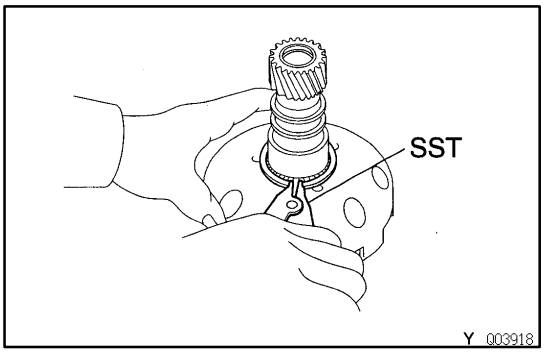


3. REMOVE NO.1 ONE- WAY CLUTCH AND THRUST WASHER FROM SUN GEAR INPUT DRUM



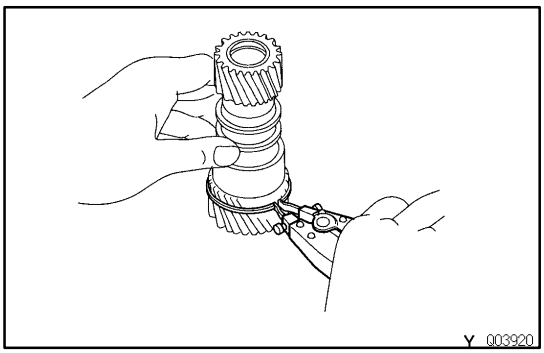
4. REMOVE SUN GEAR INPUT DRUM FROM PLANETARY SUN GEAR

(a) Use a wooden block, etc. as a work stand.



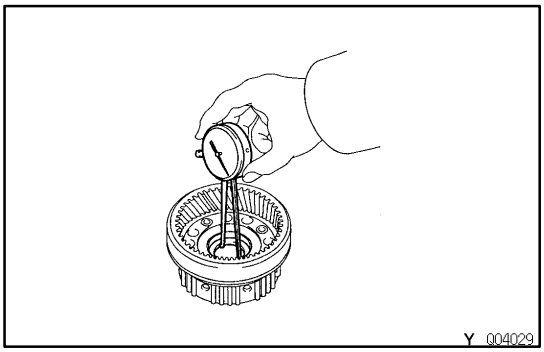
(b) Using SST, remove the snap ring.
SST 09350-30020 (09350-07070)

(c) Remove the sun gear input drum from the planetary sun gear.



5. REMOVE SNAP RING FROM PLANETARY SUN GEAR

Using a snap ring expander, remove the snap ring from the planetary sun gear.



FRONT PLANETARY GEAR INSPECTION AT0E6-03

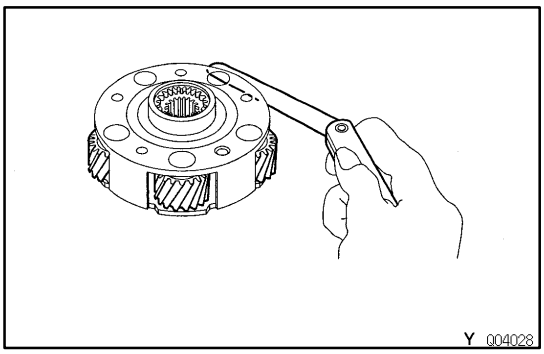
1. CHECK FRONT PLANETARY RING GEAR BUSHING

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

Maximum inside diameter:

24.08 mm (0.9480 in.)

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



2. MEASURE PLANETARY PINION GEAR THRUST CLEARANCE

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

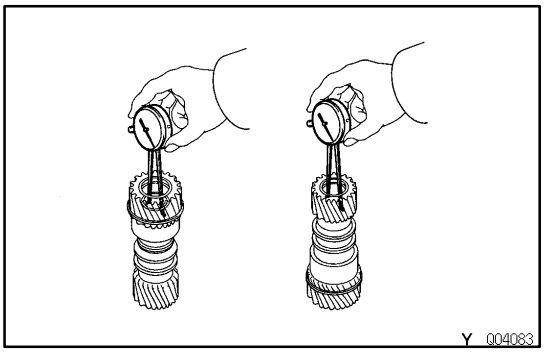
Standard clearance:

0.2-0.6 mm (0.008-0.0024 in.)

Maximum clearance:

1.0 mm (0.039 in.)

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



3. CHECK PLANETARY SUN GEAR BUSHINGS

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

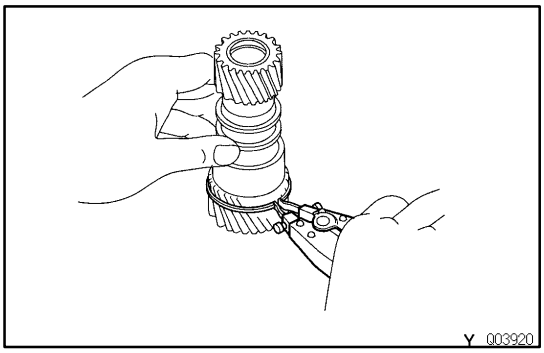
Maximum inside diameter:

27.08 mm (1.0661 in.)

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

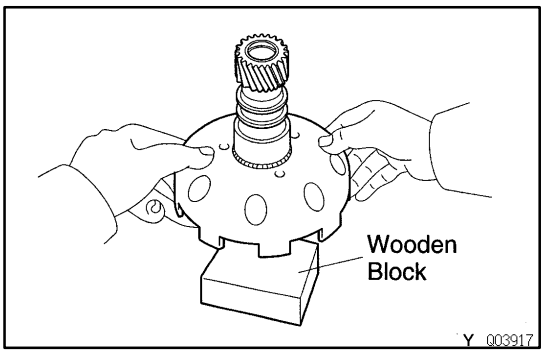
AT0E7-05

PLANETARY SUN GEAR AND NO.1 ONE-WAY CLUTCH ASSEMBLY



1. INSTALL SNAP RING TO PLANETARY SUN GEAR

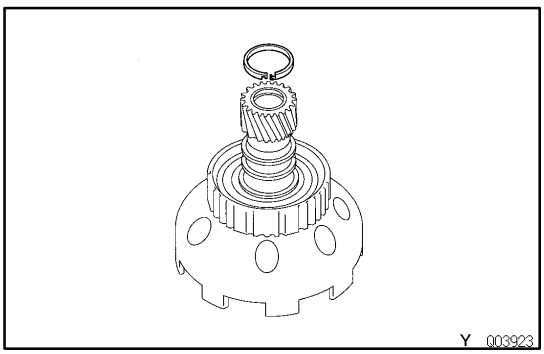
Using a snap ring expander, remove the snap ring from the planetary sun gear.



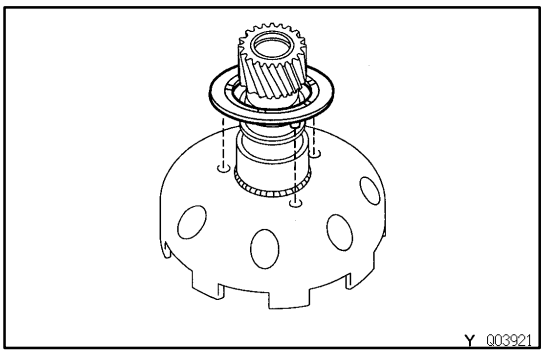
2. INSTALL SUN GEAR INPUT DRUM

(a) Use a wooden block, etc. as a work stand and place the planetary sun gear on it.

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

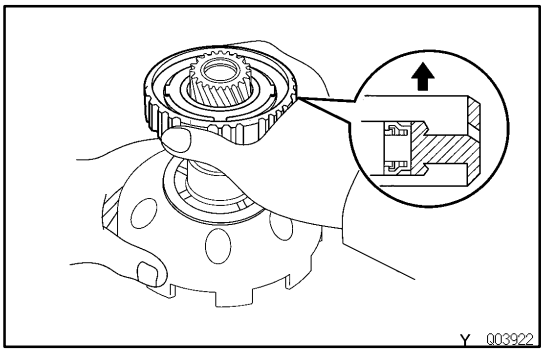


(c) Using SST, install the snap ring.
SST 09350-30020 (09350-07070)

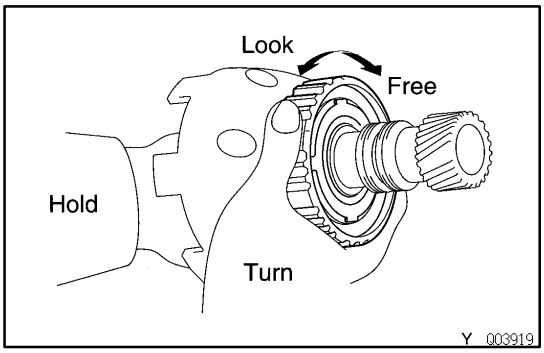


3. INSTALL THRUST WASHER ONTO PLANETARY SUN GEAR

HINT: Make sure that the lug shapes match the holes on the sun gear input drum.



4. INSTALL ASSEMBLED NO.1 ONE-WAY CLUTCH AND SECOND BRAKE HUB ONTO PLANETARY SUN GEAR

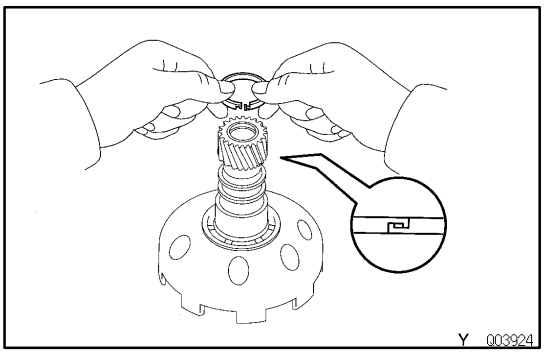


5. CHECK OPERATION OF NO.1 ONE-WAY CLUTCH

(a) Hold the planetary sun gear and turn the second brake hub.

(b) The second brake hub turns freely clockwise and locks counterclockwise.

(c) Remove the one-way clutch and second brake hub.



6. INSTALL OIL SEAL RINGS

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

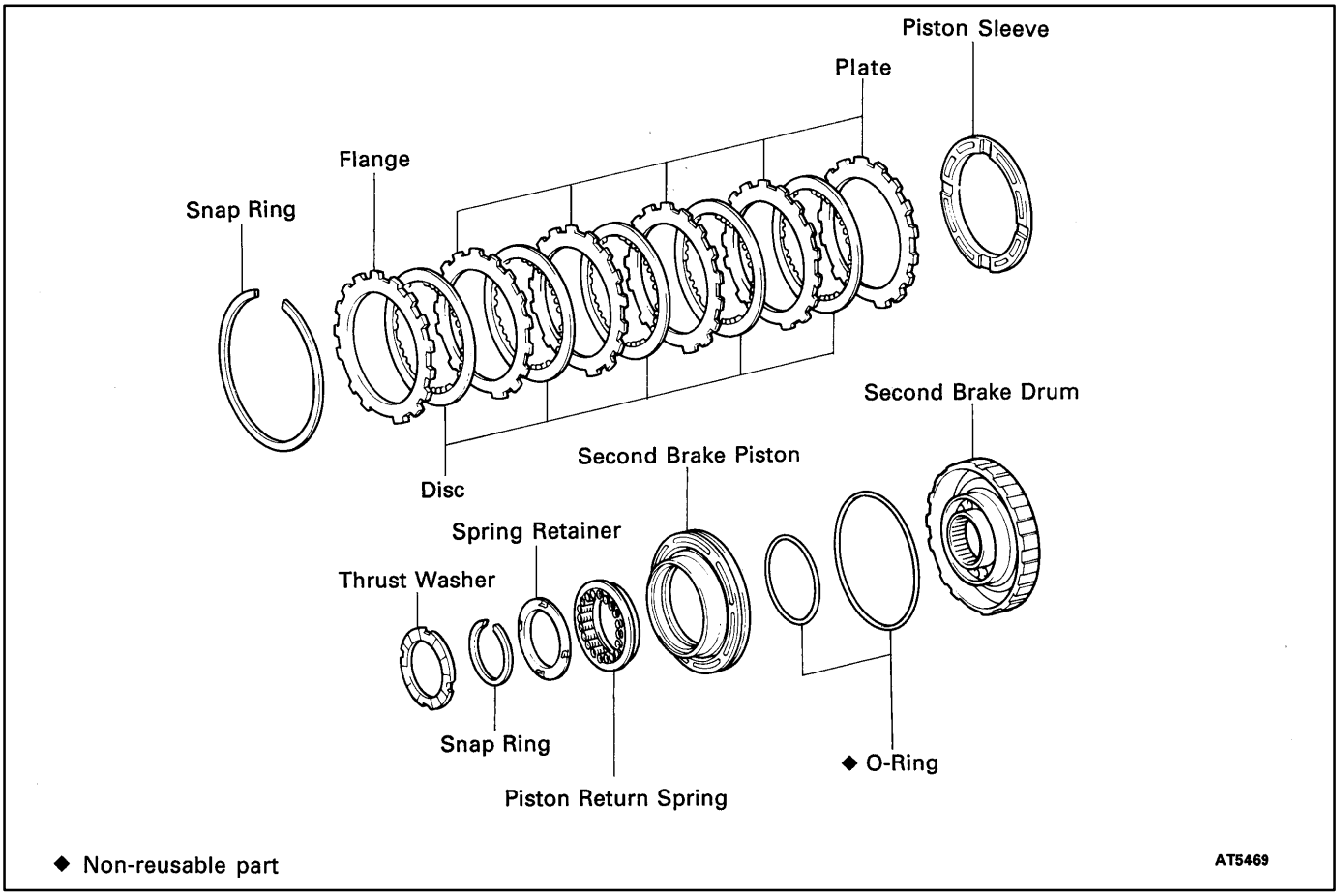
(b) Install the 2 oil seal rings onto the planetary sun gear.

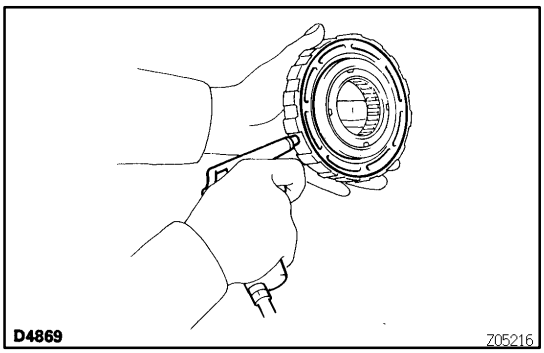
NOTICE: Do not spread the ring ends too much.

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

SECOND BRAKE
COMPONENTS

AT0E8-02



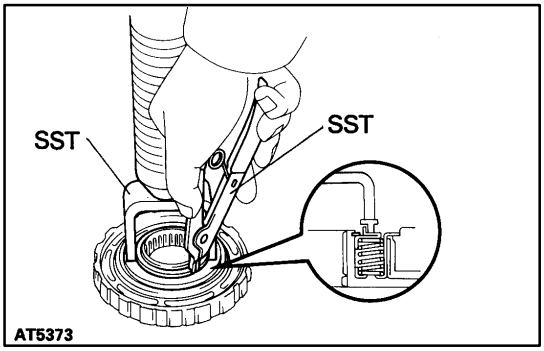


AT0E9-03

SECOND BRAKE DISASSEMBLY

1. CHECK SECOND BRAKE PISTON MOVEMENT

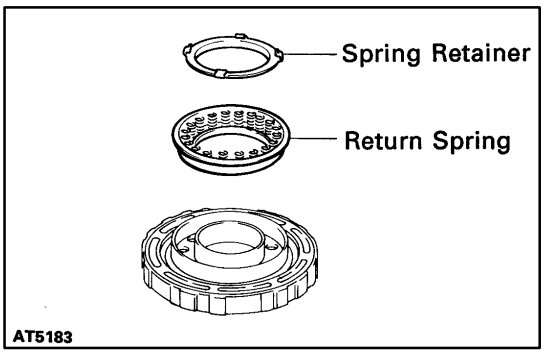
Make sure the second brake piston moves smoothly while applying and releasing low-pressure compressed air to the second brake drum.



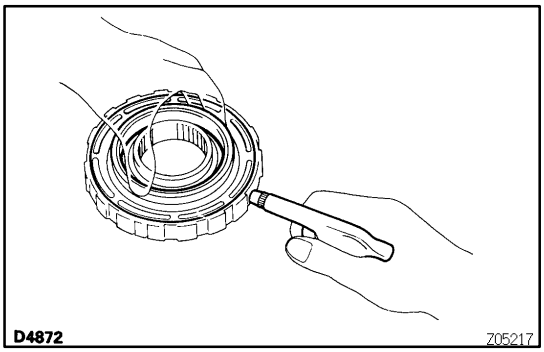
2. REMOVE PISTON RETURN SPRING

(a) Places SST on the spring retainer, and compress the return spring with a shop press.
SST 09350-30020 (09350-07040)

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



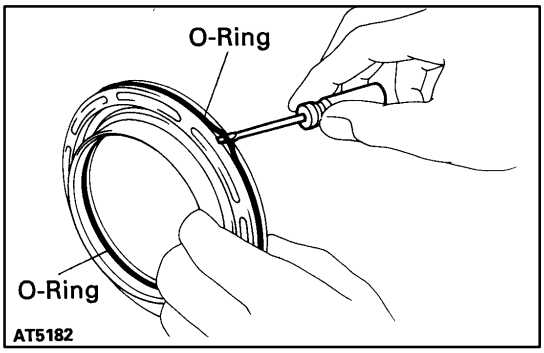
(c) Remove the spring retainer and piston return spring.



3. REMOVE SECOND BRAKE PISTON

(a) Hold the second brake piston with hand apply compressed air to the second brake drum to remove the second brake piston.

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



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

AT0EA-04

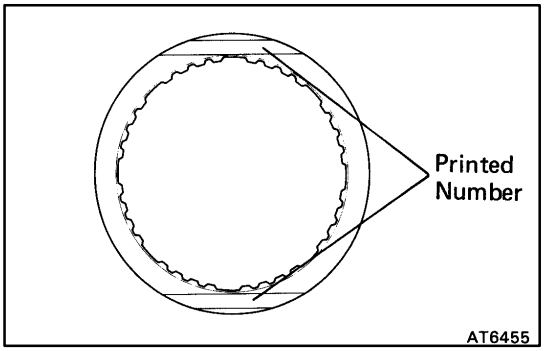
SECOND BRAKE INSPECTION

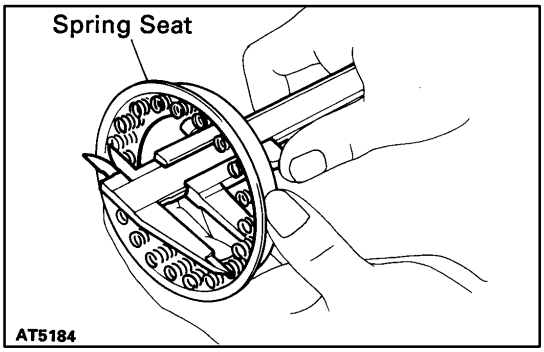
1. INSPECT DISC, PLATE AND FLANGE

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

★ If the lining of the disc is peeling off or discolored, or even if a part of the printed numbers are defaced, replace all discs.

★ Before assembling new discs, soak them in ATF for at least 15 minutes.





2. CHECK PISTON RETURN SPRING

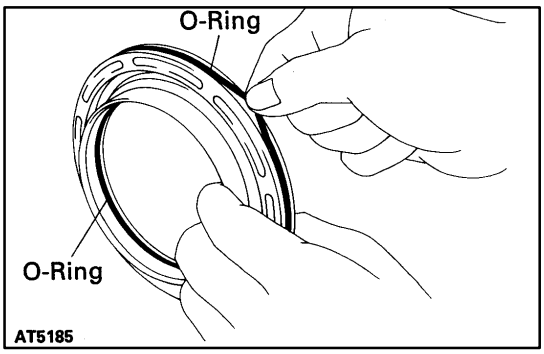
Check the return spring free length together with the spring test.

Standard free length:

19.64 mm (0.7732 in.)

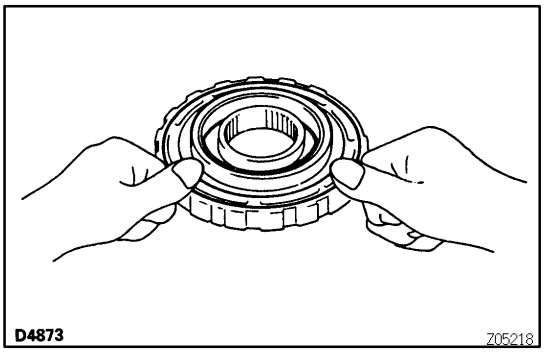
AT0EB-03

SECOND BRAKE ASSEMBLY

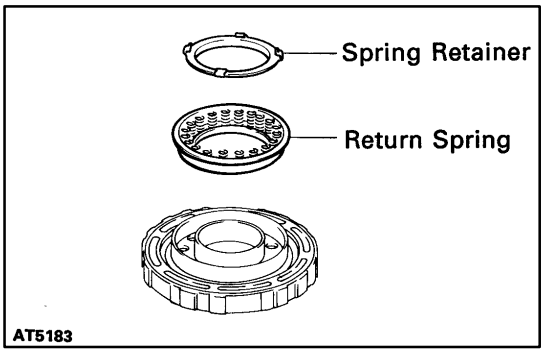


1. INSTALL SECOND BRAKE PISTON

(a) Coat 2 new O-rings with ATF and install them on second brake piston.



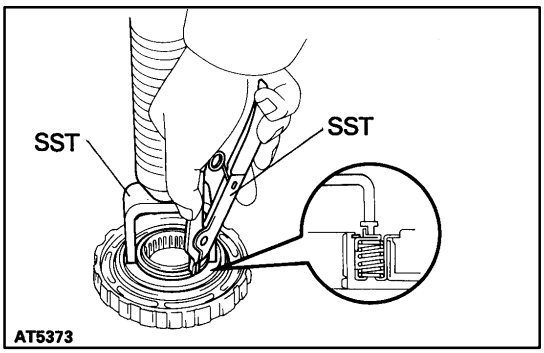
(b) Being careful not to damage the O-rings, press the second brake piston into the second brake drum with both hands.



2. INSTALL PISTON RETURN SPRINGS

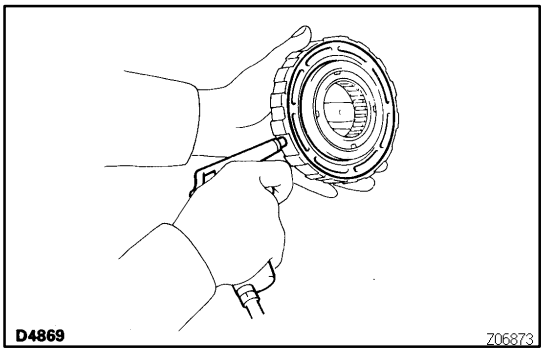
(a) Install the piston return spring.

(b) Install the spring retainer.



(c) Place SST on the spring retainer, and compress the return spring with a shop press.
SST 09350-30020 (09350-07040)

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



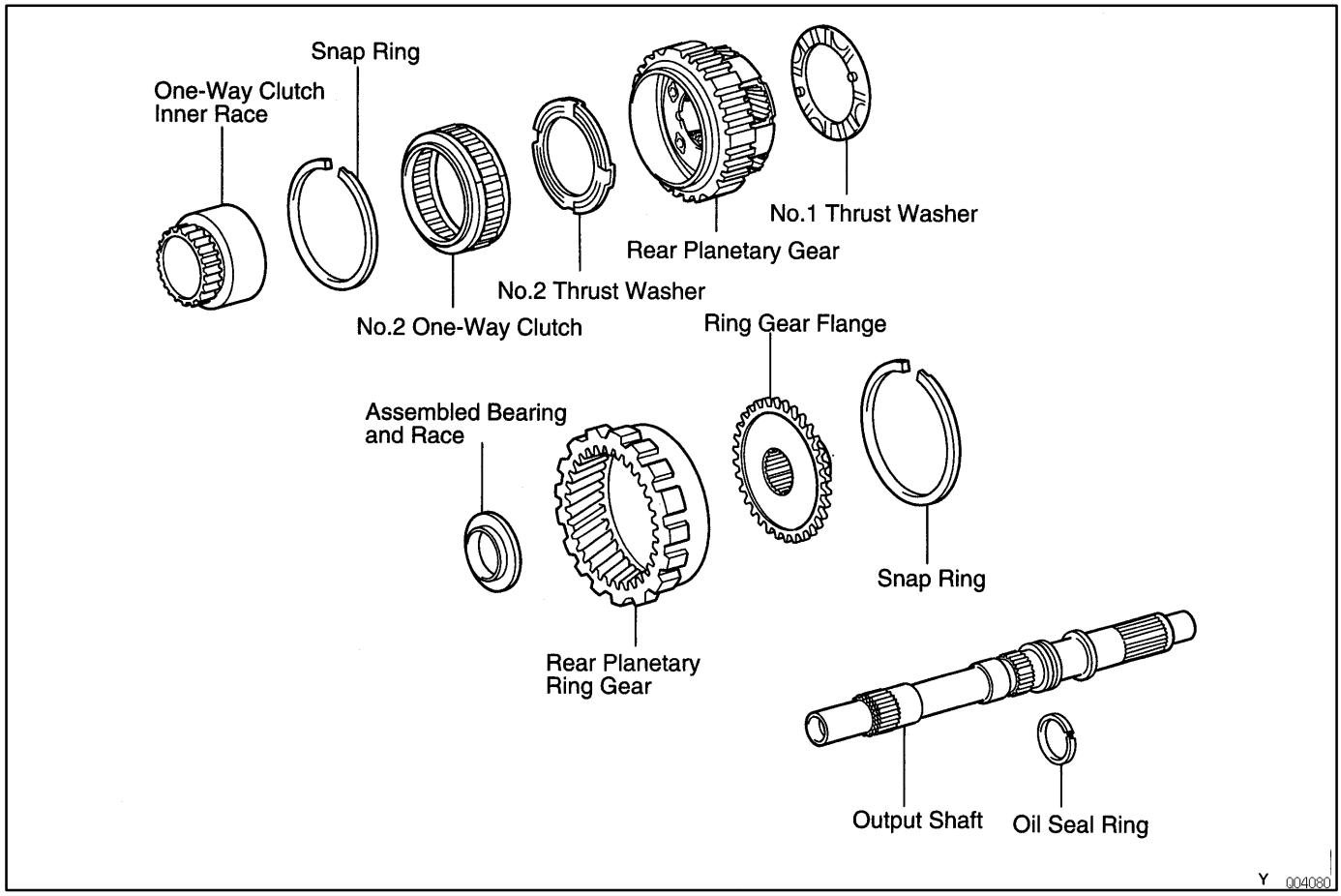
3. CHECK SECOND BRAKE PISTON MOVEMENT

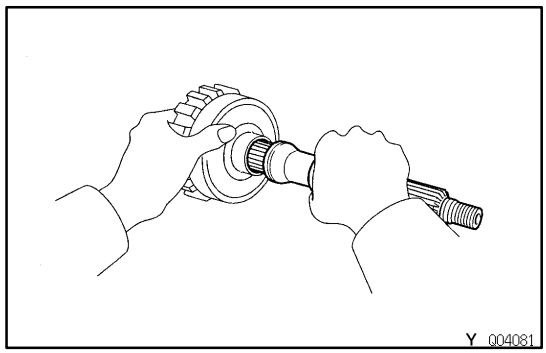
Make sure the second brake piston moves smoothly when applying and releasing low-pressure compressed air to the second brake drum.

REAR PLANETARY GEAR

AT0EC-02

COMPONENTS

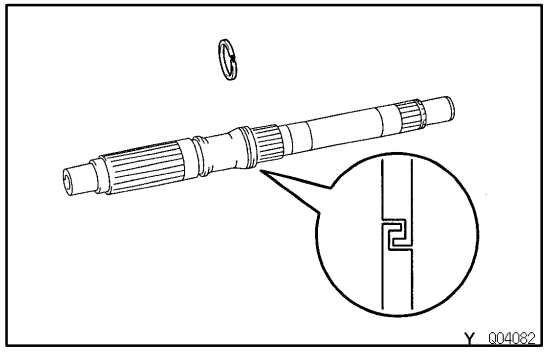




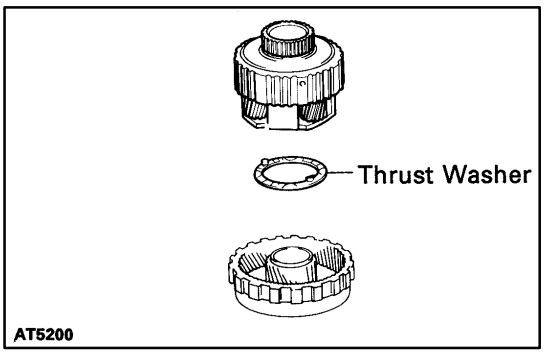
AT0ED-04

REAR PLANETARY GEAR, NO.2 ONE-WAY CLUTCH AND OUTPUT SHAFT DISASSEMBLY

1. REMOVE OUTPUT SHAFT FROM REAR PLANETARY GEAR ASSEMBLY

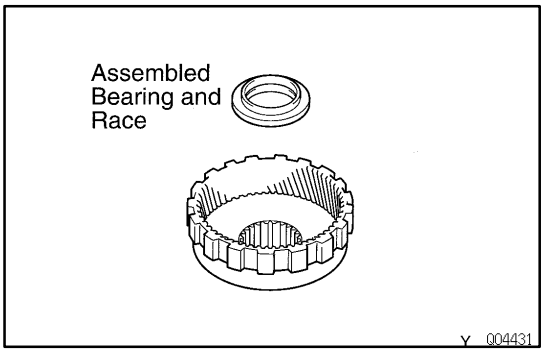


2. REMOVE OIL SEAL RING FROM OUTPUT SHAFT

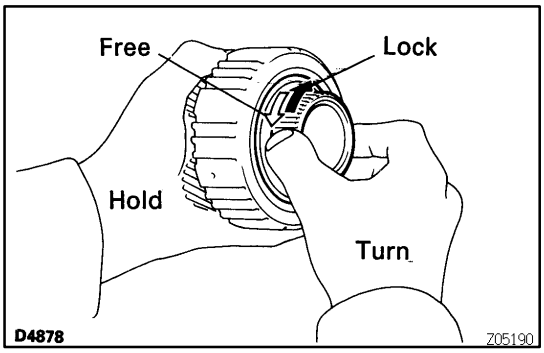


3. REMOVE REAR PLANETARY GEAR FROM REAR PLANETARY RING GEAR

(a) Remove the No.1 thrust washer from the rear planetary gear.

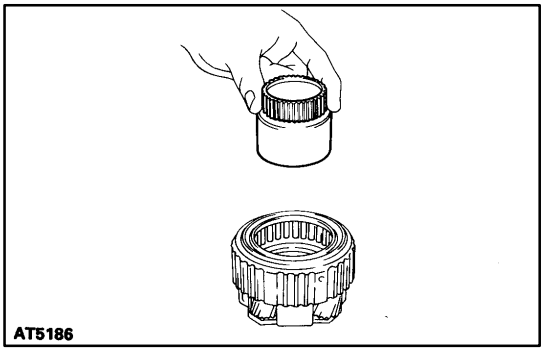


(b) Remove the assembled bearing and race from the rear planetary ring gear.



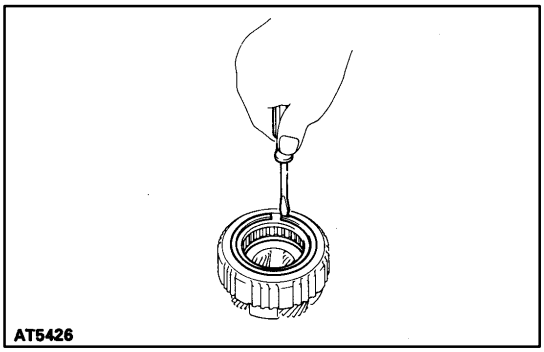
4. CHECK OPERATION OF NO.2 ONE-WAY CLUTCH

Hold the planetary gear and turn the one-way clutch inner race. The one-way clutch inner race must be able to turn freely counterclockwise and locks clockwise.

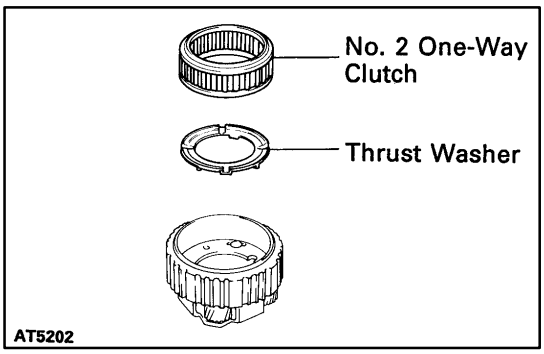


5. REMOVE NO.2 ONE-WAY CLUTCH

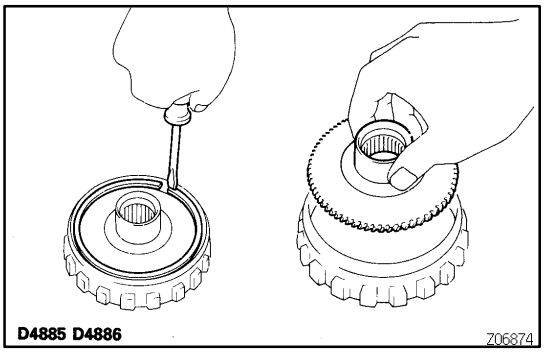
(a) Remove the one-way clutch inner race from the rear planetary gear.



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



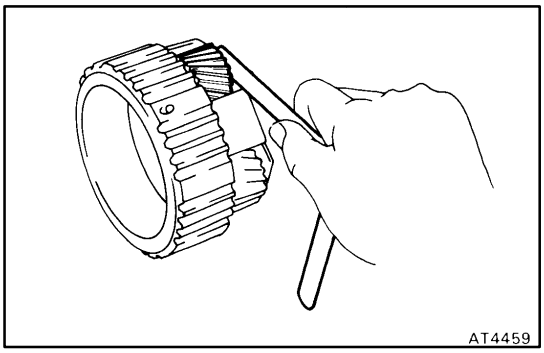
(c) Remove No.2 one-way clutch with retainers and No.2 thrust washer from the planetary gear.



6. REMOVE RING GEAR FLANGE

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

(b) Remove the ring gear flange.



REAR PLANETARY GEAR INSPECTION

AT0EE-03

MEASURE PLANETARY PINION GEAR THRUST CLEARANCE

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

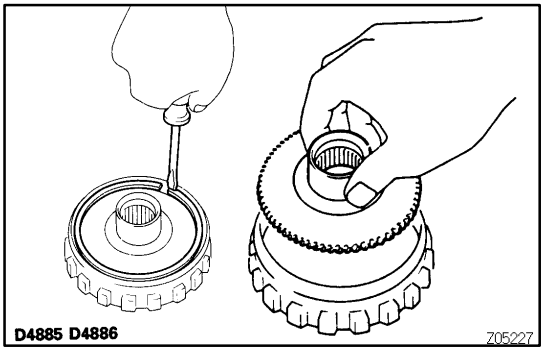
Standard clearance:

0.2-0.6 mm (0.008-0.024 in.)

Maximum clearance:

1.0 mm (0.039 in.)

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



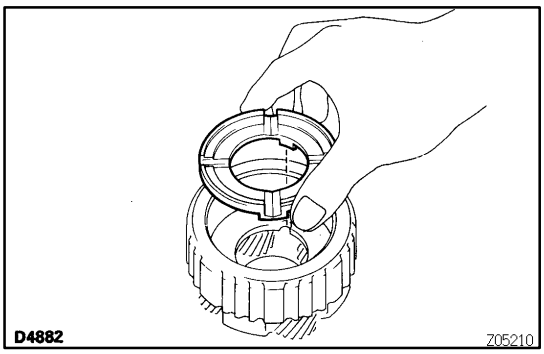
REAR PLANETARY GEAR, NO.2 ONE-WAY CLUTCH AND OUTPUT SHAFT ASSEMBLY

AT0EF-04

1. INSTALL RING GEAR FLANGE

(a) Install the ring gear flange.

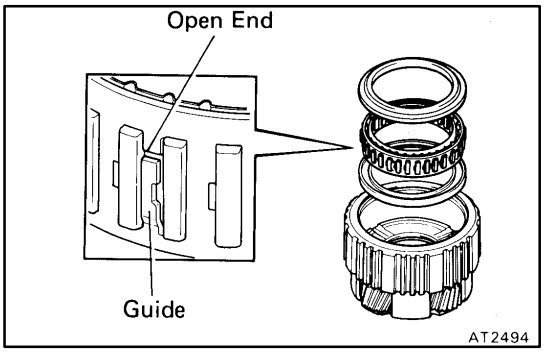
(b) Using a screwdriver, install the snap ring.



2. INSTALL NO.2 THRUST WASHER

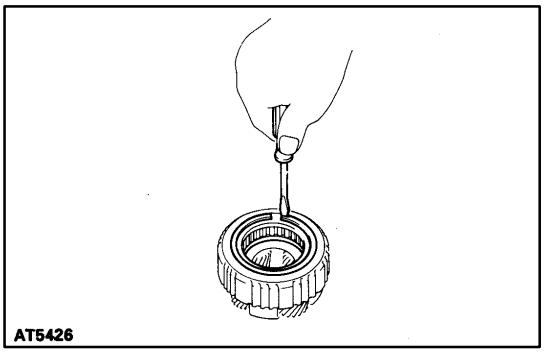
(a) Coat the thrust washer with petroleum jelly.

(b) Install the thrust washer onto the rear planetary gear.
HINT: Make sure that the lug shapes match the cutout portions on the rear planetary gear.

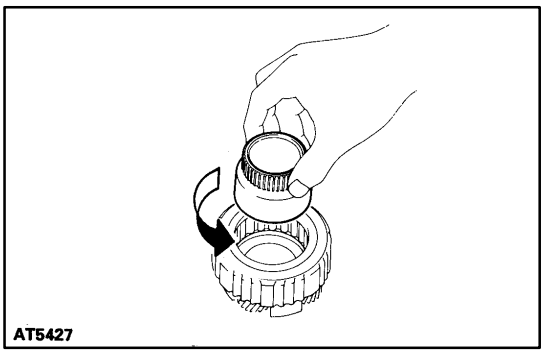


3. INSTALL NO.2 ONE-WAY CLUTCH

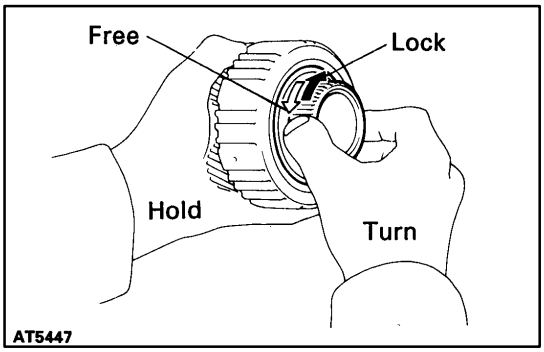
(a) Install the one-way clutch and 2 retainers into the rear planetary gear, as shown.
HINT: Make sure that the open ends of the guides on the one-way clutch face upward.



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

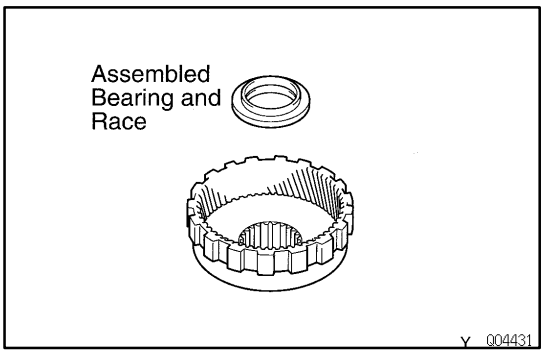


(c) While turning it counterclockwise, install the one-way clutch inner race to the rear planetary gear.



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

Hold the planetary gear and turn the one-way clutch inner race. The one-way clutch inner race turns freely counter-clockwise and locks clockwise.



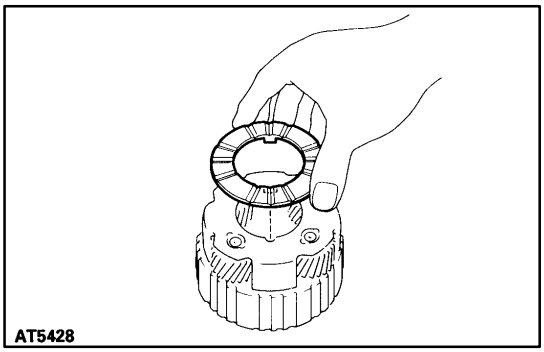
5. INSTALL ASSEMBLED BEARING AND RACE

Coat the assembled bearing and race with petroleum jelly, and install them and sun gear onto the rear planetary ring gear.

Assembled bearing and race diameter

mm (in.)

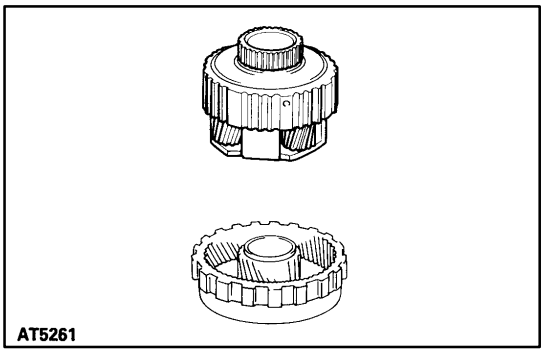
	Inside	Outside
Assembled bearing and race	54.5 (2.146)	27.6 (1.087)



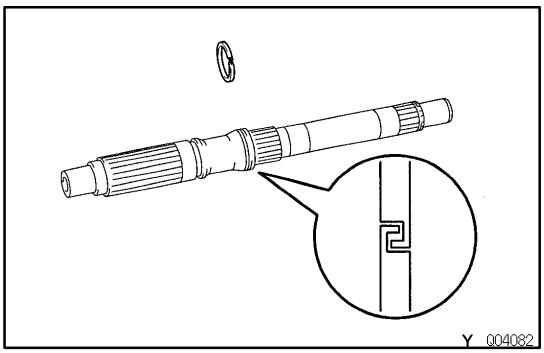
6. INSTALL NO.1 THRUST WASHER

Coat the No.1 thrust washer with petroleum jelly, and install it from the rear planetary gear.

HINT: Make sure that the lug shapes match the cutout portions on the rear planetary gear.



7. INSTALL REAR PLANETARY GEAR ONTO REAR PLANETARY RING GEAR

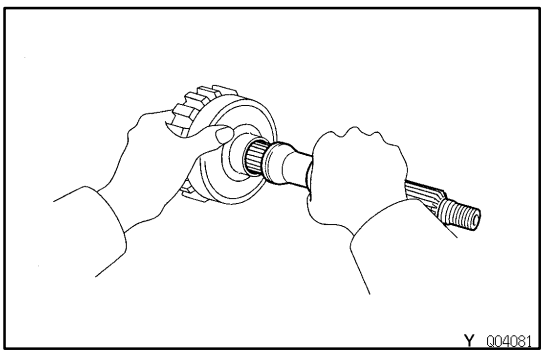


8. INSTALL OIL SEAL RING

Coat the oil seal ring with ATF and install them to the output shaft.

NOTICE: Do not spread the ring ends too much.

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

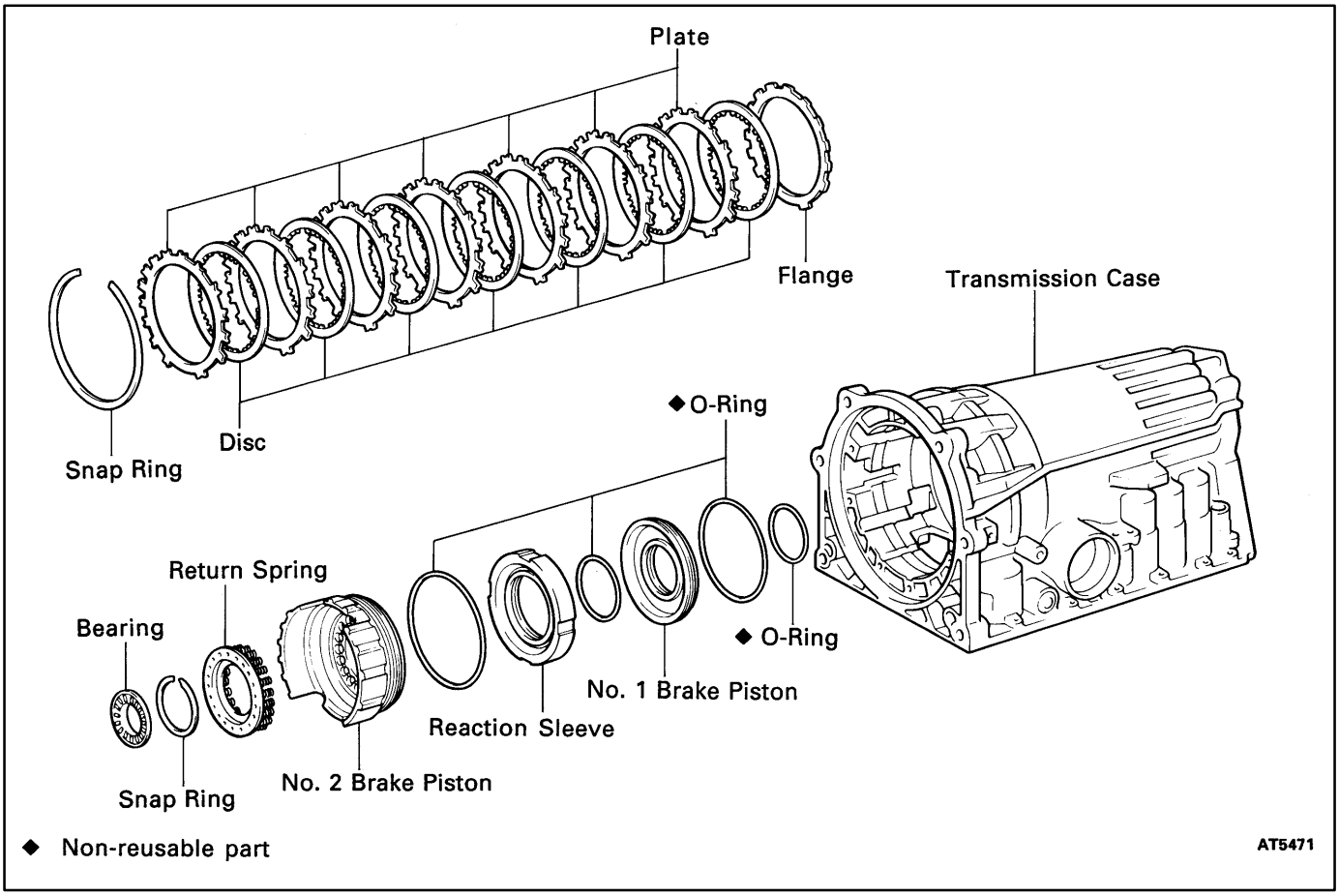


9. INSTALL OUTPUT SHAFT INTO REAR PLANETARY GEAR ASSEMBLY

FIRST AND REVERSE BRAKE

AT0EG-02

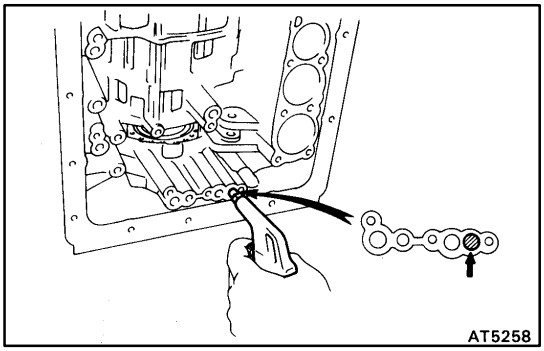
COMPONENTS



AT0EH-03

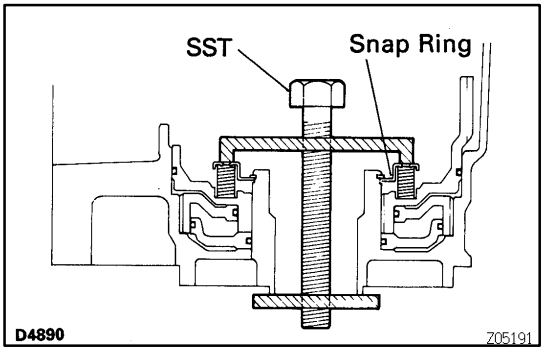
FIRST AND REVERSE BRAKE

DISASSEMBLY



1. CHECK PISTON STROKE OF FIRST AND REVERSE BRAKE

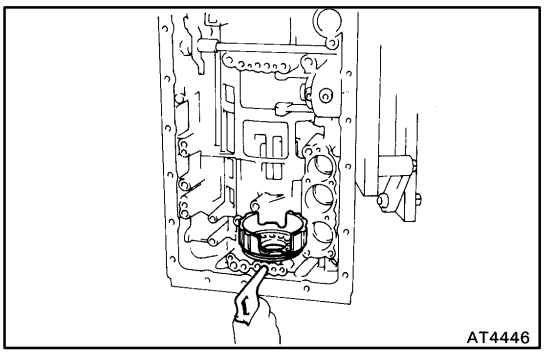
Make sure the first and reverse brake pistons move smoothly when applying and releasing the compressed air into the transmission case.



2. REMOVE PISTON RETURN SPRING

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

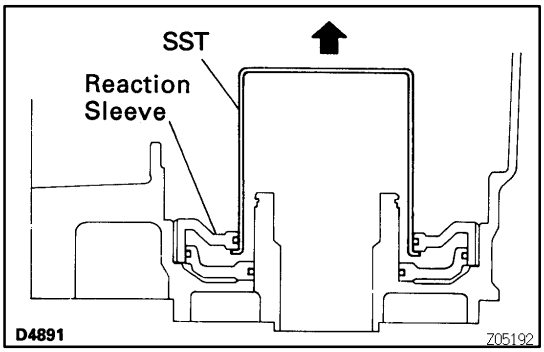
(b) Using SST, remove the snap ring.
SST 09350-30020 (09350-07070)



3. REMOVE NO.2 BRAKE PISTON

(a) Hold No.2 brake piston with hand, apply compressed air to transmission case to remove No.2 brake piston.
HINT: If the piston does not pop out with compressed air, lift the piston out with needle-nose pliers.

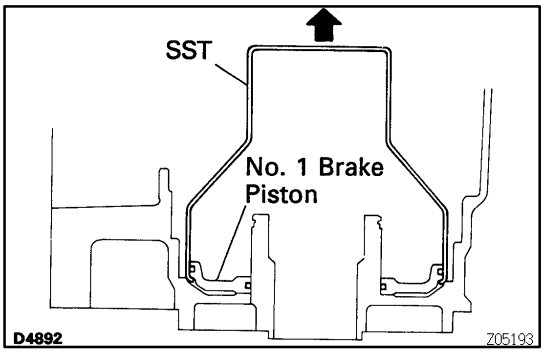
(b) Remove the O-ring from No.2 brake piston.



4. REMOVE REACTION SLEEVE

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

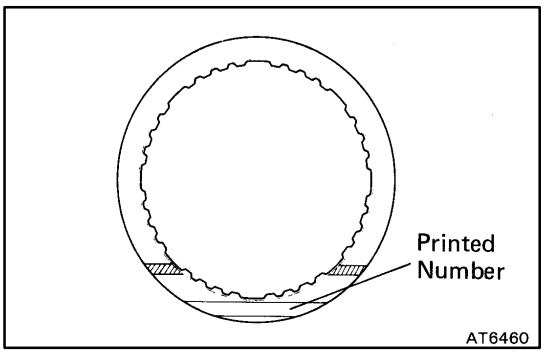
(b) Remove the O-ring from the reaction sleeve.



5. REMOVE NO.1 BRAKE PISTON

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

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



FIRST AND REVERSE BRAKE INSPECTION

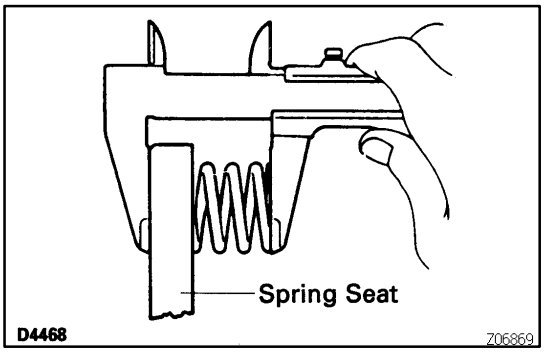
AT0EJ-04

1. CHECK DISC, PLATE AND FLANGE

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

★ If the lining of the disc is peeling off or discolored, or even if a part of the printed numbers are defaced, replace all discs.

★ Before assembling new discs, soak them in ATF for at least 15 minutes.

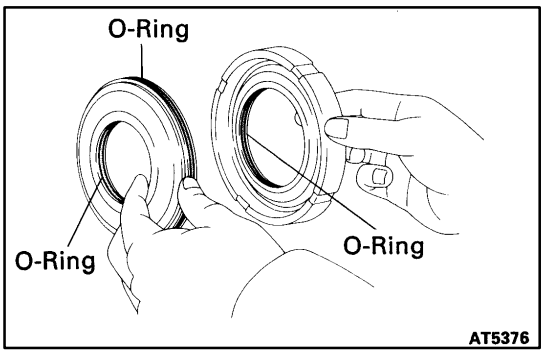


2. CHECK PISTON RETURN SPRING

Check the return spring free length together with the spring seat.

Standard free length:

12.9 mm (0.508 in.)

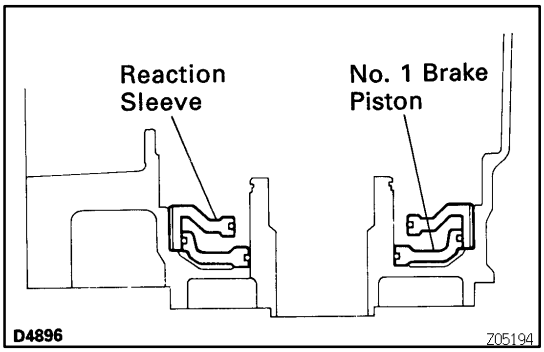


FIRST AND REVERSE BRAKE ASSEMBLY

AT0EK-03

1. INSTALL NO.1 BRAKE PISTON

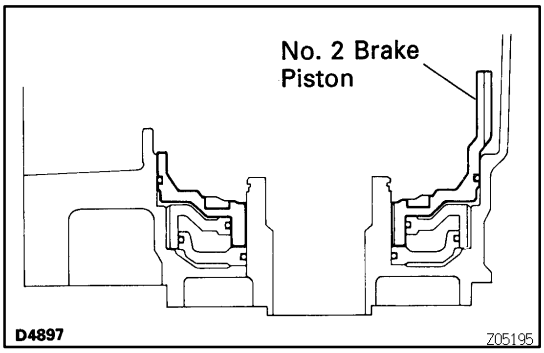
(a) Coat the 3 new O-rings with ATF.
(b) Install the 2 O-rings on No.1 brake piston.
(c) Install the O-ring on the reaction sleeve.
(d) Install the No.1 brake piston to the reaction sleeve.



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

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

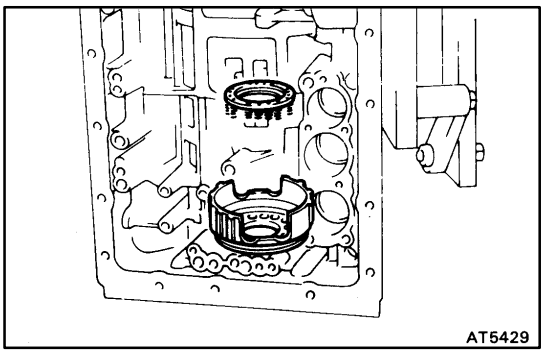
NOTICE: Be careful not to damage the O-rings.



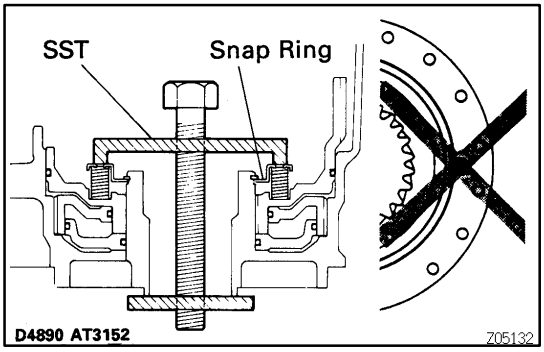
3. INSTALL NO.2 BRAKE PISTON

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

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

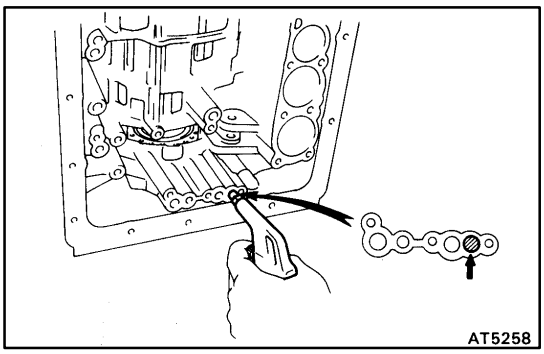


(d) Place the piston return spring onto the No.2 brake piston.



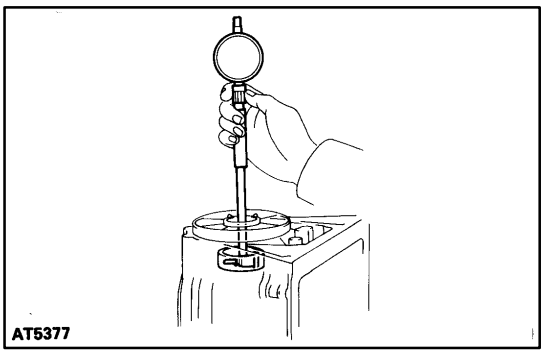
4. INSTALL PISTON RETURN SPRING

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



5. CHECK PISTON STROKE OF FIRST AND REVERSE BRAKE

Make sure the first and reverse brake pistons move smoothly when applying and releasing the compressed air into the transmission case.



TRANSMISSION CASE

AT0EL-03

TRANSMISSION CASE INSPECTION

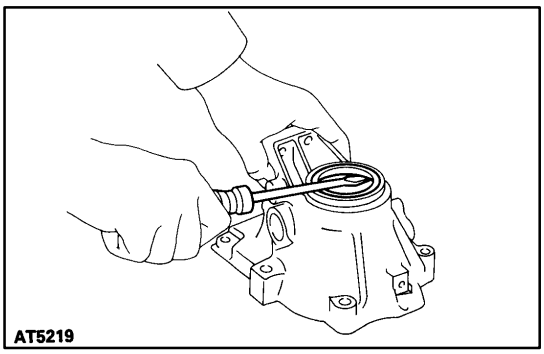
INSPECT TRANSMISSION CASE BUSHING

Using a cylinder gauge, measure the inside diameter of the transmission case rear bushing.

Maximum inside diameter:

38.18 mm (1.5031 in.)

If the inside diameter is greater than the maximum, replace the transmission case.



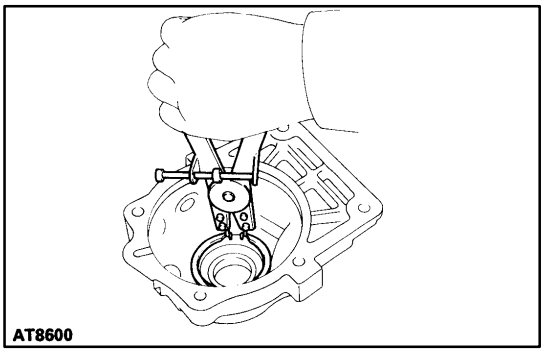
EXTENSION HOUSING

AT0EM-03

EXTENSION HOUSING DISASSEMBLY

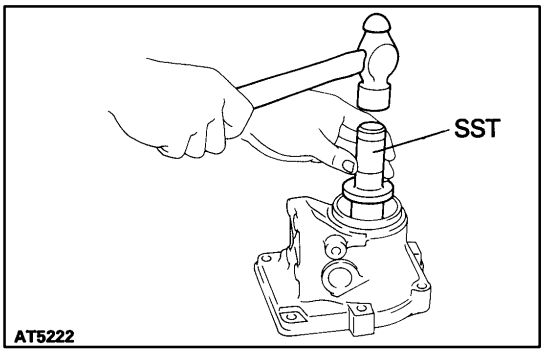
1. REMOVE OIL SEAL FROM EXTENSION HOUSING

Using a screwdriver, remove the oil seal.



2. REMOVE EXTENSION HOUSING BEARING

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



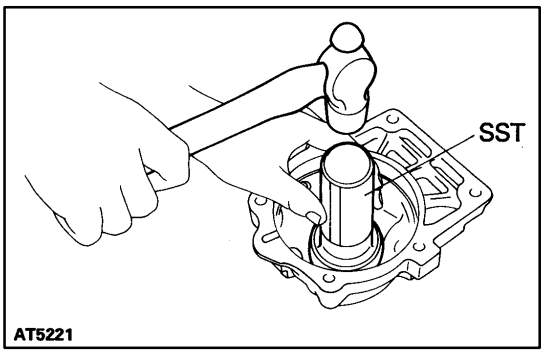
(b) Using SST, drive out the bearing.
SST 09325-12010

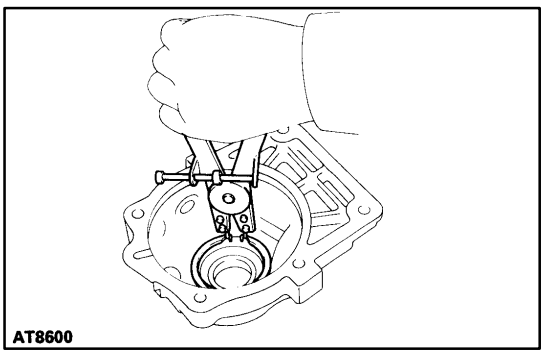
AT0EN-03

EXTENSION HOUSING ASSEMBLY

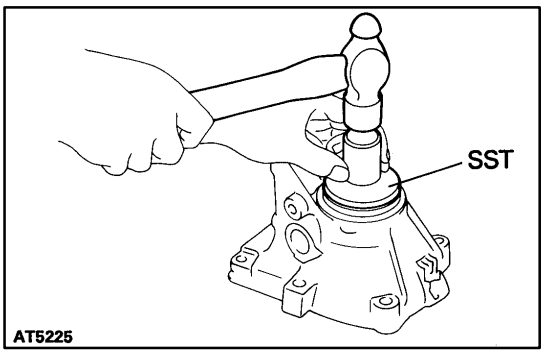
1. INSTALL EXTENSION HOUSING BEARING

(a) Using SST, drive in the bearing.
SST 09350-30020 (09350-32140)





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



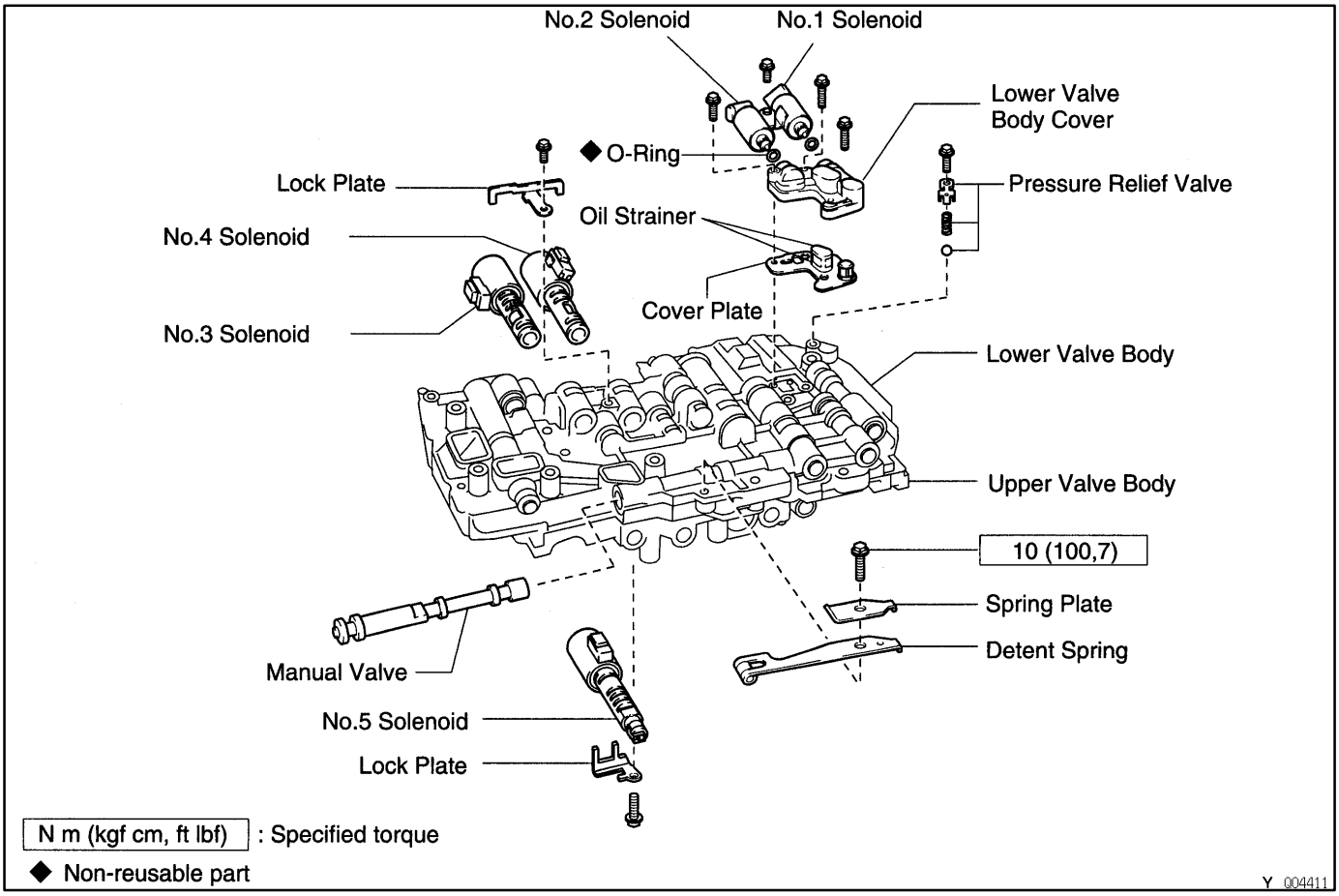
2. INSTALL OIL SEAL TO EXTENSION HOUSING

Using SST, install a new oil seal.

SST 09325-40010

VALVE BODY
COMPONENTS

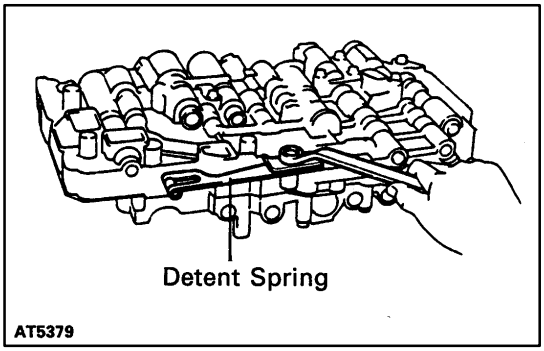
AT0EP-02



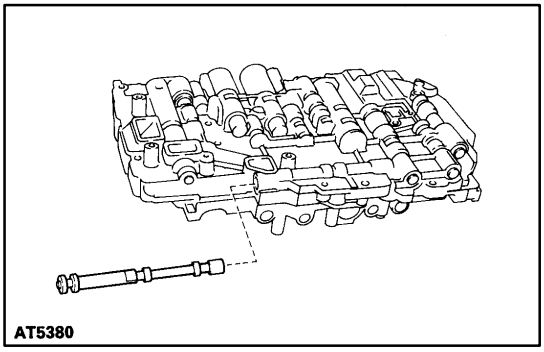
AT0PU-02

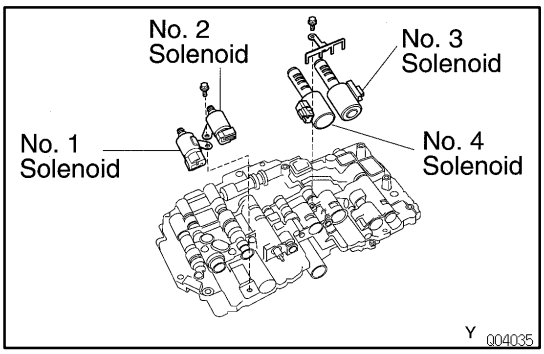
VALVE BODY DISASSEMBLY

1. REMOVE DETENT SPRING AND SPRING PLATE



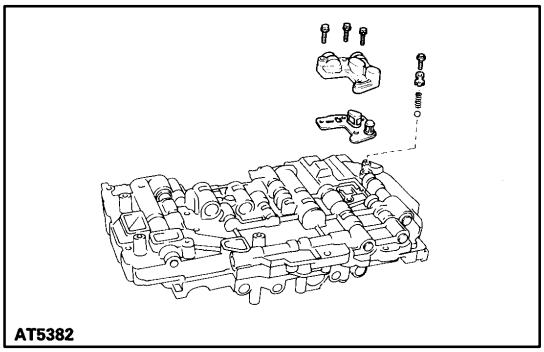
2. REMOVE MANUAL VALVE



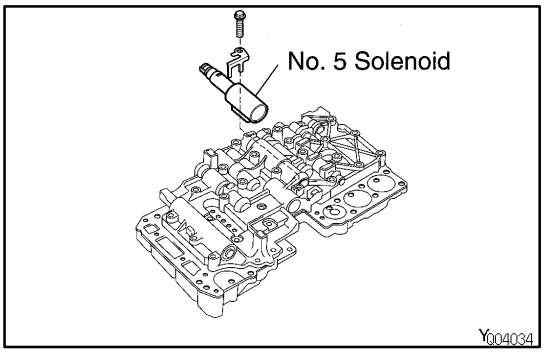


3. REMOVE 4 SOLENOIDS

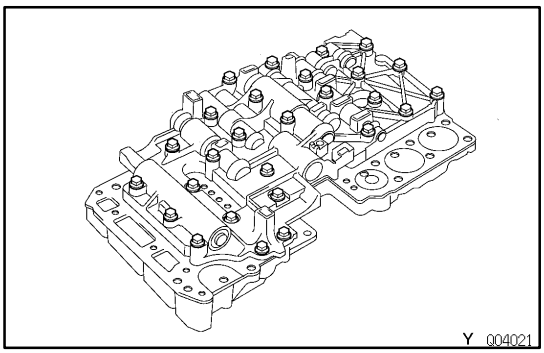
(a) Remove No.1 and No.2 solenoids.
(b) Remove the O-ring from No.1 and No.2 solenoids.
(c) Remove the lock plate and No.3 and No.4 solenoids.



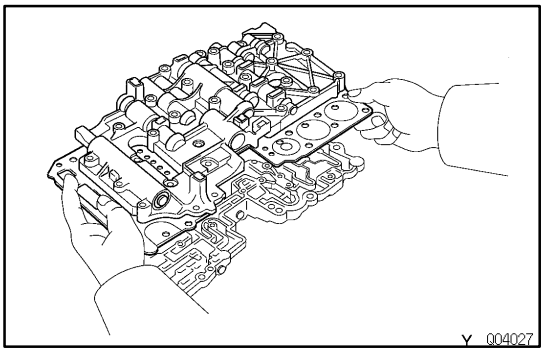
4. REMOVE OIL STRAINER AND PRESSURE RELIEF VALVE



5. TURN OVER ASSEMBLY AND REMOVE NO.5 SOLENOID VALVE



6. REMOVE 28 BOLTS

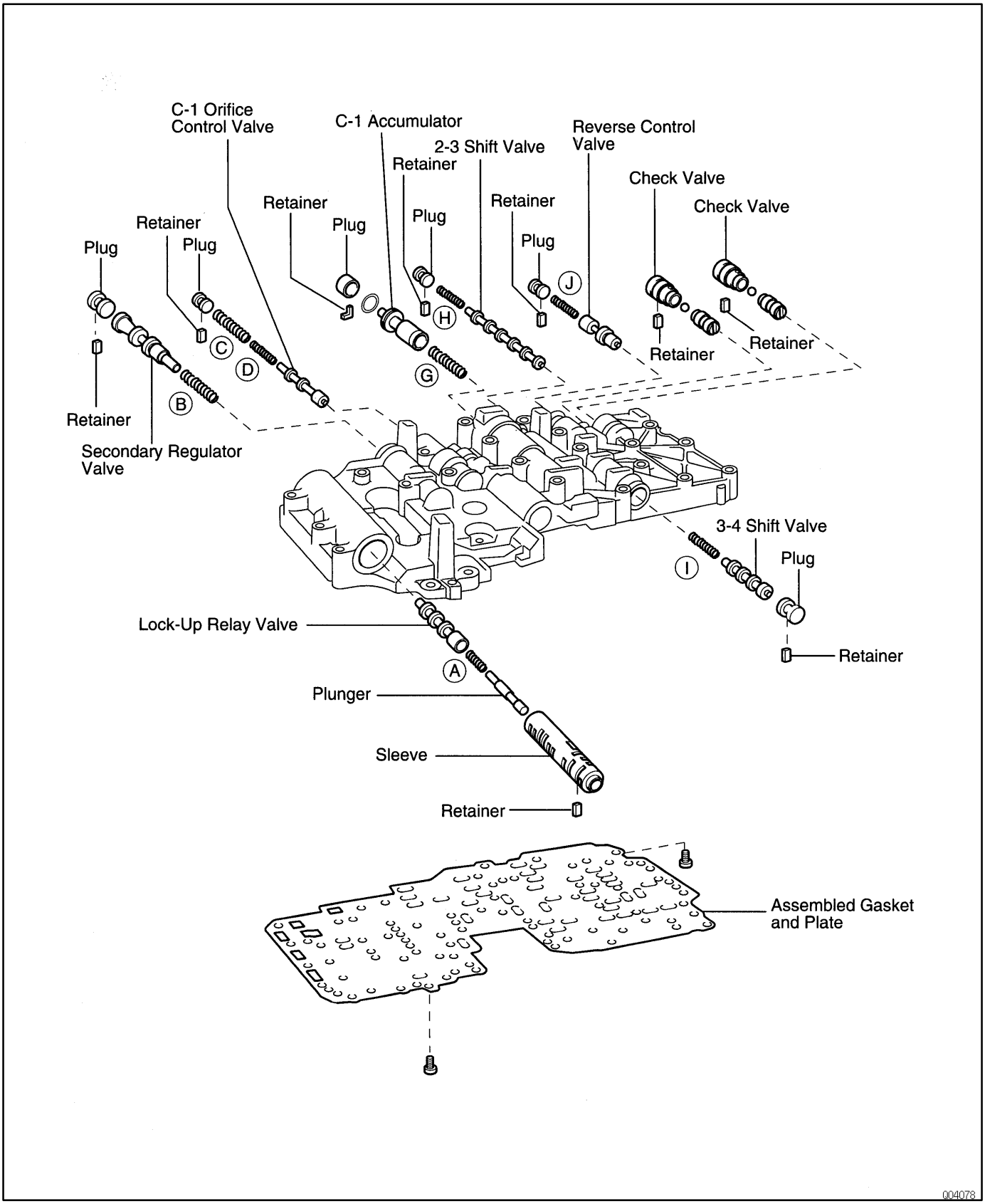


7. LIFT OFF UPPER VALVE BODY AND PLATE

UPPER VALVE BODY

AT0ER-02

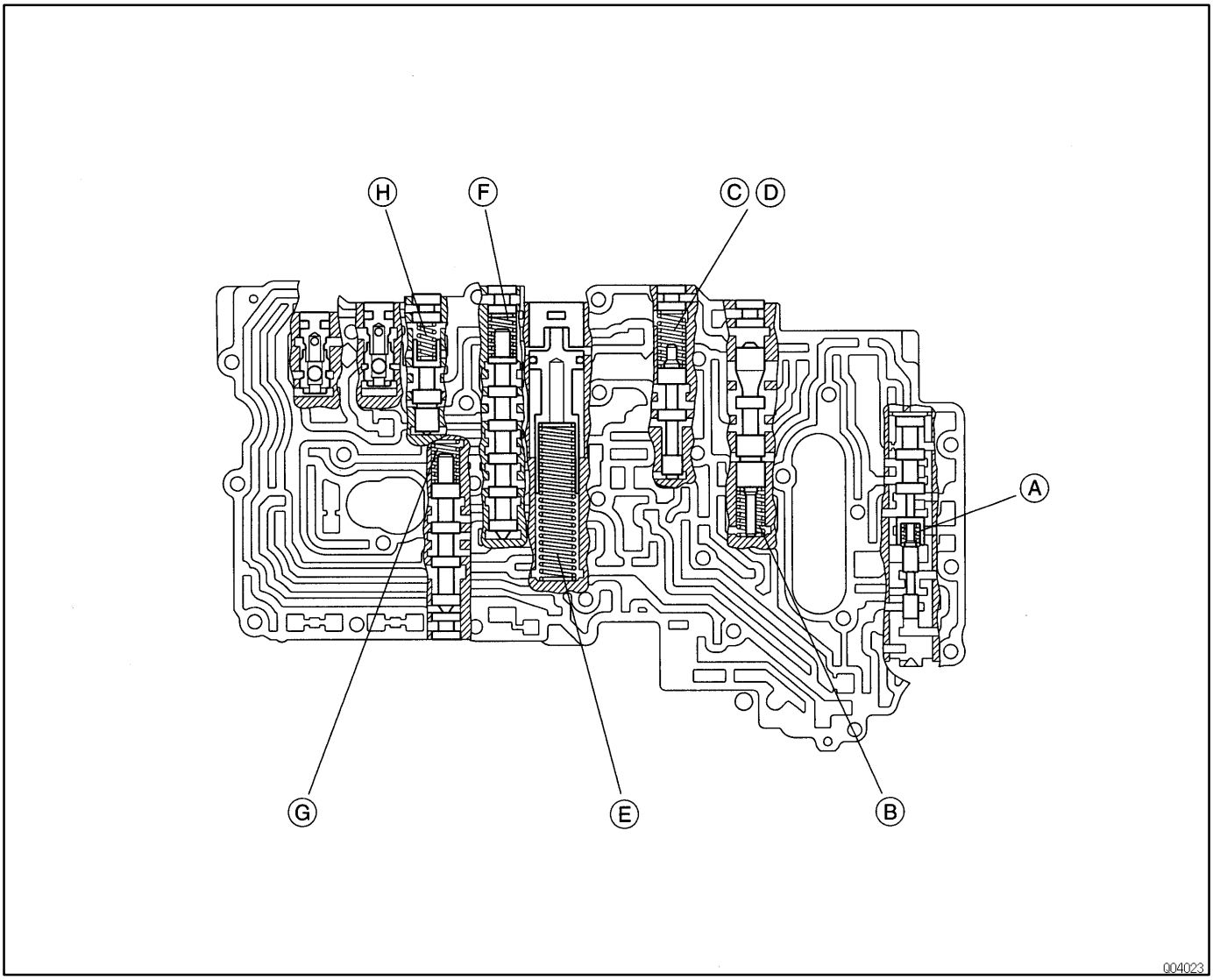
COMPONENTS



AT0ES-04

VALVE BODY SPRING SPECIFICATIONS

HINT: During reassembly please refer to the spring specifications below to help you to differentiate the different springs.

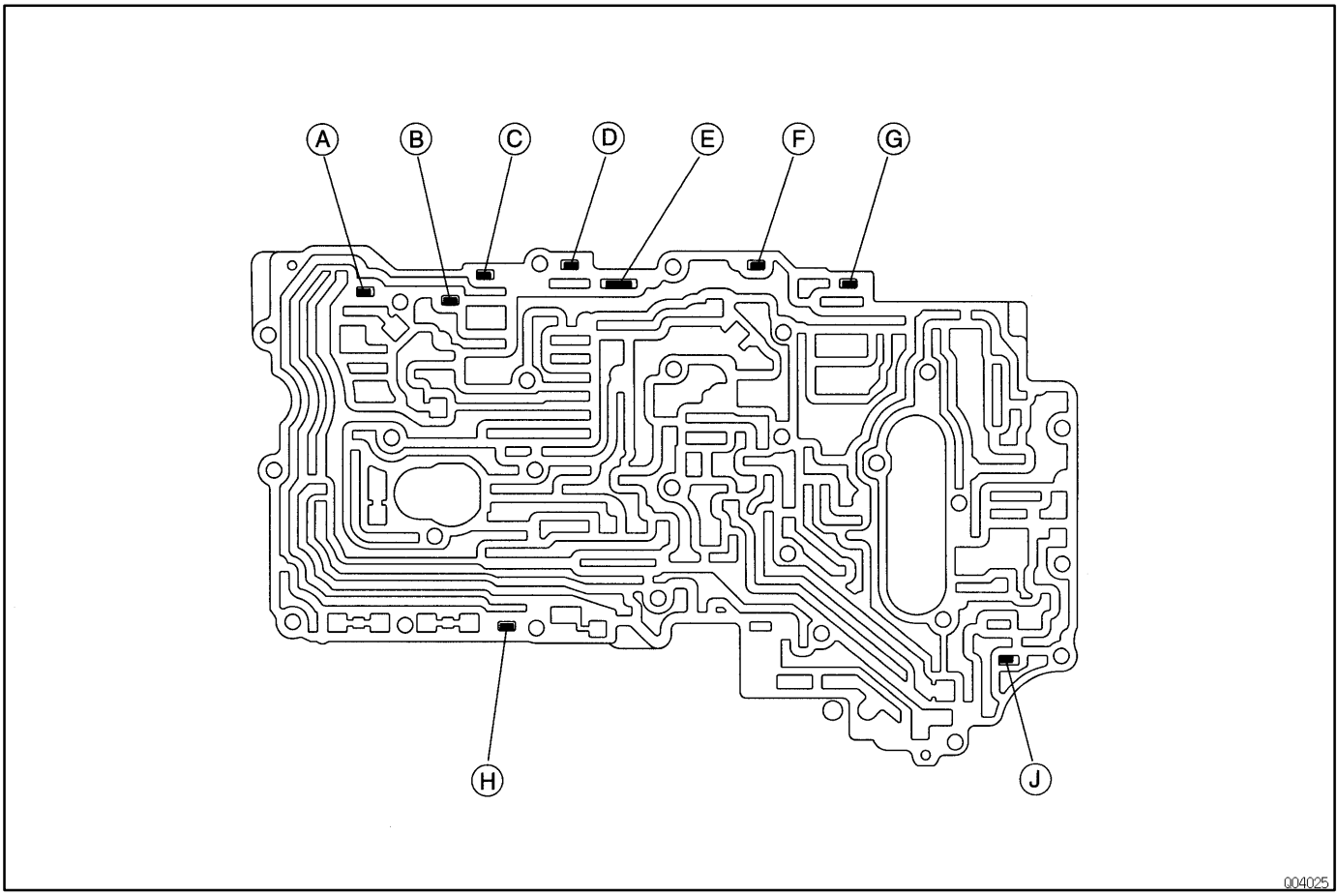


Mark	Name (Color)	Free length / Outer diameter mm (in.)	Total No. of coils
(A)	Lock-up relay valve (Red)	23.42 (0.9220) / 5.86 (0.2307)	12.25
(B)	Secondary regulator valve (Blue)	32.79(1.2909) / 9.4 (0.3700)	12.75
(C)	C_1 Orifice control valve (White)	37.13 (1.4618) / 11.14 (0.4316)	11.25
(D)	C_1 Orifice control valve (None)	21.50 (0.8465) / 7.76 (0.3055)	11.50
(E)	C_1 Accumulator (Pink)	75.26 (2.9623) / 15.02 (0.5193)	17.06
(F)	2-3 Shift valve (Purple)	30.77 (1.2114) / 9.70 (0.3819)	10.50
(G)	3-4 Shift valve (Purple)	30.77 (1.2114) / 9.70 (0.3819)	10.50
(H)	Reverse control valve (None)	25.58 (1.0070) / 8.64 (0.3402)	8.75

AT0ET-04

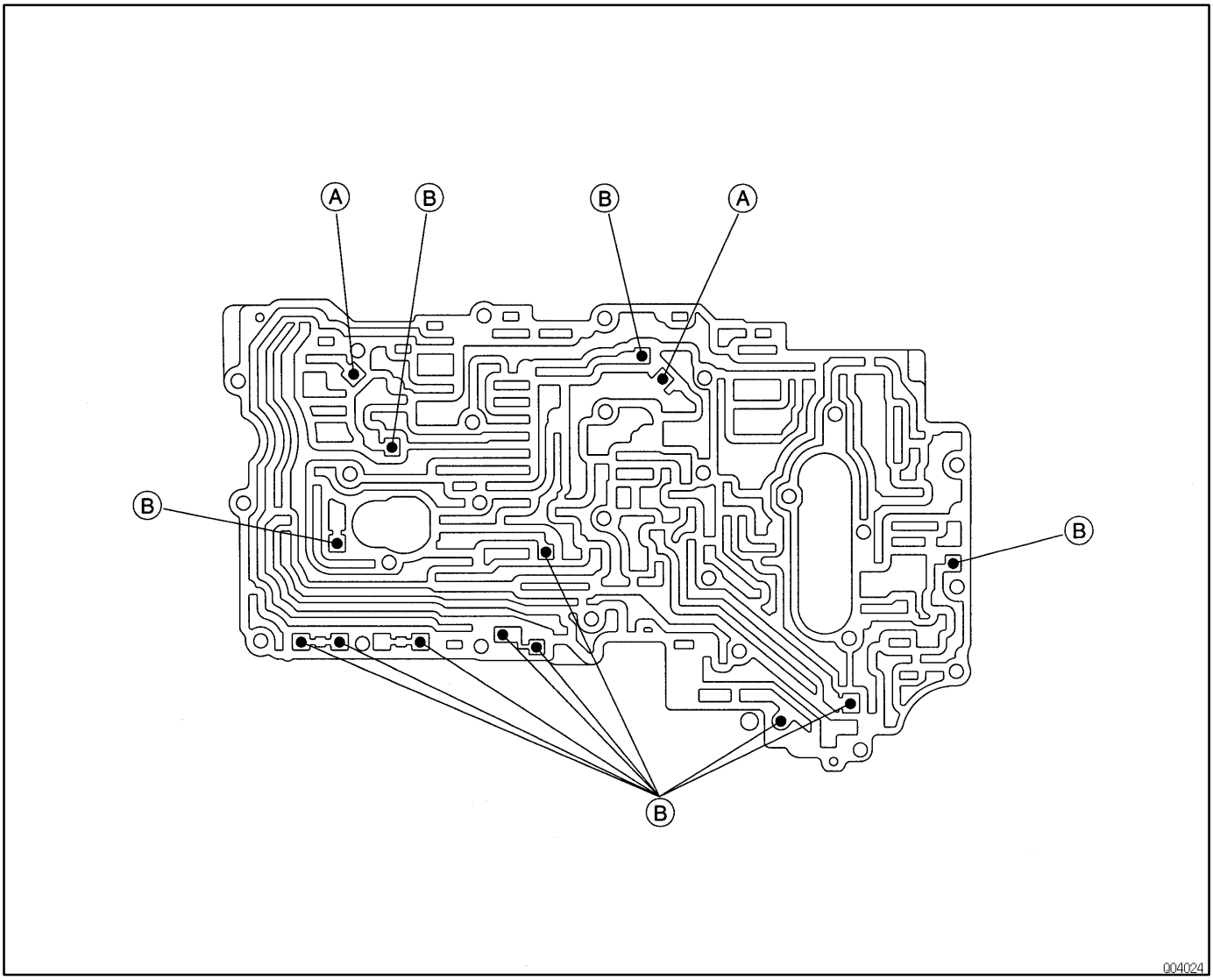
RETAINERS AND CHECK BALLS LOCATION

1. RETAINERS



Mark	Retainer	Height / Width / Thickness mm (in.)
(A)	Check valve	10.0 (0.394) / 5.0 (0.197) / 3.2 (0.126)
(B)	Check valve	19.0 (0.748) / 5.0 (0.197) / 3.2 (0.126)
(C)	Reverse control valve	16.0 (0.630) / 5.0 (0.197) / 3.2 (0.126)
(D)	2-3 Shift valve	12.5 (0.492) / 5.0 (0.197) / 3.2 (0.126)
(E)	C_1 Accumulator	37.5 (1.476) / 5.0 (0.197) / 3.2 (0.126)
(F)	C_1 Orifice control valve	12.5 (0.492) / 5.0 (0.197) / 3.2 (0.126)
(G)	Secondary regulator valve	10.0 (0.394) / 5.0 (0.197) / 3.2 (0.126)
(H)	3-4 Shift valve	11.5 (0.453) / 5.0 (0.197) / 3.2 (0.126)
(J)	Lock-up relay valve	21.2 (0.835) / 5.0 (0.197) / 3.2 (0.126)

2. CHECK BALLS

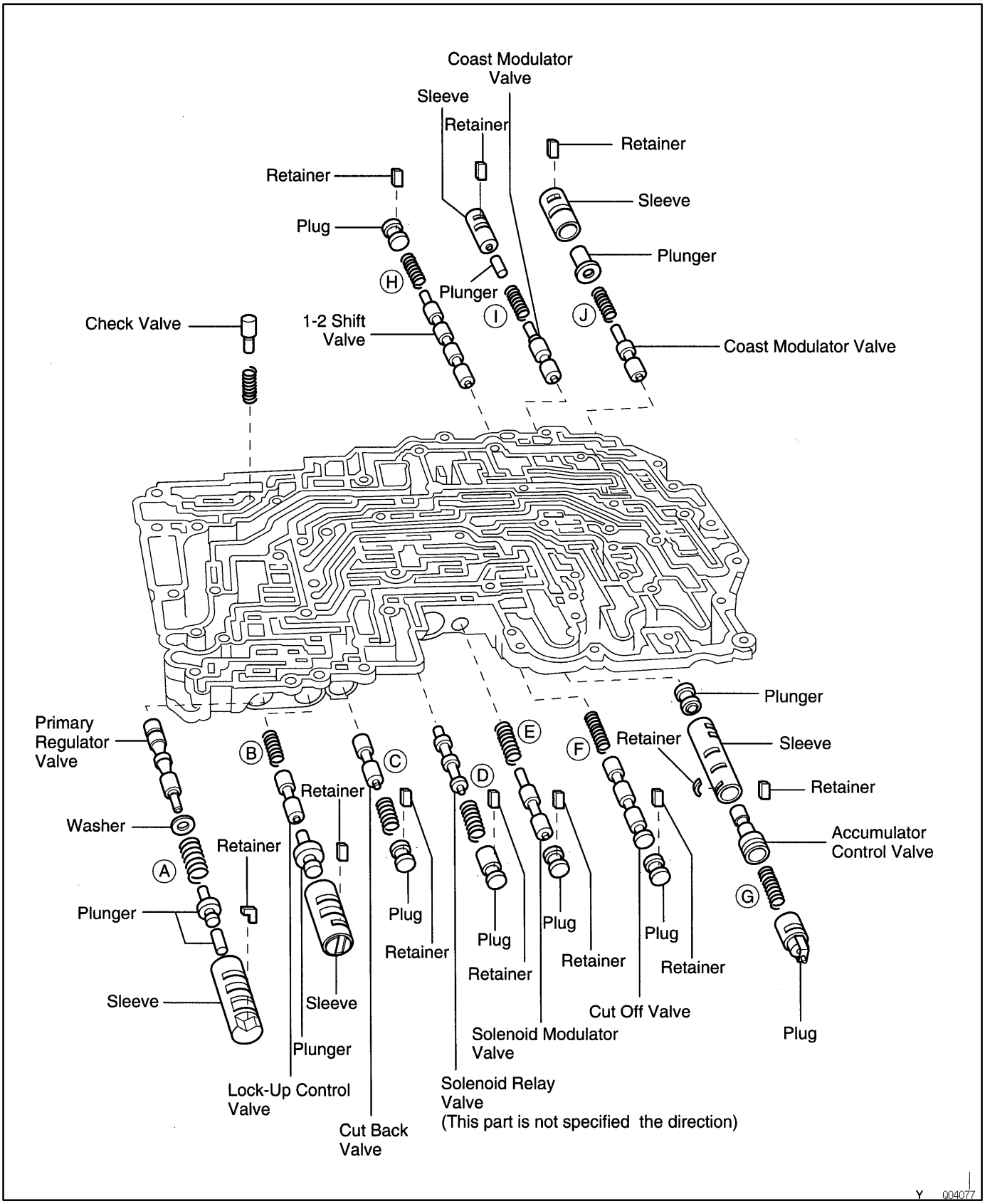


Mark	Check ball	Diameter mm (in.)
(A)	Rubber ball	6.35 (0.250)
(B)	Rubber ball	5.54 (0.2181)

LOWER VALVE BODY

COMPONENTS

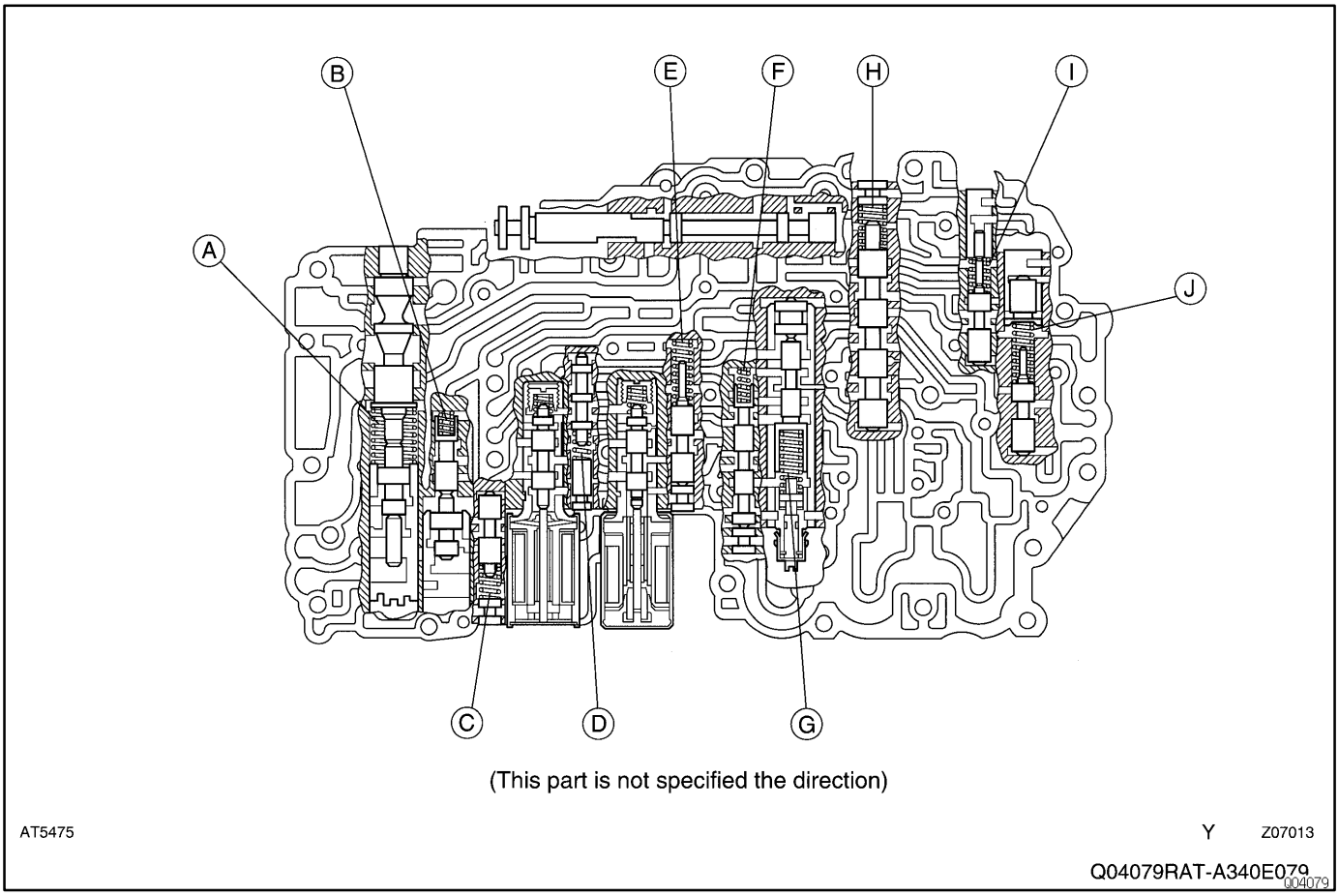
AT0EU-02



AT0EV-04

VALVE BODY SPRINGS SPECIFICATIONS

HINT: During reassembly please refer to the spring specifications below to help you to differentiate the different springs.

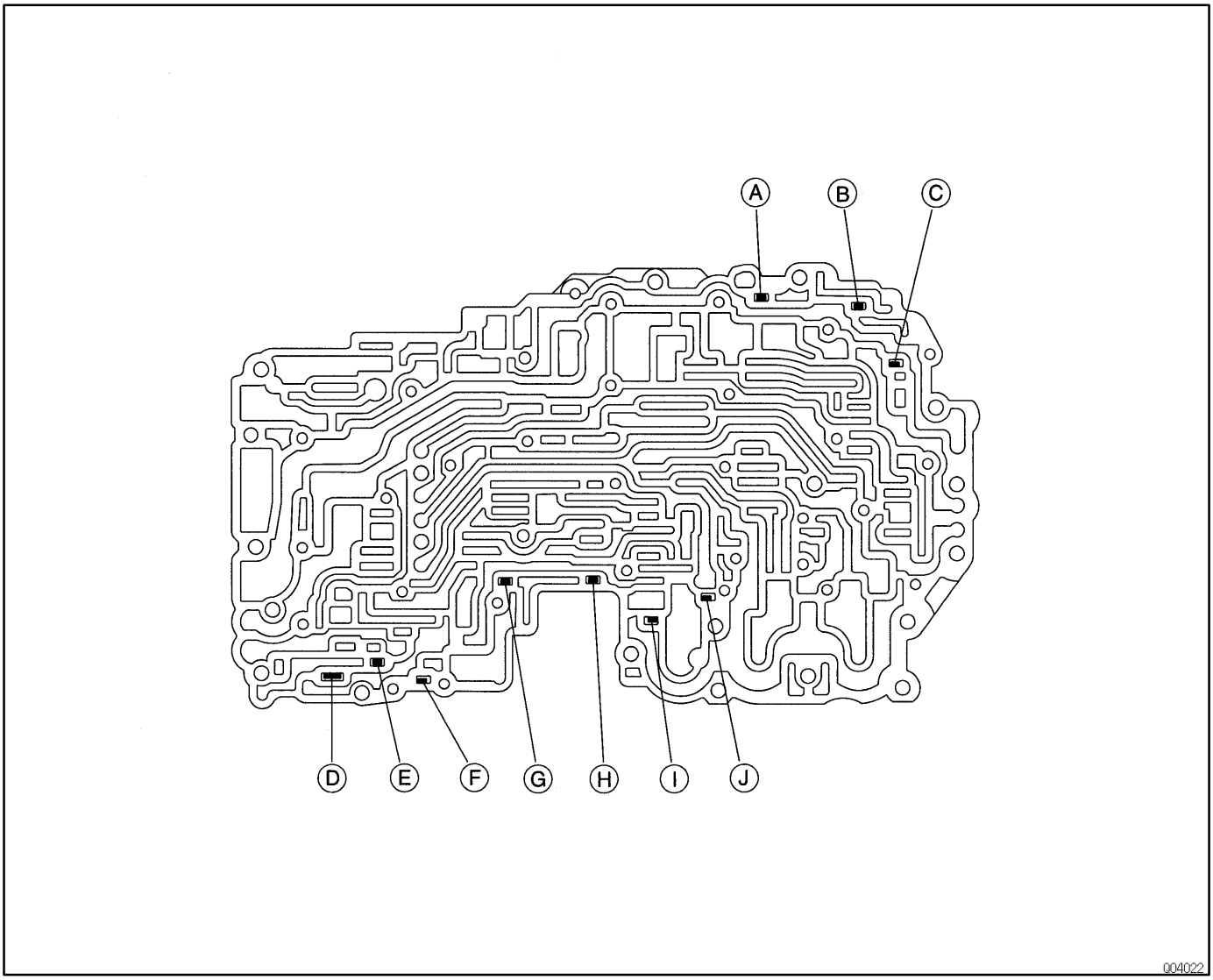


Mark	Name (Color)	Free length / Outer diameter mm (in.)	Total No. of coils
(A)	Primary regulator valve (Blue)	45.62 (1.7961) / 16.88 (0.6446)	9.5
(B)	Lock-up control valve (White)	18.52 (0.7291) / 5.30 (0.209)	12.75
(C)	Cut back valve (None)	18.80 (0.740) / 7.48 (0.2995)	7.50
(D)	Solenoid relay valve (None)	18.80 (0.740) / 7.48 (0.2995)	7.50
(E)	Solenoid modulator valve (Yellow)	32.13 (1.2650) / 8.00 (0.3150)	15.75
(F)	Cut off valve (None)	20.30 (0.719) / 6.10 (0.240)	12.75
(G)	Accumulator control valve (White)	31.17 (1.2272 / 8.85 (0.3484)	12.50
(H)	1-2 Shift valve (Purple)	30.77 (1.2114) / 9.70 (0.382)	10.50
(I)	Coast modulator valve (Green)	21.83 (0.8594) / 8.00 (0.3150)	10.5
(J)	*Coast modulator valve (Blue)	26.09 (1.0272) / 8.19 (0.3224)	12.0
	(Light Blue)	26.60 (1.0472) / 8.19 (0.3224)	12.0
	(White)	27.11 (1.0673) / 8.19 (0.3224)	12.0

* One of the 3 types of spring is installed.

AT0EW-02

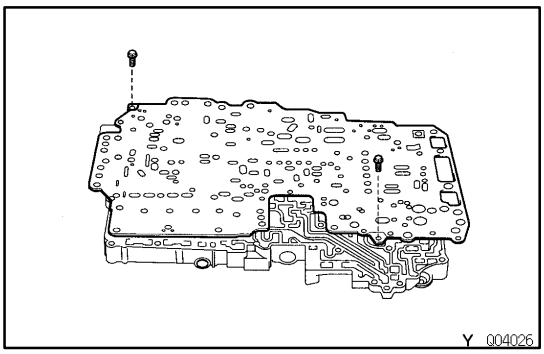
RETAINERS LOCATION



Mark	Retainer	Height / Width / Thickness mm (in.)
(A)	1-2 Shift valve	14.0 (0.551) / 5.0 (0.197) / 3.2 (0.126)
(B)	Coast modulator valve	14.0 (0.551) / 5.0 (0.197) / 3.2 (0.126)
(C)	Coast modulator valve	14.0 (0.551) / 5.0 (0.197) / 3.2 (0.126)
(D)	Primary regulator valve	13.0 (0.521) / 5.0 (0.197) / 3.2 (0.126)
(E)	Lock-up control valve	14.5 (0.570) / 5.0 (0.197) / 3.2 (0.126)
(F)	Cut back valve	8.5 (0.335) / 5.0 (0.197) / 3.2 (0.126)
(G)	Solenoid relay valve	12.5 (0.492) / 5.0 (0.197) / 3.2 (0.126)
(H)	Solenoid modulator valve	14.5 (0.570) / 5.0 (0.197) / 3.2 (0.126)
(I)	Cut off valve	19.0 (0.748) / 5.0 (0.197) / 3.2 (0.126)
(J)	Accumulator control valve	29.0 (1.142) / 5.0 (0.197) / 3.2 (0.126)

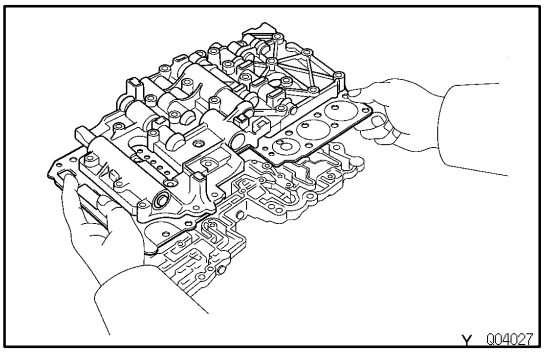
AT0PV-02

VALVE BODY ASSEMBLY



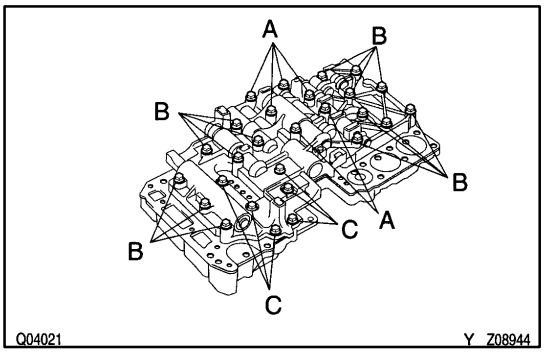
1. INSTALL ASSEMBLED GASKETS ON UPPER VALVE BODY

Align the assembled gaskets with each bolt hole and install the screw.



2. PLACE UPPER VALVE BODY WITH GASKETS ON TOP OF LOWER VALVE BODY

Align each bolt hole and gaskets in the valve body.



3. INSTALL 28 BOLTS TO UPPER VALVE BODY

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

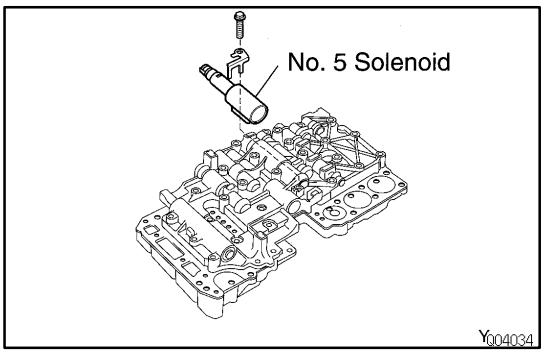
Torque: 6.5 N·m (65 kgf·cm, 56 in.·lbf)

Bolt length:

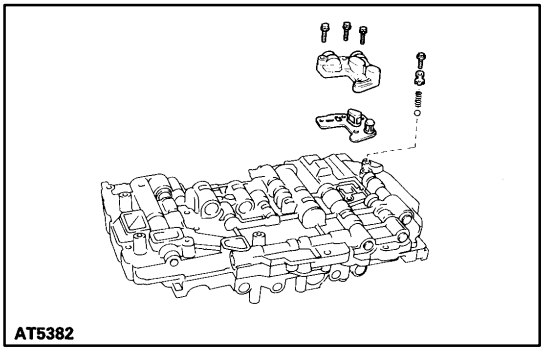
Bolt A: 45 mm (1.772 in.)

Bolt B: 35 mm (1.378 in.)

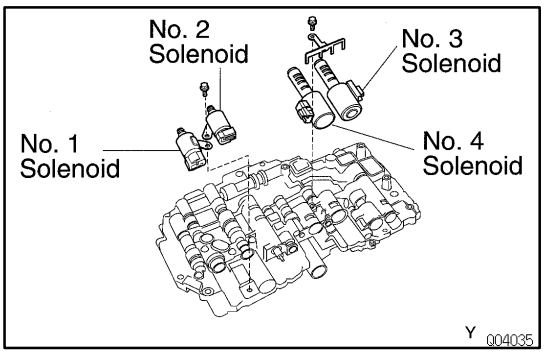
Bolt C: 20 mm (0.787 in.)



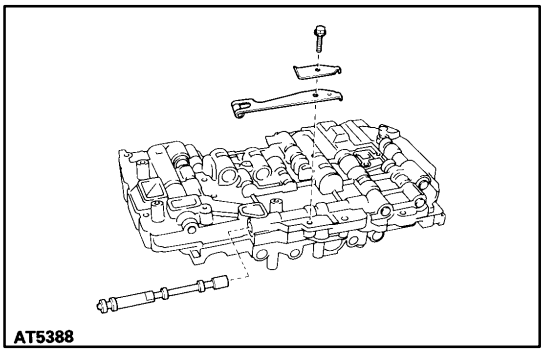
4. INSTALL NO.5 SOLENOID VALVE



5. TURN OVER ASSEMBLY INSTALL OIL STRAINER AND PRESSURE RELIEF VALVE



6. INSTALL NO.1, NO.2, NO.3, NO.4, SOLENOID VALVES



7. INSTALL MANUAL VALVE

8. INSTALL DETENT SPRING

Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

9. MAKE SURE MANUAL VALVE MOVES SMOOTHLY

COMPONENT PARTS INSTALLATION

AT0EY-02

Disassembly, inspection and assembly of each component group have been indicated in the preceding chapter. Before installation, make sure again that all component groups are assembled correctly.

If a problem is found in a certain component group during assembly, inspect and repair this group immediately.

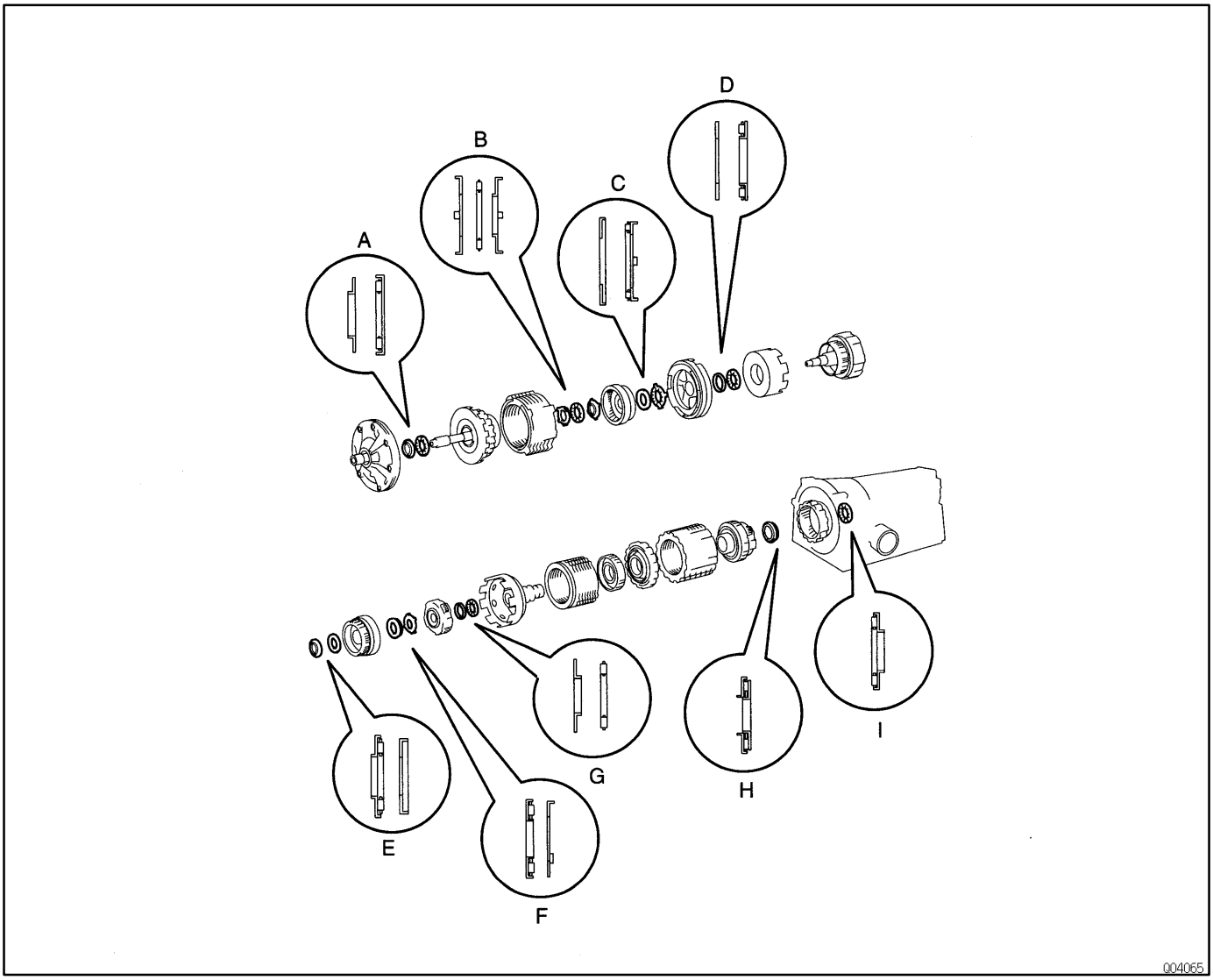
Recommended ATF:

Type T-II or equivalent

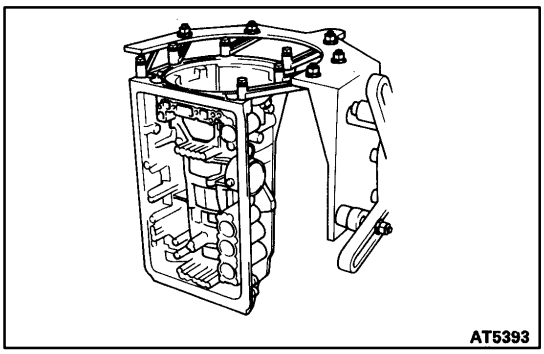
GENERAL NOTES:

1. The automatic transmission is composed of highly precision-finished parts, necessitating careful inspection before assembly because even a small nick could cause fluid leakage or affect performance.
2. Before assembling new clutch discs, soak them in automatic transmission fluid for at least 15 minutes.
3. Apply automatic transmission fluid on sliding or rotating surfaces of parts before assembly.
4. Use petroleum jelly to keep small parts in their place.
5. Do not use adhesive cements on gaskets and similar parts.
6. When assembling the transmission, be sure to use new gaskets and O-rings.
7. Dry all parts with compressed air-never use shop rags.
8. When working with FIPG material, you must observe the following.
   - ★ Using a razor blade and gasket scraper, remove all the old packing (FIPG) material from the gasket surfaces.
   - ★ Thoroughly clean all components to remove all the loose material.
   - ★ Clean both sealing surface with a non-residue solvent.
   - ★ Parts must be assembled within 10 minutes of application. Otherwise, the packing (FIPG) material must be removed and reapplied.

BEARINGS AND RACES INSTALLATION POSITION AND DIRECTION



Mark	Front Race Diameter Inside / Outside mm (in.)	Thrust Bearing Diameter Inside / Outside mm (in.)	Rear Race Diameter Inside / Outside mm (in.)
A	28.1 (1.106) / 47.5 (1.870)	28.8 (1.134) / 50.4 (1.984)	-
B	27.2 (1.070) / 42.0 (1.654)	25.9 (1.020) / 47.0 (1.850)	24.0 (0.945) / 48.0 (1.890)
C	37.1 (1.461) / 59.0 (2.323)	33.6 (1.323) / 50.3 (1.980)	-
D	37.0 (1.457) / 51.0 (2.008)	33.5 (1.319) / 47.8 (1.882)	-
E	26.0 (1.024) / 48.9 (1.925)	25.9 (1.020) / 47.0 (1.850)	26.5 (1.043) / 47.0 (1.850)
F	-	35.0 (1.378) / 53.8 (2.118)	34.0 (1.339) / 48.0 (1.890)
G	33.5 (1.319) / 47.8 (1.882)	35.4 (1.394) / 48.0 (1.890)	-
H	-	27.6 (1.087) / 54.5 (2.146)	-
H'	28.8 (1.134) / 44.8 (1.764)	30.1 (1.185) / 44.7 (1.760)	28.7 (1.094) / 44.8 (1.764)
I	-	39.0 (1.535) / 57.7 (2.272)	-

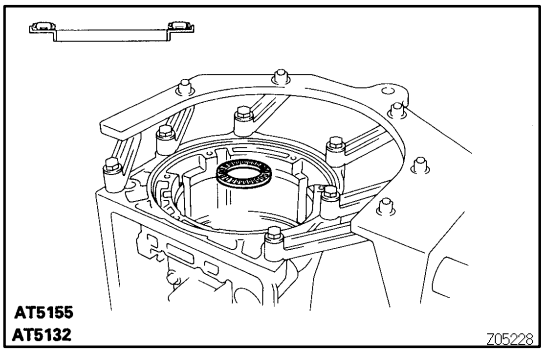


AT0PW-03

BASIC SUBASSSEMBLY REASSEMBLY

1. INSTALL TRANSMISSION CASE

Install the transmission case in the overhaul attachment.



2. INSTALL BEARING AND RACE

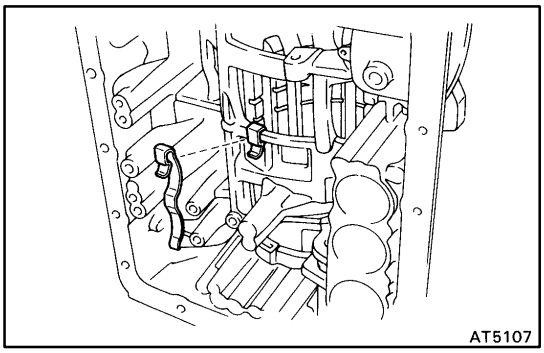
(a) Coat the assembled bearing and race with petroleum jelly.

(b) Install it onto the case.

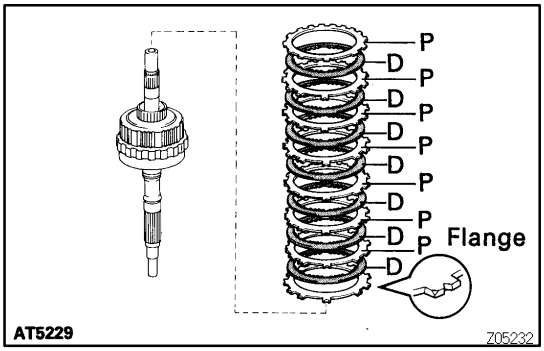
Assembled bearing and race diameter

mm (in.)

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



3. INSTALL LEAF SPRING



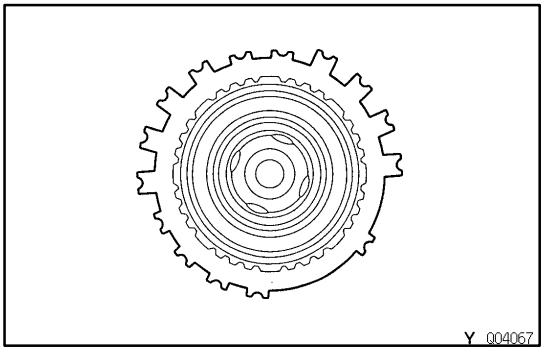
4. INSTALL REAR PLANETARY GEAR UNIT WITH FIRST AND REVERSE BRAKE AND OUTPUT SHAFT

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

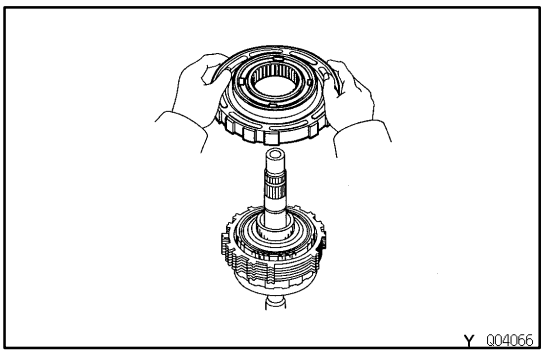
(b) Install the 7 plates and 7 discs.

Install in order: P=Plate D=Disc

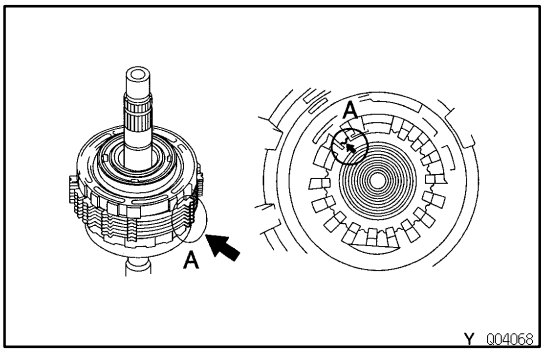
D-P-D-P-D-P-D-P-D-P-D-P-D-P



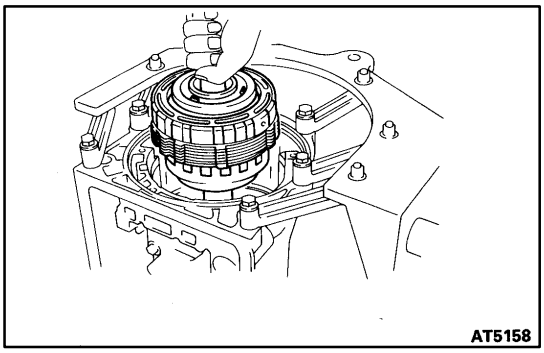
(c) Align the teeth of the flange, discs and plates.



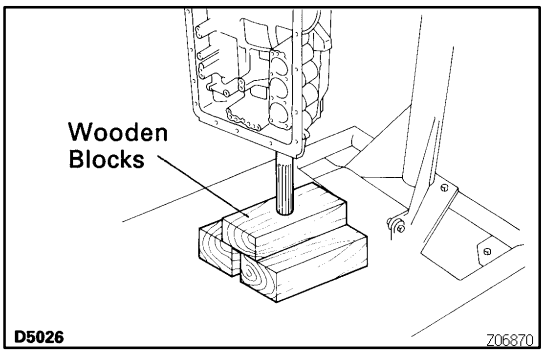
(d) Face the snap ring upward (front side) and install the second brake drum to the planetary gear.
NOTICE: Face the oil hole in the drum towards the lower side of the transmission case (the side the valve body is installed).



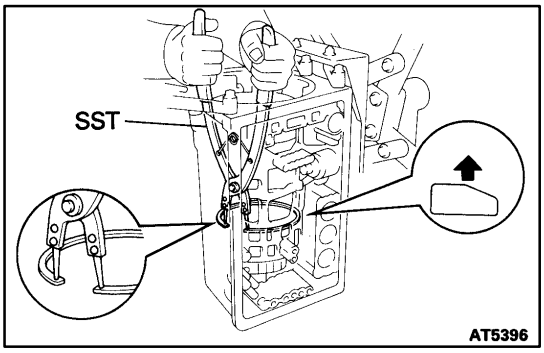
(e) Align the splines of the transmission case and the assembled rear planetary gear, first and reverse brake pack and output shaft, indicated by A.



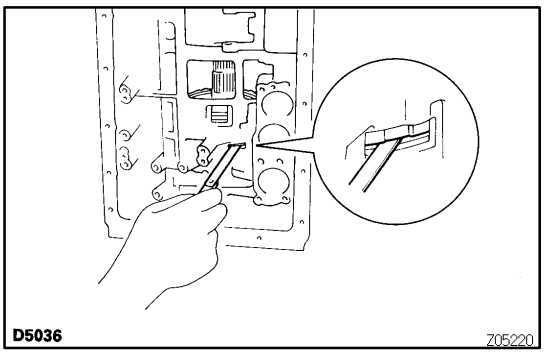
(f) Install the assembled rear planetary gear, first and reverse brake pack and output shaft.



(g) Rest the output shaft on wooden blocks.



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



5. CHECK PACK CLEARANCE OF FIRST AND REVERSE BRAKE

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

Clearance:

0.70-1.00 mm (0.028-0.039 in.)

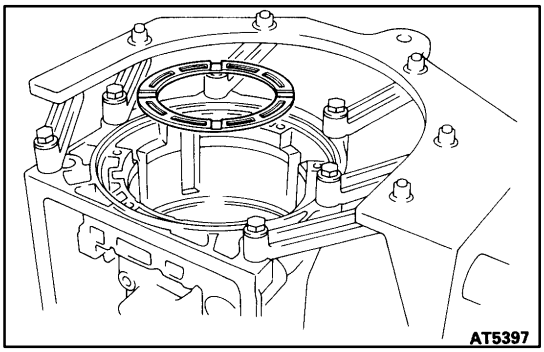
If the values are non-standard, select another flange.

HINT: There are 8 different flange thickness.

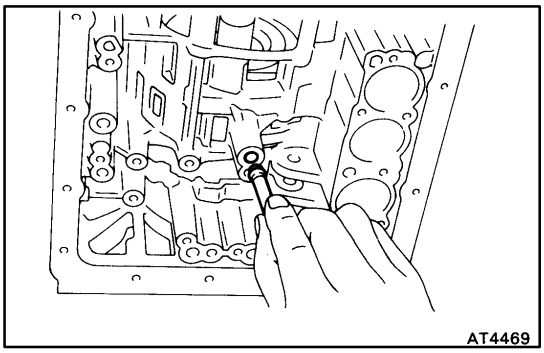
Flange Thickness

mm (in.)

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



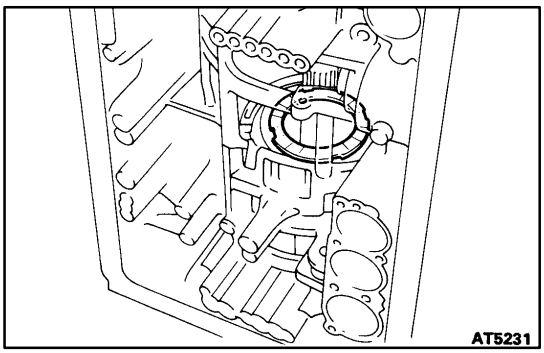
6. INSTALL SECOND BRAKE PISTON SLEEVE



7. INSTALL NEW BRAKE DRUM GASKET

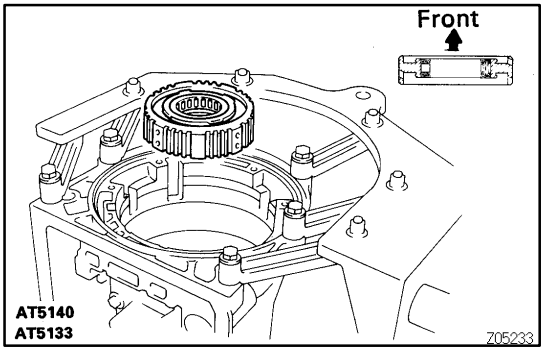
(a) Coat the gasket with ATF.

(b) Install a new brake drum gasket.

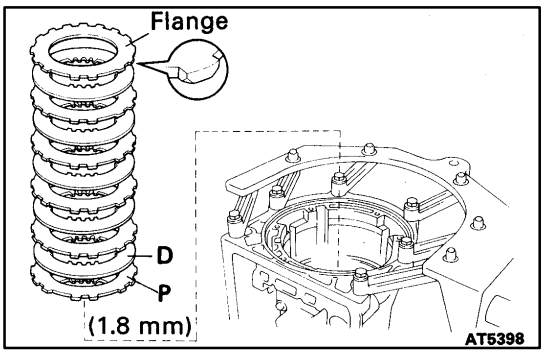


8. INSTALL NO.1 ONE-WAY CLUTCH

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



(b) Install the No.1 one-way clutch.

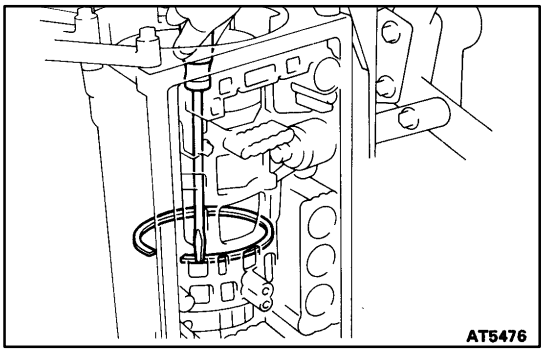


9. INSTALL FLANGE, PLATES AND DISCS OF SECOND BRAKE

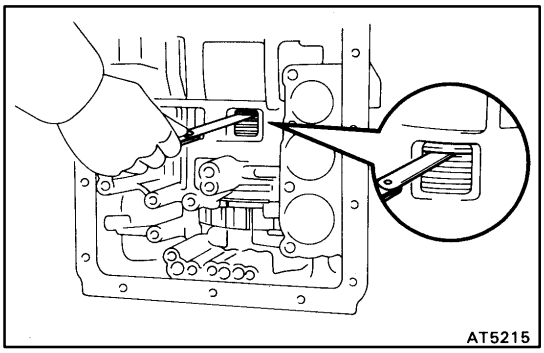
(a) Install the 1.8 mm (0.071 in.) thick plate with the rounded-edge side of the plate facing the disc.

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

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



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



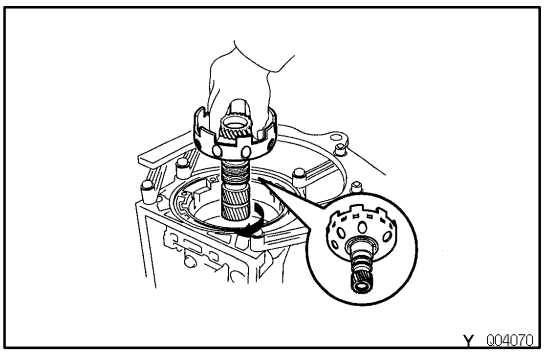
10. CHECK PACK CLEARANCE OF SECOND BRAKE

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

Clearance:

0.49-1.1 1 mm (0.0193-0.0437 in.)

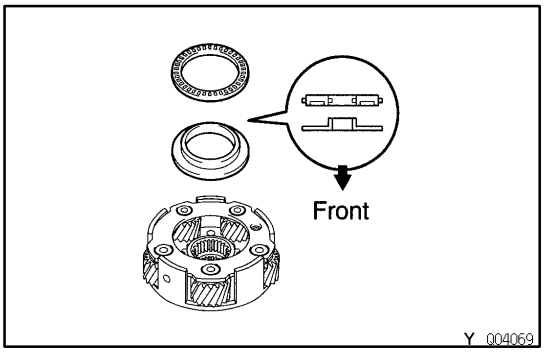
If the values are non-standard, check for improper installation.



11. INSTALL PLANETARY SUN GEAR

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

HINT: Confirm the thrust washer is installed correctly.



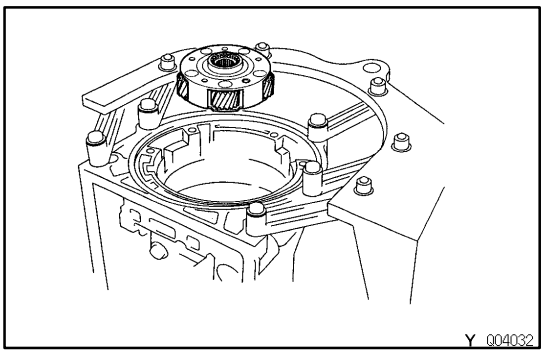
12. INSTALL FRONT PLANETARY GEAR

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

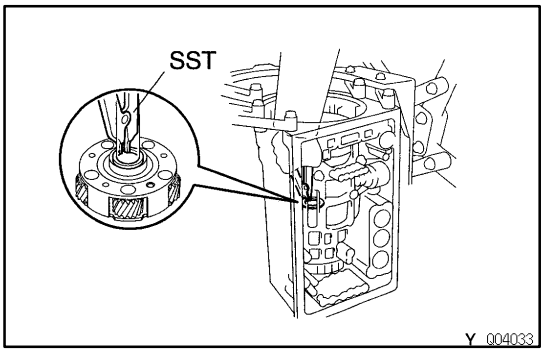
Bearing and race diameter

mm (in.)

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

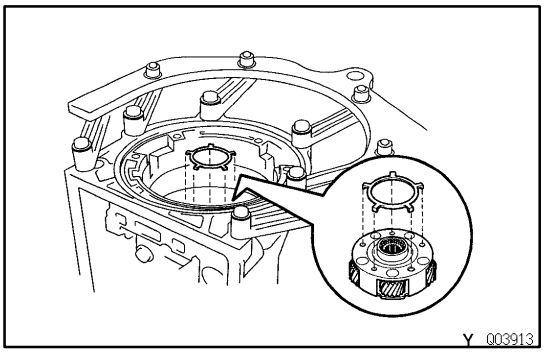


(b) Install the front planetary gear to the sun gear input drum.



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

(d) Remove the wooden blocks under the output shaft.

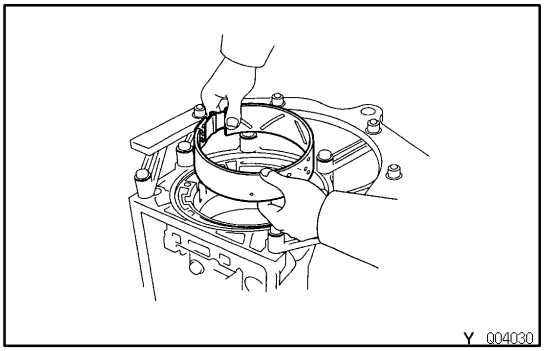


(e) Coat the race with petroleum jelly and install it onto the front planetary gear.

Race diameter

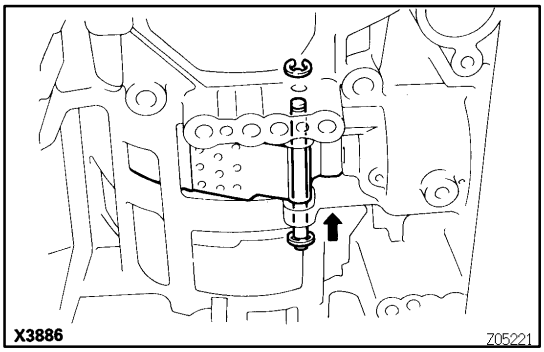
mm (in.)

	Inside	Outside
Race	34.0 (1.339)	48.0 (1.890)



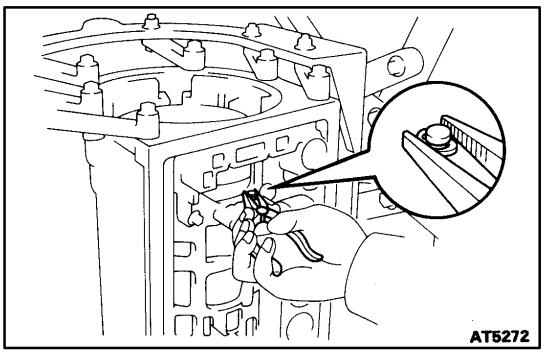
14. INSTALL SECOND COAST BRAKE BAND

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

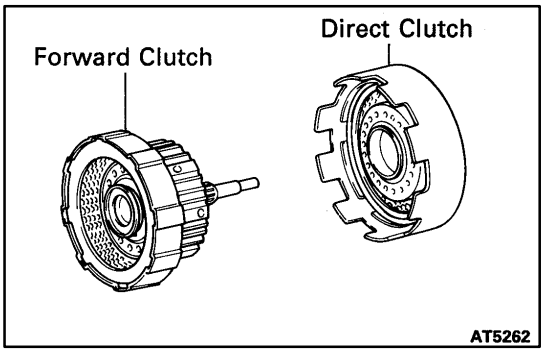


(b) Install the E-ring to the pin.

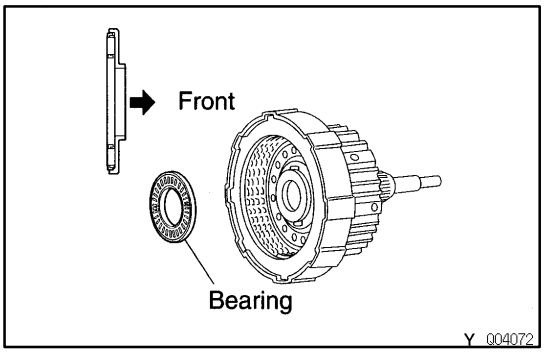
(c) Install the pin through the brake band.



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



15. INSTALL DIRECT CLUTCH TO FORWARD CLUTCH



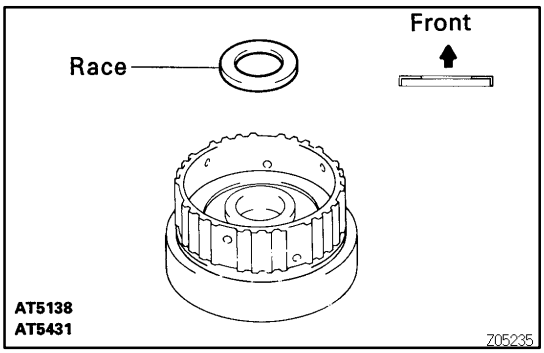
16. INSTALL FRONT PLANETARY RING GEAR TO FORWARD AND DIRECT CLUTCH

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

Bearing and race diameter

mm (in.)

	Inside	Outside
Bearing	25.9 (1.020)	48.9 (1.925)

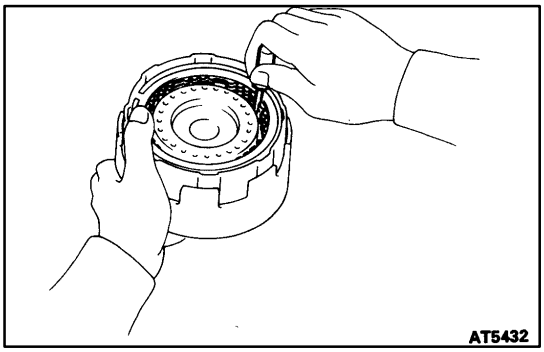


(b) Coat the race with petroleum jelly and install it onto the front planetary ring gear.

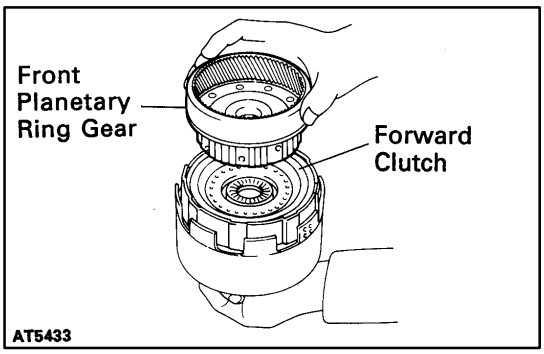
Race diameter

mm (in.)

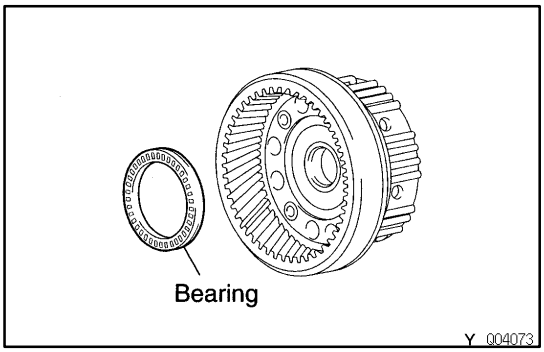
	Inside	Outside
Race	26.5 (1.043)	47.0 (1.850)



(c) Align the flukes of the discs in the forward clutch.



(d) Align the splines of the front planetary ring gear with the flukes of the discs and install the front planetary ring gear to the forward clutch.



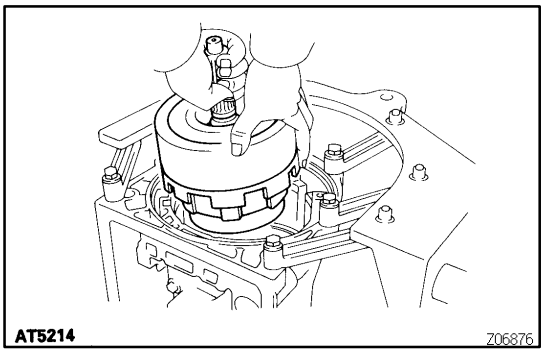
17. INSTALL ASSEMBLED DIRECT CLUTCH, FORWARD CLUTCH AND FRONT PLANETARY RING GEAR INTO CASE

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

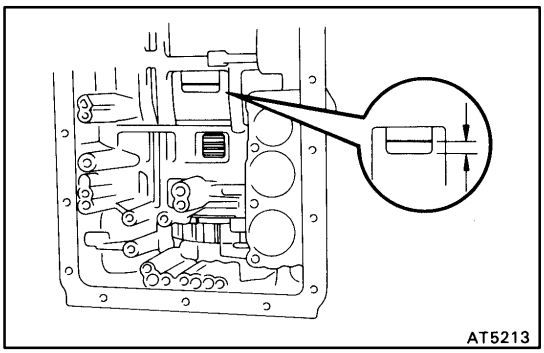
Bearing and race diameter

mm (in.)

	Inside	Outside
Bearing and Race	35.0 (1.378)	53.8 (2.118)



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

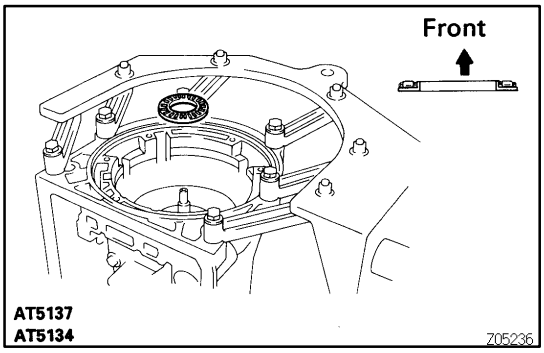


(c) Using vernier calipers, measure the distance between the sun gear input drum and direct clutch drum.

Height:

9.8-11.8 mm (0.386-0.465 in.)

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

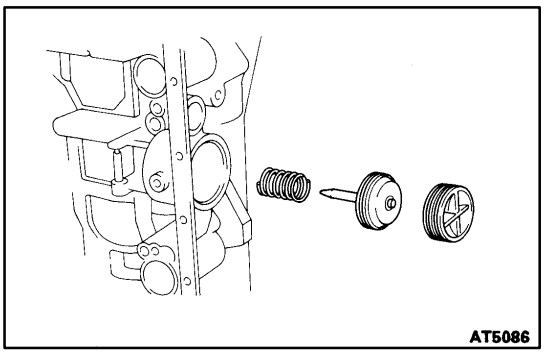


(d) Coat the assembled bearing and race with petroleum jelly and install it onto the forward clutch.

Assembled bearing and race diameter

mm (in.)

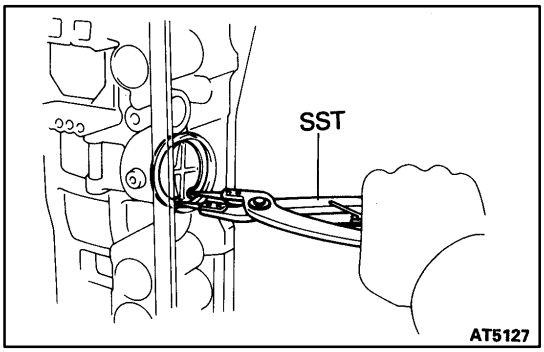
	Inside	Outside
Assembled bearing and race	33.5 (1.319)	47.8 (1.882)



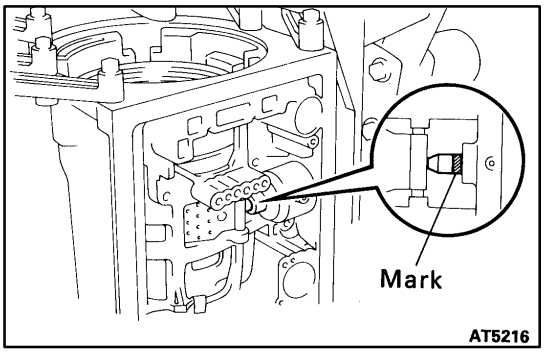
18. INSTALL SECOND COAST BRAKE COVER, PISTON ASSEMBLY AND SPRING

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

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

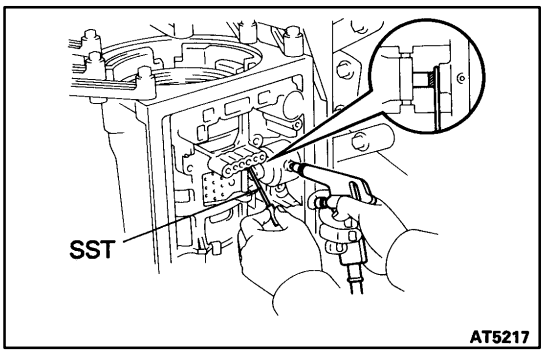


(c) Using SST, install the snap ring.
SST 09350-30020 (09350-07060)



19. CHECK PISTON ROD STROKE OF SECOND COAST BRAKE

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



(b) Using SST, measure the stroke while applying and releasing compressed air (392-785 kPa, 4-8 kgf/cm^2 or 57-114 psi).
SST 09240-00020

Piston rod stroke:

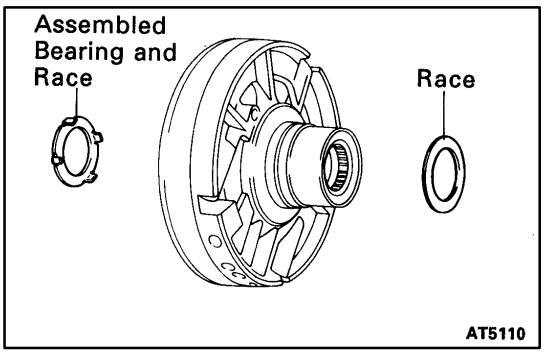
1.0-2.0 mm (0.039-0.079 in.)

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

Piston rod length:

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

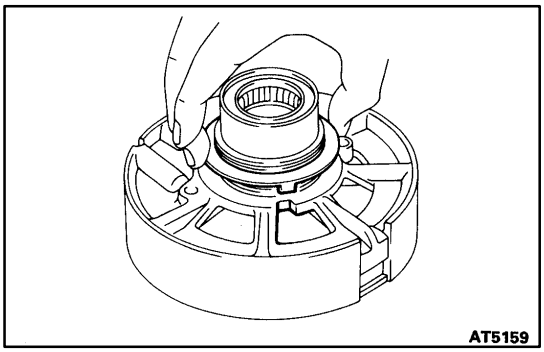
If it is still more than standard value, replace the brake band with a new one.



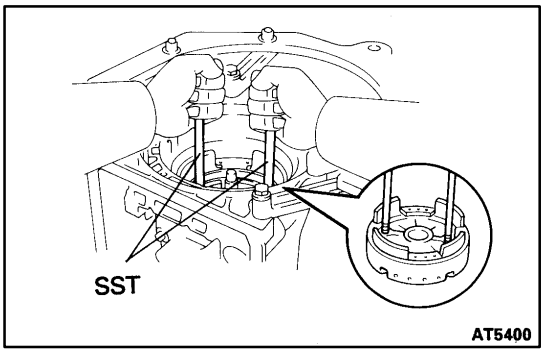
20. INSTALL OVERDRIVE SUPPORT ASSEMBLY

(a) Coat the assembled bearing and races with petroleum jelly and install them onto the overdrive support assembly.
Assembled bearing and race diameter
mm (in.)

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

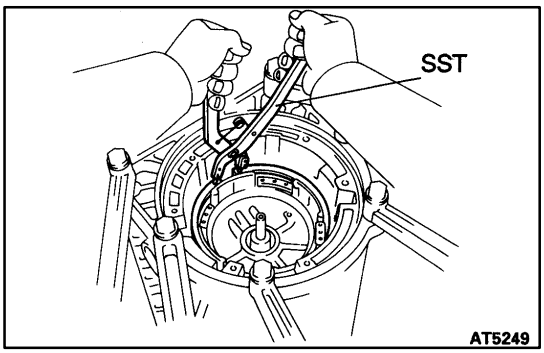


(b) Confirm the thrust washer is installed correctly.
HINT: Make sure that the lug shape matches the hole on the O/D support.

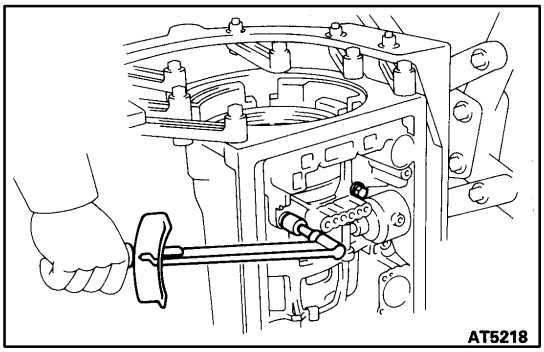


(c) Using 2 bolts of SST, aim the bolt and oil holes of the overdrive support toward the valve body side, align them with the bolt holes of the transmission case.
SST 09350-30020 (09350-07020)

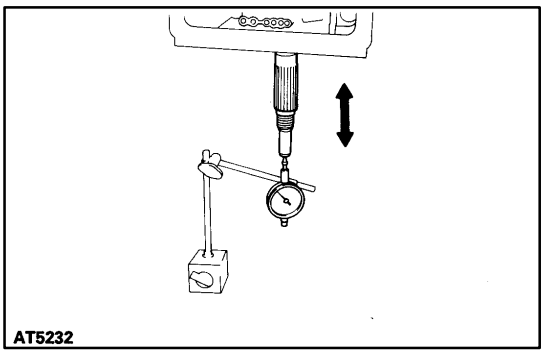
(d) Temporarily install the 2 bolts.



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



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


AT5232

21. CHECK OUTPUT SHAFT

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

End play:

1.63-2.89 mm (0.0642-0.1138 in.)

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

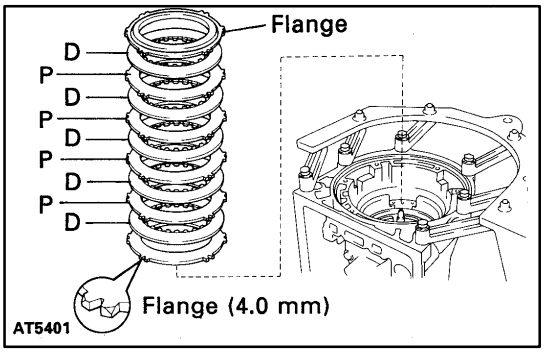
(b) Check to see that output shaft rotates smoothly.

22. INSTALL FLANGES, PLATES AND DISCS OF OVERDRIVE BRAKE

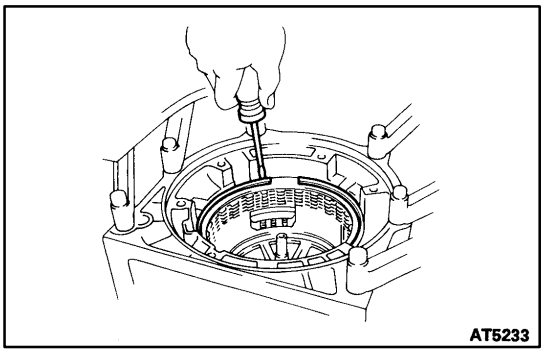
(a) Install the 4.0 mm (0.157 in.) thick flange (flat ring) with the rounded-edge side of the flange facing the disc.

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

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



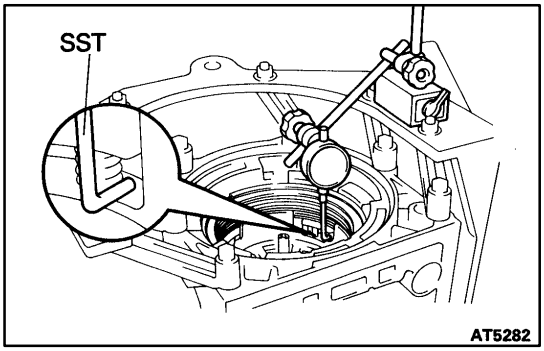
AT5401


AT5233

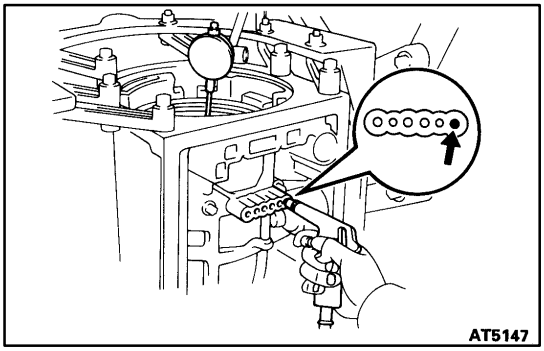
(d) Using a screwdriver, install the snap ring.

23. CHECK PISTON STROKE OF OVERDRIVE BRAKE

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



AT5282


AT5147

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

Piston Stroke:

1.75-2.05 mm (0.0690-0.0807 in.)

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

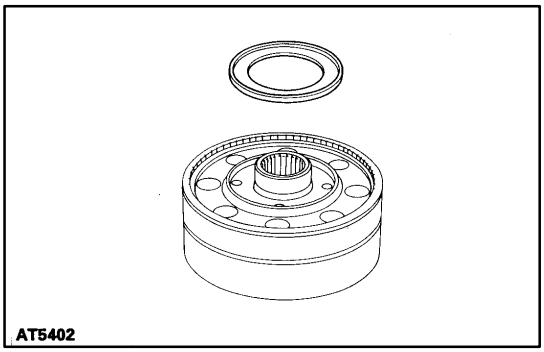
If the piston stroke is non- standard, select another flange.

HINT: There are 7 different flange thicknesses.

Flange thickness

mm (in.)

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



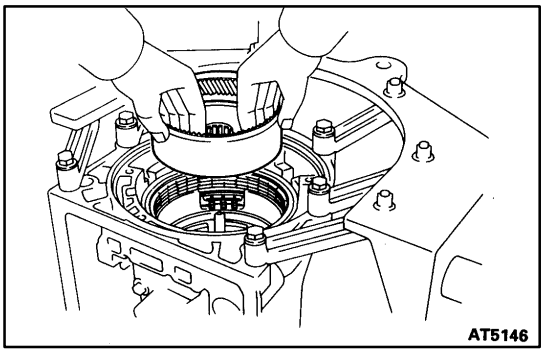
24. INSTALL OVERDRIVE PLANETARY GEAR UNIT WITH OVERDRIVE DIRECT CLUTCH AND ONE- WAY CLUTCH

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

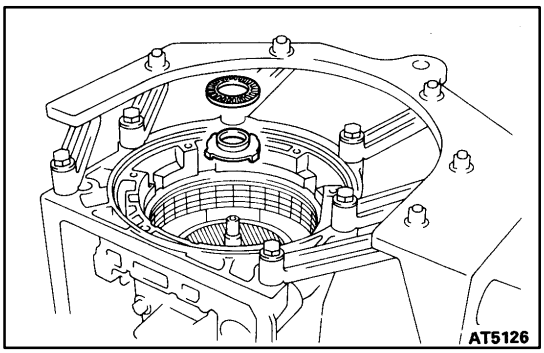
Race diameter

mm (in.)

	Inside	Outside
Race	37.1 (1.461)	59.0 (2.323)



(b) Install the overdrive planetary ring gear.

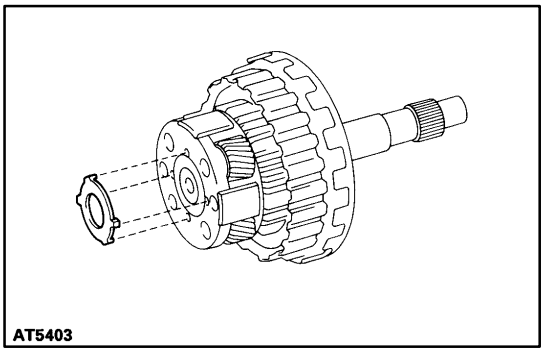


(c) Coat the bearing and race with petroleum jelly and install them onto the planetary ring gear.

Bearing and race diameter

mm (in.)

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

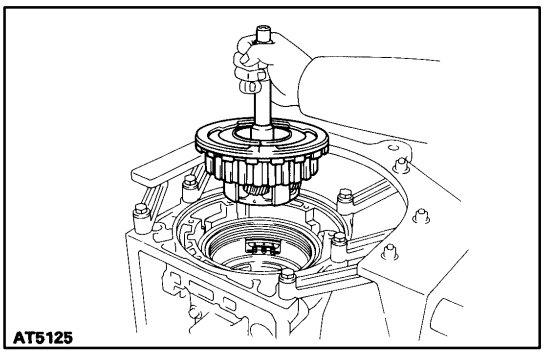


(d) Coat the race with petroleum jelly and install it onto the planetary gear.

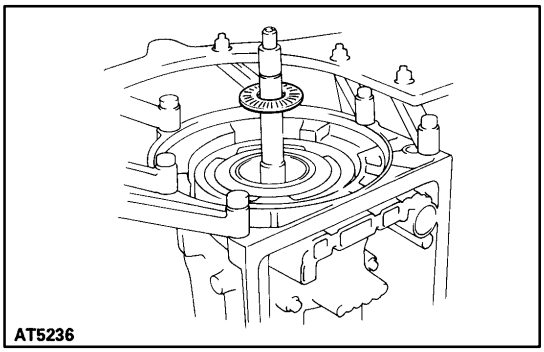
Race diameter

mm (in.)

	Inside	Outside
Race	27.2 (1.071)	42.0 (1.654)

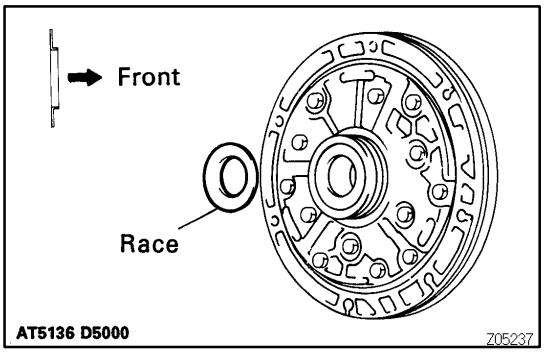


(e) Install the overdrive planetary gear with the overdrive direct clutch and one-way clutch.



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

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



25. INSTALL OIL PUMP INTO CASE

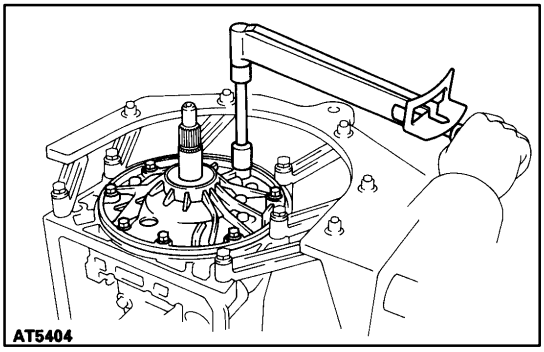
(a) Coat the race with petroleum jelly and install it onto the oil pump.
Race diameter
mm (in.)

	Inside	Outside
Race	28.1 (1.106)	47.5 (1.870)

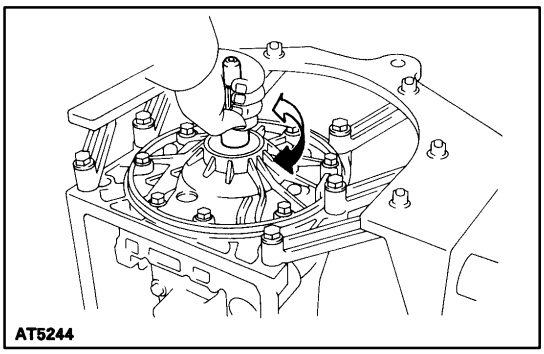
(b) Coat a new O-ring with ATF and install it around the pump body.

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

(d) Hold the input shaft, and lightly press the oil pump body to slide the oil seal rings into the overdrive direct clutch drum.
NOTICE: Do not push on the oil pump strongly, or the oil seal ring will stick to the direct clutch drum.

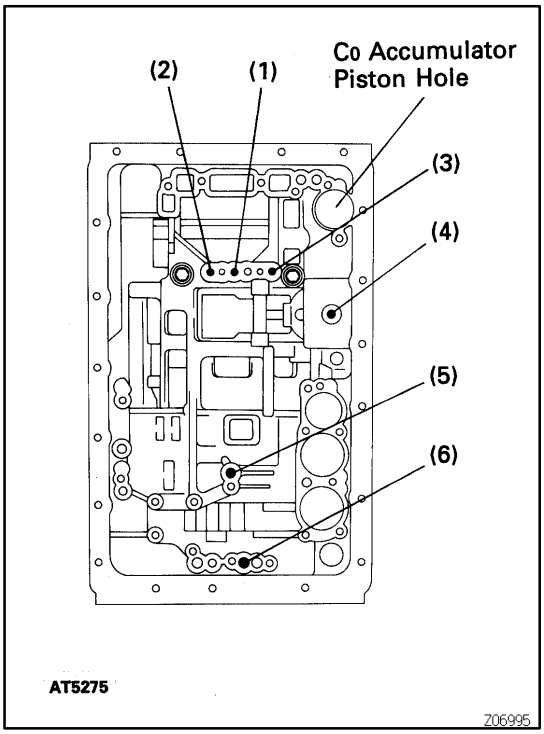


(e) Install the 7 bolts.
Torque: 21 N·m (215 kgf·cm, 16 ft·lbf)



26. CHECK INPUT SHAFT ROTATION

Make sure the input shaft rotates smoothly.



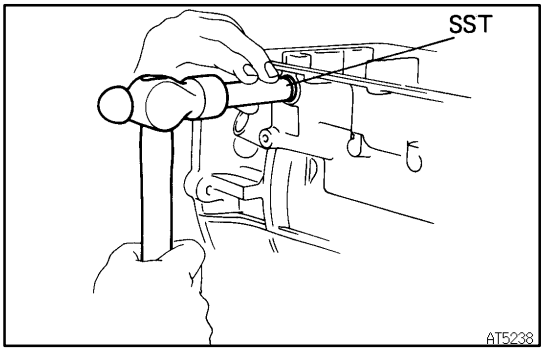
27. INDIVIDUAL PISTON OPERATION INSPECTION

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

HINT: When inspecting the O/D direct clutch, check with the C_0 accumulator piston hole closed.

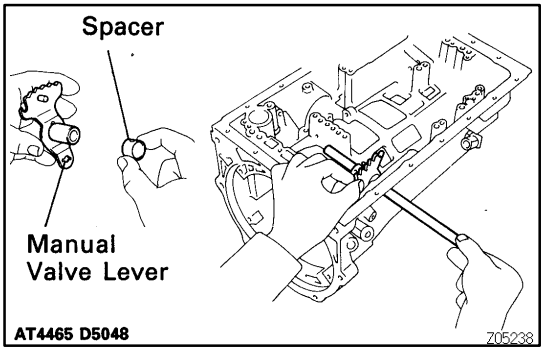
If there is no noise, disassemble and check the installation condition of the parts.

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

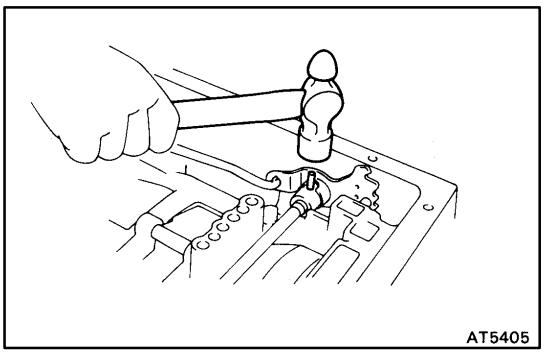


28. INSTALL MANUAL VALVE LEVER, SHAFT AND OIL SEAL

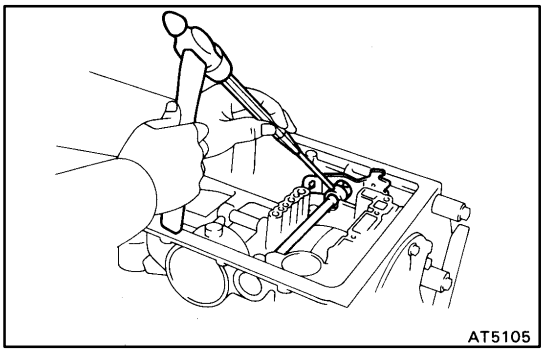
(a) Using SST, drive in a new oil seal.
SST 09350-30020 (09350-07110)
(b) Coat the oil seal lip with MP grease.



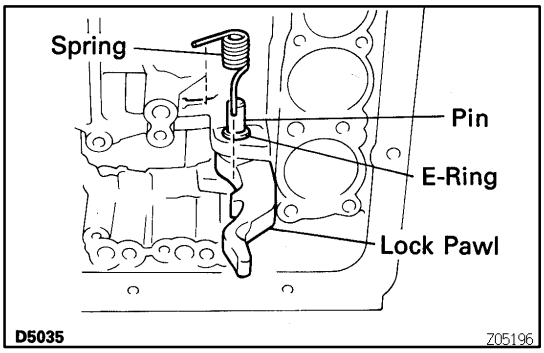
(c) Install a new spacer to the manual valve lever.
(d) Install the manual valve lever shaft to the transmission case through the manual valve lever.



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

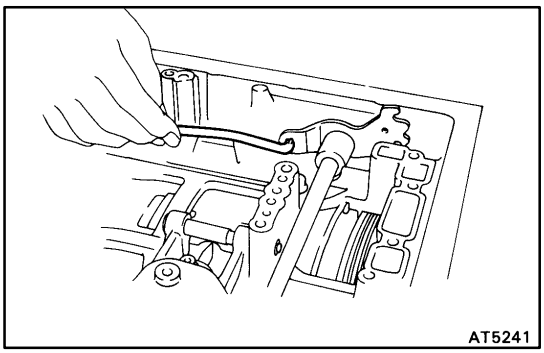


(f) Match the manual valve lever indentation with the spacer hole and calk them together with the punch.
(g) Make sure the shaft rotates smoothly.

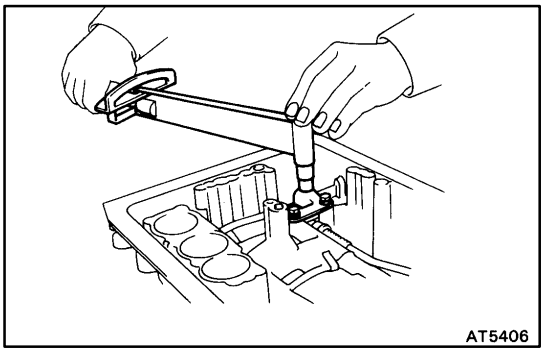


29. INSTALL PARKING LOCK PAWL AND ROD

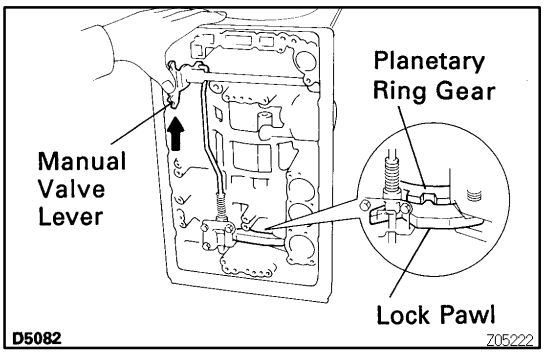
(a) Install the E-ring to the shaft.
(b) Install the parking lock pawl, shaft and spring.



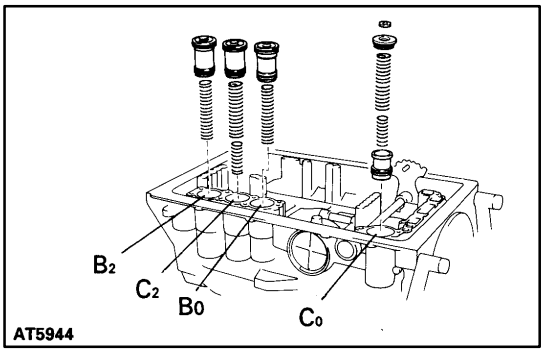
(c) Connect the parking lock rod to the manual valve lever.



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



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



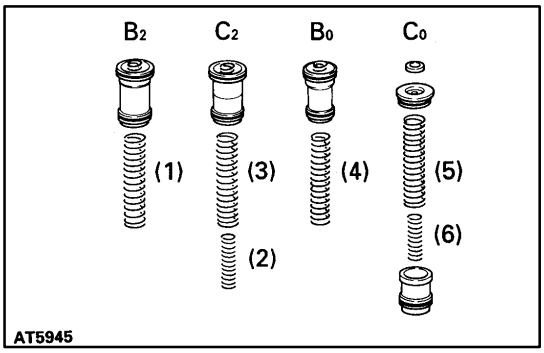
30. INSTALL ACCUMULATOR SPRINGS AND PISTONS

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

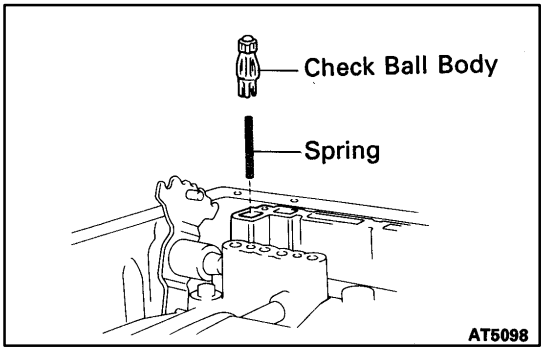
(b) Install the 6 springs and 4 accumulator pistons to the bore.

HINT: The pistons are marked in relief with either C_0, B_0, C_2 or B_2 to discriminate between them.

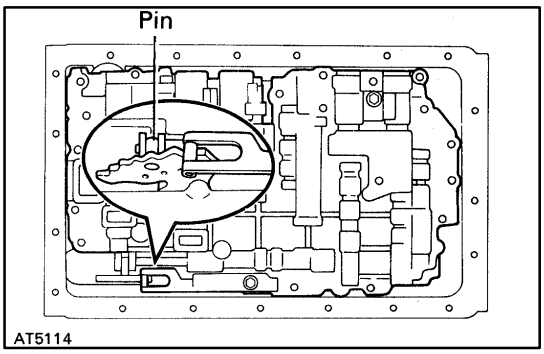
Accmulator spring



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

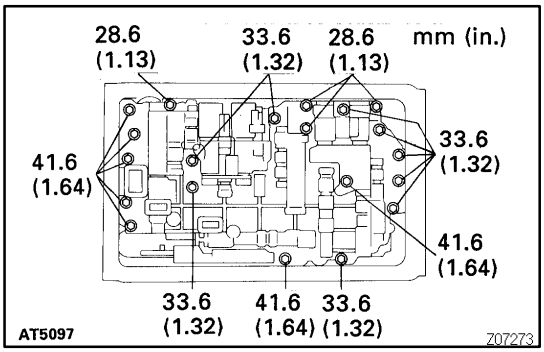


31. INSTALL SPRING AND CHECK BALL BODY

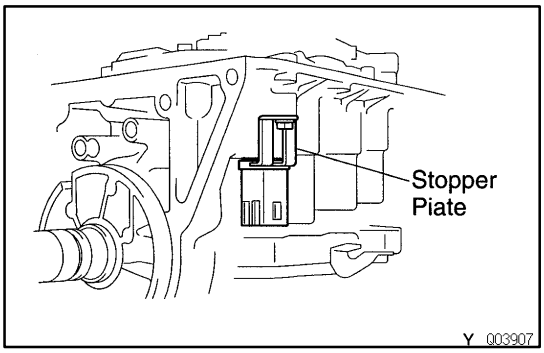


32. INSTALL VALVE BODY

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



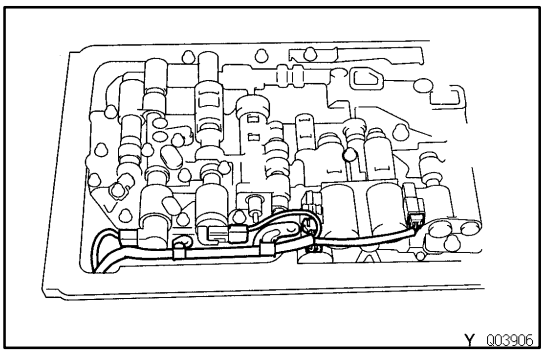
(b) Install the 20 bolts.
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)
HINT: Each bolt length (mm, in.) is indicated in the illustration.



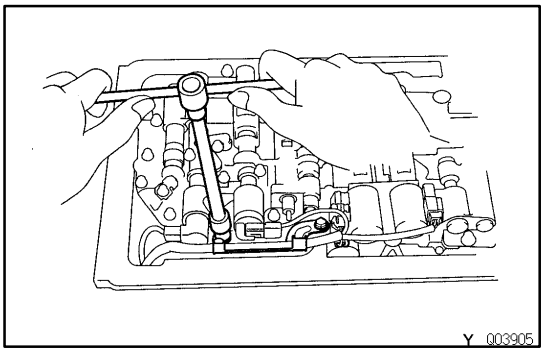
33. INSTALL SOLENOID WIRING

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

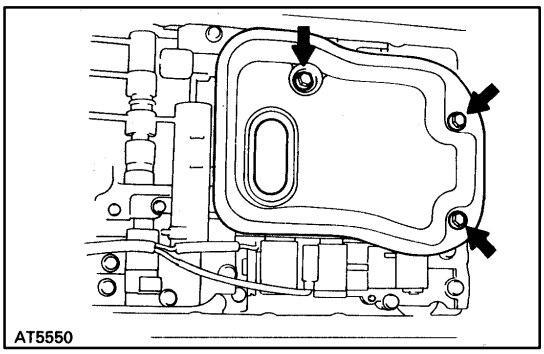
(b) Install the solenoid wiring to the case and install the stopper plate.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)



(c) Connect the 5 solenoid connectors.



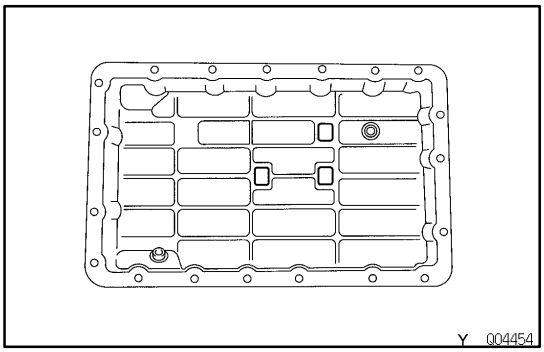
(d) Install the clamp with 2 bolts.



34. INSTALL OIL STRAINER AND GASKETS

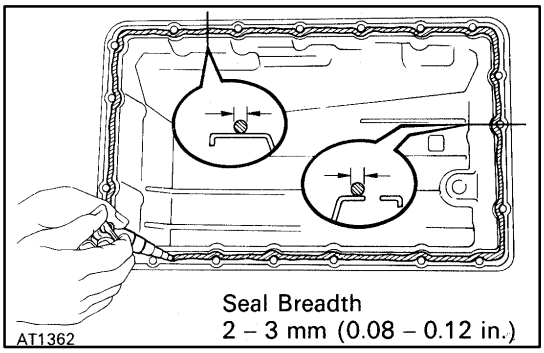
Install the oil strainer and torque the 3 bolts.

Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)



35. INSTALL OIL PAN

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

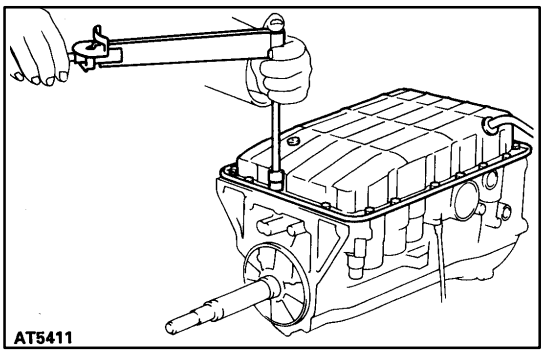


(b) Remove any packing material and be careful not to drop oil on the contacting surfaces of the transmission case and oil pan.

(c) Apply seal packing to the oil pan.

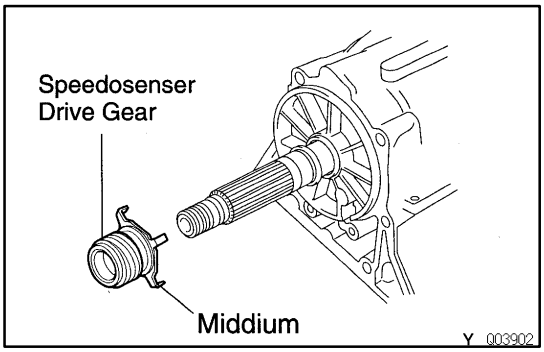
Seal packing:

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

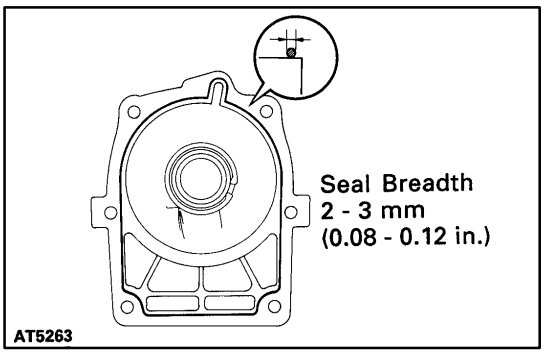


(d) Install and torque the 19 bolts.

Torque: 17 N·m (75 kgf·cm, 65 in.·lbf)



36. INSTALL SPEEDOMETER DRIVE GEAR



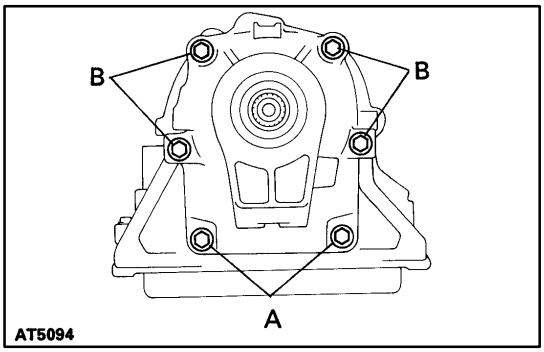
37. INSTALL EXTENSION HOUSING

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

(b) Apply seal packing to the extension housing.

Seal packing:

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



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

Seal packing:

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

(d) Install and torque the 6 bolts.

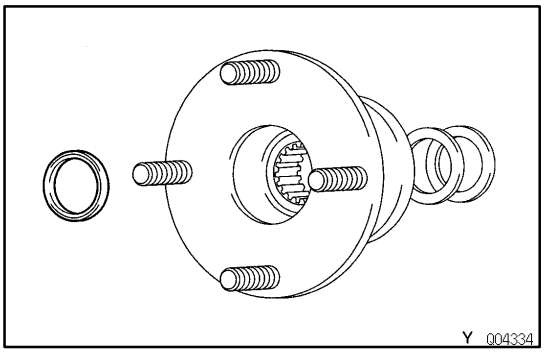
Torque: 34 N·m (345 kgf·cm, 25 ft·lbf)

HINT: Each bolt length is indicated below.

Bolt length:

Bolt A: 35 mm (1.378 in.)

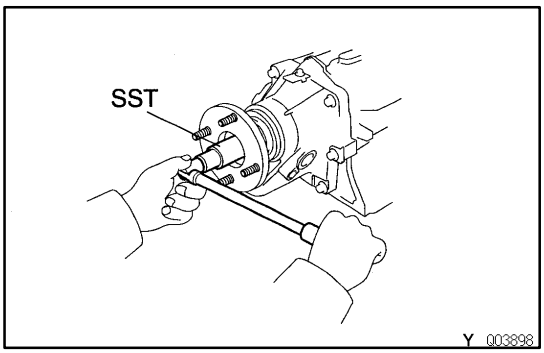
Bolt B: 45 mm (1.772 in.)



38. INSTALL TRANSMISSION OUTPUT FLANGE

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

(b) Install the output flange and 2 washers.

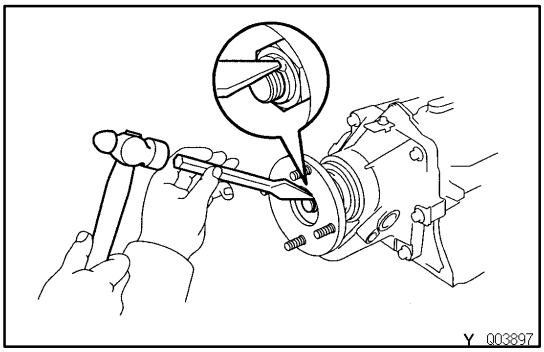


(c) Using SST, install a new nut.

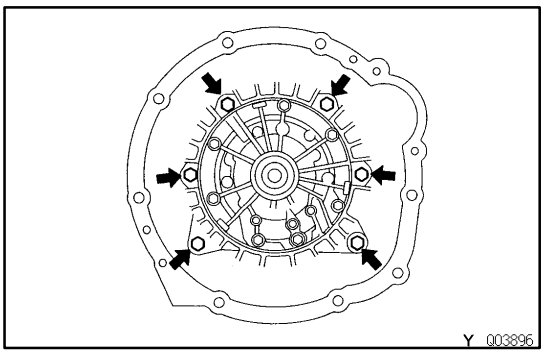
SST 09060-20100

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

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



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



39. REMOVE TRANSMISSION CASE FROM OVERHAUL ATTACHMENT

40. INSTALL TRANSMISSION HOUSING

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

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

Seal packing:

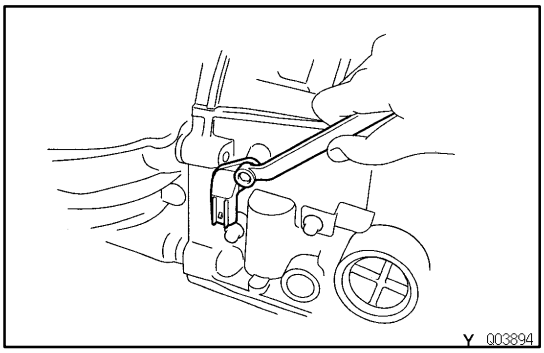
Part No.08833-00070, THREE BOND 1324 or equivalent

(c) Install and torque the 6 bolts.

Torque:

14 mm bolt: 34 N·m (345 kgf·cm, 25 ft·lbf)

17 mm bolt: 57 N·m (580 kgf·cm, 42 ft·lbf)



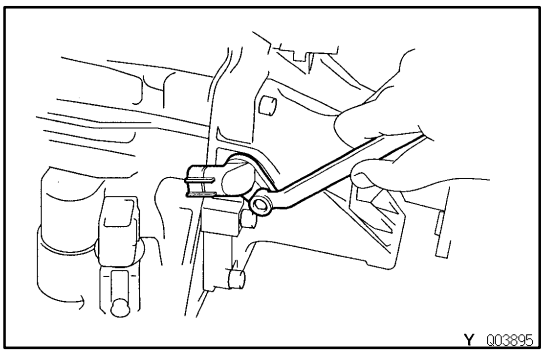
41. INSTALL O/D DIRECT CLUTCH SPEED SENSOR

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

(b) Install the speed sensor.

(c) Install and torque the bolts.

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



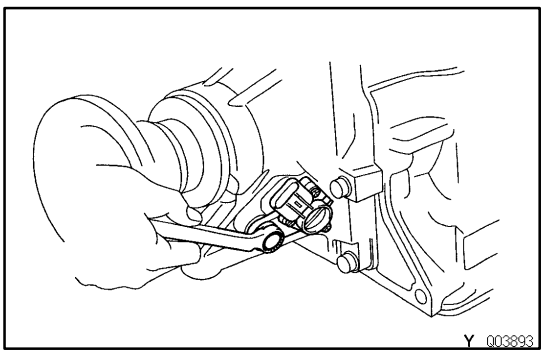
42. INSTALL NO.2 VEHICLE SPEED SENSOR

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

(b) Install the speed sensor.

(c) Install and torque the bolts.

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



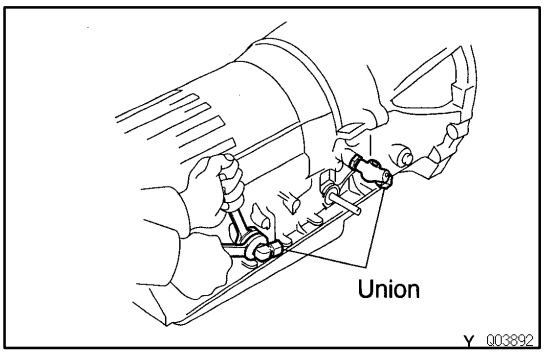
43. INSTALL NO.1 VEHICLE SPEED SENSOR

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

(b) Install the No.1 vehicle speed sensor.

(c) Install and torque the bolt.

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

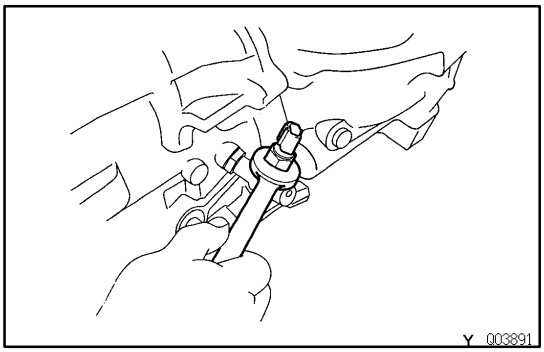


44. INSTALL UNIONS

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

(b) Install each union.

Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

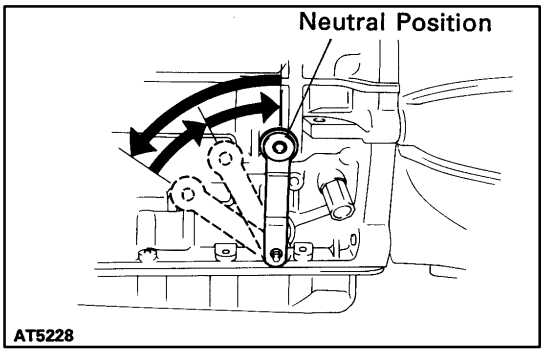


45. INSTALL OIL TEMPERATURE SENSOR

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

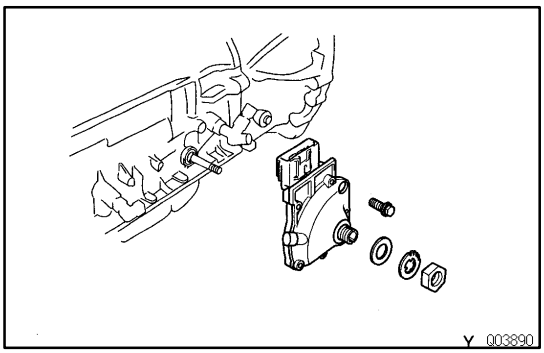
(b) Install the oil temp. sensor.

Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)



46. INSTALL PARK/NEUTRAL POSITION SWITCH

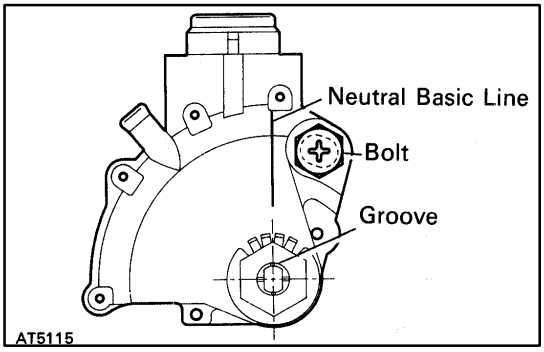
(a) Using the control shaft lever, fully turn the manual lever shaft back and return 2 notches. It is now in neutral.



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

(c) Install the grommet and a new lock washer. Install and torque the nut.

Torque: 7 N·m (70 kgf·cm, 61 in.·lbf)



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

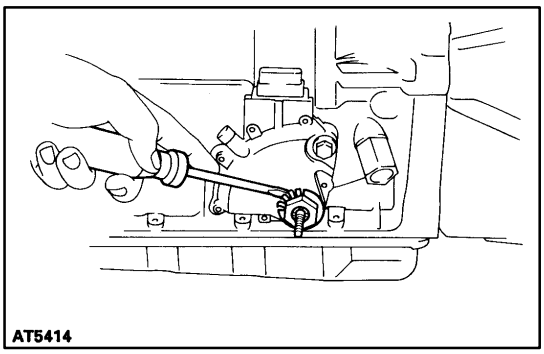
(e) Apply seal packing or equivalent to the adjusting bolt.

Seal packing:

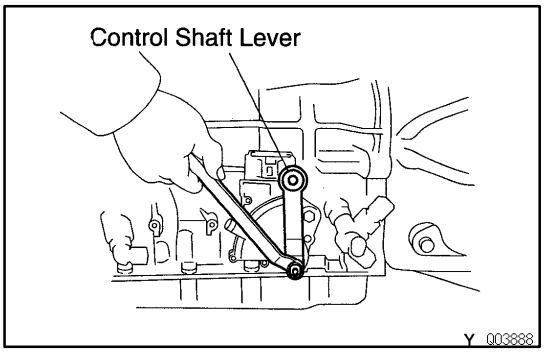
Part No.08833-00070, THREE BOND 1324 or equivalent

(f) Align the neutral basic line and the switch groove, and tighten the adjusting bolt.

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)



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



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

DESCRIPTION

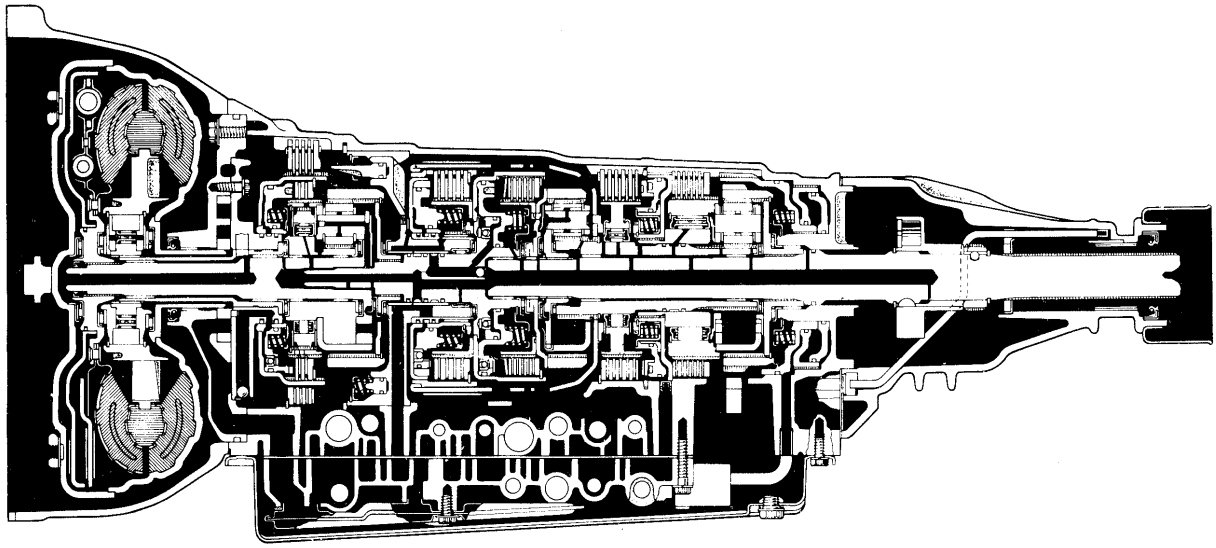
GENERAL DESCRIPTION

AT0FT-02

The A340E is a 4-speed, Electronically Controlled Transmission developed for use with high-performance engines. A lock-up mechanism is built into the torque converter clutch.

The A340E automatic transmission is mainly composed of the torque converter clutch, the overdrive (hereafter called O/D) planetary gear unit, a 3-speed planetary gear unit, a hydraulic control system and an electronic control system.

Sectional View



AT4366

GENERAL SPECIFICATIONS

TRUCK, 4 RUNNER, T100:

Type of Transmission		A340E
Type of Engine		3VZ-E
Torque Converter Clutch Stall Torque Ratio		C&C, T100 2.0 : 1 Others 2.15 : 1
Lock-up Mechanism		Equipped
Gear Ratio	1st Gear	2.804
	2nd Gear	1.531
	3rd Gear	1.000
	O/D Gear	0.705
	Reverse Gear	2.393
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)	4 / 4
	2nd Brake (B_2)	5 / 5
	1st and Reverse Brake (B_3)	6 / 6
	O/D Brake (B_0)	4 / 3
B_1 Band Width	mm (in.)	40 (1.57)
ATF Type		ATF DEXRON® II
Capacity (US qts, Imp.qts)	Total	7.2 (7.6, 6.3)
	Drain and Refill	1.6 (1.7, 1.4)

SUPRA:

Type of Transmission		A340E
Type of Engine		2JZ-GE
Torque Converter Clutch Stall Torque Ratio		1.9 : 1
Lock-up Mechanism		Equipped
Gear Ratio	1st Gear	2.804
	2nd Gear	1.531
	3rd Gear	1.000
	O/D Gear	0.705
	Reverse Gear	2.393
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)	4 / 4
	2nd Brake (B_2)	5 / 5
	1st and Reverse Brake (B_3)	6 / 6
	O/D Brake (B_0)	4 / 3
B_1 Band Width	mm (in.)	40 (1.57)
ATF Type		ATF DEXRON® II
Capacity (US qts, Imp.qts)	Total	7.2 (7.6, 6.3)
	Drain and Refill	1.6 (1.7, 1.4)

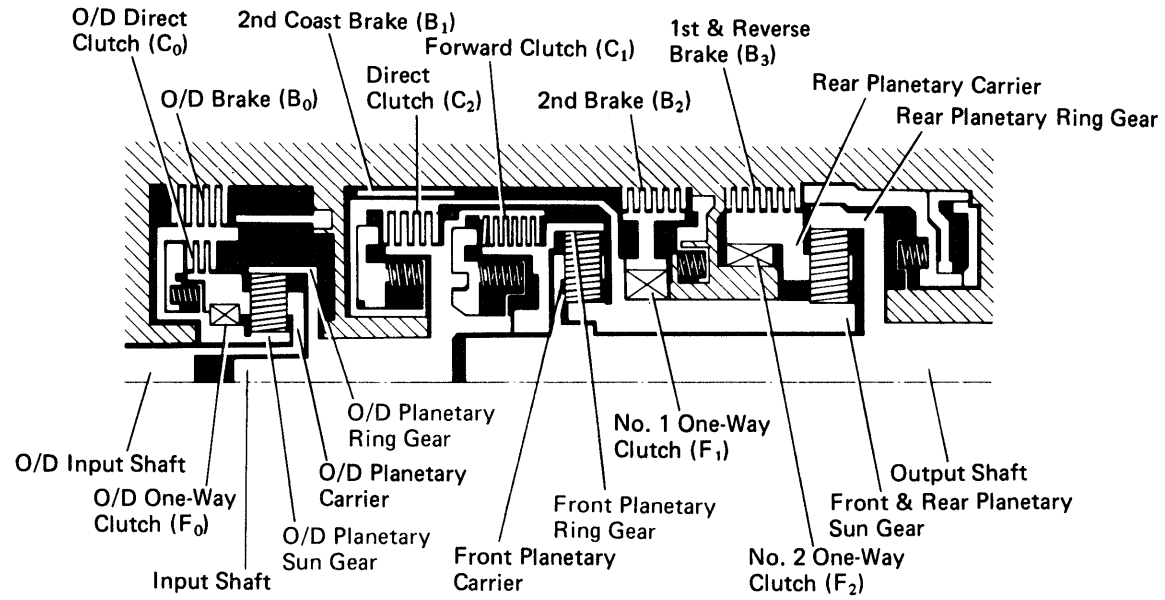
PREVIA:

Type of Transmission		A340E
Type of Engine		2TZ-FZE
Torque Converter Clutch Stall Torque Ratio		2.0 : 1
Lock-up Mechanism		Equipped
Gear Ratio	1st Gear	2.804
	2nd Gear	1.531
	3rd Gear	1.000
	O/D Gear	0.705
	Reverse Gear	2.393
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)	4 / 4
	2nd Brake (B_2)	5 / 5
	1st and Reverse Brake (B_3)	6 / 6
	O/D Brake (B_0)	3 / 2
B_1 Band Width	mm (in.)	40 (1.57)
ATF Type		ATF DEXRON® II
Capacity (US qts, Imp.qts)	Total	7.2 (7.6, 6.3)
	Drain and Refill	1.6 (1.7, 1.4)

OPERATION

AT02T-0E

1. OPERATING CONDITIONS



AT2157

○ ..... Operating

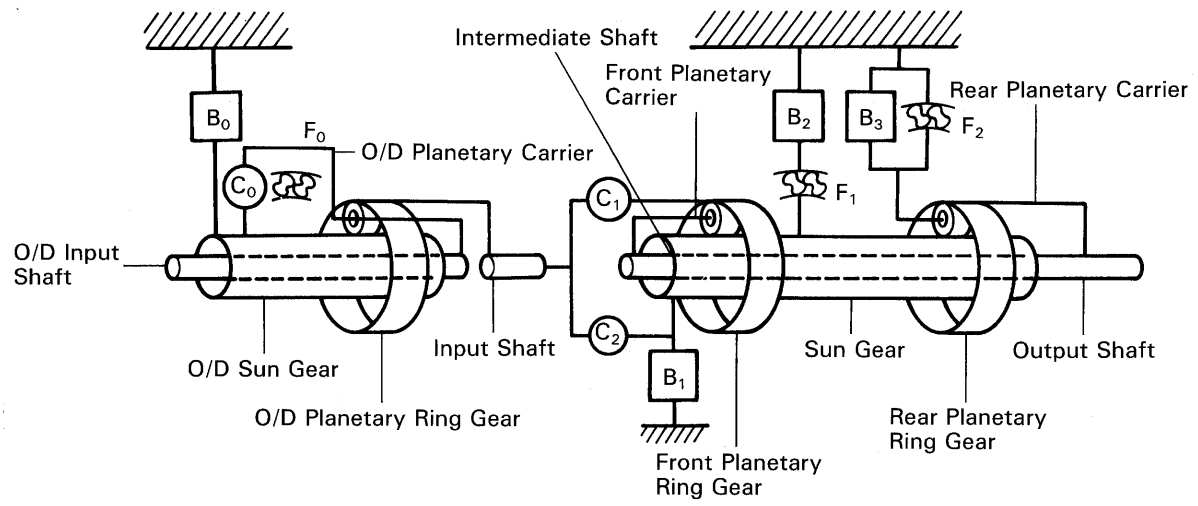
Shift lever position	Gear position	C_0	C_1	C_2	B_0	B_1	B_2	B_3	F_0	F_1	F_2
P	Parking	○									
R	Reverse	○		○				○	○		
N	Neutral	○									
D	1st	○	○						○		○
	2nd	○	○				○		○	○	
	3rd	○	○	○			○		○		
	O/D		○	○	○		○				
2	1st	○	○						○		○
	2nd	○	○			○	○		○	○	
	3rd	○	○	○			○		○		
L	1st	○	○					○	○		○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

* Down-shift only in the L position and 2nd gear — no up-shift.

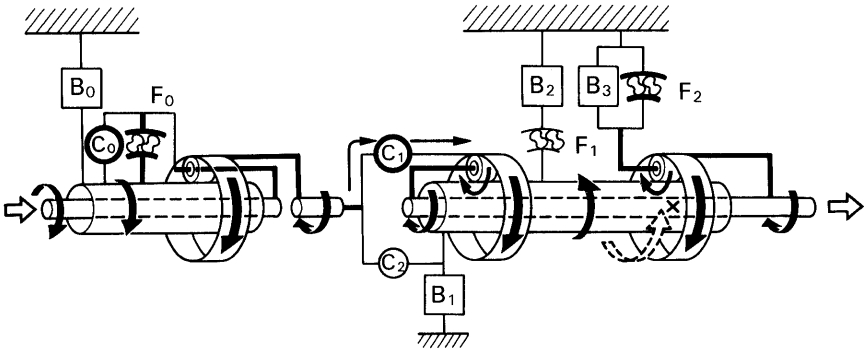
V03089

2. FUNCTION OF COMPONENTS

NOMENCLATURE	OPERATION
O/D Direct Clutch (C_0)	Connects overdrive sun gear and overdrive carrier
O/D Brake (B_0)	Prevents overdrive sun gear from turning either clockwise or counterclockwise
O/D One-Way Clutch (F_0)	When transmission is being driven by engine, connects overdrive sun gear and overdrive carrier
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

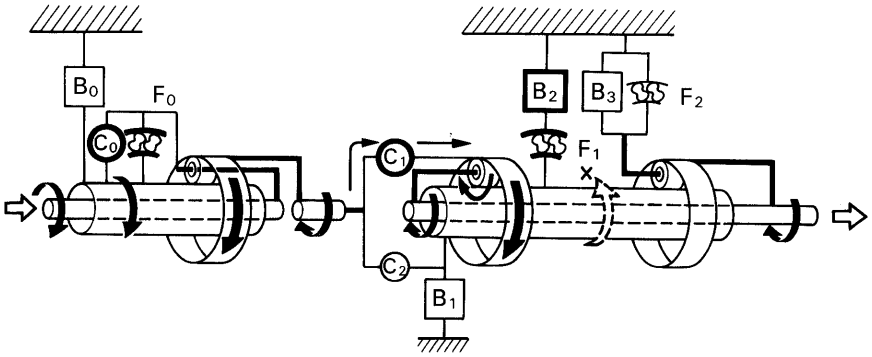


D or 2 Position 1st Gear



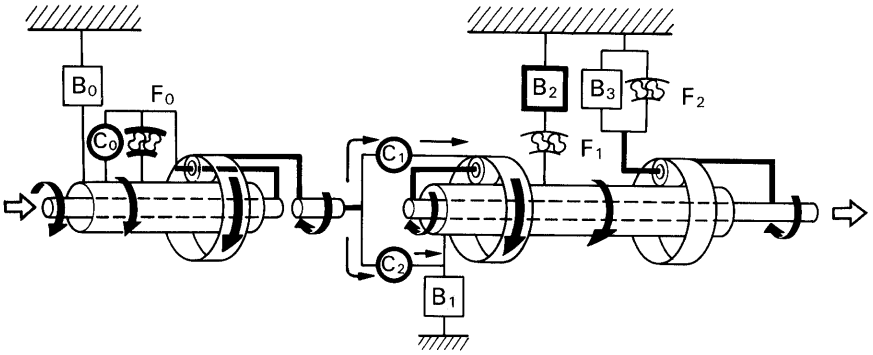
AT6675

D Position 2nd Gear



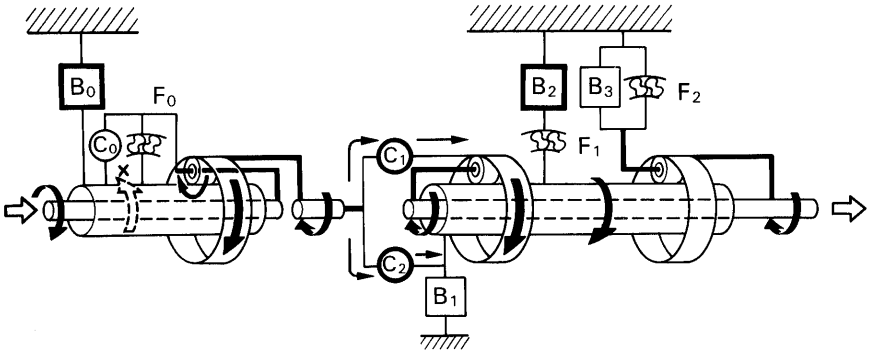
AT6676

D or 2 Position 3rd Gear



AT6677

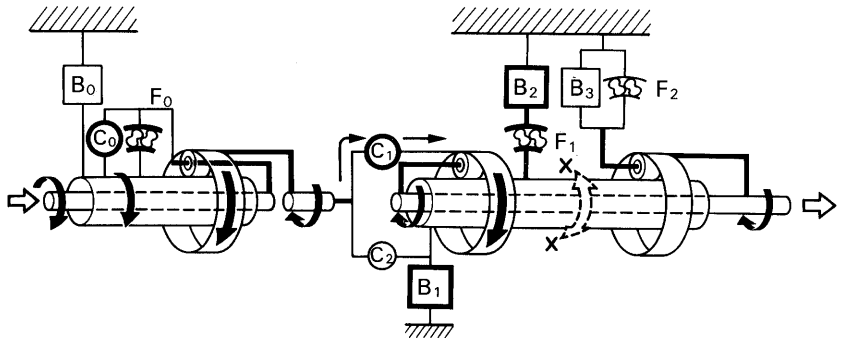
D Position O/D



AT6678

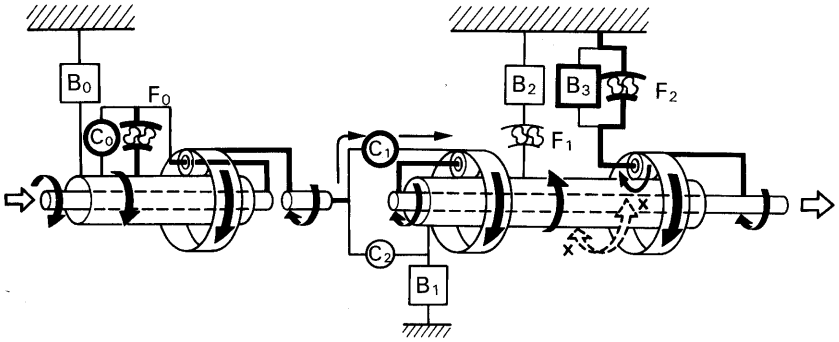
V02110

2 or L Position 2nd Gear



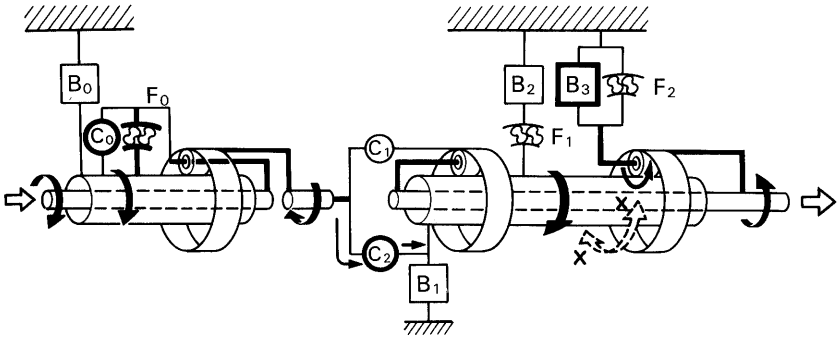
AT6679

L Position 1st Gear



AT6680

R Position Reverse Gear



AT6681

V02111

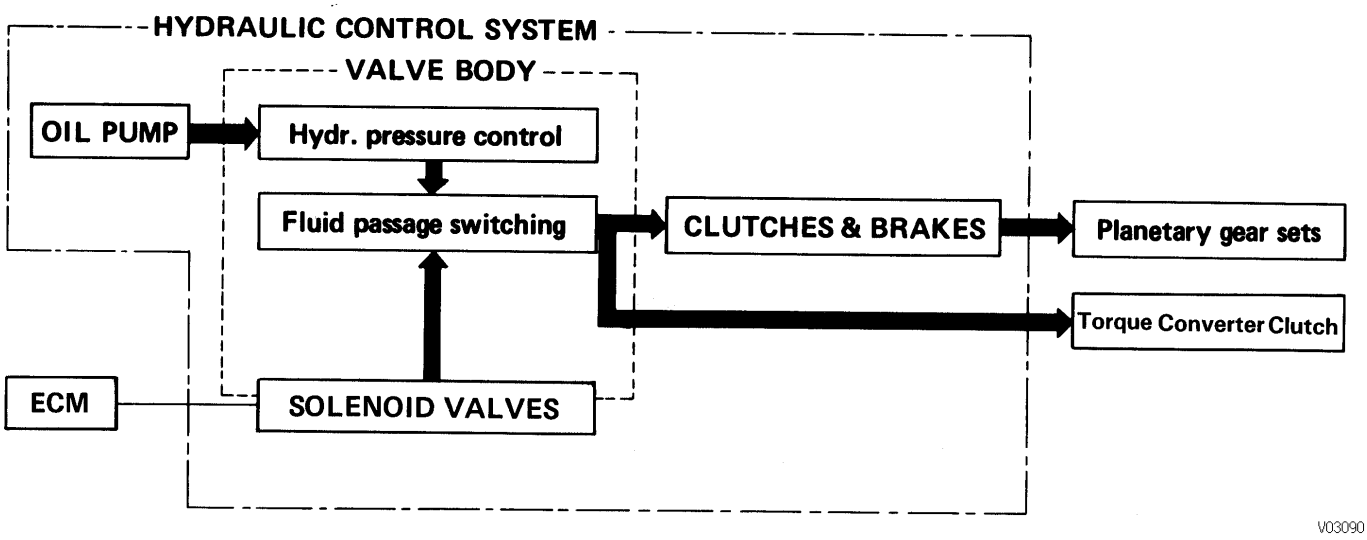
3. HYDRAULIC CONTROL SYSTEM

The hydraulic control system is composed of the oil pump, the valve body, the solenoid valves, and 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.

There are 3 solenoid valves on the valve body.

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

The lock-up solenoid valve is operated by signals from the ECM to engage or disengage the lock-up clutch of the torque converter clutch.



★ LINE PRESSURE

Line pressure is the most basic and important pressure used in the automatic transmission, because it is used to operate all of the clutches and brakes in the transmission.

If the primary regulator valve does not operate correctly, line pressure will be either too high or too low. Line pressure that is too high will lead to shifting shock and consequent engine power loss due to the greater effort required of the oil pump; line pressure that is too low will cause slippage of clutches and brakes, which will, in extreme cases, prevent the vehicle from moving. Therefore, if either of these problems are noted, the line pressure should be measured to see if it is within specification.

★ THROTTLE PRESSURE

Throttle pressure is always kept in accordance with the opening angle of the engine throttle valve. This throttle pressure acts on the primary regulator valve and, the line pressure is regulated according to the throttle valve opening.

In the hydraulically controlled automatic transmission, throttle pressure is used for regulating line pressure and as signal pressure for up-shift and down-shift of the transmission. In the electronically controlled transmission, however, throttle pressure is used only for regulating line pressure. Consequently, improper adjustment of the transmission throttle cable may result in a line pressure that is too high or too low. This, in turn, will lead to shifting shock or clutch and brake slippage.

4. ELECTRONIC CONTROL SYSTEM

The electronic control system, which controls the shift points and the operation of the lock-up clutch, is composed of the following 3 parts:

1. Sensors

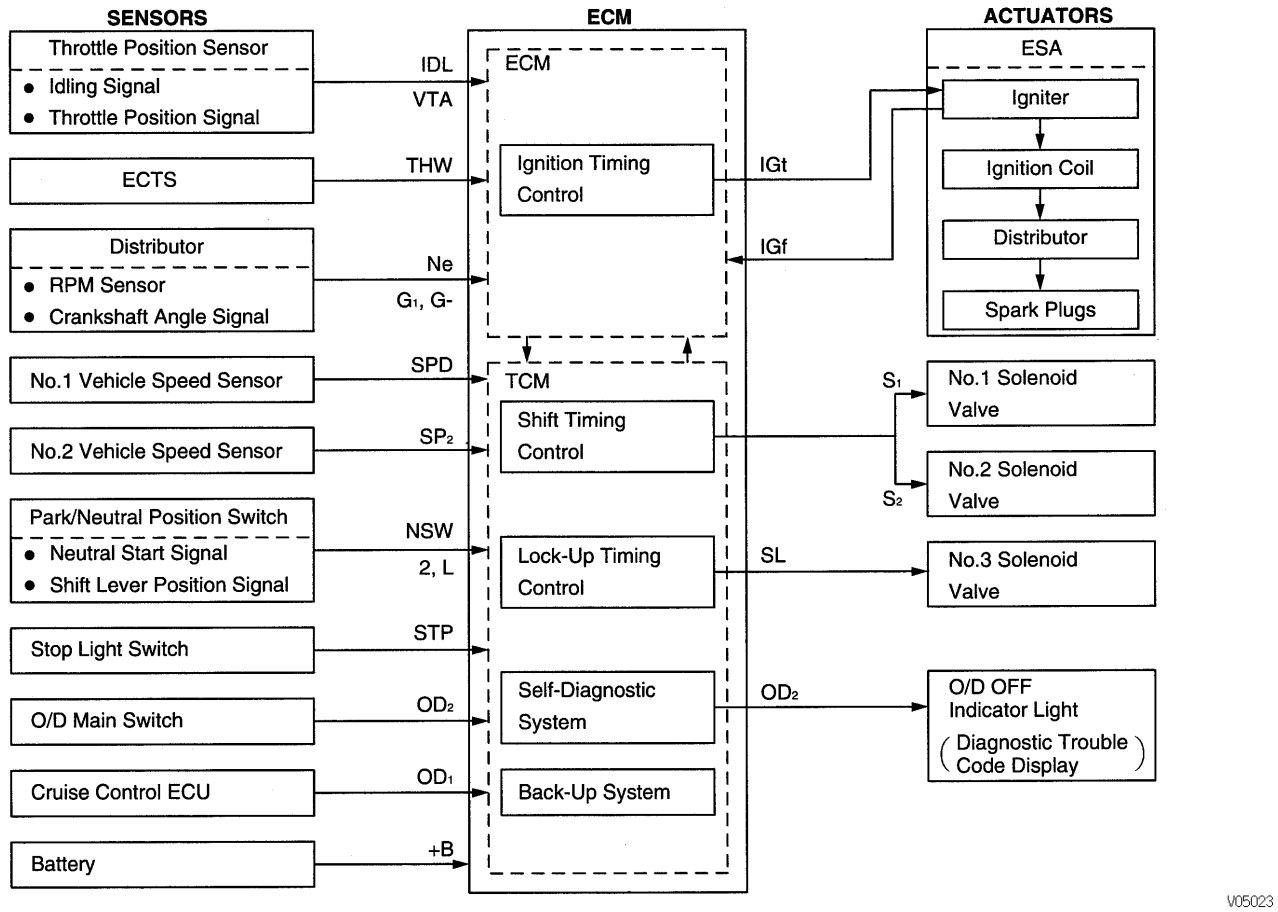
These sensors sense the vehicle speed, throttle opening and other conditions and send these data to the ECM in the form of electrical signals.

2. ECM

The ECM determines the shift and lock-up timing based upon the signals from sensors, and controls the solenoid valves of the hydraulic control unit accordingly.

3. Actuators

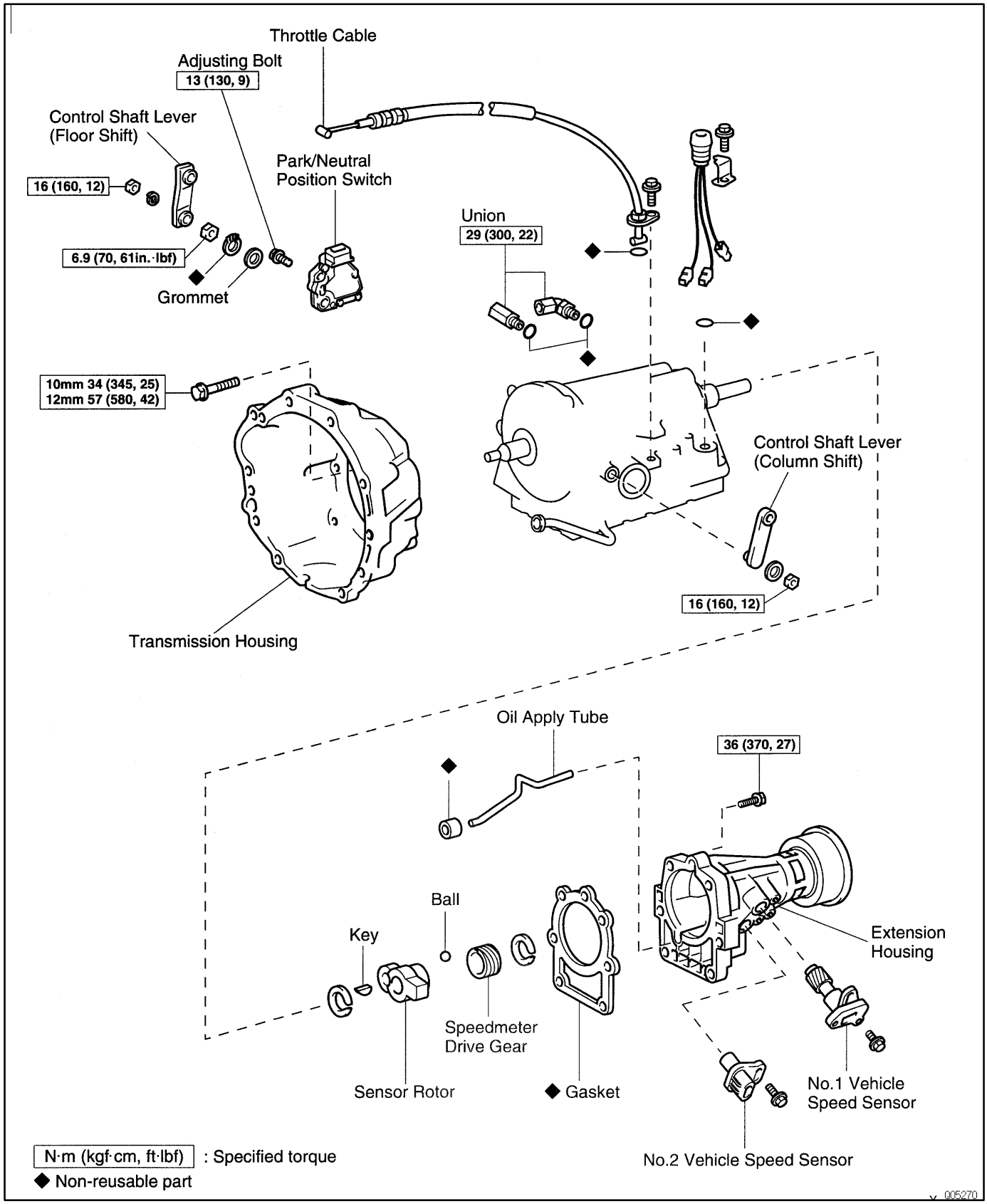
These are 3 solenoid valves that control hydraulic pressure acting on the hydraulic valves to control shifting and lock-up timing.

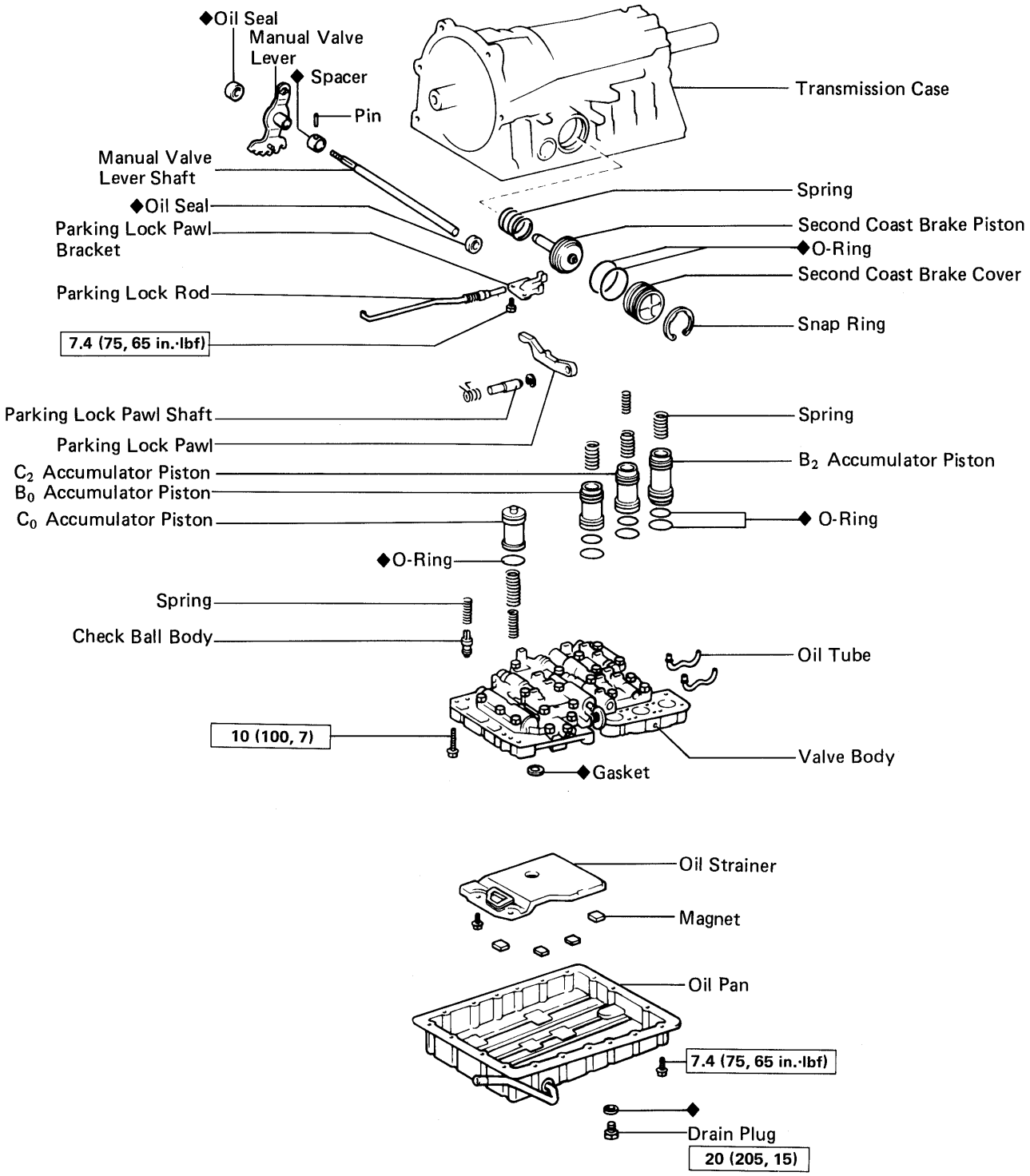


COMPONENT PARTS REMOVAL

AT0SF-01

COMPONENTS
(TRUCK, 4 RUNNER)

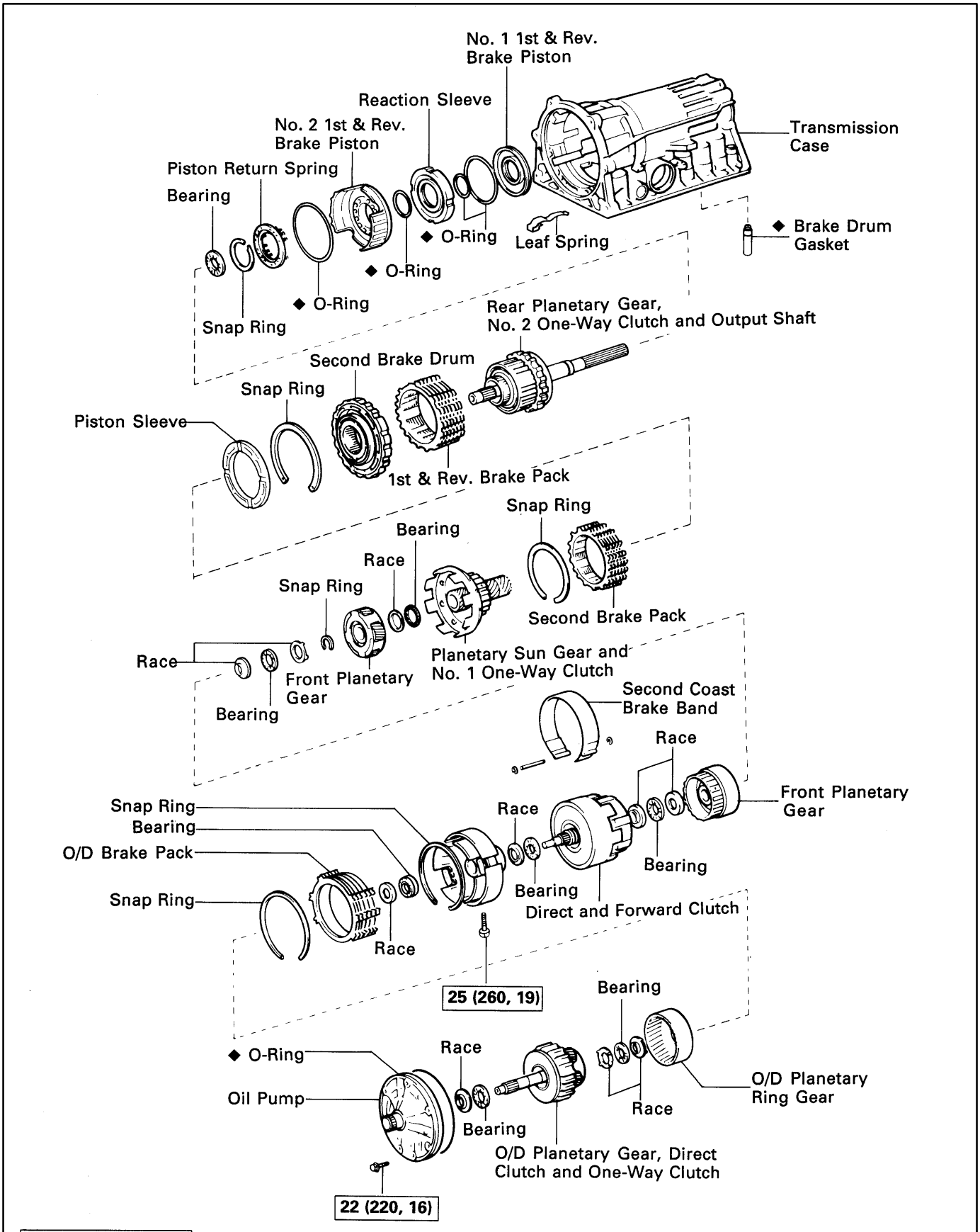




N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

Q00630

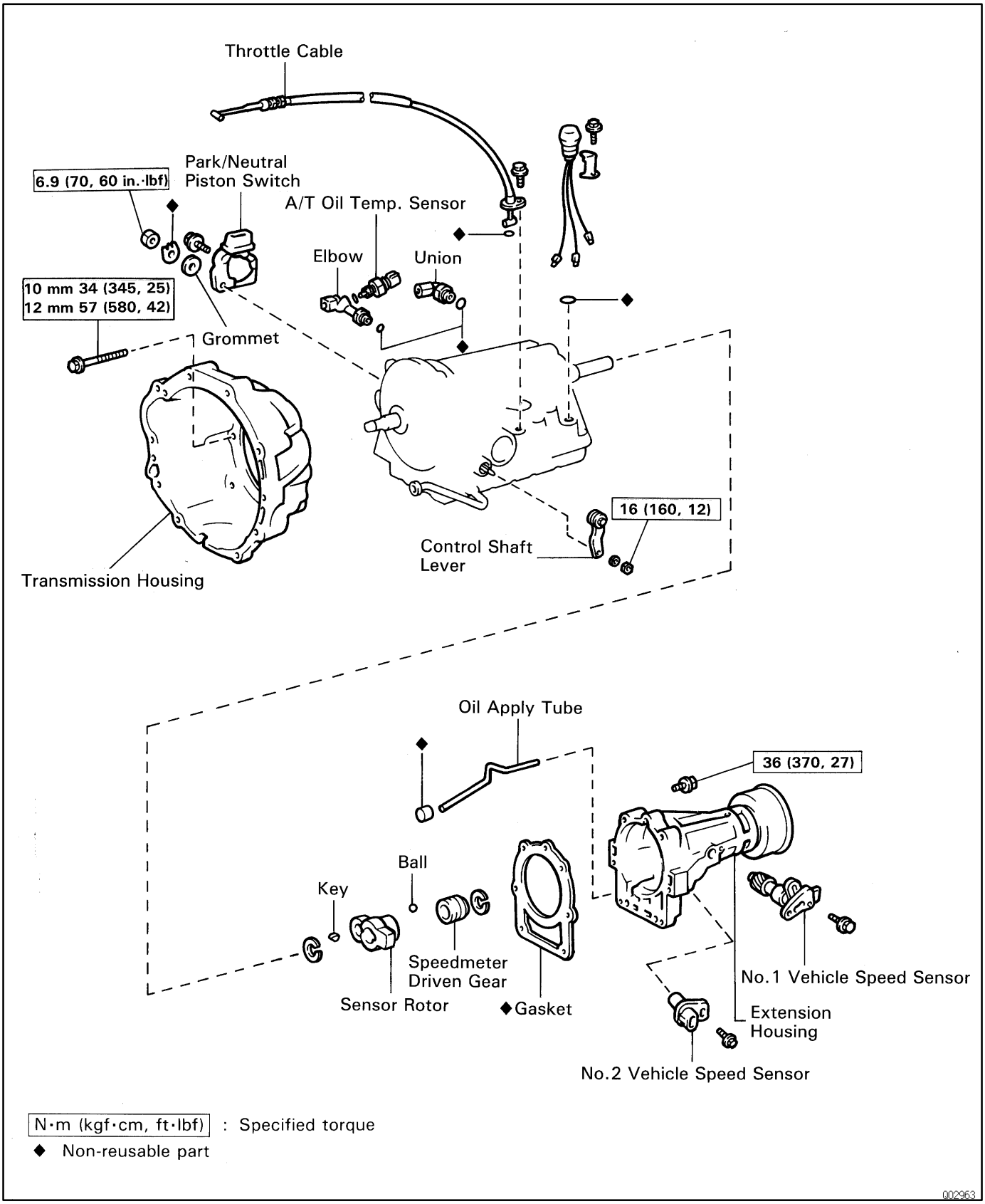


N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

AT5654

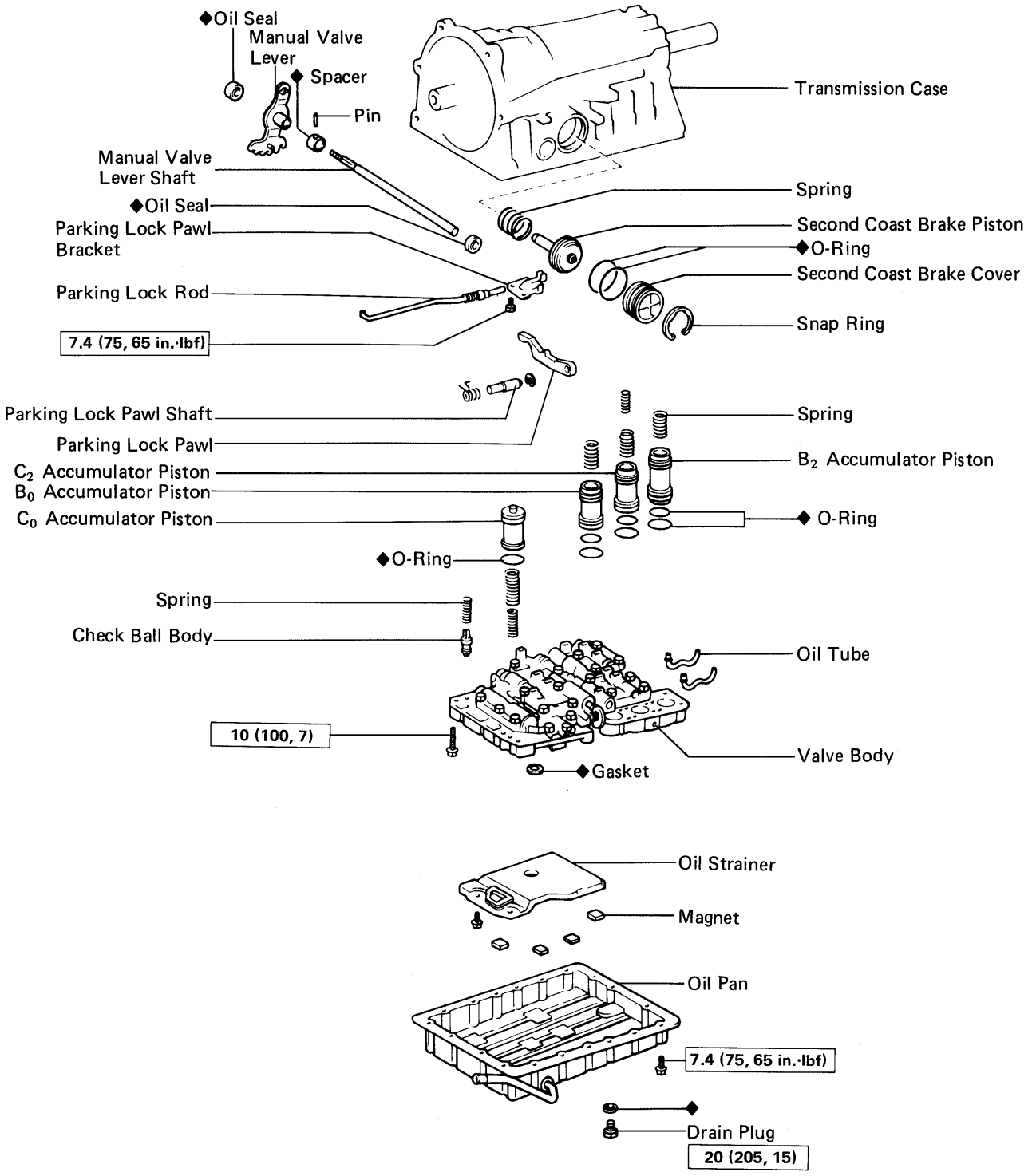
COMPONENTS
(T100)



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

◆ Non-reusable part

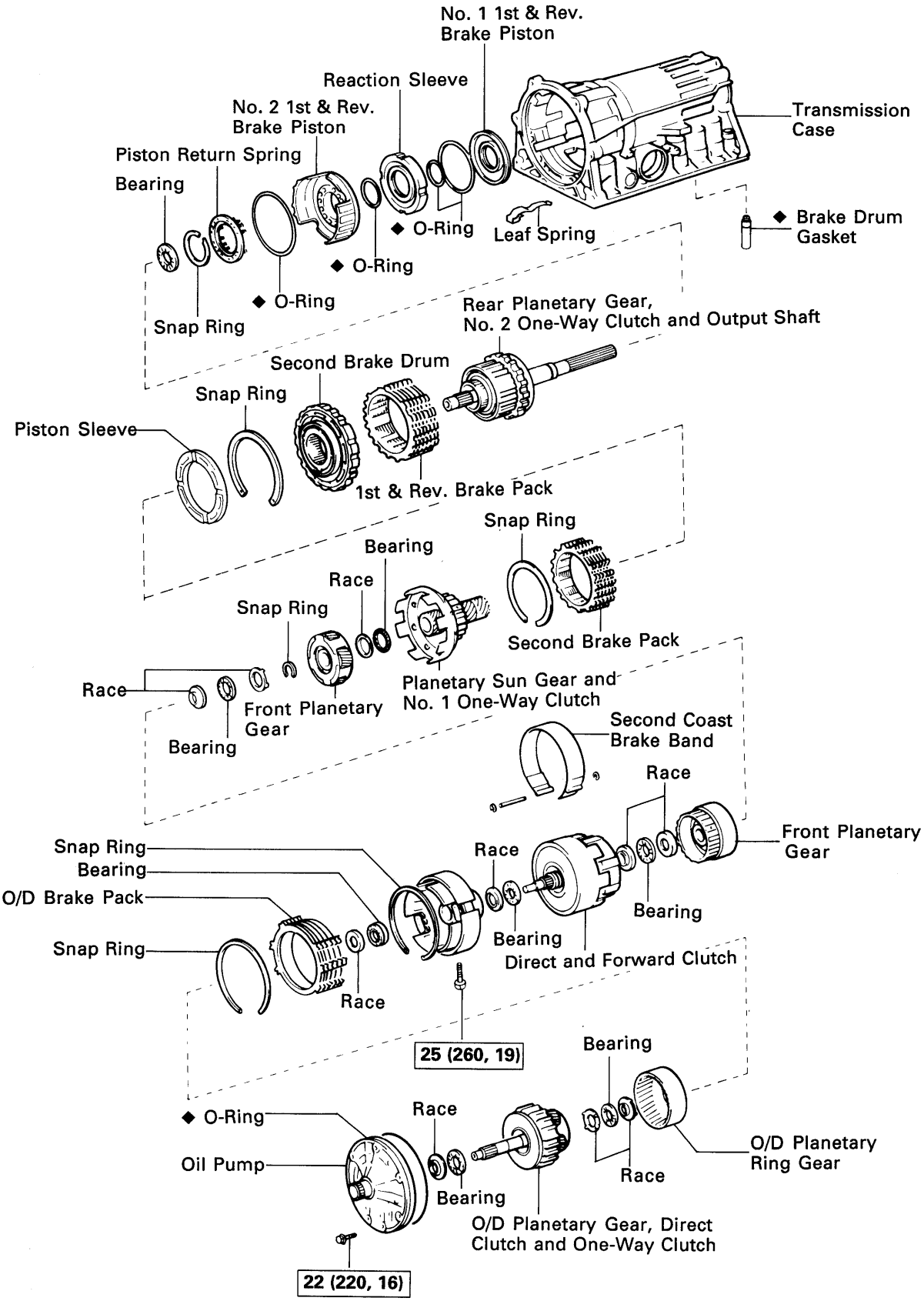
002963



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

◆ Non-reusable part

Q00630

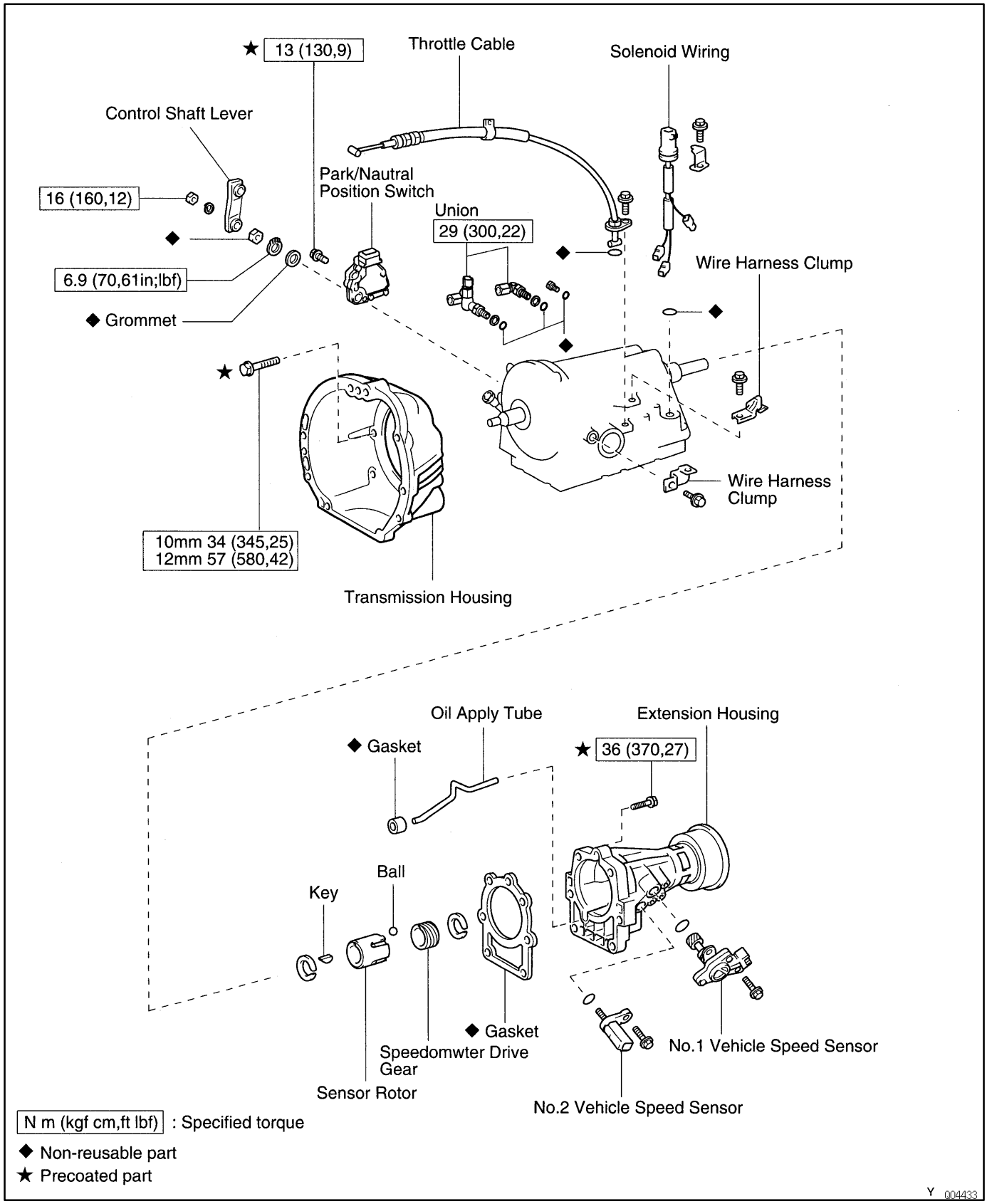


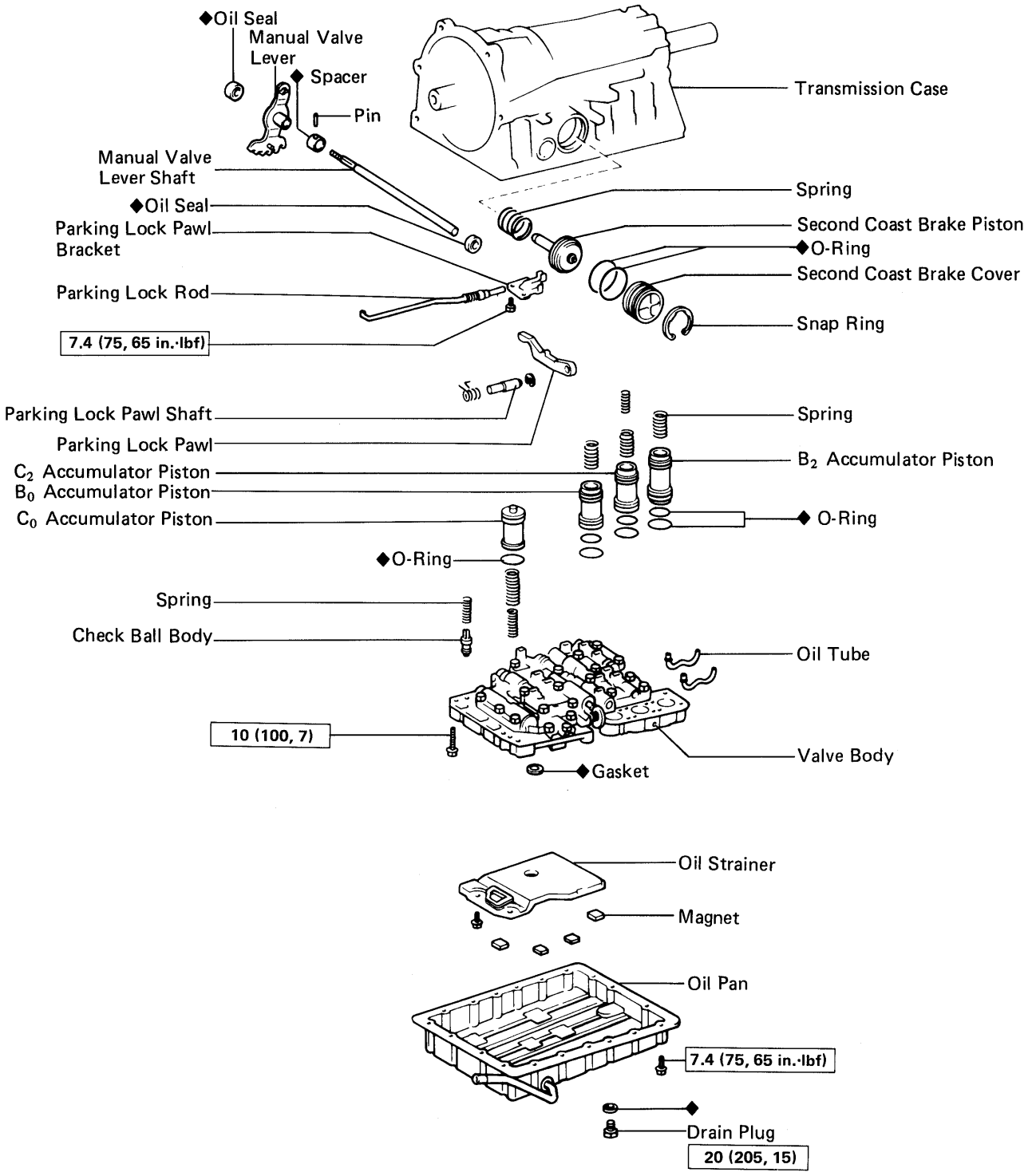
N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

AT5654

COMPONENTS (SUPRA)

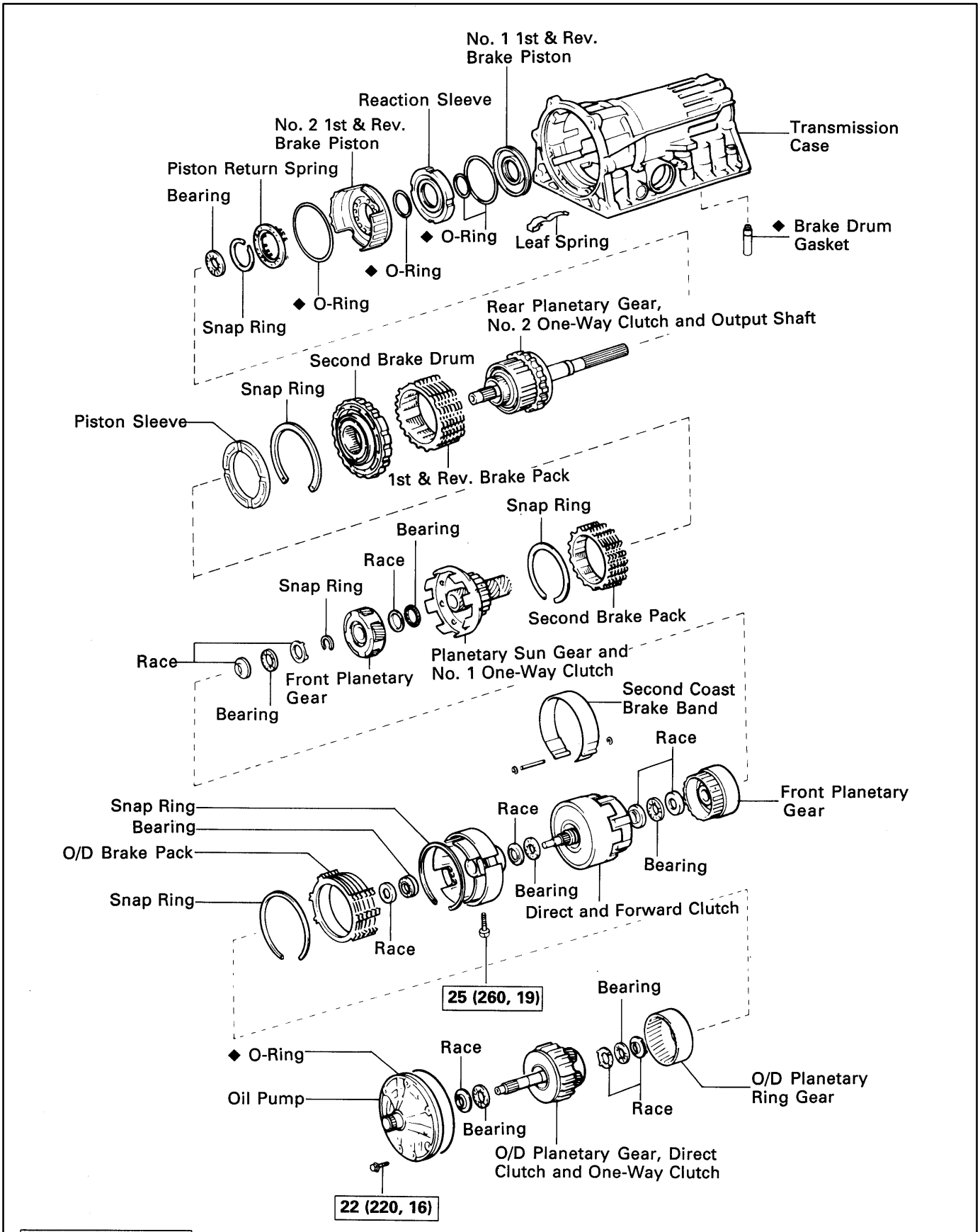




N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

Q00630

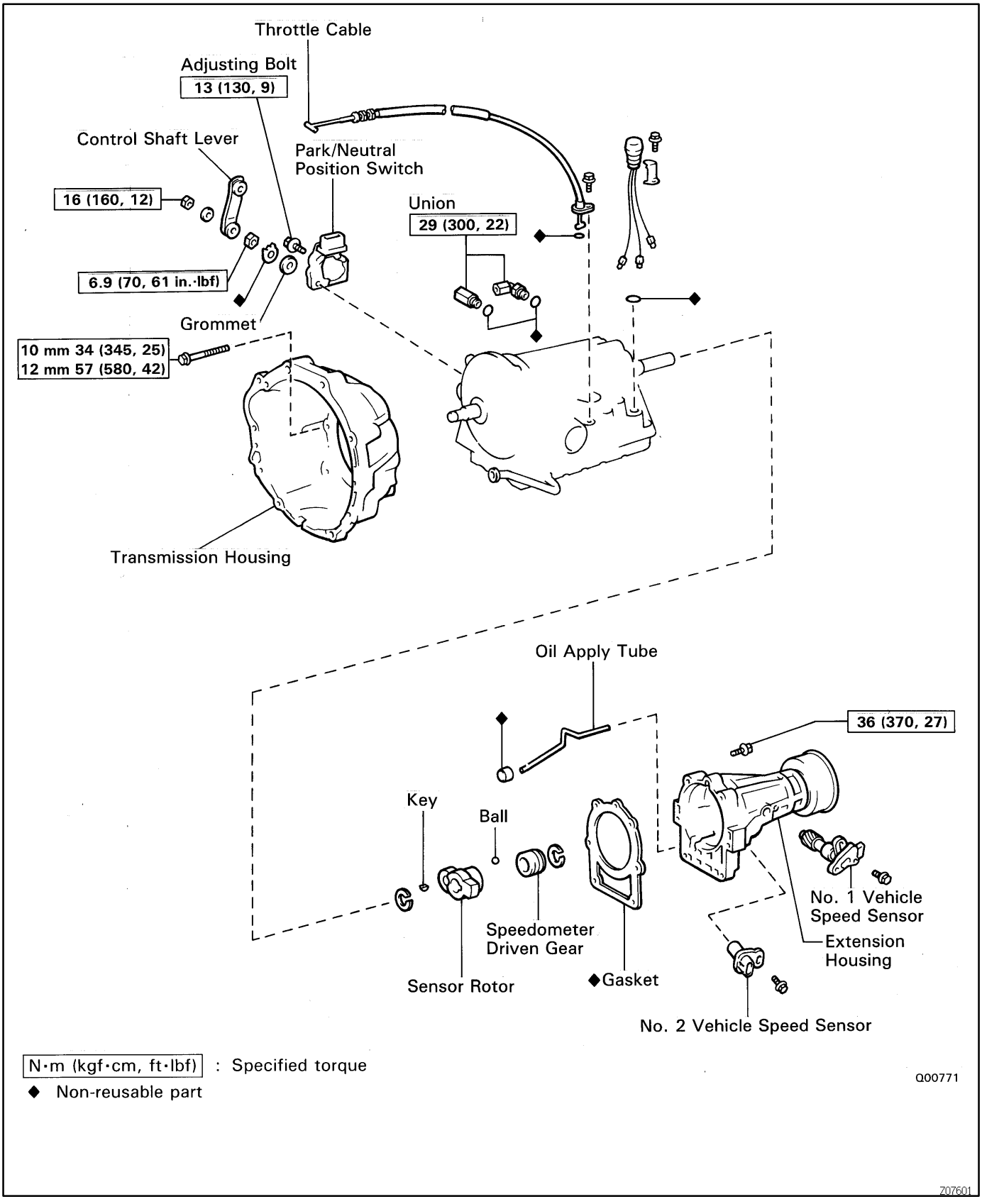


N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

AT5654

COMPONENTS
(PREVIA)

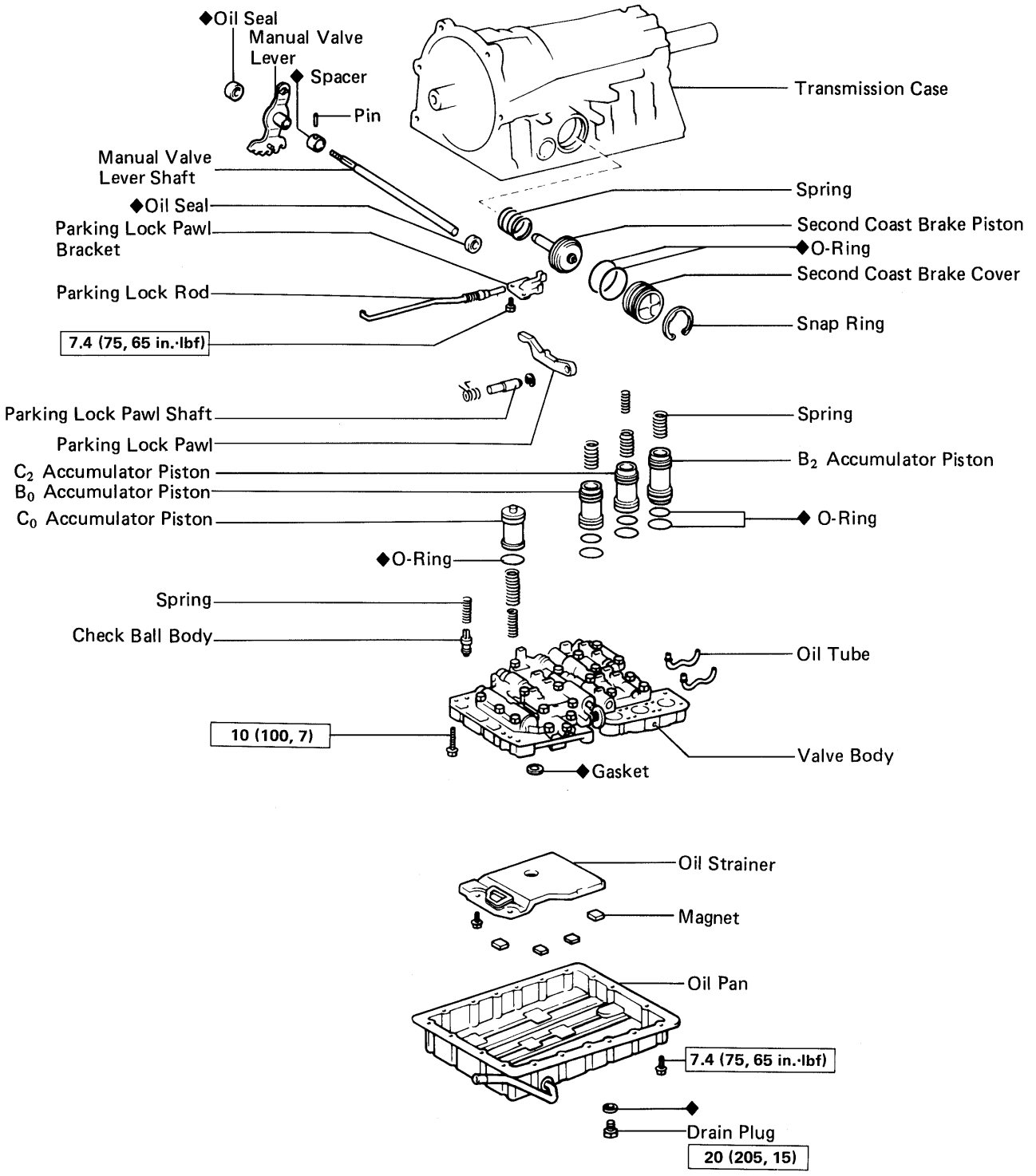


N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

Q00771

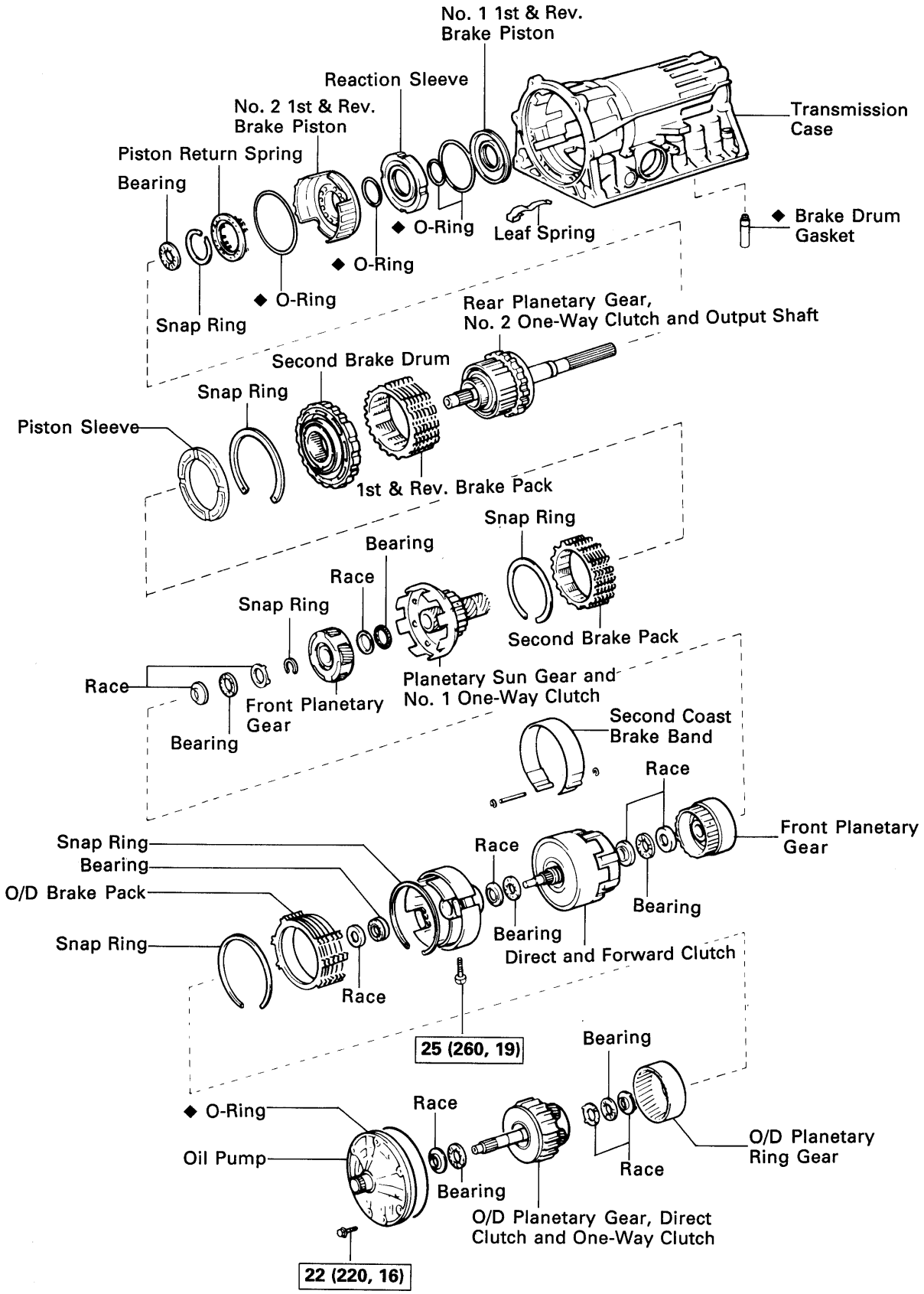
Z07601



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

◆ Non-reusable part

Q00630



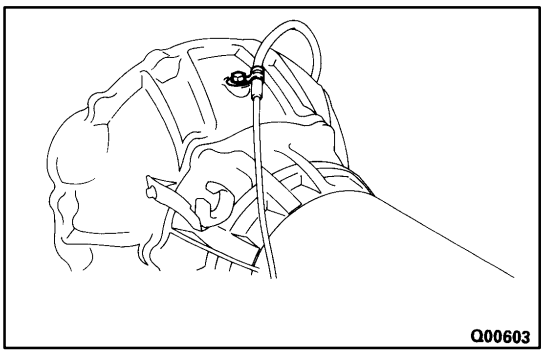
N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

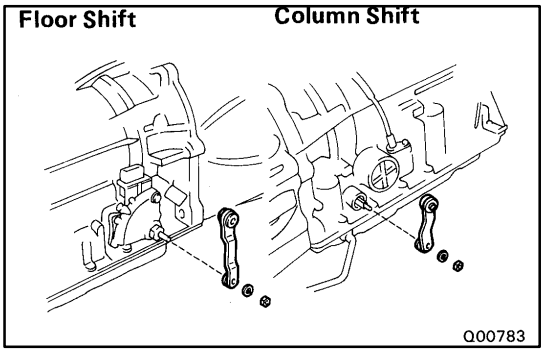
AT5654

AT0SG-01

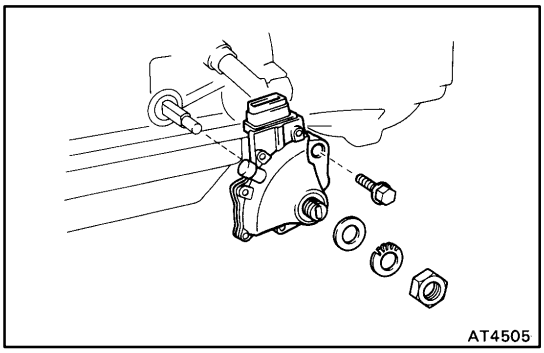
TRANSMISSION DISASSEMBLY



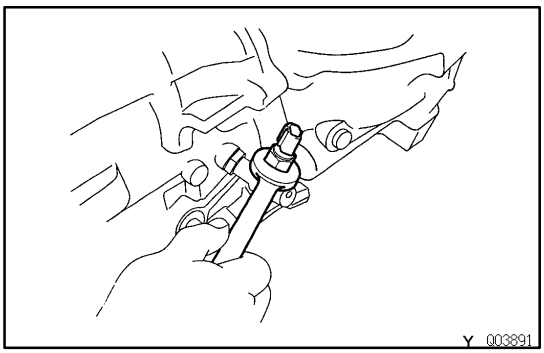
1. SUPRA, PREVIA:
REMOVE WIRE HARNESS CLAMP AND THROTTLE CABLE CLAMP



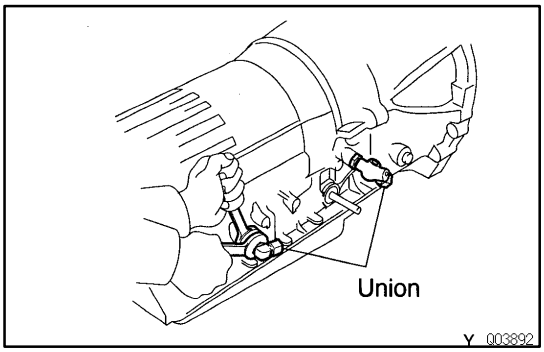
2. REMOVE TRANSMISSION CONTROL SHAFT LEVER



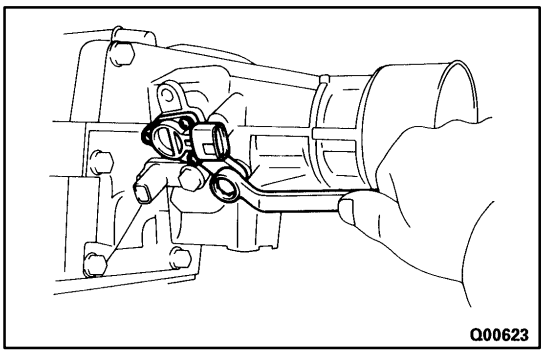
3. REMOVE PARK/NEUTRAL POSITION SWITCH
(a) Unstake the lock washer.
(b) Remove the nut and bolt, and then remove the park/neutral position switch.
(c) Remove the lock washer and grommet.



4. SUPRA, T100:
REMOVE A/T OIL TEMPERATURE SENSOR
(a) Remove the oil temperature sensor.
(b) Remove the O-ring from the sensor.

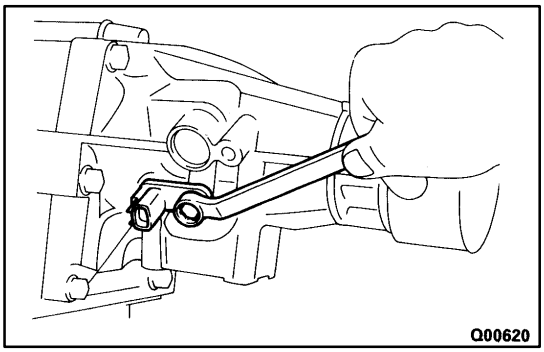


5. REMOVE UNIONS
(a) Remove the 2 unions.
(b) Remove the O-rings from both unions.



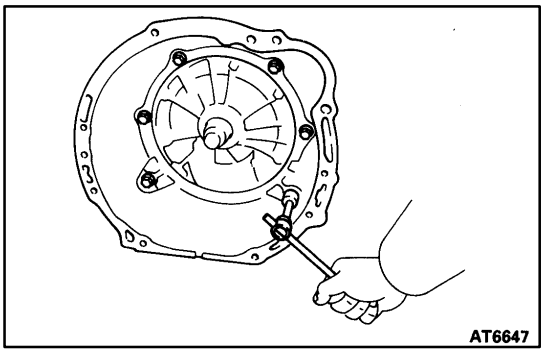
6. REMOVE NO.1 VEHICLE SPEED SENSOR

(a) Remove the No.1 vehicle speed sensor.
(b) Remove the O-ring from it.



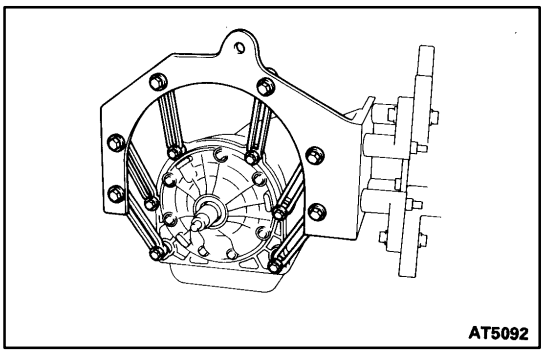
7. REMOVE NO.2 VEHICLE SPEED SENSOR

(a) Remove the No.2 vehicle speed sensor.
(b) Remove the O-ring from it.



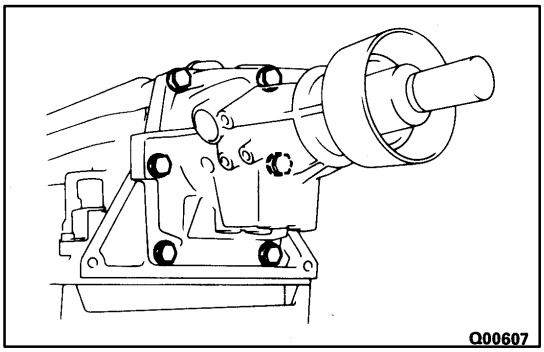
8. REMOVE TRANSMISSION HOUSING

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



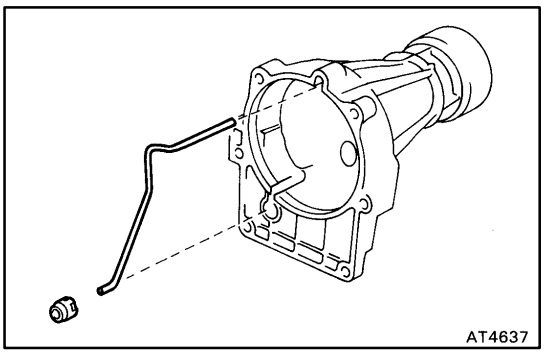
9. INSTALL TRANSMISSION CASE

Install the transmission case on the overhaul attachment.

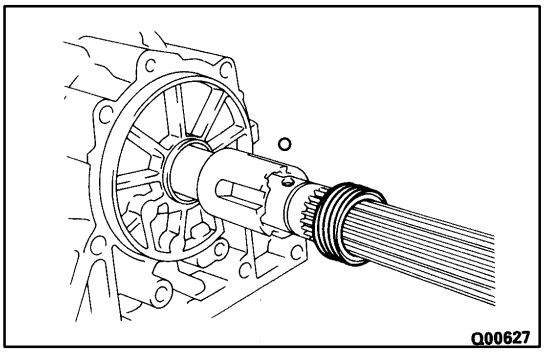


10. REMOVE EXTENSION HOUSING

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

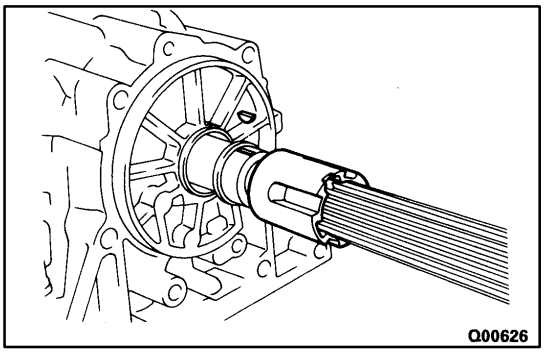


(c) Remove the oil apply tube and gasket from the extension housing.



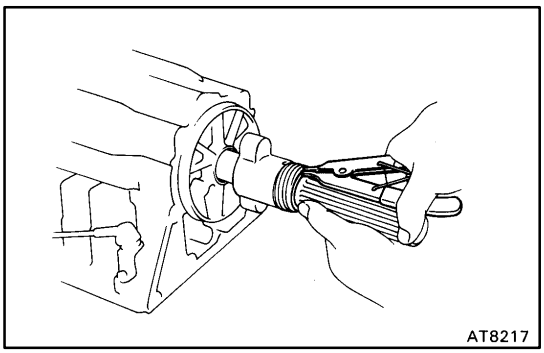
11. SUPRA:
REMOVE SPEEDOMETER DRIVE GEAR AND BALL

(a) Using snap ring pliers, remove the snap ring.
(b) Remove the speedometer drive gear and ball.



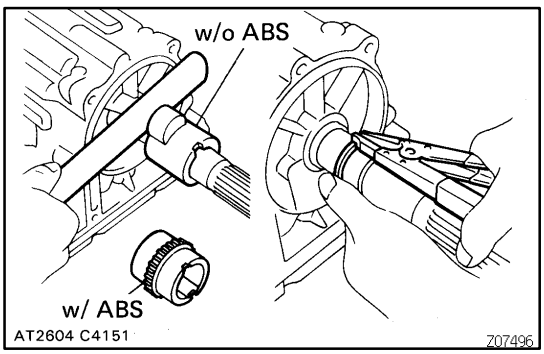
12. SUPRA:
REMOVE SENSOR ROTOR AND KEY

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



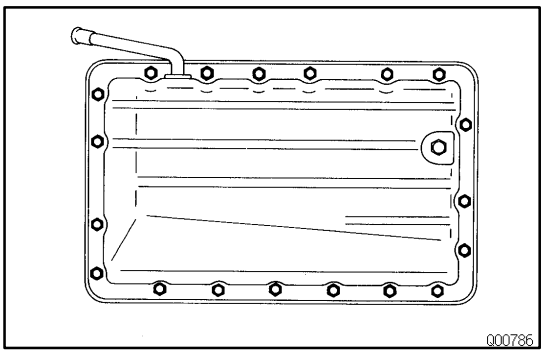
13. OTHERS:
REMOVE SPEEDOMETER DRIVE GEAR AND BALL

(a) Using snap ring pliers, remove the snap ring.
(b) Remove the speedometer drive gear and ball.



14. OTHERS:
REMOVE SENSOR ROTOR AND KEY

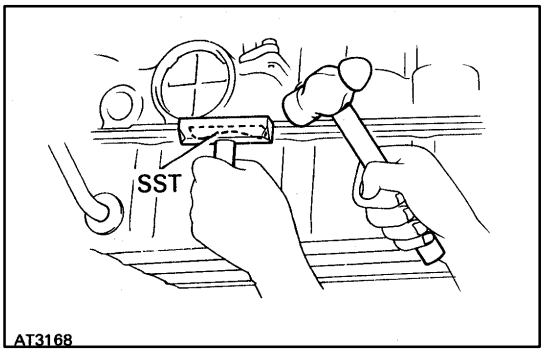
(a) Remove the sensor rotor and key.
(b) Using snap ring pliers, remove the snap ring.



15. REMOVE OIL PAN

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

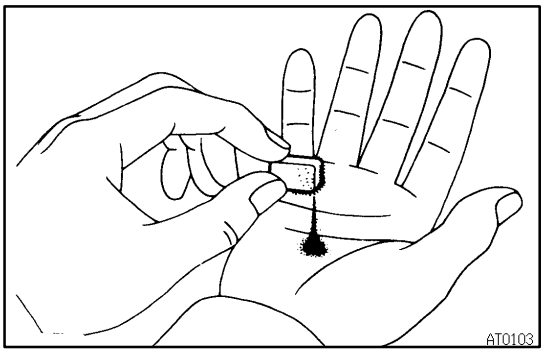
(a) Remove the 19 bolts.



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

NOTICE: Be careful not to damage the oil pan flange.

(c) Remove the pan by lifting the transmission case.

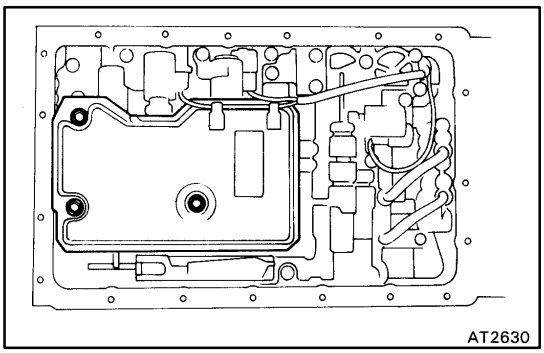


16. EXAMINE PARTICLES IN PAN

Remove the magnets and use them to collect steel particles.

Carefully look at the foreign matter and particles in the pan and on the magnets to anticipate the type of wear you will find in the transmission.

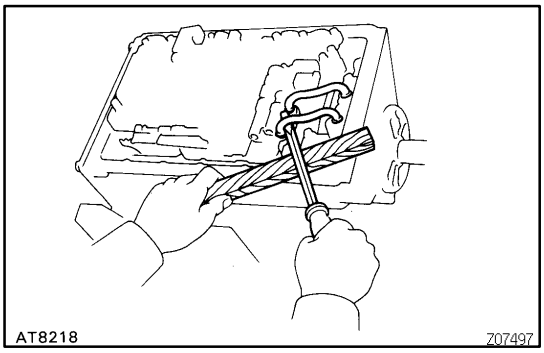
Steel (magnetic) ... bearing, gear and clutch plate wear
Brass (non-magnetic) ... bushing wear



17. REMOVE OIL STRAINER AND GASKETS

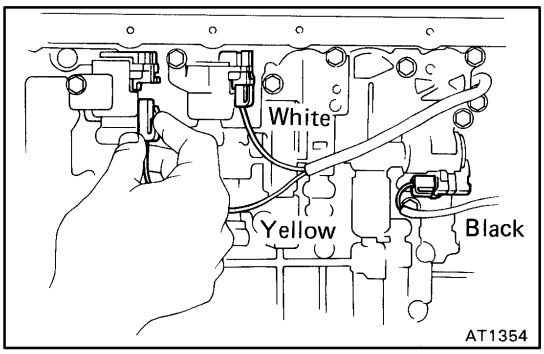
(a) Remove the 3 bolts holding the oil strainer to the valve body.

(b) Remove the oil strainer and 2 gaskets.



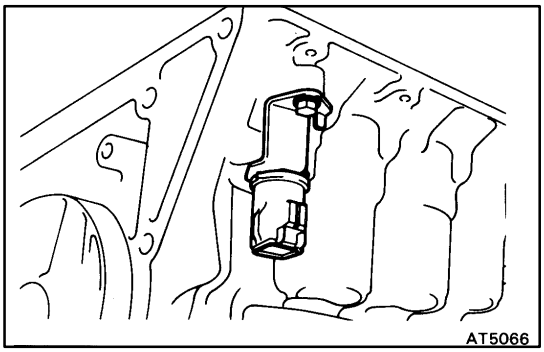
18. REMOVE OIL TUBES

Pry up both tube ends with a large screwdriver and remove the 2 oil tubes.

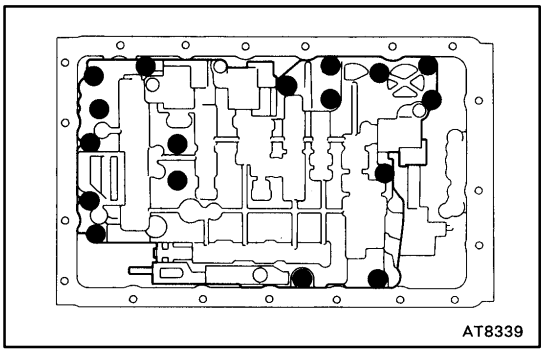


19. REMOVE SOLENOID WIRING

(a) Disconnect the 3 connectors from No.1, No.2 and lock-up solenoids.

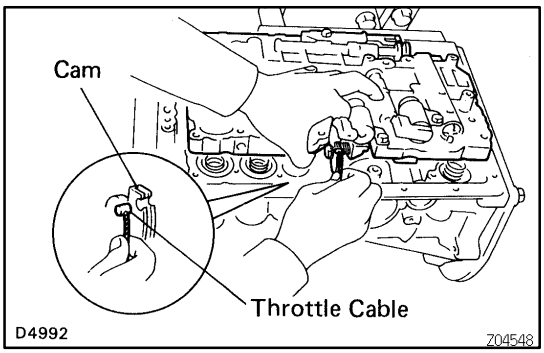


(b) Remove the bolt and stopper plate from the case.
(c) Pull out the solenoid wiring form the transmission case.
(d) Remove the O-rings from the grommet.

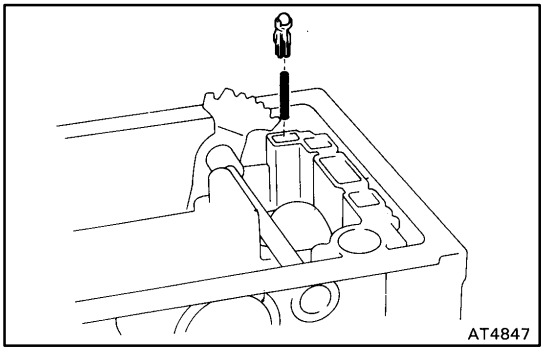


20. REMOVE VALVE BODY

(a) Remove the 17 bolts.

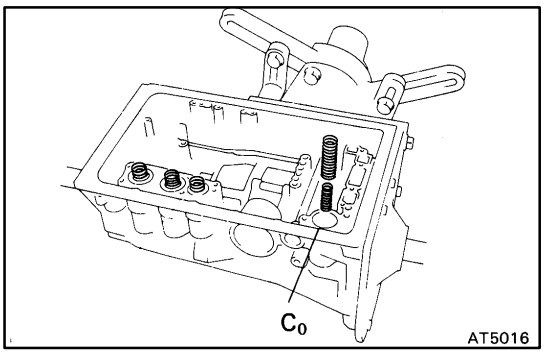


(b) Disconnect the throttle cable from the cam and remove the valve body.

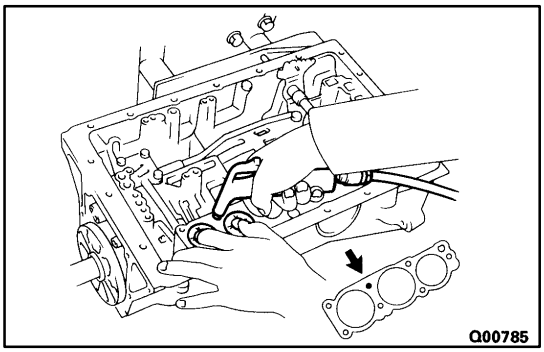


21. REMOVE CHECK BALL BODY, ACCUMULATOR SPRINGS AND PISTONS

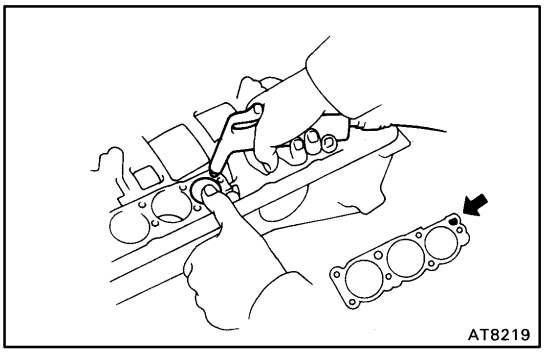
(a) Remove the check ball body and spring.



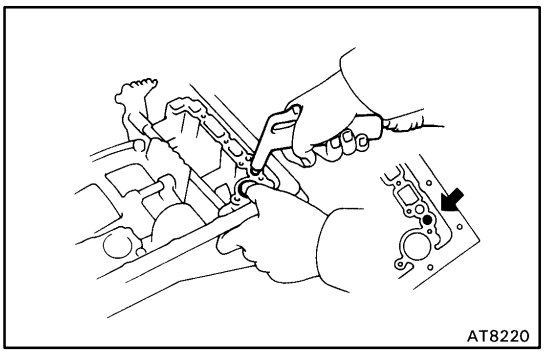
(b) Remove the 2 springs from C_0 accumulator piston.



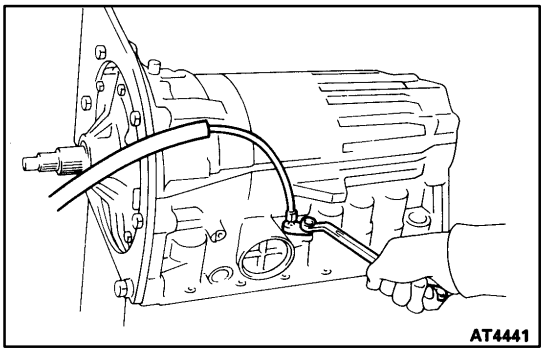
(c) Applying compressed air to the oil hole, remove the B_2 and C_2 accumulator pistons and springs.



(d) Applying compressed air to the oil hole, remove the B_0 accumulator piston and spring.

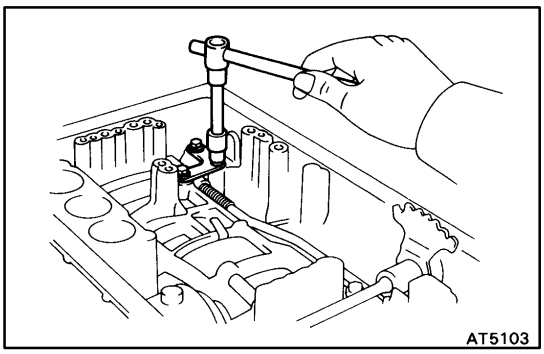


(e) Applying compressed air to the oil hole, remove the C_0 accumulator piston.
(f) Remove the O-ring from each piston.



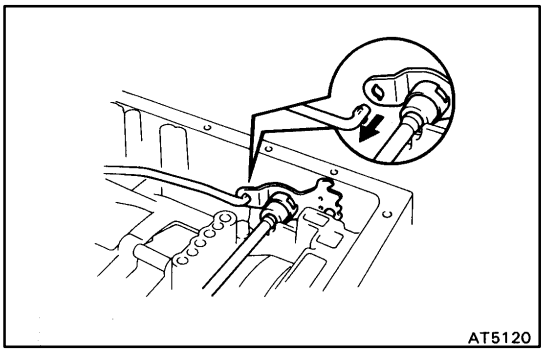
22. REMOVE THROTTLE CABLE

(a) Remove the retaining bolt and pull out the throttle cable.
(b) Remove the O-ring from the cable.

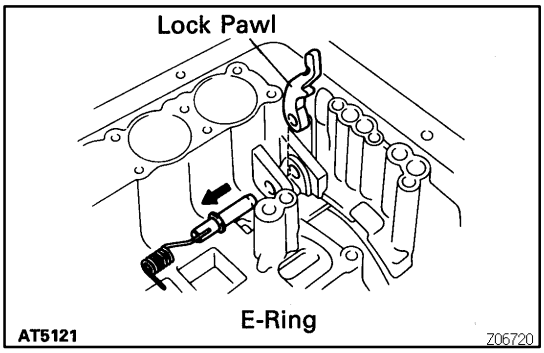


23. REMOVE PARKING LOCK ROD AND PAWL

(a) Remove the parking lock pawl bracket.

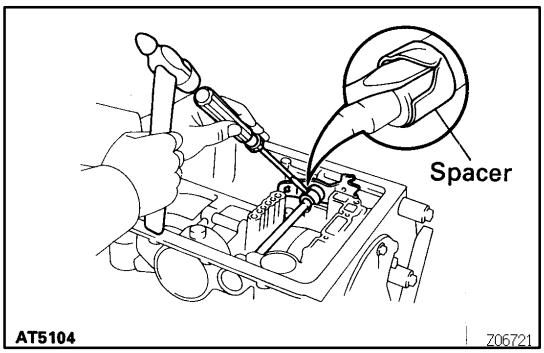


(b) Disconnect the parking lock rod from the manual valve lever.



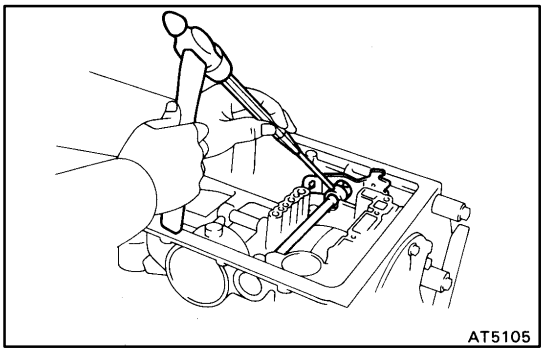
(d) Pull the parking lock pawl shaft out from the front side, then remove the lock pawl and spring.

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



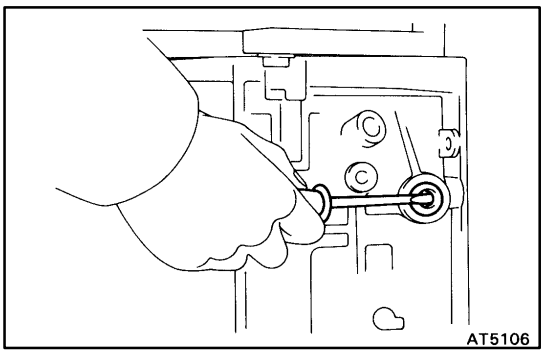
24. REMOVE MANUAL VALVE LEVER SHAFT AND OIL SEALS

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

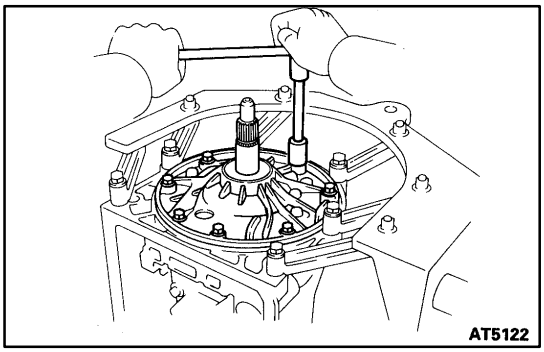


(b) Using a pin punch, drive out the pin.

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



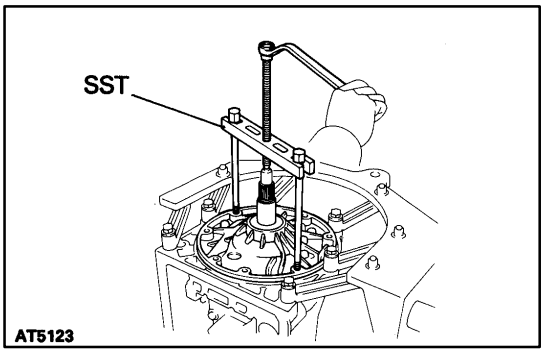
(d) Using a screwdriver, remove the 2 oil seals.



25. REMOVE OIL PUMP

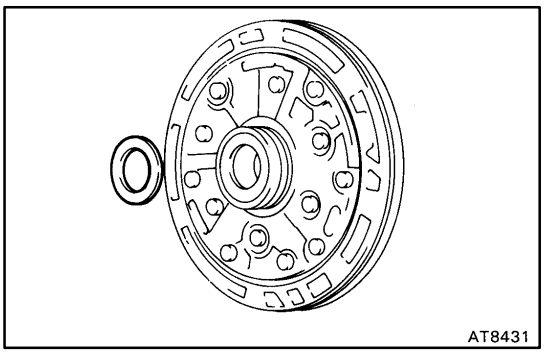
(a) Stand up the transmission.

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

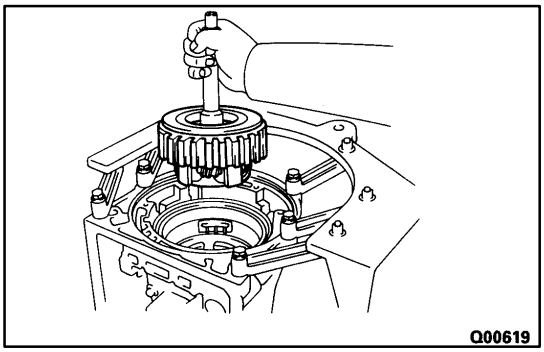


(c) Using SST, remove the oil pump.
SST 09610-20012

(d) Remove the O-ring from it.

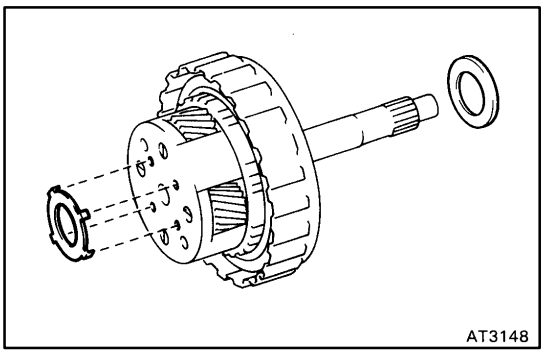


(e) Remove the race from the oil pump.

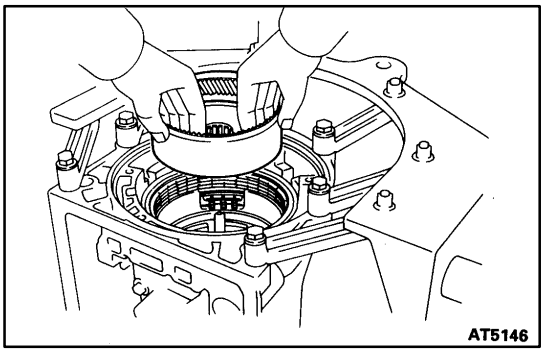


26. REMOVE OVERDRIVE PLANETARY GEAR WITH OVERDRIVE DIRECT CLUTCH AND ONE-WAY CLUTCH

(a) Remove the overdrive planetary gear with the overdrive direct clutch and overdrive one-way clutch from the transmission case.

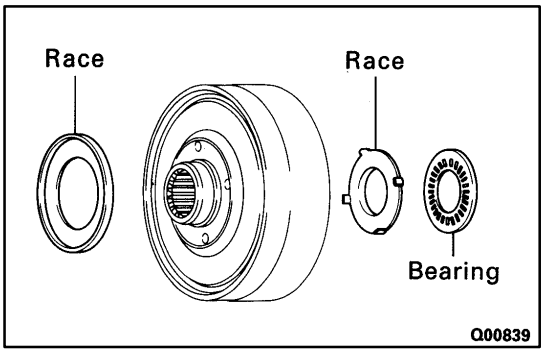


(b) Remove the race and assembled bearing and race.

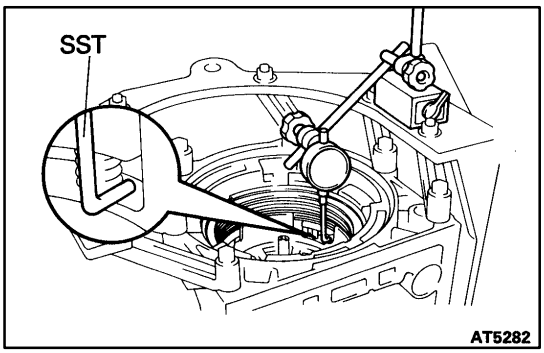


27. REMOVE OVERDRIVE PLANETARY RING GEAR

(a) Remove the overdrive planetary ring gear from the transmission case.

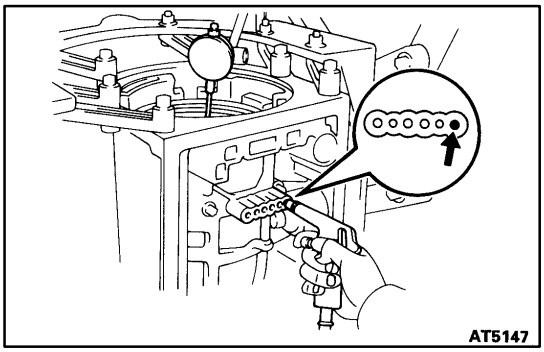


(b) Remove the bearing and 2 races from the planetary ring gear.

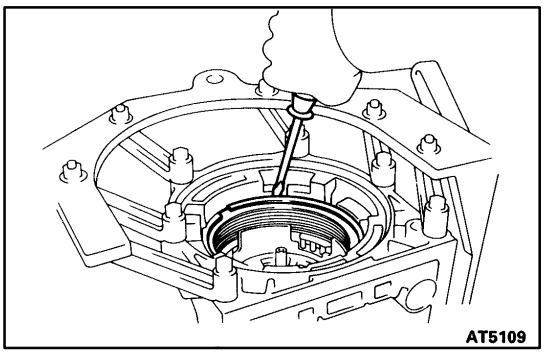


28. CHECK PISTON STROKE OF OVERDRIVE BRAKE

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

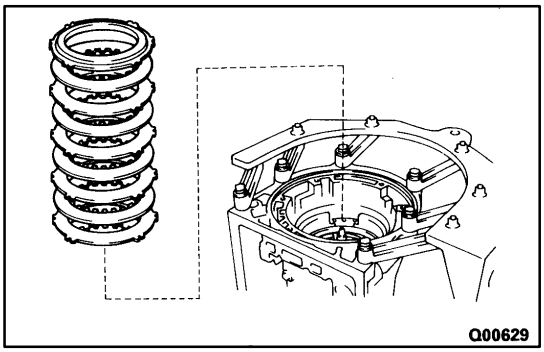


(b) Measure the stroke while applying and releasing compressed air (392-785 kPa, 4-8 kgf/cm^2, 57-114 psi).
Piston stroke:
PREVIA:
1.32-1.62 mm (0.0520-0.0638 in.)
OTHERS:
1.40-1.70 mm (0.0551-0.0669 in.)
If the values are non-standard, inspect the disc.

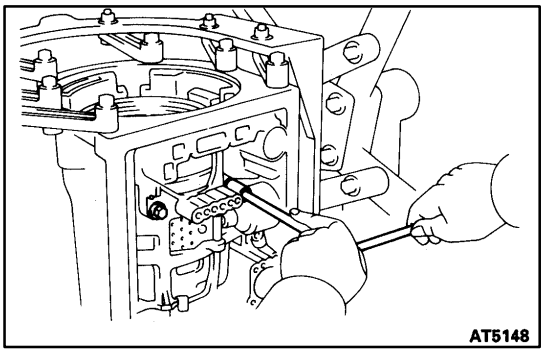


29. REMOVE FLANGES, PLATES AND DISCS OF OVER-DRIVE BRAKE

(a) Remove the snap ring.

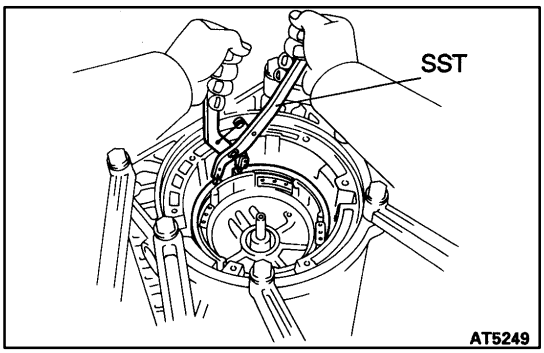


(b) Remove the flanges, plates and discs as a set.

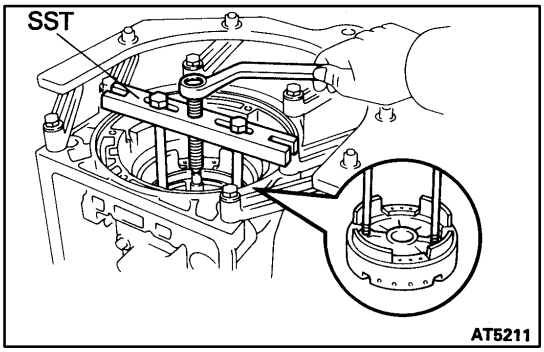


30. REMOVE OVERDRIVE SUPPORT ASSEMBLY

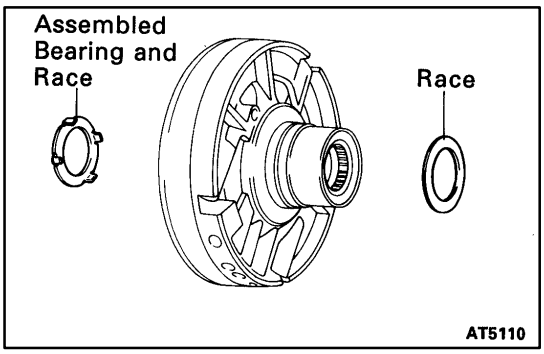
(a) Remove the 2 bolts holding the overdrive support assembly to the case.



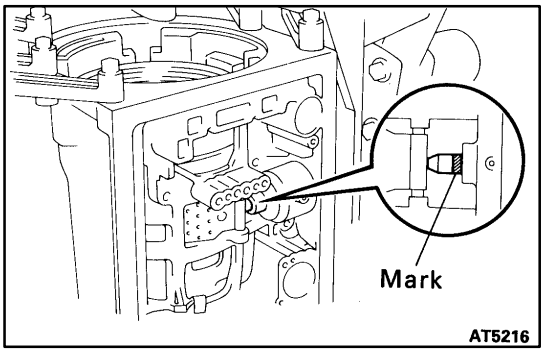
(b) Using SST, remove the snap ring.
SST 09350-30020 (09350-07060)



(c) Using SST, remove the overdrive support assembly.
SST 09350-30020 (09350-07020)

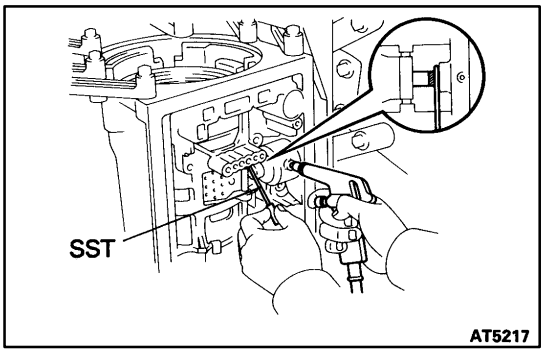


(d) Remove the assembled bearing and race from the overdrive support.

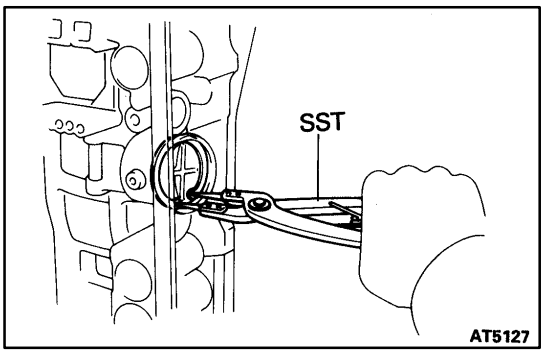


31. CHECK PISTON ROD STROKE OF SECOND COAST BRAKE

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

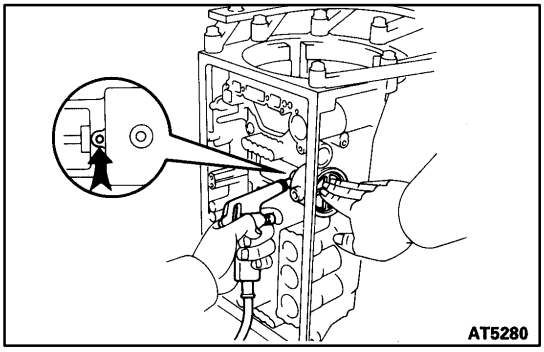


(b) Using SST, measure the stroke while applying and releasing compressed air (392-785 kPa, 4-8 kgf/cm^2, 57-114 psi).
SST 09240-00020
Piston stroke:
1.5-3.0 mm (0.059-0.118 in.)
If the values are non-standard, inspect the brake band.

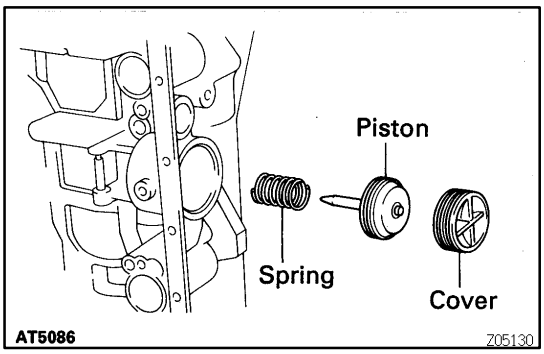


32. REMOVE SECOND COAST BRAKE COVER, PISTON ASSEMBLY AND SPRING

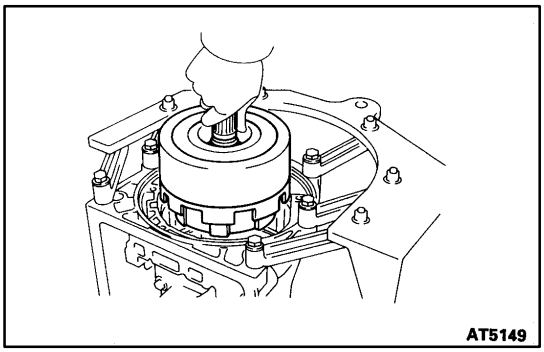
(a) Using SST, remove the snap ring.
SST 09350-30020 (09350-07060)



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

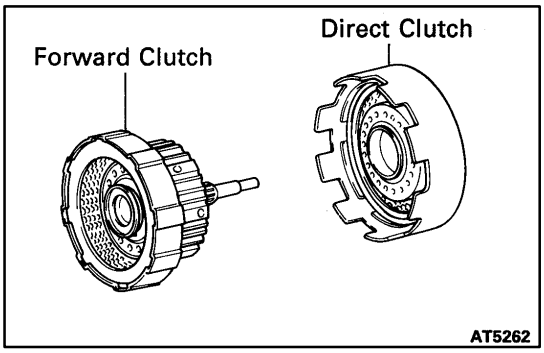


(c) Remove the 2 O-rings from the cover.

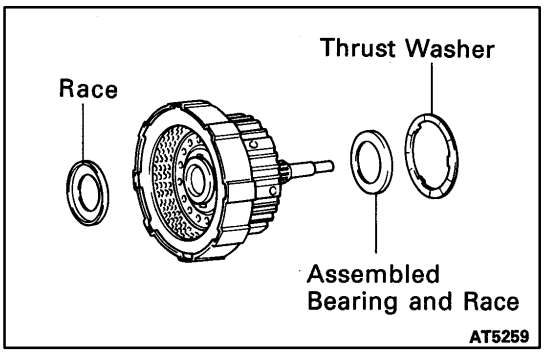


33. REMOVE DIRECT CLUTCH WITH FORWARD CLUTCH

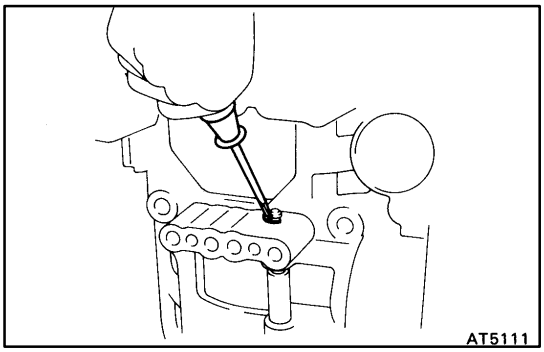
(a) Remove the direct clutch with the forward clutch from the case.



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



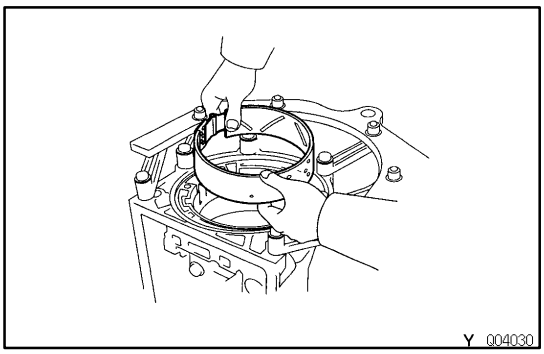
(c) Remove the assembled bearing and race, thrust washer and race from the forward clutch.



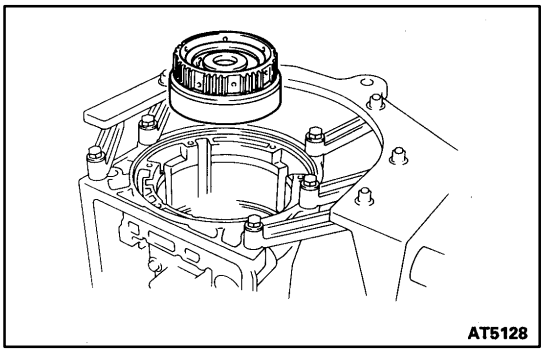
34. REMOVE SECOND COAST BRAKE BAND

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

(b) Remove the pin from the brake band.

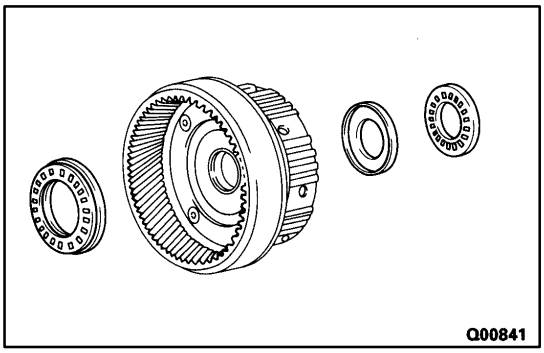


(c) Remove the second coast brake from the case.

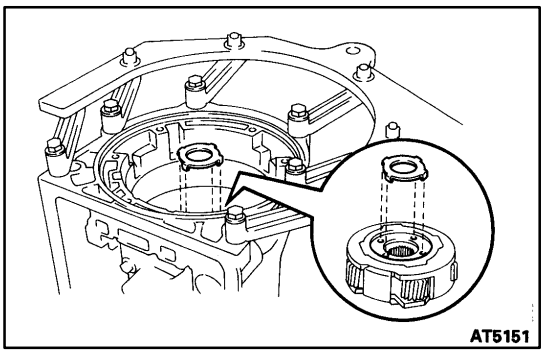


35. REMOVE FRONT PLANETARY GEAR UNIT

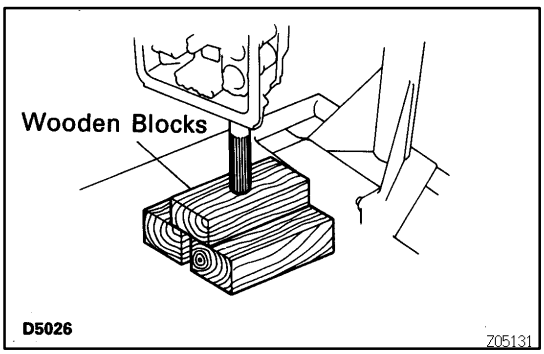
(a) Remove the front planetary ring gear from the case.



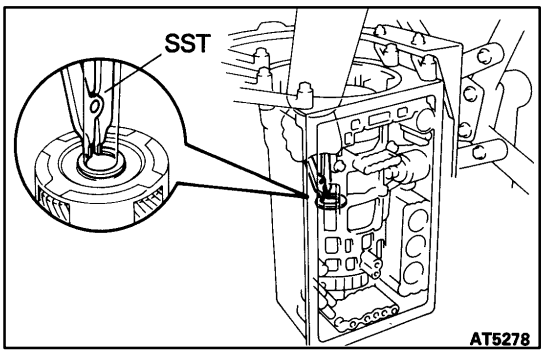
(b) Remove the bearing and race from the front planetary ring gear.



(c) Remove the race from the front planetary gear.

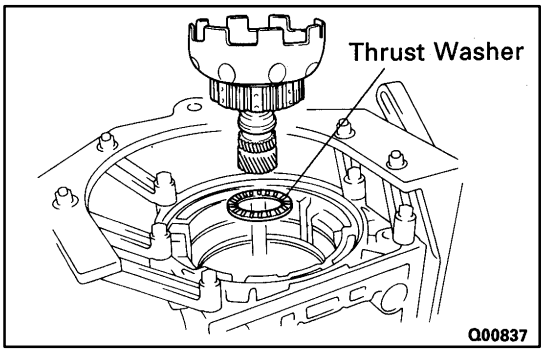


(d) With wooden blocks under the output shaft, stand the transmission on the output shaft.



36. REMOVE FRONT PLANETARY GEAR

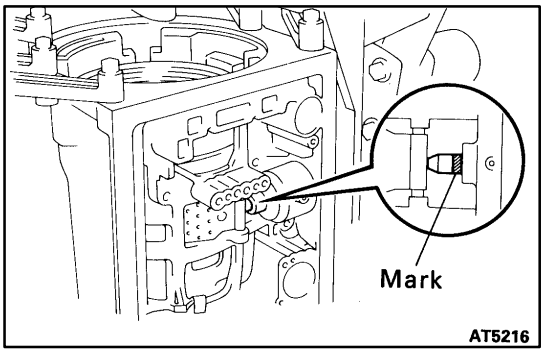
(a) Using SST, remove the snap ring.
SST 09350-30029 (09350-07070)
HINT: Pushing the output shaft towards the front makes it easier to remove.



37. REMOVE PLANETARY SUN GEAR WITH NO.1 ONE-WAY CLUTCH

(a) Remove the planetary sun gear with No.1 one-way clutch from the case.

(b) Remove the thrust washer.



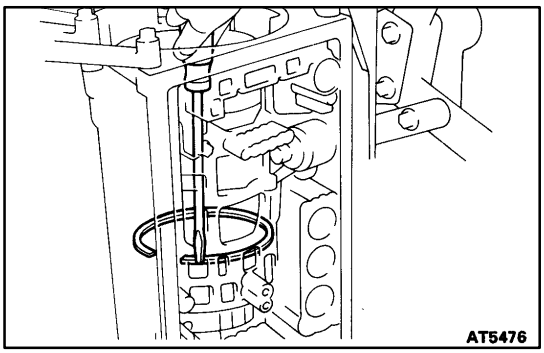
38. CHECK PACK CLEARANCE OF SECOND BRAKE

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

Clearance:

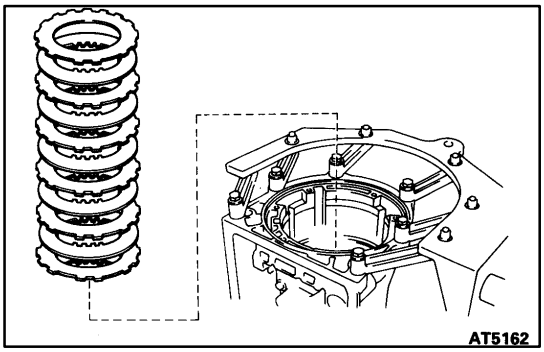
0.62-1.98 mm (0.0244-0.0780 in.)

If the values are non-standard, inspect the discs.

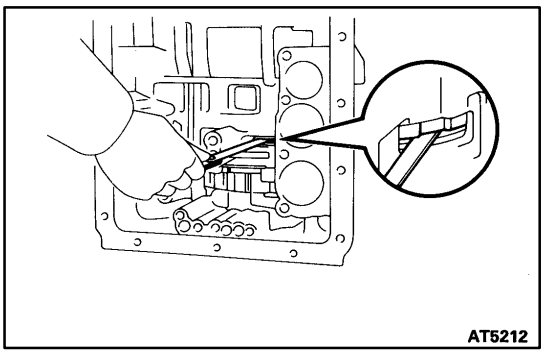


39. REMOVE FLANGE, PLATES AND DISCS OF SECOND BRAKE

(a) Remove the snap ring.



(b) Remove the flange, plates and discs.



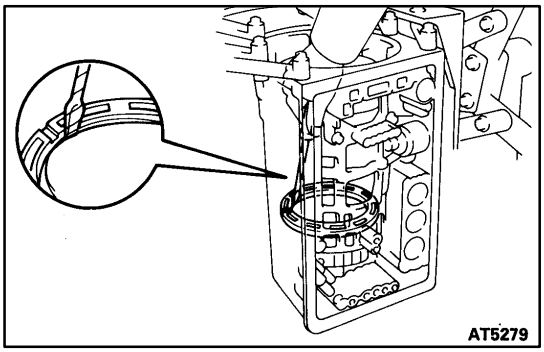
40. CHECK PACK CLEARANCE OF FIRST AND REVERSE BRAKE

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

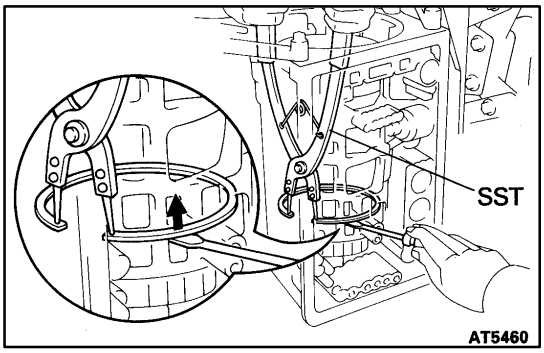
Clearance:

0.60-1.12 mm (0.0236-0.0441 in.)

If the values are non-standard, inspect the discs.

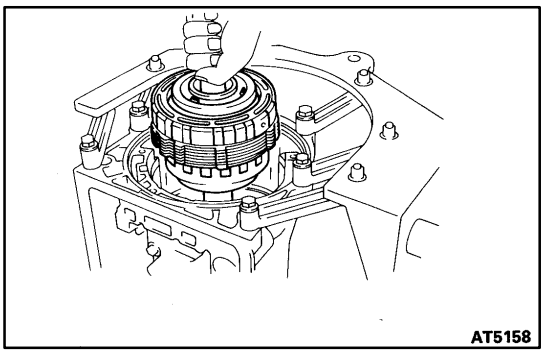


41. REMOVE SECOND BRAKE PISTON SLEEVE

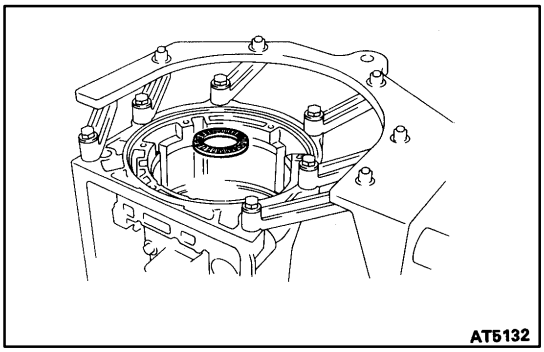


42. REMOVE REAR PLANETARY GEAR WITH SECOND BRAKE DRUM, FIRST AND REVERSE BRAKE PACK AND OUTPUT SHAFT

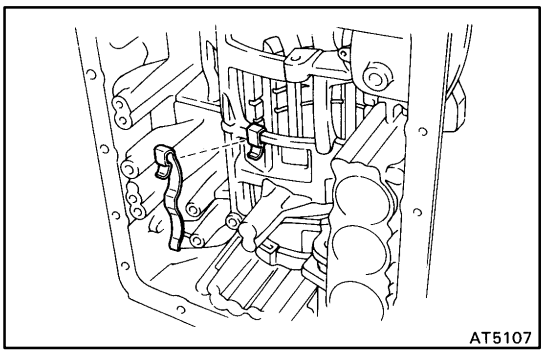
(a) Using SST and screwdriver, remove the snap ring.
SST 09350-30020 (09350-07060)



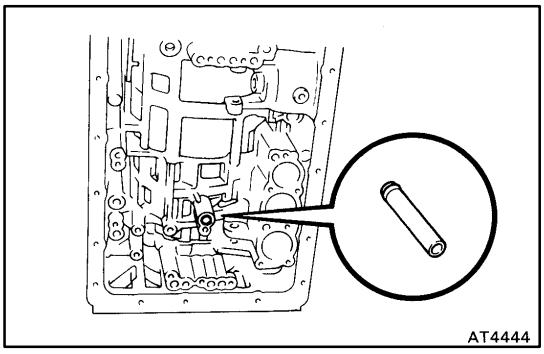
(b) Remove the rear planetary gear, second brake drum, first and reverse brake pack and output shaft as an assembly.



(c) Remove the assembled thrust bearing and race from the case.



43. REMOVE LEAF SPRING



44. REMOVE BRAKE DRUM GASKET

COMPONENT PARTS

AX0AF-0D

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 cannot be assembled because parts are being ordered, be sure to keep all parts of that group in a separate container while proceeding with disassembly, inspection, repair and assembly of other component groups.

Recommended ATF:

DEXRON® II

GENERAL CLEANING NOTES:

1. All disassembled parts should be washed clean and any fluid passages and holes blown through with compressed air.
2. When using compressed air to dry parts, always aim away from yourself to prevent accidentally spraying automatic transmission fluid or kerosene in your face.
3. The recommended automatic transmission fluid or kerosene should be used for cleaning.

PARTS ARRANGEMENT:

1. After cleaning, the parts should be arranged in the correct order to allow efficient inspection, repairs, and reassembly.
2. When disassembling a valve body, be sure to keep each valve together with the corresponding spring.
3. New discs for the brakes and clutches that are to be used for replacement must be soaked in transmission fluid for at least 15 minutes before assembly.

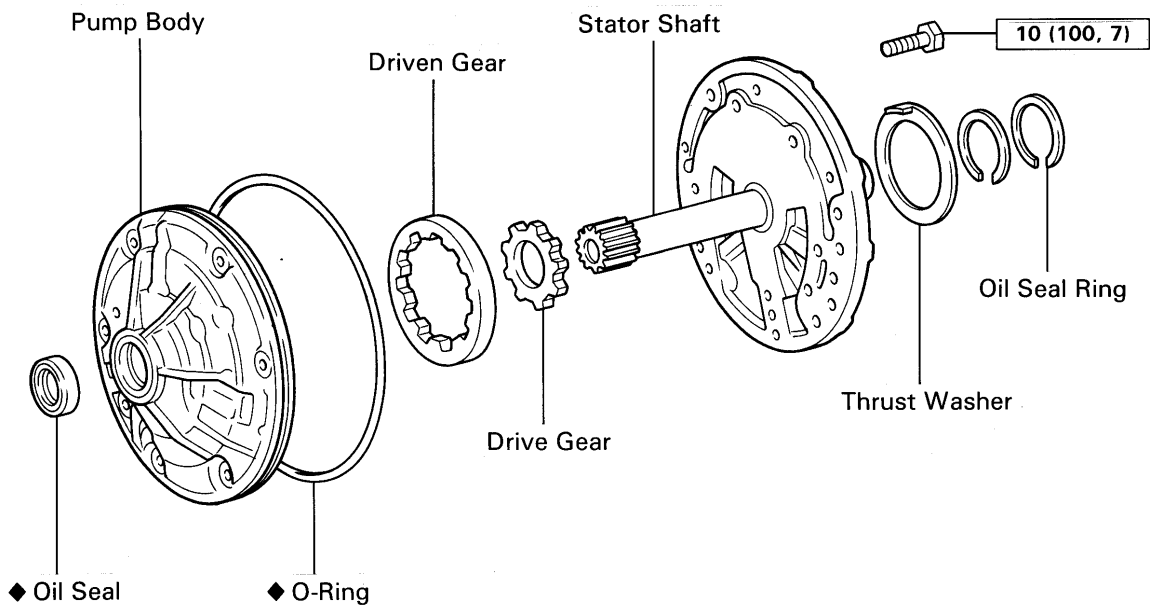
GENERAL ASSEMBLY:

1. All oil seal rings, clutch discs, clutch plates, rotating parts, and sliding surfaces should be coated with transmission fluid prior to reassembly.
2. All gaskets and rubber O-rings should be replaced.
3. Make sure that the ends of a snap ring are not aligned with one of the cutouts and are installed in the groove correctly.
4. If a worn bushing is to be replaced, the subassembly containing that bushing must be replaced.
5. Check thrust bearings and races for wear or damage. Replace if necessary.
6. Use petroleum jelly to keep parts in place.

OIL PUMP

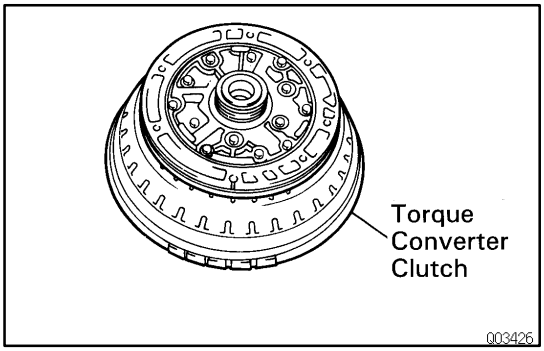
COMPONENTS

AX0AL-0A



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

AT8669



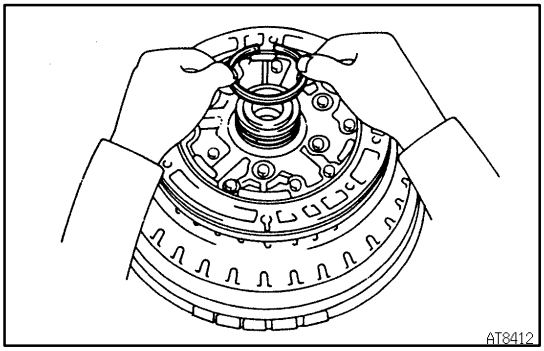
Q03426

AT0FV-02

OIL PUMP DISASSEMBLY

1. USE TORQUE CONVERTER CLUTCH AS WORK STAND

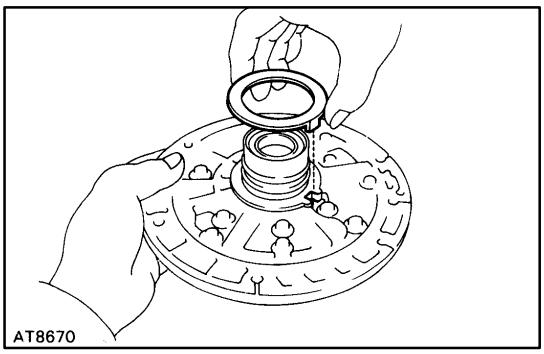
Place the oil pump body on the torque converter clutch.



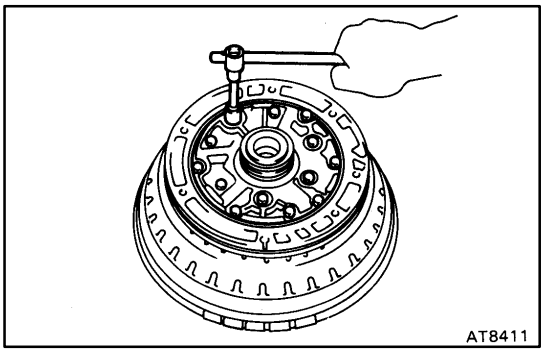
AT8412

2. REMOVE OIL SEAL RINGS

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



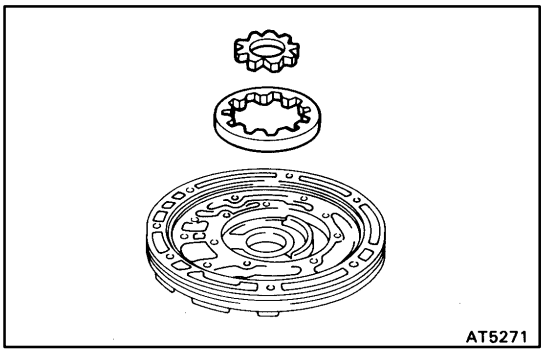
3. REMOVE THRUST WASHER FROM STATOR SHAFT BACK SIDE



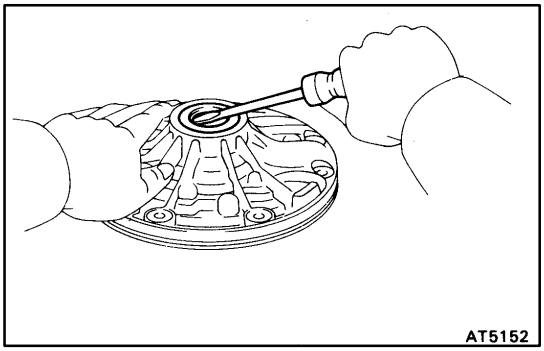
4. REMOVE STATOR SHAFT

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

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



5. REMOVE OIL PUMP DRIVE GEAR AND DRIVEN GEAR

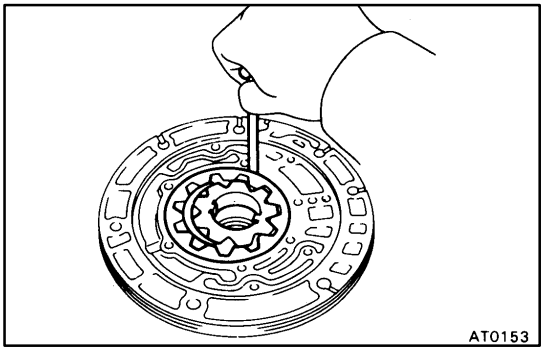


6. REMOVE OIL SEAL

Pry off the oil seal with a screwdriver.

AX0AN-0C

OIL PUMP 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.

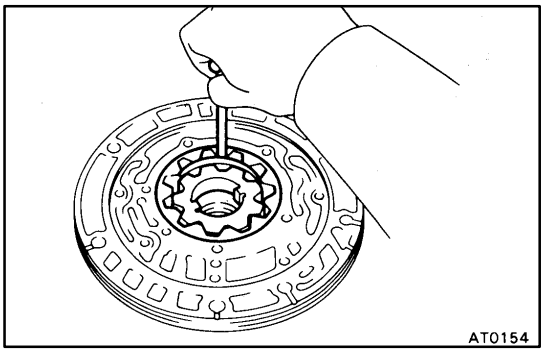
Standard body clearance:

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 drive gear, driven gear or pump body.



2. CHECK TIP CLEARANCE OF DRIVEN GEAR

Measure between the driven gear teeth and the crescent-shaped part of the pump body.

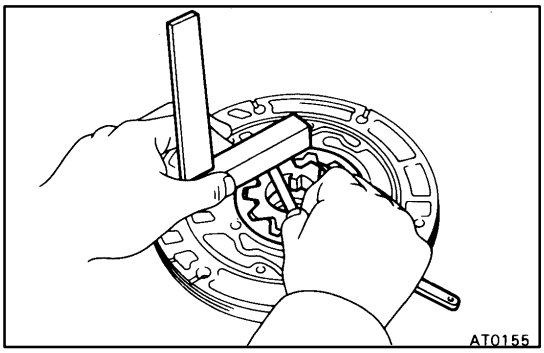
Standard tip clearance:

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 drive gear, driven gear or pump body.



3. CHECK SIDE CLEARANCE OF BOTH GEARS

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

Standard side clearance:

0.02-0.05 mm (0.0008-0.0020 in.)

Maximum side clearance:

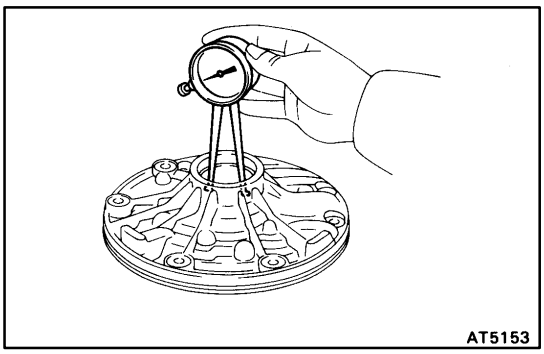
0.1 mm (0.004 in.)

If the side clearance is greater than the maximum, select and replace the gears as a set.

Drive gear and driven gear thicknesses

mm (in.)

Mark	Thickness
1	9.440-9.449 (0.3717-0.3720)
2	9.450-9.459 (0.3720-0.3724)
3	9.460-9.470 (0.3724-0.3728)
4	9.471-9.480 (0.3720-0.3724)
5	9.481-9.490 (0.3729-0.3736)



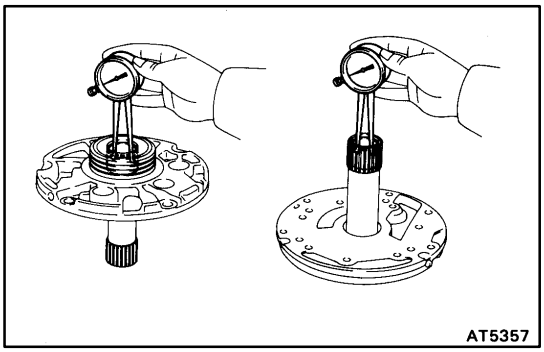
4. CHECK OIL PUMP BODY BUSHING

Using a dial indicator, measure the inside diameter of the oil pump body bushing.

Maximum inside diameter:

38.19 mm (1.5035 in.)

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



5. CHECK STATOR SHAFT BUSHINGS

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

Maximum inside diameter:

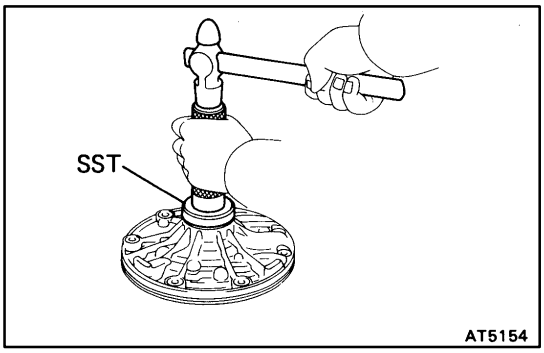
Front side 21.58 mm (0.8496 in.)

Rear side 27.08 mm (1.0661 in.)

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

AX0AP-0C

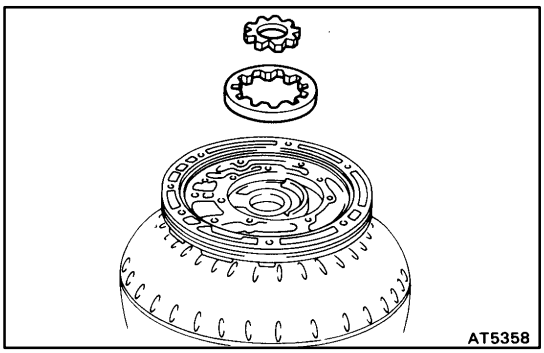
OIL PUMP ASSEMBLY



1. INSTALL FRONT OIL SEAL

(a) 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 09350-30020 (09351-32140)

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

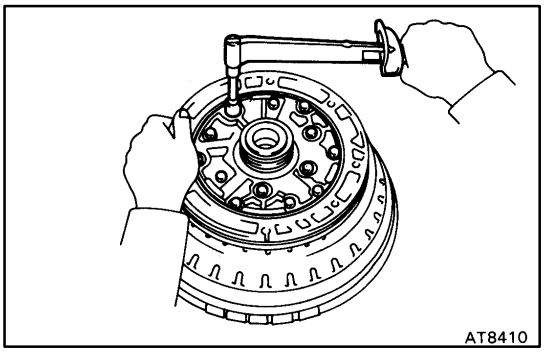


2. INSTALL DRIVEN GEAR AND DRIVE GEAR TO OIL PUMP BODY

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

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

(c) Install the driven gear and drive gear.

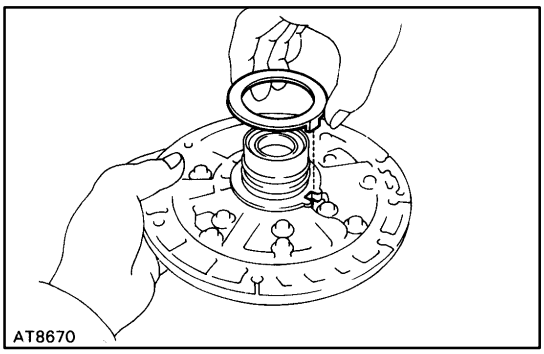


3. INSTALL STATOR SHAFT TO PUMP BODY

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

(b) Tighten the 13 bolts.

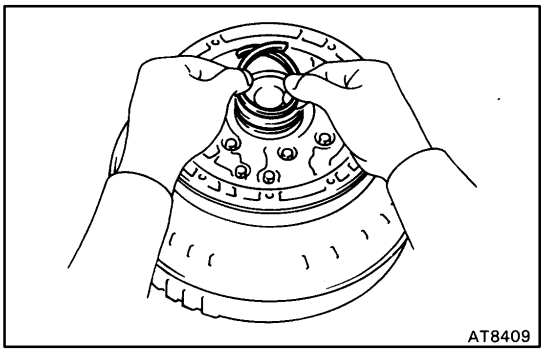
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)



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.



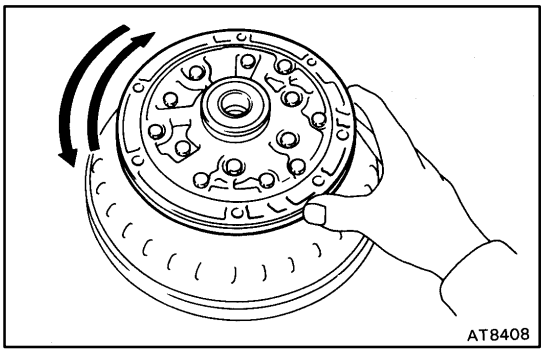
5. INSTALL OIL SEAL RINGS

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

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

NOTICE: Do not spread the ring ends too much.

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



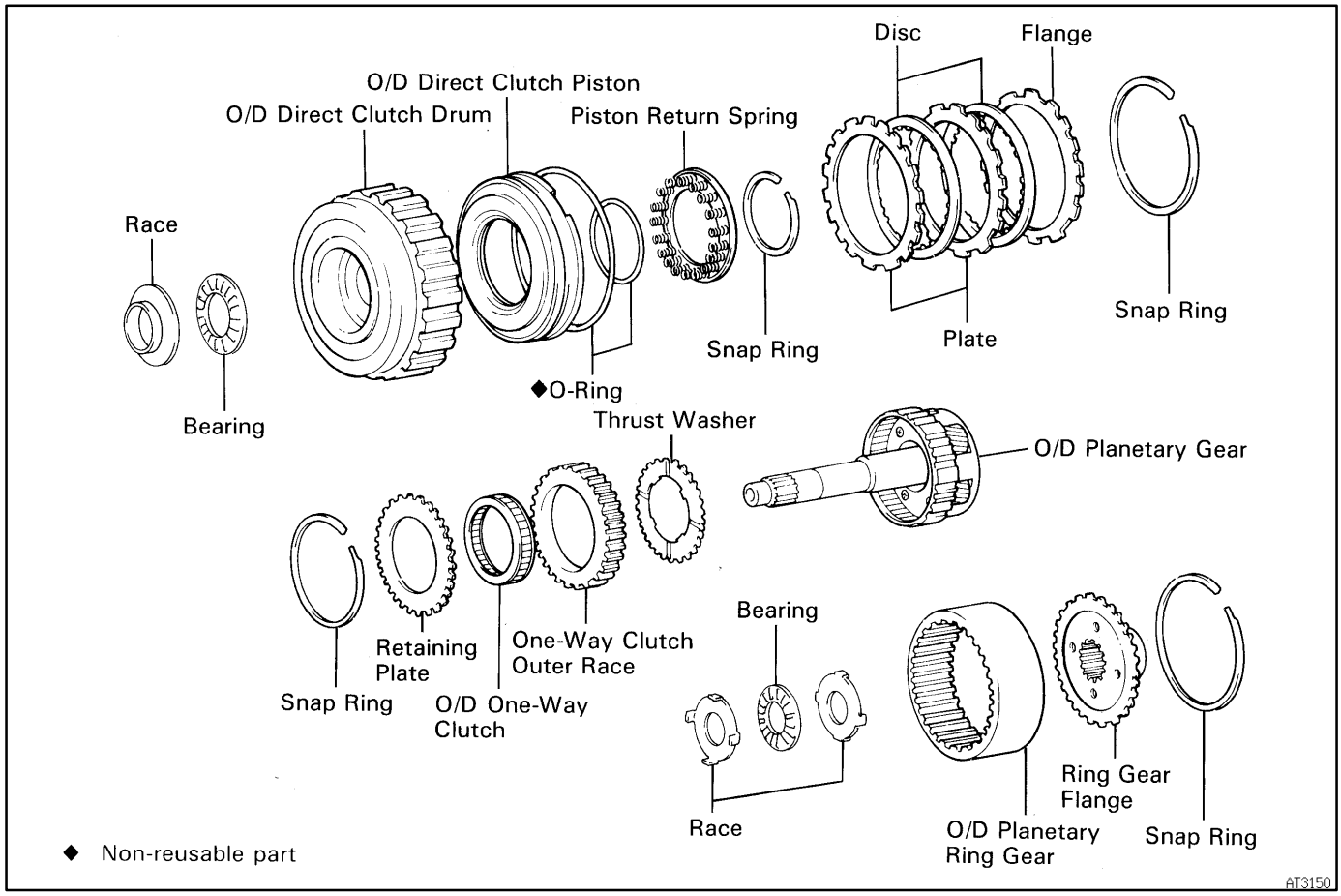
6. CHECK OIL PUMP DRIVE GEAR ROTATION

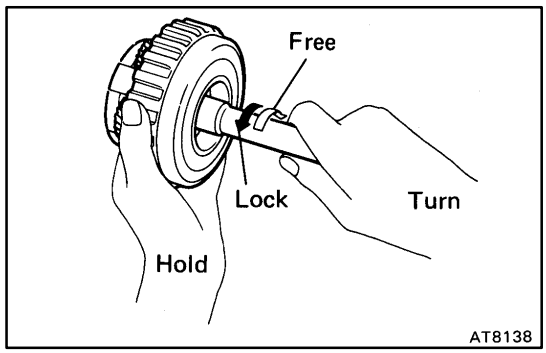
Make sure the drive gear rotates smoothly.

OVERDRIVE DIRECT CLUTCH

AT05B-04

COMPONENTS



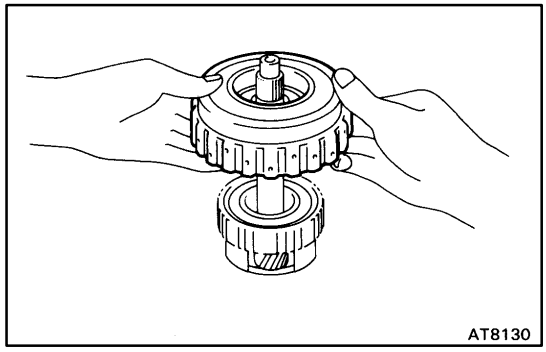


AT05C-08

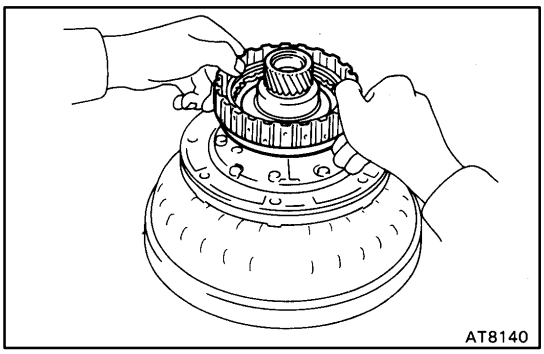
OVERDRIVE PLANETARY GEAR, OVERDRIVE DIRECT CLUTCH AND OVERDRIVE ONE-WAY CLUTCH DISASSEMBLY

1. CHECK OPERATION OF ONE-WAY CLUTCH

Hold the O/D direct clutch drum and turn the input shaft. Check that the input shaft must be able to turn freely clockwise and locks counterclockwise.

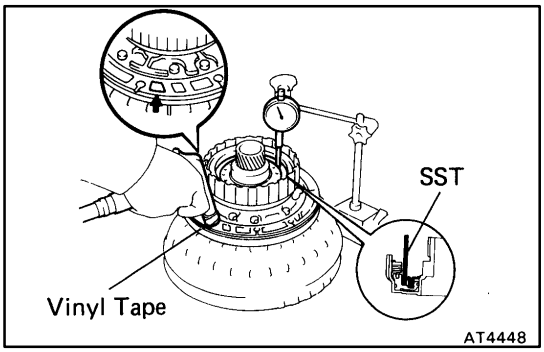


2. REMOVE OVERDRIVE DIRECT CLUTCH ASSEMBLY FROM OVERDRIVE PLANETARY GEAR

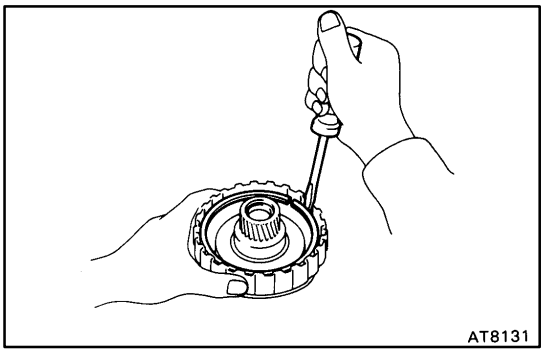


3. CHECK PISTON STROKE OF OVERDRIVE DIRECT CLUTCH

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

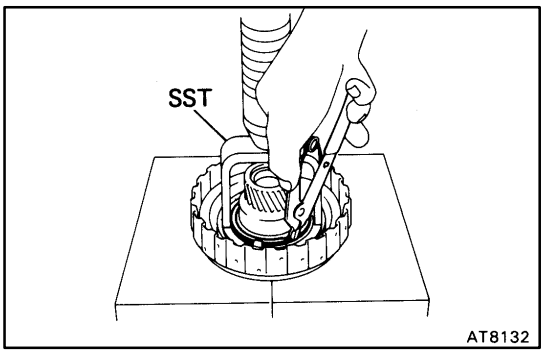


(b) Using SST and a dial indicator, measure the O/D direct clutch piston stroke while applying and releasing compressed air (392-785 kPa, 4-8 kgf/cm^2, 57-114 psi).
SST 09350-30020 (09350-06120)
Piston stroke:
SUPRA:
1.45-1.70 mm (0.0571-0.0669 in.)
OTHERS:
1.85-2.15 mm (0.0728-0.0846 in.)
If the values are non-standard, inspect the discs.



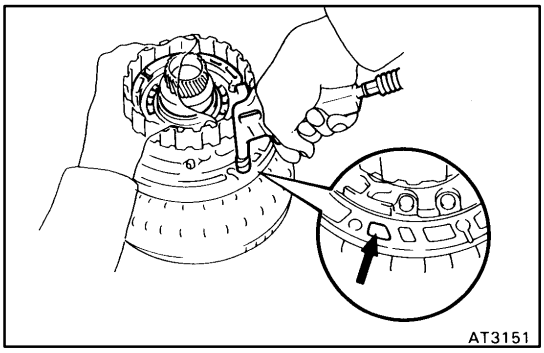
4. REMOVE FLANGE, PLATES AND DISCS

(a) Using a screwdriver, remove the snap ring from the O/D direct clutch drum.
(b) Remove the flange, plates and discs.



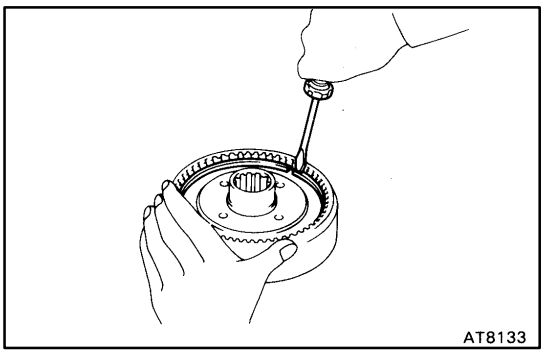
5. REMOVE PISTON RETURN SPRING

(a) Place SST on the spring retainer and compress the return spring with a shop press.
SST 09350-30020 (09350-07040)
(b) Using snap ring pliers, remove the snap ring.
(c) Remove the piston return spring.



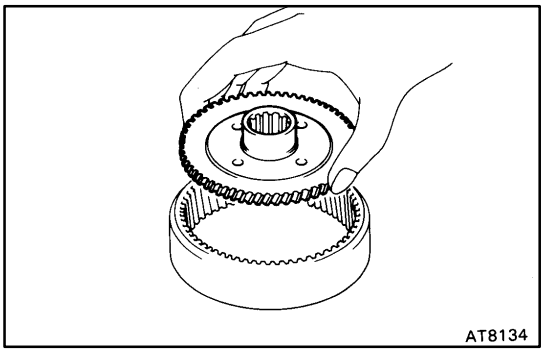
6. REMOVE OVERDRIVE DIRECT CLUTCH PISTON

(a) Place the oil pump onto the torque converter clutch and then place the O/D direct clutch onto the oil pump.
(b) Hold the O/D direct clutch piston with hand, apply compressed air to the oil pump to remove the O/D direct clutch piston.
(c) Remove the O/D direct clutch piston.
(d) Remove the 2 O-rings from the piston.

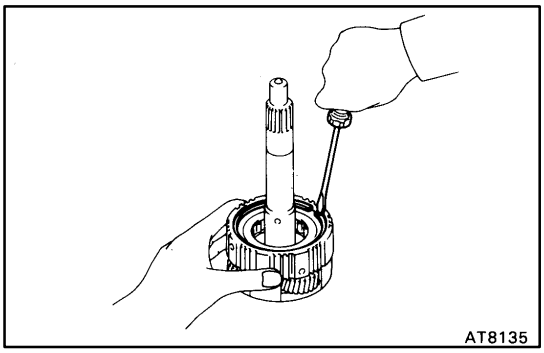


7. REMOVE RING GEAR FLANGE

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

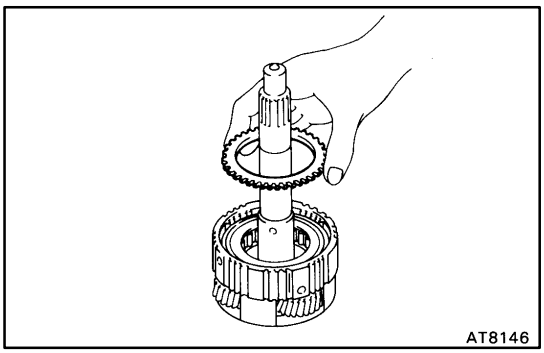


(b) Remove the ring gear flange.

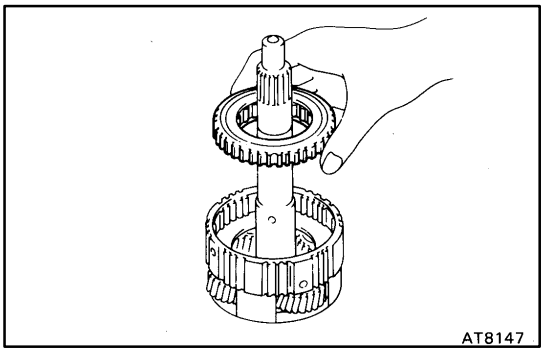


8. REMOVE RETAINING PLATE

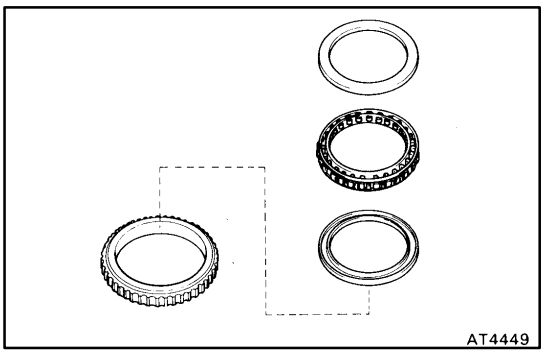
(a) Using a screwdriver, remove the snap ring.



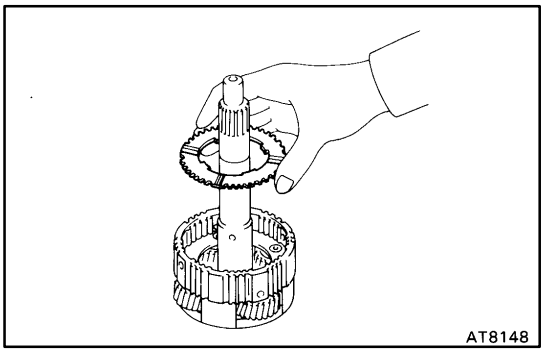
(b) Remove the retaining plate.



9. REMOVE OVERDRIVE ONE- WAY CLUTCH WITH OUTER RACE

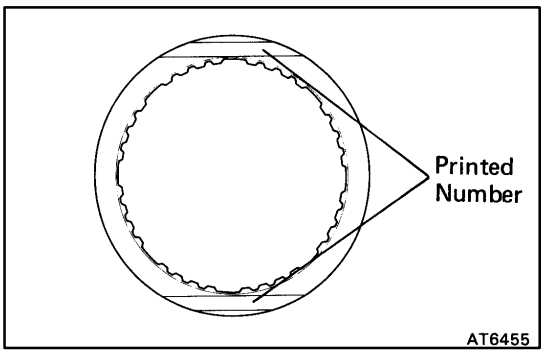


10. REMOVE ONE-WAY CLUTCH FROM OUTER RACE



11. REMOVE THRUST WASHER

AT05D-06



OVERDRIVE PLANETARY GEAR AND OVERDRIVE DIRECT CLUTCH INSPECTION

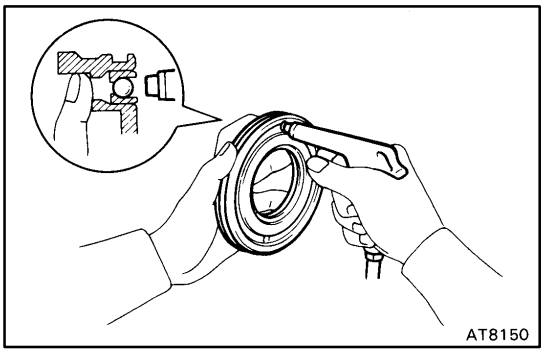
1. INSPECT DISC, PLATE AND FLANGE

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

HINT:

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

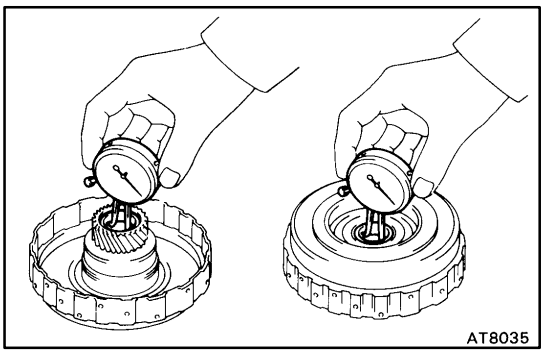
★ Before assembling new discs, soak them in ATF for at least 15 minutes.



2. CHECK OVERDRIVE DIRECT CLUTCH PISTON

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

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



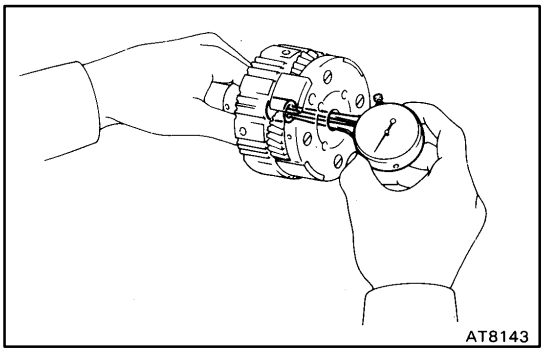
3. CHECK OVERDRIVE DIRECT CLUTCH DRUM BUSHINGS

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

Maximum inside diameter:

27.11 mm (1.0673 in.)

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



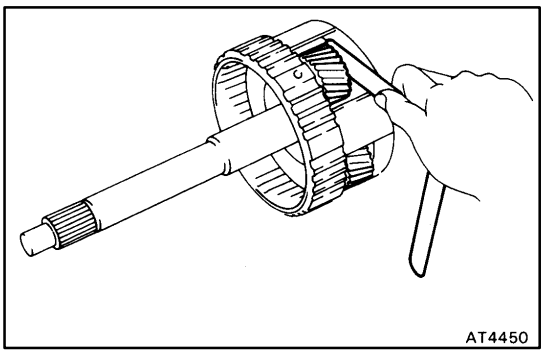
4. CHECK OVERDRIVE PLANETARY GEAR BUSHING

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

Maximum inside diameter:

11.27 mm (0.4437 in.)

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



5. MEASURE PLANETARY PINION GEAR THRUST CLEARANCE

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

Standard clearance:

0.20-0.60 mm (0.0079-0.0236 in.)

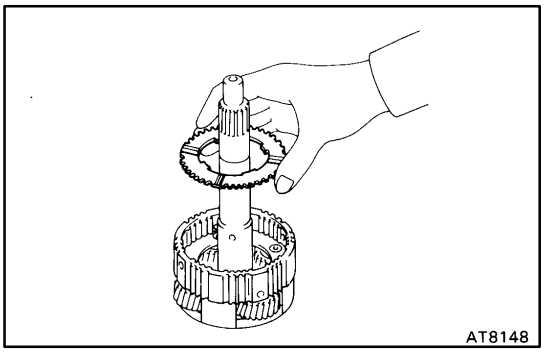
Maximum clearance:

1.00 mm (0.0394 in.)

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

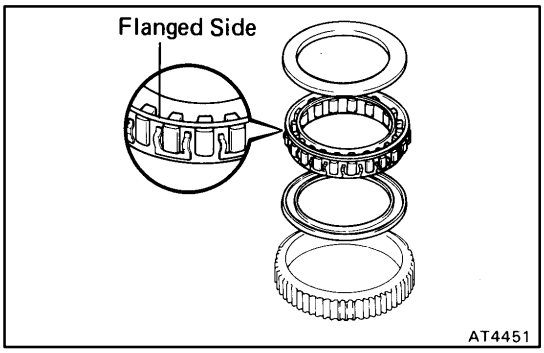
AT0FW-04

OVERDRIVE PLANETARY GEAR, OVERDRIVE DIRECT CLUTCH AND OVERDRIVE ONE-WAY CLUTCH ASSEMBLY



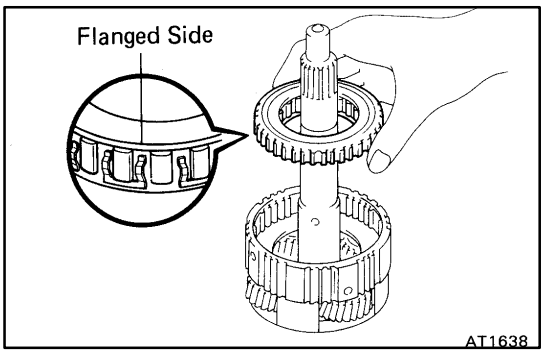
1. INSTALL THRUST WASHER TO OVERDRIVE PLANETARY GEAR

Install the thrust washer to the overdrive planetary gear, the groove side facing upward.

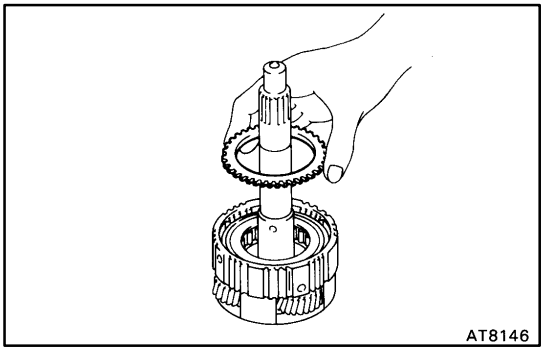


2. INSTALL OVERDRIVE ONE-WAY CLUTCH

(a) Install the one-way clutch into the outer race, the flange side of the one-way clutch facing upward.

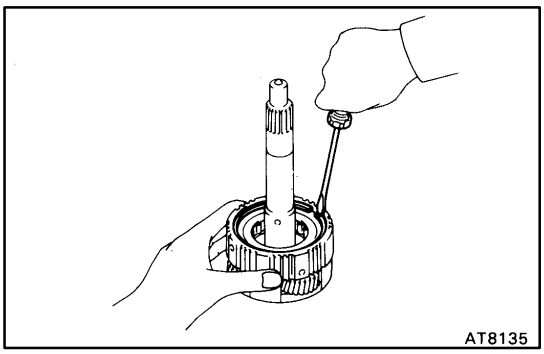


(b) Install the overdrive one-way clutch with the outer race to the overdrive planetary gear.

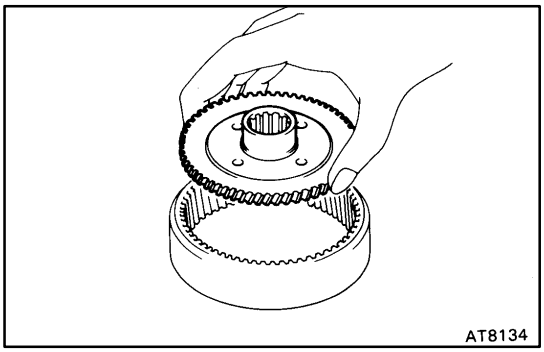


3. INSTALL RETAINING PLATE

(a) Install the retaining plate.

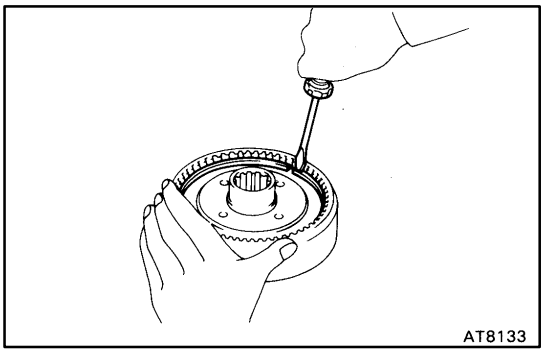


(b) Using a screwdriver, install the snap ring.

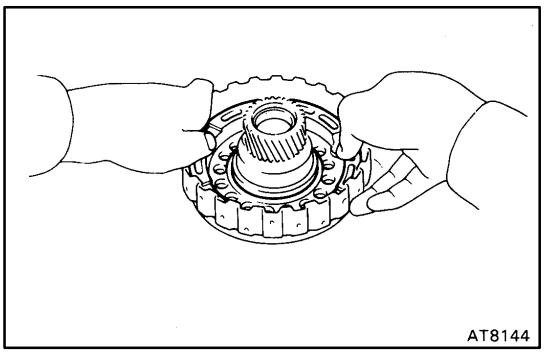


4. INSTALL RING GEAR FLANGE TO OVERDRIVE PLANETARY RING GEAR

(a) Install the ring gear flange.



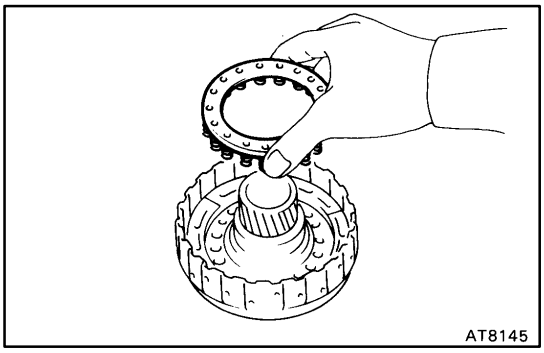
(b) Using a screwdriver, install the snap ring.



5. INSTALL OVERDRIVE DIRECT CLUTCH PISTON

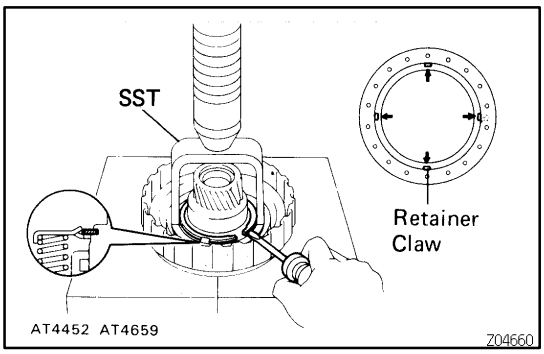
(a) Coat the new O-rings with ATF and install them on the O/D direct clutch piston.

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



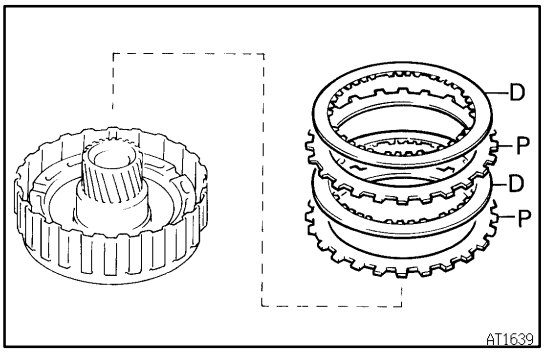
6. INSTALL PISTON RETURN SPRING

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



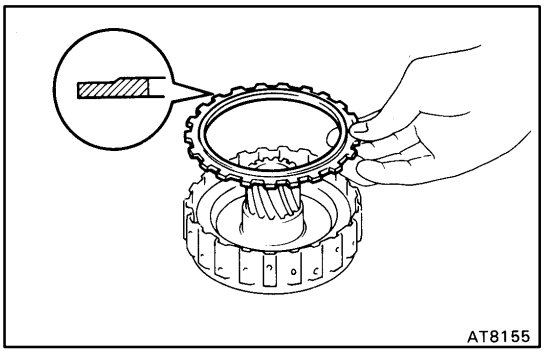
(b) Place SST on the spring retainer, and compress the return spring with a shop press.
SST 09350-30020 (09350-07040)

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

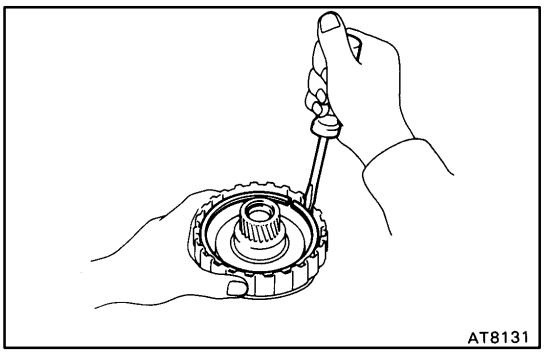


7. INSTALL PLATES, DISCS AND FLANGE

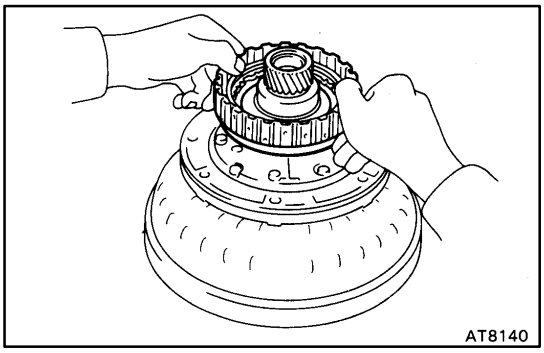
(a) Install the plates and discs.
Install in order: P = Plate D = Disc
P-D-P-D



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

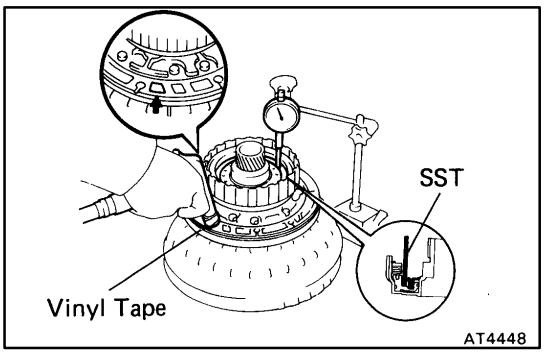


(c) Using a screwdriver, install the snap ring.



8. CHECK PISTON STROKE OF OVERDRIVE DIRECT CLUTCH

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



(b) Using SST and a dial indicator, measure the overdrive direct clutch piston stroke while applying and releasing compressed air (392-785 kPa, 4-8 kgf/cm^2, 57-114 psi).
SST 09350-30020 (09350-06120)

Piston stroke:

SUPRA:

1.45-1.70 mm (0.0571-0.0669 in.)

OTHERS:

1.85-2.15 mm (0.0728-0.0846 in.)

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

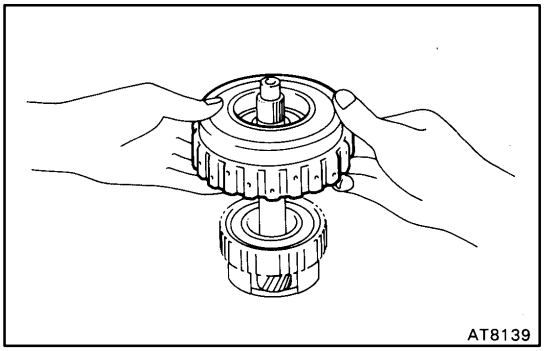
If the piston stroke is non- standard, select another flange.

HINT: There are 6 different thicknesses for the flange.

Flange thickness

mm (in.)

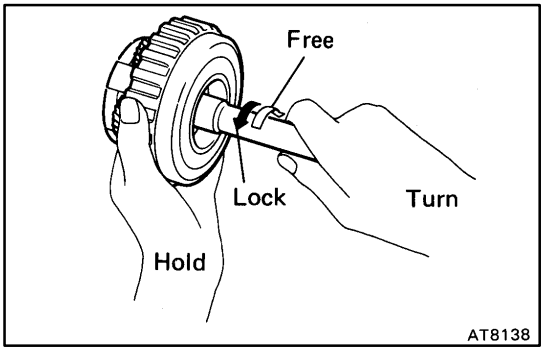
No.	Thickness	No.	Thickness
16	3.6 (0.142)	19	3.3 (0.130)
17	3.5 (0.138)	20	3.2 (0.126)
18	3.4 (0.134)	21	3.1 (0.122)



9. INSTALL OVERDRIVE DIRECT CLUTCH ASSEMBLY

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

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



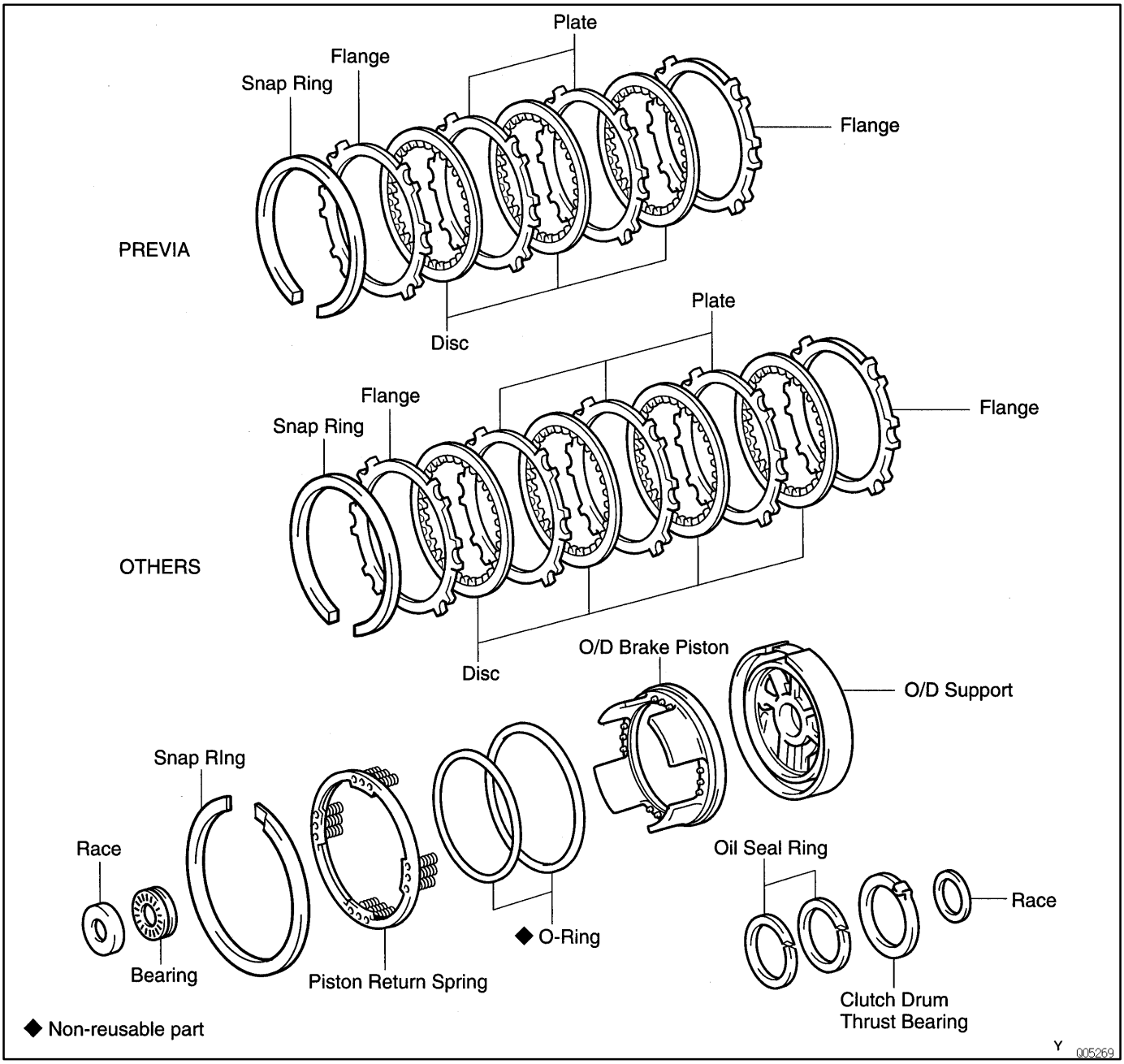
10. CHECK OPERATION OF ONE-WAY CLUTCH

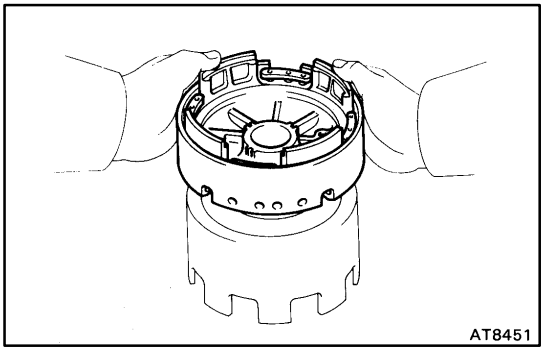
Hold the O/D direct clutch drum and turn the input shaft. Check that the input shaft must be able to turn freely clockwise and locks counterclockwise.

OVERDRIVE BRAKE

AT05F-05

COMPONENTS



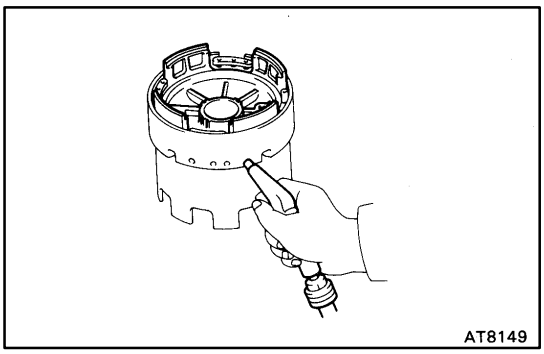


AT05G-05

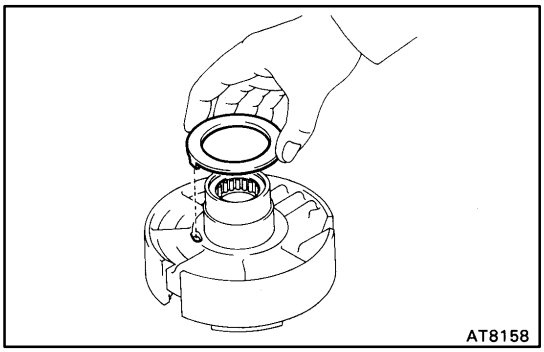
OVERDRIVE BRAKE DISASSEMBLY

1. CHECK OVERDRIVE BRAKE PISTON MOVEMENT

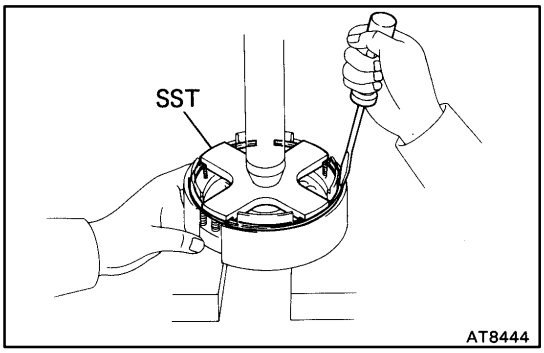
(a) Place the O/D support assembly onto the direct clutch assembly.



(b) Apply compressed air into the oil passage as shown, and be sure that the O/D brake piston moves smoothly.

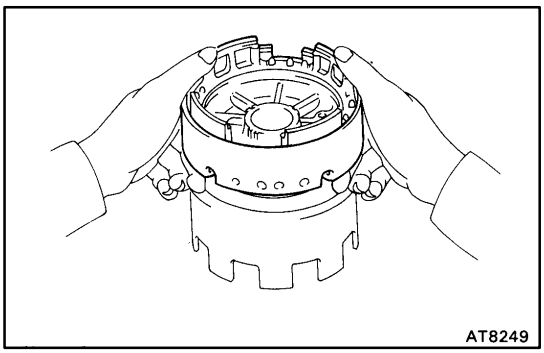


2. REMOVE CLUTCH DRUM THRUST WASHER FROM OVERDRIVE SUPPORT



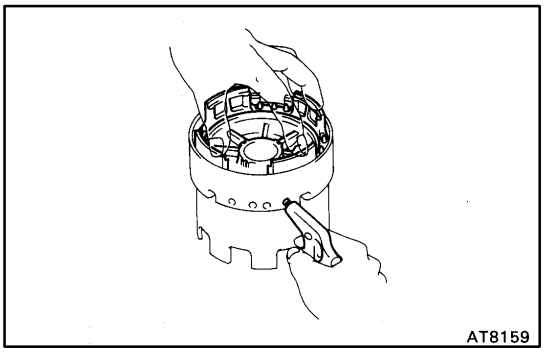
3. REMOVE PISTON RETURN SPRING

(a) Place SST on the spring retainer, and compress the return spring with a shop press.
SST 09350-30020 (09350-07030)
(b) Remove the snap ring with a screwdriver.
(c) Remove the piston return spring.

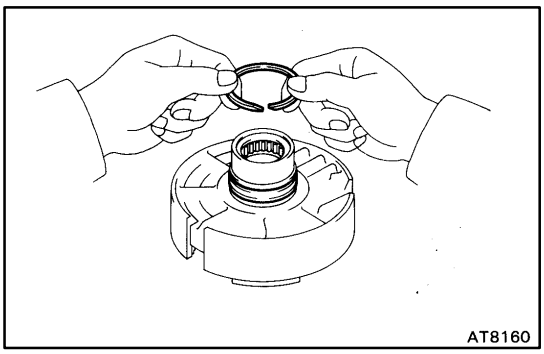


4. REMOVE OVERDRIVE BRAKE PISTON

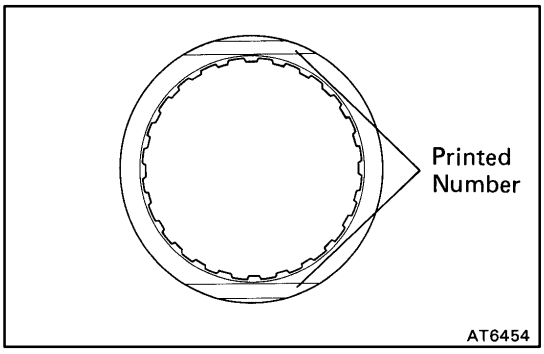
(a) Place the O/D support onto the direct clutch assembly.



(b) Hold the O/D brake piston so it does not slant, and apply compressed air into the passage to remove the O/D brake piston.
(c) Remove the O/D brake piston.
(d) Remove the 2 O-rings from the piston.



5. REMOVE 2 OIL SEAL RINGS



AT05H-06

OVERDRIVE BRAKE INSPECTION

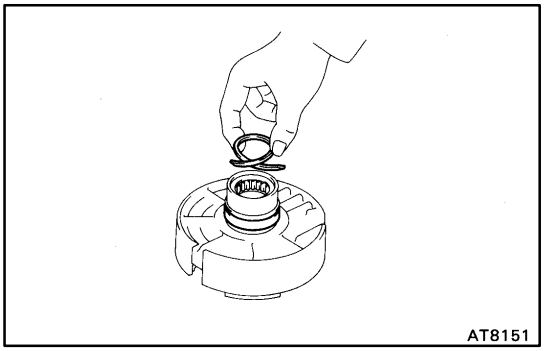
INSPECT DISC, PLATE AND FLANGE

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

HINT:

★ If the lining of the disc is peeling off or discolored, or even if a part of the printed numbers are defaced, replace all discs.

★ Before assembling new discs, soak them in ATF for at least 15 minutes.



AT05J-07

OVERDRIVE BRAKE ASSEMBLY

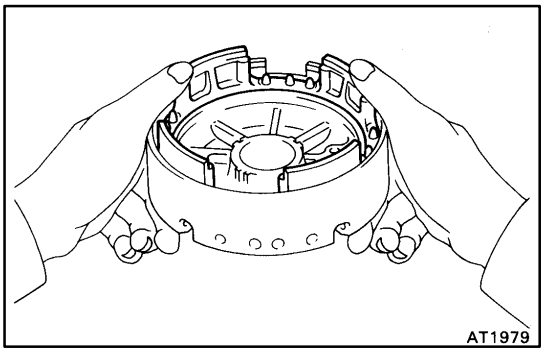
1. INSTALL OIL SEAL RINGS

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

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

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

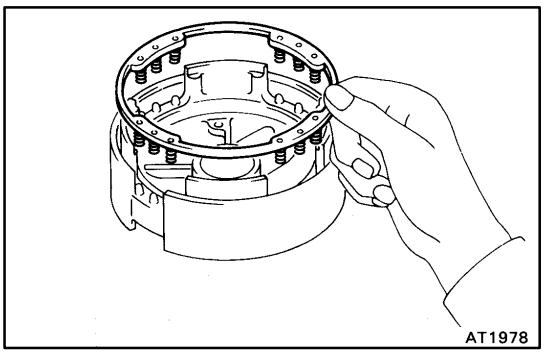
HINT: After installing the oil seal rings, check that they rotate smoothly.



2. INSTALL OVERDRIVE BRAKE PISTON

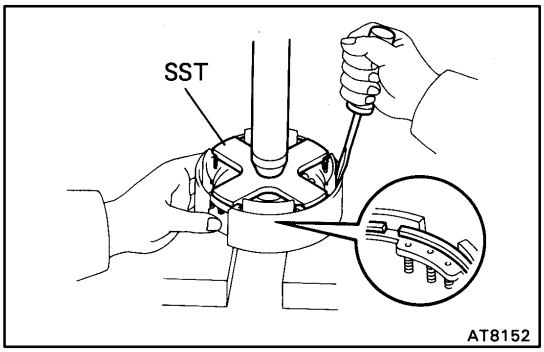
(a) Coat the 2 new O-rings with ATF and install them on the O/D brake piston.

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



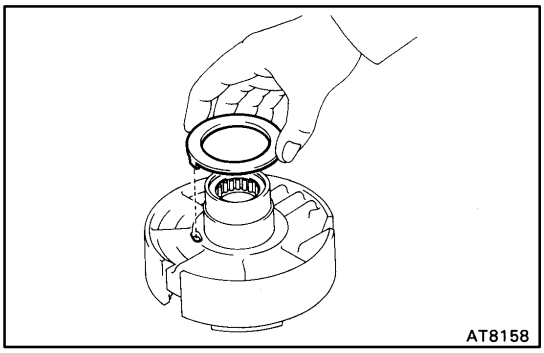
3. INSTALL PISTON RETURN SPRING

(a) Install the piston return spring.



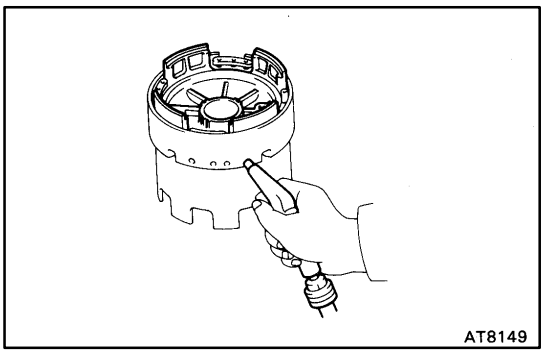
(b) Place SST on the spring retainer, and compress the return spring with a shop press.
SST 09350-30020 (09350-07030)

(c) Install the snap ring with a screwdriver. Be sure the end gap of the snap ring is not aligned with the cutout portion of the O/D support.



4. INSTALL CLUTCH DRUM THRUST WASHER

Coat the thrust washer with petroleum jelly and install it onto the O/D support.
HINT: Make sure that the lug shape matches the hole on the O/D support.



5. CHECK OVERDRIVE BRAKE PISTON MOVEMENT

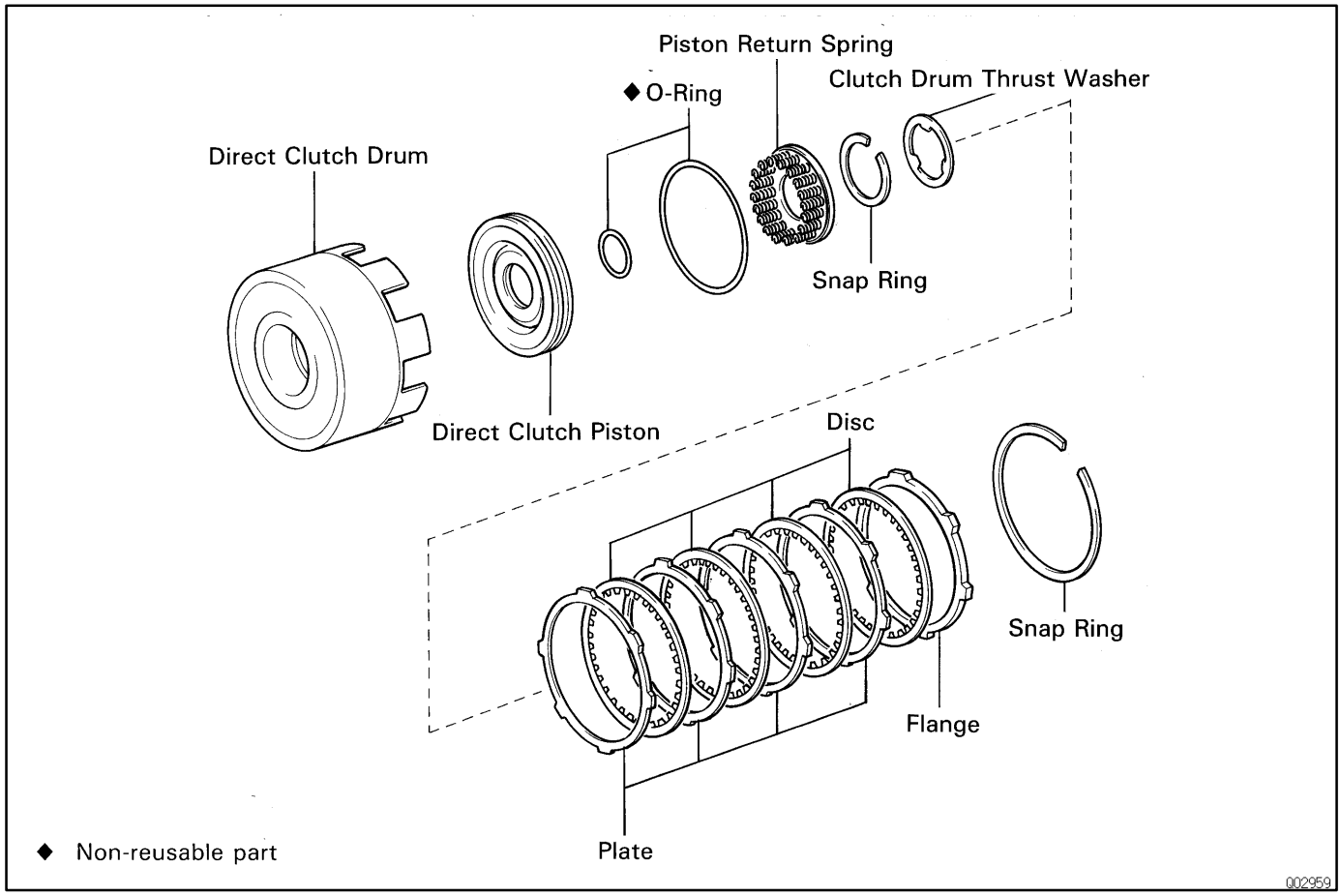
(a) Place the O/D support assembly onto the direct clutch assembly.

(b) Apply compressed air into the oil passage as shown, and be sure that the O/D brake piston moves smoothly.

DIRECT CLUTCH

AT05K-05

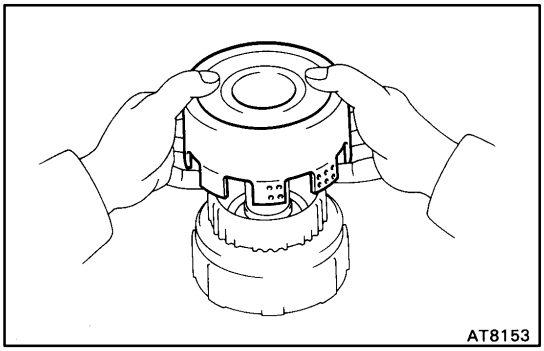
COMPONENTS



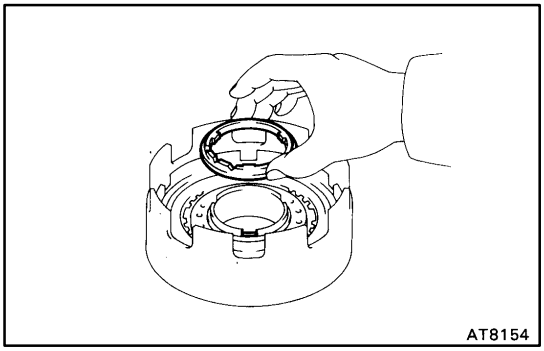
AT05L-07

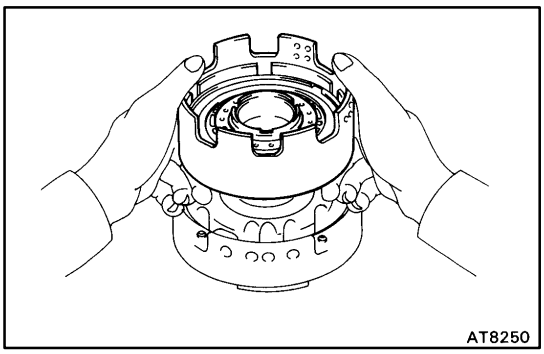
DIRECT CLUTCH DISASSEMBLY

1. REMOVE DIRECT CLUTCH DRUM FROM FORWARD CLUTCH



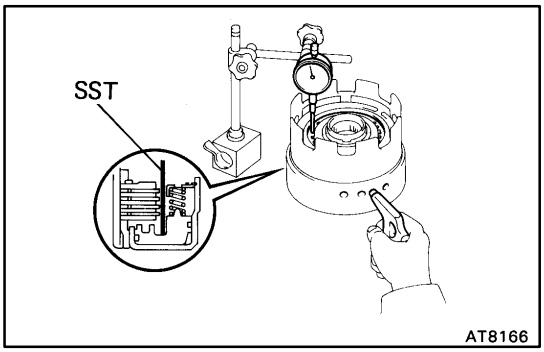
2. REMOVE CLUTCH DRUM THRUST WASHER FROM DIRECT CLUTCH



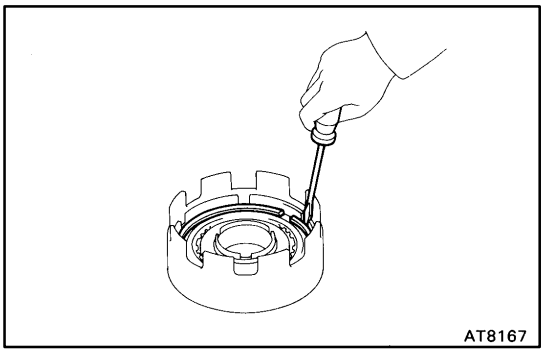


3. CHECK PISTON STROKE OF DIRECT CLUTCH

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

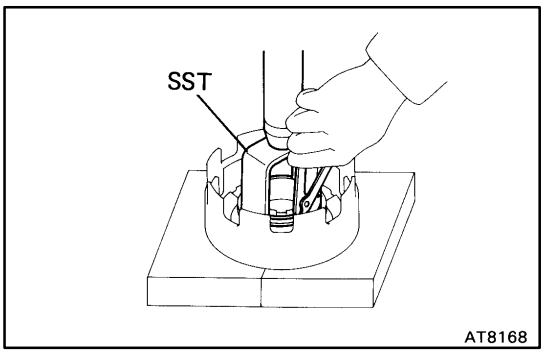


(b) Using SST and a dial indicator, measure the direct clutch piston stroke while applying and releasing compressed air (392-785 kPa, 4-8 kgf/cm^2, 57-114 psi).
SST 09350-30020 (09350-06120)
Piston stroke:
1.37-1.60 mm (0.0359-0.0630 in.)
If the values are non-standard, inspect the discs.



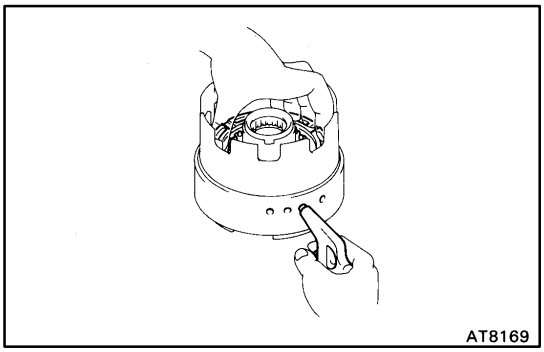
4. REMOVE FLANGE, PLATES AND DISCS

(a) Using a screwdriver, remove the snap ring from the direct clutch drum.
(b) Remove the flange, plates and discs.



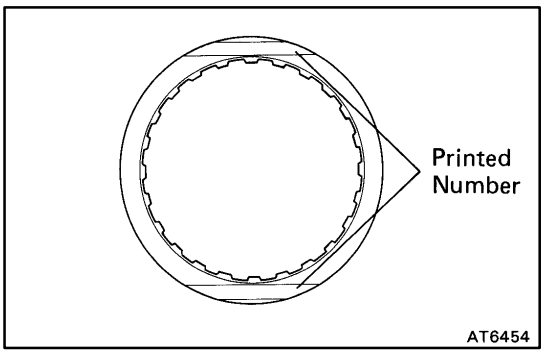
5. REMOVE PISTON RETURN SPRING

(a) Place SST on the spring retainer and compress the return spring with a shop press.
SST 09350-30020 (09350-07040)
(b) Using snap ring pliers, remove the snap ring.
(c) Remove the piston return spring.



6. REMOVE DIRECT CLUTCH PISTON

(a) Place the direct clutch drum onto the O/D support.
(b) Hold the direct clutch piston, apply compressed air to the O/D support to remove the direct clutch piston.
(c) Remove the direct clutch piston.
(c) Remove the 2 O-rings from the piston.



AT05M-06

DIRECT CLUTCH INSPECTION

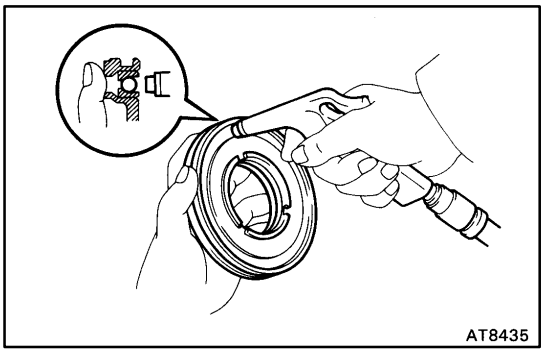
1. INSPECT DISC, PLATE AND FLANGE

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

HINT:

★ If the lining of the disc is peeling off or discolored, or even if a part of the printed numbers are defaced, replace all discs.

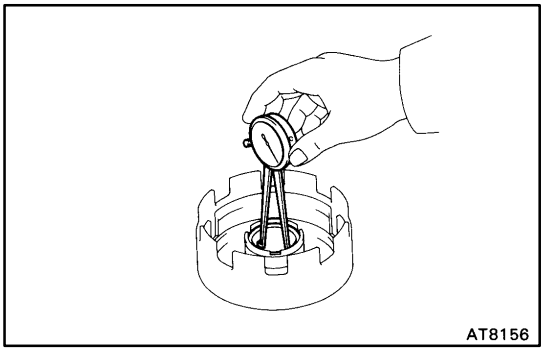
★ Before assembling new discs, soak them in ATF for at least 15 minutes.



2. CHECK DIRECT CLUTCH PISTON

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

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



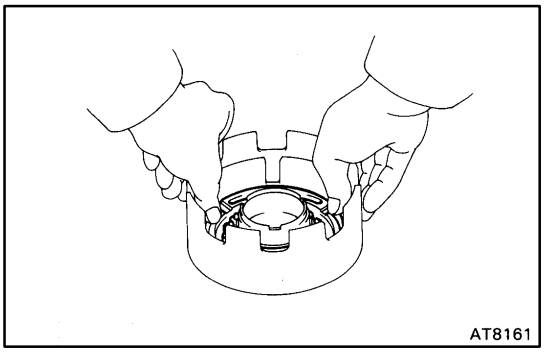
3. CHECK DIRECT CLUTCH DRUM BUSHING

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

Maximum inside diameter:

53.99 mm (2.1256 in.)

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



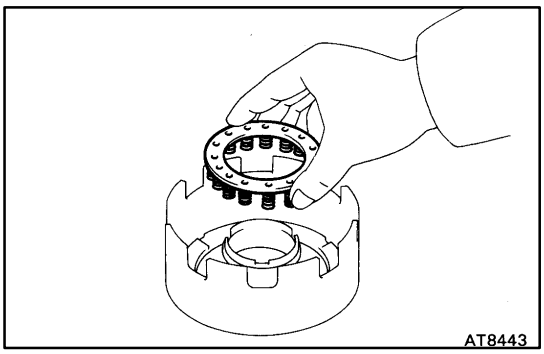
AT05N-08

DIRECT CLUTCH ASSEMBLY

1. INSTALL DIRECT CLUTCH PISTON TO DIRECT CLUTCH DRUM

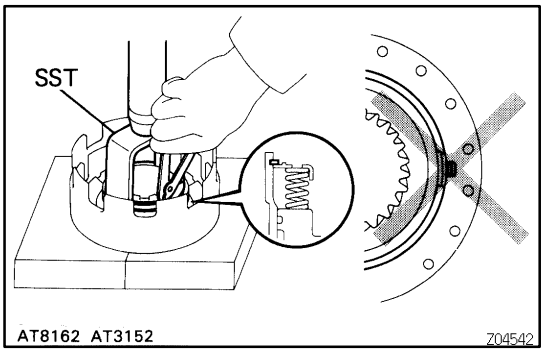
(a) Coat new O-rings with ATF and install them on the direct clutch piston.

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



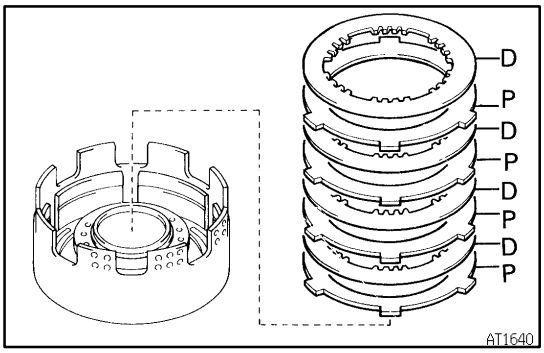
2. INSTALL PISTON RETURN SPRING

(a) Install the piston return spring.



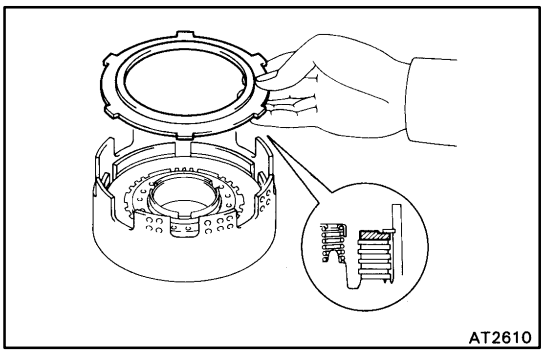
(b) Place SST on the spring retainer, and compress the return spring with a shop press.
SST 09350-30020 (09350-07040)

(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.

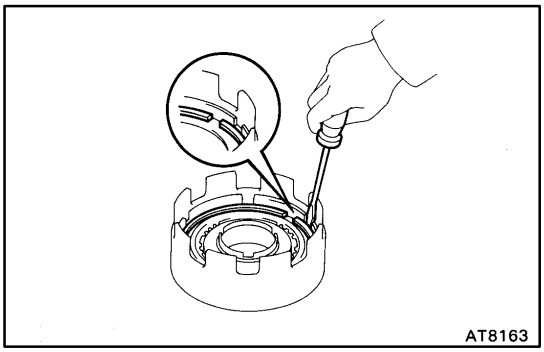


3. INSTALL PLATES, DISCS AND FLANGE

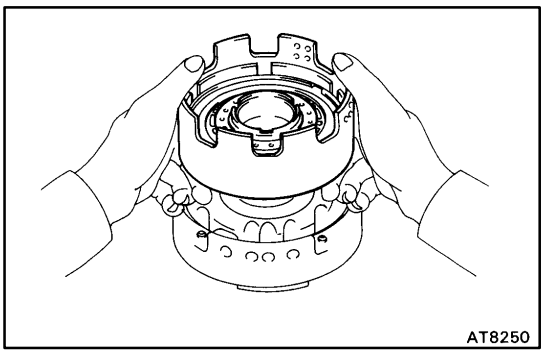
(a) Install the plates and discs.
Install in order: P = Plate D = Disc
P-D-P-D-P-D-P-D



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

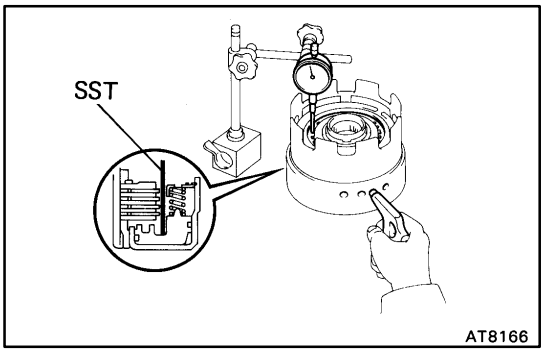


(c) Install the snap ring with a screwdriver. Be sure the end gap of the snap ring is not aligned with the cutout portion of the direct clutch drum.



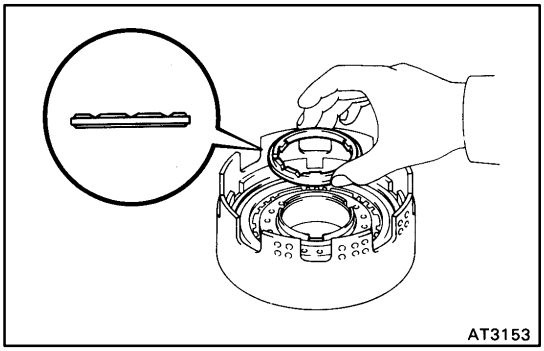
4. CHECK PISTON STROKE OF DIRECT CLUTCH

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



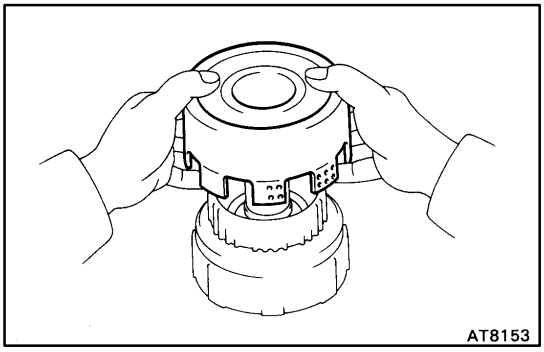
(b) Using SST and a dial indicator, measure the direct clutch piston stroke while applying and releasing compressed air (392-785 kPa, 4-8 kgf/cm^2, 57-114 psi).
SST 09350-30020 (09350-06120)
Piston stroke:
1.37-1.60 mm (0.0539-0.0630 in.)
If the piston stroke is less than the limit, parts may have been assembled incorrectly, so check and reassemble again.
If the piston stroke is non- standard, select another flange.
HINT: There are 8 different thicknesses for the flange.
Flange thickness
mm (in.)

No.	Thickness	No.	Thickness
33	3.0 (0.118)	29	3.4 (0.134)
32	3.1 (0.122)	28	3.5 (0.138)
31	3.2 (0.126)	27	3.6 (0.142)
30	3.3 (0.130)	34	3.7 (0.146)



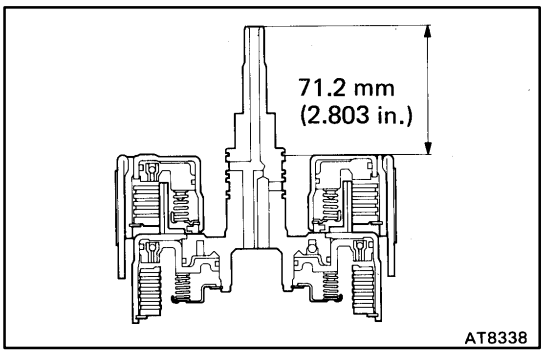
5. INSTALL CLUTCH DRUM THRUST WASHER

Coat the thrust washer with petroleum jelly and install it onto the direct clutch.



6. INSTALL DIRECT CLUTCH TO FORWARD CLUTCH

(a) Align the flukes of discs in the direct clutch.
(b) Install the direct clutch onto the forward clutch.

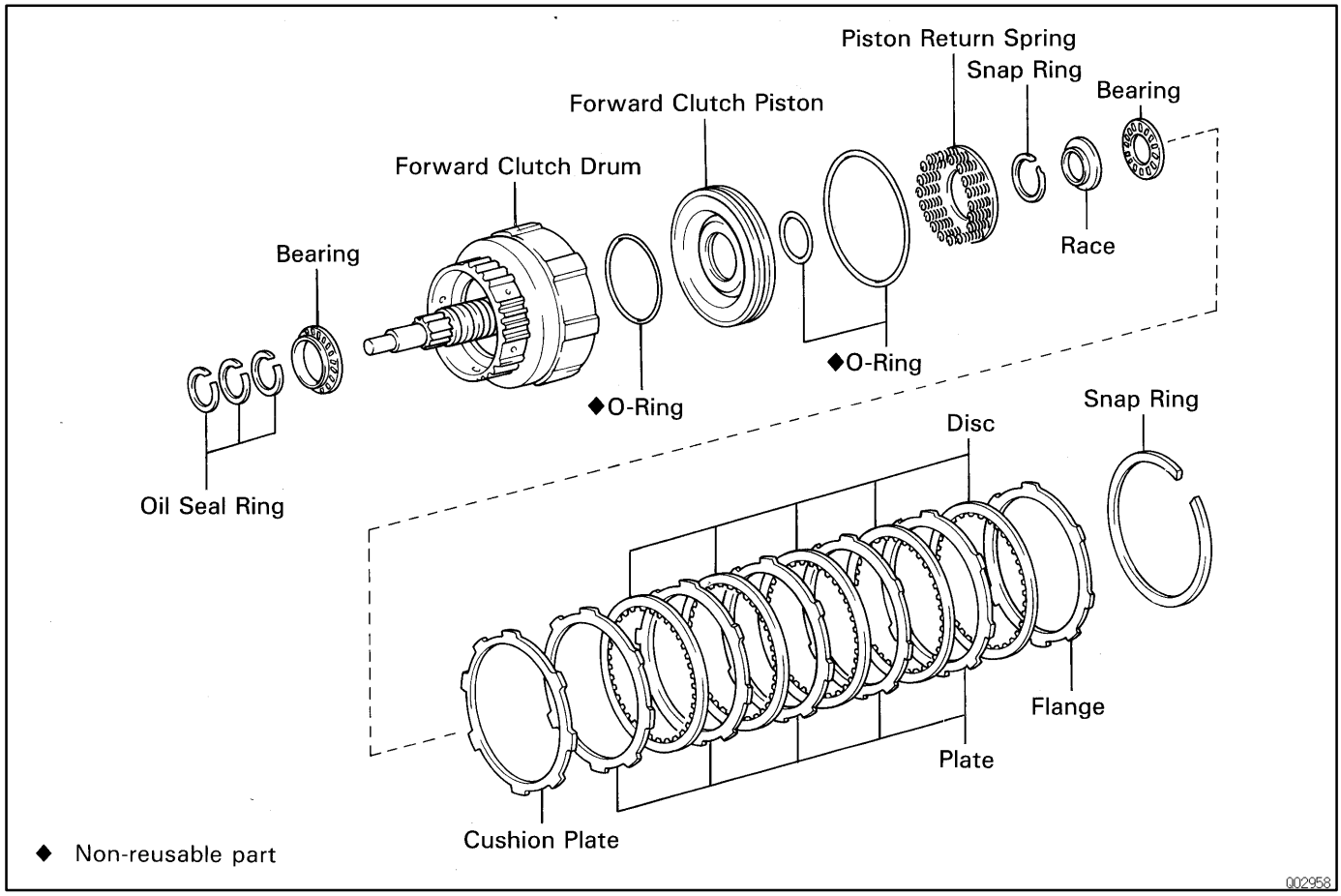


(c) Check that the distance from the direct clutch end to the forward clutch end is 71.2 mm (2.803 in.).
If the distance is less than the above value, parts may have been assembled incorrectly, check and reassemble again.

FORWARD CLUTCH

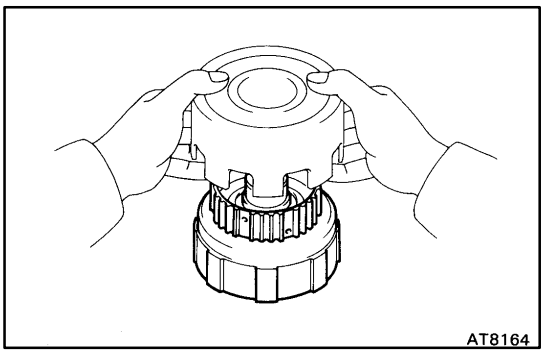
AT05P-05

COMPONENTS

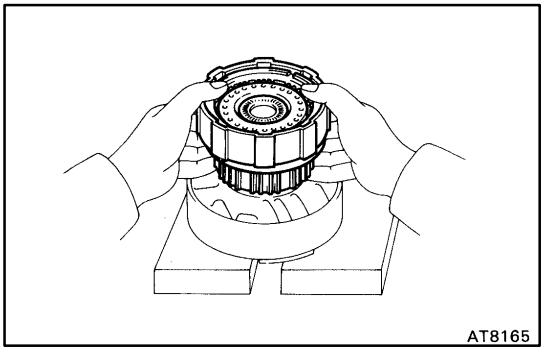


AT05Q-07

FORWARD CLUTCH DISASSEMBLY



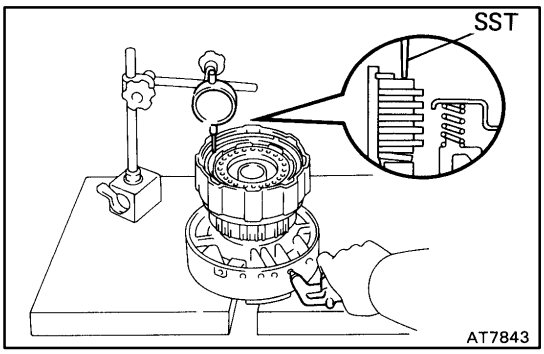
1. REMOVE FORWARD CLUTCH ASSEMBLY FROM DIRECT CLUTCH ASSEMBLY



2. PLACE FORWARD CLUTCH ONTO OVERDRIVE SUPPORT

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

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



3. CHECK PACK CLEARANCE OF FORWARD CLUTCH

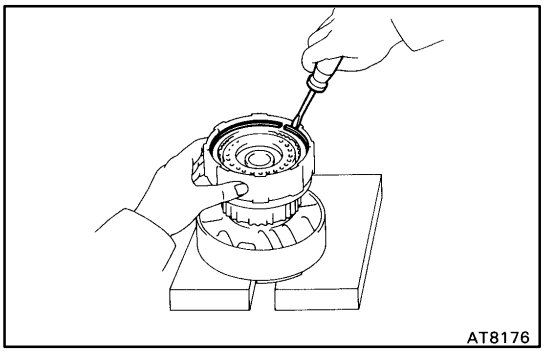
Using SST and a dial indicator, measure the forward clutch piston stroke while applying and releasing compressed air (392-785 kPa, 4-8 kgf/cm^2, 57-114 psi).

SST 09350-30020 (09350-06120)

Pack clearance:

0.5-0.9 mm (0.020-0.035 in.)

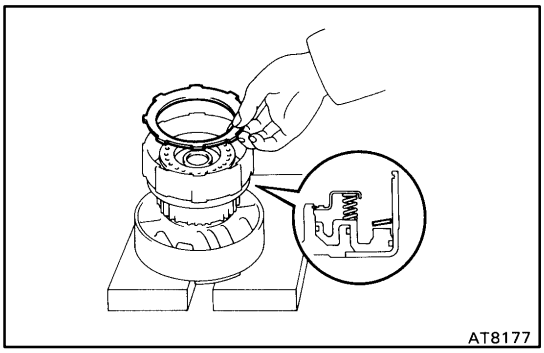
If the values are non-standard, inspect the discs.



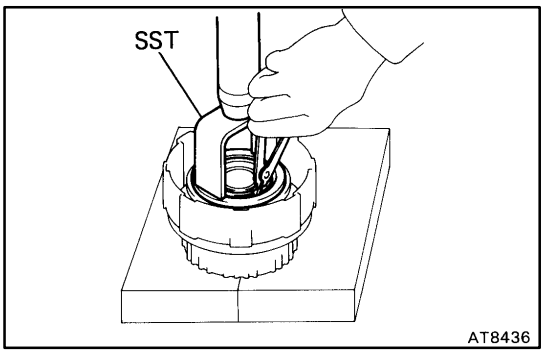
4. REMOVE FLANGE, PLATES AND DISCS

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

(b) Remove the flange, plates and discs.



5. REMOVE CUSHION PLATE

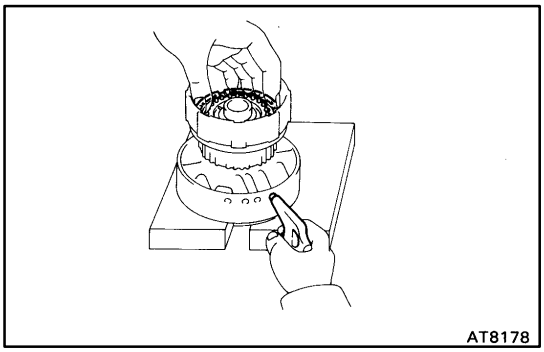


6. REMOVE PISTON RETURN SPRING

(a) Place SST on the spring retainer and compress the return spring with a shop press.
SST 09350-30020 (09350-07040)

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

(c) Remove the piston return spring.



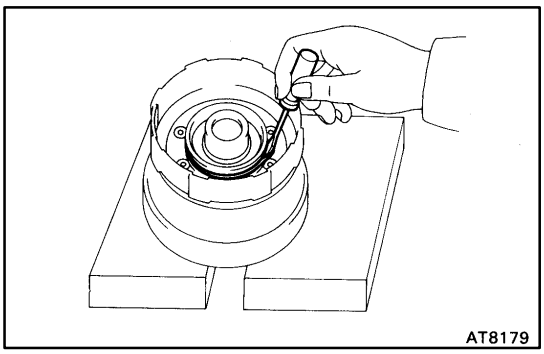
7. REMOVE FORWARD CLUTCH PISTON

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

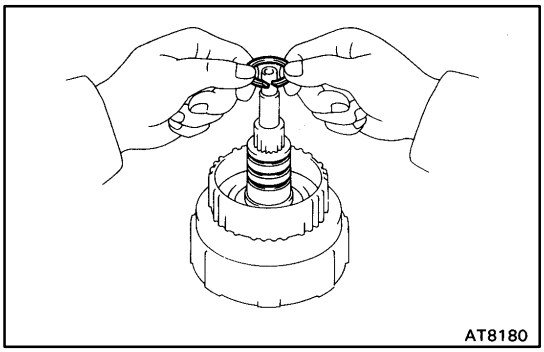
(b) Hold the forward clutch piston with hand, apply compressed air to the O/D support to remove the forward clutch piston.

(c) Remove the forward clutch piston.

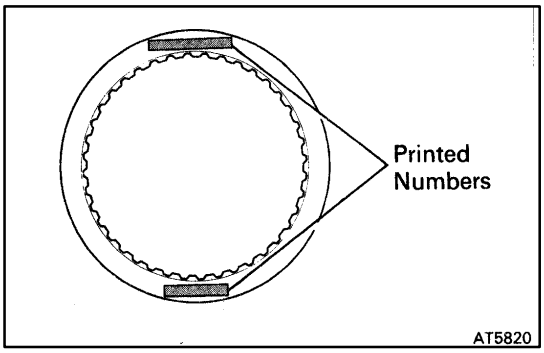
(d) Remove the 2 O-rings from the piston.



8. REMOVE O-RING FROM FORWARD CLUTCH DRUM



9. REMOVE 3 OIL SEAL RINGS



AT05R-06

FORWARD CLUTCH INSPECTION

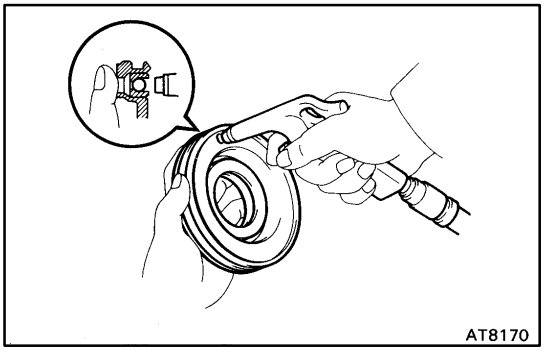
1. INSPECT DISC, PLATE AND FLANGE

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

HINT:

★ If the lining of the disc is peeling off or discolored, or even if a part of the printed numbers are defaced, replace all discs.

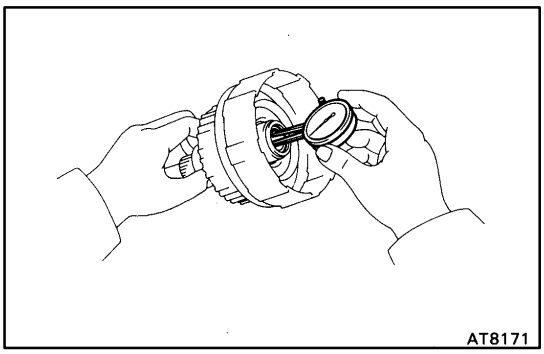
★ Before assembling new discs, soak them in ATF for at least 15 minutes.



2. CHECK FORWARD CLUTCH PISTON

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

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



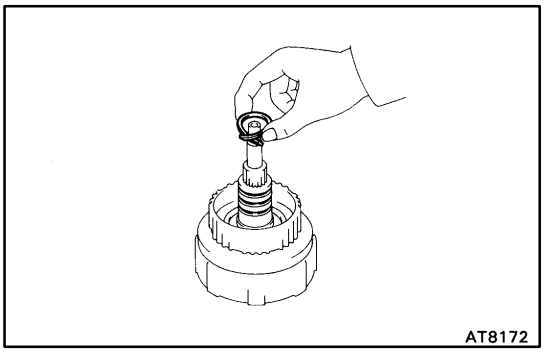
3. CHECK FORWARD CLUTCH DRUM BUSHING

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

Maximum inside diameter:

24.08 mm (0.9480 in.)

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



AT05S-08

FORWARD CLUTCH ASSEMBLY

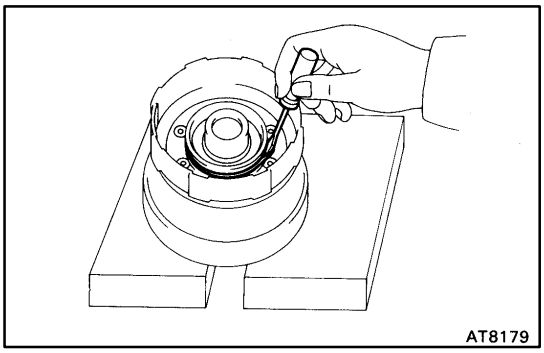
1. INSTALL OIL SEAL RINGS

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

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

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

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

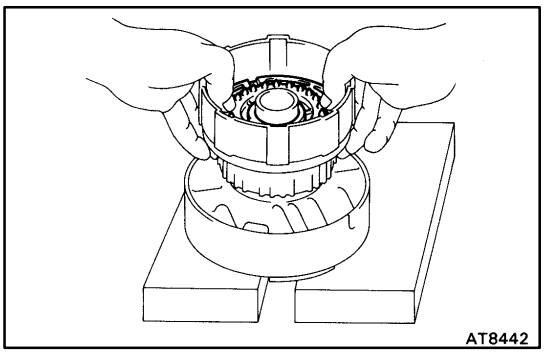


2. INSTALL NEW O-RING TO FORWARD CLUTCH DRUM

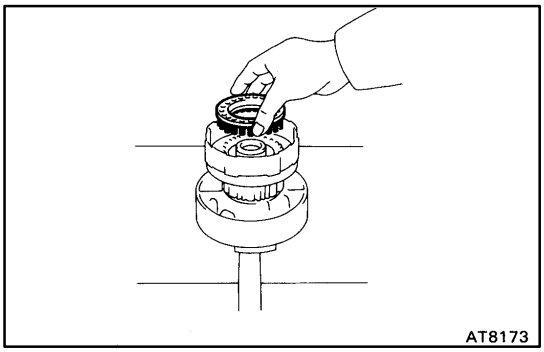
Coat a new O-ring with ATF and install it on the forward clutch drum.

3. INSTALL FORWARD CLUTCH PISTON

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

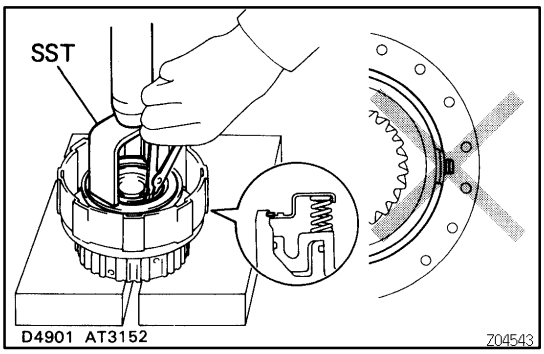


(b) Being careful not to damage the O-rings, press the clutch piston into the forward clutch drum with both hands.



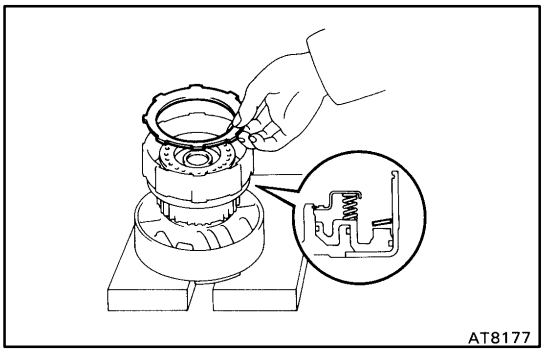
4. INSTALL PISTON RETURN SPRING

(a) Install the piston return spring.

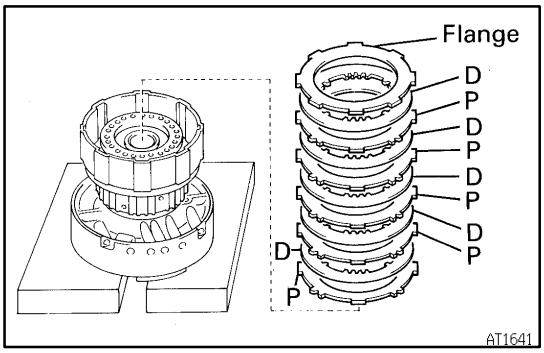


(b) Place SST on the spring retainer, and compress the return spring with a shop press.
SST 09350-30020 (09350-07040)

(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.



5. INSTALL CUSHION PLATE ROUNDED END DOWN

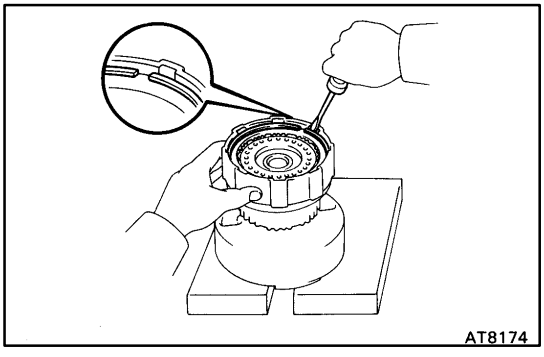


6. INSTALL PLATES, DISCS AND FLANGE

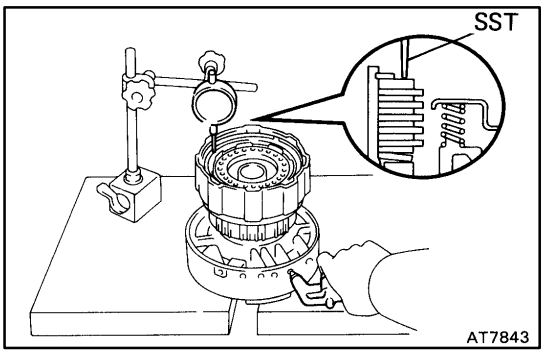
(a) Install in order: P = Plate D = Disc
P-D-P-D-P-D-P-D-P-D

(b) And then install the flange, the rounded edge facing downward.
HINT: There are 8 different thicknesses for the flange.
Flange thickness
mm (in.)

No.	Thickness	No.	Thickness
61	3.0 (0.118)	44	3.8 (0.150)
60	3.2 (0.126)	42	4.0 (0.157)
45	3.4 (0.134)	63	4.2 (0.165)
62	3.6 (0.142)	64	4.4 (0.173)



(c) Install the snap ring with a screwdriver. Be sure the end gap of the snap ring is not aligned with the cutout portion of the forward clutch drum.



7. CHECK PACK CLEARANCE OF FORWARD CLUTCH

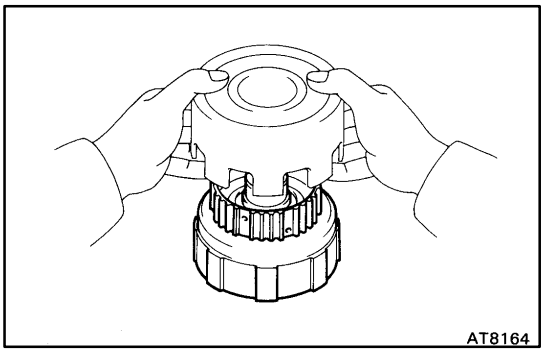
Using SST and a dial indicator, measure the forward clutch piston stroke while applying and releasing compressed air (392-785 kPa, 4-8 kgf/cm^2, 57-114 psi).

SST 09350-30020 (09350-06120)

Pack clearance:

0.5-0.9 mm (0.020-0.035 in.)

If the values are non-standard, inspect the discs.

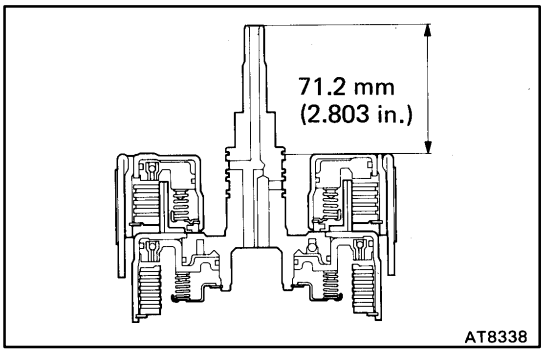


8. INSTALL DIRECT CLUTCH TO FORWARD CLUTCH

(a) Make sure that the thrust washer is installed to the direct clutch drum.

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

(c) Install the direct clutch onto the forward clutch.



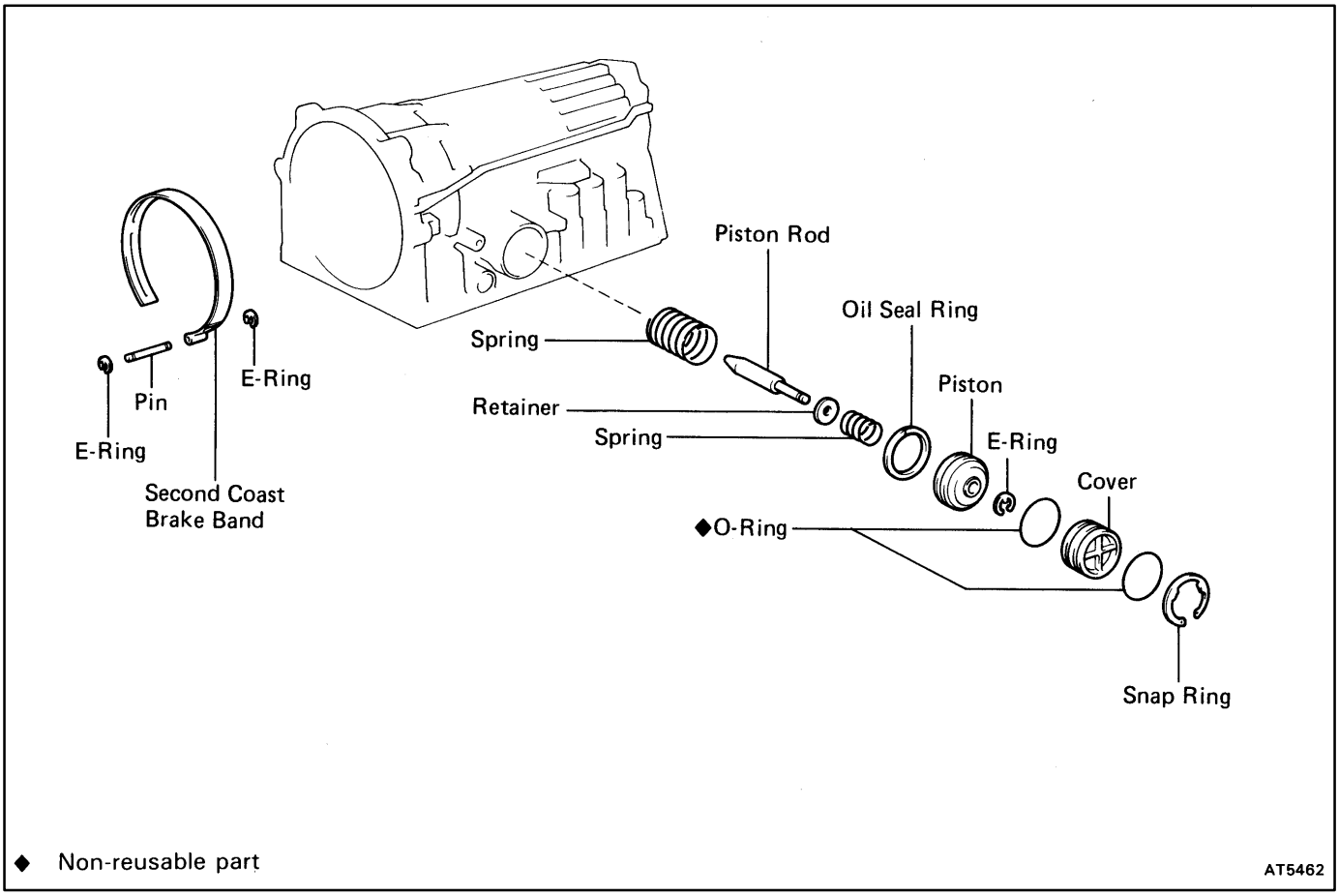
(d) Check that the distance from the direct clutch end to the forward clutch end is 71.2 mm (2.803 in.).

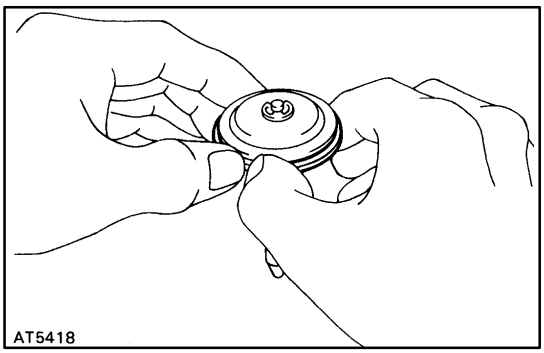
If the distance is less than the above value, parts may have been assembled incorrectly, check and reassemble again.

SECOND COAST BRAKE

AX0AG-0A

COMPONENTS



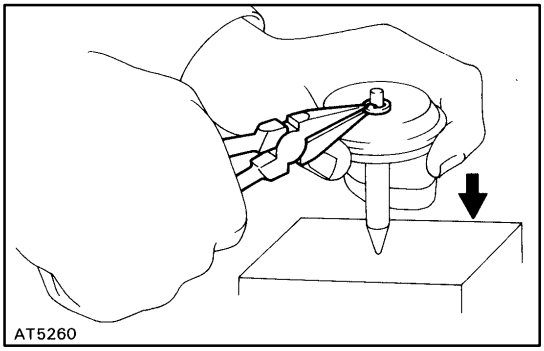


SECOND COAST BRAKE DISASSEMBLY

AX0AH-0A

1. REMOVE SECOND COAST BRAKE PISTON OIL SEAL RING

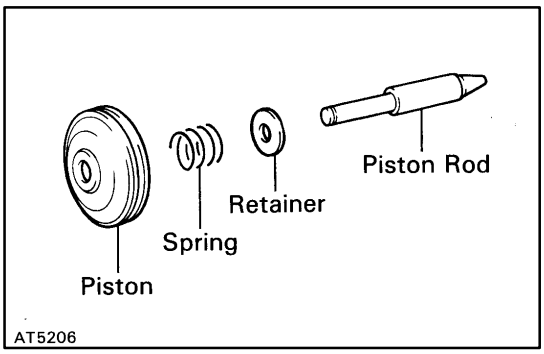
Remove the oil seal ring from the piston.



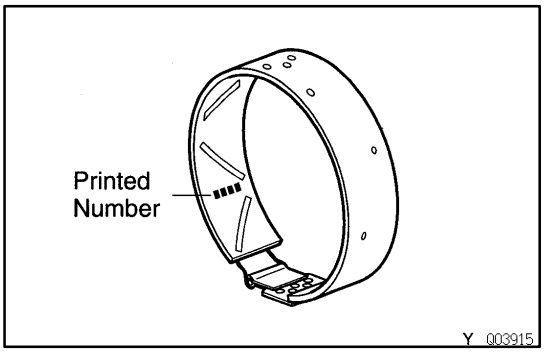
2. REMOVE SECOND COAST BRAKE PISTON ROD

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

(b) Using needle nose-pliers, remove the E-ring.



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



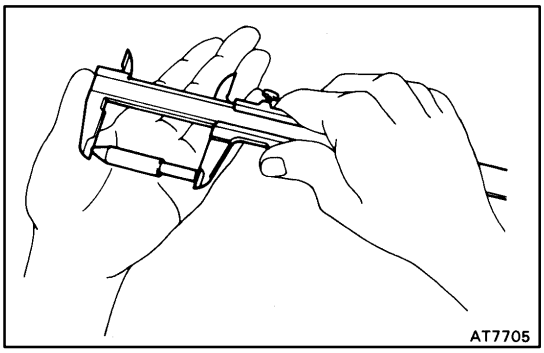
AT0SN-01

SECOND COAST BRAKE BAND INSPECTION

INSPECT BRAKE BAND

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

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



AX0AK-0D

SECOND COAST BRAKE PISTON ASSEMBLY

1. SELECT PISTON ROD

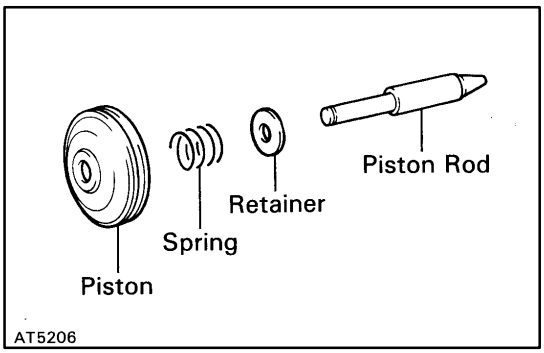
If the band is OK with piston stroke not within the standard value, select a new piston rod.

There are 2 different lengths of piston rod.

Piston rod length:

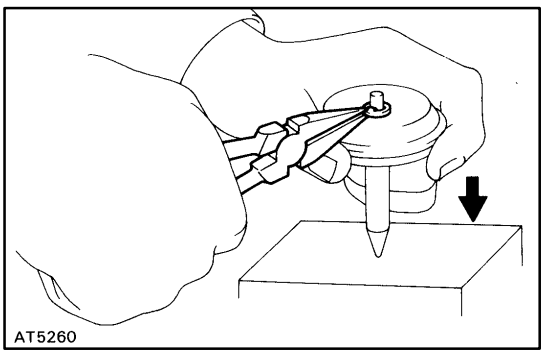
71.4 mm (2.811 in.)

72.9 mm (2.870 in.)



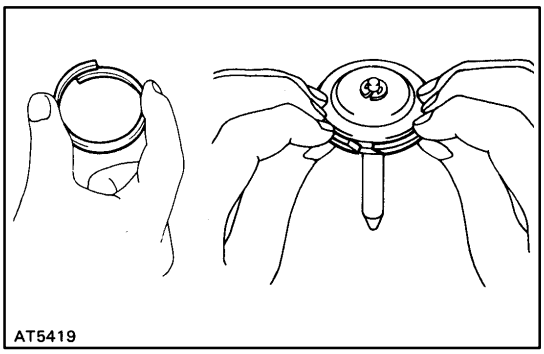
2. INSTALL PISTON ROD

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



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

(c) Using needle-nose pliers, install the E-ring.



3. INSTALL SECOND COAST BRAKE PISTON OIL SEAL RING

(a) Coat the oil seal ring with ATF.

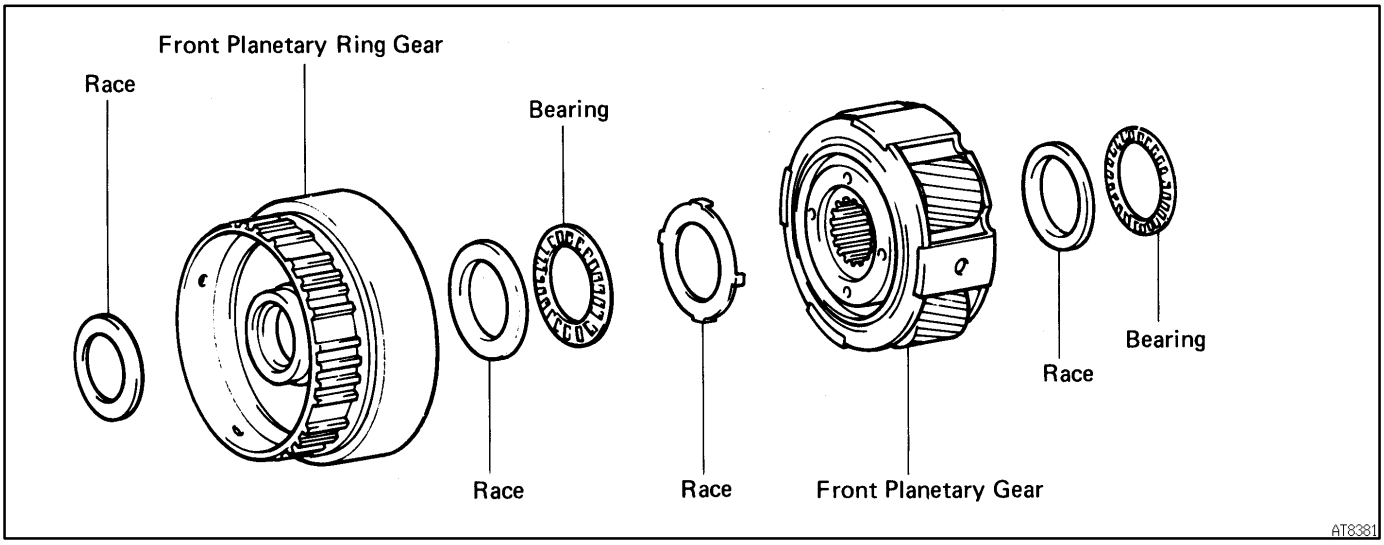
(b) Install the oil seal ring to the piston groove, then snug it down by squeezing its ends together.

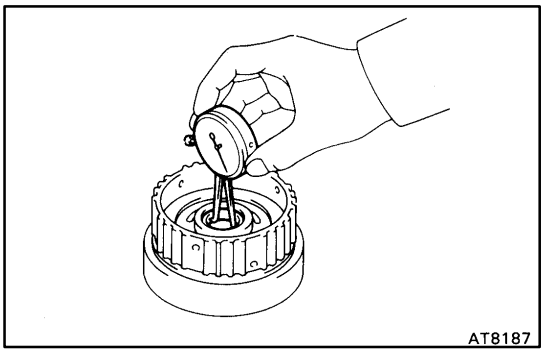
NOTICE: Do not spread the ring ends more than necessary.

FRONT PLANETARY GEAR

AT05T-03

COMPONENTS





FRONT PLANETARY GEAR INSPECTION

AT05U-04

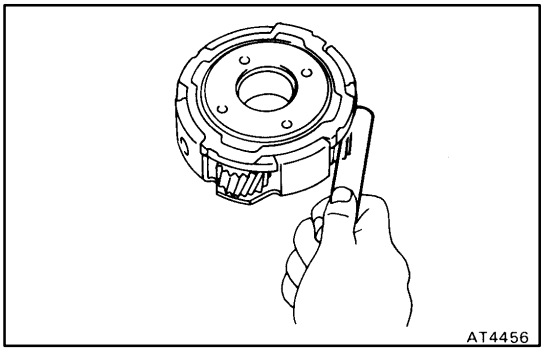
1. CHECK FRONT PLANETARY RING GEAR BUSHING

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

Maximum inside diameter:

24.08 mm (0.9480 in.)

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



2. MEASURE PLANETARY PINION GEAR THRUST CLEARANCE

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

Standard clearance:

0.20-0.60 mm (0.0079-0.0236 in.)

Maximum clearance:

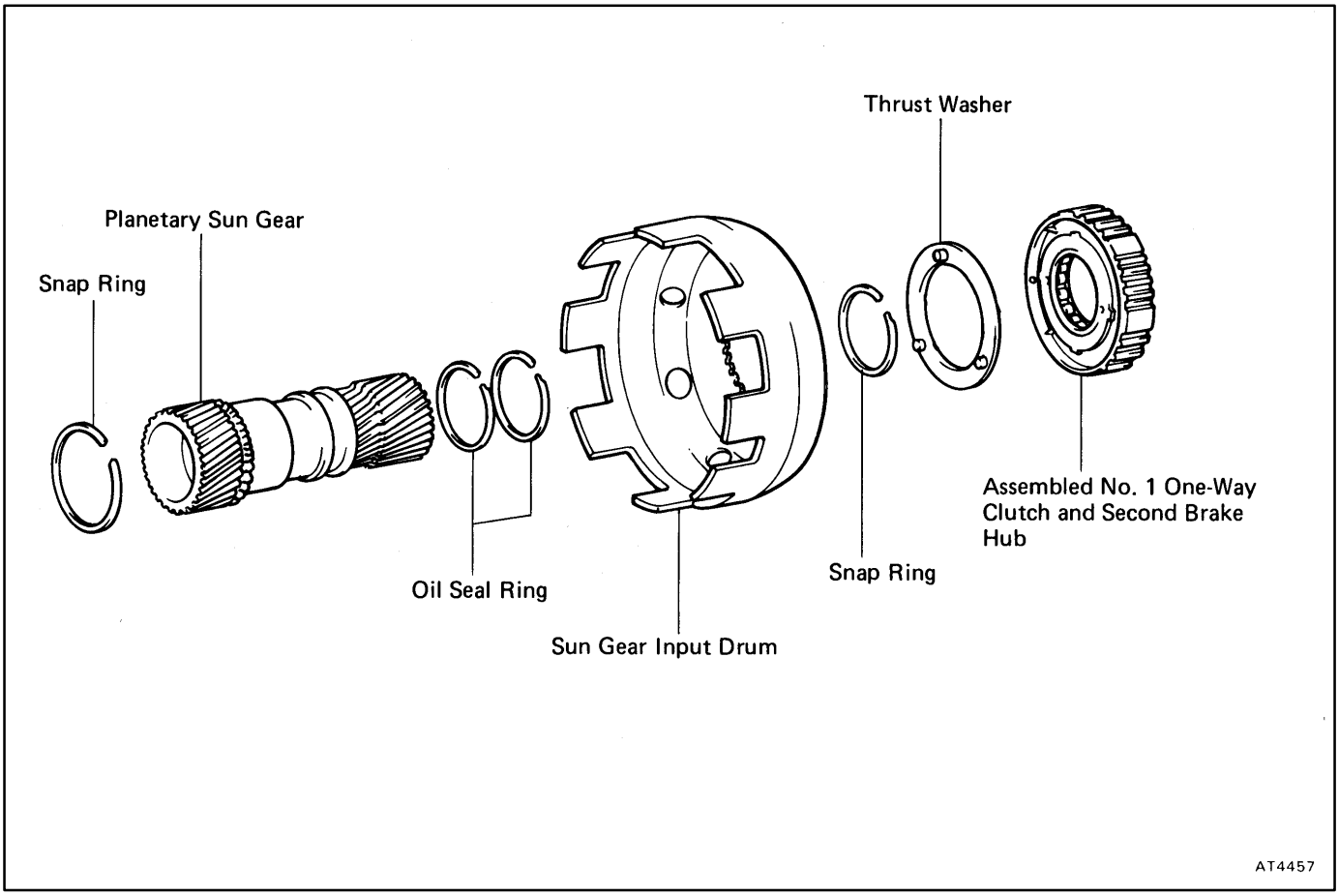
1.00 mm (0.0394 in.)

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

PLANETARY SUN GEAR

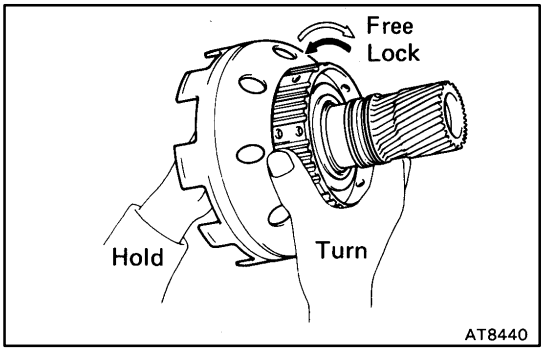
AT05V-03

COMPONENTS



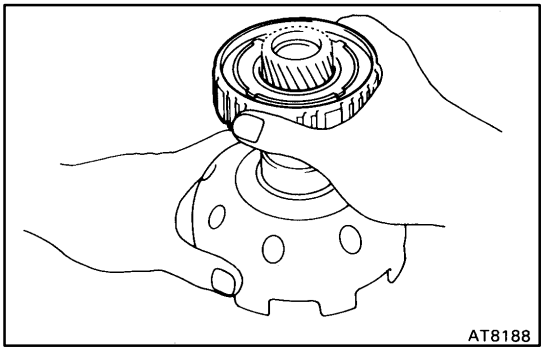
AT05W-04

PLANETARY SUN GEAR AND NO.1 ONE-WAY CLUTCH DISASSEMBLY

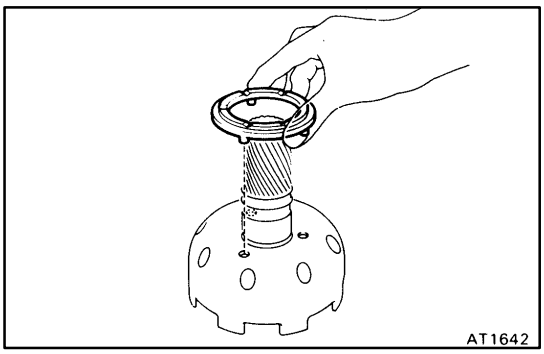


1. CHECK OPERATION OF NO.1 ONE-WAY CLUTCH

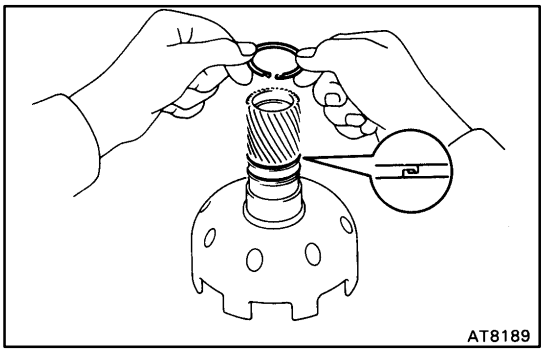
Hold the planetary sun gear and turn the second brake hub. Check that the second brake hub must be able to turn freely clockwise and locks counterclockwise.



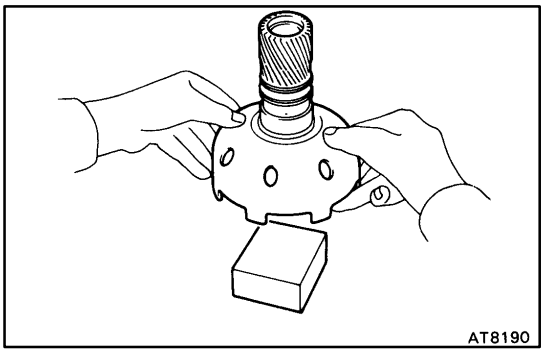
2. REMOVE ASSEMBLED NO.1 ONE-WAY CLUTCH AND SECOND BRAKE HUB



3. REMOVE THRUST WASHER FROM SUN GEAR INPUT DRUM

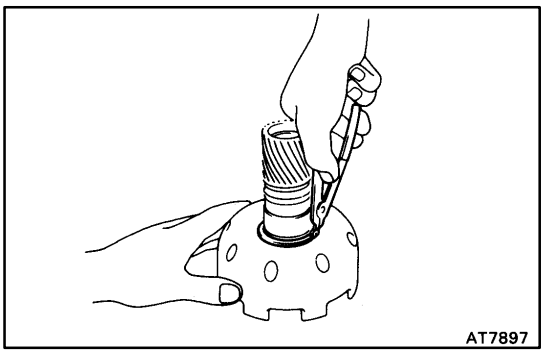


4. REMOVE 2 OIL SEAL RINGS

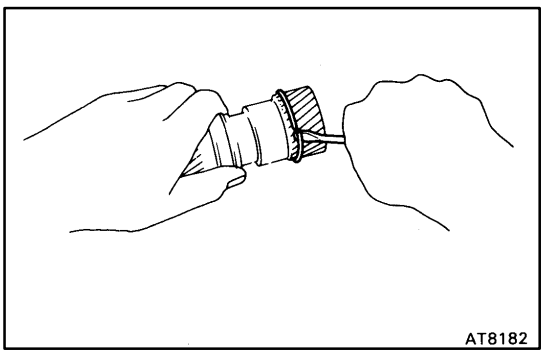


5. REMOVE SUN GEAR INPUT DRUM FROM PLANETARY SUN GEAR

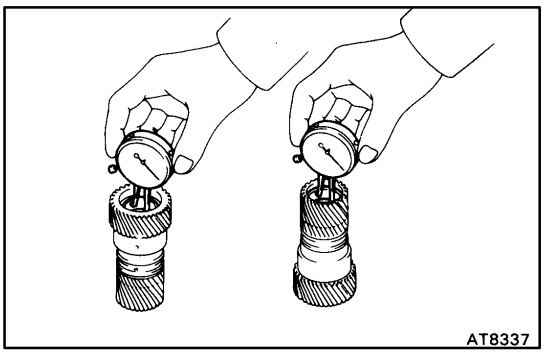
(a) Use a wooden block or similar, as work stand.



(b) Using snap ring pliers, remove the snap ring.
(c) Remove the sun gear input drum from the planetary sun gear.



6. REMOVE SNAP RING FROM PLANETARY SUN GEAR



AT05X-03

PLANETARY SUN GEAR INSPECTION

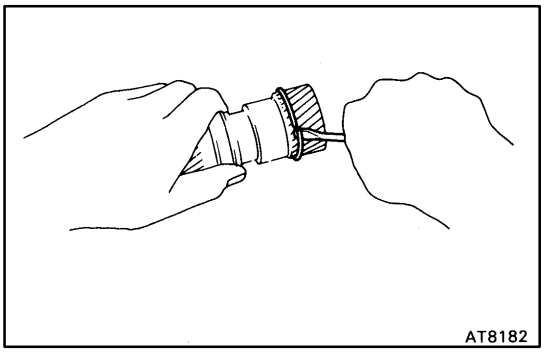
CHECK PLANETARY SUN GEAR BUSHINGS

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

Maximum inside diameter:

27.08 mm (1.0661 in.)

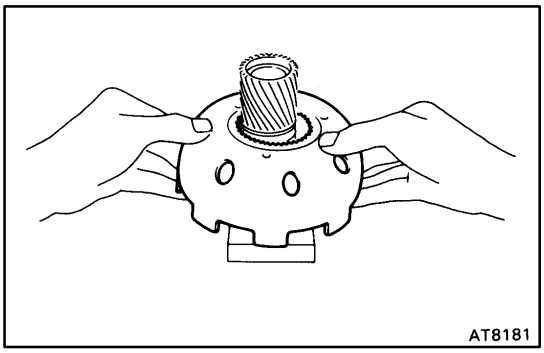
If the inside diameter is greater than the maximum, replace the planetary sun gear.



AT05Y-07

PLANETARY SUN GEAR AND NO.1 ONE-WAY CLUTCH ASSEMBLY

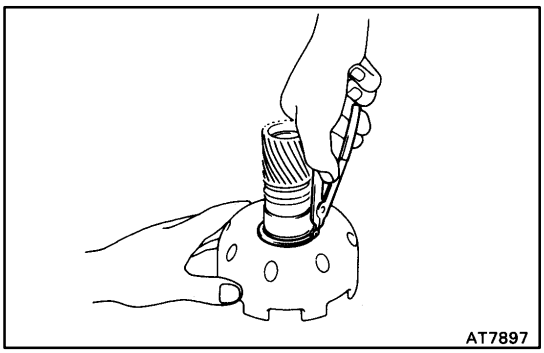
1. INSTALL SNAP RING TO PLANETARY SUN GEAR



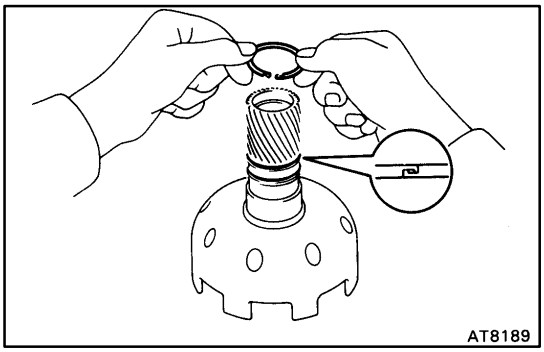
2. INSTALL SUN GEAR INPUT DRUM

(a) Place a wooden block or similar, as a work stand and place the planetary sun gear onto it.

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



(c) Install the snap ring with snap ring pliers.



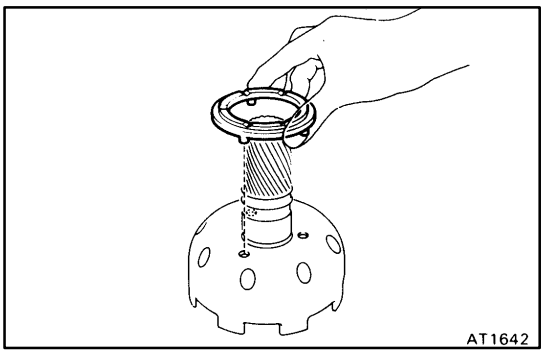
3. INSTALL OIL SEAL RINGS

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

(b) Install the 2 oil seal rings onto the planetary sun gear.

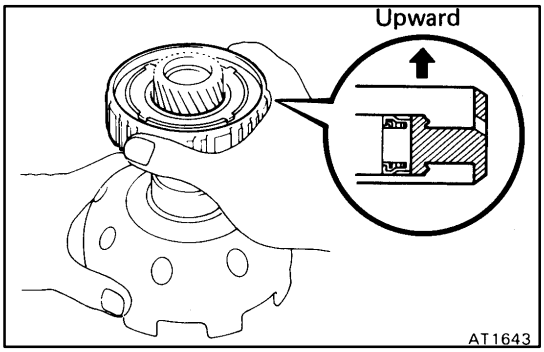
NOTICE: Do not spread the ring ends too much.

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

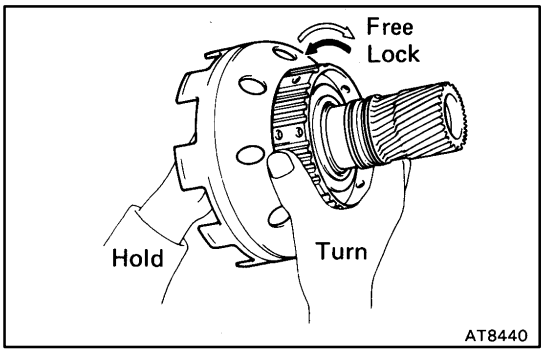


4. INSTALL THRUST WASHER

HINT: Make sure that the lug shapes match the holes on the sun gear input drum.



5. INSTALL ASSEMBLED NO.1 ONE-WAY CLUTCH AND SECOND BRAKE HUB ONTO PLANETARY SUN GEAR



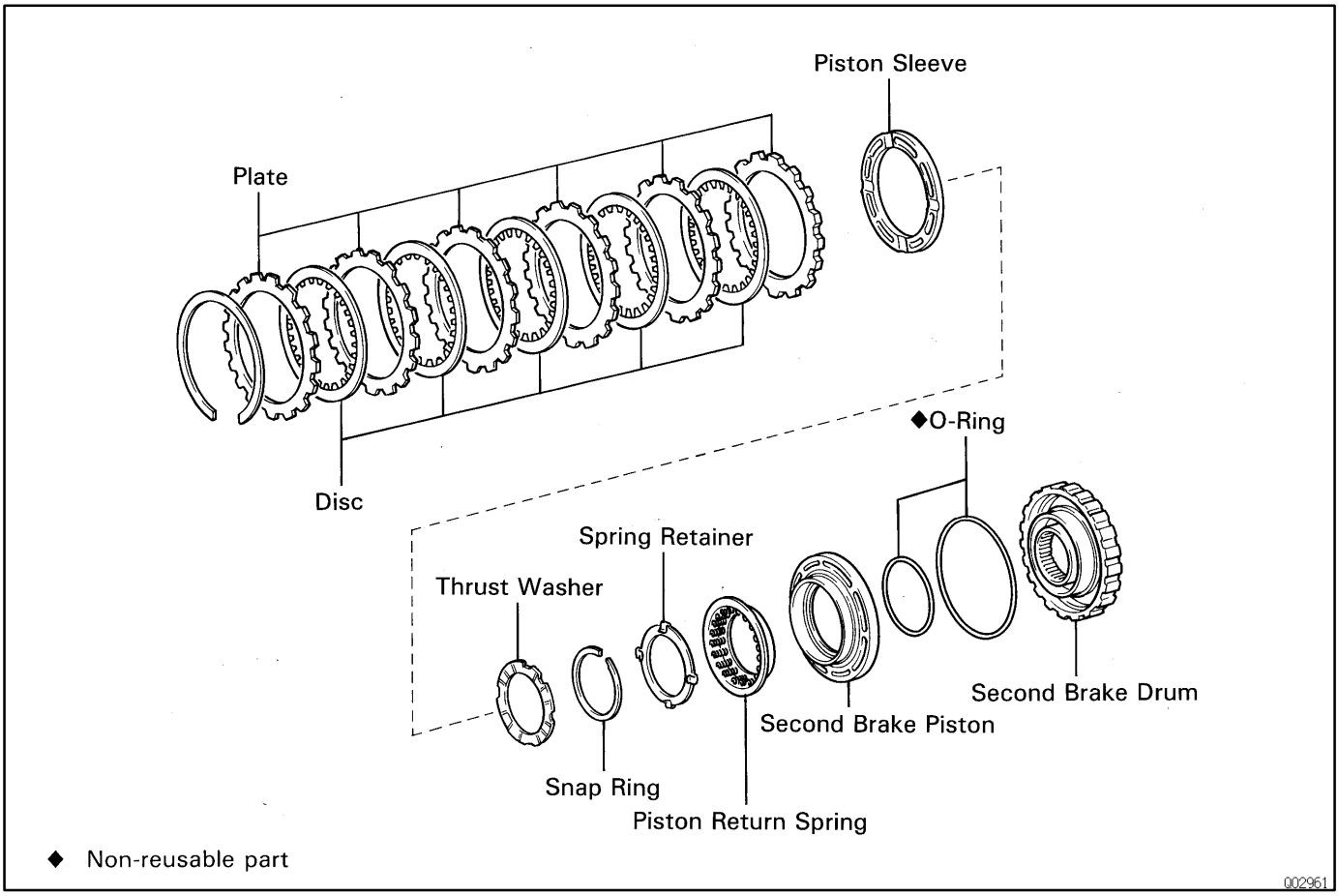
6. CHECK OPERATION OF NO.1 ONE-WAY CLUTCH

Hold the planetary sun gear and turn the second brake hub. Check that the second brake hub must be able to turn freely clockwise and locks counterclockwise.

SECOND BRAKE

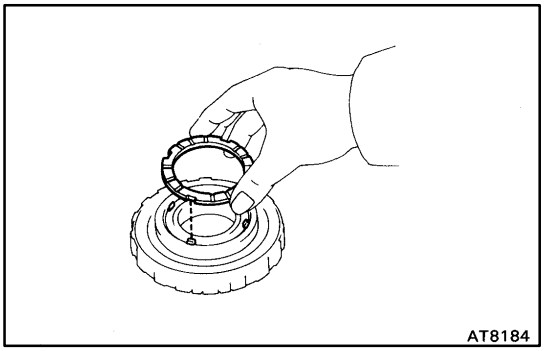
AT05Z-05

COMPONENTS

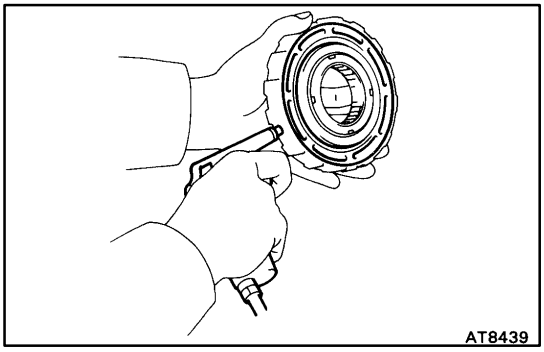


AT060-05

SECOND BRAKE DISASSEMBLY

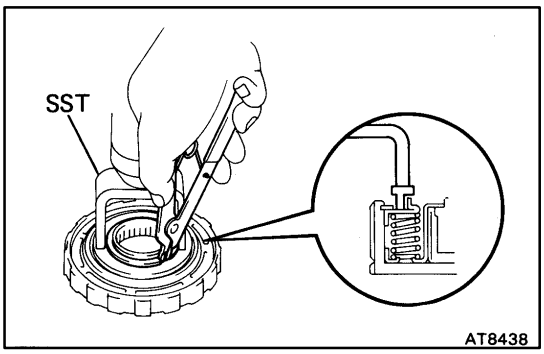


1. REMOVE THRUST WASHER FROM SECOND BRAKE DRUM



2. CHECK SECOND BRAKE PISTON MOVEMENT

Make sure the second brake piston moves smoothly when applying and releasing low-pressure compressed air to the second brake drum.

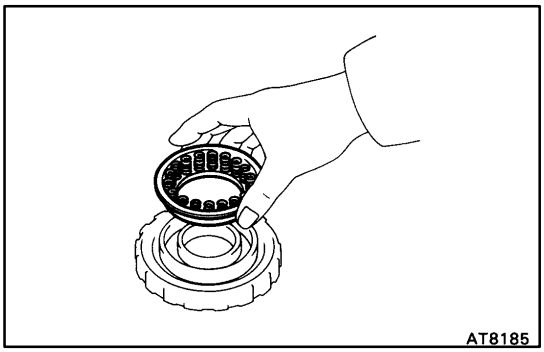


3. REMOVE PISTON RETURN SPRING

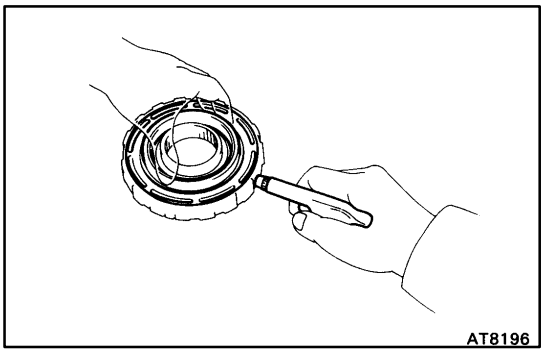
(a) Place SST on the spring retainer, and compress the return spring with a shop press.
SST 09350-30020 (09350-07040)

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

(c) Remove the spring retainer.



(d) Remove the piston return spring.

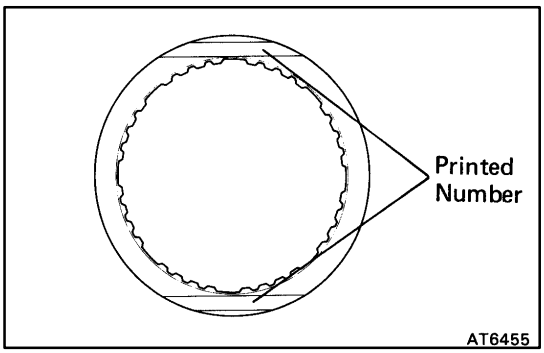


4. REMOVE SECOND BRAKE PISTON

(a) Hold the second brake piston with hand, apply compressed air to the second brake drum to remove the second brake piston.

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

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



AT061-06

SECOND BRAKE INSPECTION

INSPECT DISC, PLATE AND FLANGE

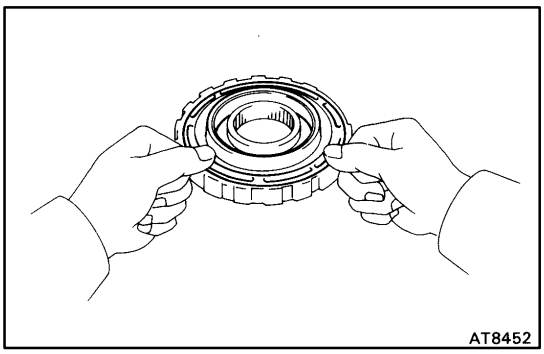
Check to see if the sliding surface of the disc, plate and flange are worn or burnt. If necessary, replace them.
HINT:

★ If the lining of the disc is peeling off or discolored, or even if a part of the printed numbers are defaced, replace all discs.

★ Before assembling new discs, soak them in ATF for at least 15 minutes.

AT062-03

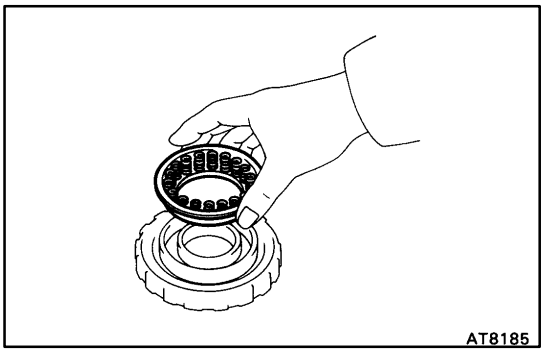
SECOND BRAKE ASSEMBLY



1. INSTALL SECOND BRAKE PISTON

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

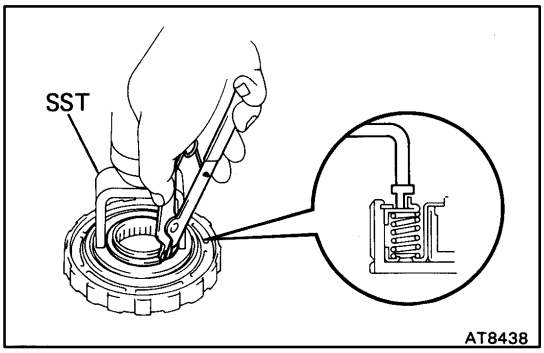
(b) Being careful not to damage the O-rings, press the second brake piston into the second brake drum with both hands.



2. INSTALL PISTON RETURN SPRING

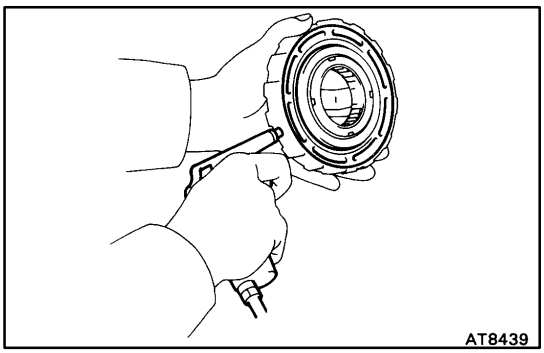
(a) Install the piston return spring.

(b) Install the spring retainer.



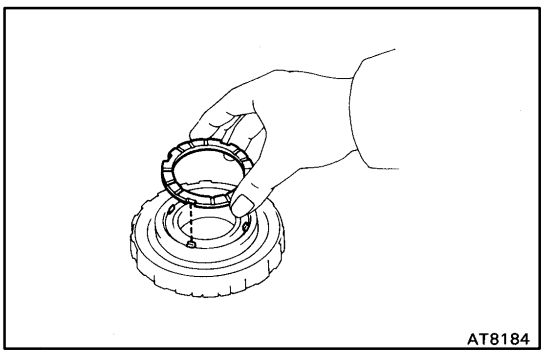
(c) Place SST on the spring retainer, and compress the return spring with a shop press.
SST 09350-30020 (09350-07040)

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



3. CHECK SECOND BRAKE PISTON MOVEMENT

Make sure the second brake piston moves smoothly when applying and releasing low-pressure compressed air to the second brake drum.



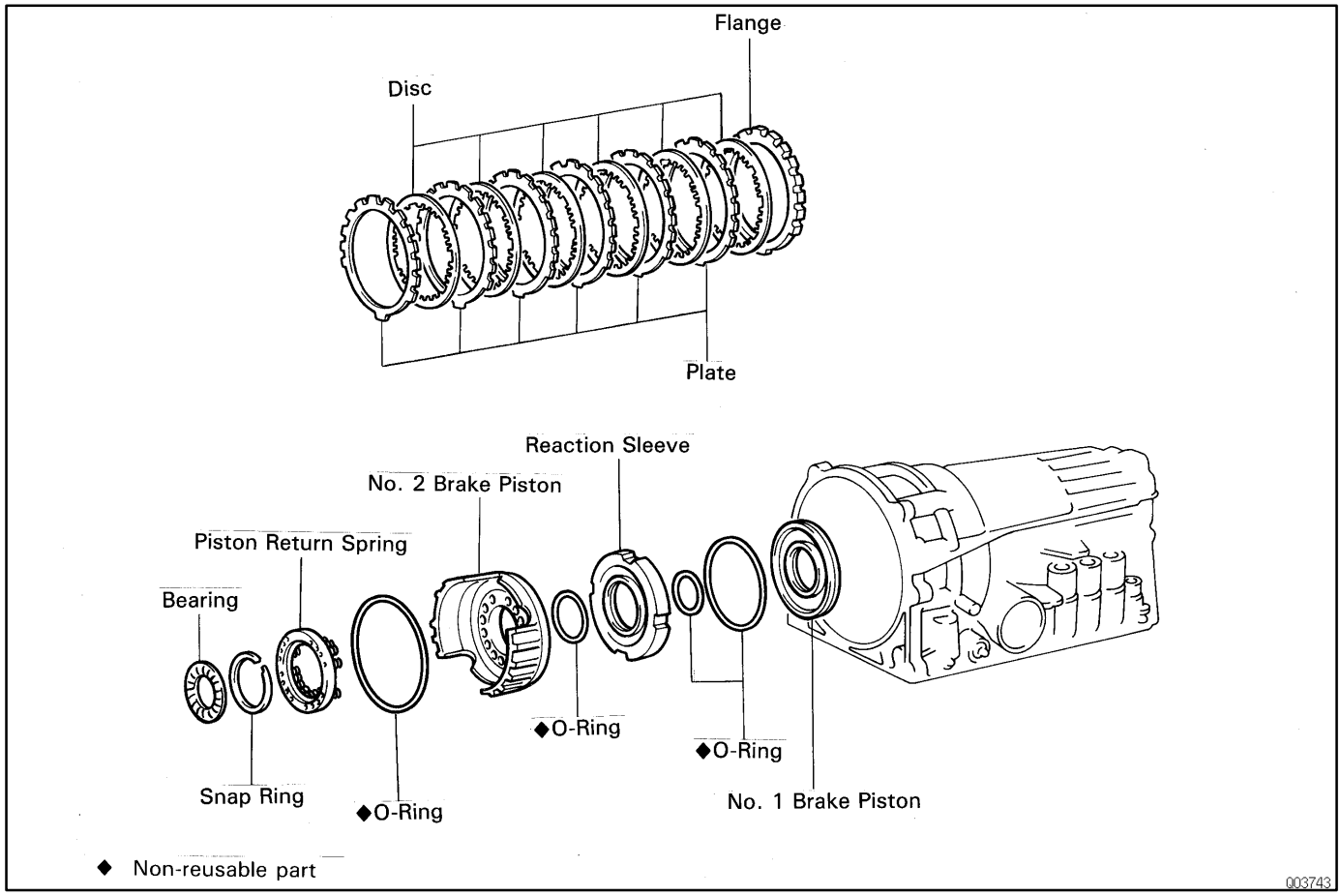
4. INSTALL THRUST WASHER

Coat the thrust washer with petroleum jelly and install it.
HINT: Make sure that the cutout portions of thrust washer match teeth of the spring retainer.

FIRST AND REVERSE BRAKE

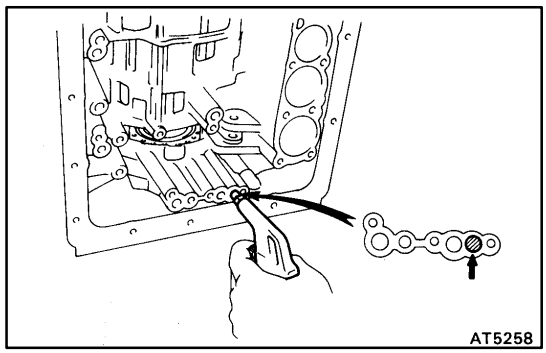
AT063-05

COMPONENTS



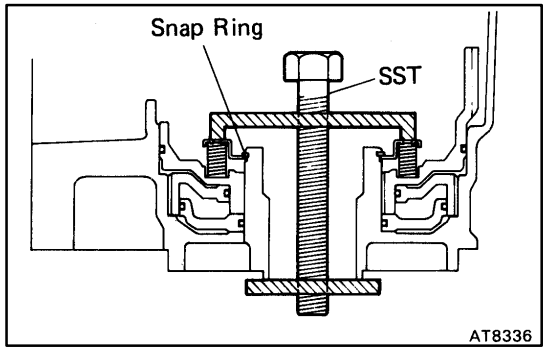
AT0CB-02

FIRST AND REVERSE BRAKE DISASSEMBLY



1. CHECK PISTON STROKE OF FIRST AND REVERSE BRAKE

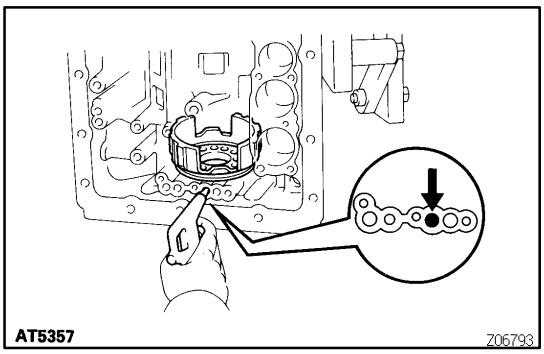
Make sure the first and reverse brake pistons move smoothly when applying and releasing the compressed air into the transmission case.



2. REMOVE PISTON RETURN SPRING

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

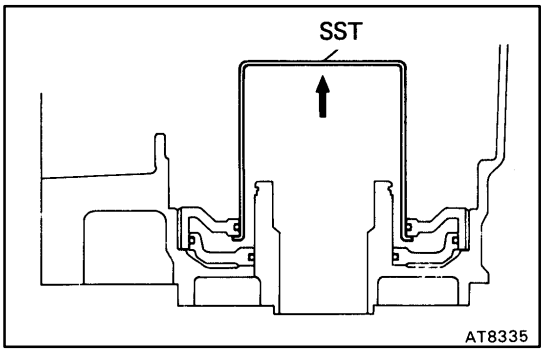
(b) Using SST, remove the snap ring.
SST 09350-30020 (09350-07070)



3. REMOVE NO.2 BRAKE PISTON

(a) Hold No.2 brake piston with hand, apply compressed air to transmission case to remove No.2 brake piston.
HINT: If the piston does not pop out with compressed air, lift the piston out with needle-nose pliers.

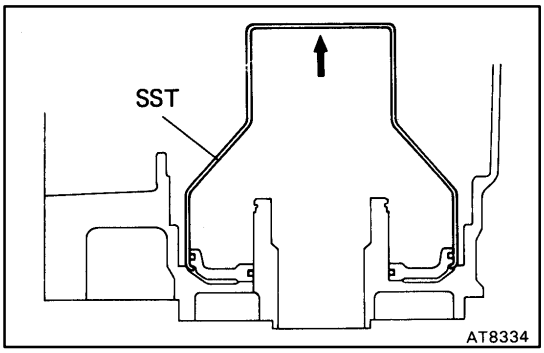
(b) Remove the O-ring from No.2 brake piston.



4. REMOVE REACTION SLEEVE

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

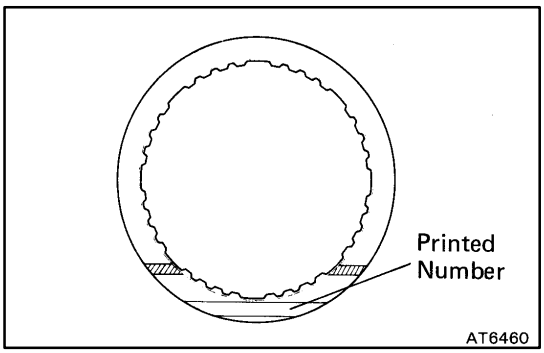
(b) Remove the O-ring from the reaction sleeve.



5. REMOVE NO.1 BRAKE PISTON

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

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



FIRST AND REVERSE BRAKE INSPECTION

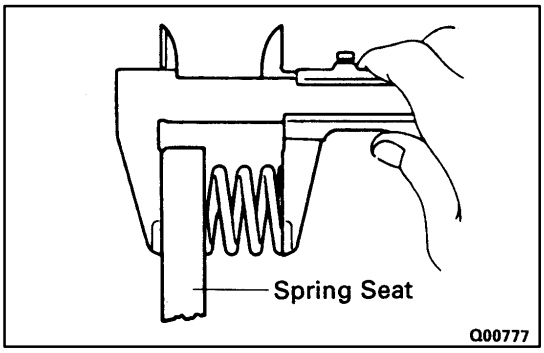
AT0CC-02

1. INSPECT DISC, PLATE AND FLANGE

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

★ If the lining of the disc is peeling off or discolored or even if a part of the printed numbers are defaced, replace all discs.

★ Before assembling new discs, soak them in ATF for at least 15 minutes.



2. CHECK PISTON RETURN SPRING

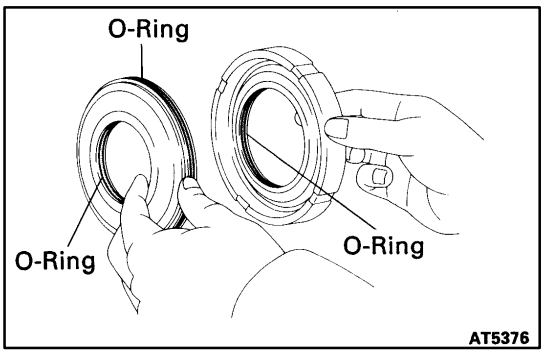
Check the return spring free length together with the spring seat.

Standard free length:

12.9 mm (0.508 in.)

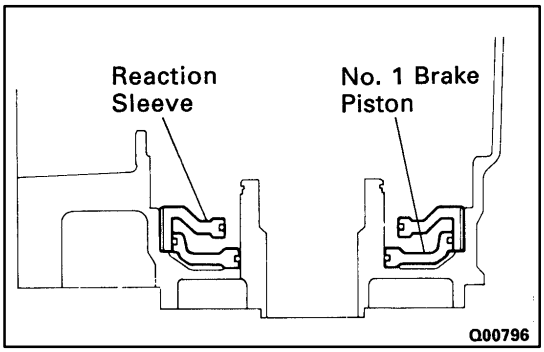
AT0CD-02

FIRST AND REVERSE BRAKE PISTON ASSEMBLY



1. INSTALL NO.1 BRAKE PISTON

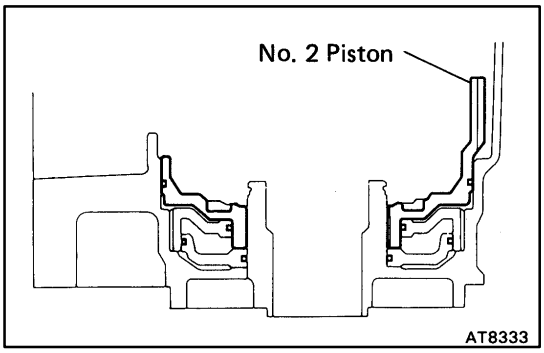
(a) Coat the 3 new O-rings with ATF.
(b) Install the 2 O-rings on No.1 brake piston.
(c) Install the O-ring on the reaction sleeve.
(d) Install the No.1 brake piston on the reaction sleeve.



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

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

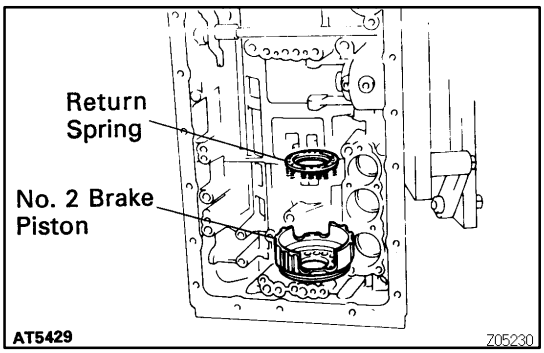
NOTICE: Be careful not to damage the O-rings.



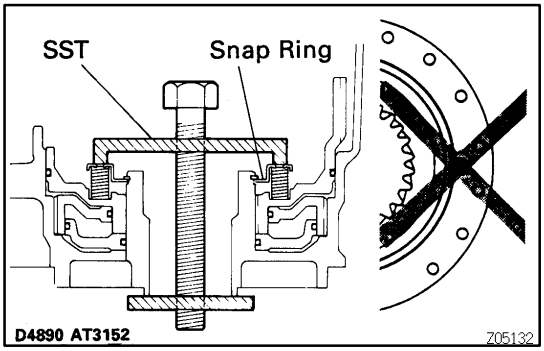
3. INSTALL NO.2 BRAKE PISTON

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

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

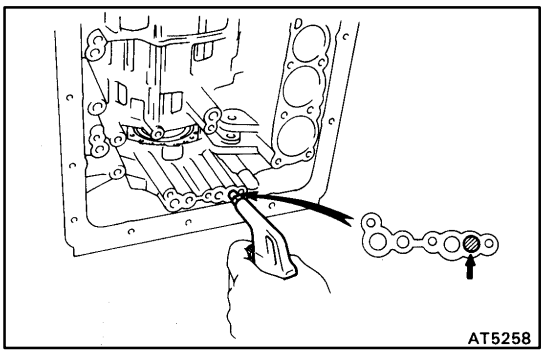


(d) Place the piston return spring onto the No.2 brake piston.



4. INSTALL PISTON RETURN SPRING

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



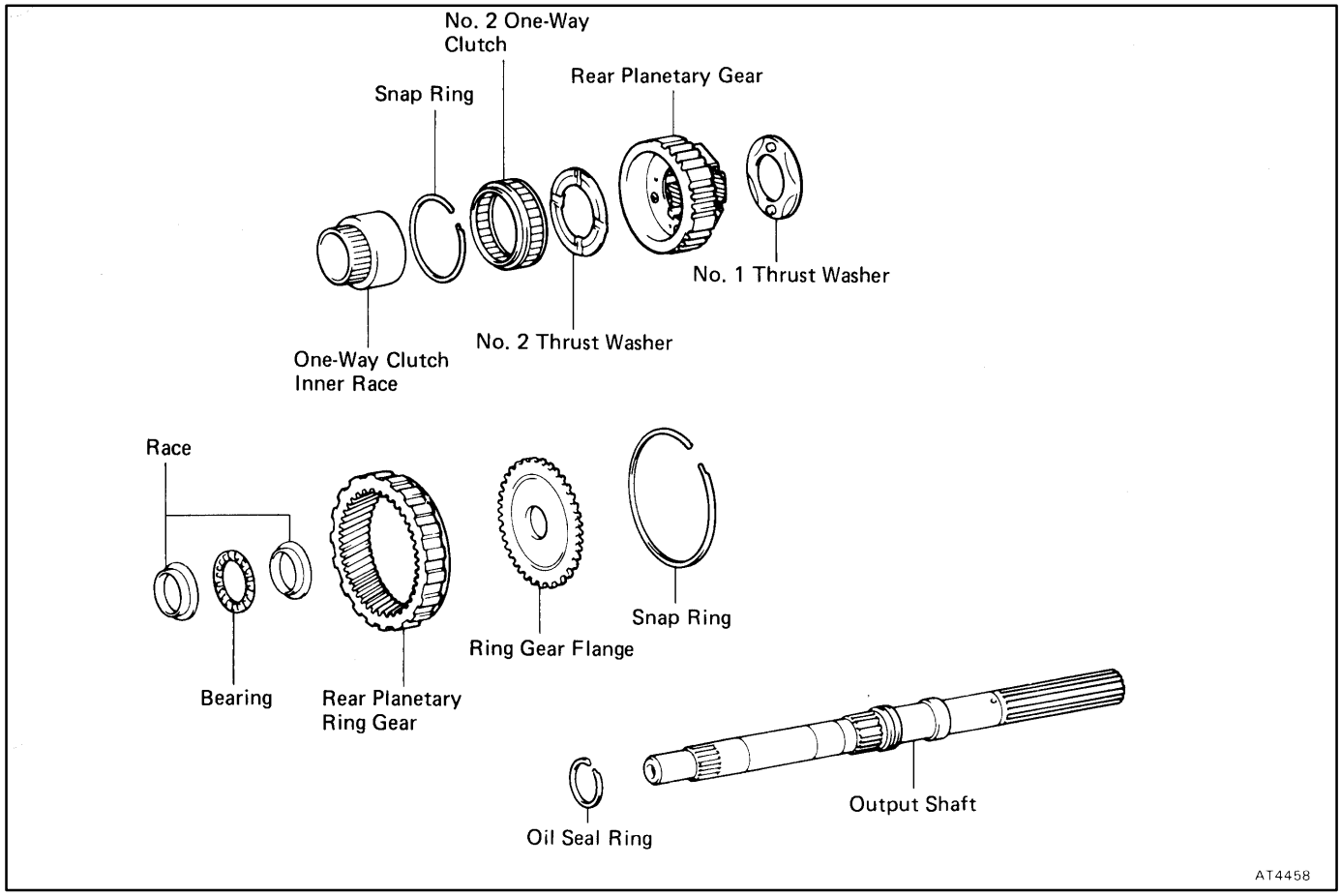
5. CHECK PISTON STROKE OF FIRST AND REVERSE BRAKE

Make sure the first and reverse brake pistons move smoothly when applying and releasing the compressed air into the transmission case.

REAR PLANETARY GEAR

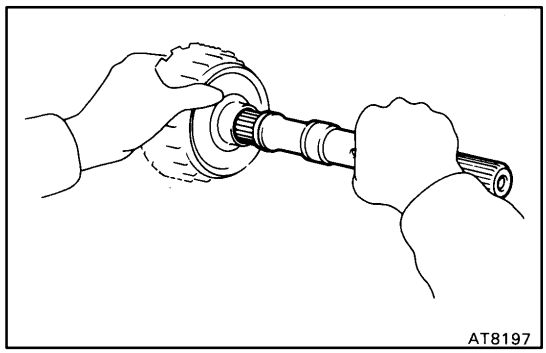
AT065-03

COMPONENTS

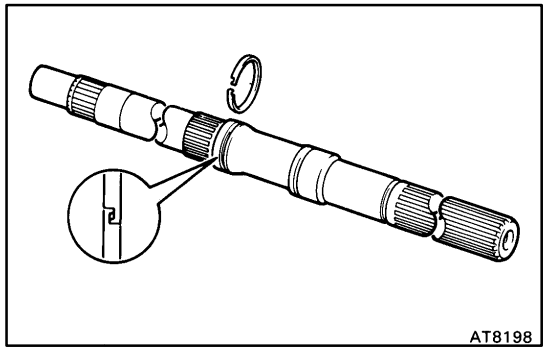


AT066-05

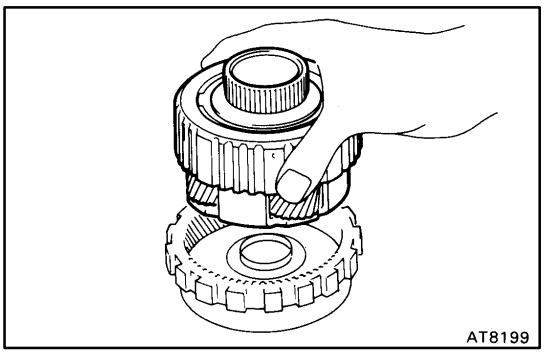
REAR PLANETARY GEAR, NO.2 ONE-WAY CLUTCH AND OUTPUT SHAFT DISASSEMBLY



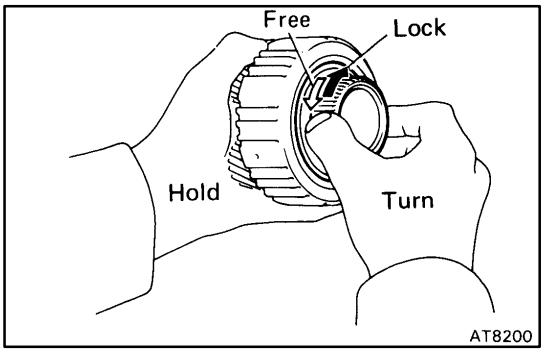
1. REMOVE OUTPUT SHAFT FROM REAR PLANETARY GEAR ASSEMBLY



2. REMOVE OIL SEAL RING FROM OUTPUT SHAFT

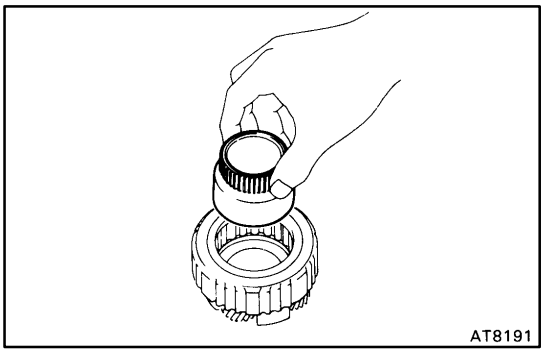


3. REMOVE REAR PLANETARY GEAR FROM REAR PLANETARY RING GEAR



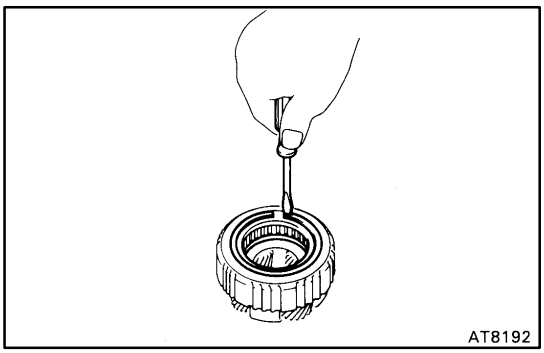
4. CHECK OPERATION OF NO.2 ONE-WAY CLUTCH

Hold the planetary gear and turn the one-way clutch inner race. Check that the one-way clutch inner race must be able to turn freely counterclockwise and locks clockwise.

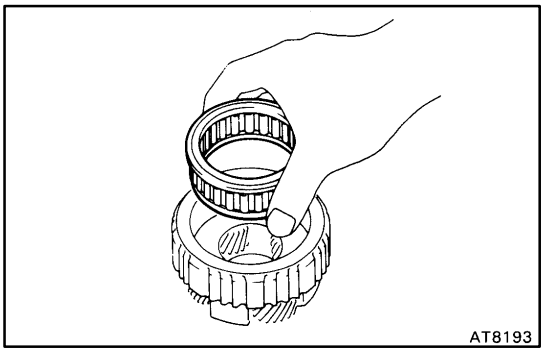


5. REMOVE NO.2 ONE-WAY CLUTCH

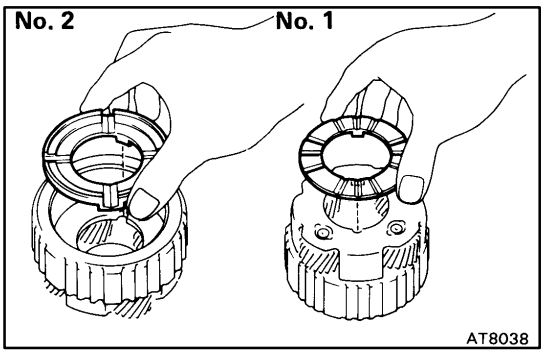
(a) Remove the one-way clutch inner race from the rear planetary gear.



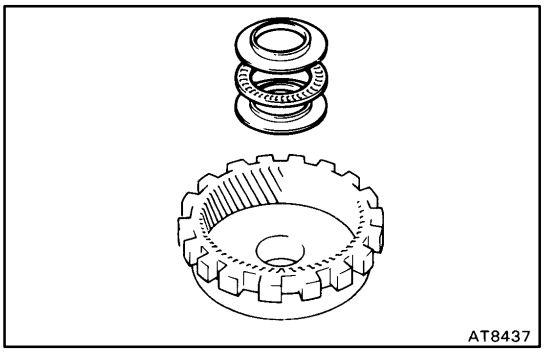
(b) Remove the snap ring with a screwdriver.



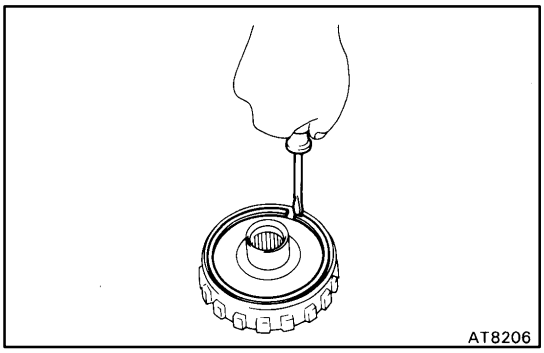
(c) Remove the No.2 one-way clutch with retainers from the planetary gear.



6. REMOVE NO.2 AND NO.1 THRUST WASHERS

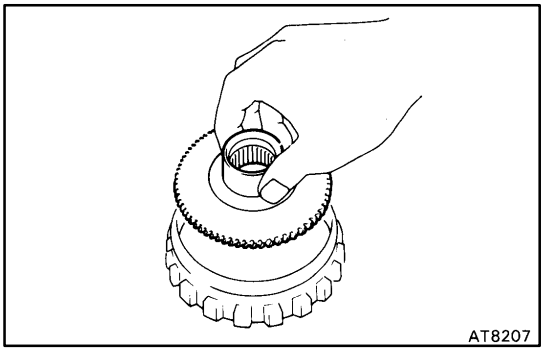


7. REMOVE RACES AND BEARING FROM REAR PLANETARY RING GEAR

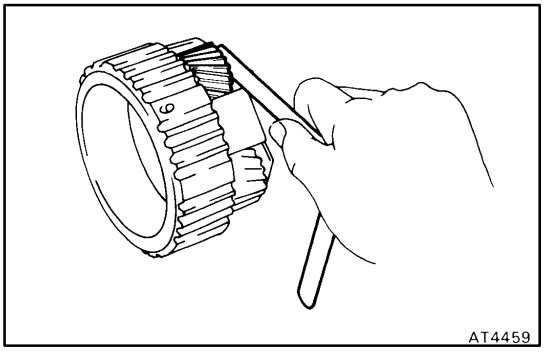


8. REMOVE RING GEAR FLANGE

(a) Remove the snap ring with a screwdriver.



(b) Remove the ring gear flange.



REAR PLANETARY GEAR INSPECTION

AT067-04

MEASURE PLANETARY PINION GEAR THRUST CLEARANCE

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

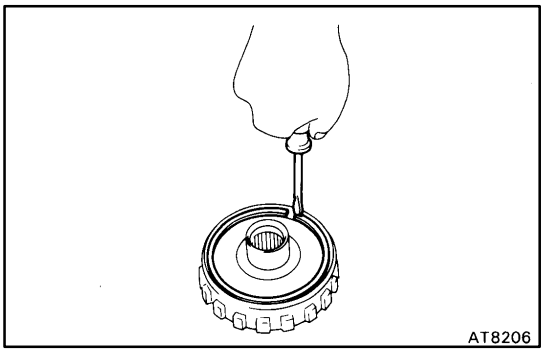
Standard clearance:

0.20-0.60 mm (0.0079-0.0236 in.)

Maximum clearance:

1.00 mm (0.0394 in.)

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



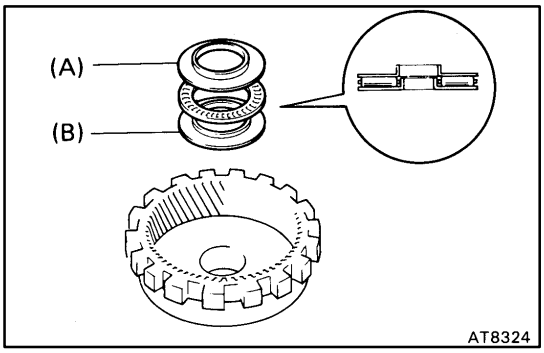
AT068-07

REAR PLANETARY GEAR, NO.2 ONE-WAY CLUTCH AND OUTPUT SHAFT ASSEMBLY

1. INSTALL RING GEAR FLANGE

(a) Install the ring gear flange.

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



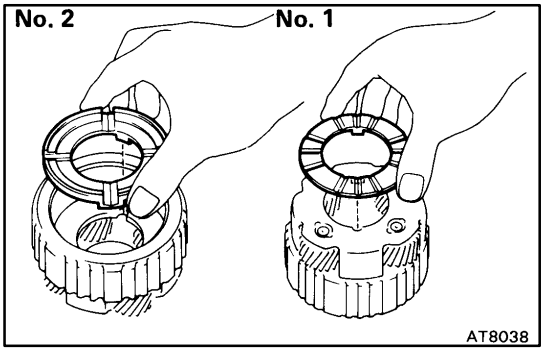
2. INSTALL RACES AND BEARING

Coat the races and bearing with petroleum jelly, and install them onto the rear planetary ring gear.

Races and bearing diameter

mm (in.)

	Inside	Out side
Race (A)	28.8 (1.134)	44.8 (1.764)
Bearing	30.1 (1.185)	44.7 (1.760)
Race (B)	27.8 (1.094)	44.8 (1.764)

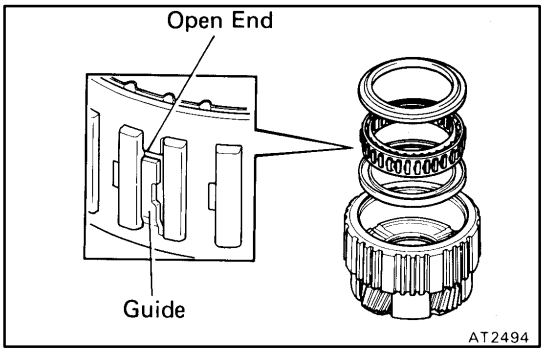


3. INSTALL NO.1 AND NO.2 THRUST WASHERS

(a) Coat the thrust washers with petroleum jelly.

(b) Install the thrust washers onto both sides of the rear planetary gear.

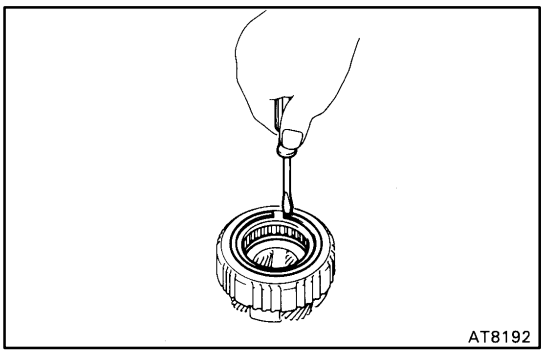
HINT: Make sure that the lug shapes match the cutout portions on the rear planetary gear.



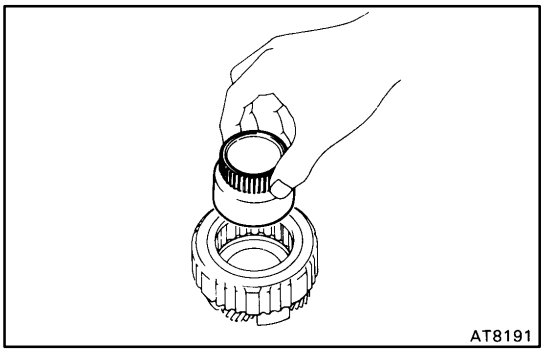
4. INSTALL NO.2 ONE-WAY CLUTCH

(a) Install the one-way clutch and 2 retainers into the rear planetary gear.

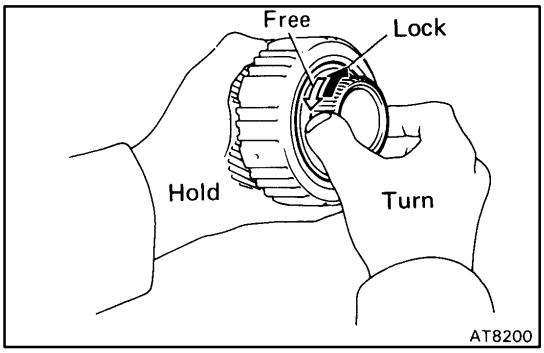
HINT: Make sure that the open ends of the guides on the one-way clutch are faced upward.



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

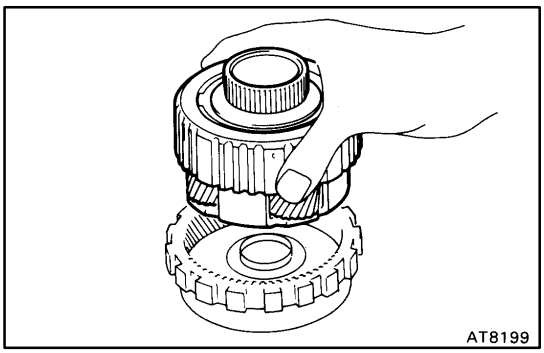


(c) While turning counterclockwise, install the one- way clutch inner race to rear planetary gear.

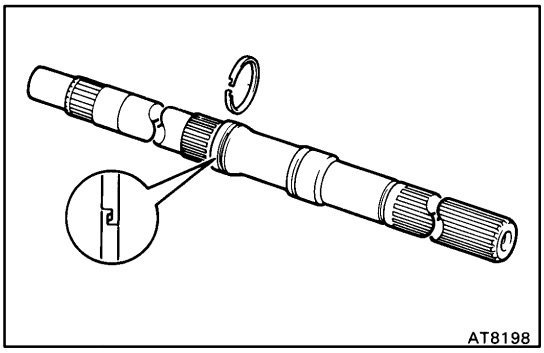


5. CHECK OPERATION OF NO.2 ONE-WAY CLUTCH

Hold the planetary gear and turn the one-way clutch inner race. Check that the one-way clutch inner race must be able to turn freely counterclockwise and locks clockwise.



6. INSTALL REAR PLANETARY GEAR ONTO REAR PLANETARY RING GEAR

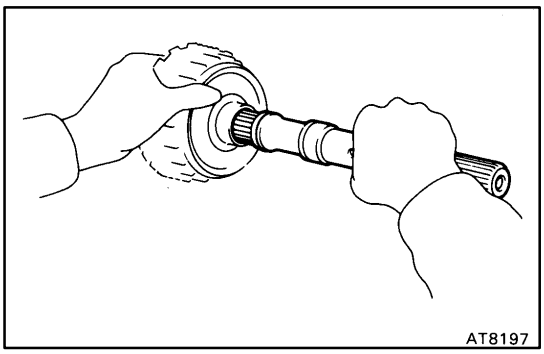


7. INSTALL OIL SEAL RING

Coat the oil seal ring with ATF and install it to the output shaft.

NOTICE: Do not spread the ring ends too match.

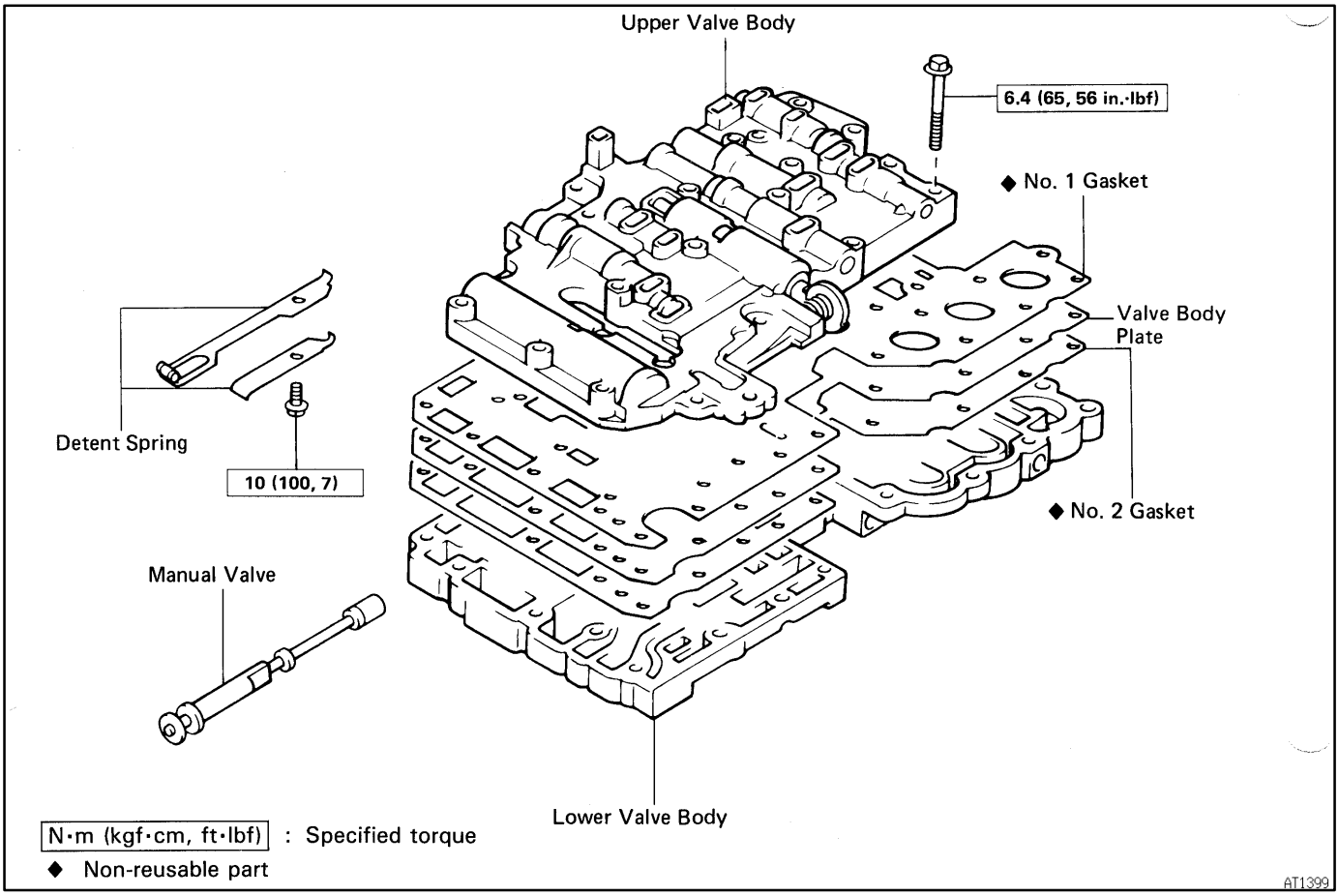
HINT: After installing the oil seal ring, check that it rotates smoothly.



8. INSTALL OUTPUT SHAFT INTO REAR PLANETARY GEAR ASSEMBLY

VALVE BODY
COMPONENTS

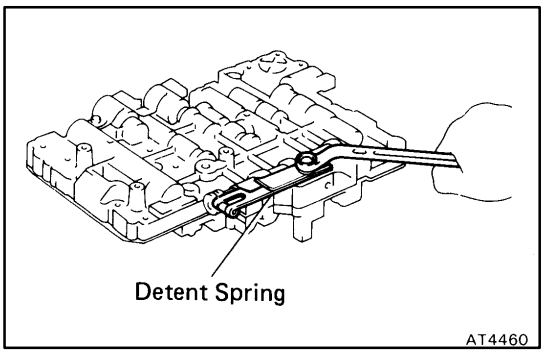
AT069-03



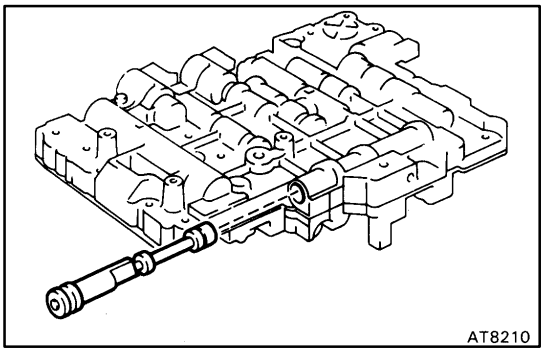
AT0SJ-01

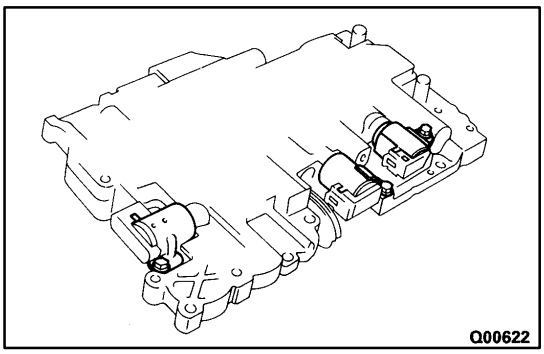
VALVE BODY DISASSEMBLY

1. UNBOLT AND REMOVE DETENT SPRING

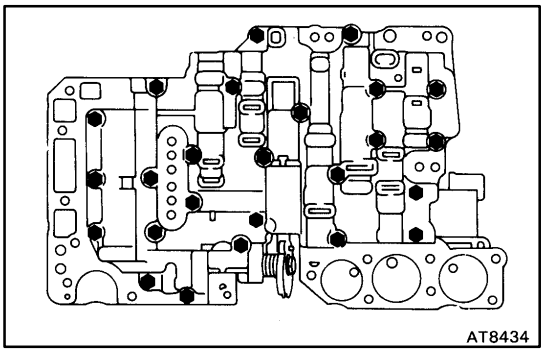


2. REMOVE MANUAL VALVE

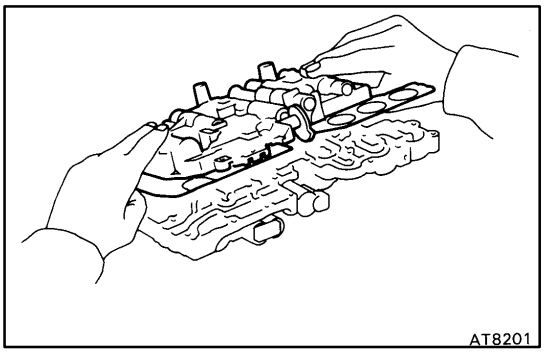




3. REMOVE 3 SOLENOIDS



4. TURN OVER ASSEMBLY AND REMOVE 25 BOLTS



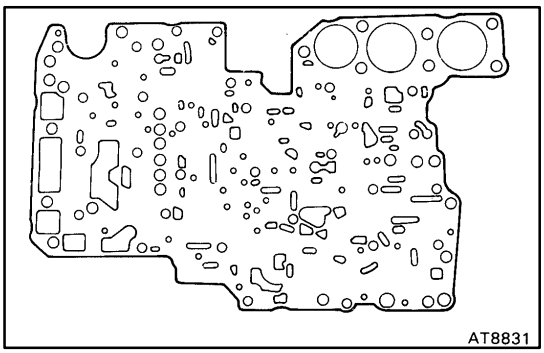
4. LIFT OFF UPPER VALVE BODY AND PLATE AS A SINGLE UNIT

Hold the valve body plate to the upper valve body.

HINT: Be careful that the check balls and strainer do not fall out.

AT0SK-01

VALVE BODY ASSEMBLY

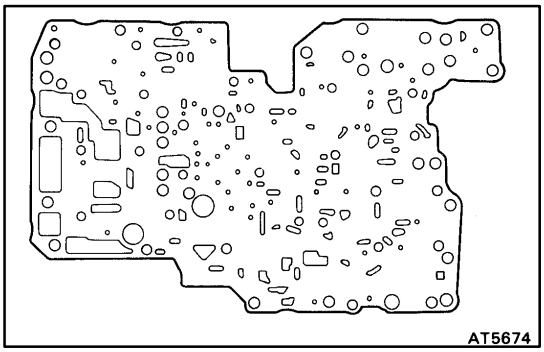


1. POSITION NEW NO.1 GASKET ON UPPER VALVE BODY

Align a new No.1 gasket at each bolt hole.

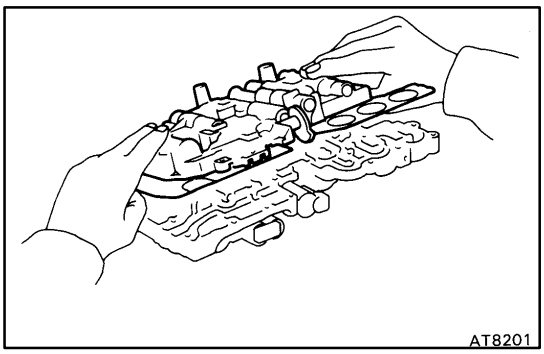
2. POSITION VALVE BODY PLATE ON NO.1 GASKET

Align the plate at each bolt hole.



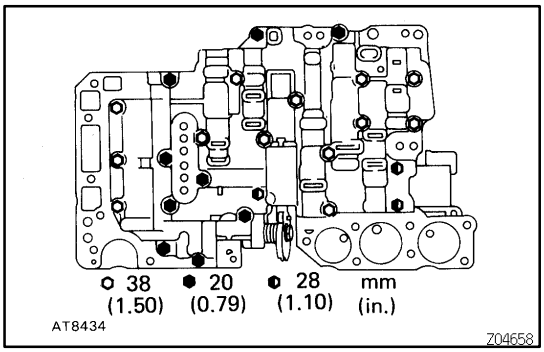
3. POSITION NEW NO.2 GASKET ON PLATE

Align a new No.2 gasket at each bolt hole.



4. PLACE UPPER VALVE BODY WITH PLATE AND GASKETS ON TOP OF LOWER VALVE BODY

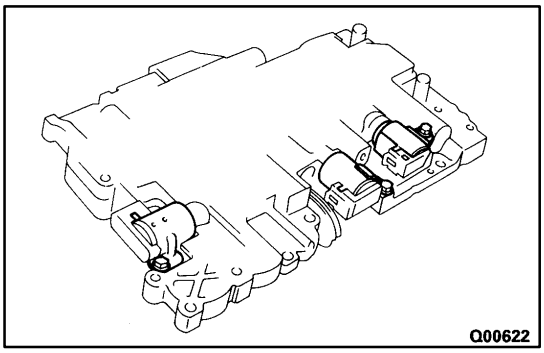
Align each bolt hole and gasket in the valve body.



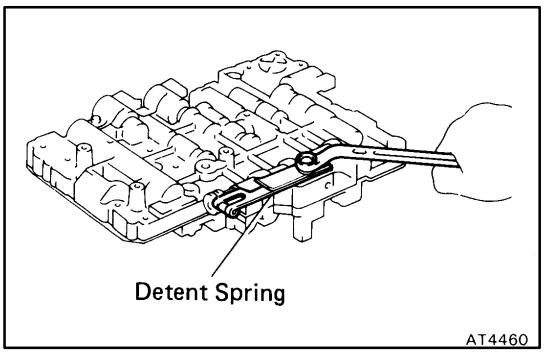
5. INSTALL 25 BOLTS TO UPPER VALVE BODY

HINT: Each bolt length is indicated in the illustration.

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



6. INSTALL 3 SOLENOIDS



7. INSTALL MANUAL VALVE

8. INSTALL DETENT SPRING

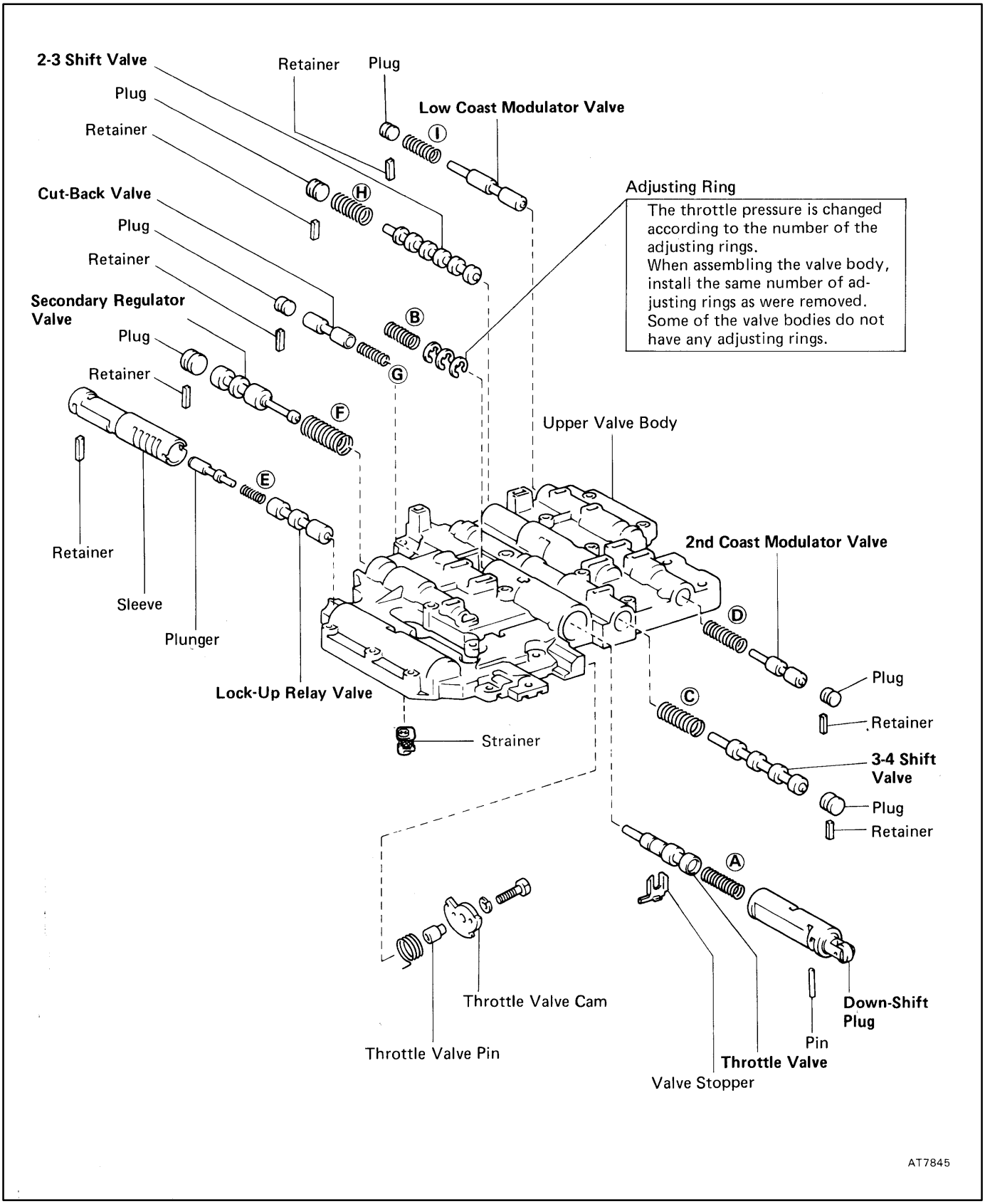
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

9. MAKE SURE MANUAL VALVE MOVES SMOOTHLY

UPPER VALVE BODY

AT06C-03

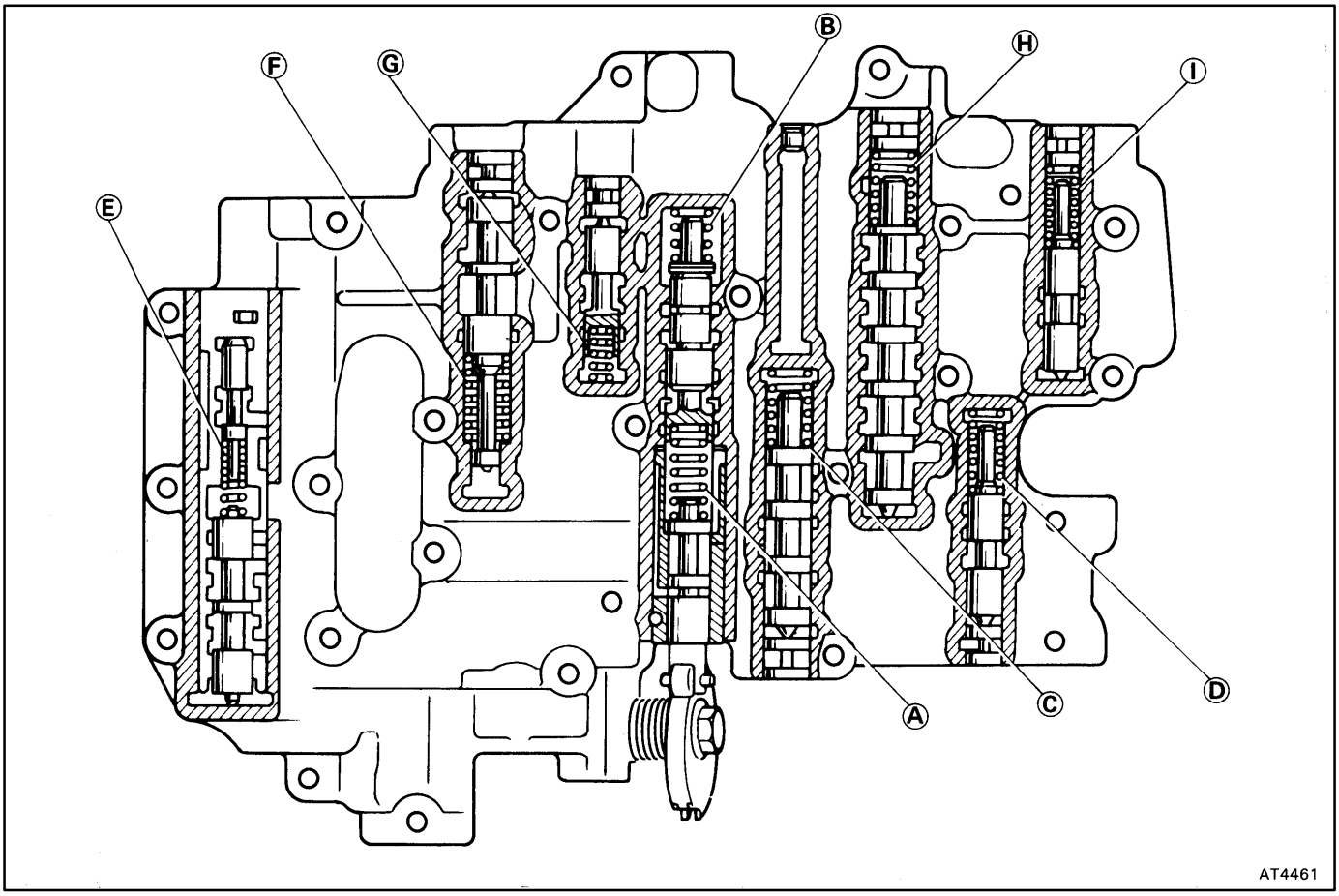
COMPONENTS



AT06D-04

VALVE BODY SPRING SPECIFICATIONS

HINT: During reassembly please refer to the spring specifications below to help you to identify the different springs.

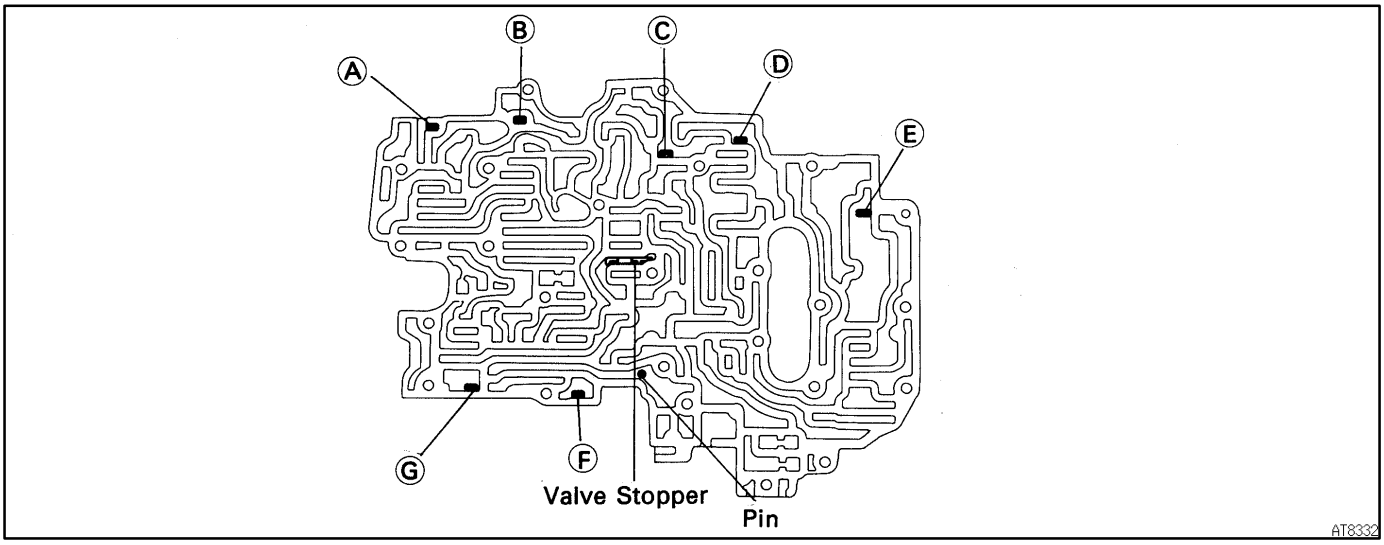


Mark	Name (color)	Free length / Outer diameter mm (in.)	Total No. of coils
(A)	Down-shift plug (Yellow)	27.3 (1.075) / 8.7 (0.343)	12.5
(B)	Throttle valve (Blue)	20.6 (0.811) / 9.2 (0.362)	9.5
	(White)	or 23.3 (0.917) / 9.2 (0.362)	9.5
(C)	3-4 shift valve (Purple)	30.8 (1.213) / 9.7 (0.382)	10.5
(D)	SUPRA, PREVIA Second coast modulator valve (Orange)	24.6 (0.967) / 8.3 (0.327)	9.0
(D)	OTHERS Second coast modulator valve (Orange)	25.3 (0.996) / 8.6 (0.339)	9.5
(E)	Lock-up relay valve (Light Gray)	21.4 (0.843) / 5.5 (0.217)	17.5
(F)	Secondary regulator valve (Blue)	30.9 (1.217) / 11.2 (0.441)	10.5
(G)	Cut-back valve (Red)	21.8 (0.858) / 6.0 (0.236)	13.5
(H)	2-3 Shift valve (Blue)	30.8 (1.213) / 9.7 (0.382)	10.5
(I)	SUPRA, PREVIA Low coast modulator valve (Yellow)	26.4 (1.039) / 8.3 (0.327)	10.5
(I)	OTHERS Low coast modulator valve (Yellow)	30.4 (1.197) / 8.3 (0.327)	8.5

AT06E-05

RETAINERS, PIN, STOPPER, CHECK BALLS AND STRAINER LOCATION

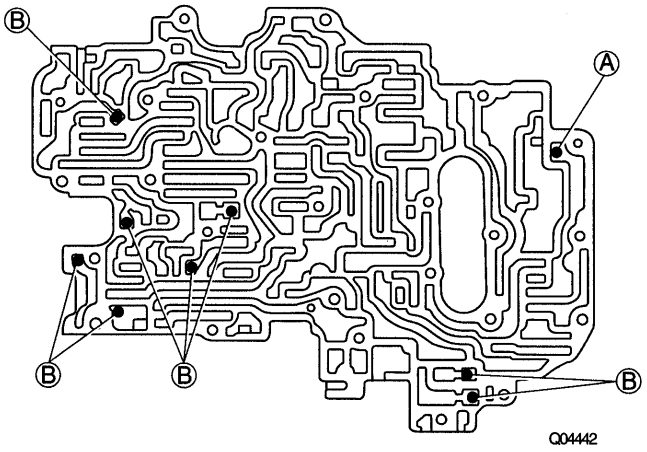
1. RETAINER, STOPPER AND PIN



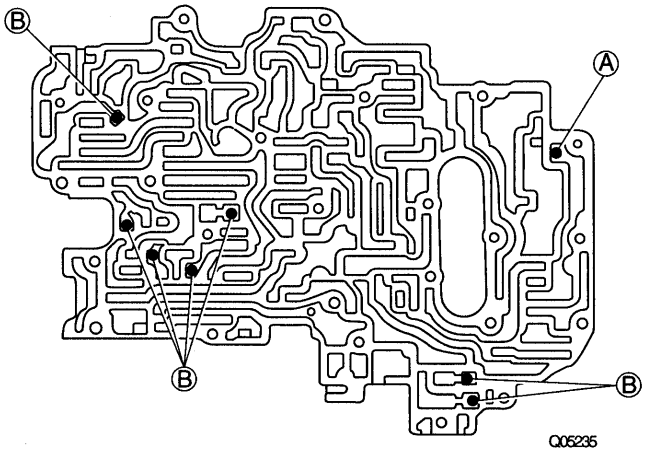
Mark	Retainer	Height / Width / Thickness mm (in.)
(A)	Low coast modulator valve	14.5 (0.571) / 5.0 (0.197) / 3.2 (0.126)
(B)	2-3 shift valve	14.0 (0.551) / 5.0 (0.197) / 3.2 (0.126)
(C)	Cut-back valve	15.0 (0.591) / 5.0 (0.197) / 3.2 (0.126)
(D)	Secondary regulator valve	14.0 (0.551) / 5.0 (0.197) / 3.2 (0.126)
(E)	Lock-up relay valve	21.2 (0.835) / 5.0 (0.197) / 3.2 (0.126)
(F)	3-4 shift valve	16.5 (0.650) / 6.0 (0.236) / 3.2 (0.126)
(G)	2nd coast modulator valve	16.5 (0.650) / 6.0 (0.236) / 3.2 (0.126)

2. CHECK BALL

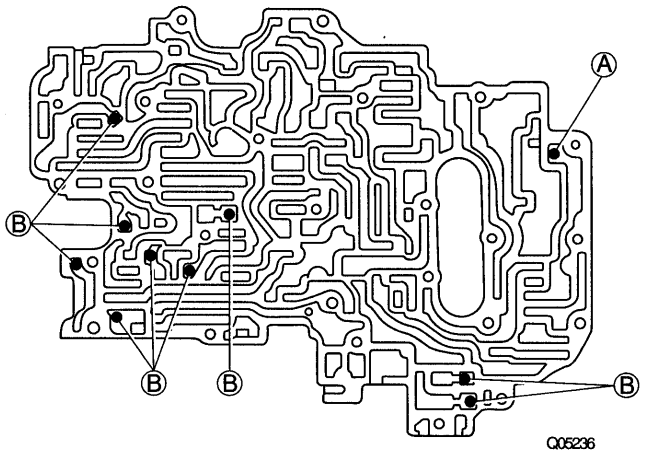
SUPRA



TRUCK
4RUNNER
TOYOTA T100



PREVIA

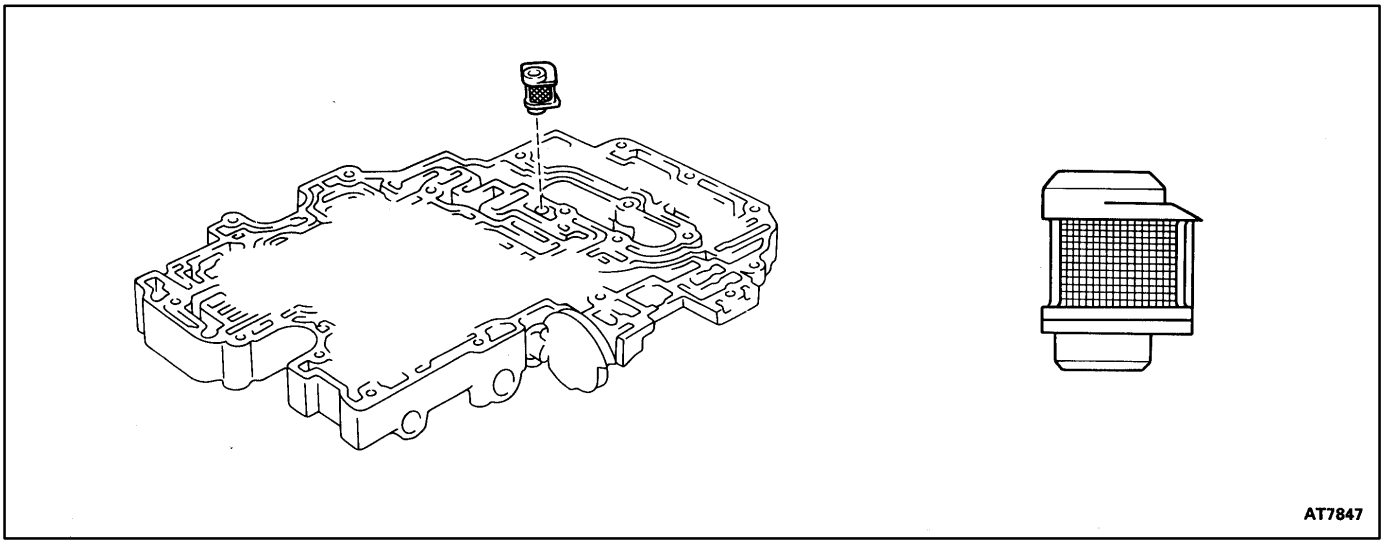


Y

Z11792

Mark	Check ball	Diameter mm (in.)
(A)	Rubber ball	6.35 (0.2500)
(B)	Rubber ball	5.45 (0.2181)

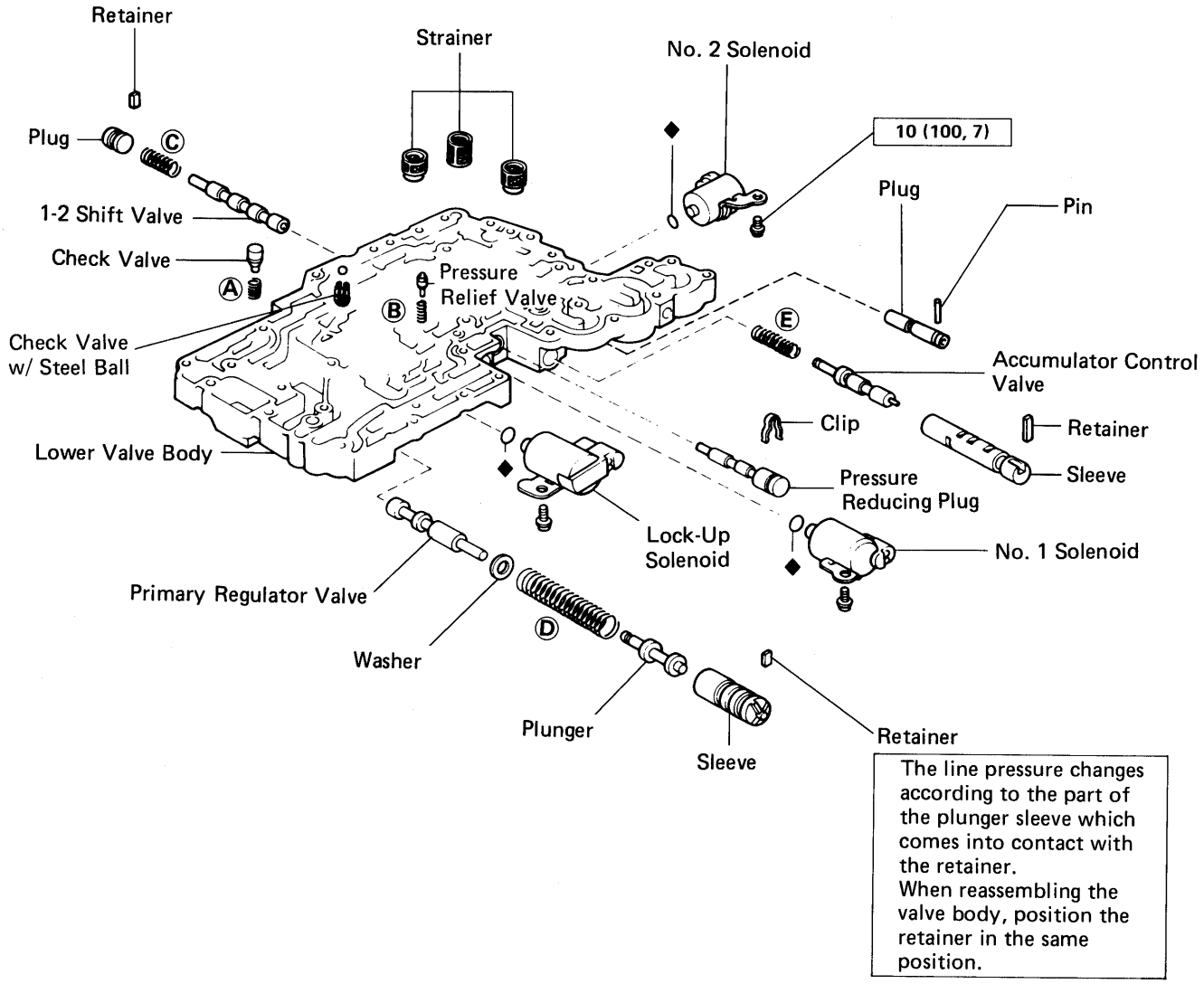
3. STRAINER



LOWER VALVE BODY

AT06F-03

COMPONENTS



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

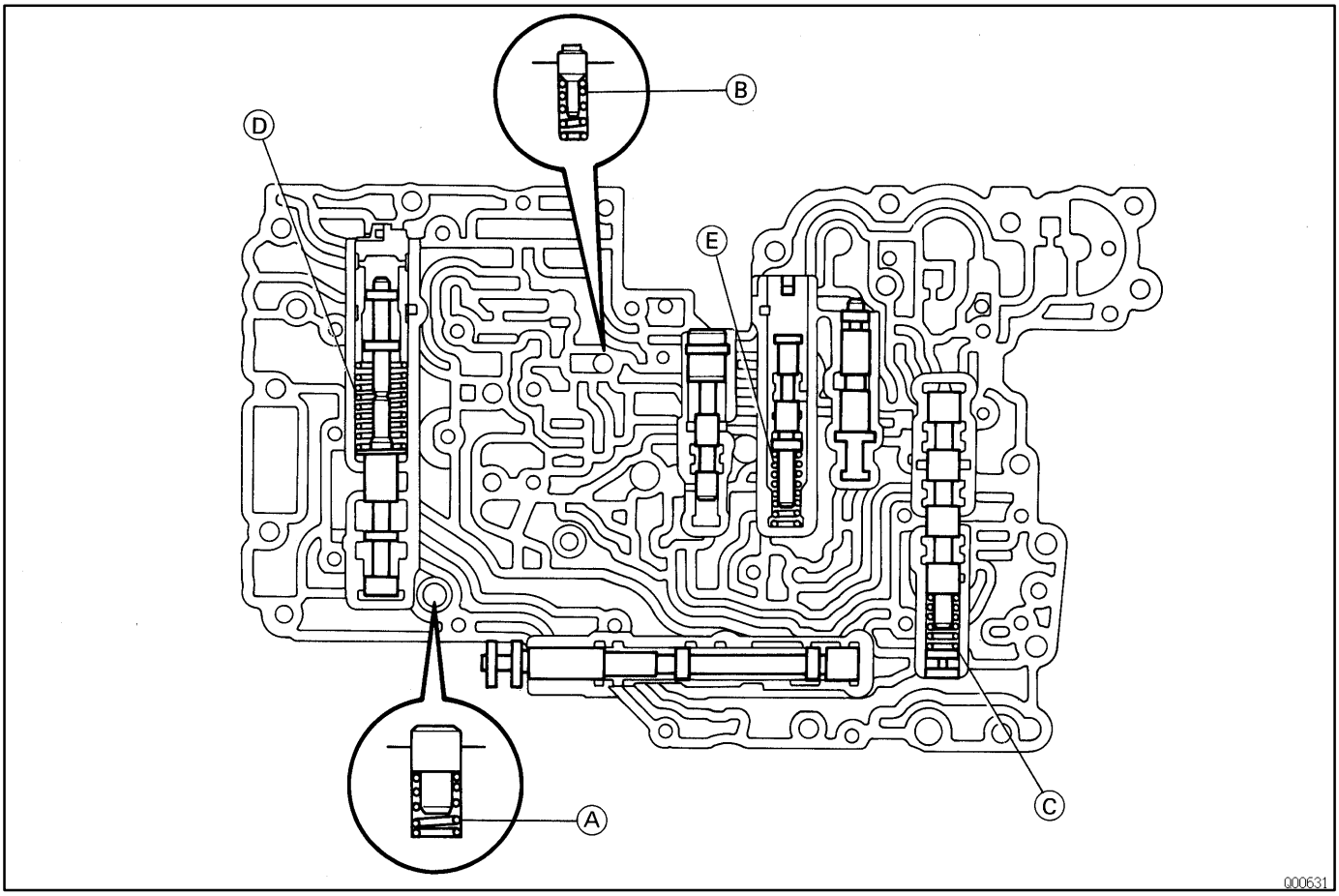
◆ Non-reusable part

AT5886

AT06G-04

VALVE BODY SPRING SPECIFICATIONS

HINT: During reassembly please refer to the spring specifications below to help you to identify the different springs.

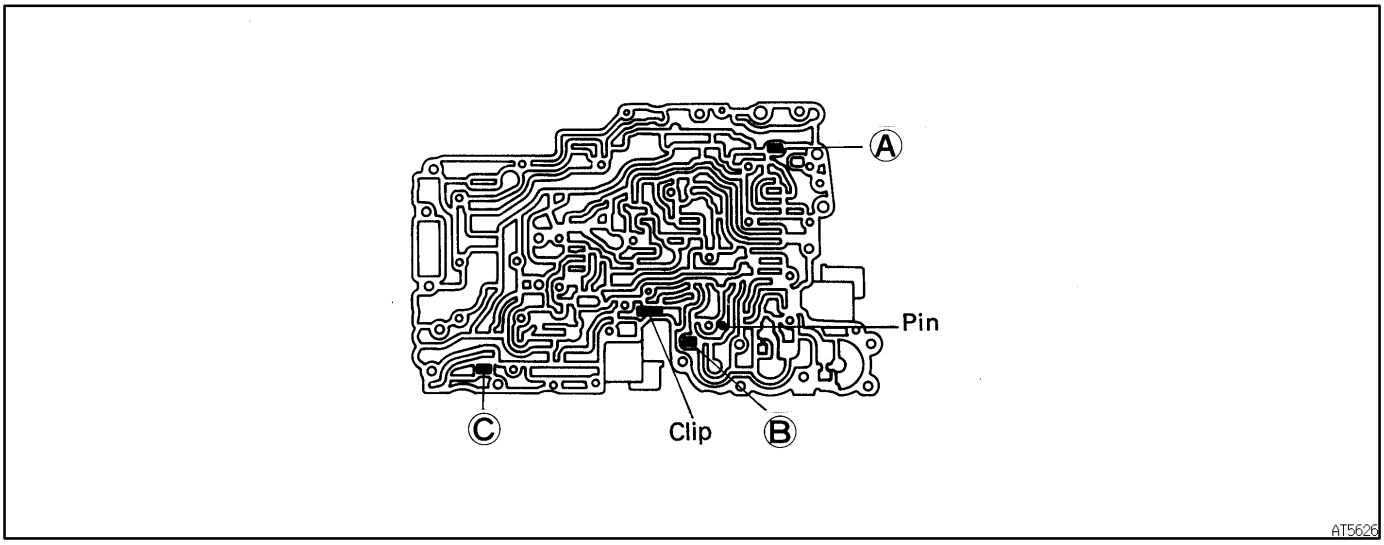


Mark	Name (Color)	Free length / Outer diameter mm (in.)	Total No. of coils
(A)	Check valve (None)	20.2 (0.796) / 12.1 (0.476)	6.5
(B)	Pressure relief valve (None)	11.2 (0.441) / 6.4 (0.252)	7.5
(C)	1-2 shift valve (Purple)	30.8 (1.213) / 9.7 (0.382)	10.5
(D)	Primary regulator valve (Purple)	62.3 (2.453) / 18.6 (0.732)	12.5
(E)	SUPRA Accumulator control valve (White)	36.1 (1.421) / 8.9 (0.327)	14.0
(E)	OTHERS Accumulator control valve (Pink)	33.9 (1.335) / 8.8 (0.346)	12.0

AT06H-06

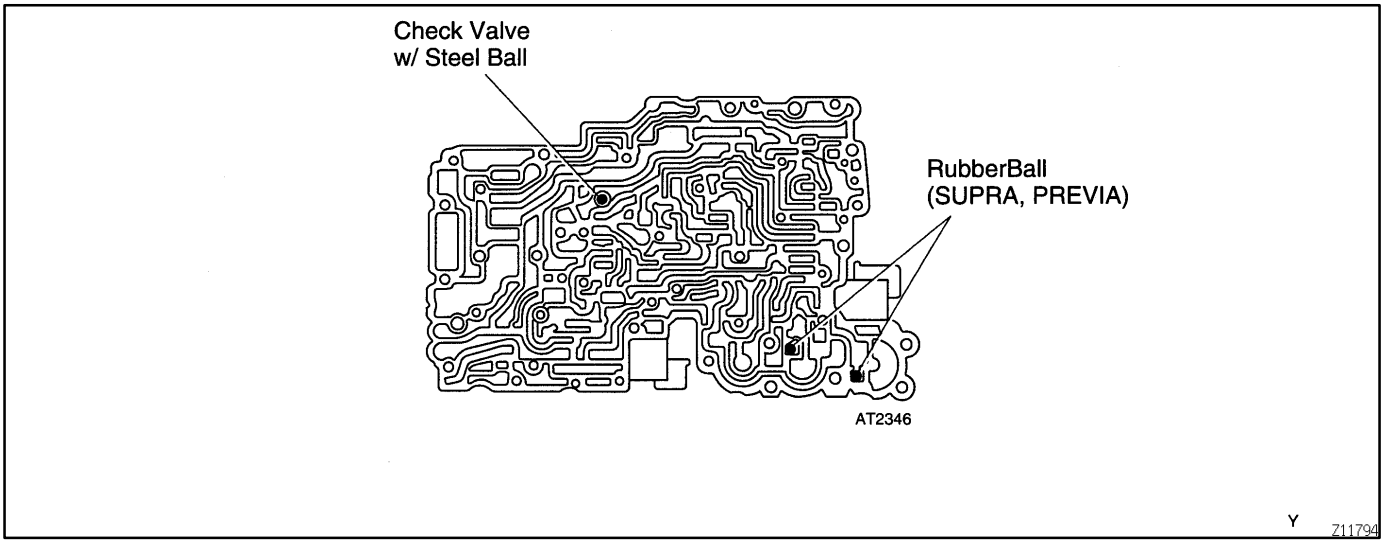
RETAINERS, CLIP, CHECK BALLS, STRAINERS, SPRINGS AND VALVES LOCATION

1. RETAINER AND CLIP



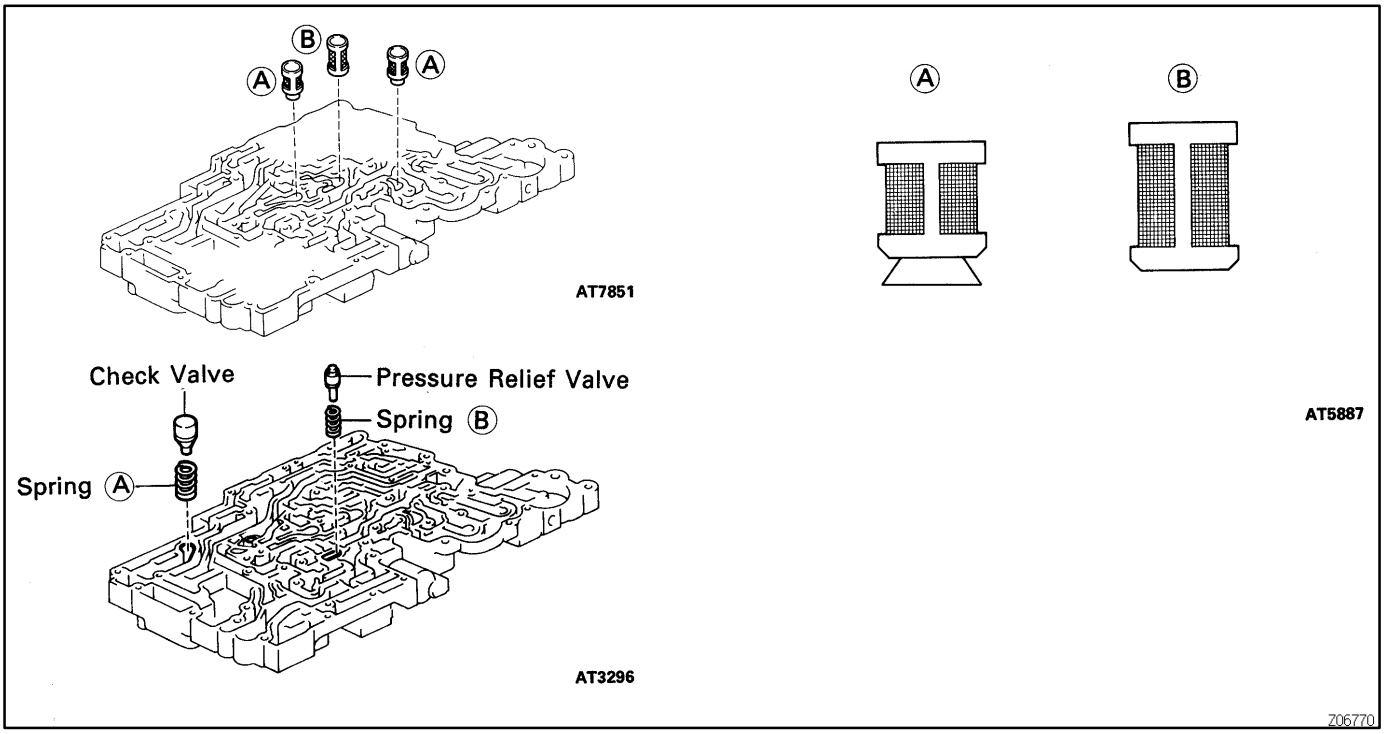
Mark	Retainer	Height / Width / Thickness mm (in.)
(A)	1-2 shift valve	16.5 (0.650) / 6.0 (0.236) / 3.2 (0.126)
(B)	Accumulator control valve	21.2 (0.835) / 5.0 (0.197) / 3.2 (0.126)
(C)	Primary regulator valve	16.2 (0.638) / 5.0 (0.197) / 3.2 (0.126)

2. CHECK BALL

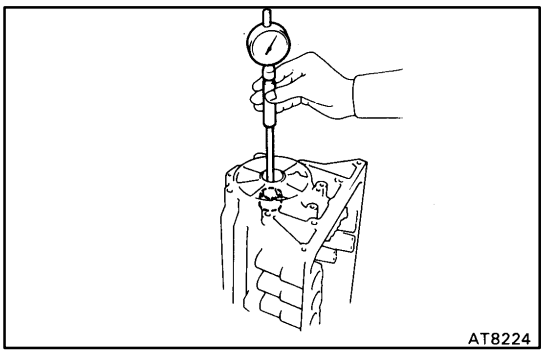


Check ball	Diameter mm (in.)
Rubber ball	5.54 (0.2181)
Steel ball	6.35 (0.2500)

3. STRAINER, SPRING AND VALVE



Mark	Strainer	Height / Diameter mm (in.)
(A)	Solenoid oil strainer	12.4 (0.448) / 10.3 (0.406)
(B)	Throttle oil strainer	19.5 (0.768) / 10.3 (0.406)



TRANSMISSION CASE

AT06J-06

TRANSMISSION CASE INSPECTION

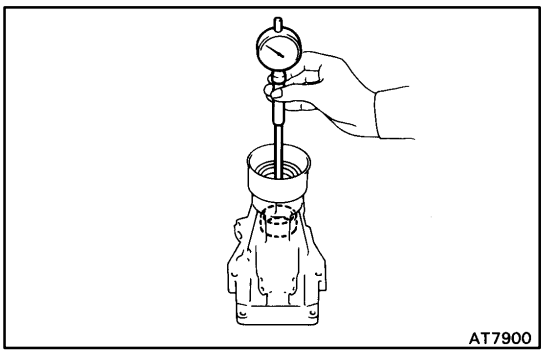
INSPECT TRANSMISSION CASE BUSHING

Using a cylinder gauge, measure the inside diameter of the transmission case rear bushing.

Maximum inside diameter:

38.19 mm (1.5035 in.)

If the inside diameter is greater than the maximum, replace the transmission case.



EXTENSION HOUSING

AT06K-03

EXTENSION HOUSING INSPECTION

INSPECT EXTENSION HOUSING BUSHING

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

Maximum inside diameter:

40.09 mm (1.5783 in.)

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

COMPONENT PARTS INSTALLATION

AT06L-07

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.

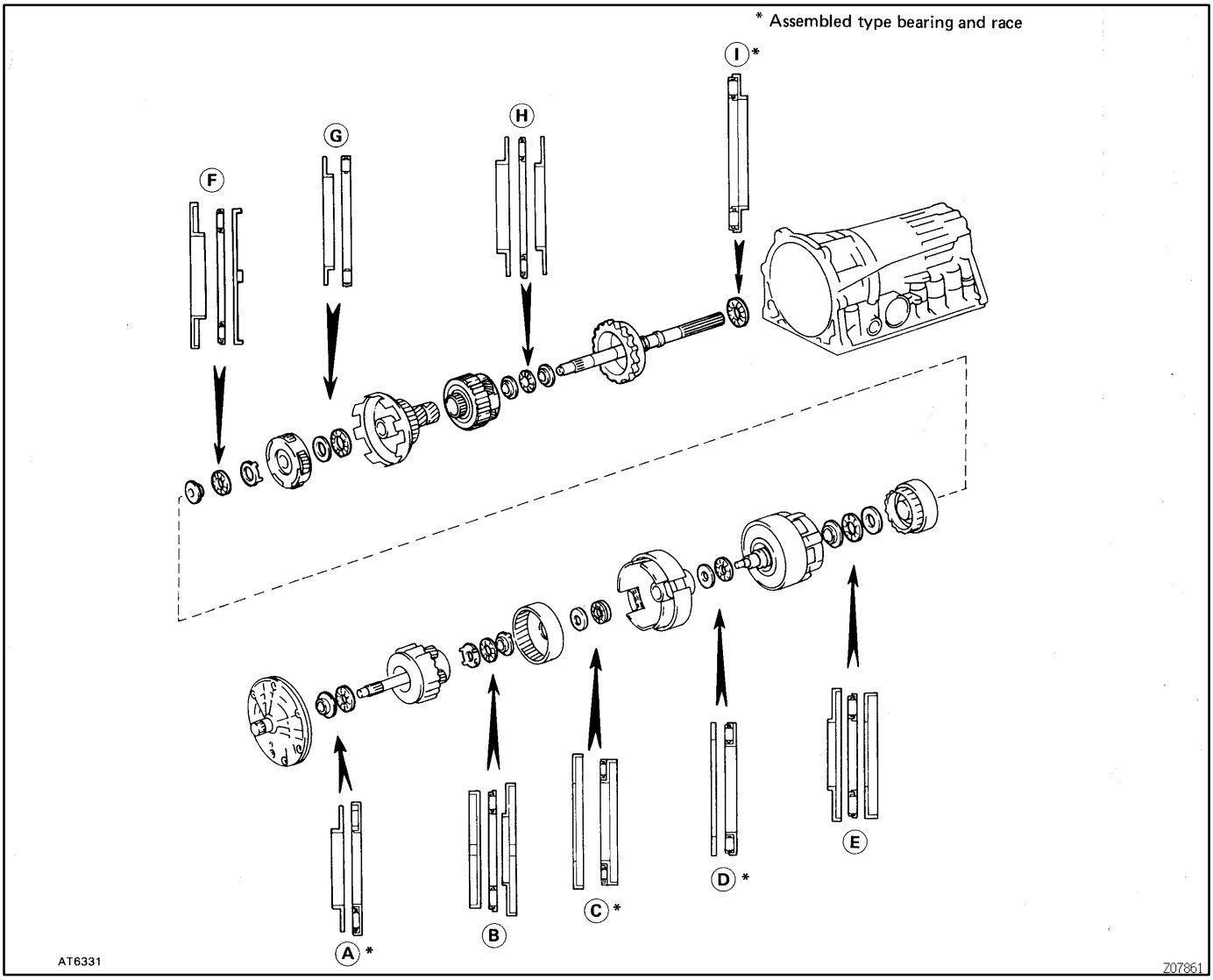
Recommended ATF:

DEXRON® II

GENERAL NOTES:

1. The automatic transmission is composed of highly precision-finished parts, necessitating careful inspection before assembly because even a small nick could cause fluid leakage or affect performance.
2. Before assembling new clutch discs, soak them in automatic transmission fluid for at least 15 minutes.
3. Apply automatic transmission fluid on sliding or rotating surfaces of parts before assembly.
4. Use petroleum jelly to keep small parts in their place.
5. Do not use adhesive cements on gaskets and similar parts.
6. When assembling the transmission, be sure to use new gaskets and O-rings.
7. Dry all parts with compressed air - never use shop rags.
8. When working with FIPG material, you must observe the following.
   - ★ Using a razor blade and gasket scraper, remove all the old packing (FIPG) material from the gasket surfaces.
   - ★ Thoroughly clean all components to remove all the loose material.
   - ★ Clean both sealing surfaces with a non-residue solvent.
   - ★ Parts must be assembled within 10 minutes of application. Otherwise, the packing (FIPG) material must be removed and reapplied.

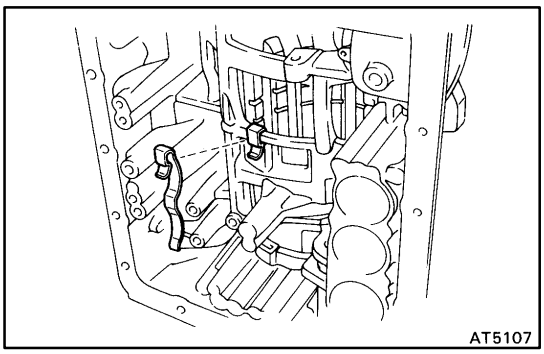
BEARINGS AND RACES INSTALLATION POSITION AND DIRECTION



Mark	Front Race Diameter Inside / Outside mm (in.)	Thrust Bearing Diameter Inside / Outside mm (in.)	Rear Race Diameter Inside / Outside mm (in.)
(A)	28.1 (1.106) / 47.3 (1.862)	28.9 (1.138) / 50.2 (1.976)	-
(B)	27.3 (1.075) / 41.8 (1.646)	26.0 (1.024) / 46.8 (1.843)	24.2 (0.953) / 47.8 (1.882)
(C)	37.2 (1.465) / 58.8 (2.315)	33.7 (1.327) / 51.1 (1.972)	-
(D)	36.8 (1.449) / 50.9 (2.004)	33.7 (1.327) / 47.6 (1.874)	-
(E)	26.0 (1.024) / 48.9 (1.925)	26.0 (1.024) / 46.7 (1.839)	26.8 (1.055) / 47.0 (1.850)
(F)	30.6 (1.205) / 53.6 (2.110)	32.6 (1.283) / 47.7 (1.878)	34.3 (1.350) / 47.8 (1.882)
(G)	33.7 (1.327) / 47.6 (1.874)	35.5 (1.398) / 47.7 (1.878)	-
(H)	28.8 (1.134) / 44.8 (1.764)	30.1 (1.185) / 44.7 (1.760)	28.7 (1.094) / 44.8 (1.764)
(I)	-	39.2 (1.543) / 57.7 (2.272)	-

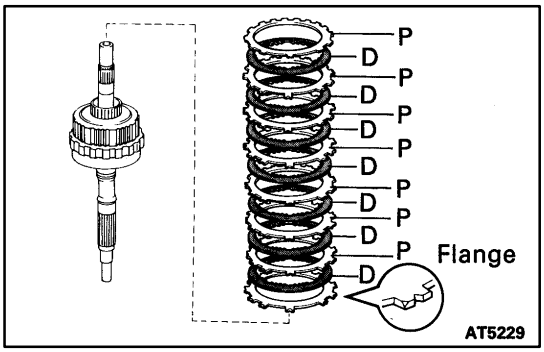
AT0SL-01

TRANSMISSION INSTALLATION



1. INSTALL TRANSMISSION CASE

Install the transmission case in the overhaul attachment.



2. INSTALL BEARING AND RACE

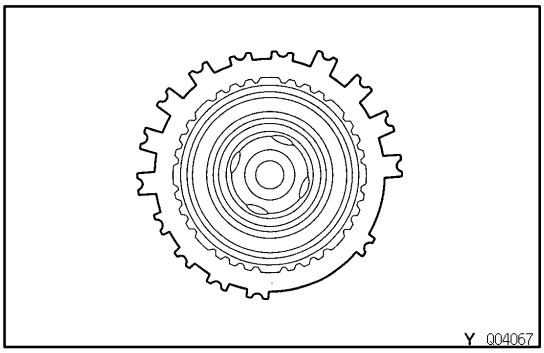
(a) Coat the assembled bearing and race with petroleum jelly.

(b) Install it onto the case.

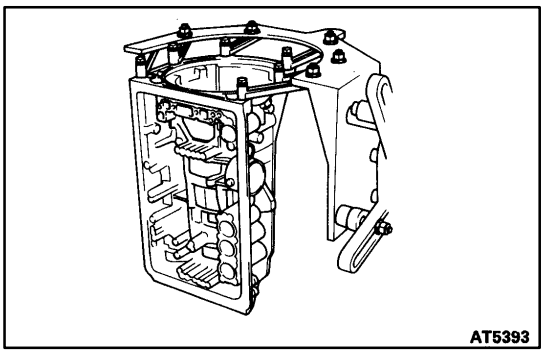
Assembled bearing and race diameter

mm (in.)

	Inside	outside
Bearing and race	39.2 (1.543)	57.7 (2.272)



3. INSTALL LEAF SPRING



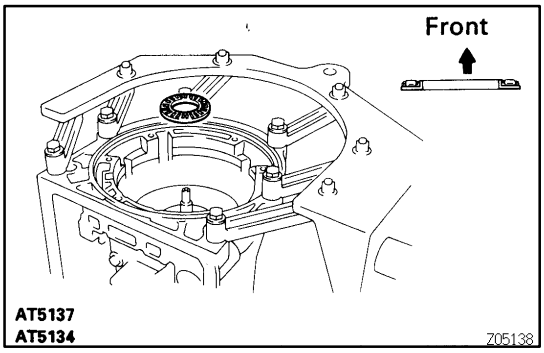
4. INSTALL REAR PLANETARY GEAR WITH FIRST AND REVERSE BRAKE PACK AND OUTPUT SHAFT

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

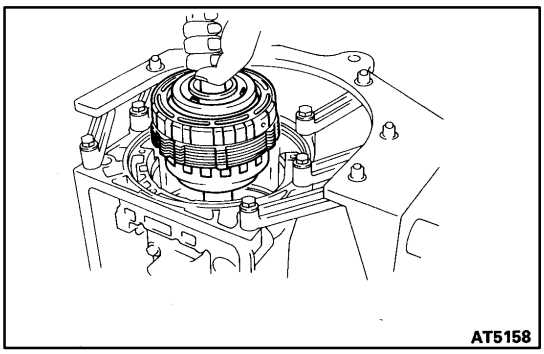
(b) Install the 6 plates and 6 discs.

Install in order: P = Plate D = Disc

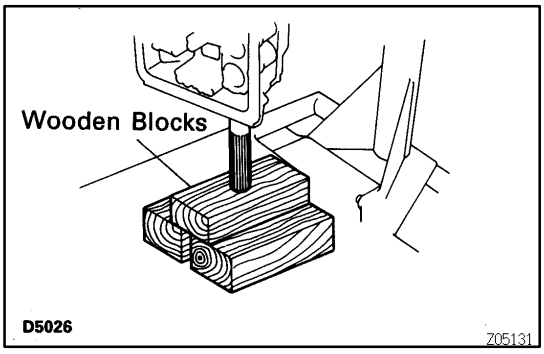
D-P-D-P-D-P-D-P-D-P-D-P



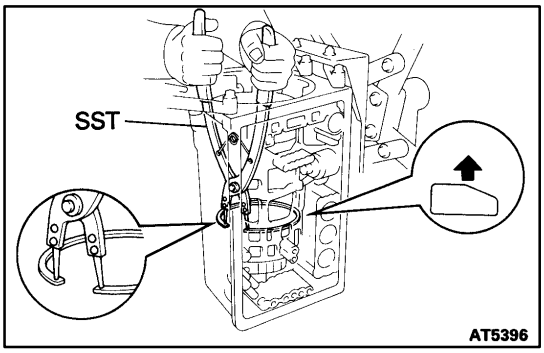
(c) Align the teeth on the flange, discs and plates.



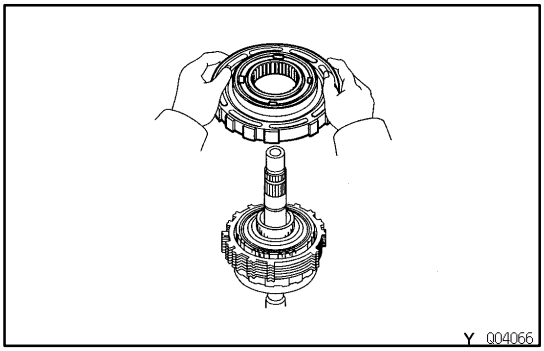
(d) face the snap ring upward (front side) and install the second brake drum to the planetary gear.
NOTICE: Face the oil hole in the drum towards the lower side of the transmission case (the side the valve body is installed).



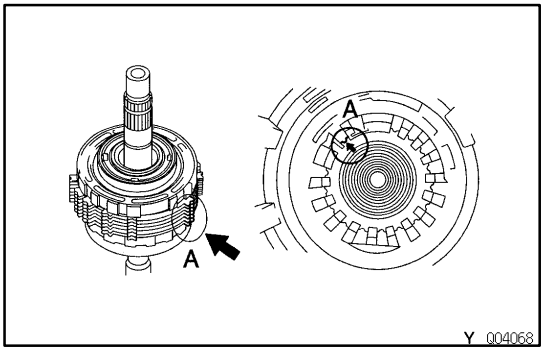
(e) Align the splines of the transmission case and the assembled rear planetary gear, first and reverse brake and output shaft, indicated by A.



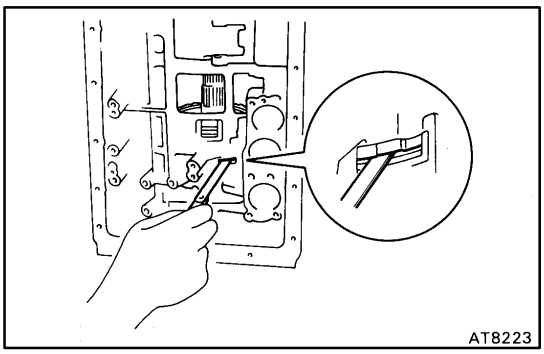
(f) Install the assembled output shaft.



(g) Rest the output shaft on wooden blocks.



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



5. CHECK PACK CLEARANCE OF FIRST AND REVERSE BRAKE

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

Clearance:

0.60 - 1.12 mm (0.0236 - 0.0441 in.)

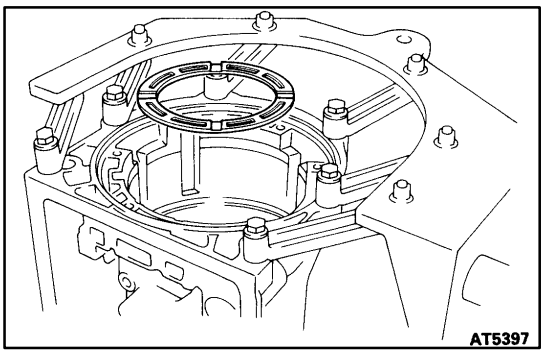
If the values are non-standard, select another flange.

HINT: There are 6 different thicknesses for the flange.

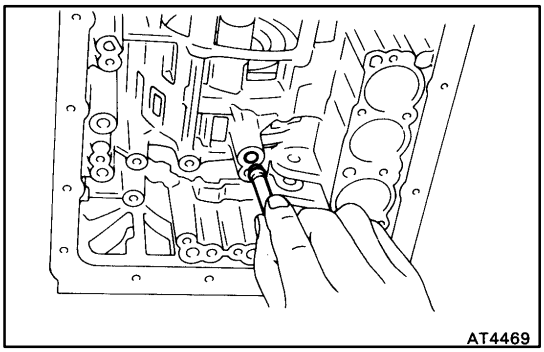
Flange thickness

mm (in.)

No.	Thickness	No.	Thickness
50	5.0 (0.197)	53	4.4 (0.173)
51	4.8 (0.189)	54	4.2 (0.165)
52	4.6 (0.181)	55	4.0 (0.157)



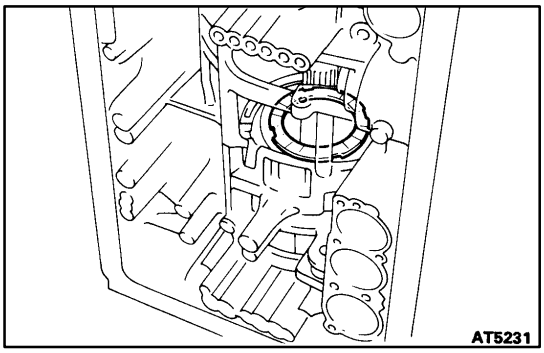
6. INSTALL SECOND BRAKE PISTON SLEEVE



7. INSTALL NEW BRAKE DRUM GASKET

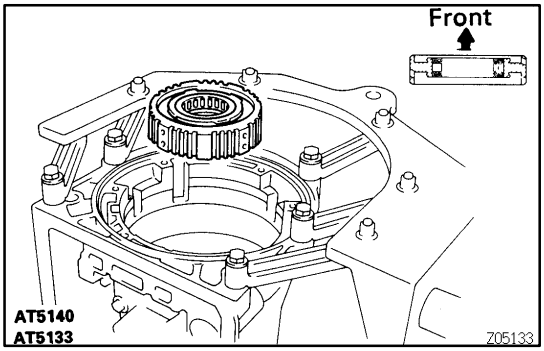
(a) Coat the gasket with ATF.

(b) Install a new brake drum gasket.

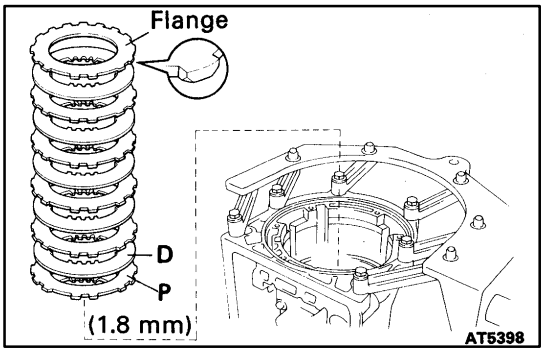


8. INSTALL NO.1 ONE-WAY CLUTCH

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



(b) Install the No.1 one-way clutch.

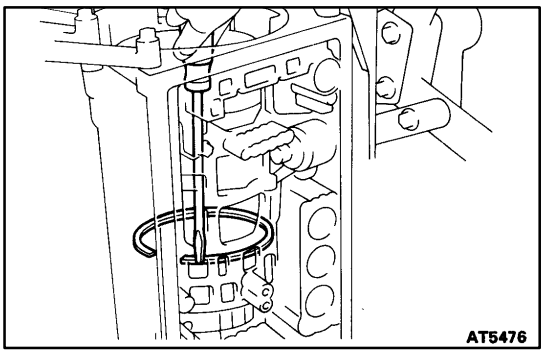


9. INSTALL FLANGE, PLATES AND DISCS OF SECOND BRAKE

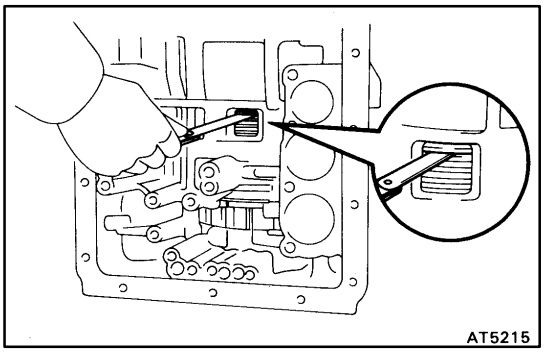
(a) Install the 1.8 mm (0.071 in.) thick plate with the rounded edge side of the plate facing the disc.

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

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



(d) Using a screwdriver, install snap ring.



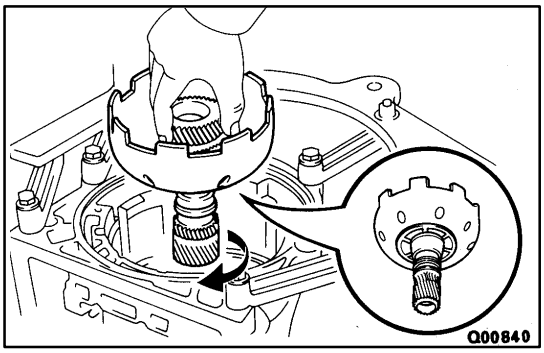
10. CHECK PACK CLEARANCE OF SECOND BRAKE

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

Clearance:

0.62 - 1.98 mm (0.0244 - 0.0780 in.)

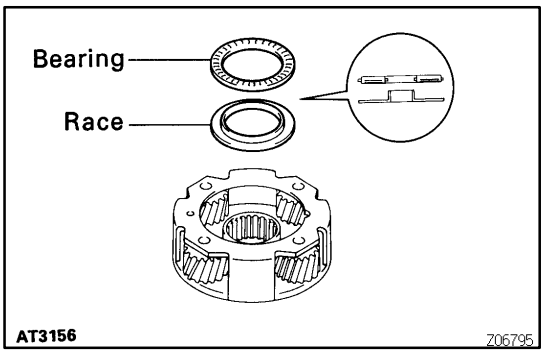
If the values are non-standard, check for an improper installation.



11. INSTALL PLANETARY SUN GEAR

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

HINT: Confirm the thrust washer is installed correctly.



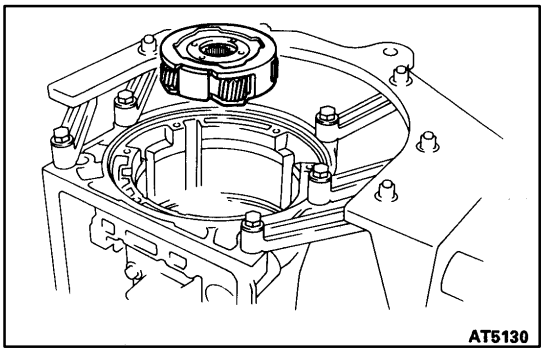
12. INSTALL FRONT PLANETARY GEAR

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

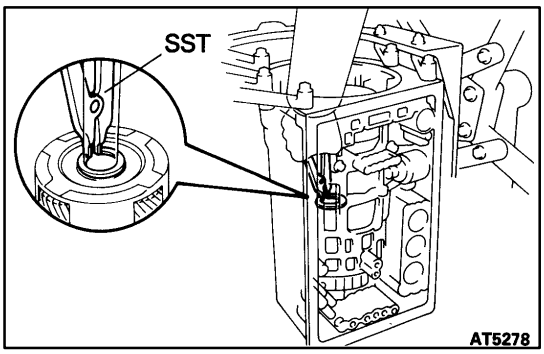
Bearing and race diameter

mm (in.)

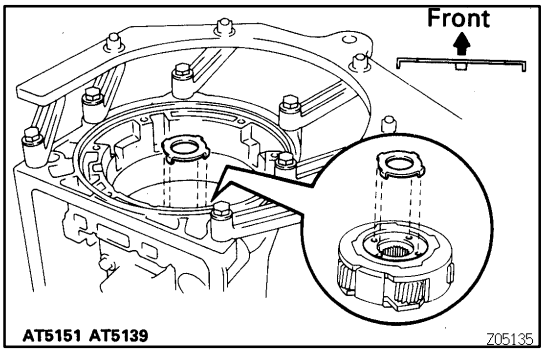
	Inside	Outside
Bearing	35.5 (1.398)	47.7 (1.878)
Race	33.7 (1.327)	47.6 (1.874)



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

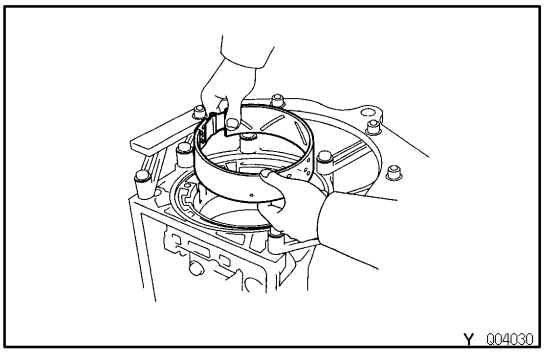


(c) Using SST, install the snap ring.
SST 09350-30020 (09350-07070)
(d) Remove the wooden blocks under the output shaft.

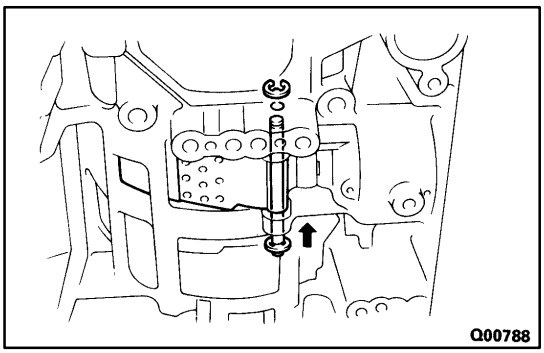


(e) Coat the bearing race with petroleum jelly and install it onto the front planetary gear.
Race diameter
mm (in.)

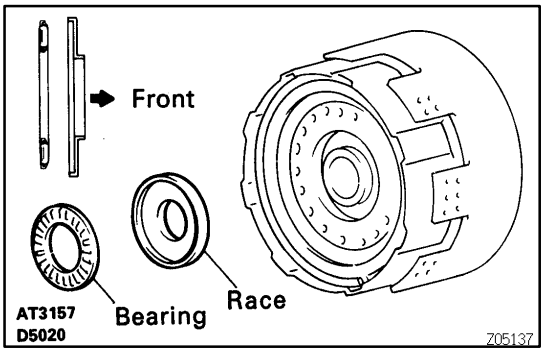
	Inside	Outside
Race	34.3 (1.350)	47.8 (1.882)



13. INSTALL SECOND COAST BRAKE BAND
(a) Install the second coast brake band to the case.

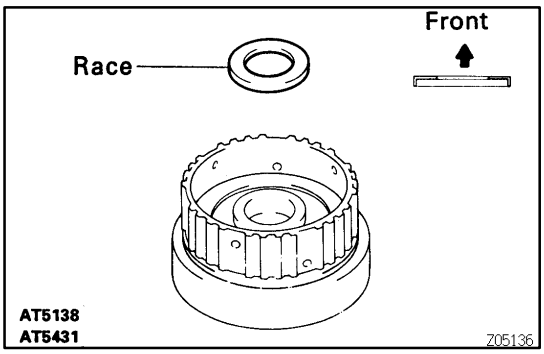


(b) Install the E-ring to the pin.
(c) Install the pin through the brake band.



14. INSTALL FRONT PLANETARY RING GEAR TO FORWARD AND DIRECT CLUTCH
(a) Coat the bearing and race with petroleum jelly and install them onto the forward clutch.
Bearing and race diameter
mm (in.)

	Inside	Outside
Bearing	26.0 (1.024)	46.7 (1.839)
Race	26.0 (1.024)	48.9 (1.925)

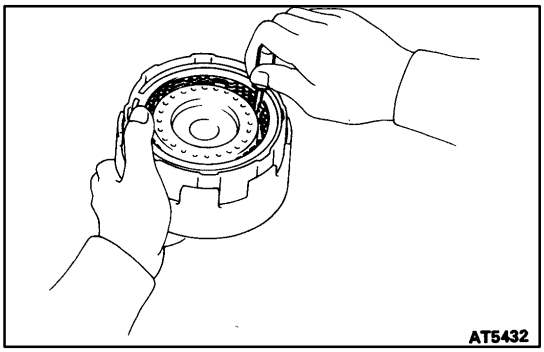


(b) Coat the race with petroleum jelly and install it onto the front planetary ring gear.

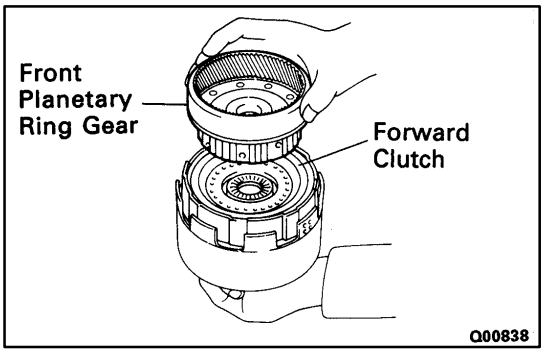
Race diameter

mm (in.)

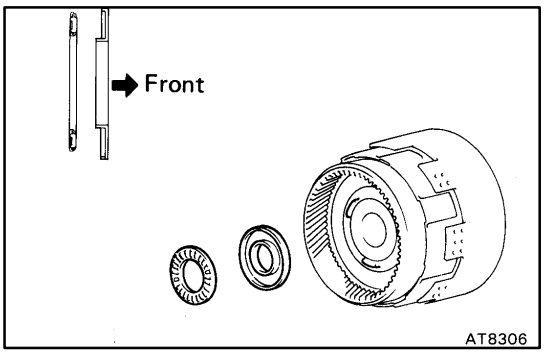
	Inside	Outside
Race	26.8 (1.055)	47.0 (1.850)



(c) Align the flukes of the discs in the forward clutch.



(d) Align the splines of the front planetary ring gear with the flukes of the discs and install the front planetary ring gear to the forward clutch.



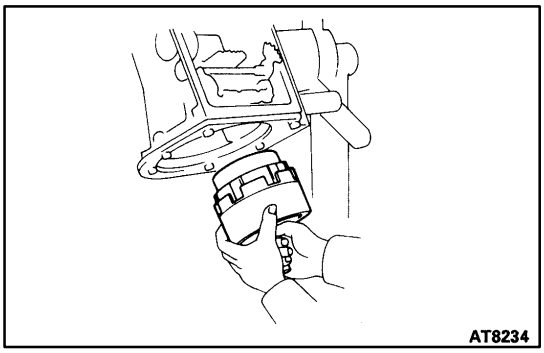
15. INSTALL ASSEMBLED DIRECT CLUTCH, FORWARD CLUTCH AND FRONT PLANETARY RING GEAR INTO CASE

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

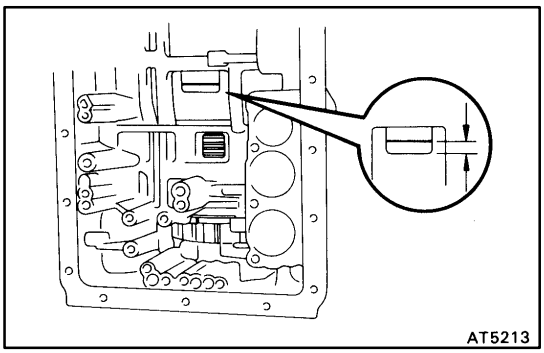
Bearing and race diameter

mm (in.)

	Inside	Outside
Bearing	32.6 (1.283)	47.7 (1.878)
Race	30.6 (1.205)	53.6 (2.110)



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

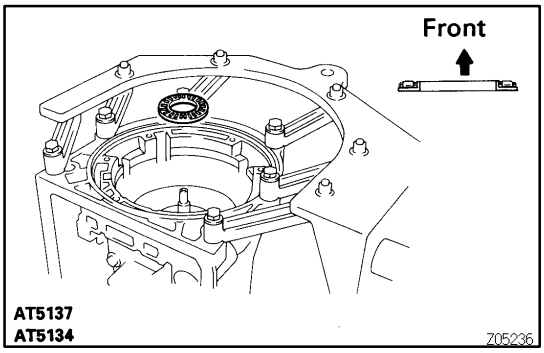


(c) Using vernier calipers, measure the distance between the sun gear input drum and direct clutch drum, as shown in the illustration.

Height:

5.3 - 7.3 mm (0.209 - 0.287 in.)

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

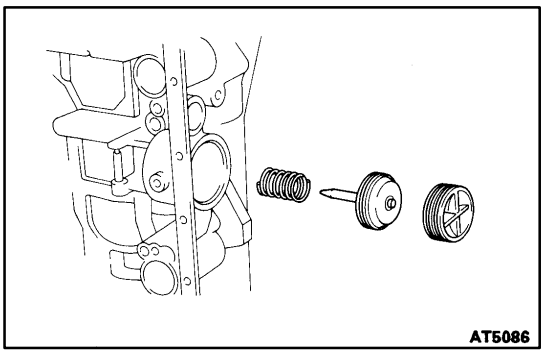


(d) Coat the assembled bearing and race with petroleum jelly and install it onto the forward clutch.

Assembled bearing and race diameter

mm (in.)

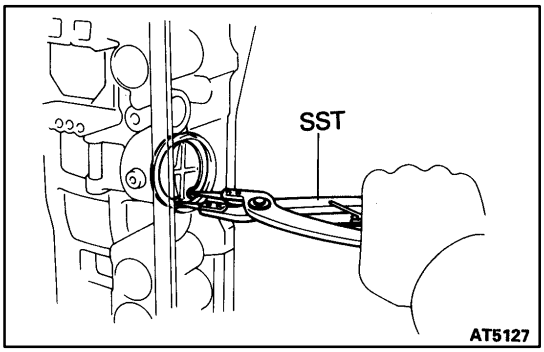
	Inside	Outside
Bearing and race	33.7 (1.327)	47.6 (1.874)



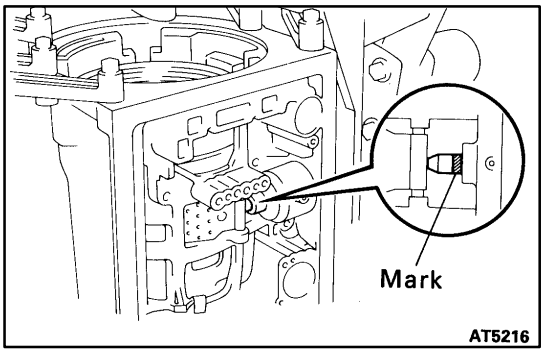
16. INSTALL SECOND COAST BRAKE COVER, PISTON ASSEMBLY AND SPRING

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

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

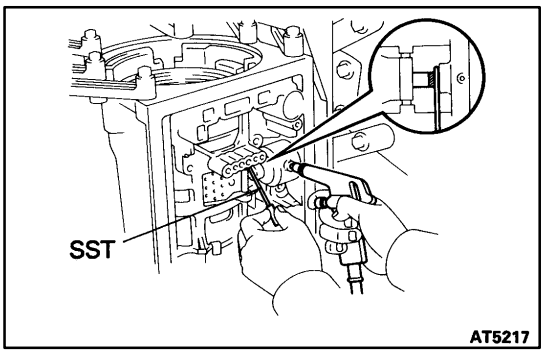


(c) Using SST, install the snap ring.
SST 09350-30020 (09350-07060)

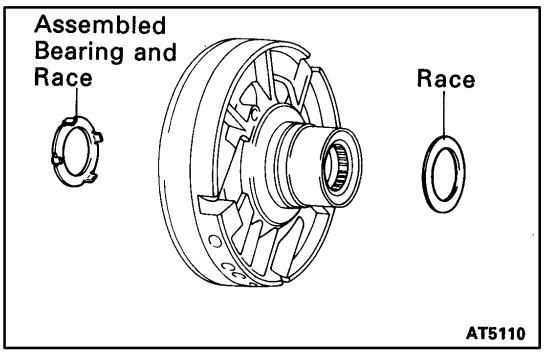


17. CHECK PISTON ROD STROKE OF SECOND COAST BRAKE

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



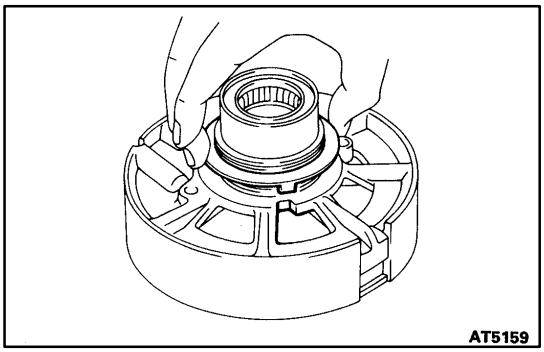
(b) Using SST, measure the stroke while applying and releasing compressed air (392-785 kPa, 4-8 kgf/cm^2, 57-114 psi).
SST 09240-00020
Piston rod stroke:
1.5 - 3.0 mm (0.059 - 0.118 in.)
If the stroke is more than specified, replace the piston rod.
Piston rod length:
71.4 mm (2.811 in.)
72.9 mm (2.870 in.)
If it is still more than standard value, replace the brake band with a new one.



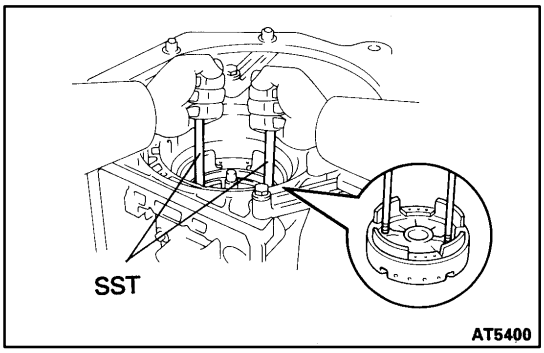
18. INSTALL OVERDRIVE SUPPORT ASSEMBLY

(a) Coat the bearing and race with petroleum jelly and install it onto the overdrive support assembly.
Bearing and race diameter
mm (in.)

	Inside	Outside
Race	36.8 (1.449)	50.9 (2.004)
Bearing	33.6 (1.323)	50.3 (1.980)

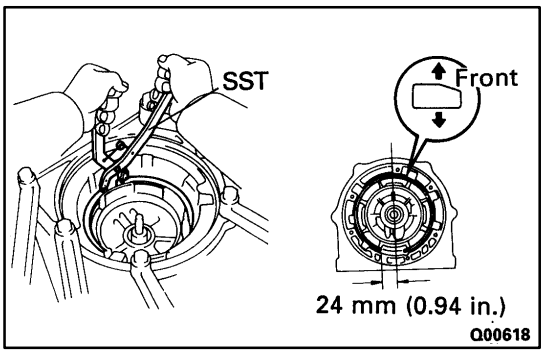


(b) Confirm the thrust washer is installed correctly.
HINT: Make sure that the lug shape matches the hole on the O/D support.

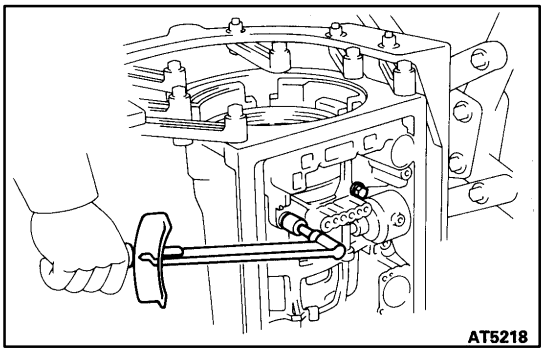


(c) Using 2 bolts of SST, aim the bolt and oil holes of the overdrive support toward the valve body side, and align them with the bolt holes of the transmission case and insert.
SST 09350-30020 (09350-07020)

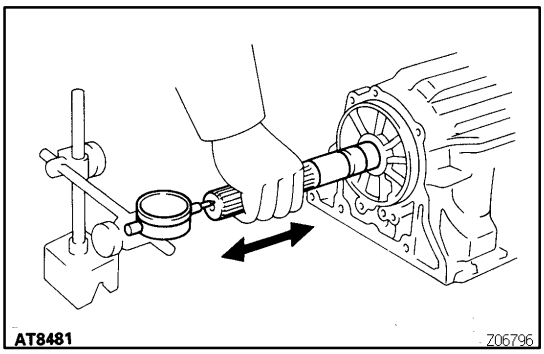
(d) Temporarily tighten the 2 bolts.



(e) Using SST, install the snap ring.
SST 09350-30020 (09350-07060)
HINT: Install the snap ring open end toward the valve body.



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



19. CHECK OUTPUT SHAFT

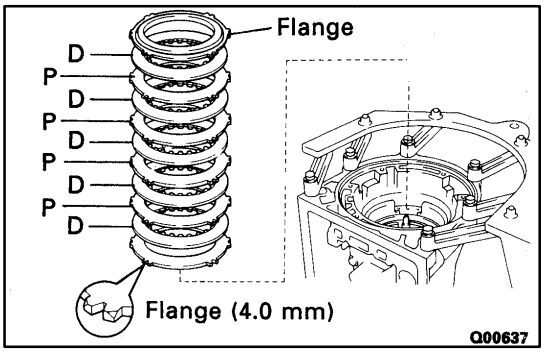
(a) Using a dial indicator, measure the end play of the output shaft with hand.

End play:

0.27 - 0.86 mm (0.0106 - 0.0339 in.)

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

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



20. INSTALL FLANGES, PLATES AND DISCS OF OVER-DRIVE BRAKE

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

(b) Install the plates and discs.

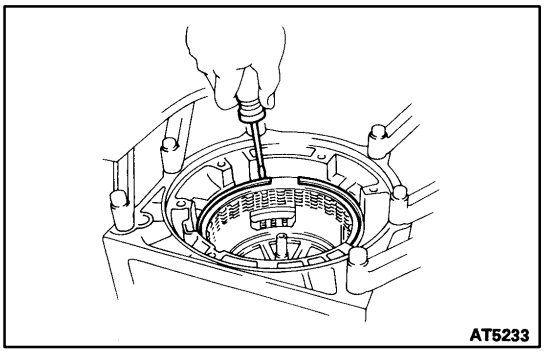
Install in order: P = Plate D = Disc

PREVIA:

D-P-D-P-D

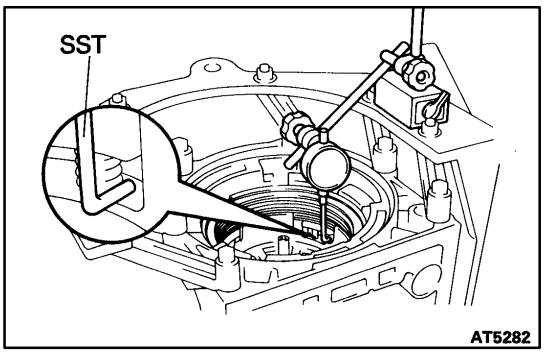
OTHERS:

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



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

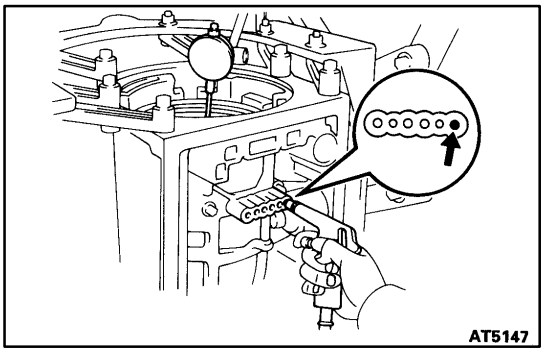
(d) Using a screwdriver, install the snap ring.



21. CHECK PISTON STROKE OF OVERDRIVE BRAKE

(a) Place SST and a dial indicator onto the overdrive brake piston.

SST 09350-30020 (09350-06120)



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

Piston stroke:

PREVIA:

1.40 - 1.70 mm (0.0551 - 0.0669 in.)

OTHERS:

1.40 - 1.70 mm (0.0551 - 0.0669 in.)

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

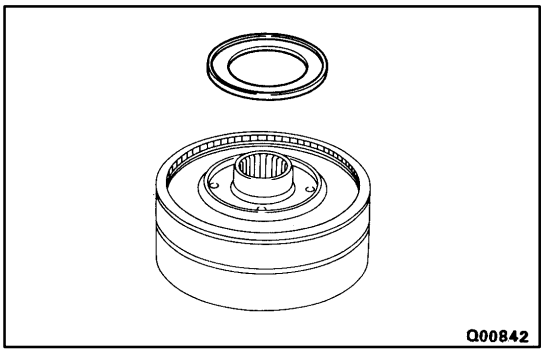
If the piston stroke is non- standard, select another flange.

HINT: There are 7 different thicknesses for the flange.

Flange thickness

mm (in.)

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



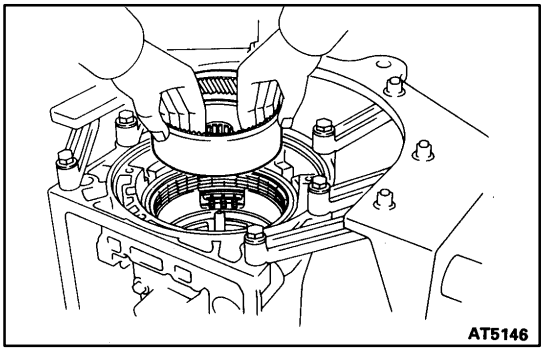
22. INSTALL OVERDRIVE PLANETARY GEAR UNIT WITH OVERDRIVE DIRECT CLUTCH AND ONE- WAY CLUTCH

(a) Coat the race with petroleum jelly and install them onto the overdrive support.

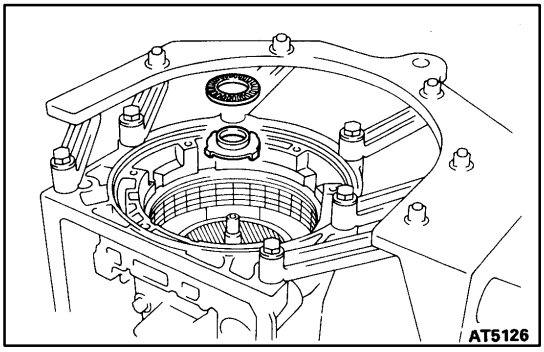
Race diameter

mm (in.)

	Inside	Outside
Race	37.1 (1.461)	59.0 (2.323)



(b) Install the overdrive planetary ring gear.

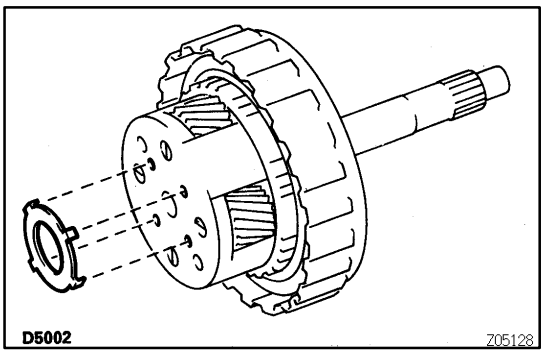


(c) Coat the bearing and race with petroleum jelly and install them onto the planetary ring gear.

Bearing and race diameter

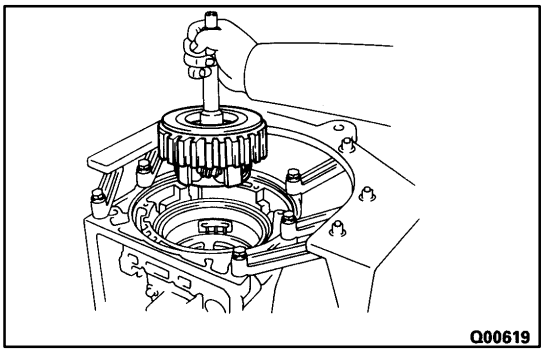
mm (in.)

	Inside	Outside
Bearing	26.0 (1.024)	46.8 (1.843)
Race	24.2 (0.953)	47.8 (1.882)

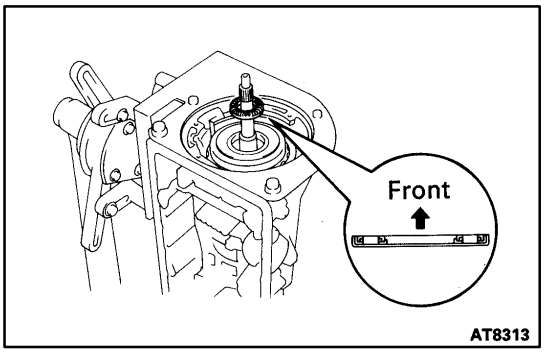


(d) Coat the race with petroleum jelly and install it onto the planetary gear.
Race diameter
mm (in.)

	Inside	Outside
Race	27.1 (1.067)	41.8 (1.646)

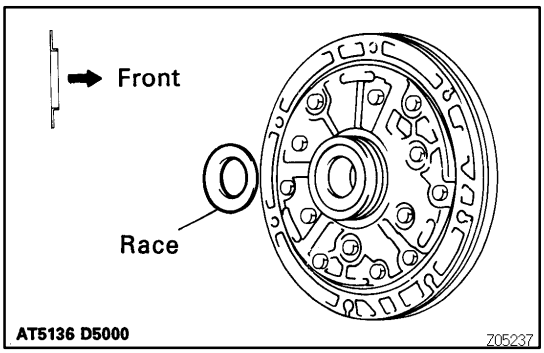


(e) Install the overdrive planetary gear with the overdrive direct clutch and one-way clutch.



(f) Coat the assembled bearing and race with petroleum jelly and install it onto the overdrive direct clutch.
Bearing and race diameter
mm (in.)

	Inside	Outside
Bearing and race	28.9 (1.138)	50.2 (1.976)

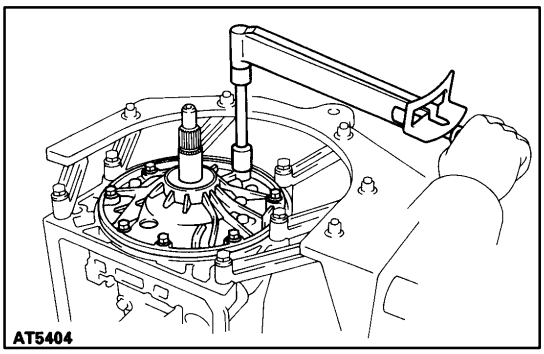


23. INSTALL OIL PUMP INTO CASE

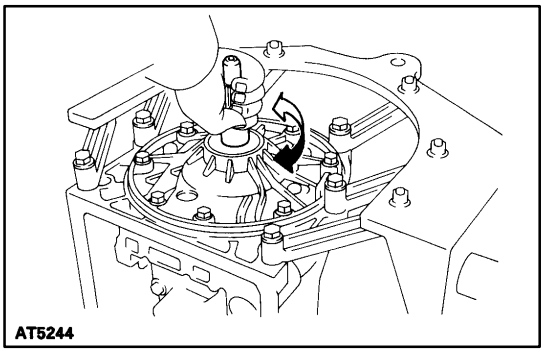
(a) Coat the race with petroleum jelly and install it onto the oil pump.
Race diameter
mm (in.)

	Inside	Outside
Race	28.1 (1.106)	47.3 (1.862)

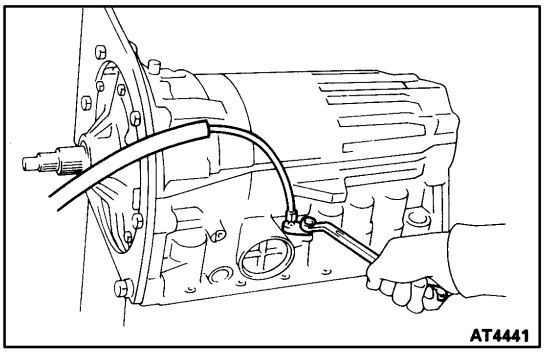
(b) Coat a new O-ring with ATF and install it around the pump body.
(c) Place the oil pump through the input shaft, and align the bolt holes of the pump body with the transmission case.
(d) Hold the input shaft, and lightly press the oil pump body to slide the oil seal rings into the O/D direct clutch drum.
NOTICE: Do not push on the oil pump strongly, or the oil seal ring will stick to the direct clutch drum.



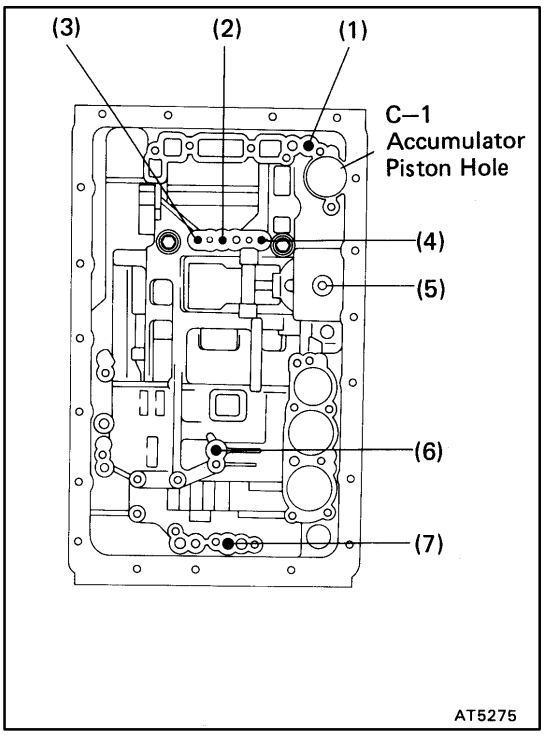
(e) Install the 7 bolts.
Torque: 22 N·m (220 kgf·cm, 16 ft·lbf)



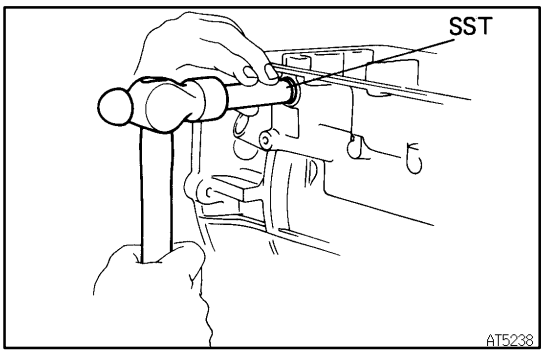
24. CHECK INPUT SHAFT ROTATION
Make sure the input shaft rotates smoothly.



25. INSTALL THROTTLE CABLE
(a) Coat a new O-ring with ATF and install it to the cable.
(b) Install the cable to the case.



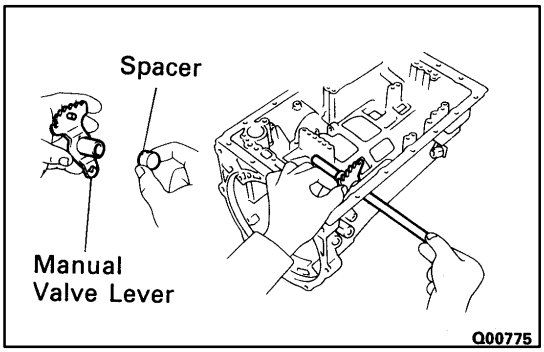
26. INDIVIDUAL PISTON OPERATION INSPECTION
Check for the sound of operation while applying compressed air into the oil hole indicated in the illustration.
HINT: When inspecting the O/D direct clutch, check with the C_0 accumulator piston hole closed.
If there is no noise, disassemble and check the installation condition of the parts.
(1) O/D direct clutch
(2) Direct clutch
(3) Forward clutch
(4) O/D brake
(5) Second coast brake
(6) Second brake
(7) First and reverse brake



27. INSTALL MANUAL VALVE LEVER, SHAFT AND OIL SEAL

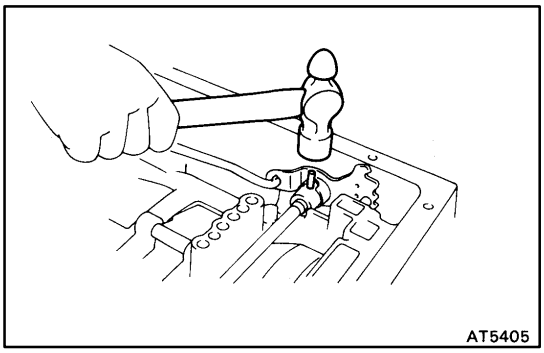
(a) Using SST, drive in 2 new oil seals.
SST 09350-30020 (09350-07110)

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

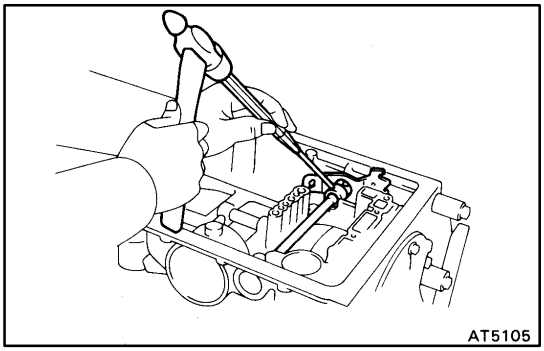


(c) Install a new spacer to the manual valve lever.

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

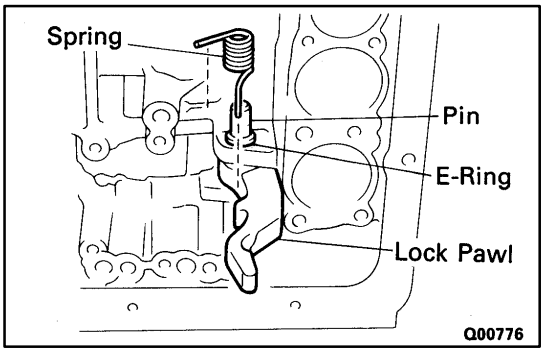


(e) Using a hammer, drive in a new spring pin.



(f) Match the manual valve lever indentation with the spacer hole and calk them the punch.

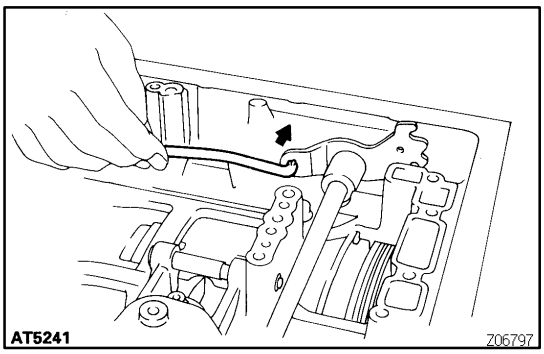
(g) Make sure the shaft rotates smoothly.



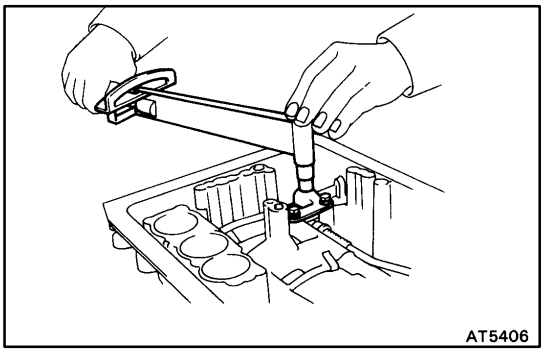
28. INSTALL PARKING LOCK PAWL AND ROD

(a) Install the E-ring to the shaft.

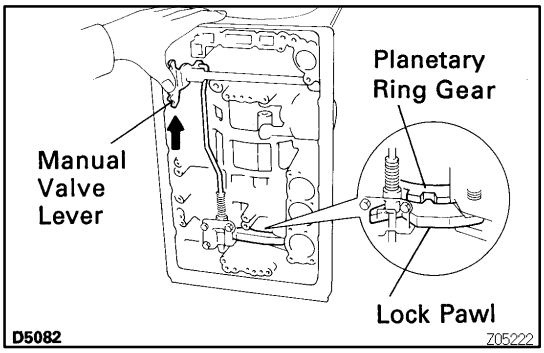
(b) Install the parking lock pawl, shaft and spring.



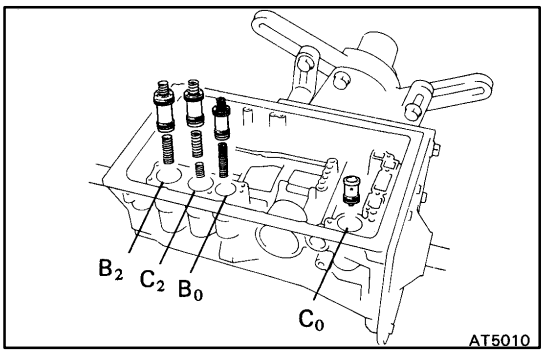
(c) Connect the parking lock rod to the manual valve lever.



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



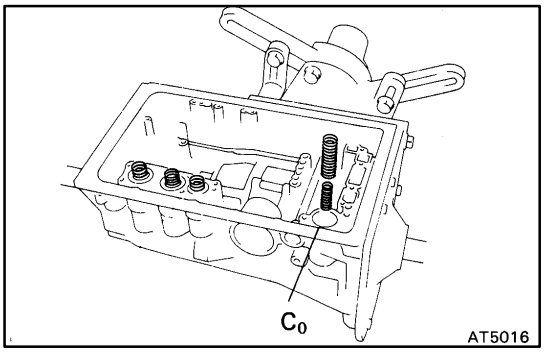
(e) Shift the manual valve lever to the P position, and confirm that the planetary ring gear is correctly locked up by the pawl.



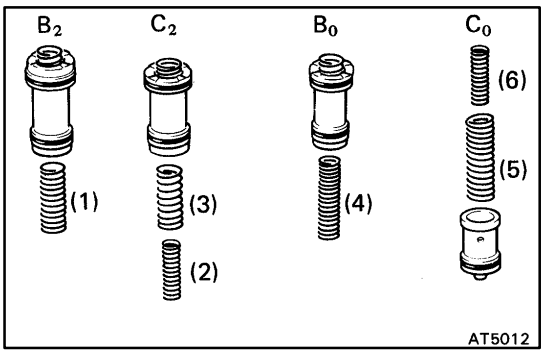
29. INSTALL ACCUMULATOR SPRINGS AND PISTONS

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

(b) Install the 3 springs and four accumulator pistons to the bore.
HINT: The pistons are marked in relief with either C_0, B_0, C_2 or B_2 to differentiate between them.



(c) Install the 2 springs to the C_0 accumulator piston.



★ **Accumulator Spring**

TRUCK, 4 RUNNER, T100:

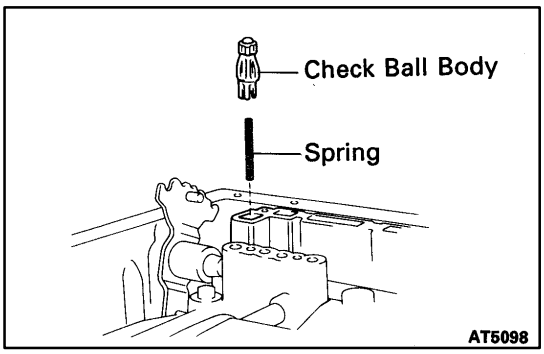
Spring	Free length Outer diameter	Color
(1) B_2	70.5 mm (2.776 in.) 19.7 mm (0.776 in.)	Yellow
(2) C_2 (Inner)	42.1 mm (1.657 in.) 14.7 mm (0.579 in.)	Pink
(3) C_2 (Outer)	70.2 mm (2.764 in.) 20.2 mm (0.795 in.)	Purple
(4) B_0	62.0 mm (2.441 in.) 16.0 mm (0.630 in.)	Green
(5) C_0 (Outer)	46.0 mm (1.811 in.) 14.0 mm (0.551 in.)	Yellow
(6) C_0 (Inner)	74.6 mm (2.397 in.) 20.9 mm (0.823 in.)	Orange

SUPRA:

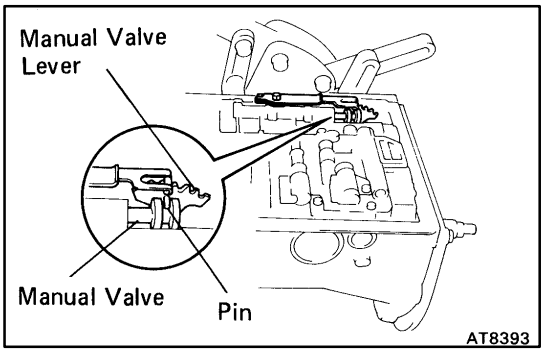
Spring	Free length Outer diameter	Color
(1) B_2	73.4 mm (2.890 in.) 19.9 mm (0.783 in.)	Red
(2) C_2 (Inner)	42.1 mm (1.657 in.) 14.7 mm (0.579 in.)	Pink
(3) C_2 (Outer)	70.2 mm (2.764 in.) 20.2 mm (0.795 in.)	Purple
(4) B_0	67.0 mm (2.638 in.) 16.2 mm (0.638 in.)	White & Blue
(5) C_0 (Outer)	46.0 mm (1.811 in.) 14.0 mm (0.551 in.)	Yellow
(6) C_0 (Inner)	74.6 mm (2.397 in.) 20.9 mm (0.823 in.)	Orange

PREVIA:

Spring	Free length Outer diameter	Color
(1) B_2	75.3 mm (2.965 in.) 20.0 mm (0.787 in.)	White & Red
(2) C_2 (Inner)	42.1 mm (1.657 in.) 14.7 mm (0.579 in.)	Pink
(3) C_2 (Outer)	70.2 mm (2.764 in.) 20.2 mm (0.795 in.)	Purple
(4) B_0	67.0 mm (2.638 in.) 16.2 mm (0.638 in.)	White & Blue
(5) C_0 (Outer)	46.0 mm (1.811 in.) 14.0 mm (0.551 in.)	Yellow
(6) C_0 (Inner)	74.6 mm (2.397 in.) 20.9 mm (0.823 in.)	Orange



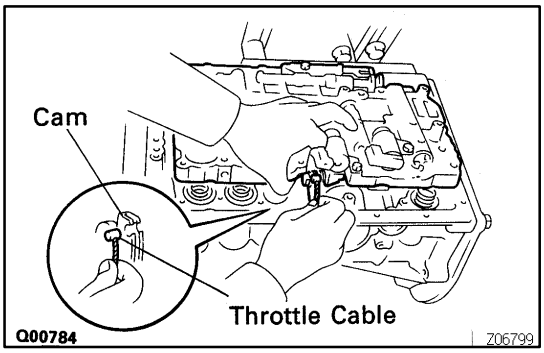
30. INSTALL CHECK BALL BODY AND SPRING



AT0SM-01

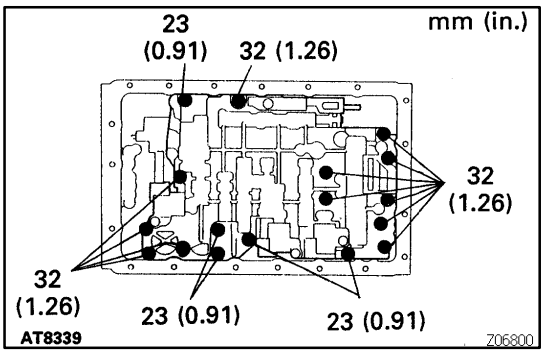
31. INSTALL VALVE BODY

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

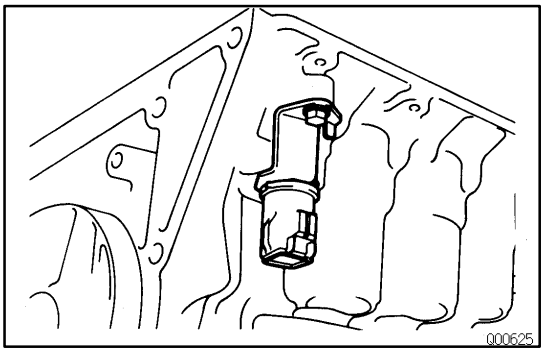


(b) Connect the throttle cable to the cam.

(c) Confirm the springs into the accumulator pistons are installed correctly.



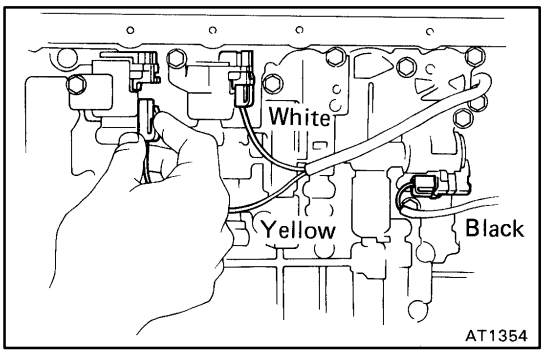
(d) Install the 17 bolts.
HINT: Each bolt length is indicated in the illustration.
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)



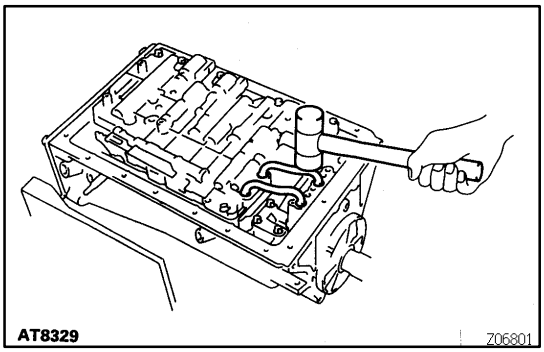
32. INSTALL SOLENOID WIRING

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

(b) Install the solenoid wiring to the case and install the stopper plate.



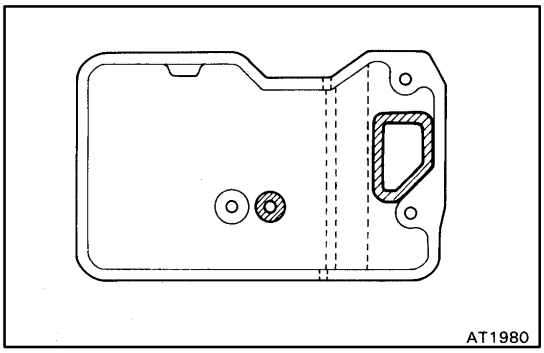
(c) Connect the connectors to the No.1, No.2 and lock-up solenoids.



33. INSTALL OIL TUBES

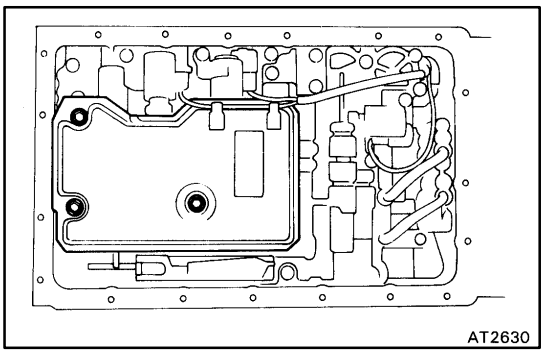
Using a plastic hammer, install the tubes into position.

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



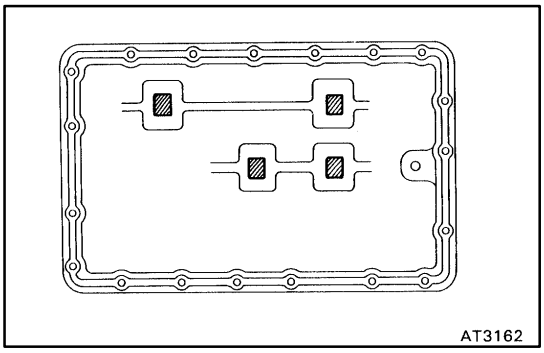
34. INSTALL OIL STRAINER AND GASKETS

(a) Install the 2 new gaskets in the oil strainer.



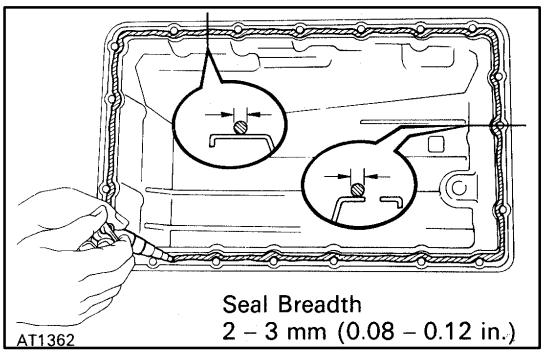
(b) Install and torque the 3 bolts.
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

(c) Clamp the solenoid wire.



35. INSTALL MAGNETS IN PAN

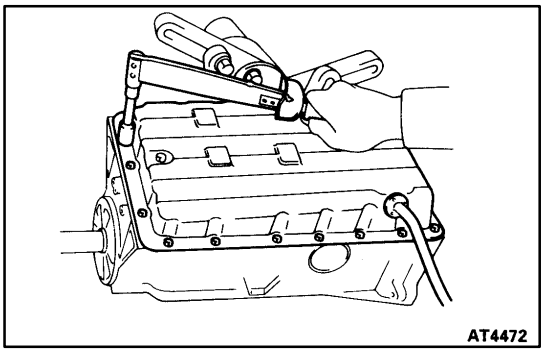
(a) Install the 3 magnets in the indications of the oil pan.



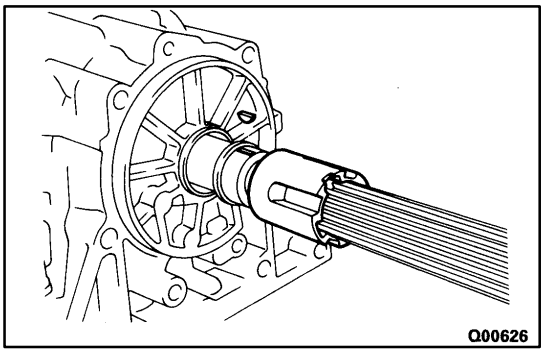
36. INSTALL OIL PAN

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

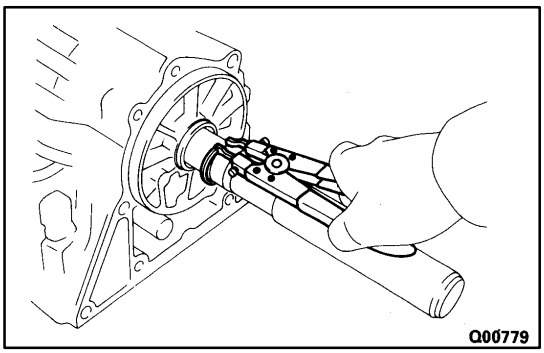
(b) Apply seal packing to the oil pan.
Seal packing:
Part No. 08826-00090, THREE BOND 1281 or equivalent



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

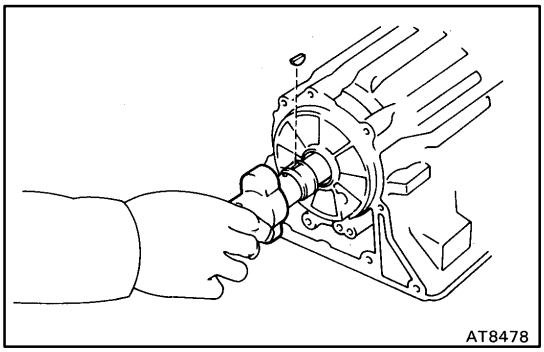


37. INSTALL SENSOR ROTOR AND KEY
SUPRA:



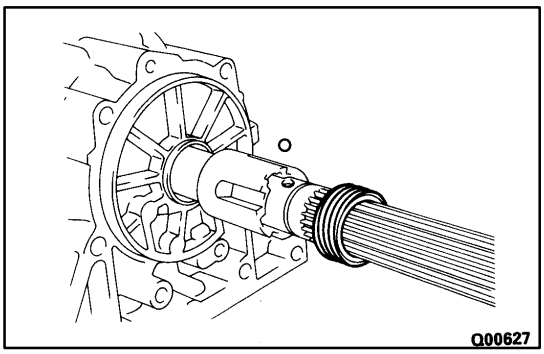
OTHERS:

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

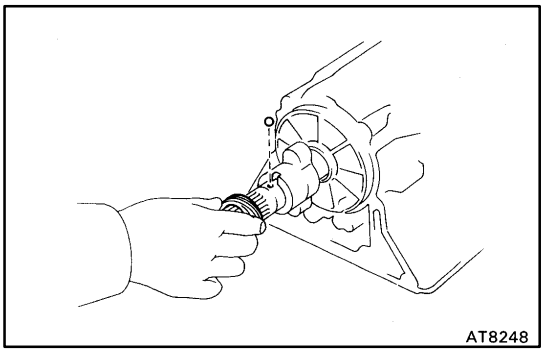


(b) Install the key on the output shaft.

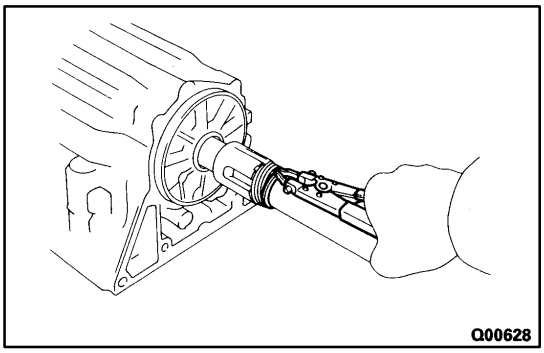
(c) Align the groove of the sensor rotor with the key, install the sensor rotor.



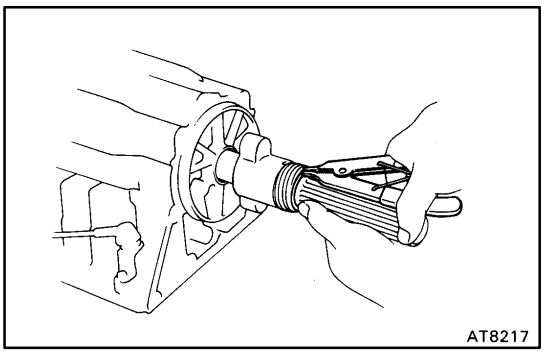
38. INSTALL SPEEDOMETER DRIVE GEAR AND BALL
SUPRA:



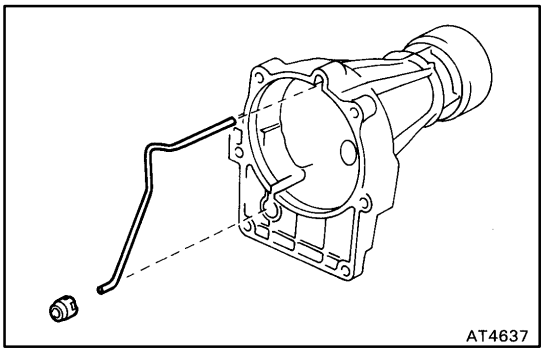
OTHERS:
(a) Install the lock ball on the output shaft.
(b) Align the groove of the drive gear with the ball, install the drive gear.



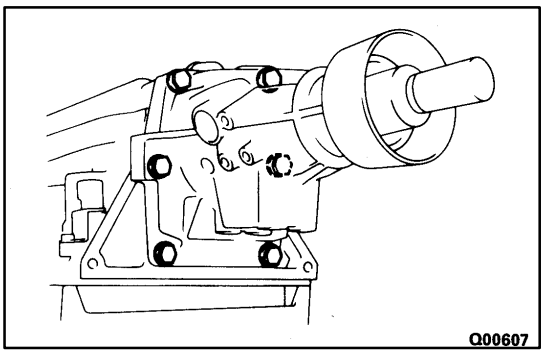
SUPRA:
(c) Using snap ring pliers, install the snap ring.



OTHERS:

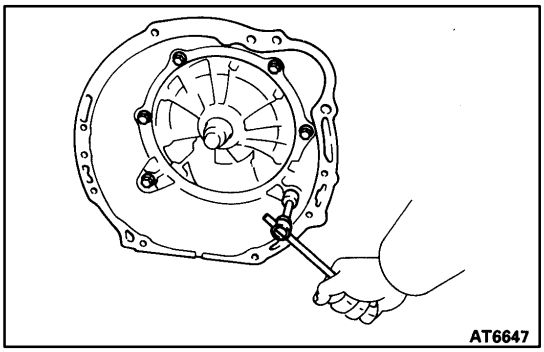


39. INSTALL EXTENSION HOUSING AND NEW GASKET
(a) Install the oil apply tube and a new gasket to the extension housing.
(b) Install the oil apply tube and a new gasket to the extension housing.



(c) Apply seal packing or equivalent to the 6 bolts.
Seal packing:
Part No. 08826-00070, THREE BOND 1324 or equivalent

(d) Install the extension housing with a new gasket to the case. install and torque the 6 bolts.
HINT: The 2 lower bolts are shorter.
Torque: 36 N·m (370 kgf·cm, 27 ft·lbf)

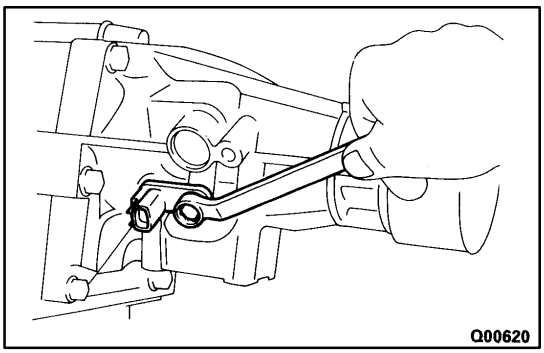


40. INSTALL TRANSMISSION HOUSING

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

(b) Apply seal packing or equivalent to the six bolts.
Seal packing:
Part No. 08826-00070, THREE BOND 1324 or equivalent

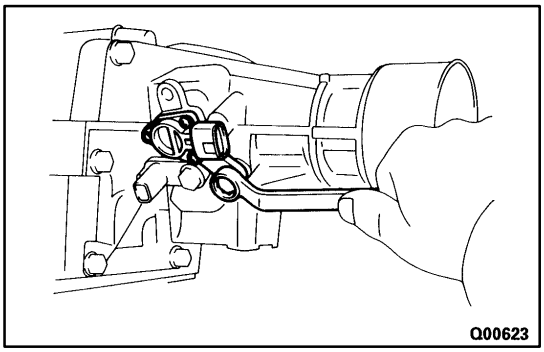
(c) Install and torque the 6 bolts.
Torque:
10 mm bolt 34 N·m (345 kgf·cm, 25 ft·lbf)
12 mm bolt 57 N·m (580 kgf·cm, 42 ft·lbf)



41. INSTALL NO.2 VEHICLE SPEED SENSOR

(a) Install the O-ring from the sensor.

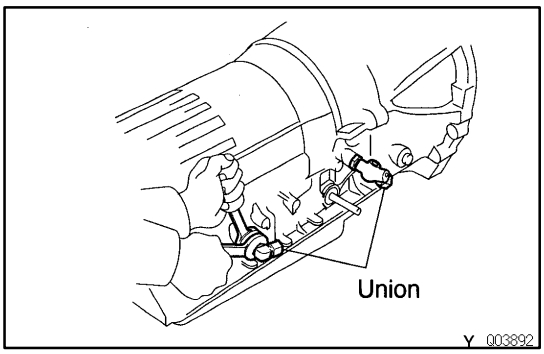
(b) Install the No.2 vehicle speed sensor.



42. INSTALL NO.1 VEHICLE SPEED SENSOR

(a) Install the O-ring from the sensor.

(b) Install the No.1 vehicle speed sensor.

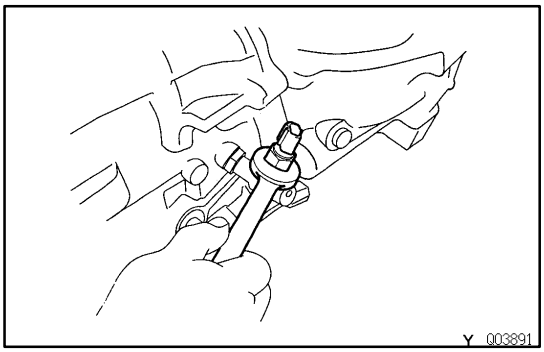


43. INSTALL UNION AND ELBOW

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

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

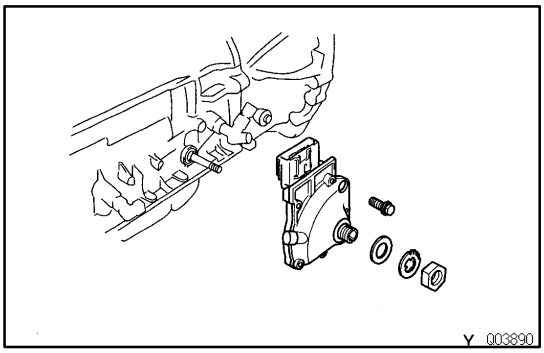
(c) Install the rear union.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)



44. SUPRA, T100
INSTALL A/T OIL TEMPERATURE SENSOR

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

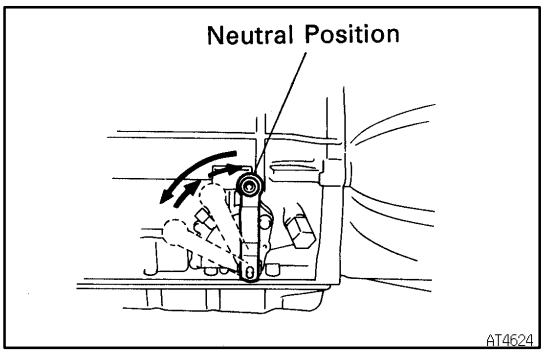
(b) Install the sensor.
Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)



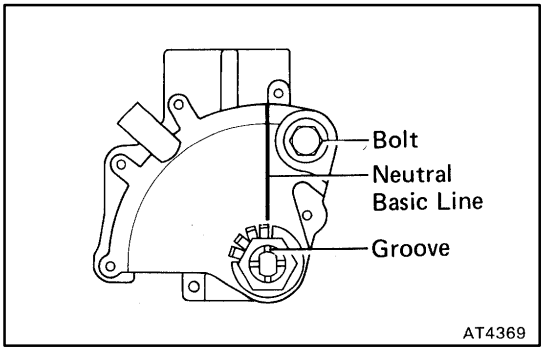
45. INSTALL PARK/NEUTRAL POSITION SWITCH

(a) Install the park/neutral position switch onto the manual valve lever shaft and temporarily tighten the adjusting bolt.

(b) Install the grommet and a new lock washer. Install and torque the nut.
Torque: 6.9 N·m (70 kgf·cm, 61 in.·lbf)

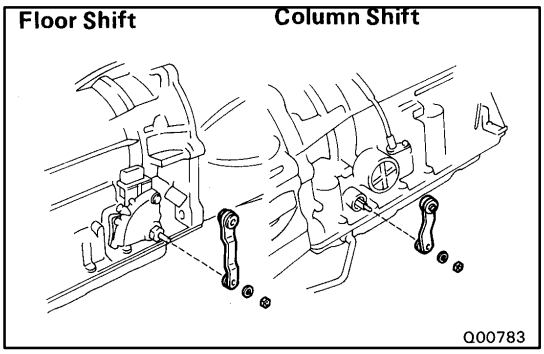


(c) Using the control shaft lever, fully turn the manual lever shaft back and return 2 notches. It is now in neutral.

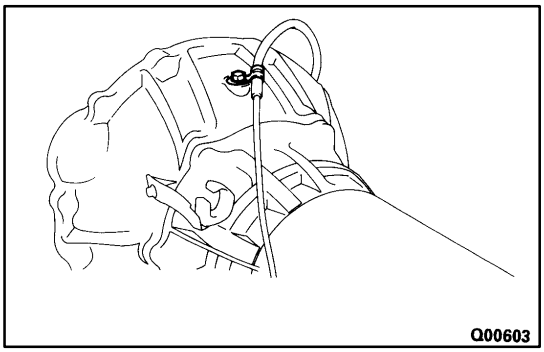


(d) Align the neutral basic line and the switch groove, and tighten the adjusting bolt.
Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

(e) Bend the tabs of the lock washer.
HINT: Bend at least 2 of the lock washer tabs.



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



47. SUPRA, PREVIA:
INSTALL WIRE HARNESS CLAMP AND THROTTLE CABLE CLAMP