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HOW TO USE THIS MANUAL

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GENERAL INFORMATION

1. GENERAL DESCRIPTION

(a) This manual is made in accordance with SAE J2008.

(b) Repair operations can be separated mainly in the following 3 processes:
  (1) Diagnosis
  (2) Removing and Installing, Replacing, Disassembling, Installing and Checking, Adjusting
  (3) Final Inspection

(c) This text explains the 1st process of “Diagnosis” (included in the “Diagnostics” section) and the 2nd process, “Removing & Installing, Replacing, Disassembling, Installing & Checking, Adjusting”, but the 3rd process of “Final Inspection” is not included.

(d) The essential operations below are not covered in this manual. However, these operations must be carried out in the practical situation.
  (1) Operation with a jack and lift
  (2) Cleaning of a removed part when necessary
  (3) Visual check

2. INDEX

(a) An INDEX is provided on the first page of each section to guide you to the item to be repaired.

3. PREPARATION

(a) Use of special service tools (SST) and special service materials (SSM) may be required, depending on the repairing condition. Be sure to use SST and SSM when they are required and follow the working procedure properly. A list of SST and SSM is in the Preparation section in this manual.

4. REPAIR PROCEDURES

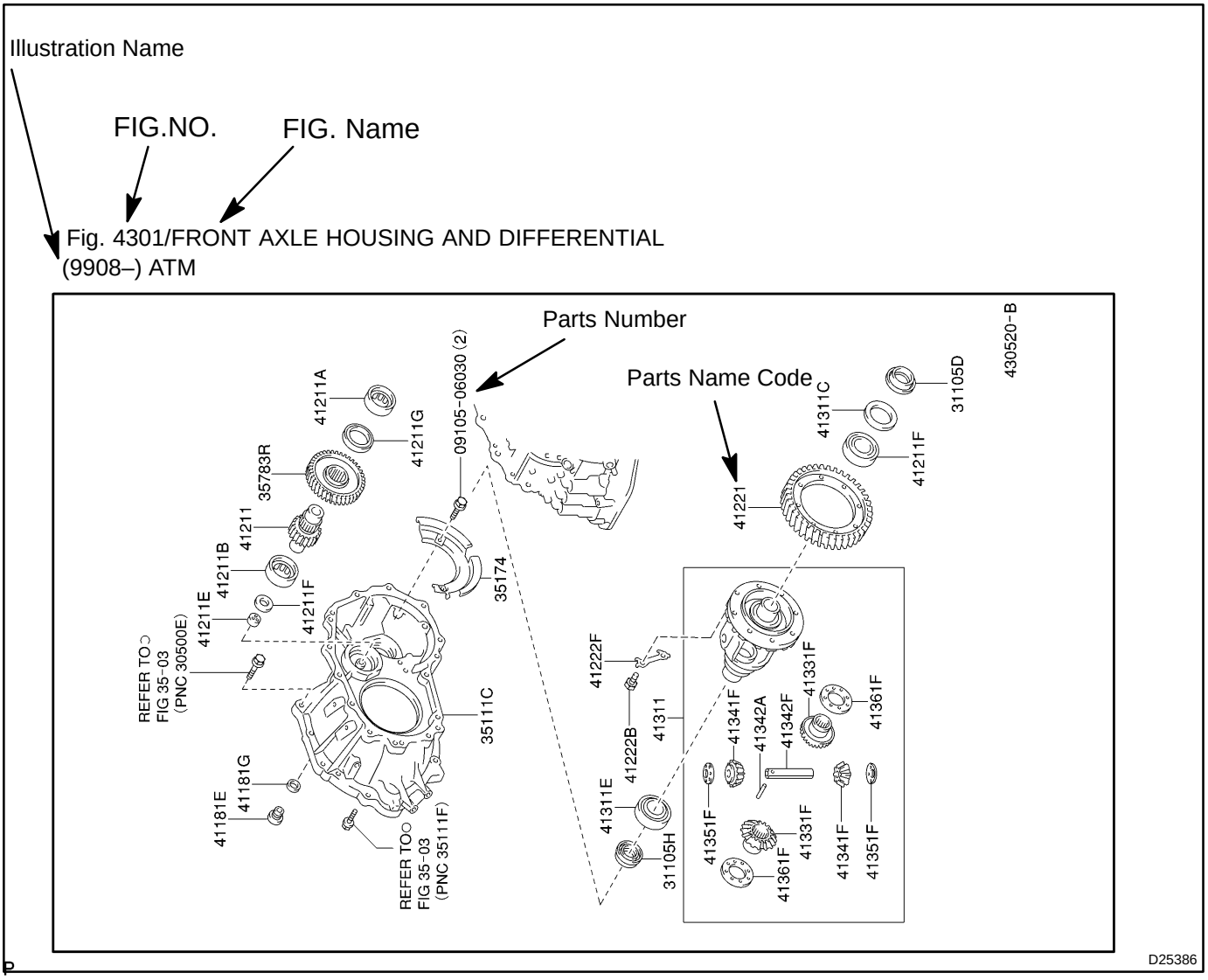
(a) Component drawings are provided in the “Component section.” These drawings enable you to understand the fitting condition of the components.

(b) Illustrations from the parts catalog are used for the component drawings. (In the illustration, the parts code of the parts catalog is described.)

NOTICE:

The parts code described in this text is as of August 2002. The parts code or the part number may change. Therefore, use the parts catalog when placing orders.

Example:



(c) Tightening torque, lubricant application position, and non–reusable parts are described as points of the procedure.

NOTICE:

In instances where the above items can only be indicated by an illustration , component drawings which describe the points are provided. In these instances, all the information such as torque, oil, etc. are described in the illustration.

(d) Generally the installation procedure is the reverse of the removal procedure, In instances where it is the same, it will be stated as such in the procedure. Where it is different, only the points of difference will be described.

(e) Only items with points are described in the procedure, and the operational portion and content are included using an illustration. In the explanations, details of the operational method, standard value and notice are included.

(f) There may be instances where generic illustrations are used. In these instances some of the details of the illustrations may be different to those of the actual vehicle.

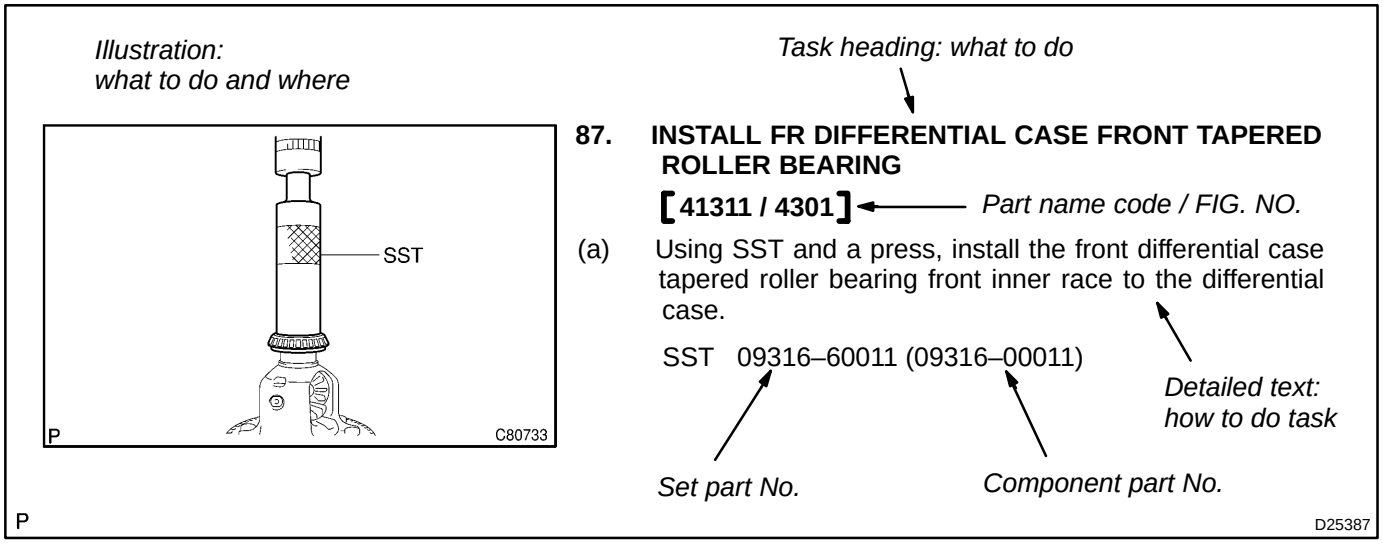
(g) The procedures are presented in a step–by–step format:

(1) The illustration shows what to do and where to do it.

(2) The task heading explains what to do.

(3) The detailed text explains how to perform the task and gives other information such as specifications and warnings.

Example:



HINT:
This format provides an 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.

5. SERVICE SPECIFICATIONS

(a) Specifications are presented in bold type throughout the text where needed. You never have to leave the procedure to look up your specifications. They are also found in the Service Specifications section for quick reference.

6. TERMS DEFINITION

CAUTION	Indicates the possibility of injury to you or other people.
NOTICE	Indicates the possibility of damage to the components being repaired.
HINT	Provides additional information to help you perform the repair efficiently.

7. SI UNIT

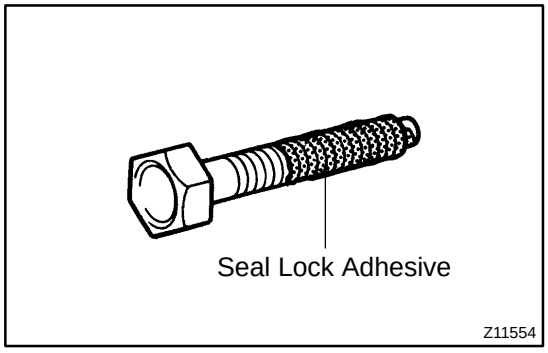
(a) The UNITS given in this manual are primarily expressed according to the SI UNIT (International System of Unit), and alternately expressed in the metric system and in the English System.
Example:
Torque: 30 N·m (310 kgf·cm, 22 ft·lbf)

REPAIR INSTRUCTION FOR AUTOMATIC TRANSAXLE REPAIR MANUAL

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PRECAUTION

1. BASIC REPAIR HINT



(a) PRECOATED PARTS

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

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

(3) 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.

NOTICE:

When checking the torque, use the lower limit value of the torque tolerance.

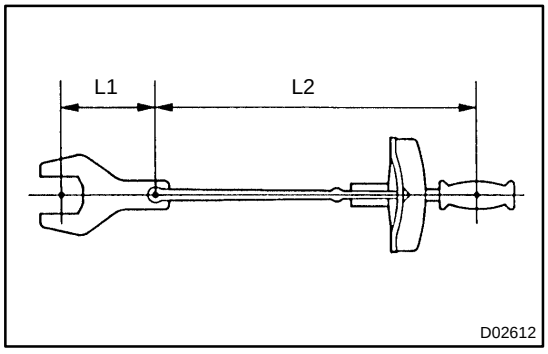
(4) Depending on the seal lock agent to be applied, it may be necessary to leave it for a specified time until it hardens.

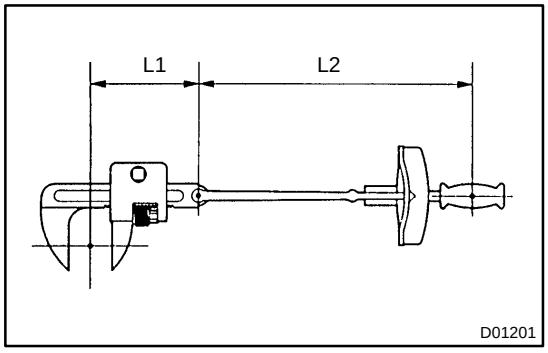
(b) GASKETS

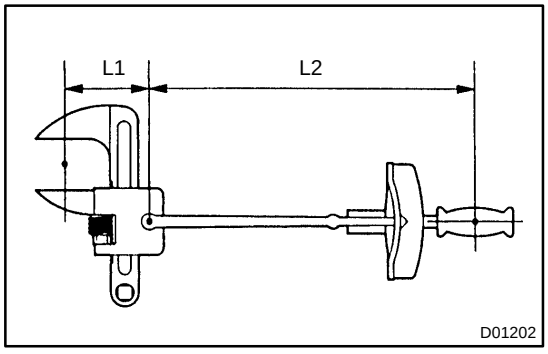
When necessary, use a sealer on gaskets to prevent leaks.

(c) BOLTS, NUTS AND SCREWS

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







(d) TORQUE WHEN USING EXTENSION TOOL WITH TORQUE WRENCH

(1) In this text, only the specified torque is described. Therefore, when the overall length of the torque wrench is increased with SST or extention tool, and the torqure wrench reading is set to the specified torque, the applied torque will be excessive.

(2) When using a torque wrench with SST or extension tool, find the correct reading of the torque wrench by the formula.

(3) Formula T'=T x L2/(L1 + L2)

T'	Reading of torque wrench {N·m (kgf·cm, ft·lbf)}
T	Torque {N·m (kgf·cm, ft·lbf)}
L1	Length of SST or tool (cm)
L2	Length of torque wrench (cm)

TERMS FOR AUTOMATIC TRANSAXLE REPAIR MANUAL

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ABBREVIATIONS USED IN THIS MANUAL

Abbreviations	Meaning
ASSY	Assembly
ATF	Automatic Transmission Fluid
B_3	U/D Brake
C_1	Forward Clutch
C_3	Reverse Clutch
FIPG	Formed In Place Gasket
O/D	Overdrive
SSM	Special Service Materials
SST	Special Service Tools
U/D	Underdrive
1ST	First
2ND	Second
w/	with
w/o	without

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GLOSSARY OF SAE AND TOYOTA TERMS

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

SAE ABBREVIATIONS	SAE TERMS	TOYOTA TERMS ( )—ABBREVIATIONS
A/C	Air Conditioning	Air Conditioner
ACL	Air Cleaner	Air Cleaner
AIR	Secondary Air Injection	Air Injection (AI)
AP	Accelerator Pedal	–
B+	Battery Positive Voltage	+B, Battery Voltage
BARO	Barometric Pressure	–
CAC	Charge Air Cooler	Inter cooler
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 Potion	–
DFI	Direct Fuel Injection (Diesel)	Direct Injection (DI)
DI	Distributor Ignition	–
DLC1 DLC2 DLC3	Data Link Connector 1 Data Link Connector 2 Data Link Connector 3	1: Check Connector 2: Total Diagnosis Communication Link (TDCL) 3: OBD II Diagnostic Connector
DTC	Diagnostic Trouble Code	Diagnostic Code
DTM	Diagnostic Test Mode	–
ECL	Engine Control Level	–
ECM	Engine Control Module	Engine ECU (Electronic Control Unit)
ECT	Engine Control Temperature	Coolant Temperature, Water Temperature (THW)
EEPROM	Electrically Erasable Programmable Read Only memory	Electrically Erasable Programmable Read Only memory (EEPROM), Erasable Programmable Read Only memory (EPROM)
EFE	Early Fuel Evaporation	Cold Mixture Heater (CMH), Heat Control Valve (HCV)
EGR	Exhaust Gas Recirculation	Exhaust Gas Recirculation (EGR)
EI	Electronic Ignition	Distributorless Ignition (DI)
EM	Engine Modification	Engine Modification (EM)
EPROM	Erasable Programmable Read Only Memory	Programmable Read Only Memory (PROM)
EVAP	Evaporative Emission	Evaporative Emission Control (EVAP)
FC	Fan Control	–
FEEPROM	Flash Electrically Erasable Programmable Read Only Memory	–
FEPROM	Flash Erasable Programmable Read Only Memory	–
FF	Flexible Fuel	–
FP	Fuel Pump	Fuel Pump
GEN	Generator	Alternator
GND	Ground	Ground (GND)
HO2S	Heated Oxygen Sensor	Heated Oxygen Sensor (HO2S)
IAC	Idol Air Control	Idol Speed Control (ISC)
IAT	Intake Air Temperature	Intake or Inlet Air Temperature
ICM	Ignition Control Module	–
IFI	Indirect Fuel Injection	Indirect Injection

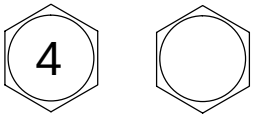
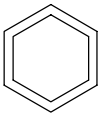
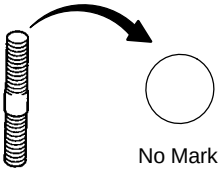
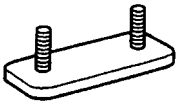
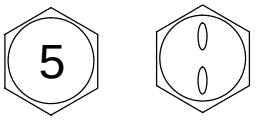
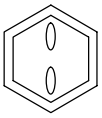
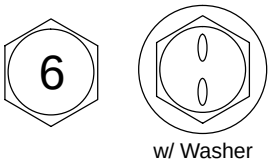
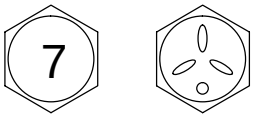
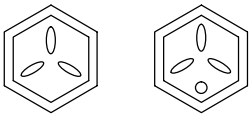
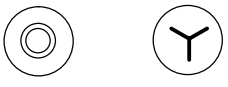
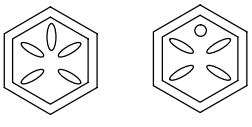
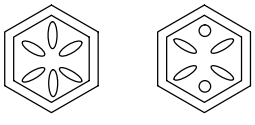
IFS	Inertia Fuel–Shutoff	–
ISC	Idle Speed Control	–
KS	Knock Sensor	Knock Sensor
MAF	Mass Air Flow	Air Flow Meter
MAP	Manifold Absolute Pressure	Manifold Pressure Intake Vacuum
MC	Mixture Control	Electric Bleed Air Control Valve (EBCV) Mixture Control Valve (MCV) Electric Air Control Valve (EACV)
MDP	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), CC_0
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 Catalytic (TWC) CC_{RO}
TWC+OC	Three–Way + Oxidation Catalytic Converter	CC_R + CC_O
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	–

STANDARD BOLT FOR AUTOMATIC TRANSAXLE REPAIR MANUAL

0103M–01

HOW TO DETERMINE BOLT STRENGTH

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

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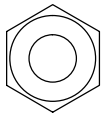
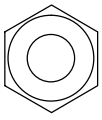
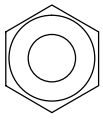
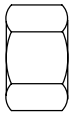
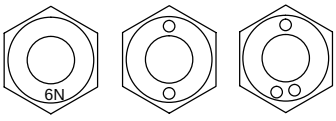
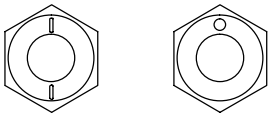
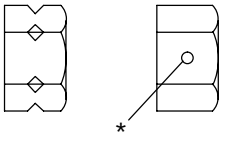
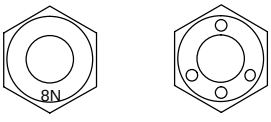
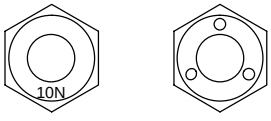
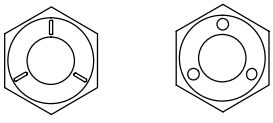
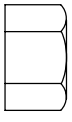
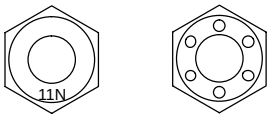
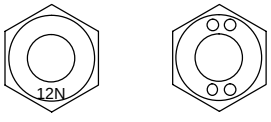
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SPECIFIED TORQUE FOR STANDARD BOLTS

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

0103O–01

HOW TO DETERMINE NUT STRENGTH

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

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

B06432

HINT:

When tightening parts with a bolt and nut, ensure that the nut has the same or greater strength classification number as the bolt strength classification number

Example: Bolt = 4T

Nut = 4N or more

PREPARATION

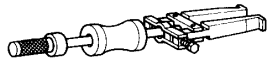
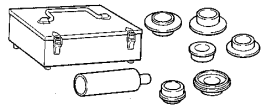
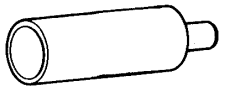
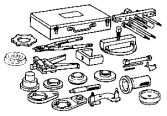
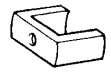
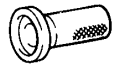
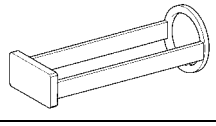
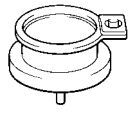
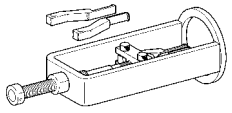
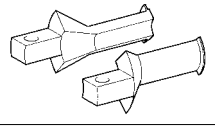
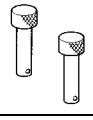
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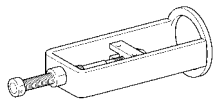
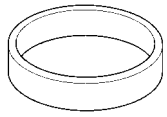
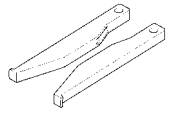
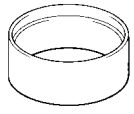
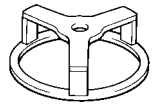
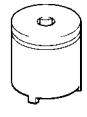
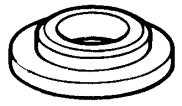
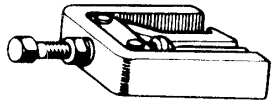
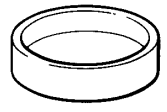
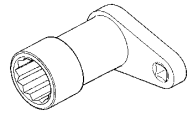
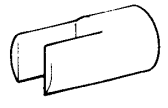
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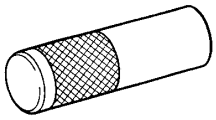
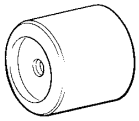
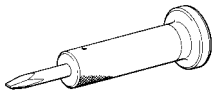
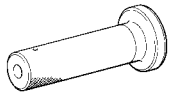
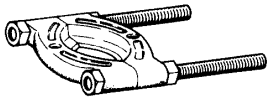
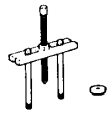
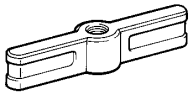
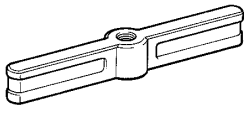
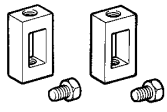
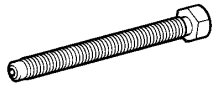
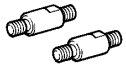
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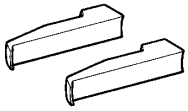
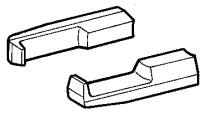
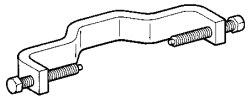
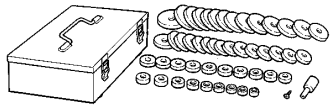
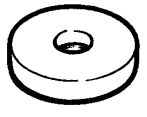
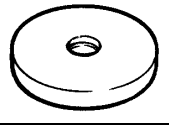
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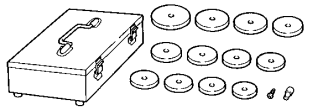
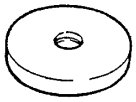
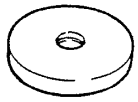
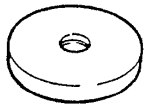
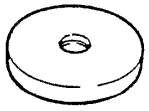
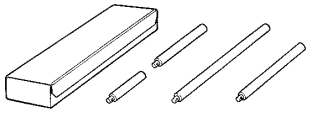
SST

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	09316–60011	Transmission & Transfer Bearing Replacer	UNDERDRIVE PLANETARY GEAR ASSY(U241E) FRONT DIFFERENTIAL ASSY(U241E)
	(09316–00011)	Replacer Pipe	UNDERDRIVE PLANETARY GEAR ASSY(U241E) FRONT DIFFERENTIAL ASSY(U241E)
	09350–32014	TOYOTA Automatic Transmission Tool Set	OIL PUMP ASSY(U241E) FORWARD CLUTCH ASSY(U241E) UNDERDRIVE CLUTCH ASSY(U241E) FRONT DIFFERENTIAL ASSY(U241E)
	(09351–32070)	No.2 Piston Spring Compressor	FORWARD CLUTCH ASSY(U241E) UNDERDRIVE CLUTCH ASSY(U241E)
	(09351–32140)	Oil Seal Replacer	OIL PUMP ASSY(U241E)
	(09351–32150)	Oil Seal Replacer	FRONT DIFFERENTIAL ASSY(U241E)
	09387–00020	Direct Clutch Wrench	AUTOMATIC TRANSAXLE ASSY(U241E) DIRECT CLUTCH ASSY(U241E)
	09387–00030	Counter Drive Gear Holding Tool	AUTOMATIC TRANSAXLE ASSY(U241E)
	09387–00040	Bearing Puller Assembly	AUTOMATIC TRANSAXLE ASSY(U241E) FRONT DIFFERENTIAL ASSY(U241E)
	(09387–01010)	Claw No.1	AUTOMATIC TRANSAXLE ASSY(U241E)
	(09387–01030)	Pin	AUTOMATIC TRANSAXLE ASSY(U241E) FRONT DIFFERENTIAL ASSY(U241E)

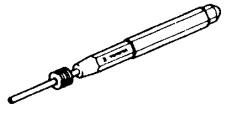
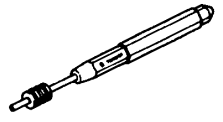
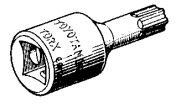
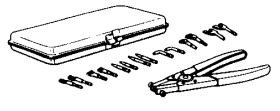
	(09387–01040)	Bearing Puller Body	AUTOMATIC TRANSAXLE ASSY(U241E) FRONT DIFFERENTIAL ASSY(U241E)
	(09387–02010)	Oil Seal Replacer	FRONT DIFFERENTIAL ASSY(U241E)
	(09387–02020)	One–way Clutch Test Tool Set	FRONT DIFFERENTIAL ASSY(U241E)
	09387–00050	Under Drive Gear Puller	UNDERDRIVE PLANETARY GEAR ASSY(U241E)
	09387–00060	Second Brake Wrench	SECOND BRAKE PISTON ASSY(U241E)
	09387–00070	First & Reverse Brake Wrench	AUTOMATIC TRANSAXLE ASSY(U241E)
	09387–00080	Counter Drive Gear Nut Wrench	AUTOMATIC TRANSAXLE ASSY(U241E)
	09506–35010	Differential Drive Pinion Rear Bearing Replacer	UNDERDRIVE PLANETARY GEAR ASSY(U241E)
	09514–35011	Rear Wheel Bearing Puller	AUTOMATIC TRANSAXLE ASSY(U241E)
	09550–60010	Differential Side Bearing Replacer	AUTOMATIC TRANSAXLE ASSY(U241E)
	(09951–00320)	Replacer 32	AUTOMATIC TRANSAXLE ASSY(U241E) UNDERDRIVE PLANETARY GEAR ASSY(U241E)
	09564–16020	Drive Pinion Lock Nut Wrench	UNDERDRIVE PLANETARY GEAR ASSY(U241E)
	09564–32011	Differential Preload Adaptor	FRONT DIFFERENTIAL ASSY(U241E)

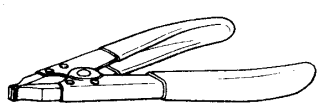
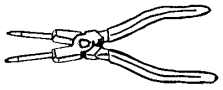
	09608–06041	Front Hub Inner Bearing Cone Replacer	FRONT DIFFERENTIAL ASSY(U241E)
	09649–17010	Steering Knuckle Tool	AUTOMATIC TRANSAXLE ASSY(U241E) FRONT DIFFERENTIAL ASSY(U241E)
	09930–00010	Drive Shaft Nut Chisel	UNDERDRIVE PLANETARY GEAR ASSY(U241E)
	(09931–00010)	Handle	UNDERDRIVE PLANETARY GEAR ASSY(U241E)
	(09931–00020)	Nut Chisel	UNDERDRIVE PLANETARY GEAR ASSY(U241E)
	09950–00020	Bearing Remover	UNDERDRIVE PLANETARY GEAR ASSY(U241E) FRONT DIFFERENTIAL ASSY(U241E)
	09950–00030	Bearing Remover Attachment	UNDERDRIVE PLANETARY GEAR ASSY(U241E) FRONT DIFFERENTIAL ASSY(U241E)
	09950–40011	Puller B Set	AUTOMATIC TRANSAXLE ASSY(U241E) FRONT DIFFERENTIAL ASSY(U241E)
	(09951–04010)	Hanger 150	AUTOMATIC TRANSAXLE ASSY(U241E)
	(09951–04020)	Hanger 200	FRONT DIFFERENTIAL ASSY(U241E)
	(09952–04010)	Slide Arm	AUTOMATIC TRANSAXLE ASSY(U241E) FRONT DIFFERENTIAL ASSY(U241E)
	(09953–04020)	Center Bolt 150	AUTOMATIC TRANSAXLE ASSY(U241E) FRONT DIFFERENTIAL ASSY(U241E)
	(09954–04010)	Arm 25	AUTOMATIC TRANSAXLE ASSY(U241E) FRONT DIFFERENTIAL ASSY(U241E)

	(09955–04011)	Claw No.1	AUTOMATIC TRANSAXLE ASSY(U241E)
	(09955–04061)	Claw No.6	FRONT DIFFERENTIAL ASSY(U241E)
	(09957–04010)	Attachment	FRONT DIFFERENTIAL ASSY(U241E)
	(09958–04011)	Holder	AUTOMATIC TRANSAXLE ASSY(U241E) FRONT DIFFERENTIAL ASSY(U241E)
	09950–60010	Replacer Set	AUTOMATIC TRANSAXLE ASSY(U241E) UNDERDRIVE PLANETARY GEAR ASSY(U241E) FRONT DIFFERENTIAL ASSY(U241E)
	(09951–00230)	Replacer 23	AUTOMATIC TRANSAXLE ASSY(U241E)
	(09951–00250)	Replacer 25	UNDERDRIVE PLANETARY GEAR ASSY(U241E)
	(09951–00320)	Replacer 32	AUTOMATIC TRANSAXLE ASSY(U241E) UNDERDRIVE PLANETARY GEAR ASSY(U241E)
	(09951–00340)	Replacer 34	UNDERDRIVE PLANETARY GEAR ASSY(U241E) FRONT DIFFERENTIAL ASSY(U241E)
	(09951–00350)	Replacer 35	AUTOMATIC TRANSAXLE ASSY(U241E)
	(09951–00400)	Replacer 40	AUTOMATIC TRANSAXLE ASSY(U241E)
	(09951–00450)	Replacer 45	AUTOMATIC TRANSAXLE ASSY(U241E)
	(09951–00600)	Replacer 60	AUTOMATIC TRANSAXLE ASSY(U241E)

	09950–60020	Replacer Set No.2	AUTOMATIC TRANSAXLE ASSY(U241E) UNDERDRIVE PLANETARY GEAR ASSY(U241E) FRONT DIFFERENTIAL ASSY(U241E)
	(09951–00680)	Replacer 68	FRONT DIFFERENTIAL ASSY(U241E)
	(09951–00710)	Replacer 71	FRONT DIFFERENTIAL ASSY(U241E)
	(09951–00810)	Replacer 81	AUTOMATIC TRANSAXLE ASSY(U241E)
	(09951–00890)	Replacer 89	AUTOMATIC TRANSAXLE ASSY(U241E) UNDERDRIVE PLANETARY GEAR ASSY(U241E)
	09950–70010	Handle Set	AUTOMATIC TRANSAXLE ASSY(U241E) UNDERDRIVE PLANETARY GEAR ASSY(U241E) FRONT DIFFERENTIAL ASSY(U241E)
	(09951–07100)	Handle 100	AUTOMATIC TRANSAXLE ASSY(U241E) UNDERDRIVE PLANETARY GEAR ASSY(U241E) FRONT DIFFERENTIAL ASSY(U241E)
	(09951–07150)	Handle 150	AUTOMATIC TRANSAXLE ASSY(U241E) FRONT DIFFERENTIAL ASSY(U241E)

RECOMENDED TOOLS

	09031–00030	Pin Punch .	AUTOMATIC TRANSAXLE ASSY(U241E)
	09031–00040	Pin Punch .	FRONNT DIFFERENTIAL ASSY(U241E)
	09042–00010	Torx Socket T30	AUTOMATIC TRANSAXLE ASSY(U241E) OIL PUMP ASSY(U241E)
	09904–00010	Expander Set	AUTOMATIC TRANSAXLE ASSY(U241E)

	09905–00012	Snap Ring No.1 Expander .	AUTOMATIC TRANSAXLE ASSY(U241E) FORWARD CLUTCH ASSY(U241E) DIRECT CLUTCH ASSY(U241E) UNDERDRIVE CLUTCH ASSY(U241E)
	09905–00013	Snap Ring Pliers .	UNDERDRIVE PLANETARY GEAR ASSY(U241E)

EQUIPMENT

Dial indicator with magnetic base	
Feeler gauge	
Vernier calipers	
Torque wrench	
Plastic hammer	
Straight edge	

LUBICANT

Item	Capacity	Classification
Automatic transaxle fluid Dry fill Drain and refill	 8.20 liters (8.7 US qts, 7.2 lmp.qts) 3.90 liters (4.1 US qts, 3.4 lmp.qts)	 ATF Type T–IV

SSM (SPECIAL SERVICE MATEIALS)

08826–00090	”Seal Packing 1281,” THREE BOND 1281 or equivalent (FIPG)	
08833–00080	Adhesive 1344 THREE BOND 1344 LOCTITE 242 or equivalent	

SERVICE SPECIFICATIONS

AUTOMATIC TRANSAXLE (U241E) 03–1
SERVICE DATA 03–1
TORQUE SPECIFICATION 03–4

AUTOMATIC TRANSAXLE (U241E)

0305N–01

SERVICE DATA

Oil pump		
Body clearance	STD	0.10 – 0.17 mm (0.0039 – 0.0067 in.)
	Max.	0.17 mm (0.0067 in.)
Tip clearance	STD	0.07 – 0.15 mm (0.0028 – 0.0059 in.)
	Max.	0.15 mm (0.0059 in.)
Side clearance	STD	0.02 – 0.05 mm (0.0008 – 0.0020 in.)
	Max.	0.05 mm (0.0020 in.)
Drive gear thickness	Mark	
	1	10.690 –10.699 mm (0.4209 – 0.4212 in.)
	2	10.700 –10.709 mm (0.4213 – 0.4216 in.)
	3	10.710 –10.720 mm (0.4217 – 0.4220 in.)
	4	10.721 –10.730 mm (0.4221 – 0.4224 in.)
	5	10.731 –10.740 mm (0.4225 – 0.4228 in.)
Driven gear thickness	Mark	
	1	10.690 –10.699 mm (0.4209 – 0.4212 in.)
	2	10.700 –10.709 mm (0.4213 – 0.4216 in.)
	3	10.710 –10.720 mm (0.4217 – 0.4220 in.)
	4	10.721 –10.730 mm (0.4221 – 0.4224 in.)
	5	10.731 –10.740 mm (0.4225 – 0.4228 in.)
Pump body bushing inside diameter	STD	38.11 – 38.14 mm (1.5005 – 1.5015 in.)
	Max.	38.19 mm (1.5035 in.)
Stator shaft bushing inside diameter	STD	20.50 – 21.53 mm (0.8465 – 0.8475 in.)
	Max.	21.57 mm (0.8492 in.)

Forward Clutch		
Piston stroke		1.74 – 2.08 mm (0.0685 – 0.0819 in.)
Piston return spring free length		28.23 mm (1.1114 in.)
Flange thickness	No.	
	1	3.00 mm (0.1181 in.)
	2	3.15 mm (0.1240 in.)
	3	3.30 mm (0.1299 in.)
	4	3.45 mm (0.1358 in.)
	5	3.60 mm (0.1417 in.)

Direct clutch		
Pack clearance		0.605 – 0.825 mm (0.02382 – 0.03248 in.)
Piston return spring free length		22.58 mm (0.8890 in.)
Flange thickness	No.	
	1	3.0 mm (0.118 in.)
	2	3.1 mm (0.122 in.)
	3	3.2 mm (0.126 in.)
	4	3.3 mm (0.130 in.)
	5	3.4 mm (0.134 in.)
	6	3.5 mm (0.138 in.)
End play		0.198 – 0.936 mm (0.00800 – 0.03685 in.)

2ND brake		
Pack clearance		0.62 – 0.91 mm (0.0244 – 0.0358 in.)

Piston return spring free length		16.61 mm (0.6539 in.)
Flange thickness	Mark	
	1	3.0 mm (0.118 in.)
	2	3.1 mm (0.122 in.)
	3	3.2 mm (0.126 in.)
	4	3.3 mm (0.130 in.)
	5	3.4 mm (0.134 in.)
	6	3.5 mm (0.138 in.)
	7	3.6 mm (0.142 in.)

Input shaft		
End play		0.26 – 1.25 mm (0.0103 – 0.0492 in.)

U/D clutch		
Pack clearance		1.51 – 1.90 mm (0.0594 – 0.0748 in.)
U/D clutch drum busing inside diameter	STD	32.56 – 32.58 mm (1.2818 – 1.2826 in.)
	Max	32.63 mm (1.2846 in.)
Piston return spring free length		17.14 mm (0.6748 in.)
Flange thickness	Mark	
	A	3.0 mm (0.118 in)
	B	3.2 mm (0.126 in.)
	C	3.4 mm (0.134 in.)

U/D brake		
Piston stroke		1.81 – 2.20 mm (0.0713 – 0.0866 in.)
Piston return spring free length		14.04 mm (0.5213 in.)
Flange thickness	Mark	
	1	3.0 mm (0.118 in.)
	2	3.2 mm (0.126 in.)
	3	3.4 mm (0.134 in.)

1ST & reverse brake		
Pack clearance		1.02 – 1.21 mm (0.0402 – 0.0476 in.)
Piston return spring free length		15.51 mm (0.6106 in.)

Front planetary gear		
Bearing turning torque at 60 rpm	New bearing:	0.5 – 1.0 N·m (5.1 – 10.0 kgf·cm, 4.4 – 8.7 in.·lbf)
	Used bearing:	0.3 – 0.5 N·m (3.1 – 5.1 kgf·cm, 2.7 – 4.4 in.·lbf)

U/D planetary gear		
U/D output shaft turning torque	at 60 rpm	0.23 – 5.01 N·m (2 – 51 kgf·cm, 2.0 – 44.3 in.·lbf)
End play		0.20 – 0.69 mm (0.0079 – 0.0272 in.)

Transmission valve body		
Bolt length	A	25 mm (0.984 in.)
	B	41 mm (1.614 in.)
	C	45 mm (1.771 in.)

Accumulator			
Spring		Free length/Outer diameter	Color
B_3	Inner	60.24 (2.3716) / 15.9 (0.626)	Yellowish Green
	Outer	74.61 (2.9374) / 21.7 (0.854)	Blue
C_1		81.53 (3.2098) / 18.5 (0.728)	Pink
C_3		90.49 (3.5626) / 19.2 (0.756)	White

Differential	
Side gear backlash	0.05 – 0.20 mm (0.0020 – 0.0079 in.)
Thrust washer thickness	1.0 mm (0.039 in) 1.1 mm (0.043 in.) 1.2 mm (0.047 in.) 1.3 mm (0.051 in.)

Preload (at starting) New bearing Used bearing		 0.20 – 0.69 N·m (2 – 7 kgf·cm, 1.8 – 6.1 in.·lbf) 0.10 – 0.35 N·m (1 – 4 kgf·cm, 0.9 – 3.1 in.·lbf)
Shim thickness	Mark	
	0	1.90 mm (0.0748 in.)
	1	1.95 mm (0.0768 in.)
	2	2.00 mm (0.0787 in.)
	3	2.05 mm (0.0807 in.)
	4	2.10 mm (0.0827 in.)
	5	2.15 mm (0.0846 in.)
	6	2.20 mm (0.0866 in.)
	7	2.25 mm (0.0886 in.)
	8	2.30 mm (0.0906 in.)
	9	2.35 mm (0.0925 in.)
	A	2.40 mm (0.0945 in.)
	B	2.45 mm (0.0965 in.)
	C	2.50 mm (0.0984 in.)
	D	2.55 mm (0.1004 in.)
	E	2.60 mm (0.1024 in.)
	F	2.65 mm (0.1043 in.)
	G	2.70 mm (0.1063 in.)
	H	2.75 mm (0.1083 in.)
	J	2.80 mm (0.1102 in.)

0305O–01

TORQUE SPECIFICATION

Part Tightened		N·m	kgf·cm	ft·lbf
Transaxle housing x Transaxle case	Bolt A, B	29.4	300	21.7
	Bolt C	22.1	225	16.3
Differential gear lube apply tube x Transaxle housing		9.8	100	7
Front planetary gear assy x Nut		268	2,728	197
Transaxle case No. 1 plug x transaxle rear cover		7.4	75	65 in.·lbf
Transaxle rear cover plate x transaxle rear cover		7.5	76	66 in.·lbf
Transaxle rear cover x Transaxle case	Bolt A	18.6	190	14
	Other bolt	24.5	250	18
Pawl shaft clamp x Transaxle case		9.8	100	7
Oil pump x Transaxle case		22	226	16
Transaxle housing x Transaxle case	Bolt A	22	226	16
	Bolt B, C	29	300	22
Transaxle case No. 1 plug x Transaxle housing		7.4	75	65 in.·lbf
Parking lock pawl bracket x Transaxle case		20	205	15
Detent spring x Transaxle case	Bolt A	20	205	15
	Bolt B	12	120	9
Solenoid wire retaining bolt		5.4	55	48 in.·lbf
ATF temperature sensor clamp x Valve body		6.6	67	58 in·lbf
Oil strainer x Valve body		11	110	8
Oil pan x Transaxle case		7.8	80	69 in.·lbf
Speed sensor		11.3	115	8
Transmission revolution sensor		11.3	115	8
Oil cooler tube union (Elbow) x Transaxle case		27	276	20
Oil cooler tube union x Transaxle case		27	280	20
Transaxle case No. 1 plug x Transaxle case		7.4	75	65 in.·lbf
Park/neutral start switch	Bolt:	5.4	55	48 in.·lbf
	Nut:	6.9	70	61 in.·lbf
Control shaft lever		13	133	10
Speedometer driven hole cover sub–assy x Transaxle case		7.0	70	61 in.·lbf
Stator shaft assy x Oil pump assy		9.8	100	7
Lock nut		280	2,855	207
Valve body x Transaxle case		11	110	8
Differential ring gear x Differential case		95	969	70

AUTOMATIC TRANSAXLE (U241E)

AUTOMATIC TRANSAXLE (U241E) 40–1

COMPONENTS 40–1

AUTOMATIC TRANSAXLE ASSY (U241E) ... 40–14

OVERHAUL 40–14

OIL PUMP ASSY (U241E) 40–69

OVERHAUL 40–69

FORWARD CLUTCH ASSY (U241E) 40–74

OVERHAUL 40–74

DIRECT CLUTCH ASSY (U241E) 40–80

OVERHAUL 40–80

SECOND BRAKE PISTON ASSY (U241E) ... 40–85

OVERHAUL 40–85

UNDERDRIVE CLUTCH ASSY (U241E) 40–87

OVERHAUL 40–87

UNDERDRIVE PLANETARY GEAR ASSY (U241E) 40–92

OVERHAUL 40–92

TRANSAXLE VALVE BODY ASSY (U241E) .. 40–97

OVERHAUL 40–97

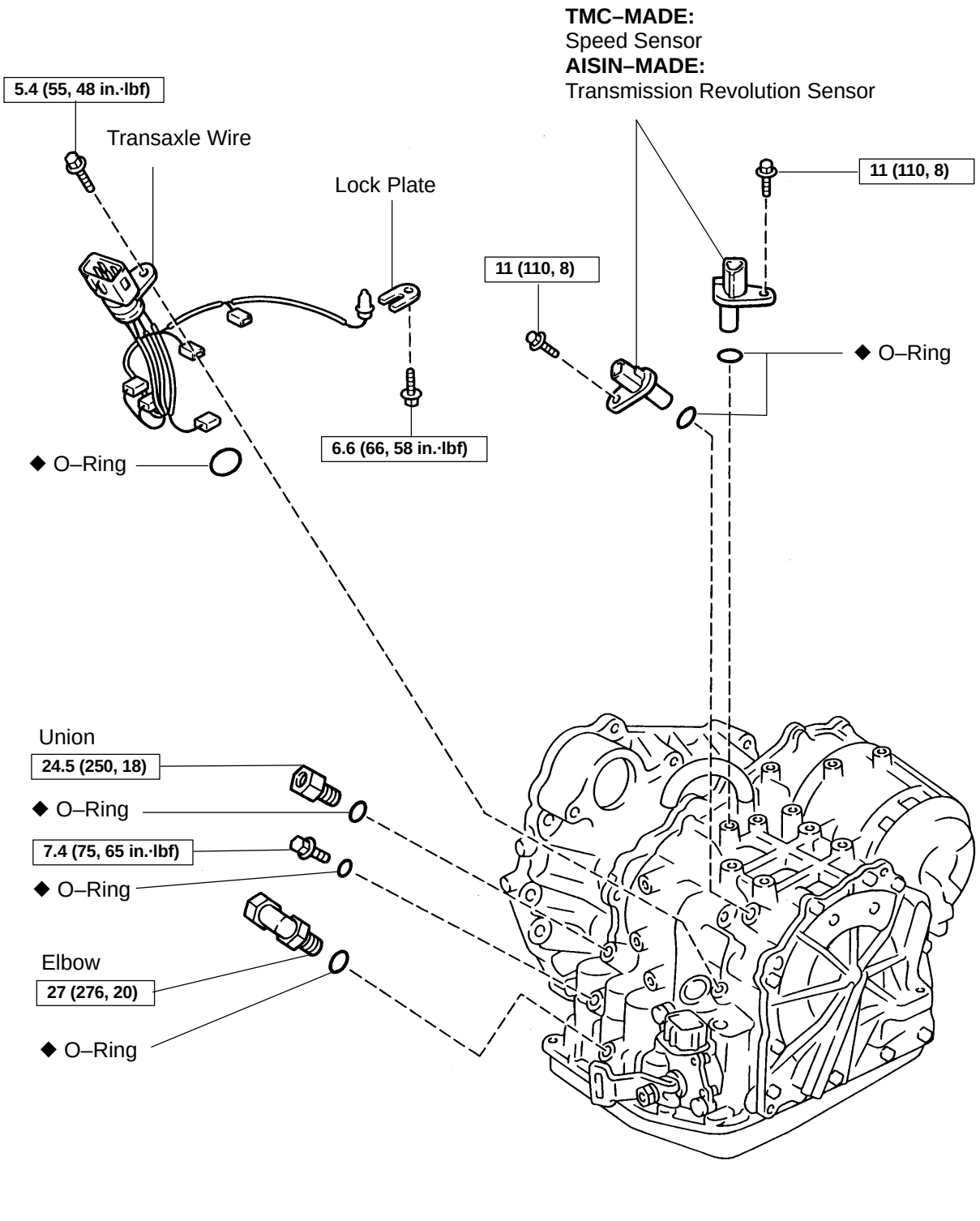
FRONT DIFFERENTIAL ASSY (U241E) 40–100

OVERHAUL 40–100

AUTOMATIC TRANSAXLE (U241E)

COMPONENTS

4006X–01

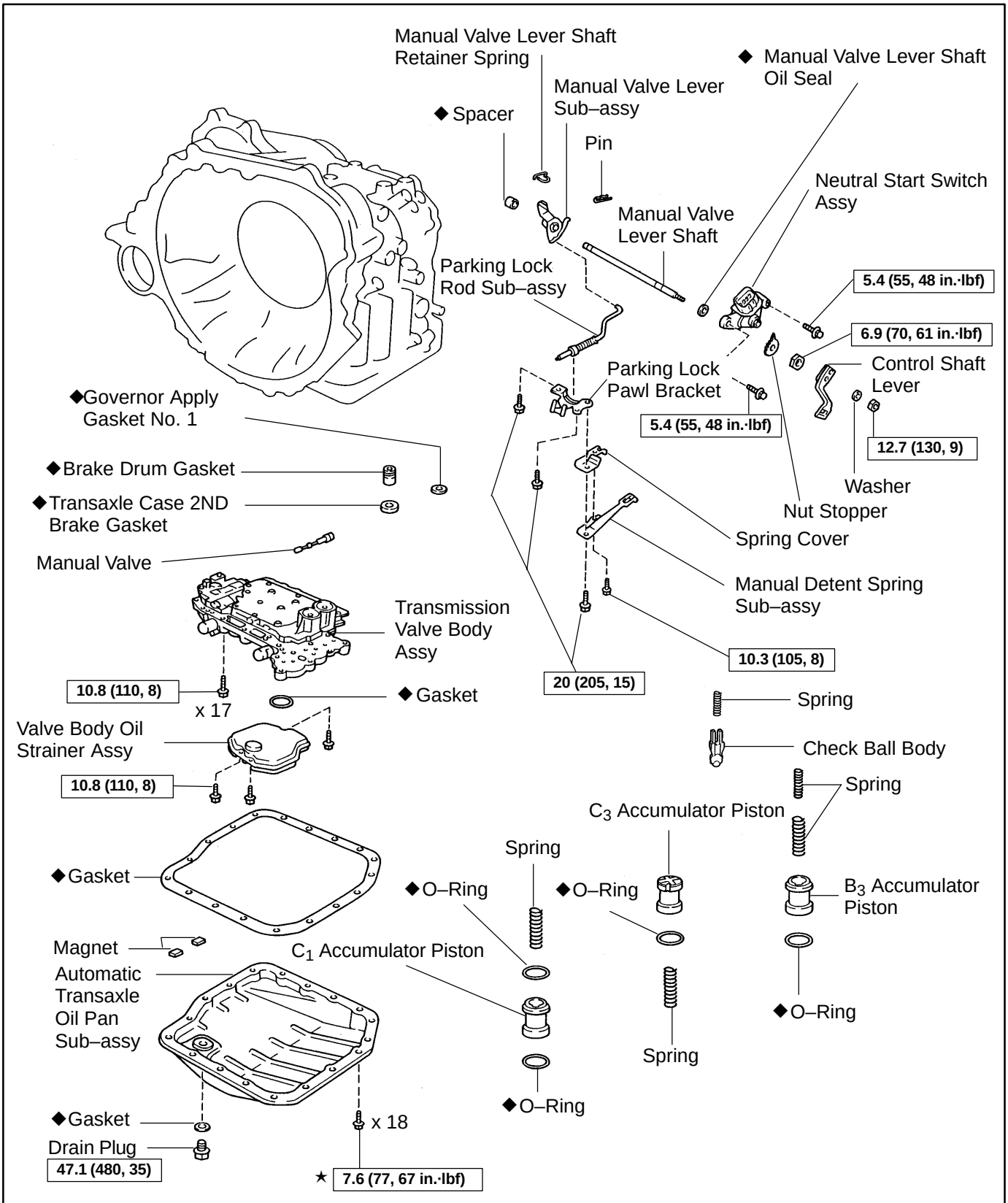


N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non–reusable part

N

D25839



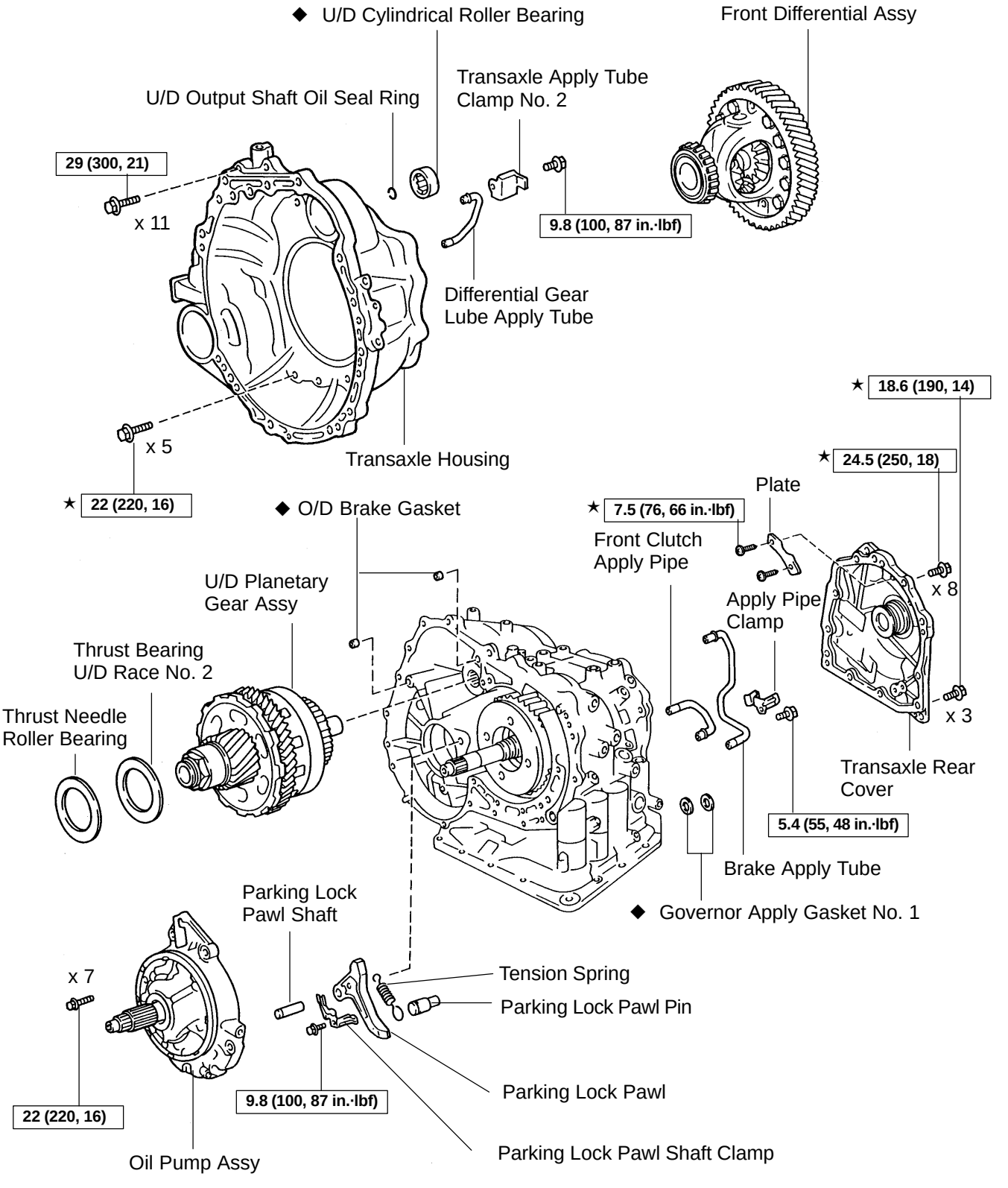
N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non–reusable part

★ Precoated part

N

D25826



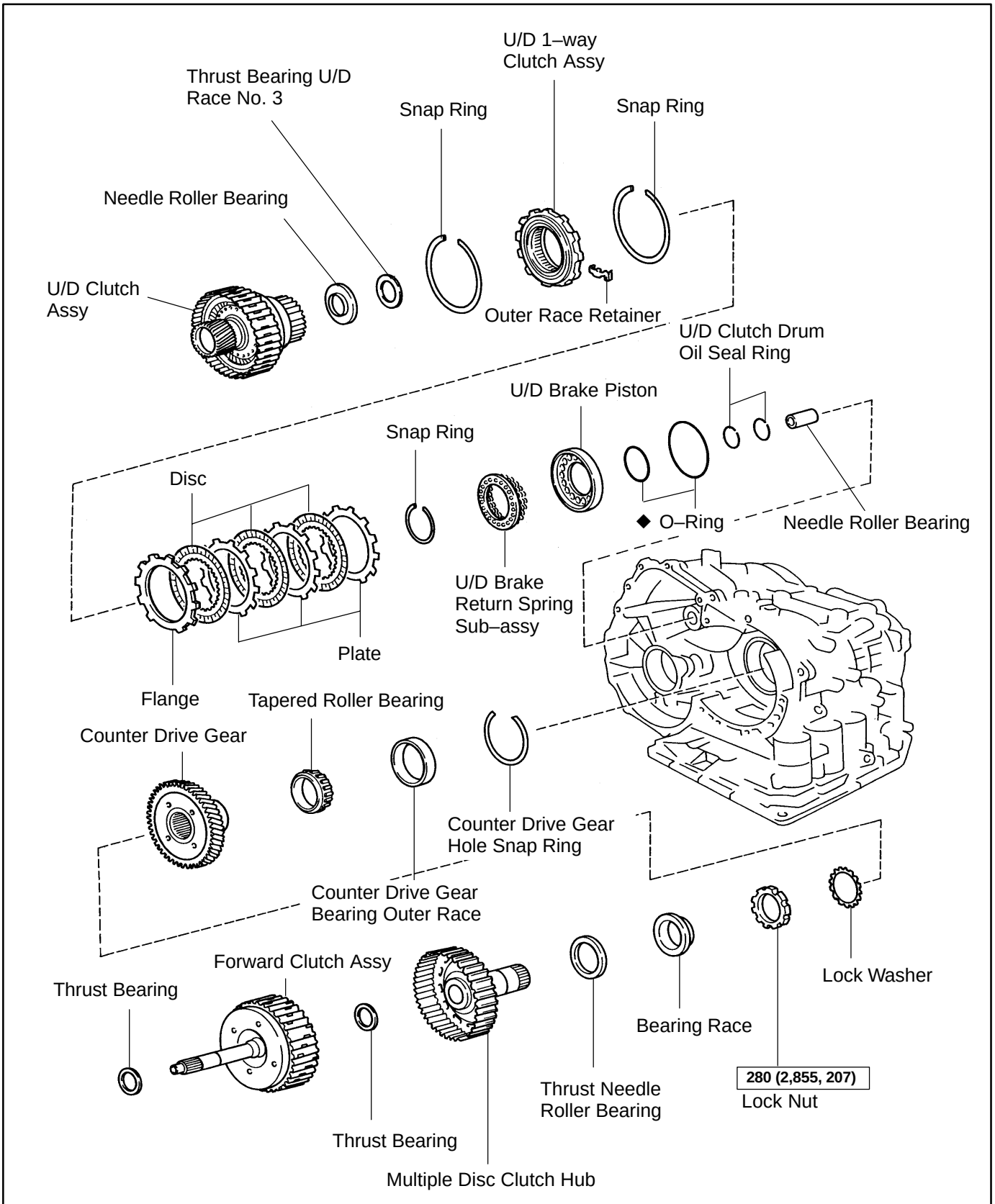
N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non–reusable part

★ Precoated part

N

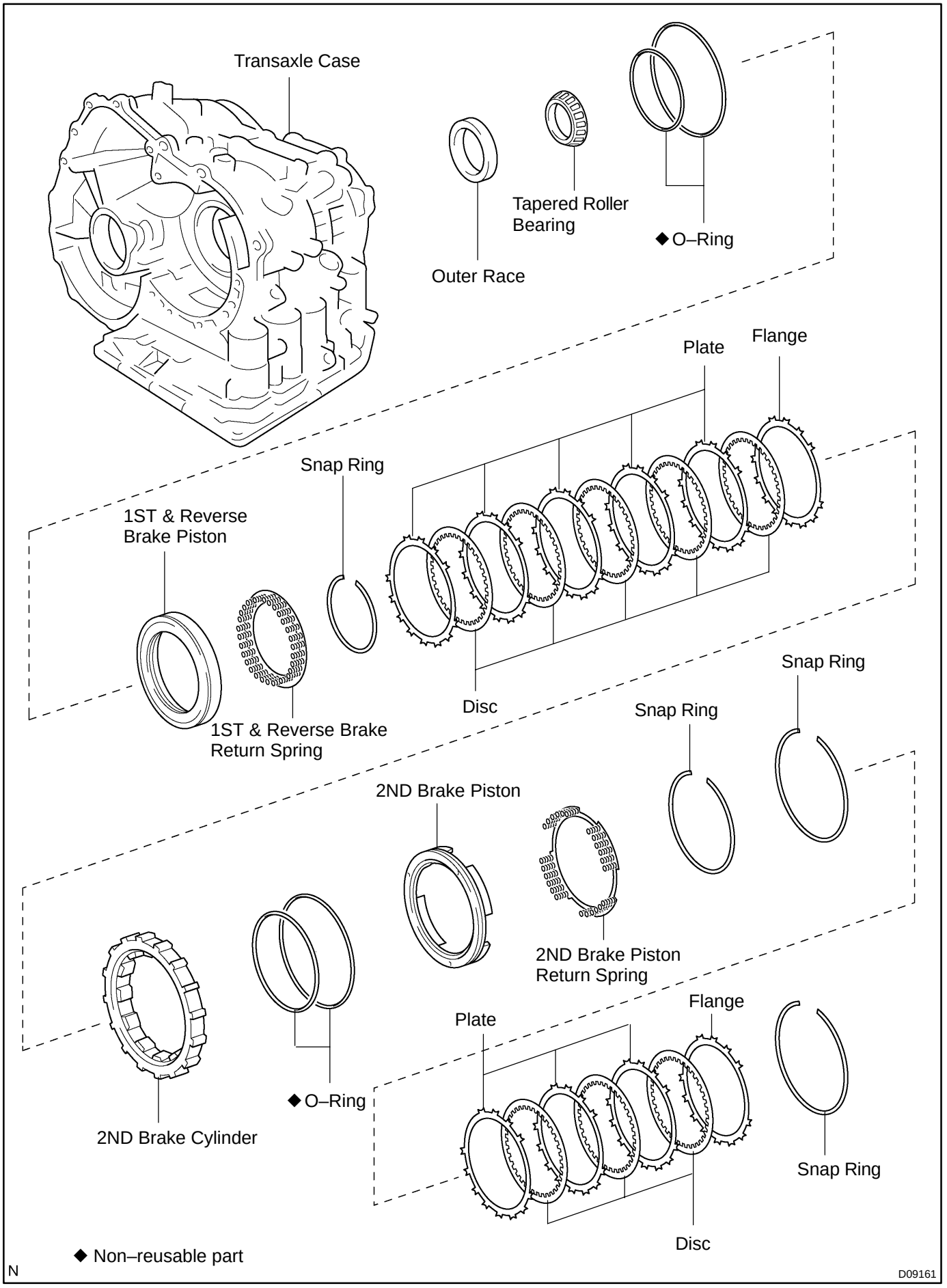
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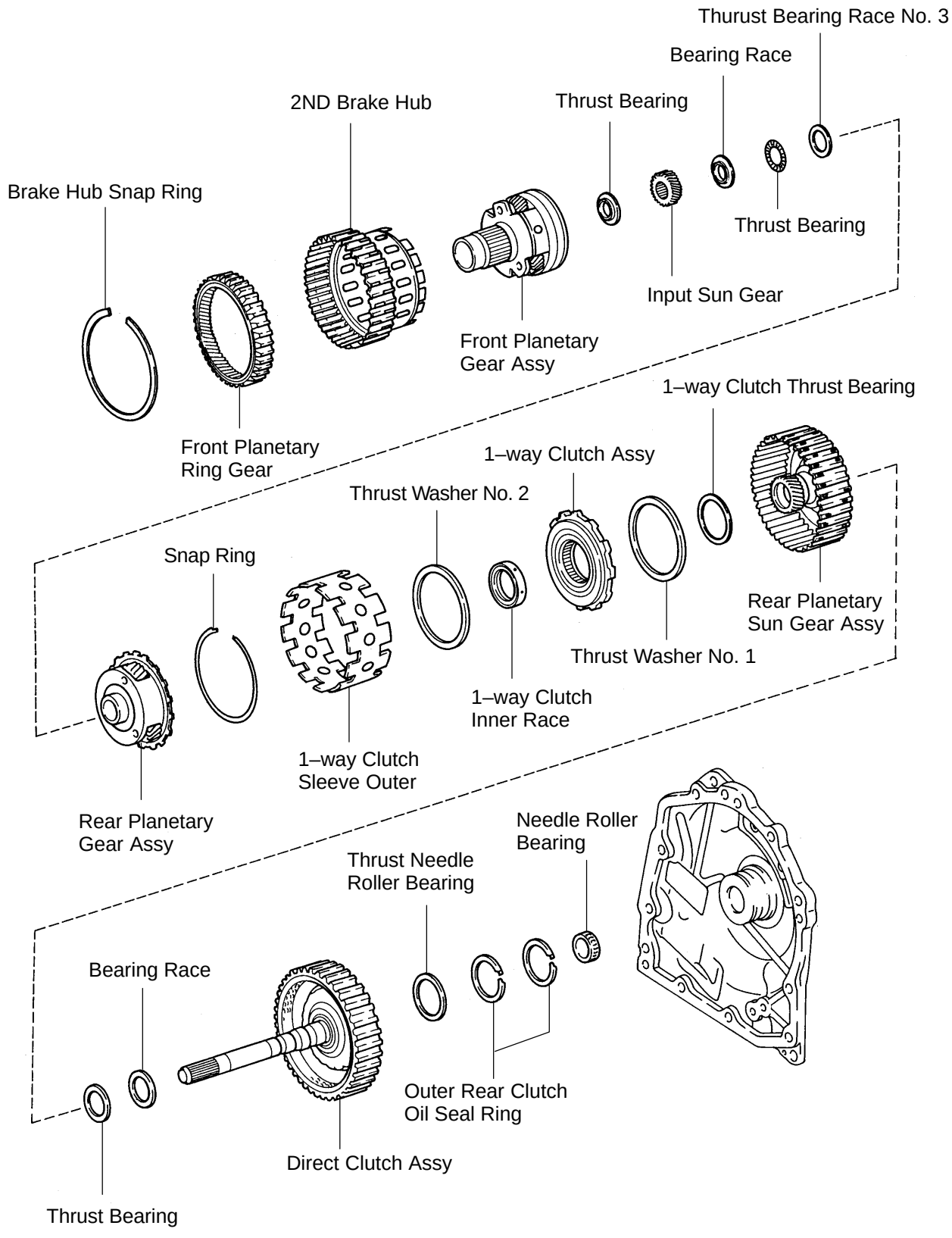


N ◆ Non–reusable part

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

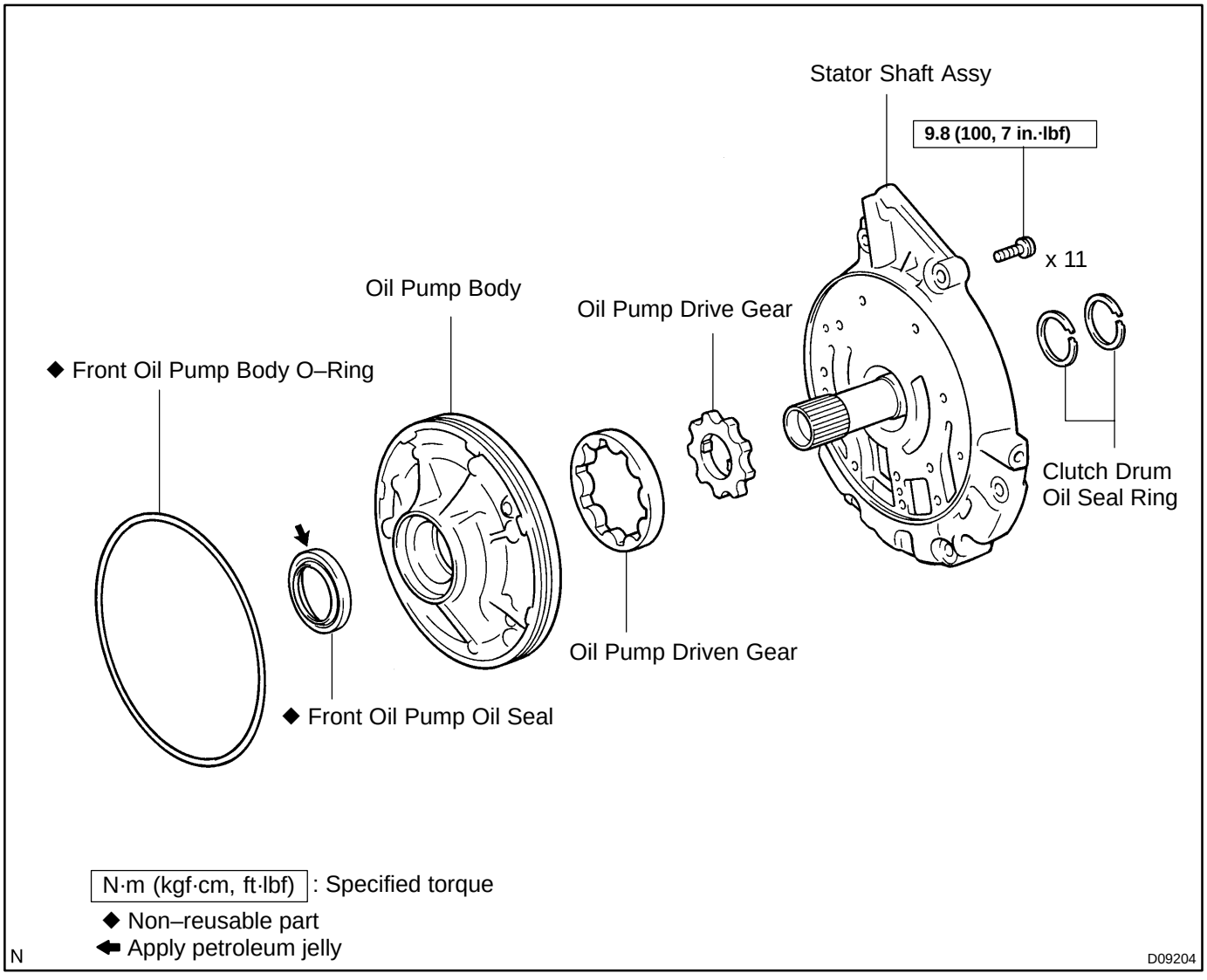
D09171

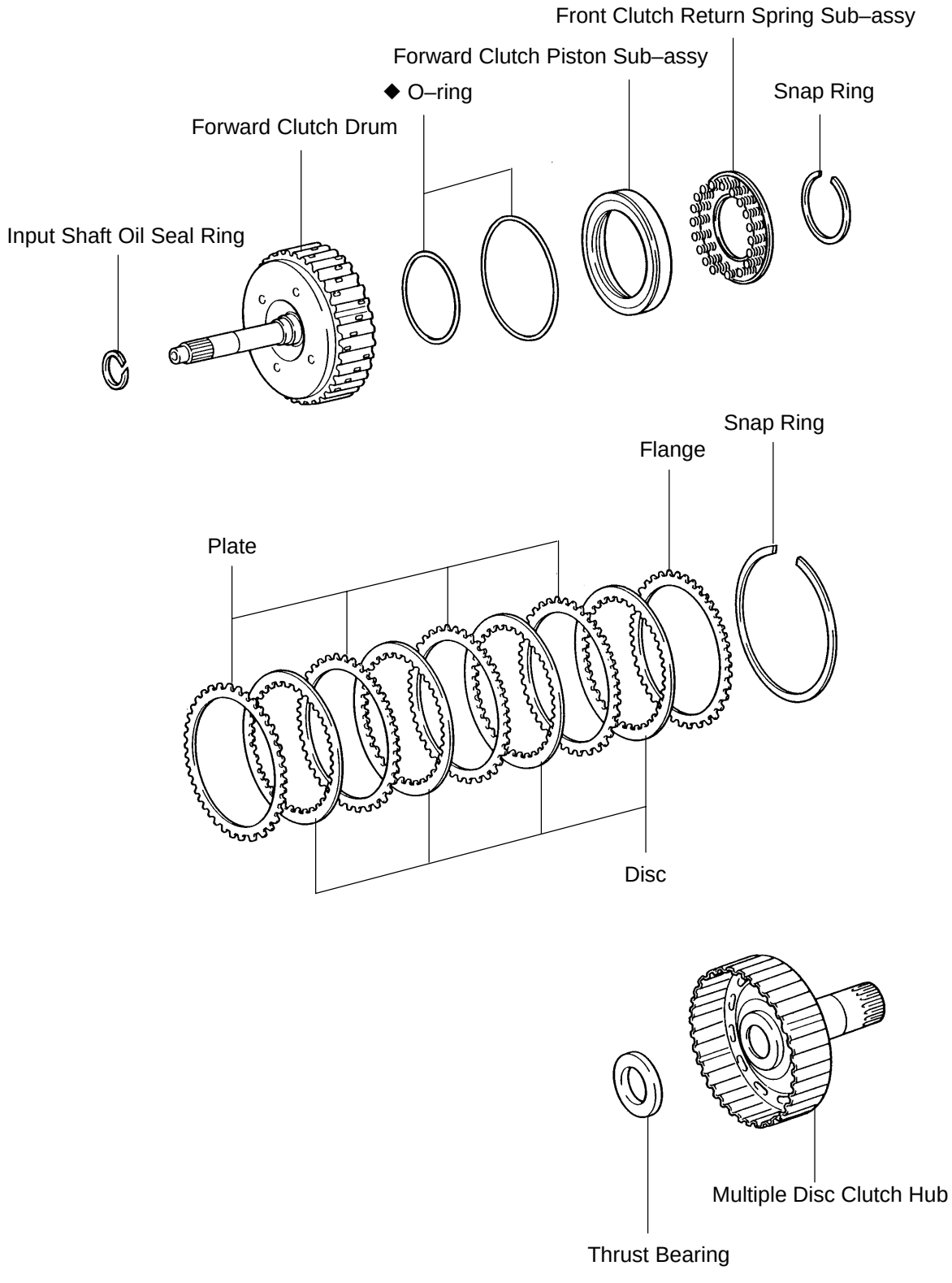

Transaxle Case
Outer Race
Tapered Roller Bearing
◆ O–Ring
Plate
Flange
Snap Ring
1ST & Reverse Brake Piston
1ST & Reverse Brake Return Spring
Disc
Snap Ring
Snap Ring
2ND Brake Piston
2ND Brake Piston Return Spring
◆ O–Ring
2ND Brake Cylinder
Plate
Flange
Snap Ring
Disc
◆ Non–reusable part
N
D09161


Thurust Bearing Race No. 3
Bearing Race
2ND Brake Hub
Thrust Bearing
Brake Hub Snap Ring
Thrust Bearing
Input Sun Gear
Front Planetary
Gear Assy
1–way Clutch Thrust Bearing
Front Planetary
Ring Gear
1–way Clutch Assy
Thrust Washer No. 2
Snap Ring
Rear Planetary
Sun Gear Assy
Thrust Washer No. 1
1–way Clutch
Inner Race
1–way Clutch
Sleeve Outer
Rear Planetary
Gear Assy
Needle Roller
Bearing
Thrust Needle
Roller Bearing
Bearing Race
Outer Rear Clutch
Oil Seal Ring
Direct Clutch Assy
Thrust Bearing

N

D09173

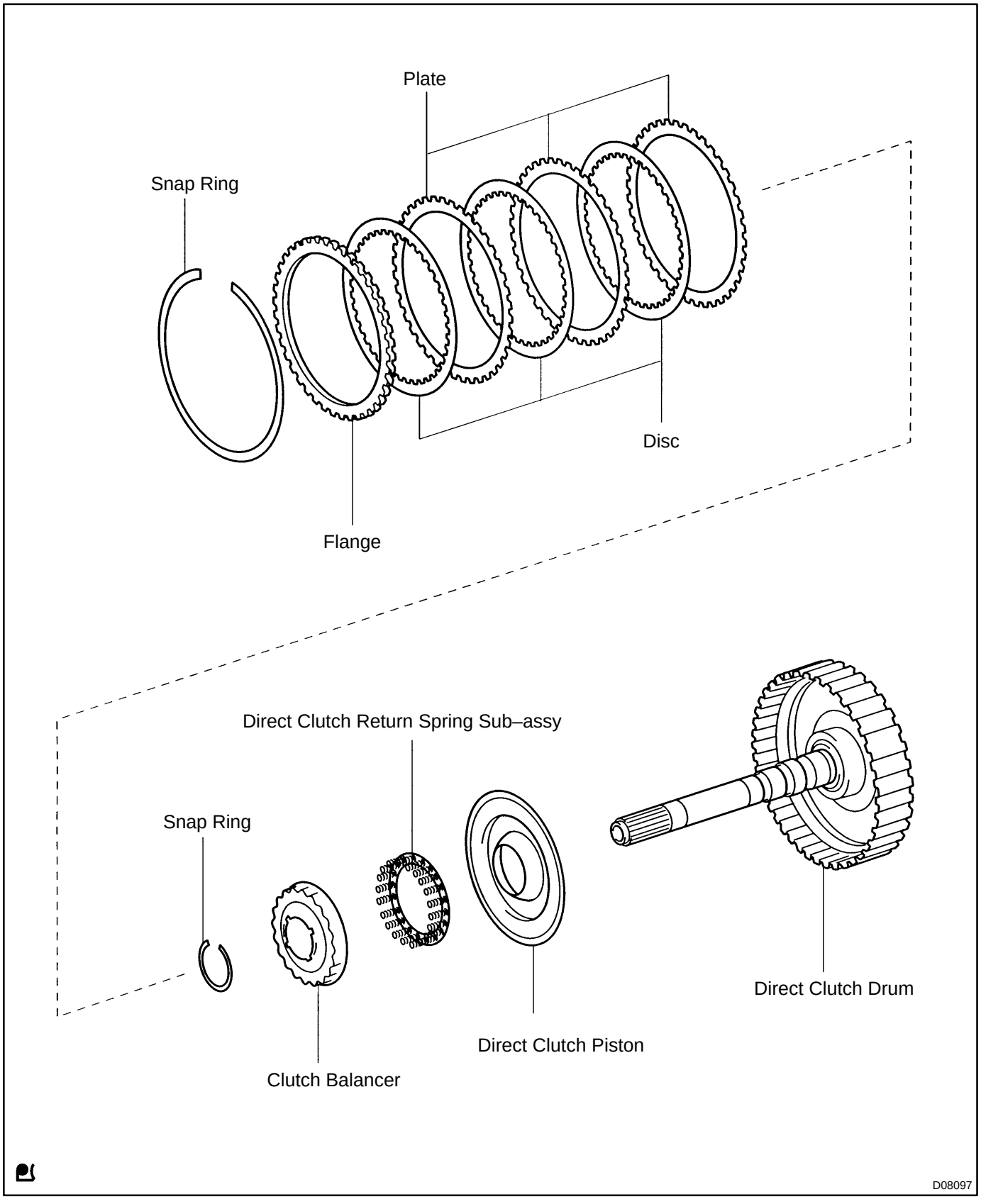

Stator Shaft Assy
9.8 (100, 7 in.·lbf)
x 11
Oil Pump Body
Oil Pump Drive Gear
◆ Front Oil Pump Body O–Ring
Clutch Drum
Oil Seal Ring
Oil Pump Driven Gear
◆ Front Oil Pump Oil Seal
N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
Apply petroleum jelly
N
D09204

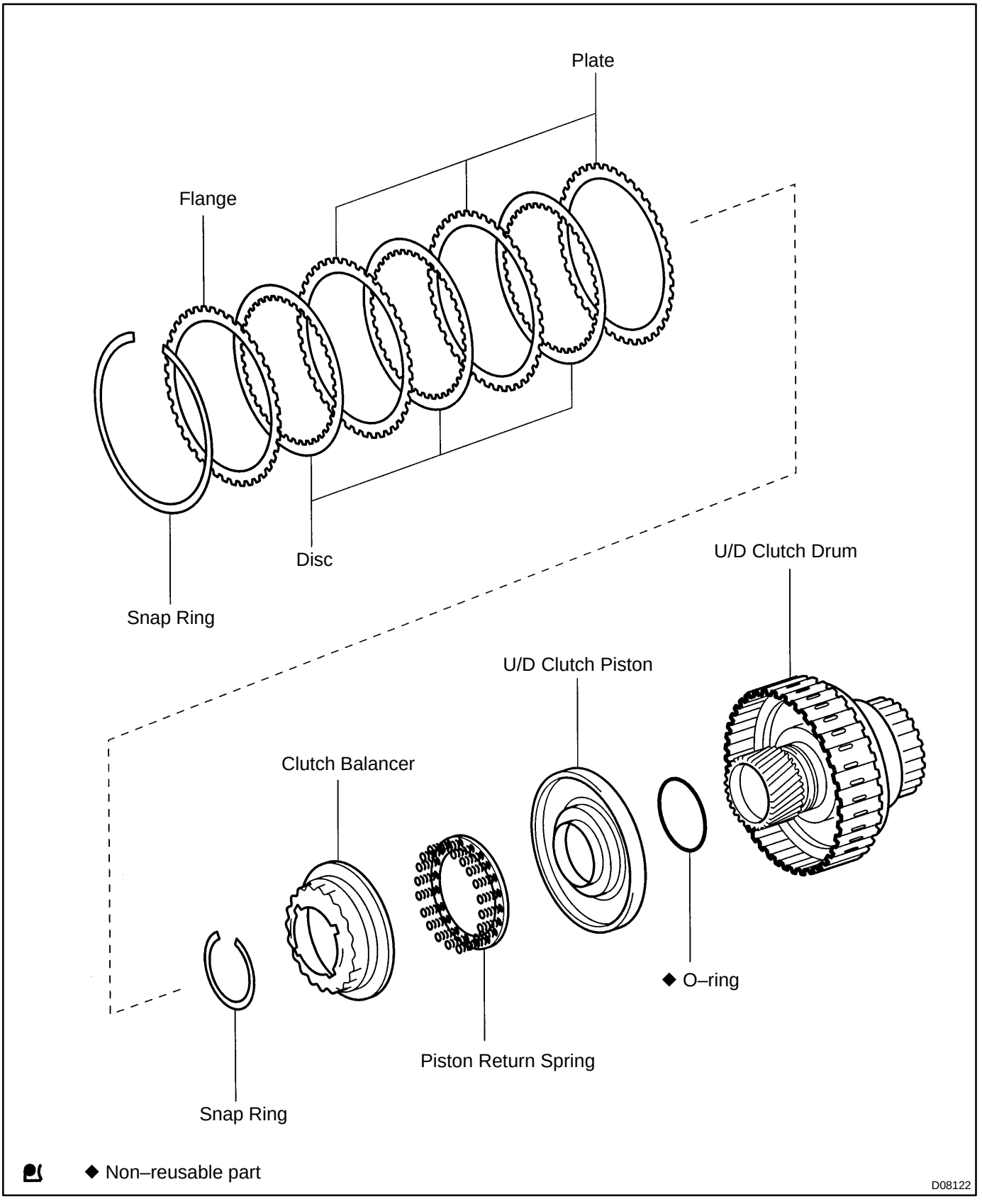


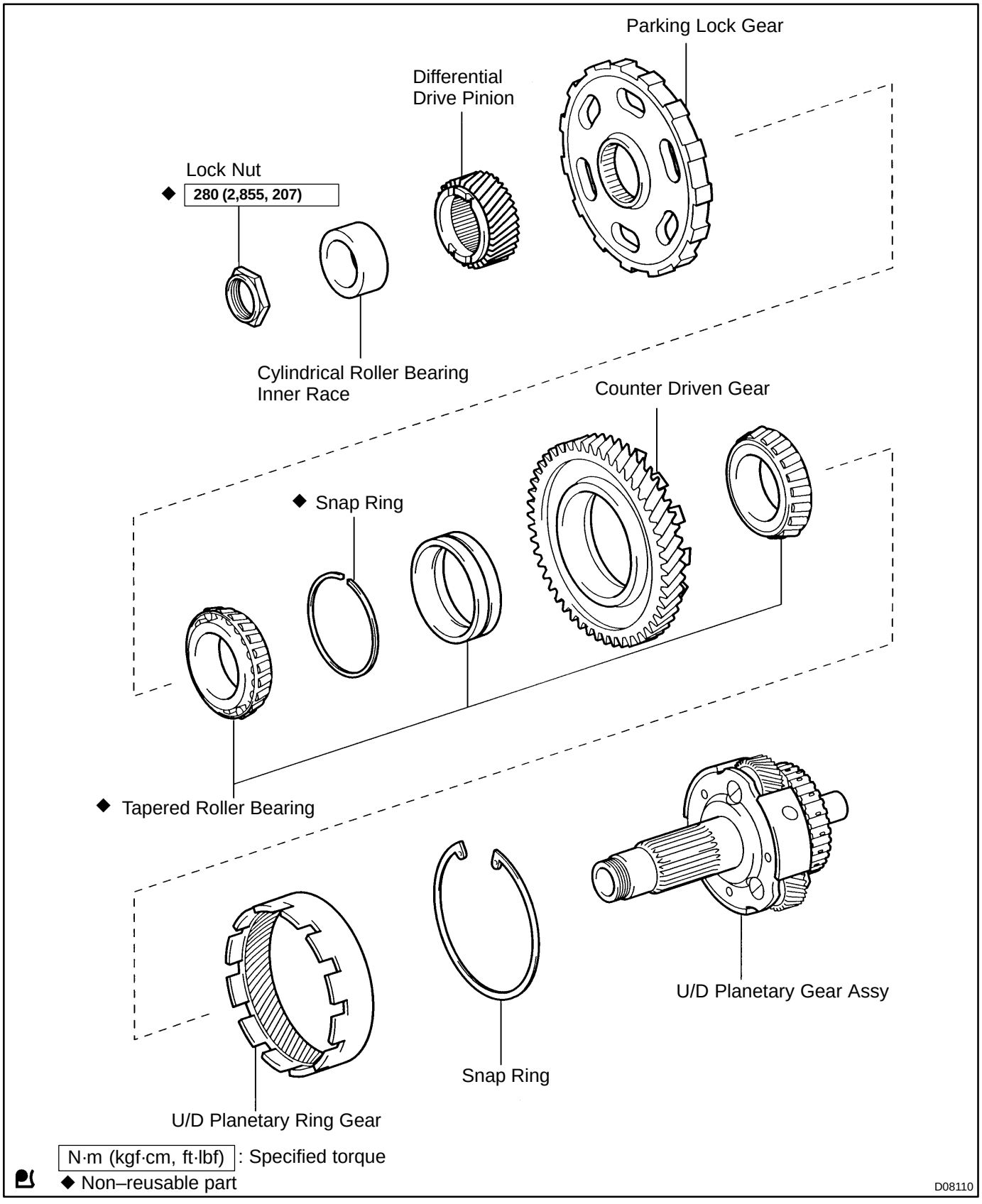
◆ Non–reusable part

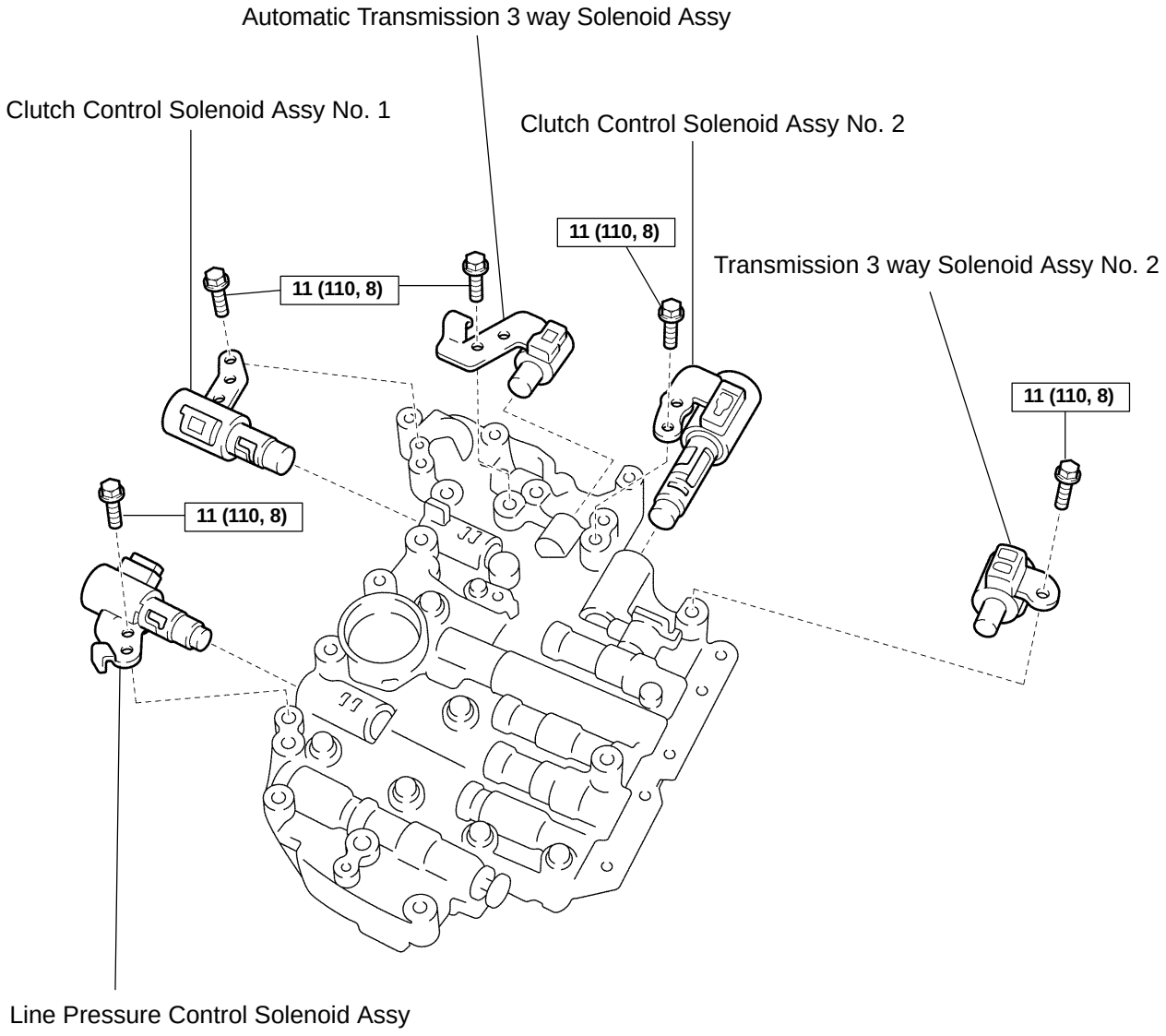
N

D25838


Plate
Snap Ring
Disc
Flange
Direct Clutch Return Spring Sub–assy
Snap Ring
Direct Clutch Drum
Direct Clutch Piston
Clutch Balancer
D08097


Plate
Flange
Disc
Snap Ring
U/D Clutch Drum
U/D Clutch Piston
Clutch Balancer
◆ O–ring
Piston Return Spring
Snap Ring
◆ Non–reusable part
D08122

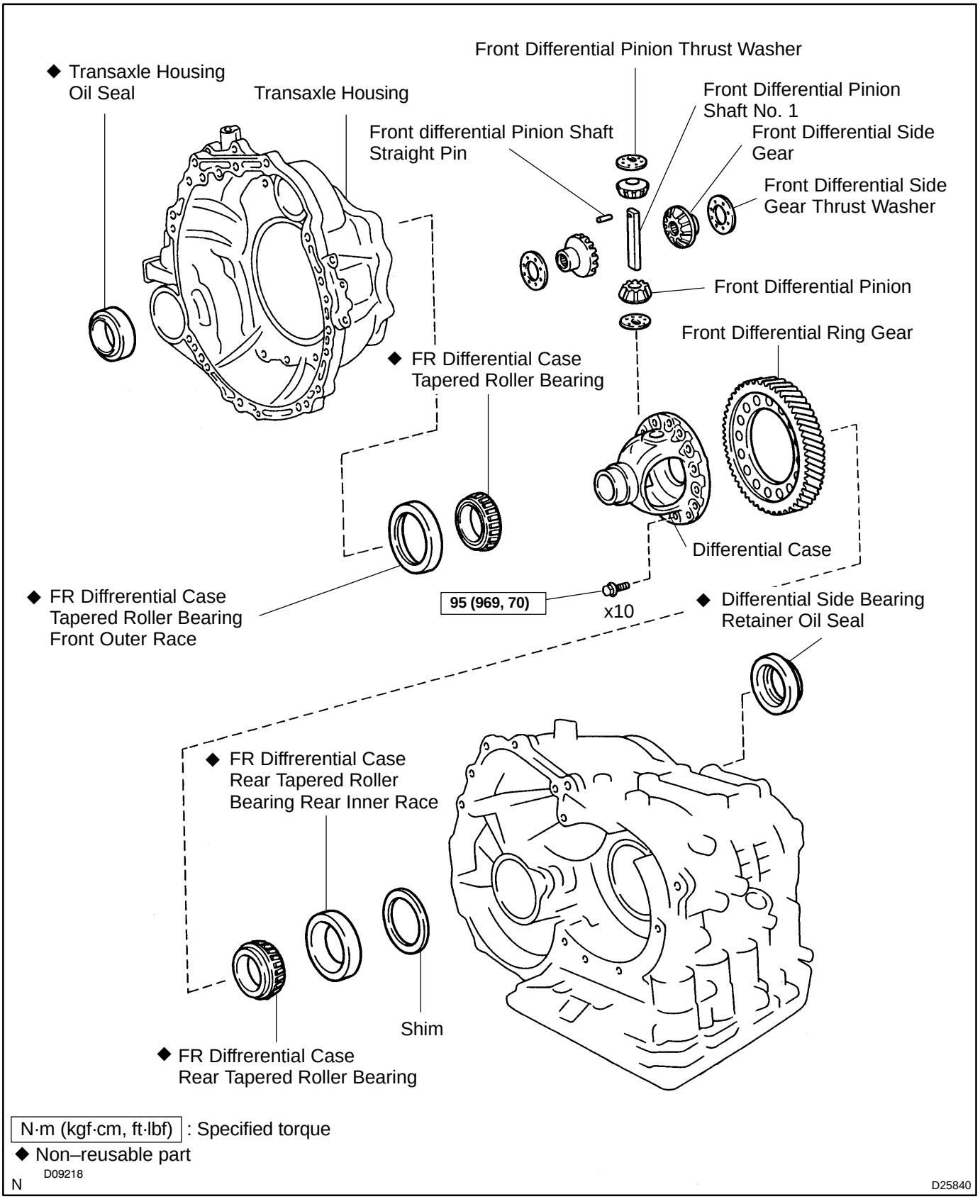

Parking Lock Gear
Differential
Drive Pinion
Lock Nut
◆ 280 (2,855, 207)
Cylindrical Roller Bearing
Inner Race
Counter Driven Gear
◆ Snap Ring
◆ Tapered Roller Bearing
U/D Planetary Gear Assy
Snap Ring
U/D Planetary Ring Gear
N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
D08110



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

P

D25769


◆ Transaxle Housing Oil Seal
Transaxle Housing
Front Differential Pinion Thrust Washer
Front Differential Pinion Shaft No. 1
Front differential Pinion Shaft Straight Pin
Front Differential Side Gear
Front Differential Side Gear Thrust Washer
Front Differential Pinion
Front Differential Ring Gear
◆ FR Differential Case Tapered Roller Bearing
Differential Case
◆ FR Diffrerential Case Tapered Roller Bearing Front Outer Race
95 (969, 70)
x10
◆ Differential Side Bearing Retainer Oil Seal
◆ FR Diffrerential Case Rear Tapered Roller Bearing Rear Inner Race
Shim
◆ FR Diffrerential Case Rear Tapered Roller Bearing
N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
N
D09218
D25840

AUTOMATIC TRANSAXLE ASSY (U241E)

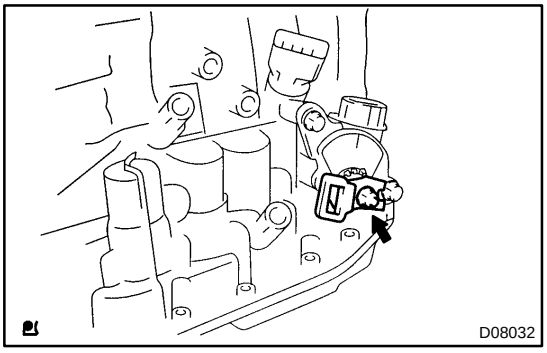
4006Z–01

OVERHAUL

1. REMOVE SPEEDOMETER DRIVEN HOLE (ATM) COVER SUB–ASSY [33403M / 98–3]

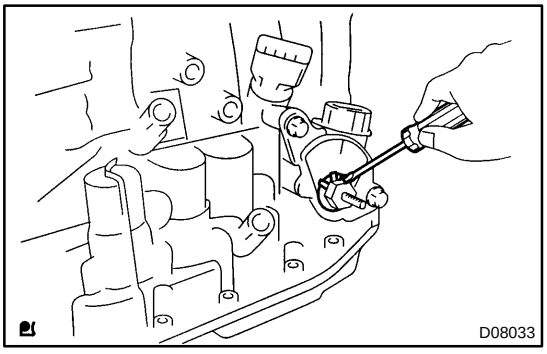
(a) Remove the bolt and speedometer driven hole cover sub–assy from the transaxle assy.

(b) Remove the O–ring from the speedometer driven hole cover.

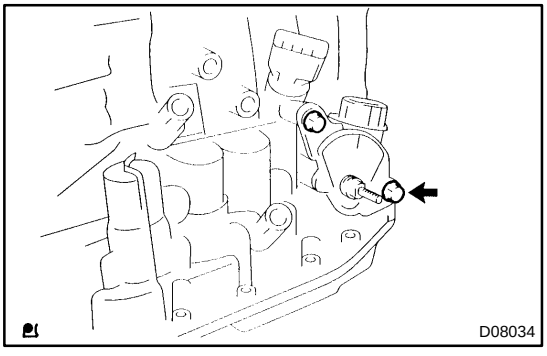


2. REMOVE PARK/NEUTRAL POSITION SWITCH ASSY [84540G / 98–11]

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



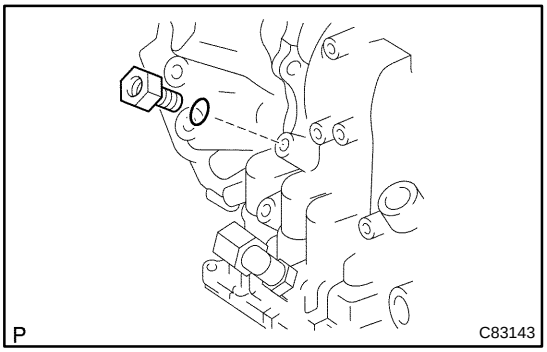
(b) Using a screwdriver, unstake the nut stopper and remove the lock nut and stopper.



(c) Remove the 2 bolts and pull out the park/neutral position switch.

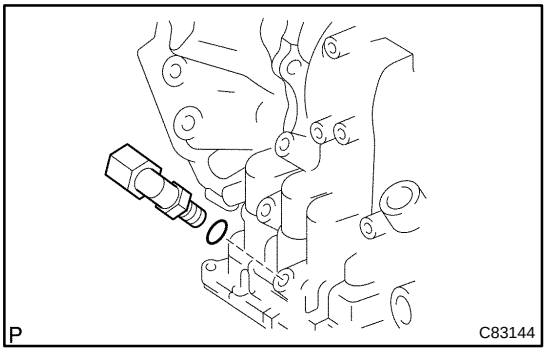
3. REMOVE BREATHER PLUG HOSE [35104V / 98–3]

(a) Remove the breather plug hose from the breather No. 2 plug.



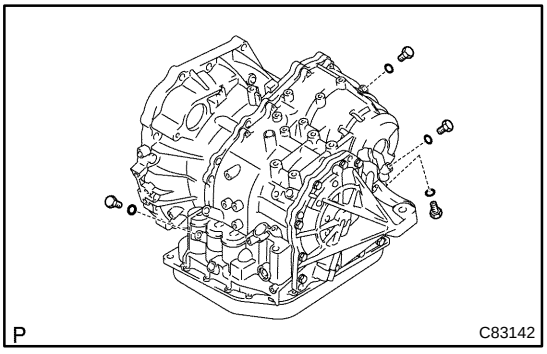
4. REMOVE OIL COOLER TUBE UNION (INLET OIL COOLER UNION)
[32921C / 3514]

(a) Remove the union.
(b) Remove the O–ring from the union.



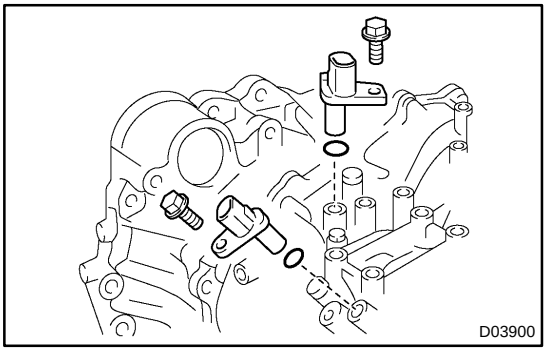
5. REMOVE OIL COOLER TUBE UNION (OUTLET OIL COOLER UNION)
[32921C / 3514]

(a) Remove the elbow.
(b) Remove the O–ring from the elbow.



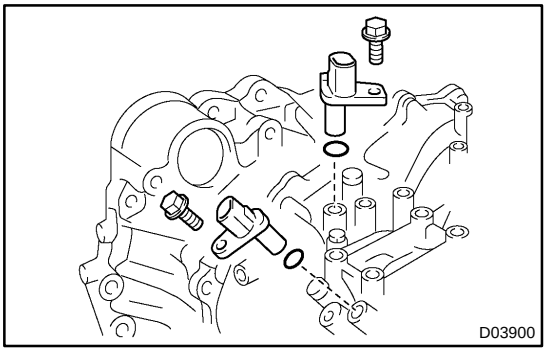
6. REMOVE TRANSAXLE CASE NO.1 PLUG
[35104Q / 98–3]

(a) Remove the 4 transaxle case No. 1 plugs from the transaxle case.
(b) Remove 4 O–rings from the 4 transaxle case No. 1 plugs.



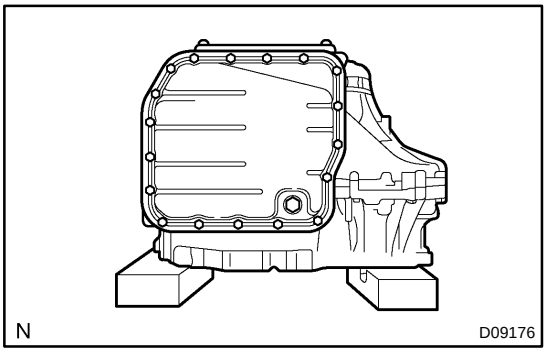
7. REMOVE SPEED SENSOR (TMC –MADE)
[89411F / 98–9]

(a) Remove the 2 bolts and the 2 speed sensors from the transaxle assy.
(b) Remove the 2 O–rings from the sensors.

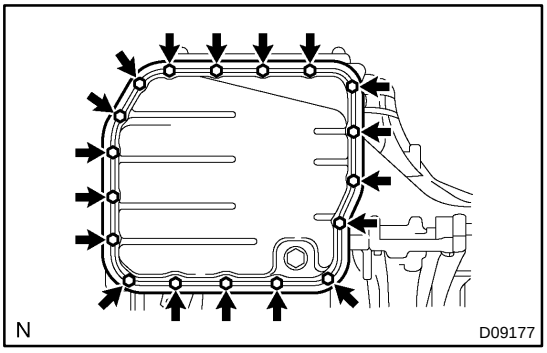


8. REMOVE TRANSMISSION REVOLUTION SENSOR (AISIN –MADE)
[89413E]

(a) Remove the 2 bolts and the 2 transmission revolution sensors from the transaxle assy.
(b) Remove the 2 O–rings from the sensors.



9. FIX AUTOMATIC TRANSAXLE ASSY
[30500 / 98–1]

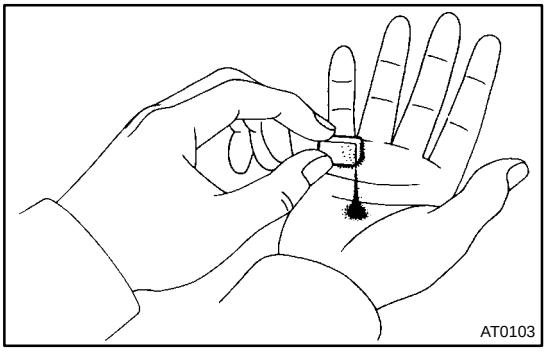


10. REMOVE AUTOMATIC TRANSAXLE OIL PAN SUB–ASSY
[35106D / 98–3]

(a) Remove the 18 bolts.
(b) Remove the oil pan and 2 magnets.

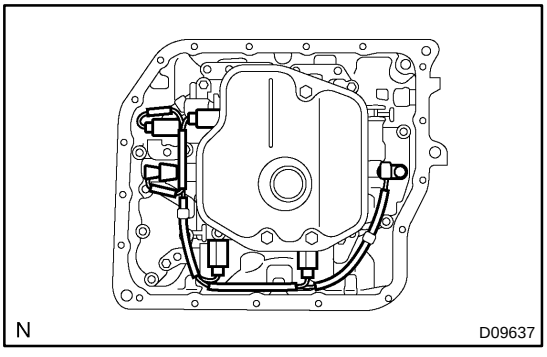
11. REMOVE AUTOMATIC TRANSAXLE OIL PAN GASKET
[35168A / 98–3]

(a) Remove the gasket from the oil pan.



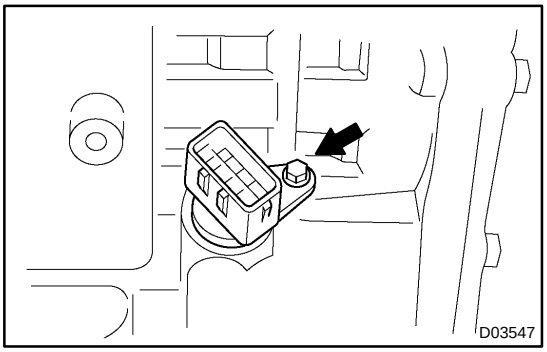
12. INSPECT AUTOMATIC TRANSAXLE OIL PAN SUB–ASSY
[35106D / 98–3]

(a) Remove the magnets and use them to collect any steel chips. Examine the chips and particles in the pan and on the magnet to determine what type of wear has occurred in the transaxle:
Steel (magnetic).... bearing, gear and plate wear
Brass (non–magnetic).... bushing wear

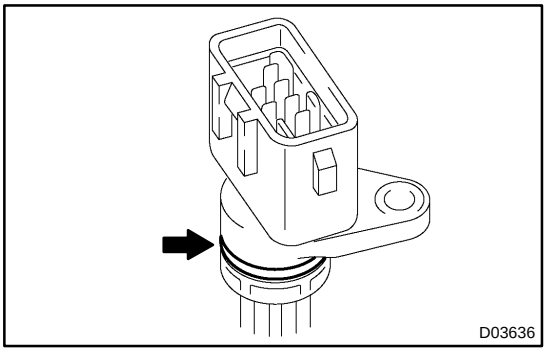


13. REMOVE TRANSMISSION WIRE
[82125J / 98–9]

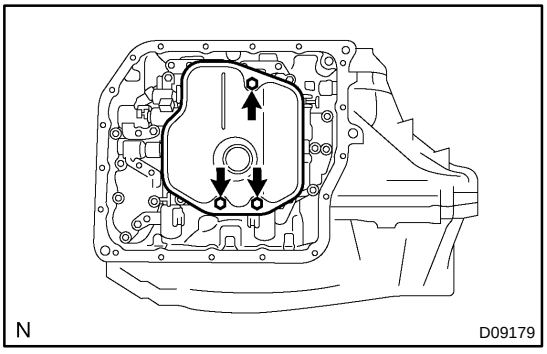
(a) Remove the 5 connectors from the shift solenoid valves.
(b) Remove the bolt, clamp and ATF temperature sensor.



(c) Remove the bolt and transaxle solenoid wire from the transaxle case.

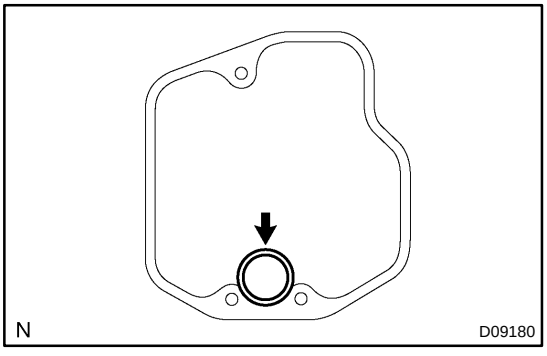


(d) Remove the O–ring from the transaxle solenoid wire.

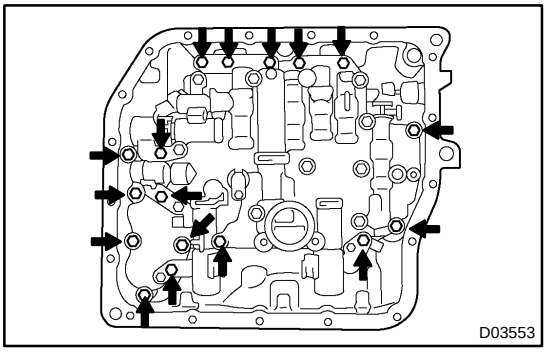


14. REMOVE VALVE BODY OIL STRAINER ASSY [35330 / 98–9]

(a) Remove the 3 bolts and oil strainer.

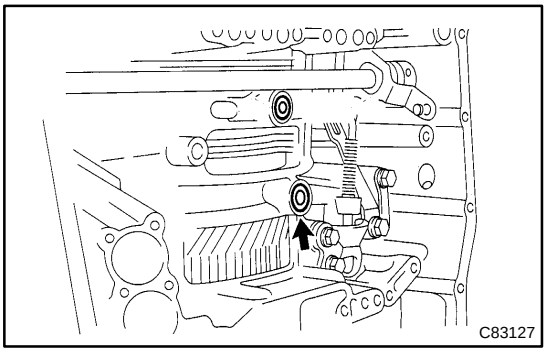


(b) Remove the O–ring from the oil strainer.



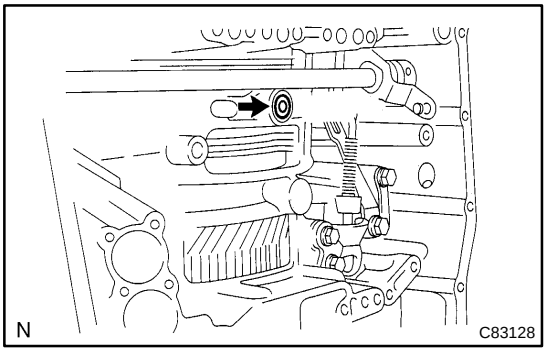
15. REMOVE TRANSMISSION VALVE BODY ASSY [35410 / 98–9]

(a) Support the valve body assy and remove the 17 bolts and the valve body assy.



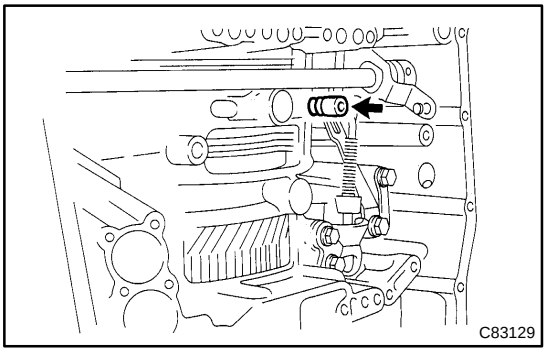
16. REMOVE GOVERNOR APPLY GASKET NO.1 [35148 / 98–3]

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



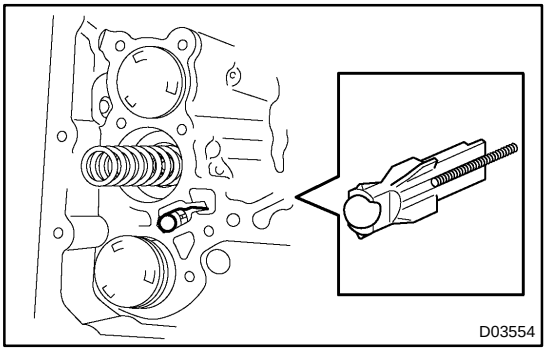
17. REMOVE TRANSAXLE CASE 2ND BRAKE GASKET [35149B / 98–3]

(a) Remove the transaxle case 2ND brake gasket from the transaxle case.



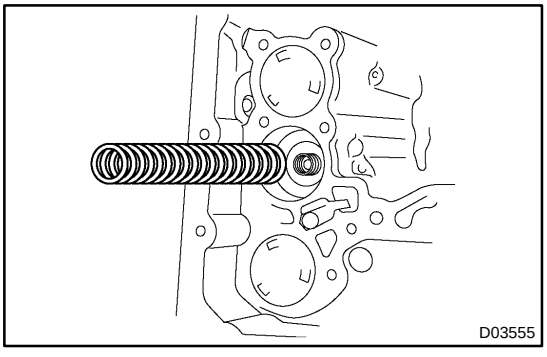
18. REMOVE BRAKE DRUM GASKET [35159 / 98–3]

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



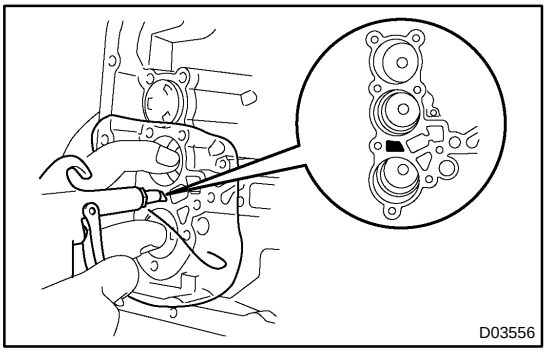
19. REMOVE CHECK BALL BODY [35251 / 98–9]

(a) Remove the check ball body and spring from the transaxle case.



20. REMOVE C–3 ACCUMULATOR PISTON [35426D / 98–9]

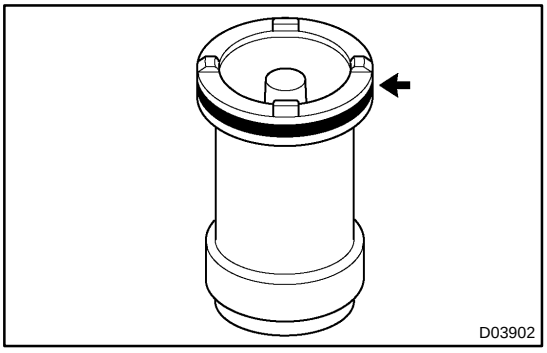
(a) Remove the compression spring from the C_3 accumulator piston.



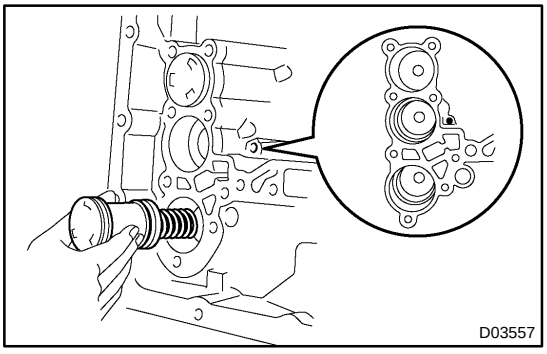
(b) Apply compressed air (392 kPa, 4.0 kgf/cm^2, 57 psi) to the oil hole and remove the C_3 accumulator piston.

NOTICE:

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



(c) Remove the O–ring from the C_3 accumulator piston.

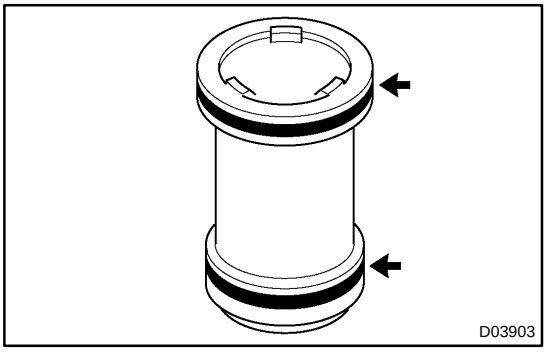


21. REMOVE C–1 ACCUMULATOR PISTON [35424C / 98–9]

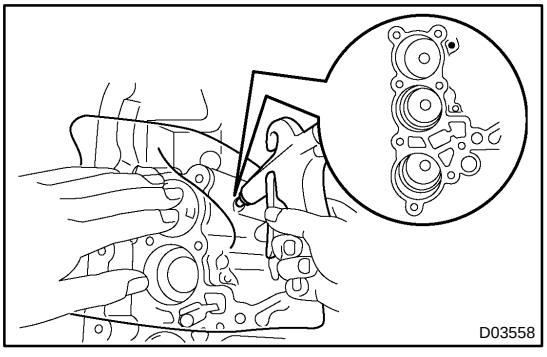
(a) Apply compressed air (392 kPa, 4.0 kgf/cm^2, 57 psi) to the oil hole and remove the C_1 accumulator piston and compression spring.

NOTICE:

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



(b) Remove the 2 O–rings from the C_1 accumulator piston.

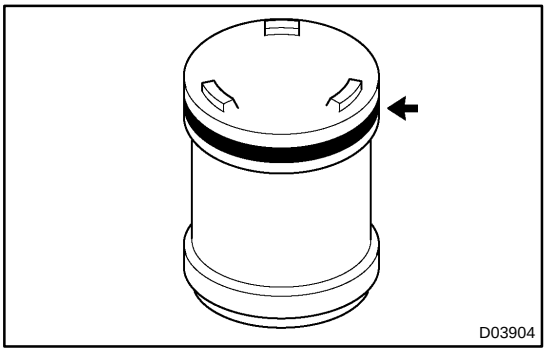


22. REMOVE B–3 ACCUMULATOR PISTON [35427K / 98–9]

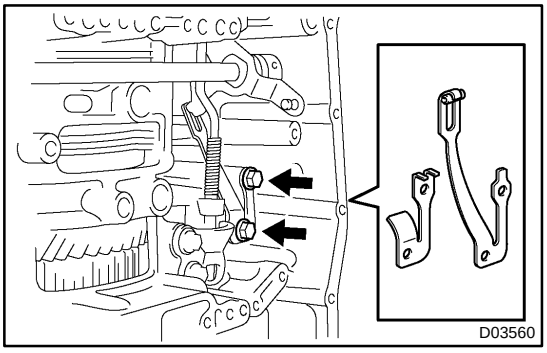
(a) Apply compressed air (392 kPa, 4.0 kgf/cm^2, 57 psi) to the oil hole and remove the B_3 accumulator piston and 2 compression springs.

NOTICE:

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

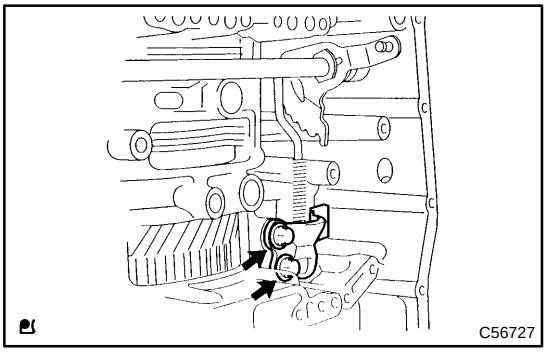


(b) Remove the O–ring from the B_3 accumulator piston.



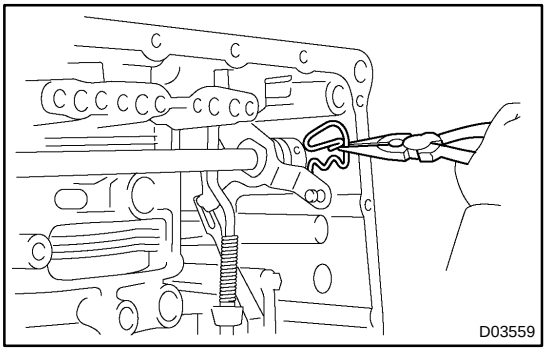
23. REMOVE MANUAL DETENT SPRING SUB–ASSY [35409 / 98–9]

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



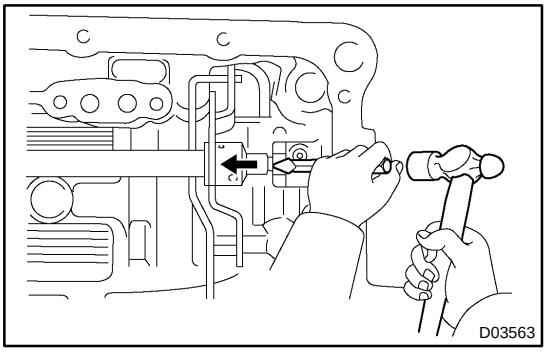
24. REMOVE PARKING LOCK PAWL BRACKET [35595 / 98–11]

(a) Remove the 2 bolts and the parking lock pawl bracket.



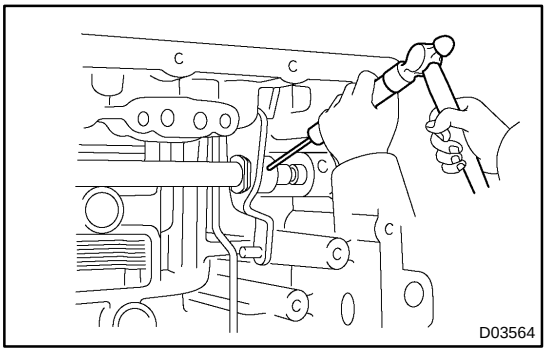
25. REMOVE MANUAL VALVE LEVER SHAFT RETAINER SPRING [35506J / 98–11]

(a) Using needle–nose pliers, remove the manual valve lever shaft retainer spring.



26. REMOVE MANUAL VALVE LEVER SUB–ASSY [35505 / 98–11]

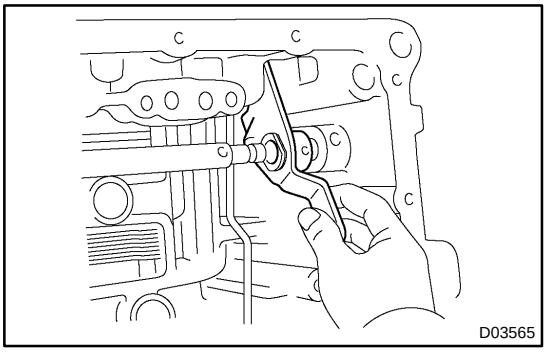
(a) Using a chisel and hammer, unstake and remove the manual valve lever spacer.



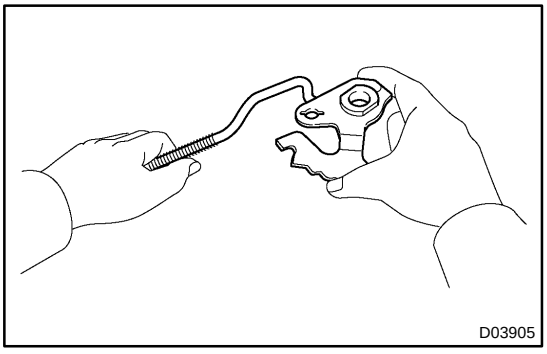
(b) Using a pin punch and hammer, drive out the manual valve lever shaft spring pin.

HINT:

Slowly drive out the pin so that it will not fall into the transaxle case.

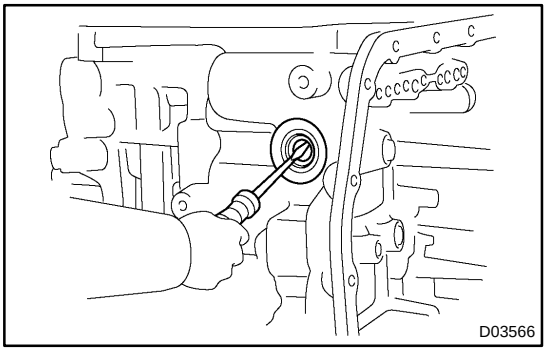


(c) Remove the manual valve lever shaft and manual valve lever.



27. REMOVE PARKING LOCK ROD SUB–ASSY [35501 / 98–11]

(a) Remove the parking lock rod from the manual valve lever.

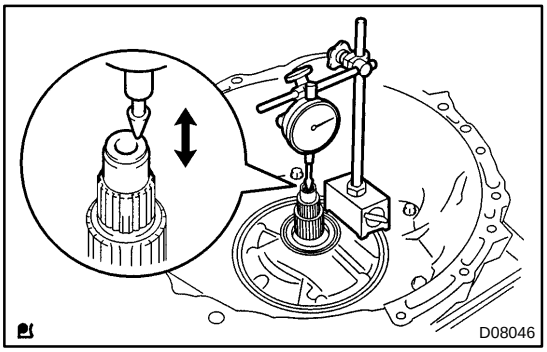


28. REMOVE MANUAL VALVE LEVER SHAFT OIL SEAL [35506F / 98–11]

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

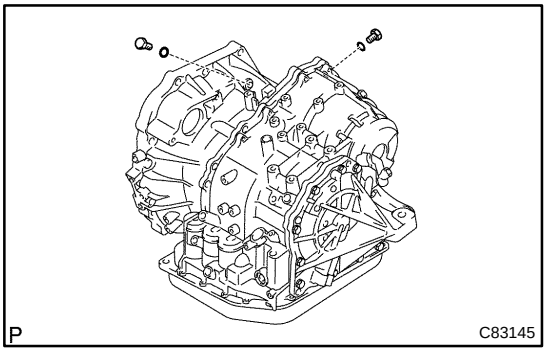
29. FIX AUTOMATIC TRANSAXLE ASSY [30500 / 98–1]

(a) Fix the transaxle case with the oil pump side facing up.



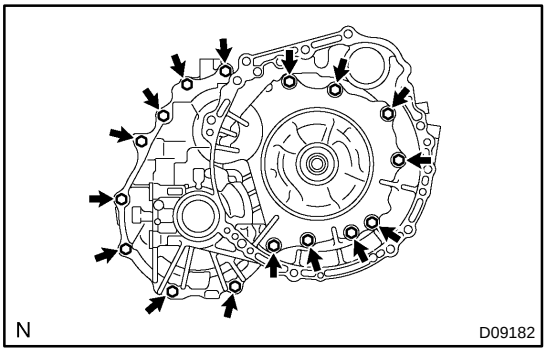
30. INSPECT INPUT SHAFT ENDPLAY

(a) Using a dial indicator, measure the input shaft end play.
END Play: 0.26 – 1.25 mm (0.0103 – 0.0492 in.)



31. REMOVE TRANSAXLE CASE NO.1 PLUG
[35104Q / 98–3]

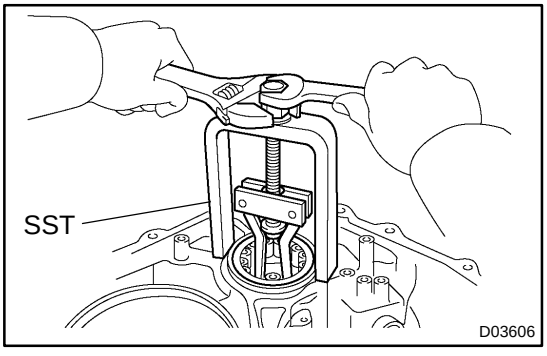
(a) Remove the 2 transaxle case No 1 plugs.
(b) Remove the 2 O–rings from the transaxle case plug.



32. REMOVE TRANSAXLE HOUSING
[35111C / 98–12]

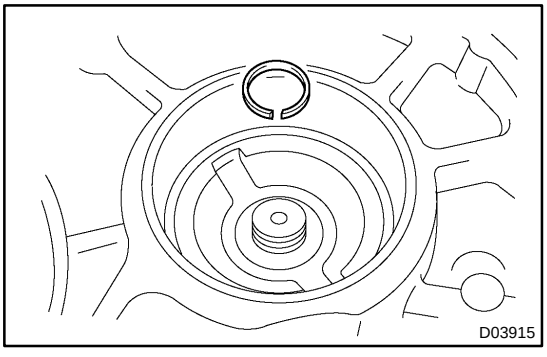
(a) Remove the 16 bolts.
(b) Tap on the circumference of the transaxle housing with a plastic hammer to remove the transaxle housing from the transaxle case.

NOTICE:
Differential may be accidentally removed when the transaxle housing is removed.



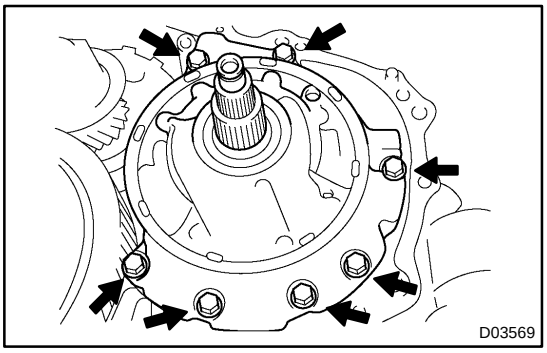
33. REMOVE UNDERDRIVE CYLINDRICAL ROLLER BEARING
[34301B / 98–4]

(a) Using SST, remove the cylindrical roller bearing from the transaxle case.
SST 09514–35011



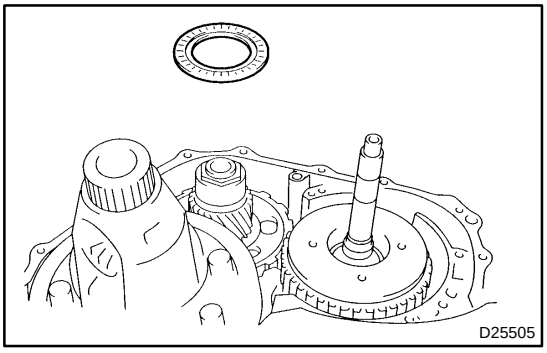
34. REMOVE UNDERDRIVE OUTPUT SHAFT OIL SEAL RING
[34346 / 98–8]

(a) Remove the oil seal ring from the transaxle housing.



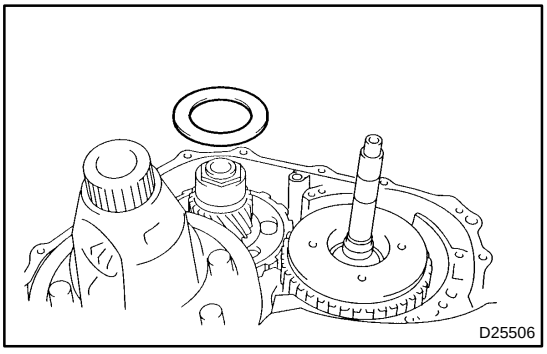
35. REMOVE OIL PUMP ASSY

(a) Remove the 7 bolts and oil pump assy from the transaxle case.



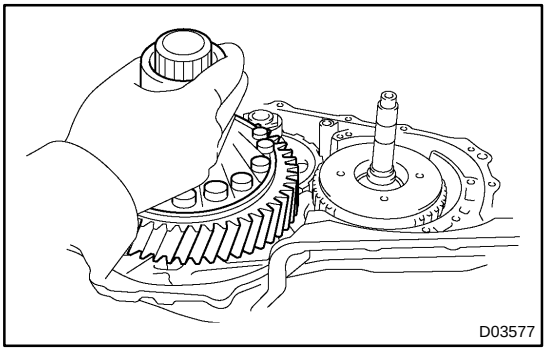
36. REMOVE THRUST NEEDLE ROLLER BEARING
[34736B / 98–4]

(a) Remove thrust needle roller bearing from the U/D planetary gear assy.



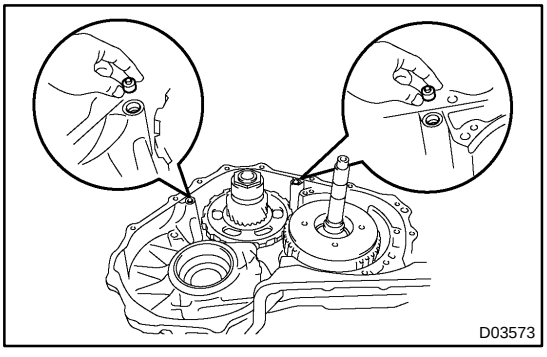
37. REMOVE THRUST BEARING UNDERDRIVE RACE NO.2
[34736A / 98–4]

(a) Remove thrust bearing race No. 2 from the U/D planetary gear assy.



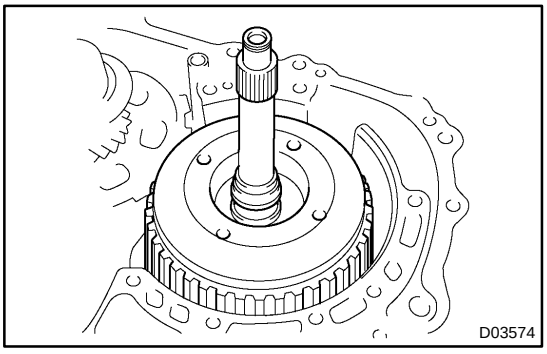
38. REMOVE FRONT DIFFERENTIAL ASSY

(a) Remove the front differential assy from the transaxle case.



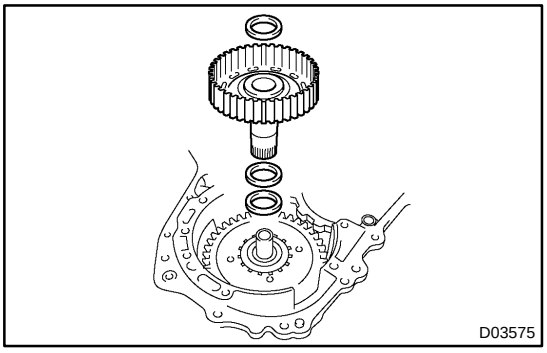
39. REMOVE OVERDRIVE BRAKE GASKET
[35179 / 98–3]

(a) Remove the 2 O/D brake gaskets from the transaxle case.



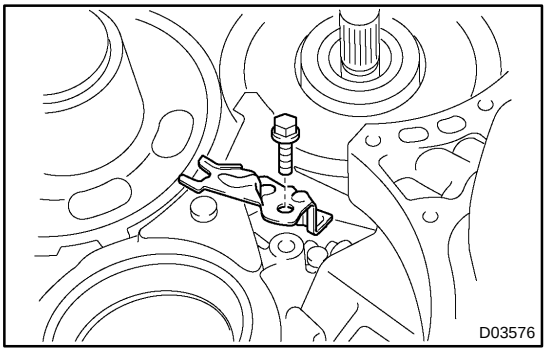
40. REMOVE FORWARD CLUTCH ASSY

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



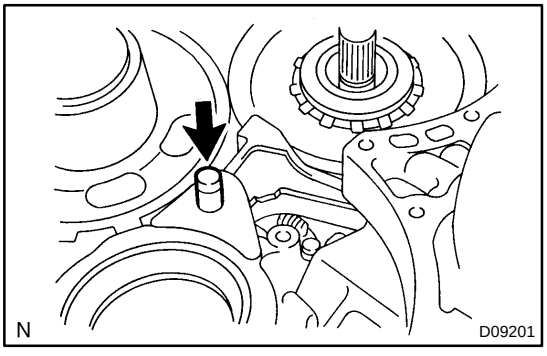
41. REMOVE MULTIPLE DISC CLUTCH HUB
[35631 / 98–5]

(a) Remove the thrust bearing, multiple clutch hub, needle roller bearing and bearing race from the transaxle case.

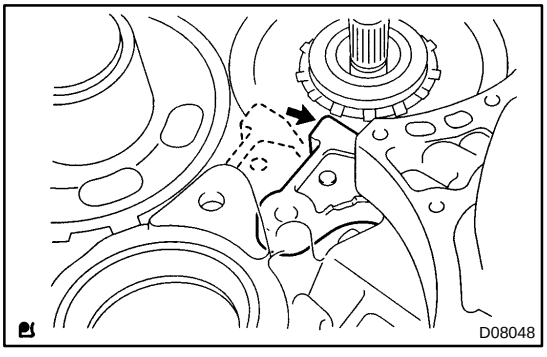


42. REMOVE UNDERDRIVE PLANETARY GEAR ASSY

(a) Remove the bolt and parking pawl shaft clamp.



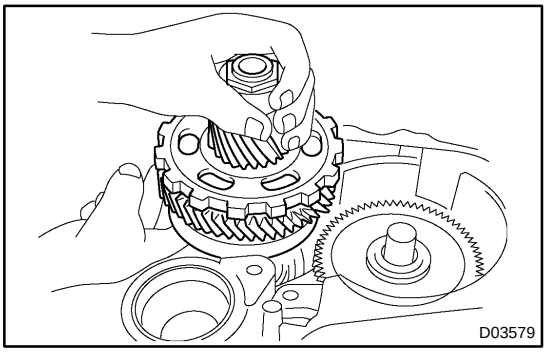
(b) Remove the parking lock pawl shaft.



(c) Push the parking lock pawn.

HINT:

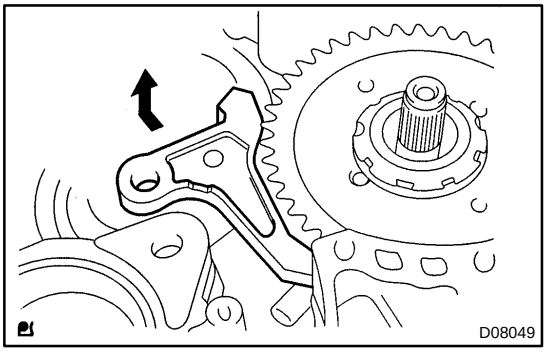
Failure to do so will cause interference when the U/D planetary gear is removed.



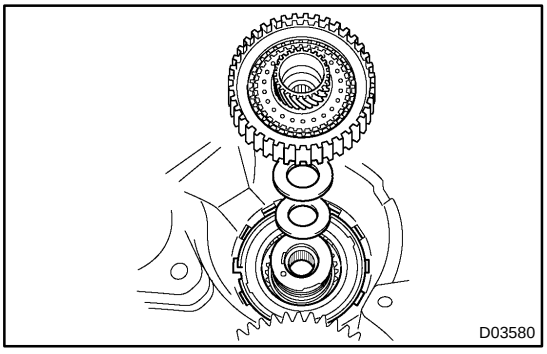
(d) Remove the U/D planetary gear assy from the transaxle case.

NOTICE:

Be careful so that the U/D planetary gear assy will not fall out.

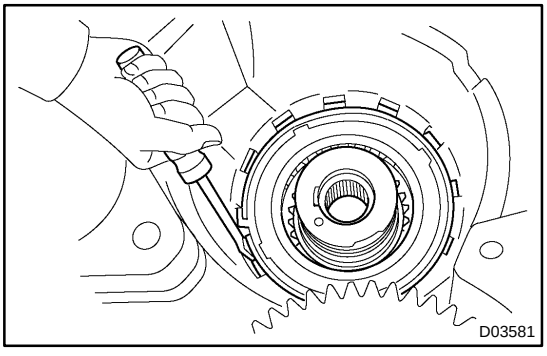


(e) Remove the spring, pawl pin and parking lock pawl.



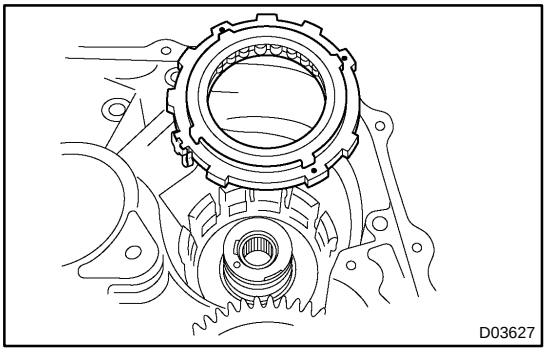
43. REMOVE UNDERDRIVE CLUTCH ASSY

(a) Remove the U/D clutch assy, needle roller bearing, thrust bearing U/D race No. 3 from the transaxle case.

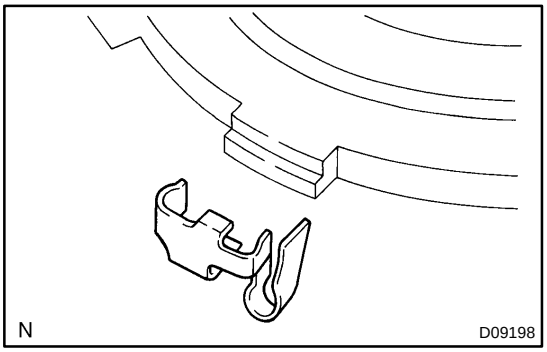


44. REMOVE UNDERDRIVE 1 WAY CLUTCH ASSY [34360 / 98–4]

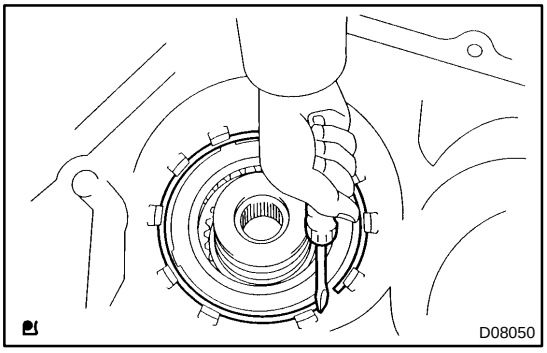
(a) Using a screwdriver, remove the snap ring from the transaxle case.



(b) Remove the 1–way clutch from the transaxle case.

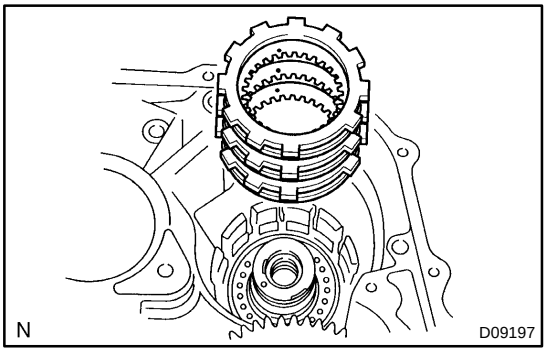


(c) Remove the outer race retainer from the 1–way clutch.

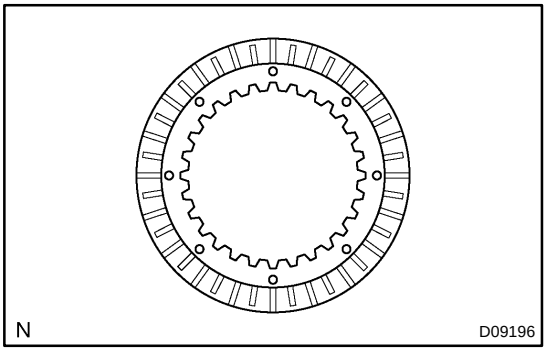


45. REMOVE UNDERDRIVE CLUTCH DISC NO.2 [34262 / 98–4]

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



(b) Remove the flange, 3 discs and 3 plates from the transaxle case.



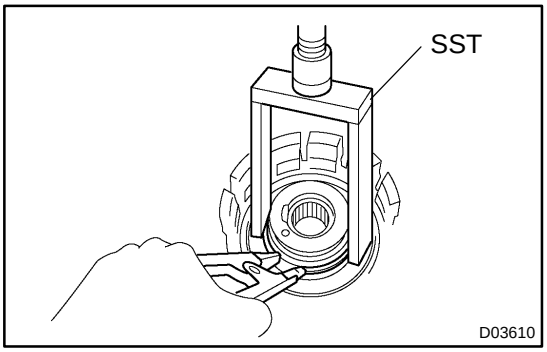
46. INSPECT UNDERDRIVE CLUTCH DISC NO.2 [34262 / 98–4]

(a) Check to see if the sliding surface of the disc, plate and flange are worn or burnt.

If necessary, replace them.

NOTICE:

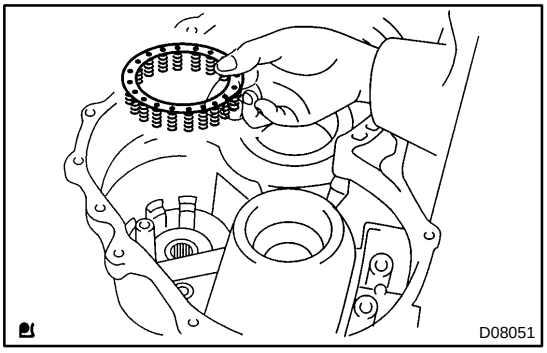
- **If the lining of the disc is peeling off or discolored, or even if a part of the groove is defaced, replace all discs.**
- **Before assembling new discs, soak them in ATF for at least 15 minutes.**



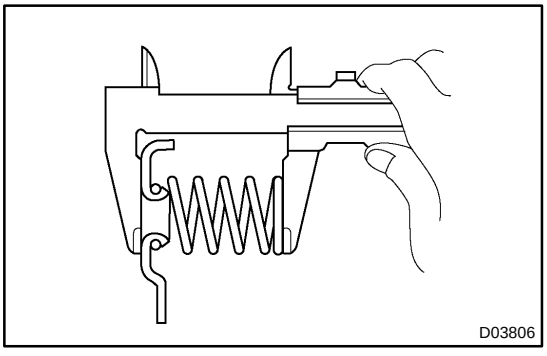
47. REMOVE UNDERDRIVE BRAKE RETURN SPRING SUB–ASSY

[34207 / 98–4]

(a) Using SST, a snap ring expander and a press, remove the snap ring from the transaxle case.
SST 09387–00020



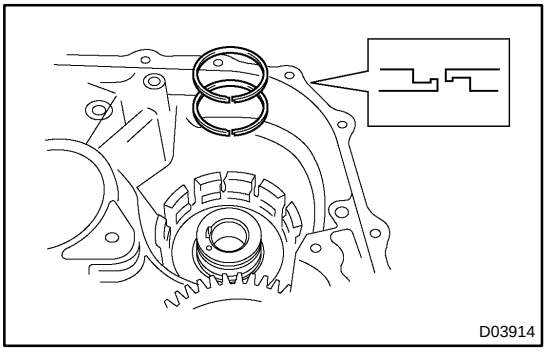
(b) Remove the U/D brake return spring sub–assy from the U/D brake piston.



48. INSPECT UNDERDRIVE BRAKE RETURN SPRING SUB–ASSY

[34207 / 98–4]

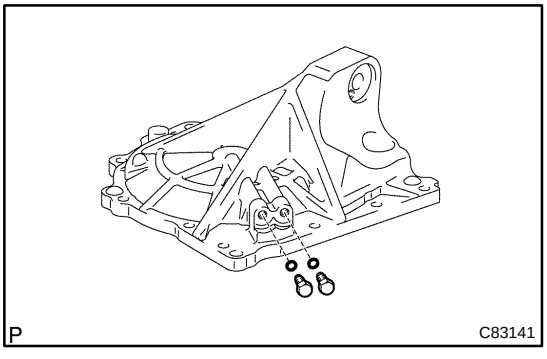
(a) Using vernier calipers, measure the free length of the U/D brake return spring sub–assy together with the spring seat.
Standard free length: 14.04 mm (0.5213 in.)



49. REMOVE UNDERDRIVE CLUTCH DRUM OIL SEAL RING

[34244 / 98–8]

(a) Remove the 2 U/D clutch drum oil seal rings from the transaxle case.

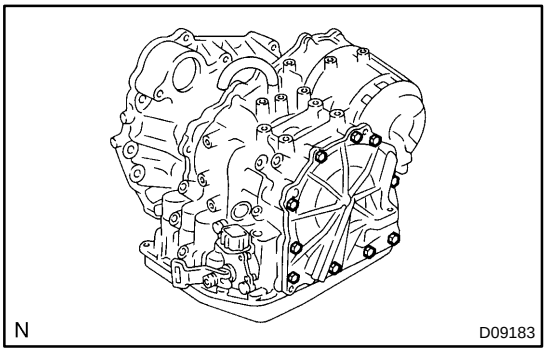


50. REMOVE TRANSAXLE CASE NO.1 PLUG

[34104Q / 98–3]

(a) Remove 2 transaxle case No. 1 plugs from the transaxle rear cover.

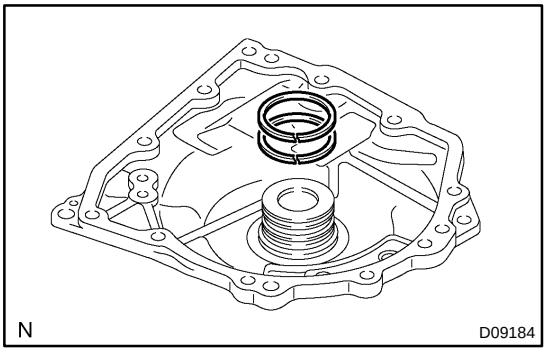
(b) Remove 2 O–rings from the 2 transaxle case No. 1 plugs.



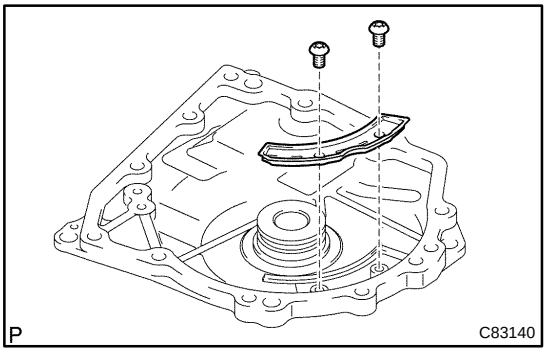
51. REMOVE TRANSAXLE REAR COVER SUB–ASSY [35102 / 98–3]

(a) Remove the 11 bolts.

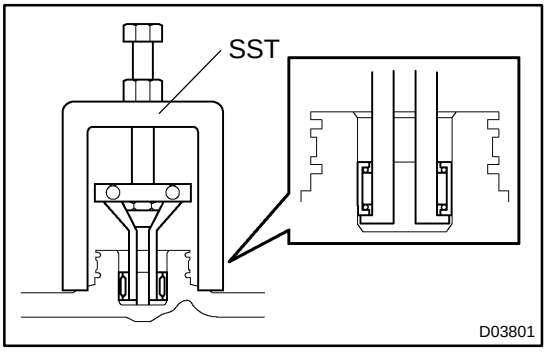
(b) Tap around the circumference of the rear cover with a plastic hammer to remove the transaxle rear cover from the transaxle case.



(c) Remove the 2 outer rear clutch oil seal rings from the transaxle rear cover.

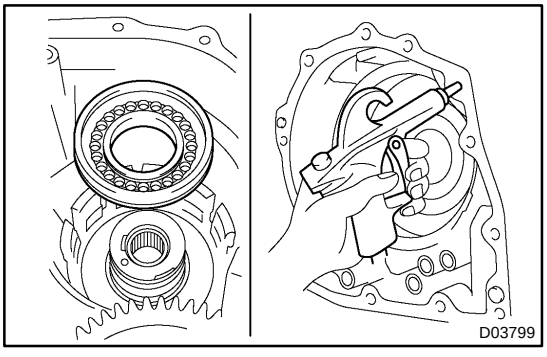


(d) Using a torx socket wrench T30, remove the 2 screws and transaxle rear cover plate.



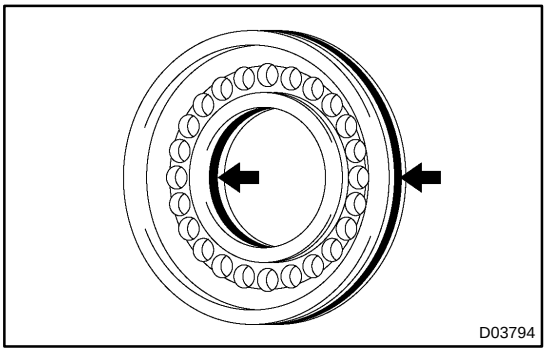
(e) Using SST, remove the needle–roller bearing from the transaxle rear cover.

SST 09387–00040 (09387–01010, 09387–01030, 09387–01040)

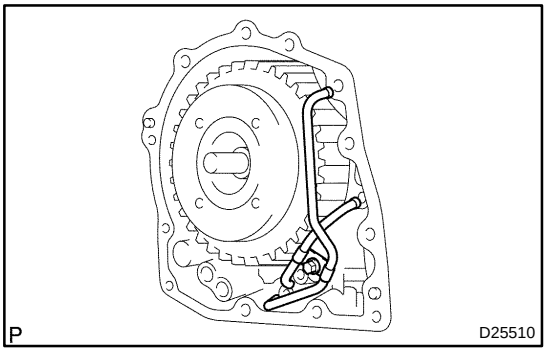


52. REMOVE UNDERDRIVE BRAKE PISTON [34253 / 98–4]

(a) Apply compressed air (392 kPa, 4.0 kgf/cm^2, 57 psi) to the transaxle case to remove the U/D brake piston.



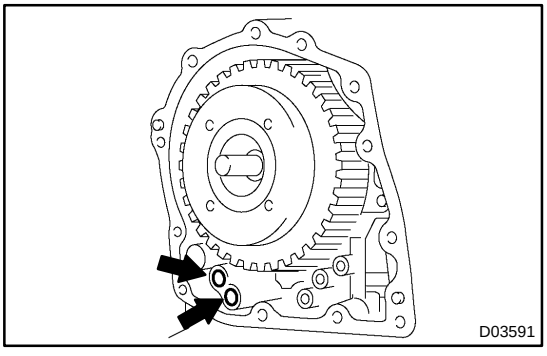
(b) Remove the 2 O–rings from the U/D brake piston.



53. REMOVE BRAKE APPLY TUBE
[35666D / 98–9]

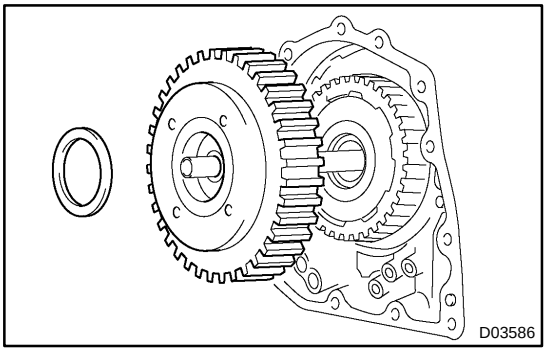
(a) Remove a bolt, clamp and 2 brake apply tubes.
(b) Remove the brake apply tube from the clamp.

54. REMOVE FRONT CLUTCH APPLY TUBE
[35895 / 98–9]



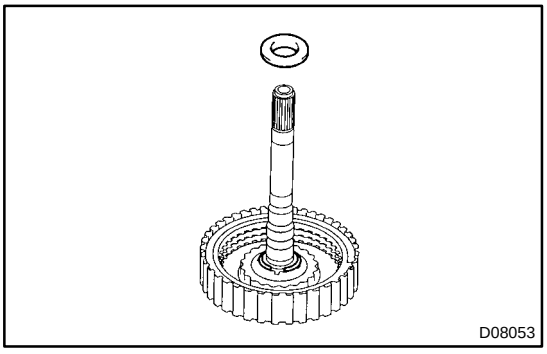
55. REMOVE GOVERNOR APPLY GASKET NO.1
[35148 / 98–3]

(a) Using a screwdriver, remove the 2 governor apply gasket No. 1.

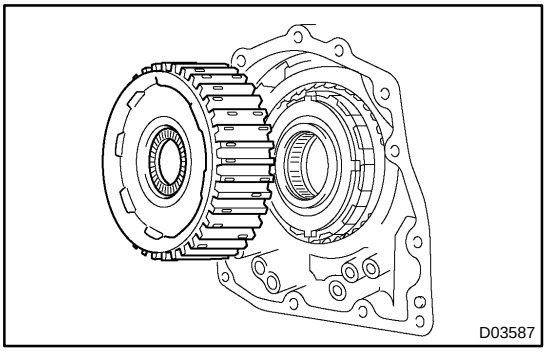


56. REMOVE DIRECT CLUTCH ASSY

(a) Remove the thrust bearing and the direct clutch assy from the transaxle case.

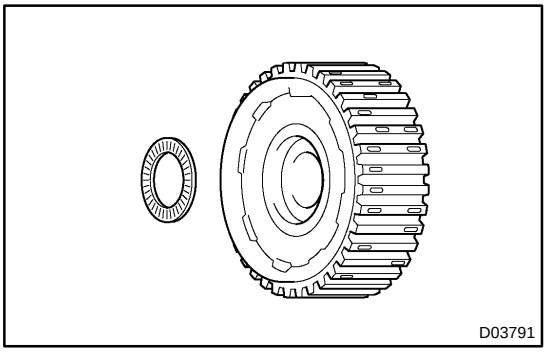


(b) Remove the bearing race from the direct clutch.

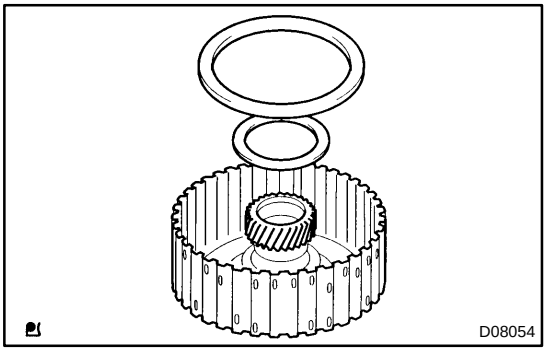


57. REMOVE REAR PLANETARY SUN GEAR ASSY [35730 / 98–8]

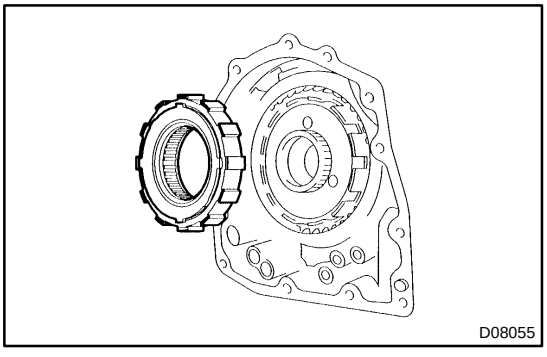
(a) Remove the rear planetary sun gear assy from the transaxle case.



(b) Remove the rear planetary sun gear thrust bearing from the rear planetary sun gear.

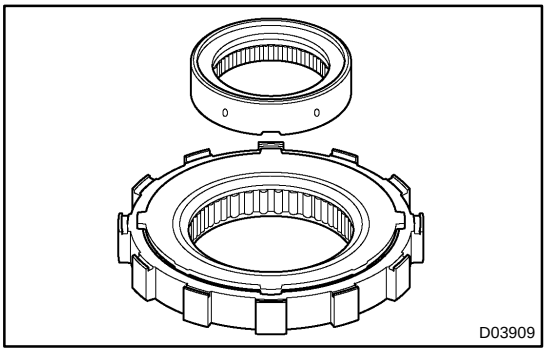


(c) Remove the thrust washer No. 1 and 1–way clutch thrust bearing from the rear planetary sun gear.

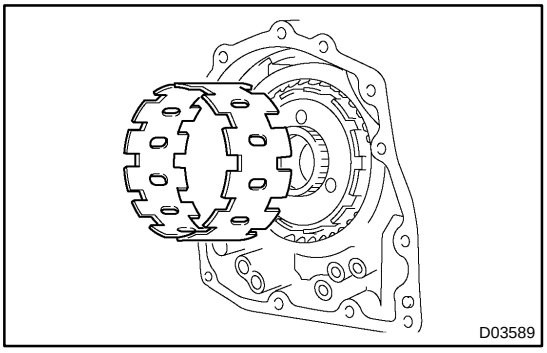


58. REMOVE 1 WAY CLUTCH ASSY [35790 / 98–6]

(a) Remove the 1–way clutch assy from the transaxle case.

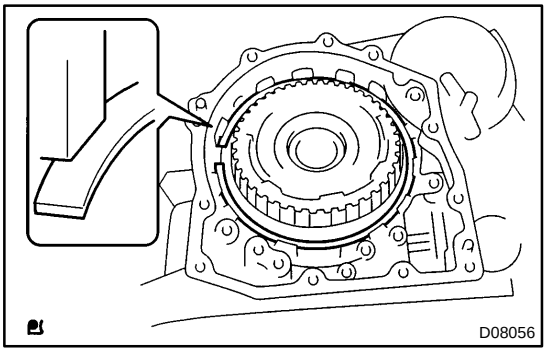


(b) Remove the 1–way clutch inner race from the 1–way clutch assy.



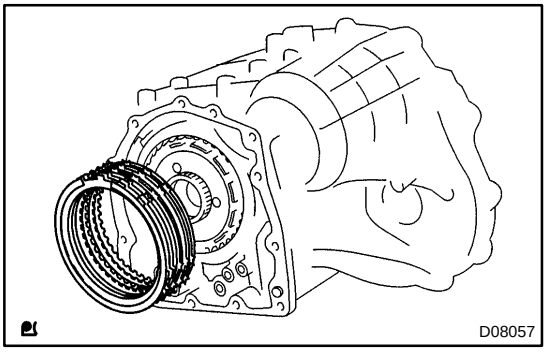
59. REMOVE 1-WAY CLUTCH SLEEVE OUTER [35798A / 98–6]

(a) Remove the 1–way clutch sleeve outer.

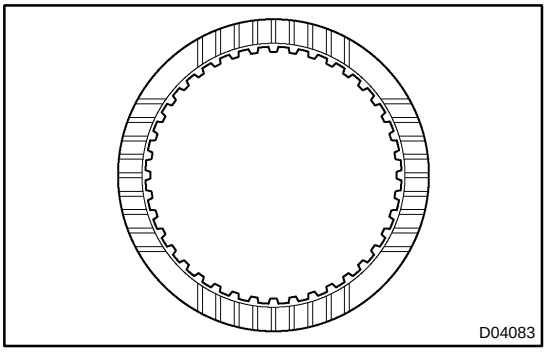


60. REMOVE 2ND BRAKE CLUTCH DISC [35677 / 98–6]

(a) Using a screwdriver, remove the 2ND brake hole snap ring from the transaxle case.



(b) Remove the flange, 3 discs and 3 plates from the transaxle case.



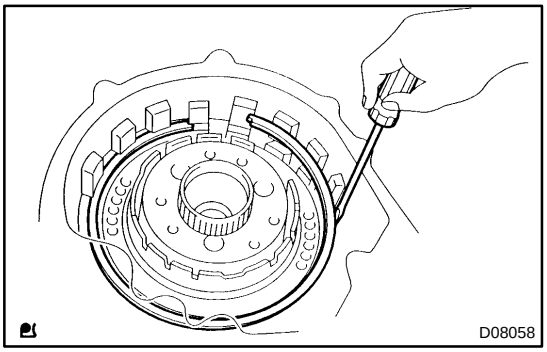
61. INSPECT 2ND BRAKE CLUTCH DISC [35677 / 98–6]

(a) Check to see if the sliding surface of the disc, plate and flange are worn or burnt.

If necessary, replace them.

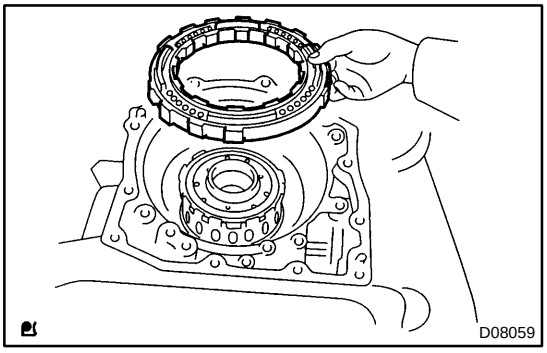
NOTICE:

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

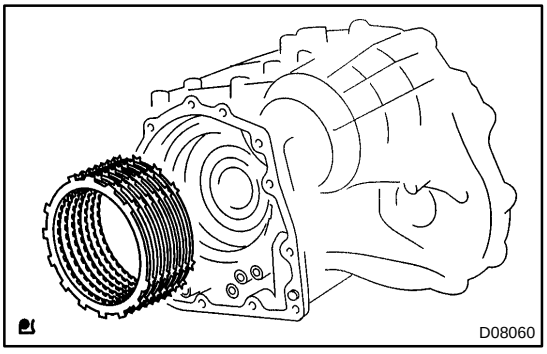


62. REMOVE SECOND BRAKE PISTON ASSY

(a) Using a screwdriver, remove the 2ND brake cylinder hole snap ring from the transaxle case.

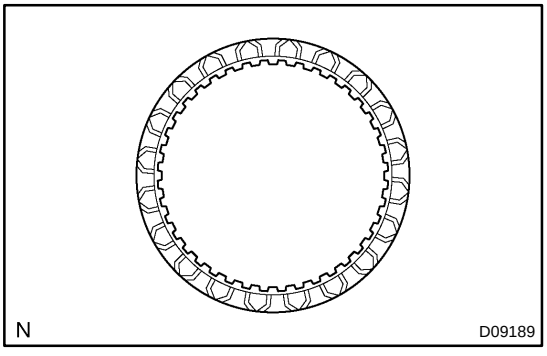


(b) Remove the 2ND brake cylinder from the transaxle case.



63. REMOVE 1ST & REVERSE BRAKE CLUTCH DISC [35677A / 98–7]

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



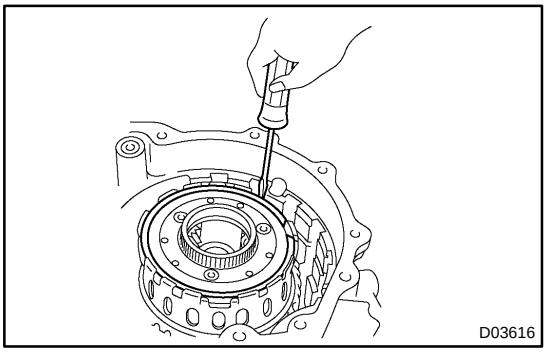
64. INSPECT 1ST & REVERSE BRAKE CLUTCH DISC [35677A / 98–7]

(a) Check to see if the sliding surface of the disc, plate, and flange are worn or burnt.

If necessary, replace them.

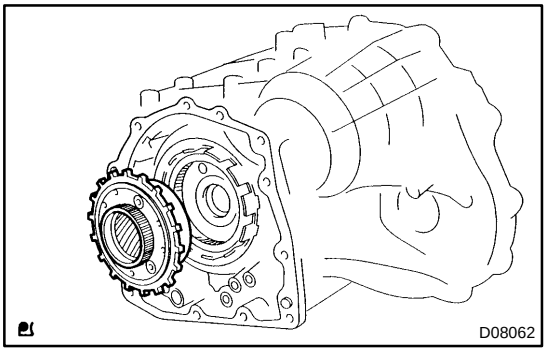
NOTICE:

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

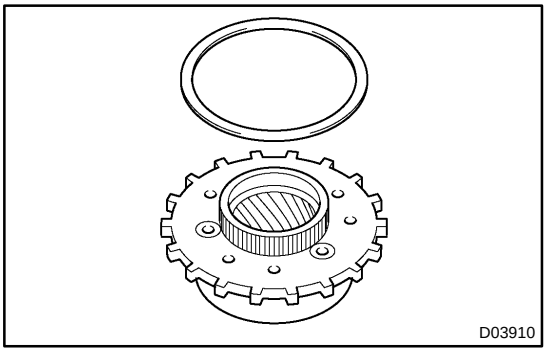


65. REMOVE REAR PLANETARY GEAR ASSY
[35760 / 98–8]

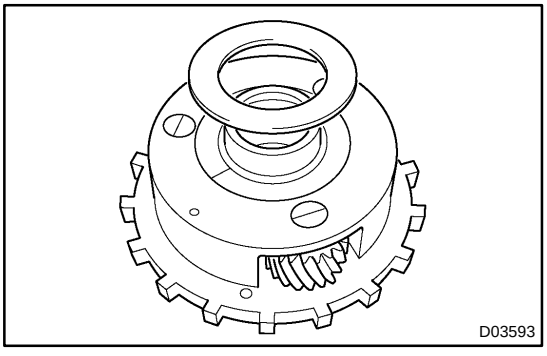
(a) Using a screwdriver, remove the snap ring from the brake hub.



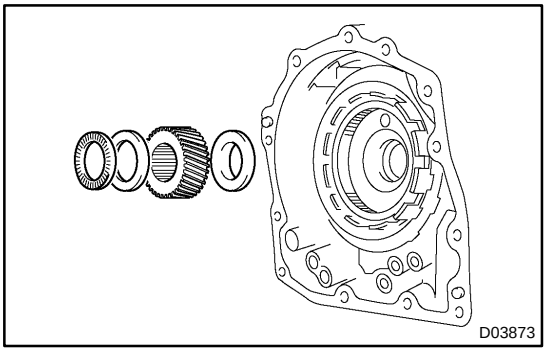
(b) Remove the rear planetary gear assy from the transaxle case.



(c) Remove the thrust washer No. 2 from the rear planetary gear assy.

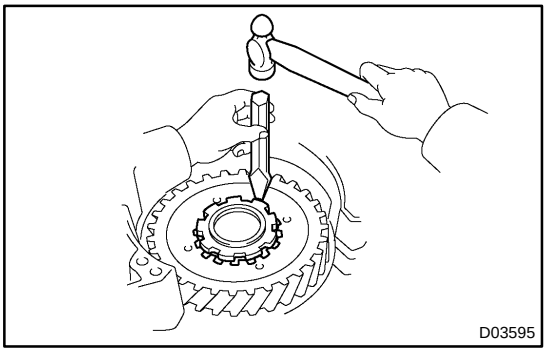


(d) Remove the thrust bearing race No. 3 from the rear planetary gear assy.



66. REMOVE INPUT SUN GEAR
[35714B / 98–6]

(a) Remove the 2 thrust bearings, the bearing race and the input sun gear from the transaxle case.

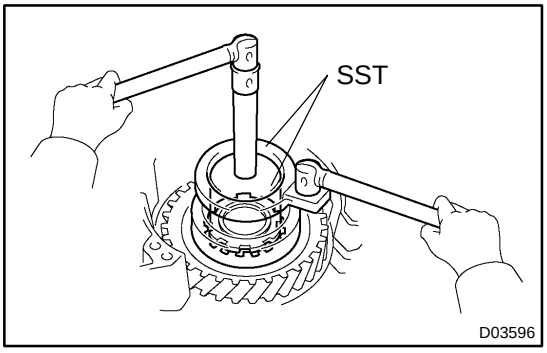


67. REMOVE FRONT PLANETARY GEAR ASSY [35720 / 98–8]

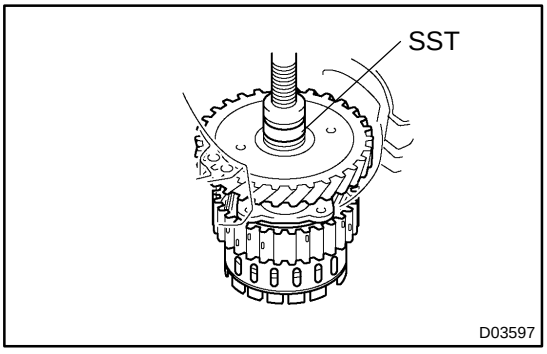
(a) Using a chisel and a hammer, unstake the lock washer.

NOTICE:

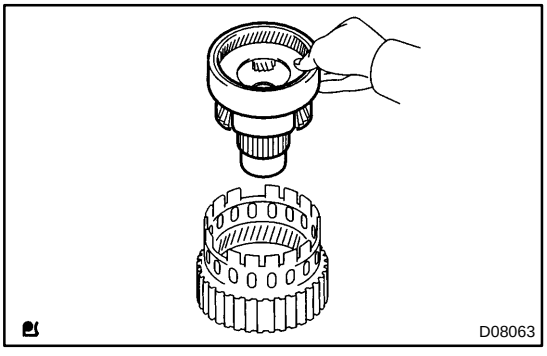
Push down all claws of the washer. Otherwise SST cannot be fully pressed against the nut and cannot loosen the nut.



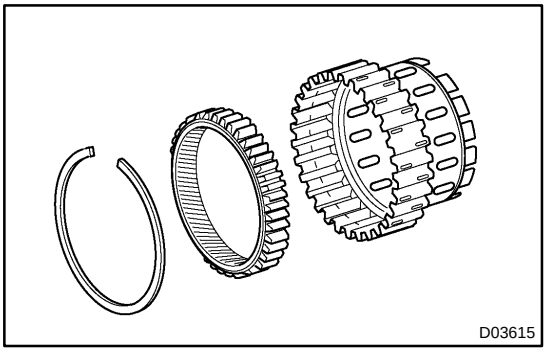
(b) Using SST, remove the nut.
SST 09387–00030, 09387–00080



(c) Using SST and a press, remove the front planetary gear assy from the counter drive gear.
SST 09950–60010 (09951–00450)

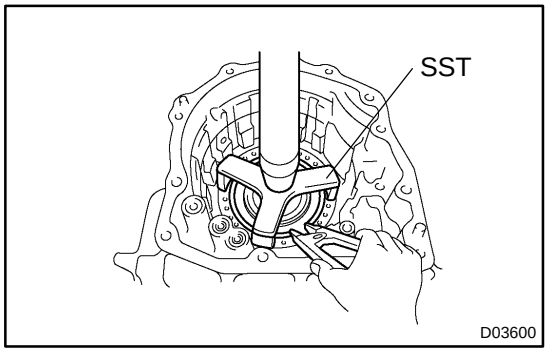


(d) Remove front planetary gear assy from the brake hub.



68. REMOVE FRONT PLANETARY RING GEAR [35743 / 98–8]

(a) Using a screwdriver, remove the brake hub snap ring and front planetary ring gear from the brake hub.

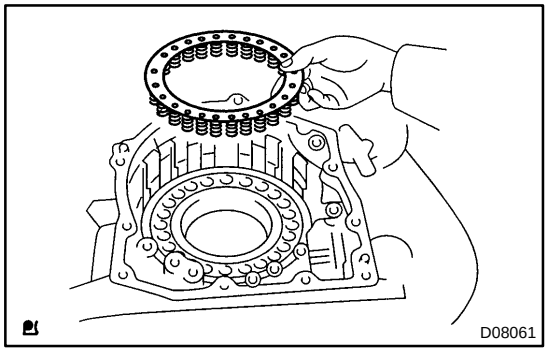


69. REMOVE 1ST & REVERSE BRAKE PISTON [35623H / 98–7]

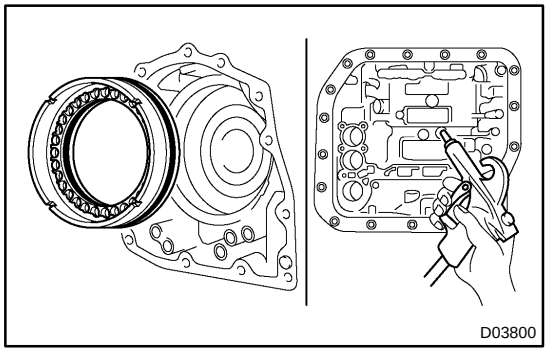
(a) Using SST, a press and a snap ring expander, remove snap ring and the piston return spring.
SST 09387–00070

NOTICE:

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



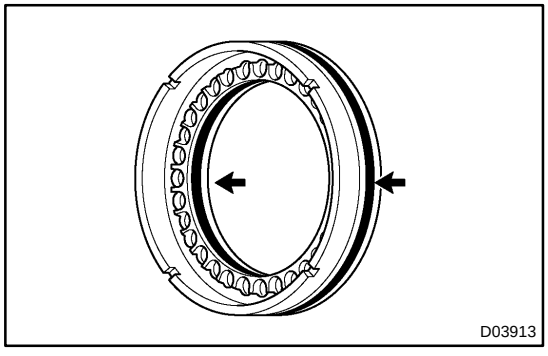
(b) Remove the1ST & reverse brake return spring from the 1ST & reverse brake piston.



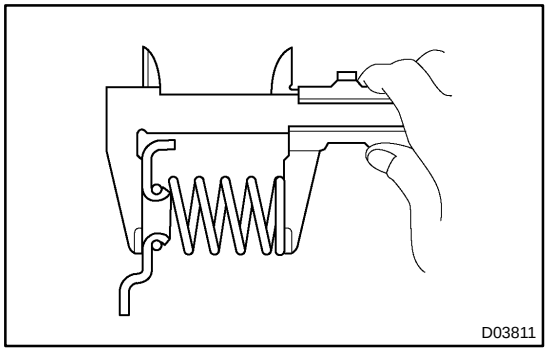
(c) Apply compressed air (392 kPa, 4.0 kgf/cm^2, 57 psi) to the transaxle case to remove 1ST & reverse brake piston.

NOTICE:

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

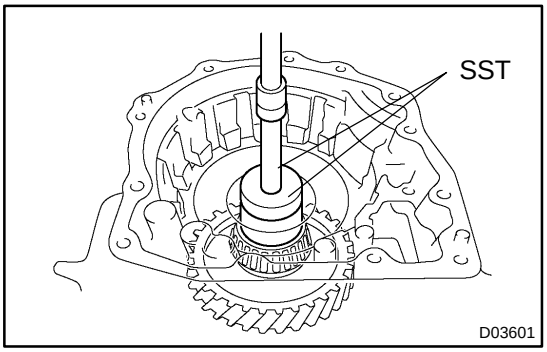


(d) Remove 2 O–rings from the 1ST & reverse brake piston.



70. INSPECT 1ST & REVERSE BRAKE RETURN SPRING SUB–ASSY [35068 / 98–7]

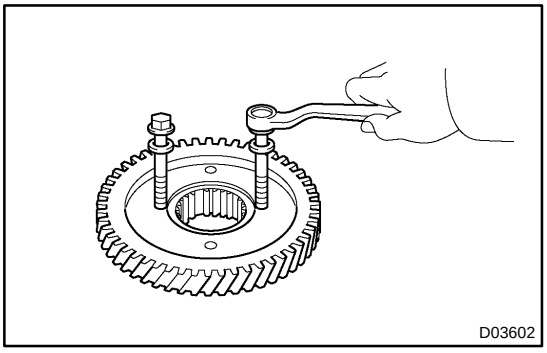
(a) Using vernier calipers, measure the free length of the 1ST & reverse brake return spring together with the spring seat.
Standard free length: 15.51 mm (0.6106 in.)



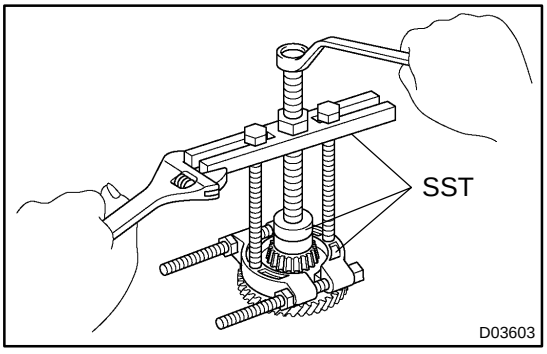
71. REMOVE COUNTER DRIVE GEAR [35782C / 98–8]

(a) Using SST and a press, remove the counter drive gear from the transaxle case.

SST 09950–60010 (09951–00600), 09950–70010 (09951–07100)

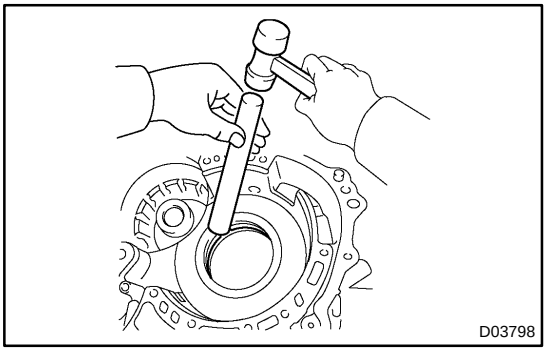


(b) As shown in the illustration, tighten 2 bolts evenly and make clearance of approx. 20.0 mm (0.797 in.) between the counter drive gear and the inner race.

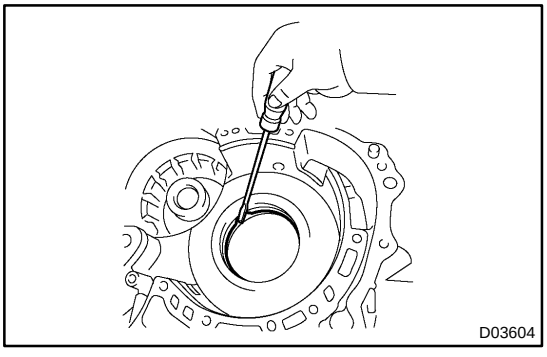


(c) Using SST, remove the tapered roller bearing.

SST 09950–60010 (09951–00600), 09950–40011 (09951–04010, 09952–04010, 09953–04020, 09954–04010, 09955–04011, 09958–04011)



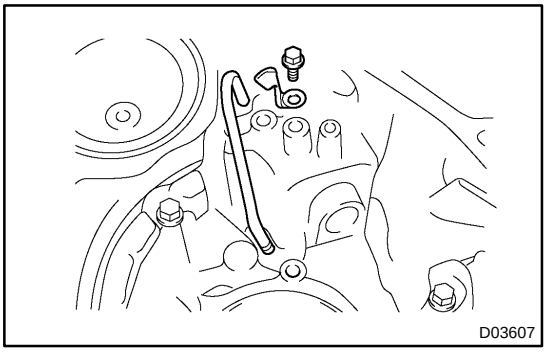
(d) Using a brass bar and a hammer, remove the 2 counter drive gear bearing outer races from the transaxle case.



72. REMOVE COUNTER DRIVE GEAR HOLE SNAP RING [35782D / 98–8]

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

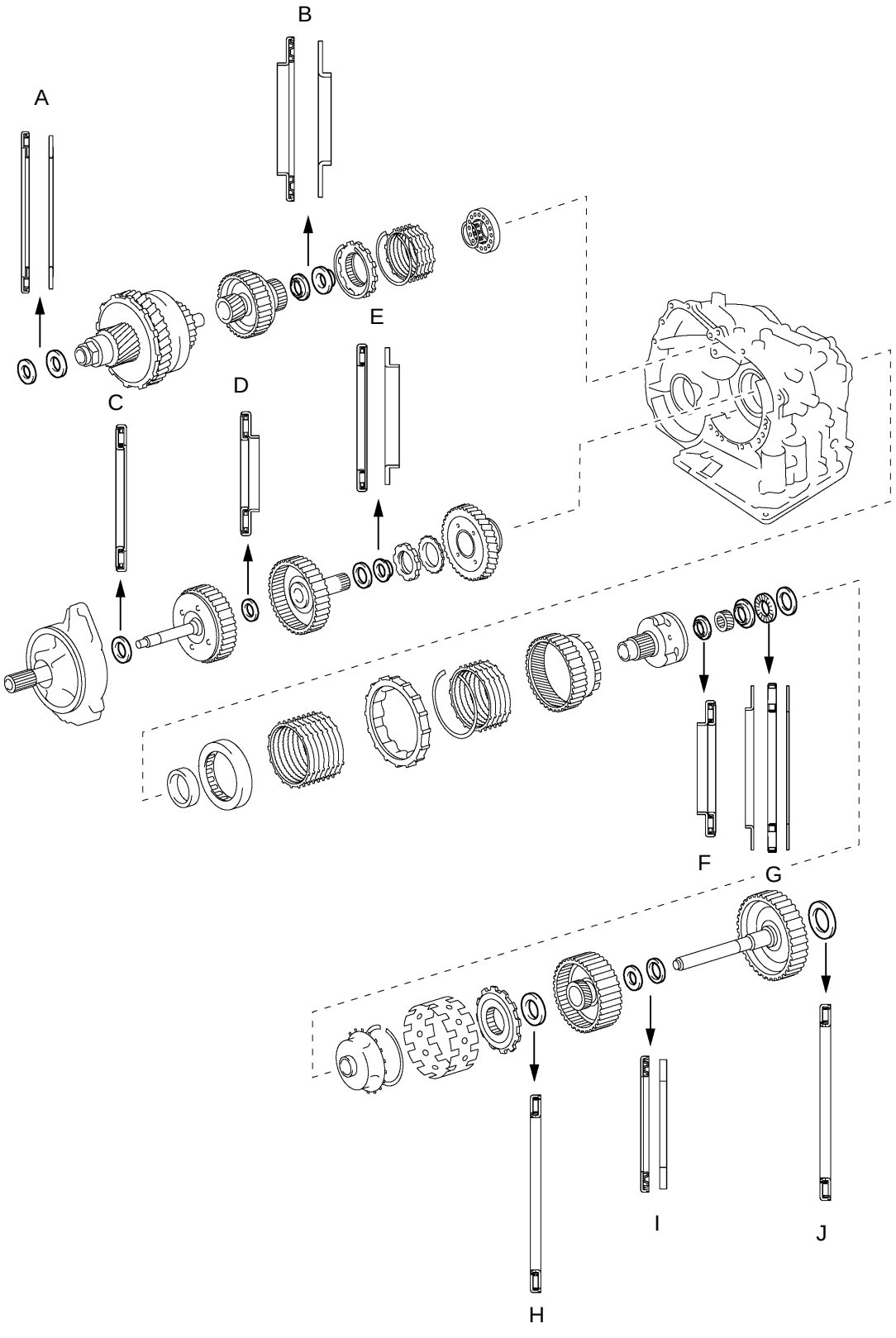
73. REMOVE BREATHER PLUG NO.2 (ATM) [35104C / 98–3]



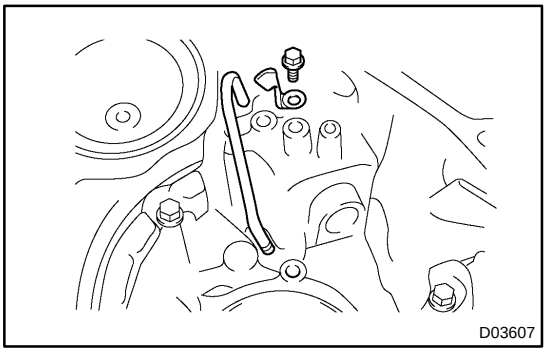
74. REMOVE DIFFERENTIAL GEAR LUBE APPLY TUBE [35882A / 98–9]

(a) Remove the bolt, the transaxle apply tube clamp No. 2 and the differential gear loop apply tube from the transaxle case.

75. BEARING POSITION



Mark	Front Race Diameter Inside / Outside mm (in.)	Thrust Bearing Diameter Inside / Outside mm (in.)	Rear Race Diameter Inside / Outside mm (in.)
A	–	53.0 (2.087) / 78.2 (3.079)	52.1 (2.051) / 75.5 (2.972)
B	–	37.73 (1.4854) / 58.0 (2.283)	29.9 (1.177) / 55.5 (2.185)
C	–	33.85 (1.3327) / 52.2 (2.055)	–
D	–	23.5 (0.925) / 44.0 (1.732)	–
E	–	36.3 (1.429) / 52.2 (2.055)	34.5 (1.358) / 48.5 (1.909)
F	–	34.6 (1.362) / 52.2 (2.055)	–
G	40.3 (1.587) / 58.0 (2.283)	38.6 (1.520) / 60.0 (2.362)	38.6 (1.520) / 58.0 (2.283)
H	–	53.6 (2.110) / 69.6 (2.740)	–
I	–	33.7 (1.327) / 48.2 (1.898)	30.3 (1.193) / 46.0 (1.811)
J	–	53.6 (2.110) / 70.18 (2.763) or 69.6 (2.740)	–



76. INSTALL DIFFERENTIAL GEAR LUBE APPLY TUBE [35882A / 98–9]

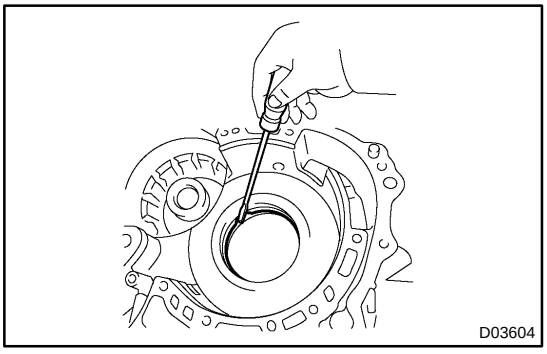
(a) Install the apply tube, and apply tube clamp No. 2 with the bolt to the transaxle housing.

Torque: 9.8 N·m (100 kgf·cm, 87 in.·lbf)

NOTICE:

Make sure to insert the tube to the stopper.

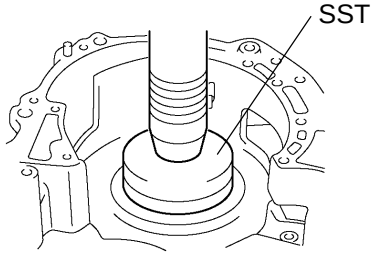
77. INSTALL BREATHER PLUG NO.2 (ATM)



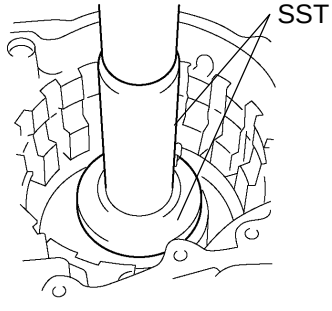
78. INSTALL COUNTER DRIVE GEAR HOLE SNAP RING [35782D / 98–8]

(a) Using a screwdriver, install the hole snap ring to the transaxle case.

Counter Drive Gear Side:



Front Planetary Gear Side:



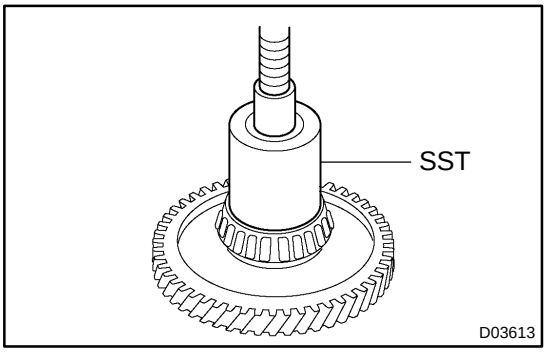
79. INSTALL COUNTER DRIVE GEAR [35782C / 98–8]

(a) Using SST and a press, install the 2 counter drive gear bearings outer races to the transaxle case.

NOTICE:

- **Press–fit the bearing race until it contacts the snap ring.**
- **Do not apply excessive pressure to it.**

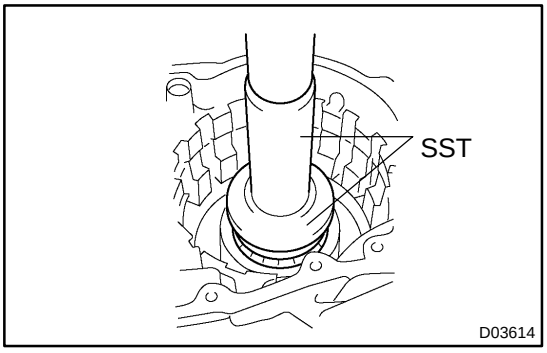
SST 09950–60020 (09951–00890), 09950–70010 (09951–07150)



(b) Using SST and a press, install the tapered roller bearing to the counter drive gear.
SST 09649–17010

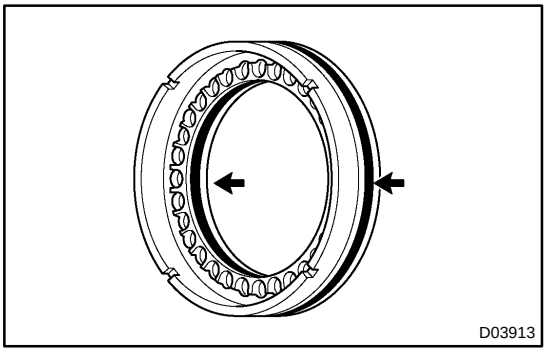
NOTICE:

- **Press–fit the bearing inner race until it contacts the counter drive gear.**
- **Do not apply excessive pressure to it.**



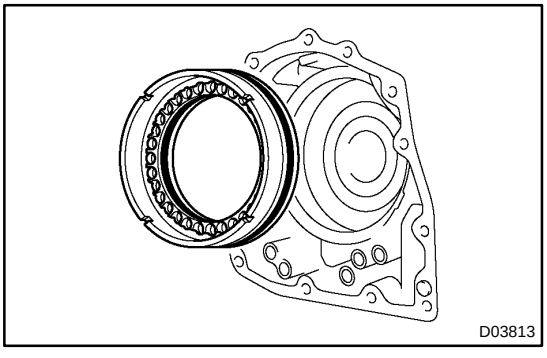
(c) Using SST and a press, install the counter drive gear and bearing to the transaxle case.
SST 09950–60020 (09951–00890), 09950–70010 (09951–07150)

NOTICE:
Do not apply excessive pressure to it.

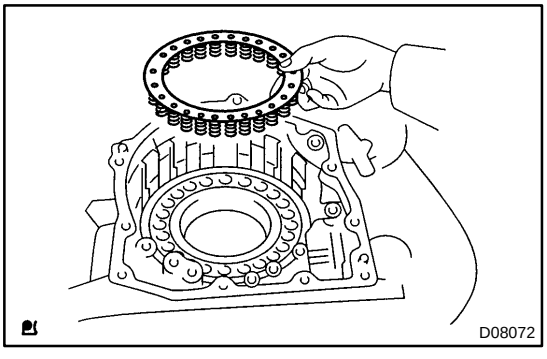


80. INSTALL 1ST & REVERSE BRAKE PISTON [35623H / 98–7]

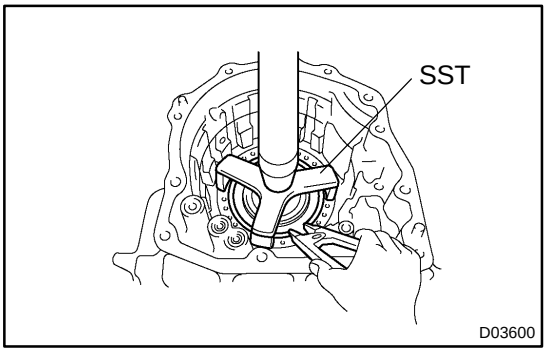
(a) Coat 2 new O–rings with ATF.
(b) Install the 2 O–rings to the 1st & reverse brake piston.



(c) Coat a 1st & reverse brake piston with ATF, install it to the transaxle case.



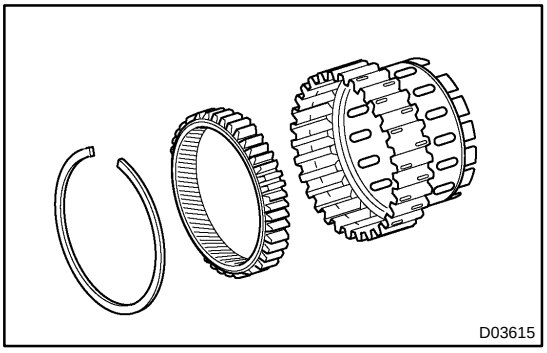
(d) Install the 1st & reverse brake return spring to the 1st & reverse brake piston.



(e) Using SST, a press and snap ring expander, install the piston return spring and snap ring to the transaxle case.
SST 09387–00070

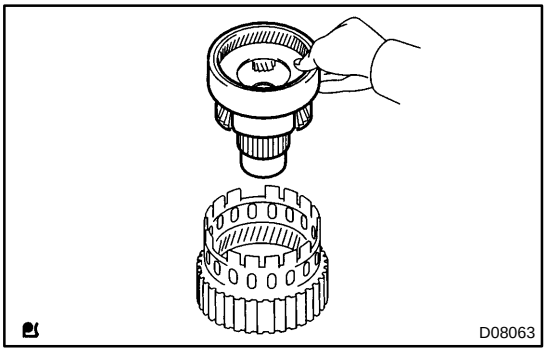
NOTICE:

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



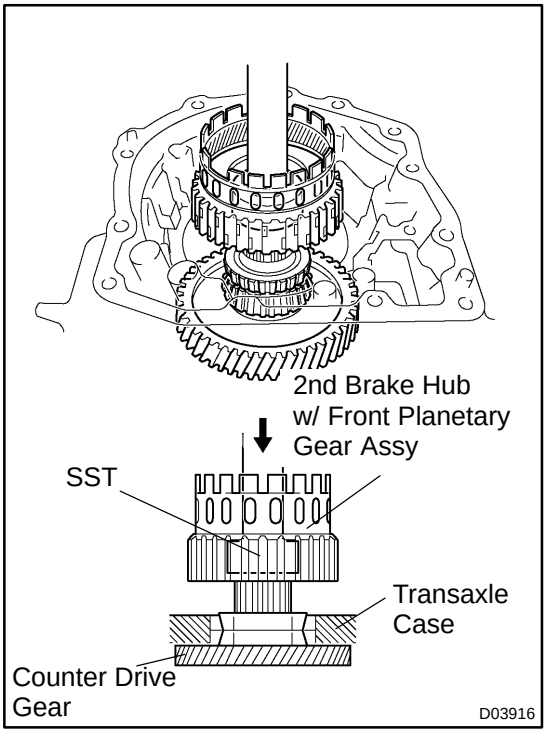
81. INSTALL FRONT PLANETARY RING GEAR [35743 / 98–8]

(a) Using a screwdriver, install the front planetary ring gear and brake hub snap ring to the brake hub.



82. INSTALL FRONT PLANETARY GEAR ASSY [35720 / 98–8]

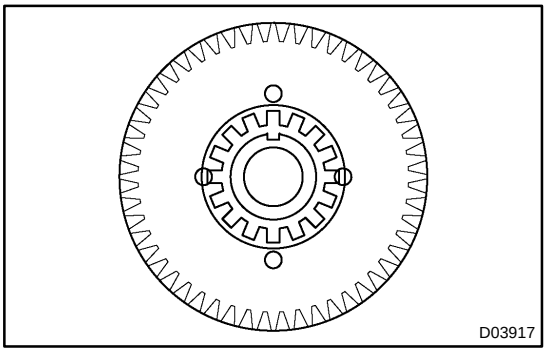
(a) Install the front planetary gear assy to the brake hub.



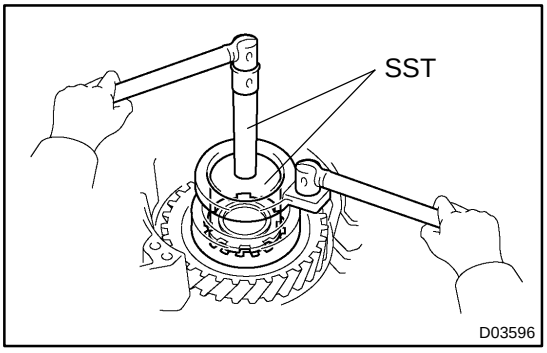
(b) Using SST and a press, press–fit the front planetary gear assy.

NOTICE:

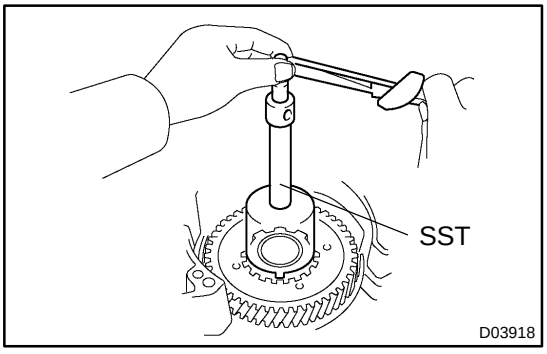
Do not apply excessive pressure to it.



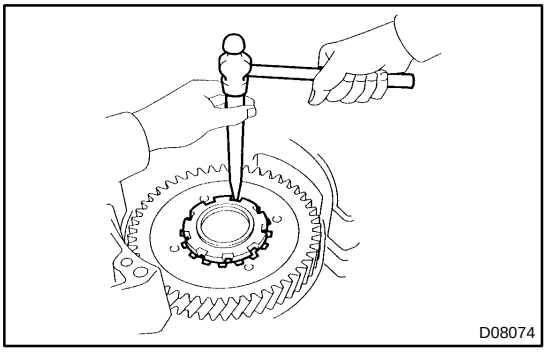
(c) Install the front planetary gear washer, as shown in the illustration.



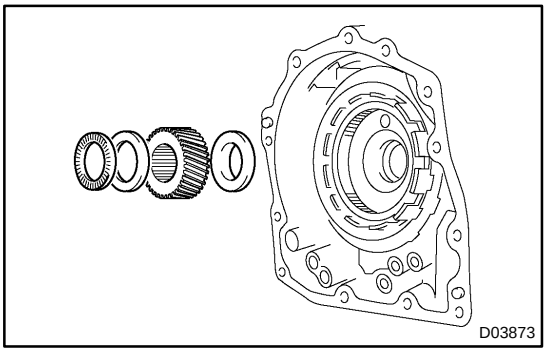
(d) Using SST, install the nut.
SST 09387–00030, 09387–00080
Torque: 268 N·m (2,728 kgf·cm, 197 ft·lbf)



(e) Using SST and a torque wrench, measure the turning torque of the bearing while rotating SST at 60 rpm. When the measured value is not within the specified value, gradually tighten the nut until it reaches the specified value.
SST 09950–60010 (09951–00400), 09950–70010 (09951–07100), 09387–00030, 09387–00080
Turning torque at 60 rpm:
New Bearing
0.5 – 1.0 N·m (5.1 – 10.0 kgf·cm, 4.4 – 8.7 in.·lbf)
Used Bearing
0.3 – 0.5 N·m (3.1 – 5.1 kgf·cm, 2.7 – 4.4 in.·lbf)



(f) Using a chesel and hammer, stake the front planetary gear washer.

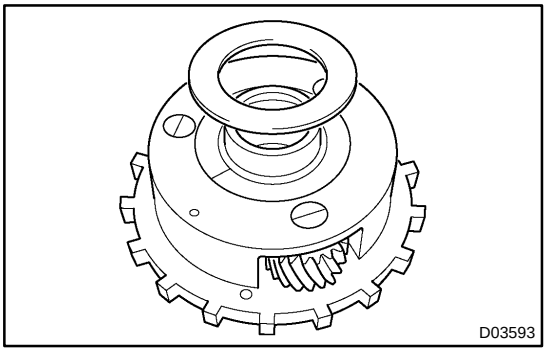


83. INSTALL INPUT SUN GEAR
[35714B / 98–6]

(a) Install the 2 thrust bearings, the bearing race and the front planetary sun gear to the front planetary gear assy.

Bearing and race diameter: mm (in.)

	inside	outside
Bearing	34.6 (1.362)	52.2 (2.055)
Race	40.3 (1.587)	58.0 (2.283)
Bearing	38.6 (1.520)	60.0 (2.362)

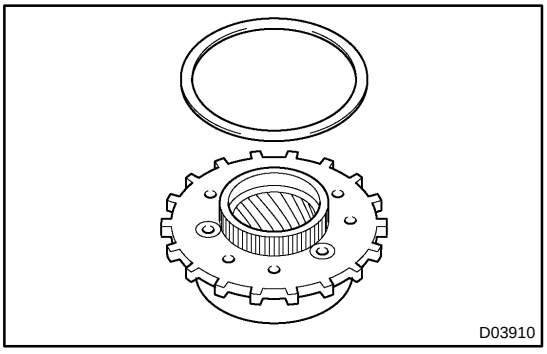


84. INSTALL REAR PLANETARY GEAR ASSY
[35760 / 98–8]

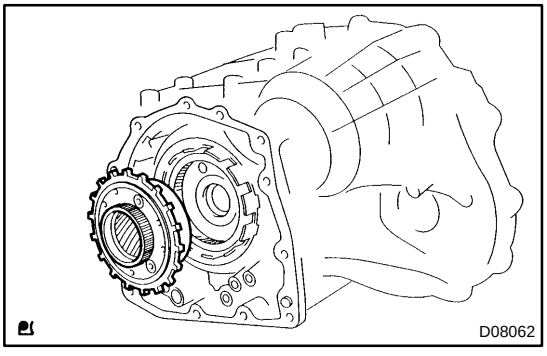
(a) Coat a bearing race with ATF, install it to the rear planetary gear assy.

Bearing race diameter: mm (in.)

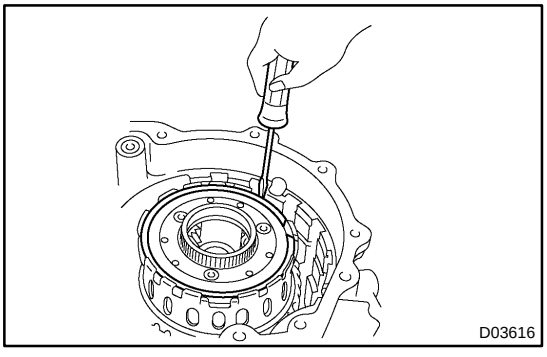
	inside	outside
Race	38.6 (1.520)	58.0 (2.283)



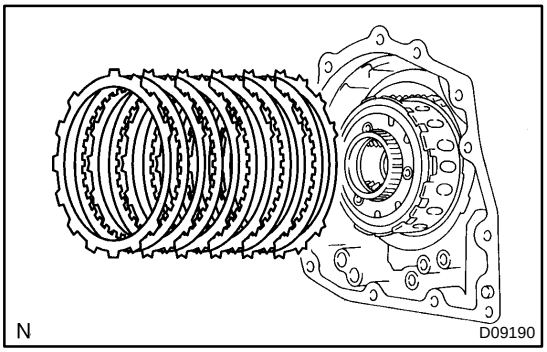
(b) Install the planetary carrier thrust washer No. 2 to the planetary gear assy.



(c) Install the rear planetary gear to the rear planetary ring gear.

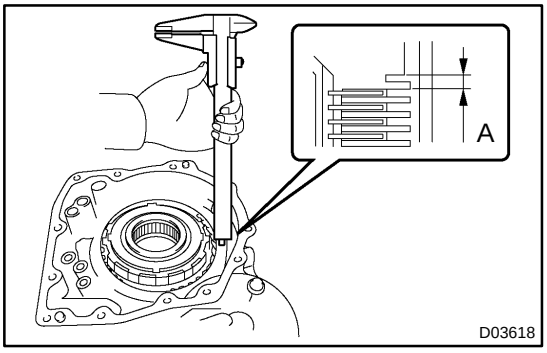


(d) Using a screwdriver, install the snap ring to the brake hub.



85. INSTALL 1ST & REVERSE BRAKE CLUTCH DISC [35677A / 98–7]

(a) Install the 5 plates and 5 discs.



86. INSPECT PACK CLEARANCE OF FIRST & REVERSE BRAKE

(a) Using vernier calipers,measure the distance between the disc surface and the contact surface of the 2nd brake cylinder and transaxle case.(Dimension A)

(b) Select an appropriate flange so that the piston stroke will meet the specified value.

Pack clearance:

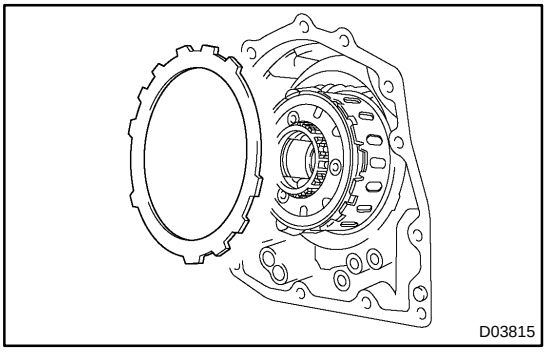
1.02 – 1.21 mm (0.0402 – 0.0476 in.)

HINT:

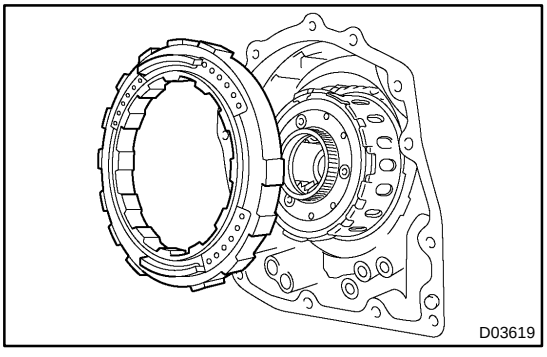
Piston stroke = Dimension A –Flange thickness

Flange thickness: mm (in.)

Mark	Thickness	Mark	Thickness
1	1.8 (0.071)	5	2.2 (0.087)
2	1.9 (0.075)	6	2.3 (0.091)
3	2.0 (0.079)	7	2.4 (0.094)
4	2.1 (0.083)	8	2.5 (0.098)



(c) Install the flange.



87. INSTALL 2ND BRAKE CYLINDER [35664 / 98–6]

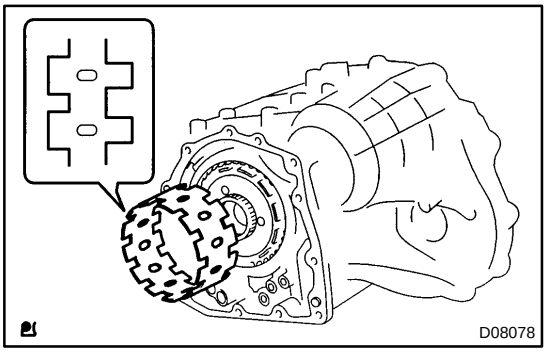
(a) Install the 2nd brake piston assy to the transaxle case.

(b) Install the snap ring and measure the inside diameter.

Inside diameter: More than 167 mm (6.57 in.)

NOTICE:

- **Because the snap ring is tapered, check the positioning direction when installing it.**
- **When the diameter is not within the specified value, replace the snap ring with a new one.**

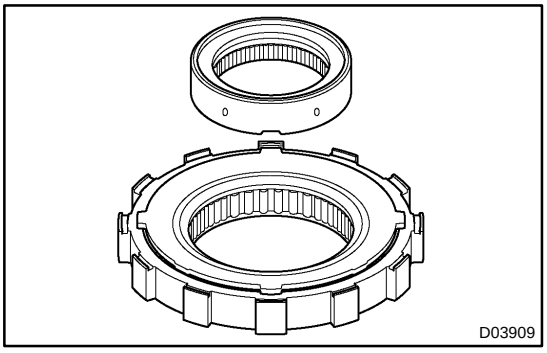


88. INSTALL 1-WAY CLUTCH SLEEVE OUTER [35798A / 98–6]

(a) Install the 1–way clutch outer sleeve to the 2nd brake cylinder assy.

NOTICE:

Check the positioning direction of the outer sleeve.

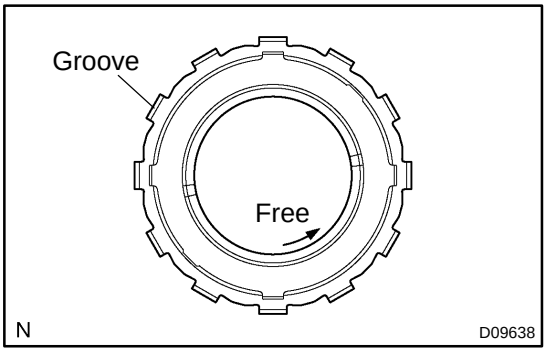


89. INSTALL 1-WAY CLUTCH ASSY [35790 / 98–6]

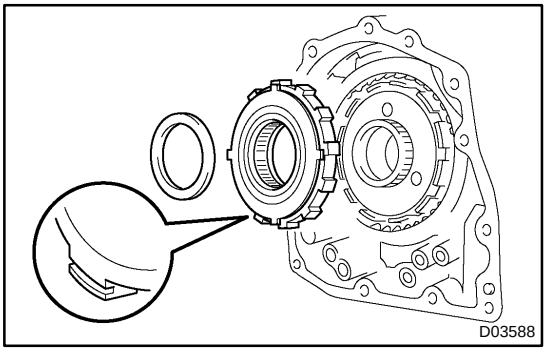
(a) Install the inner race to the 1–way clutch.

NOTICE:

Check the direction of the inner race.



(b) Check the rotating direction of 1–way clutch for the lock or free operation, as shown in illustration.



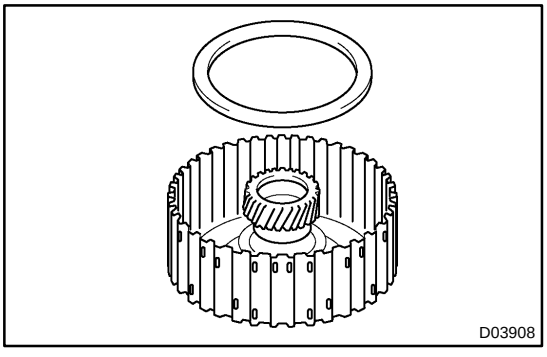
(c) Install the 1–way clutch and bearing to the 1–way clutch outer race sleeve.

Bearing diameter: mm (in.)

	Inside	Outside
Bearing	53.6 (2.110)	69.6 (2.740)

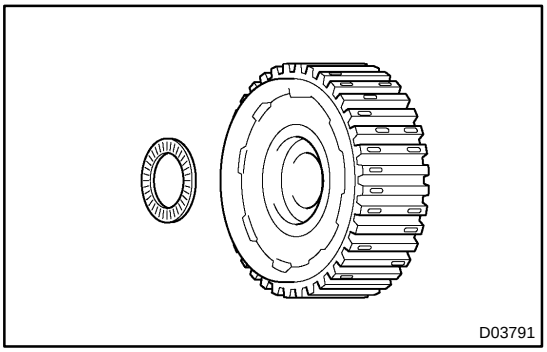
NOTICE:

Install the thrust bearing properly so that no–colored race is visible.



90. INSTALL REAR PLANETARY SUN GEAR ASSY [35730 / 98–8]

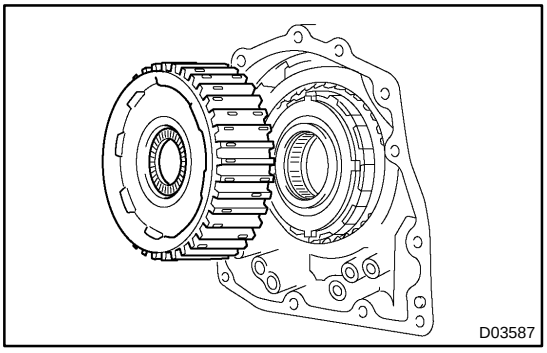
(a) Coat the planetary carrier thrust washer No. 1 with petroleum jelly, install it onto the rear planetary sun gear.



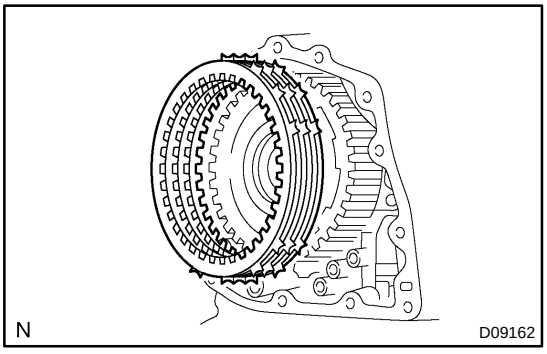
(b) Coat the bearing with petroleum jelly, install it onto the rear planetary sun gear.

Bearing diameter: mm (in.)

	Inside	Outside
Bearing	33.8 (1.331)	48.2 (1.898)

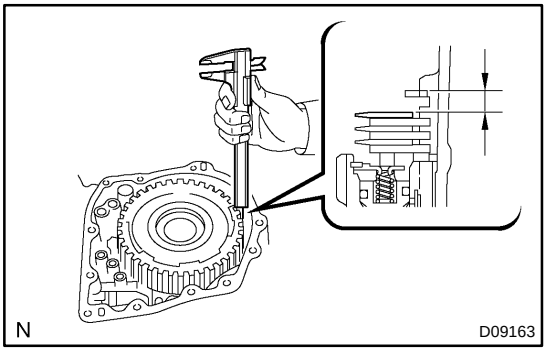


(c) Install the rear planetary sun gear assy to the rear planetary gear.



91. INSTALL 2ND BRAKE CLUTCH DISC
[35677 / 98–6]

(a) Install the 3 discs and 3 plates to the transaxle case.
(b) Temporarily install the snap ring.



92. INSPECT PACK CLEARANCE OF SECOND BRAKE

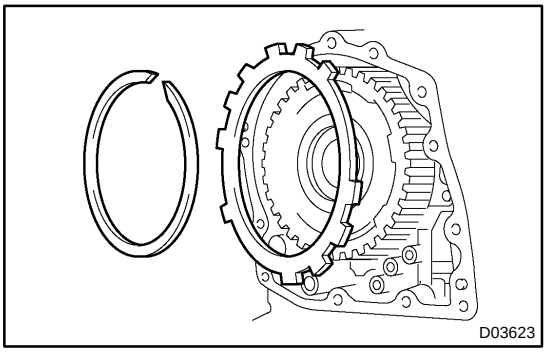
(a) Using vernier calipers, measure the distance between the disc surface and snap ring surface.
(b) Select an appropriate flange so that the piston stroke will meet the specified value.

Pack clearance: 0.62 – 0.91 mm (0.0244 – 0.0358 in.)

HINT:
Piston stroke = Clearance – Flange thickness – Snap ring thickness 1.6 mm (0.063 in.)

Flange thickness: mm (in.)

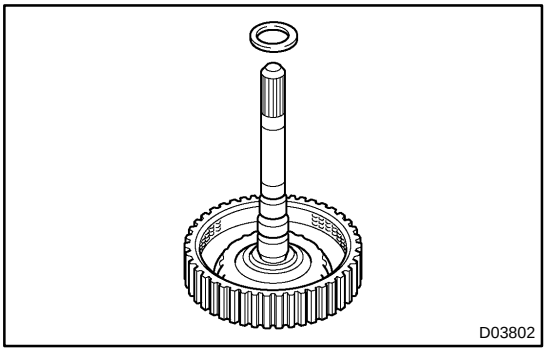
Mark	Thickness	Mark	Thickness
1	3.0 (0.118)	5	3.4 (0.134)
2	3.1 (0.122)	6	3.5 (0.138)
3	3.2 (0.126)	7	3.6 (0.142)
4	3.3 (0.130)	8	–



(c) Temporarily remove the snap ring, attach the selected flange and restore the snap ring.

NOTICE:

Secure the snap ring so that its gap is visible through the groove of the transaxle case.

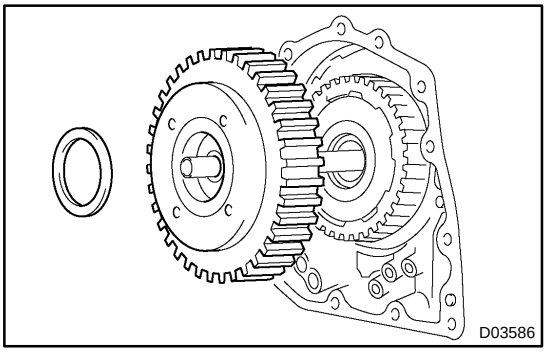


93. INSTALL DIRECT CLUTCH ASSY

(a) Install the bearing race to the direct clutch.

Bearing race diameter : mm (in.)

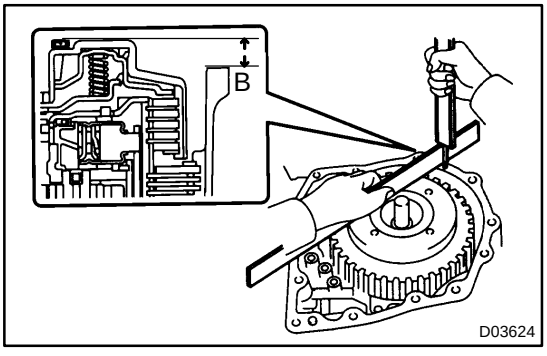
	Inside	Outside
Bearing race	30.3 (1.193)	46.0 (1.811)



(b) Install direct clutch assy and thrust needle roller bearing to the rear planetary sun gear assy.

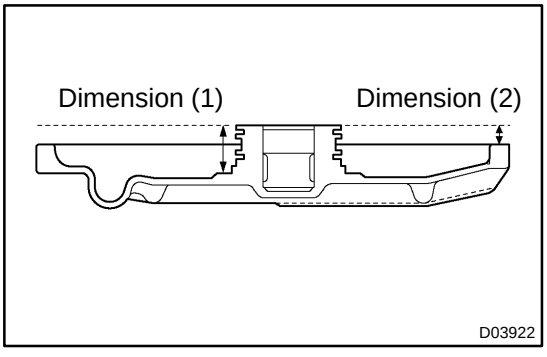
NOTICE:

The disc in the direct clutch should completely mate with the hub attached outside the rear planetary sun gear. Otherwise, the rear cover cannot be installed.



(c) Clean the connecter part of the transaxle case and rear cover.

(d) As shown in the illustration, place a straight edge on the direct clutch drum and measure the distance between the the transaxle case and the straight edge using vernier calipers. (Dimension B)



(e) Measure the 2 places of the rear cover as shown in the illustration and calculate a dimension C using the following formula.

HINT:

Dimension C = Dimension (1) – Dimension (2)

(f) Calculate the end play value using the following formula. Select a thrust bearing which satisfies the end play value and install it.

End play: 0.198 – 0.936 mm (0.00800 – 0.03685 in.)

NOTICE:

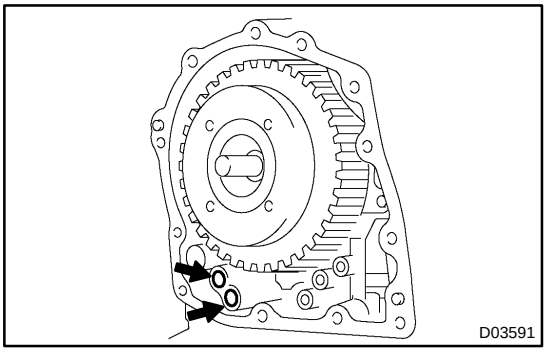
Make sure that the colored race side is facing the direct clutch assy.

HINT:

End play = Dimension C – Dimension B

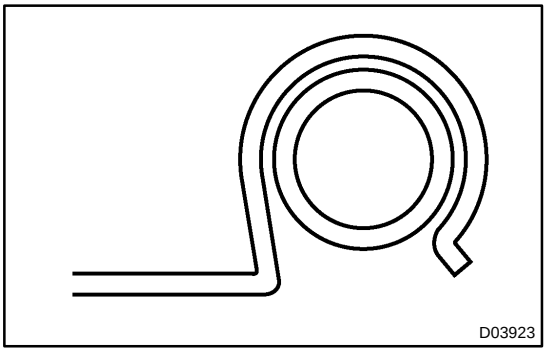
Bearing thickness and diameter : mm (in.)

Thickness	Inside	Outside
3.55 (0.1397)	53.6 (2.110)	69.6 (2.740)
3.85 (0.1515)	53.6 (2.110)	70.18 (2.763)



94. INSTALL GOVERNOR APPLY GASKET NO.1 [35148 / 98–3]

(a) Install 2 new apply gaskets to the transaxle case.

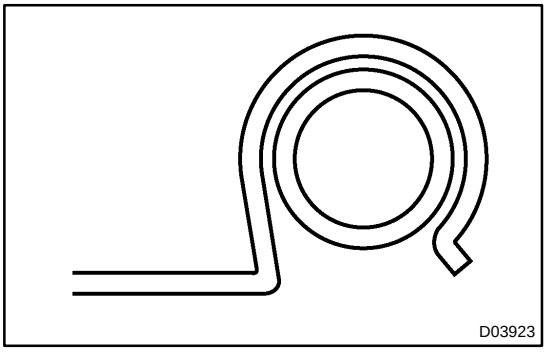


95. INSTALL FRONT CLUTCH APPLY TUBE [35895 / 98–9]

(a) Install the clamp to the front clutch apply tube.

NOTICE:

Make sure to install the clamp to the apply pipe before installing the apply pipe to the transaxle case. This prevents the apply pipe from being deformed or damaged.

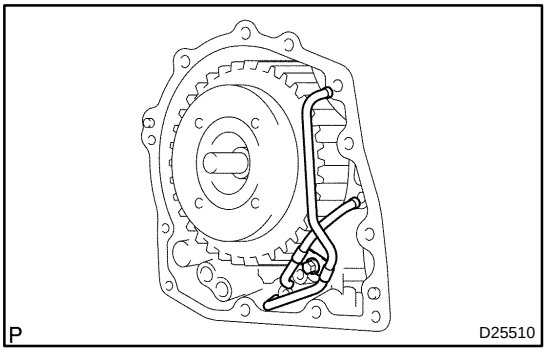


96. INSTALL BRAKE APPLY TUBE [35666D / 98–9]

(a) Install the clamp to the brake apply tube.

NOTICE:

Make sure to install the clamp to the apply pipe before installing the apply pipe to the transaxle case. This prevents the apply pipe from being deformed or damaged.

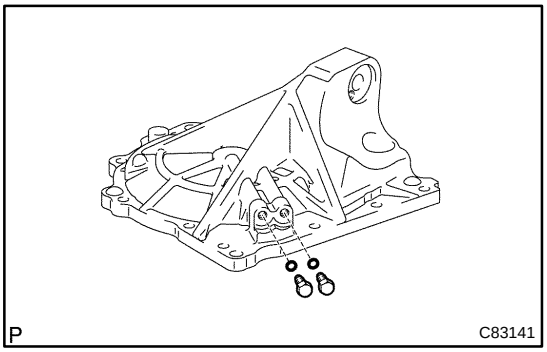


(b) Install the 2 apply tubes and a bolt to the transaxle case.

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

NOTICE:

Each pipe should be securely inserted until it reaches the stopper.

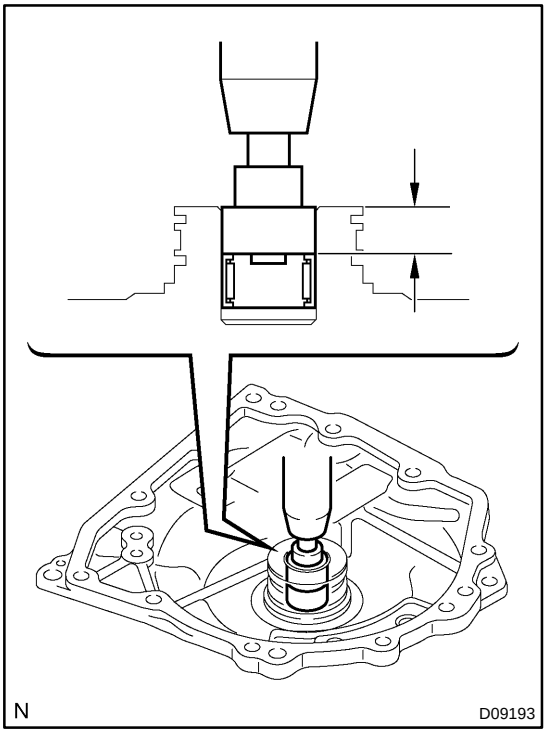


97. INSTALL TRANSAXLE CASE NO.1 PLUG [35104Q / 98–3]

(a) Install 2 new O–rings to the 2 transaxle case No. 1 plugs.

(b) Install 2 transaxle case No. 1 plugs to the transaxle rear cover.

Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)



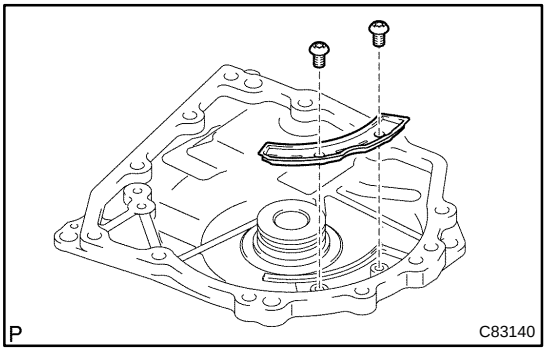
98. INSTALL TRANSAXLE REAR COVER SUB–ASSY [35102 / 98–3]

(a) Using SST and a press, install the bearing.
SST 09950–60010 (09951–00230, 09951–00350)
Press fit depth: 12.05 – 12.75 mm (0.4744 – 0.5020 in.)

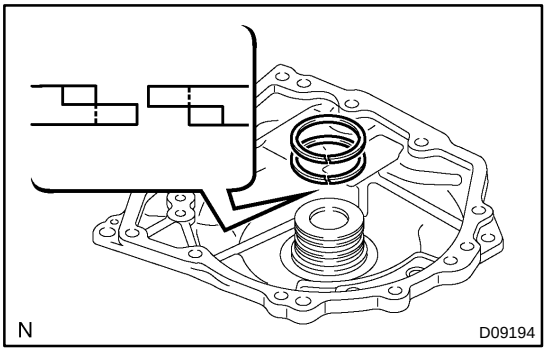
NOTICE:

- **Face the inscribed mark side of the bearing race up.**
- **Repeat the press fit until the specified value is obtained.**

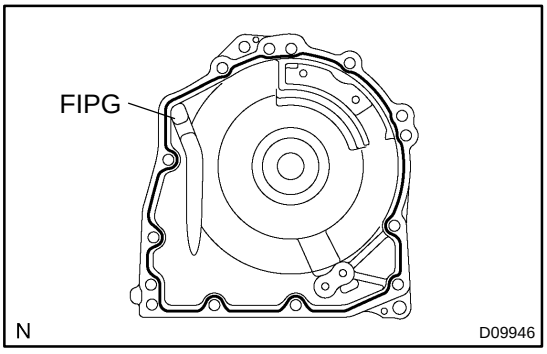
(b) Apply liquid sealer to the 2 screws.
Sealant:
Part No. 08833–00080, THREE BOND 2430 or equivalent.



(c) Using a torx socket wrench T30, install the transaxle rear cover plate with the 2 screws.
Torque: 7.5 N·m (76 kgf·cm, 66 in.·lbf)



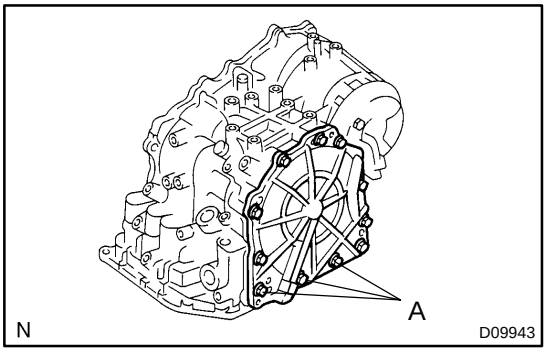
(d) Coat 2 new oil seal rings with ATF, install them to the transaxle rear cover.



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

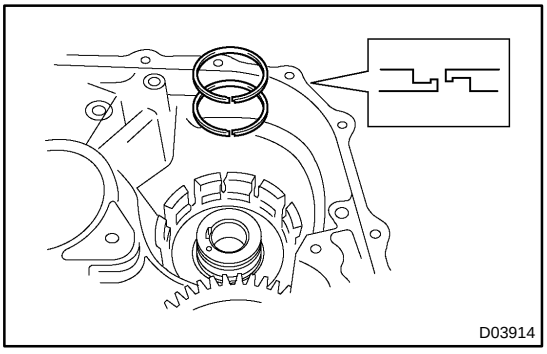
(f) Apply FIPG to the cover.
FIPG:
Part No. 08826–00090, THREE BOND 1281 or equivalent.

(g) Coat a needle roller bearing with ATF.



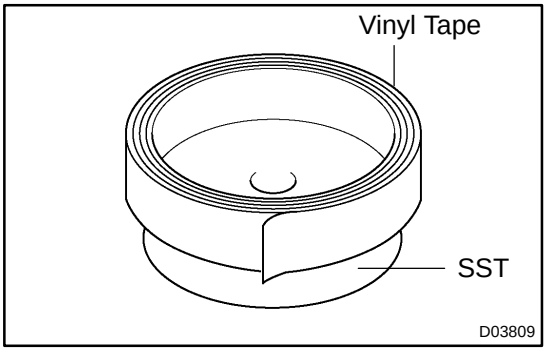
(h) Apply liquid sealer to the ”A” bolt threads.
Sealant:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent.

(i) Install the 11 bolts.
Torque:
Bolt A: 18.6 N·m (190 kgf·cm, 14 ft·lbf)
Other bolt: 24.5 N·m (250 kgf·cm, 18 ft·lbf)



99. INSTALL UNDERDRIVE CLUTCH DRUM OIL SEAL RING
[34244 / 98–8]

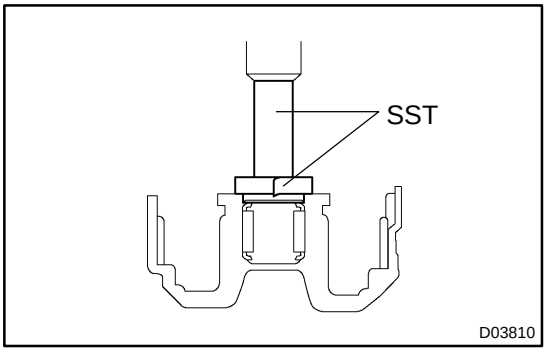
(a) Install the new 2 oil seal rings to the transaxle case.



100. INSTALL UNDERDRIVE BRAKE PISTON
[34253 / 98–4]

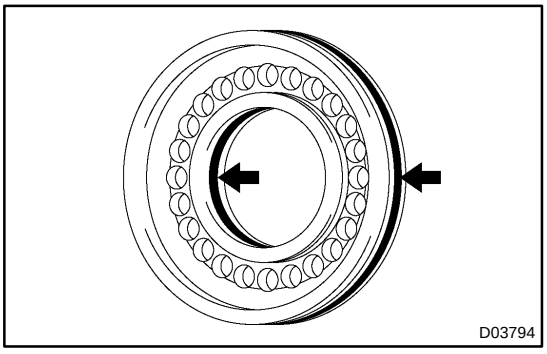
(a) Wind vinyl tape around SST 4.0 mm (0.157 in.) from the bottom end until the thickness of the wound tape is about 5.0 mm (0.197 in.).
SST 09550–60010 (09951–00320)

NOTICE:
Clean SST to remove deposited oil before applying vinyl tape.

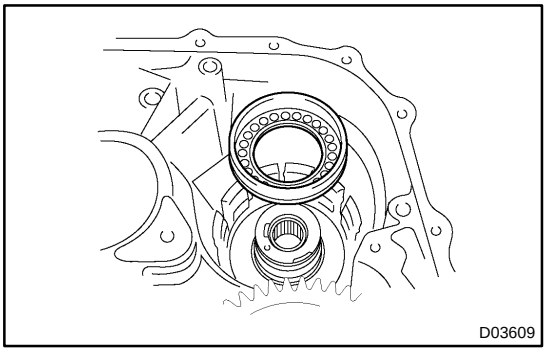


(b) Using SST and a press, install the needle–roller bearing to the transaxle case.
SST 09550–60010 (09951–00320), 09950–70010 (09951–07100), 09387–00020

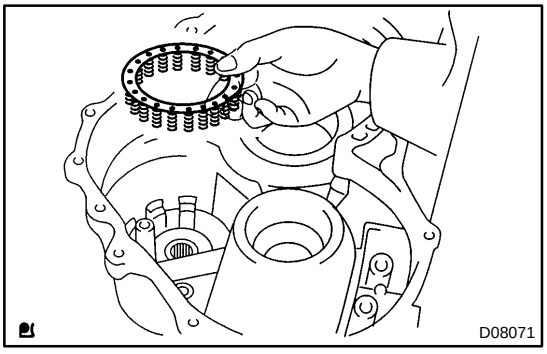
NOTICE:
When the wound vinyl tape contacts the transaxle case, stop press–fitting.



(c) Coat 2 new O–rings with ATF, install them to the U/D brake piston.

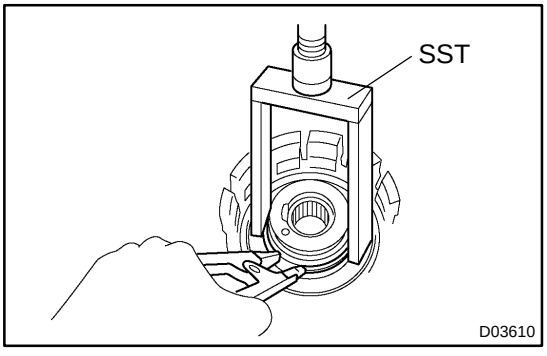


(d) Install the U/D brake piston to the transaxle case.



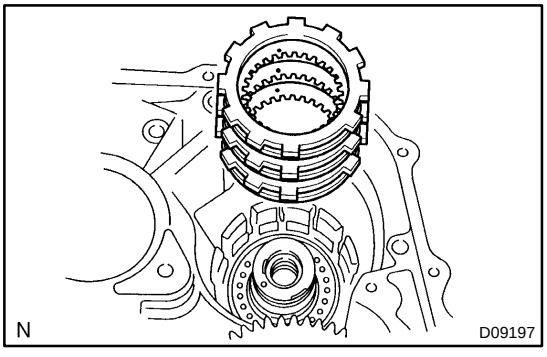
101. INSTALL UNDERDRIVE BRAKE RETURN SPRING SUB–ASSY
[34207 / 98–4]

(a) Install the U/D brake return spring to the U/D brake piston.



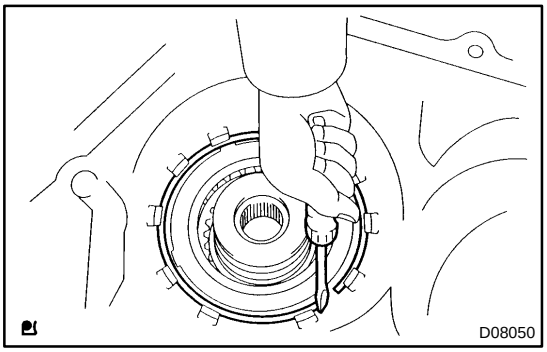
(b) Using SST, a snap ring expander and a press, install the snap ring to the transaxle case.
SST 09387–00020

NOTICE:
Do not apply excessive pressure to it.

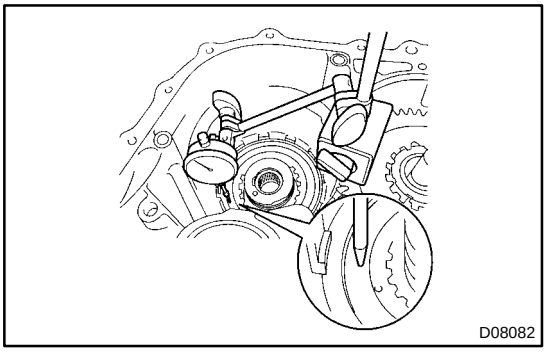


102. INSTALL UNDERDRIVE CLUTCH DISC NO.2
[34262 / 98–4]

(a) Install the 3 discs and 3 plates to the transaxle case.



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



(c) Using a dial indicator, measure the U/D brake piston stroke while applying and releasing compressed air (392 kPa, 4.0 kgf/cm^2, 57 psi).

Piston stroke: 1.81 – 2.20 mm (0.0713 – 0.0866 in.)

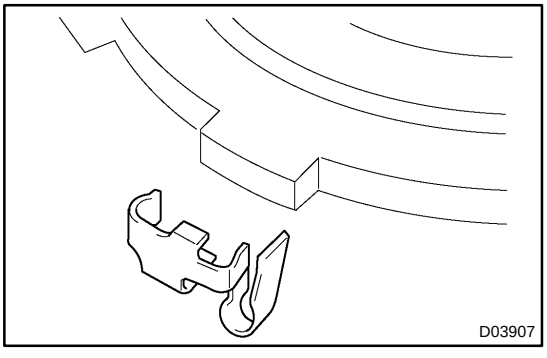
HINT:

Select an appropriate flange from the table below so that it will meet the specified value.

Flange thickness: mm (in.)

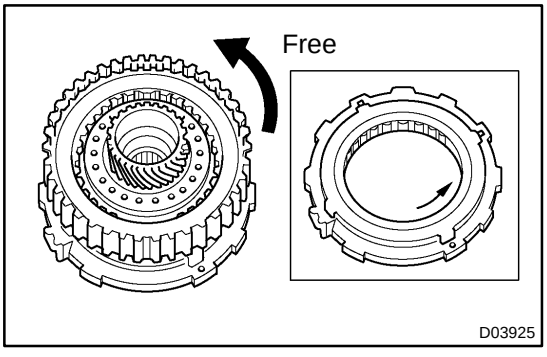
Mark	Thickness	Mark	Thickness
1	3.0 (0.118)	3	3.4 (0.134)
2	3.2 (0.126)	–	–

(d) Temporally remove the snap ring and attach the flange. Restore the snap ring.

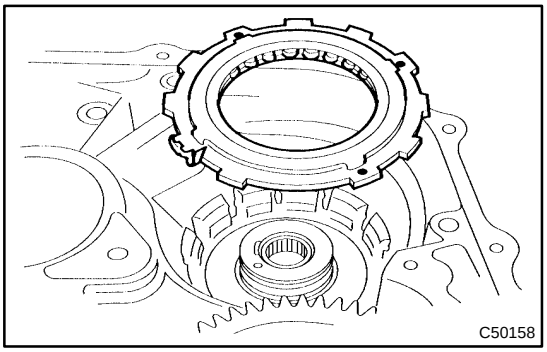


103. INSTALL UNDERDRIVE 1-WAY CLUTCH ASSY [34360 / 98–4]

(a) Install the outer race retainer to the 1–way clutch.



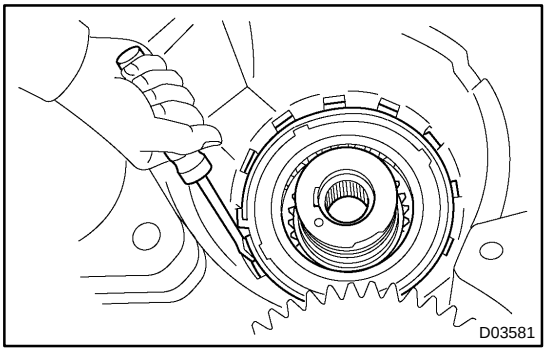
(b) Install the U/D clutch assy to the 1–way clutch. Rotate the U/D clutch assy to check the rotating direction for the lock or free operation.



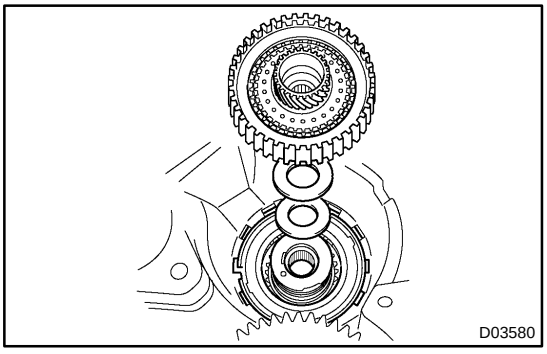
(c) Install the 1–way clutch to the transaxle case.

NOTICE:

Make sure that the mark on the 1–way clutch outer race is visible.



(d) Using screwdriver, install the snap ring to the transaxle case.



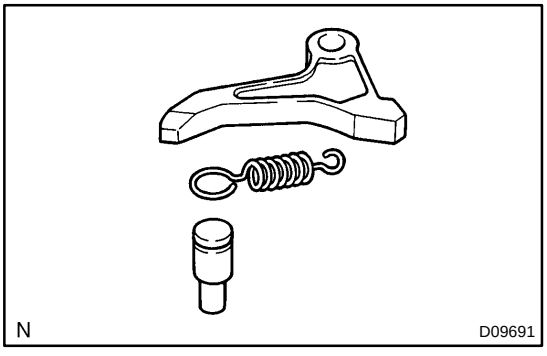
104. INSTALL UNDERDRIVE CLUTCH ASSY

(a) Coat the bearing and bearing race with petroleum jelly, install them onto the U/D clutch.

Race diameter: mm (in.)

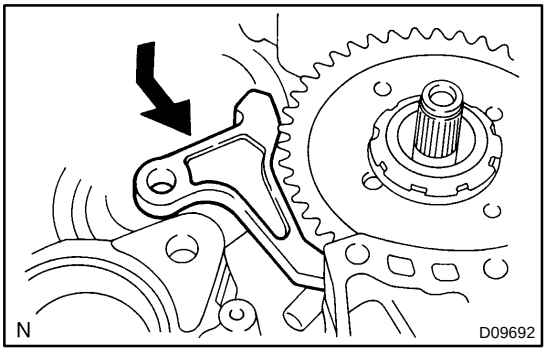
	Inside	Outside
Bearing	37.73 (1.4854)	58.0 (2.283)
Race	29.9 (1.177)	55.5 (2.185)

(b) Install the U/D clutch assy to the transaxle case.

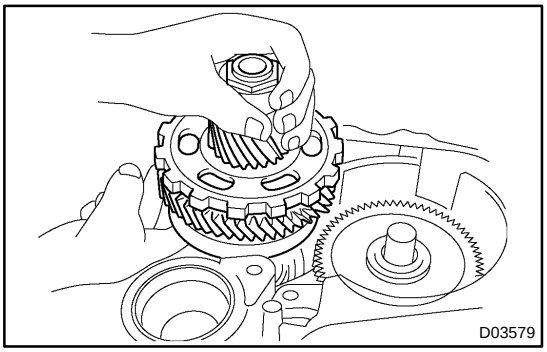


105. INSTALL UNDERDRIVE PLANETARY GEAR ASSY

(a) Install the parking lock pawl pin and torsion spring to the parking lock pawl.



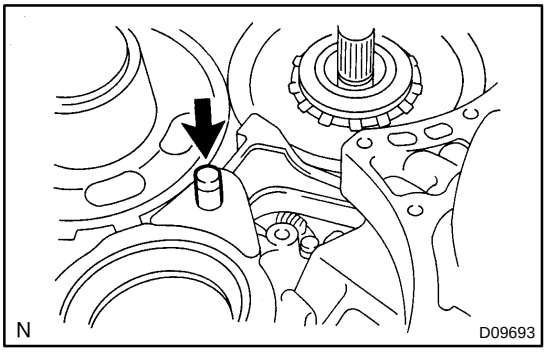
(b) Temporarily install the parking lock pawl, shaft and spring to the transaxle case as shown in the illustration.



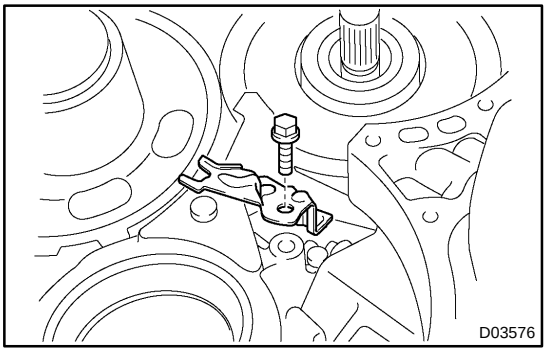
(c) Install the U/D planetary gear assy to the transaxle case.

NOTICE:

Engage all the discs of U/D clutch and hub splines of the U/D planetary gear assy firmly and assemble them securely.

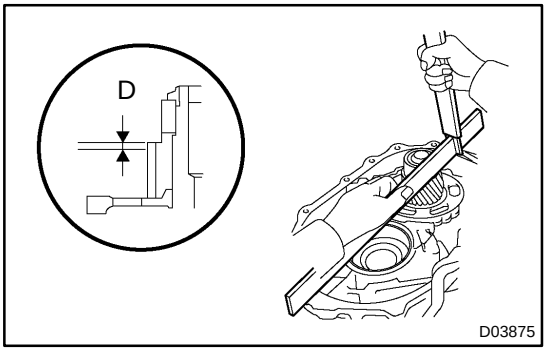


(d) Install the parking lock pawl shaft.



(e) Install the pawl shaft clamp with the bolt.

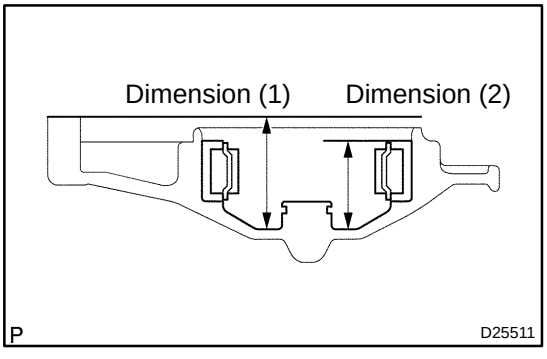
Torque: 9.8 N·m (100 kgf·cm, 87 in.·lbf)



(f) Using a straight edge and vernier calipers as shown in the illustration, measure the gap between the top of the differential drive pinion in the U/D planetary gear and contact surface of the transaxle case and housing. (Dimension D)

NOTICE:

Note down the dimension D as it is necessary for the following process.



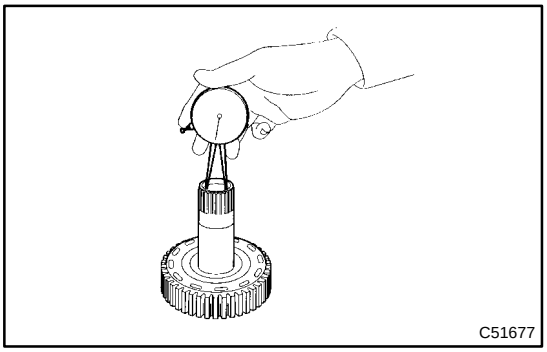
(g) As shown in the illustration, measure the 2 places of the transaxle housing, Calculate the dimension E using the formula.

NOTICE:

Note down the dimension E as it is necessary for the following process.

HINT:

Dimension E = Dimension (1) – Dimension (2)


C51677

106. INSPECT MULTIPLE DISC CLUTCH HUB [35631 / 98–5]

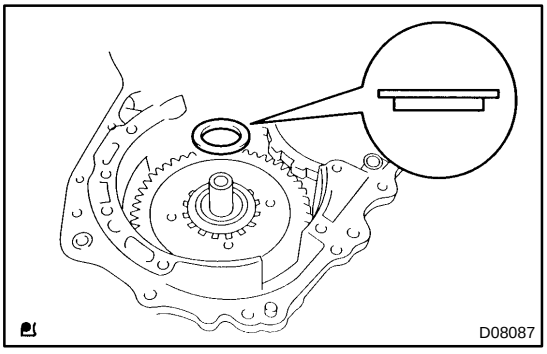
(a) Using a dial indicator, measure the inside diameter of the forward clutch hub bushing.

Standard inside diameter:
23.025 – 23.045 mm (0.9065 – 0.9073 in.)
Maximum inside diameter: 23.09 mm (0.9091 in.)

NOTICE:

- **When the diameter is over the maximum, replace the multiple disc clutch hub with a new one.**
- **Check the contact surface of the bush in the direct clutch shaft. If any scratch or discolor is identified, replace the direct clutch sub–assy with a new one.**

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

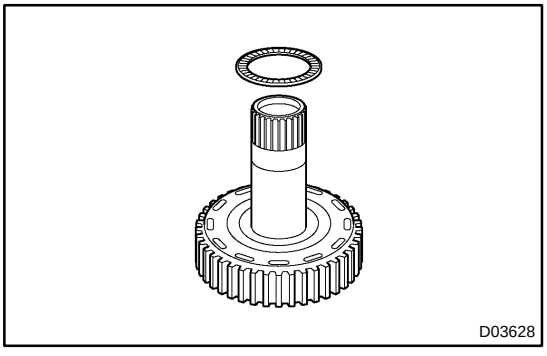

D08087

107. INSTALL MULTIPLE DISC CLUTCH HUB [35631 / 98–5]

(a) Install the bearing race to the transaxle while checking its direction.

Bearing race diameter: mm (in.)

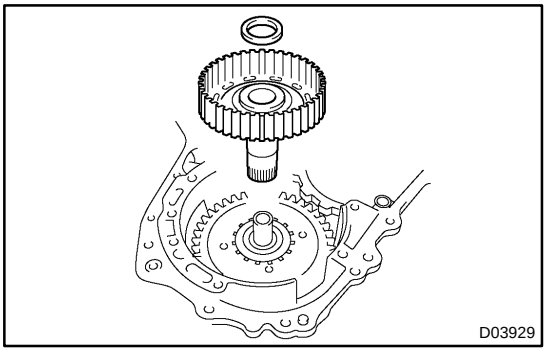
	Inside	Outside
Bearing race	34.5 (1.358)	48.5 (1.909)


D03628

(b) Coat the thrust needle roller bearing and race with petroleum jelly, install them onto the multiple disc clutch hub.

Thrust bearing and race diameter: mm (in.)

	Inside	Outside
Bearing	36.3 (1.429)	52.2 (2.055)

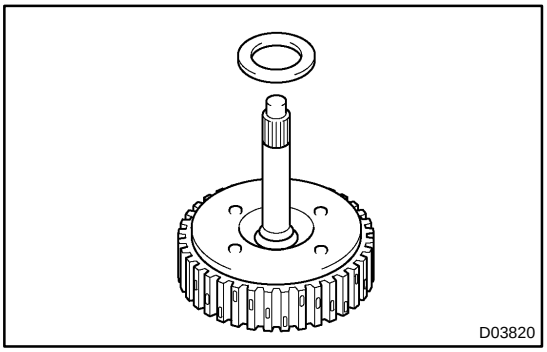

D03929

(c) Install the input shaft thrust bearing to the multiple clutch hub.

Bearing diameter: mm (in.)

	Inside	Outside
Bearing	23.5 (0.925)	44.0 (1.732)

(d) Install the forward clutch hub to the transaxle case.

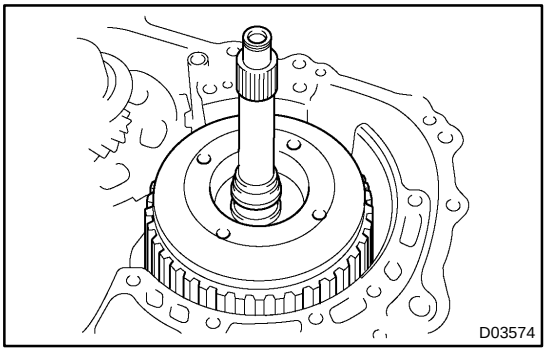


108. INSTALL FORWARD CLUTCH ASSY

(a) Install the input shaft thrust bearing to the forward clutch.
Bearing diameter: mm (in.)

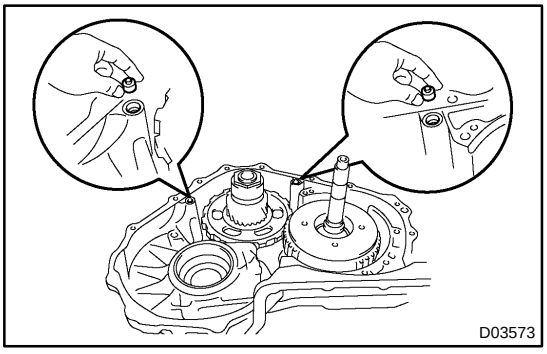
	Inside	Outside
Bearing	33.85 (1.3327)	52.2 (2.055)

NOTICE:
Install the input shaft thrust bearing properly so that the black race or blue ink jet race is visible.



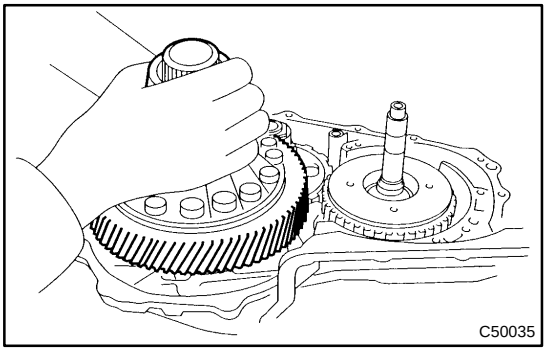
(b) Install the forward clutch to the multiple clutch hub.

NOTICE:
Align the splines of all discs in the forward clutch with those of the multiple clutch hub to assemble them securely.



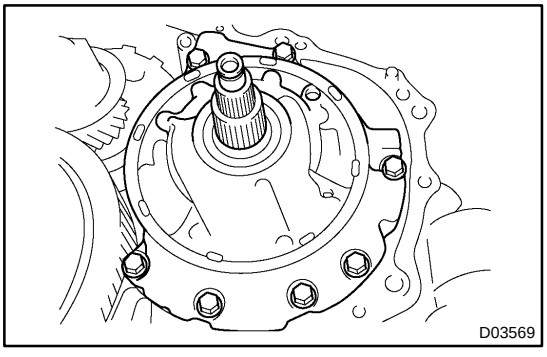
109. INSTALL OVERDRIVE BRAKE GASKET [35179 / 98–3]

(a) Install 2 new O/D brake gaskets to the transaxle case.



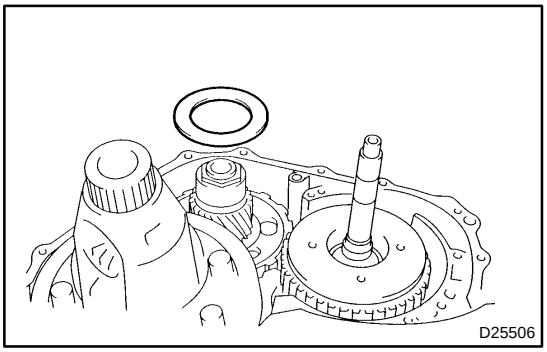
110. INSTALL FRONT DIFFERENTIAL ASSY

(a) Install the differential assy to the transaxle case.



111. INSTALL OIL PUMP ASSEMBLY

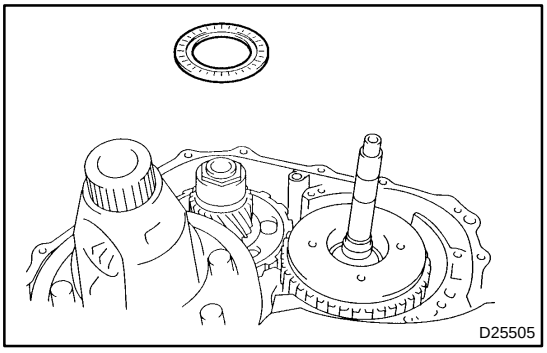
(a) Install the oil pump assy and 7 bolts to the transaxle case.
Torque: 22 N·m (226 kgf·cm, 16 ft·lbf)



112. INSTALL THRUST BEARING UNDERDRIVE RACE NO.2

[34736A / 98–4]

(a) Install the thrust bearing race to the U/D planetary gear assy.



113. INSTALL THRUST NEEDLE ROLLER BEARING

[34736B / 98–4]

(a) Calculate the end play value using the following formula and values of Dimension D and E that were measured when installing cylindrical roller bearing and U/D planetary gear, Select an appropriate U/D planetary gear thrust bearing race No. 2 which satisfies the specified end play value, and install it.

End play: 0.20 – 0.69 mm (0.0079 – 0.0272 in.)

HINT:

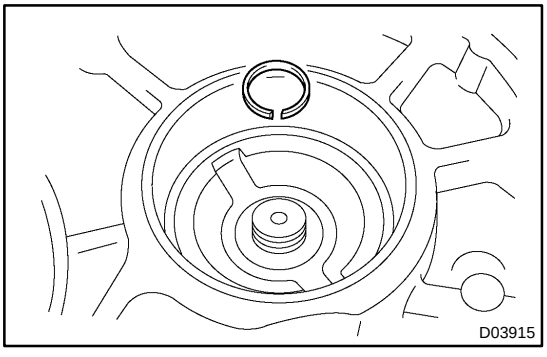
End play = Dimension E – Dimension D – thrust bearing thickness 3.28 mm (0.1291 in.) – U/D thrust bearing race No. 2 thickness.

Race thickness: mm (in.)

E – D	Thickness
Less than 7.34 (0.2890)	3.5 (0.138)
7.34 (0.2890)	3.8 (0.150)

Bearing and bearing race diameter: mm (in.)

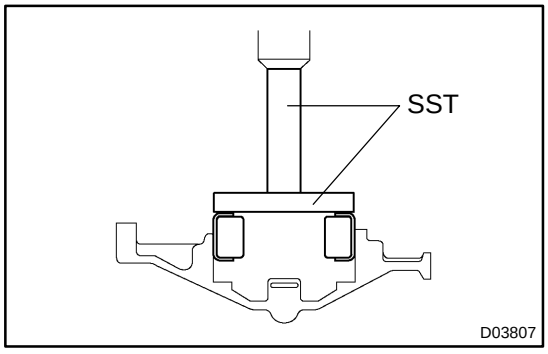
	Inside	Outside
Bearing	53.0 (2.087)	78.2 (3.079)
Bearing race	52.1 (2.051)	75.5 (2.972)



114. INSTALL UNDERDRIVE OUTPUT SHAFT OIL SEAL RING

[34346 / 98–8]

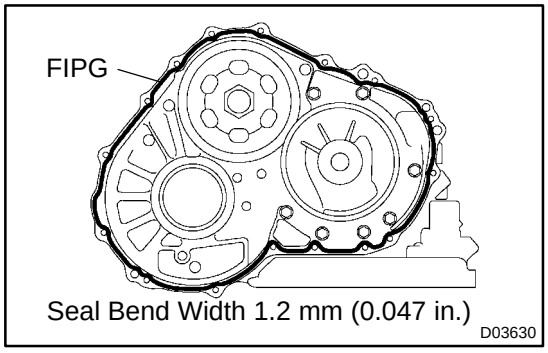
(a) Install new oil seal ring to the transaxle housing.



115. INSTALL UNDERDRIVE CYLINDRICAL ROLLER BEARING
[34301B / 98–4]

(a) Using SST and a press, install the U/D cylindrical roller bearing.
SST 09950–60020 (09951–00810), 09950–70010 (09951–07100)

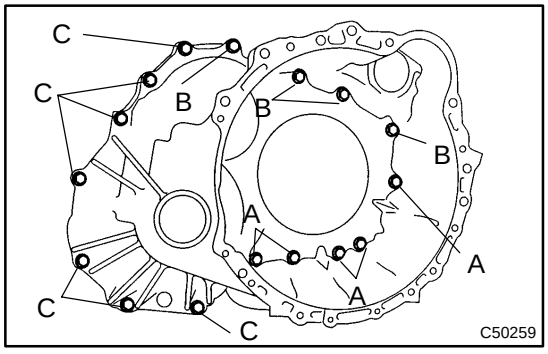
NOTICE:
Do not apply excessive pressure to it.



116. INSTALL TRANSAXLE HOUSING
[35111C / 98–12]

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

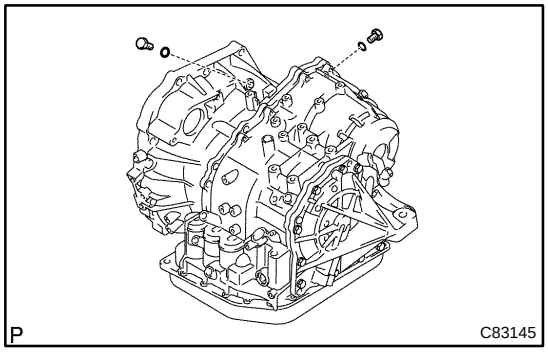
(b) Apply FIPG to the transaxle case.
FIPG:
Part No. 08826–00090, THREE BOND 1281 or equivalent



(c) Install the transaxle housing and 16 bolts to the transaxle case.
Torque:
Bolt A: 22 N·m (226 kgf·cm, 16 ft·lbf)
Bolt B and C: 29 N·m (300 kgf·cm, 22 ft·lbf)

HINT:
Apply seal packing or equivalent to the bolt A.
Seal packing:
THREE BOND 2403 or equivalent
Bolt length:
Bolt A: 50 mm (1.969 in.)
Bolt B: 50 mm (1.969 in.)
Bolt C: 42 mm (1.654 in.)

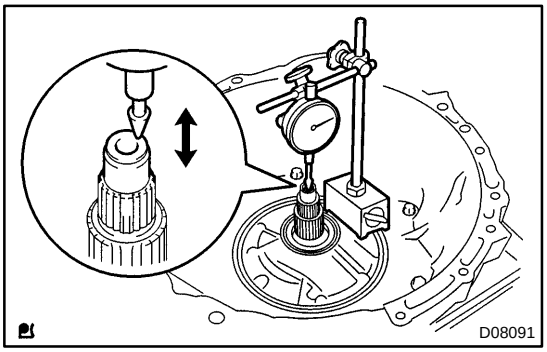
NOTICE:
Because bolt A is a sealed bolt, apply the seal packing to new bolts and tighten them within 10 minutes after application.



117. INSTALL TRANSAXLE CASE NO.1 PLUG
[35104Q / 98–3]

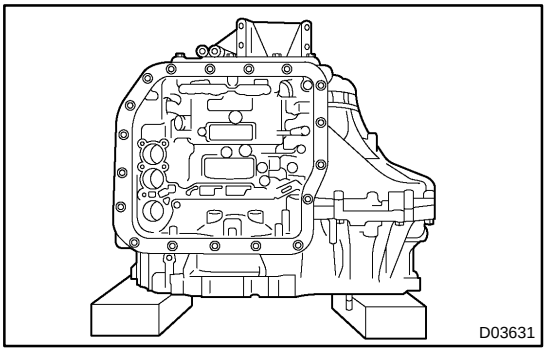
(a) Install 2 new O–rings to the 2 transaxle case No. 1 plugs.

(b) Install the 2 transaxle case No. 1 plugs to the transaxle housing.
Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)

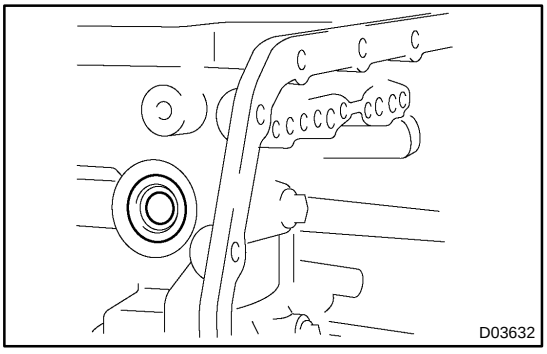


118. INSPECT INPUT SHAFT END PLAY

(a) Using a dial indicator, measure the input shaft end play.
End play: 0.26 – 1.25 mm (0.0103 – 0.0492 in.)



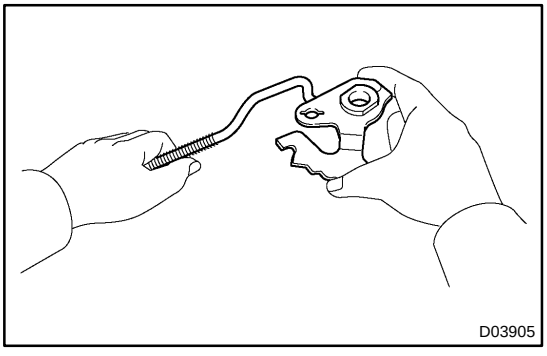
119. FIX AUTOMATIC TRANSAXLE ASSY
[30500 / 98–1]



120. INSTALL MANUAL VALVE LEVER SHAFT OIL SEAL
[35506F / 98–11]

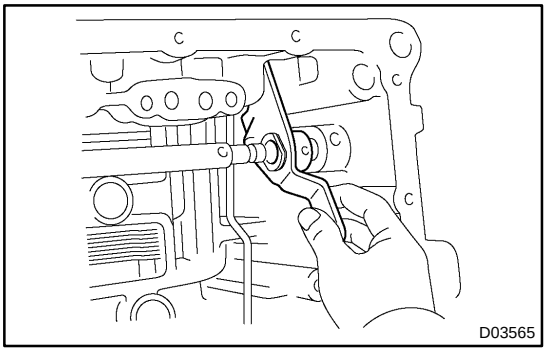
(a) Coat a new oil seal with ATF, install it to the transaxle case.

(b) Install the oil seal to the transaxle case.



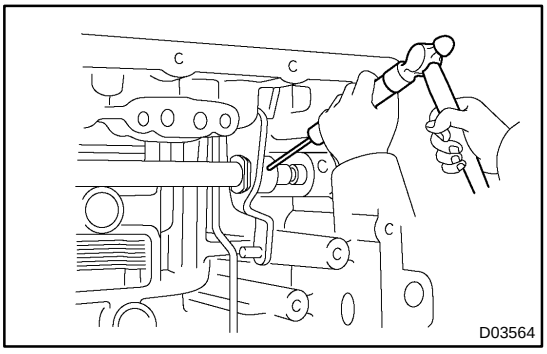
121. INSTALL PARKING LOCK ROD SUB–ASSY
[35501 / 98–11]

(a) Install the parking lock rod to the manual valve lever.

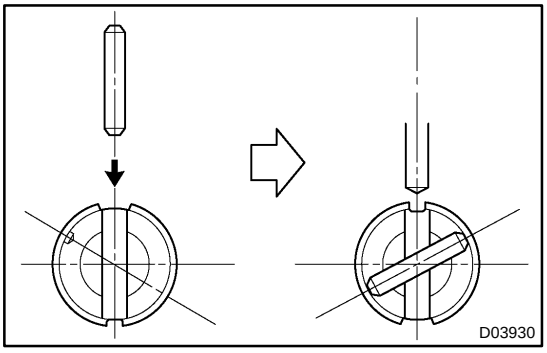


122. INSTALL MANUAL VALVE LEVER SUB–ASSY
[35505 / 98–11]

(a) Install a new spacer and manual valve lever shaft to the transaxle case.



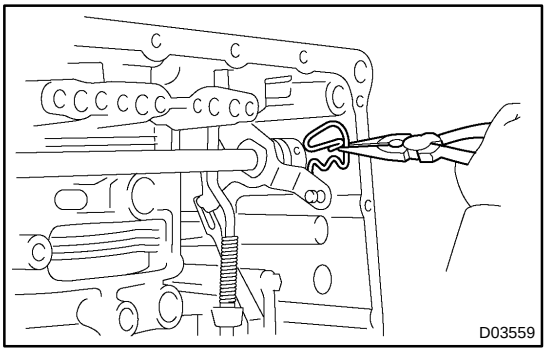
(b) Using a pin punch and a hammer, drive in a new pin.



(c) Turn the spacer and the lever shaft to align the small hole for locating the staking position in the spacer with the staking position mark on the lever shaft.

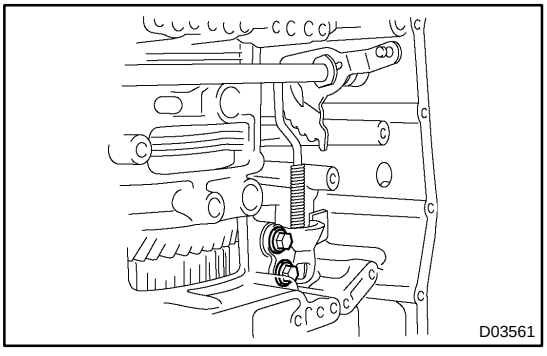
(d) Using a pin punch, stake the spacer through the small hole.

(e) Check that the spacer does not turn.



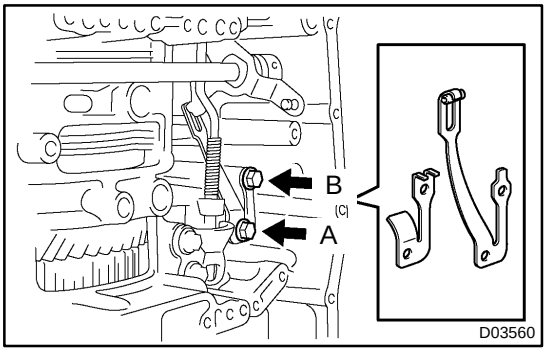
123. INSTALL MANUAL VALVE LEVER SHAFT RETAINER SPRING
[35506J / 98–11]

(a) Using needle–nose pliers, install the retainer spring.



124. INSTALL PARKING LOCK PAWL BRACKET
[35595 / 98–11]

(a) Install the parking lock pawl bracket with the 2 bolts.
Torque: 20 N·m (205 kgf·cm, 15 ft·lbf)
Bolt length: 25 mm (0.984 in.)



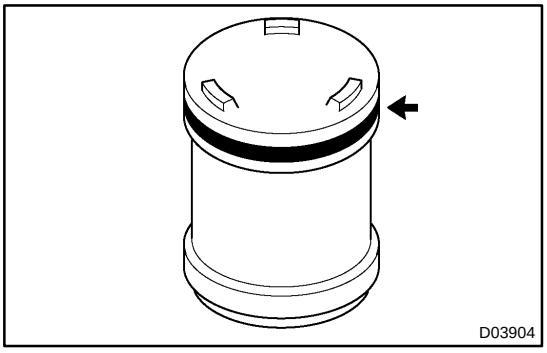
125. INSTALL MANUAL DETENT SPRING SUB–ASSY
[35409 / 98–9]

(a) Install the manual detent spring with the 2 bolts.

NOTICE:
Make sure to install the manual detent spring and cover in this order.

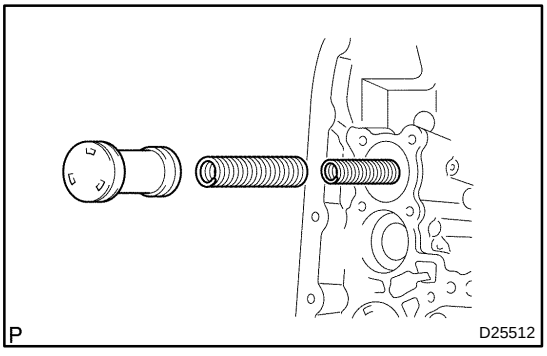
Torque:
Bolt A: 20 N·m (205 kgf·cm, 15 ft·lbf)
Bolt B: 12 N·m (120 kgf·cm, 9 ft·lbf)

Bolt length:
Bolt A: 27 mm (1.063 in.)
Bolt B: 16 mm (0.630 in.)



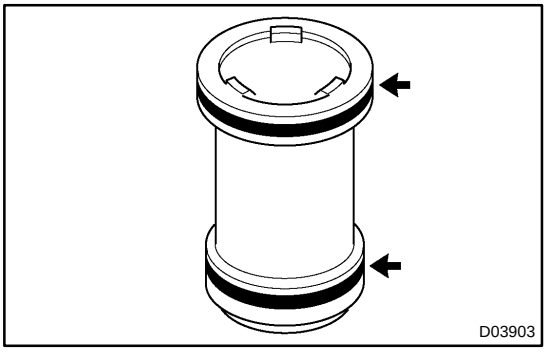
126. INSTALL B–3 ACCUMULATOR PISTON [35427K / 98–9]

(a) Coat a new O–ring with ATF, install it to the B_3 accumulator piston.



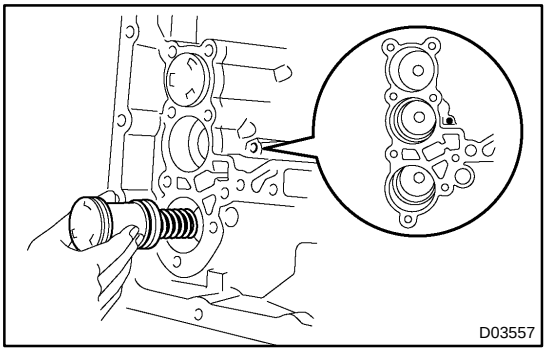
(b) Coat the accumulator B_3 piston and spring with ATF, install them to the transaxle case.
Accumulator spring:

Free length Outer diameter mm (in.)	Color
Inner 60.24 (2.3716) / 15.9 (0.626)	Yellowish green
Outer 74.61 (2.9374) / 21.7 (0.854)	Blue



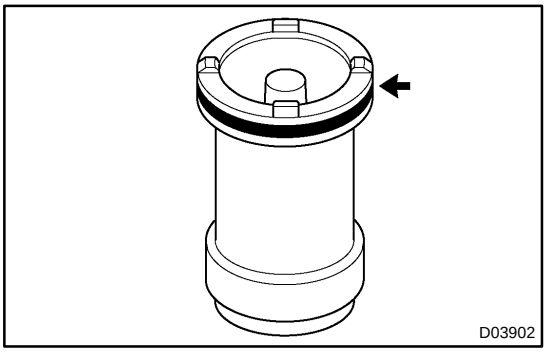
127. INSTALL C–1 ACCUMULATOR PISTON [35424C / 98–9]

(a) Coat 2 new O–rings with ATF, install them to the C_1 accumulator piston.



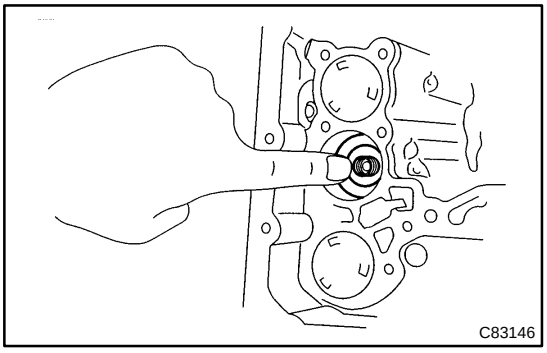
(b) Coat accumulator C_1 piston with ATF, install it to the transaxle case.
Accumulator spring:

Free length Outer diameter mm (in.)	Color
81.53 (3.2098) / 18.5 (0.728)	Pink



128. INSTALL C–3 ACCUMULATOR PISTON
[35426D / 98–9]

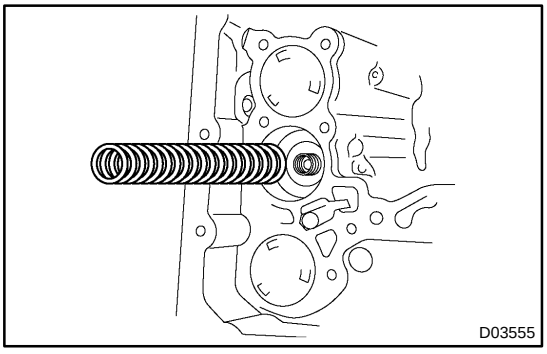
(a) Coat a new O–ring with ATF, install it to the C_3 accumulator piston.



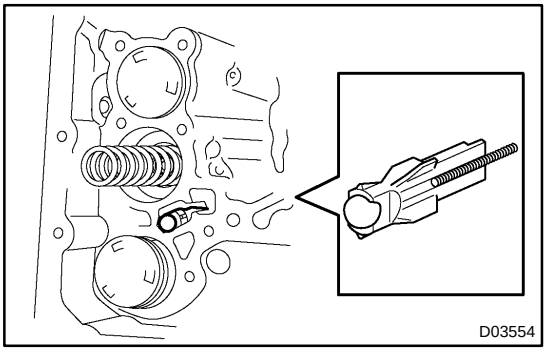
(b) Coat the C_3 accumulator piston with ATF, install it to the transaxle case.

Accumulator spring:

Free length Outer diameter mm (in.)	Color
90.49 (3.5626) / 19.2 (0.756)	White

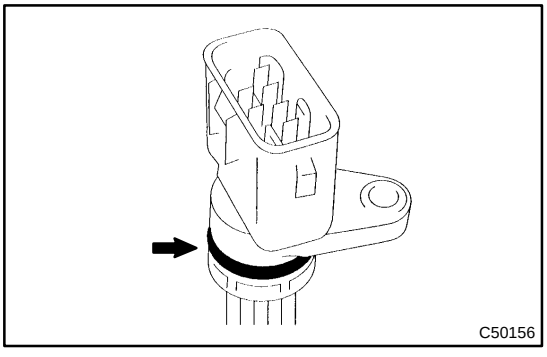


(c) Install the compression spring from the C_3 accumulator piston.



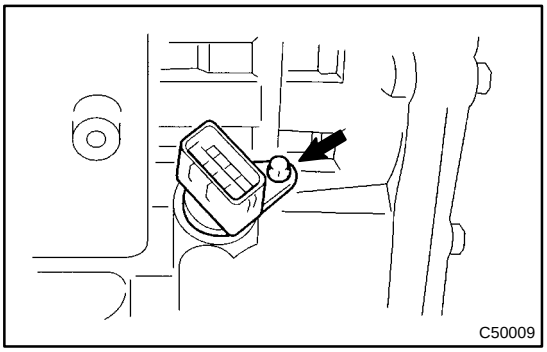
129. INSTALL CHECK BALL BODY
[35251 / 98–9]

(a) Install the check ball body and spring.

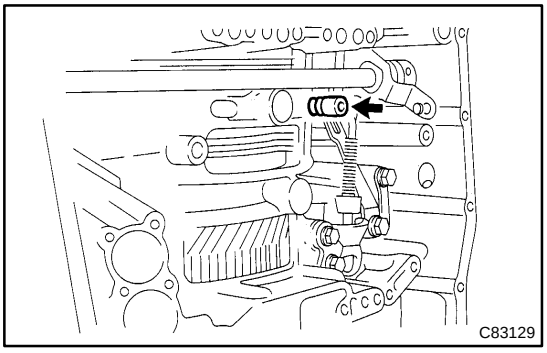


130. INSTALL TRANSMISSION WIRE
[82125J / 98–9]

(a) Coat a new O–ring with ATF, install it to the transaxle solenoid wire.

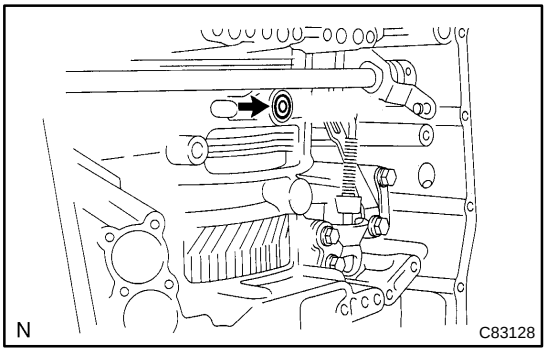


(b) Install the solenoid wire retaining bolt
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)



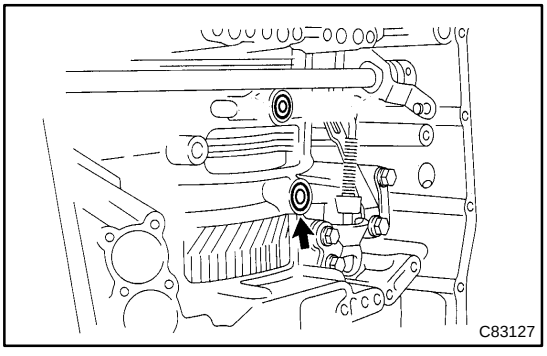
131. INSTALL BRAKE DRUM GASKET
[35159 / 98–3]

(a) Coat a new brake drum gasket with ATF, install it to the transaxle case.



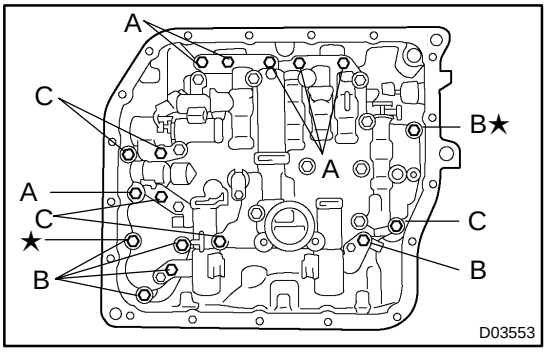
132. INSTALL TRANSAXLE CASE 2ND BRAKE GASKET
[35149B / 98–3]

(a) Coat a new transaxle case 2nd brake gasket with ATF, install it to the transaxle case.



133. INSTALL GOVERNOR APPLY GASKET NO.1
[35148 / 98–3]

(a) Coat a new governor apply gasket No. 1 with ATF, install it to the transaxle case.

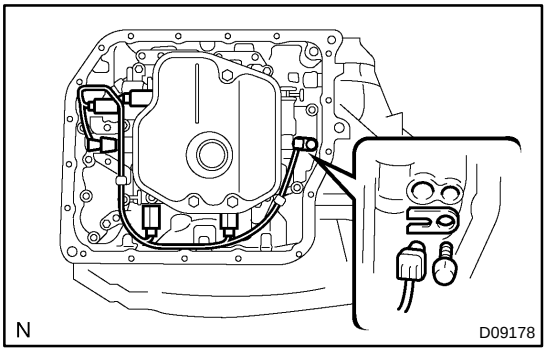


134. INSTALL TRANSMISSION VALVE BODY ASSY
[35410 / 98–9]

(a) Make sure that the manual valve lever position, install the valve body with 17 bolts to the transaxle case.
Torque: 11 N·m (110 kgf·cm, 8 ft·lbf)
Bolt length:
Bolt A: 25 mm (0.984 in.)
Bolt B: 41 mm (1.614 in.)
Bolt C: 45 mm (1.771 in.)

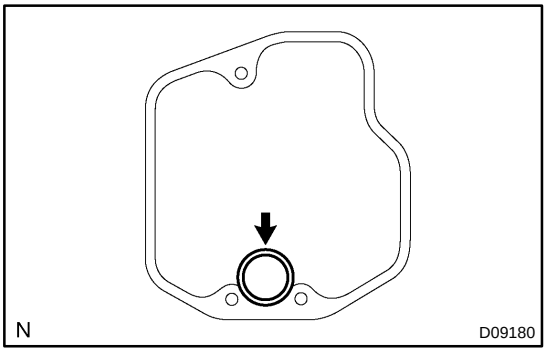
NOTICE:

- **Push the valve body against the accumulator piston spring and the check ball body to install it.**
- **When installing the valve body to the transaxle case, do not hold the solenoids.**
- **Tighten those bolts marked by ★ in the illustration first temporarily because they are positioning bolts.**



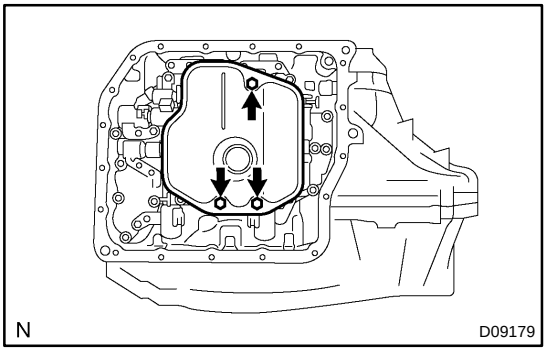
(b) Connect the 5 solenoid connectors.

(c) Install the ATF temperature sensor, clamp and bolt.
Torque: 6.6 N·m (67 kgf·cm, 58 in·lbf)



135. INSTALL VALVE BODY OIL STRAINER ASSY [35330 / 98–9]

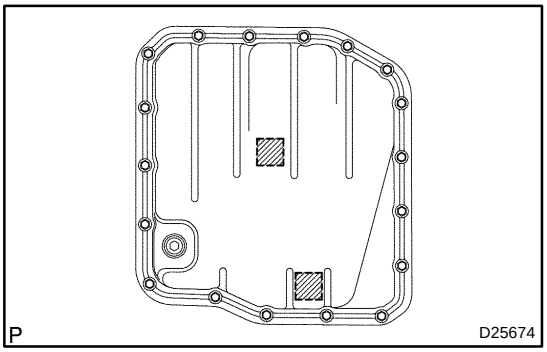
(a) Coat a new O–ring with ATF, install it to the oil strainer.



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

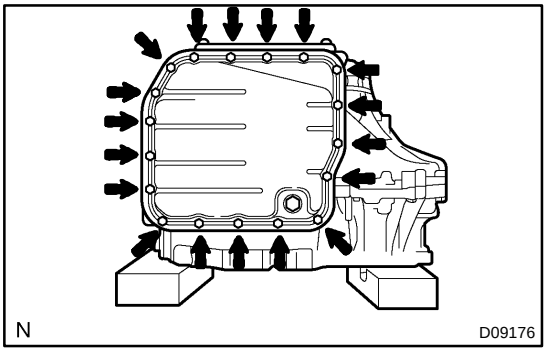
136. INSTALL AUTOMATIC TRANSAXLE OIL PAN GASKET [35168A / 98–3]

(a) Install a new oil pan gasket to the oil pan.



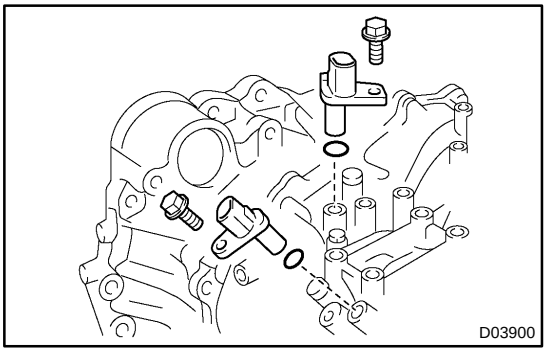
137. INSTALL AUTOMATIC TRANSAXLE OIL PAN SUB–ASSY
[35106D / 98–3]

(a) Install the 2 magnets in the oil pan.
(b) Apply seal packing or equivalent to new 18 bolts.
Seal packing:
THREE BOND 2430 or equivalent



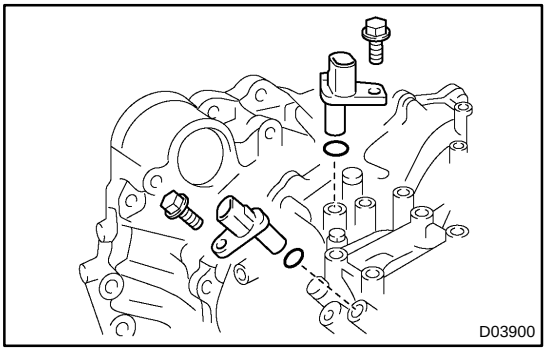
(c) Install oil pan and 18 bolts to the transaxle case.
Torque: 7.8 N·m (80 kgf·cm, 69 in.·lbf)

NOTICE:
Because the bolts are sealed bolts, apply seal packing to new bolts and tighten them within 10 minutes after application.



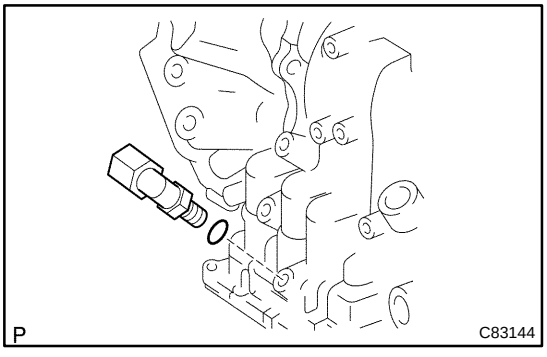
138. INSTALL SPEED SENSOR (TMC –MADE)
[89411F / 98–9]

(a) Coat 2 new O–rings with ATF, install them to the 2 sensors.
(b) Install the 2 sensors with the 2 bolts to the transaxle case.
Torque: 11.3 N·m (115 kgf·cm, 8 ft·lbf)



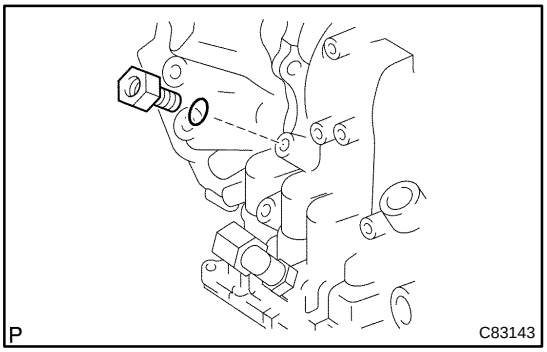
139. INSTALL TRANSMISSION REVOLUTION SENSOR (AISIN –MADE)
[89413E]

(a) Coat 2 new O–rings with ATF, install them to the 2 sensors.
(b) Install the 2 sensors with the 2 bolts to the transaxle case.
Torque: 11.3 N·m (115 kgf·cm, 8 ft·lbf)



140. INSTALL OIL COOLER TUBE UNION
[32921C / 3514]

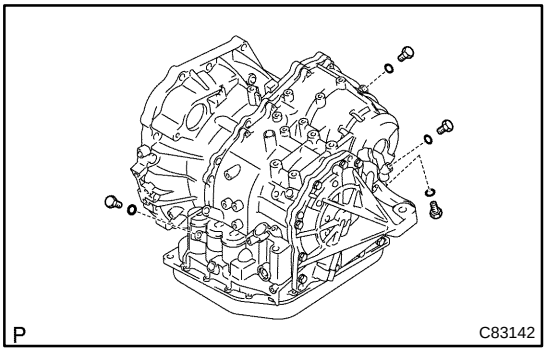
(a) Coat a new O–ring with ATF, install it to the elbow.
(b) Install the elbow to the transaxle case.
Torque: 27 N·m (276 kgf·cm, 20 ft·lbf)



141. INSTALL OIL COOLER TUBE UNION [32921C / 3514]

(a) Coat a new O–ring with ATF, install it to the union.

(b) Install the union to the transaxle case.
Torque: 27 N·m (280 kgf·cm, 20 ft·lbf)



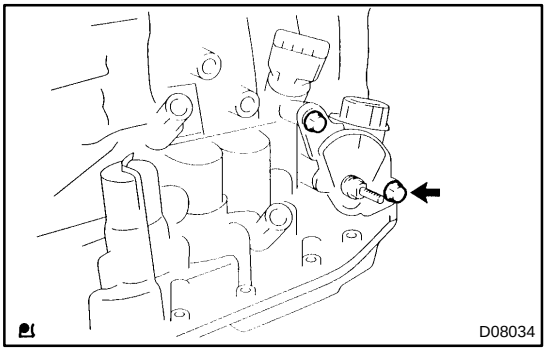
142. INSTALL TRANSAXLE CASE NO.1 PLUG [35104Q / 98–3]

(a) Coat 4 new O–rings with ATF, install them to the 4 transaxle case No. 1 plugs.

(b) Install the 4 transaxle case No. 1 plugs to the transaxle case.
Torque: 7.4 N·m (75 kgf·cm, 65 in.·lbf)

143. INSTALL BREATHER PLUG HOSE

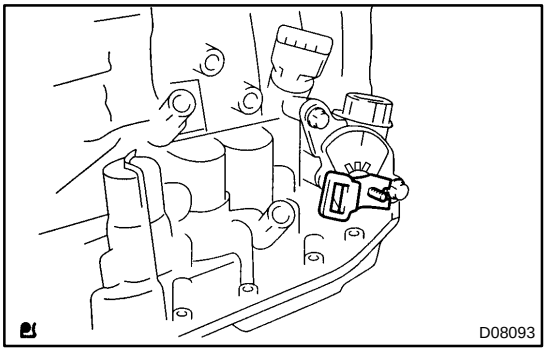
(a) Install the breather plug hose to the breather No. 2 plug.



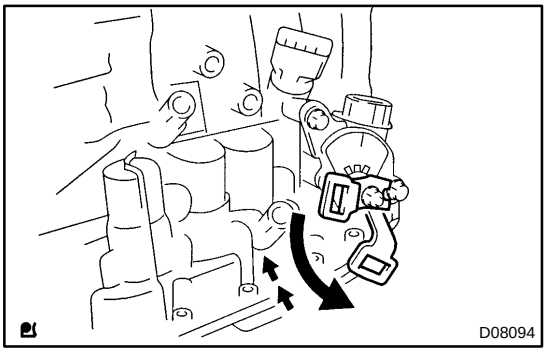
144. INSTALL PARK/NEUTRAL POSITION SWITCH ASSY [84540G / 98–11]

(a) Install the park/neutral position switch onto the manual valve lever shaft and temporarily install the 2 adjusting bolts.

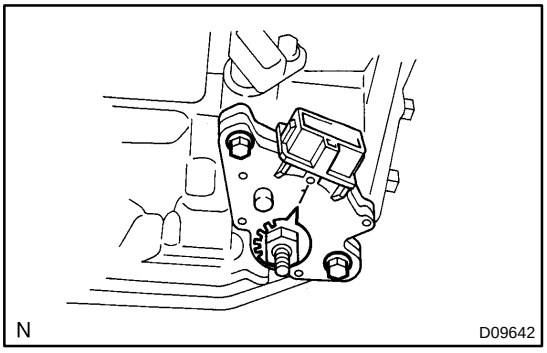
(b) Install a new nut stopper and nut.
Torque: 6.9 N·m (70 kgf·cm, 61 in.·lbf)



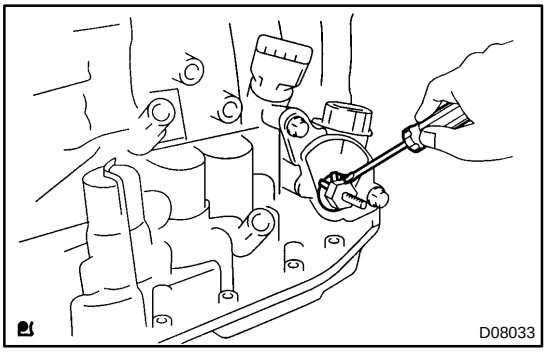
(c) Temporarily install control shaft lever.



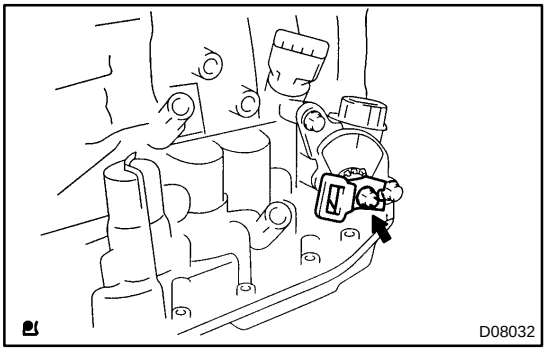
(d) Turn the lever counterclockwise until it stops, and then turn it clockwise 2 notches.
(e) Remove the control shaft lever.



(f) Align the groove with neutral basic line.
(g) Tighten the 2 bolts.
Torque: 5.4 N·m (55 kgf·cm, 48 in.·lbf)



(h) Using a screwdriver, stake the nut with the nut stopper.



(i) Install the control shaft lever, washer and nut.
Torque: 13 N·m (133 kgf·cm, 10 ft·lbf)

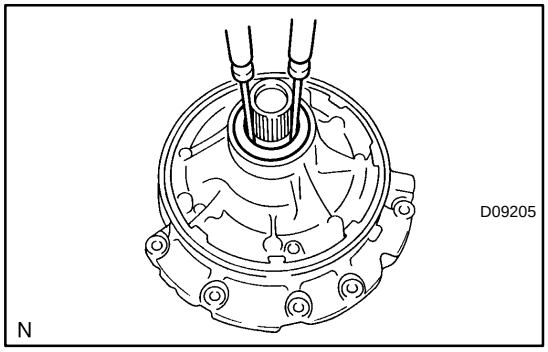
145. INSTALL SPEEDOMETER DRIVEN HOLE (ATM) COVER SUB–ASSY [33403M / 98–3]

(a) Coat the new O–ring with ATF and install it to the speedometer driven hole cover.
(b) Install the bolt and speedometer driven hole cover sub–assy to the transaxle assy.
Torque: 7.0 N·m (70 kgf·cm, 61 in.·lbf)

OIL PUMP ASSY (U241E)

4006P–01

OVERHAUL

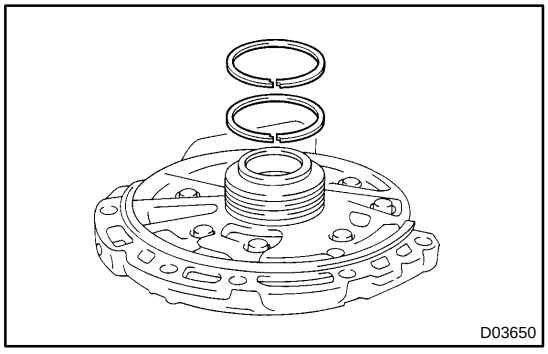


1. INSPECT OIL PUMP ASSY

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

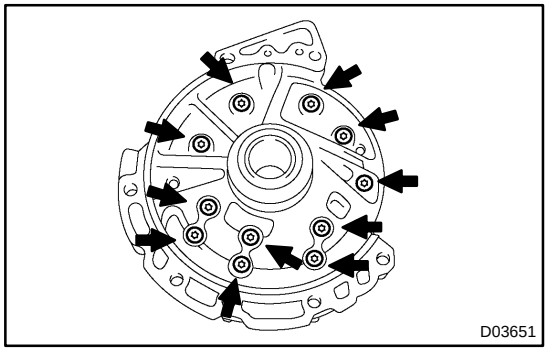
NOTICE:

Be careful not to damage the oil seal lip.



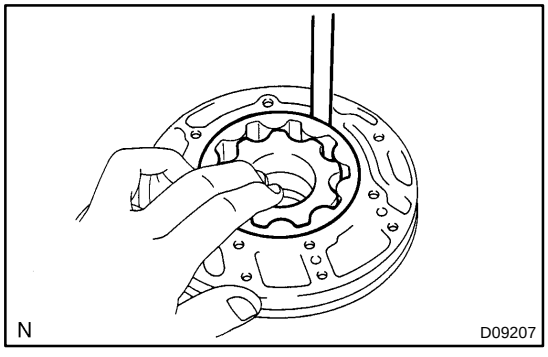
2. REMOVE CLUTCH DRUM OIL SEAL RING [35617 / 98–2]

(a) Remove 2 clutch drum oil seal rings.



3. REMOVE STATOR SHAFT ASSY [35370 / 98–2]

(a) Using a torx socket (T30), remove the 11 bolts and stator shaft.



4. INSPECT CLEARANCE OF OIL PUMP ASSEMBLY

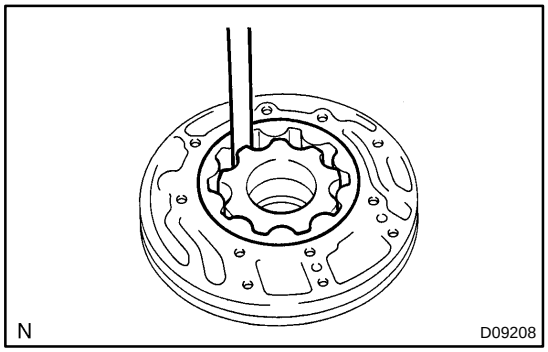
(a) Push the driven gear to one side of the body. Using a feeler gauge, measure the clearance.

Standard body clearance:

0.10 – 0.17 mm (0.0039 – 0.0067 in.)

Maximum body clearance: 0.17 mm (0.0067 in.)

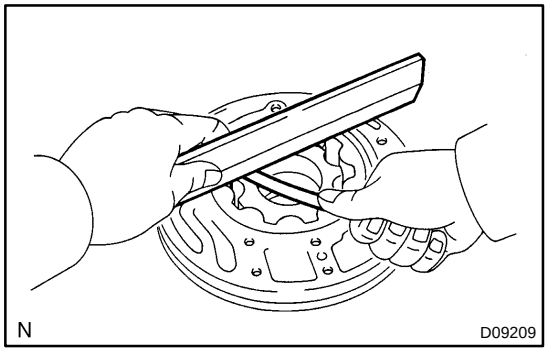
If the body clearance is greater than the maximum, replace the oil pump body sub–assy.



(b) Measure the tip clearance between the driven gear teeth and drive gear teeth.

Standard tip clearance:
0.07 – 0.15 mm (0.0028 – 0.0059 in.)
Maximum tip clearance: 0.15 mm (0.0059 in.)

If the tip clearance is greater than the maximum, replace the oil pump body sub–assy.



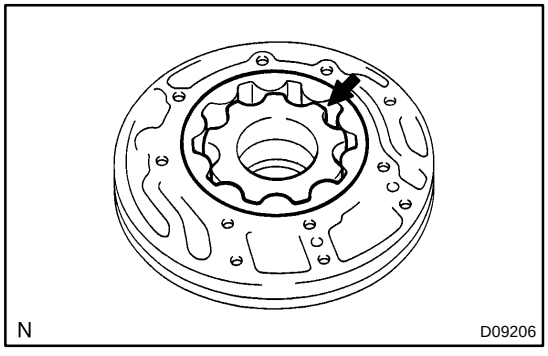
(c) Using a straight edge and feeler gauge, measure the side clearance of both gears.

Standard side clearance:
0.02 – 0.05 mm (0.0008 – 0.0020 in.)
Maximum side clearance: 0.05 mm (0.0020 in.)
Drive gear thickness: mm (in.)

Mark	Thickness
1	10.690 – 10.699 (0.4209 – 0.4212)
2	10.700 – 10.709 (0.4213 – 0.4216)
3	10.710 – 10.720 (0.4217 – 0.4220)
4	10.721 – 10.730 (0.4221 – 0.4224)
5	10.731 – 10.740 (0.4225 – 0.4228)

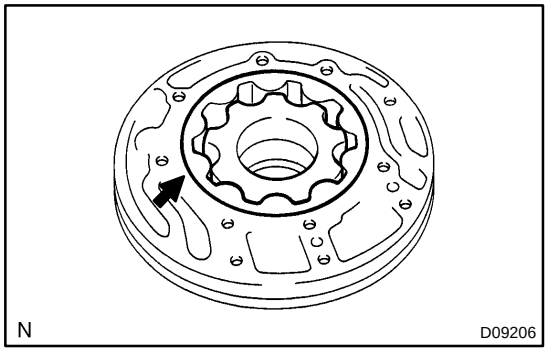
Driven gear thickness: mm (in.)

Mark	Thickness
1	10.690 – 10.699 (0.4209 – 0.4212)
2	10.700 – 10.709 (0.4213 – 0.4216)
3	10.710 – 10.720 (0.4217 – 0.4220)
4	10.721 – 10.730 (0.4221 – 0.4224)
5	10.731 – 10.740 (0.4225 – 0.4228)



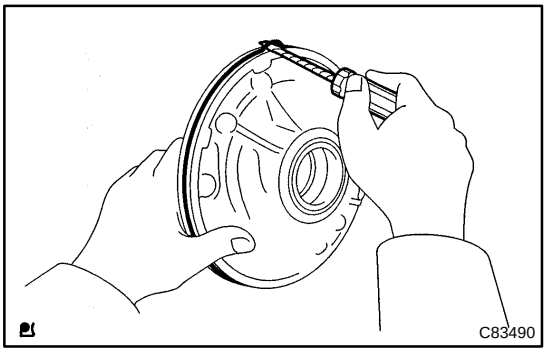
5. REMOVE FRONT OIL PUMP DRIVE GEAR [35321 / 98–2]

(a) Remove the front oil pump drive gear.



6. REMOVE FRONT OIL PUMP DRIVEN GEAR [35322 / 98–2]

(a) Remove the front oil pump driven gear.

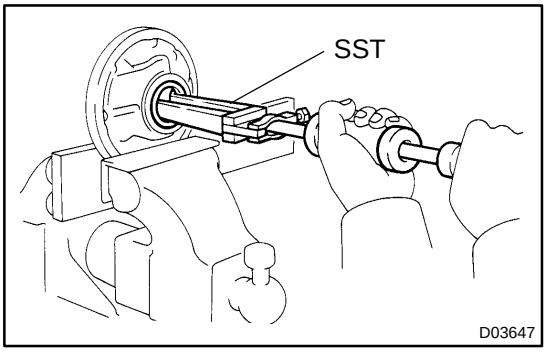


7. REMOVE FRONT OIL PUMP BODY O–RING [35301B / 98–2]

(a) Using a screwdriver, remove the O–ring.

HINT:

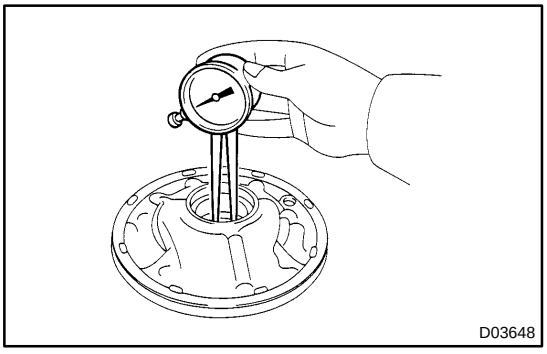
Tape the screwdriver before use.



8. REMOVE FRONT OIL PUMP OIL SEAL [35301A / 98–2]

(a) Mount oil pump in a soft jaw vise.

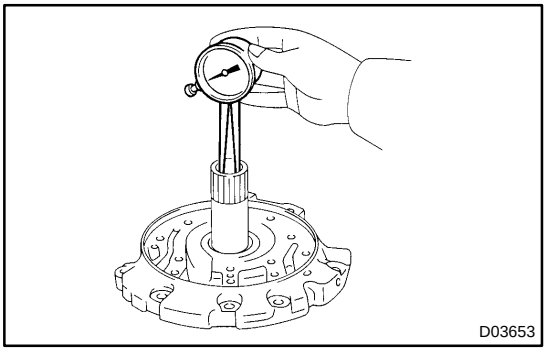
(b) Using SST, remove oil seal from the oil pump body.
SST 09308–00010



9. INSPECT FR OIL PUMP & GEAR BODY SUB–ASSY [35035 / 98–2]

(a) Using a dial indicator, measure the inside diameter of the oil pump body bushing.
Standard inside diameter:
38.11 – 38.14 mm (1.5005 – 1.5015 in.)
Maximum inside diameter: 38.19 mm (1.5035 in.)

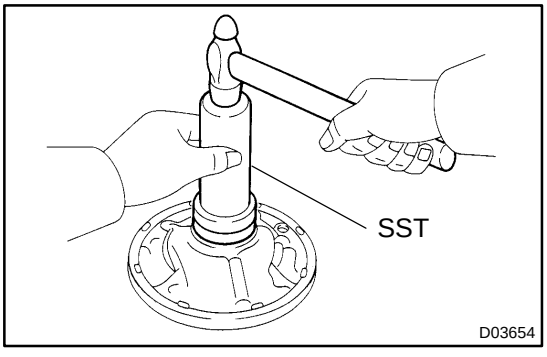
If the inside diameter is greater than the maximum, replace the oil pump body sub–assy.



10. INSPECT STATOR SHAFT ASSY [35370 / 98–2]

(a) Using a dial indicator, measure the inside diameter of the stator shaft bushings.
Standard inside diameter:
20.50 – 21.53 mm (0.8465 – 0.8475 in.)
Maximum inside diameter: 21.57 mm (0.8492 in.)

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



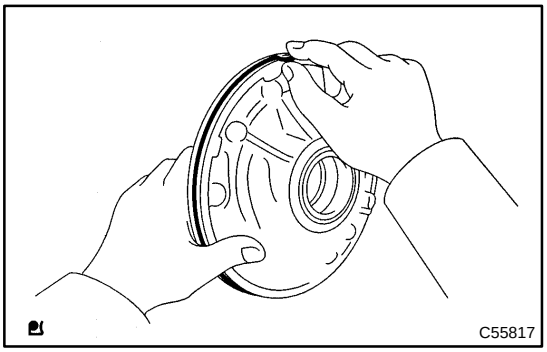
11. INSTALL FRONT OIL PUMP OIL SEAL [35301A / 98–2]

(a) Using SST, install a new oil seal to the pump.
SST 09350–32014 (09351–32140)

HINT:

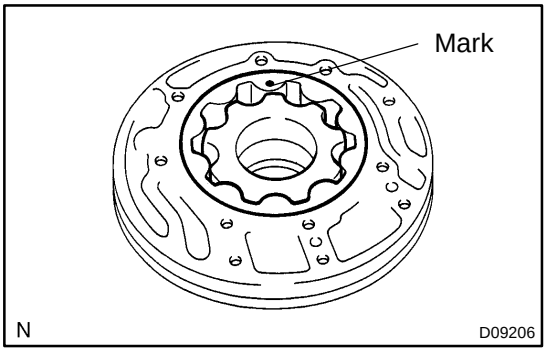
The seal end should be flush with the outer edge of the oil pump.

(b) Coat the lip of the oil seal with petroleum jelly.



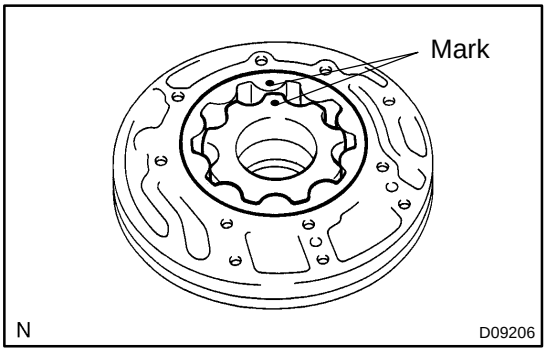
12. INSTALL FRONT OIL PUMP BODY O–RING [35301B / 98–2]

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



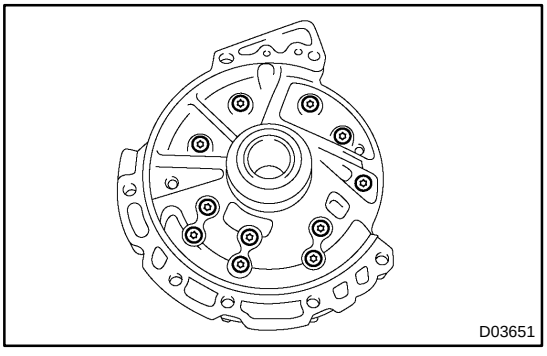
13. INSTALL FRONT OIL PUMP DRIVEN GEAR [35322 / 98–2]

(a) Coat the front oil pump driven gear with ATF, install it to the oil pump body with the maked side up.



14. INSTALL FRONT OIL PUMP DRIVE GEAR [35321 / 98–2]

(a) Coat the front oil pump drive gear with ATF, install it to the oil pump body with the maked side up.

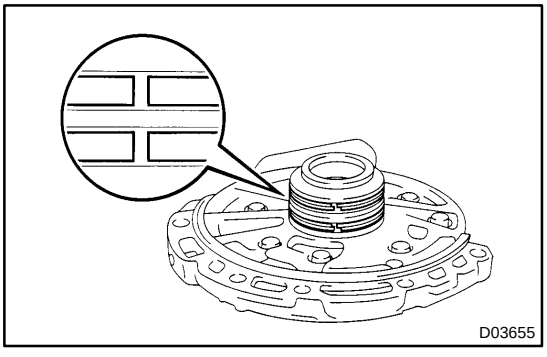


15. INSTALL STATOR SHAFT ASSY [35370 / 98–2]

(a) Set the stator shaft by aligning each bolt hole.

(b) Using a torx socket T30, install the 11 bolts.

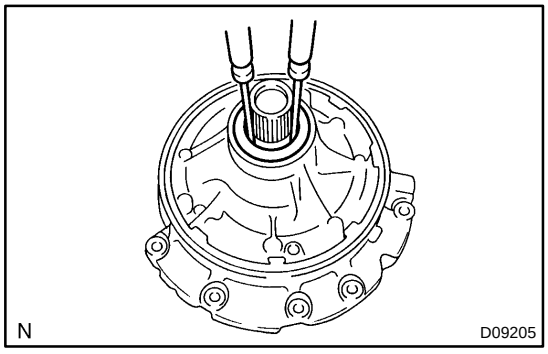
Torque: 9.8 N·m (100 kgf·cm, 87 in.·lbf)



16. INSTALL CLUTCH DRUM OIL SEAL RING [35617 / 98–2]

NOTICE:

Do not expand the ring ends excessively.



17. INSPECT OIL PUMP ASSY

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

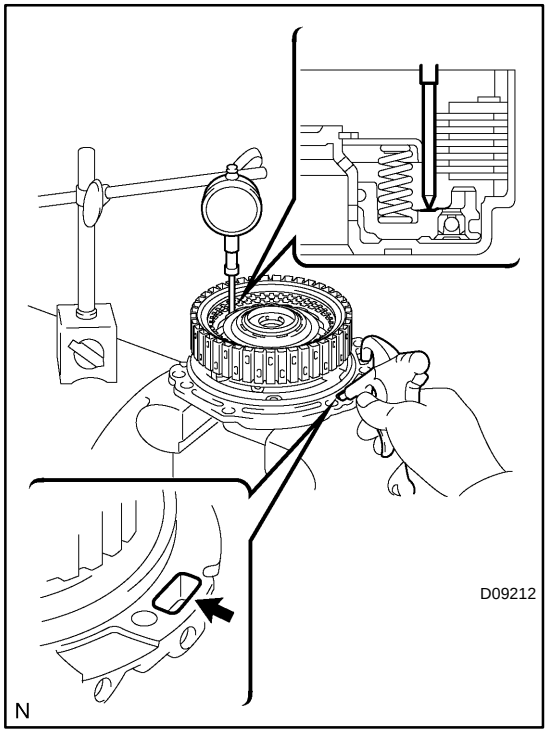
NOTICE:

Be careful not to damage the oil seal lip.

FORWARD CLUTCH ASSY (U241E)

4006Q–01

OVERHAUL



1. INSPECT PACK CLEARANCE OF FORWARD CLUTCH

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

NOTICE:

Be careful not to damage the oil seal ring of oil pump.

(b) Using a dial indicator, measure the forward clutch piston stroke while applying and releasing compressed air (392 kPa, 4.0 kgf/cm^2, 57 psi).

Piston stroke: 1.74 – 2.08 mm (0.0685 – 0.0819 in.)

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

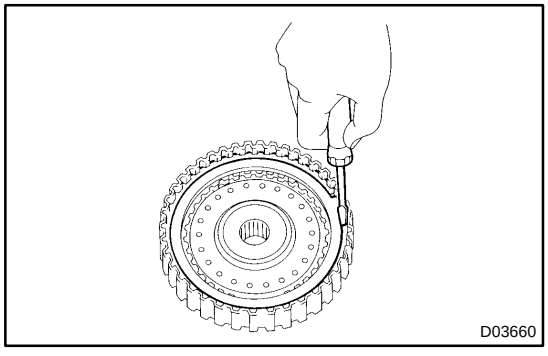
If the clearance is non–standard, select another flange.

HINT:

There are 5 flanges of different thickness.

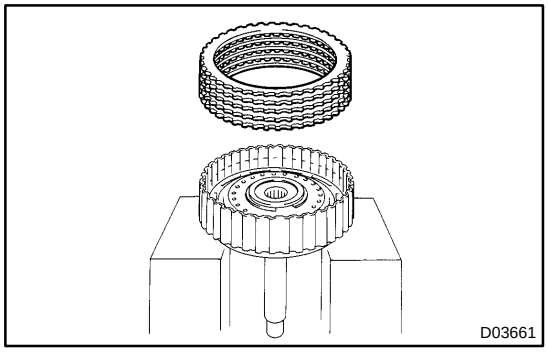
Flange thickness: mm (in.)

No.	Thickness	No.	Thickness
1	3.00 (0.1181)	4	3.45 (0.1358)
2	3.15 (0.1240)	5	3.60 (0.1417)
3	3.30 (0.1299)	–	–

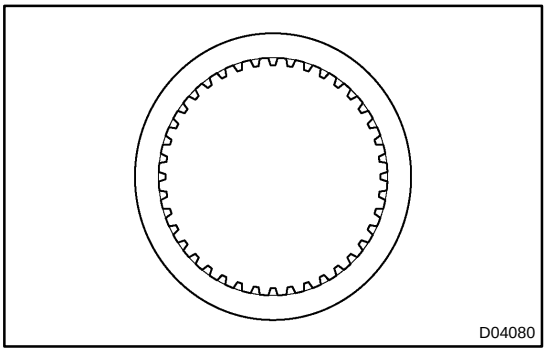


2. REMOVE FORWARD MULTIPLE DISC CLUTCH DISC [35633B / 98–5]

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



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



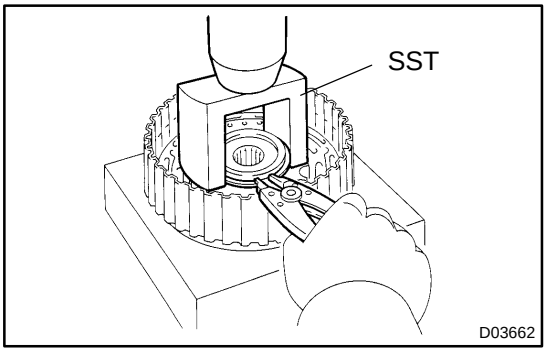
3. INSPECT FORWARD MULTIPLE DISC CLUTCH DISC [35633B / 98–5]

(a) Check to see if the sliding surface of the disc, plate and flange are worn or burnt.

If necessary, replace them.

HINT:

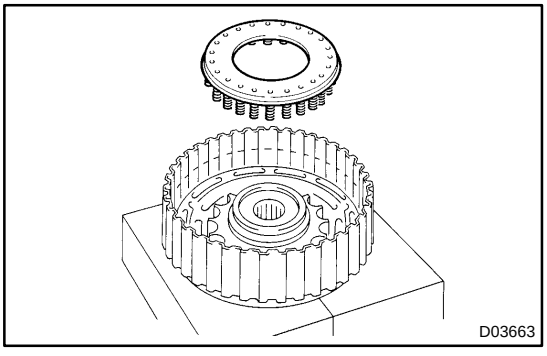
- If the lining of the disc is peeling off or discolored, replace all discs.
- Before assembling new discs, soak them in ATF for at least 15 minutes.



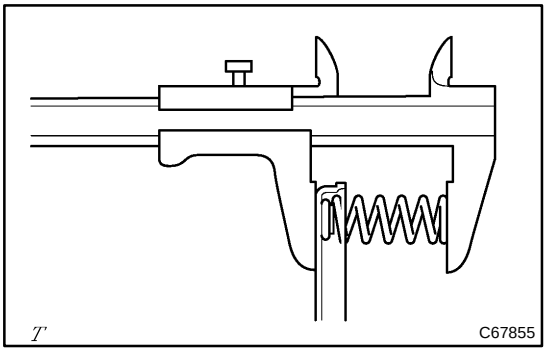
4. REMOVE FORWARD CLUTCH RETURN SPRING SUB–ASSY [35603A / 98–5]

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

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

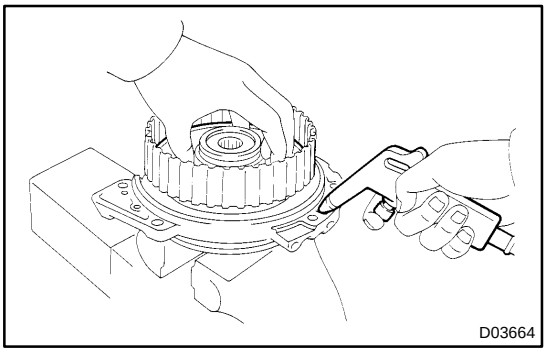


(c) Remove the piston return spring.



5. INSPECT FORWARD CLUTCH RETURN SPRING SUB–ASSY [35603A / 98–5]

(a) Using vernier calipers, measure the free length of the spring together with the spring seat.
Standard free length: 28.23 mm (1.1114 in.)

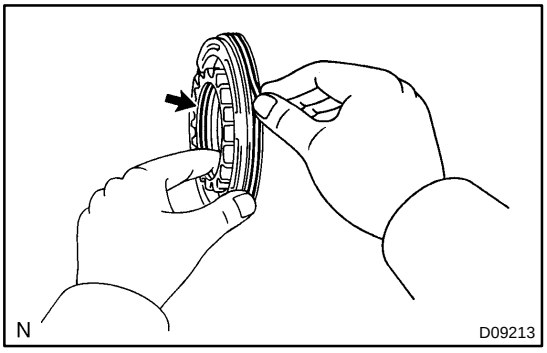


6. REMOVE FORWARD CLUTCH PISTON SUB–ASSY [35602A / 98–5]

(a) Place the forward clutch drum onto the oil pump.

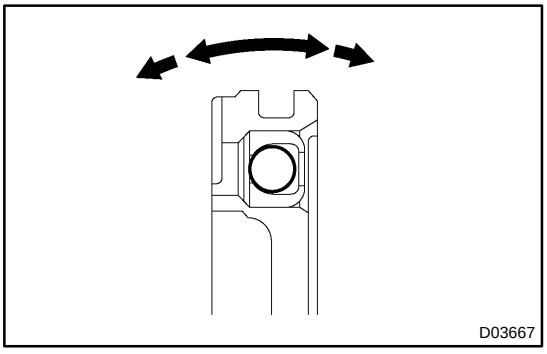
(b) Holding the forward clutch piston with your hard, apply compressed air (392 kPa, 4.0 kgf/cm^2, 57 psi) to the oil pump to remove the forward clutch piston.

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



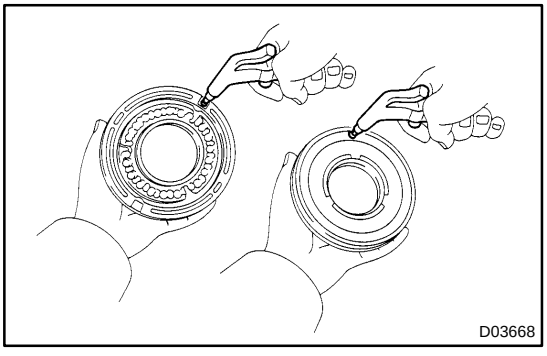
7. REMOVE FORWARD CLUTCH PISTON O–RING [35602B / 98–5]

(a) Remove the 2 O–rings.

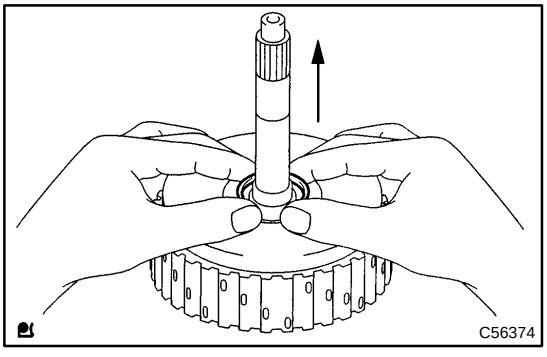


8. INSPECT FORWARD CLUTCH PISTON SUB–ASSY [35602A / 98–5]

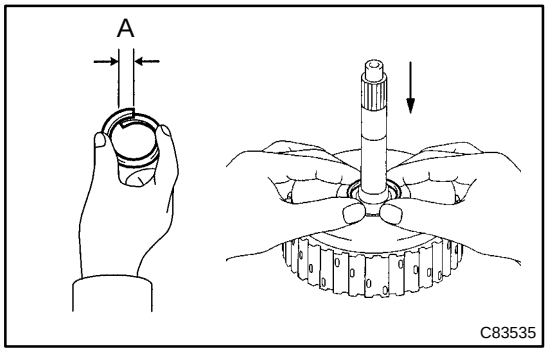
(a) Shake the piston to check that the check ball is not stuck.



(b) Check that the valve does not leak when applying low compressed air (392 kPa, 4.0 kgf/cm^2, 57 psi).



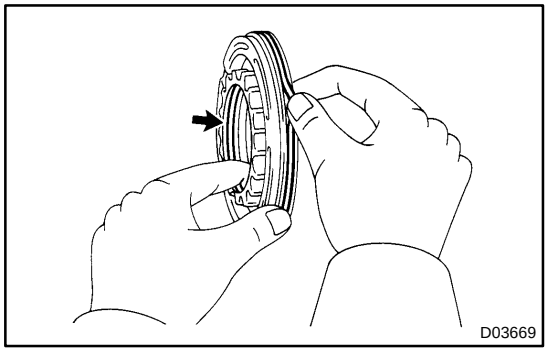
9. REMOVE INPUT SHAFT OIL SEAL RING [35712A / 98–5]



10. INSTALL INPUT SHAFT OIL SEAL RING
[35712A / 98–5]

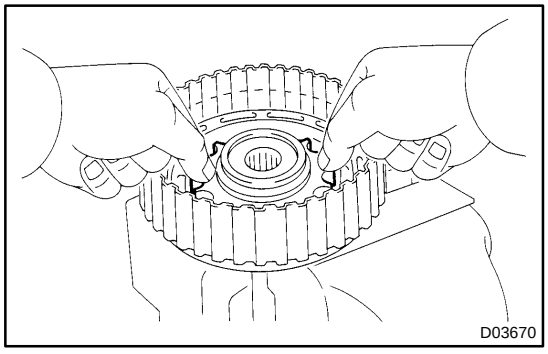
(a) Compress the oil seal ring from both sides to reduce dimension A.
Dimension A:
5.0 mm (0.197 in.)

(b) Coat the oil seal ring with ATF and install it to the input shaft.



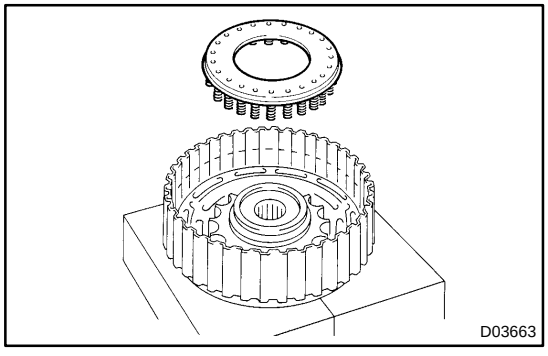
11. INSTALL FORWARD CLUTCH PISTON O–RING
[35602B / 98–5]

(a) Coat 2 new O–rings with ATF, install them to the forward clutch piston.



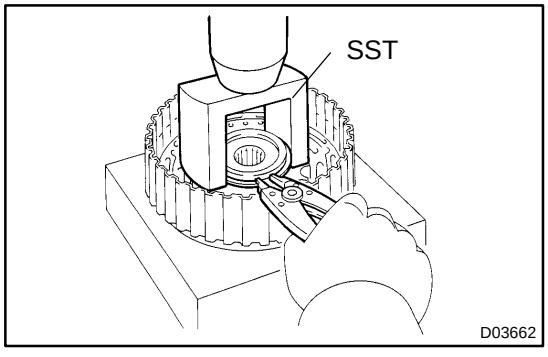
12. INSTALL FORWARD CLUTCH PISTON SUB–ASSY
[35602A / 98–5]

(a) Install the forward clutch piston sub–assy to the forward clutch drum.



13. INSTALL FORWARD CLUTCH RETURN SPRING SUB–ASSY
[35603A / 98–5]

(a) Place the forward clutch return spring sub–assy onto the forward clutch piston.

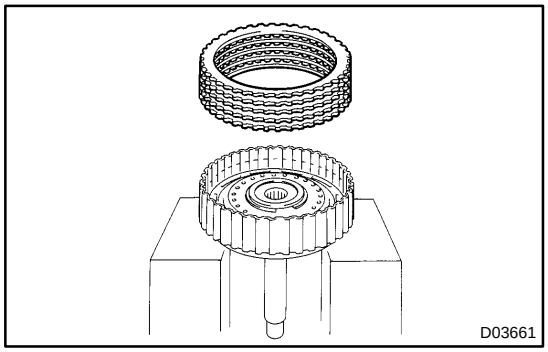


(b) Place SST on the return spring, and compress the return spring with a press.
SST 09350–32014 (09351–32070)

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

NOTICE:

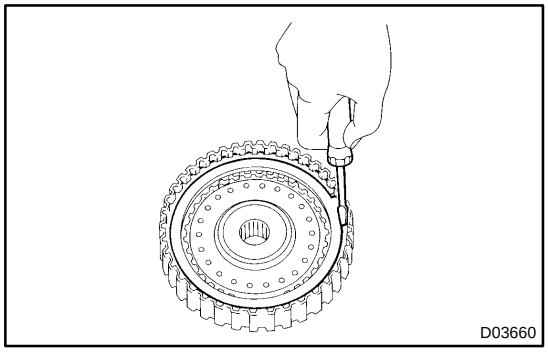
- **Stop the press when the spring sheet is lowered to 1 – 2 mm (0.039 – 0.078 in.) from the snap ring grove.**
- **This prevents the spring sheet from being deformed.**
- **Do not expand the snap ring excessively.**



14. INSTALL FORWARD CLUTCH FLANGE HOLE SNAP RING

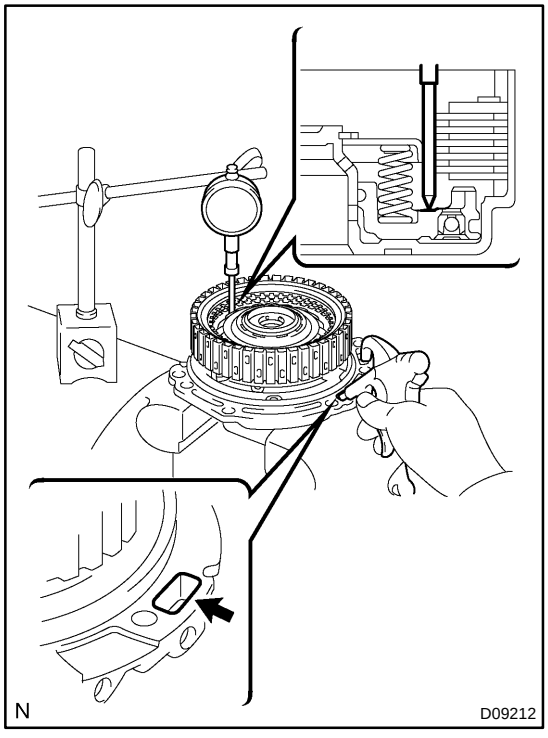
[35675B / 98–5]

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



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

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



15. INSPECT PACK CLEARANCE OF FORWARD CLUTCH

(a) Using a dial indicator, measure the forward clutch piston stroke while applying and releasing compressed air (392 kgf·cm^2, 4.0 kPa, 57 psi).

Piston stroke: 1.74 – 2.08 mm (0.0685 – 0.0819 in.)

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

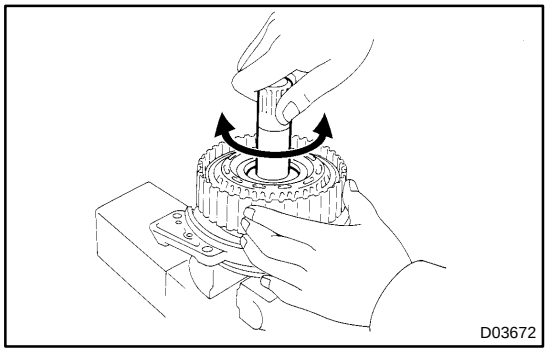
If the clearance is non–standard, select another flange.

HINT:

There are 5 flanges of different thickness.

Flange thickness: mm (in.)

No.	Thickness	No.	Thickness
1	3.00 (0.1181)	4	3.45 (0.1358)
2	3.15 (0.1240)	5	3.60 (0.1417)
3	3.30 (0.1299)	–	–



16. INSPECT FORWARD MULTIPLE DISC CLUTCH DISC [35633B / 98–5]

(a) Inspect the clutch disc rotation.

(1) Check that the disc lightly rotates when rotating the forward clutch assembly after inserting the multiple disc clutch into it.

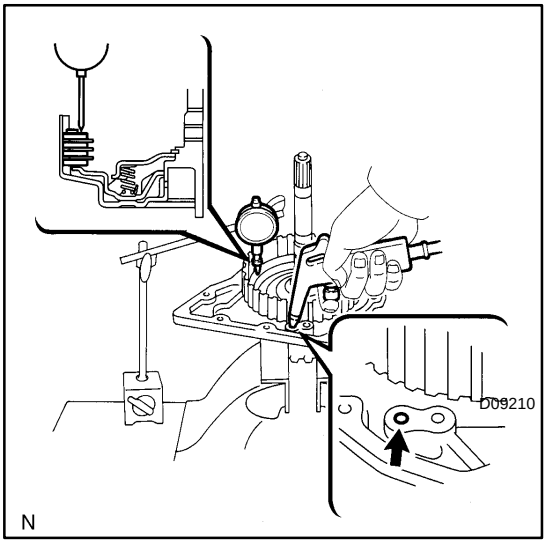
NOTICE:

Do not place the forward clutch assy in a vise.

DIRECT CLUTCH ASSY (U241E)

4006R–01

OVERHAUL



1. INSPECT PACK CLEARANCE OF DIRECT CLUTCH

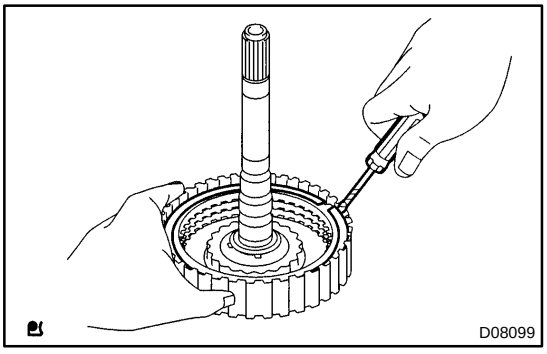
(a) Install the direct clutch and needle roller bearing on the transaxle rear cover.

(b) Using a dial indicator, measure the direct clutch pack clearance while applying and releasing compressed air (392 kPa, 4.0 kgf/cm^2, 57 psi).

Pack clearance:

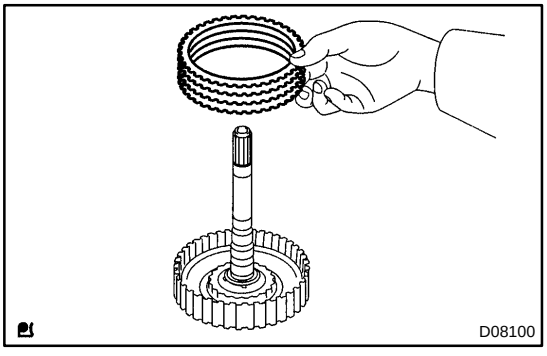
0.605 – 0.825 mm (0.02382 – 0.03248 in.)

If the pack clearance is non–standard, inspect the discs, plates and flange.

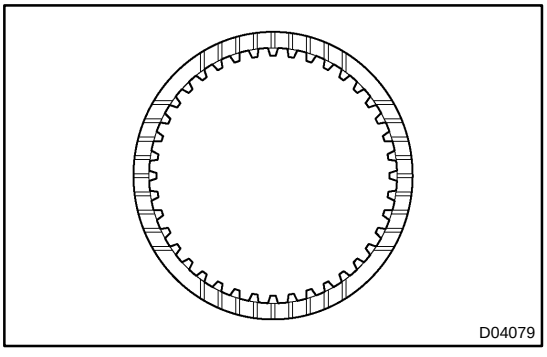


2. REMOVE DIRECT MULTIPLE DISC CLUTCH DISC [35633C / 98–5]

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



(b) Remove the flange, 3 discs and 3 plates from the direct clutch drum.



3. INSPECT DIRECT MULTIPLE DISC CLUTCH DISC [35633C / 98–5]

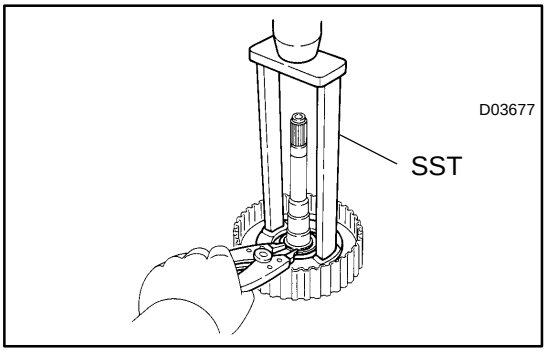
(a) Check to see if the sliding surface of the disc, plate and flange are worn or burnt.

If necessary, replace them.

HINT:

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

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



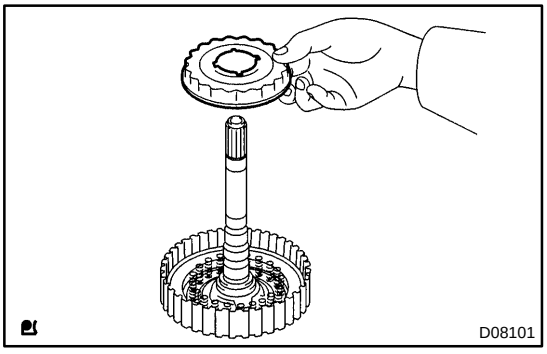
4. REMOVE DIRECT CLUTCH RETURN SPRING SUB–ASSY
[35604 / 98–5]

(a) Place SST on the clutch balancer and compress the spring with a press.
SST 09387–00020

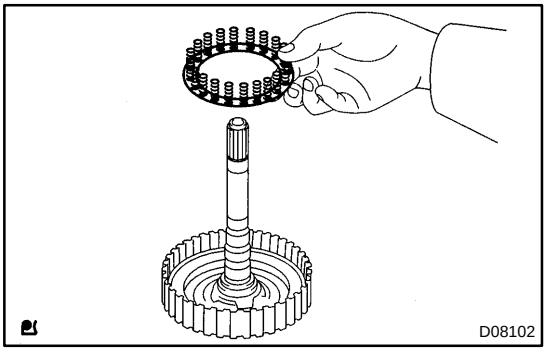
(b) Using a snap ring expander, remove the snap ring from the direct clutch drum.

NOTICE:

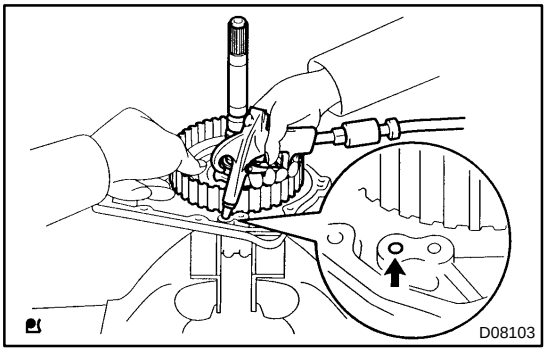
- **Stop the press when the spring sheet is lowered to 1 – 2 mm (0.039 – 0.078 in.) from the snap ring grove.**
- **This prevents the spring sheet from being deformed.**
- **Do not expand the snap ring excessively.**



(c) Remove the clutch balancer from the direct clutch drum.

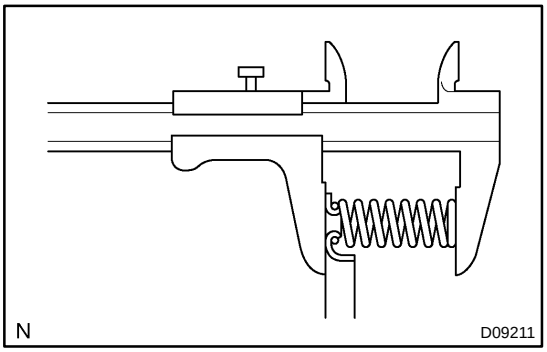


(d) Remove the piston return spring from the direct clutch drum.



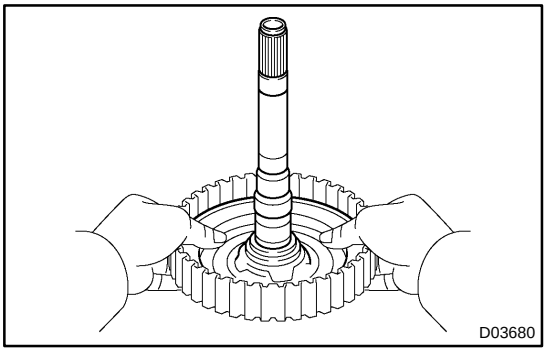
(e) Install direct clutch drum on the transaxle rear cover.

(f) Holding the direct clutch piston with your hand, apply compressed air (392 kPa, 4.0 kgf/cm^2, 57 psi) to the transaxle rear cover to remove the direct clutch piston.



5. INSPECT DIRECT CLUTCH RETURN SPRING SUB–ASSY
[35604 / 98–5]

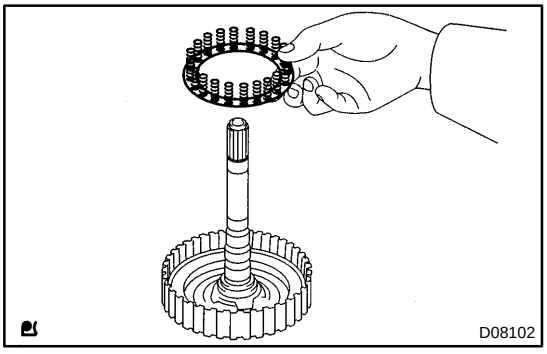
(a) Using vernier calipers, measure the free length of the spring together with the spring seat.
Standard free length: 22.58 mm (0.8890 in.)



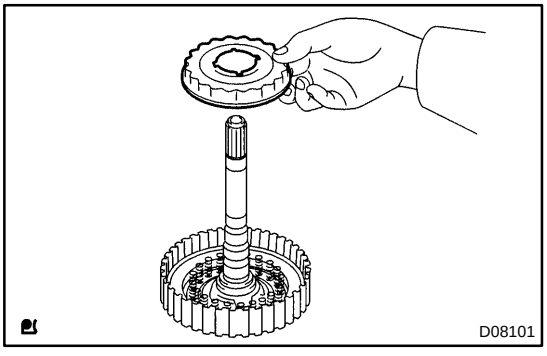
6. INSTALL DIRECT CLUTCH RETURN SPRING SUB–ASSY
[35604 / 98–5]

(a) Coat the direct clutch piston with ATF, and install it to the direct clutch drum.

NOTICE:
Be careful not to damage the lip seal of the direct clutch piston.

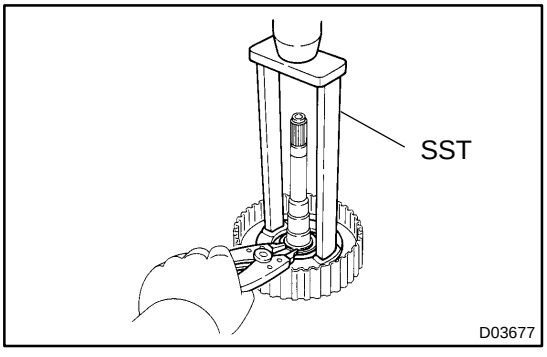


(b) Install the piston return spring to the direct clutch drum.



(c) Install the clutch balancer to the direct clutch drum.

NOTICE:
Be careful not to damage the lip seal of the direct clutch balancer.



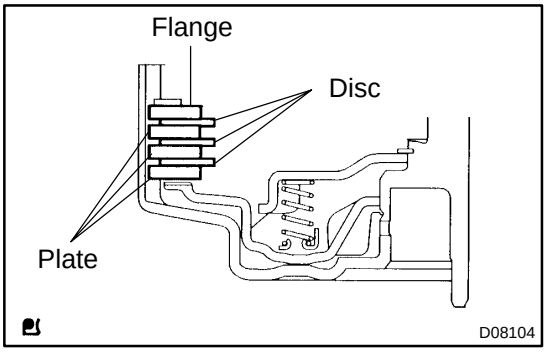
(d) Place SST on the clutch balancer and compress the piston return spring with a press.
SST 09387–00020

(e) Using a snap ring expander, install the snap ring to the direct clutch drum.

NOTICE:

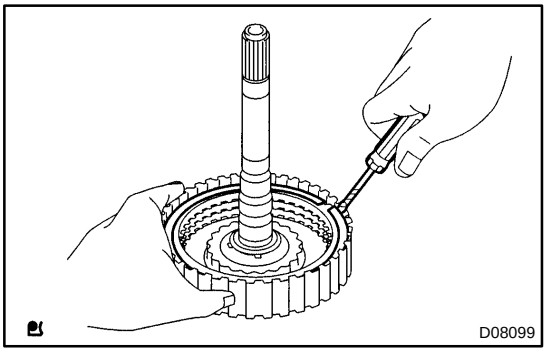
- **Be sure the end gap of the snap ring is not aligned with the clutch balancer claw.**

- **Stop the press when the spring sheet is lowered to 1 – 2 mm (0.039 – 0.078 in.) from the snap ring grove.**
- **This prevents the spring sheet from being deformed.**
- **Do not expand the snap ring excessively.**



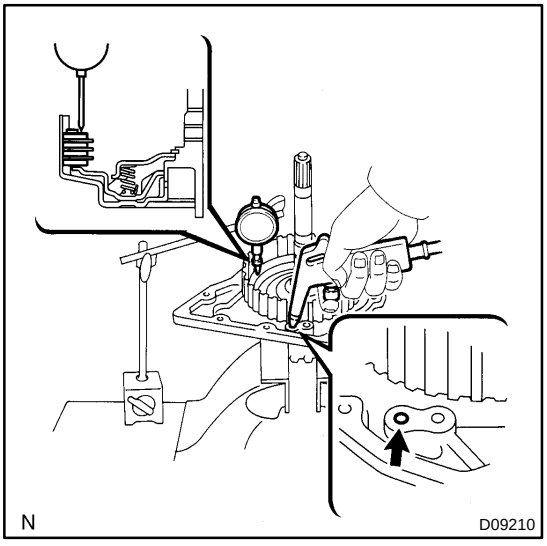
7. INSTALL DIRECT MULTIPLE DISC CLUTCH DISC [35633C / 98–5]

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



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

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



8. INSPECT PACK CLEARANCE OF DIRECT CLUTCH

(a) Install the direct clutch on the transaxle rear cover.

(b) Using a dial indicator, measure the direct clutch pack clearance while applying and releasing compressed air (392 kPa, 4.0 kgf/cm^2, 57 psi).

Park clearance:

0.605 – 0.825 mm (0.02382 – 0.03248 in.)

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

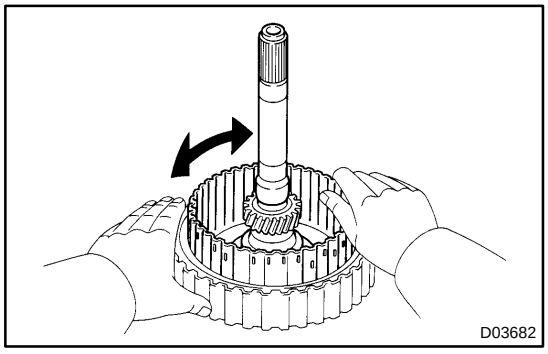
If the stroke is non–standard, select another flange.

HINT:

There are 6 flanges of different thickness.

Flange thickness: mm (in.)

No.	Thickness	No.	Thickness
1	3.0 (0.118)	4	3.3 (0.130)
2	3.1 (0.122)	5	3.4 (0.134)
3	3.2 (0.126)	6	3.5 (0.138)



9. INSPECT DIRECT MULTIPLE DISC CLUTCH DISC [35633C / 98–5]

(a) Inspect the clutch disc rotation.

(1) Check that the disc rotates when rotating the disc after inserting the rear planetary sun gear.

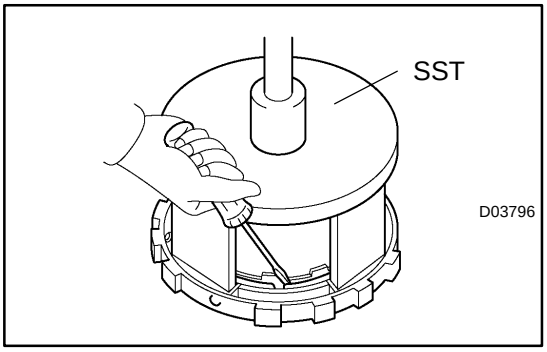
NOTICE:

Do not place the rear planetary sun gear in a vise.

SECOND BRAKE PISTON ASSY (U241E)

4006S–01

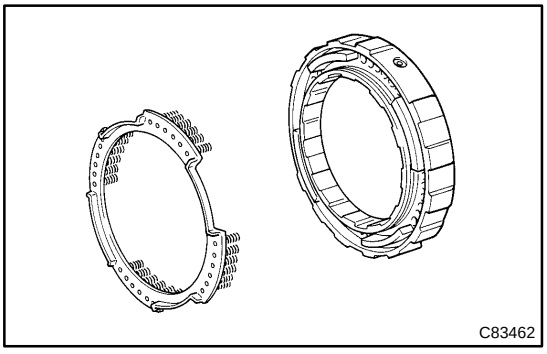
OVERHAUL



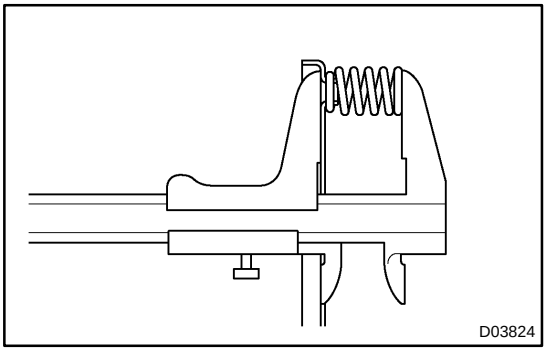
1. REMOVE 2ND BRAKE PISTON RETURN SPRING SUB–ASSY
[35608 / 98–6]

(a) Place SST on the return spring and compress.
SST 09387–00060

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

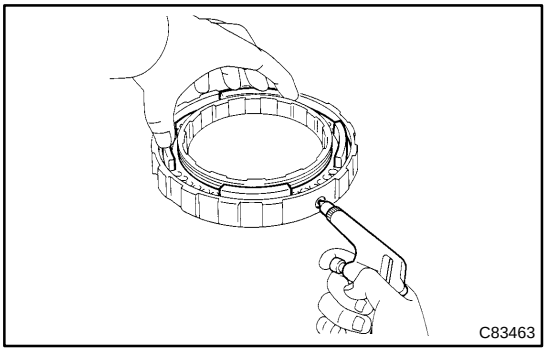


(c) Remove the piston return spring.



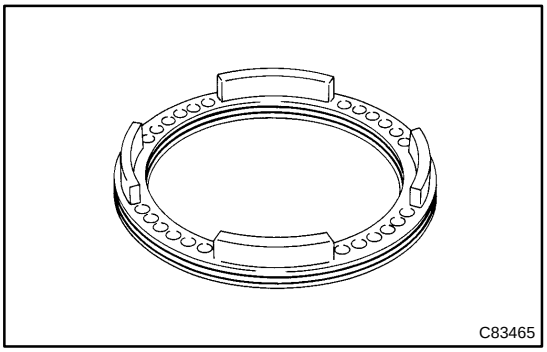
2. INSPECT 2ND BRAKE PISTON RETURN SPRING SUB–ASSY
[35608 / 98–6]

(a) Using vernier calipers, measure the free length of the spring together with the spring seat.
Standard free length: 16.61 mm (0.6539 in.)



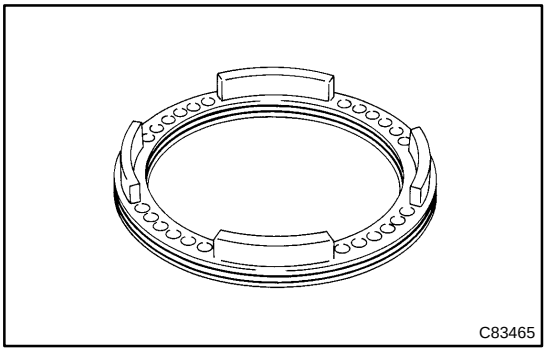
3. REMOVE 2ND BRAKE PISTON
[35624 / 98–6]

(a) Hold the 2ND brake piston and apply compressed air (392 kPa, 4.0 kgf/cm^2, 57 psi) to the 2ND brake cylinder to remove the 2ND brake piston.



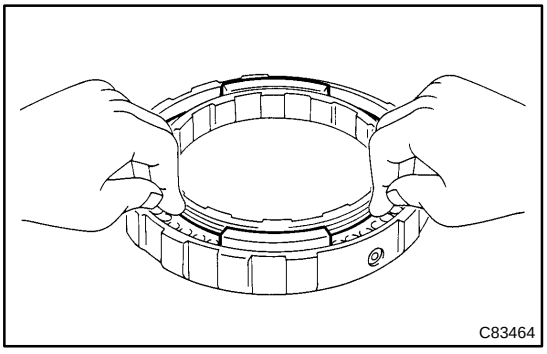
4. REMOVE 2ND BRAKE PISTON O–RING
[35624A / 98–6]

(a) Remove the 2 O–rings from the 2ND brake piston.



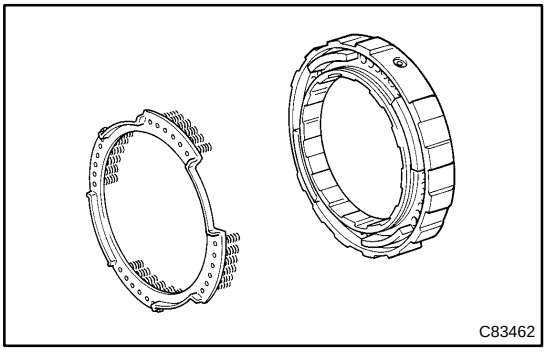
5. INSTALL 2ND BRAKE PISTON O–RING
[35624A / 98–6]

(a) Coat 2 new O–rings with ATF and install them in the 2ND brake piston.



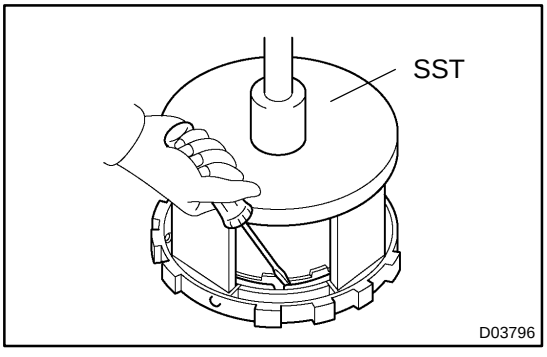
6. INSTALL 2ND BRAKE PISTON
[35624 / 98–6]

(a) Press in the 2ND brake piston into the 2ND brake cylinder with your hands.



7. INSTALL 2ND BRAKE PISTON RETURN SPRING SUB–ASSY
[35608 / 98–6]

(a) Install the piston return spring.



(b) Place SST on the piston return spring, and compress the piston return spring with a press.
SST 09387–00060

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

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

UNDERDRIVE CLUTCH ASSY (U241E)

4006T–01

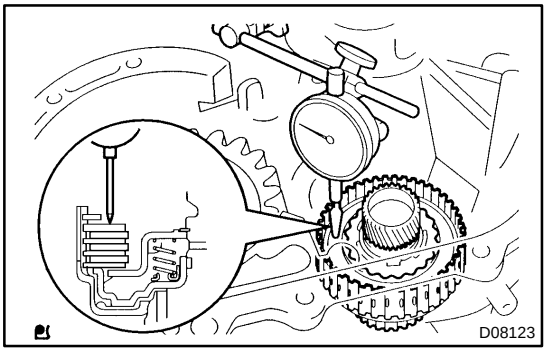
OVERHAUL

1. INSPECT UNDERDRIVE PACK CLEARANCE

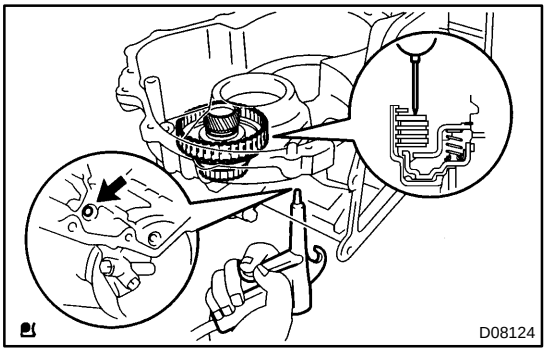
(a) Inspect the U/D clutch to the transaxle case.

NOTICE:

Be careful not to damage the oil seal rings.



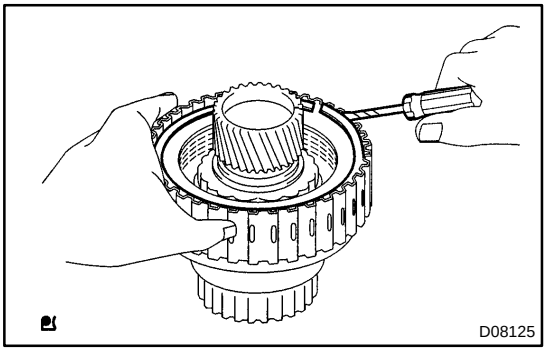
(b) Install a dial indicator as shown in the illustration.



(c) Measure the U/D clutch pack clearance while applying and releasing compressed air (392 kPa, 4.0 kgf/cm^2, 57 psi).

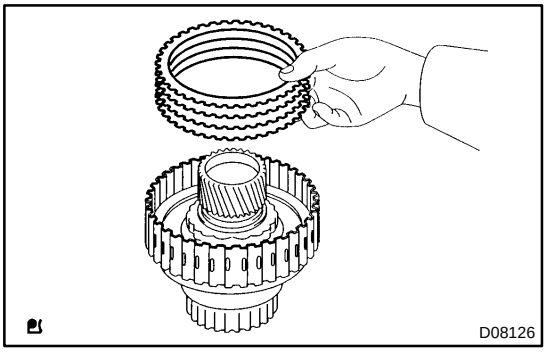
Pack clearance: 1.51 – 1.90 mm (0.0594 – 0.0748 in.)

If the pack clearance is non–standard, inspect the discs, plates and flange.

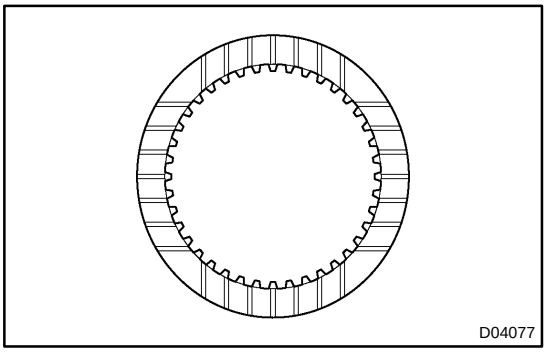


2. REMOVE UNDERDRIVE CLUTCH DISC NO.1 [34261 / 98–4]

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



(b) Remove the flange, 3 discs and 3 plates from the U/D clutch drum.

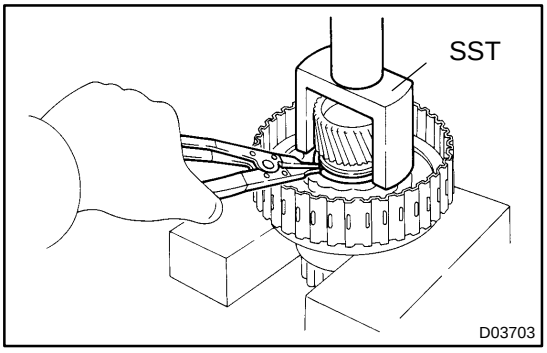


3. INSPECT UNDERDRIVE CLUTCH DISC NO.1 [34261 / 98–4]

(a) 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 mark is defaced, replace all discs.
- Before assembling new discs, soak them in ATF for at least 15 minutes.



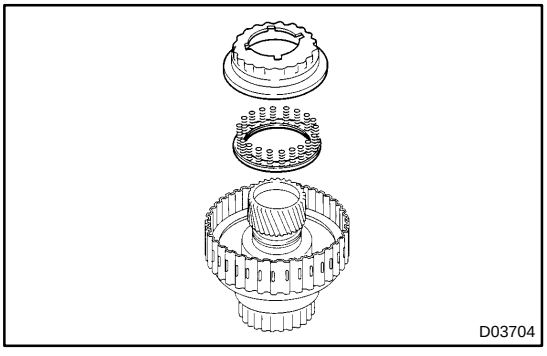
4. REMOVE UNDERDRIVE CLUTCH PISTON SET [34205B / 98–4]

(a) Place SST on the clutch balancer and compress the spring with a press.
SST 09350–32014 (09351–32070)

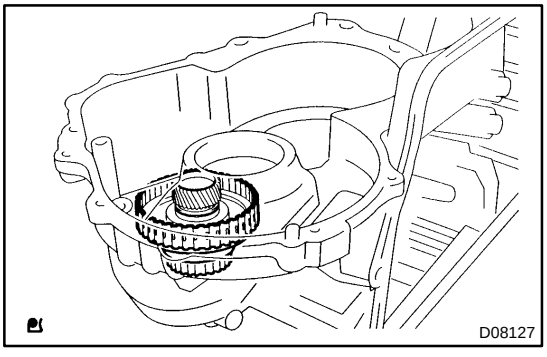
(b) Using a snap ring expander, remove the snap ring.

NOTICE:

- **Stop the press when the spring sheet is lowered to 1 – 2 mm (0.039 – 0.078 in.) from the snap ring grove.**
- **This prevents the spring sheet from being deformed.**
- **Do not expand the snap ring excessively.**



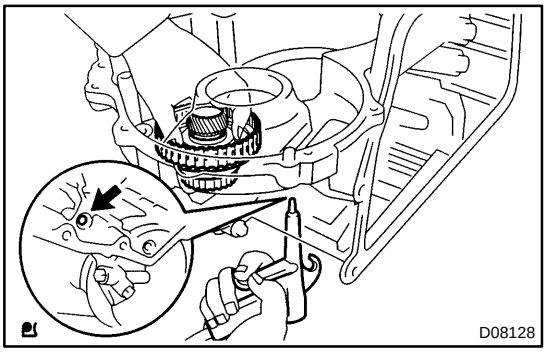
(c) Remove the clutch balancer and piston return spring from the U/D clutch drum.



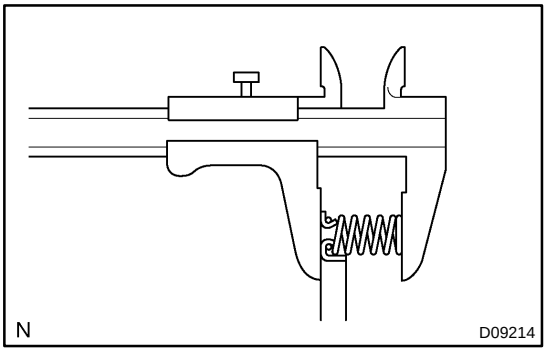
(d) Install the U/D clutch to the transaxle case.

NOTICE:

Be careful not to damage the oil seal rings.

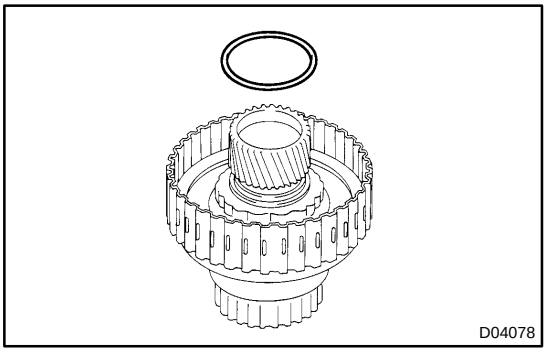


(e) Holding the U/D clutch piston with your hand, apply compressed air (392 kPa, 4.0 kgf/cm^2, 57 psi) to the transaxle case to remove the U/D clutch piston.

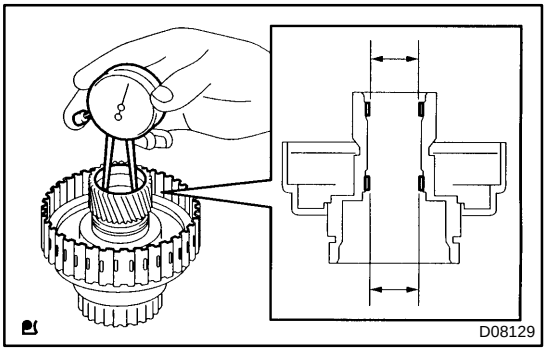


5. INSPECT UNDERDRIVE CLUTCH RETURN SPRING SUB–ASSY
[34206 / 98–4]

(a) Using vernier calipers, measure the free length of the spring together with the spring seat.
Standard free length: 17.14 mm (0.6748 in.)



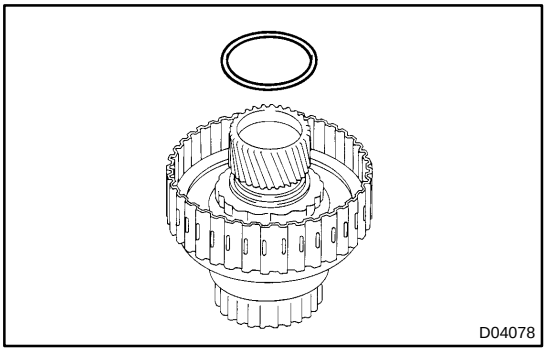
6. REMOVE UNDERDRIVE CLUTCH DRUM O–RING
[34204A / 98–4]



7. INSPECT UNDERDRIVE CLUTCH DRUM SUB–ASSY
[34204 / 98–4]

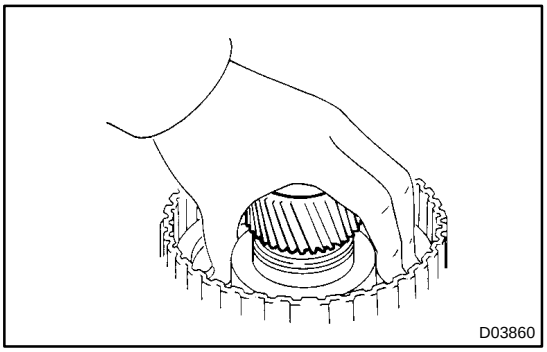
(a) Using a dial indicator, measure the inside diameter of the U/D clutch drum bushing.
Standard drum bushing:
32.56 – 32.58 mm (1.2818 – 1.2826 in.)
Maximum drum bushing: 32.63 mm (1.2846 in.)

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



8. INSTALL UNDERDRIVE CLUTCH DRUM O–RING
[34204A / 98–4]

(a) Coat a new O–ring with ATF and install it to the U/D clutch drum.

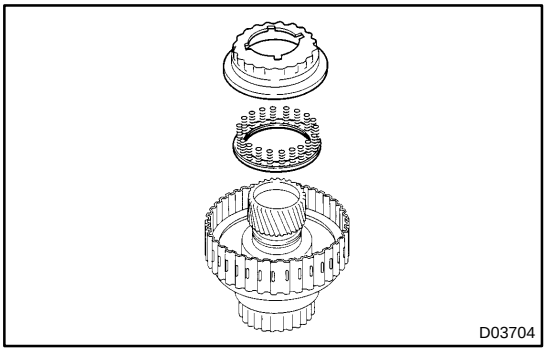


9. INSTALL UNDERDRIVE CLUTCH PISTON SET [34205B / 98–4]

(a) Coat the U/D clutch piston with ATF, and install it to the U/D clutch piston drum.

NOTICE:

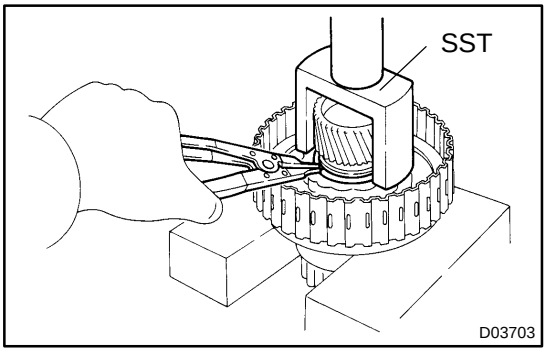
Be careful not to damage the O–ring.



(b) Install the piston return spring and clutch balancer to the U/D clutch drum.

NOTICE:

Be careful not to damage the lip seal of the clutch balancer.

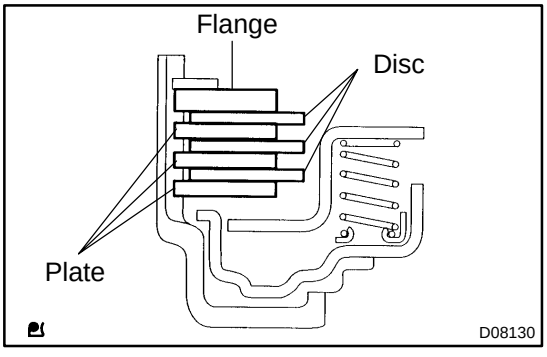


(c) Place SST on the clutch balancer and compress the piston return spring with a press.
09350–32014 (09351–32070)

(d) Using a snap ring expander, install the snap ring to U/D clutch drum.

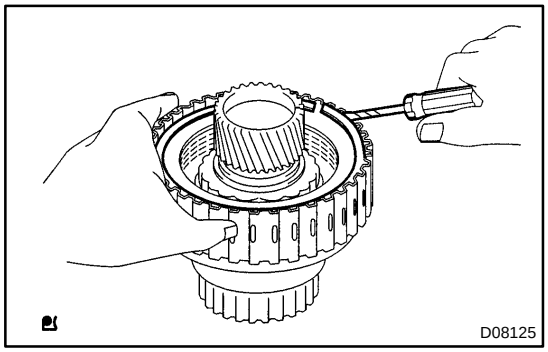
NOTICE:

- **Be sure the end gap of the snap ring is not aligned with the clutch balancer's claw.**
- **Stop the press when the spring sheet is lowered to 1 – 2 mm (0.039 – 0.078 in.) from the snap ring groove.**
- **This prevents the spring sheet from being deformed.**
- **Do not expand the snap ring excessively.**



10. INSTALL UNDERDRIVE CLUTCH DISC NO.1 [34261 / 98–4]

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



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

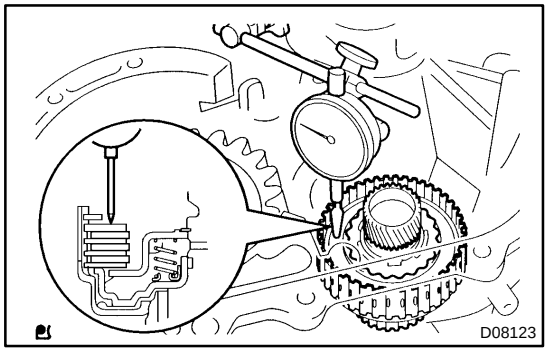
(c) Check that the end gap of the snap ring is not aligned with one of the cutouts.

11. INSPECT UNDERDRIVE PACK CLEARANCE

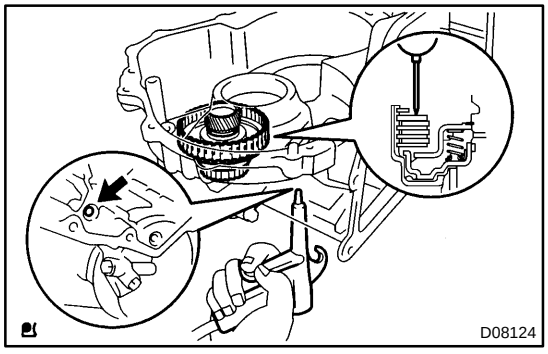
(a) Install the U/D clutch to the transaxle case.

NOTICE:

Be careful not to damage the oil seal rings.



(b) Set a dial indicator as shown in the illustration.



(c) Measure the U/D clutch piston stroke while applying and releasing compressed air (392 kPa, 4.0 kgf/cm^2, 57 psi).

Park clearance: 1.51 – 1.90 mm (0.0594 – 0.0748 in.)

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

If the park clearance is non–standard, select another flange. There are 3 flanges in different thickness.

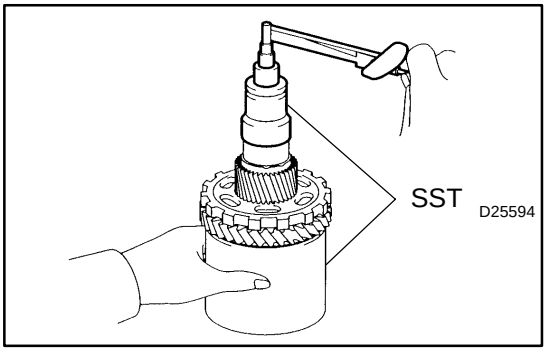
Flange thickness: mm (in.)

No.	Thickness	No.	Thickness
A	3.0 (0.118)	C	3.4 (0.134)
B	3.2 (0.126)	–	–

UNDERDRIVE PLANETARY GEAR ASSY (U241E)

4006U–01

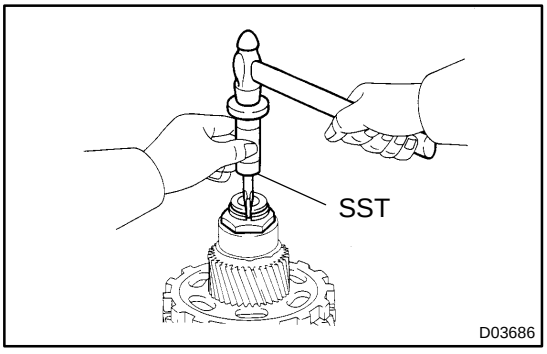
OVERHAUL



1. INSPECT UNDERDRIVE PLANETARY GEAR PRELOAD

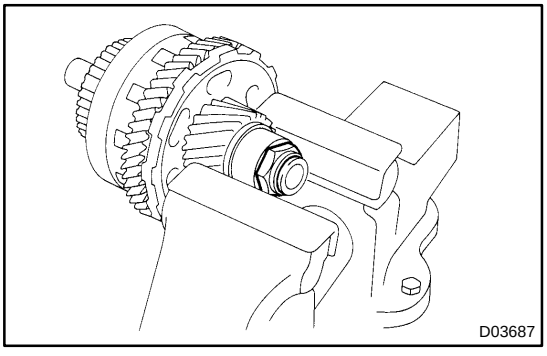
(a) Using SST a torque wrench, measure the turning torque of U/D planetary gear assy while rotating the torque wrench at 60 rpm.
SST 09387–00050, 09564–16020
Turning torque at 60 rpm:
0.23 – 5.01 N·m (2 – 51 kgf·cm, 2.0 – 44.3 in.·lbf)

HINT:
Use a torque wrench with a fulcrum length of 160 mm (6.3 in.).



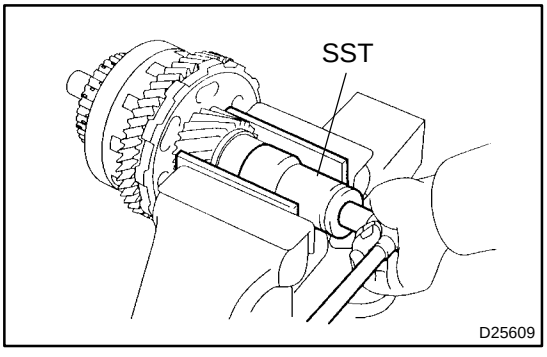
2. REMOVE CYLINDRICAL ROLLER BEARING RACE INNER
[34301F / 98–4]

(a) Using SST, loosen the staked part of the nut.
SST 09930–00010 (09931–00010, 09931–00020), 09387–00050

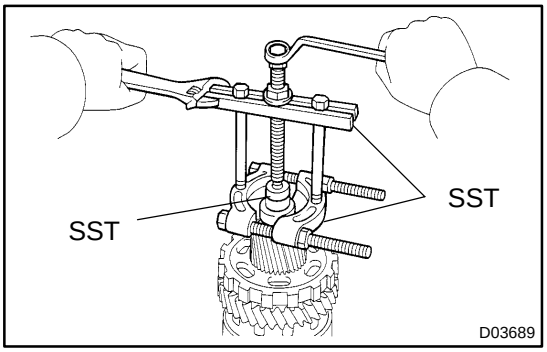


(b) Clamp the U/D planetary gear in soft jaw vise.

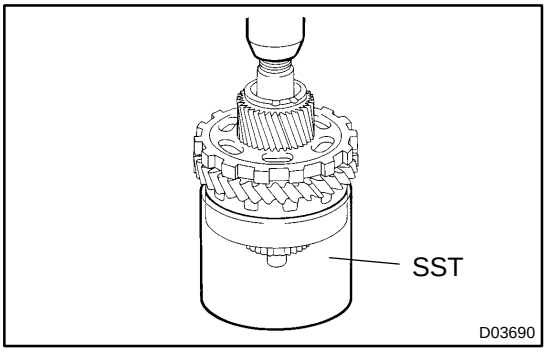
NOTICE:
Be careful not to damage the differential drive pinion.



(c) Using SST, remove lock nut.
SST 09564–16020

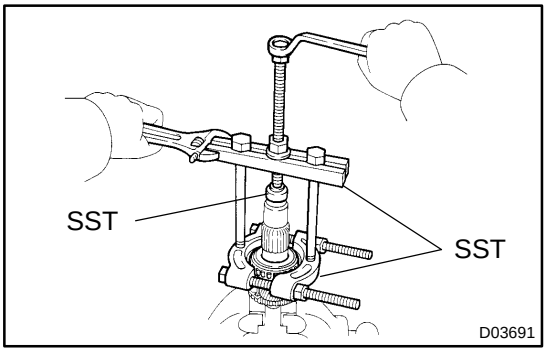


(d) Using SST, remove cylindrical roller bearing inner race.
SST 09950–00020, 09950–00030, 09950–60010 (09951–00340)



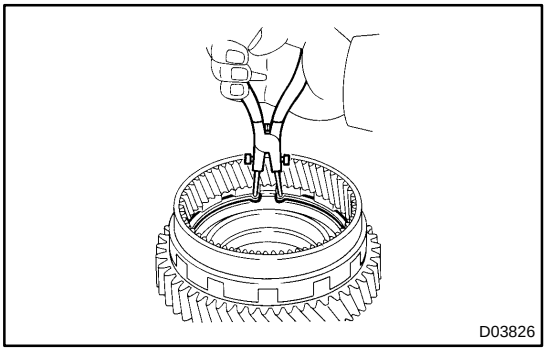
3. REMOVE UNDERDRIVE PLANETARY GEAR ASSY [34330 / 98–4]

(a) Using SST and press, remove the differential drive pinion, parking lock gear, counter driven gear with U/D planetary ring gear and front tapered roller bearing.
SST 09387–00050



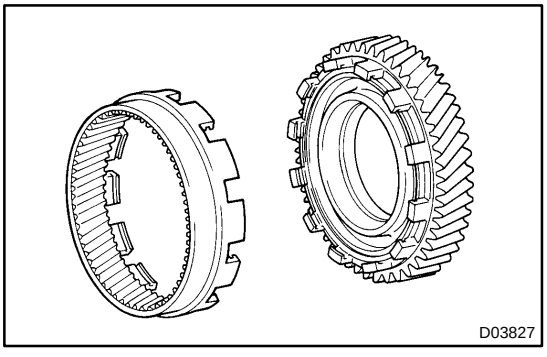
(b) Clamp the U/D planetary gear in soft jaw vise.

(c) Using SST, remove rear tapered roller bearing from the U/D planetary gear.
SST 09950–00020, 09950–00030, 09950–60010 (09951–00320)

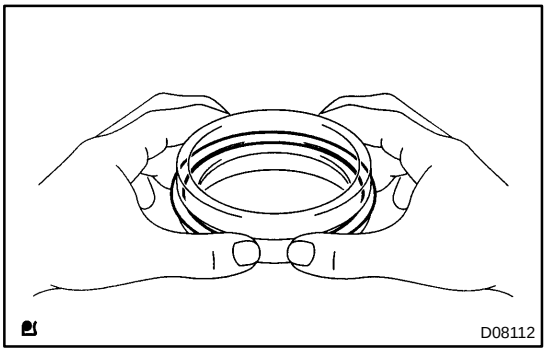


4. REMOVE UNDERDRIVE PLANETARY RING GEAR [34341 / 98–4]

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

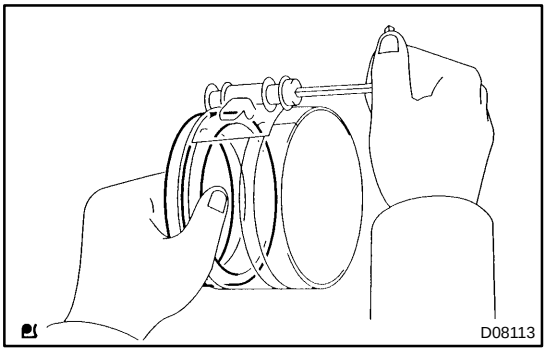


(b) Remove the U/D planetary ring gear from the counter driven gear.

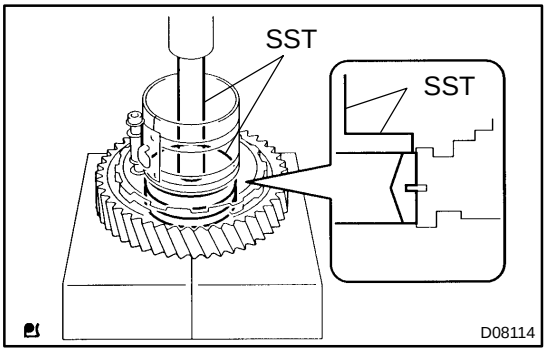


5. INSTALL UNDERDRIVE PLANETARY RING GEAR [34341 / 98–4]

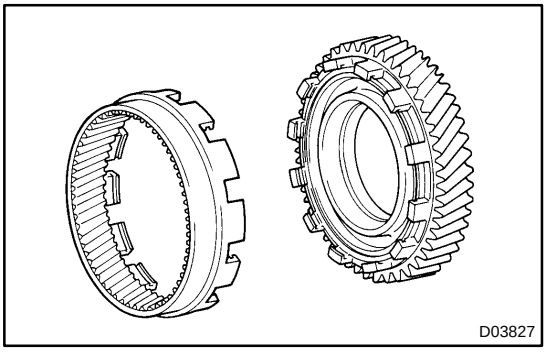
(a) Install a new snap ring to the outer race of the tapered roller bearing.



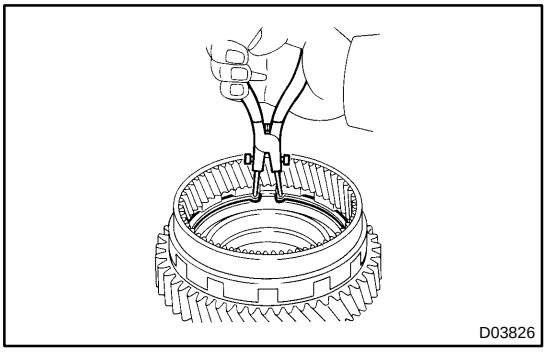
(b) Using a piston ring compressor, squeeze the snap ring.



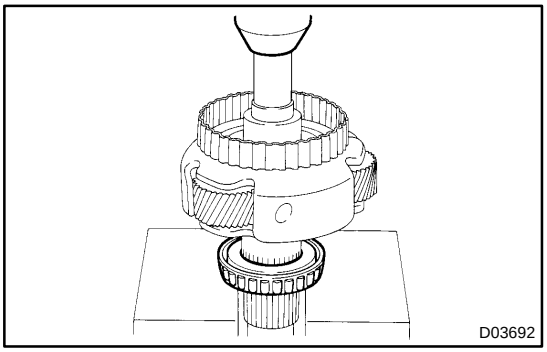
(c) Using SST and a press, press in the outer race of the tapered roller bearing.
SST 09950–60020 (09951–00890), 09950–70010 (09951–07100)



(d) Install the underdrive planetary ring gear to the counter driven gear.

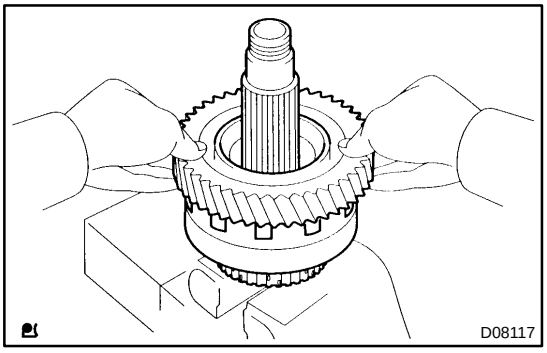


(e) Using snap ring pliers, install the snap ring.

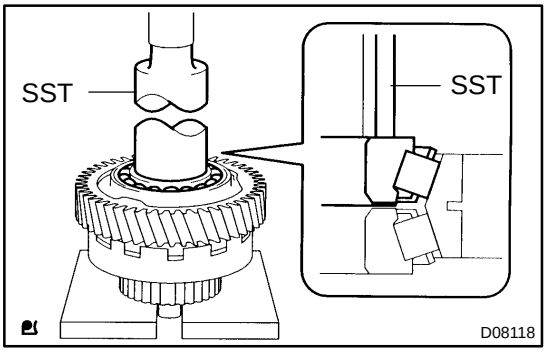


6. INSTALL UNDERDRIVE PLANETARY GEAR ASSY [34330 / 98–4]

(a) Using a press, install the tapered roller bearing.



(b) Install the counter driven gear with planetary ring gear to the U/D planetary gear.

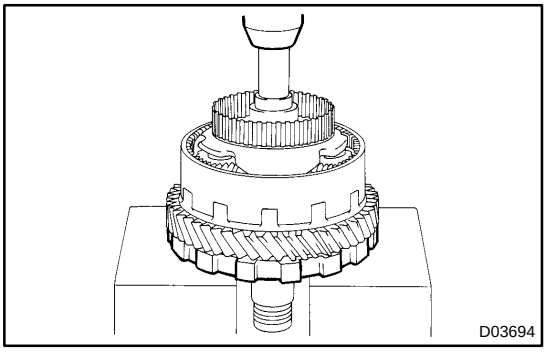


(c) Using SST and a press, press in the tapered roller bearing.

SST 09316–60011 (09316–00011)

NOTICE:

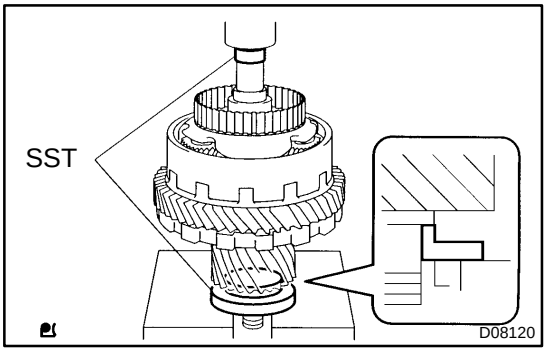
Press in the counter driven gear while rotating it.



(d) Using a press, install the parking lock gear.

NOTICE:

Press in the counter driven gear while rotating it.

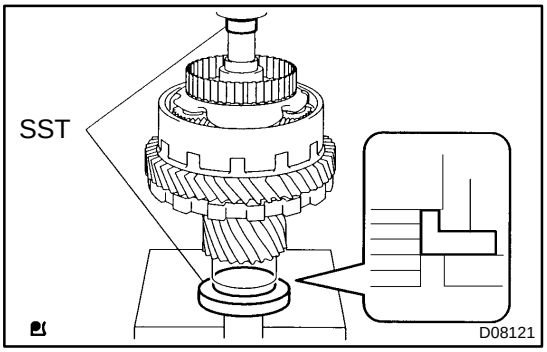


(e) Using SST and a press, install the differential drive pinion.

NOTICE:

Press in the counter driven gear while rotating it.

SST 09506–35010, 09950–60010 (09951–00250)

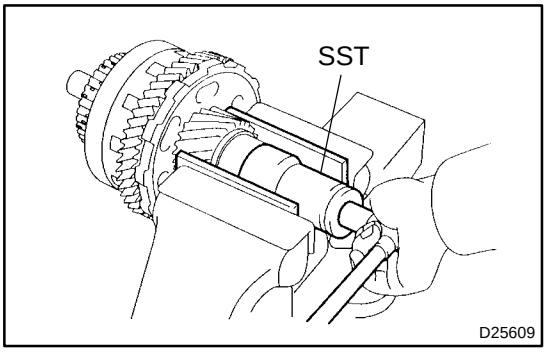


(f) Using SST and a press, press in the cylindrical roller bearing inner race.

NOTICE:

Press in the counter driven gear while rotating it.

SST 09506–35010, 09950–60010 (09951–00250)



(g) Clamp the U/D planetary gear in a soft jaw vise.

NOTICE:

Be careful not to damage the differential drive pinion.

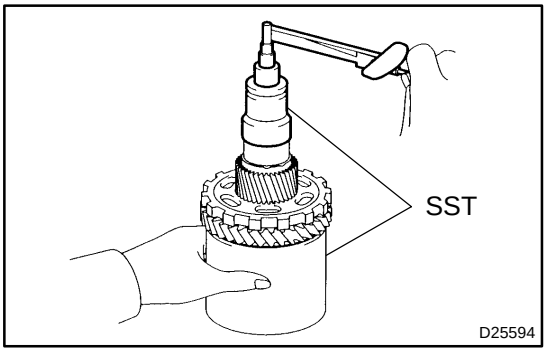
(h) Using SST, install a new lock nut.

Torque: 280 N·m (2,855 kgf·cm, 207 in.·lbf)

SST 09564–16020

HINT:

Use a torque wrench with a fulcrum length of 750 mm (29.53 in.).



(i) Using SST and a torque wrench, measure the turning torque of U/D planetary gear assy while rotating the torque wrench at 60 rpm.

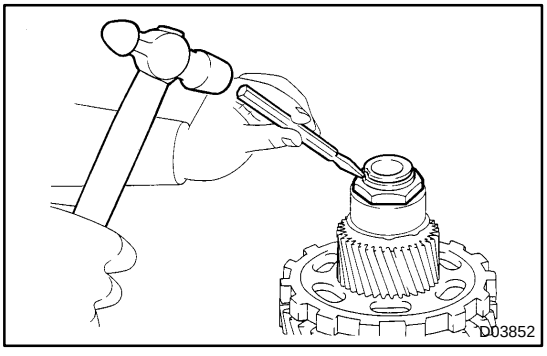
SST 09564–16020, 09387–00050

Turning torque at 60 rpm:

0.23 – 5.01 N·m (2 – 51 kgf·cm, 2.0 – 44.3 in.·lbf)

HINT:

Use a torque wrench with a fulcrum length of 160 mm (6.30 in.).



(j) Using a pin punch and hammer, stake the lock nut.

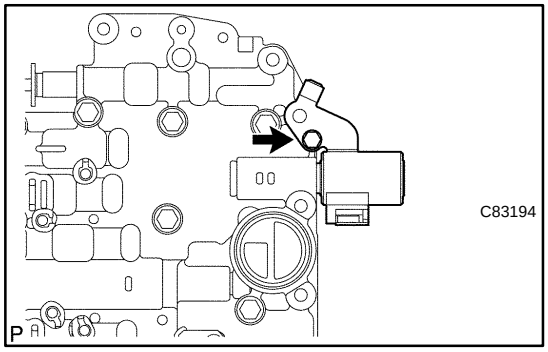
NOTICE:

Make sure that there are no cracks on the nut.

TRANSAXLE VALVE BODY ASSY (U241E)

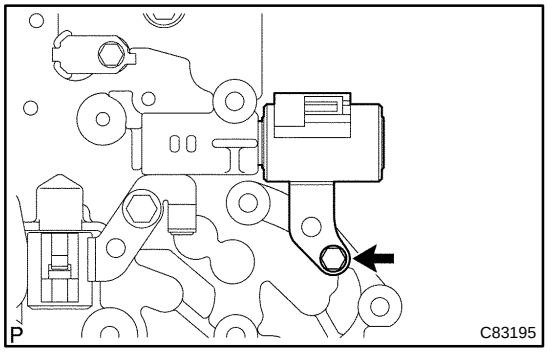
4006V–01

OVERHAUL



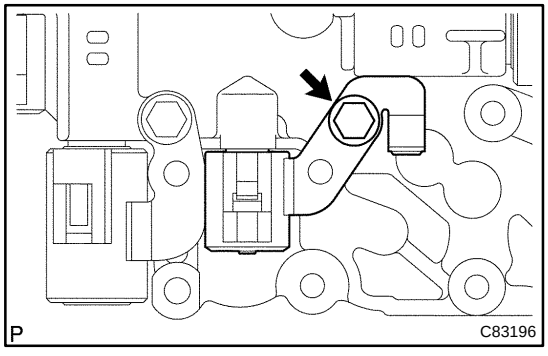
1. REMOVE LINE PRESSURE CONTROL SOLENOID ASSY
[35290A / 98–9]

(a) Remove the bolt and line pressure control solenoid assy.



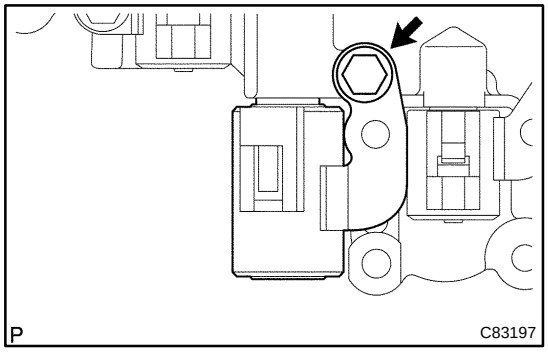
2. REMOVE SHIFT SOLENOID VALVE SL1
[35210 / 98–9]

(a) Remove the bolt and shift solenoid valve SL1.



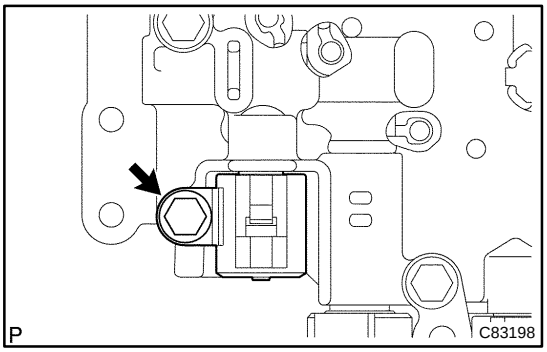
3. REMOVE SHIFT SOLENOID VALVE DSL
[35240 / 98–9]

(a) Remove the bolt and shift solenoid valve DSL.



4. REMOVE SHIFT SOLENOID VALVE SL2
[35220 / 98–9]

(a) Remove the bolt and shift solenoid valve SL2.



5. REMOVE SHIFT SOLENOID VALVE S4
[35230 / 98–9]

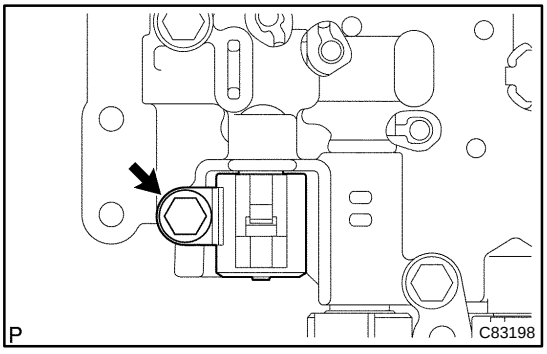
(a) Remove the bolt and shift solenoid valve S4.

6. REMOVE MANUAL VALVE
[35418 / 98–9]

(a) Remove the manual valve from the valve body assy.

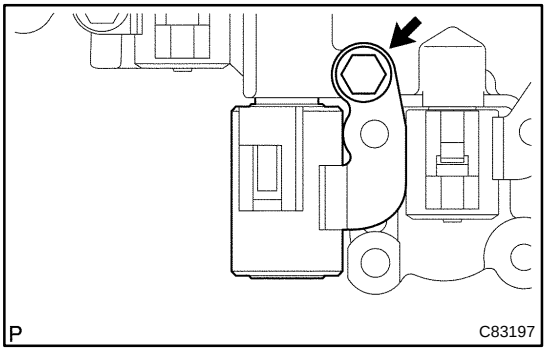
7. INSTALL MANUAL VALVE
[35418 / 98–9]

(a) Coat the manual valve with ATF, install it to the valve body assy.



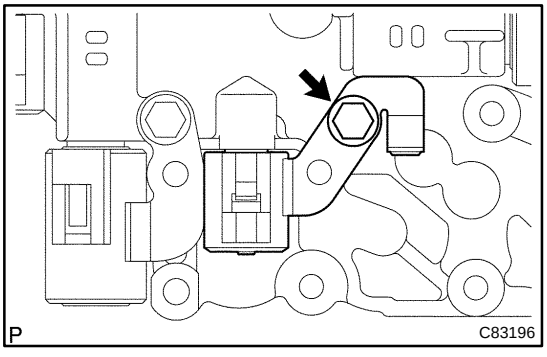
8. INSTALL SHIFT SOLENOID VALVE S4
[35230 / 98–9]

(a) Install the bolt and shift solenoid valve S4.



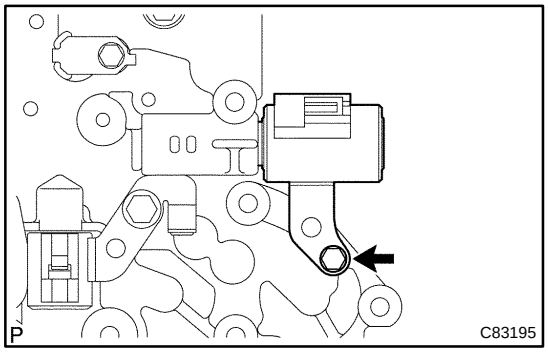
9. INSTALL SHIFT SOLENOID VALVE SL2
[35220 / 98–9]

(a) Install the bolt and shift solenoid valve SL2.



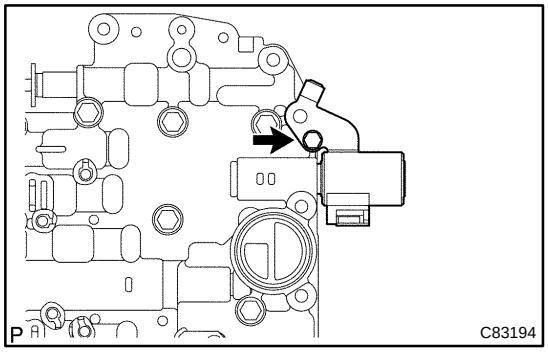
10. INSTALL SHIFT SOLENOID VALVE DSL
[35240 / 98–9]

(a) Install the bolt and shift solenoid valve DSL.



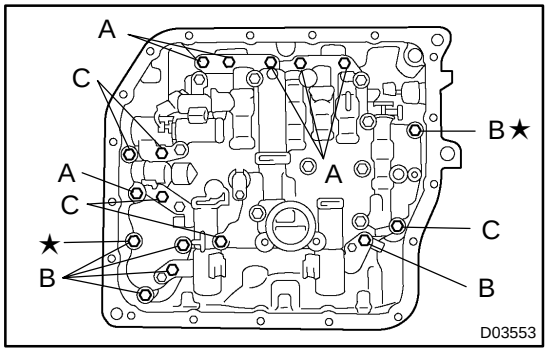
11. INSTALL SHIFT SOLENOID VALVE SL1
[35210 / 98–9]

(a) Install the bolt and shift solenoid valve SL1.



12. INSTALL LINE PRESSURE CONTROL SOLENOID ASSY
[35290A / 98–9]

(a) Install the bolt and line pressure control solenoid assy.



13. INSTALL TRANSMISSION VALVE BODY ASSY
[35410 / 98–9]

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

(b) Install the 17 bolts.
Torque: 11 N·m (110 kgf·cm, 8 ft·lbf)
Bolt length:
Bolt A: 25 mm (0.984 in.)
Bolt B: 41 mm (1.614 in.)
Bolt C: 45 mm (1.771 in.)

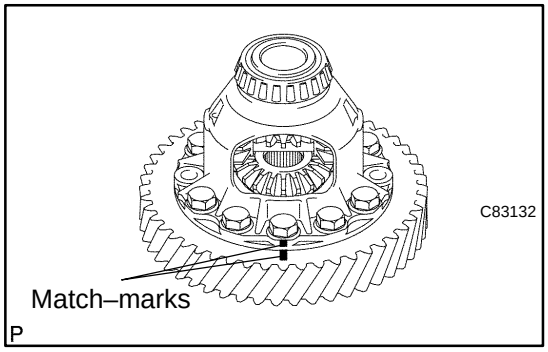
NOTICE:

- **Push the valve body against the accumulator piston spring and the check ball body to install it.**
- **Tighten those bolts marked by ★ in the illustration first temporarily because they are positioning bolts.**

FRONT DIFFERENTIAL ASSY (U241E)

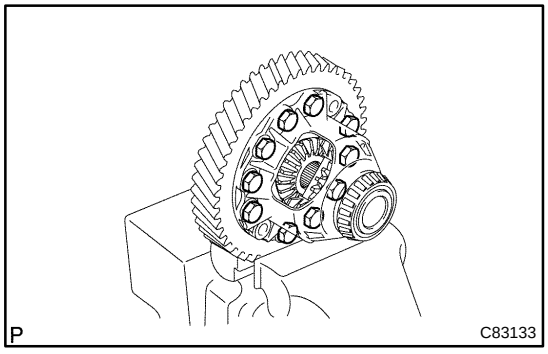
4006W–01

OVERHAUL

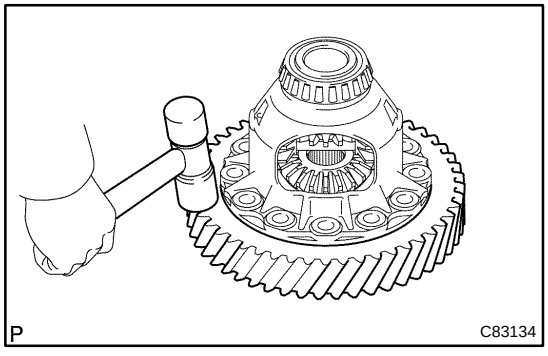


1. REMOVE FRONT DIFFERENTIAL RING GEAR [41221 / 98–12]

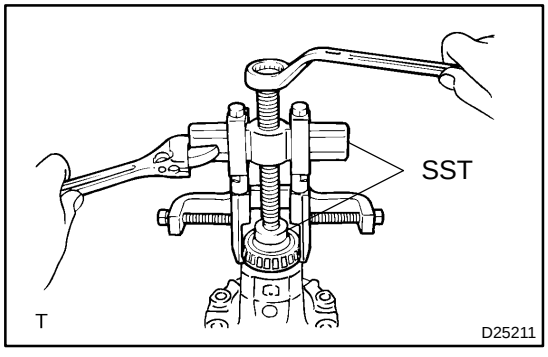
(a) Place the match–marks on the ring gear and differential case.



(b) Remove the 10 bolts.



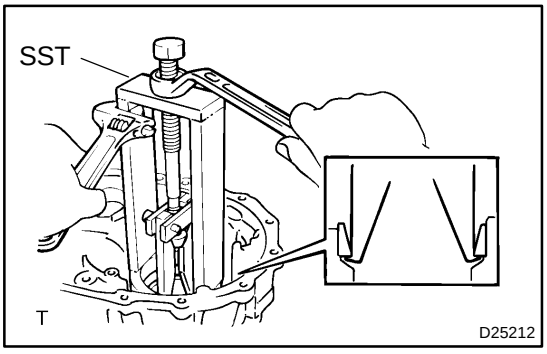
(c) Using a plastic hammer, tap on the ring gear to remove it from the case.



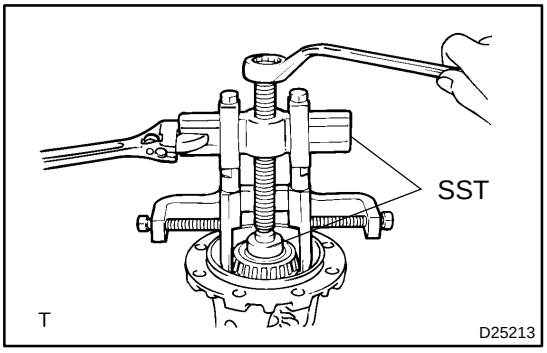
2. REMOVE FR DIFFERENTIAL CASE FRONT TAPERED ROLLER BEARING [41311E / 98–12]

(a) Using SST, remove the front differential case tapered roller bearing front inner race from the differential case.

SST 09950–40011 (09951–04020, 09952–04010, 09953–04020, 09954–04010, 09955–04061, 09957–04010, 09958–04011), 09950–60010 (09951–00340)

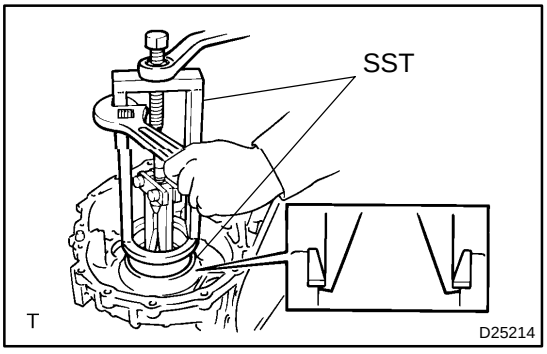


(b) Using SST, remove the front differential case tapered roller bearing front outer race and differential case washer.
SST 09387–00040 (09387–01030, 09387–01040, 09387–02010, 09387–02020)

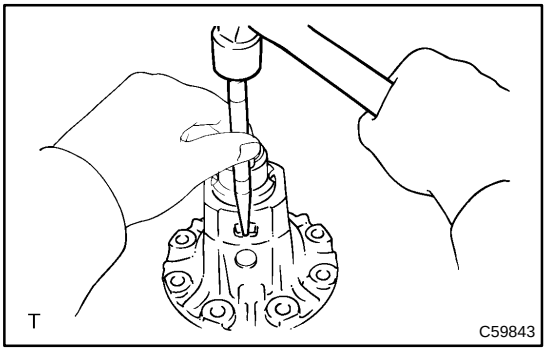


3. REMOVE FR DIFFERENTIAL CASE REAR TAPERED ROLLER BEARING
[41311F / 98–12]

(a) Using SST, remove the front differential case tapered roller bearing rear inner race from the differential case.
SST 09950–40011 (09951–04020, 09952–04010, 09953–04020, 09954–04010, 09955–04061, 09957–04010, 09958–04011), 09950–60010 (09951–00340)

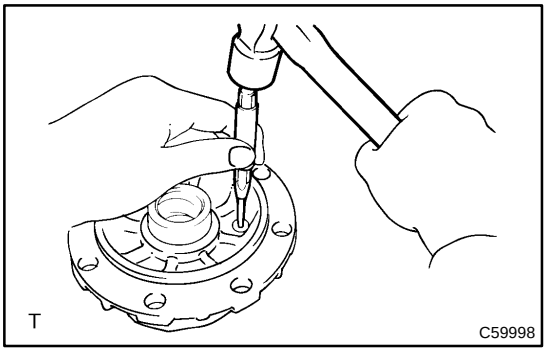


(b) Using SST, remove the front differential case tapered roller bearing rear outer race and differential case washer.
SST 09387–00040 (09387–01030, 09387–01040, 09387–02010, 09387–02020)

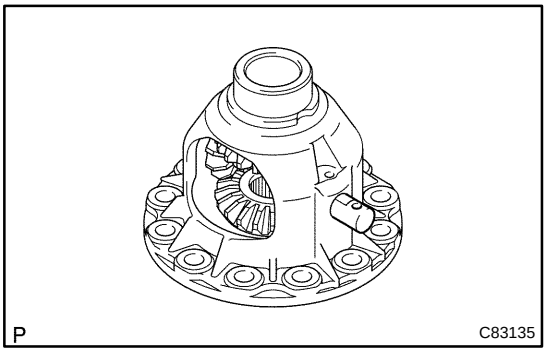


4. REMOVE FRONT DIFFERENTIAL PINION SHAFT STRAIGHT PIN
[41342A / 98–12]

(a) Using a punch and a hammer, loosen the staked part of the differential case.



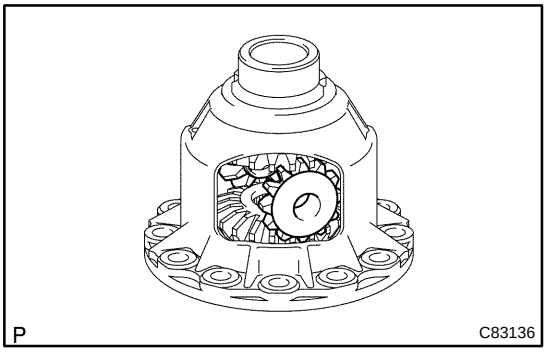
(b) Using a pin punch (5 mm), drive out the pin from the ring gear side.



5. REMOVE FRONT DIFFERENTIAL PINION SHAFT NO.1

[41342F / 98–12]

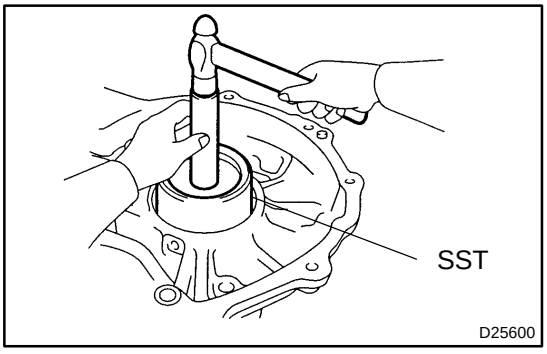
(a) Remove the front differential pinion shaft No. 1 from the differential case.



6. REMOVE FRONT DIFFERENTIAL SIDE GEAR

[41331F / 98–12]

(a) Remove the 2 front differential pinions, 2 pinion thrust washers, 2 front differential side gears and 2 side gear thrust washers from the differential case.

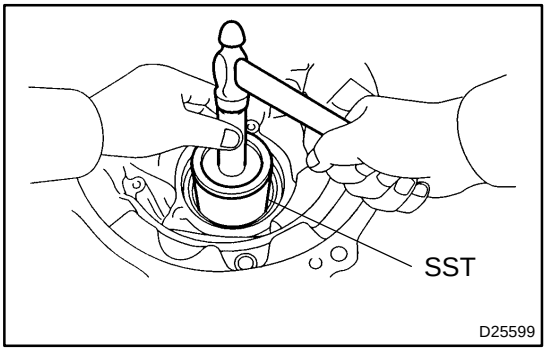


7. REMOVE DIFFERENTIAL SIDE BEARING RETAINER OIL SEAL

[41141H / 98–12]

(a) Place the transaxle case in a vise.

(b) Using SST, remove the oil seal.
SST 09308–00010

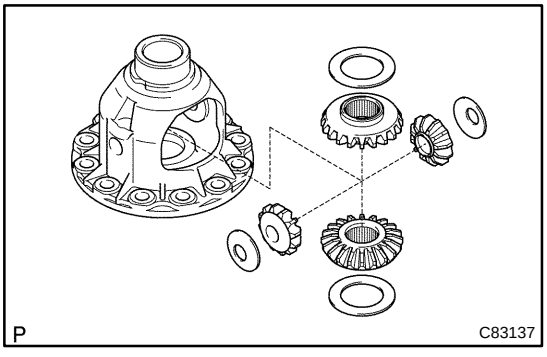


8. REMOVE TRANSAXLE HOUSING OIL SEAL

[35111D / 98–12]

(a) Place the transaxle housing in a vise.

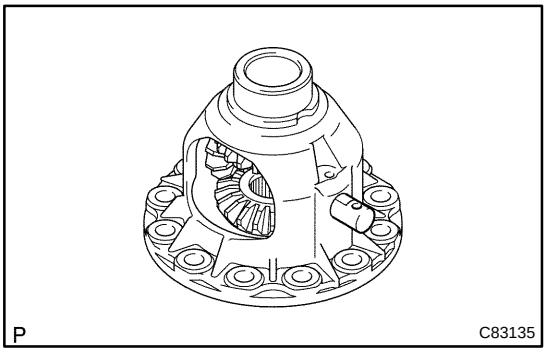
(b) Using SST, remove the oil seal.
SST 09308–00010



9. INSTALL FRONT DIFFERENTIAL SIDE GEAR

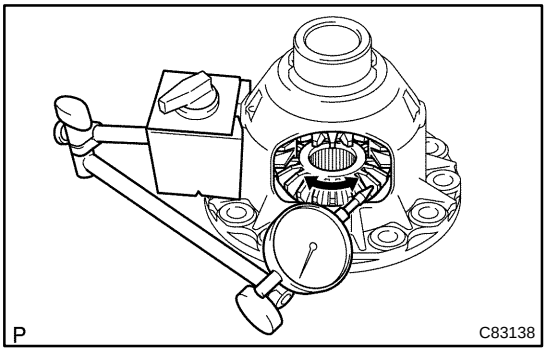
[41331F / 98–12]

(a) Coat the 2 front differential side gears, 2 side gear thrust washers, 2 front differential pinions and 2 pinion thrust washers with ATF and install them to the differential case.



10. INSTALL FRONT DIFFERENTIAL PINION SHAFT NO.1 [41342F / 98–12]

(a) Coat the front differential pinion shaft No. 1 with ATF and install it to the differential case.

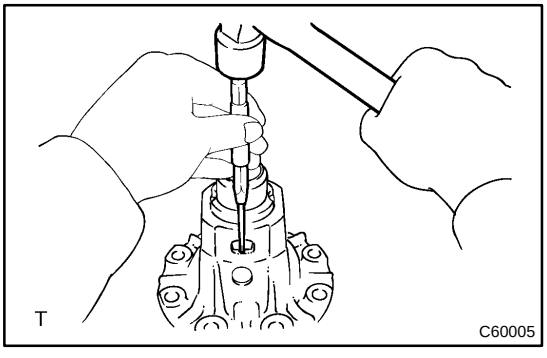


11. INSPECT FRONT DIFFERENTIAL SIDE GEAR BACKLASH

(a) Using a dial indicator, inspect the backlash of the side gear.

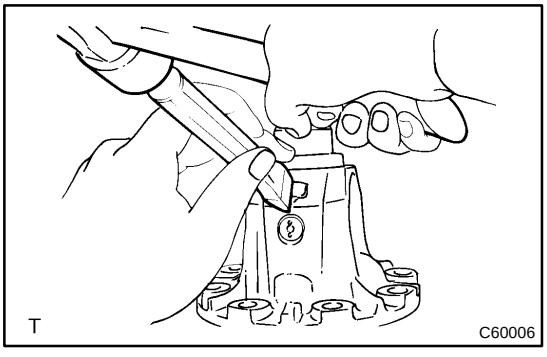
Standard backlash:
0.05 – 0.20 mm (0.0020 – 0.0079 in.)
Thrust washer thickness:

Mark	Thickness
–	1.0 mm (0.0394 in.)
–	1.1 mm (0.0433in.)
–	1.2 mm (0.0472 in.)
–	1.3 mm (0.0512 in.)

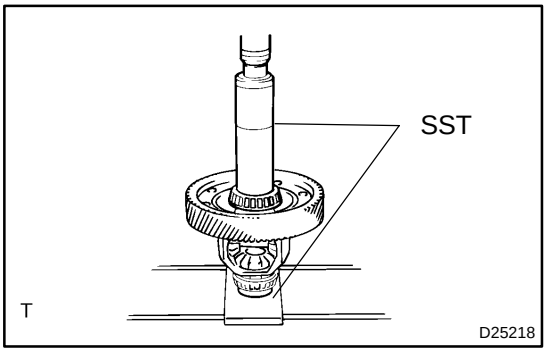


12. INSTALL FRONT DIFFERENTIAL PINION SHAFT STRAIGHT PIN [41342A / 98–12]

(a) Using a pin punch and hammer, install the pinion shaft straight pin.

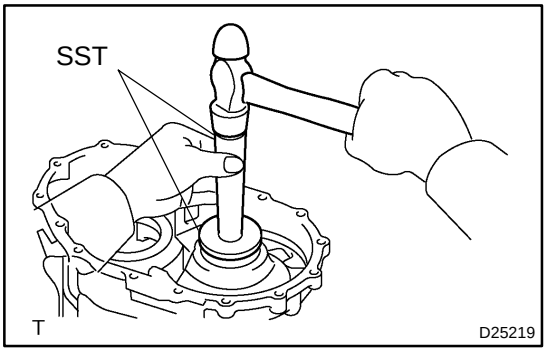


(b) Using a chisel and hammer, stake the differential case.

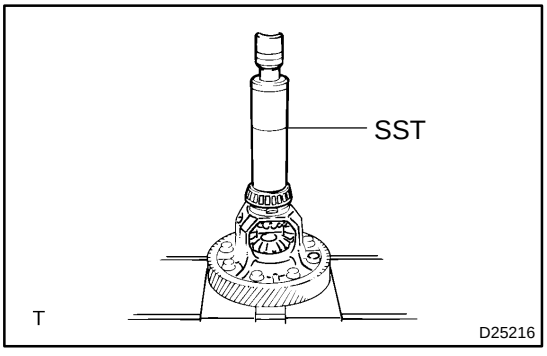


13. INSTALL FR DIFFERENTIAL CASE REAR TAPERED ROLLER BEARING
[41311F / 98–12]

(a) Using SST and a press, install the front differential case tapered roller bearing rear inner race to the differential case.
SST 09608–06041

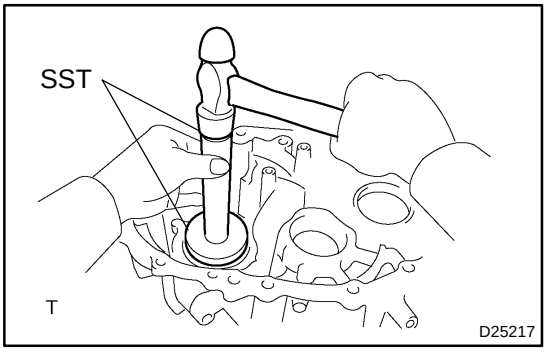


(b) Using SST and a hammer, install the case washer and front differential case tapered roller bearing rear outer race to the transaxle case.
SST 09950–60020 (09951–00710), 09950–70010 (09951–07100)

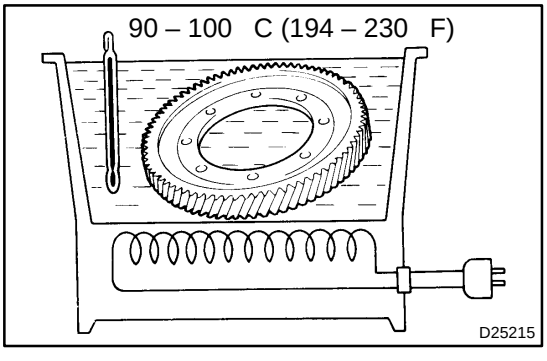


14. INSTALL FR DIFFERENTIAL CASE FRONT TAPERED ROLLER BEARING
[41311E / 98–12]

(a) Using SST and a press, install the front differential case tapered roller bearing front inner race to the differential case.
SST 09608–06041



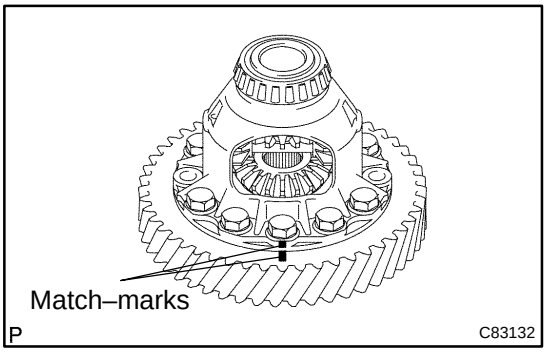
(b) Using SST and a hammer, install the front differential case tapered roller bearing front outer race to the transaxle housing.
SST 09950–60020 (09951–00680), 09950–70010 (09951–07100), 09950–60010 (09951–00340)



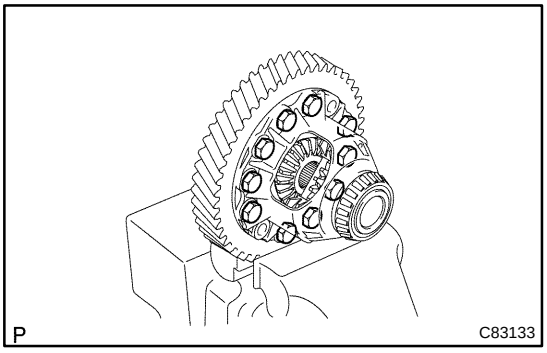
15. INSTALL FRONT DIFFERENTIAL RING GEAR
[41221 / 98–12]

(a) Using ATF and heat, heat the front differential ring gear to 90 – 110 C (194.0 – 230.0 F).

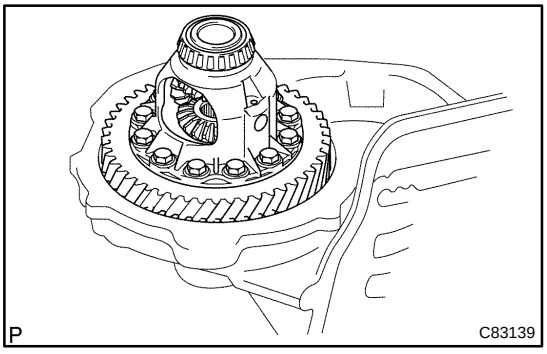
(b) Clean the contact surface of the front differential case.



(c) Set the match–marks, install the front differential ring gear case quickly.



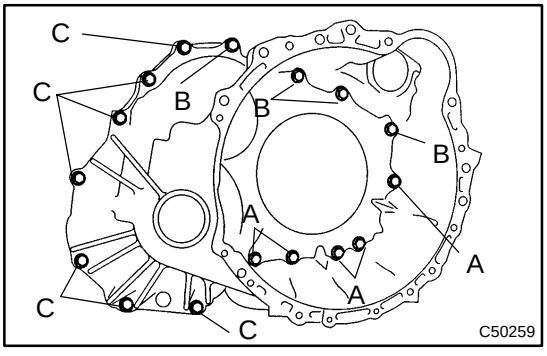
(d) Tighten the 10 bolts.
Torque: 95 N·m (969 kgf·cm, 70 ft·lbf)



16. INSPECT TAPERED ROLLER BEARING PRELOAD

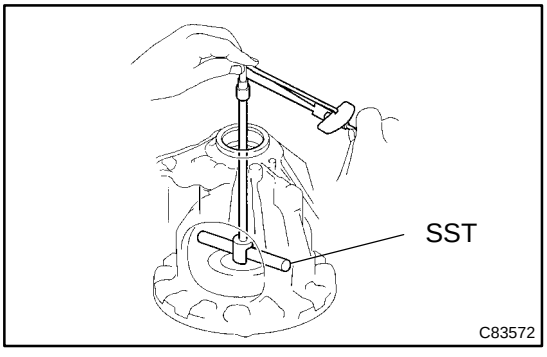
(a) Install the differential assy to the transaxle case.

(b) Install the transaxle housing to the transaxle case.

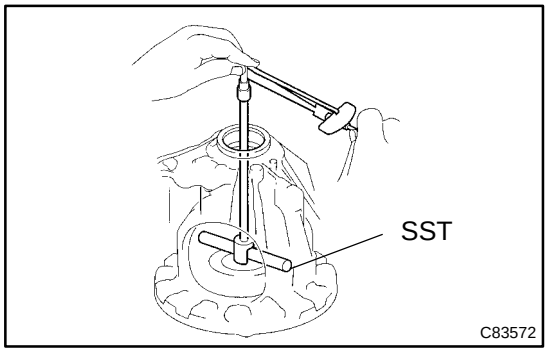


(c) Install the 16 bolts.
Torque:
Bolt A, B: 29.4 N·m (300 kgf·cm, 21.7 ft·lbf)
Bolt C: 22.1 N·m (225 kgf·cm, 16.3 ft·lbf)

Bolt	Bolt length (mm)
A, B	42
C	50

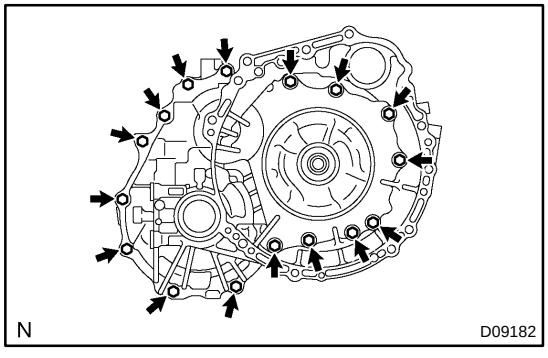


(d) Using SST, turn the differential assy.
SST 09564–32011

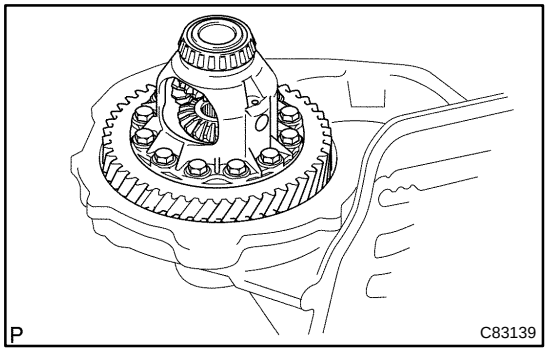


(e) Using SST and torque wrench, measure the preload of the differential assy.
SST 09564–32011
Preload
New bearing:
0.20 – 0.69 N·m (2.0 – 7.0 kgf·cm, 1.8 – 6.1 in.·lbf)
Used bearing:
0.10 – 0.35 N·m (1.0 – 3.6 kgf·cm, 0.9 – 3.1 in.·lbf)
Adjusting shim thickness: mm (in.)

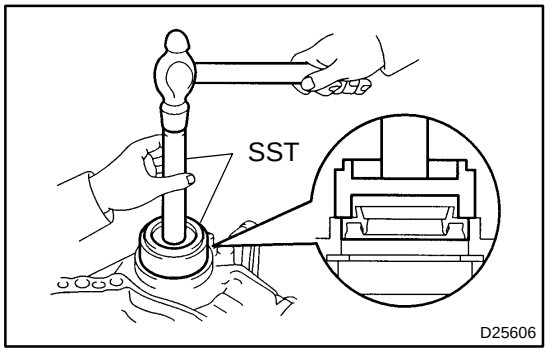
Mark	Thickness
0	1.90 (0.074)
1	1.95 (0.077)
2	2.00 (0.079)
3	2.05 (0.081)
4	2.10 (0.083)
5	2.15 (0.085)
6	2.20 (0.087)
7	2.25 (0.089)
8	2.30 (0.091)
9	2.35 (0.093)
A	2.40 (0.094)
B	2.45 (0.096)
C	2.50 (0.098)
D	2.55 (0.100)
E	2.60 (0.102)
F	2.65 (0.104)
G	2.70 (0.106)
H	2.75 (0.108)
J	2.80 (0.110)



(f) Remove the 16 bolts.
(g) Using a soft-faced hammer, remove the transaxle housing.



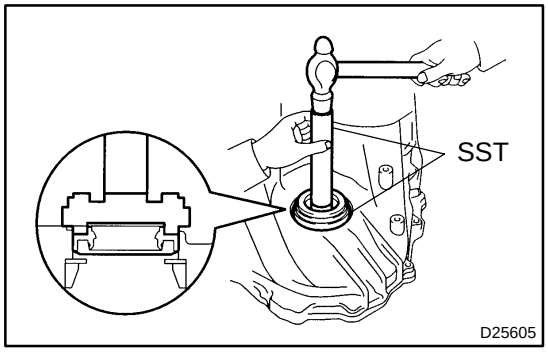
(h) Remove the differential assy.



17. INSTALL TRANSAXLE HOUSING OIL SEAL
[35111D / 98–12]

(a) Using SST, drive in a new oil seal.
SST 09350–32014 (09351–32150), 09950–70010 (09951–07150)

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



18. INSTALL DIFFERENTIAL SIDE BEARING RETAINER OIL SEAL
[41141H / 98–12]

(a) Using SST, drive in a new oil seal.
SST 09350–32014 (09351–32150), 09950–70010 (09951–07150)

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

COMPONENTS

522410 98–1

3501/TRANSAXLE OR TRANSMISSION ASSY & GASKET KIT (ATM) 98–1

3502/TORQUE CONVERTER, FRONT OIL PUMP & CHAIN (ATM) 98–2

3503/TRANSAXLE CASE & OIL PAN (ATM) 98–3

3506/OVERDRIVE GEAR (ATM) 98–4

3507/BRAKE BAND & MULTIPLE DISC CLUTCH (ATM) 98–5

3508/CENTER SUPPORT & PLANETARY SUN GEAR (ATM) 98–6

3509/BRAKE NO.3, 1ST & REVERSE BRAKE (ATM) 98–7

3510/PLANETARY GEAR, REVERSE PISTON & COUNTER GEAR (ATM) 98–8

3512/VALVE BODY & OIL STRAINER (ATM) ... 98–9

3512/VALVE BODY & OIL STRAINER (ATM) ... 98–10

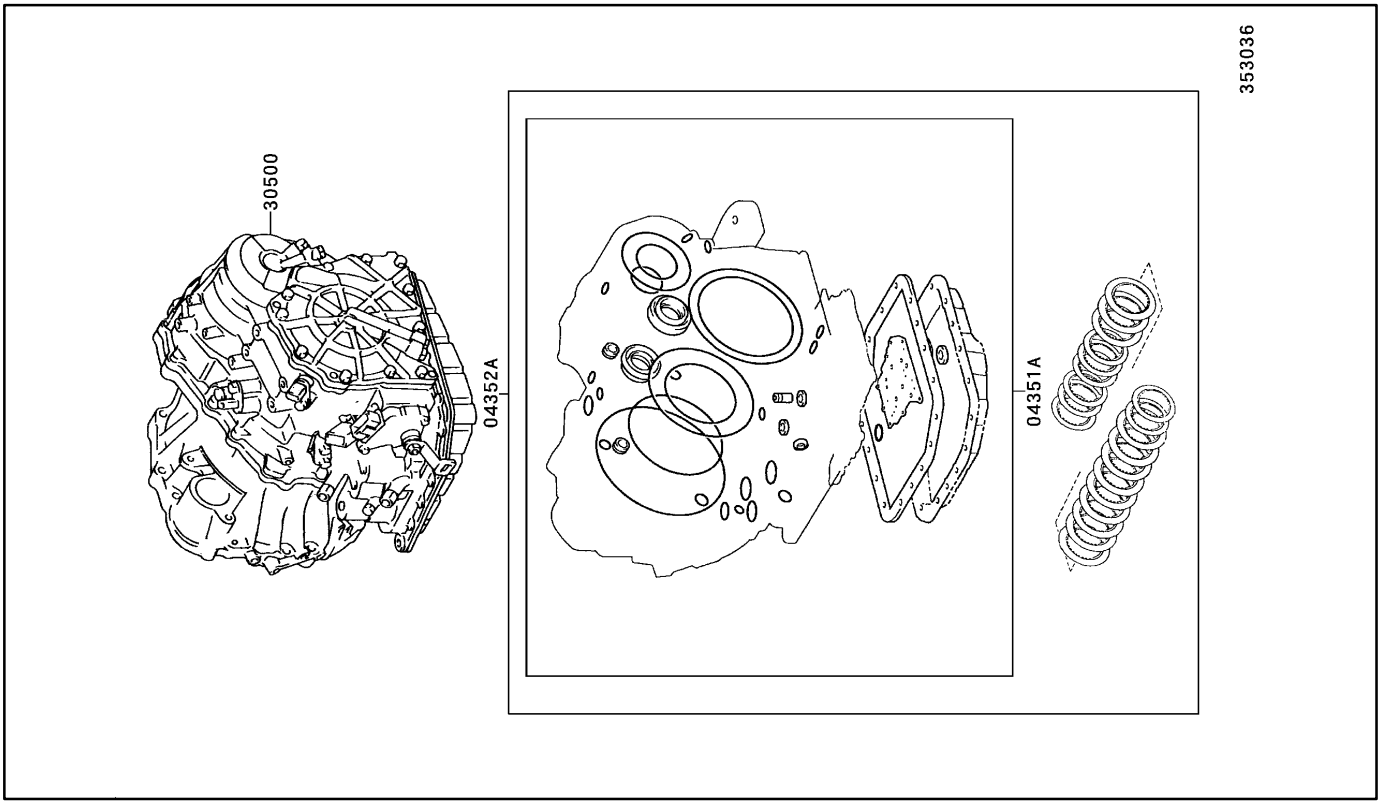
3513/THROTTLE LINK & VALVE LEVER (ATM) 98–11

4301/FRONT AXLE HOUSING & DIFFERENTIAL 98–12

3501/TRANSAXLE OR TRANSMISSION ASSY & GASKET KIT (ATM)

980WL–01

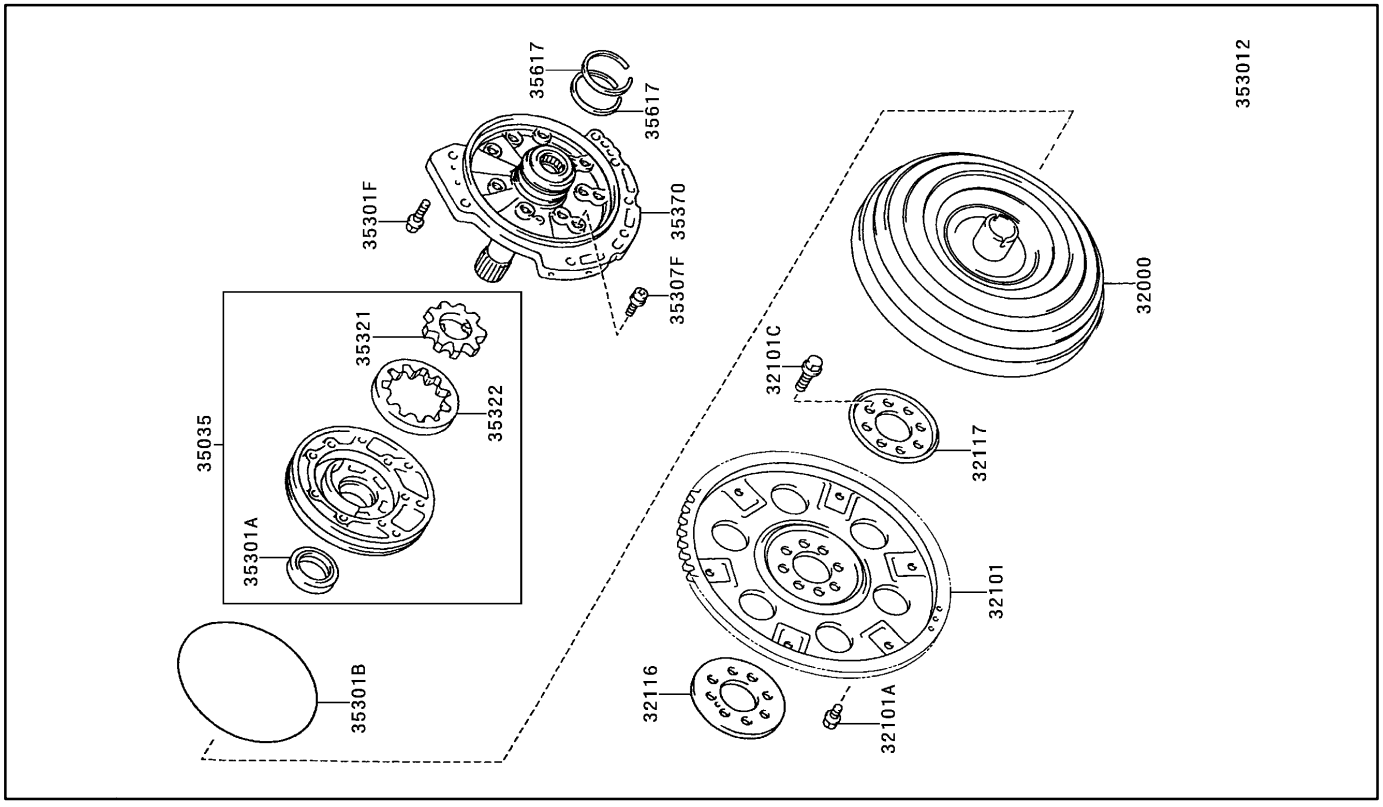
(0011–) **U241E**



3502/TORQUE CONVERTER, FRONT OIL PUMP & CHAIN (ATM)

980WM–01

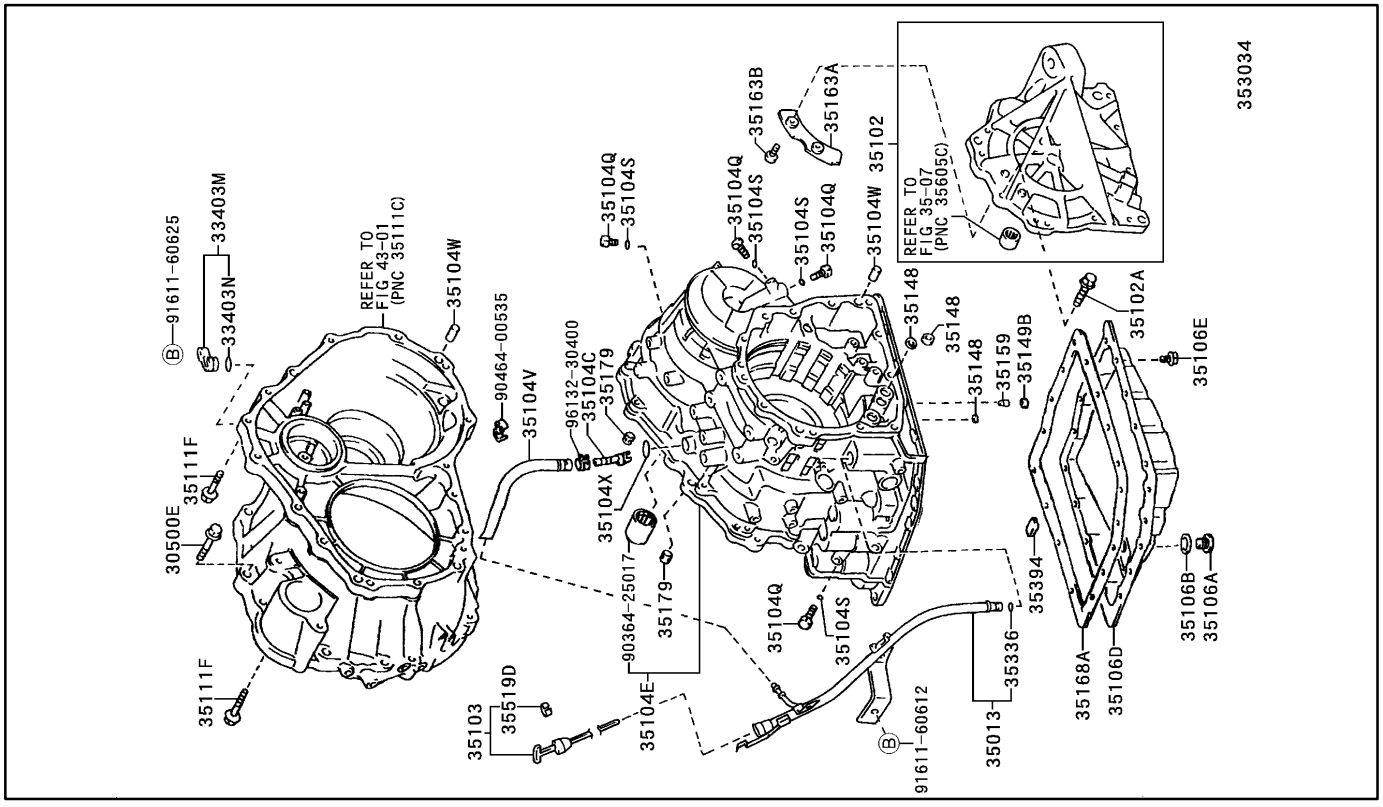
(0011–) **U241E**



980WN–01

3503/TRANSAXLE CASE & OIL PAN (ATM)

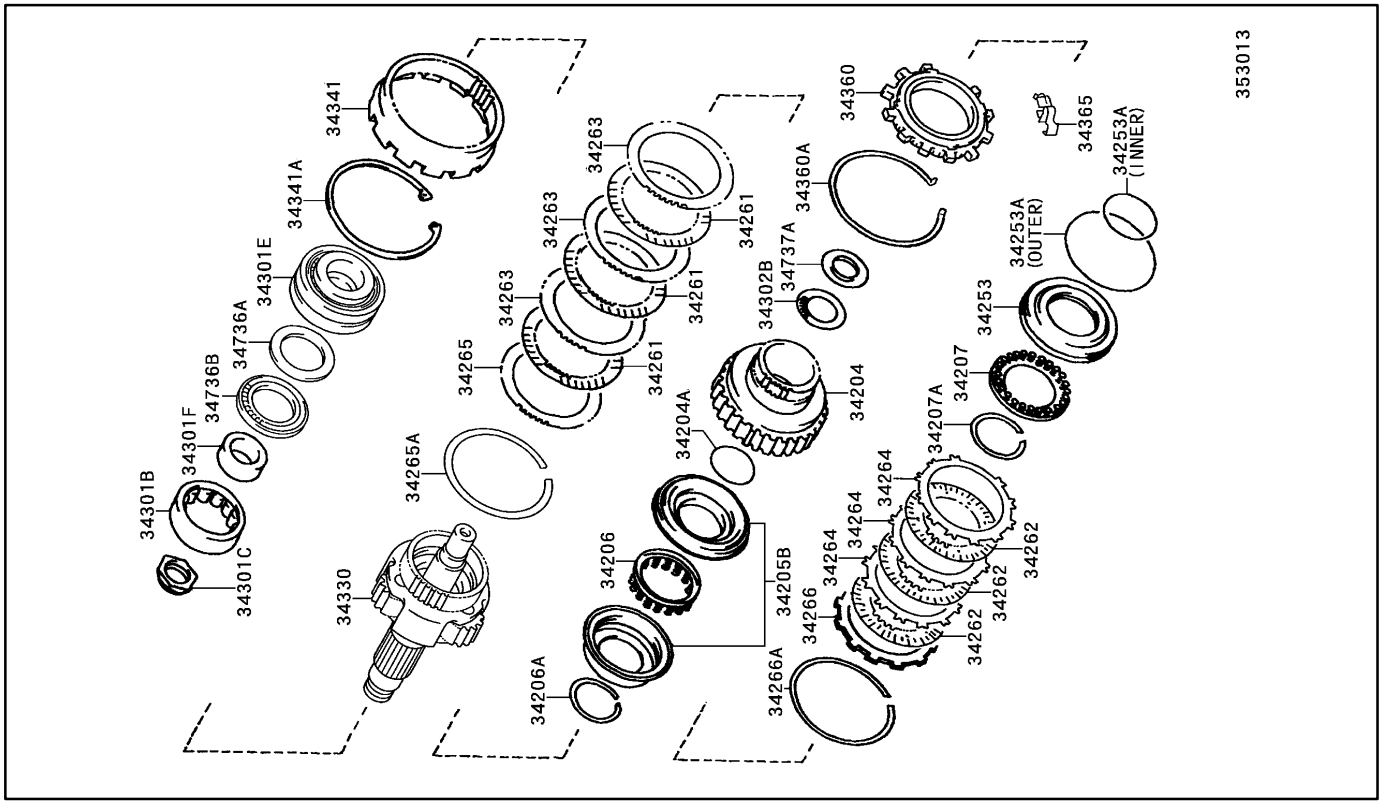
(0011–) **U241E**



980WO–01

3506/OVERDRIVE GEAR (ATM)

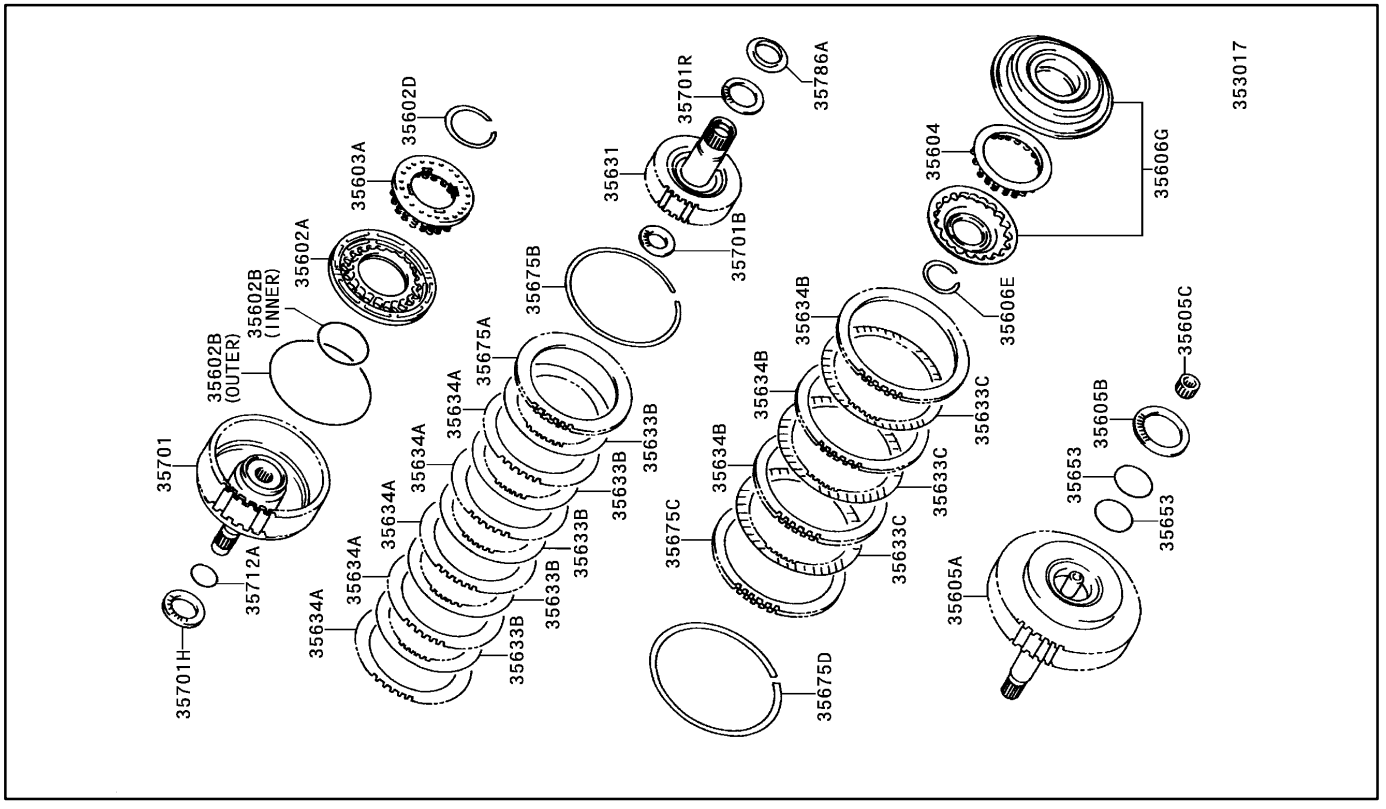
(0011–)ACU2# **U241E**



980WP–01

3507/BRAKE BAND & MULTIPLE DISC CLUTCH (ATM)

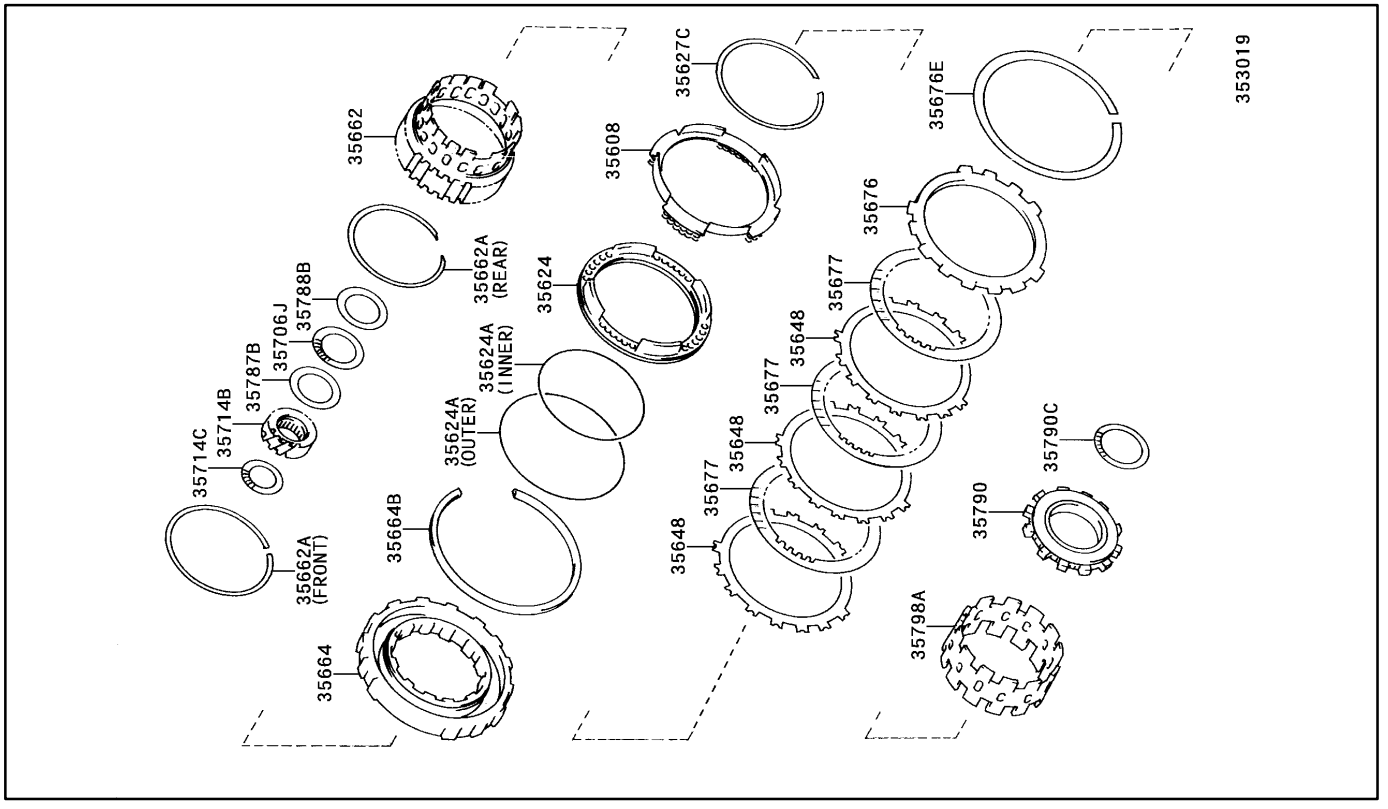
(0011–)ACU2# **U241E**



980WQ–01

3508/CENTER SUPPORT & PLANETARY SUN GEAR (ATM)

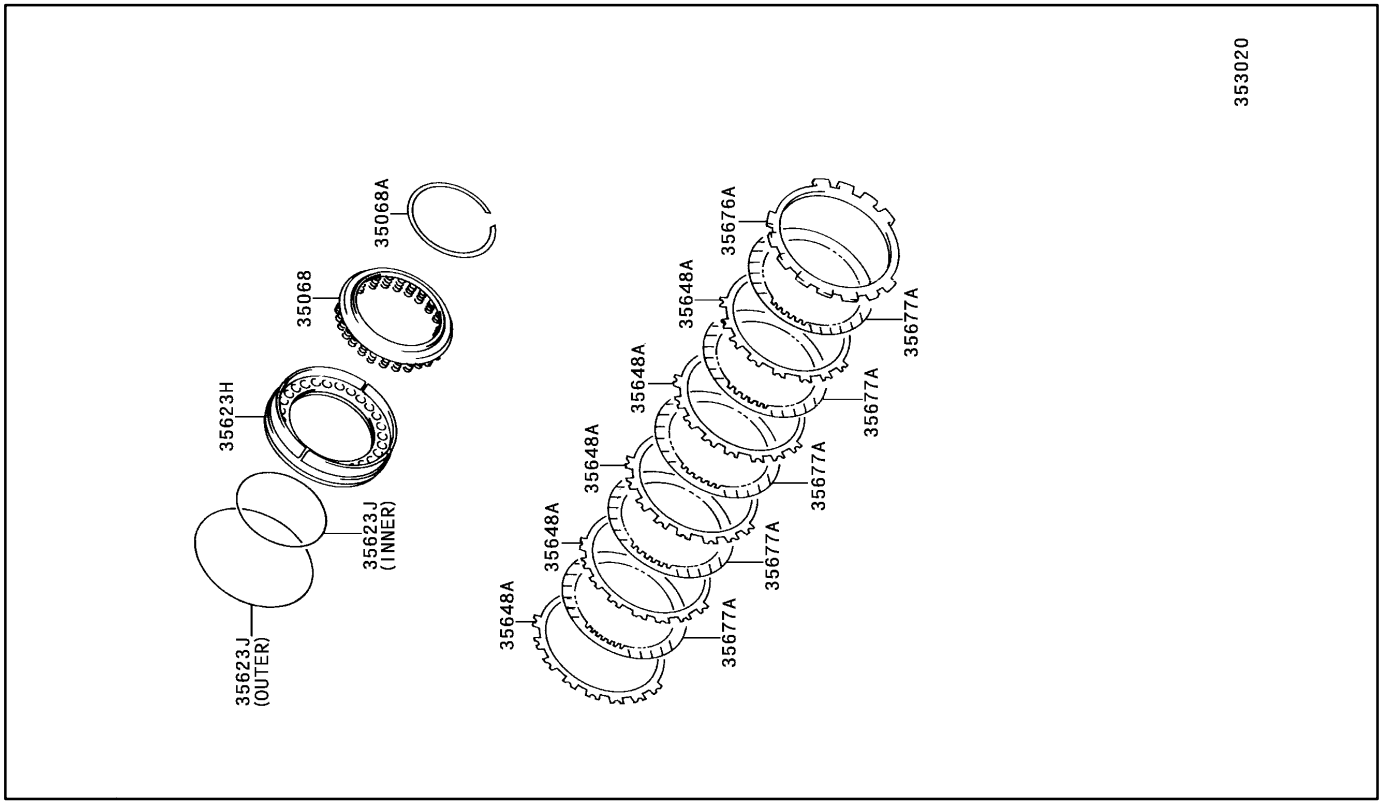
(0011–)ACU2# **U241E**



980WR–01

3509/BRAKE NO.3, 1ST & REVERSE BRAKE (ATM)

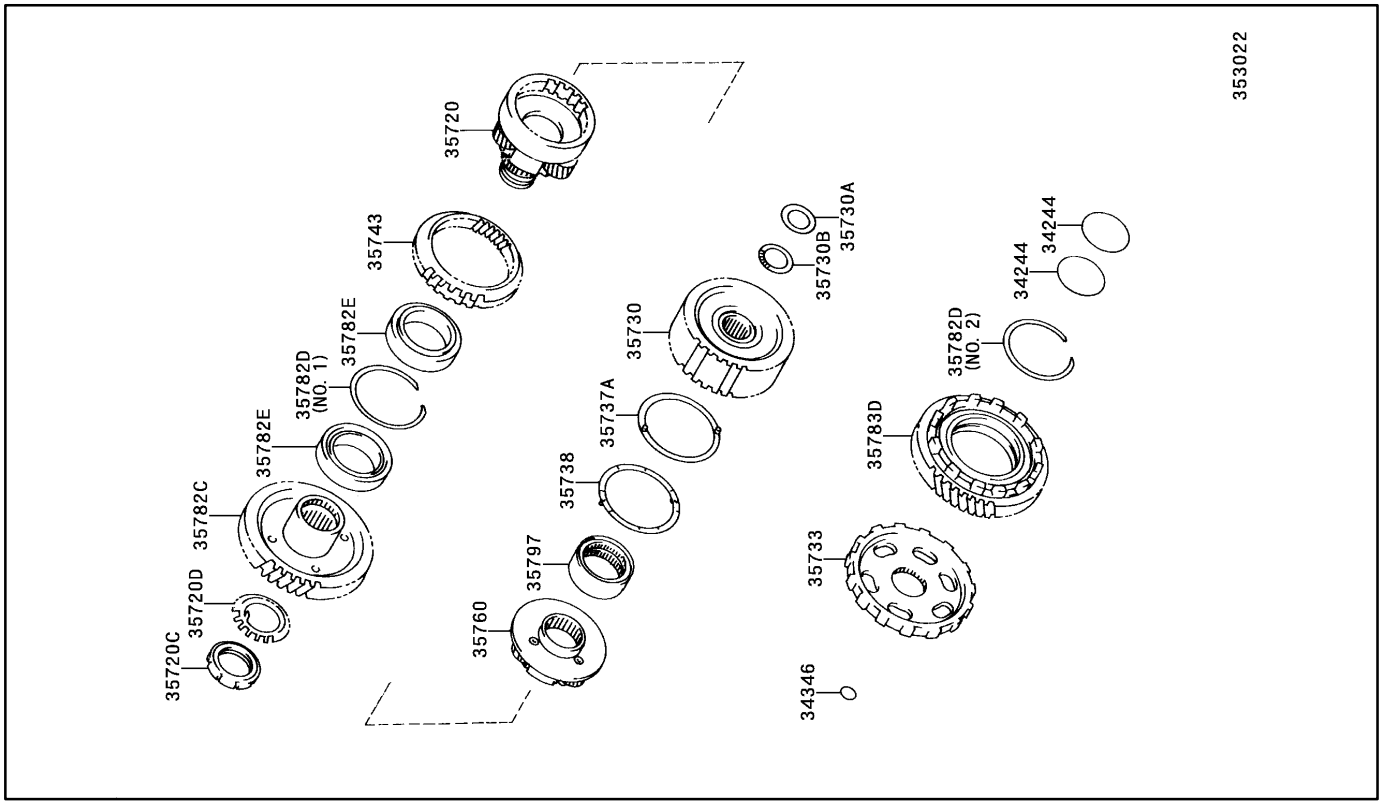
(0011–)ACU2# **U241E**



980WS–01

3510/PLANETARY GEAR, REVERSE PISTON & COUNTER GEAR (ATM)

(0011–) **U241E**

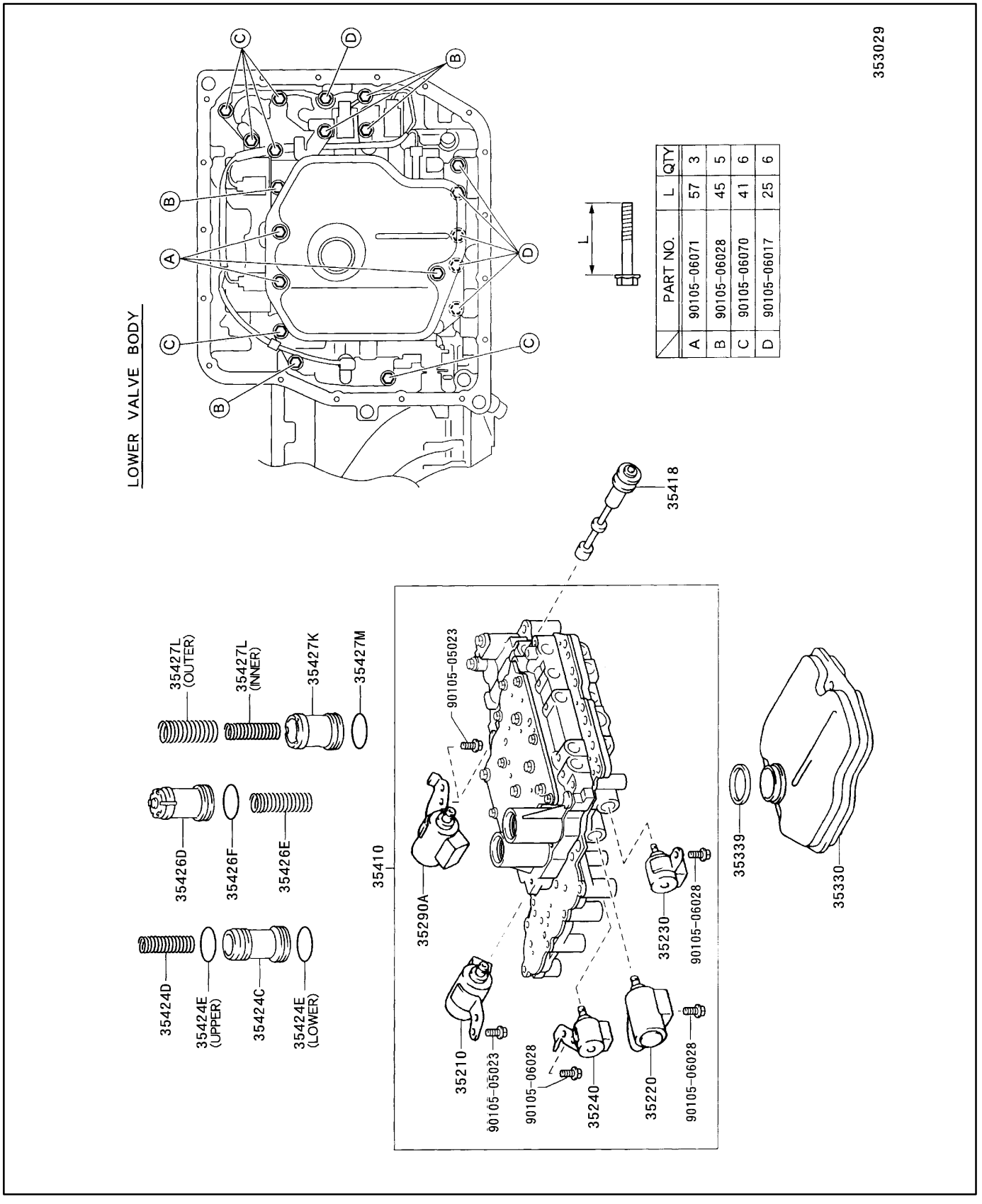


980WT–01

3512/VALVE BODY & OIL STRAINER (ATM)

(0011–) **U241E**

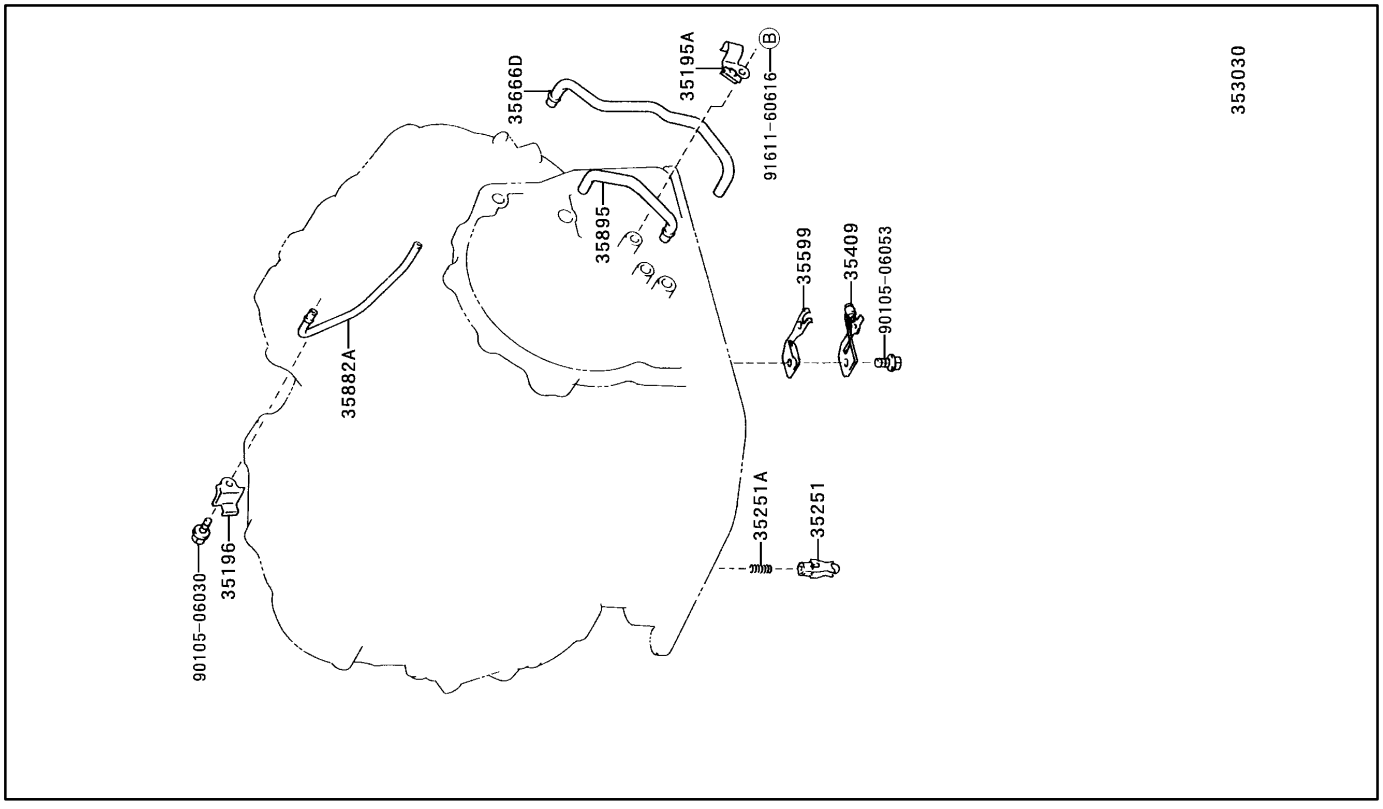
ILLUST NO. 1 OF 3



3512/VALVE BODY & OIL STRAINER (ATM)

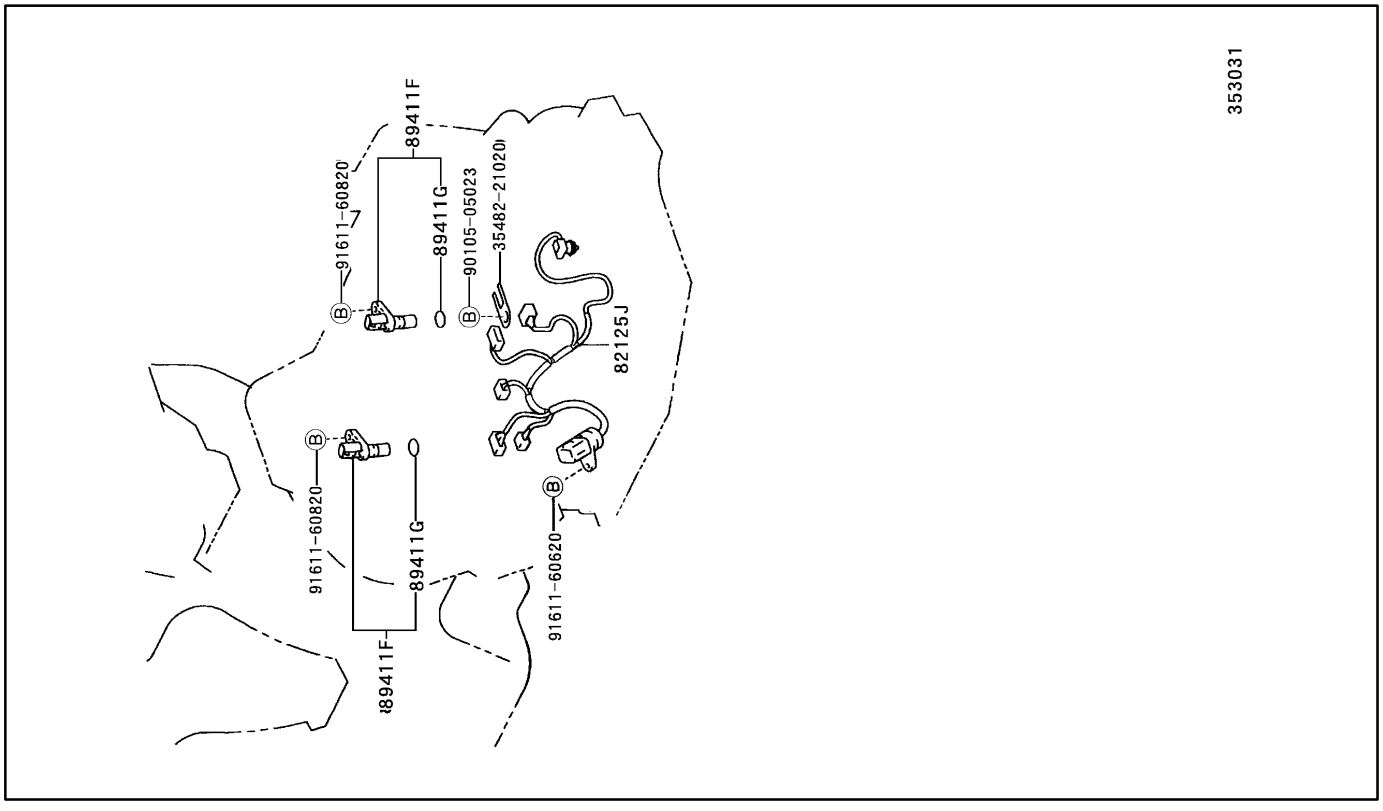
(0011–) U241E

ILLUST NO. 2 OF 3



(0011–) U241E

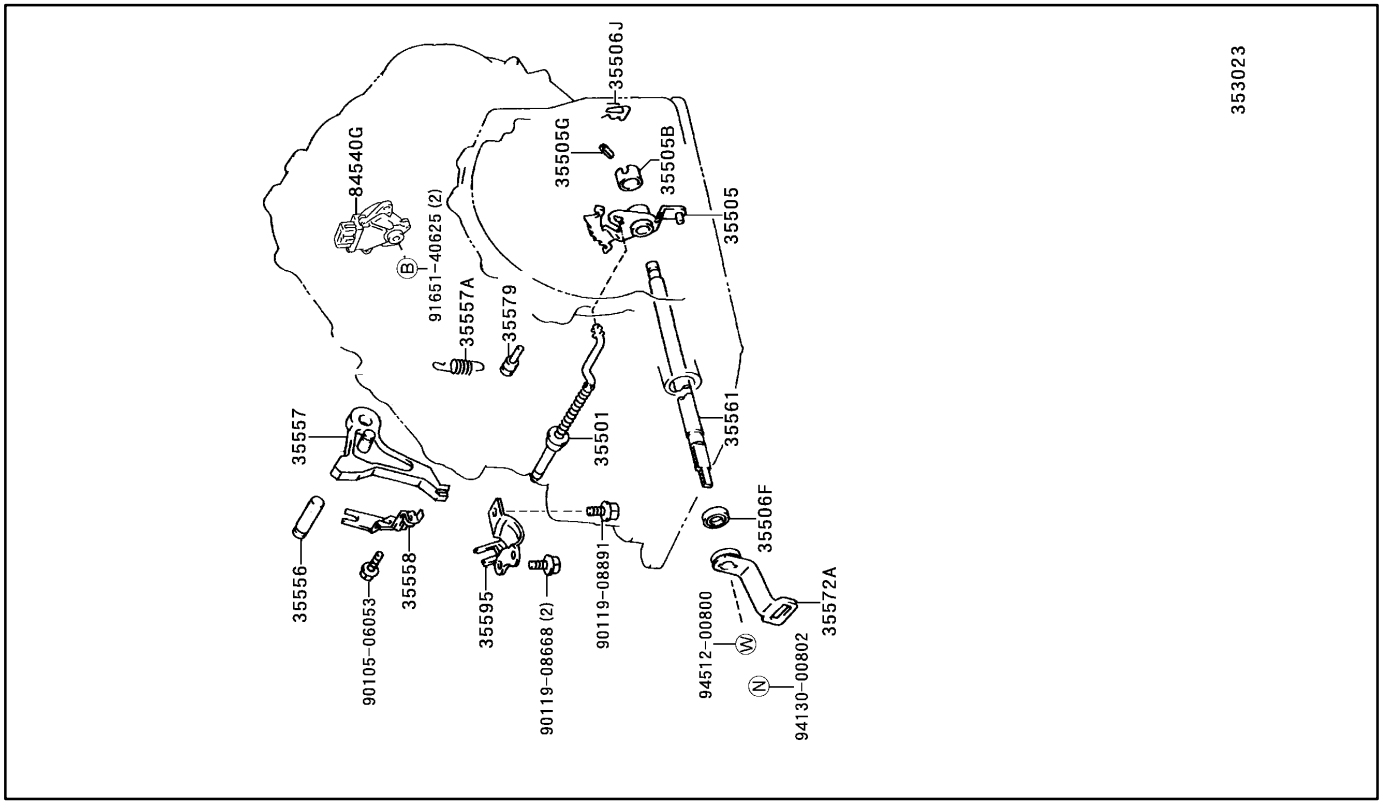
ILLUST NO. 3 OF 3



980WU–01

3513/THROTTLE LINK & VALVE LEVER (ATM)

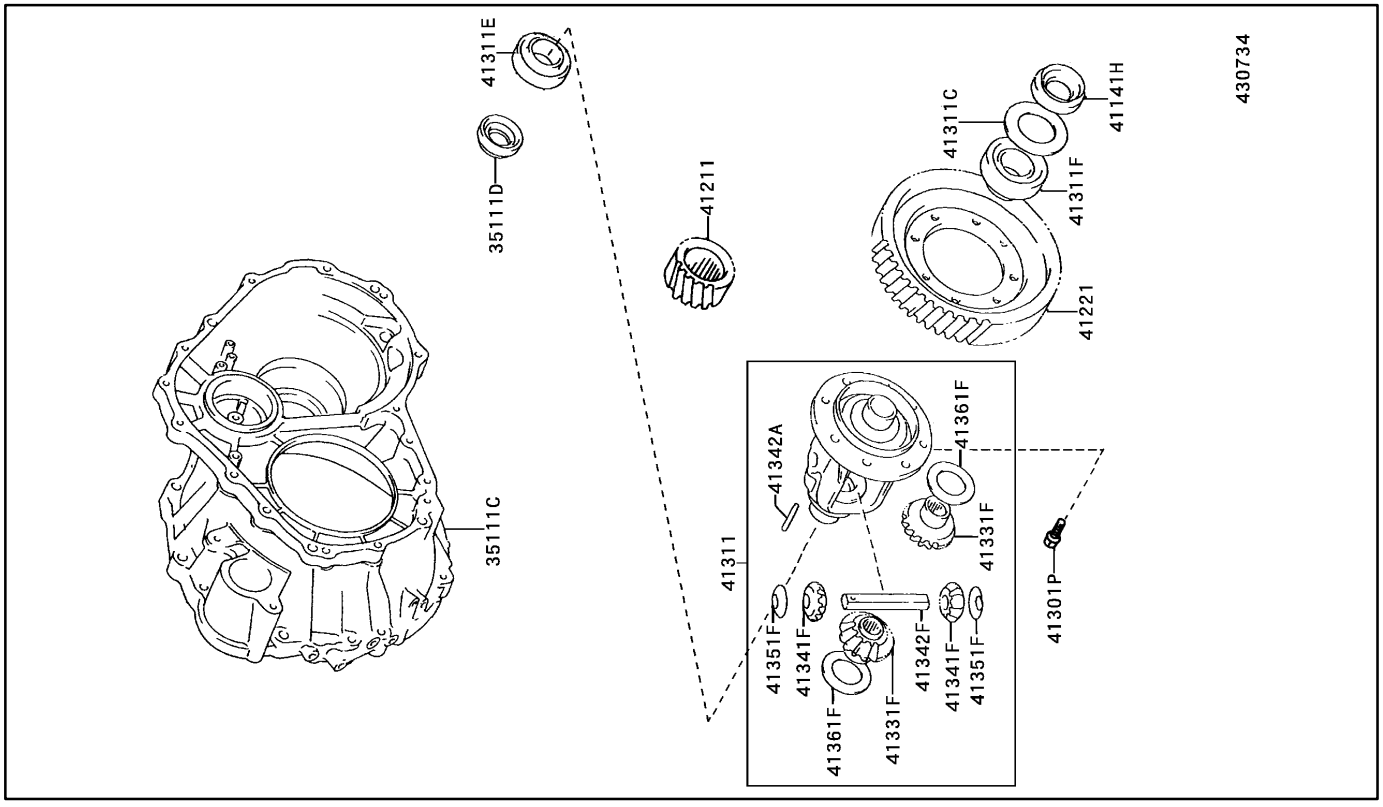
(0011–) **U241E**



980WV–01

4301/FRONT AXLE HOUSING & DIFFERENTIAL

(0011–) **U241E**



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