FOREWORD

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

Automatic Transmission	Applicable Model
A340E	’91 Supra, ’91 Cressida ’91 Truck, ’91 4 runner
A340F	”91 Truck, ”91 4 runner
A340H	’91 Truck, ’91 4 runner

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

Pub. Name	Pub. No.
’91 Supra Repair Manual	RM198U
’91 Cressida Repair Manual	RM200U
’91 Truck Repair Manual	RM201U2
’91 4 runner Repair Manual	RM202U2

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

TOYOTA MOTOR CORPORATION

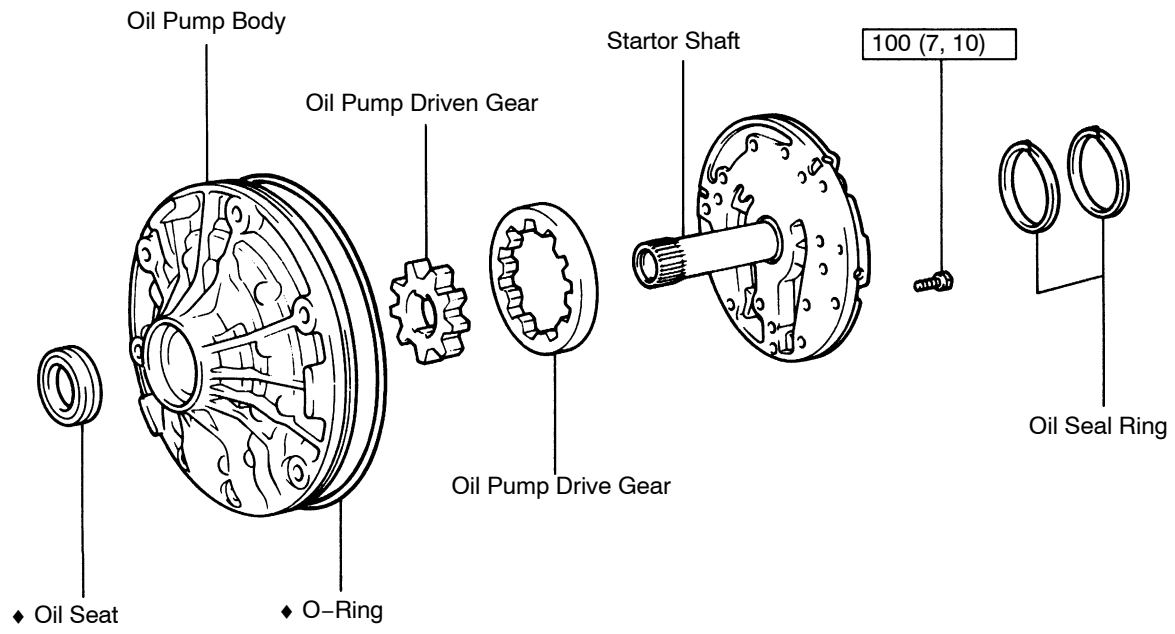
HOW TO USE THIS MANUAL

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

REPAIR PROCEDURES

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

Example:



kg–cm (ft–lb, N–m) : Specified torque

♦ Non–reusable part

AT5461

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

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

Example:

Illustration:
What to do and where

Task heading: what to do

7. CHECK PISTON STROKE OF FORWARD CLUTCH

If replacing the disc, plate or flange, check the piston stroke:

Detail text: how to do it

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

SST 09350–32014 (09351–32190)

Set part No. *Component part No.*

Piston stroke: 1.41 – 1.82 mm (0.0555 – 0.0717 in.)

Specification

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

REFERENCES

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

SPECIFICATIONS

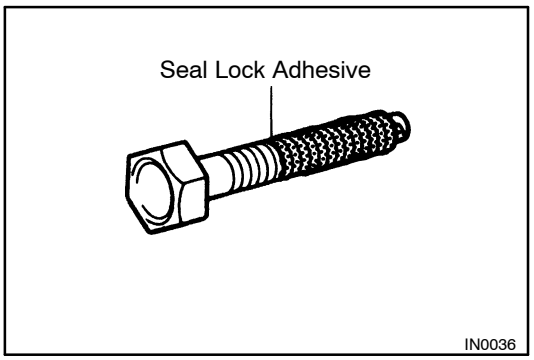
Specifications are presented in bold type throughout the text in the applicable step. You never have to leave the procedure to look up your specs. All specifications are also found in Appendix A, specifications for quick reference.

CAUTIONS, NOTICES, HINTS:

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

GENERAL REPAIR INSTRUCTIONS

1. **Use fender, seat and floor covers to keep the vehicle clean and prevent damage.**
2. **During disassembly, keep parts in order to facilitate reassembly.**
3. **Observe the following:**
   (a) Before performing electrical work, disconnect the negative cable four the battery terminal.
   (b) If it is necessary to disconnect the battery for inspection or repair, always disconnect the cable from the negative (–) terminal which is grounded to the vehicle body.
   (c) To prevent damage to the battery terminal post, loosen the terminal nut and raise the cable straight up without twisting it or prying it.
   (d) Clean the battery terminal posts and cable terminals with a shop rag. Do not scrape them with a file or other abrasive object.
   (e) Install the cable terminal to the battery post with the nut loose, and tighten the nut after installation. Do not use a hammer or such to tap the terminal onto the post.
   (f) Be sure the cover for the positive (+) terminals are properly in place.
4. **Check hoses and wiring connectors to make sure that they are secure and correct.**
5. **Non–reusable parts**
   (a) Always replace cotter pins, gaskets, O–rings and oil seals etc. with new ones.
   (b) Non–reusable parts are indicated in the component illustrations by the "♦" symbol.
6. **Precoated parts**
   Precoated parts are the bolts and nuts, which have been coated with a seal lock adhesive at the factory.
   (a) If a precoated part is retightened, loosened or caused to move in any way, it must be recoated with the specified adhesive.
   (b) Recoating of precoated parts
      (1) Clean off the old adhesive from the bolt, nut or installation part threads.
      (2) Dry with compressed air.
      (3) Apply the specified seal lock adhesive to the bolt or nut threads.
   (c) Precoated parts are indicated in the component illustrations by the "★" symbol.



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

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

9. Use of special service tools (SST) and special service materials (SSM) may be required, depending on the nature of the repair. Be sure to use SST and SSM where specified and follow the proper work procedure. A list of SST and SSM can be found at the back of this manual.

10. When replacing fuses, be sure the new fuse has the correct amperage rating. DO NOT exceed the fuse amp rating or use one of a lower rating.

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

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

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

ABBREVIATIONS USED IN THIS MANUAL

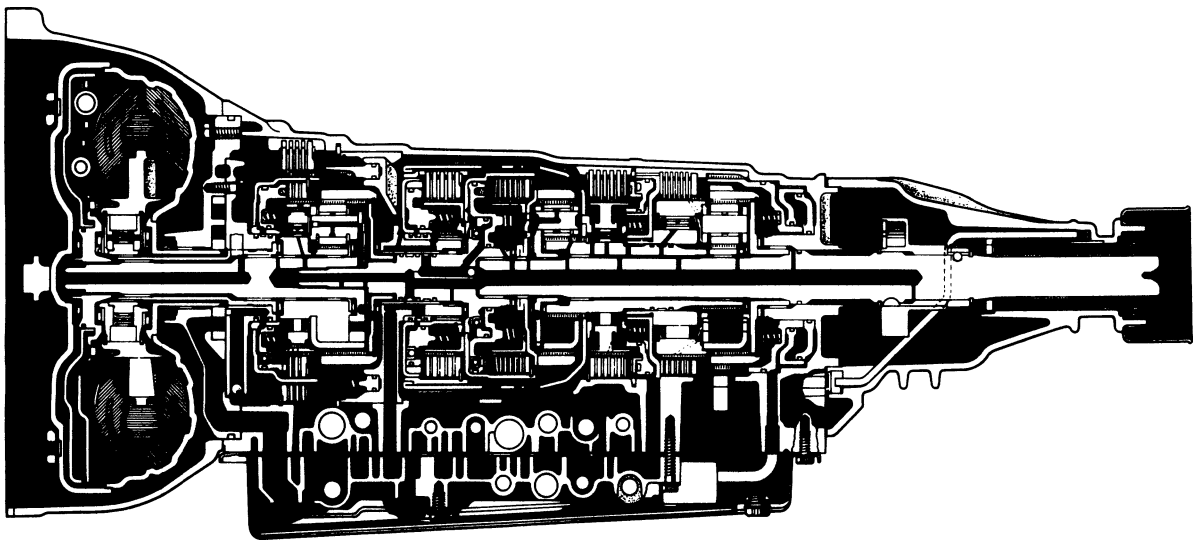
ADD	Automatic Disconnecting Differential
A/T ATM	Automatic Transmission
ATF	Automatic Transmission Fluid
B_0	Overdrive Brake
B_1	Second Coast Brake
B_2	Second Brake
B_3	First and Reverse Brake
C_0	Overdrive Clutch
C_1	Forward Clutch
C_2	Direct Clutch
D	Disc
Ex.	Except
MP	Multipurpose
O/D	Overdrive
P	Plate
SSM	Special Service Materials
SST	Special Service Tools
w/	With
w/o	Without

DESCRIPTION

General

The A340E is a 4–speed, Electronic Controlled Transmission (hereafter called ECT) developed for use with high–performance engine. A lock–up mechanism is built into the torque converter.
The A340F automatic transmission is a 4–speed automatic transmission with mechanically controlled 4WD transfer, developed with the aim of producing an easy–driving 4WD vehicle. The transmission section has fundamentally the same construction as the A340E automatic transmission.
The A340H automatic transmission is a 4–speed automatic transmission with electronically controlled 4Wd transfer, developed with the aim of producing an easy driving 4WD vehicle.
The transfer section consists of planetary gears, hydraulic clutches and hydraulic brake. The operation of these is fully controlled by the Engine & ECT ECU.
The A340E, A340F and A340H automatic transmissions are mainly composed of the torque converter, the overdrive (hereafter called O/D) planetary gear unit, 3–speed planetary gear unit, the hydraulic control system and the electronic control system.

Sectional View (A340E)



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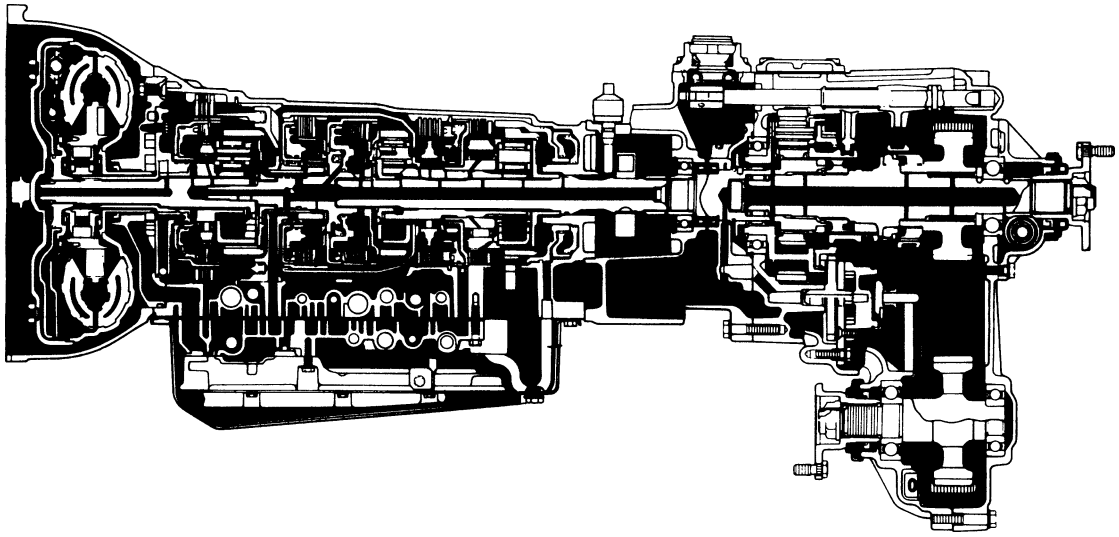
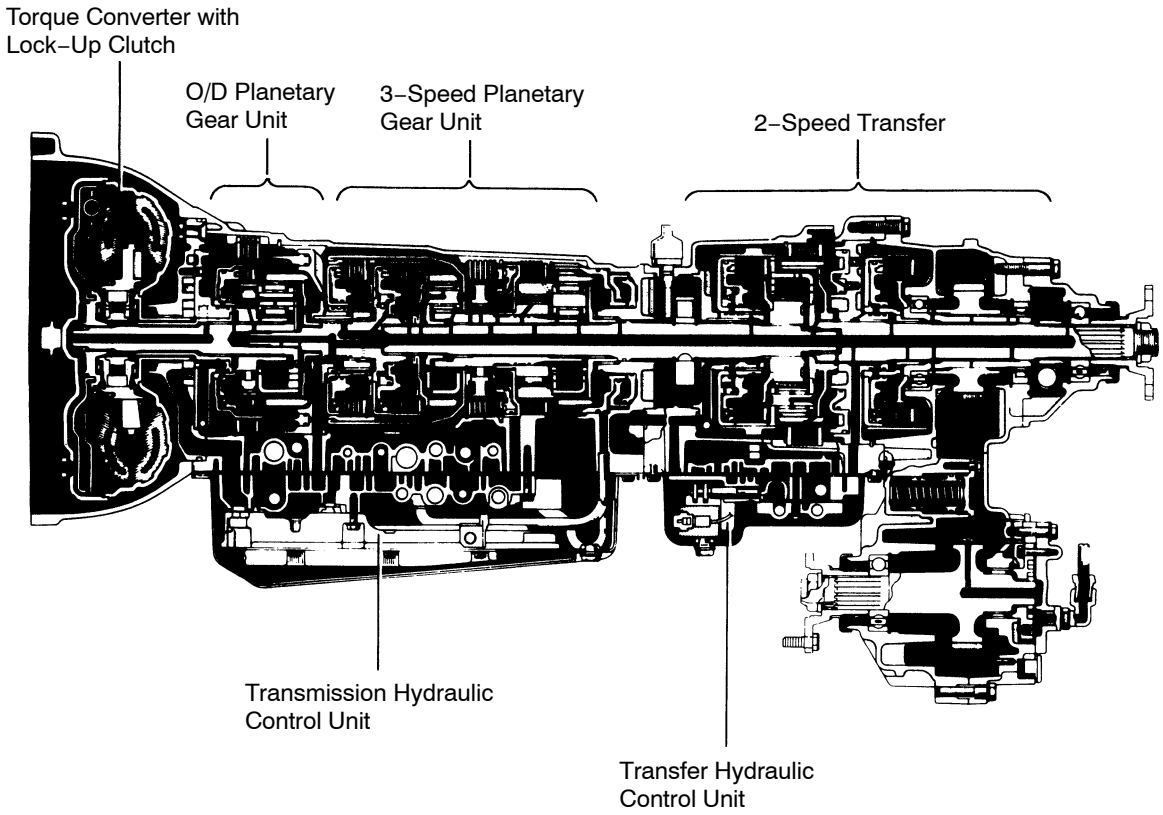
Sectional View

(A340F)



(A340H)



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General Specifications

Type of Transmission				A340E
Type of Engine				7M–GE, 7M–GTE, 3VZ–E
Torque Converter	Stall Torque Ratio			Truck : C & C 2.0 : 1 Others 2.1 : 1
	Lock–Up Mechanism			Equipped
Gear Ratio	1st Gear			2.804
	2nd Gear			1.531
	3rd Gear			1.000
	O/D Gear			0.705
	Reverse Gear			2.393
Plates (Disc/Plate)	C_0	O/D Direct Clutch		2/2
	C_1	Forward Clutch		5/5
	C_2	Direct Clutch		4/4
	B_2	2nd Brake		5/5
	B_3	1st & Reverse Brake		6/6
	B_0	O/D Brake		4/3
Second Coast Brake Band Width mm (in.)				40 (1.57)
ATF	Type			ATF DEXRON® II
	Capacity liters (US qts, Imp. qts)		Total	7.2 (7.6, 6.3)
			Drain and Refill	1.6 (1.7, 1.4)

General Specifications (Cont'd)

Type of Transmission				A340F
Type of Engine				22R–E
Torque Converter	Stall Torque Ratio			2.3 : 1
	Lock–Up Mechanism			Equipped
Gear Ratio	1st Gear			2.804
	2nd Gear			1.531
	3rd Gear			1.000
	O/D Gear			0.705
	Reverse Gear			2.393
Plates (Disc/Plate)	C_0	O/D Direct Clutch		2/2
	C_1	Forward Clutch		5/5
	C_2	Direct Clutch		4/4
	B_2	2nd Brake		5/5
	B_3	1st & Reverse Brake		6/6
	B_0	O/D Brake		4/3
Second Coast Brake Band Width mm (in.)				40 (1.57)
ATF	Type			ATF DEXRON® II
	Capacity liters (US qts, Imp. qts)		Total	7.6 (8.0, 6.7)
			Drain and Refill	1.6 (1.7, 1.4)

General Specifications (Cont'd)

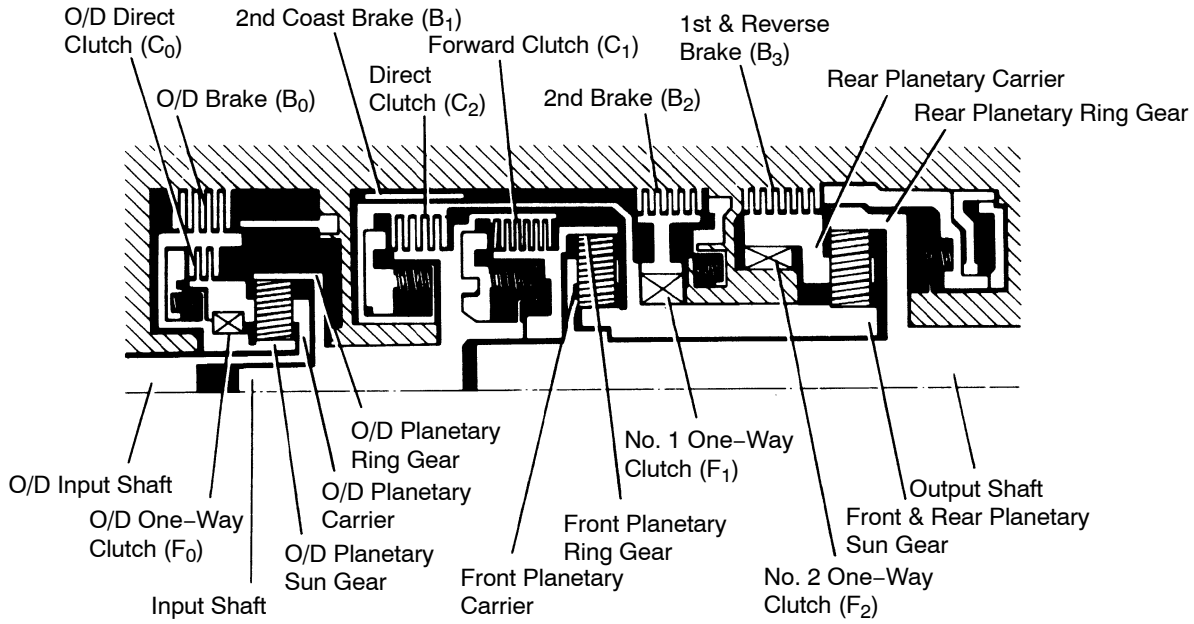
Type of Transmission				A340H
Type of Engine				3VZ–E
Torque Converter		Stall Torque Ratio		2.1 : 1
		Lock–Up Mechanism		Equipped
Gear Ratio	Transmission	1st Gear		2.804
		2nd Gear		1.531
		3rd Gear		1.000
		O/D Gear		0.705
		Reverse Gear		2.393
	Transfer	High (H2, H4)		1.000
		Low (L4)		2.659
Number of Discs and Plates (Disc /Plate)	Transmission	C_1	Forward Clutch	4/4
		C_2	Direct Clutch	3/3
		C_0	O/D Direct Clutch	1/1
		B_2	2nd Brake	4/4
		B_3	1st & Reverse Brake	5/5
		B_0	O/D Brake	3/2
	Transfer	C_3	Transfer Direct Clutch	6/6
		C_4	Front Drive Clutch	6/6
		B_4	Low Speed Brake	7/6
Second Coast Brake Band Width mm (in.)				40 (1.57)
ATF		Type		ATF DEXRON® II
		Capacity liter (US qts, Imp. qts)	Total	Transmission: 10.3 (10.9, 9.1), Transfer: 1.1 (1.2, 1.0)
			Drain & Refill	Transmission: 4.5 (4.8, 4.0), Transfer: 0.8 (0.8, 0.7)

OPERATION

Mechanical Operation

OPERATING CONDITIONS

(A340E, A340F)



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○ ..... Operating

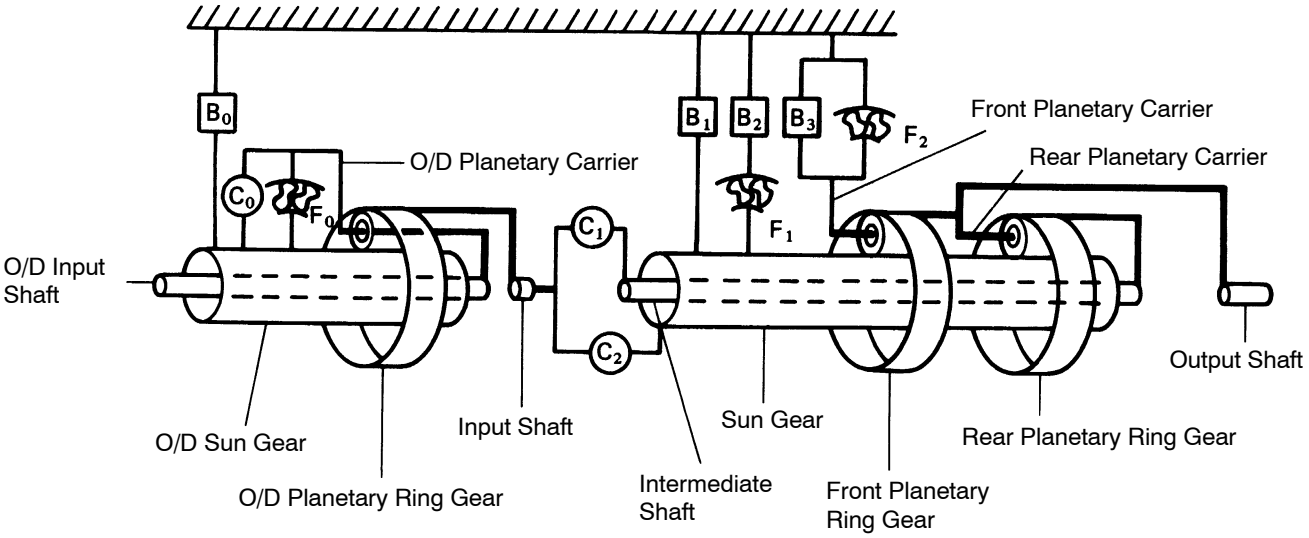
Shift lever position	Gear position	C_0	C_1	C_2	B_0	B_1	B_2	B_3	F_0	F_1	F_2
P	Parking	○									
R	Reverse	○		○				○	○		
N	Neutral	○									
D	1st	○	○						○		○
	2nd	○	○				○		○	○	
	3rd	○	○	○			○		○		
	O/D		○	○	○		○				
2	1st	○	○						○		○
	2nd	○	○			○	○		○	○	
	3rd	○	○	○			○		○		
L	1st	○	○					○	○		○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

* Down–shift only in the L range and 2nd gear – no up–shift.

FUNCTION OF COMPONENTS

(A340E, A340F)

NOMENCLATURE	OPERATION
O/D Direct Clutch (C_0)	Connects overdrive sun gear and overdrive carrier
O/D Brake (B_0)	Prevents overdrive sun gear from turning either clockwise or counterclockwise
O/D One–Way Clutch (F_0)	When transmission is being driven by engine, connects overdrive sun gear and overdrive carrier
Forward Clutch (C_1)	Connects input shaft and front planetary ring gear
Direct Clutch (C_2)	Connects input shaft and front & rear planetary sun gear
2nd Coast Brake (B_1)	Prevents front & rear planetary sun gear from turning either clockwise or counterclockwise
2nd Brake (B_2)	Prevents outer race of F_1 from turning either clockwise or counterclockwise, thus preventing front & rear planetary sun gear from turning counterclockwise
1st & Reverse Brake (B_3)	Prevents rear planetary carrier from turning either clockwise or counterclockwise
No. 1 One–Way Clutch (F_1)	When B_2 is operating, prevents front & rear planetary sun gear from turning counterclockwise
No. 2 One–Way Clutch (F_2)	Prevents rear planetary carrier from turning counterclockwise



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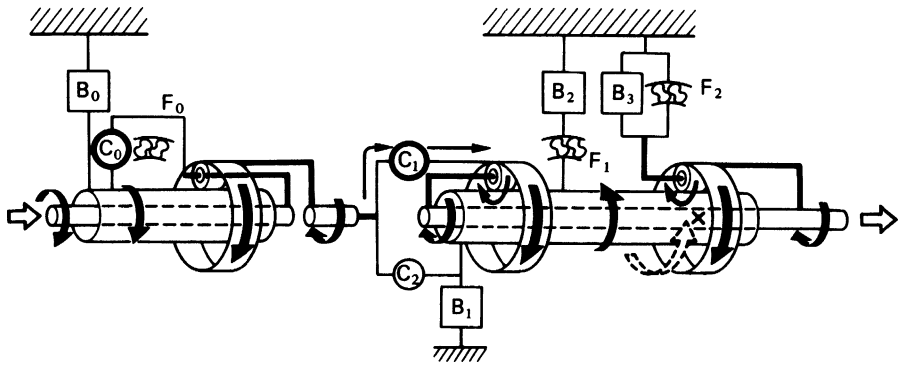
FUNCTION OF COMPONENTS (Cont'd)

The conditions of operation for each gear position are shown in the following illustrations:

D or 2 Range 1st Gear



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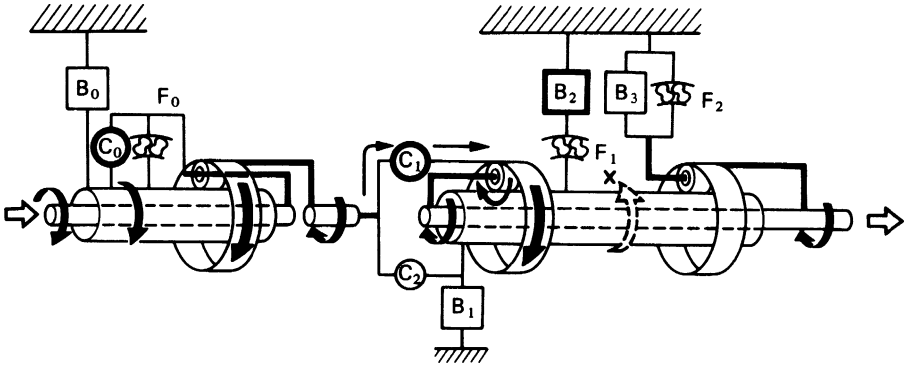
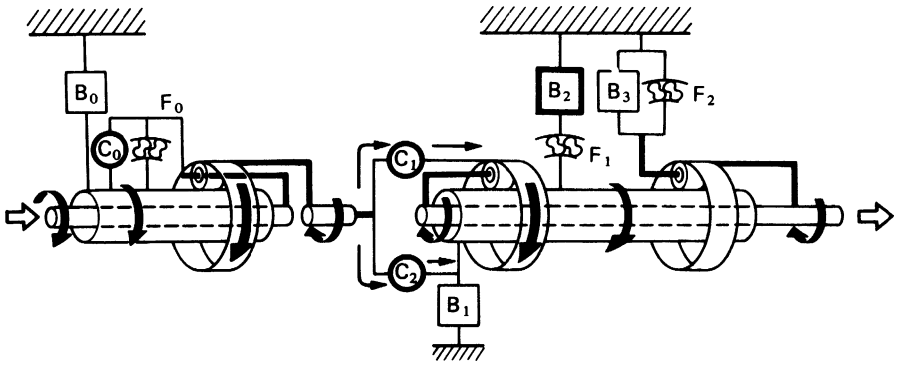
D Range 2nd Gear



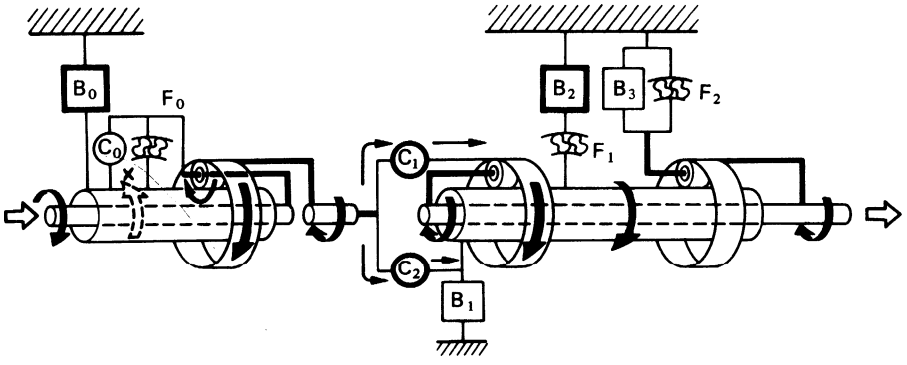
AT6676

D or 2 Range 3rd Gear



AT6677

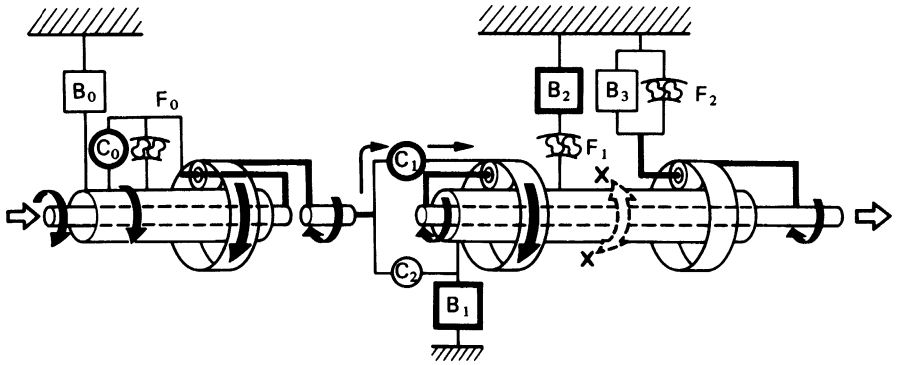
D Range O/D



AT6678

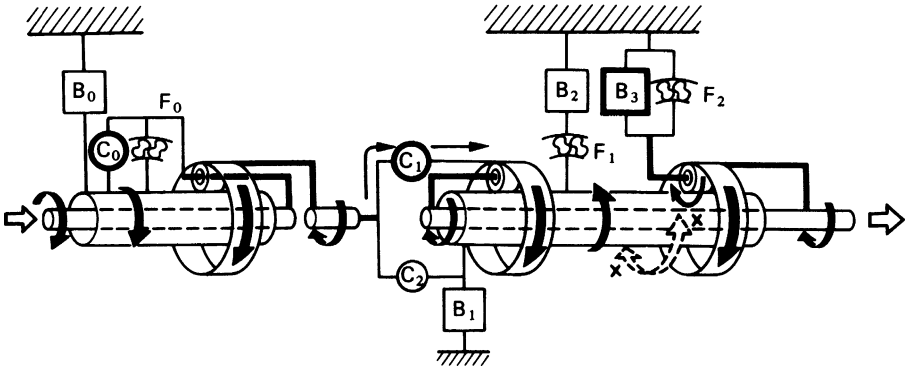
FUNCTION OF COMPONENTS (Cont'd)

2 or L Range 2nd Gear



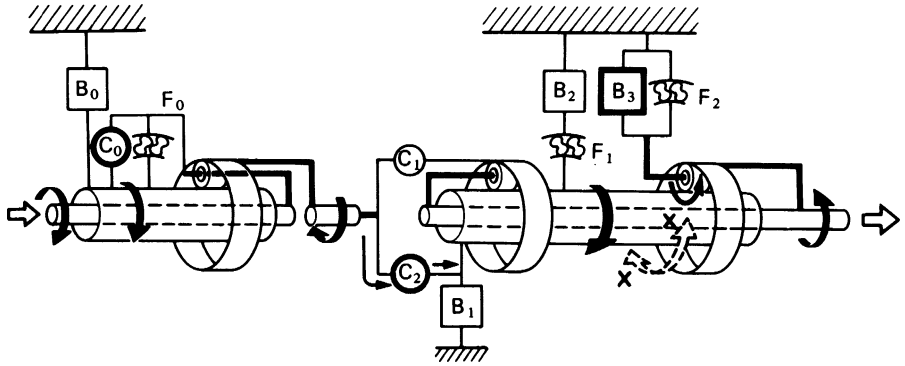
AT6679

L Range 1st Gear



AT6680

R Range Reverse Gear



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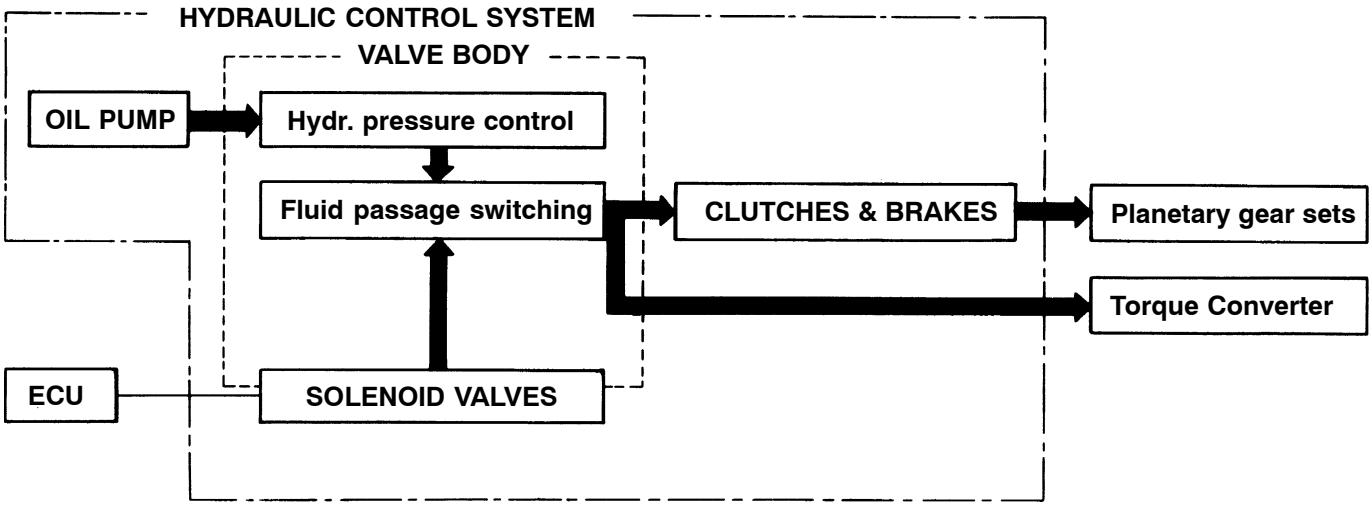
HYDRAULIC CONTROL SYSTEM

(A340E, A340F)

The hydraulic control system is composed of the oil pump, the valve body, the solenoid valves, and the clutches and brakes, as well as the fluid passages which connect all of these components. Based on the hydraulic pressure created by the oil pump, the hydraulic control system governs the hydraulic pressure acting on the torque converter, clutches and brakes in accordance with the vehicle driving conditions.

There are three solenoid valves on the valve body. These solenoid valves are turned on and off by signals from the ECU to operate the shift valves. These shift valves then switch the fluid passages so that fluid goes to the torque converter and planetary gear units.
(Except for the solenoid valves, the hydraulic control system of the ECT is basically the same as that of the fully hydraulic controlled automatic transmission.)



- **LINE PRESSURE**
  Line pressure is the most basic and important pressure used in the automatic transmission, because it is used to operate all of the clutches and brakes in the transmission.
  If the primary regulator valve does not operate correctly, line pressure will be either too high or too low. Line pressure that is too high will lead to shifting shock and consequent engine power loss due to the greater effort required of the oil pump; line pressure that is too low will cause slippage of clutches and brakes, which will, in extreme cases, prevent the vehicle from moving. Therefore, if either of these problems are noted, the line pressure should be measured to see if it is within standard.
- **THROTTLE PRESSURE**
  Throttle pressure is always kept in accordance with the opening angle of the engine throttle valve.
  This throttle pressure acts on the primary regulator valve and, accordingly, line pressure is regulated in response to the throttle valve opening.
  In the fully hydraulic controlled automatic transmission, throttle pressure is used for regulating line pressure and as signal pressure for up–shift and down–shift of the transmission. In the ECT, however, throttle pressure is used only for regulating line pressure. Consequently, improper adjustment of the transmission throttle cable may result in a line pressure that is too high or too low. This, in turn, will lead to shifting shock or clutch and brake slippage.

ELECTRONIC CONTROL SYSTEM

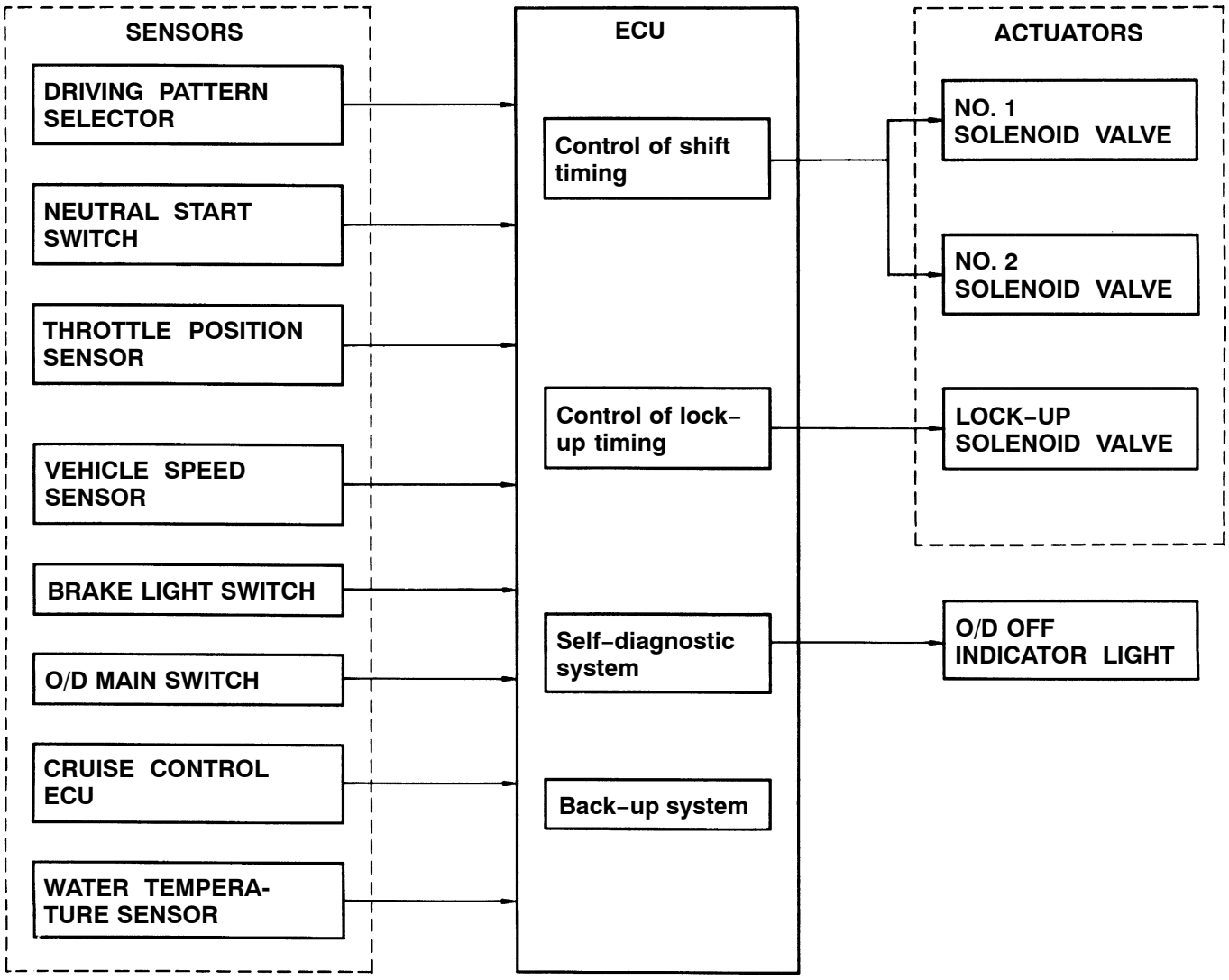
(A340E, A340F)

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

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

2. **ECU**
   The ECU determines the shift and lock–up timing based upon the signals from sensors, and controls the solenoid valves of the hydraulic control unit accordingly.

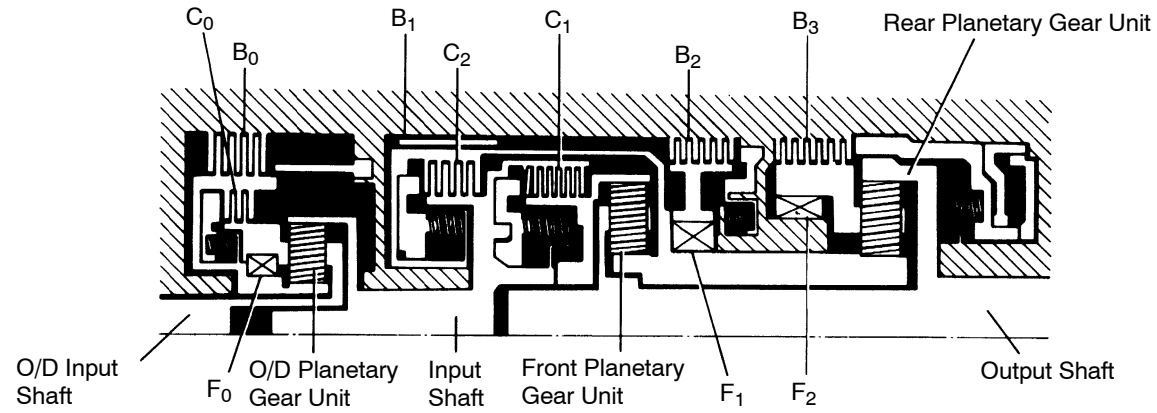
3. **Actuators**
   These are three solenoid valves that control hydraulic pressure acting on the hydraulic valves to control shifting and lock–up timing.



OPERATING CONDITIONS

(A340H)

1. Transmission



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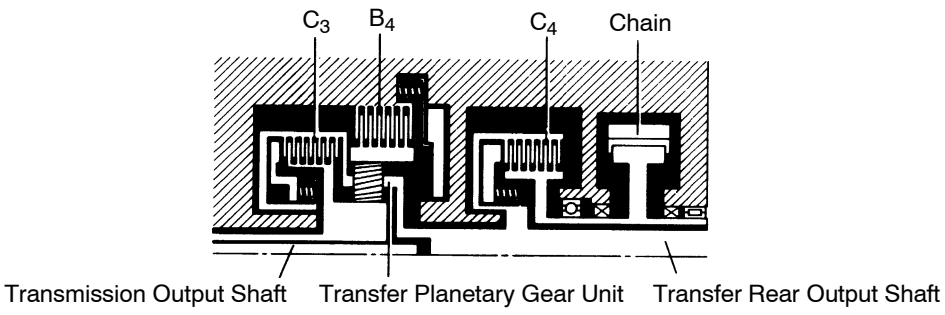
Range (i.e., Shift Lever Position)	Gear	No. 1 Solenoid Valve	No. 2 Solenoid Valve	C_0	C_1	C_2	B_0	B_1	B_2	B_3		F_0	F_1	F_2
										I.P.	O.P.			
P	Parking	ON	OFF	●										
R	Reverse	ON	OFF	●		●				●	●	●		
N	Neutral	ON	OFF	●										
D	1st	ON	OFF	●	●							●		●
	2nd	ON	ON	●	●				●			●	●	
	3rd	OFF	ON	●	●	●			●			●		
	O/D	OFF	OFF		●	●	●		●					
2	1st	ON	OFF	●	●							●		●
	2nd	ON	ON	●	●			●	●			●	●	
	3rd	OFF	ON	●	●	●			●			●		
L	1st	ON	OFF	●	●					●	●	●		●
	* 2nd	ON	ON	●	●			●	●			●	●	

* Down–shift only in the L range and 2nd gear – no up–shift.

I.P. ..... Inner Piston
O.P. ..... Outer Piston

2. Transfer



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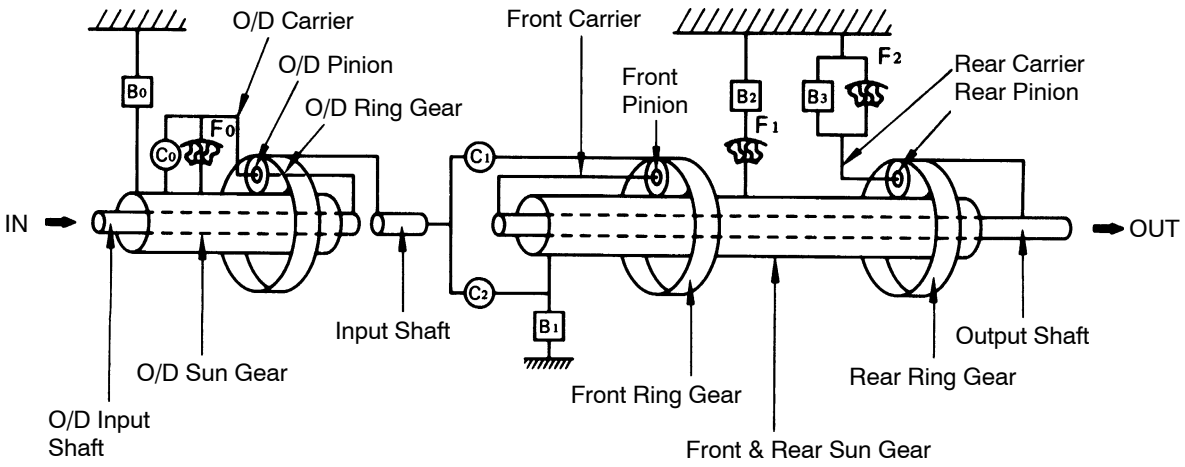
Transfer gear position	No. 4 solenoid valve	C_3	C_4	B_4
H2	OFF	●		
H4	OFF	●	●	
L4	ON		●	●

FUNCTION OF COMPONENTS

(A340H)

1. Transmission

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



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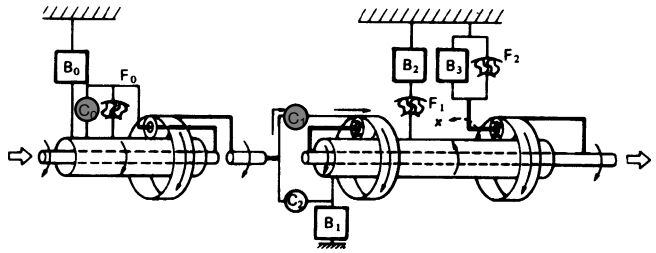
FUNCTION OF COMPONENTS (Cont'd)

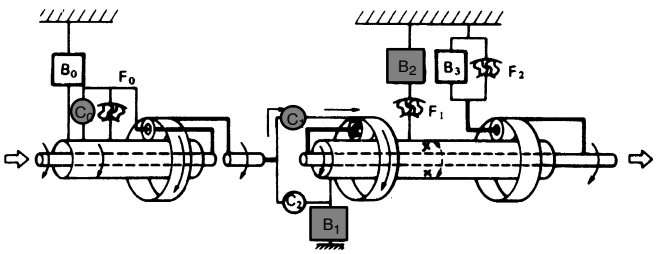
The conditions of operation for each gear position are shown in the following illustrations:

D or 2 Range 1st Gear



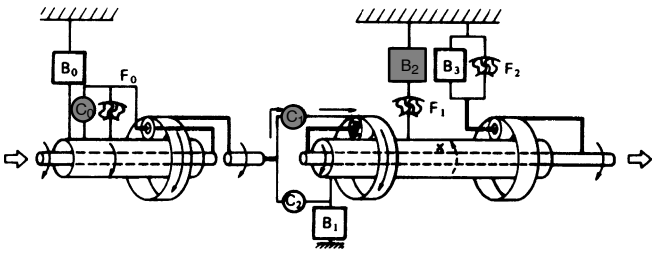
AT5854

2 or L Range 2nd Gear



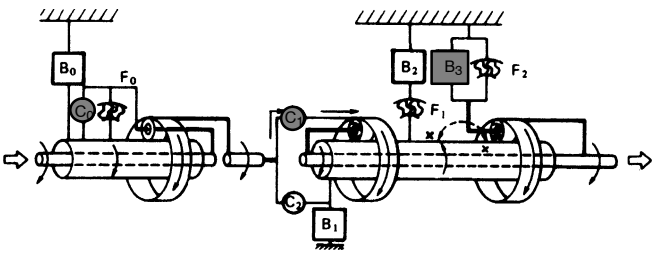
AT5854

D Range 2nd Gear



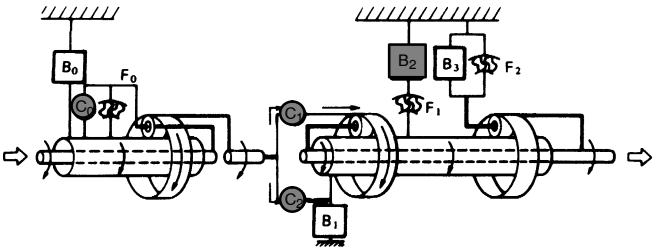
AT5854

L Range 1st Gear



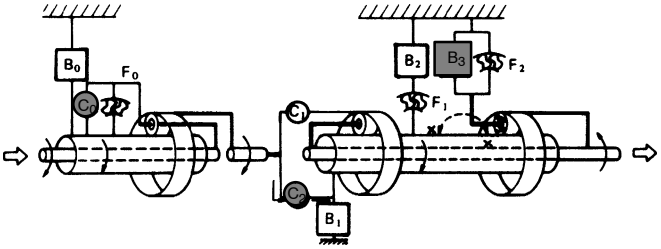
AT5854

D or 2 Range 3rd Gear



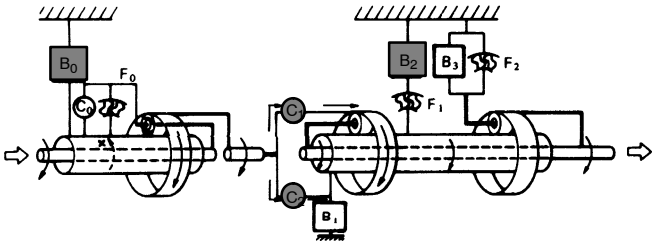
AT5854

R Range Reverse Gear



AT5854

D Range O/D

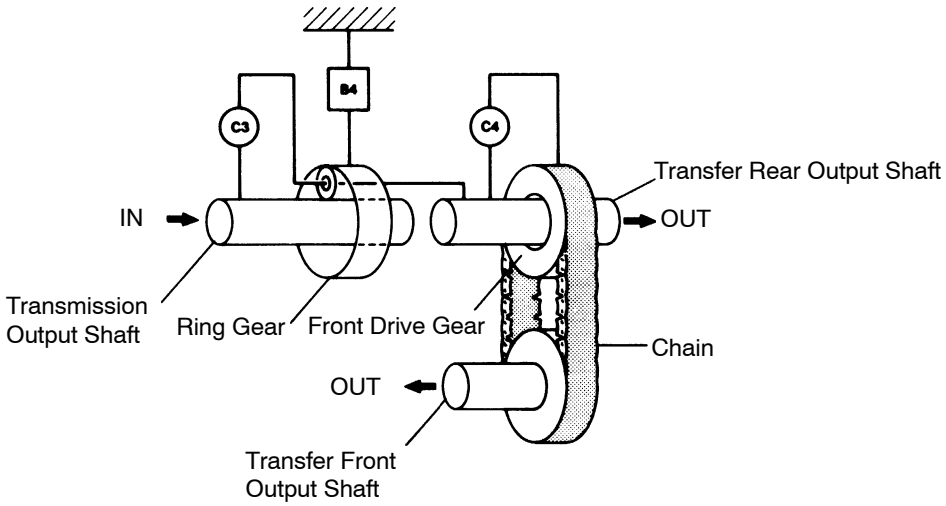


AT5854

FUNCTION OF COMPONENTS (Cont'd)

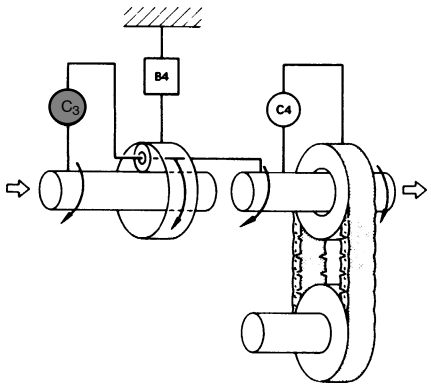
2. Transfer

Component		Function
C_3	Forward Clutch	Connects transmission output shaft and transfer pinion gear.
C_4	Direct Clutch	Connects transfer rear output shaft and front drive gear.
B_4	O/D Direct Clutch	Prevents transfer ring gear from turning either clockwise or counterclockwise.

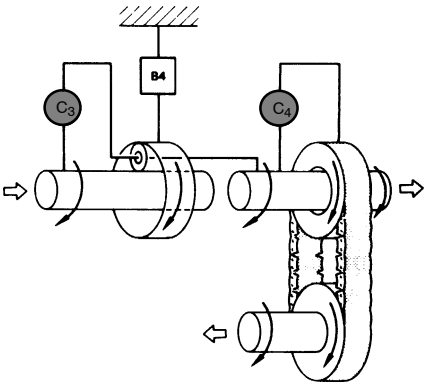


The conditions of operation for each gear position are shown in the following illustrations:

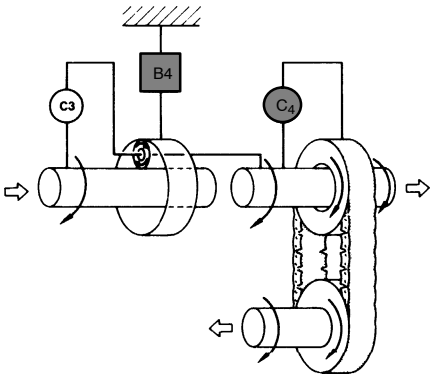
H2 Range



H4 Range



L4 Range



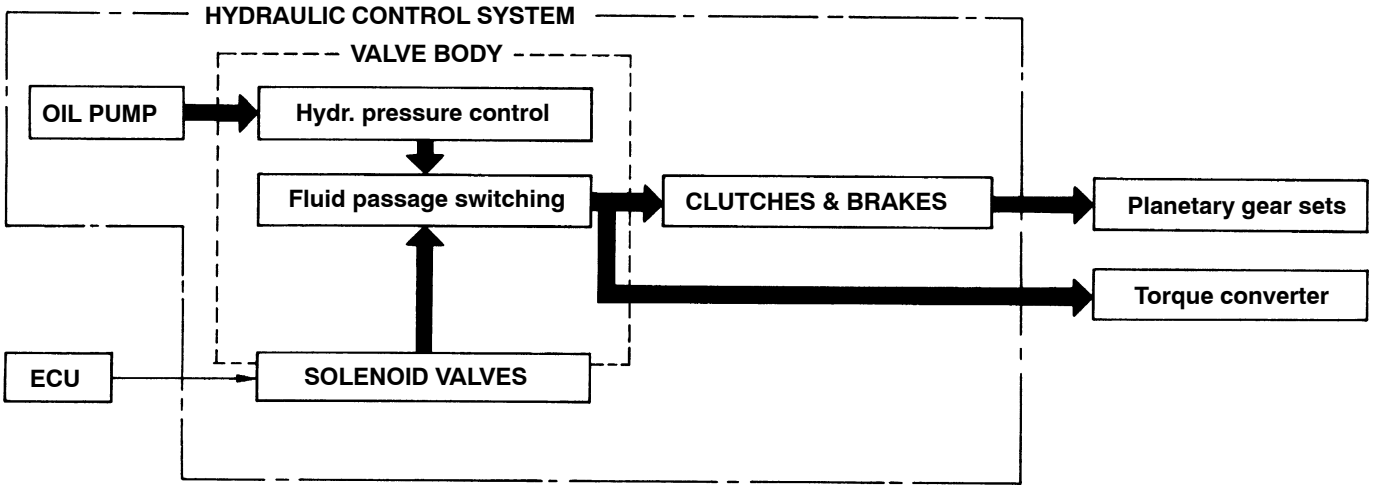
HYDRAULIC CONTROL SYSTEM

(A340H)

1. Transmission

The hydraulic control system is composed of the oil pump, the valve body, the solenoid valves, and the clutches and brakes, as well as the fluid passages which connect all of these components. Based on the hydraulic pressure created by the oil pump, the hydraulic control system governs the hydraulic pressure acting on the torque converter, clutches and brakes in accordance with the vehicle driving conditions.

There are three solenoid valves on the valve body. These solenoid valves are turned on and off by signals from the Engine & ECT ECU to operate the shift valves. These shift valves then switch the fluid passages so that fluid goes to the torque converter and planetary gear units.



2. Transfer

The hydraulic control system consists of a valve body, No. 4 solenoid valve, a brake (B_4) and two clutches (C_3, C_4) and passages that connect these elements. It hydraulically controls the planetary gear unit either manually, or automatically by the Engine & ECT ECU.

ELECTRONIC CONTROL SYSTEM

(A340H)

The electronic control system, which controls the transmission and transfer shift timing and the operation of the lock–up clutch, is composed of the following three parts:

1. **Sensors**

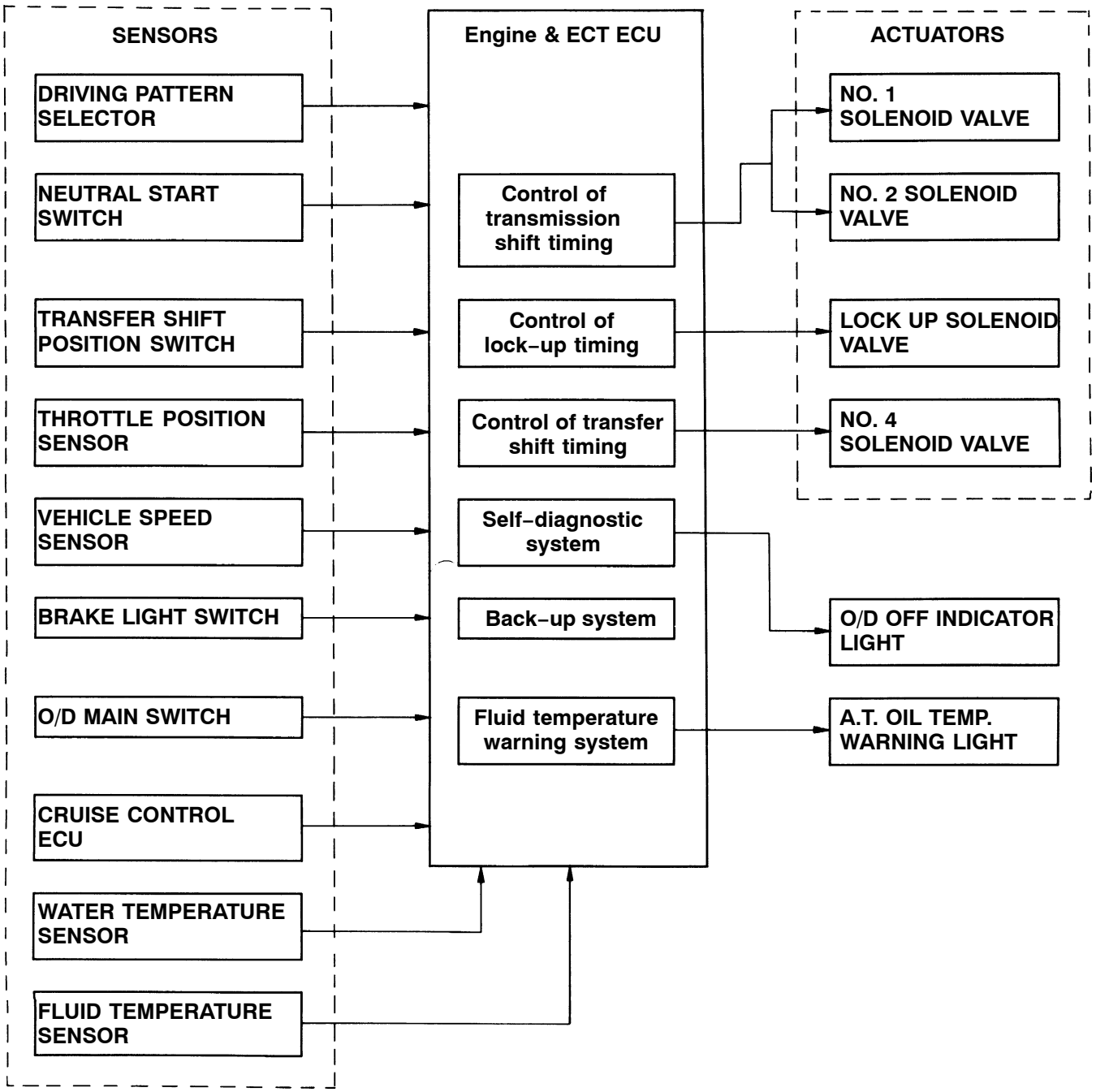
   These sensors sense the vehicle speed, throttle opening and other conditions and send these data to the Engine & ECT ECU in the form of electrical signals.

2. **Engine & ECT ECU**

   The Engine & ECT ECU determines the transmission and transfer shift timing and lock–up timing based upon the signals from sensors, and controls the solenoid valves of the hydraulic control unit accordingly.

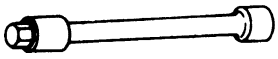
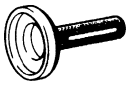
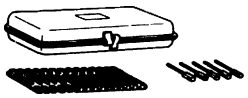
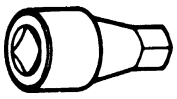
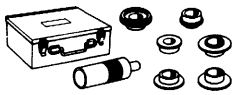
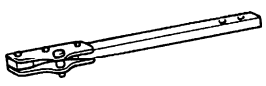
3. **Actuators**

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

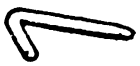
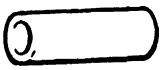


PREPARATION

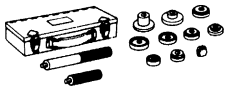
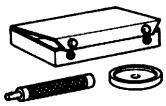
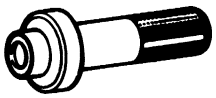
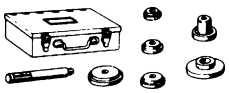
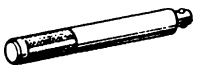
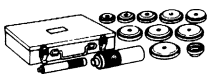
SST (SPECIAL SERVICE TOOLS)

Illustration	Part No.	Part Name	Note
	**09032–00100**	Oil Pan Seal Cutter	
	**09043–38100**	Hexagon 10 mm Wrench	Transfer (A340F)
	**09201–60011**	Valve Guide Bushing Remover & Replacer	Transfer (A340F)
	**09223–15010**	Crankshaft Front Oil Seal Replacer	Transfer (A340F)
	**09223–22010**	Crankshaft Front Oil Seal Replacer	Transfer (A340F)
	**09240–00020**	Wire Gauge Set	
	**09304–12012**	Input Shaft Front Bearing Replacer	Transfer (A340F)
	**09308–00010**	Oil Seal Puller	
	**09313–30021**	Detent Ball Plug Socket	Transfer (A340F)
	**09316–60010**	Transmission & Transfer Bearing Replacer	Transfer (A340F)
	**(09316–00010)**	Replacer ”A”	Transfer (A340F)
	**(09316 – 00070)**	Replacer ”F”	Transfer (A340F)
	**09320–89010**	Transfer Clutch Spring Compressor	A340H
	**09330–00021**	Companion Flange Holding Tool	A340H

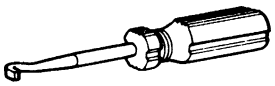
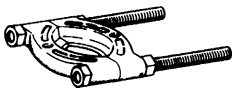
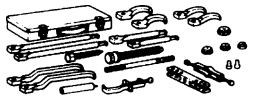
SST (SPECIAL SERVICE TOOLS) (Cont'd)

Illustration	Part No.	Part Name	Note
	**09350–30020**	TOYOTA Automatic Transmission Tool Set	
	**(09350–06120)**	No. 2 Measure Terminal	
	**(09350–07020)**	Oil Pump Puller	
	**(09350–07030)**	No. 1 Piston Spring Compressor	
	**(09350–07040)**	No. 2 Piston Spring Compressor	A340E
	**(09350–07050)**	No. 3 Piston Spring Compressor	
	**(09350–07060)**	No. 1 Snap Ring Expander	
	**(09350–07070)**	No. 2 Snap Ring Expander	
	**(09350–07080)**	Brake Reaction Sleeve Puller	
	**(09350–07090)**	Brake No. 1 Piston Puller	
	**(09350–07110)**	Oil Seal Replacer	
	**(09351–32140)**	Oil Seal Replacer	A340E
	**09350–36010**	TOYOTA Automatic Transmission Tool Set	
	**(09350–06090)**	Plate	
	**09515–30010**	Rear Wheel Bearing Replacer	Transfer (A340F)

SST (SPECIAL SERVICE TOOLS) (Cont'd)

Illustration	Part No.	Part Name	Note
	**09550–10012**	Replaces Set "B"	Transfer (A340F)
	**(09252–10010)**	No. 1 Replacer Handle	Transfer (A340F)
	**(09557–10010)**	Differential Drive Pinion Front Bearing Replacer	Transfer (A340F)
	**09550–22011**	Rear Axle Bearing & Differential Tool Set	Transfer (A340F)
	**(09550–00020)**	Handle	Transfer (A340F)
	**(09550–00031)**	(Replacer	Transfer (A340F)
	**09554–30011**	Differential Oil Seal Replacer	Transfer (A340F)
	**09555–55010**	Differential Drive Pinion Bearing Replacer	Transfer (A340F)
	**09608–12010**	Front Hub & Drive Pinion Bearing Replacer Set	Transfer (A340F)
	**(09608–00020)**	Remover & Replacer Handle	Transfer (A340F)
	**(09608–00040)**	Front Hub Outer Bearing Cup Replacer	Transfer (A340F)
	**09608–32010**	Steering Knuckle Oil Seal Replacer	A340H
	**09608–35014**	Axle Hub & Drive Pinion Bearing Tool Set	A340H
	**(09608–06020)**	Handle	A340H
	**(09608–06100)**	Front Hub Outer Replacer	A340H

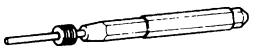
SST (SPECIAL SERVICE TOOLS) (Cont'd)

Illustration	Part No.	Part Name	Note
	**09921–00010**	Spring Tension Tool	Transfer (A340F)
	**09950–00020**	Bearing Remover	Transfer (A340F)
	**09950–20017**	Universal Puller	Transfer (A340F)

SSM (SPECIAL SERVICE MATERIALS)

Part Name	Part No.	Sec.	Use etc.
Seal packing 1281, Three bond 1281 or equivalent	08826–00090	AT	(A340E) Oil pan (A340H) Transfer case Transfer chain front case Transfer chain rear case Transfer oil pump Transfer oil pan Transmission oil pan
		TF	Rear companion flange
Adhesive 1324, Three bond 1324 or equivalent	08833–00070	AT	(A340H) Transfer oil strainer set bolts Transfer chain front case set bolts Transfer chain oil receiver set bolts Transfer oil pan set bolts
Adhesive 1344, Three bond 1344, Loctite 242 or equivalent	08833–00080	TF	Straight screw plug Extension housing set bolt Front reatainer set bolt
Adhesive 1131, Three bond 1131, Loctite 518 or equivalent	08833–00090	AT	(A340H) Transfer extension housing

RECOMMENDED TOOLS

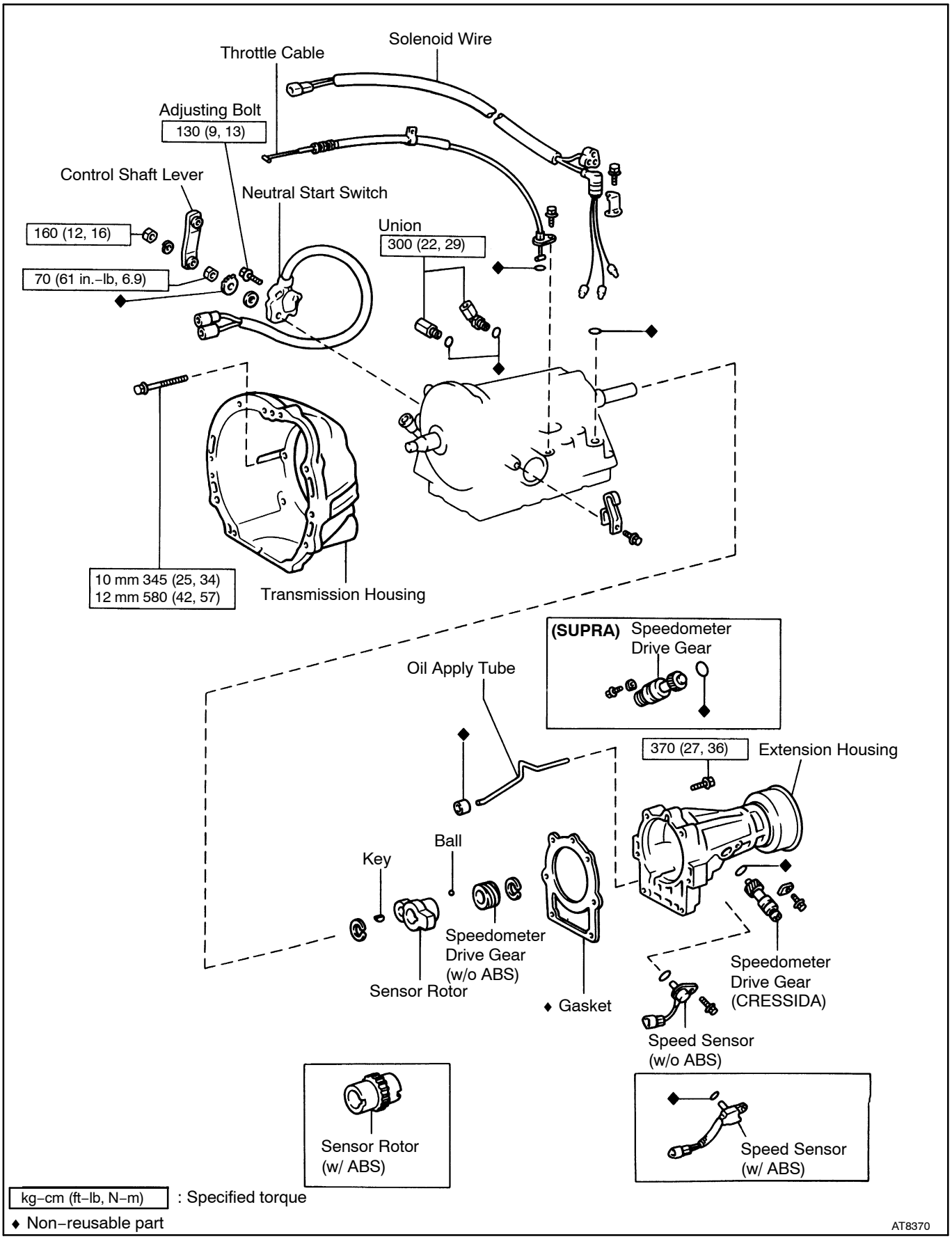
Illustration	Part No.	Part Name	Note
	**09031–00030**	Pin Punch	

EQUIPMENT

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

REMOVAL OF COMPONENT PARTS (A340E)

COMPONENTS (SUPRA and CRESSIDA)

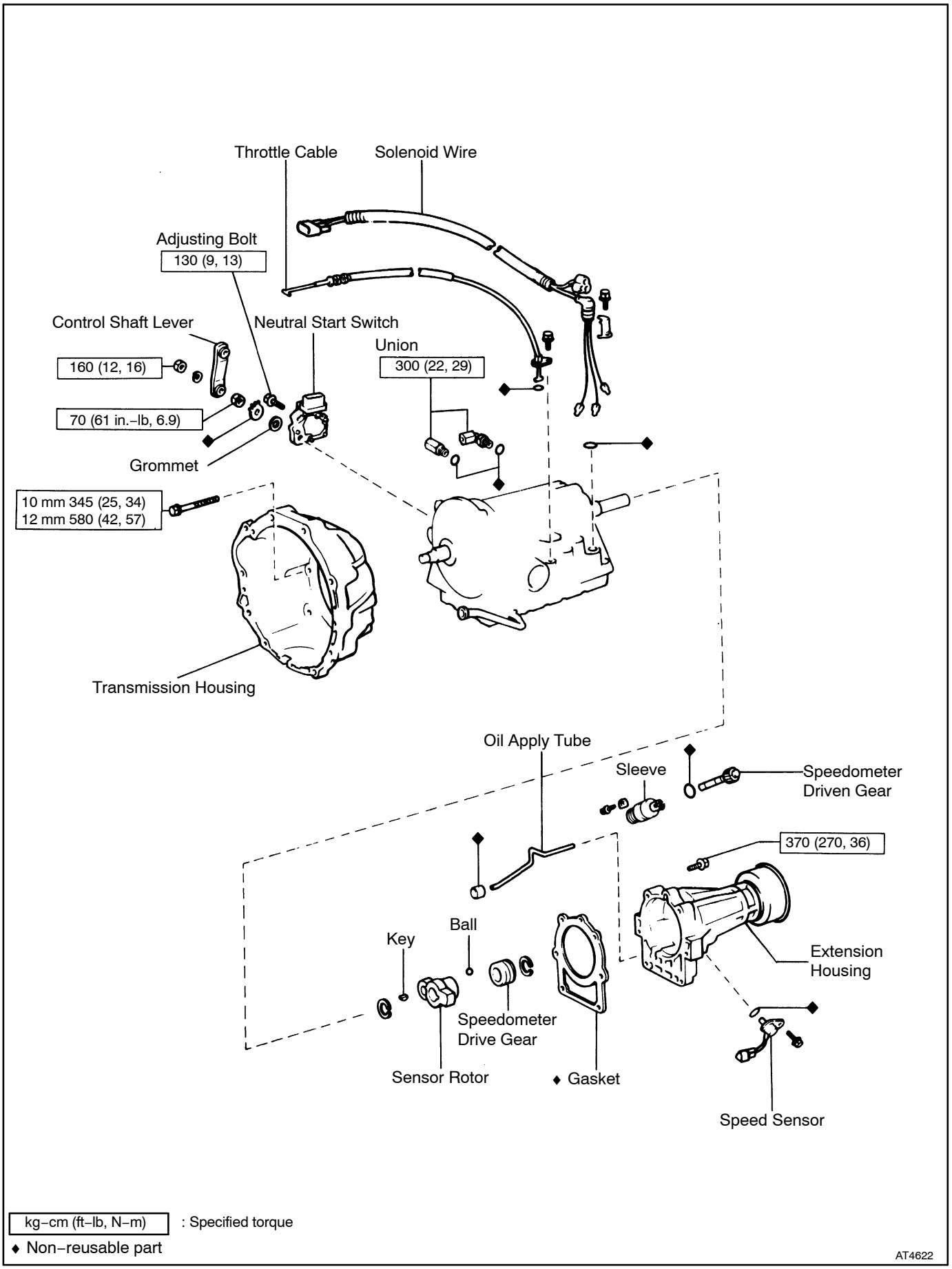


kg–cm (ft–lb, N–m) : Specified torque

♦ Non–reusable part

AT8370

COMPONENTS (TRUCK and 4 RUNNER)

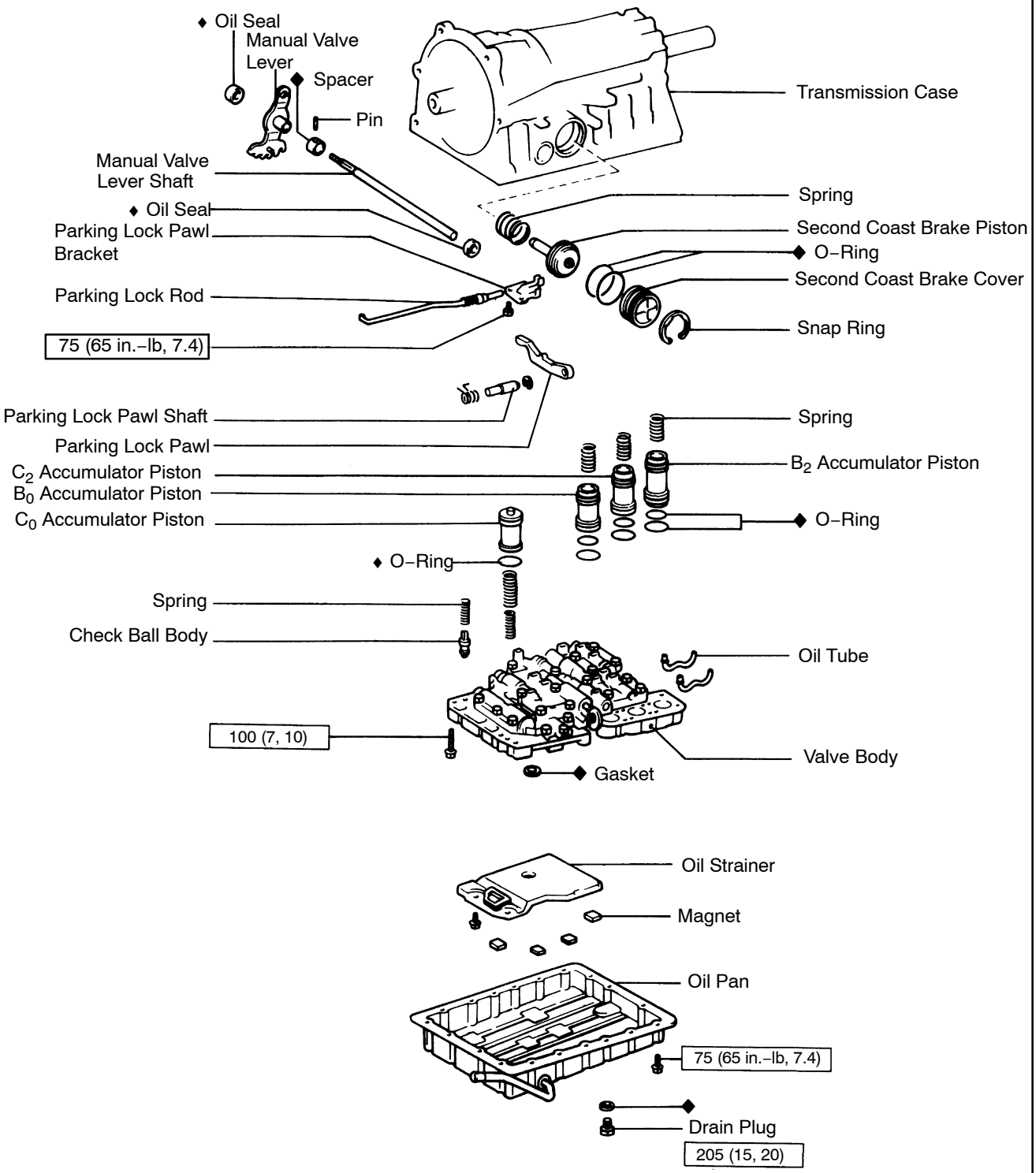


kg–cm (ft–lb, N–m) : Specified torque

♦ Non–reusable part

AT4622

COMPONENTS (Cont'd)

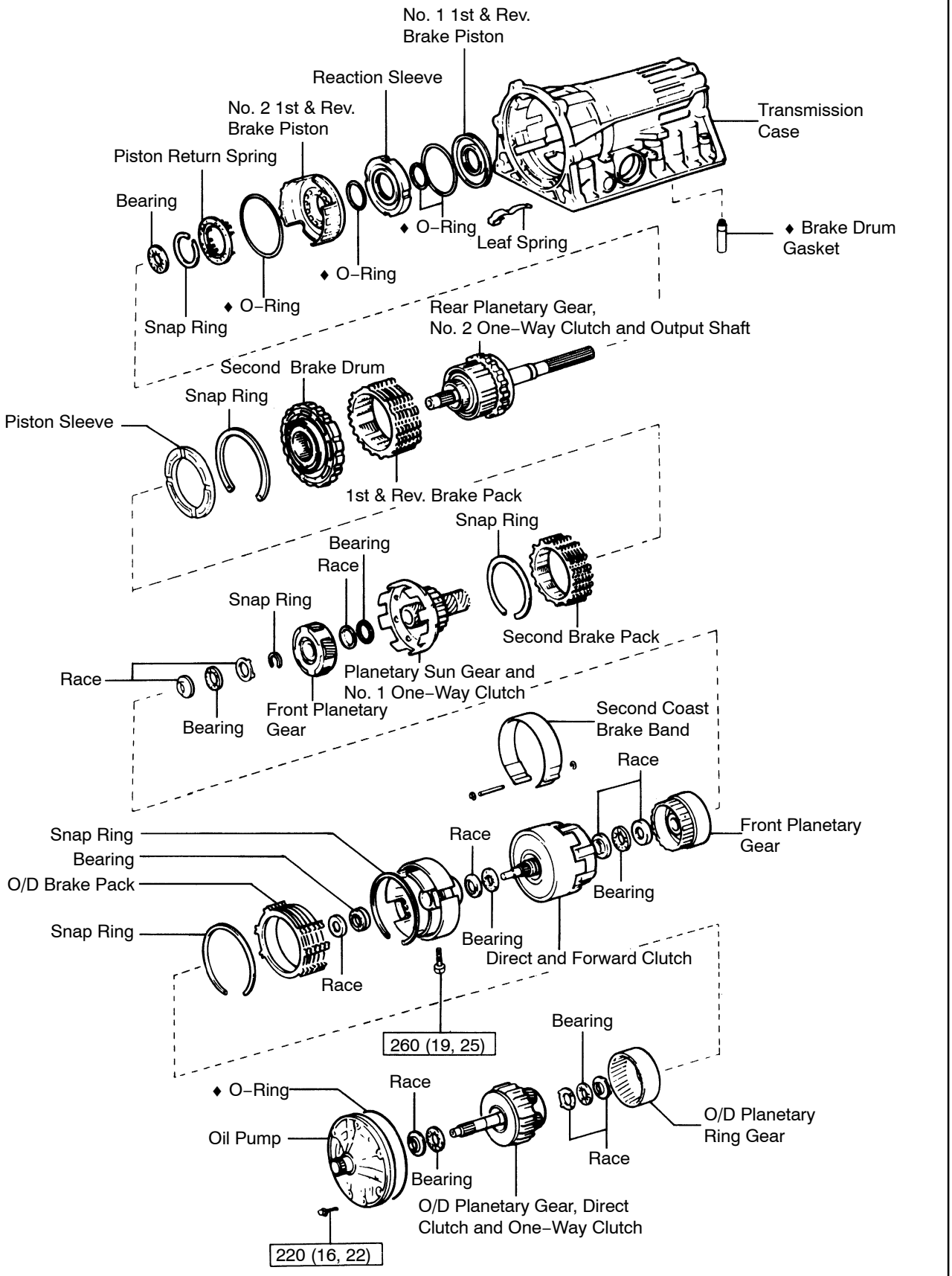


kg–cm (ft–lb, N–m) : Specified torque

♦ Non–reusable part

AT5884

COMPONENTS (Cont'd)



kg–cm (ft–lb, N–m) : Specified torque

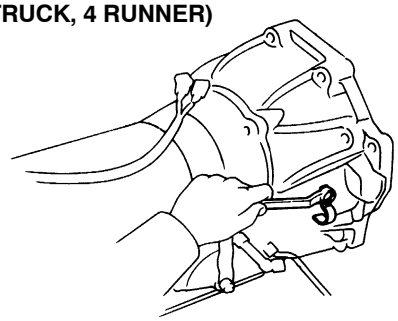
♦ Non–reusable part

AT5654

SEPARATE BASIC SUBASSEMBLY

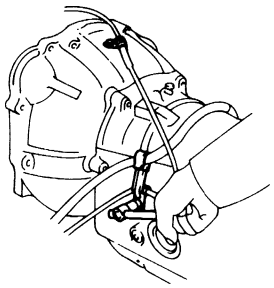
1. REMOVE WIRE HARNESS CLAMP AND THROTTLE CABLE CLAMP

(TRUCK, 4 RUNNER)



AT4625

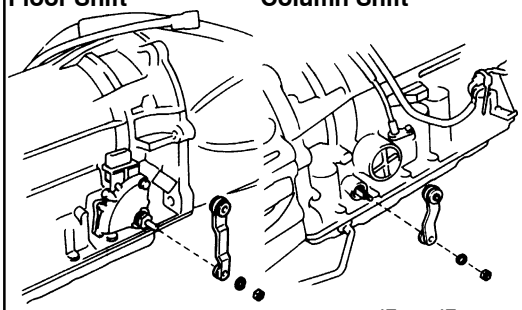
(SUPRA, CRESSIDA)



AT2310

2. REMOVE TRANSMISSION CONTROL SHAFT LEVER

Floor Shift Column Shift



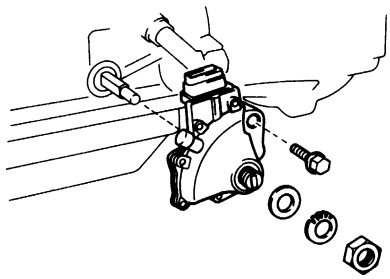
AT4836 AT4994

3. REMOVE NEUTRAL START SWITCH

(a) Unstake the lock washer.

(b) Remove the nut and bolt, and then remove the neutral start switch.

(c) Remove the lock washer and grommet.

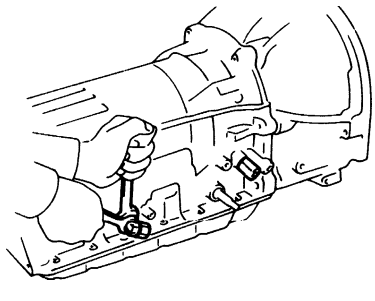


AT4505

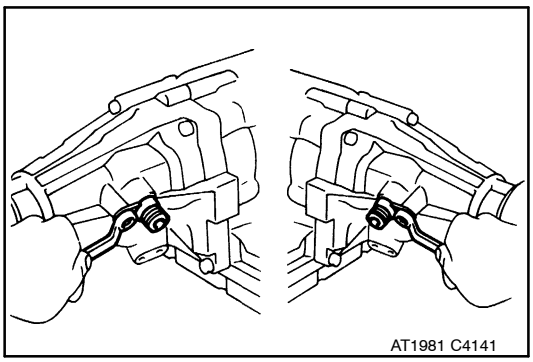
4. REMOVE UNIONS

(a) Remove the two unions.

(b) Remove the O–rings from both unions.

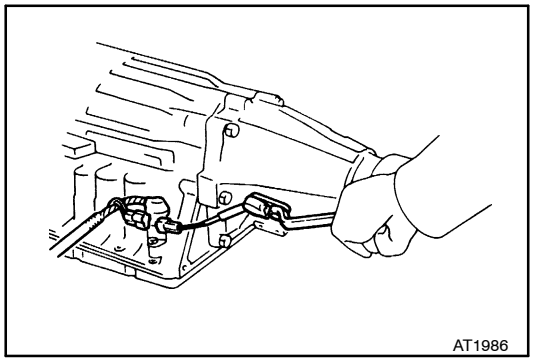


AT5072



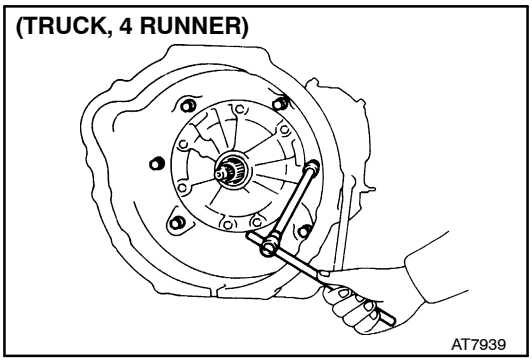
5. REMOVE SPEEDOMETER DRIVEN GEAR

(a) Remove the bolt and lock plate.
(b) Pull out the sleeve.
(c) Pull out the driven gear from the sleeve.
(d) Remove the O–ring from the sleeve.



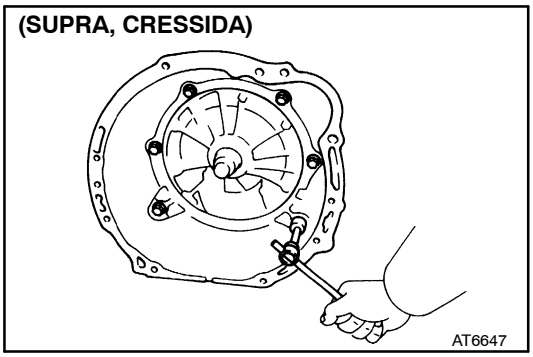
6. REMOVE SPEED SENSOR

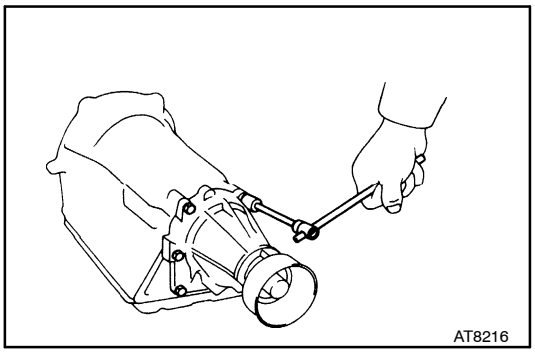
(a) Disconnect the connector.
(b) Remove the speed sensor.
(c) Remove the O–ring from it.



7. REMOVE TRANSMISSION HOUSING

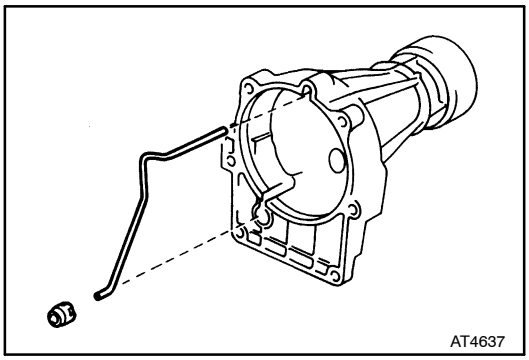
(a) Remove the six bolts.
(b) Remove the transmission housing.



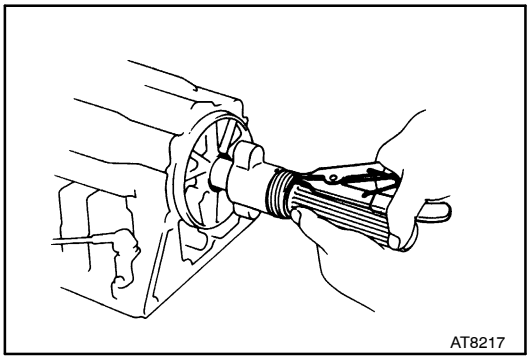


8. REMOVE EXTENSION HOUSING

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



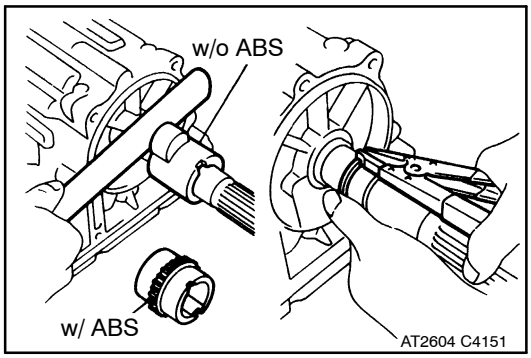
(c) Remove the oil apply tube and gasket from the extension housing.



9. REMOVE SPEEDOMETER DRIVE GEAR AND BALL

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

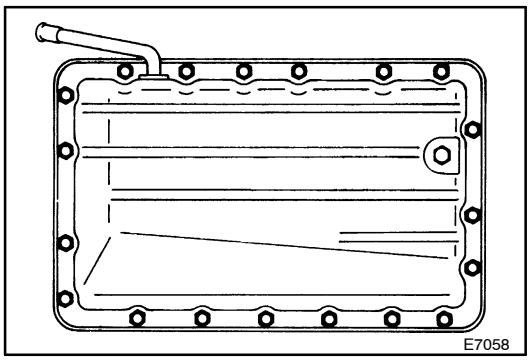
(b) Remove the speedometer drive gear and ball.



10. REMOVE SENSOR ROTOR AND KEY

(a) Remove the sensor rotor and key.

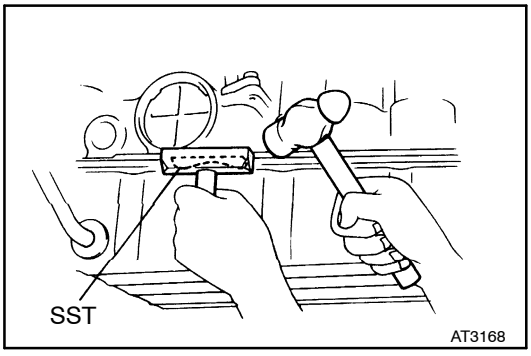
(b) Using snap ring pliers, remove the snap ring.



11. REMOVE OIL PAN

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

(a) Remove the nineteen bolts.



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

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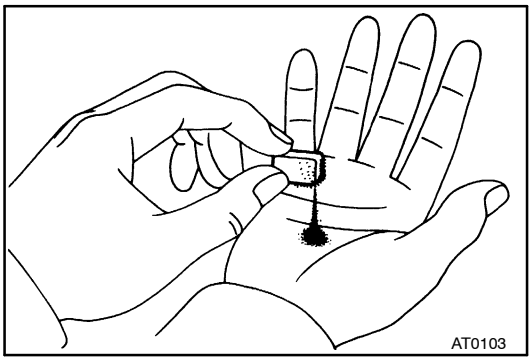
NOTICE: Be careful not to damage the oil pan flange.

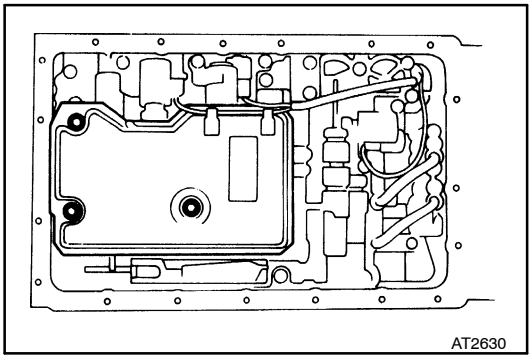
(c) Remove the pan by lifting the transmission case.



12. EXAMINE PARTICLES IN PAN

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

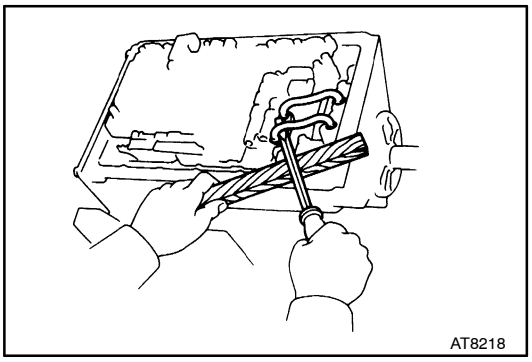
Steel (magnetic) . . . . . bearing, gear and clutch plate wear
Brass (non–magnetic) . . bushing wear



13. REMOVE OIL STRAINER AND GASKETS

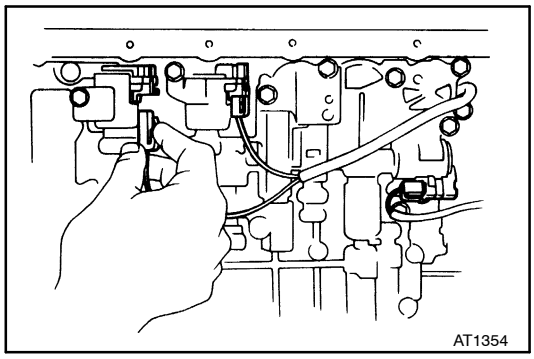
(a) Remove the three bolts holding the oil strainer to the valve body.

(b) Remove the oil strainer and two gaskets.



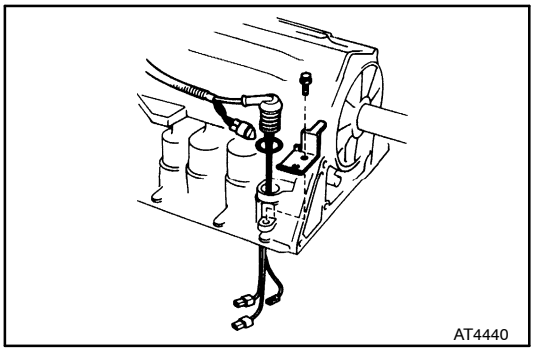
14. REMOVE OIL TUBES

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



15. REMOVE SOLENOID WIRING

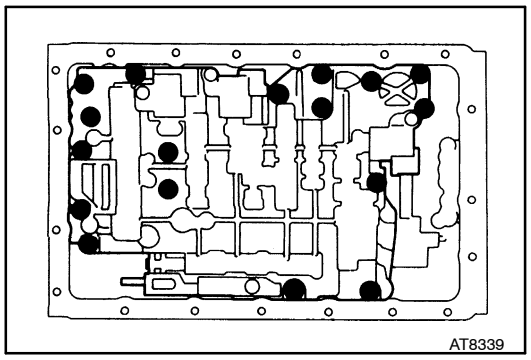
(a) Disconnect the three connectors from No. 1, No. 2 and lock–up solenoid.



(b) Remove the stopper plate from the case.

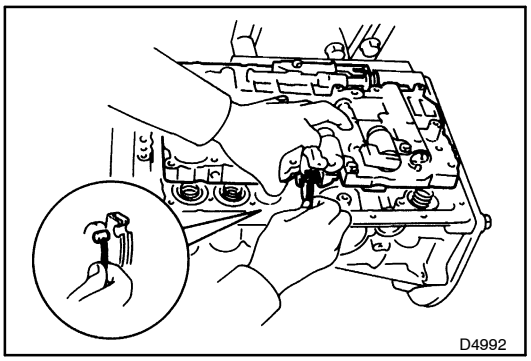
(c) Pull out the solenoid wiring from the transmission case.

(d) Remove the O–ring from the grommet.

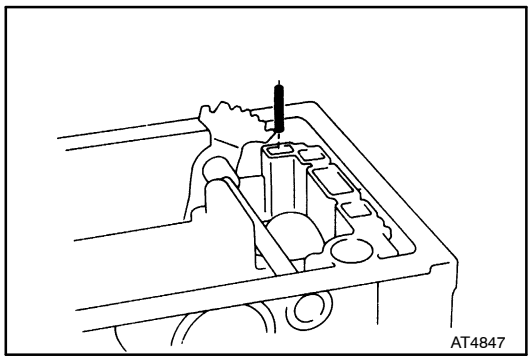


16. REMOVE VALVE BODY

(a) Remove the seventeen bolts.

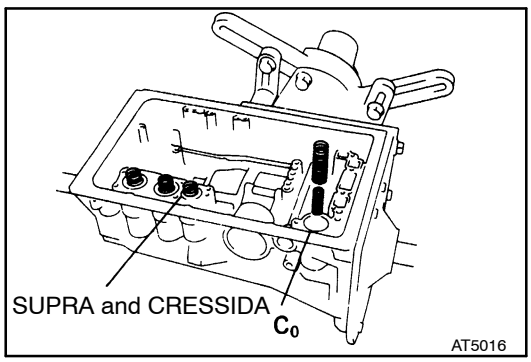


(b) Disconnect the throttle cable from the cam and remove the valve body.

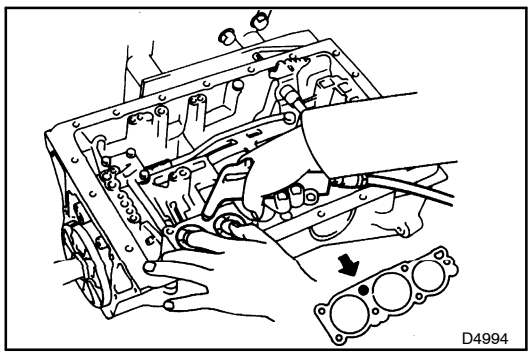


17. REMOVE CHECK BALL BODY, ACCUMULATOR SPRINGS AND PISTONS

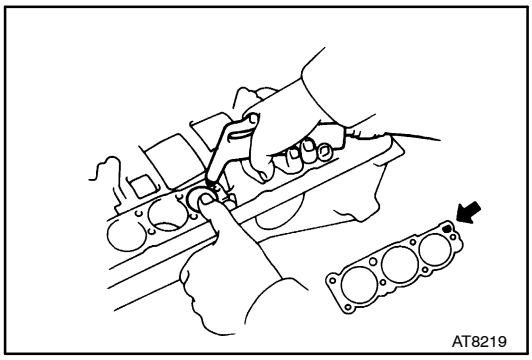
(a) Remove the check ball body and spring.



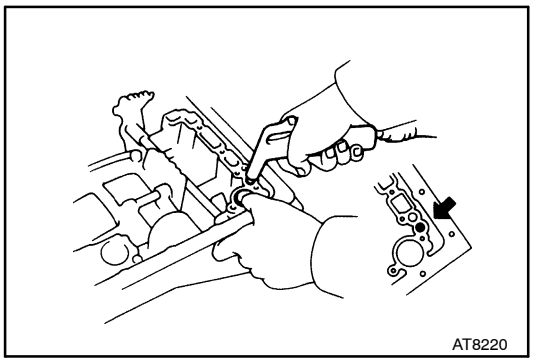
(b) Remove the two springs from the C_0 accumulator piston.



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

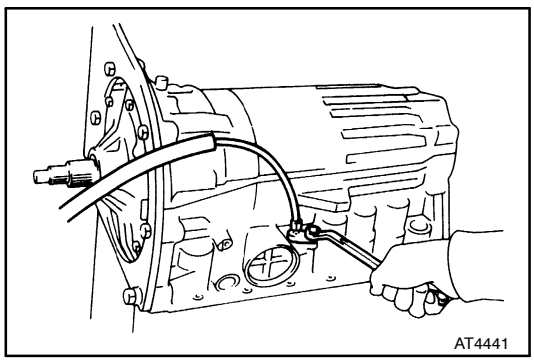


(d) Applying compressed air to the oil hole, remove the B_0 accumulator piston and spring.



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

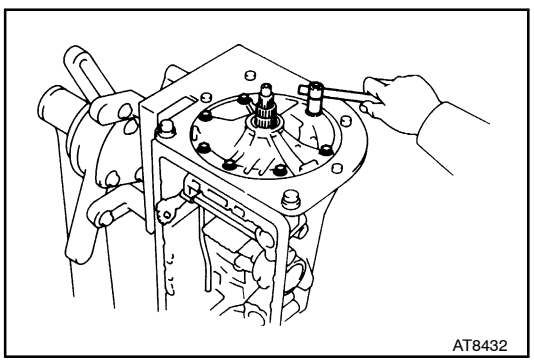
(f) Remove the O–ring from each piston.



18. REMOVE THROTTLE CABLE

(a) Remove the retaining bolt and pull out the throttle cable.

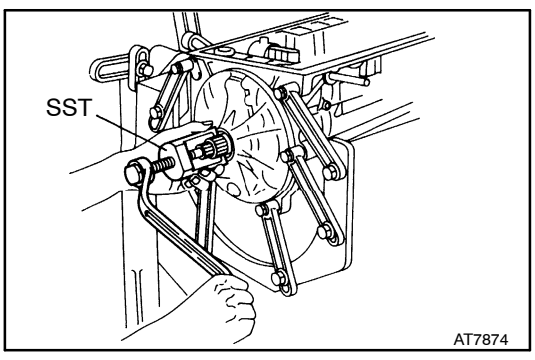
(b) Remove the O–ring from the cable.



19. REMOVE OIL PUMP

(a) Stand up the transmission.

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



(c) Using SST, remove the oil pump.

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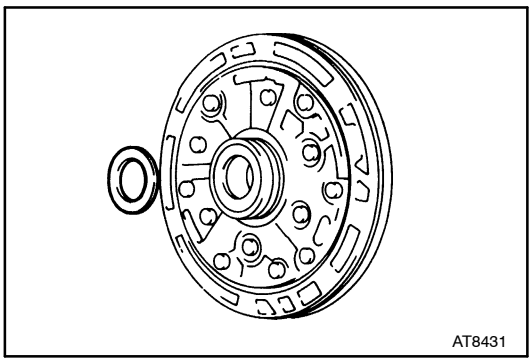
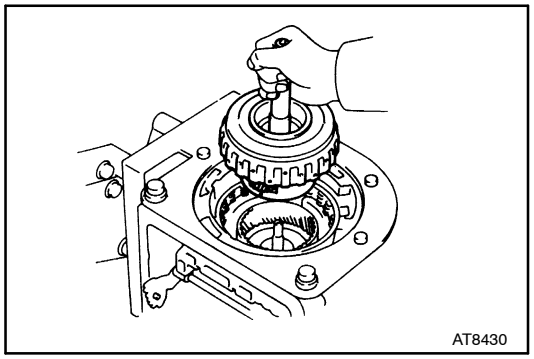
(d) Remove the O–ring from it.

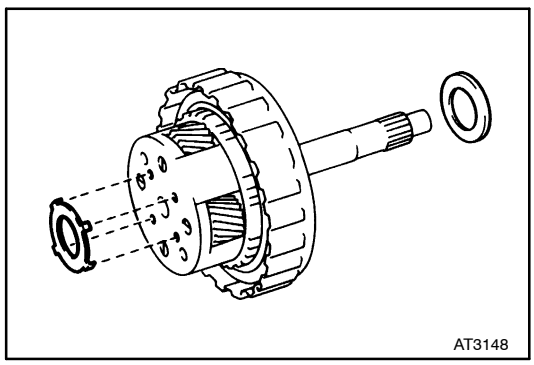


(e) Remove the race from the oil pump.

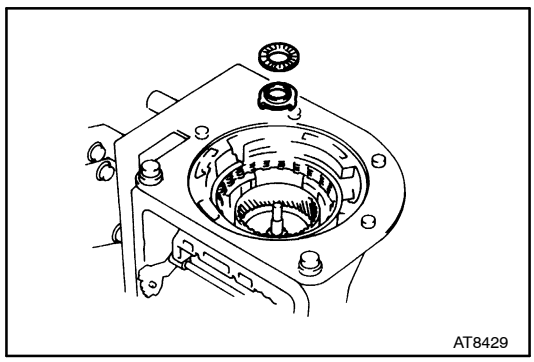


20. REMOVE OVERDRIVE PLANETARY GEAR UNIT WITH OVERDRIVE DIRECT CLUTCH AND ONE–WAY CLUTCH

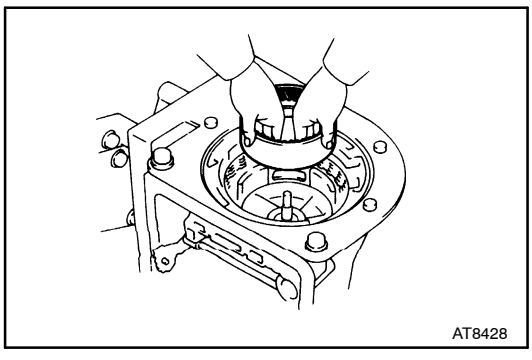
(a) Remove the overdrive planetary gear with the overdrive direct clutch and one–way clutch from the transmission case.



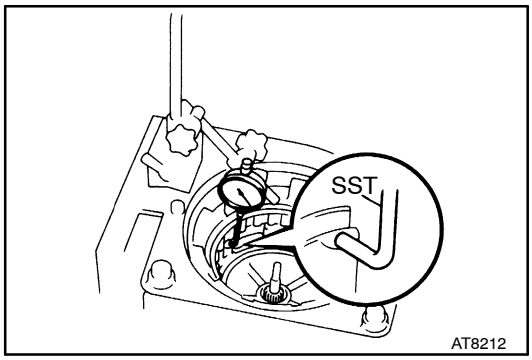
(b) Remove the race and assembled bearing and race.



(c) Remove the bearing and race.



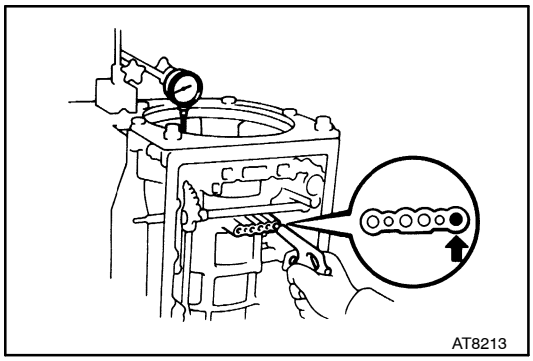
(d) Remove the overdrive planetary ring gear from the transmission case.



21. CHECK PISTON STROKE OF OVERDRIVE BRAKE

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

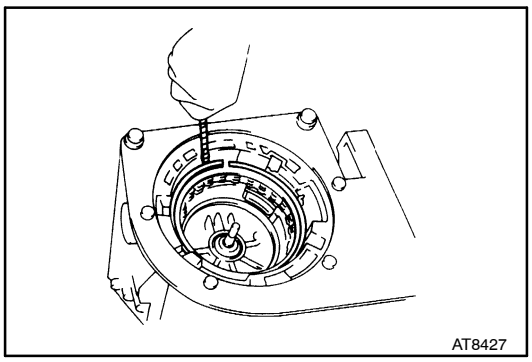
SST 09350–30020 (09350–06120)



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

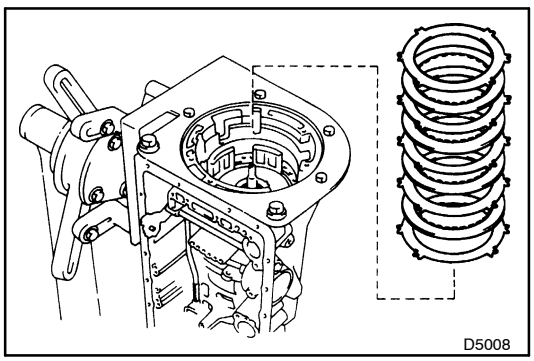
Piston stroke:
(7M–GTE)
1.75 – 2.05 mm (0.0689 – 0.0807 in.)
(Others)
1.40 – 1.70 mm (0.0551 – 0.0669 in.)

If the values are nonstandard, inspect the discs.
(See page AT–61)



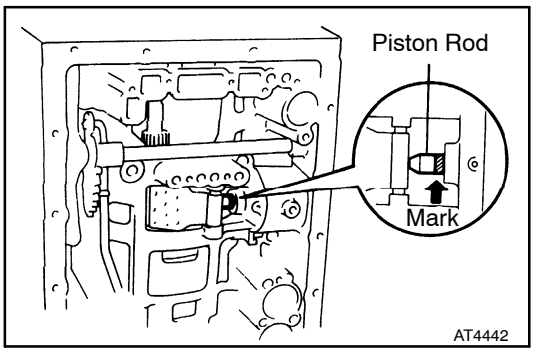
22. REMOVE FLANGES, PLATES AND DISCS OF OVERDRIVE BRAKE

(a) Remove the snap ring.



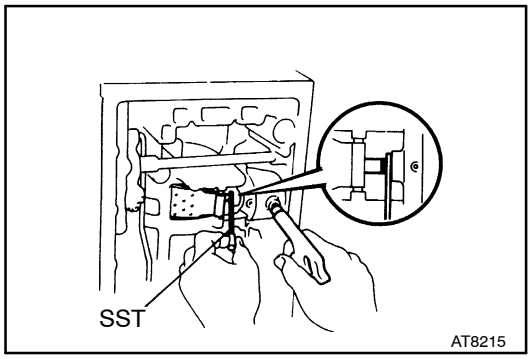
(b) Remove the flanges, plates and discs as a set.

(7M–GTE)
Two flanges, four plates and five discs
(Others)
Two flanges, three plates and four discs
The method of inspection, refer to AT–61.



23. CHECK PISTON ROD STROKE OF SECOND COAST BRAKE

(a) Place a mark on the second coast brake piston rod as shown in the figure.

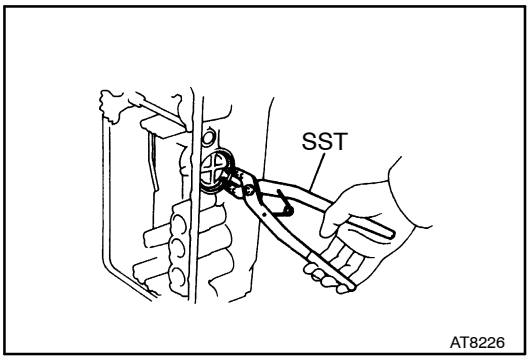


(b) Using SST, measure the stroke applying the compressed air (4 – 8 kg /cm^2, 57 – 114 psi or 392 – 785 kPa) as shown in the figure.

SST 09240–00020

Piston rod stroke: 1.5 – 3.0 mm (0.059 – 0.118 in.)

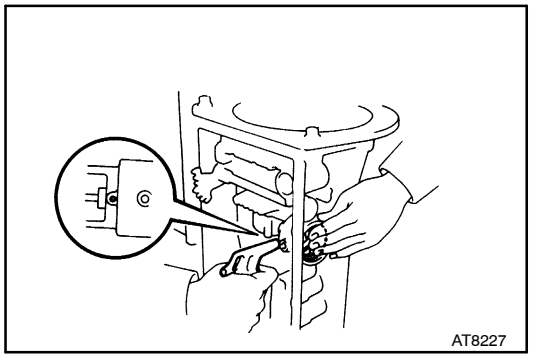
If the values are nonstandard, inspect the brake band. (See page AT–76)



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

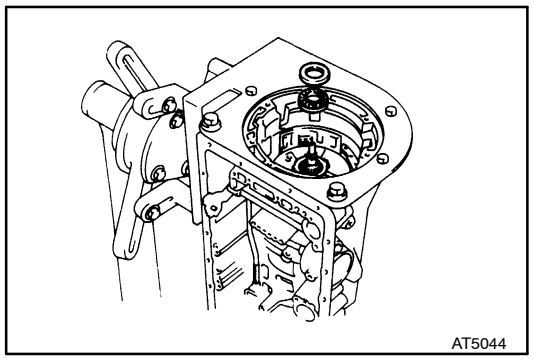
(a) Using SST, remove the snap ring.

SST 09350–30020 (09350–07060)



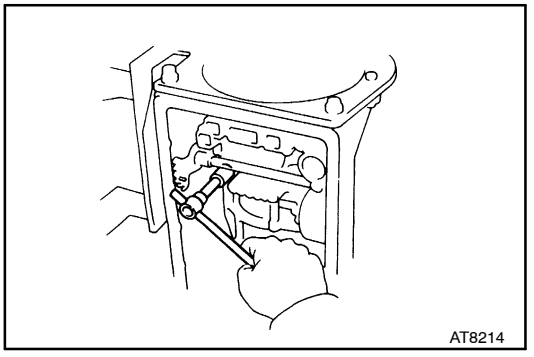
(b) Applying compressed air to the oil hole, remove the second coast brake cover, piston assembly and spring.

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

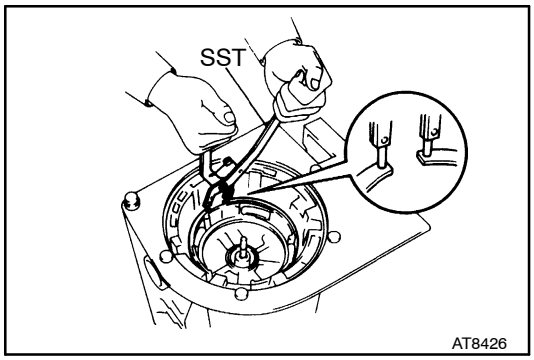


25. REMOVE OVERDRIVE SUPPORT ASSEMBLY

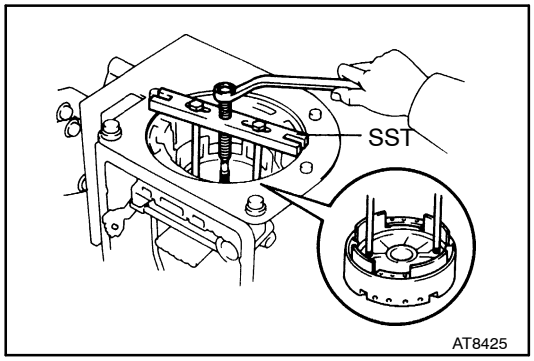
(a) Remove the bearing and race.



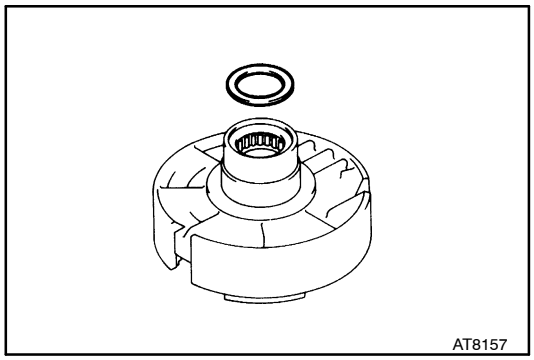
(b) Remove the two bolts holding the overdrive support assembly to the case.



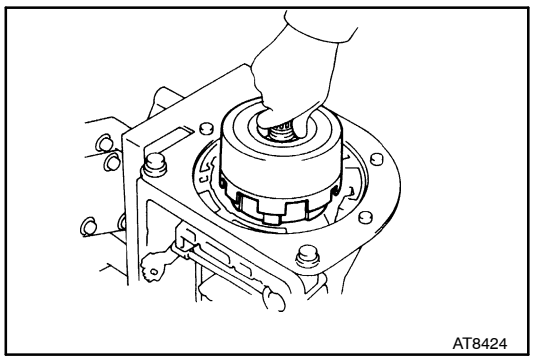
(c) Using SST, remove the snap ring.
SST 09350–30020 (09350–07060)



(d) Using SST, remove the overdrive support assembly.
SST 09350–30020 (09350–07020)

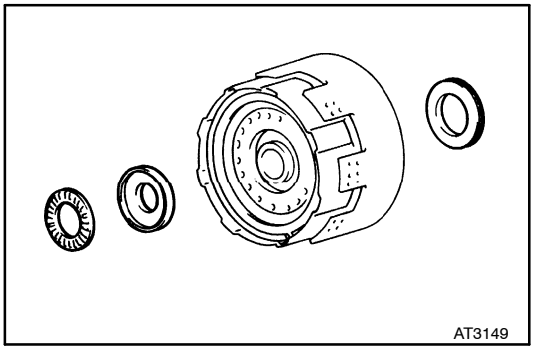


(e) Remove the race.

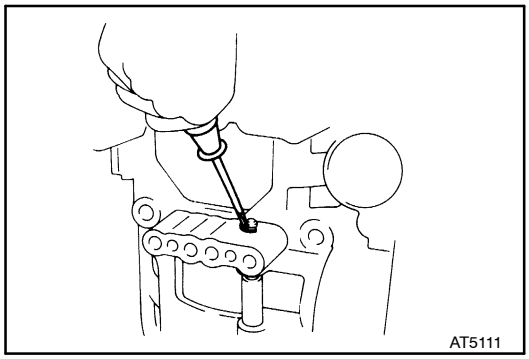


26. REMOVE DIRECT CLUTCH WITH FORWARD CLUTCH

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



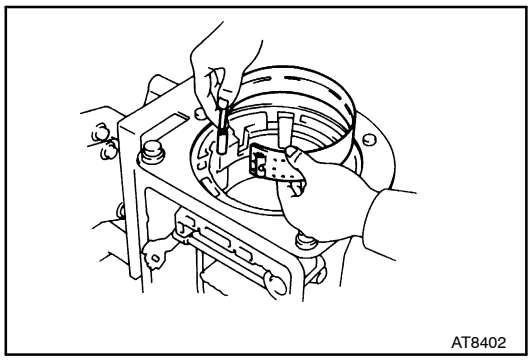
(b) Remove the two bearings and race.



27. REMOVE SECOND COAST BRAKE BAND

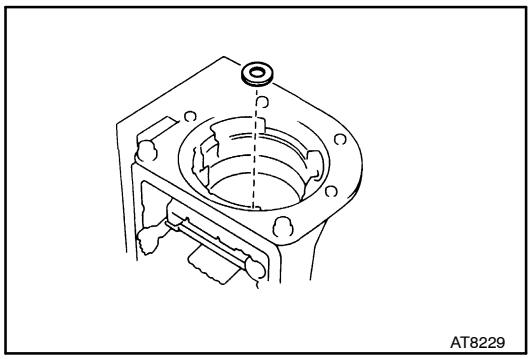
(a) Remove the E–ring from the pin.

(b) Remove the pin from the brake band.



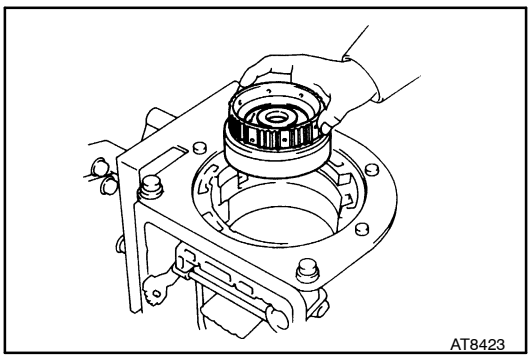
(c) Remove the second coast brake band from the case.

For the method of inspection, refer to AT–76.

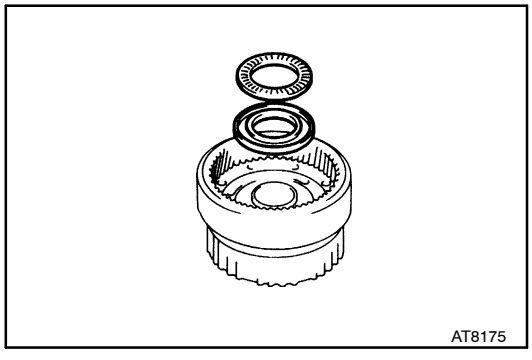


28. REMOVE FRONT PLANETARY GEAR UNIT

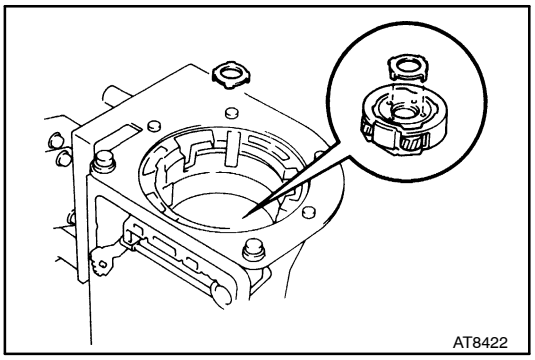
(a) Remove the race.



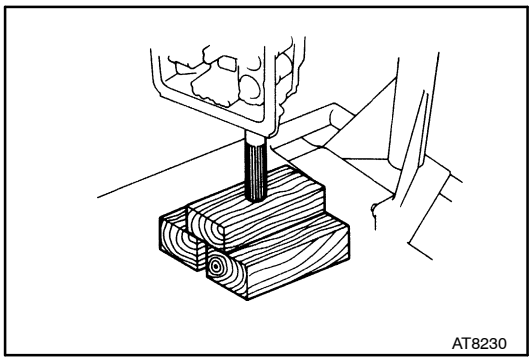
(b) Remove the front planetary ring gear from the case.



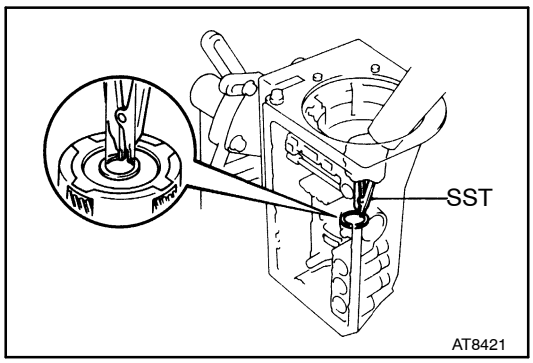
(c) Remove the bearing and race.



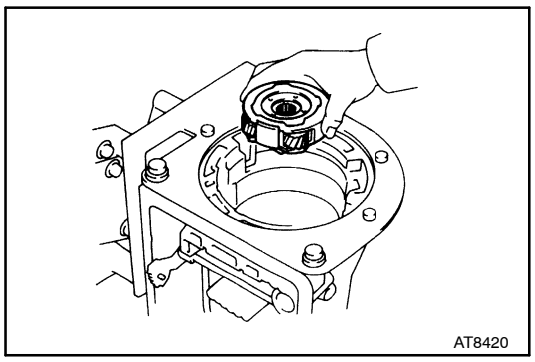
(d) Remove the race.



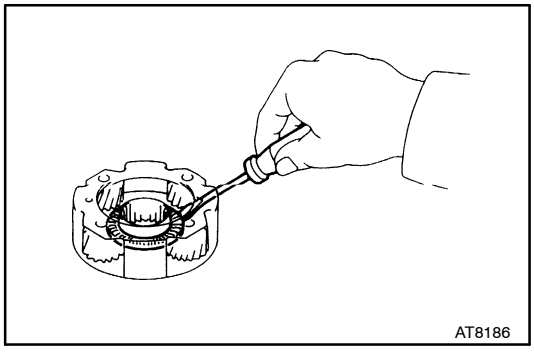
(e) With wooden blocks under the output shaft, stand the transmission on the output shaft.



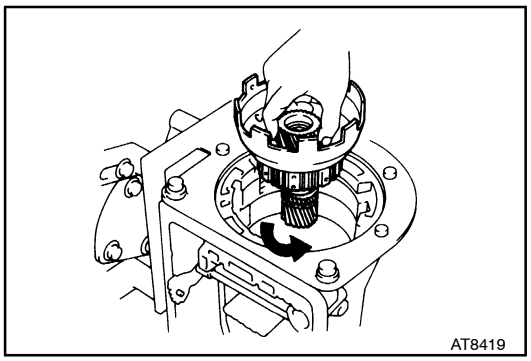
(f) Using SST, remove the snap ring.
SST 09350–30020 (09350–07070)



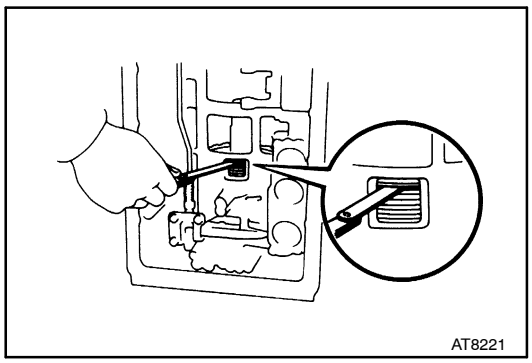
(g) Remove the front planetary gear from the case.



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

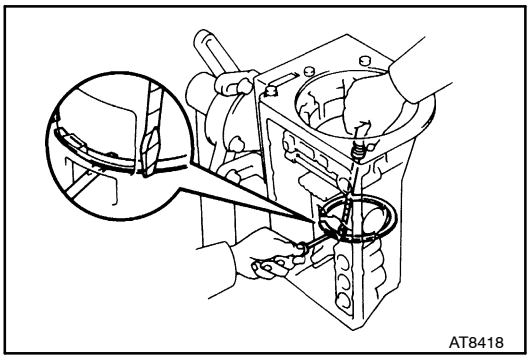


29. REMOVE PLANETARY SUN GEAR WITH NO. 1 ONE–WAY CLUTCH



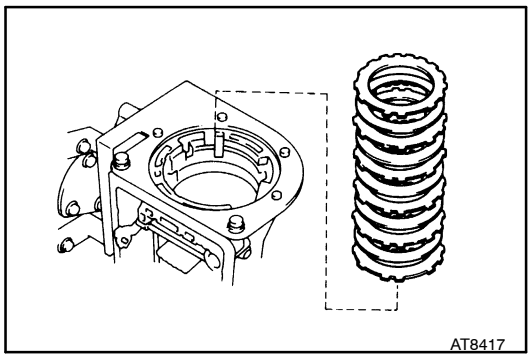
30. CHECK PACK CLEARANCE OF SECOND BRAKE

Using a thickness gauge, measure the clearance between the snap ring and flange as shown in the figure.
Clearance: 0.62 – 1.98 mm (0.0244 – 0.0780 in.)
If the values are nonstandard, inspect the discs.
(See page AT–84)

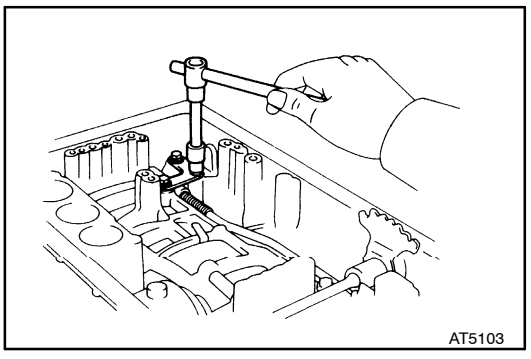


31. REMOVE FLANGE, PLATES AND DISCS OF SECOND BRAKE

(a) Remove the snap ring.

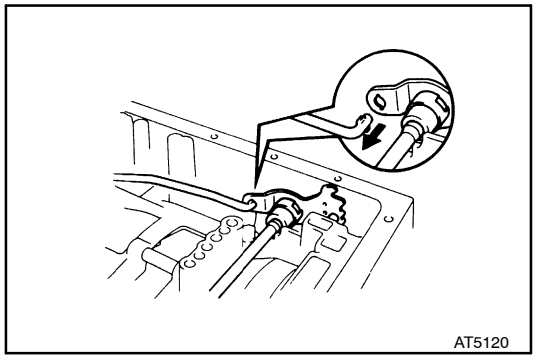


(b) Remove the flange, five plates and five discs.

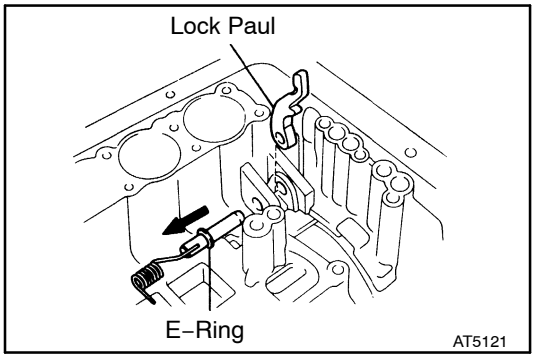


32. REMOVE PARKING LOCK ROD AND PAWL

(a) Remove the parking lock pawl bracket.

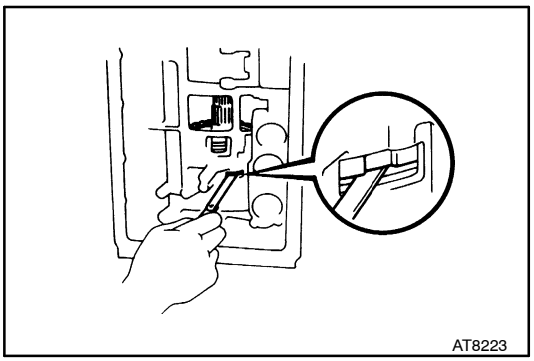


(b) Disconnect the parking lock rod from the manual valve lever.



(c) Remove the spring, parking lock pawl and shaft.

(d) Remove the E–ring from the shaft.



33. CHECK PACK CLEARANCE OF FIRST AND REVERSE BRAKE

Using a thickness gauge, measure the clearance between the plate and second brake drum as shown in the figure.

Clearance:

(7M–GTE)

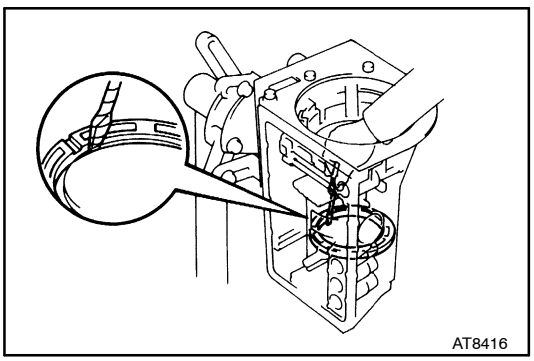
0.70 – 1.22 mm (0.0276 – 0.0480 in.)

(Others)

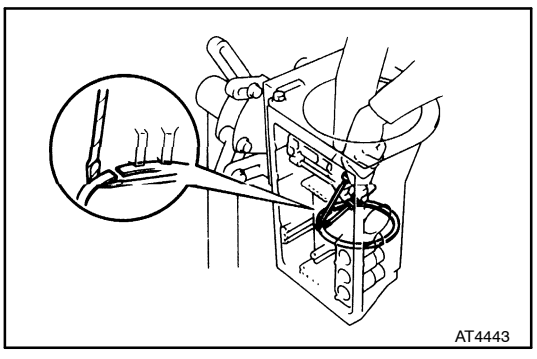
0.60 – 1.12 mm (0.0236 – 0.0441 in.)

If the values are nonstandard, inspect the discs.

(See page AT–86)

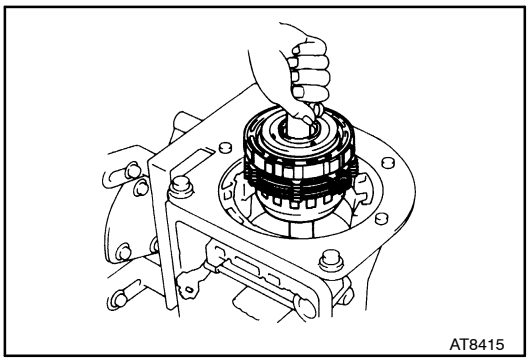


34. REMOVE SECOND BRAKE PISTON SLEEVE

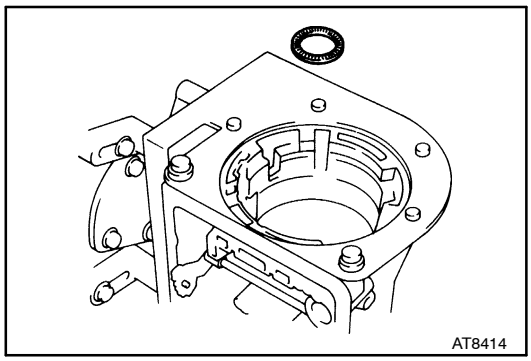


35. REMOVE REAR PLANETARY GEAR UNIT WITH SECOND BRAKE DRUM, FIRST AND REVERSE BRAKE PACK AND OUTPUT SHAFT

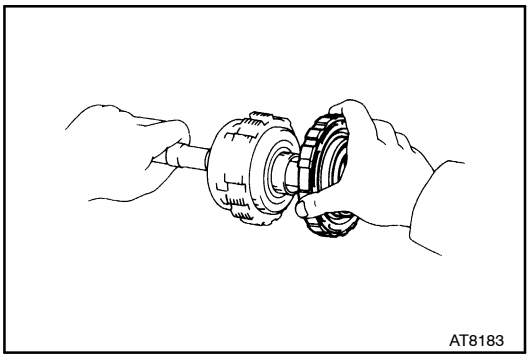
(a) Using two screwdrivers, remove the snap ring.



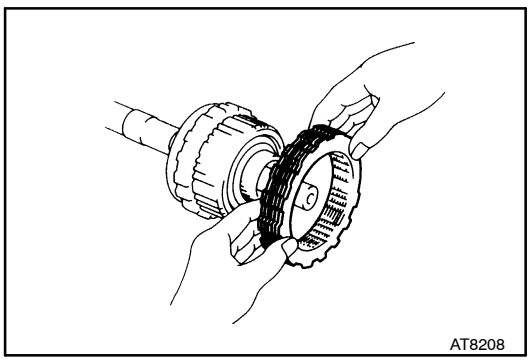
(b) Remove the rear planetary gear, second brake drum, first and reverse brake pack and output shaft as an assembly.



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

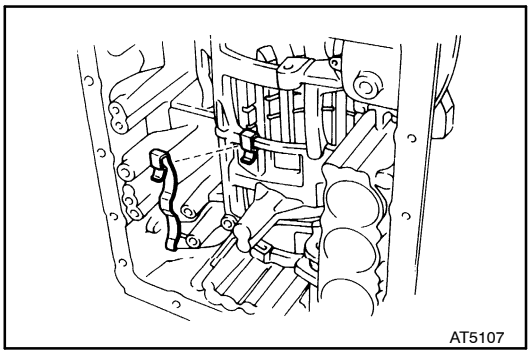


(d) Remove the second brake drum assembly.

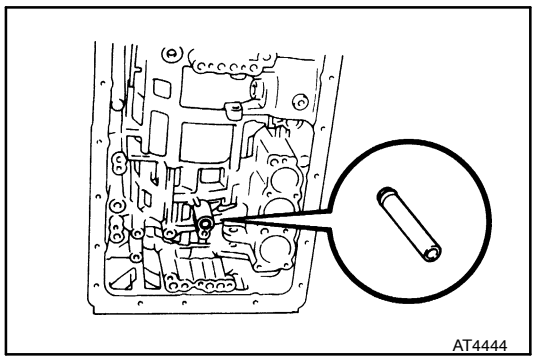


(e) Remove the flange, plates and discs of the first and reverse brake.

(7M–GTE)
One flange, seven plates and seven discs
(Others)
One flange, six plates and six discs
For the method of inspection, refer to AT–86.

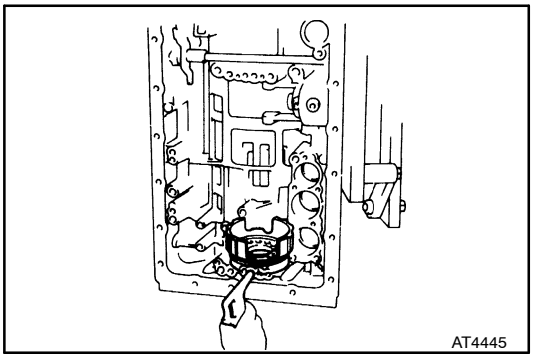


36. REMOVE LEAF SPRING



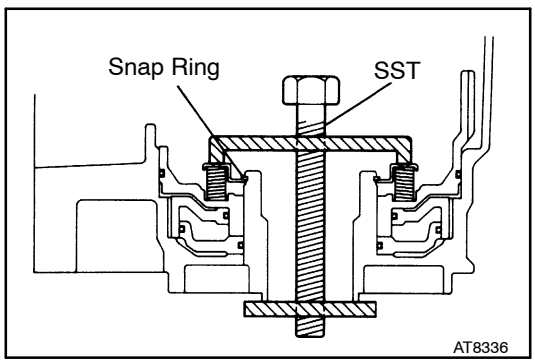
37. REMOVE BRAKE DRUM GASKET

Using a screwdriver, remove the gasket.



38. CHECK FIRST AND REVERSE BRAKE PISTONS MOVING

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



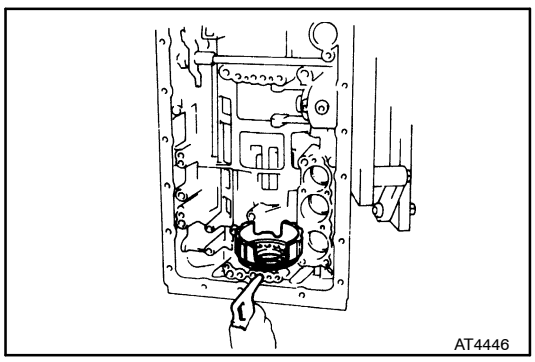
39. REMOVE COMPONENTS OF FIRST AND REVERSE BRAKE PISTON

(a) Set SST on the spring retainer, and compress the return spring.

SST 09350–30020 (09350–07050)

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

(c) Remove the piston return spring.

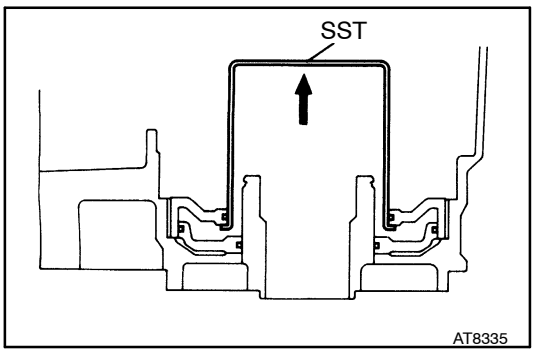


(d) Hold No. 2 first and reverse brake piston with hand, apply compressed air to transmission case to remove No. 2 first and reverse brake piston.

(e) Remove No. 2 first and reverse brake piston.

If the piston does not pop out with compressed air, lift the piston out with needle–nose pliers.

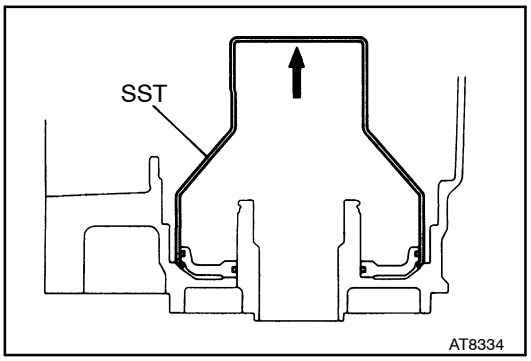
(f) Remove the O–ring from No. 2 piston.



(g) Insert SST behind the reaction sleeve and gradually lift it out of the transmission case.

SST 09350–30020 (09350–07080)

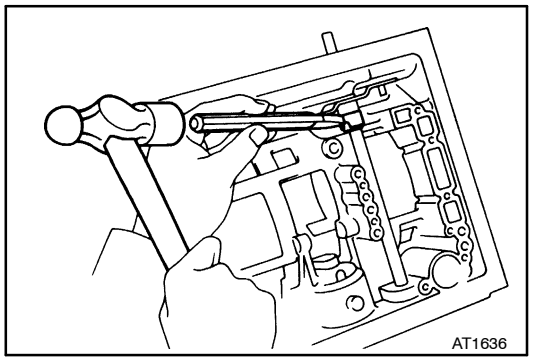
(h) Remove the O–ring from the reaction sleeve.



(i) Insert SST behind No. 1 brake piston and gradually lift it out of the transmission case.

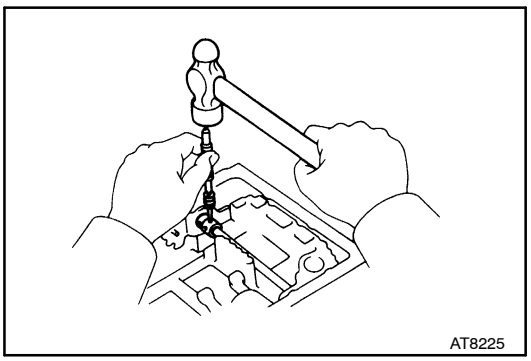
SST 09350–30020 (09350–07090)

(j) Remove the two O–rings from No. 1 piston.



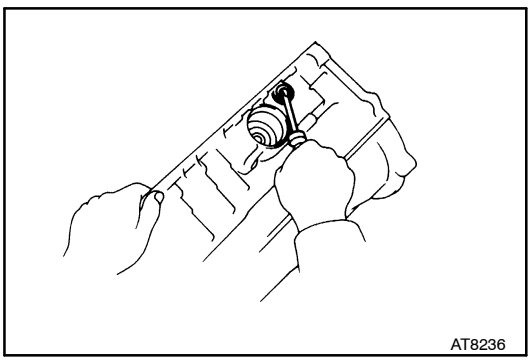
40. REMOVE MANUAL VALVE LEVER, SHAFT AND OIL SEALS

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



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

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



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

COMPONENT PARTS

General Notes

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

GENERAL CLEANING NOTES:

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

PARTS ARRANGEMENT:

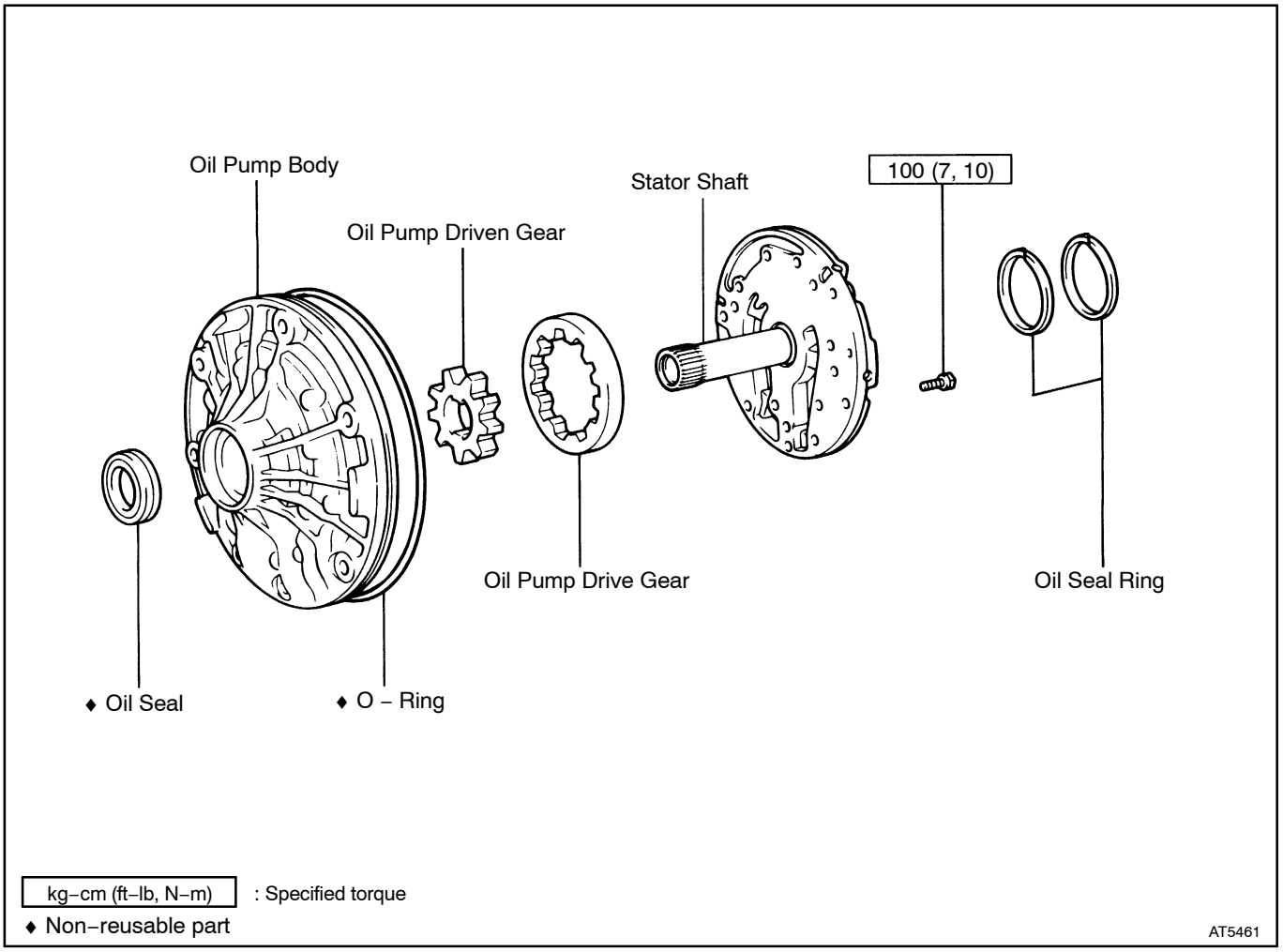
1. **After cleaning, the parts should be arranged in proper order to allow efficient inspection, repairs, and reassembly.**
2. **When disassembling a valve body, be sure to keep each valve together with the corresponding spring.**
3. **New discs for the brakes and clutches that are to be used for replacement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

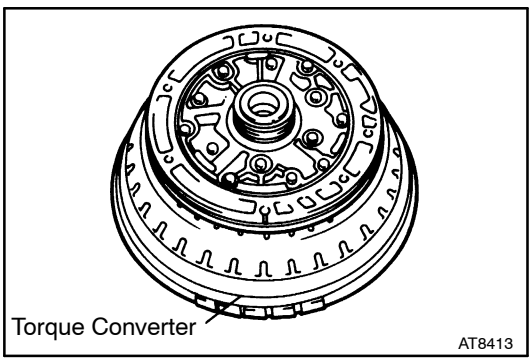
GENERAL ASSEMBLY:

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

Oil Pump

COMPONENTS

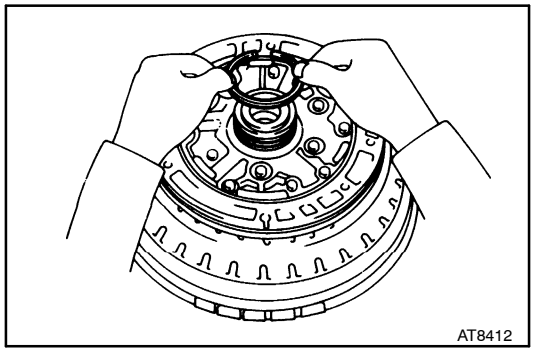




DISASSEMBLY OF OIL PUMP

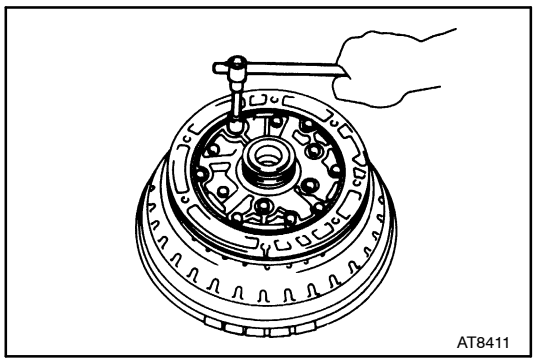
1. USE TORQUE CONVERTER AS WORK STAND

Place the oil pump body on the torque converter.



2. REMOVE OIL SEAL RINGS

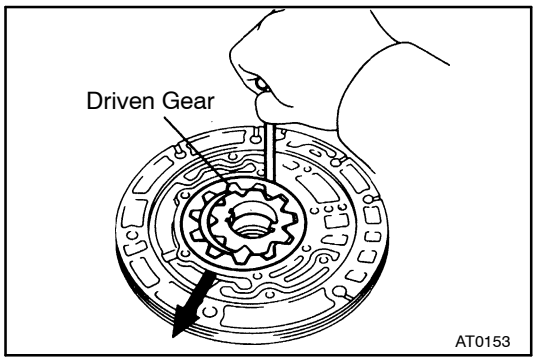
Remove the two oil seal rings.



3. REMOVE STATOR SHAFT

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

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

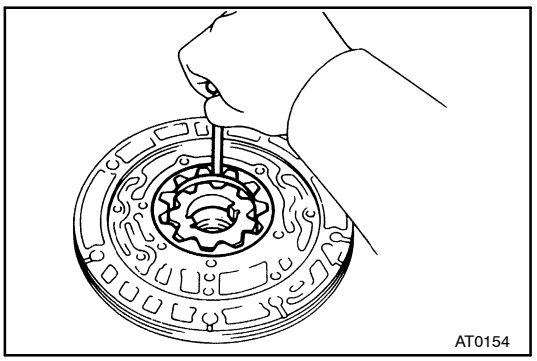


4. CHECK BODY CLEARANCE OF DRIVEN GEAR

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

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

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

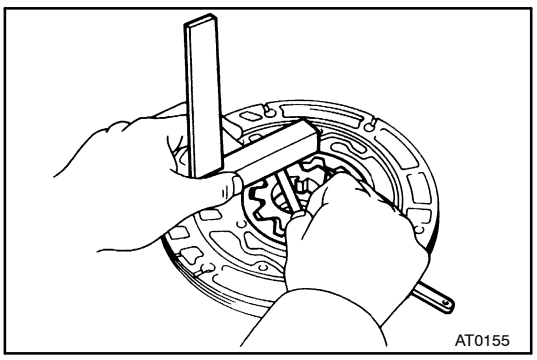


5. CHECK TIP CLEARANCE OF DRIVEN GEAR

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

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

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

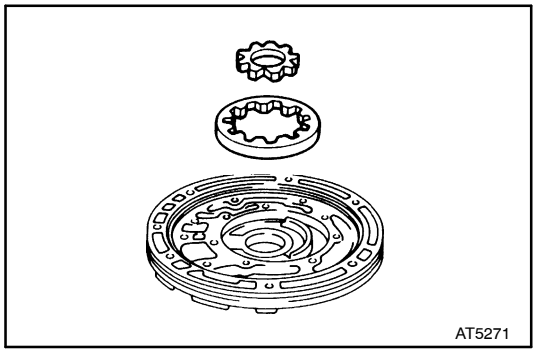


6. CHECK SIDE CLEARANCE OF BOTH GEARS

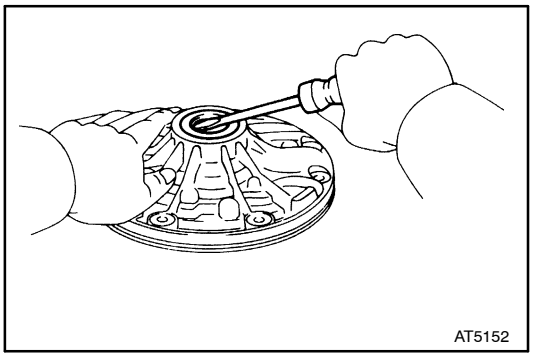
Using a steel straight edge and feeler gauge, measure the side clearance of both gears.

Standard side clearance: 0.02 – 0.05 mm (0.0008 – 0.0020 in.)
Maximum side clearance: 0.1 mm (0.004 in.)

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

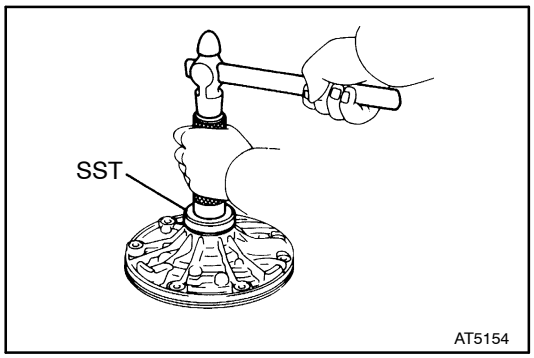


7. REMOVE OIL PUMP DRIVE GEAR AND DRIVEN GEAR



8. REMOVE OIL SEAL

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



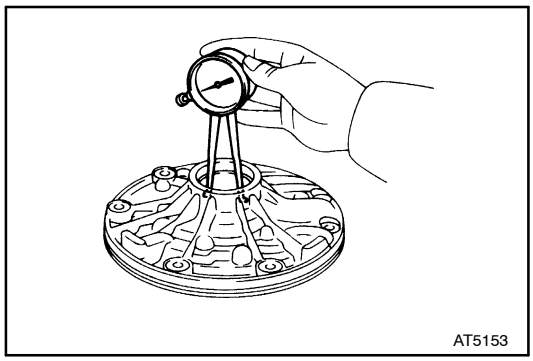
(b) Using SST, install a new oil seal.

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

SST 09350–30020 (09351–32140)

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

CHECK OIL PUMP BUSHING

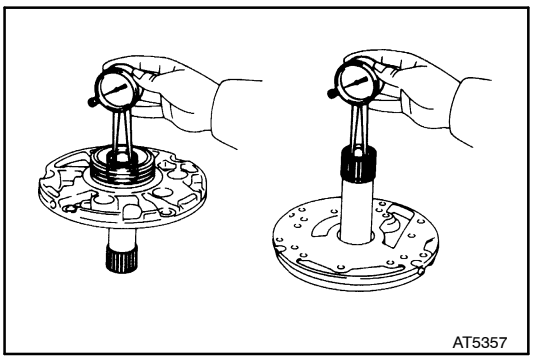


1. CHECK OIL PUMP BODY BUSHING

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

Maximum inside diameter: 38.19 mm (1.5035 in.)

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



2. CHECK STATOR SHAFT BUSHING

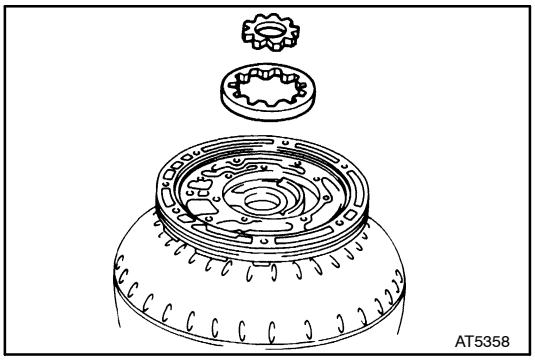
Using a dial indicator, measure the inside diameter of the stator shaft bushing.

Maximum inside diameter:

Front side: 21.58 mm (0.8496 in.)

Rear side: 27.08 mm (1.0661 in.)

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



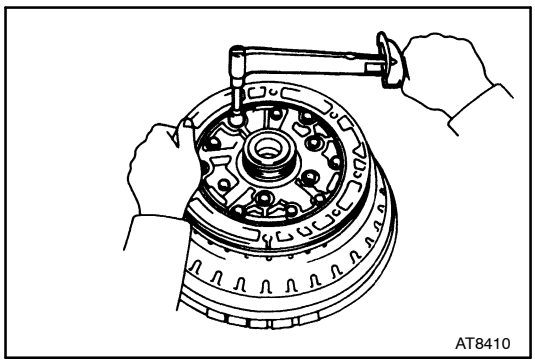
ASSEMBLY OF OIL PUMP

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

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

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

(c) Install the driven gear and drive gear.

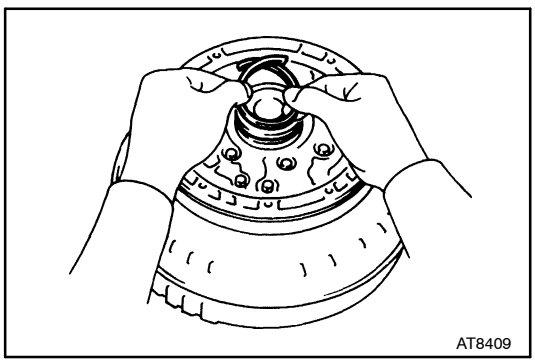


2. INSTALL STATOR SHAFT TO OIL PUMP BODY

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

(b) Tighten the thirteen bolts.

Torque: 100 kg–cm (7 ft–lb, 10 N–m)

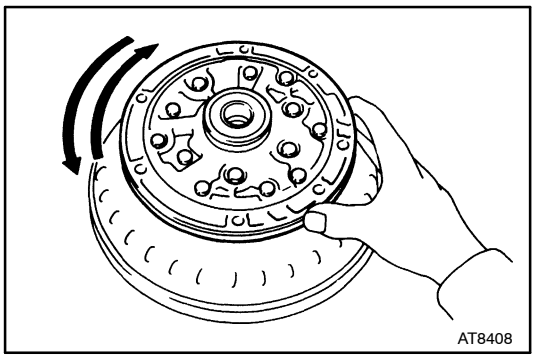


3. INSTALL OIL SEAL RINGS

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

(b) Contract the oil seal rings as shown, and install them onto the stator shaft.

NOTICE: Do not spread the ring ends too much.
HINT: After installing the oil seal rings, check that they rotate smoothly.

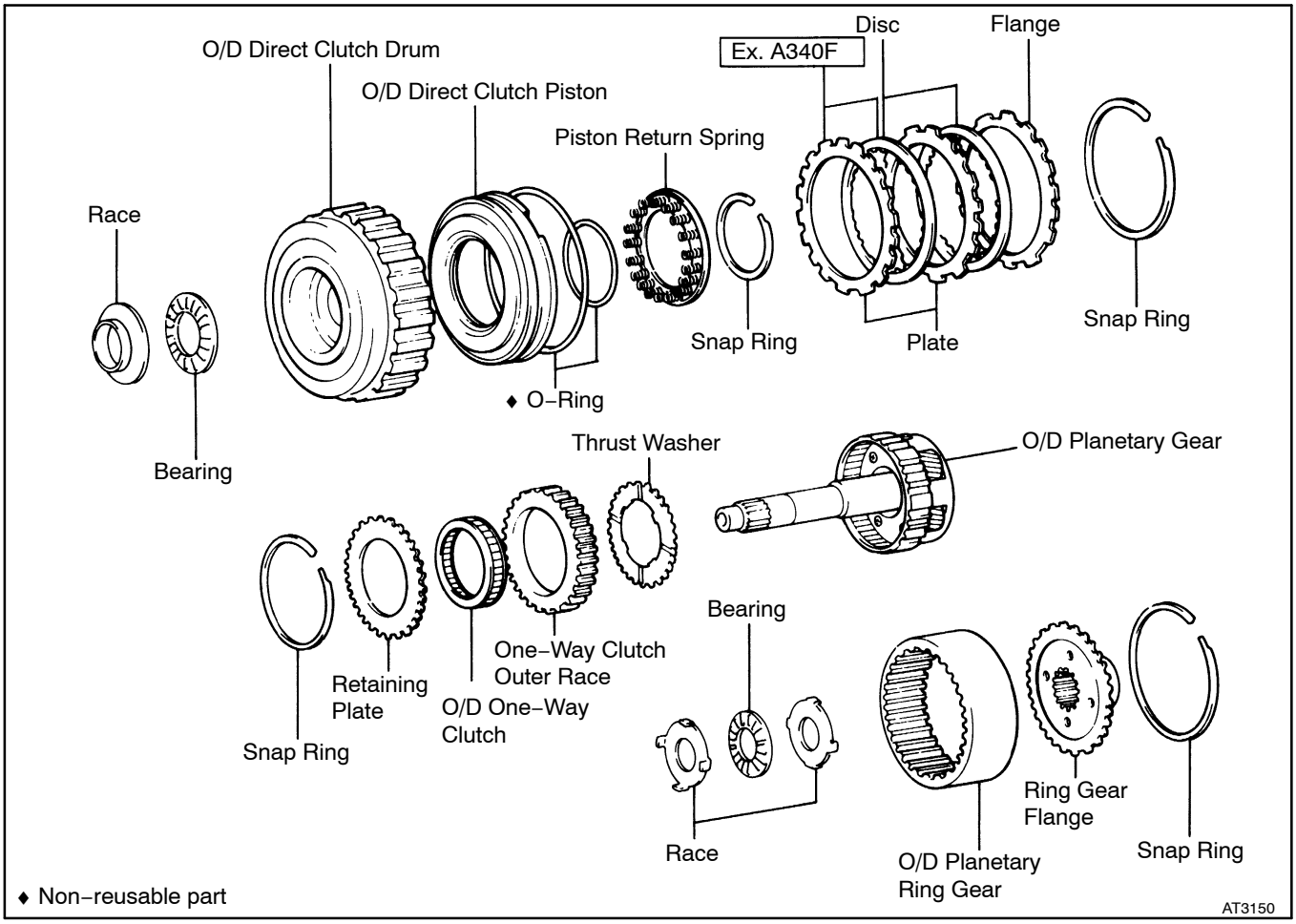


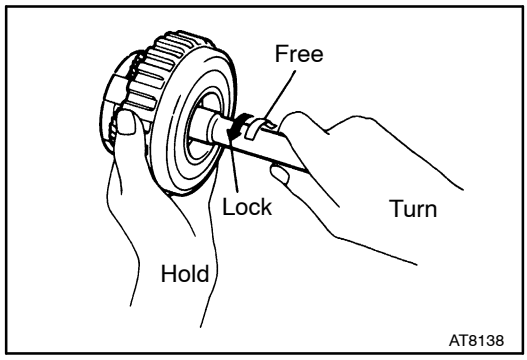
4. CHECK OIL PUMP DRIVE GEAR ROTATION

Make sure the drive gear rotates smoothly.

Overdrive Planetary Gear, Overdrive Direct Clutch and Overdrive One–Way Clutch

COMPONENTS

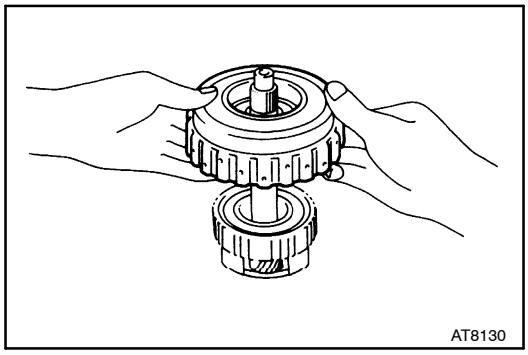




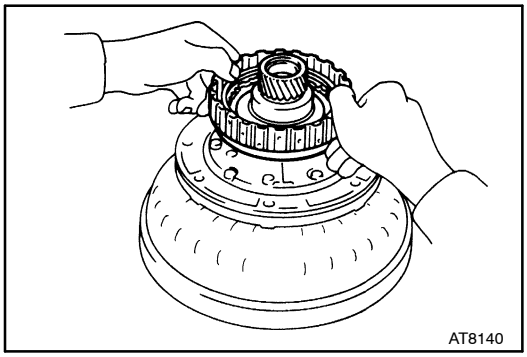
DISASSEMBLY OF OVERDRIVE PLANETARY GEAR, OVERDRIVE DIRECT CLUTCH AND OVERDRIVE ONE–WAY CLUTCH

1. CHECK OPERATION OF ONE–WAY CLUTCH

Hold the O/D direct clutch drum and turn the input shaft. The input shaft turns freely clockwise and locks counter-clockwise.

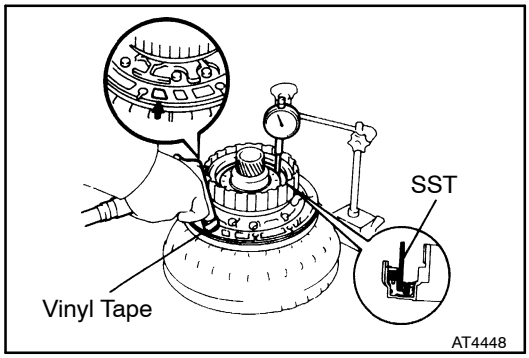


2. REMOVE OVERDRIVE DIRECT CLUTCH ASSEMBLY FROM OVERDRIVE PLANETARY GEAR



3. CHECK PISTON STROKE OF OVERDRIVE DIRECT CLUTCH

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



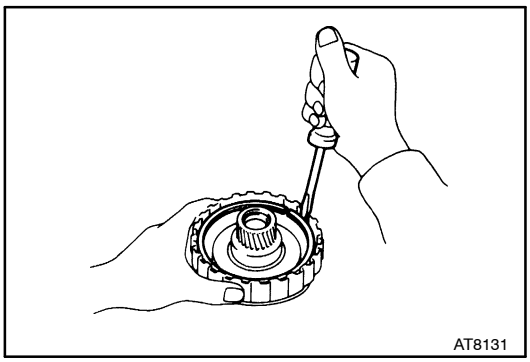
(b) Using SST and a dial indicator, measure the O/D direct clutch piston stroke applying and releasing the compressed air (4 – 8 kg /cm^2, 57 – 114 psi or 392–785 kPa) as shown.

SST 09350–30020 (09350–06120)

Piston stroke:

22R–E: 1.77 – 2.07 mm (0.0697 – 0.0815 in.)
Others: 1.85 – 2.15 mm (0.0728 – 0.0846 in.)

If the values are nonstandard, inspect the discs.



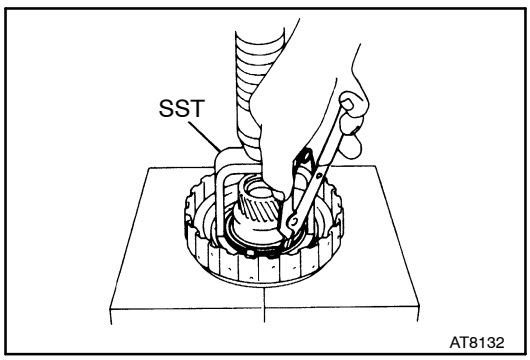
4. REMOVE FLANGE, PLATE(S) AND DISC(S)

(a) Remove the snap ring from the O/D direct clutch drum.

(b) Remove the flange, plates and discs.

HINT:

22R–E: One flange, one plate and one disc
Others: One flange, two plates and two discs



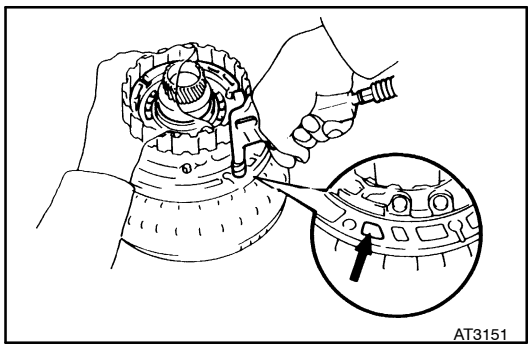
5. REMOVE PISTON RETURN SPRING

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

SST 09350–30020 (09350–07040)

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

(c) Remove the piston return spring.



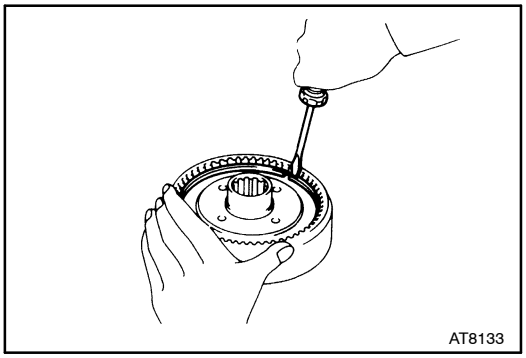
6. REMOVE OVERDRIVE DIRECT CLUTCH PISTON

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

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

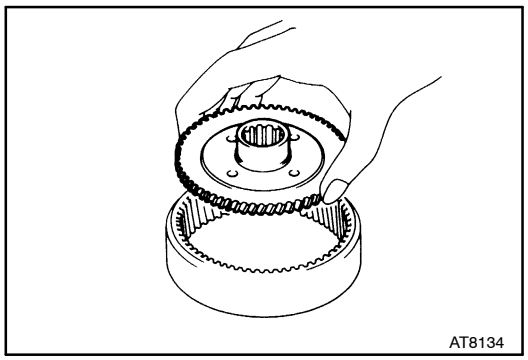
(c) Remove the O/D direct clutch piston.

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

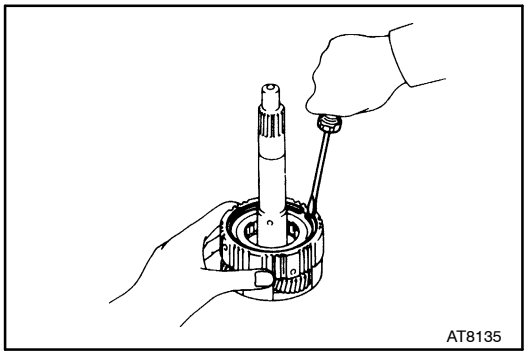


7. REMOVE RING GEAR FLANGE

(a) Remove the snap ring.

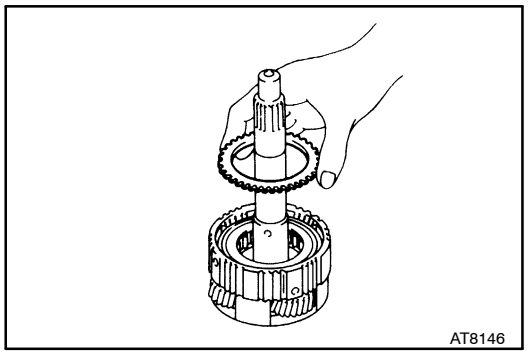


(b) Remove the ring gear flange.

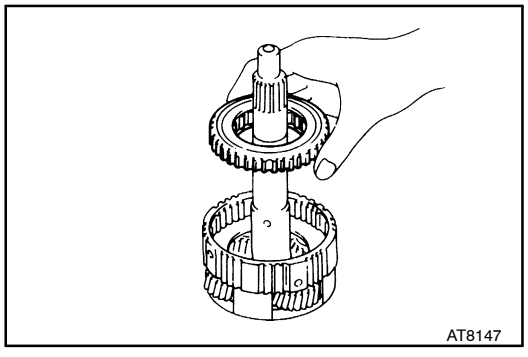


8. REMOVE RETAINING PLATE

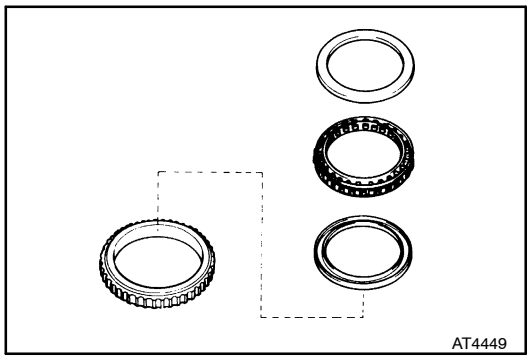
(a) Remove the snap ring.



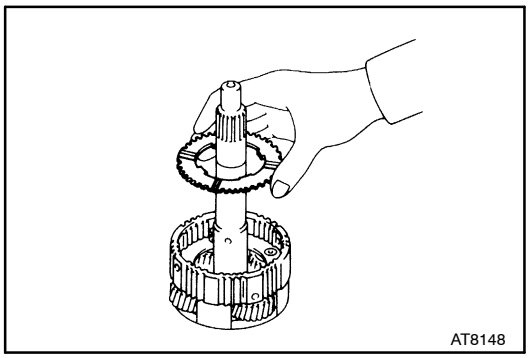
(b) Remove the retaining plate.



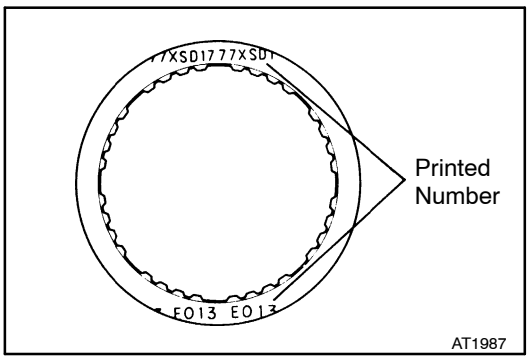
9. REMOVE OVERDRIVE ONE–WAY CLUTCH WITH OUTER RACE



10. REMOVE ONE–WAY CLUTCH FROM OUTER RACE



11. REMOVE THRUST WASHER

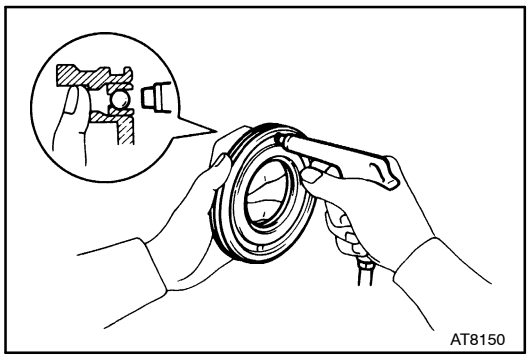


INSPECTION OF OVERDRIVE PLANETARY GEAR AND OVERDRIVE DIRECT CLUTCH

1. INSPECT DISC, PLATE AND FLANGE

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

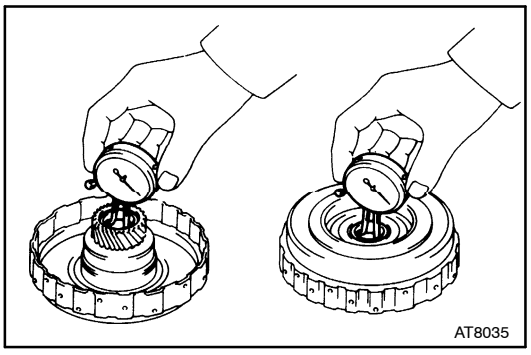
- If the lining of the disc is peeling off or discolored, or even if parts of the printed numbers are defaced, replace discs.
- Before assembling new discs, soak them in ATF for at least fifteen minutes.



2. CHECK OVERDRIVE DIRECT CLUTCH PISTON

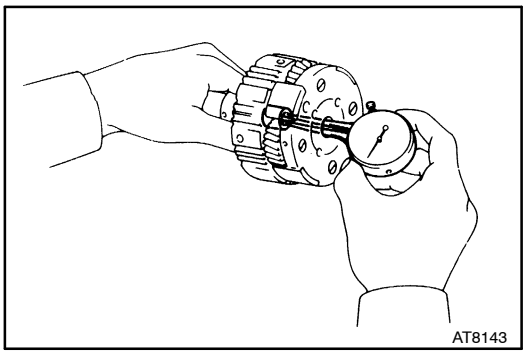
(a) Check that check ball is free by shaking the piston.

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



3. CHECK OVERDRIVE DIRECT CLUTCH DRUM BUSHINGS

Using a dial indicator, measure the inside diameter of the clutch drum bushings.
Maximum inside diameter: 27.11 mm (1.0673 in.)
If the inside diameter is greater than the maximum, replace the clutch drum.

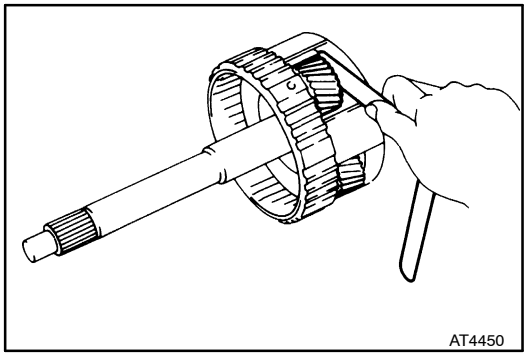


4. CHECK OVERDRIVE PLANETARY GEAR BUSHING

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

Maximum inside diameter: 11.27 mm (0.4437 in.)

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



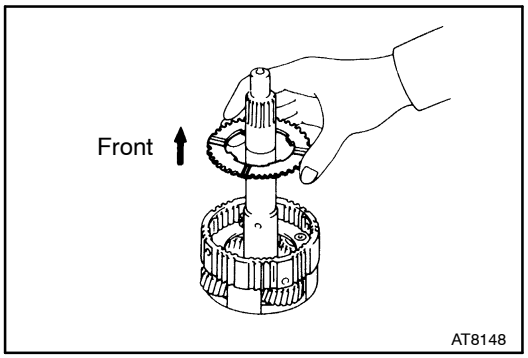
5. MEASURE PLANETARY PINION GEAR THRUST CLEARANCE

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

Standard clearance: 0.20 – 0.60 mm (0.0079 – 0.0236 in.)

Maximum clearance: 1.00 mm (0.0394 in.)

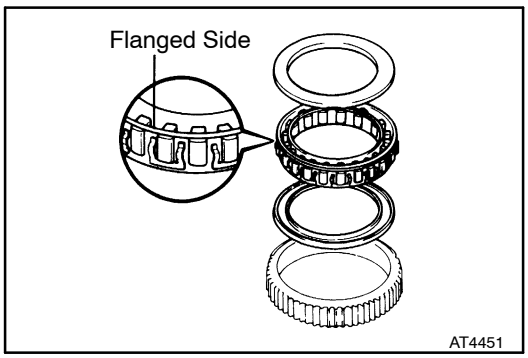
If the clearance is greater than the maximum, replace the planetary gear assembly.



ASSEMBLY OF OVERDRIVE PLANETARY GEAR, OVERDRIVE DIRECT CLUTCH AND OVERDRIVE ONE–WAY CLUTCH

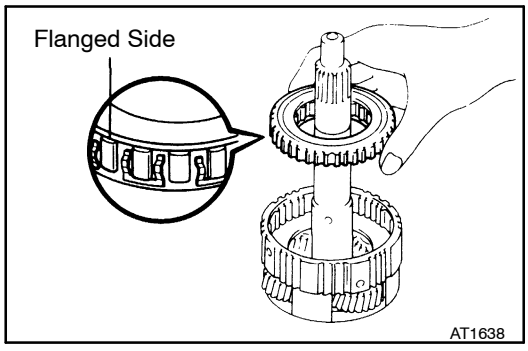
1. INSTALL THRUST WASHER TO OVERDRIVE PLANETARY GEAR

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

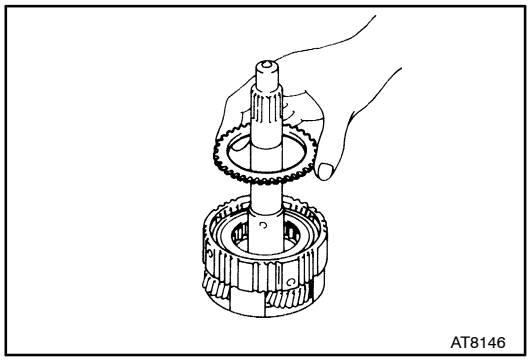


2. INSTALL OVERDRIVE ONE–WAY CLUTCH

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

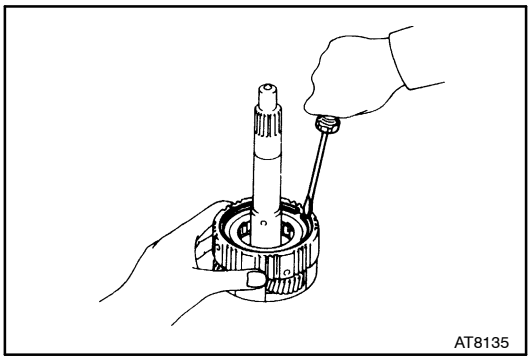


(b) Install the overdrive one–way clutch with the outer race to the overdrive planetary gear.

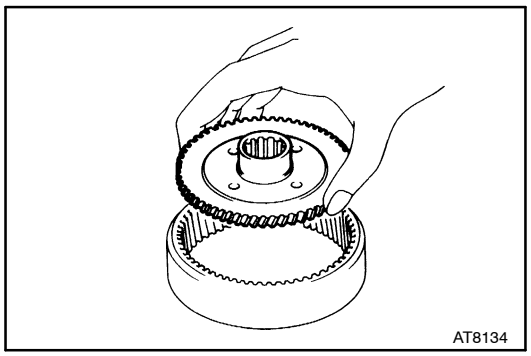


3. INSTALL RETAINING PLATE

(a) Install the retaining plate.

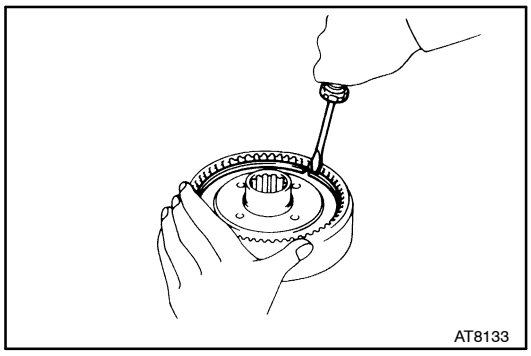


(b) Install the snap ring.

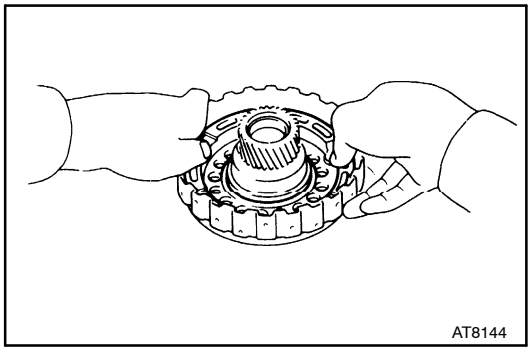


4. INSTALL RING GEAR FLANGE TO OVERDRIVE PLANETARY RING GEAR

(a) Install the ring gear flange as shown.



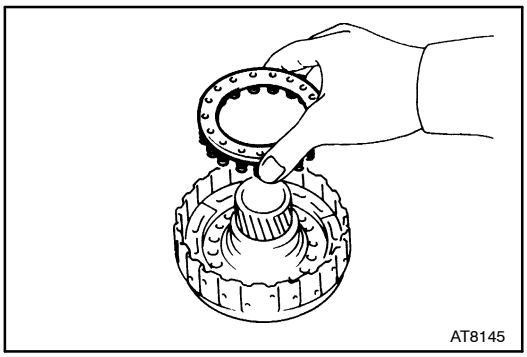
(b) Install the snap ring.



5. INSTALL OVERDRIVE DIRECT CLUTCH PISTON

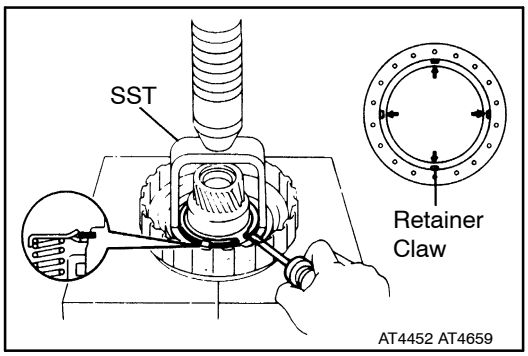
(a) Coat new O–rings with ATF and install them on the O/D direct clutch piston.

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



6. INSTALL PISTON RETURN SPRING

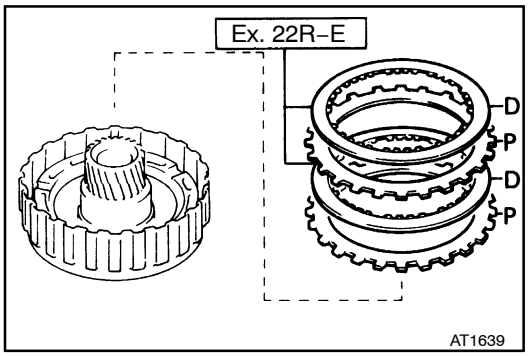
(a) Install the piston return spring to the piston.



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

SST 09350–30020 (09350–07040)

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



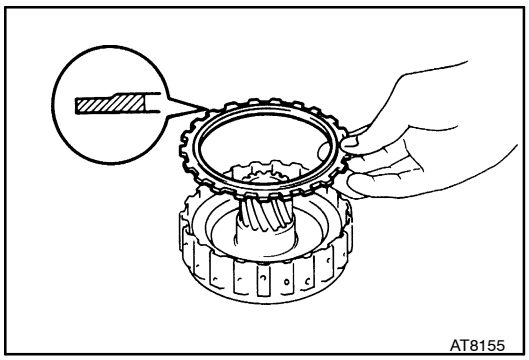
7. INSTALL PLATE(S), DISC(S) AND FLANGE

(a) Install the plates and discs.

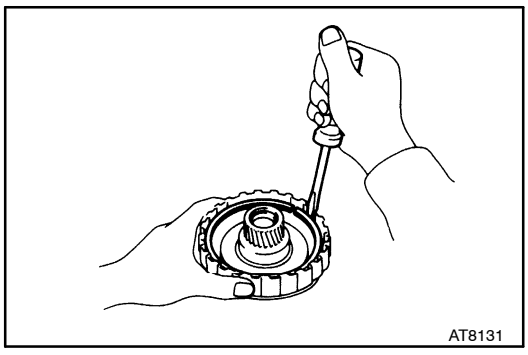
Install in order: P = Plate D = Disc

22R–E: P–D

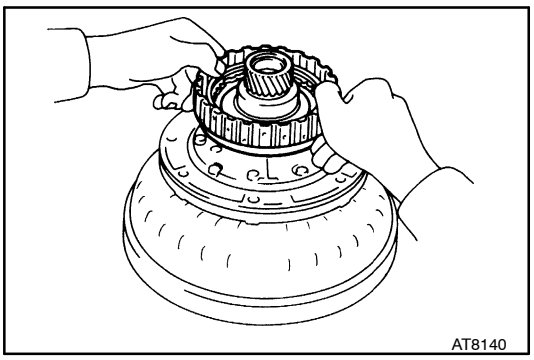
Others: P–D–P–D



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

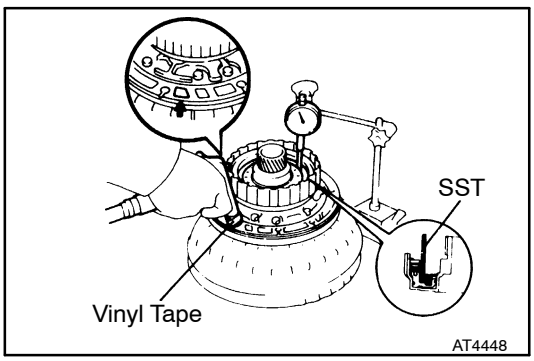


(c) Install the snap ring.



8. CHECK PISTON STROKE OF OVERDRIVE DIRECT CLUTCH

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



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

SST 09350–30020 (09350–06120)

Piston stroke:

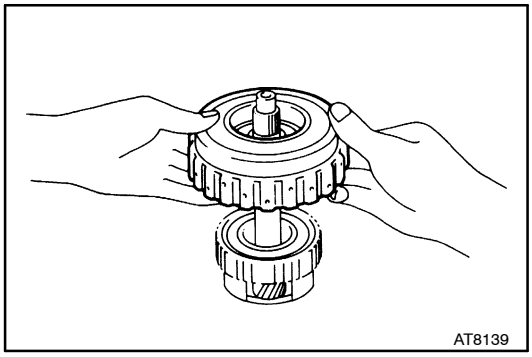
22R–E: 1.77 – 2.07 mm (0.0697 – 0.0815 in.)
Others: 1.85 – 2.15 mm (0.0728 – 0.0846 in.)

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

HINT: There are six different thicknesses for the flange.

Flange thickness mm (in.)

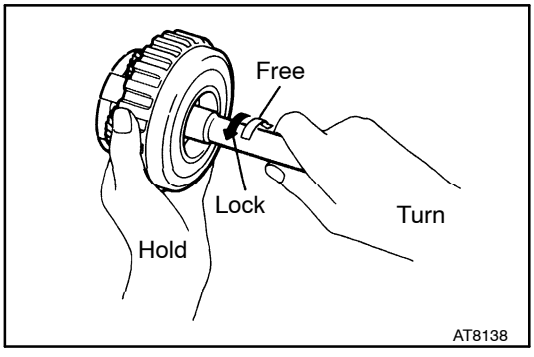
No.	Thickness	No.	Thickness
16	3.6 (0.142)	19	3.3 (0.130)
17	3.5 (0.138)	20	3.2 (0.126)
18	3.4 (0.134)	21	3.1 (0.122)



9. INSTALL OVERDRIVE DIRECT CLUTCH ASSEMBLY

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

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

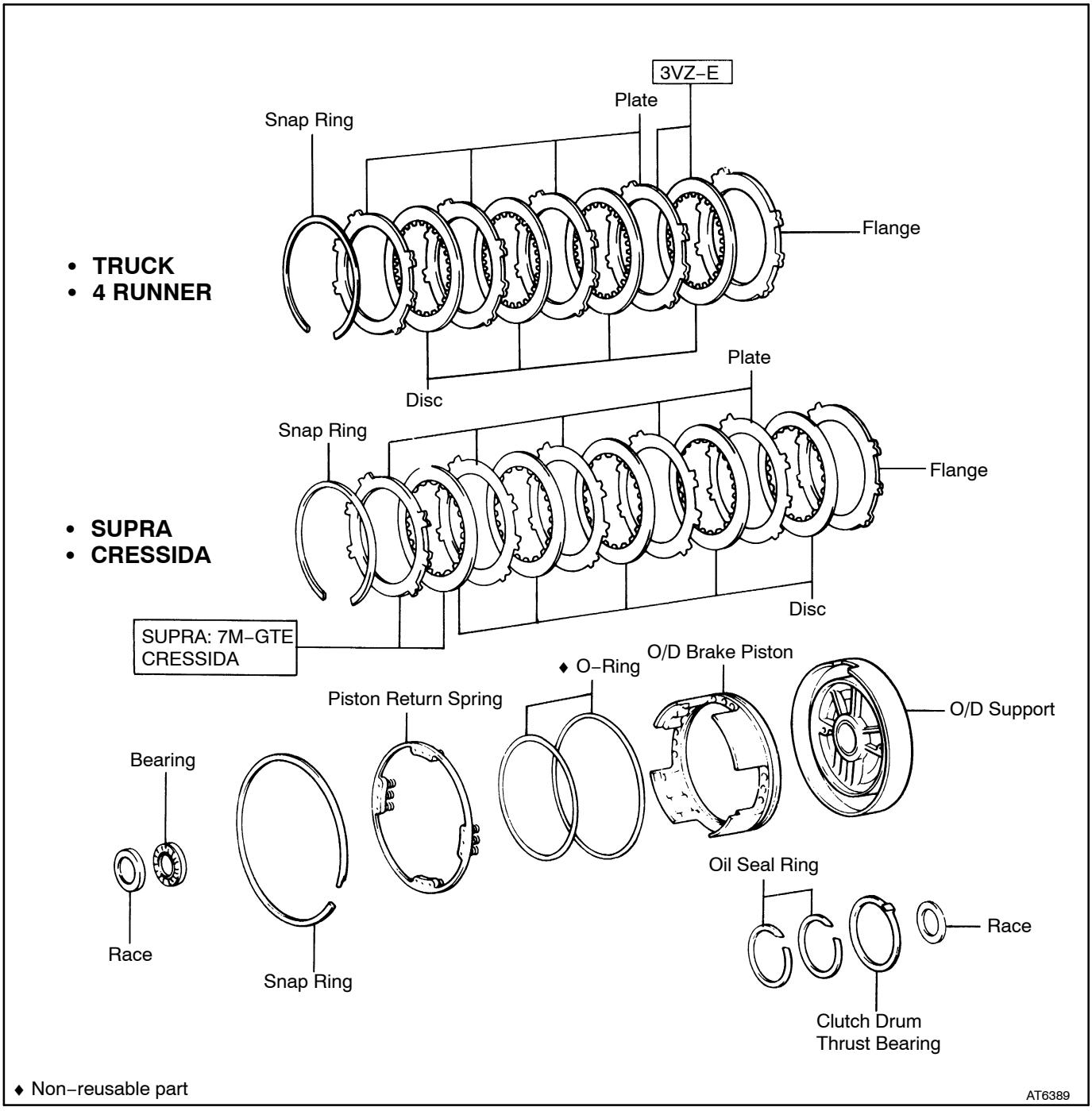


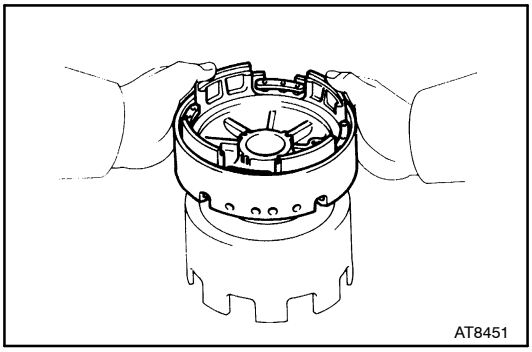
10. CHECK OPERATION OF ONE–WAY CLUTCH

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

Overdrive Brake

COMPONENTS

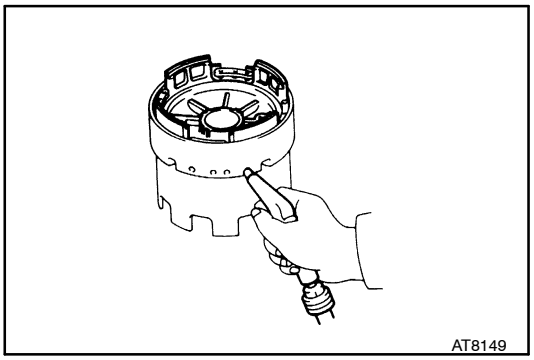




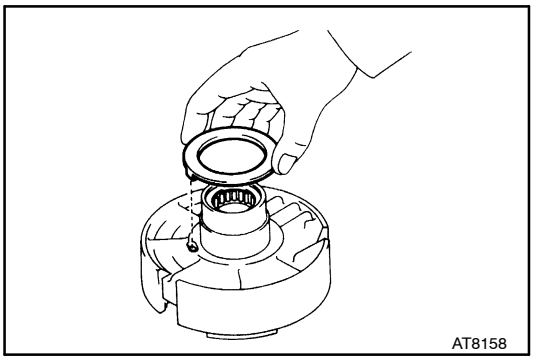
DISASSEMBLY OF OVERDRIVE BRAKE

1. CHECK OVERDRIVE BRAKE PISTON MOVEMENT

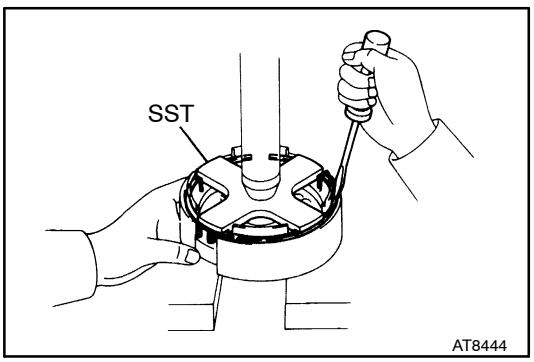
(a) Place the O/D support assembly onto the direct clutch assembly.



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



2. REMOVE CLUTCH DRUM THRUST WASHER FROM OVERDRIVE SUPPORT



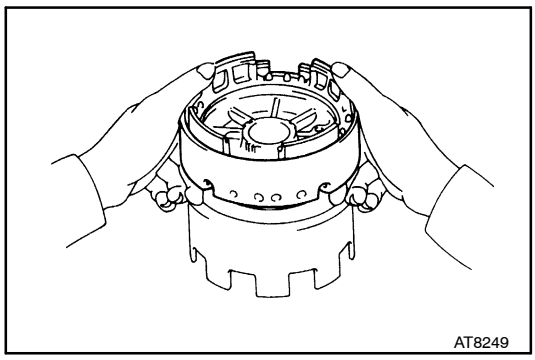
3. REMOVE PISTON RETURN SPRING

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

SST 09350–30020 (09350–07030)

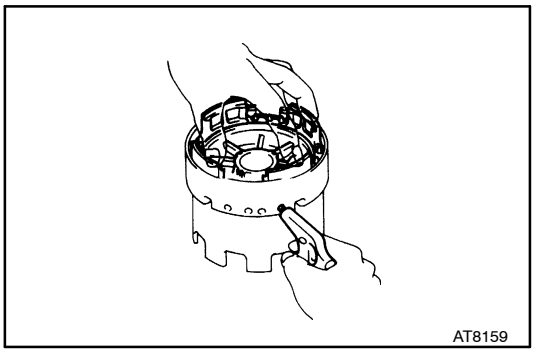
(b) Remove the snap ring with a screwdriver.

(c) Remove the piston return spring.



4. REMOVE OVERDRIVE BRAKE PISTON

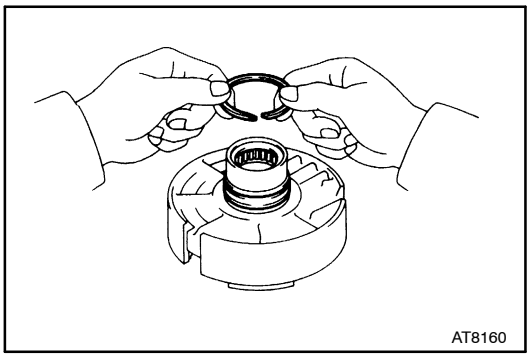
(a) Place the O/D support onto the direct clutch assembly.



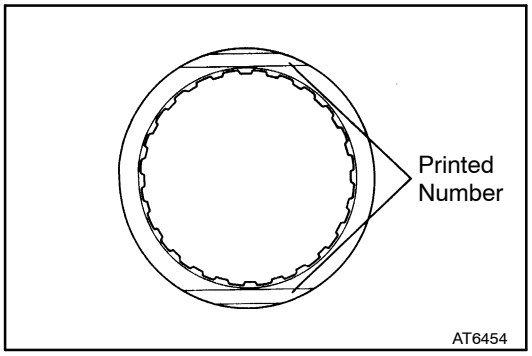
(b) Hold the O/D brake piston so it does not slant, and apply compressed air into the passage to remove the O/D brake piston.

(c) Remove the O/D brake piston.

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


AT8160

5. REMOVE OIL SEAL RINGS



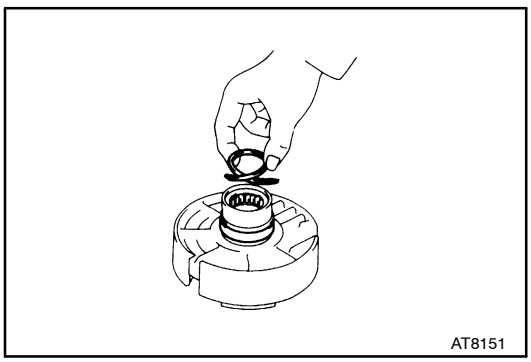
AT6454

INSPECTION OF OVERDRIVE BRAKE

INSPECT DISC, PLATE AND FLANGE

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

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


AT8151

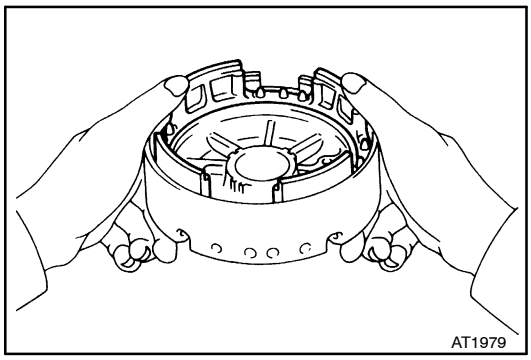
ASSEMBLY OF OVERDRIVE BRAKE

1. INSTALL OIL SEAL RINGS

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

(b) Contract the oil seal rings as shown, and install them onto the O/D support.

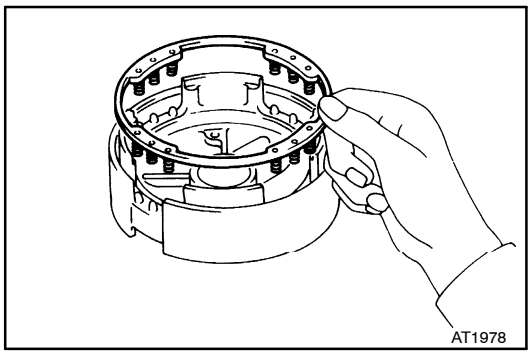
NOTICE: Do not spread the ring ends more than necessary.
HINT: After installing the oil seal rings, check that they rotate smoothly.


AT1979

2. INSTALL OVERDRIVE BRAKE PISTON

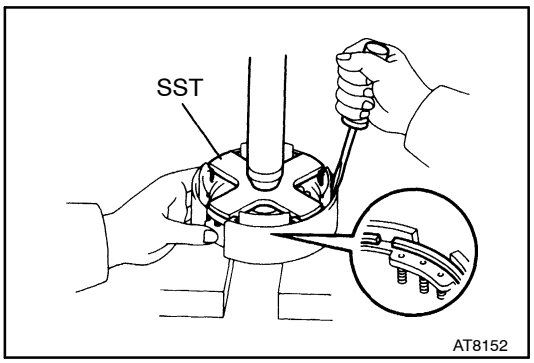
(a) Coat two new O–rings with ATF and install them on the O/D brake piston.

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


AT1978

3. INSTALL PISTON RETURN SPRING

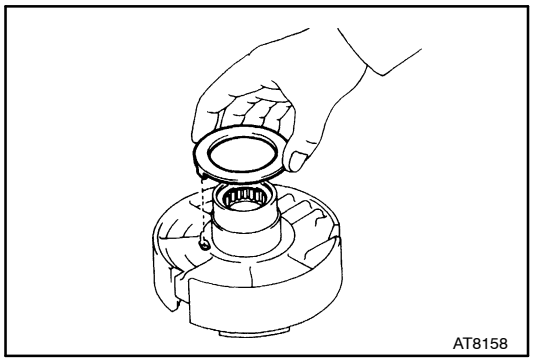
(a) Install the piston return spring.



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

SST 09350–30020 (09350–07030)

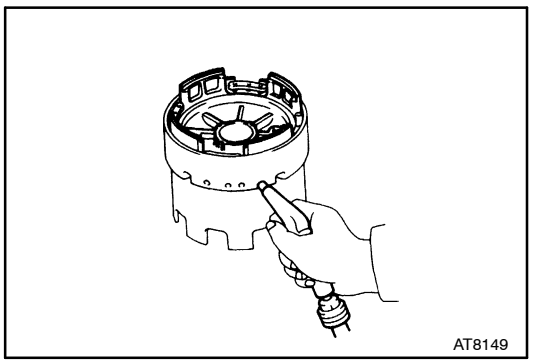
(c) Install the snap ring with a screwdriver. Be sure the end gap of the snap ring is not aligned with the cutout portion of the O/D support.



4. INSTALL CLUTCH DRUM THRUST WASHER

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

HINT: Make sure that the lug shape matches the hole on the O/D support.



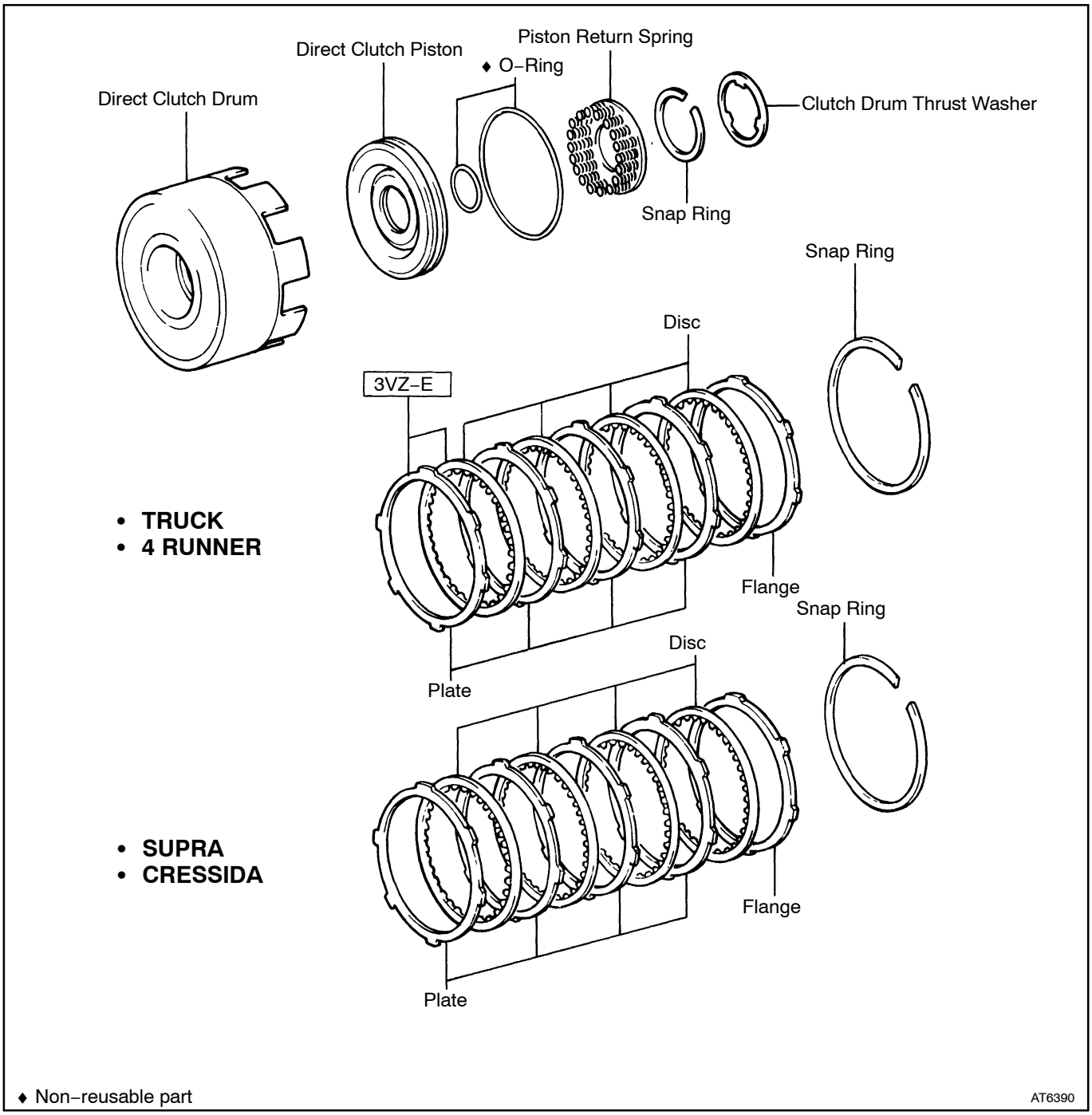
5. CHECK OVERDRIVE BRAKE PISTON MOVEMENT

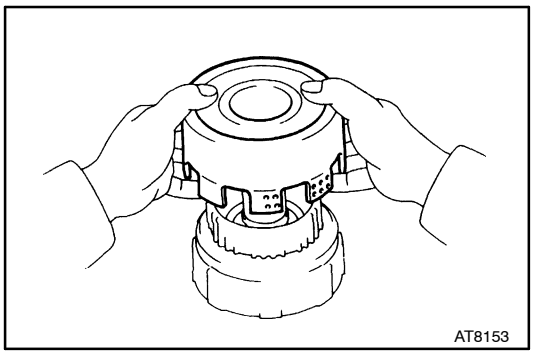
(a) Place the O/D support assembly onto the direct clutch assembly.

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

Direct Clutch

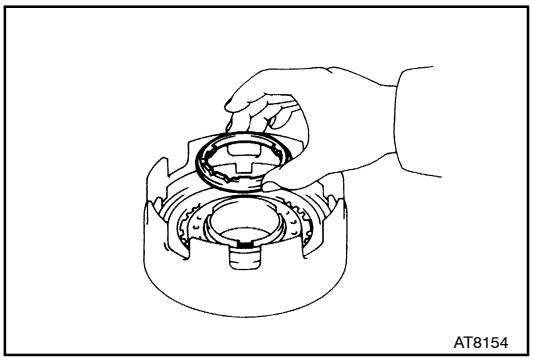
COMPONENTS



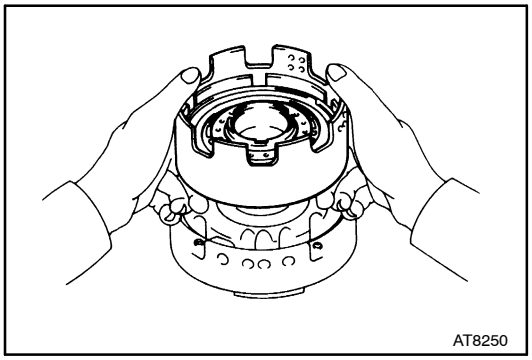


DISASSEMBLY OF DIRECT CLUTCH

1. **REMOVE DIRECT CLUTCH DRUM ASSEMBLY FROM FORWARD CLUTCH ASSEMBLY**

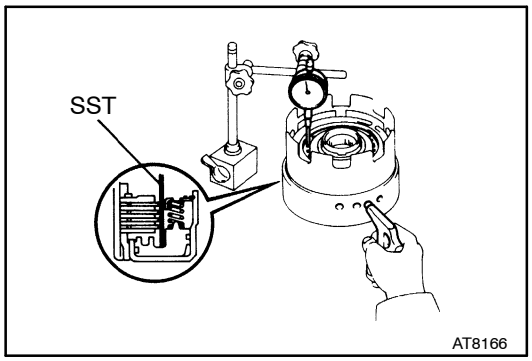


2. REMOVE CLUTCH DRUM THRUST WASHER FROM DIRECT CLUTCH ASSEMBLY



3. CHECK PISTON STROKE OF DIRECT CLUTCH

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



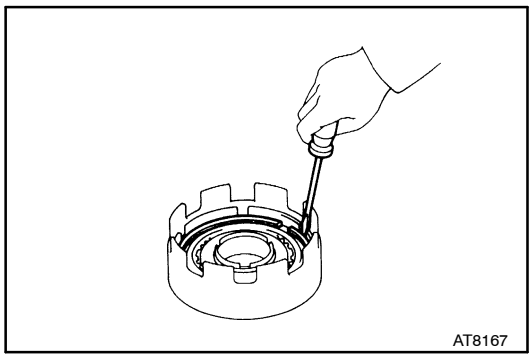
(b) Using SST and a dial indicator, measure the direct clutch piston stroke, applying and releasing the compressed air (4 – 8 kg/cm^2, 57 – 114 psi or 392 – 785 kPa) as shown.

SST 09350–30020 (09350–06120)

Piston stroke:

22R–E 1.03 – 1.33 mm (0.0405 – 0.0524 in.)
Others 1.37 – 1.60 mm (0.0359 – 0.0630 in.)

If the values are nonstandard, inspect the discs.

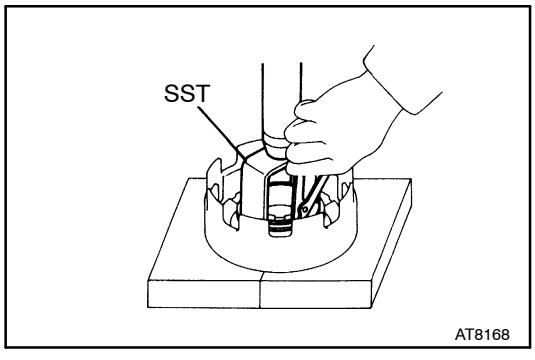


4. REMOVE FLANGE, PLATES AND DISCS

(a) Remove the snap ring from the direct clutch drum.

(b) Remove the flange, plates and discs

(22R–E)
One flange, three plates and three discs
(Others)
One flange, four plates and four discs



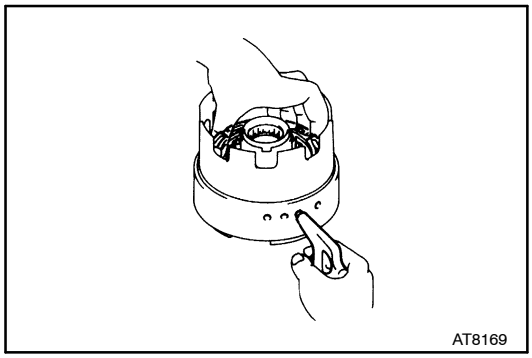
5. REMOVE PISTON RETURN SPRING

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

SST 09350–30020 (09350–07040)

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

(c) Remove the piston return spring.


AT8169

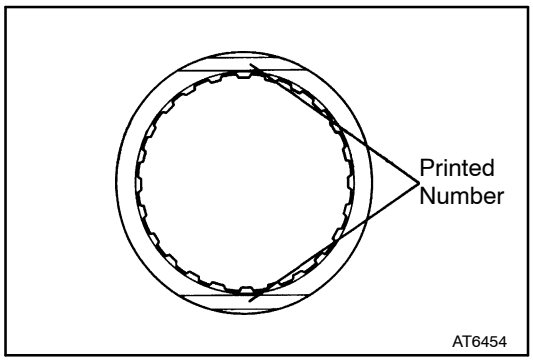
6. REMOVE DIRECT CLUTCH PISTON

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

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

(c) Remove the direct clutch piston.

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



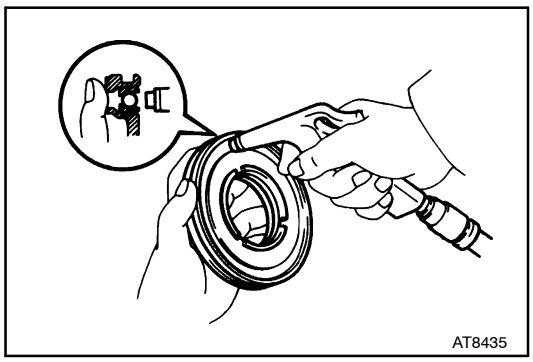
AT6454

INSPECTION OF DIRECT CLUTCH

1. INSPECT DISC, PLATE AND FLANGE

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

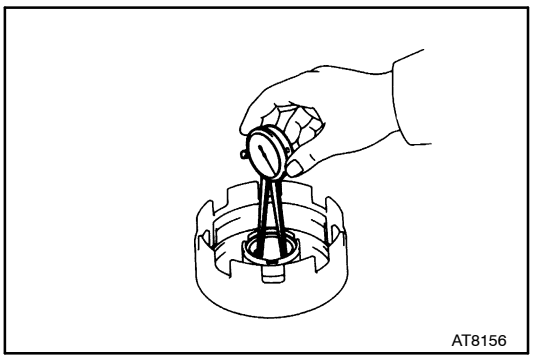
- If the lining of the disc is peeling off or discolored, or even if parts of the printed numbers are defaced, replace all discs.
- Before assembling new discs, soak them in ATF for at least fifteen minutes.


AT8435

2. CHECK DIRECT CLUTCH PISTON

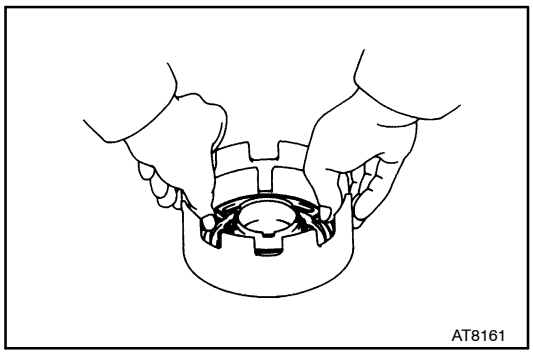
(a) Check that the check ball is free by shaking the piston.

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


AT8156

3. CHECK DIRECT CLUTCH DRUM BUSHING

Using a dial indicator, measure the inside diameter of the clutch drum bushing.
Maximum inside diameter: 53.99 mm (2.1256 in.)
If the inside diameter is greater than the maximum, replace the clutch drum.

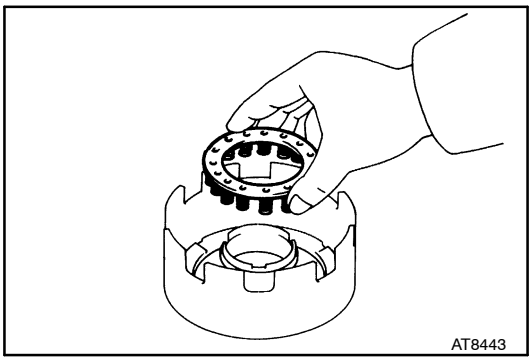

AT8161

ASSEMBLY OF DIRECT CLUTCH

1. INSTALL DIRECT CLUTCH PISTON TO DIRECT CLUTCH DRUM

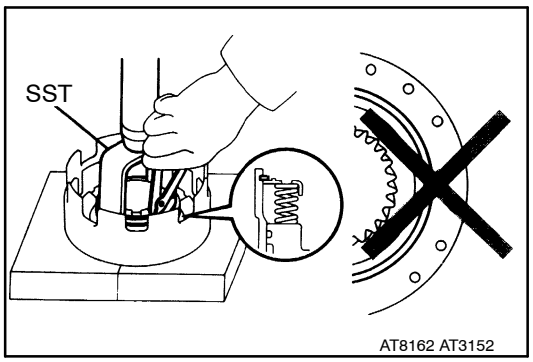
(a) Coat new O–rings with ATF and install them on the direct clutch piston.

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



2. INSTALL PISTON RETURN SPRING

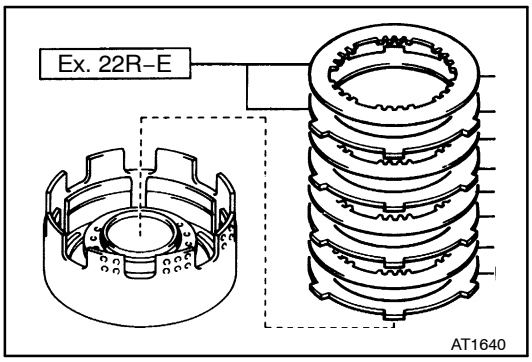
(a) Install the piston return spring.



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

SST 09350–30020 (09350–07040)

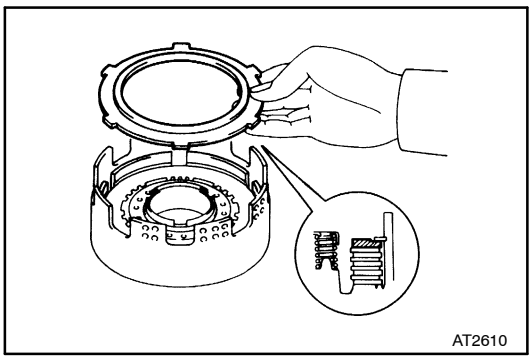
(c) Install the snap ring with snap ring pliers. Be sure the end gap of the snap ring is not aligned with the spring retainer.



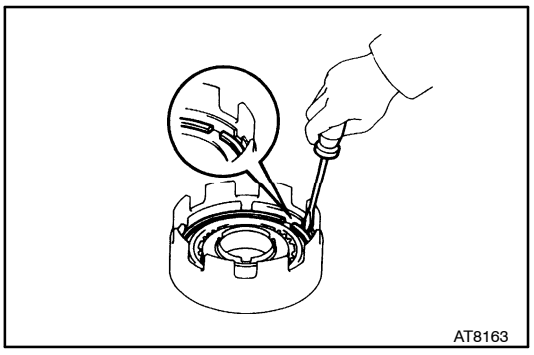
3. INSTALL PLATES, DISCS AND FLANGE

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

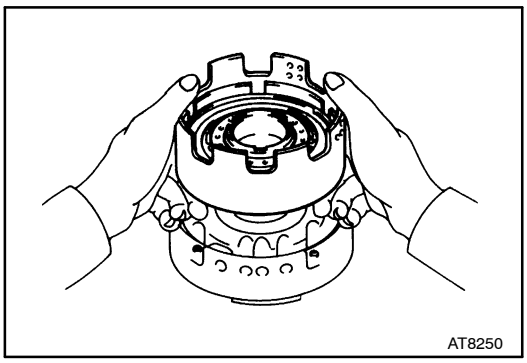
(22R–E)
P–D–P–D–P–D
(Others)
P–D–P–D–P–D–P–D



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

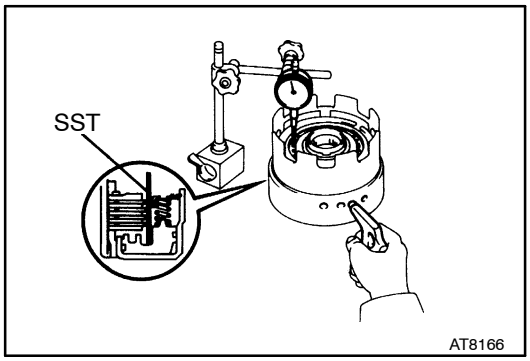


(c) Install the snap ring with a screwdriver. Be sure the end gap of the snap ring is not aligned with the cutout portion of the direct clutch drum.



4. CHECK PISTON STROKE OF DIRECT CLUTCH

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



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

SST 09350–30020 (09350–06120)

Piston stroke:

22R–E 1.03 – 1.33 mm (0.0405 – 0.0524 in.)
Others 1.37 – 1.60 mm (0.0539 – 0.0630 in.)

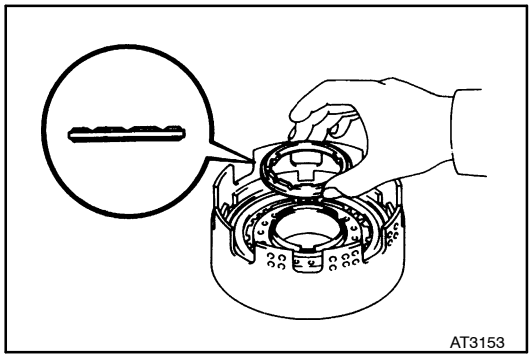
If the piston stroke is less than the limit, parts may have been assembled incorrectly, so check and reassemble again.

If the piston stroke is nonstandard, select another flange.

HINT: There are eight different thicknesses for the flange.

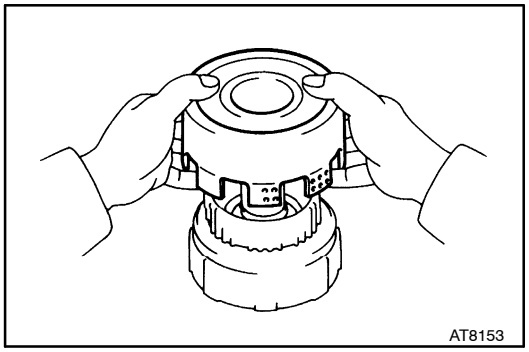
Flange thickness mm (in.)

No.	Thickness	No.	Thickness
33	3.0 (0.118)	29	3.4 (0.134)
32	3.1 (0.122)	28	3.5 (0.138)
31	3.2 (0.126)	27	3.6 (0.142)
30	3.3 (0.130)	34	3.7 (0.146)



5. INSTALL CLUTCH DRUM THRUST WASHER

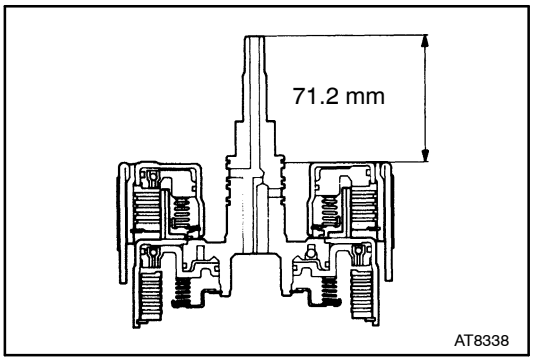
Coat the thrust washer with petroleum jelly and install it onto the direct clutch.



6. INSTALL DIRECT CLUTCH ASSEMBLY TO FORWARD CLUTCH ASSEMBLY

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

(b) Install the direct clutch assembly onto the forward clutch assembly.

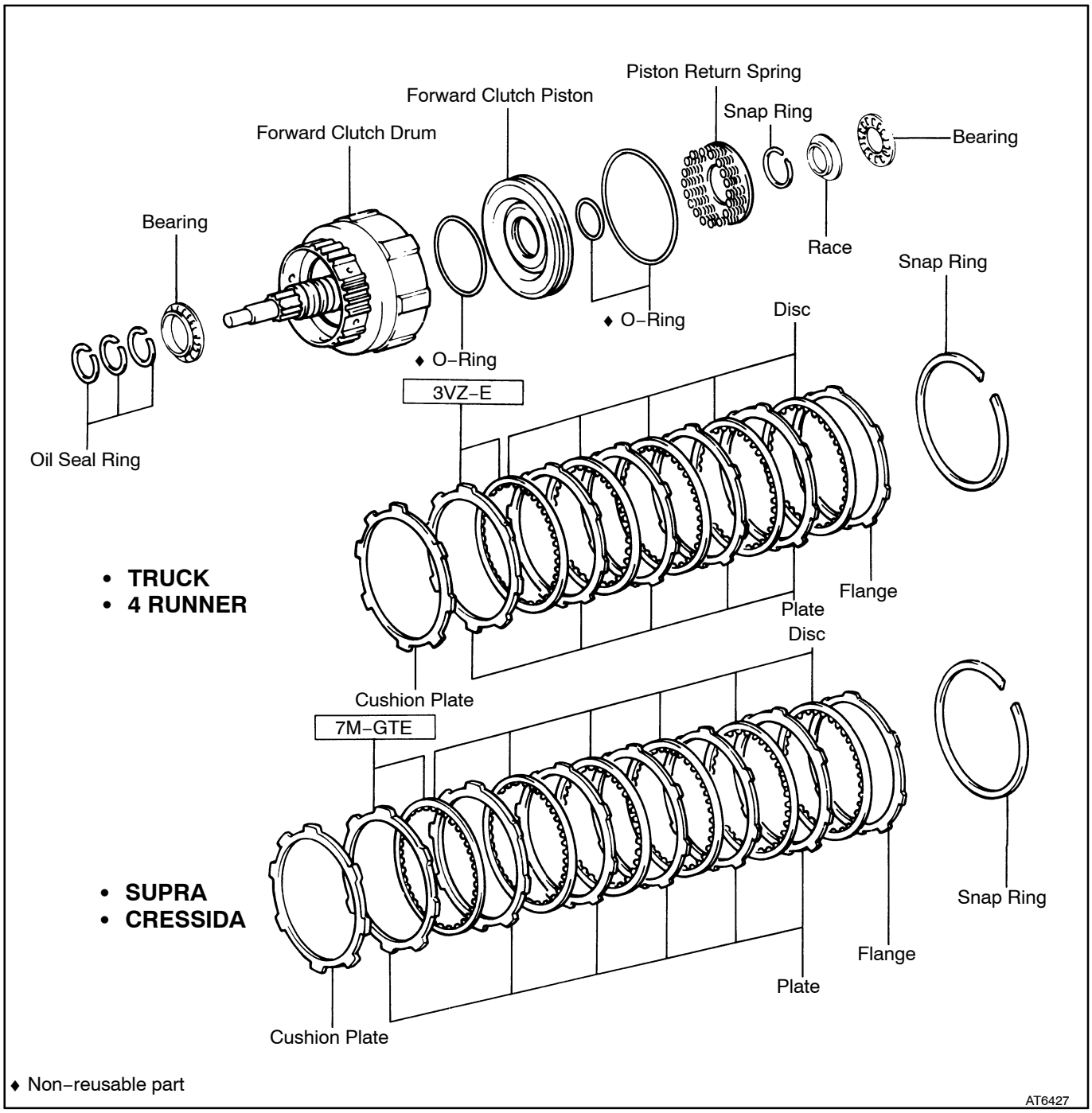


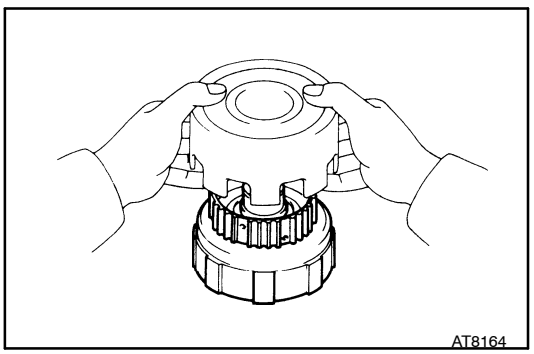
(c) Check that the distance from the direct clutch end to the forward clutch end is 71.2 mm (2.803 in.)

If the distance is less than the above value, parts may have been assembled incorrectly, check and reassemble again.

Forward Clutch

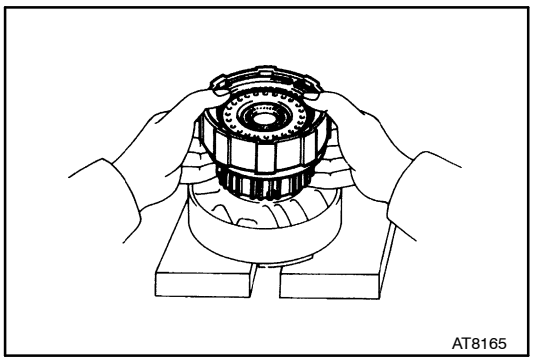
COMPONENTS





DISASSEMBLY OF FORWARD CLUTCH

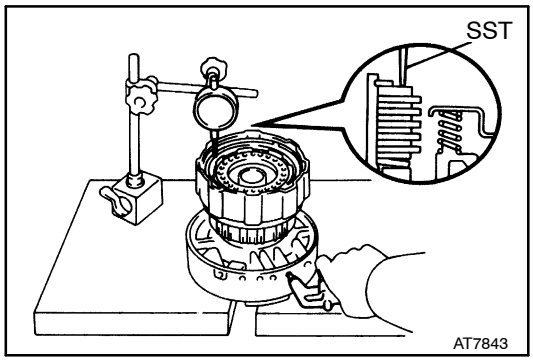
1. REMOVE FORWARD CLUTCH ASSEMBLY FROM DIRECT CLUTCH ASSEMBLY



2. PLACE FORWARD CLUTCH ONTO OVERDRIVE SUPPORT

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

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



3. CHECK PACK CLEARANCE OF FORWARD CLUTCH

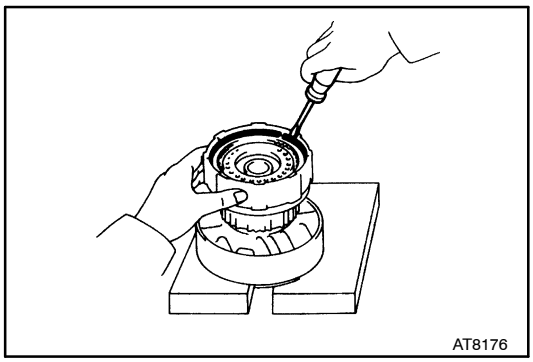
Using SST and a dial indicator, measure the forward clutch piston stroke applying and releasing the compressed air (4–8 kg/cm^2, 57 – 114 psi or 392 – 785 kPa) as shown.

SST 09350–30020 (09350–06120)

Pack clearance:

(22R–E)
0.4 – 0.8 mm (0.016 – 0.031 in.)
(7M–GTE)
0.6 – 1.0 mm (0.024 – 0.039 in.)
(Others)
0.5 – 0.9 mm (0.020 – 0.035 in.)

If the values are nonstandard, inspect the discs.



4. REMOVE FLANGE, PLATES AND DISCS

(a) Remove the snap ring from the forward clutch drum.

(b) Remove the flange, plates and discs.

(22R–E)

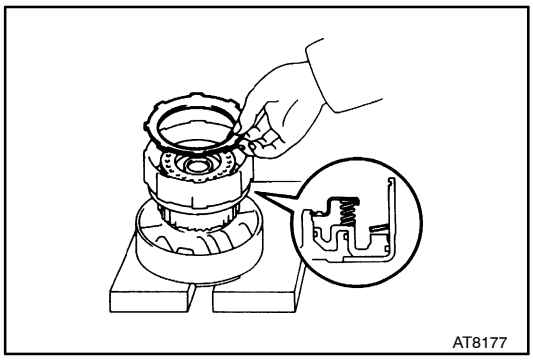
One flange, four plates and four discs

(7M–GTE)

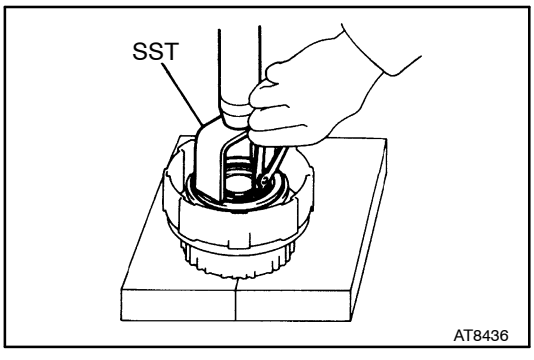
One flange, six plates and six discs

(Others)

One flange, five plates and five discs



5. REMOVE CUSHION PLATE



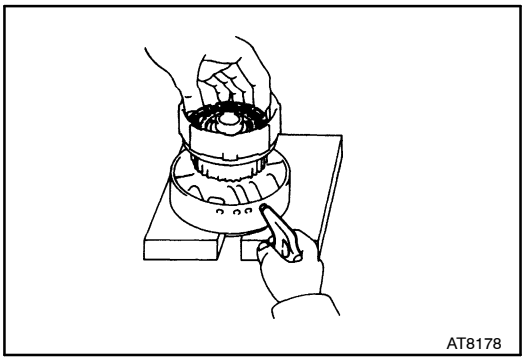
6. REMOVE PISTON RETURN SPRING

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

SST 09350–30020 (09350–07040)

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

(c) Remove the piston return spring.


AT8178

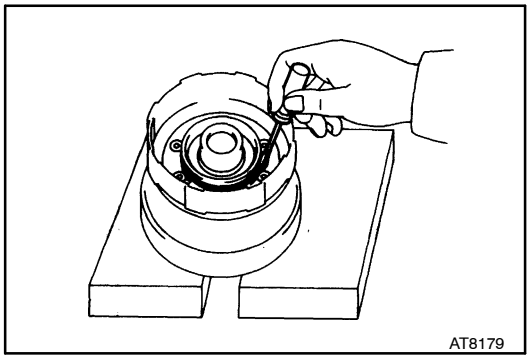
7. REMOVE FORWARD CLUTCH PISTON

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

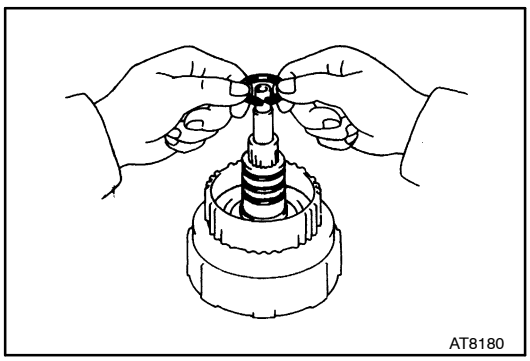
(b) Hold the forward clutch piston with hand, apply compressed air to the O/D support to remove the forward clutch piston.

(c) Remove the forward clutch piston.

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

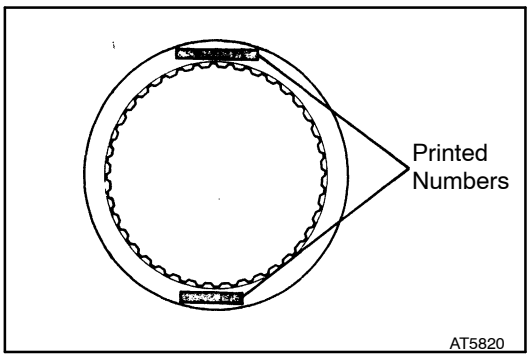

AT8179

8. REMOVE O–RING FROM FORWARD CLUTCH DRUM


AT8180

9. REMOVE OIL SEAL RINGS

INSPECTION OF FORWARD CLUTCH

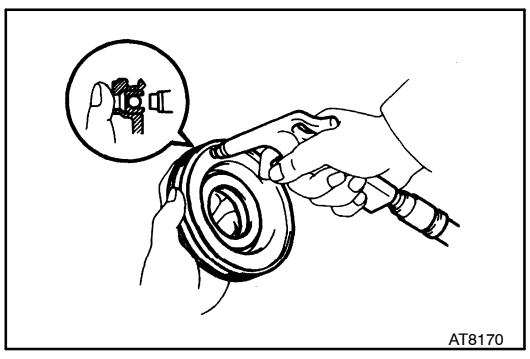


AT5820

1. INSPECT DISC, PLATE AND FLANGE

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

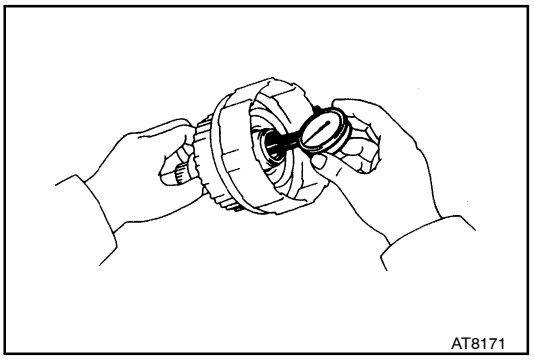
- If the lining of the disc is peeling off or discolored, or even if parts of the printed numbers are defaced, replace all discs.
- Before assembling new discs, soak them in ATF for at least fifteen minutes.


AT8170

2. CHECK FORWARD CLUTCH PISTON

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

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

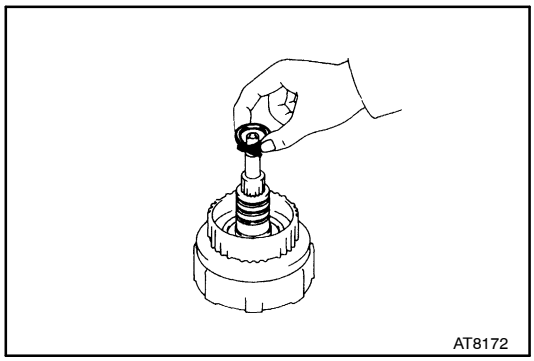


3. CHECK FORWARD CLUTCH DRUM BUSHING

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

Maximum inside diameter: 24.08 mm (0.9480 in.)

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



ASSEMBLY OF FORWARD CLUTCH

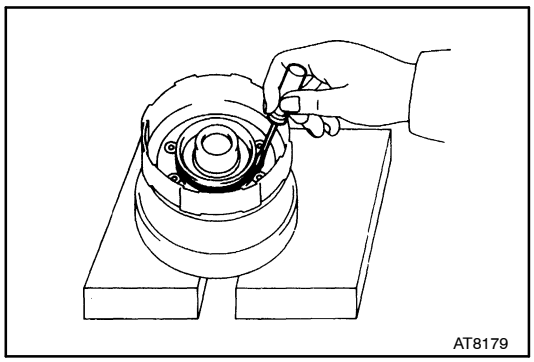
1. INSTALL OIL SEAL RINGS

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

(b) Contract the oil seal rings as shown, and install them onto the forward clutch drum.

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

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

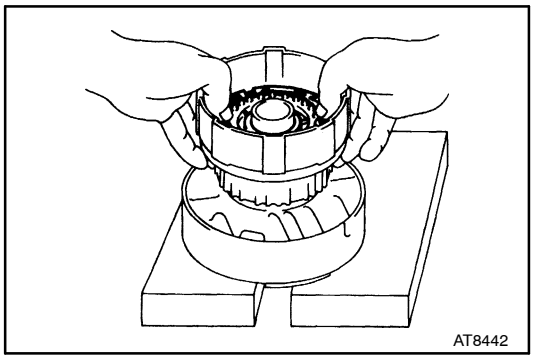


2. INSTALL NEW O–RING TO FORWARD CLUTCH DRUM

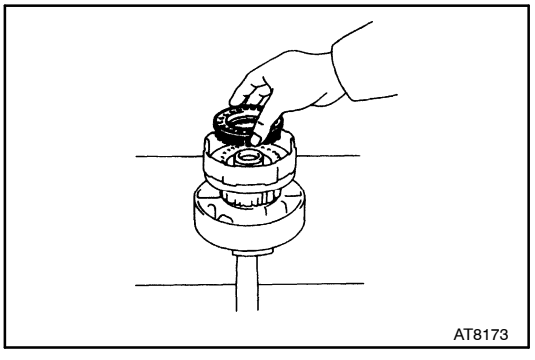
Coat a new O–ring with ATF and install it on the forward clutch drum.

3. INSTALL FORWARD CLUTCH PISTON

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

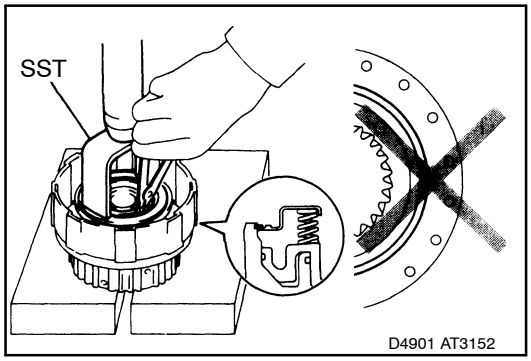


(b) Being careful not to damage the O–rings, press the clutch piston into the forward clutch drum with both hands.



4. INSTALL PISTON RETURN SPRING

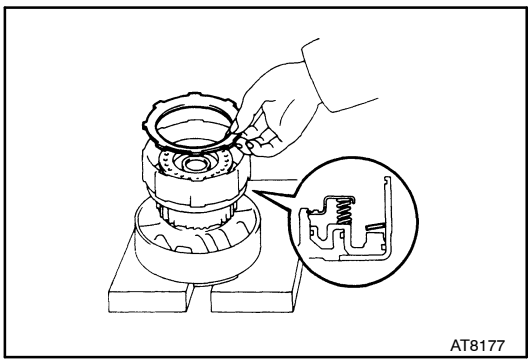
(a) Install the piston return spring.



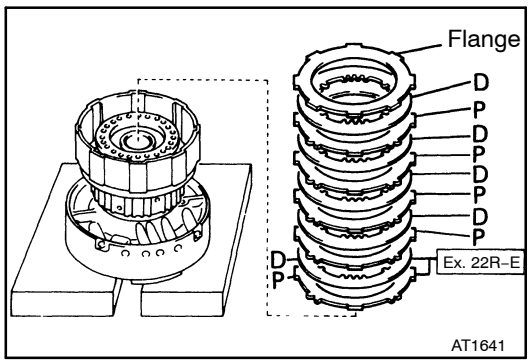
(b) Place SST on the spring retainer, and compress the return spring with a shop press.

SST 09350–30020 (09350–07040)

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



5. INSTALL CUSHION PLATE ROUNDED END DOWN AS SHOWN



6. INSTALL PLATES, DISCS AND FLANGE

(a) Install in order: P= Plate D= Disc

(22R–E)

P–D–P–D–P–D–P–D

(7M–GTE)

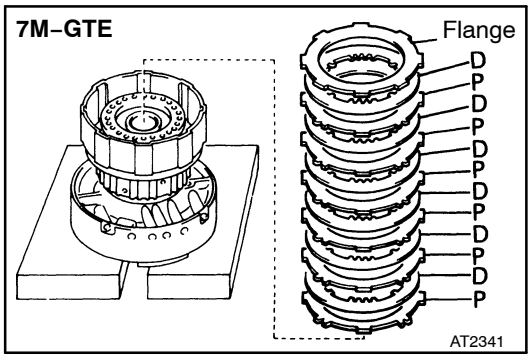
P–D–P–D–P–D–P–D–P–D–P–D

(Others)

P–D–P–D–P–D–P–D–P–D

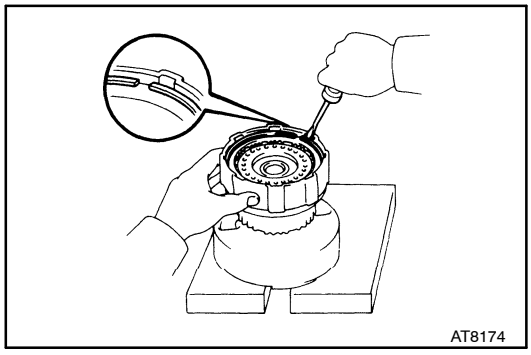
(b) And then install the flange, the rounded edge facing downward.

HINT: There are eight different thickness for the flange.

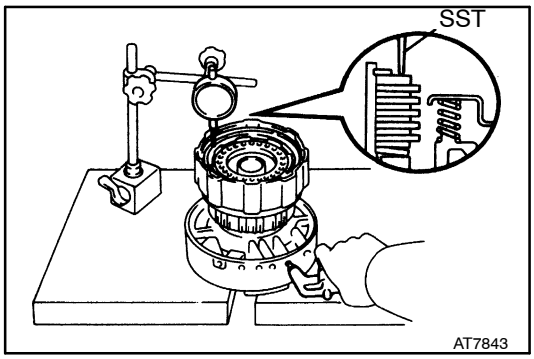


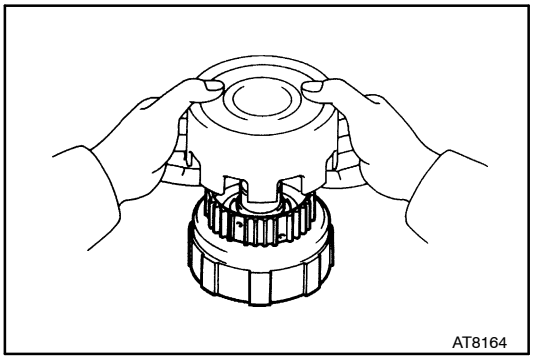
Flange Thickness mm (in.)

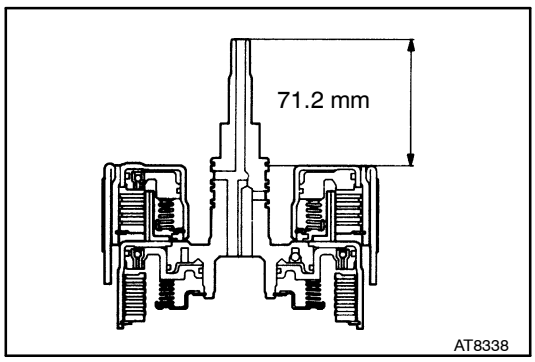
No.	Thickness	No.	Thickness
61	3.0 (0.118)	44	3.8 (0.150)
60	3.2 (0.126)	42	4.0 (0.157)
45	3.4 (0.134)	63	4.2 (0.165)
62	3.6 (0.142)	64	4.4 (0.173)



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







7. CHECK PACK CLEARANCE OF FORWARD CLUTCH

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

SST 09350–30020 (09350–06120)

Pack clearance:

(22R–E)
0.4 – 0.8 mm (0.016 – 0.031 in.)
(7M–GTE)
0.6 – 1.0 mm (0.024 – 0.039 in.)
(Others)
0.5 – 0.9 mm (0.020 – 0.035 in.)

If the values are nonstandard, inspect the discs.

8. INSTALL DIRECT CLUTCH ASSEMBLY TO FORWARD CLUTCH ASSEMBLY

(a) Make sure that the thrust washer is installed to the direct clutch drum.

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

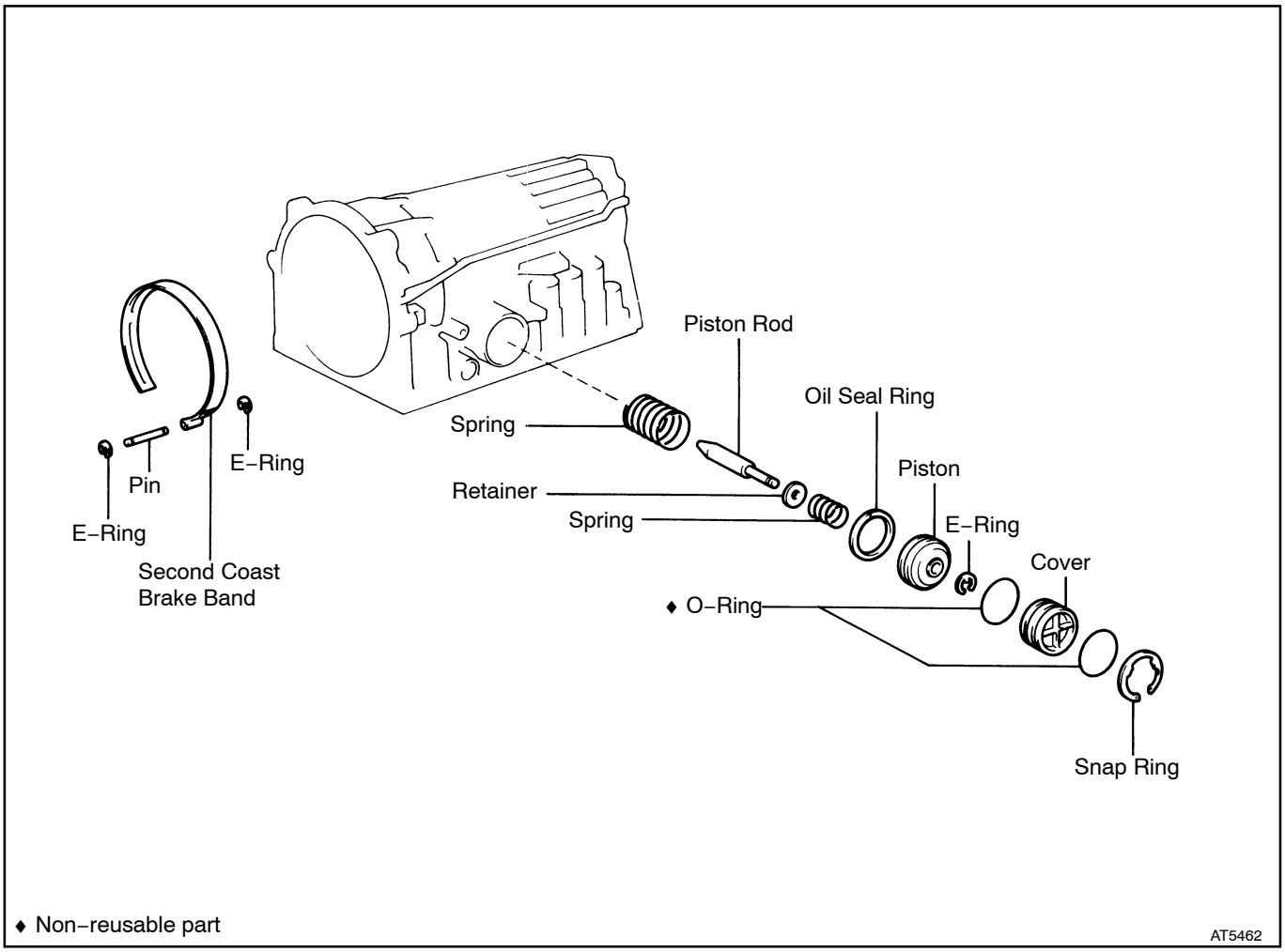
(c) Install the direct clutch assembly onto the forward clutch assembly.

(d) Check that the distance from the direct clutch end to the forward clutch end is 71.2 mm (2.803 in.).

If the distance is less than the above value, parts may have been assembled incorrectly, check and reassemble again.

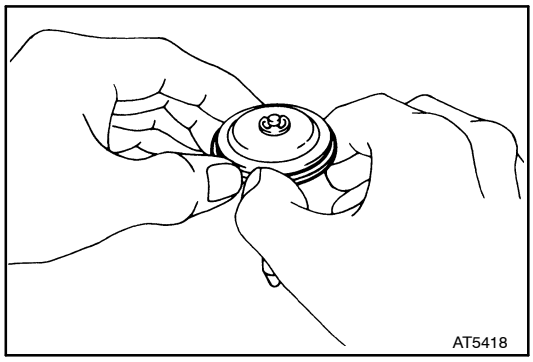
Second Coast Brake

COMPONENTS



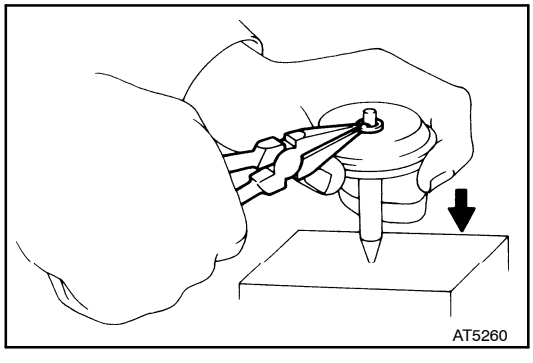
♦ Non–reusable part

AT5462



DISASSEMBLY OF SECOND COAST BRAKE PISTON

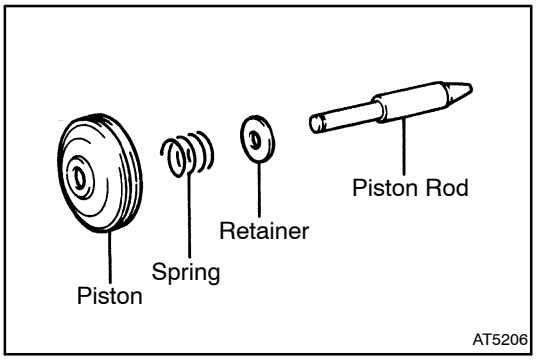
1. REMOVE SECOND COAST BRAKE PISTON OIL SEAL RING



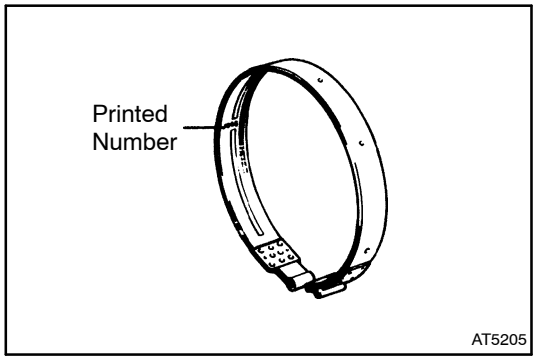
2. REMOVE SECOND COAST BRAKE PISTON ROD

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

(b) Remove the E–ring.



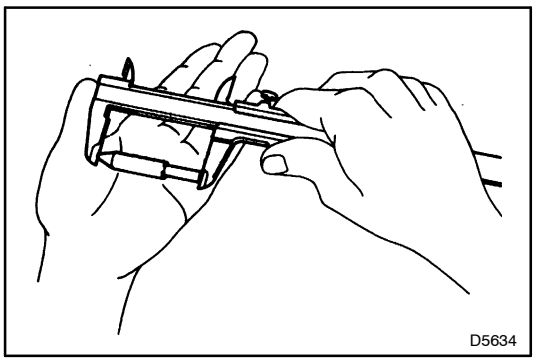
(c) Remove the compression spring, retainer and piston rod.



INSPECTION OF SECOND COAST BRAKE BAND

INSPECT BRAKE BAND

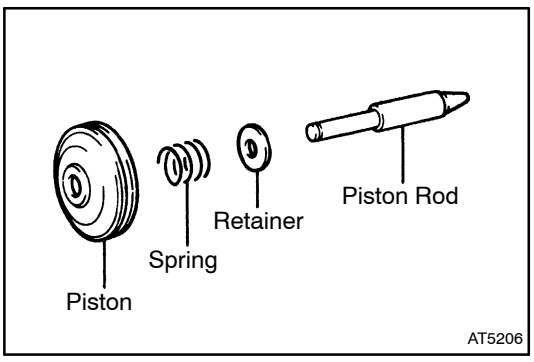
If the lining of the brake band is peeling off or discolored, or even if parts of the printed numbers are defaced, replace the brake band.
HINT: Before assembling the new band, soak it in ATF for at least fifteen minutes.



ASSEMBLY OF SECOND COAST BRAKE PISTON

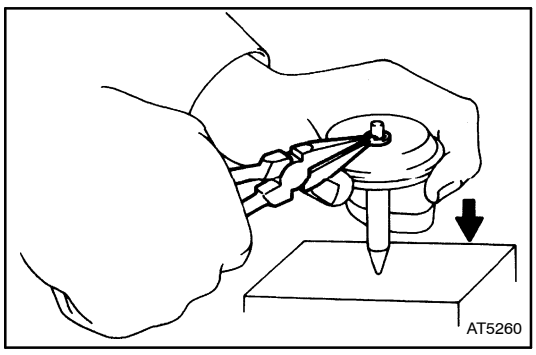
1. SELECT PISTON ROD

If the band is OK with piston rod stroke not within the standard value, select the piston rod.
There are two different lengths for piston rod.
Piston rod length: 71.4 mm (2.811 in.)
72.9 mm (2.870 in.)



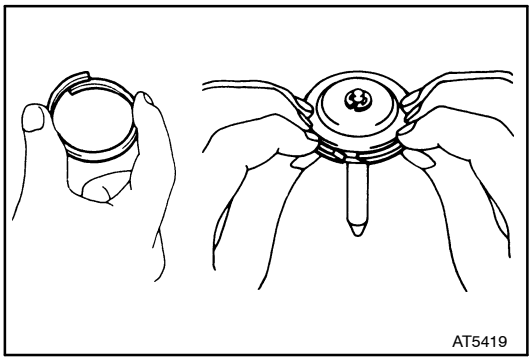
2. ASSEMBLE SECOND COAST BRAKE PISTON

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



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

(c) Install the E–ring.



3. INSTALL SECOND COAST BRAKE PISTON OIL SEAL RING

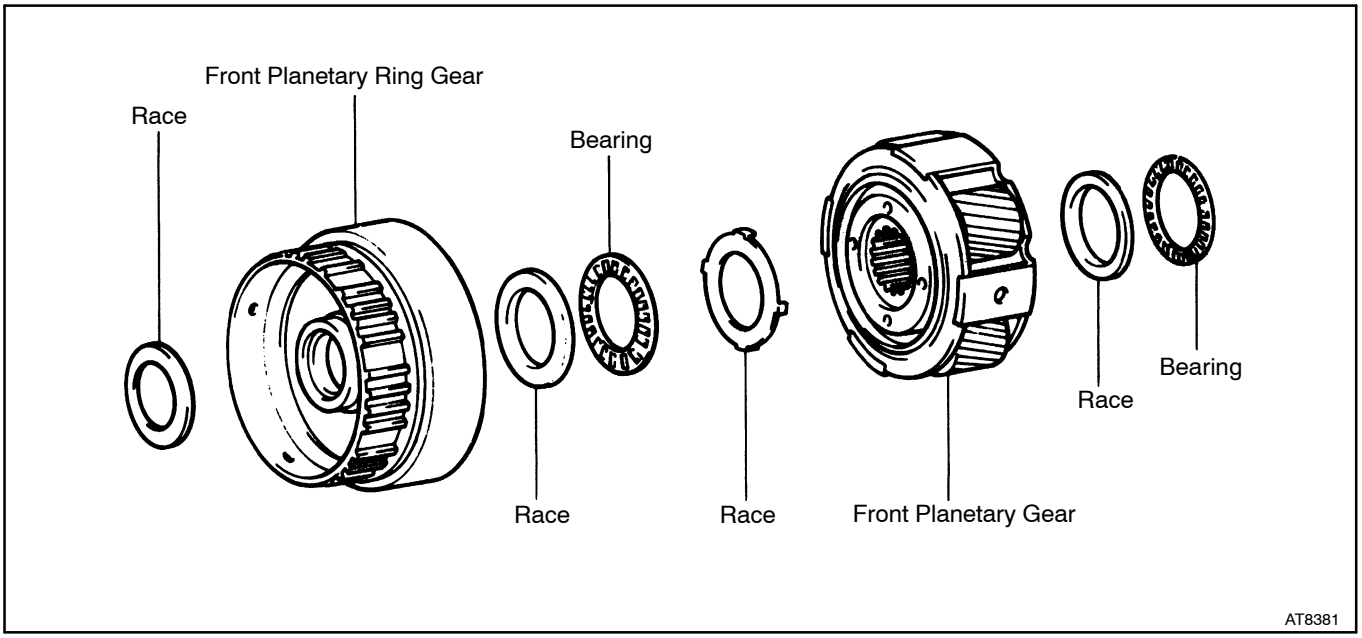
(a) Coat the oil seal ring with ATF.

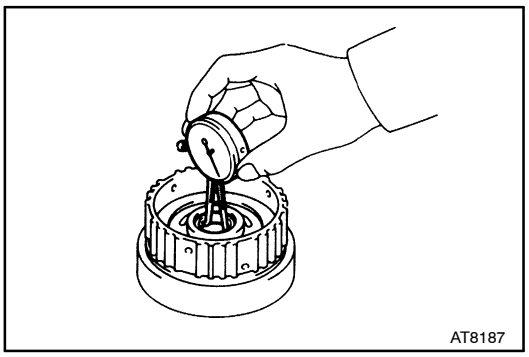
(b) Contract the oil seal ring once as shown in the diagram, then install it in the piston groove.

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

Front Planetary Gear

COMPONENTS





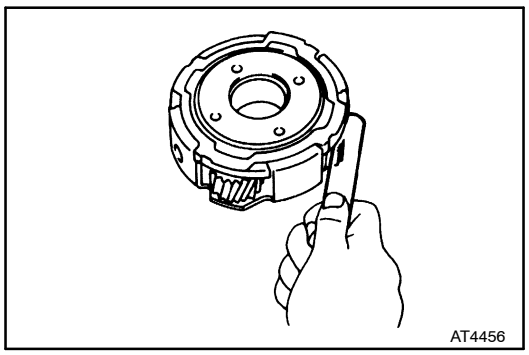
INSPECTION OF FRONT PLANETARY GEAR

1. CHECK FRONT PLANETARY RING GEAR BUSHING

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

Maximum inside diameter: 24.08 mm (0.9480 in.)

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



2. MEASURE PLANETARY PINION GEAR THRUST CLEARANCE

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

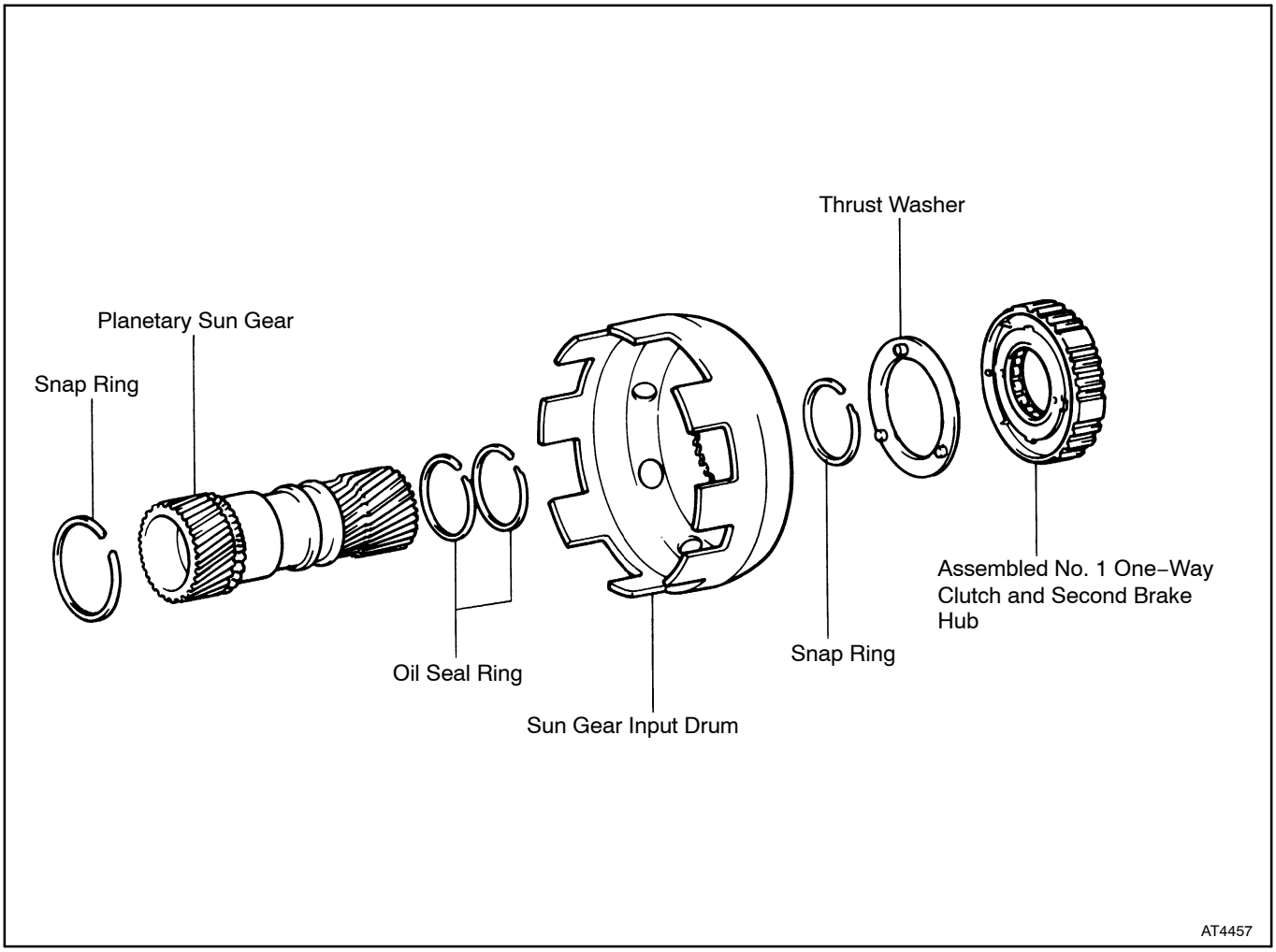
Standard clearance: 0.20 – 0.60 mm (0.0079 – 0.0236 in.)

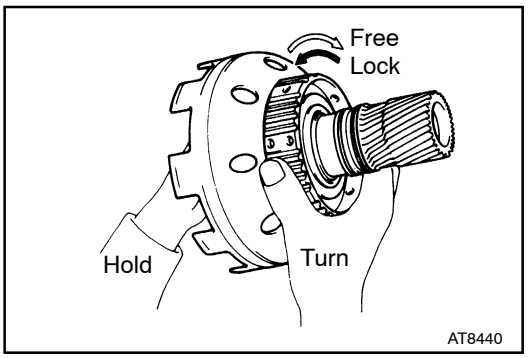
Maximum clearance: 1.00 mm (0.0394 in.)

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

Planetary Sun Gear and No. 1 One–Way Clutch

COMPONENTS

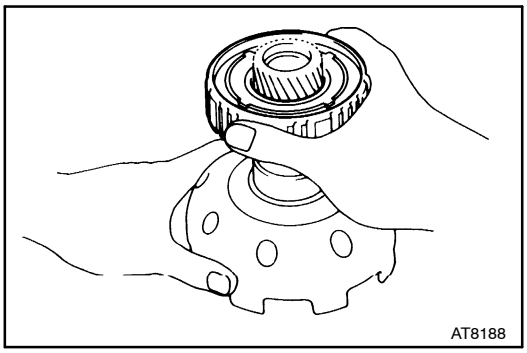




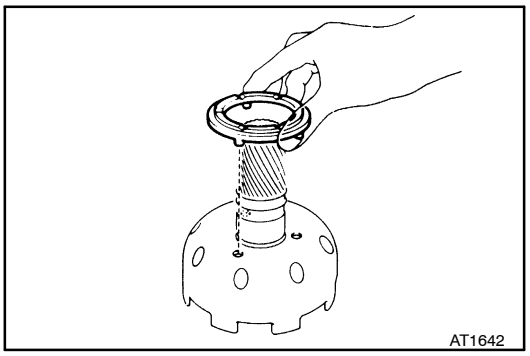
DISASSEMBLY OF PLANETARY SUN GEAR AND NO. 1 ONE–WAY CLUTCH

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

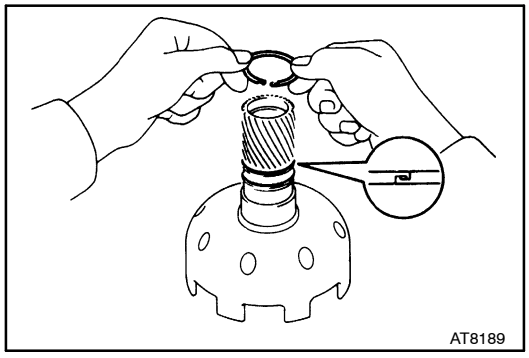
Hold the planetary sun gear and turn the second brake hub. The second brake hub turns freely clockwise and locks counterclockwise.



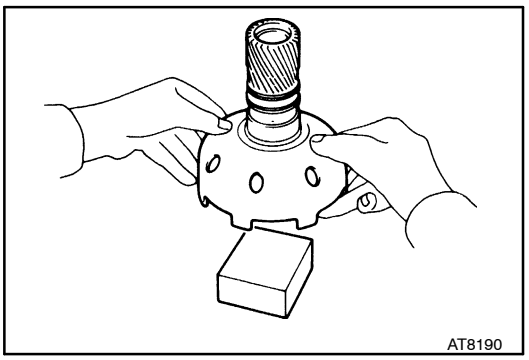
2. REMOVE ASSEMBLED NO. 1 ONE–WAY CLUTCH AND SECOND BRAKE HUB



3. REMOVE THRUST WASHER FROM SUN GEAR INPUT DRUM

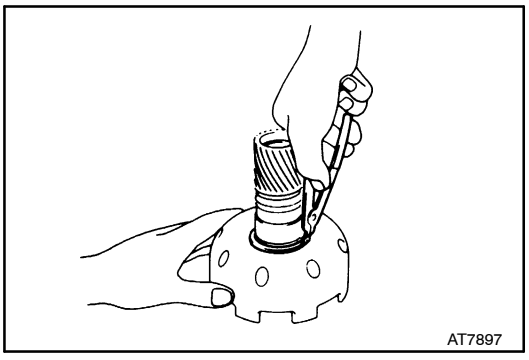


4. REMOVE OIL SEAL RINGS



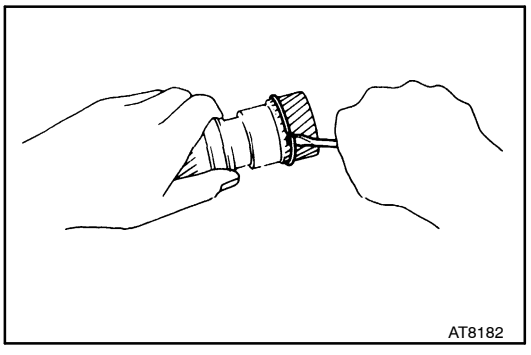
5. REMOVE SUN GEAR INPUT DRUM FROM PLANETARY SUN GEAR

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

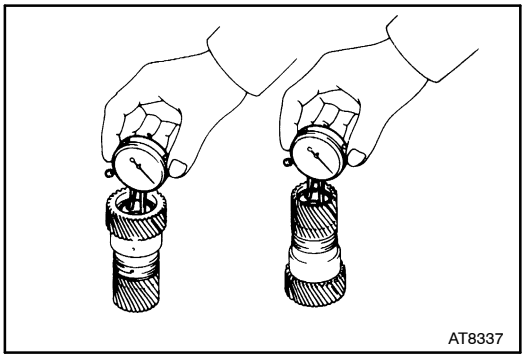


(b) Using snap ring pliers, remove the snap ring.

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



6. REMOVE SNAP RING FROM PLANETARY SUN GEAR



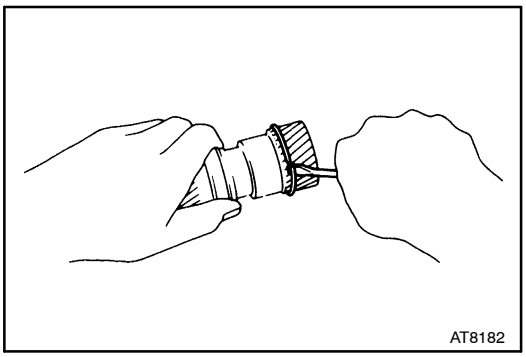
INSPECTION OF PLANETARY SUN GEAR

CHECK PLANETARY SUN GEAR BUSHINGS

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

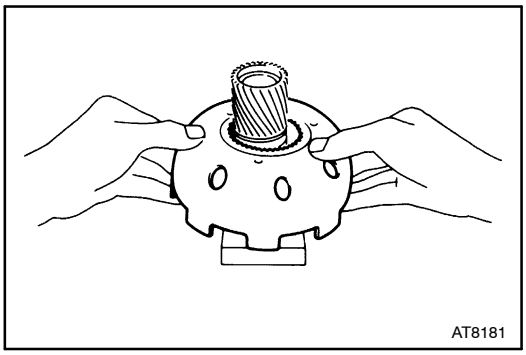
Maximum inside diameter: 27.08 mm (1.0661 in.)

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



ASSEMBLY OF PLANETARY SUN GEAR AND NO. 1 ONE–WAY CLUTCH

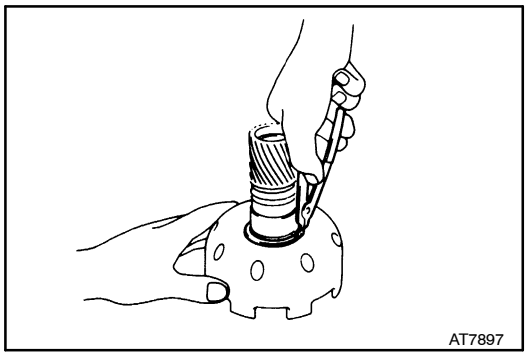
1. INSTALL SNAP RING TO PLANETARY SUN GEAR



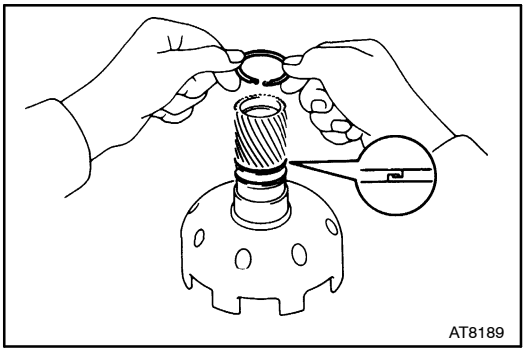
2. INSTALL SUN GEAR INPUT DRUM

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

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



(c) Install the snap ring with snap ring pliers.



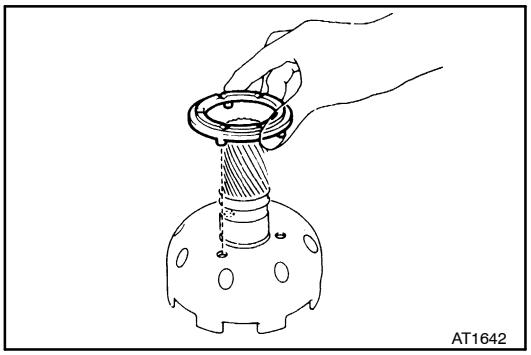
3. INSTALL OIL SEAL RINGS

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

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

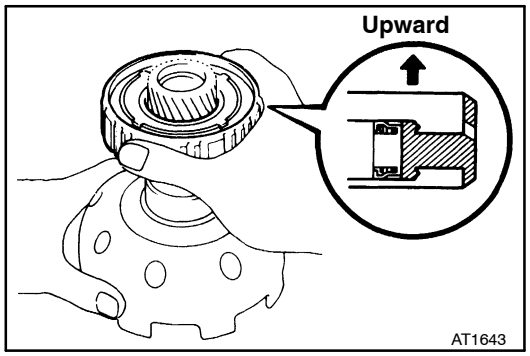
NOTICE: Do not spread the ring ends too much.

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

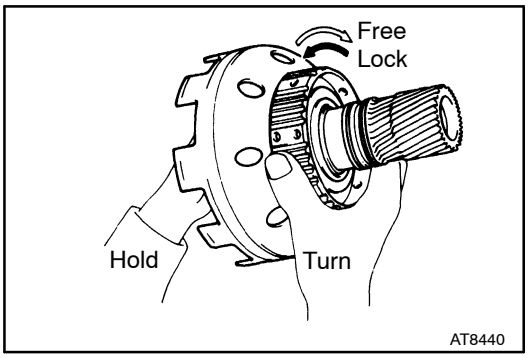


4. INSTALL THRUST WASHER

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



5. INSTALL ASSEMBLED NO. 1 ONE–WAY CLUTCH AND SECOND BRAKE HUB ONTO PLANETARY SUN GEAR AS SHOWN

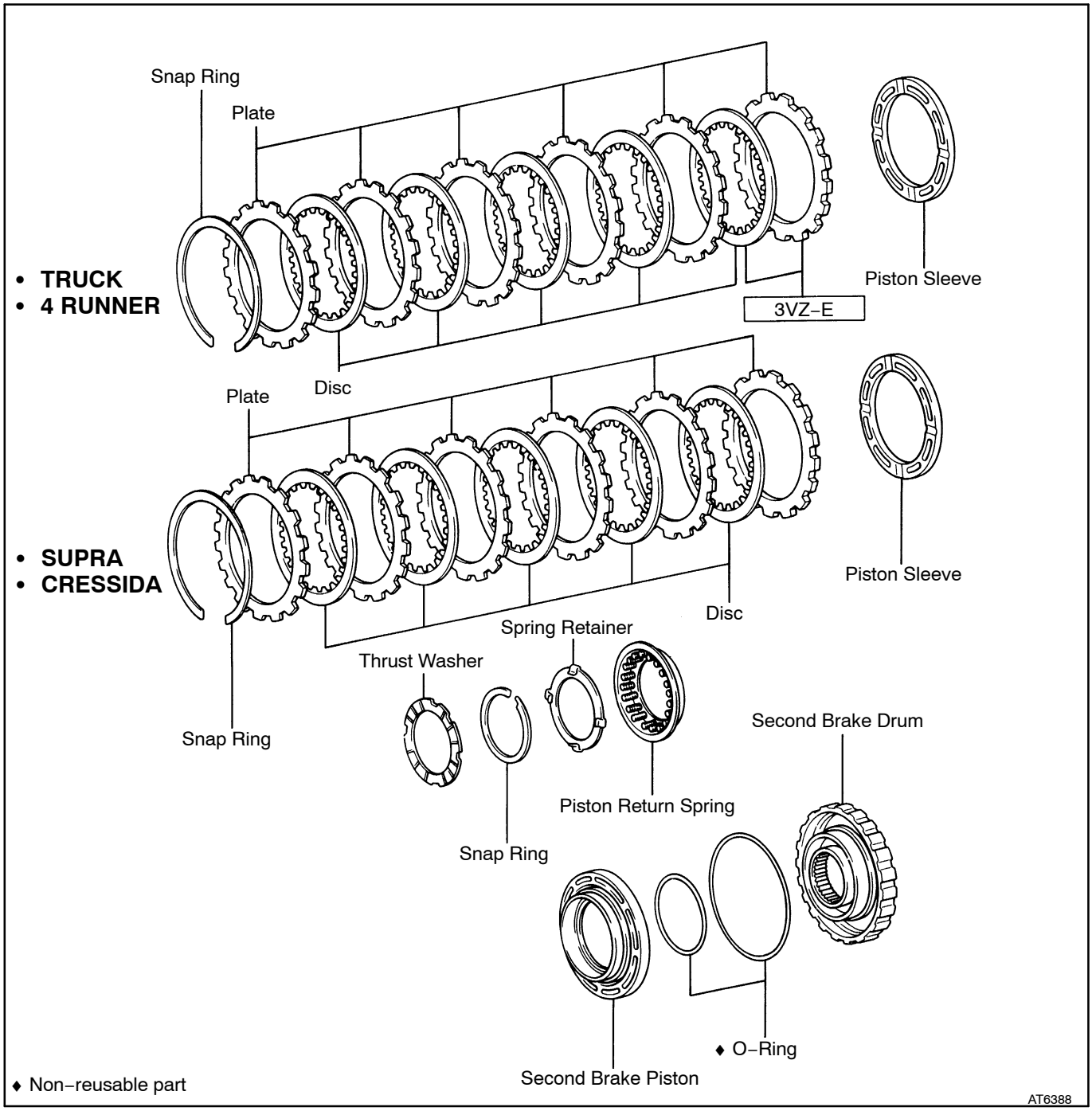


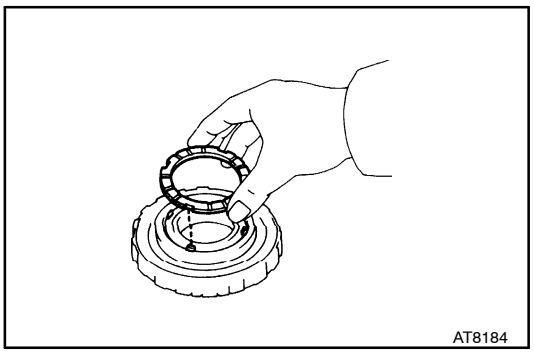
6. CHECK OPERATION OF NO. 1 ONE–WAY CLUTCH

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

Second Brake

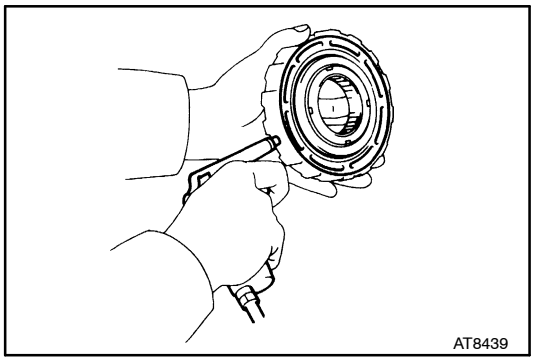
COMPONENTS





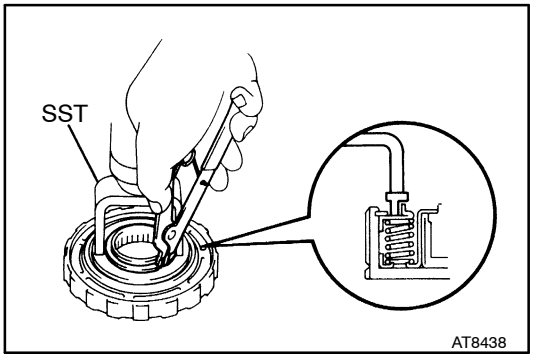
DISASSEMBLY OF SECOND BRAKE

1. REMOVE THRUST WASHER FROM SECOND BRAKE DRUM



2. CHECK SECOND BRAKE PISTON MOVEMENT

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



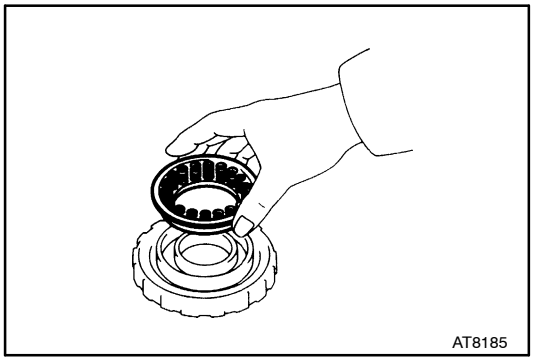
3. REMOVE PISTON RETURN SPRING

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

SST 09350–30020 (09350–07040)

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

(c) Remove the spring retainer.



(d) Remove the piston return spring.

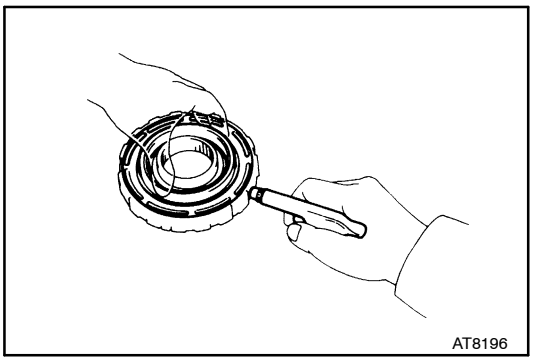
4. REMOVE SECOND BRAKE PISTON

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

(b) Remove the second brake piston.

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

(c) Remove the two O–rings from the piston.



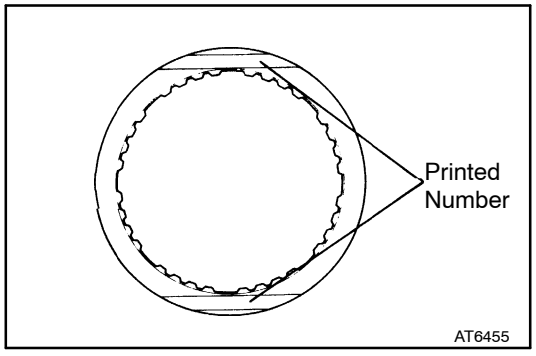
INSPECTION OF SECOND BRAKE

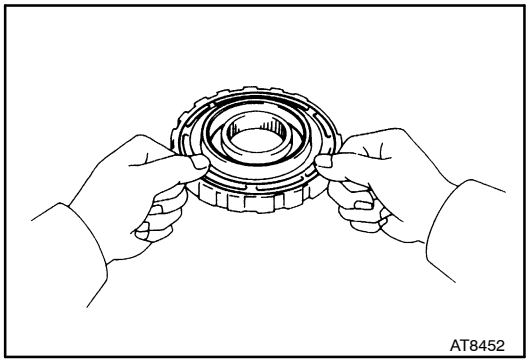
1. INSPECT DISC, PLATE AND FLANGE

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

HINT:

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



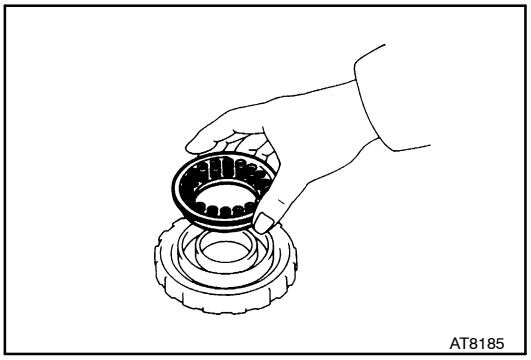


ASSEMBLY OF SECOND BRAKE

1. INSTALL SECOND BRAKE PISTON

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

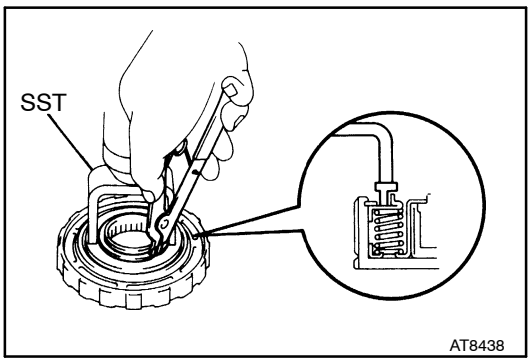
(b) Being careful not to damage the O–rings, press the second brake piston into the second brake drum with both hands.



2. INSTALL PISTON RETURN SPRING

(a) Install the piston return spring.

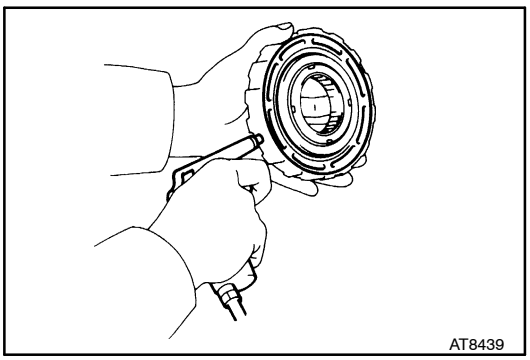
(b) Install the spring retainer.



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

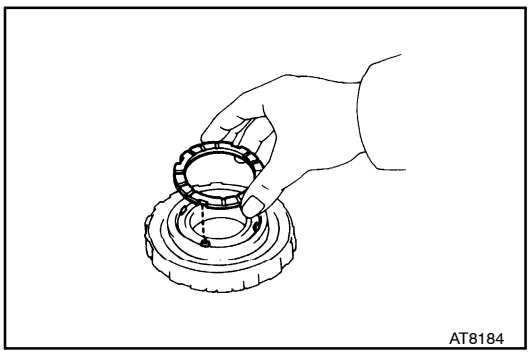
SST 09350–30020 (09350–07040)

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



3. CHECK SECOND BRAKE PISTON MOVEMENT

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

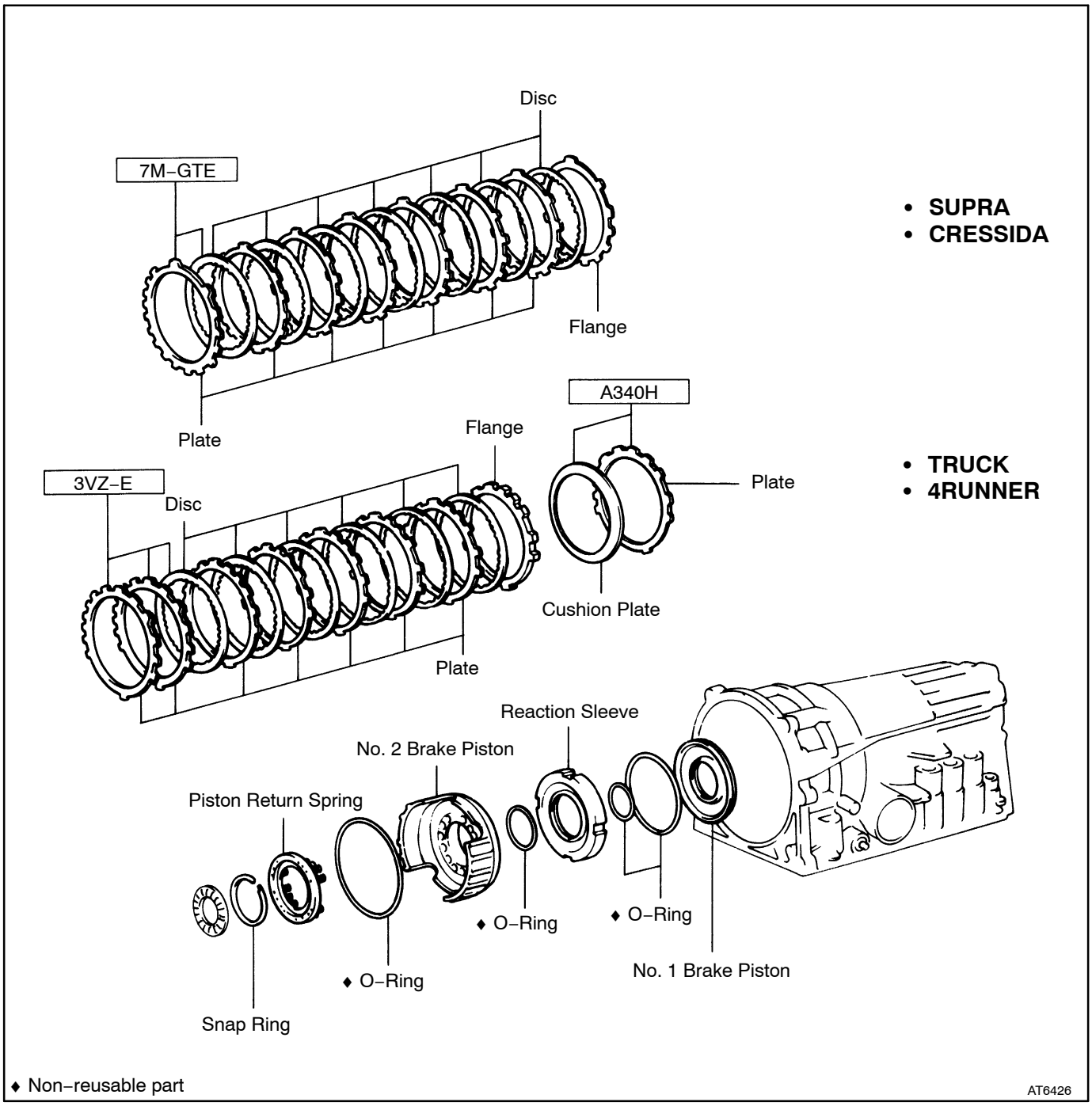


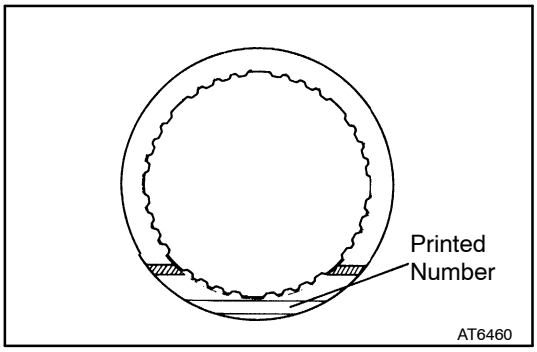
4. INSTALL THRUST WASHER

Coat the thrust washer with petroleum jelly and install it.
HINT: Make sure that the cutout portions of thrust washer match teeth of the spring retainer.

First and Reverse Brake

COMPONENTS





INSPECTION OF FIRST AND REVERSE BRAKE

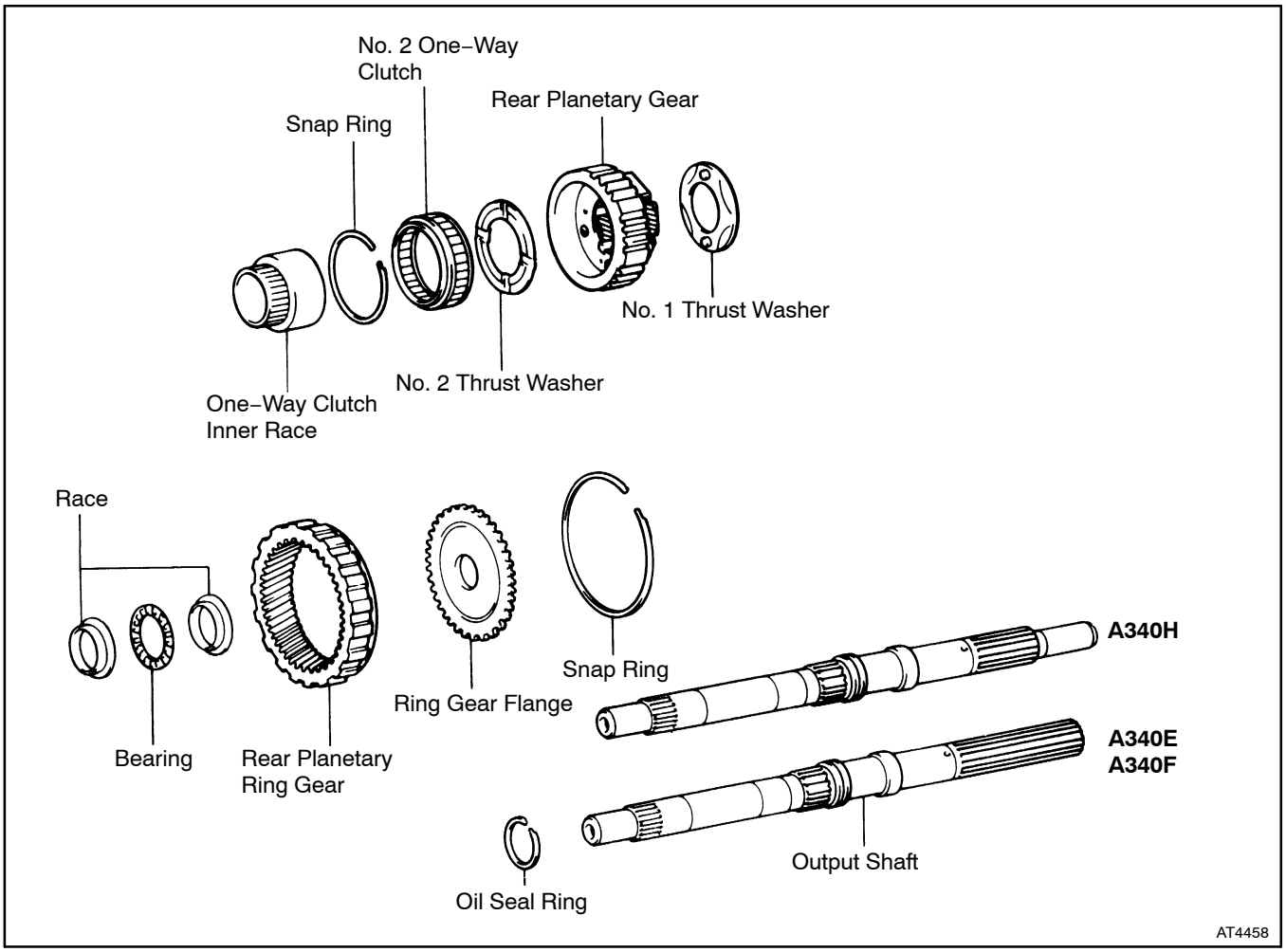
INSPECT DISC, PLATE AND FLANGE

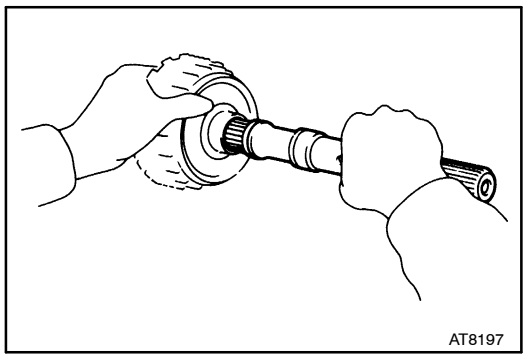
Check to see if the sliding surface of the disc, plate and flange are worn or burnt. If necessary, replace them.
HINT:

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

Rear Planetary Gear, No. 2 One–Way Clutch and Output Shaft

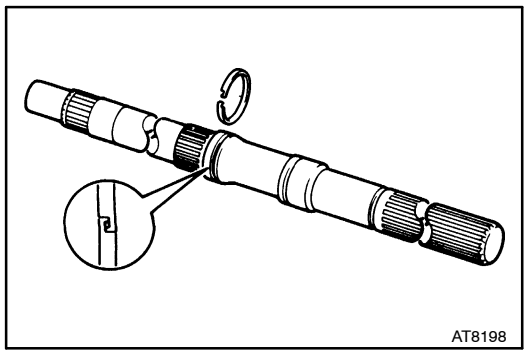
COMPONENTS



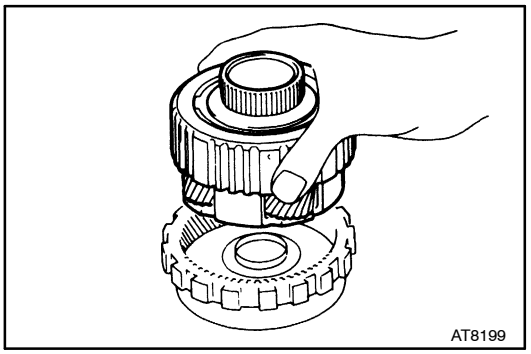


DISASSEMBLY OF REAR PLANETARY GEAR, NO. 2 ONE–WAY CLUTCH AND OUTPUT SHAFT

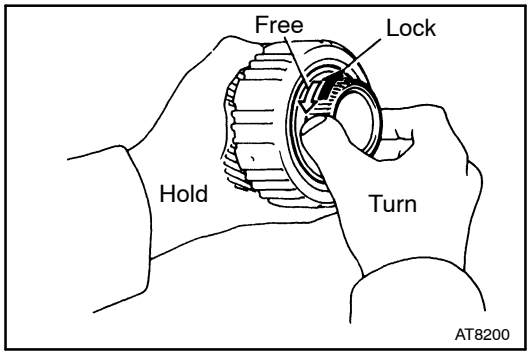
1. REMOVE OUTPUT SHAFT FROM REAR PLANETARY GEAR ASSEMBLY



2. REMOVE OIL SEAL RING FROM OUTPUT SHAFT

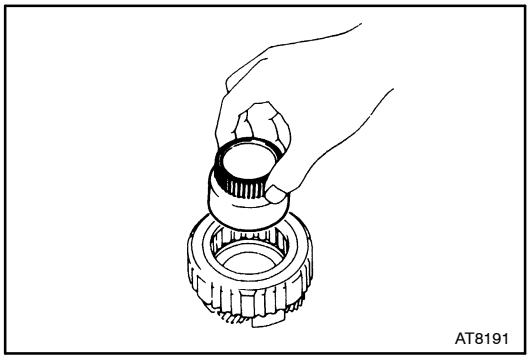


3. REMOVE REAR PLANETARY GEAR FROM REAR PLANETARY RING GEAR



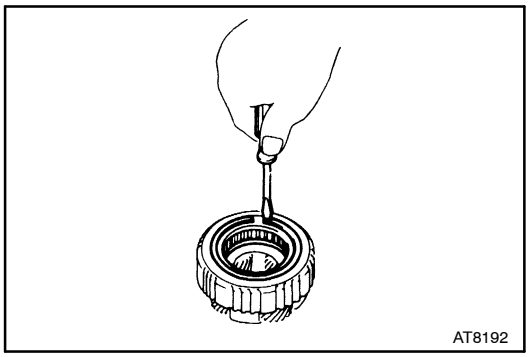
4. CHECK OPERATION OF NO. 2 ONE–WAY CLUTCH

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

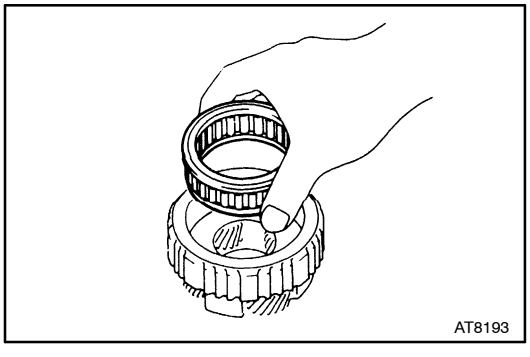


5. REMOVE NO. 2 ONE–WAY CLUTCH

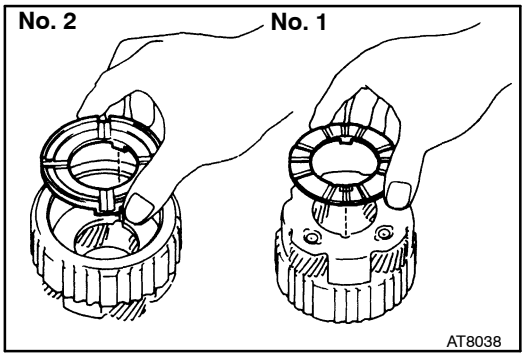
(a) Remove the one–way clutch inner race from the rear planetary gear.



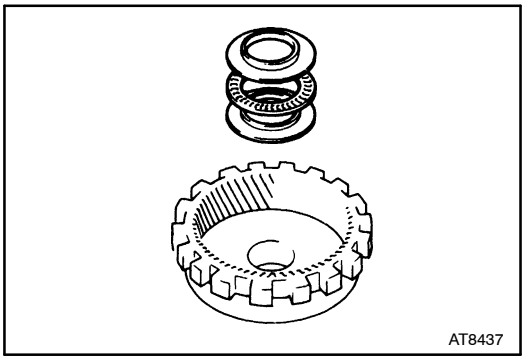
(b) Remove the snap ring with a screwdriver.



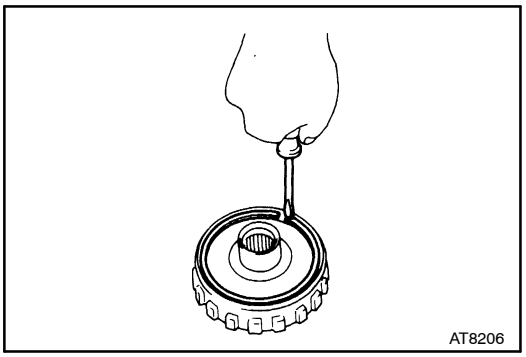
(c) Remove No. 2 one–way clutch with retainers from the planetary gear.



6. REMOVE NO. 2 AND NO. 1 THRUST WASHERS

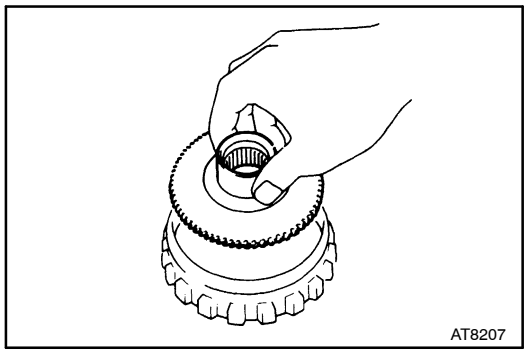


7. REMOVE RACES AND BEARING FROM REAR PLANETARY RING GEAR

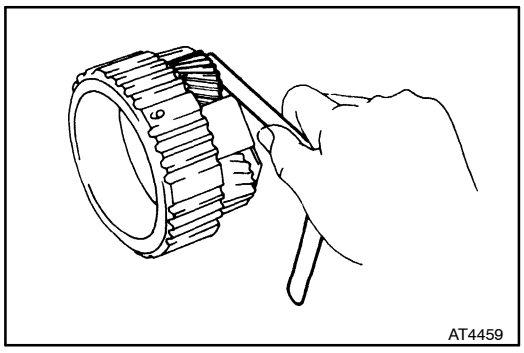


8. REMOVE RING GEAR FLANGE

(a) Remove the snap ring with a screwdriver.



(b) Remove the ring gear flange.



INSPECTION OF REAR PLANETARY GEAR

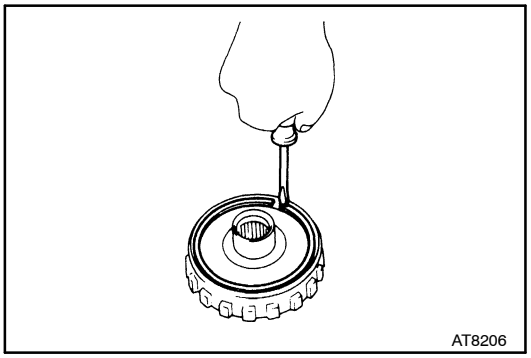
MEASURE PLANETARY PINION GEAR THRUST CLEARANCE

Using feeler gauge, measure the planetary pinion gear thrust clearance:

Standard clearance: 0.20 – 0.60 mm (0.0079 – 0.0236 in.)

Maximum clearance: 1.00 mm (0.0394 in.)

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

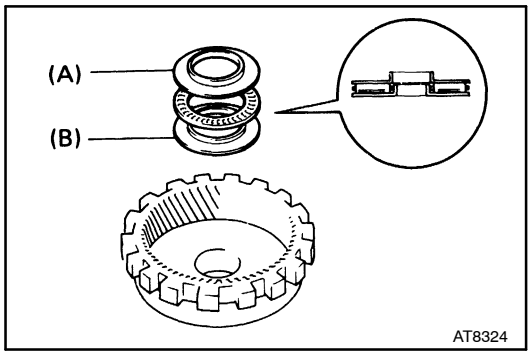


ASSEMBLY OF REAR PLANETARY GEAR, NO. 2 ONE–WAY CLUTCH AND OUTPUT SHAFT

1. INSTALL RING GEAR FLANGE

(a) Install the ring gear flange.

(b) Install the snap ring.

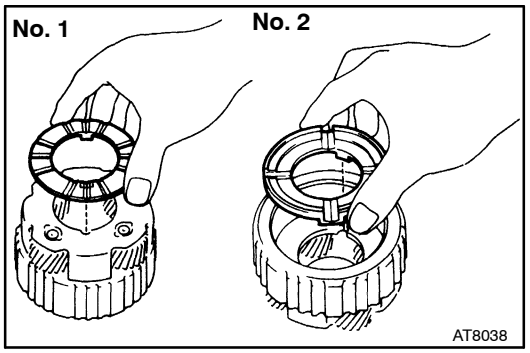


2. INSTALL RACES AND BEARING

Coat the races and bearing with petroleum jelly, and install them onto the rear planetary ring gear.
HINT: Races and bearing diameter

mm (in.)

	Inside	Outside
Race (A)	28.8 (1.134)	44.8 (1.764)
Bearing	34.1 (1.185)	44.7 (1.760)
Race (B)	27.8 (1.094)	44.8 (1.764)

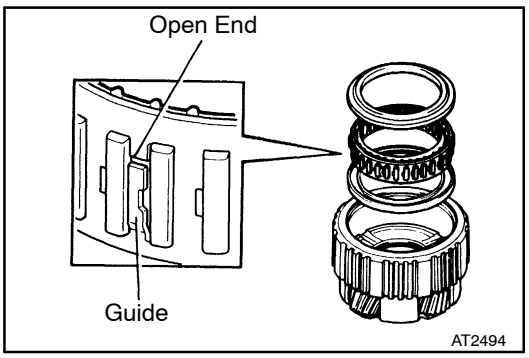


3. INSTALL NO. 1 AND NO. 2 THRUST WASHERS

(a) Coat the thrust washers with petroleum jelly.

(b) Install the thrust washers onto both sides of the rear planetary gear.

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

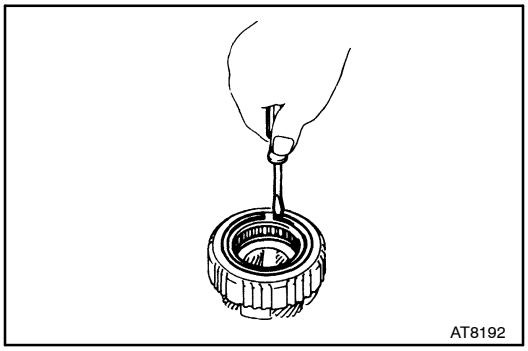


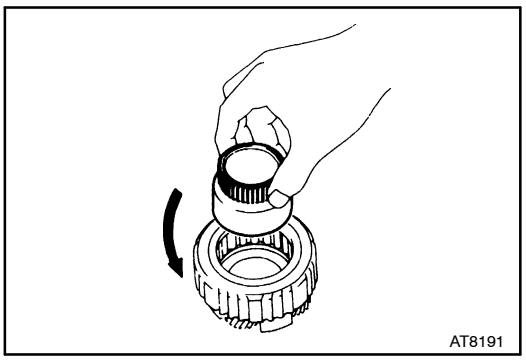
4. INSTALL NO. 2 ONE–WAY CLUTCH

(a) Install the one–way clutch and two retainers into the rear planetary gear as shown in the figure.

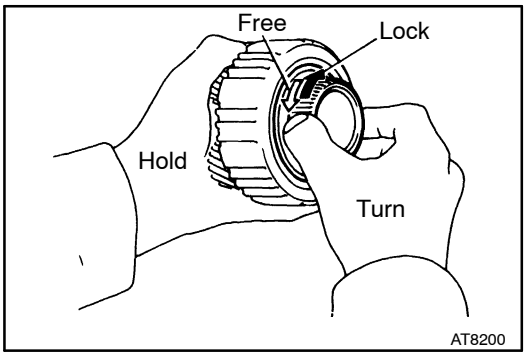
HINT: Make sure that the open ends of the guides on the one–way clutch are faced upward.

(b) Install the snap ring.



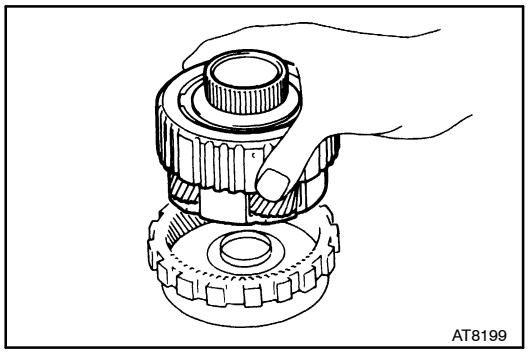


(c) While turning counterclockwise, install the one–way clutch inner race to the rear planetary gear.

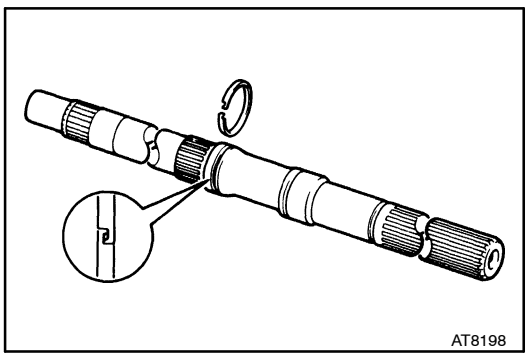


5. CHECK OPERATION OF NO. 2 ONE–WAY CLUTCH

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



6. INSTALL REAR PLANETARY GEAR ONTO REAR PLANETARY RING GEAR

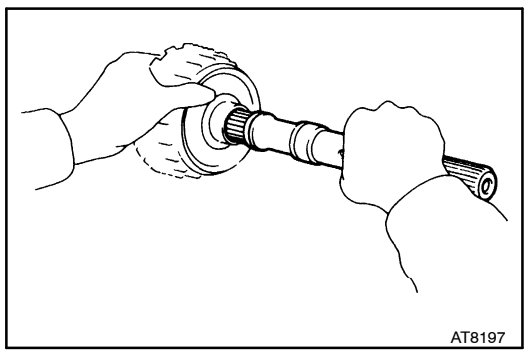


7. INSTALL OIL SEAL RING

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

NOTICE: Do not spread the ring ends too match.

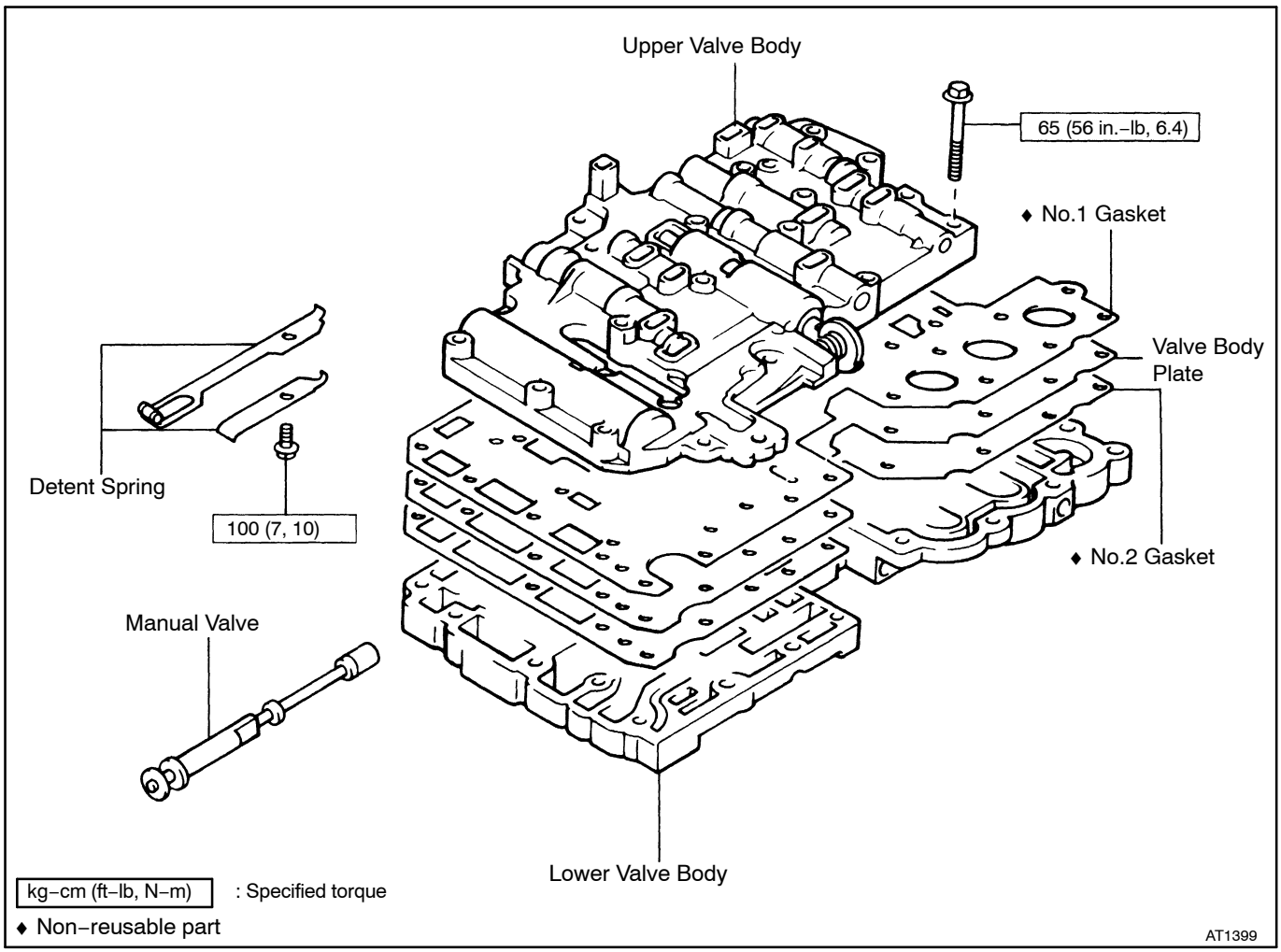
HINT: After installing the oil seal ring, check that it rotates smoothly.

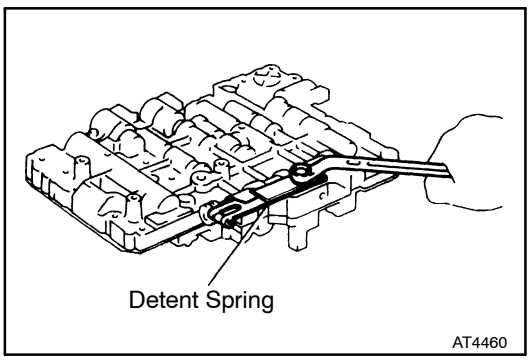


8. INSTALL OUTPUT SHAFT INTO REAR PLANETARY GEAR ASSEMBLY

Valve Body

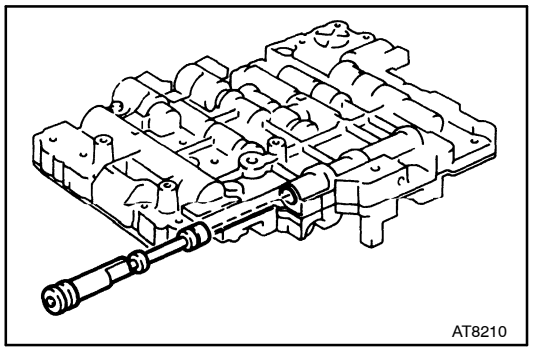
COMPONENTS



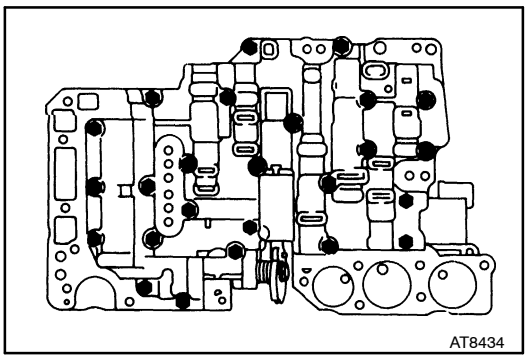


(Disassembly of Valve Body)

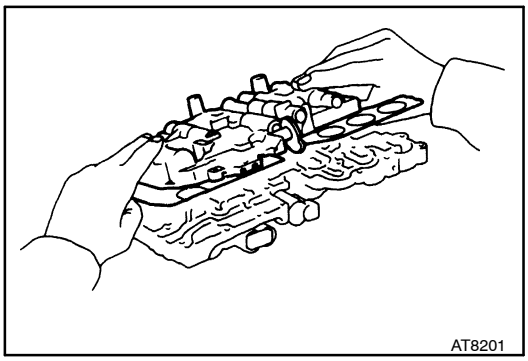
1. UNBOLT AND REMOVE DETENT SPRING



2. REMOVE MANUAL VALVE



3. TURN OVER ASSEMBLY AND REMOVE TWENTY–FIVE BOLTS

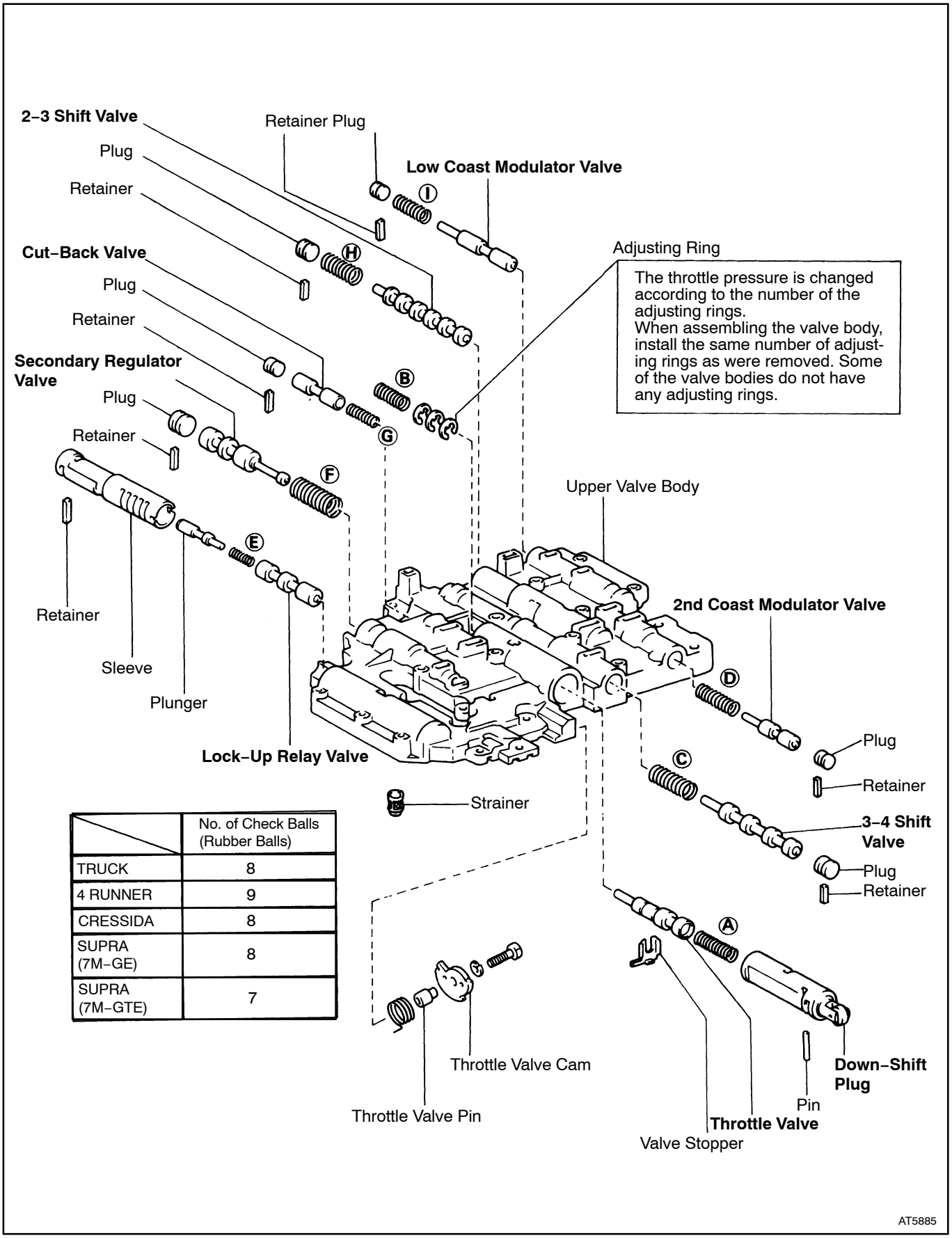


4. LIFT OFF UPPER VALVE BODY AND PLATE AS A SINGLE UNIT

Hold the valve body plate to the upper valve body.
HINT: Be careful that the check balls and strainer do not fall out.

(Upper Valve Body)

COMPONENTS



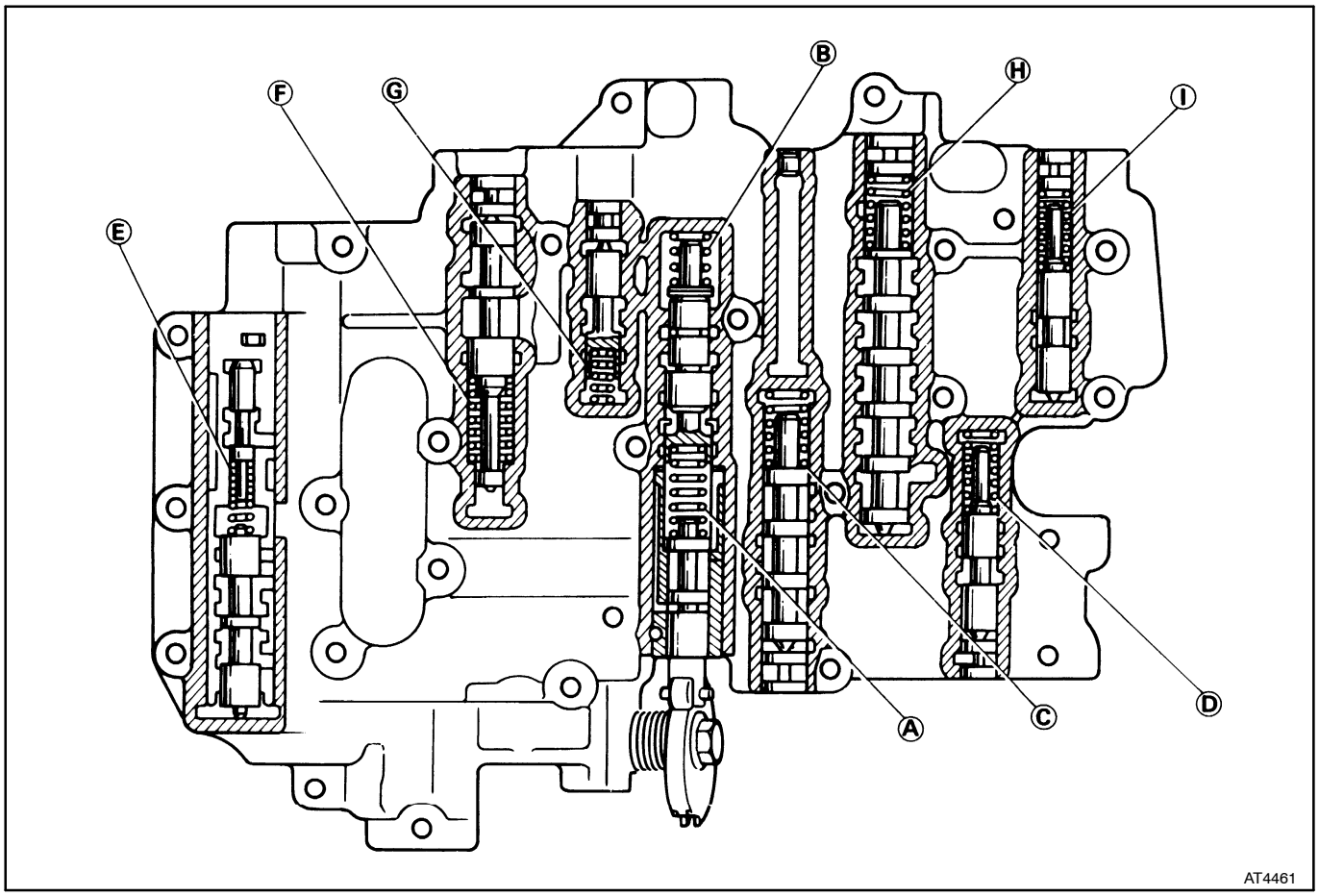
	No. of Check Balls (Rubber Balls)
TRUCK	8
4 RUNNER	9
CRESSIDA	8
SUPRA (7M–GE)	8
SUPRA (7M–GTE)	7

SPECIFICATIONS OF VALVE BODY SPRING

Spring		Free length mm (in.)	Coil outer diameter mm (in.)	Total No. of coils	Color
Ⓐ	Down–shift Plug	27.3 (1.075)	8.7 (0.343)	12.5	Yellow
Ⓑ	Throttle valve	20.6 or 23.3 (0.811) (0.917)	9.2 (0.362) 9.2 (0.362)	9.5 9.5	Blue White
Ⓒ	3–4 shift valve	30.8 (1.213)	9.7 (0.382)	10.5	Purple
Ⓓ	Second coast modulator valve	CRESSIDA 24.6 (0.969) 7M–GTE 29.6 (1.165) OTHERS 25.3 (0.996)	8.3 (0.327) 8.3 (0.327) 8.6 (0.339)	9.0 12.5 11.5	Blue Red Orange
Ⓔ	Lock–up relay valve	21.4 (0.843)	5.5 (0.217)	17.5	Light Gray
Ⓕ	Secondary regulator valve	30.9 (1.217)	11.2 (0.441)	10.5	Blue
Ⓖ	Cut–back valve	21.8 (0.858)	6.0 (0.236)	13.5	Red
Ⓗ	2–3 Shift valve	30.8 (1.213)	9.7 (0.382)	10.5	Blue
Ⓘ	Low coast modulator valve	SUPRA 27.8 (1.094) CRESSIDA 26.4 (1.039) OTHERS 30.4 (1.197)	8.3 (0.327) 8.3 (0.327) 8.3 (0.327)	10.5 10.5 10.5	Pink Yellow Light Green

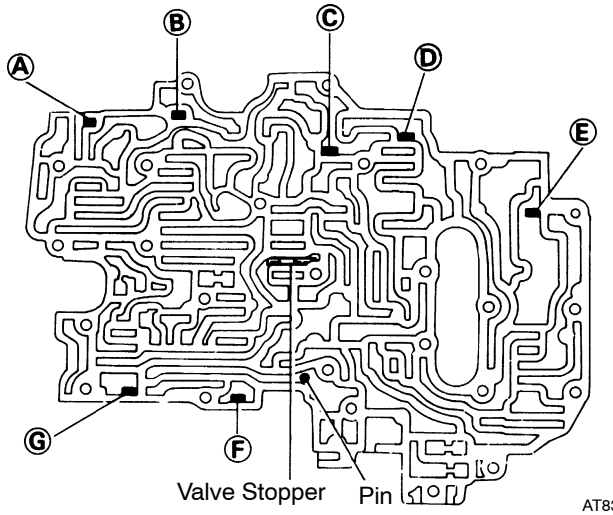
HINT: During reassembly please refer to the spring specifications above to help differentiate the different springs.

SECTIONAL VIEW OF VALVE BODY



LOCATION OF RETAINERS, PIN, STOPPER, CHECK BALLS AND STRAINER

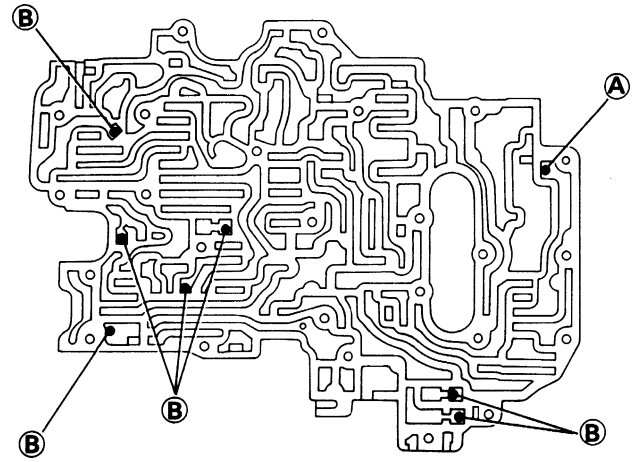
1. RETAINER, STOPPER AND PIN



mm (in.)

Retainer		Height	Width	Thickness
A	Low coast modulator valve	14.5 (0.571)	5.0 (0.197)	3.2 (0.126)
B	2–3 shift valve	14.0 (0.551)	5.0 (0.197)	3.2 (0.126)
C	Cut–back valve	15.0 (0.591)	5.0 (0.197)	3.2 (0.126)
D	Secondary regulator valve	14.0 (0.551)	5.0 (0.197)	3.2 (0.126)
E	Lock–up relay valve	21.2 (0.835)	5.0 (0.197)	3.2 (0.126)
F	3–4 shift valve	16.5 (0.650)	6.0 (0.236)	3.2 (0.126)
G	2nd coast modulator valve	16.5 (0.650)	6.0 (0.236)	3.2 (0.126)

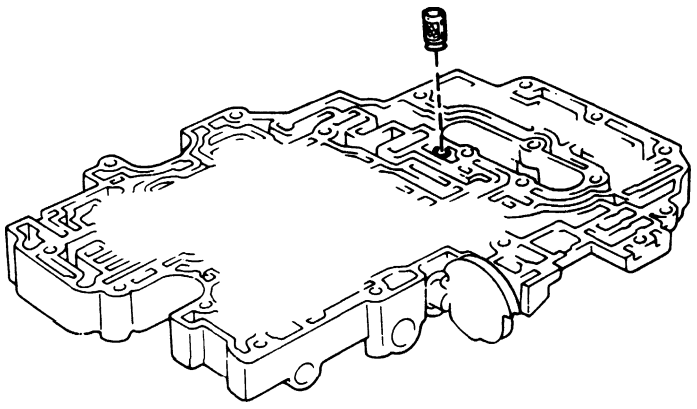
2. CHECK BALL

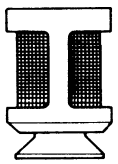


(Ex. 7M–GTE and CRESSIDA)

Check ball		Diameter mm (in.)
A	Rubber ball	6.35 (0.2500)
B	Rubber ball	5.54 (0.2181)

3. STRAINER

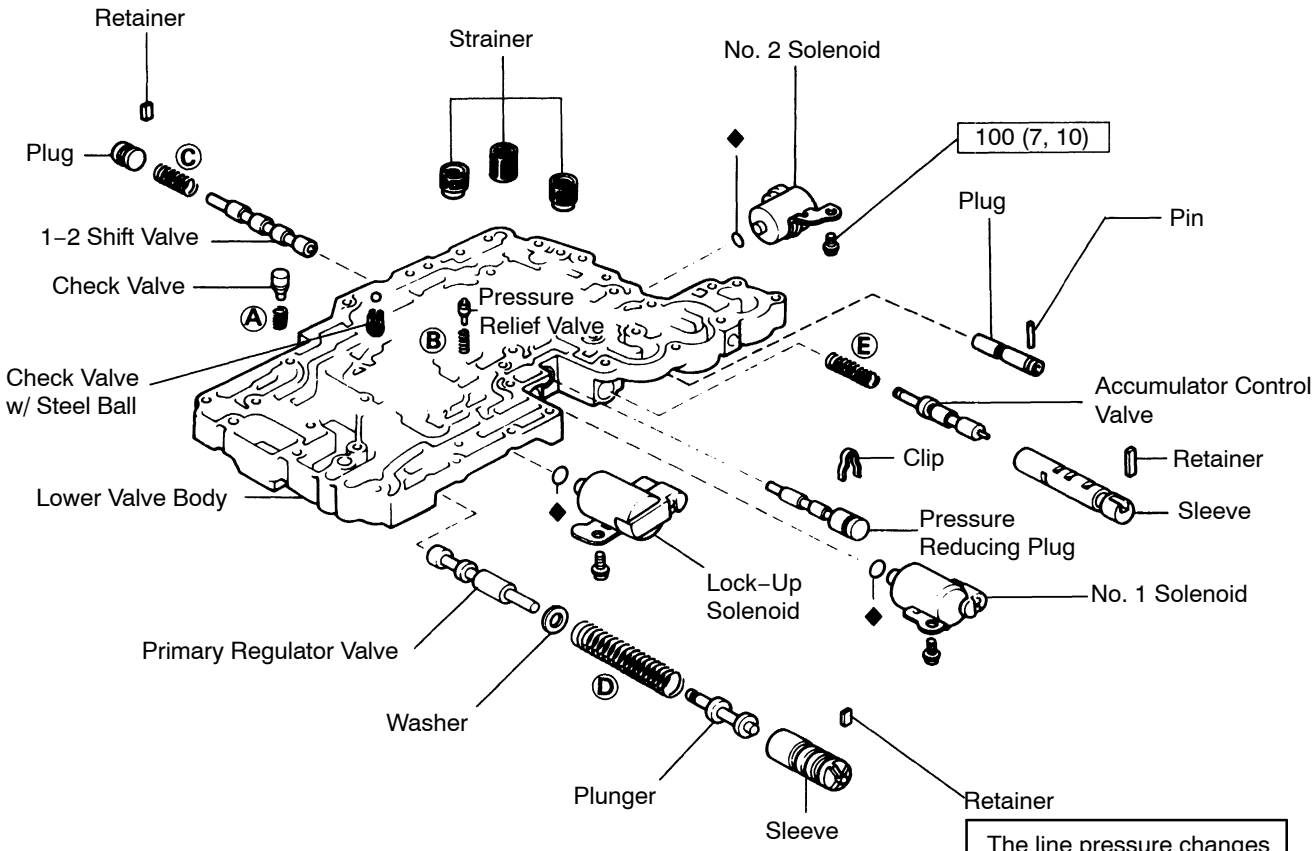




AT3243 AT4462

(Lower Valve Body)

COMPONENTS



kg–cm (ft–lb, N–m) : Specified torque

♦ Non–reusable part

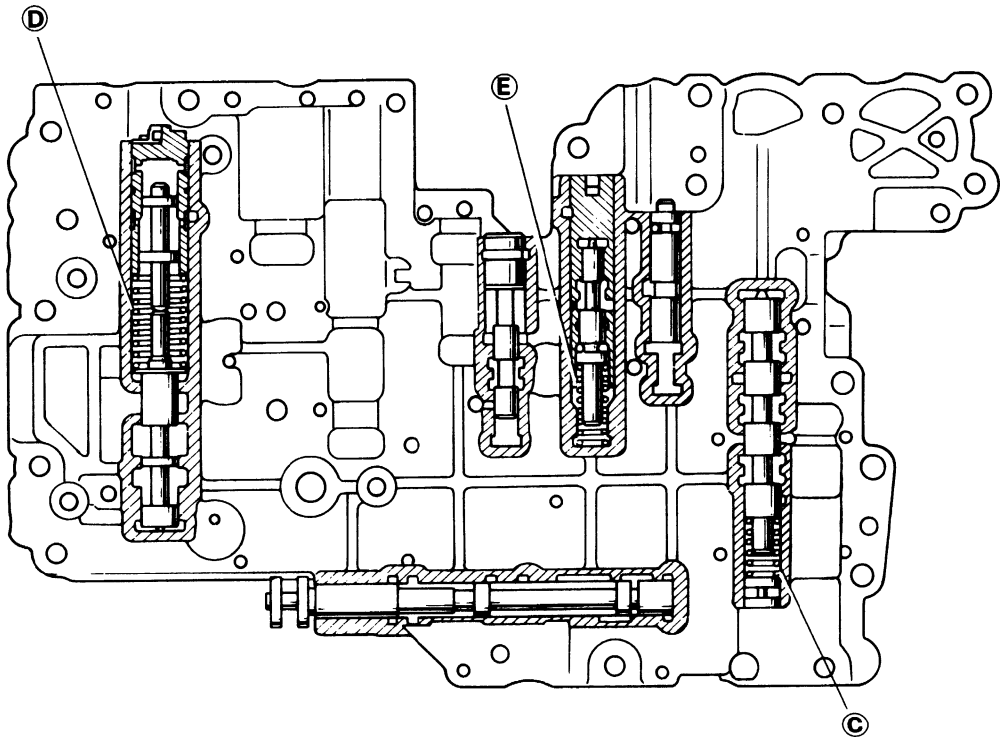
AT5886

SPECIFICATIONS OF VALVE BODY SPRINGS

Spring		Free length mm (in.)	Coil outer diameter mm (in.)	Total No. of coils	Color
Ⓐ	Check valve	20.2 (0.796)	12.1 (0.476)	6.5	None
Ⓑ	Pressure relief valve	11.2 (0.441)	6.4 (0.252)	7.5	None
Ⓒ	1–2 shift valve	30.8 (1.213)	9.7 (0.382)	10.5	Purple
Ⓓ	Primary regulator valve	TRUCK, 4RUNNER (3VZ–E) SUPRA (7M–GTE) 62.3 (2.453)	18.6 (0.732)	12.5	None
		TRUCK, 4RUNNER (22R–E) CRESSIDA 66.7 (2.626)	18.6 (0.732)	12.5	Purple
		OTHERS 66.7 (2.626)	18.6 (0.732)	12.5	None
Ⓔ	Accumulator control valve	CRESSIDA 36.1 (1.421)	8.9 (0.350)	14.0	White
		OTHERS 33.9 (1.335)	8.8 (0.346)	12.0	Pink

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

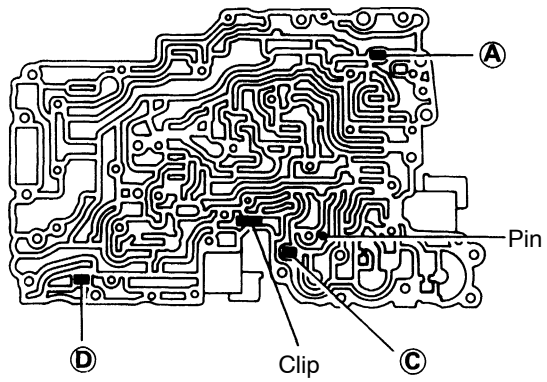
SECTIONAL VIEW OF VALVE BODY



AT5625

LOCATION OF RETAINERS, CLIP, CHECK BALLS, STRAINERS, SPRINGS AND VALVES

1. RETAINER AND CLIP

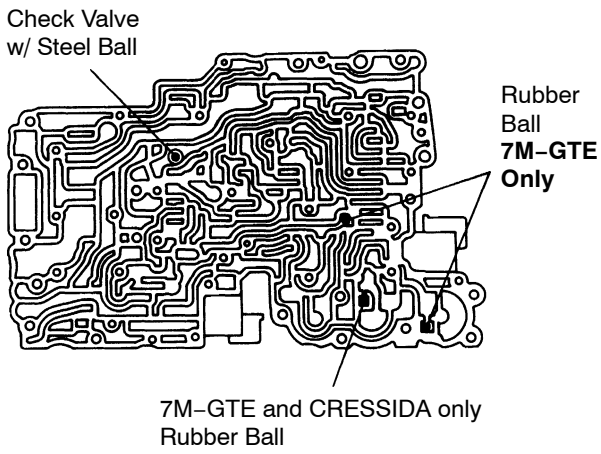


AT5626

mm (in.)

Retainer		Height	Width	Thickness
A	1–2 shift valve	16.5 (0.650)	6.0 (0.236)	3.2 (0.126)
B	Accumulator control valve	21.2 (0.835)	5.0 (0.197)	3.2 (0.126)
C	Primary regulator valve	16.2 (0.638)	5.0 (0.197)	3.2 (0.126)

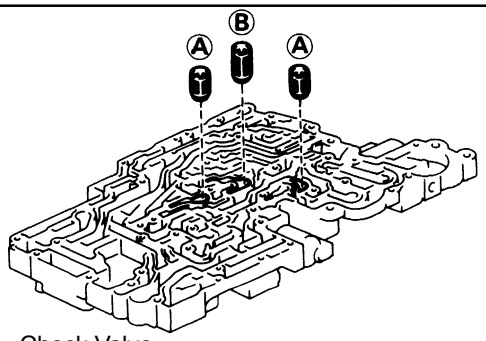
2. CHECK BALL



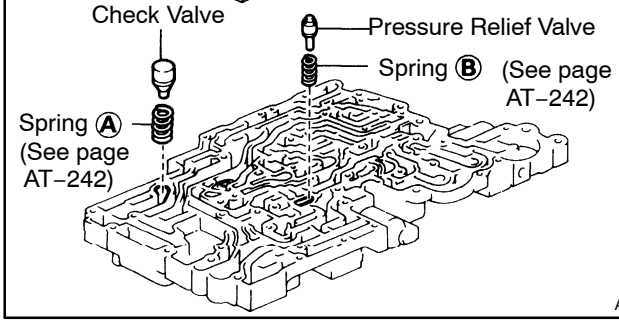
AT2346

Check ball	Diameter mm (in.)
Rubber ball	5.54 (0.2181)
Steel ball	6.35 (0.2500)

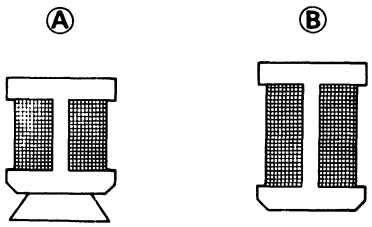
3. STRAINER, SPRING AND VALVE



D4908



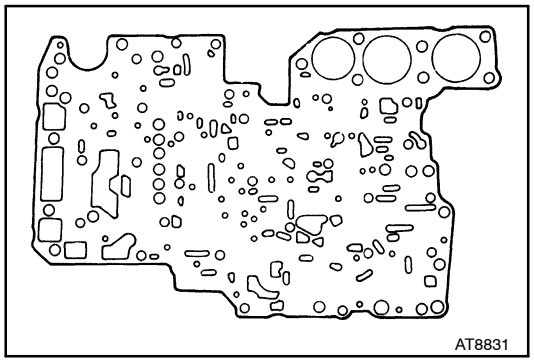
AT3296



AT5887

mm (in.)

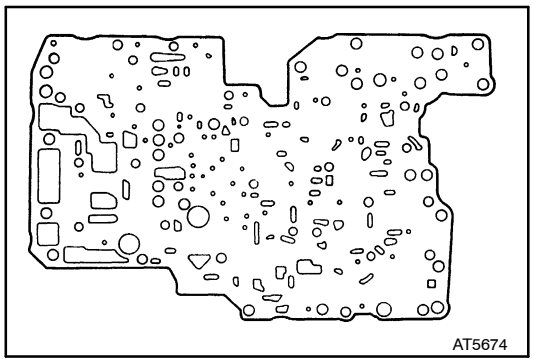
Strainer		Height	Diameter
A	Solenoid oil strainer	12.4 (0.448)	10.3 (0.406)
B	Throttle oil strainer	19.5 (0.768)	10.3 (0.406)



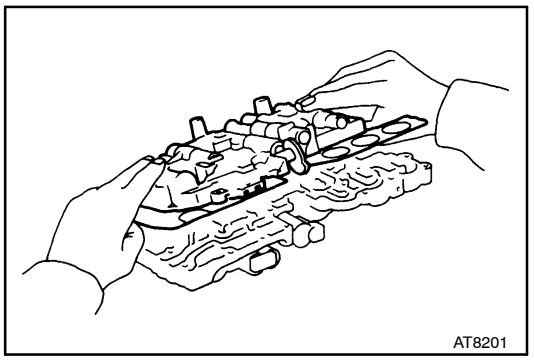
(Assembly of Valve Body)

(See page AT–92)

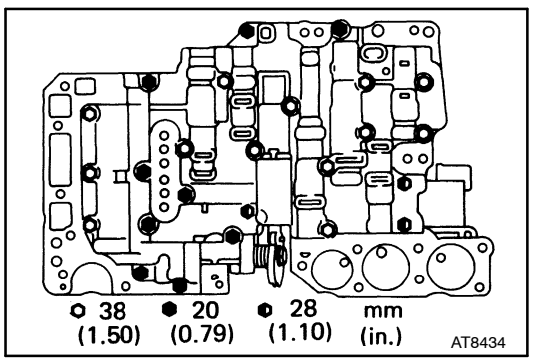
1. **POSITION NEW NO. 1 GASKET ON UPPER VALVE BODY**
   Align a new No. 1 gasket at each bolt hole.
2. **POSITION VALVE BODY PLATE ON NO. 1 GASKET**
   Align the plate at each bolt hole.



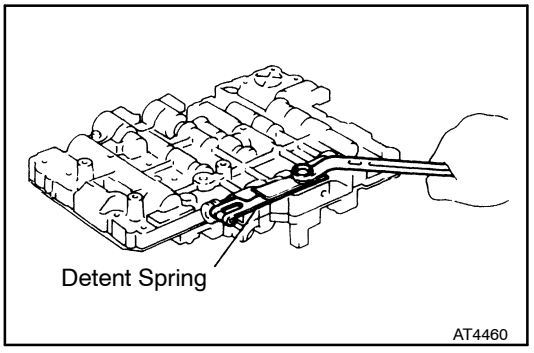
3. **POSITION NEW NO. 2 GASKET ON PLATE**
   Align a new No. 2 gasket at each bolt hole.



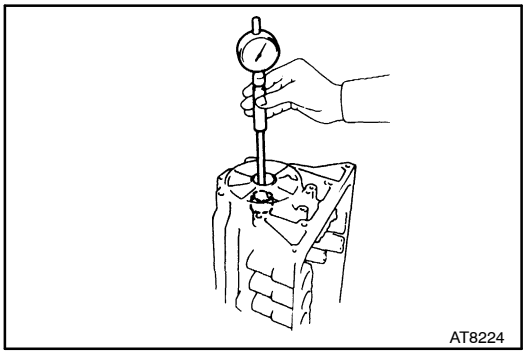
4. **PLACE UPPER VALVE BODY WITH PLATE AND GASKETS ON TOP OF LOWER VALVE BODY**
   Align each bolt hole and gasket in the valve body.



5. **INSTALL THE TWENTY–FIVE BOLTS TO UPPER VALVE BODY**
   HINT: Each bolt length (mm, in.) is indicated in the figure.
   Torque: 65 kg–cm (56 in.–lb, 6.4 N–m)



6. **INSTALL MANUAL VALVE**
7. **INSTALL DETENT SPRING**
   Torque: 100 kg–cm (7 ft–lb, 10 N–m)
8. **MAKE SURE MANUAL VALVE MOVES SMOOTHLY**



Transmission Case

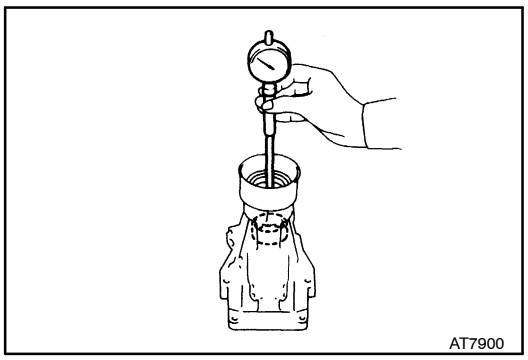
INSPECTION OF TRANSMISSION CASE

INSPECT TRANSMISSION CASE BUSHING

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

Maximum inside diameter: 38.19 mm (1.5035 in.)

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



Extension Housing

INSPECTION OF EXTENSION HOUSING

INSPECT EXTENSION HOUSING BUSHING

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

Maximum inside diameter: 40.09 mm (1.5783 in.)

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

INSTALLATION OF COMPONENT PARTS (A340E)

(See pages AT–25 to AT–28)

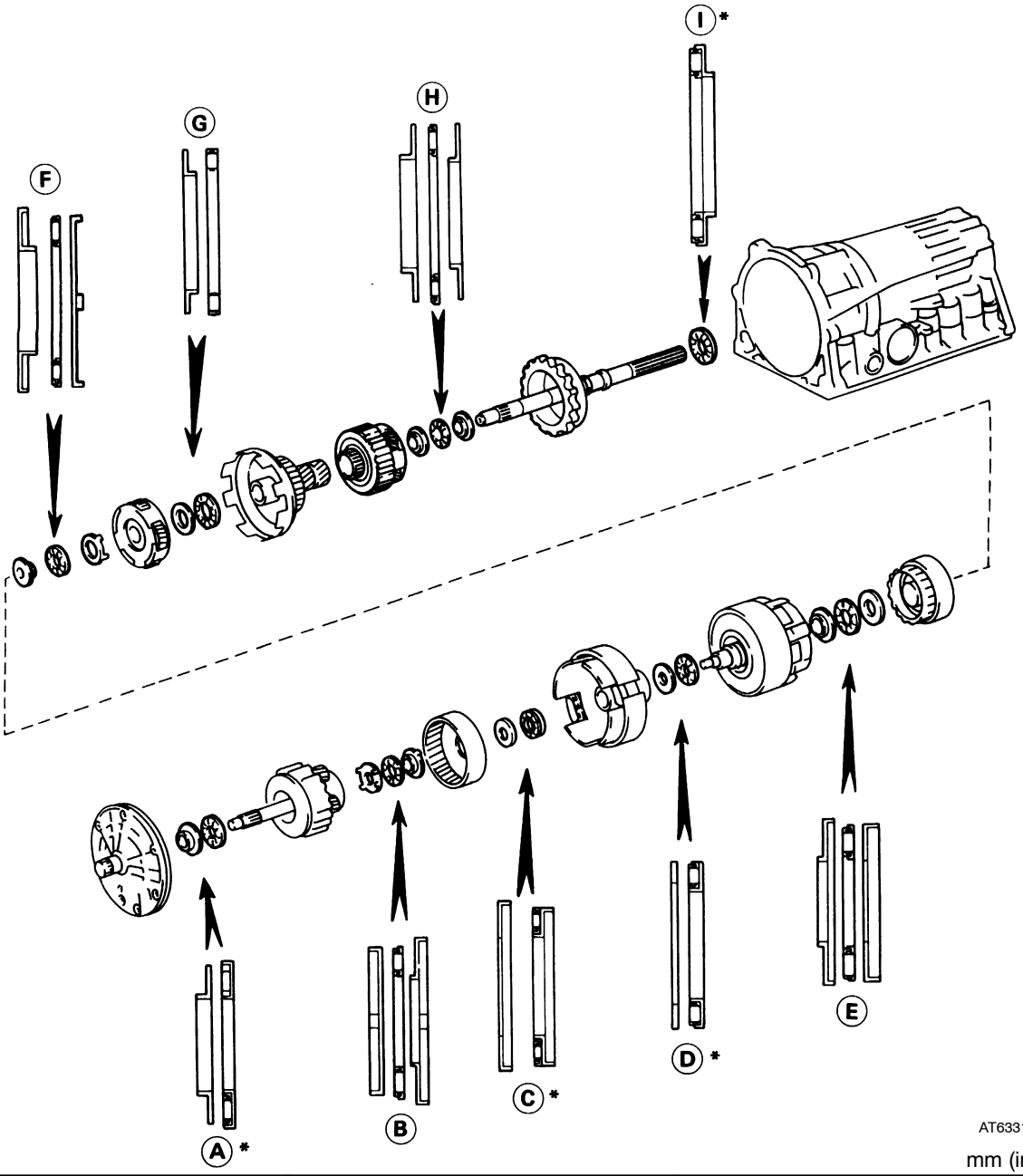
Disassembly, inspection and assembly of each component group have been indicated in the preceding chapter. Before assembly, make sure again that all component groups are assembled correctly.
If something wrong is found in a certain component group during assembly, inspect and repair this group immediately.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

GENERAL NOTES:

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

INSTALLATION POSITION AND DIRECTION OF BEARINGS AND RACES

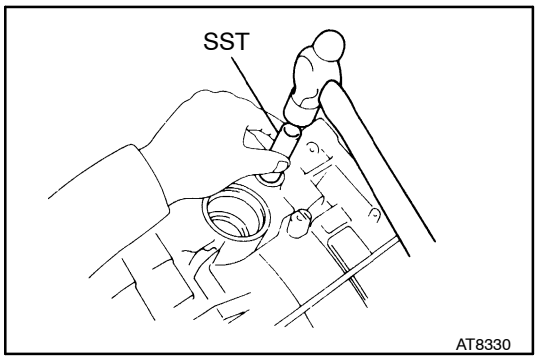
* Assembled type bearing and race



AT6331

mm (in.)

	Front Bearing Race		Thrust Bearing		Rear Bearing Race	
	Inner Diameter	Outer Diameter	Inner Diameter	Outer Diameter	Inner Diameter	Outer Diameter
A	28.1 (1.106)	47.3 (1.862)	28.9 (1.138)	50.2 (1.976)	—	—
B	27.1 (1.067)	41.8 (1.646)	26.0 (1.024)	46.8 (1.843)	24.2 (0.953)	47.8 (1.882)
C	SUPRA 37.2 (1.465) Others 37.1 (1.461)	58.8 (2.315) 59.0 (2.323)	33.7 (1.327) 33.6 (1.323)	51.1 (2.012) 50.3 (1.980)	— —	— —
D	36.8 (1.449)	50.9 (2.004)	33.7 (1.327)	47.6 (1.874)	—	—
E	26.0 (1.024)	48.9 (1.925)	26.0 (1.024)	46.7 (1.839)	26.8 (1.055)	47.0 (1.850)
F	30.6 (1.205)	53.6 (2.110)	32.6 (1.283)	47.7 (1.878)	34.3 (1.350)	47.0 (1.850)
G	33.7 (1.327)	47.6 (1.874)	35.5 (1.398)	47.7 (1.878)	—	—
H	28.8 (1.134)	44.8 (1.764)	30.1 (1.185)	44.7 (1.760)	27.8 (1.094)	44.8 (1.764)
I	—	—	39.2 (1.543)	57.7 (2.272)	—	—

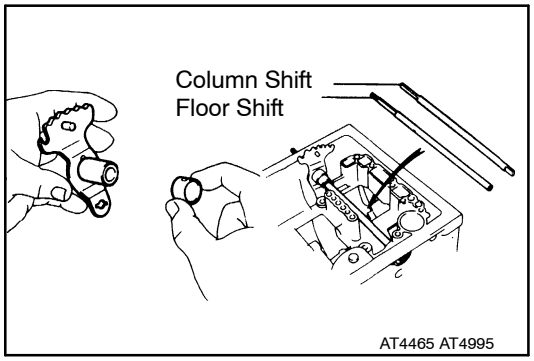


1. INSTALL MANUAL VALVE LEVER, SHAFT AND OIL SEALS

(a) Using SST, drive in two oil seals.

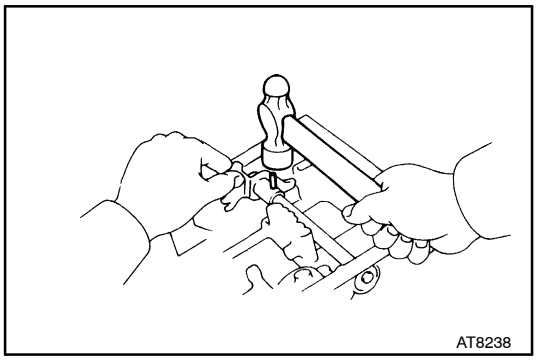
SST 09350–30020 (09350–07110)

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

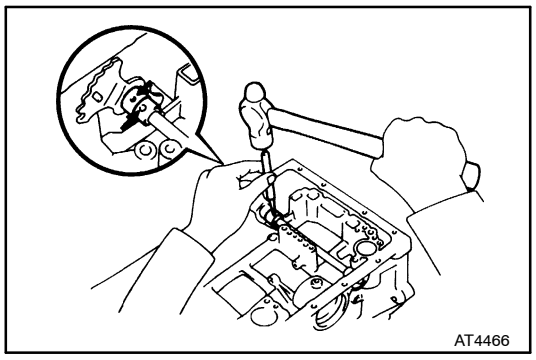


(c) Assemble a new spacer to the manual valve lever.

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

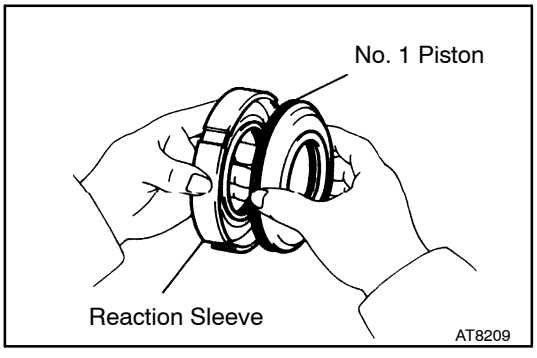


(e) Drive in the pin to the shaft.



(f) Match the spacer hole to the lever calking hollow and calk the spacer to the lever.

(g) Make sure the manual valve lever shaft turns smoothly.



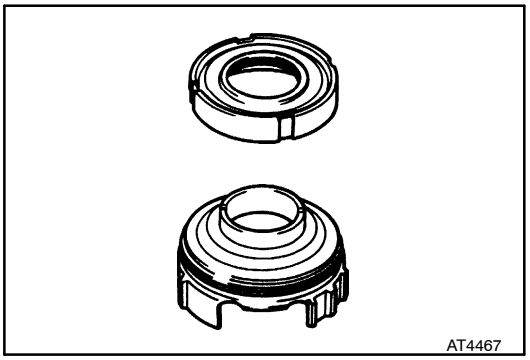
2. INSTALL COMPONENTS OF FIRST AND REVERSE BRAKE PISTON

(a) Coat three new O–rings with ATF.

(b) Install the two O–rings on No. 1 piston.

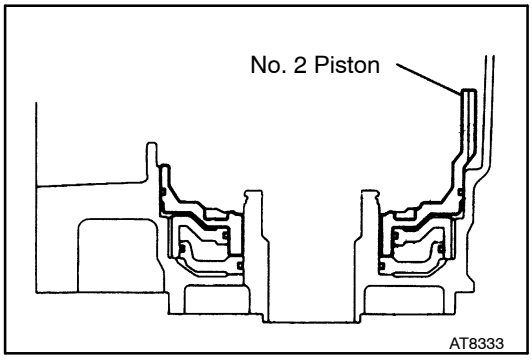
(c) Install the O–ring on the reaction sleeve.

(d) Install the No. 1 piston to the reaction sleeve.



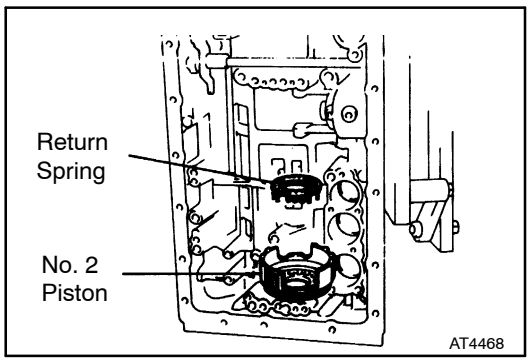
(e) Coat a new O–ring with ATF and install it on No. 2 piston.

(f) Install No. 1 piston with the reaction sleeve onto No. 2 piston.

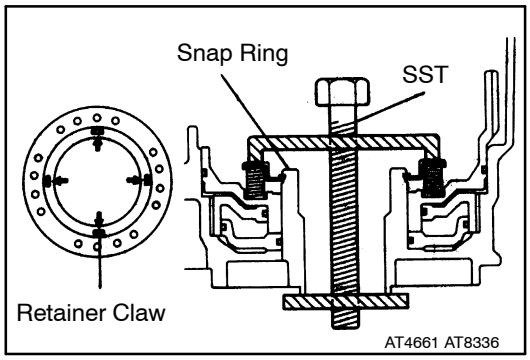


(g) Align the teeth of No. 2 piston into the proper grooves.

(h) Being careful not to damage the O–rings, press in No. 2 and No. 1 first and reverse brake pistons into the transmission case.



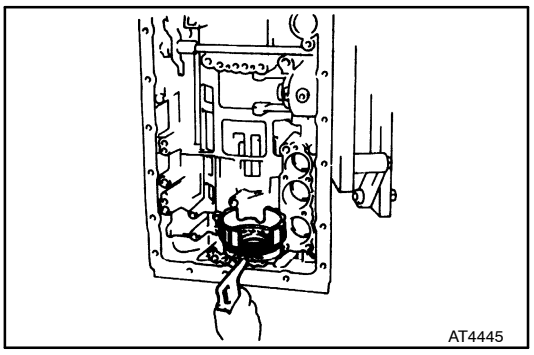
(i) Place the piston return spring onto No. 2 piston.



(j) Set SST as shown, and compress the return–spring with SST.

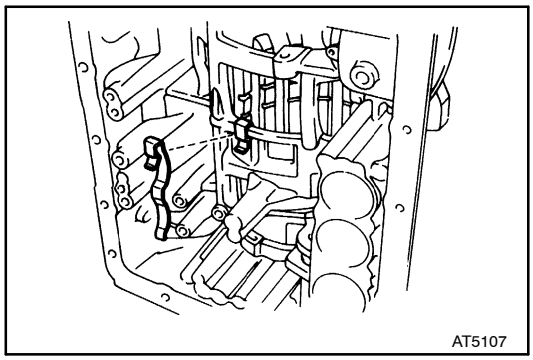
SST 09350–30020 (09350–07050)

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

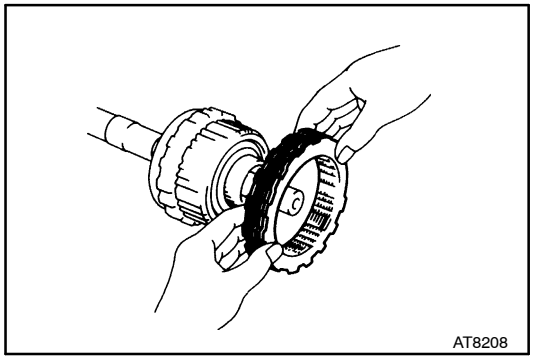


3. CHECK FIRST AND REVERSE BRAKE PISTONS MOVING

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



4. INSTALL LEAF SPRING



5. INSTALL REAR PLANETARY GEAR UNIT WITH SECOND BRAKE DRUM, FIRST AND REVERSE BRAKE PACK AND OUTPUT SHAFT

(a) Reinstall the original flange, the rounded edge facing forward.

(b) Install the plates and discs.

Install in order: P = Plate D = Disc

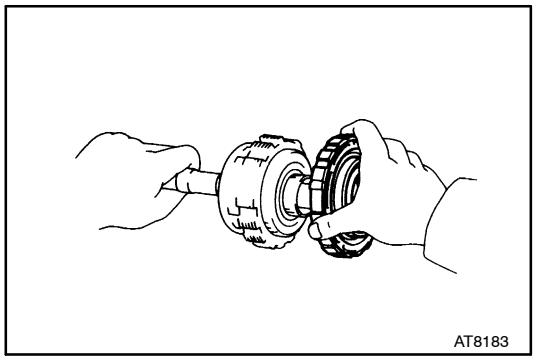
(7M–GTE)

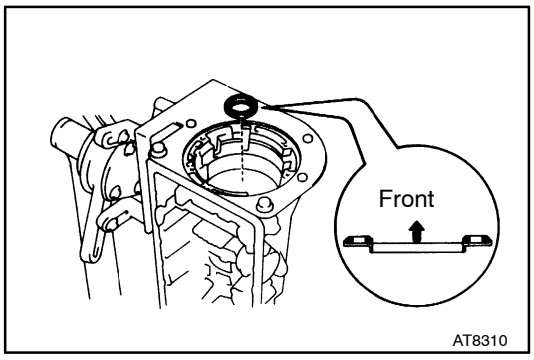
D–P–D–P–D–P–D–P–D–P–D–P–D–P

(Others)

D–P–D–P–D–P–D–P–D–P–D–P

(c) Install the second brake drum assembly.



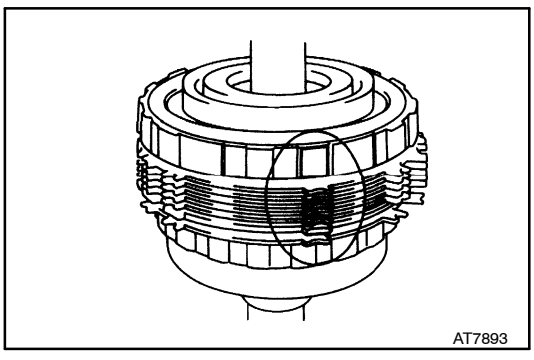


(d) Coat the assembled bearing and race with petroleum jelly and install it onto the case.

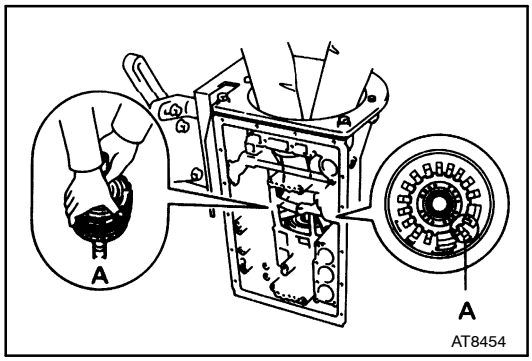
HINT: Assembled bearing and race diameter

mm (in.)

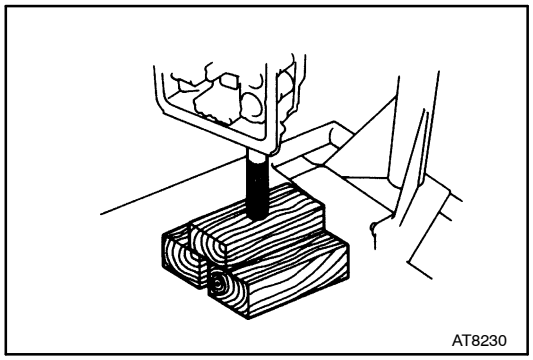
	Inside	Outside
Bearing and race	39.2 (1.543)	57.7 (2.272)



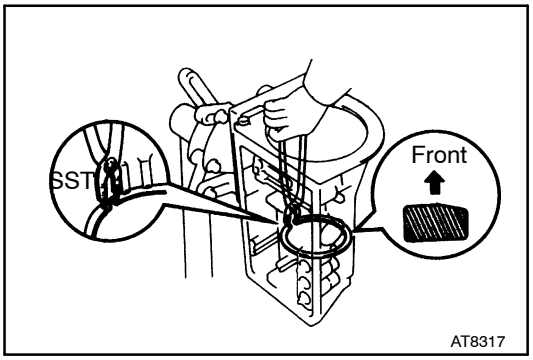
(e) Align the teeth of the second brake drum, flange, discs and plates as shown in the figure.



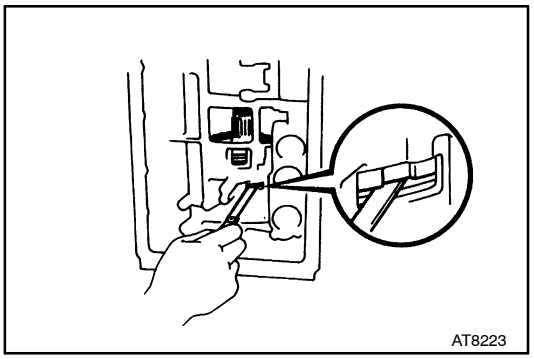
(f) Align the splines of the transmission case and the assembled rear planetary gear, second brake drum, first and reverse brake pack and output shaft, indicated by A.



(g) Hold the output shaft with wooden blocks.



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



6. CHECK PACK CLEARANCE OF FIRST AID REVERSE BRAKE

Using a thickness gauge, measure the clearance between the plate and second brake drum as shown in the figure.

Clearance:

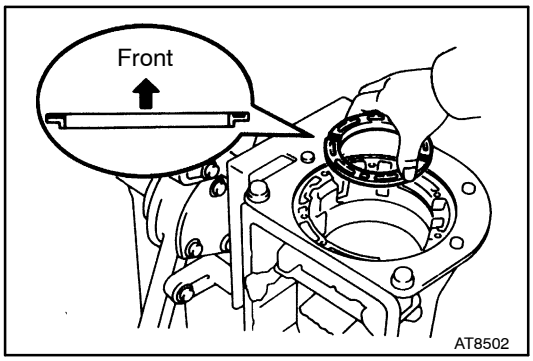
(7M–GTE)
0.70 – 1.22 mm (0.0276 – 0.0480 in.)
(Others)
0.60 – 1.12 mm (0.0236 – 0.0441 in.)

If the values are nonstandard, select another flange.

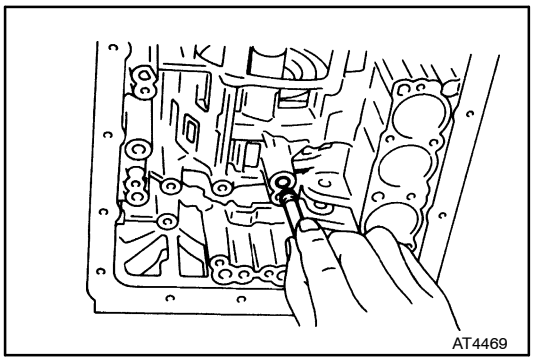
HINT: There are six different thicknesses for the flange.

mm (in.)

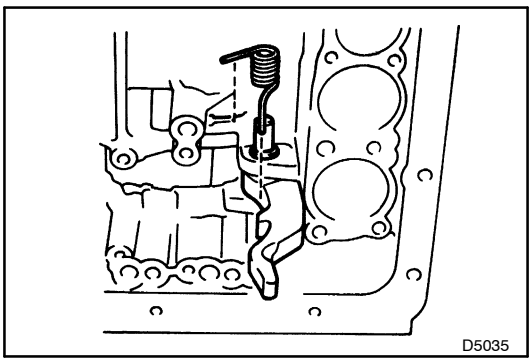
No.	Thickness	No.	Thickness
50	5.0 (0.197)	53	4.4 (0.173)
51	4.8 (0.189)	54	4.2 (0.165)
52	4.6 (0.181)	55	4.0 (0.157)



7. INSTALL SECOND BRAKE PISTON SLEEVE



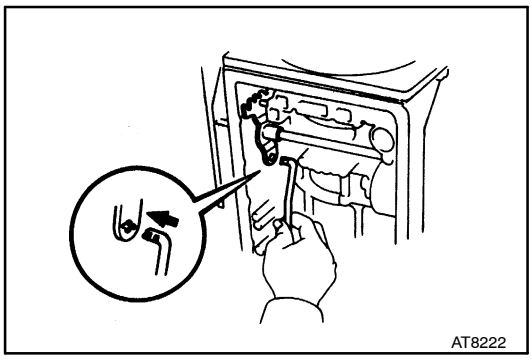
8. INSTALL NEW BRAKE GASKET



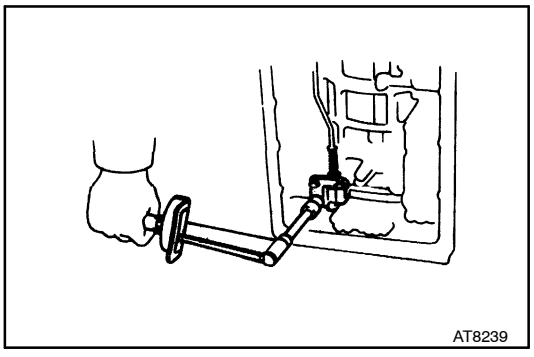
9. INSTALL PARKING LOCK PAWL AND ROD

(a) Install the E–ring to the shaft.

(b) Install the parking lock pawl, shaft and spring.

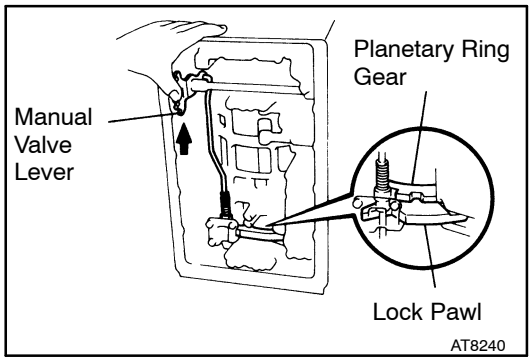


(c) Connect the parking lock rod to the manual valve lever.

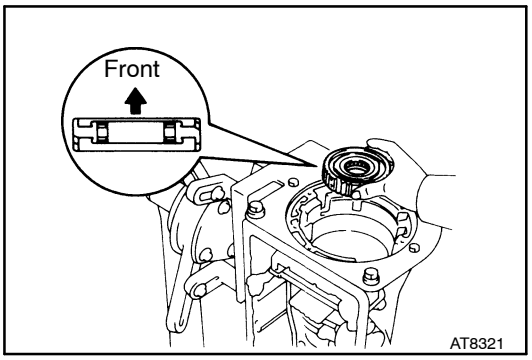


(d) Install the parking lock pawl bracket and torque the bolts.

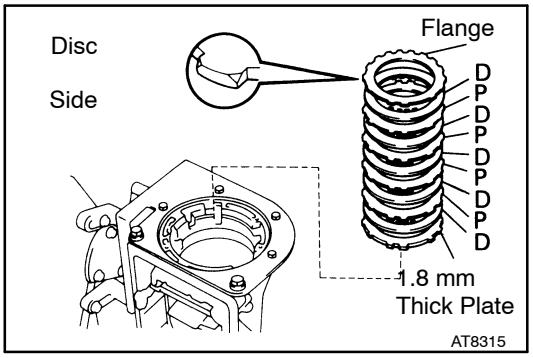
Torque: 75 kg–cm (65 in.–lb, 7.4 N–m)



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



10. INSTALL NO. 1 ONE–WAY CLUTCH



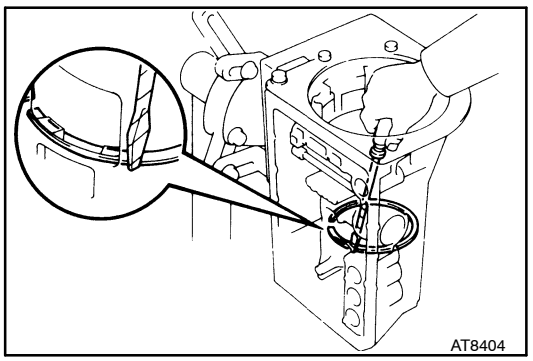
11. INSTALL FLANGE, PLATES AND DISCS OF SECOND BRAKE

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

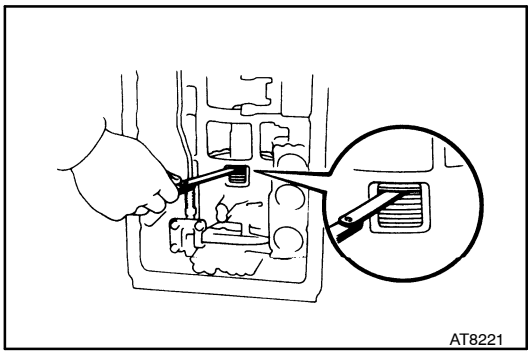
(b) Install the plates and discs.

Install in order: P = Plate, D = Disc
P–D–P–D–P–D–P–D–P–D

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

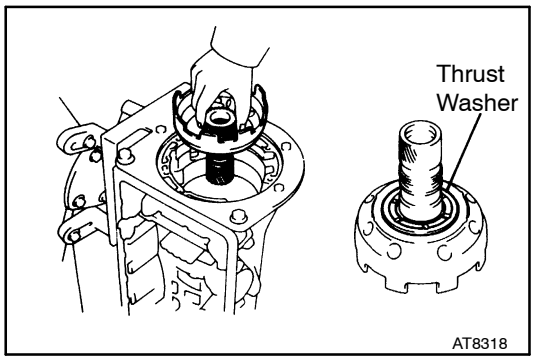


(d) Install snap ring.



12. CHECK PACK CLEARANCE OF SECOND BRAKE

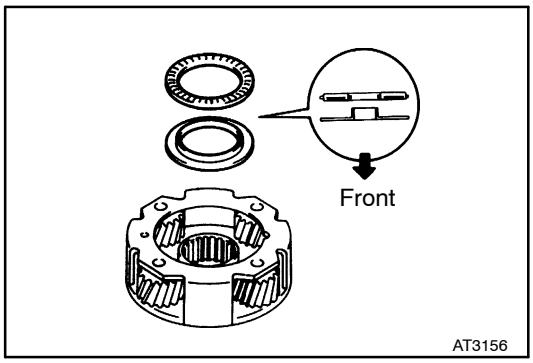
Using a thickness gauge, measure the clearance between the snap ring and flange as shown in the figure.
Clearance: 0.62 – 1.98 mm (0.0244 – 0.0780 in.)
If the values are nonstandard, check for an improper installation.



13. INSTALL PLANETARY SUN GEAR

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

HINT: Confirm that the thrust washer is installed correctly.



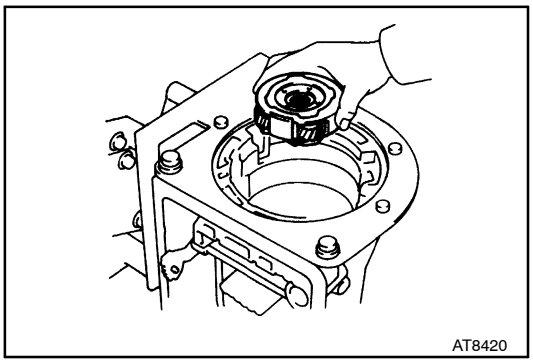
14. INSTALL FRONT PLANETARY GEAR

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

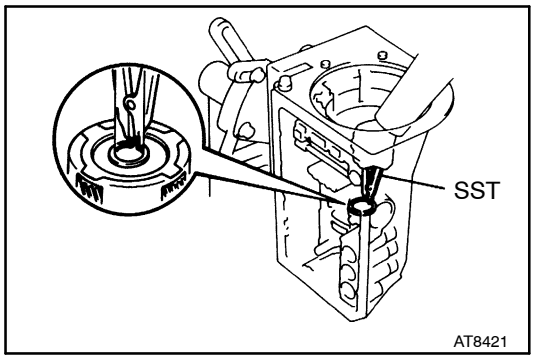
HINT: Bearing and race diameter

mm (in.)

	Inside	Outside
Bearing	35.5 (1.398)	47.7 (1.878)
Race	33.7 (1.327)	47.6 (1.874)



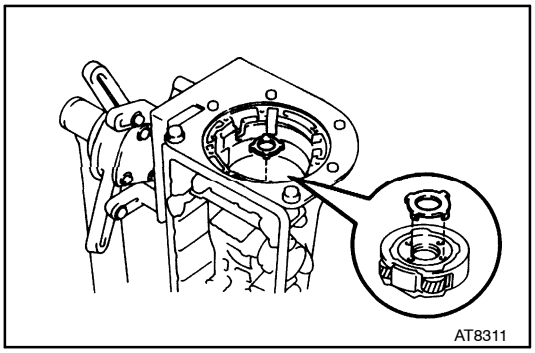
(b) Install the front planetary gear to the sun gear.



(c) Using SST, install the snap ring.

SST 09350–30020 (09350–07070)

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

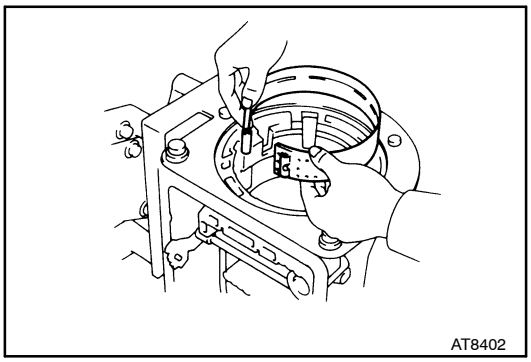


(e) Coat the bearing race with petroleum jelly and install it onto the front planetary gear.

HINT: Race diameter

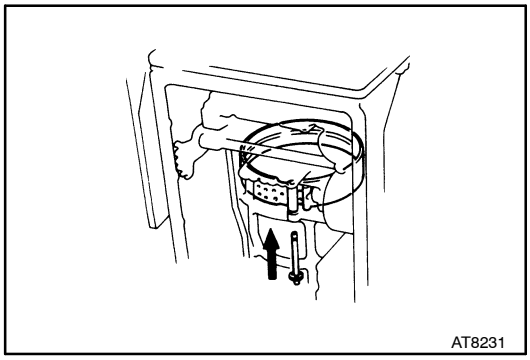
mm (in.)

	Inside	Outside
Race	34.3 (1.350)	47.8 (1.882)

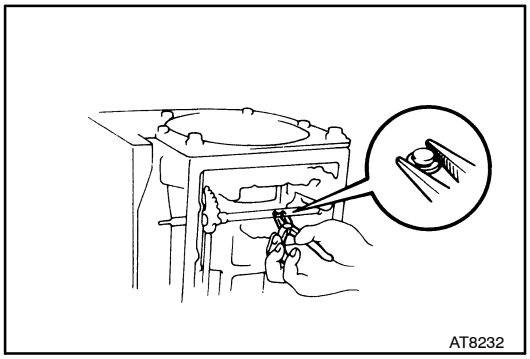


15. INSTALL SECOND COAST BRAKE BAND

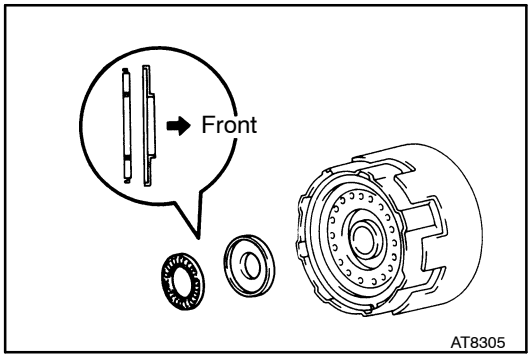
(a) Install the second coast brake band to the case.



(b) Install the pin through the brake band.



(c) Install the E–ring to the pin.



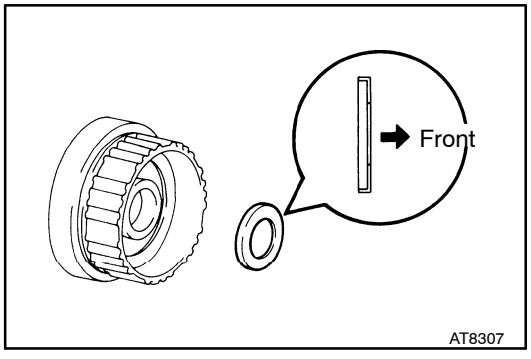
16. INSTALL FRONT PLANETARY RING GEAR TO FORWARD AND DIRECT CLUTCH

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

HINT: Bearing and race diameter

mm (in.)

	Inside	Outside
Bearing	26.0 (1.024)	46.7 (1.839)
Race	26.0 (1.024)	48.9 (1.925)

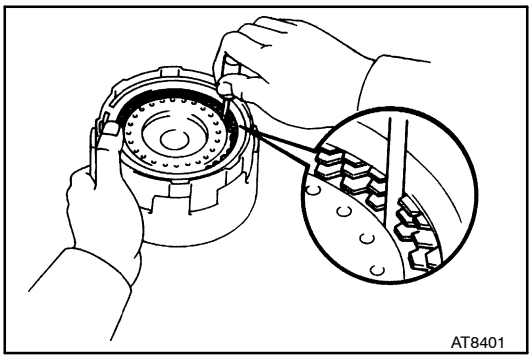


(b) Coat the race with petroleum jelly and install it onto the front planetary ring gear.

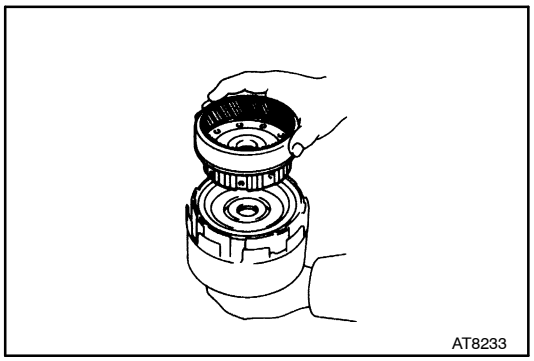
HINT: Race diameter

mm (in.)

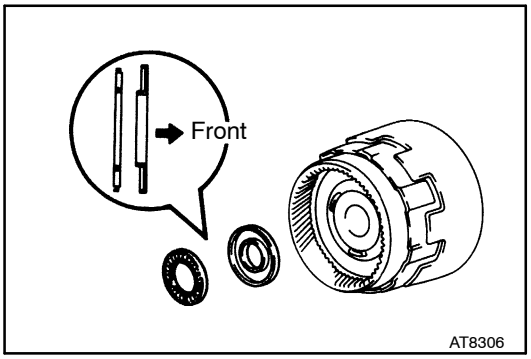
	Inside	Outside
Race	26.8 (1.055)	47.0 (1.850)



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



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



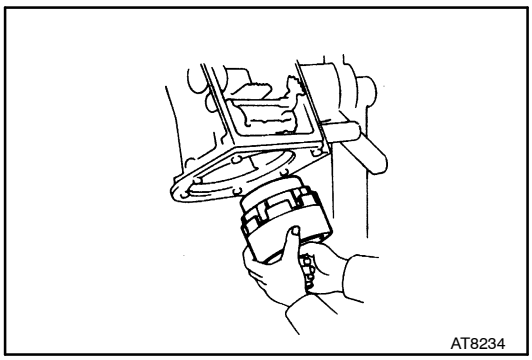
17. INSTALL ASSEMBLED DIRECT CLUTCH, FORWARD CLUTCH AND FRONT PLANETARY RING GEAR INTO CASE

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

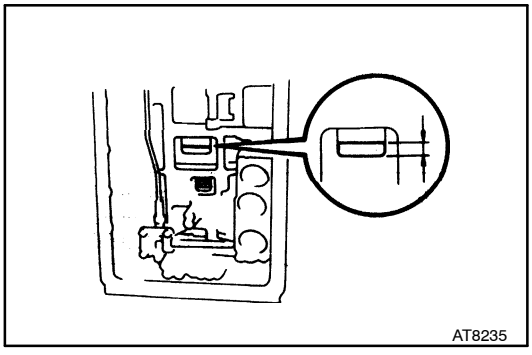
HINT: Bearing and race diameter

mm (in.)

	Inside	Outside
Bearing	32.6 (1.283)	47.7 (1.878)
Race	30.6 (1.205)	53.6 (2.110)



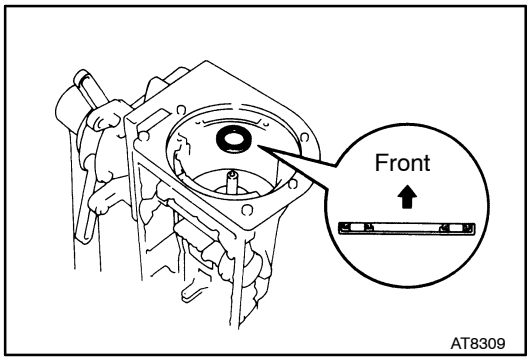
(b) Install the assembled direct clutch, forward clutch and front planetary ring gear into the transmission case.



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

Height: 9.8 – 11.8 mm (0.386 – 0.465 in.)

If the values are nonstandard, check for an improper installation.

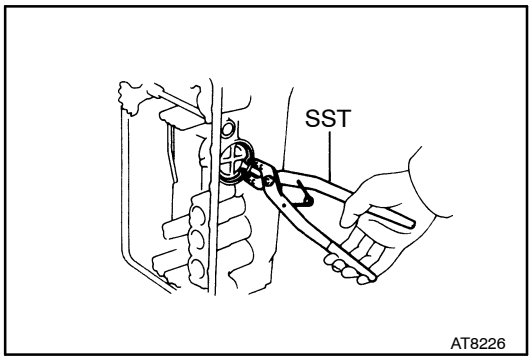


(d) Coat the assembled bearing and race with petroleum jelly and install it onto the forward clutch.

HINT: Assembled bearing and race diameter

mm (in.)

	Inside	Outside
Bearing and race	33.7 (1.327)	47.6 (1.874)



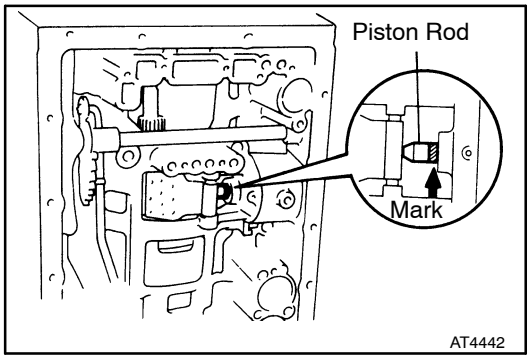
18. INSTALL SECOND COAST BRAKE COVER, PISTON ASSEMBLY AND SPRING

(a) Coat two new O–rings with ATF and intall them to the cover.

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

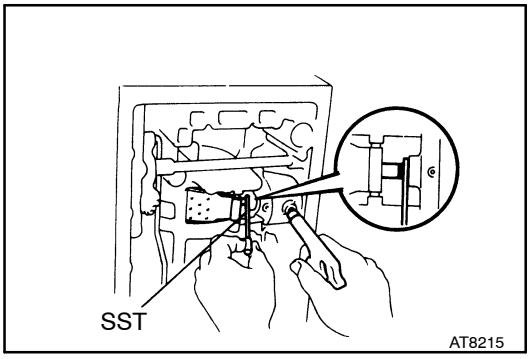
(c) Using SST, install the snap ring.

SST 09350–30020 (09350–07060)



19. CHECK PISTON ROD STROKE OF SECOND COAST BRAKE

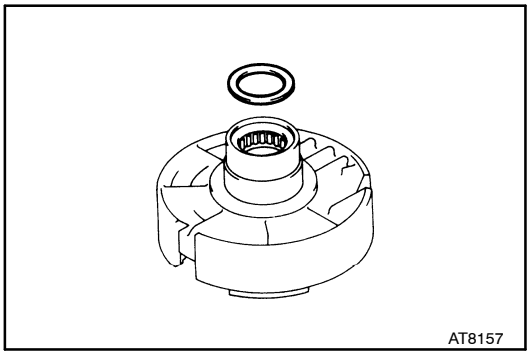
(a) Place a mark on the second coast brake piston rod as shown in the figure.



(b) Using SST, measure the stroke applying the compressed air (4 – 8 kg/cm^2, 57 – 114 psi or 392 – 785 kPa) as shown in the figure.

SST 09240–00020

Piston rod stroke: 1.5 – 3.0 mm (0.059 – 0.118 in.)



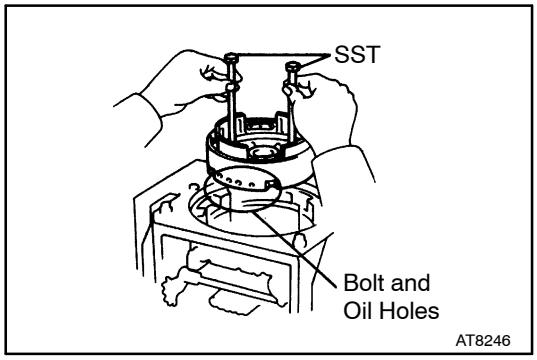
20. INSTALL OVERDRIVE SUPPORT ASSEMBLY

(a) Coat the race with petroleum jelly and install it onto the overdrive support assembly.

HINT: Race diameter

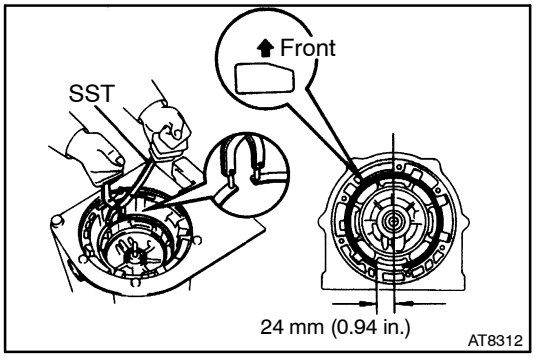
mm (in.)

	Inside	Outside
Race	36.8 (1.449)	50.9 (2.004)



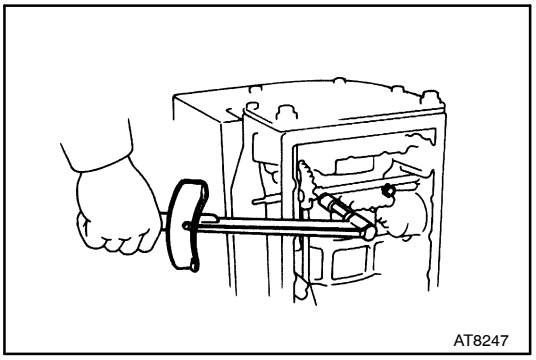
(b) Using two bolts of SST, aim the bolt and oil holes of the overdrive support toward the valve body side, and align them with the bolt holes of the transmission case and insert.

SST 09350–30020 (09350–07020)



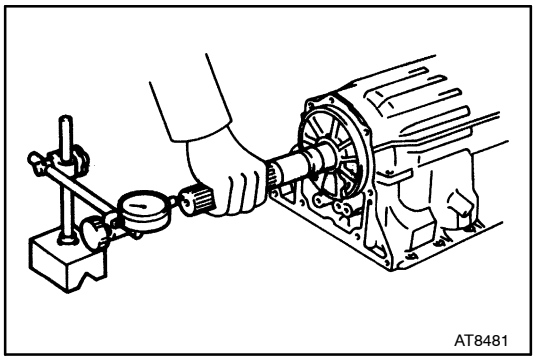
(c) Using SST, install the snap ring as shown in the figure.

SST 09350–30020 (09350–07060)



(d) Install and torque the two bolts.

Torque: 260 kg–cm (19 ft–lb, 25 N–m)



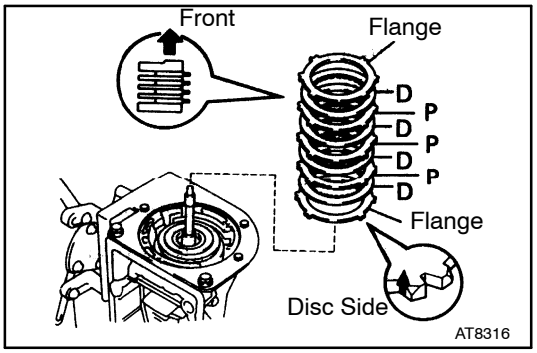
21. CHECK OUTPUT SHAFT

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

End play: 0.27 – 0.86 mm (0.0106 – 00339 in.)

If the values are nonstandard, check for an improper installation.

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



22. INSTALL FLANGES, PLATES AND DISCS OF OVER-DRIVE BRAKE

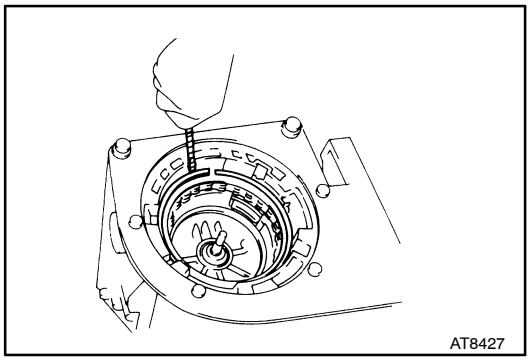
(a) Install the 4.0 mm (0.157 in.) thick flange (flat ring) with the rounded edge side of the flange facing the disc.

(b) Install the plates and discs.

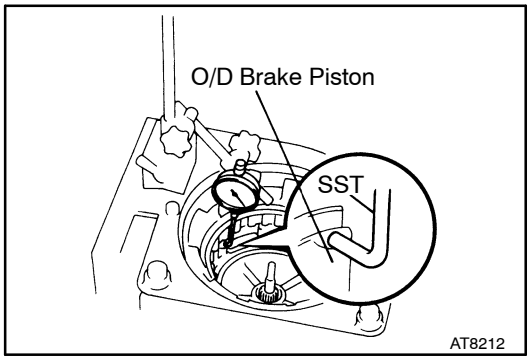
Install in order: P = Plate D = Disc

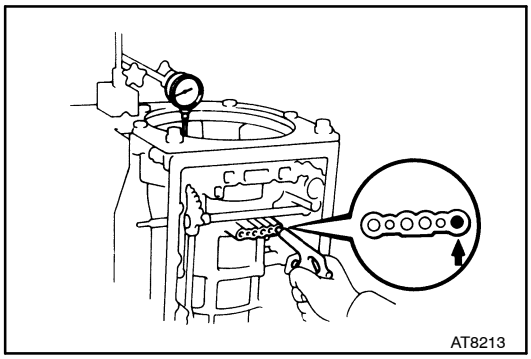
(7M–GTE)
D–P–D–P–D–P–D–P–D
(Others)
D–P–D–P–D–P–D

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



(d) Install the snap ring.





23. CHECK PISTON STROKE OF OVERDRIVE BRAKE

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

SST 09350–30020 (09350–06120)

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

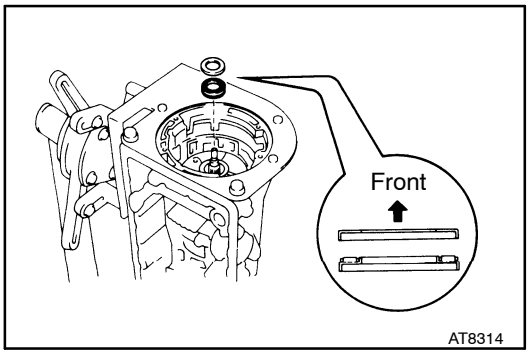
Piston stroke:

(7M–GTE)
1.75 – 2.05 mm (0.0689 – 0.0807 in.)
(Others)
1.40 – 1.70 mm (0.0551 – 0.0669 in.)

If the piston stroke is less than the limit, parts may have been assembled incorrectly, check and reassemble again.
If the piston stroke is nonstandard, select another flange.
HINT: There are seven different thicknesses for the flange.

Flange thickness mm (in.)

No.	Thickness	No.	Thickness
26	3.3 (0.130)	11	3.8 (0.150)
25	3.5 (0.138)	23	3.9 (0.154)
12	3.6 (0.142)	None	4.0 (0.157)
24	3.7 (0.146)		



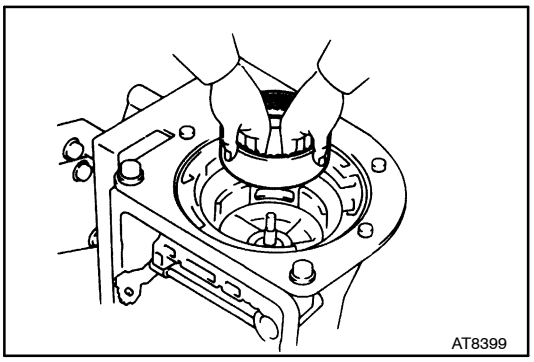
24. REMOVE FLANGE, PLATES AND DISCS OF OVERDRIVE BRAKE

(a) Remove the snap ring.

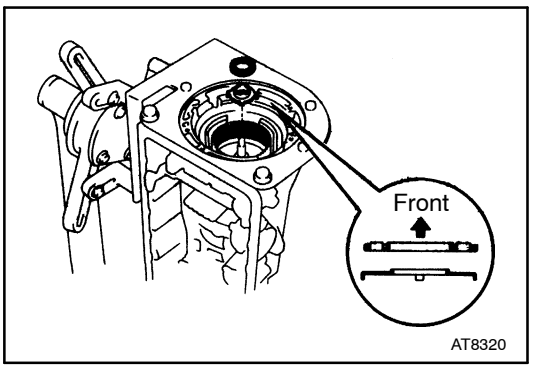
HINT: Bearing and race diameter

mm (in.)

	Inside	Outside
Bearing	33.6 (1.323)	50.3 (1.980)
Race	37.1 (1.461)	59.0 (2.323)



(b) Remove the flanges, plates and discs.

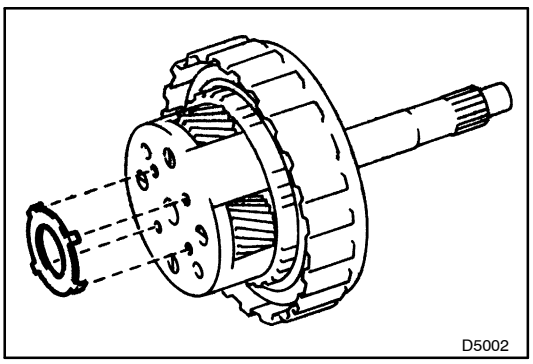


(c) Coat the bearing and race with petroleum jelly and install them onto the planetary ring gear.

HINT: Bearing and race diameter

mm (in.)

	Inside	Outside
Bearing	26.0 (1.024)	46.8 (1.843)
Race	24.2 (0.953)	47.8 (1.882)

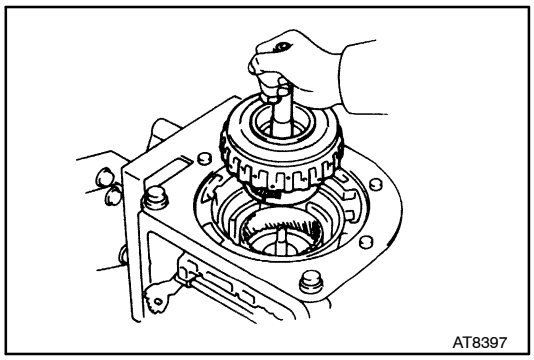


(d) Coat the race with petroleum jelly and install it onto the planetary ring gear.

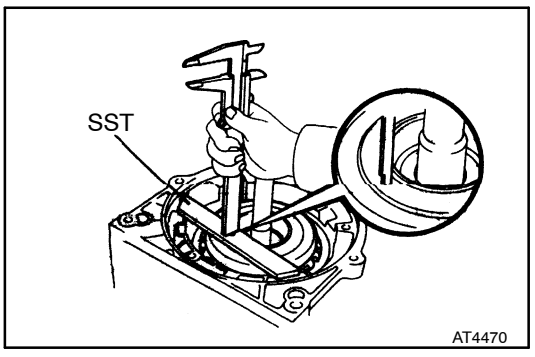
HINT: Race diameter

mm (in.)

	Inside	Outside
Race	27.1 (1.067)	41.8 (1.646)



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



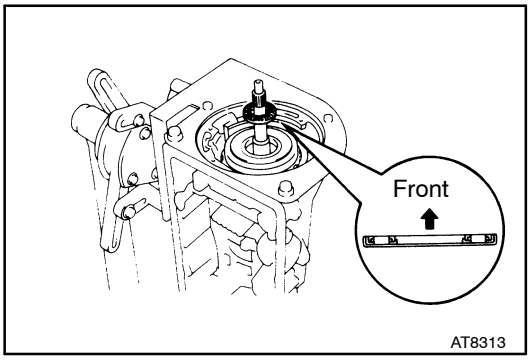
(f) Place SST on the transmission case.

SST 09350 – 36010 (09350 – 06090)

(g) Using calipers, measure distance between the tops of SST and the clutch drum.

Standard distance: 15.5 – 16.5 mm (0.610 – 0.650 in.)

If the values are nonstandard, check for an improper installation.

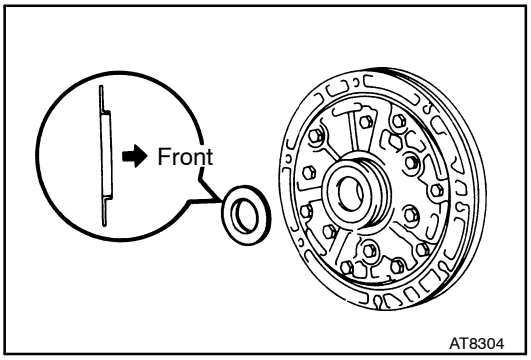


(h) Coat the assembled bearing and race with petroleum jelly and install it onto the O/D direct clutch.

HINT: Assembled bearing and race diameter

mm (in.)

	Inside	Outside
Bearing and race	28.9 (1.138)	50.2 (1.976)



25. INSTALL OIL PUMP INTO CASE

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

HINT: Race diameter

mm (in.)

	Inside	Outside
Race	28.1 (1.106)	47.3 (1.862)

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

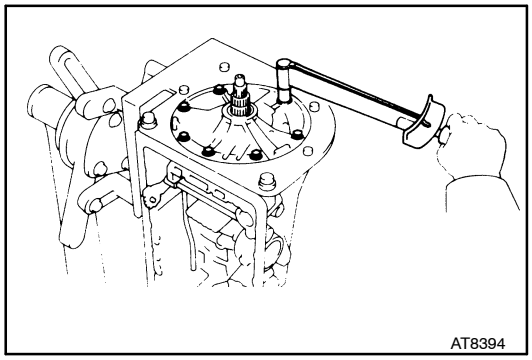
(c) Place the oil pump through the input shaft, and align the bolt holes of the pump body with the transmission case.

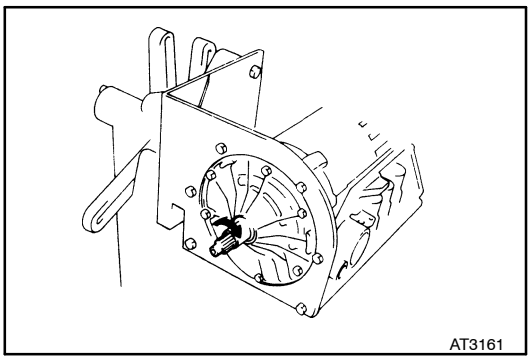
(d) Hold the input shaft, and lightly press the oil pump body to slide the oil seal rings into the O/D direct clutch drum.

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

(e) Install seven bolts.

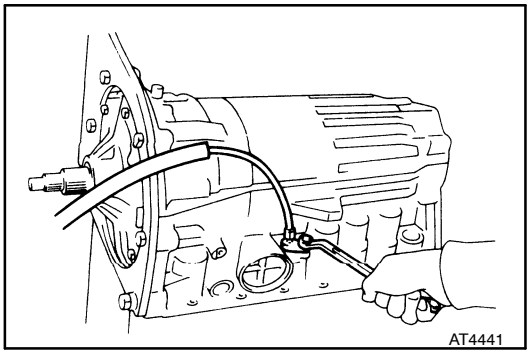
Torque: 220 kg–cm (16 ft–lb, 22 N–m)





26. CHECK INPUT SHAFT ROTATION

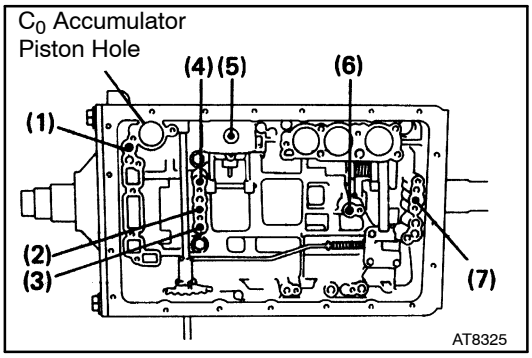
Make sure the input shaft rotates smoothly.

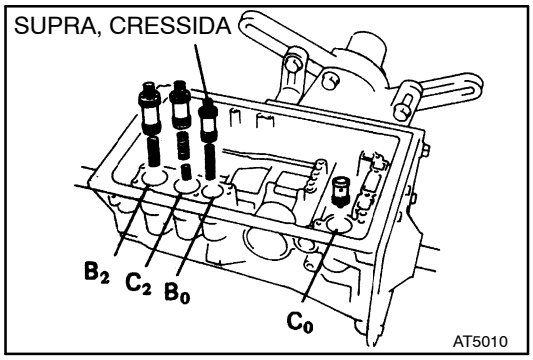


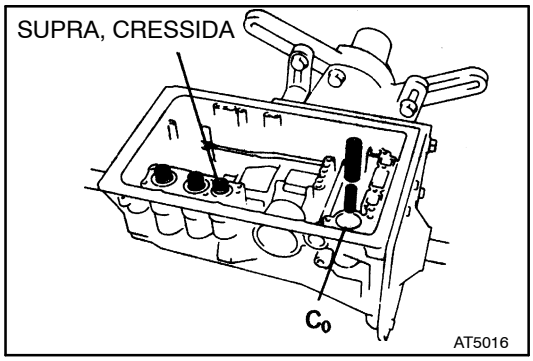
27. INSTALL THROTTLE CABLE

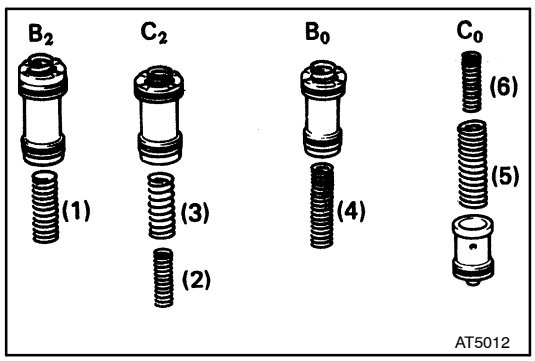
(a) Coat a new O–ring with ATF and install it to the cable.

(b) Install the cable to the case.









28. INDIVIDUAL PISTON OPERATION INSPECTION

Check for the sound of operation while applying compressed air into the oil hole indicated in the figure.

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

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

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

29. INSTALL ACCUMULATOR SPRINGS AND PISTONS

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

(b) Install the three springs and four accumulator pistons to the bore as shown in the figure.

HINT: The pistons are marked in relief with either C–0, B–0, C–2 or B–2 to differentiate between them.

(c) Install the two springs to the C_0 accumulator piston.

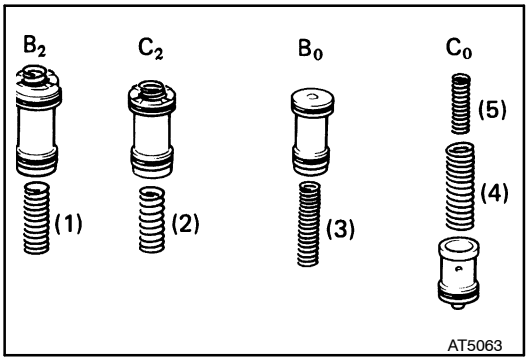
- **Spring**

(SUPRA) mm (in.)

Spring				Free length	Outer diameter	Color
(1)	B_2	7M–GE		73.4 (2.890)	19.9 (0.783)	Red
		7M–GTE		72.6 (2.858)	19.9 (0.783)	Light Gray
(2)	C_2	Inner		42.1 (1.657)	14.7 (0.579)	Pink
(3)		Outer	7M–GE	64.0 (2.520)	20.2 (0.795)	Green
			7M–GTE	70.3 (2.768)	20.2 (0.795)	Pink
(4)	B_0			62.0 (2.441)	16.0 (0.630)	Green
(5)	C_0	Outer		74.6 (2.937)	20.9 (0.823)	Orange
(6)		Inner		46.0 (1.811)	14.0 (0.551)	Yellow

(CRESSIDA) mm (in.)

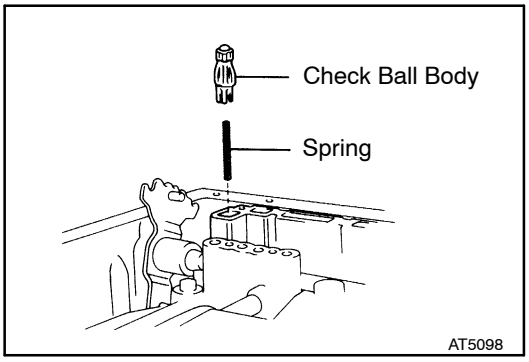
Spring			Free length	Outer diameter	Color
(1)	B_2		70.5 (2.776)	19.7 (0.776)	Green
(2)	C_2	Inner	42.1 (1.657)	14.7 (0.579)	Pink
(3)		Outer	70.3 (2.768)	20.2 (0.795)	Pink
(4)	B_0		62.0 (2.441)	16.0 (0.630)	Green
(5)	C_0	Outer	74.6 (2.937)	20.9 (0.823)	Orange
(6)		Inner	46.0 (1.811)	14.0 (0.551)	Yellow



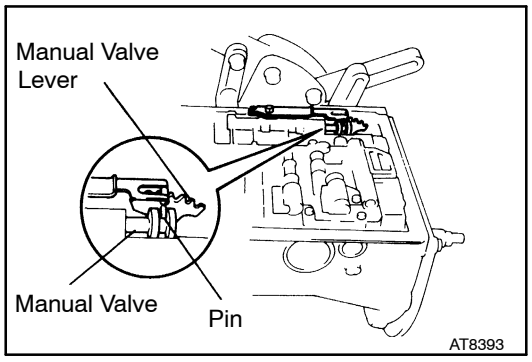
(TRUCK, 4RUNNER)

mm (in.)

Spring			Free length	Outer diameter	Color
(1)	B_2		70.5 (2.776)	19.7 (0.776)	Yellow
(2)	C_2		68.5 (2.697)	20.2 (0.795)	Blue
(3)	B_0		66.0 (2.598)	16.1 (0.634)	Purple
(4)	C_0	Outer	74.6 (2.937)	20.3 (0.799)	Yellow
(5)		Inner	46.4 (1.811)	14.0 (0.551)	Yellow

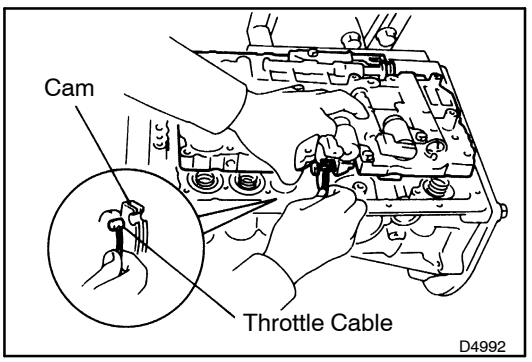


30. INSTALL CHECK BALL BODY AND SPRING



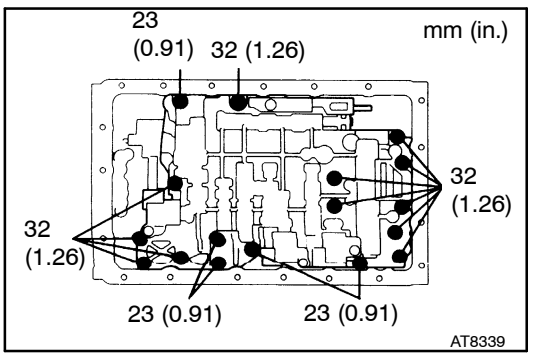
31. INSTALL VALVE BODY

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



(b) Connect the throttle cable to the cam.

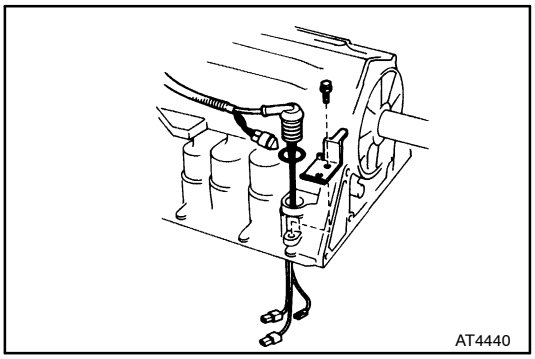
(c) Confirm the springs into the accumulator pistons are installed correctly.



(d) Install the seventeen bolts.

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

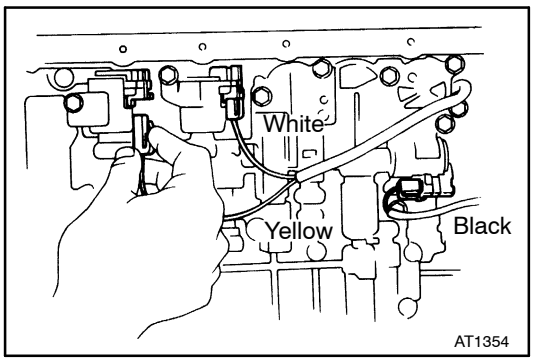
Torque: 100 kg–cm (7 ft–lb, 10 N–m)



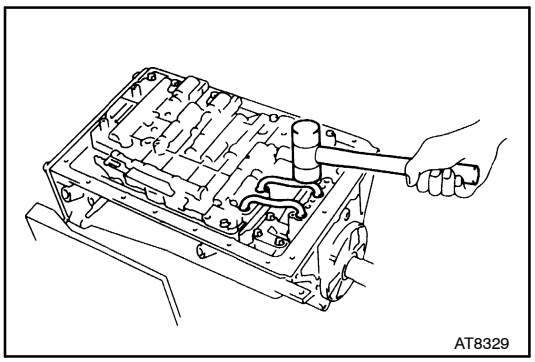
32. INSTALL SOLENOID WIRING

(a) Coat a new O–ring with ATF and install it to the grommet.

(b) Install the solenoid wiring to the case and install the stopper plate.



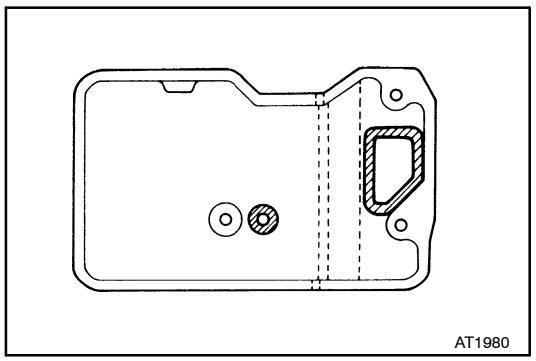
(c) Connect the connectors to No. 1, No. 2 and lock–up solenoids.



33. INSTALL OIL TUBES

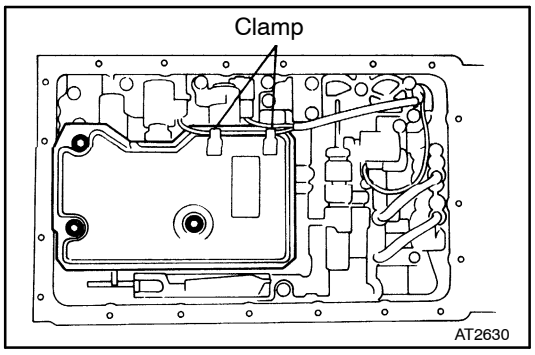
Using a plastic hammer, install the two tubes into position shown in the figure.

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



34. INSTALL OIL STRAINER AND GASKETS

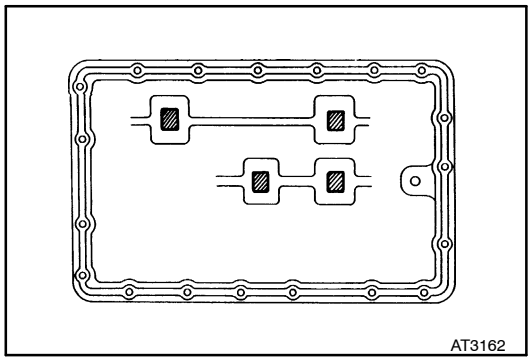
(a) Install two new gaskets to the oil strainer.



(b) Install and torque three bolts.

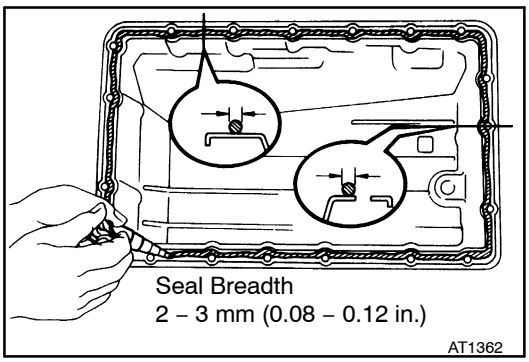
Torque: 100 kg–cm (7 ft–lb, 10 N–m)

(c) Clamp the solenoid wire.


AT3162

35. INSTALL MAGNETS IN PAN

Install the four magnets in the indentations of the oil pan as shown in the figure.



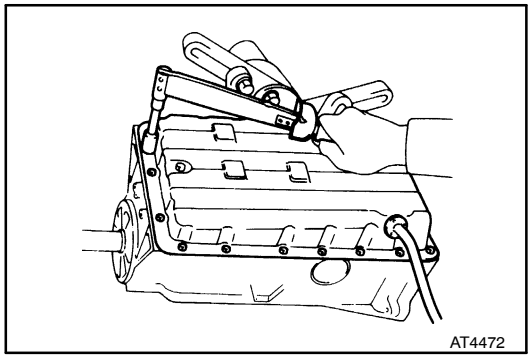
AT1362

36. INSTALL OIL PAN

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

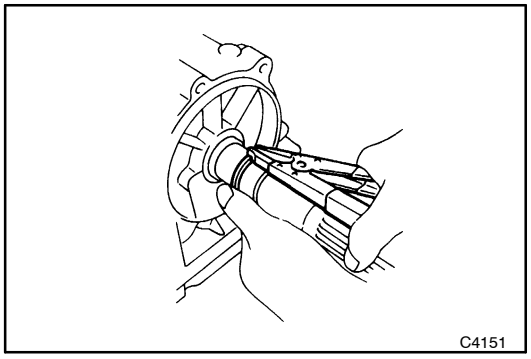
(b) Apply seal packing to the oil pan shown in the figure.

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


AT4472

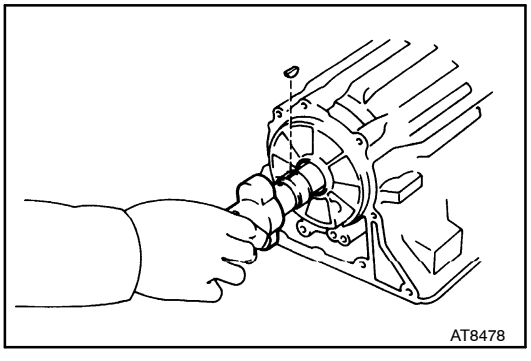
(c) Install and torque the nineteen bolts.

Torque: 75 kg–cm (65 in.–lb, 7.4 N–m)


C4151

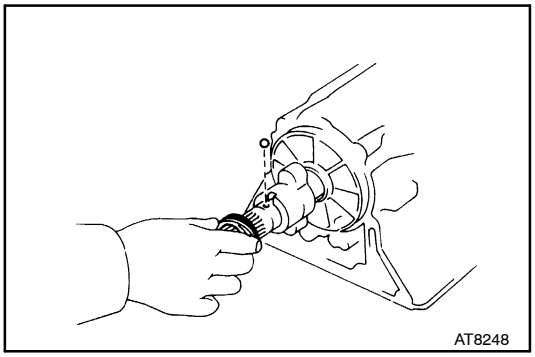
37. INSTALL SENSOR ROTOR AND KEY

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


AT8478

(b) Install the key on the output shaft.

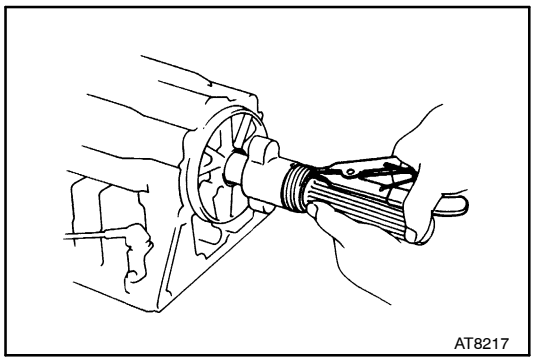
(c) Align the groove of the sensor rotor with key, install the sensor rotor.



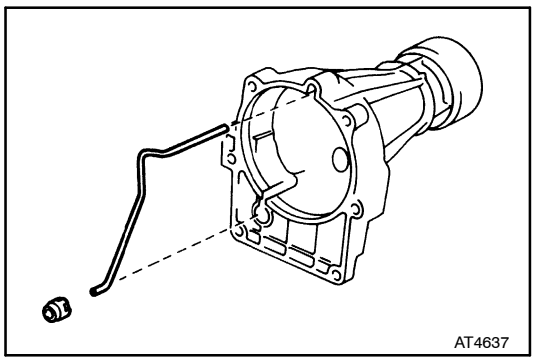
38. INSTALL SPEEDOMETER DRIVE GEAR AND BALL

(a) Install the lock ball on the output shaft.

(b) Align the groove of the drive gear with the ball, install the drive gear.

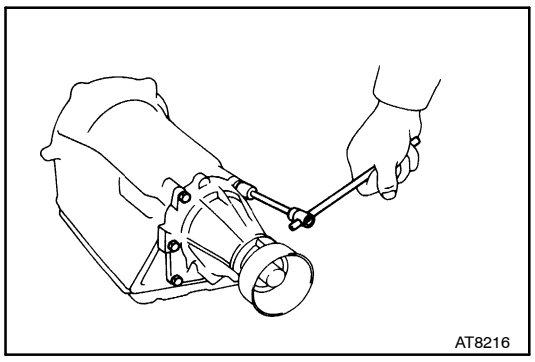


(c) Using snap ring pliers, install the snap ring.



39. INSTALL EXTENSION HOUSING AND NEW GASKET

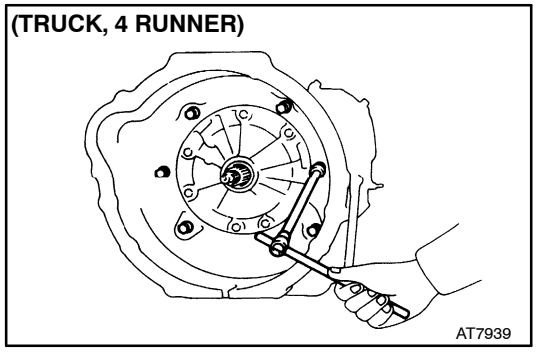
(a) Install the oil apply tube and a new gasket to the extension housing.



(b) Install the extension housing with a new gasket to the case. Install and torque the six bolts.

HINT: The two lower bolts are shorter.

Torque: 370 kg–cm (27 ft–lb, 36 N–m)

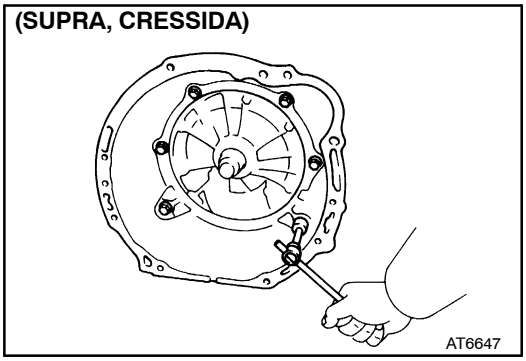


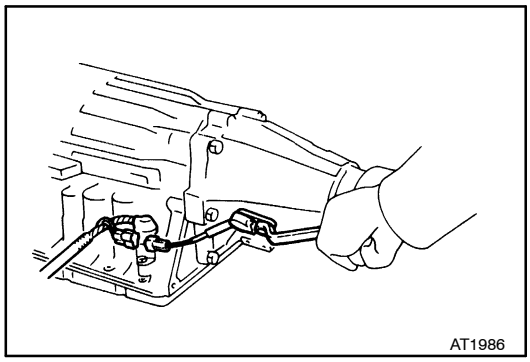
40. INSTALL TRANSMISSION HOUSING

Install and torque the six bolts.

Torque: 10 mm bolt 345 kg–cm (25 ft–lb, 34 N–m)
12 mm bolt 580 kg–cm (42 ft–lb, 57 N–m)

(SUPRA, CRESSIDA)


AT6647


AT1986

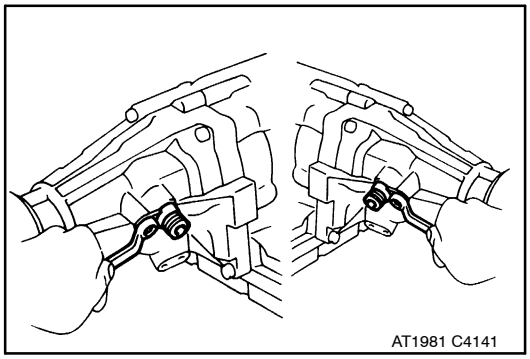
41. INSTALL SPEED SENSOR

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

(b) Install the speed sensor. Install and torque the bolt.

Torque: 160 kg–cm (12 ft–lb, 16 N–m)

(c) Connect the connector.


AT1981 C4141

42. INSTALL SPEEDOMETER DRIVEN GEAR

(a) Coat a new O–ring with ATF and install it to the sleeve.

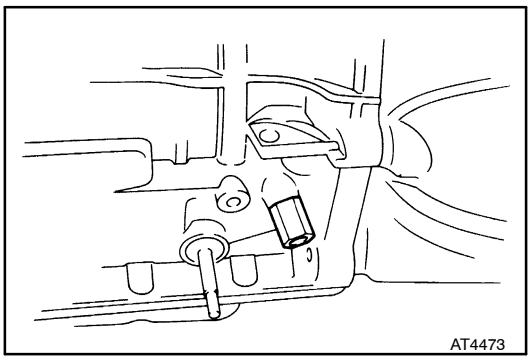
(b) Insert the driven gear into the sleeve.

(c) Install the sleeve to the extension housing.

(d) Install the lock plate with the bolt.

(e) Torque the bolt.

Torque: 160 kg–cm (12 ft–lb, 16 N–m)

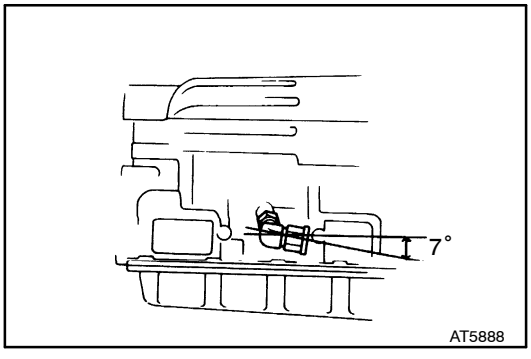

AT4473

43. INSTALL UNIONS

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

(b) Install the front union.

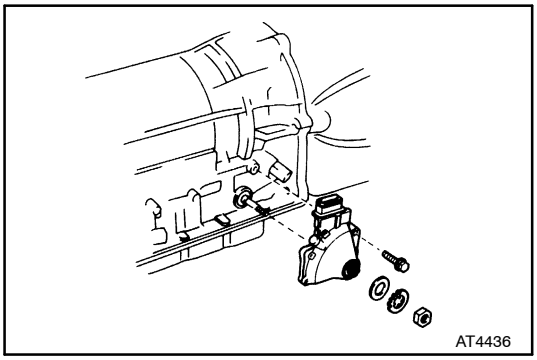
Torque: 300 kg–cm (22 ft–lb, 29 N–m)



AT5888

(c) Install the rear union as shown in the figure.

Torque: 300 kg–cm (22 ft–lb, 29 N–m)

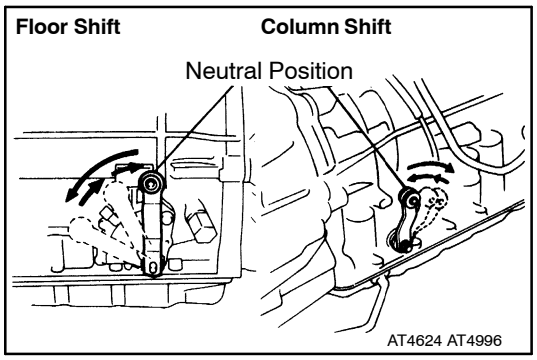


44. INSTALL NEUTRAL START SWITCH

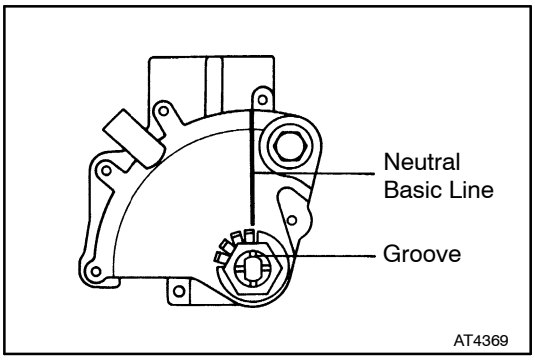
(a) Install the neutral start switch onto the manual valve lever shaft and temporarily tighten the adjusting bolt.

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

Torque: 70 kg–cm (61 in.–lb, 6.9 N–m)



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

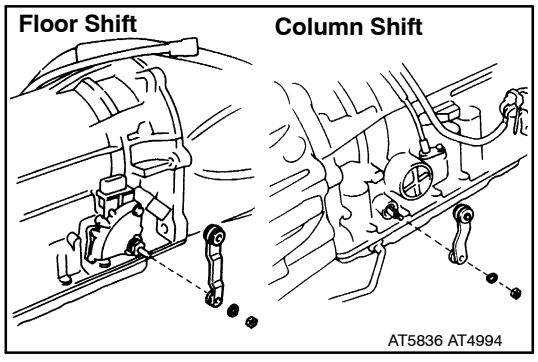


(d) Align the neutral basic line and the switch groove, and tighten the adjusting bolt.

Torque: 130 kg–cm (9 ft–lb, 13 N–m)

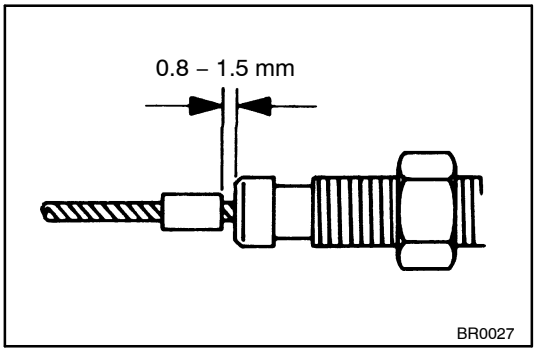
(e) Bend the tabs of the lock washer.

HINT: Bend at least two of the lock washer tabs.



45. INSTALL CONTROL SHAFT LEVER

Torque: 160 kg–cm (12 ft–lb, 16 N–m)



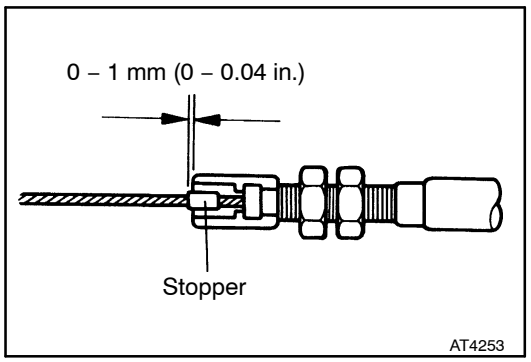
46. IF THROTTLE CABLE IS NEW, STAKE STOPPER ON INNER CABLE (SUPRA, TRUCK, 4 RUNNER)

HINT: New cable does not have a cable stopper staked.

(a) Bend the cable so there is a radius of about 200 mm (7.78 in.).

(b) Pull the inner cable lightly until a slight resistance is felt, and hold it.

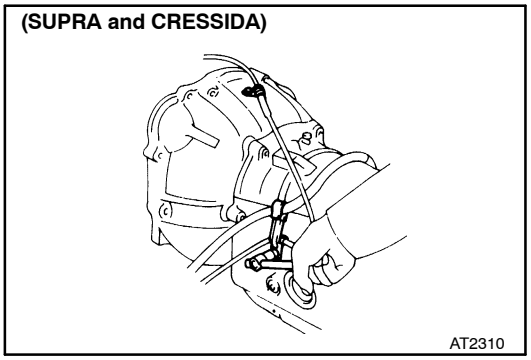
(c) Stake the stopper, 0.8 – 1.5 mm (0.031 – 0.059 in.) from the end of outer cable.



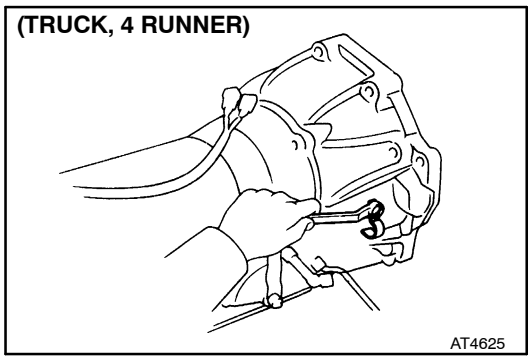
(CRESSIDA)

(a) Pull the inner cable lightly until a slight resistance is felt, and hold it.

(b) Stake a stopper on the inner cable as shown in the illustration.

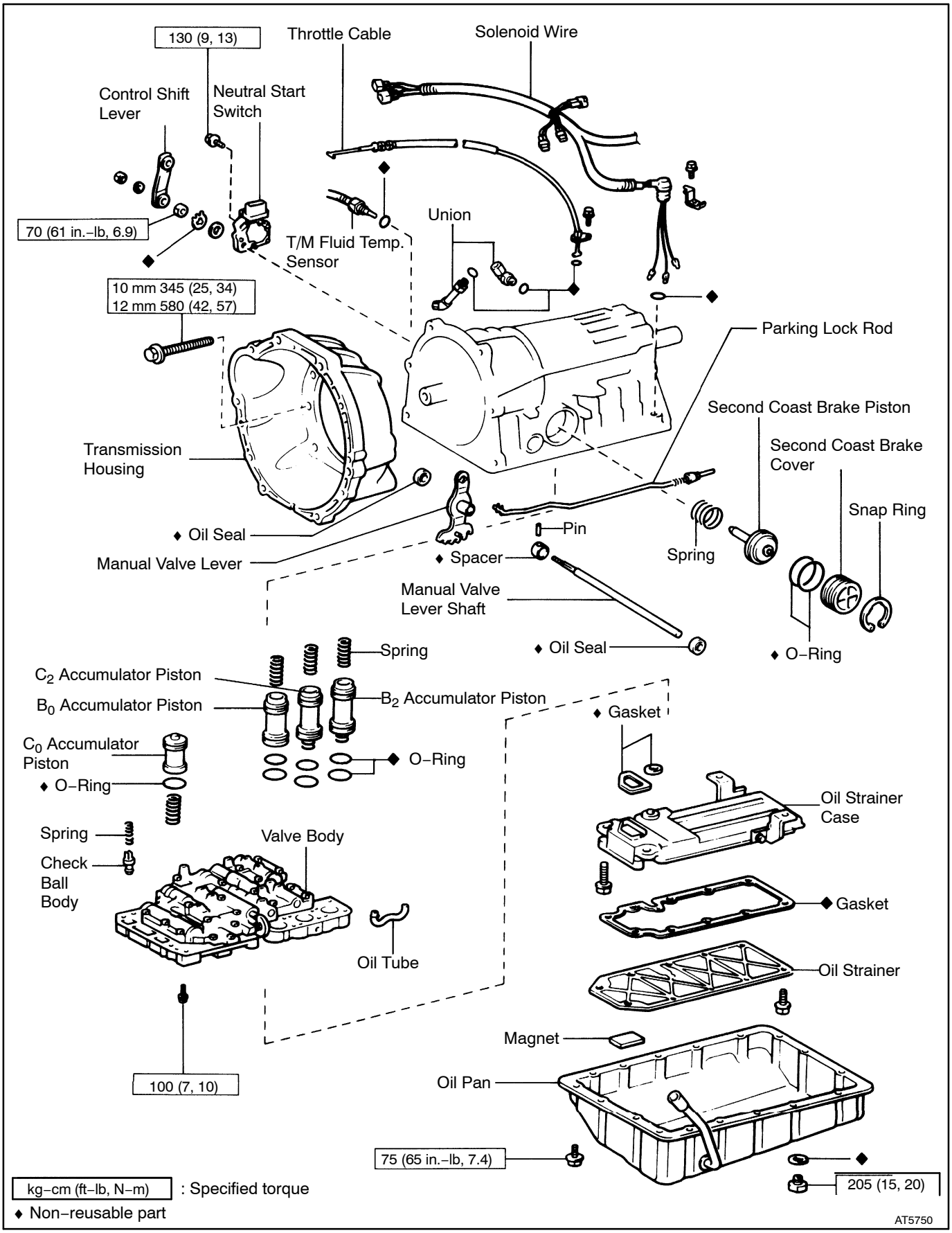


47. INSTALL WIRE HARNESS CLAMP AND THROTTLE CABLE CLAMP

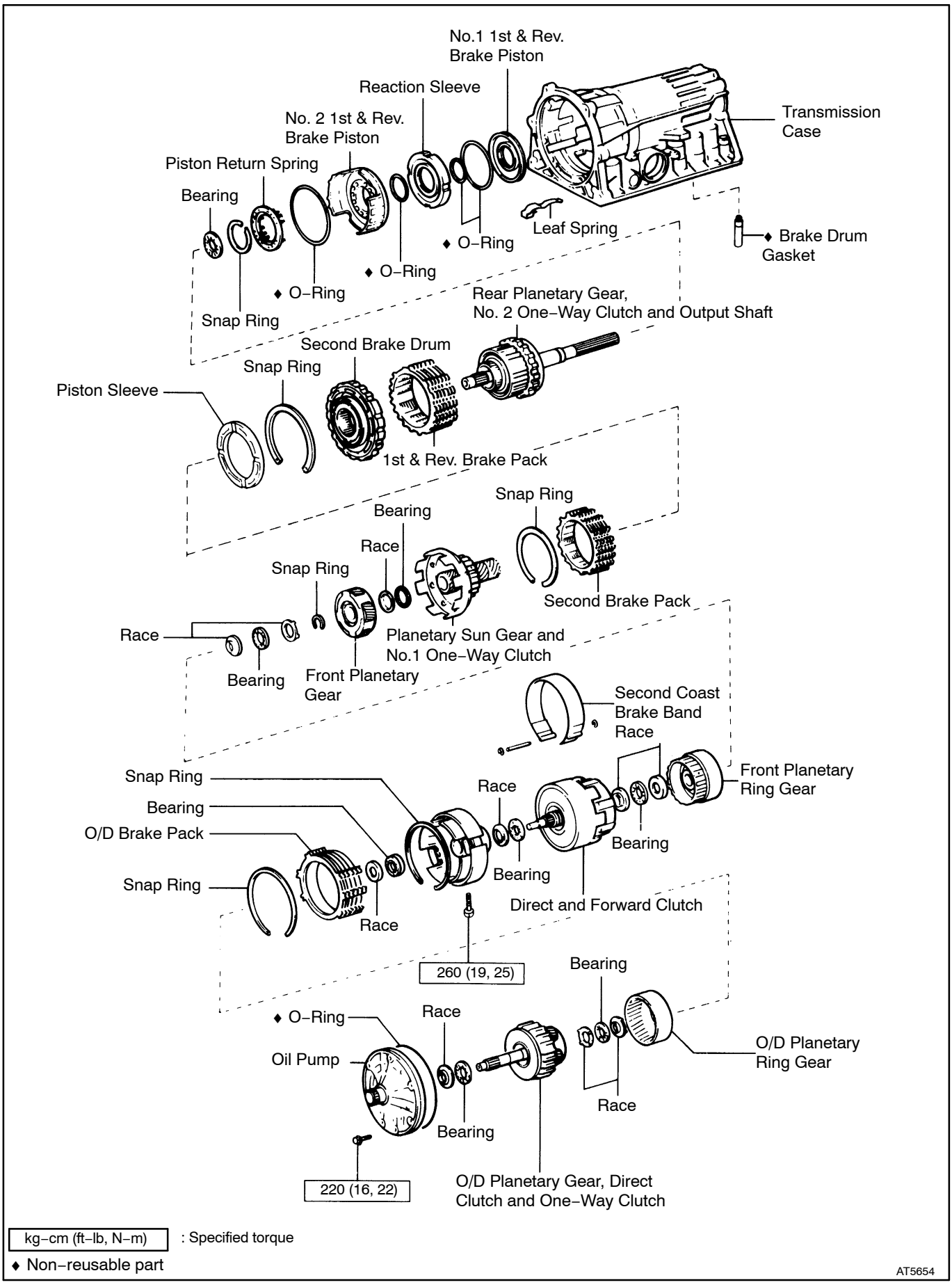


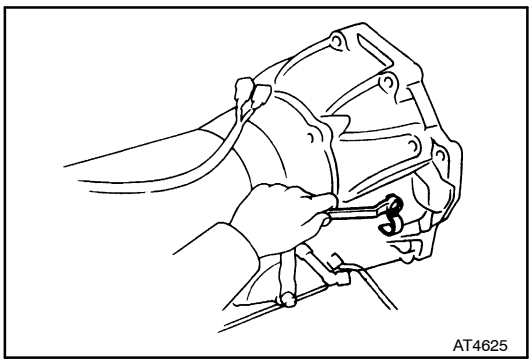
REMOVAL OF COMPONENT PARTS (A340F)

COMPONENTS (TRUCK and 4 RUNNER)



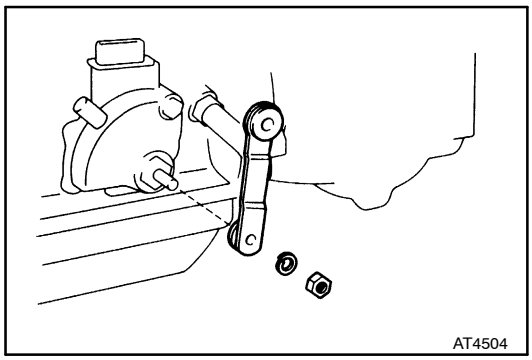
COMPONENTS (Cont'd)



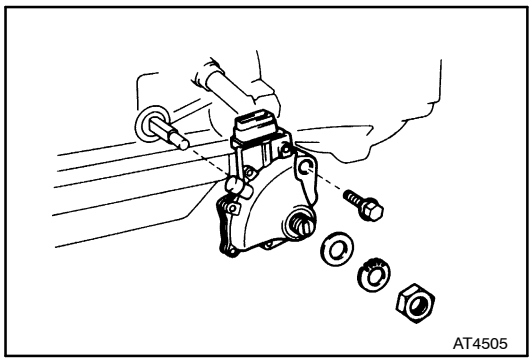


SEPARATE BASIC SUBASSEMBLY

1. REMOVE WIRE HARNESS CLAMPS



2. REMOVE TRANSMISSION CONTROL SHAFT LEVER

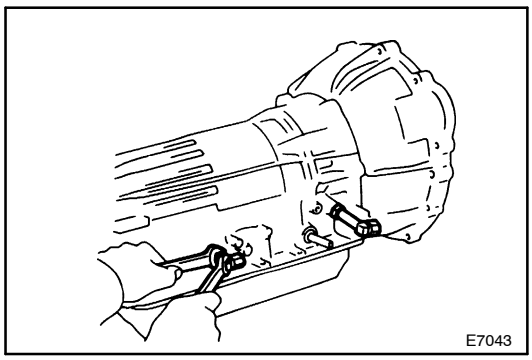


3. REMOVE NEUTRAL START SWITCH

(a) Unstake the lock washer.

(b) Remove the nut and bolt, and then remove the neutral start switch.

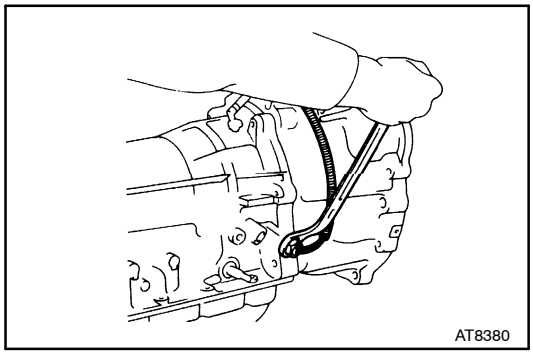
(c) Remove the lock washer and grommet.



4. REMOVE TRANSMISSION SIDE UNIONS

(a) Remove the two unions.

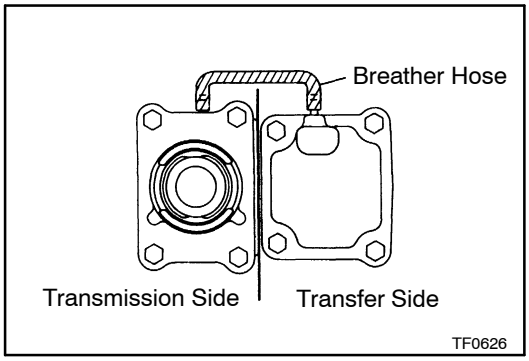
(b) Remove the O–ring from both unions.



5. REMOVE TRANSMISSION FLUID TEMPERATURE SENSOR

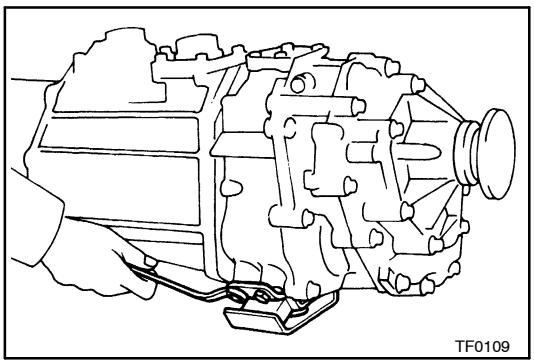
(a) Remove the temperature sensor.

(b) Remove the O–ring from the sensor.

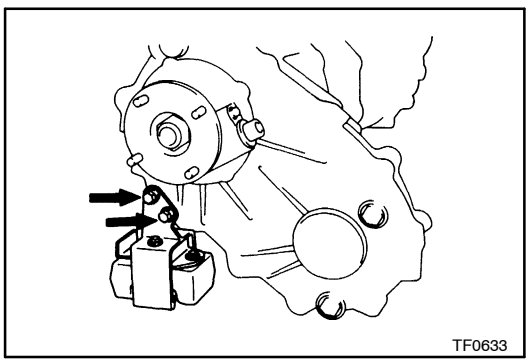


6. REMOVE BREATHER HOSE

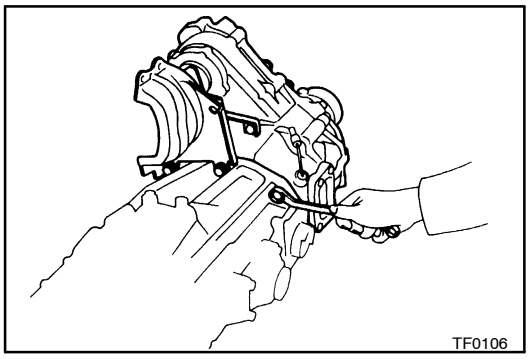
Disconnect the breather hose from transfer upper cover and transmission control retainer.



7. REMOVE ENGINE REAR MOUNTING



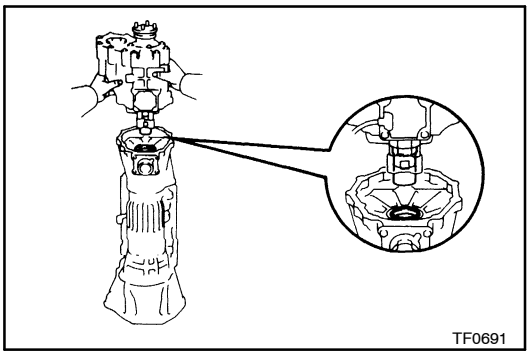
8. REMOVE DYNAMIC DAMPER



9. REMOVE PROPELLER SHAFT UPPER DUST COVER AND TRANSFER FROM TRANSMISSION

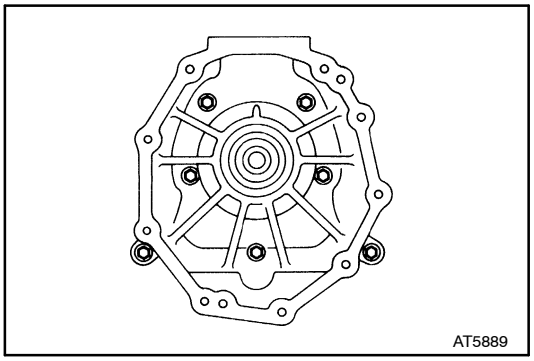
(a) Remove the dust cover bolt from the bracket.

(b) Remove the transfer adaptor rear mounting bolts.



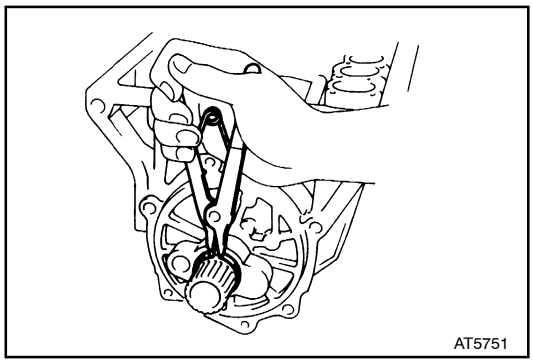
(c) Pull the transfer straight up and remove it from the transmission.

HINT: Take care not to damage the adaptor rear oil seal with the transfer input gear spline.



10. REMOVE TRANSFER CASE

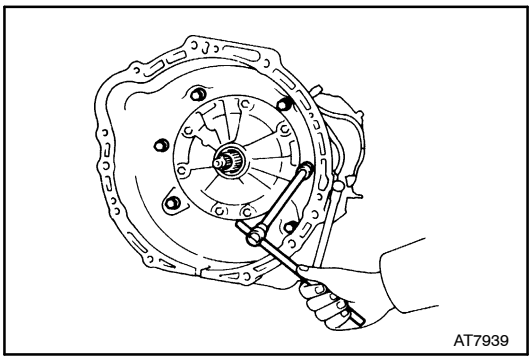
Remove the seven bolts and the case.



11. REMOVE SPEED SENSOR ROTOR AND KEY

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

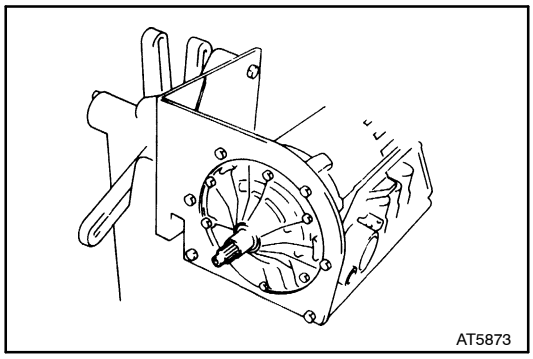
(b) Remove sensor rotor and key.



12. REMOVE TRANSMISSION HOUSING

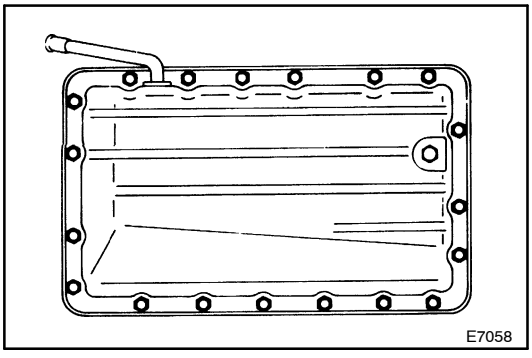
(a) Remove the six bolts.

(b) Remove the transmission housing.



13. INSTALL TRANSMISSION CASE

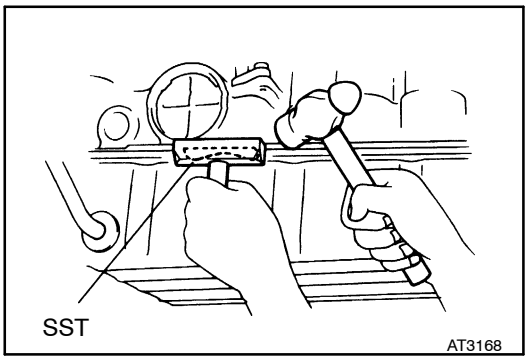
Install the transmission case on the overhaul attachment.



14. REMOVE OIL PAN

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

(a) Remove the nineteen bolts.



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

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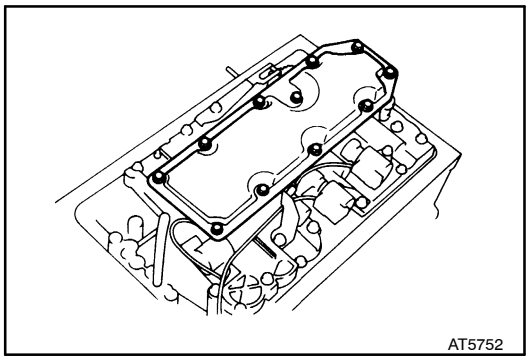
NOTICE: Be careful not to damage the oil pan flange.

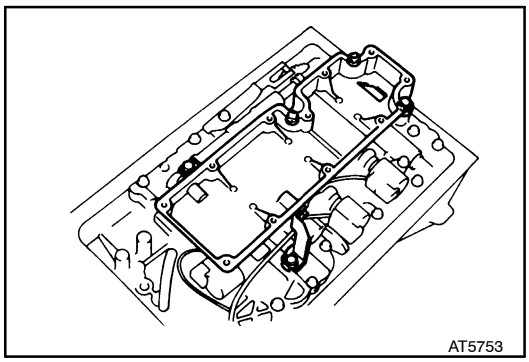
(c) Remove pan by lifting the transmission case.



15. REMOVE OIL STRAINER AND GASKETS

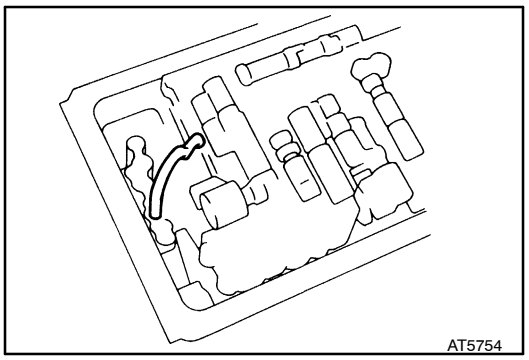
(a) Remove the eleven bolts holding the oil strainer to the oil strainer case.

(b) Remove the oil strainer and gasket.



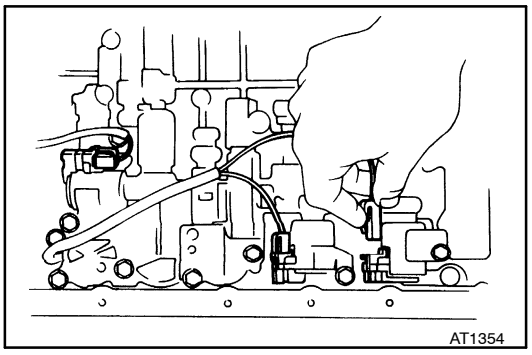
(c) Remove the five bolts and oil strainer case.

(d) Remove the two gaskets from the case.



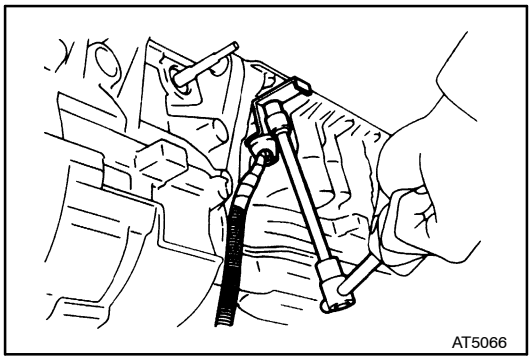
16. REMOVE OIL TUBES

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

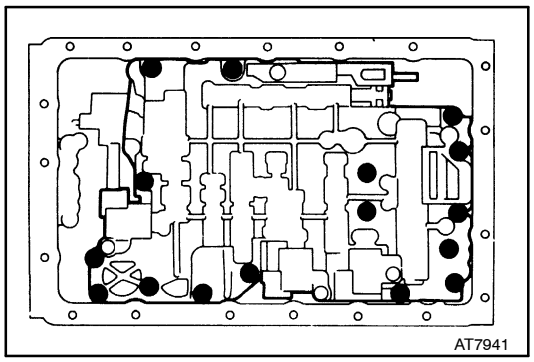


17. REMOVE SOLENOID WIRING

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

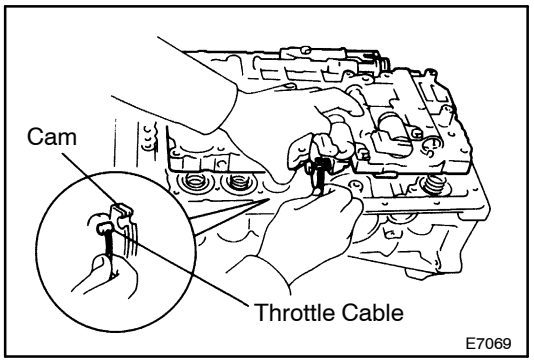


(b) Remove the stopper plate from the case.
(c) Pull out the solenoid wiring from the transmission case.
(d) Remove the O–ring from the grommet.

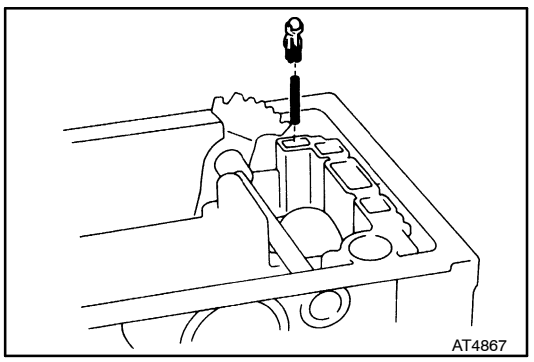


18. REMOVE VALVE BODY

(a) Remove the sixteen bolts.

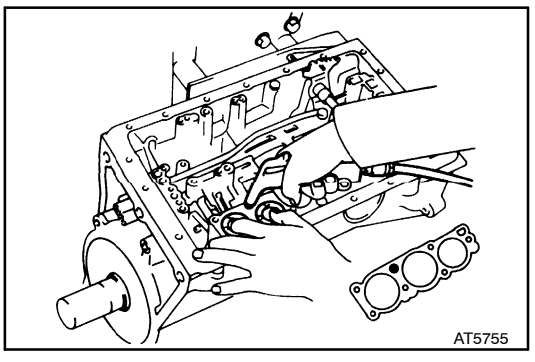


(b) Disconnect the throttle cable from the cam and remove the valve body.



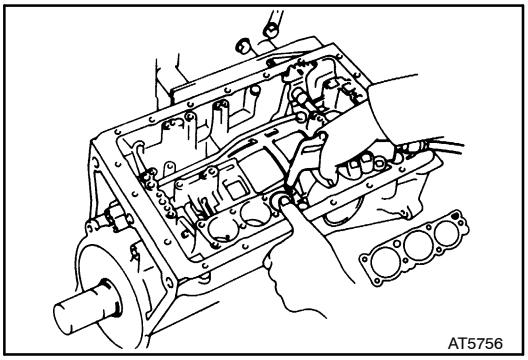
19. REMOVE CHECK BALL BODY

Remove the check ball body and spring.

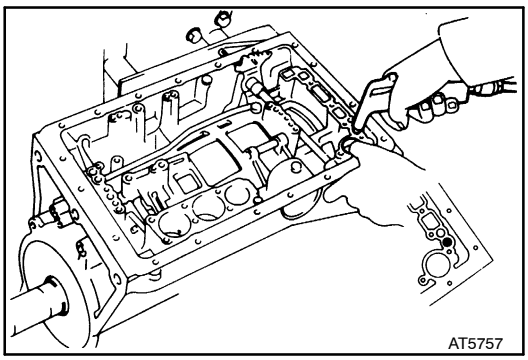


20. REMOVE ACCUMULATOR PISTONS AND SPRINGS

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

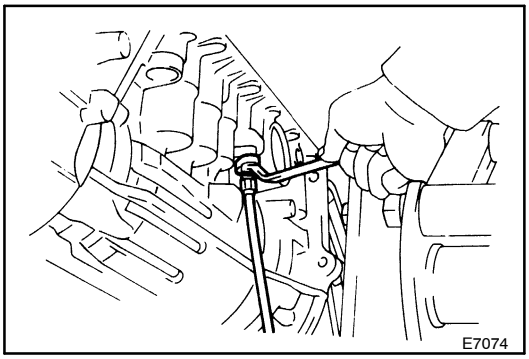


(c) Applying compressed air to the oil hole, remove the B_0 accumulator piston and spring.



(d) Applying compressed air to the oil hole, remove the C_0 accumulator piston.

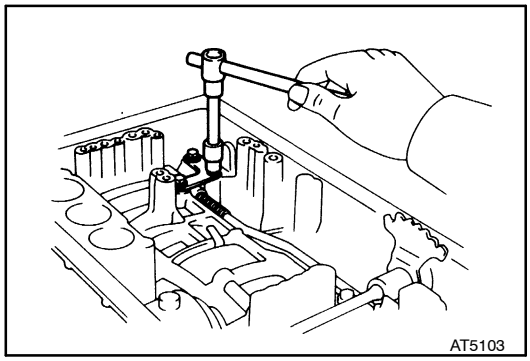
(e) Remove the O–ring from the piston.



21. REMOVE THROTTLE CABLE

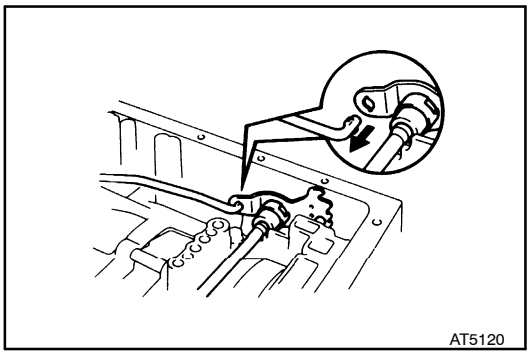
(a) Remove the retaining bolt and pull out the throttle cable.

(b) Remove the O–ring from the cable.

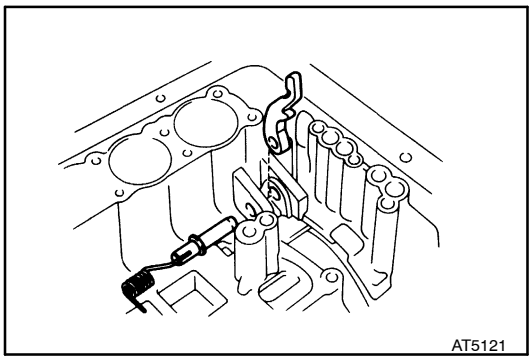


22. REMOVE PARKING LOCK ROD AND PAWL

(a) Remove the parking lock pawl bracket.

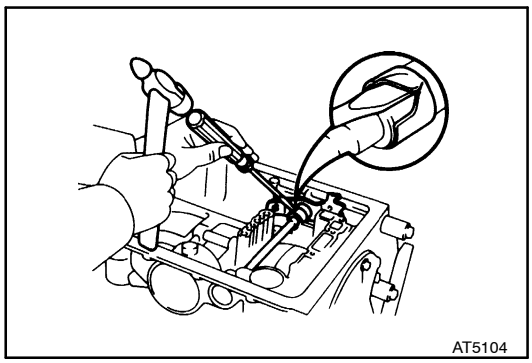


(b) Disconnect the parking lock rod from the manual valve lever.



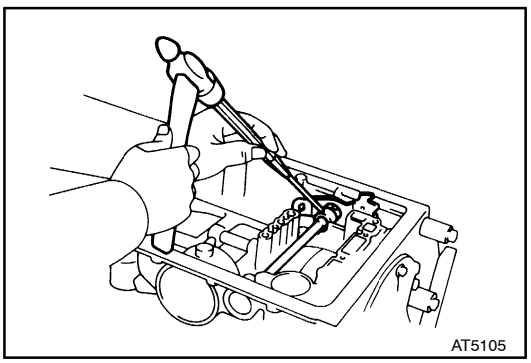
(c) Remove the E–ring from the shaft.

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



23. REMOVE TRANSMISSION CONTROL SHAFT

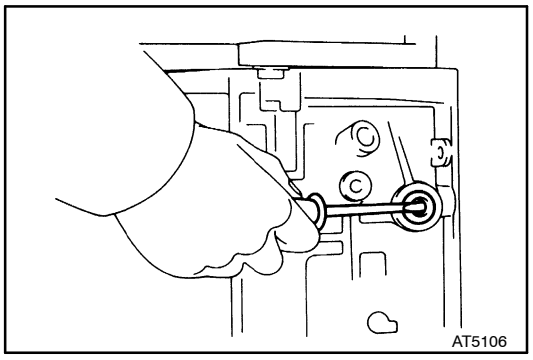
(a) Using a hammer and screwdriver, cut off the spacer and remove it from the shaft.



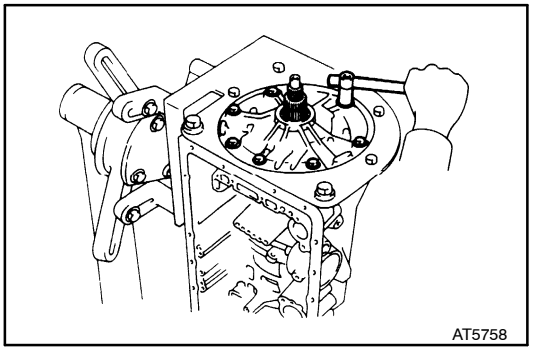
(b) Using a pin punch, drive out the spring pin.

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

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



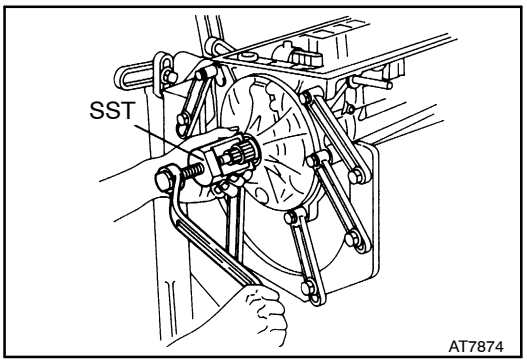
(d) Using a screwdriver, remove the two oil seals.



24. REMOVE OIL PUMP

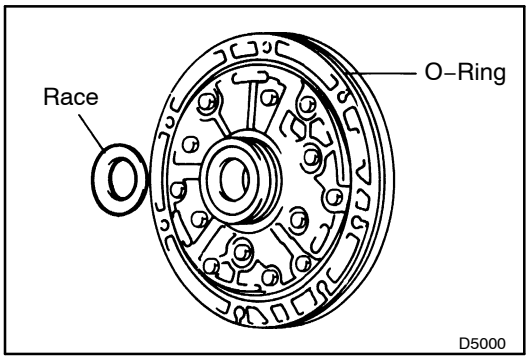
(a) Stand up the transmission.

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



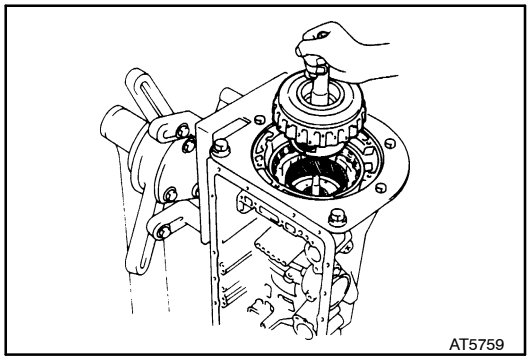
(c) Using SST, remove the oil pump.

SST 09610–20012



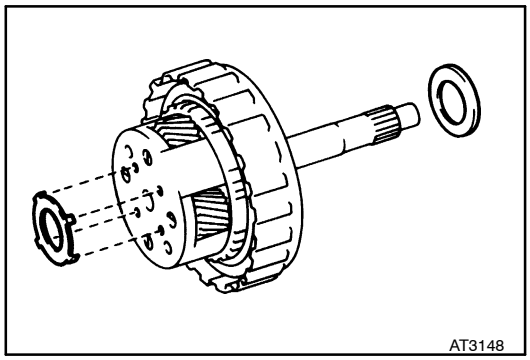
(d) Remove the race from the oil pump.

(e) Remove the O–ring from the oil pump.

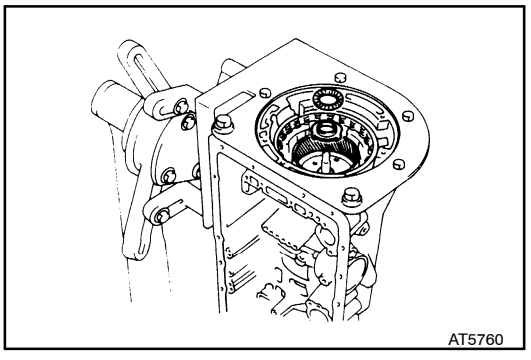


25. REMOVE OVERDRIVE PLANETARY GEAR UNIT WITH OVERDRIVE DIRECT CLUTCH AND ONE–WAY CLUTCH

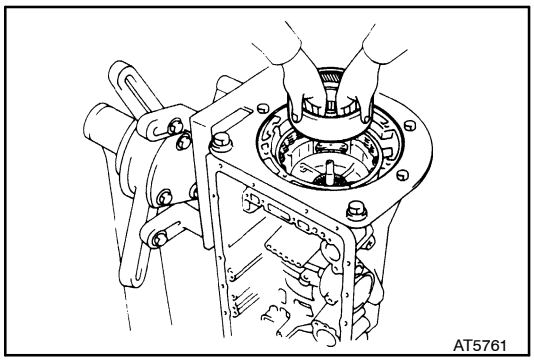
(a) Remove the overdrive planetary gear with the overdrive direct clutch and one–way clutch from the transmission case.



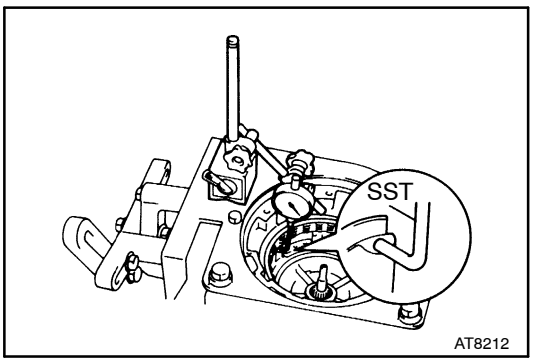
(b) Remove the race and assembled bearing and race.



(c) Remove the bearing and race.



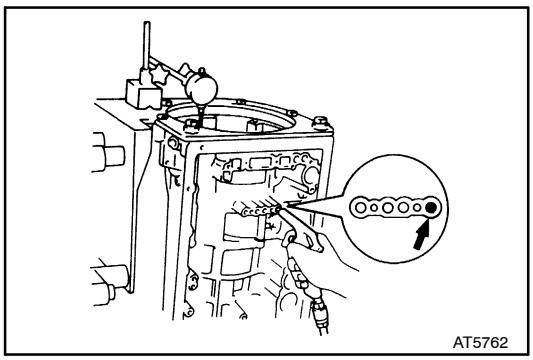
(d) Remove the overdrive planetary ring gear from the transmission case.



26. CHECK PISTON STROKE OF OVERDRIVE BRAKE

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

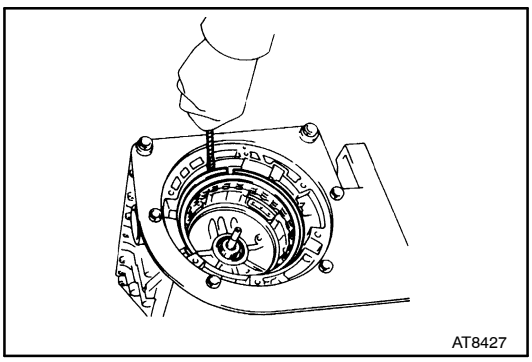
SST 09350–30020 (09350–06120)



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

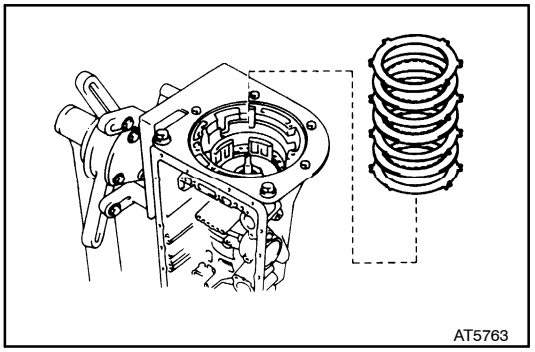
Piston stroke: 1.32 – 1.62 mm (0.0520 – 0.0638 in.)

If the values are nonstandard, inspect the discs.
(See page AT–61)

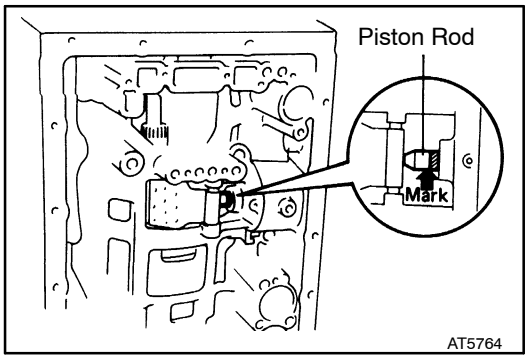


27. REMOVE FLANGE, PLATES AND DISCS OF OVERDRIVE BRAKE

(a) Remove the snap ring.

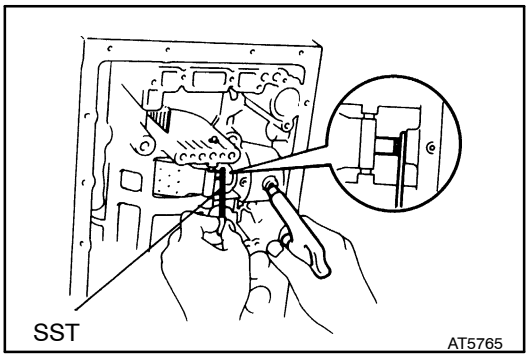


(b) Remove the flanges, plates and discs as a set.



28. CHECK PISTON ROD STROKE OF SECOND COAST BRAKE

(a) Place a mark on the second coast brake piston rod as shown in the figure.

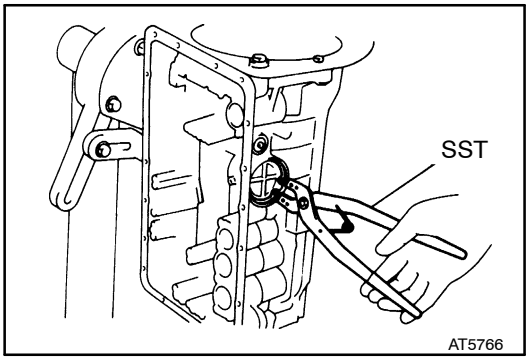


(b) Using SST, measure the stroke applying the compressed air (4 – 8 kg/cm^2, 57 – 114 psi or 392 – 785 kPa) as shown in the figure.

SST 09350–30020 (09350–00020)

Piston stroke: 1.5 – 3.0 mm (0.059 – 0.118 in.)

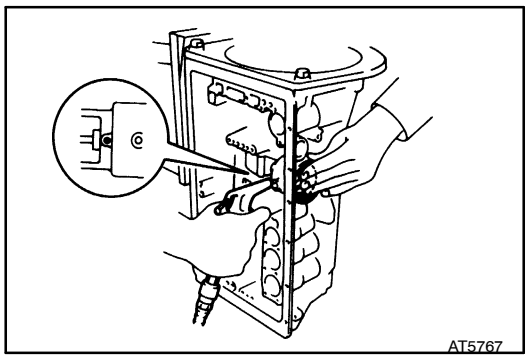
If the values are nonstandard, inspect the brake band. (See page AT–76)



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

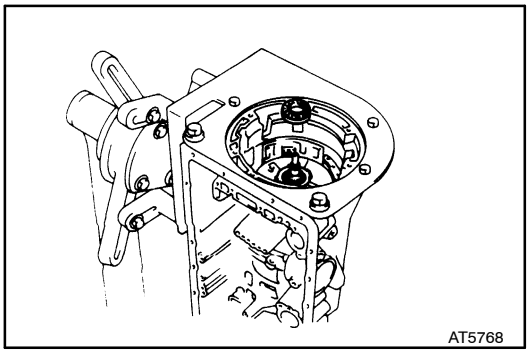
(a) Using SST, remove the snap ring.

SST 09350–30020 (09350–07060)



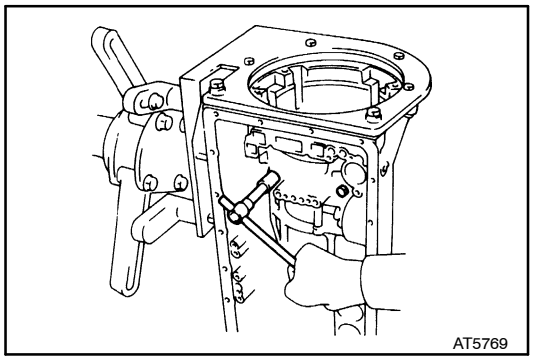
(b) Applying compressed air to the oil hole, remove the second coast brake cover, piston assembly and spring.

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

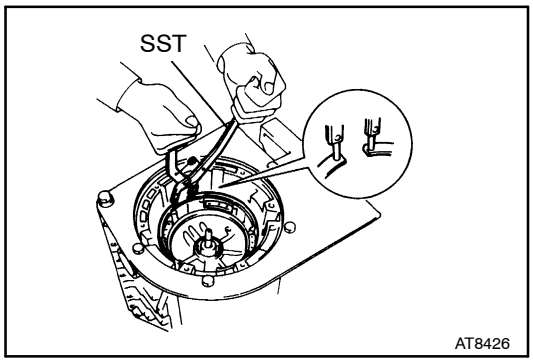


30. REMOVE OVERDRIVE SUPPORT ASSEMBLY

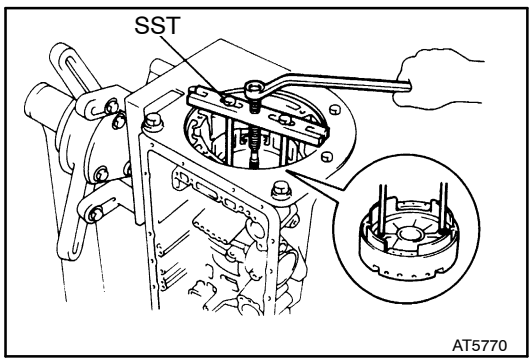
(a) Remove the assembled bearing.



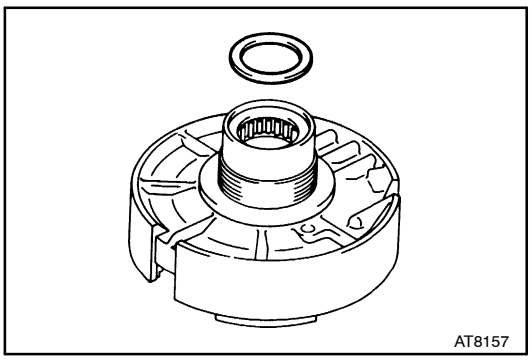
(b) Remove the two bolts holding the overdrive support assembly to the case.



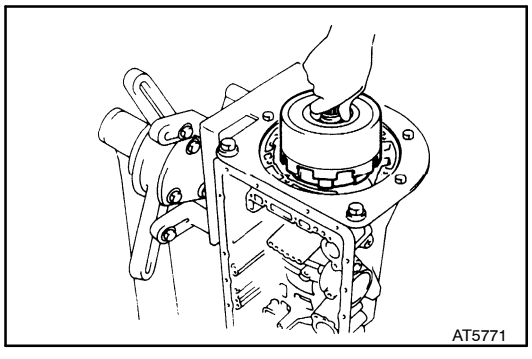
(c) Using SST, remove the snap ring.
SST 09350–30020 (09350–07060)



(d) Using SST, remove the overdrive support assembly.
SST 09350–30020 (09350–07020)

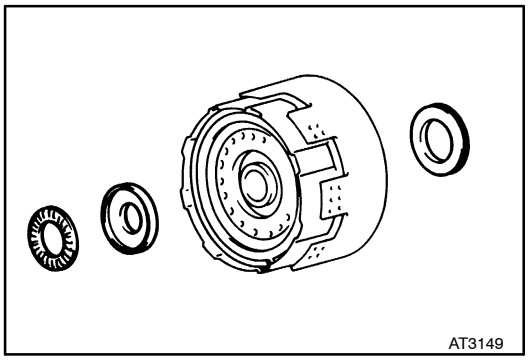


(e) Remove the race.

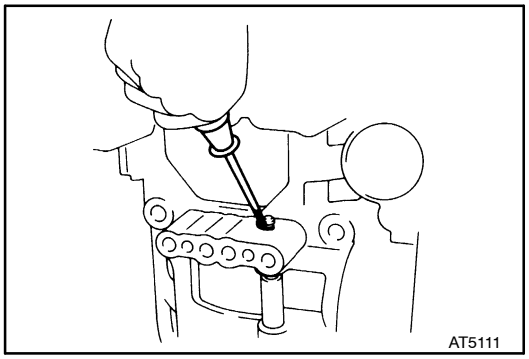


31. REMOVE DIRECT CLUTCH WITH FORWARD CLUTCH

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



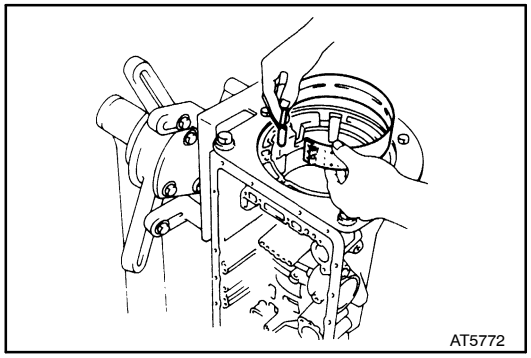
(b) Remove the two bearings and races.



32. REMOVE SECOND COAST BRAKE BAND

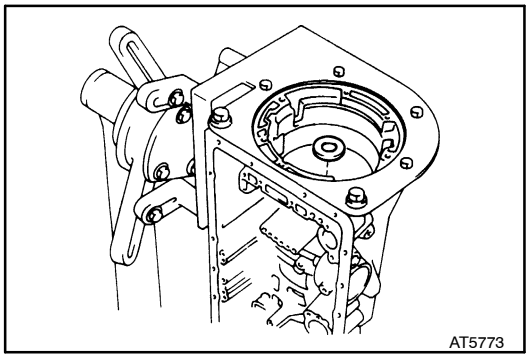
(a) Remove the E–ring from the pin.

(b) Remove the pin from the brake band.



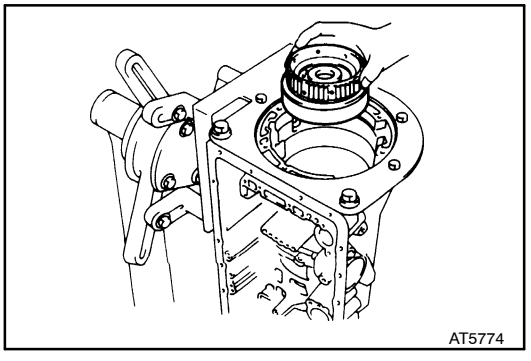
(c) Remove the second coast brake band from the case.

For the method of inspection, refer to AT–76.

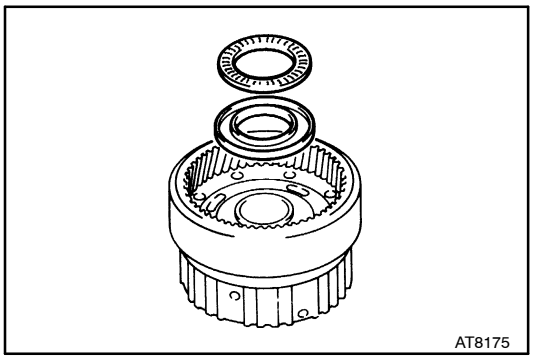


33. REMOVE FRONT PLANETARY GEAR UNIT

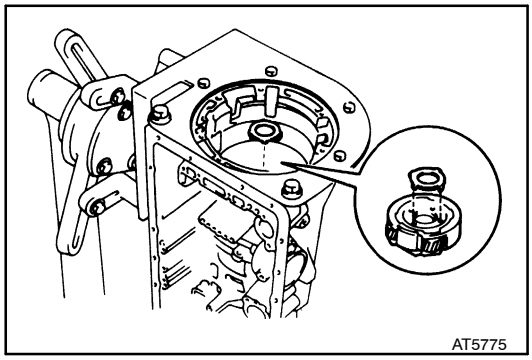
(a) Remove the race.



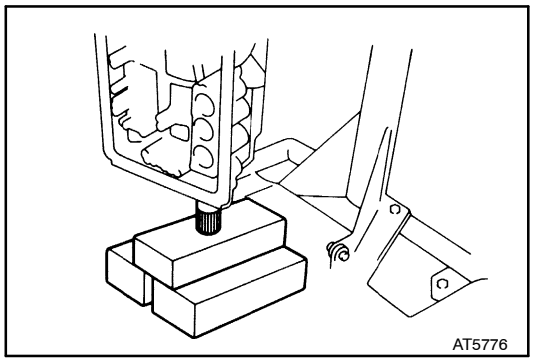
(b) Remove the front planetary ring gear from the case.



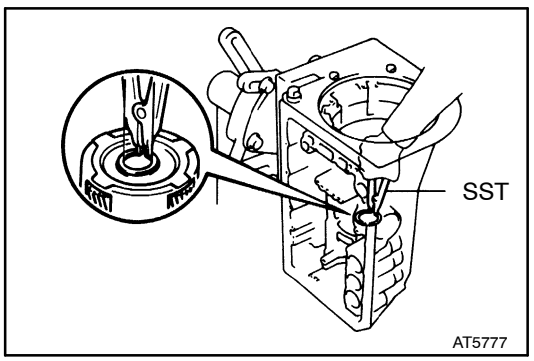
(c) Remove the bearing and race.



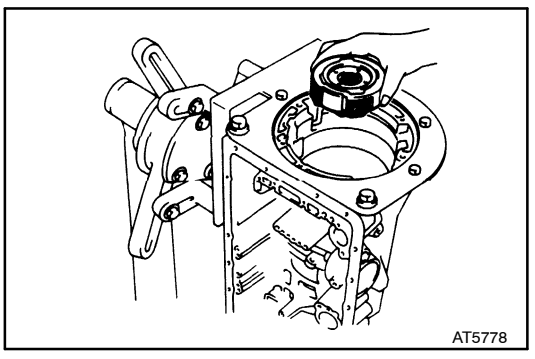
(d) Remove the race.



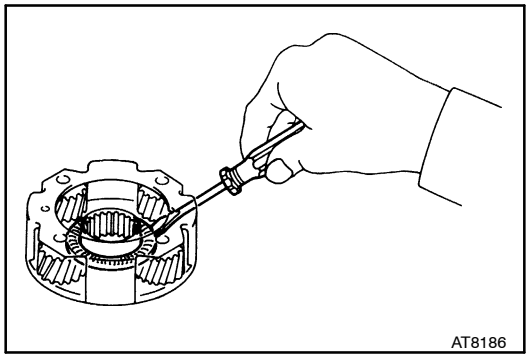
(e) With wooden blocks or equivalent under the output shaft, stand the transmission on the output shaft.



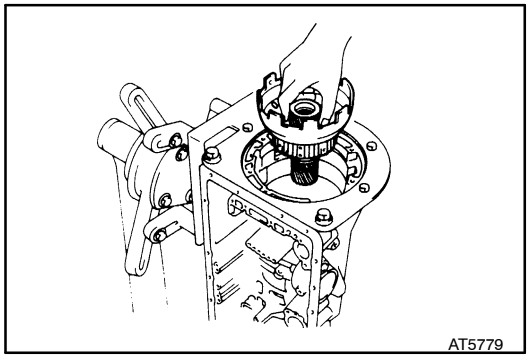
(f) Using SST, remove the snap ring.
SST 09350–30020 (09350–07070)



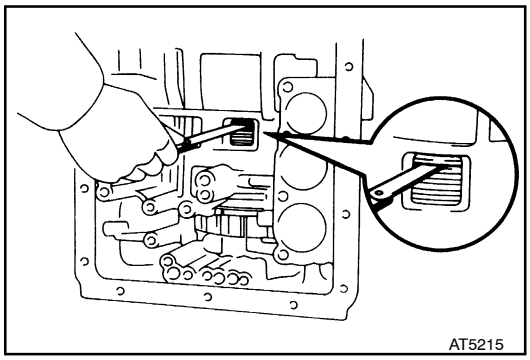
(g) Remove the front planetary gear from the case.



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

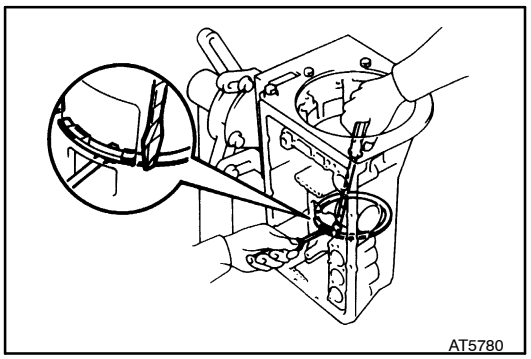


34. REMOVE PLANETARY SUN GEAR WITH NO. 1 ONE–WAY CLUTCH



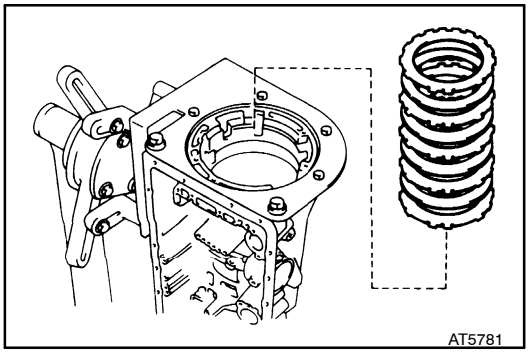
35. CHECK PACK CLEARANCE OF SECOND BRAKE

Using a feeler gauge, measure the clearance between the snap ring and flange as shown in the figure.
Clearance: 0.50 – 1.76 mm (0.0197 – 0.0693 in.)
If the values are nonstandard, inspect the discs.
(See page AT–84)

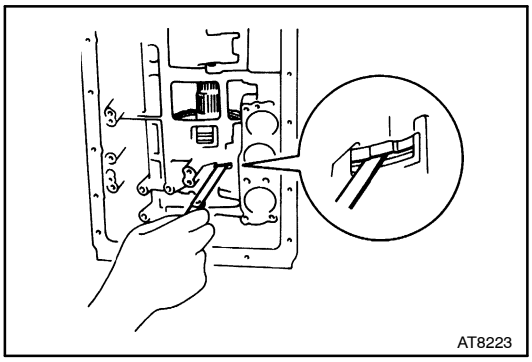


36. REMOVE FLANGE, PLATES AND DISCS OF SECOND BRAKE

(a) Remove the snap ring.

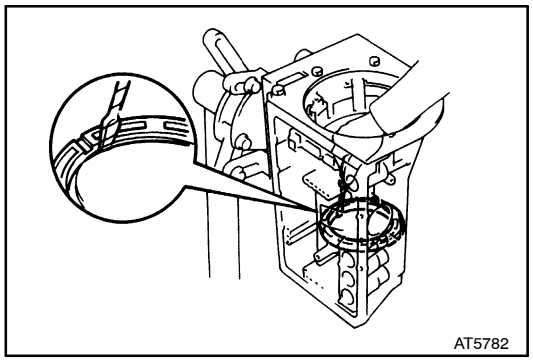


(b) Remove the flange, plates and discs as a set.

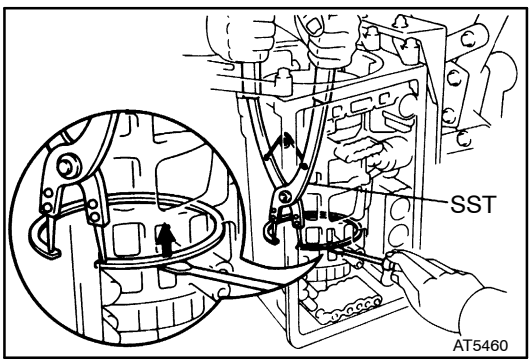


37. CHECK PACK CLEARANCE OF FIRST AND REVERSE BRAKE

Using a feeler gauge, measure the clearance between the plate and second brake drum as shown in the figure.
Clearance: 0.50 – 1.02 mm (0.0197 – 0.0402 in.)

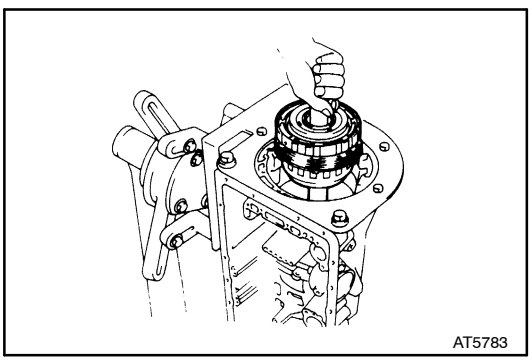


38. REMOVE SECOND BRAKE PISTON SLEEVE



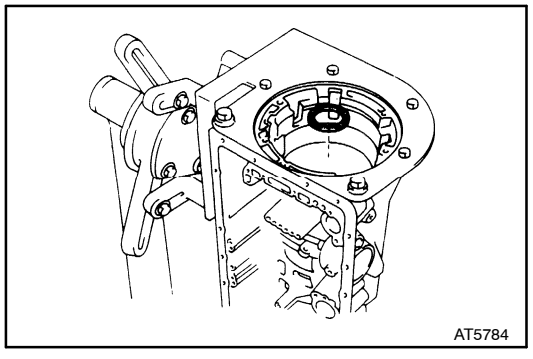
39. REMOVE REAR PLANETARY GEAR UNIT WITH SECOND BRAKE DRUM, FIRST AND REVERSE BRAKE PACK AND OUTPUT SHAFT

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

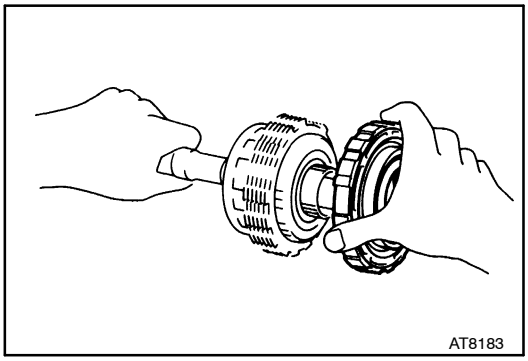


(b) Install the output shaft.

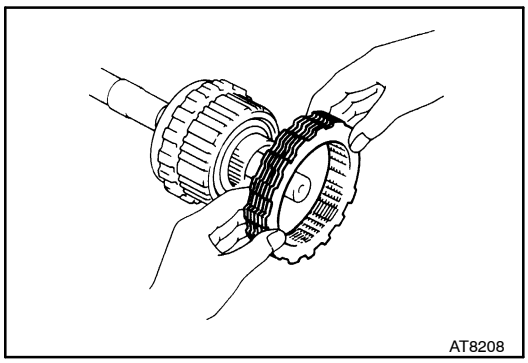
(c) Remove the rear planetary gear, second brake drum, first and reverse brake pack and output shaft as an assembly.



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

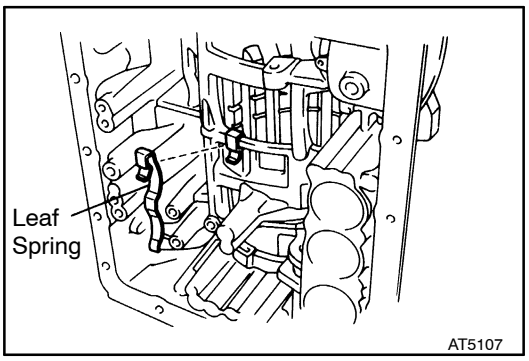


(e) Remove the second brake drum assembly.

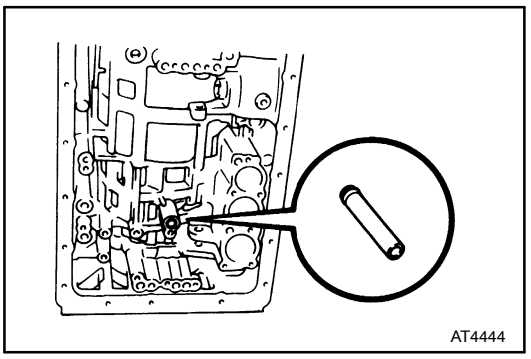


(f) Remove the cushion plate, flange, plates and discs of the first and reverse brake.

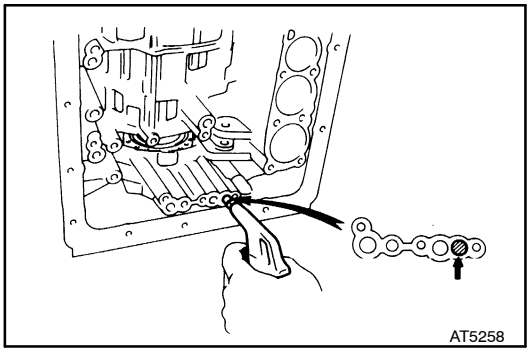
For method of inspection, refer to AT–86.



40. REMOVE LEAF SPRING

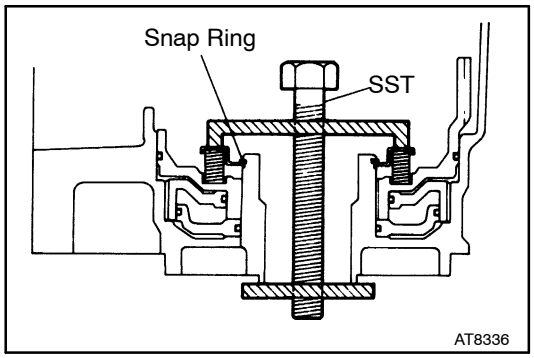


41. REMOVE BRAKE DRUM GASKET



42. CHECK PISTON STROKE OF FIRST AND REVERSE BRAKE

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



43. REMOVE COMPONENTS OF FIRST AND REVERSE BRAKE PISTON

(a) Set SST on the spring retainer, and compress the return spring.

SST 09350–30020 (09350–07050)

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

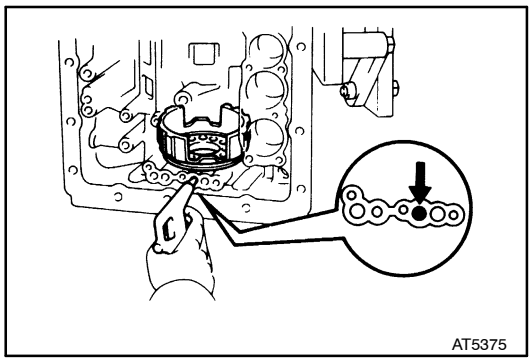
(c) Remove the piston return spring.

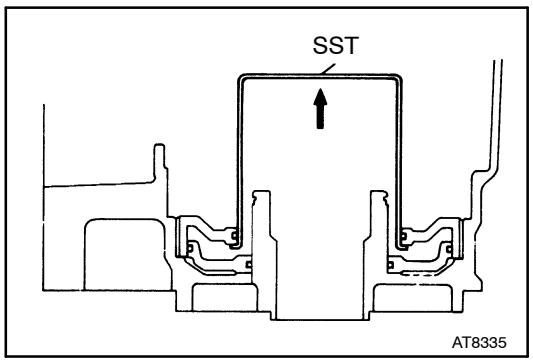
(d) Hold No. 2 first and reverse brake piston with hand, apply compressed air to the transmission case to remove No. 2 first and reverse brake piston.

(e) Remove No. 2 first and reverse brake piston.

If the piston does not pop out with compressed air, lift the piston out with needle–nose pliers.

(f) Remove the O–ring from No. 2 piston.

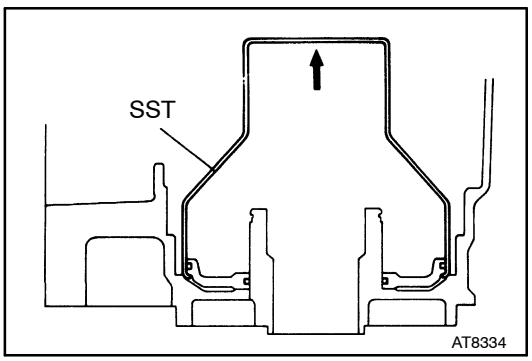




(g) Install SST behind the reaction sleeve and gradually lift it out on the transmission case.

SST 09350–30020 (09350–07080)

(h) Remove the O–ring from the reaction sleeve.



(i) Install SST behind No. 1 brake piston and gradually lift it out of the transmission case.

SST 09350–30020 (09350–07090)

(j) Remove the two O–rings from No. 1 piston.

INSTALLATION OF COMPONENT PARTS (A340F)

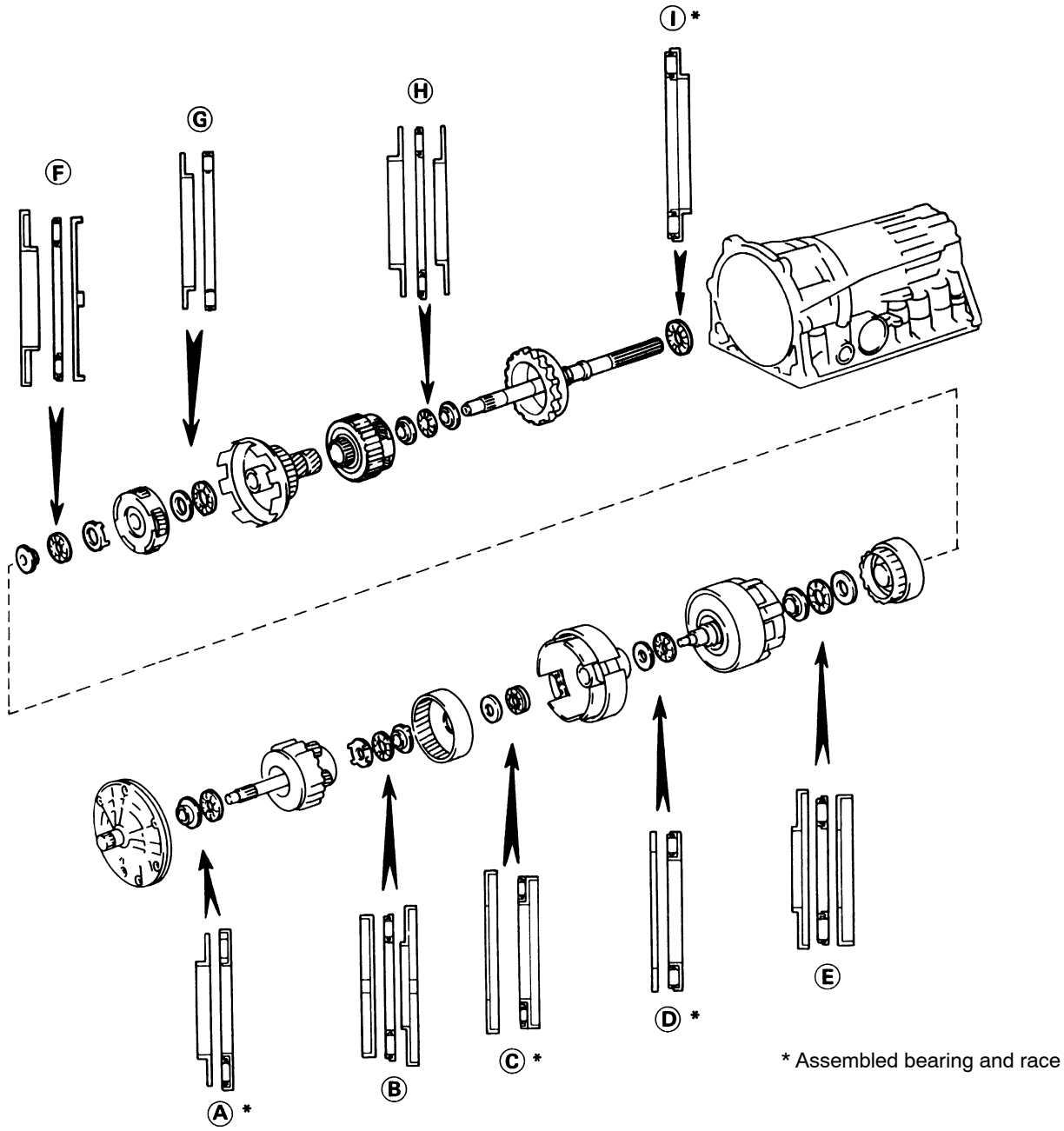
(See pages AT–126 to AT–127)

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

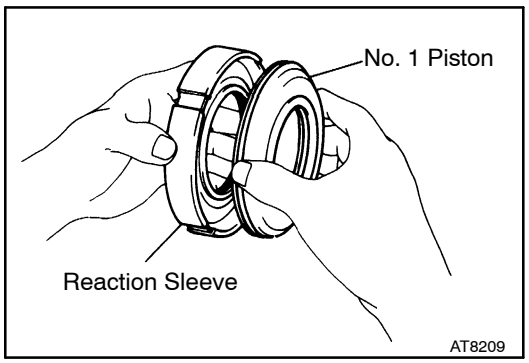
GENERAL NOTES:

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

INSTALLATION POSITION AND DIRECTION OF BEARINGS AND RACES



	Front Bearing Race		Thrust Bearing		Rear Bearing Race	
	Inner Diameter	Outer Diameter	Inner Diameter	Outer Diameter	Inner Diameter	Outer Diameter
Ⓐ	28.1 (1.106)	47.3 (1.862)	28.9 (1.138)	50.2 (1.976)	—	—
Ⓑ	27.1 (1.067)	41.8 (1.646)	26.0 (1.024)	46.8 (1.843)	24.2 (0.953)	47.8 (1.882)
Ⓒ	37.1 (1.461)	59.0 (2.323)	33.6 (1.323)	50.3 (1.980)	—	—
Ⓓ	36.8 (1.449)	50.9 (2.004)	33.7 (1.327)	47.6 (1.874)	—	—
Ⓔ	26.0 (1.024)	48.9 (1.925)	26.0 (1.024)	46.7 (1.839)	26.8 (1.055)	47.0 (1.850)
Ⓕ	30.6 (1.205)	53.6 (2.110)	32.6 (1.283)	47.7 (1.878)	34.3 (1.350)	47.8 (1.882)
Ⓖ	33.7 (1.327)	47.6 (1.874)	35.5 (1.398)	47.7 (1.878)	—	—
Ⓗ	28.8 (1.134)	44.8 (1.764)	30.1 (1.185)	44.7 (1.760)	27.8 (1.094)	44.8 (1.764)
Ⓘ	—	—	39.2 (1.543)	57.7 (2.272)	—	—



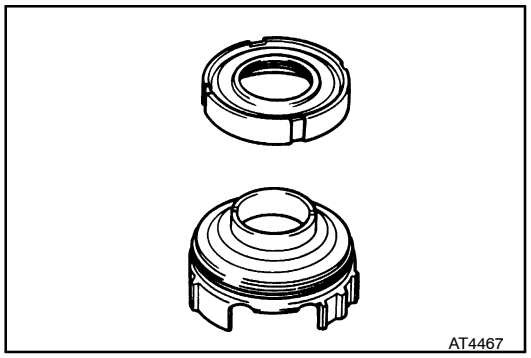
1. INSTALL COMPONENTS OF FIRST AND REVERSE BRAKE PISTON

(a) Coat three O–rings with ATF.

(b) Install the two O–rings on No. 1 piston.

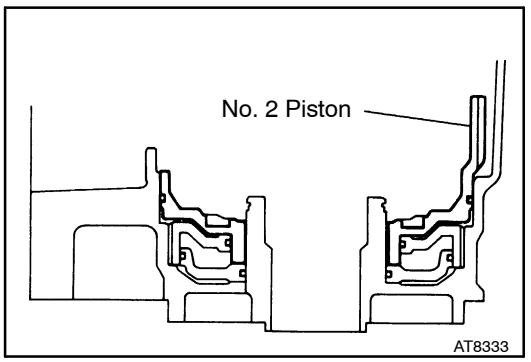
(c) Install the O–ring on the reaction sleeve.

(d) Install No. 1 piston to the reaction sleeve.



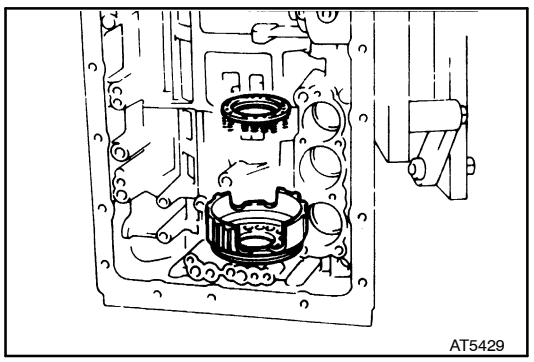
(e) Coat a new O–ring with ATF and install it on No. 2 piston.

(f) Install No. 1 piston with the reaction sleeve onto No. 2 piston.

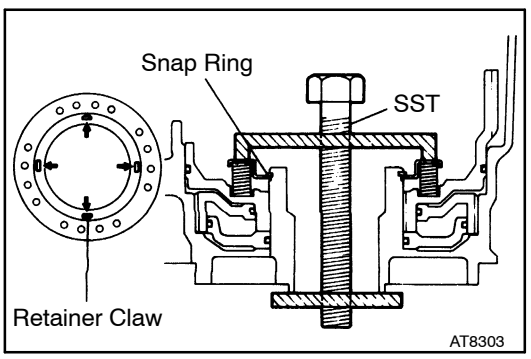


(g) Align the teeth of No. 2 piston into the proper grooves.

(h) Being careful not to damage the O–rings, press in No. 2 and No. 1 first and reverse brake pistons into the transmission case.



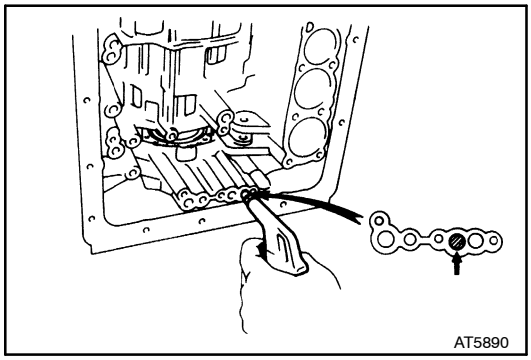
(i) Place the piston return spring onto No. 2 piston.



(j) Set SST as shown, and compress the return spring with SST.

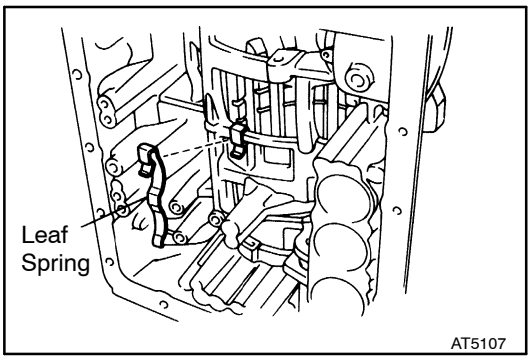
SST 09350–30020 (09350–07050)

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

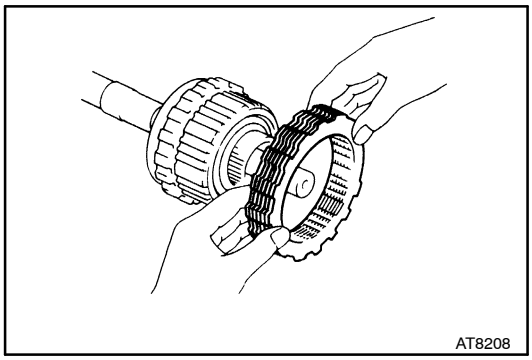


2. CHECK PISTON STROKE OF FIRST AND REVERSE BRAKE

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



3. INSTALL LEAF SPRING



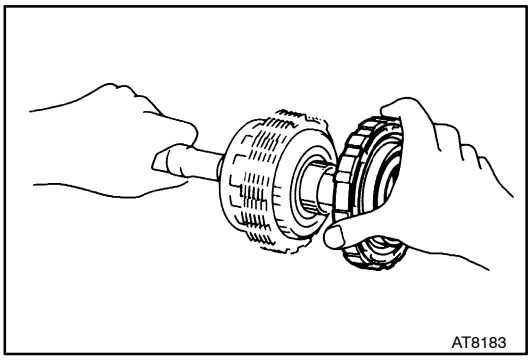
4. INSTALL REAR PLANETARY GEAR UNIT WITH SECOND BRAKE DRUM, FIRST AND REVERSE BRAKE PACK AND OUTPUT SHAFT

(a) Install one plate.

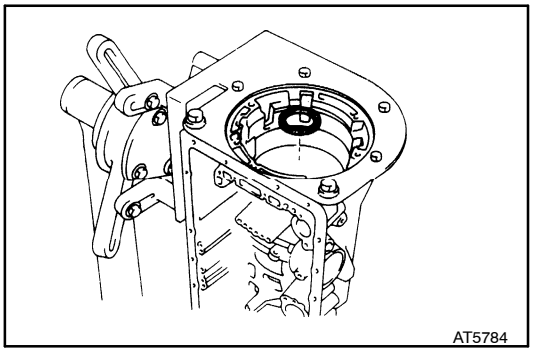
(b) Install the flange, the rounded edge facing forward.

(c) Re–install the plates and discs.

Install in order: P = Plate D = Disc
D–P–D–P–D–P–D–P–D–P



(d) Install the second brake drum assembly.

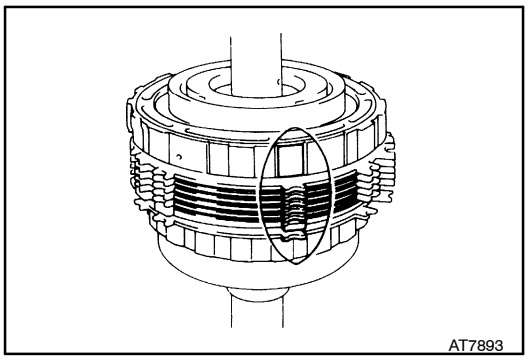


(e) Coat the assembled bearing and race with petroleum jelly and install it onto the case.

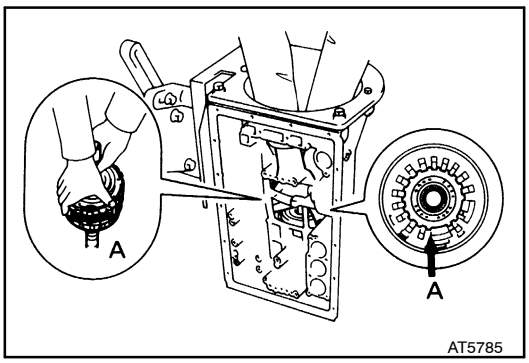
HINT: Assembled bearing and race diameter

mm (in.)

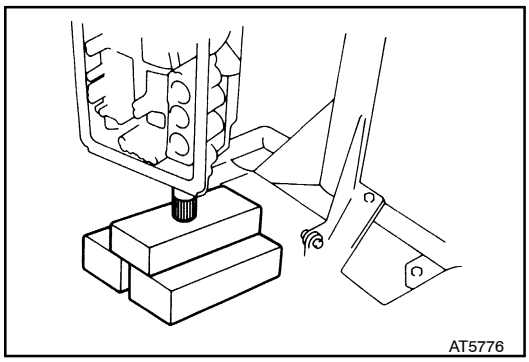
	Inside	Outside
Bearing and race	39.2 (1.543)	57.7 (2.272)



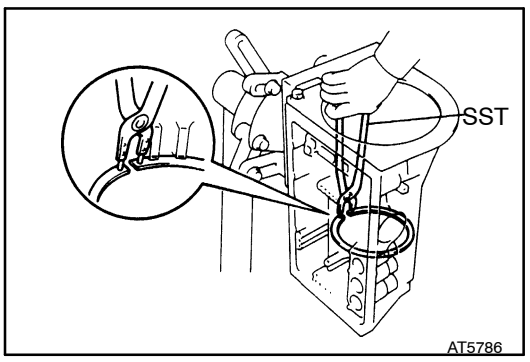
(f) Align the teeth of the second brake drum, flange, discs and plates as shown in the figure.



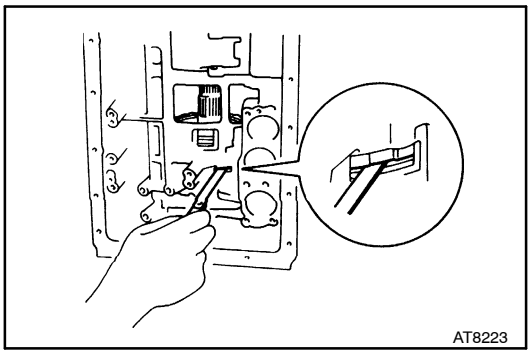
(g) Align the splines of the transmission case and the assembled rear planetary gear, second brake drum, first and reverse brake pack and output shaft, indicated by A.



(h) Hold the output shaft with wooden blocks or equivalents.



(i) Using SST, install the snap ring.
SST 09350–30020 (09350–07060)



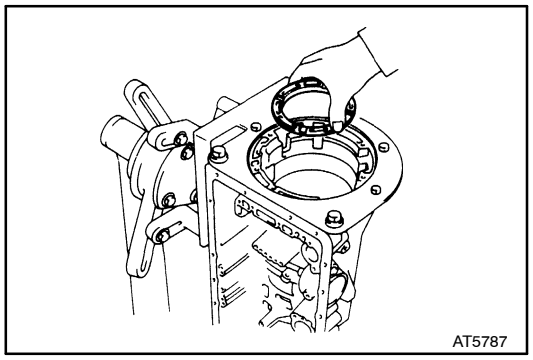
5. CHECK PACK CLEARANCE OF FIRST AND REVERSE BRAKE

Using a feeler gauge, measure the clearance between the plate and second brake drum as shown in the figure.
Clearance: 0.50 – 1.02 mm (0.0197 – 0.0402 in.)
If the values are nonstandard, select another flange.

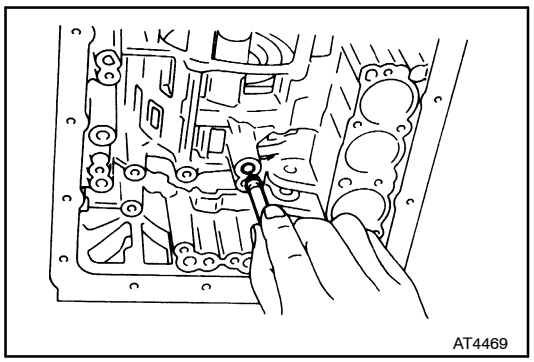
HINT: There are six different thicknesses for the flange.

Flange Thickness mm (in.)

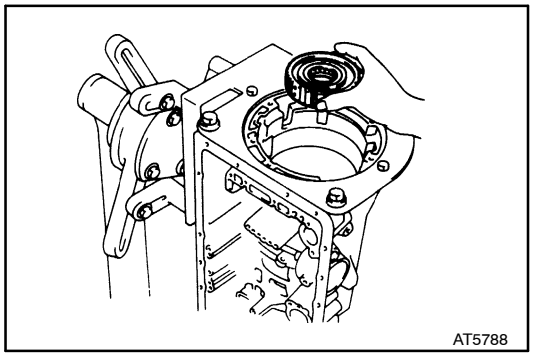
No.	Thickness	No.	Thickness
50	5.0 (0.197)	53	4.4 (0.173)
51	4.8 (0.189)	54	4.2 (0.165)
52	4.6 (0.181)	55	4.0 (0.157)



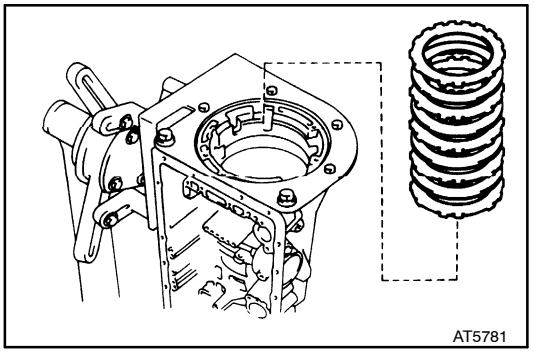
6. INSTALL SECOND BRAKE PISTON SLEEVE



7. INSTALL NEW BRAKE DRUM GASKET



8. INSTALL NO. 1 ONE–WAY CLUTCH



9. INSTALL FLANGE, PLATES AND DISCS OF SECOND BRAKE

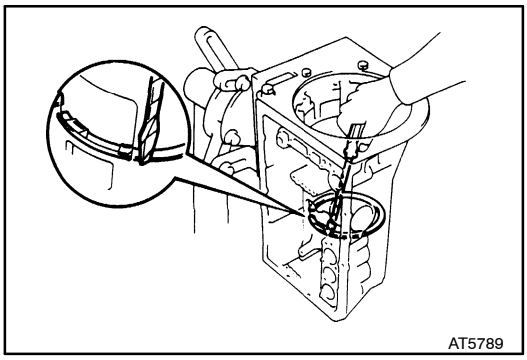
(a) Install the plate with the rounded edge side of the plate facing the discs.

Plate thickness: 2.5 mm (0.098 in.)

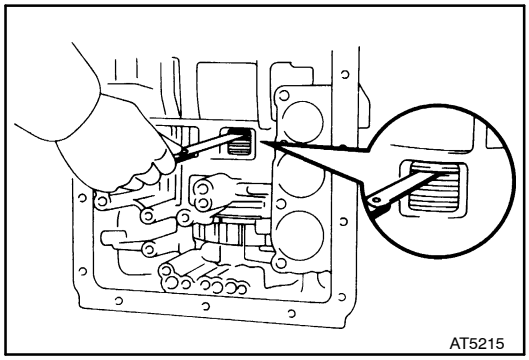
(b) Install the plates and discs.

Install in order: P = Plate D = Disc
D–P–D–P–D–P–D

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

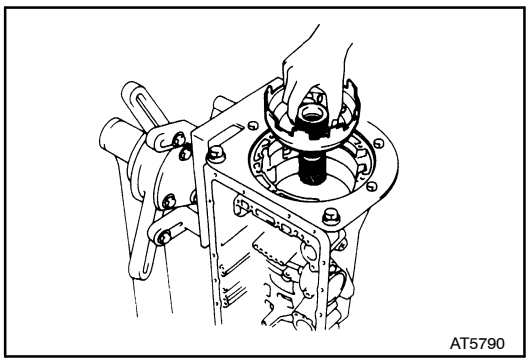


(d) Install the snap ring.



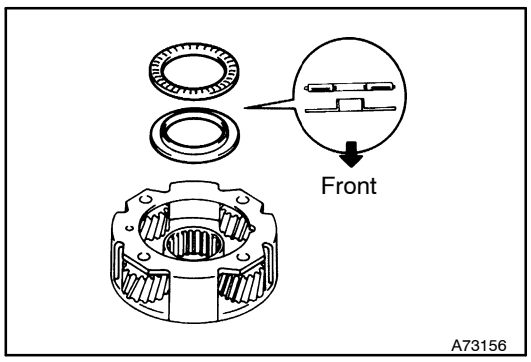
10. CHECK PACK CLEARANCE OF SECOND BRAKE

Using a feeler gauge, measure the clearance between the snap ring and flange as shown in the figure.
Clearance: 0.50 – 1.76 mm (0.0197 – 0.0693 in.)
If the values are nonstandard, check for an improper installation.



11. INSTALL PLANETARY SUN GEAR

While turning the planetary sun gear clockwise, install it into No. 1 one–way clutch.
HINT: Confirm the thrust washer is installed correctly.



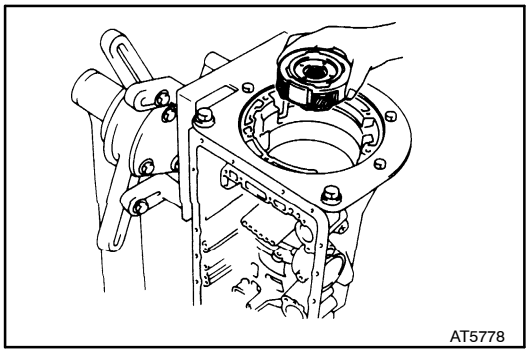
12. INSTALL FRONT PLANETARY GEAR

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

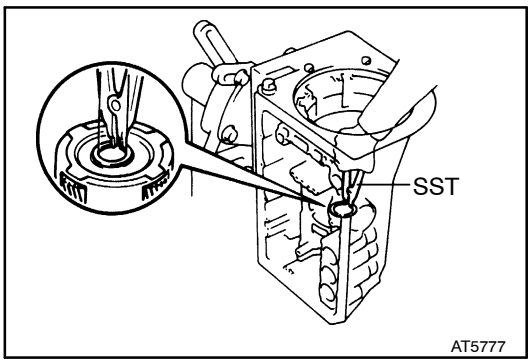
HINT: Bearing and race diameter

mm (in.)

	Inside	Outside
Bearing	35.5 (1.398)	47.7 (1.878)
Race	33.7 (1.327)	47.6 (1.874)



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



(c) Using SST, install the snap ring.

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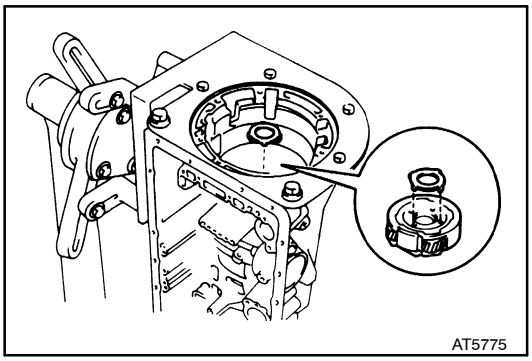
(d) Remove the wooden blocks or equivalents under the output shaft.

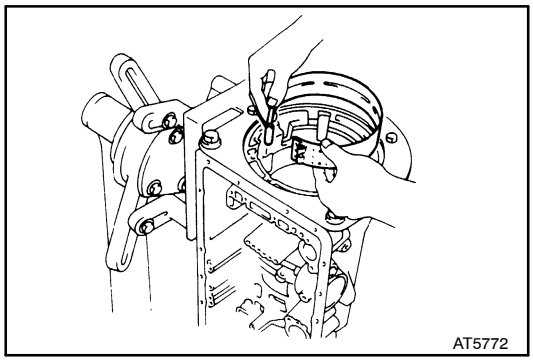


(e) Coat the bearing race with petroleum jelly and install it onto the front planetary gear.

HINT: Race diameter

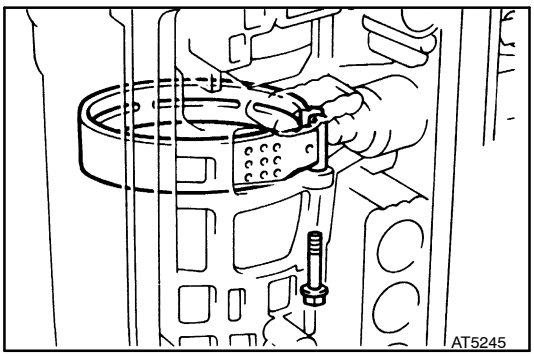
mm (in.)

	Inside	Outside
Race	34.3 (1.350)	47.8 (1.882)

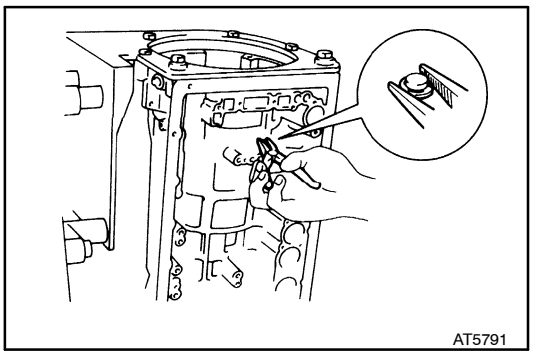


13. INSTALL SECOND COAST BRAKE BAND

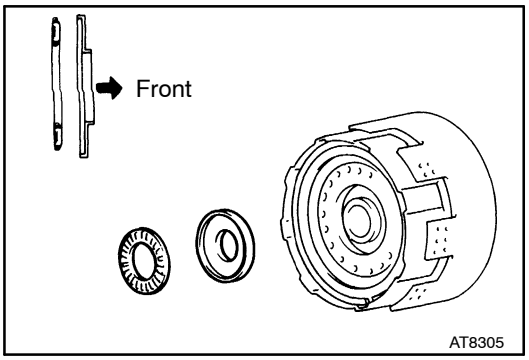
(a) Install the second coast brake band to the case.



(b) Install the pin through the brake band.



(c) Install the E–ring to the pin.



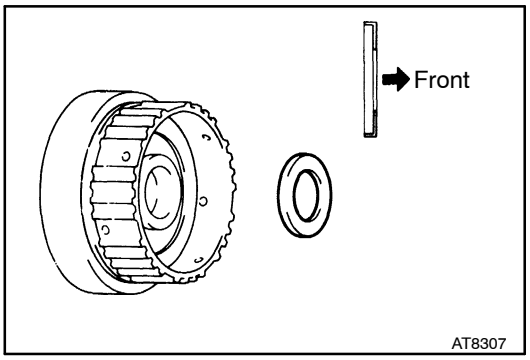
14. INSTALL FRONT PLANETARY RING GEAR TO FORWARD AND DIRECT CLUTCH

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

HINT: Bearing and race diameter

mm (in.)

	Inside	Outside
Bearing	26.0 (1.024)	46.7 (1.839)
Race	26.0 (1.024)	48.9 (1.925)

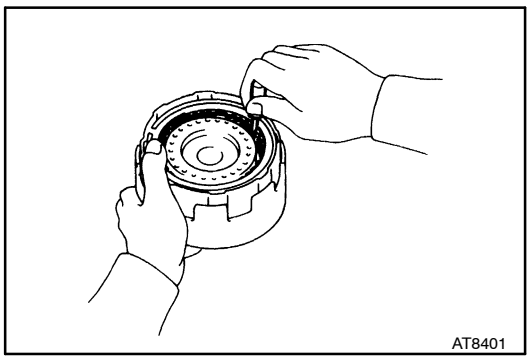


(b) Coat the race with petroleum jelly and install it onto the front planetary ring gear.

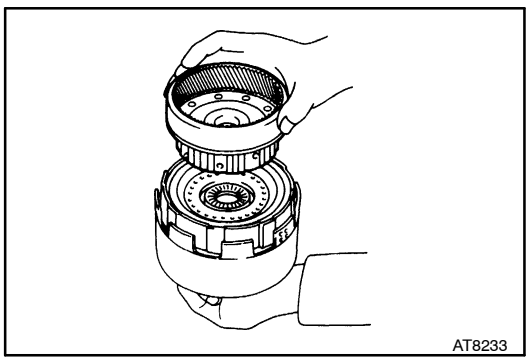
HINT: Race diameter

mm (in.)

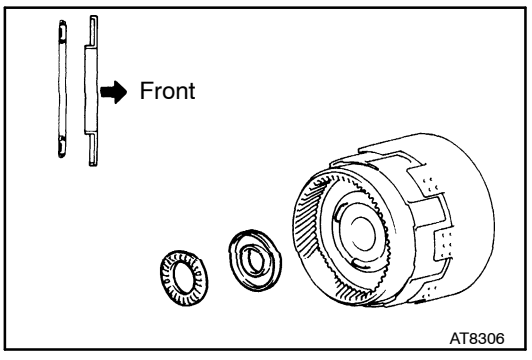
	Inside	Outside
Race	26.8 (1.055)	47.0 (1.850)



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



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



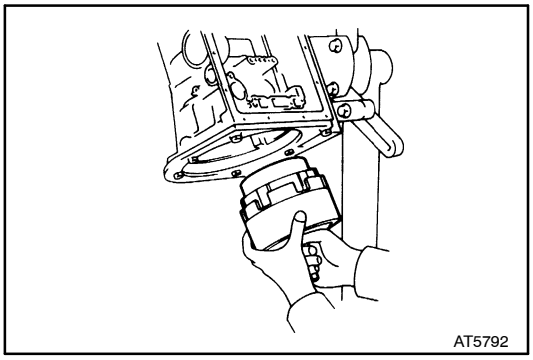
15. INSTALL ASSEMBLED DIRECT CLUTCH, FORWARD CLUTCH AND FRONT PLANETARY RING GEAR INTO CASE

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

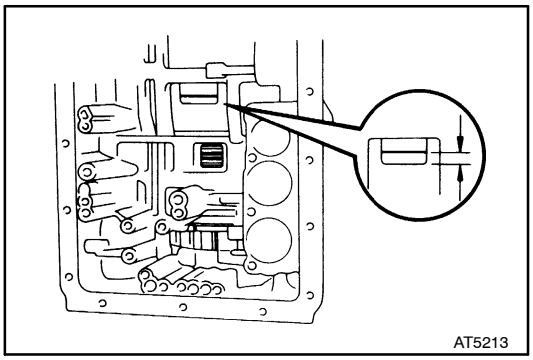
HINT: Bearing and race diameter

mm (in.)

	Inside	Outside
Bearing	32.6 (1.283)	47.7 (1.878)
Race	30.6 (1.205)	53.6 (2.110)



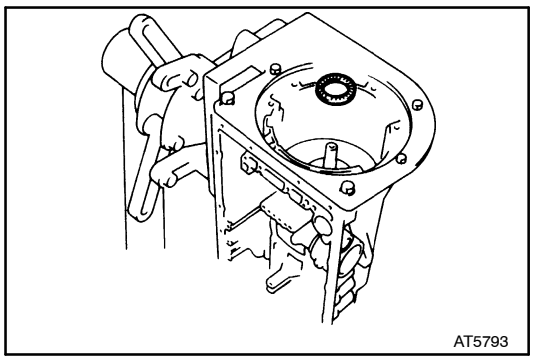
(b) Install the assembled direct clutch, forward clutch and front planetary ring gear into the transmission case.



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

Height: 9.8 – 11.8 mm (0.386 – 0.465 in.)

If the values are nonstandard, check for an improper installation.

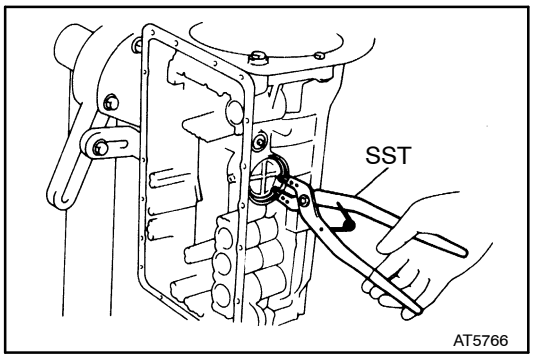


(d) Coat the assembled bearing and race with petroleum jelly and install it onto the forward clutch.

HINT: Assembled bearing and race diameter

mm (in.)

	Inside	Outside
Bearing and race	33.7 (1.327)	47.6 (1.874)



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

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

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

(c) Using SST, install the snap ring.

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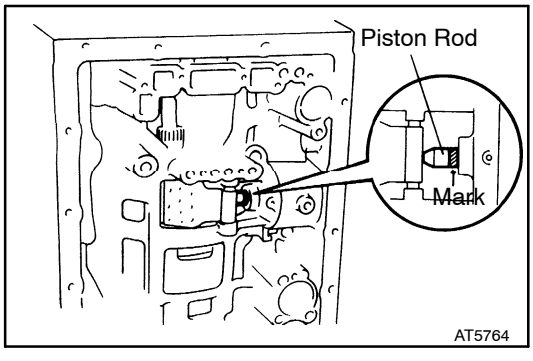
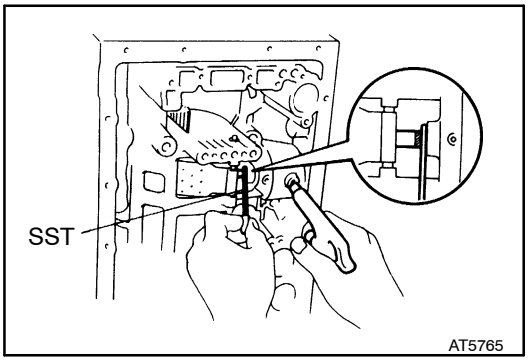


17. CHECK PISTON ROD STROKE OF SECOND COAST BRAKE

(a) Place a mark on the second coast brake piston rod as shown in the figure.

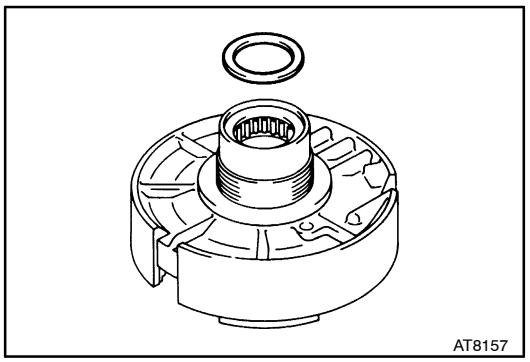


(b) Using SST, measure the stroke applying the compressed air (4 – 8 kg /cm^2, 57 – 114 psi or 392 – 785 kPa) as shown in the figure.

SST 09240–00020

Piston rod stroke: 1.5 – 3.0 mm (0.059 – 0.118 in.)

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



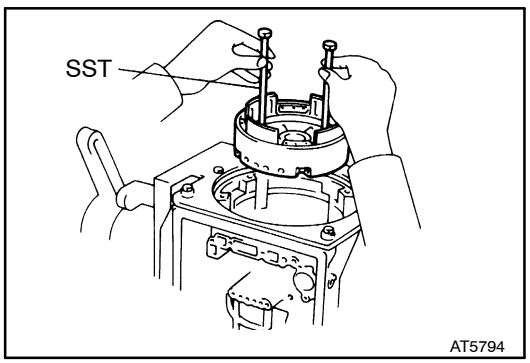
18. INSTALL OVERDRIVE SUPPORT ASSEMBLY

(a) Coat the race with petroleum jelly and install it onto the overdrive support assembly.

HINT: Race diameter

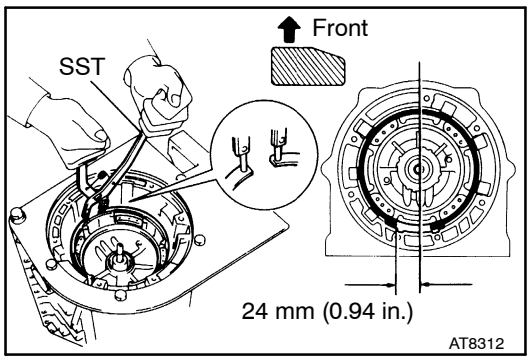
mm (in.)

	Inside	Outside
Race	36.8 (1.449)	50.9 (2.004)



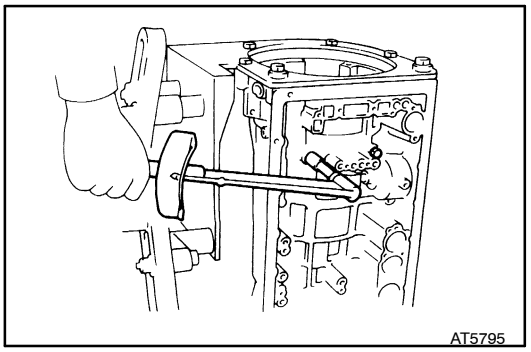
(b) Using two bolts of SST, aim the bolt and oil holes of the overdrive support toward the valve body side, and align them with the bolt holes of the transmission case and insert.

SST 09350–30020 (09350–07020)



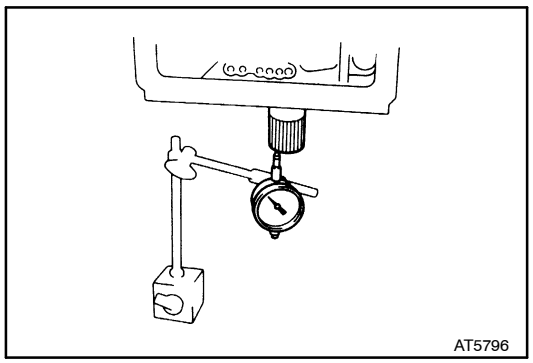
(c) Using SST, install the snap ring as shown in the figure.

SST 09350–30020 (09350–07060)



(d) Install and torque the two bolts.

Torque: 260 kg–cm (19 ft–lb, 25 N–m)

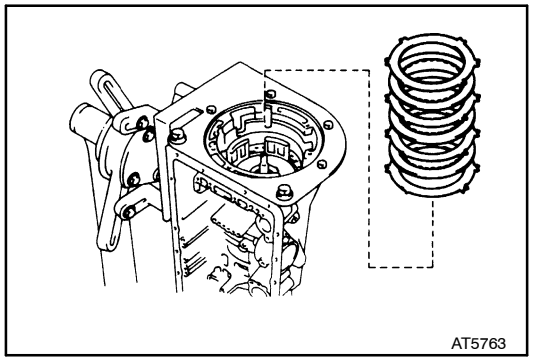


19. CHECK OUTPUT SHAFT

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

End play: 0.27 – 0.86 mm (0.0106 – 0.0339 in.)
If the values are nonstandard, check for an improper installation.

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



20. INSTALL FLANGES, PLATES AND DISCS OF OVERDRIVE BRAKE

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

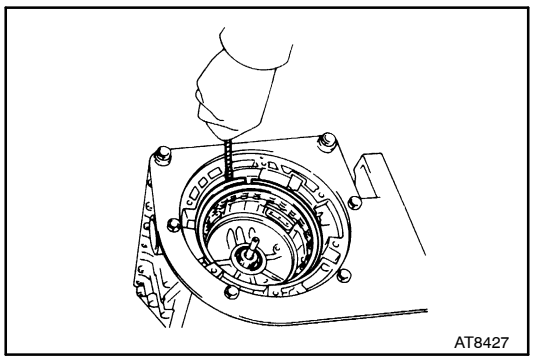
(b) Install the plates and discs.

Install in order: P = Plate D = Disc

D–P–D–P–D

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

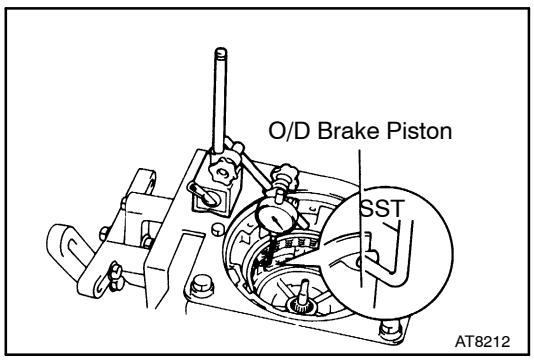
(d) Install the snap ring.



21. CHECK PISTON STROKE OF OVERDRIVE BRAKE

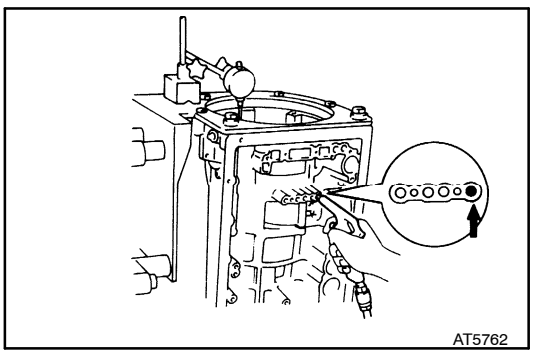
(a) Place SST and a dial indicator onto the overdrive brake piston as shown in the figure.

SST 09350–30020 (09350–06120)



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

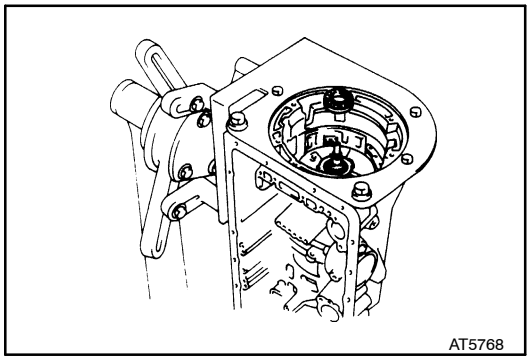
Piston stroke: 1.32 – 1.62 mm (0.0520 – 0.0638 in.)
If the piston stroke is less than the limit, parts may have been assembled incorrectly, check and reassemble again.
If the piston stroke is nonstandard, select another flange.



HINT: There are seven different thickness for the flange.

mm (in.)

No.	Thickness	No.	Thickness
26	3.3 (0.130)	11	3.8 (0.150)
25	3.5 (0.138)	23	3.9 (0.154)
12	3.6 (0.142)	None	4.0 (0.157)
24	3.7 (0.146)		


AT5768

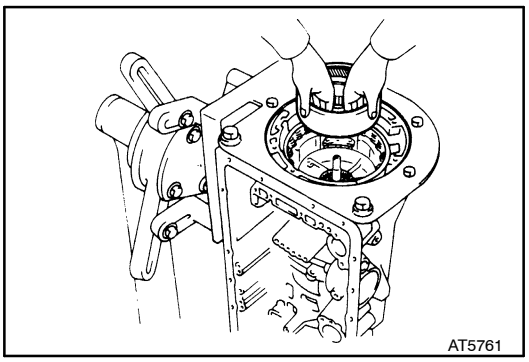
22. INSTALL OVERDRIVE PLANETARY GEAR UNIT WITH OVERDRIVE DIRECT CLUTCH AND ONE–WAY CLUTCH

(a) Coat the assembled bearing and race with petroleum jelly and install it onto the overdrive support.

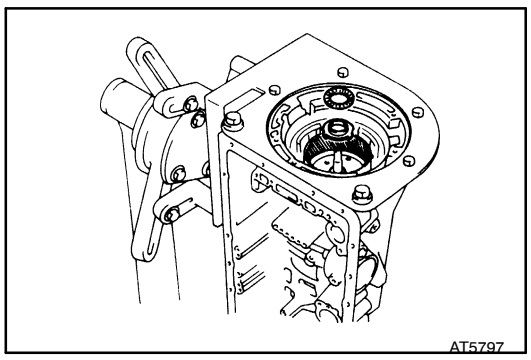
HINT: Assembled bearing and race diameter

mm (in.)

	Inside	Outside
Bearing and race	37.1 (1.461)	59.0 (2.323)


AT5761

(b) Install the overdrive planetary ring gear.

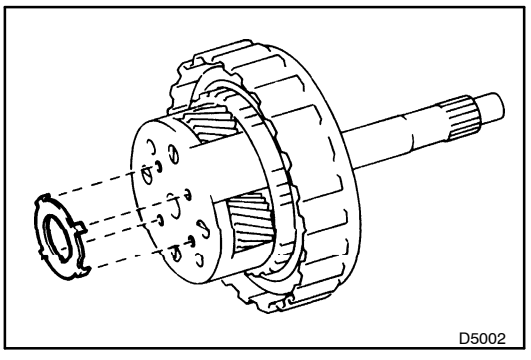

AT5797

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

HINT: Bearing and race diameter

mm (in.)

	Inside	Outside
Bearing	26.0 (1.024)	46.8 (1.843)
Race	24.2 (0.953)	47.8 (1.882)

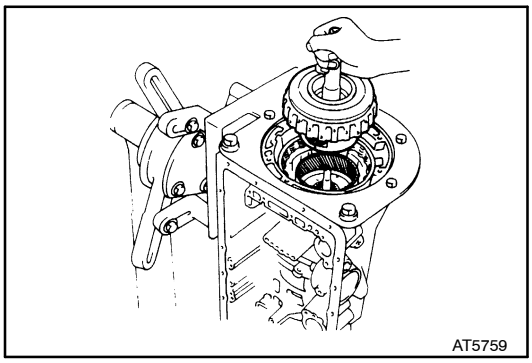

D5002

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

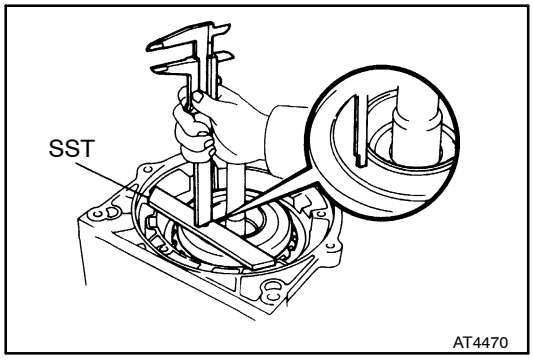
HINT: Race diameter

mm (in.)

	Inside	Outside
Race	27.1 (1.067)	41.8 (1.646)


AT5759

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



AT4470

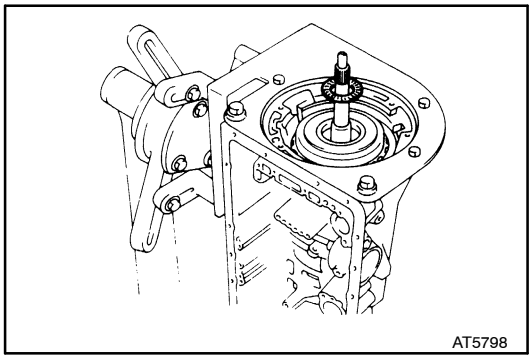
(f) Place SST on the transmission case.

SST 09350–36010 (09350–06090)

(g) Using calipers, measure distance between the tops of SST and the clutch drum.

Standard distance: 15.5 – 16.5 mm (0.610 – 0.650 in.)

If the values are nonstandard, check for an improper installation.

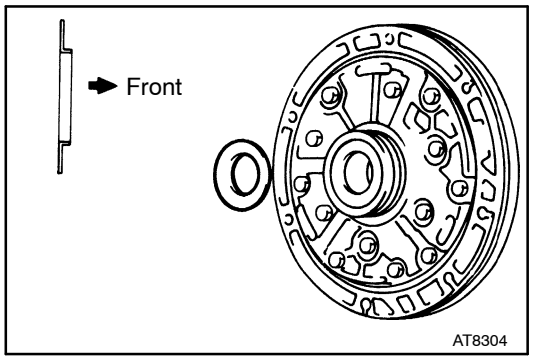

AT5798

(h) Coat the assembled bearing and race with petroleum jelly and install it onto the O/D direct clutch.

HINT: Assembled bearing and race diameter

mm (in.)

	Inside	Outside
Bearing and race	28.9 (1.138)	50.2 (1.976)



AT8304

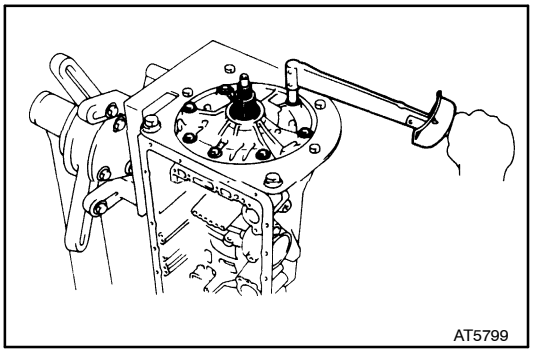
23. INSTALL OIL PUMP INTO CASE

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

HINT: Race diameter

mm (in.)

	Inside	Outside
Race	28.1 (1.106)	47.3 (1.862)


AT5799

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

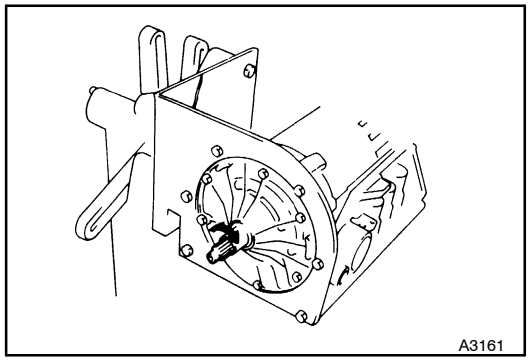
(c) Place the oil pump through the input shaft, and align the bolt holes of the pump body with the transmission case.

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

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

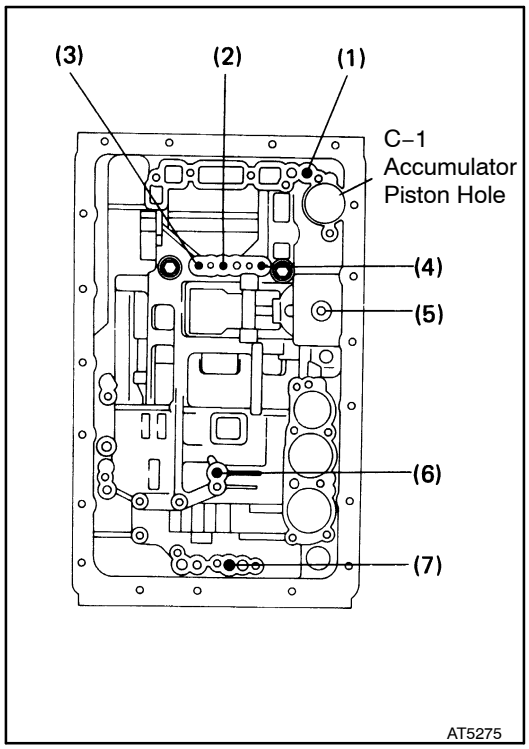
(e) Install the seven bolts.

Torque: 220 kg–cm (16 ft–lb, 22 N–m)



24. CHECK INPUT SHAFT ROTATION

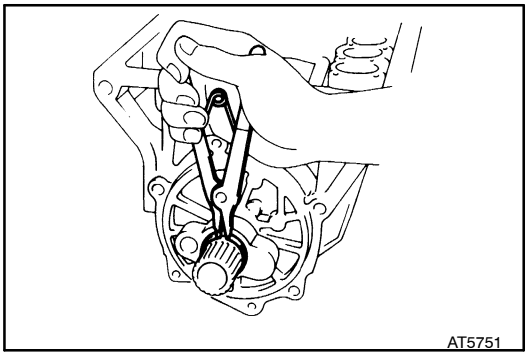
Make sure the input shaft rotates smoothly.



25. INDIVIDUAL PISTON OPERATION INSPECTION

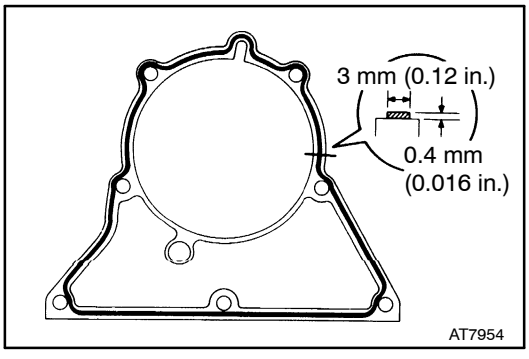
Check for the sound of operation while applying compressed air into the oil hole indicated in the figure.
HINT: When inspecting the O/D direct clutch, check with the C_0 accumulator piston hole closed.
If there is no noise, disassemble and check the installation condition of the parts.

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



26. INSTALL SPEED SENSOR ROTOR AND KEY

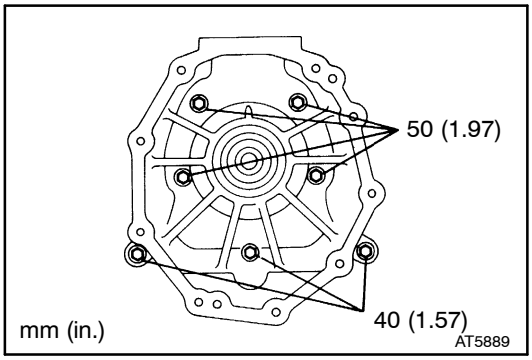
(a) Install the key on the output shaft.
(b) Align the groove of the sensor rotor with the key, install the sensor rotor.
(c) Using snap ring pliers, install the snap ring.



27. INSTALL TRANSFER CASE

(a) Clean contacting surface of any residual packing material using gasoline alcohol.
(b) Apply seal packing to the case as shown in the figure.

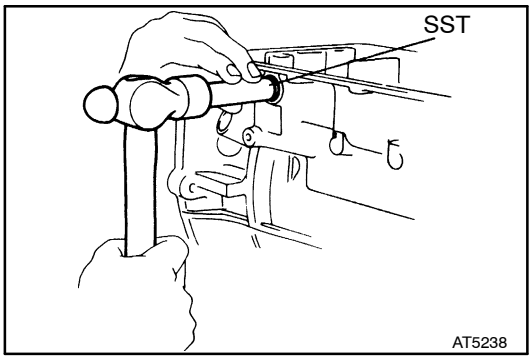
Seal packing: Part No. 08826 – 00090, THREE BOND 1281 or equivalent



(c) Install the case and torque the seven bolts.

Torque: 345 kg–cm (25 ft–lb, 34 N–m)

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

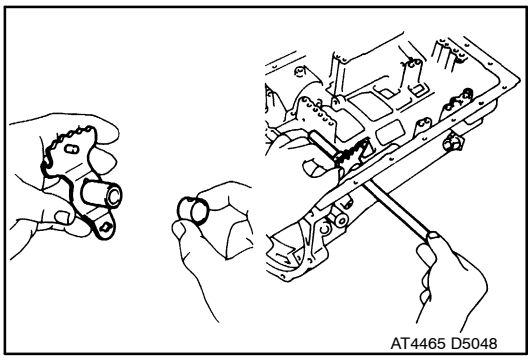


28. INSTALL MANUAL VALVE LEVER, SHAFT AND OIL SEALS

(a) Using SST, drive in two new oil seals.

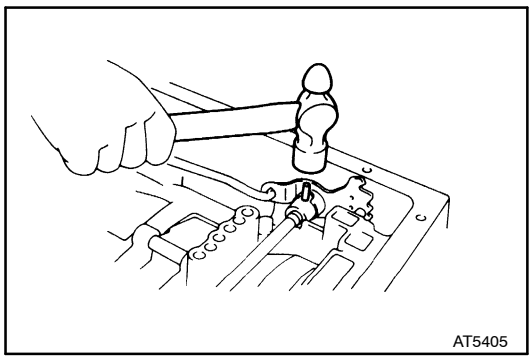
SST 09350–30020 (09350–07110)

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

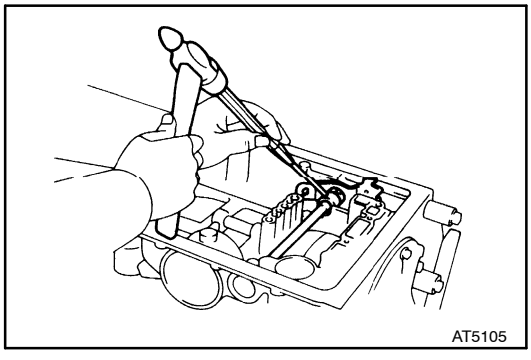


(c) Install a new spacer to the manual valve lever.

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

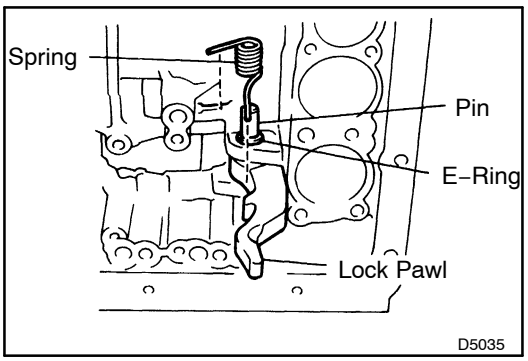


(e) Using a hammer, drive in a new spring pin.



(f) Match the manual valve lever indentation with the spacer hole and caulk them th the punch.

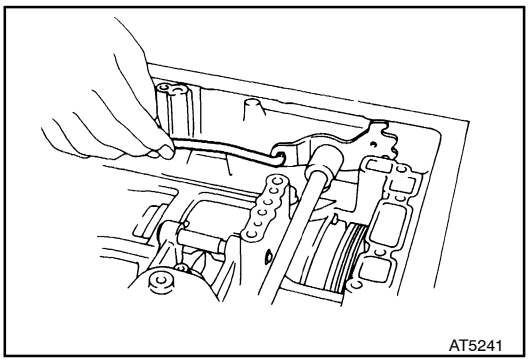
(g) Make sure the shaft rotates smoothly.



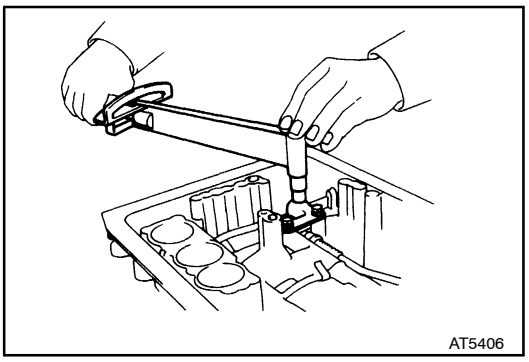
29. INSTALL PARKING LOCK PAWL AND ROD

(a) Install the E–ring to the shaft.

(b) Install the parking lock pawl, shaft and spring.

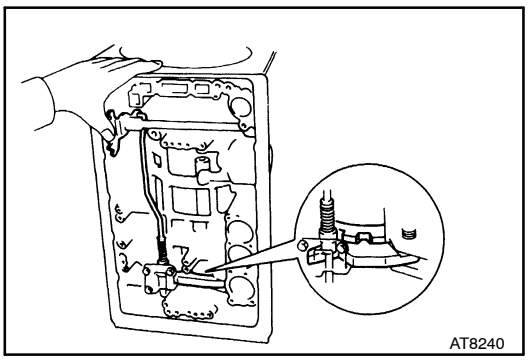


(c) Connect the parking lock rod to the manual valve lever.

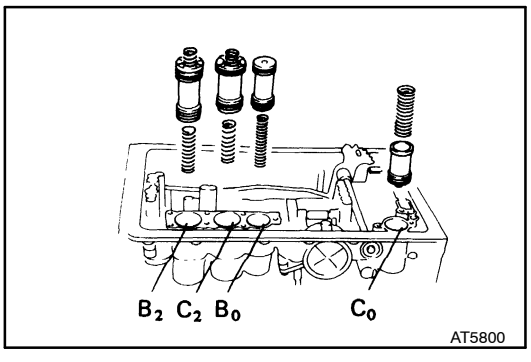


(d) Place the parking lock pawl bracket onto the transmission case and torque the three bolts.

Torque: 75 kg–cm (65 in.–lb, 7 N–m)



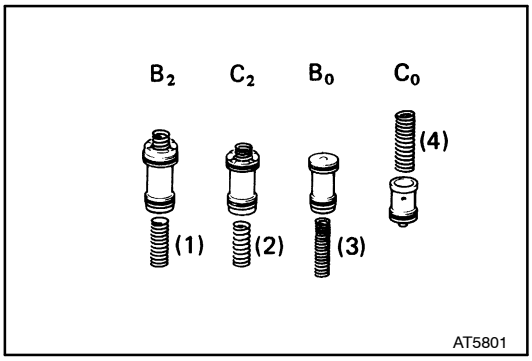
(e) Shift the manual valve lever to the P position, and confirm the planetary ring gear is correctly locked up by the lock pawl.



34. INSTALL ACCUMULATOR SPRINGS AND PISTONS

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

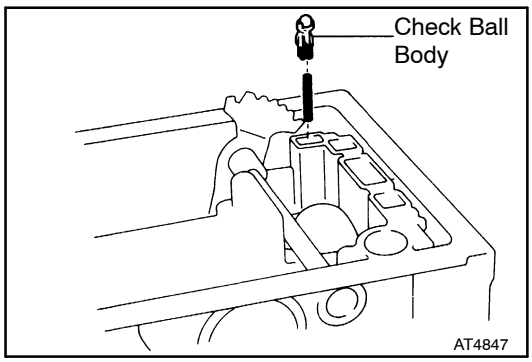
(b) Install the four springs and pistons to the bore as shown in the figure.



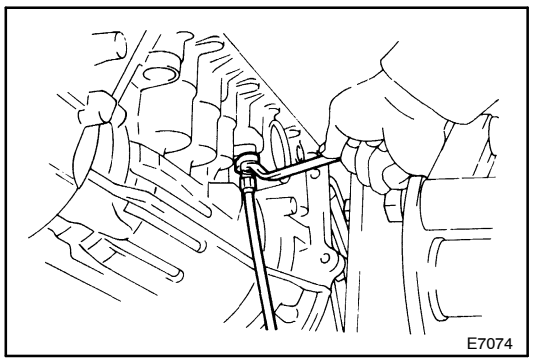
HINT: The pistons are marked in relief with either C–0, B–0, C–2, B–2 to differentiate between them.

mm (in.)

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



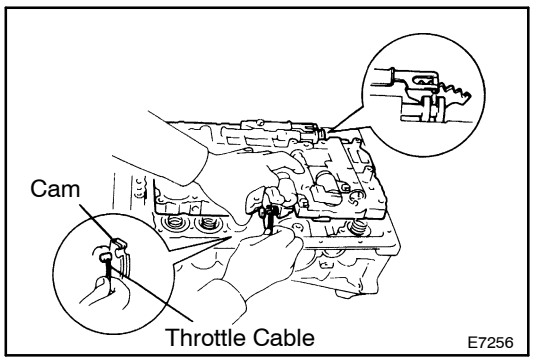
31. INSTALL CHECK BALL BODY AND SPRING



32. INSTALL THROTTLE CABLE

(a) Coat a new O–ring with ATF and install it to the cable.

(b) Install the cable to the case.

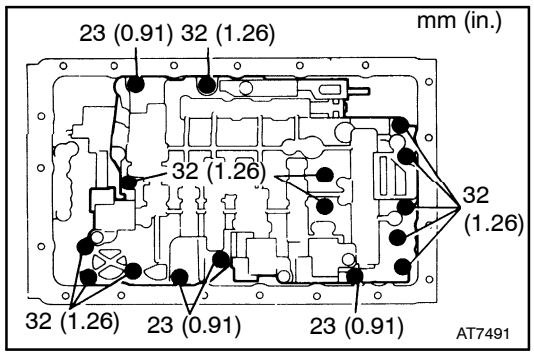


33. INSTALL VALVE BODY

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

(b) Connect the throttle cable to the cam.

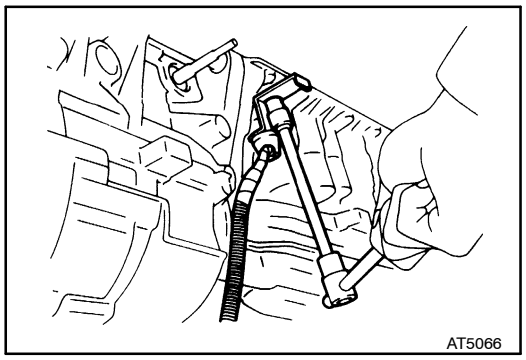
(c) Confirm the springs into the accumulator pistons are installed correctly.



(d) Install the sixteen bolts.

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

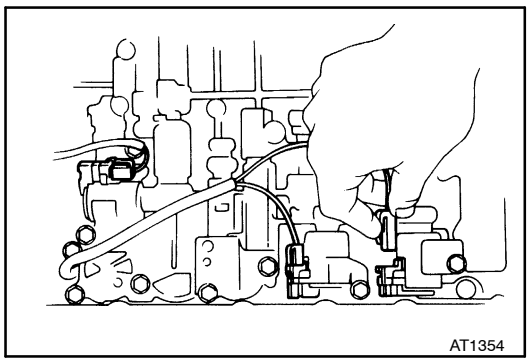
Torque: 100 kg–cm (7 ft–lb, 10 N–m)



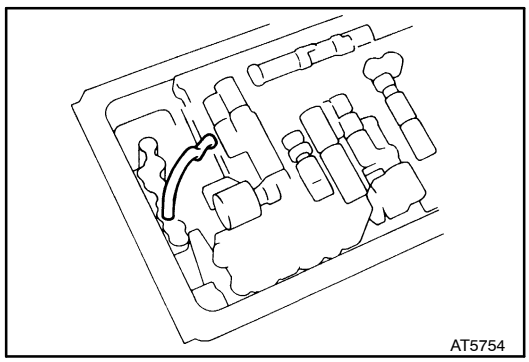
34. INSTALL TRANSMISSION SOLENOID WIRING

(a) Coat a new O–ring with ATF and install it to the grommet.

(b) Insert the solenoid wiring to the case and install the stopper plate.



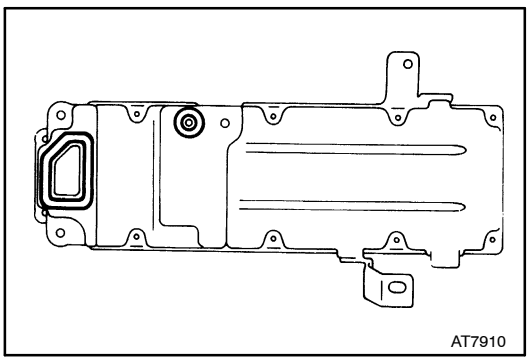
(c) Connect the connectors to No. 1, No. 2 and lock–up solenoids.



35. INSTALL OIL TUBE

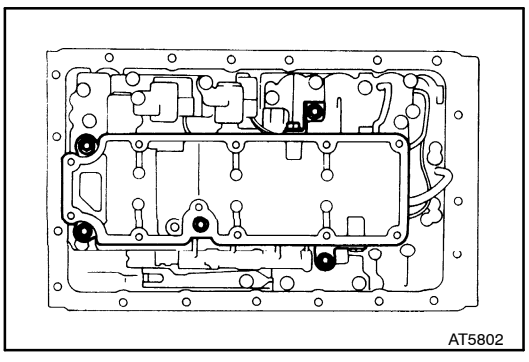
Using a plastic hammer, install the tube into position shown in the figure.

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



36. INSTALL OIL STRAINER AND GASKETS

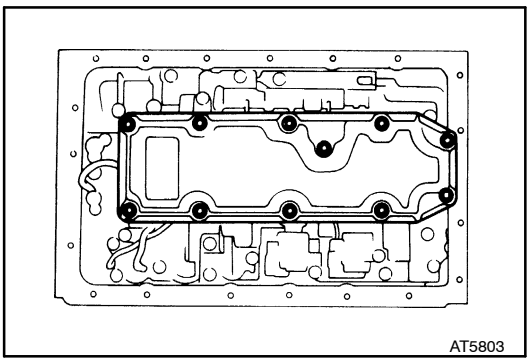
(a) Install two new gaskets to the oil strainer case.



(b) Install the oil strainer case and torque the five bolts.

Torque: 100 kg–cm (7 ft–lb, 10 N–m)

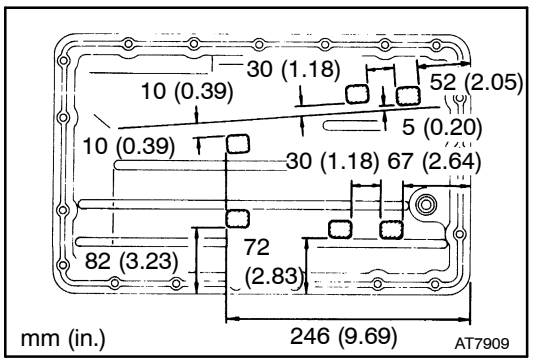
HINT: Each bolt length (mm, in.) is indicated in the figure.



(c) Install a new gasket to the oil strainer case.

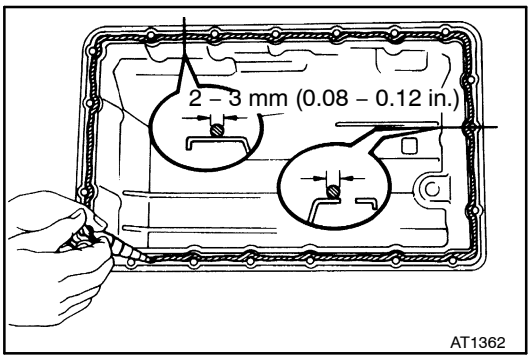
(d) Install the oil strainer and torque the eleven bolts.

Torque: 70 kg–cm (61 in.–lb, 6.9 N–m)



37. INSTALL OIL PAN

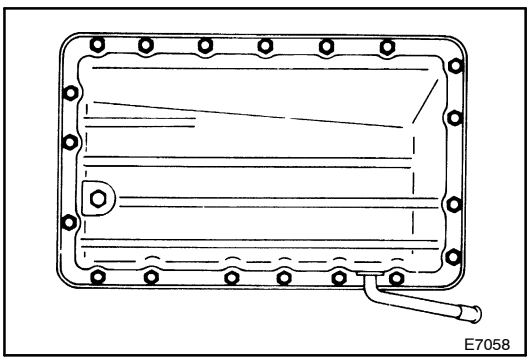
(a) Install the six magnets as shown in the figure.



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

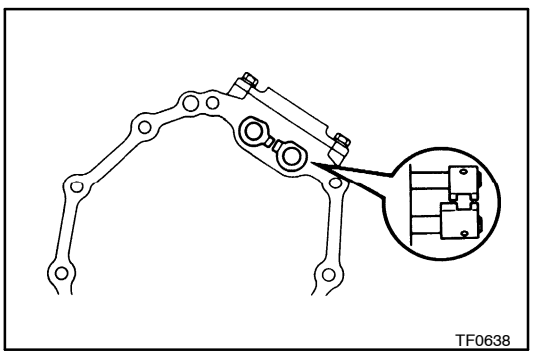
(c) Apply seal packing to the oil pan as shown in the figure.

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



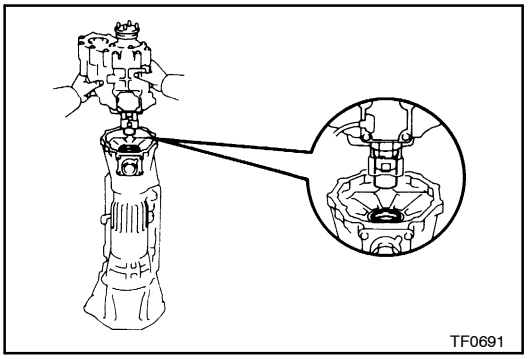
(d) Install and torque the nineteen bolts.

Torque: 75 kg–cm (65 in.–lb, 7.4 N–m)



38. INSTALL TRANSFER AND PROPELLER SHAFT UPPER DUST COVER TO TRANSMISSION WITH NEW GASKET

(a) Shift the two shift fork shafts to the high–four position.

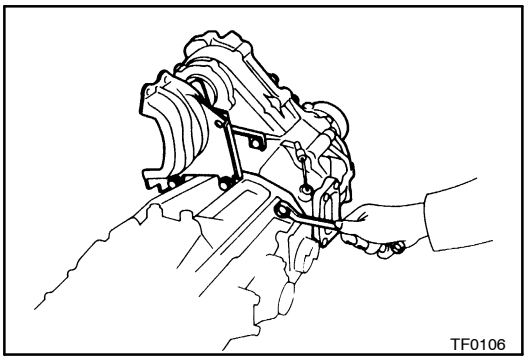


(b) Apply MP grease to the adaptor oil seal.

(c) Place a new gasket to the transfer adaptor.

(d) Install the transfer to the transmission.

HINT: Take care not to damage the oil seal by the input gear spline when installing the transfer.

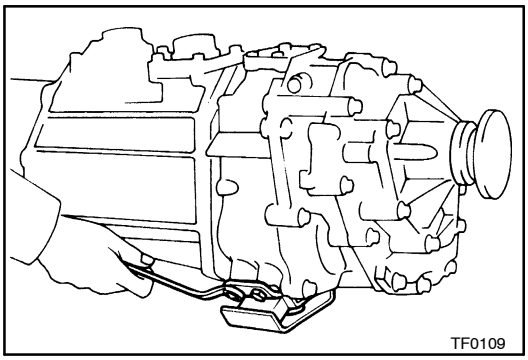


(e) Install and torque the bolts with the propeller shaft upper dust cover.

Torque: 370 kg–cm (27 ft–lb, 36 N–m)

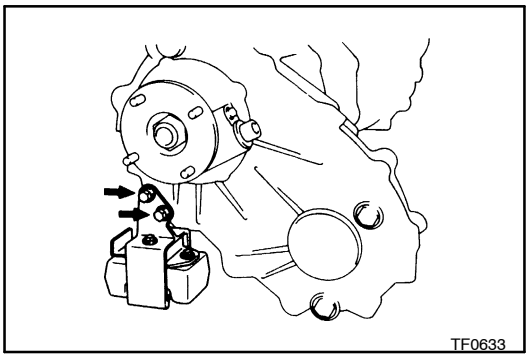
(f) Install the dust cover bolt to the bracket.

Torque: 230 kg–cm (17 ft–lb, 23 N–m)



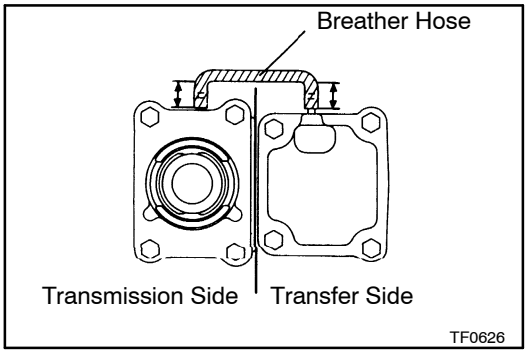
39. INSTALL ENGINE REAR MOUNTING

Torque: 260 kg–cm (19 ft–lb, 25 N–m)



40. INSTALL DYNAMIC DAMPER

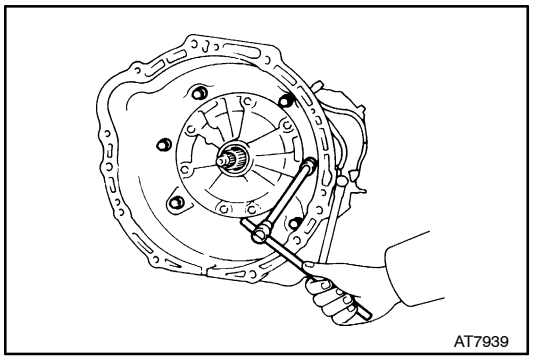
Torque: 380 kg–cm (27 ft–lb, 37 N–m)



41. INSTALL BREATHER HOSE

Connect the breather hose for transfer upper cover and transmission control retainer as shown.

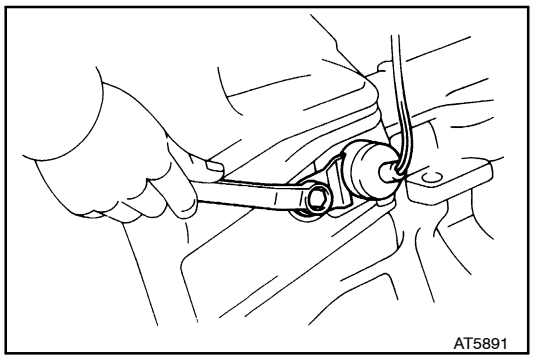
Hose depth: 13 mm (0.51 in.)



42. INSTALL TRANSMISSION HOUSING

Install and torque the six bolts.

Torque: 14 mm bolt 345 kg–cm (25 ft–lb, 34 N–m)
17 mm bolt 580 kg–cm (42 ft–lb, 57 N–m)

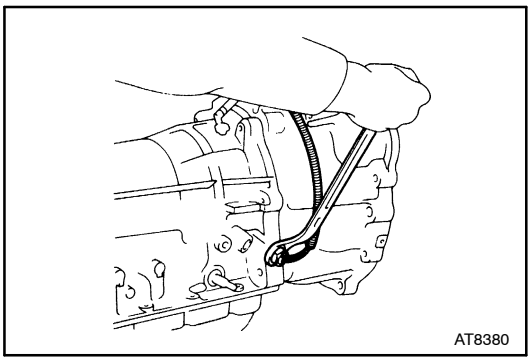


43. INSTALL SPEED SENSOR

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

(b) Install the speed sensor and stopper plate.

(c) Connect the wiring connector.

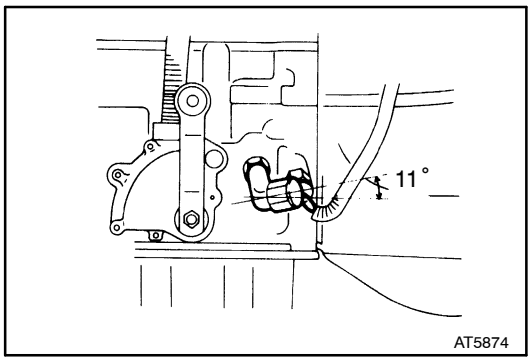


44. INSTALL FLUID TEMPERATURE SENSOR

(a) Coat new O–rings with ATF and install it to the sensor.

(b) Install and torque the fluid temperature sensor.

Torque: 150 kg–cm (11 ft–lb, 15 N–m)

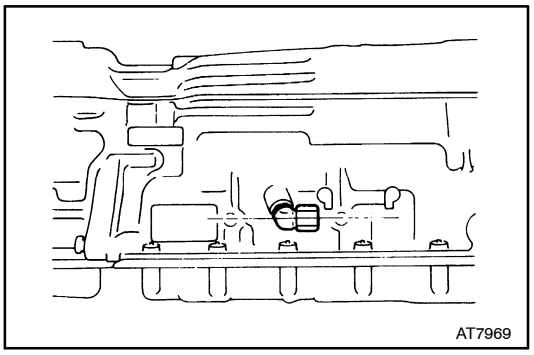


45. INSTALL UNIONS

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

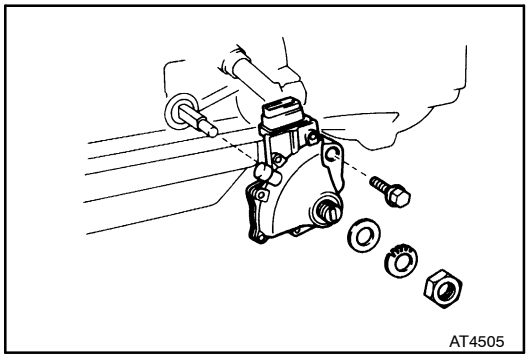
(b) Install the front union as shown in the figure.

Torque: 300 kg–cm (22 ft–lb, 29 N–m)



(c) Install the rear union as shown in the figure.

Torque: 300 kg–cm (22 ft–lb, 29 N–m)

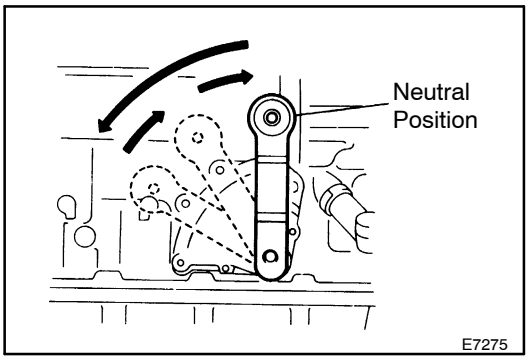


46. INSTALL NEUTRAL START SWITCH

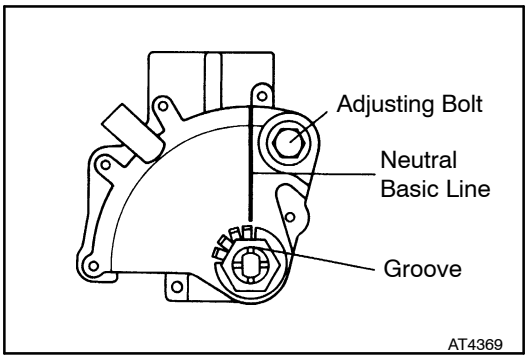
(a) Install the neutral start switch onto the manual valve lever shaft and temporarily tighten the adjusting bolt.

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

Torque: 70 kg–cm (61 in.–lb, 6.9 N–m)



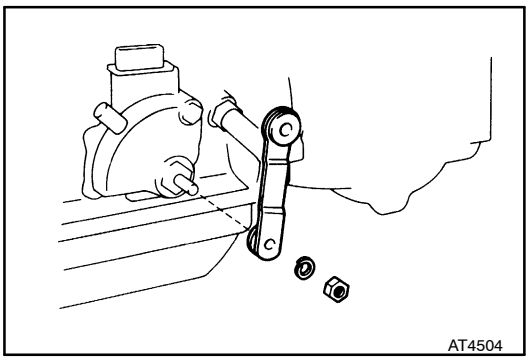
(c) Using the control shaft lever, fully turn the manual lever shaft back and return two notches. It is now in neutral.



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

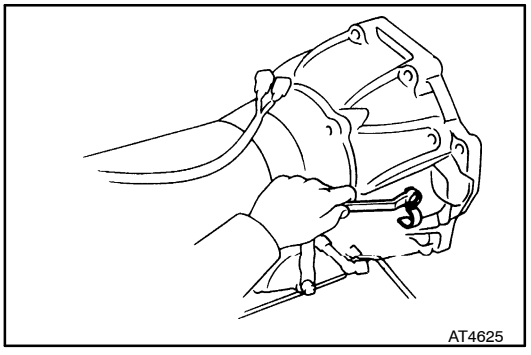
Torque: 130 kg–cm (9 ft–lb, 13 N–m)

HINT: Bend at least two of the lock washer tabs.



47. INSTALL TRANSMISSION CONTROL SHAFT LEVER

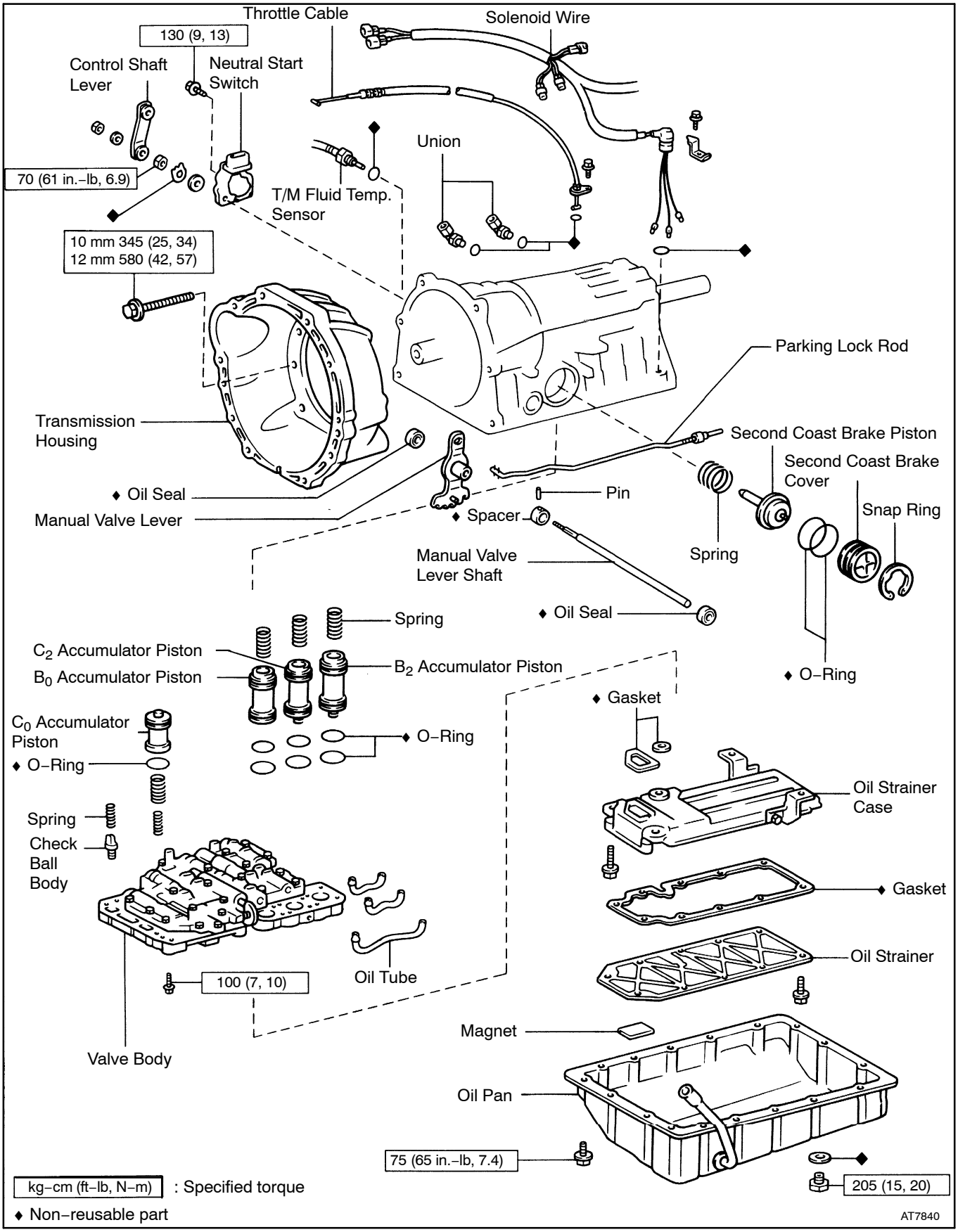
Torque: 160 kg–cm (12 ft–lb, 16 N–m)



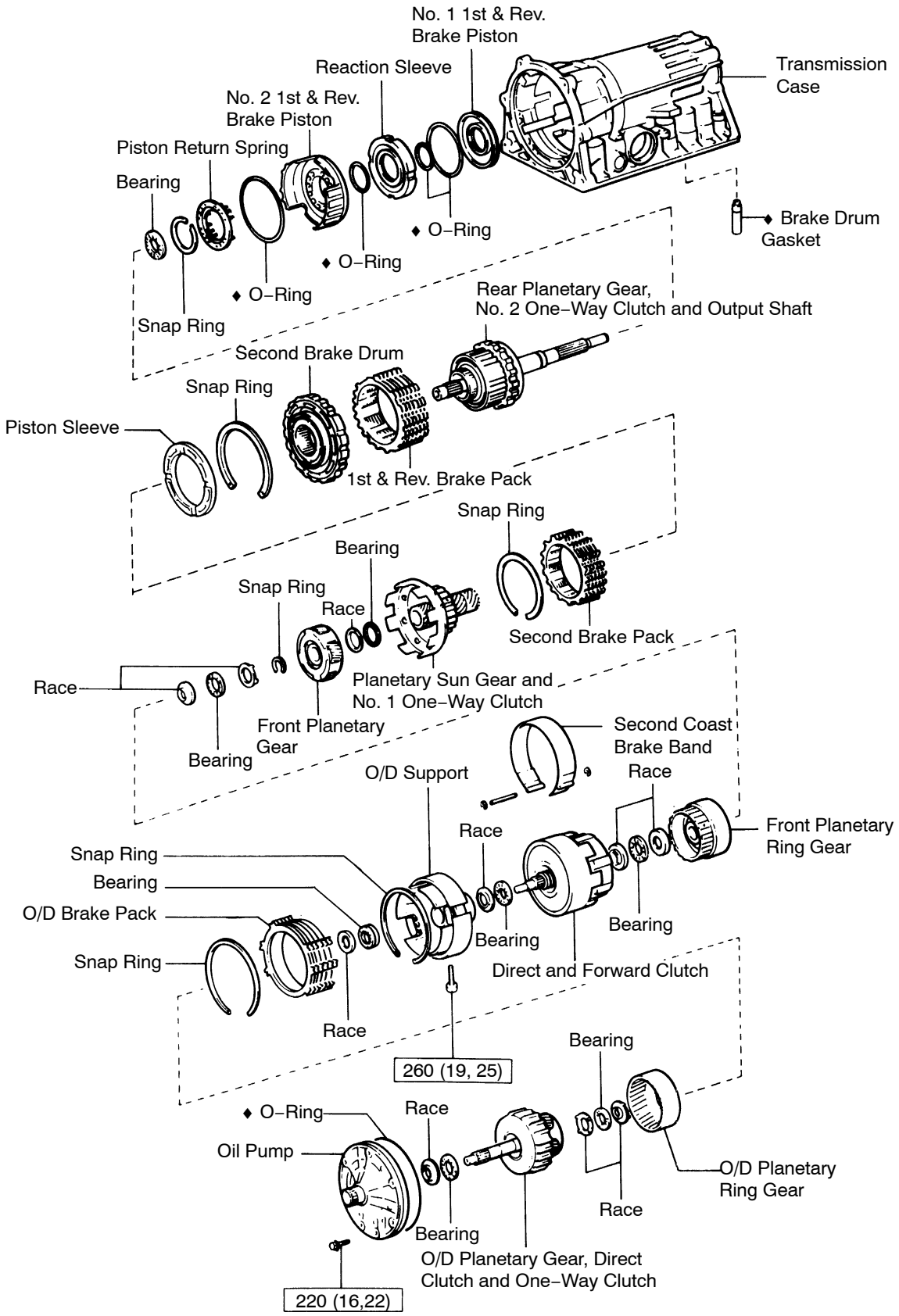
48. INSTALL WIRE HARNESS CLAMPS

REMOVAL OF COMPONENT PARTS (A340H)

COMPONENTS



COMPONENTS (Cont'd)

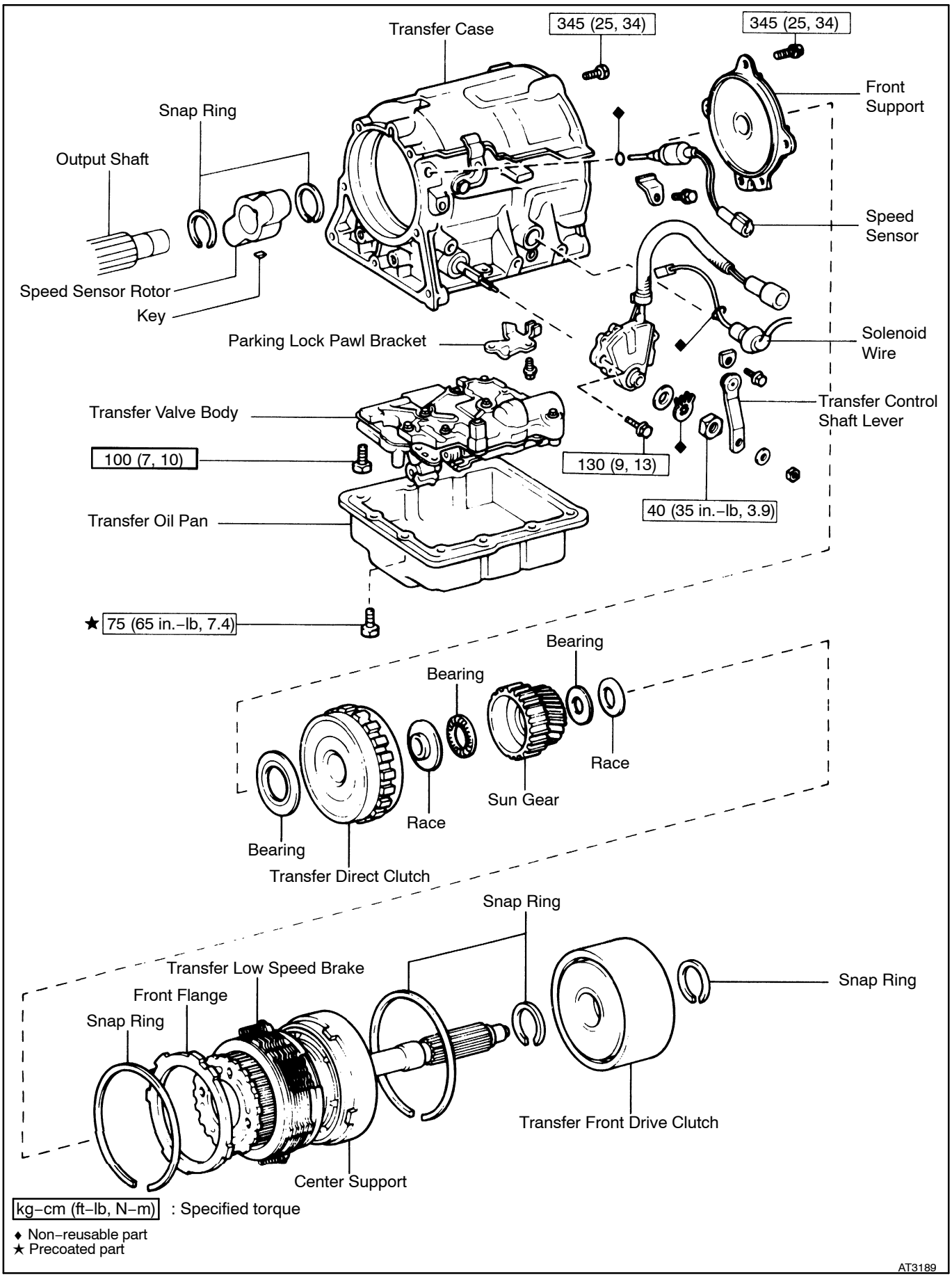


kg–cm (ft–lb, N–m) : Specified torque

♦ Non–reusable part

AT5056

COMPONENTS (Cont'd)

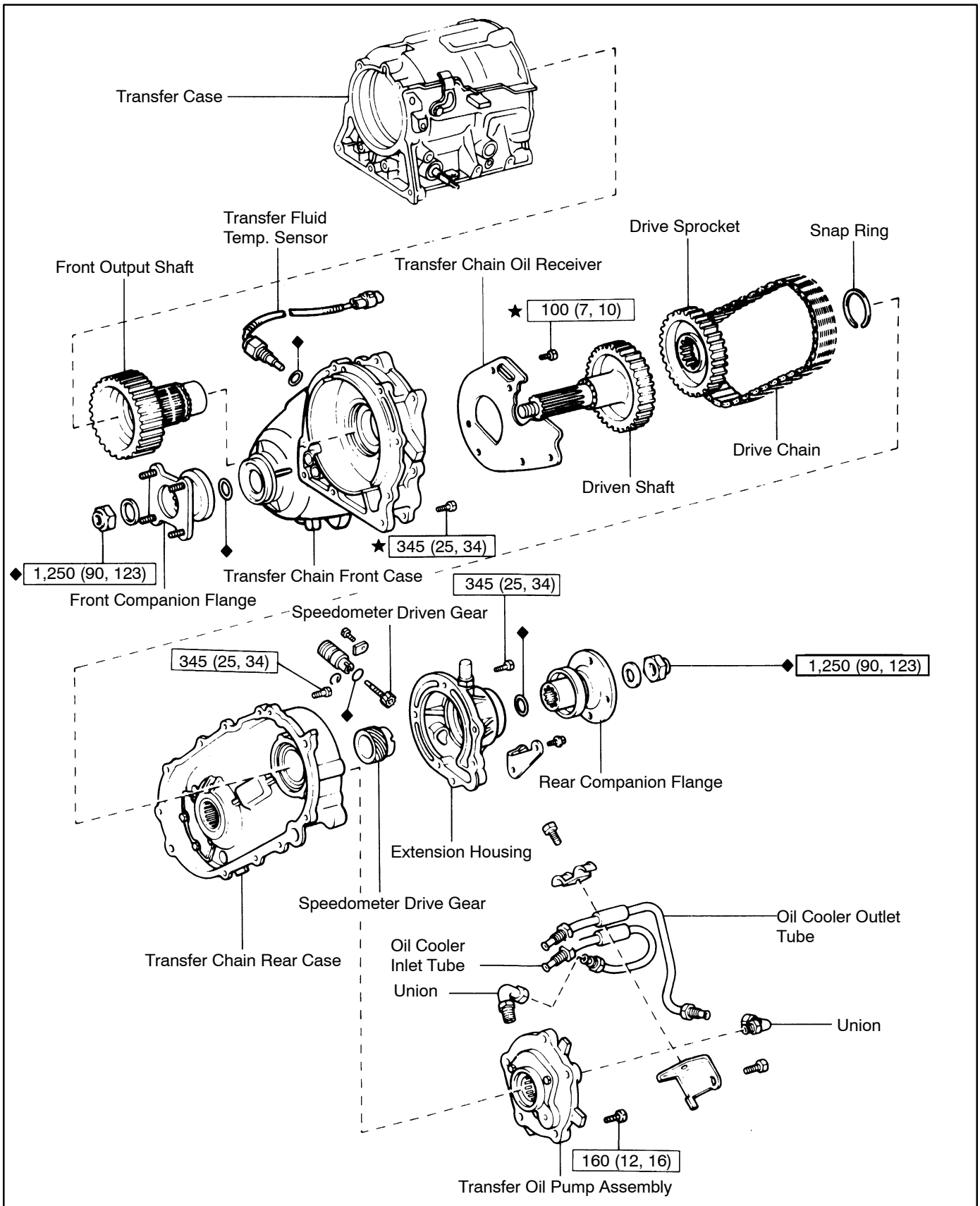


kg–cm (ft–lb, N–m) : Specified torque

♦ Non–reusable part
★ Precoated part

AT3189

COMPONENTS (Cont'd)

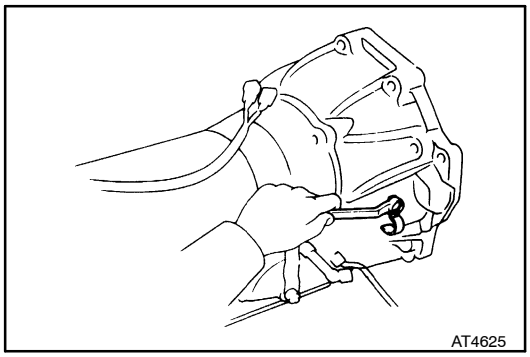


kg–cm (ft–lb, N–m) : Specified torque

◆ Non–reusable part

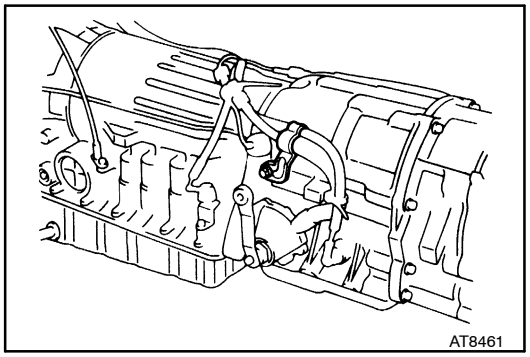
★ Precoated part

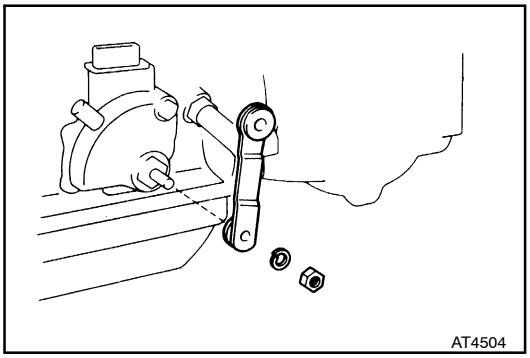
AT5045


AT4625

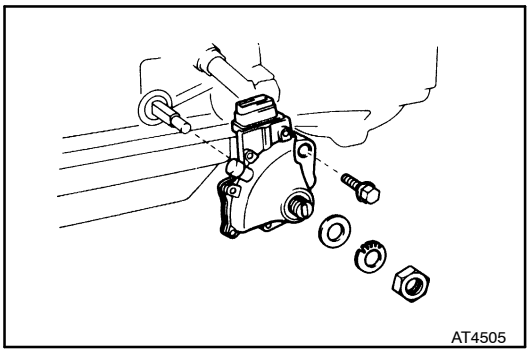
SEPARATE BASIC SUBASSEMBLY

1. REMOVE WIRE HARNESS CLAMPS


AT8461


AT4504

2. REMOVE TRANSMISSION CONTROL SHAFT LEVER

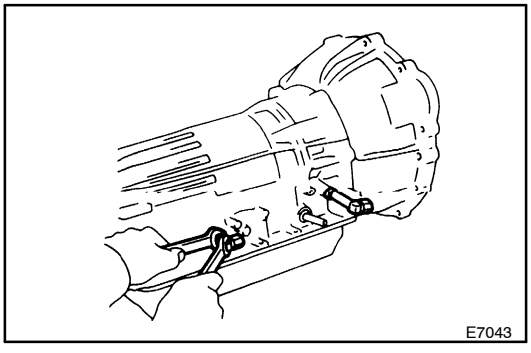

AT4505

3. REMOVE NEUTRAL START SWITCH

(a) Unstake the lock washer.

(b) Remove the nut and bolt, and then remove the neutral start switch.

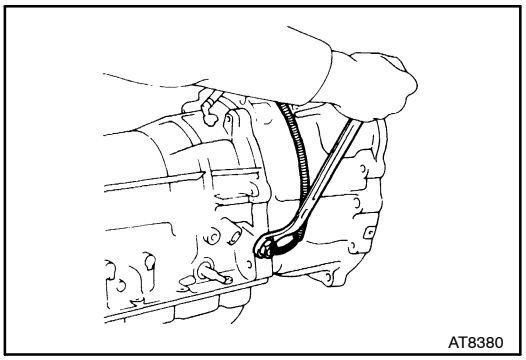
(c) Remove the lock washer and grommet.


E7043

4. REMOVE TRANSMISSION SIDE UNIONS

(a) Remove the two unions.

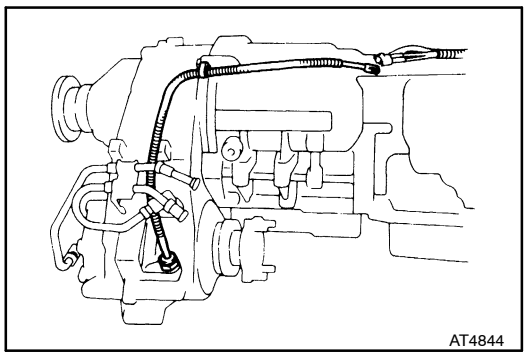
(b) Remove the O–ring from both unions.

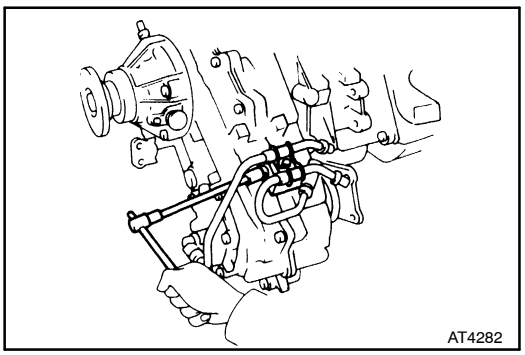


5. REMOVE TRANSMISSION AND TRANSFER FLUID TEMPERATURE SENSORS

(a) Remove the temperature sensors.

(b) Remove the O–ring from both sensors.

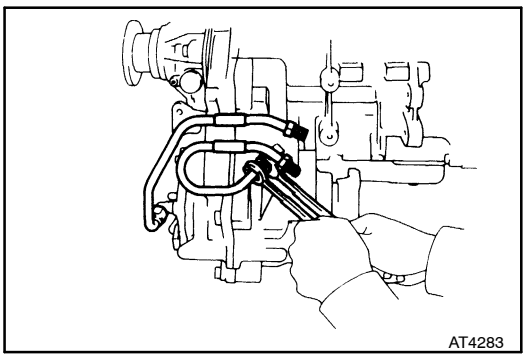




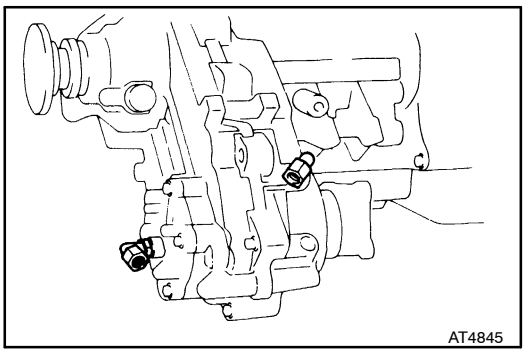
6. REMOVE TRANSFER OIL COOLER TUBES

(a) Remove the two bolts.

(b) Remove the tube clamp and bracket.



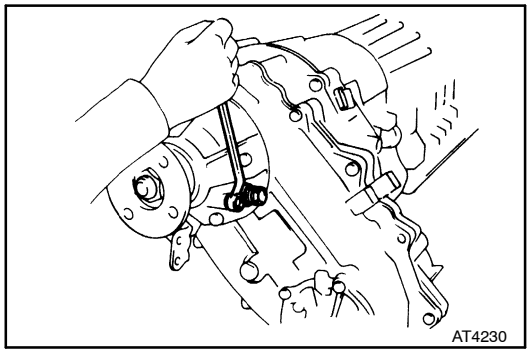
(c) Remove the two oil cooler tubes.



7. REMOVE TRANSFER SIDE UNIONS

(a) Remove the two unions.

(b) Remove the O–ring from both unions.



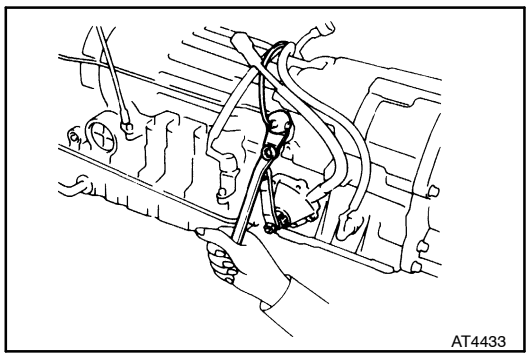
8. REMOVE SPEEDOMETER DRIVEN GEAR

(a) Remove the bolt and lock plate.

(b) Pull out the sleeve.

(c) Remove the clip and pull out the driven gear from the sleeve.

(d) Remove the O–ring from the sleeve.

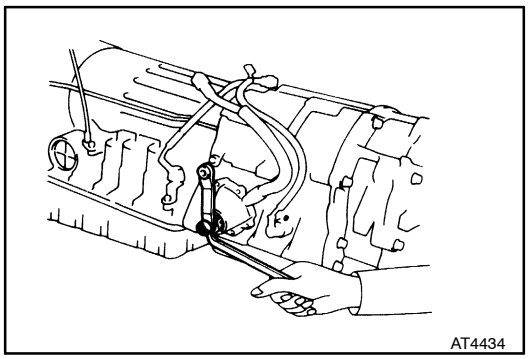


9. REMOVE SPEED SENSOR

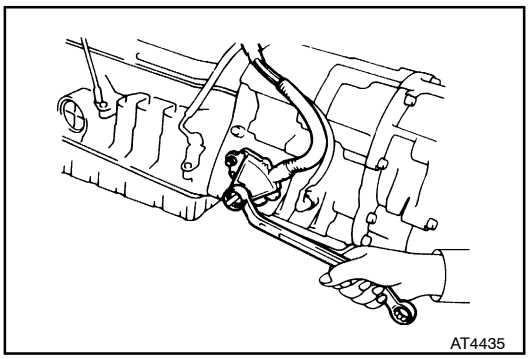
(a) Disconnect the connector.

(b) Remove the speed sensor.

(c) Remove the O–ring from it.



10. REMOVE TRANSFER CONTROL SHAFT LEVER

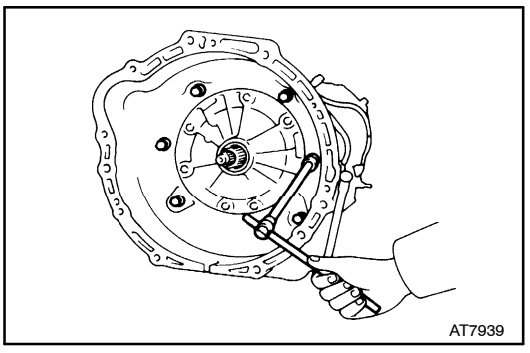


11. REMOVE TRANSFER POSITION SWITCH

(a) Unstake the lock washer.

(b) Remove the nut and bolt, and then remove the transfer position switch.

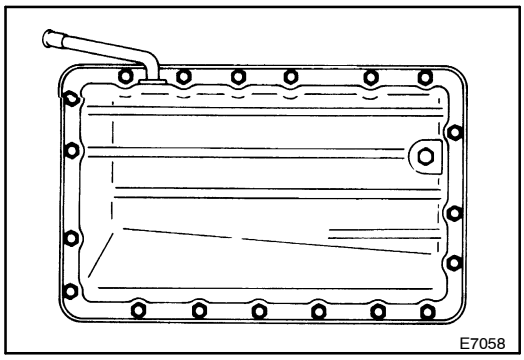
(c) Remove the lock washer and grommet.



12. REMOVE TRANSMISSION HOUSING

(a) Remove the six bolts.

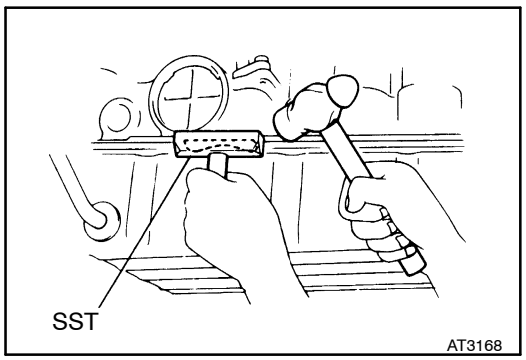
(b) Remove the transmission housing.



13. REMOVE TRANSMISSION OIL PAN

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

(a) Remove the nineteen bolts.

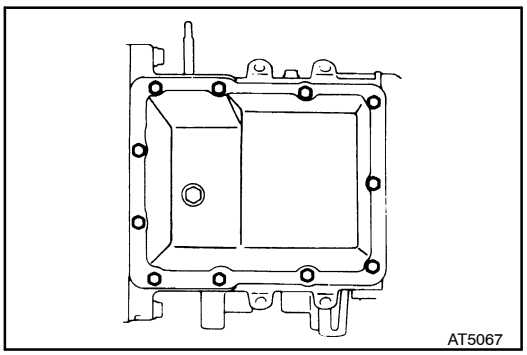


(b) Install the blade of SST between the transmission case and oil pan, cut off applied sealer.

SST 09032–00100

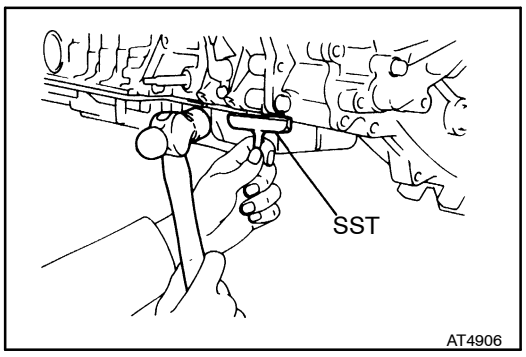
NOTICE: Be careful not to damage the oil pan flange.

(c) Remove pan by lifting the transmission case.



14. REMOVE TRANSFER OIL PAN

(a) Remove the eleven bolts.

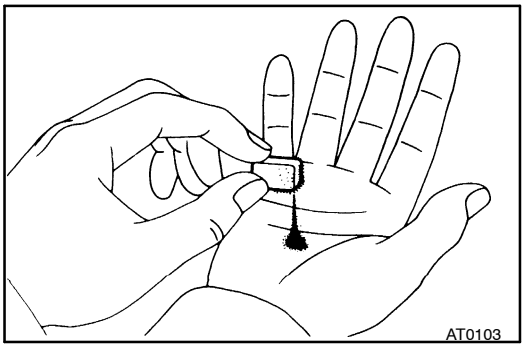


(b) Install the blade of SST between the transfer case and oil pan, cut off applied sealer.

SST 09032–00100

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

(c) Remove the transfer oil pan.



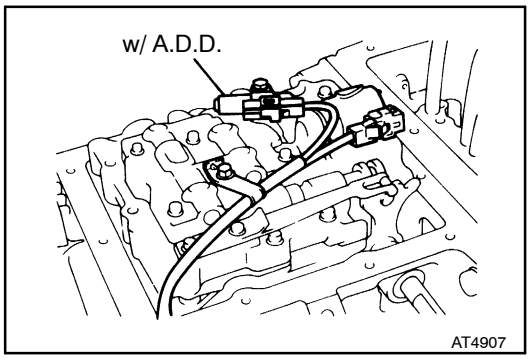
15. EXAMINE PARTICLES IN PANS

Remove the magnets and use them to collect steel particles.

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

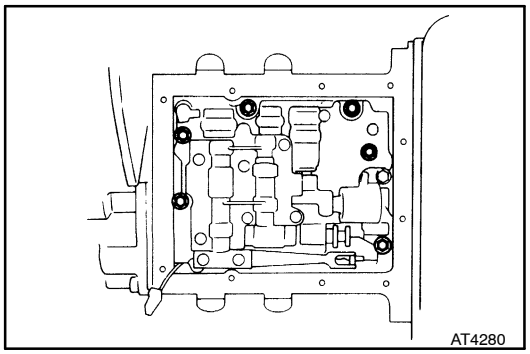
Steel (magnetic) . . . . . bearing, gear and clutch plate wear

Brass (non–magnetic) . . . bushing wear

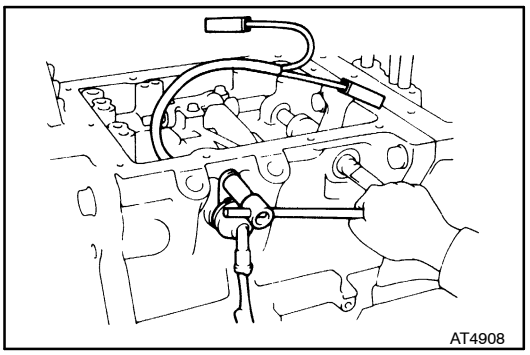


16. REMOVE TRANSFER VALVE BODY AND SOLENOID WIRING

(a) Disconnect the connectors from No. 4 solenoid and transfer pressure switch.



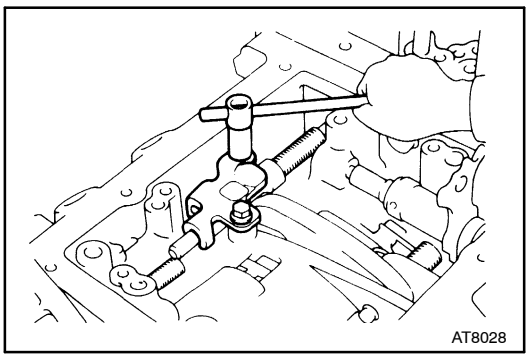
(b) Remove the six bolts and valve body.



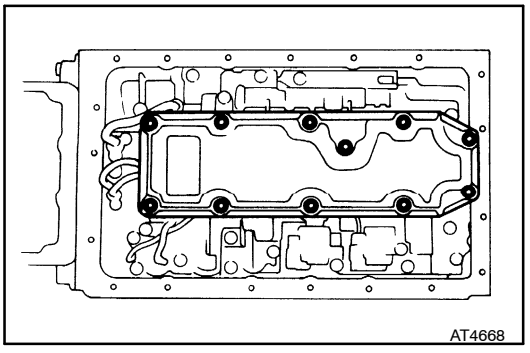
(c) Remove the solenoid wiring stopper plate.

(d) Pull out the solenoid wiring from the transfer case.

(e) Remove the O–ring from the grommet.



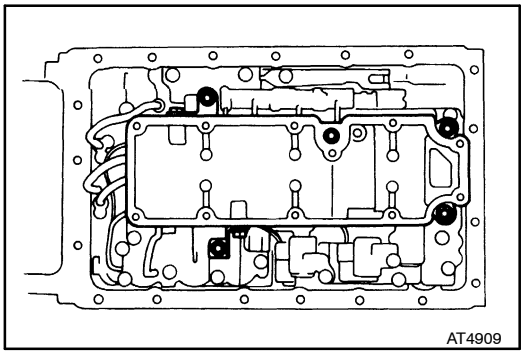
17. REMOVE PARKING LOCK PAWL BRACKET



18. REMOVE OIL STRAINER AND GASKETS

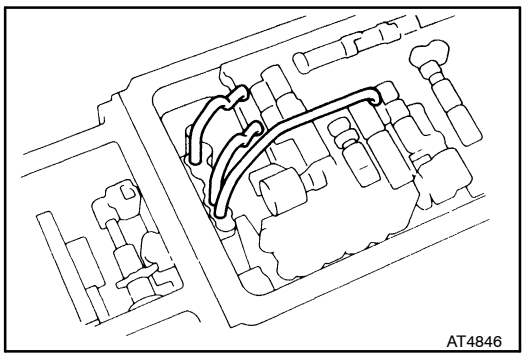
(a) Remove the eleven bolts holding the oil strainer to the oil strainer case.

(b) Remove the oil strainer and gasket.



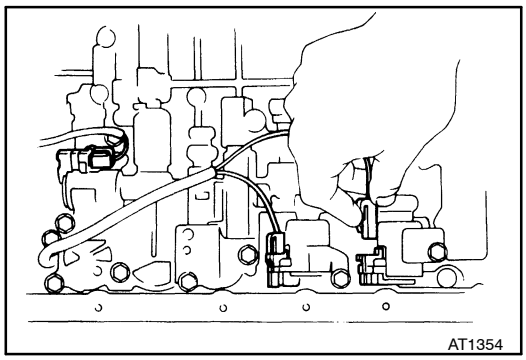
(c) Remove the five bolts and oil strainer case.

(d) Remove the two gaskets from the case.



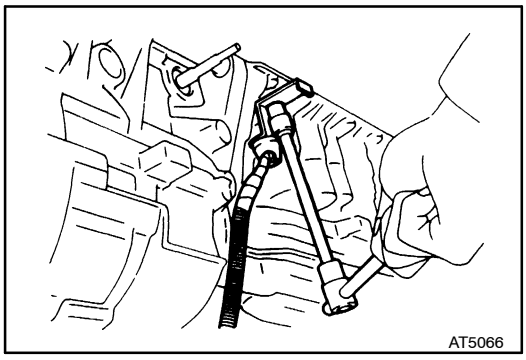
19. REMOVE OIL TUBES

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



20. REMOVE TRANSMISSION SOLENOID WIRING

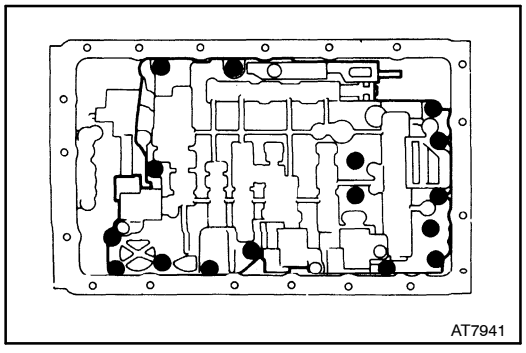
(a) Disconnect the three connectors from No. 1, No. 2 and lock–up solenoids.



(b) Remove the stopper plate from the case.

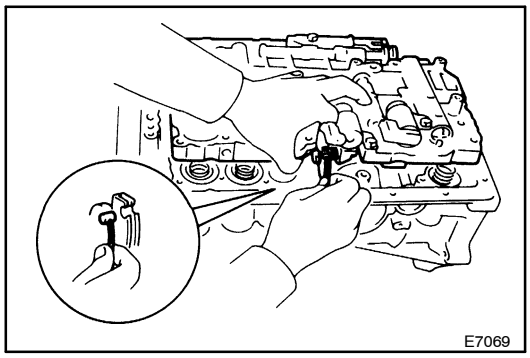
(c) Pull out the solenoid wiring from the transmission case.

(d) Remove the O–ring from the grommet.

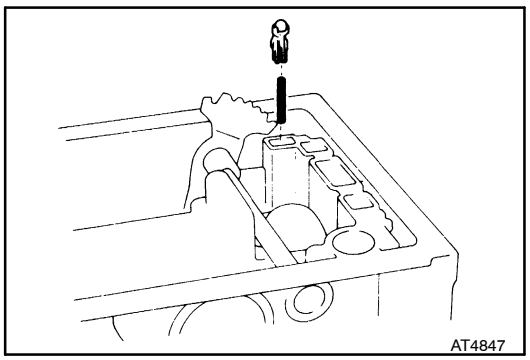


21. REMOVE TRANSMISSION VALVE BODY

(a) Remove the sixteen bolts.

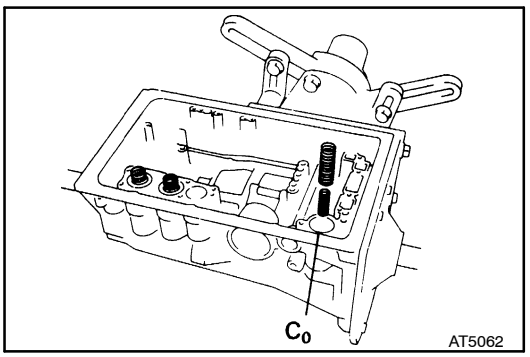


(b) Disconnect the throttle cable from the cam and remove the valve body.

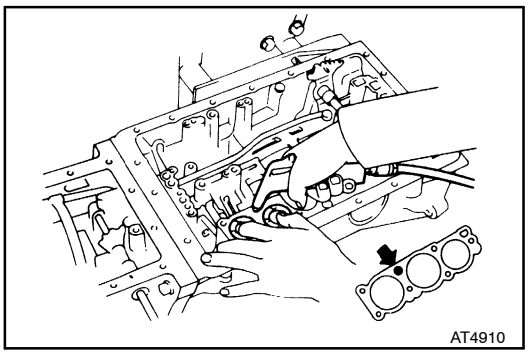


22. REMOVE CHECK BALL BODY, ACCUMULATOR SPRINGS, PINS AND PISTONS

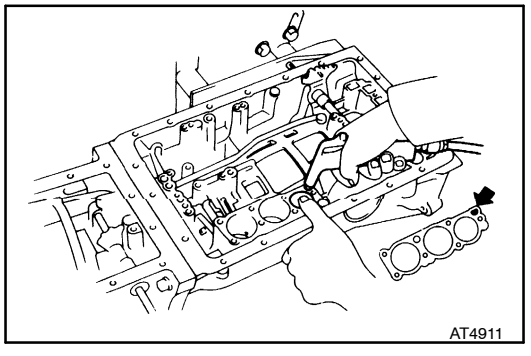
(a) Remove the check ball body and spring.



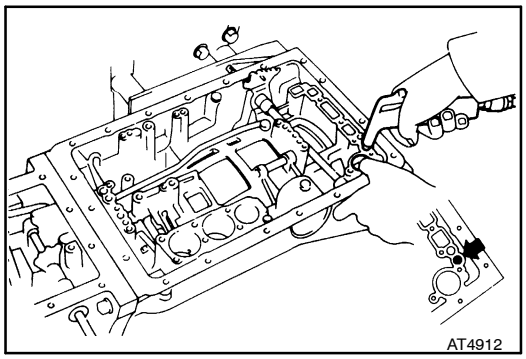
(b) Remove the two springs from the C_0 accumulator piston.



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

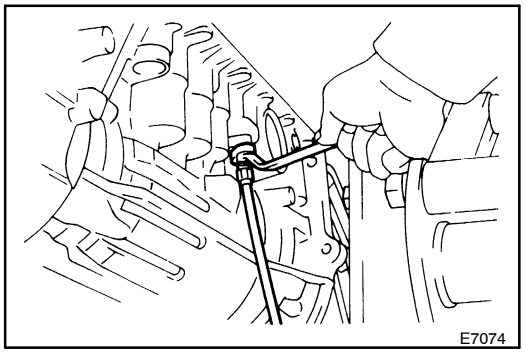


(d) Applying compressed air to the oil hole, remove the B_0 accumulator piston and spring.



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

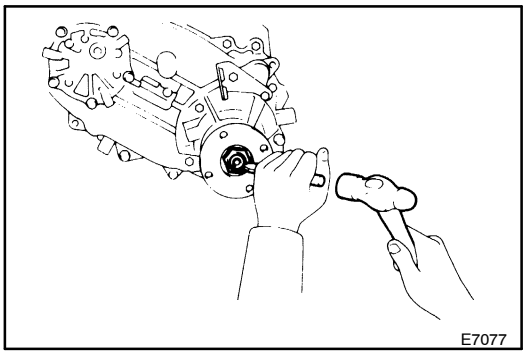
(f) Remove the O–rings from each piston.



23. REMOVE THROTTLE CABLE

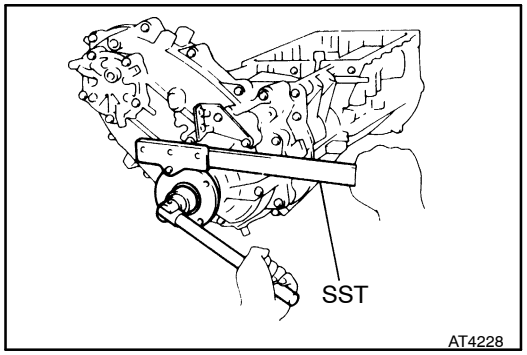
(a) Remove the retaining bolt and pull out the throttle cable.

(b) Remove the O–ring from the cable.



24. REMOVE REAR COMPANION FLANGE

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



(b) Using SST to hold the flange, remove the nut and washer.

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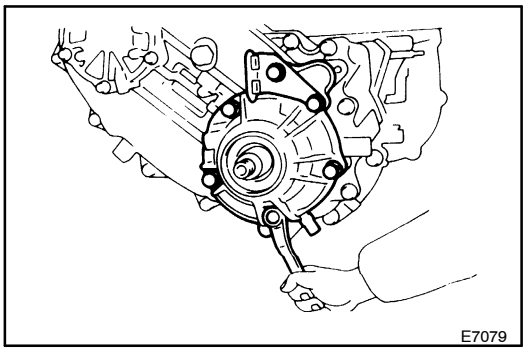
(c) Remove the companion flange.

(d) Remove the O–ring from the companion flange inner.

25. REMOVE FRONT COMPANION FLANGE

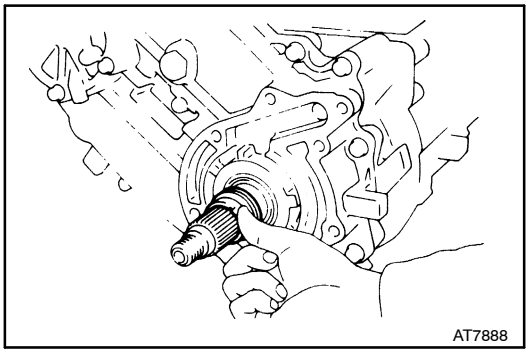
Remove the front companion flange in the same way as the rear companion flange.



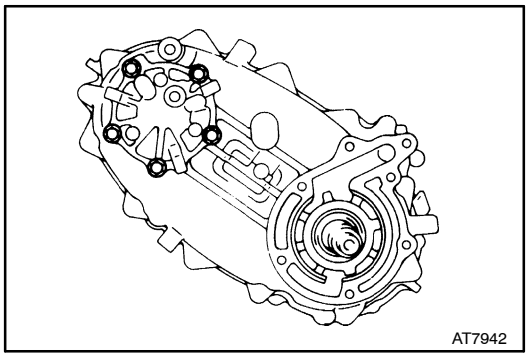
26. REMOVE TRANSFER EXTENSION HOUSING

(a) Remove the six bolts.

(b) Separate the extension housing.



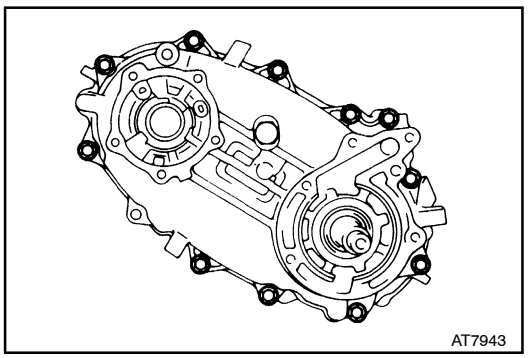
27. REMOVE SPEEDOMETER DRIVE GEAR



28. REMOVE OIL PUMP ASSEMBLY

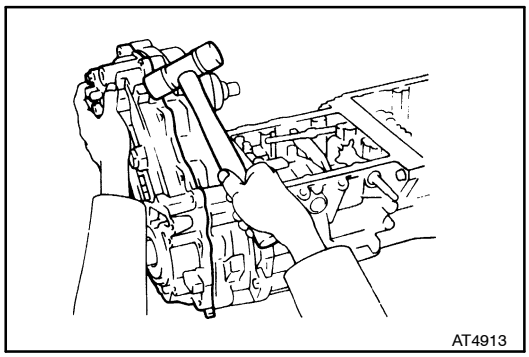
(a) Remove the five bolts.

(b) Separate the oil pump assembly.

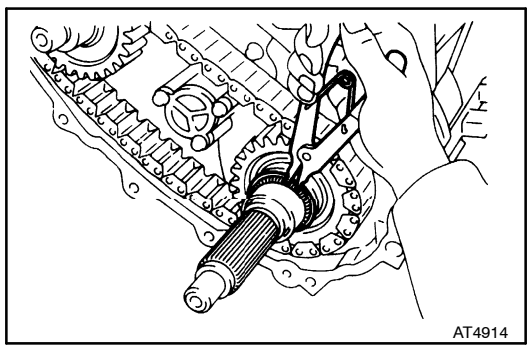


29. REMOVE TRANSFER CHAIN REAR CASE

(a) Remove the eleven bolts.

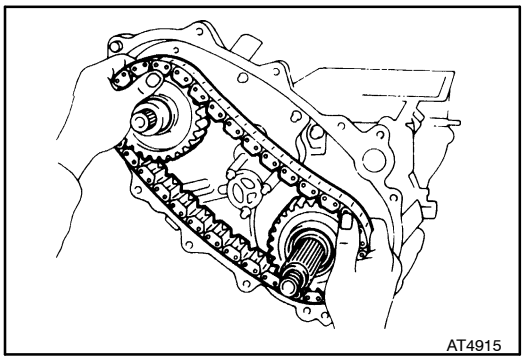


(b) Using a plastic hammer, separate the transfer chain rear case from the transfer chain front case.

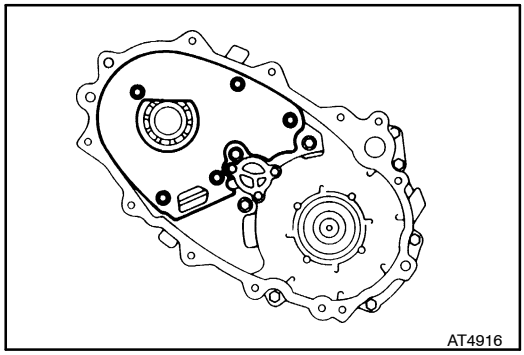


30. REMOVE DRIVE CHAIN WITH DRIVE SPROCKET AND DRIVEN SHAFT

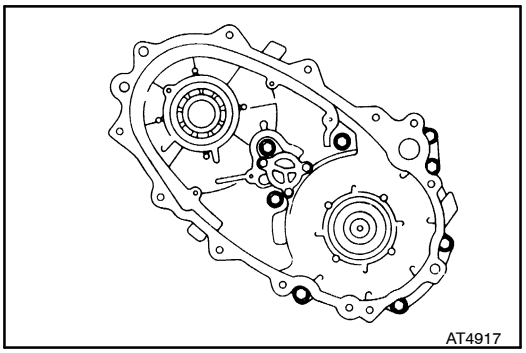
(a) Remove the snap ring.



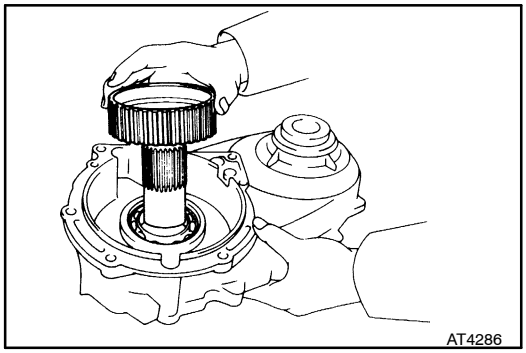
(b) Pull out the chain with the drive sprocket and driven shaft.



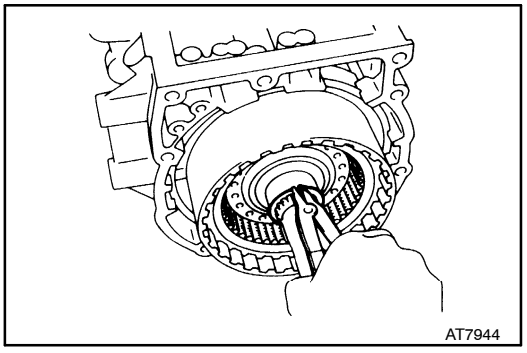
31. REMOVE TRANSFER CHAIN OIL RECEIVER



32. REMOVE TRANSFER CHAIN FRONT CASE WITH FRONT OUTPUT SHAFT

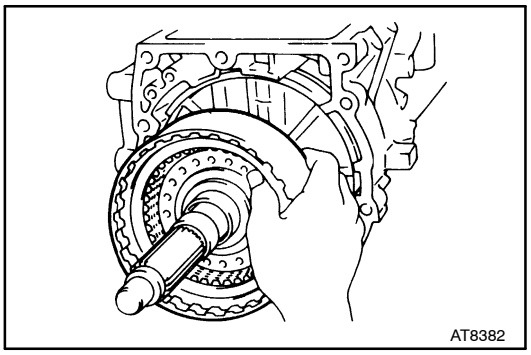


33. REMOVE FRONT OUTPUT SHAFT FROM TRANSFER CHAIN FRONT CASE

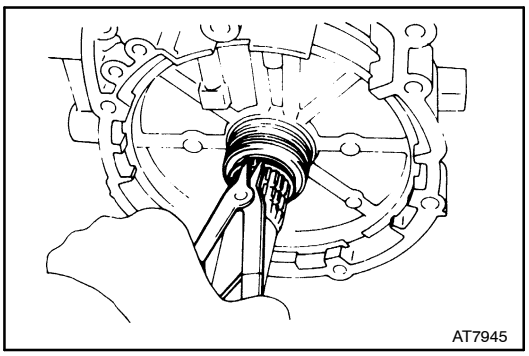


34. REMOVE TRANSFER FRONT DRIVE CLUTCH

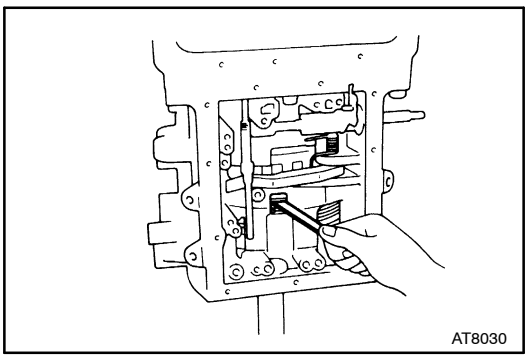
(a) Remove the snap ring.



(b) Grasp and pull out the transfer front drive clutch.

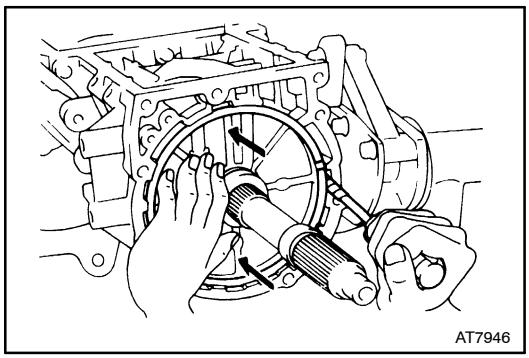


(c) Remove the snap ring from the output shaft.



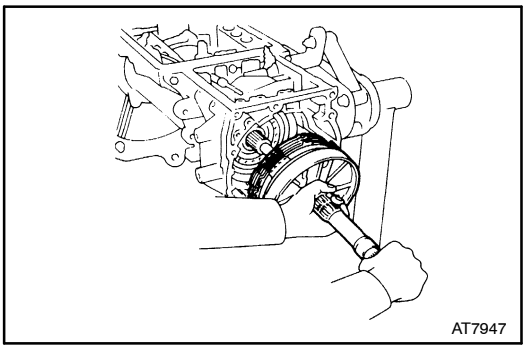
35. CHECK PACK CLEARANCE OF TRANSFER LOW SPEED BRAKE

Using a feeler gauge, measure the clearance between the snap ring and flange as shown in the figure.
Clearance: 0.91 – 2.10 mm (0.0358 – 0.0827 in.)
If the values are nonstandard, inspect the discs.
(See page AT–202)

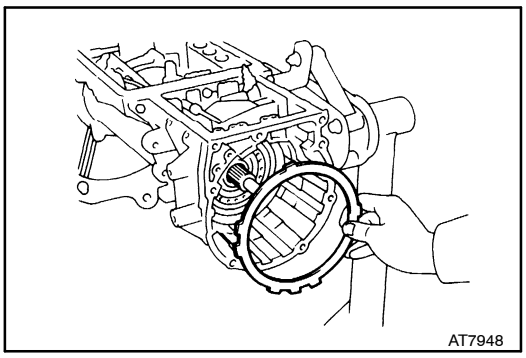


36. REMOVE TRANSFER CENTER SUPPORT AND TRANSFER LOW SPEED BRAKE

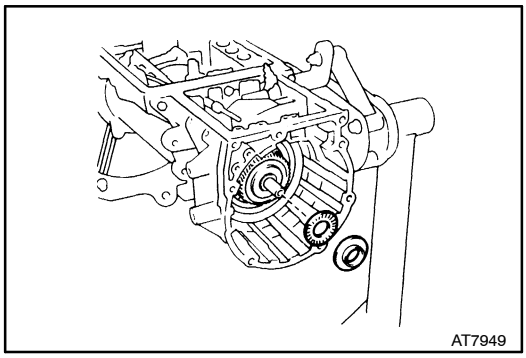
Pushing the center support forward, remove the snap ring.



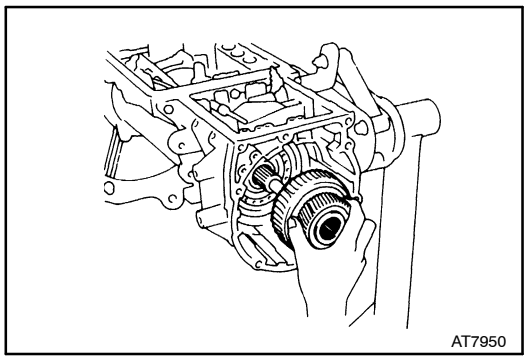
(b) Grasp the shaft and pull out the transfer center support with the transfer low speed brake assembly.



(c) Remove the front flange from the case.

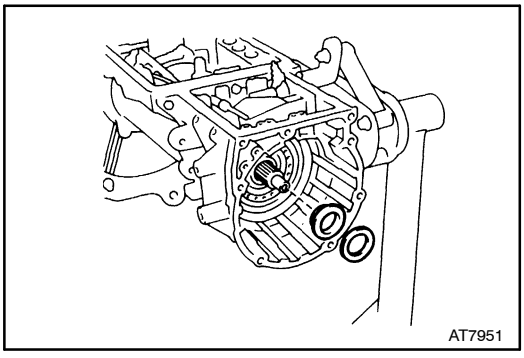


(d) Remove the race and assembled bearing and race from the sun gear.

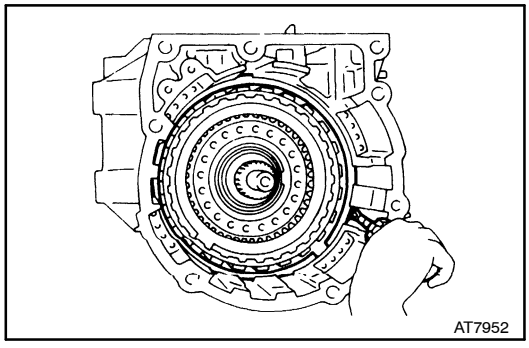


37. REMOVE SUN GEAR

(a) Pull out the sun gear.

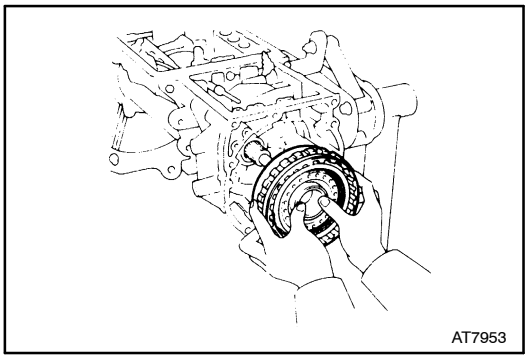


(b) Remove the race and assembled bearing and race from the transfer direct clutch.

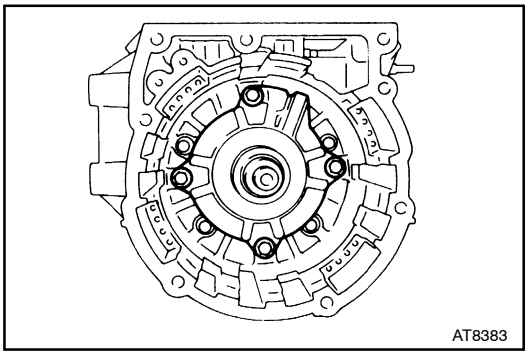


38. REMOVE TRANSFER DIRECT CLUTCH

(a) Remove the snap ring.

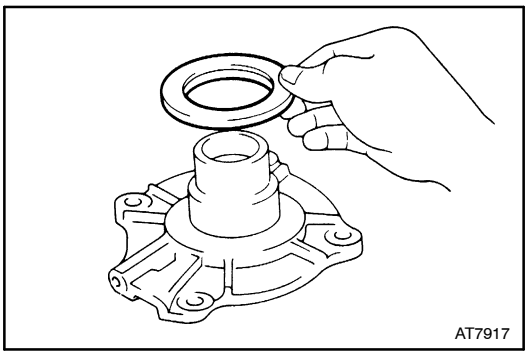


(b) Remove the transfer direct clutch from the transfer case.

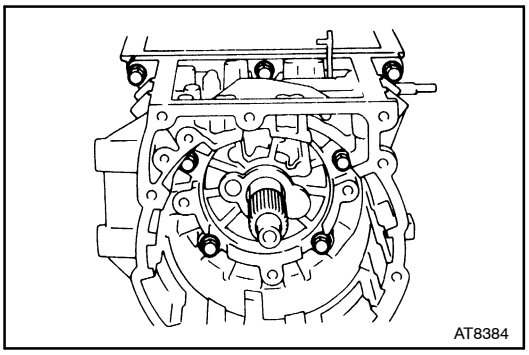


39. REMOVE FRONT SUPPORT

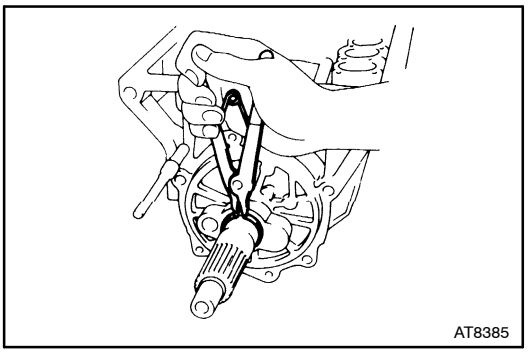
(a) Remove the front support from the transfer case.



(b) Remove the assembled bearing and race from the front support.

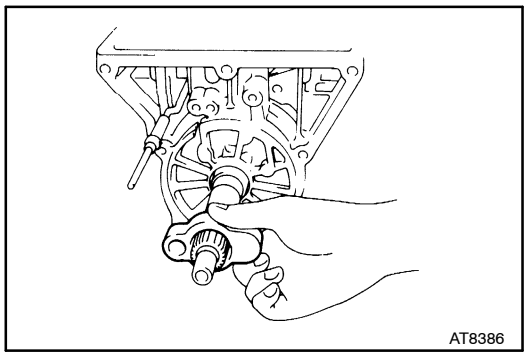


40. REMOVE TRANSFER CASE



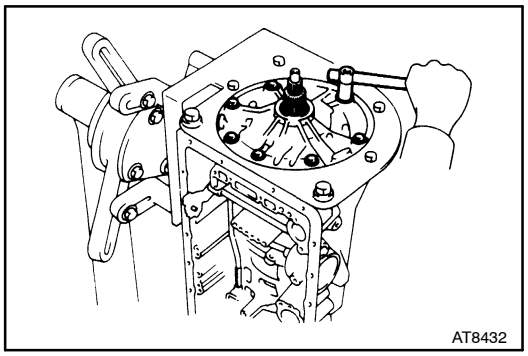
41. REMOVE SPEED SENSOR ROTOR AND KEY

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



(b) Remove the sensor rotor and key.

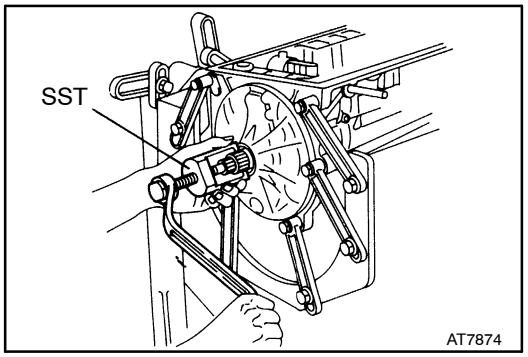
(c) Using snap ring pliers, remove the front snap ring.



42. REMOVE OIL PUMP

(a) Stand up the transmission.

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



(c) Using SST, remove the oil pump.

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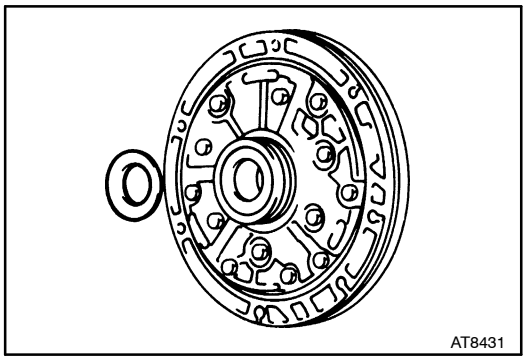
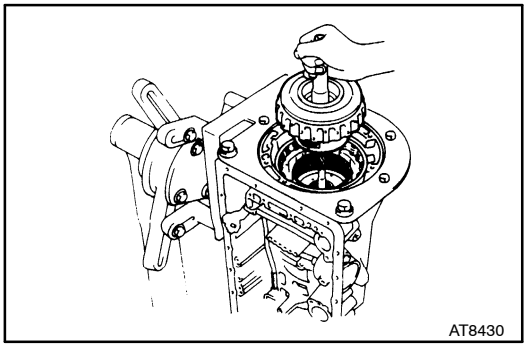
(d) Remove the O–ring from it.

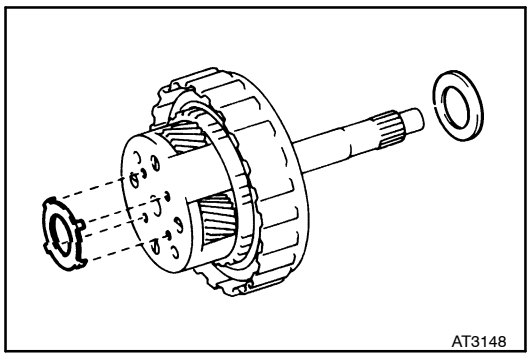


(e) Remove the race from the oil pump.

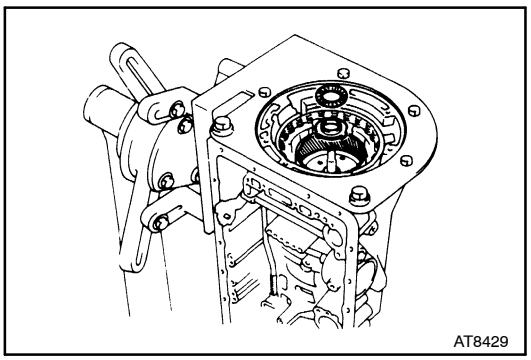


43. REMOVE OVERDRIVE PLANETARY GEAR UNIT WITH OVERDRIVE DIRECT CLUTCH AND ONE–WAY CLUTCH

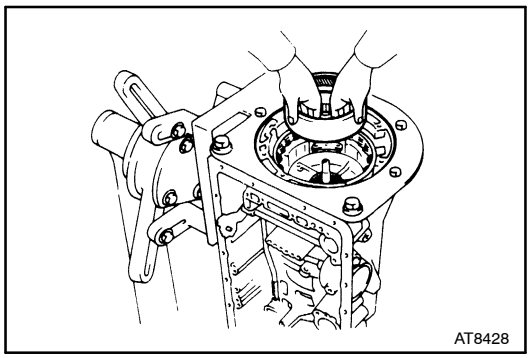
(a) Remove the overdrive planetary gear with the overdrive direct clutch and one–way clutch from the transmission case.



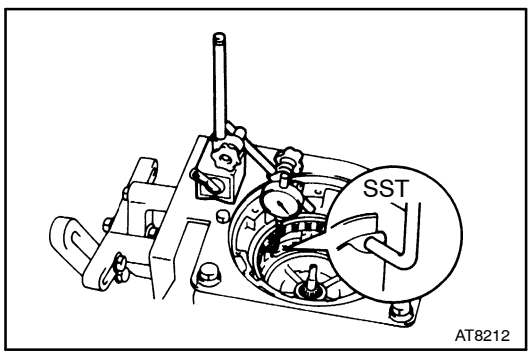
(b) Remove the race and assembled bearing and race.



(c) Remove the bearing and race.



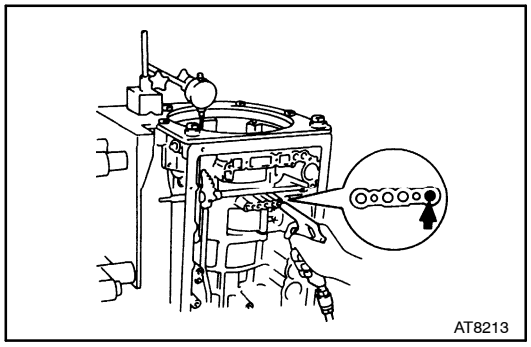
(d) Remove the overdrive planetary ring gear from the transmission case.



44. CHECK PISTON STROKE OF OVERDRIVE BRAKE

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

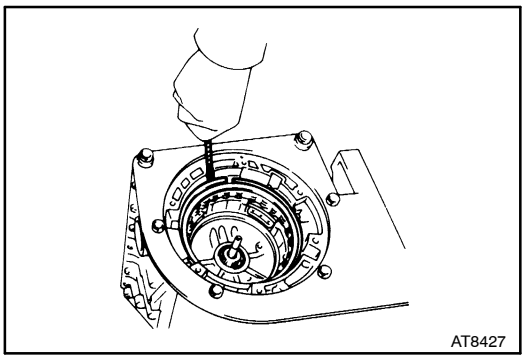
SST 09350–30020 (09350–06120)



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

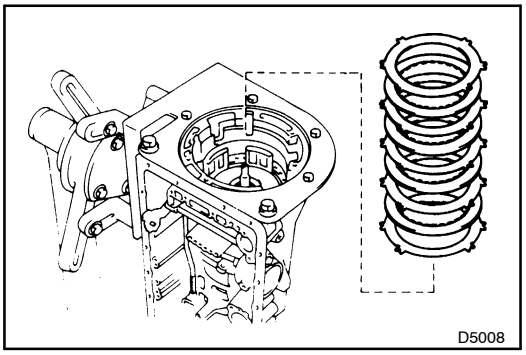
Piston stroke: 1.40 – 1.70 mm (0.0551 – 0.0669 in.)

If the values are nonstandard, inspect the discs.
(See page AT–61)



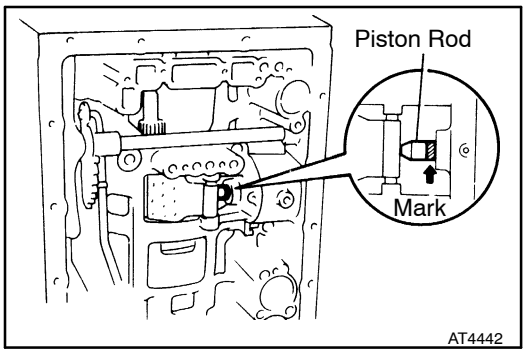
45. REMOVE FLANGES, PLATES AND DISCS OF OVERDRIVE BRAKE

(a) Remove the snap ring.



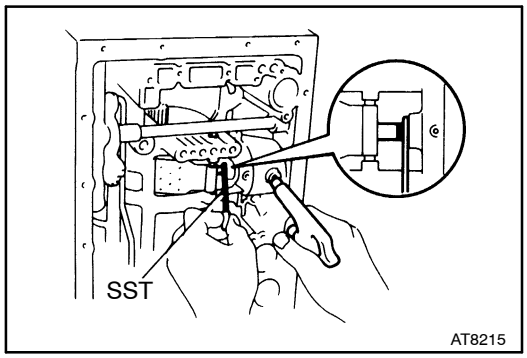
(b) Remove the flanges, plates and discs as a set.

HINT: Two flanges, three plates and four discs



46. CHECK PISTON ROD STROKE OF SECOND COAST BRAKE

(a) Place a mark on the second coast brake piston rod as shown in the figure.

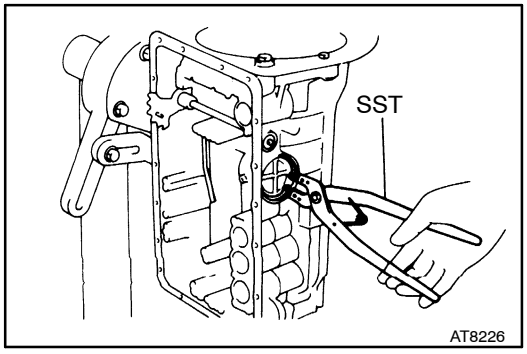


(b) Using SST, measure the stroke applying the compressed air (4 – 8 kg /cm^2, 57 – 114 psi or 392 – 785 kPa) as shown in the figure.

SST 09240–00020

Piston rod stroke: 1.5 – 3.0 mm (0.059 – 0.118 in.)

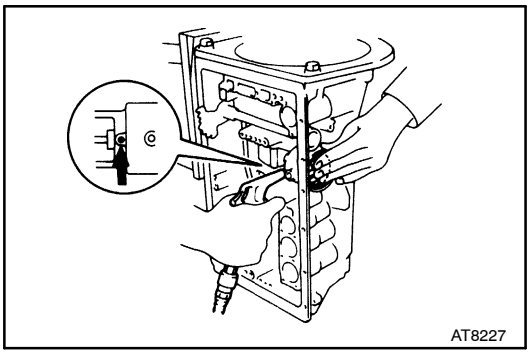
If the values are nonstandard, inspect the brake band. (See page AT–84)



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

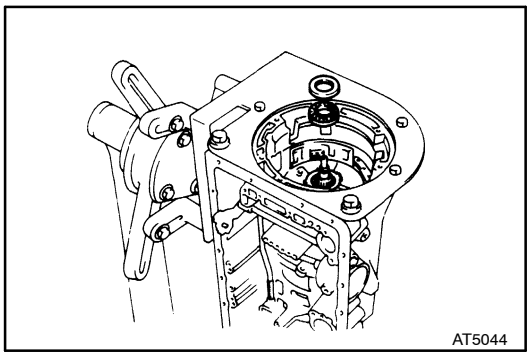
(a) Using SST, remove the snap ring.

SST 09350–30020 (09350–07060)



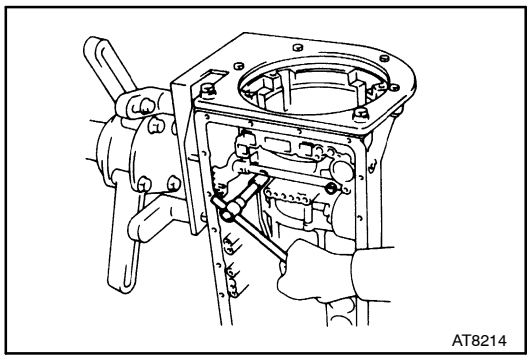
(b) Applying compressed air to the oil hose, remove the second coast brake cover, piston assembly and spring.

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

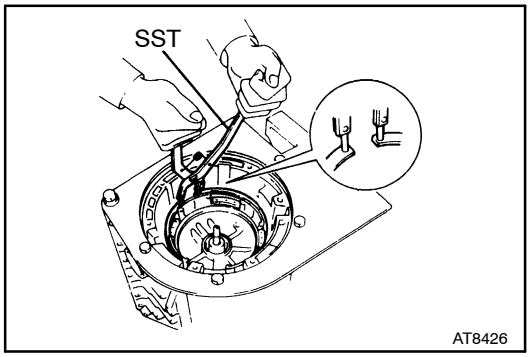


48. REMOVE OVERDRIVE SUPPORT ASSEMBLY

(a) Remove the race and bearing.

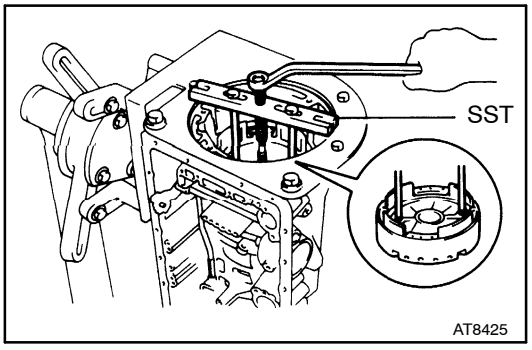


(b) Remove the two bolts holding the overdrive support assembly to the case.



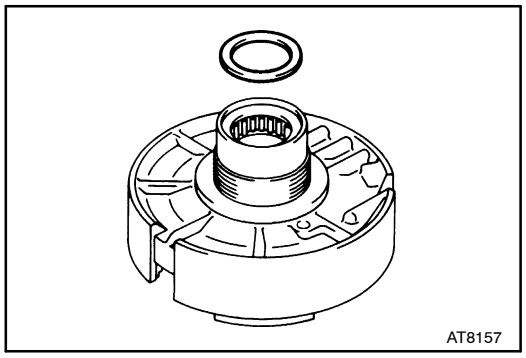
(c) Using SST, remove the snap ring.

SST 09350–30020 (09350–07060)

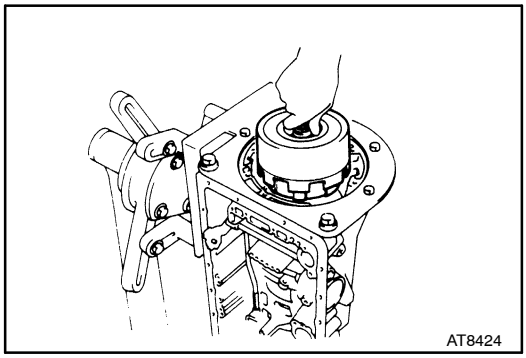


(d) Using SST, remove the overdrive support assembly.

SST 09350–30020 (09350–07020)

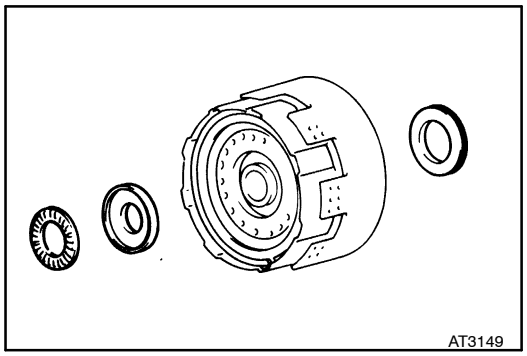


(e) Remove the race.

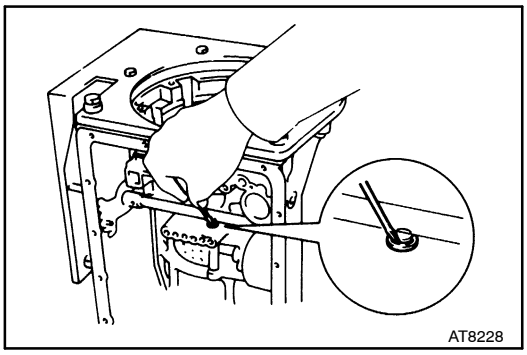


49. REMOVE DIRECT CLUTCH WITH FORWARD CLUTCH

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



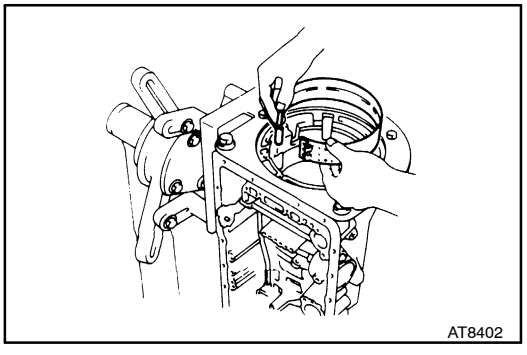
(b) Remove the two bearings and race.



54. REMOVE SECOND COAST BRAKE BAND

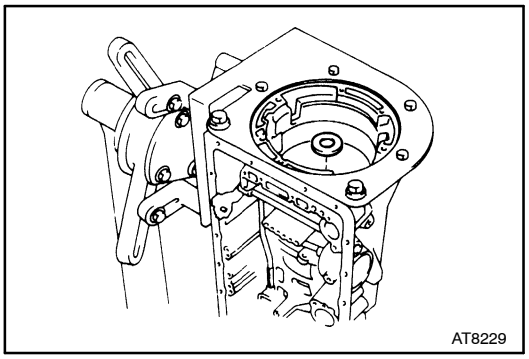
(a) Remove the E–ring from the pin.

(b) Remove the pin from the brake band.



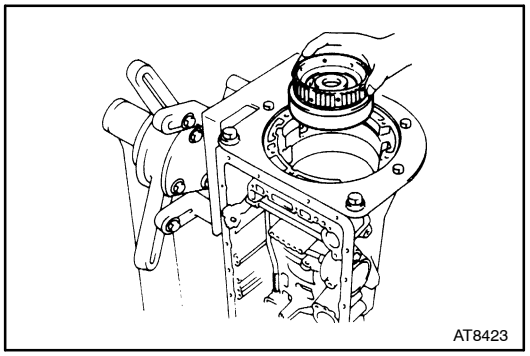
(c) Remove the second coast brake band from the case.

For the method of inspection, refer to AT–76.

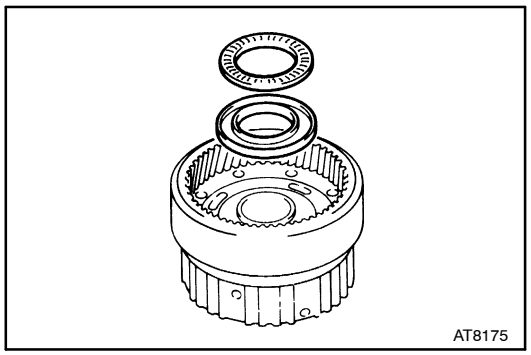


51. REMOVE FRONT PLANETARY GEAR UNIT

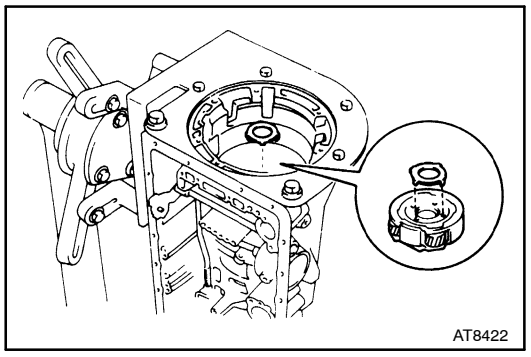
(a) Remove the race.



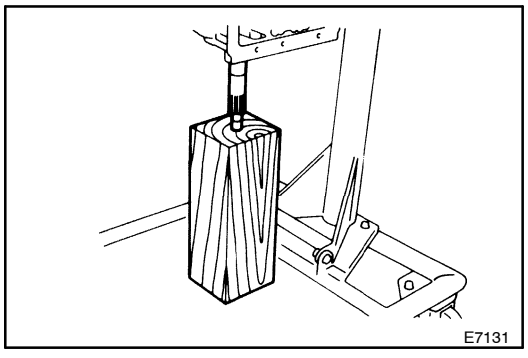
(b) Remove the front planetary ring gear from the case.



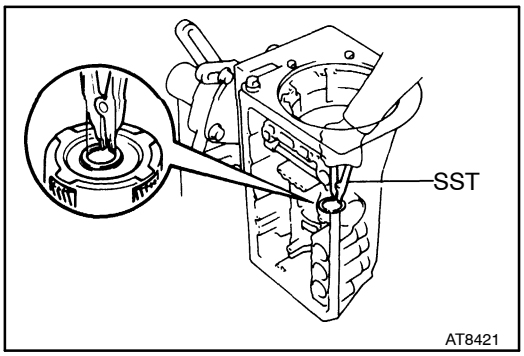
(c) Remove the bearing and race.



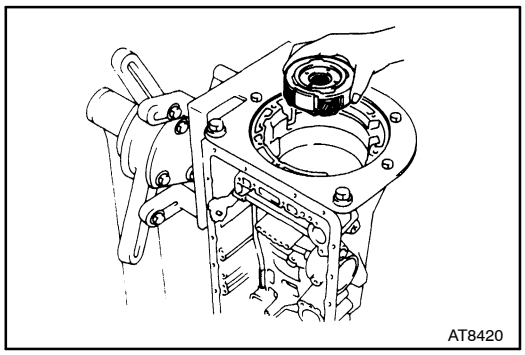
(d) Remove the race.



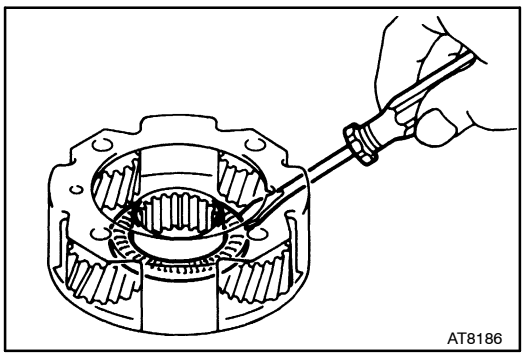
(e) With wooden blocks under the output shaft, stand the transmission on the output shaft.



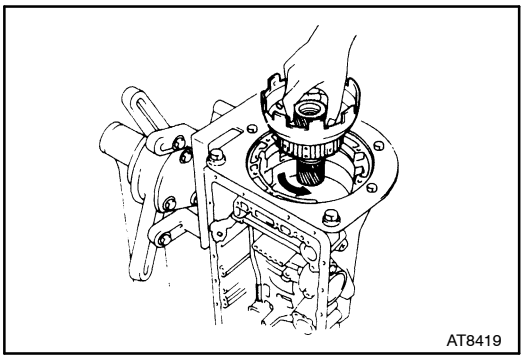
(f) Using SST, remove the snap ring.
SST 09350–30020 (09350–07070)



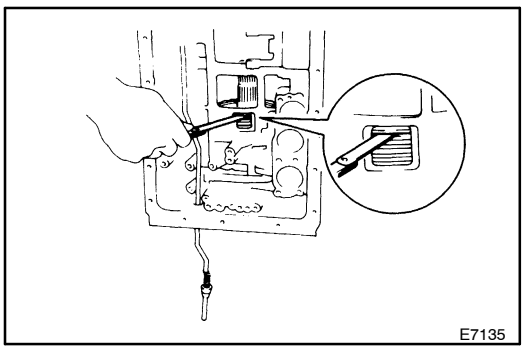
(g) Remove the front planetary gear from the case.



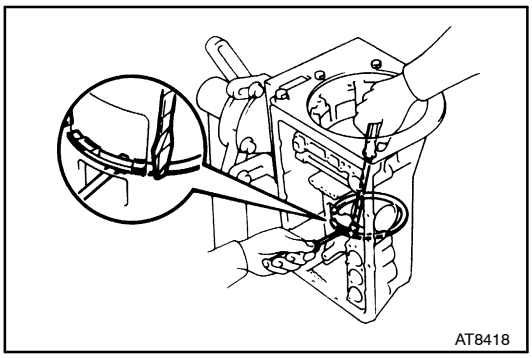
(h) Remove the bearing and race from the front planetary gear.



52. REMOVE PLANETARY SUN GEAR WITH NO. 1 ONE–WAY CLUTCH

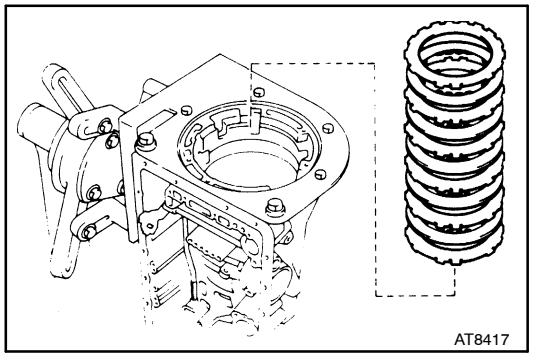


53. CHECK PACK CLEARANCE OF SECOND BRAKE
Using a feeler gauge, measure the clearance between the snap ring and flange as shown in the figure.
Clearance: 0.62 – 1.98 mm (0.0244 – 0.0780 in.)
If the values are nonstandard, inspect the discs.
(See page AT–84)



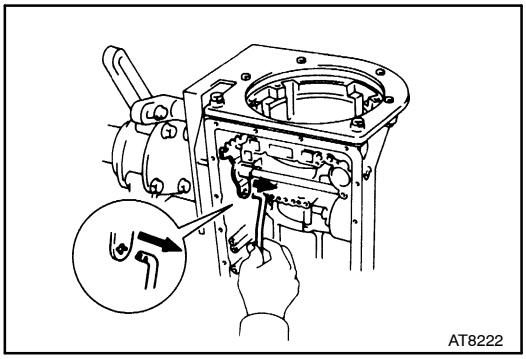
54. REMOVE FLANGE, PLATES AND DISCS OF SECOND BRAKE

(a) Remove the snap ring.



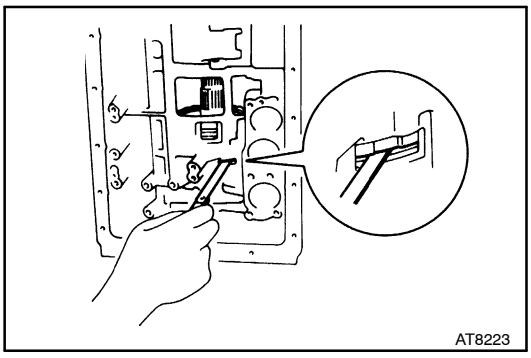
(b) Remove the flange, plates and discs as a set.

HINT: One flange, five plates and five discs



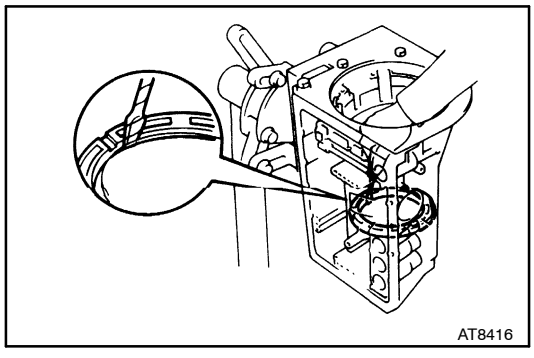
55. REMOVE PARKING LOCK ROD

Disconnect the parking lock rod from the manual valve lever.

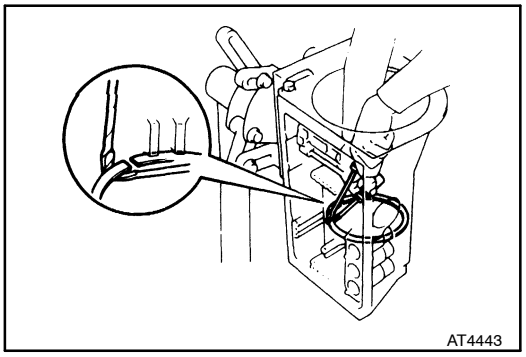


56. CHECK PACK CLEARANCE OF FIRST AND REVERSE BRAKE

Using a feeler gauge, measure the clearance between the plate and second brake drum as shown in the figure.
Clearance: 0.58 – 1.92 mm (0.0228 – 0.0756 in.)
If the values are nonstandard, inspect the discs.
(See page AT–86)

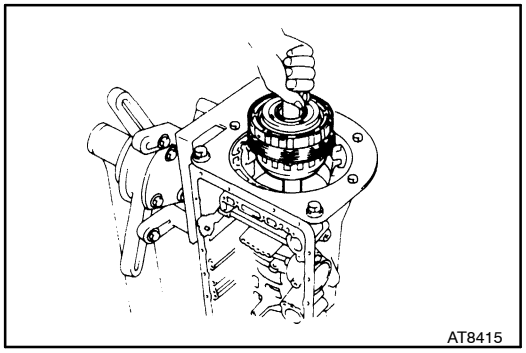


57. REMOVE SECOND BRAKE PISTON SLEEVE

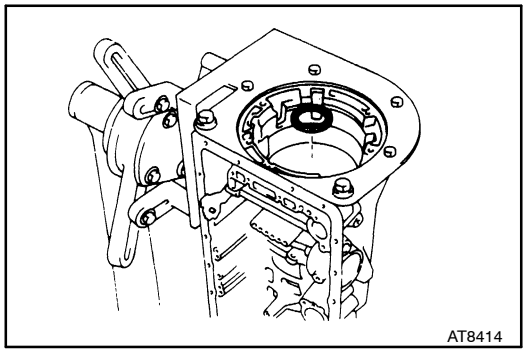

AT4443

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

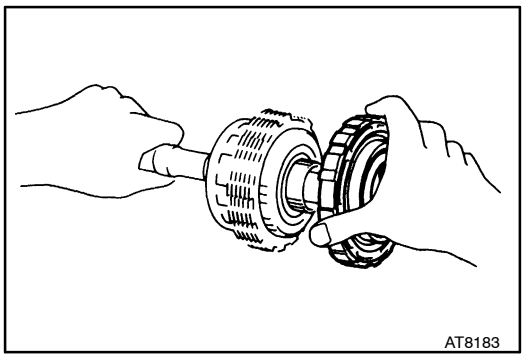
(a) Using two screwdrivers, remove the snap ring.


AT8415

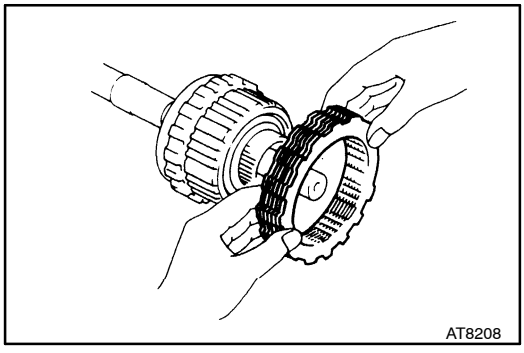
(b) Remove the rear planetary gear, second brake drum, first and reverse brake pack and output shaft as an assembly.


AT8414

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


AT8183

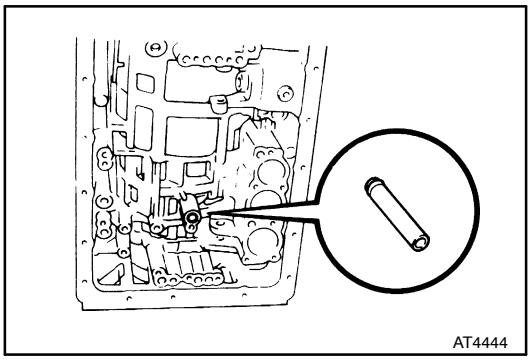
(d) Remove the second brake drum assembly.


AT8208

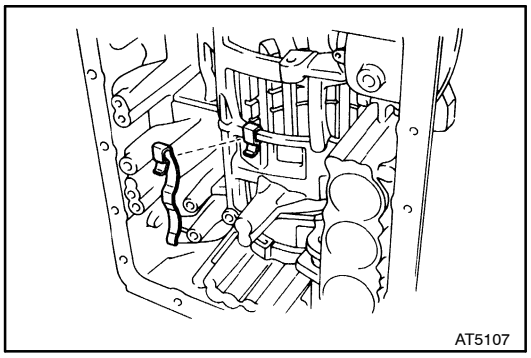
(e) Remove the cushion plate, flange, plates and discs of the first and reverse brake.

HINT: One cushion plate, one flange, seven plates and six discs

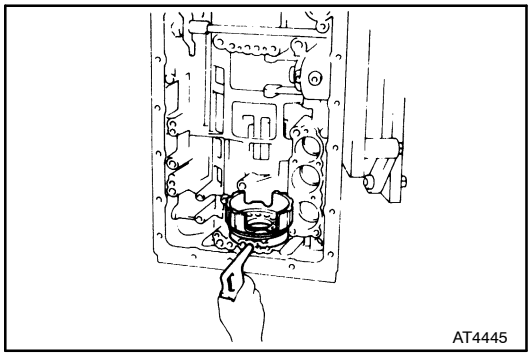
For the method of inspection, refer to AT–86.



59. REMOVE BRAKE DRUM GASKET

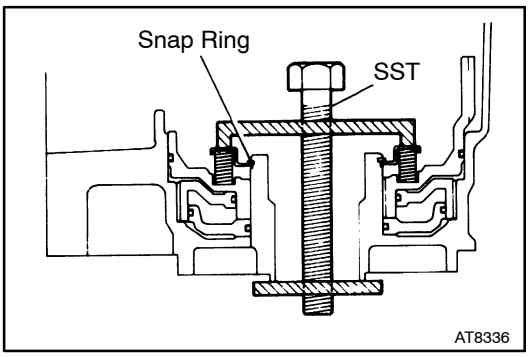


60. REMOVE LEAF SPRING



61. CHECK FIRST AND REVERSE BRAKE PISTONS MOVING

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



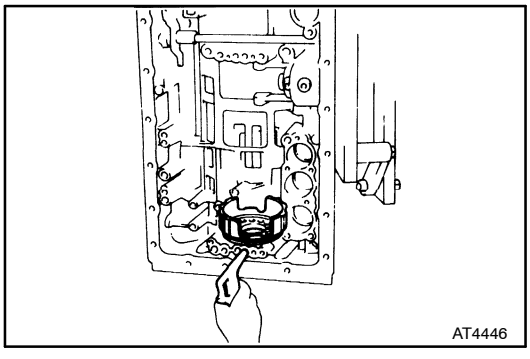
62. REMOVE COMPONENTS OF FIRST AND REVERSE BRAKE PISTON

(a) Set SST on the spring retainer, and compress the return spring.

SST 09350–30020 (09350–07050)

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

(c) Remove the piston return spring.

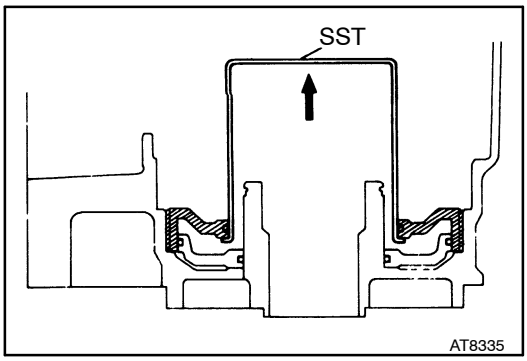


(d) Hold No. 2 first and reverse brake piston with hand, apply compressed air to the transmission case to remove No. 2 first and reverse brake piston.

(e) Remove No. 2 first and reverse brake piston.

If the piston does not pop out with compressed air, lift the piston out with needle–nose pliers.

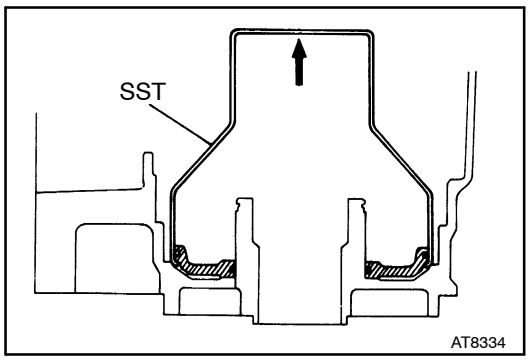
(f) Remove the O–ring from No. 2 piston.



(g) Install SST behind the reaction sleeve and gradually lift it out of the transmission case.

SST 09350–30020 (09350–07080)

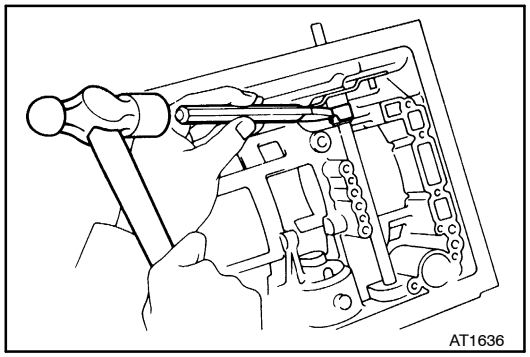
(h) Remove the O–ring from the reaction sleeve.



(i) Install SST behind No. 1 brake piston and gradually lift it out of the transmission case.

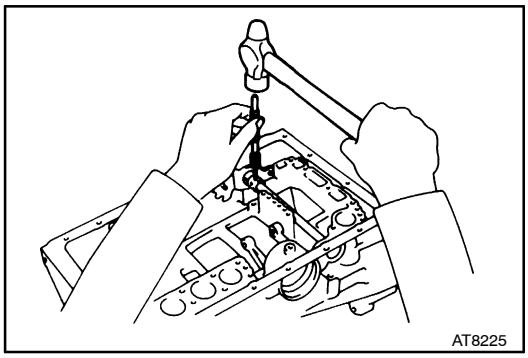
SST 09350–30020 (09350–07090)

(j) Remove the two O–rings from No. 1 piston.



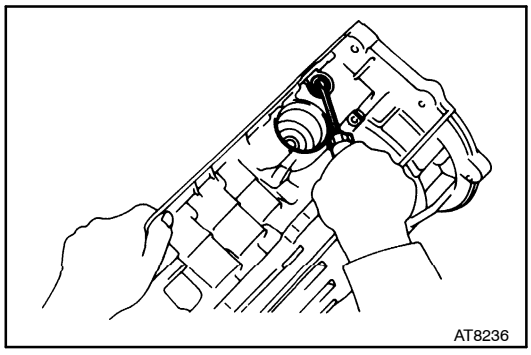
63. REMOVE MANUAL VALVE LEVER, SHAFT AND OIL SEALS

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



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

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

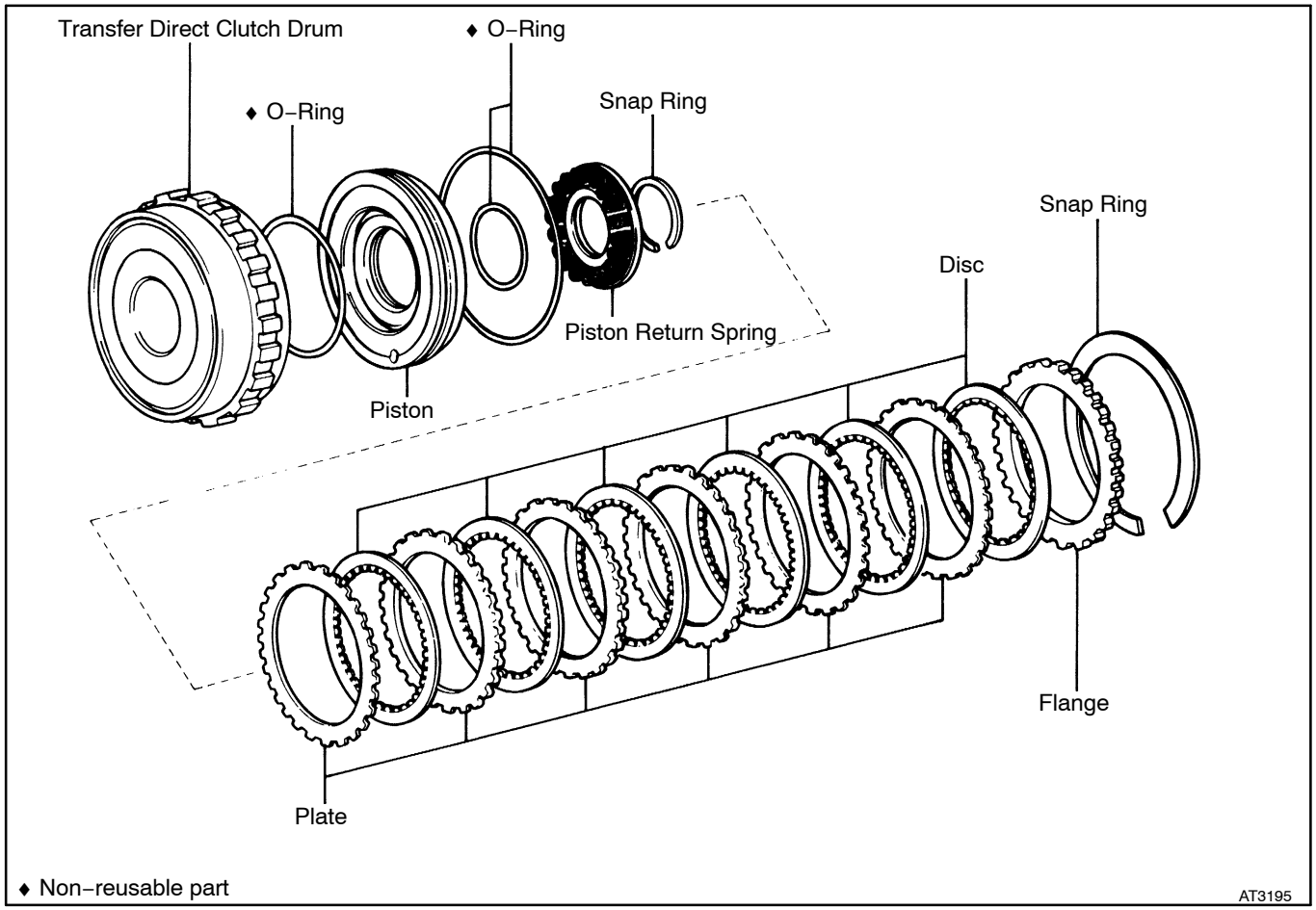


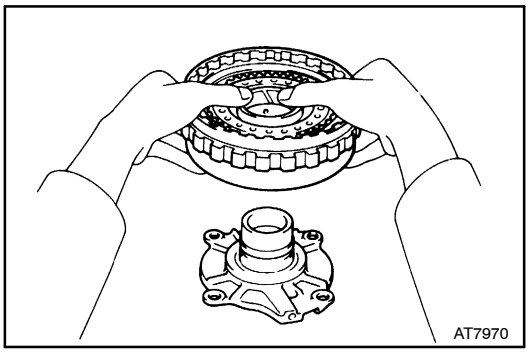
(d) Using a screwdriver, remove the two oil seals.

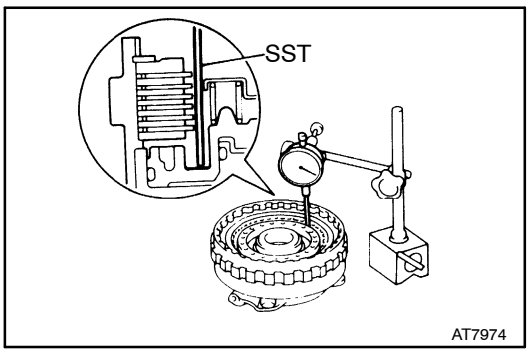
COMPONENT PARTS (A340H)

Transfer Direct Clutch

COMPONENTS







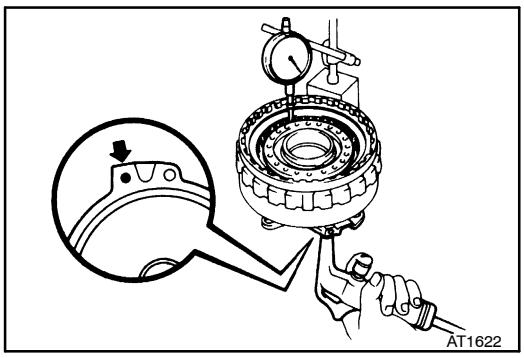
DISASSEMBLY OF TRANSFER DIRECT CLUTCH

1. CHECK PISTON STROKE OF TRANSFER DIRECT CLUTCH

(a) Install the direct clutch onto the transfer front support.

(b) Place SST and a dial indicator onto the transfer direct clutch piston as shown in the figure.

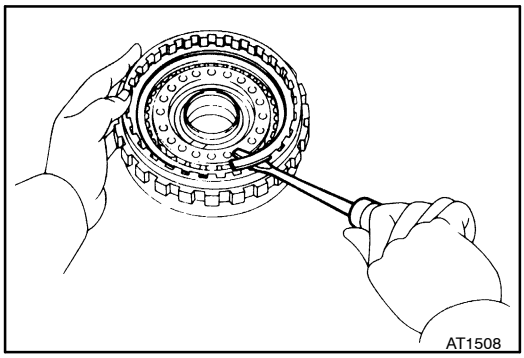
SST 09350–30020 (09350–06120)



(c) Measure the piston stroke while applying and releasing the compressed air (4 – 8 kg /cm^2, 57 – 114 psi or 392 – 785 kPa) as shown.

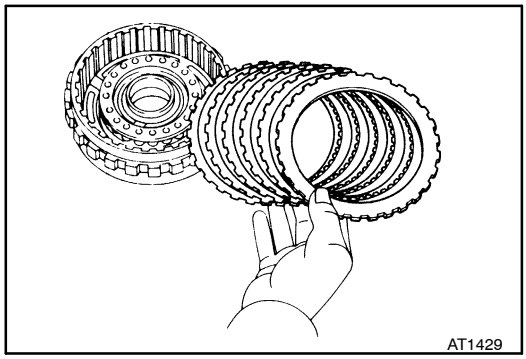
Piston stroke: 2.28 – 2.68 mm (0.0898 – 0.1055 in.)

If the values are nonstandard, inspect the discs.

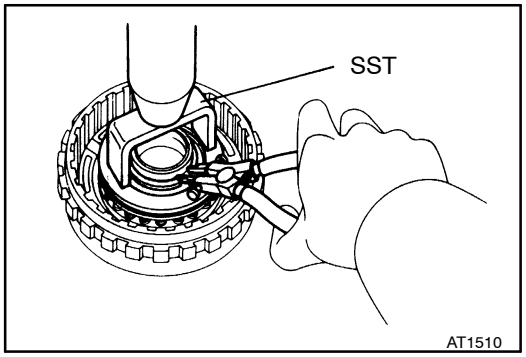


2. REMOVE FLANGE, PLATES AND DISCS

(a) Remove the snap ring from the clutch drum.



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



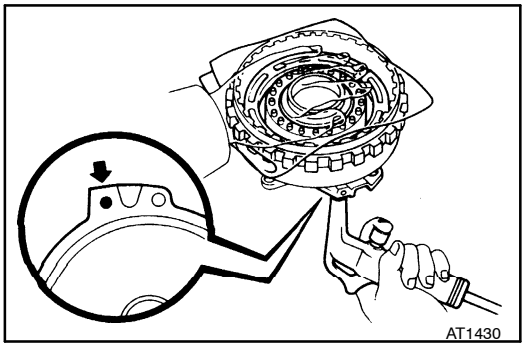
3. REMOVE PISTON RETURN SPRING

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

SST 09320–89010

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

(c) Remove the piston return spring.



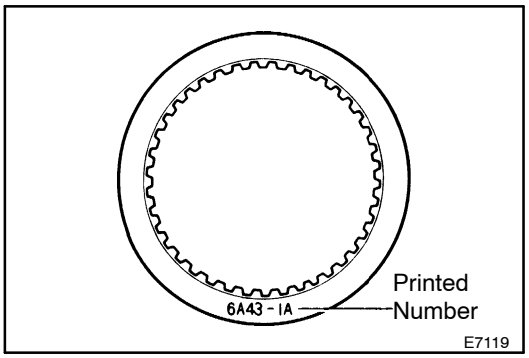
4. REMOVE TRANSFER DIRECT CLUTCH PISTON

(a) Place the direct clutch on the transfer front support.

(b) Hold the transfer direct clutch piston with hand, apply compressed air to the front support to remove the piston.

(C) Remove the transfer direct clutch piston.

(c) Remove the two O–rings from the piston and an O–ring from the drum.

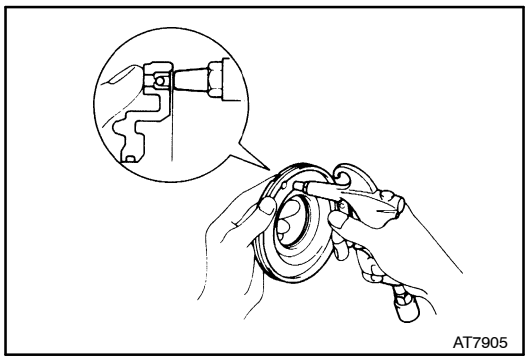


INSPECTION OF TRANSFER DIRECT CLUTCH

1. INSPECT DISC, PLATE AND FLANGE

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

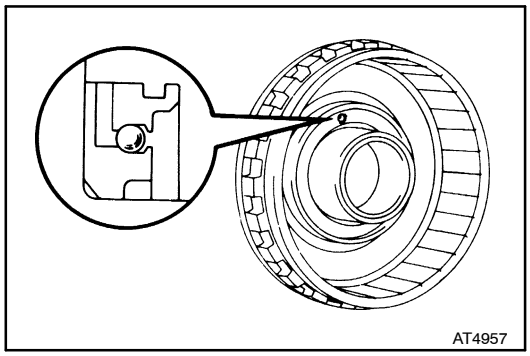
- If the lining of the disc is peeling off or discolored, or even if parts of the printed numbers are defaced, replace all discs.
- Before assembling new discs, soak them in ATF for at least fifteen minutes.



2. CHECK TRANSFER DIRECT CLUTCH PISTON

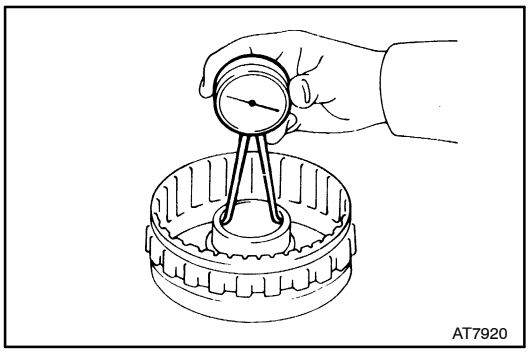
(a) Check that check ball is free by shaking the piston.

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



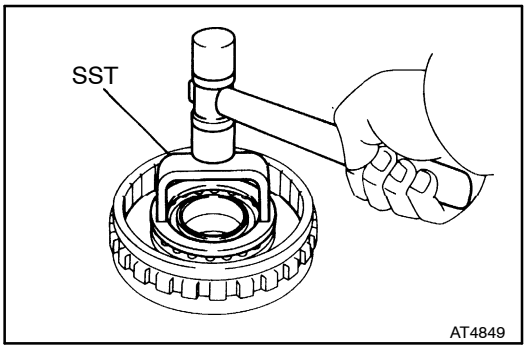
3. CHECK TRANSFER DIRECT CLUTCH DRUM CHECK BALL

Check that check ball is free by shaking the drum.



4. CHECK TRANSFER DIRECT CLUTCH DRUM BUSHING

Using a dial indicator, measure the inside diameter of the clutch drum bushing.
Maximum inside diameter: 47.65 mm (1.8760 in.)
If the inside diameter is greater than the maximum, replace the clutch drum.



ASSEMBLY OF TRANSFER DIRECT CLUTCH

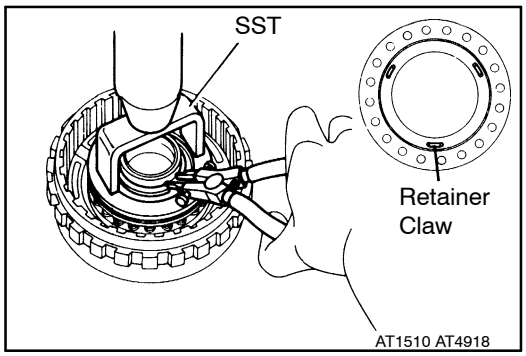
1. INSTALL PISTON TO TRANSFER DIRECT CLUTCH DRUM

(a) Coat new O–rings with ATF and install them on the piston and drum.

(b) Place SST on the transfer direct clutch piston.

SST 09320–89010

(c) Being careful not to damage the O–rings, tap the piston into the drum with plastic hammer.



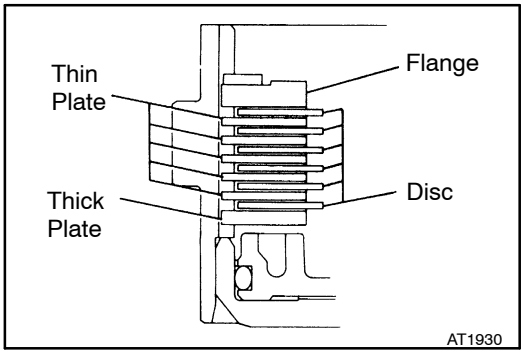
2. INSTALL PISTON RETURN SPRING

(a) Install the piston return spring.

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

SST 09320–89010

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

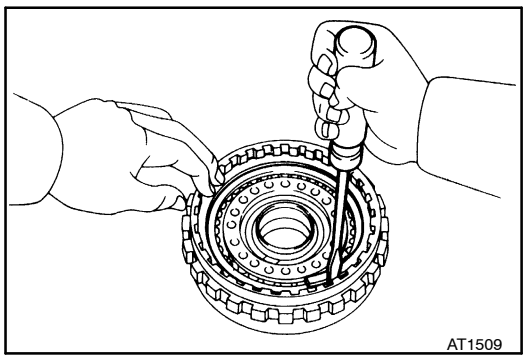


3. INSTALL PLATES, DISCS AND FLANGE

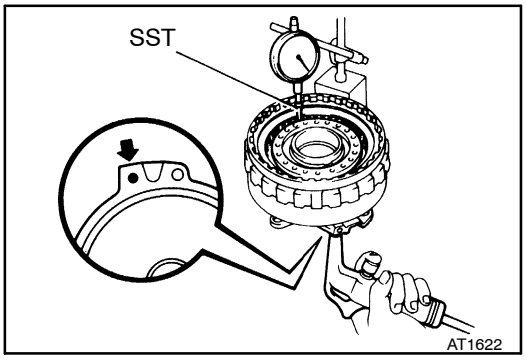
(a) Install the plates and discs.

Install in order: P = Plate D = Disc
P (Thick)–D–P (Thin)–D–P (Thin)–
D–P (Thin)–D–P (Thin)–D–P (Thin)–D

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



(c) Install the snap ring with a screwdriver.



4. CHECK PISTON STROKE OF TRANSFER DIRECT CLUTCH

(a) Install the direct clutch onto the transfer front support.
Using SST and a dial indicator, measure the piston stroke applying and releasing the compressed air (4 –8 kg /cm^2, 57 – 114 psi or 392 – 785 kPa) as shown.

SST 09350–30020 (09350–06120)

Piston stroke: 2.28 – 2.68 mm (0.0898 – 0.1055 in.)

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

If the piston stroke is nonstandard, select another flange.

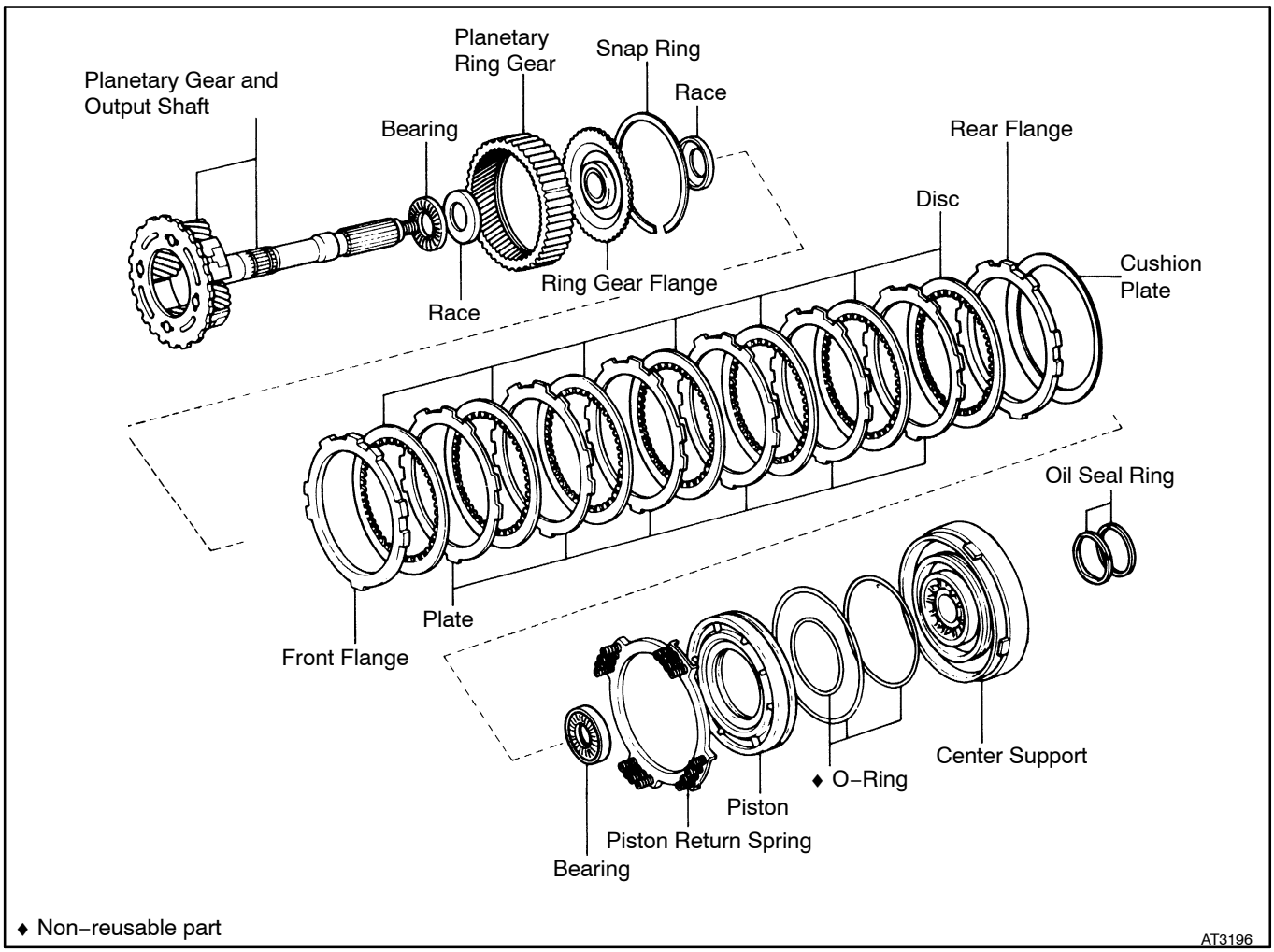
HINT: There are four different thicknesses for the flange.

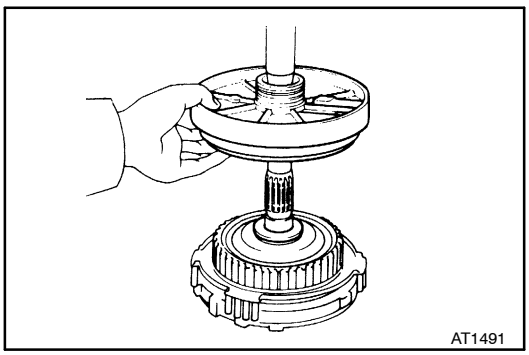
Flange thickness mm (in.)

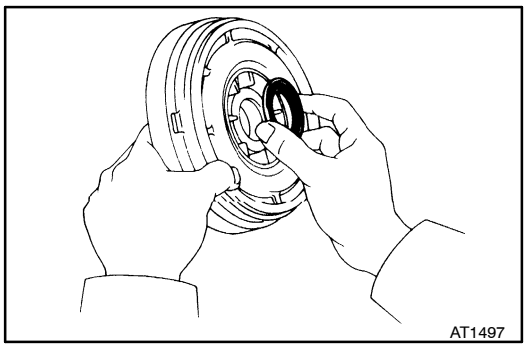
3.9 (0.154)	4.3 (0.169)
4.1 (0.161)	4.5 (0.177)

Transfer Low Speed Brake and Center Support

COMPONENTS





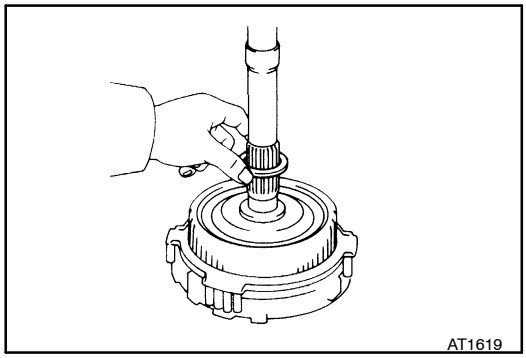


DISASSEMBLY OF TRANSFER LOW SPEED BRAKE AND CENTER SUPPORT

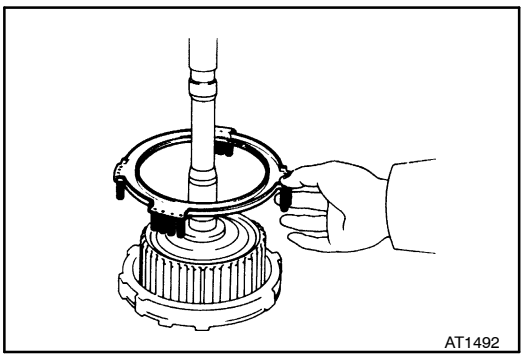
1. REMOVE TRANSFER CENTER SUPPORT

(a) Remove the center support from the output shaft.

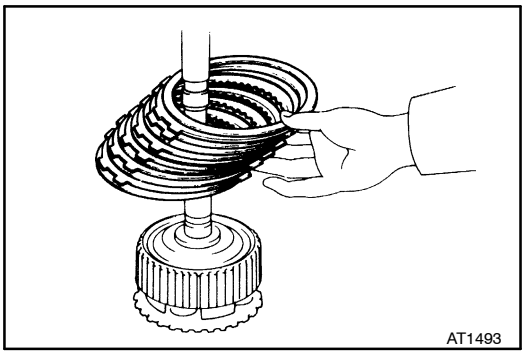
(b) Remove the assembled bearing and race from the center support.



(c) Remove the race from the output shaft.

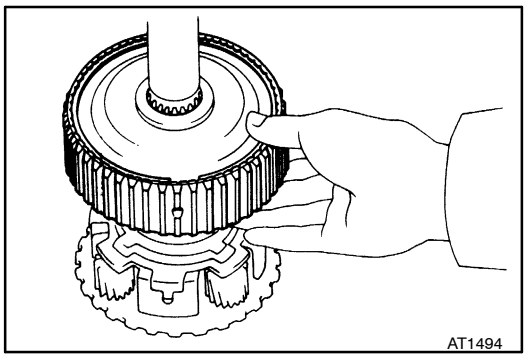


2. REMOVE PISTON RETURN SPRING

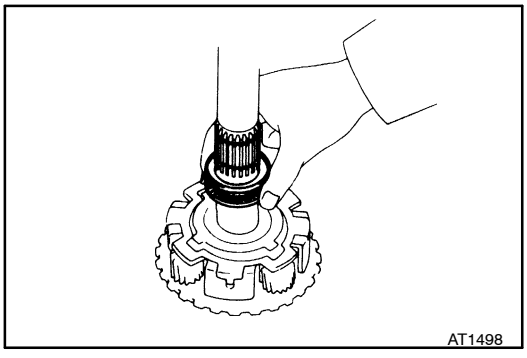


3. REMOVE CUSHION PLATE, REAR FLANGE, PLATES AND DISCS

Remove the cushion plate, rear flange, six plates and seven discs.

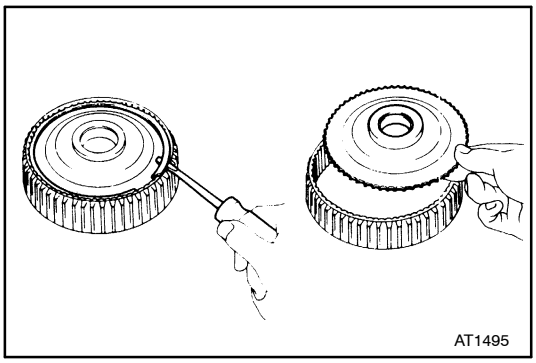


4. REMOVE PLANETARY RING GEAR FROM OUTPUT SHAFT



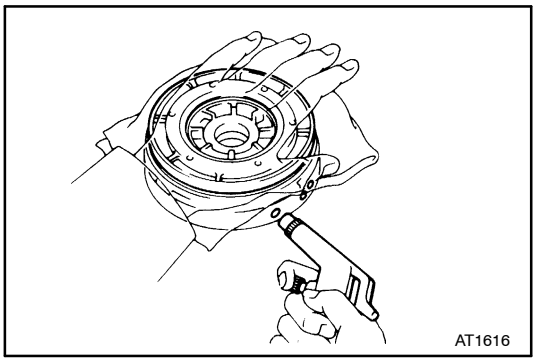
5. REMOVE RACE AND BEARING FROM PLANETARY GEAR

Remove the race and bearing from rear side of the planetary gear.



6. REMOVE PLANETARY RING GEAR FLANGE

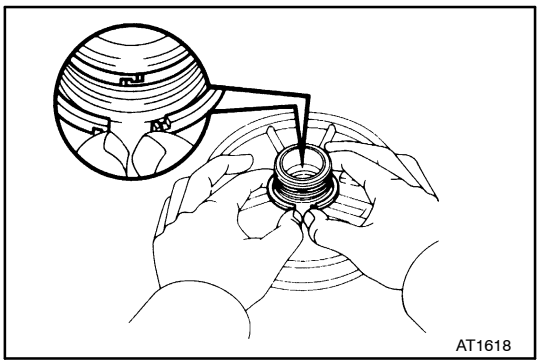
Remove the snap ring and ring gear flange.



7. REMOVE TRANSFER LOW SPEED BRAKE PISTON

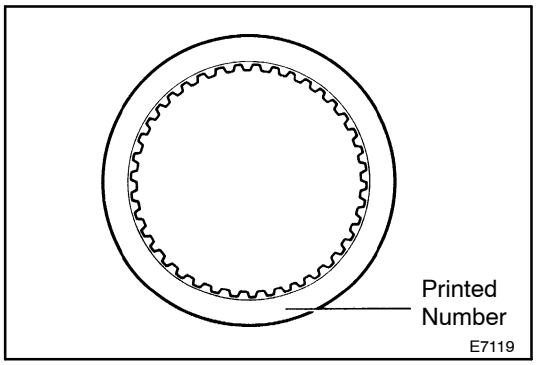
(a) Hold the low speed brake piston with hand, apply compressed air into the center support and remove the piston.

(b) Remove the two O–rings from the piston and an O–ring from the center support.



8. REMOVE OIL SEAL RINGS FROM CENTER SUPPORT

Push one end of the ring into the groove and unhook both ends of the ring by hands. Spread the ring apart and remove it.

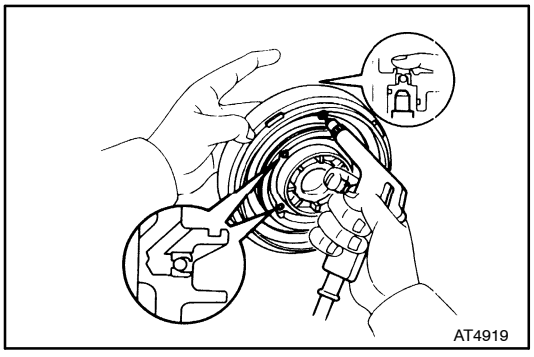


INSPECTION OF TRANSFER LOW SPEED BRAKE AND CENTER SUPPORT

1. INSPECT DISC, PLATE AND FLANGE

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

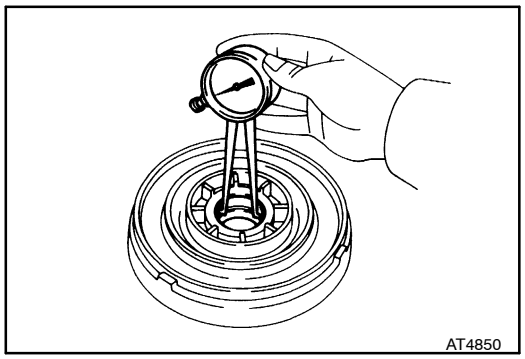
- If the lining of the disc is peeling off or discolored, or even if parts of the printed numbers are defaced, replace all discs.
- Before assembling new discs, soak them in ATF for at least fifteen minutes.



2. CHECK CENTER SUPPORT

(a) Check that check balls are free by shaking the center support.

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

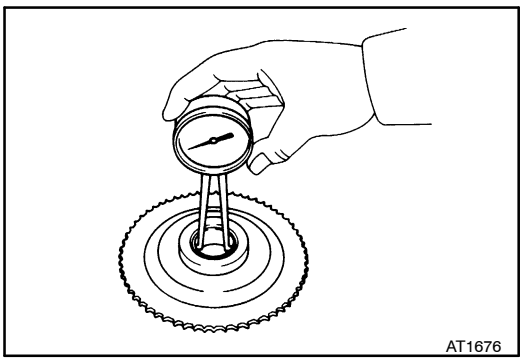


3. CHECK CENTER SUPPORT BUSHING

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

Maximum inside diameter: 35.08 mm (1.3811 in.)

If the inside diameter is greater than the maximum, replace the center support.

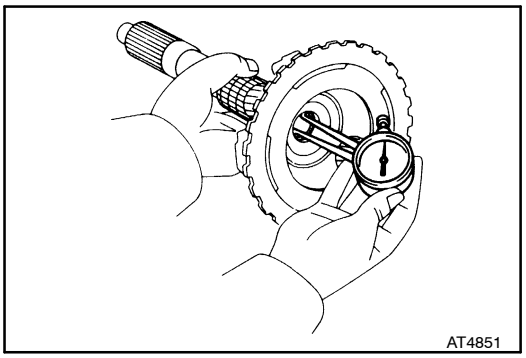


4. CHECK RING GEAR FLANGE BUSHING

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

Maximum inside diameter: 35.08 mm (1.3811 in.)

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

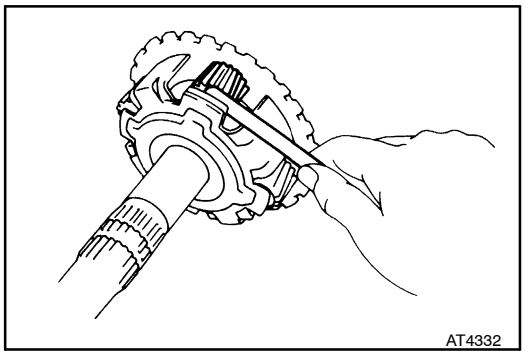


5. CHECK PLANETARY GEAR BUSHING

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

Maximum inside diameter: 18.08 mm (0.7118 in.)

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



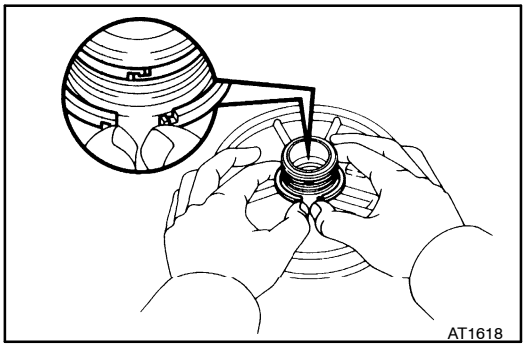
6. MEASURE PLANETARY PINION GEAR THRUST CLEARANCE

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

Standard clearance: 0.30 – 0.60 mm (0.0118 – 0.0236 in.)

Maximum clearance: 1.00 mm (0.0394 in.)

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



ASSEMBLY OF TRANSFER LOW SPEED BRAKE AND CENTER SUPPORT

1. INSTALL OIL SEAL RINGS TO CENTER SUPPORT

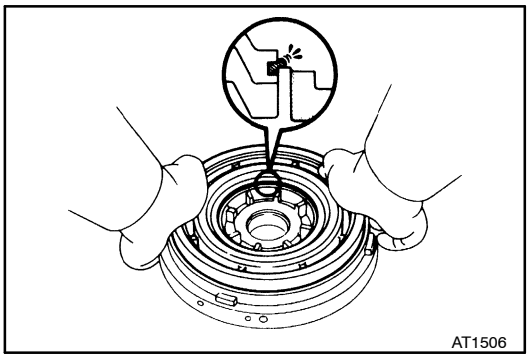
(a) Coat the two oil seal rings with ATF.

(b) Spread the ring apart and install it into the groove on the center support.

NOTICE: Do not spread the ring ends too much.

(c) Push the one end of the ring into the groove and hook both ends with hands.

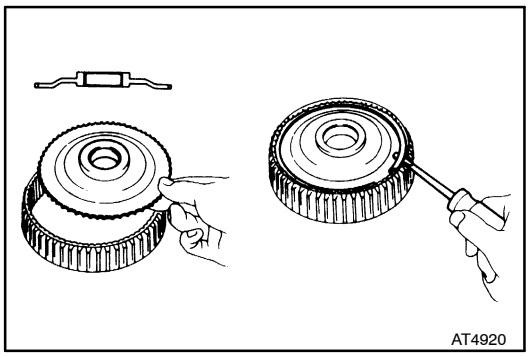
HINT: After installing the oil seal rings, check that they rotate smoothly.



2. INSTALL TRANSFER LOW SPEED BRAKE PISTON TO CENTER SUPPORT

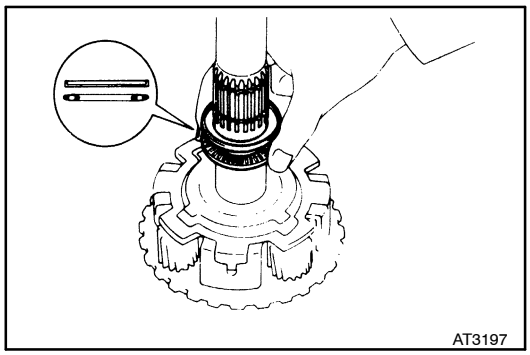
(a) Coat new O–rings with ATF and install them on the piston and center support.

(b) Being careful not to damage the O–rings, press in the low speed brake piston into the center support with both hands.



3. INSTALL PLANETARY RING GEAR FLANGE

Install the flange into the ring gear and install the snap ring.

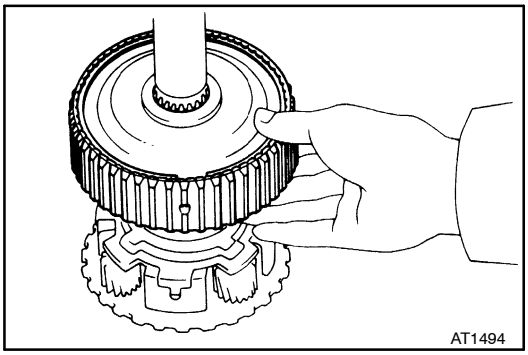


4. INSTALL BEARING AND RACE TO PLANETARY GEAR

Coat the bearing and race with petroleum jelly and install them onto the planetary gear.
HINT: Bearing and race diameter

mm (in.)

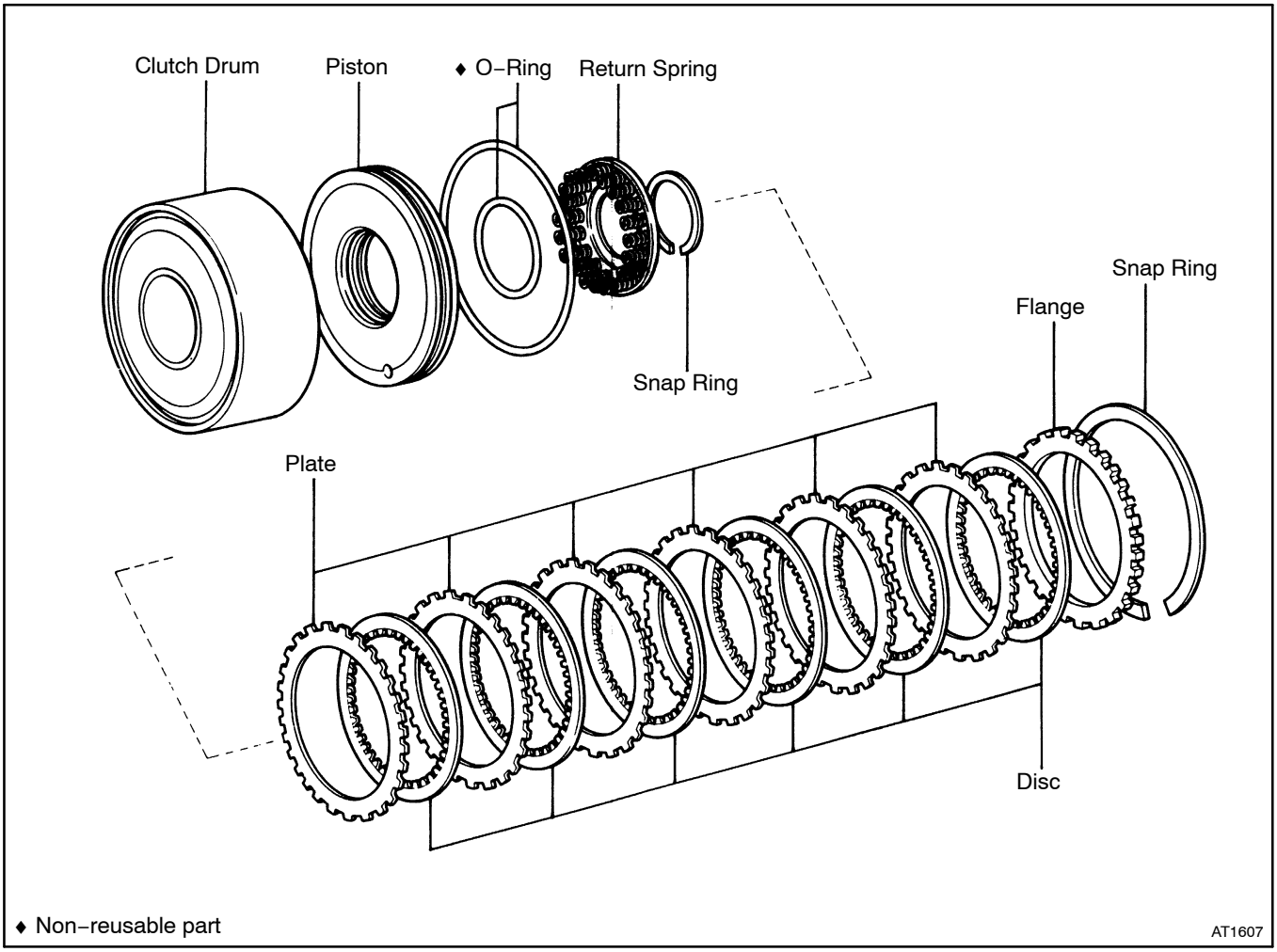
	Inside	Outside
Bearing	35.0 (1.378)	54.4 (2.142)
Race	36.3 (1.429)	53.9 (2.122)

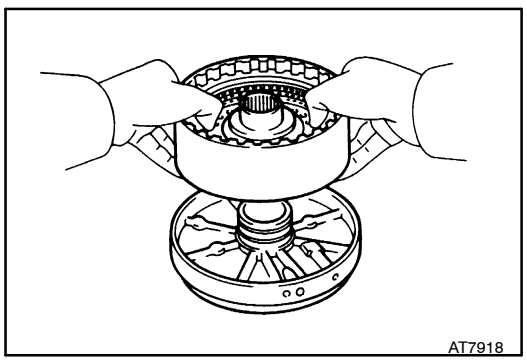


5. INSTALL PLANETARY RING GEAR TO OUTPUT SHAFT

Transfer Front Drive Clutch

COMPONENTS

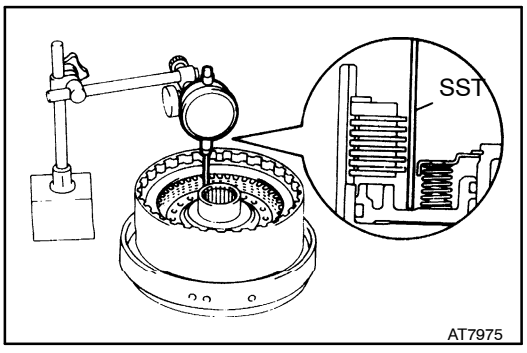




DISASSEMBLY OF TRANSFER FRONT DRIVE CLUTCH

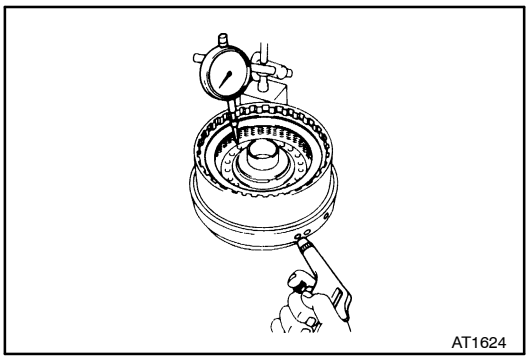
1. CHECK PISTON STROKE OF TRANSFER FRONT DRIVE CLUTCH

(a) Install the front drive clutch onto the transfer center support.



(b) Place SST and a dial indicator onto the transfer front drive clutch piston as shown in the figure.

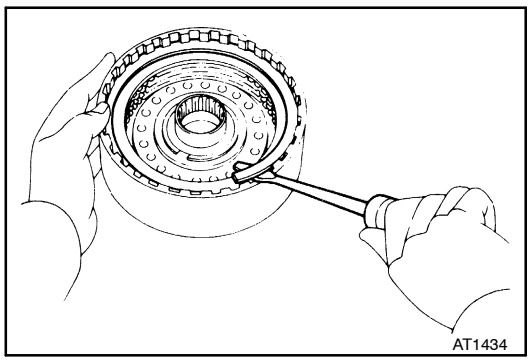
SST 09350–30020 (09350–06120)



(c) Measure the piston stroke while applying and releasing compressed air (4 – 8 kg/cm^2, 57 – 114 psi or 392 – 785 kPa) as shown.

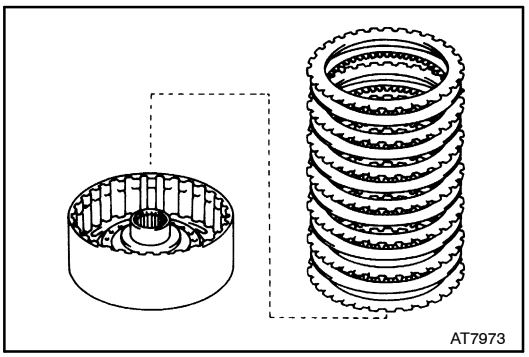
Piston stroke: 2.38 – 3.22 mm (0.0937 – 0.1268 in.)

If the values are nonstandard, inspect the discs.

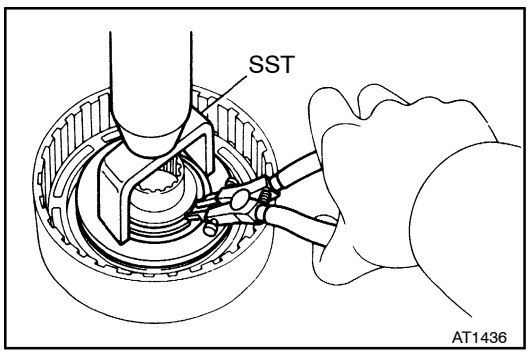


2. REMOVE FLANGE, PLATES AND DISCS

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



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



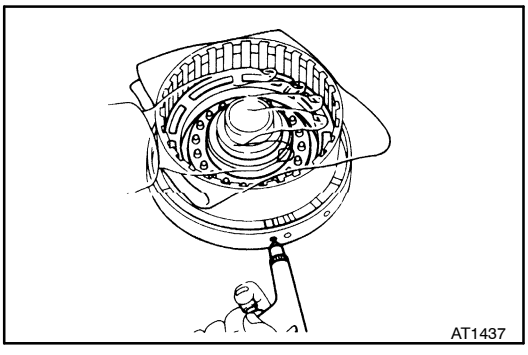
3. REMOVE PISTON RETURN SPRING

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

SST 09320–89010

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

(c) Remove the piston return spring.



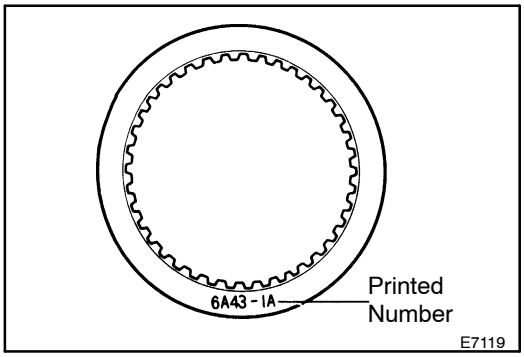
4. REMOVE TRANSFER FRONT DRIVE CLUTCH PISTON

(a) Place the front drive clutch on the transfer center support.

(b) Hold the front drive clutch piston with hand, apply compressed air to the center support to remove the piston.

(c) Remove the front drive clutch piston.

(d) Remove the O–rings from the piston.

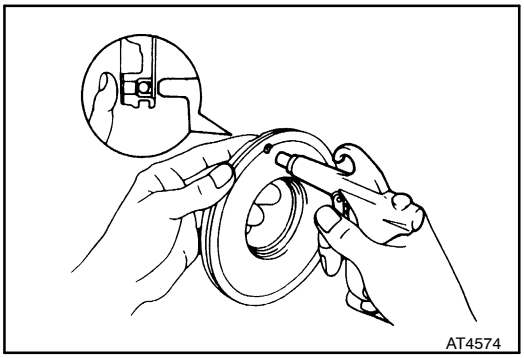


INSPECTION OF TRANSFER FRONT DRIVE CLUTCH

1. INSPECT DISC, PLATE AND FLANGE

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

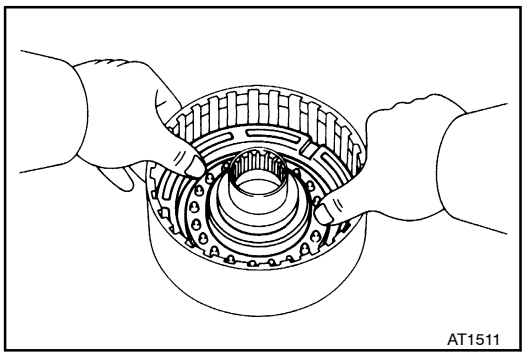
- If the lining of the disc is peeling off or discolored, or even if parts of the printed numbers are defaced, replace all discs.
- Before assembling new discs, soak them in ATF for at least fifteen minutes.



2. CHECK FRONT DRIVE CLUTCH PISTON

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

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

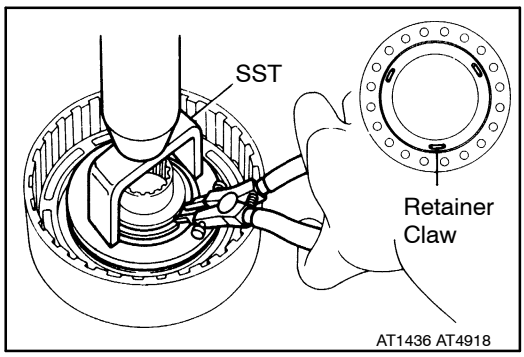


ASSEMBLY OF TRANSFER FRONT DRIVE CLUTCH

1. INSTALL PISTON TO TRANSFER FRONT DRIVE CLUTCH DRUM

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

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



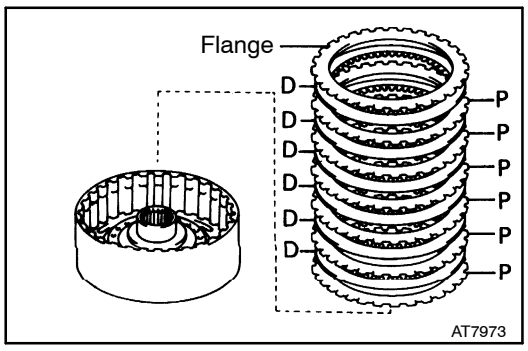
2. INSTALL PISTON RETURN SPRING

(a) Install the piston return spring.

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

SST 09320–89010

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

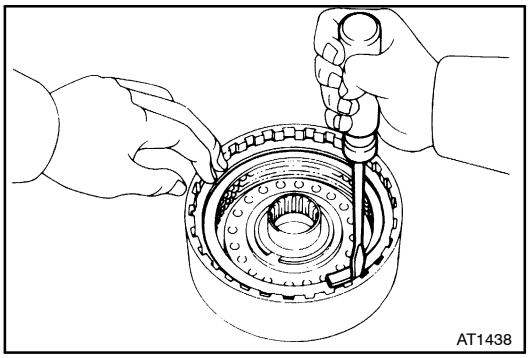


3. INSTALL PLATES, DISCS AND FLANGE

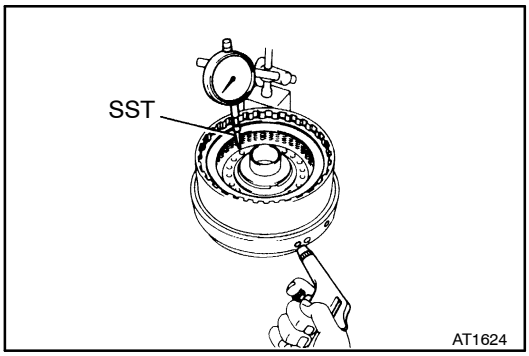
(a) Install the plates and discs.

Install in order: P = Plate D = Disc
P–D–P–D–P–D–P–D–P–D–P–D

(b) Install the flange, the rounded edge facing downward.



(c) Install the snap ring with a screwdriver.



4. CHECK PISTON STROKE OF TRANSFER FRONT DRIVE CLUTCH

(a) Install the front drive clutch onto the transfer center support.

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

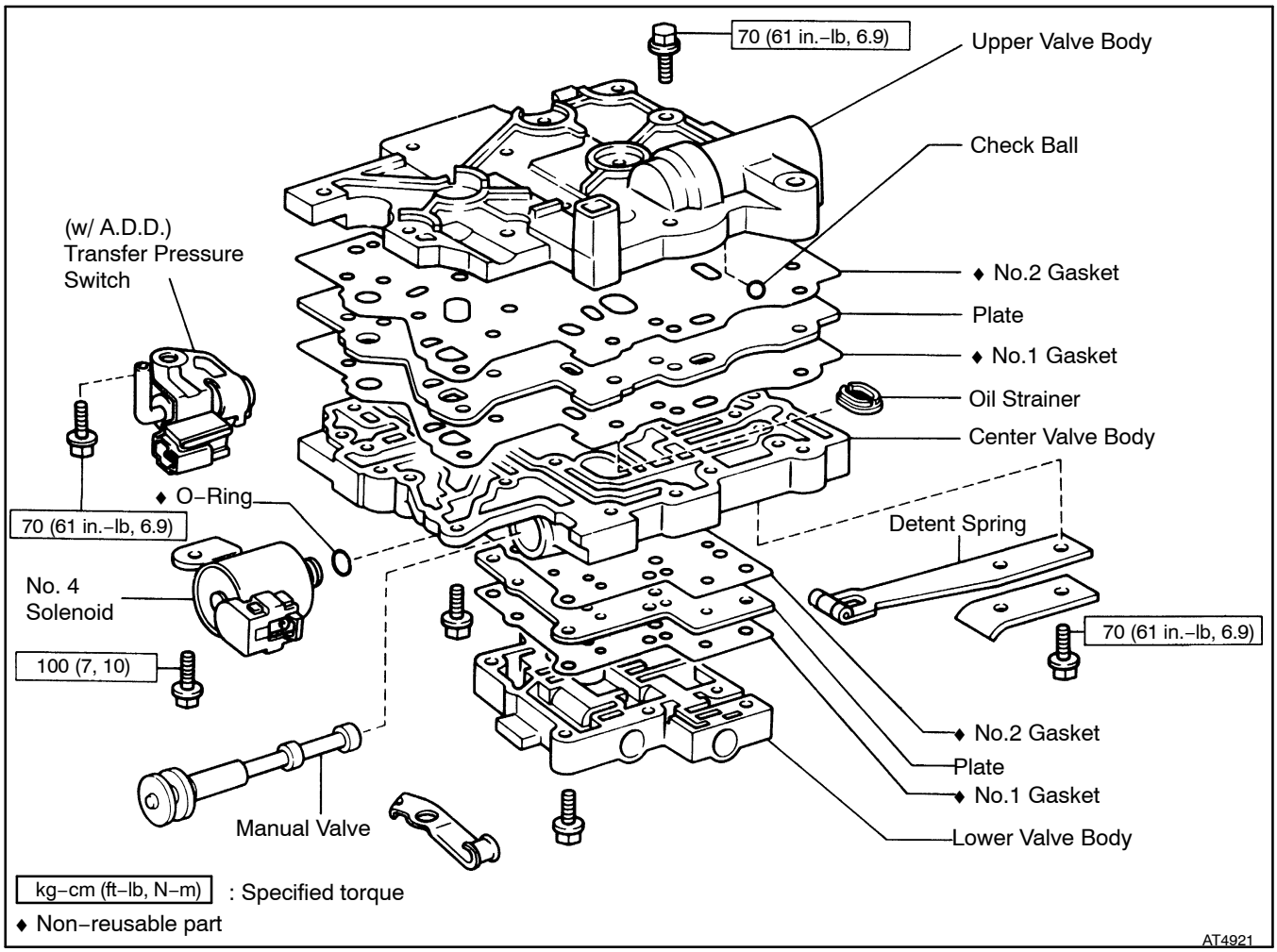
SST 09350–30020 (09350–06120)

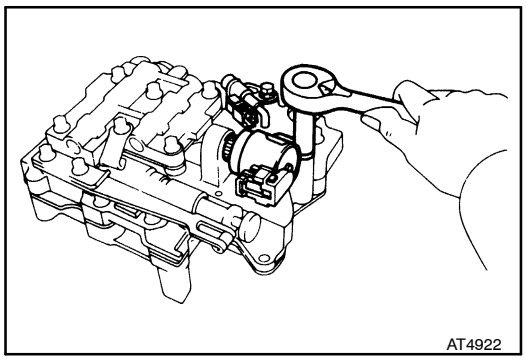
Piston stroke: 2.38 – 3.22 mm (0.0937 – 0.1268 in.)

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

Transfer Valve Body

COMPONENTS





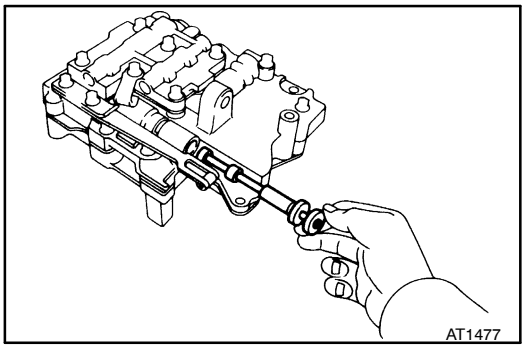
(Disassembly of Transfer Valve Body)

1. REMOVE NO. 4 SOLENOID

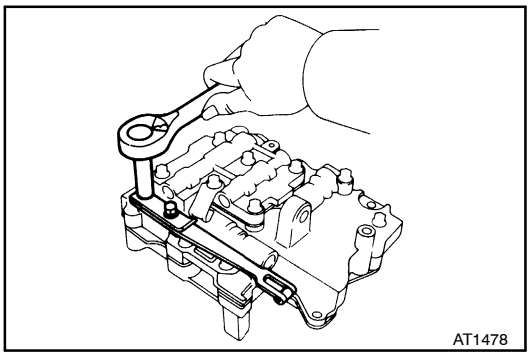
(a) Remove the bolt and No. 4 solenoid.

(b) Remove the O–ring from the solenoid.

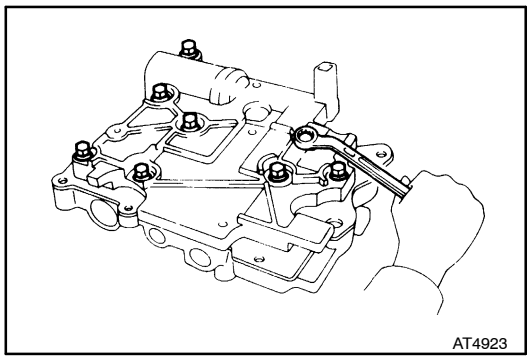
2. (w/ A.D.D.)
REMOVE TRANSFER PRESSURE SWITCH



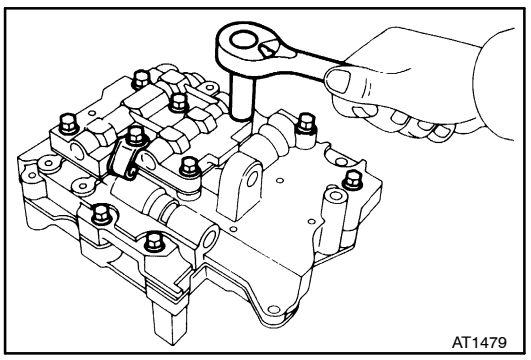
3. REMOVE MANUAL VALVE



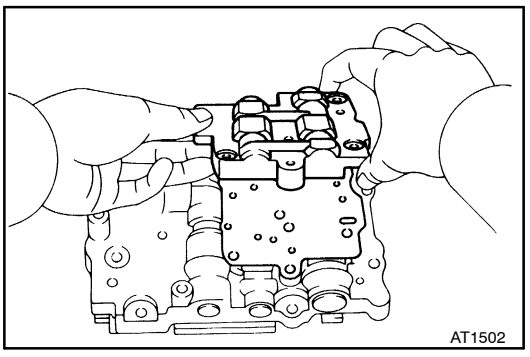
4. REMOVE DETENT SPRING



5. REMOVE EIGHT BOLTS FROM UPPER VALVE BODY



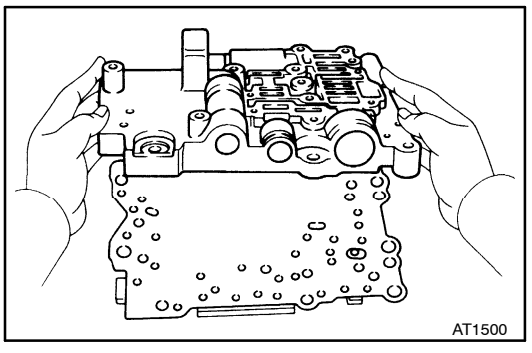
6. TURN ASSEMBLY OVER AND REMOVE TEN BOLTS FROM LOWER AND CENTER VALVE BODIES



7. LIFT OFF LOWER VALVE BODY

(a) Remove the lower valve body.

(b) Remove the plate and two gaskets.



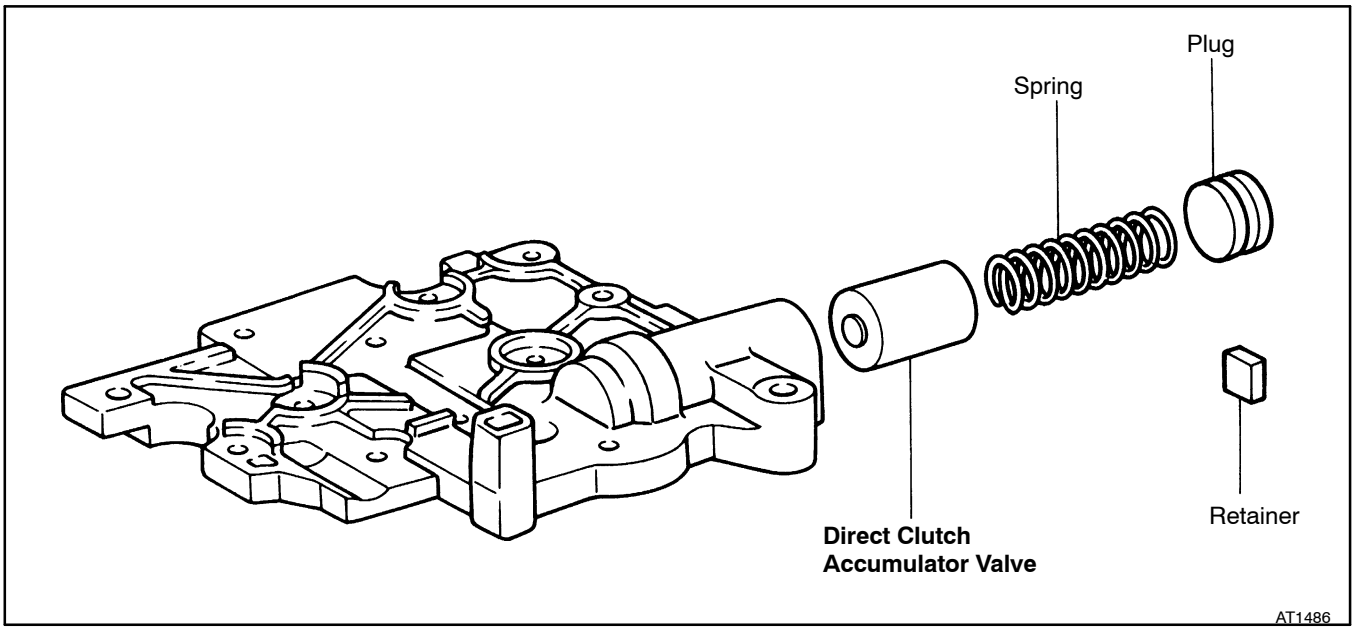
8. LIFT OFF CENTER VALVE BODY

(a) Remove the center valve body.

(b) Remove the plate and two gaskets.

(Upper Valve Body)

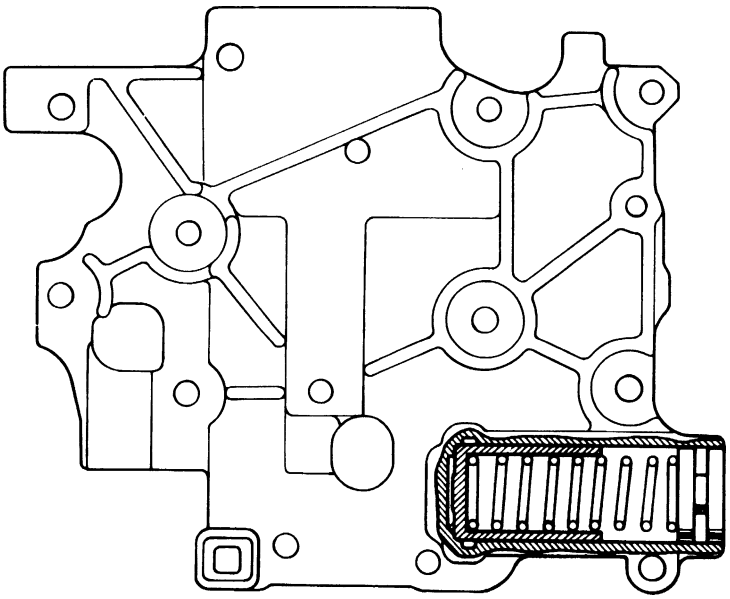
COMPONENTS



SPECIFICATIONS OF VALVE BODY SPRING

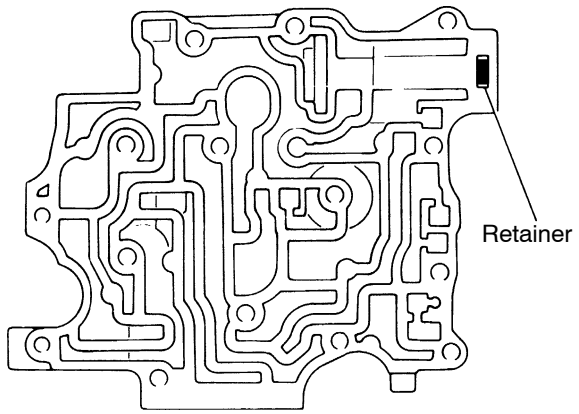
Spring	Free length mm (in.)	Coil outer diameter mm (in.)	Total No. of coils	Color
Direct clutch accumulator valve	55.7 (2.193)	18.3 (0.720)	11.1	Blue

SECTIONAL VIEW OF VALVE BODY



LOCATION OF RETAINER, CHECK BALLS AND STRAINERS

1. RETAINER

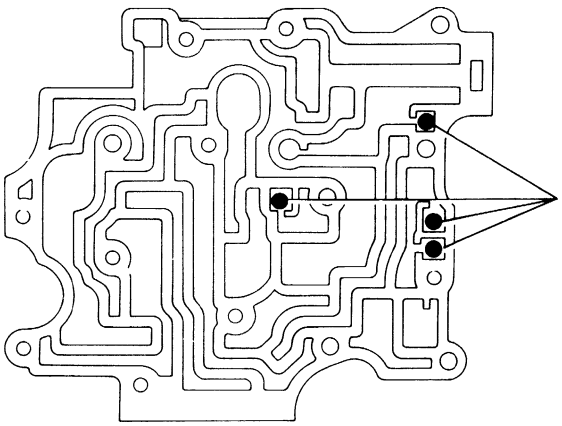


mm (in.)

Retainer	Height	Width	Thickness
Direct clutch accumulator valve	9.5 (0.374)	9.5 (0.374)	3.2 (0.126)

AT7934

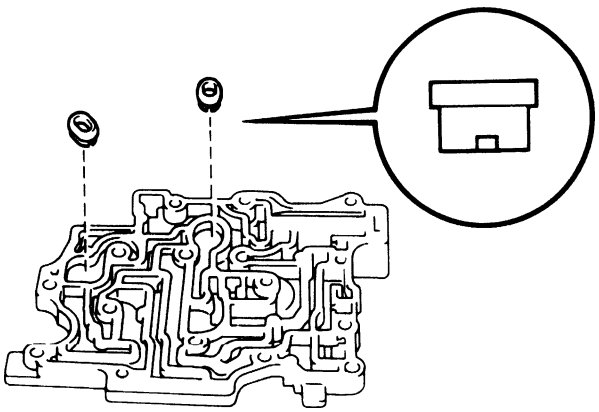
2. CHECK BALL



Check ball	Diameter mm (in.)
Rubber ball	5.54 (0.2181)

AT7935

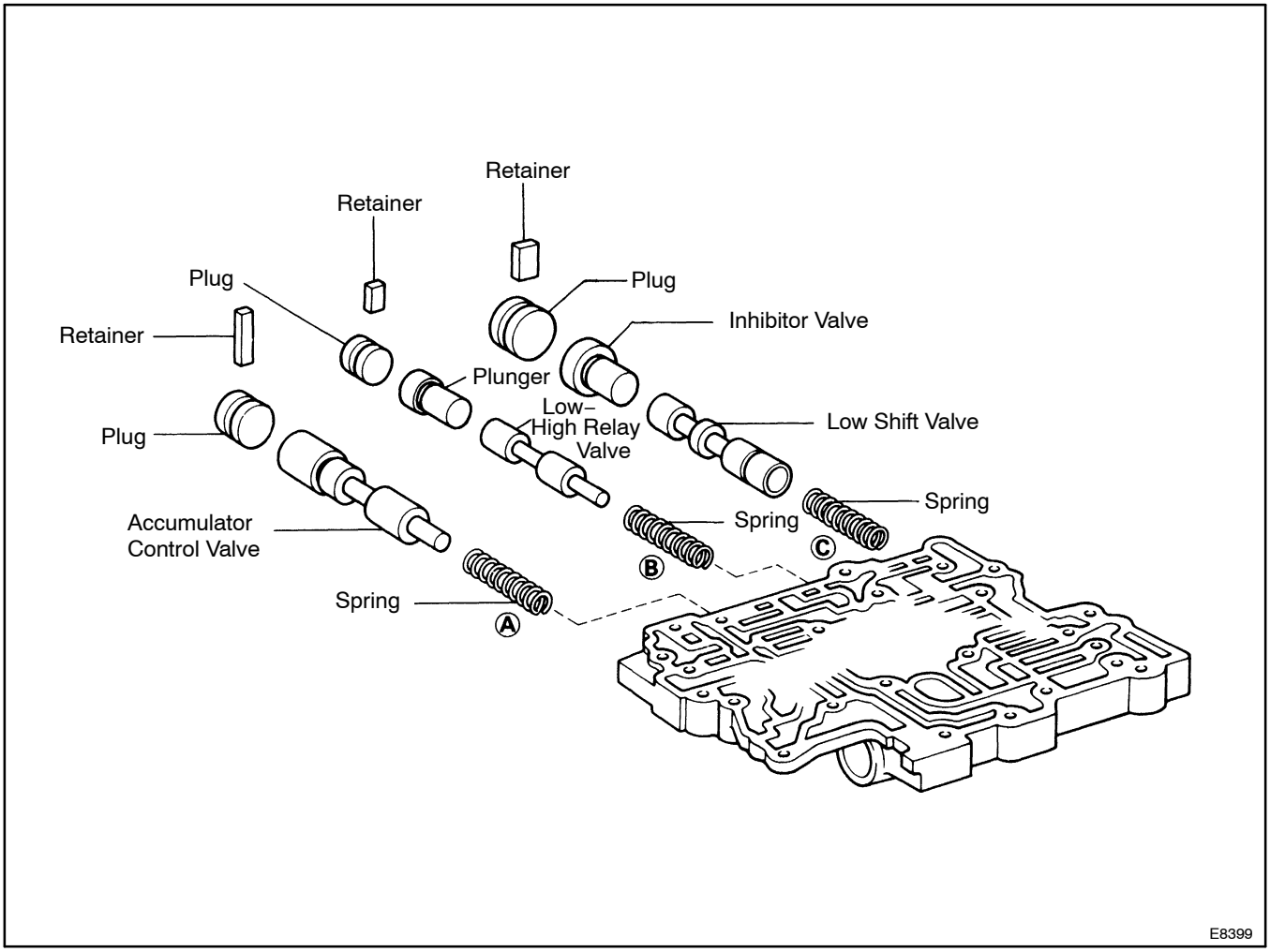
3. STRAINER



AT5064

(Center Valve Body)

COMPONENTS

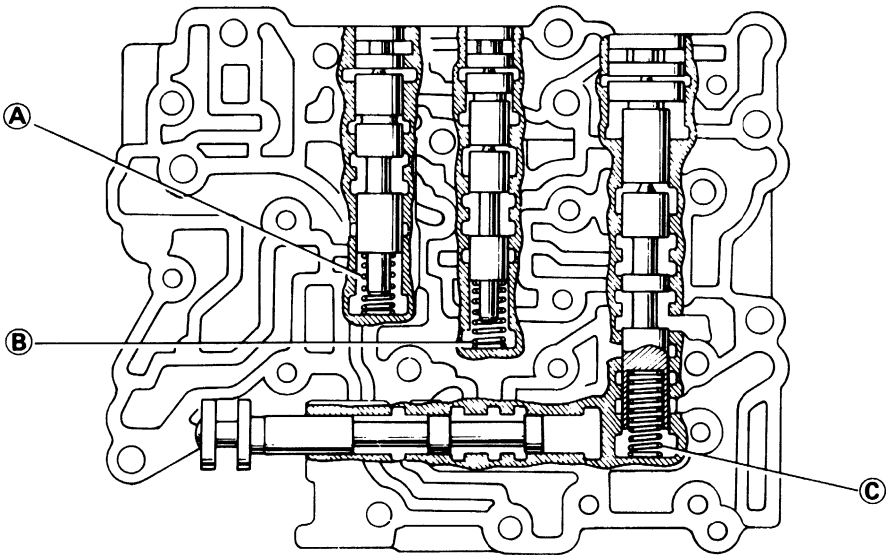


SPECIFICATIONS OF VALVE BODY SPRINGS

Spring		Free length mm (in.)	Coil outer diameter mm (in.)	Total No. of coils	Color
A	Accumulator control valve	29.3 (1.154)	8.2 (0.323)	11.8	White
B	Low–high relay valve	31.7 (1.248)	8.5 (0.335)	11.2	Light Blue
C	Low shift valve	29.2 (1.150)	8.2 (0.323)	13.0	Yellow

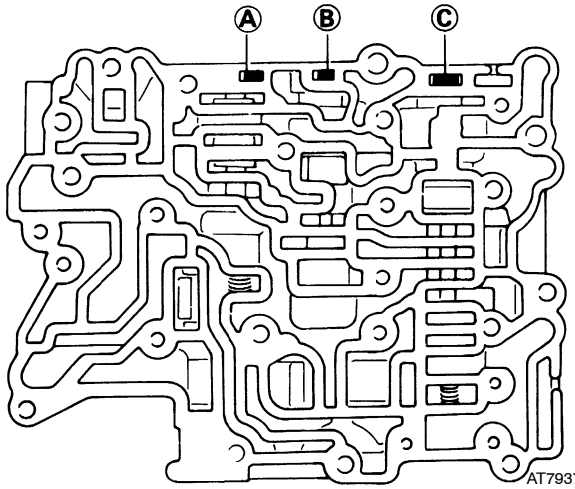
HINT: During reassembly, please refer to the spring specifications above to help differentiate the different springs.

SECTIONAL VIEW OF VALVE BODY



AT4924

LOCATION OF RETAINERS



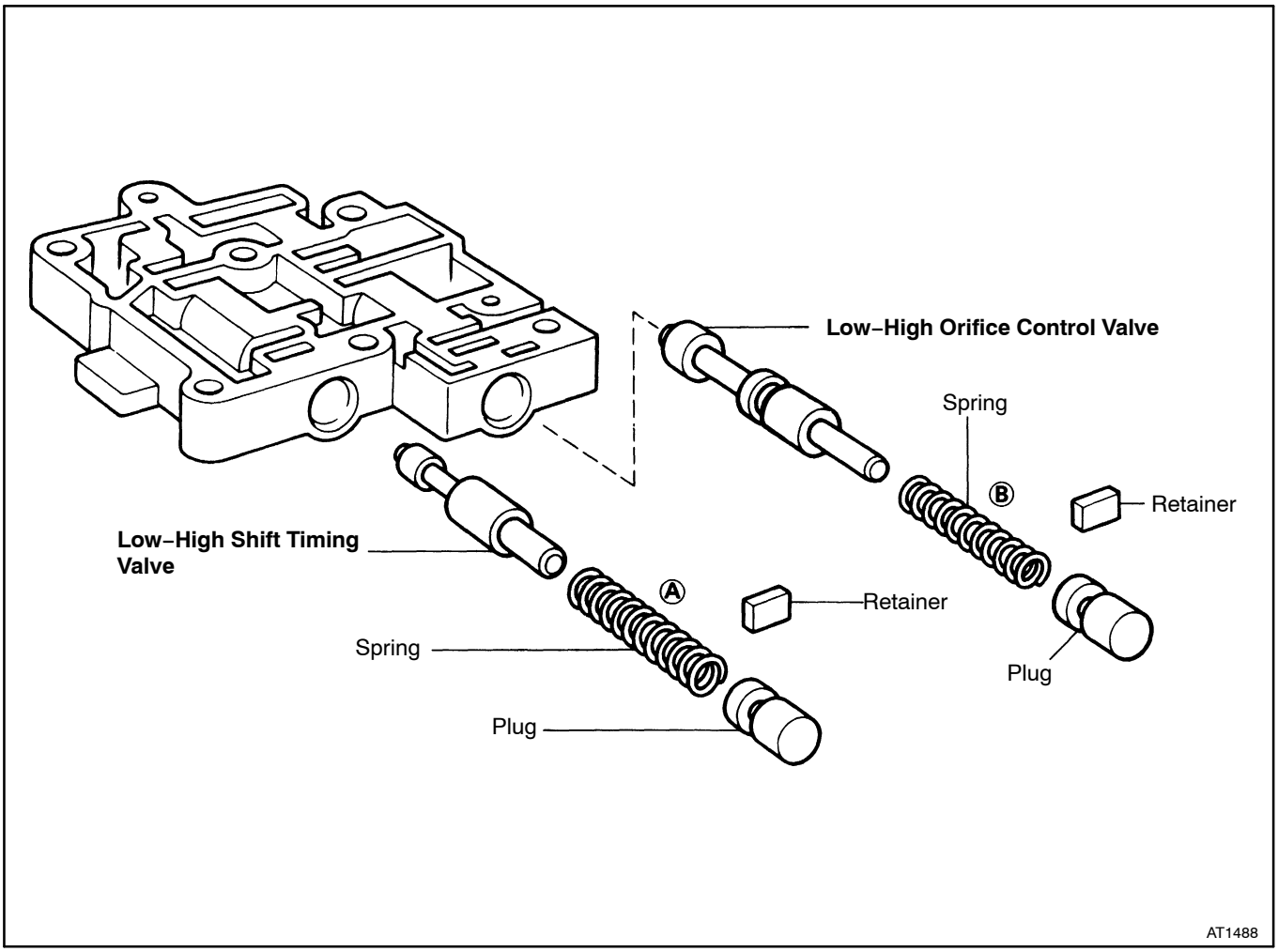
AT7937

mm (in.)

Retainer		Height	Width	Thickness
A	Accumulator control valve	21.2 (0.835)	5.0 (0.197)	3.2 (0.126)
B	Low–high relay valve	8.5 (0.335)	5.0 (0.197)	3.2 (0.126)
C	Low shift valve	9.5 (0.374)	9.5 (0.374)	3.2 (0.126)

(Lower Valve Body)

COMPONENTS

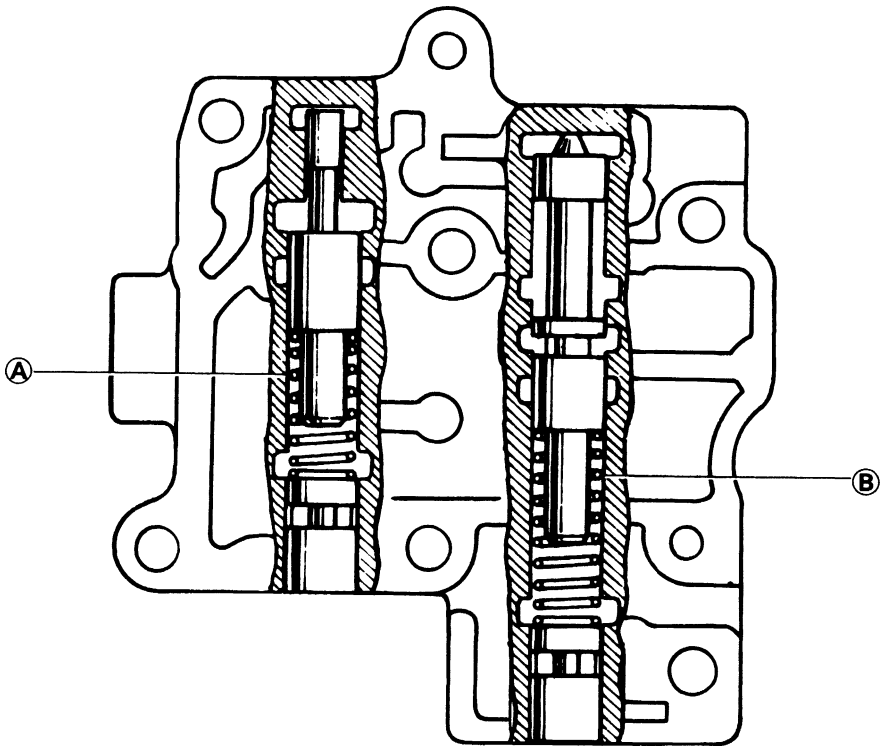


SPECIFICATIONS OF VALVE BODY SPRINGS

Spring		Free length mm (in.)	Coil outer diameter mm (in.)	Total No. of coils	Color
Ⓐ	Low–high shift timing valve	33.1 (1.303)	8.7 (0.343)	15.0	Red
Ⓑ	Low–high orifice control valve	29.7 (1.169)	9.0 (0.354)	12.3	Green

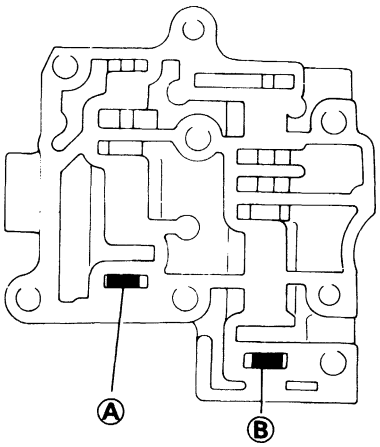
HINT: During reassembly, please refer to the spring specifications above to help differentiate the different springs.

SECTIONAL VIEW OF VALVE BODY



AT4925

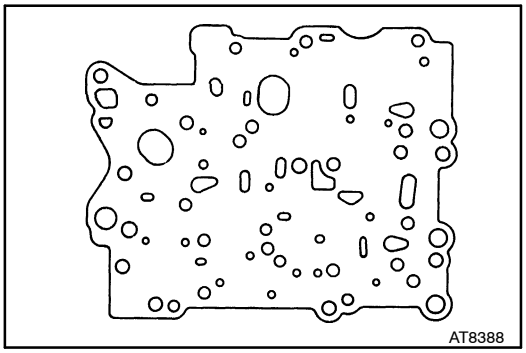
LOCATION OF RETAINERS



AT7936

mm (in.)

Retainer		Height	Width	Thickness
A	Low–high shift timing valve	8.5 (0.335)	5.0 (0.197)	3.2 (0.126)
B	Low–high orifice control valve	8.5 (0.335)	5.0 (0.197)	3.2 (0.126)

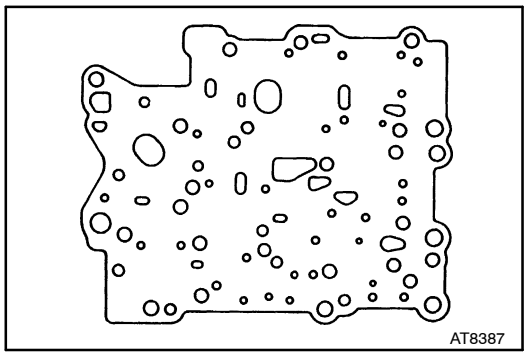


(Assembly of Transfer Valve Body)

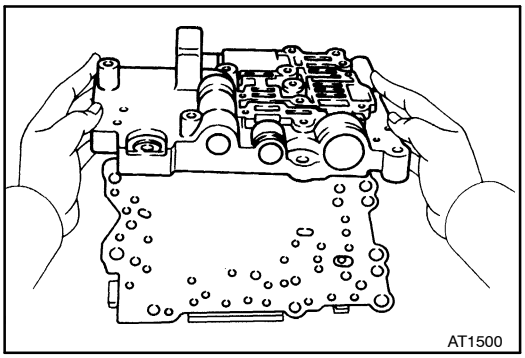
(See page AT–209)

1. POSITION NEW NO. 2 GASKET ON UPPER VALVE BODY
Align a new No. 2 gasket at each bolt hole.

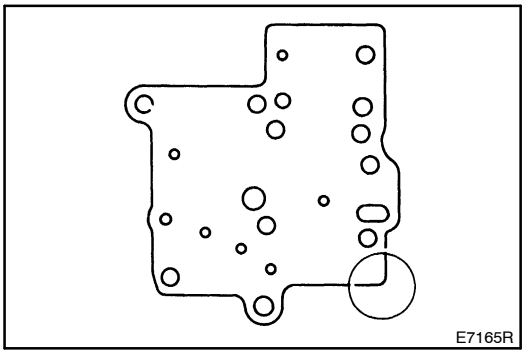
2. POSITION VALVE BODY PLATE ON NO. 2 GASKET
Align the plate at each bolt hole.



3. POSITION NEW NO. 1 GASKET ON PLATE
Align a new No. 1 gasket at each bolt hole.

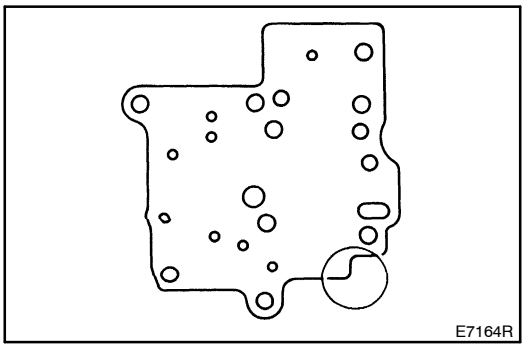


4. PLACE CENTER VALVE BODY ON TOP OF UPPER VALVE BODY

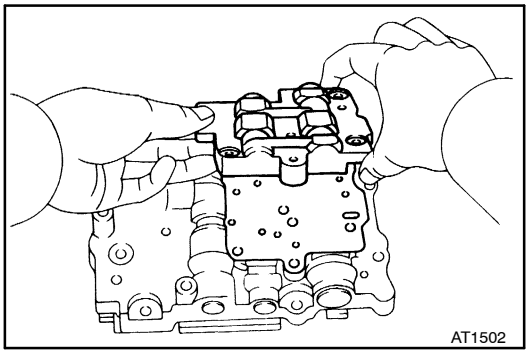


5. POSITION NEW NO. 2 GASKET ON CENTER VALVE BODY
Align a new No. 2 gasket at each bolt hole.

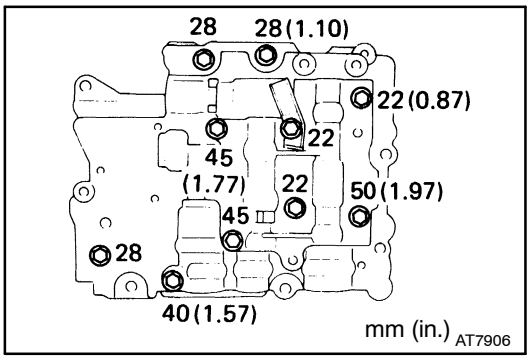
6. POSITION VALVE BODY PLATE ON NO. 2 GASKET
Align the plate at each bolt hole.



7. POSITION NEW NO. 1 GASKET ON PLATE
Align a new No. 1 gasket at each bolt hole.

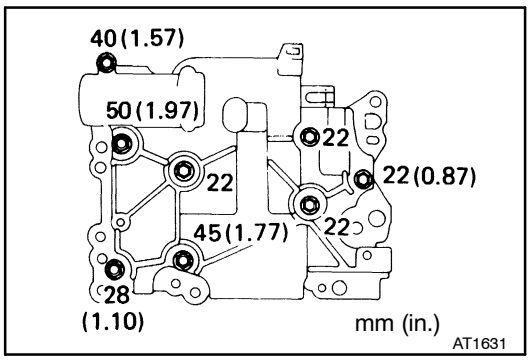


8. PLACE LOWER VALVE BODY ON TOP OF CENTER VALVE BODY



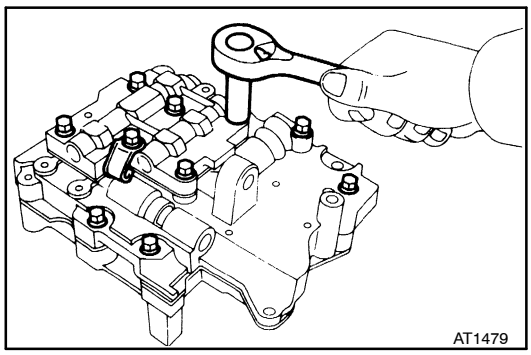
9. INSTALL AND FINGER TIGHTEN TEN BOLTS IN LOWER AND CENTER VALVE BODIES TO SECURE UPPER VALVE BODY

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



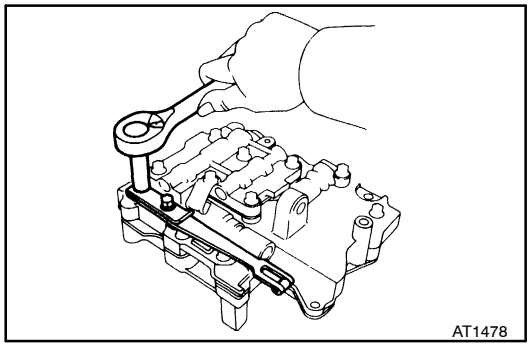
10. TURN ASSEMBLY OVER, CHECK GASKET ALIGNMENT AND FINGER TIGHTEN EIGHT BOLTS IN UPPER VALVE BODY

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



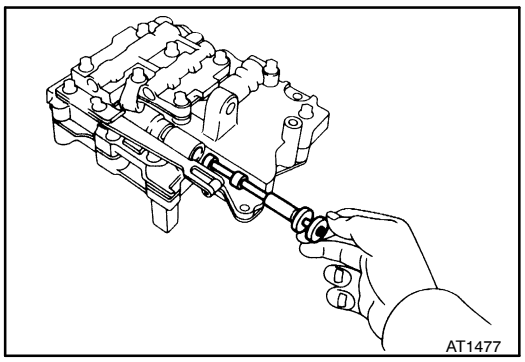
11. TIGHTEN BOLTS ON BOTH SIDES

Torque: 70 kg–cm (61 in.–lb, 6.9 N–m)



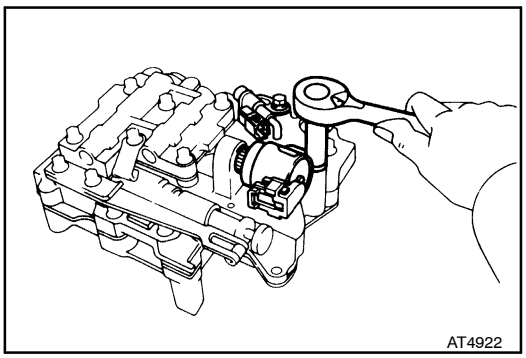
12. INSTALL DETENT SPRING

Torque: 70 kg–cm (61 in.–lb, 6.9 N–m)



13. INSERT MANUAL VALVE

HINT: Make sure the manual valve moves smoothly.



14. INSTALL NO. 4 SOLENOID

(a) Install a new O–ring to the solenoid.

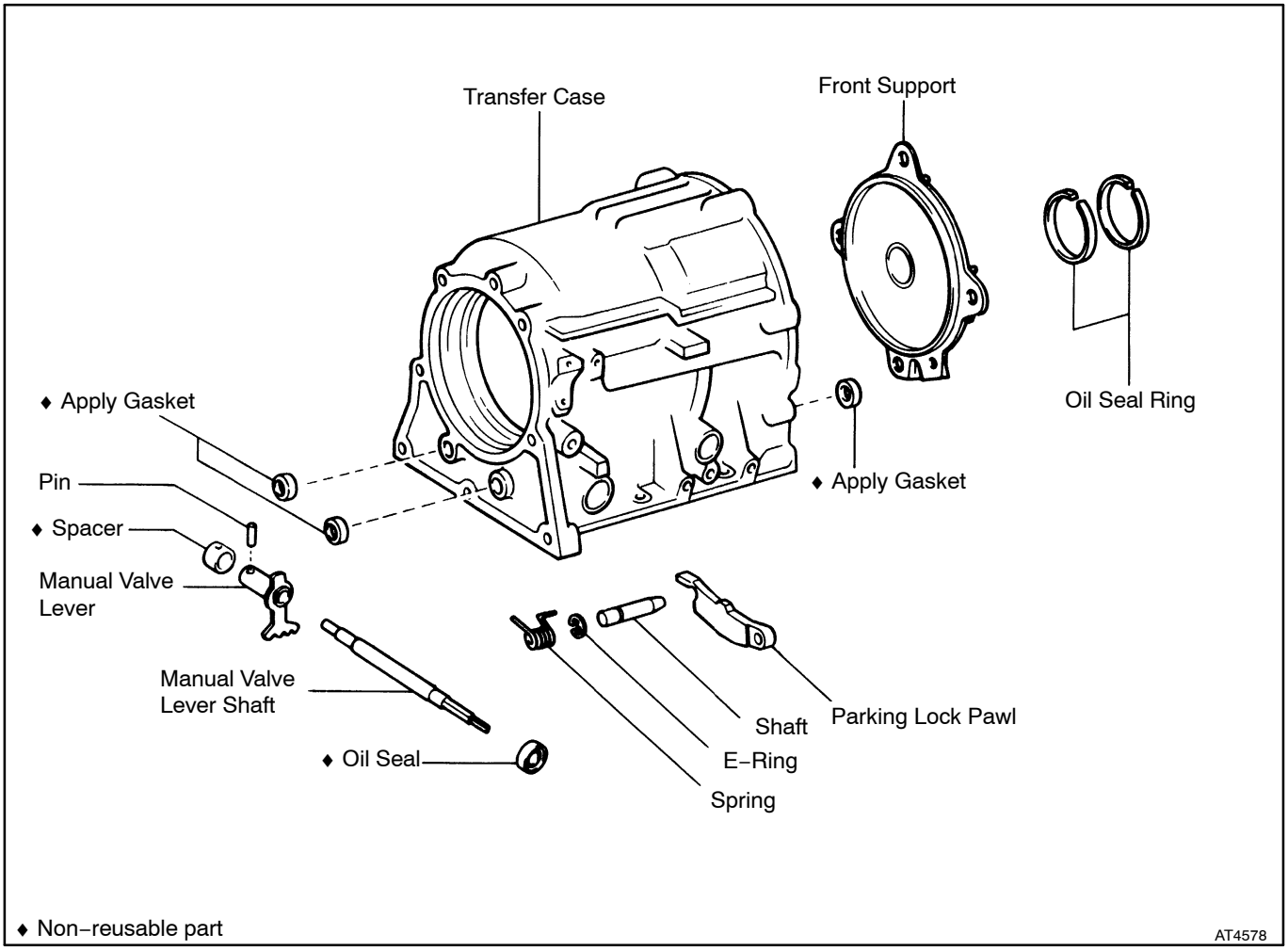
(b) Install the solenoid and torque the bolt.

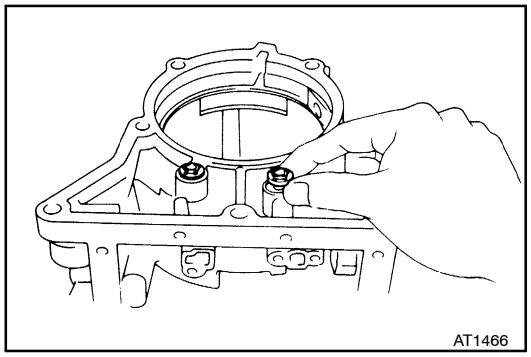
Torque: 100 kg–cm (7 ft–lb, 10 N–m)

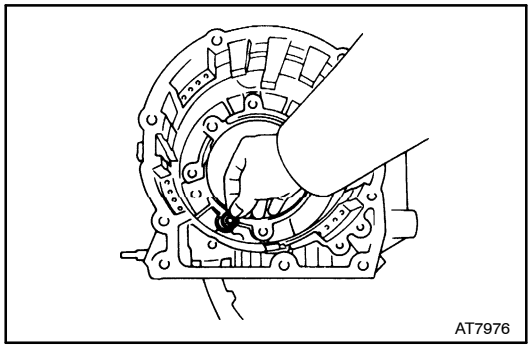
15. (w/ A.D.D.)
INSTALL TRANSFER PRESSURE SWITCH
Torque: 70 kg–cm (61 in.–lb, 6.9 N–m)

Transfer Case and Front Support

COMPONENTS





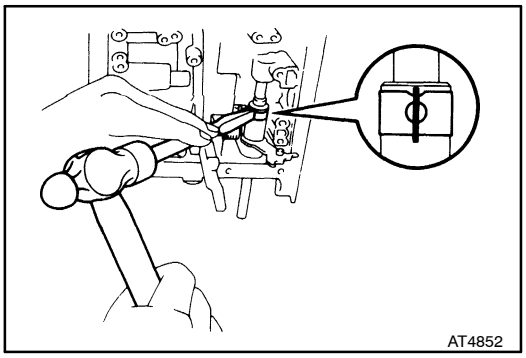


DISASSEMBLY OF TRANSFER CASE AND FRONT SUPPORT

1. REMOVE APPLY GASKETS

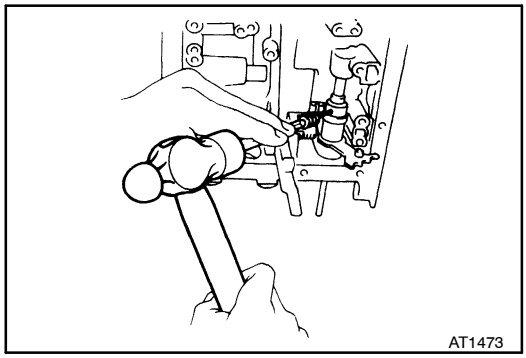
(a) Remove the two apply gaskets from the transfer case front side.

(b) Remove the apply gasket from the transfer case inner side.

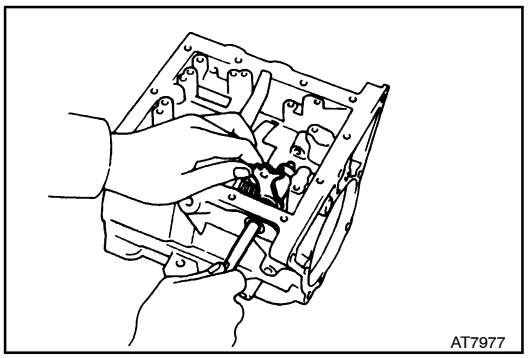


2. REMOVE TRANSFER MANUAL VALVE LEVER AND SHAFT

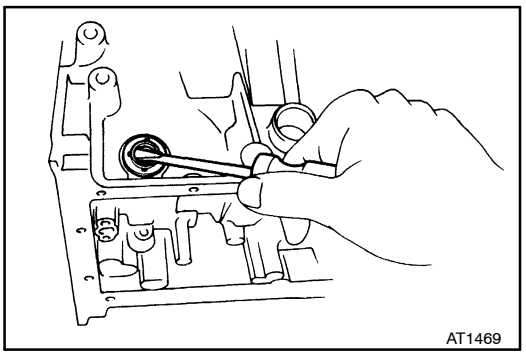
(a) Using a chisel, cut off the spacer and remove it from the shaft.



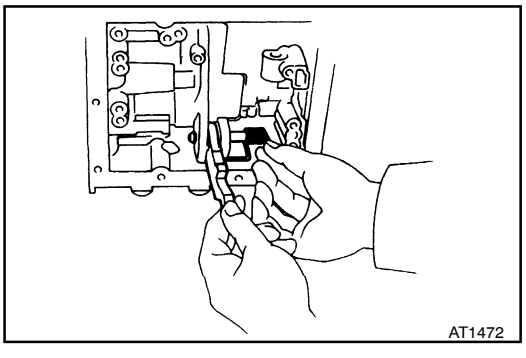
(b) Using a pin punch and hammer, drive out the pin.



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



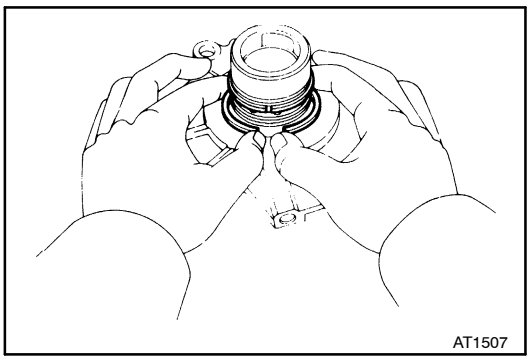
(d) Using a screwdriver, remove the oil seal from the case.



3. REMOVE SPRING, SHAFT AND PARKING LOCK PAWL

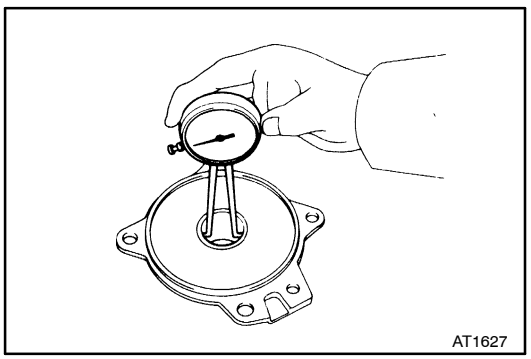
(a) Remove the spring, shaft and parking lock pawl.

(b) Remove the E–ring from the shaft.



4. REMOVE OIL SEAL RINGS FROM FRONT SUPPORT

INSPECTION OF FRONT SUPPORT



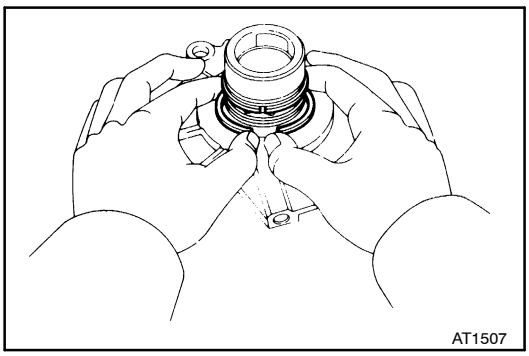
INSPECT FRONT SUPPORT BUSHING

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

Maximum inside diameter: 31.40 mm (1.2362 in.)

If the inside diameter is greater than the maximum, replace the front support.

ASSEMBLY OF TRANSFER CASE AND FRONT SUPPORT

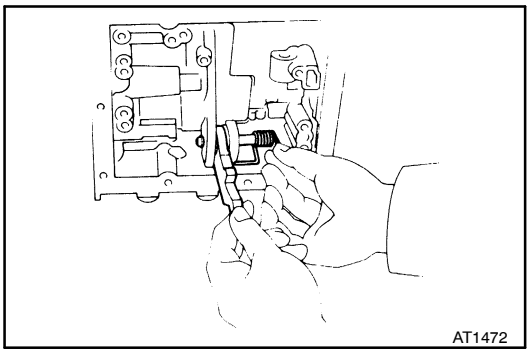


1. INSTALL OIL SEAL RINGS TO FRONT SUPPORT

Coat the two oil seal rings with ATF and install them onto the front support.

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

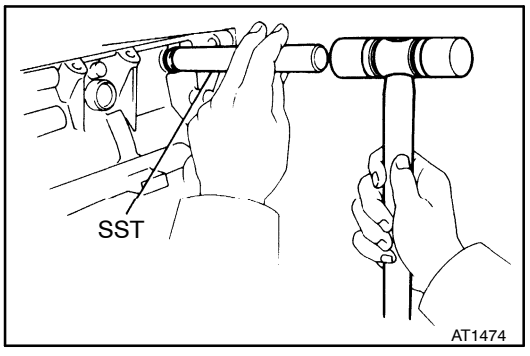
HINT: After installing the oil seal rings, check that they rotate smoothly.



2. INSTALL PARKING LOCK PAWL, SHAFT AND SPRING IN CASE

(a) Install the E–ring to the shaft.

(b) Install the parking lock pawl, shaft and spring.

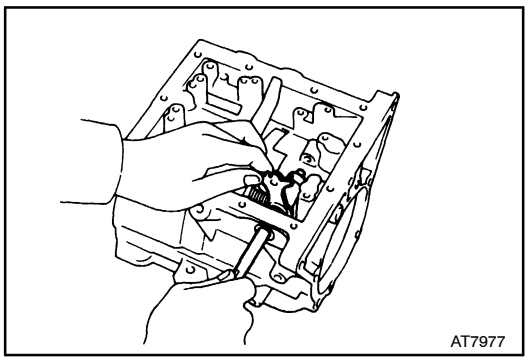


3. INSTALL MANUAL VALVE LEVER AND SHAFT

(a) Using SST and a hammer, drive in a new oil seal to the case.

SST 09350–30020 (09350–07110)

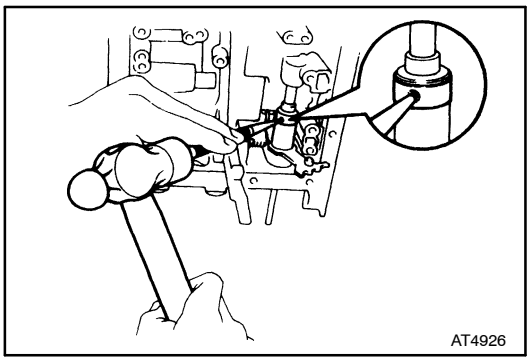
(b) Coat the oil seal lip with MP grease.



(c) Assemble a new spacer to the manual valve lever.

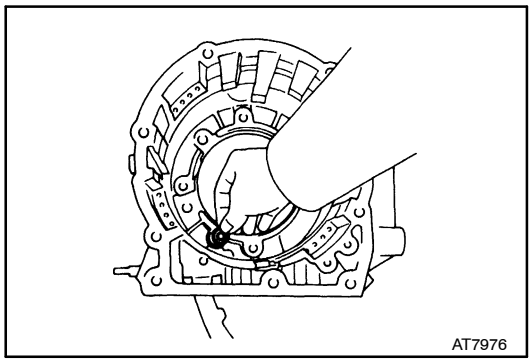
(d) Install the manual valve lever shaft to the transfer case through the manual valve lever.

(e) Drive in the roll pin to the shaft.



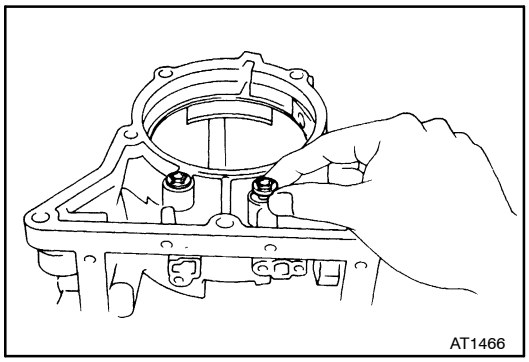
(f) Match the spacer hole to the lever calking hollow and calk the spacer to the lever.

(g) Make sure the manual valve lever shaft turns smoothly.



4. INSTALL APPLY GASKETS

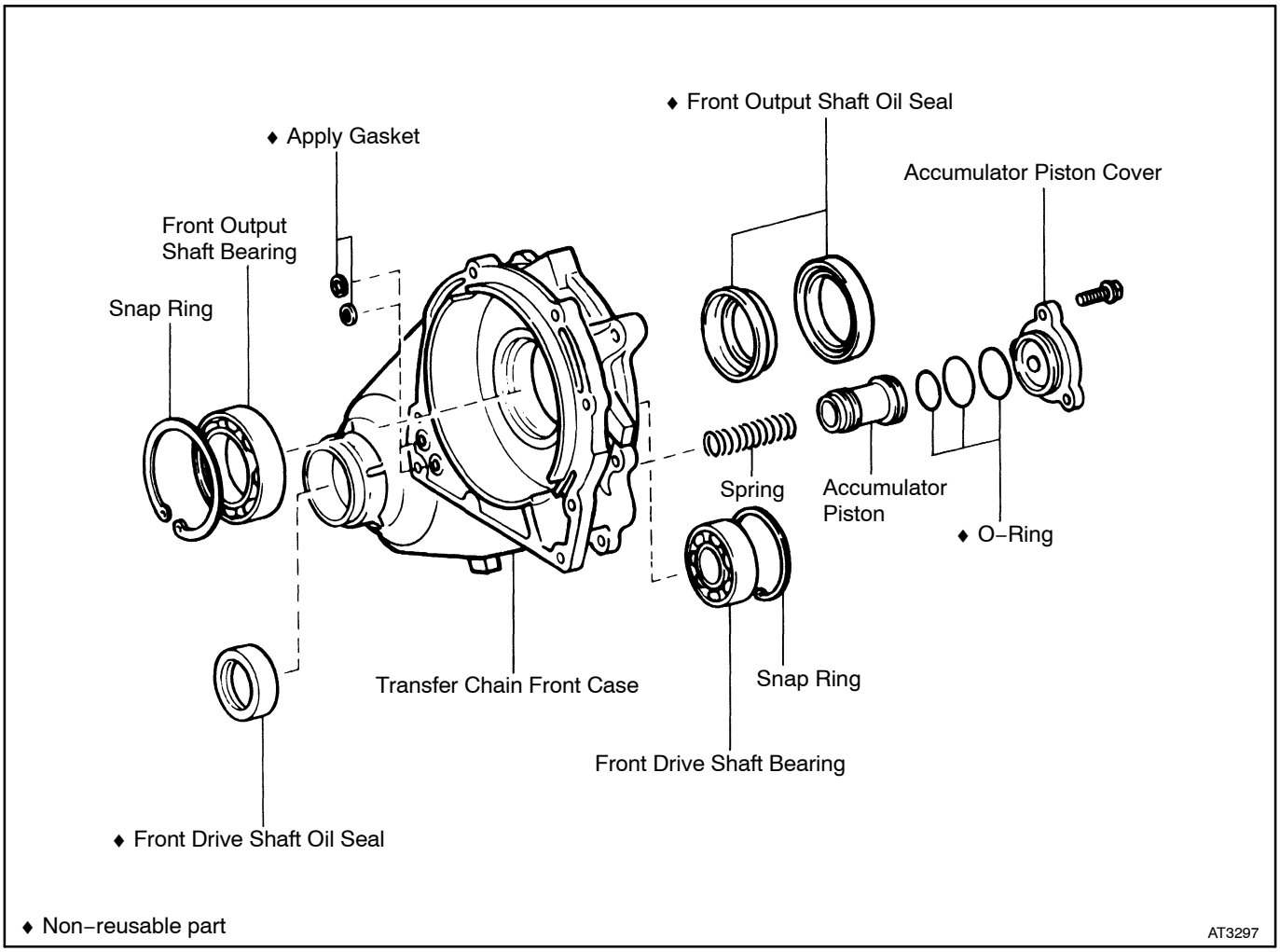
(a) Install a new apply gasket to the transfer case inner side.

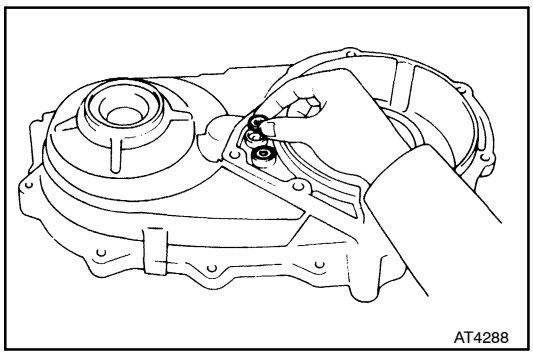


(b) Install new two apply gaskets to the transfer case front side.

Transfer Chain Front Case

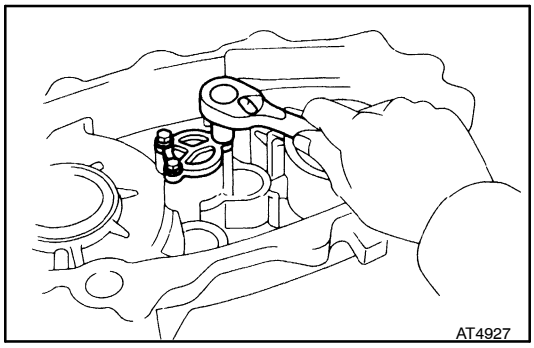
COMPONENTS





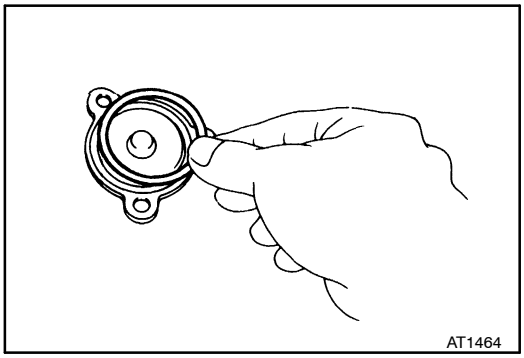
DISASSEMBLY OF TRANSFER CHAIN FRONT CASE

1. REMOVE APPLY GASKETS

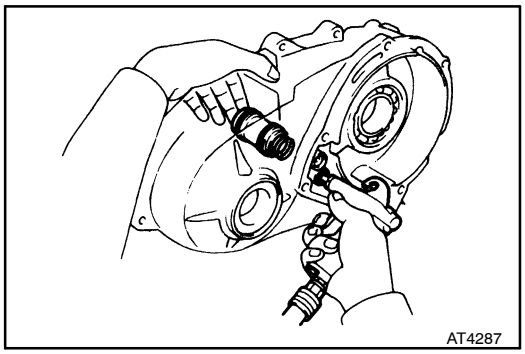


2. REMOVE B_4 ACCUMULATOR PISTON

(a) Remove the three bolts and accumulator piston cover.

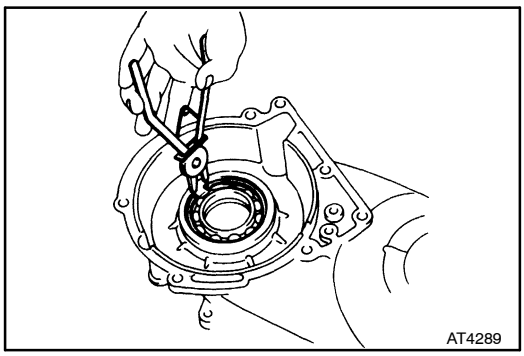


(b) Remove the O–ring from the accumulator piston cover.



(c) Position a rag to catch piston. Using low–pressure compressed air (1 kg /cm^2, 14 psi or 98 kPa max.), pop the piston into the rag. Force air holes shown, and remove the piston and spring.

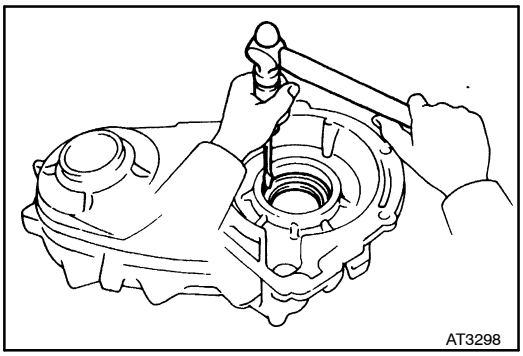
(d) Remove the O–rings from the accumulator piston.



3. REMOVE FRONT OUTPUT SHAFT BEARING

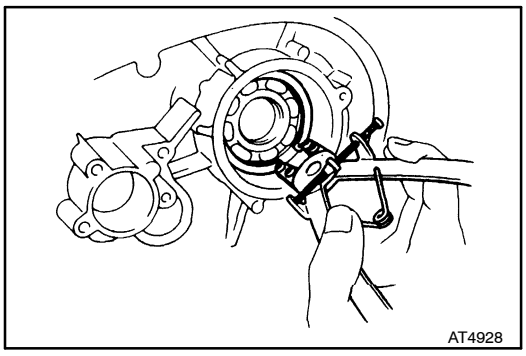
(a) Using snap ring pliers, remove the snap ring.

(b) Remove the bearing.



4. REMOVE FRONT OUTPUT SHAFT OIL SEALS

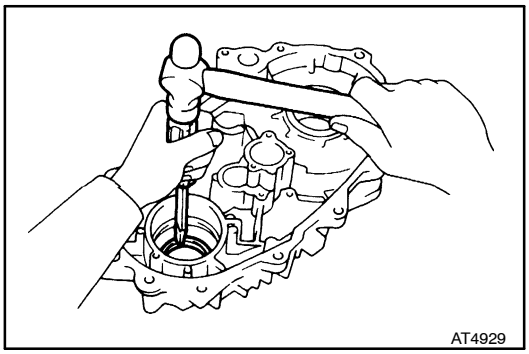
Using a screwdriver and hammer, drive out the two oil seals from the transfer chain front case.



5. REMOVE TRANSFER FRONT DRIVE SHAFT BEARING

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

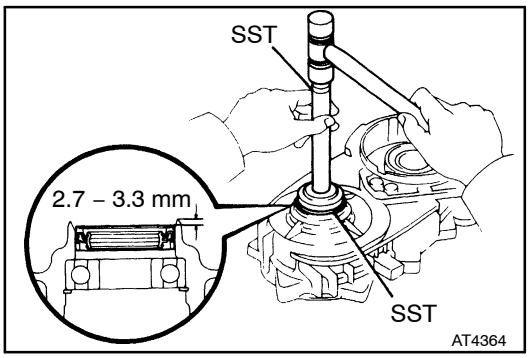
(b) Remove the bearing.



6. REMOVE TRANSFER FRONT DRIVE SHAFT OIL SEAL

Using a screwdriver and hammer, drive out the oil seal from the transfer chain front case.

ASSEMBLY OF TRANSFER CHAIN FRONT CASE



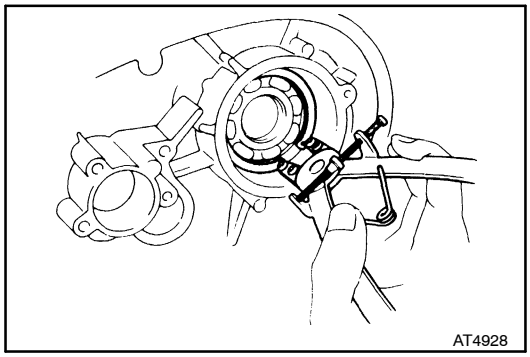
1. INSTALL TRANSFER FRONT DRIVE SHAFT OIL SEAL

(a) Using SST and a hammer, drive in a new oil seal.

SST 09608–35014 (09608–06020, 09608–06100)

Oil seal depth: 2.7 – 3.3 mm (0.106 – 0.130 in.)

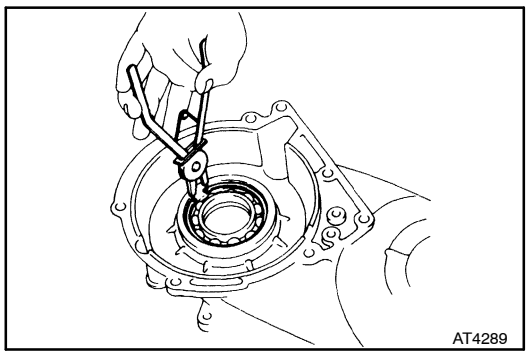
(b) Coat the oil seal lip with MP grease.



2. INSTALL TRANSFER FRONT DRIVE SHAFT BEARING

(a) Install the bearing to the transfer chain front case.

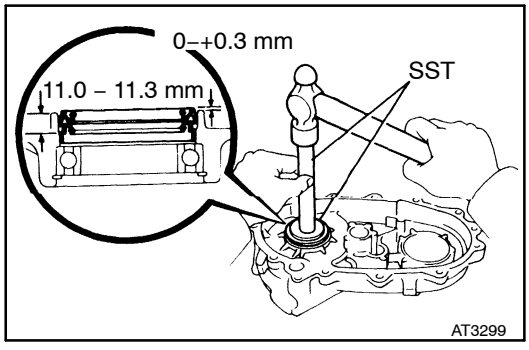
(b) Using snap ring pliers, install the snap ring.



3. INSTALL FRONT OUTPUT SHAFT BEARING

(a) Install the bearing.

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



4. INSTALL FRONT OUTPUT SHAFT OIL SEALS

(a) Using SST and a hammer, drive in a new front oil seal.

SST 09608–32010 and 09608–35014 (09608–06020)

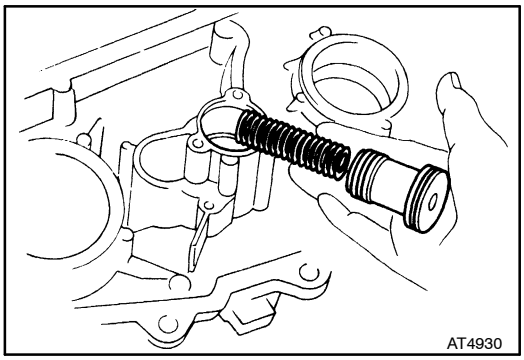
Oil seal depth: 11.0 – 11.3 mm (0.433 – 0.445 in.)

(b) Using SST and a hammer, drive in a new rear oil seal.

SST 09608–32010 and 09608–35014 (09608–06020)

Oil seal depth: 0 – +0.3 mm (0 – +0.012 in.)

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



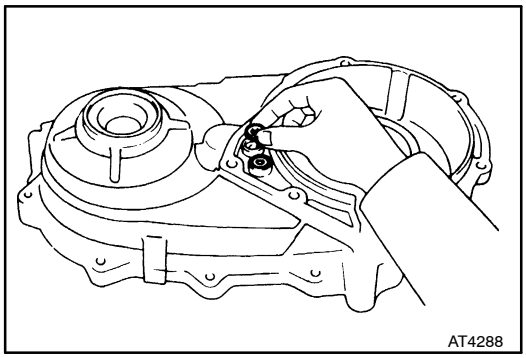
5. INSTALL B_4 ACCUMULATOR PISTON

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

(b) Install a new O–ring to the accumulator piston cover.

(c) Install the spring and accumulator piston.

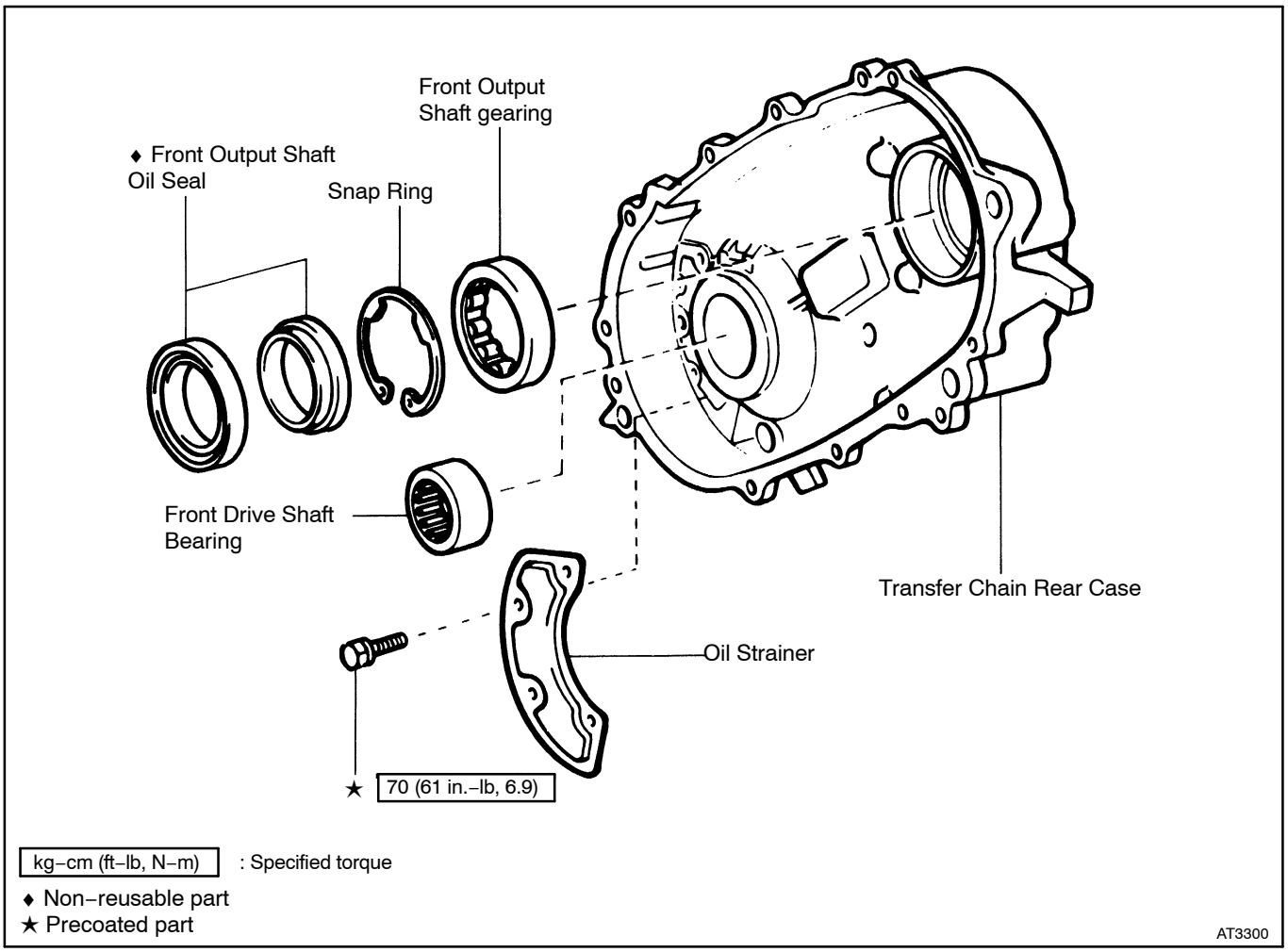
(d) Install the accumulator piston cover and torque the three bolts.

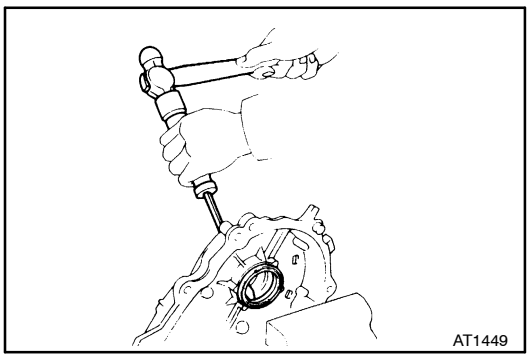


6. INSTALL NEW APPLY GASKETS

Transfer Chain Rear Case

COMPONENTS

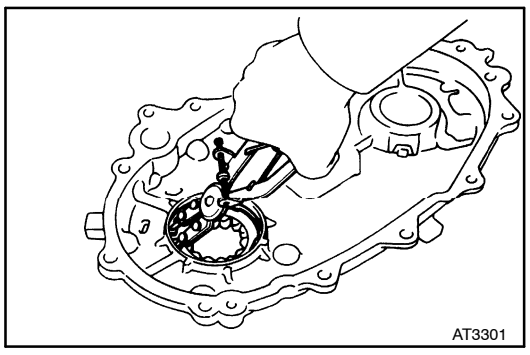




DISASSEMBLY OF TRANSFER CHAIN REAR CASE

1. REMOVE FRONT OUTPUT SHAFT OIL SEALS

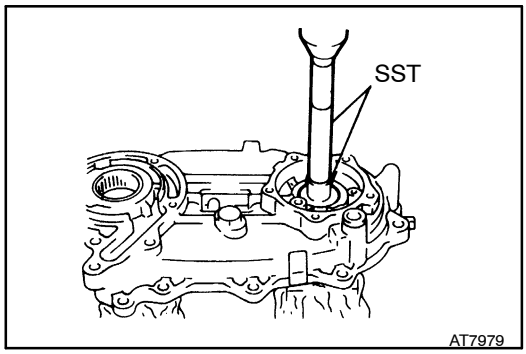
Using a screwdriver and hammer, drive out the two oil seals.



2. REMOVE FRONT OUTPUT SHAFT BEARING

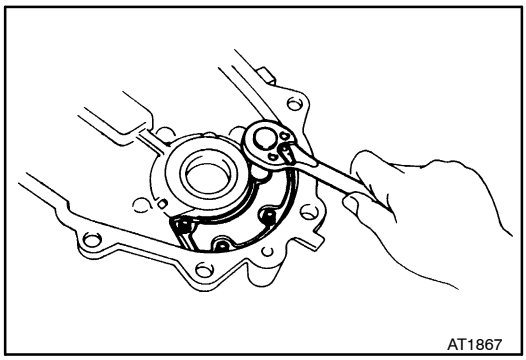
(a) Using snap ring pliers, remove the snap ring.

(b) Remove the bearing.



3. REMOVE FRONT DRIVE SHAFT BEARING

Using SST and a press, press out the bearing.
SST 09608–12010 (09608–00020, 09608–00040)



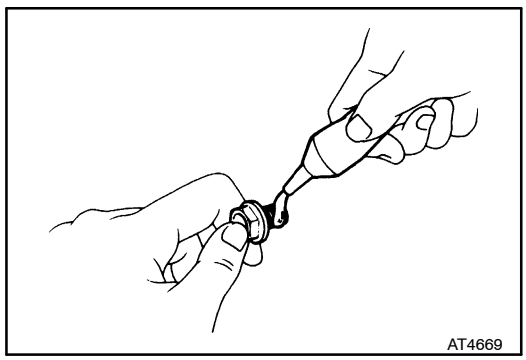
4. REMOVE OIL STRAINER

Remove the four bolts and strainer from the chain rear case.

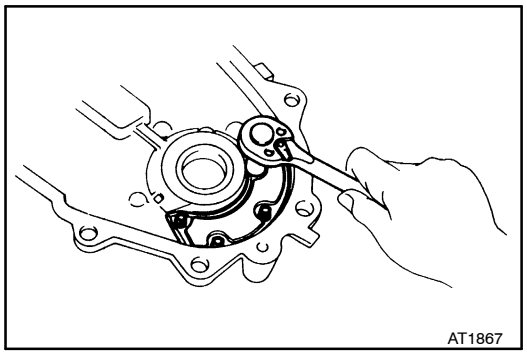
ASSEMBLY OF TRANSFER CHAIN REAR CASE

1. INSTALL OIL STRAINER

(a) Apply sealant to 2 or 3 threads of the bolt end.
Sealant: Part No. 08833 – 00070, THREE BOND 1324 or equivalent

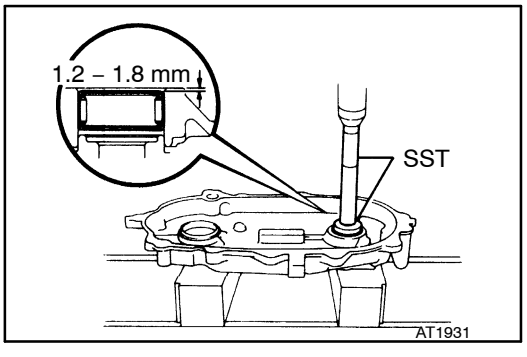


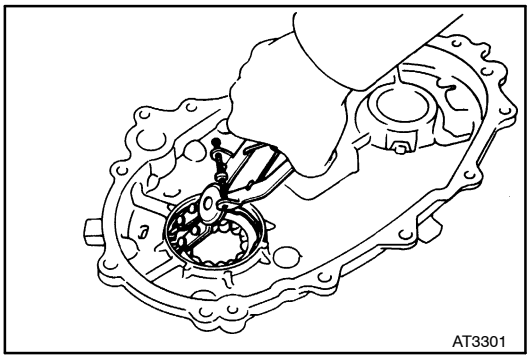
(b) Install the oil strainer with the four bolts.
Torque: 70 kg–cm (61 in.–lb, 6.9 N–m)



2. INSTALL FRONT DRIVE SHAFT BEARING

Using SST, press in the bearing.
SST 09608–12010 (09608–00020, 09608–00040)
Bearing depth: 1.2 – 1.8 mm (0.047 – 0.071 in.)

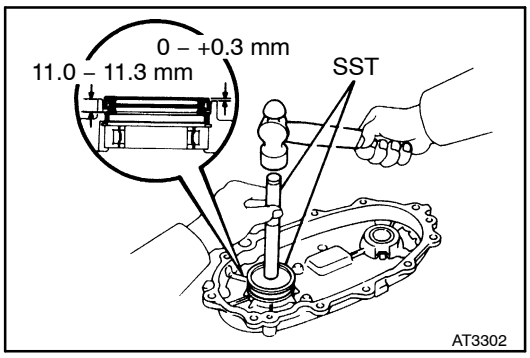




3. INSTALL FRONT OUTPUT SHAFT BEARING

(a) Install the bearing to the transfer chain rear case.

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



4. INSTALL FRONT OUTPUT SHAFT OIL SEALS

(a) Using SST and a hammer, drive in a new rear oil seal.

SST 09608–32010 and 09608–35014 (09608–06020)

Oil seal depth: 11.0 – 11.3 mm (0.433 – 0.445 in.)

(b) Using SST and a hammer, drive in a new front oil seal.

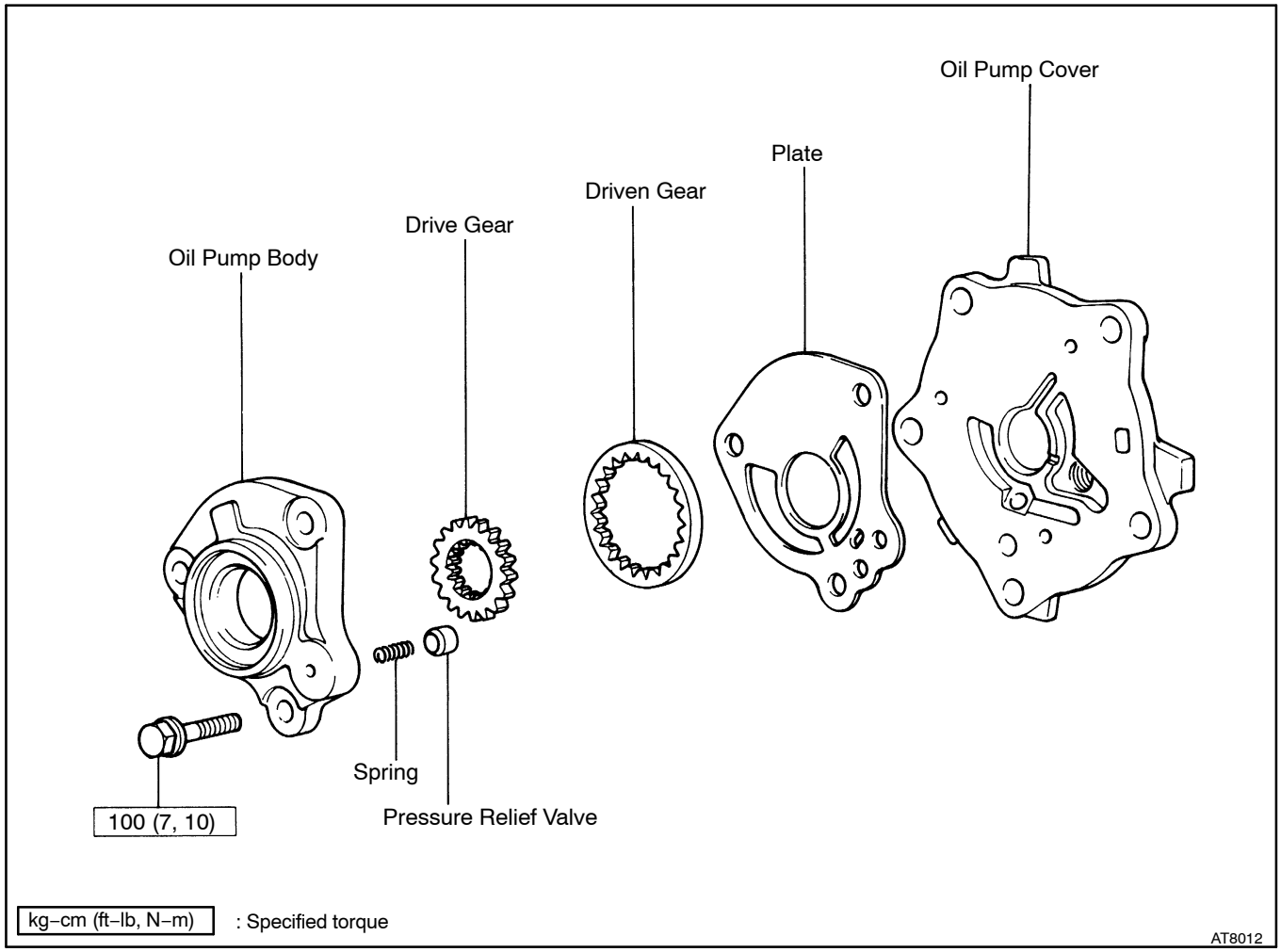
SST 09608–32010 and 09608–35014 (09608–06020)

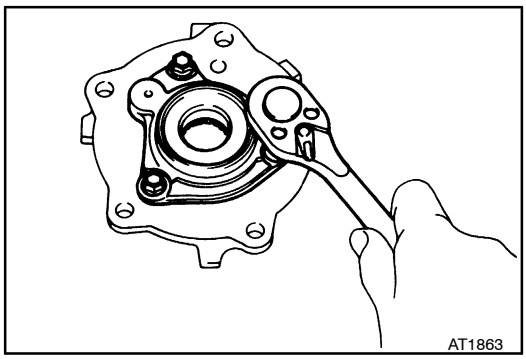
Oil seal depth: 0 – +0.3 mm (0 – +0.012 in.)

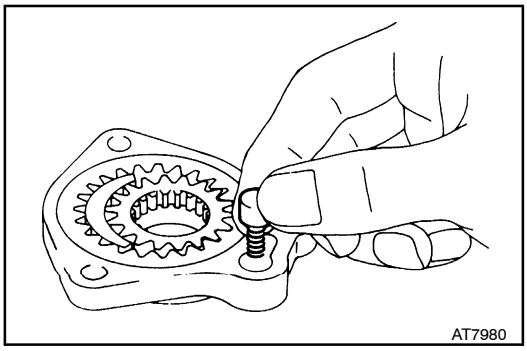
(c) Coat the oil seal lips with MP grease.

Transfer Oil Pump

COMPONENTS





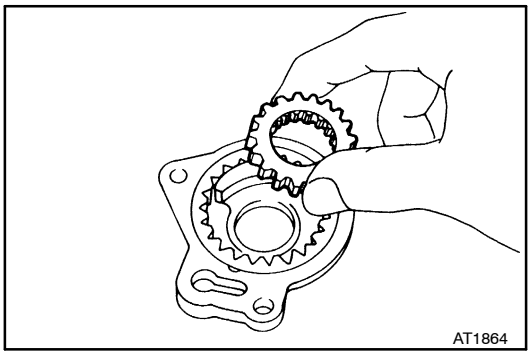


DISASSEMBLY OF TRANSFER OIL PUMP

DISASSEMBLE TRANSFER OIL PUMP ASSEMBLY

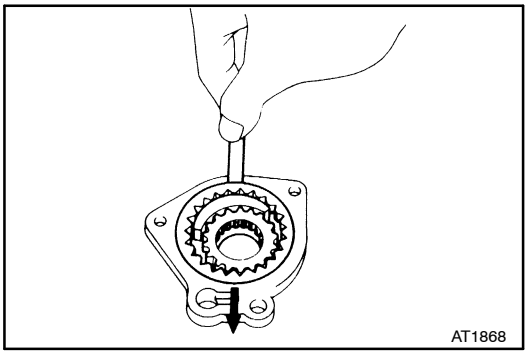
(a) Remove the three bolts, oil pump body and plate from the oil pump cover.

(b) Remove the pressure relief valve and spring.



(c) Remove the drive gear and driven gear.

INSPECTION OF TRANSFER OIL PUMP



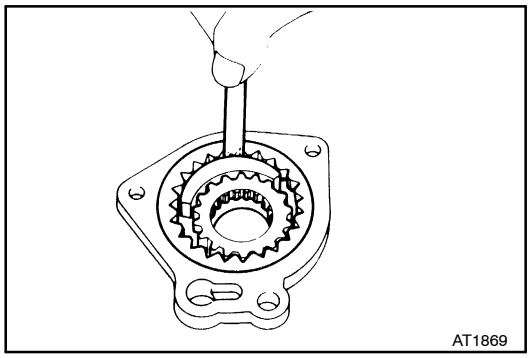
1. CHECK BODY CLEARANCE OF DRIVEN GEAR

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

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

Maximum body clearance: 0.3 mm (0.012 in.)

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



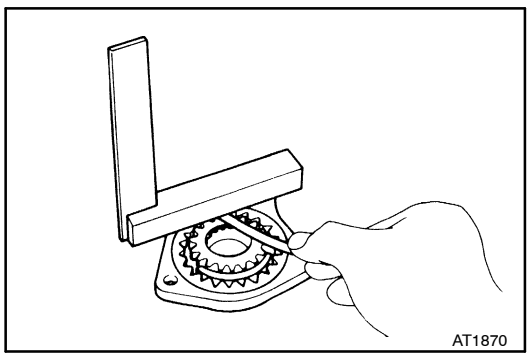
2. CHECK TIP CLEARANCE OF DRIVEN GEAR

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

Standard tip clearance: 0.15 – 0.42 mm (0.0059 – 0.0165 in.)

Maximum tip clearance: 0.6 mm (0.024 in.)

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



3. CHECK SIDE CLEARANCE OF BOTH GEARS

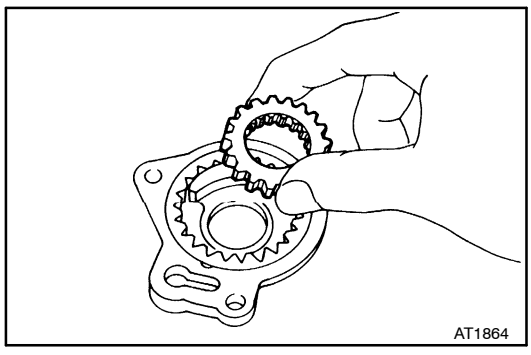
Using a steel straight edge and a feeler gauge, measure the side clearance of both gears.

Standard side clearance: 0.04 – 0.15 mm (0.0016 – 0.0059 in.)

Maximum side clearance: 0.3 mm (0.012 in.)

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

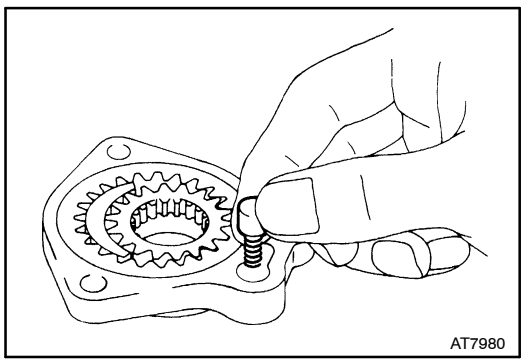
ASSEMBLY OF TRANSFER OIL PUMP



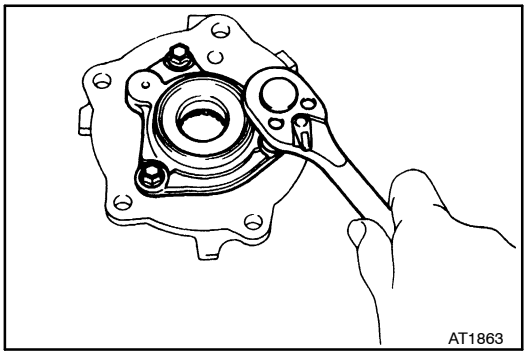
ASSEMBLE TRANSFER OIL PUMP ASSEMBLY

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

(b) Install the driven gear and drive gear.



(c) Install the pressure relief valve and spring.

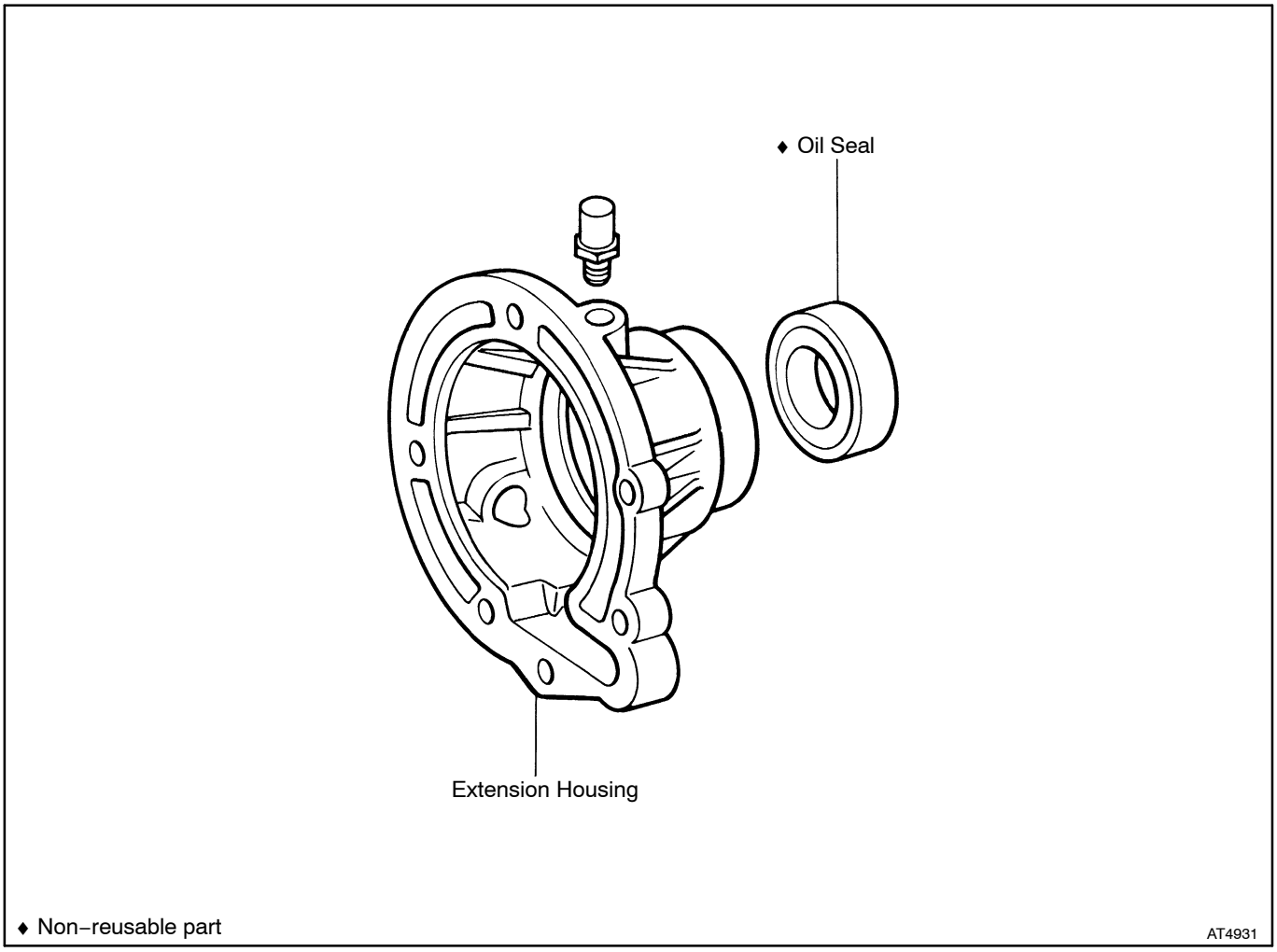


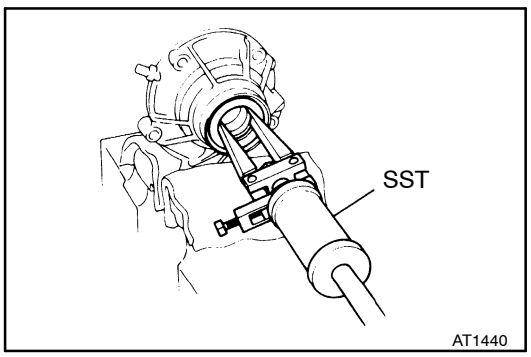
(d) Install the plate and oil pump body, and torque the three bolts.

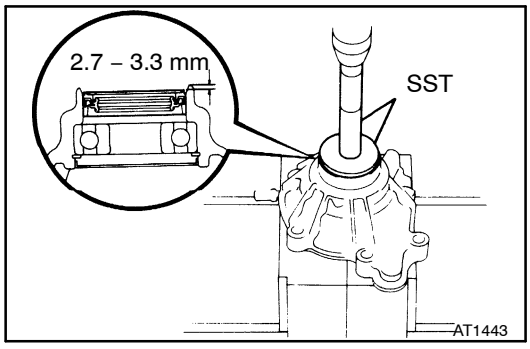
Torque: 100 kg–cm (7 ft–lb, 10 N–m)

Transfer Extension Housing

COMPONENTS







INSPECTION OF TRANSFER EXTENSION HOUSING

HINT: If the bearing is worn, replace the extension housing assembly.

IF NECESSARY, REPLACE OIL SEAL

(a) Using SST, remove the oil seal.

SST 09308–00010

(b) Using SST and a press, install a new oil seal to the extension housing.

SST 09608–35014 (09608–06020, 09608–06100)

Oil seal depth: 2.7 – 3.3 mm (0.106 – 0.130 in.)

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

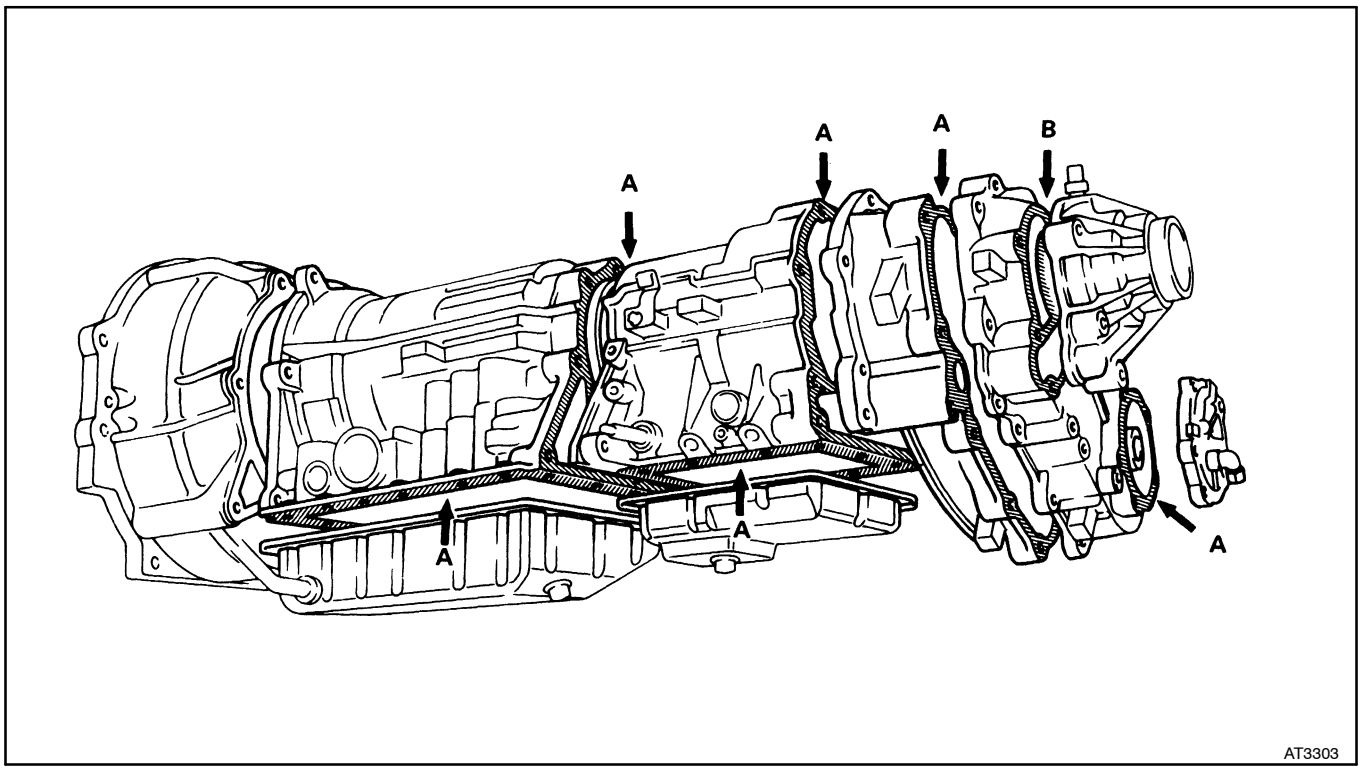
INSTALLATION OF COMPONENT PARTS (A340H)

(See pages AT–168 to 171)

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

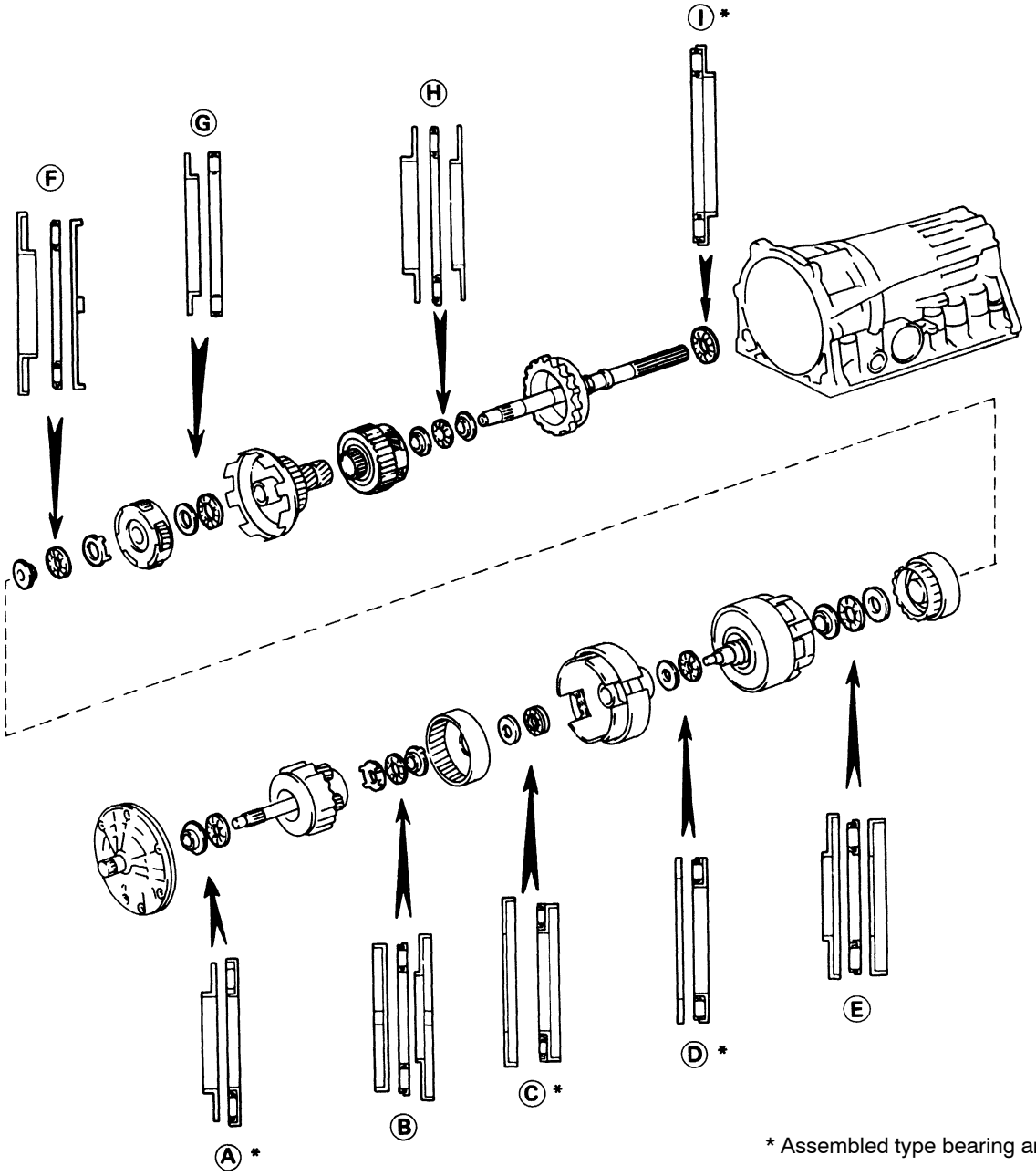
GENERAL NOTES:

1. **The automatic transmission is composed of highly precision–finished parts, necessitating careful inspection before assembly because even a small nick could cause fluid leakage or affect performance.**
2. **Before assembling new clutch discs, soak them in automatic transmission fluid for at least fifteen minutes.**
3. **Apply automatic transmission fluid on sliding or rotating surfaces of parts before assembly.**
4. **Use petroleum jelly to keep small parts in their place.**
5. **Do not use adhesive cements on gaskets and similar parts.**
6. **When assembling the transmission, be sure to use new gaskets and O–rings.**
7. **Dry all parts with compressed air – never use shop rags.**
8. **When working with FIPG material, you must observe the following.**
   - **Using a razor blade and gasket scraper, remove all the old packing (FIPG) material from the gasket surfaces.**
   - **Thoroughly clean all components to remove all the loose material.**
   - **Clean both sealing surfaces with a non–residue solvent.**
   - **Parts must be assembled within 10 minutes of application. Otherwise, the packing (FIPG) material must be removed and reapplied.**
9. **There are 2 types of seal packing on the A340H transmission. There are not interchangeable and care should be taken in selecting them.**
   A: Part No. 08826 – 00090, THREE BOND 1281 or equivalent
   B: Part No. 08833 – 00090, THREE BOND 1131, LOCTITE 518 or equivalent



INSTALLATION POSITION AND DIRECTION OF BEARINGS AND RACES

(TRANSMISSION)

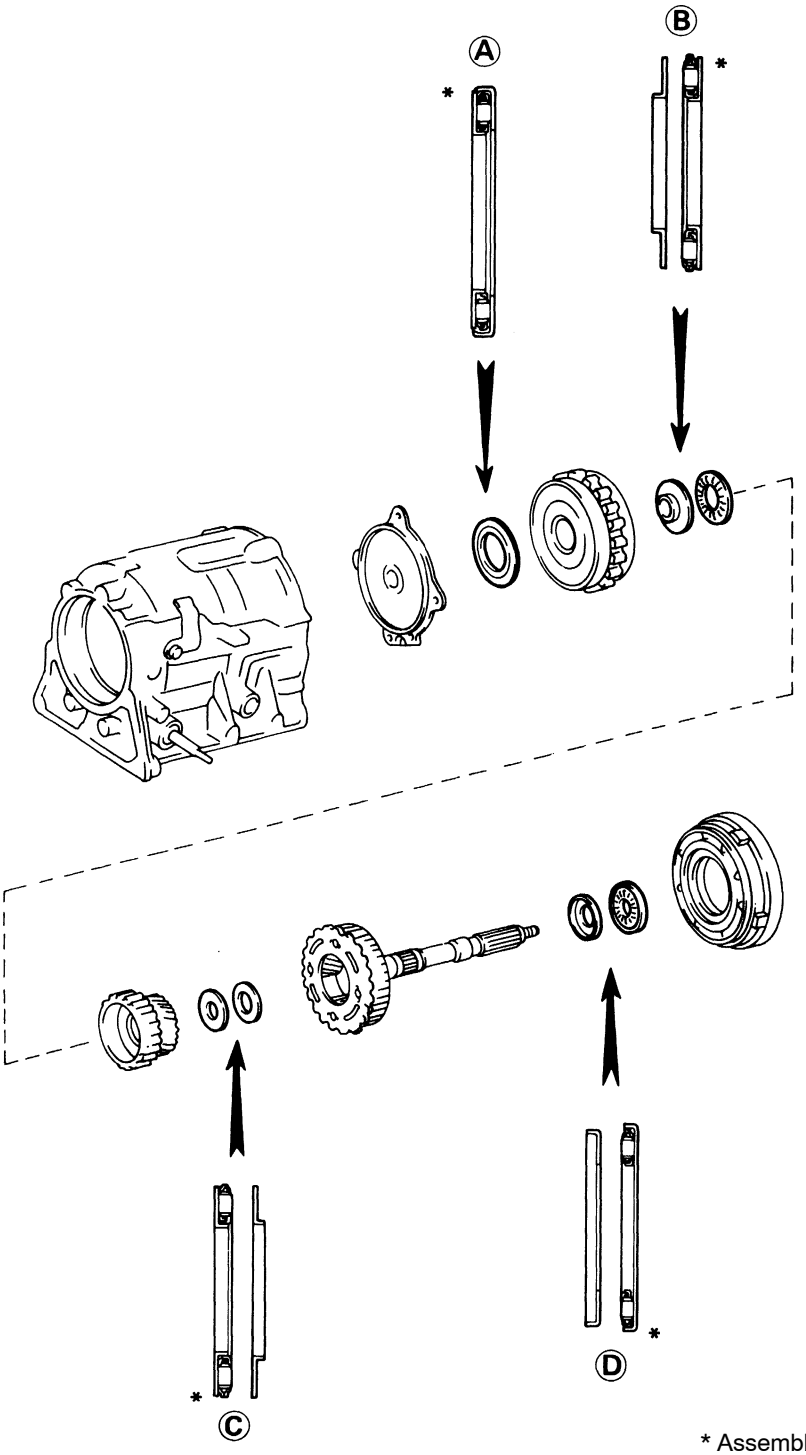


* Assembled type bearing and race

mm (in.) AT6331

	Front Bearing Race		Thrust Bearing		Rear Bearing Race	
	Inner Diameter	Outer Diameter	Inner Diameter	Outer Diameter	Inner Diameter	Outer Diameter
Ⓐ	28.1 (1.106)	47.3 (1.862)	28.9 (1.138)	50.2 (1.976)	—	—
Ⓑ	27.1 (1.067)	41.8 (1.646)	26.0 (1.024)	46.8 (1.843)	24.2 (0.953)	47.8 (1.882)
Ⓒ	37.1 (1.461)	59.0 (2.323)	33.6 (1.323)	50.3 (1.980)	—	—
Ⓓ	36.8 (1.449)	50.9 (2.004)	33.7 (1.327)	47.6 (1.874)	—	—
Ⓔ	26.0 (1.024)	48.9 (1.925)	26.0 (1.024)	46.7 (1.839)	26.8 (1.055)	47.0 (1.850)
Ⓕ	30.6 (1.205)	53.6 (2.110)	32.6 (1.283)	47.7 (1.878)	34.3 (1.350)	47.8 (1.882)
Ⓖ	33.7 (1.327)	47.6 (1.874)	35.5 (1.398)	47.7 (1.878)	—	—
Ⓗ	28.8 (1.134)	44.8 (1.764)	30.1 (1.185)	44.7 (1.760)	27.8 (1.094)	44.8 (1.764)
Ⓘ	—	—	39.2 (1.543)	57.7 (2.272)	—	—

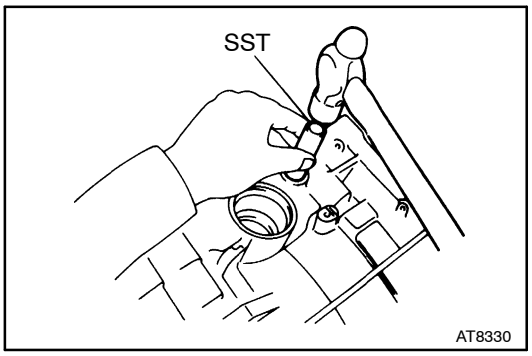
(TRANSFER)



* Assembled type bearing and race

mm (in.) AT4997

	Front Bearing Race		Thrust Bearing		Rear Bearing Race	
	Inner Diameter	Outer Diameter	Inner Diameter	Outer Diameter	Inner Diameter	Outer Diameter
A	—	—	51.1 (2.012)	78.6 (3.094)	—	—
B	33.5 (1.319)	47.8 (1.882)	30.5 (1.201)	48.0 (1.890)	—	—
C	—	—	19.0 (0.748)	45.0 (1.772)	23.1 (0.909)	45.0 (1.772)
D	36.3 (1.429)	53.9 (2.122)	38.0 (1.496)	57.3 (2.256)	—	—

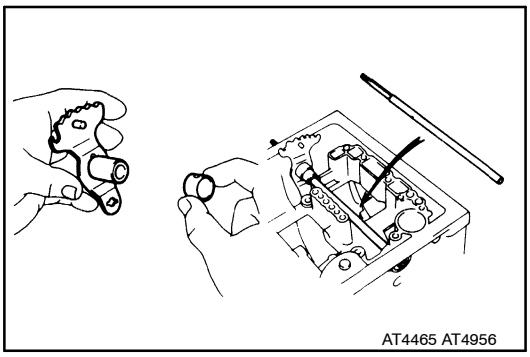


1. INSTALL MANUAL VALVE LEVER, SHAFT AND OIL SEALS

(a) Using SST, drive in two new oil seals.

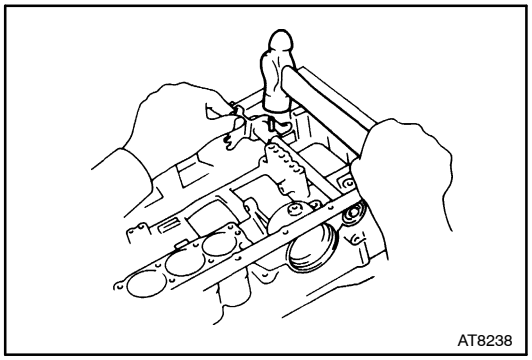
SST 09350–30020 (09350–07110)

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

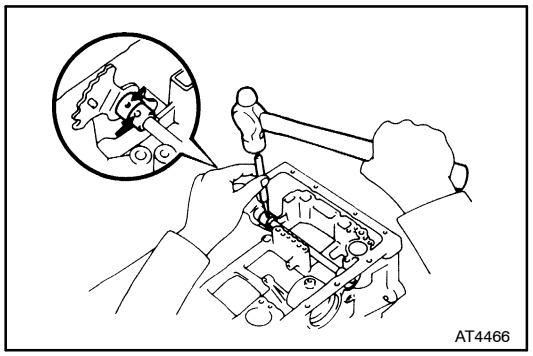


(c) Assemble a new spacer to the manual valve lever.

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

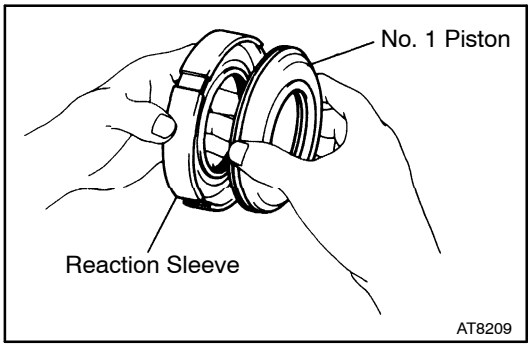


(e) Drive in the pin to the shaft.



(f) Match the spacer hole to the lever calking hollow and calk the spacer to the lever.

(g) Make sure the manual valve lever shaft turns smoothly.



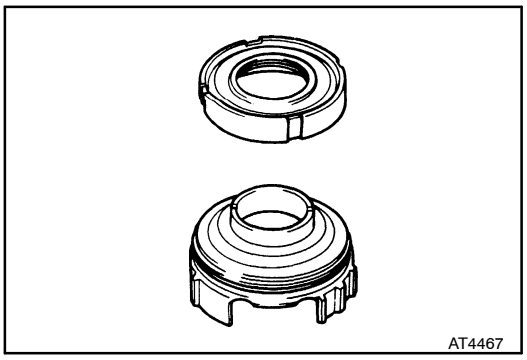
2. INSTALL COMPONENTS OF FIRST AND REVERSE BRAKE PISTON

(a) Coat three new O–rings with ATF.

(b) Install the two O–rings on No. 1 piston.

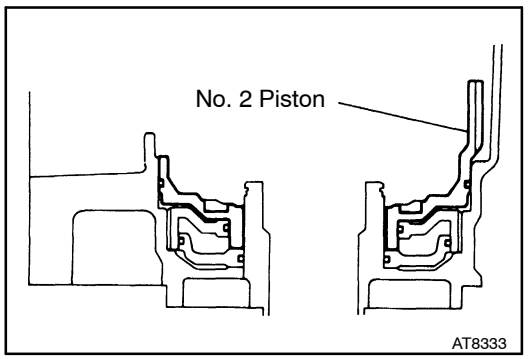
(c) Install the O–ring on the reaction sleeve.

(d) Install No. 1 piston to the reaction sleeve.



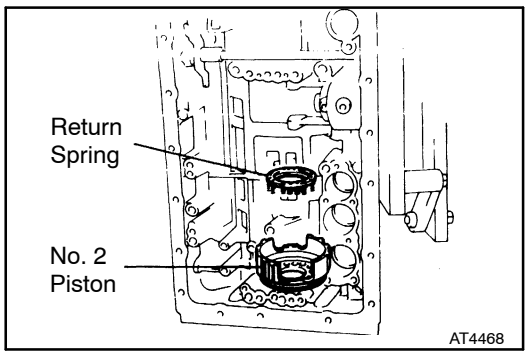
(e) Coat a new O–ring with ATF and install it on No. 2 piston.

(f) Install No. 1 piston with the reaction sleeve onto No. 2 piston.

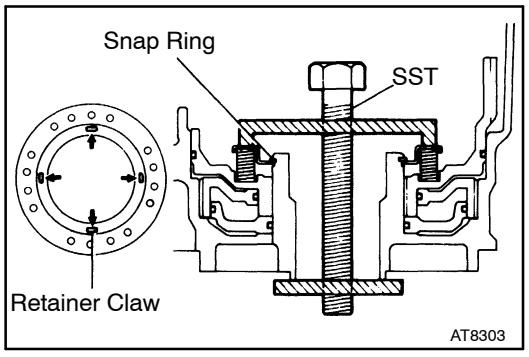


(g) Align the teeth of No. 2 piston into the proper grooves.

(h) Being careful not to damage the O–rings, press in No. 2 and No. 1 first and reverse brake pistons into the transmission case.



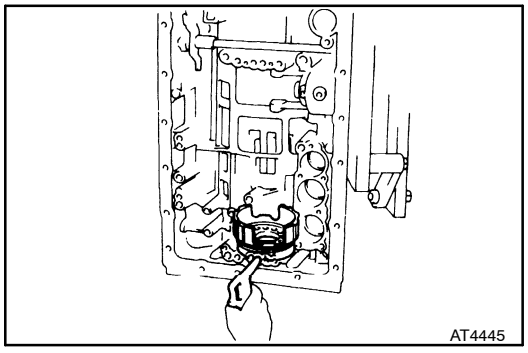
(i) Place the piston return spring onto No. 2 piston.



(j) Set SST as shown, and compress the return spring with SST.

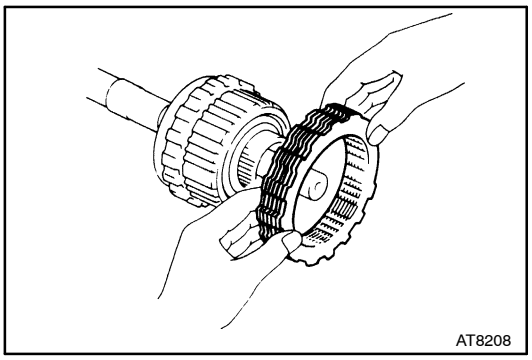
SST 09350–30020 (09350–07050)

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



3. CHECK FIRST AND REVERSE BRAKE PISTONS MOVING

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



4. INSTALL REAR PLANETARY GEAR UNIT WITH SECOND BRAKE DRUM, FIRST AND REVERSE BRAKE PACK AND OUTPUT SHAFT

(a) Install the one plate.

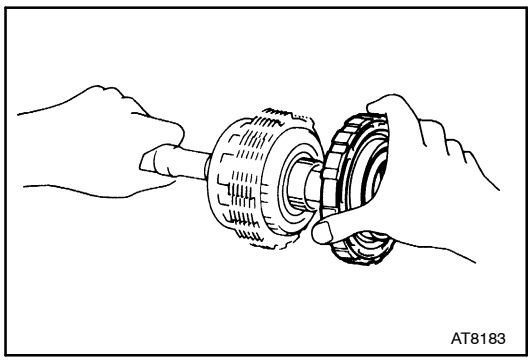
(b) Install the cushion plate rounded end toward you.

(c) Re–install the flange, the rounded edge facing forward.

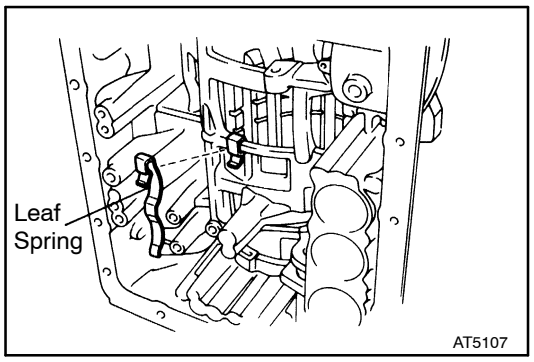
(d) Install the plates and discs.

Install in order: P = Plate D = Disc
D–P–D–P–D–P–D–P–D–P–D–P

(e) Install the second brake drum assembly.



(f) Install the leaf spring.

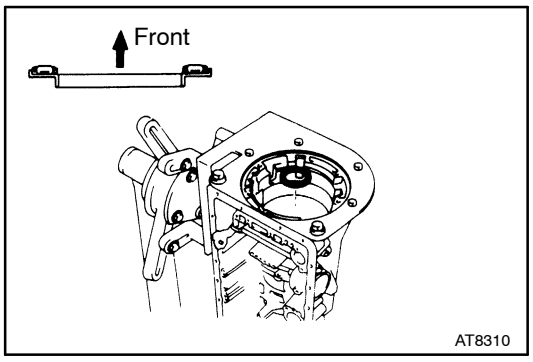


(g) Coat the assembled bearing and race with petroleum jelly and install it onto the case.

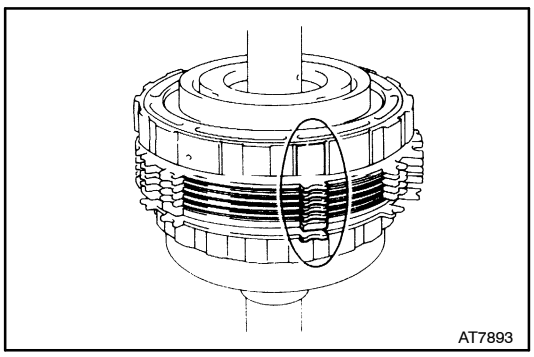
HINT: Assembled bearing and race diameter

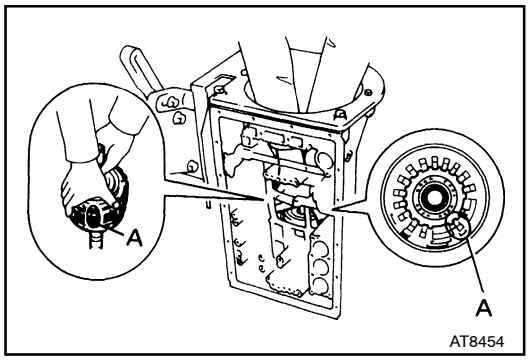
mm (in.)

	Inside	Outside
Bearing and race	39.2 (1.543)	57.7 (2.272)

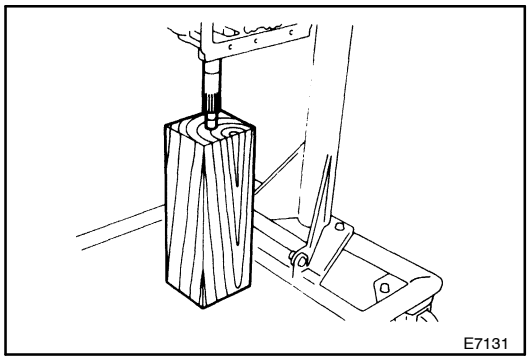


(h) Align the teeth of the second brake drum, flange, discs and plates as shown in the figure.

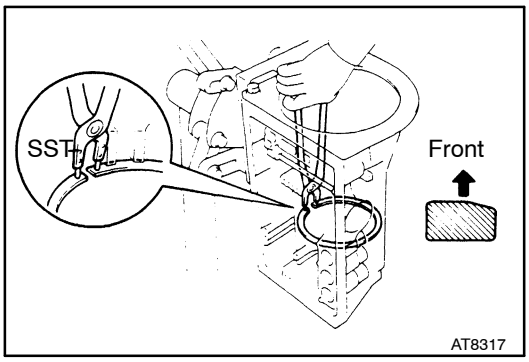




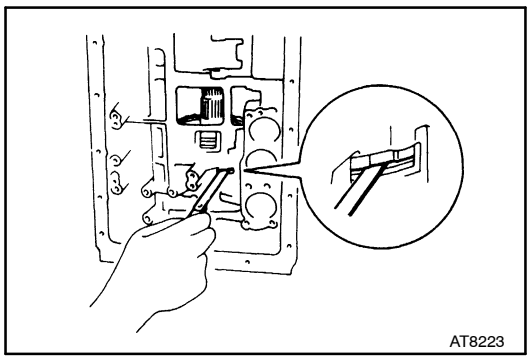
(i) Align the splines of the transmission case and the assembled rear planetary gear, second brake drum, first and reverse brake pack and output shaft, indicated by A.



(j) Hold the output shaft with wooden blocks.



(k) Using SST, install the snap ring.
SST 09350–30020 (09350–07060)

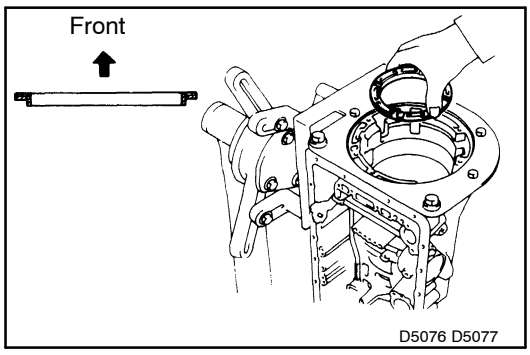


5. CHECK PACK CLEARANCE OF FIRST AND REVERSE BRAKE

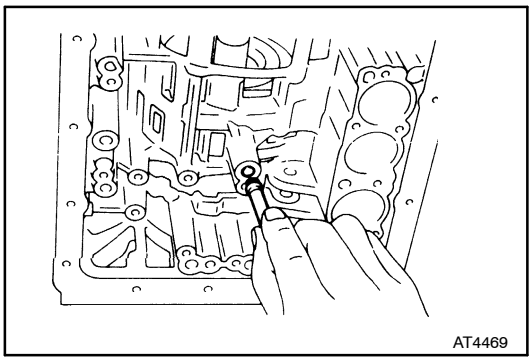
Using a feeler gauge, measure the clearance between the plate and second brake drum as shown in the figure.
Clearance: 0.60 – 1.32 mm (0.0236 – 0.0520 in.)
If the values are nonstandard, select another flange.
HINT: There are six different thicknesses for the flange.

Flange thickness mm (in.)

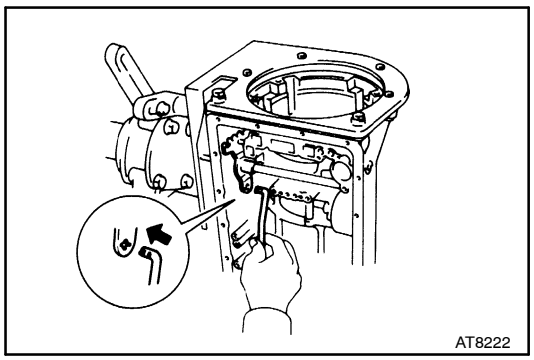
No.	Thickness	No.	Thickness
50	5.0 (0.197)	53	4.4 (0.173)
51	4.8 (0.189)	54	4.2 (0.165)
52	4.6 (0.181)	55	4.0 (0.157)



6. INSTALL SECOND BRAKE PISTON SLEEVE



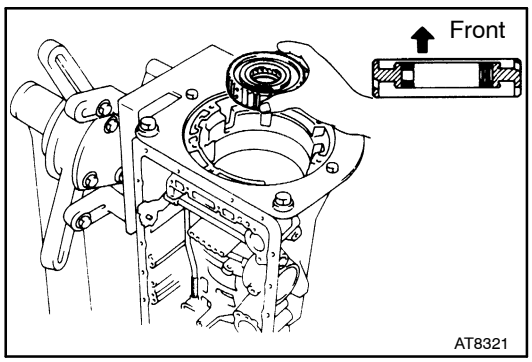
7. INSTALL NEW BRAKE DRUM GASKET



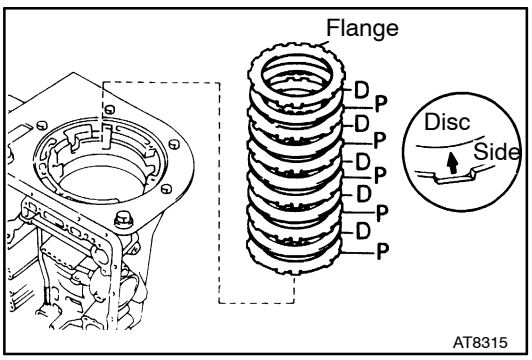
8. INSTALL PARKING LOCK ROD

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

(b) Shift the manual valve lever to the P position, and confirm the transfer direct clutch drum is correctly locked up by the lock pawl.



9. INSTALL NO. 1 ONE–WAY CLUTCH



10. INSTALL FLANGE, PLATES AND DISCS OF SECOND BRAKE

(a) Install the plate with the rounded edge side of the plate facing the disc.

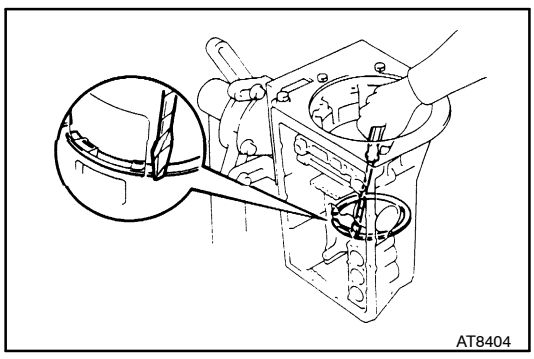
Plate thickness: 1.8 mm (0.071 in.)

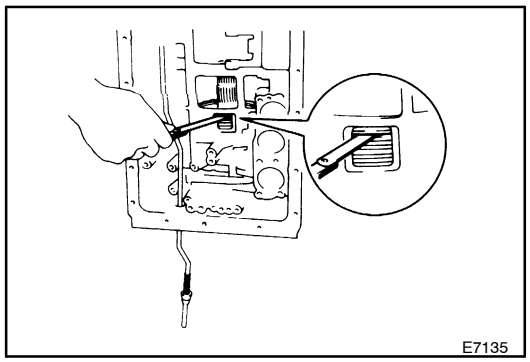
(b) Install the plates and discs.

Install in order: P = Plate D = Disc
D–P–D–P–D–P–D–P–D

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

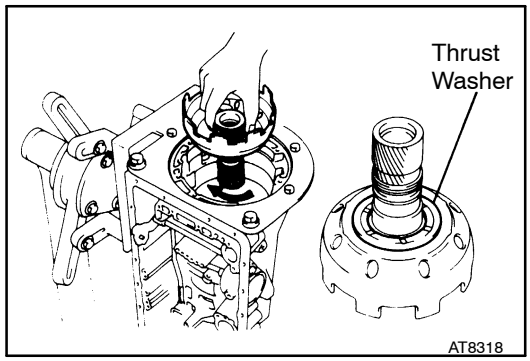
(d) Install the snap ring.





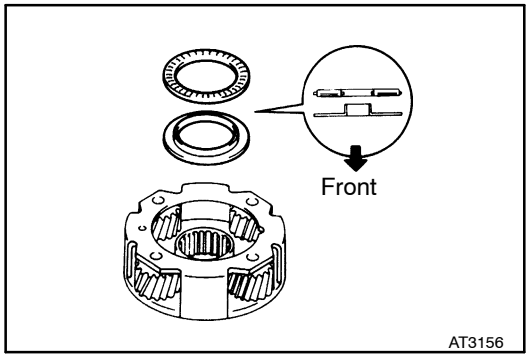
11. CHECK PACK CLEARANCE OF SECOND BRAKE

Using a feeler gauge, measure the clearance between the snap ring and flange as shown in the figure.
Clearance: 0.62 – 1.98 mm (0.0244 – 0.0780 in.)
If the values are nonstandard, check for an improper installation.



12. INSTALL PLANETARY SUN GEAR

While turning the planetary sun gear clockwise, install it into No. 1 one–way clutch.
HINT: Confirm the thrust washer is installed correctly.



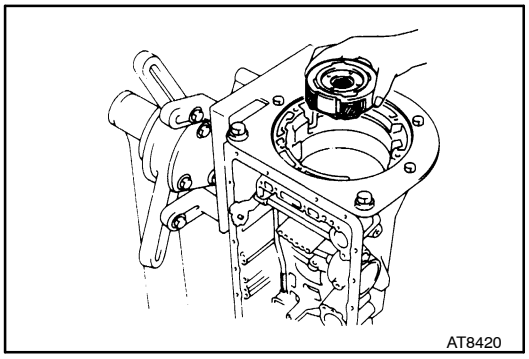
13. INSTALL FRONT PLANETARY GEAR

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

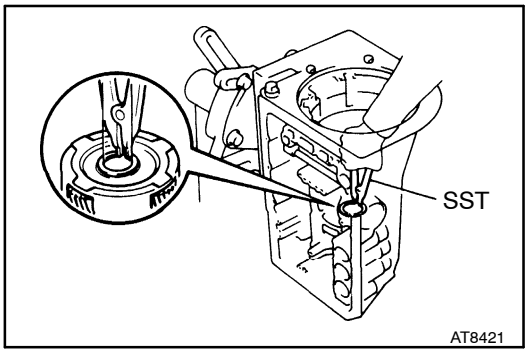
HINT: Bearing and race diameter

mm (in.)

	Inside	Outside
Bearing	35.5 (1.398)	47.7 (1.878)
Race	33.7 (1.327)	47.6 (1.874)

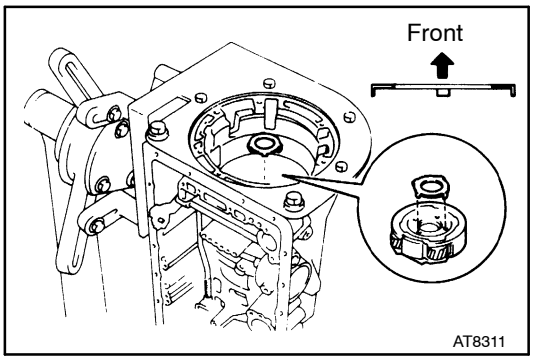


(b) Install the front planetary gear to the sun gear.



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

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

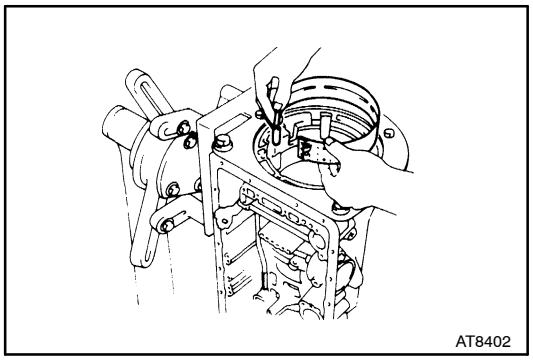


(e) Coat the bearing race with petroleum jetty and install it onto the front planetary gear.

HINT: Race diameter

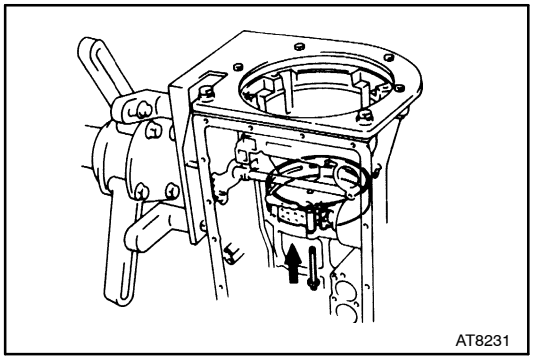
mm (in.)

	Inside	Outside
Race	34.3 (1.350)	47.8 (1.882)

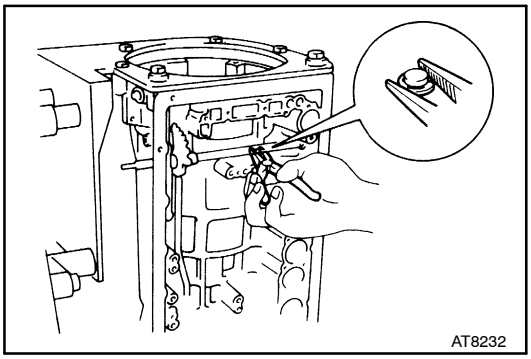


14. INSTALL SECOND COAST BRAKE BAND

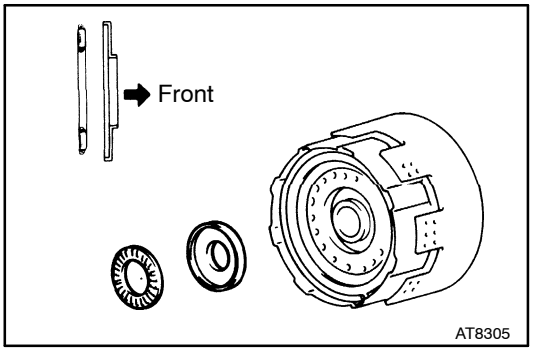
(a) Install the second coast brake band to the case.



(b) Install the pin through the brake band.



(c) Install the E–ring to the pin.



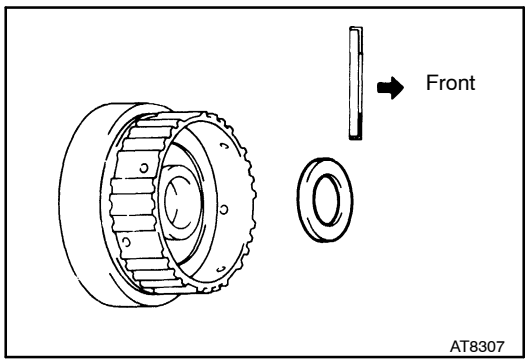
15. INSTALL FRONT PLANETARY RING GEAR TO FORWARD AND DIRECT CLUTCH

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

HINT: Bearing and race diameter

mm (in.)

	Inside	Outside
Bearing	26.0 (1.024)	46.7 (1.839)
Race	26.0 (1.024)	48.9 (1.925)

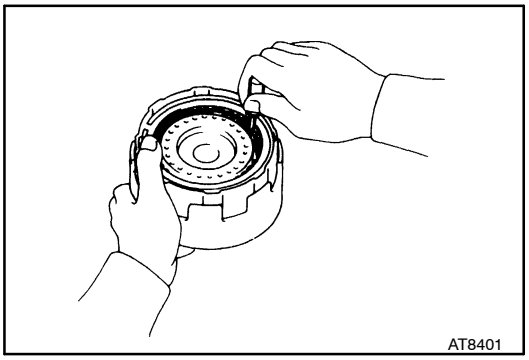


(b) Coat the race with petroleum jelly and install it onto the front planetary ring gear.

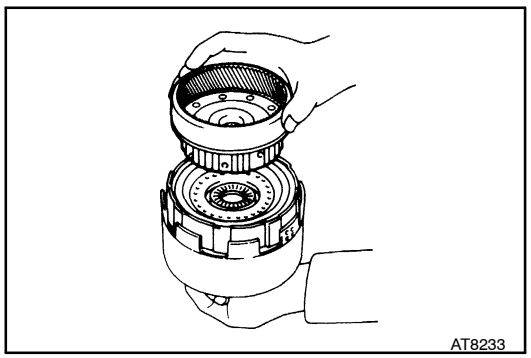
HINT: Race diameter

mm (in.)

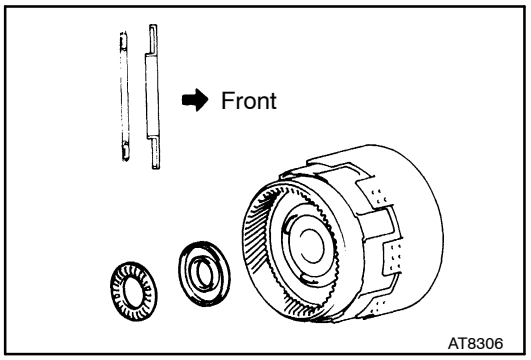
	Inside	Outside
Race	26.8 (1.055)	47.0 (1.850)



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



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



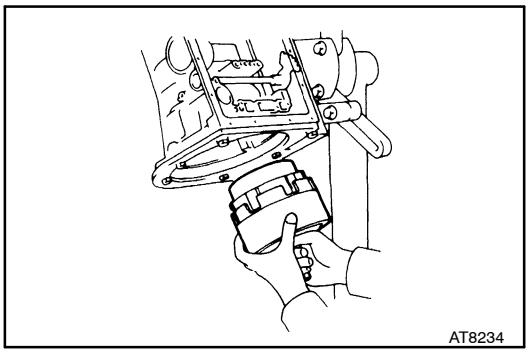
16. INSTALL ASSEMBLED DIRECT CLUTCH, FORWARD CLUTCH AND FRONT PLANETARY RING GEAR INTO CASE

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

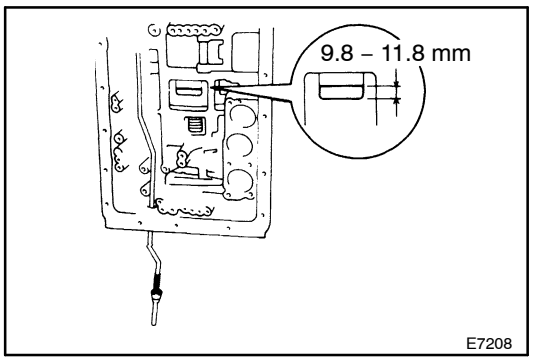
HINT: Bearing and race diameter

mm (in.)

	Inside	Outside
Bearing	32.6 (1.283)	47.7 (1.878)
Race	30.6 (1.205)	53.6 (2.110)



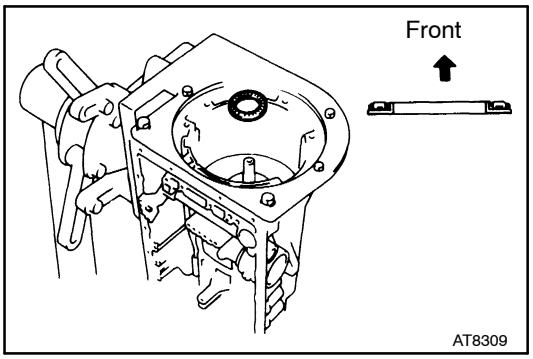
(b) Install the assembled direct clutch, forward clutch and front planetary ring gear into the transmission case.



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

Height: 9.8 – 11.8 mm (0.386 – 0.465 in.)

If the values are nonstandard, check for an improper installation.

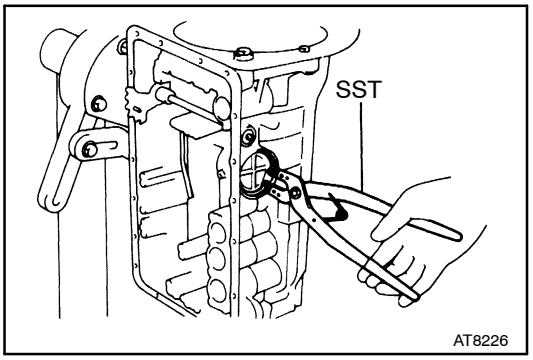


(d) Coat the assembled bearing and race with petroleum jelly and install it onto the forward clutch.

HINT: Assembled bearing and race diameter

mm (in.)

	Inside	Outside
Bearing and race	33.7 (1.327)	47.6 (1.874)



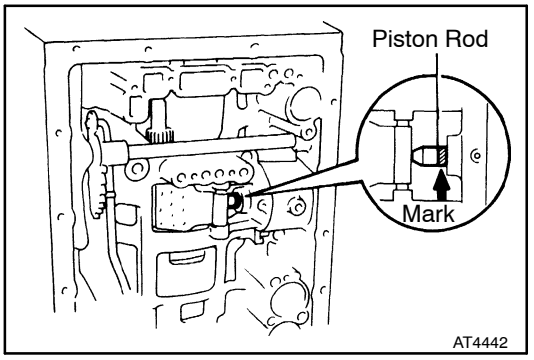
17. INSTALL SECOND COAST BRAKE COVER, PISTON ASSEMBLY AND SPRING

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

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

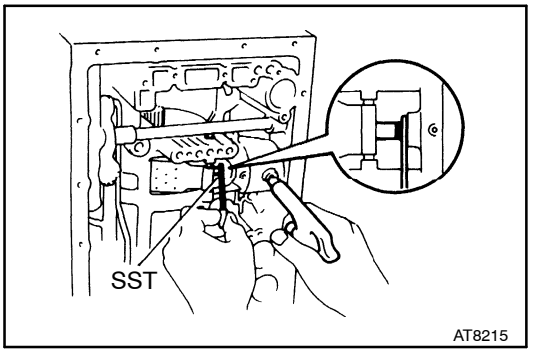
(c) Using SST, install the snap ring.

SST 09350–30020 (09350–07060)



18. CHECK PISTON ROD STROKE OF SECOND COAST BRAKE

(a) Place a mark on the second coast brake piston rod as shown in the figure.

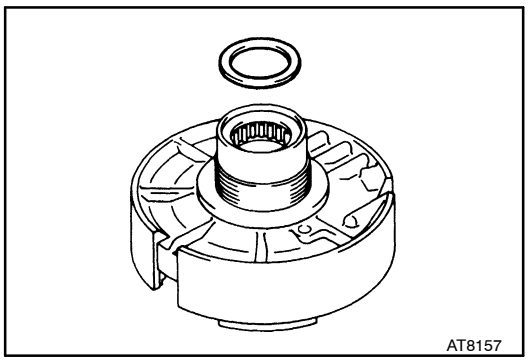


(b) Using SST, measure the stroke applying the compressed air (4 – 8 kg /cm^2, 57 – 114 psi or 392 – 785 kPa) as shown in the figure.

SST 09240–00020

Piston rod stroke: 1.5 – 3.0 mm (0.059 – 0.118 in.)

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



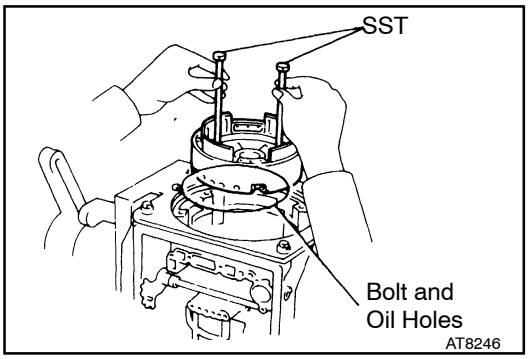
19. INSTALL OVERDRIVE SUPPORT ASSEMBLY

(a) Coat the race with petroleum jelly and install it onto the overdrive support assembly.

HINT: Race diameter

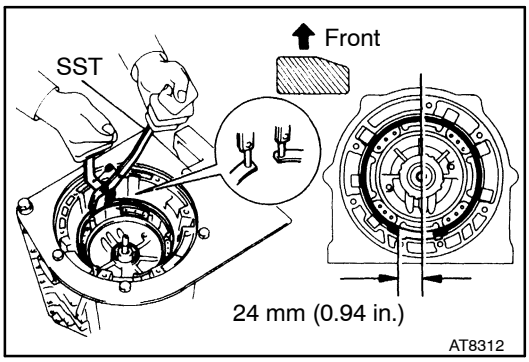
mm (in.)

	Inside	Outside
Race	36.8 (1.449)	50.9 (2.004)



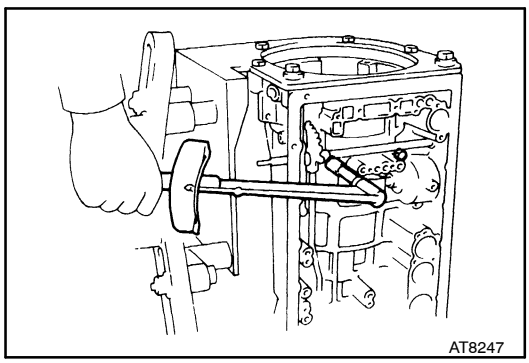
(b) Using two bolts of SST, aim the bolt and oil holes of the overdrive support toward the valve body side, and align them with the bolt holes of the transmission case and insert.

SST 09350–30020 (09350–07020)



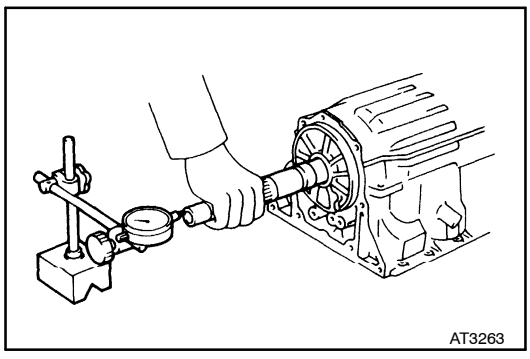
(c) Using SST, install the snap ring as shown in the figure.

SST 09350–30020 (09350–07060)



(d) Install and torque the two bolts.

Torque: 260 kg–cm (19 ft–lb, 25 N–m)



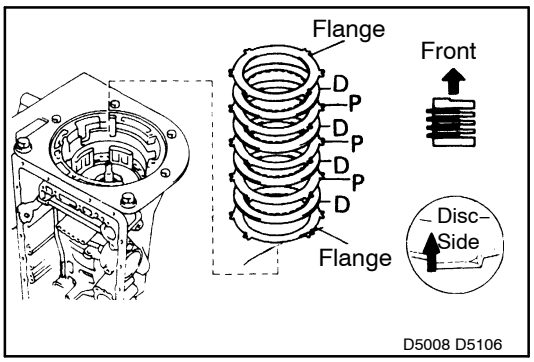
20. CHECK OUTPUT SHAFT

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

End play: 0.27 – 0.86 mm (0.0106 – 0.0339 in.)

If the values are nonstandard, check for an improper installation.

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



21. INSTALL FLANGES, PLATES AND DISCS OF OVERDRIVE BRAKE

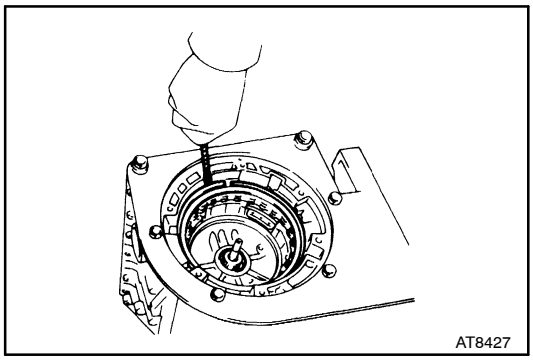
(a) Install the 4.0 mm (0.157 in.) thick flange (flat ring) with the rounded edge side of the flange facing the disc.

(b) Install the plates and discs.

Install in order: P = Plate D = Disc
D–P–D–P–D–P–D

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

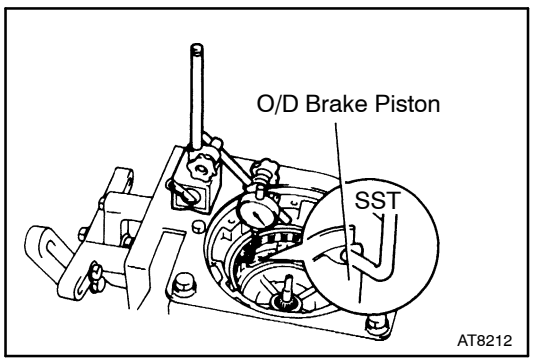
(d) Install the snap ring.

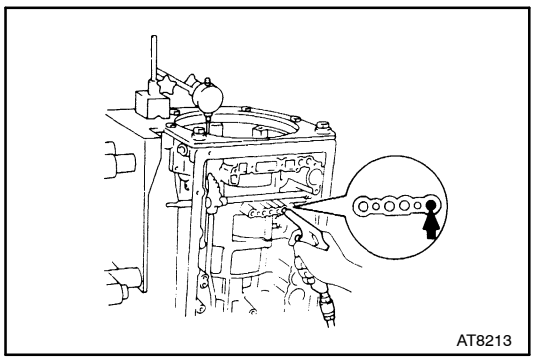


22. CHECK PISTON STROKE OF OVERDRIVE BRAKE

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

SST 09350–30020 (09350–06120)





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

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

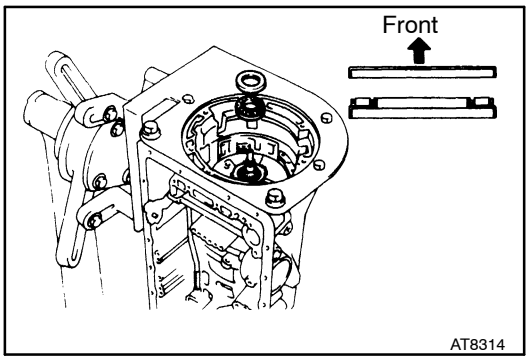
If the piston stroke is less than the limit, parts may have been assembled incorrectly, check and reassemble again.

If the piston stroke is nonstandard, select another flange.

HINT: There are seven different thicknesses for the flange.

Flange thickness mm (in.)

No.	Thickness	No.	Thickness
26	3.3 (0.130)	11	3.8 (0.150)
25	3.5 (0.138)	23	3.9 (0.154)
12	3.6 (0.142)	None	4.0 (0.157)
24	3.7 (0.146)		

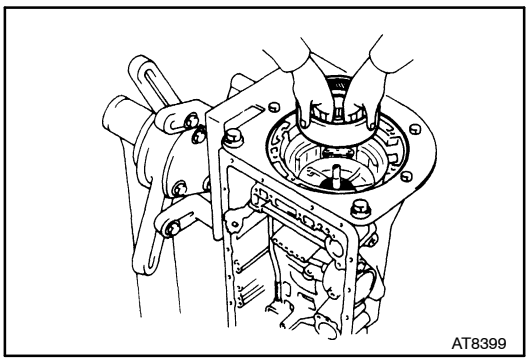


23. INSTALL OVERDRIVE PLANETARY GEAR UNIT WITH OVERDRIVE DIRECT CLUTCH AND ONE–WAY CLUTCH

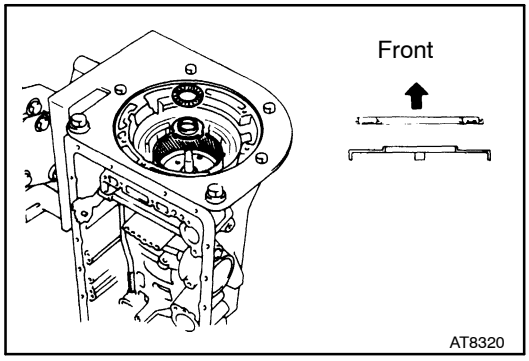
(a) Coat the bearing and race with petroleum jelly and install them onto the overdrive support.

HINT: Bearing and race diameter mm (in.)

	Inside	Outside
Bearing	33.6 (1.323)	50.3 (1.980)
Race	37.1 (1.461)	59.0 (2.323)



(b) Install the overdrive planetary ring gear.

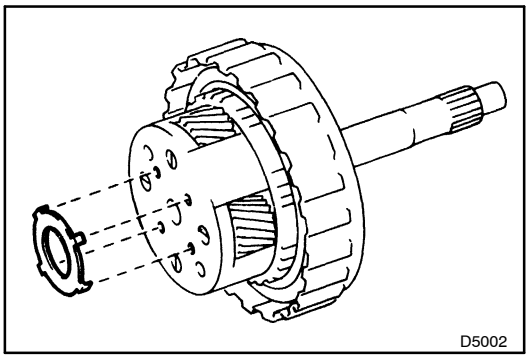


(c) Coat the bearing and race with petroleum jelly and install them onto the planetary ring gear.

HINT: Bearing and race diameter

mm (in.)

	Inside	Outside
Bearing	26.0 (1.024)	46.8 (1.843)
Race	24.2 (0.953)	47.8 (1.882)

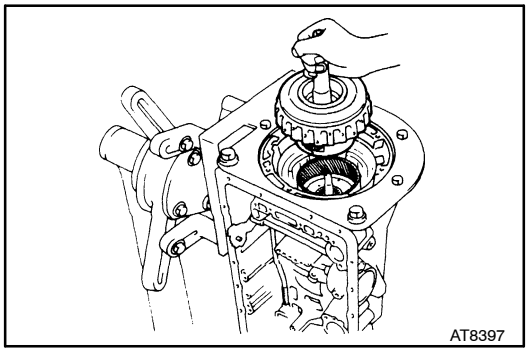


(d) Coat the race with petroleum jelly and install it onto the planetary gear.

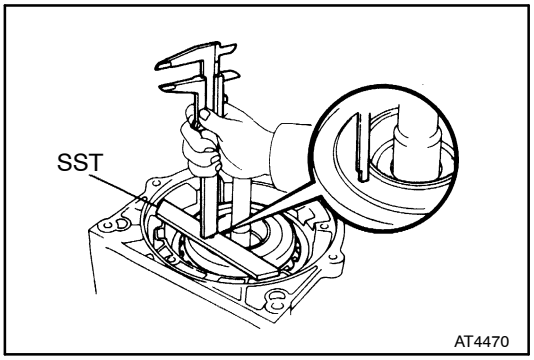
HINT: Race diameter

mm (in.)

	Inside	Outside
Race	27.1 (1.067)	41.8 (1.646)



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



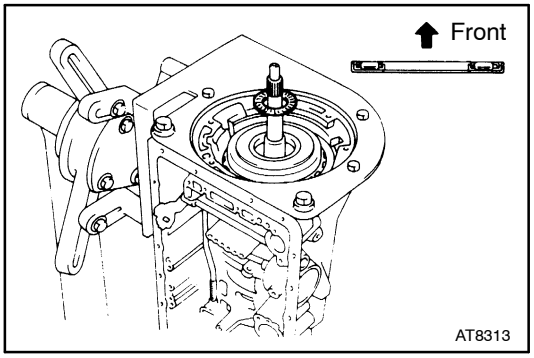
(f) Place SST on the transmission case.

SST 09350–36010 (09350–06090)

(g) Using calipers, measure distance between the tops of SST and the clutch drum.

Standard distance: 15.5 – 16.5 mm (0.610 – 0.650 in.)

If the values are nonstandard, check for an improper installation.

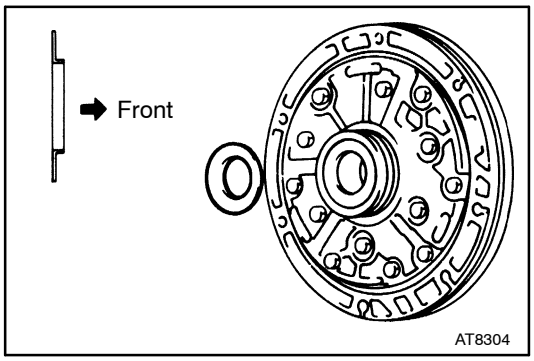


(h) Coat the assembled bearing and race with petroleum jelly and install it onto the O/D direct clutch.

HINT: Assembled bearing and race diameter

mm (in.)

	Inside	Outside
Bearing and race	28.9 (1.138)	50.2 (1.976)



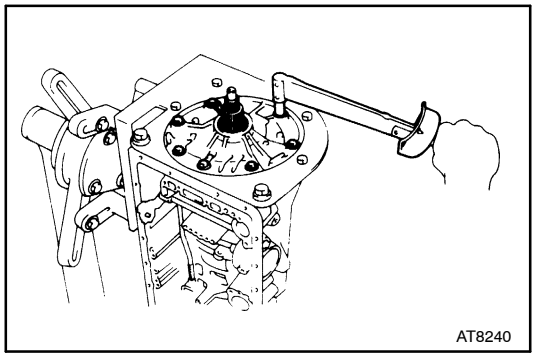
24. INSTALL OIL PUMP INTO CASE

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

HINT: Race diameter

mm (in.)

	Inside	Outside
Race	28.1 (1.106)	47.3 (1.862)



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

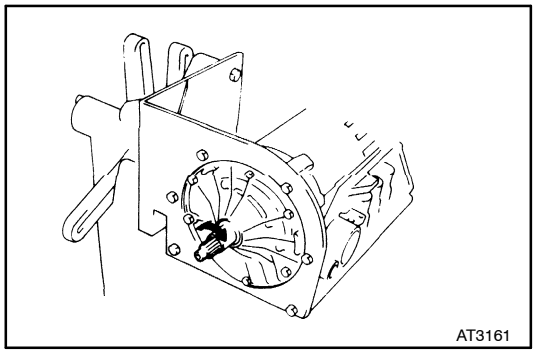
(c) Place the oil pump through the input shaft, and align the bolt holes of the pump body with the transmission case.

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

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

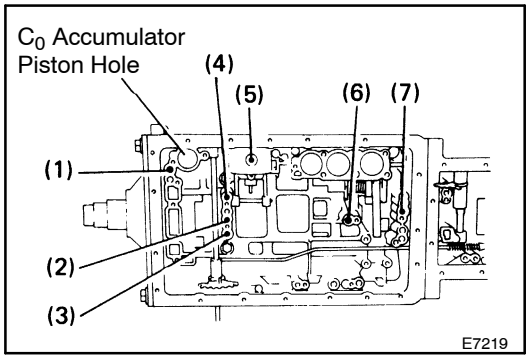
(e) Install the seven bolts.

Torque: 220 kg–cm (16 ft–lb, 22 N–m)



25. CHECK INPUT SHAFT ROTATION

Make sure the input shaft rotates smoothly.

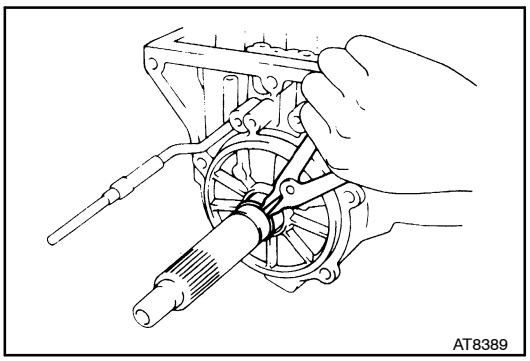


26. INDIVIDUAL PISTON OPERATION INSPECTION

Check for the sound of operation while applying compressed air into the oil hole indicated in the figure.

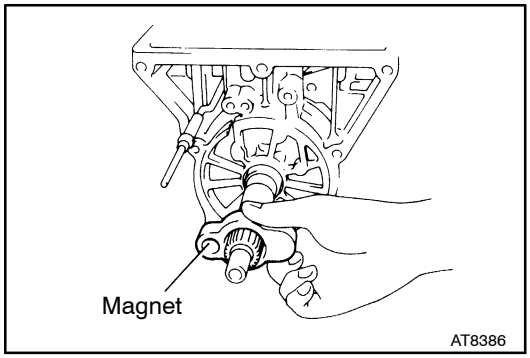
(1) O/D direct clutch
(2) Direct clutch
(3) Forward clutch
(4) O/D brake
(5) Second coast brake
(6) Second brake
(7) First and reverse brake

HINT: When inspecting the O/D direct clutch, check with the C_0 accumulator piston hole closed.
If there is no noise, disassemble and check the installation condition of the parts.

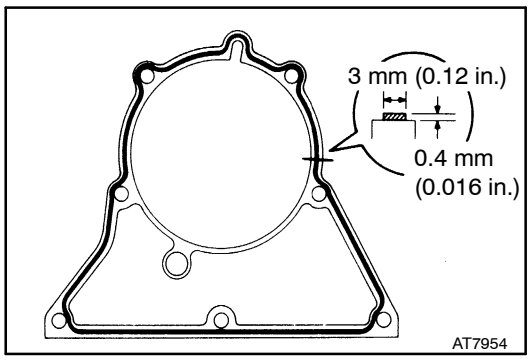


27. INSTALL SPEED SENSOR ROTOR AND KEY

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



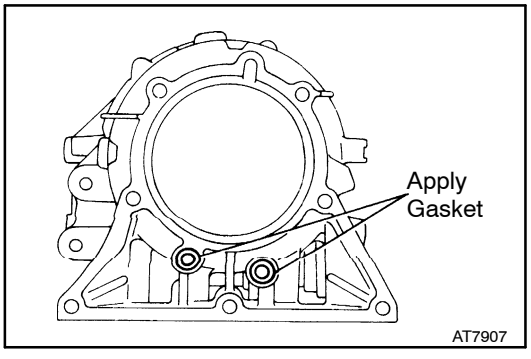
(b) Install the key on the output shaft.
(c) Align the groove of the sensor rotor with the key, install the sensor rotor.
(d) Using snap ring pliers, install the snap ring.



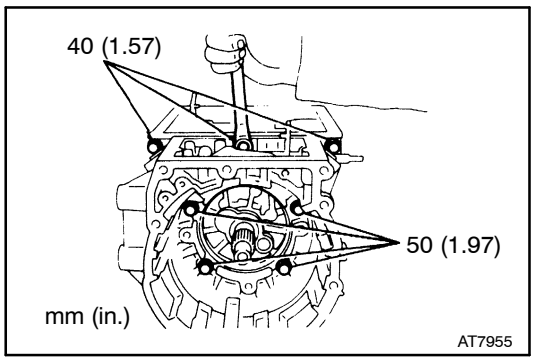
28. INSTALL TRANSFER CASE

(a) Clean contacting surfaces of any residual packing material using gasoline or alcohol.
(b) Apply seal packing to the case as shown in the figure.

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



(c) Confirm the two apply gaskets are installed correctly.

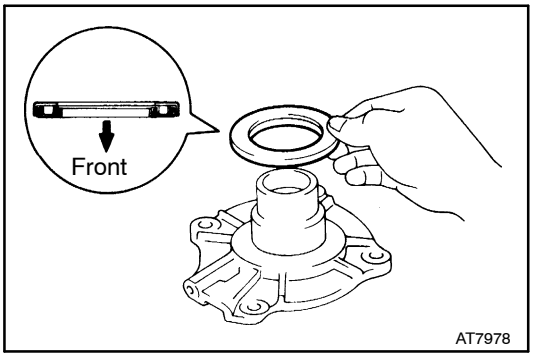


(d) Install the case and torque the seven bolts.

Torque: 345 kg–cm (25 ft–lb, 34 N–m)

HINT:

- Each bolt length (mm, in.) is indicated in the figure.
- When assembling the transmission case and transfer case, make sure the parking lock rod is above the pawl.



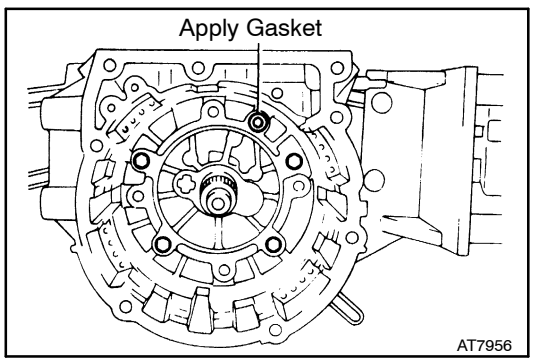
29. INSTALL FRONT SUPPORT TO TRANSFER CASE

(a) Coat the assembled bearing and race with petroleum jelly and install it onto the front support.

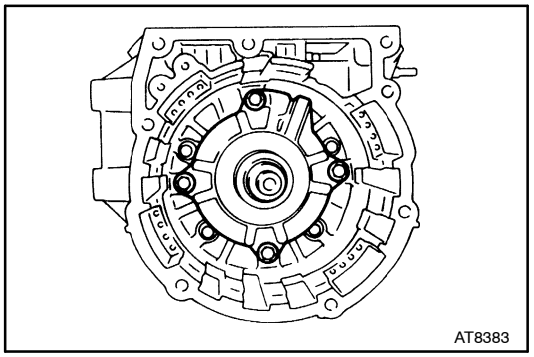
HINT: Assembled bearing and race diameter

mm (in.)

	Inside	Outside
Bearing and race	51.1 (2.012)	78.6 (3.094)

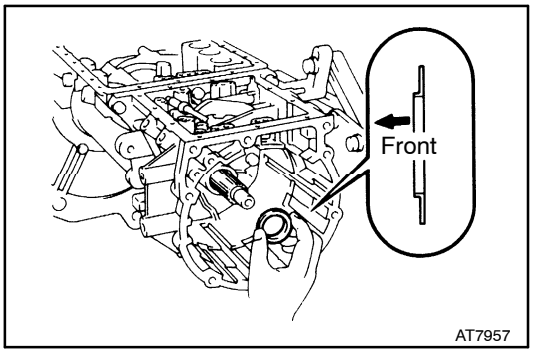


(b) Confirm the apply gasket is installed correctly.



(c) Install the front support and torque the bolts.

Torque: 345 kg–cm (25 ft–lb, 34 N–m)

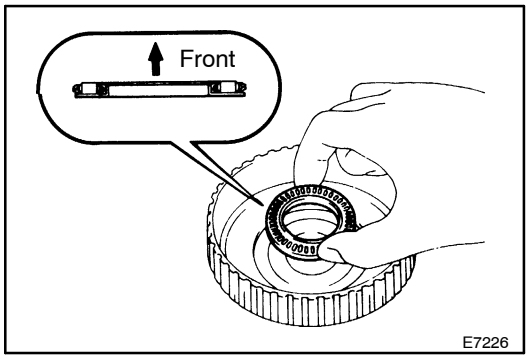


(d) Coat the race with petroleum jelly and install it onto the front support.

HINT: Race diameter

mm (in.)

	Inside	Outside
Race	33.5 (1.319)	47.8 (1.882)



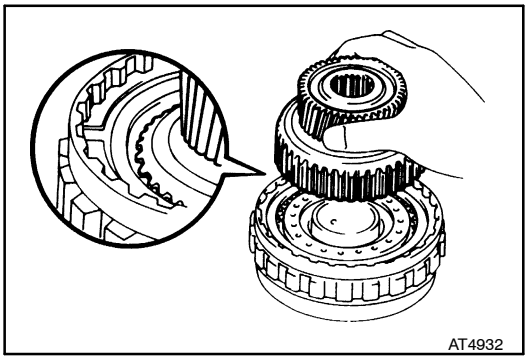
30. INSTALL SUN GEAR TO TRANSFER DIRECT CLUTCH

(a) Coat the assembled bearing and race with petroleum jelly and install it onto the sun gear.

HINT: Assembled bearing and race diameter.

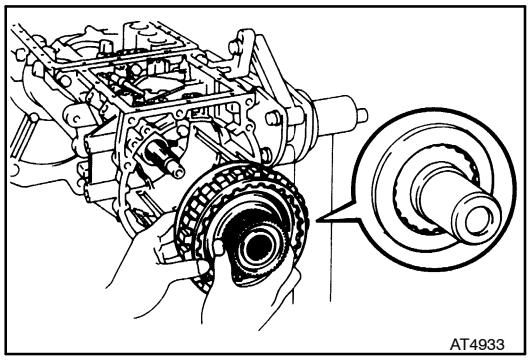
mm (in.)

	Inside	Outside
Bearing and race	30.5 (1.201)	48.0 (1.890)



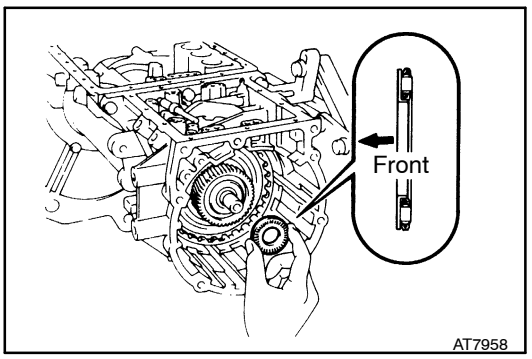
(b) Install the sun gear into the transfer direct clutch.

HINT: Mesh the splines of the sun gear with the flukes of the discs by rotating and pushing the sun gear.



31. INSTALL TRANSFER DIRECT CLUTCH WITH SUN GEAR

(a) Install the transfer direct clutch with the sun gear.

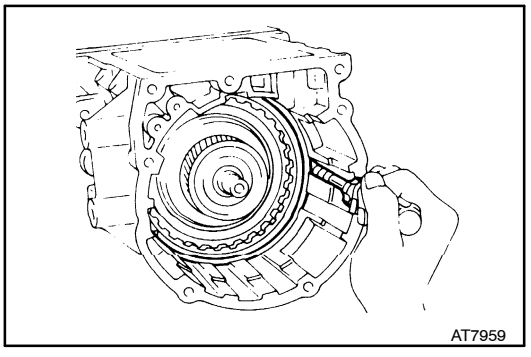


(b) Coat the assembled bearing and race with petroleum jelly and install it onto the sun gear.

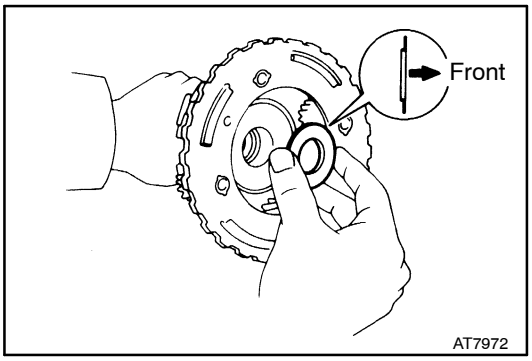
HINT: Assembled bearing and race diameter

mm (in.)

	Inside	Outside
Bearing and race	19.0 (0.748)	45.0 (1.772)



(c) Install the snap ring.



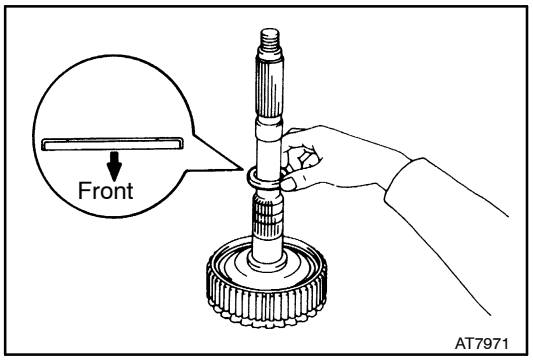
32. INSTALL OUTPUT SHAFT WITH PLANETARY RING GEAR

(a) Coat the races with petroleum jelly and install them onto the planetary gear and planetary ring gear.

HINT: Race diameter

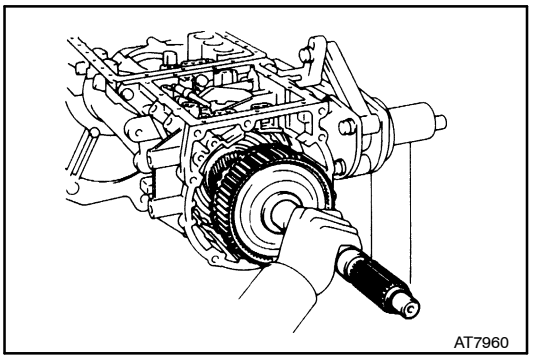
mm (in.)

	Inside	Outside
Race	23.1 (0.909)	45.0 (1.772)

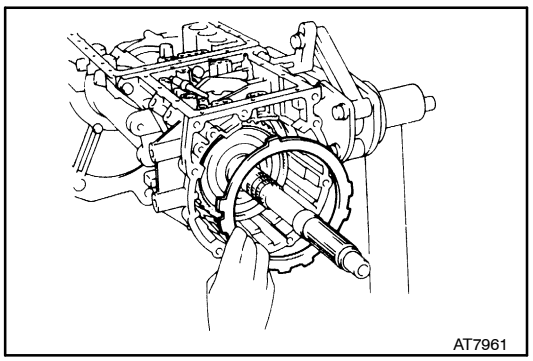


mm (in.)

	Inside	Outside
Race	36.3 (1.429)	53.9 (2.122)

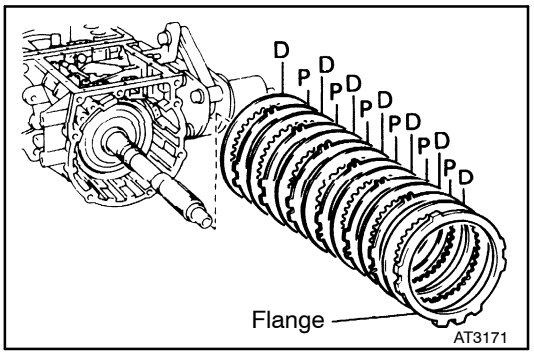


(b) Install the output shaft with the planetary ring gear.



33. INSTALL FLANGES, PLATES, DISCS AND CUSHION PLATE OF TRANSFER LOW SPEED BRAKE

(a) Install the front flange to the case.

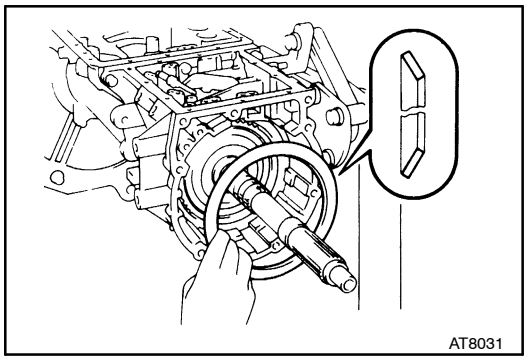


(b) Install the plates and discs.

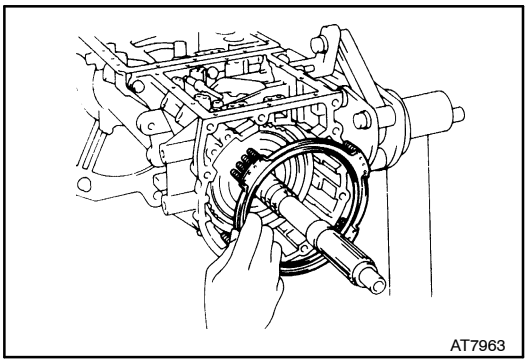
Install in order: P = Plate D = Disc

D–P–D–P–D–P–D–P–D–P–D–P–D

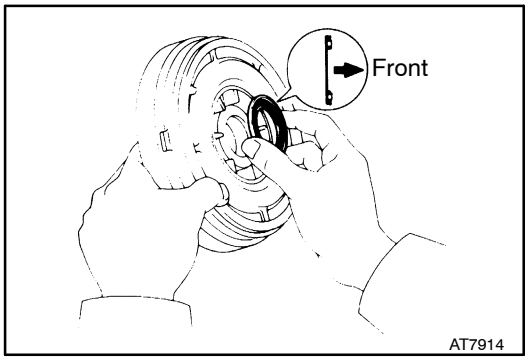
(c) Install the rear flange.



(d) Install the cushion plate, the rounded end facing rearward.



34. INSTALL PISTON RETURN SPRING OF TRANSFER LOW SPEED BRAKE



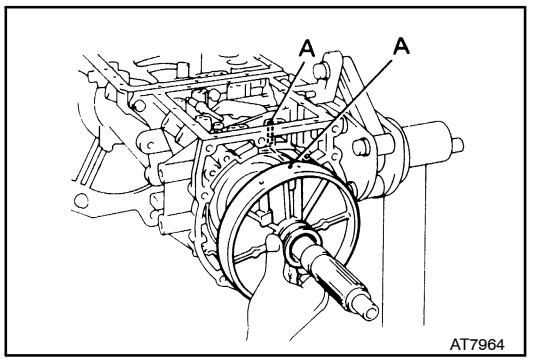
35. INSTALL TRANSFER CENTER SUPPORT

(a) Coat the assembled bearing and race with petroleum jelly and install it onto the center support.

HINT: Assembled bearing and race diameter

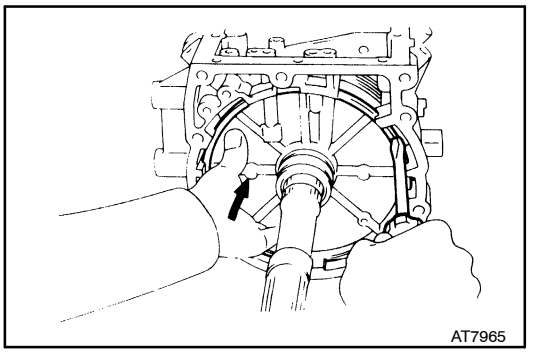
mm (in.)

	Inside	Outside
Bearing and race	38.0 (1.496)	57.3 (2.256)

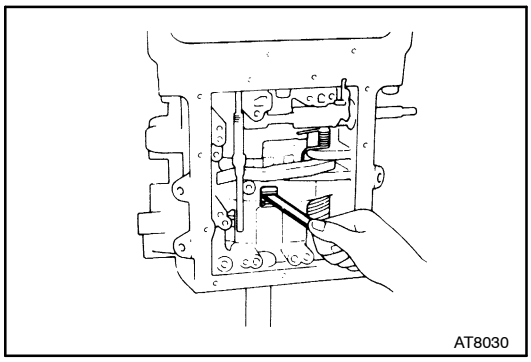


(b) Install the center support to the case.

HINT: Align the oil holes and bolt hole of the center support with those of the case side and insert.



(c) Pushing the center support forward, install the snap ring.

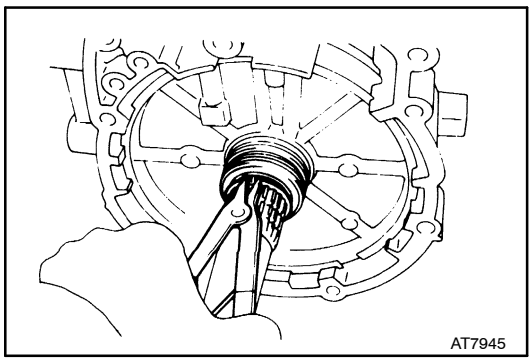


36. CHECK PACK CLEARANCE OF TRANSFER LOW SPEED BRAKE

Using a feeler gauge, measure the clearance between the snap ring and flange as shown in the figure.
Clearance: 0.91 – 2.10 mm (0.0358 – 0.0827 in.)
If the piston stroke is less than the limit, parts may have been assembled incorrectly, check and reassemble again.
If the piston stroke is nonstandard, select another flange.
HINT: There are five different thicknesses for the flange.

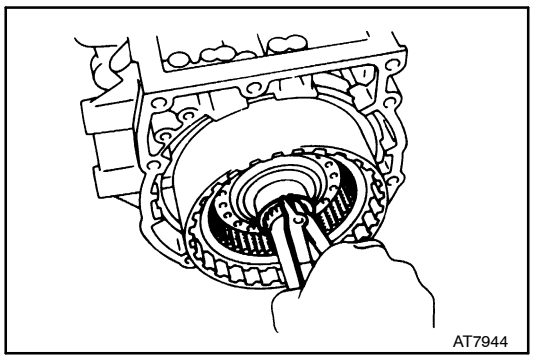
Flange thickness mm (in.)

3.8 (0.150)	4.4 (0.173)
4.0 (0.157)	4.6 (0.181)
4.2 (0.165)	



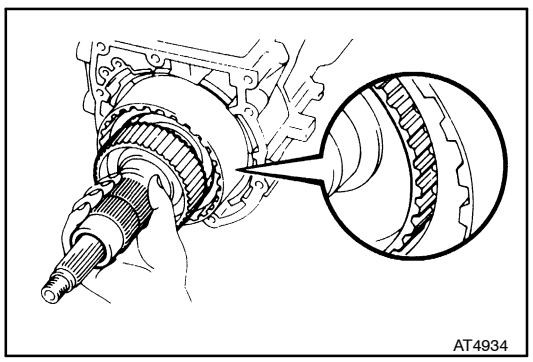
37. INSTALL TRANSFER FRONT DRIVE CLUTCH

(a) Install the snap ring to the output shaft.



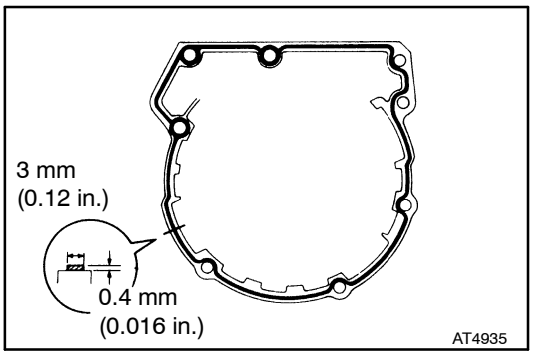
(b) Install the front drive clutch.

(c) Install the snap ring.



38. INSTALL FRONT OUTPUT SHAFT

Install the front output shaft into the transfer front drive clutch.
HINT: Mesh the splines of the front output shaft with the flukes of the discs by rotating and pushing the front output shaft.

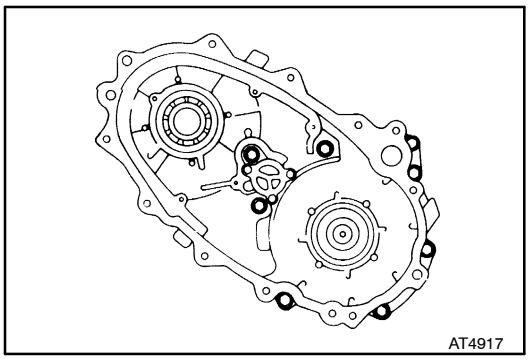


39. INSTALL TRANSFER CHAIN FRONT CASE

(a) Clean contacting surfaces of any residual packing material using gasoline or alcohol.

(b) Apply seal packing to the transfer case as shown in the figure.

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



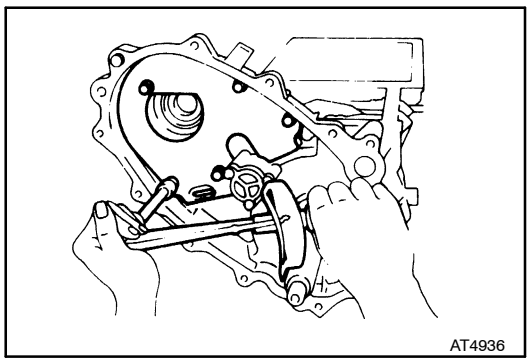
(c) Install the transfer chain front case to the transfer case.

(d) Apply sealant to the threads of the bolts.

Sealant: Part No. 08833 – 00070, THREE BOND 1324 or equivalent

(e) Install and torque the bolts.

Torque: 345 kg–cm (25 ft–lb, 34 N–m)



40. INSTALL TRANSFER CHAIN OIL RECEIVER

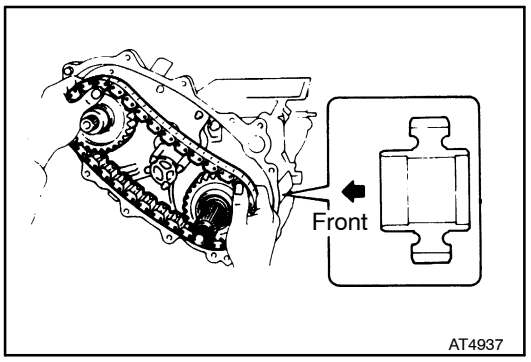
(a) Apply sealant to the threads of the bolts.

Sealant: Part No. 08833 – 00070, THREE BOND 1324 or equivalent

(b) Install the oil receiver to the transfer chain front case.

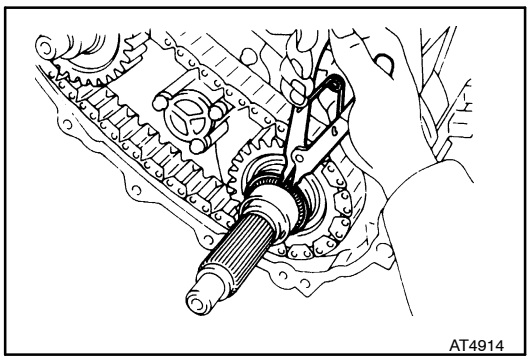
(c) Install and torque the bolts.

Torque: 100 kg–cm (7 ft–lb, 10 N–m)

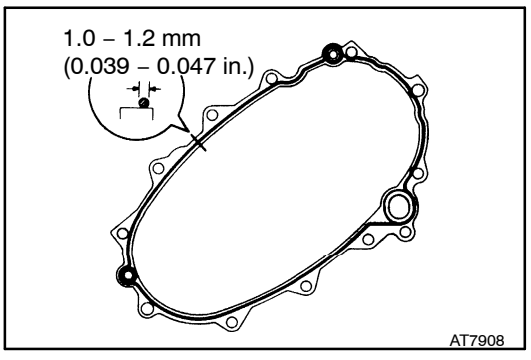


41. INSTALL DRIVE CHAIN WITH DRIVE SPROCKET AND DRIVEN SHAFT

(a) Install the chain with the drive sprocket and driven shaft.



(b) Install the snap ring.

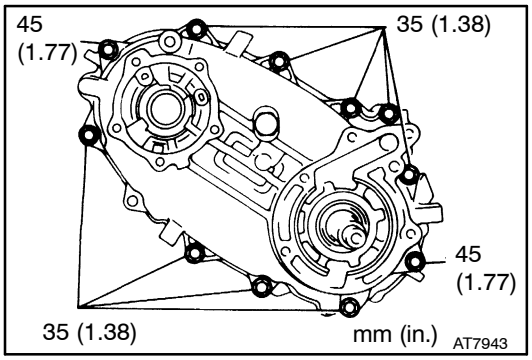


42. INSTALL TRANSFER CHAIN REAR CASE

(a) Clean contacting surfaces of any residual packing material using gasoline or alcohol.

(b) Apply seal packing to the chain rear case as shown in the figure.

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

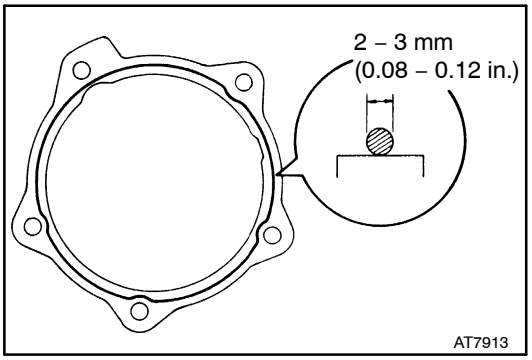


(c) Install the chain rear case to the front case.

(d) Install and torque the bolts.

Torque: 345 kg–cm (25 ft–lb, 34 N–m)

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

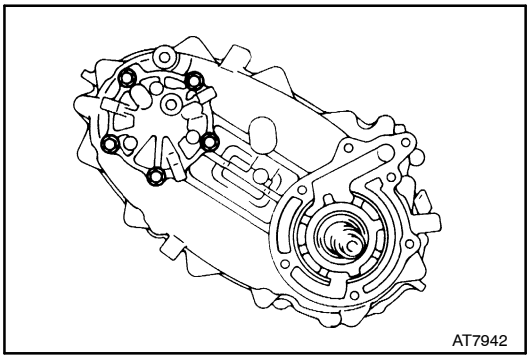


43. INSTALL OIL PUMP ASSEMBLY

(a) Clean contacting surfaces of any residual packing material using gasoline or alcohol.

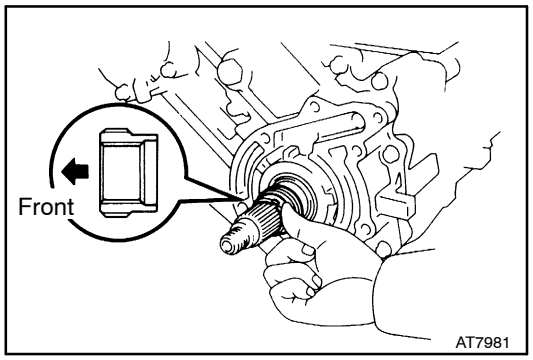
(b) Apply seal packing to the chain rear case as shown in the figure.

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

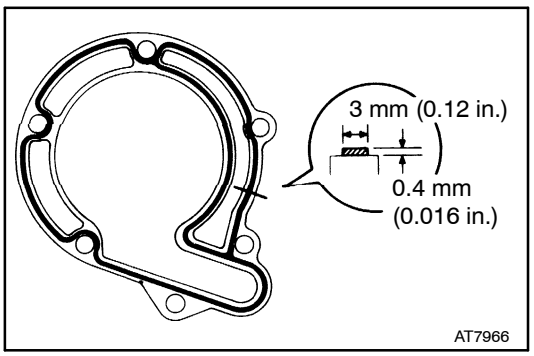


(c) Install the oil pump assembly and torque the bolts.

Torque: 160 kg–cm (12 ft–lb, 16 N–rn)



44. INSTALL SPEEDOMETER DRIVE GEAR

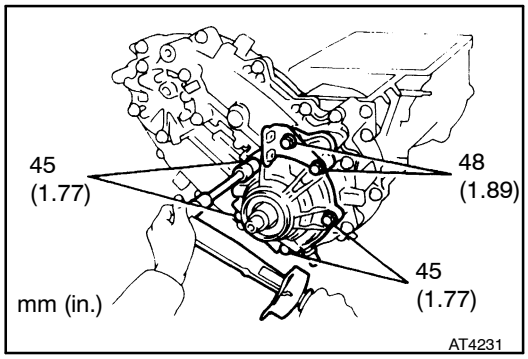


45. INSTALL EXTENSION HOUSING

(a) Clean contacting surfaces of any residual packing material using gasoline or alcohol.

(b) Apply seal packing to the extension housing as shown in the figure.

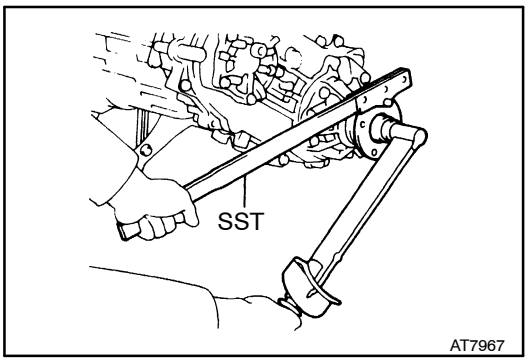
Seal packing: Part No. 08833 – 00090, THREE BOND 1131, LOCTITE 518 or equivalent



(c) Install the extension housing to the chain rear case.

Torque: 345 kg–cm (25 ft–lb, 34 N–m)

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



46. INSTALL REAR COMPANION FLANGE

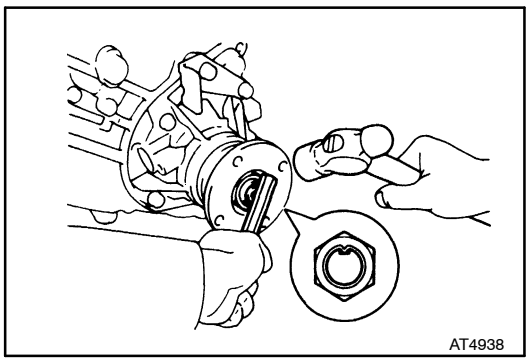
(a) Coat a new O–ring with ATF and install it to the companion flange inner.

(b) Install the companion flange and washer to the shaft.

(c) Using SST to hold the flange, torque a new nut.

SST 09330–00021

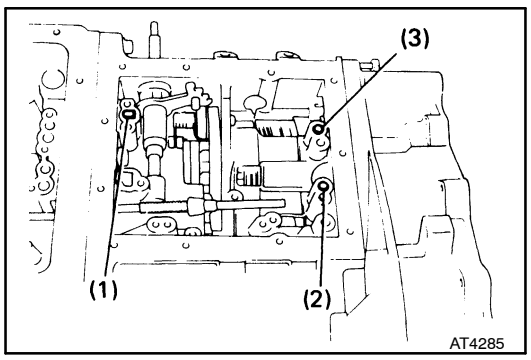
Torque: 1,250 kg–cm 190 ft–lb, 123 N–m)



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

47. INSTALL FRONT COMPANION FLANGE

Install the front companion flange in the same way as the rear companion flange.



48. INDIVIDUAL PISTON OPERATION INSPECTION

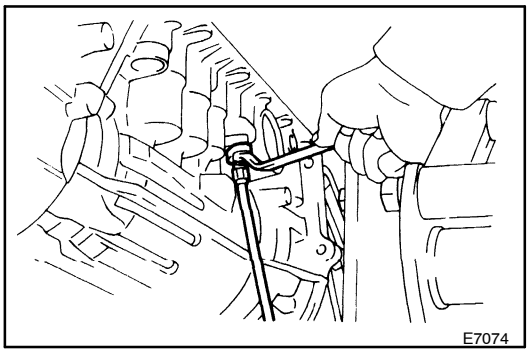
Check for the sound of operation while applying compressed air into the oil hole indicated in the figure.

(1) Transfer direct clutch

(2) Transfer low speed brake

(3) Transfer front drive clutch

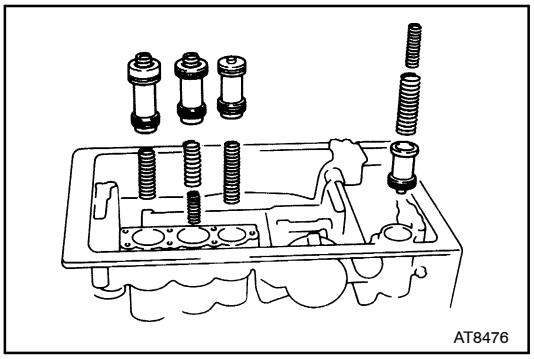
If there is no noise, disassemble and check the installation condition of the parts.



49. INSTALL THROTTLE CABLE

(a) Coat a new O–ring with ATF and install it to the cable.

(b) Install the cable to the case.

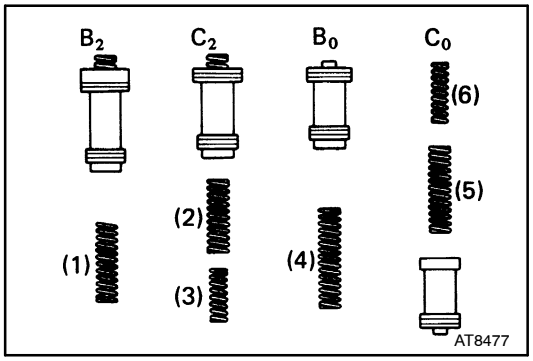


50. INSTALL ACCUMULATOR SPRINGS, PISTONS AND PINS

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

(b) Install the five springs, four accumulator pistons to the bore as shown in the figure.

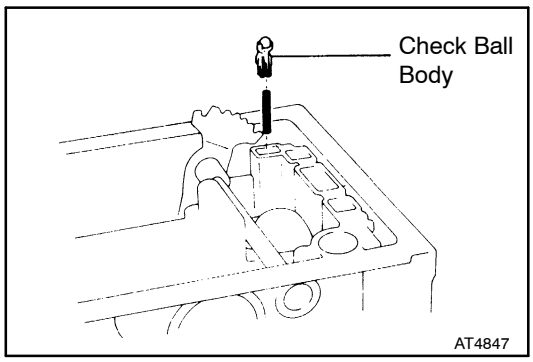
HINT: The pistons are marked in relief with either C–0, B–0, C–2, B–2 to differentiate between them.



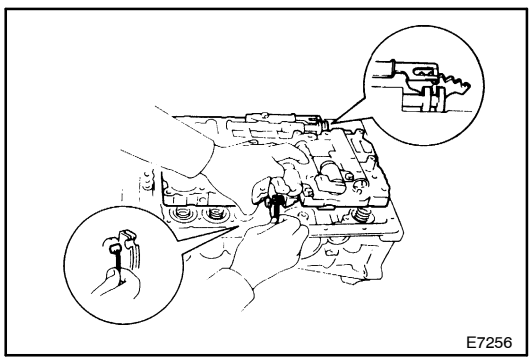
- **Spring**

mm (in.)

Spring			Free length	Outer diameter	Color
(1)	B_2		70.5 (2.776)	19.7 (0.776)	Yellow
(2)	C_2	Outer	70.3 (2.768)	20.2 (0.795)	Pink
(3)		Inner	42.1 (1.657)	14.7 (0.579)	Pink
(4)	B_0		66.0 (2.598)	16.1 (0.634)	Purple
(5)	C_0	Outer	74.6 (2.937)	20.9 (0.823)	Orange
(6)		Inner	46.0 (1.811)	14.0 (0.551)	Yellow



51. INSTALL CHECK BALL BODY AND SPRING

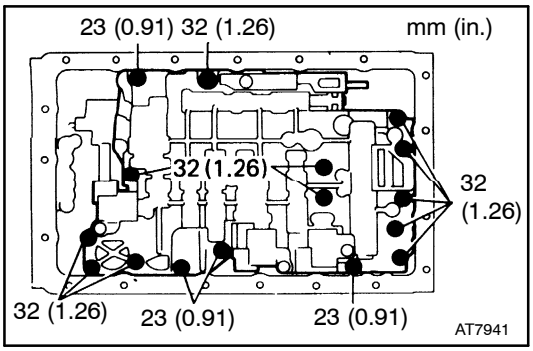


52. INSTALL TRANSMISSION VALVE BODY

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

(b) Connect the throttle cable to the cam.

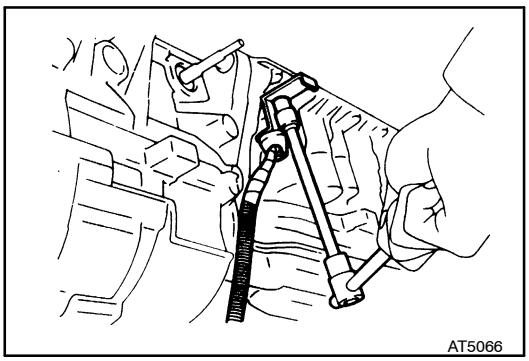
(c) Confirm the springs into the accumulator pistons are installed correctly.



(d) Install the sixteen bolts.

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

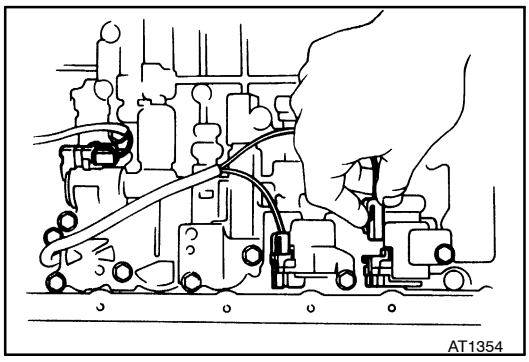
Torque: 100 kg–cm (7 ft–lb, 10 N–m)



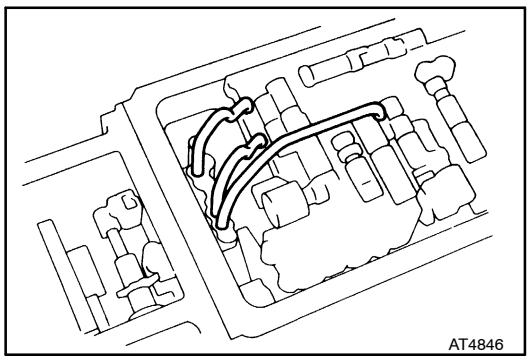
53. INSTALL TRANSMISSION SOLENOID WIRING

(a) Coat a new O–ring with ATF and install it to the grommet.

(b) Insert the solenoid wiring to the case and install the stopper plate.



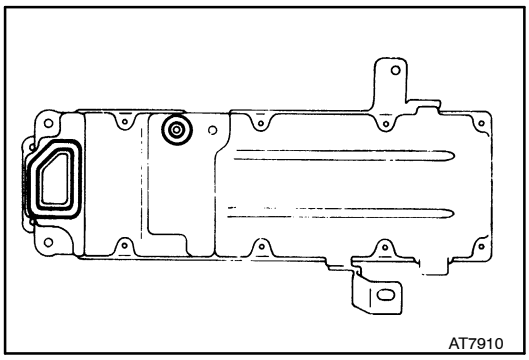
(c) Connect the connectors to No. 1, No. 2 and lock–up solenoids.



54. INSTALL OIL TUBES

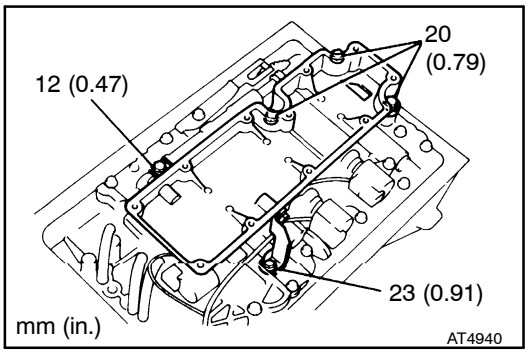
Using a plastic hammer, install the three tubes into position shown in the figure.

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



55. INSTALL OIL STRAINER AND GASKETS

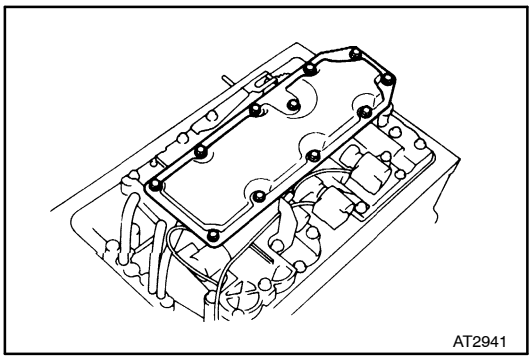
(a) Install two new gaskets to the oil strainer case.



(b) Install the oil strainer case and torque the five bolts.

Torque: 100 kg–cm (7 ft–lb, 10 N–m)

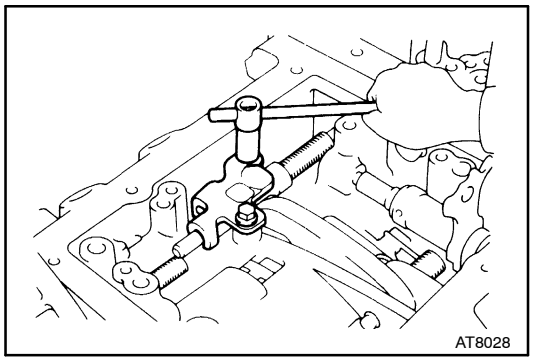
HINT: Each bolt length (mm, in.) is indicated in the figure.



(c) Install a new gasket to the oil strainer case.

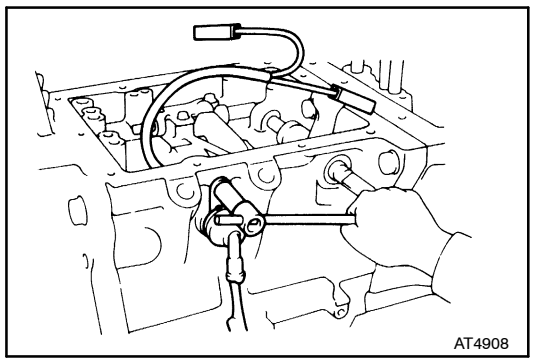
(d) Install the oil strainer and torque the eleven bolts.

Torque: 70 kg–cm (61 in.–lb, 6.9 N–m)



56. INSTALL PARKING LOCK PAWL BRACKET

Torque: 70 kg–cm (61 in.–lb, 6.9 N–m)

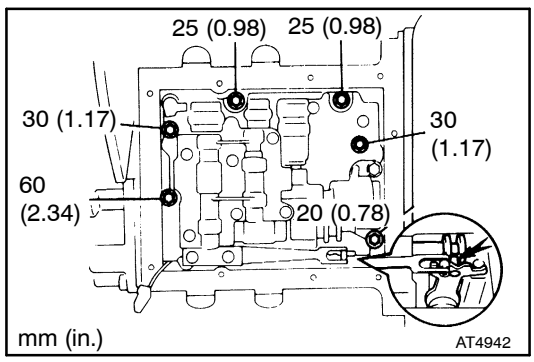


57. INSTALL TRANSFER SOLENOID WIRING

(a) Coat a new O–ring with ATF and install it to the grommet.

(b) Install solenoid wiring into the transfer case.

(c) Install the stopper plate.



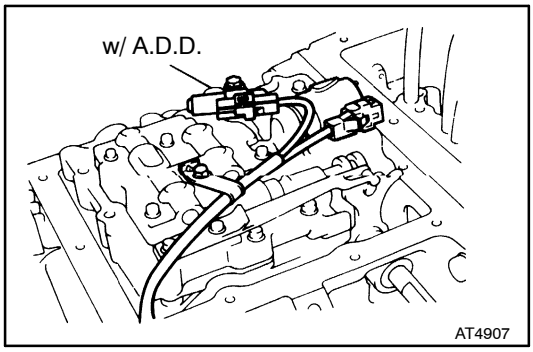
58. INSTALL TRANSFER VALVE BODY

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

(b) Install and torque the six bolts.

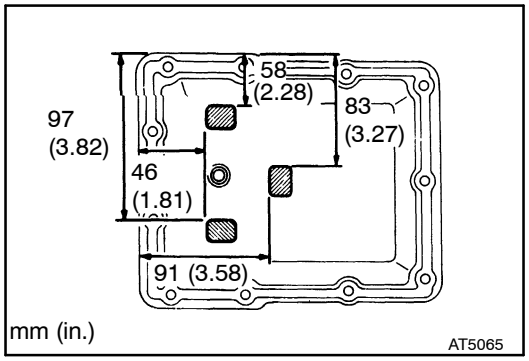
Torque: 100 kg–cm (7 ft–lb, 10 N–m)

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



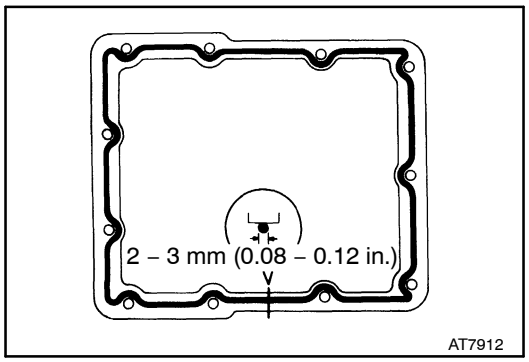
(c) Connect the connectors to No. 4 solenoid and transfer pressure switch.

(d) Clamp the wiring.



59. INSTALL TRANSFER OIL PAN

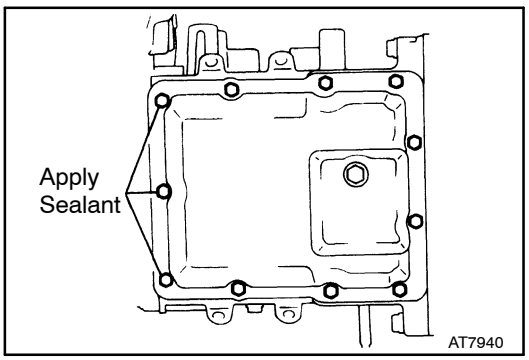
(a) Install the three magnets as shown in the figure.



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

(c) Apply seal packing to the oil pan as shown in the figure.

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

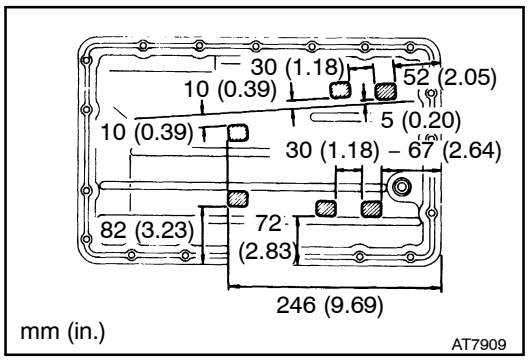


(d) Apply sealant to the threads of the three bolts.

Sealant: Part No. 08833 – 00070, THREE BOND 1324 or equivalent

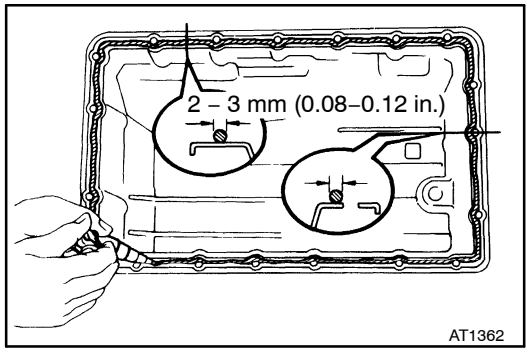
(e) Install the oil pan and torque the eleven bolts.

Torque: 75 kg–cm (65 in.–lb, 7.4 N–m)



60. INSTALL TRANSMISSION OIL PAN

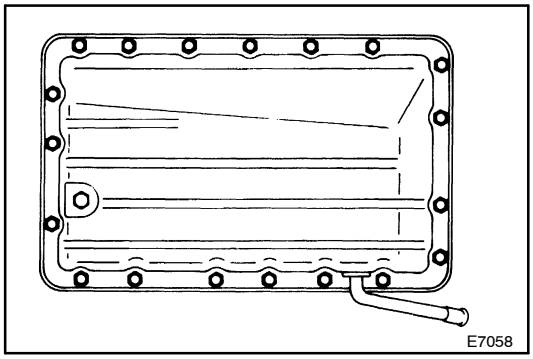
(a) Install the six magnets as shown in the figure.



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

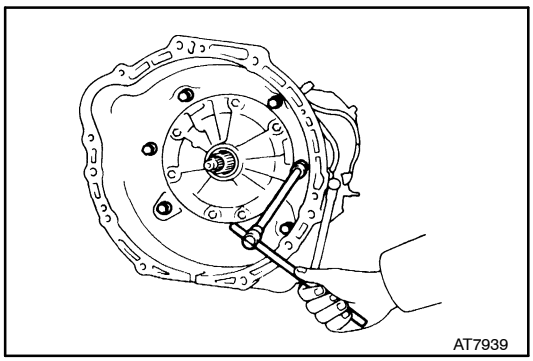
(c) Apply seal packing to the oil pan as shown in the figure.

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



(d) Install and torque the nineteen bolts.

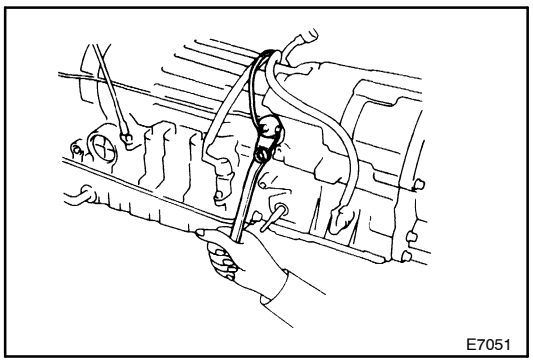
Torque: 75 kg–cm (65 in.–lb, 7.4 N–m)



61. INSTALL TRANSMISSION HOUSING

Install and torque the six bolts.

Torque: 10 mm bolt 345 kg–cm (25 ft–lb, 34 N–m)
12 mm bolt 580 kg–cm (42 ft–lb, 57 N–m)

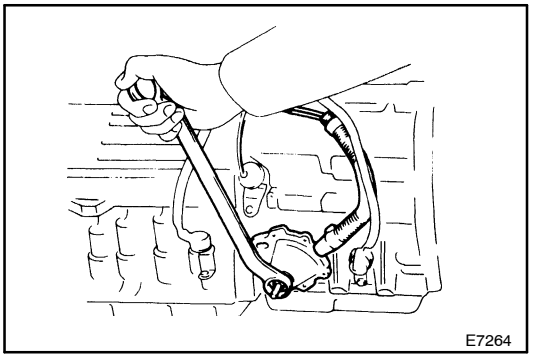


62. INSTALL SPEED SENSOR

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

(b) Install the speed sensor and stopper plate.

(c) Connect the wiring connector.

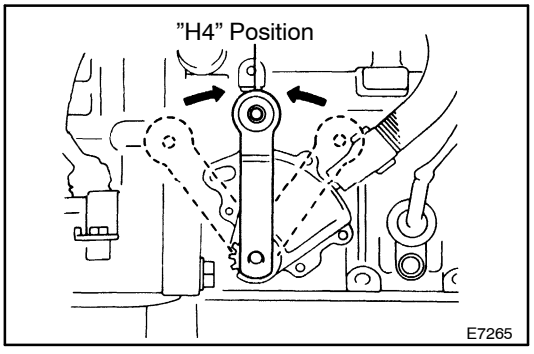


63. INSTALL TRANSFER POSITION SWITCH

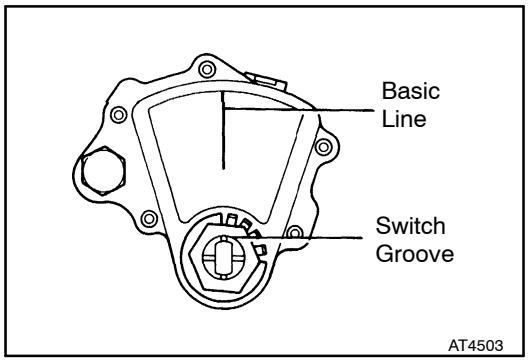
(a) Install the transfer position switch onto the manual valve lever shaft and temporarily tighten the adjusting bolt.

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

Torque: 40 kg–cm (35 in.–lb, 3.9 N–m)



(c) Using the control shaft lever, shift the lever into the "H4" position.

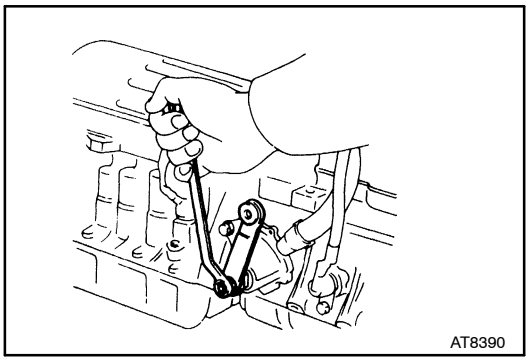


(d) Align the basic line and the switch groove, and tighten the bolt.

Torque: 130 kg–cm (9 ft–lb, 13 N–m)

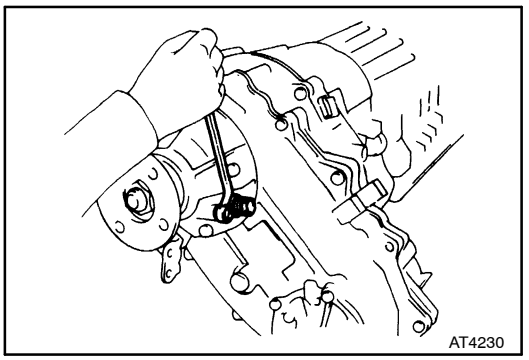
(e) Bend the tabs of the lock washer.

HINT: Bend at least two of the lock washer tabs.



64. INSTALL TRANSFER CONTROL SHAFT LEVER

Torque: 160 kg–cm (12 ft–lb, 16 N–m)



65. INSTALL SPEEDOMETER DRIVEN GEAR

(a) Coat a new O–ring with ATF and install it to the sleeve.

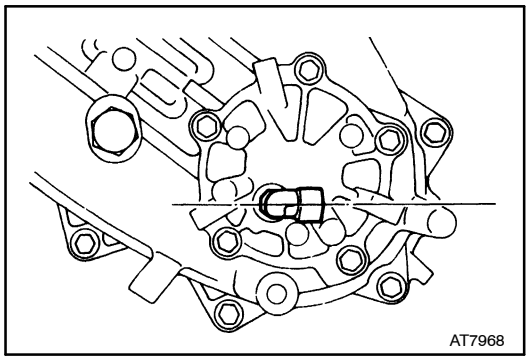
(b) Install the driven gear into the sleeve and install the clip.

(c) Install the sleeve to the extension housing.

(d) Install the lock plate with the bolt.

(e) Torque the bolt.

Torque: 160 kg–cm (12 ft–lb, 16 N–m)

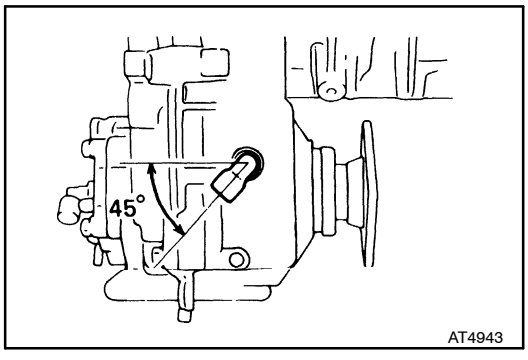


66. INSTALL TRANSFER SIDE UNIONS

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

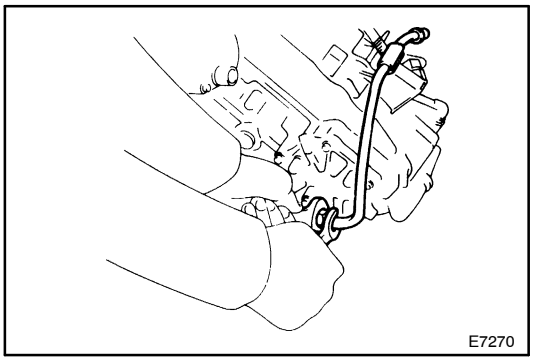
(b) Install the outlet union as shown in the figure.

Torque: 300 kg–cm (22 ft–lb, 29 N–m)



(c) Install the inlet union as shown in the figure.

Torque: 300 kg–cm (22 ft–lb, 29 N–m)



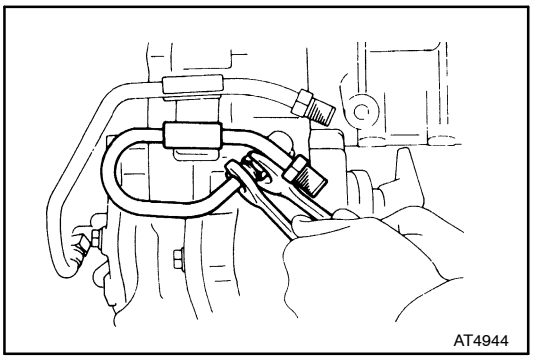
67. INSTALL TRANSFER OIL COOLER TUBES

(a) Install the tube clamp bracket.

Torque: 345 kg–cm (25 ft–lb, 34 N–m)

(b) Install the outlet tube.

Torque: 350 kg–cm (25 ft–lb, 34 N–m)

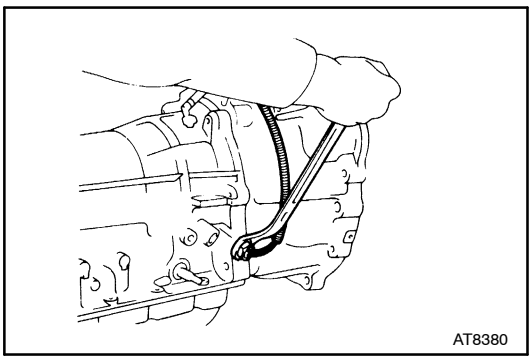


(c) Install the inlet tube.

Torque: 350 kg–cm (25 ft–lb, 34 N–m)

(d) Install the tube clamp.

Torque: 100 kg–cm (7 ft–lb, 10 N–m)

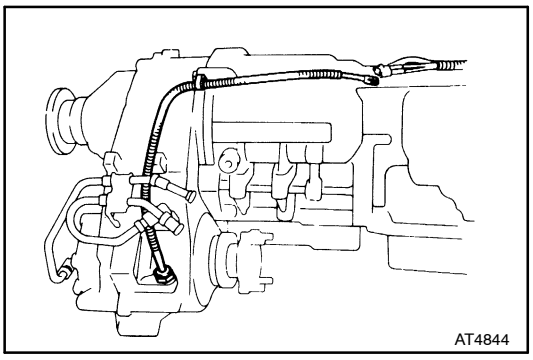


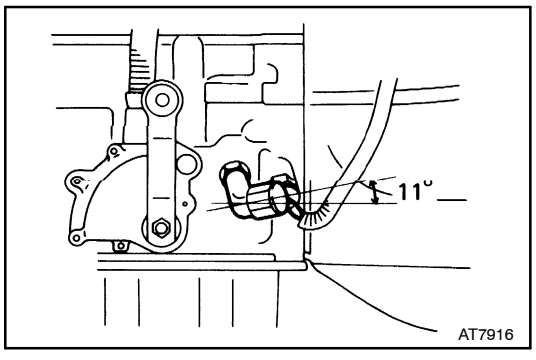
68. INSTALL TRANSMISSION AND TRANSFER FLUID TEMPERATURE SENSORS

(a) Coat new O–rings with ATF and install them to each sensor.

(b) Install and torque the transmission and transfer fluid temperature sensors.

Torque: 150 kg–cm (11 ft–lb, 15 N–m)



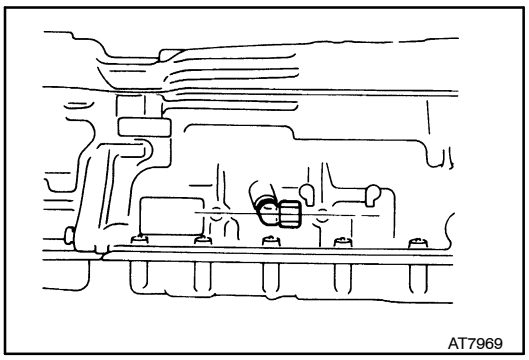


69. INSTALL TRANSMISSION SIDE UNIONS

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

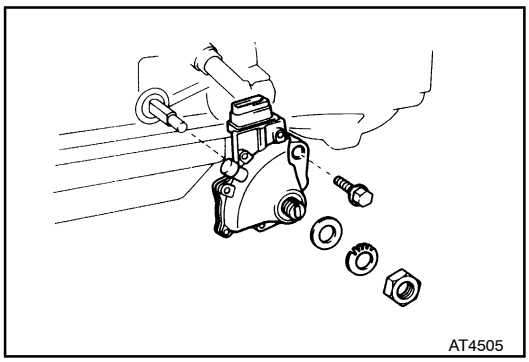
(b) Install the front union as shown in the figure.

Torque: 300 kg–cm (22 ft–lb, 29 N–m)



(c) Install the rear union as shown in the figure.

Torque: 300 kg–cm (22 ft–lb, 29 N–m)

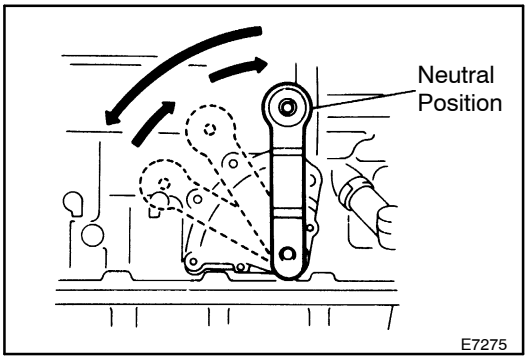


70. INSTALL NEUTRAL START SWITCH

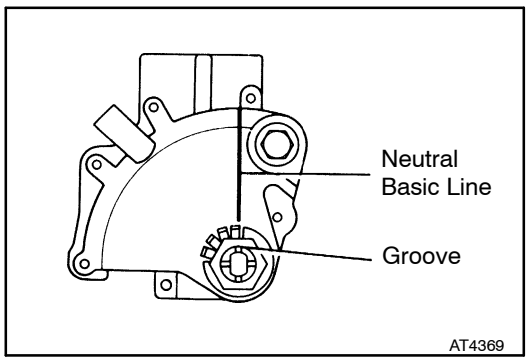
(a) Install the neutral start switch onto the manual valve lever shaft and temporarily tighten the adjusting bolt.

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

Torque: 70 kg–cm (61 in.–lb, 6.9 N–m)



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

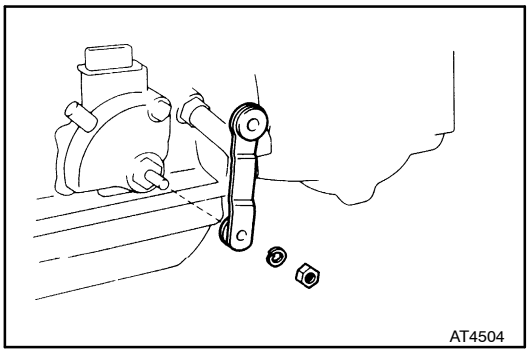


(d) Align the neutral basic line and the switch groove, and tighten the adjusting bolt.

Torque: 130 kg–cm (9 ft–lb, 13 N–m)

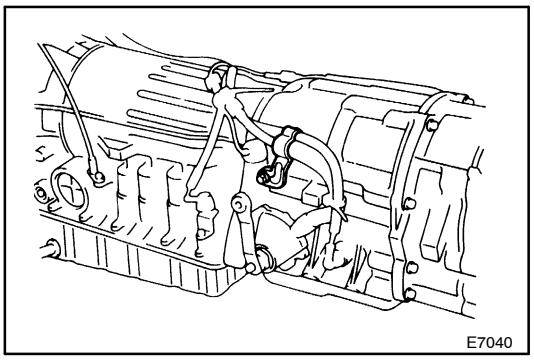
(e) Bend the tabs of the lock washer.

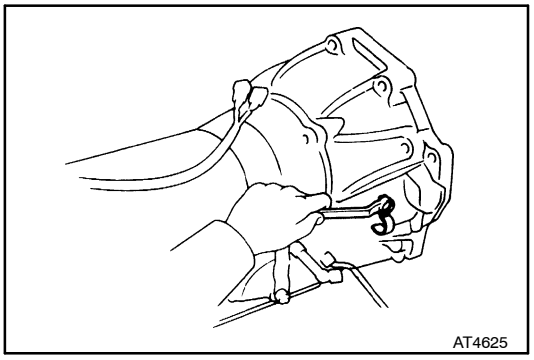
HINT: Bend at least two of the lock washer tabs.



71. INSTALL TRANSMISSION CONTROL SHAFT LEVER

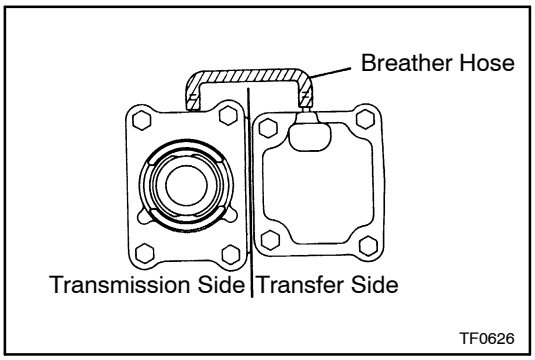
Torque: 160 kg–cm (12 ft–lb, 16 N–m)


E7040


AT4625

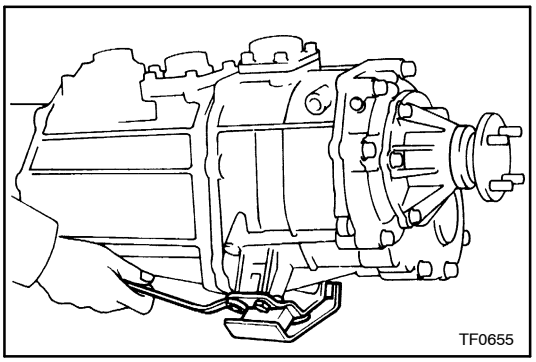
72. INSTALL WIRE HARNESS CLAMPS

REMOVAL OF TRANSFER

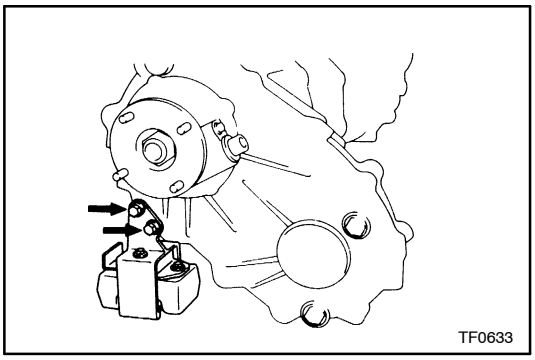


1. REMOVE BREATHER HOSE

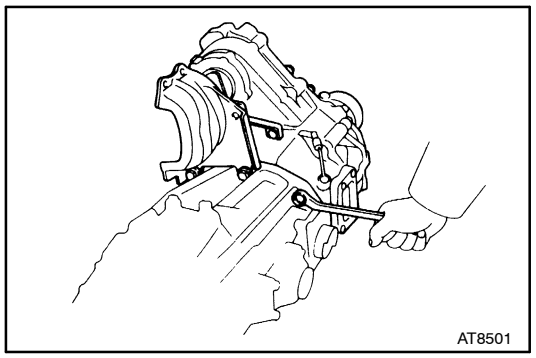
Disconnect the breather hose from transfer upper cover and transmission control retainer.



2. REMOVE ENGINE REAR MOUNTING



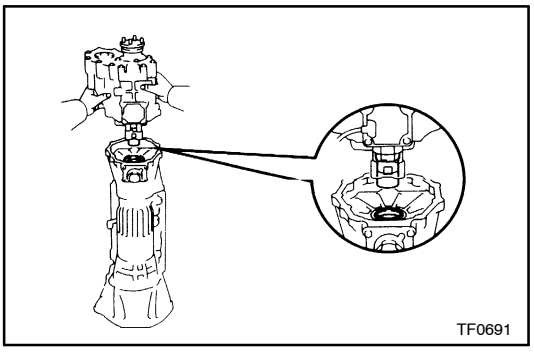
3. REMOVE DYNAMIC DAMPER



4. REMOVE PROPELLER SHAFT UPPER DUST COVER AND TRANSFER FROM TRANSMISSION

(a) Remove the dust cover bolt from the bracket.

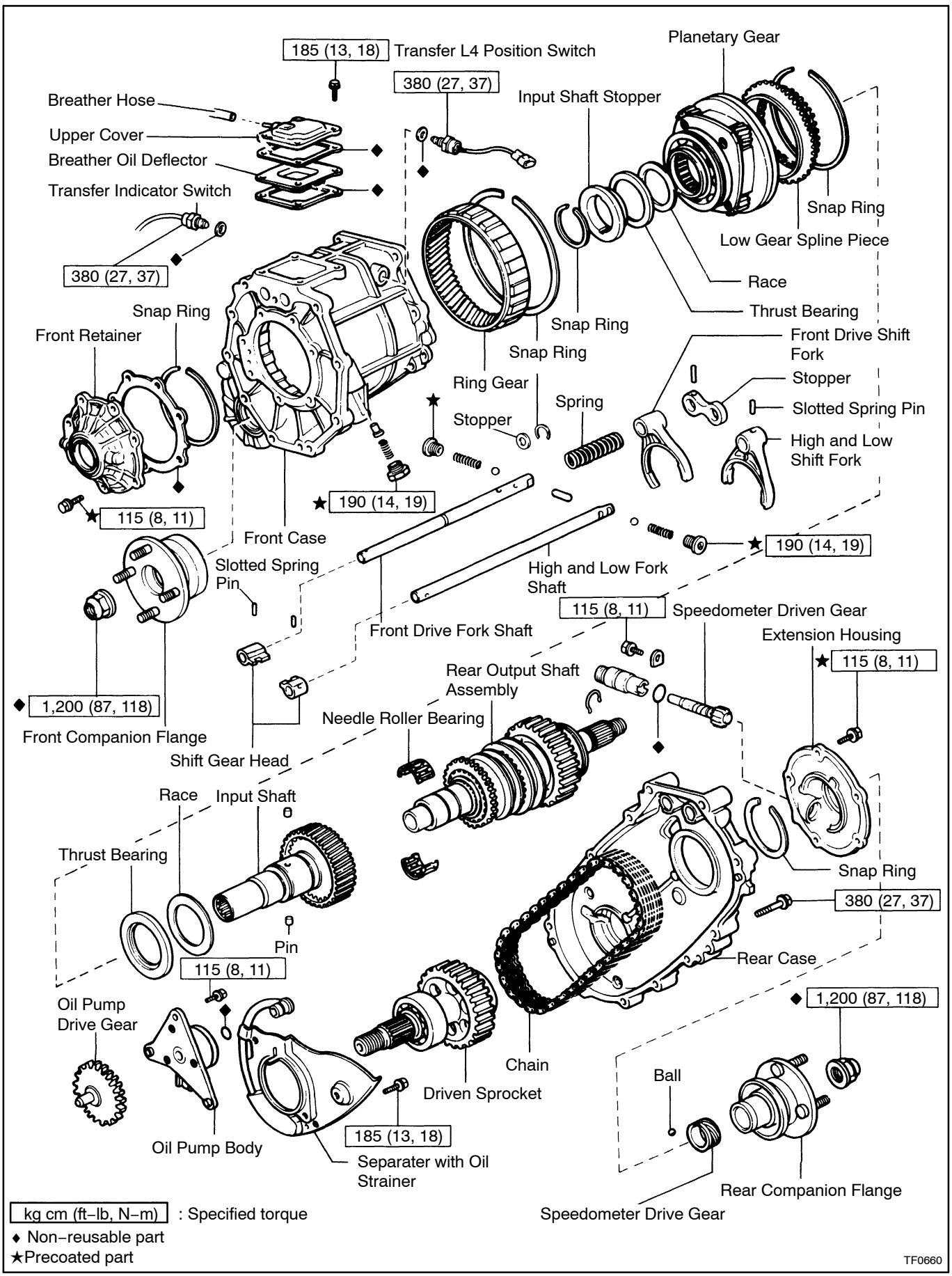
(b) Remove the transfer adaptor rear mounting bolts.



(c) Pull the transfer straight up and remove it from the transmission.

HINT: Take care not to damage the adaptor rear oil seal with the transfer input gear spline.

COMPONENTS



kg cm (ft–lb, N–m) : Specified torque
♦ Non–reusable part
★Precoated part

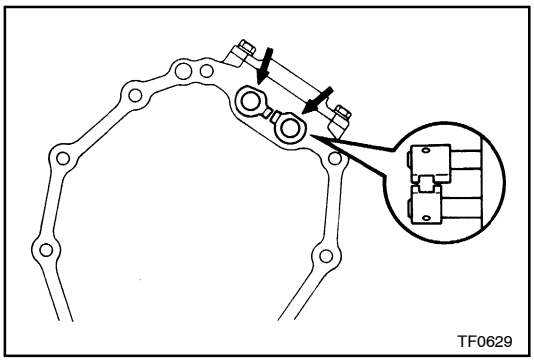
TF0660

DISASSEMBLY OF TRANSFER

1. REMOVE SPEEDOMETER DRIVEN GEAR

2. REMOVE TRANSFER INDICATOR SWITCH

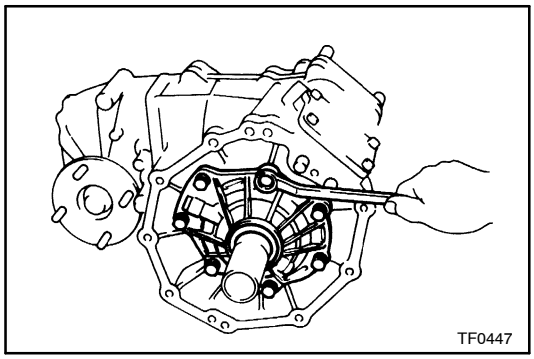
3. REMOVE TRANSFER L4 POSITION SWITCH



4. REMOVE SHIFT GEAR HEAD NO. 1 AND NO. 2

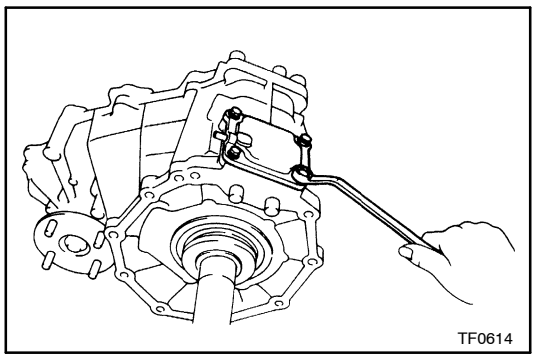
(a) Using a pin punch and hammer, drive out the two slotted spring pins.

(b) Remove two shift gear heads.



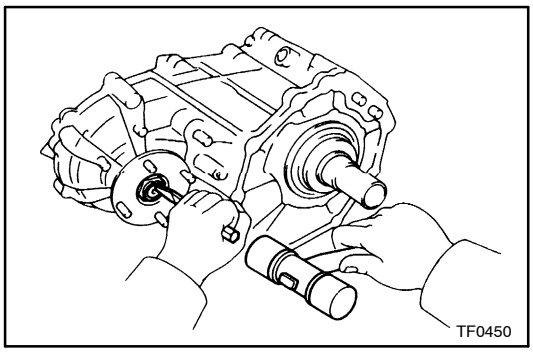
5. REMOVE FRONT RETAINER

Remove the seven bolts and the front retainer.



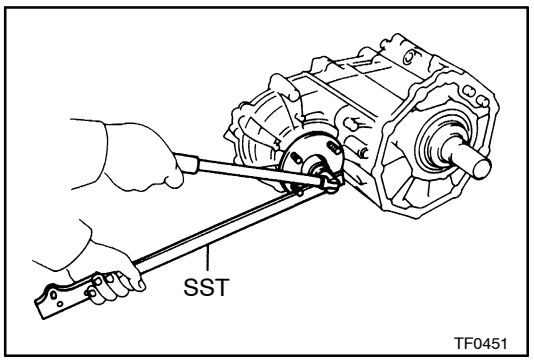
6. REMOVE UPPER COVER AND OIL DEFLECTOR

Remove the four bolts and the upper cover and oil deflector.



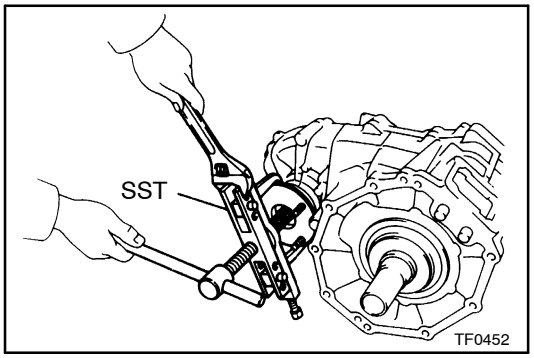
7. REMOVE FRONT COMPANION FLANGE

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



(b) Using SST to hold the flange, remove the companion flange lock nut.

SST 09330–00021

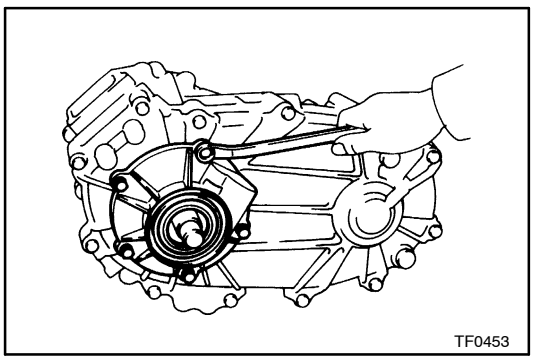


(c) Using SST, remove the companion flange.

SST 09950–20017

8. REMOVE REAR COMPANION FLANGE

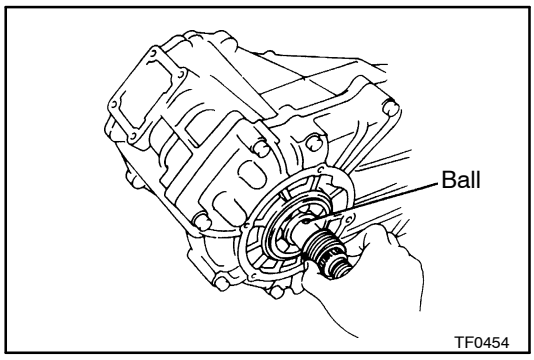
Remove the rear companion flange in the same way as the front companion flange.



9. REMOVE EXTENSION HOUSING

(a) Remove the five bolts.

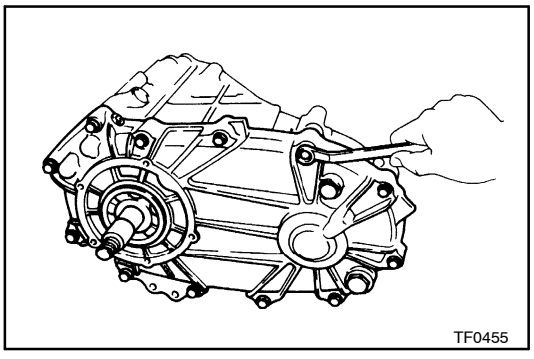
(b) Using a plastic hammer, tap the extension housing and remove it.



10. REMOVE SPEEDOMETER DRIVE GEAR

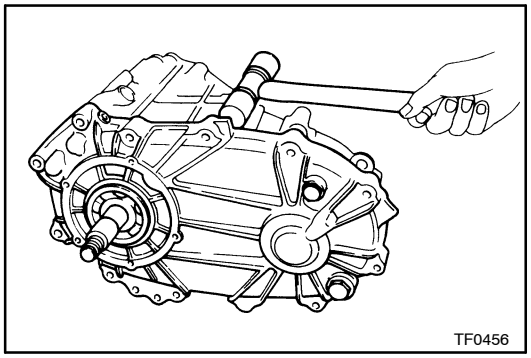
(a) Remove the speedometer drive gear.

(b) Using a magnetic finger, remove the ball from the rear output shaft.

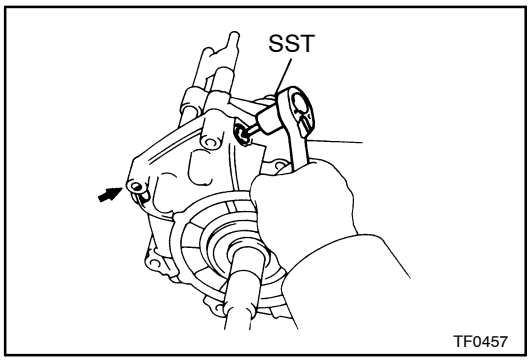


11. SEPARATE FRONT CASE AND REAR CASE

(a) Remove the twelve bolts.



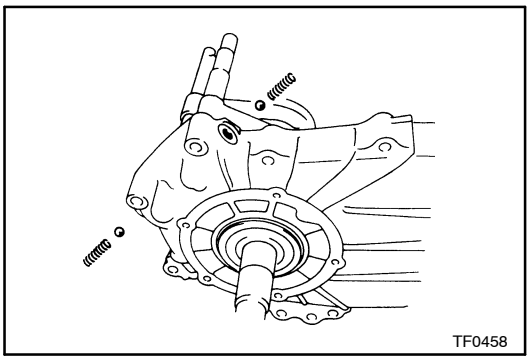
(b) Using a plastic hammer, tap the rear case and separate the front case and rear case.



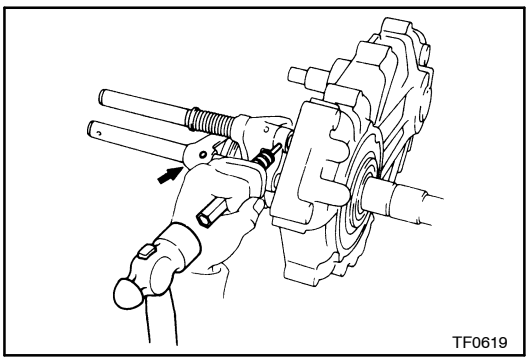
12. REMOVE STRAIGHT SCREW PLUGS, SPRING AND LOCKING BALLS

(a) Using SST, remove the two screws.

SST 09313–30021



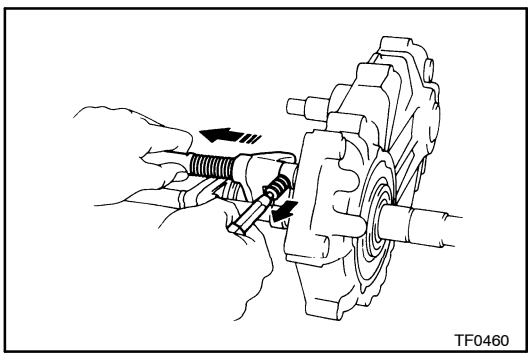
(b) Using a magnetic finger, remove the spring and ball from the both holes.



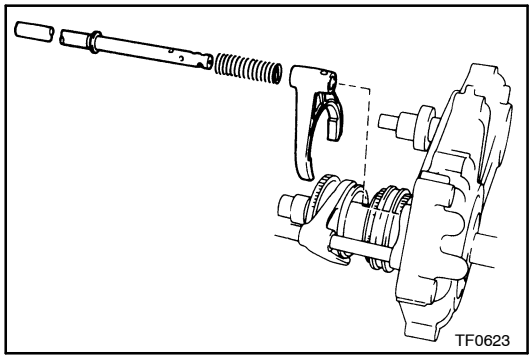
13. REMOVE FRONT DRIVE FORK SHAFT, FORK AND SPRING

(a) Using a pin punch and hammer, drive out the two slotted spring pins.

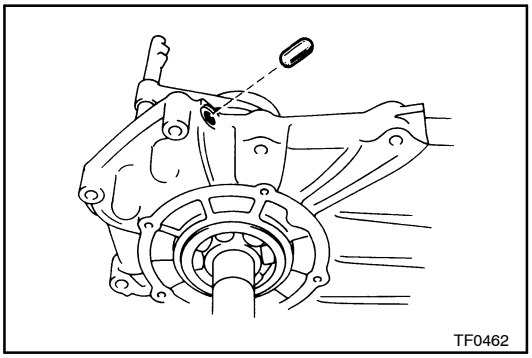
HINT: When the pin is removed from the front drive fork shaft, the shaft will spring loose if the pin punch is removed, so keep the pin punch inserted in the shaft hole.



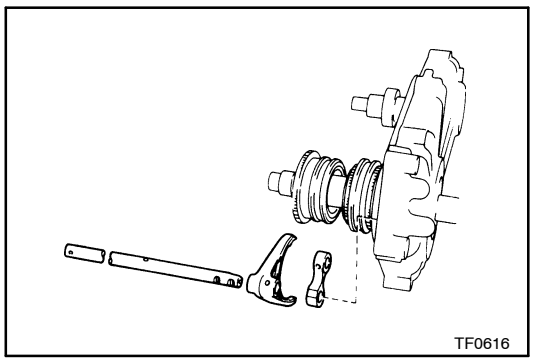
(b) Hold the front drive fork shaft in place by hand, when removing the pin punch.



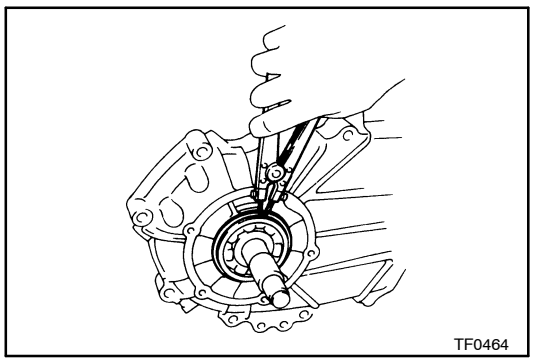
(c) Remove the front drive fork shaft, spring and fork.



(d) Using a magnetic finger, remove the straight pin.

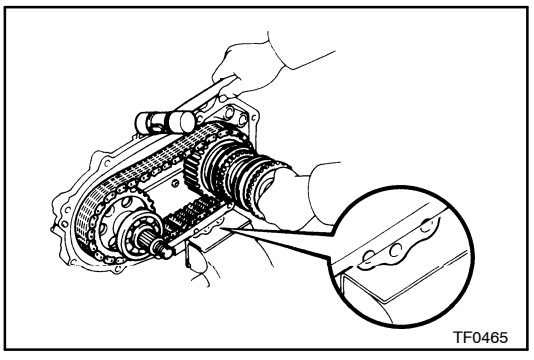


14. REMOVE HIGH AND LOW FORK SHAFT, FORK AND STOPPER



15. REMOVE REAR OUTPUT SHAFT, DRIVEN SPROCKET AND CHAIN

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

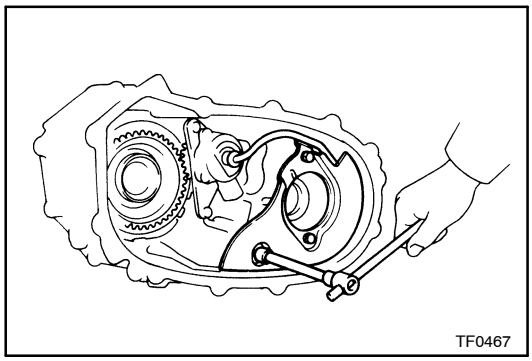


(b) Mount the rear case in the vise.

NOTICE: Be careful not to damage the sealing surface.

(c) Using a plastic hammer, tap the rear case with pulling the rear output shaft and driven sprocket.

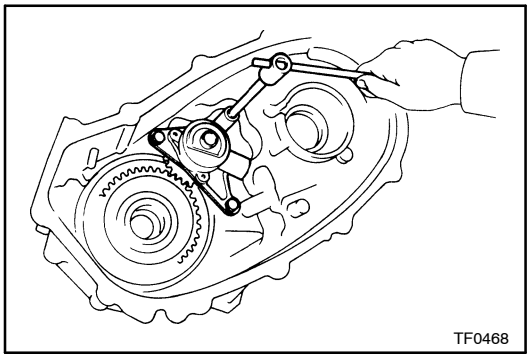
(d) Remove the chain.



16. REMOVE SEPARATER WITH OIL STRINER

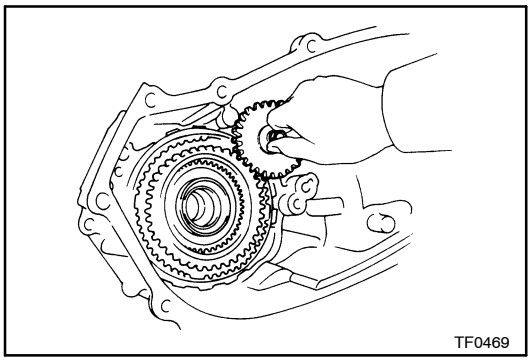
(a) Remove the three bolts and the separater with the oil strainer.

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

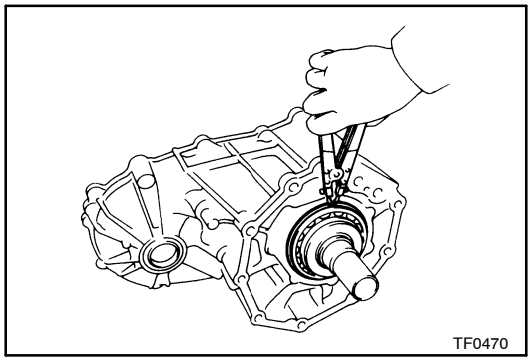


17. REMOVE OIL PUMP BODY ASSEMBLY

Remove the three bolts and the oil pump body assembly.

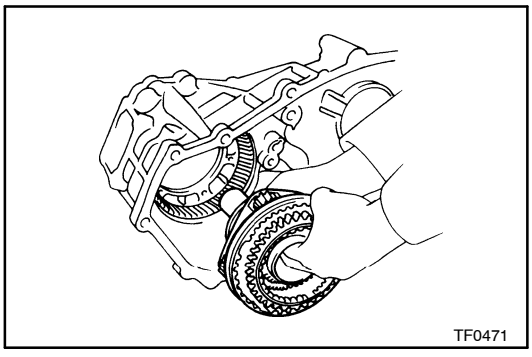


18. REMOVE OIL PUMP DRIVE GEAR

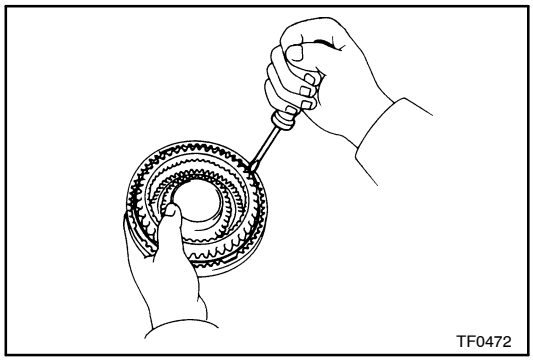


19. REMOVE PLANETARY GEAR ASSEMBLY WITH INPUT SHAFT

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

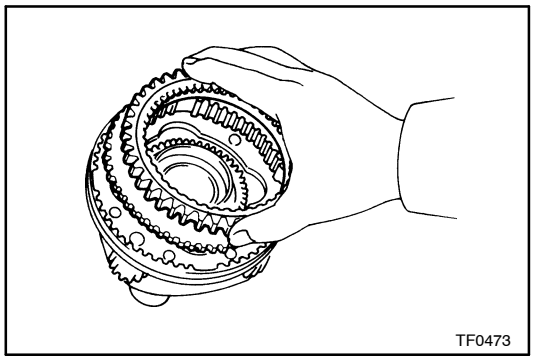


(b) Pull out the planetary gear assembly with the input shaft.

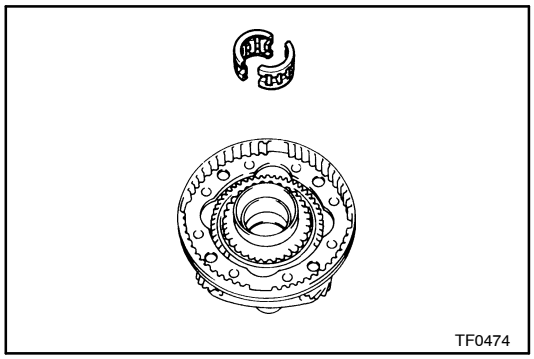


20. REMOVE LOW GEAR SPLINE PIECE

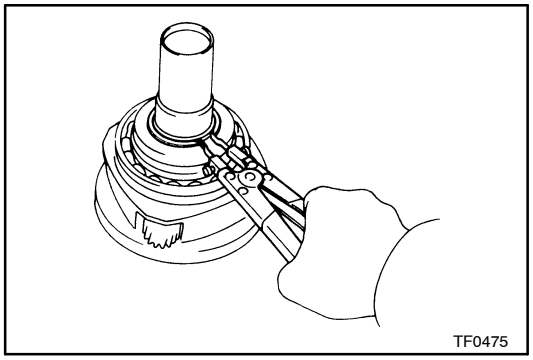
(a) Using a screwdriver, remove the snap ring.



(b) Remove the low gear spline piece.

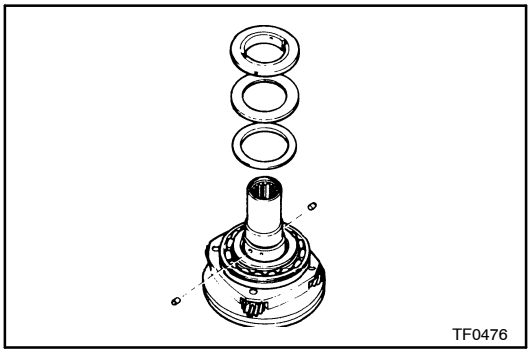


21. REMOVE NEEDLE ROLLER BEARING FROM INPUT SHAFT

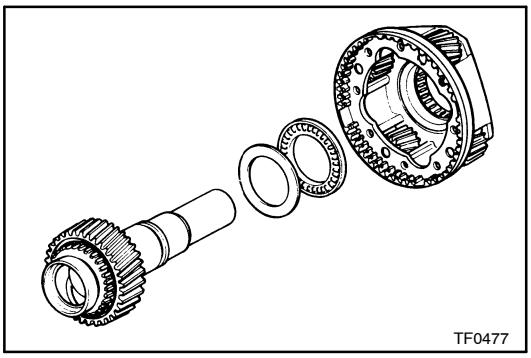


22. REMOVE INPUT SHAFT STOPPER AND THRUST BEARING

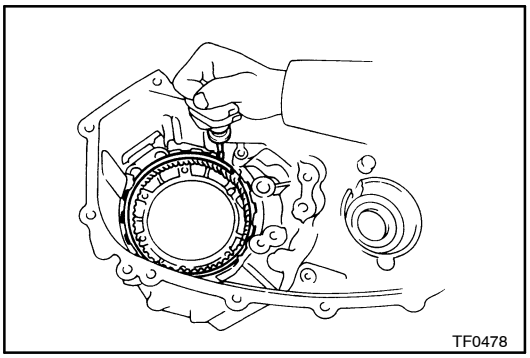
(a) Using snap ring pliers, remove the snap ring.



(b) Remove the input shaft stopper, thrust bearing, race and the two pins.

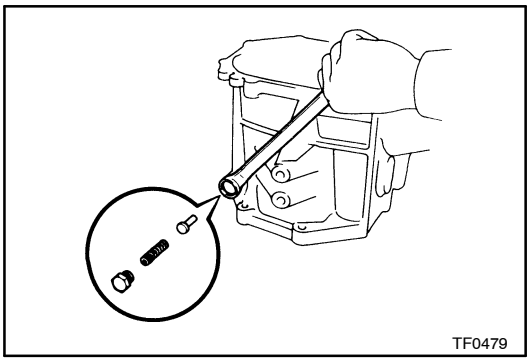


23. REMOVE INPUT SHAFT, THRUST BEARING AND RACE

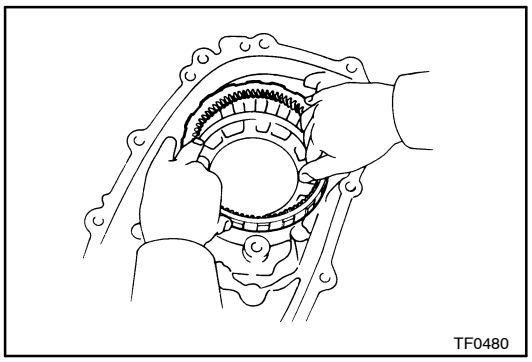


24. REMOVE PLANETARY RING GEAR

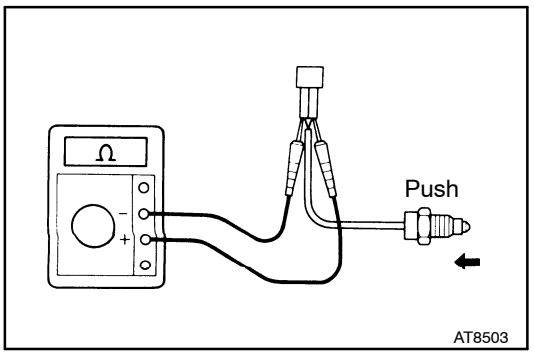
(a) Using a screwdriver, remove the snap ring.



(b) Remove the plug, spring and pin.



(c) Remove the planetary ring gear.

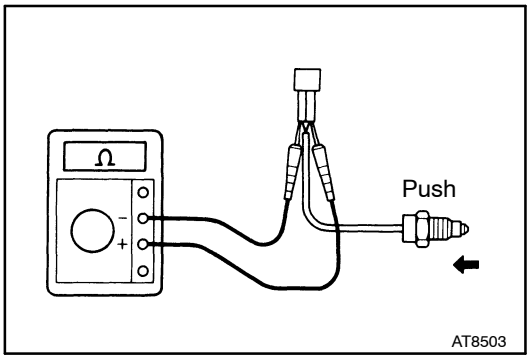


25. INSPECT TRANSFER INDICATOR SWITCH

Check that there is continuity between terminals as shown.

Switch position	Specified
Push	Continuity
Free	No continuity

If operation is not as specified, replace the switch.



26. INSPECT TRANSFER L4 POSITION SWITCH

Check that there is continuity between terminals as shown.

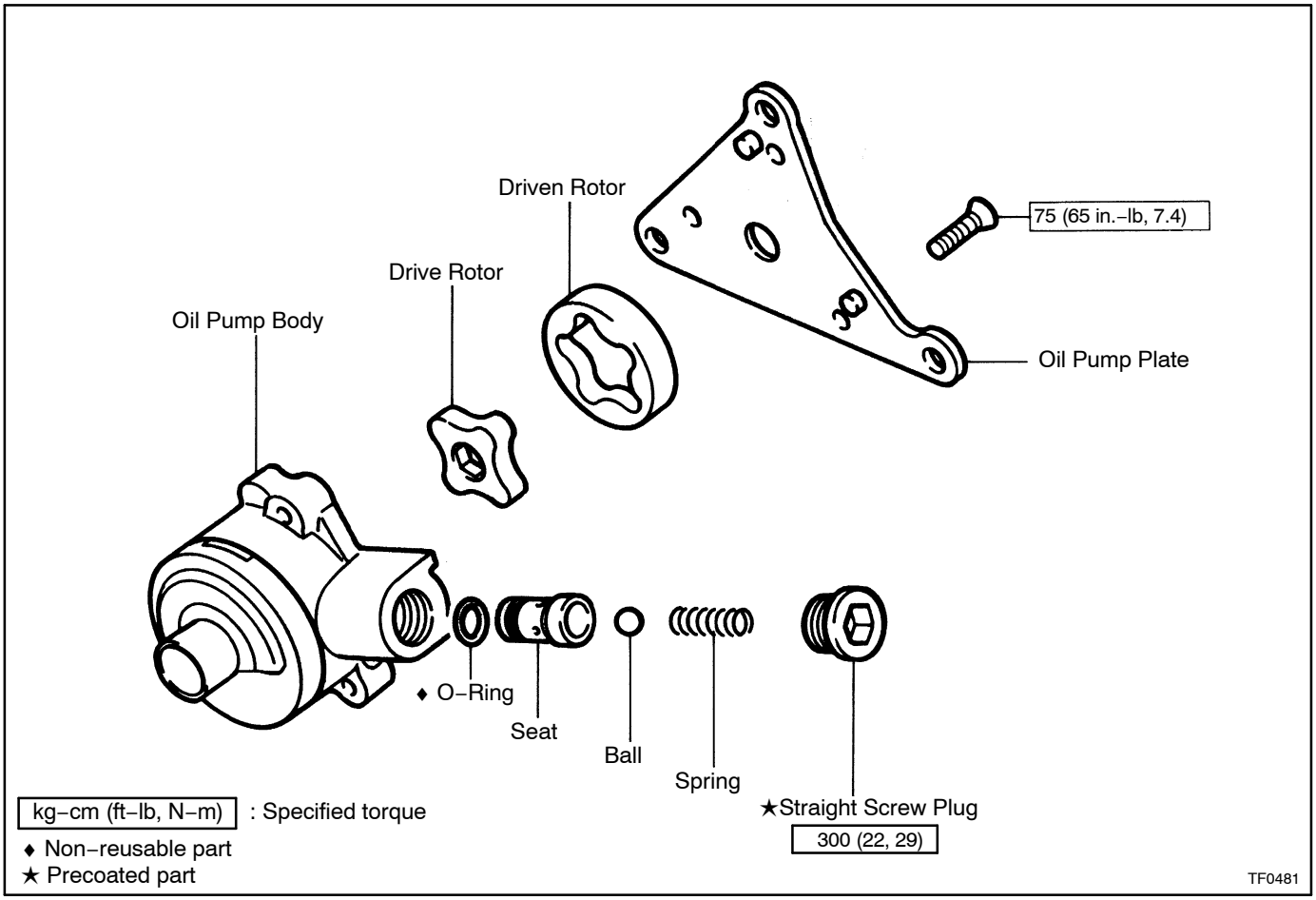
Switch position	Specified
Push	Continuity
Free	No continuity

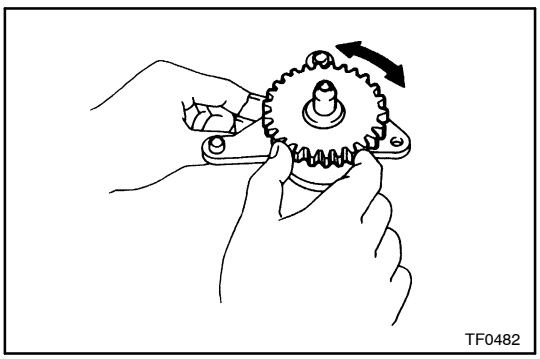
If operation is not as specified, replace the switch.

COMPONENT PARTS

Oil Pump Body

COMPONENTS

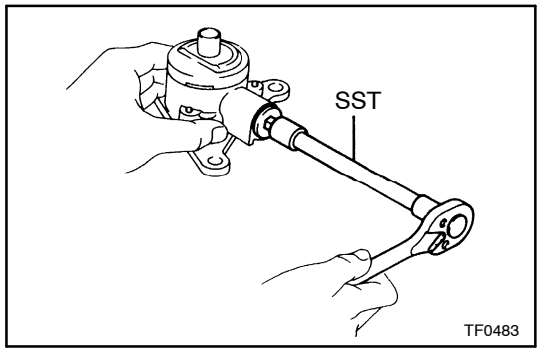




DISASSEMBLY OF OIL PUMP BODY

1. CHECK OPERATION OF OIL PUMP

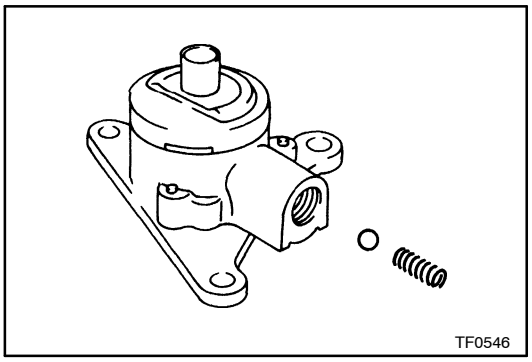
Install the oil pump drive gear to the drive rotor, check that the drive rotor turns smoothly.



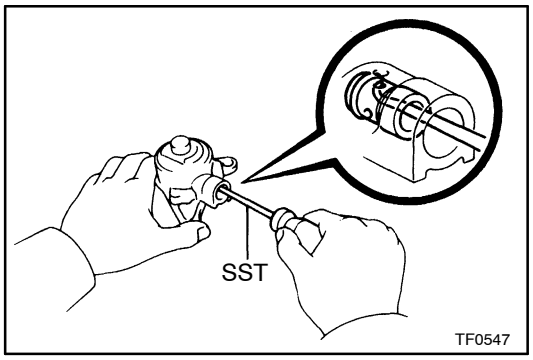
2. REMOVE STRAIGHT SCREW PLUG, SPRING, BALL AND SEAT

(a) Using SST, remove the straight screw plug.

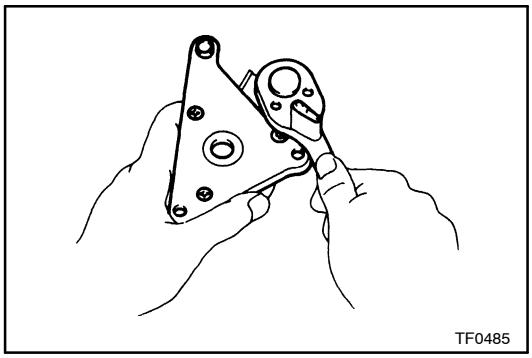
SST 09043–38100



(b) Using a magnetic finger, remove the spring and ball.



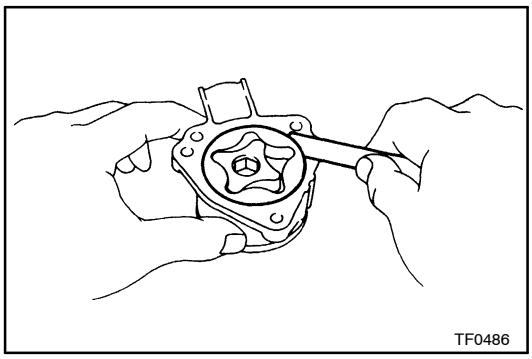
(c) Using SST, pull out the seat.
SST 09921–00010
(d) Remove the O–ring from the seat.



3. REMOVE OIL PUMP PLATE

(a) Using a torx socket wrench, unscrew the three torx screws.
(Torx socket wrench T30 09042 – 00010)
(b) Remove the oil pump plate.

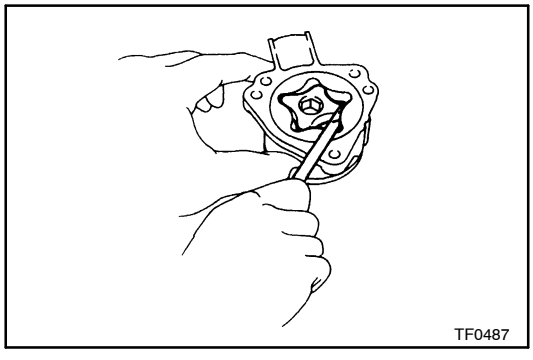
4. REMOVE DRIVE ROTOR AND DRIVEN ROTOR



INSPECTION OF OIL PUMP BODY

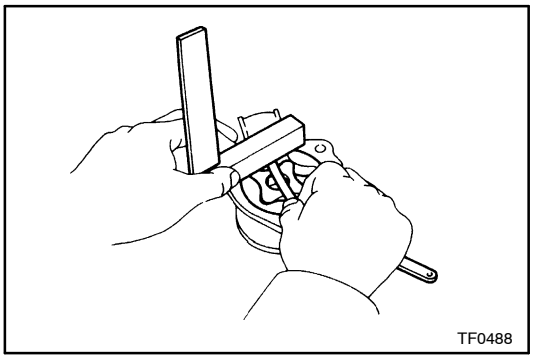
1. CHECK BODY CLEARANCE OF DRIVEN ROTOR

Push the driven rotor to one side of the body.
Using a feeler gauge, measure the clearance.
Standard clearance: 0.10 – 0.16 mm (0.0039 – 0.0063 in.)
Maximum clearance: 0.16 mm (0.0063 in.)
If the clearance exceeds the limit, replace the drive rotor, driven rotor or pump body.



2. CHECK TIP CLEARANCE OF BOTH ROTORS

Using a feeler gauge, measure the clearance between both rotor tips.
Standard clearance: 0.08 – 0.16 mm (0.0031 – 0.0063 in.)
Maximum clearance: 0.16 mm (0.0063 in.)
If the clearance exceeds the limit, replace the drive rotor, driven rotor or pump body.


TF0488

3. CHECK SIDE CLEARANCE OF BOTH ROTORS

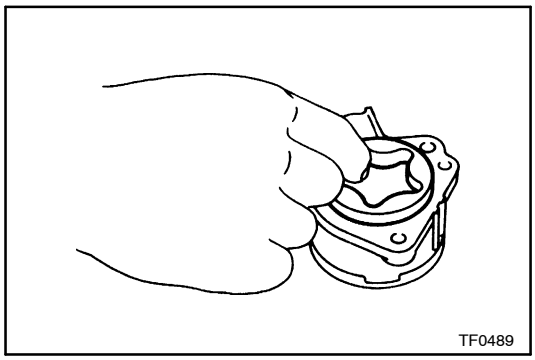
Using a steel straight edge and feeler gauge, measure the clearance between the rotors and straight edge.

Standard clearance: 0.03 – 0.08 mm (0.0012 – 0.0031 in.)

Maximum clearance: 0.08 mm (0.0031 in.)

If the clearance exceeds the limit, replace the drive rotor, driven rotor or pump body.

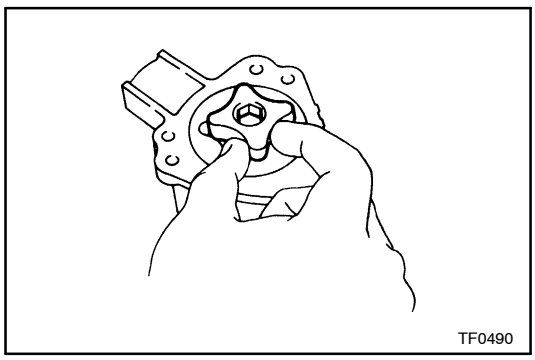
ASSEMBLY OF OIL PUMP BODY


TF0489

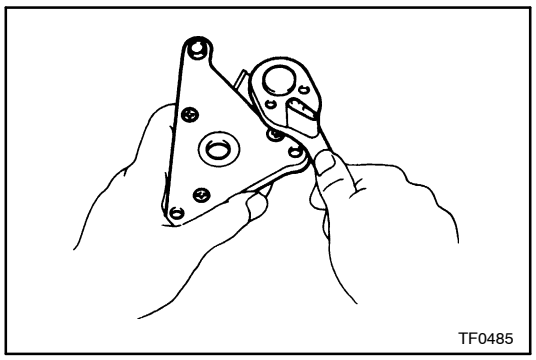
1. INSTALL OIL PUMP DRIVE ROTOR AND DRIVEN ROTOR

(a) Apply gear oil the both rotors.

(b) Install the driven rotor.


TF0490

(c) Install the drive rotor.

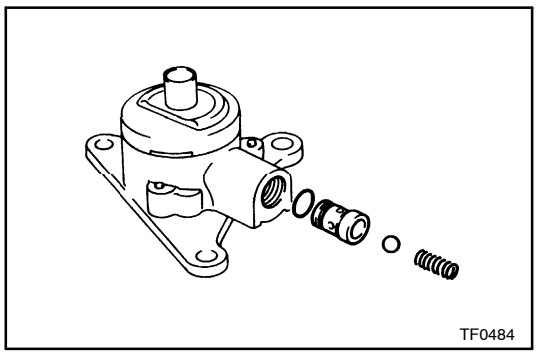

TF0485

2. INSTALL OIL PUMP PLATE

(a) Install the oil pump plate.

(b) Using a torx socket wrench, tighten the three torx screws.
(Torx socket wrench T30 09042 – 00010)

Torque: 75 kg–cm (65 in.–lb, 7.4 N–m)

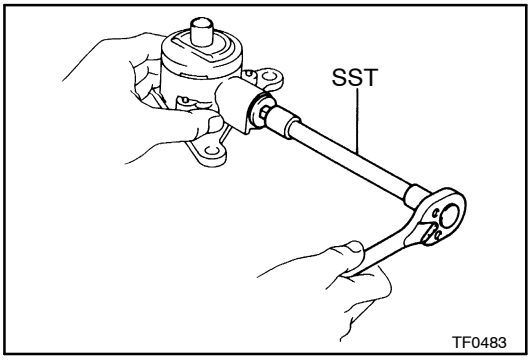

TF0484

3. INSTALL SEAT, BALL, SPRING AND STRAIGHT SCREW PLUG

(a) Install a new O–ring to the seat.

(b) Install the seat, ball and spring.

HINT: When installing the seat, push the seat until it touches the bottom of the hole in the body.



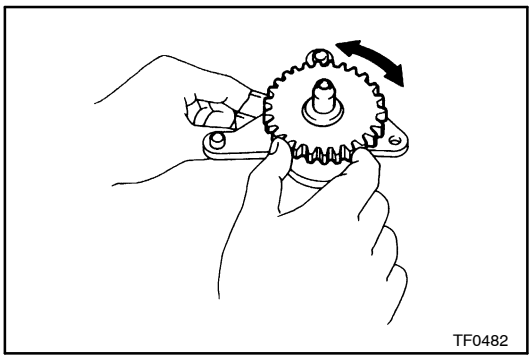
(c) Apply liquid sealer to the plug.

Sealant: Part No. 08833 – 00080, THREE BOND 1344, LOCTITE 242 or equivalent

(d) Using SST, torque the plug.

SST 09043–38100

Torque: 300 kg–cm (22 ft–lb, 29 N–m)

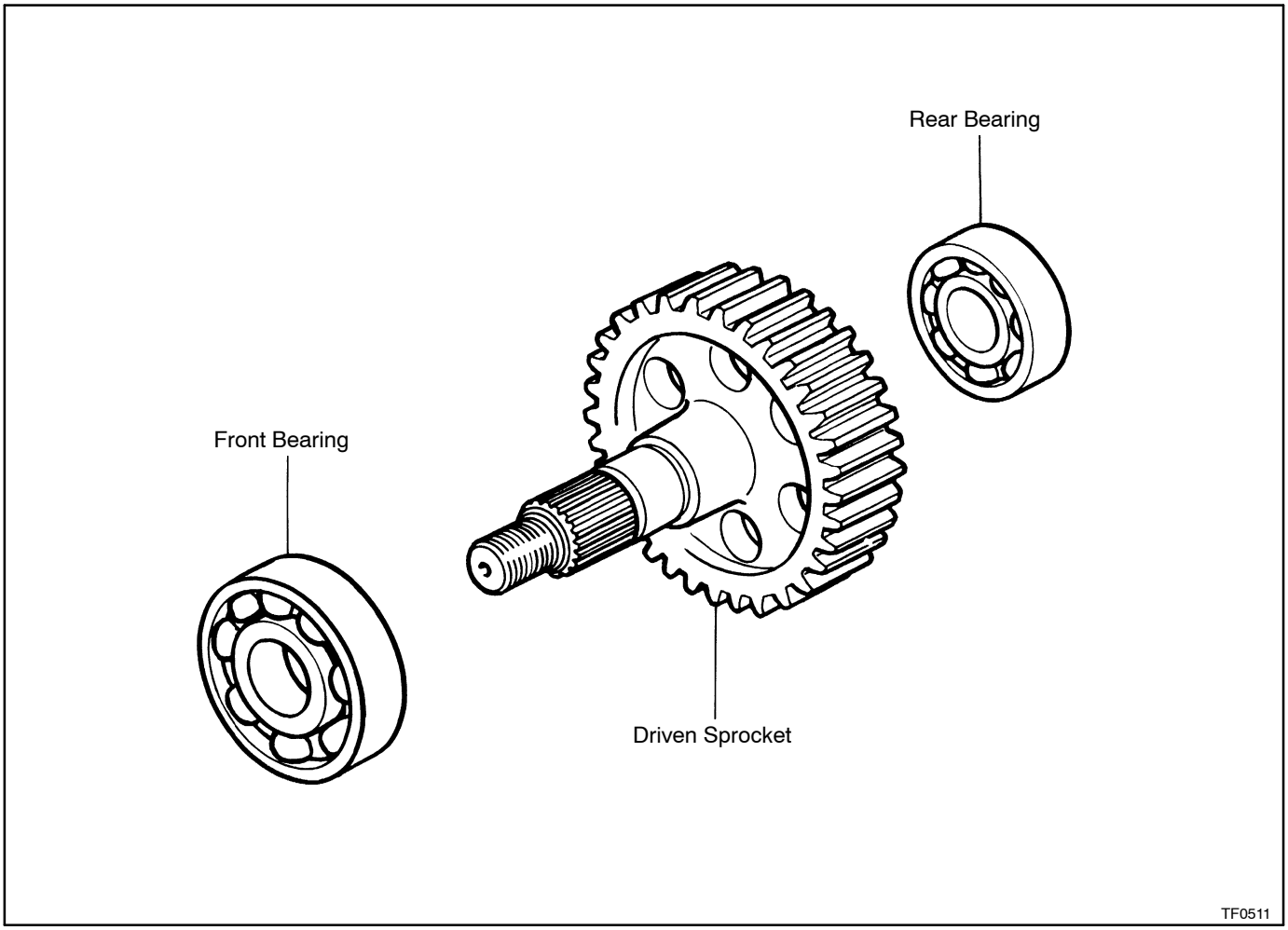


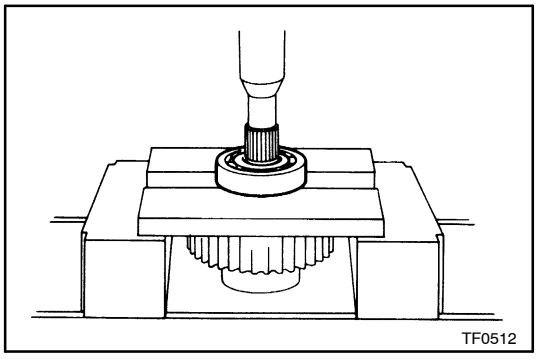
4. CHECK OPERATION OF OIL PUMP

Install the oil pump drive gear to the drive rotor, check that the drive rotor turns smoothly.

Driven Sprocket

COMPONENTS

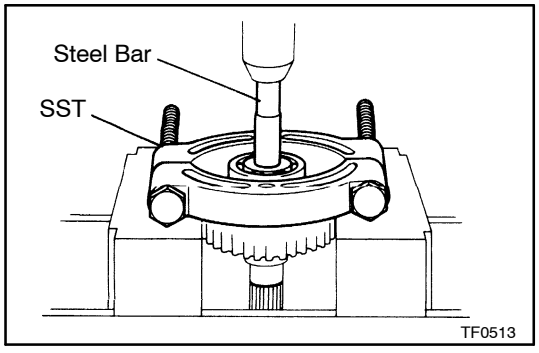




DISASSEMBLY OF DRIVEN SPROCKET

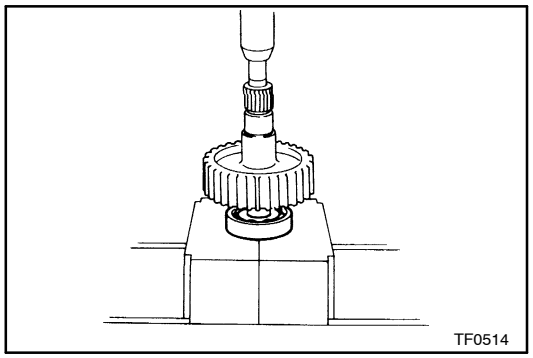
1. REMOVE FRONT BEARING

Using a press, remove the front bearing.



2. REMOVE REAR BEARING

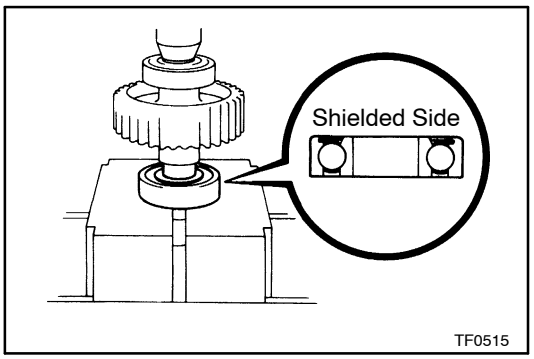
Using SST and a press, remove the rear bearing.
SST 09950–00020


TF0514

ASSEMBLY OF DRIVEN SPROCKET

1. INSTALL REAR BEARING

Using a press, install the rear bearing.



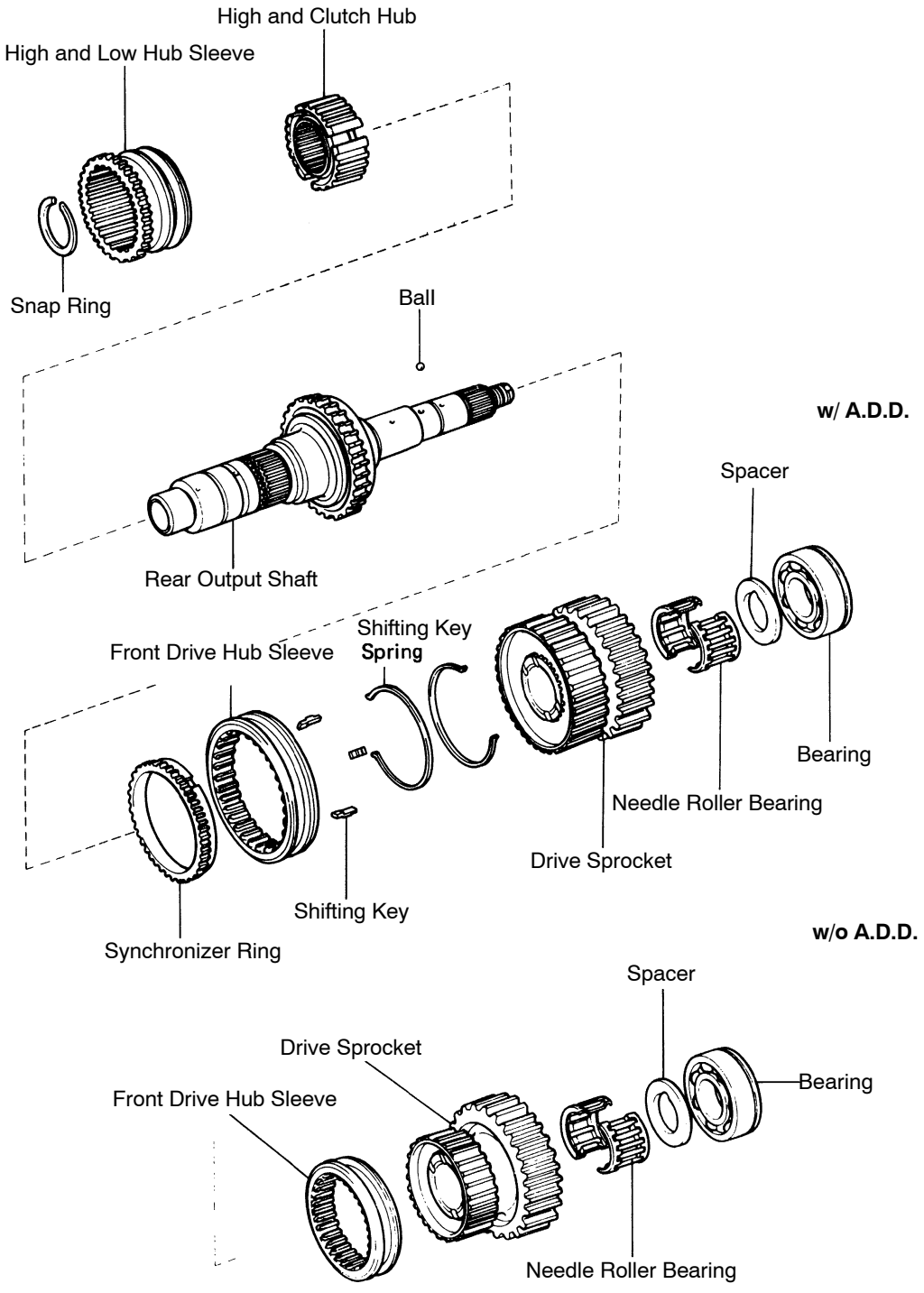
TF0515

2. INSTALL FRONT BEARING

Using a press, install the front bearing.
HINT: Make sure to install the bearing in the correct direction.

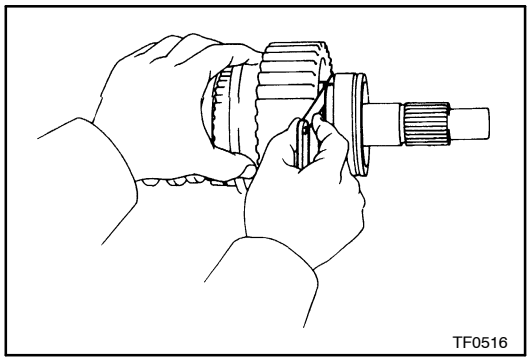
Rear Output Shaft Assembly

COMPONENTS



♦ Non–reusable part

TF0658
TF0632
TF0644


TF0516

DISASSEMBLY OF REAR OUTPUT SHAFT ASSEMBLY

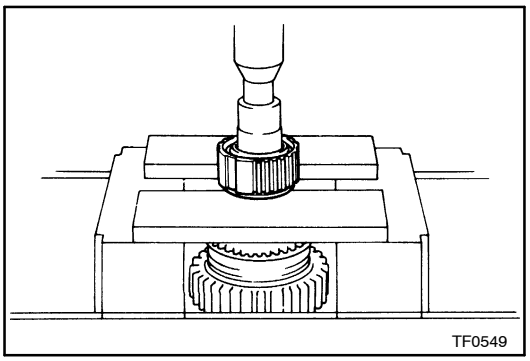
1. MEASURE DRIVE SPROCKET THRUST CLEARANCE

Using a feeler gauge, measure the drive sprocket thrust clearance.

Standard clearance: 0.10 – 0.25 mm (0.0039 – 0.0098 in.)

Maximum clearance: 0.25 mm (0.0098 in.)

If the clearance exceeds the limit, replace the drive sprocket.

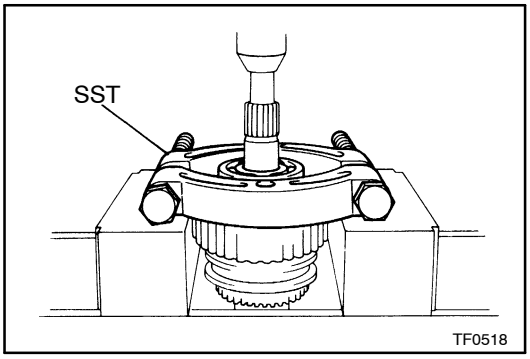

TF0549

2. REMOVE HIGH AND LOW HUB SLEEVE ASSEMBLY

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

(b) Remove the hub sleeve.

(c) Using a press, remove the clutch hub.

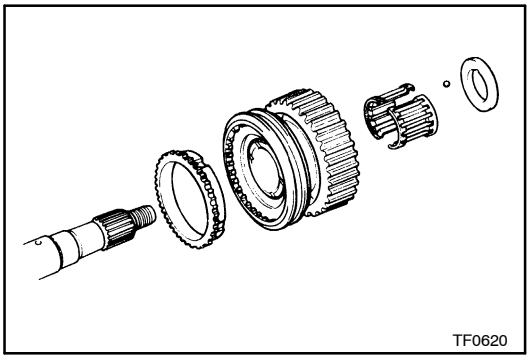


TF0518

3. (w/ A.D.D.)
REMOVE REAR BEARING, SPACER AND DRIVE SPROCKET WITH FRONT DRIVE HUB SLEEVE ASSEMBLY

(a) Using SST and a press, remove the bearing.

SST 09950–00020

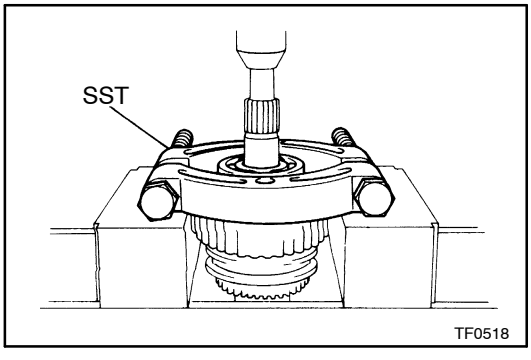

TF0620

(b) Remove the spacer and ball.

(c) Remove the drive sprocket with front drive hub and hub sleeve.

(d) Remove the needle roller bearing.

(e) Remove the synchronizer ring.

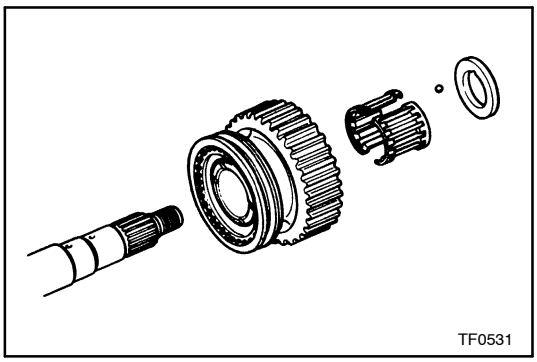


TF0518

(w/o A.D.D.)
REMOVE REAR BEARING, SPACER AND DRIVE SPROCKET WITH FRONT DRIVE HUB SLEEVE ASSEMBLY

(a) Using SST and a press, remove the bearing.

SST 09950–00020



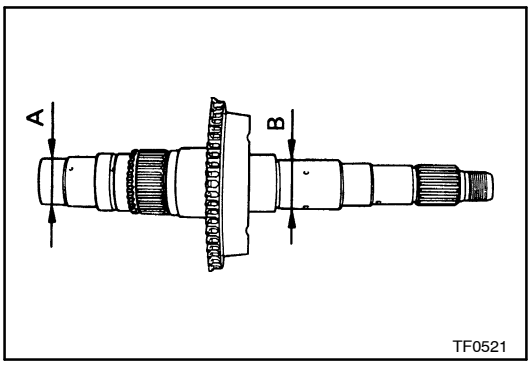
(b) Remove the spacer and ball.

(c) Remove the drive sprocket with front drive hub and hub sleeve.

(d) Remove the needle roller bearing.

4. (w/ A.D.D.)
REMOVE SHIFTING KEYS AND KEY SPRINGS FROM FRONT DRIVE HUB ASSEMBLY

Using screwdriver, remove the two shifting key springs and three shifting keys.



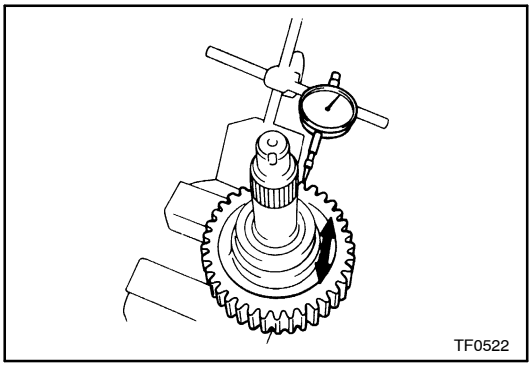
INSPECTION OF REAR OUTPUT SHAFT ASSEMBLY

1. INSPECT REAR OUTPUT SHAFT

Using a micrometer, measure the outer diameter of the rear output shaft journal surface.

Minimum diameter:

Part A 27.98 mm (1.1016 in.)
B 36.98 mm (1.4559 in.)

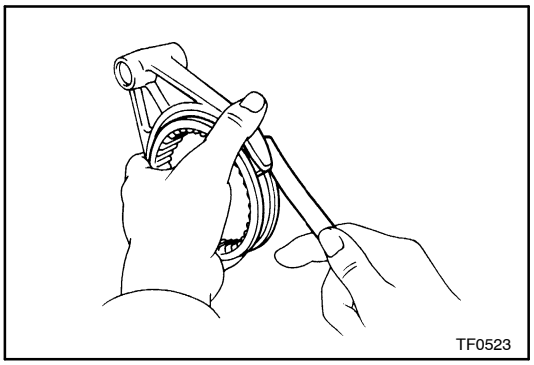


2. CHECK OIL CLEARANCE OF DRIVE SPROCKET

Using a dial indicator, measure the oil clearance between the sprocket and shaft with the needle roller bearing installed.

Standard clearance: 0.010 – 0.055 mm (0.0004 – 0.0022 in.)
Maximum clearance: 0.055 mm (0.0022 in.)

If the clearance exceeds the limit, replace the drive sprocket, rear output shaft or needle roller bearing.

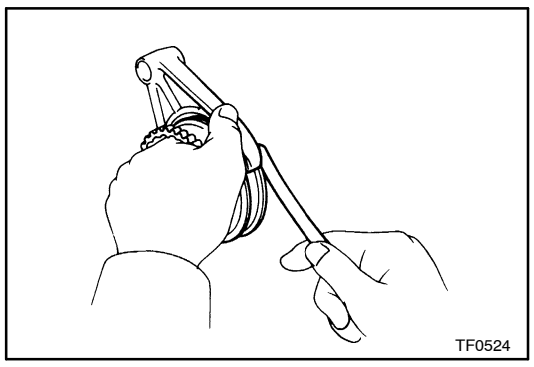


3. MEASURE CLEARANCE OF FRONT DRIVE SHAFT FORK AND HUB SLEEVE

Using a feeler gauge, measure the clearance between the front drive shaft fork and hub sleeve.

Maximum clearance: 1.0 mm (0.039 in.)

If the clearance exceeds the limit, replace the shift fork or hub sleeve.



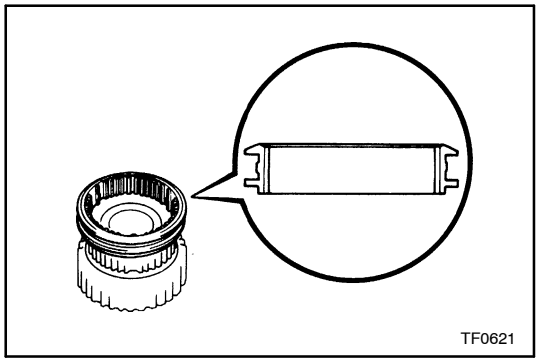
4. MEASURE CLEARANCE OF HIGH AND LOW SHIFT FORK AND HUB SLEEVE

Using a feeler gauge, measure the clearance between the high and low shift fork and hub sleeve.

Maximum clearance: 1.0 mm (0.039 in.)

If the clearance exceeds the limit, replace the shift fork or hub sleeve.

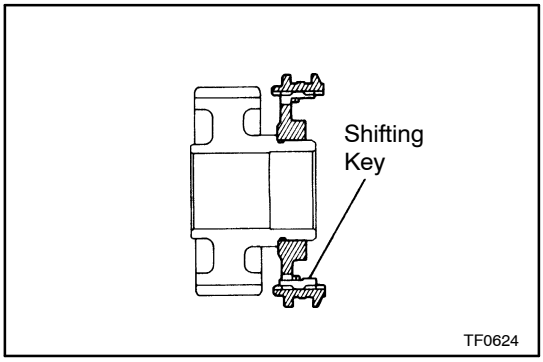
ASSEMBLY OF REAR OUTPUT SHAFT ASSEMBLY


TF0621

1. (w/ A.D.D.)
INSTALL FRONT DRIVE CLUTCH HUB AND HUB SLEEVE

(a) Install the front drive hub sleeve onto the clutch hub.

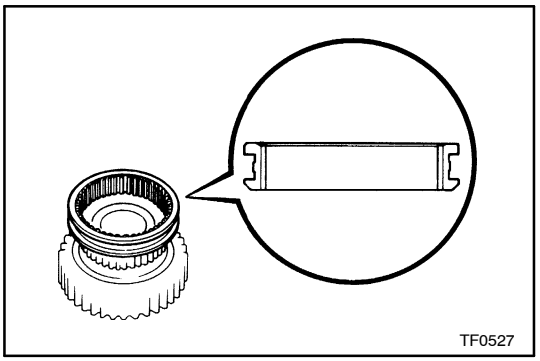
HINT: Make sure to install the hub sleeve in the correct direction.



TF0624

(b) Install the shifting keys and springs.

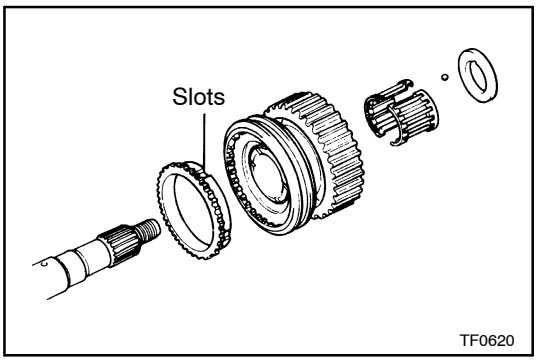
NOTICE: Install the key spring positioned so that their end gaps are not in line.


TF0527

(w/o A.D.D.)
INSTALL FRONT DRIVE CLUTCH HUB AND HUB SLEEVE

Install the front drive hub sleeve onto the clutch hub.

HINT: Make sure to install the hub sleeve in the correct direction.



TF0620

2. (w/ A.D.D.)
INSTALL DRIVE SPROCKET WITH FRONT DRIVE HUB SLEEVE ASSEMBLY, SPACER AND REAR BEARING

(a) Apply gear oil to the shaft and needle roller bearing.

(b) Install the synchronizer ring.

(c) Install the needle roller bearing in the drive sprocket.

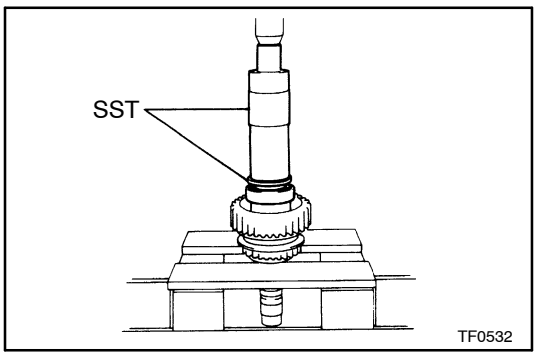
(d) Install the drive sprocket with the front drive hub sleeve.

(e) Place the synchronizer ring on the gear and align the ring slots with the shifting keys.

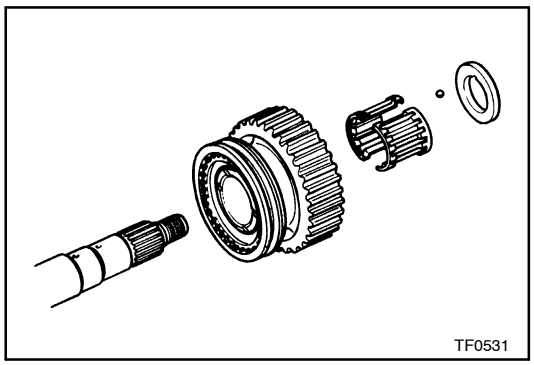
(f) Install the spacer to align it with the ball.

(g) Using SST and a press, install the rear bearing with the outer race snap ring groove toward the rear.

SST 09316–60010 (09316–00010, 09316–00070)



TF0532


TF0531

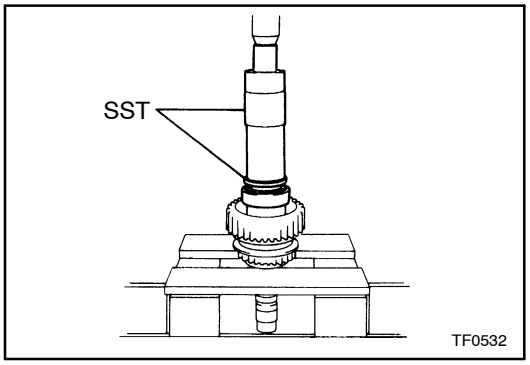
(w/o A.D.D.)
INSTALL DRIVE SPROCKET WITH FRONT DRIVE HUB SLEEVE ASSEMBLY, SPACER AND REAR BEARING

(a) Apply gear oil to the shaft and needle roller bearing.

(b) Install the needle roller bearing in the drive sprocket.

(c) Install the drive sprocket with the front drive hub sleeve.

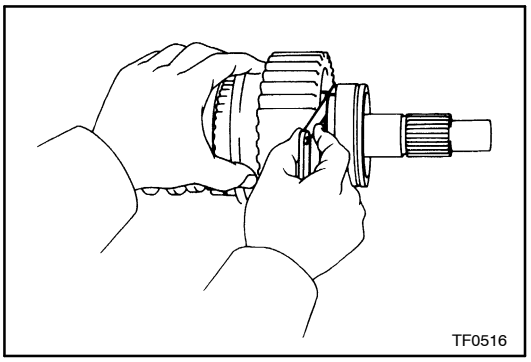
(d) Install the spacer to align it with the ball.



TF0532

(e) Using SST and a press, install the rear bearing with the outer race snap ring groove toward the rear.

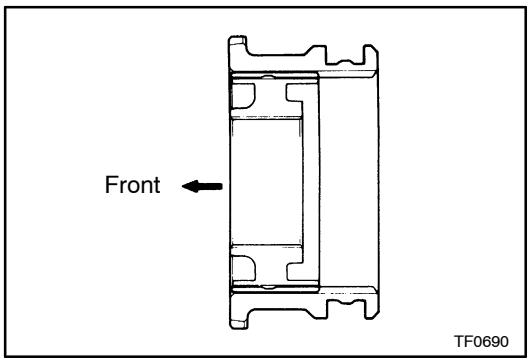
SST 09316–60010 (09316–00010, 09316–00070)


TF0516

3. MEASURE DRIVE SPROCKET THRUST CLEARANCE

Using a feeler gauge, measure the drive sprocket thrust clearance.

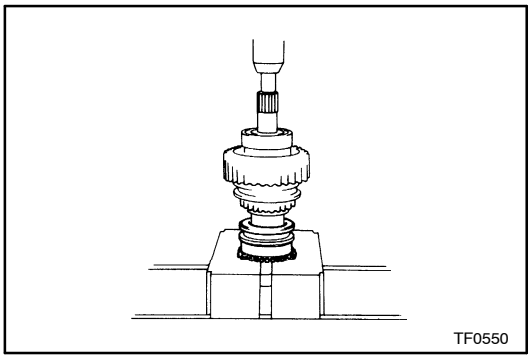
Standard clearance: 0.10 – 0.25 mm (0.0039 – 0.0098 in.)



TF0690

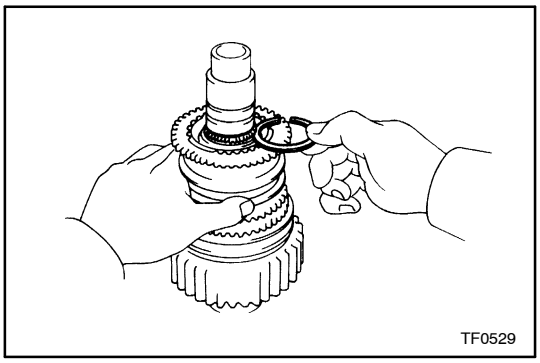
4. INSPECT HIGH AND LOW CLUTCH HUB INTO HUB SLEEVE

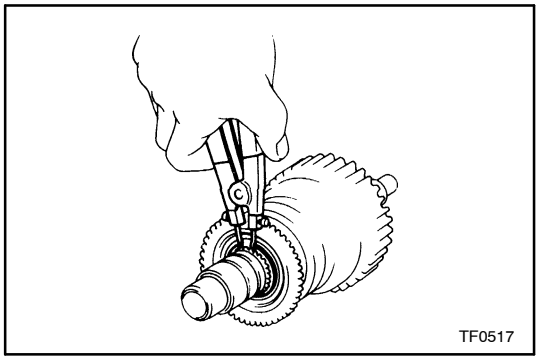
Install the clutch hub to the hub sleeve.


TF0550

5. INSTALL HIGH AND LOW HUB SLEEVE ASSEMBLY

Using a press, install the high and low hub sleeve assembly.


TF0529


TF0517

6. INSTALL SNAP RING

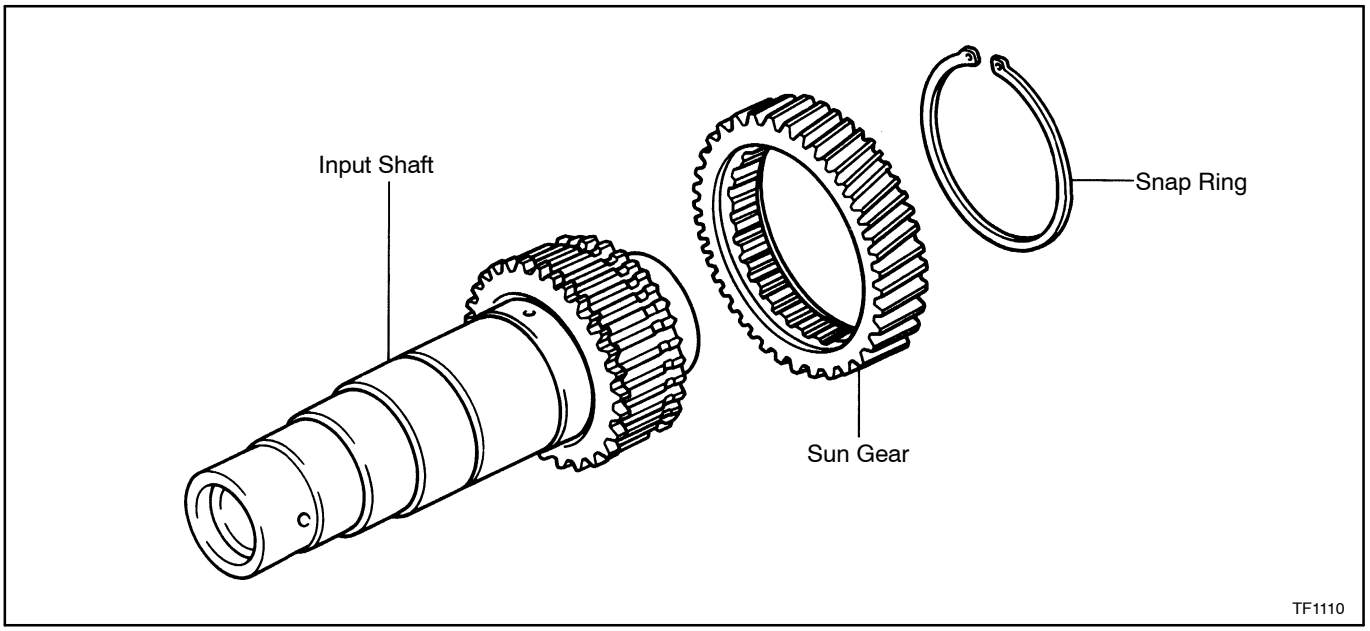
(a) Select a snap ring that will allow minimum axial play.

Mark	Thickness mm (in.)
A	2.10 – 2.15 (0.0827 – 0.0846)
B	2.15 – 2.20 (0.0846 – 0.0866)
C	2.20 – 2.25 (0.0866 – 0.0886)
D	2.25 – 2.30 (0.0886 – 0.0906)
E	2.30 – 2.35 (0.0906 – 0.0925)
F	2.35 – 2.40 (0.0925 – 0.0945)
G	2.40 – 2.45 (0.0945 – 0.0965)
H	2.45 – 2.50 (0.0965 – 0.0984)
J	2.50 – 2.55 (0.0984 – 0.1004)
K	2.00 – 2.05 (0.0787 – 0.0807)
L	2.05 – 2.10 (0.0807 – 0.0827)

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

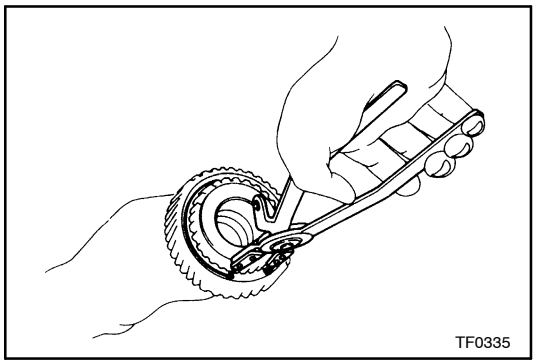
Input Shaft

COMPONENTS

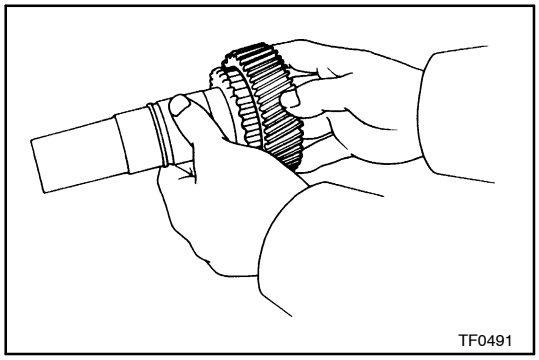


DISASSEMBLY OF INPUT SHAFT

REMOVE SUN GEAR



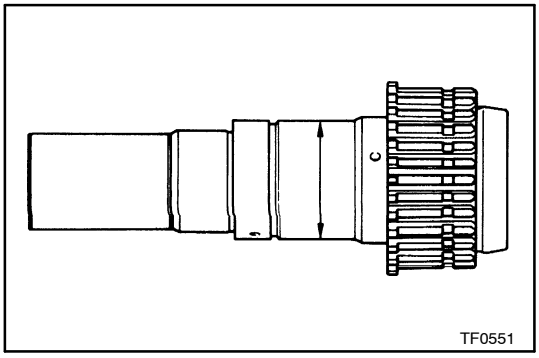
(a) Using snap ring pliers, remove the snap ring.



(b) Remove the sun gear from the input shaft.

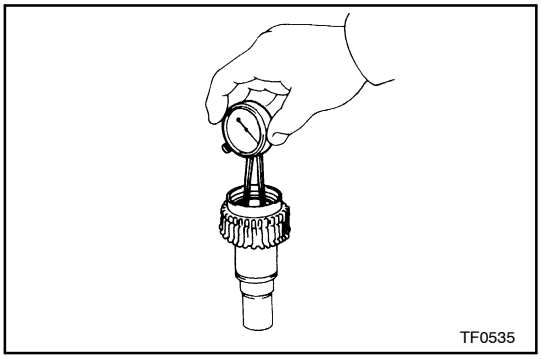
INSPECTION OF INPUT SHAFT

1. INSPECT INPUT SHAFT



(a) Using a micrometer, measure the outer diameter of the input shaft journal surface.

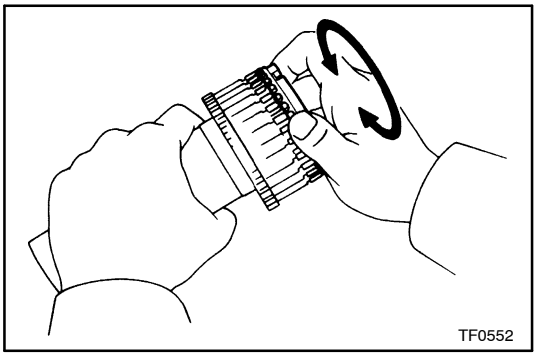
Minimum diameter: 47.59 mm (1.8736 in.)



(b) Using a dial indicator, measure the inside diameter of the input shaft bushing.

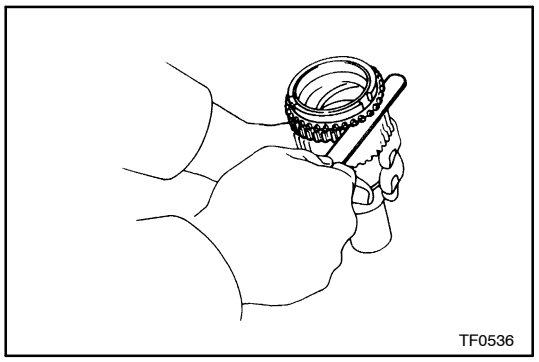
Maximum inside diameter: 39.14 mm (1.5409 in.)

If the inside diameter exceeds the limit, replace the input shaft.



2. INSPECT SYNCHRONIZER RING

(a) Turn the ring and push it in to check the braking action.



(b) Measure the clearance between the synchronizer ring back and the input shaft spline end.

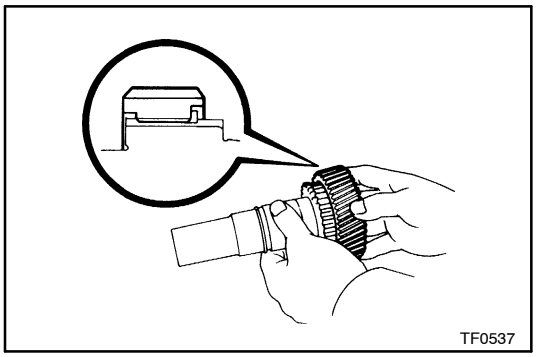
Standard clearance: 1.15 – 1.85 mm (0.0453 – 0.0728 in.)

Minimum clearance: 0.8 mm (0.031 in.)

If the clearance is less than the limit, replace the synchronizer ring.

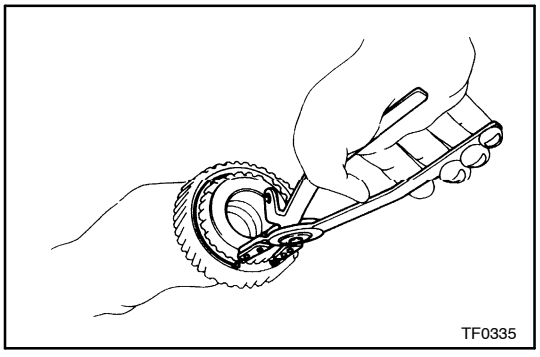
ASSEMBLY OF INPUT SHAFT

INSTALL SUN GEAR



(a) Install the sun gear to the input shaft.

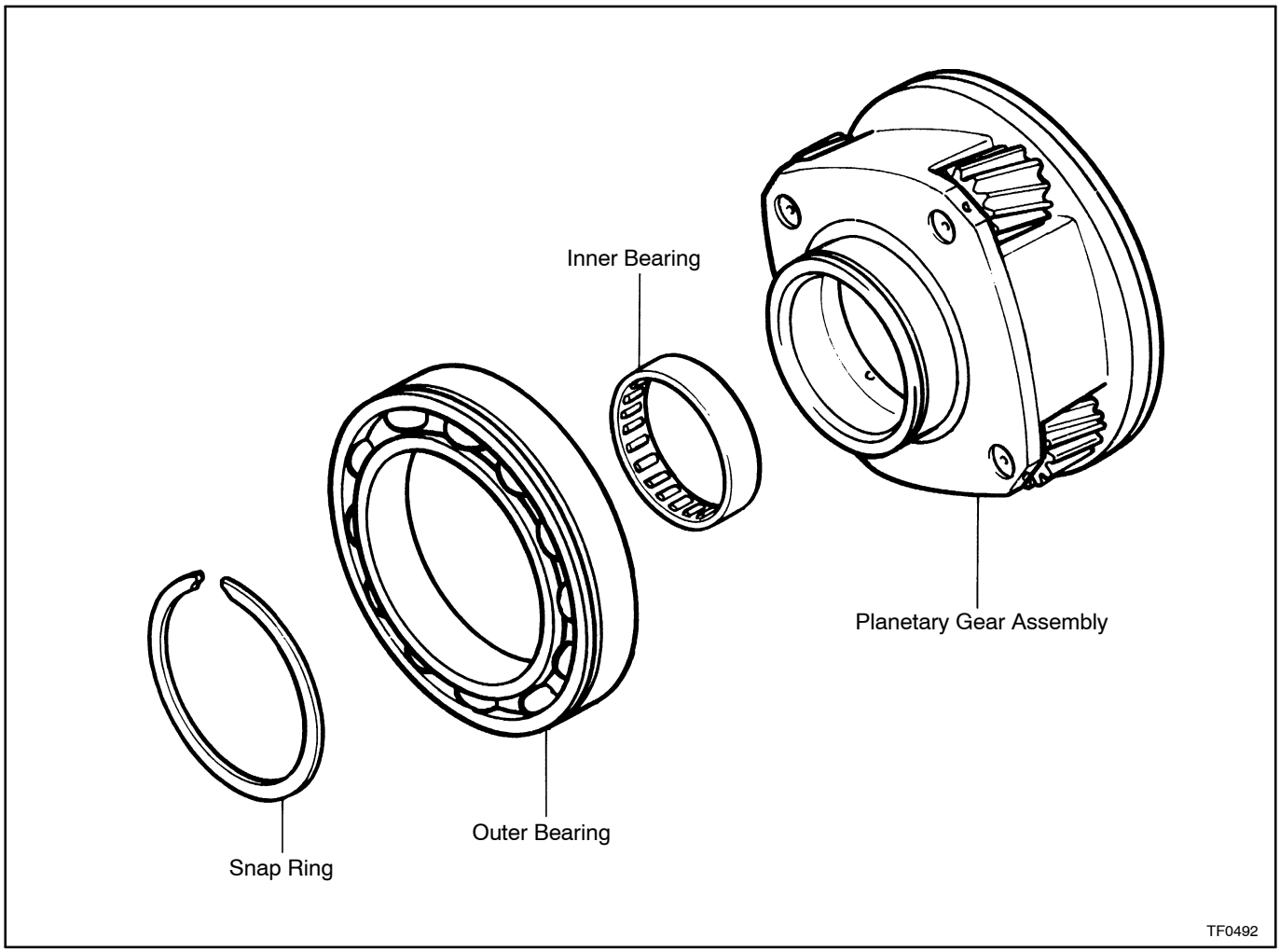
HINT: Make sure to install the sun gear in the correct direction.

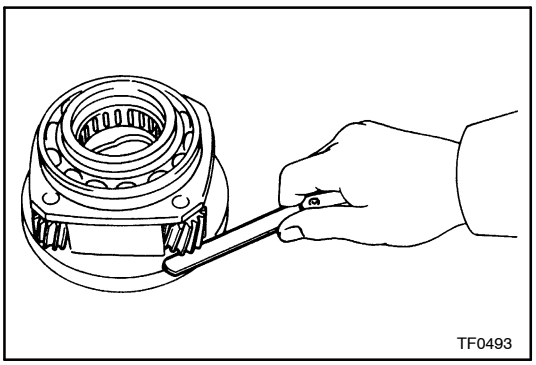


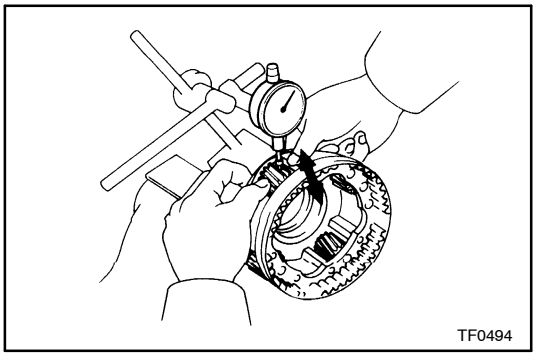
(b) Using snap ring pliers, install the snap ring.

Planetary Gear

COMPONENTS







INSPECTION OF PLANETARY GEAR

1. MEASURE PLANETARY PINION GEAR THRUST CLEARANCE

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

Standard clearance: 0.11 – 0.86 mm (0.0043 – 0.0339 in.)

Maximum clearance: 0.86 mm (0.0339 in.)

If the clearance exceeds the limit, replace the planetary gear assembly.

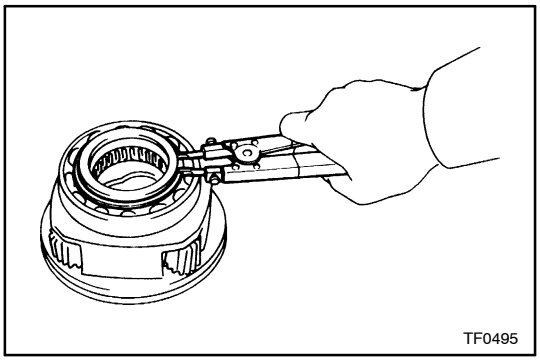
2. CHECK OIL CLEARANCE OF PLANETARY PINION GEAR

Using a dial indicator, measure the oil clearance of the planetary pinion gear.

Standard clearance: 0.009 – 0.038 mm (0.0004 – 0.0015 in.)

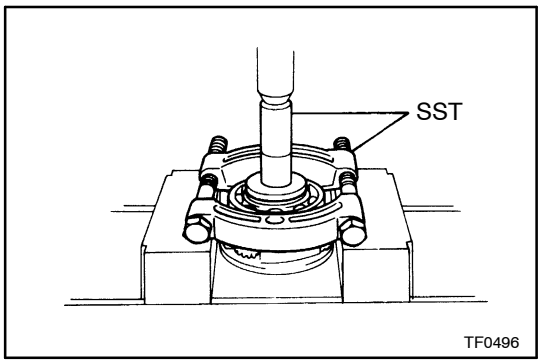
Maximum clearance: 0.038 mm (0.0015 in.)

If the clearance exceeds the limit, replace the planetary gear assembly.



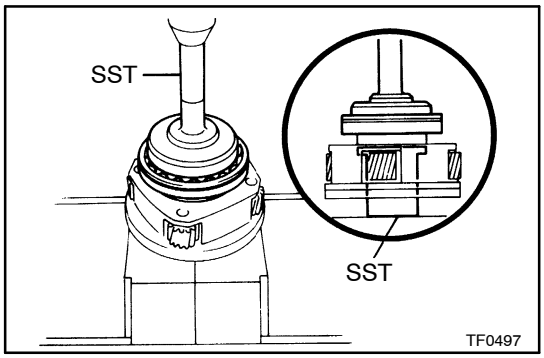
3. IF NECESSARY, REPLACE PLANETARY GEAR OUTER BEARING

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



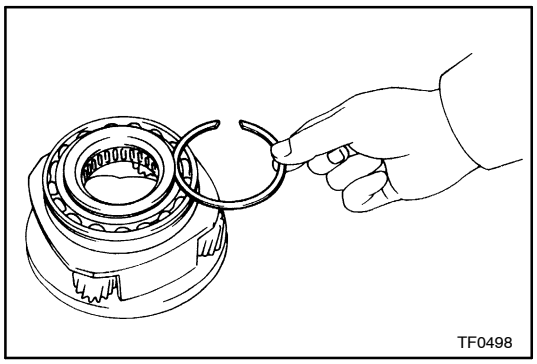
(b) Using SST and a press, remove the bearing.

SST 09554–30011 and 09555–55010



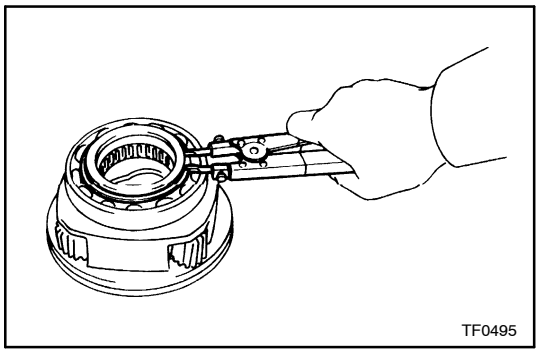
(c) Using SST and a press, install a new bearing with the outer race snap ring groove toward the front.

SST 09223–15010 and 09515–30010

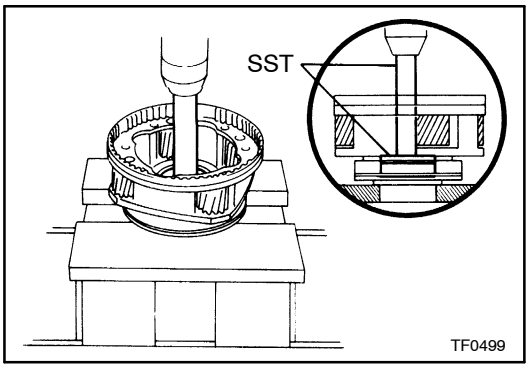


(d) Select a snap ring that will allow minimum axil play.

Mark	Thickness mm (in.)
1	1.45 – 1.50 (0.0571 – 0.0591)
2	1.50 – 1.55 (0.0591 – 0.0610)
3	1.55 – 1.60 (0.0610 – 0.0630)
4	1.60 – 1.65 (0.0630 – 0.0650)
5	1.65 – 1.70 (0.0650 – 0.0669)



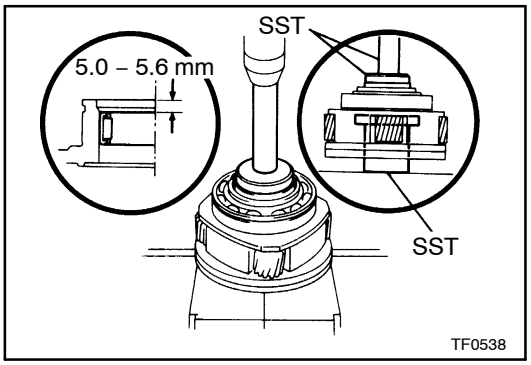
(e) Using snap ring pliers, install the snap ring.



4. IF NECESSARY, REPLACE PLANETARY GEAR INNER BEARING

(a) Using SST and a press, remove the bearing.

SST 09550–10012 (09252–10010, 09557–10010)



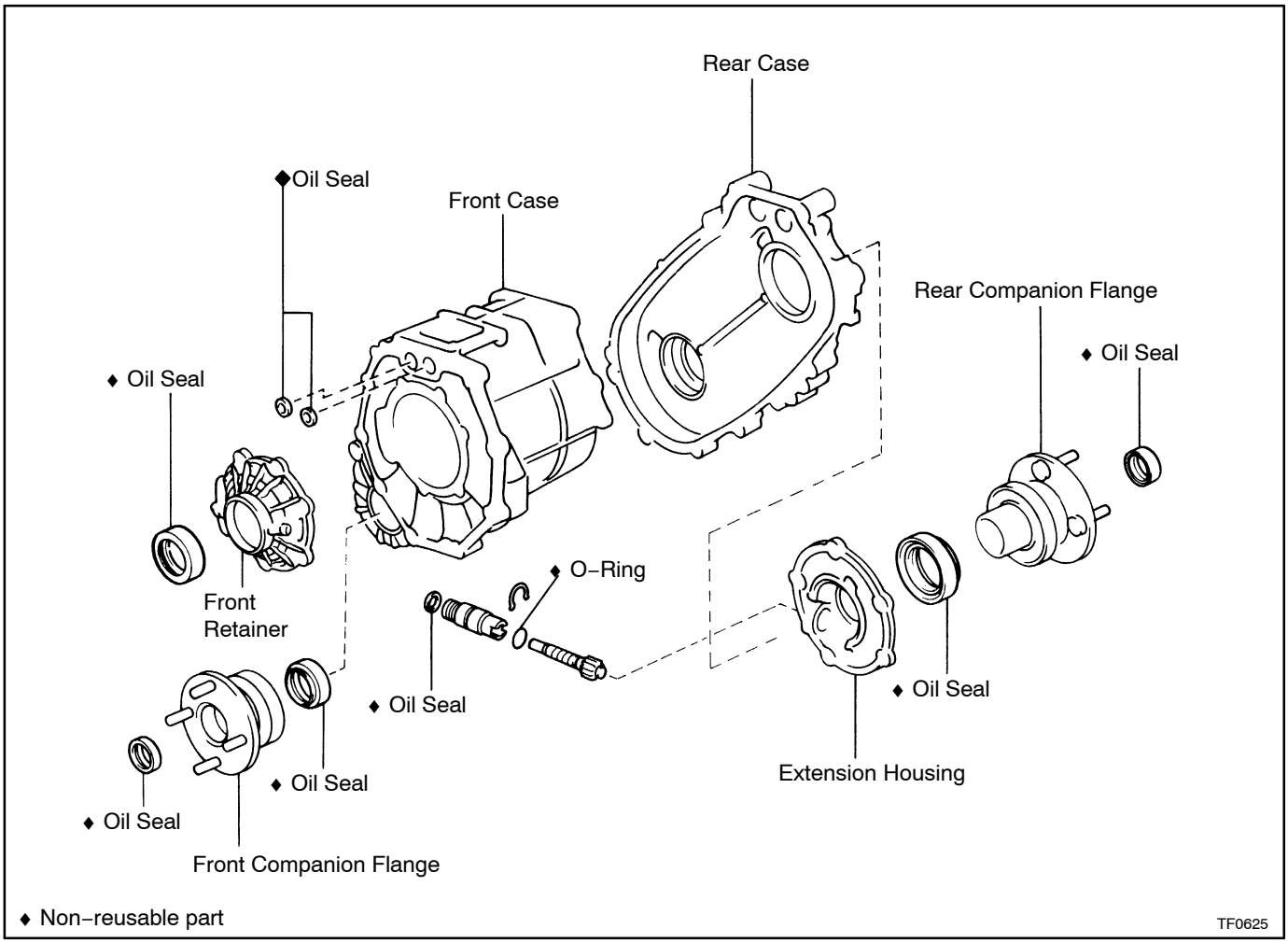
(b) Using SST and a press, install a new bearing.

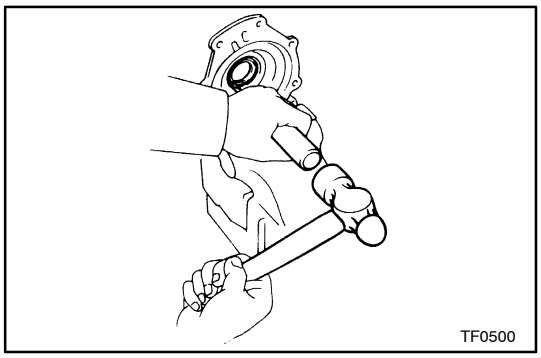
SST 09550–10012 (09252–10010, 09557–10010) and 09515–30010)

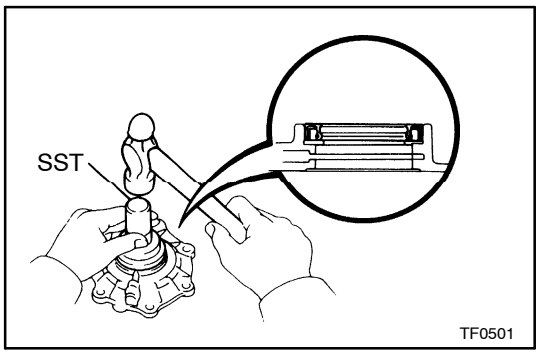
Bearing depth: 5.0 – 5.6 mm (0.197 – 0.220 in.)

Oil Seals

COMPONENTS







REPLACEMENT OF OIL SEALS

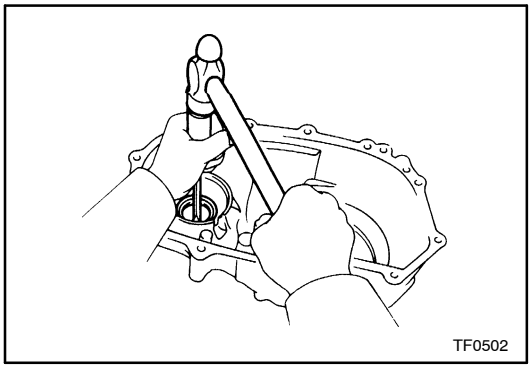
1. IF NECESSARY, REPLACE FRONT RETAINER OIL SEAL

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

(b) Using SST and a hammer, drive in a new oil seal until its surface is flush with the retainer upper surface.

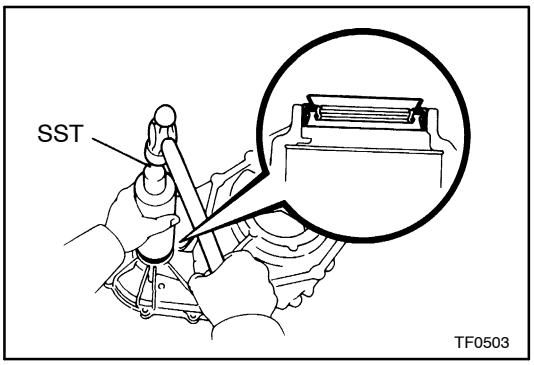
SST 09223–22010

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



2. IF NECESSARY, REPLACE FRONT CASE OIL SEAL

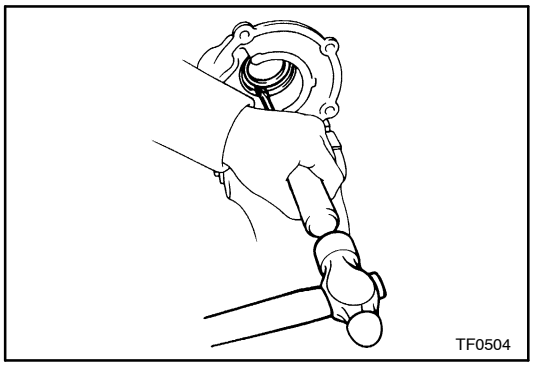
(a) Using a screwdriver and hammer, drive out the oil seal.



(b) Using SST and a hammer, drive in a new oil seal until its surface is flush with the case upper surface.

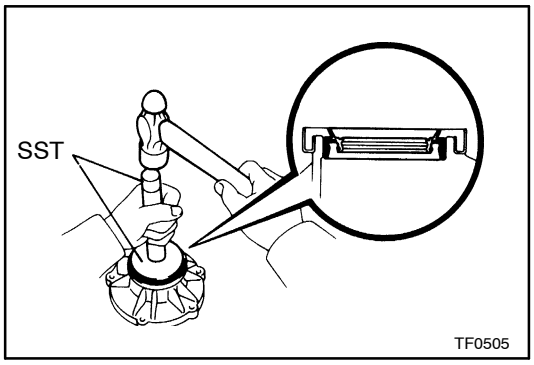
SST 09316–60010 (09316–00010)

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



3. IF NECESSARY, REPLACE EXTENSION HOUSING OIL SEAL

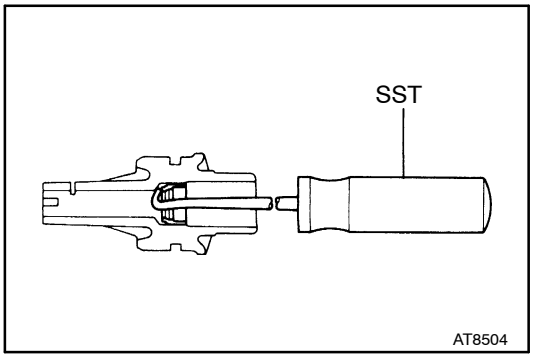
(a) Using a screwdriver and hammer, drive out the oil seal.



(b) Using SST and a hammer, drive in a new oil seal until its surface is flush with the housing upper surface.

SST 09550–22010 (09550–00020, 09550–00031)

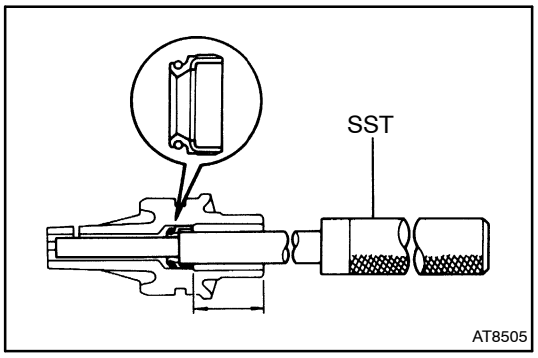
(c) Coat the lip of the oil seal with MP grease.



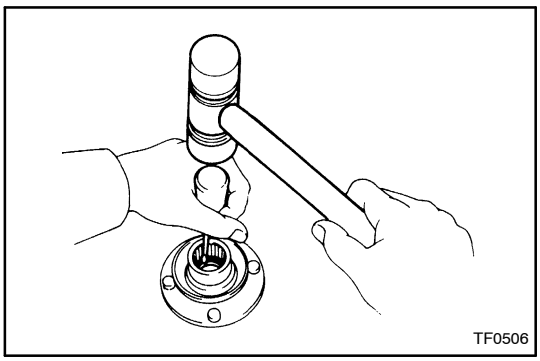
4. IF NECESSARY, REPLACE SPEEDOMETER DRIVEN GEAR OIL SEAL

(a) Using SST, pull out the oil seal.

SST 09921–00010

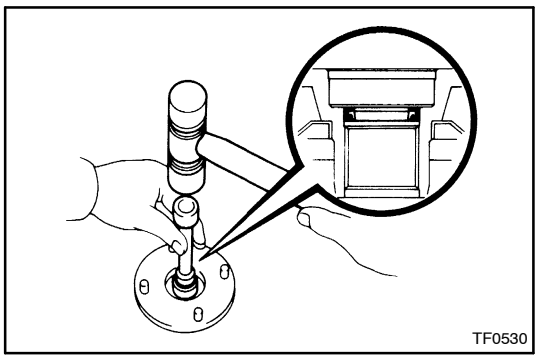


(b) Using SST, drive a new oil seal into the sleeve.
SST 09201–60011
Oil seal depth: 25 mm (0.98 in.)



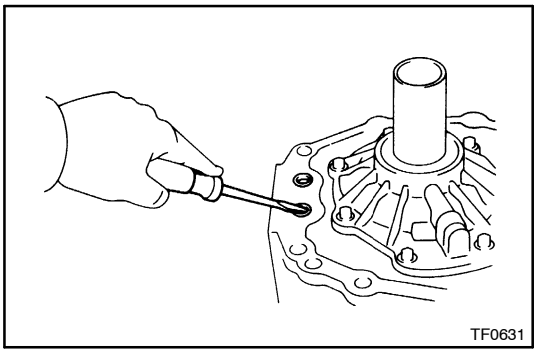
5. IF NECESSARY, REPLACE FRONT AND REAR COMPANION FLANGE OIL SEAL

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



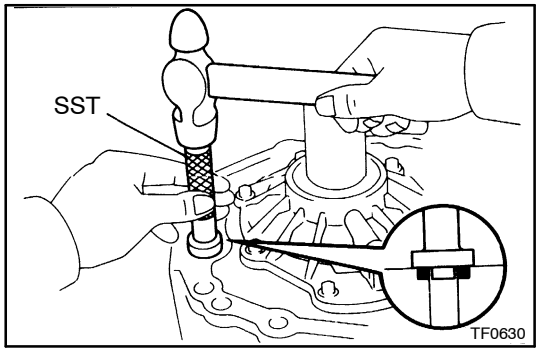
(b) Using a socket wrench and hammer, drive in a new oil seal.

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

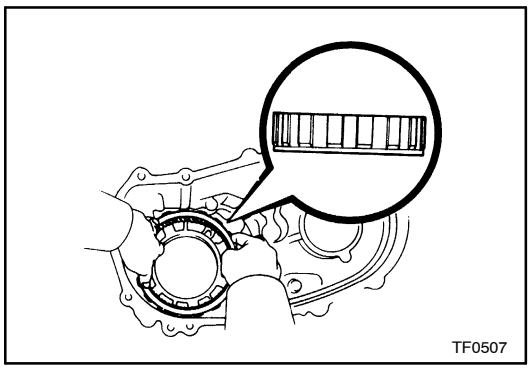


6. IF NECESSARY, REPLACE SHIFT FORK SHAFT OIL SEALS

(a) Using a screwdriver, pry out the oil seal.



(b) Using SST and a hammer, drive in a new oil seal.
SST 09304–12012
Oil seal depth: –0.5 – 0.5 mm (–0.0197 – 0.0197 in.)


TF0507

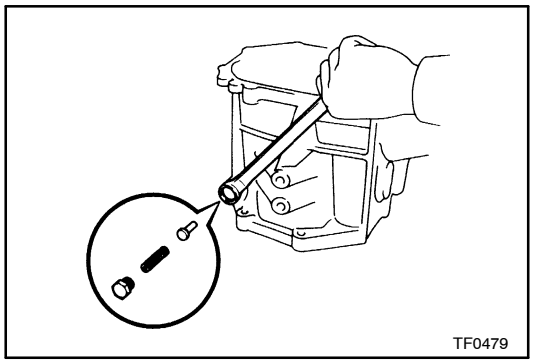
ASSEMBLY OF TRANSFER

(See page TF–3)

1. INSTALL PLANETARY RING GEAR

(a) Install the planetary ring gear to the front case.

HINT: Make sure to install the ring gear in the correct direction.


TF0479

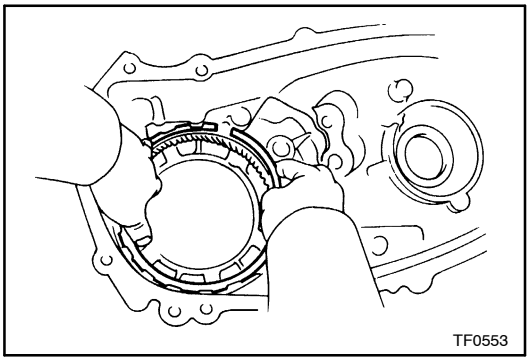
(b) Install the pin and spring.

(c) Apply liquid sealer to the plug.

Sealant: Part No. 08833 – 00080, THREE BOND 1344, LOCTITE 242 or equivalent

(d) Install and torque the plug.

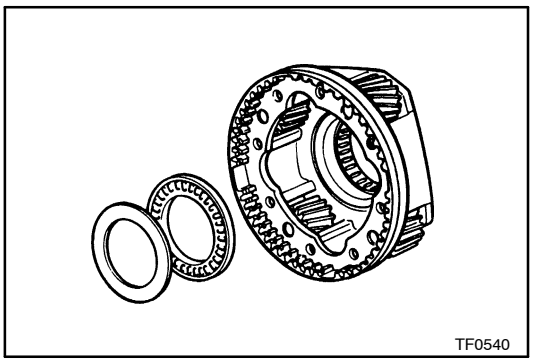
Torque: 190 kg–cm (14 ft–lb, 19 N–m)


TF0553

(e) Install the snap ring.

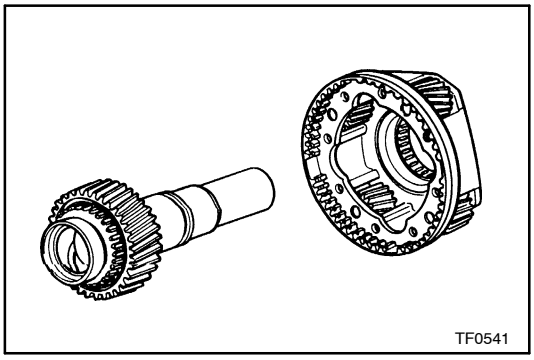
HINT: Be sure the end gap of the snap ring is not sligned with the upper side of the case.

2. INSTALL INPUT SHAFT TO PLANETARY GEAR ASSEMBLY

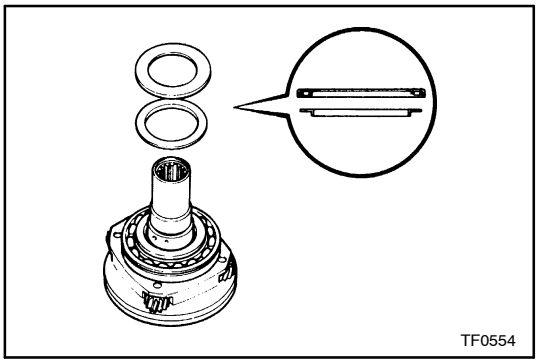

TF0540

(a) Apply gear oil to the thrust bearing and race.

(b) Install the race and thrust bearing.


TF0541

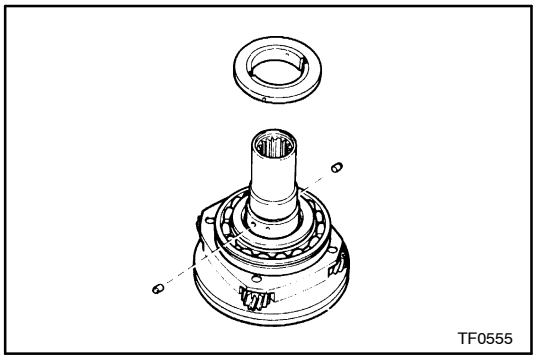
(c) Install the input shaft into the planetary gear assembly.


TF0554

3. INSTALL THRUST BEARING AND INPUT SHAFT STOPPER

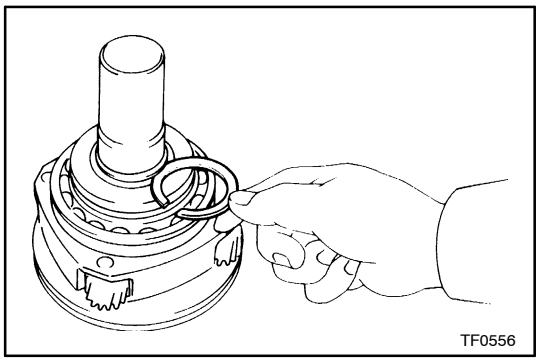
(a) Apply gear oil to the thrust bearing and race.

(b) Install the race and thrust bearing.


TF0555

(c) Install the two pins onto the input shaft.

(d) Install the input shaft stopper.

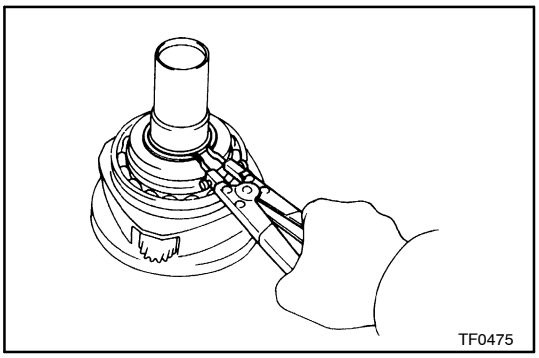

TF0556

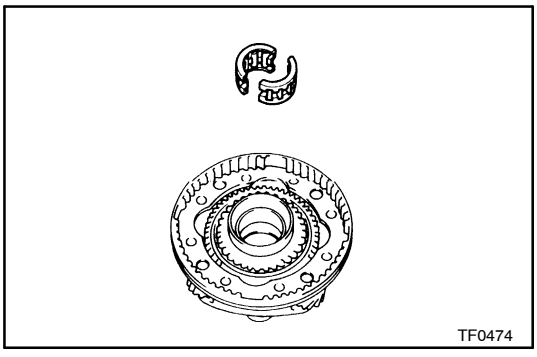
4. INSTALL SNAP RING

(a) Select a snap ring that will allow 0.05 – 0.15 mm (0.0020 – 0.0059 in.) axial play.

Mark	Thickness mm (in.)	Mark	Thickness mm (in.)
A	2.10 – 2.15 (0.0827 – 0.0846)	L	2.60 – 2.65 (0.1024 – 0.1043)
B	2.15 – 2.20 (0.0846 – 0.0866)	M	2.65 – 2.70 (0.1043 – 0.1063)
C	2.20 – 2.25 (0.0866 – 0.0886)	N	2.70 – 2.75 (0.1063 – 0.1083)
D	2.25 – 2.30 (0.0886 – 0.0906)	P	2.75 – 2.80 (0.1083 – 0.1102)
E	2.30 – 2.35 (0.0906 – 0.0925)	Q	2.80 – 2.85 (0.1102 – 0.1122)
F	2.35 – 2.40 (0.0925 – 0.0945)	R	2.85 – 2.90 (0.1122 – 0.1142)
G	2.40 – 2.45 (0.0945 – 0.0965)	S	2.90 – 2.95 (0.1142 – 0.1161)
H	2.45 – 2.50 (0.0965 – 0.0984)	T	2.95 – 3.00 (0.1161 – 0.1181)
J	2.50 – 2.55 (0.0984 – 0.1004)	U	3.00 – 3.05 (0.1181 – 0.1201)
K	2.55 – 2.60 (0.1004 – 0.1024)		

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

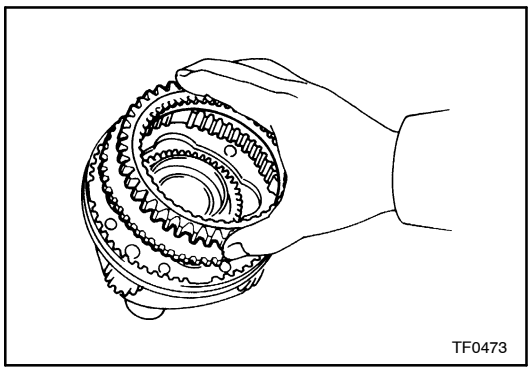

TF0475


TF0474

5. INSTALL NEEDLE ROLLER BEARING INTO INPUT SHAFT

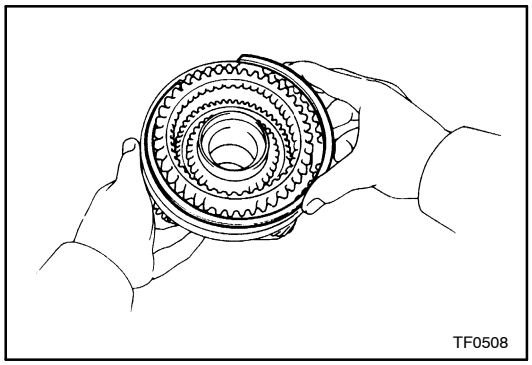
(a) Apply gear oil to the needle roller bearing.

(b) Install the needle roller bearing into the input shaft.


TF0473

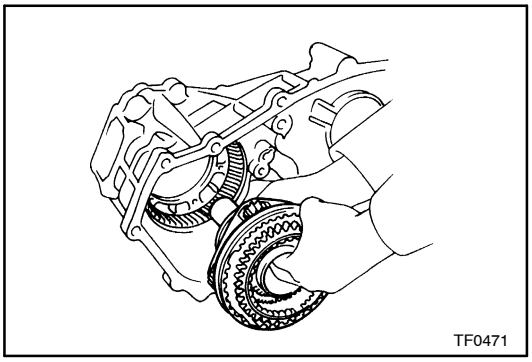
6. INSTALL LOW GEAR SPLINE PIECE

(a) Install the low gear spline piece to the planetary carrier.


TF0508

(b) Install the snap ring.

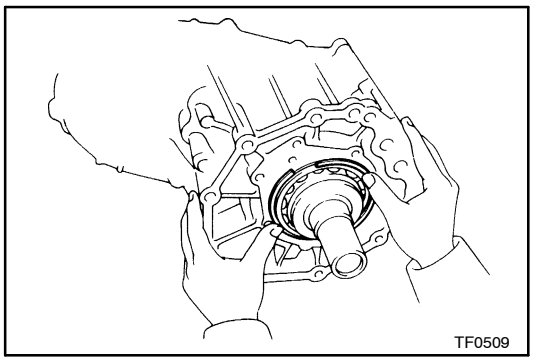
HINT: Be sure the end gap of the snap ring is not aligned with cutout portion of the planetary carrier.


TF0471

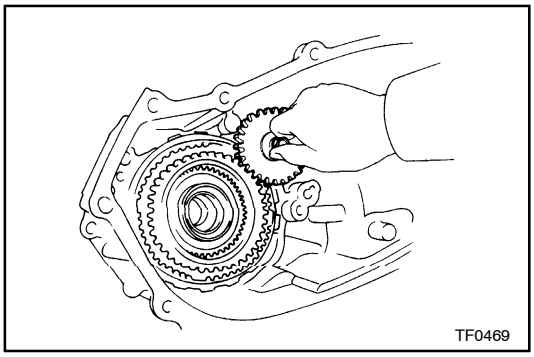
7. INSTALL PLANETARY GEAR ASSEMBLY TO FRONT CASE

(a) Install the planetary gear assembly with the input shaft.

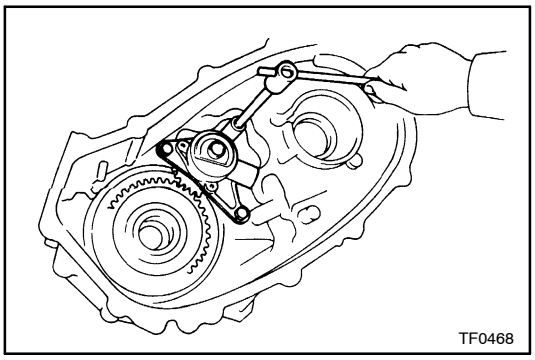
HINT: If necessary, heat the front case to about 70°C (158°F).


TF0509

(b) Install snap ring.


TF0469

8. INSTALL OIL PUMP DRIVE GEAR

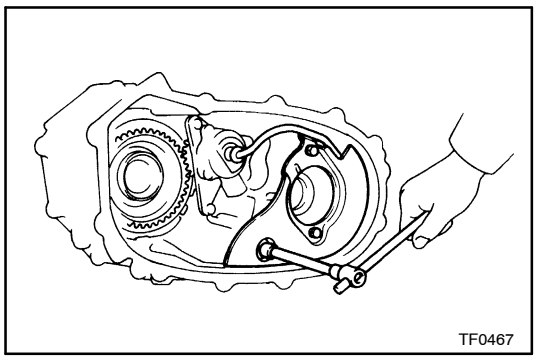

TF0468

9. INSTALL OIL PUMP BODY ASSEMBLY

(a) Install the oil pump body assembly.

(b) Install and torque the three bolts.

Torque: 115 kg–cm (8 ft–lb, 11 N–m)


TF0467

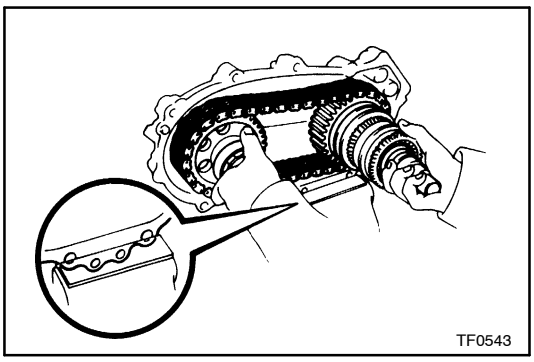
10. INSTALL SEPARATER WITH OIL STRAINER

(a) Coat a new O–ring with gear oil and install it to the oil strainer pipe.

(b) Install the separater with the oil strainer.

(c) Install and torque the three bolts.

Torque: 185 kg–cm (13 ft–lb, 18 N–m)


TF0543

11. INSTALL REAR OUTPUT SHAFT, DRIVEN SPROCKET AND CHAIN

(a) Assemble the rear output shaft, driven sprocket and chain.

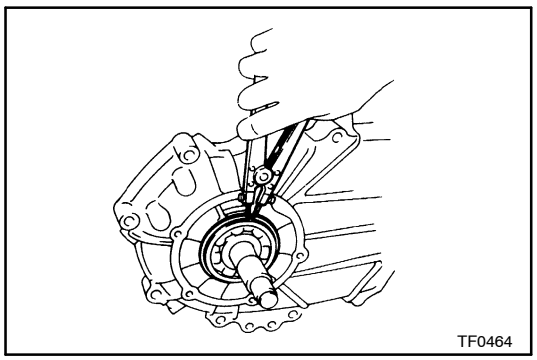
(b) Mount the rear case in the vise.

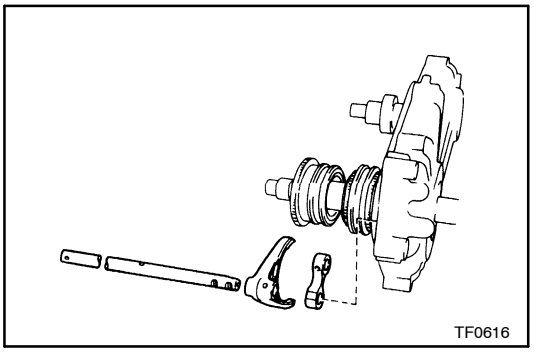
NOTICE: Be careful not to damage the sealing surface.

(c) Using a plastic hammer, tap the rear case with pushing the rear output shaft and driven sprocket.

HINT: If necessary, heat the rear case to about 70°C (158°F).

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

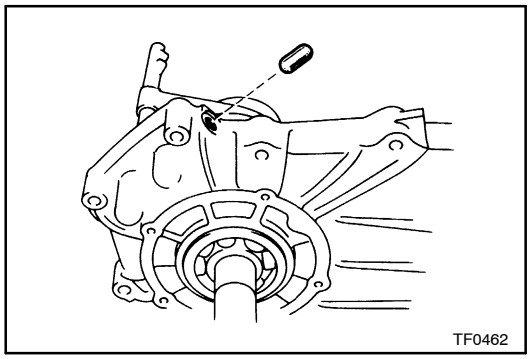

TF0464


TF0616

12. INSTALL HIGH AND LOW FORK SHAFT, FORK AND STOPPER

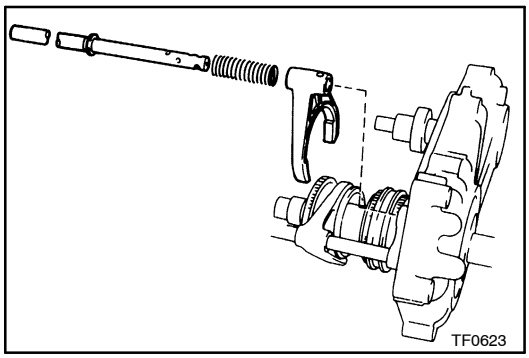
(a) Place the high and low shift fork into the groove of the hub sleeve.

HINT: Make sure to install the shift fork in the correct direction.



13. INSTALL FRONT DRIVE FORK SHAFT, FORK AND SPRING

(a) Apply gear oil to the straight pin, and insert it into the case hole.

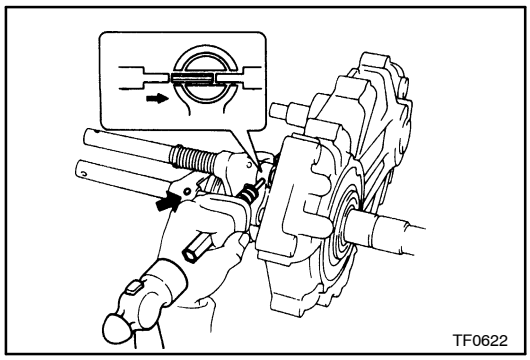


(b) Place the front drive shift fork into the groove of the hub sleeve.

HINT: Make sure to install the shift fork in the correct direction.

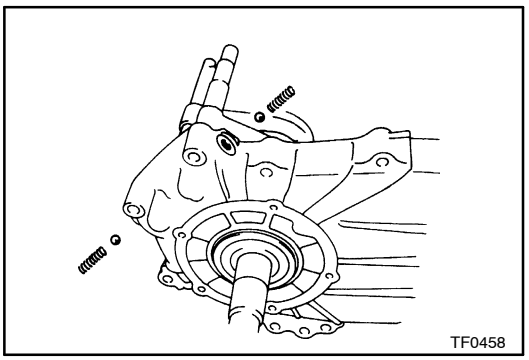
(c) Install the spring to the fork shaft.

(d) Install the fork shaft to the rear case through the shift fork and stopper.



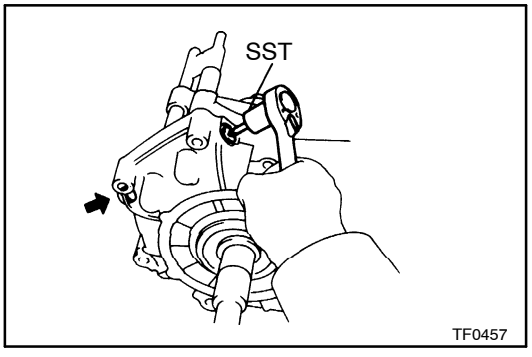
(e) Using a pin punch and hammer, drive in the two slotted spring pins.

HINT: When intalling the pin in the front drive fork shaft, push the shaft towards the rear case and install the pin while the spring is compressed.



14. INSTALL STRAIGHT SCREW PLUGS, SPRINGS AND LOCKING BALLS

(a) Install the ball and spring into the both holes.



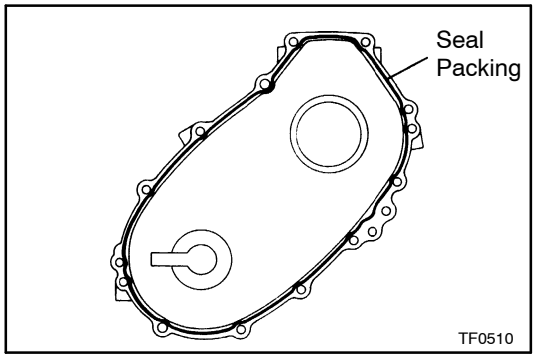
(b) Apply liquid sealer to the plugs.

Sealant: Part No. 08833 – 00080, THREE BOND 1344, LOCTITE 242 or equivalent

(c) Using SST, install and torque the two screws.

SST 09313–30021

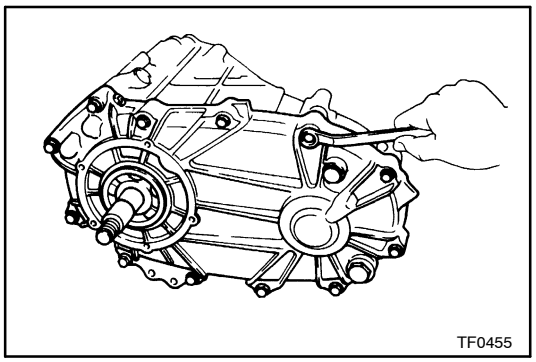
Torque: 190 kg–cm (14 ft–lb, 19 N–m)



15. ASSEMBLE FRONT CASE AND REAR CASE

(a) Apply seal packing to the rear case as shown in the figure.

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

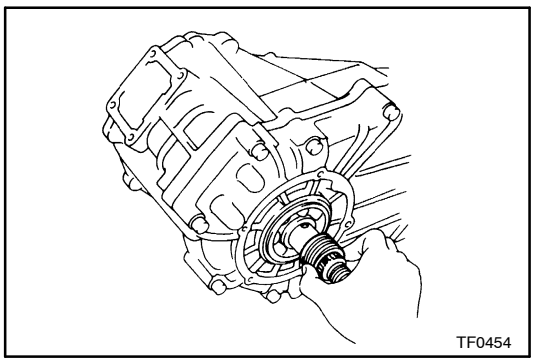


(b) Shift the high and low hub sleeve to low side (rear side).

(c) Assemble the front case and rear case.

(d) Install and torque the twelve bolts.

Torque: 380 kg–cm (17 ft–lb, 37 N–m)

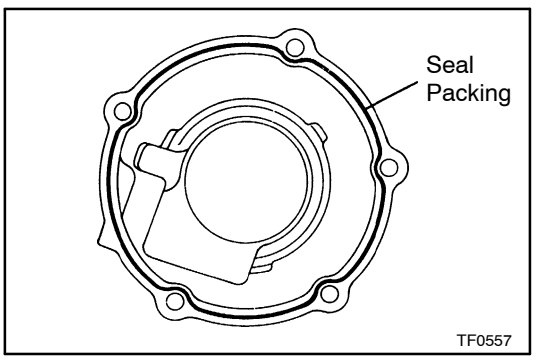


16. INSTALL SPEEDOMETER DRIVE GEAR

(a) Install the ball on the rear output shaft.

(b) Install the speedometer drive gear.

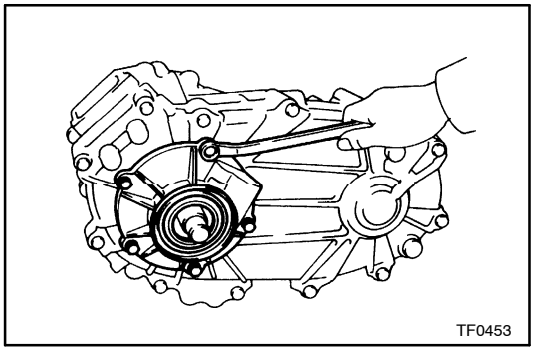
HINT: Make sure to install the speedometer drive gear in the correct direction.



17. INSTALL EXTENSION HOUSING

(a) Apply seal packing to the extension housing as shown in the figure.

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



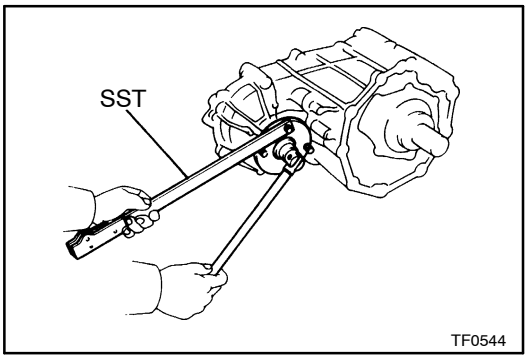
(b) Install the extension housing to the rear case.

(c) Apply liquid sealer to the bolts.

Sealer: Part No. 08833 – 00080, THREE BOND 1344, LOCTITE 242 or equivalent

(d) Install and torque the five bolts.

Torque: 115 kg–cm (8 ft–lb, 11 N–m)



18. INSTALL FRONT COMPANION FLANGE

HINT: Front companion flange bolts are silver.

(a) Apply gear oil to the companion flange inner surface.

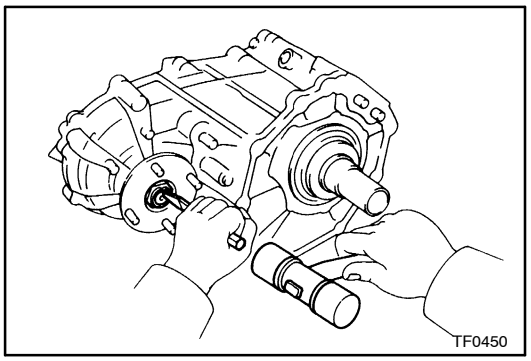
(b) Install the front companion flange to the driven sprocket shaft.

(c) Using SST to hold the flange, install the companion flange lock nut.

SST 09330–00021

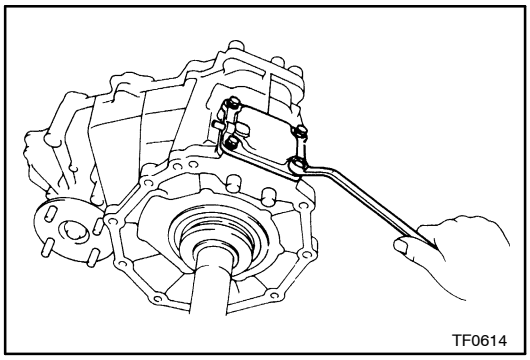
Torque: 1,200 kg–cm (87 ft–lb, 118 N–m)

(d) Stake the lock nut.



19. INSTALL REAR COMPANION FLANGE

HINT: Rear companion flange bolts are black.
Install the rear companion flange in the same way as the front companion flange.



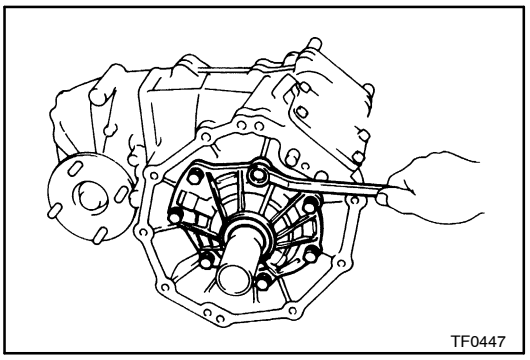
20. INSTALL UPPER COVER AND OIL DEFLECTOR

(a) Remove the gasket and install a new one to the case cover.

(b) Install the upper cover and oil deflector.

(c) Install and torque the four bolts.

Torque: 185 kg–cm (13 ft–lb, 18 N–m)



21. INSTALL FRONT RETAINER

(a) Remove the gasket and install anew one to the front retainer.

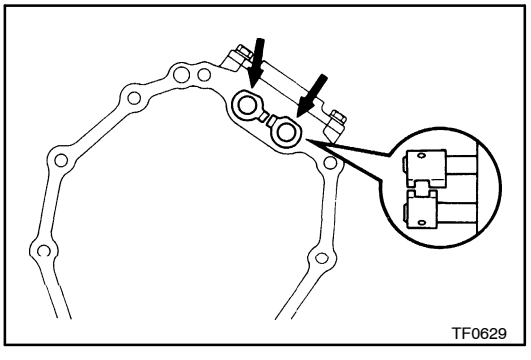
(b) Install the front retainer.

(c) Apply liquid seler to the bolts.

Sealer: Part No. 08833 – 00080, THREE BOND 1344, LOCTITE 242 or equivalent

(d) Install and torque the seven bolts.

Torque: 115 kg–cm (8 ft–lb, 11 N–m)



22. INSTALL SHIFT GEAR HEAD NO. 1 AND NO. 2

(a) Install two shift gear heads.

(b) Using a pin punch and hammer, drive in the two slotted spring pins.

23. CHECK FOLLOWING ITEMS:

(a) Check to see that the input shaft and output shafts rotate smoothly.

(b) Check to see that shifting can be made smoothly to all positions.

24. INSTALL TRANSFER INDICATOR SWITCH
Torque: 380 kg–cm (27 ft–lb, 37 N–m)

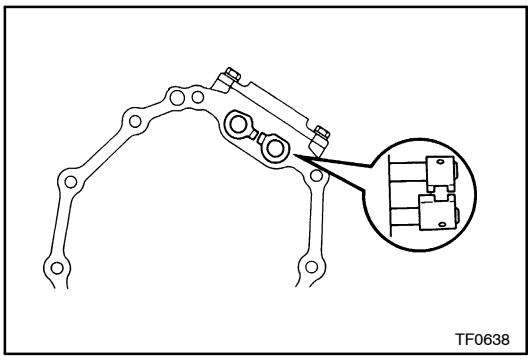
25. INSTALL SPEEDOMETER DRIVEN GEAR

(a) Install speedometer driven gear.

(b) Install lock plate and bolt, and torque the bolt.
Torque: 115 kg–cm (8 ft–lb, 11 N–m)

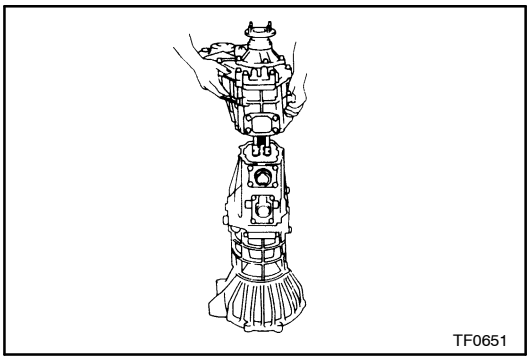
26. INSTALL TRANSFER L4 POSITION SWITCH
Torque: 380 kg–cm (27 ft–lb, 37 N–m)

INSTALLATION OF TRANSFER



1. INSTALL TRANSFER AND PROPELLER SHAFT UPPER DUST COVER TO TRANSMISSION WITH NEW GASKET

(a) Shift the two shift fork shafts to the high–four position.

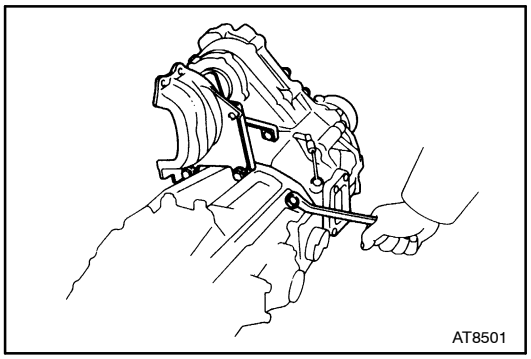


(b) Apply MP grease to the adaptor oil seal.

(c) Place a new gasket to the transfer adaptor.

(d) Install the transfer to the transmission.

HINT: Take care not to damage the oil seal by the input gear spline when installing the transfer.

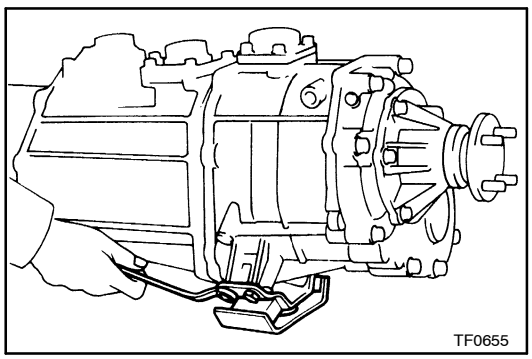


(e) Install and torque the bolts with the propeller shaft upper dust cover.

Torque: 380 kg–cm (27 ft–lb, 37 N–m)

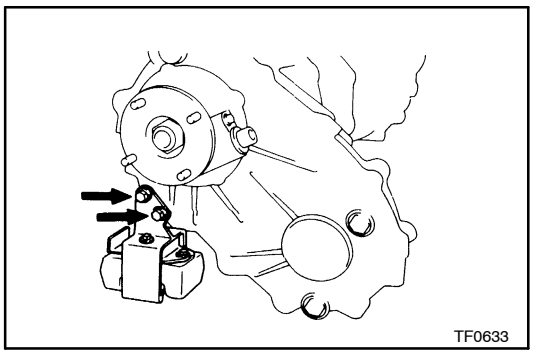
(f) Install the dust cover bolt to the bracket.

Torque: 230 kg–cm (17 ft–lb, 23 N–m)



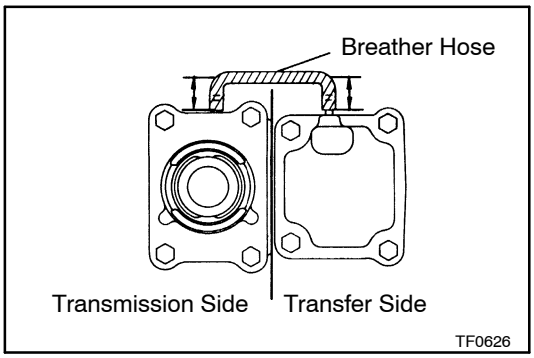
2. INSTALL ENGINE REAR MOUNTING

Torque: 260 kg–cm (19 ft–lb, 25 N–m)



3. INSTALL DYNAMIC DAMPER

Torque: 380 kg–cm (27 ft–lb, 37 N–m)



4. INSTALL BREATHER HOSE

Connect the breather hose for transfer upper cover and transmission control retainer as shown.

Hose depth: 13 mm (0.51 in.)

AUTOMATIC TRANSMISSION (A340E)

Service Data

Oil pump	Body clearance	STD	0.07 – 0.15 mm	0.0028 – 0.0059 in.
		Limit	0.3 mm	0.012 in.
	Tip clearance	STD	0.11 – 0.14 mm	0.0043 – 0.0055 in.
		Limit	0.3 mm	0.012 in.
	Side clearance	STD	0.02 – 0.05 mm	0.0008 – 0.0020 in.
		Limit	0.1 mm	0.004 in.
Bushing bore	Oil pump body	Limit	38.19 mm	1.5035 in.
	Stator shaft (FR)	Limit	21.58 mm	0.8496 in.
	(RR)	Limit	27.08 mm	1.0661 in.
	O/D direct clutch drum	Limit	27.11 mm	1.0673 in.
	O/D planetary gear	Limit	11.27 mm	0.4437 in.
	Direct clutch drum	Limit	53.99 mm	2.1256 in.
	Forward clutch drum	Limit	24.08 mm	0.9480 in.
	Front planetary ring gear	Limit	24.08 mm	0.9480 in.
	Planetary sun gear	Limit	27.08 mm	1.0661 in.
	Transmission case	Limit	38.19 mm	1.5035 in.
	Extension housing	Limit	40.09 mm	1.5783 in.
Planetary pinion gear thrust clearance	O/D planetary gear	STD	0.20 – 0.60 mm	0.0079 – 0.0236 in.
		Limit	1.00 mm	0.0394 in.
	Front planetary gear	STD	0.20 – 0.60 mm	0.0079 – 0.0236 in.
		Limit	1.00 mm	0.0394 in.
	Rear planetary gear	STD	0.20 – 0.60 mm	0.0079 – 0.0236 in.
		Limit	1.00 mm	0.0394 in.
Flange thickness	O/D direct clutch (C_0)	No. 21	3.1 mm	0.122 in.
		No. 20	3.2 mm	0.126 in.
		No. 19	3.3 mm	0.130 in.
		No. 18	3.4 mm	0.134 in.
		No. 17	3.5 mm	0.138 in.
		No. 16	3.6 mm	0.142 in.
	Direct clutch (C_2)	No. 33	3.0 mm	0.118 in.
		No. 32	3.1 mm	0.122 in.
		No. 31	3.2 mm	0.126 in.
		No. 30	3.3 mm	0.130 in.
		No. 29	3.4 mm	0.134 in.
		No. 28	3.5 mm	0.138 in.
		No. 27	3.6 mm	0.142 in.
		No. 34	3.7 mm	0.146 in.
	O/D brake (B_0)	No. 26	3.3 mm	0.130 in.
		No. 25	3.5 mm	0.138 in.
		No. 12	3.6 mm	0.142 in.
		No. 24	3.7 mm	0.146 in.
		No. 11	3.8 mm	0.150 in.
		No. 23	3.9 mm	0.154 in.
		None	4.0 mm	0.157 in.

Service Data (Cont'd)

Flange thickness	Forward clutch (C_1)	No. 61	3.0 mm	0.118 in.
		No. 60	3.2 mm	0.126 in.
		No. 45	3.4 mm	0.134 in.
		No. 62	3.6 mm	0.142 in.
		No. 44	3.8 mm	0.150 in.
		No. 42	4.0 mm	0.157 in.
		No. 63	4.2 mm	0.165 in.
		No. 64	4.4 mm	0.173 in.
	First and reverse brake (B_3)	No. 50	5.0 mm	0.197 in.
		No. 51	4.8 mm	0.189 in.
		No. 52	4.6 mm	0.181 in.
		No. 53	4.4 mm	0.173 in.
		No. 54	4.2 mm	0.165 in.
		No. 55	4.0 mm	0.157 in.
Clutch piston stroke	O/D direct clutch (C_0)		1.85 – 2.15 mm	0.0728 – 0.0846 in.
	Direct clutch (C_2)	2WD	1.37 – 1.60 mm	0.0539 – 0.0630 in.
		4WD	1.37 – 1.67 mm	0.0539 – 0.0657 in.
Brake piston stroke	O/D brake (B_0)		1.40 – 1.70 mm	0.0551 – 0.0669 in.
	Second coast brake (B_1)		1.5 – 3.0 mm	0.059 – 0.118 in.
Brake pack clearance	Second brake (B_2)		0.62 – 1.98 mm	0.0244 – 0.0780 in.
	Forward clutch (C_1)		0.50 – 0.90 mm	0.0197 – 0.0354 in.
	First and reverse brake (B_3)	2WD	0.59 – 1.87 mm	0.0232 – 0.0736 in.
		4WD	0.58 – 1.93 mm	0.0228 – 0.0760 in.

Valve body spring

	Free length mm (in.)	Coil outer diameter mm (in.)	Total No. of coils	Color
(Upper valve body)				
Down–shift plug	27.3 (1.075)	8.7 (0.343)	12.5	Yellow
Throttle valve	20.6 (0.811)	9.2 (0.362)	9.5	Blue
	or 23.3 (0.917)	9.2 (0.362)	9.5	White
3–4 shift valve	30.8 (1.213)	9.7 (0.382)	10.5	Purple
Second coast modulator valve	25.3 (0.996)	8.6 (0.339)	11.5	Orange
Lock–up relay valve	21.4 (0.843)	5.5 (0.217)	17.5	Light Gray
Secondary regulator valve	30.9 (1.217)	11.2 (0.441)	10.5	Blue
Cut–back valve	21.8 (0.858)	6.0 (0.236)	13.5	Red
2–3 shift valve	30.8 (1.213)	9.7 (0.382)	10.5	Purple
Low coast modulator valve	30.4 (1.197)	8.3 (0.327)	10.5	Light Green
(Lower valve body)				
Check valve	20.2 (0.795)	12.1 (0.476)	6.5	None
1–2 shift valve	30.8 (1.213)	9.7 (0.382)	10.5	Purple
Primary regulator valve	TRUCK, 4RUNNER (3VZ–E)			
	SUPRA (7M–GTE)			
	62.3 (2.453)	18.6 (0.732)	12.5	None
	CRESSIDA, TRUCK 4RUNNER (22R–E)			
	66.7 (2.626)	18.6 (0.732)	12.5	Purple
	Others			
	66.7 (2.626)	18.6 (0.732)	12.5	None
Accumulator control valve	33.9 (1.335)	8.8 (0.364)	12.0	Pink

Service Data (Cont'd)

Output shaft thrust play			0.27 – 0.86 mm	0.0106 – 0.0339 in.	
Second coast brake piston rod length			71.4 mm 72.9 mm	2.811 in. 2.870 in.	
Accumulator piston spring			Free length mm (in.)	Coil outer diameter mm (in.)	Color
	B_2	Upper	70.5 (2.776)	19.7 (0.776)	Yellow
		Lower	—	—	—
	C_2	Upper (Outer)	68.5 (2.697)	20.2 (0.795)	Blue
		Upper (Inner)	—	—	—
		Lower	—	—	—
	B_0	—	66.0 (2.598)	16.1 (0.634)	Purple
	C_0	Outer	74.6 (2.937)	20.3 (0.799)	Yellow
		Inner	46.0 (1.811)	14.0 (0.551)	Yellow

Torque Specifications

Part tightened		kg–cm	ft–lb	N–m
Transmission housing × Transmission case	10 mm	345	25	34
	12 mm	580	42	57
Extension housing × Transmission case		370	27	36
Parking lock pawl bracket		75	65 in.–lb	7.4
O/D support × Transmission case		260	19	25
Oil pump × Transmission case		220	16	22
Oil pump body × Stator shaft		100	7	10
Valve body × Transmission case		100	7	10
Upper valve body × Lower valve body		65	56 in.–lb	6.4
Detent spring × Valve body		100	7	10
Solenoid × Valve body		100	7	10
Oil strainer		100	7	10
Oil pan		75	65 in.–lb	7.4
Speed sensor		160	12	16
Speedometer driven gear lock plate		160	12	16
Cooler union		300	22	29
Neutral start switch	Bolt	130	9	13
	Nut	70	61 in.–lb	6.9
Control shaft lever		160	12	16

AUTOMATIC TRANSMISSION (A340F)

Service Data

Brake pack clearance	First and reverse brake (B_2)		0.50 – 1.02 mm	0.0197 – 0.0402 in.
Accumulator piston spring		Free length mm (in.)	Coil outer diameter mm (in.)	Color
	B_2	70.5 (2.776)	19.7 (0.776)	Yellow
	C_2	68.5 (2.698)	20.2 (0.795)	Blue
	B_0	69.7 (2.744)	16.7 (0.657)	Light Green
	C_0	67.0 (2.638)	17.8 (0.701)	White

Service Data/Torque Specifications (Refers to the A340E automatic transmission)

AUTOMATIC TRANSMISSION (A340H)

Service Data

Transmission

Service Data/Torque Specifications (Refer to the A340E automatic transmission)

Transfer

Service Data

Valve body spring	Spring	Free length mm (in.)	Coil outer diameter mm (in.)	Total No. of coils	Color
	(Upper valve body)				
	Direct clutch accumulator valve	55.7 (2.193)	18.3 (0.720)	11.1	Blue
	(Center valve body)				
	Low shift valve	29.2 (1.150)	8.2 (0.323)	13.0	Yellow
	Low–high relay valve	31.7 (1.248)	8.5 (0.335)	11.2	Light Blue
	Accumulator control valve	29.3 (1.154)	8.2 (0.323)	11.8	White
	(Lower valve body)				
	Low–high shift timing valve	31.7 (1.248)	8.6 (0.339)	9.0	Red
	Low–high orifice control valve	29.7 (1.169)	9.0 (0.354)	12.3	Green
Accumulator piston spring	B_4 accumulator piston	66.5 (2.618)	19.0 (0.748)	—	Pink

Clutch piston stroke	Direct clutch (C_3)		2.28 – 2.68 mm	0.0898 – 0.1055 in.
	Front drive clutch (C_4)		2.38 – 3.22 mm	0.0937 – 0.1268 in.
Brake pack clearance	Low speed brake (B_4)		0.91 – 2.10 mm	0.0358 – 0.0827 in.
Bushing bore	Direct clutch drum	Limit	47.65 mm	1.8760 in.
	Center support	Limit	35.08 mm	1.3811 in.
	Front support	Limit	31.35 mm	1.2342 in.
	Ring gear flange	Limit	35.08 mm	1.3811 in.
	Planetary gear	Limit	18.08 mm	0.7118 in.

Service Data (Cont'd)

Planetary pinion gear thrust clearance		STD	0.30 – 0.60 mm	0.0118 – 0.0236 in.
		Limit	1.00 mm	0.0394 in.
Oil pump	Body clearance	STD	0.07 – 0.15 mm	0.0028 – 0.0059 in.
		Limit	0.3 mm	0.012 in.
	Tip clearance	STD	0.15 – 0.42 mm	0.0059 – 0.0165 in.
		Limit	0.6 mm	0.024 in.
	Side clearance	STD	0.04 – 0.15 mm	0.0016 – 0.0059 in.
		Limit	0.3 mm	0.012 in.
Flange thickness	Direct clutch (C_3)		3.9 mm	0.154 in.
			4.1 mm	0.161 in.
			4.3 mm	0.169 in.
			4.5 mm	0.177 in.
	Low speed brake (B_4)		3.8 mm	0.150 in.
			4.0 mm	0.157 in.
			4.2 mm	0.165 in.
			4.4 mm	0.173 in.
			4.6 mm	0.181 in.

Torque Specifications

Part tightened		kg–cm	ft–lg	N–m
Extension housing × Chain rear case		345	25	34
Chain rear case × Chain front case		345	25	34
Chain front case × Transfer case		345	25	34
Transfer case × Transmission case		345	25	34
Valve body × Transfer case		100	7	10
Front support × Transfer case		345	25	34
Transfer oil pump × Chain rear case		160	12	16
Transfer chain oil receiver × Chain front case		100	7	10
Oil strainer × Chain rear case		70	61 in.–lb	6.9
Oil pump body × Oil pump cover		100	7	10
Front and rear companion flanges		1,250	90	123
Oil pan × Transfer case		75	65 in.–lb	7.4
No. 4 solenoid × Valve body		100	7	10
Transfer pressure switch × Valve body		70	61 in.–lb	6.9
Detent spring × Valve body		70	61 in.–lb	6.9
Parking lock pawl bracket		70	61 in.–lb	6.9
Cooler union		300	22	29
Transfer oil cooler tube union nut		350	25	34
Transfer position switch	Bolt	130	9	13
	Nut	40	35 in.–lb	3.9
Control shaft lever		160	12	16
Fluid temperature sensor		150	11	15

TRANSFER (A340F)

Service Data

Oil pump body	Body clearance	STD	0.10 – 0.16 mm	0.0039 – 0.0063 in.
		Limit	0.16 mm	0.0063 in.
	Tip clearance	STD	0.08 – 0.16 mm	0.0031 – 0.0063 in.
		Limit	0.16 mm	0.0063 in.
	Side clearance	STD	0.03 – 0.08 mm	0.0012 – 0.0031 in.
		Limit	0.08 mm	0.0031 in.
Rear output shaft assembly	Drive sprocket thrust clearance	STD	0.10 – 0.25 mm	0.0039 – 0.0098 in.
		Limit	0.25 mm	0.0098 in.
	Driven sprocket oil clearance	STD	0.010 – 0.055 mm	0.0004 – 0.0022 in.
		Limit	0.055 mm	0.0022 in.
	Rear output shaft journal diameter			
	Part A	Limit	27.98 mm	1.1016 in.
	Part B	Limit	36.98 mm	1.4559 in.
	Front drive shift fork to hub sleeve clearance	Limit	1.0 mm	0.039 in.
	High and low shift fork to hub sleeve clearance	Limit	1.0 mm	0.039 in.
	Rear output shaft snap ring thickness			
		Mark		
		A	2.10 – 2.15 mm	0.0827 – 0.0846 in.
		B	2.15 – 2.20 mm	0.0846 – 0.0866 in.
		C	2.20 – 2.25 mm	0.0866 – 0.0886 in.
		D	2.25 – 2.30 mm	0.0886 – 0.0906 in.
		E	2.30 – 2.35 mm	0.0906 – 0.0925 in.
		F	2.35 – 2.40 mm	0.0925 – 0.0945 in.
		G	2.40 – 2.45 mm	0.0945 – 0.0965 in.
		H	2.45 – 2.50 mm	0.0965 – 0.0984 in.
		J	2.50 – 2.55 mm	0.0984 – 0.1004 in.
		K	2.00 – 2.05 mm	0.0787 – 0.0807 in.
		L	2.05 – 2.10 mm	0.0807 – 0.0827 in.
Input shaft	Input shaft journal outer diameter	Limit	47.59 mm	1.8736 in.
	Input shaft bushing diameter	Limit	39.14 mm	1.5409 in.
	Synchronizer ring to sprocket clearance	STD	1.15 – 1.85 mm	0.0453 – 0.0728 in.
		Limit	0.8 mm	0.0031 in.
	Input shaft snap ring thickness	Mark		
		A	2.10 – 2.15 mm	0.0827 – 0.0846 in.
		B	2.15 – 2.20 mm	0.0846 – 0.0866 in.
		C	2.20 – 2.25 mm	0.0866 – 0.0886 in
		D	2.25 – 2.30 mm	0.0886 – 0.0906 in.
		E	2.30 – 2.35 mm	0.0906 – 0.0925 in.
		F	2.35 – 2.40 mm	0.0925 – 0.0945 in.
		G	2.40 – 2.45 mm	0.0945 – 0.0965 in.
		H	2.45 – 2.50 mm	0.0965 – 0.0984 in.
		J	2.50 – 2.55 mm	0.0984 – 0.1004 in.
		K	2.55 – 2.60 mm	0.1004 – 0.1024 in.
		L	2.60 – 2.65 mm	0.1024 – 0.1043 in.

Service Data (Cont'd)

Input Shaft (Cont'd)		M	2.65 – 2.70 mm	0.1043 – 0.1063 in.
		N	2.70 – 2.75 mm	0.1063 – 0.1083 in.
		P	2.75 – 2.80 mm	0.1083 – 0.1102 in.
		Q	2.80 – 2.85 mm	0.1102 – 0.1122 in.
		R	2.85 – 2.90 mm	0.1122 – 0.1142 in.
		S	2.90 – 2.95 mm	0.1142 – 0.1161 in.
		T	2.95 – 3.00 mm	0.1161 – 0.1181 in.
		U	3.00 – 3.05 mm	0.1181 – 0.1201 in.
Planetary gear	Pinion gear thrust clearance	STD	0.11 – 0.86 mm	0.0043 – 0.0339 in.
		Limit	0.86 mm	0.0339 in.
	Pinion gear oil clearance	STD	0.009 – 0.038 mm	0.0004 – 0.0015 in.
		Limit	0.038 mm	0.0015 in.
	Outer bearing snap ring thickness	Mark		
		1	1.45 – 1.50 mm	0.0571 – 0.0591 in.
		2	1.50 – 1.55 mm	0.0591 – 0.0610 in.
		3	1.55 – 1.60 mm	0.0610 – 0.0630 in.
		4	1.60 – 1.65 mm	0.0630 – 0.0650 in.
		5	1.65 – 1.70 mm	0.0650 – 0.0669 in.
	Inner bearing depth		5.0 – 5.6 mm	0.197 – 0.220 in.
Oil seal	Speedometer driven gear oil seal depth		25 mm	0.98 in.
	Shift fork shaft oil seal depth		–0.5 – 0.5 mm	–0.020 – 0.020 in.

Torque Specifications

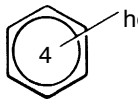
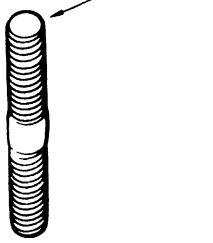
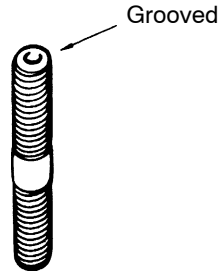
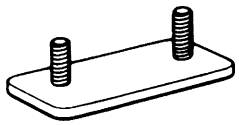
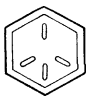
Part tightened	kg–cm	ft–lg	N–m
Oil pump plate	75	65 in.–lb	7.4
Straight screw plug for oil pump body	300	22	29
Straight screw plug for ring gear	190	14	19
Oil pump body × Front case	115	8	11
Separater with oil strainer	185	13	18
Straight screw plug for shift fork shaft	190	14	19
Front case × Rear case	380	27	37
Extension housing	115	8	11
Companion flange lock nut	1,200	87	118
Control retainer or upper cover	185	13	18
Front retainer	115	8	11
Transfer indicator switch	380	27	37
Transfer assembly × Transmission	380	27	37
Transfer L4 position switch	380	27	37
Transfer × Transfer adaptor	380	27	37
Engine rear mounting	260	19	25
Transfer × Dynamic damper (Regular cab w/ Planetary gear type transfer)	380	27	37

LUBRICANT

Item		Capacity			Classification
		Liters	US qts	Imp. qts	
A340E	Dry fill	7.2	7.6	6.3	DEXRON®II
	Drain and refill	1.6	1.7	1.4	
A340H					
(Transmission)	Dry fill	10.3	10.9	9.1	
	Drain and refill	4.5	4.8	4.0	
(Transfer)	Dry fill	1.1	1.2	1.0	
	Drain and refill	0.8	0.8	0.7	
A340F	Dry fill	7.6	8.0	6.7	
	Drain and refill	1.6	1.7	1.4	
Transfer oil		1.1	1.2	1.0	API GL–4 or GL–5 SAE 75W–90

STANDARD BOLT TORQUE SPECIFICATIONS

HOW TO DETERMINE BOLT STRENGTH

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

SPECIFIED TORQUE FOR STANDARD BOLTS

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